NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

BUDGET ESTIMATES

FISCAL YEAR 2015

CONGRESSIONAL SUBMISSION

PRIVILEGED

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Budget Estimates, Fiscal Year 2015
Congressional Justification

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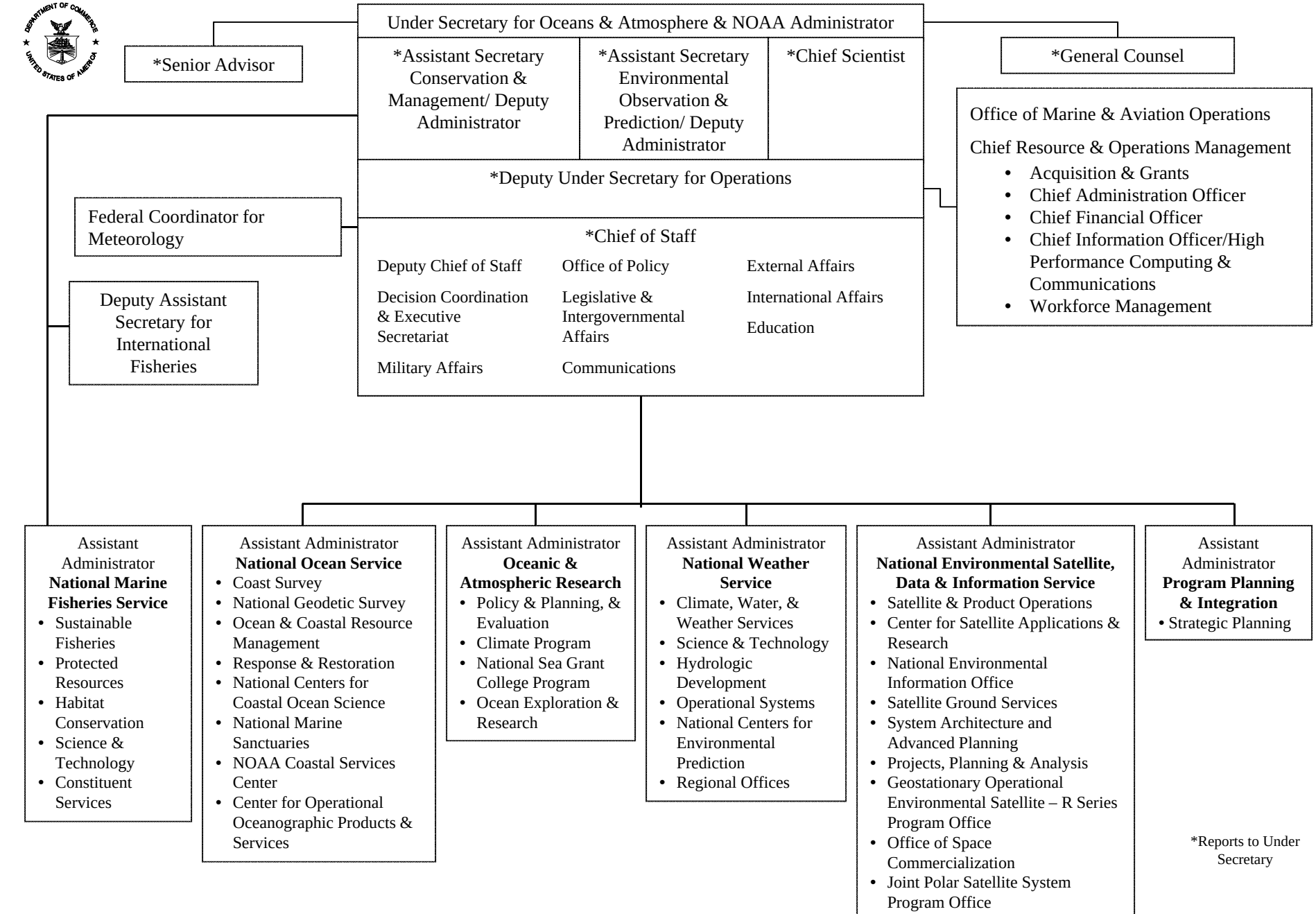
National Oceanic & Atmospheric Administration



EXECUTIVE SUMMARY

Introduction

For Fiscal Year (FY) 2015, the National Oceanic and Atmospheric Administration (NOAA) proposes a budget of $5,496.7 million, an increase of $174.1 million, or 3.2 percent above the FY 2014 Enacted. This request will enable NOAA to make critical investments in infrastructure, services, and innovations and will put the agency in a solid position to protect lives and property, enhance human health, sustain vibrant marine and coastal ecosystems, and spur economic development. This allowance will put NOAA on the right path to advancing some of our top priority areas for FY 2015 to: begin to evolve the National Weather Service (NWS); launch the next generation of weather satellites; establish NOAA as a key player in promoting adaptation and resilience efforts in coastal communities; and advance sustainable fisheries management. Furthermore, this request invests across NOAA's diverse portfolio, which will help the agency continue to balance between oceanic and atmospheric missions; intramural and extramural funding; and near-term and long-term goals, and will help us continue to build and maintain strong partnerships.

The demand for NOAA science and services is at an all-time high, given the devastating impacts of Hurricane Sandy, persistent drought across the western United States, the aftermath of the 2010 Deepwater Horizon disaster, species die-offs that are signaling the decline of ocean health around the country, and the effects of a changing Arctic ecosystem. This request will improve our ability to prepare for and address increasing public demand and need for NOAA's program capabilities across the agency's portfolio. Sustained satellite investments and support for continued evolution of the National Weather Service will enhance our Weather-Ready Nation status around the world and will improve early forecasting that will save more lives and property when the next extreme weather event strikes. Support for our observation systems will maximize the cost-effectiveness of maritime commerce and advance our understanding of global climate change as well as discrete ocean health phenomena, such as red tides, that affect public safety and economic opportunity. Innovations in fish stock assessments and electronic monitoring will help us explore new methods to enhance understanding of the dynamics that affect fisheries productivity and their economic output. Resources for research will enable better forecasts, earlier warnings for natural disasters, and better understanding of oceanic and atmospheric fluctuations and related impacts. Support for our Corporate Services will address critical gaps in essential business functions, helping us execute each of our mission areas more efficiently and effectively.

Program Increase Highlights by NOAA Line Office

National Ocean Service

One of NOAA's key goals is to leverage our resources and capabilities to promote the environmental and economic sustainability of coastal communities. NOAA is on the front lines of understanding, predicting and responding to challenges associated with increased population and economic activities along our Nation's coastlines. NOAA's FY 2015 request supports a $4.0 million increase in ecological forecasting within coastal science and assessments to better understand and predict red tides and other environmental phenomena that impact human health. This request also promotes efficiency by closing and consolidating laboratories within the National Centers for Coastal Ocean Science (NCCOS) while at the same time increasing competitive research grants to our external partners to maintain critical research performed at NCCOS labs. In addition, NOAA's request

includes an increase of $5.0 million to improve capacity to respond to extreme events by enhancing NOAA's inundation products and improving risk communication.

National Marine Fisheries Service

The conservation and protection of living marine resources and the habitats they rely on is vital to reaching the goal of healthy oceans. In FY 2015, NOAA continues to balance broad habitat conservation and protected species recovery efforts. By increasing the number of next generation stock assessments, supporting the development and implementation of electronic monitoring and reporting technologies, and expanding and advancing recent efforts to recover protected species and rebuild fisheries through large-scale habitat restoration in targeted areas, the proposal will yield a number of conservation and economic benefits. NOAA also proposes an increase of $4.0 million to implement Endangered Species Act requirements for up to 66 coral species proposed by the Administration for listing on December 7, 2012. The FY 2015 budget supports the Pacific Coastal Salmon Recovery Fund (PCSRF) at $50.0 million and Species Recovery Grants at $10 million to ensure funding is available for both endangered and threatened salmonids as well as a broader range of threatened and endangered species under NOAA's jurisdiction nationwide.

Office of Oceanic and Atmospheric Research

NOAA research helps to ensure that complex policy choices and products, such as those related to climate change, are informed by the best available science. Through research and development, NOAA examines cutting-edge issues that will guide our approach to resource management for years to come. NOAA's weather data informs millions of people each day, and our resource assessments guide legislative and policy decisions that affect peoples' lives and livelihoods. NOAA's FY 2015 request includes $3.0 million to maintain our 50+ year effort of sustained observations and research at the six Atmospheric Baseline Observatories. We include an additional $27.5 million for other climate research and services, reflecting NOAA's commitment to providing the most up to date climate information at the national and regional level to help communities prepare for and respond to changes. NOAA also proposes $3.0 million to improve the readiness of weather and related research projects and $3.0 million to acquire software engineering support and associated tools to re-architect NOAA's research applications. This request also supports an increase of $8.9 million for Integrated Ocean Acidification research to improve our understanding of enhanced ocean and coastal acidification and the impacts to ocean and coastal marine resources, and to develop tools and adaptive strategies for affected industries and stakeholders.

National Weather Service

The FY 2015 budget submission represents a first step towards defining the future NWS and making the bold vision for the Weather-Ready Nation a reality. Guided by the recent National Academy of Sciences (NAS*), "Becoming Second to None,"* and the National Academy of Public Administration (NAPA), *"Forecast for the Future: Assuring the Capacity of the NWS"* reports, NWS will continue to evolve and improve its weather, water, and climate products and services to enhance performance. This change is driven by concern for public safety and stakeholder demands for more accurate and reliable services. Increases in the frequency and severity of extreme weather and climate events require NOAA to invest in weather observation infrastructure upgrades and smart innovations for transforming the NWS. Therefore, the FY 2015 Budget requests $9.3 million to extend the useful life of the existing Next Generation Radar (NEXRAD) system. NOAA also requests $5 million to support the critical modernization of the NWS Telecommunications Gateway, the backbone of the Weather Service's information delivery system. We propose an additional $6.0 million for ground system readiness to ensure that the NWS will be prepared to use the substantial increase in data coming from NOAA's investment in new weather satellites, radar, and models. NOAA requests $8.1 million for the relocation of the Bannister Complex, a critical equipment repair facility. Finally, NOAA asks for

$3 million to begin the process of evaluating service improvements, in coordination with the broader weather enterprise, in response to Congressionally-mandated studies.

National Environmental Satellite, Data, and Information Service

One of the greatest challenges facing NOAA today is ensuring continuity of satellite operations to provide uninterrupted coverage of weather forecasts and environmental measurements into the future. The Geostationary Operational Environmental System – R Series (GOES-R) satellite acquisition program has been a successful partnership effort between NOAA and NASA to replace and update the existing GOES-N series of satellites. The first satellite in this program, GOES-R, is expected to launch in the second quarter of FY 2016. The new satellites in this series will carry improved environmental instrument suites that provide more timely and accurate weather forecasts and improved observation of meteorological events that directly affect public safety, protection of property and, ultimately, economic health and development. NOAA requests a total of $980.8 million for the GOES-R program to sustain a second quarter FY 2016 launch. In addition, NOAA requests a total of $916.3 million for the Joint Polar Satellite System, which delivers polar satellite weather observations. A total of $25.7 million is also requested to continue progress on Jason-3 in partnership with NOAA's European partners to continue precise measurements of sea surface heights. NOAA requests $6.8 million for the Global Navigation Satellite System Radio Occultation (GNSSRO) Ground System for ground reception and data processing.

NOAA Corporate Services

NOAA's Program Support services are the cornerstone of NOAA's ability to effectively execute its mission of science, service and stewardship. In recent years, NOAA's Corporate Services has faced grave challenges in performing critical oversight, guidance, and advisory services. In FY 2015, NOAA requests $12.0 million to: strengthen oversight and support for NOAA mission areas; recruit and retain a highly skilled workforce; mitigate risk of non-compliance with regulatory statutes; and fund the management and execution of NOAA-level activities needed for timely migration to the Department of Commerce's suite of business systems.

Office of Marine and Aviation Operations

NOAA's fleet, which includes an array of specialized aircraft and ships, operates throughout the world providing key observations in support of the full range of NOAA's scientific and environmental missions. In addition to critical research and monitoring activities, the NOAA fleet provides immediate response capabilities for major natural and environmental disasters. The FY 2015 Budget requests an increase of $2.9 million for days at sea, which will lead to more data and observations to support NOAA science and decision-making. NOAA requests an additional $2.0 million for progressive lifecycle maintenance to plan vital capital investments in the ship fleet to increase mission readiness and reliability.

NOAA FY 2015 Investments in the Administration's Opportunity, Growth, and Security Initiative and Climate Resilience Fund

In its FY 2015 budget, NOAA has investments in the Administration's Opportunity, Growth, and Security Initiative as well as in its Climate Resilience Fund. Both of these initiatives recognize that, through the Bipartisan Budget Act of 2013 (BBA), Congress came together to replace the damaging cuts caused by sequestration with longer-term reforms. While the President's Budget adheres to the BBA's discretionary funding levels for 2015, these levels are not sufficient to expand opportunity to all Americans, to drive the growth our economy needs, or to make needed investment in the research and products necessary to ensure community resiliency in the wake of climate change impacts (e.g., severe drought, coastal storms). For that reason, the FY 2015 Budget also includes a $56 billion, Opportunity, Growth, and Security Initiative that will help spur economic progress, promote opportunity, and strengthen national security. Moreover, the Opportunity, Growth, and Security Initiative is fully paid for with a balanced package of spending cuts and tax loophole closers, showing that additional pro-growth investments are easily affordable without increasing the deficit if Congress will enact common-sense spending and tax reforms.

For NOAA, the Opportunity, Growth, and Security Initiative will provide $180 million for expanded weather, climate, and oceans observations and research. Specifically, it funds:

- Sustained observations and data gathering capabilities by constructing a NOAA ocean survey vessel;
- Improved understanding of drought impacts on industries, ecosystems, and human communities through the National Integrated Drought Information System (NIDIS) "Coping with Drought" initiative;
- Expanded products and services related to sea level rise and coastal inundation events;
- Studies on the impacts of changing ocean conditions on living marine resources; and
- Improved heat advisories and more confident projections for heat stress probabilities.

NOAA's FY 2015 proposal also includes critical investments in the Administration's proposed $1 billion Climate Resilience Fund.

NOAA will use $25M to increase oceanic and atmospheric research grants to further the understanding of climate change impacts on various sectors (e.g., fisheries) and to improve severe weather prediction models. More specifically, NOAA will use funds to: (1) maintain and improve global monitoring systems; (2) improve climate models and predictions so that scientists can better anticipate the impacts of future climate variability and change; (3) develop informational products, diagnostics, and assessments of observed climate variability and change on global to regional scales; (4) and investigate how these changes impact both natural and developed communities to improve our understanding of resilience and adaption options.

NOAA will use $50M to help communities across the country apply lessons learned from Hurricane Sandy and other extreme weather events to be more prepared for the next extreme weather event and climate change. NOAA will provide competitive grants to state, local, and tribal governments and nonprofit organizations to implement projects that improve coastal resilience to severe weather events, climate hazards, and changing ocean conditions. Projects may include: (1) investments that integrate green infrastructure with grey, including coastal dunes, wetlands, or oyster restoration projects that mitigate flood impacts; and (2) other coastal hazard protection activities.

Department of Commerce
National Oceanic and Atmospheric Administration
PROGRAM AND PERFORMANCE: DIRECT OBLIGATIONS
(Dollar Amounts in Thousands)

Comparison by program/sub-program		FY 2013 Actuals Personnel	FY 2013 Actuals Amount	FY 2014 Enacted Personnel	FY 2014 Enacted Amount	FY 2015 Base Program Personnel	FY 2015 Base Program Amount	FY 2015 Estimate Personnel	FY 2015 Estimate Amount	Increase/ Decrease Personnel	Increase/ Decrease Amount
NATIONAL OCEAN SERVICE (NOS)											
Navigation, Observations and Positioning	Pos/BA	561	216,557	591	189,500	591	191,376	592	192,376	1	1,000
	FTE/OBL	534	203,906	562	203,432	562	191,376	563	192,376	1	1,000
Coastal Science and Assessment	Pos/BA	285	82,436	330	79,500	330	80,503	299	88,003	(31)	7,500
	FTE/OBL	272	70,545	314	91,655	314	80,503	298	88,003	(16)	7,500
Ocean and Coastal Management and Services	Pos/BA	358	202,084	368	202,946	368	204,135	368	212,135	0	8,000
	FTE/OBL	341	199,089	351	206,051	351	204,135	351	212,135	0	8,000
Undistributed ATBs	Pos/BA	0	0	0	0	0	2,043	0	0	0	(2,043)
	FTE/OBL	0	0	0	0	0	2,043	0	0	0	(2,043)
TOTAL NOS - ORF	**Pos/BA**	**1,204**	**501,077**	**1,289**	**471,946**	**1,289**	**478,057**	**1,259**	**492,514**	**(30)**	**14,457**
	FTE/OBL	**1,147**	**473,540**	**1,227**	**501,138**	**1,227**	**478,057**	**1,212**	**492,514**	**(15)**	**14,457**
TOTAL NOS - PAC	**Pos/BA**	**4**	**25**	**5**	**3,700**	**5**	**3,700**	**5**	**3,700**	**0**	**0**
	FTE/OBL	**4**	**2,403**	**5**	**4,973**	**5**	**3,700**	**5**	**3,700**	**0**	**0**
Damage Assessment and	**Pos/BA**	**56**	**3,797**	**16**	**5,424**	**16**	**6,000**	**16**	**6,000**	**0**	**0**
Restoration Revolving Fund	**FTE/OBL**	**53**	**126,111**	**16**	**95,259**	**16**	**21,000**	**16**	**21,000**	**0**	**0**
Sanctuaries Asset Forfeiture Fund	**Pos/BA**	**0**	**(41)**	**0**	**928**	**0**	**120**	**0**	**120**	**0**	**0**
	FTE/OBL	**0**	**49**	**0**	**928**	**0**	**120**	**0**	**120**	**0**	**0**
Gulf Coast Ecosystem	**Pos/BA**	**0**	**0**	**0**	**1,688**	**0**	**2,078**	**0**	**2,078**	**0**	**0**
Restoration Fund	**FTE/OBL**	**0**	**0**	**0**	**1,688**	**0**	**2,078**	**0**	**2,078**	**0**	**0**
TOTAL NOS	**Pos/BA**	**1,264**	**504,858**	**1,310**	**483,686**	**1,310**	**489,955**	**1,280**	**504,412**	**(30)**	**14,457**
	FTE/OBL	**1,204**	**602,103**	**1,248**	**603,986**	**1,248**	**504,955**	**1,233**	**519,412**	**(15)**	**14,457**

Department of Commerce
National Oceanic and Atmospheric Administration
PROGRAM AND PERFORMANCE: DIRECT OBLIGATIONS
(Dollar Amounts in Thousands)

Comparison by program/sub-program		FY 2013 Actuals Personnel	FY 2013 Actuals Amount	FY 2014 Enacted Personnel	FY 2014 Enacted Amount	FY 2015 Base Program Personnel	FY 2015 Base Program Amount	FY 2015 Estimate Personnel	FY 2015 Estimate Amount	Increase/ Decrease Personnel	Increase/ Decrease Amount
NATIONAL MARINE FISHERIES SERVICES (NMFS)											
Protected Species Research and Management	Pos/BA	843	165,356	854	176,700	854	179,711	863	186,211	9	6,500
	FTE/OBL	802	163,378	813	179,304	813	179,711	820	186,211	7	6,500
Fisheries Research and Management	Pos/BA	1,432	418,745	1,454	426,060	1,454	431,898	1,454	437,398	0	5,500
	FTE/OBL	1,365	414,459	1,386	432,922	1,386	431,898	1,386	437,398	0	5,500
Enforcement and Observers/Training	Pos/BA	383	102,645	391	108,000	391	109,328	391	109,328	0	0
	FTE/OBL	364	100,749	372	115,269	372	109,328	372	109,328	0	0
Habitat Conservation & Restoration	Pos/BA	136	38,810	137	41,700	137	42,190	137	42,190	0	0
	FTE/OBL	130	38,903	131	41,785	131	42,190	131	42,190	0	0
Other Activities Supporting Fisheries	Pos/BA	214	58,440	215	60,100	215	60,850	215	61,698	0	848
	FTE/OBL	204	56,107	205	62,789	205	60,850	205	61,698	0	848
Undistributed ATBs	Pos/BA	0	0	0	0	0	2,381	0	0	0	(2,381)
	FTE/OBL	0	0	0	0	0	2,381	0	0	0	(2,381)
TOTAL NMFS - ORF	**Pos/BA**	**3,008**	**783,996**	**3,051**	**812,560**	**3,051**	**826,358**	**3,060**	**836,825**	**9**	**10,467**
	FTE/OBL	**2,865**	**773,596**	**2,907**	**832,069**	**2,907**	**826,358**	**2,914**	**836,825**	**7**	**10,467**
TOTAL NMFS - PAC	**Pos/BA**	**0**	**1,898**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	FTE/OBL	**0**	**103**	**0**	**1,914**	**0**	**0**	**0**	**0**	**0**	**0**
Pacific Coastal Salmon Recovery	**Pos/BA**	**2**	**60,322**	**2**	**65,000**	**2**	**65,000**	**2**	**50,000**	**0**	**(15,000)**
Fund	**FTE/OBL**	**2**	**60,297**	**2**	**65,026**	**2**	**65,000**	**2**	**50,000**	**0**	**(15,000)**
Fishermen's Contingency Fund	**Pos/BA**	**0**	**325**	**0**	**350**	**0**	**350**	**0**	**350**	**0**	**0**
	FTE/OBL	**0**	**61**	**0**	**629**	**0**	**350**	**0**	**350**	**0**	**0**
Fisheries Finance Program	**Pos/BA**	**0**	**14,196**	**0**	**14,629**	**0**	**0**	**0**	**0**	**0**	**0**
Account	**FTE/OBL**	**0**	**14,196**	**0**	**14,629**	**0**	**0**	**0**	**0**	**0**	**0**

Department of Commerce
National Oceanic and Atmospheric Administration
PROGRAM AND PERFORMANCE: DIRECT OBLIGATIONS
(Dollar Amounts in Thousands)

Comparison by program/sub-program		FY 2013 Actuals Personnel	FY 2013 Actuals Amount	FY 2014 Enacted Personnel	FY 2014 Enacted Amount	FY 2015 Base Program Personnel	FY 2015 Base Program Amount	FY 2015 Estimate Personnel	FY 2015 Estimate Amount	Increase/ Decrease Personnel	Increase/ Decrease Amount
Federal Ship Financing	**Pos/BA**	**0**	**(152)**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	FTE/OBL	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Promote and Develop Fisheries	**Pos/BA**	**0**	**11,505**	**0**	**5,774**	**0**	**8,208**	**0**	**8,208**	**0**	**0**
Products	**FTE/OBL**	**0**	**902**	**0**	**17,007**	**0**	**8,208**	**0**	**8,208**	**0**	**0**
Environmental Improvement	**Pos/BA**	**0**	**0**	**0**	**9,087**	**0**	**292**	**0**	**292**	**0**	**0**
and Restoration Fund	**FTE/OBL**	**0**	**9,737**	**0**	**9,102**	**0**	**292**	**0**	**292**	**0**	**0**
Limited Access System	**Pos/BA**	**38**	**5,929**	**38**	**8,998**	**38**	**10,858**	**38**	**10,858**	**0**	**0**
Administration Fund	**FTE/OBL**	**38**	**8,520**	**38**	**14,630**	**38**	**11,855**	**38**	**11,855**	**0**	**0**
Marine Mammal Unusual	**Pos/BA**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Mortality Event Fund	**FTE/OBL**	**0**	**5**	**0**	**61**	**0**	**0**	**0**	**0**	**0**	**0**
Western Pacific Sustainable	**Pos/BA**	**0**	**625**	**0**	**160**	**0**	**250**	**0**	**250**	**0**	**0**
Fisheries Fund	**FTE/OBL**	**0**	**0**	**0**	**1,160**	**0**	**1,021**	**0**	**1,021**	**0**	**0**
Fisheries Enforcement Asset	**Pos/BA**	**0**	**2,277**	**0**	**3,640**	**0**	**4,000**	**0**	**4,000**	**0**	**0**
Forfeiture Fund	**FTE/OBL**	**0**	**1,853**	**0**	**3,640**	**0**	**4,000**	**0**	**4,000**	**0**	**0**
North Pacific Observer Fund	**Pos/BA**	**0**	**0**	**0**	**3,854**	**0**	**4,200**	**0**	**4,200**	**0**	**0**
	FTE/OBL	**0**	**0**	**0**	**3,854**	**0**	**4,200**	**0**	**4,200**	**0**	**0**
Fisheries Disaster Mitigation Fund	**Pos/BA**	**0**	**0**	**0**	**75,000**	**0**	**75,000**	**0**	**0**	**0**	**(75,000)**
	FTE/OBL	**0**	**0**	**0**	**75,000**	**0**	**75,000**	**0**	**0**	**0**	**(75,000)**
TOTAL NMFS	**Pos/BA**	**3,048**	**880,921**	**3,091**	**999,052**	**3,091**	**994,516**	**3,100**	**914,983**	**9**	**(79,533)**
	FTE/OBL	**2,905**	**869,270**	**2,947**	**1,038,721**	**2,947**	**996,284**	**2,954**	**916,751**	**7**	**(79,533)**
OFFICE OCEANIC AND ATMOSPHERIC RESEARCH (OAR)*											
Climate Research											
Laboratories & Cooperative	Pos/BA	187	49,654	202	59,450	202	59,954	208	75,454	6	15,500
Institutes	FTE/OBL	178	48,818	192	60,780	192	59,954	196	75,454	4	15,500

* FY 2013 Actuals and FY 2014 Obligation amounts for OAR reflect estimates based on FY2014 restructure for comparison purposes.

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Regional Climate Data	Pos/BA	38	40,375	21	37,000	21	37,312	26	52,312	5	15,000
& Information	FTE/OBL	36	39,549	20	37,928	20	37,312	24	52,312	4	15,000
Climate Competitive Research	Pos/BA	44	45,423	66	60,000	66	60,504	66	60,504	0	0
	FTE/OBL	42	45,767	63	61,073	63	60,504	63	60,504	0	0
Total: Climate Research	Pos/BA	269	135,452	289	156,450	289	157,770	300	188,270	11	30,500
	FTE/OBL	256	134,134	275	159,781	275	157,770	283	188,270	8	30,500
Weather & Air Chemistry Research											
Laboratories & Cooperative	Pos/BA	213	101,428	217	64,000	217	64,547	217	64,547	0	0
Institutes	FTE/OBL	203	62,522	207	103,218	207	64,547	207	64,547	0	0
Weather & Air Chemistry	Pos/BA	4	13,245	4	17,200	4	17,347	5	20,347	1	3,000
Research Programs	FTE/OBL	4	13,117	4	17,288	4	17,347	5	20,347	1	3,000
Total: Weather & Air Chemistry	Pos/BA	217	114,673	221	81,200	221	81,894	222	84,894	1	3,000
Research	FTE/OBL	207	75,639	211	120,506	211	81,894	212	84,894	1	3,000
Ocean, Coastal, and Great Lakes Research											
Laboratories & Cooperative	Pos/BA	119	23,732	131	26,442	131	26,669	131	24,669	0	(2,000)
Institutes	FTE/OBL	113	23,810	125	27,595	125	26,669	125	24,669	0	(2,000)
National Sea Grant College	Pos/BA	15	57,517	15	67,300	15	67,869	15	63,369	0	(4,500)
Program	FTE/OBL	14	57,328	14	67,540	14	67,869	14	63,369	0	(4,500)
Ocean Exploration and	Pos/BA	20	21,025	20	26,000	20	26,220	20	19,220	0	(7,000)
Research	FTE/OBL	19	22,480	19	26,760	19	26,220	19	19,220	0	(7,000)
Other Ecosystem Programs	Pos/BA	12	5,957	12	6,000	12	6,051	16	14,922	4	8,871
	FTE/OBL	11	5,982	11	6,014	11	6,051	14	14,922	3	8,871
Sustained Observations and	Pos/BA	38	40,709	49	41,000	49	41,347	49	41,347	0	0
Monitoring	FTE/OBL	36	39,052	47	41,916	47	41,347	47	41,347	0	0

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Total: Ocean, Coastal, and Great	Pos/BA	204	148,940	227	166,742	227	168,156	231	163,527	4	(4,629)
Lakes Research	FTE/OBL	193	148,652	216	169,825	216	168,156	219	163,527	3	(4,629)
Innovative Research & Technology	Pos/BA	11	10,564	11	12,000	11	12,103	11	12,103	0	0
	FTE/OBL	10	10,348	10	12,360	10	12,103	10	12,103	0	0
Undistributed ATBs	Pos/BA	0	0	0	0	0	78	0	0	0	(78)
	FTE/OBL	0	0	0	0	0	78	0	0	0	(78)
TOTAL OAR - ORF	**Pos/BA**	**701**	**409,629**	**748**	**416,392**	**748**	**420,001**	**764**	**448,794**	**16**	**28,793**
	FTE/OBL	**666**	**368,773**	**712**	**462,472**	**712**	**420,001**	**724**	**448,794**	**12**	**28,793**
TOTAL OAR - PAC	**Pos/BA**	**0**	**34,143**	**0**	**10,379**	**0**	**10,379**	**0**	**13,379**	**0**	**3,000**
	FTE/OBL	**0**	**9,796**	**0**	**34,712**	**0**	**10,379**	**0**	**13,379**	**0**	**3,000**
TOTAL OAR	**Pos/BA**	**701**	**443,772**	**748**	**426,771**	**748**	**430,380**	**764**	**462,173**	**16**	**31,793**
	FTE/OBL	**666**	**378,569**	**712**	**497,184**	**712**	**430,380**	**724**	**462,173**	**12**	**31,793**
NATIONAL WEATHER SERVICE (NWS)											
Operations and Research											
Local Warnings and Forecasts	Pos/BA	4,161	741,871	4,357	757,572	0	0	0	0	0	0
	FTE/OBL	3,963	710,116	4,150	799,618	0	0	0	0	0	0
Central Forecast Guidance	Pos/BA	300	91,298	331	94,740	0	0	0	0	0	0
	FTE/OBL	286	78,873	315	108,596	0	0	0	0	0	0
Total: Operations and Research	Pos/BA	4,461	833,169	4,688	852,312	0	0	0	0	0	0
	FTE/OBL	4,249	788,989	4,465	908,214	0	0	0	0	0	0
Systems Operation and Maintenance	Pos/BA	204	95,446	244	101,315	0	0	0	0	0	0
	FTE/OBL	193	88,021	232	110,718	0	0	0	0	0	0
Observations	Pos/BA	0	0	0	0	844	206,777	844	200,277	0	(6,500)
	FTE/OBL	0	0	0	0	804	206,777	804	200,277	0	(6,500)

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Central Processing	Pos/BA	0	0	0	0	244	100,517	146	86,517	(98)	(14,000)
	FTE/OBL	0	0	0	0	232	100,517	134	86,517	(98)	(14,000)
Analyze, Forecast and Support	Pos/BA	0	0	0	0	3,211	482,360	3,211	476,360	0	(6,000)
	FTE/OBL	0	0	0	0	3,058	482,360	3,058	476,360	0	(6,000)
Dissemination	Pos/BA	0	0	0	0	88	46,505	86	40,099	(2)	(6,406)
	FTE/OBL	0	0	0	0	84	46,505	82	40,099	(2)	(6,406)
Science and Technology Integration	Pos/BA	0	0	0	0	545	127,376	543	123,600	(2)	(3,776)
	FTE/OBL	0	0	0	0	519	127,376	517	123,600	(2)	(3,776)
Undistributed ATBs	Pos/BA	0	0	0	0	0	8,770	0	0	0	(8,770)
	FTE/OBL	0	0	0	0	0	8,770	0	0	0	(8,770)
TOTAL NWS - ORF	**Pos/BA**	**4,665**	**928,615**	**4,932**	**953,627**	**4,932**	**972,305**	**4,830**	**926,853**	**(102)**	**(45,452)**
	FTE/OBL	**4,442**	**877,010**	**4,697**	**1,018,932**	**4,697**	**972,305**	**4,595**	**926,853**	**(102)**	**(45,452)**
TOTAL NWS - PAC	**Pos/BA**	**24**	**121,194**	**25**	**113,619**	**25**	**113,619**	**23**	**136,494**	**(2)**	**22,875**
	FTE/OBL	**23**	**68,793**	**24**	**172,083**	**24**	**113,619**	**22**	**136,494**	**(2)**	**22,875**
TOTAL NWS	**Pos/BA**	**4,689**	**1,049,809**	**4,957**	**1,067,246**	**4,957**	**1,085,924**	**4,853**	**1,063,347**	**(104)**	**(22,577)**
	FTE/OBL	**4,465**	**945,803**	**4,721**	**1,191,015**	**4,721**	**1,085,924**	**4,617**	**1,063,347**	**(104)**	**(22,577)**
NATIONAL ENVIRONMENTAL SATELLITE, DATA AND INFORMATION SERVICE (NESDIS)											
Environmental Satellite Observing Systems											
Office of Satellite and Product	Pos/BA	239	88,436	302	92,000	0	0	0	0	0	0
Operations	FTE/OBL	227	84,126	287	96,574	0	0	0	0	0	0
Product Development,	Pos/BA	83	27,333	93	26,000	0	0	0	0	0	0
Readiness & Application	FTE/OBL	79	27,099	89	26,516	0	0	0	0	0	0
Commercial Remote Sensing,	Pos/BA	6	1,042	6	1,000	0	0	0	0	0	0
Licensing and Enforcement	FTE/OBL	6	1,112	6	1,121	0	0	0	0	0	0

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Office of Space	Pos/BA	3	613	4	600	0	0	0	0	0	0
Commercialization	FTE/OBL	3	629	4	618	0	0	0	0	0	0
Group on Earth Observations	Pos/BA	0	471	0	500	0	0	0	0	0	0
(GEO)	FTE/OBL	0	470	0	500	0	0	0	0	0	0
Total: Environmental Satellite	Pos/BA	331	117,895	405	120,100	0	0	0	0	0	0
Observing Systems	FTE/OBL	315	113,436	386	125,329	0	0	0	0	0	0
Data Centers & Information Services											
Archive, Access and Assessment	Pos/BA	169	45,362	229	48,000	0	0	0	0	0	0
	FTE/OBL	161	44,957	218	48,524	0	0	0	0	0	0
Coastal Data Development	Pos/BA	12	4,189	17	4,567	0	0	0	0	0	0
	FTE/OBL	11	4,174	16	4,596	0	0	0	0	0	0
Regional Climate Services	Pos/BA	15	7,260	15	6,000	0	0	0	0	0	0
	FTE/OBL	14	6,704	14	6,078	0	0	0	0	0	0
Environmental Data Systems	Pos/BA	41	8,376	43	8,500	0	0	0	0	0	0
Moderization	FTE/OBL	39	8,421	41	8,500	0	0	0	0	0	0
Total: Data Centers &	Pos/BA	237	65,187	304	67,067	0	0	0	0	0	0
Information Services	FTE/OBL	225	64,256	289	67,698	0	0	0	0	0	0
Environmental Satellite Observing Systems											
Office of Satellite and Product	Pos/BA	0	0	0	0	303	92,842	303	92,842	0	0
Operations	FTE/OBL	0	0	0	0	288	92,842	288	92,842	0	0
Product Development,	Pos/BA	0	0	0	0	92	26,000	92	26,000	0	0
Readiness & Application	FTE/OBL	0	0	0	0	88	26,000	88	26,000	0	0
Commercial Remote Sensing,	Pos/BA	0	0	0	0	6	1,200	6	1,200	0	0
Licensing and Enforcement	FTE/OBL	0	0	0	0	6	1,200	6	1,200	0	0

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Office of Space	Pos/BA	0	0	0	0	4	1,000	4	1,000	0	0
Commercialization	FTE/OBL	0	0	0	0	4	1,000	4	1,000	0	0
Group on Earth Observations	Pos/BA	0	0	0	0	0	500	0	500	0	0
(GEO)	FTE/OBL	0	0	0	0	0	500	0	500	0	0
Total: Environmental Satellite	Pos/BA	0	0	0	0	405	121,542	405	121,542	0	0
Observing Systems	FTE/OBL	0	0	0	0	386	121,542	386	121,542	0	0
National Environmental Information Office	Pos/BA	0	0	0	0	304	67,067	304	69,067	0	2,000
	FTE/OBL	0	0	0	0	289	67,067	289	69,067	0	2,000
Undistributed ATBs	Pos/BA	0	0	0	0	0	1,744	0	0	0	(1,744)
	FTE/OBL	0	0	0	0	0	1,744	0	0	0	(1,744)
TOTAL NESDIS - ORF	**Pos/BA**	**568**	**183,082**	**709**	**187,167**	**709**	**190,353**	**709**	**190,609**	**0**	**256**
	FTE/OBL	**540**	**177,692**	**675**	**193,027**	**675**	**190,353**	**675**	**190,609**	**0**	**256**
TOTAL NESDIS - PAC	**Pos/BA**	**235**	**1,706,965**	**243**	**1,895,966**	**243**	**1,895,664**	**246**	**2,057,317**	**3**	**161,653**
	FTE/OBL	**225**	**1,710,407**	**232**	**1,900,638**	**232**	**1,895,664**	**234**	**2,057,317**	**2**	**161,653**
TOTAL NESDIS	**Pos/BA**	**803**	**1,890,047**	**952**	**2,083,133**	**952**	**2,086,017**	**955**	**2,247,926**	**3**	**161,909**
	FTE/OBL	**765**	**1,888,099**	**907**	**2,093,665**	**907**	**2,086,017**	**909**	**2,247,926**	**2**	**161,909**
PROGRAM SUPPORT (PS)											
Coporate Services											
Under Secretary and	Pos/BA	133	26,184	147	27,000	147	27,000	147	27,000	0	0
Associate Offices	FTE/OBL	127	26,232	140	27,456	140	27,000	140	27,000	0	0
NOAA Wide Corporate Services	Pos/BA	641	150,847	768	159,000	713	185,230	793	197,230	80	12,000
& Agency Management	FTE/OBL	610	144,361	731	170,387	676	185,230	736	197,230	60	12,000
IT Security	Pos/BA	0	6,148	0	8,300	0	8,300	0	8,300	0	0
	FTE/OBL	0	6,786	0	9,771	0	8,300	0	8,300	0	0

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Total: Corporate Services	Pos/BA	774	183,179	915	194,300	860	220,530	940	232,530	80	12,000
	FTE/OBL	737	177,379	871	207,614	816	220,530	876	232,530	60	12,000
NOAA Education Program	Pos/BA	26	30,374	28	27,200	28	27,200	28	16,400	0	(10,800)
	FTE/OBL	26	30,446	26	27,441	26	27,200	26	16,400	0	(10,800)
Facilities	Pos/BA	43	22,802	47	23,000	47	25,000	47	25,000	0	0
	FTE/OBL	41	23,036	45	23,581	45	25,000	45	25,000	0	0
Undistributed ATBs	Pos/BA	0	0	0	0	0	416	0	0	0	(416)
	FTE/OBL	0	0	0	0	0	416	0	0	0	(416)
TOTAL PROGRAM SUPPORT - ORF	**Pos/BA**	**843**	**236,355**	**990**	**244,500**	**935**	**273,146**	**1,015**	**273,930**	**80**	**784**
(without OMAO)	**FTE/OBL**	**804**	**230,861**	**942**	**258,636**	**887**	**273,146**	**947**	**273,930**	**60**	**784**
TOTAL PROGRAM SUPPORT - PAC	**Pos/BA**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
(without OMAO)	**FTE/OBL**	**0**	**808**	**0**	**168**	**0**	**0**	**0**	**0**	**0**	**0**
TOTAL PROGRAM SUPPORT	**Pos/BA**	**843**	**236,355**	**990**	**244,500**	**935**	**273,146**	**1,015**	**273,930**	**80**	**784**
(without OMAO)	**FTE/OBL**	**804**	**231,669**	**942**	**258,804**	**887**	**273,146**	**947**	**273,930**	**60**	**784**
OFFICE OF MARINE AND AVIATION OPERATIONS (OMAO)											
Marine Operations & Maintenance	Pos/BA	858	154,508	869	170,000	869	172,181	869	175,032	0	2,851
	FTE/OBL	817	153,764	828	171,888	828	172,181	828	175,032	0	2,851
Aviation Operations	Pos/BA	126	28,145	127	31,200	127	31,600	127	31,600	0	0
	FTE/OBL	120	27,179	121	32,258	121	31,600	121	31,600	0	0
Undistributed ATBs	Pos/BA	0	0	0	0	0	0	0	0	0	0
	FTE/OBL	0	0	0	0	0	0	0	0	0	0
TOTAL OMAO - ORF	**Pos/BA**	**984**	**182,653**	**996**	**201,200**	**996**	**203,781**	**996**	**206,632**	**0**	**2,851**
	FTE/OBL	**937**	**180,943**	**949**	**204,146**	**949**	**203,781**	**949**	**206,632**	**0**	**2,851**

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TOTAL OMAO - PAC	**Pos/BA**	**1**	**54,764**	**0**	**5,200**	**0**	**5,200**	**0**	**7,200**	**0**	**2,000**
	FTE/OBL	**1**	**3,210**	**0**	**57,053**	**0**	**5,200**	**0**	**7,200**	**0**	**2,000**
Medicare Eligible Retiree	**Pos/BA**	**0**	**1,805**	**0**	**1,936**	**0**	**1,936**	**0**	**1,936**	**0**	**0**
Health Care Fund	**FTE/OBL**	**0**	**1,422**	**0**	**1,936**	**0**	**1,936**	**0**	**1,936**	**0**	**0**
NOAA Corps Commissioned	**Pos/BA**	**0**	**28,269**	**0**	**28,269**	**0**	**28,269**	**0**	**28,269**	**0**	**0**
Officers Retirement	**FTE/OBL**	**0**	**25,243**	**0**	**28,269**	**0**	**28,269**	**0**	**28,269**	**0**	**0**
TOTAL OMAO	**Pos/BA**	**985**	**267,491**	**996**	**236,605**	**996**	**239,186**	**996**	**244,037**	**0**	**4,851**
	FTE/OBL	**938**	**210,818**	**949**	**291,404**	**949**	**239,186**	**949**	**244,037**	**0**	**4,851**
NOAA ORF	**Pos/BA**	**11,973**	**3,209,171**	**12,715**	**3,272,392**	**12,660**	**3,349,001**	**12,633**	**3,361,157**	**(27)**	**12,156**
	FTE/OBL	**11,401**	**3,082,415**	**12,109**	**3,470,420**	**12,054**	**3,364,001**	**12,016**	**3,376,157**	**(38)**	**12,156**
NOAA PAC	**Pos/BA**	**264**	**1,903,989**	**273**	**2,021,864**	**273**	**2,015,562**	**274**	**2,205,090**	**1**	**189,528**
	FTE/OBL	**253**	**1,795,520**	**261**	**2,171,541**	**261**	**2,028,562**	**261**	**2,218,090**	**0**	**189,528**
NOAA Other	**Pos/BA**	**96**	**129,009**	**56**	**223,049**	**56**	**204,483**	**56**	**114,483**	**0**	**(90,000)**
	FTE/OBL	**93**	**248,396**	**56**	**331,130**	**56**	**223,329**	**56**	**133,329**	**0**	**(90,000)**

DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
JUSTIFICATION OF PROPOSED LANGUAGE CHANGES

JUSTIFICATION OF PROPOSED LANGUAGE CHANGES

1. NOAA Cost Recovery Language

SEC. 108. *In order to carry out the responsibilities of the National Oceanic and Atmospheric Administration related to permitting and related regulatory activities, the Administrator of the National Oceanic and Atmospheric Administration is authorized, with their consent: (a) to enter into grants and cooperative agreements, contracts or other agreements with; (b) to use on a non-reimbursable basis land, services, equipment, personnel, and facilities made available by and (c) to receive and expend funds made available by, any Federal agency, State or subdivision thereof, local government, Tribal government, Territory or possession or any subdivision thereof, foreign government, international or intergovernmental organization, public or private organization, or individual: Provided, That funds received for permitting and related regulatory activities pursuant to this section shall be deposited as offsetting collections und the heading "National Oceanic and Atmospheric Administration– Operations, Research, and Facilities" and shall remain available until expended for such purposes.*

Justification
NOAA proposes to clarify NOAA's ability to receive and expend funds from, and to engage in agreements with, external entities to carry out its responsibilities related to permitting and other regulatory activities. These activities include, but are not limited to, scientific data collection and research that informs NOAA's decisions on permits and regulatory actions within its mission, and that informs the regulatory decisions of other agencies. Applicable statutes include, but are not limited to, the Endangered Species Act, Marine Mammal Protection Act, Magnuson-Stevens Fishery Conservation and Management Act, National Marine Sanctuaries Act and Oil Pollution Act. Examples are agreements and funding arrangements to: perform research on stock assessment and ecosystem processes for conservation and management purposes; perform oceanographic surveys to determine baseline for Oil Pollution Act purposes; perform research and development on oil spill response; and perform research on endangered species for purposes of ESA consultation, or on marine mammals for MMPA Incidental Harassment Authorizations, to inform permitting of infrastructure projects, oil and gas drilling or other regulated activities. This provision authorizes agreements for research and other activities that are not directly related to a particular permit or regulatory action but that anticipate regulatory action by NOAA or another agency.

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JUSTIFICATION OF PROPOSED LANGUAGE CHANGES

JUSTIFICATION OF PROPOSED LANGUAGE CHANGES

2. NOAA Working Capital Fund

SEC. 111. *There is hereby established in the National Oceanic and Atmospheric Administration a Working Capital Fund, which shall be available without fiscal year limitation, for expenses and equipment necessary for the performance of such services and projects that the Administrator of the National Oceanic and Atmospheric Administration determines may be performed more advantageously when centralized: Provided, That such central services shall, to the fullest extent practicable, be used to make unnecessary the maintenance of separate like services in the divisions and offices of the National Oceanic and Atmospheric Administration and the Department of Commerce: Provided further, That a separate schedule of expenditures and reimbursements, and a statement of the current assets and liabilities of the Working Capital Fund as of the close of the last completed fiscal year, shall be prepared each year: Provided further, That notwithstanding 31. U.S.C. 3302, the Working Capital Fund may be credited with advances and reimbursements from applicable appropriations of the divisions and offices for whom the services are provided: Provided further, That any inventories, equipment, and other assets pertaining to the services to be provided by such funds, either on hand or on order, less the related liabilities or unpaid obligations, and any appropriations made hereafter for the purpose of providing capital, shall be used to capitalize the Working Capital Fund: Provided further, That the Working Capital Fund shall provide for centralized services at rates which will return in full all expenses of operation, including depreciation or replacement of Fund plant, equipment, and automated data processing software and hardware systems, and an amount necessary to maintain a reasonable operating reserve as determined by the Administrator of the National Oceanic Atmospheric Administration and the Secretary of Commerce.*

Justification
NOAA proposes to establish a NOAA Working Capital Fund, which will finance, on a reimbursable basis, NOAA-wide information technology functions that are more efficiently and economically performed on a centralized basis.

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JUSTIFICATION OF PROPOSED LANGUAGE CHANGES

Justification of Proposed Language Changes

3. Miller Act Waiver

SEC. 110. *The Secretary of Commerce may waive the requirement for bonds under 40 USC 3131 with respect to contracts for the construction, alteration, or repair of vessels, regardless of the terms of the contracts as to payment or title, when the contract is made under the Coast and Geodetic Survey Act of 1947, 33 U.S.C. § 883a et seq.*

Justification
NOAA proposes language that would waive the requirement for bonds in the Miller Act, 40 U.S.C. § 3131 et seq., to enable the Department of Commerce's National Oceanic and Atmospheric Administration (NOAA) to waive the performance and payment bond requirements of the Miller Act for the construction, alteration, or repair of ships in NOAA's fleet of research vessels. Although NOAA's research and survey ships compose the largest fleet of federal research ships in the Nation, Commerce is the only Federal agency maintaining a fleet that does not have a waiver from the Miller Act bonding requirements. By authorizing the Secretary of Commerce to hereafter waive requirements for bonds, this language would align Commerce's authorities with that of other Federal agencies, including the U.S. Navy, the U.S. Coast Guard and the National Science Foundation. In addition, eliminating the requirement would help NOAA address difficulties it has experienced in obtaining competitive bids for ship repairs which has resulted in delays to ship schedules, inferior quality and increased costs to the Government. Permitting NOAA to waive the Miller Act bonding requirement is expected to reduce costs due to improved competition, and result in greater small business participation and improved continuity of services, especially in regions like the Gulf of Mexico, where severe weather-related events require emergency coastal surveying.

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1. For necessary expenses of activities authorized by law for the National Oceanic and Atmospheric Administration,

5 USC 5348	15 USC 1511 b-e	16 USC 4101 et seq.	33 USC 2801 et seq.	PL 111-11, Sec 12202
5 USC 4703	15 USC 1514	16 USC 4701 et seq.	33 USC 3001 et seq.	PL 111-11, Sec 12304
7 USC 1622	15 USC 1517	16 USC 5001 et seq.	33 USC 3044 et seq.	PL 111-11, Sec 12404
10 USC 1072	15 USC 1537-40	31 USC 1105	33 USC 3045	PL 111-11, Sec 12502
10 USC 1111-1115	16 USC 661 et seq.	33 USC 706 et seq.	33 USC 3046	PL 111-348
10 USC 2311	16 USC 757a et seq.	33 USC 883 a-i et seq.	PL 111-281, Sec 708	PL 111-358, Sec 301-303
12 USC 1715m	16 USC 1361	33 USC 891 et seq.	42 USC 8902-05	
15 USC 313	16 USC 1431 et seq.	33 USC 893 a-b	42 USC 9601 et seq.	
15 USC 313a	16 USC 1447a et seq.	33 USC 1121-1131	43 USC 1347e	
15 USC 313b	16 USC 1451 et seq.	33 USC 1251	44 USC 1307	
15 USC 313nt	16 USC 1456a	33 USC 1321	49 USC 44720	
15 USC 325	16 USC 1531 et seq.	33 USC 1441-44	97 Stat. 1409	
15 USC 330b	16 USC 1801 et seq.	33 USC 2706	PL 111-11, Sec 12002	
15 USC 330e	16 USC 3645		PL 111-11, Sec 12102	

Organizations and Employees

5 USC 5348 - Crews of Vessels.

"...the pay of officers and members of crews of vessels excepted from chapter 51 of this title by section 5102(c)(8) of this title shall be fixed and adjusted from time to time as nearly as is consistent with the public interest in accordance with prevailing rates and practices in the maritime industry."

5 USC 4703- Demonstration Projects

"…the Office of Personnel Management may, directly or through agreement or contract with one or more agencies and other public and private organizations, conduct and evaluate demonstration projects."

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APPROPRIATION LANGUAGE AND CODE CITATIONS

Agriculture

7 USC 1622 - Distribution and Marketing of Agricultural Products

"The Secretary ... is directed and authorized: ...

(a) to determine the needs and develop or assist in the development of plans for the proper assembly, processing, transportation, storage, distribution, and handling of agricultural (fish) products.
(f) to conduct and cooperate in consumer education for the more effective utilization and greater consumption of agricultural products (fish)...
(g) to collect and disseminate marketing information... for the purpose of ... bringing about a balance between production and utilization of agricultural (fish) products.
(h) to inspect, certify, and identify the class, quality, quantity and condition of agricultural (fish) products ...
(m) to conduct ... research ... to determine the most efficient ... processes for the handling, storing, preserving, protecting...of agricultural (fish) commodities ..."

(h) - Duties of Secretary relating to agricultural products; penalties
"Whoever knowingly shall falsely make, issue, alter, forge, or counterfeit any official certificate, memorandum, or other identification, with respect to inspection, class, grade, quality, size, quantity, or condition, issued or authorized under this section or knowingly cause or procure, or aid, assist in, or be a party to, such false making, issuing, altering, forging, or counterfeiting, or whoever knowingly shall possess, without promptly notifying the Secretary (of Commerce) or his representative, utter, published, or used as true, any such falsely made, altered forged, or counterfeited official certificate, memorandum, mark, identification, or device, or whoever knowingly represents that an agricultural product has been officially inspected or graded...when in fact such commodity has not been so graded or inspected shall be fined not more than $1,000 or imprisoned not more than one year, or both."

Armed Forces

10 USC 1072 Medical and Dental Care

"…The term "uniformed services" means the armed forces and the Commissioned Corps of the National Oceanic and Atmospheric Administration and of the Public Health Service."

10 USC 1111-1115 Determinations of Contributions to the Fund

PL 108-375, Sec. 725 Revised funding methodology for military retiree health care benefits states: "At the beginning of each fiscal year after September 30, 2005, the Secretary of the Treasury shall promptly pay into the Fund from the General Fund of the Treasury--(1) the amount certified to the Secretary by the Secretary of Defense under subsection (c), which shall be the contribution to the Fund for that fiscal year required by section 1115; and (2) the amount determined by each administering Secretary under section 1111(c) as the contribution to the Fund on behalf of the members of the uniformed services under the jurisdiction of that Secretary."

10 USC 2311 Assignment and Delegation of Procurement Functions and Responsibilities

(a) In General.--Except to the extent expressly prohibited by another provision of law, the head of an agency may delegate, subject to his direction, to any other officer or official of that agency, any power under this chapter.

(b) Procurements For or With Other Agencies.--Subject to subsection (a), to facilitate the procurement of property and services covered by this chapter by each agency named in section 2303 of this title for any other agency, and to facilitate joint procurement by those agencies--

(1) the head of an agency may delegate functions and assign responsibilities relating to procurement to any officer or employee within such agency;

(2) the heads of two or more agencies may by agreement delegate procurement functions and assign procurement responsibilities from one agency to another of those agencies or to an officer or civilian employee of another of those agencies; and

(3) the heads of two or more agencies may create joint or combined offices to exercise procurement functions and responsibilities.

Banks and Banking

12 USC 1715m - Mortgage Insurance for Servicemen [NOAA Corps].

This section authorizes payment of Federal Housing Administration (FHA) home mortgage insurance premiums to NOAA Corps Officers.

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Commerce and Trade

15 USC 313 - Duties of Secretary of Commerce [National Weather Service].

"The Secretary of Commerce...shall have charge of the forecasting of weather,...issue of storm warnings,...weather and flood signals,... gauging and reporting of rivers,...collection and transmission of marine intelligence...,...reporting of temperature and rainfall conditions..., the display of frost and cold-wave signals, the distribution of meteorological information..., and the taking of such meteorological observations as may be necessary to establish and record the climatic conditions of the United States, or as are essential for the proper execution of the foregoing duties."

15 USC 313a - Establishment of Meteorological Observation Stations in the Arctic Region.

"... The Secretary of Commerce shall ... take such actions as may be necessary in the development of an international basic meteorological reporting network in the Arctic region of the Western Hemisphere..."

15 USC 313b - Institute for Aviation Weather Prediction

"The Administrator of the National Oceanic and Atmospheric Administration shall establish an Institute for Aviation Weather Prediction. The Institute shall provide forecasts, weather warnings, and other weather services to the United States aviation community.…"

15 USC 313 note - Weather Service Modernization Act

"(a) As part of the budget justification documents submitted to Congress in support of the annual budget request for the department of Commerce, the Secretary shall include a National Implementation Plan for modernization of the National Weather Service for each fiscal year following fiscal year 1993 until such modernization is complete. The Plan shall set forth the actions, during the 2-year period beginning with the fiscal year for which the budget request is made, that will be necessary to accomplish the objectives described in the Strategic Plan.

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15 USC 325 - Spending Authority for the National Weather Service

"...Appropriations now or hereafter provided for the National Weather Service shall be available for: (a) furnishing food and shelter...to employees of the Government assigned to Arctic stations; (b) equipment and maintenance of meteorological offices and stations, and maintenance and operation of meteorological facilities outside the United States... (c) repairing, altering, and improving of buildings occupied by the National Weather Service, and care and preservation of grounds...(d) arranging for communication services... and
(e) purchasing tabulating cards and continuous form tabulating paper .

15 USC 330b - Duties of Secretary relating to Weather Modification Activities or Attempts - Reporting Requirement.

(a) "The Secretary shall maintain a record of weather modification activities, including attempts, which take place in the United States and shall publish summaries thereof from time to time as he determines."
(b) "All reports, documents, and other information received by the Secretary under the provisions of this chapter shall be made available to the public to the fullest practicable extent."

15 USC 330e - Authorization of Appropriations relating to Weather Modification Activities or Attempts - Reporting Requirement.

This section provides funding authority to support the reporting requirements specified in this chapter.

15 USC 1511b - United States Fishery Trade Officers

"For purposes of carrying out export promotion and other fishery development responsibilities, the Secretary of Commerce…shall appoint not fewer than six officers who shall serve abroad to promote United States fishing interests. These officers shall be knowledgeable about the United States fishing industry, preferably with experience derived from the harvesting, processing, or marketing sectors of the industry or from the administration of fisheries programs. Such officers, who shall be employees of the Department of Commerce, shall have the designation of fishery trade officers."

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15 USC 1511c - NOAA Estuarine Programs Office.

"... The Estuarine Programs Office shall develop, coordinate, and implement the estuarine activities of the administration with the activities of other Federal and State agencies. There are authorized to be appropriated to the Administration not to exceed $560,000 for fiscal year 1989, and $600,000 for fiscal year 1990."

15 USC 1511d - Chesapeake Bay Office

The Secretary of Commerce shall establish, within the National Oceanic and Atmospheric Administration, an office to be known as the Chesapeake Bay Office…which shall provide technical assistance on processes impacting the Chesapeake Bay system, its restoration and habitat protection; develop a strategy to meet the commitments of the Chesapeake Bay Agreement; and coordinate programs and activities impacting the Chesapeake Bay, including research and grants.

15 USC 1511e - Office of Space Commercialization

"There is established with the Department of Commerce an Office of Space Commercialization" which shall "promote commercial provider investment in space activities…assist United States commercial providers in [their efforts to] conduct business with the United States Government, [act] as an industry advocate within the executive branch…, ensure that the United States Government does not compete with United States commercial providers…, [promote] the export of space-related goods and services, [represent] the Department of Commerce in the development of United States policies…and [seek] the removal of legal, policy, and institutional impediments to space commerce."

15 USC 1514 - Basic Authority for Performance of Certain Functions and Activities of Department.

"Appropriations are authorized for the following activities of the Department of Commerce:

(a) furnishing to employees...and their dependents, in Alaska and other points outside the continental United States, free emergency medical services...and supplies;
(b) purchasing, transporting, storing, and distributing food and other subsistence supplies for resale to employees...and their dependents, in Alaska and other points outside the continental United States at a reasonable value...; the proceeds from such resales to be credited to the appropriation from which the expenditure was made;
(c) ...establishment, maintenance, and operation of messing facilities, by contract or otherwise, in Alaska and other points outside the continental United States..., such service to be furnished to employees...and their dependents,...

(d) reimbursement...of officers or employees in or under the Department...for food, clothing, medicines, and other supplies furnished by them in emergencies for the temporary relief of dislocated persons in remote localities;

(e) providing motion-picture equipment and film for recreation of crews of vessels..., for recreation for employees in remote localities..., and for training purposes;

(f) erecting, altering, repairing, equipping, furnishing, and maintaining...such living and working quarters and facilities as may be necessary to carry out its authorized work at remote localities not on foreign soil where such living and working accommodations are not otherwise available."

15 USC 1517 - Transfer of Statistical or Scientific Work.

"The President is authorized, by order in writing, to transfer at any time the whole or any part of any office, bureau, division, or other branch of the public service engaged in statistical or scientific work, from the Department of State, the Department of the Treasury, the Department of Defense, the Department of Justice, the United States Postal Service, or the Department of the Interior, to the Department of Commerce; and in every such case the duties and authority performed by and conferred by law upon such office, bureau, division, or other branch of the public service, or the part thereof so transferred, shall be thereby transferred with such office, bureau, division, or other branch of the public service, or the part thereof which is so transferred. All power and authority conferred by law, both supervisory and appellate, upon the department from which such transfer is made, or the Secretary thereof, in relation to the said office, bureau, division, or other branch of the public service, or the part thereof so transferred, shall immediately, when such transfer is so ordered by the President, be fully conferred upon and vested in the Department of Commerce, or the Secretary thereof, as the case may be, as to the whole or part of such office, bureau, division, or other branch of the public service so transferred."

15 USC 1537 - 1539 Needs Assessment for Data Management.

"Not later than 12 months after October 29, 1992, and at least biennially thereafter, the Secretary of Commerce shall complete an assessment of the adequacy of the environmental data and information systems of NOAA."

15 USC 1540 – Cooperative Agreements

"The Secretary of Commerce, acting through the Under Secretary of Commerce for Oceans and Atmosphere, may enter into cooperative agreements and other financial agreements with any nonprofit organization to (1) aid and promote scientific and

educational activities to foster public understanding of the National Oceanic and Atmospheric Administration or its programs; and (2) solicit private donations for the support of such activities."

Conservation

16 USC 661 et seq.- Declaration of Purpose; Cooperation of Agencies; Surveys and Investigations; Donations.

"...the Secretary of the Interior is authorized (1) to provide assistance to, and cooperate with, Federal, State, and public or private agencies and organizations in the development, protection, rearing, and stocking of all species of wildlife, resources thereof, and their habitat, in controlling losses of the same from disease or other causes, in minimizing damages from overabundant species, in providing public shooting and fishing areas, including easements across public lands for access thereto, and in carrying out other measures necessary to effectuate the purposes of said sections; (2) to make surveys and investigations of the wildlife of the public domain, including lands and waters or interests therein acquired or controlled by any agency of the United States; and (3) to accept donations of land and contributions of funds in furtherance of the purposes of said sections."

16 USC 757a et seq.- Anadromous, Great Lakes, and Lake Champlain Fisheries

The Act authorizes cooperative agreements with States "that are concerned with the development, conservation, and enhancement of [anadromous] fish" (section 757a(a)).

16 USC 1361 - Congressional Findings.

"The Congress finds that - (1) certain species and population stocks of marine mammals are, or may be, in danger of extinction or depletion as a result of man's activities;"

"The Secretary is authorized to make grants, or to provide financial assistance in such other form as he deems appropriate, to any Federal or State agency, public or private institution, or other person for the purpose of assisting such agency, institution, or person to undertake research in subjects which are relevant to the protection and conservation of marine mammals, and shall provide financial assistance for, research into new methods of locating and catching yellow-fin tuna without the incidental taking of marine mammals."

16 USC 1431 et seq. - Findings, Purposes, and Policies [The National Marine Sanctuaries Act, as amended].

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(b) Purposes and Policies

"The purposes and policies of this title are -

(1) to identify and designate as national marine sanctuaries areas of the marine environment which are of special national significance;
(2) to provide authority for ... conservation and management of these marine areas ...
(3) to support, promote, and coordinate scientific research on, and monitoring of, the resources of these marine areas...
(4) to enhance public awareness, understanding, appreciation, and wise use of the marine environment;
(5) to facilitate to the extent compatible with the primary objective of resource protection, all public and private uses of the resources of these marine areas not prohibited pursuant to other authorities;
(6) to develop and implement coordinated plans for the protection and management of these areas...;
(7) to create models of, and incentives for, ways to conserve and manage these areas..."
(8) to cooperate with global programs ...; and
(9) to maintain, restore, and enhance living resources ..."

16 USC 1447a et seq. - Regional Marine Research Programs

Authorizes NOAA/EPA and Governors of certain states to appoint members to a number of regional marine research boards. Each board is to develop a comprehensive four year marine research plan and "the Administrator of the National Oceanic and Atmospheric Administration shall administer a grant program to support the administrative functions of each Board."

Authorization for the Boards expires on October 1, 1999. The authorization for appropriations expired at the end of fiscal year 1996.

16 USC 1451 et seq. - Findings, Purposes, and Policies [Coastal Zone Management Act]

Establishes a voluntary partnership between the Federal Government and coastal States. It also establishes the National Estuarine Reserve Research program, in which the Secretary of Commerce may designate an estuarine area as a national estuarine research reserve in consultation with governor of affected state.

16 USC 1456a – Coastal Zone Management Fund

"(b) (1) The Secretary shall establish and maintain a fund, to be known as the 'Coastal Zone Management Fund', which shall consist of amounts retained and deposited into the Fund under subsection (a) of this section and fees deposited into the Fund under section 1456 (i) (3) of this title"

16 USC 1531 et seq. – Congressional Findings and Declaration of Purposes and Policy
The purposes of the Act are "to provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved, to provide a program for the conservation of such endangered species and threatened species, and to take such steps as may be appropriate to achieve the purposes of the treaties and conventions set forth in [the statute]" (section 1531(b)).

16 USC 1801 et seq, - Magnuson-Stevens Fishery Conservation and Management Act.

The primary purpose of the Act is "to take immediate action to conserve and manage the fishery resources found off the coasts of the United States (section 1801(b)(1)).

16 USC 3645 - Pacific Coastal Salmon Recovery

"(A) For salmon habitat restoration, salmon stock enhancement, and salmon research, including the construction of salmon research and related facilities, there is authorized to be appropriated for each of fiscal years 2000, 2001, 2002, and 2003, $90,000,000 to the States of Alaska, Washington, Oregon, and California. Amounts appropriated pursuant to this subparagraph shall be made available as direct payments. The State of Alaska may allocate a portion of any funds it receives under this subsection to eligible activities outside Alaska."

Amended in PL109-479 Section 302(d) as follows: Section 16(d)(2)(A) of the Pacific Salmon Treaty, as transferred by paragraph (1), is amended—

(1) by inserting "sustainable salmon fisheries," after "enhancement,";
(2) by inserting "2005, 2006, 2007, 2008, and 2009," after "2003"; and
(3) by inserting ''Idaho,'' after ''Oregon,''.

16 USC 4101 et seq. – Interjurisdictional Fisheries

"The purposes of this chapter are - (1) to promote and encourage State activities in support of the management of interjurisdictional fishery resources, and (2) to promote and encourage management of interjurisdictional fishery resources through their range" (section 4101).

16 USC 4701 et seq. - Aquatic Nuisance Prevention and Control

Establishes an interagency Aquatic Nuisance species Task Force, of which the Administrator of NOAA is a co-chair. The task force's responsibilities include developing and implementing "a program for waters of the United States to prevent introduction and dispersal of aquatic nuisance species; to monitor, control and study such species; and to disseminate related information."

16 USC 5001 et seq. - Purpose of Convention

"It is the purpose ... to implement the Convention for the Conservation of Anadromous Stocks in the North Pacific Ocean, signed in Moscow, February 11, 1992."

Money and Finance

31 USC 1105 - Budget Contents and Submission to Congress

(a) On or after the first Monday in January but not later than the first Monday in February of each year, the President shall submit a budget of the United States Government for the following fiscal year. Each budget shall include a budget message and summary and supporting information.

Amended in PL108-447 (FY 2005 Omnibus Appropriations Act) as follows: "*Provided further,* That beginning in fiscal year 2006 and for each fiscal year thereafter, the Secretary of Commerce shall include in the budget justification materials that the Secretary submits to Congress in support of the Department of Commerce budget (as submitted with the budget of the President under section 1105(a) of title 31, 10 United States Code) an estimate for each National Oceanic and Atmospheric Administration procurement, acquisition and construction program having a total multiyear program cost of more than $5,000,000 and simultaneously the budget justification materials shall include an estimate of the budgetary requirements for each such program for each of the 5 subsequent fiscal years."

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Navigation and Navigable Waters

33 USC 706 et seq. - Department of Commerce; Current Precipitation Information; Appropriation.

"There is authorized an expenditure as required,..., for the establishment, operation, and maintenance by the Secretary of Commerce of a network of recording and non-recording precipitation stations, known as the Hydroclimatic Network, whenever...such service is advisable..."

33 USC 883a et seq. - Surveys and Other Activities.

"...the Secretary...is authorized to conduct the following activities:

(1) Hydrographic and topographic surveys;
(2) Tide and current observations;
(3) Geodetic-control surveys;
(4) Field surveys for aeronautical charts;
(5) Geomagnetic, seismological, gravity, and related geophysical measurements and investigations, and observations ..."

33 USC 883b - Dissemination of Data; Further Activities.

"...the Secretary is authorized to conduct the following activities:

(1) Analysis and prediction of tide and current data;
(2) Processing and publication of data...;
(3) Compilation and printing of nautical charts...;
(4) Distribution of nautical charts..."

33 USC 883c - Geomagnetic Data; Collection; Correlation, and Dissemination.

"To provide for the orderly collection of geomagnetic data...the Secretary ... is authorized to collect, correlate, and disseminate such data."

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33 USC 883d - Improvement of Methods, Instruments, and Equipments; Investigations and Research.

"...the Secretary ... is authorized to conduct developmental work for the improvement of surveying and cartographic methods, instruments, and equipments; and to conduct investigations and research in geophysical sciences..."

33 USC 883e - Cooperative Agreements for Surveys and Investigations; Contribution of Costs Incurred by National Oceanic and Atmospheric Administration.

"(1) The Secretary of Commerce is authorized to enter into cooperative agreements with, and to receive and expand funds made available by... for surveys or investigations... or for performing related surveying and mapping activities... and for the preparation and publication of the results thereof."

"(2) The Secretary of Commerce is authorized to establish the terms of any cooperative agreement entered into ... including the amount of funds to be received ... which the Secretary determines represents the amount of benefits derived ... from the cooperative agreement."

33 USC 883f - Contracts with Qualified Organizations.

"The Secretary is authorized to contract with qualified organizations for the performance of any part of the authorized functions of the National Ocean Survey..."

33 USC 883h - Employment of Public Vessels.

"The President is authorized to cause to be employed such of the public vessels as he deems it expedient to employ, and to give such instructions for regulating their conduct as he deems proper in order to carry out the provisions of this subchapter."

33 USC 883i - Authorization of Appropriations.

"There are hereby authorized to be appropriated such funds as may be necessary to acquire, construct, maintain, and operate ships, stations, equipment, and facilities and for such other expenditures, including personal services at the seat of government and elsewhere and including the erection of temporary observatory buildings and lease of sites therefore as may be necessary..."

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APPROPRIATION LANGUAGE AND CODE CITATIONS

33 USC 891 et seq. - Fleet Replacement and Modernization Program

"The Secretary is authorized to implement... a 15-year program to replace and modernize the NOAA fleet."
33 USC 893et seq. - Research, Development, and Education

"The Administrator….shall establish a coordinated program of ocean, coastal, Great Lakes, and atmospheric research and development….that shall focus on the development of advanced technologies and analytical methods that will promote United States leadership in ocean and atmospheric science and competitiveness in the applied uses of such knowledge."

33 USC 1121-1124, 1126-1129, 1131 - National Sea Grant College Program Act.

The Sea Grant Act authorizes the awarding of grants and contracts to initiate and support programs at Sea Grant colleges and other institutions for research, education, and advisory services in any field related to the conservation and development of marine resources.

In 2008, PL 110-394 (National Sea Grant College Program Amendments Act of 2008) amended 33 USC 1124 as follows –

(1) by striking "204(c)(4)(F)." in subsection (a) and inserting "204(c)(4)(F) or that are appropriated under section 208(b)."; and
(2) by striking the matter following paragraph (3) in subsection (b) and inserting the following -

"The total amount that may be provided for grants under this subsection during any fiscal year shall not exceed an amount equal to 5 percent of the total funds appropriated for such year under section 212.".

PL 110-394 amended 33 USC 1127 as follows –

(1) by striking ``Not later than 1 year after the date of the enactment of the National Sea Grant College Program Act Amendments of 2002, and every 2 years thereafter," in subsection (a) and inserting "Every 2 years,"; and (2) by adding at the end the following:

"(c) Restriction on Use of Funds.--Amounts available for fellowships under this section, including amounts accepted under section 204(c)(4)(F) or appropriated under section 212 to implement this section, shall be used only for award of such fellowships and administrative costs of implementing this section."

PL 110-394 amended 33 USC 1131 as follows –

(1) by striking subsection (a)(1) and inserting the following: "(1) In general.--There are authorized to be appropriated to the Secretary to carry out this title—
"(A) $72,000,000 for fiscal year 2009;
"(B) $75,600,000 for fiscal year 2010;
"(C) $79,380,000 for fiscal year 2011;
"(D) $83,350,000 for fiscal year 2012;
"(E) $87,520,000 for fiscal year 2013; and
"(F) $91,900,000 for fiscal year 2014.".

(2) in subsection (a)(2)—
(A) by striking "fiscal years 2003 through 2008—" and inserting "fiscal years 2009 through 2014—";
(B) by striking "biology and control of zebra mussels and other important aquatic" in subparagraph (A) and inserting "biology, prevention, and control of aquatic"; and (C) by striking "blooms, including Pfiesteria piscicida; and" in subparagraph (C) and inserting "blooms; and";

(3) in subsection (c)(1) by striking "rating under section 204(d)(3)(A)" and inserting "performance assessments"; and
(4) by striking subsection (c)(2) and inserting the following: "(2) regional or national strategic investments authorized under section 204(b)(4);".

<u>33 USC 1251- Water Pollution Prevention and Control</u>

Through the National Shellfish Indicator Program, authorizes the Secretary of Commerce, in cooperation with the Secretary of Health and Human Services and the Administrator of EPA, to establish and administer a 5-year national shellfish research program for the purpose of improving existing classification systems for shellfish growing waters using the latest technological advancements in microbiology and epidemiological methods.

Department of Commerce
National Oceanic and Atmospheric Administration
APPROPRIATION LANGUAGE AND CODE CITATIONS

33 USC 1321 - Oil and Hazardous Substances [Clean Water Act]

Authorizes the recovery of damages to natural resources in the event of an oil spill in waters of the United States. This authority has been delegated to several Federal agencies, including the Department, pursuant to an Executive Order.

33 USC 1441 - Monitoring and Research Program [Marine Protection, Research and Sanctuaries Act]

Authorizes the Secretary of Commerce, in coordination with other agencies, to initiate a comprehensive and continuing program of monitoring and research regarding the effects of the dumping of material into ocean waters or other coastal waters where the tide ebbs and flows or into the Great Lakes or their connecting waters.

33 USC 1442 - Research Program Respecting Possible Long-range Effects of Pollution, Overfishing, and Man-induced Changes of Ocean Ecosystems

Authorizes the Secretary of Commerce, in consultation with other agencies, to … "initiate a comprehensive and continuing program of research with respect to the possible long-range effects of pollution, overfishing, and man-induced changes of ocean ecosystems."

33 USC 1443 - Regional Management Plans for Waste Disposal in Coastal Areas.

Authorizes the Secretary of Commerce to assist the Environmental Protection Agency in assessing "the feasibility in coastal areas of regional management plans for the disposal of waste materials."

33 USC 1444 - Annual Report

Requires the Secretary of Commerce to provide Congress with an annual report on the Department's activities to monitor ocean dumping and research the long-range effects of pollution on ocean ecosystems.

33 USC 2706 - Natural Resources [NOAA Oil and Hazardous Substance Spill Cost Reimbursement].

"...the National Oceanic and Atmospheric Administration acts as trustee of said marine environment and/or resources, shall be deposited in the Damage Assessment and Restoration Revolving Fund ... for purposes of obligation and expenditure in fiscal year 1991 and thereafter, sums available in the Damage Assessment and Restoration Revolving Fund may be transferred, upon the approval of the Secretary ..., to the Operations, Research, and Facilities appropriation of the National Oceanic and Atmospheric Administration."

33 USC 2801 et seq. - National Coastal Monitoring Act.

"The purposes of this chapter are to -

(1) establish a comprehensive national program for consistent monitoring of the Nation's coastal ecosystems;
(2) establish long-term water quality assessment and monitoring programs for high priority coastal waters that will enhance the ability of Federal, State, and local authorities to develop and implement effective remedial programs for those waters;
(3) establish a system for reviewing and evaluating the scientific, analytical, and technological means that are available for monitoring the environmental quality of coastal ecosystems;
(4) establish methods for identifying uniform indicators of coastal ecosystem quality;
(5) provide for periodic, comprehensive reports to Congress concerning the quality of the Nation's coastal ecosystems;
(6) establish a coastal environment information program to distribute coastal monitoring information;
(7) provide state programs authorized under the Coastal Zone Management Act of 1972 (16 U.S.C. 1451 et seq.) with information necessary to design land use plans and coastal zone regulations that will contribute to the protection of coastal ecosystems; and
(8) provide certain water pollution control programs authorized under the Federal Water Pollution Control Act (33 U.S.C. 1251 et seq.) with information necessary to design and implement effective coastal water pollution controls."

33 USC 3001 et seq.- NOAA Corps Officers

PL 108-219 states: "All action in the line of duty by, and all Federal agency actions in relation to (including with respect to pay, benefits, and retirement) a de facto officer of the commissioned corps of the National Oceanic and Atmospheric Administration who was appointed or promoted to that office without Presidential action, and without the advice and consent of the Senate, during such time as the officer was not properly appointed in or promoted to that office, are hereby ratified and approved if otherwise in accord with the law, and the President alone may, without regard to any other law relating to appointments or promotions in such corps, appoint or promote such a de facto officer temporarily, without change in the

grade currently occupied in a de facto capacity, as an officer in such corps for a period ending not later than 180 days from the date of enactment of this Act."

33 USC 3044 et seq. -Retirement for Length of Service

PL 107-372 states: "An officer who has completed 20 years of service, of which at least 10 years was service as a commissioned officer, may at any time thereafter, upon application by such officer and in the discretion of the President, be placed on the retired list.

33 USC 3045 - Computation of Retired Pay

PL 107-372 states: " (a) Officers first becoming members before September 8, 1980: Each officer on the retired list who first became a member of a uniformed service before September 8, 1980, shall receive retired pay at the rate determined by multiplying (1) the retired pay base determined under section 1406(g) of title 10; by (2) 2 1/2 percent of the number of years of service that may be credited to the officer under section 1405 of such title as if the officer's service were service as a member of the Armed Forces. The retired pay so computed may not exceed 75 percent of the retired pay base. (b) Officers first becoming members on or after September 8, 1980. Each officer on the retired list who first became a member of a uniformed service on or after September 8, 1980, shall receive retired pay at the rate determined by multiplying (1) the retired pay base determined under section 1407 of title 10; by (2) the retired pay multiplier determined under section 1409 of such title for the number of years of service that may be credited to the officer under section 1405 of such title as if the officer's service were service as a member of the Armed Forces. (c) Treatment of full and fractional parts of months in computing years of service (1) In general, in computing the number of years of service of an officer for the purposes of subsection (a) of this section - (A) each full month of service that is in addition to the number of full years of service creditable to the officer shall be credited as 1/12 of a year; and (B) any remaining fractional part of a month shall be disregarded. (2) Rounding Retired pay computed under this section, if not a multiple of $1, shall be rounded to the next lower multiple of $1."

33 USC 3046 - Retired Grade and Retired Pay

PL 107-372 states: "Each officer retired pursuant to law shall be placed on the retired list with the highest grade satisfactorily held by that officer while on active duty including active duty pursuant to recall, under permanent or temporary appointment, and shall receive retired pay based on such highest grade, if - (1) the officer's performance of duty in such highest grade has been satisfactory, as determined by the Secretary of the department or departments under whose jurisdiction the officer served; and (2) unless retired for disability, the officer's length of service in such highest grade is no less than that required by the Secretary of officers retiring under permanent appointment in that grade.

Department of Commerce
National Oceanic and Atmospheric Administration
APPROPRIATION LANGUAGE AND CODE CITATIONS

Use of Oil Spill Liability Trust Fund

PL 111-281, Sec. 708 amends Section 1012(a)(5) of the Oil Spill Liability Trust Fund Act by: "(2) by inserting after subparagraph (A) the following:''(B) not more than $15,000,000 in each fiscal year shall be available to the Under Secretary of Commerce for Oceans and Atmosphere for expenses incurred by, and activities related to, response and damage assessment capabilities of the National Oceanic and Atmospheric Administration.''

The Public Health and Welfare

42 USC 8902-8905 - Acid Precipitation Program

Authorized the Administrator of NOAA to serve as co-chair of a task force to prepare a comprehensive research plan for a program to study the causes and effects of acid precipitation. Also authorizes the Administrator of NOAA to serve as the director of a related research program.

42 USC 9601 et seq. (CERCLA)

Through associated regulations and delegations, authorizes the Administrator to provide technical assistance to the Administrator, EPA, for hazardous waste response under CERCLA and the National Contingency Plan and authorizes the Administrator to act as a natural resource trustee with authority to bring a cause of action for damages resulting from an injury to, destruction of or loss of resources under NOAA's jurisdiction.

Public Lands

43 USC 1347e - Safety and Health Regulations

Authorizes the Secretary of Commerce in cooperation with other Federal entities, to conduct studies of underwater diving techniques and equipment "suitable for protection of human safety and improvement of diver performance…."

Department of Commerce
National Oceanic and Atmospheric Administration
APPROPRIATION LANGUAGE AND CODE CITATIONS

Public Printing and Documents

44 USC 1307 - Sale and Distribution of NOAA Nautical and Aeronautical Products.

"All nautical and aeronautical products created or published ... shall be sold at ... prices ... the Secretary of Commerce shall establish annually ... so as to recover all costs attributable to data base management, compilation, printing, and distribution of such products."

Transportation

49 USC 44720 - Meteorological services

The Administrator of the Federal Aviation Administration shall make recommendations to the Secretary of Commerce on providing meteorological services necessary for the safe and efficient movement of aircraft in air commerce. In providing the services, the Secretary shall cooperate with the Administrator and give complete consideration to those recommendations.

"To promote safety and efficiency in air navigation to the highest possible degree, the Secretary shall -(1)observe, measure, investigate, and study atmospheric phenomena, and maintain meteorological stations and offices...(2) provide reports to the Administrator (3)cooperate with persons engaged in air commerce in meteorological services...(4)maintain and coordinate international exchanges of meteorological information... (5) participate in developing an international basic meteorological reporting network...(6)coordinate meteorological requirements in the United States to maintain standard observations...;(7)promote and develop meteorological science....

Interjurisdictional Fisheries Act

97 Stat. 1409

This Act authorizes NMFS fisheries programs not otherwise authorized by law, including research to reduce entanglement of marine mammals in fishing gear, development of habitat restoration techniques, restoration of Chesapeake Bay, and conservation of Antarctic living marine resources.

Department of Commerce
National Oceanic and Atmospheric Administration
APPROPRIATION LANGUAGE AND CODE CITATIONS

Omnibus Public Land Management Act of 2009

PL 111-11, Sec 12002

Establishes a national ocean exploration program within the National Oceanic and Atmospheric Administration (NOAA) that promotes collaboration with other federal ocean and undersea research and exploration programs. Requires convening an ocean exploration and undersea research technology and infrastructure task force. Establishes the Ocean Exploration Advisory Board. Authorizes appropriations.

PL 111-11, Sec 12202

Ocean and Coastal Mapping Integration Act - Directs the President to establish a coordinated federal program to develop an ocean and coastal mapping plan for the Great Lakes and coastal state waters, the territorial sea, the exclusive economic zone, and the continental shelf of the United States that enhances ecosystem approaches in decision-making for conservation and management of marine resources and habitats, establishes research and mapping priorities, supports the siting of research and other platforms, and advances ocean and coastal science. Requires a plan for an integrated ocean and coastal mapping initiative within NOAA. Authorizes appropriations.

PL 111-11, Sec 12304

Integrated Coastal and Ocean Observation System Act of 2009 - Directs the President to establish a National Integrated Coastal and Ocean Observation System that is designed to address regional and national needs for ocean information, to gather specific data on key coastal, ocean, and Great Lakes variables, and to ensure timely and sustained dissemination and availability of such data. Requires an advisory committee. Authorizes appropriations.

PL 111-11, Sec 12404

Federal Ocean Acidification Research And Monitoring Act of 2009 or the FOARAM Act - Directs the Joint Subcommittee on Ocean Science and Technology of the National Science and Technology Council to: (1) coordinate federal activities on ocean acidification and establish an interagency working group; and (2) develop a strategic plan for federal research and monitoring on ocean acidification. Requires specified ocean acidification programs in NOAA, the National Science Foundation (NSF), and the National Aeronautics and Space Administration (NASA). Authorizes appropriations.

Department of Commerce
National Oceanic and Atmospheric Administration
APPROPRIATION LANGUAGE AND CODE CITATIONS

PL 111-11, Sec 12502

Coastal and Estuarine Land Conservation Program Act - (Sec. 12502) Amends the Coastal Zone Management Act of 1972 to authorize the Secretary of Commerce to conduct a Coastal and Estuarine Land Conservation Program to protect important coastal and estuarine areas. Requires related property acquisition grants to coastal states with approved coastal zone management plans or National Estuarine Research Reserve units. Authorizes appropriations.

NATIONAL OCEAN SERVICE
($ in Thousands)

FY 2015 PROPOSED OPERATING PLAN	FY 2013 Spend Plan	POS	FTE	FY 2014 Enacted	POS	FTE	FY 2015 Calculated ATBs	FY 2015 Technical ATBs	POS	FTE	FY 2015 Base	POS	FTE	FY 2015 Program Changes	POS	FTE	FY 2015 Estimate
Navigation, Observations and Positioning																	
Navigation, Observations and Positioning	121,463	580	552	136,000	0	0	1,876	0	580	552	137,876	1	1	0	581	553	137,876
Hydrographic Survey Priorities/Contracts	25,153	11	10	25,000	0	0	0	0	11	10	25,000	0	0	0	11	10	25,000
IOOS Regional Observations	26,551	0	0	28,500	0	0	0	0	0	0	28,500	0	0	1,000	0	0	29,500
Total, Navigation, Observations and Positioning	**173,167**	**591**	**562**	**189,500**	**0**	**0**	**1,876**	**0**	**591**	**562**	**191,376**	**1**	**1**	**1,000**	**592**	**563**	**192,376**
National Estuarine Research Reserve Construction (NERRS)																	
Coastal Science, Assessment, Response and Restoration	62,450	327	311	70,500	0	0	1,003	0	327	311	71,503	(31)	(16)	1,500	296	295	73,003
Competitive Research	8,384	3	3	9,000	0	0	0	0	3	3	9,000	0	0	6,000	3	3	15,000
Total, Coastal Science and Assessment	**70,834**	**330**	**314**	**79,500**	**0**	**0**	**1,003**	**0**	**330**	**314**	**80,503**	**(31)**	**(16)**	**7,500**	**299**	**298**	**88,003**
Ocean and Coastal Management and Services																	
Coastal Zone Management and Services	42,238	147	140	41,000	0	0	472	0	147	140	41,472	0	0	5,000	147	140	46,472
Coastal Management Grants	65,349	0	0	66,146	0	0	0	0	0	0	66,146	0	0	5,000	0	0	71,146
Coral Reef Program	24,944	24	23	26,000	0	0	78	0	24	23	26,078	0	0	0	24	23	26,078
National Estuarine Research Reserve System	20,496	0	0	21,300	0	0	0	0	0	0	21,300	0	0	0	0	0	21,300
Sanctuaries and Marine Protected Areas	45,649	197	188	48,500	0	0	639	0	197	188	49,139	0	0	(2,000)	197	188	47,139
Total, Ocean and Coastal Management and Services	**198,676**	**368**	**351**	**202,946**	**0**	**0**	**1,189**	**0**	**368**	**351**	**204,135**	**0**	**0**	**8,000**	**368**	**351**	**212,135**
Undistributed ATBs	**0**	**0**	**0**	**0**	**0**	**0**	**2,043**	**0**	**0**	**0**	**2,043**	**0**	**0**	**(2,043)**	**0**	**0**	**0**
Total, National Ocean Service - ORF	**442,677**	**1,289**	**1,227**	**471,946**	**0**	**0**	**6,111**	**0**	**1,289**	**1,227**	**478,057**	**(30)**	**(15)**	**14,457**	**1,259**	**1,212**	**492,514**
Other National Ocean Service Accounts																	
Total, National Ocean Service - PAC	0	5	5	3,700	0	0	0	0	5	5	3,700	0	0	0	5	5	3,700
Total, National Ocean Service - Other	25,643	16	16	23,040	0	0	0	158	16	16	23,198	0	0	0	16	16	23,198
GRAND TOTAL NOS	**468,320**	**1,310**	**1,248**	**498,686**	**0**	**0**	**6,111**	**158**	**1,310**	**1,248**	**504,955**	**(30)**	**(15)**	**14,457**	**1,280**	**1,233**	**519,412**

NATIONAL MARINE FISHERIES SERVICE
($ in Thousands)

FY 2015 PROPOSED OPERATING PLAN	FY 2013 Spend Plan	POS	FTE	FY 2014 Enacted	POS	FTE	FY 2015 Calculated ATBs	FY 2015 Technical ATBs	POS	FTE	FY 2015 Base	POS	FTE	FY 2015 Program Changes	POS	FTE	FY 2015 Estimate
Protected Species Research and Management																	
Protected Species Research and Management Programs Base	37,615	195	186	39,000	0	0	680	0	195	186	39,680	0	0	0	195	186	39,680
Species Recovery Grants	4,022	3	3	5,000	0	0	9	0	3	3	5,009	0	0	5,000	3	3	10,009
Marine Mammals	46,257	202	192	49,000	0	0	717	0	202	192	49,717	0	0	(2,500)	202	192	47,217
Marine Turtles	12,006	56	53	12,200	0	0	188	0	56	53	12,388	0	0	(1,000)	56	53	11,388
Other Protected Species (Marine Fish, Plants, and Invertebrates)	6,557	35	33	7,000	0	0	116	0	35	33	7,116	9	7	4,000	44	40	11,116
National Estuarine Research Reserve Construction (NERRS)	4,658	24	23	5,000	0	0	74	0	24	23	5,074	0	0	1,000	24	23	6,074
Pacific Salmon (for Salmon Management Activities, see FRM)	54,406	339	323	59,500	0	0	1,227	0	339	323	60,727	0	0	0	339	323	60,727
Total, Protected Species Research and Management	**165,521**	**854**	**813**	**176,700**	**0**	**0**	**3,011**	**0**	**854**	**813**	**179,711**	**9**	**7**	**6,500**	**863**	**820**	**186,211**
Fisheries Research and Management																	
Fisheries Research and Management Programs	170,470	805	767	175,000	0	0	2,833	0	805	767	177,833	0	0	4,000	805	767	181,833
National Catch Share Program	24,457	68	65	25,000	0	0	216	0	68	65	25,216	0	0	2,000	68	65	27,216
Expand Annual Stock Assessments - Improve Data Collection	63,950	190	181	69,000	0	0	745	0	190	181	69,745	0	0	2,500	190	181	72,245
Economics & Social Sciences Research	6,801	30	29	7,300	0	0	117	0	30	29	7,417	0	0	0	30	29	7,417
Salmon Management Activities	36,332	28	27	30,200	0	0	102	0	28	27	30,302	0	0	(3,000)	28	27	27,302
Regional Councils and Fisheries Commissions	29,397	13	12	32,000	0	0	738	0	13	12	32,738	0	0	0	13	12	32,738
Fisheries Statistics	21,614	108	103	22,000	0	0	361	0	108	103	22,361	0	0	0	108	103	22,361
Fish Information Networks	20,588	16	15	22,000	0	0	56	0	16	15	22,056	0	0	0	16	15	22,056
Survey and Monitoring Projects	22,671	119	113	24,000	0	0	404	0	119	113	24,404	0	0	0	119	113	24,404
Fisheries Oceanography	2,049	5	5	2,160	0	0	19	0	5	5	2,179	0	0	0	5	5	2,179
American Fisheries Act	3,541	24	23	3,700	0	0	82	0	24	23	3,782	0	0	0	24	23	3,782
Interjurisdictional Fisheries Grants	1,863	1	1	2,500	0	0	2	0	1	1	2,502	0	0	0	1	1	2,502
National Standard 8	948	2	2	1,000	0	0	9	0	2	2	1,009	0	0	0	2	2	1,009
Reducing Bycatch	3,205	3	3	3,500	0	0	8	0	3	3	3,508	0	0	0	3	3	3,508
Product Quality and Safety	6,138	42	40	6,700	0	0	146	0	42	40	6,846	0	0	0	42	40	6,846
Total, Fisheries Research and Management	**414,024**	**1,454**	**1,386**	**426,060**	**0**	**0**	**5,838**	**0**	**1,454**	**1,386**	**431,898**	**0**	**0**	**5,500**	**1,454**	**1,386**	**437,398**
Enforcement & Observers/Training																	
Enforcement	62,533	231	220	65,000	0	0	850	0	231	220	65,850	0	0	0	231	220	65,850
Observers/Training	40,214	160	152	43,000	0	0	478	0	160	152	43,478	0	0	0	160	152	43,478
Total, Enforcement & Observers/Training	**102,747**	**391**	**372**	**108,000**	**0**	**0**	**1,328**	**0**	**391**	**372**	**109,328**	**0**	**0**	**0**	**391**	**372**	**109,328**

NATIONAL MARINE FISHERIES SERVICE
($ in Thousands)

FY 2015 PROPOSED OPERATING PLAN	FY 2013 Spend Plan	POS	FTE	FY 2014 Enacted	POS	FTE	FY 2015 Calculated ATBs	FY 2015 Technical ATBs	POS	FTE	FY 2015 Base	POS	FTE	FY 2015 Program Changes	POS	FTE	FY 2015 Estimate
Habitat Conservation & Restoration																	
Sustainable Habitat Management	19,563	87	83	21,000	0	0	313	0	87	83	21,313	0	0	0	87	83	21,313
Fisheries Habitat Restoration	19,285	50	48	20,700	0	0	177	0	50	48	20,877	0	0	0	50	48	20,877
Subtotal, Habitat Conservation & Restoration	**38,848**	**137**	**131**	**41,700**	**0**	**0**	**490**	**0**	**137**	**131**	**42,190**	**0**	**0**	**0**	**137**	**131**	**42,190**
Other Activities Supporting Fisheries																	
Antarctic Research	2,609	11	10	2,900	0	0	42	0	11	10	2,942	0	0	0	11	10	2,942
Aquaculture	5,293	21	20	5,600	0	0	80	0	21	20	5,680	0	0	0	21	20	5,680
Climate Regimes & Ecosystem Productivity	1,683	12	11	2,000	0	0	31	0	12	11	2,031	0	0	848	12	11	2,879
Computer Hardware and Software - FY 2004 Omnibus Funded in PAC	1,717	2	2	1,800	0	0	5	0	2	2	1,805	0	0	0	2	2	1,805
Cooperative Research	11,179	25	24	12,000	0	0	80	0	25	24	12,080	0	0	0	25	24	12,080
Information Analyses & Dissemination	14,254	90	86	15,000	0	0	314	0	90	86	15,314	0	0	0	90	86	15,314
Marine Resources Monitoring, Assessment & Prediction Program (MarMap)	745	0	0	800	0	0	1	0	0	0	801	0	0	0	0	0	801
National Environmental Policy Act (NEPA)	6,056	30	29	6,500	0	0	109	0	30	29	6,609	0	0	0	30	29	6,609
NMFS Facilities Maintenance	3,075	0	0	3,300	0	0	2	0	0	0	3,302	0	0	0	0	0	3,302
Regional Studies	9,502	24	23	10,200	0	0	86	0	24	23	10,286	0	0	0	24	23	10,286
Total, Other Activities Supporting Fisheries	**56,113**	**215**	**205**	**60,100**	**0**	**0**	**750**	**0**	**215**	**205**	**60,850**	**0**	**0**	**848**	**215**	**205**	**61,698**
Undistributed ATBs	**0**	**0**	**0**	**0**	**0**	**0**	**2,381**	**0**	**0**	**0**	**2,381**	**0**	**0**	**(2,381)**	**0**	**0**	**0**
Total, National Marine Fisheries Service - ORF	**777,253**	**3,051**	**2,907**	**812,560**	**0**	**0**	**13,798**	**0**	**3,051**	**2,907**	**826,358**	**9**	**7**	**10,467**	**3,060**	**2,914**	**836,825**
Other National Marine Fisheries Service Accounts																	
National Marine Fisheries Service - PAC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total, National Marine Fisheries Service - Other	105,239	40	40	186,492	0	0	0	(16,566)	40	40	169,926	0	0	(90,000)	40	40	79,926
GRAND TOTAL NMFS	**882,492**	**3,091**	**2,947**	**999,052**	**0**	**0**	**13,798**	**(16,566)**	**3,091**	**2,947**	**996,284**	**9**	**7**	**(79,533)**	**3,100**	**2,954**	**916,751**

OFFICE of OCEANIC AND ATMOSPHERIC RESEARCH
($ in Thousands)

FY 2015 PROPOSED OPERATING PLAN	FY 2013 Spend Plan	POS	FTE	FY 2014 Enacted	POS	FTE	FY 2015 Calculated ATBs	FY 2015 Technical ATBs	POS	FTE	FY 2015 Base	POS	FTE	FY 2015 Program Changes	POS	FTE	FY 2015 Estimate
Climate Research																	
Laboratories & Cooperative Institutes																	
Laboratories & Cooperative Institutes	49,703	202	192	59,450	0	0	504	0	202	192	59,954	6	4	15,500	208	196	75,454
Subtotal, Laboratories & Cooperative Institutions	**49,703**	**202**	**192**	**59,450**	**0**	**0**	**504**	**0**	**202**	**192**	**59,954**	**6**	**4**	**15,500**	**208**	**196**	**75,454**
Regional Climate Data & Information																	
National Estuarine Research Reserve Construction (NERRS)	40,415	21	20	37,000	0	0	312	0	21	20	37,312	5	4	15,000	26	24	52,312
Subtotal, Climate Data & Information	**40,415**	**21**	**20**	**37,000**	**0**	**0**	**312**	**0**	**21**	**20**	**37,312**	**5**	**4**	**15,000**	**26**	**24**	**52,312**
Climate Competitive Research																	
Climate Competitive Research	45,468	66	63	60,000	0	0	504	0	66	63	60,504	0	0	0	66	63	60,504
Subtotal, Climate Competitive Research, Sustained Obs and Regional Info	**45,468**	**66**	**63**	**60,000**	**0**	**0**	**504**	**0**	**66**	**63**	**60,504**	**0**	**0**	**0**	**66**	**63**	**60,504**
Total, Climate Research	**135,586**	**289**	**275**	**156,450**	**0**	**0**	**1,320**	**0**	**289**	**275**	**157,770**	**11**	**8**	**30,500**	**300**	**283**	**188,270**
Weather & Air Chemistry Research																	
Laboratories & Cooperative Institutes																	
Laboratories & Cooperative Institutes	51,229	217	207	64,000	0	0	547	0	217	207	64,547	0	0	0	217	207	64,547
Subtotal, Laboratories & Cooperative Institutes	**51,229**	**217**	**207**	**64,000**	**0**	**0**	**547**	**0**	**217**	**207**	**64,547**	**0**	**0**	**0**	**217**	**207**	**64,547**
Weather & Air Chemistry Research Programs																	
U.S. Weather Research Program (USWRP)	3,934	4	4	4,200	0	0	36	0	4	4	4,236	1	1	3,000	5	5	7,236
Tornado Severe Storm Research / Phased Array Radar	9,324	0	0	13,000	0	0	111	0	0	0	13,111	0	0	0	0	0	13,111
Subtotal, Weather & Air Chemistry Research Programs	**13,258**	**4**	**4**	**17,200**	**0**	**0**	**147**	**0**	**4**	**4**	**17,347**	**1**	**1**	**3,000**	**5**	**5**	**20,347**
Total, Weather & Air Chemistry Research	**64,487**	**221**	**211**	**81,200**	**0**	**0**	**694**	**0**	**221**	**211**	**81,894**	**1**	**1**	**3,000**	**222**	**212**	**84,894**
Ocean, Coastal, and Great Lakes Research																	
Laboratories & Cooperative Institutes																	
Laboratories & Cooperative Institutes	23,756	131	125	26,442	0	0	227	0	131	125	26,669	0	0	(2,000)	131	125	24,669
Subtotal, Laboratories & Cooperative Institutes	**23,756**	**131**	**125**	**26,442**	**0**	**0**	**227**	**0**	**131**	**125**	**26,669**	**0**	**0**	**(2,000)**	**131**	**125**	**24,669**

OFFICE of OCEANIC AND ATMOSPHERIC RESEARCH
($ in Thousands)

FY 2015 PROPOSED OPERATING PLAN	FY 2013 Spend Plan	POS	FTE	FY 2014 Enacted	POS	FTE	FY 2015 Calculated ATBs	FY 2015 Technical ATBs	POS	FTE	FY 2015 Base	POS	FTE	FY 2015 Program Changes	POS	FTE	FY 2015 Estimate
National Sea Grant College Program																	
National Sea Grant College Program Base	57,574	14	13	62,800	0	0	569	0	14	13	63,369	0	0	(2,000)	14	13	61,369
Marine Aquaculture Program	0	1	1	4,500	0	0	0	0	1	1	4,500	0	0	(2,500)	1	1	2,000
Subtotal, National Sea Grant College Program	**57,574**	**15**	**14**	**67,300**	**0**	**0**	**569**	**0**	**15**	**14**	**67,869**	**0**	**0**	**(4,500)**	**15**	**14**	**63,369**
Ocean Exploration and Research																	
Ocean Exploration and Research	21,046	20	19	26,000	0	0	220	0	20	19	26,220	0	0	(7,000)	20	19	19,220
Subtotal, Ocean Exploration and Research	**21,046**	**20**	**19**	**26,000**	**0**	**0**	**220**	**0**	**20**	**19**	**26,220**	**0**	**0**	**(7,000)**	**20**	**19**	**19,220**
Other Ecosystems Programs																	
Integrated Ocean Acidification	5,963	12	11	6,000	0	0	51	0	12	11	6,051	4	3	8,871	16	14	14,922
Subtotal, Other Ecosystems Programs	**5,963**	**12**	**11**	**6,000**	**0**	**0**	**51**	**0**	**12**	**11**	**6,051**	**4**	**3**	**8,871**	**16**	**14**	**14,922**
Sustained Ocean Observations and Monitoring																	
Sustained Ocean Observations and Monitoring	40,750	49	47	41,000	0	0	347	0	49	47	41,347	0	0	0	49	47	41,347
Subtotal, Sustained Observations and Monitoring	**40,750**	**49**	**47**	**41,000**	**0**	**0**	**347**	**0**	**49**	**47**	**41,347**	**0**	**0**	**0**	**49**	**47**	**41,347**
Total, Ocean, Coastal, & Great Lakes Research	**149,089**	**227**	**216**	**166,742**	**0**	**0**	**1,414**	**0**	**227**	**216**	**168,156**	**4**	**3**	**(4,629)**	**231**	**219**	**163,527**
Innovative Research & Technology																	
High Performance Computing Initiatives	10,575	11	10	12,000	0	0	103	0	11	10	12,103	0	0	0	11	10	12,103
Total, Innovative Research & Technology	**10,575**	**11**	**10**	**12,000**	**0**	**0**	**103**	**0**	**11**	**10**	**12,103**	**0**	**0**	**0**	**11**	**10**	**12,103**
Undistributed ATBs	**0**	**0**	**0**	**0**	**0**	**0**	**78**	**0**	**0**	**0**	**78**	**0**	**0**	**(78)**	**0**	**0**	**0**
Total, Office of Oceanic and Atmospheric Research - ORF	**359,737**	**748**	**712**	**416,392**	**0**	**0**	**3,609**	**0**	**748**	**712**	**420,001**	**16**	**12**	**28,793**	**764**	**724**	**448,794**
Other Office of Oceanic and Atmospheric Research Accounts																	
Total, Office of Ocean and Atmospheric Research - PAC	9,677	0	0	10,379	0	0	0	0	0	0	10,379	0	0	3,000	0	0	13,379
Total, Office of Oceanic and Atmospheric Research - Other	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GRAND TOTAL OAR	**369,414**	**748**	**712**	**426,771**	**0**	**0**	**3,609**	**0**	**748**	**712**	**430,380**	**16**	**12**	**31,793**	**764**	**724**	**462,173**

NATIONAL WEATHER SERVICE
($ in Thousands)

FY 2015 PROPOSED OPERATING PLAN	FY 2013 Spend Plan	POS	FTE	FY 2014 Enacted	POS	FTE	FY 2015 Calculated ATBs	FY 2015 Technical ATBs	POS	FTE	FY 2015 Base	POS	FTE	FY 2015 Program Changes	POS	FTE	FY 2015 Estimate
Observations	196,899	844	804	205,342	0	0	1,435	0	844	804	206,777	0	0	(6,500)	844	804	200,277
Central Processing	82,326	244	232	100,225	0	0	292	0	244	232	100,517	(98)	(98)	(14,000)	146	134	86,517
Analyze, Forecast and Support	447,585	3,211	3,058	475,467	0	0	6,893	0	3,211	3,058	482,360	0	0	(6,000)	3,211	3,058	476,360
Dissemination	44,092	88	84	46,331	0	0	174	0	88	84	46,505	(2)	(2)	(6,406)	86	82	40,099
Science and Technology Integration	100,370	545	519	126,262	0	0	1,114	0	545	519	127,376	(2)	(2)	(3,776)	543	517	123,600
National Estuarine Research Reserve Construction (NERRS)																	
Undistributed ATBs	**0**	**0**	**0**	**0**	**0**	**0**	**8,770**	**0**	**0**	**0**	**8,770**	**0**	**0**	**(8,770)**	**0**	**0**	**0**
Total, National Weather Service - ORF	**871,272**	**4,932**	**4,697**	**953,627**	**0**	**0**	**18,678**	**0**	**4,932**	**4,697**	**972,305**	**(102)**	**(102)**	**(45,452)**	**4,830**	**4,595**	**926,853**
Other National Weather Service Accounts																	
Total, National Weather Service - PAC	82,289	25	24	113,619	0	0	0	0	25	24	113,619	(2)	(2)	22,875	23	22	136,494
Total, National Weather Service - Other	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GRAND TOTAL NWS	**953,561**	**4,957**	**4,721**	**1,067,246**	**0**	**0**	**18,678**	**0**	**4,957**	**4,721**	**1,085,924**	**(104)**	**(104)**	**(22,577)**	**4,853**	**4,617**	**1,063,347**

NATIONAL ENVIRONMENTAL SATELLITE, DATA AND INFORMATION SERVICE
($ in Thousands)

FY 2015 PROPOSED OPERATING PLAN	FY 2013 Spend Plan	POS	FTE	FY 2014 Enacted	POS	FTE	FY 2015 Calculated ATBs	FY 2015 Technical ATBs	POS	FTE	FY 2015 Base	POS	FTE	FY 2015 Program Changes	POS	FTE	FY 2015 Estimate
Environmental Satellite Observing Systems																	
Office of Satellite and Product Operations (OSPO)																	
Satellite and Product Operations	75,543	303	288	84,000			342		303	288	84,342	0	0	0	303	288	84,342
NSOF Operations	7,461	0	0	8,000			500		0	0	8,500	0	0	0	0	0	8,500
Subtotal, Office of Satellite and Product Operations	**83,004**	**303**	**288**	**92,000**	**0**	**0**	**842**	**0**	**303**	**288**	**92,842**	**0**	**0**	**0**	**303**	**288**	**92,842**
National Estuarine Research Reserve Construction (NERRS)																	
Product Development, Readiness & Application	25,141	92	88	26,000					92	88	26,000	0	0	0	92	88	26,000
Subtotal, Product Development, Readiness & Application	**25,141**	**92**	**88**	**26,000**	**0**	**0**	**0**	**0**	**92**	**88**	**26,000**	**0**	**0**	**0**	**92**	**88**	**26,000**
Commercial Remote Sensing Regulatory Affairs	1,043	6	6	1,000			200		6	6	1,200	0	0	0	6	6	1,200
Office of Space Commercialization	614	4	4	600			400		4	4	1,000	0	0	0	4	4	1,000
Group on Earth Observations (GEO)	471	0	0	500					0	0	500	0	0	0	0	0	500
Total, Environmental Satellite Observing Systems	**110,273**	**405**	**386**	**120,100**	**0**	**0**	**1,442**	**0**	**405**	**386**	**121,542**	**0**	**0**	**0**	**405**	**386**	**121,542**
National Environmental Information Office																	
National Environmental Information Office	64,966	304	289	67,067					304	289	67,067	0	0	2,000	304	289	69,067
Total, National Environmental Information Office	**64,966**	**304**	**289**	**67,067**	**0**	**0**	**0**	**0**	**304**	**289**	**67,067**	**0**	**0**	**2,000**	**304**	**289**	**69,067**
Undistributed ATBs	**0**	**0**	**0**	**0**	**0**	**0**	**1,744**	**0**	**0**	**0**	**1,744**	**0**	**0**	**(1,744)**	**0**	**0**	**0**
Total, NESDIS - ORF	**175,239**	**709**	**675**	**187,167**	**0**	**0**	**3,186**	**0**	**709**	**675**	**190,353**	**0**	**0**	**256**	**709**	**675**	**190,609**
Other NESDIS Accounts																	
Total, NESDIS - PAC	1,689,586	243	232	1,895,966	0	0	0	(302)	243	232	1,895,664	3	2	161,653	246	234	2,057,317
Total, NESDIS - Other	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GRAND TOTAL NESDIS	**1,864,825**	**952**	**907**	**2,083,133**	**0**	**0**	**3,186**	**(302)**	**952**	**907**	**2,086,017**	**3**	**2**	**161,909**	**955**	**909**	**2,247,926**

PROGRAM SUPPORT
($ in Thousands)

FY 2015 PROPOSED OPERATING PLAN	FY 2013 Spend Plan	POS	FTE	FY 2014 Enacted	POS	FTE	FY 2015 Calculated ATBs	FY 2015 Technical ATBs	POS	FTE	FY 2015 Base	POS	FTE	FY 2015 Program Changes	POS	FTE	FY 2015 Estimate
Corporate Services																	
Under Secretary and Associate Offices																	
Under Secretary and Associate Offices Base	26,210	147	140	27,000	0	0	0	0	147	140	27,000	0	0	0	147	140	27,000
Subtotal, Under Secretary and Associate Offices	**26,210**	**147**	**140**	**27,000**	**0**	**0**	**0**	**0**	**147**	**140**	**27,000**	**0**	**0**	**0**	**147**	**140**	**27,000**
NOAA Wide Corporate Services & Agency Management																	
National Estuarine Research Reserve Construction (NERRS)	109,324	729	694	111,000	(55)	(55)	2,139	0	674	639	113,139	80	60	12,000	754	699	125,139
DOC Accounting System	9,068	39	37	10,000	0	0	0	0	39	37	10,000	0	0	0	39	37	10,000
Payment to the DOC Working Capital Fund	32,606	0	0	38,000	0	0	10,405	13,686	0	0	62,091	0	0	0	0	0	62,091
Subtotal, NOAA Wide Corporate Services & Agency Mgmt	**150,998**	**768**	**731**	**159,000**	**(55)**	**(55)**	**12,544**	**13,686**	**713**	**676**	**185,230**	**80**	**60**	**12,000**	**793**	**736**	**197,230**
IT Security																	
IT Security	6,154	0	0	8,300	0	0	0	0	0	0	8,300	0	0	0	0	0	8,300
Subtotal, IT Security	**6,154**	**0**	**0**	**8,300**	**0**	**0**	**0**	**0**	**0**	**0**	**8,300**	**0**	**0**	**0**	**0**	**0**	**8,300**
Total, Corporate Services	**183,362**	**915**	**871**	**194,300**	**(55)**	**(55)**	**12,544**	**13,686**	**860**	**816**	**220,530**	**80**	**60**	**12,000**	**940**	**876**	**232,530**
NOAA Education Program																	
BWET Regional Programs	6,707	1	1	7,200	(1)	(1)	0	0	0	0	7,200	0	0	(7,200)	0	0	0
Education Partnership Program/Minority Serving Institutions (EPP/MSI)	13,043	12	11	14,400	(12)	(11)	0	(14,400)	0	0	0	0	0		0	0	0
Office of Education	5,590	15	14	5,600	13	12	0	14,400	28	26	20,000	0	0	(3,600)	28	26	16,400
Total, NOAA Education Program	**25,340**	**28**	**26**	**27,200**	**0**	**0**	**0**	**0**	**28**	**26**	**27,200**	**0**	**0**	**(10,800)**	**28**	**26**	**16,400**
Facilities																	
NOAA Facilities Management & Construction and Safety	22,825	47	45	23,000	0	0	2,000	0	47	45	25,000	0	0	0	47	45	25,000
Subtotal, NOAA Facilities Management, Construction & Maintenance	**22,825**	**47**	**45**	**23,000**	**0**	**0**	**2,000**	**0**	**47**	**45**	**25,000**	**0**	**0**	**0**	**47**	**45**	**25,000**
Total, Facilities	**22,825**	**47**	**45**	**23,000**	**0**	**0**	**2,000**	**0**	**47**	**45**	**25,000**	**0**	**0**	**0**	**47**	**45**	**25,000**
Undistributed ATBs	**0**	**0**	**0**	**0**	**0**	**0**	**416**	**0**	**0**	**0**	**416**	**0**	**0**	**(416)**	**0**	**0**	**0**
Total, Program Support - ORF	**231,527**	**990**	**942**	**244,500**	**(55)**	**(55)**	**14,960**	**13,686**	**935**	**887**	**273,146**	**80**	**60**	**784**	**1,015**	**947**	**273,930**
Total, Program Support - PAC	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Total, Program Support - ORF and PAC	**231,527**	**990**	**942**	**244,500**	**(55)**	**(55)**	**14,960**	**13,686**	**935**	**887**	**273,146**	**80**	**60**	**784**	**1,015**	**947**	**273,930**

PROGRAM SUPPORT
($ in Thousands)

FY 2015 PROPOSED OPERATING PLAN	FY 2013 Spend Plan	POS	FTE	FY 2014 Enacted	POS	FTE	FY 2015 Calculated ATBs	FY 2015 Technical ATBs	POS	FTE	FY 2015 Base	POS	FTE	FY 2015 Program Changes	POS	FTE	FY 2015 Estimate
Marine Operations & Maintenance																	
Marine Operations & Maintenance	154,662	869	828	170,000	0	0	2,181	0	869	828	172,181	0	0	2,851	869	828	175,032
Total, Marine Operations & Maintenance	**154,662**	**869**	**828**	**170,000**	**0**	**0**	**2,181**	**0**	**869**	**828**	**172,181**	**0**	**0**	**2,851**	**869**	**828**	**175,032**
Aviation Operations																	
Aircraft Services	28,173	127	121	31,200	0	0	400	0	127	121	31,600	0	0	0	127	121	31,600
Total, Aviation Operations	**28,173**	**127**	**121**	**31,200**	**0**	**0**	**400**	**0**	**127**	**121**	**31,600**	**0**	**0**	**0**	**127**	**121**	**31,600**
Undistributed ATBs	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Total, OMAO - ORF	**182,835**	**996**	**949**	**201,200**	**0**	**0**	**2,581**	**0**	**996**	**949**	**203,781**	**0**	**0**	**2,851**	**996**	**949**	**206,632**
Total, OMAO - PAC	**12,544**	**0**	**0**	**5,200**	**0**	**0**	**0**	**0**	**0**	**0**	**5,200**	**0**	**0**	**2,000**	**0**	**0**	**7,200**
Total, OMAO - Other	**30,068**	**0**	**0**	**30,205**	**0**	**0**	**0**	**0**	**0**	**0**	**30,205**	**0**	**0**	**0**	**0**	**0**	**30,205**
Total, OMAO - ORF, PAC and Other	**225,447**	**996**	**949**	**236,605**	**0**	**0**	**2,581**	**0**	**996**	**949**	**239,186**	**0**	**0**	**4,851**	**996**	**949**	**244,037**
Total, Program Support and OMAO - ORF	**414,362**	**1,986**	**1,891**	**445,700**	**(55)**	**(55)**	**17,541**	**13,686**	**1,931**	**1,836**	**476,927**	**80**	**60**	**3,635**	**2,011**	**1,896**	**480,562**
Other Program Support and OMAO Accounts																	
Total, Program Support - PAC	12,544	0	0	5,200	0	0	0	0	0	0	5,200	0	0	2,000	0	0	7,200
Total, Program Support - Other	30,068	0	0	30,205	0	0	0	0	0	0	30,205	0	0	0	0	0	30,205
GRAND TOTAL PS	**456,974**	**1,986**	**1,891**	**481,105**	**(55)**	**(55)**	**17,541**	**13,686**	**1,931**	**1,836**	**512,332**	**80**	**60**	**5,635**	**2,011**	**1,896**	**517,967**

ORF SUMMARY
LINE OFFICE DIRECT OBLIGATIONS
($ in Thousands)

FY 2015 PROPOSED OPERATING PLAN	FY 2013 Spend Plan	POS	FTE	FY 2014 Enacted	POS	FTE	FY 2015 Calculated ATBs	FY 2015 Technical ATBs	POS	FTE	FY 2015 Base	POS	FTE	FY 2015 Program Changes	POS	FTE	FY 2015 Estimate
National Ocean Service	442,677	1,289	1,227	471,946	0	0	6,111	0	1,289	1,227	478,057	(30)	(15)	14,457	1,259	1,212	492,514
National Marine Fisheries Service	777,253	3,051	2,907	812,560	0	0	13,798	0	3,051	2,907	826,358	9	7	10,467	3,060	2,914	836,825
Office of Oceanic and Atmospheric Research	359,737	748	712	416,392	0	0	3,609	0	748	712	420,001	16	12	28,793	764	724	448,794
National Estuarine Research Reserve Construction (NERRS)																	
National Weather Service	871,272	4,932	4,697	953,627	0	0	18,678	0	4,932	4,697	972,305	(102)	(102)	(45,452)	4,830	4,595	926,853
National Environmental Satellite, Data and Information Service	175,239	709	675	187,167	0	0	3,186	0	709	675	190,353	0	0	256	709	675	190,609
Program Support	414,362	1,986	1,891	445,700	(55)	(55)	17,541	13,686	1,931	1,836	476,927	80	60	3,635	2,011	1,896	480,562
SUBTOTAL LO DIRECT OBLIGATIONS	**3,040,540**	**12,715**	**12,109**	**3,287,392**	**(55)**	**(55)**	**62,923**	**13,686**	**12,660**	**12,054**	**3,364,001**	**(27)**	**(38)**	**12,156**	**12,633**	**12,016**	**3,376,157**

ORF ADJUSTMENTS
($ in Thousands)

FY 2015 PROPOSED OPERATING PLAN	FY 2013 Spend Plan	POS	FTE	FY 2014 Enacted	POS	FTE	FY 2015 Calculated ATBs	FY 2015 Technical ATBs	POS	FTE	FY 2015 Base	POS	FTE	FY 2015 Program Changes	POS	FTE	FY 2015 Estimate
SUBTOTAL LO DIRECT OBLIGATIONS	**3,040,540**	**12,715**	**12,109**	**3,287,392**	**(55)**	**(55)**	**62,923**	**13,686**	**12,660**	**12,054**	**3,364,001**	**(27)**	**(38)**	**12,156**	**12,633**	**12,016**	**3,376,157**
FINANCING																	
De-Obligations	(16,236)	0	0	(15,000)	0	0	0	0	0	0	(15,000)	0	0	0	0	0	(15,000)
National Estuarine Research Reserve Construction (NERRS)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unobligated Balance, EOY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total ORF Financing	**(16,236)**	**0**	**0**	**(15,000)**	**0**	**0**	**0**	**0**	**0**	**0**	**(15,000)**	**0**	**0**	**0**	**0**	**0**	**(15,000)**
SUBTOTAL BUDGET AUTHORITY	**3,024,304**	**12,715**	**12,109**	**3,272,392**	**(55)**	**(55)**	**62,923**	**13,686**	**12,660**	**12,054**	**3,349,001**	**(27)**	**(38)**	**12,156**	**12,633**	**12,016**	**3,361,157**
TRANSFERS																	
Transfer from PAC to ORF	(14,649)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Transfer from P&D to ORF	(119,064)	0	0	(115,000)	0	0	0	(8,164)	0	0	(123,164)	0	0	0	0	0	(123,164)
Total ORF Transfers	**(133,713)**	**0**	**0**	**(115,000)**	**0**	**0**	**0**	**(8,164)**	**0**	**0**	**(123,164)**	**0**	**0**	**0**	**0**	**0**	**(123,164)**
SUBTOTAL APPROPRIATION	**2,890,591**	**12,715**	**12,109**	**3,157,392**	**(55)**	**(55)**	**62,923**	**5,522**	**12,660**	**12,054**	**3,225,837**	**(27)**	**(38)**	**12,156**	**12,633**	**12,016**	**3,237,993**

PROCUREMENT, ACQUISITION, AND CONSTRUCTION
($ in Thousands)

FY 2015 PROPOSED OPERATING PLAN	FY 2013 Spend Plan	POS	FTE	FY 2014 Enacted	POS	FTE	FY 2015 Calculated ATBs	FY 2015 Technical ATBs	POS	FTE	FY 2015 Base	POS	FTE	FY 2015 Program Changes	POS	FTE	FY 2015 Estimate
NOS																	
CELCP Acquisition																	
Coastal and Estuarine Land Conservation Program	0	0	0	0	0	0	0	0	0	0	0			0	0	0	0
Subtotal, NOS Acquisition	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
NERRS Construction																	
National Estuarine Research Reserve Construction (NERRS)	0	2	2	1,700	0	0	0	0	2	2	1,700	0	0	0	2	2	1,700
Subtotal, NERRS Construction	**0**	**2**	**2**	**1,700**	**0**	**0**	**0**	**0**	**2**	**2**	**1,700**	**0**	**0**	**0**	**2**	**2**	**1,700**
Marine Sanctuaries Construction																	
Marine Sanctuaries Base	0	3	3	2,000	0	0	0	0	3	3	2,000	0	0	0	3	3	2,000
Subtotal, Marine Sanctuary Construction	**0**	**3**	**3**	**2,000**	**0**	**0**	**0**	**0**	**3**	**3**	**2,000**	**0**	**0**	**0**	**3**	**3**	**2,000**
Subtotal, NOS Construction	**0**	**5**	**5**	**3,700**	**0**	**0**	**0**	**0**	**5**	**5**	**3,700**	**0**	**0**	**0**	**5**	**5**	**3,700**
Total, NOS - PAC	**0**	**5**	**5**	**3,700**	**0**	**0**	**0**	**0**	**5**	**5**	**3,700**	**0**	**0**	**0**	**5**	**5**	**3,700**
Total, NMFS - PAC	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
OAR																	
Systems Acquisition																	
Research Supercomputing/ CCRI	9,677	0	0	10,379	0	0	0	0	0	0	10,379	0	0	3,000	0	0	13,379
Subtotal, OAR Systems Acquisition	**9,677**	**0**	**0**	**10,379**	**0**	**0**	**0**	**0**	**0**	**0**	**10,379**	**0**	**0**	**3,000**	**0**	**0**	**13,379**
Total, OAR - PAC	**9,677**	**0**	**0**	**10,379**	**0**	**0**	**0**	**0**	**0**	**0**	**10,379**	**0**	**0**	**3,000**	**0**	**0**	**13,379**
NWS																	
Systems Acquisition																	
Observations	10,302	2	2	5,649	0	0	0	0	2	2	5,649	(2)	(2)	7,665	0	0	13,314
Central Processing	54,785	23	22	65,761	0	0	0	0	23	22	65,761	0	0	(1,500)	23	22	64,261
Dissemination	12,847	0	0	34,209	0	0	0	0	0	0	34,209	0	0	11,000	0	0	45,209
Subtotal, NWS Systems Acquisition	**77,934**	**25**	**24**	**105,619**	**0**	**0**	**0**	**0**	**25**	**24**	**105,619**	**(2)**	**(2)**	**17,165**	**23**	**22**	**122,784**
Construction																	
Facilities Construction and Major Repairs	4,355	0	0	8,000	0	0	0	0	0	0	8,000	0	0	5,710	0	0	13,710
Subtotal, NWS Construction	**4,355**	**0**	**0**	**8,000**	**0**	**0**	**0**	**0**	**0**	**0**	**8,000**	**0**	**0**	**5,710**	**0**	**0**	**13,710**
Total, NWS - PAC	**82,289**	**25**	**24**	**113,619**	**0**	**0**	**0**	**0**	**25**	**24**	**113,619**	**(2)**	**(2)**	**22,875**	**23**	**22**	**136,494**

PROCUREMENT, ACQUISITION, AND CONSTRUCTION
($ in Thousands)

FY 2015 PROPOSED OPERATING PLAN	FY 2013 Spend Plan	POS	FTE	FY 2014 Enacted	POS	FTE	FY 2015 Calculated ATBs	FY 2015 Technical ATBs	POS	FTE	FY 2015 Base	POS	FTE	FY 2015 Program Changes	POS	FTE	FY 2015 Estimate
NESDIS																	
Systems Acquisition																	
Geostationary Systems - R	734,862	50	48	941,899	0	0	0	0	50	48	941,899	0	0	38,939	50	48	980,838
Jason-3	30,000	3	3	18,500	0	0	0	0	3	3	18,500	0	0	7,156	3	3	25,656
Joint Polar Satellite System (JPSS)	818,069	71	68	820,855	0	0	0	0	71	68	820,855	0	0	95,412	71	68	916,267
Solar Irradiance, Data and Rescue (SIDAR)	0	0	0	0	0	0	0	0	0	0	0	3	2	15,000	3	2	15,000
DSCOVR	20,556	4	4	23,675	0	0	0	0	4	4	23,675	0	0	(2,575)	4	4	21,100
COSMIC 2/GNSS RO	0	1	1	2,000	0	0	0	0	1	1	2,000	0	0	4,800	1	1	6,800
Satellite Ground Services	42,640	64	61	49,734	0	0	0	0	64	61	49,734	0	0	2,983	64	61	52,717
System Architecture and Advanced Planning	4,587	15	14	4,587	0	0	0	0	15	14	4,587	0	0	0	15	14	4,587
Projects, Planning and Analysis	36,795	35	33	33,488	0	0	0	0	35	33	33,488	0	0	0	35	33	33,488
Subtotal, NESDIS Systems Acquisition	**1,687,509**	**243**	**232**	**1,894,738**	**0**	**0**	**0**	**0**	**243**	**232**	**1,894,738**	**3**	**2**	**161,715**	**246**	**234**	**2,056,453**
Construction																	
Satellite CDA Facility	2,077	0	0	2,228	0	0	0	0	0	0	2,228	0	0	(62)	0	0	2,166
Subtotal, NESDIS Construction	**2,077**	**0**	**0**	**2,228**	**0**	**0**	**0**	**0**	**0**	**0**	**2,228**	**0**	**0**	**(62)**	**0**	**0**	**2,166**
Transfer to OIG	**0**	**0**	**0**	**(1,000)**	**0**	**0**	**0**	**(302)**	**0**	**0**	**(1,302)**	**0**	**0**	**0**	**0**	**0**	**(1,302)**
Total, NESDIS - PAC	**1,689,586**	**243**	**232**	**1,895,966**	**0**	**0**	**0**	**(302)**	**243**	**232**	**1,895,664**	**3**	**2**	**161,653**	**246**	**234**	**2,057,317**
Total, Program Support - PAC	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
OMAO																	
OMAO - Fleet Replacement																	
Fleet Capital Improvements & Tech Infusion (Vessel Equip & Tech Refresh)	943	0	0	5,200	0	0	0	0	0	0	5,200	0	0	2,000	0	0	7,200
New Vessel Construction	11,601	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subtotal, OMAO Fleet Replacement	**12,544**	**0**	**0**	**5,200**	**0**	**0**	**0**	**0**	**0**	**0**	**5,200**	**0**	**0**	**2,000**	**0**	**0**	**7,200**
Total, OMAO - PAC	**12,544**	**0**	**0**	**5,200**	**0**	**0**	**0**	**0**	**0**	**0**	**5,200**	**0**	**0**	**2,000**	**0**	**0**	**7,200**
GRAND TOTAL PAC	**1,794,096**	**273**	**261**	**2,028,864**	**0**	**0**	**0**	**(302)**	**273**	**261**	**2,028,562**	**1**	**0**	**189,528**	**274**	**261**	**2,218,090**

PAC ADJUSTMENTS
($ in Thousands)

FY 2015 PROPOSED OPERATING PLAN	FY 2013 Spend Plan	POS	FTE	FY 2014 Enacted	POS	FTE	FY 2015 Calculated ATBs	FY 2015 Technical ATBs	POS	FTE	FY 2015 Base	POS	FTE	FY 2015 Program Changes	POS	FTE	FY 2015 Estimate
SUBTOTAL DIRECT OBLIGATIONS	**1,794,096**	**273**	**261**	**2,028,864**	**0**	**0**	**0**	**(302)**	**273**	**261**	**2,028,562**	**1**	**0**	**189,528**	**274**	**261**	**2,218,090**
FINANCING																	
National Estuarine Research Reserve Construction (NERRS)	(15,000)			(7,000)	0	0	0	(6,000)	0	0	(13,000)	0	0	0	0	0	(13,000)
Unobligated Balance Adj. SOY (start of year)	0			0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unobligated Balance End of Year	0			0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total PAC Financing	**(15,000)**	**0**	**0**	**(7,000)**	**0**	**0**	**0**	**(6,000)**	**0**	**0**	**(13,000)**	**0**	**0**	**0**	**0**	**0**	**(13,000)**
SUBTOTAL BUDGET AUTHORITY	**1,779,096**	**273**	**261**	**2,021,864**	**0**	**0**	**0**	**(6,302)**	**273**	**261**	**2,015,562**	**1**	**0**	**189,528**	**274**	**261**	**2,205,090**
TRANSFERS																	
Transfer from PAC to ORF	14,649	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Transfer to OIG	1,000	0	0	1,000	0	0	0	302	0	0	1,302	0	0		0	0	1,302
Total PAC Transfers/Rescissions	**15,649**	**0**	**0**	**1,000**	**0**	**0**	**0**	**302**	**0**	**0**	**1,302**	**0**	**0**	**0**	**0**	**0**	**1,302**
SUBTOTAL APPROPRIATION	**1,794,745**	**273**	**261**	**2,022,864**	**0**	**0**	**0**	**(6,000)**	**273**	**261**	**2,016,864**	**1**	**0**	**189,528**	**274**	**261**	**2,206,392**

OTHER ACCOUNTS (DISCRETIONARY)
($ in Thousands)

FY 2015 PROPOSED OPERATING PLAN	FY 2013 Spend Plan	POS	FTE	FY 2014 Enacted	POS	FTE	FY 2015 Calculated ATBs	FY 2015 Technical ATBs	POS	FTE	FY 2015 Base	POS	FTE	FY 2015 Program Changes	POS	FTE	FY 2015 Estimate
NMFS																	
Fishermen's Contingency Fund Obligations	324	0	0	350	0	0	0	0	0	0	350	0	0	0	0	0	350
Fishermen's Contingency Fund Budget Authority	324	0	0	350	0	0	0	0	0	0	350	0	0	0	0	0	350
Fishermen's Contingency Fund Appropriations	324	0	0	350	0	0	0	0	0	0	350	0	0	0	0	0	350
Foreign Fishing Observer Fund Obligations	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Foreign Fishing Observer Fund Budget Authority	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Foreign Fishing Observer Fund Appropriation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fisheries Finance Program Account Obligations	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fisheries Finance Program Account Budget Authority	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fisheries Finance Program Account Appropriation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Promote and Develop Fisheries Obligations	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Promote and Develop Fisheries Budget Authority	(119,064)	0	0	(115,000)	0	0	0	(8,164)	0	0	(123,164)	0	0	0	0	0	(123,164)
Promote and Develop Fisheries Appropriation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pacific Coastal Salmon Fund Obligations	60,382	2	2	65,000	0	0	0	0	2	2	65,000	0	0	(15,000)	2	2	50,000
Pacific Coastal Salmon Fund Budget Authority	60,382	2	2	65,000	0	0	0	0	2	2	65,000	0	0	(15,000)	2	2	50,000
Pacific Coastal Salmon Fund Appropriation	60,382	2	2	65,000	0	0	0	0	2	2	65,000	0	0	(15,000)	2	2	50,000
Marine Mammal Unusual Mortality Event Fund Obligations	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Marine Mammal Unusual Mortality Event Fund Budget Authority	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Marine Mammal Unusual Mortality Event Fund Appropriation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fisheries Disaster Assistance Fund Obligations	0	0	0	75,000	0	0	0	0	0	0	75,000	0	0	(75,000)	0	0	0
Fisheries Disaster Assistance Fund Budget Authority	0	0	0	75,000	0	0	0	0	0	0	75,000	0	0	(75,000)	0	0	0
Fisheries Disaster Assistance Fund Appropriation	0	0	0	75,000	0	0	0	0	0	0	75,000	0	0	(75,000)	0	0	0
Subtotal, NMFS Other Discretionary Direct Obligation	**60,706**	**2**	**2**	**140,350**	**0**	**0**	**0**	**0**	**2**	**2**	**140,350**	**0**	**0**	**(90,000)**	**2**	**2**	**50,350**
Subtotal, NMFS Other Discretionary Budget Authority	**(58,358)**	**2**	**2**	**25,350**	**0**	**0**	**0**	**(8,164)**	**2**	**2**	**17,186**	**0**	**0**	**(90,000)**	**2**	**2**	**(72,814)**
Subtotal, NMFS Other Discretionary Appropriation	**60,706**	**2**	**2**	**140,350**	**0**	**0**	**0**	**0**	**2**	**2**	**140,350**	**0**	**0**	**(90,000)**	**2**	**2**	**50,350**
OMAO																	
Medicare Eligible Retiree Healthcare Fund Acct Obligations	1,799	0	0	1,936	0	0	0	0	0	0	1,936	0	0	0	0	0	1,936
Medicare Eligible Retiree Healthcare Fund Acct Budget Authority	1,799	0	0	1,936	0	0	0	0	0	0	1,936	0	0	0	0	0	1,936
Medicare Eligible Retiree Healthcare Fund Acct Appropriations	1,799	0	0	1,936	0	0	0	0	0	0	1,936	0	0	0	0	0	1,936
Subtotal, OMAO Other Discretionary Direct Obligations	**1,799**	**0**	**0**	**1,936**	**0**	**0**	**0**	**0**	**0**	**0**	**1,936**	**0**	**0**	**0**	**0**	**0**	**1,936**
Subtotal, OMAO Other Discretionary Budget Authority	**1,799**	**0**	**0**	**1,936**	**0**	**0**	**0**	**0**	**0**	**0**	**1,936**	**0**	**0**	**0**	**0**	**0**	**1,936**
Subtotal, OMAO Other Discretionary Appropriation	**1,799**	**0**	**0**	**1,936**	**0**	**0**	**0**	**0**	**0**	**0**	**1,936**	**0**	**0**	**0**	**0**	**0**	**1,936**
TOTAL, OTHER DISCRETIONARY DIRECT OBLIGATIONS	**62,505**	**2**	**2**	**142,286**	**0**	**0**	**0**	**0**	**2**	**2**	**142,286**	**0**	**0**	**(90,000)**	**2**	**2**	**52,286**
TOTAL, OTHER DISCRETIONARY BUDGET AUTHORITY	**(56,559)**	**2**	**2**	**27,286**	**0**	**0**	**0**	**(8,164)**	**2**	**2**	**19,122**	**0**	**0**	**(90,000)**	**2**	**2**	**(70,878)**
TOTAL, OTHER DISCRETIONARY APPROPRIATION	**62,505**	**2**	**2**	**142,286**	**0**	**0**	**0**	**0**	**2**	**2**	**142,286**	**0**	**0**	**(90,000)**	**2**	**2**	**52,286**

GRAND TOTAL SUMMARY
Discretionary Appropriations
($ in Thousands)

FY 2015 PROPOSED OPERATING PLAN	FY 2013 Spend Plan	POS	FTE	FY 2014 Enacted	POS	FTE	FY 2015 Calculated ATBs	FY 2015 Technical ATBs	POS	FTE	FY 2015 Base	POS	FTE	FY 2015 Program Changes	POS	FTE	FY 2015 Estimate
Operations, Research and Facilities	2,890,591	12,715	12,109	3,157,392	(55)	(55)	62,923	5,522	12,660	12,054	3,225,837	(27)	(38)	12,156	12,633	12,016	3,237,993
Procurement, Acquisition and Construction	1,794,745	273	261	2,022,864	0	0	0	(6,000)	273	261	2,016,864	1	0	189,528	274	261	2,206,392
Coastal Zone Management Fund	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
National Estuarine Research Reserve Construction (NERRS)	324	0	0	350	0	0	0	0	0	0	350	0	0	0	0	0	350
Foreign Fishing Observer Fund	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fisheries Financing Program Account	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pacific Coastal Salmon Fund	60,382	2	2	65,000	0	0	0	0	2	2	65,000	0	0	(15,000)	2	2	50,000
Fisheries Disaster Assistance Fund	0	0	0	75,000	0	0	0	0	0	0	75,000	0	0	(75,000)	0	0	0
Marine Mammal Unusual Mortality Event Fund	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Medicare Eligible Retiree Health Care Fund	1,799	0	0	1,936	0	0	0	0	0	0	1,936	0	0	0	0	0	1,936
GRAND TOTAL DISCRETIONARY APPROPRIATION	**4,747,841**	**12,990**	**12,372**	**5,322,542**	**(55)**	**(55)**	**62,923**	**(478)**	**12,935**	**12,317**	**5,384,987**	**(26)**	**(38)**	**111,684**	**12,909**	**12,279**	**5,496,671**

SUMMARY OF DISCRETIONARY RESOURCES
($ in Thousands)

FY 2015 PROPOSED OPERATING PLAN	FY 2013 Spend Plan	POS	FTE	FY 2014 Enacted	POS	FTE	FY 2015 Calculated ATBs	FY 2015 Technical ATBs	POS	FTE	FY 2015 Base	POS	FTE	FY 2015 Program Changes	POS	FTE	FY 2015 Estimate
Discretionary Direct Obligations																	
ORF Direct Obligations	3,040,540	12,715	12,109	3,287,392	(55)	(55)	62,923	13,686	12,660	12,054	3,364,001	(27)	(38)	12,156	12,633	12,016	3,376,157
PAC Direct Obligations	1,794,096	273	261	2,028,864	0	0	0	(302)	273	261	2,028,562	1	0	189,528	274	261	2,218,090
OTHER Direct Obligations	62,505	2	2	142,286	0	0	0	0	2	2	142,286	0	0	(90,000)	2	2	52,286
TOTAL Discretionary Direct Obligations	**4,897,141**	**12,990**	**12,372**	**5,458,542**	**(55)**	**(55)**	**62,923**	**13,384**	**12,935**	**12,317**	**5,534,849**	**(26)**	**(38)**	**111,684**	**12,909**	**12,279**	**5,646,533**
National Estuarine Research Reserve Construction (NERRS)																	
Discretionary Budget Authority																	
ORF Budget Authority	3,024,304	12,715	12,109	3,272,392	(55)	(55)	62,923	13,686	12,660	12,054	3,349,001	(27)	(38)	12,156	12,633	12,016	3,361,157
PAC Budget Authority	1,779,096	273	261	2,021,864	0	0	0	(6,302)	273	261	2,015,562	1	0	189,528	274	261	2,205,090
OTHER Budget Authority	(56,559)	2	2	27,286	0	0	0	(8,164)	2	2	19,122	0	0	(90,000)	2	2	(70,878)
TOTAL Discretionary Budget Authority	**4,746,841**	**12,990**	**12,372**	**5,321,542**	**(55)**	**(55)**	**62,923**	**(780)**	**12,935**	**12,317**	**5,383,685**	**(26)**	**(38)**	**111,684**	**12,909**	**12,279**	**5,495,369**
Discretionary Appropriations																	
ORF Appropriations	2,890,591	12,715	12,109	3,157,392	(55)	(55)	62,923	5,522	12,660	12,054	3,225,837	(27)	(38)	12,156	12,633	12,016	3,237,993
PAC Appropriations	1,794,745	273	261	2,022,864	0	0	0	(6,000)	273	261	2,016,864	1	0	189,528	274	261	2,206,392
OTHER Appropriations	62,505	2	2	142,286	0	0	0	0	2	2	142,286	0	0	(90,000)	2	2	52,286
TOTAL Discretionary Appropriation	**4,747,841**	**12,990**	**12,372**	**5,322,542**	**(55)**	**(55)**	**62,923**	**(478)**	**12,935**	**12,317**	**5,384,987**	**(26)**	**(38)**	**111,684**	**12,909**	**12,279**	**5,496,671**

OTHER ACCOUNTS (MANDATORY)
($ in Thousands)

FY 2015 PROPOSED OPERATING PLAN	FY 2013 Spend Plan	POS	FTE	FY 2014 Enacted	POS	FTE	FY 2015 Calculated ATBs	FY 2015 Technical ATBs	POS	FTE	FY 2015 Base	POS	FTE	FY 2015 Program Changes	POS	FTE	FY 2015 Estimate
NOS																	
Damage Assessment & Restoration Revolving Fund Obligations	24,694	16	16	20,424	0	0	0	576	16	16	21,000	0	0	0	16	16	21,000
National Estuarine Research Reserve Construction (NERRS)	7,694	16	16	5,424	0	0	0	576	16	16	6,000	0	0	0	16	16	6,000
Damage Assessment & Restoration Revolving Fund Appropriation	0	16	16	0	0	0	0	0	16	16	0	0	0	0	16	16	0
Sanctuaries Enforcement Asset Forfeiture Fund Obligations	949	0	0	928	0	0	0	(808)	0	0	120	0	0	0	0	0	120
Sanctuaries Enforcement Asset Forfeiture Fund Budget Authority	949	0	0	928	0	0	0	(808)	0	0	120	0	0	0	0	0	120
Sanctuaries Enforcement Asset Forfeiture Fund Appropriation	949	0	0	1,000	0	0	0	(880)	0	0	120	0	0	0	0	0	120
Gulf Coast Ecosystem Restoration Fund Obligations	0	0	0	1,688	0	0	0	390	0	0	2,078	0	0	0	0	0	2,078
Gulf Coast Ecosystem Restoration Fund Budget Authority	0	0	0	1,688	0	0	0	390	0	0	2,078	0	0	0	0	0	2,078
Gulf Coast Ecosystem Restoration Fund Appropriation	0	0	0	1,819	0	0	0	259	0	0	2,078	0	0	0	0	0	2,078
Subtotal, NOS Other Mandatory Direct Obligations	**25,643**	**16**	**16**	**23,040**	**0**	**0**	**0**	**158**	**16**	**16**	**23,198**	**0**	**0**	**0**	**16**	**16**	**23,198**
Subtotal, NOS Other Mandatory Budget Authority	**8,643**	**16**	**16**	**8,040**	**0**	**0**	**0**	**158**	**16**	**16**	**8,198**	**0**	**0**	**0**	**16**	**16**	**8,198**
Subtotal, NOS Other Mandatory Appropriation	**949**	**16**	**16**	**2,819**	**0**	**0**	**0**	**(621)**	**16**	**16**	**2,198**	**0**	**0**	**0**	**16**	**16**	**2,198**
NMFS																	
Promote and Develop Fisheries Obligations	11,172	0	0	5,774	0	0	0	2,434	0	0	8,208	0	0	0	0	0	8,208
Promote and Develop Fisheries Budget Authority	130,236	0	0	120,774	0	0	0	10,598	0	0	131,372	0	0	0	0	0	131,372
Promote and Develop Fisheries Appropriation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fisheries Finance Program Account Obligations	9,827	0	0	14,629	0	0	0	(14,629)	0	0	0	0	0	0	0	0	0
Fisheries Finance Program Account Budget Authority	9,800	0	0	14,629	0	0	0	(14,629)	0	0	0	0	0	0	0	0	0
Fisheries Finance Program Account Appropriation	9,800	0	0	14,629	0	0	0	(14,629)	0	0	0	0	0	0	0	0	0
Federal Ship Financing Obligations	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Federal Ship Financing Budget Authority	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Federal Ship Financing Appropriation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Environmental Improve & Restoration Fund Obligations	9,680	0	0	9,087	0	0	0	(8,795)	0	0	292	0	0	0	0	0	292
Environmental Improve & Restoration Fund Budget Authority	11,022	0	0	9,087	0	0	0	(8,795)	0	0	292	0	0	0	0	0	292
Environmental Improve & Restoration Fund Appropriation	11,022	0	0	9,792	0	0	0	(9,500)	0	0	292	0	0	0	0	0	292
Limited Access System Administration Fund Obligations	8,897	38	38	8,998	0	0	0	2,857	38	38	11,855	0	0	0	38	38	11,855
Limited Access System Administration Fund Budget Authority	14,098	38	38	8,998	0	0	0	1,860	38	38	10,858	0	0	0	38	38	10,858
Limited Access System Administration Fund Appropriation	14,098	38	38	9,718	0	0	0	1,140	38	38	10,858	0	0	0	38	38	10,858

OTHER ACCOUNTS (MANDATORY)
($ in Thousands)

FY 2015 PROPOSED OPERATING PLAN	FY 2013 Spend Plan	POS	FTE	FY 2014 Enacted	POS	FTE	FY 2015 Calculated ATBs	FY 2015 Technical ATBs	POS	FTE	FY 2015 Base	POS	FTE	FY 2015 Program Changes	POS	FTE	FY 2015 Estimate
Western Pacific Sustainable Fisheries Fund Obligations	949	0	0	160	0	0	0	861	0	0	1,021	0	0	0	0	0	1,021
Western Pacific Sustainable Fisheries Fund Budget Authority	949	0	0	160	0	0	0	90	0	0	250	0	0	0	0	0	250
Western Pacific Sustainable Fisheries Fund Appropriation	949	0	0	250	0	0	0	0	0	0	250	0	0	0	0	0	250
Fisheries Enforcement Asset Forfeiture Fund Obligations	4,008	0	0	3,640	0	0	0	360	0	0	4,000	0	0	0	0	0	4,000
Fisheries Enforcement Asset Forfeiture Fund Budget Authority	4,745	0	0	3,640	0	0	0	360	0	0	4,000	0	0	0	0	0	4,000
Fisheries Enforcement Asset Forfeiture Fund Appropriation	4,745	0	0	4,000	0	0	0	0	0	0	4,000	0	0	0	0	0	4,000
North Pacific Observer Fund Obligations	0	0	0	3,854	0	0	0	346	0	0	4,200	0	0	0	0	0	4,200
North Pacific Observer Fund Budget Authority	0	0	0	3,854	0	0	0	346	0	0	4,200	0	0	0	0	0	4,200
North Pacific Observer Fund Appropriation	0	0	0	4,200	0	0	0	0	0	0	4,200	0	0	0	0	0	4,200
Subtotal, NMFS Other Mandatory Direct Obligations	**44,533**	**38**	**38**	**46,142**	**0**	**0**	**0**	**(16,566)**	**38**	**38**	**29,576**	**0**	**0**	**0**	**38**	**38**	**29,576**
Subtotal, NMFS Other Mandatory Budget Authority	**170,850**	**38**	**38**	**161,142**	**0**	**0**	**0**	**(10,170)**	**38**	**38**	**150,972**	**0**	**0**	**0**	**38**	**38**	**150,972**
Subtotal, NMFS Other Mandatory Appropriation	**40,614**	**38**	**38**	**42,589**	**0**	**0**	**0**	**(22,989)**	**38**	**38**	**19,600**	**0**	**0**	**0**	**38**	**38**	**19,600**
OMAO																	
NOAA Corp Commissioned Officers Retirement Obligations	28,269	0	0	28,269	0	0	0	0	0	0	28,269	0	0	0	0	0	28,269
NOAA Corp Commissioned Officers Retirement Budget Authority	28,269	0	0	28,269	0	0	0	0	0	0	28,269	0	0	0	0	0	28,269
NOAA Corp Commissioned Officers Retirement Budget Appropriation	28,269	0	0	28,269	0	0	0	0	0	0	28,269	0	0	0	0	0	28,269
Subtotal, OMAO Other Mandatory Direct Obligations	**28,269**	**0**	**0**	**28,269**	**0**	**0**	**0**	**0**	**0**	**0**	**28,269**	**0**	**0**	**0**	**0**	**0**	**28,269**
Subtotal, OMAO Other Mandatory Budget Authority	**28,269**	**0**	**0**	**28,269**	**0**	**0**	**0**	**0**	**0**	**0**	**28,269**	**0**	**0**	**0**	**0**	**0**	**28,269**
Subtotal, OMAO Other Mandatory Appropriation	**28,269**	**0**	**0**	**28,269**	**0**	**0**	**0**	**0**	**0**	**0**	**28,269**	**0**	**0**	**0**	**0**	**0**	**28,269**
TOTAL, OTHER MANDATORY DIRECT OBLIGATIONS	**98,445**	**54**	**54**	**97,451**	**0**	**0**	**0**	**(16,408)**	**54**	**54**	**81,043**	**0**	**0**	**0**	**54**	**54**	**81,043**
TOTAL, OTHER MANDATORY BUDGET AUTHORITY	**207,762**	**54**	**54**	**197,451**	**0**	**0**	**0**	**(10,012)**	**54**	**54**	**187,439**	**0**	**0**	**0**	**54**	**54**	**187,439**
TOTAL, OTHER MANDATORY APPROPRIATION	**69,832**	**54**	**54**	**73,677**	**0**	**0**	**0**	**(23,610)**	**54**	**54**	**50,067**	**0**	**0**	**0**	**54**	**54**	**50,067**

NOAA SUMMARY
($ in Thousands)

FY 2015 PROPOSED OPERATING PLAN	FY 2013 Spend Plan	POS	FTE	FY 2014 Enacted	POS	FTE	FY 2015 Calculated ATBs	FY 2015 Technical ATBs	POS	FTE	FY 2015 Base	POS	FTE	FY 2015 Program Changes	POS	FTE	FY 2015 Estimate
TOTAL Direct Obligations (Discretionary & Mandatory)	4,995,586	13,044	12,426	5,555,993	(55)	(55)	62,923	(3,024)	12,989	12,371	5,615,892	(26)	(38)	111,684	12,963	12,333	5,727,576
TOTAL Budget Authority (Discretionary & Mandatory)	4,954,603	13,044	12,426	5,518,993	(55)	(55)	62,923	(10,792)	12,989	12,371	5,571,124	(26)	(38)	111,684	12,963	12,333	5,682,808
TOTAL Appropriation (Discretionary & Mandatory)	4,817,673	13,044	12,426	5,396,219	(55)	(55)	62,923	(24,088)	12,989	12,371	5,435,054	(26)	(38)	111,684	12,963	12,333	5,546,738
National Estuarine Research Reserve Construction (NERRS)																	
Reimbursable Financing	242,000	706	706	242,000	0	0	0	0	706	706	242,000	0	0	0	706	706	242,000
TOTAL OBLIGATIONS (Direct & Reimbursable)	**5,237,586**	**13,750**	**13,132**	**5,797,993**	**(55)**	**(55)**	**62,923**	**(3,024)**	**13,695**	**13,077**	**5,857,892**	**(26)**	**(38)**	**111,684**	**13,669**	**13,039**	**5,969,576**
Offsetting Receipts	(3,521)	0	0	(6,000)	0	0	0	0	0	0	(3,445)	0	0	0	0	0	(3,445)
TOTAL OBLIGATIONS (Direct, Reimbursable & Offsetting Receipts)	**5,234,065**	**13,750**	**13,132**	**5,791,993**	**(55)**	**(55)**	**62,923**	**(3,024)**	**13,695**	**13,077**	**5,854,447**	**(26)**	**(38)**	**111,684**	**13,669**	**13,039**	**5,966,131**

LINE OFFICE SUMMARY
($ in Thousands)

FY 2015 PROPOSED OPERATING PLAN	FY 2013 Spend Plan	POS	FTE	FY 2014 Enacted	POS	FTE	FY 2015 Calculated ATBs	FY 2015 Technical ATBs	POS	FTE	FY 2015 Base	POS	FTE	FY 2015 Program Changes	POS	FTE	FY 2015 Estimate
National Ocean Service																	
ORF	442,677	1,289	1,227	471,946	0	0	6,111	0	1,289	1,227	478,057	(30)	(15)	14,457	1,259	1,212	492,514
PAC	0	5	5	3,700	0	0	0	0	5	5	3,700	0	0	0	5	5	3,700
OTHER	25,643	16	16	23,040	0	0	0	158	16	16	23,198	0	0	0	16	16	23,198
TOTAL, NOS	468,320	1,310	1,248	498,686	0	0	6,111	158	1,310	1,248	504,955	(30)	(15)	14,457	1,280	1,233	519,412
National Estuarine Research Reserve Construction (NERRS)																	
National Marine Fisheries Service																	
ORF	777,253	3,051	2,907	812,560	0	0	13,798	0	3,051	2,907	826,358	9	7	10,467	3,060	2,914	836,825
PAC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OTHER	105,239	40	40	186,492	0	0	0	(16,566)	40	40	169,926	0	0	(90,000)	40	40	79,926
TOTAL, NMFS	882,492	3,091	2,947	999,052	0	0	13,798	(16,566)	3,091	2,947	996,284	9	7	(79,533)	3,100	2,954	916,751
Oceanic and Atmospheric Research																	
ORF	359,737	748	712	416,392	0	0	3,609	0	748	712	420,001	16	12	28,793	764	724	448,794
PAC	9,677	0	0	10,379	0	0	0	0	0	0	10,379	0	0	3,000	0	0	13,379
OTHER	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL, OAR	369,414	748	712	426,771	0	0	3,609	0	748	712	430,380	16	12	31,793	764	724	462,173
National Weather Service																	
ORF	871,272	4,932	4,697	953,627	0	0	18,678	0	4,932	4,697	972,305	(102)	(102)	(45,452)	4,830	4,595	926,853
PAC	82,289	25	24	113,619	0	0	0	0	25	24	113,619	(2)	(2)	22,875	23	22	136,494
OTHER	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL, NWS	953,561	4,957	4,721	1,067,246	0	0	18,678	0	4,957	4,721	1,085,924	(104)	(104)	(22,577)	4,853	4,617	1,063,347
National Environmental Satellite, Data and Information Service																	
ORF	175,239	709	675	187,167	0	0	3,186	0	709	675	190,353	0	0	256	709	675	190,609
PAC	1,689,586	243	232	1,895,966	0	0	0	(302)	243	232	1,895,664	3	2	161,653	246	234	2,057,317
OTHER	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL, NESDIS	1,864,825	952	907	2,083,133	0	0	3,186	(302)	952	907	2,086,017	3	2	161,909	955	909	2,247,926
Program Support / Corporate Services																	
ORF	183,362	915	871	194,300	(55)	(55)	12,544	13,686	860	816	220,530	80	60	12,000	940	876	232,530
PAC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OTHER	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL, PS / Corporate Services	183,362	915	871	194,300	(55)	(55)	12,544	13,686	860	816	220,530	80	60	12,000	940	876	232,530
Program Support / NOAA Education Program																	
ORF	25,340	28	26	27,200	0	0	0	0	28	26	27,200	0	0	(10,800)	28	26	16,400
PAC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OTHER	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL, PS / NOAA Education Program	25,340	28	26	27,200	0	0	0	0	28	26	27,200	0	0	(10,800)	28	26	16,400

LINE OFFICE SUMMARY
($ in Thousands)

FY 2015 PROPOSED OPERATING PLAN	FY 2013 Spend Plan	POS	FTE	FY 2014 Enacted	POS	FTE	FY 2015 Calculated ATBs	FY 2015 Technical ATBs	POS	FTE	FY 2015 Base	POS	FTE	FY 2015 Program Changes	POS	FTE	FY 2015 Estimate
Program Support / Facilities																	
ORF	22,825	47	45	23,000	0	0	2,000	0	47	45	25,000	0	0	0	47	45	25,000
PAC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OTHER	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL, PS / Facilities	22,825	47	45	23,000	0	0	2,000	0	47	45	25,000	0	0	0	47	45	25,000
Program Support / Corp Srv, Edu, Fac																	
ORF	231,527	990	942	244,500	(55)	(55)	14,960	13,686	935	887	273,146	80	60	784	1,015	947	273,930
PAC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OTHER	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL, PS / Corp Srv, Edu, Fac	231,527	990	942	244,500	(55)	(55)	14,960	13,686	935	887	273,146	80	60	784	1,015	947	273,930
Program Support / Office of Marine and Aviation Operations																	
ORF	182,835	996	949	201,200	0	0	2,581	0	996	949	203,781	0	0	2,851	996	949	206,632
PAC	12,544	0	0	5,200	0	0	0	0	0	0	5,200	0	0	2,000	0	0	7,200
OTHER	30,068	0	0	30,205	0	0	0	0	0	0	30,205	0	0	0	0	0	30,205
TOTAL, PS / OMAO	225,447	996	949	236,605	0	0	2,581	0	996	949	239,186	0	0	4,851	996	949	244,037
Total PS ORF	414,362	1,986	1,891	445,700	(55)	(55)	17,541	13,686	1,931	1,836	476,927	80	60	3,635	2,011	1,896	480,562
Total PS PAC	12,544	0	0	5,200	0	0	0	0	0	0	5,200	0	0	2,000	0	0	7,200
Total PS Other	30,068	0	0	30,205	0	0	0	0	0	0	30,205	0	0	0	0	0	30,205
TOTAL, PS	456,974	1,986	1,891	481,105	(55)	(55)	17,541	13,686	1,931	1,836	512,332	80	60	5,635	2,011	1,896	517,967
DIRECT OBLIGATIONS																	
ORF	3,040,540	12,715	12,109	3,287,392	(55)	(55)	62,923	13,686	12,660	12,054	3,364,001	(27)	(38)	12,156	12,633	12,016	3,376,157
PAC	1,794,096	273	261	2,028,864	0	0	0	(302)	273	261	2,028,562	1	0	189,528	274	261	2,218,090
OTHER	160,950	56	56	239,737	0	0	0	(16,408)	56	56	223,329	0	0	(90,000)	56	56	133,329
TOTAL, DIRECT OBLIGATIONS	**4,995,586**	**13,044**	**12,426**	**5,555,993**	**(55)**	**(55)**	**62,923**	**(3,024)**	**12,989**	**12,371**	**5,615,892**	**(26)**	**(38)**	**111,684**	**12,963**	**12,333**	**5,727,576**
ORF Adjustments (Deobligations/Rescissions)	(16,236)	0	0	(15,000)	0	0	0	0	0	0	(15,000)	0	0	0	0	0	(15,000)
ORF Transfers	(133,713)	0	0	(115,000)	0	0	0	(8,164)	0	0	(123,164)	0	0	0	0	0	(123,164)
PAC Adjustments (Deobligations/Rescissions)	(15,000)	0	0	(7,000)	0	0	0	(6,000)	0	0	(13,000)	0	0	0	0	0	(13,000)
PAC Transfers	15,649	0	0	1,000	0	0	0	302	0	0	1,302	0	0	0	0	0	1,302
OTHER Discretionary Adjustments	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mandatory Accounts Excluded	(98,445)	(54)	(54)	(97,451)	0	0	0	16,408	(54)	(54)	(81,043)	0	0	0	(54)	(54)	(81,043)
TOTAL, DISCRETIONARY APPROPRIATIONS	**4,747,841**	**12,990**	**12,372**	**5,322,542**	**(55)**	**(55)**	**62,923**	**(478)**	**12,935**	**12,317**	**5,384,987**	**(26)**	**(38)**	**111,684**	**12,909**	**12,279**	**5,496,671**

Exhibit 5

Department of Commerce
National Oceanic and Atmospheric Administration
Operations Research and Facilities
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar Amounts in Thousands)

	Positions	FTE	Appropriation	Budget Authority	Direct Obligations
FY 2014 Enacted	12,715	12,109	3,157,392	3,272,392	3,470,420
less: Carryover	0	0	0	0	(183,028)
plus: 2015 Other Adjustments to Base	(55)	(55)	68,445	76,609	76,609
FY 2015 Base	12,660	12,054	3,225,837	3,349,001	3,364,001
plus(or less): 2015 Program Changes	(27)	(38)	27,588	27,588	27,588
Inflationary Adjustments	0	0	(15,432)	(15,432)	(15,432)
FY 2015 Estimate	12,633	12,016	3,237,993	3,361,157	3,376,157

Exhibit 5

Department of Commerce
National Oceanic and Atmospheric Administration
Operations Research and Facilities
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar Amounts in Thousands)

Comparison by program/sub-program		FY 2013 Actuals Personnel	FY 2013 Actuals Amount	FY 2014 Enacted Personnel	FY 2014 Enacted Amount	FY 2015 Base Program Personnel	FY 2015 Base Program Amount	FY 2015 Estimate Personnel	FY 2015 Estimate Amount	Increase/ Decrease Personnel	Increase/ Decrease Amount
National Ocean Service	Pos/BA	1,204	501,077	1,289	471,946	1,289	478,057	1,259	492,514	(30)	14,457
	FTE/OBL	1,147	473,540	1,227	501,138	1,227	478,057	1,212	492,514	(15)	14,457
National Marine Fisheries Service	Pos/BA	3,008	783,996	3,051	812,560	3,051	826,358	3,060	836,825	9	10,467
	FTE/OBL	2,865	773,596	2,907	832,069	2,907	826,358	2,914	836,825	7	10,467
Oceanic and Atmospheric Research	Pos/BA	700	409,629	748	416,392	748	420,001	764	448,794	16	28,793
	FTE/OBL	666	368,773	712	462,472	712	420,001	724	448,794	12	28,793
National Weather Service	Pos/BA	4,665	928,615	4,932	953,627	4,932	972,305	4,830	926,853	(102)	(45,452)
	FTE/OBL	4,442	877,010	4,697	1,018,932	4,697	972,305	4,595	926,853	(102)	(45,452)
National Environmental Satellite, Data, & Info Service	Pos/BA	568	183,082	709	187,167	709	190,353	709	190,609	0	256
	FTE/OBL	540	177,692	675	193,027	675	190,353	675	190,609	0	256
Program Support	Pos/BA	843	236,355	990	244,500	935	273,146	1,015	273,930	80	784
	FTE/OBL	804	230,861	942	258,636	887	273,146	947	273,930	60	784
Office of Marine Aviation & Ops	Pos/BA	984	182,653	996	201,200	996	203,781	996	206,632	0	2,851
	FTE/OBL	937	180,943	949	204,146	949	203,781	949	206,632	0	2,851
Less Deobligations/Other	Pos/BA	0	(16,236)	0	(15,000)	0	(15,000)	0	(15,000)	0	0
	FTE/OBL	0	0	0	0	0	0	0	0	0	0
Total	Pos/BA	11,972	3,209,171	12,715	3,272,392	12,660	3,349,001	12,633	3,361,157	(27)	12,156
	FTE/OBL	11,401	3,082,415	12,109	3,470,420	12,054	3,364,001	12,016	3,376,157	(38)	12,156

Exhibit 5

Department of Commerce
National Oceanic and Atmospheric Administration
Operations Research and Facilities
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar Amounts in Thousands)

	FY 2013 Actuals		FY 2014 Enacted		FY 2015 Base Program		FY 2015 Estimate		Increase/ Decrease	
	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount
Direct Discretionary Obligation	11,401	3,082,415	12,109	3,470,420	12,054	3,364,001	12,016	3,376,157	(38)	12,156
Total Obligations	**11,401**	**3,082,415**	**12,109**	**3,470,420**	**12,054**	**3,364,001**	**12,016**	**3,376,157**	**(38)**	**12,156**
Adjustments to Obligations:										
Cash Refunds/Prior Year Recoveries	0	(1,345)	0	0	0	0	0	0	0	0
Deobligations	0	(11,729)	0	(15,000)	0	(15,000)	0	(15,000)	0	0
Unobligated Balance Expired	0	2,808	0	0	0	0	0	0	0	0
Unobligated Balance Adj SOY	0	(59,170)	0	(183,028)	0	0	0	0	0	0
Unobligated balance, Adj EOY	0	183,028	0	0	0	0	0	0	0	0
Unobligated balance , Not Apportioned	0	13,164	0	0	0	0	0	0	0	0
Total Budget Authority	**11,401**	**3,209,171**	**12,109**	**3,272,392**	**12,054**	**3,349,001**	**12,016**	**3,361,157**	**(38)**	**12,156**
Financing from Transfers and Other:										
Transfer from P&D to ORF	0	(119,064)	0	(115,000)	0	(123,164)	0	(123,164)	0	0
Transfer from CZMF to ORF	0	0	0	0	0	0	0	0	0	0
Transfer from Pacific Salmon	0	(60)	0	0	0	0	0	0	0	0
Transfer from PAC to ORF	0	(66,456)	0	0	0	0	0	0	0	0
Net Appropriation	**11,401**	**3,023,591**	**12,109**	**3,157,392**	**12,054**	**3,225,837**	**12,016**	**3,237,993**	**(38)**	**12,156**

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Exhibit 6

Department of Commerce

National Oceanic and Atmospheric Administration

PROGRAM and PERFORMANCE: REIMBURSABLE OBLIGATIONS

(Dollar Amount in Thousands)

	Positions	FTE	Approp.	Budget Authority	Obligations
FY 2014 Enacted	706	706	0	242,000	242,000
less: obligations from prior year balances	0	0	0	0	0
FY 2015 Base	706	706	0	242,000	242,000
less: 2015 Program Changes	0	0	0	0	0
FY 2015 Estimate	706	706	0	242,000	242,000

Comparison by program		FY 2013 Actuals Personnel	FY 2013 Actuals Amount	FY 2014 Enacted Personnel	FY 2014 Enacted Amount	FY 2015 Base Program Personnel	FY 2015 Base Program Amount	FY 2015 Estimate Personnel	FY 2015 Estimate Amount	Increase/ Decrease Personnel	Increase/ Decrease Amount
National Ocean Service	Pos/BA	38	18,572	85	29,000	85	29,000	85	29,000	0	0
	FTE/OBL	38	18,572	85	29,000	85	29,000	85	29,000	0	0
National Marine Fisheries Service	Pos/BA	315	102,653	311	69,000	311	69,000	311	69,000	0	0
	FTE/OBL	315	102,653	311	69,000	311	69,000	311	69,000	0	0
Oceanic and Atmospheric Research	Pos/BA	46	52,149	53	31,000	53	31,000	53	31,000	0	0
	FTE/OBL	46	52,149	53	31,000	53	31,000	53	31,000	0	0
National Weather Service	Pos/BA	173	49,357	174	75,000	174	75,000	174	75,000	0	0
	FTE/OBL	173	49,357	174	75,000	174	75,000	174	75,000	0	0
National Environmental Satellite Service	Pos/BA	41	25,021	45	23,000	45	23,000	45	23,000	0	0
	FTE/OBL	41	25,021	45	23,000	45	23,000	45	23,000	0	0
Program Support	Pos/BA	28	12,372	38	15,000	38	15,000	38	15,000	0	0
	FTE/OBL	28	12,372	38	15,000	38	15,000	38	15,000	0	0
Total	Pos/BA	641	260,124	706	242,000	706	242,000	706	242,000	0	0
	FTE/OBL	641	260,124	706	242,000	706	242,000	706	242,000	0	0

Exhibit 6

Department of Commerce

National Oceanic and Atmospheric Administration

PROGRAM and PERFORMANCE: REIMBURSABLE OBLIGATIONS

(Dollar Amount in Thousands)

	FY 2013 Actuals		FY 2014 Enacted		FY 2015 Base Program		FY 2015 Estimate		Increase/ Decrease	
	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount
Reimbursable Obligations	641	260,124	706	242,000	706	242,000	706	242,000	0	0
Total Obligations	**641**	**260,124**	**706**	**242,000**	**706**	**242,000**	**706**	**242,000**	**0**	**0**
Adjustments to Obligations:										
Federal Funds	0	(208,427)	0	(186,000)	0	(186,000)	0	(186,000)	0	0
Non-federal sources	0	(109,411)	0	(56,000)	0	(56,000)	0	(56,000)	0	0
Change in Uncollected customer payments	0	(104,072)	0	0	0	0	0	0	0	0
Cancellations of expired and no-year accounts	0	4,021	0	0	0	0	0	0	0	0
Deobligations	0	(289)	0	0	0	0	0	0	0	0
Unobligated balance, SOY Reimbursable	0	(126,431)	0	0	0	0	0	0	0	0
Unobligated balance, not apportioned	0	280,023	0	0	0	0	0	0	0	0
Unobligated balance, Expiring	0	4,462	0	0	0	0	0	0	0	0
Total Budget Authority	**641**	**0**	**706**	**0**	**706**	**0**	**706**	**0**	**0**	**0**

Exhibit 7

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
SUMMARY OF FINANCING
(Dollar Amount in Thousands)

	FY 2013 Actual	FY 2014 Enacted	FY 2015 Base Program	FY 2015 Estimate	Increase/ (Decrease) over FY 2015 Base
Direct Discretionary Obligation	3,082,415	3,470,420	3,364,001	3,376,157	12,156
Direct Mandatory Obligation	25,243	28,269	28,269	28,269	0
Reimbursable Obligation	260,124	242,000	242,000	242,000	0
Total Obligations	3,367,782	3,740,689	3,634,270	3,646,426	12,156
Adjustments and Obligations:					
Federal funds	(208,427)	(186,000)	(186,000)	(186,000)	0
Non-Federal Sources	(109,411)	(56,000)	(56,000)	(56,000)	0
Recoveries	(1,345)	0	0	0	0
Uncollected Cust Payments from Fed. Sources	0				0
Enacted Rescissions	0	0	0	0	0
Deobligations, direct	(11,729)	(15,000)	(15,000)	(15,000)	0
Deobligations, reimbursable	(289)	0	0	0	0
Change in uncollected customer payments	(104,072)	0	0	0	0
Cancellations of expired and no-year accounts	4,021	0	0	0	0
Unobligated balance, adj. SOY	(59,170)	(183,028)	0	0	0
Unobligated balance, not apportioned	293,187	0	0	0	0
Unobligated balance, transferred to other accounts	0	0	0	0	0
Unobligated balance, EOY	183,028	0	0	0	0
Unobligated balance, SOY Reimbursable	(126,431)	0	0	0	0
Unobligated balance, EOY Reimbursable	0	0	0	0	0
Unobligated balance, Expiring Discretionary	2,808	0	0	0	0
Unobligated balance, Expiring Mandatory	0	0	0	0	0
Unobligated balance, Expiring Reimbursable	4,462	0	0	0	0
Total Budget Authority	3,234,414	3,300,661	3,377,270	3,389,426	12,156

Exhibit 7

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
SUMMARY OF FINANCING
(Dollar Amount in Thousands)

	FY 2013 Actuals	FY 2014 Enacted	FY 2015 Base Program	FY 2015 Estimate	Increase/ (Decrease) over FY 2015 Base
Financing from Transfers and Other:					
Transfer from P&D	(119,064)	(115,000)	(123,164)	(123,164)	0
Transfer from CZMF	0	0	0	0	0
Transfer from USDA	0	0	0	0	0
Transfer from PCSRF to ORF	(60)	0	0	0	0
Transfer to other accounts	0	0	0	0	0
Transfer to FFPA	0	0	0	0	0
Transfer to/from Dept of Interior	0	0	0	0	0
NOAA Corps Retirement Pay (Mandatory)	(25,243)	(28,269)	(28,269)	(28,269)	0
Transfer from ORF to Pacific Salmon	0	0	0	0	0
Transfer to PAC	0	0	0	0	0
Transfer from PAC	(66,456)	0	0	0	0
Transfer - CCSP (USDA Farm Bill)	0	0	0	0	0
Net Appropriation	3,023,591	3,157,392	3,225,837	3,237,993	12,156

Department of Commerce
National Oceanic and Atmospheric Administration
Operations Research and Facilities
JUSTIFICATION OF CHANGES TO BASE
(Dollar Amounts in Thousands)

		FTE	Amount
Adjustments:		0	15,000
Restoration of FY 2014 deobligations	15,000,000		
Financing:			
In 2015, NOAA expects to realize recoveries of prior year obligations of $15,000,000. This amount will be used to offset the budget authority in 2015.	(15,000,000)	0	(15,000)
Pay Raises		0	16,147
Full-year cost of 2015 pay increase and related costs:			
The 2015 President's Budget assumes a civilian pay raise of 1.0% and NOAA Corp pay raise of 1.0% to be effective April 1, 2014.			
Total cost of 2015 pay raise	19,873,498		
Less amount funded in 2014	(14,905,124)		
Adjustment for FY 2015 of 2014 pay increase	4,968,374		
2015 pay increase and related costs:			

Department of Commerce
National Oceanic and Atmospheric Administration
Operations Research and Facilities
JUSTIFICATION OF CHANGES TO BASE
(Dollar Amounts in Thousands)

A general civilian pay raise of 1.0% and NOAA Corp pay raise of 1.0% is assumed to be effective January 1, 2014.			
Total cost in 2015 of pay increase	14,905,124		
Less amount not funded in 2014	(3,726,281)		
Total cost of January 2015 pay increase	11,178,843		
Payment to Working Capital Fund	-		
Total, adjustment for 2015 pay increase	11,178,843		
Compensable Day			0
Civil Service Retirement System (CSRS)		0	(2,289)
The number of employees covered by the Civil Service Retirement System (CSRS) continues to drop as positions become vacant and are filled by employees who are covered by Federal Employees Retirement System (FERS). The estimated percentage covered by CSRS will drop from 9.6% in 2014 to 6.7% in 2015 for regular employees and will drop from 4.0% in 2014 to 0% in 2015 for law enforcement employees. Contribution rates will remain the same.			
Regular:			
2015 $1,118,282,000 x 0.067 x .07	5,244,743		
2014 $1,118,282,000 x 0.960 x .07	7,514,855		
Subtotal	(2,270,112)		

Department of Commerce
National Oceanic and Atmospheric Administration
Operations Research and Facilities
JUSTIFICATION OF CHANGES TO BASE
(Dollar Amounts in Thousands)

Law Enforcement:			
2015 $6,408,000 x .000 x .075	0		
2014 $6,408,000 x .004 x .075	19,224		
Subtotal	(19,224)		
Total adjustment to base	(2,289,336)		
Federal Employees Retirement System (FERS)		0	17,497
The number of employees covered by the FERS continues to rise as employees covered by CSRS leave and are replaced by employees covered by FERS. The estimated percentage of payroll for regular employees covered by FERS will rise from 90.4% in 2014 to 93.3% in 2015 for regular employees. The estimated percentage of payroll for law enforcement employees covered by FERS will rise from 95.6% in 2014 to 100% in 2015. The contribution rate for FERS Regular increased from 11.9% to 13.2% in 2015.			
Regular:			
2015 $1,118,282,000 x 0.933 x 0.1320	137,723,138		
2014 $1,118,282,000 x 0.904 x 0.119	120,300,304		
Subtotal	17,422,834		

Department of Commerce
National Oceanic and Atmospheric Administration
Operations Research and Facilities
JUSTIFICATION OF CHANGES TO BASE
(Dollar Amounts in Thousands)

Law Enforcement:			
2015 $6,408,000 x 1.00 x 0.263	1,685,304		
2014 $6,408,000 x .956 x 0.263	1,611,151		
Subtotal	74,153		
Total adjustment to base	17,496,987		
Thrift Savings Plan		0	327
The cost of agency contributions to the Thrift Savings Plan will also rise as FERS participation increases. The contribution rate is 1%.			
Regular:			
2015 $1,118,282,000 x 0.933 x 0.01	10,433,571		
2014 $1,118,282,000 x 0.904 x 0.01	10,109,269		
Subtotal	324,302		
Law Enforcement:			
2015 $6,408,000 x 1.00 x 0.01	64,080		
2014 $6,408,000 x .956 x 0.01	61,260		
Subtotal	2,820		

Department of Commerce
National Oceanic and Atmospheric Administration
Operations Research and Facilities
JUSTIFICATION OF CHANGES TO BASE
(Dollar Amounts in Thousands)

Total adjustment to base	327,122		
Federal Insurance Contribution Act (FICA)		0	1,931
The maximum salary subject to OASDI tax will decrease from $115,800 in 2014 to $119,100 in 2015. The OASDI tax rate will remain at 6.2% in 2015.			
Regular:			
2015 $1,118,282,000 x .933 x .959 x .062	62,035,927		
2014 $1,118,282,000 x .904 x .961 x .062	60,233,048		
Subtotal	1,802,879		
Law Enforcement:			
2015 $6,408,000 x 1.0 x .959 x .062	381,007		
2014 $6,408,000 x .956 x .961 x .062	365,002		
Subtotal	16,005		
Other			
2015 $69,576,000 x .933 x .959 x .062	3,859,681		
2014 $69,576,000 x .904 x .961 x .062	3,747,511		
Subtotal	112,170		
Total adjustment to base			

Department of Commerce
National Oceanic and Atmospheric Administration
Operations Research and Facilities
JUSTIFICATION OF CHANGES TO BASE
(Dollar Amounts in Thousands)

	1,931,054	
Health Insurance Premiums Effective January 2015, NOAA's contribution to Federal employees' health insurance premiums remains static at 4.1%. Applied against the 2014 estimate of $89,042,000, the additional amount required is $3,650,722.	0	3,651
Employees Compensation Fund Effective January 2015, NOAA's contribution to Federal employees' compensation fund will increase by $201,000.	0	201
Rental Payments to GSA GSA rates are projected to increase 1.6% in 2015. This percentage was applied to the 2014 estimate of $73,746,000 to arrive at an increase of $1,179,936.	0	1,180
Postage Effective January 22, 2012, the Governors of the Postal Service implemented a rate increase for shipping. The percentage increase of 4.6% will be applied to the 2014 estimate of $71,000 arrive at an increase of $3,266.	0	3

Department of Commerce
National Oceanic and Atmospheric Administration
Operations Research and Facilities
JUSTIFICATION OF CHANGES TO BASE
(Dollar Amounts in Thousands)

GPO Printing GPO has provided an estimated rate of 1.4%. This percentage was applied to the 2014 estimate of $4,361,000 to arrive at an increase of $61,054.	0	61
PEPCO Electricity A decrease of $25,000 is requested for PEPCO Electricity.	0	(25)
Water An increase of $22,000 is requested for GSA Steam and Water (DCWASA).	0	22
NARA Storage & maintenance costs The estimated cost of NARA storage and maintenance for 2015 is projected to increase by $347,428.	0	347
Working Capital Fund An increase of $10,405 is requested for the Working Capital Fund. This includes 2015 inflationary increase.	0	10,405
CBS NOAA requests an increase of $219,000 for Commerce Business System.	0	219
General Pricing Level Adjustment	0	13,717

Department of Commerce
National Oceanic and Atmospheric Administration
Operations Research and Facilities
JUSTIFICATION OF CHANGES TO BASE
(Dollar Amounts in Thousands)

This request applies OMB economic assumptions for FY 2015 to object classes where the prices the government pays are established through the market system. Factors are applied to transportation of things ($174,622); rental payment payments to others ($564,312); communications, utilities and miscellaneous charges (excluding postage and FTS) ($1,049,118); other contractual services ($9,535,024); supplies and materials ($1,853,402) and equipment ($540,596).

Grants	0	710
Grants management is projected to increase by3.0% in 2015. This percentage was applied to the 2014 estimate of $23,673,000 to arrive at an increase of $710,190.		
Ship and Aircraft Fuel Costs	0	(1,181)
Subtotal, Other Changes	0	62,923
Other Adjustments	0	0
Total Adjustments to Base	0	62,923

Department of Commerce
National Oceanic and Atmospheric Administration
Operations Research and Facilities
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
(Dollar Amounts in Thousands)

	Object Class	FY 2013 Actual	FY 2014 Enacted	FY 2015 Base	FY 2015 Estimate	Increase / (Decrease)
11	Personnel compensation					
11.1	Full-time permanent	1,066,877	1,138,285	1,154,432	1,151,398	(3,034)
11.3	Other than full-time permanent	7,889	8,417	8,417	8,325	(92)
11.5	Other personnel compensation	52,830	56,366	56,366	58,075	1,709
11.6	Leave Surcharge	(5,134)	(5,478)	(5,478)	(5,478)	0
11.7	Military personnel	31,875	34,008	34,008	34,008	0
11.9	Total Personnel Compensation	1,154,336	1,231,599	1,247,746	1,246,329	(1,417)
12	Civilian personnel benefits	343,950	366,971	388,289	388,184	(105)
13	Benefits for former personnel	24,417	26,052	26,052	26,052	0
21	Travel and transportation of persons	27,842	29,706	29,706	30,432	726
22	Transportation of things	11,691	12,473	12,648	12,592	(56)
23.1	Rental payments to GSA	71,353	73,746	74,926	76,136	1,210
23.2	Rental payments to others	35,546	40,308	40,872	40,982	110
23.3	Communications, utilities and miscellaneous charges	70,236	74,937	76,552	77,110	558
24	Printing and reproduction	4,087	4,361	4,422	4,389	(32)
25.1	Advisory and assistance services	169,980	181,358	181,358	178,928	(2,430)
25.2	Other services from non-Federal sources	406,688	433,909	443,444	443,306	(138)

Department of Commerce
National Oceanic and Atmospheric Administration
Operations Research and Facilities
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
(Dollar Amounts in Thousands)

	Object Class	FY 2013 Actual	FY 2014 Enacted	FY 2015 Base	FY 2015 Estimate	Increase / (Decrease)
25.3	Other goods and services from Federal sources	94,880	101,231	125,322	119,687	(5,635)
25.4	Operation and maintenance of facilities	0	0	0	600	600
25.5	Research and development contracts	12,225	13,043	13,043	18,712	5,669
25.7	Operation and maintenance of equipment	0	0	0	3,837	3,837
26	Supplies and materials	98,299	104,878	105,550	107,147	1,597
31	Equipment	36,192	38,614	39,155	39,927	772
32	Lands and structures	3,401	3,628	3,628	3,628	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsides, and contributions	542,482	578,791	579,501	586,391	6,890
42	Insurance claims and indemnities	21	22	22	22	0
43	Interest and dividends	31	33	33	33	0
44	Refunds	0	0	0	0	0
99	Total Obligations	3,107,658	3,315,661	3,392,270	3,404,426	12,156

Department of Commerce
National Oceanic and Atmospheric Administration
Operations Research and Facilities
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
(Dollar Amounts in Thousands)

Object Class	FY 2013 Actual	FY 2014 Enacted	FY 2015 Base	FY 2015 Estimate	Increase / (Decrease)
Unobligated Balance Lapse					
Cash Refund	(1,345)				
De-obligations	(11,729)	(15,000)	(15,000)	(15,000)	
Prior Year Recoveries					
Unobligated Balance, Start of Year	(59,170)				
Transfer of Unobligated P&D Balance					
Unobligated Balance, End of Year	183,028				
Unobligated Balance, Expiring	2,808				
Unobligated Balance, not apportioned	13,164				
Subtotal Budget Authority	3,234,414	3,300,661	3,377,270	3,389,426	12,156
Less: NOAA Corps	(25,243)	(28,269)	(28,269)	(28,269)	0
Total Discretionary ORF Budget Authority	3,209,171	3,272,392	3,349,001	3,361,157	12,156
Positions	11,972	12,715	12,660	12,633	(27)
FTE	11,401	12,109	12,054	12,016	(38)

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Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research and Facilities
PROGRAM/SUB-PROGRAM CHANGE CROSSWALK
Part 1 2014 Structure
(Dollar amounts in thousands)

Program/Sub-program/Program Activity	2015 Direct Obligations	Proposed Changes (Sub-program/Program Activity)
National Weather Service		
Operations and Research		
Local Warnings and Forecasts		
Local Warnings and Forecasts Base	675,018	Move to Observations/Central Processing/Analyze, Forecast, & Support/Dissemination/Science & Technology Integration
Air Quality Forecasting	865	Move to Science & Technology Integration
Alaska Data Buoy	1,700	Move to Observations
Sustain Cooperative Observer Network	1,000	Move to Observations
NOAA Profiler Network	1,800	Move to Observations
Strengthen U.S. Tsunami Warning Network	20,880	Move to Observations/Analyze, Forecast, & Support
Pacific Island Compact	3,775	Move to Analyze, Forecast & Support
National Mesonet Network	5,500	Move to Observations
Advanced Hydrological Prediction Services	6,200	Move to Central Processing
Aviation Weather	12,452	Move to Observations/Analyze, Forecast, & Support/Dissemination/Science & Technology Integration
WFO Maintenance	6,600	Move to Analyze, Forecast & Support
Weather Radio Transmitters		
Weather Radio Transmitters Base	2,300	Move to Dissemination
Central Forecast Guidance		
Central Forecast Guidance	87,243	Move to Central Processing/Analyze, Forecast, & Support/Dissemination/Science & Technology Integration
Systems Operation & Maintenance		
Systems Operations & Maintenance		
NEXRAD	46,455	Move to Observations
ASOS	11,131	Move to Observations
AWIPS	38,652	Move to Central Processing
NWSTG Backup - CIP	5,282	Move to Dissemination

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research and Facilities
PROGRAM/SUB-PROGRAM CHANGE CROSSWALK
Part 1 2014 Structure
(Dollar amounts in thousands)

Program/Sub-program/Program Activity	2015 Direct Obligations	Proposed Changes (Sub-program/Program Activity)
National Environmental Satellite, Data and Information Service		
Environmental Satellite Observing Systems		
Office of Satellite and Product Operations		
Satellite Command and Control	39,000	Move $39,000 to new Satellite and Product Operations PPA
NSOF Operations	8,000	No Change
Product Processing and Distribution	45,000	Move $45,000 to new Satellite and Product Operations PPA
Production Development, Readiness & Application		
Product Development, Readiness & Application	19,000	Move $19,000 to Product Development, Readiness and Application PPA;
Product Development, Readiness & Application (Ocean Remote Sensing)	4,000	Move $4,000 to Product Development, Readiness & Application PPA
Joint Center for Satellite Data Assimilation	3,000	Move $3,000 to Product Development, Readiness & Application PPA
Commercial Remote Sensing Regulatory Affairs	1,000	No change
Office of Space Commercialization	600	No change
Group on Earth Observations (GEO)	500	No change

Exhibit 19

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research and Facilities
ACTIVITY/SUBACTIVITY CHANGE CROSWALK
Part 2 2015 Structure
(Dollar amounts in thousands)

Program/Sub-program/Program Activity	FY 2011 Spend Plan	FY 2012 Spend Plan	FY 2013 Spend Plan	FY 2014 Enacted	FY 2015 Estimate
Operations and Research					
Local Warnings and Forecasts					
Local Warnings and Forecasts Base	628,121	655,828	630,846	0	0
Air quality Forecasting	2,994	1,705	1,629	0	0
Alaska Data Buoys	1,680	1,678	1,568	0	0
Sustain Cooperative Observer Network	998	1,065	1,737	0	0
NOAA Profiler Network	2,768	4,228	3,939	0	0
Strengthen U.S. Tsunami Warning Network	23,233	23,466	21,931	0	0
Pacific Island Compact	3,308	3,703	3,517	0	0
National Mesonet Network	8,000	10,965	11,179	0	0
Subtotal, Local Warnings and Forecasts	671,102	702,638	676,346	0	0
Advanced Hydrological Prediction Services	6,037	8,137	7,639	0	0
Aviation Weather	11,538	11,697	19,985	0	0
WFO Maintenance	7,301	5,416	6,137	0	0
Weather Radio Transmitter Base	2,292	2,190	2,141	0	0
Subtotal, Local Warnings and Forecasts	698,270	730,114	712,248	0	0
Central Forecast Guidance					
Central Forecast Guidance	79,208	77,540	64,113	0	0
Subtotal Central Forecast Guidance	79,208	77,540	64,113	0	0

Exhibit 19

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research and Facilities
ACTIVITY/SUBACTIVITY CHANGE CROSWALK
Part 2 2015 Structure
(Dollar amounts in thousands)

Program/Sub-program/Program Activity	FY 2011 Spend Plan	FY 2012 Spend Plan	FY 2013 Spend Plan	FY 2014 Enacted	FY 2015 Estimate
Total Operations and Research	777,478	807,654	776,361	0	0
Systems Operations & Maintenance					
NEXRAD	46,145	45,505	43,085	0	0
ASOS	11,186	10,278	10,111	0	0
AWIPS	39,273	36,621	36,794	0	0
NWSTG Backup - CIP	5,500	5,265	4,921	0	0
Total, Systems Operation & Maintenance	102,104	97,669	94,911	0	0
Observations	0	0	0	205,342	200,277
Central Processing	0	0	0	100,225	86,517
Analyze, Forecast, & Support	0	0	0	475,467	476,360
Dissemination	0	0	0	46,331	40,099
Science & Technology Integration	0	0	0	126,262	123,600
Total, National Weather Service - ORF	879,582	905,323	871,272	953,627	926,853

Department of Commerce

Exhibit 19

National Oceanic and Atmospheric Administration

Operations, Research and Facilities

ACTIVITY/SUBACTIVITY CHANGE CROSWALK

Part 2 2015 Structure

(Dollar amounts in thousands)

Program/Sub-program/Program Activity	FY 2011 Spend Plan	FY 2012 Spend Plan	FY 2013 Spend Plan	FY 2014 Enacted	FY 2015 Estimate
National Environmental Satellite, Data and Information Service (NESDIS)					
Environmental Satellite Observing Systems					
Office of Satellite and Product Operations	83,955	83,053	83,004		
Product Development, Readiness, and Application	28,152	26,667	25,141		
Commercial Remote Sensing Regulatory Affairs	1,308	1,104	1,043		
Office of Space Commercialization	653	651	614		
Group on Earth Observations (GEO)	505	503	471		
Subtotal Environmental Satellite Observing Systems	114,573	111,978	110,273		
Data Centers & Information Services					
Archive, Access, and Assessment	51,469	47,353	45,122		
Coastal Data Development	4,629	4,500	4,193		
Regional Climate Services	3,493	6,800	7,267		
Environmental Data Systems Modernization	9,492	8,912	8,384		
Subtotal Data Centers & Information Services	69,083	67,565	64,966		
Environmental Satellite Observing Systems					
Office of Satellite and Product Operations				92,000	92,842
Product Development, Readiness, and Application				26,000	26,000
Commercial Remote Sensing Regulatory Affairs				1,000	1,200
Office of Space Commercialization				600	1,000
Group on Earth Observations (GEO)				500	500

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research and Facilities
ACTIVITY/SUBACTIVITY CHANGE CROSWALK
Part 2 2015 Structure
(Dollar amounts in thousands)

Exhibit 19

Program/Sub-program/Program Activity	FY 2011 Spend Plan	FY 2012 Spend Plan	FY 2013 Spend Plan	FY 2014 Enacted	FY 2015 Estimate
Subtotal Environmental Satellite Observing Systems				120,100	121,542
National Environmental Information Office				67,067	69,067
Subtotal National Environmental Information Office				67,067	69,067
Total, NESDIS ORF	183,656	179,543	175,239	187,167	190,609

Department of Commerce
National Oceanic and Atmospheric Administration
Operations Research and Facilities
CONSULTING AND RELATED SERVICES
(Dollars in Thousands)

	2013 Actual	2014 Estimate	2015 Estimate
Management and Professional Support Services	$66,292	$70,729	$69,391
Studies, Analysis and Evaluations	$27,197	$29,017	$28,469
Engineering and Technical Services	$76,491	$81,611	$80,068
Total	$169,980	$181,358	$177,928

Consulting Services are those services of a pure nature relating to the governmental functions of agency administration and management and agency problem management. These services are normally provided by persons or organizations generally considered to have knowledge and special abilities that are not usually available within the agency. Such services can be obtained through personnel appointments, procurement contracts, or advisory committees.

Management and professional services deal with management data collection, policy review or development, program development, review or evaluation, systems engineering and other management support services. Special studies and analyses deal with the highly specialized areas of agency activity, e.g., air quality, chemical, environmental, geophysical, oceanographic, technological, and etc. Management and support services for research and development are procurement actions that meet the description of management and professional services or special studies and analyses but are funded under research and development.

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Exhibit 35

Department of Commerce
National Oceanic and Atmospheric Administration
Operations Research and Facilities
PERIODICAL, PAMPHLETS, AND AUDIOVISUAL PRODUCTS
(Dollars in Thousands)

	2013 Actual	2014 Estimate	2015 Estimate
Periodicals	$1,982	$2,115	$2,128
Pamphlets	$1,428	$1,524	$1,533
Audiovisuals	$677	$723	$727
Total	$4,087	$4,361	$4,389

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Department of Commerce
National Oceanic and Atmospheric Administration
Operations Research and Facilities
AVERAGE GRADE AND SALARY
(Dollars in Thousands)

	2013 Actual	2014 Estimate	2015 Estimate
Average executive and SES level pay plans	$165,524	$167,180	$168,933
Average GS/GM grade	12	12	12
Average GS/GM salary	$92,612	$93,538	$94,520
Average Pay Band salary	$97,636	$98,613	$99,647
Average Commissioned Officers salary	$106,403	$107,467	$108,581
Average salary for other positions (FWS/Wage Marine)	$54,731	$55,278	$55,852

Average salaries provided here reflect Federal Civilian and Military pay raises for 2013 and 2014, respectively.

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Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition, and Construction
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar Amounts in Thousands)

	Positions	FTE	Appropriation	Budget Authority	Direct Obligations
FY 2014 Enacted	273	261	2,022,864	2,021,864	2,171,541
less: Carryover	0	0	0	0	(142,677)
plus: 2015 Other Adjustments to Base	0	0	(6,000)	(6,302)	(302)
FY 2015 Base	273	261	2,016,864	2,015,562	2,028,562
plus(or less): 2015 Program Changes	1	0	189,528	189,528	189,528
FY 2015 Estimate	274	261	2,206,392	2,205,090	2,218,090

Exhibit 5

Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition, and Construction
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar Amounts in Thousands)

Comparison by activity/subactivity		FY 2013 Actuals Personnel	FY 2013 Actuals Amount	FY 2014 Enacted Personnel	FY 2014 Enacted Amount	FY 2015 Base Program Personnel	FY 2015 Base Program Amount	FY 2015 Estimate Personnel	FY 2015 Estimate Amount	Increase/ Decrease Personnel	Increase/ Decrease Amount
National Ocean Service	Pos/BA	4	25	5	3,700	5	3,700	5	3,700	0	0
	FTE/OBL	4	2,403	5	4,973	5	3,700	5	3,700	0	0
National Marine Fisheries Service	Pos/BA	0	1,898	0	0	0	0	0	0	0	0
	FTE/OBL	0	103	0	1,914	0	0	0	0	0	0
Oceanic and Atmospheric Research	Pos/BA	0	34,143	0	10,379	0	10,379	0	13,379	0	3,000
	FTE/OBL	0	9,796	0	34,712	0	10,379	0	13,379	0	3,000
National Weather Service	Pos/BA	24	121,194	25	113,619	25	113,619	23	136,494	(2)	22,875
	FTE/OBL	23	68,793	24	172,083	24	113,619	22	136,494	(2)	22,875
National Environmental Satellite, Data, & Info Service	Pos/BA	235	1,706,965	243	1,895,966	243	1,895,664	246	2,057,317	3	161,653
	FTE/OBL	225	1,710,407	232	1,900,638	232	1,895,664	234	2,057,317	2	161,653
Program Support	Pos/BA	0	0	0	0	0	0	0	0	0	0
	FTE/OBL	0	808	0	168	0	0	0	0	0	0
Office of Marine Aviation & Ops	Pos/BA	1	54,764	0	5,200	0	5,200	0	7,200	0	2,000
	FTE/OBL	1	3,210	0	57,053	0	5,200	0	7,200	0	2,000
Less Deobligations/Other	Pos/BA	0	(15,000)	0	(7,000)	0	(13,000)	0	(13,000)	0	0
	FTE/OBL	0	0	0		0	0	0	0	0	0
Total	Pos/BA	264	1,903,989	273	2,021,864	273	2,015,562	274	2,205,090	1	189,528
	FTE/OBL	253	1,795,520	261	2,171,541	261	2,028,562	261	2,218,090	0	189,528

Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition, and Construction
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar Amounts in Thousands)

	FY 2013 Actual		FY 2014 Enacted		FY 2015 Base Program		FY 2015 Estimate		Increase/ Decrease	
	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount
Direct Discretionary Obligation	253	1,795,520	261	2,171,541	261	2,028,562	261	2,218,090	0	189,528
Total Obligations	**253**	**1,795,520**	**261**	**2,171,541**	**261**	**2,028,562**	**261**	**2,218,090**	**0**	**189,528**
Adjustments to Obligations:										
Cash Refunds/Prior Year Recoveries	0	(2,436)	0	0	0	0	0	0	0	0
Deobligations	0	(8,290)	0	(7,000)	0	(13,000)	0	(13,000)	0	0
Enacted Rescissions	0	0	0	0	0	0	0	0	0	0
Unobligated Balance Expired	0	261	0	0	0	0	0	0	0	0
Unobligated Balance deferred	0	0	0	0	0	0	0	0	0	0
Unobligated Balance, not apportioned	0	555	0	0	0	0	0	0	0	0
Unobligated Balance, unavailable	0	0	0	0	0	0	0	0	0	0
Unobligated Balance Rescission Adj BA	0	0	0	0	0	0	0	0	0	0
Unobligated Balance Adj SOY	0	(24,298)	0	(142,677)	0	0	0	0	0	0
Unobligated balance, Adj EOY	0	142,677	0	0	0	0	0	0	0	0
Transfer to NOAA ORF	0		0	0	0	0	0	0	0	0
Total Budget Authority	**253**	**1,903,989**	**261**	**2,021,864**	**261**	**2,015,562**	**261**	**2,205,090**	**0**	**189,528**
Financing from Transfers and Other:										
Transfer from P&D to ORF	0	0	0	0	0	0	0	0	0	0
Transfer from CZMF to ORF	0	0	0	0	0	0	0	0	0	0
Transfer from Pacific Salmon	0	0	0	0	0	0	0	0	0	0
Transfer from PAC	0	0	0	0	0	0	0	0	0	0
Transfer from PAC to ORF	0	66,456	0	0	0	0	0	0	0	0
Transfer to OIG	0	1,000	0	1,000	0	1302	0	1,302	0	0
Net Appropriation	**253**	**1,971,445**	**261**	**2,022,864**	**261**	**2,016,864**	**261**	**2,206,392**	**0**	**189,528**

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Exhibit 7

Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition, and Construction
SUMMARY OF FINANCING
(Dollar Amounts in Thousands)

	FY 2013 Actual	FY 2014 Enacted	FY 2015 Base Program	FY 2015 Estimate	Increase/(Decrease) over FY 2015 Base
Direct Discretionary Obligation	1,795,520	2,171,541	2,028,562	2,218,090	189,528
Total Obligations	1,795,520	2,171,541	2,028,562	2,218,090	189,528
Adjustments and Obligations:					
Cash Refund	0	0	0	0	0
Recoveries	(2,436)	0	0	0	0
Deobligations	(8,290)	(7,000)	(13,000)	(13,000)	0
Unobligated balance, adj. SOY	(24,298)	(142,677)	0	0	0
Unobligated balance, EOY	142,677	0	0	0	0
Unobligated balance, expiring EOY	261	0	0	0	0
Unobligated Balance, not apportioned	555	0	0	0	0
Total Budget Authority	1,903,989	2,021,864	2,015,562	2,205,090	189,528
Financing from Tranfers and Other:					
Transfer to ORF	66,456	0	0	0	0
Transfer from GSA	0	0	0	0	0
Transfer from ORF	0	0	0	0	0
Transfer to OIG	1,000	1,000	1,302	1,302	0
Transfer from Census to PAC	0	0	0	0	0
Unobligated Balance, Rescission	0	0	0	0	0
Net Appropriation	1,971,445	2,022,864	2,016,864	2,206,392	189,528

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Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition and Construction
ADJUSTMENTS TO CHANGES TO BASE
(Dollar Amounts in Thousands)

	FTE	Amount
Adjustments:		
Restoration of FY 2015 deobligations	0	7,000
Transfer to OIG	0	(302)
Subtotal, Adjustments	0	6,698
Financing:		
NOAA expects to realize recoveries of prior year obligations of $13,000,000. This amount will be used to offset the budget authority in FY 2015.	0	(13,000)
Subtotal, Financing	0	(13,000)
Other Changes	0	0
Total Adjustments to Base	0	(6,302)

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Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition, and Construction
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
(Dollar Amounts in Thousands)

	Object Class	FY 2013 Actual	FY 2014 Enacted	FY 2015 Base	FY 2015 Estimate	Increase / (Decrease)
11	Personnel compensation					
11.1	Full-time permanent	33,107	37,409	37,409	36,596	(813)
11.3	Other than full-time permanent	160	181	181	181	0
11.5	Other personnel compensation	828	935	935	935	0
11.6	Leave Surcharge	0	0	0	0	0
11.7	Military personnel	0	0	0	0	0
11.9	Total Personnel Compensation	34,095	38,525	38,525	37,712	(813)
12	Civilian personnel benefits	6,828	7,715	7,715	7,492	(223)
13	Benefits for former personnel	0	0	0	0	0
21	Travel and transportation of persons	1,244	1,406	1,406	1,417	11
22	Transportation of things	86	97	97	90	(7)
23.1	Rental payments to GSA	5,783	6,534	6,534	6,534	0
23.2	Rental payments to others	447	505	505	505	0
23.3	Communications, utilities and miscellaneous charges	7,223	8,162	8,162	8,160	(2)
24	Printing and reproduction	2	3	3	3	0

Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition, and Construction
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
(Dollar Amounts in Thousands)

	Object Class	FY 2013 Actual	FY 2014 Enacted	FY 2015 Base	FY 2015 Estimate	Increase / (Decrease)
25.1	Advisory and assistance services	48,679	55,006	54,704	63,563	8,859
25.2	Other services	93,459	105,604	105,604	130,727	25,123
25.3	Purchases of goods and services from Govt accounts	1,342,786	1,517,293	1,517,293	1,659,208	141,915
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	20,772	23,472	23,472	23,472	0
26	Supplies and materials	6,793	7,676	7,676	15,990	8,314
31	Equipment	192,469	217,482	217,482	217,482	0
32	Lands and structures	883	998	998	7,349	6,351
33	Investments and loans	0	0	0	0	0
41	Grants, subsides and contributions	33,965	38,379	38,379	38,379	0
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	6	7	7	7	0
44	Refunds	0	0	0	0	0
99	Total Obligations	1,795,520	2,028,864	2,028,562	2,218,090	189,528

Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition, and Construction
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
(Dollar Amounts in Thousands)

Object Class	FY 2013 Actual	FY 2014 Enacted	FY 2015 Base	FY 2015 Estimate	Increase / (Decrease)
Cash Refund	(2,436)				
Prior Year Recoveries					
Deobligations	(8,290)	(7,000)	(13,000)	(13,000)	
Unobligated Balance, expiring	261				
Unobligated Balance, Start of Year	(24,298)				
Unobligated Balance, End of Year	142,677				
Unobligated Balance, not apportioned	555				
Subtotal Budget Authority	1,903,989	2,021,864	2,015,562	2,205,090	189,528
Total Discretionary PAC Budget Authority	1,903,989	2,021,864	2,015,562	2,205,090	189,528
Positions	264	273	273	274	1
FTE	253	261	261	261	0

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Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition, and Construction
PROGRAM/SUB-PROGRAM CHANGE CROSSWALK
Part 1 2014 Structure
(Dollar amounts in thousands)

Program/Sub-program/Program Activity	2015 Direct Obligations	Proposed Changes (Sub-program/Program Activity)
National Weather Service		
Systems Acquisition		
ASOS	0	Move to Observations
AWIPS	20,092	Move to Central Processing
NEXRAD	9,300	Move to Observations
NWSTG Legacy Replacement	21,215	Move to Dissemination
Radiosonde Network Replacement	4,014	Move to Observations
Weather and Climate Supercomputing	44,169	Move to Central Processing
Cooperative Observer Network Modernization (NERON)	0	Move to Observations
Complete and Sustain NOAA Weather Radio	5,594	Move to Dissemination
NOAA Profiler Conversion	0	Move to Observations
Ground Readiness Project	18,400	Move to Dissemination
Construction		
WFO Construction	13,710	Move to Facilities Construction & Major Repairs

Exhibit 18

Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition, and Construction
PROGRAM/SUB-PROGRAM CHANGE CROSSWALK
Part 1 2014 Structure
(Dollar amounts in thousands)

Program/Sub-program/Program Activity	2015 Direct Obligations	Proposed Changes (Sub-program/Program Activity)
National Environmental Satellite, Data and Information Service		
Systems Acquisition		
Geostationary Systems – N	26,321	Move $11,517 to new Projects, Planning & Analysis PPA; move $416 to new Systems Architecture & Advanced Planning PPA; move $14,388 to new Satellite Ground Services PPA
Geostationary Systems – R	954,761	Move $8,177 to new Projects, Planning & Analysis PPA; move $2,143 to new Systems Architecture & Advanced Planning PPA; move $2,542 to new Satellite Ground Services PPA; $941,899 remains in GOES-R PPA
Polar Orbiting Systems - POES	28,788	Move $13,794 to Projects, Planning & Analysis PPA; move $528 to new Systems Architecture & Advanced Planning PPA; move $14,466 to new Satellite Ground Services PPA
Jason-3	18,500	No change
Joint Polar Satellite System	824,000	Move $1,500 to new Systems Architecture & Advanced Planning PPA; move $1,645 to new Satellite Ground Services PPA; $820,855 remains in JPSS PPA
DSCOVR	23,675	No change
COSMIC 2/GNSSRO	2,000	No change
EOS & Advanced Polar Data Processing Distributio Archiving Systems	990	Move $990 to new Satellite Ground Services PPA
CIP – single point of failure	2,772	Move $2,772 to new Satellite Ground Services PPA
Comprehensive Array Data Stewardship Sys (CLASS)	6,476	Move $6,476 to new Satellite Ground Services PPA
NPOESS Preparatory Data Exploitation	3,455	Move $3,455 to new Satellite Ground Services PPA
Enterprise Ground System	3,000	Move $3,000 to new Satellite Ground Services PPA
Construction		
Satellite CDA Facility	2,228	No change

Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition, and Construction
PROGRAM/SUB-PROGRAM CHANGE CROSSWALK
Part 2 2015 Structure
(Dollar amounts in thousands)

Program/Sub-program/Program Activity	FY 2011 Spend Plan	FY 2012 Spend Plan	FY 2013 Spend Plan	FY 2014 Enacted	FY 2015 Estimate
Systems Acquisition					
ASOS	1,632	1,635	1,525	0	0
AWIPS	23,952	18,190	19,198	0	0
NEXRAD	11,104	15,219	0	0	0
NWSTG Legacy Replacement	5,185	1,195	7,631	0	0
Radiosonde Network Replacement	4,006	4,014	3,742	0	0
Weather and Climate Supercomputing	29,111	40,069	35,587	0	0
Cooperative Observer Network Modernization (NERON)	3,727	1,526	3,450	0	0
Complete and Sustain NOAA Weather Radio	12,589	5,494	5,216	0	0
NOAA Profiler Conversion	0	1,700	1,585	0	0
Ground Readiness Project	0	0	0	0	0
Subtotal, NWS Systems Acquisition	91,306	89,042	77,934	0	0
Construction					
WFO Construction	5,593	1,650	2,937	0	0
NOAA Center for Weather & Climate Prediction	0	0	1,418	0	0
Cooperative Institute and Research Center for Southeast Weather, AL	0	0	0	0	0
Subtotal Construction	5,593	1,650	4,355	0	0
Observations	0	0	0	5,649	13,314
Central Processing	0	0	0	65,761	64,261

Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition, and Construction
PROGRAM/SUB-PROGRAM CHANGE CROSSWALK
Part 2 2015 Structure
(Dollar amounts in thousands)

Program/Sub-program/Program Activity	FY 2011 Spend Plan	FY 2012 Spend Plan	FY 2013 Spend Plan	FY 2014 Enacted	FY 2015 Estimate
Dissemination	0	0	0	34,209	45,209
Facilities Construction & Major Repairs	0	0	0	8,000	13,710
Total, National Weather Service - PAC				113,619	136,494

Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition, and Construction
PROGRAM/SUB-PROGRAM CHANGE CROSSWALK
Part 2 2015 Structure
(Dollar amounts in thousands)

Program/Sub-program/Program Activity	FY 2011 Spend Plan	FY 2012 Spend Plan	FY 2013 Spend Plan	FY 2014 Enacted	FY 2015 Estimate
National Environmental Satellite, Data, and Information Service					
Systems Acquisition					
Geostationary Systems - N	40,520	32,467	25,853		
Geostationary Systems - R	662,373	615,622	747,724		
Polar Orbiting Systems - POES	40,796	32,241	28,963		
Jason-3	19,960	19,700	30,000		
Joint Polar Satellite System (JPSS)	471,900	924,014	821,214		
DSCOVR	2,000	29,800	20,556		
COSMIC 2	0	0	0		
EOS & Advanced Polar Data Processing, Distribution & Archiving Systems	988	990	889		
CIP - single point of failure	2,766	2,772	2,490		
Comprehensive Large Array Data Stewardship Sys (CLASS)	5,463	6,476	5,818		
NPOESS Preparatory Data Exploitation	4,446	4,455	4,002		
Restoration of Climate Sensors	6,986	25,880	0		
Subtotal Systems Acquisition	1,258,198	1,694,417	1,687,509		
Construction					
Satellite CDA Facility	2,224	2,228	2,077		
Subtotal Construction	2,224	2,228	2,077		
Systems Acquisition					
Geostationary Systems - R				941,899	980,838
Jason-3				18,500	25,656
Joint Polar Satellite System (JPSS)				820,855	916,267

Department of Commerce
National Oceanic and Atmospheric Administration
Procurement, Acquisition, and Construction
PROGRAM/SUB-PROGRAM CHANGE CROSSWALK
Part 2 2015 Structure
(Dollar amounts in thousands)

Program/Sub-program/Program Activity	FY 2011 Spend Plan	FY 2012 Spend Plan	FY 2013 Spend Plan	FY 2014 Enacted	FY 2015 Estimate
DSCOVR				23,675	21,100
COSMIC 2/GNSSRO				2,000	6,800
Satellite Ground Services				49,734	52,717
System Architecture and Advanced Planning				4,587	4,587
Projects, Planning, and Analysis				33,488	33,488
Subtotal Systems Acquisition				1,894,738	2,056,453
Construction					
Satellite CDA Facility				2,228	2,166
Subtotal Construction				2,228	2,166

Exhibit 5

Department of Commerce
National Oceanic and Atmospheric Administration
NOAA Working Capital Fund
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar Amounts in Thousands)

	Positions	FTE	Budget Authority	Reimbursable Obligations
FY 2014 Enacted	0	0		0
less: Unobligated balance	0	0		0
plus: 2015 Adjustments to Base	0	0		0
FY 2015 Base	55	55		100,000
plus(or less): 2015 Program Changes	0	0		0
FY 2015 Estimate	55	55		100,000

Department of Commerce
National Oceanic and Atmospheric Administration
NOAA Working Capital Fund
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar Amounts in Thousands)

		FY 2013 Actuals		FY 2014 Enacted		FY 2015 Base		FY 2015 Estimate		Increase/ Decrease	
		FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount
	Pos/BA	0	0	0	0	55	96,666	55	96,666	0	0
Program Support - OCIO	FTE/OBL	0	0	0	0	55	96,666	55	96,666	0	0
NESDIS - Satellite, Data, & Info	Pos/BA										
Service	FTE/OBL	0	0	0	0	0	3,334	0	3,334	0	0
		0	0	0	0	0	3,334	0	3,334	0	0
TOTAL	Pos/BA	0	0	0	0	55	100,000	55	100,000	0	0
	FTE/OBL	0	0	0	0	55	100,000	55	100,000	0	0
Unobligated Balance, SOY		0	0	0	0	0	0	0	0	0	0
Unobligated Balance, EOY		0	0	0	0	0	0	0	0	0	0
Total reimburseable authority		0	0	0	0	0	100,000	0	100,000	0	0

Exhibit 5

Department of Commerce
National Oceanic and Atmospheric Administration
NOAA Working Capital Fund
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar Amounts in Thousands)

	FY 2013 Actuals		FY 2014 Enacted		FY 2015 Base		FY 2015 Estimate		Increase/ Decrease	
	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount
Direct Discretionary Obligation	0	0	0	0	55	100,000	55	100,000	0	0
Total Obligations	**0**	**0**	**0**	**0**	**55**	**100,000**	**55**	**100,000**	**0**	**0**
Adjustments to Obligations:										
Unobligated balance	0	0	0	0	0	0	0	0	0	0
Total Budget Authority	**0**	**0**	**0**	**0**	**55**	**100,000**	**55**	**100,000**	**0**	**0**
Financing from Transfers and Other:										
Net Appropriation	**0**	**0**	**0**	**0**	**55**	**100,000**	**55**	**100,000**	**0**	**0**

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APPROPRIATION ACCOUNT: NOAA WORKING CAPITAL FUND

For FY 2015, NOAA requests a total of $100,000,000 funded on a reimbursable basis for a WCF.

NOAA proposes to establish a NOAA Working Capital Fund, which will finance, on a reimbursable basis, NOAA-wide information technology functions that are more efficiently and economically performed on a centralized basis.

Proposed Legislation:

Sec. 110. There is hereby established in the National Oceanic and Atmospheric Administration a Working Capital Fund, which shall be available without fiscal year limitation, for expenses and equipment necessary for the performance of such services and projects that the Administrator of the National Oceanic and Atmospheric Administration determines may be performed more advantageously when centralized: Provided, That such central services shall, to the fullest extent practicable, be used to make unnecessary the maintenance of separate like services in the divisions and offices of the National Oceanic and Atmospheric Administration and the Department of Commerce: Provided further, That a separate schedule of expenditures and reimbursements, and a statement of the current assets and liabilities of the Working Capital Fund as of the close of the last completed fiscal year, shall be prepared each year: Provided further, That notwithstanding 31. U.S.C. 3302, the Working Capital Fund may be credited with advances and reimbursements from applicable appropriations of the divisions and offices for whom the services are provided: Provided further, That any inventories, equipment, and other assets pertaining to the services to be provided by such funds, either on hand or on order, less the related liabilities or unpaid obligations, and any appropriations made hereafter for the purpose of providing capital, shall be used to capitalize the Working Capital Fund: Provided further, That the Working Capital Fund shall provide for centralized services at rates which will return in full all expenses of operation, including depreciation or replacement of Fund plant, equipment, and automated data processing software and hardware systems, and an amount necessary to maintain a reasonable operating reserve as determined by the Administrator of the National Oceanic and Atmospheric Administration and the Secretary of Commerce.

NOAA Working Capital Fund Overview:

The NOAA Working Capital Fund is a non-appropriated account which finances, on a reimbursable basis, NOAA-wide information technology functions that are more efficiently and economically performed on a centralized basis.

- Enterprise Provision of IT Services- Consistent with NOAA's IT vision, cost reductions can be achieved by eliminating unnecessary duplication within IT infrastructure investments through the establishment of shared services, consolidated assets, and expanded strategic sourcing. These efforts will be complemented by the establishment of standardized processes and key performance metrics that drive service delivery improvements and provide the workforce with appropriate incentives to succeed. Enterprise IT services include Grants Online, eMail and Unified Messaging Service (UMS), NOAA Directory Services, NOAANet-NOC, Administrative Licenses (Oracle), NOAA Enterprise Telecom Billing, Microsoft and Secure Active Directory Support, NOAA Emergency Notification System (ENS). The CIO Business Operating Plans (BOPs) provide technical and engineering services for the development and maintenance of network and telecommunications infrastructure. Architecture & Engineering of Shared Infrastructure Services include the development and operations & maintenance (O&M) of the

strategic enterprise architecture, engineering and design services (e.g., capacity planning) of core data centers, and interaction with the NOAALink cloud service provider(s).

- Enterprise Provision of IT Security- Enterprise IT security includes Enterprise IT Security hardware, Cybersecurity Assessment and Management (CSAM), and NOAA Emergency Operations Center (WebEOC). Enterprise IT security activity (1) Implements a comprehensive insider threat detection and management capability; (2) Implements the logical access and 2-factor authentication requirements of HSPD-12 (Policy for a Common Identification Standard for Federal Employees and Contractors) to complement and leverage the Facilities Program's implementation of the HSPD-12 Physical Access Control System (PACS); (3) Eliminates 8 known single points of failure in Silver Spring Metro Center (SSMC) IT infrastructure; and (4) Acquires, manages, and deploys enterprise security software for patch management, virus protection, anti-spam, security event correlation, and other functions.

- Consolidated Website Operations- The CIO will facilitate the migration of several hundred additional websites to the NOAA Web Operations Center (WOC), an enterprise-wide service for providing public access to NOAA data. NOAA has over 600 websites; most are hosted by individual Line and Staff organizations. The Web Operations Center (WOC) is a unified web service available by all organizational units in NOAA, but currently only an estimated 60% of NOAA websites reside at the WOC. The WOC acts as a data repository whereby any NOAA element can securely post information for public access. It is highly reliable with five locations dispersed across the US and can efficiently scale to meet all NOAA requirements for secure, public dissemination. By migrating the majority of NOAA's websites to the WOC, significant savings in NOAA's budget can be gained from reducing duplication, aggregating demand, pooling buying power, and pursuing safe and secure IT cloud solutions. NOAA is planning to aggressively pursue efficiencies by consolidating its websites to public, community, and private clouds.

- Consolidated Data Centers- The CIO will reduce and consolidate NOAA Data Centers with the goal of having services provided by a relatively small number of large, state of the art, high performing and well-managed facilities distributed across NOAA's geographic footprint. Data center servers will be substantially virtualized, resulting in higher server utilization. NOAA will no longer host the majority of commodity infrastructure services, but rather acquire these as managed services from either commercial public or Federal community cloud providers. The overall data center architecture will be designed to minimize aggregate data center costs across NOAA (including telecommunications to deliver data and virtual services), maximize performance and efficiency through intelligent load balancing, and mitigate current mission risks through enhanced failover and alternative site processing capabilities.

- Enterprise Archiving- The Comprehensive Large Array Data Stewardship System (CLASS) program currently supports large data arrays from satellite programs. FY 2015 funding within the NOAA Working Capital Fund will be used to conduct a study to assess whether a fee-for-service model could be implemented within CLASS, and also to determine whether CLASS' current capability could support an Enterprise Archive Service. An Enterprise Archive Service would be used to provide additional archival storage for NOAA's environmental data from other NOAA line offices and programs.

- NOAALink- Improves IT acquisition practices across NOAA, establishes enterprise-wide solutions, standardizes common IT products and services, leverages purchasing power, and achieves the most significant cost advantages possible.

Department of Commerce
National Oceanic and Atmospheric Administration
NOAA Working Capital Fund
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
(Dollar amounts in Thousands)

	Object Class	FY 2013 Actuals	FY 2014 Enacted	FY 2015 Base	FY 2015 Estimate	Increase / (Decrease)
11	Personnel compensation					
11.1	Full-time permanent	0	0	5,454	5,454	0
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	0	0	0	0	0
11.6	Military personnel basic allowance for housing	0	0	0	0	0
11.7	Military personnel	0	0	0	0	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total Personnel Compensation	0	0	5,454	5,454	0
12	Civilian personnel benefits	0	0	1,430	1,430	0
13	Benefits for former personnel	0	0	0	0	0
21	Travel and transportation of persons	0	0	54	54	0
22	Transportation of things	0	0	15	15	0
23.1	Rental payments to GSA	0	0	3,193	3,193	0
23.2	Rental payments to others	0	0	0	0	0
23.3	Communications, utilities and miscellaneous charge	0	0	0	0	0
24	Printing and reproduction	0	0	0	0	0
25.1	Advisory and assistance services	0	0	0	0	0
25.2	Other services from non-Federal sources	0	0	70,507	70,507	0
25.3	Other goods and services from Federal sources	0	0	0	0	0
25.4	Operation and maintenance of facilities	0	0	0	0	0
25.5	Research and development contracts	0	0	0	0	0

Department of Commerce
National Oceanic and Atmospheric Administration
NOAA Working Capital Fund
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
(Dollar amounts in Thousands)

	Object Class	FY 2013 Actuals	FY 2014 Enacted	FY 2015 Base	FY 2015 Estimate	Increase / (Decrease)
26	Supplies and materials	0	0	11,245	11,245	0
31	Equipment	0	0	8,103	8,103	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsides, and contributions	0	0	0	0	0
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	Total Obligations	0	0	100,000	100,000	0
	Unobligated Balance Lapse					
	Cash Refund	0	0	0	0	0
	De-obligations	0	0	0	0	
	Prior Year Recoveries	0	0	0	0	0
	Unobligated Balance, Start of Year	0	0			
	Transfer of Unobligated P&D Balance	0	0			
	Unobligated Balance, End of Year	0	0			
	Unobligated Balance, Expiring	0	0			
	Subtotal Budget Authority	0	0	0	0	0
	Less: NOAA Corps	0	0	0	0	0
	Total Discretionary ORF Budget Authority	0	0	0	0	0
Positions		0	0	55	55	0
FTE		0	0	55	55	0

Department of Commerce
National Oceanic and Atmospheric Administration
NOAA Working Capital Fund
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
(Dollar amounts in Thousands)

	FY 2013 Actuals	FY 2014 Enacted	FY 2015 Base Program	FY 2015 Estimate	Increase/ Decrease
Full-Time Equivalent Employment:					
Full-time permanent	0	0	0	0	0
Other than full-time permanent	0	0	55	55	0
Total	0	0	55	55	
Authorized Positions:					
Full-time permanent	0	0	55	55	0
Other than full-time permanent	0	0	0	0	0
Total	0	0	55	55	0

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Department of Commerce
National Oceanic and Atmospheric Administration
NOAA Working Capital Fund
DIRECT COST BY OFFICE
(Dollar amounts in thousands)

	FY 2013 Actuals			FY 2014 Enacted			FY 2015 Estimate		
	POS	FTE	Amount	POS	FTE	Amount	POS	FTE	Amount
Offices:									
Program Support - OCIO	0	0	0	0	0	0	55	55	96,666
NESDIS	0	0	0	0	0	0	0	0	3,334
Total Working Capital Fund	0	0	$0	0	0	0	55	55	$ 100,000

Department of Commerce
National Oceanic and Atmospheric Administration
NOAA Working Capital Fund
DIRECT COST BY OFFICE
(Dollar amounts in thousands)

	FY 2013 Actuals	FY 2014 Enacted	FY 2015 Estimate
National Ocean Service	0	0	$9,355
National Marine Fisheries Service	0	0	16,008
Oceanic and Atmoshperic Research	0	0	9,738
National Weather Service	0	0	31,712
Satellite, Data, Info Service	0	0	21,674
Office of Marine and Aviation Operations	0	0	3,057
Program Support	0	0	8,456
Total NOAA	$0	$0	$100,000

BUDGET PROGRAM: NATIONAL OCEAN SERVICE

For FY 2015, NOAA requests a total of $519,412,000 and 1,233 FTE for the National Ocean Service, including an increase of $14,457,000 in net program changes.

National Ocean Service Overview

The National Ocean Service (NOS) is the primary Federal agency that is responsible for enabling and promoting the sustainable, safe, and efficient use of coastal resources and coastal places. As the health of marine resources faces increasing threats, NOS's science-based products and services have never been more essential to the Nation's economic and ecological well-being. In addition to informing smart resource management and stewardship, NOS directly enables the safe and efficient operation of all oceangoing economic activity, including maritime commerce, offshore energy development, fishing, aquaculture, and tourism.

In 2014, NOAA restructured National Ocean Service projects, programs and activities (PPAs) as part of a broader effort to refocus NOS and improve coordination and collaboration among activities that advance its interlocking missions and authorizations. The new budget structure presents a more functional grouping of budgetary resources while retaining separate PPAs for major extramural activities. NOAA believes that this approach balances transparency with enhanced accountability for achieving ocean and coastal goals and objectives at the line office level.

The National Ocean Service is organized into three sub-programs under the Operations, Research and Facilities (ORF) account ($478,057,000 and 1,227 FTE).

- Navigation, Observations and Positioning ($191,376,000 and 562 FTE) includes NOAA's physical oceanographic activities conducted under the authority of the Coast and Geodetic Survey Act, the Hydrographic Services Improvement Act, the Integrated Coastal and Ocean Observation System Act, and the Ocean and Coastal Mapping Integration Act.
- Coastal Science and Assessment ($80,503,000 and 314 FTE) includes research, assessment and monitoring programs conducted under the authority of the Harmful Algal Bloom and Hypoxia Research and Control Act; the National Coastal Monitoring Act; the Marine Debris Act; the Oceans and Human Health Act; the Oil Pollution Act; and the Comprehensive Environmental Response, Compensation, and Liability Act.
- Ocean and Coastal Management and Services ($204,135,000 and 351 FTE) includes NOAA programs conducted under the authority of the Coastal Zone Management Act, the National Marine Sanctuaries Act, Executive Order 13158 (Marine Protected Areas) and the Coral Reef Conservation Act.

Procurement, Acquisition, and Construction (PAC) activities ($3,700,000 and 5 FTE) include the National Estuarine Research Reserve System (NERRS) Construction and Land Acquisition Program and the National Marine Sanctuaries Construction Program.

NOS manages three mandatory accounts, the NOAA Damage Assessment and Restoration Revolving Fund ($21,000,000 and 16 FTE), the Sanctuaries Enforcement Asset Forfeiture Fund ($120,000 and 0 FTE) and the Gulf Coast Ecosystem Restoration Science, Observations, Monitoring and Technology Fund ($2,078,000 and 0 FTE).

- The NOAA Damage Assessment and Restoration Revolving Fund facilitates and sustains: (1) natural resource damage assessment while the Departments of Commerce and Justice seek full reimbursement from potentially responsible parties; and (2) restoration, replacement or acquisition of the equivalent of injured or lost natural resources, including resources of

National Marine Sanctuaries and National Estuarine Research Reserves, tidal wetlands and other habitats for which NOAA is trustee. These program functions are conducted jointly within NOAA by the Office of General Counsel, the National Ocean Service, and the National Marine Fisheries Service.

- The Sanctuaries Enforcement Asset Forfeiture Fund receives proceeds from civil penalties and forfeiture claims against responsible parties, as determined through court settlements or decisions, for violations of NOAA sanctuary regulations. Proceeds from penalties and forfeitures are held in sanctuary site-specific accounts and spent on resource protection within the sanctuary site where the violation occurred. Funds are available for resource protection purposes which may include all aspects of law enforcement (from equipment to labor), community oriented policing programs, and other resource protection and management measures such as the installation of mooring buoys or restoration of injured resources.
- The Gulf Coast Ecosystem Restoration Science, Observation, Monitoring and Technology Fund provides funding for the NOAA RESTORE Act Science Program. The purpose of this program is to initiate and sustain an integrative, holistic understanding of the Gulf of Mexico ecosystem and support, to the maximum extent practicable, restoration efforts and the long-term sustainability of the ecosystem, including its fish stocks, fishing industries, habitat, and wildlife through ecosystem research, observation, monitoring, and technology development.

The decennial Census counted 163.8 million people (over 50 percent of the United States population) living in coastal counties in 2010, and this number is expected to increase by more than 15 million by 2020 (*National Coastal Population Report*, http://stateofthecoast.noaa.gov). As population densities and economic activity increase, so do their accompanying negative externalities: port congestion, navigation hazards, shoreline erosion, pollution, and other ill effects. These pressures, along with long-term environmental shifts such as sea level change, ocean acidification and the increasing incidence of catastrophic weather events, make the task of managing coastal resources increasingly difficult.

Against this challenging backdrop, states, other Federal agencies, coastal communities, and coastal industries depend on NOS for accurate information, reliable expertise, and vital services to support everyday policy and business decisions that sustain lives and livelihoods, reduce risk, and anticipate future challenges. NOS's physical oceanographic science activities—mapping, observations, and positioning—are essential not only to ensuring the safety and efficiency of maritime commerce, but also to managing coastal resources, planning for multiple uses of coastal areas, and addressing coastal flooding and water quality issues. NOS continuously improves the quality and applications of ocean and coastal observations through applied research, data integration, and collaboration.

In other program areas, NOS translates data and scientific knowledge into technical assistance, tools, and direct stewardship actions. NOS delivers scientific expertise on releases of oil, chemicals and marine debris, to enable sound decision making in the assessment and restoration of damaged coastal resources. In collaboration with international, Federal, state, and local managers, NOS is also the steward of the National Marine Sanctuaries system and the Papahānaumokuākea Marine National Monument, the main Federal partner to state-managed National Estuarine Research Reserves, and the coordinator of the National System of Marine Protected Areas. With respect to management of coastal zone resources, NOS helps its Federal and non-federal partners build capacity to protect and sustainably use coastal ecosystems through financial and technical assistance, applied research, effective policies, and partnership-building resources.

NOS's ethos of collaboration creates synergies between national and regional interests in working towards vibrant, healthy coasts and coastal economies. These synergies result both from vertically

integrating actions—NOS brings together applied research, observations, mapping, assessment, planning, management, restoration, and conservation—and from horizontally coordinating activities of Federal, state, local, and non-governmental stakeholders in coastal zones. NOS efforts to prepare communities for sea level rise is a prominent demonstration of the benefits of integrated and coordinated action; as both natural and human-induced hazards threaten our Nation's coasts, NOS products and services are directly improving resiliency.

NOS staff and facilities are located around the country, with concentrations in Silver Spring, MD; Charleston, SC; Seattle, WA; Norfolk, VA; Mobile, AL; Beaufort, NC; and Honolulu, HI.

Research and Development (R&D) Investments:
The NOAA FY 2015 Budget estimates for R&D investments are the result of an integrated requirements-based strategic planning process. This process provides the structure to link NOAA's strategic vision with programmatic detail and budget development, with the goal of maximizing resources while optimizing capabilities. NOS requests $54,000,000 for investments in R&D in the FY 2015 budget.

NOAA's R&D planning is tied to the goals, enterprises, and associated objectives outlined in NOAA's Next Generation Strategic Plan. Specifically, NOAA's Science and Technology Enterprise and underlying objectives include a holistic understanding of the Earth system through research; accurate and reliable data from observing systems; and an integrated environmental modeling system. These provide the basis for a set of internal implementation plans covering a 7-year period which guide NOAA's research and development activities. The NOAA Research Council - an internal body composed of senior scientific personnel from every Line Office in the agency - informs the annual updates to these implementation plans, and has developed the next 5-Year Research and Development Plan for NOAA (FY 2013-2017). This plan will guide NOAA's R&D activities over the next five years. The plan provides a common understanding among NOAA's leadership, its workforce, its partners, constituents and Congress on the value of NOAA's R&D activities. As such, the Plan is a framework with which NOAA and the public can monitor and evaluate the Agency's progress and learn from past experience.

Significant Inflationary Adjustments:
NOAA's FY 2015 Base includes a total of $6,111,000 and 0 FTE to account for the full funding requirement for inflationary adjustments to current programs for NOS activities. This includes the estimated 2015 Federal pay raise of 1.0 percent as well as inflationary increases for non-labor activities, including service contracts, utilities, field office lease payments, and rent charges from the General Service Administration (GSA). National Ocean Service will offset $2,043,000 of its inflationary costs through program management efficiencies.

Headquarters Administrative Costs:
In FY 2015, NOS headquarters will use $25,017,100 to support general management activities, policy direction, financial management, information technology, facilities, and other general operating costs, including service contracts, utilities, and rent payments to the General Services Administration. Specifically, these headquarters administrative funds will support the following:

Headquarters Program Support Type	Description	FY 2015 Amount	FY 2015 FTE associated with NOS HQ
General Management & Direction/Executive Management	Includes Assistant Administrator's office, public affairs, information services	$10,424,000	47.0
Budget & Finance	Includes Budget, Finance and Accounting	$4,705,000	19.3
Facilities/Other Administrative Functions (CAO Functions)	Includes Facilities and Security costs, as well as other CAO related activities	$2,071,000	1.8
Human Resources	All HR services, including EEO	$914,800	5.0
Acquisitions and Grants		$241,100	1.0
Information Technology	Includes IT-related expenses and other CIO related activities	$6,661,200	10.4
Total		$25,017,100	84.5

APPROPRIATION ACCCOUNT: OPERATIONS, RESEARCH AND FACILITIES
SUB-PROGRAM: NAVIGATION, OBSERVATIONS AND POSITIONING

NOAA conducts activities within the Navigation, Observations and Positioning sub-program under the authority of the Coast and Geodetic Survey Act, the Hydrographic Services Improvement Act (as amended in 2008), the Integrated Coastal and Ocean Observation System Act, and the Ocean and Coastal Mapping Integration Act. NOAA also represents these programs for the Department of Commerce on the interagency Committee on the Marine Transportation System.

NOS's activities under this sub-program produce an integrated suite of physical oceanographic data and applications that are essential to safe, efficient, and sustainable uses of busy coastal areas and waterways. Positioning and geodetic control provide the foundational data layer for mapping of underwater features and observations of coastal environmental variables. These activities support much more than safe navigation—they contribute to actionable coastal intelligence that informs decisions by a multitude of public and private decision makers in the coastal landscape. Storm surge forecasting, ecological forecasting, coastal industries, habitat restoration, coastal ocean science and oil spill response, to name just a few activities, all rely on these NOS products and services.

The following program offices are responsible for carrying out the Navigation, Observation, and Positioning sub-program:

- **Office of Coast Survey (OCS).** Established by President Thomas Jefferson in 1807, the Coast Survey is the oldest U.S. scientific agency and the longest-standing NOAA organization. OCS is responsible for conducting hydrographic surveys and producing charts of the Nation's waters. The OCS director serves as the Nation's Hydrographer and represents the United States on the International Hydrographic Organization, which sets standards for surveying and charting and builds hydrographic capacity in other nations for safe navigation globally.
- **National Geodetic Survey (NGS).** NGS defines maintains, and provides access to the National Spatial Reference System to meet our nation's economic, social, and environmental needs. NGS coastal mapping activities define the national shoreline and aids emergency response, among other functions. Additionally, NGS develops industry guidelines, specifications, and standards and provides training for conducting geodetic surveys and using surveying equipment.
- **Center for Operational Oceanographic Products and Services (CO-OPS).** CO-OPS provides the national infrastructure, science, and technical expertise to monitor, assess, and distribute tide, current, water level, and other coastal oceanographic and meteorological products and services that support NOAA's missions. Its products combine observations and monitoring with operational nowcast/ forecast modeling.
- **Integrated Ocean Observing System (IOOS).** NOAA leads the implementation and administration of IOOS, a major improvement to ocean observing capability. IOOS draws together the vast network of Federal and non-federal observing systems to fulfill regional, national, and global needs for integrated ocean information. At the national level, U.S. IOOS represents a partnership of 17 Federal agencies and 11 Regional Associations (RAs) for coastal and ocean observing. These organizations share responsibility for the design, operation, and improvement of global, national, and regional networks.

The narrative below describes programs funded through the Navigation, Observations and Positioning; Hydrographic Survey Priorities/Contracts; and IOOS Regional Observations program activities.

Navigation, Observations and Positioning

Navigation Charts and Services

The Coast and Geodetic Survey Act and the Hydrographic Services Improvement Act (as amended) authorize NOAA to survey and chart the 3.4 million square nautical miles of waters in the U.S. Exclusive Economic Zone (EEZ). Since Thomas Jefferson was President of the United States, NOAA and its predecessor agencies have supported safe and efficient transportation in U.S. waters through its hydrographic surveys and nautical charts. Today, NOAA continues to meet the navigation information needs of vessel operators that are carrying ever-larger payloads of people, cargo and hazardous materials. Users of NOAA navigation products and services include commercial shippers, fishers, the U.S. Navy, the U.S. Coast Guard, state and local governments, and recreational boaters. NOAA also conducts research and development activities to improve the accuracy and productivity of hydrography and charting efforts.

In addition to navigation uses, the hydrographic and shoreline data from NOS navigation services provide a foundation for many other uses including coastal zone and emergency management, climate assessments, and coastal research. NOAA also leads the interagency Integrated Ocean and Coastal Mapping (IOCM) initiative as authorized by the Ocean and Coastal Mapping Integration Act. IOCM activities include coordination and end-to-end collaboration on data acquisition, management, processing, and tools development for maximum use and re-use of ocean and coastal mapping data from all sources, including Federal, state, regional, local, academic, and private sector data collection efforts.

The following activities compose NOAA's integrated suite of charting and navigation products and services:

- Hydrographic Surveys – NOAA acquires hydrographic data through the NOAA hydrographic fleet and contract surveyors, primarily in the 511,000 square nautical miles of navigationally significant U.S. waters. These surveys provide the most essential depth and hazardous obstruction data for nautical charts and other applications such as water level modeling, fisheries management, coastal land use, and planning. Additionally, through participation in data collection on NOAA survey platforms, NOAA personnel maintain the hydrographic expertise necessary to oversee contracts, quality control data, develop more efficient survey technologies, and interact with the International Hydrographic Organization and other nations.
- Water Level Datums – NOAA's National Water Level Observation Network (NWLON) provides the framework for the national tidal datum network, an elevation network used for navigation and shoreline boundary purposes. Reference datums, such as the International Great Lakes Datum (IGLD) or Mean Lower Low Water (MLLW) are used for nautical chart products, as well as for definitions of marine boundaries and the national shoreline. Among its many other functions, NWLON supports the entire portfolio of NOAA's Navigation Services by providing accurate and reliable tide data to support hydrographic and shoreline mapping surveys.
- Tide and Tidal Current Predictions – NOAA is responsible for providing and updating the official tide and tidal current prediction tables. NOAA collects and processes data from temporary gauges to update these tables. Predictions can be used to help determine maritime conditions in the absence of real-time observations.
- Marine Charts – NOAA cartographers compile data from many sources to produce 2,000 nautical charts and products. These products provide the basis for all vessel navigation in and out of U.S. ports. NOAA marine charts are available in both electronic and paper form. These cartographers also provide active leadership and technical expertise on International Hydrographic Organization working groups to maintain international standards for charts and

the electronic systems that assist with vessel navigation. NOAA is continually testing and vetting new techniques and software systems to enhance production of nautical charts.

- Research and Development – NOS continually develops, evaluates, and implements emerging cartographic, hydrographic, and oceanographic systems to advance the science and processes that underpin NOAA's coastal ocean mapping efforts. The program delivers new acoustic survey technologies, scientific software, coastal ocean models, and geospatial products and tools. Specific projects include the National Vertical Datum Transformation tool, or VDatum, Autonomous Underwater Vehicles, and support to Ellipsoidally Referenced Surveys. NOAA's Joint Hydrographic Center (JHC) develops new sonar and light detection and ranging (LIDAR) technologies and processes to improve efficiencies in hydrographic data acquisition, IOCM processing, and nautical charting. JHC also conducts bathymetric data collection and analysis necessary to support the extension of sovereign rights and delimitation of the U.S. Extended Continental Shelf beyond 200 nautical miles.
- Navigation Response Teams and Regional Services – The program's Regional Navigation Managers interact directly with customers and stakeholders on charting issues and Marine Transportation System infrastructure improvements. These interactions improve NOAA's response to charting and navigation questions and serves as a means to educate constituents on emerging charting technologies and their uses. In addition, Navigation Response Teams perform hydrographic surveys in inshore areas and provide rapid response surveys after maritime emergencies or natural disasters. These emergency services minimize costly port closures and draft restrictions.
- Coastal Mapping – The Coastal Mapping Program (CMP) defines the official 95,000-mile U.S. shoreline that serves as the baseline for defining America's marine territorial limits, including its EEZ. The national shoreline is the single largest data layer for nautical charts, as well as the geographic reference needed to manage coastal resources, conduct marine planning, adapt to climate change, support Homeland Security emergency response efforts, and perform many other IOCM activities. NOAA delineates the shoreline by processing tidally coordinated, geo-referenced data from multiple sources – primarily stereo aerial photographs and high-resolution satellite imagery. In addition, the Coastal Mapping Program conducts research into new technologies including LIDAR and hyperspectral imaging. The program uses NOAA, contract, and IOCM capabilities to collect and process shoreline data.
- Physical Oceanographic Real-Time System (PORTS®) – PORTS® is a decision support tool that improves the safety and efficiency of maritime commerce and coastal resource management through the integration of real-time environmental observations, forecasts and other geospatial information. PORTS® measures and disseminates observations and predictions of water levels and currents and provides meteorological (e.g., winds, atmospheric pressure, visibility, air and water temperatures), salinity, bridge air gap and wave information that mariners need to navigate safely. There are currently 22 active PORTS® nationwide. For more information on PORTS®, see the Tides and Currents Program information under Ocean and Coastal Observations.
- Hydrodynamic Models – NOAA develops models to assist with maritime navigation and planning by providing water level, current, temperature and salinity nowcasts (modeled data for locations where there are no observations) and forecast guidance out to 48 hours based on nearby real-time observation data, meteorological forecasts and astronomical predictions.

Positioning and Geodesy

NOS's Geodesy program originates from a 200-year old authorization to provide the Nation's public and private sectors with accurate positioning data. NOS is responsible for defining, maintaining, and providing access to the National Spatial Reference System (NSRS), the common reference framework for establishing the coordinate positions of all geospatial data: latitude, longitude, height,

scale, gravity, and orientation. A 2009 study estimated that the NSRS provides more than $2.4 billion in potential annual benefits to the U.S. economy. The study found that the NOAA Continuously Operating Reference Station (CORS) network alone provides an estimated $758 million per year in benefits. The study estimated that an additional $522 million in annual economic benefits could be generated by the full implementation of a new vertical reference system through the Gravity for the Re-Definition of the American Vertical Datum (GRAV-D) initiative, with approximately $240 million saved from improved floodplain management alone (Socio-Economic Benefits Study: Scoping the Value of CORS and GRAV-D, Levenson 2009).

NOS conducts geodesy activities in all 50 states and many U.S. territories. NOS's geodesy products provide the foundational data layer for transportation, mapping and charting, and a multitude of scientific and engineering applications. The NSRS, as the fundamental geodetic control for the United States, is also an essential component of all national observing systems. To meet growing demand for more accurate, timely, and consistent positioning services, the Geodesy program is continually improving the quality and accessibility of the NSRS. As the Federal geodetic control theme lead, NOS also participates in the development of international geodetic policy, standards, and guidelines relating to GPS and other global navigation satellite systems.

The NOAA Geodesy Program can be grouped into five major overlapping elements:

- Passive Network Infrastructure Support – A major component of NSRS is a network of over one million permanently marked passive reference points. These monuments form a crucial foundation for all geospatially-referenced activities conducted in the United States.
- Continuously Operating Reference Stations (CORS) – The National CORS Network is a network of permanent global positioning system (GPS) receivers that enables positioning accuracies that approach a few centimeters relative to the NSRS. NOAA provides access to GPS data from this network free of charge via the Internet. NOS is also working to establish a small network of Foundation CORS, at the rate of about one per year, which link the NSRS to the International Terrestrial Reference Frame (ITRF) and contribute data to the ITRF. Foundation CORS differ from others in their geodetic stability and are fully owned by the NOS rather than as a public private partnership. Foundation CORS improve forecasts of absolute global sea level rise on the order of millimeters per year; and inform coastal management and construction project planning.
- Modernization of the Vertical Datum – NOS leads the Nation's efforts to enhance the vertical aspect of the NSRS through its Gravity for the Re-Definition of the American Vertical Datum (GRAV-D) initiative, a long-term multi-year effort to collect gravity data and build the Nation's gravimetric geoid model. This initiative will ultimately lead to new, highly accurate national vertical datum, allowing GPS to efficiently establish accurate elevations for all types of positioning and navigational needs. Because GRAV-D will take a number of years to complete, ongoing height modernization efforts are also focusing on integrating GPS technology with existing survey techniques in areas of the country that have critical need for updated height data in response to changing land elevations.
- Data Access and Capacity Building – NOS provides web access to geodetic control, shoreline, and aeronautical survey data from its own surveys and from cooperating organizations. As part of its technology transfer efforts NOS conducts a series of workshops and constituent forums around the country. NOS also manages the State Geodetic Advisor Program, a cost-shared program that provides a liaison to states to provide assistance to states' geodetic and surveying programs. There are currently advisors or coordinators for 25 states. NGS is transitioning to a fully funded regional advisor program, which will serve the entire United States.

- Research and Development – NOS develops standards, specifications, guidelines, and best practices for the surveying and positioning industry, as well as a variety of models and programs describing geophysical and atmospheric phenomena that affect spatial measurements. These tools and models are crucial to scientific and commercial positioning activities. To improve the collection, distribution, and use of spatial data, NOS also conducts cutting-edge applied research and development in geophysics, including geodynamics and geodesy. Current research includes improvement of accuracy and precision of geodetic positions/velocities, automated processing of GPS data for static and/or kinematic positioning, orbital dynamics, sea level rise, crustal motion, GPS antenna characteristics, meteorological effects, and tidal effects.

Ocean and Coastal Observations

In addition to providing essential data for positioning and mapping activities, NOS's ocean and coastal observation programs support three interconnected legislative authorizations. The Coast and Geodetic Survey Act authorizes the collection and dissemination of water level data, analysis, and predictions. The Hydrographic Services Improvement Act provided updated authorities for the collection of real-time information and the use of information for coastal resource management. The Integrated Coastal and Ocean Observation System Act (ICOOS Act) charges NOAA with leading oversight and administration of regional observing systems and coordinating across Federal and non-federal entities to maximize the Nation's return on investment in IOOS. Other relevant legislation includes the Tsunami Warning and Education Act, which directs the use of real-time tide data for tsunami warnings.

Tides and Currents Program

NOAA, through its Tides and Currents Data Program, directly operates two primary observing systems that the maritime community relies upon for safe and efficient navigation: the National Water Level Observation Network (NWLON) and National Current Program. NOAA conducts tidal data analysis and current surveys to update NOAA's annual tide and tidal current prediction tables. Mariners of all types use tide and current tables to navigate safely—U.S. Coast Guard carriage regulations require large commercial vessels to carry NOAA's annual Tide and Tidal Current Prediction tables along with Nautical Charts. In FY 2013, NOS conducted tidal current surveys in Key West, FL., and San Francisco, CA.

The NWLON consists of long-term, continuously operating water level stations throughout the coastal U.S., the Great Lakes, and U.S. island possessions and territories. There are currently 210 of these long term stations. Information from the NWLON ranges from real-time, high frequency content in the record (e.g., tsunami 1-minute data and storm surge) to long-term datasets (e.g., sea level and lake level trends). In 2013, NOS completed two station hardening upgrades and will, in 2014, similarly upgrade four additional stations damaged by Superstorm Sandy using supplemental appropriations. NWLON data forms the basis of the vertical reference framework (tidal datums in coastal areas; International Great Lakes Datum in the Great Lakes) for all marine boundary applications (ranging from international-to-Federal- to-state-to-private property), delineation of the national shoreline, nautical chart products, and dredging operations. In addition to navigation and mapping uses, applications of this water level and vertical datum information include habitat restoration, emergency management, dredging, coastal planning and management, and coastal construction projects.

Using NWLON, National Current Program, and other measurements, NOS produces and disseminates observations, nowcasts and forecasts of water levels, currents, salinity, and meteorological parameters (e.g., winds, atmospheric pressure, and air and water temperatures) that

commercial mariners need to navigate safely. Recreational users and the fishing industry are also among the core users of these products. Updated, accurate predictions of water levels and currents are essential for these users to navigate coastal areas safely and for fishers to determine best catch times. Emergency response agencies use NOS's water level predictions and current models for effective oil spill response planning.

In 22 coastal areas around the U.S., NOS supports Physical Oceanographic Real Time Systems (PORTS®), a decision-support tool that integrates and disseminates real-time data on water levels, currents, salinity, winds, and other atmospheric observations to various users. PORTS® systems serve 50 of the top seaports in the Nation. In some locations, PORTS® also includes sensors for visibility, waves and bridge clearance. PORTS® is a cost-shared program; local partners— local port authorities, pilot associations, shippers, the U.S. Coast Guard, the U.S. Army Corps of Engineers, the U.S. Navy, academia and others—provide funding for the sensor systems and their ongoing maintenance. NOS provides technical expertise for systems design, 24/7 quality control, data collection and dissemination infrastructure, and ongoing management of the data. In FY 2013, the 23rd PORTS® in Charleston, S.C., became operational, however, a PORTS® in Gulfport, MS went offline due to lack of partner funding. Installation of PORTS® in Matagorda Bay, TX, and Jacksonville, FL, began in 2013 and these PORTS® will begin operating in FY 2014.

Where sensors are not present or future data is needed, NOS operates nowcast and forecast models that provide short-term water level and other environmental forecasts that are accurate out to 48 hours and enable better planning and decision-making, particularly for vessel transits. NOS typically operates these models in conjunction with PORTS® to address needs for real-time data. NOS presently operates thirteen nowcast/forecast models; ten are currently running on the high performance computers at the National Centers for Environmental Prediction (NCEP) and the remaining three will be transitioned to NCEP when they are upgraded or replaced over the next several years. The change will improve performance by coupling the models with other models and taking advantage of more capable infrastructure. In FY 2013, NOS developed a new model for San Francisco Bay, CA, and nested grid models within the Northern Gulf region model. NOS expects to implement these models in FY 2014. NOS is developing a model for Cook Inlet, AK in FY 2014 for deployment in FY 2015.

Data and modeling from NWLON and the National Current Program also provide essential information to users and applications outside the navigation community. Examples of these applications include generating beneficial uses for dredged material, coastal planning, habitat restoration, long-term sea-level assessments, storm-surge monitoring, tsunami warning, emergency preparedness, hydrokinetic energy development, and HAZMAT response. Of note, NWLON and National Current Program data contribute to harmful algal bloom forecasts for the Gulf of Mexico (a critical component of NOAA's Ecological Forecasting Roadmap). NOAA also defines tidal datums for the United States and maintains the National Tidal Datum Epoch through the Tides and Current Data Program.

NOAA regularly seeks the input of the maritime transportation community and other stakeholders to identify new requirements, product improvement opportunities, and training needs for all of its observation activities. The Tides and Currents Data Program further extends the reach of its interactions by leveraging regional networks such as the Office of Coast Survey Navigation Managers, the National Geodetic Survey State Advisors, the Coastal Services Center Regional Representatives, the NOAA Regional Coordination Teams, and others. NOS also partners with other Federal agencies, such as the U.S. Army Corps of Engineers, to collaborate on standards for national vertical reference

Data Integration, Regional Support, and Sensor Development

The United States Integrated Ocean Observing System (U.S. IOOS) program, led by NOAA, serves the dual functions of improving compatibility between Federal and regional observing systems and providing direct support for regional observing systems. The vision of IOOS is a unified network of Federal and non-federal observing assets, which serve coastal industries and decision makers. Users of ocean data, including modelers, researchers, and meteorologists, spend an average of 25–50 percent of their time searching for, accessing, formatting, and ingesting data into their products. Significant resources are expended on data management activities that might otherwise be used to forecast and research. By improving the accessibility and interoperability of ocean data, IOOS delivers time and cost savings that can be redirected to improving existing and developing new products. NOAA adheres to international standards used by other countries and entities that provide similar geospatial reference systems and data. Observations by NOS assets and partners are critical components of the U.S. IOOS and the Global Earth Observation (GEO).

The IOOS Regional component complements Federal ocean observing assets data, models, and information, and is tailored to the economic and environmental requirements of local communities. NOAA supports regional IOOS associations primarily through cooperative agreements that support operations and maintenance, capital investment, and research, development, testing, and evaluation of new sensor equipment and new sensor technologies. IOOS Regional Associations deploy observing assets in accordance with nationally coordinated build-out plans. Recent investments have focused on expanded use of buoys, gliders, coastal high frequency (HF) radar, animal telemetry (data from electronic tags attached to marine animals) and models to support hurricane storm surge and inundation forecasting. These capabilities protect American lives and support American livelihoods by aiding storm forecasting, response to oil spills and extreme weather events, climate adaptation strategies, ocean acidification monitoring and near-shore search-and-rescue operations.

In 2013, NOS awarded its first marine sensor innovation grants to research, evaluate, and transition to operations new biological, chemical, and physical marine sensing technologies. When mature, these technologies will allow rapid, accurate, and cost effective detection, identification, characterization, and quantification of environmental conditions. NOS selected two projects in 2013: 1) transitioning new ocean acidification sensor technology and increasing technical capacity to work with these sensors, and 2) transitioning the Environmental Sample Processor (ESP) for harmful algal bloom monitoring. With funding in the 2014 Budget, NOS will publish a Federal funding opportunity for multi-year grants, which align with two themes: (1) ocean acidification monitoring, to be funded in conjunction with OAR's Ocean Acidification Program; and (2) other topics including hypoxia monitoring, sensors for human and ecosystem health, animal-borne sensors, and sensors for gliders.

The program will incorporate the successful marine sensor technologies and observing strategies into IOOS operations and other monitoring and prediction programs. Required coordination between U.S. IOOS Regions and other partners from the research community and Federal operational programs will ensure new technologies and resulting data sources integrate with existing regional and national operational models and forecasts.

Hydrographic Survey Priorities/Contracts

This program activity provides funding for contract hydrographic survey services that support NOS's Navigation, Observations and Positioning program activity. See the program activity description for Navigation, Observations and Positioning for program descriptions, schedule, milestones, and performance measures.

IOOS Regional Observations

This program activity provides extramural grants and cooperative agreements in support of regional observations, which support the Integrated Ocean Observing System, which is part of NOS's Navigation, Observation and Positioning program activity. See the program activity description for Navigation, Observations and Positioning for program descriptions, schedule, milestones, and performance measures.

Schedule and Milestones:

- Maintain VDatum for contiguous United States (FY 2015-2019)
- Develop Nautical Charting System II – one central database available for all formats of charts (FY 2015-2019)
- Build and maintain Electronic Navigational Charts (ENCs) for a total of 1,100 available to public (FY 2018)
- Schedule, prepare and maintain 175 new editions of Raster Navigational Charts each year, increasing 10 percent each year with a final goal of 250 per year (FY 2015-2019)
- Publish eight New Editions of Coast Pilot each year (FY 2015-2019)
- Evaluate and approve 120 hydrographic surveys conducted by NOAA survey units, contractors, and other sources for nautical charting and other uses (FY 2015-2019)
- Collaborate on developing and maintaining IOCM standards/ specifications to aid integrated data acquisition, management and archival (FY 2015-2019)
- Accept/process data, deliver products to ocean and coastal mapping programs, and archive data at NGDC, providing custom and standard products that would otherwise be unavailable (e.g. gridded multibeam data and side-scan sonar mosaics) (FY 2015-2019)
- Implement data archive capability for NOAA charter mapping data from University-National Oceanographic Laboratory System (UNOLS) projects (FY 2015-2019)
- Continue increased bathymetric/ topographic shoreline data collection and reach full production levels in FY 2018 (FY 2015-2019)
- Provide Homeland Security National Response Framework support (FY 2015-2019)
- Publish Annual NOAA Tide and Tidal Current Predictions (FY 2015-2019)
- Maintain all 210 NWLON stations (FY 2015-2019)
- Deliver > 95 percent water level data availability (FY 2015-2019)
- Maintain data management systems for all operational PORTS® (FY 2015-2019)
- Conduct 70 tidal current surveys per year (FY 2015-2019)
- Install six seasonal tide gauges per year in support of the International Great Lakes Datum update starting in FY 2017
- Support hydrographic survey and shoreline survey projects (FY 2015-2019)
- Produce Operational Forecast Models (FY 2015-2019)
- Install one foundation CORS site for the improvement of the National Spatial Reference System (NSRS) and the International Terrestrial Reference Frame (ITRF) (FY 2015)
- Complete field survey work for the second geoid slope validation survey (FY 2015)
- Provide a Method for Real-Time Network (RTN) Operators to validate that their RTNs are aligned with the National Spatial Reference System (FY 2016)
- Complete GRAV-D and release of a gravity-based geoid (FY 2022)
- Maintain regional data assembly centers, including registration of metadata to make regional IOOS data holdings discoverable through IOOS Data Catalog (FY 2015-2019)
- Meet ICOOS Act requirements: promulgate guidelines to certify non-federal assets; identify observing gaps and or needs for capital improvements, for Federal and non-federal assets; submit annual report to interagency ocean observing committee; administer the IOOS Advisory Committee; and deliver biennial report to Congress (FY 2015-2019)

- Partner with NOAA/OAR/Ocean Acidification Program to deploy and operate ocean acidification sensors on regional IOOS platforms (buoys, shore stations, gliders) (FY 2015-2019)
- Establish processes for Regional IOOS partners to engage with stakeholders in their respective regions and provide updated stakeholder input (FY 2015-2019)
- Sustain Regional IOOS operations and maintenance of existing HF Radar network, including quality assurance, control procedures and fail-over redundancy, to support U.S. Coast Guard operational search and rescue, oil spill response, water quality and pollutant tracking, harmful algal bloom (HAB) monitoring, and offshore wind energy siting (FY 2015-2019)
- Initiate competitively selected Marine Sensor Innovation demonstration projects and conduct technology demonstrations and evaluations in U.S. IOOS Regions (FY 2015-2019)
- Transition demonstrated marine sensor tools or technologies into operations (FY 2016-2018)
- Develop a national IOOS modeling strategy to determine how regional-scale models supported by IOOS regions can be integrated into Federal efforts (FY 2015)

Deliverables:

- VDatum maintained along the contiguous U.S. coastline, enabling seamless integration of land and water information
- Hydrographic survey backlog reduced by 13,505 SNM from FY 2015 to FY 2019 within navigationally significant areas
- New editions of Raster Navigational Charts produced at a rate of 175 per year
- New editions of Coast Pilot published at a rate of eight per year
- Improved efficiency and accuracy of hydrographic surveys by surveying on the ellipsoid where practical, eliminating the need for time-consuming activities such as tide gauge installations concurrent with hydro data collection (where validated VDatum grids are available), vessel settlement and squat corrections, and inefficient post-survey-processing
- Data standards, tools and expertise for IOCM and guidance on acquisition, processing and archives in support of the OCM community and ocean.data.gov
- Acoustic backscatter collection protocols that will facilitate the acquisition of these valuable data while maintaining the quality of bathymetric data
- Streamlined application of Federal LIDAR capacity and data that support multiple agency needs
- Participation in the development of international geodetic policy, standards, and guidelines and in the development of GPS and other global navigation satellite system policy to the extent it relates to the NSRS
- Positioning, instrument testing, and calibration services to ensure accurate implementation of NSRS
- Publicly accessible models and tools relating spatial datums and describing geophysical, atmospheric, equipment, and GPS orbit phenomena impacting accurate spatial measurement
- Enhanced GPS augmentation by managing, monitoring, and providing access to the CORS Networks, in support of civil positioning and the U.S. transportation infrastructure
- GPS satellite orbit analysis and act as the International GNSS Service (IGS) Analysis Center Coordinator to pinpoint the locations of more than 40 GPS and GNSS satellites to ensure the accuracy of satellite-delivered positioning information
- Continuous accurate, reliable, and timely quality controlled real time data from over 2,000 oceanographic and meteorological sensors to support safe and efficient navigation, hazmat response, emergency response planning and execution, NWS tsunami and storm surge warnings, and dredging

- Tide and tidal current predictions and nowcast/forecast oceanographic and meteorological parameters for safe and efficient navigation, coastal resource management, and dredging
- Periodic releases of IOOS Data Catalog with increased contributions from all participating coastal, Great Lakes and open ocean data providers
- Formal documentation for implementation and training of IOOS data providers and partners
- Standardized data access services and data formats at key NOAA and regional data providers, thereby simplifying access to new and archived oceanographic data
- Published "Quality Assurance of Real Time Oceanographic Data" (QARTOD) manuals for IOOS core variables including temperature, salinity, etc.
- Improved IOOS information products and applications to meet the priority needs of regional and local communities
- Refined IOOS enterprise metrics for assessing performance and maturity of the system
- Expanded capability of U.S. IOOS, improving mission readiness of Federal agencies and ability of U.S. IOOS regions to meet local and regional stakeholder needs for ecosystems data including new data from marine sensor development
- High Frequency radar trend analysis of system performance and operational readiness of the system
- Incorporation of two or more emerging marine sensor tools or technologies into operations of two or more U.S. IOOS regions every three years

Performance Goals and Measurement Data:

Performance Measure: Percentage of top US Seaports with access to suite of NOAA Navigation Products and Services (ENCs and access to VDatum and NRTs)	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	74%	74%	74%	74%	74%	74%	74%

Description: The U.S. Army Corps of Engineers tracks the number of vessel transits and cargo tonnage that pass through the approximately 300 ports in the U.S. on an annual basis. Over 95 percent of the annual tonnage passes through the top 175 seaports. By identifying the seaports to which NOAA provides a full suite of its products and services, NOAA can determine what percentage of cargo is benefitting from NOAA navigational products and services.

Performance Measure: Reduce the hydrographic survey backlog within navigationally significant areas	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	2,285	2,709	2,853	2,853	2,853	2,853	2,853

Description: NOAA conducts hydrographic surveys to determine bathymetry primarily in U.S. waters significant for navigation. This activity includes the detection, location, and identification of wrecks and obstructions with side scan and multi-beam sonar technology. NOAA uses the data to produce nautical charts in a variety of formats for safe and efficient navigation, in addition to the commercial shipping industry; other user communities that benefit include recreational boaters, the commercial fishing industry, port authorities, coastal zone managers, and marine spatial and emergency planners.

Performance Measure: Update National Shoreline and Priority Ports (Percentage of	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**

total per year)	4.3% / 17%	4.2%/ 17%	3.7%/ 17%	3.7%/ 17%	3.7%/ 17%	3.7%/ 17%	3.7%/ 17%

Description: Updating the National Shoreline and Priority Ports is a measure NOAA typically uses to capture annual performance of NOAA in-house and contract assets for acquiring shoreline data for navigation safety and other programs.

Performance Measure: Percent of U.S. and territories enabled to benefit from a new national vertical reference system for improved inundation management	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	31%	36%	45%	53%	62%	70%	79%

Description: This measure tracks progress of NOAA's National Geodetic Survey toward completing the Gravity for the Redefinition of the American Vertical Datum (GRAV-D) initiative and implementation of a new National Vertical Datum for a wide variety of applications including improved inundation management. This improved vertical reference system is critical for all observing systems and activities requiring accurate heights and is a key component of the enhanced geospatial framework required for success in achieving NOAA's strategic priorities. It is of particular importance for community resilience by determining where water flows in order to make accurate inundation models and assessments as well as better management and planning decisions with improved water level predictions based on accurate elevations. "Enabled" is technically defined as having GRAV-D data necessary to support 2 cm orthometric heights (heights relative to sea level) necessary to define a new national vertical datum where possible. NGS will calculate the percentage of area enabled relative to a pre-defined total area that includes U.S. territorial land and adjacent land and water areas necessary for final determination of a national vertical reference system. As progress is made, each survey area will be represented by a polygon that will define the completed areas. The performance measure will be tracked as a percent of the total area that is identified as complete.

Performance Measure: Percentage of top 175 US Seaports with access to suite of NOAA Navigation Products and Services (CO-OPS contribution by tonnage)	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	55%	55%	55%	55%	55%	55%	55%

Description: The U.S. Army Corps of Engineers tracks the number of vessel transits and cargo tonnage that pass through the 300 or so ports in the U.S. on an annual basis. Over 95 percent of the annual tonnage passes through the top 175 seaports. By tracking how many seaports to whom NOAA is providing a full suite of its products and services, one can determine what percentage of cargo is transiting more safely and efficiently. The percentage of seaports can then be correlated with these statistics.

Performance Measure: Percentage of U.S. coastline with accurate vertical control (tidal and geodetic)	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	8%	8%	8%	8%	8%	8%	8%

Description: The Coast and Geodetic Survey Act authorizes NOAA to conduct tide and current observations and geodetic control surveys. NOAA is the authority for providing vertical reference

datums for all marine boundary applications, national shoreline, and nautical chart products. This measure tracks NOAA's ability to provide these datums by measuring the percentage of the U.S. coastline that has accurate vertical control.

Performance Measure: Update accuracy of NOAA tidal current predictions (number of locations)	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	40	70	70	70	70	70	70

Description: The Coast and Geodetic Survey Act authorizes NOAA to conduct tide and current observations and to analyze and predict tide and current data and publish data, information, compilations, and reports, including short term tidal current surveys that are used to update the NOAA annual tidal current prediction tables. This measure tracks NOAA's progress in updating the accuracy of these predictions by tracking the number of locations that have been updated.

PROGRAM CHANGES FOR FY 2015:

Navigation, Observations and Positioning: Shoreline TopoBathy LIDAR Data for Coastal Resiliency and Navigation Safety (Base Funding: $2,789,000 and 1 FTE; Program Change: +$4,000,000 and +1 FTE): NOAA requests an increase of $4,000,000 and 1 FTE for a total of $6,789,000 and 2 FTE to collect Shoreline TopoBathy (topographic-bathymetric) LIDAR data.

Proposed Actions:
With this increase, NOAA will expand and enhance its current Shoreline TopoBathy LIDAR (light detection and ranging) data acquisition and processing efforts to build a seamless elevation dataset of the Coastal Zone, both below and above the shoreline. NOAA is currently using Hurricane Sandy supplemental appropriations to survey Sandy-affected areas and a small portion of its annual appropriations to perform Shoreline TopoBathy LIDAR surveys in other limited areas. The additional proposed funding would expand the scope of this effort into a National initiative that would culminate in a continuous coastal data layer for the United States and its territories. This multi-use, comprehensive dataset would be applicable across multiple Federal and state mission areas that rely on coastal elevation data and inform resource management and economic development in coastal zones and adjacent watersheds.

High resolution topographic and bathymetric elevation data are essential for responding to national issues associated with coastal inundation, shoreline erosion, sediment transport, geologic hazards, sea level rise, marine debris and ecosystem health. In addition, a robust Shoreline TopoBathy LIDAR program would fill existing gaps in NOAA's core navigation safety mission by providing much-needed updates to shallow water areas where hydrographic surveys are not effective or efficient. NOAA will prioritize areas for data collection through engagement with partners and stakeholders at the state, tribal, and Federal levels. This increase will leverage NOAA's ongoing aerial imaging of shorelines and vastly improve its surveys. NOAA will acquire the data primarily through external contract support and will hire one employee to oversee task orders and contracts, which will increase in both quantity and complexity, and perform quality assurance.

NOAA will continue to coordinate its Shoreline TopoBathy LIDAR activities with the U.S. Army Corps of Engineers, U.S. Geological Survey, the Interagency Committee on Ocean and Coastal Mapping (IOCM) and the Interagency National Digital Elevation Program (NDEP). This coordination will ensure that all data meet shared standards for multiple uses and support cooperative development of capabilities across the community of practice.

Statement of Need and Economic Benefits:
Extreme events such as Hurricanes Sandy and Katrina have highlighted the importance of accurate elevation and charting data to preparedness for hazards related to weather, climate and coastal economic activity. Coastal storms, sea level rise, development and many other natural and engineered changes to the environment are rapidly altering our shoreline. This is happening across the U.S., including regions of specific interest such as the Arctic. Despite these increasing requirements, NOAA has not acquired new data in many shoreline areas since the early 1900s, if at all. Accurate mapping of the nation's shoreline is necessary to provide a foundational data layer for multiple applications including navigation, geodesy, monitoring land changes, environmental protection, recreation, habitat mapping, energy exploration, natural disaster response, research, and many more cross-industry applications.

A 2012 socio-economic scoping study found that NOAA's Coastal Mapping Program (CMP), the program responsible for NOAA's shoreline mapping activities, yielded over $200 million per year in total estimated economic benefits to the Nation[1]. For every $1 in program expenditures, there is a combined direct and indirect return of $35 in benefits for the Nation. Additionally, the CMP supports over 1,500 jobs at its current funding levels. NOAA's shoreline mapping work, Coast and Shoreline Change Analysis Program (CSCAP), and emergency response efforts will benefit from this data and related products. Fully integrating LIDAR elevation mapping into NOAA's Coastal Mapping Program will advance the Integrated Ocean and Coastal Mapping vision of "map once, use many times" and increase the cost benefit of the program exponentially as the data is able to serve more users across a multitude of government and private sectors.

Resource Assessment:
NOAA is currently in the process of collecting topo-bathy data using 2013 Hurricane Sandy supplemental appropriations to aid ongoing recovery and preparedness activities in Sandy-affected areas. In addition, NOAA will begin expanding its LIDAR capabilities and data acquisition with 2014 appropriations. This increase will expand on these existing multi-use datasets toward a National dataset that will inform safety, resiliency and stewardship activities of coastal decision makers.

Schedule and Milestones:

- Accelerate increased data collection in 2015 and reach full targeted production levels in FY 2019 and beyond.

Deliverables:

- Streamlined application of Federal LIDAR capacity and data that support multiple agency needs.
- A seamless, topo-bathy shoreline derived from imagery and LIDAR, which advances IOCM goals and NOAA's nautical charting mission.

Performance Goals and Measurement Data:

Performance Measure: Update National Shoreline/ Priority Ports (Percentage of total per year)	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With Increase	N/A	N/A	4.2%/ 25%	4.8%/ 33%	5.4%/ 33%	6.0%/ 33%	6.6%/ 33%
Without Increase	4.3% / 17%	4.2%/ 17%	3.7%/ 17%	3.7%/ 17%	3.7%/ 17%	3.7%/ 17%	3.7%/ 17%
Description: Updating the National Shoreline and Priority Ports is a measure NOAA typically uses to capture annual performance of NOAA in-house and contract assets for acquiring shoreline data for navigation safety and other applications. [Note: This measure does not capture the additional value-added of adding TopoBathy elevation data to existing aerial surveys.]							

[1] Leveson, Ira. *Socio-Economic Study: Scoping the Value of NOAA's Coastal Mapping Program*, 2012.

PROGRAM CHANGE PERSONNEL DETAIL

Program: National Ocean Service
Sub-program: Navigation, Observations and Positioning
Program Change: Shoreline TopoBathy LIDAR Data for Coastal Resiliency and Navigation Safety

Title:	Location	Grade	Number of Positions	Annual Salary	Total Salaries
Contract Monitor	Silver Spring, MD	ZP-IV	1	89,924	89,924
Total			1		89,924
less Lapse		25%	0		(22,481)
Total full-time permanent (FTE)			1		67,443
2015 Pay Adjustment (1.0%)					674
TOTAL					68,117

Personnel Data	Number
Full-Time Equivalent Employment	
Full-time permanent	1
Other than full-time permanent	0
Total	1
Authorized Positions:	
Full-time permanent	1
Other than full-time permanent	0
Total	1

PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Program: National Ocean Service
Sub-program: Navigation, Observations and Positioning
Program Change: Shoreline TopoBathy LIDAR Data for Coastal Resiliency and Navigation Safety

	Object Class	2015 Increase	2015 Total Program
11	Personnel compensation		
11.1	Full-time permanent	$68	$58,792
11.3	Other than full-time permanent	0	334
11.5	Other personnel compensation	0	526
11.8	Special personnel services payments	0	1,212
11.9	Total personnel compensation	68	60,864
12	Civilian personnel benefits	18	17,305
13	Benefits for former personnel	0	60
21	Travel and transportation of persons	0	2,551
22	Transportation of things	0	130
23.1	Rental payments to GSA	0	4,370
23.2	Rental Payments to others	0	1,126
23.3	Communications, utilities and miscellaneous charges	0	1,702
24	Printing and reproduction	0	34
25.1	Advisory and assistance services	0	33,383
25.2	Other services	3,914	4,964
25.3	Purchases of goods & services from Gov't accounts	0	829
25.4	Operation and maintenance of facilities	0	0
25.5	Research and development contracts	0	23
25.6	Medical care	0	0
25.7	Operation and maintenance of equipment	0	0
25.8	Subsistence and support of persons	0	0
26	Supplies and materials	0	2,500
31	Equipment	0	3,498
32	Lands and structures	0	0
33	Investments and loans	0	0
41	Grants, subsidies and contributions	0	8,536
42	Insurance claims and indemnities	0	0
43	Interest and dividends	0	1
44	Refunds	0	0
99	Total obligations	4,000	141,876

Navigation, Observations and Positioning: Regional Geospatial Modeling Grants (Base Funding: $4,000,000 and 0 FTE; Program Change: -$4,000,000 and 0 FTE): NOAA requests a decrease of $4,000,000 and 0 FTE for a total of $0 and 0 FTE to terminate the Regional Geospatial Modeling Grant program. NOAA will continue to support a range of other regional geospatial requirements through NOS's Coastal Zone Management and Services and Navigation, Observations and Positioning program activities. These regionally significant activities include height modernization, Continuously Operating Reference Stations (CORS), data access and capacity building.

PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Program: National Ocean Service
Sub-program: Navigation, Observations and Positioning
Program Change: Regional Geospatial Modeling Grants

	Object Class	2015 Decrease	2015 Total Program
11	Personnel compensation		
11.1	Full-time permanent	$0	$58,724
11.3	Other than full-time permanent	0	334
11.5	Other personnel compensation	0	526
11.8	Special personnel services payments	0	1,212
11.9	Total personnel compensation	0	60,796
12	Civilian personnel benefits	0	17,287
13	Benefits for former personnel	0	60
21	Travel and transportation of persons	0	2,551
22	Transportation of things	0	130
23.1	Rental payments to GSA	0	4,370
23.2	Rental Payments to others	0	1,126
23.3	Communications, utilities and miscellaneous charges	0	1,702
24	Printing and reproduction	0	34
25.1	Advisory and assistance services	0	33,383
25.2	Other services	0	1,050
25.3	Purchases of goods & services from Gov't accounts	0	829
25.4	Operation and maintenance of facilities	0	0
25.5	Research and development contracts	0	23
25.6	Medical care	0	0
25.7	Operation and maintenance of equipment	0	0
25.8	Subsistence and support of persons	0	0
26	Supplies and materials	0	2,500
31	Equipment	0	3,498
32	Lands and structures	0	0
33	Investments and loans	0	0
41	Grants, subsidies and contributions	(4,000)	4,536
42	Insurance claims and indemnities	0	0
43	Interest and dividends	0	1
44	Refunds	0	0
99	Total obligations	(4,000)	133,876

IOOS Regional Observations: Marine Sensor Innovation (Base Funding: $4,330,000 and 0 FTE; Program Change: +$1,000,000 and 0 FTE): NOS requests an increase of $1,000,000 and 0 FTE for a total of $5,330,000 and 0 FTE to develop and improve marine sensors for ocean chemical, biological, and physical parameters at multiple spatial and temporal scales to monitor changing conditions in the oceans, coasts, and Great Lakes.

Proposed Actions:
With these funds NOAA will expand its research and development program to develop, test and implement a variety of biological, chemical, and physical marine sensing technologies. These technologies will allow rapid, accurate and cost effective observations of environmental conditions. The program will incorporate successful marine sensor technologies and observing strategies into IOOS and other monitoring and prediction programs to enhance coastal intelligence and meet regional stakeholder needs as authorized by the Integrated Coastal and Ocean Observation System (ICOOS) Act.

NOAA will use this increase to support additional extramural competitive awards to teams from IOOS Regions, industry, academia, and Federal partners for the development, demonstration, testing, and evaluation of marine sensor technologies. IOOS will require coordination between grantees and operational users of the new technologies—including Federal programs, U.S. IOOS Regions and other research partners—to ensure new technologies and resulting data sources enhance and integrate with existing regional and national operational models and forecasts.

Under the cooperative agreements, the grantees and other partners:

- Develop and identify appropriate biogeochemical sensors and platforms for rapid and accurate detection, identification, and quantification of ocean and coastal pathogens, nutrients, contaminants and harmful algae and their toxins that may indicate health risks to humans;
- Develop sensors to support validation of ocean satellite and in-situ observation systems;
- Evaluate and test sensors for transition to operational use to support harmful algal bloom monitoring, ocean acidification monitoring, aquaculture production, and ecosystem-based management;
- Develop technologies to ensure sustainable and reliable use of sensors in the marine environment, including analysis of emerging technologies such as miniaturization of sensors for hosting on smaller, energy constrained platforms such as gliders and the use of marine animals as mobile observing platforms via tagging;
- Enhance coastal ocean and human health risk assessments and forecasts by refining models to describe and predict impacts of stressors (climate change, freshwater availability, coastal development, anthropogenic pollutants, and naturally occurring pathogens and toxins);
- Evaluate the increased benefit of new data sources for transitioning into operational coastal models through the U.S. IOOS Coastal and Ocean Modeling Testbed; and
- Integrate U.S. IOOS compliant data into user-specified tools and information products (observations, model output, forecasts) at local and regional scales.

The demonstrations are staggered and phased to allow new topics or new demonstration regions to be competed every two years and will include cross-agency prioritization of topics; NOS selects projects in consultation with groups such as the Ocean Research Advisory Panel, the Interagency Ocean Observation Committee, the Interagency Working Group on Ocean Partnerships, and the U.S. IOOS Advisory Committee.

Statement of Need and Economic Benefits:
Stressors on ocean and coastal resources—including coastal development, changes in land use, a varying climate and altered ecosystem diversity—are increasing in impact and complexity. The consequences of these stressors are not yet fully understood and may be challenging to manage. For example, approximately 100 million Americans use coastal and Great Lakes waters for recreation each year, and in doing so they are exposed to an array of ocean health threats from industrial, urban, and agricultural sources. In 2004, there were nearly 20,000 days of beach closings and advisories at ocean, bay and Great Lakes beaches, of which 73 percent were attributed to unknown sources. During 2006-2007, there were 4,000 beach advisory days due to sewage contamination and 35 percent of tested estuaries and 12 percent of ocean shoreline waters were considered unfit for designated uses.[2]

Technological advancements to monitor and assess biological indicators of marine ecosystem health and biological responses to environmental changes have lagged behind our capacity to detect physical changes in the oceans and atmosphere. This capability gap is a target of the Marine Sensor Innovation program. This increase will speed the development of new marine sensing technologies designed to deliver rapid and cost-effective data to improve understanding of coastal, ocean, and Great Lakes ecosystems, and to support better decision making to improve public, animal, and ecosystem health.

Investments in ocean observation generate significant economic benefits to both NOAA and the Nation.[3] Developing the next generation of marine sensors will help upgrade and strengthen our U.S. ocean observing system and will contribute to marine sector businesses, job growth, and scientific discovery.

Resource Assessment:
The resources for IOOS are described in the Navigation, Observations and Positioning narrative. This program also leverages efforts of NOAA/OAR's Ocean Acidification Program.

Schedule and Milestones:

Performance Schedule	**FY 2015**	**FY 2016**	**FY 2017**	**FY 2018**	**FY 2019**
Prioritize topics with Federal agencies and the National Oceanographic Partnership Program (NOPP) for marine sensor innovative technology demonstrations to advance three-dimensional monitoring of coastal, Great Lakes, and ocean conditions	X		X		X
Publish proposal solicitation for a 3-year marine sensor technology demonstration for transition to the system within IOOS Regions.		X		X	
Initiate competitively selected demonstration projects	X*	X		X	

[2] Dorfman and Rosselot. *Testing the Waters: A Guide to Water Quality at Vacation Beaches*, Natural Resources Defense Council, 2009.
[3] Willis, Zdenka. *The Business Case for Improving NOAA's Management and Integration of Ocean and Coastal Data*, 2009 and Kite-Powell et al. *Estimating the Economic Benefits of Regional Ocean Observing Systems*, 2004.

Make awards and conduct technology demonstrations and sensor verification and validation evaluations in IOOS Regions	X	X	X	X	X
Evaluate and test new data sources using operational coastal models for transitioning into operations	X	X	X	X	X
Transition demonstrated tools or technologies into the system	X	X	X	X	X

* FY 2015 projects will be initiated from the competitively reviewed FY 2014 Federal funding opportunity.

Deliverables:

- Incorporation of two or more emerging tools or technologies into the system within two or more U.S. IOOS regions every three years (FY 2016–2019)
- Transition of sensor technologies into higher technology readiness levels or greater use within the system. FY 2016-2019)

Performance Goals and Measurement Data

Performance Measure: Cumulative number of new marine sensors or ecosystem tools developed to enhance coastal intelligence and ecosystem based management for fisheries, protected species, public health, and additional topics as defined by the National Oceanographic Partnership Program process	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With Increase	N/A	N/A	2	3	7	9	11
Without Increase	0	2	2	3	5	6	8
Description: This measure focuses on the development of new sensors or tools resulting from multi-year marine sensor technology demonstrations. Following a continuous pattern, projects initiated in FY 2015 are expected to deliver results in FY 2017 and FY 2018 toward this measure.							

PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Program: National Ocean Service
Sub-program: Navigation, Observations and Positioning
Program Change: Marine Sensor Innovation

	Object Class	2015 Increase	2015 Total Program
11	Personnel compensation		
11.1	Full-time permanent	$0	$21
11.3	Other than full-time permanent	0	0
11.5	Other personnel compensation	0	0
11.8	Special personnel services payments	0	0
11.9	Total personnel compensation	0	21
12	Civilian personnel benefits	0	6
13	Benefits for former personnel	0	0
21	Travel and transportation of persons	0	12
22	Transportation of things	0	0
23.1	Rental payments to GSA	0	1
23.2	Rental Payments to others	0	0
23.3	Communications, utilities and miscellaneous charges	0	16
24	Printing and reproduction	0	0
25.1	Advisory and assistance services	0	493
25.2	Other services	0	3
25.3	Purchases of goods & services from Gov't accounts	0	0
25.4	Operation and maintenance of facilities	0	0
25.5	Research and development contracts	0	0
25.6	Medical care	0	0
25.7	Operation and maintenance of equipment	0	0
25.8	Subsistence and support of persons	0	0
26	Supplies and materials	0	39
31	Equipment	0	0
32	Lands and structures	0	0
33	Investments and loans	0	0
41	Grants, subsidies and contributions	1,000	28,909
42	Insurance claims and indemnities	0	0
43	Interest and dividends	0	0
44	Refunds	0	0
99	Total obligations	1,000	29,500

APPROPRIATION ACCOUNT: OPERATIONS, RESEARCH AND FACILITIES
SUB-PROGRAM: COASTAL SCIENCE AND ASSESSMENT

The activities under the Coastal Science and Assessment sub-program provide a scientific foundation for sustainable management, protection, restoration, and use of U.S. coastal resources, especially NOAA's public trust resources. Burgeoning coastal development and increasing climate variability continue to exacerbate stressors on ecosystem services in the Nation's coastal areas. NOS research and advisory services promote Federal, state, local, and private industry management actions and practices to enhance resiliency and mitigate the cumulative effects of these stressors. Furthermore, the increasing level of coastal human activity—drilling, shipping and other activity—increases the risk of emergencies, such as ship groundings and oil spills, which lead to both pollution and physical damage to sensitive ecosystems. NOS is the Nation's leading scientific expert on responding to such emergencies and conducting natural resource damage assessments in oceans and coasts. These assessments support litigation and negotiated settlements that fund restoration of public trust resources. For long-term sustainability, management and restoration efforts, NOS continues to focus its research capabilities on understanding, monitoring, predicting and mitigating coastal ecosystem changes that have enormous implications for the Nation's economic well-being. NOAA's Ecological Forecasting Roadmap guides the transition of mature research into operational ecological forecasts, particularly in the areas of harmful algal blooms (HABs), hypoxia, and pathogens.

NOS implements the activities of this sub-program under the authorization of the Clean Water Act; Oil Pollution Act; the Comprehensive Environmental Response, Compensation, and Liability Act; the National Coastal Monitoring Act; the Marine Debris Act; and the Harmful Algal Bloom and Hypoxia Research and Control Act. The research conducted in this sub-program also helps to inform NOAA's activities under the National Marine Sanctuaries Act and the Coastal Zone Management Act. This sub-program also supports NOAA's and the Nation's obligations under international treaties and conventions; and increases effectiveness of international programs for coastal environmental science and technology, integrated coastal zone management, and sustainability of coastal resources.

The following program offices and program office components are responsible for carrying out the Coastal Science and Assessment sub-program:

- **National Centers for Coastal Ocean Science.** NOS's National Centers for Coastal Ocean Science (NCCOS) conduct anticipatory and applied research, monitoring, and assessments to build the scientific foundation essential to support coastal management and resilient coastal ecosystems. NCCOS's capabilities are leveraged and enhanced by partnerships to manage threats of HABs, support marine planning, and advance knowledge of ecological effects of climate change and coastal contamination. NCCOS engagement with stakeholders ensures that its research activities meet the highest priority national, regional and local issues. NCCOS centers are located in Maryland, South Carolina, North Carolina and Alaska.
- **Office of Response and Restoration.** NOAA's Office of Response and Restoration (OR&R) is a center of expertise in preparing for, evaluating, and responding to threats to coastal environments, including oil and chemical spills, releases from hazardous waste sites, and marine debris. When oil or hazardous substances threaten or injure coastal and marine resources, OR&R is responsible for assessing damage to natural resources and ensuring that cleanup actions protect those resources from further injury. NOAA responds to over 100 significant oil or chemical spills each year as scientific advisors to the U.S. Coast Guard and conducts natural resource damage assessments at affected sites.

The narrative below describes programs funded through the Coastal Science, Assessment, Response and Restoration and Competitive Research program activities.

Coastal Science, Assessment, Response and Restoration

Coastal Science and Monitoring

NOS conducts applied research, monitoring, and assessments to build the scientific foundation essential for sustainable use of coastal resources. NOS pursues these research priorities through its laboratories and by providing grants for competitive, peer-reviewed, interdisciplinary research investigations. This complementary mix of intramural and extramural approaches makes possible a seamless science-to-decision connection to between NOS's research and management programs.

NOS's applied coastal science portfolio includes efforts to understand the physical, biological, and social impacts of coastal management decisions in the face of climate change and increasing use of coastal and ocean resources. Research increasingly focuses on response to and recovery from a range of hazards: contaminants (including oil, hazardous waste, and microplastics), natural toxins such as those produced by HABs, and contaminants of emerging concern. NOS science supports a broad spectrum of coastal ecosystem management needs. NOS continues to predict and map resilience to climate change and regional stressors. Some examples include modeling of climate change impacts on biological communities and habitats; characterizing and forecasting of coastal, marine, and Great Lakes ecosystem conditions; and identifying the environmental impacts of various coastal uses including offshore energy development, tourism in National Marine Sanctuaries, and marine aquaculture. Activities include developing core capabilities in pathogen detection and differentiation, environmental chemistry and toxicology, combined effects of environmental stressors on coastal communities and ecosystems, and human dimension indicators.

NOS laboratories have the flexibility to address the most current and pressing coastal stewardship research demands from NOAA, states, and territories. For this reason, as restoration in the wake of the Deep Water Horizon spill continues, NOAA has located the RESTORE Act Science Program within NCCOS. Many of NOS's laboratories are located in places that provide ready access to a diversity of coastal habitats. Furthermore, NOS intramural research programs are well positioned to conduct long term monitoring and maintain standardized, longitudinal datasets.

Competitive research grantees and collaborators conduct studies on mission-critical scientific questions and coastal environmental issues using multi-disciplinary approaches. These approaches include understanding and predicting the impacts of natural and anthropogenic stressors on coastal ecosystems, communities, and economies. Merit-based awards of cooperative agreements often address specific coastal management needs on a regional scale and benefit significantly from subject matter expertise of the most qualified teams of scientists in the Nation, whether they are in academic institutions, private industry or other government laboratories. Grantee research often culminates with the development of models explaining how ecosystems work and how they will respond to stressors and interventions.

Response and Restoration of NOAA Trust Resources

NOS's emergency response capabilities support Federal, state, and local agencies across the country that depend on NOAA's science-based guidance during oil and chemical spills, vessel groundings, hazardous waste releases, search and rescue efforts, national security events, and other coastal hazards, including marine debris. NOS provides scientific expertise, including oil spill trajectory modeling, shoreline cleanup assessment, identification of sensitive resources, information management, and development of cleanup strategies. This knowledge and experience enables Federal on-scene coordinators to make the best cleanup decisions to minimize the environmental

and economic impacts of oil spills and response actions. NOS enhances national knowledge and readiness by training hundreds of Federal, state and local partners each year. NOS continues to provide critical scientific support to the Coast Guard for the Deepwater Horizon oil spill in the Gulf of Mexico.

After the initial response to a pollution event or grounding NOS, along with other state, tribal, and Federal natural resource trustees, is responsible for assessing natural resource damages, seeking compensation on behalf of the public for the loss of services that the natural resources provided prior to the event, and ensuring that cleanup actions protect those resources from further injury. NOS's assessment and restoration program is a leader within the damage assessment community, working closely with other Federal and state trustees to protect and restore natural resources that are vital to coastal ecosystems and local economies. NOS also ensures that remediation at hazardous waste sites protects NOAA trust resources. The NOS assessment and restoration program and its partners have generated over $500 million of restoration over the life of the program, all of which has been paid for by responsible parties.

In FY 2013, NOAA and its co-trustees from U.S. Fish and Wildlife Service, Saint Regis Mohawk Tribe, and the State of New York finalized a $19.4 million settlement and Restoration Plan for the St. Lawrence River. The plan includes restoration projects for natural resources and recreational opportunities of the St. Lawrence River in New York, as well as cultural resources of the Saint Regis Mohawk Tribe. NOS is now leading the damage assessment activities for the Deepwater Horizon oil spill in the Gulf of Mexico. In this arena, NOS works with the NOAA Restoration Center to provide assistance for estuary habitat restoration projects and to develop and enhance restoration monitoring and research capabilities. NCCOS research under this sub-program is also essential to establishing a baseline assessment of the ecosystem before the pollution event, enabling the trustees and the responsible party to quantify the damage and evaluate long-term restoration projects.

In FY 2012, NOAA began implementing an oil spill research and development program. The goal of this program is to conduct research to provide tools and training for planners, oil spill responders, and assessment practitioners. In FY 2013, NOS made significant progress on a number of projects including improvements to a chemical reactivity model that cross compares multiple compounds for adverse reactions, improvements to the General NOAA Operational Modeling Environment (GNOME) model for sub-surface oil spills and marine debris, and the Computer Aided Management of Emergency Operations (CAMEO) suite of products. NOS is also conducting a study to evaluate spill cleanup technologies and oil impacts in marshes, developing a tool for operational use of hydrodynamic models from multiple sources, and developing a methodology for extrapolating acute toxicity from existing data.

NOS's Marine Debris Program (MDP), authorized by the Marine Debris Act, has a lead role in addressing marine debris affecting the ocean and coastal environment and navigation safety in the United States. Through the Marine Debris Program, NOS conducts reduction, prevention, and research activities, as well as supports grants, partnerships, and contracts to address marine debris. Current activities emphasize research, establishing a network of partners to implement standardized monitoring protocols, and removal projects that benefit communities, coastal habitat, waterways, and wildlife. The program has also positioned itself as a leader on marine debris issues within NOAA and the Federal community, including chairing the Federal Interagency Marine Debris Coordinating Committee. The program has led Federal efforts to address marine debris generated by the tsunami in Japan in March 2011 and Superstorm Sandy in October 2012. Tsunami debris efforts have included contingency planning assistance to states, debris detection, shoreline modeling, removal grants, and data dissemination. In 2013, the U.S. government received a $5 million gift from the

Government of Japan to aid in the response to debris from the 2011 tsunami. NOAA continues to distribute these funds to affected states as needed for debris assessment and removal. The Disaster Relief Appropriations Act, 2013, provided additional funds for the Marine Debris Program to respond to marine debris generated by Superstorm Sandy.

Competitive Research

This program activity provides funding for extramural research grants in support of NOS's Coastal Science, Assessment, Response and Restoration program activity. See the program activity description for Coastal Science, Assessment, Response and Restoration for program descriptions, schedule, milestones, and performance measures.

Schedule and Milestones:

- Characterize climate sensitivity of selected coastal ecosystems using community vulnerability and biophysical indicators (FY 2015-2019)
- Assess impacts of coastal erosion and beach modifications on marsh vegetation to inform coastal development, ecological restoration, infrastructure protection strategies, and redevelopment following extreme events (FY 2015-2019)
- Develop and enhance sea level rise forecast modeling systems for the northern Gulf of Mexico and other priority regions to inform coastal planning, restoration and protection of economic interests in the face of long-term sea level rise (FY 2015-2017)
- Develop and transfer tools (e.g., climate change models) and water quality protection measures (e.g., BMPs) aimed at assessing and mitigating the impact of future climate change and ocean acidification, focusing on NOAA-managed areas (National Estuarine Research Reserve System, and National Marine Sanctuaries) (FY 2015-2019)
- Improve scientific knowledge and develop new tools, including biological system models, to describe impacts of combined effects of environmental stressors on coastal ecosystems and resources (FY 2015-2019)
- Develop and transfer new scientific tools, technologies and information products for decision-making on coastal resilience and resource sustainability.
- Develop methods of harmful algal bloom prevention~~,~~ control, and mitigation (FY 2015-2019)
- Investigate effects of land use and weather on runoff, eutrophication, hypoxic conditions, Harmful Algal Blooms and pathogens (FY 2015-2019)
- Develop and operationalize regional ecological forecast models, leading toward a nationwide capability, for harmful algal bloom prediction and mitigation of economic impacts (FY 2015-2017)
- Develop scenario-based hypoxia forecast modeling systems and time-scales of ecosystem recovery in Chesapeake Bay, Narragansett Bay, and Gulf of Mexico to provide critical information for management (FY 2015-2019)
- Establish metrics for coral health, resilience and recovery that can be used to guide and track the effectiveness of management actions (FY 2015-2016)
- Plan and improve infrastructure, including availability of standards and probes, shared-use facilities, monitoring platforms, and training, to develop the expertise necessary for state-of-the-art national capabilities for HAB monitoring and detection and improving accuracy of HAB forecasting (FY 2015-2019)
- Develop analytical capabilities on contaminants of emerging concern, including nanoparticles, and increase the integration of science and services to provide targeted, actionable information to increase coastal ecosystem resilience (FY 2015-2019)

- Identify and analyze biological, benthic and oceanographic datasets at appropriate spatial and temporal scales to support offshore energy planning and siting (FY 2015-2019)
- Conduct research to support National Marine Sanctuary rezoning, boundary delineation, and nominations (FY 2015-2019)
- Conduct research on the sources and effects of nutrients and contaminants on the benthos and selected coastal habitats and species to determine the effects of such pollution and identify mitigating solutions (FY 2015-2019)
- Collect and analyze data to support regional assessments and management plans for protecting coral ecosystems (FY 2015-2019)
- Support RESTORE Act Science Program through competitive research grants and other means of financial assistance.(FY 2015 – 2019)
- Respond to approximately 100 oil spills and other pollution events to influence sound, science-based cleanup decisions (FY 2015-2019)
- Conduct natural resource damage assessments at spill and hazardous waste sites (FY 2015-2019)
- Train 1000 responders and partners (Federal, state and local) in technical and scientific elements of incident response and damage assessment (FY 2015-2019)
- Achieve significant progress on regional ecosystem restoration planning, implementation, and monitoring (FY 2015-2019)
- Plan and Implement priority oil spill and marine debris research and development projects including assessment and response tools, techniques and methods development (FY 2015-2019)
- Provide national and international leadership on reducing the harmful effects of marine debris through coordination, research, monitoring, education, outreach, partnership-building, and debris removal (FY 2015-2019)
- Develop Marine Debris Rapid Response Plans with partners in the Gulf of Mexico, the Southeast and the Northeast, as outlined in the Marine Debris Act 2012 reauthorization (FY 2015-2019)

Deliverables:

- Enhanced data integration and visualization tools such as DIVER, ERMA, ADIOS and GNOME
- Baseline ecological assessments in the Gulf of Mexico, Chesapeake Bay and selected NMS and NERRs
- Models on marsh response to sea level rise and assessments of impacts of shoreline modification on ecosystem services
- Model output evaluating the impact of alternative land management actions on the export of phosphorus and suspended solids into the lower portion of Lake Michigan
- Hypoxia ensemble forecast for the Gulf of Mexico (FY 2015)
- Identify ecologically at-risk species in hypoxic systems and develop their vulnerability, including social and economic costs (FY 2015-2017)
- Multidisciplinary ecological model to evaluate marsh, oyster and sea grass response to sea level rise in selected locations of the Gulf of Mexico (FY 2017)
- Technical support to Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) lead agencies, investigate potential injury to NOAA trust resources, develop protective remedial strategies, and address contaminated sediments
- Significant progress toward completing natural resource damage assessments or cases settled to recover funds for restoration of coastal resources

- Two regional response exercises per quarter with NOAA presence (Federal, state, local, private)
- Enhanced functionality of Environmental Response Management Application (ERMA)
- Socioeconomic monitoring of Deepwater Horizon restoration projects to estimate restoration project benefits to Gulf Coast economies
- Up to 5 research projects funded annually that address priority marine debris research and development focus areas
- Marine Debris Rapid Response Plans

Performance Goals and Measurement Data:

Performance Measure: Annual number of coastal, marine and Great Lakes ecosystem sites adequately characterized for management	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	11	13	13	10	10	10	10

Description: Ecological characterizations provide the scientific basis for coastal and ocean assessments and forecasts, and the development of plans to manage resources and assess the effectiveness of measures implemented to effectively manage natural resources. Characterizations are conducted on NOAA trust resources, essential fish habitats, Great Lakes habitats and living resources and throughout the Nation's coastal zone.

Performance Measure: Cumulative number of coastal, marine and Great Lakes forecast capabilities developed and used for management	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	4	6	7	7	7	7	7

Description: NOAA's discrete forecast models allow resource managers to: 1) make decisions based on predicted environmental and socioeconomic impacts related to a particular issue; 2) use issue-based forecasts to predict the impacts of a single ecosystem stressor (e.g., climate change, extreme natural events, pollution, invasive species, and land and resource use) and 3) evaluate the potential options to manage those stressors to fulfill the ultimate goal for resource managers to use NOAA's forecasts to better manage ecosystem use, condition, and productivity. These forecasts will be based on field and laboratory studies, existing data, and models predicting environmental conditions under different scenarios, will have capabilities specific to a geographic area, and be counted for each ecosystem as they become operational. For example, harmful algal bloom forecasts in the Gulf of Mexico and Gulf of Maine are two separate forecast capabilities and similarly, multiple, distinct forecast capabilities could be counted within a single ecosystem (i.e., harmful algal blooms, pink shrimp harvest, and hypoxia –all in the Gulf of Mexico).

Performance Measure: Percent of all coastal communities susceptible to harmful algal blooms verifying use of accurate HAB forecasts	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	N/A	11	11	11	11	11	11

Description: This measure tracks the forecast communities (currently using operational forecasts) within a coastal region vulnerable to harmful algal blooms (HAB) and the utility and accuracy of HAB forecasts as verified through customer feedback responses before and after a forecast HAB event.

Performance Measure: Number of responders (federal, state, local) trained in technical and scientific elements of incident response (SCAT, SOS, ERMA, CAMEO, etc.),	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	1,825	2,000	2,000	2,000	2,000	2,000	2,000
Description: This measure tracks the number of emergency responders (federal, state, local) trained by OR&R in technical and scientific elements of incident response (SCAT, SOS, ERMA, CAMEO, etc.).							

Performance Measure: Metric tons of marine debris removed annually	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	615.5	450	400	400	400	400	400
Description: This measure reflects the metric tons of marine debris removed from coastal areas as a direct result of NOAA funding. [NOTE: The target is reduced for future years to reflect the shift in the Fishing for Energy Partnership from removal to prevention. Also, while this is an important metric for Marine Debris, it is important to note that weight is only part of the picture.]							

Performance Measure: Number of Natural Resource Damage Assessment cases where liability is resolved	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	7	4	5	5	5	5	5
Description: This measure tracks the annual number of natural resource damage cases that are resolved and supply restoration funds. Successful cases reflect NOAA's ability to conduct assessments, provide assistance and work cooperatively with industry and other trustees on natural resource damage cases. [Note: NRDA settlements in a given year are highly variable and hard to predict as they incorporate external factors beyond OR&R control. These targets represent a reasonable expectation based on the FY 2014 budget increase and the historical moving average.]							

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PROGRAM CHANGES FOR FY 2015:

Coastal Science, Assessment, Response, and Restoration: Ecological Forecasting (Base Funding: $71,503,000 and 311 FTE; Program Change: +$4,000,000 and 0 FTE): NOAA requests an increase of $4,000,000 and 0 FTE for a total of $75,503,000 and 311 FTE for the National Centers for Coastal Ocean Science to develop and operationalize ecological forecasts for harmful algal blooms (HABs), hypoxia, pathogens, and species distributions.

Proposed Actions:
With this increase, NOAA will develop and transition to operations ecological forecast models for harmful algal blooms (HABs), hypoxia, pathogens, and species distributions. NOAA will procure necessary equipment and a data analysis system for forecasting. NOAA will also fund additional analytical science capability in oceanography, social science, modeling and systems engineering. These actions are essential for developing NOAA's ecological forecasting capabilities nationwide, beginning in high priority regions.

This investment will mitigate risks to coastal communities and economies from HAB and hypoxia events. Additional investment in detection and modeling capabilities will improve the scope and accuracy of HAB and hypoxia predictions, reducing the number of false positives and false negatives. Additional ecosystem modelers and engineers will integrate and interpret complex data to deliver seasonal and short-term forecasts. With improved social science capabilities, NOAA will be better able to quantify impacts and identify communities at highest risk. Investment in modeling will expand forecast capabilities to other priority areas, including the coasts of California and Washington states as well as the Gulf of Maine, which are not currently served by HAB and hypoxia forecasts.

The funding requested will enhance program coordination, research, development, and operations as outlined in NOAA's Ecological Forecasting Roadmap.

Operating Ecological Forecasts

- Continue operational HAB forecasts in the West coast of Florida, Western Gulf of Mexico, and expand to operationalize *Vibrio* pathogen forecasts in Delaware Bay, Chesapeake Bay, Tampa Bay, and northern Gulf of Mexico. These saltwater and estuarine bacterial pathogens pose a threat to human health through foodborne infection.

Validating and Transitioning Ecological Forecasts to Operation

- Transition HAB forecasts from development to operations in the Gulf of Maine and Lake Erie.
- Transition Finite Volume Coastal Ocean Model (FVCOM)/TAMU coupled models to NOAA operations.
- Validate E. coli exposure forecasts for Shellfish Harvest Areas in South Carolina.
- Initiate model testing and validation for hypoxia forecasts in the northern Gulf of Mexico and Chesapeake Bay.
- Initiate model testing and validation for beach quality forecasts in the Chesapeake Bay.
- Train NOAA personnel and customers to ensure effective use of the forecasts.

Conducting Research and Monitoring in Support of Ecological Forecasts

- Quantify impacts of hypoxia to living resources and coastal communities.
- Obtain high-resolution satellite data to support operational HAB forecasts.
- Incorporate improved wind models into ecological forecasts.
- Develop sampling kits for rapid low-cost detection of key HAB species for regions to improve the resolution and accuracy of operational HAB forecasts.

- Standardize methods to calculate hypoxia area and volume and fill gaps in available data (circa 2002).
- Assess biodiversity and ecosystem health in the Gulf of Maine to establish a baseline for biodiversity forecasts and development of bio indicators.

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Statement of Need and Economic Benefits:

Improving the predictability of ecological systems has been a national environmental goal for the past 20 years. The agency-wide effort to advance the priorities as identified by NOAA's Ecological Forecasting Roadmap builds on and unites forecasting efforts within and external to NOAA to deliver useful, regular, and reliable ecological forecasts to the American public. The requested funding is critical to transitioning forecasts from research to operational models that can simulate the complexity of an ecosystem and will provide a sound scientific basis for ecosystem-based management. This funding will help to accelerate progress in this emerging field and ensure the development of a sustainable operational framework.

Harmful algal bloom and hypoxia outbreaks have continued to strike coastal economies. Ecological forecasting provides coastal managers flexible tools to prevent, mitigate and adapt to the harmful effects of environmental stressors such as harmful algal blooms and hypoxia. In areas where NOAA has produced ecological forecasts (e.g., harmful algal bloom off the west coast of Florida, HABs and hypoxia in Lake Erie, pathogens in shellfish beds and on beaches off South Carolina), they have been essential to coastal resource managers, public health officials, fishermen, and public utility officials.

There is widespread evidence that the productivity of these ecosystems has declined as a result of legacy contaminants (pesticides and industrial chemicals), current human activities (agricultural runoff) and emerging stressors (human and veterinary pharmaceuticals and changing sea level). Consequences of such stressors, individually or in combination, include increases in the incidence and severity of harmful algal blooms and the spread of oxygen depleted waters or "dead zones". These incidents can have devastating economic effects. For example, a single harmful algal bloom event off the coast of Texas (September 2011) caused a $7.5 million loss to the oyster industry

NOAA seeks to integrate and substantially strengthen its ecological forecasting capabilities by leveraging existing, complementary capabilities in its Line Offices. NOAA recently adopted an Ecological Forecasting Roadmap, a blueprint for advancing ecological forecasting expertise.

Resource Assessment:

The NCCOS ecological forecasting program will continue to leverage existing capacity, expertise, and infrastructure to advance forecasting capabilities. For example, NOS hydrodynamic models developed to support maritime commerce applications are being leveraged to develop new ecological forecasts (e.g. HAB, pathogens), and requirements for ecological forecasting are being incorporated into planning horizons.

The requested funds will enable a swifter and more efficient production of ecological forecasts on a national scale. Two ecological forecast capabilities are developed and awaiting transition to operation. This increase will provide an immediate return on investment by successfully transitioning these forecasts to sustainable operations.

Schedule and Milestones:

- Develop and make available a standardized and comprehensive hypoxia dataset (FY 2015-2016)
- Incorporate seasonal river flow information into hypoxia forecasts (FY 2015-2016)

- Develop scenario-based hypoxia forecasts (F Y2015-2016)
- Transition Lake Erie HAB forecast to operations (FY 2016-2017)
- Transition Gulf of Maine HAB forecast to operations (FY 2016-2017)
- Secure high resolution satellite data for HAB forecasting (FY 2016-2017)
- Conduct cruises in Gulf of Maine to develop cyst maps for HAB forecasting (FY 2015-2019)
- Complete development of test kits for key HAB species (FY 2016-2017)
- Transition coupled hypoxia models to NOAA operations (FY 2016-2017)
- Prioritize management needs for hypoxia impacts on living resources and mechanisms to incorporate forecasts into fishery management and policy (FY 2015-2019)
- Transition 4 new *Vibrio* forecasts to operations (FY 2016-2017)
- Transition Pacific Northwest HAB forecast to operations (FY 2018-2019)

Deliverables:

- Operational HAB forecasts in Gulf of Mexico (Texas and West Florida Shelf), Lake Erie, Gulf of Maine, and Pacific Northwest
- Operational Hypoxia Forecasts in Gulf of Mexico and Chesapeake Bay
- Operational Pathogen Forecasts (geographic areas to be determined)
- Operational Ecosystem Forecasts for species distribution, including biodiversity and invasive species (geographic areas to be determined)

Performance Goals and Measurement Data:

Performance Measure: Cumulative number of coastal, marine and Great lakes forecasts capabilities developed and used for management	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With Increase	N/A	N/A	9	11	13	15	17
Without Increase	4	6	7	7	7	7	7

Description: NOAA's discrete forecast models allow resource managers to: 1) make decisions based on predicted environmental and socioeconomic impacts related to a particular issue; 2) use issue-based forecasts to predict the impacts of a single ecosystem stressor (e.g., climate change, extreme natural events, pollution, invasive species, and land and resource use) and 3) evaluate the potential options to manage those stressors to fulfill the ultimate goal for resource managers to use NOAA's forecasts to better manage ecosystem use, condition, and productivity. These forecasts will be based on field and laboratory studies, existing data, and models predicting environmental conditions under different scenarios, will have capabilities specific to a geographic area, and be counted for each ecosystem as they become operational. For example, harmful algal bloom forecasts in the Gulf of Mexico and Gulf of Maine are two separate forecast capabilities and similarly, multiple, distinct forecast capabilities could be counted within a single ecosystem (e.g., harmful algal blooms, pink shrimp harvest, and hypoxia –all in the Gulf of Mexico).

PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Program: National Ocean Service
Sub-program: Coastal Science and Assessment
Program Change: Ecological Forecasting

	Object Class	2015 Increase	2015 Total Program
11	Personnel compensation		
11.1	Full-time permanent	$0	$31,789
11.3	Other than full-time permanent	0	492
11.5	Other personnel compensation	0	282
11.8	Special personnel services payments	0	346
11.9	Total personnel compensation	0	32,909
12	Civilian personnel benefits	0	9,605
13	Benefits for former personnel	0	0
21	Travel and transportation of persons	100	935
22	Transportation of things	0	164
23.1	Rental payments to GSA	0	1,465
23.2	Rental Payments to others	0	448
23.3	Communications, utilities and miscellaneous charges	300	2,575
24	Printing and reproduction	0	24
25.1	Advisory and assistance services	950	19,685
25.2	Other services	0	224
25.3	Purchases of goods & services from Gov't accounts	0	163
25.4	Operation and maintenance of facilities	0	0
25.5	Research and development contracts	2,400	2,400
25.6	Medical care	0	0
25.7	Operation and maintenance of equipment	0	0
25.8	Subsistence and support of persons	0	0
26	Supplies and materials	0	857
31	Equipment	250	825
32	Lands and structures	0	0
33	Investments and loans	0	0
41	Grants, subsidies and contributions	0	3,223
42	Insurance claims and indemnities	0	0
43	Interest and dividends	0	1
44	Refunds	0	0
99	Total obligations	4,000	75,503

Coastal Science, Assessment, Response and Restoration: Arctic Spill Preparedness (Base Funding: $71,503,000 and 311 FTE; Program Change: +1,315,000 and 0 FTE): NOAA requests an increase of $1,315,000 and 0 FTE for a total of $72,818,000 and 311 FTE for Coastal Science, Assessment, Response and Restoration to improve NOAA's scientific and operational support for Arctic oil spill response.

Proposed Actions:
NOAA is proposing to fill critical science and data gaps to address NOAA obligations for Arctic oil spill response under the National Contingency Plan (NCP) (40CFR300 §300.145(c)). Although the Plan calls for NOAA to provide scientific support on oil cleanup to the Federal On-Scene Coordinator, NOAA is not currently able to meet these obligations because of critical science and data gaps. Industrial interest in the Arctic will increase as companies, such as Shell Oil, begin exploratory drilling and marine transportation system (MTS) activities in the region. This proposal directly addresses oil spill-related implementation actions in the National Strategy for the Arctic Region to prevent loss of life and reduce environmental risk, while facilitating sustainable Arctic economic development. Specifically, this investment will improve NOAA models to predict oil movement and weathering in ice-covered waters, assess vulnerable natural habitats, improve coordination with and preparedness of local communities, improve remote field observation and assessment capabilities, build Arctic oil spill response capacity and efficacy, support interagency Arctic development planning and preparedness efforts, and fund research to fill scientific gaps.

This investment also directly addresses stakeholder needs stated in reports such as the Alaska Northern Waters Task Force recommendations and the Aspen Institute Commission on Arctic Climate Change report, which acknowledge the need to support emerging Arctic economic opportunities while mitigating threats to the environment, and the cultures and livelihoods of the indigenous peoples.

Statement of Need and Economic Benefits:
The United States, by virtue of the State of Alaska, is a maritime Arctic nation and has substantial interests in the region. Climate change is driving rapid sea ice loss in the Arctic, with some empirical estimates predicting the complete loss of summer sea ice within the next 20 years. This drastic change in the physical environment is helping to spur a sharp increase in Arctic economic activity, especially in the areas of maritime commerce and natural resource extraction. Despite the Arctic's remote location on the globe, its economy affects the entire Nation, whether through the cost of fuel, the security and ease of trade with global markets, the availability of seafood, or the financial and environmental impacts of a major maritime disaster such as an oil spill.

Numerous high level policy statements have attested to the increasing importance of the region, including; the 2013 National Strategy for the Arctic Region, the President's Report on Integrated Arctic Management, the Committee on Marine Transportation System 2013 U.S Arctic MTS Overview and Priorities for Action, and the recently signed Arctic Council Agreement on Cooperation on Marine Oil Pollution Preparedness and Response in the Arctic. These new drivers, combined with recent policy decisions, underscore the need for NOAA actions that facilitate safe and efficient navigation, prevent loss of life and property, and reduce the risk of environmental damage in the region, while facilitating economic development and employment.

A U.S. Geological Survey assessment estimates that the Arctic may contain 22 percent of the world's estimated mean undiscovered, technically recoverable oil and gas resources, a projected 84 percent of which would occur offshore. Currently there are 673 active Arctic Alaska Outer Continental Shelf (OCS) oil and gas leases. The safety and financial risk of such ventures will depend heavily on NOAA information as destination traffic increases for vessels that supply drill sites, move the

resources from site to customer, and, in the event of an incident, support a spill response or other emergency.

The Marine Exchange of Alaska reports that total commercial vessel traffic for all uses increased by 30 percent in the Arctic region from 2008 to 2010. Growing use of these trans-Arctic routes and their dependence on the Bering Strait will lead to increased traffic in U.S. Arctic waters, and increased risk of oil spill and injury to people, places and living marine resources. An estimated 26 percent of the jobs in Alaska depend on a healthy environment[4]. At the same time, the level of spill event support that NOAA is able to provide in this region is not equivalent to the level that NOAA provides to the contiguous United States.

Resource Assessment:
NOS has current resources of $634,000 in Coastal Science, Assessment, Response and Restoration to support Arctic oil spill response capacity in recognition of the expanding activity there. The NOS Office of Response and Restoration also maintains a scientific support coordinator for Alaska, and limited NRDA capacity at a level of $500,000.

Schedule and Milestones:

Milestones	FY 2015	FY 2016	FY 2017	FY 2018
Improved trajectory models for Beaufort/Chukchi Seas			X	X
Environmental Sensitivity Index (ESI) Map Update - NW Arctic, North Slope		X	X	

Deliverables:

- Conduct an Arctic safety assessment to identify equipment and training needs unique to the region, including aviation safety and cold weather survival training
- Significantly enhanced incident response capability for Arctic Ocean, Bering Sea and Gulf of Alaska to support USCG
- Updated Arctic operational oceanography models and oil fate and behavior models to include oil-in-ice behavior to support oil spill response
- Updated Environmental Sensitivity Index maps to reflect current resources at risk-- NW Arctic, North Slope
- NOAA staff have adequate training and experience to provide support for the tasks identified under the National Contingency Plan
- Timely and thorough environmental review of oil spill response plans through the interagency review process
- Research projects implemented to determine the concentrations of mixtures of oil and dispersants that could be expected to adversely impact populations of Arctic cod, as well as determining how long such potential impacts would persist

[4] UNEP. *GEO-3: GLOBAL ENVIRONMENT OUTLOOK*. Rep. 2002. http://www.unep.org/geo/geo3/English/133.htm

Performance Goals and Measurement Data:

Performance Measure: Number of joint and international oil spill pollution trainings/exercises conducted or participated in by NOAA	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With Increase	N/A	N/A	1	2	3	3	3
Without Increase	0	0	0	0	1	0	0
Description: This tracks the number of joint and international oil spill pollution trainings and exercises that NOAA will participate in and/or conduct.							

PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Program: National Ocean Service
Sub-program: Coastal Science and Assessment
Program Change: Arctic Spill Preparedness

	Object Class	2015 Increase	2015 Total Program
11	Personnel compensation		
11.1	Full-time permanent	$0	$31,789
11.3	Other than full-time permanent	0	492
11.5	Other personnel compensation	0	282
11.8	Special personnel services payments	0	346
11.9	Total personnel compensation	0	32,909
12	Civilian personnel benefits	0	9,605
13	Benefits for former personnel	0	0
21	Travel and transportation of persons	0	835
22	Transportation of things	0	164
23.1	Rental payments to GSA	0	1,465
23.2	Rental Payments to others	0	448
23.3	Communications, utilities and miscellaneous charges	0	2,275
24	Printing and reproduction	0	24
25.1	Advisory and assistance services	0	18,735
25.2	Other services	1,315	1,539
25.3	Purchases of goods & services from Gov't accounts	0	163
25.4	Operation and maintenance of facilities	0	0
25.5	Research and development contracts	0	0
25.6	Medical care	0	0
25.7	Operation and maintenance of equipment	0	0
25.8	Subsistence and support of persons	0	0
26	Supplies and materials	0	857
31	Equipment	0	575
32	Lands and structures	0	0
33	Investments and loans	0	0
41	Grants, subsidies and contributions	0	3,223
42	Insurance claims and indemnities	0	0
43	Interest and dividends	0	1
44	Refunds	0	0
99	Total obligations	1,315	72,818

Coastal Science, Assessment Response and Restoration: National Centers for Coastal Ocean Science (NCCOS) (Base Funding: $36,246,000 and 199 FTE; Program Change: $0 and - 16 FTE): NOAA requests a decrease of 16 FTE for a total of $36,246,000 and 183 FTE to reflect a realignment of NCCOS intramural research activities.

Proposed Actions:
In order to strengthen NOAA's coastal science in the long run, NOAA proposes to reduce its physical footprint and fixed costs by closing and consolidating some of its laboratories within the National Centers for Coastal Ocean Science (NCCOS). NOAA will close one laboratory facility within the Center for Coastal Fisheries and Habitat Research located in Beaufort, North Carolina. The aging facility requires infrastructure repairs and improvements exceeding a sustainable level of capital investment. Intramural research conducted by NOAA would be reduced in the areas of oceans and human health, coastal pollutants and contamination, and coastal environmental chemistry, toxicology, microbiology, molecular biology and ecology.

NOAA also proposes to consolidate one laboratory of the Center for Coastal Environmental Health and Biomolecular Research (CCEHBR), located in Charleston, South Carolina, with the Hollings Marine Lab, also in Charleston. CCEHBR will vacate the space it currently occupies in the state-owned building and will move staff to the Hollings Marine Lab. This move may necessitate a change in the Hollings Marine Lab Joint Project Agreement, as accommodating a larger NOAA staff may reduce space for state partners. NOAA will continue its commitment to collaborative science initiatives and continued partner use of unique laboratory assets.

NOAA does not anticipate any savings in FY 2015 for this proposal because of expenses associated with employee relocations, facilities disposal, and partial operating costs for the affected facilities. NCCOS will pursue Voluntary Early Retirement Authority and Voluntary Separation Incentive Program options in reshaping its workforce across the organization and make use of other workforce flexibilities in implementing these actions. At the Beaufort lab, NOAA will reassign and/or relocate the remaining employees prior to closure. In Charleston, 46 employees will be relocated to Hollings Marine Laboratory.

Statement of Need and Economic Benefits:
With this proposal, NOAA is shifting to a more partnership-oriented model. NOAA fixed costs would be reduced in future years through the elimination of older facilities with high fixed costs, allowing greater flexibility for work with NOAA partners and their local facilities. With the closure and consolidation of these regional labs, NOAA will avoid substantial capital costs for deferred maintenance at the Beaufort facility and reduce lease expenses for NCCOS's Charleston-area activities. With regard to its ongoing science needs, NOS will increase its reliance on extramural and state institutions to collect data and develop models.

Resource Assessment:
The resources for this activity are described in the Coastal Science and Assessment narrative.

Schedule and Milestones:
FY 2015:

- Partner with Workforce Management to ensure the appropriate transition for affected staff
- Begin closure of laboratory in Beaufort, NC
- Begin consolidation of Center for Coastal Environmental Health and Biomolecular Research in Charleston, SC with the Hollings Marine Laboratory

- Consider all options for federally owned facilities in Beaufort, NC, including excessing or transfer of ownership to Federal, state, and local partners in accordance with GSA real property excess procedures

Deliverables:

- Realignment of core mission internal operations within activities of the remaining facilities
- Coordination of applicable projects amongst research partners

Performance Goals and Measurement Data:

Performance Measure: Annual number of coastal, marine and Great Lakes ecosystem sites adequately characterized for management	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With Decrease	N/A	N/A	9	7	7	7	7
Without Decrease	11	13	13	10	10	10	10

Description: Ecological characterizations provide the scientific basis for coastal and ocean assessments and forecasts, and the development of plans to manage resources and assess the effectiveness of measures implemented to effectively manage natural resources. NOAA conducts characterizations on NOAA trust resources, essential fish habitats, Great Lakes habitats and living resources throughout the Nation's coastal zone.

PROGRAM CHANGE PERSONNEL DETAIL[5]

Program: National Ocean Service
Sub-program: Coastal Science and Assessment
Program Change: NCCOS

Title:	Location	Grade	Number of Positions	Annual Salary	Total Salaries
Oceanographer	Beaufort,NC	ZP-02	(2)	39,179	(78,358)
Oceanographer	Beaufort,NC	ZP-03	(2)	57,982	(115,964)
Oceanographer	Beaufort,NC	ZP-05	(3)	114,872	(344,616)
IT Specialist	Beaufort,NC	ZP-03	(1)	57,982	(57,982)
Purchasing Agent	Beaufort,NC	ZS-04	(1)	31,628	(31,628)
Facility Operations Specialist	Beaufort,NC	ZA-03	(1)	57,982	(57,982)
Program Analyst	Beaufort,NC	ZA-03	(1)	57,982	(57,982)
Program Analyst	Beaufort,NC	ZA-04	(1)	82,642	(82,642)
Safety & Occupational Health Speciali	Beaufort,NC	ZA-02	(1)	39,179	(39,179)
Technical Information Specialist	Beaufort,NC	ZA-03	(1)	57,982	(57,982)
Equipment Specialist	Beaufort,NC	ZA-03	(1)	57,982	(57,982)
Budget Analyst	Beaufort,NC	ZA-03	(1)	57,982	(57,982)
Maintenance Worker	Beaufort,NC	WG-09	(1)	48,027	(48,027)
Biological Science Technician	Beaufort,NC	ZT-02	(4)	31,628	(126,512)
Fish Biologist	Beaufort,NC	ZP-03	(3)	57,982	(173,946)
Fish Biologist	Beaufort,NC	ZP-04	(1)	82,642	(82,642)
Ecologist	Beaufort,NC	ZP-04	(3)	82,642	(247,926)
Microbiologist	Beaufort,NC	ZP-04	(1)	82,642	(82,642)
Research Chemist	Beaufort,NC	ZP-04	(2)	82,642	(165,284)
Total			(31)		(1,967,258)
less Lapse		50%	(15)		983,629
Total full-time permanent (FTE)			(16)		(983,629)
2015 Pay Adjustment (1.0%)					(9,836)
TOTAL					(993,465)

Personnel Data	Number
Full-Time Equivalent Employment	
Full-time permanent	(16)
Other than full-time permanent	0
Total	(16)
Authorized Positions:	
Full-time permanent	(31)
Other than full-time permanent	0
Total	(31)

[5] This represents decreases at Beaufort specifically but efforts will be made to reassign FTE within the organization.

PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Program: National Ocean Service
Sub-program: Coastal Science and Assessment
Program Change: NCCOS

	Object Class	2015 Increase	2015 Total Program
11	Personnel compensation		
11.1	Full-time permanent	($993)	$30,796
11.3	Other than full-time permanent	(92)	400
11.5	Other personnel compensation	971	1,253
11.8	Special personnel services payments	0	346
11.9	Total personnel compensation	(114)	32,795
12	Civilian personnel benefits	(239)	9,366
13	Benefits for former personnel	0	0
21	Travel and transportation of persons	(94)	741
22	Transportation of things	(43)	121
23.1	Rental payments to GSA	0	1,465
23.2	Rental Payments to others	0	448
23.3	Communications, utilities and miscellaneous charges	(20)	2,255
24	Printing and reproduction	0	24
25.1	Advisory and assistance services	132	18,867
25.2	Other services	(98)	126
25.3	Purchases of goods & services from Gov't accounts	0	163
25.4	Operation and maintenance of facilities	400	400
25.5	Research and development contracts	0	0
25.6	Medical care	0	0
25.7	Operation and maintenance of equipment	0	0
25.8	Subsistence and support of persons	0	0
26	Supplies and materials	(24)	833
31	Equipment	100	675
32	Lands and structures	0	0
33	Investments and loans	0	0
41	Grants, subsidies and contributions	0	3,223
42	Insurance claims and indemnities	0	0
43	Interest and dividends	0	1
44	Refunds	0	0
99	Total obligations	0	71,503

Coastal Science, Assessment, Response and Restoration: Scientific Support and Emergency Preparedness (Base Funding: $71,503,000 and 311 FTE; Program Change: -$3,815,000 and 0 FTE): NOAA requests a decrease of $3,815,000 and 0 FTE for a total of $67,688,000 and 311 FTE to conclude research and monitoring projects aimed at fulfilling high priority science needs within NCCOS centers around the country and to conclude preparedness activities in the Gulf of Mexico Disaster Response Center (DRC).

NOAA will use FY 2014 funding to conduct several training activities at its Gulf of Mexico Disaster Response Center, including Incident Command System training, a NOAA all-hazard response drill and training, spill response observing training, Science of Spills training, risk communications and media training, and Gulf NERRS disaster response planning drills and trainings. These activities will conclude at the end of FY 2014 after training more than 300 emergency and recovery responders and conducting an all hazards threat risk assessment. With remaining resources NOAA will continue critical support for response and restoration in the Gulf region in 2015.

PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Program: National Ocean Service
Sub-program: Coastal Science and Assessment
Program Change: Scientific Support and Emergency Preparedness

	Object Class	2015 Decrease	2015 Total Program
11	Personnel compensation		
11.1	Full-time permanent	$0	$31,789
11.3	Other than full-time permanent	0	492
11.5	Other personnel compensation	0	282
11.8	Special personnel services payments	0	346
11.9	Total personnel compensation	0	32,909
12	Civilian personnel benefits	0	9,605
13	Benefits for former personnel	0	0
21	Travel and transportation of persons	0	835
22	Transportation of things	0	164
23.1	Rental payments to GSA	0	1,465
23.2	Rental Payments to others	0	448
23.3	Communications, utilities and miscellaneous charges	0	2,275
24	Printing and reproduction	0	24
25.1	Advisory and assistance services	(3,815)	14,920
25.2	Other services	0	224
25.3	Purchases of goods & services from Gov't accounts	0	163
25.4	Operation and maintenance of facilities	0	0
25.5	Research and development contracts	0	0
25.6	Medical care	0	0
25.7	Operation and maintenance of equipment	0	0
25.8	Subsistence and support of persons	0	0
26	Supplies and materials	0	857
31	Equipment	0	575
32	Lands and structures	0	0
33	Investments and loans	0	0
41	Grants, subsidies and contributions	0	3,223
42	Insurance claims and indemnities	0	0
43	Interest and dividends	0	1
44	Refunds	0	0
99	Total obligations	(3,815)	67,688

Competitive Research: Competitive Research (Base Funding: $9,000,000 and 3 FTE; Program Change: +$6,000,000 and 0 FTE): NOAA requests an increase of $6,000,000 and 0 FTE for a total of $15,000,000 and 3 FTE to expand competitive research grants that address coastal ocean issues across NOAA's mission responsibilities including harmful algal blooms, hypoxia, and coastal ecosystem research and assessment.

Proposed Actions:
With this increase, NOAA will expand its competitive research grants program. The program addresses accelerating threats of Harmful Algal Bloom (HAB), hypoxia, sea level and land use change, and to better understand and predict the combined effects of environmental stressors on coastal communities, ecosystems, and economies. NOAA will continue to focus on the Nation's highest priority research needs of forecasting the ecological effects of regional stressors on coastal ecosystems and applying that information toward proactive management. The National Centers for Coastal Ocean Science (NCCOS) supports competitive, peer-reviewed, interdisciplinary research investigations with finite life cycles conducted on a regional ecosystem scale over a 3-5 year period. The program relies upon established processes that reflect the requirements and advice of both the management and science communities in setting its priorities to ensure the utility and credibility of funded research and its support of NOAA's mission and Congressional direction. This approach has proven highly successful over the past two decades in bringing together and leveraging subject matter and management expertise of the most qualified teams of scientists and managers in the nation across academic institutions, private industry and government laboratories. The program will also work with coastal programs to meet their priority coastal stewardship research needs.

Statement of Need and Economic Benefits:
Harmful algal blooms, hypoxia, climate change, and a diverse array of ecosystem stressors negatively affect human health, impair coastal ecosystems, and severely limit a community's ability to achieve economic and environmental sustainability. NCCOS competitive funding of research and applied science provides the information and tools, such as ecological assessments and forecasts, which coastal managers need to combat and mitigate the accelerating decline of the ecosystems and living resources under their purview. A single harmful algal bloom event can cause up to $25M in losses to coastal economies that rely on recreation, tourism, and seafood harvesting. These economic and resource impacts are increasing dramatically in many areas, thus increasing the demand for the type comprehensive and actionable science supported by these funds to combat these threats. Funded activities will directly support a range of NOAA's program authorizations, including the Harmful Algal Bloom and Hypoxia Research and Control Act, the Coastal Zone Management Act, the National Coastal Monitoring Act, and the Oceans and Human Health Act and are also responsive to Administration ocean and coastal policy priorities, including in the Great Lakes and Chesapeake Bay.

Resource Assessment:
Coastal Science and Assessment competitive funds support ecosystem research and assessment, focusing on climate change impacts, harmful algal blooms, hypoxia, and research to understand ecosystem services and support ecosystem management. There are approximately 50 ongoing projects managed by NCCOS, representing an active full life-cycle investment in excess of $87 million, involving 400 plus investigators at partner research institutions and management agencies. Together, these efforts are leading to rapid advances in the capacity of NOAA and coastal managers to understand, respond to, and mitigate the impacts of ecosystem stressors such as harmful algal blooms, hypoxia, sea level rise, nutrient pollution and coral reef declines. Key advances include: the development and transition to application of an advanced harmful algal bloom forecasting system; the capability to predict hypoxia and its impacts in the Nation's most important water bodies in order to guide ecosystem-level management; the ability to incorporate the ecological effects of sea level

rise into future planning scenarios; harmful algal bloom detection tools that are protecting public safety and allowing harvesting of economically valuable shellfisheries; and tools allowing managers to evaluate the trade-offs and linkages between watershed development and impacts to coastal ecosystems. Additional resources for this activity are described in the Coastal Science and Assessment narrative.

Schedule and Milestones:

- Develop methods of harmful algal bloom prevention, control, and mitigation for high priority coastal management requirements (FY 2016-2018)
- Develop and transfer new scientific tools, technologies and information products for decision-making on coastal resilience and resource sustainability (FY 2016-2019)
- Develop coupled hydrodynamic-biogeochemical model of Green Bay in Lake Michigan (FY 2016)
- Establish metrics for coral health and resilience and recovery that can be used to guide and track the effectiveness of restoration (FY 2015-2016)
- Investigate effects of land use and weather on runoff, eutrophication, hypoxic conditions, Harmful Algal Blooms and pathogens (FY 2016-2019)
- Develop sea level rise forecast modeling system for the northern Gulf of Mexico to drive coastal planning, restoration and protection of economic interests in the face of long-term sea level rise (FY 2016-2017)
- Develop and operationalize regional ecological forecast models for harmful algal bloom prediction and mitigation of economic impacts (FY 2016-2017)
- Develop operational hypoxia forecast modeling system for Chesapeake Bay, Narragansett Bay, and Gulf of Mexico to provide critical information for management (FY 2016-2018)
- Transition detection and monitoring technologies for harmful algal bloom cells and their toxins into observing systems to support forecasting and state shellfish surveillance (FY 2016-2018)

Deliverables:

- Model output evaluating the impact of alternative land management actions on the export of phosphorus and suspended solids into the lower portion of Lake Michigan
- Hypoxia ensemble forecast for the Gulf of Mexico
- Model output for developing and refining shoreline management guidelines in the Chesapeake and Delaware Bays, and the MD and DE Inland Bays
- Enhanced data integration and visualization tools
- Models on marsh response to changing sea level and assessments of impacts of shoreline modification on ecosystem services
- Forecasts of harmful algal blooms in five major coastal regions
- Coupled regional biophysical model for understanding population connectivity between Pulley Ridge and Florida Keys ecosystems
- Multidisciplinary ecological model to evaluate marsh, oyster and sea grass response to sea level rise in selected locations of the Gulf of Mexico
- Forecasts of hypoxia conditions in three major coastal regions

Performance Goals and Measurement Data:

Performance Measure: Cumulative number of coastal, marine and Great lakes forecasts capabilities developed and used for management	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With Increase	N/A	N/A	7	8	9	9	9
Without Increase	4	6	7	7	7	7	7

Description: NOAA's discrete forecast models allow resource managers to: 1) make decisions based on predicted environmental and socioeconomic impacts related to a particular issue; 2) use issue-based forecasts to predict the impacts of a single ecosystem stressor (e.g., climate change, extreme natural events, pollution, invasive species, and land and resource use) and 3) evaluate the potential options to manage those stressors to fulfill the ultimate goal for resource managers to use NOAA's forecasts to better manage ecosystem use, condition, and productivity. These forecasts will be based on field and laboratory studies, existing data, and models predicting environmental conditions under different scenarios, will have capabilities specific to a geographic area, and be counted for each ecosystem as they become operational. For example, harmful algal bloom forecasts in the Gulf of Mexico and Gulf of Maine are two separate forecast capabilities and similarly, multiple, distinct forecast capabilities could be counted within a single ecosystem (e.g., harmful algal blooms, pink shrimp harvest, and hypoxia –all in the Gulf of Mexico).

PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Program: National Ocean Service
Sub-program: Coastal Science and Assessment
Program Change: Competitive Research

	Object Class	2015 Increase	2015 Total Program
11	Personnel compensation		
11.1	Full-time permanent	$0	$334
11.3	Other than full-time permanent	0	95
11.5	Other personnel compensation	0	0
11.8	Special personnel services payments	0	0
11.9	Total personnel compensation	0	429
12	Civilian personnel benefits	0	0
13	Benefits for former personnel	0	0
21	Travel and transportation of persons	0	10
22	Transportation of things	0	2
23.1	Rental payments to GSA	0	45
23.2	Rental Payments to others	0	3
23.3	Communications, utilities and miscellaneous charges	0	0
24	Printing and reproduction	0	3
25.1	Advisory and assistance services	0	565
25.2	Other services	0	11
25.3	Purchases of goods & services from Gov't accounts	0	44
25.4	Operation and maintenance of facilities	0	0
25.5	Research and development contracts	0	0
25.6	Medical care	0	0
25.7	Operation and maintenance of equipment	0	0
25.8	Subsistence and support of persons	0	0
26	Supplies and materials	0	53
31	Equipment	0	3
32	Lands and structures	0	0
33	Investments and loans	0	0
41	Grants, subsidies and contributions	6,000	13,832
42	Insurance claims and indemnities	0	0
43	Interest and dividends	0	0
44	Refunds	0	0
99	Total obligations	6,000	15,000

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APPROPRIATION ACCOUNT: OPERATIONS, RESEARCH AND FACILITIES
SUB-PROGRAM: OCEAN AND COASTAL MANAGEMENT AND SERVICES

Activities and programs under the Ocean and Coastal Management and Services sub-program employ a diverse range of place-based and national approaches to achieve sound management and sustainable use of resources in coastal watersheds and marine areas of the U.S. Exclusive Economic Zone. NOAA's authorizations in these areas emphasize full consideration of economic, ecological, cultural, historic, and esthetic values of places.

Within this sub-program, NOS employs a broad range of approaches that emphasize inter-governmental collaboration. Through partnerships, capacity building, applied science, incentives, regulation, and direct management, NOS works collaboratively with Federal, state, tribal, local, and private entities to achieve national goals. NOAA conducts these activities under the Coastal Zone Management Act; National Marine Sanctuaries Act; the Coastal Zone Act Reauthorization Amendments of 1990 (the Coastal Nonpoint Pollution Control Program); the Department of Commerce, Justice, and State Appropriations Act of 2002; the Omnibus Public Land Management Act; the Ocean Thermal Energy Conversion Act and the Deep Seabed Hard Mineral Resources Act; the Ocean and Coastal Mapping Integration Act; Executive Order 13158 on Marine Protected Areas; and Presidential Proclamations 8031 and 8337.

The following program offices and program office components are responsible for carrying out the Ocean and Coastal Management and Services sub-program:

- **Office of Ocean and Coastal Resource Management/ Coastal Services Center.** These offices are responsible for supporting states' development and implementation of their Coastal Zone Management programs and National Estuarine Research Reserve management plans and promoting effective management of the associated coastal resources. This support includes delivery of a comprehensive suite of applied tools, technical and policy assistance, and training resources to a range of coastal partners to address resource management challenges. These offices also are cooperating to administer and support NOAA's Digital Coast Partnership, the Coastal Storms Program, the Coral Reef Conservation Program, Regional Ocean Partnerships, and the Ocean Thermal Energy Conversion Act and the Deep Seabed Hard Mineral Resources Act.
- **Office of National Marine Sanctuaries/ National Marine Protected Areas Center.** This newly merged office is responsible for the direct management of the National Marine Sanctuary System and the Papahānaumokuākea Marine National Monument. This office facilitates public and private uses of the resources of these special places that are compatible with resource protection and conservation. This office is also responsible for developing a national system of marine protected areas, which includes sanctuaries. By coordinating actions of a national network of Federal, state, tribal and local protected areas, the Office advances national conservation goals and helps to identify additional areas in need of protection.

Coastal Zone Management and Services

The narrative below describes programs funded through the Coastal Zone Management and Services and Coastal Management Grants program activities.

Coastal states and local governments play an important role in fostering resilient coastal communities and protecting and managing natural resources. The challenges are increasing with population growth and resource impacts and use, particularly given extreme weather events and a changing climate. Voluntary partnerships between states and NOAA form the basis of NOS's comprehensive approach under the Coastal Zone Management Act. NOAA provides financial assistance, national policy guidance, coordination and leadership, technical assistance, and other support to implement 34 coastal management programs; support research, monitoring, education, training and stewardship at 28 National Estuarine Research Reserves; and support the protection of ecologically significant coastal lands (such as wetlands, natural shorelines and other important habitats) through the Coastal and Estuarine Land Conservation Program.

NOS's Coastal Zone Management (CZM) Program helps states with balance competing demands for resource use, economic development, and conservation along the Nation's coasts. The 34 (out of 35 eligible) coastal and Great Lakes states, territories and commonwealths with federally approved coastal management programs, protect more than 61,000 miles of ocean and Great Lakes coastline, which benefits 99 percent of the U.S. coastal population. NOS administers the CZM Program at the Federal level, approving state coastal management programs and policies and providing implementation assistance in the form of technical, policy, and legal guidance. NOS also analyzes national and regional issues in coastal management, measures progress of the national Program in meeting its goals, and communicates on issues of importance from national to local levels. NOS also helps to ensure that Federal agency activities are consistent with enforceable policies of state coastal management programs. NOS assesses the performance of each state program approximately every five years to provide guidance on improving programs.

Also in support of state management programs, NOS provides financial assistance to states through cooperative agreements (Coastal Zone Management Grants). States may use these funds toward a broad range of approved activities under the Coastal Zone Management Act, including coastal planning and permitting, habitat conservation and restoration, protection of life and property from coastal hazards, public access to the coast for recreation, and urban waterfront and port revitalization. NOS allocates the majority of CZM grant funding using a formula based on shoreline mileage (60 percent) and coastal population (40 percent) of each state. NOS also competitively awards a portion of the Coastal Zone Enhancement funding (Section 309 CZMA) for projects of special merit. States match most of the CZM Grant funding on a 1:1 basis.

To enable more effective implementation of the Coastal Zone Management Act, NOS (through its Coastal Services Center) builds regional, state, and local capacity for informed decision making that improves the resiliency of our coasts and coastal communities and economies. The Coastal Storms Program, which harnesses and leverages NOAA and community resources to reduce the impacts of coastal storms, is included in these efforts. Eighty percent of decisions that affect our coasts are made at the local level, and the primary customers for these efforts are the Nation's coastal managers: natural resource managers, planners, floodplain managers, and emergency officials. By developing successful tools, social science applications, strategies, and partnerships and transferring them to the broader coastal management community, NOS effectively "buys down" the cost of improving state and local coastal management programs.

For example, NOS expertise in socioeconomic analysis, vulnerability assessment, and resilience planning supports a NOAA-led team to coordinate and execute activities established by the

RESTORE Act under the Gulf Coast Ecosystem Restoration Council. NOAA collaborates with the Federal Emergency Management Agency, U.S. Army Corps of Engineers, and the Department of Housing and Urban Development to develop a consistent suite of resilience principles for development and redevelopment in coastal areas. Also included in NOS's suite of coastal services is a partnership to plan and execute effective habitat conservation with NOAA's Office of Habitat Conservation and the Department of Interior's Landscape Conservation Cooperatives.

Coastal Management Grants

This program activity provides funding for cooperative agreements with states in support of the Coastal Zone Management Program. See the program activity description for NOS's Coastal Zone Management and Services for program descriptions, schedule, milestones, and performance measures.

Coral Reef Program

NOAA's coral reef conservation and science activities are funded within the Coral Reef Program program activity.

NOS's Coral Reef Conservation Program (Coral Program) brings together multidisciplinary expertise from over 30 NOAA offices and partners with state, jurisdictional and international coastal resource managers to protect, conserve and restore coral reefs. Nineteen percent of the world's reefs are effectively lost[6] and up to 75 percent, either are under threat or seriously threatened with loss in the next few decades from unsustainable fishing practices, climate change impacts, and land-based sources of pollution[7]. In response to these threats, NOAA's Coral Program invests in ecosystem-based management initiatives to build marine protected area (MPA) management capacity; monitor, model and forecast climate-related risks and vulnerabilities to coral reefs; and foster partnerships to address and reduce impacts of land-based sources of pollution. In addition, the program's educational efforts foster an engaged public that understands the importance of conserving coral reef ecosystems.

Coral reefs are some of the most biologically diverse ecosystems in the world and provide a range of economic benefits and vital ecosystem services: food, recreation, marine habitat, medicines, coastal protection, climate regulation, and maintenance of genetic diversity. A study in 2009 estimated the average annual value of these ecosystem services at $130,000 per hectare of reef, reaching $1,200,000 in some cases[8]. Therefore, declines in coral reef habitats have alarming consequences for approximately 500 million people who depend on them for their livelihoods.[9]

To date, the Coral Program has integrated coastal management efforts across NOAA and with more than 170 partners have mapped over 50 percent of shallow reef ecosystems in U.S. jurisdictions, established approximately 200 operational and experimental coral bleaching alert stations, and developed watershed management plans in over 85 percent of U.S. jurisdictions with coral reef habitats. These collaborations have supported 20 assessments on MPA management effectiveness, increased reef managers' monitoring and response efforts on coral bleaching events, and addressed

[6] Wilkinson, C. *Status of Coral Reefs of the World*, 2008.
[7] Burke et al. *Reefs at Risk Revisited*, 2011.
[8] The Economics of Ecosystems and Biodiversity (TEEB), 2009.
[9] Wilkinson, C. *Status of Coral Reefs of the World*, 2008.

the release of land-based sources of pollution from over 200 square miles discharging to six priority site coral reef habitats.

National Estuarine Research Reserve System

The National Estuarine Research Reserve System (NERRS) is a national network of protected areas established under the Coastal Zone Management Act to conduct research, provide long-term protection and enhance public awareness and opportunities for education. NERRs sites represent the diverse biological and physical characteristics of estuarine systems of the United States and are economically significant areas for recreation, fishing, and ecotourism. The 28 reserves in 22 states and territories protect over 1.3 million acres of estuarine lands and waters and are owned and operated by state agencies or universities. The Governors of Connecticut and Hawaii have submitted a request to NOAA to begin the process for designation of a new reserve in their state. Each Reserve serves as both a mixed-use protected area and a living laboratory. Reserves enable improvements in resource management by serving as research sites, testing grounds for direct resource management and restoration practices, and venues for the translation and dissemination of information to coastal decision makers, teachers, students, and the public. Additionally, reserves monitor coastal water quality and habitat and are working to better understand the impacts of local sea level change and inundation impacts to key estuarine habitats that contribute to the NOAA Sentinel Sites Program.

NOAA provides funding assistance, national guidance and technical assistance, while state agencies or universities perform day-to-day management of each reserve with input from local partners. NOAA funds site-specific programs as well as system-wide activities. Federal NERRS funding (70 percent) is matched by the states (30 percent) for reserve operations, research, monitoring, training, education and facilities construction. Federal NERRS funding (50 percent) for land acquisition is also matched by the states (50 percent). The NERRS Science Collaborative helps reserves and coastal managers address complex management issues by funding research projects that grantees conduct in close consultation with intended users of the research products.

As states and NOS have selected each reserve site for its unique ecological and conservation characteristics, the reserve system is invaluable for piloting innovative resource management practices, researching restoration practices, and providing professional training and education. Scientists working in NERRs have contributed to more than 300 peer-reviewed scientific publications since FY 2000. Research and monitoring data are used to inform stakeholders such as coastal managers, shellfish growers, public health officials, search and rescue personnel, and recreation users. Coastal decision-makers participating in reserve-based training gain practical information to inform estuarine management at the local and regional level. In the last year alone, reserves organized training to more than 10,000 coastal decision-makers in communities across the Nation.

Sanctuaries and Marine Protected Areas

National Marine Sanctuaries

Under the National Marine Sanctuary Act, NOS manages and operates the Nation's system of 13 designated marine sanctuaries and the Papahānaumokuākea Marine National Monument. The sanctuaries range in size from one square mile near Cape Hatteras, North Carolina, to over 13,500 square miles in the waters off America Samoa. Together, these sanctuaries and the Monument encompass over 172,000 square miles of protected special marine places. Unique sanctuaries habitats include deep ocean and near-shore coral reefs, live bottom, whale migration corridors, deep-sea canyons, areas of deep water upwelling, submerged banks that rise close to the ocean surface, kelp forests, and sea grass beds. The sanctuary system also protects maritime heritage assets such as shipwrecks.

Individual sanctuary and monument offices are responsible for the daily operation of a wide variety of education, research, monitoring and management activities:

- Development, implementation, and systematic review of comprehensive management plans to protect these unique areas;
- Local research and monitoring programs to better understand the resources and potential impacts on those resources;
- Cultural resource programs to survey and inventory resources to ensure their long-term protection;
- Education and outreach activities to inform the public about the value of marine resources and how human activities impact the marine environment;
- Coordination through partnerships to ensure enforcement of sanctuary regulations;
- Permitting of otherwise prohibited activities to allow valuable research and education activities;
- Management of volunteer programs that monitor and educate on marine resources; and
- Management of citizen advisory councils to ensure that each sanctuary is responsive to community needs.

Sanctuaries' national and regional offices provide overall programmatic oversight and guidance to ensure that the National Marine Sanctuary System (NMSS) operates as an integrated system that has greater national impact than the sum of the individual site actions. Headquarters functions include system-wide research, monitoring, and outreach programs; review and revisions of existing management plans; evaluation of new sites; and overall policy development and program direction. Sanctuaries' regional offices serve as hubs for program integration with NOAA's evolving ecosystem approach to management and NOAA regional teams for national priorities pertaining to climate change and marine planning. Sanctuary regions coordinate programs and assets among the sites, build partnerships with regional stakeholders and enable Federal interagency regional activities.

Marine Protected Area Coordination

NOS manages its sanctuaries and estuarine reserves activities in close coordination with its activities under the Marine Protected Areas (MPA) Center, as guided by the Framework for the National System of MPAs. The program, in coordination with the Department of the Interior, fills a long-standing need for objective science, policy, and management tools to advance the effective use of MPAs in meeting diverse conservation and management objectives. The MPA Center's primary goal is to coordinate among the various Federal, state and tribal MPA programs to develop a comprehensive and integrated national system of MPAs, including NERRs and sanctuaries, that more effectively conserves and protects significant areas of our natural and cultural marine heritage. A diverse MPA Federal Advisory Committee--including representatives of industry, user groups, scientists, and others-- provides advice on the establishment and management of the national system.

Sentinel Sites

The NOAA Sentinel Site Program (SSP) uses existing capacity of range of NOAA programs to answer critical coastal management science questions using place-based approaches. While the concept of leveraging existing resources is not new, the NOAA Sentinel Site Program provides a framework to connect programs across disciplines and activities to inform decision makers at relevant spatial and temporal scales. The Sentinel Site Program's initial focus is on assessing and responding to the impacts of climate change, specifically sea level change and coastal inundation. In the future, NOAA plans to expand the program's issue coverage to include other pressing issues that affect both NOAA trust resources and surrounding communities, such as ocean acidification.

The three major criteria for site selection are scientific rationale and ecological significance; practicality of working in the area and the potential for leveraging existing assets; and potential relevance to local management and the potential for responsiveness of the local communities and ecosystems to management actions. Using these criteria, five Cooperatives were selected for initial implementation. They are Hawaii; San Francisco Bay and Outer Coast; Chesapeake Bay; North Carolina; and the Northern Gulf of Mexico.

Each of the current five Sentinel Site Cooperatives includes a coastal commerce center and at least one sanctuary or NERR. Sanctuaries and NERRs generally contain significant existing NOAA investments in observing infrastructure, monitoring, modeling assets, historical data, and partnerships. The Sentinel Site Program leverages these existing investments to maximize the benefit of the end-to-end spectrum of products and services— monitoring, research, modeling, spatial analysis, knowledge transfer, and resource management action. The presence of significant coastal commerce at the sites maximizes the potential economic return on improved management and planning practices.

Schedule and Milestones:

- Develop and deliver state coastal resource and emergency manager decision support tools, such as hazard assessment tools, sea level rise visualizations, and coastal county snapshots (FY 2015-2019)
- Provide technical assistance, tools and coordination on priority issues to support managers in state led regional partnerships including the Gulf of Mexico Alliance, the West Coast Governors' Alliance on Ocean Health, the Northeast Regional Ocean Council, the Hawaii Ocean Partnership, the Mid-Atlantic Regional Council on the Oceans, and others (FY 2015-2019)
- Develop, distribute, update, and apply moderate resolution coastal land cover change analysis data (refreshed on five-year basis) for coastal regions (FY 2015-2019)
- Develop integrated models to provide information about storm vulnerability and ecological impacts (FY 2015-2019)
- Complete revision of 15 NERR management plans by FY 2016
- Complete 96 percent of National Estuarine Research Reserve site profiles by FY 2016
- Conduct sentinel site monitoring of sea level change and habitat response at four reserves (FY 2015-2019)
- Work with states/territories toward approval of non-point pollution control programs (FY 2015-2019)
- Execute 33 state coastal assessments and strategies under CZMA Sec. 309 to enhance coastal management in the U.S. states and territories, including innovative coastal resilience strategies competitively funded under Projects of Special Merit (FY 2015-2019
- Work with states/territories to improve public access to the coast for recreation and to protect key coastal habitats (FY 2015-2019)
- Conduct reef assessment and monitoring cruises in Pacific and Atlantic/Caribbean (FY 2015-2019)
- Continue to improve coral bleaching forecasts and ocean acidification models (FY 2015-2019)
- Complete the State of Coral Reef Ecosystems Report every four years and distribute to policy makers, resource managers and others to facilitate implementation of coral reef conservation strategies (FY 2016)
- Conduct social marketing campaigns to raise awareness of coral reef conservation and change behavior (FY 2015-2019)

- Conduct surveys in the U.S jurisdictions to monitor social change regarding reef resources (FY 2015-2019)
- Implement additional sentinel monitoring activities where necessary to assess impacts of threats (e.g. climate change, biodiversity loss, invasive species) to ONMS resources and detect early warnings of change at national, regional, and local scales (FY 2015-2019)
- Update the Framework for the National System of Marine Protected Areas of the United States of America (FY 2015-2019)
- Implement data management (including access and distribution) protocols, infrastructure, and partnerships for ONMS Sentinel Monitoring Program (FY 2015- 2019)
- Complete watershed management plans for 21 priority coral reef areas (FY 2017)
- Complete assessments on management effectiveness of 20 Marine Protected Areas (MPAs) in priority coral reef sites (FY 2017)

Deliverables:

- Data, mapping, tools, and information resources through Digital Coast to address competing uses of coastal resources and adaptation to coastal hazards and climate change
- Training and workshops on data, tools, and techniques that address competing uses of coastal resources and adaptation to coastal hazards/climate change
- Effective regional ocean partnerships by building capacity through facilitation, training, and workshops addressing completing uses of coastal resources and adaptation to coastal hazards and climate change
- A coordinated NOAA structure that supports targeted capacity building for Regional Planning Bodies and geospatial data and decision support tools needed for regional planning efforts
- Outreach publications to increase capacities among coastal resource managers, land use planners, emergency managers, floodplain managers, and others
- Development of risk and vulnerability decision-support tools to assist with decision making regarding the impacts of storms on natural resources and communities
- Visualization tool incorporating socio-economic data overlaid with coastal inundation scenarios
- Two state or local adaptation plans annually to decrease community vulnerability
- Average of 250 sites created or improved each year that provide public access to the coast for recreation
- Average of 2,000 acres of key coastal habitats protected by state coastal management programs through acquisition or easement per year
- More than 300 training activities conducted annually for coastal decision makers through the NERRS Coastal Training Program
- More than 80,000 annual participants in experiential education activities that increase their understanding about estuaries
- 140 operational monitoring stations at NERR sites delivering water quality and weather data to a wide range of private and public users
- Development and/or expansion of partnerships with local communities and businesses to implement sustainable practices for fishing, tourism, recreation, ecosystem protection and alternative energy technologies
- Development and/or expansion of education and public outreach, including those with multi-cultural communities, related to ecosystems, climate change and human use impacts
- Identified and implemented suite of actions to increase local capacity to management priority coral reef sites in U.S. jurisdictions
- Forecasts and models that increase reef managers' monitoring and response efforts on coral bleaching events

- Priority coral reef Marine Protected Areas (MPAs) demonstrating an improvement in management capacity
- Seven reports – one per jurisdiction – on the status of jurisdictional management capacity (organizational, human resources, legal and technical) to determine the capacity gaps that need to be addressed in order for local resource management efforts to be effective
- Development and implementation of watershed management plans to reduce pollutant loadings in target watersheds adjacent to priority coral reef habitats
- New management strategies to better protect coral reef areas implemented through targeted research to better understand the impacts of stressors to coral reefs
- Habitat restoration and marine debris removal at all sanctuaries
- Monitoring programs, scientific assessments, technology application, public awareness and mitigation strategies associated with ecosystem changes at all sanctuaries
- Marine acoustics programs to determine the distribution of marine mammals and vessel traffic patterns at Stellwagen Bank and Channel Islands sanctuaries. Develop education initiatives at all sites that protect marine mammals from vessel strikes and conduct disentanglement and rescue operations
- Design and implantation of MPA networks, to enable effective conservation of more acres of coral reefs within U.S. boundaries
- New education, survey and eradication programs to avoid and mitigate introduction of invasive species in multiple sanctuaries
- Community-based management plan for HI/Humpback Whale NMS

Performance Goals and Measurement Data:

Performance Measure: Percentage of U.S. coastal states and territories demonstrating 20% or more annual improvement in resilience capacity to weather and climate hazards	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	57%	46%	51%	57%	63%	69%	74%
Description: This measure tracks a range of contributions to address coastal community risk, vulnerability, and resilience to coastal hazards. It quantifies NOAA's contributions to this important goal across NOAA's coastal programs, measuring how NOAA is improving the Nation's capacity for resilience to hazards and is contributing significantly to NOAA's efforts to improve integration of its coastal programs, and expanding beyond the three coastal integration programs providing inputs to the measure (CSC, OCRM, and Sea Grant).							

Performance Measure: Percentage of tools, technologies, and information services that are used by NOAA partners/ customers to improve ecosystem-based management	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	91%	90%	91%	91%	91%	91%	91%

Description: This measure tracks NOAA's success in providing tools, technologies, and information services such as those for coastal and marine resource managers that enable progress toward the principles of ecosystem-based management (considering ecological, economic, social, and security concerns) for coastal, marine, and Great Lakes ecosystems. By cataloging and tracking each fiscal year the existing and new tools, technologies, and information services authorized and developed to meet stakeholders' needs (50 to 100), NOAA encourages their completion and use to advance ecosystem-based management. NOAA can also then ensure investments in the most effective programs and products for the Nation. NOAA partners and customers include Federal, state, local and tribal authorities who make decisions affecting resources in the U.S. coastal zone, and other users affecting the condition of coastal ecosystems (e.g., private industry). Actuals are derived by dividing the number of tools/services developed by the end of the year by the number proposed at the beginning of the year. Targets are based on historical patterns and the amount of funds being requested. Services can include on-line courses for managers, enhanced websites, broadcasts of live events, and workshops and other training techniques. New tools are developed with partners and customers that improve our products and services for ecosystem managers. Benefits of better management of the Nation's coastal, marine, and Great Lakes resources accrue to all citizen's through sustainable ecosystems that provide jobs, products and services that are unique to coastal and ocean areas.

Performance Measure: Annual number of new or improved public access sites through CZMP	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	551	200	250	250	250	250	250

Description: This measure tracks the number of sites that have been created or enhanced under the Coastal Zone Management Program for public recreational access to the coast.

Performance Measure: Percentage of NERR System adequately characterized for management	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	96%	96%	96%	96%	96%	96%	96%

Description: This tracks NOAA's progress in characterizing each National Estuarine Research Reserve's resources and condition to guide effective long-term management. Reserves are characterized through site profiles, which summarize the existing state of knowledge about reserve research and monitoring activities and identify research needs that should be addressed in the future. It is measured as the percent of designated Reserves that have completed a site profile.

Performance Measure: Number of priority sites with completed and approved watershed management plans	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	16	18	19	20	21	21	21

Description: This measure tracks the progress of NOAA's Coral Program to reduce land-based sources of pollution (LBSP) from priority site watersheds to coral reef areas that have been identified through the jurisdictional management priority setting process. Watershed management plans include to the greatest extent practicable, the nine (9) required elements of a WMP according to the EPA Section 319 program and include a ridge to reef approach to ensure coral reef ecosystems are integrated into watershed planning processes. Once plans are approved, projects are implemented to reduce LBSP to coral reef ecosystems.

Performance Measure: Number of participants of focus area training activities	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	1,281	1,092	1,114	1,136	1,159	1,182	1,182

Description: This measure tracks the number of participants trained by the NOAA Coastal Services Center on priority coastal issues (e.g., climate adaptation strategies, coastal inundation mapping) the application of geospatial technology (e.g., GIS), process skills (e.g., project design and evaluation), and tool-based trainings that explain how to apply certain customized decision support tools to coastal management (e.g., CanVis).

Performance Measure: Number of NMS Sites that maintain or improve water quality, habitat and living marine resources	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	10	10	10	12	12	12	12

Description: This measure assesses the status of water quality, habitat, and/or living marine resources based on indicators of biodiversity, key species, extracted species, invasive species, health and human impacts. The NMSP and independent evaluators (universities, research institutions SAC research subcommittees, and environmental consultants) evaluate data to determine whether the condition is improving, remaining stable (maintaining), or deteriorating. These outcome-based measures are derived from the National Marine Sanctuaries Act and provide direct and quantifiable evidence to demonstrate Program effectiveness. For each sanctuary, a "condition report" integrates the best available science and scientific interpretation to quantify the status and trends of WQ, habitat and living resource conditions. During the past five years, ONMS has undergone two additional formal external reviews (NAPA and DOC OIG) that have documented successful application and progress toward these performance measures.

Performance Measure: Number of MPA stewardship projects and technical assistance projects funded	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	4	4	4	4	4	4	4

Description: A primary goal of the National Marine Protected Areas Center is to provide technical assistance to Federal, state and territorial MPA programs. This measure tracks the number of MPA Partnership Grants (provided through a partnership with the National Fish and Wildlife Foundation) and technical assistance projects directly supported by the MPA Center that enhance the management of coastal and marine resources.

PROGRAM CHANGES FOR FY 2015:

Coastal Zone Management and Services: Capacity to Respond to Extreme Events (Base Funding: $41,472,000 and 140 FTE; Program Change: $5,000,000 and 0 FTE): NOAA requests an increase of $5,000,000 and 0 FTE for a total of $46,472,000 and 140 FTE to build capacity for response and resilience to extreme events, including continued improvements to inundation monitoring and modeling, social science and risk communication, tools and decision support, place-based monitoring, and planning and training for resilient coastal development.

Proposed Action:
NOAA requests an increase of $5,000,000 to provide products and services that help coastal communities to prepare for, respond to, and recover more quickly from, natural disasters.

Building off recovery efforts in communities impacted by recent major disasters, NOAA will extend its products and services to provide:

- An enhanced network of expanded real-time inundation observations, providing coastal decision makers with accurate and timely information ($500K);
- Inundation modeling to improve storm surge forecasts and long term detection of sea level impacts. ($1M);
- Targeted technical assistance through improved tools and training resources (e.g., guidance regarding the balanced use of hard infrastructure approaches with "green," habitat-oriented approaches in coastal development) and training on risk communication strategies ($2M);
- A robust network of NOAA expertise and capabilities (NOAA Sentinel Sites Program), monitoring sites (e.g., Tide stations and NERRS Sentinel Stations), and decision makers focused on detecting changes associated with climate impacts (e.g., sea level change) and applying those to management activities ($500K); and
- Social science research, methods, and tools to improve our ability to communicate risk associated with inundation events ($1M).

NOAA will deliver actionable information that can guide decision-making, addressing the urgent need for technical assistance to help state and local communities to apply, and therefore maximize the benefits of, existing data and tools for coastal planning and development decisions. Many inundation-related products are currently tailored to navigation safety but could inform protection of land-based coastal resources if combined with value added services. For example, the Nation's coastal communities have requested tools that describe inundation risk in terms of physical markers on land (i.e. predicted water level as a distance above a specific location on land) rather than a tidal datum (e.g. mean high water level). In addition, the development of ensemble model products (aggregating surge, tides, waves and wave run-up data) would produce easily understandable and actionable total water level products.

Using more easily applicable information, coastal communities can translate NOAA water level data, elevation data, and storm surge forecasting products into deliberate preparedness, response and recovery actions. The intended outcome of such actions would include mitigating inundation risk to inland resources, accelerating recovery from disaster events, adapting to changing conditions, and to minimizing post-disaster "down time" for area businesses and residents. In disseminating this information, NOAA will place emphasis on integrating existing inundation products and improving methods of communicating risk.

Statement of Need and Economic Benefits:
Our coastal communities and shorelines are facing escalating risks from changes in storm intensity, precipitation, flooding, and sea level that can result in dramatic economic losses. Storm surge and flooding from extreme weather events pose an acute and increasingly frequent risk to the coasts. Increasing sea level can further escalate the risk. NOAA's National Climatic Data Center noted 14 weather and climate-related disasters in 2011 with over $1 billion in damages each, and in 2012, AON Benfield (insurance broker) noted 11 disasters with over $1 billion in damages. Coastal areas also account for the most repetitive flood loss claims with the National Flood Insurance Program (NFIP) and the private casualty loss insurance industry at a cost of $200 million per year for the NFIP alone. Furthermore, a recent Heinz Center study reported that insurance claims only account for half of the actual losses associated with any one disaster event.

According to a report released in March by the Census Bureau, the U.S. population in the counties directly along the coast experienced a 39 percent increase in population from 1970 to 2010. The population density at the coast is expected to continue increasing into the future, further intensifying the pressures on ecologically and economically important areas, and putting more people, infrastructure, and businesses/ economic drivers in the path of coastal storms. Potential economic impacts are significant in this region, as coastal economies contributed $8.3 trillion to the GDP in 2010 (58 percent).

Resource Assessment:
A majority of the current social science support for NOAA is supplemented through limited, yet productive, grants and contracts with academia and private industry. This request allows NOAA to incorporate social science expertise into the life cycle of product development, providing more targeted messaging, delivery mechanisms, training, and evaluation to NOAA customers.

Observations, data management and analysis; the development and application of models and visualization tools; appropriate education and outreach; and the inclusion of adaptation strategies for the management of NOAA trust resources are all being conducted within the current resources of many NOAA programs. In addition, NOAA's supplemental funding resulting from Hurricane Sandy is already supporting technical assistance activities in Sandy-affected communities. The support outlined in this proposal would build upon these efforts, transferring lessons-learned to other regions working to improve their resilience before the next extreme event.

Schedule and Milestones:
FY 2015:

- Extend water level benchmarks networks to provide inundation information at locally-significant landmarks to improve communication of risk and facilitate clear warnings
- Improve accuracy of total water level inundation predictions for all vulnerable U.S. coastal regions by transitioning to operations community-based models evaluated in a test bed framework which provides a high resolution ensemble of coupled surge/tide/wave/river modeling systems
- Align and simplify communication of NOAA's real-time products, observations, forecasts, and seasonal outlooks by improving mechanisms to promote situational awareness and referencing terms readily understood by emergency managers and the public (e.g. "above ground level")
- Collect non-federal IOOS models and data sets to support ensemble approaches and Next Generation Storm Surge Modeling and evaluation via the U.S. IOOS Coastal and Ocean Modeling Testbed (COMT)

- Continue developing capacity to model wave run-up to provide better forecasts for impacts to beaches, based a pilot project with NWS Eastern Region and USGS (Marine Geology).
- Begin to develop pilot maps and tools that communicate future flood risk
- Enhance flood inundation impacts viewer by incorporating probabilistic seasonal outlooks and extremes, with an initial emphasis on the Pacific Islands, PR, and USVI
- Develop outreach and training materials (including virtual formats) based on the findings of recent social science research and assessments on effectively communicating storm surge and sea level rise risks so safer actions are taken
- Begin to develop training and place-based planning to improve disaster preparedness, response and recovery operations
- Develop a Sentinel Site Program national decision support framework that integrates cross-NOAA sea level rise resources and other climate resources

FY 2016-2019:

- Document evaluation results of modeling capabilities to ensure complementary non-federal and federal approaches and improved efficiency
- Continue to use social science research, methods, and tools to better understand how to communicate risk and improve the public's response to risks across multiple inundation products and time scales (storm surge forecasts, FEMA FIRMs, sea level change mapping)
- Assess social, ecological, and economic benefits of utilizing green/gray infrastructure to support recovery of impacted communities
- Improved visualizations and animations of inundation events and scenarios
- Support and enhance a network of place-based Sentinel Sites providing information that supports regional planning and decision-making linked to extreme events and climatic impacts
- Build out training and place-based, pre-disaster preparedness and disaster mitigation planning, response, and recovery operations
- Improve local strategies and policy enhancements to address inundation impacts

Deliverables:

- Protocols and practices for establishing benchmarks and water level stations for real-time inundation reporting (water level height above ground level) and integration into NERRS Sentinel Sites to address long term impacts
- Outreach and training materials for emergency managers to understand how to relate storm surge forecasting with real-time water level observation to more clearly communicate predicted water level and risk as a distance above a specific location on land
- Technical assistance and expertise for applying and expanding inundation products and risk communication messaging targeted to NOAA Sentinel Site Cooperatives
- Tools and visualizations (3-4 annually) that allow coastal community decision makers and the private sector to assess their risk from flood disasters
- Assessments of social and economic benefits of green infrastructure implementation in recovering/redeveloping communities
- Place based, coordinated, disaster response planning, in coordination with coastal states and communities, to support development of response protocols, mitigation/adaptation strategies, and identification of environmental stressors and potential environmental resources at risk
- NOAA Sentinel Site Program national decision support framework

- Virtual training modules to proliferate courses and curricula covering a wide variety of topics for emergency decision makers, including: science of oil spills, storm surge dynamics, marine debris monitoring, risk assessment and removal best practices, risk communications, shoreline assessment, environmental trade-offs, Natural Resource Damage Assessment, response to oiled wildlife, and others

Performance Goals and Measurement Data:

Performance Measure: Virtual training modules developed for decision-makers and responders to support disaster response planning and preparedness	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With Increase	N/A	N/A	2	2	2	2	2
Without Increase	1	1	1	1	1	1	1

Description: NOAA/OR&R presently offers in-person training for responders on topics including the Science of Oil Spills, Aerial Observer Training, and the Shoreline Cleanup and Assessment Technique (SCAT), but these opportunities are volume-limited by staff availability and class size and cannot meet demand. Making these training modules available virtually would provide first responders and other stakeholders in geographically dispersed (including tribal and rural) communities, as well as new response staff who may be unable to travel, access to these valuable trainings that enhance safety and effective scientific support for all-hazards incidents.

Performance Measure: Digital Coast Balanced Score Card: Number of communities that utilize Digital Coast	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With Increase	N/A	N/A	4,500	4,500	4,500	4,500	4,500
Without Increase	3,275	3,500	3,500	3,500	3,500	3,500	3,500

Description: This measure, obtained via web statistics, provides a level of depth beyond traditional measures, such as number of visits or page views, which allows the effort to assess where its users are coming from. Given that the Digital Coast effort is national in scope, yet local in its approach to providing geospatial information to address coastal issues, such as coastal resilience, this measure provides valuable information that is used to direct outreach efforts and content development.

Performance Measure: Percentage of US coastal states and territories demonstrating 20% or more annual improvement in resilience capacity to weather and climate hazards	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With Increase	N/A	N/A	51	60	66	71	77
Without Increase	57	46	51	57	63	69	74

Description: This measure tracks a range of contributions to address coastal community risk, vulnerability, and resilience to coastal hazards. It quantifies NOAA's contributions to this important goal across NOAA's coastal programs, measuring how NOAA is improving the Nation's capacity for resilience to hazards and is contributing significantly to NOAA's efforts to improve integration of its coastal programs, and expanding beyond the three coastal integration programs providing inputs to the measure (CSC, OCRM, and Sea Grant).

PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Program: National Ocean Service
Sub-program: Ocean and Coastal Management and Services
Program Change: Capacity to Respond to Extreme Events

	Object Class	2015 Increase	2015 Total Program
11	Personnel compensation		
11.1	Full-time permanent	$0	13,860
11.3	Other than full-time permanent	0	244
11.5	Other personnel compensation	0	130
11.8	Special personnel services payments	0	16
11.9	Total personnel compensation	0	14,250
12	Civilian personnel benefits	0	4,293
13	Benefits for former personnel	0	24
21	Travel and transportation of persons	0	695
22	Transportation of things	0	18
23.1	Rental payments to GSA	0	1,299
23.2	Rental Payments to others	0	6
23.3	Communications, utilities and miscellaneous charges	0	430
24	Printing and reproduction	0	9
25.1	Advisory and assistance services	3,500	17,011
25.2	Other services	0	20
25.3	Purchases of goods & services from Gov't accounts	0	156
25.4	Operation and maintenance of facilities	0	0
25.5	Research and development contracts	0	0
25.6	Medical care	0	0
25.7	Operation and maintenance of equipment	0	0
25.8	Subsistence and support of persons	0	0
26	Supplies and materials	0	389
31	Equipment	0	375
32	Lands and structures	0	0
33	Investments and loans	0	0
41	Grants, subsidies and contributions	1,500	7,497
42	Insurance claims and indemnities	0	0
43	Interest and dividends	0	0
44	Refunds	0	0
99	Total obligations	5,000	46,472

Coastal Management Grants: Regional Coastal Resilience Grants (Base Funding: $0 and 0 FTE; Program Change: +5,000,000 and 0 FTE): NOAA requests an increase of $5,000,000 and 0 FTE for a total of $5,000,000 and 0 FTE to establish a competitive grant program designed to address risks of weather events, climate hazards, and changing ocean conditions on regions, communities, and existing and emerging sectors.

Proposed Actions:
NOAA proposes to establish a competitive grants program to fund collaborative projects that increase coastal communities' and economies' resilience to the impacts of weather events, climate hazards, and changing ocean conditions. Priority will be given to actions that bring together partners across states, tribes, local governments, and public/private partnerships. The grants would empower multiple sectors in a region to identify and address shared risks and vulnerabilities and would fill a gap in the current state-centric structure of the Coastal Zone Management Grants. Examples of eligible cross-jurisdictional projects would include improved understanding and use of "green and gray" infrastructure, information sharing, and data acquisition and integration projects that improve resiliency of coastal ecosystems, communities, infrastructure, economies, and vulnerable populations. Green infrastructure includes natural barriers such as dunes and swamps while gray infrastructure includes human engineered solutions such as dams and levees.

This program will allow grantees to leverage existing state-Federal partnerships (i.e., IOOS, NERRS, and Sanctuaries), inter-governmental partnerships, and key national authorities (e.g., CZMA) to:

- Identify and address priority data, information, and capacity gaps
- Develop tools, as needed, to inform sound, science-based decisions, which support regional efforts to plan for a resilient ocean and coastal economy
- Acquire and integrate socioeconomic information with physical and biological information to improve the assessment of risk and vulnerability for planning and decision making
- Understand how hazards and changing ocean conditions affect coastal economies, including existing and emerging sectors that depend on the ocean and coasts
- Develop the information and approaches needed for improved risk communication, and the necessary tools, technical assistance and training tailored toward enhanced resilience to weather events, climate hazards, and changing ocean conditions
- Evaluate the costs, benefits, and tradeoffs of systems-based development or redevelopment approaches that incorporate both natural defenses and hard structural solutions
- Support the development of sustainable recovery, redevelopment, and adaptation plans and implement programs and projects that incentivize rebuilding and development approaches which reduce risk and increase resilience

Statement of Need and Economic Benefits:
Our coastal communities, shorelines and economies are facing escalating risks from changes in storm intensity, precipitation, flooding, and changing sea levels that can result in dramatic economic losses. Increasing population density along the coast will further intensify pressures on ecologically and economically important areas, and put more people in the path of coastal storms. Increasing sea level can further escalate the costs and risks of inundation events. NOAA's National Climatic Data Center recorded 14 weather and climate-related disasters in 2011 with over $1 billion in damages each, the highest number on record for a single year.

Superstorm Sandy highlighted the regional implications of hazard preparedness, response, and recovery. Just as storms and inundation events do not heed jurisdictional boundaries, collaborative action among states, tribes, local governments, and non-governmental entities are necessary to identify and address together the full scope of risks and hazards that affect the Nation's coasts. Since many coastal hazard risks are common across a region, supporting a regional approach to resilience will enable greater consistency and broaden implementation of best practices and successful solutions. For example, the increased Federal focus on providing more consistent guidance and messaging on flood risk and other hazards will yield an improved level of benefits if paired with an improved understanding and application of risk communication methods and a strong partnership with state and local communities to broaden delivery.

Resource Assessment:
NOAA has previously provided resources and technical assistance for regional approaches toward increased resilience. With these funds NOAA will help organizations and inter-governmental groups to implement multi-sector resilience projects. This increase provides an opportunity for new and existing inter-governmental partnerships to advance shared resilience goals. In many cases, existing networks have already achieved consensus on cross-jurisdictional needs and actions, which will allow a results-based funding program to readily advance progress toward resilient coasts. In areas where cross-jurisdictional collaboration is less mature, NOAA will continue to provide in-kind technical assistance on identifying potential projects.

The proposed grant program would complement NOAA's ongoing role in providing technical assistance under the Coastal Zone Management Act. For example, NOAA's Digital Coast provides geospatial information resources to analyze community vulnerabilities in concert with resilience, sustainability, and demographic parameters. These baseline data, information, training, and lessons-learned promote progress toward defined resilience objectives across a broader geographic area that may include jurisdictions of multiple states and local governments.

Schedule and Milestones:

- Complete and publish a Federal Funding Opportunity (FY 2015)
- Award up to 12 cooperative agreements (FY 2015)
- Ensure effective connections with and to interagency planning, guidance, resources, and points of contact associated with Presidential Policy Directive-8 for National Preparedness (FY 2015 – 2019)
- Provide technical assistance to awardees regarding data management and linkages to existing data and decision support tools to support their resilience objectives (FY 2015 – 2019)

Deliverables:

- Up to 12 cooperative agreement awards to address coastal resilience objectives (FY 2015)

Performance Goals and Measurement Data:

Performance Measure: Percentage of U.S. coastal states and territories demonstrating 20% or more annual improvement in resilience capacity to weather and climate hazards	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With Increase	N/A	N/A	51%	60%	66%	71%	77%
Without Increase	57%	46%	51%	57%	63%	69%	74%

Description: This measure tracks a range of contributions to address coastal community risk, vulnerability, and resilience to coastal hazards. It quantifies NOAA's contributions to this important goal across NOAA's coastal programs, measuring how NOAA is improving the Nation's capacity for resilience to hazards and is contributing significantly to NOAA's efforts to improve integration of its coastal programs, and expanding beyond the three coastal integration programs providing inputs to the measure (CSC, OCRM, and Sea Grant).

Performance Measure: Number of coastal communities that completed projects to reduce future damage from or increase public awareness of hazards with assistance from CZM funding or staff (annual)	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With Increase	N/A	N/A	70	75	85	95	105
Without Increase	70	70	70	70	70	70	70

Description: This measure tracks how support from NOAA programs is applied in state and local communities to achieve improvements in hazard awareness and/or preparedness. Because funds would be awarded in FY 2015, projects are not expected to be completed until FY 2016. Not all projects can be completed within a single year; however, which is why the number of communities does not steadily increase until FY 2017.

PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Program: National Ocean Service
Sub-program: Ocean and Coastal Management and Services
Program Change: Regional Coastal Resilience Grants

	Object Class	2015 Increase	2015 Total Program
11	Personnel compensation		
11.1	Full-time permanent	$0	$0
11.3	Other than full-time permanent	0	0
11.5	Other personnel compensation	0	0
11.8	Special personnel services payments	0	0
11.9	Total personnel compensation	0	0
12	Civilian personnel benefits	0	0
13	Benefits for former personnel	0	0
21	Travel and transportation of persons	0	0
22	Transportation of things	0	0
23.1	Rental payments to GSA	0	0
23.2	Rental Payments to others	0	0
23.3	Communications, utilities and miscellaneous charges	0	0
24	Printing and reproduction	0	0
25.1	Advisory and assistance services	0	0
25.2	Other services	0	0
25.3	Purchases of goods & services from Gov't accounts	0	0
25.4	Operation and maintenance of facilities	0	0
25.5	Research and development contracts	0	0
25.6	Medical care	0	0
25.7	Operation and maintenance of equipment	0	0
25.8	Subsistence and support of persons	0	0
26	Supplies and materials	0	0
31	Equipment	0	0
32	Lands and structures	0	0
33	Investments and loans	0	0
41	Grants, subsidies and contributions	5,000	71,146
42	Insurance claims and indemnities	0	0
43	Interest and dividends	0	0
44	Refunds	0	0
99	Total obligations	5,000	71,146

Sanctuaries and Marine Protected Areas: Dr. Nancy Foster Scholarship Program (Base Funding: $49,139,000 and 188 FTE; Program Change: $0 and 0 FTE): NOS requests a decrease of $0 and 0 FTE to terminate the Dr. Nancy Foster Scholarship Program at NOAA which is part of the Administration's reorganization of STEM education.

Proposed Actions:
As part of the Administration's comprehensive reorganization of STEM education programs to increase the impact of Federal investments, NOAA proposes to transfer responsibility for the Dr. Nancy Foster Scholarship Program. NOAA currently provides awards through this Program to graduate students in oceanography, marine biology or maritime archeology. Funding for the Dr. Nancy Foster Scholarship Program is determined as one percent of Marine Sanctuaries funding in ORF and PAC according to the National Marine Sanctuaries Amendments Act of 2000 (Pub. L. 106-513). This funding will remain in the Sanctuaries and Marine Protected Areas and Marine Sanctuaries Construction Base PPAs.

In 2014, the President's Budget proposed a government-wide STEM reorganization to create a coherent framework for delivering STEM education to more students and more teachers more effectively while reducing fragmentation, and the Administration published a Five-Year Federal Strategic Plan on STEM Education to help align the reorganization with key goals and strategies. The areas of priority for this plan include: improving pre-kindergarten-through-grade-twelve (pre-K-12) instruction; increasing and sustaining youth and public engagement with STEM; enhancing undergraduate STEM education; creating a national strategy around graduate fellowships; and better serving groups historically underrepresented in STEM.

Over the past year, agencies have made considerable progress towards a stronger and more cohesive infrastructure for delivering STEM education. For example, in implementing the Strategic Plan, mission agencies have increased coordination with the lead agencies (the Department of Education, the National Science Foundation, and the Smithsonian Institution) and are identifying ways to leverage existing resources to improve the reach of agency assets.

The 2015 Budget builds on these efforts by proposing a fresh reorganization with targeted adjustments to enable more strategic investment in STEM education with a focus on building and using evidence-based practices and finding new models for leveraging assets and expertise.

Sanctuaries and Marine Protected Areas: Sanctuaries Operations (Base Funding: $49,139,000 and 188 FTE; Program Change: -$2,000,000 and 0 FTE): NOAA requests a decrease of $2,000,000 and 0 FTE for a total of $47,139,000 and 188 FTE for the Sanctuaries and Marine Protected Areas Program. Operational reductions will be realized in scalable activities such as vessel operations. At this funding level, NOAA will support the highest priorities of all its authorizations, maintain its unique capabilities, support continued implementation of management plans across the National Marine Sanctuary System, and continue engaging coastal communities and stakeholders to promote science-based stewardship of designated areas.

PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Program: National Ocean Service
Sub-program: Ocean and Coastal Management and Services
Program Change: Sanctuaries Operations

	Object Class	2015 Decrease	2015 Total Program
11	Personnel compensation		
11.1	Full-time permanent	$0	$20,407
11.3	Other than full-time permanent	0	87
11.5	Other personnel compensation	0	180
11.8	Special personnel services payments	0	405
11.9	Total personnel compensation	0	21,079
12	Civilian personnel benefits	0	6,423
13	Benefits for former personnel	0	1
21	Travel and transportation of persons	0	666
22	Transportation of things	0	225
23.1	Rental payments to GSA	0	1,784
23.2	Rental Payments to others	0	630
23.3	Communications, utilities and miscellaneous charges	0	795
24	Printing and reproduction	0	54
25.1	Advisory and assistance services	(1,500)	10,690
25.2	Other services	(100)	268
25.3	Purchases of goods & services from Gov't accounts	0	892
25.4	Operation and maintenance of facilities	0	0
25.5	Research and development contracts	0	0
25.6	Medical care	0	0
25.7	Operation and maintenance of equipment	0	0
25.8	Subsistence and support of persons	0	0
26	Supplies and materials	(200)	1,301
31	Equipment	0	416
32	Lands and structures	0	0
33	Investments and loans	0	0
41	Grants, subsidies and contributions	(200)	1,915
42	Insurance claims and indemnities	0	0
43	Interest and dividends	0	0
44	Refunds	0	0
99	Total obligations	(2,000)	47,139

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APPROPRIATION ACCOUNT: PROCUREMENT, ACQUISITION AND CONSTRUCTION
SUB-PROGRAM: NATIONAL OCEAN SERVICE ACQUISITION AND CONSTRUCTION

The NOS Procurement, Acquisition, and Construction account includes two program activities funded within the NOS Acquisition and NOS Construction sub-programs.

National Estuarine Research Reserve System Construction/Acquisition
The National Estuarine Research Reserve System (NERRS) is a Federal-state partnership established under the CZMA designed to protect and understand valuable estuarine resources through research and education. For PAC, NERRS funding is matched 70:30 (Federal: state) for facilities construction and 1:1 for land acquisition. Reserves are publicly owned lands and onsite facilities that provide opportunities for researchers as well as the public to better understand these estuarine areas. Supplementing or updating facilities at the 28 reserves is carried on in conjunction with the development of system-wide construction plans. All construction activities are based on current needs for implementing core NERRS programs and external opportunities for partnerships. When land buying opportunities are available, reserves acquire additional nearby critical habitat within, or adjacent to, a reserve boundary as identified in reserve management plans to increase protection and provide places for conducting long-term science, education, and demonstration programs. The facilities and land of the reserves are owned and managed by the states. NERRS construction and land acquisition projects are selected on a competitive basis.

Outyear Funding Estimates ($ in Thousands):

NERRS Construction and Land Acquisition	FY 2014 & Prior	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	CTC	Total
Change from FY 2015 Base								
Total Request	96,418	1,700	1,700	1,700	1,700	1,700	N/A	Recurring

National Marine Sanctuary Program Construction/Acquisition
NOAA administers the National Marine Sanctuary System under authority of the National Marine Sanctuaries Act. The Office of National Marine Sanctuaries manages and operates the Nation's system of 13 Marine Sanctuaries and the Papahānaumokuākea Marine National Monument. The program has developed a comprehensive facilities plan that prioritizes needs and opportunities at individual sites for constructing exhibits, collaborative education and visibility projects, and operational needs. In order to establish better understanding and appreciation for sanctuary and other ocean resources by the public, the program constructed a network of exhibits, signage, and kiosks. Whenever possible, sanctuaries utilize existing aquaria, museums and other appropriate facilities to develop cooperative centers where the public and environmental decision makers can gain direct, objective and focused information on conservation issues. These facilities serve as important windows into the resources of the Sanctuaries and act as a storefront for public interaction with NOAA programs. The goal of these exhibits is to share with the public these ocean treasures. In addition to these efforts, PAC funding supported operational facility requirements for NOAA-owned facilities, including safety improvements, ADA (Americans with Disabilities Act) upgrades, and replacement and repair.

Out year Funding Estimates ($ in Thousands):

National Marine Sanctuaries Construction	FY 2014 & Prior	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	CTC	Total
Change from FY 2015 Base								
Total Request	106,365	2,000	2,000	2,000	2,000	2,000	N/A	Recurring

Schedule and Milestones:

- Conduct national competitions for NERRS Acquisition/Construction to select projects for funding and report acres protected through the programs (FY 2015-2019)
- Conduct critical capital construction activities on Sanctuaries facilities and vessels, construction of exhibits, signage, and kiosks, and funding for limited emergency and required major small boat repairs (FY 2015-2019)

Deliverables:

- Financial assistance awards to state or local governments for competitively-selected projects
- Completion of ongoing projects at one of three sites: Crissy Field in San Francisco, CA, Gulf of Farallones National Marine Sanctuary (GFNMS), Galveston, TX, Flower Gardens Banks National Marine Sanctuary (FGBNMS), or Scituate, MA, Stellwagen Bank National Marine Sanctuary (SBNMS)
- Construction of exhibits, signage, and kiosks

Performance Goals and Measurement Data:

Performance Measure: Annual number of NERRS facility construction projects that improve safety or environmental sustainability	FY 2013 Actual	FY 2014 Target	FY 2015 Target	FY 2016 Target	FY 2017 Target	FY 2018 Target	FY 2019 Target
	4	7	7	7	7	7	7
Description: NERRS PAC funding is awarded for construction projects based on a competitive process. Projects must be consistent with approved reserve management plans. Projects are prioritized by those that address safety or inadequate facilities and projects that improve environmental sustainability or public use/access.							

PROGRAM CHANGES:

There are no program changes requested for this sub-program in 2015

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APPROPRIATION ACCOUNT: DAMAGE ASSESSMENT AND RESTORATION REVOLVING FUND

A National Oceanic and Atmospheric Administration (NOAA) Damage Assessment and Restoration Revolving Fund was established, under Section 1012(a) of the Oil Pollution Act, for deposit of sums provided by any party or governmental entity for response to discharges of oil or releases of hazardous substances, for assessment of damages to NOAA trust resources resulting from those discharges and releases, and for the restoration of the injured natural resources. Through the Revolving Fund, NOAA:

- Retains funds that are recovered through settlement or awarded by a court for restoration of injured natural resources, and retains reasonable costs of conducting spill response and damage assessments that are recovered by NOAA through negotiated settlement, court award, or other reimbursement.
- Ensures funds deposited shall remain available to the trustee, without further appropriation, until expended to pay costs associated with response, damage assessment, and restoration of natural resources.

The NOAA Damage Assessment and Restoration Revolving Fund facilitates and sustains: (1) natural resource damage assessment while the Departments of Commerce and Justice seek full reimbursement from potentially responsible parties; and (2) restoration, replacement, or acquisition of the equivalent of injured or lost natural resources, including resources of National Marine Sanctuaries and National Estuarine Research Reserves, tidal wetlands and other habitats, for which NOAA is trustee. These program functions are conducted jointly within NOAA by the Office of General Counsel, the National Ocean Service, and the National Marine Fisheries Service.

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Exhibit 5

Department of Commerce
National Oceanic and Atmospheric Administration
Damage Assessment and Restoration Revolving Fund
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	Positions	FTE	Budget Authority	Direct Obligations
FY 2014 Enacted	16	16	5,424	95,259
less: Obligations from prior year balances	0	0	0	(74,835)
less: Unobligated balance transferred, DOI	0	0	0	0
plus: 2015 Adjustments to Base	0	0	576	576
FY 2015 Base	16	16	6,000	21,000
plus: program Changes	0	0	0	0
FY 2015 Estimate	16	16	6,000	21,000

		FY 2013 Actuals		FY 2014 Enacted		FY 2015 Base Program		FY 2015 Estimate		Increase/ Decrease	
		Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount
Damage Assessment and Restoration Revolving Fund	Pos/BA	53	3,796	16	5,424	16	6,000	16	6,000	0	0
	FTE/OBL	53	126,111	16	95,259	16	21,000	16	21,000	0	0
Total: Damage Assessment and Restoration Revolving Fund	Pos/BA	53	3,796	16	5,424	16	6,000	16	6,000	0	0
	FTE/OBL	53	126,111	16	95,259	16	21,000	16	21,000	0	0

Exhibit 5

Department of Commerce
National Oceanic and Atmospheric Administration
Damage Assessment and Restoration Revolving Fund
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	FY 2013 Actuals		FY 2014 Enacted		FY 2015 Base Program		FY 2015 Estimate		Increase/ Decrease	
	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount
Direct Mandatory Obligation	53	126,111	16	95,259	16	21,000	16	21,000	0	0
Total Obligations	53	126,111	16	95,259	16	21,000	16	21,000	0	0
Adjustments to Obligations:										
Federal Funds	0	(28)	0	0	0	0	0	0	0	0
New offsetting collections	0	(94,781)	0	(9,000)	0	(9,000)	0	(9,000)	0	0
Recoveries	0	(2,621)	0	0	0	0	0	0	0	0
Unobligated balance, adj. SOY	0	(98,173)	0	(74,835)	0		0		0	0
Unobligated balance transferred (FROM DOI)	0	(1,547)	0	(6,000)	0	(6,000)	0	(6,000)	0	0
Unobligated balance, EOY	0	74,835	0	0	0		0		0	0
Total Budget Authority	53	3,796	16	5,424	16	6,000	16	6,000	0	0
Financing from Tranfers and Other:										
Transfer from Other Accounts	0	0	0	0	0	0	0	0	0	0
Transfer to/from DOI	0	(4,102)	0	(6,000)	0	(6,000)	0	(6,000)	0	0
Appropriation temporarily reduced*	0	306	0	576	0	0	0	0	0	0
Net Appropriation	53	0	16	0	16	0	16	0	0	0

*The FY2014 sequestrable amount from the the DOI transfer is $8M.

Exhibit 16

Department of Commerce
National Oceanic and Atmospheric Administration
Damage Assessment and Restoration Revolving Fund
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
(Dollar amounts in thousands)

	Object Class	FY 2013 Actuals	FY 2014 Enacted	FY 2015 Base Program	FY 2015 Estimate	Increase/ Decrease
11	Personnel compensation					
11.1	Full-time permanent	1,373	1,373	1,373	1,373	0
11.3	Other than full time permanent	8	8	8	8	0
11.2	Other personnel compensation	29	29	29	29	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	1,410	1,410	1,410	1,410	0
12.1	Civilian personnel Benefits	552	552	552	552	0
13	Benefits for former personnel	0	0	0	0	0
21	Travel and transportation of persons	210	210	210	210	0
22	Transportation of things	4	4	4	4	0
23.1	Rental payments to GSA	130	130	130	130	0
23.2	Rental payments to others	6	6	6	6	0
24	Printing and reproduction	4	4	4	4	0
25.1	Advisory and assistance services	844	844	844	844	0
25.2	Other services	120,814	89,962	15,703	15,703	0
25.3	Other purchases of goods and services from Gov't accounts	182	182	182	182	0
26	Supplies and materials	146	146	146	146	0
31	Equipment	144	144	144	144	0
41	Grants, subsidies and contributions	1,652	1,652	1,652	1,652	0
42	Insurance claims and indemnities	1	1	1	1	0
43	Interest and dividends	12	12	12	12	0
99	Total Obligations	126,111	95,259	21,000	21,000	0

Exhibit 16

Department of Commerce
National Oceanic and Atmospheric Administration
Damage Assessment and Restoration Revolving Fund
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
(Dollar amounts in thousands)

	FY 2013 Actuals	FY 2014 Enacted	FY 2015 Base Program	FY 2015 Estimate	Increase/ Decrease
Federal Funds	(28)	0	0	0	0
Less collections	(94,781)	(9,000)	(9,000)	(9,000)	0
Less recoveries	(2,621)	0	0	0	0
Less unobligated balance, SOY	(98,173)	(74,835)	0	0	0
Plus unobligated balance, EOY	74,835	(6,000)	(6,000)	(6,000)	0
Plus unobligated balance transferred	(1,547)	0	0	0	0
Total Budget Authority	**3,796**	**5,424**	**6,000**	**6,000**	**0**
Transfers:					
Transfers from Other Accounts	0				
Transfer from DOI	(4,102)	(6,000)	(6,000)	(6,000)	0
Appropriation temporarily reduced	306	576	0	0	0
Discretionary Budget Authority	0	0	0	0	0
Personnel Data					
Full-Time equivalent Employment:					
Full-time permanent	53	16	16	16	0
Other than full time permanent	0	0	0	0	0
Total	53	16	16	16	0
Authorized Positions:					
Full-time permanent	16	16	16	16	0
Other than full time permanent	0	0	0	0	0
Total	16	16	16	16	0

APPROPRIATION ACCOUNT: SANCTUARIES ENFORCEMENT ASSET FORFEITURE FUND

The Sanctuaries Enforcement Asset Forfeiture Fund receives proceeds from civil penalties and forfeiture claims against responsible parties, as determined through court settlements or agreements, for violations of NOAA sanctuary regulations. Penalties received are held in sanctuary site-specific accounts from year to year (technically reimbursables), as the funds are spent on resource protection within the sanctuary site where the penalty or forfeiture occurred. Funds are expended for resource protection purposes which may include all aspects of law enforcement (from equipment to labor), community oriented policing programs, and other resource protection and management measures such as the installation of mooring buoys or restoration of injured resources.

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Department of Commerce
National Oceanic and Atmospheric Administration
Sanctuaries Enforcement Asset Forfeiture Fund
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	Positions	FTE	Budget Authority	Direct Obligations
FY 2014 Enacted	0	0	928	928
less: Obligations from prior year balances	0	0	0	0
plus: 2015 Adjustments to Base	0	0	(808)	(808)
FY 2015 Base	0	0	120	120
plus: program Changes	0	0	0	0
FY 2015 Estimate	0	0	120	120

		FY 2013 Actuals		FY 2014 Enacted		FY 2015 Base Program		FY 2015 Estimate		Increase/ Decrease	
		Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount
Sanctuaries Asset Forfeiture Fund	Pos/BA	0	(41)	0	928	0	120	0	120	0	0
	FTE/OBL	0	49	0	928	0	120	0	120	0	0
Total: Sanctuaries Asset Forfeiture Fund	Pos/BA	0	(41)	0	928	0	120	0	120	0	0
	FTE/OBL	0	49	0	928	0	120	0	120	0	0

Exhibit 5

Department of Commerce
National Oceanic and Atmospheric Administration
Sanctuaries Enforcement Asset Forfeiture Fund
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	FY 2013 Actuals		FY2014 Enacted		FY 2015 Program		FY 2015 Estimate		Increase/ Decrease	
	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount
Direct Mandatory Obligation	0	49	0	928	0	120	0	120	0	0
Total Obligations	0	49	0	928	0	120	0	120	0	0
Adjustments to Obligations:										
New offsetting collections	0	0	0	0	0	0	0	0	0	0
Recoveries	0	0	0	0	0	0	0	0	0	0
Unobligated balance, adj. SOY	0	(488)	0	(398)	0	(398)	0	(398)	0	0
Unobligated balance, EOY	0	398	0	398	0	398	0	398	0	0
Total Budget Authority	0	(41)	0	928	0	120	0	120	0	0
Financing from Tranfers and Other:										
Transfer from Other Accounts	0	0	0	0	0	0	0	0	0	0
Appropriation temporarily reduced	0	51	0	72	0	0	0	0	0	0
Net Appropriation	0	10	0	1,000	0	120	0	120	0	0

Exhibit 16

Department of Commerce
National Oceanic and Atmospheric Administration
Sanctuaries Enforcement Asset Forfeiture Fund
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
(Dollar amounts in thousands)

	Object Class	FY 2013 Actuals	FY 2014 Enacted	FY 2015 Base Program	FY 2015 Estimate	Increase/ Decrease
11	Personnel compensation					
11.1	Full-time permanent	0	0	0	0	0
11.3	Other than full time permanent	0	0	0	0	0
11.2	Other personnel compensation	0	0	0	0	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	0	0	0	0	0
12.1	Civilian personnel Benefits	0	0	0	0	0
13	Benefits for former personnel	0	0	0	0	0
21	Travel and transportation of persons	0	0	0	0	0
22	Transportation of things	0	0	0	0	0
23.1	Rental payments to GSA	0	0	0	0	0
23.2	Rental payments to others	0	0	0	0	0
24	Printing and reproduction	0	0	0	0	0
25.1	Advisory and assistance services	0	0	0	0	0
25.2	Other services	49	928	120	120	0
25.3	Other purchases of goods and services from Gov't accounts	0	0	0	0	0
26	Supplies and materials	0	0	0	0	0
31	Equipment	0	0	0	0	0
41	Grants, subsidies and contributions	0	0	0	0	0
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
99	Total Obligations	49	928	120	120	0

Exhibit 16

Department of Commerce
National Oceanic and Atmospheric Administration
Sanctuaries Enforcement Asset Forfeiture Fund
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
(Dollar amounts in thousands)

	FY 2013 Actuals	FY 2014 Enacted	FY 2015 Base Program	FY 2015 Estimate	Increase/ Decrease
Less collections	0	0	0	0	0
Less recoveries	0	0	0	0	0
Less unobligated balance, SOY	(488)	(398)	(398)	(398)	0
Plus unobligated balance, EOY	398	398	398	398	0
Plus unobligated balance transferred		0	0	0	0
Total Budget Authority	**(41)**	**928**	**120**	**120**	**0**

APPROPRIATION ACCOUNT: GULF COAST ECOSYSTEM RESTORATION SCIENCE, OBSERVATION, MONITORING AND TECHNOLOGY FUND

The Gulf Coast Ecosystem Restoration Science, Observation, Monitoring and Technology Fund provides funding for the NOAA RESTORE Act Science Program. The purpose of this program is to initiate and sustain an integrative, holistic understanding of the Gulf of Mexico ecosystem and support, to the maximum extent practicable, restoration efforts and the long-term sustainability of the ecosystem, including its fish stocks, fishing industries, habitat, and wildlife through ecosystem research, observation, monitoring, and technology development.

To ensure the best use of resources the Program will coordinate with existing federal and state science and technology programs, including other activities funded under the RESTORE Act. Section 1604 of the RESTORE Act authorized funding for the Program using 2.5 percent of the Gulf Coast Restoration Trust Fund.

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Department of Commerce
National Oceanic and Atmospheric Administration
Gulf Coast Ecosystem Restoration Science, Observation, Monitoring and Technology Fund
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	Positions	FTE	Budget Authority	Direct Obligations
FY 2014 Enacted	0	0	1,688	1,688
less: Obligations from prior year balances	0	0	0	0
plus: 2015 Adjustments to Base	0	0	390	390
FY 2015 Base	0	0	2,078	2,078
plus: program Changes	0	0	0	0
FY 2015 Estimate	0	0	2,078	2,078

		FY 2013 Actuals		FY 2014 Enacted		FY 2015 Base Program		FY 2015 Estimate		Increase/ Decrease	
		Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount
Gulf Coast Restoration Fund	Pos/BA	0	0	0	1,688	0	2,078	0	2,078	0	0
	FTE/OBL	0	0	0	1,688	0	2,078	0	2,078	0	0
Total: Gulf Coast Restoration Fund	Pos/BA	0	0	0	1,688	0	2,078	0	2,078	0	0
	FTE/OBL	0	0	0	1,688	0	2,078	0	2,078	0	0

Exhibit 5

Department of Commerce
National Oceanic and Atmospheric Administration
Gulf Coast Ecosystem Restoration Science, Observation, Monitoring and Technology Fund
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	FY 2013 Actuals		FY 2014 Enacted		FY 2015 Program		FY 2015 Estimate		Increase/ Decrease	
	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount
Direct Mandatory Obligation	0	0	0	1,688	0	2,078	0	2,078	0	0
Total Obligations	0	0	0	1,688	0	2,078	0	2,078	0	0
Adjustments to Obligations:										
New offsetting collections	0	0	0	0	0	0	0	0	0	0
Recoveries	0	0	0	0	0	0	0	0	0	0
Unobligated balance, adj. SOY	0	0	0	0	0	0	0	0	0	0
Unobligated balance, EOY	0	0	0	0	0	0	0	0	0	0
Total Budget Authority	0	0	0	1,688	0	2,078	0	2,078	0	0
Financing from Tranfers and Other:										
Transfer from Other Accounts	0	0	0	0	0	0	0	0	0	0
Appropriation temporarily reduced	0	0	0	131	0	0	0	0	0	0
Net Appropriation	0	0	0	1,819	0	2,078	0	2,078	0	0

Exhibit 16

Department of Commerce
National Oceanic and Atmospheric Administration
Gulf Coast Ecosystem Restoration Science, Observation, Monitoring and Technology Fund
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
(Dollar amounts in thousands)

	Object Class	FY 2013 Actuals	FY 2014 Enacted	FY 2015 Base Program	FY 2015 Estimate	Increase/ Decrease
11	Personnel compensation					
11.1	Full-time permanent	0	211	227	227	0
11.3	Other than full time permanent	0	0	0	0	0
11.2	Other personnel compensation	0	0	0	0	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	0	211	227	227	0
12.1	Civilian personnel Benefits	0	78	88	88	0
13	Benefits for former personnel	0	0	0	0	0
21	Travel and transportation of persons	0	27	30	30	0
22	Transportation of things	0	0	0	0	0
23.1	Rental payments to GSA	0	0	0	0	0
23.2	Rental payments to others	0	14	15	15	0
23.3	Communicaets, utilities and miscellaneous charges	0	18	20	20	0
24	Printing and reproduction	0	5	5	5	0
25.1	Advisory and assistance services	0	55	61	61	0
25.2	Other services	0	0	0	0	0
25.3	Other purchases of goods and services from Gov't accounts	0	0	0	0	0
26	Supplies and materials	0	2	2	2	0
31	Equipment	0	3	3	3	0
41	Grants, subsidies and contributions	0	1,275	1,627	1,627	0
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
99	Total Obligations	0	1,688	2,078	2,078	0

Department of Commerce
National Oceanic and Atmospheric Administration
Gulf Coast Ecosystem Restoration Science, Observation, Monitoring and Technology Fund
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
(Dollar amounts in thousands)

	FY 2013 Actuals	FY 2014 Enacted	FY 2015 Base Program	FY 2015 Estimate	Increase/ Decrease
Less collections	0	0	0	0	0
Less recoveries	0	0	0	0	0
Less unobligated balance, SOY	0	0	0	0	0
Plus unobligated balance, EOY	0	0	0	0	0
Plus unobligated balance transferred		0	0	0	0
Total Budget Authority	**0**	**1,688**	**2,078**	**2,078**	**0**

BUDGET PROGRAM: NATIONAL MARINE FISHERIES SERVICE

For FY 2015, NOAA requests a total of $916,751,000 and 2,954 FTE for the National Marine Fisheries Service, including a decrease of $79,533,000 and an increase of 7 FTE in net program changes.

National Marine Fisheries Service Overview

The National Marine Fisheries Service (NMFS) is responsible for the management and conservation of living marine resources within the U.S. Exclusive Economic Zone (EEZ)—the area extending from three to 200 nautical miles offshore. NMFS provides critical support, and scientific and policy leadership in the international arena, and plays a key role in the management of living marine resources in coastal areas under state jurisdiction. NMFS implements science-based conservation and management actions aimed at sustaining long-term use and promoting the health of coastal and marine ecosystems. These actions result in maximized benefits to the Nation from the use of living marine resources. Programmatic authority for fisheries management, species protection, and habitat conservation activities is derived primarily from the Magnuson-Stevens Fishery Conservation and Management Act (MSA), Marine Mammal Protection Act (MMPA), and Endangered Species Act (ESA). Other acts provide additional authority for enforcement, seafood safety, habitat restoration, and cooperative efforts with states, tribes, interstate fishery commissions, and other countries. All of these activities rely on a strong scientific and research competency to support the challenging public policy decision process associated with NMFS's stewardship responsibility.

The National Marine Fisheries Service budget is organized into five sub-programs under the Operations, Research and Facilities appropriation account ($826,358,000 and 2,907 FTE):

- Protected Species Research and Management ($179,711,000 and 813 FTE) includes Protected Species Research and Management Programs Base, Species Recovery Grants, Marine Mammals, Marine Turtles, Other Protected Species (Marine Fish, Plants, and Invertebrates), Atlantic Salmon, and Pacific Salmon.
- Fisheries Research and Management ($431,898,000 and 1,386 FTE) includes Fisheries Research and Management Programs, National Catch Share Program, Expand Annual Stock Assessments - Improve Data Collection, Economics & Social Sciences Research, Salmon Management Activities, Regional Councils and Fisheries Commissions, Fisheries Statistics, Fish Information Networks, Survey and Monitoring Projects, Fisheries Oceanography, American Fisheries Act, National Standard 8, Reducing Bycatch, and Product Quality and Safety.
- Enforcement and Observers/Training ($109,328,000 and 372 FTE).
- Habitat Conservation and Restoration ($42,190,000 and 131 FTE) includes Sustainable Habitat Management and Fisheries Habitat Restoration.
- Other Activities Supporting Fisheries ($60,850,000 and 205 FTE) includes Antarctic Research, Aquaculture, Climate Regimes & Ecosystem Productivity, Computer Hardware and Software, Cooperative Research, Information Analyses & Dissemination, Marine Resources Monitoring, Assessment & Prediction Program (MarMap), National Environmental Policy Act (NEPA), NMFS Facilities Maintenance, and Regional Studies.

The National Marine Fisheries Service budget includes the following other accounts:

- Fishermen's Contingency Fund
- Pacific Coastal Salmon Recovery Fund

- Promote and Develop American Fishery Products & Research Pertaining to American Fisheries, which includes Saltonstall-Kennedy (S-K) Funds
- Environmental Improvement and Restoration Fund
- Limited Access System Administration Fund
- Foreign Fishing Observer Fund
- Marine Mammal Unusual Mortality Event Fund
- Federal Ship Financing Fund
- Fisheries Finance Program Account
- Western Pacific Sustainable Fisheries Fund
- Fisheries Enforcement Asset Forfeiture Fund
- North Pacific Observer Fund
- Fisheries Disaster Assistance Fund

In partnership with other Federal agencies and with state and local governments, NMFS is responsible for managing living marine resources along the Nation's coastal zone and throughout the EEZ. This is done through restoring degraded habitats; protecting and ensuring sustainable use of ocean, coastal, and Great Lakes living resources; and enabling domestic marine aquaculture production. NMFS is responsible for protecting, restoring, and managing species listed under the ESA and MMPA, as well as their habitats, and for managing and rebuilding fish stocks to population levels that will support economically viable and sustainable harvest opportunities. NMFS also provides advice, technical tools, scientific information, and training to coastal residents, communities, and other decision makers and users of ocean, coastal, and Great Lakes areas.

Ecosystem-based management is an important component of NMFS's conservation and management practices. By understanding the complex ecological and socioeconomic environments in which living marine resources exist, managers may be able to better anticipate and predict the effects of management actions on a given coastal or marine ecosystem. NMFS uses the following strategies for implementing ecosystem-based management:

- Engage and collaborate with partners to achieve regional objectives by delineating regional ecosystems, working with regional ecosystem councils, and implementing cooperative strategies to improve regional ecosystem health.
- Where appropriate, seek to transform the way fisheries are managed, moving from more traditional management tools to market-based approaches to fisheries management - variously called catch shares, limited access privilege programs, or sector management. These types of approaches create incentives for fishermen to engage in sustainable and economically efficient fishing practices that conserve and protect the fishery, thereby maximizing the current and future value of the resource.
- Improve management of living marine resources by advancing the understanding of ecosystems through better simulation and predictive models.
- Develop coordinated regional and national outreach and education efforts to improve public understanding and involvement in stewardship of coastal and marine ecosystems.
- Engage in technological and scientific exchange with domestic and international partners to protect, restore, and manage living marine resources within and beyond the Nation's borders.

Work is conducted by NMFS field elements, with oversight, review, and direction provided from NMFS headquarters in Silver Spring, Maryland. The field structure consists of five Regional Offices and six Science Centers that conduct research and direct work carried out by the other laboratories and satellite/special purpose facilities in that region.

In October 2013, NMFS combined the Northwest Regional Office and the Southwest Regional Office into single region, the West Coast Region. The scope of NOAA Fisheries' work on the West Coast did not change with this new structure. Rather, the integration opens the opportunity to pursue closer program coordination throughout the West Coast, promoting appropriate levels of programmatic consistency, efficiency, and the allocation of available resources to the high priority challenges. The new structure also allows NMFS to work more efficiently with our domestic and international partners as we manage groundfish fisheries, salmon, halibut, whiting, highly migratory species, such as tunas and sharks, and coastal pelagic species, such as sardines.

In addition, NMFS is changing the name of its Northeast Regional Office to the Greater Atlantic Fisheries Regional Office in order to better reflect the geographic region that this office supports.

Major NMFS facilities are located at the following sites:

Northeast:	Regional Office - Gloucester, MA Science Center - Woods Hole, MA Major Laboratories - Milford, CT; Narragansett, RI; J. J. Howard, Sandy Hook, NJ Satellite/Special Purpose Facilities - Smithsonian (National Systematics Lab), Washington, DC
Southeast:	Regional Office - St. Petersburg, FL Science Center - Miami, FL Major Laboratories - Beaufort, NC; Galveston, TX; Panama City, FL; Pascagoula, MS Satellite/Special Purpose Facilities - Stennis Space Center Bay, St. Louis, MS
West Coast:	Regional Office – Seattle, WA at Sand Point; Portland, OR; Long Beach, CA
Southwest:	Science Center - La Jolla, CA Major Laboratories - Santa Cruz, CA Satellite/Special Purpose Facilities – Pacific Grove, CA
Northwest:	Science Center - Seattle, WA at Montlake Satellite/Special Purpose Facilities - Manchester, WA; Mukilteo, WA; Pasco, WA; Newport, OR; Hammond, OR
Alaska:	Regional Office - Juneau, AK Science Center - Seattle, WA at Sand Point Major Laboratories – Ted Stevens Marine Research Institute, AK; Auke Bay, AK; Kodiak, AK Satellite/Special Purpose Facilities - Little Port Walter, AK
Pacific Islands:	Regional Office – Honolulu, HI Science Center – Honolulu, HI

Research and Development (R&D) Investments:
The NOAA FY 2015 Budget estimates for R&D investments are the result of an integrated requirements-based strategic planning process. This process provides the structure to link NOAA's strategic vision with programmatic detail and budget development, with the goal of maximizing resources while optimizing capabilities. NMFS requests $61,008,000 for investments in R&D in the FY 2015 budget.

NOAA's R&D planning is tied to the goals, enterprises, and associated objectives outlined in NOAA's Next Generation Strategic Plan. Specifically, NOAA's Science and Technology Enterprise and underlying objectives include a holistic understanding of the Earth system through research; accurate and reliable data from observing systems; and an integrated environmental modeling system. These provide the basis for a set of internal implementation plans covering a 7-year period which guide NOAA's research and development activities. The NOAA Research Council - an internal body composed of senior scientific personnel from every Line Office in the agency - informs the annual updates to these implementation plans, and has developed the next 5-Year Research and Development Plan for NOAA (FY 2013-2017). This plan will guide NOAA's R&D activities over the next five years. The plan provides a common understanding among NOAA's leadership, its workforce, its partners, constituents and Congress on the value of NOAA's R&D activities. As such, the Plan is a framework with which NOAA and the public can monitor and evaluate the Agency's progress and learn from past experience.

Significant Inflationary Adjustments:
NOAA's FY 2015 Base includes a total of $13,798,000 and 0 FTE to account for the full funding requirement for inflationary adjustments to current programs for NMFS activities. This includes the estimated 2015 Federal pay raise of 1.0 percent as well as inflationary increases for non-labor activities, including service contracts, utilities, field office lease payments, and rent charges from the General Service Administration (GSA). NMFS will offset $2,381,000 of its inflationary costs through program management efficiencies.

Headquarters Administrative Costs:
In FY 2015 NMFS Line Office headquarters will use $25,051,207 in funds to support general management activities, financial and budgeting, and IT related expenses, as well as supporting facilities and other general operating costs. These funds also include support for service contracts, utilities, and rent charges from the General Services Administration. Specifically, NMFS will use headquarters administrative funds to support the following:

Headquarters Program Support Type	**Description**	**FY 2015 Estimated Amount**	**FY 2015 FTE associated with NMFS**
General Management & Direction/Executive Management	Includes Assistant Administrator's office, public affairs, information services	$9,399,506	38.7
Budget & Finance	Includes Budget, Finance and Accounting	$6,974,883	25.0
Facilities/Other Administrative (CAO Functions)	Includes Facilities and Security costs, as well as other CAO related activities	$2,676,220	6.0

Human Resources	All HR services, including EEO	$1,847,914	13.7
Acquisitions and Grants		$338,417	3.0
Information Technology	Includes IT-related expenses and other CIO related activities	$3,814,267	20.6
Total		**$ 25,051,207**	**107.0**

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APPROPRIATION ACCOUNT: OPERATIONS, RESEARCH AND FACILITIES
SUB-PROGRAM: PROTECTED SPECIES RESEARCH AND MANAGEMENT

The mission of the Protected Species Research and Management program is to assess, understand, and protect the health of protected species, the ecosystems that sustain them, and the communities that value and depend on them. The program fosters internal and external partnerships and conducts conservation actions with scientific rigor to reduce threats to marine and coastal ecosystems by instituting best practices and establishing assessment and monitoring programs. Protected species include those listed under the Endangered Species Act (ESA) and marine mammals covered by the Marine Mammal Protection Act (MMPA). This work supports increased certainty about protected species abundance and distribution patterns within the U.S. exclusive economic zone (EEZ) to avoid unnecessary regulatory restrictions on industry and other users of living marine resources.

NMFS implements the ESA and MMPA with the U.S. Fish and Wildlife Service (USFWS). In general, USFWS is responsible for the conservation of terrestrial and freshwater aquatic organisms, some marine mammals, and marine turtles on their nesting beaches. NMFS is responsible for the conservation of most marine mammals, most marine and anadromous fish, marine turtles at sea, marine invertebrates (including corals), and marine plants. In addition, the Marine Mammal Commission provides oversight and makes recommendations to NMFS on priority marine mammal issues, and three regional Scientific Review Groups provide independent review of our marine mammal stock assessments.

NMFS develops recovery and conservation plans to identify and evaluate threats to ESA-listed species—these plans include recovery actions to help eliminate these threats to improve the conservation status of listed species. NMFS implements conservation programs for protected resources in cooperation with federal partners, states, territories, tribal communities, and industry—such as the energy and fisheries industries—by leveraging resources and engaging local knowledge and expertise. Conservation actions may also include promulgating regulations to ensure that lawful activities are compatible with species recovery (e.g., reducing ship speed in coastal waters to reduce vessel collisions with endangered whales). Good science translates into informed management action and fewer restrictions on human activities. Thus, to ensure its decisions are based on reliable and current science, NMFS needs to conduct broad-scale and regular surveys to assess seasonal and inter-annual changes in abundance and distribution patterns. NMFS strives to use an ecosystem-based approach, and a combination of advanced technology and traditional survey platforms to collect and integrate data into ecological models. Data gathered from these investigations provide information on potential effects on these species from fisheries, energy exploration and development, and climate change. These data also help NMFS develop methods to eliminate, minimize, or mitigate the adverse effects of these activities.

Protected Species Programs are administered through the following budget line items:

Protected Species Research and Management Programs Base
Under the legislative authority of the ESA and MMPA—as well as other environmental legislation, international treaties, and agreements—this budget line supports activities that conserve and recover species threatened or endangered with extinction, as well as most marine mammals. This effort is critical to ensuring biological sustainability of all marine and anadromous species and the ecosystems on which they depend, as well as sustainable economic development in a manner compatible with species conservation and recovery. These funds are also used to coordinate with other NOAA programs to deliver science for the

assessment of threats to these species and understand the risk of proposed actions. The science is used for determining appropriate conservation measures to reduce or eliminate threats to protected species while authorizing appropriate economic and national defense readiness activities that may affect these species. Examples of the scientific research conducted include identifying and quantifying the effects of anthropogenic and natural factors on protected species populations and the variability of these effects over time and space, and identifying and evaluating various science-based management tools—such as fishing gear modifications and passive acoustic monitoring devices—that can be used to monitor populations and to recover and conserve protected species. Major components of this budget line include:

Interagency Consultation (ESA Section 7): ESA Section 7 requires Federal agencies to ensure that any action they fund, authorize, or undertake is not likely to jeopardize the continued existence of threatened or endangered species, or result in the destruction or adverse modification of critical habitat that has been designated for these species. This consultation with Federal action agencies is critical for decision-making regarding authorizations for lawful activities such as construction of roads and bridges, commercial fishing, or defense readiness training to be implemented in a manner that is compatible with species conservation and recovery.

Listing: Any U.S. citizen or organization may petition NMFS to list a species as threatened or endangered, reclassify an already listed species, or revise designated critical habitat under the ESA. Once a petition is received, the ESA outlines specific deadlines that must be followed. Within 90 days of receiving a petition to list a species, reclassify a species, or revise critical habitat, NMFS must announce in the *Federal Register* its initial determination regarding whether the petitioned action may be warranted. If NMFS determines the petitioned action may be warranted it must begin a status review of the species. Status reviews rely upon the best available scientific and commercial data to determine whether a species should be listed or reclassified. Within 12 months of receiving the petition, NMFS must determine if the listing or reclassification is warranted. If warranted, NMFS must then publish a proposed rule to list the species. NMFS then considers public comments and any new information that might become available and must publish a final determination a year after the date of publishing the proposed rule. The ESA also generally requires that critical habitat be designated concurrently with the final listing.

Once a species is listed, NMFS is required by the ESA to develop a recovery plan and implement the protections of the ESA. When a species is listed as endangered, the ESA prohibits any harm to it. However, if the species is listed as threatened, NMFS must issue separate protective regulations under Section 4(d) of the ESA in order to specify the prohibitions against harming the species.

Permits and Authorizations: NMFS issues permits and authorizations under the ESA and MMPA to conduct activities that may result in the direct and indirect take (harassing, hunting, capturing, harming, killing, or collecting) of a protected species. Permits and take authorizations cover scientific research to study the ecology and biology of protected species and the incidental take and harassment of marine mammals by otherwise lawful activities, such as seismic surveys, construction activities, or Navy training exercises.

Marine Mammal Health and Stranding Program: This program, authorized by the 1992 Amendments to the MMPA, designates NMFS as the lead Federal agency to coordinate stranding networks, responses and investigations of mortality events, biomonitoring, tissue and serum banking, and analytical quality assurance.

Marine Mammal and Sea Turtle Assessment and Marine Acoustics: The protected resources stock assessment and monitoring activities supported under this line determine whether assessments of various protected species stocks are adequate for management purposes, and whether a species' ecological status is declining, stable, or increasing. Assessments are typically comprehensive and are not limited to estimates of abundance and distribution, but include analysis of historical trends, serious injury and mortality levels, life history and demographics, impacts of human activities, noise, climate, habitat, and ecosystem change. Without the collection of these basic assessment data, monitoring and mitigation requirements will be more rigorous to compensate for uncertain science. Further, the assessment data are the basis for NMFS research and planning activities as well as issuance of permits and authorizations.

Species Recovery Grants

Recovery and conservation actions for ESA-listed species under NMFS' jurisdiction are implemented through Species Recovery Grants, which are awarded to states and tribes under the authority of Section 6 of the ESA and the Fish and Wildlife Coordination Act. To be eligible, states must first enter into an agreement with NMFS under Section 6 of the ESA—all federally recognized tribes are automatically eligible. NMFS currently has agreements with 23 states and territories, and is developing an agreement with Guam (Connecticut and American Samoa have initiated discussions to develop an agreement). Funding supports management, research, monitoring, or public outreach and education activities that have direct conservation benefits for listed species. Funding may also support monitoring of candidate species and recently de-listed species.

Marine Mammals

Under the authority of the MMPA and ESA (for listed marine mammals), NMFS develops and implements a variety of programs for the protection, conservation, and recovery of the approximately 160 marine mammal stocks listed under the MMPA. The major activities conducted under this budget line include:

Marine Mammal–Commercial Fisheries Interactions: NMFS annually classifies fisheries into one of three categories according to the level of incidental mortality or serious injury of marine mammals based on verification by trained observers on fishing vessels. The categories are: 1) frequent incidental mortality or serious injury of marine mammals, 2) occasional incidental mortality or serious injury of marine mammals, and 3) remote likelihood of or no known incidental mortality or serious injury of marine mammals. For those fisheries classified in categories 1 and 2, NMFS works collaboratively with the commercial fishing industry and other stakeholders to identify measures to reduce the impact of commercial fisheries on marine mammals to sustainable levels. NMFS convenes take reduction teams to develop plans that reduce the incidental serious injury or mortality of marine mammals from commercial fishing to levels less than the potential biological removal level (the maximum number of animals, not including natural mortalities that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population).

Population Assessment and Monitoring: NMFS uses several years of assessments and statistical modeling to assess the status of marine mammal stocks, identify population trends, classify fisheries interactions, assess other anthropogenic threats, and determine the impact of climate and natural environmental variations on marine mammals. Population assessments, analyses of population trends over time, and estimates of human-caused mortality and serious injury provide the biological basis for developing management actions to

recover and conserve marine mammals. Further, the results of assessments inform the consideration of proposed actions affecting marine mammals and guide the development of regulatory actions to minimize the impacts of human activities.

Research: NMFS conducts research to address management actions focusing on specific questions concerning the biology, behavior, and health of the species, status of marine mammal populations within the larger marine ecosystem, genetic differentiation, ecosystem interactions, and effects of human activities on the sustainability of marine mammals on regional and international scales.

Partnerships with Alaska Native Organizations: Under the MMPA, NMFS has entered into agreements with Alaska Native groups regarding the management of harvested marine mammal stocks in Alaska. These agreements provide funding for cooperative management of these stocks.

Marine Turtles

Under the legislative authority of the ESA, NMFS and USFWS implement the identification, listing, and recovery of threatened and endangered marine turtles. All six species of sea turtles occurring in the United States are protected under the ESA. NMFS has the lead responsibility for the conservation and recovery of sea turtles in the marine environment, and USFWS has the lead for the conservation and recovery of sea turtles on nesting beaches. Major threats to sea turtles in the United States include: bycatch in commercial and recreational fisheries; destruction and alteration of nesting and foraging habitats; and vessel strikes. To reduce the incidental capture of sea turtles in commercial fisheries, NMFS has enacted regulations in certain U.S. fisheries that are known to result in significant bycatch of sea turtles (such as shrimp trawl fishery, pelagic longline fisheries). NMFS and USFWS have developed recovery plans to guide research and management efforts necessary for each sea turtle species.

Because sea turtles are highly migratory, their conservation and recovery requires multilateral cooperation and agreements. NMFS uses a broad national and international program for the conservation and recovery of sea turtles and works closely with two international environmental agreements that deal exclusively with sea turtle conservation: Indian Ocean-South-East Asian (IOSEA) Marine Turtle Memorandum of Understanding, and Inter-American Convention (IAC) for the Protection and Conservation of Sea Turtles. The goal of the international component of the sea turtle program is to facilitate the global conservation and recovery of sea turtles by working closely with other nations through diplomatic channels, capacity building, and scientific exchange.

Under the Marine Turtle budget line, NMFS conducts interagency Section 7 consultations and listing activities as described under the Protected Species Research and Management Programs Base, as well as the following activity:

Bycatch in Commercial Fisheries: Bycatch in fishing operations is a primary threat to the recovery and conservation of sea turtle populations. To reduce this threat, NMFS uses fishery observer programs to document the bycatch of sea turtles, researches and develops alternative fishing practices and fishing gear to reduce bycatch, and promulgates regulations to implement solutions to sea turtle bycatch in the Pacific and Atlantic Oceans and the Gulf of Mexico. NMFS is currently involved in gear research projects designed to reduce sea turtle bycatch in the Gulf of Mexico bottom longline fishery, skimmer trawl shrimp fishery, and non-shrimp trawl fisheries in the Atlantic Ocean and Gulf of Mexico. In addition, NMFS continues

to conduct research on reducing sea turtle interactions in gillnet fisheries through the Pacific (Indonesia, Chile, Mexico and Brazil) and poundnet fisheries in Japan.

Other Protected Species
This budget line includes corals and other invertebrates, plants, and non-salmonid fishes. Funding authorized under the ESA provides support for recovery of these species through recovery planning, interagency Section 7 consultations, and Section 10 habitat conservation development, as well as Section 4 listing and regulatory activities as previously described in the Protected Species Research and Management Programs Base.

Atlantic Salmon
Under the legislative authority of the ESA, NMFS implements stock assessments, interagency Section 7 consultations, and recovery actions to protect and recover the endangered Atlantic salmon. The major threats to Atlantic salmon are dams and their inter-related effects on freshwater salmon habitat, such as preventing or impeding access to spawning habitat for returning adult salmon, and low marine survival. NMFS continues to work to remove and or modify these barriers to improve the population status of Atlantic salmon.

Pacific Salmon
Under the legislative authority of the ESA, NMFS implements stock assessments, interagency Section 7 consultations, and listing and recovery actions to protect and recover threatened and endangered Pacific salmon. Population declines and extirpations of Pacific salmon and steelhead are the result of numerous factors affecting habitat (such as hydropower development, land development, resource extraction, timber harvest practices, and other land uses), as well as effects from harvest, hatchery practices, natural variation in ocean-climate conditions, and other factors such as predation and the introduction of non-native species. These threats affect each listed species differently, and no single factor is solely responsible for declines. Loss of habitat ultimately limits the ability of salmon and steelhead populations to adapt to natural and human-caused changes. Variable ocean conditions over the past two decades reduced populations already weakened by loss of freshwater and estuary habitat, fishing pressures, and hatchery practices. Improved ocean conditions as well as improvements in habitat, the hydrosystem, and hatchery management have led to increased salmon returns.

NMFS is also responsible for ensuring that hydroelectric facilities do not compromise the survival of salmon and steelhead that must pass through them while migrating. The majority of hydroelectric dams lack adequate fish passage. To stem the loss of habitat critical for listed salmonids, NMFS works to develop and implement ESA Section 10 habitat conservation plans with Federal and state partners whose actions affect these resources. NMFS works with these same partners to improve fish passage through hydroelectric dams through ESA Section 7 interagency consultation. In addition, NMFS consults with the Environmental Protection Agency to assess the adverse effects of 37 active pesticide ingredients on threatened and endangered salmonids.

Schedule and Milestones:
FY 2015–2019

- Solicit and review Species Recovery Grant proposals submitted by states for conservation and recovery activities.
- Develop additional Section 6 agreements with Guam, Connecticut, and American Samoa.

- Prepare recovery plans and designate critical habitat.
- Provide technical assistance, consultation, and authorization services for all Federal agencies' proposed actions (ESA Section 7).
- Continue development and implementation of 10 Take Reduction Teams to achieve MMPA goals through increased compliance monitoring and bycatch assessments.
- Evaluate effectiveness and recommend enforcement measures, modify existing regulations, and add protective measures to reduce marine mammal bycatch in fisheries.
- Review listing petitions and issue 90-day findings.
- Conduct ESA status reviews and issue 12-month findings.
- Promulgate ESA protective regulations.
- Implement recovery actions identified in recovery plan to improve the status of ESA listed species.
- Respond to marine animal strandings and unusual mortality events.
- Provide diagnostic services to the stranding network to aid in the marine mammal cause of death determinations. Participate in international and regional agreements to further the U.S. policy on protected species conservation.
- Conduct comprehensive protected species stock assessments.
- Continue solicitation and evaluation of protected species science information needs from NMFS/NOAA and external decision makers.
- Solicit and review Prescott grant proposals submitted by stranding networks for marine animal stranding activities.

Deliverables:

FY 2015–2019

- Recovery actions identified in recovery plans to prevent species extinction.
- Comprehensive strategies for assessing the effectiveness of each marine mammal take reduction plan.
- MMPA and ESA permits.
- Annual compilation of protected species information needs internal and external to NMFS
- Take Reduction Teams to reduce marine mammal and sea turtle bycatch in fisheries that meet MMPA requirements.
- Develop or improve abundance and fishery mortality estimates for stocks in Alaska, the Pacific Islands, and the Gulf of Mexico to inform management decisions.
- Formal and informal consultation for other Federal agencies.
- Protection to species that are listed after the completion of status reviews.
- Assessments of protected species stocks with inadequate information to inform management decisions.
- Stock identification for more than 60 percent of protected species.

Performance Goals and Measurement Data:

Performance Measure: Number of Protected Species Designated as Threatened, Endangered or Depleted with Stable or Increasing Population Levels (Measure 17d)	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	30/79	27/83	27/86	30	30	30	30

Description: This measure tracks progress at achieving partial recovery of endangered, threatened, or depleted protected species under the jurisdiction of the National Marine Fisheries Service (NMFS). These species include those listed as threatened or endangered under the Endangered Species Act (ESA) as well as those marine mammal species listed as "depleted" under the Marine Mammal Protection Act (MMPA). Recovery of threatened, endangered, or depleted species can take decades, so while it may not be possible to recover or de-list a species in the near term, progress can be made to stabilize or increase the species population. For some, this means trying to stop a steep decline, while for others it means trying to increase their numbers. This measure currently tracks 79 species/stocks designated as threatened, endangered, or depleted.
NOTE: We begin tracking newly listed species a full fiscal year after they were listed.

Performance Measure: Percent of Protected Species with Adequate Population Assessments and Forecasts (Measure 17c)	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	19.0% (76/400)	18.90% (78/412)	24.30% (100/412)	25.50% (105/412)	23.50% (97/412)	25.00% (103/412)	26.20% (108/412)

Description: This measure tracks the percentage of protected species stocks for which adequate assessments are available to determine the scientific basis for supporting and evaluating the impact of management actions. To reach this standard, which is defined as "Tier II and Tier III" by the Protected Species Stock Assessment Improvement Plan (SAIP), assessments must be based on recent quantitative information sufficient to determine current stock status (abundance and mortality) relative to established reference levels and to forecast stock status under different management scenarios. This measure covers the protected species stocks covered by the MMPA or listed under the ESA. The number of such stocks can change as new species are listed and as new stocks of listed species and marine mammals are identified.
NOTE: As a result of a comprehensive review of the stocks tracked for this measure matched against existing marine mammal stock assessment reports, a net correction of 22 stocks was made to reset the total number of stocks in FY 2012 and FY 2013 to 400. In FY 2014, 12 additional stocks were added (5 Atlantic sturgeon and 7 marine mammals stocks) to bring the total to 412.

Performance Measure: Number and Percentage of Recovery Actions Ongoing or Completed (Measure17e)	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	1897/ 4202 (45.1%)	1979/ 4457 (44.4%)	2030/ 4457 (45.5%)	2080/ 4457 (46.7%)	2125/ 4457 (47.7%)	2171/ 4457 (48.7%)	2216/ 4457 (49.7%)

Description: This measure tracks progress of ongoing or completed recovery actions (including Priority 1 actions needed to prevent extinction) included in NMFS approved recovery plans for species listed as threatened or endangered under the ESA. Recovery actions are those actions found to be necessary to remove species from the ESA. They are identified, quantified to the extent possible, ranked in importance to prevent extinction and to promote recovery, and described in species recovery plans. Actions may include items that can be completed in a year or other actions, including monitoring, that may take many years to complete or that may be ongoing. Recovery of threatened or endangered species is a gradual process that can take decades, and completed recovery actions can show incremental progress made in achieving recovery. The increase in the total number of actions in FY 2014 is due to the addition of the Lower Columbia River salmonids recovery plan with new recovery actions

Performance Measure: Number of priority recovery actions being addressed through Species Recovery Grants	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	20	25	25	25	25	25	25

Description: Funding may support recovery actions for any of the listed species under NMFS jurisdiction, with the exclusion of Pacific salmonids.

Performance Measure: Respond to known strandings in a timely manner and collect data on diseases, cause of death and injuries	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	10%	26%	26%	26%	26%	26%	26%

Description: Percentage of stranding network organizations that have Prescott Grants to improve their rapid response and examination of stranded marine mammals. Rapid responses enable a higher probability of decreasing pain and suffering, saving individuals, and determining cause of death, type of disease, and other types of injuries.

Performance Measure: Rapid first response and further examination in Navy training ranges	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	2/5	4/5	4/5	4/5	4/5	4/5	4/5

Description: The U.S. Navy has five training ranges that have letters of authorization to take or harass marine mammals. Examples of actions that may take/harass marine mammals include high frequency sonar and explosive detonations. This performance measure indicates the number of US Navy training ranges that have at least one stranding network participant funded by the Prescott Grant Program to improve their ability for rapid response and further examination when strandings occur during Navy Training Exercises.

Performance Measure: Percent detection of Unusual Mortality Events	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	9%	28%	28%	28%	28%	28%	28%

Description: Percent of the coast with Prescott Grant funded stranding coverage in the contiguous states along the Pacific, Atlantic, and Gulf of Mexico that enables detection of Unusual Mortality Events.

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PROGRAM CHANGES FOR FY 2015:

Species Recovery Grants: Species Recovery Grants (Base Funding: $5,009,000 and 3 FTE; Program Change: $5,000,000 and 0 FTE): NOAA requests an increase of $5,000,000 and 0 FTE for a total of $10,009,000 and 3 FTE for the conservation and recovery of marine and anadromous species under NMFS's jurisdiction and listed under the Endangered Species Act (ESA) through the Species Recovery Grant Program.

Proposed Actions:
Recovery and conservation actions for ESA-listed species under NMFS's jurisdiction are implemented through Species Recovery Grants, which are awarded to states and tribes under the authority of Section 6 of the ESA and the Fish and Wildlife Coordination Act. This funding will provide additional grants to increase the capacity of states and tribes to conduct high priority recovery actions for listed species. Priority recovery actions can include reducing or removing significant sources of mortality and injury, assessing and monitoring species status and trends, developing conservation plans to minimize and mitigate bycatch of listed species, conserving habitat, and educating and engaging the public in the conservation of ESA-listed species. Grants may also support needed monitoring of candidate and recently de-listed species. Species Recovery Grants will be administered in close coordination with the Community Based Restoration Program (CBRP) and the Pacific Coastal Salmon Recovery Fund (PCSRF) to realize management efficiencies, identify strategic opportunities, and achieve significant conservation benefits on a national scale.

Statement of Need and Economic Benefits:
As of January 31, 2014, NMFS had jurisdiction over 93 threatened or endangered species, 80 species that have been proposed for listing, and 25 species that are candidates for listing under the ESA. An additional 39 species are the subject of listing petitions currently under review by NMFS. Given the large number of species that have been petitioned or are under consideration for listing, many more species will likely be added to the list in 2014. The escalating number of species requiring the protections of the ESA without increased investment in recovery and delisting will increase the agency's statutory and regulatory responsibilities and lead to increased pressure on protected species programs nationwide (e.g., Section 7 consultations, Section 10 permitting). Similarly, state agencies that share management responsibilities for these species will also require additional support in order to adequately manage the growing number of threatened and endangered species in state waters.

The Species Recovery Grants Program is the primary mechanism for funding and implementing recovery actions for listed species. Recovery actions are those actions needed to recover and delist species. These actions are identified in NMFS Recovery plans, which are developed by expert teams and subjected to public and peer reviews. Proposals selected for Species Recovery Grant funding are those that address high priority recovery actions for listed species. Additional species and actions may be supported (e.g., candidate species monitoring) when funding is available.

Two competitive grant programs are administered under the Species Recovery Grant Program - one for states and one for tribes. States and tribes have management authorities and responsibilities for protected species within their jurisdictions, and as such, they are uniquely qualified to partner with NMFS in the implementation of recovery actions for listed species. These partnerships leverage existing state and tribal resources and expertise. Section 6 of the ESA also includes a matching provision that requires states to provide 25 percent of total projects costs, or 10 percent of total project costs when two or more states work together.

The Species Recovery Grant Program supports all types of activities identified in recovery plans —management, monitoring, research and outreach—and funding may be applied to any one of the species under NMFS' jurisdiction from blue whales to black abalone. Twenty-three states (including U.S. territories), from Guam to Alaska to Puerto Rico, are eligible for this funding. All federally recognized tribes are also eligible. Over $30 million in Federal grant funding has been provided to states, tribes, and approximately 53 other partner organizations to support conservation and recovery of 26 threatened or endangered species since fiscal year 2003, when just under $1 million was first available for grants to states. Examples of funded work to date include Hawaiian monk seal disentanglement and rescue; captive breeding efforts to prevent extinction of white abalone; development of an Atlantic coast sturgeon tagging network and database; and repair of water control structures to allow Atlantic salmon access to historical spawning grounds. Multiple indirect economic benefits are expected as grant dollars are expended to improve populations of listed species, which typically receive significant public interest and attention and often have recreational and commercial value for coastal states, as well as cultural and subsistence value for tribes.

Resource Assessment:
The resources for this activity are described in the Protected Species Research and Management narrative.

Schedules and Milestones:
FY 2015 – 2019:

- Solicit and review Species Recovery Grant proposals submitted by states and tribes for conservation and recovery activities.
- Develop additional Section 6 agreements with states and territories.
- Update the U.S. Fish and Wildlife Service Recovery Online Activity Reporting System and the Species Recovery Grants Tracking Database.

Deliverables:
FY 2015 – 2019:

- Implementation of recovery actions identified in recovery plans to prevent species extinction.
- Updates to the System Species Recovery Grants Tracking Database.
- Updated Recovery Online Activity Reporting System.

Performance Goals and Measurement Data:

Performance Measure: Number of priority recovery actions being addressed through Species Recovery Grants	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With Increase	N/A	N/A	50	50	50	50	50
Without Increase	14	25	25	25	25	25	25

Description: Funding may support recovery actions for any of the listed species under NMFS jurisdiction, with the exclusion of Pacific salmonids.

Note: NMFS has established an online database for use by agency personnel monitoring grant performance to enter successfully completed priority recovery actions. This monitoring and reporting will assist NMFS to more accurately track and evaluate species progress to recovery. In the past an assumption of $200K per priority recovery action has applied and is based on prior year activities.

PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Budget Program: National Marine Fisheries Service
Sub-program: Protected Species Research and Management
Program Change: Species Recovery Grants

	Object Class	FY 2015 Increase	FY 2015 Total Program
11	Personnel compensation		
11.1	Full-time permanent	$0	$337
11.3	Other than full-time permanent	0	14
11.5	Other personnel compensation	0	0
11.7	Special personnel services payments	0	0
11.9	Total personnel compensation	0	351
12	Civilian personnel benefits	0	90
13	Benefits for former personnel	0	0
21	Travel and transportation of persons	0	3
22	Transportation of things	0	0
23.1	Rental payments to GSA	0	11
23.2	Rental Payments to others	0	0
23.3	Communications, utilities and miscellaneous charges	0	2
24	Printing and reproduction	0	1
25.1	Advisory and assistance services	0	11
25.2	Other services	0	37
25.3	Purchases of goods & services from Gov't accounts	0	12
25.4	Operation and maintenance of facilities	0	0
25.5	Research and development contracts	0	0
25.6	Medical care	0	0
25.7	Operation and maintenance of equipment	0	0
25.8	Subsistence and support of persons	0	0
26	Supplies and materials	0	8
31	Equipment	0	0
32	Lands and structures	0	0
33	Investments and loans	0	0
41	Grants, subsidies and contributions	5,000	9,483
42	Insurance claims and indemnities	0	0
43	Interest and dividends	0	0
44	Refunds	0	0
99	Total obligations	5,000	10,009

Marine Mammals: Marine Mammals (Base Funding: $49,717,000 and 192 FTE; Program Change: -$2,500,000 and 0 FTE): NOAA requests a decrease of $2,500,000 and 0 FTE for a total of $47,217,000 and 192 FTE for Marine Mammals. Within this amount, NOAA requests a decrease of $1,914,000 for the John H. Prescott Marine Mammal Rescue Assistance Grant program for a total of $1,140,000, and an additional decrease of $586,000 for the Marine Mammal Protection program for a total of $10,860,000. NOAA will still meet existing requirements pursuant to the Marine Mammal Protection Act, but NOAA will reduce funding for research abundance surveys, and conservation and recovery actions.

Proposed Actions:
The Prescott Grant Program provides competitive grants to stranding network organizations to rescue, rehabilitate, or investigate sick, injured or distressed live marine mammals and to determine the cause of death or disease in dead marine mammals. With this funding, NOAA anticipates awarding approximately 12 grants in FY 2015. Awards will be based on data from episodic strandings and mortality events from the previous year, as well as status of marine mammal populations, NOAA will also continue to provide coordination support, technical and veterinary assistance, and guidance to the stranding network through the Protected Species Research and Management Base program.

Information collected by stranding network participants is important for fulfilling NOAA's Marine Mammal Protection Act (MMPA) and Endangered Species Act (ESA) mandates, including compiling the List of Fisheries and Stock Assessment Reports, identifying key recovery activities, as well as in monitoring natural and manmade causes of death in marine mammals around the country. NOAA realizes a significant return on its investment by providing small grants to these organizations, allowing them to leverage this money with larger private funding and in-kind services.

Stranding networks are relied upon by local communities for providing timely and adequate responses when marine mammals wash ashore or are seen injured, ill or trapped along our coasts. The Prescott Grant Program provides funds to stranding network organizations to provide quality care for marine mammals that are stranded, sick, injured, or distressed. Since Prescott grants often provide seed funds for stranding responders, they have a significantly larger impact than just the grants alone. In addition, the Prescott Grant Program requires applicants to provide a minimum of 25 percent non-federal cost match for each project. To date, the stranding network has leveraged over $14.9 million in non-federal funding from this match requirement.

Resource Assessment:
The resources for the Marine Mammal Health and Stranding Program activities are described in the Protect Species Research and Management narrative.

Schedule and Milestones:
FY 2015 – 2019:
- Solicit and review Prescott grant proposals submitted by stranding networks for marine animal stranding activities in FY 2015.
- Award approximately 12 grants of up to $100,000 each for FY 2015.

Deliverables:
FY 2015 – 2019:
- Data collection on diseases and causes of strandings.

- Detection of unusual mortality events.
- Jobs for rescue/response/facility personnel.
- Improved health and welfare of marine mammals.
- Response to marine mammal strandings through a network of responders.

Performance Goals and Measurement Data:

Performance Measure: Respond to known strandings in a timely manner and collect data on diseases, cause of death and injuries	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With Decrease	N/A	N/A	10%	10%	10%	10%	10%
Without Decrease	10%	23%	23%	23%	23%	23%	23%
Description: Percentage of stranding network organizations that have Prescott Grants to improve their rapid response and examination of stranded marine mammals. Rapid responses enable a higher probability of decreasing pain and suffering, saving individuals, and determining cause of death, type of disease, and other types of injuries.							

Performance Measure: Rapid first response and further examination in Navy training ranges	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With Decrease	N/A	N/A	2/5	2/5	2/5	2/5	2/5
Without Decrease	2/5	4/5	4/5	4/5	4/5	4/5	4/5
Description: The US Navy has five training ranges that have letters of authorization to take or harass marine mammals. Examples of actions that may take/harass marine mammals include high frequency sonar and explosive detonations. This performance measure indicates the number of US Navy training ranges that have at least one stranding network participant funded by the Prescott Grant Program to improve their ability for rapid response and further examination when strandings occur during Navy Training Exercises.							

Performance Measure: Percent detection of Unusual Mortality Events	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With Decrease	N/A	N/A	9%	9%	9%	9%	9%
Without Decrease	9%	26%	26%	26%	26%	26%	26%
Description: Percent of the coast with Prescott Grant funded stranding coverage in the contiguous states along the Pacific, Atlantic, and Gulf of Mexico that enables detection of Unusual Mortality Events.							

PROGRAM CHANGE DETAIL BY OBJECT CLASS

(Dollar amounts in thousands)

Program: National Marine Fisheries Service
Sub-program: Protected Species Research and Management
Program Change: Marine Mammals

	Object Class	FY 2015 Decrease	FY 2015 Total Program
11	Personnel compensation		
11.1	Full-time permanent	$0	$20,216
11.3	Other than full-time permanent	0	772
11.5	Other personnel compensation	0	0
11.7	Special personnel services payments	0	217
11.9	Total personnel compensation	0	21,205
12	Civilian personnel benefits	0	6,568
13	Benefits for former personnel	0	7
21	Travel and transportation of persons	0	949
22	Transportation of things	0	51
23.1	Rental payments to GSA	0	614
23.2	Rental Payments to others	0	102
23.3	Communications, utilities and miscellaneous charges	0	743
24	Printing and reproduction	0	159
25.1	Advisory and assistance services	0	475
25.2	Other services	(564)	0
25.3	Purchases of goods & services from Gov't accounts	0	7,827
25.4	Operation and maintenance of facilities	0	0
25.5	Research and development contracts	0	0
25.6	Medical care	0	0
25.7	Operation and maintenance of equipment	0	0
25.8	Subsistence and support of persons	0	0
26	Supplies and materials	0	1,115
31	Equipment	0	248
32	Lands and structures	0	0
33	Investments and loans	0	0
41	Grants, subsidies and contributions	(1,936)	7,154
42	Insurance claims and indemnities	0	0
43	Interest and dividends	0	0
44	Refunds	0	0
99	Total obligations	(2,500)	47,217

Marine Turtles: Marine Turtles (Base Funding: $12,388,000 and 53 FTE; Program Change: -$1,000,000 and 0 FTE): NOAA requests a decrease of $1,000,000 and 0 FTE for a total of $11,388,000 and 53 FTE across all Marine Turtle programs.

Proposed Actions:
The FY 2014 Consolidated Appropriations Act provided additional funds for recovery and protection activities related to Hawaiian sea turtles. The FY 2015 President's Budget seeks to build upon the knowledge gained in recovery and protection of Hawaiian sea turtles and continue to carry out recovery activities such as interagency consultation and technical assistance on bycatch reduction strategies and cooperative conservation actions; including Hawaii, Territories of America Samoa and Guam, the Commonwealth of the Northern Mariana Islands.

The NOAA Marine Turtle program conducts recovery and conservation activities of marine turtles in the Northeast, Southeast, Gulf of Mexico, and U.S. Pacific through regulations to reduce sea turtle bycatch in federal and state fisheries, Section 7 consultations, and numerous domestic and international cooperative research and conservation activities. NOAA Fisheries will also continue to develop a strong scientific research program on marine turtles, including the development of tools to conduct marine turtle stock assessments and bycatch reduction research. These activities will enable the effective conservation and protection of marine turtles by NOAA.

Resource Assessment:
The resources for this activity are described in the Protect Species Research and Management narrative.

Schedules and Milestones:
- Provide technical assistance, consultation, and authorization services for all Federal agencies' proposed actions [Endangered Species Act (ESA) Section 7]
- Evaluate effectiveness and recommend enforcement measures, modify existing regulations, and add protective measures to reduce marine turtle bycatch in fisheries
- Promulgate ESA protective regulations
- Participate in international and regional agreements to further the U.S. policy on marine turtle conservation
- Conduct marine turtle stock assessments

Deliverables:
- Implementation of recovery actions identified in recovery plans to improve the status of marine turtle populations
- Reduction of marine turtle bycatch in commercial and recreational fisheries
- Improvement in abundance and fishery mortality estimates for marine turtles stocks in the Atlantic, Pacific, and the Gulf of Mexico to inform management decisions
- Formal and informal consultation for other Federal agencies

PROGRAM CHANGE DETAIL BY OBJECT CLASS

(Dollar amounts in thousands)

Budget Program: National Marine Fisheries Service
Sub-program: Protected Species Research and Management
Program Change: Marine Turtles

	Object Class	FY 2015 Decrease	FY 2015 Total Program
11	Personnel compensation		
11.1	Full-time permanent	$0	$5,178
11.3	Other than full-time permanent	0	170
11.5	Other personnel compensation	0	0
11.7	Special personnel services payments	0	0
11.9	Total personnel compensation	0	5,348
12	Civilian personnel benefits	0	1,755
13	Benefits for former personnel	0	2
21	Travel and transportation of persons	0	360
22	Transportation of things	0	6
23.1	Rental payments to GSA	0	166
23.2	Rental Payments to others	0	69
23.3	Communications, utilities and miscellaneous charges	0	96
24	Printing and reproduction	0	84
25.1	Advisory and assistance services	0	337
25.2	Other services	0	47
25.3	Purchases of goods & services from Gov't accounts	(1,000)	1,090
25.4	Operation and maintenance of facilities	0	0
25.5	Research and development contracts	0	0
25.6	Medical care	0	0
25.7	Operation and maintenance of equipment	0	0
25.8	Subsistence and support of persons	0	0
26	Supplies and materials	0	343
31	Equipment	0	21
32	Lands and structures	0	0
33	Investments and loans	0	0
41	Grants, subsidies and contributions	0	1,664
42	Insurance claims and indemnities	0	0
43	Interest and dividends	0	0
44	Refunds	0	0
99	Total obligations	(1,000)	11,388

Other Protected Species (Marine Fish, Plants, and Invertebrates): ESA Recovery: (Base Funding: $7,116,000 and 33 FTE; Program Change: $4,000,000 and 7 FTE): NOAA requests an increase of $4,000,000 and 7 FTE for a total of $11,116,000 and 40 FTE to implement Endangered Species Act (ESA) requirements for up to 66 coral species proposed by the Administration for listing on December 7, 2012, final determination in June 2014. The new funding will supplement existing funding in this budget that address ESA activities for species other than marine mammals, sea turtles, or salmon.

Proposed Actions:
The requested funding will be used to work with private, state, territorial and other governmental entities to ensure that their actions can be conducted harmoniously with any corals that are ultimately listed by conducting Section 7 consultations and issuing incidental take and scientific research permits. In addition, the funds will be used to designate critical habitat, develop tailored 4(d) rules for threatened species, and develop recovery plans.

Once the coral species are listed, NMFS must conduct ESA Section 7 consultations for all new and ongoing federal projects that may affect the listed coral species. For coral species that are listed as endangered, all take will be prohibited unless authorized; but if a coral species is listed as threatened, NMFS must develop and issue necessary regulations to extend take prohibitions to that species. Finally, other ESA-required processes (such as Recovery Planning, Section 9 enforcement, incidental take permitting for non-federal actions, including scientific research activities) will also require significant commitment of staff time and resources.

NMFS will also conduct ESA Section 7 consultations for all new and ongoing Federal actions affecting corals including fishing, land-based sources of pollution, and marine/coastal development and construction activities. Numerous Federal agencies carry out or regulate such activities, including: the Department of the Interior (Fish and Wildlife Service Refuge activities); Department of Defense (military training exercises, construction projects); Department of Transportation (road construction and maintenance projects); Department of Agriculture (agricultural run-off control); Department of Energy (alternative energy development); Department of Commerce (NMFS: Federal fisheries authorization and management); the Environmental Protection Agency (pollution control); the U.S. Army Corps of Engineers (development permits, channel maintenance projects); and the U.S. Coast Guard (buoy maintenance, aids to navigation). Conducting Section 7 consultations in a timely manner will allow these activities that may impact listed species to move forward without delay in order to help facilitate economic growth. While NMFS will seek efficiencies through development of best practices and programmatic approaches to consultations, the new coral listings will significantly increase ESA Section 7 workload and associated actions including the issuance of scientific research permits, over the short and near terms.

Research on endangered species can proceed only after a scientific research permit is issued by NMFS. Once a species is listed, NMFS must work with researchers throughout the scientific community (federal and non-federal) to process applications for scientific research permits. NMFS must assess the proposed research under Section 10 of the ESA and conduct an analysis under NEPA and Section 7 consultation of the ESA before it can issue the permit. A final listing of the magnitude of the proposed coral species will result in a significant increase in the number of scientific permits needed by researchers to continue their current research activities.

Finally, NMFS will need to develop recovery plans for the newly listed coral species. The proposed listing rule identifies 19 threats to the survival of coral, including: rising ocean temperatures, ocean acidification, coral disease, fishing, land-based sources of pollution, and

damage from marine/coastal construction and development activities. To better understand those threats and identify specific actions to conserve these corals, NMFS will increase coral research with partners. This information will be used to develop recovery plans that will identify the actions that NOAA or other agencies and stakeholders can take to reduce or eliminate threats that are determined to impede coral recovery. Once the plans are finalized, NMFS will track the initiation and completion of recovery actions through the Recovery Online Activity Reporting System.

Statement of Need and Economic Benefits:
In June 2014, NMFS will make a final listing determination on 66 species of coral—59 in the Pacific and seven in the Caribbean. Currently NMFS has jurisdiction over 93 threatened and endangered species. The coral listing will nearly double the number of ESA listed species managed by NMFS—this is analogous to the listing of two dozen Pacific salmon species in the mid-1990s which brought a dramatic increase in workload (tenfold increase in Section 7 workforce). Current funding and staffing levels are inadequate to meet the ESA regulatory and recovery requirements for corals once they are listed.

Resource Assessment:
This budget line includes support for corals and other invertebrates, plants, and non-salmonid fishes. Funding authorized under the ESA provides support for recovery of these species through recovery planning, interagency Section 7 consultations, and Section 10 habitat conservation plan development, as well as Section 4 listing and regulatory activities as previously described in the Protected Species Research and Management Programs Base. NMFS is currently assessing the best mechanism to ensure researchers obtain their scientific research permits as soon possible after up to 66 coral species are listed. Additional information on these activities can be found in in the Protected Species Research and Management base narrative.

Schedule and Milestones:
FY 2015 – 2019:

- Prepare ESA Section 4(d) rules for new species that are listed as threatened.
- Prepare ESA rule to designate critical habitat.
- Conduct research to understand threats and recovery actions.
- Develop recovery plans for newly listed coral species.
- Update the Recovery Online Activity Reporting System with recovery actions initiated.

Deliverables:
FY 2015 – 2019:

- Final protective regulations (Section 4(d) rules), recovery plans and critical habitat designations.
- Completed Section 7 consultations.
- Issuance of scientific research and enhancement permits.
- Issuance of incidental take permits to states and territories.
- Updated Recovery Online Activity Reporting System.

Performance Goals and Measurement Data:

Performance Measure: Number of additional Section 7 formal consultations and permits prepared for proposed Federal activities	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With Increase	N/A	N/A	45	45	75	90	90
Without Increase	N/A	N/A	0	0	0	0	0
Description: This measure tracks increased consultations and related authorizations including scientific research and incidental take permits. Reductions in cost in out-years reflect process improvement and greater efficiency due to streamlining.							

PROGRAM CHANGE PERSONNEL DETAIL

(Dollar amount in thousands)

Budget Program: National Marine Fisheries Service
Sub-program: Protected Species Research and Management
Program Change: ESA Recovery

Title:	Location	Grade	Number of Positions	Annual Salary	Total Salaries
Fishery Biologist	Silver Spring, MD	ZP-3	1	$63,091	$63,091
Fishery Biologist	St. Petersburg, FL	ZP-3	2	$61,349	$122,698
Fishery Biologist	St. Petersburg, FL	ZP-4	1	$87,441	$87,441
Fishery Biologist	Honolulu, HI	ZP-3	4	$59,175	$236,700
Fishery Biologist	Honolulu, HI	ZP-4	1	$84,343	$84,343
Subtotal			9		$594,273
Less Lapse	25%		(2)		($148,568)
Total Full-time permanent:			7		$445,705
2015 Pay Adjustment	1.0%				$4,457
TOTAL			7		$450,162

Personnel Data	**Number**
Full-time Equivalent Employment	
Full-time permanent	7
Other than full-time permanent	0
Total	7
Authorized Positions:	
Full-time permanent	9
Other than full-time permanent	0
Total	9

PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Budget Program: National Marine Fisheries Service
Sub-program: Protected Species Research and Management
Program Change: ESA Recovery

	Object Class	FY 2015 Increase	FY 2015 Total Program
11	Personnel compensation		
11.1	Full-time permanent	$450	$3,834
11.3	Other than full-time permanent	0	65
11.5	Other personnel compensation	0	0
11.7	Special personnel services payments	0	0
11.9	Total personnel compensation	450	3,899
12	Civilian personnel benefits	136	1,230
13	Benefits for former personnel	0	0
21	Travel and transportation of persons	500	575
22	Transportation of things	0	2
23.1	Rental payments to GSA	0	170
23.2	Rental Payments to others	0	40
23.3	Communications, utilities and miscellaneous charges	0	57
24	Printing and reproduction	26	52
25.1	Advisory and assistance services	2,000	2,118
25.2	Other services	0	27
25.3	Purchases of goods & services from Gov't accounts	0	1,314
25.4	Operation and maintenance of facilities	0	0
25.5	Research and development contracts	854	854
25.6	Medical care	0	0
25.7	Operation and maintenance of equipment	0	0
25.8	Subsistence and support of persons	0	0
26	Supplies and materials	0	173
31	Equipment	34	50
32	Lands and structures	0	0
33	Investments and loans	0	0
41	Grants, subsidies and contributions	0	555
42	Insurance claims and indemnities	0	0
43	Interest and dividends	0	0
44	Refunds	0	0
99	Total obligations	4,000	11,116

Atlantic Salmon: Atlantic Salmon: (Base Funding: $5,074,000 and 23 FTE: Program Change: $1,000,000 and 0 FTE): NOAA requests an increase of $1,000,000 and 0 FTE for a total of $6,074,000 and 23 FTE for Atlantic Salmon.

Proposed Actions:
NOAA proposes to increase funding for Atlantic salmon recovery. Under this proposal, NOAA will enhance support for the Maine Department of Marine Resources' Atlantic salmon research and management program. NOAA will also support investigations to understand and recover diadromous species that co-evolved with Atlantic salmon to design and implement actions to recover the ecosystems upon which Atlantic salmon depend, monitoring of the Penobscot River and Estuary to detect changes in the ecosystem as a result of mainstem dam removal, add expertise in fish passage engineering and modeling, and implement additional fish passage improvement and barrier removal projects in the Gulf of Maine distinct population segment (DPS).

Statement of Need and Economic Benefits:
The Atlantic salmon program is a cooperative effort among NOAA, Maine Department of Marine Resources (DMR), Penobscot Indian Nation, and the U.S. Fish and Wildlife Service (USFWS). Each entity has clearly defined, unique and complimentary roles in this integrated effort. The FY 2015 request will stabilize core Atlantic salmon recovery programs including stock assessment, Endangered Species Act (ESA) and North Atlantic Salmon Conservation Organization (NASCO) management, and ocean fishery and telemetry elements. NOAA and its public and private partners invested significantly in Atlantic salmon conservation and recovery, including $50 million to purchase and remove two dams, and build a natural bypass around a third dam, on the Penobscot River.

Specific activities added in FY 2015:

- Enhanced Support for the Maine Department of Marine Resources: With this increase, NOAA will increase the grant to the Maine DMR to continue Atlantic salmon cooperative management and research activities focused in the estuary and marine environment.
- Co-Evolved Diadromous Fish: NOAA will strengthen programs to address factors identified in the listing and critical habitat designation relative to depleted status of co-evolved diadromous species. Efforts will focus on studying response of diadromous communities in estuarine and coastal systems and increasing connectivity to strengthen resilience in a changing environment.
- Fish Passage Engineering and Modeling Expertise: NOAA will provide engineering and technical support to hydro-electric dam owners and operators as they evaluate upstream and downstream fish passage survival and design modifications to meet performance standards across watersheds. These performance standards are included in Biological Opinions and FERC license articles.
- Restoring Connectivity: NOAA will support studies and management actions to enhance river connectivity and diadromous species resilience in the Androscoggin, Kennebec, and Penobscot drainages as well as smaller coastal rivers. Funds will partially support continuation of critical post-removal studies in the Penobscot River and Estuary (2015–16). Dam removals are being considered throughout the country, yet little quantitative data exists on the effects of dam removal to inform decisions.

Resource Assessment:
NMFS currently conducts stock assessments, measures vital survival rates, conducts interagency Section 7 consultations, issues ESA Section 10 incidental take permits, identifies and implements recovery actions, and leads the U.S. international management efforts for

Atlantic salmon. NMFS works closely with the State of Maine, under a cooperative agreement, which is designed to protect and recover the endangered Atlantic salmon. Additional information on the resources for this activity can be found in the Protected Species Research and Management narrative.

Schedule and Milestones:
FY 2015 – 2019:

- Evaluate fish passage effectiveness studies being conducted by dam owners as a condition of their interim species protection plans and associated biological opinions and conduct modeling to establish performance standards on a watershed basis.
- Conduct ESA Section 7 consultations on proposed federal actions in the estuarine and marine environment and for dams.
- Work with dam owners to consider study results as they develop applications for long term species protection plans.
- Participate in inter-sessional and the annual meeting of the NASCO and the International Council for the Exploration of the Sea (ICES), and US Atlantic Salmon Assessment Committee.
- Participate and lead international Atlantic salmon sampling program at West Greenland
- Develop assessment and information tools to model Atlantic salmon population dynamics as related to dams and marine survival in the Maine river systems and report on impact analysis and utility to managers.
- Conduct Annual stock assessment and implement Marine and Estuary Action Plan for Interagency Salmon Framework and Governance (Penobscot Indian Nation, USFWS, and State of Maine).
- Deploy and tend estuarine and coastal acoustic array in Penobscot and Gulf of Maine region from April-October in collaboration with network cooperators and analyze data on salmon survival and interspecies interactions.
- Provide a grant to the state of Maine to conduct Atlantic salmon assessment and management activities including actions to conserve genetic diversity.
- Work cooperatively with partners to conduct post dam removal monitoring studies in the Penobscot River and estuary.
- Conduct investigations on the status and role of co-evolved diadromous species in order to design and implement actions to recover the ecosystems upon which Atlantic salmon depend.

Deliverables:
FY 2015 – 2019:

- Completion of informal and formal Section 7 consultations on actions in the estuarine and marine environment and dams.
- Five year Implementation Plan and Annual Progress Reports for NASCO.
- Quantification of individual and cumulative upstream and downstream fish passage survival at hydro dams on the Kennebec, Androscoggin, and Penobscot Rivers.
- Scientific review of monitoring facilities study plan and results to determine compliance with quantitative fish passage metrics.
- Annual Status of Stocks by Salmon Habitat Recovery Unit Report for ESA decision makers, partner agencies, tribes, and public.
- Annual Marine and Estuary Survival Metrics and Accomplishment Report to Atlantic Salmon Framework and Governance Management and Policy Boards.
- Report on pre and post dam removal monitoring in the Penobscot River and Estuary.
- Lab reference document establishing and supporting fish passage performance standards.

- Description of the role of co-evolved diadromous fish in the effort to recover endangered Atlantic salmon, including predator and prey relationships.

Performance Goals and Measurement Data:

Performance Measure: Number of ESA section 10 incidental take permits issued	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With Increase	3	3	5	5	5	5	5
Without Increase	N/A	N/A	3	3	3	3	3
Description: ESA section 10 incidental take permits require a proactive approach where agency biologists identify illegal take that is occurring and work with the industry, state agency, or private entity to encourage them to apply for an incidental take permit. Under this funding proposal, this proactive program could enhance the opportunity to pursue passage for Atlantic salmon and other diadromous species at the 396 non-hydroelectric dams that exist in the range of the Gulf of Maine DPS of Atlantic salmon.							

PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Budget Program: National Marine Fisheries Service
Sub-program: Protected Species Research and Management
Program Change: Atlantic Salmon

	Object Class	FY 2015 Increase	FY 2015 Total Program
11	Personnel compensation		
11.1	Full-time permanent	$0	$2,154
11.3	Other than full-time permanent	0	89
11.5	Other personnel compensation	0	0
11.7	Special personnel services payments	0	0
11.9	Total personnel compensation	0	2,243
12	Civilian personnel benefits	0	719
13	Benefits for former personnel	0	0
21	Travel and transportation of persons	0	94
22	Transportation of things	0	35
23.1	Rental payments to GSA	0	86
23.2	Rental Payments to others	0	131
23.3	Communications, utilities and miscellaneous charges	0	73
24	Printing and reproduction	0	33
25.1	Advisory and assistance services	0	14
25.2	Other services	400	421
25.3	Purchases of goods & services from Gov't accounts	0	366
25.4	Operation and maintenance of facilities	0	0
25.5	Research and development contracts	0	0
25.6	Medical care	0	0
25.7	Operation and maintenance of equipment	0	0
25.8	Subsistence and support of persons	0	0
26	Supplies and materials	50	160
31	Equipment	100	135
32	Lands and structures	0	0
33	Investments and loans	0	0
41	Grants, subsidies and contributions	450	1,564
42	Insurance claims and indemnities	0	0
43	Interest and dividends	0	0
44	Refunds	0	0
99	Total obligations	1,000	6,074

APPROPRIATION ACCOUNT: OPERATIONS, RESEARCH AND FACILITIES
SUB-PROGRAM: FISHERIES RESEARCH AND MANAGEMENT

The Fisheries Research and Management sub-program encompasses many of the scientific and management activities that enable NMFS to be effective stewards of living marine resources by using an ecosystem-based approach, for the benefit of the Nation.

Managing the Nation's marine fisheries at sustainable harvest rates and rebuilding depleted fish stocks requires the best scientific information available to implement sound management and conservation actions. NMFS' science quality assurance activities combined with a rigorous peer-review program ensure that management decisions are based on the highest quality scientific information. This includes species' responses to environmental changes, species interactions, and fishing and other human activities that affect species and their habitat. Social, cultural, and economic behaviors and incentives that influence interactions between humans and marine fisheries are also addressed.

NMFS and the eight Regional Fishery Management Councils develop fishery management plans and regulations through an adaptive public process for sustainable management of fisheries, using the best available science. The regulatory process involves extensive analysis of alternatives to meet a number of statutory requirements. This sub-program also supports key partners, such as the Interstate Marine Fisheries Commissions and that states that manage many of the same fish stocks within state waters and therefore contribute to the sustainable fishery outcomes for which NMFS is responsible.

Fisheries Research and Management Programs:
Under the authority of the Magnuson-Stevens Fishery Conservation and Management Act (MSA) and other fisheries legislation, the Fisheries Research and Management Program budget line supports activities and staff working on preventing and eliminating overfishing and rebuilding overfished stocks. This is essential to ensuring biological sustainability and to increasing long-term economic and social sustainability of fisheries. The funds are used to coordinate with other NOAA programs to deliver products and services, including basic and applied science for the analysis and decision-making that support ecosystem approaches to fisheries management, fishery management plans and regulatory implementation, and enforcement to ensure compliance with regulations. Major components of this line include:

- *Annual Catch Limits (ACLs) and Accountability Measures (AMs), Peer Reviews, and Stipends:* Overfishing has a detrimental impact on the ecological and economic sustainability of fisheries, negatively affecting fishing communities, industry and recreational interests, and other marine resources. In accordance with MSA requirements, ACLs and AMs are now implemented in all fisheries. The Councils use the funds to develop amendments to their Fishery Management Plans (FMPs), and to track the progress that implementation of ACLs and AMs has made toward preventing and ending overfishing. The six NMFS Regions and the Atlantic Highly Migratory Species Division monitor ACLs and AMs, process and analyze catch data, and report annual data for national performance monitoring. Analysis of this data will determine management action and lead to the development or improvement of ACL management systems. In addition, this activity supports independent and authoritative reviews of fisheries science and recommendations necessary for the management of marine fisheries resources using the best available science, as specified in the MSA.

- *International Requirements of the MSA:* The international requirements of the MSA include participation and leadership for international obligations under the Convention on the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean. This program also allows NOAA to provide leadership for the U.S. delegation to the Western and Central Pacific Fisheries Commission (WCPFC). The WCPFC is responsible for the conservation and management of highly migratory fish stocks in the Western and Central Pacific Ocean.

- *Illegal, Unreported, and Unregulated (IUU) Fishing*: NMFS publishes a biannual report identifying nations whose vessels are engaging in IUU fishing. The identification of these nations opens the way for continued consultations between the U.S. Government and officials of these nations to take corrective action to stop IUU fishing. NMFS activities include bycatch identification, consultation and certification procedures, and collection of data to support the identification, consultation, and certification actions with nationals engaged in IUU/bycatch activities and governing Regional Fishery Management Organizations. In the event that any nation fails to take MSA-required actions, the Department of Commerce—working through NOAA and in coordination with the State Department, the U.S. Trade Representative, and other agencies—is required to take remedial steps. Such actions could lead to the eventual implementation of trade prohibitions on fishery products.

- *Recreational Fisheries Engagement and Information*: NOAA is currently implementing the Recreational Fisheries Engagement Initiative to establish a strong and trusting relationship with the recreational fishing community by listening to anglers, taking action to address critical issues of concern, following through on commitments, and empowering anglers to be responsible stewards and resource users. Continued discussions have resulted in specific tasks outlined in the national and subsequent regional Action Agendas. The Engagement Initiative and Action Agendas are fundamental to improving our conservation and management of marine resources and increasing the positive economic impact of the recreational fishing industry. This funding also supports the Marine Recreational Information Program's (MRIIP) work to improve and expand NMFS' data collection efforts for monitoring recreational fisheries impacts. Under MSA, MRIP established and implemented a regionally based registry program for recreational fishermen and for-hire fishing vessels. MRIP has developed and tested improved survey designs that utilize the new regional registries, resulting in more efficient and accurate survey methods. This is contributing significantly to improving relations with the recreational fishing community and improving Federal fisheries management.

- *Regulatory Streamlining Program*: The Regulatory Streamlining Program (RSP) improves the quality and timeliness of regulatory processes and policy development for its Fishery Management Program through comprehensive impact analyses, full and timely consideration of all relevant issues, and compliance with all applicable laws and procedures. The RSP enables NOAA to efficiently address policy issues with the Regional Fishery Management Councils early in the regulatory process, rather than later when it becomes difficult to comprehensively address a new and possibly contentious issue.

- *Regional Fishery Management Councils*: All eight Regional Fishery Management Councils and six NMFS regions receive support to frontload development, analysis,

evaluation, and implementation of fishery management actions. Deliverables include fishery management plans, plan amendments, implementation regulations (proposed and final rules), annual harvest specifications, and in-season management actions. NOAA assists in the development, review, and implementation of Council-proposed actions. NMFS staff assist the efforts of the Councils by facilitating and expediting Secretarial approval and implementation of Fishery Management Plans and amendments, and preparing analytical documents in support of rulemaking.

- *Marine National Monuments:* Funds are used to sustainably manage three Marine National Monuments in the Pacific Ocean. These Monuments encompass nearly 200,000 square miles and together represent the largest marine reserve in the world. This requires that NOAA conduct fisheries and living marine ecosystem observation and monitoring, develop a management plan and monument advisory council, conserve Essential Fish Habitat designations, and consult on protected species.

- *Pelagic Fisheries Research:* NOAA collaborates with academic and research institutions that provide resources and opportunities relevant to NOAA's mission, but generally extend beyond the agency's own capacities. Projects under this program are determined via a competitive proposal process. Examples of previously funded projects include: research to improve the assessments of tuna and billfish populations in the Pacific; studies on the biology and ecology of sea turtles, seabirds, sharks and other non-target key open ocean ecosystem inhabitants that interact with or are incidentally taken in these fisheries; research on essential habitat for open ocean animals; and studies on fisheries economics and socio-cultural profiles of fishing communities in the Pacific Islands region.

- *West Coast Groundfish Management and Research:* The West Coast groundfish program provides the key science support needed for management of more than 80 fish stocks along the coasts of Washington, Oregon, and California. The full-service program conducts resource surveys to track trends in fish abundance; manages the coastwide observer program; conducts needed biological studies on fish habitat, bycatch, and other pertinent issues; and prepares stock assessments that provide the information needed to track rebuilding of six stocks and to guide sustainable catch levels for all stocks.

- *Atlantic Bluefin Tuna Observer Coverage:* These funds support observer coverage of the pelagic longline fishery in the Gulf of Mexico where Atlantic bluefin tuna (ABFT) are incidentally caught. ABFT is an extremely valuable and severely overfished stock, and although a rebuilding plan has been in place since 1999, management measures have yet to result in rebuilding the stock. Observers have been trained in documenting ABFT bycatch, collecting and preserving biological samples, and evaluating the performance of commercial and experimental fishing gear in reducing ABFT bycatch.

- *Regional Science and Operations:* These funds are used to support core survey and stock assessment activities in Alaska. These activities include groundfish survey and stock assessment personnel, as well as groundfish age and growth program, charters for survey vessels, fuel, supplies, and gear. All of these basic components provide information on current Alaskan groundfish stock status for use by NMFS and the North Pacific Fishery Management Council in determining annual catch quotas. Funds are used internally and for competitive contracts in the case of charter survey vessels. Funds are also used to support implementation of fishery management plans, amendments, and regulations for managing the commercial fisheries in the EEZ off Alaska, and commercial,

subsistence, and recreational halibut fisheries in U.S. Convention waters off Alaska, as well as the operational in-season management of fisheries under Federal management. In addition, funds are used for the identification of Essential Fish Habitat (EFH) affected by fishery management actions and environmental review of non-fishing-related activities that may adversely affect habitat described as EFH or other habitats for living marine resources.

- *Charters in Lieu of COBB*: These funds provide charter vessel support for the NMFS Alaska Fisheries Science Center's fishery-independent surveys, habitat assessments, longstanding marine mammal research, and logistical support of the Little Port Walter remote field station in Southeast Alaska. These funds are necessary since the NOAA ship *John N. Cobb* was retired in 2008.

- *Pacific Islands Region/Center:* Funds are included to support effective science-based fishery management decisions and advance peer-reviewed ecosystem science within the Pacific Islands. Furthermore, this base funding enhances the ability of NOAA and the Western Pacific Fishery Management Council to deliver timely, accurate advice and scientific input to inquiries from NMFS and other stakeholders.

National Catch Share Program:

"Catch share" is a general term for several fishery management strategies that allocate a specific portion of the total allowable fishery catch to individuals, cooperatives, communities, or other entities. Each recipient of a catch share is directly accountable to cease fishing when its specific quota is reached. The term includes specific programs defined in law, such as limited access privilege (LAP) and individual fishing quota (IFQ) programs.

Catch share management provides a tool to improve the economic and ecological quality of certain fisheries. A number of U.S. fisheries are underperforming biologically and economically and require the consideration of additional tools to improve management effectiveness. While this management strategy is not new, Congress, in its 2006 amendments to the MSA, as well as national experts, have recognized that catch shares are an important management tool that should be available for use in any fishery. In November 2010, NOAA released its Catch Share Policy, which encourages the consideration and adoption of catch share programs. Catch share programs have been used in the United States since 1990 and now include 15 fisheries from Alaska to Florida managed by six different Councils. Additional fisheries are in the process of considering catch share programs as part of their management plans. Both here and in other countries, catch shares have shown they can effectively achieve annual catch limits, reduce the negative biological and economic impacts of the "race for fish," and when properly designed can eliminate overfishing and result in safer and more profitable fisheries while also addressing other social objectives. Funding supports:

- Activities and capabilities that support development of catch share programs. This category includes program management at the national and regional levels, improvements in fishery-dependent data collection systems to support future catch share programs, quality control on historic catch data to support individual or group allocations, fishery data management, social and economic data collection or analysis, and adjudication of administrative appeals by program participants.

- Implementation and operation of specific catch share programs—including NE Sectors, Pacific Trawl ITQ, Gulf of Mexico Grouper/Tilefish, Alaska Halibut Sportfish—and

development and implementation of new programs currently being worked on by the Councils. Key implementation activities include support for management and enforcement staff, establishment of share accounting databases and reporting systems, identification of eligible participants, issuance of catch shares, and computation of annual quota for each participant. These activities need to be completed before fishermen begin fishing under the catch share program. The operational costs include program administration, at-sea and dockside monitoring, enforcement, and science evaluation. Some or all of the incremental operational costs for the catch share programs that meet the definition of a Limited Access Privilege program under the MSA can be recovered once the catch share program is operational. Agency cost recovery is capped at a maximum of three percent of the ex-vessel value of the fishery.

Expand Annual Stock Assessments (EASA):

One of NMFS's core functions is to provide accurate and timely assessments of fish and shellfish stocks that support commercial and recreational fisheries. These assessments provide the technical basis for fishery management decisions such as setting ACLs to achieve optimum yield from the fishery while avoiding overfishing and ecosystem harm. Information on changes in abundance of fishery stocks in response to fishing, ecosystem, and environmental factors are all necessary to forecast future trends in stock abundance and sustainable fishery yield. Good assessments are also a foundation for successful catch share programs.

EASA funds support a wide range of assessment activities, such as:

- Major data collection efforts:
    - Year-round catch and biological data collected directly from fisheries to monitor total fish catch;
    - Annual fishery-independent surveys conducted on chartered vessels or NOAA Fishery Survey Vessels (FSVs) to track changes in abundance, distribution, and biological characteristics of fish stocks;
    - Processing of biological samples to determine fish age and growth.
- Assessment methods:
    - Funding for stock assessment scientists who incorporate these data into assessment models to produce scientific advice for fishery managers, including estimates of stock status and recommendations regarding optimum yield;
    - Conduct stock assessments under a prioritized portfolio with a goal of frequent, comprehensive assessments for major stocks, including linkages to climate, ecosystem, and habitat where appropriate, and at least baseline monitoring for minor stocks.
- Research efforts:
    - Development and implementation of advanced sampling technologies to improve survey techniques and operations, especially in habitats not accessible to conventional gear;
    - Standardization of methods and establishment of protocols for assessments to increase the program's efficiency;
    - Identification of ecosystem indicators for inclusion in stock assessments wherever relevant.

Of the 230 stocks considered most important, NMFS has sufficient capacity to conduct enough new or updated assessments each year to maintain 134 of these stocks with adequate, timely information.

Economics and Social Science Research:
NMFS economists and social scientists conduct legislatively mandated (e.g., NEPA and MSA) economic and social analysis for almost 300 rulemakings each year. Underpinning these assessments is a broad range of socio-economic data collection, modeling, and research activities, as well as the development of decision support tools. The NMFS Economics and Social Sciences Program addresses topics ranging from traditional fishery management issues (effects of rebuilding programs, catch share programs, and fishery allocation decisions) to emerging coastal and marine resource management issues such as marine spatial planning, ecosystem services trade-offs and valuation, and community resiliency.

Research and assessments undertaken by the program may be used to identify cost-minimizing solutions, which respects the hardship imposed on participants from regulations and establishes credibility with stakeholders. The program enables NOAA to better respond to community needs, identify and provide market incentives that achieve management goals, and use information to achieve more sustainable marine ecosystems. Specifically, this capability enables NOAA to: 1) develop indicators describing the status and trends of catch share fishery and non-catch share fishery participants, shoreside firms, and fishing communities that help prevent economic and social hardship and detect it early on; 2) assess the benefits/cost-effectiveness of fisheries' rebuilding programs and habitat restoration in an integrated ecosystem framework; 3) assess the economic and social impacts of management options such as area closures, gear restrictions, quota reductions in support of rebuilding programs, and current policies on fishery participants, shoreside firms, and coastal communities; and, 4) develop means by which to identify whether a catch share program has excessive market share, is mindful of potential harmful effects on fishing communities, and ensures fair and equitable allocations of harvest privileges.

Salmon Management Activities:
This funding supports research and management activities associated with salmon not listed under the ESA. Funding for the Mitchell Act component supports the operations and maintenance of Columbia River hatcheries through grants and contracts to the states of Washington, Oregon, and Idaho, and to the U.S. Fish and Wildlife Service to mitigate the loss of salmon on the Columbia and Snake Rivers.

The Pacific Salmon Treaty component funds NMFS and the states of Alaska, Washington, Oregon, and Idaho to provide personnel support to the Pacific Salmon Commission's technical committees and conduct a broad range of salmon stock assessment and fishery monitoring programs to produce information required to implement Pacific Salmon Treaty provisions. These programs are carried out in fisheries and rivers located from Southeast Alaska to Oregon, including the Columbia River.

Regional Councils and Fisheries Commissions:
NOAA is the sole source of funding for the eight Regional Fishery Management Councils. The Councils were established by the MSA to prepare fishery management plans for the Nation's fisheries for approval by the Secretary of Commerce. The funding is divided among the eight councils and is used for their operating costs such as staff costs, rent, public meeting costs, council member salaries, and travel. It also supports the Interstate Marine Fisheries Commissions and their related activities. Council members are appointed and consist of members from state governments, industry, and academia.

- International Fisheries Commissions: This project was established in 1993 to meet U.S. obligations regarding joint enhancement efforts on the Transboundary River system as

specified in the U.S.-Canada Agreement Relating to the Pacific Salmon Treaty. The program involves supplementing the number of sockeye salmon available to fishermen by increasing fry production from several Transboundary Lakes through hatchery incubation in the United States. The program utilizes otolith mass marking to identify these hatchery fish as a means to monitor the program and to aid in the management of fisheries targeting the Transboundary River stocks. The three Interstate Marine Fisheries Commissions are critical to managing and conserving our shared coastal fisheries within the first three miles of the Nation's coastline.

- Interstate Marine Fisheries Commissions:
    - The Atlantic States Marine Fisheries Commission was formed by the Atlantic coastal states in 1942 for the promotion and protection of coastal fishery resources. The 15 member states of the Commission are: Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia, North Carolina, South Carolina, Georgia, and Florida. The states and NMFS work together using the Striped Bass Conservation Act and the Atlantic Coastal Fisheries Cooperative Management Act to sustain Atlantic coastal resources.
    - The Gulf States Marine Fisheries Commission is an organization of five states (Texas, Louisiana, Mississippi, Alabama, and Florida) whose principal objectives are the conservation, development, and full utilization of the fishery resources of the Gulf of Mexico, to provide food, employment, income, and recreation to the Nation.
    - The Pacific States Marine Fisheries Commission's primary goal is to promote and support policies and actions to conserve, develop, and manage our fishery resources in California, Oregon, Washington, Idaho, and Alaska.

Fisheries Statistics:
Accurate data and reliable statistics on fishing effort and catch are essential for assessing impacts on fish stocks, as well as for monitoring fishing performance relative to fishery management targets. Funds are used to manage and conduct data collection, data processing, statistical analysis, information management, and statistical reporting activities for commercial and recreational fisheries. Specifically, funds support three functions: 1) statisticians, fishery biologists, economists, and information technology specialists in the regional science centers, regional offices, and headquarters offices; 2) the collection of biological data on commercial and recreational fishery catches in all regions through well-designed survey sampling programs and the continued development of electronic reporting systems that will deliver more timely landings data for commercial and for-hire fisheries; and 3) the Marine Recreational Information Program (MRIP).

The MRIP continues the implementation of the National Saltwater Angler Registry needed for conducting more accurate and efficient surveys of recreational fishing activities. In addition, the MRIP continues the development, testing, and implementation of improved survey designs for the monitoring and assessment of marine recreational fishing participation, fishing effort, and catch. Upgrading NMFS' recreational fishing data collection program improves Federal fisheries management, as well as relations with the recreational fishing community.

Fish Information Networks:
The Fish Information Networks program supports several state-Federal cooperative programs that coordinate data collection, data management, and information management activities, which are essential for accurate monitoring of commercial and recreational fishing impacts in each region. These cooperative programs collect data and manage information on fishing

participation, fishing effort, and catch. They also help collect fishery-dependent biological data needed for stock assessments. The programs included are:

- Atlantic States Marine Fisheries Commission, to help fund the Atlantic Coast Cooperative Statistics Program, which coordinates state and Federal fisheries statistics programs for the Atlantic coast.
- Gulf of Mexico Fisheries Information Network, to coordinate state and Federal fisheries statistics programs for the Gulf of Mexico and the Atlantic coast of Florida.
- Alaska Fisheries Information Network, which supports the coordination of state and Federal commercial fisheries statistics work in Alaska.
- Pacific Fisheries Information Network, to coordinate state and Federal commercial fisheries statistics programs for both the Pacific and Western Pacific regions.
- Recreational Fisheries Information Network, which supplements cooperative recreational fisheries statistics programs for the Atlantic, Gulf, and Pacific coasts.
- National Fisheries Information System, to coordinate cross-regional communication and planning efforts that enhance development of the regional networks while supporting improved national gathering and reporting of statistics on the status of U.S. fisheries.
- Marine Fisheries Initiative, to operate a competitive grant program that provides financial assistance for research and development projects that optimize the use of fisheries in the Southeast region.

Survey and Monitoring Projects:
The Science Centers' survey activities and Regional Office fisheries monitoring activities complement those conducted under the Expand Annual Stock Assessments (EASA) line. These activities support bluefin tuna tagging research, red snapper monitoring and research, West Coast groundfish surveys, Alaska extended jurisdiction programs, Maine and New Hampshire inshore trawl surveys, Chesapeake Bay multi-species surveys and research, Bering Sea pollock research, and Gulf of Maine groundfish assessment, to name a few. These targeted surveys and biological investigations improve the information available to conduct accurate stock assessments and directly contribute to the Percentage of Fish Stocks with Adequate Population Assessments and Forecasts performance measure.

Fisheries Oceanography:
NMFS' resource management focuses on the connectivity of managed living resources with their predators and their prey, their habitats, and the effects of environmental variation within a determined ecosystem. Humans are considered part of these ecosystems. The ecosystem approach to management relies upon research and analyses that integrate biological, socio-economic, environmental, and oceanographic data into predictive models that improve the Nation's forecasting capabilities for resource management. NMFS' use of an ecosystem-based approach increases the ability to make scientifically sound management decisions that are less prone to risk and more likely to succeed. Improved scientific analyses ensure that constituents receive the most accurate and complete analyses, thereby fostering a constructive public stewardship process. Fisheries Oceanography funds are distributed between two programs: Fisheries and the Environment (FATE) and Integrated Ecosystem Assessment (IEA).

- FATE is a research program to advance the understanding of climate and other environmental impacts on living marine resources for improving information available to stock and ecosystem assessments. FATE projects analyze the response of living marine resources to environmental change, including the development of ecosystem indicators, construction of new forecasting

models, and development of techniques to incorporate ecosystem indicators into stock or ecosystem assessments.

- The IEA program conducts research and develops products to enhance scientific advice for better managing the Nation's resources and achieve economic and societal objectives. IEAs are a dynamic, iterative, and adaptive process that includes the analysis of diverse ecosystem information and evaluation of potential management actions relative to societal goals. The IEA program enhances traditional management advice by taking into account diverse ecosystem interactions, including those with humans, thus, providing a more comprehensive view scaled to societal goals for the ecosystem.

American Fisheries Act:
The American Fisheries Act (AFA) requires a suite of management measures that fall into four general categories: 1) regulations that limit access into the fishing and processing sectors of the Bering Sea and Aleutian Islands (BSAI) pollock fishery and that allocate pollock to such sectors; 2) regulations governing the formation and operation of fishery cooperatives in the BSAI pollock fishery; 3) regulations to protect other fisheries from spillover effects from the AFA; and 4) regulations governing catch measurement and monitoring in the BSAI pollock fishery.

Interjurisdictional Fisheries Grants:
The Interjurisdictional Fisheries Act of 1986 (IFA) is a formula-based financial assistance program with three overall purposes: 1) to promote and encourage state activities in support of the management of interjurisdictional resources; 2) to promote the management of interjurisdictional fisheries resources throughout their range; and 3) to promote and encourage research in preparation for the implementation of the use of ecosystems and interspecies approaches to the conservation and management of interjurisdictional fishery resources throughout their range.

Any state, either directly or through an interstate commission, may submit a research proposal that supports management of fishery resources that: 1) occur in waters under the jurisdiction of one or more states and in the U.S. Exclusive Economic Zone; 2) are managed under an interstate fishery management plan; or (3) migrate between the waters under the jurisdiction of two or more states bordering on the Great Lakes.

Examples of activities supported by this funding include: management of American lobster, Atlantic sea herring, American shad and river herring, and northern shrimp in the northeast region; research and management initiatives supporting commercial and creational interjurisdictional fisheries of the Great Lakes; stock assessments needed for management of rockfish and groundfish fisheries in the northwest region; commercial finfish assessments and fishery independent assessments of coastal stocks in the southeast region; monitoring and management of coastal pelagic stock in the southwest region; management of groundfish stocks in the eastern Gulf of Alaska; and the development and implementation of a web based internet commercial fisheries reporting system for the Pacific region.

National Standard 8:
The MSA National Standard 8 requires all fishery management plans (FMPs) to include a fishery impact statement intended to assess, specify, and describe the likely effects of the measures on fishermen and fishing communities. When establishing any new regulations, the cultural and social framework relevant to the fishery and any affected fishing communities must be taken into account. Funds provided are used for conducting core data collections that enable NMFS

to conduct a range of Social Impact Assessments required under NEPA and MSA. In addition, this research also contributes to increased knowledge regarding community engagement in and dependence on commercial and recreational fishing, as well as a broader understanding of community vulnerability and resiliency.

Reducing Bycatch:
National Standard 9 of the MSA requires that "conservation and management measures shall, to the extent practicable, minimize bycatch and to the extent bycatch cannot be avoided minimize the mortality of such bycatch." This funding supports the collection of observer information on bycatch of overfished stocks, marine mammals, sea turtles, seabirds, and other protected species, as well as data on fishing practices and gears that contribute to bycatch. These data are used to develop new gear technologies that reduce the bycatch and bycatch mortality of non-target species and can save fishing jobs by preventing fishery closures due to interactions with endangered species or attainment of strict bycatch quotas. Fisheries observers are required to monitor the effectiveness of bycatch reduction measures such as gear modifications or time/area closures. Information on bycatch of these critical species enhances the agency's ability to effectively manage and monitor their recovery. In addition, this funding supports the Bycatch Reduction Engineering Program competitive grants that support researchers to create innovative gear designs and fishing techniques to minimize bycatch. Preference will be given to proposals that include collaboration with U.S. fishermen.

Product Quality and Safety:
NMFS helps ensure that the Nation's seafood industry is economically sustainable and complies with food regulations. This is done through support for the National Seafood Inspection Laboratory that provides an analysis laboratory, data management, regulatory compliance risk analysis, and information transfer expertise to support the Department of Commerce's National Seafood Inspection Program. Voluntary services are also part of the program, and include sanitation evaluation, product inspection and certification, auditing of food quality and safety programs, and training. Approximately 30 percent of the seafood industry uses NOAA services, and 20 percent of the seafood consumed in the United States is processed by facilities that are inspected by the Program. This line also supports the economic sustainability of fishermen and fishing communities through improvements in the fishing fleet and shoreside processing operations, as well as reductions in overcapacity in fisheries.

Schedule and Milestones:

Fisheries Management (FY 2015 – FY 2019)

- Address MSA mandates to implement IUU/Bycatch identification, monitoring, certification procedures, and reports to Congress, and engage in technical assistance to improve the capacity of other countries to conserve and manage living marine resources of mutual interest.
- Submit to Congress IUU/Bycatch Identification/ Certification Reports on a biennial basis. In the event of countries engaging in IUU or bycatch of protected living marine resources, the Program will coordinate with other government agencies to consider possible trade prohibitions on fishery products.
- Develop technological solutions and investigate changes in fishing practices designed to minimize bycatch of fish and protected species as well as minimize bycatch injury and morality.

National Catch Share Program (FY 2015 - 2019)

- Continue to work with interested Regional Fishery Management Councils to develop and implement new catch share programs.

- Advance efforts to explore the use of technology to improve the cost effectiveness of catch share programs.

Fisheries Monitoring, Assessment, and Forecasting (FY 2015 - 2019)

- Conduct fishery-independent surveys to provide the information necessary to conduct stock assessments for commercially and recreationally important species. (i.e., red snapper, walleye pollock, Atlantic herring, etc.)
- Continue to develop advanced technologies to enhance data collection for stock assessments, work toward operationalizing technologies for surveying fish populations in rough habitats not easily accessible with conventional gear and technologies, and improve processing efficiency from data obtained using optical sensors.
- Improve the frequency of updating assessments for key stocks, provide adequate assessments for more FSSI stocks, conduct a baseline monitoring report for all managed fish stocks, and incorporate ecosystem dynamics into assessments of stocks with high sensitivity to ecosystem fluctuations.
- Improve the quality of marine recreational fishery catch statistics by increasing the number of NMFS subregions with: improved registry-based telephone and mail surveys of recreational anglers for the collection of fishing effort data; improved shoreside surveys of recreational fishing trips for the collection of catch data; and improved survey programs that include logbook reporting programs to provide catch and effort data for for-hire fisheries.
- Conduct non-market recreational fishery valuation surveys for recreationally important fish species.

Ecosystem Science (FY 2015 - 2019)

- Continue to work with resource managers to provide ecosystem-based science information, including Management Strategy Evaluations, to inform management decisions for evolving constituent-defined management issues in the California Current IEA; continue to develop capacity in additional IEA regions.
- Develop and evaluate environmental indicators for improving stock assessments and integrated ecosystem assessments.

Economics and Social Science (FY 2015 - 2019)

- Partner with state agencies and fishing commissions, as appropriate, to conduct existing economic and social data collection programs.
- Predict the benefits and costs associated with specific stock rebuilding programs in selected commercial fisheries where economic data is available.
- Expand BLAST—an integrated Bioeconomic Length-structured Angler Simulation Tool for estimating benefits associated with a broad range of recreational fisheries management measures—to one additional fishery.
- Pilot the Social Indicator Toolbox for assessing community resiliency and impacts of management measures.
- Assess the economic performance of catch share and non-catch share fisheries, providing results to improve fishery management and catch share program design features.
- Implement FishSET – a spatial economics toolbox in one fishery.

Deliverables:

Fisheries Management

- Support for preventing and eliminating overfishing and rebuilding overfished stocks. This is essential to ensuring biological sustainability and to increasing long-term economic and social sustainability of fisheries.
- Coordination with other NOAA programs to deliver products and services, including basic and applied science for the analysis and decision-making that support ecosystem approaches to fisheries management and enforcement to ensure compliance with regulations.
- Implementation of international agreements, education, and outreach by working within the legislative structure
- Development of fisheries regulations and Fisheries Management Plans and amendments in order to maintain and restore productive stocks important to commercial, recreational, tribal, and subsistence fisheries.
- Analysis and research to identify, consult, and certify nations whose vessels engage in IUU fishing and bycatch of Protected Living Marine Resources (PLMR).
- Recommendations to the Secretary of Commerce, after coordination with other Federal agencies, on possible fishery-product trade prohibitions on nations whose vessels engage in IUU and bycatch of PLMRs.
- Implementation and monitoring a worldwide international technical assistance program, including use of bilateral and regional workshops, invitational travel to agency facilities, and technology transfer to support domestic conservation and management objectives.
- Continuation of economically and ecologically sustainable fishing communities in a manner consistent with the goals of the MSA and each Council's fishery management plan objectives.
- Improvements in fishing gear and fishing practices that allows fishermen to avoid hitting hard bycatch caps that end fishing seasons early and avoid protected species interactions that can close fishing seasons or entire fisheries.

National Catch Share Program

- Implement electronic monitoring to reduce costs while maintaining data quality.
- Manage catch share programs as determined by Fishery Councils.
- Continue assessments of the economic and social impacts of catch share management options and current policies on fishery participants, firms, and communities.

Fisheries Monitoring, Assessment, and Forecasting

- Continuation of fishery-independent surveys, including South Atlantic reef fish, to provide ongoing data for stock assessments.
- Additional surveys using advanced technologies for fish stocks inhabiting rough areas that cannot be surveyed with current methods and to efficiently process survey data obtained using optical sensors.
- Operate under a next generation stock assessment framework that will result in timely and efficient management advice from high quality assessments.Achieve more precise estimates of recreational catch through improved surveys.

Ecosystem Science

- Updated or new Management Strategy Evaluations (MSEs) delivered to resource managers from the California Current IEA.

- Delivery of environmental indicators and predicted impacts on managed species to appropriate stock assessment scientists and Councils through the FATE program.

Economics and Social Science

- Assessments of the benefits/cost-effectiveness of fisheries rebuilding programs and habitat and protected species recovery programs.
- Assessments of the economic and social impacts of management options and current policies on fishery participants, firms, and communities.
- Developed indicators describing the status and trends of fishery participants and shoreside firms and communities.
- Decision support tools and improved quantitative models for conducting benefit-cost analyses and predicting how fishery participants will respond to changes in management measures.

Performance Goals and Measurement Data:

Performance Measure: Original Fish Stock Sustainability Index (Measure 17a)	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	618.5	645.5	647.5	675.5	679.5	681.5	690.5

Description: The targets in this table are based on the current number of stocks in the FSSI. As the revised FSSI is phased in, this measure will be replaced. FSSI tracks the rebuilding and maintaining of fish stocks at sustainable levels, along with critical components of NOAA's efforts to manage fish harvest rates and increase knowledge about the status of fish stocks. It is calculated by assigning a score between 0 and 4 to each of 230 stocks selected for their importance to commercial and recreational fisheries and then adding the scores together. For more information: http://www.nmfs.noaa.gov/sfa/statusoffisheries/SOSmain.htm.

Performance Measure: Revised Fish Stock Sustainability Index	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	742	760.0	767.0	803.5	809.0	811.5	823.0

Description: The FSSI tracks the status of fish stocks at sustainable levels in relation to fishing mortality and biomass reference points supporting the policy established by Congress in the MSA, that fishing resources be managed so they can produce the maximum sustainable yield. The revised Index includes important domestic U.S. commercial and recreational stocks subject to the MSA requirement to have Annual Catch Limits. It will be calculated by assigning a score between 0 and 4 to each stock, then converting the scores to a 1,000-point scale by dividing the sum of all the individual scores by the maximum possible score and then multiplying by 1,000. This will be phased in with the intention of being introduced in FY 2015 and fully utilized by FY 2016.

Performance Measure: Percent of stocks for which catch did not exceed their specified annual catch limit (ACL)	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	N/A	78.0%	79.5%	81%	82%	83%	84%

Description: This measure tracks the percentage of stocks that did not exceed their annual catch limit (ACL). Performance is measured by comparing the final annual catch estimate to the ACL for each stock that has an ACL. If the final annual catch estimate for the stock is less than or equal to the ACL, NOAA will report that the stock did not exceed its ACL. The percent of stocks managed to their ACLs is expected to increase over time as managers improve their ability to effectively limit catch. This will be phased in with the intention of being introduced in FY 2015 and fully utilized by FY 2016.

Performance Measure: Percentage of Fish Stocks with Adequate Population Assessments and Forecasts (Measure 17b)	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	58.3% (134/230)	58.3% (134/230)	58.3% (134/230)	59.1% (136/230)	60.0% (138/230)	60.4% (139/230)	60.4% (139/230)

Description: This measure tracks the percentage of the 230 FSSI fish stocks for which adequate assessments are available to scientifically determine the impact of fishery management actions. To reach this standard, assessments must be based on quantitative information that is sufficient (defined as “Level 3” in the Fisheries Stock Assessment Improvement Plan (SAIP)) to determine current stock status (abundance and mortality relative to established reference levels), is no more than 5 years old, and can forecast stock status under different management scenarios.

Performance Measure: Number of defined management needs, identified though the Integrated Ecosystem Assessment process, met by Management Strategy Evaluations (cumulative)	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	4	6	8	10	12	14	16

Description: This measure tracks the annual performance of Integrated Ecosystem Assessments (IEAs) by identifying the number of management needs, as defined by resource managers through the IEA process that are met by a Management Strategy Evaluation (MSE). MSEs are a formal approach using models and forecast scenarios, based on the best available science, to evaluate the benefits and risks (trade-offs) of proposed management actions on ecosystems (including the human component) and to inform management decisions.

Performance Measure: Number of key objectives met by catch share programs	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	14	16	16	16	16	16	19

Description: This measure tracks the number of key objectives met by catch share programs. The key objectives are:

Increased revenue per vessel (with catch share program)*
Increased or full utilization of target species*
Decreased bycatch*
ACL not exceeded

Four key objectives are tracked for the four current catch share programs (NE groundfish sectors, NW groundfish trawl, GOM Snapper Grouper, Mid-Atlantic tilefish), so the possible objectives to be met total 16.

*Changes will be determined by comparing the performance under the catch share program with the average performance prior to implementation of the catch share program.

Performance Measure: Number of new catch share programs meeting all objectives	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	4	4	4	4	4	4	4

Description: The four key objectives are expected outcomes of implementing catch share programs. By meeting these key objectives, the programs will demonstrate their success in improving the ecological and economic health of that fishery. More detailed information will be reported on a fishery-by-fishery basis when available.

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PROGRAM CHANGES FOR FY 2015:

Fisheries Research and Management Programs: Electronic Monitoring and Reporting: (Base Funding: $0 and 0 FTE; Program Change: $4,000,000 and 0 FTE): NOAA requests an increase of $4,000,000 and 0 FTE for a total of $4,000,000 and 0 FTE to support the development and implementation of electronic monitoring and reporting technologies across the country. These electronic solutions will improve the timeliness, quality, integration, and accessibility of fishery-dependent data for fishery managers, stock assessment scientists, the fishing industry, and other key stakeholders. The goal is to deliver cost-effective and sustainable electronic data collection solutions that enhance monitoring of catch and bycatch in all U.S. fisheries. Progress to date has been limited because we have not had a consistent and sufficient source of funding to address shortcomings identified in the pilot studies and to support implementation of electronic monitoring (EM) and electronic reporting (ER) programs beyond the pilot stage for both catch share and non-catch share fisheries.

Proposed Actions:
Electronic technologies will be developed, tested, and implemented to record and transmit data on fishing vessel operations. Electronic technologies include vessel monitoring systems (VMS), electronic logbooks (ELBs), video cameras for monitoring, and other technologies that provide EM and ER capabilities. VMS enable precise satellite-monitoring of fishing vessel locations in space and time, including course and speed tracking. Video monitoring applications record on-deck harvest and discard operations and have the potential to complement data collected by at-sea observers or record operations on smaller vessels not currently covered by observers. ER applications facilitate accurate and timely reporting of catch and landings data by vessel operators, seafood dealers, seafood processors, and at-sea observers.

With the proposed increase, NMFS will support further development and implementation of electronic monitoring and reporting across the country. The amount of funds to be allocated between EM and ER may vary based on agency needs and priorities, as well as the quality and performance of EM/ER projects. Initially, efforts will focus on the major EM pilot projects that are currently underway in the Northwest and Alaska. In the Northwest, an EM pilot program covering multiple segments of the Pacific groundfish fishery, including trawl and fixed gear vessels, is currently in the second year of testing. In Alaska, the Council has already implemented EM for compliance purposes in two fisheries and is further evaluating the expansion of EM to other fleets and fisheries, in particular smaller vessels in the halibut and sablefish fleet. Each of these projects will be nearing completion of field-testing over the next two years. Each of the projects is aimed at determining the feasibility of using EM on commercial fishing vessels for either data collection, or for compliance monitoring. Funds would be used to purchase video or electronic reporting equipment, hardware and software, and contract support needed to set up and maintain equipment, and process data from the pilot study. Funding would also be used to implement the projects deemed feasible as a result of the pilot projects.

Electronic reporting has been implemented in numerous fisheries throughout the country. Funding will be used to explore development of additional ER technologies and expand the use of ER tools that have been proven effective. For example, in the Northeast, priority will be given to expand ER to fishing vessels to better support in-season monitoring of annual catch limits and thus eliminate paper-based reporting. The use of ELBs has been pilot tested on approximately 500 shrimp vessels in the Gulf of Mexico, roughly one-third of the offshore fleet. At present, ELBs are the best method to obtain shrimp effort data critical to assessing the status of shrimp stocks as well as monitoring bycatch and bycatch mortality, particularly of juvenile red snapper. With this

increase, ELB technology could potentially be implemented fleet-wide and be tested for implementation in other fisheries.

The agency is in the process of developing regional EM/ER implementation plans that will focus on bringing specific aspects of electronic technologies to an operational level. NMFS is currently working with the Regional Fishery Management Councils, fishermen, Commissions, and other stakeholders to identify specific EM/ER goals and objectives for operational data collection programs, evaluate case studies and pilot project results, and develop guidance and best practices for use in the consideration and selection of electronic monitoring options for full implementation.

Regional implementation plans are to be completed by the end of calendar year 2014. The plans will include a prioritized list of fisheries[1] for which EM and/or ER is currently an option (i.e. necessary regulations are in place authorizing paperless reporting or video monitoring), and fisheries for which regulations authorizing EM/ER may not be in place but are considered viable candidates for implementation of EM or ER systems[2] . The plans will also include a schedule for implementing EM/ER options in those fisheries.

At the national level, NMFS will prioritize the list of fisheries identified in the regional implementation plans and based on the project proposals submitted, determine which fisheries will receive funding to implement EM/ER systems. Over time, funding from this request will result in an increase in the number of fisheries and FMPs with implemented EM and ER systems.

As with other fishery management actions, implementation of EM and ER will likely require changes to fisheries management regulations through the Regional Fishery Management Council process, as well as other relevant state and federal regulations. Additionally, where cost-sharing of monitoring costs between the agency and industry is deemed appropriate and approved under applicable law and regulation, NMFS will work with Councils and stakeholders to develop plans to transition costs to industry.

There are many levels of risk in not supporting this effort, such as not increasing the use of technology where possible especially in New England and Alaska. There is also a strategic risk as NMFS has adopted a policy for using electronic technology solutions in fishery-dependent data collection to improve collection methodologies in the most cost effective way to ultimately benefit fishermen.

Statement of Need and Economic Benefit:
Increasing demands for data are driving the need to evaluate and improve existing fishery-dependent data collection programs, in particular with respect to cost-effectiveness, economies of scale, and sharing of electronic technology solutions across regions. NOAA Fisheries recently approved a policy regarding the adoption of electronic technology solutions in fishery-dependent data collection programs. This policy states:

[1] There may be multiple fisheries in a single fishery management plan (FMP). Each fishery in the FMP will be analyzed and considered in terms of its viability and priority for implementation of ER or EM systems.
[2] There may be some small-scale fisheries for which ER or EM may not be cost-effective or necessary.

"*It is the policy of the National Oceanic & Atmospheric Administration's (NOAA's) National Marine Fisheries Service (NOAA Fisheries) to encourage the consideration of electronic technologies to complement and/or improve existing fishery-dependent data collection programs to achieve the most cost-effective and sustainable approach that ensures alignment of management goals, funding sources and regulations*."

Electronic technologies have the potential to increase the quantity of data; lower costs and reduce the time for data entry; improve the quality of data analysis; and lower the economic and time burden on fishermen for compliance with recordkeeping and reporting regulations.

ER systems implemented in recent years have improved the quality of entered data, reduced the time to enter data, enabled the automated entry of sensor data from fishing gear and the vessel, improved processing of data to find and correct errors, provided more timely information for use by fishery managers and fishermen, and reduced duplicative reporting of similar information to multiple agencies. For example, the electronic fish ticket (E-ticket) system implemented in 2011 to support a new catch share program in the Pacific groundfish trawl fishery has allowed almost real time tracking of individual catches. Before electronic fish tickets (E-tickets), it normally took about two to three months to process the paper fish tickets. In-season management of the fishery was based on a combination of paper fish tickets and the Pacific States Marine Fisheries Commission's aggregation of weekly state port sampler estimates of fleet catch. In 2012, about 2,500 E-tickets were submitted and 96 percent of them were processed within 48 hours. This timely monitoring is essential for reducing the amount of bycatch of these overfished species.

In addition, a variety of different ER tools are being developed and tested to facilitate the capture and transmission of fishery data collected by shoreside samplers or at-sea observers. The more widespread use of hand-held devices such as data loggers, iPads, and cell/smart phones that are programmed with appropriate data entry and checking software will speed the delivery of high quality data to a central database.

Electronic monitoring and reporting technologies have the capability to improve the agency's data collection efforts. Improved data collection supports more robust assessments and reduces uncertainty in management programs. NMFS will continue to work with the Councils, fishing industry, and other stakeholders to further develop, improve, and implement electronic monitoring and reporting in fishery management plans where it makes the most technical and financial sense.

Resource Assessment:
EM/ER projects have been funded from a variety of budget lines over the years, resulting in short-lived research projects. For example, some EM pilot projects have been partially funded through the National Fish and Wildlife Foundation. The Shrimp e-logbooks have been funded on a year-to-year basis through Cooperative Research funds, Expand Annual Stock Assessment funds, and a one-time grant award. Other pilot projects have been supported using National Catch Share Program funds. Up to $2.8 million in FY 2014 will be directed toward EM/ER projects. To ensure that EM/ER projects become operational, the agency may request that project proposals demonstrate how the project would transition from field testing to implementation, including options for cost-sharing with industry.

Schedule and Milestones:
FY 2015-2019

- Develop regional implementation plans for EM and ER using the FY 2014 assessment to determine which of the 46 FMPs, that contain fisheries, are candidates for implementation of EM/ER.
- Further research and develop cost-effective EM applications to support accurate accounting of catch by species and size.
- Implement EM and ER options in 80 percent of the fisheries identified as candidate fisheries in the regional implementation plans and the national prioritization process by 2020.

Deliverables:
FY 2015-2019

- Regionally based EM/ER implementation plans, with a prioritized schedule for implementation of EM/ER projects.
- New applications of electronic technologies incorporated into fishery-dependent data collection programs.

Performance Goals and Measurement Data:

Performance Measure: Number of FMPs with implemented ER data collection programs	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With Increase	N/A	N/A	31	32	33	34	35
Without Increase	29	29	30	31	31	31	31
Description: This is the cumulative number of FMPs with ER systems. Of the total 46 FMPs, currently 29 FMPs have implemented ER (through dealer/processer reporting, vessel reporting, or both). NMFS will work with the Councils to identify the appropriate FMPs and increase the number of implemented EM/ER programs each year.							

Performance Measure: Number of FMPs with implemented EM data collection programs	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With Increase	N/A	N/A	4	5	6	7	8
Without Increase	2	2	3	4	4	5	5
Description: This is the cumulative number of FMPs with EM systems. Of the total 46 FMPs, currently 2 FMPs (3 fisheries) have implemented EM. NMFS will work with the Councils to identify the candidate FMPs and increase the number of implemented EM programs each year.							

PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Budget Program: National Marine Fisheries Service
Sub-program: Fisheries Research and Management
Program Change: Electronic Monitoring and Reporting

	Object Class	FY 2015 Increase	FY 2015 Total Program
11	Personnel compensation		
11.1	Full-time permanent	$0	$76,892
11.3	Other than full-time permanent	0	2,038
11.5	Other personnel compensation	0	0
11.7	Special personnel services payments	0	0
11.9	Total personnel compensation	0	78,930
12	Civilian personnel benefits	0	24,214
13	Benefits for former personnel	0	35
21	Travel and transportation of persons	32	2,739
22	Transportation of things	0	394
23.1	Rental payments to GSA	0	7,594
23.2	Rental Payments to others	0	1,087
23.3	Communications, utilities and miscellaneous charges	0	4,968
24	Printing and reproduction	0	1,239
25.1	Advisory and assistance services	0	8,141
25.2	Other services	1,968	6,383
25.3	Purchases of goods & services from Gov't accounts	0	24,314
25.4	Operation and maintenance of facilities	0	0
25.5	Research and development contracts	400	400
25.6	Medical care	0	0
25.7	Operation and maintenance of equipment	0	0
25.8	Subsistence and support of persons	0	0
26	Supplies and materials	0	4,417
31	Equipment	0	1,309
32	Lands and structures	0	0
33	Investments and loans	0	0
41	Grants, subsidies and contributions	1,600	15,668
42	Insurance claims and indemnities	0	0
43	Interest and dividends	0	1
44	Refunds	0	0
99	Total obligations	4,000	181,833

Fisheries Research and Management Programs: Teacher at Sea Program (Base Funding: $177,833,000 and 0 FTE; Program Change: $0 and 0 FTE): NMFS requests a decrease of $0 and 0 FTE to terminate the Teacher at Sea Program at NOAA which is part of the Administration's reorganization of STEM education. NOAA will reinvest funding in Fisheries Research and Management activities.

Proposed Actions:
As part of the Administration's comprehensive reorganization of STEM education programs to increase the impact of Federal investments, NOAA proposes to terminate funding for the Teacher at Sea Program. The Teacher at Sea Program provided authentic at-sea research experiences for kindergarten through college-level teachers by partnering them with NOAA scientists and effectively leveraging existing NOAA facilities, resources, research, and scientific platforms, including fisheries vessels, aircraft, and laboratories. NOAA proposes to reinvest funding previously used for Teacher-at-Sea in the Fisheries Research and Management Programs, in order to support activities and staff working on preventing and eliminating overfishing and rebuilding overfished stocks.

In 2014, the President's Budget proposed a government-wide STEM reorganization to create a coherent framework for delivering STEM education to more students and more teachers more effectively while reducing fragmentation and the Administration published a Five-Year Federal Strategic Plan on STEM Education to help align the reorganization with key goals and strategies. The areas of priority for this plan include: improving pre-kindergarten-through-grade-twelve (pre-K-12) instruction; increasing and sustaining youth and public engagement with STEM; enhancing undergraduate STEM education; creating a national strategy around graduate fellowships; and better serving groups historically underrepresented in STEM.

Over the past year, agencies have made considerable progress towards a stronger and more cohesive infrastructure for delivering STEM education. For example, in implementing the Strategic Plan, mission agencies have increased coordination with the lead agencies (the Department of Education, the National Science Foundation, and the Smithsonian Institution) and are identifying ways to leverage existing resources to improve the reach of agency assets.

The 2015 Budget builds on these efforts by proposing a fresh reorganization with targeted adjustments to enable more strategic investment in STEM education with a focus on building and using evidence-based practices and finding new models for leveraging assets and expertise.

National Catch Share Program: National Catch Share Program: (Base Funding: $25,216,000 and 65 FTE; Program Change: $2,000,000 and 0 FTE): NOAA requests an increase of $2,000,000 and 0 FTE for a total of $27,216,000 and 65 FTE in the National Catch Share Program to develop and implement new catch share programs and strengthen NMFS capabilities to put catch share infrastructure efficiencies in place. These changes will provide an opportunity to improve the economic and ecological quality of certain fisheries and increase accuracy and timeliness of information and analysis on the biological, ecological, and socio-economic aspects of the Nation's fisheries resources.

Proposed Actions:
In FY 2015, NMFS will have 15 programs under catch share management and one pilot program (the Gulf of Mexico headboat pilot program.) Additional programs, including the Atlantic Migratory Species program, are expected to be implemented in the next one to two years. The requested increase will support activities for development of new catch share programs as well as the implementation and operational efforts, after Council approval. Some activities include program management at the national and regional levels, social and economic data collection or analysis, as well as establishment of catch share accounting databases and reporting systems, program administration, at-sea and dockside monitoring, and science evaluation. While each program is unique with its own set of regional and local economic and ecological issues, there are tools that, if developed on a national level, will eliminate redundancies in programs, encourage more consistent data and data collection practices, and increase efficiencies that will help programs to improve performance. Examples of these tools include the establishment of systems for landings and at-sea discards, improvements to social and economic data collection and analysis, and the establishment of quota accounting systems. The implementation of these systems will reduce the costs to NMFS and industry over time.

Statement of Need and Economic Benefits:
While catch share programs are not new, Congress (in its 2006 amendments to the Magnuson-Stevens Act), as well as national experts have recognized that catch shares are an important management tool that should be available for use in any fishery. In November 2010, NOAA released its Catch Share Policy, which encourages the consideration and adoption of catch share programs. Catch share programs have been used in the United States since 1990 and now include 15 different fisheries from Alaska to Florida managed by six different Councils. Additional fisheries are in the process of considering catch share programs as part of their management plans. Both here and in other countries catch shares have shown they can effectively achieve annual catch limits, reduce the negative biological and economic impacts of the "race for fish", and when properly designed can eliminate overfishing and result in safer and more profitable fisheries while also addressing other social objectives. The long-term economic and ecological benefits of investments in catch share programs have been seen in fisheries that have moved to catch share programs, such as red snapper where the value of the fishery (based on quota prices) has increased by 82 percent, and the ex-vessel price of red snapper has increased by 17 percent. The requested increase will improve NMFS abilities to develop and implement catch share programs and support some fisheries in more easily realizing the benefits of catch share management.

Resource Assessment:
"Catch share" is a general term for several fishery management strategies that allocate a specific portion of the total allowable fishery catch to individuals, cooperatives, communities, or other entities. Each recipient of a catch share is directly accountable to cease fishing when its specific quota is reached. The term includes specific programs defined in law, such as limited access privilege (LAP) and individual fishing quota (IFQ) programs. The funding supports

activities and capabilities that support development of catch share programs, as well as the implementation and operations of specific catch share programs—including NE Sectors, Pacific Trawl ITQ, Gulf of Mexico Grouper/Tilefish, Alaska Halibut Sportfish. Additional information on the Catch Share program can be found in the Fisheries Research and Management narrative.

Schedule and Milestones:
FY 2015 – 2019:

- Work with regional councils to develop new catch share programs.
- Work with regional councils to implement new catch share programs.
- Observe increased revenue per boat in fisheries with catch share programs incorporating catch share programs.
- Observe decreased TAC overages annually in fisheries incorporating catch share programs.

Deliverables:
FY 2015 – 2019:

- Implement reporting systems, where appropriate, to reduce costs while maintaining data quality.
- Manage catch share programs as determined by Fishery Councils.
- Continue assessments of the economic and social impacts of catch share management options and current policies on fishery participants, firms, and communities.
- Ensure the continuation of economically and ecologically sustainable fishing communities in a manner consistent with the goals of the MSA and each Council's fishery management plan objectives.
- Support implementation of Regional Council-specified royalty collection programs for the initial or any subsequent distribution of allocations consistent with the MSA.
- Although there can be lag time for data reporting and analysis for some of the key catch share objectives, the number of key catch share objectives met should increase from 14 in FY 2013 to 19 in FY 2019.

PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Budget Program: National Marine Fisheries Service
Sub-program: Fisheries Research and Management
Program Change: National Catch Share Program

	Object Class	FY 2015 Increase	FY 2015 Total Program
11	Personnel compensation		
11.1	Full-time permanent	$0	$6,289
11.3	Other than full-time permanent	0	145
11.5	Other personnel compensation	0	0
11.7	Special personnel services payments	0	0
11.9	Total personnel compensation	0	6,434
12	Civilian personnel benefits	0	1,921
13	Benefits for former personnel	0	0
21	Travel and transportation of persons	0	337
22	Transportation of things	0	3
23.1	Rental payments to GSA	0	179
23.2	Rental Payments to others	0	118
23.3	Communications, utilities and miscellaneous charges	0	106
24	Printing and reproduction	0	122
25.1	Advisory and assistance services	0	3,144
25.2	Other services	1,500	1,666
25.3	Purchases of goods & services from Gov't accounts	0	6,501
25.4	Operation and maintenance of facilities	0	0
25.5	Research and development contracts	0	0
25.6	Medical care	0	0
25.7	Operation and maintenance of equipment	0	0
25.8	Subsistence and support of persons	0	0
26	Supplies and materials	0	145
31	Equipment	500	1,126
32	Lands and structures	0	0
33	Investments and loans	0	0
41	Grants, subsidies and contributions	0	5,414
42	Insurance claims and indemnities	0	0
43	Interest and dividends	0	0
44	Refunds	0	0
99	Total obligations	2,000	27,216

Expand Annual Stock Assessments: Expand Annual Stock Assessments: (Base Funding: $69,745,000 and 181 FTE; Program Change: +$2,500,000 and 0 FTE): NOAA requests an increase of $2,500,000 and 0 FTE for a total of $72,245,000 and 181 FTE to increase the number of next generation stock assessments (NGSA) critical to the sustainable management and economic viability of fisheries in a changing climate. The NGSA framework will allow for more informed fishery management to optimize fishing opportunity and species conservation.

Proposed Actions:
The requested funding will allow NMFS to achieve a next generation capability to advance fish stock assessment efforts for their timely delivery to fishery managers. This will be accomplished according to a prioritized portfolio, currently under development, based on fishery and ecosystem importance, stock status, biology, and assessment history. These assessments will incorporate ecosystem information in assessments that need them and utilize advanced sampling technologies wherever possible. All NOAA managed fish stocks will have assessments with specific target levels, allowing for activities to be adapted in order to meet regional needs. NOAA will use this funding increase to strengthen its stock assessment capacity in each region over time. NGSA build on an improved standardization of stock assessment methods, incorporating ecosystem data into assessment models (e.g., climate, environment, habitat, predator-prey dynamics), and conducting at least baseline monitoring of more stocks, especially those in areas where resources and coastal economies are impacted by a changing climate.

The ecosystem linkage aspect of the NGSA framework requires more data than needed for traditional stock assessments. Advanced sampling technologies can improve the quality and efficiency of data collection and is important to advance the incorporation of ecosystem dynamics into assessments that need them (e.g., linkages to predator-prey dynamics). For example, changes in abundance of apex predators may cause significant changes in natural mortality for some fish stocks, causing biases in assessments that do not account for these changes. For other species, climate-related changes to prey or predators may also affect mortality, and climate-related changes in distribution may affect when and where fishery-independent surveys need to be conducted, which is why these features need to be considered in future assessments.

NOAA is challenged by stakeholders on the quality and status of stock assessments and the data that supports them. Fisheries with limited data have more uncertainty in assessments and their catch recommendations. Due to this uncertainty, conservative buffers on annual catch limits are needed to prevent overfishing. Improving the amount of data available and moving into a next generation framework can reduce the size of these buffers for some stocks. National Standard 1 of the MSA mandates that NMFS prevent overfishing while attaining long-term optimum yield. The NGSA portfolio will improve the ability to meet this standard.

Statement of Need and Economic Benefits:
Fish stock assessments provide quantitative information on abundance and the level of removals that can be sustained over the long term. The role of stock assessments has been well-established. National Research Council studies and the Ocean Commission Report both found that a strong fishery stock assessment program is the foundation of successful management of commercial and recreational fisheries. Furthermore, the Magnuson-Stevens Fishery Conservation and Management Act (MSA), which mandated establishment of ACLs in all fisheries by 2011 to prevent overfishing, require improved assessment capacity. Traditionally, fish stocks have been assessed from a single-species perspective, with only a few assessments that incorporate ecosystem information. Transitioning to a more holistic

approach for more stocks has been identified as an important step for improving the assessment and management of marine resources. Development of a comprehensive NGSA framework is a substantial, long-term undertaking, but once established, it will provide a holistic strategic approach for assessment of a wide range of species in a regional ecosystem. Therefore, investment in NGSAs may equate to an investment in NMFS' long term management efficiency by enabling more data collection per unit of effort.

For many fish stocks, incomplete scientific information leads to substantial uncertainty in assessments resulting in fishery managers setting conservative annual catch limits to confidently prevent overfishing; limiting fishing opportunity. There are stocks that lack fisheries-independent data, particularly in the Caribbean and Western Pacific, since their habitats are inaccessible using traditional survey methods. Furthermore, even adequate assessments are not necessarily sufficient for estimating sustainable harvest rates of certain species. Atlantic cod assessments have been conducted at an adequate level for many years, yet the anticipated stock rebuilding has not been realized. One probable cause is the lack of ecosystem-level information for cod has contributed to the difficulty in estimating sustainable harvest rates. An assessment using the NGSA framework may provide a more accurate appraisal of this important resource. It is likely that the productivity of many species is closely linked to the ecosystem; thus, NGSAs may improve management of numerous stocks.

Resource Assessment:
Assessments that incorporate ecosystem data according to a NGSA framework have been completed for four fish stocks, primarily flatfish in the Pacific Northwest and Alaska. Other regions are exploring ways to incorporate ecosystem data into their stock assessments, where needed, and to set target levels for other stocks according to the prioritized portfolio which NMFS is currently developing. Additional information on the current resources that support these activities is described in the Fisheries Research and Management Programs narrative.

Schedule and Milestones:

- FY 2015: Conduct workshops and contract studies to evaluate advanced technologies most ready for transition to operations; identify best practices for standardizing fish stock assessments and develop strategic plan for implementing the NGSA framework.
- FY 2016-2017: Improve the timely delivery and quality of stock assessments through increased capacity in each region; expand surveys of target fish for selected areas (e.g., reef fishes in the South Atlantic, Caribbean, and Gulf of Mexico.)
- FY 2018: Conduct NGSA activities that consider climate and ecosystem forecasts and multispecies interactions, where appropriate.
- FY 2019: Deliver initial assessment reports for key stocks in surveyed areas.

Deliverables:

- Survey designs using advanced technologies to cover climate-related changes in certain stock distributions.
- New and more comprehensive data for some key managed fish stocks.
- Stock survey results for key stocks found in the selected survey areas.
- Delivery of initial stock assessment reports based on an NGSA framework for key stocks by 2019.

Performance Goals and Measurement Data:

Performance Measure: Number of fish stocks with assessments that consider ecosystem linkages	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With Increase	N/A	N/A	8	10	11	11	11
Without Increase	4	6	8	9	10	10	10
Description: This measure tracks the number of stock assessments that consider ecosystem linkages, including climate, habitat, environment, and food web dynamics. To reach this standard, assessments must reach a "Level 5" as defined in the Fisheries Stock Assessment Improvement Plan (SAIP). This is a new and cumulative measure that directly evaluates NMFS' transition to a next generation stock assessment (NGSA) framework.							

PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Budget Program: National Marine Fisheries Service
Sub-program: Fisheries Research and Management
Program Change: Expand Annual Stock Assessments

	Object Class	FY 2015 Increase	FY 2015 Total Program
11	Personnel compensation		
11.1	Full-time permanent	$0	$19,673
11.3	Other than full-time permanent	0	1,563
11.5	Other personnel compensation	0	0
11.7	Special personnel services payments	0	217
11.9	Total personnel compensation	0	21,453
12	Civilian personnel benefits	0	7,316
13	Benefits for former personnel	0	0
21	Travel and transportation of persons	0	1,088
22	Transportation of things	0	154
23.1	Rental payments to GSA	0	1,348
23.2	Rental Payments to others	0	28
23.3	Communications, utilities and miscellaneous charges	800	6,706
24	Printing and reproduction	0	169
25.1	Advisory and assistance services	0	4,811
25.2	Other services	600	1,012
25.3	Purchases of goods & services from Gov't accounts	0	7,650
25.4	Operation and maintenance of facilities	0	0
25.5	Research and development contracts	900	900
25.6	Medical care	0	0
25.7	Operation and maintenance of equipment	0	0
25.8	Subsistence and support of persons	0	0
26	Supplies and materials	0	4,635
31	Equipment	200	778
32	Lands and structures	0	0
33	Investments and loans	0	0
41	Grants, subsidies and contributions	0	14,196
42	Insurance claims and indemnities	0	0
43	Interest and dividends	0	1
44	Refunds	0	0
99	Total obligations	2,500	72,245

Salmon Management Activities: Salmon Management Activities (Base Funding: $30,302,000 and 27 FTE; Program Change: -$3,000,000 and 0 FTE): NOAA requests a decrease of $3,000,000 and 0 FTE for a total of $27,302,000 and 27 FTE to Salmon Management Activities.

Proposed Actions

The requested amount reflects a $3.0 million decrease from FY 2014 appropriations for Salmon Management Activities. The decrease will reduce the pace at which the hatchery programs funded under the Mitchell Act are reformed to bring them into compliance and consistency with the Endangered Species Act. At the requested level, NOAA will fund Mitchell Act hatcheries at $15.8 million. NMFS will continue to meet its obligations under the Mitchell Act to support the operations and maintenance of Columbia River hatcheries. The hatcheries mitigate the loss of fish production due to hydroelectric dams. NMFS will also conduct a broad range of salmon stock assessment and fishery monitoring programs in the Snake and Columbia Rivers.

The requested level for Salmon Management Activities will fund the Pacific Salmon Treaty implementation at $10.9 million. This amount is sufficient to meet our obligations under the treaty providing personnel support to the Pacific Salmon Commission's technical committees and conducting a broad range of salmon stock assessment and fishery monitoring programs to produce information required to implement Pacific Salmon Treaty provisions. In addition, the requested amount includes $0.5 million for Chinook salmon management and Chinook salmon research at Auke Bay.

Statement of Need and Economic Benefits

Projects funded under the Salmon Management Activities line are conducted for the conservation, development, and enhancement of salmon. This base funding supports research and management activities associated with salmon composed of three main activities: the Mitchell Act–Columbia River hatcheries, Pacific Salmon Treaty, and Chinook salmon research and management. The Mitchell Act component supports the operations and maintenance of Columbia River hatcheries and construction of fish passage facilities to mitigate the loss of fish production due to hydropower dams.

Resource Assessment:

The resources for this activity are described in the Fisheries Research and Management narrative.

Schedule and Milestones:

FY 2015-2019:

- Support the operations and maintenance of Columbia River hatcheries to mitigate the loss of fish production due to hydropower dams.
- Conduct a broad range of salmon stock assessment and fishery monitoring programs in the Snake and Columbia Rivers.

Deliverables:

FY 2015-2019:

- Maintenance of smolt production as required under the Mitchell Act.
- Broad range of salmon stock assessment and fishery monitoring programs in the Snake and Columbia Rivers.

Performance Goals and Measurement Data:

Performance Measure: Number of salmon smolt produced by Mitchell Act hatcheries (in millions)	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With Decrease	N/A	N/A	65.8	65.8	65.8	65.8	65.8
Without Decrease	70	70	70	70	70	70	70
Description: This performance measure projects the number of salmon smolt produced by the Columbia River hatcheries.							

PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Budget Program: National Marine Fisheries Service
Sub-program: Fisheries Research and Management
Program Change: Salmon Management Activities

	Object Class	FY 2015 Decrease	FY 2015 Total Program
11	Personnel compensation		
11.1	Full-time permanent	$0	$2,403
11.3	Other than full-time permanent	0	45
11.5	Other personnel compensation	0	0
11.7	Special personnel services payments	0	84
11.9	Total personnel compensation	0	2,532
12	Civilian personnel benefits	0	734
13	Benefits for former personnel	0	0
21	Travel and transportation of persons	0	0
22	Transportation of things	0	3
23.1	Rental payments to GSA	0	33
23.2	Rental Payments to others	0	0
23.3	Communications, utilities and miscellaneous charges	0	200
24	Printing and reproduction	0	11
25.1	Advisory and assistance services	0	67
25.2	Other services	0	102
25.3	Purchases of goods & services from Gov't accounts	0	3,240
25.4	Operation and maintenance of facilities	0	0
25.5	Research and development contracts	0	0
25.6	Medical care	0	0
25.7	Operation and maintenance of equipment	0	0
25.8	Subsistence and support of persons	0	0
26	Supplies and materials	0	120
31	Equipment	0	3
32	Lands and structures	0	0
33	Investments and loans	0	0
41	Grants, subsidies and contributions	(3,000)	20,257
42	Insurance claims and indemnities	0	0
43	Interest and dividends	0	0
44	Refunds	0	0
99	Total obligations	(3,000)	27,302

APPROPRIATION ACCOUNT: OPERATIONS, RESEARCH AND FACILITIES
SUB- PROGRAM: ENFORCEMENT & OBSERVERS / TRAINING

ENFORCEMENT

NOAA's Office of Law Enforcement (OLE) is the only conservation enforcement program (Federal or state) that is exclusively dedicated to Federal fisheries and marine resource enforcement. OLE enforces NOAA's natural resource protection laws and improves compliance with Federal regulations to conserve and protect our Nation's living marine resources and their natural habitat. OLE's jurisdiction spans more than three million square miles of ocean, more than 95,000 miles of U.S. coastline, and the country's 13 National Marine Sanctuaries and four Marine National Monuments. OLE is responsible for carrying out more than 35 Federal statutes and international agreements related to living marine resources with primary mandates contained in the Magnuson-Stevens Fishery Conservation and Management Act (MSA), Marine Mammal Protection Act (MMPA), Endangered Species Act (ESA), National Marine Sanctuaries Act, and the Lacey Act. OLE provides direct support for enforcement activities in the NMFS Regional Offices, NMFS headquarters' Office of Sustainable Fisheries and Office of Protected Resources, and the National Ocean Service's (NOS) Office of National Marine Sanctuaries. OLE further leverages the strength of collaboration through the operation of Joint Enforcement Agreements with 27 coastal states and territories, and partnerships with other Federal agencies such as the U.S. Coast Guard. OLE enforcement cases that document violations are referred to NOAA's Office of General Council, the Department of Justice, or the United States Attorney's Office for review and potential prosecution under their jurisdiction.

NOAA's mandate to end overfishing could not be realized without OLE's efforts to ensure that the millions of people who enjoy these resources for recreation or rely on them for their livelihood understand and comply with the regulations necessary to ensure sustainable resources for future generations. OLE supports two objectives: (1) enforce laws and regulations that govern commercial fisheries, international and interstate commerce in marine resources, and human interactions with marine mammals and threatened and endangered species; and (2) protect resources within designated sanctuaries, marine monuments, and protected areas. To address these mission requirements, OLE implements four primary methods: (1) traditional enforcement such as investigations and patrols, (2) partnerships with state and Federal agencies, (3) technological tools such as Vessel Monitoring Systems, and (3) outreach and education strategies designed to enhance voluntary compliance with environmental laws and regulations. OLE's goal is to increase this compliance.

<u>Enforcement and Surveillance:</u>

The purpose of most enforcement programs is to ensure effective compliance with laws so their intent is met. In NOAA's case, this means ensuring compliance with a number of laws designed to protect such natural resources as fisheries, ocean ecosystems, sanctuaries, threatened and endangered species, and marine mammals through enforcement tools designed to encourage people to meet their legal obligations. NOAA's special agents and enforcement officers around the country work to deter, detect, investigate, and document any violations of Federal laws and regulations to protect and conserve the marine environment and its resources. NOAA's approach to fisheries enforcement emphasizes compliance assistance and increases in monitoring and inspections to assist regulated parties in understanding and complying with fishery regulations. NOAA's compliance assistance program continues to expand as new Enforcement Officers are hired around the country and increase NOAA's participation in community meetings and trade shows, and provide on-the-dock informational visits. Through these efforts, NOAA works to increase public awareness of enforcement goals and ensure objectives are understood and, to the extent possible, supported by the stakeholders.

Interpersonal interaction with Enforcement Officers and the community has proven to be an effective means of maintaining dialog on often complex regulations, and allows NOAA's investigative efforts and subsequent prosecution to focus on cases that are beyond misunderstandings and/or clerical errors. This program responds to and works to resolve internal and external inquiries and requests for assistance from a variety of industry and public stakeholders, covering a broad range of issues related to fisheries and marine mammals. The capabilities associated with deterring violations and investigating egregious cases are maintained as critical elements in NOAA's enforcement approach to ensure a strong Enforcement Program. Most commercial and recreational fishermen comply with conservation measures, and OLE's role is to ensure fair competition and a level playing field.

Cooperative Agreements with States:
The Cooperative Enforcement Program leverages the resources of 27 coastal state and U.S. territorial marine conservation law enforcement agencies in direct support of the Federal enforcement mission. Through the execution of Joint Enforcement Agreements, these partners are primarily involved in Federal enforcement efforts near shore and at-sea, as well as land-based monitoring and inspection activities. Since 2001, OLE has capitalized on this approach as a way to address challenges associated with the geographic jurisdiction, breadth of laws and regulations within NOAA's stewardship responsibilities, amount of regulated commercial activity (fishing and both domestic and international trade), and amount of recreational use of the marine environment. This cooperative program affords OLE the opportunity to concentrate on the investigation and resolution of more serious violations by integrating monitoring and inspection activities for Federal requirements with the work of state/territorial enforcement partners and the U.S. Coast Guard. In 2012, these partnerships directly provided 244,064 hours of labor, increasing by a factor of 8 the number of hours dedicated to Federal marine conservation activities compared to what NOAA could have accomplished alone.

Vessel Monitoring System:
The Vessel Monitoring System (VMS) is a satellite-based technology program for remote monitoring of fishing vessels at sea. The program supports a growing number of regulations requiring vessels to report in the VMS, and it allows OLE to monitor compliance and track violators over vast expanses of water. The VMS data have proven to be valuable evidence and are vital to NMFS' scientific community and fisheries managers. This satellite-based communications system remotely reports vessel positions and provides an infrastructure for the communication of positional, fisheries declaration, and days-at-sea data. Efficiencies realized by this electronic monitoring method and the data it produces are monumental and have been a significant advance in NOAA's at-sea monitoring efforts. VMS is a cost-effective way to help enforce protected areas, fishing quotas, actual landings, and several Federal natural resource, environmental, and species conservation laws. Prior to VMS implementation, the only methods used to police protected areas were surface and air patrols. These methods are costly and do not provide the round-the-clock coverage provided by VMS at lower cost.

Implementation of the High Seas Driftnet Fisheries Enforcement Act:
The High Seas Driftnet Fisheries Enforcement Act sets forth U.S. policy to enforce the United Nations' worldwide moratorium on large-scale driftnet fishing beyond the exclusive economic zone of any nation. Renegade large-scale high seas drift net fishing indiscriminately kills massive amounts of fish and other marine life such as whales and turtles by means of enormous nets suspended for miles in open water. The practice is universally condemned because it is a significant threat to ocean ecosystems and to the food and economic security of nations that rely on fishery resources. The Act provides for denial of port privileges and import sanctions against nations whose vessels

and/or nationals are determined to be conducting illegal driftnet activities, and who do not take corrective action. The implementation of the Act requires a high level of coordination across multiple agencies including NOAA, the U.S. Coast Guard, and the Department of State as well as international partners to continue to combat illegal, unreported, and unregulated (IUU) fishing activities and to achieve the sustainable management of all living marine resources. NOAA conducts scientific research that provides information on ecosystem indicators in order to reduce uncertainty in population assessments and to inform fishery management and enforcement. OLE provides investigation and enforcement efforts required to prosecute and deter these IUU fisheries actions.

OBSERVERS/TRAINING

The goal of observer programs is to provide accurate and timely information and analyses on the biological, ecological, economic, and social aspects of the Nation's fisheries resources. The authority to place observers on commercial fishing and processing vessels is provided by the MSA, MMPA, and ESA. The scientific data collected by observer programs are critical inputs for population assessments of threatened and endangered species such as sea turtles, seabirds, and marine mammals, and for effective management of the Nation's fish stocks. Observer programs support sustainable and resilient fisheries, species, and habitats, and help protect and restore biodiversity within healthy and productive ecosystems. Without observer programs there would be insufficient data and information to monitor and adapt to changes in the ocean's environment and living marine resources. Fisheries observer programs are a proven, unbiased, and valuable source of information on the Nation's fisheries, and are considered the most reliable and cost-effective means currently available to collect fishery-dependent data.

Since 1972, NMFS has deployed fishery observers to collect catch and bycatch data from U.S. commercial fishing and processing vessels. Observers monitor fishing activities on all U.S. coasts and collect data for a range of conservation and management issues. This includes information on fishing practices, vessel and gear characteristics, fishing locations and times, environmental conditions within the fishing grounds, compliance with fishing regulations, and socioeconomic data. Observers also collect biological samples and may assist in fish tagging and tag recovery, or in special data collections for stock assessment programs.

Observer programs are implemented in each of NMFS' six regions. The Office of Science and Technology coordinates observer programs at the national level through the National Observer Program. Observers annually monitor 48 fisheries , including 10 catch share fisheries.. The data are used for a variety of purposes including quota monitoring, estimating discards, establishing and monitoring annual catch limits, and documenting target and non-target catch for management purposes. Resources are allocated to each of the regions according to the number of fisheries and sea days that are observed annually, regulatory requirements, and emerging needs such as catch share fisheries and protected species monitoring. NMFS identifies, where practicable, alternative approaches for collection of fishery-dependent data such as electronic monitoring systems and/or industry-funded observer programs to meet current data collection requirements for stock assessments, quota monitoring, and bycatch estimation.

NMFS's observer program priorities include monitoring fisheries in each of the regions to meet statutory and regulatory requirements, while also addressing critical science and management needs for catch and discard estimates as well as stock assessments. A secondary priority is to expand observer coverage into more fisheries with bycatch concerns, as identified in the National Bycatch Report published in September 2011, and in fisheries with pilot or baseline levels of observer coverage. A third priority is to continue the development of electronic monitoring technologies to address growing fishery-dependent data collection requirements.

During FY 2013, NOAA implemented observer programs in each region, with ,833 observers and 80,891 sea days observed in 47 fisheries nationwide. Specific regional accomplishments during FY 2013 include:

- The Southeast Fisheries Observer Program observed over 5,728 sea days in the pelagic longline, reef fish, shrimp trawl, coastal teleost gillnet, and shark fisheries. The Southeast pelagic longline observer program continued enhanced observer coverage in the Gulf of Mexico from March through June 2013 to monitor landings and discards of bluefin tuna during the spawning season. The Shrimp Observer Program also completed178 days in the shrimp skimmer trawl fishery for experimental turtle excluder (TED) evaluations in the northern Gulf of Mexico. The Southeast Gillnet Observer Program initiated a pilot program to place observers on state gillnet vessels in Alabama, Mississippi, and Louisiana.

- The Northeast Fisheries Observer Program observed a total of 11,731 sea days in FY13, of which 4,570 sea days were completed in groundfish fisheries and under the SBRM requirements, and 2,967 days in the Atlantic sea scallop dredge fishery, which was funded in large part by industry through a set-aside program. The program also completed 4,194 days in the At-Sea Monitoring Program, which is an integral part of catch monitoring to ensure that Annual Catch Limits are not exceeded. The program is in the fourth year and final phase of an electronic monitoring system (EMS) project to evaluate the utility of electronic monitoring in monitoring catch on a real-time basis in the Northeast groundfish sector fleet.

- The North Pacific Groundfish and Halibut Observer Program observed 40,466 sea days and 3,177 days monitoring shoreside processing plants bringing the total coverage days to 43,643. The program had 100% coverage on all catcher/processors, motherships, catcher vessels participating in American Fisheries Act (AFA) or Community Development Quota (CDQ) pollock, CDQ groundfish (except pot and jig gear), and Central Gulf of Alaska rockfish program fisheries, and processors receiving or processing Bering Sea pollock. The program had partial coverage (<100%) on BSAI and Gulf of Alaska groundfish trawl, longline and pot fisheries, and the Pacific halibut fishery. The partial coverage fisheries were divided between trip selection (~14% on vessels >57.5 ft.) and vessel selection (~10% coverage of vessels 40-57.5 ft.).
- The West Coast Groundfish Observer Program observed a total of 10,440 sea days in 10 fisheries in 2013. 8,990 sea days were observed in the West Coast trawl catch share fishery (shoreside and at-sea fleets) and 1,450 days observed in the West Coast non-catch share fisheries, comprised of limited entry sablefish and state-managed and open access fisheries such as California halibut trawl, nearshore rockfish, pink shrimp, and open access fixed gear fisheries. Observers recorded haul information, determined the official total catch, sampled hauls for species composition, collected length and age structure data, completed special projects and collected samples related to protected species such as salmon, green sturgeon and eulachon. Observers also recorded marine mammal and seabird sighting and interaction data. In addition to supporting fisheries management, these data are being used for fish stock and protected species population assessments, bycatch estimation and to allow catch share fishers to manage their quota.

- The Southwest Observer Program provided 261 days in the California large-mesh drift gillnet fishery, the Southern California set gillnet fishery, and the California-based deep-set pelagic longline fishery to document the incidental take of marine mammals, sea turtles,

seabirds, and target and non-target fish species, and to collect selected biological specimens.

- The Hawaii Fisheries Observer Program observed a total of 9,088 sea days in the Hawaii pelagic longline and American Samoa longline fisheries. The program continued to implement 100 percent observer coverage in the Hawaii shallow-set longline fishery, in which 1,725 sea days were completed and 20 percent coverage in the Hawaii deep-set longline fishery, 6,483 sea days. The program also observed 880 sea days in the American Samoa longline fishery. Observers collected data on incidental sea turtle takes and fishing effort, documented interactions of all protected species, and recorded species of fish kept and discarded. They also processed selected specimens for life history information.

- The National Observer Program (NOP) completed its first update to the first edition of the National Bycatch Report. http://www.st.nmfs.noaa.gov/observer-home/finaldraftnbr The NOP also submitted and received approval for a Paperwork Reduction Act renewal request to the Office of Management and Budget (OMB) for all observer data collection forms, and participated in the 7th International Observer Monitoring Conference. The NOP also helped draft a series of while papers on electronic monitoring (EM) to improve the agency's fishery-dependent data collection efforts.

Schedule and Milestones:
Enforcement
OLE measures outputs in terms of incidents (documentation of possible violations) initiated, man-hours of monitoring and inspection work, and man-hours of outreach to the regulated public. OLE work performance has fluctuated based primarily on staffing levels with a general increasing trend in outputs.

During FY 2015, OLE plans to:

- Continue to execute the Workforce Analysis and Staffing Plan.
- Continue the transition to catch share management and appropriate enforcement strategies, including the shifting of existing resources to compliance assistance and monitoring activities designed to foster voluntary compliance and deter violations.
- Refresh and maintain equipment that supports law enforcement functions.

Observers/Training
FY 2015–2019
National

- Provide coverage in 48 fisheries nationwide, with a goal of expanding observer coverage in existing fisheries and implementing new observer programs in fisheries transitioning to catch share management.
- Maintain the number of fisheries with adequate or near adequate observer coverage at 29, the number of sea days observed annually at 75,000, and the percentage of fish stocks with adequate population assessments and forecasts.
- Provide updated bycatch estimates for the National Bycatch Report.

Regional

- The Southeast Fisheries Observer Program will continue to provide observer coverage in the Southeast and Gulf of Mexico shrimp trawl fisheries (including rock shrimp), the Gulf of Mexico reel fish fishery, and in the Atlantic, Gulf of Mexico, and Caribbean pelagic longline fishery, with increased coverage in the Gulf of Mexico during bluefin

tuna spawning season; and 100 percent observer coverage in the Southeast shark research fishery.

- The Northeast Fisheries Observer Program will continue to provide observer coverage in the New England groundfish sectors, the groundfish common pool fisheries, the herring fishery, mid-Atlantic coastal gillnet fishery, Northeast and mid-Atlantic small mesh trawl fisheries, mid-Atlantic Illex squid trawl fishery, Atlantic sea scallop dredge fishery, and the Northeast and Mid-Atlantic large mesh trawl fisheries.
- The North Pacific Groundfish Observer Program (NPGOP) will continue to provide observer coverage in the groundfish and halibut fisheries of Alaska and will continue to deploy observers according to Federal Regulation and Annual Deployment Plans that are developed through the Fisheries Council process. The coverage rate in partially covered portions of the fleet is determined by available funds, the cost of observation, and fishing effort.
- The Northwest Fisheries Science Center Observer Program, comprised of the West Coast Groundfish Observer Program (WCGOP) and the Catch Share Observer Program, will continue to provide observer coverage in state and federally managed West Coast fisheries. Under the Pacific trawl rationalization program, 100 percent observer coverage will continue to be required on all vessels participating in the rationalized fishery. The WCGOP will continue to provide observer coverage in state-managed fisheries (e.g., halibut trawl, nearshore shrimp, and pink shrimp).
- The Southwest Observer Program will continue to provide observer coverage in the California drift gillnet fishery and the California pelagic longline fishery. The observer program is also considering whether to expand observer coverage into the coastal pelagic species purse seine fishery for sardine off Oregon and Washington.
- The Pacific Islands Regional Observer Program will continue to provide 20 percent observer coverage in the Hawaii-based pelagic longline deep-set fishery and 100 percent coverage in the shallow-set fishery for swordfish, and a target of approximately 12 percent coverage in the American Samoa pelagic longline fishery.
- The National Observer Program will continue to coordinate observer program activities at the national level by developing new standards, policies, and procedures to improve observer programs. The National Observer Program will complete the NOP Annual Reports and provide biennial online updates to the National Bycatch Report that was first published in September 2011, with a target publication date of 2017 for the next comprehensive report.

Deliverables:
Enforcement

FY 2015–2019

- Equipment refresh for computers, safety equipment, uniforms, and general law enforcement equipment.
- Increased compliance assistance through enhanced outreach to the regulated community.

FY 2016–2019

- Increased compliance assistance through enhanced outreach to the regulated community.
- Increased monitoring and inspections activity while maintaining investigative capability.
- Replacement of essential law enforcement equipment as required, including aging enforcement vessels and vehicles.

Observers/Training

FY 2015–2019

- Data necessary for management of the Nation's fisheries, including information to support management of marine mammals, sea turtles, seabirds, and other protected species.
- Information on catch, bycatch, discards, and biological data necessary for in-season monitoring and stock assessments.
- Information to increase compliance with specific regulations.
- Establishment of contracts needed to hire observers through companies providing independent observers.
- Information needed to support other specified science and management programs.
- Biological information needed for age and growth studies and genetic analyses of threatened or endangered sea turtle populations.
- Information on fishing effort, fishing gear, and specific fishing techniques that minimize bycatch.
- Marine Safety Instructor Training for all new marine safety instructors, as well as refresher training every two years for all other instructors who provide observer safety training.

Performance Goals and Measurement Data:

Enforcement*

Performance Measure: Investigations	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	4.054	2,520	2,520	2,250	2,250	2,250	2,250
Description: Total number of investigations conducted.							

Performance Measure: Man hours of monitoring and inspections	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	22,642	25,045	27,900	30,450	30,450	30,450	30,450
Description: Total number of hours spent on inspections and monitoring.							

Performance Measure: Man hours of outreach	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	17,840	15,080	15,550	15,600	15,600	15,600	15,600
Description: Total number of hours spent on outreach.							

*Note: At this time NOAA is updating two of the ENF Performance Measure annual targets to better reflect the changes that have/will result from the implementation of the Workforce Analysis and Staffing Plan. Hours of Patrol and Outreach have been increased to echo the anticipated increase of Enforcement Officer hires. The increase in this specific personnel series will directly increase OLE's capability to conduct monitoring, patrols, inspections, and compliance assistance activities. OLE has recently refocused its efforts on supporting and expanding its compliance assistance program work, and these new staff will play a vital role in this approach. These positions will increase the visibility and interactions with the men and women in the fishing industry and coastal communities, and will enhance and complement OLE's compliance assistance to those in the fishing community and others who must comply with conservation regulations. This anticipated hiring will directly impact the ENF Programs Patrol and Outreach Measures; as such, success in meeting these new targets will be directly linked to the ability to execute the projected hires. The staffing plan changes are proposed to happen over time and simultaneously are budget neutral, so hiring actions and the resulting Performance Measure results remain contingent on funding realities. Targets for the number of Investigations Initiated Measure will not change at this time.

Observers/Training

Performance Measure: Fisheries with adequate observer coverage	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	31	31	31	31	31	31	31
Description: Total number of fisheries that are observed with adequate observer coverage as defined in the Fishery Management Plan. The number of fisheries with adequate or near adequate observer coverage, as well as the target observer coverage, are dependent on funding, fishing effort, changes in management and/or regulations, and observer program priorities.							

Performance Measure: Number of Sea Days Observed	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	80,891	78,000	78,000	78,000	78,000	78,000	78,000
Description: These values represent the total number of sea days observed. Some sea days are industry-funded; however, they still rely on Federal funding to occur, and should thus be included in performance tracking, as is the case in the NMFS Annual Operating Plan.							

PROGRAM CHANGES FOR FY 2015:

No program change is requested for this sub-program.

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APPROPRIATION ACCOUNT: OPERATIONS, RESEARCH AND FACILITIES
SUB-PROGRAM: HABITAT CONSERVATION & RESTORATION

The Habitat Conservation and Restoration Program has the critical and challenging conservation mission to protect and restore habitats that provide important societal and ecological benefits. The Program contributes to rebuilding fisheries, recovering protected species, and improving the resiliency of coastal communities. NOAA's mandate to conserve habitat is embedded in several pieces of legislation including Magnuson-Stevens Fishery Conservation and Management Act, Federal Power Act, and Energy Policy Act of 2005 (commercial and recreational fisheries); the Endangered Species Act (protected species), and the Oil Pollution Act and Comprehensive Environmental Response, Compensation and Liability Act (trust resources injured from oil and hazardous waste spills).

Healthy habitats sustain valuable commercial and recreational fisheries, which in 2011 supported more than 1.7 million jobs and generated over $199 billion in sales (Fisheries Economics of the United States, 2011). Widespread habitat loss presents a challenge as NOAA seeks to sustain and rebuild the nation's fisheries. A recent report shows that we are losing coastal wetlands—prime nurseries for many species—at the rate of about 80,000 acres per year.[3] This rate of increase is 20,000 more acres per year than was lost during the period between 1998 and 2004. Other areas have experienced great habitat losses., 85 percent of Galveston Bay sea grasses are gone, and river herring, an important prey for commercial species like tuna and cod, have lost access to all but 27 percent of their historic habitat along the East Coast.[4]

In response to these significant threats to habitat, we have developed the NOAA Habitat Blueprint (www.habitat.noaa.gov/blueprint), an innovative cross-NOAA strategy which will increase the effectiveness of NOAA's conservation efforts to improve habitat conditions for fisheries, coastal and marine life, and coastal communities. The Blueprint's guiding principles of prioritizing resources and activities across NOAA, implementing place-based habitat solutions, and fostering and leveraging partnerships are currently being implemented across the country. Under the Blueprint, NOAA is implementing seven regional habitat initiatives, coordinating habitat science and conservation in identified Habitat Focus Areas, implementing a systematic and strategic approach to habitat science, and strengthening policy and legislation to more effectively protect and restore habitat.

The program plays an integral role in the conservation and management of fisheries, protected species, and corals. NOAA's Fisheries Management, Coral Reef Conservation, and Protected Species programs rely on habitat conservation expertise for implementing and managing habitat restoration projects, avoiding adverse impacts to habitat, determining and implementing appropriate conservation techniques for addressing threats to habitat, and monitoring conservation success. NOAA partners with Federal and state agencies, the public, academia, non-governmental organizations, industry, and tribes to leverage resources and implement priority conservation actions.

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[3] T.E. Dahl and S.M. Stedman. 2013. Status and trends of wetlands in the coastal watersheds of the Conterminous United States 2004 to 2009. U.S. Department of the Interior, Fish and Wildlife Service and National Oceanic and Atmospheric Administration, National Marine Fisheries Service. (46 p.)
http://www.habitat.noaa.gov/pdf/Coastal_Watershed.pdf

[4] Restore America's Estuaries. 2011. Jobs & Dollars – Big Returns from Coastal Habitat Restoration
http://estuaries.org/images/81103-RAE_17_FINAL_web.pdf)

The Habitat Conservation and Restoration Program implements two courses of action for conserving important habitat for rebuilding fisheries and recovering protected species: 1) Sustainable Fisheries Management to protect healthy habitats from loss and degradation and 2) Fisheries Habitat Restoration to restore injured, degraded, or lost habitat.

Sustainable Fisheries Management
Habitat management and protection is the first step and most cost-effective means for ensuring the long-term survival and health of fishery resources. Habitat management and protection is integral to ensuring healthy regional ecosystems and the host of benefits derived from healthy and productive marine, coastal, and riverine habitats. As marine fish depend on habitat for survival and reproduction, it is important to protect and restore the habitats that sustain commercial and recreational fisheries.

Sustainable habitat management integrates sound science and technical expertise to assist private organizations and Federal agency actions in the following areas:

- Protecting Essential Fish Habitat (EFH): The program minimizes impacts to EFH in consultation with Federal agencies whose proposed actions may affect EFH of federally managed species. In coordination with the Regional Fishery Management Councils, the program describes and identifies EFH and evaluates the effects of proposed Federal actions. This work ensures that proposed actions posing threats to marine, coastal, and riverine EFHs are undertaken in a manner that prevents, minimizes, or compensates for adverse effects.

  NOAA provides conservation recommendations for proposed construction projects, applications for dredging and filling wetlands, waste discharge permits, renewable energy proposals, and other Federal funding and permit activities that may adversely affect EFH. These efforts have been successful—NOAA has protected more than 100,000 acres from non-fishing impacts through the EFH program each year. The consultation program provides NOAA with thousands of opportunities a year to guide development in a manner that protects fish habitat without hindering economic development. NOAA targets its consultations to consider highest priority projects at various scales at both the local and watershed levels. Many of the consultations are complicated and controversial in nature and thus require a high level of analysis and coordination. The program collaborates with industry sectors and regulatory agencies to establish best management practices for major activities or to expand use of programmatic consultations on recurring threats to EFH. The agency also strives to develop EFH consultation exceptions for categories of actions that usually do not have adverse impacts. In addition, NOAA works with the Regional Fishery Management Councils, the fishing industry, and environmental groups to protect habitat from detrimental fishing practices, such as the use of bottom-tending gear. Since FY 2004, efforts focused on fishing impacts have protected more than 978 million acres of habitat. Examples include restricting bottom trawling in important cod and scallop habitats in New England, prohibiting the use of bottom-tending fishing gear in several submarine canyons in the Mid-Atlantic, and prohibiting the use of dredge gear in deep-sea coral areas off the West Coast and Alaska.

- Providing fish passage at hydroelectric dams: The program ensures passage for migratory fish past hydroelectric dams that block valuable river miles. NOAA has the ability to require fish passage through the development of mandatory conditions under the Federal Power Act for the safe, timely, and effective passage of migrating fish at

hydropower dams licensed by the Federal Energy Regulatory Commission (FERC). This is a unique role and responsibility granted to NOAA by the Federal Power Act that also presents a limited window of opportunity for NOAA action since license renewals are generally approved for 30 to 50 years. Each year there are opportunities for the program to engage in additional new FERC hydropower licensings and relicensings. Since 2004, the Hydropower Program has opened up passage along more than 1,300 miles of streams and rivers that have been blocked by hydropower dams.

- Utilizing partnerships for habitat conservation: NOAA recognizes the need to leverage expertise and resources to maximize habitat conservation results, and has been a leader in efforts to build Federal and state partnerships under the National Fish Habitat Action Plan. These efforts enhance habitat sustainability and support the goals of increased commercial and recreational fish populations and resilient coastal communities. In addition, in FY 2013, NOAA played a leadership role in the Cape Fear River Partnership and the release of the Cape Fear River Action Plan for migratory fish. The Partnership—composed of state and Federal agencies, non-governmental organizations, and university partners—worked together to develop the action plan to restore access to historic migratory fish habitat, improve habitat conditions for migratory fish, and communicate the socioeconomic values associated with restored access and habitat improvements.

- Protecting deep-sea coral: The Magnuson-Stevens Fishery Conservation and Management Act (MSA) directed NOAA to implement a Deep Sea Coral Research and Technology Program. The MSA also provides Regional Fishery Management Councils with discretionary authority to designate zones to protect deep-sea corals identified by the program from physical damage from fishing gear. Since initial funding in FY 2009, NOAA has implemented a program to identify and map locations of deep-sea corals as well as analyze and provide scientific information needed to protect their habitats. NOAA implements this work in coordination with other Federal agencies and research institutions. Three major outcomes from the work include discovering new deep-sea coral habitats, providing relevant information to Council management efforts, and supporting NOAA's coastal and marine spatial planning work.

Fisheries Habitat Restoration

NOAA, as directed by the MSA, implements and supports restoration of priority coastal, marine, and riverine habitats essential for the reproduction, growth, and sustainability of commercial and recreational fisheries. NOAA's Restoration Center provides a full range of restoration expertise and services (e.g., planning and consultation for project design, engineering, environmental compliance, and permitting; oversight during implementation and construction; and monitoring and evaluation of project success), and financial support for habitat restoration projects nationwide, capitalizing on the investments of partnering organizations to help us meet MSA and ESA requirements for rebuilding stocks and recovering protected species.

The NOAA Restoration Center also manages restoration planning and implementation activities for Natural Resource Damage Assessment (NRDA) and Restoration Trustee responsibilities for all active cases (e.g., Deepwater Horizon oil spill) as required by the Oil Pollution Act (OPA) and Comprehensive Environmental Response, Compensation and Liability Act (CERCLA or Superfund Act). In addition, staff provide restoration services across other NOAA programs, including the Coral Reef Conservation Program, Marine

Debris Program, National Marine Sanctuaries Program, Office of Response and Restoration, and Protected Species Program.

Habitat restoration also benefits local economies through improved habitat conditions that support recreational and commercial uses, as well as increased resiliency of coastal resources. In addition, habitat restoration projects support a variety of job types in local communities—including construction workers and project managers working directly onsite—as well as other businesses and professionals who design, engineer, provide materials, and monitor the success of these projects. And, unlike in other economic sectors, restoration jobs can't be outsourced to far-off places. In an Oregon-based study, an average of $0.80 of every $1.00 spent on a restoration project stayed in the county where the project was located, and $0.90 stayed in the state.[5]

NOAA's restoration services focus on:

- Restoring injured or lost habitat: The NOAA Restoration Center leads restoration planning and implementation, and monitors the success of implemented restoration projects for coastal and marine resources threatened or injured by oil spills, waste sites, or ship groundings (i.e., injured coral reefs, damaged sea turtle nesting sites and fishery habitat, lost recreational opportunities). The scientific and policy expertise housed in this program is critical to NOAA's ability to respond to oil spills and hazardous waste releases, and restore habitats and resources after these events. Through the program, injuries to habitat are repaired when possible and any lost natural resources are replaced through restoration projects that focus on revitalizing and improving coastal and marine habitats such as wetlands, coral reefs, and submerged aquatic vegetation.

  Although NRDA restoration projects are often supported with funding recovered from polluters, the restoration expertise and leadership required for project planning, implementation, and monitoring is provided with Habitat Management and Restoration resources. Appropriated funding is needed to pay for this expertise as well as some of the non-reimbursable labor costs associated with running an NRDA program. NRDA case work is only reimbursable when a responsible party is identified and a legal agreement is reached, and even then some of the labor costs incurred are not covered. NOAA must cover these labor costs completely when no responsible party can be identified or when that party has no ability to pay.

  NOAA's Restoration Center works to ensure that restoration under NRDA is coordinated with other restoration efforts. For example, as multiple Gulf of Mexico recovery restoration initiatives begin, the Restoration Center will be required to coordinate among initiatives to promote efficient use of restoration funding and avoid duplicated efforts. RESTORE Act funds and DWH NRDA funds can both be used for recovery of the Gulf Coast, but the efforts are distinct and separate and the eligible uses are different under each funding source. Total investment from these two initiatives is expected to result in an unprecedented number of restoration projects requiring a new level of coordination not previously supported—potentially billions of dollars in projects will be implemented through dozens of local, state,

[5] Hibbard, M. and S. Lurie. 2006. "Some Community Socio-Economic Benefits of Watershed Councils: A Case Study From Oregon." Journal of Environmental Planning and Management 49: 891-908. *In Oregon's Restoration Economy* http://www.ecotrust.org/wwri/downloads/WWRI_OR_brochure.pdf

and Federal entities. NOAA Restoration Center staff has a critical role in coordinating NOAA's NRDA restoration planning and implementation with RESTORE Act activities in addition to their typical NRDA responsibilities.

- Targeting restoration of priority habitats: The Community-based Restoration Program (CRP) supports fishery rebuilding efforts and the recovery of listed species through the restoration of spawning and rearing habitat provided by wetlands, rivers, oyster, and coral reefs in targeted areas (e.g., Blueprint Focus Areas, areas identified in recovery plans or fishery management plans). The CRP's ecosystem-based habitat approach also supports and enables additional ecosystem benefits to coastal communities (e.g., shoreline protection, flood reduction, increased tourism and recreational opportunities).

  NOAA provides the planning, engineering, and design expertise, and the financial support not found in local communities for habitat restoration projects. This highly successful national effort partners with state and local governments, nonprofit organizations, and local communities, and regularly leverages non-Federal to Federal funds by factors of 3-to-1. The results demonstrate the benefits of healthy habitat for fish. For example, just three years after the culvert connecting Bride Brook to Long Island Sound was enlarged, the herring population has grown roughly 484%, from 75,000 to 363,224 fish in spring 2013. Herring are an important prey species for cod and other federally managed species in the Northeast.

  NOAA is strategically investing in larger-scale habitat restoration to achieve larger impacts. Restoration is focused in targeted areas where NOAA can significantly affect protected species or fisheries recovery through habitat restoration. Habitat restoration projects are selected through a competitive solicitation process that leverages substantial investments from partners. Larger-scale projects are more complex and tend to be multi-year projects. Examples include:

  - **The Penobscot River Restoration Project** demonstrates the success of larger-scale investment in habitat restoration. Coordinated dam removals, fish passage installation, and shoreline restoration at several strategic sites along the Penobscot River will benefit multiple species—improving access to almost 1,000 miles of spawning habitat when complete. Ten species of migratory fish will directly benefit, including the endangered Atlantic salmon.
  - In the **California Russian River Habitat Blueprint Focus Area**, where offices across NOAA (including NMFS, NOS, NWS, and OAR) are collaborating to meet mutual habitat objectives on a watershed scale. These objectives include 1) rebuilding endangered coho salmon and threatened Chinook and steelhead stocks to sustainable levels through habitat protection and restoration; 2) improving frost, rainfall, and river forecasts in the Russian River watershed through improved data collection and modeling; and 3) increasing community resiliency to flooding damage through improved planning and water management strategies. Recent restoration efforts in the Russian River watershed have restored passage in priority tributaries such as Willow Creek to support recovery of listed coho and Chinook salmon and steelhead trout. Monitoring in 2013 confirmed successful spawning of endangered coho salmon and threatened steelhead trout in Willow Creek for the first time since 1990.

- Implementing the Estuary Restoration Act: The Estuary Restoration Act Program was created in response to the Estuary Restoration Act of 2000 (ERA) to make restoring estuaries a national priority. The Estuary Restoration Program maintains a national

inventory of restoration projects, supports the work of the ERA Council, and provides assistance for restoration project monitoring.

Schedules and Milestones:

FY 2015–2019

- Conduct priority project consultations each year to protect EFH.
- Work with 10 coastal and marine Fish Habitat Partnerships to develop and implement strategic plans.
- Conduct deep-sea coral research activities in conjunction with habitat characterization cruises.
- Develop management options for protecting deep-sea coral in partnership with Fishery Management Councils and National Marine Sanctuaries.
- Participate in the re-licensing process for an estimated 125 hydroelectric projects.
- Develop and select strategic national restoration projects (FY 2016).
- Develop and implement restoration plans for addressing NRDA, OPA, and CERCLA injuries to NOAA trust resources.
- Develop and implement priority restoration projects critical for NOAA trust resources.
- Evaluate restoration projects to better quantify the socioeconomic and ecological benefits.
- Implement habitat conservation and science actions in selected habitat focus areas and regional initiatives under the NOAA Habitat Blueprint framework.
- Develop habitat conservation targets for Habitat Blueprint focus areas.

Deliverables:

FY 2015–2019

- Leveraged and expanded local, interagency, and NGO partnership efforts in Habitat Blueprint focus areas to achieve measurable conservation results.
- Management-driven research products to better understand how deep-sea corals function as habitat for fish and invertebrates.
- Accurate deep-sea coral habitat distribution maps that allow managers to better protect these biologically rich ecosystems.
- Improved assessments of potential fisheries impacts to deep-sea coral habitats.
- Increased presence of target migratory fish species.
- Technical guidance and assistance provided to NOAA partners, Federal action agencies, and resource decision-makers to achieve protection and restoration of NOAA trust resources.
- Restoration plans reviewed and approved through NRDA public process.
- Restoration requirements met as defined by specific NRDA settlements.

Performance Goals and Measurement Data:

Performance Measure:	FY 2013 Actual	FY 2014 Target	FY 2015 Target	FY 2016 Target	FY 2017 Target	FY 2018 Target	FY 2019 Target
Number of Habitat Acres Restored (Annually) (Measure 17f)	46,857*	40,820	30,660	45,000	45,000	46,000	46,000
Habitat Acres	8,763	10,250	4,000	4,000	4,000	4,000	4,000
*ARRA Acres***	242	1,570	660	0	0	0	0
*PCSRF acres****	37,913	29,000	26,000	41,000	41,000	42,000	42,000

Description: NOAA restores habitat areas lost or degraded as a result of development and other human activities, as well as specific pollution incidents and sources. Activities are geared toward NOAA trust resources found across the marine environment, including the Great Lakes region, and are supportive of anadromous fish species. The intent of this measure is to summarize or project the geographic area over which ecosystem function has been or will be improved as the direct result of habitat restoration efforts. This measure does not include restoration conducted through Natural Resource Damage Assessments or the Species Recovery Grants.

**Number of acres shown for FY 2013 actuals reflect total acres reported. Total acres reported takes into account joint acres i.e., acres restored that have been supported and reported by both Habitat and PCSRF for the same project but not necessarily the same activity. For example, Habitat may fund the engineering phase of a project and PCSRF may fund the construction phase. Consequently, the total reported is less than the sum of Habitat, ARRA, and PCSRF acres to account for double counting. In FY 2013 there were 61 joint acres reported.*

***American Recovery and Reinvestment Act (ARRA)*

****PCSRF FY 2014 and FY 2015 targets represent the expected acres restored from funded projects with an anticipated completion date within the respective fiscal years. FY 2016 through FY 2019 targets are based on formula projections of acres restored based on program appropriations and past program performance.*

Performance Measure:	FY 2013 Actual	FY 2014 Target	FY 2015 Target	FY 2016 Target	FY 2017 Target	FY 2018 Target	FY 2019 Target
Stream miles made accessible (Annually)	1,363*	815	536	540	540	550	550
Habitat stream miles	752	105	100	100	100	100	100
*ARRA stream miles***	81	3	50	0	0	0	0
*PCSRF stream miles****	536	700	380	440	440	450	450

Description: This performance measure counts stream miles made accessible as a result of Habitat Program activities. Stream miles made accessible in this context will include barrier removal and fish passage projects that support recovery of listed species.

**Number of stream miles shown for FY 2013 actuals reflect total stream miles reported. Total stream miles reported takes into account joint stream mile i.e., stream miles made accessible through projects funded by both Habitat and PCSRF for the same project but not necessarily the same activity. For example, Habitat may fund the removal of a passage-blocking culvert at a road crossing, and PCSRF may fund the construction of a bridge to replace the removed culvert. Consequently, the total reported is less than the sum of Habitat, ARRA, and PCSRF stream miles to account for double counting. In FY 2013 there were 6.5 joint stream miles reported.*

***American Recovery and Reinvestment Act (ARRA)*

**** PCSRF FY 2014 and FY 2015 targets represent the expected stream miles made accessible from funded projects with an anticipated completion date within the respective fiscal years. FY 2016 through FY 2019 targets are based on formula projections of stream miles based on program appropriations and past program performance.*

PROGRAM CHANGES FOR FY 2015:

No program change is requested for this account.

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APPROPRIATION ACCOUNT: OPERATIONS, RESEARCH AND FACILITIES
SUB-PROGRAM: OTHER ACTIVITIES SUPPORTING FISHERIES

Other Activities Supporting Fisheries includes items that cross multiple NMFS programs. Activities funded include Antarctic research, aquaculture, climate impacts research, computer hardware and software, cooperative research, information analysis and dissemination, the National Environmental Policy Act (NEPA), regional studies, and facilities maintenance.

Antarctic Research

The Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) was established by international convention in 1982 with the objective of conserving Antarctic marine life. The U.S. AMLR Convention Act requires that the Department of Commerce conduct a program of directed scientific research to "achieve the United States goal of effective implementation of the objectives of the Convention [on the Conservation of Antarctic Marine Living Resources]." NOAA is the only bureau within the Department of Commerce with the capabilities to fulfill this mandate. NOAA's Antarctic Ecosystem Research Division (AERD) implements the ecosystem research program known as the U.S. Antarctic Marine Living Resources (AMLR) Program. This program is NOAA's only dedicated, long-term ecological presence in the Antarctic, with observations going back to 1986.

The U.S. AMLR Program conducts ecosystem-based research in support of U.S. policy interests related to Antarctic resource management. Its objective is to understand the relative impacts of fishing, climate change, and other human activities on the Antarctic marine ecosystem. The program includes research to estimate the biomass of krill and to monitor the reproductive successes (or failures) and foraging patterns of krill-dependent predators, such as penguins and seals. Krill is the largest fishery in Antarctica and the main source of food for most of the Southern Ocean's fishes, birds, and mammals. Further research includes studies of how the production of krill-dependent predators is, in turn, impacted by predation from higher-level predators, such as leopard seals. The research program is conducted at sea to study krill and oceanographic processes, and from two field camps to study krill-dependent predators located in the vicinity of important krill fishing areas. This work results in stock assessments for 26 targeted stocks of Antarctic krill, fishes, and crabs.

Research to synthesize all field data occurs at the laboratory and includes efforts to build and implement ecosystem and stock-assessment models to advise harvest strategies for Antarctic fisheries such as Patagonian toothfish (a.k.a. Chilean Sea Bass), Antarctic toothfish, and mackerel icefish. Outputs from the U.S. AMLR Program include biomass estimates for commercially important species; peer-reviewed articles, as well as other reports that increase knowledge about the Antarctic marine ecosystem and the impacts of fishing and climate change on that ecosystem; scientific advice to the U.S. Delegation to CCAMLR; and representation of the United States to the CCAMLR Scientific Committee and its working groups.

Aquaculture

The NMFS Office of Aquaculture is guided by the objectives in the 2011 Department of Commerce and NOAA Aquaculture Policies and the National Ocean Policy Implementation Plan. These policies and plan establish a framework to allow sustainable domestic aquaculture to contribute to the U.S. seafood supply, support job creation in coastal communities, enhance important commercial and recreational fisheries, and help to restore species and habitat.

NOAA sees aquaculture as a critical component to creating jobs in coastal communities, meeting increasing global demand for seafood, and maintaining healthy ecosystems. The United States is a major consumer of aquaculture products, yet we are a minor producer. The United States imports more than 90 percent of its seafood, of which nearly half is from foreign produced aquaculture, while only five percent of the seafood Americans consume is from domestic freshwater and marine aquaculture. NOAA is focusing on addressing the regulatory, technical, and scientific barriers to domestic marine aquaculture production. These efforts include: streamlining aquaculture permitting through the Administration's Office of Science and Technology Policy (OSTP) Joint Subcommittee on Aquaculture's Regulatory Task Force; implementing the National Shellfish Initiative; developing private-public partnerships for the Technology Transfer Initiative; and implementing the Gulf of Mexico Aquaculture Fishery Management Plan. In the current fiscal environment, the Office of Aquaculture is working to develop external partnerships with the private sector and research institutions to leverage private or university resources in order to implement the DOC and NOAA Aquaculture Policies.

Funds support:

- Operations at the NOAA Office of Aquaculture to lead and coordinate national regulatory, research, and outreach activities for marine aquaculture.
- Regional aquaculture coordinators who are currently in place in the Northeast, Northwest, Southeast, Southwest, and Pacific Islands regions.
- Aquaculture science, and research and development activities at NOAA laboratories, including work to assess and minimize environmental impacts of shellfish and finfish aquaculture; environmental modeling; hatchery research; and disease and genetics management.

Climate Regimes & Ecosystem Productivity

The Climate Regimes & Ecosystem Productivity Program (CREP) provides Federal, state, tribal and private-sector decision-makers with information on how climate variability and change is impacting U.S. marine ecosystems and the communities and economies that depend on them. This information is critical to fulfilling NOAA's management responsibilities for fisheries, protected species, and their habitats in a rapidly changing world. Through observations and research, CREP provides managers with information and early warnings of current and future climate-driven impacts on marine ecosystems, fisheries, and protected species. CREP's highly efficient, leveraged observation networks provide information used to:

- Improve fishery recruitment predictions and stock assessments.
- Track climate-related impacts on fisheries and other living marine resources.
- Anticipate and reduce the impacts of climate-related changes on fishing communities and industries.

While CREP was designed to provide information in each region, it is currently operational only in the North Pacific region through the North Pacific Climate Regimes and Ecosystem Productivity project (NPCREP). NPCREP provides information, assessments, and projections of climate-related impacts on living marine resources of the Bering Sea and Gulf of Alaska. This area is home to some of our Nation's richest commercial fishing grounds—55 percent of U.S. landings, by weight, occur in Alaska, with a landed value of $1.7 billion in 2012.[6] The area

[6] Fisheries of the United States (2012), http://www.st.nmfs.noaa.gov/commercial-fisheries/fus/fus12/index

is also home to many protected species and native communities that depend on this productive marine ecosystem. These resources and the communities that depend on them are particularly vulnerable to climate-related impacts given the scale, scope, and pace of climate changes in this region.

The NPCREP research and observing system has provided information on climate-related impacts in the eastern Bering Sea and western Gulf of Alaska since 2004. During this time, the project has delivered the key observations, biophysical indicators, and models used to track and forecast climate-related impacts on the marine ecosystem. This information has increased the accuracy of predictions of fish stocks in future climate conditions, and allowed the North Pacific Fishery Management Council to take proactive steps to sustainably manage valuable fish stocks during changing climate conditions that threaten these valuable resources.

Computer Hardware and Software

The Computer Hardware and Software line item is the sole appropriated resource available to operate and maintain the NMFS Wide Area Network (WAN) and the NMFS IT security program. The WAN is the primary conduit for all mission-critical data and enterprise applications used in support of the stewardship of commercial and recreational fishing, protection of species and their habitats, and NMFS law enforcement efforts. It provides crucial security components including firewall hardware, secured router hardware, security monitoring software, and intrusion detection system software—all critical for preventing and monitoring security risks and vulnerabilities to the NMFS network.

Cooperative Research

Cooperative research enables commercial and recreational fishermen to become involved in collecting fundamental fisheries information to support the development and evaluation of management options. Through cooperative research, industry and other stakeholders can partner with NMFS and university scientists in all phases of the research program—planning the survey and statistical design, conducting research, analyzing data, and communicating results.

Current cooperative research activities complement existing NMFS monitoring programs nationwide by providing access to platforms (recreational and commercial fishing vessels) widely distributed over a variety of habitats simultaneously, including areas not accessible to NOAA vessels. The information collected through cooperative research programs assists scientists and managers by supplementing the data currently collected through Federal research programs. This information improves the information base for single species, multi-species, and ecosystem assessment models and ultimately improves the evaluation of stock status and the management of fishery resources.

Cooperative research covers a wide range of study areas, including fishery-dependent data, species life history, conservation engineering, species abundance and distribution, habitat, and socio-economic impacts. The agency's program selects high-level cooperative research projects nationwide through competitive grant and contract procurements, as well as cooperative agreements. These projects are selected in consultation with the Councils, Commissions, and stakeholders and in accordance with research areas established in Section 318 of the reauthorized Magnuson-Stevens Fishery Conservation and Management Act (MSA).

Information Analysis and Dissemination

The MSA, Marine Mammal Protection Act, Endangered Species Act, Data Quality Act, and the President's Open Government Directive for Information Sharing Memorandum entitled

"Building a 21st Century Digital Government," Executive Order titled "Making Open and Machine Readable the New Default for Government Information" and Open Data Policy all include requirements and directives for data collection, data management, and data dissemination. NMFS has specific roles and responsibilities under these mandates that require staff expertise in managing data and supporting model development for population dynamics and economic trends, statistical data analyses for stock assessments, and developing data and business models for database and management tools. In response to these directives, the information analysis and dissemination line supports NMFS staff that process, analyze, and produce data and disseminate the resulting information to resource managers and other users. This is particularly important as it relates to fisheries statistics, fish and protected species stock assessments, socio-economics, and other biological, ecological, and oceanographic data and analyses that resource managers need to make ecosystem-based management decisions. The information analysis and dissemination line complements research and data collection programs, as it takes information collected through research and surveys and combines the results into meaningful information that is served back to constituents and decision-makers.

The Information Analysis and Dissemination line also allows NMFS to maintain efficient data processing and integration, and ensure the timely and secure dissemination of information of critical fisheries science data sets. The tools and mechanisms produced using this line support effective decision-making and promote public awareness and education.

Marine Resources Monitoring, Assessment, & Prediction Program

The Marine Resources Monitoring, Assessment, and Prediction (MARMAP) Program is a cooperative fisheries project of NMFS and the South Carolina Marine Resources Research Institute (MRRI). For over 40 years, the MRRI has conducted fisheries-independent surveys and related research on groundfish, reef fish, and coastal pelagic fishes within the region between Cape Lookout, North Carolina, and Cape Canaveral, Florida. The overall mission of the program has been to determine distribution, relative abundance, life-history characteristics, and critical habitat of economically and ecologically important fishes of the South Atlantic Bight (SAB) and to relate these features to environmental factors and exploitation activities. Research toward fulfilling these goals has included region-wide trawl and trap surveys (from approximately 6–350 m depth), ichthyoplankton surveys, location and mapping of reef habitat, life history and population studies of priority species, tagging studies of commercially important species, and special studies directed at specific management problems in the region. Data resulting from MARMAP surveys – i.e., data describing how fish populations vary over space and time - are consistently used in stock assessments to determine if managed species are overfished or experiencing overfishing.

National Environmental Policy Act (NEPA)

This funding supports NMFS's NEPA coordinators and a staff of NEPA experts who ensure the compliance of agency actions under NEPA, which includes development of environmental impact studies supporting NMFS actions to manage and conserve fisheries and protected resources and their habitats. Environmental review under NEPA is an essential, legally mandated element of all agency decision-making that, if not performed efficiently with the guidance of well-trained professionals, can result in disruption of program and project timelines and corresponding escalations in cost. NEPA requires Federal agencies to analyze the environmental impacts of, and alternatives to, major Federal actions and to involve the public in that process so that agencies make well-informed and legally defensible decisions in an open and transparent manner. In addition to conducting NEPA analyses for its actions, NMFS provides knowledge and expertise through NEPA cooperation with other Federal agencies (e.g.

U.S. Navy, National Science Foundation, Department of the Interior's Bureau of Ocean Energy Management and U.S. Fish and Wildlife Service) on actions that may impact trust resources under NOAA's jurisdiction. Funding supports NEPA documentation for a wide range of NMFS actions, including:

- Fishery management plans and plan amendments.
- Endangered species and marine mammal research and conservation.
- Fisheries and bycatch reduction science.
- Coastal and marine habitat restoration and construction.
- Oil and gas exploration and development.
- Alternative energy exploration and development.

NMFS Facilities Operations and Maintenance

The NMFS Facilities Operations and Maintenance line supports lease costs for the Kodiak Fisheries Research Center and for the Sandy Hook, New Jersey facility. This line also funds some of the operations and maintenance costs for the Lena Point laboratory in Juneau, Alaska.

- The Kodiak Fisheries Research Center (KFRC) is the primary facility for the Alaska Fisheries Science Center's Resource and Conservation Engineering Shellfish Assessment Program. The KFRC facility also provides offices and research support for other NMFS program activities, including: Groundfish Assessment Program, North Pacific Groundfish Observer Program, National Marine Mammal Laboratory, and Alaska Regional Office Sustainable Fisheries Division.
- The Lena Point laboratory in Juneau consists of 66,000 square feet of office and laboratory space and houses the Auke Bay Laboratories. This facility conducts scientific research throughout Alaska on fish stocks, fish habitats, and the chemistry of marine environments. Information from this research is widely used by commercial interests such as fishing industries and governmental agencies involved in managing natural resources.
- The primary mission of the Sandy Hook laboratory is to conduct ecological research for the Northeast Fisheries Science Center to improve understanding of both coastal and estuarine organisms and the effects of human activities on nearshore marine populations.

Regional Studies

Chesapeake Bay Studies

The Regional Studies budget line supports the funding for the NOAA Chesapeake Bay Office (NCBO) to apply expertise in fisheries, aquatic habitats, community education, and in-water observations to protect and restore the Chesapeake Bay. NCBO programs exemplify an integrated approach to ecosystem management, enabling scientists and resource managers to examine the interconnected elements of the Bay ecosystem and ensuring that Bay residents have a holistic understanding of its treasured natural and cultural resources. NCBO is the primary agent for meeting NOAA's mandate to support the Chesapeake Bay Program as authorized by PL107-372 and implementing the agency's requirements under Executive Order 13508 (EO). By combining resources from the Regional Studies and Survey and Monitoring lines, NCBO carries out programs in: 1) habitat assessment, characterization and oyster restoration, 2) fisheries research and modeling, 3) environmental literacy and community engagement; and 4) observations.

In FY 2015, the Regional Studies portion of NCBO's budget will support targeted restoration, conservation, and monitoring of vital habitats and key resources; synthesis and interpretation of scientific data for resource managers, educators, and communities who rely on NOAA for timely and credible information. NCBO will continue to operate and maintain the Chesapeake Bay Interpretive Buoy System (CBIBS) and will also use emerging technologies for data collection and dissemination, such as real-time data sensors, predictive modeling, smart phone apps that improve scientific understanding of the dynamic Bay and enhance the user experience.

Southeast Area Monitoring & Assessment Program (SEAMAP)
Funding for SEAMAP supports the collection of fishery-independent data through state, Federal, and university partnerships. Partnership arrangements are set up through cooperative agreements composed of three components: South Atlantic (North Carolina to Florida), Gulf of Mexico (Florida to Texas), and Caribbean (U.S. Virgin Islands and Puerto Rico). SEAMAP coordinates state and Federal surveys for the collection, management, and dissemination of fishery-independent data on marine resources. The data support the sustainable use of commercially and recreationally valuable fish stocks in the southeastern United States.

State, Federal, and university partners in the SEAMAP program conduct a variety of fishery-independent research surveys, including groundfish trawl surveys, plankton and larval fish surveys, shark and snapper longline surveys, and reef fish video surveys. These surveys provide a wide range of information to support regional stock assessment and management activities, including biological information on distribution, abundance, growth, mortality, and recruitment. In addition, all surveys collect environmental and habitat information that provides a broad-based ecosystem approach to survey methodology. These data are essential to support current species-specific and habitat fishery management plans, while supporting marine spatial planning and ecosystem-based management approaches.

The data provided by SEAMAP support management activities in four Regional Fishery Management Councils: Mid-Atlantic, South Atlantic, Gulf of Mexico, and Caribbean. SEAMAP data provide the basis for the majority of stock assessments conducted for managed species in these regions and are critical to current requirements to set annual catch limits (ACLs) for managed stocks. Data management activities include electronic data collection on all research surveys, centralization of SEAMAP data to improve accessibility, and coordination with the National Data Centers to link SEAMAP data to additional environmental data such as satellite and buoy data. These activities will ensure that SEAMAP data are easily accessible to fishery managers, scientists, and the general public.

The majority of funding is provided to the SEAMAP partners through NOAA cooperative agreements for data collection. The remaining funding is for the Southeast Fisheries Science Center's Mississippi Laboratories to support data management activities for all components of the SEAMAP program. These funds are proportionally allocated to the regional SEAMAP components and then to the individual states. SEAMAP activities are coordinated through meetings of the SEAMAP components to ensure consistency in data collection and use.

Schedule and Milestones:
NMFS will continue to conduct monitoring, assessments, and forecasts to provide resource managers with the best available science on living marine and coastal resources, their habitats, and socio-economic conditions.

Antarctic Research

FY 2015–2019

- Conduct U.S. research surveys and cooperate on foreign research surveys to estimate the biomasses of Antarctic krill and fishes and complete or contribute to stock assessments for 26 targeted stocks.
- Continue annual studies and assessments of krill-dependent predators (e.g., penguins and seals) at remote field camps to determine the impacts of fishing and climate change.
- Contract small businesses to provide personnel for field work conducted at sea and at the field camps.
- Provide scientific advice to the U.S. Delegation to CCAMLR and represent the United States at meetings of the CCAMLR Scientific Committee and its working groups.

Aquaculture

FY 2015

- Report on progress of the Washington State and California Shellfish Initiatives.
- Implement regulations for the Gulf of Mexico Fishery Management Plan for Aquaculture.
- Identify and make available best management practices to inform and improve Federal permitting processes for aquaculture, in coordination with interagency partners.
- Develop an analysis of the contribution and impacts (including job creation) of emerging uses—including renewable energy, aquaculture, and biotechnology—on the economies of the communities and regions dependent on marine and coastal resources.
- Implement an interagency aquaculture initiative that supports jobs and innovation, through the National Science and Technology Council's Interagency Working Group on Aquaculture and other partnerships.

FY 2016

- Develop and incorporate adaptation strategies for coastal and ocean species and habitats into future shellfish aquaculture planning and management processes.

FY 2015–2019

- Continue implementing the NOAA Aquaculture Policy and DOC Aquaculture Policy.
- Update and report on NOAA Science Center research on environmentally sound aquaculture practices (e.g., genetics and disease management; research on sustainable aquaculture feeds).
- Based on outcomes of the Joint Subcommittee on Aquaculture's (JSA) Regulatory Task Force, continue to develop internal and interagency strategies to streamline interagency permit reviews and better provide science to permit reviewers and industry.
- Monitor progress on research and technology transfer projects, cooperative research with non-federal partners and/or grants.
- Continue permitting of offshore finfish operations in the Gulf of Mexico.
- Add projects to national and state Shellfish Initiatives and report on progress.
- Continue research on the environmental impacts of shellfish aquaculture, and support restoration and commercial shellfish initiatives that provide locally produced food and jobs, help improve water quality, and restore coastal habitat.

Cooperative Research
FY 2015–2019

- Issue annual national notice for cooperative research Request for Proposals (RFP) competitive process.
- Conduct Spring and Fall ME-NH inshore trawl survey.
- Develop and implement more effective means of identifying and tracking the use of elective fishing gears in the Northeast so that the performance of these specific gears can be better understood and communicated to industry and managers.
- Develop ways to use recreational platforms in the Northeast to support the collection of more accurate abundance information and improved discard mortality estimates for stock assessments.
- Continue to collect socioeconomic data to investigate the impacts of Northeast sector management.
- Release annual Marine Resource Education Program (MREP) course curriculum for stakeholder participation.
- Conduct an annual competitive grant process through the Northeast Research Set-Aside (RSA) Programs focused on priorities established through the Mid-Atlantic Fishery Management Council Research Set-Aside committee, RSA species oversight committees, and the New England Fishery Management Council Research Steering committee.
- Issue Annual Federal Funding Opportunity based on annual research priorities via Grants.gov for Southeast CRP competitive grants.
- Conduct Fall Western Gulf of Alaska Cooperative Acoustic Survey.
- Conduct fishery-independent survey for bottomfish in waters around Oahu and Maui.
- Conduct acoustic-video survey of West Coast rockfish.

Climate Regimes and Ecosystem Productivity
FY 2015–2019

- Enhance the existing climate and ecosystem observing network and distribution of data to stakeholders.
- Maintain the NPCREP climate and ecosystem observing network and distribute data to decision-makers and stakeholders.
- Conduct long-term observations of climate-related impacts on Bering Sea ecosystem using variety of observation networks and platforms for use in integrated ecosystem assessments.
- Increase information on climate-related impacts on early life history stages of key Bering Sea fisheries.
- Stage and conduct expanded surveys for five commercial fish stocks and four protected species stocks.
- Deliver Bering Sea Ecosystem Forecasts to help living marine resource managers incorporate climate-related impacts into management decisions.

Information Analysis and Dissemination
FY 2015–2019

- Improve population dynamics/assessment/management model development and data analysis tools to support fisheries science programs, including fisheries statistics, stock assessment, socio-economics, and ecosystem management.
- Improve statistical data analyses for stock assessments.
- Develop environmental data products and information for ecosystem research and management to researchers, decision-makers, and the public.
- Incrementally improve and expand database development and integration and data

standards.
- Improve data dissemination and sharing of integrated (climatology, socio-economic, ecosystem, and fishery-dependent and fishery-independent) data and analyses, both internally and externally.
- Develop cost-effective uses of cutting-edge technologies to facilitate data analyses and dissemination.
- Improve data documentation and information sharing.
- Improve data standards and system interoperability.

Marine Resources Monitoring, Assessment, and Prediction (MARMAP)

FY 2015–2019

- Perform fishery-independent assessments of reef fish abundance and life history characteristics of economically and ecologically important reef fish species in shelf and upper slope waters from Cape Lookout to Cape Canaveral.

NMFS Facilities Maintenance

FY 2015 –2019

- Maintain facilities to operational standards.
- Make necessary repairs to ensure safety.

Regional Studies

Chesapeake Bay

FY 2015–2019

- Participate in the Chesapeake Bay Program activities to establish interagency research and assessment priorities consistent with NOAA's mission.
- Engage Maryland, Virginia, and the U.S. Army Corps of Engineers in restoration planning and actions in multiple tributaries in Maryland and Virginia.
- Conduct and/or synthesize side scan, multi-beam, and patent tong survey of proposed tributaries.
- Continue identification of reef restoration sites in targeted tributaries through multi-beam surveys.
- Monitor success of FY 2014 restoration efforts.
- Apply expertise, and resources for science, and on-the-ground conservation efforts in the Choptank River complex to maximize ecosystem benefits to marine resources and increase coastal resilience.
- Link habitat assessment and characterization efforts to Chesapeake Bay fisheries and living resources.
- Develop trophic- and ecosystem-based model runs.
- Develop the annual blue crab advisory report.
- Implement trainings and community engagement programming focused on NOAA priorities through the Environmental Science Training Center located in Oxford, Maryland.

FY 2015–2019

- Continue to survey additional tributaries for oyster restoration and evaluate the progress made during the previous year's effort.
- Develop annual blue crab advisory reports.
- Continue science communication and training activities.
- Continue CBIBS operations, maintenance, and programmatic development.

SEAMAP
FY 2015–2019

- Update SEAMAP management plan to expand coordination activities and improve standardization of collected data.
- Conduct summer and fall SEAMAP groundfish surveys in state and Federal waters; conduct spring and fall SEAMAP plankton surveys in state and Federal waters; conduct SEAMAP inshore and offshore longline surveys; and conduct spring and summer reef fish surveys in offshore waters.
- Provide fishery, habitat, biological, and environmental data to Regional Fishery Management Councils for incorporation into regional species stock assessments and for development of effective fisheries and habitat management strategies.
- Continue coordination with the National Data Centers for linkage of SEAMAP data to data collected via satellites, buoys, and other mechanisms to provide integrated information to support marine spatial planning and ecosystem-based management activities.

Deliverables:
Antarctic Research
FY 2015–2019

- Advice on ecosystem-based management of fisheries that impact krill, fin fishes, krill-dependent predators, and other components of the Antarctic ecosystem.
- Stock assessments for 26 targeted stocks of krill, fishes, and crabs managed by the CCAMLR completed or contributed to.
- Land-based research on, and assessments of, key krill predators breeding near two NOAA-operated field camps in the Antarctic Peninsula region.
- Annual update to NOAA's only long-term data set designed both to address fisheries management and conservation issues in the Southern Ocean and to understand the ecological impacts of climate change.
- Opportunities for other government agencies (both domestic and international) and academic partners to conduct research (e.g., on microbial dynamics) using AMLR's extensive data bases or through shipboard collaborations.

Aquaculture
FY 2015

- Report on an interagency strategy for establishing a coordinated permitting system for Federal waters.
- Best management practices to inform and improve Federal permitting processes for aquaculture.
- Analysis of the contribution and impacts (including job creation) of aquaculture on the economies of the communities and regions dependent on marine and coastal resources.

FY 2015–2019

- Reports on research and development to support environmentally sound aquaculture practices.
- Permits issued for aquaculture operations in the Gulf of Mexico.
- Report on progress of key research and technology transfer projects.

Climate Regimes and Ecosystem Productivity
FY 2015–2019

- Expand survey information for five commercial fish stocks and four protected species stocks.

- Enhance NPCREP climate and ecosystem observation network and improve distribution of high-quality data and products to living marine resource managers and stakeholders of the Bering Sea Ecosystem.
- Deliver Eastern Bering Sea Ecosystem Synthesis reports to the North Pacific Fisheries Management Council that includes assessment of current and future climate-related impacts on fisheries.
- Develop and update climate and ecosystem indices for presentation to the Scientific and Statistical Committee of the North Pacific Fishery Management Council.
- Monitor commercially important fish and shellfish in the Bering Sea.

Cooperative Research
FY 2015–2019

- Produce individual project final reports of the results and archive all associated data with the NOAA Fisheries Science Centers and added to the NMFS InPort Centralized documentation (metadata) repository.

Information Analysis and Dissemination
FY 2015–2019

- Support IOOS (Integrated Ocean Observing System); NOAA EDMC (Environmental Data Management Committee), NMFS EDM (Enterprise Data Management); NMFS FIS (Fisheries Information Systems); NMFS MRIP (Marine Recreational Information Program),GeoSpatial One Stop; data.gov requirements for data collection, processing, dissemination, archiving, and data sharing.
- Use advances in modern technology to improve information analysis, sharing, dissemination, and storage capabilities within NMFS, including headquarters, Science Centers, Regional Offices, state partners, and Fisheries Information Networks (FINs).
- Develop central and regionally integrated data repositories and tools to improve data accessibility through data management programs such as MRIP, FIS, FINSS, SIS, and NOAA PASS.
- Continue NMFS-wide data management program documentation through InPort.
- Continue to improve NMFS scientific information management infrastructure to support NMFS scientific enterprise.

Marine Resources Monitoring, Assessment, and Prediction (MARMAP)
FY2015–2019

Perform fishery-independent assessments of reef fish abundance and life history survey characteristics of economically and ecologically important reef fish species in shelf and upper slope waters from Cape Lookout to Cape Canaveral; provide resulting data for use in stock assessments and in support of other research and management needs.

NMFS Facilities Maintenance
FY 2015 – 2019

- Maintain the effectiveness and efficiency of staff at all locations.
- Maintain safety standards and reduce risks to employees.
- Maintain operational and functional efficiency.

Regional Studies

FY2015–2019

Chesapeake Bay

- Annually develop maps and habitat assessments in furtherance of oyster restoration.
- Collate sponsored research results and report out on the implications of the work.

SEAMAP

- Provide ecosystem data to support ecosystem modeling and management activities.
- Conduct all SEAMAP surveys in inshore and offshore waters and provide data to Regional Fishery Management Councils.
- Update SEAMAP management plan to improve coordination and standardization of SEAMAP surveys.

Performance Goals and Measurement Data:

Performance Measure: Number of Antarctic Fish Assessments *(Antarctic Research)*	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	26	26	26	26	26	26	26
Description: This measure tracks the 26 stocks of Antarctic krill, finfishes, and crabs in order to quantify the functional relationships between krill, finfishes, their environment and their predators. Total fish assessments will depend on the availability of capable vessels.							

Performance Measure: Number of Days at Sea for Antarctic Research	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	30	35	35	35	35	35	35
Description: This measure tracks the number of sea days for NOAA researchers to conduct comprehensive field surveys for 26 stocks of Antarctic krill, fishes, and crabs. The numbers refer to the total number of sea days in which AMLR scientists are in the field and able to collect data designed specifically to address the management issues of the Southern ocean.							

Performance Measure: Number of Research Projects Conducted Annually *(Cooperative Research)*	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	48	54	54	54	54	54	54
Description: This performance measure projects the number of cooperative research projects conducted annually.							

Performance Measure: Number of web-based tools or applications developed to support NMFS Science programs (*Information Analysis & Dissemination)*	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	19	19	19	19	19	19	19
Description: This performance measure projects the number of data analysis tools and websites produced to support NMFS science data management mission each year.							

Performance Measure: Scientific and Technical publications produced by the NMFS Scientific Publications Office *(Information Analysis & Dissemination)*	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	16	16	16	16	16	16	16
Description: This performance measure projects the number of scientific and technical publications produced by the NMFS Scientific Publications Office (SPO).							

Performance Measure: The number of SEAMAP surveys conducted annually *(SEAMAP)*	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	25	25	25	25	25	25	25
Description: This performance measure projects the number of surveys conducted annually within the Southeast Area Monitoring and Assessment Program (SEAMAP).							

Performance Measure: Conduct pre and post restoration monitoring in 20 tributaries out of 35 to 40 candidate tributaries by 2025 (cumulative)	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	2	4	6	8	10	12	14
Description: This performance measure projects the cumulative number of tributaries monitored before and after restoration has occurred.							

Performance Measure: Number of CBIBS buoys maintaining 90% (industry standard) 24 hr. data return *(Chesapeake Bay)*	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	10	10	10	10	10	10	10
Description: Operate and maintain a system of 10 oceanographic and atmospheric buoys in the Chesapeake Bay.							

PROGRAM CHANGES FOR FY 2015:

Climate Regimes & Ecosystem Productivity: Distributed Biological Observatory (Arctic) (Base Funding: $2,031,000 and 11 FTE; Program Change: +848,000 and 0 FTE): NOAA requests an increase of $848,000 and 0 FTE for a total of $2,879,000 and 11 FTE for NMFS Climate Regimes & Ecosystem Productivity to implement a distributed biological observatory (DBO) to detect climate and human- induced change on Arctic ecosystems.

Proposed Actions:
Implement a distributed biological observatory (DBO) to detect climate and human-induced change on Arctic ecosystems ($848,000). The dramatic seasonal retreats and thinning of sea ice, record-setting seawater temperatures and multiple observations of biological changes in the Pacific Arctic require monitoring the ecosystem's response to climate forcing. The DBO is a change detection array for the identification and consistent monitoring of biophysical responses along a latitudinal gradient extending from the northern Bering Sea to the Barrow Canyon. DBO sampling is focused on transects centered on locations of high productivity, biodiversity, and rates of biological change. A DBO, accomplished via partnership with other Federal agencies, academia, and international partners, will improve our understanding of how climate and human-induced change are affecting subsistence cultures and the environment. Agencies can then determine and mitigate the effects of their decisions on marine resources, resulting in improved conservation and management of Arctic coastal and ocean resources. This effort leverages existing interagency investments under the auspices of the recently approved Interagency Arctic Research Policy Committee's five year science plan. These funds help meet DBO obligations in the 2014 President's Implementation Plan for the Arctic Region. Requested funding supports data sampling and analysis, data visualization portal, and archiving.

Statement of Need and Economic Benefits:
Commercial fishing in Alaska, a $6.7 billion industry, accounts for nearly half the total fish and shellfish catch for the entire United States[7]. In the U.S. Arctic, fishing is currently concentrated in the Bering Sea. The North Pacific Fisheries Management Council has closed the Arctic Management Area in U.S. waters in the Beaufort and Chukchi Seas. Fishing north of the Bering Sea would not be authorized until after NOAA has the scientific data needed to manage the fisheries in order to ensure sustainable harvests. If increasing temperatures and changing ocean conditions shift distribution of some fish species into the Beaufort and Chukchi Seas, this would likely result in greater interest by U.S. commercial fishermen in moving operations north for economic reasons. However, NOAA science to understand the shifts and impacts of climate change and human activity on trust resources is needed before this can happen.

Resource Assessment:
NOAA has provided approximately $500,000, with additional leveraged funding from BOEM, to test a pilot DBO's value to science and research in the Chukchi and Beaufort Seas. The pilot DBO study has provided baseline information supportive of process-oriented research in a region of rapid climate change. OAR obtains atmospheric, oceanic, and sea ice observations, conducts research on Arctic climate change, process-level understanding and modeling, and

[7] "The Economic Value of the Alaska Seafood Industry," is:http://www.mcdowellgroup.net/pdf/publications/2013_07_ASMI_Economic_Value_of_the_Alaska_Seafood_Industry.pdf. Value inflated for 2014 dollar values.

into Arctic ecosystem status and trends, and NMFS Alaska Fisheries Science Center researches and delivers scientific analysis necessary for the conservation, management, and utilization of the region's living marine resources.

Schedule and Milestones:

Milestones	FY 2015	FY 2016	FY 2017	FY 2018
Sample DBO stations in 5 regions for sustained ecosystem observations in Chukchi and Beaufort Seas	X	X	X	X
DBO Data QA/QC, Visualization, Archive and Integration with International programs	X	X	X	X

Deliverables:

- A five-station Distributed Biological Observatory, with periodically updated evaluations of variability and change in the context of increased industry activity.
- Deliver annual NOAA Arctic Report Card with updates that summarize DBO information for broad distribution.

Performance Goals and Measurement Data:

Performance Measure: Number of DBO regions sampled, and results reported annually for integration into scientific models/meetings/symposia and to support the work of interagency and NOAA studies	FY 2013 Actual	FY 2014 Target	FY 2015 Target	FY 2016 Target	FY 2017 Target	FY 2018 Target	FY 2019 Target
With Increase	N/A	N/A	5	5	5	5	5
Without Increase	0	0	0	0	0	0	0

Description:
Sampling of the Distributed Biological Observatory (DBO) since its pilot inception in FY 2010 has been limited to two of five regions. Current annual sampling effort is constrained by funding and the capability to collaborate effectively with international partners. Proposed new effort will include sampling in all five DBO regions, consistent collaboration with international partners and annual report outs via NOAA's Arctic Report Card, scientific meeting and public symposia.

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PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Program: National Marine Fisheries Service
Sub-program: Other Activities Supporting Fisheries
Program Change: Responding to Societal Imperatives of a Changing Arctic

	Object Class	FY 2015 Increase	FY 2015 Total Program
11	Personnel compensation		
11.1	Full-time permanent	$0	$1,151
11.3	Other than full-time permanent	0	94
11.5	Other personnel compensation	0	0
11.7	Special personnel services payments	0	0
11.9	Total personnel compensation	0	1,245
12	Civilian personnel benefits	0	300
13	Benefits for former personnel	0	0
21	Travel and transportation of persons	0	43
22	Transportation of things	0	15
23.1	Rental payments to GSA	0	34
23.2	Rental Payments to others	0	0
23.3	Communications, utilities and miscellaneous charges	448	468
24	Printing and reproduction	0	12
25.1	Advisory and assistance services	0	120
25.2	Other services	0	0
25.3	Purchases of goods & services from Gov't accounts	0	116
25.4	Operation and maintenance of facilities	0	0
25.5	Research and development contracts	0	0
25.6	Medical care	0	0
25.7	Operation and maintenance of equipment	0	0
25.8	Subsistence and support of persons	0	0
26	Supplies and materials	0	14
31	Equipment	0	43
32	Lands and structures	0	0
33	Investments and loans	0	0
41	Grants, subsidies and contributions	400	469
42	Insurance claims and indemnities	0	0
43	Interest and dividends	0	0
44	Refunds	0	0
99	Total obligations	848	2,879

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APPROPRIATION ACCOUNT: PACIFIC COASTAL SALMON RECOVERY FUND

Land-use, harvest, and hatchery practices, as well as changing ocean conditions, have increased the vulnerability of Pacific salmonid populations, contributing to their decline and the listing of many populations as threatened or endangered under the Endangered Species Act (ESA). Over the course of their life cycle, salmonids require suitable habitat in mainstem rivers, tributaries, coastal estuaries, wetlands, and the Pacific Ocean. A number of environmental challenges affect the survival of salmonids, including variability in ocean conditions, destruction of nearshore and freshwater habitats, and other natural- and human-caused ecosystem changes.

The Pacific Coastal Salmon Recovery Fund (PCSRF) was established by Congress in FY 2000 to protect, restore, and conserve Pacific salmonids and their habitats. The Congressionally authorized activities that were funded under the PCSRF program included: (1) conserving salmon and steelhead populations that are listed as threatened or endangered, or identified by a state as at-risk to be so listed; (2) maintaining populations necessary for exercise of tribal treaty fishing rights or native subsistence fishing; and (3) conserving Pacific coastal salmon and steelhead habitat. NMFS provides competitive funding to states and tribes of the Pacific Coast region to implement projects that restore and protect salmonid populations and their habitats. Eligible applicants include the States of Washington, Oregon, California, Idaho, Nevada and Alaska and federally recognized tribes of the Columbia River and Pacific Coast (including Alaska). States are required to provide 33 percent matching funds, and PCSRF awards are supplemented further by significant private and local contributions at the project level. No match is required from the federally recognized tribes.

Key accomplishments for PCSRF-funded activities from 2000-2013 include:

- More than 1,030,000 acres of habitat restored, protected, and made accessible.
- Over 8,000 miles of stream opened.

Habitat restoration activities funded by PCSRF are an important component of overall salmonid recovery efforts in the Pacific Coast region. Restoration projects have increased the quality and quantity of spawning and rearing habitat from stream headwaters to coastal estuaries. Upstream restoration activities have controlled erosion, enhanced in-stream flow and streambed conditions, and provided the habitat necessary for successful spawning and egg survival. Estuary and wetland restoration projects closer to the coast have protected and improved feeding and rearing habitat used by juvenile fish as they transition from freshwater to the open ocean. PCSRF restoration projects have also removed over 2,800 barriers to fish passage along small creeks and streams, restoring access to high-quality habitat. Additionally, PCSRF habitat projects provided a number of benefits to the human community, including enhanced water quality, recreation opportunities, flood control, and coastline protection. PCSRF restoration projects also provide significant benefits to local communities in terms of increased jobs and economic activity. Recent analyses suggest that up to 17 new "green" jobs[8] and $1.86 million[9] in additional economic activity result for each $1 million investment of PCSRF and state-matching funds. Additionally, approximately

[8] Edwards, P.E.T., A.E. Sutton-Grier and C.E. Coyle. 2012 Investing in nature: Restoring coastal habitat blue infrastructure and green job creation. Marine Policy (2012), http://dx.doi.org/10.1016/j.marpol.2012.05.020

[9] Nielsen-Pincus, M., , and C. Moseley. 2009. A Preliminary Estimate of Economic Impact and Job Creation from the Oregon Watershed Enhancement Board's Restoration Investments. Ecosystem Workforce Program, Briefing Paper #13. Institute for a Sustainable Environment, University of Oregon. 2pp. [http://ewp.uoregon.edu/sites/ewp.uoregon.edu/files/downloads/bp13.pdf]

80 percent of habitat restoration investments are spent locally in the county in which the project is located, and over 90 percent is spent within the state[10], supporting local jobs and local economies often in rural and economically distressed communities. Since 2000, the PCSRF has funded more than 11,100 projects along the Pacific Coast that contribute to preventing extinction and improving the status of ESA-listed species and their habitats, as well as supporting and protecting healthy populations. Projects range from single-site culvert replacement to hundreds of acres of habitat acquisition and restoration. As projects are completed, state and tribal grantees are required to collect and report project specific data to inform the PCSRF performance metrics. The PCSRF program ensures that funded projects are implementing the priority actions that address the identified factors limiting salmon and steelhead recovery, as specified in NOAA's ESA recovery plans.

Schedule and Milestones:

FY 2015–2019:

- Issue a Federal Funding Opportunity through Grants.gov soliciting proposals for Pacific salmon recovery from states and tribes from the Pacific Coast region.
- Review Pacific salmon recovery proposals per the NOAA program priorities and evaluation criteria detailed in the Federal Funding Opportunity.
- Competitively award Pacific salmon recovery grants to states and tribes from the Pacific region to implement habitat restoration and recovery projects focused on improving the status of salmonid population and their habitats.
- Annually review, evaluate, and assess the effectiveness of funded projects and programs to improve species recovery.
- Track progress, measure performance, and ensure accountability in the use of PCSRF funds.

Deliverables:

FY 2015–2019:

- Enhanced availability of salmonid habitat.
- Improved quality of salmon habitat.
- Implementation of projects targeting the factors limiting the recovery of ESA-listed salmonids.
- Continued tracking of the collective effectiveness of PCSRF and other recovery programs through the monitoring of population status and trends and the intensive monitoring of the ecological conditions in sentinel watersheds.

[10] Hibbard, M. and S. Lurie. 2006. Some community socio-economic benefits of watershed councils: A case study from Oregon. Journal of Environmental Planning and Management 49:891-908

Performance Goals and Measurement Data:

Performance Measure:	FY 2013 Actual	FY 2014 Target	FY 2015 Target	FY 2016 Target	FY 2017 Target	FY 2018 Target	FY 2019 Target
Number of Habitat Acres Restored (Annually) (Measure 17f)	46,857*	40,820	30,660	45,000	45,000	46,000	46,000
Habitat Acres	8,763	10,250	4,000	4,000	4,000	4,000	4,000
ARRA Acres**	242	1,570	660	0	0	0	0
PCSRF acres***	37,913	29,000	26,000	41,000	41,000	42,000	42,000

Description:

NOAA restores habitat areas lost or degraded as a result of development and other human activities, as well as specific pollution incidents and sources. Activities are geared toward NOAA trust resources found across the marine environment, including the Great Lakes region, and are supportive of anadromous fish species. The intent of this measure is to summarize or project the geographic area over which ecosystem function has been or will be improved as the direct result of habitat restoration efforts. This measure does not include restoration conducted through Natural Resource Damage Assessments or the Species Recovery Grants.

**Number of acres shown for FY 2013 actuals reflect total acres reported. Total acres reported takes into account joint acres i.e., acres restored that have been supported and reported by both Habitat and PCSRF for the same project but not necessarily the same activity. For example, Habitat may fund the engineering phase of a project and PCSRF may fund the construction phase. Consequently, the total reported is less than the sum of Habitat, ARRA, and PCSRF acres to account for double counting. In FY 2013 there were 61 joint acres reported.*

***American Recovery and Reinvestment Act (ARRA)*

****PCSRF FY 2014 and FY 2015 targets represent the expected acres restored from funded projects with an anticipated completion date within the respective fiscal years. FY 2016 through FY 2019 targets are based on formula projections of acres restored based on program appropriations and past program performance.*

Performance Measure:	FY 2013 Actual	FY 2014 Target	FY 2015 Target	FY 2016 Target	FY 2017 Target	FY 2018 Target	FY 2019 Target
Stream miles made accessible	1,363*	815	536	540	540	550	550
Habitat stream miles	752	105	100	100	100	100	100
ARRA stream miles**	81	3	50	0	0	0	0
PCSRF stream miles***	536	700	380	440	440	450	450

Description: This performance measure counts stream miles made accessible as a result of Habitat Program activities. Stream miles made accessible in this context will include barrier removal and fish passage projects that support recovery of listed species.

**Number of stream miles shown for FY 2013 actuals reflect total stream miles reported. Total stream miles reported takes into account joint stream mile i.e., stream miles made accessible through projects funded by both Habitat and PCSRF for the same project but not necessarily the same activity. For example, Habitat may fund the removal of a passage-blocking culvert at a road crossing, and PCSRF may fund the construction of a bridge to replace the removed culvert. Consequently, the total reported is less than the sum of Habitat, ARRA, and PCSRF stream miles to account for double counting. In FY 2013 there were 6.5 joint stream miles reported.*

***American Recovery and Reinvestment Act (ARRA)*

**** PCSRF FY 2014 and FY 2015 targets represent the expected stream miles made accessible from funded projects with an anticipated completion date within the respective fiscal years. FY 2016 through FY 2019 targets are based on formula projections of stream miles based on program appropriations and past program performance.*

PROGRAM CHANGES FOR FY 2015:

Pacific Coastal Salmon Recovery Fund (PCSRF): PCSRF (Base Funding: $65,000,000 and 2 FTE; Program Change: -$15,000,000 and 0 FTE): NOAA requests a decrease of $15,000,000 and 0 FTE for a total of $50,000,000 and 2 FTE for the Pacific Coastal Salmon Recovery Fund (PCSRF).

Proposed Actions:
In order to balance protected species recovery efforts for a broader range of threatened and endangered species under NOAA's jurisdiction and to take a more strategic approach to species recovery and management nationwide, NOAA proposes to decrease funding for the Pacific Coastal Salmon Recovery Fund (PCSRF).

The FY 2015 request of $50,000,000 for PCSRF will maintain a significant level of investment in habitat protection and restoration in support of recovering Pacific salmonid (i.e., salmon and steelhead) populations listed under the Endangered Species Act (ESA), as well as sustaining listed and non-listed salmonid populations to uphold our tribal treaty obligations. The PCSRF remains an essential tool for achieving these goals. Given the over $1 billion Federal investment made over the past decade toward Pacific salmonid recovery and the significant community support for these efforts, the program can continue to make critical progress toward recovery with this request. PCSRF-funded efforts will be coordinated with other NOAA programs such as Mitchell Act, Pacific Salmon Treaty, NOAA Restoration Center's CBRP, and Species Recovery Grants. These NOAA programs will continue to be administered in close coordination to realize efficiencies; identify strategic opportunities; ensure complementary implementation in the furtherance of the respective goals of the programs; and, to achieve significant conservation benefits on a national scale.

PCSRF activities along the Pacific coast are part of our Federal commitment to salmon and steelhead recovery and treaty Indian fishing rights, and represent a conservation effort that enables tens of billions of dollars of economic activity in these western states. Seventeen Evolutionary Significant Units of Pacific salmon and 11 Distinct Population Segments of Steelhead are listed under the Endangered Species Act. PCSRF funds are used to protect and recover habitat, assist in the planning and design of restoration projects, support research and monitoring efforts, encourage outreach and education with local communities and land owners, implement hatchery reform efforts, implement management strategies that allow for tribal harvest while being protective of at-risk populations, and maintain salmon populations necessary for the exercise of Native American treaty rights and to meet federal tribal trust obligations.

Resource Assessment:
NMFS currently funds projects along the Pacific Coast that contribute to preventing extinction and improving the status of ESA-listed species and their habitats, as well as supporting and protecting healthy populations. Projects range from single-site culvert replacement to hundreds of acres of habitat acquisition and restoration. Additional information on the resources for this activity can be found in the Pacific Coastal Salmon Recovery Fund narrative.

Schedule and Milestones:
FY 2015 – 2019

- Issue *a Federal Funding Opportunity* through Grants.gov soliciting proposals for Pacific salmonid recovery from states (i.e., CA, OR, WA, ID, NV, AK) and tribes from the Pacific Coast region
- Review Pacific salmonid recovery proposals per the NOAA program priorities and evaluation criteria detailed in the *Federal Funding Opportunity*
- Competitively award Pacific salmonid recovery grants to states and tribes from the Pacific Coast region to implement habitat restoration and recovery projects focused on improving the status of salmonid population and their habitats
- Annually review, evaluate, and assess the effectiveness of funded projects and programs to improve species recovery
- Track progress, measure performance, and ensure accountability in the use of PCSRF funds

Deliverables:
FY 2015 – 2019

- Enhanced availability of salmonid habitat
- Improved quality of salmonid habitat
- Implementation of projects targeting the factors limiting the recovery of ESA-listed salmonids
- Continued tracking the collective effectiveness of PCSRF and other recovery programs through the monitoring of population status and trends and the intensive monitoring of the ecological conditions in sentinel watersheds

Performance Goals and Measurement Data:

Performance Measure: Number of Habitat Acres Restored (Annually) (Measure 17f) (PCSRF only*)	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With Decrease	N/A	N/A	26,000	41,000	38,000	35,000	32,000
Without Decrease	37,913	29,000	26,000	41,000	41,000	42,000	42,000

Description: NOAA restores habitat areas lost or degraded as a result of development and other human activities, as well as specific pollution incidents and sources. Activities are geared toward NOAA trust resources found across the marine environment, including the Great Lakes region, and supportive of anadromous fish species. The intent of this measure is to summarize or project the geographic area over which ecosystem function has been or will be improved as the direct result of habitat restoration efforts. These measures have at least a two-year lag time from the year of appropriation of funds to when projects are accomplished.

***PCSRF FY 2014 and FY 2015 targets represent the expected acres restored from funded projects with an anticipated completion date within the respective fiscal years. FY 2016-FY 2019 targets are based on formula projections of acres restored based on program appropriations and past program performance. These FY 2016-FY 2019 out year targets represent accomplishments with funding from prior years. The PCSRF awards 5-year grants, and in developing the out year targets NMFS assumes 2 years of project "ramp-up" (e.g., project selection, design, permitting, and implementation), with the performance accomplishments being achieved and reported in years 3–5. Out year target-setting is based on average acres restored in previous years, without regard to trends in cost per acre. NMFS is now seeing a trend toward higher per-acre costs resulting in smaller and more expensive projects, which impacts future targets*

Performance Measure: Number of Stream Miles Made Accessible (Annually) (PCSRF Only*)	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With Decrease	N/A	N/A	380	440	410	380	350
Without Decrease	536	700	380	440	440	450	450

Description: NOAA restores access to habitat areas for anadromous fish species that have been blocked by human activities (e.g., road development, culverts, irrigation diversions, dams. The intent of this measure is to summarize or project the stream miles of habitat that have been made accessible through funded passage improvement projects. These measures have at least a two-year lag time from the year of appropriation of funds to when projects are accomplished.

***** *PCSRF FY 2014 and FY 2015 targets represent the expected stream miles made accessible from funded projects with an anticipated completion date within the respective FYs. FY 2016-FY 2019 targets are based on formula projections of stream miles made accessible based on program appropriations and past program performance. These FY 2016-FY 2019 out year targets represent accomplishments with funding from prior years. The PCSRF awards 5-year grants, and in developing the out year targets NMFS assumes 2 years of project "ramp-up" (e.g., project selection, design, permitting, and implementation), with the performance accomplishments being achieved and reported in years 3–5. Out year target-setting is based on average stream miles made accessible in previous years, without regard to trends in this performance measure. NMFS is now seeing a trend toward higher per-project costs resulting in smaller and more expensive projects, which impacts future targets.*

PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Budget Program: National Marine Fisheries Service
Sub-program: Pacific Coastal Salmon Recovery Fund
Program Change: PCSRF

	Object Class	FY 2015 Decrease	FY 2015 Total Program
11	Personnel compensation		
11.1	Full-time permanent	$0	$204
11.3	Other than full-time permanent	0	0
11.5	Other personnel compensation	0	0
11.7	Special personnel services payments	0	0
11.9	Total personnel compensation	0	204
12	Civilian personnel benefits	0	63
13	Benefits for former personnel	0	0
21	Travel and transportation of persons	0	1
22	Transportation of things	0	0
23.1	Rental payments to GSA	0	0
23.2	Rental Payments to others	0	0
23.3	Communications, utilities and miscellaneous charges	0	0
24	Printing and reproduction	0	0
25.1	Advisory and assistance services	0	0
25.2	Other services	0	0
25.3	Purchases of goods & services from Gov't accounts	0	328
25.4	Operation and maintenance of facilities	0	0
25.5	Research and development contracts	0	0
25.6	Medical care	0	0
25.7	Operation and maintenance of equipment	0	0
25.8	Subsistence and support of persons	0	0
26	Supplies and materials	0	0
31	Equipment	0	0
32	Lands and structures	0	0
33	Investments and loans	0	0
41	Grants, subsidies and contributions	(15,000)	49,404
42	Insurance claims and indemnities	0	0
43	Interest and dividends	0	0
44	Refunds	0	0
99	Total obligations	(15,000)	50,000

Exhibit 5

Department of Commerce
National Oceanic and Atmospheric Administration
Pacific Coastal Salmon Recovery
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	Positions	FTE	Budget Authority	Direct Obligations
FY 2014 Enacted	2	2	65,000	65,026
less: Prior year obligations	0	0	0	(26)
less: Terminations	0	0	0	0
FY 2015 Base	2	2	65,000	65,000
plus: 2015 Program Changes	0	0	(15,000)	(15,000)
FY 2015 Estimate	2	2	50,000	50,000

		FY 2013 Actuals		FY 2014 Enacted		FY 2015 Base Program		FY 2015 Estimate		Increase/ Decrease	
		Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount
Pacific Coastal Salmon Recovery Account	Pos/BA	2	60,322	2	65,000	2	65,000	2	50,000	0	(15,000)
	FTE/OBL	2	60,297	2	65,026	2	65,000	2	50,000	0	(15,000)
Total: Pacific Coastal Salmon Recovery Account	Pos/BA	2	60,322	2	65,000	2	65,000	2	50,000	0	(15,000)
	FTE/OBL	2	60,297	2	65,026	2	65,000	2	50,000	0	(15,000)

Exhibit 5

Department of Commerce
National Oceanic and Atmospheric Administration
Pacific Coastal Salmon Recovery
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	FY 2013 Actuals		FY 2014 Enacted		FY 2015 Base Program		FY 2015 Estimate		Increase/ Decrease	
	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount
Direct Discretionary Obligation	2	60,297	2	65,026	2	65,000	2	50,000	0	(15,000)
Total Obligations	**2**	**60,297**	**2**	**65,026**	**2**	**65,000**	**2**	**50,000**	**0**	**(15,000)**
Adjustments to Obligations:										
Unobligated balance, expiring	0	0	0	0	0	0	0	0	0	0
Recoveries	0	(1)	0	0	0	0	0	0	0	0
Unobligated balance, adj. SOY	0	(2)	0	(26)	0	0	0	0	0	0
Unobligated balance, adj. EOY	0	29	0	0	0	0	0	0	0	0
Total Budget Authority	**2**	**60,322**	**2**	**65,000**	**2**	**65,000**	**2**	**50,000**	**0**	**(15,000)**
Financing from Transfers and Other:										
Permanently Reduced	0	0	0	0	0	0	0	0	0	0
Transfer to ORF	0	60	0	0	0	0	0	0	0	0
Net Appropriation	**2**	**60,382**	**2**	**65,000**	**2**	**65,000**	**2**	**50,000**	**0**	**(15,000)**

Exhibit 16

Department of Commerce
National Oceanic and Atmospheric Administration
Pacific Coastal Salmon Recovery
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
(Dollar amounts in thousands)

	Object Class	FY 2013 Actuals	FY 2014 Enacted	FY 2015 Base	FY 2015 Estimate	Increase/ (Decrease) over 2015 Base
11	Personnel compensation					
11.1	Full-time permanent	190	255	255	255	0
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	0	0	0	0	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	190	255	255	255	0
12.1	Civilian personnel benefits	58	80	80	80	0
13	Benefits for former personnel	0	0	0	0	0
21	Travel and transportation of persons	1	0	0	0	0
22	Transportation of things	0	0	0	0	0
23.1	Rental payments to GSA	0	0	0	0	0
23.2	Rental payments to others	0	0	0	0	0
23.3	Commun., util., misc. charges	0	0	0	0	0
24	Printing and reproduction	0	0	0	0	0
25.2	Other services	304	120	120	120	0
26	Supplies and materials	0	0	0	0	0
31	Equipment	0	0	0	0	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	59,744	64,571	64,545	49,545	(15,000)
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	**Total Obligations**	60,297	65,026	65,000	50,000	(15,000)
	Less prior year recoveries	(1)	0	0	0	0

Exhibit 16

Department of Commerce
National Oceanic and Atmospheric Administration
Pacific Coastal Salmon Recovery
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
(Dollar amounts in thousands)

Less unobligated balance, SOY	(2)	(26)	0	0	0
Plus unobligated balance, EOY	29	0	0	0	0
Unobligated Balance, expiring	0	0	0	0	0
Total Budget Authority	60,322	65,000	65,000	50,000	(15,000)

APPROPRIATION ACCOUNT: FISHERMEN'S CONTINGENCY FUND

For FY 2015, NMFS requests a total of $350,000 for the Fishermen's Contingency Fund.

JUSTIFICATION FOR FY 2015:

The Fishermen's Contingency Fund is authorized under Section 402 of Title IV of the Outer Continental Shelf Lands Act Amendments of 1978. NOAA compensates U.S. commercial fishermen for damage or loss of fishing gear, vessels, and resulting economic loss caused by obstructions related to oil and gas exploration, development, and production in any area of the Outer Continental Shelf. The funds used to provide this compensation are derived from fees collected on an annual basis by the Secretary of the Interior from the holders of leases, exploration permits, easements, or rights-of-way in areas of the Outer Continental Shelf.

This activity is funded totally through user fees. Disbursements can be made only to the extent authorized in appropriation acts.

PROPOSED LEGISLATION:

For carrying out the provisions of Title IV of Public Law 95-372, not to exceed $350,000, to be derived from receipts collected pursuant to that Act, to remain available until expended.

PROGRAM CHANGE FOR FY 2015:

No program change is requested for this account.

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Exhibit 5

Department of Commerce
National Oceanic and Atmospheric Administration
Fishermen's Contingency Fund
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	Positions	FTE	Budget Authority	Direct Obligations
FY 2014 Enacted	0	0	350	629
plus: Obligations from prior year balances	0	0	0	(279)
plus: Other Adjustments-to-Base	0	0	0	0
FY 2015 Base	0	0	350	350
plus: 2015 Program Changes	0	0	0	0
FY 2015 Estimate	0	0	350	350

		FY 2013 Actuals Personnel Amount		FY 2014 Enacted Personnel Amount		FY 2015 Base Program Personnel Amount		FY 2015 Estimate Personnel Amount		Increase/ Decrease Personnel Amount	
Fishermen's Contingency Fund	Pos/BA	0	325	0	350	0	350	0	350	0	0
	FTE/OBL	0	61	0	629	0	350	0	350	0	0
Total: Fishermen's Contingency Fund	Pos/BA	0	325	0	350	0	350	0	350	0	0
	FTE/OBL	0	61	0	629	0	350	0	350	0	0

Exhibit 5

Department of Commerce
National Oceanic and Atmospheric Administration
Fishermen's Contingency Fund
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	FY 2013 Actuals		FY 2014 Enacted		FY 2015 Base Program		FY 2015 Estimate		Increase/ Decrease	
	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount
Direct Discretionary Obligation	0	61	0	629	0	350	0	350	0	0
Total Obligations	**0**	**61**	**0**	**629**	**0**	**350**	**0**	**350**	**0**	**0**
Adjustments to Obligations:										
Unobligated balance, adj. SOY	0	(14)	0	(279)	0	0	0	0	0	0
Unobligated balance, EOY	0	279	0	0	0	0	0	0	0	0
Total Budget Authority	**0**	**325**	**0**	**350**	**0**	**350**	**0**	**350**	**0**	**0**
Financing from Transfers and Other:										
Temporarily Reduced	0	0	0	0	0	0	0	0	0	0
Discretionary Appropriation	0	0	0	0	0	0	0	0	0	0
Net Appropriation	**0**	**325**	**0**	**350**	**0**	**350**	**0**	**350**	**0**	**0**

Exhibit 16

Department of Commerce
National Oceanic and Atmospheric Administration
Fishermen's Contingency Fund
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
(Dollar amounts in thousands)

	Object Class	FY 2013 Actuals	FY 2014 Enacted	FY 2015 Base	FY 2015 Estimate	Increase/ (Decrease) over 2015 Base
11	Personnel compensation					
11.1	Full-time permanent	0	0	0	0	0
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	0	0	0	0	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	0	0	0	0	0
12.1	Civilian personnel benefits	0	0	0	0	0
13	Benefits for former personnel	0	0	0	0	0
21	Travel and transportation of persons	0	0	0	0	0
22	Transportation of things	0	0	0	0	0
23.1	Rental payments to GSA	0	0	0	0	0
23.2	Rental payments to others	0	0	0	0	0
23.3	Commun., util., misc. charges	0	0	0	0	0
24	Printing and reproduction	0	0	0	0	0
25.2	Other services	0	0	0	0	0
26	Supplies and materials	0	0	0	0	0
31	Equipment	0	0	0	0	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	0	0	0	0	0
42	Insurance claims and indemnities	61	629	350	350	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	**Total Obligations**	61	629	350	350	0
	Less prior year recoveries	0	0	0	0	0

Exhibit 16

Department of Commerce
National Oceanic and Atmospheric Administration
Fishermen's Contingency Fund
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
(Dollar amounts in thousands)

Less unobligated balance, SOY	(14)	(279)	0	0	0
Plus unobligated balance, EOY	279	0	0	0	0
Unobligated balance, rescission	0	0	0	0	0
Total Budget Authority	325	350	350	350	0

APPROPRIATION ACCOUNT: FOREIGN FISHING OBSERVER FUND

For FY 2015, NMFS requests a total of $0 for the Foreign Fishing Observer Fund.

JUSTIFICATION FOR FY 2015:
The Foreign Fishing Observer Fund is financed through fees collected from owners and operators of foreign fishing vessels fishing within the U.S. EEZ (such fishing requires a permit issued under the Magnuson-Stevens Act). This includes longline vessels fishing in the Atlantic billfish and shark fishery and other foreign vessels fishing in the EEZ. The fund is used by NOAA to pay salaries, administrative costs, data editing and entry costs, and other costs incurred in placing observers aboard foreign fishing vessels. The observer program is conducted primarily through contracts with the private sector. NOAA/NMFS places these observers aboard foreign fishing vessels to monitor compliance with U.S. fishery laws and to collect fishery management data. Amounts available in the fund can be disbursed only to the extent and in amounts provided in appropriation acts. In FY 1985 Congress approved the establishment of a supplemental observer program. The program provided that foreign vessels without federally funded observers are required to obtain the services of private contractors certified by the Secretary of Commerce.

PROGRAM CHANGE FOR FY 2015:
No program change is requested for this account.

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Exhibit 5

Department of Commerce
National Oceanic and Atmospheric Administration
Foreign Fishing Observer Fund
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	Positions	FTE	Budget Authority	Direct Obligations
FY 2014 Enacted	0	0	0	0
less: Obligations from prior year balances	0	0	0	0
Plus: 2014 Adjustments to Base			0	
FY 2015 Base	0	0	0	0
plus: 2015 Program Changes	0	0	0	0
FY 2015 Estimate	0	0	0	0

Comparison by activity/subactivity		FY 2013 Actuals Personnel Amount		FY 2014 Enacted Personnel Amount		FY 2015 Base Program Personnel Amount		FY 2015 Estimate Personnel Amount		Increase/ Decrease Personnel Amount	
Foreign Fishing Observer Fund	Pos/BA	0	(350)	0	0	0	0	0	0	0	0
	FTE/OBL	0	0	0	0	0	0	0	0	0	0
Total: Foreign Fishing Observer Fund	Pos/BA	0	(350)	0	0	0	0	0	0	0	0
	FTE/OBL	0	0	0	0	0	0	0	0	0	0

Exhibit 5

Department of Commerce
National Oceanic and Atmospheric Administration
Foreign Fishing Observer Fund
SUMMARY OF Financing
(Dollar amounts in thousands)

	FY 2013 Actuals		FY 2014 Enacted		FY 2015 Base Program		FY 2015 Estimate		Increase/ Decrease	
	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount
Direct Discretionary Obligation	0	0	0	0	0	0	0	0	0	0
Total Obligations	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Adjustments to Obligations:										
Unobligated balance, adj. SOY	0	(522)	0	(172)	0	(172)	0	(172)	0	0
Unobligated balance, EOY	0	172	0	172	0	172	0	172	0	0
Total Budget Authority	**0**	**(350)**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Financing from Transfers and Other:										
Unobligated balance, rescission	0	0	0	0	0	0	0	0	0	0
Net Appropriation	**0**	**(350)**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Exhibit 16

Department of Commerce
National Oceanic and Atmospheric Administration
Foreign Fishing Observer Fund
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
(Dollar amounts in thousands)

	Object Class	FY 2013 Actuals	FY 2014 Enacted	FY 2015 Base	FY 2015 Estimate	Increase/ (Decrease) over 2015 Base
11	Personnel compensation					
11.1	Full-time permanent	0	0	0	0	0
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	0	0	0	0	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	0	0	0	0	0
12.1	Civilian personnel benefits	0	0	0	0	0
13	Benefits for former personnel	0	0	0	0	0
21	Travel and transportation of persons	0	0	0	0	0
22	Transportation of things	0	0	0	0	0
23.1	Rental payments to GSA	0	0	0	0	0
23.2	Rental payments to others	0	0	0	0	0
23.3	Commun., util., misc. charges	0	0	0	0	0
24	Printing and reproduction	0	0	0	0	0
25.2	Other services	0	0	0	0	0
26	Supplies and materials	0	0	0	0	0
31	Equipment	0	0	0	0	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	0	0	0	0	0
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	**Total Obligations**	0	0	0	0	0
	Less prior year recoveries	0	0	0	0	0
	Less unobligated balance, SOY	(522)	(172)	(172)	(172)	0

Exhibit 16

Department of Commerce
National Oceanic and Atmospheric Administration
Foreign Fishing Observer Fund
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
(Dollar amounts in thousands)

Plus unobligated balance, EOY	172	172	172	172	0
Unobligated balance, rescission	0	0	0	0	0
Total Budget Authority	(350)	0	0	0	0

APPROPRIATION ACCOUNT: FISHERIES FINANCE PROGRAM ACCOUNT

For FY 2015, NMFS requests a total of $0 for the Fisheries Finance Program Account.

JUSTIFICATION FOR FY 2015:

The Fisheries Finance Program (FFP) is a national loan program that makes long-term fixed-rate financing available to U.S. citizens who otherwise qualify for financing or refinancing of the construction, reconstruction, reconditioning, and, in some cases, the purchasing of fishing vessels, shoreside processing, aquaculture, mariculture facilities, and the purchase of individual fishing quota (IFQ). The purpose of these loans is to provide stability to at least one aspect of an otherwise volatile industry. The FFP also provides fishery-wide financing to ease the transition to sustainable fisheries through its fishing capacity reduction programs and provides financial assistance in the form of loans to fishermen who fish from small vessels and entry-level fishermen to promote stability and reduce consolidation in already rationalized fisheries. Additionally, FFP can provide loans for fisheries investments of Native American Community Development Quota (CDQ) groups.

The FFP operates under the authority of Title XI of the Merchant Marine Act of 1936, as amended (46 USC 53701); Section 303(a) of the Sustainable Fisheries Act amendments to the Magnuson-Stevens Act; and, from time to time FFP-specific legislation. FFP lending practices are guided by Title XI, general rules implementing Title XI (found at 50 CFR part 253, subpart B), NOAA's sustainable fisheries policy, and the practical considerations of a program that has continually not required an appropriation of loan loss subsidy under the Federal Credit Reform Act, as discussed below. The overriding guideline for all FFP financings is that they cannot contribute or be construed to contribute to an increase in existing fishing capacity.

All FFP authority is subject to the Federal Credit Reform Act of 1990 (FCRA) (2 U.S.C. 661) which requires the estimated loan losses (FCRA cost) be appropriated in cash at the time Congress authorizes annual credit ceilings. Some types of FFP loans require no FCRA subsidy appropriations because these types of loans have historically not required additional loan subsidy. However, specific loan ceilings for each type of loan authority must be included in appropriation language or other bill language regardless of the need for cash appropriations.

PROPOSED LEGISLATION:

Subject to section 502 of the Congressional Budget Act of 1974, during fiscal year 2015, obligations of direct loans may not exceed $24,000,000 for Individual Fishing Quota loans and not to exceed $100,000,000 for traditional direct loans as authorized by the Merchant Marine Act of 1936.

PROGRAM CHANGE FOR FY 2015:

No program change is requested for this account.

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Exhibit 5

Department of Commerce
National Oceanic and Atmospheric Administration
Fisheries Finance Program Account
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	Positions	FTE	Budget Authority	Direct Obligations
FY 2014 Enacted	0	0	14,629	14,629
less: 2015 Adjustments to Base	0	0	(14,629)	(14,629)
less: Negative Subsidy Receipts Adjustment	0	0	0	0
FY 2015 Base	0	0	0	0
plus: 2015 Program Changes	0	0	0	0
FY 2015 Estimate	0	0	0	0

Comparison by activity/subactivity		FY 2013 Actuals Personnel	Amount	FY 2014 Enacted Personnel	Amount	FY 2015 Base Program Personnel	Amount	FY 2015 Estimate Personnel	Amount	Increase/ Decrease Personnel	Amount
Fisheries Finance Program Account	Pos/BA	0	14,196	0	14,629	0	0	0	0	0	0
	FTE/OBL	0	14,196	0	14,629	0	0	0	0	0	0
Total: Fisheries Finance Program Account	Pos/BA	0	14,196	0	14,629	0	0	0	0	0	0
	FTE/OBL	0	14,196	0	14,629	0	0	0	0	0	0

Exhibit 5

Department of Commerce
National Oceanic and Atmospheric Administration
Fisheries Finance Program Account
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	FY 2013 Actuals		FY 2014 Enacted		FY 2015 Base Program		FY 2015 Estimate		Increase/ Decrease	
	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount
Cost Loan Subsidy	0	0	0	0	0	0	0	0	0	0
Credit Reestimates	0	14,196	0	14,629	0	0	0	0	0	0
Total Obligations	**0**	**14,196**	**0**	**14,629**	**0**	**0**	**0**	**0**	**0**	**0**
Adjustments to Obligations:										
Unobligated balance, adj. SOY	0	(2,779)	0	(2,779)	0	(2,779)	0	(2,779)	0	0
Unobligated balance, EOY	0	2,779	0	2,779	0	2,779	0	2,779	0	0
Total Budget Authority	0	14,196	0	14,629	0	0	0	0	0	0
Financing from Transfers and Other:										
Less: Permanent Indefinite Authority (Mandatory)	0	0	0	0	0	0	0	0	0	0
Net Appropriation	**0**	**14,196**	**0**	**14,629**	**0**	**0**	**0**	**0**	**0**	**0**

Exhibit 16

Department of Commerce
National Oceanic and Atmospheric Administration
Fisheries Finance Program Account
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
(Dollar amounts in thousands)

	Object Class	FY 2013 Actuals	FY 2014 Enacted	FY 2015 Base	FY 2015 Estimate	Increase/ (Decrease) over 2015 Base
11	Personnel compensation					
11.1	Full-time permanent	0	0	0	0	0
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	0	0	0	0	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	0	0	0	0	0
12.1	Civilian personnel benefits	0	0	0	0	0
13	Benefits for former personnel	0	0	0	0	0
21	Travel and transportation of persons	0	0	0	0	0
22	Transportation of things	0	0	0	0	0
23.1	Rental payments to GSA	0	0	0	0	0
23.2	Rental payments to others	0	0	0	0	0
23.3	Commun., util., misc. charges	0	0	0	0	0
24	Printing and reproduction	0	0	0	0	0
25.2	Other services	0	0	0	0	0
26	Supplies and materials	0	0	0	0	0
31	Equipment	0	0	0	0	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	14,196	14,629	0	0	0
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	**Total Obligations**	14,196	14,629	0	0	0
	Less prior year recoveries	0	0	0	0	0

Exhibit 16

Department of Commerce
National Oceanic and Atmospheric Administration
Fisheries Finance Program Account
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
(Dollar amounts in thousands)

Less unobligated balance, SOY	(2,779)	(2,779)	(2,779)	(2,779)	0
Plus unobligated balance, EOY	2,779	2,779	2,779	2,779	0
Unobligated balance, rescission	0	0	0	0	0
Total Budget Authority	14,196	14,629	0	0	0

APPROPRIATION ACCOUNT: PROMOTE AND DEVELOP FISHERIES PRODUCTS

For FY 2015, NMFS requests a total of $8,208,000 for the Saltonstall-Kennedy Grant Program. NMFS estimates that a total of $131,372,000 will be transferred from the Department of Agriculture to the Promote and Develop Account and that $123,164,000 will be transferred from the Promote and Develop account to the Operations, Research and Facilities (ORF) account.

JUSTIFICATION FOR FY 2015:
The American Fisheries Promotion Act (AFPA) of 1980 amended the Saltonstall-Kennedy (S-K) Act to authorize a grants program for fisheries research and development projects to be carried out with S-K funds. S-K funds are derived from a transfer from the Department of Agriculture to NOAA from duties on imported fisheries products. An amount equal to 30 percent of these duties is made available to NOAA and, subject to appropriation, is available to carry out the purposes of the AFPA. The S-K grants program has provided substantial assistance to address impediments to the management, development, and utilization of the Nation's living marine resources. Each year a *Federal Register* notice is published announcing the program. The annual notice outlines priority areas, such as research on the reduction and/or elimination of bycatch, and aquaculture. The remainder of the Promote and Develop funds transferred is used to offset the appropriation requirements of the ORF account. At the President's Budget request, a transfer to ORF of $123,164,000 will be allocated to the following activities at the specified level:

Expand Annual Stock Assessments (all)	$ 72,245,000
Fish Information Networks (partial)	$ 11,933,000
Survey and Monitoring Projects (all)	$ 24,404,000
Interjurisdictional Fisheries Grants (all)	$ 2,502,000
Cooperative Research (all)	$ 12,080,000
Total	$123,164,000

PROGRAM CHANGE FOR FY 2015:
No program change is requested for this account.

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Exhibit 5

Department of Commerce
National Oceanic and Atmospheric Administration
Promote and Develop Fisheries Products
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	Positions	FTE	Budget Authority	Direct Obligations
FY 2014 Enacted	0	0	5,774	17,029
less: Obligations from prior year balances	0	0	0	(11,255)
plus: 2015 Adjustments to Base	0	0	2,434	2,434
FY 2015 Base	0	0	8,208	8,208
plus: 2015 Program Changes	0	0	0	0
FY 2015 Estimate	0	0	8,208	8,208

Comparison by activity/subactivity		FY 2013 Actuals Personnel	Amount	FY 2014 Enacted Personnel	Amount	FY 2015 Base Program Personnel	Amount	FY 2015 Estimate Personnel	Amount	Increase/ Decrease Personnel	Amount
Promote and Develop Fisheries Products	Pos/BA	0	11,505	0	5,774	0	8,208	0	8,208	0	0
	FTE/OBL	0	902	0	17,029	0	8,208	0	8,208	0	0
Total: Promote and Develop Fisheries Products	Pos/BA	0	11,505	0	5,774	0	8,208	0	8,208	0	0
	FTE/OBL	0	902	0	17,029	0	8,208	0	8,208	0	0

Exhibit 5

Department of Commerce
National Oceanic and Atmospheric Administration
Promote and Develop Fisheries Products
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	FY 2013 Actuals		FY 2014 Enacted		FY 2015 Base Program		FY 2015 Estimate		Increase/ Decrease	
	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount
Direct Discretionary Obligation	0	902	0	17,029	0	8,208	0	8,208	0	0
Total Obligations	**0**	**902**	**0**	**17,029**	**0**	**8,208**	**0**	**8,208**	**0**	**0**
Adjustments to Obligations:										
Unobligated balance, adj. SOY	0	(419)	0	(11,255)	0	0	0	0	0	0
Recoveries	0	(221)	0	0	0	0	0	0	0	0
Transfer of unobligated balances	0	(34)	0	0	0	0	0	0	0	0
Unobligated balance, adj. EOY	0	11,277	0	0	0	0	0	0	0	0
Total Budget Authority	**0**	**11,505**	**0**	**5,774**	**0**	**8,208**	**0**	**8,208**	**0**	**0**
Financing from Transfers and Other:										
Transfer from USDA	0	(131,372)	0	(130,144)	0	(131,372)	0	(131,372)	0	0
Permanently Reduced	0	803	0	0	0	0	0	0	0	0
Temporarily Reduced	0	0	0	9,370	0	0	0	0	0	0
Transfer to ORF	0	119,064	0	115,000	0	123,164	0	123,164	0	0
Net Appropriation	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Exhibit 16

Department of Commerce
National Oceanic and Atmospheric Administration
Promote and Develop Fisheries Products
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
(Dollar amounts in thousands)

	Object Class	FY 2013 Actuals	FY 2014 Enacted	FY 2015 Base	FY 2015 Estimate	Increase/ (Decrease) over 2015 Base
11	Personnel compensation					
11.1	Full-time permanent	0	0	0	0	0
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	0	0	0	0	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	0	0	0	0	0
12.1	Civilian personnel benefits	0	0	0	0	0
13	Benefits for former personnel	0	0	0	0	0
21	Travel and transportation of persons	0	0	0	0	0
22	Transportation of things	0	0	0	0	0
23.1	Rental payments to GSA	0	0	0	0	0
23.2	Rental payments to others	0	0	0	0	0
23.3	Commun., util., misc. charges	0	0	0	0	0
24	Printing and reproduction	0	0	0	0	0
25.2	Other services	302	0	0	0	0
26	Supplies and materials	0	0	0	0	0
31	Equipment	0	0	0	0	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	600	17,029	8,208	8,208	0
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	**Total Obligations**	902	17,029	8,208	8,208	0
	Less prior year recoveries	(221)	0	0	0	0

Exhibit 16

Department of Commerce
National Oceanic and Atmospheric Administration
Promote and Develop Fisheries Products
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
(Dollar amounts in thousands)

Less unobligated balance, SOY	(419)	(11,255)	0	0	0
Plus unobligated balance, EOY	11,277	0	0	0	0
Permanently Reduced	803				
Unobligated balance, rescission	0	0	0	0	0
Total Budget Authority	11,505	5,774	8,208	8,208	0

APPROPRIATION ACCOUNT: FEDERAL SHIP FINANCING FUND

For FY 2015, NMFS estimates a total of $0 for the Federal Ship Financing Fund Account.

JUSTIFICATION FOR FY 2015:
The Federal Ship Financing Fund is the liquidating account necessary for the collection of premiums and fees of the loan guarantee portfolio that existed prior to FY 1992. Administrative expenses for management of the loan guarantee portfolio were charged to the Federal Ship Financing Fund prior to the enactment of the Federal Credit Reform Act of 1990. Currently administrative expenses are charged to the Operations, Research, and Facilities (ORF) account.

PROGRAM CHANGE FOR FY 2015:
No program change is requested for this account.

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Exhibit 5

Department of Commerce
National Oceanic and Atmospheric Administration
Federal Ship Financing Fund
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	Positions	FTE	Budget Authority	Direct Obligations
FY 2014 Enacted	0	0	0	0
FY 2015 Base	0	0	0	0
plus: 2015 Program Changes	0	0	0	0
FY 2015 Estimate	0	0	0	0

Comparison by activity/subactivity		FY 2013 Actuals Personnel Amount		FY 2014 Enacted Personnel Amount		FY 2015 Base Program Personnel Amount		FY 2015 Estimate Personnel Amount		Increase/ Decrease Personnel Amount	
Federal Ship Financing Fund	Pos/BA	0	(152)	0	0	0	0	0	0	0	0
	FTE/OBL	0	0	0	0	0	0	0	0	0	0
Total: Federal Ship Financing Fund	Pos/BA	0	(152)	0	0	0	0	0	0	0	0
	FTE/OBL	0	0	0	0	0	0	0	0	0	0

Exhibit 5

Department of Commerce
National Oceanic and Atmospheric Administration
Federal Ship Financing Fund
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	FY 2013 Actuals		FY 2014 Enacted		FY 2015 Base Program		FY 2015 Estimate		Increase/ Decrease	
	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount
Transfer to Treasury (Mandatory)	0	152	0	0	0	0	0	0	0	0
Offsetting collections, mandatory	0	(152)	0	0	0	0	0	0	0	0
Total Obligations	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Adjustments to Obligations:										
Offsetting Collections	0	(152)	0	0	0	0	0	0	0	0
Unobligated balance, adj. SOY	0	0	0	0	0	0	0	0	0	0
Unobligated balance, adj. EOY	0	0	0	0	0	0	0	0	0	0
Total Budget Authority	**0**	**(152)**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Exhibit 16

Department of Commerce
National Oceanic and Atmospheric Administration
Federal Ship Financing Fund
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
(Dollar amounts in thousands)

	Object Class	FY 2013 Actuals	FY 2014 Enacted	FY 2015 Base	FY 2015 Estimate	Increase/ (Decrease) over 2015 Base
11	Personnel compensation					
11.1	Full-time permanent	0	0	0	0	0
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	0	0	0	0	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	0	0	0	0	0
12.1	Civilian personnel benefits	0	0	0	0	0
13	Benefits for former personnel	0	0	0	0	0
21	Travel and transportation of persons	0	0	0	0	0
22	Transportation of things	0	0	0	0	0
23.1	Rental payments to GSA	0	0	0	0	0
23.2	Rental payments to others	0	0	0	0	0
23.3	Commun., util., misc. charges	0	0	0	0	0
24	Printing and reproduction	0	0	0	0	0
25.2	Other services	0	0	0	0	0
26	Supplies and materials	0	0	0	0	0
31	Equipment	0	0	0	0	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	0	0	0	0	0
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	**Total Obligations**	0	0	0	0	0
	Less prior year recoveries	0	0	0	0	0

Exhibit 16

Department of Commerce
National Oceanic and Atmospheric Administration
Federal Ship Financing Fund
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
(Dollar amounts in thousands)

Less unobligated balance, SOY	0	0	0	0	0
Plus unobligated balance, EOY	0	0	0	0	0
Offsetting Collections	(152)	0	0	0	0
Total Budget Authority	(152)	0	0	0	0

APPROPRIATION ACCOUNT: ENVIRONMENTAL IMPROVEMENT & RESTORATION FUND

For FY 2015, NMFS estimates obligating $292,000 in the Environmental Improvement and Restoration Fund.

JUSTIFICATION FOR FY 2015:
The Environmental Improvement & Restoration Fund (EIRF) was created by the Department of Interior and Related Agencies Appropriations Act of 1998 for the purpose of carrying out marine research activities in the North Pacific. These funds will provide grants to Federal, State, private or foreign organizations or individuals to conduct research activities on or relating to the fisheries or marine ecosystems in the North Pacific Ocean, Bering Sea, and Arctic Ocean.

PROGRAM CHANGE FOR FY 2015:
No program change is requested for this account.

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Exhibit 5

Department of Commerce
National Oceanic and Atmospheric Administration
Environmental Improvement Restoration Fund
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	Positions	FTE	Budget Authority	Direct Obligations
FY 2014 Enacted			9,087	9,102
less: obligations from prior year balances	0	0	0	(15)
plus: 2015 Adjustments to Base	0	0	(8,795)	(8,795)
FY 2015 Base	0	0	292	292
plus: 2015 Program Changes	0	0	0	0
FY 2015 Estimate	0	0	292	292

Comparison by activity/subactivity		FY 2013 Actuals Personnel	Amount	FY 2014 Enacted Personnel	Amount	FY 2015 Base Program Personnel	Amount	FY 2015 Estimate Personnel	Amount	Increase/ Decrease Personnel	Amount
Environmental Improvement & Restoration Fund	Pos/BA	0	0	0	9,087	0	292	0	292	0	0
	FTE/OBL	0	9,737	0	9,102	0	292	0	292	0	0
Total: Environmental Improvement & Restoration Fund	Pos/BA	0	0	0	9,087	0	292	0	292	0	0
	FTE/OBL	0	9,737	0	9,102	0	292	0	1292	0	0

Exhibit 5

Department of Commerce
National Oceanic and Atmospheric Administration
Environmental Improvement Restoration Fund
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	FY 2013 Actuals		FY 2014 Enacted		FY 2015 Base Program		FY 2015 Estimate		Increase/ Decrease	
	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount
Direct Mandatory Obligation	0	9,737	0	9,102	0	292	0	292	0	0
Total Obligations	**0**	**19,432**	**0**	**9,102**	**0**	**292**	**0**	**292**	**0**	**0**
Adjustments to Obligations:										
Unobligated balance, adj. SOY	0	(9,752)	0	(15)	0	0	0	0	0	0
Unobligated balance, EOY	0	15	0	0	0	0	0	0	0	0
Total Budget Authority	**0**	**0**	**0**	**9,087**	**0**	**292**	**0**	**292**	**0**	**0**
Financing from Transfers and Other:										
Appropriation (special fund)	0	0	0	0	0	0	0	0	0	0
Temporarily Reduced	0	0	0	705	0	0	0	0	0	0
Net Mandatory Appropriation	**0**	**0**	**0**	**9,792**	**0**	**292**	**0**	**292**	**0**	**0**

Exhibit 16

Department of Commerce
National Oceanic and Atmospheric Administration
Environmental Improvement Restoration Fund
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
(Dollar amounts in thousands)

	Object Class	FY 2013 Actuals	FY 2014 Enacted	FY 2015 Base	FY 2015 Estimate	Increase/ (Decrease) over 2015 Base
11	Personnel compensation					
11.1	Full-time permanent	0	0	0	0	0
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	0	0	0	0	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	0	0	0	0	0
12.1	Civilian personnel benefits	0	0	0	0	0
13	Benefits for former personnel	0	0	0	0	0
21	Travel and transportation of persons	0	0	0	0	0
22	Transportation of things	0	0	0	0	0
23.1	Rental payments to GSA	0	0	0	0	0
23.2	Rental payments to others	0	0	0	0	0
23.3	Commun., util., misc. charges	0	0	0	0	0
24	Printing and reproduction	0	0	0	0	0
25.2	Other services	0	0	0	0	0
26	Supplies and materials	0	0	0	0	0
31	Equipment	0	0	0	0	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	9,737	9,102	292	292	0
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	**Total Obligations**	9,737	9,102	292	292	0
	Less prior year recoveries	0	0	0	0	0

Exhibit 16

Department of Commerce
National Oceanic and Atmospheric Administration
Environmental Improvement Restoration Fund
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
(Dollar amounts in thousands)

Less unobligated balance, SOY	(9,752)	(15)	0	0	0
Plus unobligated balance, EOY	15	0	0	0	0
Unobligated balance, rescission	0	0	0	0	0
Total Budget Authority	0	9,087	292	292	0

APPROPRIATION ACCOUNT: LIMITED ACCESS SYSTEM ADMINISTRATION

For FY 2015, NMFS estimates obligating $11,855,000 in the Limited Access System Administration account.

JUSTIFICATION FOR FY 2015:
Under the authority of the Magnuson-Stevens Act Section 304(d)(2)(A), NMFS must collect a fee to recover the incremental costs of management, data collection, and enforcement of Limited Privilege (LAP) programs. Funds collected under this authority are deposited into the "Limited Access System Administrative Fund" (LASAF). Fees shall not exceed three percent of the ex-vessel value of fish harvested under any such program, and shall be collected at either the time of the landing, filing of a landing report, or sale of such fish during a fishing season or in the last quarter of the calendar year in which the fish is harvested. The LASAF shall be available, without appropriation or fiscal year limitation, only for the purposes of administrating the central registry system; and administering and implementing the Magnuson-Stevens Act in the fishery in which the fees were collected. Sums in the fund that are not currently needed for these purposes shall be kept on deposit or invested in obligations of, or guaranteed by the U.S. Also, in establishing a LAP program, a Regional Council can consider, and may provide, if appropriate, an auction system or other program to collect royalties for the initial or any subsequent distribution of allocations. If an auction system is developed, revenues from these royalties are deposited in the Limited Access System Administration Fund.

PROGRAM CHANGE FOR FY 2015:
No program change is requested for this account.

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Exhibit 5

Department of Commerce
National Oceanic and Atmospheric Administration
Limited Access System Administration Fund
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	Positions	FTE	Budget Authority	Direct Obligations
FY 2014 Enacted	38	38	8,998	14,630
Adjustments to Base			1,860	1,860
less: Obligations from Prior Year Balances	0	0	0	(4,635)
FY 2015 Base	38	38	10,858	11,558
plus: 2015 Program Changes	0	0	0	0
FY 2015 Estimate	38	38	10,858	11,855

Comparison by activity/subactivity		FY 2013 Actuals Personnel	Amount	FY 2014 Enacted Personnel	Amount	FY 2015 Base Program Personnel	Amount	FY 2015 Estimate Personnel	Amount	Increase/ Decrease Personnel	Amount
Limited Access System Administration Fund	Pos/BA	38	5,929	38	8,998	38	10,858	38	10,858	0	0
	FTE/OBL	38	8,520	38	14,630	38	11,855	38	11,855	0	0
Total: Limited Access System Administration Fund	Pos/BA	38	5,929	38	8,998	38	9,164	38	10,858	0	0
	FTE/OBL	38	8,520	38	14,630	38	11,855	38	11,844	0	0

Exhibit 5

Department of Commerce
National Oceanic and Atmospheric Administration
Limited Access System Administration Fund
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	FY 2013 Actuals		FY 2014 Enacted		FY 2015 Base Program		FY 2015 Estimate		Increase/ Decrease	
	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount
Direct Discretionary Obligation	38	8,520	38	14,630	38	11,855	38	11,855	0	0
Total Obligations	**38**	**8,520**	**38**	**14,630**	**38**	**11,855**	**38**	**11,855**	**0**	**0**
Adjustments to Obligations:										
Recoveries	0	(81)	0	0	0	0	0	0	0	0
Unobligated balance, adj. SOY	0	(13,865)	0	(11,355)	0	(5,723)	0	(5,723)	0	0
Unobligated balance, EOY	0	11,355	0	5,723	0	4,726	0	4,726	0	0
Total Budget Authority	**38**	**5,929**	**38**	**8,998**	**38**	**10,858**	**38**	**10,858**	**0**	**0**
Financing from Transfers and Other:										
Temporarily Reduced	0	744	0	720	0	0	0	0	0	0
Net Appropriation	**38**	**6,673**	**38**	**9,718**	**38**	**10,858**	**38**	**10,858**	**0**	**0**

Exhibit 16

Department of Commerce
National Oceanic and Atmospheric Administration
Limited Access System Administration Fund
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	Object Class	FY 2013 Actuals	FY 2014 Enacted	FY 2015 Base	FY 2015 Estimate	Increase/ (Decrease) over 2015 Base
11	Personnel compensation					
11.1	Full-time permanent	3,157	3,157	3,157	3,157	0
11.3	Other than full-time permanent	16	16	16	16	0
11.5	Other personnel compensation	414	414	414	414	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	3,587	3,587	3,587	3,587	0
12.1	Civilian personnel benefits	1,370	1,370	1,370	1,370	0
13	Benefits for former personnel	0	0	0	0	0
21	Travel and transportation of persons	106	222	222	222	0
22	Transportation of things	0	4	4	4	0
23.1	Rental payments to GSA	409	418	418	418	0
23.2	Rental payments to others	42	43	43	43	0
23.3	Commun., util., misc. charges	53	54	54	54	0
24	Printing and reproduction	3	5	5	5	0
25.2	Other services	801	6,796	4,021	4,021	0
26	Supplies and materials	60	43	43	43	0
31	Equipment	88	87	87	87	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	2,001	2,001	2,001	2,001	0
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	**Total Obligations**	8,520	14,630	11,855	11,855	0
	Less prior year recoveries	(81)	0	0	0	0

Exhibit 16

Department of Commerce
National Oceanic and Atmospheric Administration
Limited Access System Administration Fund
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

Less unobligated balance, SOY	(13,865)	(11,355)	(5,723)	(5,723)	0
Plus unobligated balance, EOY	11,355	5,723	4,726	4,726	0
Unobligated balance, rescission	0	0	0	0	0
Total Budget Authority	5,929	8,998	10,858	10,858	0

APPROPRIATION ACCOUNT: MARINE MAMMAL UNUSUAL MORTALITY EVENT FUND

For FY 2015, NMFS estimates obligating $50,000 to $100,000 from the Marine Mammal Unusual Mortality Event Fund.

JUSTIFICATION FOR FY 2015:
An unusual mortality event (UME) is defined under the Marine Mammal Protection Act (MMPA) as "a stranding that is unexpected; involves a significant die-off of any marine mammal population; and demands immediate response." In recent years, increased efforts to examine carcasses and live stranded animals have improved the knowledge of mortality rates and causes, allowing a better understanding of population threats and stressors and the ability to determine when a situation is "unusual." Understanding and investigating marine mammal UMEs is important because they can serve as indicators of ocean health, giving insight into larger environmental issues, which may also have implications for human health.

The Marine Mammal Protection Act Section 405 (16 USC 1421d) establishes the Marine Mammal Unusual Mortality Event Fund and describes its purposes and how donations can be made to the Fund. The fund: "shall be available only for use by the Secretary of Commerce, in consultation with the Secretary of the Interior:

- to compensate persons for special costs incurred in acting in accordance with the contingency plan issued under section 1421c(b) of this title or under the direction of an Onsite Coordinator for an unusual mortality event;
- for reimbursing any stranding network participant for costs incurred in preparing and transporting tissues collected with respect to an unusual mortality event for the Tissue Bank; and,
- for care and maintenance of marine mammal seized under section 1374(c)(2)(D) of this title."

According to the MMPA, deposits can be made into Fund in the following ways:

- "amounts appropriated to the Fund;
- other amounts appropriated to the Secretary for use with respect to unusual mortality events; and,
- amounts received by the United States in the form of gifts, devises, and bequests under subsection (d) of this section."

The Marine Mammal Unusual Mortality Event Fund is an emergency response fund used to help cover expenses incurred by the volunteer Marine Mammal Stranding Network during a UME. Since UMEs are unpredictable emergency events caused by any number of circumstances (natural or human-caused), it is impossible to predict how many UMEs may occur in a given year or how much funding will be needed. From 1991–2014 (past 23 years) NOAA declared 60 UMEs, which averages to 2.6 UMEs per year. The highest number of UMEs declared in a year was 5 (in both 2006 and 2007). The costs associated with UMEs are highly variable and depend on the species involved, location, and equipment/laboratory needs. For example, a UME involving large whales offshore can cost well over $100K in expenses because of the considerable logistical challenges and needs (e.g., ship time or aerial support, number of personnel, safety equipment, etc.). Based on previous experience, NOAA expects to obligate between $50K and $100K in FY 2015 depending on the severity of the emergencies that year and the balance of funds remaining.

To date, Congress has appropriated funding for UMEs on one occasion in 2005. As of January 2014, there was approximately $214,000 left in the UME account; of that total, $106,900 is readily available to support future events. The remaining balance is invested in a U.S. Treasury investment account.

PROGRAM CHANGE FOR FY 2015:
No program change is requested for this account.

Exhibit 5

Department of Commerce
National Oceanic and Atmospheric Administration
Marine Mammal Unusual Mortality Event Fund
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	Positions	FTE	Budget Authority	Direct Obligations
FY 2014 Enacted	0	0	0	61
Adjustments to Base	0	0	0	(11)
FY 2015 Base	0	0	0	50
plus: 2015 Program Changes	0	0	0	0
FY 2015 Estimate	0	0	0	50

Comparison by activity/subactivity		FY 2013 Actuals Personnel Amount		FY 2014 Enacted Personnel Amount		FY 2015 Base Program Personnel Amount		FY 2015 Estimate Personnel Amount		Increase/ Decrease Personnel Amount	
Marine Mammal Unusual Mortality Event Fund	Pos/BA	0	0	0	0	0	0	0	0	0	0
	FTE/OBL	0	5	0	61	0	50	0	50	0	0
Total: Marine Mammal Unusual Mortality Event Fund	Pos/BA	0	0	0	0	0	0	0	0	0	0
	FTE/OBL	0	5	0	61	0	50	0	50	0	0

Exhibit 5

Department of Commerce
National Oceanic and Atmospheric Administration
Marine Mammal Unusual Mortality Event Fund
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	FY 2013 Actuals		FY 2014 Enacted		FY 2015 Base Program		FY 2015 Estimate		Increase/ Decrease	
	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount
Direct Discretionary Obligation	0	5	0	61	0	50	0	50	0	0
Total Obligations	**0**	**5**	**0**	**61**	**0**	**50**	**0**	**50**	**0**	**0**
Adjustments to Obligations:										
Recoveries	0	(4)	0	0	0	0	0	0	0	0
Unobligated balance, adj. SOY	0	(112)	0	(11)	0	(50)	0	(50)	0	0
Unobligated balance, EOY	0	111	0	50	0	0	0	0	0	0
Total Budget Authority	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Financing from Transfers and Other:										
Net Appropriation	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Exhibit 16

Department of Commerce
National Oceanic and Atmospheric Administration
Marine Mammal Unusual Mortality Event Fund
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
(Dollar amounts in thousands)

	Object Class	FY 2013 Actuals	FY 2014 Enacted	FY 2015 Base	FY 2015 Estimate	Increase/ (Decrease) over 2015 Base
11	Personnel compensation					
11.1	Full-time permanent	0	0	0	0	0
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	0	0	0	0	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	0	0	0	0	0
12.1	Civilian personnel benefits	0	0	0	0	0
13	Benefits for former personnel	0	0	0	0	0
21	Travel and transportation of persons	0	0	0	0	0
22	Transportation of things	0	0	0	0	0
23.1	Rental payments to GSA	0	0	0	0	0
23.2	Rental payments to others	0	0	0	0	0
23.3	Commun., util., misc. charges	0	0	0	0	0
24	Printing and reproduction	0	0	0	0	0
25.2	Other services	0	61	50	50	0
26	Supplies and materials	5	0	0	0	0
31	Equipment	0	0	0	0	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	0	0	0	0	0
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	**Total Obligations**	5	61	50	50	0
	Less prior year recoveries	(4)	0	0	0	0

Exhibit 16

Department of Commerce
National Oceanic and Atmospheric Administration
Marine Mammal Unusual Mortality Event Fund
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
(Dollar amounts in thousands)

Less unobligated balance, SOY	(112)	(11)	(50)	(50)	0
Plus unobligated balance, EOY	111	50	0	0	0
Unobligated balance, rescission	0	0	0	0	0
Total Budget Authority	0	0	0	0	0

APPROPRIATION ACCOUNT: WESTERN PACIFIC SUSTAINABLE FISHERIES FUND

For FY 2015, NMFS estimates obligating $1,021,000 in the Western Pacific Sustainable Fisheries Fund.

JUSTIFICATION FOR FY 2015:

Section 204(e) of the 2006 amendments to the Magnuson-Stevens Fishery Conservation and Management Act authorizes the establishment of the Western Pacific Sustainable Fisheries Fund. The purpose of this Fund is to allow foreign fishing within the U.S. Exclusive Economic Zone (EEZ) in the Western Pacific though a Pacific Insular Area Fishery Agreement. Before entering into such an Agreement, the Western Pacific Fishery Management Council must develop a Marine Conservation Plan that provides details on uses for any funds collected by the Secretary of Commerce. Marine Conservation Plans must also be developed by the Governors of the Territories of Guam and American Samoa and of the Commonwealth of the Northern Mariana Islands and approved by the Secretary or designee.

The Western Pacific Sustainable Fisheries Fund serves as a repository for any permit payments received by the Secretary for foreign fishing within the U.S. EEZ around Johnston Atoll, Kingman Reef, Palmyra Atoll, and Jarvis, Howland, Baker and Wake Islands, sometimes known as the Pacific remote island areas (PRIA). Also, in the case of violations by foreign vessels occurring in these areas, amounts received by the Secretary attributable to fines and penalties shall be deposited into the Western Pacific Sustainable Fisheries Fund. Additionally, any funds or contributions received in support of conservation and management objectives under a Marine Conservation Plan for any Pacific Insular Area other than American Samoa, Guam, or the Northern Mariana Islands shall be deposited in the Western Pacific Sustainable Fisheries Fund.

PROGRAM CHANGE FOR FY 2015:

No program change is requested for this account.

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Exhibit 5

Department of Commerce
National Oceanic and Atmospheric Administration
Western Pacific Sustainability Fisheries Fund
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	Positions	FTE	Budget Authority	Direct Obligations
FY 2014 Enacted	0	0	160	1,160
Adjustments to Base	0	0	90	(139)
FY 2015 Base	0	0	250	1,021
plus: 2015 Program Changes	0	0	0	0
FY 2015 Estimate	0	0	250	1,021

Comparison by activity/subactivity		FY 2013 Actuals Personnel Amount		FY 2014 Enacted Personnel Amount		FY 2015 Base Program Personnel Amount		FY 2015 Estimate Personnel Amount		Increase/ Decrease Personnel Amount	
Western Pacific Sustainability Fisheries Fund	Pos/BA	0	625	0	160	0	250	0	250	0	0
	FTE/OBL	0	0	0	1,160	0	1,021	0	1,021	0	0
Total: Western Pacific Sustainability Fisheries Fund	Pos/BA	0	625	0	160	0	250	0	250	0	0
	FTE/OBL	0	0	0	1,160	0	1,021	0	1,021	0	0

Exhibit 5

Department of Commerce
National Oceanic and Atmospheric Administration
Western Pacific Sustainability Fisheries Fund
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	FY 2013 Actuals		FY 2014 Enacted		FY 2015 Base Program		FY 2015 Estimate		Increase/ Decrease	
	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount
Direct Discretionary Obligation	0	0	0	1,160	0	1,021	0	1,021000	0	0
Total Obligations	**0**	**0**	**0**	**1,160**	**0**	**1,021**	**0**	**1,021**	**0**	**0**
Adjustments to Obligations:										
Unobligated balance, adj. SOY	0	(1,146)	0	(1,771)	0	(771)	0	(771)	0	0
Unobligated balance, EOY	0	1,771	0	771	0	0	0	0	0	0
Total Budget Authority	**0**	**625**	**0**	**160**	**0**	**250**	**0**	**250**	**0**	**0**
Financing from Transfers and Other:										
Temporarily Reduced	0	510		90	0	0	0	0	0	0
Net Appropriation	**0**	**1,135**	**0**	**250**	**0**	**250**	**0**	**250**	**0**	**0**

Exhibit 16

Department of Commerce
National Oceanic and Atmospheric Administration
Western Pacific Sustainability Fisheries Fund
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
(Dollar amounts in thousands)

	Object Class	FY 2013 Actuals	FY 2014 Enacted	FY 2015 Base	FY 2015 Estimate	Increase/ (Decrease) over 2015 Base
11	Personnel compensation					
11.1	Full-time permanent	0	0	0	0	0
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	0	0	0	0	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	0	0	0	0	0
12.1	Civilian personnel benefits	0	0	0	0	0
13	Benefits for former personnel	0	0	0	0	0
21	Travel and transportation of persons	0	0	0	0	0
22	Transportation of things	0	0	0	0	0
23.1	Rental payments to GSA	0	0	0	0	0
23.2	Rental payments to others	0	0	0	0	0
23.3	Commun., util., misc. charges	0	0	0	0	0
24	Printing and reproduction	0	0	0	0	0
25.2	Other services	0	0	0	0	0
26	Supplies and materials	0	0	0	0	0
31	Equipment	0	0	0	0	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	0	1,160	1,021	1,021	0
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	**Total Obligations**	0	1,160	1,021	1,021	0
	Less prior year recoveries	0	0	0	0	0

Exhibit 16

Department of Commerce
National Oceanic and Atmospheric Administration
Western Pacific Sustainability Fisheries Fund
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
(Dollar amounts in thousands)

Less unobligated balance, SOY	(1,146)	(1,771)	(771)	(771)	0
Plus unobligated balance, EOY	1,771	771	0	0	0
Unobligated balance, rescission	0	0	0	0	0
Total Budget Authority	625	160	250	250	0

APPROPRIATION ACCOUNT: FISHERIES ASSET FORFEITURE FUND

For FY 2015, NMFS estimates it will collect $4,000,000 in fines, penalties, and forfeitures proceeds. NOAA will obligate this amount to support the activities described below.

JUSTIFICATION FOR FY 2015:

Section 311(e)(1) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA) authorizes the Secretary of Commerce (Secretary) to pay certain enforcement-related expenses from fines, penalties and forfeiture proceeds received for violations of the Magnuson-Stevens Act, Marine Mammal Protection Act, National Marine Sanctuaries Act, or any other marine resource law enforced by the Secretary. Pursuant to this authority, the NOAA has established a Civil Monetary Penalty/Asset Forfeiture Fund (AFF). Certain fines, penalties and forfeiture proceeds received by NOAA are deposited into this Fund, and subsequently used to pay for certain enforcement-related expenses. When Congress established the AFF it was deemed appropriate to use these proceeds to offset in part the costs of administering the Enforcement program. Expenses funded through this source include: costs directly related to the storage, maintenance, and care of seized fish, vessels, or other property during a civil or criminal proceeding; expenditures related directly to specific investigations and enforcement proceedings such as travel for interviewing witnesses; enforcement-unique information technology infrastructure; and annual interagency agreement and contract costs for the administrative adjudication process, including Administrative Law Judges hired by the Coast Guard.

PROGRAM CHANGE FOR FY 2015:

No program change is requested for this account.

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Exhibit 5

Department of Commerce
National Oceanic and Atmospheric Administration
Fisheries Asset Forfeiture Fund
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	Positions	FTE	Budget Authority	Direct Obligations
FY 2014 Enacted	0	0	3,640	4,000
Adjustments to Base			360	
FY 2015 Base	0	0	4,000	4,000
plus: 2015 Program Changes	0	0	0	0
FY 2015 Estimate	0	0	4,000	4,000

Comparison by activity/subactivity		FY 2013 Actuals Personnel	FY 2013 Actuals Amount	FY 2014 Enacted Personnel	FY 2014 Enacted Amount	FY 2015 Base Program Personnel	FY 2015 Base Program Amount	FY 2015 Estimate Personnel	FY 2015 Estimate Amount	Increase/ Decrease Personnel	Increase/ Decrease Amount
Asset Forfeiture Fund	Pos/BA	0	2,277	0	3,640	0	4,000	0	4,000	0	0
	FTE/OBL	0	1,853	0	3,640	0	4,000	0	4,000	0	0
Total: Asset Forfeiture Fund	Pos/BA	0	2,277	0	3,640	0	4,000	0	4,000	0	0
	FTE/OBL	0	1,853	0	3,640	0	4,000	0	4,000	0	0

Exhibit 5

Department of Commerce
National Oceanic and Atmospheric Administration
Fisheries Asset Forfeiture Fund
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	FY 2013 Actuals		FY 2014 Enacted		FY 2015 Base Program		FY 2015 Estimate		Increase/ Decrease	
	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount
Direct Mandatory Obligation	0	1,853	0	3,640	0	4,000	0	4,000	0	0
Total Obligations	**0**	**1,853**	**0**	**3,640**	**0**	**4,000**	**0**	**4,000**	**0**	**0**
Adjustments to Obligations:										
Recoveries	0	(7)	0	0	0	0	0	0	0	0
Unobligated balance, adj. SOY	0	(10,523)	0	(10,955)	0	(10,955)	0	(10,955)	0	0
Unobligated balance, EOY	0	10,955	0	10,955	0	10,955	0	10,955	0	0
Total Budget Authority	**0**	**2,277**	**0**	**3,640**	**0**	**4,000**	**0**	**4,000**	**0**	**0**
Financing from Transfers and Other:										
Mandatory Appropriation										
Temporarily Reduced	0	255	0	360	0	0	0	0	0	0
Transfer from Other Accounts	0	0	0	0	0	0	0	0	0	0
Net Appropriation	**0**	**2,532**	**0**	**4,000**	**0**	**4,000**	**0**	**4,000**	**0**	**0**

Exhibit 16

Department of Commerce
National Oceanic and Atmospheric Administration
Fisheries Asset Forfeiture Fund
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
(Dollar amounts in thousands)

	Object Class	FY 2013 Actuals	FY 2014 Enacted	FY 2015 Base	FY 2015 Estimate	Increase/ (Decrease) over 2015 Base
11	Personnel compensation					
11.1	Full-time permanent	0	0	0	0	0
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	0	0	0	0	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	0	0	0	0	0
12.1	Civilian personnel benefits	0	0	0	0	0
13	Benefits for former personnel	0	0	0	0	0
21	Travel and transportation of persons	437	404	404	404	0
22	Transportation of things	1	1	1	1	0
23.1	Rental payments to GSA	0	0	0	0	0
23.2	Rental payments to others	6	121	121	121	0
23.3	Commun., util., misc. charges	0	0	0	0	0
24	Printing and reproduction	2	2	2	2	0
25.2	Other services	1,379	3,101	3,461	3,461	0
26	Supplies and materials	28	6	6	6	0
31	Equipment	0	5	5	5	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	0	0	0	0	0
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	**Total Obligations**	1,853	3,640	4,000	4,000	0
	Less prior year recoveries	(7)	0	0	0	0

Department of Commerce
National Oceanic and Atmospheric Administration
Fisheries Asset Forfeiture Fund
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
(Dollar amounts in thousands)

Less unobligated balance, SOY	(10,523)	(10,955)	(10,955)	(10,950)	0
Plus unobligated balance, EOY	10,955	10,955	10,955	10,950	0
Unobligated balance, rescission	0	0	0	0	0
Total Budget Authority	2,277	3,640	4,000	4,000	0

APPROPRIATION ACCOUNT: NORTH PACIFIC OBSERVER FUND

For FY 2015, NMFS estimates obligating $4,200,000 for the North Pacific Observer Fund.

JUSTIFICATION FOR FY 2015:

On January 1, 2013, the restructured North Pacific Groundfish Observer Program (NPGOP) went into effect and made important changes to how observers are deployed, how observer coverage is funded, and the vessels and processors that must have some or all of their operations observed. Coverage levels are no longer based on vessel length and processing volume; rather, NMFS now has the flexibility to decide when and where to deploy observers based on a scientifically defensible deployment plan. The new observer program places all vessels and processors in the groundfish and halibut fisheries off Alaska into one of two observer coverage categories: (1) a full coverage category, and (2) a partial coverage category.

Vessels and processors in the full coverage category (≥100% observer coverage) will obtain observers by contracting directly with observer providers. Vessels and processors in the full observer coverage category are required to have at least one observer at all times. This will represent no change from the status quo for participants in the full coverage category.

Vessels and processors in the partial coverage category (<100% observer coverage) will no longer contract independently with an observer provider, and will be required to carry an observer when they are selected through the Observer Declare and Deploy System (ODDS). Additionally, landings from all vessels in the partial coverage category will be assessed a 1.25 percent fee on standard ex-vessel prices of the landed catch weight of groundfish and halibut. The fee percentage is set in regulation and will be reviewed periodically by the Council after the second year of the program. The money generated by this fee will be used to pay for observer coverage on the vessels and processors in the partial coverage category in the following year. NMFS expects approximately $4.2M to be collected in fees from the FY2014 season, to be used in FY 2015 for observer coverage.

PROGRAM CHANGE FOR FY 2015:

No program change is requested for this account.

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Exhibit 5

Department of Commerce
National Oceanic and Atmospheric Administration
North Pacific Observer Fund
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	Positions	FTE	Budget Authority	Direct Obligations
FY 2014 Enacted	0	0	3,854	3,854
Adjustments to Base			346	346
FY 2015 Base	0	0	4,200	4,200
plus: 2015 Program Changes	0	0	0	0
FY 2015 Estimate	0	0	4,200	4,200

Comparison by activity/subactivity		FY 2013 Actuals Personnel	Amount	FY 2014 Enacted Personnel	Amount	FY 2015 Base Program Personnel	Amount	FY 2015 Estimate Personnel	Amount	Increase/ Decrease Personnel	Amount
North Pacific Observer Fund	Pos/BA	0	0	0	3,854	0	4,200	0	4,200	0	0
	FTE/OBL	0	0	0	3,854	0	4,200	0	4,200	0	0
Total: North Pacific Observer Fund	Pos/BA	0	0	0	3,854	0	4,200	0	4,200	0	0
	FTE/OBL	0	0	0	3,854	0	4,200	0	4,200	0	0

Exhibit 5

Department of Commerce
National Oceanic and Atmospheric Administration
North Pacific Observer Fund
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	FY 2013 Actuals		FY 2014 Enacted		FY 2015 Base Program		FY 2015 Estimate		Increase/ Decrease	
	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount
Direct Mandatory Obligation	0	0	0	3,854	0	4,200	0	4,200	0	0
Total Obligations	**0**	**0**	**0**	**3,854**	**0**	**4,200**	**0**	**4,200**	**0**	**0**
Adjustments to Obligations:										
Unobligated balance, adj. SOY	0	0	0	0	0	0	0	0	0	0
Unobligated balance, EOY	0	0	0	0	0	0	0	0	0	0
Total Budget Authority	**0**	**0**	**0**	**3,854**	**0**	**4,200**	**0**	**4,200**	**0**	**0**
Financing from Transfers and Other:										
Temporarily Reduced	0	0	0	346	0	0	0	0	0	0
Net Appropriation	**0**	**0**	**0**	**4,200**	**0**	**4,200**	**0**	**4,200**	**0**	**0**

Exhibit 16

Department of Commerce
National Oceanic and Atmospheric Administration
North Pacific Observer Fund
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	Object Class	FY 2013 Actuals	FY 2014 Enacted	FY 2015 Base	FY 2015 Estimate	Increase/ (Decrease) over 2015 Base
11	Personnel compensation					
11.1	Full-time permanent	0	0	0	0	0
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	0	0	0	0	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	0	0	0	0	0
12.1	Civilian personnel benefits	0	0	0	0	0
13	Benefits for former personnel	0	0	0	0	0
21	Travel and transportation of persons	0	0	0	0	0
22	Transportation of things	0	0	0	0	0
23.1	Rental payments to GSA	0	0	0	0	0
23.2	Rental payments to others	0	0	0	0	0
23.3	Commun., util., misc. charges	0	0	0	0	0
24	Printing and reproduction	0	0	0	0	0
25.2	Other services	0	3,854	4,200	4,200	0
26	Supplies and materials	0	0	0	0	0
31	Equipment	0	0	0	0	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	0	0	0	0	0
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	**Total Obligations**	0	3,854	4,200	4,200	0
	Less prior year recoveries	0	0	0	0	0

Exhibit 16

Department of Commerce
National Oceanic and Atmospheric Administration
North Pacific Observer Fund
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

Less unobligated balance, SOY	0	0	0	0	0
Plus unobligated balance, EOY	0	0	0	0	0
Unobligated balance, rescission	0	0	0	0	0
Total Budget Authority	0	3,854	4,200	4,200	0

APPROPRIATION ACCOUNT: FISHERIES DISASTER ASSISTANCE FUND

For FY 2015, NMFS requests a total of $0 for Fisheries Disaster Assistance Fund.

JUSTIFICATION FOR FY 2015:

The Department of Commerce is authorized to provide disaster assistance under either sections 308(b) or 308(d) of the Interjurisdictional Fisheries Act or sections 312(a) or 315 of the Magnuson-Stevens Fishery Conservation and Management Act. Under both statutes, a request for a fishery disaster determination is generally made by the Governor of a State, or by a fishing community, although the Secretary of Commerce may also initiate a review. The Secretary determines whether the circumstances are consistent with relevant statutes and warrant a fishery disaster determination. If the Secretary determines that a fishery disaster has occurred, Congress may appropriate funds for disaster assistance, which are administered by the Secretary.

The 2014 Consolidated Appropriations Act established a new account for fisheries disaster assistance and provided $75 million within this account to mitigate the effects of commercial fishery failures and fishery resource disasters. This $75 million responds to the specific disaster declarations in calendar years 2012 and 2013.

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PROGRAM CHANGE FOR FY 2015:

Fisheries Disaster Assistance Fund: Fisheries Disaster Assistance (Base Funding: $75,000,000 and 0 FTE; Program Change: -$75,000,000 and 0 FTE): NOAA requests a decrease of $75,000,000 and 0 FTE for a total of $0 and 0 FTE.

Proposed Actions:
The FY 2015 President's Request does not include funding for any fisheries disaster assistance. The FY 2014 Consolidated Appropriations Act provided $75,000,000 for fisheries disasters declared by the Secretary of Commerce in calendar years 2012 and 2013. NOAA will work with the States and Tribes with respect to future disaster determinations and shall work with the Congress if future disasters are declared.

Resource Assessment:
The resources for this activity are described in the Fisheries Disaster Assistance Fund narrative.

PROGRAM CHANGE DETAIL BY OBJECT CLASS

(Dollar amounts in thousands)

Budget Program: National Marine Fisheries Service
Sub-program: Fisheries Disaster Assistance Fund
Program Change: Fisheries Disaster Assistance

Object Class		2015 Decrease
11	Personnel compensation	
11.1	Full-time permanent	$0
11.3	Other than full-time permanent	0
11.5	Other personnel compensation	0
11.8	Special personnel services payments	0
11.9	Total personnel compensation	0
12	Civilian personnel benefits	0
13	Benefits for former personnel	0
21	Travel and transportation of persons	0
22	Transportation of things	0
23.1	Rental payments to GSA	0
23.2	Rental Payments to others	0
23.3	Communications, utilities and miscellaneous charges	0
24	Printing and reproduction	0
25.1	Advisory and assistance services	0
25.2	Other services	0
25.3	Purchases of goods & services from Gov't accounts	0
25.4	Operation and maintenance of facilities	0
25.5	Research and development contracts	0
25.6	Medical care	0
25.7	Operation and maintenance of equipment	0
25.8	Subsistence and support of persons	0
26	Supplies and materials	0
31	Equipment	0
32	Lands and structures	0
33	Investments and loans	0
41	Grants, subsidies and contributions	(75,000)
42	Insurance claims and indemnities	0
43	Interest and dividends	0
44	Refunds	0
99	Total obligations	(75,000)

Exhibit 5

Department of Commerce
National Oceanic and Atmospheric Administration
Fisheries Disaster Assistance Fund
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	Positions	FTE	Budget Authority	Direct Obligations
FY 2014 Enacted	0	0	75,000	75,000
FY 2015 Base	0	0	75,000	75,000
plus: 2015 Program Changes	0	0	(75,000)	(75,000)
FY 2015 Estimate	0	0	0	0

Comparison by program/sub-program		FY 2013 Actuals Personnel	Amount	FY 2014 Enacted Personnel	Amount	FY 2015 Base Program Personnel	Amount	FY 2015 Estimate Personnel	Amount	Increase/ Decrease Personnel	Amount
Fisheries Disaster Assistance Fund	Pos/BA	0	0	0	75,000	0	75,000	0	0	0	(75,000)
	FTE/OBL	0	0	0	75,000	0	75,000	0	0	0	(75,000)
Total: Fisheries Disaster Assistance Fund	Pos/BA	0	0	0	75,000	0	75,000	0	0	0	(75,000)
	FTE/OBL	0	0	0	75,000	0	75,000	0	0	0	(75,000)

Exhibit 5

Department of Commerce
National Oceanic and Atmospheric Administration
Fisheries Disaster Assistance Fund
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	FY 2013 Actuals		FY 2014 Enacted		FY 2015 Base Program		FY 2015 Estimate		Increase/ Decrease	
	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount
Direct Mandatory Obligation	0	0	0	75,000	0	75,000	0	0	0	(75,000)
Total Obligations	**0**	**0**	**0**	**75,000**	**0**	**75,000**	**0**	**0**	**0**	**(75,000)**
Adjustments to Obligations:										
Unobligated balance, adj. SOY	0	0	0	0	0	0	0	0	0	0
Unobligated balance, EOY	0	0	0	0	0	0	0	0	0	0
Total Budget Authority	**0**	**0**	**0**	**75,000**	**0**	**75,000**	**0**	**0**	**0**	**(75,000)**
Financing from Transfers and Other:										
Offsetting Collections from Non-Federal Sources	0	0	0	0	0	0	0	0	0	0
Net Appropriation	**0**	**0**	**0**	**75,000**	**0**	**75,000**	**0**	**0**	**0**	**(75,000)**

Exhibit 16

Department of Commerce
National Oceanic and Atmospheric Administration
Fisheries Disaster Assistance Fund
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	Object Class	FY 2013 Actuals	FY 2014 Enacted	FY 2015 Base	FY 2015 Estimate	Increase/ (Decrease) over 2015 Base
11	Personnel compensation					
11.1	Full-time permanent	0	0	0	0	0
11.3	Other than full-time permanent	0	0	0	0	0
11.5	Other personnel compensation	0	0	0	0	0
11.8	Special personnel services payments	0	0	0	0	0
11.9	Total personnel compensation	0	0	0	0	0
12.1	Civilian personnel benefits	0	0	0	0	0
13	Benefits for former personnel	0	0	0	0	0
21	Travel and transportation of persons	0	0	0	0	0
22	Transportation of things	0	0	0	0	0
23.1	Rental payments to GSA	0	0	0	0	0
23.2	Rental payments to others	0	0	0	0	0
23.3	Commun., util., misc. charges	0	0	0	0	0
24	Printing and reproduction	0	0	0	0	0
25.2	Other services	0	0	0	0	0
26	Supplies and materials	0	0	0	0	0
31	Equipment	0	0	0	0	0
32	Lands and structures	0	0	0	0	0
33	Investments and loans	0	0	0	0	0
41	Grants, subsidies and contributions	0	75,000	75,000	0	(75,000)
42	Insurance claims and indemnities	0	0	0	0	0
43	Interest and dividends	0	0	0	0	0
44	Refunds	0	0	0	0	0
99	**Total Obligations**	0	0	0	0	0
	Less prior year recoveries	0	75,000	75,000	0	(75,000)

Exhibit 16

Department of Commerce
National Oceanic and Atmospheric Administration
Fisheries Disaster Assistance Fund
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

Less unobligated balance, SOY	0	0	0	0	0
Plus unobligated balance, EOY	0	0	0	0	0
Unobligated balance, rescission	0	0	0	0	0
Total Budget Authority	0	75,000	75,000	0	(75,000)

BUDGET PROGRAM: OCEANIC AND ATMOSPHERIC RESEARCH

For FY 2015, NOAA requests a total of $462,173,000 and 724 FTE for the Office of Oceanic and Atmospheric Research (OAR) including an increase of $31,793,000 and 12 FTE in net program changes.

OAR is NOAA's central research Line Office. It provides the Nation with critical environmental information through climate, weather, ocean, coastal, and Great Lakes research, technology development, and related services that support informed decision-making and promote healthy, productive, and resilient ecosystems, communities, and economies. NOAA looks to OAR to meet key NOAA science challenges; to lead advances in Earth system research using observations, analysis, and modeling; and to play an expanded role as the innovator, incubator, and integrator of science and technology across NOAA. OAR's role is three-fold: to integrate research across the agency; use innovative science to improve current NOAA operational products and services; and to rely on a robust federal scientific workforce, and its partners, to conduct innovative research for the development of the next generation of products and services. OAR conducts ocean, coastal, weather and climate research necessary to provide society with useful information to help decision makers manage such challenges as regional water resources, and plan for extreme events in a variable and changing climate. NOAA relies on OAR to coordinate and develop research and technology for such emerging and integrative subjects as ocean acidification, "warn on forecast," climate and weather testbeds, diagnosis and forecast of the behavior of the Earth system, ocean exploration, unmanned aircraft systems, and autonomous underwater vehicles. OAR also serves as lead for a shift toward truly integrated modeling that spans the full domain of physical, chemical, and biological systems. When mature, the products and the information produced will inform a broad range of users, sectoral interests, and transition appropriate advances to another Line Office for operation or application.

Office of Oceanic and Atmospheric Research Overview

The OAR budget ($420,001,000 and 712 FTE) is organized into four sub-programs under the Operations, Research, and Facilities account:

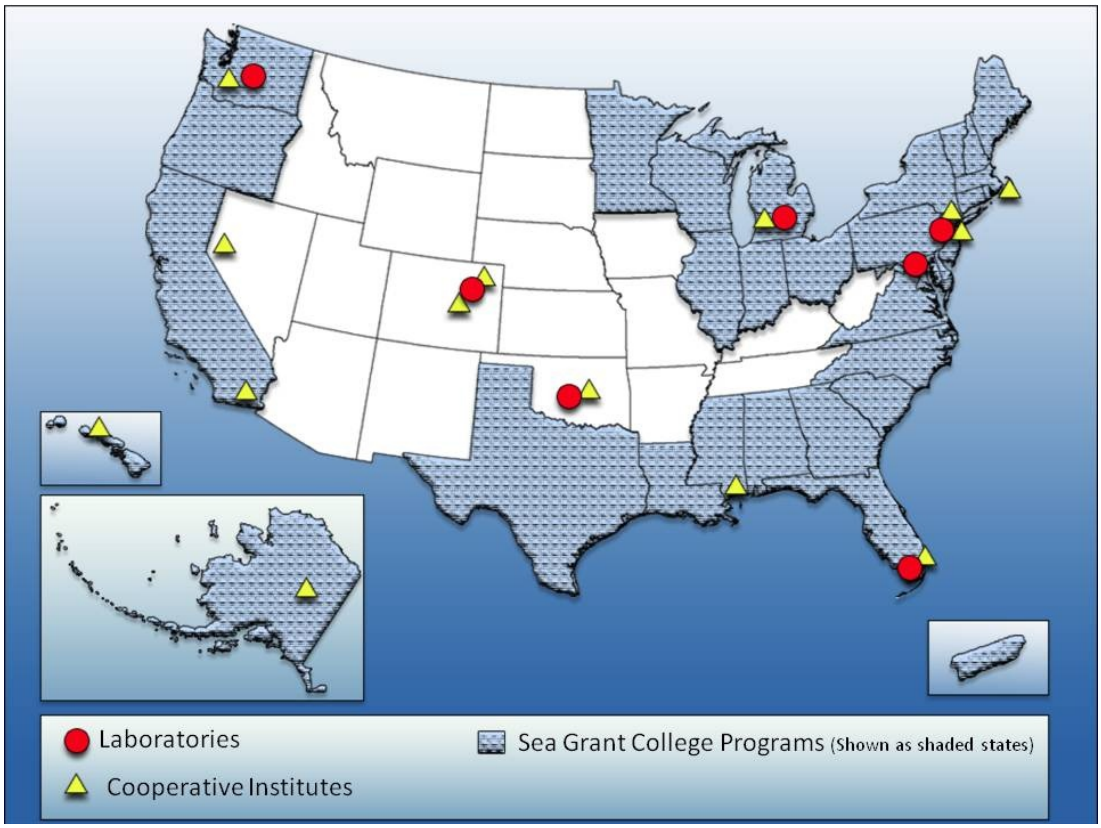
- **Climate Research** ($157,770,000 and 275 FTE) includes Laboratories and Cooperative Institutes and competitive research that seek to establish a greater understanding of and ability to predict climate variability and change to enhance society's ability to plan and respond.
- **Weather and Air Chemistry Research** ($81,894,000 and 211 FTE) includes Laboratories and Cooperative Institutes as well as research programs that develop improved understanding and forecast capabilities for atmospheric events that endanger lives and property.
- **Ocean, Coastal, and Great Lakes Research** ($168,156,000 and 216 FTE) includes Laboratories and Cooperative Institutes, the National Sea Grant College Program, Office of Ocean Exploration and Research, Other Ecosystem Programs (Ocean Acidification Program), and Sustained Ocean Observations and Monitoring. Collectively, activities funded seek to better understand habitats, processes, and resources in the oceanic, coastal, and Great Lakes environments and lead to innovative and useful management tools that help NOAA meet its mission.
- **Innovative Research and Technology** ($12,103,000 and 10 FTE) includes High Performance Computing Initiatives, which seeks to accelerate the adoption of advanced computing, communications, and information technology throughout NOAA.

The Procurement, Acquisition, and Construction (PAC) account ($10,379,000 and 0 FTE) includes the following sub-program:

- **System Acquisition**, which includes NOAA's investments in Research High Performance Computing. OAR supports the management of a high-performance computing system, which provides a key platform to characterize and quantify climate variations and change at a range of temporal and spatial scales.

OAR's Organizational Components:
OAR operates through a national network of laboratories and other university-based research programs. OAR manages its budget through seven organizational components: Laboratories and Cooperative Institutes, Climate Program Office, National Sea Grant College Program, Office of Ocean Exploration and Research (OER), Other Ecosystem Programs (Ocean Acidification Program), Office of Weather and Air Quality (OWAQ), and the NOAA High-Performance Computing and Communications (HPCC) Program.

OAR Laboratories and Cooperative Institutes
OAR has seven laboratories across the United States that conduct innovative research and development to support NOAA's mission of understanding and predicting changes in climate, weather, oceans, and coasts. These laboratories collaborate with numerous external partners, including NOAA-funded cooperative institutes at premier academic and scientific institutions. Primary objectives of the Laboratories and Cooperative Institutes are innovative research as well as the improvement of NOAA products and services to facilitate decision making by policy makers and the public.



Research Laboratories

- **Air Resources Laboratory (ARL)**, headquartered in College Park, Maryland, and with offices in Oak Ridge, Tennessee, Idaho Falls, Idaho and Las Vegas, Nevada, carries out research on air chemistry, atmospheric dispersion, and climate, with a focus on conditions near the Earth's surface that affect people and ecosystems. More information about ARL is available at http://www.arl.noaa.gov/.

- **Atlantic Oceanographic and Meteorological Laboratory (AOML)** in Miami, Florida, conducts scientific research focused on understanding the physical, chemical, and biological characteristics and processes of the ocean and atmosphere, both separately and as a coupled system. The laboratory's research themes of oceans and climate, coastal ecosystems, and hurricanes and tropical meteorology each employ a cross-disciplinary approach, conducted through collaborative interactions with national and international research and environmental forecasting institutions. More information about AOML is available at http://www.aoml.noaa.gov/.

- **Earth System Research Laboratory (ESRL)** in Boulder, Colorado, represents a combination of climate and weather research capabilities aimed at observing and understanding the Earth system and developing environmental information products and services on global to local scales. ESRL primarily works to understand the roles of gases and particles that contribute to climate change, provides weather and climate information related to water management decisions, improves weather prediction, studies the recovery of the stratospheric ozone layer, and develops air quality forecast models. ESRL has four divisions: Chemical Sciences Division (CSD), Global Monitoring Division (GMD), Global Systems Division (GSD), and Physical Sciences Division (PSD). More information about ESRL is available at http://www.esrl.noaa.gov.

- **Geophysical Fluid Dynamics Laboratory (GFDL)** in Princeton, New Jersey, conducts the cutting-edge research necessary to understand, project, and predict Earth's climate on a range of space and timescales. Research at GFDL addresses many topics through advanced mathematical modeling of the climate and Earth system, including natural climate variability, anthropogenic climate change, weather and hurricane forecasts, El Niño prediction, and stratospheric ozone depletion. More information about GFDL is available at: http://www.gfdl.noaa.gov/.

- **Great Lakes Environmental Research Laboratory (GLERL)** in Ann Arbor, Michigan, conducts integrated interdisciplinary environmental research in support of resource management and environmental services in coastal and estuarine waters, with a primary emphasis on the Great Lakes. More information about GLERL is available at: http://www.glerl.noaa.gov/.

- **National Severe Storms Laboratory (NSSL)** in Norman, Oklahoma, conducts weather research aimed at improving the accuracy and timeliness of forecasts and warnings of hazardous weather events such as thunderstorms, blizzards, ice storms, flash floods, tornadoes, and lightning. More information about NSSL is available at: http://www.nssl.noaa.gov/.

- **Pacific Marine Environmental Laboratory (PMEL)** in Seattle, Washington, carries out interdisciplinary scientific investigations in oceanography, marine meteorology, and related

subjects. PMEL also supports an undersea observation and research program in Newport, Oregon. More information about PMEL is available at: http://www.pmel.noaa.gov/.

Cooperative Institutes *(http://www.ci.noaa.gov/)*
OAR has Cooperative Institute partnerships with academic and scientific institutions to foster long-term collaborations dedicated to advancing oceanic and atmospheric research. These Cooperative Institutes are usually co-located with one or more NOAA facilities to promote scientific exchange and technology transfer, and provide valuable capabilities and expertise to supplement OAR laboratory work. The primary purpose of each institute is to create a mechanism to bring together the resources of a research-oriented university or institution, OAR, and other branches of NOAA in order to develop and maintain a center of excellence in research. The institutes are:

- The **Cooperative Institute for Climate and Satellites (CICS-M)** is a national consortium of academic, non-profit, and community organizations with leadership from the University of Maryland and North Carolina State University. CICS-M conducts climate and satellite research and applications, climate and satellite observations and monitoring, and climate research and modeling. CICS-M collaborates with NOAA's National Environmental Satellite, Data, and Information Service (NESDIS) and National Weather Service (NWS) in addition to OAR.

- The **Cooperative Institute for Climate Science (CICS-P)**, located at Princeton University's Forrestal Campus in Princeton, New Jersey, conducts research on Earth system modeling development and analysis, Earth system modeling applications, and data assimilation.

- The **Cooperative Institute for Alaska Research (CIFAR)**, located at the University of Alaska-Fairbanks, Alaska, conducts research on ecosystem function, coastal hazards, and climate change and variability.

- The **Cooperative Institute for Limnology and Ecosystems Research (CILER)** is a ten-member consortium of academic institutions in the Great Lakes region. CILER is administratively housed at the University of Michigan in Ann Arbor, Michigan. CILER conducts research on Great Lakes ecosystem processes and forecasting, invasive species, observing systems, protection and restoration of resources, and integrated assessment.

- The **Cooperative Institute for Marine and Atmospheric Studies (CIMAS)** is a nine-member consortium of academic institutions in Florida and the Caribbean which is administratively housed at the University of Miami in Miami, Florida. CIMAS member institutions conduct research on climate and impacts, tropical weather, sustained ocean and coastal observations, ocean modeling, ecosystem modeling and forecasting, ecosystem management, and protection and restoration of resources. CIMAS collaborates primarily with three NOAA facilities located in Miami: the Atlantic Oceanographic and Meteorological Laboratory (AOML), the Southeast Fisheries Science Center, and the National Hurricane Center.

- The **Cooperative Institute on Marine Ecosystems and Climate (CIMEC)**, located at Scripps Institution of Oceanography at the University of California-San Diego, conducts research on climate and coastal observations, analysis, and prediction, research on biological systems, research in extreme environments, and research and development on observations systems. CIMEC collaborates with NOAA's National Marine Fisheries Service (NMFS) in addition to OAR. (Formerly titled the Joint Institute for Marine Operations).

- The **Cooperative Institute for Mesoscale Meteorological Studies (CIMMS)**, located at the University of Oklahoma in Norman, Oklahoma, concentrates its research efforts and resources on basic convective and mesoscale research, forecast improvements, climatic effects of and controls on mesoscale processes, socioeconomic impacts of mesoscale weather systems and regional-scale climate variations, Doppler weather radar research and development, and climate change monitoring and detection. CIMMS collaborates with NWS in addition to OAR.

- The **Cooperative Institute for Marine Resource Studies (CIMRS)**, located at Oregon State University, Corvallis, Oregon, conducts research on West Coast fisheries, the ocean environment, and marine mammal acoustics. CIMRS collaborates with NMFS in addition to OAR.

- The **Cooperative Institute for the North Atlantic Region (CINAR)**, located at Woods Hole Oceanographic Institution, Woods Hole, Massachusetts, conducts research on ecosystem forecasting, ecosystem monitoring and management, protection and restoration of resources, and sustained ocean observations and climate research. CINAR collaborates with NMFS in addition to OAR.

- The **Cooperative Institute for Ocean Exploration, Research, and Technology (CIOERT)**, located at Florida Atlantic University's Harbor Branch Oceanographic Institution in Boca Raton, Florida, explores and studies the nation's poorly known ocean areas using innovation and cutting-edge technologies. CIOERT investigations and studies focus on vulnerable deep and shallow coral reef ecosystems, as well as other unique habitats along the continental shelf and slope along the eastern U.S. and Gulf of Mexico.

- The **Cooperative Institute for Research in the Atmosphere (CIRA)**, located at the Colorado State University in Fort Collins, Colorado, conducts research on satellite algorithm development training and education, regional to global scale modeling systems, data assimilation, climate-weather processes, and data distribution. CIRA collaborates with NESDIS in addition to OAR.

- The **Cooperative Institute for Research in Environmental Sciences (CIRES)**, at the University of Colorado, in Boulder, Colorado, conducts research on advanced modeling and observing systems, climate system variability, geodynamics, integrative activities, planetary metabolism, and regional processes.

- The **Joint Institute for Marine and Atmospheric Research (JIMAR)**, located at the University of Hawaii in Honolulu, Hawaii, conducts research on ecosystem forecasting and monitoring, ecosystem-based management, protection and restoration of natural resources, equatorial oceanography, climate impacts, tropical meteorology and long-period ocean waves, including tsunamis. JIMAR collaborates with NMFS in addition to OAR.

- The **Joint Institute for the Study of the Atmosphere and Ocean (JISAO)**, located at the University of Washington in Seattle, Washington, conducts research on climate, environmental chemistry, seafloor processes, marine ecosystems, protection and restoration of marine resources, tsunami observations and modeling, and ocean and coastal oceanography. JISAO collaborates with NMFS in addition to OAR.

- The **Northern Gulf Institute (NGI)** is a consortium of universities, led by Mississippi State University, which includes the University of Southern Mississippi, Louisiana State University, Florida State University, and the Dauphin Island Sea Lab, at Stennis Space Center, Mississippi.

NGI conducts research on ecosystem management, geospatial data integration and visualization in environmental science, climate change and climate variability effects on regional ecosystems, and coastal hazards.

NOAA Climate Program Office

The NOAA Climate Program Office (CPO) manages the OAR Climate Competitive Research and Regional Climate Data and Information PPAs under the OAR Climate Research sub-program, the Sustained Ocean Observations and Monitoring PPA under the Ocean, Coastal, and Great Lakes Research sub-program, and coordinates with the climate programs in the OAR laboratories. CPO coordinates climate activities with other Line Offices (including NESDIS, NWS, NMFS, and NOS) and works with many external partners. CPO manages competitive grant programs and seeks to understand climate variability and change to enhance society's ability to plan and respond. CPO implements and maintains nearly half of NOAA's Global Ocean Observing System (GOOS), sponsors research into the forcings and feedbacks contributing to changes in the Earth's climate, improves climate predictive capability from weeks to decades, and develops climate products and services to enhance decision making capabilities across all sectors of society. Among other things, CPO serves as the NOAA focal point for such national and international climate efforts as maintaining the National Integrated Drought Information System, facilitating the U.S. National Climate Assessment, and leading U.S. involvement in the Sustaining Arctic Observing Networks and the Circumpolar Marine Biodiversity Monitoring Plan. More information about CPO can be found at http://www.climate.noaa.gov.

Office of Weather & Air Quality

The Office of Weather and Air Quality (OWAQ) manages the U.S. Weather Research Program and coordinates with weather and air chemistry programs in OAR, NWS, and NESDIS as well as with other external partners. OWAQ manages competitive grant programs and provides research and development in observations, analysis, modeling, and social science that leads to more accurate and timely warnings and forecasts of high-impact weather that causes loss of life and property and air quality parameters, including ozone and aerosols/particulate matter which impact human health, and cause crop damage.

National Sea Grant College Program

Congress established the National Sea Grant College Program in 1966 to enhance the development, use, and conservation of the Nation's coastal, marine, and Great Lakes resources. The legislation establishes a network of Sea Grant Colleges to conduct education, training, and research in all fields of marine study. The National Sea Grant College Program Office is located in Silver Spring, Maryland. Currently, there are 33 university-based Sea Grant programs located in every U.S. coastal and Great Lakes state, Vermont, and Puerto Rico. These programs have aligned their efforts around the NOAA National Sea Grant College Program Strategic Action Agenda, which focuses on four critical areas: Safe and Sustainable Seafood Supply, Sustainable Coastal Development, Healthy Coastal Ecosystems and Hazard Resilience in Coastal Communities. More information about the National Sea Grant College Program can be found at http://www.seagrant.noaa.gov.

Office of Ocean Exploration and Research

The Office of Ocean Exploration and Research (OER) supports: (1) scientific baseline characterization of unknown or poorly-known ocean areas, processes, and resources; (2) transitioning observations and discoveries to catalyze new areas of scientific inquiry and to support natural resource management decisions; (3) increasing the pace, scope, and efficiency of exploration and research through the development of new and innovative technologies; and (4) engaging a wide variety of audiences by innovative means, including new telepresence technologies. OER operates the *Okeanos Explorer*, a NOAA ship dedicated to the ocean exploration missions.

OER partners with and supports the Cooperative Institute for Ocean Exploration, Research, and Technology, and has established long-term partnerships with academic institutions such as the Woods Hole Oceanographic Institution, University of Rhode Island, University of New Hampshire, and private organizations such as the Sea Research Foundation and Ocean Exploration Trust. OER also partners with major Aquaria across the Nation in innovative efforts to engage multiple and diverse audiences in learning more about the global ocean and ocean issues.

More information about the Office of Ocean Exploration and Research can be found at http://explore.noaa.gov.

Other Ecosystem Programs

Other Ecosystem Programs is comprised of the Ocean Acidification Program (OAP). OAP was established by section 12406 of the 2009 Federal Ocean Acidification Research and Monitoring Act to coordinate research, monitoring, and other activities to improve understanding of ocean acidification (OA). The OAP maintains long-term OA monitoring; conducts research designed to enhance conserving marine ecosystems sensitive to OA; promotes OA educational opportunities; engages national public outreach activities related to OA and its impacts; and coordinates OA activities across other agencies and appropriate international ocean science bodies. As part of its responsibilities, the OAP provides grants for critical research projects that explore the effects on ecosystems and the socioeconomic impacts leading to potential adaptive strategies.

NOAA High Performance Computing and Communications Program

The High Performance Computing and Communications Program (HPCC) supports many NOAA Strategic Plan objectives utilizing information technology research targeted at improving NOAA's mission, services, and science education. HPCC seeks to make major improvements in the ability to forecast weather and climate, and to disseminate environmental information by stimulating modernization of NOAA's computationally-intensive services. HPCC represents NOAA, the lead agency, in the Networking and Information Technology Research and Development (NITRD) program.

Research and Development (R&D) Investments:

The NOAA FY 2015 Budget estimates for R&D investments are the result of an integrated requirements-based strategic planning process. This process provides the structure to link NOAA's strategic vision with programmatic detail and budget development, with the goal of maximizing resources while optimizing capabilities. OAR requests $357,445,000 for investments in R&D in the FY 2015 budget.

NOAA's R&D planning is tied to the goals, enterprises, and associated objectives outlined in NOAA's Next Generation Strategic Plan. Specifically, NOAA's Science and Technology Enterprise and underlying objectives include a holistic understanding of the Earth system through research; accurate and reliable data from observing systems; and an integrated environmental modeling system. These provide the basis for a set of internal implementation plans covering a 7-year period which guide NOAA's research and development activities. The NOAA Research Council - an internal body composed of senior scientific personnel from every Line Office in the agency - informs the annual updates to these implementation plans, and has developed the next 5-Year Research and Development Plan for NOAA (FY 2013-2017). This plan will guide NOAA’s R&D activities over the next five years. The plan provides a common understanding among NOAA’s leadership, its workforce, its partners, constituents and Congress on the value of NOAA’s R&D activities. As such, the Plan is a framework with which NOAA and the public can monitor and evaluate the Agency’s progress and learn from past experience.

Significant Inflationary Adjustments:
NOAA's FY 2015 Base includes a total of $3,609,000 and 0 FTE to account for the full funding requirement for inflationary adjustments to current programs for OAR activities. This includes the estimated 2015 Federal pay raise of 1.0 percent as well as inflationary increases for non-labor activities, including service contracts, utilities, field office lease payments, and rent charges from the General Service Administration (GSA). OAR will offset $78,000 of its inflationary costs through program management efficiencies

Headquarters Administrative Costs:
In FY 2015, OAR Line Office headquarters will use $16,042,000 in funds and 67.4 FTE to support general management activities, financial, and budgeting, and IT related expenses, as well as supporting facilities and other general operating costs. These funds also include support for service contracts, utilities, and rent charges from the General Services Administration. Specifically, OAR will use headquarters administrative funds to support the following:

Headquarters Program Support Type	Description	FY 2015 Amount	FY 2015 FTE associated with OAR HQ
General Management & Direction/Executive Management	Includes Assistant Administrator's office, public affairs, information services	$8,082,000	25.5
Budget & Finance	Includes Budget, Finance and Accounting	$2,629,000	15.3
Information Technology	Includes IT-related expenses and other CIO related activities	$1,791,000	7.0
Facilities/Other Administrative (CAO Functions)	Includes Facilities and Security costs, as well as other CAO related activities	$1,447,000	0
Human Resources	All HR services, including EEO	$1,853,000	13.3
Acquisitions and Grants		$240,000	0
Total		**$16,042,000**	**61.1**

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APPROPRIATION ACCOUNT: OPERATIONS, RESEARCH, AND FACILITIES
SUB-PROGRAM: CLIMATE RESEARCH

The objectives of the Climate Research sub-program are to:

- Describe and understand the state of the climate through sustained atmospheric and oceanic observations and research related to global distributions, trends, sources, and sinks of atmospheric constituents that are capable of forcing change in the climate of the Earth;
- Understand, predict, and project climate variability and change from weeks to decades to centennial timescales;
- Conduct advanced modeling of the climate and Earth systems, including natural climate variability, anthropogenic climate change, weather and hurricane forecasts, El Niño prediction, and stratospheric ozone depletion to increase fundamental understanding and to improve the prediction of climate phenomena;
- Sustain the observing systems essential for climate, oceanographic, monitoring, and data management;
- Conduct physical process research to advance a seamless suite of information and forecast products, ranging from short-term weather forecasts to longer-term climate forecasts and assessments; and
- Understand how decision makers use climate information to improve the ability of society to plan for and respond to climate variability and change.

The mission of the Climate Research sub-program is to monitor and understand Earth's climate system to predict both the potential long-term changes in global climate as well as shorter-term climate variations that are of societal and economic importance. More information on OAR's climate research is available at: http://www.oar.noaa.gov/climate/.

To accomplish the above sub-program objectives, Climate Research across OAR is structured to support the long-term goal of Climate Adaptation and Mitigation described in NOAA's Next-Generation Strategic Plan (NGSP). The NGSP identifies four Objectives under the Goal: (1) Improved scientific understanding of the changing climate system and its impacts; (2) Assessments of current and future states of the climate system that identify potential impacts and inform science, service, and stewardship decisions; (3) Mitigation and adaptation efforts supported by sustained, reliable, and timely climate services; and (4) A climate-literate public that understands its vulnerabilities to a changing climate and makes informed decisions.

OAR's Climate Program Office (CPO) is the strategy lead for the NGSP Climate Goal, and it provides resources, programmatic oversight, and coordination to ensure NOAA's Climate Research objectives are met in an integrated and cost-effective manner. In this role, CPO brings together and maintains relationships across NOAA Laboratories, Cooperative Institutes, and university-based partners to execute research in support of these objectives. OAR's Laboratories and Cooperative Institutes contribute, both directly and indirectly, to all four Objectives and work in partnership with the CPO to ensure NOAA meets its aim of an informed society anticipating and responding to climate and its impacts. The sections below describe these relationships in more detail.

LABORATORIES AND COOPERATIVE INSTITUTES

A central objective of Climate Research is to predict, to the extent possible, the future evolution of the Earth system in order to provide a basis for informed decision making. Such predictions require a comprehensive understanding of the physical, chemical, and dynamical processes that shape our climate. OAR's Laboratories and Cooperative Institutes are central to the climate research community's effort to improve that understanding, to test our understanding through the development of state-of-the-art Earth System Models, and then to use those models to predict the future state of the climate. Observations of the Earth system and their analysis underpin the efforts that form the scientific basis for Climate Research. This section describes the activities of OAR's Laboratories and Cooperative Institutes in advancing all four NGSP Objectives of NOAA's Climate Adaptation and Mitigation goal.

Earth System Research Laboratory (ESRL)
ESRL was formed to pursue a broad and comprehensive understanding of the Earth system. At ESRL, three divisions are working toward a greater understanding of the changing climate system and its impacts through a number of areas aimed at understanding Earth system processes and changes, as follows:

Physical Sciences Division (PSD)/ESRL
The Physical Sciences Division core mission is to conduct physical science research to advance NOAA's capacity to observe, understand, critically evaluate, and advance prediction of the physical behavior of the earth system (atmosphere, ocean, cryosphere, hydrosphere, land) and related impacts on global-to-local scales over periods of time from days to decades. The Physical Sciences research activities have five strategic goals: (1) to improve understanding of Earth-system processes and maintain world-class capabilities in water resource research and boundary layer science through comprehensive observational studies and analyses; (2) to integrate climate, weather, and water research to support decision making, ecosystem-based management and assessments of marine ecosystem tipping points; (3) to diagnose, understand and explain extreme climate and weather events, and to develop an improved model-based capability to resolve and predict the behavior of these extreme events; (4) to advance understanding of regional processes and critically assess the skill of associated predictive tools; and (5) to conduct research and develop prototypes to improve NOAA's regional environmental information and services. To meet needs for science-based information, the program works closely with its internal partners and a broad external user community.

Chemical Sciences Division (CSD)/ESRL
The Chemical Sciences Division, in partnership with the Cooperative Institute for Research in Environmental Sciences (CIRES), conducts studies that are fundamental to our understanding and prediction of Earth's climate, U.S. air quality, and the stratospheric ozone layer. Related meteorological, dynamical, and radiative processes also are addressed when necessary. These goals are met through studies in the laboratory, extensive measurements in the atmosphere in focused field studies, diagnostic analyses, representation of these processes in models (in collaboration with others in NOAA and the extramural community), and interpreting the results to elucidate the roles of these processes. Research is focused on understanding and quantifying man-made and natural emissions of gases and particles to the atmosphere, chemical and physical processes that alter the composition of the atmosphere, and transport and mixing that redistribute pollutants throughout the atmosphere. NOAA provides this information to its customers in government, industry, and the public through the preparation of assessments and evaluations of the current and future states of Earth's stratosphere (ozone

layer), climate, and air quality, as well as the processes that link them. These evaluations inform decisions regarding mitigation options.

Global Monitoring Division (GMD)/ESRL

The Global Monitoring Division, in partnership with CIRES, conducts sustained observations and research toward understanding the global distributions, trends, sources, and sinks of atmospheric constituents that are capable of forcing change in Earth's climate and environment. This research advances climate projections and provides scientific policy-relevant, decision support information to enhance society's ability to plan and respond by providing the best possible information on atmospheric constituents that drive climate change, stratospheric ozone depletion, and baseline air quality. Sustained observations are conducted through globally distributed observing networks which include six manned Global Atmospheric Baseline Observatories, and as many as 250 different atmospheric parameters are measured. GMD supports and provides leadership in several components of the U.S. Global Change Research Program (USGCRP), much of the World Meteorological Organization's Global Atmospheric Watch program, and other international programs, including the Global Climate Observing System, the Baseline Surface Radiation Network, and the Global Earth Observing System of Systems. The U.S. scientific community coordinates its carbon cycle activities through the USGCRP North American Carbon Program, which aims to quantify, understand, and project the evolution of global carbon sources and sinks to better predict future climate. With input from other agencies, the Carbon Tracker analysis tool forms the foundation for routine spatial carbon maps and is essential for other USGCRP reports and products, such as periodic "State of the Carbon Cycle" reports and assessments that keep scientists and policy-makers abreast of progress in understanding the North American carbon cycle.

Geophysical Fluid Dynamics Laboratory (GFDL)

The Geophysical Fluid Dynamics Laboratory is engaged in comprehensive, long lead-time research on climate and Earth system sciences to better understand natural climate variability and anthropogenic climate change. Based on fundamental principles of meteorology, oceanography, hydrology, physics, chemistry, fluid dynamics, applied mathematics and numerical analysis, GFDL develops and uses mathematical models and high-performance computer simulations to advance understanding of the behavior of the atmosphere, ocean, biosphere, and cryosphere, and produce a range of projections about the future global climate, terrestrial and marine ecosystems, atmospheric composition, and air quality. GFDL research includes the predictability of weather and climate, including the hydrologic cycle, from global to regional scales; the structure, variability, and dynamics of the oceans; atmosphere-ocean interactions; role of land and cryospheric processes; global transport of chemical species and pollutants, and their forcing of climate change; biogeochemical cycles; Earth's atmospheric circulation; the sensitivity of global and regional climate; understanding where, when and how marine ecosystems may reach critical "tipping points"; and the rigorous understanding and projections of future risk of climate extremes to improve the reliability of multidecadal threat assessments for high-impact extreme events. GFDL's principal research products are peer-reviewed publications on the state and dynamics of the climate and Earth system, natural climate variations, and anthropogenic climate change. GFDL provides numerical models and model simulation datasets to its collaborators and the public. These products include contributions to Carbon Tracker and state-of-the-science Earth System Models used to project sea level rise and abrupt climate change, particularly in the Arctic. The Laboratory engages in national and international assessments such as those of the U.S. Global Change Research Program, Intergovernmental Panel on Climate Change, and World Meteorological Organization, providing information and data for decision making processes. GFDL has research partnerships within NOAA and with other Federal agencies, and other governmental and nongovernmental organizations. The latter include an active partnership with Princeton University through the Cooperative Institute for

Climate Science and additional collaborations through Columbia University with its Cooperative Institute for Climate Applications and Research.

Atlantic Oceanographic and Meteorological Laboratory (AOML)

AOML conducts research based on models and observations to understand and characterize the role of the oceans in climate variability and change. Techniques vary from shipboard-conducted process studies, models, long-term continuous time series, and satellite-derived products. In support of these studies, AOML presently manages significant portions of the following NOAA contributions to the internationally coordinated Global Ocean Observing System activities: the Global Drifter Program, U.S. Argo Consortium, Global Ship of Opportunity Program (for deployment of XBTs and underway surface ocean observations), CLIVAR Repeat Hydrography Program, Prediction and Research Moored Array in the Tropical Atlantic (PIRATA) Program, and Western Boundary Time Series Program. These activities include the design, implementation, maintenance, and enhancement of the observational network, real time quality control of the data for use by operational forecast agencies, delayed mode quality control of the data for use in scientific projects, and the production and provision of ocean products used by operational and research communities in their ocean activities. AOML also develops new instrumentation for observing the ocean. AOML's research related to ocean dynamics includes the Meridional Overturning Circulation, western boundary currents, and Gulf of Mexico and Caribbean Sea oceanography. In addition to global *in situ* and hydrographic observations, satellite observations and numerical modeling also complement and augment AOML's research. AOML participates in international research projects directed at developing new methods to observe the ocean for climate studies. In addition, AOML collaborates with NOAA's Pacific Marine Environmental Laboratory (PMEL) to augment and maintain the PIRATA array (the Atlantic's counterpart to the very successful Tropical Atmosphere Ocean array in the Pacific). The magnitude of carbon dioxide exchange and the quantification of uptake of carbon dioxide by the ocean are two key processes that are studied at AOML in collaboration with academic and NOAA partners, in particular, the Ocean Carbon Group at PMEL. The Ocean Carbon Group at PMEL addresses key issues pertaining to the global carbon cycle through observations, analysis, and interpretation.

Pacific Marine Environmental Laboratory (PMEL)

The Pacific Marine Environmental Laboratory improves scientific understanding of the changing climate system and its impacts by providing the core capabilities of research, technology development, and observing system implementation that are central to meeting NOAA's climate goals. PMEL has a strong history of innovation to meet the challenge of fielding a robust, accurate observation activity. PMEL climate activities include: (1) establishing and maintaining moored buoys in the Atlantic (PIRATA) and Indian (RAMA) Oceans as part of the Global Tropical Moored Buoy Array (GTMBA); (2) conducting Argo float deployment and research activities; (3) monitoring ocean carbon uptake and storage through moored and underway carbon dioxide measurements; (4) conducting NOAA/NSF operations in support of the global CLIVAR Repeat Hydrography program; (5) maintaining global ocean reference station time series moored arrays; (6) conducting marine aerosol, atmospheric chemistry, and air quality research cruises; (7) conducting autonomous glider sections of western boundary currents in the Solomon Sea; (8) observing ocean modeling system adequacy studies; (9) participating in ocean data management and information technology activities; (10) conducting Arctic climate research, focusing on the causes of rapid changes in Arctic climate over the past decade as compared to the more gradual temperature changes over the rest of the globe; and (11) supporting climate observations critical to international assessments, such as the Intergovernmental Panel on Climate Change (IPCC).

While most of these activities are conducted in partnership with OAR's Climate Program Office, PMEL also engages in two climate and ecosystem research activities that are more broadly focused: PMEL's Ocean Acidification (OA) and Ecosystems-Fisheries Oceanography Coordinated Investigations (EcoFOCI) research programs. Both programs work with other NOAA Line Offices to study the impacts of changing climate conditions on marine ecosystems. OA research focuses on the impacts of increased carbon dioxide concentrations in oceanic waters, while EcoFOCI studies the impacts of changing ocean and climate conditions on marine ecosystems in the Gulf of Alaska, Bering Sea, and U.S. Arctic Ocean areas, and contributes to operational Fishery Management Council products. For further information on both of these research programs, see the Other Ocean Programs/Ocean Acidification and Ocean Coastal and Great Lakes Research sub-activities in this document.

Air Resources Laboratory (ARL)

ARL's Climate Research and Development program concentrates on: (1) understanding how the interactions of atmosphere and the underlying land surface influence and are affected by the climate and, (2) analyzing long-term observational datasets to understand climate variability and change. ARL conducts studies that measure key physical and chemical processes that influence climate—such as the interaction of water in the atmosphere, soil, and plants. This includes understanding the water cycle and land cover/land use changes. This research provides a better understanding of how climate affects agriculture and drought, and supports calibration of remotely sensed soil moisture and land surface temperatures. ARL also analyzes climate observations to determine what natural climate variability and what climate trends have occurred in the past, with an emphasis on variability and trends above the earth's surface. ARL's research contributes to the evaluation and improvement of climate models and to national and international climate assessments.

Schedule and Milestones:

FY 2015 – FY 2019

Geophysical Fluid Dynamics Laboratory (GFDL)

- **Modeling**

Schedule/ Milestones	**FY 2015**	**FY 2016**	**FY 2017**	**FY 2018**	**FY 2019**
Earth System Modeling (ESM)	Simulate 20th and 21st century sea level rise using prototype next-generation models of ice sheet dynamics and other physics	Report on Arctic climate change assessment	Communicate ESM research findings through assessments, publications, and climate services	Complete experiments for International Assessment on Climate Change	Communicate ESM research findings through assessments, publications, and climate services

Marine Ecosystem Tipping Point Research	Develop high-resolution ocean simulation of historical multidecadal marine ecosystem variability	Hold a workshop with marine scientists and managers	Assess climate impacts on U.S. marine ecosystems	Develop high-resolution prototype seasonal-to-interannual prediction system of future marine ecosystem variability	Apply new ESMs for tipping point prediction in global estuarine, coastal, and benthic ecosystems
National and International Assessment Products	Develop quarter - degree model for reduction in tropical uncertainties of climate projections	Continue ESM development	Continue ESM development Release National Assessment	Use upgraded ESMs for regional climate change projections	Continue ESM development
Experimental Decadal Forecasts	Decadal projections using higher resolution coupled model	Continue Decadal Predictability studies	Continue Decadal Predictability studies	Decadal Predictability studies in climate extremes	Prototype decadal predictions of climate extremes

- Improved understanding of decadal-to-centennial climate change, variability and predictability, and increasing confidence in climate projections, using coupled-climate model (CM2.5) at 4 times the resolution of recent IPCC-class coupled climate models.
- Robust simulations of regional climate change around the world (including tropical storms) using 25-km resolution global atmospheric model.
- Improved realism of the NOAA Earth System Models and reduced uncertainty in future carbon cycle feedbacks by closing the nitrogen cycle and improving the representation of the terrestrial biosphere. Major feedbacks on the global carbon cycle.
- Reduction in percentage of uncertainty in possible twenty-first century sea level rise.
- Development of initial physical formulations to incorporate soot and dust aerosol impacts on snow and ice albedo in climate models, and improved sea ice models essential to developing a predictive understanding of Arctic climate change.
- A decadal climate prediction system, including an assessment of the level of predictability realizable from the system, in terms of sea surface temperature predictions, and predictions of related changes in extreme events (hurricane activity, drought, heat waves, flooding, etc.).
- Enhanced contributions to assessments of human impacts on climate through inclusion of more realistic physical processes and important feedbacks in climate models, and analysis of causes of past climate change; greater confidence in projections of regional climate impacts.
- Published datasets of marine ecosystem retrospective simulations, predictions, and projections.

Physical Sciences Division / Earth System Research Laboratory (PSD/ESRL)

- **Earth System Analysis**

Schedule/Milestones	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019
Cumulative field projects advancing water resources	3	4	5	6	7
Cumulative number of climate model simulations used to assess changes in extremes	120	150	180	210	240
Number of assessments of extreme weather and climate events, anomalies, and trends	3	3	3	4	4
Increase utilization of Earth system observations in the Russian Arctic as measured by cumulative publications	4	5	6	6	7
Carry out analysis of oceanic weather-climate observations in the tropics as measured by cumulative publications	2	3	4	5	6

- Co-lead and complete data processing and analysis of the DYNAMO experiment in the Indian Ocean to better understand the dynamics of the Madden-Julian Oscillation which may improve sub-seasonal weather and climate prediction over the United States.
- Assess the improvement in boundary layer wind forecasting at successive time scales using real-time assimilation of radar wind profiler data drawing from resources from the Wind Forecast Improvement Project sponsored by the Department of Energy (DOE).
- Assess the causes for recent variations in U.S. national and regional seasonal temperature, precipitation and drought.
- Develop a high-resolution global multimodel diagnostic capability to resolve high-impact heat wave, droughts, floods, and extreme precipitation to assess changes in the frequency and intensity of extreme events.
- Complete analysis of hydrometeorology testbed and CalWater experiments in terms of understanding the role of atmospheric rivers and aerosols in water supply and extreme precipitation.
- Quantify baseline performance on NOAA extreme precipitation forecasts over previous 10 years.

Chemical Sciences Division / Earth System Research Laboratory (CSD/ESRL)

Chemical Sciences

- Intensive field studies in the troposphere are conducted approximately every other year and are focused on atmospheric chemical and dynamical (e.g., boundary layer; complex-terrain flow) processes that affect climate (e.g., aerosol-cloud interactions) and air quality. These studies use aircraft and ship platforms, as well as ground sites.
- Climate research on the upper atmosphere (upper troposphere-lower stratosphere; UT/LS) is ongoing and includes both measurement and modeling components. Research foci include the stratospheric ozone layer and tropospheric-stratospheric connections, such as water vapor transport to the stratosphere; stratospheric ozone transport to the troposphere; effects of volcanic emissions; temperature trends; etc. A field study in 2015 will use measurements from UAS for investigation of water vapor distributions in the UT/LS.

- Fundamental laboratory studies of properties of compounds are ongoing. A principal focus is the detailed evaluation prior to manufacture of industry-proposed compounds for their greenhouse-warming potential and ozone-depletion potential. Additional studies investigate chemical reactions important to atmospheric chemistry, including heterogeneous and photolytic reactions.
- Top-down emission inventory evaluations are based on intensive field study results, satellite data, and focused short-term studies (e.g., in regions with oil and natural gas development activities). Inverse modeling techniques are utilized and improved as necessary.
- Short-lived climate pollutant (SLCP: e.g., black carbon; hydrofluorocarbons - HFCs) studies integrate laboratory data, field measurements, and modeling results to evaluate potential win-win solutions for climate, air quality, and stratospheric ozone depletion environmental issues. A key aspect of this research is improving the representation in models of those processes that affect production, distribution, and loss of SLCPs in the atmosphere.
- New instrument development and deployment is ongoing based on research needs.

Global Monitoring Division / Earth System Research Laboratory (GMD/ESRL)

- **Global Monitoring and Research**

Schedule/Milestones	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019
Cumulative number of updates to NOAA Annual Greenhouse Gas Index	11	12	13	14	15
Cumulative number of updates to NOAA Ozone Depleting Gas Index	10	11	12	13	14

- Continue to conduct sustained observations and research related to global distributions, trends, sources and sinks of atmospheric constituents that are capable of forcing change in the climate of the Earth. Continue to advance climate projections and provide scientific policy-relevant, decision support information to enhance society's ability to plan and respond. Continue research of improving instruments, reducing uncertainty values, economies of scale, calibration techniques, and statistical analysis of data.
- Updates to Daily/Monthly/Annual Products suite as appropriate (http://www.esrl.noaa.gov/gmd/dv/).
- Publish Annual Greenhouse Gas Index (http://www.esrl.noaa.gov/gmd/aggi/) and Ozone Depleting Gas Index Update (http://www.esrl.noaa.gov/gmd/odgi/).
- Updates and refinement to Carbon Tracker (http://www.esrl.noaa.gov/gmd/ccgg/carbontracker/).
- Maintain current Arctic observation capability in support of Arctic science as directed by NOAA's Annual Guidance Memorandum/Next Generation Strategic Plan.
- Provide timely South Pole Ozone hole updates (http://www.esrl.noaa.gov/gmd/dv/spo_oz/)
- Continue suite of radiation budget products including GMD's Solar Calculator (http://www.esrl.noaa.gov/gmd/grad/).

Atlantic Oceanographic and Meteorological Laboratory (AOML)

- Oceanic Heat Transport Analysis: Complete eight new reports using observations from ocean temperature and salinity profiles that describe the state of the ocean's meridional heat transport.
- Ship of Opportunity Program: Collect Upper layer temperature data and meteorological weather data.
- Surface Drifter Program: Provide the workforce to deploy and maintain an array of 1200 surface drifters, some equipped with pressure and wind sensors. AOML maintains the U.S. Data Acquisition Center.

- Ocean Observations Analysis: Continue to evaluate observing systems, monitoring and analysis of critical climate-related parameters such as ocean heat content, meridional heat transport, sea level trends, ocean acidification, and ocean currents.

Pacific Marine Environmental Laboratory (PMEL)

- Atmospheric Chemistry Program: Conduct a major survey cruise to monitor marine aerosols and air quality approximately every other year.
- Tropical Moored Arrays for Climate: RAMA is now expected to be complete in 2020. There will be two sites per year until all NOAA sites are completed, assuming the work is not affected by piracy in the Arabian Sea.
- Autonomous Glider Sections in the Solomon Sea: Complete two sections per year across the Solomon Sea, and conduct numerical modeling studies to help interpret the observations.
- Carbon Dioxide Time Series: PMEL will maintain 15 existing moorings and deploy an average of 5 additional moorings each year (FY 2015 – FY 2019), provided adequate funding support from the Climate and Ocean Acidification program offices.

AOML and PMEL

- Argo Floats: Collectively, AOML and PMEL deploy approximately 50 Argo floats per year to replace older floats that have reached the end of their useful lives. The global array consists of 3000 floats, each with an expected life span of four years.
- Ocean Climate Stations: Maintain OceanSITES moorings in the Deep Western Boundary Current, the Subtropical South Atlantic Ocean, and in the North Pacific (the Kuroshio Extension region in the NW Pacific and at station PAPA in the NE Pacific). Moorings are visited and refreshed annually.
  - Tropical Moored Arrays for Climate:
    - PIRATA array maintained in the tropical Atlantic.
    - Deploy and maintain moorings, and visit and refresh each mooring at least annually.
  - Ocean Carbon Uptake and Storage: Repeat hydrography cruises are carried out approximately every year. These are repeats of sections originally conducted more than ten years ago, during other international ocean monitoring programs, and show the long-term changes in ocean temperature, salinity, carbon dioxide, and other chemical concentrations, and other water properties. Ocean heat content can be inferred from the data.
  - Air-Sea Carbon Dioxide Exchange:
    - Maintain instruments that collect carbon dioxide underway measurements by three ships in the equatorial Pacific and three ships off the Pacific coast of North America. This is a very cost-effective way to monitor the oceans, requiring no funded research ship time and little intervention by scientists.
    - Complete four reports or publications describing carbon dioxide exchange at the ocean surface globally based on underway observations of carbon dioxide from ships of opportunity and research vessels.

Air Resources Laboratory (ARL)

- Climate Assessments: Contribute to national/international climate assessments (e.g., Intergovernmental Panel on Climate Change) to inform climate mitigation and adaptation (ongoing).
- Climate Observing Systems: Conduct studies on the design and evaluation of a highly accurate international observation system for the atmosphere above the surface, which will provide essential information for understanding and predicting climate change (ongoing).
- Spatial Variability: Perform studies of spatial variability around surface climate stations to improve interpretation of regional climate variability and change and to support evaluation of models (ongoing).

- Snow Measurement Technology: Participate in a World Meteorological Organization study on snow measurement technologies to improve characterization of snowfall variability and change—an important influence on water resources in cold and mountainous regions.
- Surface Energy Fluxes: Initiate evaluation studies of physical energy fluxes in different regions of the continental United States to improve land service model parameterizations and to improve seasonal predictions of water resources (ongoing).
- Low-Level Wind Study**:** Report on efforts to improve the prediction of low-level winds that will translate into more efficient wind energy production.

Performance Goals and Measurement Data:

Performance Measure: Number of new regional scale projections for assessments and decision support (per year)	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	1	3	4	6	7	8	9
Description: Regional scale projections will contribute to international assessments (e.g. CMIP 6, scheduled for 2014), national assessments under the U.S. Global Climate Research Program, and other assessments as requested. The number of meaningful regional projections possible will increase as NOAA's Earth System Model increases in realism and complexity. Examples of regional scale projections include: regional sea level rise projections that require explicit representation of the global eddy field in the ocean models; projections of parameters essential to ocean and coastal ecosystem forecasting; assessment of regional carbon budgets; and projections of climate change in the Arctic region that require improved sea ice models.							

Performance Measure: Improved climate model performance and utility based on model advancements (planned milestones) and climate assessments benefited (GPRA 16e)	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	28	24	24	24	24	24	24
Description: This measure will reflect the major advancements made in the long-term development of models and will reflect the value of models as the outputs are used in major assessments such as the Intergovernmental Panel on Climate Change (IPCC) and the United States Global Change Research Program (USGCRP) National Assessment. Models are used to further research and discovery, are considered valuable for analysis in assessments, and improve the value of assessments for policy makers. A major outcome of this work will be improved regional forecast/ prediction/ projection products based on improved models and methodologies. This measure is based on the number of model advancements, model evaluations, and assessments and publications that use the model outputs.							

Performance Measure: Percentage uncertainty in possible 21st century sea level rise (0-1m = 100% uncertainty)	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	75%	74%	65%	55%	50%	40%	30%

Description: This metric is calculated using the IPCC 4th Assessment Report estimates for the range of 21st century global-mean sea level rise. Completion of the proposed effort will reduce the uncertainties by almost half as a result of modeling that better captures the more accurate measurements of ice-sheet discharge, thermal expansion, and regional anomalies due to ocean circulation and heat storage. Reducing the uncertainty in sea level rise will allow government and industry to have better information on projected sea level rise and therefore tailor their planning and actions to address the impacts.

Performance Measure: Percent of labs that have had formal expert peer reviews in the past 5 years and were rated effective in terms of quality, mission relevance, and performance	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	100%	100%	100%	100%	100%	100%	100%

Description: This performance measure is recognized by the National Academy of Sciences report *Evaluating Federal Research Programs,* which states —The most effective means of evaluating Federally-funded research programs is expert review.

Performance Measure: Percent certainty associated with the carbon dioxide exchange at the ocean surface globally	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	51.5%	52%	52.5%	53%	53.5%	54%	54.5%

Description: Based on observations, studies, and publications quantifying the exchange of carbon dioxide at the ocean surface, there will be improvement in the understanding of the oceans' capacity to sequester carbon dioxide. This in turn controls the atmospheric carbon dioxide that is the major greenhouse gas. The resulting changes in ocean chemistry (ocean acidification) will also be better described, providing a framework for determining the impacts of ocean acidification on ecosystems.

Performance Measure: Annual number of journal articles published in peer-reviewed literature	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	50	50	50	50	50	50	50

Description: PMEL conducts basic research and reports the results in peer-reviewed journal articles. The annual publication total is a measure of the laboratory climate research output. Past research papers have addressed such topics as describing the predictability of El Niño and La Niña events and describing the negative impacts on marine ecosystems of ocean acidification. These publications document advances in scientific understanding that lead to improved capabilities (analyses, forecasts, etc.) or identify "next steps" for research.

REGIONAL CLIMATE DATA AND INFORMATION

NOAA's Regional Climate Data and Information Program, overseen by the Climate Program Office, supports *in situ* and remotely-sensed global climate data and information to: promote environmental stewardship; describe, monitor and assess the climate; and support efforts to predict changes in the Earth's environment. This program helps address the Next Generation Strategic Plan Objectives related to climate information services and a climate-literate public. Through information collected by our climate observing networks, we can assemble, develop, and communicate data and information about the trends and predictions of climate and weather events to decision makers. NOAA supports the following under the Regional Climate Data and Information Program:

- The **U.S. Climate Reference Network** (USCRN) provides baseline, high-quality surface observations of air temperature and precipitation to detect long-term changes in climate through a robust climate record. The USCRN also supports the National Integrated Drought Information System (NIDIS) [1] through the inclusion of soil moisture sensors, which provide data critical to understanding drought.
- The **U.S. Drought Portal** is part of NIDIS, and it provides users with the ability to determine the potential impacts of drought and their associated risks, while also providing needed decision support tools. More information is available at: http://www.drought.gov.
- NOAA's **Observing System Monitoring Program** provides early detection and remediation of network problems that can adversely affect the quality of data records and diminish the ability to evaluate climate variability and change.
- NOAA's **Assessment Services Program** delivers climate information to support decision-making by providing authoritative, relevant, accessible and useful assessments in a timely, sustained, and repeatable manner for a wide range of audiences and key stakeholders. The program supports three types of climate assessment: national and international science assessments, problem-focused assessments, and needs assessments.
    - As part of the Assessment Services program, in coordination with the U.S. Global Change Research Program, NOAA supports the technical support unit for the National Climate Assessment, participates in the co-development of the Global Change information System (GCIS), which is a comprehensive web-based information system including information for different audiences and transparent access to data and sources, and funds foundational science, especially at the regional level.
- The **Climate Model Data Archive** will generate and house model-based data records and implement an operational archive and access capability for the next generation high resolution weather and climate reanalysis datasets. The Archive also addresses the recommendation of the NOAA Science Advisory Board that NOAA develop products from climate model outputs. The Climate Model Data Archive provides a single point of access to several new NOAA datasets and will improve linkages between research findings and the transfer of those findings into operational capabilities. The Climate Model Data Archive will be designed to provide critical data to the scientific community while also conveying key aspects of complex scientific data in a manner accessible to non-specialists and NOAA's climate information user communities.
- In May 2013, NOAA transitioned the **Climate.gov** Portal from a prototype to an operational phase to represent the breadth of NOAA's climate science, data, and information services. NOAA Climate.gov serves as the public's primary online point of entry, and as a cornerstone of the agency's Climate Mission Goal: "a climate-literate public that understands its vulnerabilities to a changing climate and makes informed decisions." The site offers user-friendly information

[1] The NIDIS program is funded through the Regional Climate Data and Information program and the Climate Competitive Research program.

services, decision support tools, and data products in formats that are readily usable by the climate interested public, educators, businesses, planners, resource managers, policy leaders, and public media.

- The **Communications and Education Program** is actively working to build NOAA's and partners' capacity for climate communication, education, and engagement, while also working to integrate NOAA's and its partners' climate data and information into a coordinated portfolio of projects, products, and partnerships to promote climate literacy and enhance climate-related decision making.
- The **Arctic Research Program** focuses on sustained observations and retrospective analysis of key variables in the Arctic region's atmosphere, ocean, and sea ice cover to document variability, detect change, and evaluate impacts of climate change on marine ecosystems. The Arctic Research Program (ARP) and its partners have been leaders in documenting the changing state of the Arctic region and reporting the changes to the public and policy officials. The ARP also works collaboratively with national and international agencies.
- The mission of the **National Climate Predictions and Projections (NCPP) Platform** is to accelerate the application of knowledge about climate variability and change at regional and local spatial scales to adaptation and preparedness planning efforts. NOAA also conducts a Communication and Education Program that has aims to improve public climate science literacy and to raise public awareness, understanding of, and engagement with NOAA's climate science and services programs.
- NOAA provides funding for both internal and external research and development programs through CPO's **Climate and Societal Interactions** (CSI) activity. CSI provides national leadership in developing interdisciplinary science and services, including assessments, for application in climate-sensitive sectors and regions. The goals of CSI are: (1) identification and articulation of user-community requirements in multiple sectors, initially with regard to water resources and the coastal zone, then branching to related sectors; (2) Research and development of innovative and broadly applicable approaches to support decision-making, especially for risk characterization; and (3) promotion of the transfer of knowledge, tools, and products across climate research efforts within NOAA, across the Federal government, nationally, and internationally. In addition, several of CSI's initiatives support the Coping with Drought Initiative of NIDIS.
    - As part of CSI, the **Regional Integrated Sciences and Assessments** (RISA) program supports research teams that help build the Nation's capacity to prepare for and adapt to climate variability and change. Core research objectives of RISA include: understand decision contexts for using climate information; perform interdisciplinary science and research; maintain diverse, flexible user networks for sharing knowledge; and innovate climate services to enhance the use of science in decision-making by local, state and federal partners.

Schedule and Milestones:

National Integrated Drought Information System (NIDIS)

Schedule/Milestones	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019
Number of soil moisture sensors reporting in real-time	114	114	114	114	114
Number of interoperable drought systems accessible through the U.S. Drought Portal	32	36	40	40	40

Assessment Services

- FY 2015 - 2019: Support the Technical Support Unit for the National Climate Assessment
- FY 2015 - 2016: Improve and update GCIS (particularly with phased updates from indicators system).
- FY 2016: Support the development of foundational science, including at the regional level to be reflected in the National Climate Assessment product suite.
- FY 2017: Produce reviewable draft of the National Climate Assessment, update of assessment content online.
- FY 2018 - 2019: Improve and update the GCIS. Complete and publish National Climate Assessment synthesis.

RISA

- FY 2015: Climate training for US Forest Service employees.
- FY 2015: Hazard outlook for disaster management in the Western U.S.
- FY 2015: Water reservoir data visualization tool for the Southern U.S.
- FY 2016 – 2017: Climate training for tribal communities in the Southern U.S.
- FY 2018 – 2019: New experimental drought indicators based on decision making needs in the NIDIS Pilot regions.

NOAA Climate.gov Portal

- FY 2015: Increase the number of educators who incorporate the Teaching Climate section's climate education resources into their classrooms and/or informal science education institutions.
- FY 2015: Build and launch a mobile app version of the Global Climate Dashboard
- FY 2015: Expand the scope and refine the functionality of the "Data Snapshots" area within Maps & Data.
- FY 2015: Expand the scope and refine the functionality of the "Datasets Catalog" within Maps & Data.
- FY 2015 and FY 2017: Conduct Quality of Relationship measure to assess and evaluate Climate.gov's use and usability by target audiences.
- FY 2016: Develop and deploy a new "Climate Explorer" and "Climate Widget" functionality for browsing climate data in geospatial and historical contexts.
- FY 2016: Make user-driven refinements in the Portal's design and functionality.
- FY 2018: Make user-driven refinements in the Portal's interface design and functionality. This is an ongoing activity based upon lessons learned from bi-annual surveys and focus group sessions with members of our target audience. The Web is a rapidly evolving medium so periodic, user-driven upgrades and refinements are essential to Climate.gov's success.

Communication and Education

- FY2015-2016: Launch a series of public dialogs to help participants understand their vulnerability to extremes of weather, climate and the environment, and to assess the costs of particular adaptation and/or mitigation options versus the costs of inaction.
- FY 2015: Finish building out geospatial tools that enable resource managers to place maps, data, and information on impacts and affected resources in a place-based context relevant and resource management.
- FY2015-2019: Launch a new public engagement effort to utilize the new geospatial tools via direct engagements, using telepresence.
- FY 2015-2019: Sustain and grow the annotated collection of thoroughly reviewed digital climate

educational resources.

- FY 2015-2019: Continue publishing narratives and data visualizations that show how NOAA advances climate science understanding, and how those advances benefit society.
- FY 2015-2019: Offer courses, workshops, and trainings on climate science and adaptation for our target audiences, for NOAA's and partners' staff, and for the international community, based upon their needs and feedback.

Arctic Research Program

- FY 2015: Complete the Annual Arctic Report Card.
- FY 2015: Maintain five ice buoy deployments for the International Arctic Buoy Programme.
- FY 2015-2017: Service the Arctic upward looking ice sonar on the Chukchi Plateau.
- FY 2015-2017: Deploy Ice mass balance buoys in the Pacific Arctic.
- FY 2015-2019: Carry out RUSALCA program in the Pacific Arctic with U.S. and international partners.
- FY 2015-2019: Continue Arctic Atmospheric Observatory observations.

Deliverables:

National Integrated Drought Information System (NIDIS)

- Develop monitoring gaps analysis, develop improvements in monitoring (e.g., stream flow and snow), and perform spatial analysis of water demand for the pilot basins.
- Develop and improve drought indicators and indices, such as: (1) the Natural Resources Conservation Services update to the Surface Water Supply Index; (2) improve and utilize low flow impacts database; (3) custom drought index server; and (4) water demand projections and revised triggering criteria (threshold for making management decisions).
- Produce and deliver drought impacts research to regionally specific information products on the U.S. Drought Portal.
- Assimilate drought impacts data and information into a database for use with different types of drought conditions across climate timescales into drought and water management plans.
- Sustain close coordination and collaboration between drought early warning activities and the planning and preparedness mission responsibilities of partner federal agencies, including the National Drought Resilience Partnership (NDRP).

NOAA Climate.gov Portal

- Improve access to NOAA's climate science data and information, and decision-support tools via a comprehensive Web portal with four audience-focused sections and conduct bi-annual comprehensive evaluations of the Portal's overall impacts on its target audiences.
- Continue evolving and refining NOAA Climate.gov in response to stakeholder communities' needs and interests.
- Work with Data.gov and the Federal government's "Big Data" initiative to seamlessly integrate Climate.gov together with Data.gov.

Arctic Research Program

- Contribute annually to the following Arctic Observing activities:
    - Three Moorings: one in the western Bering Strait, one on the Chukchi Plateau, and one in a transit pathway for Pacific water as it enters the Arctic Basin to monitor variability in the flux of heat, salt, nutrients, marine life, and sea ice thickness.
    - One repeat hydrographic, sea ice, and ecosystem expedition in the Pacific Arctic with continued monitoring of the U.S. Distributed Biological Observatory and its counterpart in the western Chukchi Sea.

- One to three international Arctic Climate-Atmospheric Observatories with our Canadian, Russian, and other international partners.
- Sea ice thickness observations from ice mass balance instrumentation.

- Annual support for the Arctic Report Card.

Performance Goals and Measurement Data:

NIDIS Early Warning Systems (to support Regional Services delivery)

Performance Measure: Number of states and territories working with NIDIS to incorporate drought early warning information into their drought adaptation and mitigation plans (Cumulative)	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	4	5	7	10	15	22	26

Description: This performance measure is based on the number of states and territories that partner with NIDIS to incorporate drought early warning information into their drought planning activities. Activities that count toward this measure include: local or regional drought planning/management groups; use of tailored information from the U.S. Drought Portal to establish drought indicators and set management triggers in state and territory drought adaptation and mitigation plans; and incorporation of information from basin specific drought monitors developed through the drought early warning information systems into either state and territory drought adaptation and mitigation plans or as part of state and territory drought planning and management groups.

Assessment Services

Performance Measure: Annual number of climate change related impacts, vulnerability, adaptation, or mitigation information topics addressed in the Assessments	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	8	8	8	8	8	8	8

Description: This performance measure will demonstrate the role of formal climate change assessments in decisions to address climate change impacts by identifying the number of topics addressed in the assessments that are considered by business, government, or the public that affected decisions related to improved climate resilience. Information topics are based on the U.S. Global Change Research Program report, "Global Climate Change Impacts in the U.S." This measure will track the extent to which the USGCRP topical information items are used by industry, etc., to inform their key decisions on how to mitigate or adapt to climate change.

NOAA Climate.gov Portal

Performance Measure: Percentage growth in number of visits to NOAA's Climate Portal over the preceding year's measure	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	155%	FY13+ 10%	FY14+ 10%	FY15+ 10%	FY16+ 10%	FY17+ 10%	FY18+ 10%

Description: This performance measure will show the ongoing increase in the average number of visits to NOAA Climate.gov among the four target audiences the Climate Services Portal serves0 The average number of monthly visits in FY 2012 was 56,932. The average number of monthly visits in FY 2013 was 145,390, 155% growth above the FY 2012 baseline.

Communication and Education

Performance Measure: Improvement in the index measurement of the Quality of Relationship between engagement personnel and the public they serve (Measure 16f).	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	N/A	75	N/A	77	N/A	79	N/A

Description: The Quality of Relationship (QoR) instrument measures are comprised of the following five elements: awareness, trust, satisfaction, use/usability, and control mutuality. Like the American Customer Satisfaction Index, the QoR instrument produces an index score from 0-100. The goal is to monitor and increase the Quality of Relationship with each of our priority publics as they access, understand, and integrate climate information, products, and services into their decision-making. The first QoR measure was made via a combination of a survey and focus groups, and established a baseline measurement of 72.6 in FY 2012. We will perform follow-up measurements every other year to determine whether and how much we're improving our QoR with our target publics; and to take corrective action if we find that we're not.

Regional Information Applications

Performance Measure: Number of regionally and sectorally focused climate impacts and adaptation studies communicated to decision makers (per year)	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	27	27	27	27	27	27	27

Description: Number of peer-reviewed publications and reports published and released in one fiscal year. The publications/reports are developed through interaction with and/or communication to stakeholders. Publications and reports are collected from investigators conducting climate impacts and adaptation research in cooperation with stakeholders. The goal of this research is to better understand and enhance the use of NOAA products and information to meet user requirements for natural resource management information in various sectors (e.g. drought and water resources, fire risk, ecosystem and coastal impacts, sea-level rise, human health, agriculture, etc.)

Climate & Societal Interactions

Performance Measure: Number of U.S. coastal states and territories demonstrating 20% in annual improvement in resilience capacity to climate hazards (Each Year)	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	14	16	18	20	22	22	22

Description: As an indicator for this measure, data is used from the existing hazards resilience GPRA Measure 18e "Percentage of U.S. coastal states and territories demonstrating 20 percent or more annual improvement in resilience capacity to weather and climate hazards." To meet the 20 percent or more improvement in resilience capacity, coastal counties representing at least 20 percent of the state's coastal population must meet or exceed predefined performance targets for each of the contributing areas of training, technical assistance, and outcomes.

Performance Measure:	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
Number of states or territories using new or tailored climate services (tools, information, technical assistance, or products) as a result of regional, state and local interaction with decision makers (Each Year)	4	5	7	8	9	10	11
Description: The number of products and services, provided or existing products and services that are modified/expanded for new user groups or regions. 'Products and services' includes technical assistance, training, and guidance documents to enable planning and decision making. [This measure is partially based on the current GPRA: Number of regionally and sectorally focused climate impacts and adaptation studies communicated to decision makers.]							

Performance Measure:	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
Annual percentage of U.S. states and territories that use NOAA climate information and services to improve decision making in the face of a changing climate (Measure 16d)	22%	24%	25%	27%	29%	29%	30%
Description: Number of states and territories where climate information is integrated into state and territory planning and decision making (e.g., changes in policies, plans, and actions), as well as indicators of success such as training and technical assistance. Percentage of improvement in state and territory resilience to climate hazards. This measure is an indicator of societal benefit derived from the use of NOAA climate information in public decision making in states and territories. This performance measure will track the numbers of states and territories that are benefiting from the inclusion of NOAA climate information in their decision making processes. It will also show how these decisions will lead to better results or improved decisions based on inclusion of this climate information. The measure accounts for all 50 states and five U.S. territories.							

CLIMATE COMPETITIVE RESEARCH

Climate Competitive Research funds high-priority mission-critical climate science through a competitive selection process within NOAA and with our academic partners to advance our understanding of Earth's climate system, including its atmospheric, oceanic, land, and snow and ice components, as well as the impacts of climate on society. The program supports research that is conducted in regions across the United States, at national and international scales, and globally. Outcomes from the Climate Competitive Research program have directly benefited NOAA's operational climate products. The program also provides strategic guidance and oversight for the agency's climate science and services programs.

Competitive grant efforts within Climate Competitive Research are organized under two activities:

Earth System Science

The Earth System Science (ESS) activity provides the process-level understanding of the climate system through observation, modeling, research analysis, and field studies to support the development of improved climate models and predictions in support of NOAA's mission. Major objectives include:

1. Understanding and improving the prediction of tropical convection, with a focus on identifying the key processes involved in linking convection with environmental moisture and responsibility for the dynamic evolution of cloud populations on intra-seasonal time scales;
2. Identifying the location, magnitude, dynamics, and variability of global carbon sources and sinks; understanding how ocean ecosystems are impacted by changes in carbon cycling and the role of these ecosystems in regulating the ocean’s carbon uptake; and
3. Improving understanding of the role of aerosols and chemically-active greenhouse gases in the global climate system.

ESS-sponsored research is carried out at NOAA and other Federal laboratories, NOAA Cooperative Institutes, academic institutions, and private research companies, and is coordinated with major national and international scientific bodies including the World Climate Research Programme, the International Geosphere-Biosphere Programme, and the U.S. Global Change Research Program.

Modeling, Analysis, Predictions, and Projections

The mission of the Modeling, Analysis, Predictions, and Projections (MAPP) activity is to enhance the Nation's capability to predict variability and changes in Earth's climate system, to improve the representation of Earth system processes in models, and to test the limits of model capabilities towards the goal of producing model output on scales relevant to decision makers. MAPP focuses on the coupling, integration, and application of Earth System Models and analyses across NOAA, among partner agencies, and with the external research community. Primary objectives include:

1. Improving Earth System Models;
2. Developing a national multi-model ensemble prediction system for intra-seasonal to inter-annual time scales; and
3. Advancing decadal climate predictions and projections.

MAPP focuses on targeted infrastructure support, operates a competitive grants program, encourages community interaction through task forces and webinars, and supports mechanisms that enable the transference of research findings into NOAA's operations.

Climate Monitoring, Analyses, and Diagnostics (CMAD)
CMAD contributes to the development of continuous records, analyses, and diagnostics of a range of ocean, atmosphere, and land surface parameters based on observational information. CMAD ensures that high-quality data sets needed to understand the climate system are available to the research community for further analysis and supports projects that document and study observed variations in climate. Analysis products support other program efforts in modeling of the climate system and developing targeted services to better inform society about potential climate impacts and possible response options.

Climate and U.S. Fish Stocks
Healthy and productive fisheries are an essential component of U.S. economies and societies. Americans consume about five billion pounds of seafood each year.[2] In 2011, U.S. marine commercial and recreational fisheries contributed approximately $200 billion in sales impacts and 1.7 million jobs to the national economy.[3] Sustainable fisheries create and sustain jobs, stabilize economies in coastal working waterfronts, provide opportunities for commerce, and help to meet the growing demand for seafood across the U.S. and the world. This program advances understanding and management of the impacts of climate variability and change on U.S. fish stocks, their prey, and habitat, with a focus on the Northeast groundfish region.

More information on the wide variety of climate research programs is available at: http://www.climate.noaa.gov/cpo_pa/.

Performance Goals and Measurement Data:

Performance Measure: Cumulative number of science-based adaptation tools and technologies that are used by NOAA partners and stakeholders to improve ecosystem-based management of fisheries.	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	N/A	N/A	0	1	2	3	5
Description: This measure tracks success in translating research findings into adaptation tools and technologies used by fisheries management community. The use of these products will improve sustainable management to enhance ecological and economic resilience in the face of change.							

[2] National Marine Fisheries Service. 2012. Fisheries of the United States, 2011. U.S. Department of Commerce, Current Fisheries Statistics No. 2011.
[3] National Marine Fisheries Service. 2012. Fisheries Economics of the United States, 2011. U.S. Department of Commerce, NOAA Technical Memorandum. NOAA Fisheries-F/SPO-128, 136p.

Performance Measure: Cumulative number of new decadal prototype forecasts and predictions made with high-resolution coupled climate models	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	2	3	4	5	6	7	8
Description: One of the goals of this activity is to develop new prototype forecasts and predictions on decade time-scales for climate changes and impacts such as sea level rise, Arctic climate impacts, and rapid climate change. These forecasts and predictions are dependent on the development of state-of-the-art climate models.							

Performance Measure: Cumulative site-years of data collection for cryospheric, boundary layer mean and turbulent properties, hydrometeorological, and oceanic process studies	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	20	30	40	50	60	65	70
Description: Process studies in the polar regions, over the ocean, in coastal watersheds, and mountainous terrain depend on precise, robust, routine, and relevant observations of the Earth system at time and space scales to diagnose its behavior and to assess the skill of predictive tools used to forecast its future.							

Performance Measure: Cumulative number of reports to stakeholders and decision makers that provide a policy-relevant scientific synthesis of results from intensive field studies, process studies, and analyses.	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	2	2	3	3	3	3	3
Description: Reports to stakeholders provide a distillation of key scientific findings on emissions, transport, atmospheric processing, and impacts of climate forcing agents, their precursors and species related to air quality degradation to inform policy development and emission management strategies for climate and air quality. Recent stakeholders include the Texas Commission on Environmental Quality (TCEQ) and the California Air Resources Board (CARB).							

Performance Measure: Cumulative number of substances, proposed as replacements for stratospheric ozone depleting industrial compounds (e.g., solvents; refrigerants) whose ozone depleting potential and greenhouse-warming potential have been evaluated	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	2	2	3	3	3	3	3
Description: Provides to industry stakeholders critical information on climate impacts of proposed replacement stratospheric ozone depleting chemicals prior to manufacture.							

Performance Measure: Cumulative number of individual emission sources and source regions relevant to climate and air quality whose inventories have been evaluated for accuracy via top-down analyses	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	1	2	3	3	3	3	3
Description: Provides verification of critical inputs to climate models resulting in reduced uncertainty in model outputs, which provides decision makers greater confidence in establishing policies and emission management strategies.							

Performance Measure: Uncertainty of the North American carbon sink to better understand the contribution of human activities toward increasing atmospheric carbon dioxide and methane (million tons carbon/year) (Measure 16b)	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	405	410	410	405	400	400	390
Description: The provision of NOAA scientific guidance to policymakers concerned with managing emissions of carbon dioxide requires NOAA to assess and quantify the sources of carbon variability. This GPRA measure demonstrates the scientifically accepted level of confidence in carbon measurement that is needed to accurately evaluate levels of carbon emissions in North America. The uptake of atmospheric carbon (mainly as carbon dioxide) by the biosphere across North America is of the order of one billion tons (one petagram) per year.							

Performance Measure: Cumulative number of studies on the design and evaluation of an international climate-quality observation system for the atmosphere above the surface	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	2	3	3	3	4	4	4

Description: Sustained observations of Essential Climate Variables will (1) ensure that climate scientists will be able to more confidently identify upper-air climate change signals and (2) provide essential calibration data for satellite observing systems so that significant progress can be made in the generation of global climate products and derived information to manage the Nation's response to the climate and climate change. This measure refers to publication of studies to optimize the design and implementation of a reference upper-air observing network.

Performance Measure: Cumulative number of regions for which a surface flux study has been conducted	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	1	2	3	4	5	6	7

Description: "Surface flux" refers to the exchange of energy (e.g., heat) and substances (e.g., water) between the land surface and the atmosphere. These fluxes are critical drivers of climate change because they affect air and land temperatures and other important aspects of the climate. These fluxes also drive important climate-related phenomena such as droughts and such weather-related phenomena as the development of storms. Surface fluxes vary significantly with surface and weather conditions. The measurements taken in this work and the related analyses will provide essential information for improving the representation of the fluxes in climate and weather models, improving the accuracy of both weather and climate forecasts.

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PROGRAM CHANGES FOR FY 2015:

Climate Laboratories and Cooperative Institutes: Atmospheric Baseline Observatories (Base Funding: $7,200,000 and 12 FTE; Program Change: +$3,000,000 and 0 FTE): NOAA requests an increase of $3,000,000 and 0 FTE for a total of $10,200,000 and 12 FTE to maintain NOAA's 50+ year effort of sustained observations and research at the six Atmospheric Baseline Observatories (ABO) through OAR's Earth System Research Laboratory's (ESRL) Global Monitoring Division (GMD).

Proposed Actions:
This increase will allow NOAA to continue full operations at all six ABOs. The ABOs are at operational risk due to long-term erosion of funding, in part through rapidly rising costs at these remote sites. In particular, the National Science Foundation (NSF) has provided significant support for years, which will no longer be able to continue in the full amount as a result of cuts to the NSF budget. NSF support has included the provision of free buildings, maintenance, janitorial and refurbishment support, transport of staff and equipment to the South Pole and Greenland, helium for balloons, food and accommodations for NOAA staff (year around) and utilities at both the South Pole and Summit stations. In the case of the South Pole this support began in 1956 and is now approaching ~$1M/year. NSF has informed the Global Monitoring Division that NOAA will have to start paying the total cost of transport of staff and supplies, and an even share of building replacement and maintenance. Some of these charges will begin in 2014 and be fully implemented in 2015. Resources from the other sites would have to be diverted to pay for these rising costs. This cost increase over the years, compounded by the risk of NSF funding decline, has led to degraded operations, unsustainably-deferred maintenance, and substantial staff reductions. This request is in recognition that this degradation now threatens these long-term, high-quality measurement records, which have a robust 50+ year-long history that remains timely and relevant today.

With this program increase, NOAA will ensure that all six observatories continue to provide the measurements necessary to document trends and distributions of atmospheric constituents influencing global climate, ozone depletion, and changes in baseline air quality for years to come. The present construct of this network, covering the hemispheric scale north-to-south, is the minimum coverage required to monitor the trends and relative source/sinks between the northern hemisphere sources of anthropogenic effluents, and the southern hemisphere sinks (great southern oceans and associated atmosphere).

This proposed funding will allow for the continued operation of all ABOs and the following specific improvements:

- Repair and modernization of infrastructure across all ABOs to limit the amount of downtime, increase safety, continue support for cooperative data collection with dozens of partners from different agencies and research institutions, increase data delivery efficiency, and continue to enhance overall research effectiveness. Without this support, services will drop dramatically, data streams will be reduced in number and speed of delivery, and two of the six ABOs will be at-risk of near-term closure (FY 2016 or 2017).
- Enhanced ability for joint project undertaking with NOAA's 100+ partners, thus leveraging NOAA's costs and ensuring relevant data for the future. Without this additional funding, NOAA will not be able sustain many joint, long-term monitoring efforts; several have been terminated already.
- Continued delivery of ongoing data streams for substances such as carbon dioxide, methane, ozone, aerosols, and surface radiation for joint assimilation into meteorological and Earth-system models to improve weather forecasts, understand changes in the Earth-system, and provide objective verification of greenhouse gas (GHG) sources and sinks.

- Ability to address rapidly increasing costs of energy, maintenance, and operations at remote locations. Facing rapidly increasing change, NOAA's polar observatories are especially at risk with increasing costs of transport and other logistics falling on NOAA. Without additional resources, the increased costs to maintain operations at these increasingly important facilities would cause a reallocation of ABO resources that would dramatically reduce or terminate operations at other sites, e.g., Mauna Loa, Hawaii.

Statement of Need and Economic Benefits:
The ABOs are world-class observing facilities that conduct 250 high quality measurements crucial to understanding atmospheric drivers of environmental change, national scale air quality, and ozone distributions and trends. NOAA's ABOs were the first to show the exponential global increase in GHGs in the late 1950s, confirm the appearance and growth of the Antarctic ozone hole, document the transport of Asian pollution to the US, and point to the manmade chemicals causing the ozone destruction (1980s). They also help ensure continued recovery of the stratospheric ozone layer under the US Clean Air Act (1990) requirement to monitor and report on ozone and ozone-depleting gases covered in the Montreal Protocol (1987) and Clean Air Act. More recently, the Trinidad Head Observatory has been identifying atmospheric pollutants entering the western U.S. from burgeoning economies in Asia. As future environmental changes on Earth are unknown, yet will likely be significant in coming decades, the importance of continuing these high quality observations persists.

The ABOs have a long-standing record of quality and duration. The measurement of trends in global atmospheric gas concentrations was one of the first capabilities globally to quantify such changes with broad effects on the Earth system, including measurements of long-range transport of pollutants. Today, two of several unique products providing valuable tracking information are the NOAA Annual Greenhouse Gas Index (AGGI) and the Ozone Depleting Gas Index (ODGI). As Earth's environment changes, the nexus of environmental stress and globalization will alter the economic, political, and resource landscape of today's world. U.S. security depends on the ability to ascertain and respond to environmental change. The ABOs provide the historical context as well as trending and magnitude of those changes and serve as the basis for understanding and predicting the degree of change in the future.

Data provided by the ABOs is used by more than 500 partners and stakeholders, including international organizations, universities, other federal agencies, and public and private organizations. ABO data sets have been cited in thousands of peer-reviewed research papers since their inception and are fundamental components of national and international assessments. For example, the steadily rising, 50+ year-long carbon dioxide record from Mauna Loa – known as the Keeling curve, along with other greenhouse gases, black carbon, and aerosols, form the basis for understanding our changing climate.

The composition of Earth's atmosphere is rapidly changing owing to the addition of anthropogenic gases and aerosols, including black carbon. Climate change induced by these radiative forcing agents involves uncertainties, synergies, and feedbacks that make forecasting climate, projecting changes in weather, and developing mitigation strategies problematic. Reliable NOAA atmospheric composition and radiative forcing data are crucial for addressing these uncertainties and for evaluating the effectiveness of control strategies for greenhouse gases, black carbon, and ozone-depleting substances. Sustaining these long-term records is essential for understanding changes in the Earth System and is necessary for international negotiations and national decisions on climate, ozone-depletion, and air quality.

NOAA's ABOs – Barrow, AK (established 1973); Trinidad Head, CA (2001); Mauna Loa, HI (1956);

American Samoa (1974); South Pole, Antarctica (1956) and Summit, Greenland (2001) – are the backbone of NOAA's efforts to monitor the constituents that influence global climate change, ozone-depletion, global pollutant transport, and baseline air quality. The ABO sites were chosen specifically to cover a "pole-to-pole grid" at sites representative of the atmosphere in each regional location. For example, Barrow, AK was established to cover the Arctic; Mauna Loa, HI measures the northern mid-latitudes where the air is pure; Samoa, AS covers the southern mid-latitudes; and the South Pole measures the Antarctic. These four form the backbone of regional air measurements. Added slightly later in 2001, the Trinidad Head, CA site was set up measure the increasing inflow of ozone pollutants and greenhouse gases from Asia into the western U.S.; and Summit, Greenland was established in the same year to measure U.S. and European pollutants flowing into the Arctic. The six sites in tandem form a well-linked network, yet each has a distinctive role to play. One sample scientific highlight from each ABO includes:

- Barrow, AK measures surface ozone destruction and captured the extent of atmospheric mercury deposition into the Arctic food chain carried into the Arctic from industrialized nations;
- Mauna Loa, HI is famous for the Keeling curve and the discovery of the steady increase in the most important greenhouse gas - carbon dioxide;
- Trinidad Head, CA measured large inflows of ozone effluents from Asia to the U.S. that are affecting the background ozone levels in California;
- Samoa, in American Samoa, has captured large differences in concentration of greenhouse gases between the northern and southern hemispheres;
- South Pole, is well known as the site for the Antarctic Ozone Hole and recovery measurements;
- Summit, Greenland has documented episodic injections of large blobs of European air pollutants containing black carbon and ozone that have wafted into the Arctic.

Measurements from the ABOs include greenhouse and ozone-depleting gases, aerosols and black carbon, surface and stratospheric ozone, and net solar radiation. ABO measurements and calibrations are world-class and the de facto standard in the international community, with NOAA scientists serving in many international leadership roles for observation network expertise.

Resource Assessment:
The resources for this activity are described in the Climate Research narrative. In order to provide the most efficient observational coverage, the ABO sites were chosen specifically to cover a "pole-to-pole grid" at sites representative of the atmosphere in each regional location, allowing for fewer number of sites providing maximum benefit. The requested resources in FY 2015 are neeed to continue to support NOAA's 50+ year effort of sustained observations and research.

Schedule and Milestones:
FY 2015: Address the most significant infrastructure needs and replace aging equipment and data delivery systems.
FY 2016: Introduce upgrades in renewable energy at American Samoa and Mauna Loa for long term sustainability, reduced costs, and efficiency; Continue to address infrastructure concerns across all ABOs.
FY 2017-2019: Improve measurement programs at Barrow and Summit ABOs for monitoring and understanding the increasingly diverse and rapid changes in the Arctic.

Deliverables:

- High quality measurements of greenhouse gases, aerosols, halocarbons, ozone, and solar radiation at the six baseline stations such that data collected in the next decade will be completely compatible with existing records and future measurements.

- Refreshed instrumentation and address infrastructure concerns. Improve measurement efficiency, energy conservation, and safety at all ABOs.
- Expanded measurements at the Summit, Greenland, observatory to better monitor arctic processes and air pollution, especially black carbon entering the Arctic from Europe. Summit is uniquely located within the Arctic as the only high elevation, year-round research station; unlike other arctic observatories, it is not substantially affected by changing local phenomena.
- Cooperative methane monitoring sites in central Alaska to monitor increasing methane out-gassing in these permafrost peat rich areas.
- Improved capability of aerosol instrumentation, methane and other non-CO2 measurements, total ozone, solar radiation, and stratospheric lidar instrumentation at all observatories.
- Near-real time data streams to support weather and climate analyses and model development.

Performance Goals and Measurement Data:

Performance Measure: Globally Distributed Manned Atmospheric Baseline Observatories (# of sites that monitor 200+ atmospheric parameters)	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With Increase	N/A	N/A	5	6	6	6	6
Without Increase	5	5	4	4	3	3	3
Description: Five out of six NOAA Atmospheric Baseline Observatories have the capability to monitor the full suite of 200+ atmospheric parameters. With an increase of support, all six can be brought up to the full monitoring suite. Without an increase, a reduction in capability and capacity will be required at two ABOs.							

PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Budget Program: Office of Oceanic and Atmospheric Research
Sub-program: Climate Research
Program Change: Atmospheric Baseline Observatories

	Object Class	FY 2015 Increase	FY 2015 Total Program
11	Personnel compensation		
11.1	Full-time permanent	$0	$23,314
11.3	Other than full-time permanent	0	899
11.5	Other personnel compensation	0	0
11.8	Special personnel services payments	0	0
11.9	Total personnel compensation	0	24,213
12	Civilian personnel benefits	0	6844
13	Benefits for former personnel	0	123
21	Travel and transportation of persons	30	940
22	Transportation of things	45	741
23.1	Rental payments to GSA	0	959
23.2	Rental Payments to others	0	706
23.3	Communications, utilities and miscellaneous charges	20	1001
24	Printing and reproduction	0	142
25.1	Advisory and assistance services	0	951
25.2	Other services	550	3,572
25.3	Purchases of goods & services from Gov't accounts	0	5,705
25.4	Operation and maintenance of facilities	0	0
25.5	Research and development contracts	0	70
25.6	Medical care	0	0
25.7	Operation and maintenance of equipment	250	250
25.8	Subsistence and support of persons	0	0
26	Supplies and materials	750	3,506
31	Equipment	850	2,066
32	Lands and structures	0	0
33	Investments and loans	0	0
41	Grants, subsidies and contributions	505	11,165
42	Insurance claims and indemnities	0	0
43	Interest and dividends	0	0
44	Refunds	0	0
99	Total obligations	3,000	62,954

Climate Research Laboratories and Cooperative Institutes: U.S. Global Change Research-Improved Understanding of Earth Systems and Extremes, Thresholds, and Tipping Points (Base Funding: $59,954,000 and 192 FTE; Program Change: $4,500,000 and 1 FTE): NOAA requests an increase of $4,500,000 and 1 FTE for a total of $64,454,000 and 193 FTE to implement research and other activities in support of the U.S. Global Change Research Program's priority research areas. This work will focus on expanding NOAA's capabilities for improved understanding of Carbon, Weather and Climate Extremes, and Marine Ecosystem Tipping Points.

Proposed Actions:
Carbon Research: NOAA will enhance the Carbon Observation and Analysis System (COAS) within the USGCRP North American Carbon Program, which focuses on quantifying, understanding, and assessing the dynamics of carbon sources and sinks in North America. This set of tasks will build upon current efforts to operationally monitor greenhouse gases (GHGs) with the COAS of tall towers, AirCore, and vertical aircraft profiling. The output and modeling from these observations are shown in CarbonTracker and will be leveraged to improve fundamental understanding of interactions between the human and natural components of the carbon cycle. Specifically, this effort will increase the number of locations and frequency of NOAA's greenhouse gas observations in the atmosphere by installing an additional Tall Tower. This provides a total of 13 towers; increases the frequency of aircraft flights from once every 2-3 weeks to once every 1-2 weeks at selected sites; adds a few additional aircraft sites; and supports development of NOAA's AirCore technology. The increased location and number of observations will help improve NOAA's ability to validate satellite retrievals and constrain results of ecosystem models. Ultimately, use of the increased observations of these unique conservative tracers in the free troposphere can help improve transport resolution in weather models.

Extremes Research: Extreme climate and weather events such as heat waves, droughts, and floods can profoundly affect society and the environment, resulting in loss of life, property, and natural habitat. Building on recent investments, this increase will further NOAA's capability to explain and to predict high-impact weather and climate events by providing new information products to support policy development, decision-making, and resource management. These information products will allow decision makers managing coastal, marine, water, and other critical resources to have timely access to the best available information in order to understand risks related to extreme events in a varying and changing climate. The majority of these funds will support research by staff in the cooperative institutes who will be working closely with Federal staff both at Princeton and the Physical Sciences Division of ESRL. Research will include climate attribution assessments, climate predictability assessments, and the implementation of a global, super-ensemble, high-resolution, multi-model approach to resolve and to predict the behavior of extreme events. The resulting increased NOAA capabilities to explain and to predict high-impact weather and climate events will ensure decision makers managing coastal, marine, water, and other critical resources have access to the best available information in order to understand risks related to extreme events in a varying and changing climate.

Marine Ecosystem Tipping Point Research: Climate variability and change have major effects on marine ecosystems, living marine resources and the people and economies that depend on them in the U.S. and globally. These climate-driven effects, in combination with non-climatic stressors, such as pollution, over-use and habitat destruction, can lead to abrupt changes in structure, function and valuable services of marine ecosystems on which the nation depends. NOAA will use this funding to accelerate the development and broaden the application of Earth System Models (ESMs) and other tools necessary for understanding where, when and how marine ecosystems may reach critical "tipping points" or abrupt major changes in structure, function and services that could significantly affect the millions of jobs, billions of dollars and thousands of communities involved in the seafood

industry, coastal tourism and recreation and other ocean-dependent industries. Some specific target areas for these efforts include: applying high-resolution ESMs to assess past and future marine ecosystem variability at regional scales; use data assimilation to improve retrospective analyses of seasonal to decadal shifts in U.S. marine ecosystem productivity, structure and function; developing a prototype seasonal-to-interannual prediction system of future marine ecosystem variability; developing indices of marine ecosystem condition to better track, assess and provide early-warning of possible tipping points in US marine ecosystems; and enhanced ESM capabilities for understanding, predicting and projecting ocean acidification.

Statement of Need and Economic Benefits:
It is essential that the nation have the solid infrastructure for the observations, research on extremes, and predictive modeling, so policy makers can have the best tools in hand for decision making on local, regional, and national scales.

Carbon Research - For the nation to be able to address changes in Earth's climate and ecosystems, it must have high quality information on the trends, distributions, and fluxes of greenhouse gases on policy-relevant scales. Such information needs to be grounded with on-going, high quality observations which are necessary to determine relative contributions of human and natural components, to assess trends in the natural contributions, and to understand their linkages with the Earth System. Several national reports (National Research Council of the National Academy of Sciences, US Global Change Research Program) have underscored the need for augmenting our existing network of high quality greenhouse gas observations. Currently it is difficult to separate land and ocean influences on atmospheric greenhouse gases in any given region and it is difficult to estimate carbon uptake across the nation with any degree of reliability because of insufficient observations. This effort is a necessary step to having a robust, greenhouse gas monitoring system across North America and will help deliver the kind of information needed for anticipating risks to human and natural systems, devising strategies for addressing those risks, and responsibly informing the public.

Extremes Research - Without knowledge of the background conditions and processes leading to extreme climate and weather events, policy and decision makers cannot make informed decisions concerning how society should invest in critical infrastructure in risk-prone areas. In 2011 the U.S. experienced a dozen billion-dollar extreme climate and weather events (e.g., heat wave, droughts, wildfire, and floods), resulting in approximately $52 billion in aggregated damages. In 2012 the U.S. experienced eleven billion-dollar extreme events last year, with economic losses from Sandy and the yearlong drought accounting for much of the approximately $60 billion in damages[4]. Preliminary analyses suggest at least seven extreme events in the U.S. with economic losses exceeding $1 billion or greater in 2013. The investment to expand NOAA's capability to advance the understanding and predictability of weather and climate extremes is critical to meet private and public sector demands for information on extreme events for early warning and to inform preparedness.

Marine Ecosystem Tipping Point Research - An estimated 4 million metric tons of fish and shellfish are harvested in the United States each year[5]. The commercial catch is valued at 4 billion dollars, supports 1 million jobs and yields over 32 billion dollars in industry-wide income[6]. Marine

[4] http://www.ncdc.noaa.gov/billions/overview

[5] National Marine Fisheries Service, National Oceanic and Atmospheric Administration. 2011b. Annual Commercial Landing Statistics. http://www.st.nmfs.noaa.gov/st1/commercial/landings/annual_landings.html (accessed September 20, 2011)

[6] National Marine Fisheries Service, National Oceanic and Atmospheric Administration. 2011c. Fisheries Economics of the U.S., 2009. http://www.st.nmfs.noaa.gov/st5/publication/fisheries_economics_2009.html (accessed September 20, 2011)

ecosystems support recreational fisheries estimated to have a total economic impact of 73 billion dollars and supporting over 300,000 additional jobs[7]. Healthy ecosystems also play a key role in sustaining broader coastal tourism activities. In contrast, the global costs to society of degraded ocean conditions and inadequate management of marine resources include $50 billion a year for overfishing, $200 to $790 billion a year for hypoxia, $10 to $90 billion a year for invasive species and $104 to $182 billion a year for acidification[8]. The potential for rapid ecosystem state changes or "tipping points" presents a threat to sustainable management of marine resources. Stakeholders such as regional fisheries managers, fishermen, and the multi-sectoral seafood industry are demanding improved information on the causes of observed changes to living marine resources, whether past changes are indicative of future conditions, and what, where, when and how "tipping points" might be experienced in these systems. This research effort leverages NOAA's capabilities in high-resolution modeling, pelagic ecosystem modeling, data assimilation, observation systems for ocean physical and biological conditions (e.g., fish stock surveys) and numerous interdisciplinary collaborations with partners across NOAA and in academia to better understand, anticipate, prepare for and respond to possible marine ecosystem "tipping points" in a changing climate. These activities are crucial to strengthening marine resource management by developing decision-support tools and other resources to incorporate climate-related information into marine resource management.

Resource Assessment:
The resources for this activity are described in the Climate Laboratories and Cooperative Institutes narrative.

Schedule, Milestones, and Deliverables:
Carbon Research:
FY 2015 – 2019 – Install a total of 13 tall towers
FY 2015 – 2019 – Increase total number of operational aircraft sites, and increase frequency of flights
FY 2015 – 2019 – Increase number of AirCore soundings

Extremes Research:
FY 2015 – Triple the number of climate model simulations available to resolve high impact extreme events to address full frequency distribution with statistical robustness, such as 1 in 100 year events
FY 2016 - Produce timely and credible explanations of evolving extreme climate and weather events
FY 2017 – Increase the number of explanations of evolving extreme climate and weather events while reducing the lag time between when an event occurred and the completion of the assessment

Marine Ecosystem Tipping Point Research:
FY 2016 – Global high-resolution prototype ocean simulation of retrospective analysis multidecadal marine ecosystem variability integrated with data-assimilative physics
FY 2017 – Global high-resolution prototype seasonal-to-interannual prediction system of future marine ecosystem variability
FY 2018 – Global high-resolution prototype seasonal-to-interannual prediction system of future marine ecosystem variability, including estuarine, coastal, and benthic ecosystems

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[7] National Marine Fisheries Service, National Oceanic and Atmospheric Administration. 2011c. Fisheries Economics of the U.S., 2009. http://www.st.nmfs.noaa.gov/st5/publication/fisheries_economics_2009.html (accessed September 20, 2011)
[8] Globals costs: Hudson, A. and Y. Glemarec, 2012: Catalysing Ocean Finance Volume I Transforming Markets to Restore and Protect the Global Ocean, United Nations Development Programme and Global Environment Facility, New York, NY and Washington, DC

Performance Measures:

Carbon Research:

Performance Measure: Reduce Uncertainty of the North American Carbon Sink (million tons C/y) (Measure 16b)	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With Increase	N/A	N/A	410	400	395	390	380
Without Increase	405	410	410	405	400	400	390

Extremes Research:

Performance Measure: Reduce the lag time between climate and weather extreme events and the assessment of their causes in order to improve the timeliness of the climate intelligence that can inform decision-making and risk management.	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With increase	N/A	N/A	7 months	7 months	6 months	3 months	3 months
Without increase	12 months	11 months	8-10 months	8-10 months	8-10 months	8-10 months	8-10 months
Description: Increasingly timely scientific explanations for the causes of climate and weather extreme events, which clarify which aspects of high impact extreme events are attributable to natural or to human causes, are needed to meet decision making timeframes for risk management, adaptation and policy responses.							

Performance Measure: Cumulative number of climate model simulations used to assess changes in extremes	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With increase	N/A	N/A	180	240	360	420	480
Without increase	0	60	120	150	180	210	240
Description: A fully populated, continuously updated, multi-model, multi-representative concentration pathway emission scenarios, super-ensemble diagnostic modeling capabllity for climate assessments will advance NOAA's mission to develop scientific capabilities in order to provide a continuous delivery of knowledge and information for climate attribution and predictability assessments.							

Performance Measure: Number of seasonal or interannual outlooks of high impact climate and weather extreme events	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With increase	N/A	N/A	4	4	5	5	6
Without increase	2	3	3	3	3	3	4
Description: Outlooks on seasonal to interannual timescales of high impact climate and weather extreme events for droughts, floods, heatwaves and cold outbreaks that are comparable to the existing NOAA hurricane season outlook annual and midseason update.							

Marine Ecosystem Tipping Point Research:

Performance Measure: Publically available and useful marine ecosystem predictions and projections	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With Increase	N/A	N/A	350	500	650	800	1000
Without Increase	128	200	270	320	400	500	500
Description: Predictions and projections of marine ecosystem change, including potential tipping points, can provide insight and early warning to inform resource management. Ensuring that the information, products, models, and services developed are made widely available and usable will enhance the integration of best-available science into decision-making processes.							

Performance Measure: Peer-reviewed journal articles (cumulative number)	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With Increase	N/A	N/A	22	32	42	52	62
Without Increase	8	12	18	24	30	36	42
Description: These publications provide the information needed by stakeholders, resource managers, and decision-makers to develop effective policies and adaptation strategies for climate impacts on marine ecosystems.							

Performance Measure: Contributions to assessments relevant to regional ecosystem-based management activities in the U.S.	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With Increase	N/A	N/A	6	6	8	8	10
Without Increase	2	3	3	3	4	4	5

Description: Regional scale projections will contribute to international assessments (e.g. IPCC AR5, released in 2013), national assessments under the U.S. Global Climate Research Program, and other assessments as requested. The number of meaningful regional projections possible will increase as NOAA's Earth System Model increases in realism and complexity. Examples of regional scale projections include: regional sea level rise projections that require explicit representation of the global eddy field in the ocean models; projections of parameters essential to ocean and coastal ecosystem forecasting; assessment of regional carbon budgets; and projections of climate change in the Arctic region that require improved sea ice models.

PROGRAM CHANGE PERSONNEL DETAIL

Budget Program: Office of Oceanic and Atmospheric Research
Sub-program: Climate Labs and Cooperative Institutes
Program Change: USGCRP

Title:	Location	Grade	Number of Positions	Annual Salary	Total Salaries
Physical Scientist	Princeton, NJ	ZP-III	1	65,377	65,377
Physical Scientist	Boulder, CO	ZP-IV	1	88,693	88,693
Subtotal			2		$154,070
Less Lapse	25%		(1)		($38,518)
Total Full-time permanent:			1		$115,552
2015 Pay Adjustment	1.0%				$1,156
TOTAL			1		$116,708

Personnel Data	Number
Full-time Equivalent Employment	
Full-time permanent	1
Other than full-time permanent	0
Total	1
Authorized Positions:	
Full-time permanent	2
Other than full-time permanent	0
Total	2

PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Budget Program: Office of Oceanic and Atmospheric Research
Sub-program: Climate Research
Program Change: USGCRP

	Object Class	FY 2015 Increase	FY 2015 Total Program
11	Personnel compensation		
11.1	Full-time permanent	$117	$23,431
11.3	Other than full-time permanent	0	899
11.5	Other personnel compensation	0	0
11.8	Special personnel services payments	0	0
11.9	Total personnel compensation	117	24,330
12	Civilian personnel benefits	40	6,884
13	Benefits for former personnel	0	123
21	Travel and transportation of persons	30	940
22	Transportation of things	0	696
23.1	Rental payments to GSA	0	959
23.2	Rental Payments to others	0	706
23.3	Communications, utilities and miscellaneous charges	0	981
24	Printing and reproduction	0	142
25.1	Advisory and assistance services	0	951
25.2	Other services	600	3,622
25.3	Purchases of goods & services from Gov't accounts	0	5,705
25.4	Operation and maintenance of facilities	0	0
25.5	Research and development contracts	150	220
25.6	Medical care	0	0
25.7	Operation and maintenance of equipment	0	0
25.8	Subsistence and support of persons	0	0
26	Supplies and materials	0	2,756
31	Equipment	0	1,216
32	Lands and structures	0	0
33	Investments and loans	0	0
41	Grants, subsidies and contributions	3,563	14,223
42	Insurance claims and indemnities	0	0
43	Interest and dividends	0	0
44	Refunds	0	0
99	Total obligations	4,500	64,454

Climate Laboratories and Cooperative Institutes: Greenhouse Gas Monitoring (Base Funding: $59,954,000 and 192 FTE; Program Change: +8,000,000 and +3 FTE): NOAA requests an increase of $8,000,000 and 3 FTE for a total of $67,954,000 and 195 FTE to complete and sustain an observation and analysis system to determine uptake and emissions of carbon dioxide and greenhouse gases (GHGs) across North America.

Proposed Actions

With this increase, NOAA will build upon its Atmospheric Baseline Observatories, Global Reference Networks for atmospheric composition, and North American Carbon Observation and Analysis System (COAS) to deliver policy-relevant information on the full suite of greenhouse gas emissions, including carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), and the full suite of chlorofluorocarbon (CFC) replacements. This information will serve not to regulate, but rather to verify, greenhouse gas emission inventories nationally and globally, consistent with the National Academy of Sciences report, *Verifying Greenhouse Gas Emissions* (Pacala et al. 2010, Nat'l. Res. Council). The enhanced network will allow for separation of human and natural influences on greenhouse gas trends, on-going resolution of ocean and land-based contributions, precise subcontinental-scale determinations of continental uptake and emission of greenhouse gases, modernization of instrumentation and analytical techniques, improvement in Earth System and carbon models, and validation of retrievals by emerging satellite-techniques. These augmentations in quality and granularity of measurements will provide a path for improving national inventories and verifying global emission estimates. It will contribute substantially to on-going national efforts through the USGCRP North American Carbon Program (NACP) in coordination with twelve other agencies (http://www.carboncyclescience.gov/). The enhanced observing and analysis system will continue to serve as a model for other nations and regions across the world in their efforts to understand and address greenhouse gas emissions.

Specifically, this effort will markedly increase the number of locations and frequency of NOAA's high quality, greenhouse gas observations in the atmosphere, expand the suite of gases provided routinely from ground-based, tall tower, and aircraft platforms to include methane, carbon isotopes (e.g., C-14, C-13), CFC replacements, and additional tracers. Climatologies of the vertical distribution of carbon dioxide and methane from approximately 30 km altitude to the surface with measurements made using AirCore technology will dramatically enhance the nation's ability to deliver the basis for on-going validation and integration of satellite retrievals and improve weather and CarbonTracker modeling by increasing transport resolution. With the increased number of observing sites and higher frequency of observations, NOAA's CarbonTracker and other analysis models will be able to provide the key information for assessing greenhouse gas emissions and improving national and state inventories.

Statement of Need and Economic Benefits

As greenhouse gases continue to rise in the atmosphere, nations, including the U.S., are looking at managing their emissions. Ensuring that management policies are effective requires that they be consistent with what is happening in the atmosphere. The scientific information provided must be able to separate ocean from land influences, human activities from Earth System contributions, and do so on sub-continental scales. Providing this scientific information over North America at policy-relevant scales calls for a more tightly constrained observing system not only for CO2, but also for the other greenhouse gases, especially the second most important and potentially most risky greenhouse gas, CH4. Unlike CO2, CH4 is emitted largely by the Earth System itself. In addition, human influences on the planet have increased its atmospheric concentration by a factor of 2.5 over the past 200 years. These include oil and gas extraction, but also growing rice fields, cattle feedlots, landfills, and land-use change to name a few.

While these activities are not easily inventoried methane emissions can be estimated on policy-relevant scales with a more granular observing network. A similar case can be made for the third most influential greenhouse gas, nitrous oxide, which again is emitted predominantly by the Earth System as it is influenced by humans. Finally, separating fossil fuel emissions of CO2 from natural influences requires use of an indisputable tracer such as C-14. Other tracers are useful for further granularity in source attribution. NOAA's measurements of the isotopes and tracers assess the relative contributions of human and natural systems on policy-relevant scales across the North American continent.

Resource Assessment:
The Nation's (and world's) ability to understand the trends, distributions, and fluxes of greenhouse gases depend heavily on NOAA's long-term observing systems (Reference Networks). These systems extend from a handful of Atmospheric Baseline Observatories that provide the backbone of measurements for trends and distributions of greenhouse gases and other aspects of atmospheric composition. The Observatories and the more extensive Reference Networks (e.g., http://www.esrl.noaa.gov/gmd/ccgg/index.html) have served for decades as a model to the world and constitute a framework of high quality observations upon which the World Meteorological Organization has been expanding global networks. For more information on the resources associated with these activities, see the Climate Research narrative.

Schedule and Milestones:

FY 2015
- Contract construction of 130 automated air sampling packages (proven design, 12 samples in each package) to create the capacity for taking the additional samples from which CO2 will be extracted for carbon-14 measurements
- Increase sample extraction and processing capacity to prepare samples for AMS measurements
- 5 site enhancements (2 tall tower augmented with full GHG monitoring suite and 3 aircraft) installed; begin or continue satellite retrieval comparisons and validations (e.g., GOSAT, AIRS, IASI, OCO-2)

FY 2016
- Issue grant to purchase an accelerator mass spectrometer (AMS) optimized for carbon-14 measurements. Lead-time from order: ~1.5 years
- Measure or archive a total of 4,000 CO2 extracts per year.
- Increase number of measurements at LLNL by1,500 samples/year
- Extract and archive a substantial fraction of the early samples (need to do this before the AMS measurement capability has been expanded to be able to handle the load)
- 4 sites enhancements (1 tall tower augmented with full GHG monitoring suite & 3 aircraft) installed; new lab instrumentation operational; CarbonTracker assimilations to include NOAA transport data along with European data

FY 2017
- Measure 3,000 samples/year, and archive the rest for a total of 5,000 per year
- 4 sites enhancements (2 tall towers augmented with full GHG monitoring suite and 2 aircraft) installed; Extensive QA/QC and Data management enhancement verified & operational

FY 2018-2019

- Reduce archive of extracted samples and process samples in real time
- 4 sites enhancements (2 tall towers augmented with full GHG monitoring suite and 2 aircraft) installed; Regional Flux Estimates Defined Seasonal Estimating Capability in place

Deliverables:

- 13 fully augmented tall towers measuring the full suite of greenhouse gases continuously across North America
- 24 sets of aircraft vertical profiles of ~50 greenhouse gases and tracers across North America each week
- CarbonTracker op erating with both NOAA's and European (ECMWF) global meteorology to produce sustained outputs for both CO2 and methane
- Satellite retrieval verification capability in place
- Fully operating accelerator mass spectrometer (AMS)
- On-going ^{14}CO2 measurements at 80+ sites
- Comparison of US fossil fuel emission inventory with atmospheric measurements of 14CO2
- Determination of fossil fuel contributions to GHGs in at least one urban "dome" in the US
- Improved emission inventories of numerous GHGs

Performance Goal: Improved uncertainty of the North American carbon sink to better understand the contribution of human activities toward changes in atmospheric carbon dioxide and methane (million tons carbon/year) (Measure 16b)	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With Increase	N/A	N/A	405	395	390	385	370
Without Increase	405	410	410	405	400	400	390
Description: The provision of NOAA scientific guidance to policymakers concerned with managing emissions of carbon dioxide requires NOAA to assess and quantify the sources of carbon variability. This GPRA measure demonstrates the scientifically accepted level of confidence in carbon measurement that is needed to accurately evaluate levels of carbon emissions in North America. The uptake of atmospheric carbon (mainly as carbon dioxide) by the biosphere across North America is of the order of one billion tons (one petagram) per year.							

Performance Measure: Number of sites supporting frequent 14CO2 measurements	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With Increase	N/A	N/A	18	50	80	80	90
Without Increase	18	18	18	18	18	18	18
Description: The number of sites sampled represents NOAA's capacity to attribute emissions to both regions and economic sectors, predominantly within North America. While NOAA analyzes for CO2 and many greenhouse gases at all sites, samples are currently collected for C-14 analysis at only 18 of these. With more sites, smaller regions can be targeted. These sites include tall towers and weekly aircraft profiles.							

Performance Measure: Number of samples extracted per year for 14CO2 analyses	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With Increase	N/A	N/A	2,000	4000	5,000	6,000	7,000
Without Increase	1,700	1,700	1,700	1,700	1,700	1,700	1,700
Description This measure represents NOAA's capacity to evaluate fossil fuel vs. "natural" emissions in both space and time. With samples collected more frequently from a larger number of sites, NOAA will be able to provide needed information on policy-relevant scales. Samples to be analyzed by AMS first require extraction, a meticulous process involving several steps. Extraction capacity will be increased even before the AMS is acquired, as, once extracted, samples can be safely stored before analysis. This allows the measurement record to begin even before the analytical capacity is fully developed.							

PROGRAM CHANGE PERSONNEL DETAIL

Budget Program: Office of Oceanic and Atmospheric Research
Sub-program: Climate Research
Program Change: Greenhouse Gas Monitoring

Title:	Location	Grade	Number of Positions	Annual Salary	Total Salaries
Physical Scientist	Boulder, CO	ZP-IV	4	87,815	351,260
Subtotal			4		$351,260
Less Lapse	25%		(1)		($87,815)
Total Full-time permanent:			3		$263,445
2015 Pay Adjustment	1.0%				$2,634
TOTAL			3		$266,079

Personnel Data	**Number**
Full-time Equivalent Employment	
Full-time permanent	3
Other than full-time permanent	0
Total	3
Authorized Positions:	
Full-time permanent	4
Other than full-time permanent	0
Total	4

PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Budget Program: Office of Oceanic and Atmospheric Research
Sub-program: Climate Research
Program Change: Greenhouse Gas Monitoring

Object Class	FY 2015 Increase	FY 2015 Total Program
Personnel compensation		
Full-time permanent	$266	$23,580
Other than full-time permanent	0	0
Other personnel compensation	0	899
Special personnel services payments	0	0
Total personnel compensation	266	24,479
Civilian personnel benefits	77	6,921
Benefits for former personnel	0	123
Travel and transportation of persons	50	960
Transportation of things	75	771
Rental payments to GSA	0	959
Rental Payments to others	450	1,156
Communications, utilities and miscellaneous charges	50	1,031
Printing and reproduction	0	142
Advisory and assistance services	0	951
Other services	0	3,022
Purchases of goods & services from Gov't accounts	0	5,705
Operation and maintenance of facilities	0	0
Research and development contracts	0	70
Medical care	0	0
Operation and maintenance of equipment	2,587	2,587
Subsistence and support of persons	0	0
Supplies and materials	0	2,756
Equipment	900	2,116
Lands and structures	0	0
Investments and loans	0	3,545
Grants, subsidies and contributions	3,545	10,660
Insurance claims and indemnities	0	0
Interest and dividends	0	0
Refunds	0	0
Total obligations	8,000	67,954

Regional Climate Data and Information: National Integrated Drought Information System's Regional Drought Early Warning Information Systems (Base Funding: $11,043,000 and 1 FTE; Program Change: +$1,900,000 and 0 FTE): NOAA requests an increase of $1,900,000 and 0 FTE for a total of $12,943,000 and 1 FTE to develop Regional Drought Early Warning Information Systems (RDEWS). NOAA will develop RDEWS by providing focused drought impacts research and applications development to underserved regions of the country. Extending products, tools, and knowledge to areas outside of the NIDIS Pilots is the final stage of implementing a national early warning information system for drought.

Proposed Actions:
This funding will support additional competitive research grants and contracts to develop and expand the Regional Drought Early Warning Information System (RDEWS) to: the Pacific Northwest; the Mid-west agricultural belt including the Missouri River Basin; the Southern Plains states (TX, NM, OK); and the Carolinas. In addition, this effort will build on existing activities in California to support regional drought early warning systems and provide information for drought planning across the state to develop a comprehensive state-wide system with NOAA partners in California. The Pacific Northwest was identified as a priority area by NOAA partners, including the Western Governors Association, through a Memorandum of Understanding with NOAA. Work in the Mid-west agricultural belt will focus on closer engagement and efforts to reduce drought vulnerability in the Great Plains for constituents, including farmers and tribes. In collaboration with the NOAA Coastal Services Center, NIDIS will develop early warning of low flow conditions from major rivers in the Carolinas into the coastal environment. This low flow condition affects water supply in large population centers, and increases salinity intrusion into near-shore coastal ecosystems with important economic value to those states. With the new resources, NOAA will further develop ongoing drought information outlook products. These products include information sheets on local drought conditions that improve on the national drought monitor, impacts assessments, and inputs into Federal, state, and tribal plans and fulfills agreements with USDA and the Western Governors Association.

NIDIS will create a network of Federal and non-federal partners to assess and adopt innovations in drought warning and planning including, Regional Integrated Science and Assessments (RISAs), Regional Climate Centers, State Climatologists, USDA Extension Offices, and others. It will increase the Nation's capacity to use climate forecasts and data in decision making in key regions and within prime socioeconomic sectors. This funding will provide new tools, models and methodologies to enhance decision makers' abilities to plan for climate variability and change. The results from these studies will be key inputs into early warning systems that will serve NIDIS partners in Federal, state, tribal and private sectors.

Statement of Need and Economic Benefit:
Economic, environmental, and societal drought impacts are severe. The estimated impacts of the 2012 drought have been as high as $60 billion[9]. Factors that will continue to increase this kind of cost include: population growth and shifts into areas at risk from severe drought impacts (especially in the west, mid-west, and southeast); land use changes; increased water resource demands from sectors such as agriculture, energy, recreation, and ecosystems; and increasing aridity in specific regions. Implementing a national drought early warning system (DEWS) is particularly critical now because of the recent severe drought in California and the continued drought in southwestern U.S. and other regions. In addition, the of the 2006 NIDIS Act, the 2007 NIDIS Implementation Plan, and

[9] Munich Re, 2013: The great Drought. US Experiences the worst drought Catastrophe in recent decades, GEO Topics Analyses, assessments, positions. Munich Reinsurance 2013. 60 pp.

the 2004 Western Governors' report, *Creating a Drought Early Warning System for the 21st* Century, authorize for a DEWS. This research supports planning activities in anticipation of impacts of El Niño Southern Oscillation; early warning system design; development of decision support tools; and evaluation to meet demands from constituents, including watershed managers, partner states, and agencies.

Resource Assessment:
The resources for this activity can be found in the Regional Climate Data and Information narrative.

Schedule and Milestones:
Research must be conducted before outputs can be quantified, which creates a lag between research and product delivery.

FY 2015:

- Produce and deliver drought impacts research to regionally specific information products on the U.S. Drought Portal.
- Use products to develop regionally specific drought monitors and early warning system indicators and triggers.
- Identify research gaps and further user communication and awareness of drought information and its integration into drought planning processes in support of NIDIS.
- Identify drought decision support tools to assess impacts and conduct drought research, including forecasts that contribute towards preparedness and coordination methods developed and tested in pilots and the new RDEWS regions.
- Transition drought decision support tools to the U.S. Drought Portal and to these new regions.
- Integrate modeling, forecasting and GIS-based products from the Climate Prediction Center and the Climate Test-beds into NOAA River Forecast Centers and promote governmental drought training and scenario development.

FY 2015-2016:

- Evaluate value of drought impacts research undertaken and revisit priorities in light of progress made on NIDIS implementation.
- Continue transition of drought decision support tools and methodologies to the U.S. Drought Portal. Test application of tools in new areas.
- Assimilate drought impacts data and information into a database for use with different types of drought conditions across climate timescales into drought and water management plans.
- Increase the number of tribal communities engaged in NIDIS for developing drought early warnings and impacts assessments in two new areas (Rio Grande basin, Montana)

FY 2015 – FY 2017: Award grants and or contracts for regional and sectoral drought impacts research and transition drought decision support tools, methodologies and related research and products to the U.S. Drought Portal (e.g., socio-economic, agriculture, urban, and water resource management).

FY 2016 – FY 2018: Award new grants and or contracts to address research gaps and user needs identified in FY 2014. Continue transition of drought decision support tools, methodologies and related research and products to the U.S. Drought Portal and to new regions.

Deliverables:
Drought products (assessments, forecasts, tools, and scenarios) incorporated into stakeholder drought planning and decision making for new geographic regions (the Pacific Northwest, the Mid-west and the Carolinas). These will be informed by Coping with Drought research and conducted in direct coordination with existing NIDIS pilots and incorporated into the drought portals (as subset of the U.S. Drought Portal) at region-specific scales.

Example of products developed through new RDEWS could include: dynamic drought indices; fire outlooks; paleo-climate web-tools for water managers; guidance tools for planning and management of urban drainage systems (such as the Carolina coasts); closer engagement and efforts to reduce vulnerability of the tribes in the Great Plains; development of a decision support system specifically designed to help forage producers; forecasts and GIS products from the Climate Prediction Center and the Climate Test-beds used by NOAA River Forecast Centers, U.S. Geological Survey (USGS), U.S. Army Corps of Engineers, and Bureau of Reclamation. Funding will also allow for the integration of the regional Drought Early Warning Systems into the RISAs, Regional Climate Centers, and NWS field and State Climatologist offices in order to expand the system into a fully sustainable national drought early warning system.

Performance Goals and Measurement Data:

Performance Measure: Number of states and territories working with NIDIS to incorporate drought early warning information into their drought adaptation and mitigation plans. (Cumulative)	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With Increase	N/A	N/A	8	16	22	28	35
Without Increase	4	5	7	10	15	22	26
Description: The performance measure is based on the number of states and territories that partner with NIDIS to incorporate drought early warning information into their drought planning activities. Activities that count toward this measure include: local or regional drought planning/management groups; use of tailored information from the U.S. Drought Portal to establish drought indicators and set management triggers in state, watershed, and territory drought adaptation and mitigation plans; incorporation of information from basin-specific drought monitors developed through the drought early warning information systems into either state and territory drought adaptation and mitigation plans or as part of state and territory drought planning/management groups.							

PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Budget Program: Office of Oceanic and Atmospheric Research
Sub-program: Climate Research
Program Change: National Integrated Drought Information System's Regional Drought Early Warning Information Systems

	Object Class	FY 2015 Increase	FY 2015 Total Program
11	Personnel compensation		
11	Full-time permanent	0	3,445
11	Other than full-time permanent	0	12
12	Other personnel compensation	0	0
12	Special personnel services payments	0	0
12	Total personnel compensation	0	3,457
12	Civilian personnel benefits	0	1,019
13	Benefits for former personnel	0	0
21	Travel and transportation of persons	0	556
22	Transportation of things	0	15
23	Rental payments to GSA	0	174
23	Rental Payments to others	0	120
23	Communications, utilities and miscellaneous charges	0	69
24	Printing and reproduction	0	3
25	Advisory and assistance services	0	763
25	Other services	250	6,943
25	Purchases of goods & services from Gov't accounts	0	12,441
25	Operation and maintenance of facilities	0	0
26	Research and development contracts	425	355
26	Medical care	0	0
26	Operation and maintenance of equipment	0	0
26	Subsistence and support of persons	0	0
26	Supplies and materials	0	1,178
31	Equipment	25	141
32	Lands and structures	0	0
33	Investments and loans	0	0
41	Grants, subsidies and contributions	1,200	14,046
42	Insurance claims and indemnities	0	0
43	Interest and dividends	0	0
44	Refunds	0	0
99	Total obligations	1,900	41,280

Regional Climate Data and Information: NOAA Arctic Research Program: Arctic Observing Network (Base Funding: $3,156,000 and 1 FTE; Program Change: +$2,190,000 and 1 FTE:
NOAA requests an increase of $2,190,000 and 1 FTE for a total of $5,346,000 and 2 FTE to support northward development of NOAA's Arctic Observing Network. It will also enable the development of observation-based Arctic informational products, including future scenarios of Arctic Ocean changes, sea-ice extent, ecosystem evolution, and Arctic to mid-latitude weather/climate linkages.

Proposed Actions:
OAR will work with partners across NOAA, other Federal agencies, and the countries of the Arctic Council, plus those countries who participate in the Pacific Arctic Group, to develop the necessary observing in the high Pacific Arctic. Full ocean depth moorings will be deployed to monitor changes in currents, fluxes, of heat, fresh water, nutrients, marine life. In addition, atmospheric shipboard observations of radiative properties and other atmospheric information will provide much needed information on the coupled ocean-ice-atmosphere which is critical to prediction efforts in the WMO, Polar Prediction Project, etc.

The proposed actions are to: (1) Fill in critical observation gaps in the warming Pacific Arctic, that are thought to be a critical key to understanding linkages between heat flux changes in the Arctic and impacts on the mid-latitude. Data will need to be transitioned to both National networks and to Arctic Council networks to respond to data information needs; (2) develop information products based on ongoing observations; (3) expand observation-based synthesis contributions to the Arctic Research Program (ARP) Arctic Report Card; (4) provide new data to support NOAA's contribution to the WCRP Polar Prediction Project; and (5) further develop NOAA's Arctic Research Program's contribution to the U.S. Arctic Observing Network, and the Arctic Council's Sustaining Arctic Observing Network. NOAA will seek and strengthen partnerships with Korea, Japan, Russia, the Arctic Council, National Science Foundation, Office of Naval Research, DOI and NASA to carry out this program.

The ARP has engaged the Alaska Ocean Observing System (AOOS) to house the nodes for the Distributed Biological Observatory, the Russian-American Long-term Census of the Arctic (RUSALCA) program data, and the newly developing Arctic Council contributions for the Circumpolar Marine Biodiversity Monitoring Program. If funded, data from the next decade will be housed in this facility as well.

Statement of Need and Economic Benefits:
Over the last 10 years, through direct investment and interagency/international partnerships, the NOAA Arctic Research Program (ARP) has built a considerable Arctic observation capacity, including regular ship surveys of the ecosystems and physical oceanography in the Chukchi Sea, the Distributed Biological Observatory adjacent to Arctic Alaska, a pan-Arctic ring of sentinel Atmospheric Observatories, and the International Arctic Buoy and Ice Mass Balance Programs. Following a review of the program in 2013, and agreements with partner agencies and countries, the ARP is planning a strategic move during 2015-2020 northward in the Pacific Arctic, a region where waters from the Pacific and Arctic are interacting with, affecting sea-ice, and responding to radiative forcing from the atmosphere.

Resource Assessment:
Resources for this activity are described in the Regional Climate Data and Information narrative.

Schedules and Milestones:
FY 2015

- Coordinate with our National and International Partners, vessel opportunities, science missions, logistics, financial obligations.
- Enhance Data management and aggregation for the NOAA's Arctic Observing Network.
- Summarize data already gathered in the proposed observing area to plan efficient work plans for the participants.

FY 2016

- Carry out initial expedition to the high Pacific Arctic with Japan, Korea, Russia and other Arctic Council countries.
- Continue to contribute data to the Alaska Ocean Observing System and other national data archives including the NGDC and NSIDC.
- Sync data sharing between vessels, other platforms.
- Provide baseline data that will inform issues of Arctic change including future scenarios of Arctic Ocean heat flux changes, sea-ice extent, ecosystem evolution, Arctic to mid-latitude weather/climate linkages and human health. The expected outcome will be a multi-disciplinary program providing data to the U.S and to the Arctic Council whose responsibilities include the support of sustainable Arctic Region policies.

FY 2017:

- Process and analyze data obtained in 2016.
- Plan for the 2018 expedition.
- Release data to the AOOS, NSIDC for access by stakeholders.
- Coordinate with partners date exchanges, support observation-modeling workshops through the Pacific Arctic Group.

FY 2018:

- Launch the 2nd Pacific Arctic Expedition.
- Coordinate data exchanges.
- Review observations and revise survey based on what we learned during the expedition in 2016.

Deliverables:

- Multiple observations of the Pacific Arctic.
- Increased knowledge and characterization of critical processes for sea-ice extent, mid-latitude weather, extremes, and marine ecosystems.
- Provision of ARP data and products via AOOS portal and other centers.
- Additional and improved syntheses within the annual Arctic Report Card.
- Improvements in the Sea Ice Outlook annual report.
- Model-data fusion workshops- both regional and northern hemisphere, to increase uptake of observational information within models and forecast systems.
- Interoperable Interface Design & Programming.
- Data service system integration & programming.

Performance Goals and Measurement Data:

Performance Measure: Increase in the number of Arctic system products needed to clarify extent of Pacific Water influx into the Arctic Ocean	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With Increase	N/A	N/A	1	3	3	5	7
Without Increase	1	1	1	1	1	1	1
Description: This performance measure describes the increase in the number of value-added products (based on observations) describing the changes in time of Pacific and Atlantic water fluxes in the Pacific sector of the Arctic Ocean region. Monitoring these fluxes is important for sea-ice extent and other Arctic changes.							

Performance Measure: Cumulative increase in number of baseline ecosystem transects and sentinel stations (e.g., Distributed Biological Observatory)	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With Increase	N/A	N/A	1	2	3	4	4
Without Increase	1	1	1	1	1	1	1
Description: This performance measure describes the increase in the number of transects/stations where standardized observations of marine ecosystems are recorded to monitor year-to-year variability.							

Performance Measure: Increase in number of new Observations data sets from the Pacific Arctic made available to NOAA (AOOS), the Pacific Arctic Group, and the Arctic Council working groups.	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With Increase	N/A	N/A	1	3	3	5	6
Without Increase	1	1	1	1	1	1	1

Description: This performance measure aims to show an ongoing increase in NOAA's contribution to carrying out its mission to deploy an Arctic Observing Network in key regions of the Pacific Arctic that are thought to be critical drivers of global change. These observations will be made available via the AOOS to the country, to the Pacific Arctic Group, to the Arctic Council Working group and to the Sustaining Arctic Observing Networks. The outcomes will strengthen informational links to stakeholders in the Arctic region.

PROGRAM CHANGE PERSONNEL DETAIL

Budget Program: Office of Oceanic and Atmospheric Research
Sub-program: Climate Research
Program Change: Arctic Observing Network

Title:	Location	Grade	Number of Positions	Annual Salary	Total Salaries
Program Manager	Silver Spring, MD	ZP-IV	1	89,924	89,924
Physical Scientist	Seattle, WA	ZP-IV	1	88,179	88,179
Subtotal			2		$178,103
Less Lapse	25%		(1)		($44,526)
Total Full-time permanent:			1		$133,577
2015 Pay Adjustment	1.0%				$1,336
TOTAL			1		$134,913

Personnel Data	Number
Full-time Equivalent Employment	
Full-time permanent	1
Other than full-time permanent	0
Total	1
Authorized Positions:	
Full-time permanent	2
Other than full-time permanent	0
Total	2

PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Budget Program: Office of Oceanic and Atmospheric Research
Sub-program: Climate Research
Program Change: Arctic Observing Network

	Object Class	FY 2015 Increase	FY 2015 Total Program
11	Personnel compensation		
11.1	Full-time permanent	$135	$3,532
11.3	Other than full-time permanent	0	12
11.5	Other personnel compensation	0	0
11.8	Special personnel services payments	0	0
11.9	Total personnel compensation	135	3,544
12	Civilian personnel benefits	34	1,005
13	Benefits for former personnel	0	0
21	Travel and transportation of persons	20	516
22	Transportation of things	0	15
23.1	Rental payments to GSA	0	174
23.2	Rental Payments to others	0	120
23.3	Communications, utilities and miscellaneous charges	0	69
24	Printing and reproduction	0	3
25.1	Advisory and assistance services	0	763
25.2	Other services	0	6,870
25.3	Purchases of goods & services from Gov't accounts	0	12,441
25.4	Operation and maintenance of facilities	0	0
25.5	Research and development contracts	0	120
25.6	Medical care	0	0
25.7	Operation and maintenance of equipment	0	0
25.8	Subsistence and support of persons	0	0
26	Supplies and materials	0	1,178
31	Equipment	0	141
32	Lands and structures	0	0
33	Investments and loans	0	0
41	Grants, subsidies and contributions	2,001	12,543
42	Insurance claims and indemnities	0	0
43	Interest and dividends	0	0
44	Refunds	0	0
99	Total obligations	2,190	39,502

Regional Climate Data and Information: Assessments (Base Funding: $4,330,000 and 0 FTE; Program Change +$3,970,000 and 1 FTE): NOAA requests an increase of $3,970,000 and 1 FTE for a total of $8,300,000 and 1 FTE to support a permanent capability to produce climate assessments at national and regional scales.

Proposed Actions:
This increase will ensure that NOAA supports a robust assessment process and delivers science-based, high-value climate information to support decision-making by providing authoritative, relevant, accessible and useful assessments in a timely, sustained, and repeatable manner for a wide range of audiences and key stakeholders.

Funding will support science activities with existing inter-agency programs, to develop the foundational scientific knowledge required for a sustained national climate assessment. Regular climate assessments are essential to ongoing efforts to understand what climate change means for the United States and what services are necessary to allow for informed decision-making.

NOAA will enhance existing and engage in new activities to further develop and refine scenarios (e.g. future climate, regions, sea level, land use); test and deploy a system of climate indicators beyond the FY 14 pilot phase; and undertake regional and sectoral research activities, including risk and vulnerability analyses, targeted to address key science questions and stakeholder needs identified from the 2014 National Assessment reports. Funding will also be dedicated to develop strategies to enhance collaboration between existing regional networks, within NOAA and with partners, in order to better coordinate scientific research on climate impacts and vulnerabilities across the U.S.

Funds will also be used to analyze new model results through the international Coupled Model Intercomparison Project Phase 5 (CMIP5) to inform regional assessments drawing from scientific excellence across the research community. A key aspect of this effort will be to assess how well CMIP5 models simulate regional climate processes and relevant global processes that are underpinning simulated variability and projected changes. Investments in FY 2015 will enable analysis of model performance in simulating regional climate variability and trends over North America, evaluating projections of regional climate relevant to assessment efforts, and developing an understanding of how well regional climate processes are represented in CMIP5 models; the assessment community has a critical need for this information to inform assessments with solid scientific understanding.

In addition, to support access to the National Climate Assessment and its data and source information, NOAA will continue to lead the technical support unit and further contribute to the interagency Global Change Information System. Investments in FY 2015 will build on work from prior years to support the development of a robust data access infrastructure for assessment datasets, prototyping the NCA's commitment to transparency and traceability for assessment data and conclusions. In addition, a user-focused interface is planned for linking foundational assessment information with other tools and applications across the Government.

Statement of Need and Economic Benefit:
The Global Change Research Act of 1990 (GCRA) calls for the President (through a Federal interagency body) to prepare and submit to the Congress, on a periodic basis (at least every 4 years), an assessment which: 1) integrates, evaluates, and interprets the findings of the Federal interagency research effort and discusses the scientific uncertainties associated with such findings; 2) analyzes the effects of global change on the natural environment, agriculture, energy production

and use, land and water resources, transportation, human health and welfare, human social systems, and biological diversity; and 3) analyzes current trends in global change, both human-induced and natural, and projects major trends for the subsequent 25 to 100 years. NOAA has thelead federal role in the 2014 National Climate Assessment.

A sustained assessment process is called for in both the *National Global Change Research Plan: 2012-2021* (the strategic plan for the U.S. Global Change Research Program (USGCRP)) and *Preparing the Nation for Change: Building a Sustained National Climate Assessment Process* (the report of the Sustained Assessment Special Report (SASR) Workgroup of the NOAA-supported National Climate Assessment Development Advisory Committee (NCADAC)). It has the potential to build on current assessment activities across NOAA Line Offices to establish the standing capacity to provide periodic syntheses and assessment of foundational climate science, which can provide new scientific insights, identify knowledge gaps, serve as the basis for federal policy, and provide a starting point for the development of tailored, contextualized information that is easy for stakeholders to use within their specific regional and sectoral decision contexts.

Regional and national assessments can meet an increasing range of demands for climate change decision support across the Nation. Building on the past two decades of experience, and pairing existing expertise with emerging capacity, NOAA will support a collaborative, participatory assessment process that engages scientists, government officials, businesses, and communities in the investigation of climate impacts and effective mitigation and adaptation.

Cumulatively, the assessments will contribute to ongoing efforts to understand what climate change means for the U.S. and what services are necessary to allow for informed decision making. Assessments will contribute to an objective basis for adaptation and mitigation strategies on a variety of temporal and spatial scales, primarily through the legislatively mandated National Climate Assessment and future international assessments such as the Intergovernmental Panel on Climate Change.

Climate assessments will help synthesize both operational and research elements of NOAA, and will build upon many existing NOAA resources and functions including research in the physical, biological, and social sciences, observing, data management, modeling and forecasting, education, and outreach. NOAA will also enhance its capabilities and tailor its products through partnerships with other Federal agencies, and the academic, public and private sectors.

Resource Assessment:
The resources for this activity are described in the Regional Climate Data and Information narrative.

Schedule and Milestones:
FY 2015: Produce regional scale projections for key climate variables from existing projections. Begin to develop regional analysis of new CMIP5 projections.

FY 2015: Develop strategies to enhance collaboration between existing regional programs, within NOAA and with partners, in order to better coordinate scientific research on climate impacts and vulnerabilities across the U.S

FY 2015 – 2016: Fund new research to assess national and regional climate impacts and vulnerabilities.

FY 2016: Deploy climate indicator system through the Global Change Information System. Support assessment product development for topical/regional issues of high priority to NOAA and its partners.

FY 2016: Update regional projections from new model results; initiate research to improve understanding of model performance in simulating climate processes that underlie projections including the development of relevant model metrics.

FY 2016 – 2017: Improve and expand Global Change Information System to make data and information more fully available to a broad range of users.

FY 2017 – 2018: Complete updates of existing regional and sectoral assessments. Finalize process-level understanding of CMIP5 model performance to assessments community and set of associated metrics.

FY 2018: Complete assessments that will feed into the National Climate Assessment.

Deliverables:
FY 2015: Deploy the prototype version of the Global Change Information System, including pilot of climate indicator system.

FY 2015 – FY 2016: An initial set of metrics to determine process-level performance of climate models and its implications for assessments of climate variability and projections.

FY 2016 – FY 2018: Report on options for enhancing collaboration between existing regional programs, within NOAA and with partners, in order to better coordinate scientific research on climate impacts and vulnerabilities across the U.S

FY 2016: Deploy next generation climate indicator system through the Global Change Information System.

FY 2016 – FY 2017: Funded research is published in the peer-reviewed literature and reflected in assessment products.

FY 2017: Produce reviewable draft of the National Climate Assessment and update assessment content online. A technical report and journal publications on process-level performance of climate models for use by the assessment process.

FY 2018: Completion and publication of National Climate Assessment synthesis.

Performance Goals and Measurement Data:

Performance Measure: Annual number of climate change related impacts, vulnerability, adaptation, or mitigation information topics addressed in the Assessments	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With Increase	N/A	N/A	14	14	18	20	22

Without Increase	8	8	8	8	8	8	8
Description: This performance measure will demonstrate the role of formal climate change assessments in decisions to address climate change impacts by identifying the number of topics addressed in the assessments that are considered by business, government, or the public that affected decisions related to improved climate resilience. Information topics are based on the U.S. Global Change Research Program report, "Global Climate Change Impacts in the U.S." This measure will track the extent to which the USGCRP topical information items are used by industry, etc., to inform their key decisions on how to mitigate or adapt to climate change.							

Performance Measure: Number of new metrics developed and applied to evaluate CMIP5 projections for regional application by the assessments	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With Increase	N/A	N/A	1	3	5	7	9
Without Increase	N/A	N/A	0	0	0	0	0
Description: This performance measure will demonstrate how scientific investigations underpinning the development of projections, quantified by the number of processes evaluated in the CMIP5 models, will be used to inform the development of assessments."							

PROGRAM CHANGE PERSONNEL DETAIL

Budget Program: Office of Oceanic and Atmospheric Research
Sub-program: Climate Research
Program Change: Assessments

Title:	Location	Grade	Number of Positions	Annual Salary	Total Salaries
Physical Scientist	Silver Spring, MD	ZP-III	1	63,091	63,091
Subtotal			1		$63,091
Less Lapse	25%		0		($15,773)
Total Full-time permanent:			1		$47,318
2015 Pay Adjustment	1.0%				$473
TOTAL			1		$47,791

Personnel Data	Number
Full-time Equivalent Employment	
Full-time permanent	1
Other than full-time permanent	0
Total	1
Authorized Positions:	
Full-time permanent	1
Other than full-time permanent	0
Total	1

PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Program: Office of Oceanic and Atmospheric Research
Sub-program: Climate Research
Program Change: Assessments

Object Class	FY 2015 Increase	FY 2015 Total Program
Personnel compensation		
Full-time permanent	$48	$3,445
Other than full-time permanent	0	12
Other personnel compensation	0	0
Special personnel services payments	0	0
Total personnel compensation	48	3,457
Civilian personnel benefits	48	1,019
Benefits for former personnel	0	0
Travel and transportation of persons	60	556
Transportation of things	0	15
Rental payments to GSA	0	174
Rental Payments to others	0	120
Communications, utilities and miscellaneous charges	0	69
Printing and reproduction	0	3
Advisory and assistance services	0	763
Other services	75	6,945
Purchases of goods & services from Gov't accounts	0	12,441
Operation and maintenance of facilities	0	0
Research and development contracts	235	355
Medical care	0	0
Operation and maintenance of equipment	0	0
Subsistence and support of persons	0	0
Supplies and materials	0	1,178
Equipment	0	141
Lands and structures	0	0
Investments and loans	0	0
Grants, subsidies and contributions	3,504	14,046
Insurance claims and indemnities	0	0
Interest and dividends	0	0
Refunds	0	0
Total obligations	3,970	41,282

Regional Climate Data and Information: NOAA Climate.gov Portal (Base Funding: $1,350,000 and 0 FTE; Program Change: +$2,300,000 and +1 FTE): NOAA requests an increase of $2,300,000 and 1 FTE for a total of $3,650,000 and 1 FTE to continue supporting development of the NOAA Climate.gov Portal that will facilitate public online access to NOAA's climate data, information, and services. Specifically, NOAA will expand the Portal to include a Climate Resilience Toolkit, which will include an interoperable interface for climate data access and a climate literacy learning center for formal and informal educators.

Proposed Actions:
OAR will work with partners across NOAA and other Federal agencies to accelerate the development of a comprehensive web-based Climate.gov Portal, which, in turn, will feed into the larger government "Big Data" and Climate Resilience Toolkit initiatives. NOAA Climate.gov will be a central component of NOAA's commitment to integrate and deliver climate science data, information, and decision-support tools to the public in easily accessible, relevant, and broadly applicable ways. The goal of Climate.gov is to help build a more "climate-smart" nation that better understands its climate-related risks and opportunities, and has the tools and resources make more informed decisions that reduce vulnerabilities to extreme events and make communities and businesses more resilient to climate-related impacts.

NOAA will expand and improve scope and functionality of Climate.gov in the following key ways:

1. Develop a **Climate Resilience Toolkit** ($2,150,000) comprised of the following four components:
    A. Semantic web search tool and mobile app that allows users to search across NOAA's and its partners' entire Web domains, and to retrieve datasets and tools according to very specific criteria that yield results sets precisely matching users' interests and needs. In short, users will be able to parse according to topical relevance, regional relevance, sectoral relevance, application types, time periods of interest, compatibility with other software tools, and other distinguishing criteria.
    B. Certified online training courses tailored to teach professionals in particular sectors what data and tools are available and how to use them to manage their risks and opportunities. While work has begun in this area, this new initiative will scale up NOAA's efforts to serve 13 major societal sectors not being adequately served today (agriculture, city planners, civil infrastructure, economists, energy utilities, fisheries managers, human healthcare providers, insurance companies, legal services, various entities in U.S. homeland security, tourism, transportation, and water utilities). These courses will be designed in partnership with professional societies that serve those sectors.
    C. Social media tools for science-based problem solving for societal benefit. The aim is to bring professionals together into an online forum that bridges over cultural, geographic, political and discipline barriers for interdisciplinary collaboration and knowledge sharing. While social media tools exist today, none exists specifically to support interdisciplinary climate adaptation-related decision-making.
    D. An Interoperable Interface for Climate Data Access. This will be a user-friendly Google-map-like interface in which non-scientists / non-specialists can easily find, display, manipulate, analyze, and download climate data from all across NOAA's and its partners data centers. This effort will include a component designed to stimulate public-private partnerships for private-sector development of commercial applications using federal science tools and data. This Interoperable Interface will work in tandem with the aforementioned semantic web search capabilities we will build as part of the Climate Resilience Toolkit, which will provide users with a federated (cross-agency), faceted search capability. We will develop and deploy a mobile app version of the Interoperable Data Interface.

2. An on-demand **Climate Literacy Learning Center for formal and informal educators** ($150,000) to boost their climate literacy and capacity for incorporating climate science data and information into their jobs. NOAA will expand its partnership with the National Science Teachers Association (NSTA), other federal science agencies, and relevant partners to provide on-demand professional learning resources and climate data for science teachers.— mapped to grade and learning standards —with training on how to use these materials. This is a much-needed investment in our nation's "intellectual 401k," aimed at producing a more-skilled workforce and climate-literate life-long learners.

Statement of Need and Economic Benefits:
Societal interest in climate is growing, as indicated by the rising number and sophistication of the questions and requests for climate data and services submitted to NOAA in recent years. Every day, communities and businesses across the nation grapple with environmental challenges due to unusual or extreme climate and weather conditions. In 2011 and 2012, the U.S. experienced 25 climate- and weather-related disasters in which damages exceeded $1 billion ($115 billion total)[10]. People are going online seeking information to help them understand why these events are happening and to better prepare for them. From 2012 to 2013, for example, Climate.gov saw a 153 percent increase in site visits and a fourfold increase in questions about climate data for decision-making applications. Individuals and organizations are seeking easy access to credible climate science information from NOAA at finer geographic and time scales to help them manage climate-related risks and opportunities in their lives, jobs, and communities. However, users report having difficulty locating and using NOAA's online data products and services. Thus, resolving this online accessibility issue, and boosting users' capacity to understand and use our resources, will be main outcomes of Climate.gov's efforts.

U.S. science teachers are only getting about a fourth of the professional learning they need every year to improve their practice[11] — a critical shortfall given the expertise now demanded by the Next Generation Science Standards. This challenge is compounded by the fact that face-to-face teacher learning experiences alone do not address the scale or sustainability required to reach and teach the nation's 3.2 million science teachers. The Climate.gov online Climate Literacy Learning Center for formal and informal educators will provide immediacy, convenience, and access that educators want and need that would otherwise not exist. Multiple reports by the U.S. Dept. of Education substantiate the effectiveness and need for blended learning experiences — online and face-to-face.

Resource Assessment:
Resources for this activity are described in the Regional Data and Information narrative.

Schedules and Milestones:
FY 2015

- Begin Phase 1 development for the Climate Resilience Toolkit
- Begin Phase 1 development for the Interoperable Interface for Climate Data Access
- Begin Phase 1 development for the Climate Literacy Learning Center

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[10] NOAA NCDC "Billion Dollar Weather / Climate Disasters." Onlineat https://www.ncdc.noaa.gov/billions/events. (Accessed Jan. 30, 2014)
[11] Pasley, Joan D. (2011): "Perspectives on Deepening Teachers' Mathematics and Science Content Knowledge." Horizon Research, Inc. White paper online at http://www.mspkmd.net/cases/tck/perspectives/introduction.pdf (NSF-funded research paper accessed Jan. 30, 2014)

FY 2016

- Complete and deploy functional Phase 1 Climate Resilience Toolkit; begin user testing
- Complete and deploy Phase 1 Interoperable Data Interface, with access limited to data sets served via compatible service software (e.g., OPeNDAP); begin user testing
- Complete and deploy Phase 1 Climate Literacy Learning Center

FY 2017:

- Launch mobile app for Climate Resilience Toolkit
- Launch mobile app for Interoperable Data Interface
- Launch mobile app for Climate Literacy Learning Center
- Conduct Phase 2 refinement and expansion of Climate Resilience Toolkit in response to user feedback
- Conduct Phase 2 Interoperable Data Interface to enhance the Interoperable Data Interface based upon user feedback, and to expand the number of accessible climate data records
- Conduct Phase 2 refinement of Climate Literacy Learning Center based on user feedback

FY 2018:

- Complete and deploy Phase 2 builds of the Climate Resilience Toolkit, Interoperable Data Interface, and Climate Literacy Learning Center, with corresponding refinements in their mobile app versions

Deliverables:

Climate Resilience Toolkit

- Semantic Web Wearch Tool
- Certified Training Courses
- Social Media for Scientists
- Mobile App for Searching & Social Media

Interoperable Data Interface

- Interoperable Interface Design & Programming
- Data service system integration & programming
- Mobile App for Data Interoperable Interface

Climate Literacy Learning Center

- Learning Center interface design and development

Performance Goals and Measurement Data:

A new goal through this new development effort is to show a sustained increase in return visits by 20 percent per year over the previous year to the Maps & Data, Supporting Decisions, and Teaching Climate sections of Climate.gov. This measure will be in addition to and will complement our ongoing Quality of Relationship metric and other success metrics already in place.

Performance Measure: Percentage growth in number of return visits to each section in NOAA Climate.gov over the preceding year's measure.	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With Increase	N/A	N/A	N/A	20%	20%	20%	20%

Without Increase	N/A	10%	10%	10%	10%	10%	10%
Description: This performance measure aims to show an ongoing increase in the average number of return visits to the Portal's Maps and Data, Supporting Decisions, and Teaching Climate sections. The late FY13 deployment of Google Analytics gives NOAA the ability to track return visitors, which allows NOAA to track this measure going forward.							

PROGRAM CHANGE PERSONNEL DETAIL

Budget Program: Office of Oceanic and Atmospheric Research
Sub-program: Climate Research
Program Change: NOAA Climate.gov Portal

Title:	Location	Grade	Number of Positions	Annual Salary	Total Salaries
Decision Support Specialist	Silver Spring, MD	ZP-IV	1	89,924	89,924
Subtotal			1		$89,924
Less Lapse	25%		0		($22,481)
Total Full-time permanent:			1		$67,443
2015 Pay Adjustment	1.0%				$674
TOTAL			1		$68,117

Personnel Data	**Number**
Full-time Equivalent Employment	
Full-time permanent	1
Other than full-time permanent	0
Total	1
Authorized Positions:	
Full-time permanent	1
Other than full-time permanent	0
Total	1

PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Budget Program: Office of Oceanic and Atmospheric Research
Sub-program: Climate Research
Program Change: NOAA Climate.gov Portal

	Object Class	FY 2015 Increase	FY 2015 Total Program
11	Personnel compensation		
11.1	Full-time permanent	$68	$3,465
11.3	Other than full-time permanent	0	32
11.5	Other personnel compensation	0	20
11.8	Special personnel services payments	0	0
11.9	Total personnel compensation	68	3,517
12	Civilian personnel benefits	20	971
13	Benefits for former personnel	0	0
21	Travel and transportation of persons	20	496
22	Transportation of things	0	15
23.1	Rental payments to GSA	0	174
23.2	Rental Payments to others	0	120
23.3	Communications, utilities and miscellaneous charges	0	69
24	Printing and reproduction	0	3
25.1	Advisory and assistance services	0	763
25.2	Other services	2,152	9,022
25.3	Purchases of goods & services from Gov't accounts	0	12,441
25.4	Operation and maintenance of facilities	0	0
25.5	Research and development contracts	0	120
25.6	Medical care	0	0
25.7	Operation and maintenance of equipment	0	0
25.8	Subsistence and support of persons	0	0
26	Supplies and materials	20	1,198
31	Equipment	20	161
32	Lands and structures	0	0
33	Investments and loans	0	0
41	Grants, subsidies and contributions	0	10,542
42	Insurance claims and indemnities	0	0
43	Interest and dividends	0	0
44	Refunds	0	0
99	Total obligations	2,300	39,612

Regional Climate Data and Information: Regional Integrated Sciences and Assessments (RISA) (Base Funding: $5,872,000 and 2 FTE; Program Change: +$4,640,000 and +1 FTE):
NOAA requests an increase of $4,640,000 and 1 FTE for a total of $10,512,000 and 3 FTE to expand its capability for regional research and information services.

Proposed Actions:
OAR will increase its support of external research teams who work with resource managers and planners to develop and utilize new information about the impacts of climate on communities, natural and managed resources, infrastructure, transportation, and health.

Two new regions, adding to the current number of 11, would be competitively awarded funding under this augmentation. The regions would include the Mid-Atlantic (e.g. Virginia, Maryland, Delaware, and the District of Columbia) and the Midwest (e.g. Iowa, Missouri, Illinois, Indiana, and Ohio). Each RISA award would provide research and service capacity to the decision makers and regional, state, and local communities afflicted by climate risks in these regions. For example, a Mid-Atlantic RISA could help coastal communities prepare for and respond to coastal flooding from storms like Hurricane Sandy, much like the current RISA based in New York City formed the scientific foundation for Mayor Bloomberg's Stronger, More Resilient New York. A Midwest RISA could help farmers cope with the effects of drought and flooding in the Missouri River basin, much the same way that the current RISA based in Oklahoma helped ranchers in Texas, Oklahoma, and Alabama cope with the 2011-12 drought.

Furthermore, funds will be used to help communities prepare for and respond to the societal challenge areas identified in NOAA's Next Generation Strategic Plan, including extremes of weather and climate, drought and water resource management, and coastal community resilience. In each of these areas, the funds would augment and ensure explicit collaborative partnering with NOAA's regional information system components (e.g., NIDIS, NESDIS Regional Climate Service Directors, NOS Coastal Services Centers, NWS Regional offices, NMFS regional offices) as well as other Federal, state, and private providers (e.g. DOI Climate Science Centers, USDA Climate Change Hubs). Such collaborative efforts have already supported a water reservoir visualization tool for water managers and cattle ranchers in the southern US, and climate outlook products for emergency managers in California who work with FEMA.

Statement of Need and Economic Benefits:
With each passing year, the impacts of climate variability and change on water availability, wildfire regimes, public health, agriculture, energy issues, and coastal communities become more acute. At the same time, climate sciences are making great strides in producing knowledge that could aid decision makers dealing with these issues.

Crops and livestock alone are valued at $77 billion for the Midwestern region of the U.S[12]., and fisheries and tourism amount to over $5 billion of value for the Chesapeake Bay region[13]. The agriculture, fisheries and tourism sectors, along with cities and communities in the Midwest and Chesapeake Bay regions, all stand to gain from scientifically-based information about droughts, floods, storm surges, and temperature changes in these regions. RISA scientists provide information

[12] Hatfield, J., 2012: Agriculture in the Midwest. In: *U.S. National Climate Assessment Midwest Technical Input Report*. J. Winkler, J. Andresen, J. Hatfield, D. Bidwell, and D. Brown, coordinators. Available from the Great Lakes Integrated Sciences and Assessments (GLISA) Center, http://glisa.msu.edu/docs/NCA/MTIT_Agriculture.pdf.
[13] *The Economic Importance of the Bay*. Retrieved from http://www.cbf.org/how-we-save-the-bay/issues/cost-of-clean-water/economic-importance-of-the-bay.

that decision makers use to cope with drought, understand climatic influences on wildfire, and assess climate impacts on the transportation sector, coastal communities and human health. Stakeholders use such information to evaluate potential climate impacts on water supplies and hydroelectric power, and support disaster management planning. RISAs are helping farmers, ranchers, and fishermen use climate information to produce the Nation's foods and fibers.. Stakeholders from the Midwest and Chesapeake Bay regions are asking for similar help in their regions. **Resource Assessment:**
Resources for this activity are described in the Regional Data and Information narrative.

Schedules and Milestones:
FY 2015:

- Solicit proposals for new RISAs in the Mid-Atlantic and Midwest.
- Solicit proposals to develop research products that will contribute to and deepen partnerships with regional information providers in the existing RISA regions.

FY 2016: Launch new RISAs.

FY 2016 - FY 2017: Initiate 1-2 new research partnerships between RISA, regional NOAA information providers, and interagency partners (e.g. DOI, USDA).

FY 2018 - FY 2019: Initiate 1-2 new research partnerships between RISA, regional NOAA information providers, and interagency partners (e.g. DOI, USDA).

Deliverables:

- In new states located in both the Mid-Atlantic and the Midwest, expand applied research support of local, state, and regional decision makers (e.g., state and city governments, coastal managers, farmers, private and public water utilities, etc.) with two new five-year cooperative agreement centers, which focus on:
    - Development of new and/or enhancement of existing climate science for use in risk management (e.g., records of past climate and projections of seasonal, interannual, and decadal climate variability).
    - New approaches for analyzing and assessing environmental change, risk, impacts, and for developing response options (per the U.S. Global Change Research Act).
    - Socio-economic research on human impacts from climate variability and change.
    - Scenarios of environmental change integrating climate, land use, water, sea level and vegetation.
    - Tools (including trainings, guidebooks, websites, etc.) to support ongoing decision making to manage and respond to climate risks.
    - Develop innovations in drought early warning systems in priority areas of the National Integrated Drought Information System.
- In partnership with the U.S. Department of Agriculture and the Department of the Interior, develop or enhance research priorities for regional climate science and services.

Performance Goals and Measurement Data:

Performance Measure: Number of regionally and sectorally focused climate impacts and adaptation studies communicated to decision makers (per year)	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With Increase	N/A	N/A	28	29	30	31	32
Without Increase	30	27	27	27	27	27	27

Description: Number of peer-reviewed publications and reports published and released annually. The publications/reports are developed through interaction with and/or are communicated to stakeholders. Publications and reports are collected from investigators conducting climate impacts and adaptation research in cooperation with stakeholders. The goal of this research is to better understand and enhance the use of NOAA products and information to meet user requirements for natural resource management information in various sectors (e.g. drought and water resources, fire risk, ecosystem and coastal impacts, sea-level rise, human health, agriculture, etc.

Performance Measure: Number of states or territories using new or tailored climate services (tools, information, technical assistance, or products) as a result of regional, state, and local interaction with decision makers (each year)	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With Increase	N/A	N/A	8	9	12	13	14
Without Increase	4	5	7	8	9	10	11

Description: The number of products and services, including provided or existing products and services that are modified/expanded for new user groups or regions. 'Products and services' include technical assistance, training, and guidance documents to enable planning and decision making. (This measure is partially based on the current GPRA: Number of regionally and sectorally focused climate impacts and adaptation studies communicated to decision makers.)

PROGRAM CHANGE PERSONNEL DETAIL

Program: Office of Oceanic and Atmospheric Research
Sub-program: Climate Research
Program Change: Regional Integrated Sciences and Assessments

Title:	Location	Grade	Number of Positions	Annual Salary	Total Salaries
Physical or Social Scientist	Silver Spring, MD	ZP-IV	1	$89,924	$89,924
Subtotal			1		$89,924
Less Lapse	25%		0		($22,481)
Total Full-time permanent:			1		$67,443
2015 Pay Adjustment	1.0%				$674
TOTAL			1		$68,117

Personnel Data	Number
Full-time Equivalent Employment	
Full-time permanent	1
Other than full-time permanent	0
Total	1
Authorized Positions:	
Full-time permanent	1
Other than full-time permanent	0
Total	1

PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Budget Program: Office of Oceanic and Atmospheric Research
Sub-program: Climate Research
Program Change: Regional Integrated Sciences and Assessments

	Object Class	FY 2015 Increase	FY 2015 Total Program
11	Personnel compensation		
11.1	Full-time permanent	$68	$3,465
11.3	Other than full-time permanent	0	12
11.5	Other personnel compensation	0	0
11.8	Special personnel services payments	0	0
11.9	Total personnel compensation	68	3,477
12	Civilian personnel benefits	24	995
13	Benefits for former personnel	0	0
21	Travel and transportation of persons	0	496
22	Transportation of things	0	15
23.1	Rental payments to GSA	0	174
23.2	Rental Payments to others	0	120
23.3	Communications, utilities and miscellaneous charges	0	69
24	Printing and reproduction	0	3
25.1	Advisory and assistance services	0	763
25.2	Other services	305	7,175
25.3	Purchases of goods & services from Gov't accounts	0	12,441
25.4	Operation and maintenance of facilities	0	0
25.5	Research and development contracts	0	120
25.6	Medical care	0	0
25.7	Operation and maintenance of equipment	0	0
25.8	Subsistence and support of persons	0	0
26	Supplies and materials	0	1,178
31	Equipment	0	141
32	Lands and structures	0	0
33	Investments and loans	0	0
41	Grants, subsidies and contributions	4,243	14,785
42	Insurance claims and indemnities	0	0
43	Interest and dividends	0	0
44	Refunds	0	0
99	Total obligations	4,640	41,952

APPROPRIATION ACCOUNT: OPERATIONS, RESEARCH, AND FACILITIES
SUB-PROGRAM: WEATHER AND AIR CHEMISTRY RESEARCH

The objectives of the Weather and Air Chemistry Research sub-program are to support:

- Research and development that provides the Nation with more accurate and timely warnings and forecasts of high-impact weather events and their broader impact on issues of societal concern such as weather and air quality; and
- Research that provides the scientific basis for informed management decisions about weather, water, and air quality.

Researchers at OAR Laboratories and Cooperative Institutes have been key contributors to the modernization of the NWS by providing the research to better understand severe weather events and through technological advancements in weather modeling and observing. OAR scientists strive to continually improve NOAA's capabilities as well as other Federal agencies' capabilities to provide more accurate and timely warnings and forecasts of various high-impact weather, water, and air quality events. Examples of these high-impact events includes, floods, droughts, heat waves, severe storms, hurricanes, tsunamis, smoke, volcanic ash, and dust plumes, and the deposition of nutrients, heavy metals, and toxic organic substances to the surface of the earth. More information on this sub-program is available at http://www.research.noaa.gov/weather/.

LABORATORIES AND COOPERATIVE INSTITUTES

Hurricane Research

OAR's Hurricane Research Division, within the Atlantic Oceanographic and Meteorological Laboratory (AOML), focuses on improving the understanding and prediction of hurricane track and intensity change through directed research with the goal of transferring these improved capabilities to NOAA's operational hurricane forecast components. AOML's hurricane research supports NOAA's long-term goal of a weather-ready nation by reducing forecast uncertainty and unnecessary evacuations that result in economic impacts to communities. NOAA research and transition efforts include:

- Coordination of NOAA's annual hurricane field program - the Intensity Forecast Experiment (IFEX) – which is a partnership among AOML, NWS Environmental Prediction and Tropical Prediction Centers, and NESDIS, with support from NOAA's Aircraft Operation Center's research/reconnaissance aircraft;
- Theoretical and numerical modeling research to improve hurricane forecast guidance, including the preparations of storm surge atlases and wind field diagrams;
- Analysis of data from models and field programs to improve understanding of physical processes that effect hurricane track and intensity changes;
- Providing leadership and critical assistance to the NOAA Hurricane Forecast Improvement Project; and
- Active participation in and support of the Joint Hurricane Testbed.

Severe Storms Research

OAR's National Severe Storms Laboratory (NSSL) seeks to improve the accuracy and timeliness of forecasts and warnings of hazardous weather events such as thunderstorms, tornadoes, flash floods, lightning, and winter weather. NSSL accomplishes this goal through a balanced research program that conducts research in three general areas, including severe and hazardous weather research, storm-scale hydrometeorology research, and weather radar research development. These programs aim to:

- Advance the understanding of weather processes;
- Improve and develop new forecast and warning techniques and applications (such as warn-on-forecast), and evaluate them for operational use in the Hazardous Weather Testbed;
- Transfer knowledge, techniques, and applications to NWS and other agencies;
- Develop enhancements for the NEXRAD Doppler weather radar, the cornerstone of the radar network now operated by NWS offices across the United States;
- Develop new radar technologies (e.g., dual-polarization and phased-array radar); and
- Conduct field programs that use mobile, *in situ*, and remote observational capabilities to collect data that support theoretical research.

The new NEXRAD radar upgrade called Dual Polarization modification has been shown to greatly improve the radar's accuracy in precipitation estimation and differentiation of types of weather phenomena (e.g., rain, hail, snow, freezing rain, etc.). The outcome will improve: warnings to the public for flash floods; identification of and warnings for tornadoes, severe hail, dangerous freezing rain, and snow; and water management capability.

Dual polarization optimization will ensure that NOAA fully takes advantage of the expected benefits from this new radar technology, including:

- Improvements in flash flood warnings and water management.
- Greatly improved probability of hail detection, hail size estimation, and reduction of the false alarm rate will all contribute to improved severe weather warnings.
- Identification of specific tornado debris clouds, a capability which will support greater areal specificity in tornado warnings for rain-wrapped and nighttime tornadoes. This improved accuracy will increase public confidence in tornado warnings.
- Improved capability to distinguish between non-meteorological scatterers (i.e., birds) and meteorological scatterers (i.e., precipitation) resulting in higher quality data used across the NWS enterprise and more accurate weather products.
- Improved NWS training material and automated detection tools of unique polarimetric signatures that will aid NWS forecasters in better interpreting rapidly developing severe and winter weather situations, thereby improving warnings and short term forecasts for the public.

Physical Sciences Division (PSD)/ESRL provides NOAA with the essential core capability to conduct physical science research across time and space scales with an emphasis on extreme events in the Earth system that lead to floods, droughts, and heat waves. Examples include: (1) the role of the Hydrometeorological Testbed in elucidating the role that Atmospheric Rivers play in creating flood conditions in U.S. coastal areas and inland basins; and (2) improving surface parameterizations in hurricane models to better represent the role of surface process such as sea spray in hurricane intensity changes. In conducting this research, the program advances NOAA's abilities to observe, understand, and improve the credible prediction of the behavior of the atmosphere, ocean, cryosphere, hydrosphere, land, and related impacts on global-to-local and days-to-decades timescales.

Air Chemistry Research

OAR's air chemistry activities respond to significant societal needs. Air pollutants are a primary cause or significant contributor to a number of pressing societal issues. These include health impacts such as illness and/or premature death due to respiratory and cardiac effects, permanent neurological damage (affecting tens of thousands of newborns annually), and environmental degradation caused by exposure to air pollutants and deposition of nutrients, mercury, and other toxic substances.

The Air Resources Laboratory (ARL) provides information and products that directly support air quality decision-makers, air quality forecasters, and the research community. ARL conducts field studies and long-term measurements, and develops numerical models to address a wide range of critical air chemistry and deposition issues. ARL addresses multiple important pollutants including mercury, nitrogen oxides, smoke, dust, and volcanic ash, which can have significant impacts on and implications for human and ecosystem health and for industrial and transportation activities. Field activities include development and evaluation of new measurement approaches, short-term field experiments to characterize key chemical and physical processes, and long-term monitoring of selected chemical air concentration and deposition trends. ARL develops numerical models to forecast selected pollutants, such as smoke and volcanic ash, and to better understand sources and receptors of pollution, such as mercury compounds. Information from ARL's work supports avoidance of health impacts, safe operation of aircraft, and well informed, effective management of ecosystems.

ARL also conducts research to improve the characterization and prediction of plumes resulting from the accidental or intentional release and dispersion of airborne hazardous materials, including smoke, harmful chemicals, radioactive materials, and biological agents. These plume dispersion activities provide essential information for first responders and emergency management in the government, as well as industrial, agricultural, and transportation sectors to minimize risks to health, safety, and economic activities. Knowledge of where hazardous materials will likely spread enables emergency managers to effectively evacuate people from harm's way and helps industrial and transportation companies to take protective measures for a wide range of situations, including oil drilling platform disasters, chemical plant explosions, containment failures at nuclear reactors, and the spread of plant pathogens.

The Chemical Sciences Division (CSD)/ESRL conducts research to understand and quantify the chemical emissions of gaseous and particle (aerosol) pollutants, their precursors, and the processes responsible for their transport and transformation in the atmosphere. This contributes to better understanding of the impacts of pollutants on U.S. air quality and our climate. To reach these goals, CSD maintains an integrated program of laboratory studies, intensive field experiments, and analyses to study the linkages among emissions, air quality, and climate. In addition, CSD develops new sensors to quantify key atmospheric constituents and their properties (optical and physical) when that information is lacking. The information developed provides the scientific underpinning for policy development and management decisions related to air quality. CSD is leading a series of regional intensive field studies designed to provide new insights into, and potential cures for, poor air quality throughout the U.S. Collectively, the information garnered from these activities provides new understanding of the root causes of poor air quality across the country which improves predictive tools. Ultimately, this provides the scientific basis for more effective environmental policies and emission management strategies. Recent efforts have focused on Southern California and the southeastern U.S., where local air quality managers are challenged by difficult air quality problems and concerns relating to climate change.

The Global Monitoring Division (GMD)/ESRL conducts long term observations by balloon-borne, cryogenic frost point hygrometers launched from Boulder, Colorado; Hilo, Hawaii; and Lauder, New Zealand to obtain vertical profiles of water vapor in the upper troposphere and lower stratosphere (to ~30 km). Water vapor soundings over Boulder (since 1980) provide a unique long-term data record that may reveal changes in atmospheric dynamics resulting from climate change. Water vapor is a natural and very important component of the Earth's atmosphere. Its distribution influences many physical and chemical properties of the atmosphere, including weather, clouds, precipitation, lightning generation, convective uplift, and the Antarctic ozone hole.

Weather Models and Advanced Technologies Research

The Global Systems Division (GSD)/ESRL develops next-generation weather models, advances new technologies to run the models, and enhances the forecast information for better decision making. GSD's efforts lead to improved forecasts of hurricanes and other local-to-global severe weather phenomena. Collaborators in this effort include research organizations and operational services such as the National Weather Service, Federal Aviation Administration, Department of Energy, and Department of Defense. GSD's global modeling capability is designed to provide an improved research tool for dynamical-chemical-hydrological-ocean-land-surface interactions. For regional and local domains, GSD conducts very short-range, storm-resolving modeling and advanced data assimilation capabilities for watches and warnings and heavy precipitation events. To promote efficiency and effectiveness, high-resolution models are being developed to serve multiple purposes and users, providing significant value to commercial aviation, civilian, and military weather forecasting, energy generation, regional air and global pollution prediction, and emergency preparedness.

GSD also investigates, develops, and applies advanced technologies to optimize the computing of models, to provide faster and more comprehensive weather information to decision makers, to assess the forecast impact of meteorological observations, and to educate about Earth system science using Science On a Sphere. GSD is also exploring alternative high-performance computing architecture options for the future to increase both computing capability and cost efficiencies.

As part of its weather research activities, modeling activities centered at Geophysical Fluid Dynamics Laboratory (GFDL) focus on long lead-time research to understand the predictability of weather on both large and small scales and to translate this understanding into improved numerical weather prediction models. These activities improve our understanding of atmospheric circulations ranging in scale from general circulation to hurricanes, with an emphasis on extreme weather events. These activities also focus on the interplay between weather phenomena and climate variability and change, using high resolution atmospheric modeling as the central tool. This effort is augmented by research to improve our understanding of the interactive three-dimensional structure of the climate system from the surface and troposphere to the upper stratosphere and mesosphere on various time and space scales. GFDL works to understand the relationship between the physical climate and the Earth's biogeochemical cycles, as well as assessing the impact of natural variability and past, present, and future human activities, including the interplay of sea-level rise, coastal physical processes, and ecological processes and the Earth System's hydrologic cycle. This research is a key aspect of developing comprehensive Earth System Models that extend current climate predictive capability to land and ocean ecosystems.

The Office of Weather and Air Quality (OWAQ) leads NOAA's participation in the multi-agency Earth System Prediction Capability (ESPC) project and coordinates ESPC research activities conducted by OAR's laboratories and cooperative institutes. The primary goal of ESPC is to develop a national numerical modeling capability to predict hazards on intraseasonal to interannual scales using high resolution, extended range, seamless global earth system models (atmosphere, ocean, waves, land,

cryosphere, and stratosphere). These predictions will allow for public warning of high-impact environmental events as well as the ability to contribute important environmental information for resource and infrastructure planning prior to and during these events.

The National Severe Storms Laboratory (NSSL) leads efforts to develop and evaluate storm-scale numerical weather prediction models suitable for very short-range ensemble prediction of severe weather, such as tornadoes, hail, damaging winds and flash floods. Development focuses upon the accurate representation of precipitation processes within models and the assimilation of high-resolution radar and satellite observations to provide accurate model initial conditions. The goal is to transition severe weather warning operations from a warn-on-detection approach to a warn-on-forecast approach, providing longer severe weather lead times. Model evaluation is conducted in partnership with the National Weather Service, and seeks to develop best practices for using storm-scale ensemble model forecasts in operational forecast and warning operations. This evaluation process is a very effective way to quickly assess model strengths and weaknesses.

Tsunami Research

The Pacific Marine Environmental Laboratory (PMEL) develops tools and cost-effective observing systems to improve the accuracy and timeliness of NOAA's tsunami forecasting capabilities. This research is conducted through PMEL's NOAA Center for Tsunami Research which works closely with NWS (which has operational responsibility for warnings and observations), NOS, and NESDIS. The NOAA Tsunami Forecast System operated by NWS and supported by research at PMEL has been effective in over thirty tsunami events since inception. During the Honshu, Japan tsunami in March 2011, the system provided accurate forecasts of wave amplitude when compared to coastal tide gauge observations. This catastrophic event highlighted the need for faster local tsunami forecasts and quickly disseminated graphical flooding forecast products.

PMEL has worked to accelerate development of engineering technology and modeling capabilities for more cost-effective observing technology and tsunami forecast coverage to additional communities. For example, in FY 2013, PMEL deployed a test mooring utilizing new, more sensitive tsunameter technology, which will allow re-positioning DART buoys much closer to potential tsunami sources, reducing detection time and improving forecast accuracy for close-to-source communities.

The Tsunami Research Program is linked to stakeholders in coastal states through the National Tsunami Hazard Mitigation Program (NTHMP), created in 1995 to provide improved tsunami warning services to coastal communities. All coastal states and territories, NOAA, FEMA, and the U.S. Geological Survey are members of the NTHMP.

Unmanned Aircraft Systems

OAR's Unmanned Aircraft Systems (UAS) program is an initiative that accelerates the research, development, and transition of innovative new observational platforms and forecast tools to advance NOAA's Earth-system product, service, and information enterprise. The program works with academia to develop and test a UAS observing strategy for regional river flood monitoring suitable to address the real-time observing needs of the National Weather Service. This observing strategy will be expanded in 2015 to include localized severe storms and tornadoes. The UAS program is also working with NASA to expand the Global Hawk partnership to NOAA-dedicated Global Hawk missions using NASA-funded Hurricane Severe Storm Sentinel (HS3) payload sensors, facilities, and science team and aviation personnel. These missions will be used to evaluate the impact of UAS observations on improving real-time weather forecasting and the feasibility of UAS observations to mitigate the degradation of weather forecasting services in the event of satellite observing gaps.

Wind Boundary Layer Research
NOAA is improving physical characterization of winds in the boundary layer in its foundational weather models by deploying wind testbeds in different regions of the nation that are meteorologically distinct (i.e., have different factors affecting the weather), selected from among the Pacific Northwest, offshore regions, U.S. Great Plains, Appalachia, inter-mountain west, California, and Hawaii. To collect the required observations, NOAA relies heavily on remote sensing instruments, such as wind profiling radars, sodars, lidars, and radiometers, standard in-situ anemometers on industry-provided tall towers. NOAA will continue to obtain additional operational observations and assimilate them into the High-Resolution Rapid Refresh (HRRR) weather model. NOAA uses the additional observations collected at the testbeds to initialize the HRRR model and equip it with more accurate initial values of weather parameters to produce a more accurate forecast of wind speeds and direction and to improve model physics and data assimilation schemes. Additional observations will also be used to improve physical parameterization in NWP models. Observations collected at testbeds will be used in observation sensitivity experiments (OSEs), such as data denial experiments. Additional High Performance Computing (HPC) or disk space for analysis may be required and procured. NOAA will collect key information to assess the operational observations needed for wind resource characterization and forecast improvement. NOAA will review the state of the art in observing system simulation experiments (OSSEs) and will assess the viability of using OSSEs to inform our assessment of an adequate observing system.

Schedule and Milestones:

FY 2015

- Complete a report documenting the readiness of WoF technology and utility of transitioning WoF functionality to operations.
- Assess the use of frequently updated national scale and local ensembles for probabilistic forecasts in the WoF context and determine methods for best communicating uncertainty in warnings to both forecasters and non-NOAA customers with help from social scientists. Test and evaluate a Probabilistic Hazard Information grid in the Hazardous Weather Testbed based on the results of the historical reanalysis of WSR-88D and other sensor data.
- Conduct intensive field study in the northeast U.S. to advance understanding of climate-air chemistry interconnections.
- Validate and improve emission inventory for species important for climate and air chemistry using data from southeastern U.S. study.
- Provide scientific synthesis report from intensive field study in the southeast U.S.
- Conduct laboratory evaluation of ozone-depletion potential, greenhouse-warming potential, and atmospheric degradation products of an industry-proposed replacement compound
- Provide scientific assessment of the impact of aerosols on cloud systems.
- Perform radar data analysis to improve data quality and usability through signal processing improvements. Signal processing improvements may be used to identify and mitigate Wind-farm clutter and to detect tornado signatures using spectral analysis.
- Evaluate the impact of dual polarization radar data on flash flood 0-6 hour forecasts.
- Demonstrate improved QPE accuracy for flash flood events in warm season.
- Collect ground truth data for cool season precipitation events.
- Integrate environmental data into the advanced Multi-Radar, Multi-Sensor MRMS dual-polarization radar QPE system for improved segregation of different precipitation regimes.
- Continue development of the advanced dual polarization radar QPE in the MRMS system using adaptive relationships between the rainfall rate and dual polarization radar variables based on segregations of precipitation regimes.

- Tests of advanced physics packages in each active storm for possible implementation into HWRF to enable simulations at resolutions down to 1 km. Focus will be on microphysics and aerosol.
- Testing of HRRR Ensemble model and data assimilation system.
- Testing of an hourly-updated global Rapid Refresh (RAP) data assimilation and model in preparation for NextGen mid-operational capability.
- Expand number of scientific dataset visualizations for NOAA Science On a Sphere for use by government and museum partners.
- Complete a field study of ammonia exchange between the air and agricultural land in a Midwestern region.
- Complete HYSPLIT-Hg simulations of the atmospheric fate and transport of mercury from global sources.
- Continue analyses of climate-stratospheric chemistry interactions.
- Improved realism of the NOAA Earth System Models by closing the nitrogen cycle, and major feedback on the global carbon cycle.
- Conduct field missions and prepare observation impact, cost benefit and operational effectiveness analysis of UAS observations for improved forecasting of river floods, localized severe storms and high impact storms at sea.
- Develop and conduct two tests of observing system sensitivity analysis in each active storm using ensemble Kalman filter data assimilation system and NOAA's operational Hurricane Weather Research and Forecasting (HWRF) model. Focus will be on developing synthetic airborne Doppler radar and Lidar observations from high-resolution nature runs of hurricanes.
- High quality observations from a yearly Intensity Forecast Experiment in partnership with NWS, NESDIS, and AOC to improve hurricane track and intensity forecasts. Continue development of new instrumentation. (FY 2015 – FY 2019)
- Maintain current hydrometeorological testbeds in meteorologically distinct regions of the Nation. (FY 2015-FY 2016)
- Complete transition of HRRR model into NWS operations.
- Upgrade GFDL Hurricane Prediction System.
- Integrate long-term records to understand changes in the distributions and trends of atmospheric gases affecting climate, ozone depletion, and atmospheric composition. (FY 2015-FY 2017)
- Provide interpretations for supporting development and analyses of annual updates of Annual Greenhouse Gas Index and Ozone Depleting Gas Index. (FY 2015-FY 2017)
- Complete a demonstration within the Hazardous Weather Testbed of a warn-on-forecast (WoF) component during the severe weather season that uses input from the HRRR model. WoF is a research program tasked to increase tornado, severe thunderstorm, and flash flood warning lead times. The new research uses probabilistic hazard guidance provided by an ensemble of forecasts from convection-resolving numerical weather prediction models.
- Test one component in the Hazardous Weather Testbed. (FY 2015-FY 2018)
- Ingest and assimilate additional observations, e.g., from wind farms, to improve weather forecast model output. (FY 2015-FY 2019)
- Develop modeling and detection tools to support tsunami forecasting, including specific tools to improve warnings of local tsunami events.
- Continue hazard assessment training for U.S. community planners/emergency managers and forecast modeling training for U.S. and international tsunami forecasting professionals.
- Begin running models regularly that have met standard ESPC criteria for evaluation and improvement and use results from the analysis of case studies to identify and formulate

model improvements for the ESPC focus areas. Begin sharing model data and results with operational offices within the National Weather Service.

- Continue development of polarimetric microphysical retrieval methods for rain
- Start development of polarimetric microphysical retrieval methods for snow and mixed-phase hydrometeors
- Begin to address improving the data quality of polarimetric variables and spectral moments through spectral processing.

FY 2016

- Develop North American Rapid Refresh Ensemble, an ensemble forecast system composed of multiple models using different configurations.
- Develop the initial data mining applications to identify severe weather signatures in model analyses.
- Demonstrate and test a probabilistic warning system using model assimilation analyses as a prototype for WoF.
- Continue to maintain and develop research radar systems (NO-XP, KOUN, mobile radars) to support scientific inquiry. Maintenance and development activities include the hardware and software required to collect data, as well as the software needed to perform data analysis and display.
- Utilize storm-scale precipitation 0-6 hour forecasts from high-resolution NWP models (e.g., the Center for Analysis and Predictions of Storms (CAPS) model or HRRR ensembles) that assimilate radar data into flash flood forecast systems to increase lead-time.
- Transfer to operations the advanced multi-sensor dual polarization radar QPE techniques for warm season.
- Begin development of advanced MRMS dual polarization radar QPE for cool season using ground radar, rain gauges, and atmospheric environmental data.
- Begin integration of space-borne radar data from Global Precipitation Mission into the MRMS system to improve QPE accuracy for the U.S. mountainous west.
- Coordinate and conduct yearly Intensity Forecast Experiment in partnership with NWS, NESDIS, and AOC to collect high quality observations in support of operations and Hurricane Forecast Improvement Project needed to improve hurricane track and intensity forecasts. Continue development and testing of new instrumentation.
- Continue tests of ensemble Kalman filter data assimilation system for possible implementation in NOAA's operational HWRF. Test impact of assimilation of satellite microwave radiance data using OSSE and OSE approaches.
- Develop and test advanced physics packages for possible implementation into HWRF to enable simulations at resolutions down to 1 km. Focus will be on microphysics and aerosol.
- Complete source-receptor analysis, GIS analysis, model evaluation ("ground-truthing") for a source-receptor model of atmospheric mercury.
- High-quality hurricane observations from airborne experiments for use in hurricane regional model data assimilation and evaluation, in particular dropsondes, Doppler radar, *in situ*, and stepped frequency microwave radiometer. (FY 2016 – FY 2017)
- Conduct field missions and prepare observation impact, cost benefit and operational effectiveness analysis of UAS observations for improved forecasting of river floods, localized severe storms and high impact storms at sea.
- Deploy and operate testbed in meteorologically distinct regions of the Nation. Each testbed would remain in operation for one year.
- Delivery of improved operational forecast products for NWS Tsunami Warning Centers. (FY 2016-2019)

- Continue training for U.S. and international community planners/emergency managers and forecast modeling professionals.
- Implement ESPC-proposed model improvements and evaluate impact on predictions of case studies and current high-impact weather events.
- Continue development of polarimetric microphysical retrieval methods for snow and mixed-phase hydrometeors.
- Start the evaluation of microphysical parameterization schemes in the numerical weather prediction (NWP) models by converting their outputs into the fields of polarimetric radar variables and comparing them with results of observations by operational WSR-88D radars.

FY 2017

- Expand the number of stations feeding observations data to the Meteorological Assimilation Data Ingest System (MADIS) to 100,000.
- Determine which data assimilation methods are most accurate and cost-effective when applied to radar data at convection-resolving scales to provide guidance to further WoF development.
- Evaluate accuracy and lead-time improvements through the use of inputs from quantitative precipitation forecasts.
- Continue development of advanced multi-sensor dual polarization radar QPEs for cool season precipitation.
- Evaluation and refinements of the real-time MRMS dual polarization radar QPE performance from different seasons and different geographical regions. (FY 2017-FY 2018)
- Continue development of the space-borne and ground radar merged QPE in the MRMS system.
- Complete regional field studies of ammonia exchange between the air and agricultural land.
- Conduct intensive field study to advance understanding of climate-air chemistry interconnections - region TBD.
- Provide scientific synthesis report from previous intensive field study in the U.S.
- Conduct laboratory evaluation of ozone-depletion potential, greenhouse-warming potential, and atmospheric degradation products of an industry-proposed replacement compound.
- Validate and improve emission inventory for species important for climate and air chemistry using data from previous intensive field study.
- Prepare final observation impact, cost benefit and operational effectiveness analysis to inform NOAA Go/No Go of UAS acquisition for improved weather forecasting.
- Refine microphysical parameterizations of the NWP models using polarimetric radar data and results of polarimetric microphysical retrievals.

FY 2018

- Provide NOAA management with information needed to decide whether to make WoF operational, including the total costs of going forward.
- Address fundamental science questions that may limit WoF utility, including effects of model error on thunderstorm evolution, needed accuracy of storm environmental conditions, and errors in conversions from model data to observational data. VORTEX2 data will assist this evaluation.
- Transfer to operations the advanced multi-sensor dual-polarization radar QPE techniques for cool season precipitation. Provide scientific synthesis report from intensive field study.
- Evaluate the HRRR Ensemble model and data assimilation system in preparation for NextGen mid-operational capability.

- Deploy and operate testbed in meteorologically distinct regions of the Nation. Each testbed would remain in operation for one year.
- Assess the advanced nesting capability of the HWRF model coupled with an ocean/wave model.
- Implement UAS transition plans from research to operations
- Start developing the schemes for assimilation of polarimetric radar data and microphysical retrieval products into NWP models.

FY 2019 and Beyond

- Conduct intensive field study to advance understanding of climate-air chemistry interconnections - region TBD.
- Validate and improve emission inventory for species important for climate and air chemistry using data from previous intensive field study.
- Provide scientific synthesis report from previous intensive field study in the U.S.
- Conduct laboratory evaluation of ozone-depletion potential, greenhouse-warming potential, and atmospheric degradation products of an industry-proposed replacement compound.
- Continue tests of ensemble Kalman filter data assimilation system for possible implementation in NOAA's operational HWRF. Test impact of assimilation of satellite microwave radiance data using OSSE and OSE approaches.
- Obtain high-quality hurricane observations from airborne experiments for use in hurricane regional model data assimilation and evaluation, in particular dropsondes, Doppler radar, in situ, and stepped frequency microwave radiometer.
- Coordinate and conduct yearly Intensity Forecast Experiment in partnership with NWS, NESDIS, and AOC to collect high quality observations in support of operations and Hurricane Forecast Improvement Project needed to improve hurricane track and intensity forecasts. Continue development and testing of new instrumentation.
- Conduct real-time tests of WoF system in Hazardous Weather Testbed in collaboration with NWS forecasters and collect data needed to verify WoF predictions. Collaborate with NWS forecasters to evaluate WoF and develop new display capabilities for use in warning operations. Evaluate WoF predictions using rigorous verification measures and use knowledge gained to further improve WoF system. (FY 2020)
- Transfer to operations the MRMS space-borne and ground radar merged QPE.
- In preparation for real-time tests of WoF system in 2020, implement and test a real-time version of WoF system in research mode. (FY 2019)
- Evaluation and refinements of the real-time MRMS dual polarization radar QPE performance from different seasons and different geographical regions. (FY 2019-FY 2020)
- Testing the assimilation methodologies of the polarimetric radar data and microphysical retrieval products into NWP models.

<u>Water Cycle</u> (FY 2015 – FY 2019)

- Assess and document the ability of gap filling radars to augment legacy observing systems (e.g. NEXRAD) in the west to provide better precipitation and water supply information.
- Conduct field experiments (Hydrometeorology Testbed & CalWater) focused on extreme precipitation events and their role in the water cycle - required for better climate projections and forecasts for flood and water supply.
- Couple ensemble precipitation forcing to hydrological models for two key watersheds.
- Deliver a preliminary report on quality of precipitation and runoff forecasts.
- Document and coordinate model development and operations plan to increase number of communities served by stream and river forecasts for the CERIS region.

Weather and Climate Physics (FY 2015 – FY 2019)

- Bring Tiksi observatory to 30 percent capacity and maintain Alert Baseline Surface Radiation Network (BSRN)/Aerosol with GMD.
- Make public version 10 of the PSD/ESRL hurricane flux algorithm.
- Generate data archive of ship and aircraft observations from participation in the NOAA/National Science Foundation DYNAMO field program in the Indian Ocean.
- Repackage W-band radar for future installation on NOAA P-3.

Deliverables:

- Recommendations for improvements to address seasonal biases in particulate matter forecasts.
- High-quality hurricane observations from airborne experiments for use in hurricane regional model data assimilation and evaluation, in particular dropsondes, Doppler radar, *in situ*, and stepped frequency microwave radiometer.
- Observing system sensitivity analysis capability utilizing the ensemble Kalman filter data assimilation system and the improved nesting for HWRF.
- Fully coupled advanced nesting capability for testing and evaluation in the operational HWRF model system.
- Report documenting the impact of improved physics for air-sea fluxes and boundary layer on hurricane track and intensity forecasts using regional HWRF model system.
- Report documenting the impact of assimilating Doppler Wind Lidar and radar on hurricane track and intensity forecasts using the regional HWRF model system.
- Code for the Flow-following finite-volume Icosahedral Model to NWS National Centers for Environmental Prediction (NCEP) as a member of a global ensemble model.
- Preliminary development of a tornado debris signature algorithm using Dual Polarization radar data.
- Report documenting the impact of improved physics for microphysics and aerosol on hurricane track and intensity forecasts using the regional HWRF model system.
- Deliver code for HRRR model at NWS/NCEP depending on availability of necessary high performance computing resources.
- Urban Meteorology: Improve dispersion predictions in urban environments (ongoing).
- Dispersion Forecast System: Provide annual updates to dispersion forecast system, used for local to international incidents.
- Improved research-grade weather forecast capability designed for transition to operations.
- Assessment of the optimal mix of instrumentation needed for wind resource characterization and forecast improvement possibly using observing system simulation experiments (OSSEs).
- Improved 0 to 100 day weather predictions.
- Model upgrades, re-evaluation against diagnostics.
- Successful delivery of training material to the NWS Warning Decision Training Branch.
- Successful completion of TDS algorithm development, testing and delivery to the NWS ROC.
- Successful delivery of QPE and HCA improvements to the NWS ROC.
- Successful operational deployment of CLEAN-AP and SPRT to the NEXRAD WSR-88D's (dependent upon NWS ROC's ability to integrate).
- Methods to retrieve microphysical parameters from polarimetric radar data for rain, snow and mixed phase precipitation. (2017)
- Transition spectral processing algorithms for improved polarimetric variables and spectral moments. (2017)

- Improved numerical weather model performance through the assimilation of polarimetric-derived. (2019)

Performance Goals and Measurement Data:

Performance Measure: Percent of labs that have had formal expert peer reviews in the past 5 years & were rated effective in terms of quality, mission relevance, & performance	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	100%	100%	100%	100%	100%	100%	100%
Description: This performance measure is recognized by the National Academy of Sciences report *Evaluating Federal Research Programs,* which states "The most effective means of evaluating Federally funded research programs is expert review."							

Hurricane Research

Performance Measure: Reduction in uncertainty of hurricane processes that drive track and intensity change based on high-quality observations from airborne experiments (cumulative)	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	6%	9%	11%	13%	15%	17%	19%
Description: Data collected in and about the hurricane environment from hurricane hunter flights during the annual field program is invaluable to increasing knowledge of how hurricanes develop, move, and intensify. As a result of research and publications based on these observations, there will be increased knowledge that will be incorporated by the hurricane modeling community, resulting in increased accuracy in hurricane models. This observation program serves as the foundation for meeting NOAA's weather-ready nation goal of reducing forecast uncertainty and unnecessary evacuations that result in economic impacts to communities.							

Performance Measure: Cumulative percent reduction in error of track and intensity guidance of the HWRF model system	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	20%	27%	32%	37%	42%	47%	52%
Description: As a result of new hurricane observing systems, improved nesting capability, and advanced physics packages applicable at 1-km horizontal resolution, hurricane track and intensity forecasts using regional HWRF model system will see a reduction in forecast error. Incorporating this improved hurricane data directly addresses NOAA's weather-ready nation goal of reducing forecast uncertainty and unnecessary evacuations that result in economic impacts to communities.							

Severe Storms Research

Performance Measure: Cumulative number of severe weather events for which Warn-on-Forecast numerical predictions of tornado lead time exceeds 20 minutes	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	1	2	3	3	4	4	5

Description: The Warn-on-Forecast program is working to combine high resolution models with high resolution data (from radars and other observations), advanced data assimilation and quality control techniques, and high-end computing to produce a forecast of a tornado that would effectively extend tornado warning lead times well beyond the current national average of 13-14 minutes. This NWS GPRA goal shows the amount of warning the public is given for tornadoes (national average, in minutes) by NWS. NSSL conducts research that leads to improved warning skill scores (higher probability of detection, increased lead times, and reduced false alarms) through the Hazardous Weather Testbed experiments.

Performance Measure: Cumulative number of years completed in historical re-analysis of CONUS WSR-88D data	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	12	14	18	20	21	22	23

Description: This performance measure shows the cumulative number of years of the CONUS WSR-88D network that have been processed and analyzed with the MRMS system (WRDD). The re-analysis of WSR-88D data will provide storm statistics (probabilistic guidance) that can be used to better inform the public. The probabilistic guidance available from the re-analysis will also set the baseline performance measure for evaluation of Warn-on-Forecast guidance products. Archive begins in 1996.

Performance Measure: Improvement of flash flood warning skill scores of a prototype national flash flood guidance tool	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	0.39	0.38	0.40	0.42	0.46	0.50	0.54

Description: This performance measure shows the improvement of the Critical Success Index (CSI) skill score (higher CSI scores show a combined higher probability of detection and reduced number of false alarms) of the prototype flash flood guidance tool compared to the operational flash flood guidance during a demonstration and evaluation in the Hazardous Weather Testbed. Improved flash flood guidance will result in more precise and timely Flash Flood warnings and benefit the public.

Air Chemistry Research

Performance Measure: Cumulative number of regional assessments of atmospheric mercury source-receptor relationships	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	2	2	2	3	3	3	3

Description: This provides key information for air quality and environmental policy-makers and managers and for negotiators for international agreements—enabling them to effectively target mercury emissions reductions.

Performance Measure: Cumulative number of completed field studies of ammonia exchange between the air and land	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	1	2	2	3	3	3	3

Description: Ammonia is a key atmospheric pollutant affecting ecosystems, such as estuaries. These studies provide essential information for air quality, agriculture, and environmental policy-makers and managers to inform Federal and state decisions regarding coastal water quality and habitat. It also addresses a key uncertainty in air quality models. Each study addresses different regions/land uses (e.g., fertilized farm fields, concentrated animal feeding operation) and contributes to the scientific understanding of ammonia exchange in peer-reviewed journal publications. Publications are a measure of program depth, quality, and credibility.

Performance Measure: Cumulative number of updates provided to NWS for the volcanic ash forecast system	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	9	10	11	12	13	14	15

Description: This provides improvements to a forecast system used to inform pilots where volcanic ash is located, enabling them to avoid in-flight catastrophes. Examples of improvements include better use of satellite observations to estimate volcano source strength and improved flexibility for configuring simulations for various types of eruptions.

Performance Measure: Cumulative number of dispersion prediction system updates provided to NWS	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	4	5	6	7	8	9	10

Description: The updates of the HYSPLIT dispersion model provided to NWS for operational implementation will contribute to improved outcomes by improving the accuracy and usefulness of NWS dispersion prediction products. The updates will also improve the ease of use and flexibility of the software for meeting NWS needs. NWS uses HYSPLIT for dispersion predictions for applications ranging from local chemical releases to international radiological incidents, providing information to customers ranging from local emergency managers to the World Meteorological Organization.

Performance Measure: Cumulative number of reports to stakeholders and decision makers that provide a policy-relevant scientific synthesis of results from intensive field studies, process studies, and analyses	FY 2013 Actual	FY 2014 Target	FY 2015 Target	FY 2016 Target	FY 2017 Target	FY 2018 Target	FY 2019 Target
	2	2	3	3	4	4	5

Description: This is a new performance measure for the FY 2014 request. Reports provide a distillation of key scientific findings on emissions, transport, atmospheric processing, and impacts of climate forcing agents, their precursors and species related to air quality degradation to inform policy development and emission management strategies for climate and air quality.

Weather Models and Advanced Technologies

Performance Measure: Cumulative percentage improvement in accuracy (probability of detection of ceiling <1000 ft.) of the 3-hour cloud ceiling for aviation forecasts	FY 2013 Actual	FY 2014 Target	FY 2015 Target	FY 2016 Target	FY 2017 Target	FY 2018 Target	FY 2019 Target
	5%	6%	7%	8%	9%	10%	10%

Description: Better awareness of expected cloud ceiling over the next 3-hour period is critical to airline safety and aircraft take-offs and landings. Cumulative percentage improvements (approx. 1% per year) will be derived from operational implementation of a new short-range, rapidly updated model called the Rapid Refresh at NWS/National Centers for Environmental Prediction and continuous updates.

Performance Measure: Cumulative number of major tests and evaluations of numerical weather prediction forecast system component improvements for transitioning to operational numerical weather prediction systems	FY 2013 Actual	FY 2014 Target	FY 2015 Target	FY 2016 Target	FY 2017 Target	FY 2018 Target	FY 2019 Target
	16	21	26	31	36	41	46

Description: The multi-agency Developmental Testbed Center conducts major tests and evaluations of improvements to NWP forecast system components provided by the Numerical Weather Prediction research and operational communities. These tests and evaluations are critical for selecting proposed changes that need to be transitioned to operational centers.

Performance Measure: Number of case studies of specific meteorological/oceanic events related to the five ESPC focus areas (cumulative)	FY 2013 Actual	FY 2014 Target	FY 2015 Target	FY 2016 Target	FY 2017 Target	FY 2018 Target	FY 2019 Target
	0	2	5	8	11	14	17

Description: The cumulative number of in-depth case studies pursued each year to diagnose model deficiencies at representing physical processes and prescribe model improvements.

Performance Measure: Number of model upgrades and improvements (cumulative)	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	0	1	2	3	4	5	6
Description: The cumulative number of numerical model improvements to the models being tested in Earth System Prediction Capability leading to better representation of physical processes and hence better forecasts of high-impact weather phenomena.							

Performance Measure: Number of scores showing improvement over baseline (cumulative)	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	0	0	0	1	2	3	4
Description: The cumulative number of numerical model skill scores showing improvement over an established baseline.							

Tsunami Research

Performance Measure: Cumulative number of formal expert peer-reviewed publications related to tsunami research (from FY 2011 baseline)	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	28	30	32	34	36	38	40
Description: The number of peer-reviewed publications is widely recognized as being critically important to the advancement of science. It reflects success in conducting research with recognized value and quality and the transfer of scientific information to the public.							

Unmanned Aircraft Systems

Performance Measure: Conduct Unmanned Aircraft Systems (UAS) field tests – number of field tests: number of operational transition plans	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	2:1	2:1	2:1	2:1	2:1	2:1	2:1
Description: This measure reflects the ratio of the number of field tests conducted to the number that are transitioned to operational applications. Field tests (with NASA, DOE, & other agencies) focus on data collection over vast, remote areas, including the Gulf of Mexico & Atlantic (e.g., hurricane tests), Central Pacific (e.g., endangered species at the Papahānaumokuākea Marine National Monument), and Arctic (e.g., measuring changes in pack ice).							

Performance Measure: UAS observing systems transitioned into operations	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	0	1	1	1	1	1	1
Description: The number of UAS technology applications formally transitioned into operations after final acceptance of system requirements, concept of operations, and resource allocation by the appropriate Line Office stakeholders and OMAO.							

Performance Measure: Number of NOAA-dedicated Global Hawk missions conducted per year for real-time data assimilation	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	N/A	10	10	10	10	10	10

Description: The NOAA UAS Program will collaborate with the NASA Earth Science Office to plan and execute 10 Global Hawk missions per year with a combined NASA and NOAA payload to determine the effectiveness of targeted observations from a high altitude, long range, and long endurance UAS for real-time data assimilation into weather forecast models and improved prediction of high impact weather events.

Performance Measure: Percentage of numerical weather forecast improvement attributed to Global Hawk observations in a research setting	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	N/A	10%	10%	10%	10%	10%	10%

Description: This work will test the hypothesis that a high altitude, long range, and long endurance UAS will provide unique high spatial and temporal resolution information capable of improving weather prediction skill by 10% or more for high impact weather events.

Wind Boundary Layer Research

Performance Measure: Number of Wind Testbeds Established (yearly). Each testbed would remain in operation for one year	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	N/A	1	0	1	0	1	0

Description: Deploying a testbed refers to the installation of meteorological equipment, such as wind profiling radars, lidars, and sodars, which collect meteorological observations for use in weather models to provide better weather forecasts. Observations are also used to determine forecast quality and understand forecasting error for later improvements.

Performance Measure: Cumulative improvement in accuracy of forecasted wind speed and direction and accuracy of forecasted timing, amplitude, and duration of wind-ramp events (in testbed regions)	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	N/A	0%	3%	4%	5%	6%	7%

Description: The skill of a forecast is measured by the error, most often by the root mean square error (RMSE). The RMSE is a standard term in statistics that measures the differences between values predicted by a model and the values actually observed.

WEATHER & AIR CHEMISTRY RESEARCH PROGRAMS

Research Programs encourage cooperation with external experts in critical fields of research. NOAA's external partners include Federal, state, and local government entities, universities, and industry. Currently two primary research programs are supported under this line.

Tornado/Severe Storm Research (Multi-Function Phased-Array Radar)

NOAA develops new technologies for detecting and forecasting severe and hazardous weather, including thunderstorms, tornadoes, flash floods, lightning, and winter storms, and for disseminating this information to emergency managers, the media, and the general public for appropriate action. Multi-function Phased-Array Radar (MPAR) has the potential to significantly extend lead times for detecting tornadoes and other forms of severe and hazardous weather. Electronically steered beams and faster scan rates can reduce the time it takes to make a complete Doppler radar observation from 4.5 minutes to less than one minute. Coupled with artificial-intelligence-based decision-support systems, tornado lead times could be increased from the current 14 minutes to over 20 minutes. By 2020, more than 350 Federal Aviation Administration (FAA) radars and by 2025 nearly 150 weather radars will either need to be replaced or have their service life extended. If MPAR is successful and implemented as a replacement radar, estimated multi-agency savings could total $4.8 billion in acquisition costs ($1.8 billion if replacing all existing radars with similar technology) and life cycle cost savings over 30 years ($3.0 billion due to fewer radars) (Federal Research and Development Needs and Priorities for Phased Array Radar FCM-R25-2006).

The MPAR program is jointly funded by NOAA and the FAA, and both agencies are coordinating their budget requests. Polarization is not currently available on phased array radars, but is a requirement for NWS to ensure no degradation of service. FAA contributes funding to the joint effort to fulfill its requirement for airport terminal weather and aircraft tracking. It is important that the leading agencies continue a joint risk-reduction R&D program given the potential for savings, complexity of the mission, the technology involved, agency go/no-go decision points, and the long lead times required for interagency acquisition times. Congress established a joint R&D program for NOAA, DOD, and FAA to investigate the feasibility and benefits of using military phased- array radars for improving severe weather forecast and warning systems.

Both FAA and NOAA provided additional funding in FY 2014 to support the MPAR Risk Reduction activities. The additional funding is being used to develop an MPAR Advanced Technology Demonstrator as called for in the MPAR R&D plan. This Advanced Technology Demonstrator will bring the dual polarization technology and multi-function capability into an operating radar system to demonstrate the full capabilities of an MPAR system before the Final Investment Decision (the Go / No-Go decision in FY 2018). The MPAR Advanced Technology Demonstrator will serve as a platform necessary for the definition of requirements of the MPAR production system.

U.S. Weather Research Program (USWRP)

Through its U.S. Weather Research Program (USWRP), NOAA seeks to improve weather and air chemistry forecast and warning information and products by funding, facilitating, and coordinating cutting-edge research to improve high-impact weather and air chemistry predictions and warnings to protect lives and property of the American public and inform weather sensitive U.S. industries. USWRP collaborates closely with NOAA scientists and academic partners to transition this research into useful applications that help forecasters provide more accurate and reliable weather forecasts and warnings. The USWRP also supports societal impact studies in weather and a set of related program projects to provide outreach and coordination among NOAA, other government agencies, academia, and industry. Within NOAA/OAR, the Office of Weather and Air Quality (OWAQ) Program manages the overall USWRP effort in support of research, societal benefits, and related weather research through projects with internal and external partners, including NOAA's cooperative institutes

and other academic partners. USWRP project activities include weather testbeds, environmental modeling research, weather research partnership projects, and socioeconomic research.

- ***Testbeds*** provide an infrastructure where the latest research findings and techniques are continuously tested by scientists and evaluated by operational weather forecasters. Testbed funding provides support for managing the activities at weather-related NOAA testbeds as well as research conducted with academic partners within the testbed. Testbeds serve as an effective means of demonstrating the value of research results to operational forecasters at the NWS by providing an environment in which the computer hardware and software used by forecasters is used in evaluating the utility of research results. These testbeds allow for an accelerated transfer of research results into operations, as described in two recent articles that were published in the *Bulletin of the American Meteorological Society*[14].
- ***Environmental Modeling Research*** is required for better weather and flash flood warnings and forecasts. OWAQ supports Federal and university partnerships to improve computer models and develop techniques to quickly incorporate observations from radar (both operational and experimental), satellite, and other sources into models. USWRP will support scientists to improve existing computer models and the methods for incorporating environmental observations into these models. In collaboration with other NOAA Line Offices and other federal agencies, additional research will develop techniques that produce detailed, probabilistic forecasts so users understand the uncertainty associated with the forecast and can make more informed decisions.
- ***Partnership Projects*** focus on research that cannot be easily evaluated in a testbed. The USWRP funds competitive academic-NOAA research partnership projects. The projects usually take place outside of the testbed environment because of geographical limitations of the NOAA scientist and/or the academic researcher or the nature of the research. This research usually involves an academic-NOAA forecaster partnership to ensure that the project will benefit from the expertise of both the academic community and NOAA forecasters to ease transition into NOAA forecast and warning operations.
- ***Socioeconomic Research*** incorporates the societal needs for weather forecasts and warnings in the USWRP. This research provides information about the economic value of weather research and contributes to understanding how society uses and interprets weather information. Socioeconomic research also provides information about improving the communication of weather information to the public.

Schedule and Milestones:

FY 2015

- Participate in FAA's Investment Analysis Readiness Decision review.
- Begin MPAR Investment Analysis with FAA.
- Complete study indicating the MPAR can support both weather surveillance and aircraft tracking functions (Multi-function) simultaneously.
- Identify additional candidate ground-based observation platforms to study.
- Engage industry to begin fabrication of MPAR Advanced Technology Demonstrator.

[14] http://www.nhc.noaa.gov/pdf/rappaport-et-al-bams2012.pdf and http://www.goes-r.gov/resources/Scipubs/docs/2012/BAMS-D-11-00040.pdf.

- Host scientific seminars to discuss USWRP research results with NOAA and academic scientists. (FY 2015-FY 2019)
- Evaluate transfer of USWRP-supported research into operations. (FY 2015-FY 2019)

FY 2016

- Complete research with social scientist on the Phased-array Radar Innovative Sensing Experiment in the NOAA Hazardous Weather Testbed. Complete submission of findings for publication in refereed journal.
- Complete observational case studies of tornadic storms to investigate the importance of sampling time on understanding storm evolution to be submitted for publication.
- Begin field testing selected ground-based observation platforms.
- Test radar control and signal processing software.
- Complete competitive grant process to select USWRP-funded weather projects.

FY 2017

- Simulation of full array using computer-based models.
- Complete MPAR investment analysis for FAA's Final Investment Decision.
- Begin assimilation of observing system data into numerical models and analyze effect on model predictions and determine feasibility of operational implementation along with future operational requirements.
- Demonstration of MPAR Advanced Technology Demonstrator and multi-function software.

FY 2018

- Prepare recommendation for NOAA's participation in FAA's Final Investment Decision.
- Begin development of MPAR production system in coordination with FAA (first article for eventual evaluation and testing).
- Use test results from MPAR prototype to inform Go/No Go decision.
- Begin data collection using the MPAR Advanced Technology Demonstrator.
- Identify candidate ground-based observation platforms to study.
- Complete competitive grant process to select USWRP-funded weather projects.

FY 2019

- Participate in MPAR acquisition program with FAA.
- Complete observational case studies of tornadic and other severe storms to investigate importance of sampling time on understanding evolution of dual polarization signatures to be submitted for publication.
- Complete competitive grant process to select USWRP-funded weather projects.

Deliverables:

- Communication of research results to NOAA forecasters and other scientists at national conferences.
- Computer algorithms developed during testbed evaluations.
- Environmental model data and observations obtained during USWRP projects.
- Prototype products available for transfer into NOAA operations.
- Computer code for improved numerical weather models.
- Test/evaluation of dual-polarization panel characteristics and performance
- Contract out design and fabrication of dual-polarized PAR sub-array antenna with FAA.
- Test/evaluation of dual-polarization sub-array antenna characteristics and performance.

- Participation in FAA's Investment Analysis Readiness Decision (IARD).
- Coordination with NWS and FAA to define initial requirements for joint FAA/NOAA MPAR prior to IARD.
- Information to inform future development and procurement of ground-based observing systems.
- Publication in FY 2016 of research results demonstrating improved tornado warning decision performance produced in collaboration with NWS forecasters within the NOAA hazardous weather testbed (HWT).
- Studies completed to assess MPAR dual-polarized antenna array configurations for both weather (NOAA weather and FAA airport terminal weather mission) and air surveillance operations (FAA mission). Design (paper) studies completed in FY 2015. Prototype based results completed in FY 2018.

Performance Goals and Measurement Data:

Tornado/Severe Storm Research (Multi-Function Phased-Array Radar (MPAR))

Performance Measure: Number of major milestones completed to support NOAA and FAA decision point. (cumulative)	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	7	11	15	18	21	25	27
Description: Cumulative number of successfully completed major milestones within Phased Array Radar Risk Reduction Activity such that NOAA and FAA have the information needed to make a Go/No-Go decision on whether to replace existing radar systems with MPAR.							

Performance Measure: Cumulative number of events demonstrating improved tornado warning decision performance	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	3	3	5	5	7	7	7
Description: Cumulative number of events demonstrating improved tornado warning decision performance (e.g. longer lead-times, fewer missed events, fewer false alarms, etc.) using the NWRT Phased Array Radar data compared to the WSR-88D-like data in matched studies within the Hazardous Weather Testbed. Note: Research using the NWRT will be phased out beginning in FY18 and a new Performance Measure based on the MPAR "Advanced Technology Demonstrator" will replace it (NWRT will be replaced with a prototype using the latest technology).							

Performance Measure: Number of observing platforms evaluated in a year.	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	N/A	1	1	2	2	3	3
Description: The number of observing systems evaluated each year for their ability to improve the detection and/or prediction of severe weather.							

U.S. Weather Research Program (USWRP)

Performance Measure: Research results that are transferred into operations through Testbed Evaluations (per/year)	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	6	10	10	10	10	10	10

Description: Evaluation of new scientific findings or development of forecaster tools for potential use in operations that will lead to improved weather forecasts and warnings. The evaluation of research that is targeted for transfer into operations also is informed by the socioeconomic research that is funded within USWRP. Annually, university and Federal scientists receive competitive funding to conduct research that will improve forecasts and warnings of high-impact weather, including tornados and hurricanes. In collaboration with NOAA scientists, the knowledge and tools obtained from these studies are tested and transitioned into NOAA forecast operations.

Performance Measure: High-Resolution Numerical Model Changes or Tests	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2018 Target**
	3	3	3	3	3	3	3

Description: Make changes to the physical parameterization or data assimilation processes of experimental forecast models and address the uncertainties in numerical weather predictions. This contributes to the improvement of the 1-5 day weather forecasts for the U.S.

Performance Measure: Number of peer reviewed publications funded by the Office of Weather and Air Quality	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	15	15	15	15	15	15	15

Description: Communicate critical knowledge obtained through research evaluated in testbeds, implemented in numerical models and obtained through partnership projects on high-impact weather events with U.S. agencies and the broader scientific community through peer-reviewed publications.

PROGRAM CHANGES FOR FY 2015:

U.S. Weather Research Program: Enhancing Readiness Levels for Short- and Long-term research (Base Funding: $0 and 0 FTE; Program Change: +$3,000,000 and +1 FTE): NOAA requests an increase of $3,000,000 and 1 FTE for a total of $3,000,000 and 1 FTE to improve the readiness of those weather and related research projects associated with critical technologies, model improvements, and service applications to a stage of development that will enable a successful future transition to operations for deployment by NOAA's operational entities.

Proposed Actions:
Continually improving NOAA's products and services to meet the needs of the Nation is an integral part of the Research and Development (R&D) enterprise. This is evidenced by the U.S. Weather Research Program (USWRP), which supports improving NOAA's weather products and services. These improvements occur by developing the most promising research, including new or improved observing, modeling and information technologies to the point that they can ultimately be transitioned into operational use.

In order for any transition from research to operations (R2O) to occur, two phases must be successful: demonstration and deployment. Demonstration is part of R&D (e.g., the use of test-beds to confirm operational usability or demonstration using rapid prototyping), while deployment is part of operations (e.g., the integration of new information or equipment into an operational environment). One way to measure the maturity of a developing R&D technology is through a defined set of Technology Readiness Levels (TRLs). TRLs are usually defined as 1-9, with TRL 1 described as simple observation or reporting of basic principles, and TRL 9 represents actual successful operations of the technology.

This proposal complements the FY 2014 request in the National Weather Service (NWS) that will enhance NWS's ability to successfully execute the deployment portion of a successful transition. Before any successful transition of technologies and products into operations, the new technology must be demonstrated in a 'proof of concept' and direct comparison mode against present technology. This proposal enables the evaluation, delivery and certainty of the developed product available for the operator to pick up. Correspondingly, the NWS R2O funds complement this request as research on a product tapers off, and operational focus and refinement increases to the point of hand-off. The value of this fund is that it will be recycled from application to application of many technologies in preparing them for proven readiness and delivery to the mission operators.

This request will provide a competitively-awarded incentive to allow the most promising research activities to move more quickly through the established Technology Readiness Levels (TRLs). In the short term, TRL 4 (proof of concept) through TRL 8 (mission qualified) will be the focus for two-five year transition. In the longer term, OAR will continue to develop and pursue those technologies that will continue to fuel the next generation of products for transition. This established system is similar to successful transition programs within the Department of Defense (DOD), the National Aeronautics and Space Administration (NASA), and the Department of Energy (DOE). The greatest benefit of this improved transition process is that program funding will be increased to accelerate, and increase the number of, research activities that are made ready for deployment by the operational office.

Types of projects that could benefit from this funding include, but are not limited to: improvements to probabilistic forecasts, improvements to numerical modeling systems, field testing of new sensors and instrumentation for improved observations, testing of systems that integrate new observations into forecast models, and development and enhancement of model output ensembling techniques. The demonstrations supported could include predictions of the transport of volcanic ash,

radionuclides, smoke, and toxic releases to aid emergency managers, improved tornado forecasts yielding longer warning lead times, as well as in advancements in ecological modeling and forecasting including waves, water levels, and ice cover.

Based in the Office of Weather and Air Quality, project funding would be distributed competitively, based on criteria of both technical maturity and operational needs (i.e., that the technology not only works, but that it meets operational requirements).

- Qualifying proposals must be jointly filed by at least one R&D unit and one operational unit within NOAA, with external partners as appropriate. The R&D unit may be a Federal laboratory or other organization, an academic department, or a non-profit research organization.
- Funds would be available for a maximum of three years for a single project, with regular review and progress assessment, with a possible extension at the discretion of the program.
- Proposals must define successful transition using specific, measurable results and make the case that significant progress -- if not complete transition -- is possible over this period with the funding requested.

Proven business processes for identifying, monitoring, evaluating, and reporting will ensure success. These include: establishing transition plans with principal investigators and operational units; reviewing, monitoring and analyzing projects and portfolios to manage risk, including the authority to terminate projects based on progress reviews; and identifying and prioritizing emerging technological challenges and opportunities. Information systems will allow the program office to monitor and analyze projects and portfolios to manage risk, and to grow systems of complementary technologies.

Background information:

Research

TRL 1: Basic principles observed and reported

Development

TRL 2: Technology concept and/or application formulated

TRL 3: Analytical and experimental critical function and/or characteristic proof-of-concept

Demonstration

TRL 4: Component/subsystem validation in laboratory environment

TRL 5: System/subsystem/component validation in relevant environment

TRL 6: System/subsystem model or prototyping demonstration in a relevant end-to-end environment

TRL 7: System prototyping demonstration in an operational environment

TRL 8: Actual system completed and "mission qualified" through test and demonstration in an operational environment

Deployment

TRL 9: Actual system "mission proven" through successful mission operations

Statement of Need and Economic Benefits:

NOAA science and technology impacts lives and the economy. The transition to operations fulfills the social and economic promise of R&D. Key examples of where NOAA has successfully transitioned research results into operations include:

- In the 10 years following NEXRAD's (NOAA's Next Generation Radar originating in NOAA's R&D units) full implementation in 1998, NEXRAD has reduced deaths and injuries by 34 percent and 45 percent, respectively, and saving the nation almost $3.2 billion.[15]

[15] Simmons, K.M., and D. Sutter. (2011). Economic and Societal Impacts of Tornadoes. Boston, MA: American Meteorological Society.

- Following a 7.5 magnitude earthquake near the Aleutian Islands in November 2003, the NWS Pacific Tsunami Warning Center issued a tsunami watch in Hawaii and Alaska. Data from DART buoys (developed by NOAA's R&D units and transitioned to operations) showed the wave was not significant, and no warning was issued, thus saving Hawaii greater than $68 million in evacuation costs.[16]
- The Rapid Refresh Model, developed by NOAA's R&D units and transitioned to its operational units, delivers improved predictions of quickly developing severe weather events including thunderstorms, winter storms and aviation hazards such as clear air turbulence. The model updates every hour with a new forecast extending out 18 hours for North America. Such forecasts are especially important in aviation, where fast-developing weather conditions can affect safety and efficiency, but they are equally important for severe weather and energy-related forecasting.[17]

Potential future benefits of improving NOAA's demonstration and ultimate transition capabilities include:

- U.S. electricity producers save $166 million annually using 24-hour temperature forecasts to improve the mix of generating units that are available to meet electricity demand. Incremental benefits are relevant in assessing the merits of investments that will improve forecast accuracy. For a 1°C improvement in accuracy, the benefit is about $59 million per year (or a $37 million benefit for a 1°F improvement). It is estimated that a perfect forecast would add $75 million to these savings (all values in 2002 dollars).[18]
- Advances in climate forecasting have enabled forecasters to predict stream flows in the Columbia River basin – which covers portions of seven western states and British Columbia, and has a total drainage area about the size of Texas – six months earlier than forecasts that rely on actual snowpack measurements. This allows more spot market energy sales to be made in late summer and fall. Benefits from the improved forecasts were measured as the value of spot market energy sales that could result from improved stream flow estimates. It was estimated that these sales could increase annual revenue by approximately $161 million per year (in 2004 dollars).[19]

Recent evaluations of the National Weather Service (NWS) by the National Academy of Public Administration[20] and the National Academy of Sciences[21] have highlighted areas of transition that must be improved. In its 2013 assessment, NAPA emphasized the importance of transition activities to the health of the National Weather Service, the primary intended recipient of the results of OAR's meteorological research. In particular, NAPA noted that "*A cohesive R2O and O2R process includes adequately resourcing not only research activities, but also the steps needed to transition research results into the operational environment. This includes evaluation through testbeds, proving grounds, and/or pilot projects. In a constrained budget environment this may require shifts in resources to*

[16] Meinig, C., Stalin, S.E., Nakamura, A.I. and H.B. Milburn. (2005, June 4). Real-Time Deep-Ocean Tsunami Measuring, Monitoring, and Reporting System: The NOAA DART II Description and Disclosure. Seattle, WA: NOAA's Pacific Marine Environmental Laboratory
[17] http://www.noaanews.noaa.gov/stories2012/20120501_rapmodel.html
[18] Teisberg, T., Weiher, R., and A. Khotanzad. (2005, December). The Economic Value of Temperature Forecasts in Electricity Generation. Bulletin of the American Meteorological Society, 86(12). Available at: http://journals.ametsoc.org/doi/pdf/10.1175/BAMS-86-12-1765
[19] Source: Hamlet, A.F., D. Huppert, and D.P. Lettenmaier. (2002). Economic value of long-lead streamflow forecasts for Columbia River hydropower. Journal of Water Resources Planning and Management, 128(2).Available at: http://www.waterandclimateinformationcentre.org/resources/8022007_Hamlet2002_JWRPM.pdf
[20] Downey, M., Anderson, E., Comfort, L., Healy, P., and Tobias, R., (2013) *Forecast for the Future: Assuring the Capacity of the National Weather Service.* National Academy of Public Administration, Washington, DC. http://www.napawash.org/wp-content/uploads/2013/05/ForecastfortheFuture-AssuringtheCapacityoftheNationalWeatherService.pdf
[21] National Academy of Sciences/National Research Council. *Weather Services for the Nation: Becoming Second to None*. Washington, DC: The National Academies Press, 2012.

accommodate transitioning research already underway or in the pipeline."[22] Additionally, the coordinated efforts required for projects supported by the transition fund would *"forge partnerships of researchers and users at the outset of a project, and continue these partnerships until the project is complete,"* noted by NOAA's Science Advisory Board as one of the most effective ways of enhancing the transitioning of research into operations/applications.[23]

Finally, while this request is intended primarily to support transition of technologies from research to operations within the agency -- to improve or create mission capabilities (i.e., innovation of public goods) -- an unavoidable spill-over effect will often be commercially viable inventions that may be patented and licensed. NOAA will facilitate and track these economic outcomes through its Technology Partnerships Office. The creation of intellectual property -- both public and private -- ensures future economic growth and job creation.

Resource Assessment:
The current resources for OWAQ are described in the Weather and Air Chemistry Research Programs narrative. the requested resources will allow NOAA to improve the readiness of those weather and related research projects associated with critical technologies, model improvements, and service applications to a stage of development that will enable a successful future transition to operations for deployment by NOAA's operational entities.

Schedule and Milestones:
FY 2015:
- Develop an implementation plan for the identification and evaluation of projects.
- Competitively select and fund selected demonstration projects. (FY 2015-2017)
- Develop, implement, and evaluate a R&D project database and management system with transition project tracking capabilities.
- Begin the population of the R&D project database and management system with the OAR transition projects.

FY 2016:
- Conduct semi-annual reviews of funded projects.
- Competitively select and fund selected demonstration projects. (FY 2016-2018)
- R&D project database and management system fully populated with the OAR transition projects.

FY 2017-2019:
- Conduct semi-annual reviews of funded projects.
- Competitively select and fund selected demonstration projects. (FY 2017-2019)
- Monitor projects status via the R&D database.

Deliverables:
- Transition of critical technologies, model improvements, and service applications to NOAA's operational entities.
- More effective management of the R&D projects portfolio with the ability to track the performance and stage/TRL of each R&D project as it is transitioned into operations/applications.
- A new set of Balanced Scorecard and GPRA level performance measures for R2O.

[22] Downey, M., Anderson, E., Comfort, L., Healy, P., and Tobias, R., (2013) *Forecast for the Future: Assuring the Capacity of the National Weather Service.* National Academy of Public Administration, Washington, DC.
[23] http://www.sab.noaa.gov/Doc/SAB%20R&D%20Portfolio%20Review%20Report%20to%20NOAA%20FINAL.pdf

Performance Goals and Measurement Data:

Performance Measure: Percent of projects that increase technical readiness.	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With Increase	N/A	N/A	N/A	30%	50%	70%	70%
Without Increase	0	0	0	0	0	0	0
Description: This measure tracks the proportion of transition projects that have increased the maturity of a technology by at least one degree of technical readiness (e.g., from TRL 4 to 5) over the course of a year. The total number of transition projects is the number of current projects at TRL 4 and above.							

Performance Measure: Percent of transition projects that are tested and demonstrated in an operational environment	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With Increase	N/A	N/A	N/A	10%	20%	30%	30%
Without Increase	0	0	0	0	0	0	0
Description: This measure is the proportion of transition projects that achieve TRL 8 over the course of the year. This marks the end of the demonstration phase and projects are “mission qualified” as defined by TRLs. At this point, systems are ready for deployment (TRL9), though they may not have yet been adopted by operations. The total number of transition projects is the number of current projects at TRL 4 and above.							

Performance Measure: Percent of transition projects with signed Transition Plans (percent)	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With Increase	N/A	N/A	0%	25%	50%	75%	100%
Without Increase	0%	0%	5%	5%	10%	15%	20%
Description: Transition plans are documents identifying the comprehensive activities necessary to transfer a R&D output to application. The total number of transition projects is the number of current projects at TRL 4 and above.							

PROGRAM CHANGE PERSONNEL DETAIL

Budget Program: Office of Oceanic and Atmospheric Research
Sub-program: Weather and Air Chemistry Research
Program Change: Enhancing Readiness Levels for Short- and Long-term research

Title:	Location	Grade	Number of Positions	Annual Salary	Total Salaries
Management and Program Analyst	Silver Spring, MD	ZA-IV	1	$89,924	$89,924
Subtotal			1		$89,924
Less Lapse	25%		0		($22,481)
Total Full-time permanent:			1		$67,443
2015 Pay Adjustment	1.0%				$674
TOTAL			1		$68,117

Personnel Data	**Number**
Full-time Equivalent Employment	
Full-time permanent	1
Other than full-time permanent	0
Total	1
Authorized Positions:	
Full-time permanent	1
Other than full-time permanent	0
Total	1

PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Budget Program: Office of Oceanic and Atmospheric Research
Sub-program: Weather and Air Chemistry Research
Program Change: Enhancing Readiness Levels for Short- and Long-term Research

	Object Class	FY 2015 Increase	FY 2015 Total Program
11	Personnel compensation		
11.1	Full-time permanent	$68	$526
11.3	Other than full-time permanent	0	
11.5	Other personnel compensation	0	0
11.8	Special personnel services payments	0	0
11.9	Total personnel compensation	68	526
12	Civilian personnel benefits	20	156
13	Benefits for former personnel	0	0
21	Travel and transportation of persons	10	18
22	Transportation of things	0	2
23.1	Rental payments to GSA	0	13
23.2	Rental Payments to others	15	28
23.3	Communications, utilities and miscellaneous charges	20	29
24	Printing and reproduction	0	2
25.1	Advisory and assistance services	0	178
25.2	Other services	-	391
25.3	Purchases of goods & services from Gov't accounts	0	420
25.4	Operation and maintenance of facilities	0	0
25.5	Research and development contracts	500	638
25.6	Medical care	0	0
25.7	Operation and maintenance of equipment	0	0
25.8	Subsistence and support of persons	0	0
26	Supplies and materials	0	32
31	Equipment	0	85
32	Lands and structures	0	0
33	Investments and loans	0	0
41	Grants, subsidies and contributions	2,367	4,717
42	Insurance claims and indemnities	0	0
43	Interest and dividends	0	0
44	Refunds	0	0
99	Total obligations	3,000	7,235

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APPROPRIATION ACCOUNT: OPERATIONS, RESEARCH, AND FACILITIES
SUB-PROGRAM: OCEAN, COASTAL, AND GREAT LAKES RESEARCH

The objectives of the Ocean, Coastal, and Great Lakes Research sub-program are to:

- Improve understanding of the physics, chemistry, and ecology of oceanic, coastal, and Great Lakes systems, including changes in these environments and the impacts of stressors such as changes in temperature, changes in ocean and Great Lakes chemistry, pollution, and invasive species;
- Improve predictive capability for oceanic, coastal, and Great Lakes processes, including developing predictive models for ecosystems, and coupling these with physical and biogeochemical models to create comprehensive Earth System Models for these environments;
- Translate ocean, coastal, and Great Lakes science into services through tools developed for resource managers, policy makers and the public, and through increased education and outreach; and
- Develop and use cutting edge technology for understanding and exploring the ocean, coasts and Great Lakes.

The ocean, coasts, and Great Lakes are closely tied to the Earth's weather and climate, and a sound understanding of these environments is essential to NOAA's research portfolio as a whole. OAR addresses this activity through core programs, which include the National Sea Grant College Program, the Office of Ocean Exploration and Research, NOAA's Ocean Acidification Program, Sustained Ocean Observations managed by the Climate Program Office, as well as through research conducted at OAR Laboratories and Cooperative Institutes. OAR's ocean, coastal, and Great Lakes programs are diverse, unique and essential to NOAA's mission. They provide science to coastal communities from a wide network of university partners, develop and use cutting edge technology to explore the depths of the ocean and share that world with scientists and the public, and accelerate our understanding of changes in our oceans and Great Lakes. More information on research in this sub-program is available at http://www.research.noaa.gov/oceans/.

LABORATORIES AND COOPERATIVE INSTITUTES

Great Lakes Environmental Research Laboratory (GLERL)
Research conducted at GLERL advances understanding of the physical, chemical, and biological processes in the lakes, and how they affect ecosystem dynamics. This knowledge leads to the development of information and tools for coastal constituents and Federal, state, and international decision and policy makers. GLERL's three main areas of research include: observing systems and advanced technology, ecosystem dynamics, and ecological modeling and forecasting. They track changes in the lakes through long-term observations of biological, chemical, and physical variables in the lakes, conduct laboratory and field experiments to define and understand the ecological processes that drive and connect these variables, and develop, test, and implement ecological models to predict the impacts of changes (e.g., invasive species, climate change, nutrient loading, and overfishing) on Great Lakes ecosystems.

GLERL has collected over 30 years of biological, chemical, and physical data from targeted sites in the Great Lakes. These databases and active observation networks provide a means to understand changes in the physical environment, and to evaluate biological trends in the context of natural variation. In addition, GLERL develops models used for ecological forecasting which predicts the

effects of biological, chemical, physical, and human-induced changes on ecosystems and their components. The models can inform decisions about how to respond to extreme natural events like storms, how to deal with human impacts from such things as storm water runoff and oil spills, and how best to manage resources such as recreational fisheries. GLERL is developing new remote sensing products, observing platforms, and instrumentation to continuously improve NOAA's observational capabilities in the Great Lakes region. New and innovative sensors, sensor deployment systems, and data management techniques are providing data and information needed to improve our understanding of regional ecosystems in all of the Great Lakes, in order to provide decision support for regional resource managers. The observation systems also contribute to forecast model research and support NOAA goals under the U.S. Integrated Ocean Observing System.

Pacific Marine Environmental Laboratory (PMEL)
PMEL conducts interdisciplinary scientific investigations in oceanography and atmospheric science. PMEL has four major research programs that fall under the sub-program of Ocean, Coastal, and Great Lakes Research: Ecosystems and Fisheries Oceanography Coordinated Investigations (Eco-FOCI), the Acoustics program, the Earth-Ocean Interactions (EOI) program, and Ocean Acidification research (details below under Other Ecosystem Programs).

The **Earth-Ocean Interactions (EOI) Program** at PMEL focuses primarily on interdisciplinary exploration and research within the deep, or inner, ocean. Within NOAA, only the EOI Program holds the capability for discovering, understanding, and predicting the interactions between the ocean and the solid earth, particularly from submarine volcanoes and hydrothermal vents. The Program's exploration and research activities reveal the importance and diversity of these continuous interactions, which affect the cycles and fate of ocean nutrients and marine carbon. These processes create and sustain mineral and biological (macro- and micro-) resources that may lead to new classes of pharmaceuticals. Continuing discoveries reveal that submarine vents create highly-acidic, animal-rich habitats that provide a broad array of natural laboratories to study the effects of ocean acidification. Documenting the unique diversity in chemosynthetic ecosystems is essential to NOAA's goal of a holistic understanding of the oceans.

The **Acoustics Program** works closely with EOI using ocean acoustics for global-ocean detection of earthquakes and magmatic events. The program also quantifies ambient ocean noise from natural and anthropogenic sources. PMEL researchers work closely with NMFS to assess populations and distributions of endangered marine mammals.

The **Ecosystems and Fisheries Oceanography Coordinated Investigations** (Eco-FOCI) is a collaborative research effort by scientists at PMEL and the Alaska Fisheries Science Center to improve the understanding of the productive ecosystems in the Gulf of Alaska, Bering Sea, and Arctic waters, which support economically valuable fisheries (e.g., pollock, shellfish, and salmon). This research provides predictions, indices, and forecasts to the North Pacific Fishery Management Council (NPFMC) which is responsible for allocating fish landings by commercial fishermen. Additionally, EcoFOCI is part of the team that provides an annual ecosystem assessment report card for the Bering Sea to the NPFMC. EcoFOCI research supports integrated ecosystem research programs in the Bering Sea and Gulf of Alaska that form the basis for two Integrated Ecosystem Assessments. EcoFOCI also supports other NOAA missions by including equipment such as carbon dioxide sensors and passive listening devices for marine mammals on their existing moorings.

Atlantic Oceanographic and Meteorological Laboratory (AOML)
AOML is a multi-disciplinary laboratory, with research spanning the topics of hurricanes, coastal ecosystems, oceans and human health, climate studies, global carbon systems, and ocean

observations. AOML's research programs are augmented by the Cooperative Institute for Marine and Atmospheric Studies (CIMAS), which is a nine-member consortium of academic institutions in Florida and the Caribbean. Some of the research programs at AOML that fall under the subactivity of Ocean, Coastal, and Great Lakes Research are detailed below.

The **Integrated Coral Observing Network Program** at AOML acquires and integrates near real-time data from *in situ*, satellite, radar and other data sources from more than 120 sites associated with important U.S. and international coral reef ecosystems. Much of the data collection for this program is accomplished through meteorological and oceanographic monitoring stations, which measure physical, chemical, and biological parameters above and below the surface of the ocean. The data collection and processing system has been successfully used in modeling and alerts of coral bleaching conditions in the Florida Keys and the Great Barrier Reef. NOAA intends to expand this alerting capability to other coral reef areas, and to better refine and enhance its alerting capabilities. Ecological forecasts help Marine Protected Area managers and researchers understand and predict coral reef ecosystem responses to environmental changes. The observing network also creates a long-term record of conditions at each of these sites, essential to understanding the impact of global climate change, as well as providing information for sound management decisions and long-term planning.

Coastal Ocean and Ecosystem Research Modeling and Technology at AOML conducts observational research and modeling, and develop and transfer tools and technologies to improve the capability to measure and understand the sources of degradation in coastal ecosystems and the resulting impact on ecosystem health and resilience, including implications to human health. This work seeks to enhance the incorporation of science into ecosystem restoration and ecosystem-based management decisions to facilitate improved management of coastal ecosystems, thereby maximizing ecosystem health and economic yield. Scientists work in cooperation with other NOAA Line Offices, other Federal, state, and local authorities, and academia to maximize research capability and results.

Schedule and Milestones:
FY 2015-FY 2019

- Establish and maintain long-term complementary data sets coincident with each reef-based ocean acidification observing platform (annually through 2019).
- Conduct regular cruises and sampling for monitoring of nutrients, microbes, Colored Dissolved Organic Matter (CDOM), and other anthropogenic source material that threaten the sustainability of coastal ecosystems, particularly those resulting from increasing urbanization and human use of the coastal zone (annually through 2019).
- Perform data analysis and evaluation of models for IPCC Assessment Report on Arctic (including Bering Sea) sea ice and temperature, and complete Fifth Assessment Report (Intergovernmental Panel on Climate Change AR5) (annually through 2017).
- Complete field work, analysis and synthesis of work in the Chukchi Sea (sponsored by DOI/BOEM) consisting of moorings and hydrographic surveys of the water column to determine the relationships among climate change, ice thickness, and biological productivity (annually through 2016).
- Maintain observation network including biophysical moorings at two stations for the Distributed Biological Observatory.
- Conduct expedition to the New Millennium Observatory/Ocean Observatories Initiative (NeMO/OOI) cabled observatory on Axial Seamount to acquire data for eruption forecasting and maintaining time series of chemical and microbiological sampling to understand deep-

sea ecosystems and the impacts and fate of volcanically produced ocean nutrients and carbon dioxide. Data will be made available to users in real time.

- Conduct ecosystem assessment for the Gulf of Alaska synthesis phase.
- Conduct ecosystem Assessment for the Gulf of Mexico.
- Initiate multidisciplinary exploration and research to locate and characterize hydrothermal vents in the unexplored parts of the Mariana Trench Marine National Monument.
- Recover previously deployed hydrophones in the equatorial Atlantic and review data for earthquake predictability (retrospectively) at ocean transforms, assess ambient noise levels resulting from oil exploration, and examine the distribution of large cetaceans.
- Maintain an array of biophysical moorings in the Bering Sea. Mooring "M2" will be deployed for the 20th consecutive year, extending the longest time series of oceanographic data in the Bering Sea.
- Continue field work, analysis and synthesis of work in the Chukchi Sea (sponsored by DOI/BOEM) consisting of moorings and hydrographic surveys of the water column to determine the relationships among climate change, ice thickness, and biological productivity (annually through 2016).
- Maintain observation network including biophysical moorings at two stations for the Distributed Biological Observatory.
- Development/integration activities commence on two candidate technologies.

Deliverables:

- Quality-controlled data acquisition and process studies to characterize carbonate chemistry dynamics within coral reef environments.
- Automated and validated ecological forecasts of coral bleaching as a result of data integration through the ICON program. Historical field observations and ecosystem forecast models will be used to develop web-based products that forecast coral bleaching events.
- An integrated conceptual ecosystem model and indicator set for south Florida coastal waters.
- Technical Report to describe current and chemical (nutrient) distributions in coastal waters in relation to known point sources (inlets and waste-water outfalls), to assist in assessing relative strengths of land-based sources of pollution over southeast Florida reef tracks.
- Use of molecular assays by NOAA partners/customers.
- Low-oxygen warning systems will be deployed and real-time results provided to water intake managers, protecting the drinking water quality of over two million coastal Lake Erie residents.
- Vessel-based measurements and other observing systems in the Great Lakes will provide data for satellite ground-truthing.
- An annual, synthetic, ecosystem-based assessment of the eastern Bering Sea published in the Ecosystem Considerations Chapter of the Stock Assessment and Fishery Evaluation reports delivered to the North Pacific Fisheries Management Council and contributions to at least two individual species stock assessments.
- Publication of the 4th special issues of the Bering Sea Integrated Ecosystem Research Program. (FY 2015)
- Gulf of Alaska Integrated Ecosystem Research Program special issue published in an appropriate peer-reviewed journal. (FY 2015)
- Two special issues on the Synthesis of Arctic Research (SOAR) published in peer-reviewed journals and information delivered to stakeholders via internet, media, and Native village outreach. (FY 2015, FY 2016)
- Annual Arctic Report Card and outreach video: http://www.arctic.noaa.gov/reportcard/
- Coupled trophic model for use in ecosystem assessments for the Bering Sea. (annual)

- Regular contribution of data from 4 moored arrays in the Bering Sea and at least two arrays in the Chukchi Sea to year-round, long-term time series. This is accomplished through maintenance of the Bering Sea Climate and Ecosystem Observational Network. (FY 2015-2016)
- New/improved ship, seafloor *in situ,* and autonomous systems and sensors
- Updated forecast of the timing of the next eruption at Axial Seamount, the NeMO and Ocean Observatory Initiative (OOI) seafloor observatory site in the Northeast Pacific.
- Synthesis of results from globally-deployed acoustic devices.
- Annual data and results from NOAA's exclusive access to the U.S. Navy's Sound Surveillance system (SOSUS) arrays as well as the deployable arrays of NOAA hydrophone assets.
- Annual synthesis of data and scientific results derived from EOI sensors and systems on the OOI cabled observatory at Axial Seamount.
- Annual synthesis of data and science results derived from ocean acidification research and experiments at submarine volcanoes in the Marianas region and other relevant sites.

Performance Goals and Measurement Data:

Performance Measure: Percent of labs that have had formal expert peer reviews in the past 5 years and were rated "effective" in terms of quality, mission relevance, and performance	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	100%	100%	100%	100%	100%	100%	100%
Description: This performance measure is recognized by the National Academy of Sciences report *Evaluating Federal Research Programs*, which states that "The most effective means of evaluating federally funded research programs is expert review."							

Performance Measure: Percentage of coral bleaching events successfully forecasted at monitored sites that support management decisions	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	80%	82%	84%	86%	88%	90%	92%
Description: This performance measure is for the continued improvement and production of coral bleaching forecasts used to identify events and support management decisions. Forecasts are developed at AOML using oceanographic data from *in situ* sensors at U.S. sites and validated in the field by host site collaborators. By comparing observations of bleaching with predictions made, the hit rate and false alarm rate of predictions can be calculated and used to compute the Peirce skill score. This metric can be used to compare different predictive techniques and measure improvements.							

Performance Measure: Cumulative number of coastal, marine and Great Lakes issue-based forecasting capabilities developed and used for management. (AOML contribution)	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	10	20	30	40	50	60	70

Description: This performance measure is for the Integrated Coral Observing Network (ICON) Project and includes 1) ecoforecasts and 2) continued long-term data collection. This performance measure is for the continued development and production of coral bleaching forecasts used to identify events and support management decisions. Forecasts are developed using oceanographic data from in-situ sensors at US sites (the Florida Keys National Marine Sanctuary, the La Parguera Estuarine Preserve, and the Salt River Bay National Historical Ecological Preserve, and Laolao Bay. Forecast capabilities are produced hourly for 10 in-situ sites. The raw data are submitted to NOAA's Coral Reef Conservation Program, and the bleaching forecasts are archived on servers at AOML.

Performance Measure: Annual number of coastal, marine, and Great Lakes ecosystem sites adequately characterized for management (GLERL contribution only)	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	9	13	13	13	13	13	13

Description: This performance measure is associated with Measure 18a and reflects GLERL contribution only. The measure is for development and validation, by GLERL, of a harmful algal bloom warning system from real-time results provided to water intake managers protecting the drinking water of over 2 million coastal Lake Erie residents. *Microcystis aeruginosa* is the dominant bloom-forming, toxic cyanobacterium occurring in the Great Lakes. Preliminary studies have verified the presence of the cyanotoxin, microcystin in Lake Erie near water intake systems. In particular, microcystin concentrations have exceeded the recommended limit of 1 µg/L for drinking water (World Health Organization, 1998). This research will provide predictive models using baseline environmental data. This NOAA-wide performance measure is highlighting only one GLERL component. NOAA will continue to expand the number of ecosystems characterized for management.

Performance Measure: Number of peer-reviewed papers published in the scientific literature each year documenting research that supports Great Lakes management	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	31	35	35	35	35	35	35

Description: Peer-reviewed publications are a recognized benchmark of scientific productivity and research quality and significance supporting the decisions of managers and policy makers in the Great Lakes including regulation of water levels, siting of freshwater intakes for city water supplies, forecasts of beach contamination, and the forecast of environmental parameters used for recreation and shipping.

Performance Measure: Number of published peer-reviewed papers highlighting PMEL marine ecosystem research (per year)	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	28	28	28	28	28	28	28

Description: Peer-reviewed publications are a recognized benchmark of scientific productivity related to PMEL/EOI, Acoustics, and EcoFOCI research. The EOI-related publications will advance our understanding of unique hydrothermal ecosystems. EcoFOCI publications will increase knowledge of the North Pacific, Bering Sea, and Arctic ecosystems that will improve our current understanding, predictive ecosystem models, and management decisions in the face of climate change. Acoustic publications will improve understanding of ambient sound fields (anthropogenic and natural) and their effects on marine animals and their ecosystems.

Performance Measure: Number of ecosystem indicators contributed to the eastern Bering Sea Report Card	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	3	3	3	3	3	3	3

Description: EcoFOCI will provide indicators of ecosystem health for the eastern Bering Sea to the annual publication of the Ecosystem Considerations chapter of the SAFE report to the North Pacific Fishery Management Council and for individual species stock assessments.

Performance Measure: Cumulative number of coastal, marine, and Great Lakes ecosystem sites adequately characterized for management (PMEL contribution only)	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	11	14	17	20	23	26	29

Description: This measure is associated with Measure 18a and reflects PMEL contribution only. EOI interdisciplinary exploration and research will discover and characterize new chemosynthetic ecosystem diversity as well as provide new scientific data for understanding their critical relationships with ecosystems in the upper ocean's sunlit zone. Emphasis will be on discovery and characterization of hydrothermal ecosystem relationships to important NOAA goals including understanding ocean acidification, discovery and understanding of sources and sinks for carbon (particularly carbon dioxide) and ocean nutrient sources and cycles. All of these efforts are essential to enable NOAA to achieve a holistic understanding of the global ocean ecosystem.

NATIONAL SEA GRANT COLLEGE PROGRAM (**http://www.seagrant.noaa.gov/**)
The National Sea Grant College Program (Sea Grant) was established by Congress in 1966 (reauthorized in 2008) to enhance the practical use and conservation of coastal, marine, and Great Lake resources in order to create a sustainable economy and environment. The 33 state Sea Grant programs are located in every coastal and Great Lakes state, Puerto Rico, and Guam, forming a dynamic national network of more than 300 participating institutions represented by more than 3,000 scientists, engineers, outreach experts, educators and students. As a non-regulatory program, Sea Grant focuses on generating and disseminating science-based information to a wide range of groups who require scientific information to make daily decisions, including commercial and recreational fishermen, finfish and shellfish farmers, state and local planning officials, port and harbor commissioners, seafood processors and retailers, and natural resource, water, and environmental quality managers.

The Sea Grant model integrates research outreach, and education in every coastal and Great Lakes state. Many Sea Grant personnel live and work in the coastal communities they serve; thus, they are both trusted community residents and coastal experts who provide innovative and reliable science-based information to identify locally relevant solutions to critical coastal issues. On one hand, these on-the-ground experts translate scientific information, policy, and regulations into tools, products, and services that benefit local coastal residents and communities every day, providing a mechanism for implementation of national priorities at the local and regional level. On the other hand, Sea Grant personnel identify local stakeholder needs in order to inform state, regional, and national research and policy agendas. This two-way flow of services and information ensures that Sea Grant solutions meet demonstrated needs, help support businesses, and enable policy-makers to make balanced, well-informed decisions.

In accordance with the goals of NOAA's strategic plan, Sea Grant's program activities fall into the following four focus areas and two cross-cutting efforts:

Focus areas:

- Sea Grant ***Healthy Coastal Ecosystems*** objectives are to improve ecosystem services by enhanced health, diversity and abundance of fish, wildlife and plants, and to assist coastal managers use ecosystem-based approaches to manage land, water, coastal habitat, and living marine resources.
  - Sea Grant is a leader in local and regional approaches to understand and maintain healthy ecosystems, with planning efforts across the country that identify information gaps, implement research priorities, and coordinate information and technology transfer to people who need it.
- Sea Grant ***Resilient Communities and Economies*** objectives are to develop vibrant and resilient coastal economies that use comprehensive planning to make informed strategic decisions, improve coastal water resources that sustain human health and ecosystem services, and adapt to the impacts of coastal hazards.
  - Sea Grant will use its unique research and outreach capabilities to assist coastal communities in balancing the multiple demands on their coastal resources and responding to and mitigating natural and technological hazards and the demands of an increasing coastal population.
- Sea Grant ***Environmental Literacy and Workforce Development*** objectives are to: (1) Provide national leadership in ensuring public literacy in marine and coastal issues; and (2) Develop professionals who understand marine and aquatic science.
- Sea Grant ***Sustainable Fisheries and Aquaculture*** objectives are to meet public demand with a safe, secure and sustainable supply of seafood, and consumers who understand the health

benefits of seafood consumption and how to evaluate the safety and sustainability of the seafood they buy.

Sea Grant continues to be a leader in developing innovative technologies and solutions for all sectors of the seafood industry, including fishing, aquaculture, seafood processing, and consumer safety to ensure a safe and sustainable supply of seafood products now and for future generations.
Beginning in FY 2014, Sea Grant also administers a Grand Challenge initiative to foster scientific and technological innovation in ocean mapping and observing technologies that will increase the rate of discovering new energy sources, seafloor features, pharmaceutical products, species, ecosystems, artifacts, and improve understanding of the role oceans play in our weather and climate. The Grand Challenge is an incentive prize opportunity with oversight by all Line Organizations, the NOAA Research Council, and the NOAA Chief Scientist and external partners. The goal is to recruit private innovators, industry and other interested parties to compete against each other to obtain a goal and specific criteria as specified by the challenge. Challenge subjects solve gaps in NOAA's technology solutions to meet recognized missions at significantly reduced cost.

Marine Aquaculture Program
The Sea Grant Marine Aquaculture Program works with NOAA Line Offices, the National Marine Fisheries Service (NMFS) in particular, to support sustainable aquaculture through integrated research and technology transfer. The program focuses on key scientific, engineering, environmental, and socioeconomic challenges facing this nascent industry in order to meet the demand for seafood, create and sustain jobs to stabilize coastal working waterfronts, and support efforts to manage and rebuild wild fish stocks. NMFS and OAR work collaboratively on this synergistic and complimentary division of labor for the most effective and efficient use of NOAA's resources. Both the efforts at the state program level and the national aquaculture competition are important to realizing the potential of U.S. aquaculture.

Schedule and Milestones:
FY 2015 – FY 2019

- State programs hold local and regional requests for proposals.
- Initiate 10 new projects to improve understanding of wind, solar, tidal, and wave energy, production, siting, and socioeconomic and/or environmental effects.
- Review all 32 programs against their program plans through external Performance Review Panels.
- Complete 66 community climate adaptation projects across the Nation by FY 2016.
- Produce an inventory of university-based research and extension personnel regularly involved in projects, activities, and research efforts directed at tourism matters.
- By FY 2016, create or retain over 9,600 jobs as a result of Sea Grant research and outreach in renewable energy, aquaculture, biotechnology, and other emerging industries.
- Carry out 20 locally-focused research projects on the impacts of ocean acidification on coastal ecosystems and on commercially important species by FY 2018.
- Carry out 50 locally-focused research projects each year to develop techniques and knowledge that will enhance the resilience of coastal communities to economic and environmental hazards.
- Define areas of needed technological advancement for the subsequent rounds of challenges.
- Publish the availability of prize amounts for some of the community/agency derived challenges subordinate to the Grand Challenge.

- Complete engagement of National Oceanographic Partnership Program (NOPP) partners, prize foundations, industry, and other potential contributors to recruit participation.
- Announce subsequent major Grand Challenges.

Deliverables:

- 2.4 million resource managers, decision makers, and the general public will have attended Sea Grant sponsored/organized conferences, workshops, and meetings.
- Sea Grant will have leveraged nearly $200 million from state and other partners.
- 100 coastal communities will have implemented climate adaptation measures.
- 15,600 conferences, workshops and meetings will have been sponsored /organized by Sea Grant.
- 3,600 graduate students supported.
- 900 students will have received PhD or MS/MA degrees with Sea Grant assistance.
- 70 peer-reviewed articles/book chapters per year.
- A domestic aquaculture industry finds alternative sources of feed materials to reduce pressure on wild harvested feed fish species.
- An oyster aquaculture industry adopts production and harvesting techniques that increase the delivery of safe oysters to market: 20 aquaculturists adopt cost-effective harvest and production methods that reduce *Vibrio* in oysters to improve public health.
- At least one major aquaculture company will implement new approaches to seafood production that benefits from Sea Grant research and extension on integrated multi-trophic aquaculture.
- Create and transfer at least 250 decision-support tools/technologies to coastal managers per year.
- Complete training of more than 3,000 seafood processors in Hazard Analysis Critical Control Point per year.
- More than 2,800 acres of degraded ecosystems are restored due to Sea Grant activities (per year).
- Engage more than 550 coastal communities in activities (e.g. visioning, resource inventories, analysis of development policies) that address the sustainability of economic and environmental resources.
- Provide 150,000 coastal resource managers with information/training in local hazard resiliency, and hazard mitigation tools, techniques, and best practices.
- Assist 200 coastal communities to adopt sustainable development principles.
- Approximately 400 peer-reviewed journal articles/book chapters per year.
- Technology to map and characterize the oceans at five percent of the present cost.

Performance Goals and Measurement Data:

Performance Measure: Percent of Sea Grant College Programs that have had formal expert peer reviews in the past 5 years and were rated "effective" in terms of quality, mission relevance, and performance	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	100%	100%	100%	100%	100%	100%	100%
Description: This performance measure is recognized by the National Academy of Sciences report *Evaluating Federal Research Programs* that states "The most effective means of evaluating							

federally funded research programs is expert review."

Performance Measure: Annual economic and societal benefits derived from Sea Grant activities	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
Jobs created/retained	15,000	9,600	9,600	9,600	9,600	9,600	9,600
Businesses created/retained	3,400	2,000	2,000	2,000	2,000	2,000	2,000
Economic benefit (millions of dollars)	485	320	320	320	320	320	320
Description: Society benefits from Sea Grant's assistance in developing new businesses/jobs and retaining existing businesses/jobs. This measure also tracks economic (market and non-market) benefits from the development of new ocean, coastal, and Great Lakes resources and technology.							

Performance Measure: Annual number of coastal communities that adopt/implement hazard resiliency practices to prepare for and respond to/minimize coastal hazardous events	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	260	200	200	200	200	200	200
Description: This metric tracks Sea Grant's contribution to individuals, businesses, and communities that develop comprehensive emergency preparedness and response plans to increase their resiliency and enable them to respond effectively. Sea Grant will contribute to this by building a sound knowledge base to improve forecasting capabilities, by identifying development and best management practices that reduce the vulnerability of people, buildings, and businesses to coastal hazards, and by advancing ways communities can manage and recover from these events when they occur.							

Performance Measure: Percentage of U.S. coastal states and territories demonstrating 20% or more annual improvements in resilience capacity to weather and climate hazards (%/yr) (Measure 18e)	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	40%	46%	51%	57%	63%	69%	74%
Description: This measure tracks a range of contributions to address coastal community risk, vulnerability, and resilience to coastal hazards. It quantifies NOAA's contributions to this important goal across NOAA's coastal programs, measuring how NOAA is improving the Nation's capacity for resilience to hazards and is contributing significantly to NOAA's efforts to improve integration of its coastal programs, and expanding beyond the three coastal integration programs providing inputs to the measure (Coastal Services Center, Office of Ocean, Coastal, and Resource Management, and Sea Grant).							

Performance Measure: Annual number of coastal communities that have adopted/implemented sustainable development practices and policies as a result of Sea Grant activities	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	600	480	480	480	480	480	480
Description: This metric tracks communities that have made strides in sustainable development with Sea Grant aid – moving beyond analysis and planning and into implementation.							

Performance Measure: Annual number of fishermen, resource managers, consumers, and seafood businesses (harvesters, aquaculturists, processors, and recreational fishermen) who modify their practices using knowledge gained in fisheries sustainability, seafood safety, and the health benefits of seafood	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	184,000	125,000	125,000	125,000	125,000	125,000	125,000
Description: This measure tracks Sea Grant success in having stakeholders adopt responsible fishery practices. For example, Sea Grant efforts to educate fishermen on the benefits of using circle hooks as an alternative to j-hooks has decreased by-catch and increased the survival of hooked and released fish. Responsible harvesting and processing techniques and practices include measures to minimize by-catch and habitat destruction, ensure seafood safety, and support sustainability.							

Performance Measure: Cumulative number of regionally-focused climate impacts and adaptation studies, tools, and capacity-building utilized by coastal emergency management	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	5	7	8	10	12	14	16
Description: This measure tracks the cumulative number of regionally-focused climate impacts and adaption studies, tools, and capacity-building utilized by coastal and emergency management. The use of these products will improve management responses to climate change.							

Performance Measure: Cumulative number of tools, technologies, and information services that are used by NOAA partners/customers to improve ecosystem-based management (2010 baseline)	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	1320	1820	2320	2820	3320	3820	4320
Description: This measure tracks success in translating research findings into tools, technologies and information services that improve the use and management of coastal, ocean, and Great Lakes ecosystems. Examples of tools include: land cover data, benthic habitat maps, and environmental sensitivity index maps. Technologies refer to the transfer of new or underused approaches for							

addressing coastal management (e.g., remote sensing, biosensors, autonomous underwater vehicles, genetic markers for fishery stocks) and resource development (e.g., culture systems for aquaculture, marine pharmaceuticals). This includes the application of technology to coastal resource management through synthesis, integration, training, and the development of new management tools.

Performance Measure: Annual number of coastal communities that have restored degraded ecosystems as a result of Sea Grant activities	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	260	260	260	260	260	260	260

Description: The number of coastal communities (including cities, municipalities, small towns even if unincorporated, and neighborhoods if they have a cohesive identity) that have undertaken activities for the purpose of restoring degraded ecosystems, and have succeeded in the goals of that activity. A community that undertakes a project with the goal of partial restoration of an ecosystem, and that significantly meets its goals, would count toward this performance measure even though the ecosystem was not completely restored.

Performance Measure: Number of technical mission gaps filled to meet NOAA mission needs. (cumulative)	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	0	0	1	2	3	4	5

Description: NOAA will define gaps (in technology, methods, or cost) in current methods that restrain technical advances and offer prizes in these areas with specific performance targets. Prizes will generate direct and indirect solutions to advance missions.

Performance Measure: Number of projects with leveraged partners delivering results. (per year)	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	0	0	1	1	1	1	1

Description: Prize opportunity invites leveraging, and the extent of leveraging will be a measure of how wide the reach of prizes has extended.

OCEAN EXPLORATION AND RESEARCH (OER) (http://explore.noaa.gov/)

OER focuses on unknown and poorly known ocean areas and phenomena, with an emphasis on regions that are a priority to the Nation. OER supports scientific baseline characterizations, as well as efforts to transition and apply the results to stimulate further research and to support natural resource management decisions.

OER develops and uses leading-edge technology and sensors to explore the ocean. OER also manages the information acquired and generates the knowledge necessary to educate the public and inform environmental resource managers and policy makers on the use and preservation of ocean resources. OER contributes significantly to important NOAA focus areas such as the Gulf of Mexico, the system of Marine National Monuments in the Pacific, and the Arctic Ocean, as well as engaging with international partners exploring other key areas of the global ocean such as the Coral Triangle. The information gained contributes to critical ocean issues such as global climate change, ocean acidification, biodiversity, new ocean resources such as discovery of new medicines, and coastal and marine spatial planning. OER collects information on new ecosystems, habitats, and resources, and conducts the research necessary to gauge their health, determine how they function and change over time, and to understand how human activities affect their long-term stability. In addition, OER investigates newly observed ocean phenomena such as volcanic eruptions, and ensures that data and information are made available to scientists and decision makers working on significant environmental challenges such as climate change and ocean acidification. OER core activities include: (1) supporting interdisciplinary expeditions to characterize new ocean areas and phenomena; (2) conducting cutting edge transformational research to address National priorities and to identify new and emerging issues; (3) working with partners to develop new technologies focused on increasing the pace and efficiency of ocean exploration and research; and (4) engaging a broad spectrum of stakeholders and audiences through education and outreach.

OER efforts focus on the first step of the scientific process – initial investigation of the unknown to characterize natural features and phenomena. Areas to be explored are identified by working with other NOAA programs and Federal agencies, as well as the academic community, and emphasis is given to areas where there is consensus that the need for information is critical, and the potential for discovery is high.

Results include a rich variety of products such as peer-reviewed scientific reports and journal articles, maps and geospatial databases and models, inventories and samples of living and non-living marine resources, oceanographic and atmospheric data, and multimedia products such as video and still images. These results provide a critical baseline of knowledge which serves to catalyze new lines of research and inquiry, supports management decisions at multiple scales, and improves ocean literacy and stewardship through education and outreach. OER accomplishes its mission in the following distinct ways:

- Core Exploration Program: OER provides funding through competitive extramural grants and intra- and interagency transfers to interdisciplinary teams of scientists, explorers and educators focusing on exploring natural environments and phenomena, searching for and identifying shipwrecks and submerged paleo-landscapes once inhabited by humans, and development of advanced underwater technologies.

- NOAA Ship *Okeanos Explorer*: In FY 2005, Congress directed the U.S. Navy to transfer the 224-foot survey vessel USNS *Capable* to NOAA for conversion to the Nation's first vessel dedicated to systematically exploring the ocean. Renamed the NOAA ship *Okeanos Explorer,* the vessel is outfitted with three unique mission systems designed specifically for exploration: (1) deep-ocean high-resolution multibeam sonar mapping; (2) deep-water high-definition videotaping, sensing

and sampling using a sophisticated dual-body remotely-operated vehicle (ROV); and (3) a satellite-based broad-band transmission "telepresence" capability, to allow teams of scientists to lead expeditions from shore-based "Exploration Command Centers" (ECC) and to engage students and the general public in the real-time ocean exploration and discovery with live transmissions from the seafloor. The *Okeanos Explorer* Program discovery data has been used by scientists and managers for follow-up research on targeted habitat, species and ecosystems, geologic features, natural resource and hazards identification; oceanographic research and modeling; hydrographic mapping and nautical chart development; fisheries management; damage assessment; discovery and preservation of maritime heritage resources; and extension of the U.S. continental shelf (see "Extended Continental Shelf Mapping" below). The program of exploration aboard the ship also serves as a test-bed for developing advanced exploration sensors and technology, new data products, and data processing and management.

- Partnership Projects: OER invests in a variety of small- and large-scale projects with Federal and non-Federal partners who have a shared interest in ocean exploration, as well as funding they can apply to leverage the OER investment. The following examples highlight large-scale, multiyear exploration partnerships:

  - *Telepresence*: In June 2009, the University of Rhode Island established the "Inner Space Center" (ISC) to receive data and information from the *Okeanos Explorer* and transmit it to the shore-based ECCs, and conduct live events during expeditions and develop post-event processed videos and other products. Further, the University of New Hampshire also partnered to acquire, process, and develop products from the multibeam mapping system on the *Okeanos Explorer*. Furthermore, OER has a long-term partnership under a Joint Project Agreement with the Ocean Exploration Trust, which operates the exploration vessel (E/V) *Nautilus* that is outfitted with mission systems similar to the *Okeanos Explorer,* and which operates on the same shore-based network through the ISC.

  - *Extended Continental Shelf Mapping (ECS)*: In FY 2007, OER joined an interagency task force formed under the Interagency Committee on Ocean Science and Resource Management to plan and prepare for new investments in field surveys to identify potential extensions of the U.S. Exclusive Economic Zone (EEZ) using criteria set forth in Article 76 of the United Nations Convention on the Law of the Sea, which defines how coastal States may define their ECS. In collaboration with several Federal agencies, OER invests funds to support bathymetric mapping, geophysical and seismic surveys, data management and analysis, and the development of products to help define the ECS. In addition to mapping unknown territory, information on habitat and resources is also collected. As of FY 2014, OER and its partners initiated a series of expeditions to survey and conduct baseline characterizations of key critical areas within the potential ECS. This information is critical to support the Nation in efforts to establish polices protecting U.S. interests in these regions, as well as to enable the U.S. to successfully negotiate with other coastal states when it comes to formally establishing ECS boundaries.

  - *National Oceanographic Partnership Program (NOPP)*: Through NOPP, OER partners with the Bureau of Ocean Energy Management (BOEM) and the U.S. Geological Survey (USGS) to investigate and characterize offshore lease blocks for decision support on permitting oil and gas exploration and development. The results of these investigations have proven valuable to help meet NOAA mission priorities related to ecosystem-based management, addressing fisheries management concerns, and supporting the NOAA deep sea coral and sponge program. Under this partnership, OER provides the ships and submersibles to

BOEM-funded peer-reviewed scientific investigations. OER and BOEM have successfully applied this approach to investigating and characterizing deep water areas in the Gulf of Mexico and the continental shelf and slope in the Mid-Atlantic Bight, and are planning investigations into the Arctic Ocean.

Engagement: A core component of OER's mission is to engage a broad spectrum of stakeholders and audiences in innovative ways; using the mystery and excitement of exploring new territories to build interest in careers that support ocean-related work. Innovative expedition-based materials are developed to encourage educators and students, the general public, and other audiences to become personally involved with the voyages and discoveries of the NOAA Ship *Okeanos Explorer* and other expeditions supported by the program. .

Schedule and Milestones:

FY 2015 – FY 2019

- Conduct two to three interagency partnership (i.e., BOEM, National Science Foundation) expeditions per year to explore and characterize habitats and ecosystems in deep water areas.
- Develop an annual extramural competition for conducting the next phase in improving our understanding of the potential resources and natural habitats in areas identified through the ECS Mapping Initiative.
- Acquire Days-At-Sea on UNOLS, Navy, NOAA and other vessels to accelerate and complete the baseline mapping of the potential ECS.
- Develop an annual extramural competition for the exploration of unknown and poorly known ocean areas where there is a high potential for discovery, including efforts focused on new and unique ecosystems and historically important submerged cultural resources, as well as efforts to advance ocean exploration technology.

Deliverables:

- Conduct expeditions to locate, map, and prepare baseline characterizations of new habitats and ecosystems, as well as to identify and evaluate new marine resources in the potential ECS.
- Complete BOEM-NOAA Partnership expeditions to explore and characterize habitats and ecosystems the Arctic and other key areas within the U.S. EEZ, generating maps, peer-review journal reports, and other products.
- Conduct Autonomous Underwater Vehicle (AUV) mapping and habitat characterization surveys generating maps and databases containing information on environmental and oceanographic conditions in the areas surveyed.
- Conduct an increased number of telepresence-enabled systematic expeditions providing opportunities to engage a multitude of shore-based stakeholders and other users in real-time ocean exploration. Specific deliverables include baseline high-resolution maps and GIS products of previously unmapped areas or areas that have only been mapped at low-resolution, baseline characterization reports, high-resolution video and still image libraries, and voucher specimens. Continue to populate the appropriate national archives with oceanographic and geospatial data collected in these areas.
- Transition results of exploration expeditions and projects to deliberately catalyze and plan targeted follow-up exploration, research, and products tailored to support management decisions related to marine resources.

Performance Goals and Measurement Data:

Performance Measure: Annual number of coastal, marine and Great Lakes ecological characterizations that meet management needs (Measure 18a, OER contribution only – number of expeditions per year)	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	1	2	2	2	2	2	2

Description: Conduct joint expeditions with DOI's BOEM, USGS and other partners to explore and characterize habitats and ecosystems in deep water areas of the Gulf of Mexico, the Mid-Atlantic Bight, the Arctic, and other high priority areas.

Performance Measure: Annual number of coastal, marine and Great Lakes ecological characterizations that meet management needs (Measure 18a. OER contribution only – number of bathymetric expeditions per year)	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	0	2	2	2	2	N/A	N/A

Description: The Extended Continental Shelf mapping (ECS) effort is a high-level interagency multi-year effort to define the potential extension of the U.S. continental shelf under international law. Conduct mapping and ecosystem surveys per ECS task force directives. The ECS bathymetric mapping effort is expected to conclude by 2017. Within NOAA, OER intends to use this information strategically to make informed decisions regarding comprehensive exploration and research.

Performance Measure: Annual number of coastal, marine and Great Lakes ecological characterizations that meet management needs (Measure 18a, OER contribution only – number of interdisciplinary expeditions per year	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	0	3	3	3	3	3	3

Description: The ECS effort is a high-level interagency multi-year effort to define the potential extension of the U.S. continental shelf under international law. Using the information collected during previous bathymetric mapping cruises, identify high-priority areas that may contain unique and vulnerable habitats and/or marine resources, and conduct interdisciplinary exploration expeditions to establish baseline characterizations.

Performance Measure: Annual number of coastal, marine and Great Lakes ecological characterizations that meet management needs (Measure 18a, OER contribution only – number of	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	1	1	1	1	1	1	1

expeditions per year.)							

Description: Conduct joint interdisciplinary expeditions with CIOERT, NOAA/NOS/NCCOS, CIMAS, NIUST and other partners to explore and prepare baseline characterizations of mesophotic habitats and ecosystems in the Gulf of Mexico, South Atlantic Bight, and Caribbean.

Performance Measure:	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
Annual number of coastal, marine and Great Lakes ecological characterizations that meet management needs (Measure 18a, OER contribution only – number of expeditions per year.)	2	2	2	2	2	2	2

Description: OER Marine Archaeology program explores and discovers maritime heritage sites significant to American and World history using the latest in advanced technology. Sites include shipwrecks, prehistoric submerged landscapes, and other maritime cultural sites. The program supports the research and protections standards enumerated in the United Nations Educational, Scientific, and Cultural Organization (UNESCO) Convention on the Protection of the Underwater Cultural Heritage.

Performance Measure:	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
Annual number of coastal, marine and Great Lakes ecological characterizations that meet management needs (Measure 18a, OER contribution only – number of expeditions per year.)	7	8	8	8	8	8	8

Description: Conduct systematic exploration, mapping and characterization of unknown areas in national and international waters using the NOAA Ship *Okeanos Explorer* Program and provide information and products to multiple users through telepresence links. The *Okeanos Explorer* offers a new approach to discovery: systematic exploration. This approach includes: (a) telepresence, the ability to bring scientific expertise virtually to the vessel through live connections between shore and sea, (b) a next-generation multi-beam sonar system, and (c) a highly sophisticated remotely operated vehicle (ROV). The ship's telepresence system delivers live images from the ship's ROV and maps from its multi-beam sonar to support live interactions between dedicated centers located throughout the world and the *Okeanos Explorer*.

Performance Measure:	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
Number of tools, technologies, and information services that are used by NOAA partners/customers to improve ecosystem-based management (OER contribution to GPRA 18c)	3	3	3	3	3	3	3

Description: Work towards this performance measure represents the cumulative number of projects OER partners/customers that use the cutting edge exploration technologies mission systems on the NOAA Ship *Okeanos Explorer* and associated shore-based network, as well as the data collection, processing and dissemination tools developed in partnership with NESDIS.

Performance Measure: Annually prepare engagement products expressly tied to OER's mission for use by a diversity of stakeholders and audiences to enhance ocean science literacy	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	8	8	8	8	8	8	8
Description: The goal of OER's engagement strategy and products is to increase access to, understanding of, and appreciation for systematic deep-ocean exploration and its importance in forming the baseline for ocean research, management, and policy decisions.							

OTHER ECOSYSTEMS PROGRAMS

NOAA Ocean Acidification Program (OAP)

Ocean acidification (OA) refers to changes in the ocean carbonate chemistry primarily due to uptake of carbon dioxide from the atmosphere and further affected by local factors such as upwelling, riverine discharge, nutrient loading and hypoxia. Understanding OA and predicting the consequences for marine resources is necessary for informing national and international carbon mitigation discussions and enabling local communities to better mitigate, prepare, and adapt to changes caused by OA.

OAP was established according to section 12406 of the 2009 Federal Ocean Acidification Research and Monitoring Act (FOARAM) to fund, oversee and coordinate research, monitoring, and other activities consistent with the Strategic Plan for Federal Research and Monitoring of Ocean Acidification developed by the interagency working group on ocean acidification (OA). OAP is responsive to additional requirements introduced in the Magnuson Stevens Reauthorization Act.

OAP administers a multi-disciplinary, matrixed program, coordinating OA activities NOAA-wide across multiple Line Offices including OAR, NMFS, NOS and NESDIS. To achieve FOARAM Act requirements, the OAP promotes:

1. The development of an ocean, coral reef, and coastal OA monitoring network comprised of fixed observing platforms, underwater systems, AUV's, and dedicated cruises within the Pacific, Atlantic, and Gulf of Mexico with partners in the Climate Program Office, Coral Reef Conservation Program, and Integrated Ocean Observing System (IOOS).
2. Funds a range of experimental studies examining the sensitivity of commercially important living marine resources under NOAA's purview to OA.
3. Promotes the development of forecasting models of ecosystem and socioeconomic impacts
4. Invests in critical new technologies that can facilitate geochemical and ecosystem monitoring.
5. Conducts outreach and education to explain ocean acidification and its potential impacts on ecosystems and society.
6. Supports research to identify and develop adaptation strategies for communities impacted by OA, including resource managers and marine industry.

The 2010 *NOAA Ocean and Great Lakes Acidification Research Plan (http://www.pmel.noaa.gov/co2/files/feel3500_without_budget_rfs.pdf)* provides organized details about NOAA's research strategy.

The value of ocean acidification research is already evident in the Pacific Northwest where oyster hatcheries on the verge of collapse just a few years ago are again major contributors to the $111 million West Coast shellfish industry. Beginning in 2005, production at some Pacific Northwest oyster hatcheries began to decline at an alarming rate, posing severe economic impacts and challenging a way of life held by shellfish growers for over 130 years. Oyster production represents 76 percent of the West Coast shellfish industry, which supports more than 3,000 jobs. A $500,000 investment in monitoring coastal seawater, which enables hatchery managers to schedule production when water quality is good, is helping to restore commercial hatcheries and expected to reap an estimated $35 million for coastal communities in Oregon and Washington. This example highlights the urgency of this problem and the value of ocean acidification research and monitoring.

Schedule and Milestones:

FY 2015 – FY 2019

- Deploy and maintain OA moorings in coordination with a broad range of internal and external partners.

- Deploy and maintain coral reef monitoring sites according to new implementation guidelines completed in FY 2013.
- Instrument and maintain OA sensors on NOAA Research and Volunteer Observing Ships
- Conduct Ocean Acidification coastal observing and process research cruises.
- Single- and multi-species experiments (vulnerable economically-important and protected species).
- Develop high-resolution physical-biogeochemical-ecosystem and socioeconomic regional models critical for developing adaptation strategies.
- Develop coastal early-warning system that can identify episodic low pH events (coastal upwelling, river high discharge occurrences) and alert managers of potentially impacted resources.
- Integration and serving of OA data generated through the activities listed above, across NOAA, and with other Federal agencies.
- Development of data synthesis products responsive to stakeholder needs.
- Conduct robust education and outreach activities in coordination with partners.
- Develop curricula and outreach products and services including development of NOAA national OA web portal for access to information and data.
- Support competitive extramural awards to conduct regionally targeted ocean acidification observing optimization studies within coastal environments to foster improved cost efficiencies and data quality in the OA coastal observing network.
- Partner with IOOS Marine Sensor Program to develop marine sensors that can assist coastal industries with both scientific and monitoring capacity.

Deliverables:

- Integrated assessments of the ecological and societal impacts of ocean acidification in each U.S. coastal region and the Great Lakes to identify vulnerable communities where mitigation and adaptation strategies may be needed.
- Improved public understanding of the threats of ocean acidification and the solutions to preserving our ocean and Great Lakes ecosystems via public lectures and web-based information.
- Standardized chemical and biological monitoring protocols for the measurement of carbon dioxide system parameters and physiological effects on marine organisms.
- Predictions of pH and carbonate saturation in the future ocean using global climate change model projections.
- Enhanced characterization of the threat ocean acidification poses by resolving the direct and indirect ecological impacts to economically-important species and NOAA-managed protected species.
- Regional biogeochemical and ecological models developed through the synthesis efforts of existing models and the incorporation of new knowledge gained on the impact of ocean acidification.
- Decision support tools, such as readily available near real time data products, and requisite scientific knowledge for understanding and responding to ocean acidification in support of ecosystem based management and other related management schemes, such as fisheries management and coastal and marine spatial planning.
- Educational and outreach products and services to increase the dialogue among scientists, policy-makers, teachers, and the public.
- Optimized observing system in each of the eight large marine ecosystem regions.
- Seafood industries more resilient to ocean acidification impacts.

Performance Goals and Measurement Data:

Performance Measure: Number of sites with *in situ*-based fixed platforms that are accurately measuring the carbon parameters needed to calculate mean annual Aragonite Saturation State determined to be within 0.2 units of the actual mean	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	14	15	16	18	18	18	18

Description: This measure represents an annual inventory of *in situ*-based fixed and underway observing platforms dedicated to monitoring the magnitude, and rate of biogeochemical changes in response to increasing atmospheric carbon dioxide. Monitoring sites will be located in ecologically and economically important marine ecosystems. These ocean acidification observing platforms are defined by their inherent ability to fully constrain the carbonic acid system and must be capable of resolving decadal changes in ocean chemistry in response to ocean acidification. The data provided will be used by Federal and state regulatory agencies and commercial fisheries organizations.

Performance Measure: Cumulative number of living marine resources characterized for vulnerability to ocean acidification	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	40	45	50	55	60	65	70

Description: Cumulative number of economically important species (or species on which those commercially important species rely) whose vulnerability to ocean acidification has been tested in NOAA or university laboratories.

Performance Measure: Number of large marine ecosystem (LME) provided coastal OA models and synthesis products and tools in support of stakeholder and management decisions	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	0	0	0	0	1	1	2

Description: Number of regions provided OA models and/or synthesis products and tools. Regions are defined by NOAA's Regional Ecosystems and U.S. LMEs. Although we plan to rotate the focus from LME to LME, the targeted optimization studies and synthesis products will likely focus on subregions within the LMEs (distinct estuaries, marine protected areas, seamounts, river mouths within LMEs) given the limited funding.

SUSTAINED OCEAN OBSERVATIONS AND MONITORING

OAR develops and sustains key components of the Global Ocean Observing System (GOOS). This requires an integrated effort with the NOAA Climate Program Office (CPO) providing the oversight and program management responsibility, which includes planning, budgeting, evaluation, and coordination of the overall program. With support from CPO, OAR Laboratories AOML and PMEL, and the Cooperative Institutes, carry out core observing activities including deployment, operations, and maintenance of *in situ* platforms and instrumentation, data management, monitoring, and technology development. These observing systems provide a range of physical, biogeochemical, and ecological *in situ* research observations and products.

GOOS is a foundation for climate research and prediction as well as long-term monitoring for climate change detection and attribution. GOOS observations are used routinely for weather and ecosystems research, invaluable for weather and ocean predictions, and provide validation information for NOAA and NASA satellite products. Satellites are critical elements of this composite system, but are listed elsewhere in the NOAA and NASA budgets. All interdependent elements work together to provide the needed system.

NOAA provides the major U.S. contribution to the global component of the Integrated Ocean Observing System (IOOS), as codified in the Integrated Coastal and Ocean Observation System Act of 2009. All components of the global system require international partnerships and contributions. This observation system is based on measuring a set of core variables that have been agreed to internationally to provide the information needed by the U.S. and other nations to effectively plan for and manage their response to climate variability and change.

Major elements of GOOS that this program contributes to include:

Argo Profiling Floats
These floats provide the subsurface measurements of ocean temperature and salinity that are critical inputs to global sea level change and upper ocean heat content, as well as fundamental global subsurface ocean information important for understanding distribution and movement of fish. Twenty-two nations plus the European Union currently maintain 3,500 floats. Development of deep diving Argo floats is underway with deployment of test floats anticipated in FY 2014.

Surface Drifting Buoys
Sea surface temperature is an important ocean variable for the global heat, water, and carbon cycles and is critical to climate, ecosystem, and weather research. NOAA strives to maintain a global array of 1,250 surface drifting buoys with 14 international partners. This array is used to calibrate satellite observations and reduce errors in global measurement of this critical ocean variable.

Tide Gauge Stations
Sea level rise is one of the most immediate impacts of climate change with the potential to affect coastal ecosystems, communities, and economies. Tide gauge stations also contribute to weather research through improved storm surge models. NOAA, in cooperation with 66 nations, is implementing the Global Climate Observing System sea level reference network of 170 international tide gauge stations to measure sea level change at the coast and to calibrate the satellite altimeter measurements of the deep ocean. GPS-enhanced tide gauge stations will enable more accurate measurements of sea level change.

Tropical Moored Buoys

Earth's tropics are the ocean's major source for heat exchange with the atmosphere. Together with international partners, NOAA is working to instrument all three tropical oceans - the Pacific - Tropical Atmosphere Ocean (TAO) Array; Atlantic (PIRATA); and Indian (RAMA) Oceans - for continuous real-time measurement of ocean-atmosphere exchanges that affect the way our climate varies from year to year.

Ocean Reference Stations

NOAA, in cooperation with international partners, is implementing a sparse global network of high-quality ocean reference station (ORS) moorings for accurate long-term climate records in key ocean regions. The ORS surface and subsurface measurements are a cornerstone of the documentation of long-term changes in the ocean and provide "ground truth" for improving forecast models.

Ships of Opportunity

The data from Ships of Opportunity (SOOP) have been the foundation for understanding long-term changes in marine climate and are essential input to climate and weather forecast models as well as deployment of the drifting buoys and Argo floats.

Ocean Carbon Networks

Projecting decadal to centennial global climate change is closely linked to assumptions about feedbacks between the ocean and atmosphere related to sequestering of carbon in the ocean and additional input of carbon dioxide into the atmosphere. NOAA, in cooperation with the National Science Foundation and international partners, is implementing an ongoing ocean carbon inventory surveying the globe once every ten years and augmenting those observations with a network of moored buoys and instrument systems installed aboard volunteer observing ships.

Dedicated Ships

Ocean research vessels from NOAA and university partners are essential elements of the support infrastructure necessary to sustain the ocean observing system. The dedicated ships provide the highest quality reference data sets, the platforms for the ocean carbon surveys, and platforms for deployment of the moored and drifting buoys and the Argo floats, but support is needed to strengthen this fleet.

Data Management and Analysis

A robust and scalable Data Management and Communications infrastructure is essential to the vision of a sustained and integrated ocean observing system. Standards and protocols are essential to enable interoperability across all global and coastal ocean observing systems. Data must be retained and made available for analyses and for assimilation into models to understand and forecast climate change, and for efficiently managing observing system operations and improvements.

Schedule and Milestones:

Schedule/Milestones	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019
Ocean Reference Stations deployed (Cumulative total number)	10	9	9	9	9
Drifting Buoy Array deployed (Total number/year-reseeding the array)	950	950	950	950	950
Argo Array deployed (Total number/year – reseeding the array)	350	320	320	320	320
Deep Argo profiling floats deployed (Cumulative total number)	8	12	20	28	28
Tropical Moored Buoys (TAO / PIRATA / RAMA) installed (Cumulative total number)	89	89	89	89	89
Tide Gauge Reference Stations (Cumulative total number)	63	63	63	63	63
Tide Gauge Reference Stations w/GPS installed (Cumulative total number)	112	113	114	115	116
Ocean Carbon Surveys conducted (Cumulative total number)	22	23	24	25	26
Dedicated ship support (Cumulative total days at sea)	200	200	200	200	200
Integration of Deep Argo data into the Argo Data Management System	Yes	Yes	Yes	Yes	Yes

Deliverables:
The value of the ocean observing system can be assessed by the type and quality of products derived from it and from its scientific and operational value. The current observing system is designed with the objective to assess key ocean parameters for use in climate, ecosystem, and weather research.

For each of the observational programs, the data deliverables and outputs are quality controlled and made available on a publically accessible web site. For programs such as Argo, involving measurements by multiple institutions, a single data center web site is typically maintained with the data from all providers available from the single site. The remaining deliverables are scientific papers in the peer-reviewed literature, which communicate the ecosystem, climate and weather research results.

Performance Goals and Measurement Data:

Ocean Observations

Performance Measure: Error in global measurement of sea surface temperature (ºC) (Measure 16c)	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	0.66	0.63	0.59	0.55	0.51	0.50	0.50

Description: This measure is intended to document progress in accurately measuring the global sea surface temperature (SST) using *in situ* drifting buoys to verify that satellite SST data are accurate and representative. This reflects how improvements in ocean observations will decrease the uncertainty in global sea surface temperature measurements, which will ultimately play a role in calculations of the ocean-atmosphere exchange of heat and the heat storage in the global ocean. The sea surface, covering over 70% of the Earth surface, has a tremendous influence on global climate because it is where the atmosphere responds to the ocean via the transfer of heat either to or from the atmosphere. Since sea surface temperature is measured by buoys, ships, and satellites, this performance measure is well-suited as an indicator of the effectiveness of our integrated ocean observing system and the more accurate estimates of sea surface temperature will improve our ability to detect changes in the climate system. Success in this performance measure requires the maintenance and increase of *in situ* ocean sensors. The goal is to reach an indicator value of 0.3 degrees Celsius, which has been specified by the international Global Ocean Observing System (GOOS) as the required accuracy for measurement of sea surface temperature.

Performance Measure: Increased percentage of global *in situ* ocean observing system implementation	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	61%	59%	58%	57%	57%	57%	57%

Description: This measure tracks the percentage of global coverage of the Global Ocean Observing System. There are eight (8) individual ocean observing systems and one data management system that make up GOOS. The percentage completion of the eight systems determines the cumulative total percentage of this performance measure. A predictive understanding of the Earth's climate is critically dependent on quantitative measurements of ocean parameters - the ocean is second only to the sun in effecting climate change and variability.

Performance Measure: Percent reduction in the error of the observed estimates of ocean and meridional heat transport (AOML contribution)	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	0.9%	1.2%	1.6%	1.9%	2.2%	2.5%	2.8%

Description: As a result of observations, research, and reports on the state of the ocean, heat storage, and meridional heat transport in the Atlantic Ocean, there will be increased knowledge for scientists creating modeled estimates of heat transport over time, leading to less uncertainty in those models. Accurately describing heat is a key part of climate models, and increased longevity in datasets leads to a more accurate average or mean measurement of these systems. This contributes to developing a framework for future research that promises to improve the ability of climate models to predict summer rainfall and hurricane activity for the Western Hemisphere, helping local communities and economies.

Performance Measure: Cumulative number of data collection platforms deployed by PMEL in support of the Global Ocean Observing System (GOOS)	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	680	724	780	832	875	914	934
Description: This measure represents a significant portion of PMEL's contribution to GOOS. The measure identifies each Argo float deployed and each moored buoy from the PIRATA, RAMA, and ocean climate station programs as a unit; TAO is not included as it is maintained by the National Data Buoy Center (NWS). Completion of GOOS is analogous to the global weather observing system since fully-implemented GOOS will provide ocean data that all nations can use to provide improved ocean-related analytical and predictive products (forecasts).							

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PROGRAM CHANGES FOR FY 2015:

Ocean, Coastal and Great Lakes Research Laboratories and Cooperative Institutes: AUV Demonstration (Base Funding: $26,669,000 and 125 FTE; Program Change: -$2,000,000 and 0 FTE): NOAA requests a decrease of $2,000,000 and 0 FTE for a total of $24,669,000 and 125 FTE to reduce support for an autonomous underwater vehicle testbed.

Proposed Actions:
The AUV demonstration provides an array of surface and subsurface autonomous vehicles and other appropriate technology to support ocean observations for NOAA use, which will be augmented with sensor packages designed by NOAA and its Cooperative Institute partners for testing and evaluation in the marine environment. This program was established in 2014 and a number of candidate vehicles and/or technologies will be procured for testing various instrument suites in 2015 and beyond. With this reduction, the pace of evaluating new technologies for ocean observations will be slowed.

NOAA will maintain its fleet of autonomous vehicles and other alternative technologies, and will continue to support an RFP process open to NOAA Labs and Cooperative Institutes but will reduce the funding available for ongoing development, test and evaluation activities. Innovative instrumentation will continue to be developed by NOAA and its partners, with testing and evaluations conducted in the marine environment with vessels of opportunity.

Resource Assessment:
NOAA and multiple other Federal agencies (USN/ONR, BOEM, USGS, and others) have an interest in conducting research and operational data collection activities in oceanic areas. The U.S. government and academic fleets are only able to provide a fraction of the shiptime required to meet these requirements. Recently, the development and introduction of several unmanned surface and sub-surface technologies, as well as other systems designed to collect ocean data for long periods of time without being tended, offer a viable substitute for days at sea.

Performance Goals and Measurement Data:

Performance Measure: Identify high priority technologies as candidate systems for development/ integration. (annual)	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With Decrease	N/A	N/A	2	2	2	2	2
Without Decrease	N/A	4	4	4	4	4	4
Description: The NOAA AUV Working Group will provide the initial recommendations for candidate technologies for development. NOAA envisions funding, on average, two technologies per year, but depending on the complexity of the technologies chosen, it may be necessary to fund only one new technology in some years with the existing funding level.							

Performance Measure: Demonstration/testing of new technologies (annual)	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With Decrease	N/A	N/A	0	1	1	2	2
Without Decrease	N/A	0	0	2	3	4	4

Description: Successful demonstration of new technologies will depend on the degree of difficulty in the development of those technologies. We plan on introducing early in the process some technologies which are further developed in order to produce some return in a one-year timeframe. More complex technologies can require 5 years or more to bring to an operational demonstration status. This measure is an approximation only.

PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Budget Program: Office of Oceanic and Atmospheric Research
Sub-program: Ocean, Coastal, and Great Lakes Research
Program Change: AUV Demonstration

	Object Class	FY 2015 Increase	FY 2015 Total Program
11	Personnel compensation		
11.1	Full-time permanent	$0	$11,554
11.3	Other than full-time permanent	0	374
11.5	Other personnel compensation	0	509
11.8	Special personnel services payments	0	
11.9	Total personnel compensation	0	12,437
12	Civilian personnel benefits	0	3716
13	Benefits for former personnel	0	0
21	Travel and transportation of persons	0	274
22	Transportation of things	0	110
23.1	Rental payments to GSA	0	230
23.2	Rental Payments to others	0	810
23.3	Communications, utilities and miscellaneous charges	0	435
24	Printing and reproduction	0	35
25.1	Advisory and assistance services	0	53
25.2	Other services	-	343
25.3	Purchases of goods & services from Gov't accounts	0	2,484
25.4	Operation and maintenance of facilities	0	0
25.5	Research and development contracts	0	0
25.6	Medical care	0	0
25.7	Operation and maintenance of equipment	0	0
25.8	Subsistence and support of persons	0	0
26	Supplies and materials	0	1,055
31	Equipment	-1800	-1281
32	Lands and structures	0	0
33	Investments and loans	0	0
41	Grants, subsidies and contributions	-200	3,967
42	Insurance claims and indemnities	0	1
43	Interest and dividends	0	0
44	Refunds	0	0
99	Total obligations	(2,000)	24,669

National Sea Grant College Program Base: Grand Challenge (Base Funding: $1,000,000 and 0 FTE; Program Change: -$1,000,000 and 0 FTE): NOAA requests a decrease of $1,000,000 and 0 FTE in order to terminate the Grand Challenge initiative.

Proposed Actions:
NOAA proposes to terminate Grand Challenge initiative that began in 2014, which was designed to foster scientific and technological innovation in ocean mapping and observing technologies. NOAA will continue its focus on ocean observing systems and technologies through other programs, such as Global Ocean Observing Systems, Ocean Exploration Program, and OAR's Ocean Laboratories and Cooperative Institutes..

Resource Assessment:
The Grand Challenge initiative provided incentive prize opportunities for private innovators, industry and other interested parties. Competition for prizes was meant to foster scientific and technological innovation for delivering the technology to map and characterize the oceans more quickly and efficiently in order to limit the use of costly at-sea days.

Performance Goals and Measurement Data:

Performance Measure: Number of technical mission gaps filled to meet NOAA mission needs. (cumulative)	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With Decrease	N/A	N/A	1	1	1	1	1
Without Decrease	0	0	1	2	3	4	5
Description: NOAA will define gaps (in technology, methods, or cost) in current methods that restrain technical advances and offer prizes in these areas with specific performance targets. Prizes will generate direct and indirect solutions to advance missions.							

Performance Measure: Number of projects with leveraged partners delivering results. (per year)	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With Decrease	N/A	N/A	1	0	0	0	0
Without Decrease	0	0	1	1	1	1	1
Description: Prize opportunity invites leveraging, and the extent of leveraging will be a measure of how wide the reach of prizes has extended.							

PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Base Program: Office of Oceanic and Atmospheric Research
Sub-program: Ocean, Coastal, and Great Lakes Research
Program Change: Grand Challenge

	Object Class	FY 2015 Increase	FY 2015 Total Program
11	Personnel compensation		
11.1	Full-time permanent	$0	$1,703
11.3	Other than full-time permanent	0	92
11.5	Other personnel compensation	0	0
11.8	Special personnel services payments	0	0
11.9	Total personnel compensation	0	1,795
12	Civilian personnel benefits	0	526
13	Benefits for former personnel	0	0
21	Travel and transportation of persons	0	158
22	Transportation of things	0	7
23.1	Rental payments to GSA	0	274
23.2	Rental Payments to others	0	20
23.3	Communications, utilities and miscellaneous charges	0	29
24	Printing and reproduction	0	2
25.1	Advisory and assistance services	0	0
25.2	Other services	-	20
25.3	Purchases of goods & services from Gov't accounts	0	900
25.4	Operation and maintenance of facilities	0	0
25.5	Research and development contracts	0	0
25.6	Medical care	0	0
25.7	Operation and maintenance of equipment	0	0
25.8	Subsistence and support of persons	0	0
26	Supplies and materials	0	132
31	Equipment	0	125
32	Lands and structures	0	0
33	Investments and loans	0	0
41	Grants, subsidies and contributions	(1,000)	58,381
42	Insurance claims and indemnities	0	0
43	Interest and dividends	0	0
44	Refunds	0	0
99	Total obligations	(1,000)	62,369

National Sea Grant College Program Base: National Sea Grant College Program (Base Funding: $63,369,000 and 13 FTE; Program Change: -$1,000,000 and 0 FTE): NOAA requests a decrease of $1,000,000 and 0 FTE for a total of $62,369000 and 13 FTE to reduce funding for research.

Proposed Actions:
NOAA Sea Grant will decrease the amount of research funding available for competitively awarded projects under two of its four specific focus areas: Healthy Coastal Ecosystems; and Resilient Coastal Communities and Economies.

This proposal will reduce the amount of funding available for research that examines stressors facing our diverse coastal ecosystems. This research helps coastal managers understand the characteristics of species, landscape and their interactions within each ecosystem. In addition, it contributes to better coordination among Federal, state and local jurisdictions and the active engagement of the people who live, work and play along our coasts. It will also reduce the amount of funding available for research on marine-related energy sources, climate change, coastal processes, energy efficiency, hazards, storm water management and tourism.

Resource Assessment
Sea Grant funds competitive grant competitions through its network of 33 Sea Grant Colleges. Sea Grant is a leader in local and regional approaches to understand and maintain healthy ecosystems, with planning efforts across the country that identify information gaps, implement research priorities, and coordinate information and technology transfer to people who need it. Sea Grant also uses its unique research and outreach capabilities to assist coastal communities in balancing the multiple demands on their coastal resources and responding to and mitigating natural and technological hazards and the demands of an increasing coastal population.

Schedule and Milestones:
- Between FY 2013 and FY 2017, create or retain over 53,090 jobs as a result of Sea Grant research and outreach in renewable energy, aquaculture, biotechnology, and other emerging industries.

Deliverables:
- Create and transfer at least 175 decision-support tools/technologies to coastal managers per year.

Performance Goals and Measurement Data:

Performance Measure: Annual economic and societal benefits derived from Sea Grant activities	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With Decrease:							
Jobs created/retained	N/A	N/A	9,600	9,445	9,445	9,445	9,445

Businesses created/retained	N/A	N/A	2,000	1,965	1,965	1,965	1,965
Economic benefit (millions of dollars)	N/A	N/A	320	315	315	315	315
Without Decrease:							
Jobs created/retained	15,000	9,600	9,600	9,600	9,600	9,600	9,600
Businesses created/retained	3,400	2,000	2,000	2,000	2,000	2,000	2,000
Economic benefit (millions of dollars)	485	320	320	320	320	320	320
Description: Society benefits from Sea Grant's assistance in developing new businesses/jobs and retaining existing businesses/jobs. This measure also tracks economic (market and non-market) benefits from the development of new ocean, coastal, and Great Lakes resources and technology.							

Performance Measure: Cumulative number of tools, technologies, and information services that are used by NOAA partners/customers to improve ecosystem-based management (2010 baseline)	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With Decrease	N/A	N/A	2320	2775	3220	3660	4090
Without Decrease	1320	1820	2320	2820	3320	3820	4320
Description: This measure tracks success in translating research findings into tools, technologies and information services that improve the use and management of coastal, ocean, and Great Lakes ecosystems. Examples of tools include: land cover data, benthic habitat maps, and environmental sensitivity index maps. Technologies refer to the transfer of new or underused approaches for addressing coastal management (e.g., remote sensing, biosensors, autonomous underwater vehicles, genetic markers for fishery stocks) and resource development (e.g., culture systems for aquaculture, marine pharmaceuticals). This includes the application of technology to coastal resource management through synthesis, integration, training, and the development of new management tools.							

PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Base Program: Office of Oceanic and Atmospheric Research
Sub-program: Ocean, Coastal, and Great Lakes Research
Program Change: National Sea Grant College Program

	Object Class	FY 2015 Increase	FY 2015 Total Program
11	Personnel compensation		
11.1	Full-time permanent	$0	$1,703
11.3	Other than full-time permanent	0	92
11.5	Other personnel compensation	0	0
11.8	Special personnel services payments	0	0
11.9	Total personnel compensation	0	1,795
12	Civilian personnel benefits	0	526
13	Benefits for former personnel	0	0
21	Travel and transportation of persons	0	158
22	Transportation of things	0	7
23.1	Rental payments to GSA	0	274
23.2	Rental Payments to others	0	20
23.3	Communications, utilities and miscellaneous charges	0	29
24	Printing and reproduction	0	2
25.1	Advisory and assistance services	0	0
25.2	Other services	0	20
25.3	Purchases of goods & services from Gov't accounts	0	900
25.4	Operation and maintenance of facilities	0	0
25.5	Research and development contracts	0	0
25.6	Medical care	0	0
25.7	Operation and maintenance of equipment	0	0
25.8	Subsistence and support of persons	0	0
26	Supplies and materials	0	132
31	Equipment	0	125
32	Lands and structures	0	0
33	Investments and loans	0	0
41	Grants, subsidies and contributions	(1,000)	58,381
42	Insurance claims and indemnities	0	0
43	Interest and dividends	0	0
44	Refunds	0	0
99	Total obligations	(1,000)	62,369

National Sea Grant College Program Base: STEM Education (Base Funding: $63,369,000 and 13 FTE; Program Change: $0 and 0 FTE): NOAA requests a decrease of $0 and 0 FTE to terminate Sea Grant STEM education activities at NOAA which is part of the Administration's reorganization of STEM education. The Sea Grant STEM Education activities funding will be reinvested within the National Sea Grant Program.

Proposed Actions:
As part of the Administration's comprehensive reorganization of STEM education programs to increase the impact of Federal investments, NOAA proposes to terminate funding NOAA Sea Grant STEM education activities. This funding will be reinvested in NOAA's National Sea Grant College Program.

In 2014, the President's Budget proposed a government-wide STEM reorganization to create a coherent framework for delivering STEM education to more students and more teachers more effectively while reducing fragmentation and the Administration published a Five-Year Federal Strategic Plan on STEM Education to help align the reorganization with key goals and strategies. The areas of priority for this plan include: improving pre-kindergarten-through-grade-twelve (pre-K-12) instruction; increasing and sustaining youth and public engagement with STEM; enhancing undergraduate STEM education; creating a national strategy around graduate fellowships; and better serving groups historically underrepresented in STEM.

Over the past year, agencies have made considerable progress towards a stronger and more cohesive infrastructure for delivering STEM education. For example, in implementing the Strategic Plan, mission agencies have increased coordination with the lead agencies (the Department of Education, the National Science Foundation, and the Smithsonian Institution) and are identifying ways to leverage existing resources to improve the reach of agency assets.

The 2015 Budget builds on these efforts by proposing a fresh reorganization with targeted adjustments to enable more strategic investment in STEM education with a focus on building and using evidence-based practices and finding new models for leveraging assets and expertise.

Therefore, in accordance with the Administration's STEM education initiative, NOAA proposes to terminate STEM education programs within Sea Grant, including the following programs:

- All state Sea Grant Program STEM activities, such as K-12 teacher training, curricula development, and education
- Sea Grant/National Marine Fisheries Service (NMFS) Graduate Fellowship Program

Resource Assessment:
Resources from the Sea Grant College Program support Sea Grant John A. Knauss Marine Policy Fellowships, Sea Grant/NMFS Fellowships, and State Sea Grant Program STEM activities such as K-12 teacher training, curricula development, and education.

Schedule and Milestones:
N/A

Deliverables:
N/A

Performance Goals and Measurement Data:
N/A

Marine Aquaculture Program: Marine Aquaculture Program (Base Funding: $4,500,000 and 1 FTE; Program Change: -$2,500,000 and 0 FTE): NOAA requests a decrease of $2,500,000 and 0 FTE for a total of $2,000,000 and 1 FTE to reduce the national technology transfer and extension competition for Marine Aquaculture.

Proposed Actions:
NOAA will reduce the National Strategic Investment competition for technology transfer/ extension competitions in Marine Aquaculture. This funding decrease will reduce the number of grants NOAA provides for decision-support tools and technology transfer related to sustainable domestic aquaculture. It will also reduce base-funded sustainable seafood industry research performed for National Marine Fisheries Service (NMFS)

Resource Assessment:
The NOAA National Sea Grant Marine Aquaculture Program works with other line offices (NMFS and NOS) to support NOAA's efforts to increase the domestic production of safe and sustainable seafood by funding competitive extramural research in aquaculture in ocean, coastal, Great Lakes areas. Environmentally and economically sustainable aquaculture helps meet increasing demands for seafood, creates and sustains jobs, stabilizes economies in coastal working waterfronts, and supports efforts to manage and rebuild wild fish stocks.

In general, whereas NMFS science centers focus on federal, intramural development of science and tools to facilitate efficient and effective permitting, Sea Grant state programs and the National Marine Aquaculture grants competition are focused extramurally to generate scientific knowledge for industry development, produce innovative university research, and provide extension/tool and technology transfer to support sustainable domestic aquaculture.

The Marine Aquaculture program funding will support extramural grants to generate scientific knowledge for industry development, produce innovative university research, and provide extension/tool and technology transfer to support sustainable domestic aquaculture. NOAA will also use remaining funding to facilitate the transfer of aquaculture research and technology into business operations, as well as inform the public and practitioners about key issues and information related to aquaculture.

Sea Grant, through the individual state Sea Grant programs, also supports some local aquaculture research in response to local, state, and regional issues, and this can be expected to continue. In addition, NOAA's Office of Aquaculture in NMFS will work on behalf of NOAA in response to the newly developed National Aquaculture Policy to foster sustainable aquaculture that will create employment and business opportunities in coastal communities; provide safe, sustainable seafood; and complement NOAA's comprehensive strategy for maintaining healthy and productive marine populations, species, and ecosystems and vibrant coastal communities.

Schedule and Milestones:
- Reduce the number of decision-support tools/technologies created and transferred to coastal managers from 250 per year to 200 per year in FY 2015 and beyond.

Deliverables:
- At least one major aquaculture company will implement new approaches to seafood production that benefits from Sea Grant research and extension on integrated multi-trophic aquaculture.

- Create and transfer at least 250 decision-support tools/technologies to coastal managers per year.
- Complete training of more than 3,000 seafood processors in Hazard Analysis Critical Control Point per year.

Performance Goals and Measurement Data

Performance Measure: Cumulative number of tools, technologies, and information services that are used by NOAA partners/customers to improve ecosystem-based management	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With decrease	N/A	N/A	2,270	2,720	3,170	3,620	4,100
Without decrease	1,320	1,820	2,320	2,820	3,320	3,820	4,320
Description: This measure tracks success in translating research findings into tools, technologies and information services that improve the use and management of coastal, ocean, and Great Lakes ecosystems. Examples of tools include: land cover data, benthic habitat maps, and environmental sensitivity index maps. Technologies refer to the transfer of new or underused approaches for addressing coastal management (e.g., remote sensing, biosensors, AUVs, genetic markers for fishery stocks) and resource development (e.g. culture systems for aquaculture, marine pharmaceuticals). This includes the application of technology to coastal resource management through synthesis, integration, training, and the development of new management tools.							

PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Base Program: Office of Oceanic and Atmospheric Research
Sub-program: Ocean, Coastal, and Great Lakes Research
Program Change: Marine Aquaculture Program

	Object Class	FY 2015 Increase	FY 2015 Total Program
11	Personnel compensation		
11	Full-time permanent	0	0
11	Other than full-time permanent	0	0
12	Other personnel compensation	0	0
12	Special personnel services payments	0	0
12	Total personnel compensation	0	0
12	Civilian personnel benefits	0	0
13	Benefits for former personnel	0	0
21	Travel and transportation of persons	0	0
22	Transportation of things	0	0
23	Rental payments to GSA	0	0
23	Rental Payments to others	0	0
23	Communications, utilities and miscellaneous charges	0	0
24	Printing and reproduction	0	0
25	Advisory and assistance services	0	0
25	Other services	0	0
25	Purchases of goods & services from Gov't accounts	0	0
25	Operation and maintenance of facilities	0	0
26	Research and development contracts	0	0
26	Medical care	0	0
26	Operation and maintenance of equipment	0	0
26	Subsistence and support of persons	0	0
26	Supplies and materials	0	0
31	Equipment	0	0
32	Lands and structures	0	0
33	Investments and loans	0	0
41	Grants, subsidies and contributions	-2,500	2,500
42	Insurance claims and indemnities	0	0
43	Interest and dividends	0	0
44	Refunds	0	0
99	Total obligations	-2,500	2,500

Ocean Exploration and Research: Ocean Exploration Program (Base Funding: $26,220,000 and 19 FTE; Program Change:-$7,000,000 and 0 FTE): NOAA requests a decrease of $7,000,000 and 0 FTE for a total of $19,220,000 and 19 FTE to reduce mapping and exploration of unknown and poorly known ocean areas and phenomena.

Proposed Actions:
With this decrease the Ocean Exploration Program will reduce the number days for the Extended Continental Shelf (ECS) mapping effort, which is a high-level, interagency, multi-year effort to define the potential extension of the US continental shelf under international law. In addition, this reduction will decrease the number of missions for the *EV Nautilus* program and the *Okeanos Explorer*. Finally OE will eliminate support for interagency biodiversity observation network funding.

Results from Ocean Exploration (OE) efforts include a rich variety of products. These products include: maps and geospatial databases; inventories and samples of living and non-living marine resources; oceanographic and atmospheric data; multimedia products such as video and still images; and peer-reviewed reports and journal articles. These products are archived and made accessible through the appropriate NOAA archive centers. The results provide a critical baseline of knowledge which serves to catalyze new lines of research and scientific inquiry, support ocean resource management decisions at local, regional, and basin scales, and improve ocean literacy and stewardship through public engagement.

Resource Assessment:
Current resources for this activity are described in the Ocean, Coastal and Great Lakes Research narrative.

Schedule and Milestones:
- Conduct one interagency partnership (i.e., BOEM, National Science Foundation) expeditions per year to explore and characterize habitats and ecosystems in deep water areas.
- Acquire limited amount of Days-At-Sea on UNOLS, Navy, NOAA and other vessels to accelerate and complete the baseline mapping of the potential ECS.

Deliverables:
- One ECS expedition to map and characterize the potential ECS in the central and western Pacific, Arctic, Gulf of Alaska, and the western Atlantic.
- One BOEM-NOAA partnership expedition to explore and characterize habitats and ecosystems in deep water areas in the Mid-Atlantic Bight and expand this highly leveraged NOPP sanctioned partnership into the Arctic and other EEZ regions, generating maps, peer-review journal reports, and other products.
- Autonomous Underwater Vehicle (AUV) mapping and habitat characterization surveys generating maps and databases containing information on environmental and oceanographic conditions in the areas surveyed.

Performance Goals and Measurement Data:

Performance Measure: Annual number of coastal, marine and Great Lakes ecological characterizations that meet management needs (Measure 18a, OER contribution only – number of expeditions per year)	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With Decrease	N/A	N/A	2	1	1	1	1
Without Decrease	1	2	2	2	2	2	2
Description: Conduct joint expeditions with DOI's BOEM, USGS and other partners to explore and characterize habitats and ecosystems in deep water areas of the Gulf of Mexico, the Mid-Atlantic Bight, the Arctic, and other high priority areas.							

Performance Measure: Annual number of coastal, marine and Great Lakes ecological characterizations that meet management needs (Measure 18a. OER contribution only – number of bathymetric expeditions per year)	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With Decrease	N/A	N/A	1	1	1	N/A	N/A
Without Decrease	0.5	2	2	2	2	N/A	N/A
Description: The Extended Continental Shelf mapping (ECS) effort is a high-level interagency multi-year effort to define the potential extension of the U.S. continental shelf under international law. Conduct mapping and ecosystem surveys per ECS task force directives. The ECS bathymetric mapping effort is expected to conclude by 2017. Within NOAA, OER intends to use this information strategically to make informed decisions regarding comprehensive exploration and research.							

Performance Measure: Annual number of coastal, marine and Great Lakes ecological characterizations that meet management needs (Measure 18a, OER contribution only – number of interdisciplinary expeditions per year)	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With Decrease	N/A	N/A	1	1	1	1	1
Without Decrease	0	3	3	3	3	3	3

Description: The ECS effort is a high-level interagency multi-year effort to define the potential extension of the U.S. continental shelf under international law. Using the information collected during previous bathymetric mapping cruises, identify high-priority areas that may contain unique and vulnerable habitats and/or marine resources, and conduct interdisciplinary exploration expeditions to establish baseline characterizations.

Performance Measure: Annual number of coastal, marine and Great Lakes ecological characterizations that meet management needs (Measure 18a, OER contribution only – number of expeditions per year.)	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With Decrease	N/A	N/A	1	1	1	1	1
Without Decrease	2	2	2	2	2	2	2

Description: OER Marine Archaeology program explores and discovers maritime heritage sites significant to American and World history using the latest in advanced technology. Sites include shipwrecks, prehistoric submerged landscapes, and other maritime cultural sites. The program supports the research and protections standards enumerated in the United Nations Educational, Scientific, and Cultural Organization (UNESCO) Convention on the Protection of the Underwater Cultural Heritage.

Performance Measure: Annual number of coastal, marine and Great Lakes ecological characterizations that meet management needs (Measure 18a, OER contribution only – number of expeditions per year.)	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With Decrease	N/A	N/A	6	6	6	6	6
Without Decrease	7	8	8	8	8	8	8

Description: Conduct systematic exploration, mapping and characterization of unknown areas in national and international waters using the NOAA Ship *Okeanos Explorer* Program and provide information and products to multiple users through telepresence links. The *Okeanos Explorer* offers a new approach to discovery: systematic exploration. This approach includes: (a) telepresence, the ability to bring scientific expertise virtually to the vessel through live connections between shore and sea, (b) a next-generation multi-beam sonar system, and (c) a highly sophisticated remotely operated vehicle (ROV). The ship's telepresence system delivers live images from the ship's ROV and maps from its multi-beam sonar to support live interactions between dedicated centers located throughout the world and the *Okeanos Explorer*.

PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Program: Office of Oceanic and Atmospheric Research
Sub-program: Ocean, Coastal, and Great Lakes Research
Program Change: Ocean Exploration

	Object Class	FY 2015 Increase	FY 2015 Total Program
11	Personnel compensation		
11.1	Full-time permanent	$0	$2,837
11.3	Other than full-time permanent	0	369
11.5	Other personnel compensation	0	117
11.8	Special personnel services payments	0	0
11.9	Total personnel compensation	0	3,323
12	Civilian personnel benefits	0	801
13	Benefits for former personnel	0	0
21	Travel and transportation of persons	0	252
22	Transportation of things	0	42
23.1	Rental payments to GSA	0	252
23.2	Rental Payments to others	0	49
23.3	Communications, utilities and miscellaneous charges	0	693
24	Printing and reproduction	0	5
25.1	Advisory and assistance services	0	1,725
25.2	Other services	(713)	-110
25.3	Purchases of goods & services from Gov't accounts	0	2,494
25.4	Operation and maintenance of facilities	0	1,844
25.5	Research and development contracts	0	0
25.6	Medical care	0	0
25.7	Operation and maintenance of equipment	0	0
25.8	Subsistence and support of persons	0	0
26	Supplies and materials	(300)	(300)
31	Equipment	(700)	(577)
32	Lands and structures	0	0
33	Investments and loans	0	0
41	Grants, subsidies and contributions	(5,287)	8,726
42	Insurance claims and indemnities	0	0
43	Interest and dividends	0	1
44	Refunds	0	0
99	Total obligations	(7,000)	19,220

<u>Ocean Exploration and Research: STEM Education (Base Funding: $$26,220,000 and 19 FTE; Program Change: $0 and 0 FTE)</u>: NOAA requests a decrease of $0 and 0 FTE to terminate Ocean Exploration and Research STEM education activities at NOAA which is part of the Administration's reorganization of STEM education. The Ocean Exploration and Research STEM education funding will be reinvested within the Ocean Exploration and Research Program.

Proposed Actions:
As part of the Administration's comprehensive reorganization of STEM education programs to increase the impact of Federal investments, NOAA proposes to terminate funding for Ocean Exploration and Research STEM education activities. This funding will be reinvested in NOAA's Ocean Exploration and Research program.

In 2014, the President's Budget proposed a government-wide STEM reorganization to create a coherent framework for delivering STEM education to more students and more teachers more effectively while reducing fragmentation, and the Administration published a Five-Year Federal Strategic Plan on STEM Education to help align the reorganization with key goals and strategies. The areas of priority for this plan include: improving pre-kindergarten-through-grade-twelve (pre-K-12) instruction; increasing and sustaining youth and public engagement with STEM; enhancing undergraduate STEM education; creating a national strategy around graduate fellowships; and better serving groups historically underrepresented in STEM.

Over the past year, agencies have made considerable progress towards a stronger and more cohesive infrastructure for delivering STEM education. For example, in implementing the Strategic Plan, mission agencies have increased coordination with the lead agencies (the Department of Education, the National Science Foundation, and the Smithsonian Institution) and are identifying ways to leverage existing resources to improve the reach of agency assets.

The 2015 Budget builds on these efforts by proposing a fresh reorganization with targeted adjustments to enable more strategic investment in STEM education with a focus on building and using evidence-based practices and finding new models for leveraging assets and expertise.

Therefore, in accordance with the Administration's STEM education initiative, NOAA proposes to terminate STEM education programs within the Office of Ocean Exploration, including outreach and education programs.

Schedule and Milestones:
N/A

Deliverables:
N/A

Performance Goals and Measurement Data:
N/A

Integrated Ocean Acidification: Integrated Ocean Acidification (Base Funding: $6,051,000 and 11 FTE; Program Change: +$8,871,000 and + 3 FTE): NOAA requests an increase of $8,871,000 and 3 FTE for a total of $14,922,000 and 14 FTE to improve our understanding of enhanced ocean and coastal acidification and the impacts to ocean and coastal marine resources, and to develop tools and adaptive strategies for affected industries and stakeholders.

Proposed Actions:
This program increase will enable NOAA to better inform both national and regional stakeholders and state agencies about the consequences of enhanced coastal and shelf ocean acidification (OA) for water quality and ecosystem resilience, allowing coastal resource managers to better develop adaptive strategies and inform policy. This increase will also enable NOAA to lead both national and international coordination efforts necessary to achieve maximum leverage and cost efficiency.

Additional program resources will support the following critical activities:

Enhanced U.S Ocean Acidification Observing System
Improving our understanding of ocean and coastal acidification processes demands strategic coordination of observing infrastructure and process monitoring (chemical, physical, ecological).. NOAA will make competitive, extramural awards to advance *regionally targeted ocean acidification observing optimization studies* within coastal, estuarine, coral reef and shelf environments. In addition, development of advanced technologies for cost effective routine, *in situ* observing of both chemical and ecological indices will be pursued (in partnership with IOOS) to meet the interdisciplinary monitoring needs of OA. Through the establishment of regional test-beds, new technologies can be developed and evaluated prior to operational deployment with the networks. Regions of interest (e.g., Puget Sound, Chesapeake Bay, Southeast Coast including Caribbean coral reefs, Gulf of Mexico including the Flower Garden Banks, select Pacific Islands, and Gulf of Maine) will be prioritized on the basis of marine species impact studies which will also be expanded. The studies will then guide the development and growth of an integrated enterprise of multi-platform observing and coupled ecological process monitoring needed to track carbon cycle dynamics and the associated ecosystem response, as well as determine long-term trends of OA in response to global change U.S. coral reef ecosystems as designated within the National Coral Reef Monitoring Plan will be fully implemented in partnership with the NOAA Coral Reef Conservation Program. Data access and management must be expanded to accommodate the growth of this enhanced observing system.

Scientific Capacity Building and Adaptation Strategies Development for Impacted Industries and other coastal stakeholders
Development of adaptation strategies will require a multi-prong approach. 1) Seafood industries in regions beyond the Pacific Northwest are growing increasingly concerned about potential impacts of OA on their harvest and the economic consequences. With this increased funding, NOAA will work with the IOOS Marine Sensor Program to promote research and development of better science and monitoring to support coastal industries and other stakeholders such as coral reef managers. The goal will be to fully develop new methods and technologies for operational adoption by industry. 2) In order to make these technologies directly relevant, this increase will expand laboratory and field biological impacts studies of potential impacts on commercial and recreational fishery species, such as lobster, and larger ecosystems, such as seagrass, oyster beds and coral reefsboth within the NMFS fisheries science center experimental facilities and through extramural research grants to academic partners. 3) Finally, NOAA will test proposed potential adaptation strategies to provide stakeholders with the most viable options and evaluate local environmental impacts where appropriate.

Regional Coastal Ocean Acidification Models
NOAA will develop enhanced, linked biogeochemical and ecosystem-level models which are regionally focused and optimized for characterizing carbonate chemistry dynamics and their impacts on species and ecosystems as caused by ocean and coastal acidification within high priority coastal ecosystems. These models will provide information for coastal managers such as how nutrient or local atmospheric input affects local acidification, how that change in chemistry affects the in situ biology, and how future emission and local policy decisions will alter these systems in coming decades.

Regional Ocean Acidification Visualization and Synthesis Products
NOA will develop data products specific to user needs that will integrate a growing wealth of OA knowledge to clearly communicate how ocean acidification is affecting U.S. waters and living marine resources. Products will include 1) near real time visualization of changing ocean water chemistry at global, regional, and local scales with an emphasis on high priority regions; 2) short and long term forecasts (e.g. early warnings for shellfish growers) of a range of OA indicators; and 3) other visualizations pertinent to coastal resources (fisheries, protected areas, coral reefs) potentially endangered by OA including maps of socioeconomic vulnerability. These products will be developed in close coordination with regional stakeholder communities and academic partners. These products will eventually be served through the OAP office in partnership with other NOAA programs (e.g. CPO, CO-OPS, IOOS).

Statement of Need and Economic Benefits:
Global ocean chemistry is changing at a rate at least ten times faster than at any time over the past 50 million years in response to rising atmospheric carbon dioxide.[24] This ocean acidification (OA) has been associated with changes in a broad range of marine biological processes including shell formation, recruitment, and behavior. Coastal factors such as upwelling, riverine discharge, nutrient loading, and hypoxia can enhance OA at regional and local scales. In 2009, U.S. shellfish represented about half the total seafood revenue estimated at $3.9 billion.[25] In Washington State alone, the shellfish industry generates $270 million annually, and directly and indirectly supports 3200 jobs. Recreational oyster and clam harvesters contribute more than $27 million annually to coastal economies.[26] Coral reefs also provide $30 billion in ecosystem services to local communities.[27] It has been determined through research that ocean acidification is already having a negative impact on coral reefs and shellfish causing marine resource managers (including industry owners) to request enhanced information on how to adapt to the changing conditions. NOAA's scientific contributions to oyster hatcheries in Washington and Oregon have already helped reverse the financial losses. To more effectively respond to and mitigate the impacts of OA, we need to improve our understanding of OA and the impacts to valuable coastal marine resources. NOAA also needs to develop tools and adaptive strategies for affected industries and stakeholders.

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[24] Honisch, B. et al. 2012. The Geological Record of Ocean Acidification. Science. Vol 335: p1058-1063.
[25] U.S. summary data (page 7) of the 2009 NMFS Fisheries Economics report.
[26] Washington Shellfish Initiative white paper, December 2011, http://www.mypugetsound.net/index.php?option=com_docman&task=doc_view&gid=589&Itemid=238; Washington State Blue Ribbon Panel on Ocean Acidification. 2012. Ocean Acidification: From Knowledge to Action (Washington State's Strategic Response). p. xv. https://fortress.wa.gov/ecy/publications/publications/1201015.pdf/.
[27] Cesar, H., L. Burke, and L. Pet-Soede. 2003. The Economics of Worldwide Coral Reef Degradation. Cesar Environmental Economics Consulting (CEEC), 6828GH Arnhem, The Netherlands, 23 pp.

Resource Assessment:
Resources for this program can be found in the Ocean, Coastal and Great Lakes narrative.

Schedule and Milestones:
FY 2015

- Inventory of regional hydrodynamic/biogeochemical models and regional workshops to identify stakeholder need for data products.
- Announce competitive RFPs for modeling, species impacts research, observing optimization studies, and synthesis product development. Some direct scientific assistance to regional partners provided. Leveraged partnerships with other NOAA divisions will be used whenever possible (IOOS, NCCOS, Sea Grant).
- Award grants to impacted industry/stakeholder capacity building projects identified through FY13/14 competitive RFP with IOOS. Scientific capacity increased for these industries as new technologies are developed.
- Award grants for model development projects identified through FY 14/15 competitive RFP process with NCCOS/NOS.
- Implement NCRMP Class III coral reef monitoring at two additional sites.
- Establish Test-bed monitoring project within Chesapeake Bay.

FY 2016

- Announce competitive RFPs for modeling, species impacts research, observing optimization studies, and technology and synthesis product development. Leveraged partnerships with other NOAA divisions will be used whenever possible (IOOS, NCCOS, Sea Grant).
- Award competitive grants for species impacts, modeling, observing optimization and data synthesis product development.
- Three more sites provided *in situ* observing capacity.

FY 2017

- Announce competitive RFPs for modeling, species impacts research, observing optimization studies, and synthesis product development.
- Release initial data synthesis visualization products in four regions.
- Observing optimization completed for two regions which were already well constrained (Pacific Northwest and Northeast).
- Deploy additional observing assets, as identified through observing optimization process, in the two preliminary regions.
- Three more sites provided in situ observing capacity.
- New technologies for use by impacted industries begin transfer to commercial production.

FY 2018

- Announce competitive RFPs for modeling, species impacts research, observing optimization studies, and technology and synthesis product development.
- Complete observing optimization for 4 more regions.
- Deploy additional observing assets, as identified through observing optimization process, in four additional coastal regions.
- Four regions provided data visualization products useful for management. Two more regions provided initial products.
- Biogeochemical/ecosystem impacts models completed covering at least four coastal regions.
- Three more sites provided in situ observing capacity.

FY 2019

- Announce competitive RFPs for modeling, species impacts research, observing optimization studies, and synthesis product development. Some direct scientific assistance to regional partners provided.
- Complete observing optimization for 3 more regions (total of nine high priority regions).
- Deploy additional observing assets, as identified through observing optimization process, in 3 additional regions.
- Biogeochemical/ecosystem impacts models for management application completed covering at least four coastal regions.
- Three more sites provided in situ observing capacity.

Deliverables:

- Optimized and expanded observing system in 9 coastal regions or subregions designed to make observing data collection more efficient.
- Operational regional ecosystem models, which can be used to inform management of inputs to coastal waters of anthropogenic substances which enhance local acidification and to predict impacts of OA on living marine resources and their ecosystems.
- Readily available near real time data products, which raise the visibility of ocean acidification and provide actionable information to policymakers and coastal managers.
- Seafood industries, coastal ecosystems, and human communities more resilient to ocean acidification impacts.

Performance Goals and Measurement Data:

Performance Measure: Number of coastal regions with completed observing system optimization studies. (cumulative)	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With Increase	N/A	N/A	0	0	2	6	9
Without Increase	0	0	0	0	0	0	0
Description: Cumulative number of completed regional analyses. Competitive studies will be initiated beginning in FY 2016 with final analysis of the initial regions anticipated in two years (FY 2018). Some regions are already being analyzed through an OAP/IOOS partnership (Northeast) and through NOAA/state partnerships (Pacific NW) so these can be completed sooner. Coral reef ecosystems are a high priority.							

Performance Measure: Number of industry partners provided scientific capacity through OA adaptation technologies and methods (cumulative)	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With Increase	N/A	N/A	6	6	12	12	18
Without Increase	0	0	0	0	0	0	0
Description: Industry partners provided direct scientific and monitoring support to aid them in designing adaptive management technologies and strategies that promote resilience to enhanced coastal OA conditions.							

Performance Measure: Number of large marine ecosystem (LME) provided coastal OA models and synthesis products and tools in support of stakeholder and management decisions (cumulative)	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With Increase	N/A	N/A	0	0	4	6	8
Without Increase	0	0	0	0	1	1	2
Description: Number of regions provided OA models and/or synthesis products and tools. Regions are defined by NOAA's Regional Ecosystems and U.S. LMEs. Although we plan to rotate the focus from LME to LME, the targeted optimization studies and synthesis products will likely focus on "hot spot" subregions within the LMEs (distinct estuaries or coral reefs, marine protected areas, seamounts, river mouths within LMEs) and then expanded out overtime.							

Performance Measure: Cumulative number of living marine resources characterized for vulnerability to ocean acidification	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With Increase	N/A	N/A	55	70	85	100	120
Without Increase	40	45	50	55	60	65	70
Description: Cumulative number of economically important species (or species on which those commercially important species rely) whose vulnerability to ocean acidification has been tested in NOAA or university laboratories.							

Performance Measure: Number of sites with *in situ*-based fixed and underway platforms that are accurately measuring the carbon parameters needed to calculate mean annual Aragonite Saturation State determined to be within 0.2 units of the actual mean	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With Increase	N/A	N/A	18	21	24	27	28
Without Increase	14	15	16	18	18	18	18

Description: This measure represents an annual inventory of *in situ*-based fixed and underway observing platforms dedicated to monitoring the magnitude, and rate of biogeochemical changes in response to increasing atmospheric carbon dioxide. Monitoring sites will be located in ecologically and economically important marine ecosystems, especially coral reefs in coordination with the Coral Reef Conservation Program. These ocean acidification observing platforms are defined by their inherent ability to fully constrain the carbonic acid system, as well as observing biological change, and must be capable of resolving decadal changes in ocean chemistry in response to ocean acidification. The data provided will be used by Federal and state regulatory agencies and commercial fisheries organizations and will contribute to and comply with the Global OA Observing Network.

PROGRAM CHANGE PERSONNEL DETAIL

Program: Office of Oceanic and Atmospheric Research
Sub-program: Ocean, Coastal, and Great Lakes Research
Program Change: Integrated Ocean Acidification

Title:	Location	Grade	Number of Positions	Annual Salary	Total Salaries
Physical Scientist	Silver Spring, MD	ZP-III/IV	4	63,091	252,364
Subtotal			4		$252,364
Less Lapse	25%		(1)		($63,091)
Total Full-time permanent:			3		$189,273
2015 Pay Adjustment	1.0%				$1,893
TOTAL			3		$191,166

Personnel Data	**Number**
Full-time Equivalent Employment	
Full-time permanent	3
Other than full-time permanent	0
Total	3
Authorized Positions:	
Full-time permanent	4
Other than full-time permanent	0
Total	4

PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Budget Program: Office of Oceanic and Atmospheric Research
Sub-program: Ocean, Coastal, and Great Lakes Research
Program Change: Integrated Ocean Acidification

	Object Class	FY 2015 Increase	FY 2015 Total Program
11	Personnel compensation		
11.1	Full-time permanent	$191	$1,211
11.3	Other than full-time permanent	0	42
11.5	Other personnel compensation	0	0
11.8	Special personnel services payments	0	0
11.9	Total personnel compensation	191	1,253
12	Civilian personnel benefits	116	430
13	Benefits for former personnel	0	0
21	Travel and transportation of persons	50	184
22	Transportation of things	50	103
23.1	Rental payments to GSA	212	259
23.2	Rental Payments to others	0	21
23.3	Communications, utilities and miscellaneous charges	0	15
24	Printing and reproduction	5	13
25.1	Advisory and assistance services	0	51
25.2	Other services	0	83
25.3	Purchases of goods & services from Gov't accounts	492	1,487
25.4	Operation and maintenance of facilities	200	200
25.5	Research and development contracts	0	0
25.6	Medical care	0	0
25.7	Operation and maintenance of equipment	1,000	1,000
25.8	Subsistence and support of persons	0	0
26	Supplies and materials	500	951
31	Equipment	750	934
32	Lands and structures	0	0
33	Investments and loans	0	0
41	Grants, subsidies and contributions	5,305	7,938
42	Insurance claims and indemnities	0	0
43	Interest and dividends	0	0
44	Refunds	0	0
99	Total obligations	8,871	14,922

APPROPRIATION ACCOUNT: OPERATIONS, RESEARCH, AND FACILITIES
SUB-PROGRAM: INNOVATIVE RESEARCH AND TECHNOLOGY

The objective of the Innovative Research and Technology sub-program is to accelerate the adoption of advanced computing, communications, and information technology throughout NOAA. Innovative Research and Technology supports OAR's High Performance Computing and Communications (HPCC) Initiative. The HPCC program supports OAR through major improvements in weather and climate forecasting, ecosystem and ocean modeling, and environmental information dissemination. These improvements are heavily dependent on major advances in high-end computing power, advanced information technology, and the availability of environmental data and information. These critical investments allow NOAA to meet its mission to deliver vital services and science education.

Through this program, NOAA participates as a mission agency in the multi-agency Networking and Information Technology Research and Development (NITRD) program. NOAA participates on several NITRD Interagency Working Groups including:

- High End Computing
- Large Scale Networking
- Software Design and Productivity
- Human Computer Interaction and Information Management.

HIGH PERFORMANCE COMPUTING (HPCC) INITIATIVES

HPCC supports a number of objectives in NOAA's Strategic Plan through support of IT research targeted at improving NOAA's mission and services which expands the global understanding of environmental science. The purpose of the HPCC program is to make major improvements in the Nation's ability to forecast the weather and climate, and to disseminate environmental information. At the same time, the program is aimed at stimulating the modernization of NOAA's computationally intensive services through the use of evolving high performance computing and high-speed networking technologies. Improvements in the accuracy and timeliness of NOAA's short-term weather warnings, seasonal forecasts, hurricane forecast improvements, as well as regional and global climate predictions are heavily dependent on major advances. These advances would include high-end computing power, advanced information technology, and the widespread availability of environmental data and information. Timely and responsive dissemination of NOAA's services and information requires full use of modern network and communication technologies. This program provides NOAA's focus for coordinating with external organizations and programs impacting the HPCC Program, through NITRD and its Interagency Coordinating Groups on Information Technology Research and Development (IT R&D), and by establishing agreements with other Federal agencies to obtain additional computational cycles to support NOAA's environmental research activities.

The activities that are currently being conducted with program resources and how those resources are allocated are as follows:

Activity	***Dollars***	***FTE***
Program Management	$1.3M	6
HPCC R&D IT Proposals	$0.8M	1
Environmental Modeling Software Development	$5.4M	3
R&D HPC Contract	$3.6M	2
Acquisition Support	$0.7M	1

The HPCC program provides NOAA with necessary computational and network resources required to support continued advances in environmental modeling capabilities. Benefits of the HPCC program include:

- Improvements in short-term warning and weather forecast systems and models,
- Enabling scientists to attack long-lead time problems associated with the physical processes that govern the behavior of the atmosphere and ocean,
- Maintaining NOAA's leadership position in understanding climate with applications towards critical issues such as hurricanes, drought, sea-level rise, and
- Accelerating modeling and simulation activities and providing relevant decision support information on a timely basis for programs such as the multi-agency Climate Change Science Program.

Schedule and Milestones:

FY 2015

- Fund approximately 11 HPC and advanced networking R&D projects
- Update FIM global model for operations
- Develop 1 km non-hydrostatic Atmospheric General Circulation Model (AGCM)
- Develop 1/50º Ocean General Circulation Model (OGCM)
- Develop high resolution climate/carbon/ice model for Polar Regions for decadal prediction capability for Arctic, assessment of potential for Arctic feedbacks to accelerate global warming, and more accurate estimates of sea level rise rates

FY 2016

- Fund approximately 11 HPC and advanced networking R&D projects
- Update FIM global model and updates for operations

FY 2017

- Fund approximately 11 HPC and advanced networking R&D projects
- Update FIM global model and updates for operations

FY 2018

- Fund approximately 11 HPC and advanced networking R&D projects

FY 2019

- Fund approximately 11 HPC and advanced networking R&D projects

Deliverables:

- HPC System availability – Maximum number of computational hours made available to scientists

Performance Goals and Measurement Data:

Performance Measure: HPCC / R&D System Availability	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	97%	96%	96%	96%	96%	96%	96%

Description: Maintaining high system availability translates into providing NOAA scientists, researchers, and collaboration partners with the maximum number of computational hours available enabling them to conduct important R&D on an almost 24/7 basis. The HPCC program provides NOAA researchers with a reliable computing resource which allows them to plan, with a high degree of confidence, their project milestones and deliverables. System outages can adversely affect NOAA initiatives such as meeting the Intergovernmental Panel on Climate Change milestones or cause delays in implementing operational improvements for hurricane track and intensity predictions. Ensuring high system availability enables NOAA to maximize its investment in these resources.

Performance Measure: Number of software development projects completed for climate, weather and water environmental R&D (per year)	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	5	8	8	8	8	8	8

Description: Each year the HPCC program funds software modeling development projects supporting NOAA's environmental scientists. These models run on NOAA's R&D supercomputers. These modeling efforts are focused on many different disciplines including climate change supporting the IPCC, hurricane forecast improvement, and advances in models supporting weather forecasting. Other OAR performance measures have direct dependencies on these modeling efforts.

Performance Measure: Number of R&D Information technology innovation projects initiated and completed. (per year)	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	0	11	11	11	11	11	11

Description: Each year the HPCC program sponsors a program to promote innovation in information technology across all elements of NOAA supporting NOAA's many missions. The goal in the program is identify promising new and innovative technologies or uses for existing technologies that can rapidly be adopted into operational settings supporting NOAA.

Performance Measure: Number of Networking and Information Technology Research and Development (NITRD) interagency activities that NOAA actively participates in (per year)	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	5	5	5	5	5	5	5
Description: NOAA has traditionally been an active participant in the White House Office of Science and Technology NITRD program. Funding from HPCC allows NOAA to participate in several NITRD interagency working groups including High End Computing, Human Computer Interaction and information management, Large Scale Networking, Software Design and Productivity. The NITRD activity has resulted in many benefits for NOAA including improvements to NOAA's wide area networking capabilities.							

PROGRAM CHANGE FOR FY 2015:

No program change is requested for this sub-program.

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APPROPRIATION ACCOUNT: PROCUREMENT, ACQUISITION, AND CONSTRUCTION
SUB-PROGRAM: OAR SYSTEMS ACQUISTION

The objective of this sub-program is to provide sustained capability of the NOAA Research and Development High Performance Computing System (R&D HPCS) in order to advance climate science and accelerate the development of regional and sub-regional information products and services.

NOAA's R&D HPCS provides computational resources to support advances in environmental modeling crucial for understanding some of the most critical climate issues of today. This investment includes the supercomputing systems, associated storage devices, advanced data communications, hardware and software engineering services, security, and necessary data center space. NOAA's R&D HPCS leverages world-class research staff and modeling capabilities now in place at NOAA to address important research problems in climate and weather research. NOAA's on-going model development is advancing the climate research program through NOAA computational research and collaboration with the inter-agency and academic climate research community. The American Recovery and Reinvestment Act funding enhanced NOAA's R&D HPCS, accelerating NOAA's capabilities to provide climate information to decision makers at regional and state levels.

Schedule and Milestones:

FY 2015

- Continue to maintain Gaea R&D HPCS system at Oak Ridge National Laboratory.
- Migrate major modeling applications and begin migration of minor applications.
- Improve realism of the NOAA Earth System Models by closing the nitrogen cycle, and major feedback on the global carbon cycle.
- Reduce the percentage of uncertainty in possible twenty-first century sea level rise.

FY 2016

- Upgrade storage capacity of climate model data archive.
- Develop the initial physical formulations to incorporate soot and dust aerosol impacts on snow and ice albedo in climate models, and improve sea ice models essential to developing a predictive understanding of Arctic climate change.
- Migrate minor applications to perform in balance with major applications.

FY 2017

- Enhance contributions to assessments of human impacts on climate through inclusion of more realistic physical processes and important feedback in climate models, and analysis of causes of past climate change.
- Gain greater confidence in projections of regional climate impacts.

FY 2018

- High-resolution Earth System Model integrations publically available for use in regional decision-making through federated data services.
- Exploratory application of Earth System Models using exascale high-performance computing platforms.

FY 2019

- High-resolution integrations for prediction of seasonal tornado risks at multi-month lead times.
- Exploratory application of Earth System Models using exascale high-performance computing platforms.

Deliverables:

- Sustained high availability of the NOAA R&D High Performance Computing system.
- Improved credibility of projections of changes of important climatic quantities, such as regional climate change and extreme events, to allow society to efficiently plan for and adapt to climate change.
- Major contributions of model data to the Program for Climate Model Diagnosis and Inter-comparison, in support of national and international climate assessments.
- Capability to develop and provide decadal prototype forecasts and predictions made with high-resolution coupled climate model.
- NOAA's environmental modeling applications able to utilize performance increases available through fine-grain architectures.

Performance Goals and Measurement Data:

Performance Measure: HPCC / R&D System Availability	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	96%	96%	96%	96%	96%	96%	96%
Description: Maintaining high system availability translates into providing NOAA scientists, researchers, and collaboration partners with the maximum number of computational hours available enabling them to conduct important R&D on an almost 24/7 basis. The HPCC program provides NOAA researchers with a reliable computing resource which allows them to plan, with a high degree of confidence, their project milestones and deliverables. System outages can adversely affect NOAA initiatives such as meeting the Intergovernmental Panel on Climate Change milestones or cause delays in implementing operational improvements for hurricane track and intensity predictions. Ensuring high system availability enables NOAA to maximize its investment in these resources.							

Out-year Funding Estimates

Research Supercomputing	**FY 2014 & Prior**	**FY 2015**	**FY 2016**	**FY 2017**	**FY 2018**	**FY 2019**	**CTC**	**Total**
Change from 2015 Base		-	-	-	-	-		
Total Request	305,435	10,379	10,379	10,379	10,379	10,379	N/A	Recurring

PROGRAM CHANGES FOR FY 2015:

Research Supercomputing/CCRI: High Performance Computing Software Engineering (Base Funding: $10,379,000 and 0 FTE; Program Change: +$3,000,000 and 0 FTE): NOAA requests an increase of $3,000,000 and 0 FTE for a total of $13,379,000 and 0 FTE to acquire software engineering support and associated tools to re-architect NOAA's research applications to run efficiently on next-generation fine-grain High Performance Computing (HPC) architectures.

Proposed Actions:
With this request, NOAA will acquire software engineering support and associated tools to re-architect NOAA's applications to run efficiently on next generation fine-grain HPC architectures. Through a focused effort coordinated by the NOAA Office of the Chief Information Officer's High Performance Computing (HPC) Program, these engineers will investigate and test new algorithms, train existing NOAA developers with new coding techniques, and assist these developers in accelerating the re-architecting of NOAA's applications. These software engineering efforts will not only prepare NOAA to take advantage of next-generation research computing technologies, but will also help NOAA more efficiently use its existing HPC assets and the computing that will be purchased through the Hurricane Sandy Supplemental. Without this increase, NOAA will not be positioned to make best use of new technologies as they emerge and will be limited by existing research computing power.

Throughout the computing industry, it is a widely accepted problem that modern HPC hardware (that have large numbers of CPU cores, each with decreasing levels of memory and memory bandwidth) is causing a mismatch with existing application software. In other words, the software is not able to keep up with the hardware, even in a research environment. This challenge drives a need to fundamentally redesign and rewrite HPC application software in order to perform well on next generation fine-grain HPC research systems. There is a significant risk to not pursuing this initiative, including operational and strategic risks to both the Department and to NOAA. Operating with outdated software will increase the costs for NOAA while being less efficient. The initiative will allow the Department and NOAA to meet their strategic objectives (15 &16) of enhancing weather, water, and climate reporting and forecasting as well as supporting climate adaptation and mitigation.

The December 2010 President's Council of Advisors on Science and Technology (PCAST) report on Federally Funded Research and Development in Networking and Information Technology acknowledges that harnessing the computing power of research systems requires a fundamental rethinking of how systems are structured and how application programs are written.

As the complexity of our computing systems is projected to continue its exponential growth, scientific users must adopt more sophisticated software. There will be a higher number of computational units requiring better code scalability; novel computational processors requiring new programming models; distributed input and output requiring optimized data management; and highly-complex, distributed systems requiring the development advanced software fault tolerance. NOAA's existing environmental modeling frameworks cannot simply be extended to the next generation of research platforms without these significant changes that require advance planning.

Statement of Need and Economic Benefits:
Weather and Climate affects approximately one third of the Nation's economy. Decision makers need credible information at finer scales to protect the life and livelihood of American citizens and support of commerce. NOAA's environmental modeling enterprise underpins NOAA's products and services to the nation by providing models and model-based estimates of both current and future states of the Earth's environment. This request fuels NOAA's ability to continually improve the

performance of NOAA's science-based modeling applications on the next generation of research HPC; thereby increasing societal benefit.

Without this re-architecting of environmental modeling applications through enhanced software and engineering support, NOAA's suite of environmental models will run slower on the next generation of high performance computing systems. Under this scenario, NOAA will be driven to utilize legacy computing technology, if available, at a higher cost (twice as much based on initial experiments within NOAA and DOE). These legacy systems will be far less efficient, occupying more data center space, and needing more cooling capacity and electrical power. This set back will halt the current pace of scientific advancement and degrade the operational delivery of environmental modeling guidance to the public.

Resource Assessment:
The current resources for NOAA's HPC provide equipment maintenance, support, facilities lease, electrical power, and data network communications costs for operational and R&D systems. Competitive performance based contracts are utilized to provision computing at the best value for NOAA. HPC resources are managed through NOAA's HPC Board to meet NOAA's mission goals and objectives. NOAA's successful HPC program has demonstrated efficiencies by consolidating HPC acquisitions and systems. The program is utilizing HPC shared services at Oak Ridge National Laboratory through an interagency agreement with the Department of Energy and is actively supporting data center consolidation initiatives Department wide through shared use of the program's HPC facilities. NOAA is also leveraging the Nation's advanced research networking infrastructure at affordable pricing through the use of Internet2 and university consortiums providing regional optical network services. New resources must be provided to prepare NOAA's mission critical applications to efficiently execute on next generation HPC architectures while maintaining performance levels on the current HPC.

Schedule and Milestones:
- FY2015 – Select programming model, assess coding techniques, and train developers.
- FY2015 – Begin migration of major modeling applications to fine-grain architecture.
- FY2016 – Continue migration of major modeling applications.
- FY2016 – Prepare limited benchmark suite for operational fine-grain architecture acquisition.
- FY2017 – Complete migration of major applications.
- FY2017 – Complete requirements for operational acquisition of classical architecture with limited fine-grain architecture.
- FY2018 – Begin migration of minor applications.
- FY2019 – Migrate minor applications to perform in balance with major applications.

Deliverables:
- Limited readiness for fine-grain architecture to be implemented into Operations in time for the FY2018 technology upgrade.
- NOAA's environmental modeling applications able to utilize performance increases available through Fine-Grain architectures.

Performance Goals and Measurement Data:

Performance Measure: Percent of codes ported to fine-grain architectures in NOAA's model suite	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With Increase	N/A	N/A	5%	15%	30%	60%	80%
Without Increase	0	0	0	0	0	0	0
Description: NOAA models are currently written to maximize efficiency on scalar computer architectures. It is expected that architectures based on fine-grained computing technologies will be replacing current architectures in the near future. NOAA must prepare mission critical applications to efficiently execute on next generation HPC architectures while maintaining performance levels on the current HPC. This performance measure tracks the re-coding of these applications to run on fine-grained architectures.							

Outyear Funding Estimates:

Research Supercomputing	**FY 2014 & Prior**	**FY 2015**	**FY 2016**	**FY 2017**	**FY 2018**	**FY 2019**	**CTC**	**Total**
Change from FY 2015 Base		3,000	3,000	3,000	3,000	3,000		
Total Request	305,435	13,379	13,379	13,379	13,379	13,379	N/A	Recurring

PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Budget Program: Office of Oceanic and Atmospheric Research
Sub-Program: OAR Systems Acquisition
Program Change: High Performance Computing Software Engineering

	Object Class	FY 2015 Increase	FY 2015 Total Program
11	Personnel compensation		
11.1	Full-time permanent	$0	$0
11.3	Other than full-time permanent	0	0
11.5	Other personnel compensation	0	0
11.8	Special personnel services payments	0	0
11.9	Total personnel compensation	0	0
12	Civilian personnel benefits	0	0
13	Benefits for former personnel	0	0
21	Travel and transportation of persons	0	0
22	Transportation of things	0	0
23.1	Rental payments to GSA	0	0
23.2	Rental Payments to others	0	0
23.3	Communications, utilities and miscellaneous charges	0	1,270
24	Printing and reproduction	0	0
25.1	Advisory and assistance services	0	0
25.2	Other services	3,000	6,477
25.3	Purchases of goods & services from Gov't accounts	0	3,186
25.4	Operation and maintenance of facilities	0	0
25.5	Research and development contracts	0	129
25.6	Medical care	0	0
25.7	Operation and maintenance of equipment	0	0
25.8	Subsistence and support of persons	0	0
26	Supplies and materials	0	687
31	Equipment	0	1,035
32	Lands and structures	0	595
33	Investments and loans	0	0
41	Grants, subsidies and contributions	0	0
42	Insurance claims and indemnities	0	0
43	Interest and dividends	0	0
44	Refunds	0	0
99	Total obligations	3,000	13,379

BUDGET PROGRAM: NATIONAL WEATHER SERVICE

For FY 2015, NOAA requests a total of $1,063,347,000 and 4,617 FTE for the National Weather Service, including a decrease of $22,577,000 and 104 FTE in net program changes.

National Weather Service Overview

The NWS (http://www.weather.gov/) provides weather, water, and climate forecasts and warnings for the United States, its territories, adjacent waters, and ocean areas for the protection of life and property and the enhancement of the national economy 24 hours every day. NWS is the sole, official and authoritative U.S. voice for issuing warnings during life-threatening weather situations. NWS forecasters issue public, aviation, marine, fire weather, climate, space weather, river and flood forecasts and warnings every day. NWS data and products form a national information database and infrastructure, which can be used by the public, other governmental agencies, the private sector, and the global community.

In 2015, NOAA proposes to restructure NWS Operations, Research, and Facilities (ORF) and Procurement, Acquisition and Construction (PAC) account Programs, Projects, and Activities (PPA) as part of a broader effort to align the NWS budget to function and link to performance. This restructure will restore budget credibility and transparency by strengthening internal controls and customer service while improving coordination and collaboration among activities that serve NWS' overall mission. The new budget structure presents a more functional grouping of budgetary resources while retaining separate PPAs for the key components in the forecast process and service delivery. NOAA believes that this approach balances transparency with enhanced accountability for achieving Weather-Ready Nation goals and objectives at the line office level. This restructure is reflected in the crosswalk tables provided in the ORF and PAC Exhibits 18 and 19 (pages ORF-21 and ORF-23) (pages PAC-13 and PAC-15) and in the table accompanying this narrative (page NWS-7).

Guided by the recent National Academy of Sciences, "*Becoming Second to None,*" and the National Academy of Public Administration (NAPA), "*Forecast for the Future: Assuring the Capacity of the NWS*" reports, NWS will continue to evolve and improve its weather, water, and climate products and services to enhance performance. This requires a careful examination of requirements, along with strategic science, technology, and infrastructure investments. The FY 2015 budget submission represents a first step towards defining the future NWS and making the bold vision for the Weather-Ready Nation, a reality.

The NWS proposes five sub-programs in the restructuring of the ORF account. This includes $972,305,000 and 4,697 FTE in the following distribution:

- Observations ($206,777,000 and 804 FTE) includes the operation of systems that collect and process the observations necessary to provide weather forecasts, warnings, and outlooks, such as the Next Generation Radar (NEXRAD), the Automated Surface Observing System (ASOS) and others.
- Central Processing ($100,517,000 and 232 FTE) includes the management and systems administration for the information technology infrastructure supporting national centers and field operations including the Weather and Climate Operational Supercomputing System (WCOSS), the Advanced Weather Interactive Processing System (AWIPS), and hydrology information technology initiatives.
- Analyze, Forecast, and Support ($482,360,000 and 3,058 FTE) includes the operation of a distributed network of forecast offices and specialized centers that include a workforce

of meteorologists, hydrologists, climatologists, and space physicists, which provide up-to-date and accurate weather forecasts, warnings, and outlooks to the Nation.

- Dissemination ($46,505,000 and 84 FTE) includes operations of the communication infrastructure required by NWS for collecting, tailoring, and distributing of information and products to customers and partners, such as the Telecommunications Gateway, NOAA Weather Radio, and other systems.
- Science and Technology Integration ($127,376,000 and 519 FTE) includes efforts of the NWS' operational modeling suite and other research to operations activities that advance weather and climate prediction, such as the Hurricane Forecast Improvement Project to better hurricane track and intensity predictions.

The NWS proposes two sub-programs in the restructuring of the PAC account. This includes $113,619,000 and 24 FTE. The sub-programs include:

- Systems Acquisition:
    - Observations ($5,649,000 and 2 FTE) supports the enhancement and life-cycle of observing systems that collect and process the observations necessary to provide weather forecasts, warnings, and outlooks, such as the Next Generation Radar (NEXRAD), the Radiosonde Replacement System (RRS) and others.
    - Central Processing ($65,761,000 and 22 FTE) provides the high performance computing (HPC) capacity for operations and development.
    - Dissemination ($34,209,000 and 0 FTE) enhances the dissemination infrastructure by expanding capacity to meet new satellite and model data requirements, including the Telecommunications Gateway and upgrading select NOAA Weather Radio locations.
- Construction:
    - Facilities Construction & Major Repairs ($8,000,000 and 0 FTE) includes upgrades and improvements to NOAA's Forecast Offices and facilities.

NWS is dedicated to serving the American public by providing a broad spectrum of weather, climate, and hydrological forecast guidance and decision support services. NWS strives to meet society's need for weather and hydrological forecast information. As more sectors of the economy recognize the impacts of weather and water on their businesses, they are becoming more adept at using sophisticated weather and water information to improve commerce. According to the American Meteorological Society, weather is directly linked to public safety, and a significant portion of the U.S. economy is weather-sensitive. Concern for public safety drives NWS to improve the timeliness and accuracy of warnings for all weather-related hazards. In turn NWS measures public and private sector satisfaction with NOAA information and warning services, through surveys and analysis of emergency managers, first responders, natural resource and water managers, public health professionals, industry, government and the public. NWS then uses these results to inform service improvements.

NWS is committed to enhancing observation capabilities by: (1) improving data assimilation that effectively uses all the relevant data NWS and others collect; (2) improving collaboration with the research community through creative approaches such as community modeling; by rapidly transforming scientific advances in modeling into improved operational products; (3) improving the techniques used by our expert forecasters; (4) making NWS information available quickly, efficiently, and in a useful form (e.g., the National Digital Forecast Database); (5) including information on forecast uncertainty to help customers make better-informed decisions; (6) taking

advantage of emerging technologies to disseminate this information; and (7) maintaining an up-to-date technology base and a workforce trained to use all of these tools to maximum effect.

NWS operates and maintains critical infrastructure, which enables the provision of NOAA's services to the Nation. NWS manages a distributed network of offices that span the Nation, delivering essential NOAA services, especially those related to high-impact events, at the local level where critical, life-saving decisions are made. This includes the management of all major weather observing systems, from software engineering and communications to facilities and logistics planning. NWS also ensures worldwide acquisition and delivery of weather and water data through the Telecommunications Gateway and the Office of Operational Systems Network (OPSnet). In support of NOAA's operational forecasting mission, NWS develops, improves and monitors data assimilation systems and models of the atmosphere and oceans, using advanced methods developed internally as well as cooperatively with scientists from universities, NOAA laboratories, other government agencies, and the international scientific community.

In accordance with the strategic plan, NWS launched an initiative called Weather-Ready Nation (WRN) to build community resilience in the face of increasing vulnerability to extreme weather and water events. The initiative includes improvements to support management of the Nation's water supply, understanding of climate-related risks, economic productivity, and healthy communities and ecosystems. Record-breaking snowfall, cold temperatures, extended drought, high heat, severe flooding, violent tornadoes, and massive hurricanes have all combined to reach the greatest number of multi-billion dollar weather disasters in the Nation's history. The devastating impacts of extreme events can be reduced through improved readiness, which is why NWS is reacting with the WRN initiative to further reduce the Nation's weather-related vulnerabilities. The initiative will be enacted through improvements to demand-driven support services, innovative technology, and specialized training of our workforce.

Building a WRN requires the participation and commitment of a vast nationwide network of partners that comprise the weather and water enterprise including other government agencies, emergency managers, researchers, the media, the private sector and more to assess why the Nation is experiencing such extreme impacts. NWS depends on partners including other NOAA line offices to acquire data, conduct research, provide education and training, help disseminate critical environmental information, and provide advice to make best use of NWS information.

Performance:
NWS is a customer-oriented government agency focused on service to the public. NWS delivers a large number of weather forecasts, warnings, and advisories every day that are used by virtually every American. As a professional science-based agency, verification of organizational performance is an integral part of the way that NWS does business. NWS uses the performance management process to align resources, systems, and workforce to achieve service based objectives and priorities for the Nation. The integrated investments for Observations to Processing to Analyze, Forecast, and Support to Disseminate to Science and Technology Integration to Facilities Construction and Major Repairs are managed to continuously improve NWS forecast and warning service. The effectiveness of these investments is assessed using numerous internal and external performance measures including the Government Performance and Results Act (GPRA) goals. These efforts have been institutionalized in NWS operations to maintain quality control and use objective methods to assess NWS performance.

Performance Goals and Measurement Data:

Performance Measure	FY 2013 Actual	FY 2014 Target	FY 2015 Target	FY 2016 Target	FY 2017 Target	FY 2018 Target	FY 2019 Target
Tornado Warnings Lead Time, Measure 15a	9	13	13	13	13	13	13
Tornado Warnings Accuracy, Measure 15a	57	72	72	72	72	72	72
Tornado Warnings False Alarm Ratio, Measure 15a	74	72	72	71	71	71	71
Flash Flood Warnings Lead Time, Measure 15b	64	60	61	61	63	65	65
Flash Flood Warnings Lead Accuracy, Measure 15b	78	74	76	76	76	76	76
48 hour Hurricane Track Error in nautical miles (Measure 15c)	103	81	80	78	77	77	77
48 hour Hurricane Intensity Error in knots (Measure 15d)	10.5	12	10	9	7	6	6
Accuracy (%) (Threat score) of Day 1 precipitation forecasts, Measure 15e	33	32	32	33	33	33	33
Winter Storm Warnings Lead Time, Measure 15f	22	20	20	20	20	20	20
Winter Storm Warnings Accuracy, Measure 15f	89	90	90	90	90	90	90
Marine Wind Speed Forecast Accuracy, Measure 15g	76	74	75	75	76	76	76
Marine Wave Height Forecast Accuracy, Measure 15g	81	76	76	77	77	77	77

Aviation Forecast IFR Accuracy, Measure 15h	62	65	65	65	65	65	65
Aviation Forecast IFR False Alarm Ratio, Measure 15h	37	38	38	38	38	38	38
Geomagnetic Storm Forecast Accuracy, Measure 15i	N/A	51	53	53	53	53	53
U.S. Seasonal Temp. Forecast Skill, Measure 16a	26	23	24	25	26	26	26

Research and Development Investments:
The NOAA FY 2015 Budget estimates are the result of an integrated requirements based strategic planning process. This process provides the structure to link NOAA's strategic vision with programmatic detail and budget development, with the goal of maximizing resources while optimizing capabilities. NWS requests $14,993,000 for investments in R&D in the FY 2015 budget.

NOAA's R&D planning is tied to the goals, enterprises, and associated objectives outlined in NOAA's Next Generation Strategic Plan. Specifically, NOAA's Science and Technology Enterprise and underlying objectives include a holistic understanding of the Earth system through research; accurate and reliable data from observing systems; and an integrated environmental modeling system. These provide the basis for a set of internal implementation plans covering a 7-year period which guide NOAA's research and development activities. The NOAA Research Council - an internal body composed of senior scientific personnel from every Line Office in the agency - informs the annual updates to these implementation plans, and has developed the next 5-Year Research and Development Plan for NOAA (FY 2013-2017). This plan will guide NOAA’s R&D activities over the next five years. The plan provides a common understanding among NOAA’s leadership, its workforce, its partners, constituents and Congress on the value of NOAA’s R&D activities. As such, the Plan is a framework with which NOAA and the public can monitor and evaluate the Agency’s progress and learn from past experience.

Significant Inflationary Adjustments:
NOAA’s FY 2015 Base includes a total of $18,678,000 and 0 FTE to account for the full funding requirement for inflationary adjustments to current programs for NWS activities. This includes the estimated 2015 Federal pay raise of 1.0 percent as well as inflationary increases for non-labor activities, including service contracts, utilities, field office lease payments, and rent charges from the General Service Administration (GSA). The FY 2015 request, however, only includes an increase of $9,908,000 to cover these costs. NWS will offset $8,770,000 of its inflationary costs through program management efficiencies.

Headquarters Administrative Costs:
In FY 2015, NWS Line Office headquarters will use $26,678,421 in funds to support general management activities, financial and budgeting, and IT related expenses, as well as supporting facilities and other general operating costs. These funds also include support for service contracts, utilities, and rent charges from the General Services Administration. Specifically, NWS will use headquarters administrative funds to support the following:

Headquarters Program Support Type	Description	FY 2015 Amount	FY 2015 FTE associated with NWS HQ
General Management & Direction/Executive Management	Includes Assistant Administrator's office, public affairs, information services	$9,551,455	37.0
Budget & Finance	Includes Budget, Finance and Accounting	$6,499,732	22.0
Information Technology (IT)	Includes IT-related expenses and other CIO related activities	$5,111,614	19.0
Facilities/Other Administrative (CAO Functions)	Includes Facilities and Security costs, as well as other CAO related activities	$3,646,500	6.0
Human Resources	All HR services, including EEO	$1,869,120	14.0
TOTAL		**$26,678,421**	**98.0**

PROPOSED NWS BUDGET RESTRUCTURE (ORF)

Current Sub-program	**Current PPA**	**Proposed Sub-program/PPA**
Operations and Research	Local Warnings and Forecasts	Observations; Central Processing; Analyze, Forecast, & Support; Dissemination; Science & Technology Integration
Operations and Research	Air Quality Forecasting	Science & Technology Integration
Operations and Research	Alaska Data Buoys	Observations
Operations and Research	Sustain Cooperative Observer Network	Observations
Operations and Research	NOAA Profiler Network	Observations
Operations and Research	Strengthen U.S. Tsunami Warning Network	Observations; Analyze, Forecast, & Support
Operations and Research	Pacific Island Compact	Analyze, Forecast, & Support
Operations and Research	National Mesonet Network	Observations
Operations and Research	Advanced Hydrological Prediction Services	Central Processing
Operations and Research	Aviation Weather	Observations, Analyze, Forecast, & Support; Dissemination; Science & Technology Integration
Operations and Research	WFO Maintenance	Analyze, Forecast, & Support
Operations and Research	Weather Radio Transmitters Base	Dissemination
Operations and Research	Central Forecast Guidance	Central Processing; Analyze, Forecast, & Support; Dissemination; Science & Technology Integration
Systems Operation and Maintenance	NEXRAD	Observations
Systems Operation and Maintenance	ASOS	Observations
Systems Operation and Maintenance	AWIPS	Central Processing
Systems Operation and Maintenance	NWSTG Backup – CIP	Dissemination

PROPOSED NWS BUDGET RESTRUCTURE (PAC)

Current Sub-program	**Current PPA**	**Proposed PPA**
Systems Acquisition	ASOS	Observations
Systems Acquisition	AWIPS	Central Processing
Systems Acquisition	NEXRAD	Observations
Systems Acquisition	NWSTG Legacy Replacement	Dissemination
Systems Acquisition	Radiosonde Network Replacement	Observations
Systems Acquisition	Weather and Climate Supercomputing	Central Processing
Systems Acquisition	Complete and Sustain NOAA Weather Radio	Dissemination
Systems Acquisition	Ground Readiness Project	Dissemination
Construction	WFO Construction	Facilities Construction & Major Repairs

APPROPRIATION ACCOUNT: OPERATIONS, RESEARCH, AND FACILITIES
SUB-PROGRAMs: OBSERVATIONS; CENTRAL PROCESSING; ANALYZE, FORECAST AND SUPPORT; DISSEMINATATION; SCIENCE AND TECHNOLOGY INTEGRATION

The objectives of the sub-programs are to:

- Provide up-to-date and accurate weather forecasts, warnings, and outlooks to the Nation
- Support the emergency management community
- Engage in outreach and education activities to support public decisions
- Maintain the operations of systems that collect observations necessary to provide weather forecasts, warnings, and outlooks to the Nation
- Maintain processing systems necessary to generate weather forecasts, warnings, and outlooks to the Nation
- Improve services by integrating new advances in science and technology

NWS has over 4,400 full-time equivalents (FTEs) in 122 Weather Forecast Offices (WFO), 13 River Forecast Centers (RFC), 9 National Centers for Environmental Prediction (NCEP), and other support offices around the country. In addition, NWS supports a national infrastructure to gather and process data worldwide from the land, sea, and air. This infrastructure collects data from technologies such as Doppler weather radars, satellites operated by NOAA's National Environmental Satellite, Data, and Information Service (NESDIS), data buoys for marine observations, surface observing systems, and instruments for monitoring space weather. These data feed sophisticated models running on high-speed supercomputers. A highly trained and skilled workforce uses powerful workstations to analyze all of these data and issue forecasts and warnings. High-speed communications tie this entire information infrastructure together and disseminate forecasts and warnings to the public.

NWS staff also use trained community volunteers to enhance weather service operations. Cooperative observers collect weather data that become part of the Nation's climate records and citizen storm spotters provide NWS with visual confirmation of severe weather events. As environmental information becomes more sophisticated, complete, and available to all, the environmental literacy of the public becomes more important. NWS outreach and education activities are aimed at making sure the public understands the information we provide and can use it effectively in the decisions they make.

OBSERVATIONS

NWS is fundamentally dependent on environmental observations from the surface of the sun to the bottom of the sea to meet its forecast and warnings mission. Observing the environment requires integration of all available sources; to include both in-situ and remotely-sensed data from satellites and radars, and data from NOAA systems, commercial sources, Federal and even international partners. No single observation source can stand on its own.

The Observations PPA supports the life-cycle of all NWS observing system investments and includes observational requirements analysis for NOAA systems such as satellites. This PPA manages the activities from defining observational requirements, to systems development, operational implementation, and routine system maintenance. NWS missions, from issuing timely and accurate tornado and flood warnings to providing weather forecasts and accurate seasonal predictions, depend on data from an integrated suite of observing systems. Observing systems must provide a global picture of the atmosphere and oceans, as well as high-definition 3-dimensional views of individual storms. Together, observing systems enable forecasters to

identify emerging threats, characterize the severity of the threat, and provide detailed warnings and forecasts of an event.

Observation systems must measure a broad array of parameters to support forecasting in the varied mission service areas of the NWS: aviation weather, severe weather, space weather, tropical weather, tsunami and more. Sensors must operate in a variety of environments such as space, the atmosphere, and on the surface (ground or water). Prioritizing observing systems requirements and observing systems investments are key to the success of other NWS PPAs such as Analyze, Forecast and Support, Central Processing, and Science and Technology Integration. The optimal mix of observing systems is driven by mission and performance requirements. Observation systems may be integral to determine initial and boundary conditions for longer term numerical weather prediction and climate forecast while others may be critical for short term local warnings, watches and outlooks. All observing systems have strengths and weaknesses in monitoring the environment; individual systems in the overall suite must complement each other.

The Observations PPA assesses observation architecture alternatives based on analyses and studies to optimize an integrated observation system PPA that maximizes NWS' ability to save lives and property while improving trade and commerce. This PPA assesses the effectiveness of NOAA's integrated observing systems and recommends necessary configuration changes to meet the requirements and maximize the benefits of a Weather-Ready Nation (WRN).

Specifically, the Observations PPA:

- Manages operations and maintenance of NWS observational suites
- Provides holistic, on-going assessments/analyses of the observation system portfolio
- Identifies and validates NWS' observation requirements
- Seeks solutions to fulfill NWS' observation requirements
- Develops a strategy to maximize effectiveness while minimizing cost
- Coordinates NWS' observation system activities with NOAA and its partners

To achieve these goals, Observations maintains the following programs:

Upper Air (UA) Observations Program provides meteorological data above the surface to support NWS forecast operations. To achieve this requirement, NWS operates a radiosonde network, acquires observations from private and commercial aircraft, and operates a wind profiler network in Alaska.

- Each year, NWS launches over 78,000 radiosondes from locations throughout the United States, its possessions, the Caribbean and Pacific Island nations. A radiosonde, is a small, expendable instrument package launched by a large hydrogen or helium gas filled balloon, and provides atmospheric profiles of pressure, temperature, relative humidity and winds aloft. These data are significant sources for NWS weather prediction models and NWS forecaster operations, which are used to support severe storm, aviation and marine forecasts, and climate and other research uses. Radiosondes also serve to provide a reference for satellite sounding data and operational forecasts.
- NWS leverages private-public partnerships with the aviation community to obtain additional upper air observational data. These aircraft provide accurate information at major airports up to 40,000 feet and en route at flight level. Meteorological Data, Collection and Reporting System (MDCARS) equipped aircraft provide temperature and wind information; while Water Vapor Sensor System (WVSS) provides relative humidity.

- The Alaskan NOAA Profiler Network (NPN) consists of three Doppler radar sites providing continuous vertical wind profile data. This data is utilized as a forecast tool to validate numerical weather model information and to provide fidelity in public and aviation weather warnings in Alaska. The most critical use of the Alaska profiler network is to support the production of aviation warnings of volcanic ash, as ash can cause catastrophic engine failure for aircraft in flight. Alaska has 40 active volcanoes.

Radar Observations Program provides meteorological data from the surface to approximately 10,000 feet above ground level to support NWS forecast operations. To achieve this requirement, NWS operates the Next Generation Weather Radar (NEXRAD) and acquires supplementary radar data from other sources.

- NEXRAD (http://www.roc.noaa.gov/) is the joint NWS/Federal Aviation Administration (FFA) /Department of Defense weather radar system consisting of 160 operational radars. NEXRAD utilizes Doppler technology and hydrometeorological processing to provide significant improvements over the previous generation of weather radars for tornado and thunderstorm warnings, air safety, flash flood warnings, and water resources management. The primary tool used by NOAA's meteorologists for issuing warnings for flash floods, tornadoes, and severe thunderstorms is NEXRAD. NEXRAD data have become integrated into America's decision support serving air traffic management, homeland security, military operations, emergency managers, and water resource management. NEXRAD data is vital to many sectors of the economy including the public, media, tourism, agriculture, transportation, and energy production. The current NEXRAD system was fielded in the mid-1990s with an original design life of 20 years. However, the United States is 20-25 years away from full deployment of its next generation weather radar. Therefore, technology refresh efforts and strategic investments are critical to sustaining the availability of the NEXRAD fleet and to maximizing the benefit the NEXRAD network provides until the current network is replaced.
- NWS leverages other radar data sources such as the Federal Aviation Administration's (FAA) Terminal Doppler Weather Radar to supplement and gap fill the NEXRAD data.

Surface Observations Program provides meteorological data at the surface to support NWS forecast operations. To achieve this requirement, NWS operates the Automated Surface Observing System (ASOS), the Cooperative Observer Program (COOP) and the National Mesonet Program.

- ASOS (http://www.weather.gov/asos/) is the Nation's primary surface weather observing network supporting aviation operations and the needs of the meteorological, hydrological, and climatological research communities. ASOS is a joint NWS/FAA/DOD automated surface observation system consisting of 1,001 operational systems located at airports. ASOS operates 24x7, significantly increasing the amount of reliable, continuous information available to forecasters and the aviation community.
- COOP, formally created in 1890 by the Organic Act, is a network of volunteer observers providing a significant source of metrological data representative of where our citizens live, work, and play. The COOP data are the primary data utilized in the NWS snowfall forecast guidance. The data are also critical for precipitation type and flood forecasts, drought monitoring, and disaster declarations. The COOP network continues to be used to prepare national, regional, and local climate forecasts and is important in the development of climatological normals and averages.
- The National Mesonet provides localized, high resolution observations in both time and space. These data, combined with other observations throughout the vertical structure

of the atmosphere, provide input to NWS models. Mesonet data can identify small scale features at the surface, such as changes in wind speed/direction, temperature and pressure - each of which can indicate rapidly deteriorating weather conditions not shown by other observations. Mesonet data is also a primary source for the National Centers for Environmental Prediction's Real-Time Mesoscale Analysis products, developed to provide field forecasters with high quality analyses for nowcasting, situational awareness, and forecast verification purposes. In addition, the North American Mesoscale model and the hourly Rapid Refresh model take advantage of the high frequency nature of this data.

Marine Observations Program deploys and manages an enhanced observational network of buoys and coastal stations providing real-time meteorological, climatological and tsunami data in the open ocean and coastal zone surrounding the United States to support NWS forecast operations. To achieve this requirement, NWS operates the Weather and Ocean Platform network, the Tropical Atmosphere Ocean (TAO) Array and the Deep-ocean Assessment and Reporting of Tsunamis (DART®) stations.

- The Weather and Ocean Platform network operates a global network of over 148 observing platforms to provide real-time marine meteorological, oceanographic and geophysical observations. Included in this network is the 101 moored Coastal Weather Buoys (CWB) and 48 land-based Coastal Marine Automated Networks (C-MAN) stations. They are deployed in the coastal and offshore waters from the western Atlantic to the Pacific Ocean around Hawaii, and from the Bering Sea to the South Pacific. This network provides forecasters with frequent, high-quality marine observations for forecast preparation and to verify forecasts after they are produced. Other users rely on the observations and forecasts for commercial and recreational activities. All stations measure wind speed, direction, and gusts; barometric pressure; and air temperature. In addition, all CWB stations, and some C-MAN stations, measure sea surface temperature and wave height and wave period. Conductivity and water current are measured at some stations as well. In addition, all CWB stations measure sea surface temperature and wave height and wave period.
- The TAO array is designed for the study of year-to-year climatic variations related to El Niño and the Southern Oscillation (ENSO). The array consists of 55 moored ocean buoys and 4 Acoustic Doppler Current Profilers (ADCP) in the equatorial Pacific. The buoys collect real-time air temperature; relative humidity; wind speed and direction; ocean temperature and pressure; and some buoys collect shortwave radiation; rainfall amounts; and ocean currents.
- DART® stations, located throughout the Pacific Ocean, Atlantic Ocean, and Caribbean, along with seismic sensors and sea-level stations, collect observational data which is used by NWS' Tsunami Warning Centers to prepare and refine watches and warnings covering all U.S. territories and states bordering on the Pacific and Atlantic Ocean Basins. This data supports WFOs, Federal and state disaster agencies, military organizations, private broadcast media, and other facilities that furnish warning information to the public.

National Reconditioning Center/National Logistics Support Center (NRC/NLSC) provides long-term systems support for NWS mission critical operations through its operation of its depot and warehouse. The NLSC/NRC provides mission critical components through which NWS' and Tri-Agency Federal Aviation Administration's and Department of Defense' equipment pass for repair, quality inspection, warehousing and distribution. The total capital inventory managed in this facility is valued at over $130 million. NLSC manages over 12,000 stock items and ships an average of 130 line items daily to over 14,500 customer sites world-wide. NRC makes over

12,000 repairs each year to critical components of the weather enterprise infrastructure including those of observation systems.

Schedule and Milestones:

FY 2015

- Acquire additional water vapor data via aircraft observation
- Deploy NEXRAD RPG and RDA Software Build 15
- Develop and Test NEXRAD PG and RDA Build 16
- Evaluate ASOS maintenance data to Identify facility and obsolescence issues
- Plan acquisition for ASOS Service Life Extension Program
- Evaluate ASOS telecommunications capabilities and cost for technological upgrade
- Purchase and install 50 telemetered Fischer & Porter Rain Gauges (FPR)
- Maintain National Mesonet Program Office
- Conduct buoy operations and maintenance
- Engineer and design activities for new buoy moorings and components
- Address backlogged buoy maintenance
- Sustain critical observing system networks and the operations and maintenance of (tsunami-reporting) seismic sensors and sea-level stations

FY 2016

- Acquire additional water vapor data via aircraft observation
- Deploy NEXRAD RPG and RDA Software Build 16
- Develop and test NEXRAD PG and RDA Software Build 17
- Manage acquisition for ASOS Service Life Extension Program equipment
- Manage ASOS Operational Test Resources
- Purchase and install100 telemetered FPR
- Purchase and install100 wireless thermometer systems
- Maintain National Mesonet Program Office
- Conduct buoy operations and maintenance
- Engineer and design activities for new buoy moorings and components
- Address backlogged buoy maintenance
- Sustain critical observing system networks and the operations and maintenance of (tsunami-reporting) seismic sensors and sea-level stations

FY 2017

- Acquire additional water vapor data via aircraft observation
- Deploy NEXRAD RPG and RDA Software Build 17
- Develop and Test NEXRAD PG and RDA Software Build 18
- Implement ASOS Service Life Extension Program equipment
- Manage ASOS Operational Test Resources
- Purchase and install final 100 telemetered FPR
- Purchase and install 200 wireless temperature systems
- Maintain National Mesonet Program Office
- Conduct buoy operations and maintenance
- Engineer and design activities for new buoy moorings and components
- Address backlogged buoy maintenance
- Sustain critical observing system networks and the operations and maintenance of (tsunami-reporting) seismic sensors and sea-level stations

FY 2018

- Acquire additional water vapor data via aircraft observation
- Deploy NEXRAD RDA and RPG Software Build 18

- Develop and Test NEXRAD RDA and RPG Software Build 19
- Implement ASOS Service Life Extension Program equipment
- Purchase and install200 wireless temperature systems
- Purchase and install 50 soil temperature systems
- Maintain National Mesonet Program Office
- Conduct buoy operations and maintenance
- Engineer and design activities for new buoy moorings and components
- Address backlogged buoy maintenance
- Sustain critical observing system networks and the operations and maintenance of (tsunami-reporting) seismic sensors and sea-level stations

FY 2019

- Acquire additional water vapor data via aircraft observation
- Implement ASOS Service Life Extension Program equipment
- Purchase and install 200 wireless temperature systems
- Purchase and install 50 soil temperature systems
- Maintain National Mesonet Program Office
- Conduct buoy operations and maintenance
- Engineer and design activities for new buoy moorings and components
- Address backlogged buoy maintenance
- Sustain critical observing system networks and the operations and maintenance of (tsunami-reporting) seismic sensors and sea-level stations

Deliverables:

- Operations or support 102 radiosonde stations in the United States and possessions, Caribbean, and Pacific Island nations
- Operational NPN at three locations in Alaska
- Operations and maintenance of 122 operational NEXRAD systems and 7 non-operational support systems at 96 percent availability
- Operations and maintenance of 315 NWS ASOS units and maintenance of 572 FAA ASOS units under a reimbursable funding arrangement
- Fischer & Porter Rain Gauge Replacements project complete
- Installation of 600 of needed 4000 wireless temperature systems
- Installation of 100 of needed 400 soil temperature systems
- Hourly marine weather wind speed and direction, air and sea temperature, atmospheric pressure, and detailed wave information
- Operations and maintenance of 39 DART® stations located throughout the Pacific Ocean, Atlantic Ocean, and Caribbean with availability of 80 percent
- Data availability level of 80 percent for TAO buoys
- Data availability level of 73 percent for CWB and C-MAN stations
- Procurement of new buoy moorings and components
- End-to-end capability for obtaining and using non-federal observational data and associated metadata to improve NWS operational products and services
- Access to several thousand non-federal observations of near-surface wind, temperature, humidity, solar radiation, and soil moisture
- Telemetered FPR project complete, total of 250 telemetered gauges

CENTRAL PROCESSING

Central Processing ingests data produced and obtained from the Observations PPA to provide guidance, capabilities, and tools for use by NWS under its Analyze, Forecast, and Support PPA and directly to the weather enterprise and the general public. Central Processing ensures the uninterrupted flow of information and data from collection of observations to central guidance production to local applications of all essential weather and climate data products, and continuity of public watches and warnings. This includes the management and systems administration of the Weather and Climate Operational Supercomputing System (WCOSS), the Advanced Weather Interactive Processing System (AWIPS), hydrology information technology initiatives, and the information technology (IT) infrastructure supporting national centers and field operations.

Central Processing takes a “systems of systems” approach to establishing a national and regional IT infrastructure from observing system data flow to product generation. Therefore, Central Processing provides (1) holistic, on-going assessment and analysis of the processing system PPA and (2) specific recommendations for changes to the configuration of NWS’ processing systems and overall PPA to maximize the benefit to NWS and its many constituents.

Maintaining an optimum processing systems configuration and architecture enables NWS’ to meet current and future missions. Demands for new products and more accurate weather forecasts with uncertainty require effective management of NWS’ infrastructure. Central Processing assesses architecture alternatives based on analyses and studies to optimize an integrated processing system PPA that maximizes NWS’ abilities to save lives and property while improving trade and commerce. Central Processing ensures the continued generation of NWS products from operational forecast models and provides support for operating NOAA’s research and development supercomputer which serves as a meteorological and climate testbed. In addition, it supports NOAA’s climate development and the Joint Center for Satellite Data Acquisition (JCSDA) efforts.

In general, Central Processing will:

- Operate NWS’ IT processing infrastructure
- Identify NWS’ processing requirements and gaps
- Review NWS’ processing system capabilities
- Seek solutions to fulfill NWS processing requirements
- Develop a strategy to maximize effectiveness while minimizing cost
- Coordinate NWS’ processing system activities across NOAA
- Maintain a 24/7 help desk for all forecast systems

To achieve these goals, Central Processing manages the following programs:

NCEP Central Operations (NCO) manages the WCCOS including the operational model production suite and associated infrastructure which forms the basis for much of the National Centers for Environmental Prediction (NCEP) Centers and Forecast Offices (FO) weather forecast services. NCO provides for operational quality assurance of incoming observations and outgoing products. NCO is the technical transition point between the development of numerical weather and climate prediction models and their operational use by forecasters at NCEP and the FOs. Information Technology and meteorological specialists provide system maintenance and administration service on a 24-hour basis to ensure a secure and reliable "system of systems." This includes the provision for central support for software development

for data processing, display, interaction, and product generation. This effort sustains a variety of on-demand requirements including dispersion forecasts for volcanic ash, smoke, and emergency releases.

- Support is provided for implementation and monitoring of all modifications to the operational Numerical Weather and Environmental Prediction production suite to ensure the reliability of real-time data processing, analysis, forecast, and product generation services. Standards enforcement ensures that proper procedures are followed and standards are applied for any new or modified algorithm.
- The development and support of forecaster display, interaction, and product generation software.
- The management of product data flow to and from NWS, partners, and customers, including system administration of central servers and desktop systems.

Advanced Weather Interactive Processing System (AWIPS) is a technologically advanced information processing, display, and telecommunications system that is the cornerstone of the modernized NWS. This system integrates and displays all meteorological and hydrological data, and all satellite and radar data at NWS field offices. AWIPS acquires and processes data from modernized sensors and local sources, provides computational and display functions at operational sites, provides an interactive communications system to interconnect NWS operational sites, and initiates the dissemination of weather and flood warnings and forecasts in a rapid and highly reliable manner. AWIPS also serves as the communication interface for internal and external users of much of NOAA's real-time environmental data.

Hydrology information technology initiatives within NWS are supported within the Central Processing PPA including Advanced Hydrologic Prediction System (AHPS) and Community Hydrologic Prediction System (CHPS). AHPS is a web-based suite of river-forecast products providing information on the magnitude and certainty of occurrence of floods or droughts, from hours to days and months before an event. Prior to AHPS, river forecasts were text products with 1-, 2-, and 3-day lead times and were delivered via the weather wire. Congressional funding for AHPS began in FY 2000. When implementation is complete, advanced river forecast information will be provided at 4,011 locations throughout the United States to assist emergency managers, water managers, and the general public in making decisions based on improved forecasts and the certainty of a hydrologic event. CHPS is the information technology infrastructure used to enable access to hydrologic models at all 13 River Forecast Centers (RFCs) leading to improved river forecasting. These tools enable products that community leaders and emergency managers use to effectively respond to flooding events.

National Centers and Regional IT Infrastructure
Central Processing will maintain the information technology infrastructure and standards which enable the National Centers and regional offices, including forecast offices to effectively work together. This includes:

- Computing that occurs outside of AWIPS
- Local area networking
- Desktops/Laptops
- Software
- Security
- Data center power and cooling

Schedule and Milestones:
FY 2015

- Expansion of HPC resources management, including use of the Hurricane Sandy Supplemental
- Complete transition of Meteorological Assimilation Data Ingest System (MADIS) into NWS operations
- Award re-competed contract for AWIPS
- Complete the deployment of AWIPS II to all forecast offices and National Centers
- Complete the initial implementation of the NOAA Integrated Dissemination Program, including equivalent capabilities at two geographically separated sites
- Complete Initial Operational Capability at the new National Water Center in Tuscaloosa, Alabama

FY 2016
- Manage HPC usage and reliability
- Complete AWIPS contract transition
- Update AWIPS hardware infrastructure prototype
- Continue to improve flood lead time and accuracy improvement

FY 2017
- Manage HPC usage and reliability
- Begin deployment of updated AWIPS hardware infrastructure
- Continue to improve flood lead time and accuracy improvement
- Complete AHPS services implementation at additional forecast locations

FY 2018
- Manage HPC resources, including major system upgrade
- Complete deployment of updated AWIPS hardware infrastructure
- Continue to improve flood lead time and accuracy improvement

FY 2019
- Manage HPC usage and reliability
- Undertake AWIPS Thin Client experiment at forecast office
- Continue to improve flood lead time and accuracy improvement

Deliverables:
- WCOSS capacity dramatically increased and meeting or exceeding reliability metrics
- Integrated Dissemination System under full operational support with twin data centers
- 43 million numerical prediction products produced per day for weather, climate, ocean, river, and space-weather forecasts
- AWIPS II deployment at all forecast offices and National Centers
- AWIPS II extended completed, including thin client capability
- Effective AWIPS II program under new competitively bid contract
- 4,011 operational AHPS forecast locations
- AHPS performance meeting or exceeding flood lead time and accuracy goals
- National Center and Regional IT infrastructure that meets operational reliability goals through improved annual maintenance

ANALYZE, FORECAST, & SUPPORT

NWS' mission is to provide forecasts and warnings for the protection of life and property, especially in the provision of Impact-Based Decision Support Services (IDSS). It is at this juncture where NWS' highly skilled workforce provides significant value to achieve its mission. The Analyze, Forecast, and Support (AFS) PPA leverages the work done by the Observations and Central Processing PPAs by applying expertise to observations, weather and water forecast data, guidance and local applications to produce forecasts, warnings, and IDSS for the Nation.

AFS' weather, water, climate and space weather forecasts and warnings are critical to saving lives and property and enhancing the national economy, making it integral to the creation of a Weather-Ready Nation (WRN).

AFS includes the operation of a distributed network of forecast offices and specialized centers and associated workforce of meteorologists, hydrologists, climatologists, and space physicists. They monitor the weather, water, climate and space from our oceans to the surface of the sun 24 hours a day, seven days a week to support other government agencies, the business community, private citizens and international partners. Forecasts are used globally to support agriculture, transportation and water management among other missions. Alerts, provided days in advance, of pending winter storms or hurricanes, wildland fire conditions, heat waves or river floods enable the public and emergency managers to plan effective response strategies. Warnings for high impact, rapidly evolving hazards such as solar storms, tornadoes, tsunamis, flash floods or volcanic eruptions enable the public to get out of harm's way and mitigate preventable loss. Outreach and education, and collaboration activities allow partners and communities to understand and manage risk, formulate emergency response plans and promote community resiliency and public safety. AFS encompasses an end-to-end capability from gathering requirements to collaborating on science innovations to policy development to education and outreach to the provision of service to the Nation. AFS products rely upon the Disseminate PPA for distribution to the citizens including emergency managers and the broader Weather Enterprise, and upon the Science and Technology Integration PPA for the transition of innovations into operations.

IDSS is the foundational concept of NWS' WRN. Rather than developing and transmitting a suite of products at fixed times during the day and expecting stakeholders to fully understand and take appropriate action; IDSS changes the paradigm so information users drive the update frequency and value-added meaning of the product. Moreover, as relationships develop with government partners at the national, state and local levels, key decision thresholds are provided to the WFOs in the form of "Impacts Catalogs" so NWS staff can provide increased lead times for weather conditions that generate the most impacts. IDSS also provides greater flexibility for forecasters to work with key governmental partners and even embed within their emergency operations centers to give first hand support to enhance decision making and public safety. NWS forecasters receive additional training to become Emergency Response Specialists (ERS) to for on-scene support at HAZMAT incidents, to embed with government decision makers at large public gatherings or within their operations centers, and to support rescue operations in the wake of major disasters.

To achieve these goals, AFS maintains the following programs:

NWS' Weather Forecast Offices and River Forecast Centers provide real-time meteorological, hydrological, climatological data to support NWS forecast operations. To achieve this requirement, NWS operates WFOs and RFCs within the continental United States, Alaska, Hawaii, and U.S. territories.

- WFOs are responsible for issuing advisories, warnings, statements, and forecasts for their geographic area of responsibility. These forecasts include local public, marine, aviation, fire and hydrology. WFOs also issue warnings for severe thunderstorms, flash floods and tornadoes. WFO staffs gather weather observations and climate data for their assigned area which, in many locations, includes the launching of weather balloons. Additionally, NWS's forecasters issue daily and monthly climate reports, providing localized information about temperature and precipitation records and extreme events such as droughts. WFOs also control the broadcasts of weather information on

the NOAA Weather Radio All Hazards stations, provide weather spotter training to the community and foster close ties with both the media and the emergency management community. WFO operations run 24 hours a day, seven days a week at 122 locations.

- RFCs provide daily river forecasts and flash flood guidance for water management. Some RFCs, especially those in mountainous regions, also provide seasonal snow pack and peak river flow forecasts. These forecasts are used by a wide range of users, including those in agriculture, hydroelectric dam operation, and water supply resources. The information is also the basis for local flood and flash flood warnings, watches, and advisories issued by the WFOs that emphasize flooding impacts depending on geographic area, land use, time of the year, and other factors. NWS operates 13 RFCs.

NWS' National Centers includes specialized service facilities of the National Centers for Environmental Prediction (NCEP). Each National Center depends on the observational infrastructure, data assimilation systems, numeric modeling capability, and application of model output statistics to produce both foundational and value-added forecast guidance products for NWS field offices and direct users. The National Centers provide an integrated suite of weather and environmental forecast guidance from the short-term through seasonal, inter-annual, decadal, and centennial time frames and specific tailored forecast products. The National Centers form the backbone of NOAA's Weather-Ready Nation service capability by providing expert analysis and prediction services to the local weather forecast office infrastructure. Forecasters use this guidance as the basis for consistent local forecast products, advisories and warnings. The seven National Centers within the AFS PPA include:

- Aviation Weather Center (AWC) is the mechanism by which the United States disseminates its weather forecasts and warnings to the aviation community under an international agreement through the International Civil Aviation Organization. The AWC also produces guidance products for use by WFOs in support of the airport terminal forecast function and coordinates with major airlines in the creation of en route hazards products and forecasts.
- Climate Prediction Center (CPC) provides a broad range of climate products and services related to climate monitoring, short-term climate outlooks, and information on the impacts of climate patterns on the Nation. CPC monitors for patterns that may signal drought, excessive rainfall and for periods of temperature extremes such as prolonged heat waves. These climate services are available for users in government, the public and private industry and are particularly important for water managers and agriculture.
- National Hurricane Center (NHC) produces advisories, watches, and warnings for tropical cyclones in the North Atlantic and eastern North Pacific oceans, the Caribbean Sea, and the Gulf of Mexico, including the portions of the U.S. coastline threatened by such storms. The NHC functions both to provide guidance, coordination, and tropical weather expertise to WFO forecasters and to serve users of centrally generated products. NHC experts play a major role in outreach via close relationships with coastal emergency managers and FEMA.
- Ocean Prediction Center (OPC) discharges domestic and international meteorological products to marine interests including weather and sea state warnings and forecasts for U.S. offshore waters and high seas regions of the Northern Hemisphere. The OPC also provides guidance for WFOs with coastal waters forecast responsibilities, which extend out to nearly 100 nautical miles.
- Space Weather Prediction Center (SWPC) provides real-time monitoring and forecasting of solar and geophysical events and develops techniques for forecasting solar and geophysical disturbances. The SWPC operates the national civilian space weather operations center. Forecasts, alerts, and warnings are provided to customers on a daily

24 hour basis (24x7) and are used extensively by the Nation's electric grid operators, commercial satellite companies and airlines that have transpolar routes.

- Storm Prediction Center (SPC) provides timely and accurate forecasts and watches for severe thunderstorms and tornadoes over the contiguous United States. The SPC also monitors and provides guidance on the occurrence of heavy rain, heavy snow, and fire weather potential and issues specific products for those hazards.
- Weather Prediction Center (WPC) is responsible for preparing a variety of analysis and national guidance products in support of the NWS mission. WPC forecasters track and predict the movement of weather systems, ranging from fair weather conditions to the development and movement of winter storms. WPC predicts rainfall and snowfall coverage and accumulation amounts for the Nation out to 10 days, and generates foundational general weather information that is used extensively by the weather enterprise, the military, international interests, and NWS WFOs and RFCs.

NWS' Tsunami Program provides reliable tsunami, forecasting and warnings for the Pacific and Arctic regions and for the Atlantic Ocean, Caribbean Sea, and Gulf of Mexico regions, and to promote community resilience. NWS Tsunami Program addresses national tsunami priorities, and coordinates with national and international partners to improve warnings and mitigate the loss of life and damage to property as a result of tsunamis. NWS Tsunami Program is supported by the Pacific Tsunami Warning Center (PTWC) in Hawaii and the National Tsunami Warning Center (NTWC) in Alaska. Duties are as follows:

- Development of new processes and techniques to improve response times, tsunami onset forecast accuracy, and message content to residents in the area-of-responsibility.
- PTWC and NTWC issue tsunami watches and warnings for all U.S. communities at risk. NWS collects and analyzes observational data from an international network of seismological observatories and sea level observing stations that operate on a cooperative basis.
- Increased community preparedness and public tsunami education through the TsunamiReady program and outreach.

The schedule, milestones, and deliverables are provided within the program change requested for this activity.

Pacific Island Compact is part of the U.S. Compact of Free Association (COFA) or agreement with the Republic of the Marshall Islands (RMI), the Federated States of Micronesia (FSM), and the Republic of Palau (ROP) to provide basic government and commerce services including weather services to these island nations. The Compact provides the necessary funding to support the NWS Weather Service Offices (WSO) and associated weather warning, forecast, and observation services for these islands including WSO Majuro, RMI; WSOs Pohnpei, Yap and Chuuk of the FSM, and WSO Koror of ROP. This continued investment will also preserve critical weather observation infrastructure and services in the Pacific necessary to support core NOAA mission responsibilities in the Pacific such as aviation, typhoon, and marine forecasts; climate monitoring; and support to U.S. Navy operations.

The **National Water Center (NWC)** will serve as a cornerstone for **Integrated Water Resources Science and Services (IWRSS)**, and provide a central hub to integrate and advance regional hydrologic field operations and services. In partnership with field offices and Federal partners, the Center will generate new and enhanced water resources information to better inform and enable routine high-value and high-impact decision-making across a broad range of water-management and emergency-management sectors.

Schedule and Milestones:

FY 2015

- Operate national network of WFOs that provide 24x7 weather surveillance, forecast and warning services
- Operate national network of RFCs that provide river stage, flow and flood guidance
- Make Geospace model guidance operational
- Operate the NCEP service centers that monitor the tropics, warn of space weather hazards, predicts tornadoes, provides outlooks for climate events and develops the foundational data sets that are used both domestically and internationally for commerce, the military and the general population
- Train and certify Incident Meteorologists (IMETs) for support of wildland fire decision making
- Provide IDSS to core governmental partners during routine and high impact events
- Embed NWS meteorologists within all FAA Air Traffic Control Centers and FAA Command Center to provide IDSS to traffic managers in support of flight safety
- Operate Tsunami Warning Centers to monitor and predict the development and onset of tsunamis along the Nation's coasts
- Provide weather support to the Nations of the Pacific Island Compact
- Establish Initial Operating Capability at the NWC

FY 2016

- Operate national network of WFOs that provide 24x7 weather surveillance, forecast and warning services
- Operate national network of RFCs that provide river stage, flow and flood guidance
- Operate the NCEP service centers that monitor the tropics, warn of space weather hazards, predicts tornadoes, provides outlooks for climate events and develops the foundational data sets that are used both domestically and internationally for commerce, the military and the general population
- Train and certify IMETs for support of wildland fire decision making
- Provide IDSS to core governmental partners during routine and high impact events
- Embed NWS meteorologists within all FAA Air Traffic Control Centers and FAA Command Center to provide IDSS to traffic managers in support of flight safety
- Operate Tsunami Warning Centers to monitor and predict the development and onset of tsunamis along the Nation's coasts
- Provide weather support to the Nations of the Pacific Island Compact
- Operate the NWC to support water management across the Nation

FY 2017

- Operate national network of WFOs that provide 24x7 weather surveillance, forecast and warning services
- Operate national network of RFCs that provide river stage, flow and flood guidance
- Begin full operations capability of WAM
- Operate the NCEP service centers that monitor the tropics, warn of space weather hazards, predicts tornadoes, provides outlooks for climate events and develops the foundational data sets that are used both domestically and internationally for commerce, the military and the general population
- Train and certify IMETs for support of wildland fire decision making
- Provide IDSS to core governmental partners during routine and high impact events
- Embed NWS meteorologists within all FAA Air Traffic Control Centers and FAA Command Center to provide IDSS to traffic managers in support of flight safety

- Operate Tsunami Warning Centers to monitor and predict the development and onset of tsunamis along the Nation's coasts
- Provide weather support to the Nations of the Pacific Island Compact
- Operate the NWC to support water management across the Nation

FY 2018

- Operate national network of WFOs that provide 24x7 weather surveillance, forecast and warning services
- Operate national network of RFCs that provide river stage, flow and flood guidance
- Begin SWPC generated regional nowcasts and short term forecasts of ionospheric disturbances
- Operate the NCEP service centers that monitor the tropics, warn of space weather hazards, predicts tornadoes, provides outlooks for climate events and develops the foundational data sets that are used both domestically and internationally for commerce, the military and the general population
- Train and certify IMETs for support of wildland fire decision making
- Provide IDSS to core governmental partners during routine and high impact events
- Embed NWS meteorologists within all FAA Air Traffic Control Centers and FAA Command Center to provide IDSS to traffic managers in support of flight safety
- Operate Tsunami Warning Centers to monitor and predict the development and onset of tsunamis along the Nation's coasts
- Provide weather support to the Nations of the Pacific Island Compact
- Operate the NWC to support water management across the Nation

FY 2019

- Operate national network of WFOs that provide 24x7 weather surveillance, forecast and warning services
- Operate national network of RFCs that provide river stage, flow and flood guidance
- Operate the NCEP service centers that monitor the tropics, warn of space weather hazards, predicts tornadoes, provides outlooks for climate events and develops the foundational data sets that are used both domestically and internationally for commerce, the military and the general population
- Train and certify IMETs for support of wildland fire decision making
- Provide IDSS to core governmental partners during routine and high impact events
- Embed NWS meteorologists within all FAA Air Traffic Control Centers and FAA Command Center to provide IDSS to traffic managers in support of flight safety
- Operate Tsunami Warning Centers to monitor and predict the development and onset of tsunamis along the Nation's coasts
- Provide weather support to the Nations of the Pacific Island Compact
- Operate the NWC to support water management across the Nation

Deliverables:

- Operations and maintenance of 122 WFOs
- Operations and maintenance of 13 RFCs
- Operations and maintenance of 7 National Centers
- Operations and maintenance of 2 Tsunami Warning Centers
- Operations and maintenance of the NWC
- Operations and maintenance of field operational support from National Headquarters
- Improved forecasts of space weather conditions
- Improved forecasts of hurricanes, blizzards, heat waves and severe storms
- Continuity of timely and accurate weather and water forecasts and warnings

- Aviation weather forecasts for all identified airports and air routes
- Distance Learning Aviation Course modules
- Deployments of IMETs to support decision makers at wildland fires
- Continued support of StormReady and TsunamiReady Communities
- Operations and maintenance of 18 OCONUS Weather Service Offices that provide weather warnings, forecasts, and observation services to participants in the Pacific Island Compact and remote portions of Alaska

DISSEMINATION

The ability to communicate warnings and forecasts to the American public is essential to protect property and save lives. In order to be effective, NWS requires a sophisticated suite of communications systems capable of meeting the varied customer needs in a timely, reliable and authoritative manner. The Dissemination PPA manages the communication technology required by NWS for collecting, tailoring, and distributing of data and products. The Dissemination PPA collects and distributes data produced and obtained by the Observations PPA across NWS and transmits Analyze, Forecast, and Support (AFS) PPA products to the citizens including emergency managers and other Federal and private end-users. Dissemination is the provision of information in a variety of formats through multiple channels such as satellite broadcast and terrestrial networks, World Wide Web, and radio that is tailored for the Weather Enterprise and the public. Current major systems include the NWS Telecommunications Gateway (NWSTG), NOAA Weather Radio (NWR), and the Emergency Managers Weather Information Network (EMWIN). Dissemination ensures the timely and reliable delivery of data of NWS information needed by stakeholders.

NWS is restructuring its dissemination capabilities using an integrated, enterprise approach to ensure a modern, scalable, extensible, and reliable system using industry best practices and technologies. This change is required to continue, in a cost efficient manner, the timely delivery of critical environmental data and products, provide capacity for substantial increases in observing and modeling systems and other data volumes, and to meet the demands of an evolving service delivery paradigm.

To ensure a Weather-Ready Nation and optimize the delivery of a scalable and agile dissemination capabilities the NWS organized this PPA around infrastructure, networks, web services and warning services.

In general, Dissemination will:

- Operate NWS' IT dissemination infrastructure and services
- Identify NWS' dissemination requirements and gaps
- Review NWS' system capabilities
- Seek to build a NOAA wide enterprise architecture
- Maintain a strategy to maximize effectiveness while minimizing cost

To achieve these goals, Dissemination maintains the following programs:

Dissemination IT Infrastructure and Virtualized Application Services provides a scalable, robust, secure and commonly shared dissemination IT infrastructure for NWS as well as for other NOAA and Federal partners to aggregate, consolidate and host software applications and systems.

- The NWSTG is the Nation's hub for the collection and distribution of weather data and products. NWSTG provides national and global real-time exchange services using automated communication resources to collect and distribute a wide variety of environmental data such as observations, analysis, and forecast products. These time-perishable data products are distributed as received to ensure the fastest availability of the information.
- Next Generation Air Transportation System (NextGen) IT services will provide enhanced weather forecast information required for integration into an air traffic management system. This investment supports aviation industry and stakeholders including the FAA, International Civil Aviation Organization (ICAO), and the World Meteorological Organization (WMO).

The schedule, milestones, and deliverables are provided within the program change requested for this activity.

Terrestrial and Satellite Networking Services provides the capabilities to ensure the required networking capacity and reliability to deliver weather critical data. NWS strives to promote commerce, and protection of life and property goals, by providing environmental data supporting society's ability to take preventive actions so that people remain safe; less damage is done to communities, businesses, and the environment; and economic productivity is maximized. NWS operates and maintains critical terrestrial and satellite networking capabilities.

- NWS manages a distributed network of terrestrial telecommunication circuits, satellite communications space segments, wireless, broadband and wireless capabilities that span the Nation, including the Pacific and Alaskan regions, delivering essential NOAA data.
- Satellite Broadcast Network (SBN) transmits critical weather data from satellites, models, observations systems and other sources, to all field office forecasters. The SBN offers the communications capability to provide internal and external users with open access to much of NOAA's real-time environmental data.

Web and Geospatial Services provides the capabilities to ensure that web services and Geographic Information Systems (GIS) are leveraged to disseminate and integrate NWS critical weather data. When considering the impact of severe events such as hurricanes or winter storms, climate, water and weather information needs to be analyzed and then linked with details about the people, properties, and infrastructure that can be or will be affected.

- With many decision makers using GIS as an analytical tool to link different types of data, identify spatial relationships and analyze patterns, NWS uses GIS to strengthen its capacities and delivery of relevant products and services.
- Another important element of making data accessible is leveraging web services to provide data via subscriptions, via a single web access point and in standard access formats to the broader community. This includes maintaining compliance with agreed upon international standards for operational critical environmental data and information.

Weather Warning Services provides the capabilities to communicate weather related warnings directly to emergency managers and the public. NWS operates several weather warning services systems, most notably NOAA Weather Radio (NWR). NWR was designed to be used as a reliable means of communicating weather related warnings directly to the public. The existing infrastructure of NWR has tremendous potential for use communicating warnings and information about non-weather related hazards and emergencies. NWR infrastructure consists of over 1,000 existing broadcast stations; broadcast coverage that reaches 98 percent of the

Nation's population; and the ability to deliver the broadcast message to individuals monitoring their own NWR receivers. In addition, NWR signals enter the Emergency Alert System monitored by television and radio license holders enabling a second path that reaches millions of listeners and viewers.

- NWR is the only NWS dissemination system capable of reaching individuals at nominal cost (individual purchase of NOAA weather radio) and is the only system the Federal Communications Commission mandates that broadcast media outlets monitor as a source of public safety announcements.
- EMWIN provides the emergency management community with access to a set of NWS warnings, watches, forecasts, and other products.
- NOAA Weather Wire Service (NWWS) is a satellite data collection and dissemination system which provides state and Federal government, commercial users, media, and private citizens with timely delivery of meteorological, hydrological, climatological, and geophysical information. The vast majority of NWWS products are weather and hydrologic forecasts and warnings issued around the clock from NWS Forecast Offices.

Schedule and Milestones:

FY 2015

- Complete build out of NWSTG at Dissemination backup site
- Complete and test IT Dissemination Infrastructure primary and backup site for all NextGen IT Services requirements in preparation for NWS' NextGen Initial Operational Capability (IOC) at end of FY 2015
- Increase the distribution of critical weather data and products using advanced information technologies (such as the internet and web-based GIS formats) to provide broader and more timely access to and delivery of information
- Maintain NWR and NWSTG Services
- Execute approved Roadmap for future Weather Warning Services

FY 2016

- Augment Dissemination Infrastructure to support requirements
- Operate test and evaluation of NextGen IT/Web Services infrastructure and capabilities for Full Operating Capability at end of FY 2016 to support the FAA's NextGen IOC milestone
- Maintain NWR and NWSTG Services
- Execute approved Roadmap for future Weather Warning Services
- Operate and maintain NWS Network bandwidth/reliability

FY 2017

- Augment Dissemination Infrastructure to support requirements
- Optimize NextGen IT Services to accommodate additional data providers, users and increase data throughput
- Maintain NWR and NWSTG Services
- Execute approved Roadmap for future Weather Warning Services
- Operate and maintain NWS Network bandwidth/reliability

FY 2018

- Augment Dissemination Infrastructure to support requirements
- Optimize NextGen IT Services to accommodate additional data providers, users and increase data throughput
- Maintain NWR and NWSTG Services
- Execute approved Roadmap for future Weather Warning Services
- Operate and maintain NWS Network bandwidth/reliability

FY 2019

- Conduct 5 year refresh of Dissemination Infrastructure hardware
- Optimize NextGen IT Services to accommodate additional data providers, users and increase data throughput
- Maintain NWR and NWSTG Services
- Execute approved Roadmap for future Weather Warning Services
- Operate and maintain NWS Network bandwidth/reliability

Deliverables:

- NWSTG functionality and continued 24x7 support at 99.8 percent availability
- NWR service availability at 96 percent
- Integration of enhanced weather data into air traffic management system
- 24x7 support of SBN
- Operational Terrestrial and Satellite Networking Services

SCIENCE AND TECHNOLOGY INTEGRATION

Integrated and modernized NWS services are needed to meet society's growing demands for better environmental information to safeguard life and protect livelihoods. To enable NWS to benefit from advances in science and technology and synergize activities, NWS consolidates its distributed research and development functions into a single PPA. NWS' Science and Technology Integration (STI) PPA leverages the entire weather enterprise including users and research communities, partner agencies, and industry to provide state-of-the-science weather forecast guidance for the Nation. This includes engaging partners in outreach efforts, supporting targeted development efforts, maintaining and improving a suite of forecast guidance models and post-processing, continuously training workforce on scientific advances, and infusing new science into operations.

NWS works with core partners to identify mission requirements which enable NWS to prioritize its research to operations (R2O) transition activities from outreach to targeted development. Scientific and technological advancements in atmosphere, ocean, coasts and climate predictions from research communities are continuously adopted into NWS to improve services. The STI PPA identifies and transfers new science concepts and techniques aimed at accelerating the transition of scientific and technical advancements into new and improved NWS operational warning, forecast and decision support services, thus enabling the NWS vision to build a Weather-Ready Nation (WRN).

Key actions of the STI PPA include:

- Accelerate applications of advanced observing capabilities including data assimilation;
- Develop advanced operational numerical forecast models and applications of high performance computing capabilities;
- Develop the next generation warning and forecast guidance paradigm, taking into account users perspectives about warning and forecast information;
- Use test beds and proving grounds to enable the research community to leverage operational infrastructure to conduct research, thus accelerating research to operations transition;
- Continue development of advanced training approaches to enable the workforce to keep pace with advanced science and technologies; and
- Rapidly develop solutions to address regional-local forecasts issues through partnership with the university research community.

To achieve these goals, STI maintains the following programs:

Weather-Ready Nation (WRN) is a nationwide initiative to build community resilience in the face of increasing vulnerability to extreme weather, water and climate events. STI focuses on identifying science and technology advances that will enable NWS to better serve our increasingly weather-sensitive Nation and transition them into new and improved warning and forecast services. WRN empowers emergency managers, first responders, government officials, businesses, and the public to make faster, smarter decisions to save lives and protect livelihoods. Key STI actions that enable implementation of the WRN roadmap include:

- Develop, transition, and improve advanced forecast tools, techniques, service products and next generation warning and forecast paradigms to enhance NWS' national regional and local warning, forecast, and guidance services such as hurricane, tornado, wild fire, winter storm, climate variations, aviation, marine and space weather hazards.
- Develop and evaluate national air quality forecast models and provide national forecast pollutant information to states and local communities, to public and commercial sectors, and to the Environmental Protection Agency.
- Leverage testbeds and operations proving grounds to provide operational platforms for broad research and development (R&D) community across NWS, academia, core partners, and the weather enterprise to conduct demonstration, simulation, verification, and validation of new science and service capabilities. Testbeds and proving grounds are an effective way to enable accelerated transition of new science and technology into NWS operations and services.
- Sponsor collaborative research projects through the Collaborative Science, Technology, and Applied Research (CSTAR) Program. NWS and academic research community will work closely together to identify new science concepts and techniques for improvement of NWS services.

The schedule, milestones, and deliverables are provided within the program change requested for this activity.

NWS' Hurricane Forecast Improvement Project (HFIP) works towards improving the accuracy and reliability of hurricane track and intensity forecasts; extending lead time for hurricane forecasts with increased certainty; and increasing confidence in hurricane and storm surge forecasts. HFIP also focuses on advances in data assimilation and processing in modeling that underpin and extend to all weather and ocean forecasting and ultimately reduce the computing capacity necessary to run operational models. These needs are identified in the recent National Academies of Science (NAS) report, "*Weather Services for the Nation: Becoming Second to None*" (2012), with the recommendation that the NWS should give priority to upgrading its data assimilation system and increasing the resolution of its deterministic and ensemble modeling systems.

- Through HFIP, NOAA engages the U.S. Navy, U.S Air Force, National Science Foundation, National Center for Atmospheric Research (NCAR), and the academic community to address challenges in the national hurricane program.
- HFIP supports the needs of the National Hurricane Center (NHC) and emergency management community by providing improved 5-day advanced warnings decades sooner than otherwise possible.

The schedule, milestones, and deliverables are provided within the program change requested for this activity.

NOAA's Next Generation Air Transportation System (NextGen) Weather Program leads the integration of enhanced weather information into air traffic operations as part of the multi-agency NextGen initiative. This includes the creation of skillful, high-resolution probabilistic weather information consistent across space and time for all National Airspace System managers. NWS' role is to improve the accuracy, resolution, timeliness and consistency of forecasts of hazardous weather conditions which impact aviation operations. Weather is the direct cause of 70 percent of all air traffic delays greater than 15 minutes. Current estimates are that up to two thirds of convective weather delay might be avoidable, if more accurate forecasts were available to support the management of traffic flow plans. This effort includes:

- Support for the transition to operations of advanced numerical weather prediction models, data assimilation systems and forecast applications and processes;
- Improvements to the science behind aviation weather predictions; and
- Development of new methods to evaluate the performance of aviation and other NWS forecasts.

NOAA's NextGen Weather Program also serves as a pathfinder effort; many advances made to aviation weather predictions are extensible across the enterprise to support WRN goals.

The schedule, milestones, and deliverables are provided within the program change requested for this activity.

NWS' Operational Environmental Prediction Modeling Suite is the foundation for all warning, forecast and decision support services at all levels (national, regional and local). The Environmental Modeling Center (EMC) within the STI PPA develops, enhances, and maintains complex software of numerical weather, ocean, climate, sea ice, and coastal prediction models and data assimilation systems that span the globe. These forecast systems are highly leveraged and underpin all NOAA forecast capabilities. The operational modeling suite provides the basic numerical guidance that NWS operational forecasters rely on in making weather, water, and climate forecasts warnings, and decision support service products.

- EMC integrates advancements of environmental prediction modeling research and development at universities and research laboratories, and incorporates them into advanced NWS operational models.
- EMC also collaborate with partners within NOAA and with other Federal agencies to conduct studies to validate observing requirements and data impacts for existing and new observing platforms and technologies such as satellites and radar.

Hydrology and Water Resource Programs leverage NOAA science and service partnerships for atmosphere, watersheds, estuaries and oceans to improve and integrate water resource prediction modeling capabilities. NWS' Hydrology Laboratory conducts studies, investigations and analyses leading to the application of new scientific and computer technologies for hydrologic forecasting and related water resources problems.

- NWS transitions advances in atmosphere, watersheds, estuaries and ocean modeling and data assimilation science and technology into operational hydrologic and water resource forecast capability that provides integrated decision support tools that offers a seamless suite of treetop-to-bedrock, summit-to-sea forecasts.
- Through partnerships under the auspices of the Integrated Water Resources Science and Services (IWRSS) Consortium, NWS is developing a new suite of high-resolution forecasts of stream flow, soil moisture, soil temperature and other variables directly related to watershed conditions to enable monitoring and forecasting hydrologic conditions from floods to droughts.

The schedule, milestones, and deliverables are provided within the program change requested for this activity.

NWS' Training Program is critical to ensure the current and future workforce if prepared for WRN. Effective training will lead to better integration of new models and transition of science and technology into operations leading to improved service to the Nation. The NWS workforce must remain agile and flexible to meet core partner needs. NWS will use a blended learning approach, including online courses, webinars, and residence training.

- Implementation of these training initiatives requires new and enhanced methods and technologies for training delivery, such as simulations and on-demand training integrated into applications and other systems.
- Concepts defined in the WRN roadmap include greater interdisciplinary training, deeper understanding of the scientific method and research design, and additional education on communicating science effectively.

Continuing infusion of meteorological and hydrological science and technology into NWS field operations is critical for improving services and ensuring the current and future workforce is prepared to meet the requirements of a WRN. NWS must maintain a high level of competency in local science, training and operational leadership for its field operations (at local WFOs). These actions include:

- Coordinate national and regional implementation of research to operations transition at the local level including applications that improving model guidance;
- Maintain local science expertise to lead improvements of operations through adopting new science and technology by the forecasting staff, and addressing local forecast and warning issues;
- Maintain local training expertise to identify and address local training needs, to facilitate professional development, and to address individual strengths and weaknesses of the local forecast staff; and
- Ensure local operations and management teams are fully proficient and knowledgeable in protocols, tools, forecast and warning operations for delivery of effective Impact-based Decision Support Services.

Schedule and Milestones:

FY 2015 – 2019:

- Conduct testing, demonstration and validation for new science and service capability through testbeds and proving grounds
- Implement model upgrades routinely
- Improve weather model and post processing guidance
- Update product suite based on customer requirements

FY 2015

- Develop improved volcanic ash modeling to enhance aviation safety
- Extend NOAA Environmental Modeling System (NEMS) infrastructure to include ice, ocean, near shore water level (storm surge), and land surface prediction models
- Implement new operational storm surge warning service (inundation map) for Gulf of Mexico and U.S. East Coast
- Initiate transition to upgraded and optimized NWS networks

FY 2016

- Enhance ensemble and probabilistic modeling techniques for aviation parameters

- Initiate Development Testing for coupled global prediction system
- Demonstrate increased skill (7 day skill extended to 9 days) for coupled global ocean-atmosphere-ice-wave system demonstrated
- Complete transition to upgraded & optimized NWS networks
- Retire legacy NWS networks

FY 2017

- Re-architect and re-engineer component models for efficient transfer to fine grain computing platforms

FY 2018

- Implement Next Generation Global Modeling System, Version 1.0
- Implement operational coupled atmosphere-ocean-wave-sea ice forecast system
- Implement high resolution, ensemble storm surge model

FY2019

- Implement operational seasonal Arctic sea ice outlook
- Implement version 3 of the operational Climate Forecast System

Deliverables:

- Experimental real-time forecast guidance from Hurricane Forecast System on the HFIP R&D Computing
- Extended model guidance out to two weeks and longer into the future
- Advanced, physically based, high-resolution hydrologic modeling data assimilation capability
- Probabilistic hydrologic forecasts for assessing river level and flood risks
- Continuous improvements to NOAA's suite operational forecast models
- New and improved modeling techniques, evaluated by the Developmental Testing Center, delivered to NWS for incorporation in the Operational Modeling Suite
- Annual upgrades to operational Data Assimilation System
- Annual upgrades to NEMS infrastructure
- Annual upgrades to operational NOAA Hurricane Forecast System
- Upgraded ocean, atmosphere, sea ice, land surface, wave component models
- Coupled global system using re-engineered system component models
- Improved utilization of HPC resources and cost effective implementation of model improvements
- Agile HPC environment with quicker operational transition of R&D efforts
- Upgraded operational storm surge warning service products (e.g., inundation map)
- Upgraded probabilistic storm surge guidance
- Coupled ocean-atmosphere-wave-sea ice forecast system for Arctic ocean
- Operational seasonal sea ice outlook guidance products for Arctic Ocean
- Forecaster applications (tools, methodologies, datasets) of near real time data products (e.g., ocean surface wind, wave, temperature, color) from research ocean remote sensing satellites
- Next generation severe weather warning paradigm
- Week-2 to seasonal climate outlook tools/products for local decision support services
- Operational geospace model for space weather forecast guidance

PROGRAM CHANGES FOR FY 2015:

Observations: National Mesonet Network (Base Funding: $12,000,000 and 0 FTE; Program Change: -$6,500,000 and 0 FTE): NOAA requests a decrease of $6,500,000 and 0 FTE for a total $5,500,000 and 0 FTE. The request reduces congressionally directed funds for the National Mesonet Network. NWS is using congressionally directed FY 2014 funding as indicated in the Consolidated Appropriations Act, 2014 to continue to ingest data from mesonets. NWS created a national mesonet program within NOAA through the Consolidated Appropriations Act, 2014.

PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Budget Program: National Weather Service
Sub-program: Observations
Program Change: National Mesonet Network

	Object Class	FY 2015 Decrease	FY 2015 Total Program
11	Personnel compensation		
11.1	Full-time permanent	$0	$66,960
11.3	Other than full-time permanent	0	98
11.5	Other personnel compensation	0	2,061
11.6	Leave Surcharge Full-Time	0	0
11.7	Military personnel	0	229
11.8	Special personnel services payments	0	0
11.9	Total personnel compensation	0	69,348
12.1	Civilian personnel benefits	0	20,705
13	Benefits for former personnel	0	36
21	Travel and transportation of persons	0	739
22	Transportation of things	0	1,868
23.1	Rental payments to GSA	0	2,195
23.2	Rental Payments to others	0	1,273
23.3	Communications, utilities and misc charges	0	13,564
24	Printing and reproduction	0	27
25.1	Advisory and assistance services	0	26,147
25.2	Other services	(6,500)	37,832
25.3	Purchases of goods & services from Gov't accounts	0	2,041
25.4	Operation and maintenance of facilities	0	0
25.5	Research and development contracts	0	0
25.6	Medical care	0	0
25.7	Operation and maintenance of equipment	0	0
25.8	Subsistence and support of persons	0	0
26	Supplies and materials	0	21,022
31	Equipment	0	2,665
32	Lands and structures	0	6
33	Investments and loans	0	0
41	Grants, subsidies and contributions	0	809
42	Insurance claims and indemnities	0	0
43	Interest and dividends	0	0
44	Refunds	0	0
99	Total obligations	(6,500)	200,277

Central Processing: Establishment of Regional Enterprise Application Development and Integration Teams (Base Funding: $12,420,000 and 122 FTE; Program Change: -$10,000,000 and -98 FTE): NOAA requests a decrease of $10,000,000 and 98 FTE for a total of $2,420,000 and 24 FTE to reflect the significant efficiencies that can be achieved by transition to a new information technology (IT) service delivery model for the National Weather Service (NWS) forecast offices.

Proposed Actions:
The NWS has identified efficiencies which have been realized in the delivery of IT support services to field offices through investments in open source software and implementation of IT best practices. In FY 2015, NWS proposes to consolidate 122 Information Technology Officer (ITO) full-time equivalents (FTE) (one from each Weather Forecast Office (WFO)) to a regional approach consisting of 24 ITO FTEs allocated at the six NWS Regional Headquarters and the National Headquarters through the establishment of Regional Enterprise Application Development and Integration (READI) teams.

The current service delivery model has redundancies and through regionalization of these IT support functions, significant efficiencies can be realized in service delivery. These savings can be accomplished by leveraging upgrades and improvements to existing systems and new technologies, such as the ongoing Advanced Weather Interactive Processing System II (AWIPS), deployment and adopting a more efficient service model. Through investments in IT, NWS has gained the ability to fulfill much of the ITO responsibilities remotely, including systems analysis and software modifications and updates. These technology efficiencies enable NWS to reduce its workforce without impact to its mission to protect lives and property and enable the agency to provide a higher degree of consistency of service delivery.

The READI teams will have responsibility in these two primary areas which the ITOs currently manage:

- Enterprise compatible application development and integration
- IT management and systems analysis

These READI teams will ensure the working order of all computer applications and software including regular maintenance and installation of new software. The IT teams will be available to each Weather Forecast Office (WFO) as a source of software and information technology expertise. The READI concept plans to replicate the service currently provided by on-site ITOs with a regional approach that meets or exceeds current service levels.

NWS will make every effort to minimize the impact to affected employees and reduce ITO staffing through attrition across the entire organization. Many current ITOs can qualify for other NWS positions, such as meteorologists or electronics systems analysts. In addition, NWS will explore opportunities for voluntary separation incentives for interested individuals.

Resources Assessment:
Current resource assessment is provided in the Central Processing narrative.

Schedule and Milestones:
FY 2015

- Finalize consolidation plans
- Execute ITO consolidation
- Staff READI teams

Deliverables:

- READI teams at six NWS Regional Headquarters and the National Headquarters which meet or exceed current levels of service

PROGRAM CHANGE PERSONNEL DETAIL

Program: National Weather Service
Sub-program: Central Processing
Program Change: Establishment of Regional Enterprise Application Development and Integration Teams

Title:	Location	Grade	Number of Positions	Annual Salary	Total Salaries
Information Technology Officer	various*	GS-13	(98)	$81,823	($8,018,654)
Subtotal			(98)		($8,018,654)
Less Lapse	0%		0		$0
Total Full-time permanent:			(98)		($8,018,654)
2015 Pay Adjustment	1.0%				($80,187)
TOTAL			(98)		($8,098,841)

Personnel Data	Number
Full-time Equivalent Employment	
Full-time permanent	(98)
Other than full-time permanent	0
Total	(98)
Authorized Positions:	
Full-time permanent	(98)
Other than full-time permanent	0
Total	(98)

PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Budget Program: National Weather Service
Sub-program: Central Processing
Program Change: Establishment of Regional Enterprise Application Development and Integration Teams

	Object Class	FY 2015 Decrease	FY 2015 Total Program
11	Personnel compensation		
11.1	Full-time permanent	($8,099)	$21,831
11.3	Other than full-time permanent	0	0
11.5	Other personnel compensation	0	600
11.6	Leave Surcharge Full-Time	0	0
11.7	Military personnel	0	0
11.8	Special personnel services payments	0	0
11.9	Total personnel compensation	(8,099)	22,431
12.1	Civilian personnel benefits	(1,901)	6,734
13	Benefits for former personnel	0	19
21	Travel and transportation of persons	0	358
22	Transportation of things	0	15
23.1	Rental payments to GSA	0	5,795
23.2	Rental Payments to others	0	0
23.3	Communications, utilities and misc. charges	0	646
24	Printing and reproduction	0	11
25.1	Advisory and assistance services	0	7,273
25.2	Other services	0	37,396
25.3	Purchases of goods & services from Gov't accounts	0	891
25.4	Operation and maintenance of facilities	0	0
25.5	Research and development contracts	0	0
25.6	Medical care	0	0
25.7	Operation and maintenance of equipment	0	0
25.8	Subsistence and support of persons	0	0
26	Supplies and materials	0	246
31	Equipment	0	1,289
32	Lands and structures	0	0
33	Investments and loans	0	0
41	Grants, subsidies and contributions	0	3,413
42	Insurance claims and indemnities	0	0
43	Interest and dividends	0	0
44	Refunds	0	0
99	Total obligations	(10,000)	86,517

Central Processing: Advanced Hydrologic Prediction Services: Flood Forecasts (Base Funding: $10,200,000 and 0 FTE; Program Change: -$4,000,000 and 0 FTE): NOAA requests a decrease of $4,000,000 and 0 FTE for a total of $6,200,000 and 0 FTE. The request reduces congressionally directed use of funds for the Advanced Hydrologic Prediction Services (AHPS) program. NWS used FY 2014 funding to support increased flood forecasts as indicated in the Consolidated Appropriations Act, 2014. However, the dual polarization advancements to the Next Generation Weather Radar (NEXRAD) radar will dramatically improve quantitative precipitation forecasts, which inform flood prediction. NOAA will continue to collaborate with river commissions to ensure that critical data is coordinated and incorporated in accurate and timely flood forecasts.

PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Budget Program: National Weather Service
Sub-program: Central Processing
Program Change: Advanced Hydrologic Prediction Services: Flood Forecasts

	Object Class	FY 2015 Decrease	FY 2015 Total Program
11	Personnel compensation		
11.1	Full-time permanent	$0	$21,831
11.3	Other than full-time permanent	0	0
11.5	Other personnel compensation	0	600
11.6	Leave Surcharge Full-Time	0	0
11.7	Military personnel	0	0
11.8	Special personnel services payments	0	0
11.9	Total personnel compensation	0	22,431
12.1	Civilian personnel benefits	0	6,734
13	Benefits for former personnel	0	19
21	Travel and transportation of persons	0	358
22	Transportation of things	0	15
23.1	Rental payments to GSA	0	5,795
23.2	Rental Payments to others	0	0
23.3	Communications, utilities and misc. charges	0	646
24	Printing and reproduction	0	11
25.1	Advisory and assistance services	(1,386)	7,273
25.2	Other services	0	37,396
25.3	Purchases of goods & services from Gov't accounts	(2,614)	891
25.4	Operation and maintenance of facilities	0	0
25.5	Research and development contracts	0	0
25.6	Medical care	0	0
25.7	Operation and maintenance of equipment	0	0
25.8	Subsistence and support of persons	0	0
26	Supplies and materials	0	246
31	Equipment	0	1,289
32	Lands and structures	0	0
33	Investments and loans	0	0
41	Grants, subsidies and contributions	0	3,413
42	Insurance claims and indemnities	0	0
43	Interest and dividends	0	0
44	Refunds	0	0
99	Total obligations	(4,000)	86,517

Analyze, Forecast, & Support: National Tsunami Hazard Mitigation Program Grants (Base Funding: $14,695,000 and 27 FTE; Program Change: -$6,000,000 and 0 FTE): NOAA requests a decrease of $6,000,000 and 0 FTE for a total of $8,695,000,000 and 27 FTE. For FY 2015, this reduction eliminates NOAA's partner funding for education and awareness programs through the National Tsunami Hazard Mitigation Program (NTHMP).

Proposed Actions:
NOAA proposes to eliminate NTHMP grant funding supporting local education, awareness, and inundation and evacuation map development. With this proposal, NTHMP will not be funded in FY 2015. NOAA is not seeking to terminate NTHMP with this action. NOAA will continue to fund critical tsunami program components in order to ensure timely and accurate tsunami warnings, watches and advisories.

NOAA is committed to maintaining its strong forecast and warning program through the operations of its two Tsunami Warning Centers (Pacific Tsunami Warning Center and National Tsunami Warning Center located in Alaska), targeted research and development and international coordination activities.

Resources Assessment:
Current resources are being used to maintain a U.S. Tsunami Warning System in accordance with P.L.109-427. These resources reside in the Observations and the Analyze, Forecast, & Support (AFS) PPAs. This program change only affects the Analyze, Forecast, & Support PPA.

Current Structure	Proposed Structure	
PPA: Strengthen U.S. Tsunami Warning Network	PPA: Observations	PPA: Analyze, Forecast, & Support
Base: $26,880,000	Base: $12,185,000	Base: $14,695,000
Program Change: -$6,000,000	Program Change: $0	Program Change: -$6,000,000

AFS activities include operations of two 24x7 Tsunami Warning Centers tsunami forecast inundation mapping and model development, research and development for improved tsunami detection and analysis capabilities, and continued administration of the TsunamiReady™ Program. Observations activities include data collected from the Deep-ocean Assessment and Reporting of Tsunamis (DART®) stations and sea-level and seismic networks. The DART® array consists of 39 deep-water buoys located throughout the Pacific Ocean, Atlantic Ocean, and Caribbean.

Schedule and Milestones:
FY 2015 – 2019:

- Operate Tsunami Warning Centers
- Operate the International Tsunami Information Center and the Caribbean Tsunami Warning Program
- Sustain TsunamiReady™ Program

Deliverables:

- Operational Tsunami Warning Centers
- Operational International Tsunami Information Center and Caribbean Tsunami Warning Program

Performance Goals and Measurement Data:

Performance Measure: TsunamiReady Communities	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With Decrease	N/A	N/A	168	168	168	168	168
Without Decrease	154	168	178	188	198	208	218
Description: This measure represents the cumulative number of communities that NOAA designates as being adequately prepared for a tsunami. As a voluntary program, the communities earn the designation through spreading awareness of tsunamis, educating community members, and improving emergency evacuation plans.							

PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Budget Program: National Weather Service
Sub-program: Analyze, Forecast, & Support
Program Change: National Tsunami Hazard Mitigation Program Grants

	Object Class	FY 2015 Decrease	FY 2015 Total Program
11	Personnel compensation		
11.1	Full-time permanent	$0	$269,325
11.3	Other than full-time permanent	0	621
11.5	Other personnel compensation	0	24,685
11.6	Leave Surcharge Full-Time	0	0
11.7	Military personnel	0	0
11.8	Special personnel services payments	0	0
11.9	Total personnel compensation	0	294,631
12.1	Civilian personnel benefits	0	90,005
13	Benefits for former personnel	0	246
21	Travel and transportation of persons	0	2,214
22	Transportation of things	0	4,079
23.1	Rental payments to GSA	0	5,337
23.2	Rental Payments to others	0	3,670
23.3	Communications, utilities and misc charges	0	11,140
24	Printing and reproduction	0	77
25.1	Advisory and assistance services	0	8,166
25.2	Other services	0	33,997
25.3	Purchases of goods & services from Gov't accounts	0	2,157
25.4	Operation and maintenance of facilities	0	0
25.5	Research and development contracts	0	0
25.6	Medical care	0	0
25.7	Operation and maintenance of equipment	0	0
25.8	Subsistence and support of persons	0	0
26	Supplies and materials	0	7,305
31	Equipment	0	3,578
32	Lands and structures	0	3,261
33	Investments and loans	0	0
41	Grants, subsidies and contributions	(6,000)	6,497
42	Insurance claims and indemnities	0	0
43	Interest and dividends	0	0
44	Refunds	0	0
99	Total obligations	(6,000)	476,360

Dissemination, and Science & Technology Integration: NOAA's Next Generation Air Transportation System Weather Program (Base Funding: $16,154,000 and 9 FTE; Program Change: -$9,000,000 and -4 FTE): NOAA requests a decrease of $9,000,000 and 4 FTE for a total of $7,154,000 and 5 FTE to maintain continuity of NOAA support for the Next Generation Air Transportation System (NextGen) initiative and implement key IT infrastructure efforts, while conducting NextGen science and application development and implementation at a slower pace to reduce annual costs and allow for a re-evaluation of NextGen goals and scope with NextGen partners.

Proposed Actions:
The proposed decrease recognizes the constrained budget environment while enabling NOAA's NextGen Weather Program to complete several high priority and more mature efforts. The requested funding will enable the National Weather Service (NWS) to implement IT and weather information improvements begun in FY 2012 to provide the aviation community greater and easier access to enhanced weather information. This funding decrease suspends most long lead time weather research and development (R&D) efforts, including research to improve aviation parameters forecasts, applications to monitor and improve automatically generated forecast products, ensemble and probabilistic model development for aviation parameters, and a robust single authoritative source of weather information for aviation decision makers. NWS, as described in its Weather-Ready Nation Strategic Plan, will continue its current weather capabilities and activities in support of sound and informed decisions by the aviation community. NOAA, working with its NextGen, will discuss the impacts of these delays in achievement of NextGen weather goals and the need to re-baseline the entire program. NextGen is an extended investment over many years, and as such requires coordinated planning and the ability to reexamine the scope to adjust to a changing financial environment, new technologies, and emerging needs.

Current Structure	Proposed Structure	
PPA: Aviation Weather (NextGen)	PPA: Dissemination	PPA: Science & Technology Integration
Base: $16,154,000	Base: $11,559,000	Base: $4,595,000
Program Change: -$9,000,000	Program Change: -$6,406,000	Program Change: -$2,594,000

Utilizing the remaining NextGen funding ($7,154,000 and 5 FTE) within the Dissemination, and Science & Technology Integration funding lines, NWS will be able to support the following activities:

1) Dissemination: NextGen Information Technology (IT) Services ($5,153,000 and 1 FTE) – Implement NextGen IT Services via the NOAA Integrated Dissemination Program (IDP), fulfilling the NextGen Weather Initial Operational Capability (IOC) milestone in late 2015. Completion of this effort enables the FAA to implement its "Common Support Services – Weather (CSS-Wx)" Program for improved dissemination of weather information in the FAA in mid-2016. NOAA intends to transition this effort to IDP operations upon completion of IOC as part of FAA's NextGen IOC.
2) Science & Technology Integration: Multi-Radar/Multi-Sensor (MRMS) ($550,000) – Maintain funding to progress with MRMS integration into the National Centers for Environmental Prediction (NCEP) operations on the Weather and Climate Operational Supercomputing System (WCOSS). MRMS integrates radar, surface observations, satellite, and numerical weather prediction data and generates automated, seamless

national 3D radar mosaics at high resolutions. These improvements will enhance aviation, hydrological, and severe weather forecasting capabilities.

3) Science & Technology Integration: Localized Aviation Model Output Statistical Products (LAMP) ($375,000) – LAMP is a statistical forecast guidance model of weather elements, many of which are important to aviation, such as thunderstorms, winds, cloud heights and visibility. The improvements currently underway and planned over the next several years will increase output resolution and further develop algorithms for aviation elements.
4) Science & Technology Integration: Verification ($250,000) – Continue verification of aviation products and services. Such work is needed to baseline aviation product quality and to assess and plan needed base-funded improvements.
5) Science & Technology Integration: Project planning, management and studies ($826,000 and 4 FTE) – Continue management functions for remaining activities, conduct planning activities and studies, and facilitate continued collaboration with the FAA, and other partner agencies.

NOAA is legislatively mandated by Title 49 of the U.S. Code to provide weather information to the FAA; NOAA currently provides some of this information on a reimbursable basis. The majority of aviation specific weather information is generated with current NWS funding. In addition, Public Law No 108-176 directs the Department of Transportation (DOT), FAA, Department of Commerce, the National Aeronautics and Space Administration (NASA) other partner agencies to conduct integrated planning for research to operations to support NextGen.

The incumbents of the four positions will be absorbed within the organization through attrition. NWS will make every effort to minimize the impact to affected NextGen Weather Program employees.

A reduction to the NextGen Weather Program introduces operational and safety risks to this multi-agency Presidential Initiative. A slowed investment means that there will be less improvement in the accuracy, timeliness and consistency of weather products affecting air travel delays and safety and efficiency in the National Airspace System. There is also a risk to NOAA's ability to meet commitments to NextGen partner agencies and the overall NextGen initiative. Re-baselining could also push the timeline of the program further to the right; however, this program would greatly benefit from a mid-way review and evaluation of emerging needs and refocusing of funding. However, in the current fiscal environment, NOAA has had to consider the budgetary and reputation risks of funding these aviation improvements at the expense of immediate needs in its other core mission areas.

Resources Assessment:
The current resources for this activity are described in the Dissemination and STI narratives.

Schedule and Milestones:
FY 2015
- Baseline quality and performance assessments of selected aviation products complete
- Achieve Final Operational Capability for Multi-Radar/Multi-Sensor system in NCEP operations

FY 2016-2019
- Operationalize NextGen IT/Web Services
- Make available improvements to Localized Aviation MOS Product
- Complete additional aviation product verification

Deliverables:

- NextGen Web Services
- Multi-Radar/Multi-Sensor system integrated into NCEP operations
- Aviation forecast metrics
- LAMP enhancements

Performance Goals and Measurement Data:

Performance Measure: Weather Products Net-Enabled	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With decrease	N/A	N/A	0	130	130	130	130
Without decrease	0	0	0	130	140	150	150
Description: The emergence of pervasive digital networks, including the public Internet and internal NOAA and governmental broadcast networks has created opportunities in all sectors of society. Enhanced web services products and technologies allow for new channels for access by customers, a real-time integration capability, and new efficiencies in internal operations, and offer new digital products or services. The previous and current requests contribute to the effort to net-enable all aviation weather products in order to allow ready access to information and support automation of forecast products and improvement of National Air Space NAS management. Metric indicates number of distinct products that are available operationally from net-enabled NextGen Web Services							

PROGRAM CHANGE PERSONNEL DETAIL

Program: National Weather Service
Sub-program: Dissemination, and Science & Technology Integration
Program Change: NextGen Weather Program

Title:	Location	Grade	Number of Positions	Annual Salary	Total Salaries
Systems Engineer	Silver Spring, MD	GS-14	(1)	$105,211	($105,211)
Logistics Coordinator	Silver Spring, MD	GS-12	(1)	$74,872	($74,872)
Contract Manager	Silver Spring, MD	GS-12	(1)	$74,872	($74,872)
Budget Specialist	Silver Spring, MD	GS-12	(1)	$74,872	($74,872)
Subtotal			(4)		($329,827)
Less Lapse	0%		0		$0
Total Full-time permanent:			(4)		($329,827)
2015 Pay Adjustment	1.0%				($3,298)
TOTAL			(4)		($333,125)

Personnel Data	Number
Full-time Equivalent Employment	
Full-time permanent	(4)
Other than full-time permanent	0
Total	(4)
Authorized Positions:	
Full-time permanent	(4)
Other than full-time permanent	0
Total	(4)

PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Budget Program: National Weather Service
Sub-program: Dissemination
Program Change: NextGen Weather Program

	Object Class	FY 2015 Decrease	FY 2015 Total Program
11	Personnel compensation		
11.1	Full-time permanent	($83)	$83
11.3	Other than full-time permanent	0	0
11.5	Other personnel compensation	0	0
11.6	Leave Surcharge Full-Time	0	0
11.7	Military personnel	0	0
11.8	Special personnel services payments	0	0
11.9	Total personnel compensation	(83)	83
12.1	Civilian personnel benefits	(31)	29
13	Benefits for former personnel	0	0
21	Travel and transportation of persons	0	179
22	Transportation of things	0	24
23.1	Rental payments to GSA	0	2
23.2	Rental Payments to others	0	3,142
23.3	Communications, utilities and misc. charges	0	3,292
24	Printing and reproduction	0	0
25.1	Advisory and assistance services	(5,292)	1,132
25.2	Other services	0	29,410
25.3	Purchases of goods & services from Gov't accounts	(1,000)	510
25.4	Operation and maintenance of facilities	0	0
25.5	Research and development contracts	0	0
25.6	Medical care	0	0
25.7	Operation and maintenance of equipment	0	0
25.8	Subsistence and support of persons	0	0
26	Supplies and materials	0	1,654
31	Equipment	0	131
32	Lands and structures	0	131
33	Investments and loans	0	0
41	Grants, subsidies and contributions	0	380
42	Insurance claims and indemnities	0	0
43	Interest and dividends	0	0
44	Refunds	0	0
99	Total obligations	(6,406)	40,099

PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Budget Program: National Weather Service
Sub-program: Science & Technology Integration
Program Change: NextGen Weather Program

	Object Class	FY 2015 Decrease	FY 2015 Total Program
11	Personnel compensation		
11.1	Full-time permanent	($249)	$48,413
11.3	Other than full-time permanent	0	197
11.5	Other personnel compensation	0	1,257
11.6	Leave Surcharge Full-Time	0	0
11.7	Military personnel	0	0
11.8	Special personnel services payments	0	0
11.9	Total personnel compensation	(249)	49,867
12.1	Civilian personnel benefits	(88)	14,445
13	Benefits for former personnel	0	76
21	Travel and transportation of persons	(28)	456
22	Transportation of things	0	40
23.1	Rental payments to GSA	0	2,076
23.2	Rental Payments to others	0	0
23.3	Communications, utilities and misc. charges	0	954
24	Printing and reproduction	0	22
25.1	Advisory and assistance services	(1,609)	11,101
25.2	Other services	0	12,665
25.3	Purchases of goods & services from Gov't accounts	0	1,810
25.4	Operation and maintenance of facilities	0	0
25.5	Research and development contracts	0	50
25.6	Medical care	0	0
25.7	Operation and maintenance of equipment	0	0
25.8	Subsistence and support of persons	0	0
26	Supplies and materials	0	427
31	Equipment	0	1,826
32	Lands and structures	0	0
33	Investments and loans	0	0
41	Grants, subsidies and contributions	(620)	27,785
42	Insurance claims and indemnities	0	0
43	Interest and dividends	0	0
44	Refunds	0	0
99	Total obligations	(2,594)	123,600

Science & Technology Integration: Responding to Congressionally-Requested Studies of NWS (Base Funding: $0 and 0 FTE; Program Change: +$3,000,000 and 0 FTE): NOAA requests an increase of $3,000,000 and 0 FTE for a total of $3,000,000 and 0 FTE to support effective response to recommendations of two recently-completed independent studies of the National Weather Service: "*Weather Services for the Nation: Becoming Second to None,"* National Academy of Sciences (NAS), 2012, and "*Forecast for the Future: Assuring the Capacity of the National Weather Service,"* National Academy of Public Administration (NAPA), May 2013.

Proposed Actions:
Both reports endorse the goals of NOAA's Weather-Ready Nation (WRN) initiative, call on NWS to become a more agile and effective organization to support these goals, and recommend a strategic approach founded on continuous and incremental changes in NWS operations. Both also recommend significant NWS change be developed and tested in collaboration with key stakeholders. Some of these changes will redirect and restructure current NWS resources, but there are also actions essential to facilitate the process of change itself. The requested increase will support these actions, including:

- Analyses of workforce and infrastructure
    - This effort will obtain contractor support to perform most of the assessments. Additionally, there will be limited government personnel travel supporting facility conditions and training needs assessments.
- Enhanced capacity for testing and demonstration
    - This effort will utilize a combination of Cooperative agreements, grants to academia and contractor support. As the effort progresses, software and IT equipment investments will be made.
- Establishing and operating improved mechanisms to seek stakeholder advice
    - This effort will use contractor support to develop, plan and implement increased stakeholder participation. After the establishment of a committee under the auspices of the Federal Advisory Committee Act (FACA), there will be support costs associated with travel and meeting related costs.
- Improved capability to evaluate progress toward broad WRN objectives in general and specific test/demonstration activities in particular
    - Similar to the testing and demonstration, this effort will utilize a combination of Cooperative agreements, grants to academia and contractor support.

Although not specifically recommended by NAS, NAPA, or Congress, NWS plans to prepare an annual report on progress toward building a more agile and effective NWS and toward broader societal goals of the WRN initiative. These annual reports will be public documents available six months after the conclusion of every fiscal year.

Provided below is information on the activities that will be conducted in FY 2015 (and beyond).

- Analyses of workforce and infrastructure: Focus will be on supporting baseline analyses of current workforce skills and critical training requirements associated with improving labor/management relations, with facility and other infrastructure analyses limited to the most critical deficiencies. Outyear focus will shift to describing workforce skills needed to support a WRN initiative and developing plans for training and recruitment to develop these skills, as well as a more comprehensive analysis and prioritized plans for improving NWS facility conditions.
- Enhanced capacity for testing and demonstration: Focus will be on upgrading the NWS Operations Proving Ground infrastructure and supporting the next wave of pilot project

activities once the six WRN pilot projects currently underway are completed in FY 2014. The Operations Proving Ground serves as a framework for advancing NWS decision support services and science and technology.

- Improved mechanisms to seek stakeholder advice: NAPA recommends creation of a new FACA committee. NOAA is also considering alternative institutional arrangement, e.g. operating within current advisory structures such as the NOAA Science Advisory Board. Regardless of the institutional arrangement (which may change over time), NAPA recommends improved advisory mechanisms, and this item will be a recurring cost.
- Improved capability to evaluate progress: Focus will be on improving evaluation procedures for testing and demonstration activities, including pilot projects. Sound evaluation of testing and demonstration activities based on established social science methods will remain an important focus under the continuous, incremental strategic approach to change recommended by NAPA. Activities aimed at measuring broader societal outcomes (e.g. lives saved, damages averted, and economic effects at regional, sectorial, and ultimately national scale) will also be supported.

NWS must become a more agile and effective organization. This investment will improve NWS' ability to make the changes necessary to meet the growing demands for its services to support a WRN.

Statement of Need and Economic Benefits:
Congress requested the independent studies which led to the subject reports by NAS and NAPA. The main strategic impact of these reports will be changes in NWS operations and services to serve the country's needs more effectively and efficiently. These changes will ultimately be reflected throughout the entire NWS budget and affect the economic benefits associated with all NWS programs.

This budget request supports planning, analysis, advisory, and evaluation efforts associated with these large-scale changes in NWS operations, so the economic benefits associated with this budget request will accrue *indirectly* through better plans, better incorporation of stakeholder input, and more reliable estimates of the economic benefits produced by NWS. These effects will be included in the NWS Annual Report described above.

Resources Assessment:
This is a new initiative and currently does not have any dedicated funding.

Schedule and Milestones:
FY 2015

- Analyze workforce and infrastructure
    - Conduct baseline staffing analysis of current decision support services for all NWS offices, comprehensive review of facility condition, and emerging training needs
    - Initiate comprehensive review of NWS facility condition
- Enhance capacity for testing and demonstration
    - Initiate demonstration capability at selected offices ("second wave" of pilot projects)
- Improve mechanisms to seek stakeholder advice
    - First meeting of new stakeholder advisory body

    - Evaluation of testing and demonstration plans, including assessment of adequacy of protections against degradation of services
- Improve capability to evaluate progress
    - Develop evaluation templates for testing (in Operations Proving Ground) and demonstrations (in pilot projects)
- First NWS Annual Report (review of FY 2014) – repeat annually thereafter

FY 2016

- Analyze workforce and infrastructure:
    - Conduct continuing re-assessments of workforce
    - Complete analysis of emerging training needs
    - Complete comprehensive review of NWS facility condition
- Enhance capacity for testing and demonstration
    - Progress reports on all testing and demonstration activities included in Annual Report – ongoing
- Improve mechanisms to seek stakeholder advice
    - Evaluation of testing/demonstration plans and results – ongoing
    - Advisory body engaged as needed when change proposals require external advice and guidance

- Improve capability to evaluate progress
    - Initiate effort to evaluate overall WRN initiative outcomes

FY 2017

- Analyze workforce and infrastructure
    - Conduct continuing re-assessments of workforce
- Enhance capacity for testing and demonstration
    - Testing and Demonstration functions ongoing, with modifications based on emerging customer needs, new science and technology
- Improve mechanisms to seek stakeholder advice
    - Advisory body engaged as needed when change proposals require external advice and guidance
- Improve capability to evaluate progress
    - NWS products and services are evaluated against more effective measures of progress, founded on social science, which is being integrated across the Federal government and weather enterprise

FY 2018

- Analyze workforce and infrastructure
    - Conduct continuing re-assessments of workforce and infrastructure
- Enhance capacity for testing and demonstration
    - Testing and Demonstration functions ongoing, with modifications based on emerging customer needs, new science and technology
- Improve mechanisms to seek stakeholder advice
    - Advisory body engaged as needed when change proposals require external advice and guidance
- Improve capability to evaluate progress
    - NWS products and services are evaluated against more effective measures of progress, founded on social science, which is being integrated across the Federal government and weather enterprise

FY 2019

- Analyze workforce and infrastructure
    - Conduct continuing re-assessments of workforce and infrastructure

- Enhance capacity for testing and demonstration
    - Testing and Demonstration functions ongoing, with modifications based on emerging customer needs, new science and technology
- Improve mechanisms to seek stakeholder advice
    - Advisory body engaged as needed when change proposals require external advice and guidance
- Improve capability to evaluate progress
    - NWS products and services are evaluated against more effective measures of progress, founded on social science, which is being integrated across the federal government and weather enterprise

Deliverables:

- Annual progress reports
- Evaluation of NWS testing/demonstration plans
- Evaluation of NWS testing/demonstration results
- Proposals to change NWS operations and services based on testing/demonstration results
- Comprehensive facilities assessments and emerging training needs.
- Comprehensive analyses of workforce

PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Budget Program: National Weather Service
Sub-program: Science & Technology Integration
Program Change: Responding to Congressionally-Requested Studies of NWS

	Object Class	FY 2015 Increase	FY 2015 Total Program
11	Personnel compensation		
11.1	Full-time permanent	$0	$48,413
11.3	Other than full-time permanent	0	197
11.5	Other personnel compensation	0	1,257
11.6	Leave Surcharge Full-Time	0	0
11.7	Military personnel	0	0
11.8	Special personnel services payments	0	0
11.9	Total personnel compensation	0	49,867
12.1	Civilian personnel benefits	0	14,445
13	Benefits for former personnel	0	76
21	Travel and transportation of persons	250	456
22	Transportation of things	0	40
23.1	Rental payments to GSA	0	2,076
23.2	Rental Payments to others	0	0
23.3	Communications, utilities and misc. charges	0	954
24	Printing and reproduction	0	22
25.1	Advisory and assistance services	2,000	11,101
25.2	Other services	0	12,665
25.3	Purchases of goods & services from Gov't accounts	0	1,810
25.4	Operation and maintenance of facilities	0	0
25.5	Research and development contracts	0	50
25.6	Medical care	0	0
25.7	Operation and maintenance of equipment	0	0
25.8	Subsistence and support of persons	0	0
26	Supplies and materials	0	427
31	Equipment	0	1,826
32	Lands and structures	0	0
33	Investments and loans	0	0
41	Grants, subsidies and contributions	750	27,785
42	Insurance claims and indemnities	0	0
43	Interest and dividends	0	0
44	Refunds	0	0
99	Total obligations	3,000	123,600

Science & Technology Integration: Centralized Water Forecasting Demonstration (Base Funding: $0 and 0 FTE; Program Change: +$4,000,000 and 0 FTE): NWS requests an increase of $4,000,000 and 0 FTE for a total of $4,000,000 and 0 FTE to develop and test new centralized national hydrologic modeling and forecast capabilities to be deployed at the National Water Center (NWC).

Proposed Action:
Current National Weather Service (NWS) operational hydrologic forecast models rely on decades-old science and are extensively calibrated to overcome limitations of the models, observations, and anthropogenic effects such as water use, reservoir storage, and water diversions.[1] Data on anthropogenic effects are obtained locally through routine interactions between NWS hydrologic forecasters and water managers within their domain, and are almost always incomplete. Current practice is limited to providing decentralized forecasts at approximately 4,000 stream gage locations on rivers nationwide using a myriad of technologies that are unique to each office. These forecasts are focused on predicting high flows (i.e. floods).

The centralized Earth System hydrologic modeling approach proposed here is a cost-effective way to implement state-of-the-science hydrologic models, improve efficiency and consistency in the NWS hydrologic forecast process, provide forecasts at all locations on a high-resolution grid, and provide forecasts of all water conditions. Centralized hydrologic modeling will allow regional hydrologic forecasters to focus more attention on improving the acquisition of anthropogenic data, interpreting and communicating forecasts and providing decision-support services. Developing centralized hydrologic modeling capabilities provides focus and establishes a framework for interaction with the research community, improving both research to operations and operations to research, while also leveraging prior investments to develop state-of-the-art hydrologic models.

The need for improved and more comprehensive water forecast information has been consistently echoed in NWS interactions with water managers, emergency managers, and other stakeholders. Customer satisfaction surveys and stakeholder forums repeatedly call for consistent, well-integrated and reliable water data and information needed for decision-making that the current NWS approach to hydrologic forecasting does not fully provide. This centralized approach will develop, test and demonstrate the capability to address stakeholders' needs while supporting future interagency efforts to address national water resource challenges.

The proposed investment is comprised of four major tasks associated with developing and demonstrating a new Earth System modeling approach for hydrologic forecasting:

- Establish a Centralized Water Resources Data Service (CWRDS) at NWC and accommodate operational data streams within an existing Earth System model prototype (WRF-HYDRO). This task will collect, process, archive and provide access to essential hydrologic data elements necessary to support centralized hydrologic modeling. The CWDRS will also provide convenient access to data for use by NOAA, other Federal, State and local agencies, and stakeholders.
- Development and expansion of WRF-HYDRO hydrologic modeling components and improving large-domain computational performance. Additional model components are

[1] Weather Service for the Nation: Becoming Second to None, National Academy of Sciences 2012 http://www.nap.edu/catalog.php?record_id=13429#toc

needed within WRF-HYDRO to improve its applicability for NWS operations. This task will couple additional water management models into WRF-HYDRO.

- Develop and implement a Water Resources Testbed and Evaluation Service (WRTES). This task will develop the tools and testing framework needed to objectively assess and diagnose the performance of the new centralized modeling system, as well as allow objective inter-comparison with existing hydrologic forecast products. The NAS identified the lack of an objective assessment framework as a critical gap in the NWS Hydrology program.
- Test and demonstrate centralized operational hydrologic prediction at NWC. This task will implement and demonstrate the enhanced WRF-HYDRO system within an operationally relevant end-to-end environment at NWC, using full-scale simulations integrated with operational data streams.

To achieve these objectives, NOAA will use a combination of existing NOAA scientists, NOAA Corps Officers, collaborating agencies, contractors, and visiting scientists.

Statement of Need and Economic Benefits:
Without this investment, NWS will continue to use water resources prediction capabilities that are insufficient to address the nation's growing challenges in hydrologic extremes, water security, and freshwater controls on ecosystem health. Water resources are now considered to be one of the greatest challenges facing our Nation in the 21st century. In the U.S. and globally, we face a triple threat: population growth and economic development are stressing water supplies and increasing vulnerability; a changing climate is impacting water availability and quality, increasing uncertainty and the frequency of extreme events; and an aging water infrastructure is forcing critical, expensive decisions.

NOAA's current water resources prediction capabilities are insufficient to address the nation's growing challenges in hydrologic extremes, water security, and freshwater controls on ecosystem health. NOAA's hydrologic prediction tools are outdated, unable to utilize readily available data, and structurally incapable of representing critical processes.[2] Cross-NOAA investments are needed for seamless water prediction services for the full range of hydrologic extremes from floods to droughts, predict hydrologic transport of nutrients/contaminants, link terrestrial and marine water systems, and provide reliable predictions of water availability that bridge weather to climate time scales.

Addressing these and other water resources challenges requires a *broad, integrative national water resources information system* to serve as a reliable and authoritative basis for water-related planning, preparedness and response activities. To provide this national water resources information system, NOAA has formed an innovative partnership with Federal agencies that have complementary operational missions in water science, observation, prediction and management. Initial partners in Integrated Water Resources Science and Services (IWRSS) consortium include NOAA, the US Geological Survey, and the US Army Corp of Engineers. The intent of this partnership is to streamline access to Federal water resource capabilities and enable private and public water managers to have a shared comprehensive view of water resources. A full seamless suite of water resources forecasts and information is needed to inform critical decisions such as coastal water conditions, flood mitigation, drought

[2] Weather Services for the Nation: Second to None, National Academy of Sciences, The National Academies Press, Washington, DC, 2012 http://www.nap.edu/catalog.php?record_id=13429#toc

risk management, and ecosystem management; to support the optimization of water use for competing sectors and mitigate risk. Emerging stakeholder needs require NOAA with support from the other Federal water agencies to:

- Provide high spatial and temporal resolution “summit to sea” analyses and forecasts for full spectrum of water budget parameters (e.g., soil moisture, runoff, groundwater, evapotranspiration, streamflow)
- Expand the temporal range, improve the accuracy, and quantify the certainty of river stage and volume forecasts (hours to seasonal probabilistic forecasts)
- Provide static flood inundation map libraries and real-time flood forecast inundation mapping services identifying potential socioeconomic impacts. These maps depict the areal extent and depth of floodwaters and will be used by emergency managers to preposition people and resources to more effectively mitigate flood impacts. Integrate access to geospatial water resource information from multiple Federal agencies through a single information service

Resource Assessment:

NOAA’s Hydrology and Water Resource Programs deliver our Nation’s flood and river forecasts and warnings for the protection of life and property and the enhancement of the national economy. Current activities include:

- infusing new hydrologic science into operations at NWS River Forecast Centers and Weather Forecast Offices
- developing hydrologic techniques for operational use
- managing hydrologic development by NWS field offices
- providing advanced hydrologic products to meet needs identified by NWS customers

Schedule and Milestones:

FY	CWRDS	WRF-HYDRO Dev.	WRTES	Demonstration
15	• Establish CWDRS and implement 50 percent of the essential hydrologic data elements	• Complete WRF-HYDRO accommodation of operational data streams	• Establish base-line evaluation methodologies and metrics	• Initialize IT connectivity between National Water Center and NCEP Central Operations (NCO)
16	• Implement 100 percent of the essential hydrologic data elements	• Incorporate additional hydrologic models	• Centralize and consolidate the product and service evaluation activities that occur at distributed field offices or national centers	• Migrate WRF-HYDRO testing into NCO environment
17	• Establish robust, interactive data archival and retrieval capability for essential hydrologic data elements	• Release enhanced WRF-HYDRO code	• Initiate prototype evaluation capability and inter-comparison of forecast products	• Commence centralized runs of enhanced WRF-HYDRO
18	• Provide external access to CWRDS	• Modify or adjust enhanced WRF-HYDRO as necessary	• Evaluate Demonstration Year 1 results	• Continue centralized runs of enhanced WRF-HYDRO
19	• Maintain external access to CWRDS and modify based on stakeholder feedback	• Modify or adjust enhanced WRF-HYDRO as necessary	• Evaluate Demonstration Year 2 results	• Complete demonstration of centralized hydrologic forecasting and report results

Deliverables:

- Demonstration of centralized national water modeling and forecast capability, with quantitative analysis of results and comparative analysis with current practice
- Established CWRDS
- Technical Readiness Level of WRF-HYDRO raised to TRL 6 (near-operational)
- Established WRTES

PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Budget Program: National Weather Service
Sub-program: Science & Technology Integration
Program Change: Centralized Water Forecasting Demonstration

	Object Class	FY 2015 Increase	FY 2015 Total Program
11	Personnel compensation		
11.1	Full-time permanent	$0	$48,413
11.3	Other than full-time permanent	0	197
11.5	Other personnel compensation	0	1,257
11.6	Leave Surcharge Full-Time	0	0
11.7	Military personnel	0	0
11.8	Special personnel services payments	0	0
11.9	Total personnel compensation	0	49,867
12.1	Civilian personnel benefits	0	14,445
13	Benefits for former personnel	0	76
21	Travel and transportation of persons	0	456
22	Transportation of things	0	40
23.1	Rental payments to GSA	0	2,076
23.2	Rental Payments to others	0	0
23.3	Communications, utilities and misc. charges	0	954
24	Printing and reproduction	0	22
25.1	Advisory and assistance services	2,000	11,101
25.2	Other services	2,000	12,665
25.3	Purchases of goods & services from Gov't accounts	0	1,810
25.4	Operation and maintenance of facilities	0	0
25.5	Research and development contracts	0	50
25.6	Medical care	0	0
25.7	Operation and maintenance of equipment	0	0
25.8	Subsistence and support of persons	0	0
26	Supplies and materials	0	427
31	Equipment	0	1,826
32	Lands and structures	0	0
33	Investments and loans	0	0
41	Grants, subsidies and contributions	0	27,785
42	Insurance claims and indemnities	0	0
43	Interest and dividends	0	0
44	Refunds	0	0
99	Total obligations	4,000	123,600

Science & Technology Integration: Hurricane Forecast Improvement Project (Base Funding: $13,004,000 and 1 FTE; Program Change: -$8,182,000 and 0 FTE): NOAA requests a decrease of $8,182,000 and 0 FTE for a total of $4,822,000 and 1 FTE to delay on-going research toward improving hurricane track and intensity prediction within the Hurricane Forecast Improvement Project (HFIP).

Proposed Actions:
Since its inception, HFIP has made significant progress towards the development of a next generation hurricane forecast system (HFS). Components of this HFS, such as global data assimilation system and improvements to the Weather Research and Forecasting model for Hurricanes (HWRF), have been transitioned to operations. NWS anticipates meeting HFIP goals of 20 percent improvement for both track and intensity in a demonstration mode using the prototype hurricane forecast system by the end of the 2015 hurricane season. The current prototype hurricane forecast system already supports track goals, but additional development and testing is needed to reliably achieve intensity goals. The increased operational high performance computing (HPC) capacity from the Disaster Relief Appropriations Act, 2013 investment and the modeling research to operations (R2O) funded in the Consolidated Appropriations Act, 2014 enable additional components of the HFS to be transitioned into operations.

NOAA proposes to reduce its investment in this effort. A sustained funding level of $4,822,000 will provide for maintenance of already developed hurricane models within a research environment. HFIP model guidance will continue to be produced in a research environment and provided to NOAA's Hurricane Forecasters. With this reduction, hurricane forecast improvements will return to historical, rates of three percent for track error and less than one percent for intensity error per year.

Proposed actions include:
- Sustain current hurricane forecast system in its framework at the end of FY 2014
- Sustain community software architecture to ensure effective and efficient use of NOAA's suite of numerical weather prediction models and effective leveraging of research advancements
- Significantly scaling back hurricane forecast system research and operational modeling efforts aimed at hurricane forecast track and intensity error reduction, including work on physics-based numerical predictions, enhanced global and regional models, and ocean models
- Delaying development of new tools for evaluation of hurricane forecasts. This includes tools for cyclone tracking, verification of forecasts, forecasts of tropical cyclone (TC) genesis, TC rainfall, and TC structure

Reduction to HFIP introduces risk to NOAA's efforts to improve regional and global weather models, as well as data assimilation techniques. Populations in vulnerable coastal regions of the United States will not benefit from improved guidance leading to continued over warning resulting in unnecessary, costly evacuations. Strategic partnerships with interagency and academic partners will be significantly scaled back or terminated risking the reputation of NOAA to be a contributing member of this research community. NOAA has weighed these considerations and concluded in the current fiscal environment, the risks of not focusing on immediate, key needs outweigh the slowed progress of HFIP that has achieved many of its goals.

Resources Assessment:
Current resources are used to improve the accuracy and reliability of hurricane track and intensity forecasts; extend lead time for hurricane forecasts with increased certainty; and increase confidence in hurricane and storm surge forecasts. HFIP provides the basis for NOAA to engage and align with other agencies and larger scientific community efforts to work towards coordinated national hurricane research needed to significantly improve operational hurricane forecast guidance. HFIP pursues existing science and technology innovations to develop an advanced hurricane forecast system; initial technology demonstrations show significant promise. HFIP development efforts also include enhanced observational strategies and improved data assimilation. Output from the hurricane forecast system is expected to be high quality information with associated probabilities on high impact variables such as wind speed, precipitation, and storm surge. Once operationally implemented, this guidance will be used by the National Hurricane Center (NHC) in their development of hurricane forecasts and warnings, resulting in significantly improved response to the tropical storm and hurricane threat to coasts. This transition to operations is contingent upon the ability to leverage investments in high performance computing.

Schedule and Milestones:
FY 2015 – 2019:

- Complete annual updates to operational HWRF at NCEP

Deliverables:

- Experimental real-time forecast guidance to NHC from running the experimental Hurricane Forecast System on the HFIP research and development computing

Performance Goals and Measurement Data:

Performance Measure: 48 hour Hurricane Track Error in nautical miles (Measure 15c)	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With decrease	N/A	N/A	80	79	78	78	78
Without decrease	103	81	80	78	77	77	76
Description: Please see measure description under the Annual Performance Plan (APP) under section Targets and Performance Summary.							

Performance Measure: 48 hour Hurricane Intensity Error in knots (Measure 15d)	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With decrease	N/A	N/A	14	14	13	13	13
Without decrease	10.5	12	10	9	7	6	6
Description: Please see measure description under the Annual Performance Plan (APP) under section Targets and Performance Summary.							

PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Budget Program: National Weather Service
Sub-program: Science & Technology Integration
Program Change: Hurricane Forecast Improvement Project

	Object Class	FY 2015 Decrease	FY 2015 Total Program
11	Personnel compensation		
11.1	Full-time permanent	$0	$48,413
11.3	Other than full-time permanent	0	197
11.5	Other personnel compensation	0	1,257
11.6	Leave Surcharge Full-Time	0	0
11.7	Military personnel	0	0
11.8	Special personnel services payments	0	0
11.9	Total personnel compensation	0	49,867
12.1	Civilian personnel benefits	0	14,445
13	Benefits for former personnel	0	76
21	Travel and transportation of persons	0	456
22	Transportation of things	0	40
23.1	Rental payments to GSA	0	2,076
23.2	Rental Payments to others	0	0
23.3	Communications, utilities and misc. charges	0	954
24	Printing and reproduction	0	22
25.1	Advisory and assistance services	(1,322)	11,101
25.2	Other services	(2,860)	12,665
25.3	Purchases of goods & services from Gov't accounts	0	1,810
25.4	Operation and maintenance of facilities	0	0
25.5	Research and development contracts	0	50
25.6	Medical care	0	0
25.7	Operation and maintenance of equipment	0	0
25.8	Subsistence and support of persons	0	0
26	Supplies and materials	0	427
31	Equipment	0	1,826
32	Lands and structures	0	0
33	Investments and loans	0	0
41	Grants, subsidies and contributions	(4,000)	27,785
42	Insurance claims and indemnities	0	0
43	Interest and dividends	0	0
44	Refunds	0	0
99	Total obligations	(8,182)	123,600

APPROPRIATION ACCOUNT: PROCUREMENT, ACQUISITION, AND CONSTRUCTION
SUB-PROGRAM: NWS SYSTEMS ACQUISITION

The objectives of the Systems Acquisition sub-program are to:

- Enhance NOAA's operational observational suite
- Provide High Performance Computing (HPC) capacity of operations and development
- Develop forecaster tools for improved decision support
- Enhance NOAA's dissemination capabilities for weather and climate services and products

OBSERVATIONS

The Observations Program, Project, or Activity (PPA) supports the life-cycle of all NWS observing system investments and provides for new NWS' operational observational requirements. With Procurement, Acquisition and Construction (PAC) funding, NOAA develops improvements to current observational capabilities, provides for large scale recapitalization of significant observational systems, and reengineers systems to meet changing requirements and demands.

Specifically with the PAC appropriation, the Observations PPA:

- Deploys new radiosonde systems to meet radio spectrum allocations changes
- Implements improved sensors to the current observational suite

To achieve these goals, Observations maintains the following programs:

Upper Air (UA) Observations Program executes the Radiosonde Replacement System (RRS) effort.

- The NWS radiosonde network, which is managed by the Observations PPA, is the primary real-time upper air observation system for NOAA prediction models for severe weather, aviation, and marine prediction models and forecasts for day two and beyond. The legacy Radio Direction Finding (RDF) radiosonde network is currently being replaced by a Global Positioning System (GPS) radiosonde network. The replacement ground-receiving and GPS-based radiosonde system has already provided a six-fold increase in independent vertical observing. In addition, the replacement system has virtually eliminated data losses due to physical obstructions. Finally, GPS radiosondes prevent the loss of both wind speed and direction readings due to low antenna angle observations caused by the jet stream carrying RDF radiosondes slightly beyond the radio horizon. RRS meets NOAA's legislative mandate under the Omnibus Budget Reconciliation Act (OBRA) to vacate radio frequency spectra for auction and telecommunication utilization and to reduce bandwidth and interference on the frequencies used to transmit data from the radiosonde to the ground receiving station. GPS radiosondes, in order to meet requirements for reduction of radio-frequency spectrum usage, require deployment of new ground station equipment. This ground equipment provides compatibility with more spectrum efficient radiosonde instruments, while replacing obsolete equipment in service for more than 30 years. The new ground station equipment deployment is scheduled to be completed in FY 2014.

Radar Observations Program executes the Next Generation Weather Radar (NEXRAD) Doppler weather system effort.

- NEXRAD is one of the most important elements in NOAA's capability to warn for severe weather such as tornados, hail, and damaging thunderstorm induced-high winds. NEXRAD, which is managed by the Observations PPA, provides automated signal processing, computerized data processing by sophisticated meteorological software algorithms, and a high-capacity, processor-driven communications capability. NEXRAD, initially developed as a tri-agency Program (NWS, Federal Aviation Administration (FAA), and the United States Air Force Weather Agency) evolved into NEXRAD Product Improvement (NPI) Program, focusing on shared agency requirements to effect synergistic solutions. For example, external FAA radar data are provided to NWS forecast offices to address coverage issues and provide backup data sources. NPI managed the Dual Polarization modification to NEXRAD. Dual Polarization transmits and receives signals in two dimensions, resulting in a significant improvement in precipitation estimation; improved ability to discriminate rain, snow, and hail; and a general improvement in data quality. The Dual Polarization modification contract was awarded in September 2007. Initial deployment began in FY 2011 was completed in FY 2013.

Surface Observations Program executes the Automated Surface Observing System (ASOS) effort.

- ASOS serves as the Nation's primary surface weather observing network and is managed by the Observations PPA. The product improvement portion of this acquisition program developed new ASOS sensor capabilities to meet changing user requirements and decrease maintenance costs for NOAA, DOD, and FAA in this tri-agency program. In FY 2015, NOAA proposes to close out the ASOS Product Improvement Program. The tri-agency ASOS Program Management Committee (Departments of Commerce, Defense and Transportation) agree that there are no current product improvement requirements for ASOS. NWS will continue its tech refresh of the Acquisition Control Unit (ACU), Data Collection Platform (DCP) through its ASOS operations and maintenance budget. This on-going initiative will ensure the continued operation of this critical system that supports the meteorological requirements of both the NWS and FAA. The upgrade to the ACU/DCP will enable ASOS to provide rapidly updated real time sensor data for the Next Generation Air Transportation System (NextGen).

Schedule and Milestones:
FY 2015-2019

- Maintain RRS in Steady State

Deliverables:

- 102 GPS site network within assigned radio spectrum

The ASOS and NEXRAD schedule, milestones, deliverables, and outyear funding estimates are provided with the program change requested for this activity.

CENTRAL PROCESSING

The Central Processing PPA ensures the uninterrupted flow of information and data from collection of observations to central guidance production to local applications of all essential weather and climate data products, and continuity of public watches and warnings.

Specifically with the PAC appropriation, the Central Processing PPA:

- Provides HPC capacity of operations and development
- Develops forecaster tools for improved decision support

To achieve these goals, Central Processing manages the following programs:

Weather and Climate Operational Supercomputing System (WCOSS)
The NWS WCOSS is composed of primary and backup operational supercomputing systems, development computing systems, and the wide area network, which collectively perform a wide range of computational tasks. These tasks include data analysis, data assimilation, execution of complicated prediction models, post processing, and product generation. The WCOSS, which is managed by the Processing PPA, provides support resources for (a) weather and climate forecasting capabilities 24 hours a day, 7 days a week, (b) numerical environmental prediction model development and testing, and (c) dissemination of operational products using the wide area networks. Operational products include national and global weather, water, climate and space weather guidance, forecasts, warnings and analyses to a broad range of users and partners (within NOAA, with other government agencies, military and the general public).

NWS maintains a backup supercomputer system, which is a clone of the primary supercomputer system located in an offsite facility. This system is used to thoroughly test pre-production weather and climate forecasting applications when it is not being used to run the Production Suite during a backup system test or actual emergency. The backup supercomputer system is capable of handling 100 percent of the operational workload should the primary supercomputer system be disrupted. Implementation and maintenance of a redundant WCOSS architecture ensures uninterrupted flow of essential weather and climate data and products, continuity of storm watch and warning services to the public, and compliance with NOAA Critical Infrastructure Protection (CIP) plans.

The increased need for NWS products for air quality, ecosystem, coupled modeling, and short-range ensemble forecasts has increased demands on the infrastructure support required to deliver them. The cyclical upgrade of WCOSS capability is intended to procure the computing and communications equipment needed to receive and process the increasing wealth of environmental data acquired by modernized observing systems, process improved and more sophisticated numerical weather prediction models, and stay current with the supercomputing technology the market has to offer. Execution of this program promotes public safety and the protection of property by providing NWS with the computer systems that are capable of producing more accurate climate and numerical weather prediction (NWP) guidance products for hurricanes, severe thunderstorms, floods, and winter storms. Additionally, the upgraded supercomputing system will more accurately forecast large-scale weather patterns in the medium (3 to 10 days) and extended range (30 days), as well as forecasts of major climate events such as El Niño and La Niña.

The High Performance Computing and Communications Act of 1991 Section 204(a) (2) (P.L. 102-994, 15 U.S.C. 5501-5528) states: “the National Oceanic and Atmospheric Administration shall conduct basic and applied research in weather prediction and ocean sciences, particularly in development of new forecast models, in computational fluid dynamics, and in the incorporation of evolving computer architectures and networks into the systems that carry out agency missions.” NOAA Administrative Order 216-110 establishes a policy for managing high performance computing resources as a corporate asset in support of NOAA's mission. The WCOSS investment supports NOAA’s objectives of: (1) Serving society’s needs for weather and water information; (2) Supporting the Nation's commerce with information for safe, efficient, and environmentally sound transportation; and (3) Providing critical support for NOAA’s mission.

The WCOSS supports strategic use of information technology including integrated high performance computing resources and data archival/retrieval capabilities, as needed to support NOAA's observation systems, data management, and modeling needs for operational service delivery.

NOAA provides environmental monitoring, assessment, and prediction services in order to protect life and property by ensuring an uninterrupted flow of critical forecast products. This program ensures the continued generation of NWS products from operational forecast models and provides support for operating the Hurricane Forecast Improvement Project (HFIP) R&D supercomputer which runs HFIP models in real-time and provides results to the National Hurricane Center (NHC) forecasters as a basis for official hurricane forecasts and warnings. This program also provides support for operating NOAA's R&D supercomputer which serves as meteorological and climate testbeds. Moreover, it supports the climate development work and the Joint Center for Satellite Data Acquisition (JCSDA) efforts.

WCOSS has been designated a Primary Mission Essential Function (PMEF) system. WCOSS has been identified as an essential government resource in the National Security Presidential Directive/NSPD 51 and Homeland Security Presidential Directive/HSPD 20. Funding provided in this program is critical to providing adequate security for this National Critical system.

The Disaster Relief Appropriations Act of 2013 provided additional funding to increase the WCOSS capacity. The increased capacity is currently being implemented with full operations anticipated for the end of FY 2015.

Advanced Weather Interactive Processing System (AWIPS)
AWIPS is the cornerstone of a modernized NWS and is managed by the Central Processing PPA. AWIPS hardware and software were deployed to Weather Forecast Offices (WFOs), River Forecast Centers (RFCs), and other NWS sites throughout the United States from 1996 to 1999. The system has been in the Operations and Maintenance phase of its lifecycle since 1999, and is critical to NWS mission related to the preservation of life and property from severe weather and flooding events, and the enhancement of the national economy.

Sustained investments in the AWIPS hardware, communications, and software infrastructure, are necessary for realizing return on NOAA investments in many other programs such as Next Generation Weather Radar, weather satellites, other weather radars, sensors, and instruments. NWS Government Performance and Results Act goals are based on the effective use of these technology investments along with advanced decision assistance tools, forecast preparation and advanced database capabilities. Continued AWIPS improvements produce increased performance in the NWS GPRA goals of Tornado Warning Lead Time, Flash Flood Warning Lead Time and Winter Storm Warning Lead Time goals.

In 2006, NOAA instituted a major software re-architecture (AWIPS II) with the AWIPS prime contractor through a series of task orders. AWIPS II development was completed in late 2011 and deployment will be completed in 2015.

AWIPS II Extended contains multiple projects to add new and improved functionalities and capabilities for NWS field forecasters, NOAA partners and the public. These capabilities include the National Centers AWIPS (NAWIPS) integration, remote access capabilities to support Incident Meteorologists mission requirements, and training capabilities. In addition, the AWIPS II Extended projects will add new functionalities to more effectively access data providers (data delivery), improve collaboration capabilities among NWS operational units and NOAA trusted

partners, improve means to generate information to support decision makers, and improve ways for forecasters to access and visualize meteorological information.

AWIPS needs to transform its service delivery to better align itself with the emerging needs of the Department of Homeland Security (DHS), Federal Aviation Administration (FAA), emergency managers, decision makers, the American public and industry. Emergency managers, DHS, and industry are demanding increased lead time and more precision and consistency in weather, flood, and hurricane forecasts to improve their decisions for resource planning, evacuation planning, and business operations. These decisions are potentially lifesaving and can have multi-billion dollar impacts on the economy and livelihoods.

Schedule and Milestones:
FY 2015
- Achieve WCOSS capacity of 1,100 Tera (trillion) Floating Point Operations per Second

FY 2016 – 2019:
- Maintain WCOSS in steady state operations
- Maintain Production Suite (NPS) On-Time Product Generation at 99 percent
- Maintain Operational Use Time at 99.9 percent
- Maintain Development Use Time at 99 percent

Deliverables:
- Operational WCOSS with full backup capability
- Production Suite (NPS) On-Time Product Generation at 99 percent
- Operational Use Time at 99.9 percent
- Development Use Time at 99 percent

The AWIPS schedule, milestones, deliverables, and outyear funding estimates are provided with the program change requested for this activity

DISSEMINATION

To ensure a Weather-Ready Nation and optimize the delivery of scalable and agile dissemination capabilities, the Dissemination PPA is organized around infrastructure, networks, web services and warning services.

Specifically within the PAC appropriation, the Dissemination PPA:
- Procures NWS' IT dissemination infrastructure and services
- Closes NWS' dissemination requirements and gaps
- Enhances NWS' dissemination system capabilities
- Builds an NOAA wide enterprise architecture
- Develops a strategy to maximize effectiveness while minimizing cost

To achieve these goals, Dissemination manages the following programs:

NWS Telecommunications Gateway (NWSTG)
The NWSTG (http://www.weather.gov/tg/), which is managed by the Dissemination PPA, is the NWS communications hub for collecting and distributing weather data and products. NWSTG provides national and global collection and distribution of environmental data and forecast products to its field units and external users. Replacing the NWSTG functions with up-to-date technology will reduce the current delays in collecting and disseminating data by reducing

transit time through the NWSTG. The replacement will ensure reliable delivery of NWS products to users and will fully capitalize on better observation data and prediction models to improve services.

Timely, available, and accurate weather forecasts and warnings are critical to the health and well-being of the citizens and businesses in the United States and around the world. The NWSTG facilitates every NWS GPRA goal including: Tornado Warning Lead Time, Flash Flood Warning Lead Time, Winter Storm Warnings Lead Time, and Hurricane Track Forecasts. Weather and environmental disturbances have the potential to disrupt virtually every major public infrastructure system including transportation systems, power grids, telecommunications, and emergency response systems that protect the public. If any of the above were to occur, the effect on government would most probably come in the form of denial of service to the users of the services. Minutes count in saving lives and the performance of the NWS dissemination systems to supply information needed is crucial. The NWSTG has been identified as an essential government resource in Presidential Decision Directive 67 – Enduring Constitutional Government and Continuity of Government Operations.

Complete and Sustain NOAA Weather Radio

NWS faces challenges in its efforts to sustain a high level of reliability and maintainability of NOAA Weather Radio (NWR), due to equipment obsolescence and degraded reliability. Four hundred (400) NWR station transmitters employ 1970's-installed vacuum tube technology from four different manufacturers. These older stations are less reliable than newer ones using solid-state transmitters. Older stations demonstrate mean time between failure (MTBF) rates of 6,000 hours, or one failure every 250 days. In comparison, newer solid-state transmitters demonstrate MTBF of over 10,000 hours, a 67 percent improvement. Furthermore, stations have single points of failure due to configurations that include single, instead of dual, transmitters and lack of backup power generators to ensure continued service in the event of primary electrical service failure. Combined, these factors significantly decrease reliability and availability and increase logistics and maintenance costs. Refurbishing these older stations and adequately funding operations and maintenance costs will allow NWR to meet expectations of availability as the Nation's weather and all hazard warning system. NWR is managed by the Disseminate PPA.

NWS will implement the NWR Console Replacement System (CRS) functions in the AWIPS-II at each of the 122 Weather Forecast Offices (WFOs) to sustain the NWS capability to quickly disseminate severe and high impact weather warnings, watches and forecasts and non-weather emergency messages to the public. NWS will implement the NOAA Weather Wire Service (NWWS) broadcast to emergency managers and other customers using the AWIPS Satellite Broadcast Network (SBN) to replace the service provided by the NWWS contractor.

Ground Readiness Project (GRP)

GRP, which is managed by the Dissemination PPA, will ensure utilization of the substantial increase in environmental satellite, radar, and model data that will improve weather warnings and forecasts. NWS is updating its information technology (IT) infrastructure with the GRP program to ensure adequate processing, delivery and exploitation of new environmental satellite, model, and radar data. In order to improve the fidelity and accuracy of weather warnings and forecasts, NOAA has invested billions of dollars in new satellite sensing systems and data sets within NOAA's National Environmental Satellite, Data, and Information Service (NESDIS) that will come online over the course of fiscal years 2015-2017.

The GRP investment will prepare NOAA for the three-fold increase in data volume expected from these new systems, which would far exceed the capacity of NWS's current IT infrastructure to transmit the data to NWS forecast offices and between systems. To fully exploit and benefit from these new observations and products, NWS's IT infrastructure must be enhanced.

With GRP, NWS will take a holistic, enterprise-based approach to managing and integrating the necessary IT infrastructure redesign and upgrades. These IT infrastructure upgrades will allow the NWS to boost both data-processing and dissemination capabilities. NWS primary dissemination capabilities include both a Satellite Broadcast Network (SBN) and terrestrial communication circuits. The SBN is a key component of the NWS AWIPS communication network that feeds data to all NWS Weather Forecast Offices (WFOs) and River Forecast Centers (RFCs) nationwide and distributes information among these NWS sites, as well as provides for dissemination of information to the public and other outside users. Furthermore NWS direct readout (DRO) antennas will be enhanced to receive broadcasts from the new Geostationary Operational Environmental Satellite R-Series (GOES-R) which has a data transmission rate 13 times the previous generation satellite system. All of these IT infrastructure investments support and allow for improved weather warnings and forecasts.

Schedule and Milestones:
FY 2015-2019**:**

- Procure final 80 transmitters
- Install remaining 181 transmitters
- Upgrade telecoms to digital Image and Publications System
- Replace obsolete transmitter site monitoring equipment
- Procure and install 240 antennas/coaxial cables
- Procure and install 160 generators
- Replace 133 Radio Frequency (RF) test meters
- Procure 138 RF signal analyzers
- Conduct transmitter O&M

Deliverables:

- 100 percent solid state transmitter network for all 1010+ stations
- Replacement of obsolete and end-of-life site components
- 96 percent or better station availability

The NWSTG and GRP schedule, milestones, deliverables, and outyear funding estimates are provided with the program change requested for this activity.

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PROGRAM CHANGES FOR FY 2015:

Observations: Termination of Automated Surface Observing System Product Improvement: (Base Funding: $1,635,000 and 9 FTE; Program Change: -$1,635,000 and -9 FTE): NOAA requests a planned decrease of $1,635,000 and 9 FTE for a total of $0 and 0 FTE for the planned completion of the Automated Surface Observing System (ASOS) Product Improvement (PI) program.

Proposed Action:
NOAA proposes to close out this program. The ASOS PI program has implemented new beneficial technologies, replaced sensors no longer in production, and reduced maintenance costs. ASOS PI has also improved performance in solid and liquid/solid mixes of precipitation and in icing conditions. These have promoted increased aviation safety, and improved weather forecasting and climatology. ASOS PI completed full-scale production and deployment of replacement Ceilometers for the logistically unsupportable legacy sensors on ASOS. ASOS PI most recently supported the deployment of Enhanced Precipitation Identifier sensors to NWS ASOS sites. The tri-agency ASOS Program Management Committee (Departments of Commerce, Defense and Transportation) agree that there are no current product improvement requirements for ASOS.

The incumbents of the nine positions will be absorbed within the organization through attrition. NWS will make every effort to minimize the impact to affected ASOS employees.

Resources Assessment:
Current resources are used to develop new ASOS sensor capabilities to meet changing user requirements and decrease maintenance costs for Departments of Commerce, Defense and Transportation in this tri-agency program. There are no current product improvement requirements for ASOS.

Schedule and Milestones:
- Cease NWS support for ASOS PI in FY 2015

Deliverables:
N/A

Outyear Funding Estimates ($ in thousands):

Observations	FY 2014 & Prior	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	CTC	Total
Change from FY 2015 Base		7,665	14,585	23,620	21,318	11,274	N/A	
Total Request	41,545	13,314	20,234	29,269	26,967	16,923	N/A	Recurring

Outyears are estimates only. Future requests will be determined through the annual budget process.
*Includes Disaster Relief Appropriations Act, 2013.
**FY 2014 & Prior is back to FY 2012

PROGRAM CHANGE PERSONNEL DETAIL

Program: National Weather Service
Sub-program: Systems Acquisition
Program Change: Automated Surface Observing System

Title:	Location	Grade	Number of Positions	Annual Salary	Total Salaries
Program Analyst	Silver Spring, MD	GS-14	(1)	$105,211	($105,211)
Physical Scientist	Silver Spring, MD	GS-14	(1)	$105,211	($105,211)
Program Analyst	Silver Spring, MD	GS-13	(1)	$89,033	($89,033)
Physical Scientist	Silver Spring, MD	GS-13	(1)	$89,033	($89,033)
Electronics Engineer	Silver Spring, MD	GS-13	(2)	$89,033	($178,066)
Meteorologist	Silver Spring, MD	GS-13	(1)	$89,033	($89,033)
Electronics Engineer	Silver Spring, MD	GS-12	(1)	$74,872	($74,872)
Meteorologist	Silver Spring, MD	GS-12	(1)	$74,872	($74,872)
Subtotal			(9)		($805,331)
Less Lapse	0%		0		$0
Total Full-time permanent:			(9)		($805,331)
2015 Pay Adjustment	1.0%				($8,053)
TOTAL			(9)		($813,384)

Personnel Data	Number
Full-time Equivalent Employment	
Full-time permanent	(9)
Other than full-time permanent	0
Total	(9)
Authorized Positions:	
Full-time permanent	(9)
Other than full-time permanent	0
Total	(9)

PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Budget Program: National Weather Service
Sub-program: Systems Acquisition
Program Change: Termination of ASOS PI

	Object Class	FY 2015 Decrease	FY 2015 Total Program
11	Personnel compensation		
11.1	Full-time permanent	($813)	$366
11.3	Other than full-time permanent	0	0
11.5	Other personnel compensation	0	3
11.6	Leave Surcharge Full-Time	0	0
11.7	Military personnel	0	0
11.8	Special personnel services payments	0	0
11.9	Total personnel compensation	(813)	369
12.1	Civilian personnel benefits	(223)	106
13	Benefits for former personnel	0	0
21	Travel and transportation of persons	(5)	135
22	Transportation of things	(7)	0
23.1	Rental payments to GSA	0	0
23.2	Rental Payments to others	(2)	0
23.3	Communications, utilities and misc. charges	0	525
24	Printing and reproduction	0	0
25.1	Advisory and assistance services	0	422
25.2	Other services	0	819
25.3	Purchases of goods & services from Gov't accounts	0	0
25.4	Operation and maintenance of facilities	0	0
25.5	Research and development contracts	0	0
25.6	Medical care	0	0
25.7	Operation and maintenance of equipment	0	0
25.8	Subsistence and support of persons	0	0
26	Supplies and materials	(585)	9,756
31	Equipment	0	1,182
32	Lands and structures	0	0
33	Investments and loans	0	0
41	Grants, subsidies and contributions	0	0
42	Insurance claims and indemnities	0	0
43	Interest and dividends	0	0
44	Refunds	0	0
99	Total obligations	(1,635)	13,314

Observations: Next Generation Weather Radar (NEXRAD) Service Life Extension Program: (Base Funding: $0 and 0 FTE; Program Change: +$9,300,000 and 0 FTE): NOAA requests an increase of $9,300,000 and 0 FTE for a total of $9,300,000 and 0 FTE to extend the useful life of the aging Next Generation Weather Radar (NEXRAD) weather radar infrastructure that underpins severe weather forecast and warning services for high-impact events critical for a Weather-Ready Nation. This is a multi-year effort that is anticipated to be completed in 2022.

Proposed Actions:
The National Weather Service's (NWS) 122 operational NEXRADs were fielded in the mid-1990s with an original design life of 20 years. A Service Life Extension Program is required to sustain current weather forecast and warning services until the next generation of weather radars are identified, developed, and deployed. A service life extension will extend the useful life of the NEXRAD array by approximately 15 years. Refurbishing the existing system provides a cost effective approach to preserving this $3.1 billion capital investment[3]. As the radars enter the wear-out failure stage, consequences of not making a service life extension investment include reduced reliability from significant outages causing regional radar gaps, greatly increasing risk not only to the NWS warning mission but also to the missions of Department of Transportation (DOT) and Department of Defense (DOD).

The NEXRAD service life extension is comprised of four components. These components are:

- Radar Receiver and Signal Processor Technology Refresh
- Radar Pedestal Refurbishment
- Transmitter Refurbishment
- Shelter Refurbishment

The NEXRAD service life extension will initially focus on the receiver and signal processor which due to its impending obsolescence is the critical requirement of the Service Life Extension. Provided below is information on the activities that will be conducted in FY 2015.

- Radar Receiver and Signal Processor Technology Refresh: The signal processor has reached the point of obsolesce. In FY 2015, new signal processing replacement hardware will be procured with delivery beginning in FY 2016 and completing in FY 2018. At the same time, new software will be developed to provide antenna control functionality in the new signal processor hardware, thus eliminating obsolete antenna control circuit cards. Initial deployment will begin in FY 2016 with kits shipped from the National Reconditioning Center (NRC) to field beta test sites for installation by local maintenance personnel with assistance from a Depot Team. Actual full scale deployment will begin in late FY 2016 and will finish in FY 2018.

Approximately 85 percent of all tornado warnings are based on radar detections. NWS Government Performance Results Act (GPRA) Tornado Warnings Lead Time performance will be improved through new signal processing techniques enabled by the new signal processor hardware introduced by service life extension.

The Federal Aviation Administration (FAA) has 12 operational NEXRADs and the U.S. Air Force (USAF) has 26 operational NEXRADs. When combined with NWS' 122 operational NEXRADs, these form a nationwide fleet of 160 operational tri-agency radars. This request covers the NWS requirements for this effort. The FAA and USAF will be participating in this service life

[3] Derived from "The Federal Plan for Meteorological Services and Supporting Research", FY 1980-2000.

extension project for their systems as well. Costs will be shared in accordance with an existing tri-agency agreement.

Additional actions within the out-year budget profile for this service life extension includes Radar Pedestal Refurbishment, Transmitter Refurbishment, and Shelter Refurbishment.

- Radar Pedestal Refurbishment: Procurement activities will begin in FY 2016, with multiple award contracts awarded in FY 2017. Refurbishment work will begin in FY 2017 and finish in FY 2022.
- Transmitter Refurbishment: Procurement activities will begin in FY 2016 to purchase materials needed to refurbish transmitter cabinets and build new modulators. Transmitter refurbishment work at field sites will begin FY 2017 and finish in FY 2022.
- Shelter Refurbishment: Procurement activities will begin in FY 2018, with multiple award contracts awarded in FY2019. Refurbishment work will begin in FY 2019 and finish in FY 2022.

Investment in this service life extension mitigates high operational risk by extending the useful life of the radars. Conversely, without this investment, NEXRAD availability will degrade rapidly beginning in 2020 resulting in long-duration radar outages and regional radar gaps; these radar gaps would negatively impact our ability to provide tornado and flash flood warnings. Without this investment, maintenance and operations costs for obsolete radars could accelerate, quickly exceeding technology refreshment budgets. NOAA believes that the cost of pursuing a multi-million dollar, multi-year NEXRAD SLEP are far outweighed by the severe safety, reputation, performance, and compliance impacts discussed above.

Statement of Need and Economic Benefits:
In 2011, severe weather caused over $29 billion of economic losses and contributed to hundreds of deaths[4]. The primary tool used by NOAA's meteorologists for issuing warnings for flash floods, tornadoes and severe thunderstorms is the NEXRAD. NEXRAD data have become integrated into America's decision support serving air traffic management; homeland security; military operations; emergency managers; and water resource management. NEXRAD data is vital to many sectors of the economy including the public media; tourism; agriculture; transportation; and energy production. The current NEXRAD system was fielded in the mid-1990s with an original design life of 20 years. However, the United States is 20-25 years away from full deployment of its next generation weather radar. Therefore, technology refresh efforts and strategic investments are critical to sustaining the availability of the NEXRAD fleet and to maximizing the benefit the NEXRAD network provides until the current network is replaced.

NEXRAD is a tri-agency system that has been instrumental in assisting NWS, FAA, and DOD in meeting mission objectives. The system's performance has met or exceeded the 96 percent operational availability requirement to reliably observe weather and detect severe storms, support forecast/warning programs, protect life and property, promote a safe and efficient National Airspace System, and enhance the Nation's economy. Since deployment began in 1992, the NEXRAD program has executed a continuous program of modifications, retrofits, technology refreshments, and pre-planned product improvement upgrades. The aim of continual modifications was to avoid obsolescence, prevent wholesale replacement, improve data quality, meet new mission requirements, improve system maintainability and reliability, and

[4] NOAA/National Climatic data Center, http://www.ncdc.noaa.gov/billions/events.pdf

control NEXRAD operations and maintenance (O&M) costs. As a result of these sustaining engineering and technology refresh investments, the NEXRAD continues to be upgradable, reliable, and maintainable through at least 2020 with the funding levels in the current NEXRAD O&M program.

An independent assessment of the benefits of the NEXRAD radars concluded that the introduction of the NEXRAD radar network allowed NWS to increase by 70 percent the number of tornadoes warned in advance and increased the warning lead time on all tornadoes by 80 percent. This has led to a 45 percent reduction in tornado related fatalities and a 40 percent reduction in tornado related injuries. If the proposed service life extension is not implemented, NEXRAD radars will begin to become permanently inoperable after 2020, putting lives and property at greater risk.

Tornado warnings lead time performance will be improved through new signal processing techniques enabled by the new signal processor hardware introduced by this service life extension. Specifically, Whitening and Oversampling (introduced in FY 2016-2018) allow faster antenna rotation while improving data quality and adding more frequent scans of the lower atmosphere to better detect quick developing and short-lived tornadoes. Conversely, without this investment, NEXRAD availability will decrease rapidly beginning in 2020, resulting in long-duration radar outages and regional radar gaps; these radar gaps would have a significant negative impact on performance in meeting tornado warning lead time targets. Improvements in FY 2014-2015 result from innovative new antenna scanning strategies that provide more frequent low elevation scans.

Resources Assessment:
The NEXRAD Product Improvement program was terminated in FY 2013. NEXRAD has an O&M program that only supports routine sustainment. The NEXRAD system was initially deployed in the 1990's. NEXRAD radars are currently on average 20 years old. Beginning in FY 2015, NWS plans to undertake a service life extension for the Nation's NEXRAD radars. This project will extend the useful lifetime of NEXRAD by an additional 10 to 15 years.

NEXRAD O&M resources will be utilized to keep radars running, as well as to implement the service life extension. Although current resources will be used to do much of the basic engineering and management of the service life extension, some additional contract services will be needed to manage the effort and to perform technical work in specialized areas. A major investment is needed in order to procure the necessary parts and to fund various contractor implementations of the service life extension program developed by NEXRAD O&M funded personnel. Upon completion, the fleet of NEXRAD radars will be viable until at least 2030, at which time another service life extension program can be performed or the NEXRAD radars can be replaced by a new generation of weather radar.

Schedule and Milestones:
FY 2015

Signal Processor

- Develop software for antenna control, and begin formal testing
- Procure signal processors and related hardware for beta site testing
- Release request for proposals (RFP), establish contracts and begin accepting delivery of all hardware

Transmitter

- Release RFP for transmitter backplane redesign and consolidation of four Control and Monitoring Circuit Card Assembly's (CCA)

FY 2016

Signal Processor

- Complete formal testing, including beta field sites
- Begin deployment of new signal processors
- Modify 31 Field Signal Processers

Pedestal

- Release RFP for Pedestal Refurbishment Contract(s)

Transmitter

- Procure materials needed to refurbish transmitter cabinets and build new modulators
- Select vendor to provide Printed Wiring Board (PWB) replacement of transmitter backplane and consolidation of four Control and Monitoring CCAs
- Use parts to refurbish 4 transmitters to finalize procedures to be used by refurbishment contractor
- Prepare RFP for contractor to refurbish transmitters in the field

FY 2017

Signal Processor

- Modify 102 Field Signal Processers

Pedestal

- Issue solicitation for "full-service" contract to refurbish all WSR-88D Pedestals
- Rebuild 2 pedestals

Transmitter

- NRC begins full scale modulator modification
- Begin receiving new transmitter backplane PWBs and CCAs
- Award transmitter refurbishment contract and begin refurbishment at field sites
- Modify 3 transmitters

Shelter

- Release request for information (RFI) to solicit industry interest and capabilities

FY 2018

Signal Processor

- Complete deployment of Signal Processor Replacement modification

Pedestal

- Rebuild 29 pedestals

Transmitter

- Modify 12 transmitters

Shelter

- Develop RFP based on responses to RFI

FY 2019

Pedestal

- Rebuild 57 pedestals

Transmitter

- Modify 40 transmitters

Shelter

- Release RFP and award contracts
- Begin shelter refurbishment via contract
- Refurbish 9 shelters

Deliverables:

- New signal processor replacing obsolete hardware; implementation of new signal processor software replacing obsolete antenna control cards
- Totally refurbished pedestals with expected service life to at least 2030
- Totally refurbished transmitters with expected service life to at least 2030
- Refurbished radar shelters

Performance Goals and Measurement Data:

Performance Measure: NEXRAD service availability (%)	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With increase	N/A	N/A	96%	96%	96%	96%	96%
Without increase	99.5%	96%	96%	96%	96%	96%	96%
Description: Engineering and logistics analyses have shown that NEXRAD service availability will fall rapidly below 96 percent beginning in 2020 without a SLEP investment, resulting in long-duration outages and regional radar coverage gaps. The goal of SLEP is to prevent this decrease and sustain service availability above 96 percent through at least 2030.							

Performance Measure: Tornado Warnings Lead Time, Measure 15a	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With increase	N/A	N/A	14	14	14	15	15
Without increase	9	13	13	13	13	13	13
Description: Please see measure description under the Annual Performance Plan (APP) under section Targets and Performance Summary.							

Outyear Funding Estimates ($ in thousands):

Observations	**FY 2014 & Prior**	**FY 2015**	**FY 2016**	**FY 2017**	**FY 2018**	**FY 2019**	**CTC**	**Total**
Change from FY 2015 Base		7,665	14,585	23,620	21,318	11,274	N/A	
Total Request	41,545	13,314	20,234	29,269	26,967	16,923	N/A	Recurring

Outyears are estimates only. Future requests will be determined through the annual budget process.
*Includes Disaster Relief Appropriations Act, 2013.
**FY 2014 & Prior is back to FY 2012

PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Budget Program: National Weather Service
Sub-program: Systems Acquisition
Program Change: NEXRAD Service Life Extension Program

	Object Class	FY 2015 Increase	FY 2015 Total Program
11	Personnel compensation		
11.1	Full-time permanent	$0	$366
11.3	Other than full-time permanent	0	0
11.5	Other personnel compensation	0	3
11.6	Leave Surcharge Full-Time	0	0
11.7	Military personnel	0	0
11.8	Special personnel services payments	0	0
11.9	Total personnel compensation	0	369
12.1	Civilian personnel benefits	0	106
13	Benefits for former personnel	0	0
21	Travel and transportation of persons	16	135
22	Transportation of things	0	0
23.1	Rental payments to GSA	0	0
23.2	Rental Payments to others	0	0
23.3	Communications, utilities and misc. charges	0	525
24	Printing and reproduction	0	0
25.1	Advisory and assistance services	0	422
25.2	Other services	385	819
25.3	Purchases of goods & services from Gov't accounts	0	0
25.4	Operation and maintenance of facilities	0	0
25.5	Research and development contracts	0	0
25.6	Medical care	0	0
25.7	Operation and maintenance of equipment	0	0
25.8	Subsistence and support of persons	0	0
26	Supplies and materials	8,899	9,756
31	Equipment	0	1,182
32	Lands and structures	0	0
33	Investments and loans	0	0
41	Grants, subsidies and contributions	0	0
42	Insurance claims and indemnities	0	0
43	Interest and dividends	0	0
44	Refunds	0	0
99	Total obligations	9,300	13,314

Central Processing: Slow Advanced Weather Interactive Processing System Service Improvements (Base Funding: $21,592,000 and 22 FTE; Program Change: -$1,500,000 and 0 FTE): NOAA requests a decrease of $1,500,000 and 0 FTE for a total of $20,092,000 and 22 FTE for Advanced Weather Interactive Processing System (AWIPS) Technology Infusion.

Proposed Action:
NOAA proposes to slow development and implementation of new tools and capabilities aimed at achieving the NWS Future Forecast Office operations. In FY 2015, this will defer the implementation of the AWIPS Weather Event Simulator (WES) application from FY 2015 to FY 2017. The WES application, a comprehensive training capability, will enable NWS forecasters to develop and sustain AWIPS' product and service dissemination skills. WES integration into the operational AWIPS baseline will also allow forecasters to more effectively utilize new Weather-Ready Nation capabilities as they are added to the AWIPS infrastructure.

Remaining funds will support more critical NWS Future Forecast Office operations projects, some of which are listed in the Schedule and Milestones below. NWS Future Forecast Office operations will improve situational awareness during weather events by reducing the time forecasters spend on the production of forecast products and information in order to spend more time supporting Impact-Based Decision Support Services (IDSS).

A reduction to AWIPS will delay future development work associated with new tools and capabilities aimed at improved decision support services to transform NWS' service delivery functions. NWS will be limited in providing future tools and capabilities which meteorologists/hydrologists use in situational awareness for warning/forecast preparation to better align with the emerging needs of a Weather-Ready Nation. The development of robust, efficient service backup capabilities to support local needs as well as COOP activities will also be deferred.

Resources Assessment:
Current resources are used to add new and improved functionalities and capabilities for NWS field forecasters, NOAA partners and the public to address existing and emerging NWS mission requirements. AWIPS II Extended will add new capabilities to more effectively access data providers (data delivery), improve collaboration capabilities to support collaboration among NWS operational units and NOAA trusted partners, improve means to generate information to support decision makers, and improve ways for forecasters to access and visualize meteorological information. Sustained investments in the AWIPS hardware, communications, and software infrastructure, are necessary for realizing return on NOAA investments in many other programs such as NEXRAD, weather satellites, other weather radars, sensors, and instruments. NWS Government Performance and Results Act goals are based on the effective use of these technology investments along with advanced decision assistance tools, forecast preparation and advanced database capabilities. Improvements in NWS Tornado Warning Lead Time, Flash Flood Warning Lead Time and Winter Storm Warning Lead Time goals can only be realized with continued support of, and improvements to AWIPS using new and improved science, and exploiting more accurate and higher resolution data and weather forecast model information.

Schedule and Milestones:
FY 2015-2019:

- Continue to implement new forecast tools and capabilities, but at a slower rate

Deliverables:

- New forecast tools and capabilities for Future Forecast Office operations
- Implementation of IDSS
- New data delivery methods
- WES integration into AWIPS

Performance Goals and Measurement Data:

Performance Measure: Annual number of new capabilities or products introduced into field operations	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With decrease	N/A	N/A	8-18	8-18	8-18	8-18	8-18
Without decrease	N/A	10-20	10-20	10-20	10-20	10-20	10-20
Description: AWIPS II Extended will add new capabilities and products to sustain operations and more effectively access and process data, resulting in better forecasts and warning. This performance measure reflects the number of capabilities and products NWS transitions into field operations per year.							

Outyear Funding Estimates ($ in thousands):

Central Processing	**FY 2014 & Prior**	**FY 2015**	**FY 2016**	**FY 2017**	**FY 2018**	**FY 2019**	**CTC**	**Total**
Change from FY 2015 Base		(1,500)	(1,500)	(1,500)	(1,500)	(1,500)	N/A	
Total Request	203,980	64,261	64,261	64,261	64,261	64,261	N/A	Recurring

Outyears are estimates only. Future requests will be determined through the annual budget process.
*Includes Disaster Relief Appropriations Act, 2013.
**FY 2014 & Prior is back to FY 2012

PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Budget Program: National Weather Service
Sub-program: Systems Acquisition
Program Change: Slow AWIPS Service Improvements

	Object Class	FY 2015 Decrease	FY 2015 Total Program
11	Personnel compensation		
11.1	Full-time permanent	$0	$2,683
11.3	Other than full-time permanent	0	75
11.5	Other personnel compensation	0	35
11.6	Leave Surcharge Full-Time	0	0
11.7	Military personnel	0	0
11.8	Special personnel services payments	0	0
11.9	Total personnel compensation	0	2,793
12.1	Civilian personnel benefits	0	672
13	Benefits for former personnel	0	360
21	Travel and transportation of persons	0	126
22	Transportation of things	0	41
23.1	Rental payments to GSA	0	517
23.2	Rental Payments to others	0	421
23.3	Communications, utilities and misc. charges	0	2,373
24	Printing and reproduction	0	0
25.1	Advisory and assistance services	(1,500)	41,340
25.2	Other services	0	40
25.3	Purchases of goods & services from Gov't accounts	0	64
25.4	Operation and maintenance of facilities	0	0
25.5	Research and development contracts	0	6
25.6	Medical care	0	0
25.7	Operation and maintenance of equipment	0	0
25.8	Subsistence and support of persons	0	0
26	Supplies and materials	0	488
31	Equipment	0	13,315
32	Lands and structures	0	0
33	Investments and loans	0	0
41	Grants, subsidies and contributions	0	1,705
42	Insurance claims and indemnities	0	0
43	Interest and dividends	0	0
44	Refunds	0	0
99	Total obligations	(1,500)	64,261

Dissemination: Re-architected NWS Telecommunications Gateway (Base Funding: $16,215,000 and 0 FTE; Program Change: +$5,000,000 and 0 FTE): NWS requests a planned increase of $5,000,000 and 0 FTE for a total of $21,215,000 and 0 FTE to continue implementation of a re-architected NWS Telecommunications Gateway (NWSTG) and its backup. This effort is a multi-year project that started with funding in FY 2013. The re-architected NWSTG capability will ensure a modern, scalable, extensible, and reliable dissemination and infrastructure services using current best practices.

Proposed Action:
This proposed increase will allow high availability through a fully redundant geographical diverse backup capability, fully eliminating NWSTG functions as a single point of failure for the collection and dissemination of time-perishable products to and from thousands of customers worldwide. A re-architected NWSTG will be poised to accommodate future data volumes driven by increased satellite, numerical model data and climate observations and other requirements, and to maintain system integrity and reliability. Increases in environmental data volume expected from:

- New satellites to include Geostationary Operational Environment Satellite - R series (GOES-R) and Joint Polar Satellite System (JPSS);
- Increases and enhancements of environmental model prediction including High-Resolution Rapid Refresh (HRRR), higher resolution global ensembles and higher resolution short range ensembles); and
- Radar data.

The NWSTG re-architecture effort is part of NWS' Dissemination PPA. The objective is to complete the NWSTG re-architected capabilities by FY 2017 hosted on the NWS dissemination IT infrastructure primary and backup site.

Initial re-architecture efforts started in FY 2013 with the start of the build out of the primary IT dissemination infrastructure to prepare to host the future NWSTG re-architected capabilities. In FY 2015, the continued porting and testing of the IT dissemination infrastructure at the primary and back site will enable completion of the NWSTG re-architecture by FY 2017. By investing into this initiative, the NWSTG re-architected capabilities (and other NWS and NOAA dissemination requirements) will leverage the Dissemination IT infrastructure to maximize overall efficiencies by using shared, robust, scalable and secure infrastructure.

Investment in the NWSTG re-architecture mitigates high operational and safety risks to NWS and NOAA by ensuring 100 percent NWSTG backup capabilities with enhanced abilities to process increases in satellite, model and radar data. Failure of the NWSTG would prevent the collection and dissemination of time perishable products to and from thousands of customers worldwide, greatly reducing the ability of NWS to meet its mission to protect life and property and enhance the national economy. NOAA believes that the cost of pursuing a multi-million dollar, multi-year re-architecture of the program are far outweighed by the severe safety, reputation, performance, and compliance impacts discussed above.

Statement of Need and Economic Benefits:
The NWSTG is the Nation's hub for the collection and distribution of weather data and products. It is a central collection center and communications data switching system for millions of hydrometeorological observations and products each day for NOAA's internal use as well as other user communities, including other Federal Agencies; international organizations; commercial partners; academia; and the public. NWSTG operates twenty-four hours a day, 365 days a year, to acquire data, process observations, construct messages, and disseminate

messages and files of observations, model analysis, and forecast products to NOAA offices and customers world-wide. The NWSTG has been identified as an essential government resource in Presidential Decision Directive 67 – Enduring Constitutional Government and Continuity of Government Operations. In addition, NWSTG serves as the backbone for the Global Information Systems Center (GISC) Washington, serving as a metadata catalogue archive and portal for data inquires for North America, Central America, and the Caribbean.

In FY 2013 the NWSTG realignment technology refreshment was completed. In early FY 2014, the NWSTG has approximately 74 percent of its operational capability backup at the facility located in the NOAA Environmental Security Computing Center (Fairmont, West Virginia). It is important to note that the current NWSTG capability is based on antiquated legacy software designs and technology. To ensure 100 percent backup capability and technological sustainment that can accommodate projected volumes of observational and weather forecast and warning information, the NWSTG architecture requires a re-architecture to ensure the availability, accuracy, and timeliness of critical products and services to thousands of customers worldwide including emergency managers and the public who rely on NWSTG dissemination services for severe weather events.

Resources Assessment:
Current resources are being used to implement a re-architected NWSTG and its backup to ensure a modern, scalable, extensible, and reliable system using current best practices. This includes the implementation and transition of NWSTG functions into a new operational dissemination architecture, allowing the revamped NWSTG to ingest and disseminate new and improved satellite, model and radar data. Additionally, current funding supports telecommunication circuits costs within the NWSTG and ad hoc corrective maintenance. New resources are required to continue the third year of this critical program which will allow high availability through a fully redundant backup system, eliminating NWSTG functions as a single point of failure for the collection and dissemination of time-perishable products to and from thousands of customers worldwide. A re-architected NWSTG will be poised to accommodate future data volumes driven by increased satellite, model and radar data ensuring a return on satellite and supercomputer investments.

Schedule and Milestones:
FY 2015
- Complete dissemination IT infrastructure at primary and backup site
- Provide initial NWSTG re-architected capabilities at dissemination IT infrastructure primary site
- Implement full porting and testing of NWSTG re-architected capabilities onto dissemination IT infrastructure primary and backup site
- Provide foundation to provide full operational capabilities for NWSTG re-architected capabilities by FY 2017 to include NWSTG 100 percent backup capabilities

FY 2016
- Provide NWSTG re-architected capabilities at dissemination IT infrastructure backup site
- Complete full testing of fail-over capabilities between IT infrastructure primary and backup site
- Complete full testing of 7x24 operational NSWTG re-architected monitoring, and problem response and resolution capabilities
- Complete IT security Authority to Operate (ATO)
- Complete training of support staff

- Complete full operational NWSTG re-architected capabilities at dissemination IT infrastructure primary and backup site

FY 2017

- NWSTG re-architected capabilities go-live at dissemination IT infrastructure primary and backup site

FY 2018

- Steady-State

FY 2019

- Steady-State

Deliverables:

- Completed dissemination IT infrastructure for dissemination services at primary and backup sites
- Completed initial NWSTG re-architected capabilities at dissemination IT infrastructure primary site
- Completed capabilities to support continuation of full porting and testing of NWSTG re-architected capabilities onto dissemination IT infrastructure
- Full operational capabilities for NWSTG re-architected capabilities by FY 2017 to include NWSTG 100 percent backup capabilities

Performance Goals and Measurement Data:

Performance Measure: System Availability (%)	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With increase	N/A	N/A	98.0%	98.0%	99.0%	99.9%	99.9%
Without increase	96.6%	98.0%	98.0%	96.6%	95.6%	94.6%	85.0%
Description: This metric is a measure of the effectiveness and robustness of the system. It measures the amount of time the system is on-line and available to support the primary mission.							

Performance Measure: Operational Backup Capability	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With increase	N/A	N/A	80%	90%	100%	100%	100%
Without increase	20%	74%%	74%	74%	74%	74%	74%
Description: This metric is the percentage of operational capability supported by the backup system. The completion of the Technology Re-alignment in early FY 2014 increases the backup capabilities targets with the end goal of implementing 100 percent operational backup capability by the end of FY 2017 via the Dissemination Re-architecture project. The purpose of ensuring all functions are successfully implemented via the backup system at 100% level by 2017 to limit mission interruption and mission degradation to ensure NWS can meet its mission providing timely forecast, watches, and warnings to its customers.							

Outyear Funding Estimates ($ in thousands):

Dissemination	FY 2014 & Prior	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	CTC	Total
Change from FY 2015 Base		11,000	986	(10,021)	(10,021)	(10,021)	N/A	
Total Request	66,095	45,209	35,195	24,188	24,188	24,188	N/A	Recurring

Outyears are estimates only. Future requests will be determined through the annual budget process.
*Includes Disaster Relief Appropriations Act, 2013.
**FY 2014 & Prior is back to FY 2012

PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Budget Program: National Weather Service
Sub-program: Systems Acquisition
Program Change: Re-architected NWS Telecommunications Gateway

	Object Class	FY 2015 Increase	FY 2015 Total Program
11	Personnel compensation		
11.1	Full-time permanent	$0	$0
11.3	Other than full-time permanent	0	0
11.5	Other personnel compensation	0	0
11.6	Leave Surcharge Full-Time	0	0
11.7	Military personnel	0	0
11.8	Special personnel services payments	0	0
11.9	Total personnel compensation	0	0
12.1	Civilian personnel benefits	0	0
13	Benefits for former personnel	0	0
21	Travel and transportation of persons	0	73
22	Transportation of things	0	13
23.1	Rental payments to GSA	0	9
23.2	Rental Payments to others	0	0
23.3	Communications, utilities and misc. charges	0	3,779
24	Printing and reproduction	0	0
25.1	Advisory and assistance services	5,000	25,071
25.2	Other services	0	4,767
25.3	Purchases of goods & services from Gov't accounts	0	326
25.4	Operation and maintenance of facilities	0	0
25.5	Research and development contracts	0	0
25.6	Medical care	0	0
25.7	Operation and maintenance of equipment	0	0
25.8	Subsistence and support of persons	0	0
26	Supplies and materials	0	3,137
31	Equipment	0	8,034
32	Lands and structures	0	0
33	Investments and loans	0	0
41	Grants, subsidies and contributions	0	0
42	Insurance claims and indemnities	0	0
43	Interest and dividends	0	0
44	Refunds	0	0
99	Total obligations	5,000	45,209

Dissemination: Ground Readiness Project (Base Funding: $12,400,000 and 0 FTE; Program Change: +$6,000,000 and 0 FTE): NOAA requests an increase of $6,000,000 and 0 FTE for a total of $18,400,000 and 0 FTE to ensure utilization of the substantial increase in environmental satellite, radar, and model data that will improve weather warnings and forecasts. The National Weather Services' (NWS) ground readiness activities are a multi-year effort that was supported in the FY 2013 President's Budget and began work with funding from the Disaster Relief Appropriations Act, 2013.

Proposed Action:
This NWS Ground Readiness Project (GRP) investment will continue to prepare NOAA for the three-fold increase in data volume expected from new environmental satellites as well as increased models and radar data. This increase in critical environmental data far exceeds the capacity of the organization's current information technology (IT) infrastructure. To fully exploit and benefit from these new observations and products, NWS must upgrade and enhance its IT infrastructure.

In FY 2015, the following capabilities will be delivered:

- GOES-R Rebroadcast antennas (GRB) capability: Funding increase will provide NWS with Geostationary Operational Environmental Satellite-R Series (GOES-R) Rebroadcast antennas (GRB) capabilities. A GRP objective is to ensure that the organization's National Hurricane Center, Aviation Weather Center, Storm Prediction Center, Space Weather Prediction Center, NWS Pacific Region (including Guam), NWS Alaska Region, and NOAA Center for Weather & Climate Prediction (NCWCP) can receive GOES-R data and products, thus ensuring their current operational capabilities can exploit this next generation of satellite data. GOES-R is scheduled for launch in October 2015 and therefore in FY 2015 the above named facilities will replace or upgrade GOES direct readout antennas with GRB. These site antenna upgrades will be implanted per the outcomes of the GRB site survey and assessments scheduled for FY 2013 and early FY 2014.
- NOAA Dissemination Infrastructure backup capability: Funding will continue to build out the dissemination IT infrastructure backup capability.
- Increased dissemination and infrastructure capabilities: In FY 2015, NWS will perform end-to-end capability testing to ensure proper dissemination of GOES-R data as well as the increase in model data. Specifically, using the NWS dissemination infrastructure and augmenting as required, GRP will test functionality to sectorize, composite, integrate and streamline the large volumes and types of new data and metadata. The capabilities will allow NWS to significantly improve current methods of processing and distribution of data by developing intelligent distribution logic and software (smart push/pull). The system architecture includes Advanced Weather interactive Processing System (AWIPS), NWS Telecommunications Gateway (NWSTG), and the National Centers for Environmental Prediction (NCEP).
- Improved and increased terrestrial networking and interagency peering capabilities: In FY 2014, NWS will initiate its network upgrades effort to prepare for the increased data from satellite, models and radars. In FY 2015, the focus will continue to be on providing terrestrial network bandwidth and reliability upgrades to NWS while improving acquisition, management, and security processes.

Investment in GRP mitigates operational risk that NOAA would be limited to current processing and dissemination capacities, jeopardizing a return on satellite and modeling investments. NOAA has invested billions of dollars in new satellite sensing systems and data sets within the

National Environmental Satellite, Data, and Information Service (NESDIS) that have started coming online and will continue through FY 2017 with GOES-R and the Joint Polar Satellite System (JPSS). NOAA believes that the cost of pursuing this funding is far outweighed by the severe risk from not being able to utilize satellite investments and the important safety, reputation, and performance impacts discussed above.

Statement of Need and Economic Benefits:
This investment will continue to enable NWS to better meet the requirements of local, state, and Federal first responders, emergency managers, the private-weather industry, and decision-makers for significantly refined warnings and forecasts, and ensure a Weather-Ready Nation. In particular, new satellite data and processing capabilities will improve forecasts from the county/multi-town scale to the neighborhood scale, and in some cases, even street level. The activities proposed in this initiative will continue to ensure that NWS is able to exploit new satellite, radar and model data. This will also result in more refined, reliable, and advanced notice of deadly weather events by improving tornado lead time and reducing false alarm rates, which helps to save lives and decision support services.

This funding profile covers the costs needed to acquire and sustain the IT infrastructure (hardware, software and telecommunications) required to maintain mission continuity and exploit the increased satellite observations.

Resources Assessment:
Current resources are used to prepare NWS for satellite, model and radar ground readiness. Specifically, capability will be increased to the organization's dissemination and IT infrastructure. The capabilities delivered will allow NWS to significantly improve current methods of processing and distribution of new and improved satellite, model and radar data. Additionally, resources will provide improved and increased terrestrial networking and interagency peering capabilities. This includes upgrades and improved services for both the NWS terrestrial and Satellite Broadcast Network (SBN). Upgrades will include improved reliability and increased networking bandwidth to the WFO, RFC, NCEP, NWS Headquarters development and test beds, and training centers to support increases in data volume.

Schedule and Milestones:
FY 2015
- Complete direct readout antenna upgrades
- Go operational with primary and backup infrastructure and dissemination functionality and support post-launch tests
- Complete testing with NESDIS Product Distribution and Access system
- Deliver and sustain networking upgrade for ground readiness functionality
- Successfully complete capacity end-to-end testing for increase in satellite, model and radar data. Includes conducting GOES-R readiness testing activities
- Upgrade and optimize NWS networks and communications infrastructure

FY 2016
- Checkout GOES-R launch and post-launch
- Complete final testing for direct readout antenna upgrades and related product generation
- Deliver and sustain networking upgrade and ground readiness functionality
- Continue to upgrade and optimize NWS networks and communications infrastructure

FY 2017

- Conduct needed refresh and operation and maintenance activities as new satellite, model and radar data sets become available. Includes conducting JPSS readiness testing activities
- Conduct overall network and communication infrastructure maintenance and improvement activities

FY 2018

- Conduct needed refresh and operation and maintenance activities as new satellite, model and radar data sets become available
- Conduct overall network and communications infrastructure maintenance and improvement activities

FY 2019

- Conduct needed refresh and operation and maintenance activities as new satellite, model and radar data sets become available
- Conduct overall network and communications infrastructure maintenance and improvement activities

Deliverables:

- Improved NWS networking and communications infrastructure reliability and increased terrestrial and satellite telecommunications bandwidth
- GRB antennas and product generation capabilities

Performance Goals and Measurement Data:

Performance Measure: Percent (%) of mission required satellite data processed and distributed within targeted time	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With increase	N/A	N/A	98.5%	98.5%	98.5%	98.5%	98.5%
Without increase	N/A	98%	98%	70%	50%	30%	30%
Description: The without increase targets reflect the reduction in availability of satellite data. Suomi National Polar-orbiting Partnership data would need to be reduced to legacy sizes with full legacy GOES starting in FY 2013. GOES-R data would be reduced to legacy GOES sizes in FY 2015 due to only one legacy satellite being fully available with the reduced availability of the new GOES-R data. JPSS will have reduced availability by FY 2017 if NWS remains at legacy capability. The without increase target data are high level estimates based upon the ratio of legacy data to the full data set that each satellite will bring.							

Outyear Funding Estimates ($ in thousands):

Dissemination	FY 2014 & Prior	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	CTC	Total
Change from FY 2015 Base		11,000	986	(10,021)	(10,021)	(10,021)	N/A	
Total Request	66,095	45,209	35,195	24,188	24,188	24,188	N/A	Recurring

Outyears are estimates only. Future requests will be determined through the annual budget process.
*Includes Disaster Relief Appropriations Act, 2013.
**FY 2014 & Prior is back to FY 2012

PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Budget Program: National Weather Service
Sub-program: Systems Acquisition
Program Change: Ground Readiness Project

	Object Class	FY 2015 Increase	FY 2015 Total Program
11	Personnel compensation		
11.1	Full-time permanent	$0	$0
11.3	Other than full-time permanent	0	0
11.5	Other personnel compensation	0	0
11.6	Leave Surcharge Full-Time	0	0
11.7	Military personnel	0	0
11.8	Special personnel services payments	0	0
11.9	Total personnel compensation	0	0
12.1	Civilian personnel benefits	0	0
12.2	Military personnel benefits	0	0
12.3	Civilian personnel benefits	0	0
13	Benefits for former personnel	0	0
21	Travel and transportation of persons	0	73
22	Transportation of things	0	13
23.1	Rental payments to GSA	0	9
23.2	Rental Payments to others	0	0
23.3	Communications, utilities and misc. charges	0	3,779
24	Printing and reproduction	0	0
25.1	Advisory and assistance services	6,000	25,071
25.2	Other services	0	4,767
25.3	Purchases of goods & services from Gov't accounts	0	326
25.4	Operation and maintenance of facilities	0	0
25.5	Research and development contracts	0	0
25.6	Medical care	0	0
25.7	Operation and maintenance of equipment	0	0
25.8	Subsistence and support of persons	0	0
26	Supplies and materials	0	3,137
31	Equipment	0	8,034
32	Lands and structures	0	0
33	Investments and loans	0	0
41	Grants, subsidies and contributions	0	0
42	Insurance claims and indemnities	0	0
43	Interest and dividends	0	0
44	Refunds	0	0
99	Total obligations	6,000	45,209

APPROPRIATION ACCOUNT: PROCUREMENT, ACQUISITION, AND CONSTRUCTION
SUB-PROGRAM: NWS CONSTRUCTION

The objective of the Construction sub-program is to:

- Construct and provide for major repairs to Forecast Offices and other government owned weather facilities

FACILITIES CONSTRUCTION & MAJOR REPAIRS

To support its mission, the NWS operates and maintains 122 Weather Forecast Offices (WFO); 13 River Forecast Centers (RFC); 18 Weather Service Offices (WSO); 9 National Centers; 2 Data Collection Offices; and 2 Tsunami Warning Centers. Of the WFOs and RFCs, 35 are leased. To support these facilities, the Facilities Construction & Major Repairs PPA account is managed by NWS Headquarters in a matrixed approach.

The objectives of the Facilities Construction & Major Repairs sub-program are to:

- Upgrade and improve NOAA's Forecast Offices
- Maintain structural integrity through capital improvements
- Maintain compliance with Federal law and national and local building codes

This program, formerly known as WFO Construction, started in the late 1980s as part of the NWS modernization and restructuring program. The original scope of the project, completed in FY 1999, included the construction or lease of 117 WFOs (13 of which were co-located with RFC) at a cost of approximately $250 million. Since then, NWS added five WFOs to address service coverage requirements in Guam; Northern Indiana; Caribou, Maine; Huntsville, Alabama; and Key West, Florida, bringing the total WFOs to 122. The original modernization scope did not include the upgrade and modernization of Alaska and Pacific Region Weather Service Offices and associated employee housing units. The original modernization facilities are reaching and exceeding twenty years in age and require typical capital improvements necessary to maintain their structural integrity, (e.g., heating, ventilating, and air conditioning systems (HVAC), roof and uninterruptible power supply replacements). In addition, this effort is essential to maintaining compliance with Federal law and national and local building codes.

The schedule, milestones, deliverables, and outyear funding estimates are provided with the program changes requested for this activity.

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PROGRAM CHANGES FOR FY 2015:

Facilities Construction & Major Repairs: Weather Forecast Office and River Forecast Center Relocations (Base Funding: $8,000,000 and 0 FTE; Program Change: -$2,350,000 and 0 FTE): NOAA requests a decrease of -$2,350,000 and 0 FTE for a total of $5,650,000 and 0 FTE to slow investments that provide tenant improvements (TI) and support costs associated with Weather Forecast Office (WFO) and River Forecast Center (RFC) relocations due to unacceptable conditions at leased facilities that could impact operations.

Proposed Actions:
In FY 2014, NWS requested one-time funds to relocate Weather Forecast Offices' whose deteriorating conditions interfered with the mission and functions of the NWS employees who worked there. As the funds were for one-year only, a planned decrease was expected; however, NOAA requests to continue this level of funding as the NWS has a continuing need to relocate other WFOs.
Investment in the WFO and RFC relocations mitigates operational risks as these improvements are needed for the continuity of weather forecast and warning operations and compliance with weather office standards. Standards of structural integrity, maintenance, security, temperature control, and adequate utilities ensure those forecasters, and the computing and system resources they rely on, meet regulations for issuing weather forecasts and warnings. Further, these Forecast Offices (FOs) are located in severe weather areas, such as tornados and hurricanes, where citizens, emergency managers, and local officials count on the timely and accurate delivery of weather warnings.

In FY 2015, NWS will continue the relocation of WFO/RFCs. NWS will pursue Build-to-Suit leases for each of these FOs. Under a Build-to-Suit lease, the offeror constructs a facility to NWS specifications and then leases the land and facility to the NWS. The Build-to-Suit strategy provides: flexibility, customization and reduced upfront budgetary resource requirements. NWS is seeking tenant improvements (TI) and associated move costs for these FOs. NWS would align lease terms to ensure flexibility for future needs.

General Services Administration's (GSA) policy requires agencies to breakout mission unique requirements above the standard space with HVAC and lighting. These unique requirements are known as TIs and according to GSA policy should be funded separately from the lease. TI costs are estimated to be $900,000 per facility and move costs are estimated to be $600,000 per facility. NWS mission unique requirements include:

- Critical circuits and Communications
- Information Technology requirements - raised flooring; additional heating, ventilating, and air conditioning (HVAC) for Computer Room
- Tornado Shelter, as required
- Upper Air Inflatable Shelter, as required
- Security Equipment and Access Control (HSPD-12)
- Uninterruptible power supply (UPS) / Emergency Generator / Fuel Tank

Relocating a FO requires considerable costs. These costs include:

- Installation of dedicated, remote communications to existing Next Generation Weather Radar (NEXRAD)
- Relocation of all communication circuitry
- Relocation of entire Information Technology suite, including OPSnet, Advanced Weather Interactive Processing System (AWIPS) and Upper Air systems

- Parallel operation of dual AWIPS equipment during transition
- Relocation of office furniture and fixtures

Statement of Need and Economic Benefits:
To support its mission, the NWS operates a number of unique facilities including 122 WFO and 13 River Forecast Centers (RFCs). Of this total, 35 FOs have been leased since the 1990s. Today, four of these leased facilities face a multitude of issues making them unsustainable for continued operations. These leased facilities are currently facing immediate challenges.

Since the inception of these leases, many additional regulations have been implemented such as the Americans with Disabilities Act. These facilities do not comply with those regulations. At several sites, major systems such as HVAC are currently non-functional. Loss of these facilities will adversely impact vital service delivery, jeopardizing life and property. Without additional funding, NOAA will be required to revert to short-term, limited competition leases.

Resources Assessment:
The current resources for this activity are described in the Facilities Construction & Major Repairs narrative.

Schedule and Milestones:
FY 2015
- Relocate WFO/RFCs

Deliverables:
- WFO's and WFO/RFC's under new leased facilities

Outyear Funding Estimates ($ in thousands):

Facilities Construction & Major Repairs	FY 2014 & Prior	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	CTC	Total
Change from FY 2015 Base		5,710	(4,841)	(4,841)	(4,841)	(4,841)	0	
Total Request	12,587	13,710	3,159	3,159	3,159	3,159	N/A	Recurring

Outyears are estimates only. Future requests will be determined through the annual budget process.
*Includes Disaster Relief Appropriations Act, 2013.
**FY 2014 & Prior is back to FY 2012

PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Budget Program: National Weather Service
Sub-program: Construction
Program Change: Weather Forecast Office and River Forecast Center Relocations

	Object Class	FY 2015 Decrease	FY 2015 Total Program
11	Personnel compensation		
11.1	Full-time permanent	$0	$0
11.3	Other than full-time permanent	0	0
11.5	Other personnel compensation	0	0
11.6	Leave Surcharge Full-Time	0	0
11.7	Military personnel	0	0
11.8	Special personnel services payments	0	0
11.9	Total personnel compensation	0	0
12.1	Civilian personnel benefits	0	0
12.2	Military personnel benefits	0	0
12.3	Civilian personnel benefits	0	0
13	Benefits for former personnel	0	0
21	Travel and transportation of persons	0	26
22	Transportation of things	0	0
23.1	Rental payments to GSA	0	0
23.2	Rental Payments to others	0	0
23.3	Communications, utilities and misc. charges	0	0
24	Printing and reproduction	0	0
25.1	Advisory and assistance services	(2,350)	4,205
25.2	Other services	0	2,603
25.3	Purchases of goods & services from Gov't accounts	0	315
25.4	Operation and maintenance of facilities	0	0
25.5	Research and development contracts	0	0
25.6	Medical care	0	0
25.7	Operation and maintenance of equipment	0	0
25.8	Subsistence and support of persons	0	0
26	Supplies and materials	0	210
31	Equipment	0	0
32	Lands and structures	0	6,351
33	Investments and loans	0	0
41	Grants, subsidies and contributions	0	0
42	Insurance claims and indemnities	0	0
43	Interest and dividends	0	0
44	Refunds	0	0
99	Total obligations	(2,350)	13,710

Facilities Construction & Major Repairs: Relocation of the National Logistics Supply Center/National Reconditioning Center (Base Funding: $0 and 0 FTE; Program Change: + $8,060,000 and 0 FTE): NOAA requests an increase of $8,060,000 and 0 FTE for a total of $8,060,000 and 0 FTE for the relocation of the National Logistics Supply Center/National Reconditioning Center (NLSC/NRC) from the Bannister Federal Complex in Kansas City, Missouri (MO). The forced relocation of NLSC/NRC is a requirement of the General Services Administration (GSA), who plans to sell the property.

Proposed Actions:
GSA is closing the Bannister Federal Complex in order to reduce the overall Federal Real Property Portfolio. GSA requires that the NWS' NLSC/NRC vacate the property by December 31, 2015. GSA will manage the procurement of the new leased industrial facility to relocate NLSC/NRC. GSA is planning a fixed, fifteen year term lease of the new facility.

This request will fund the following GSA requirements related to the NLSC/NRC relocation:

- Requirements Development Needs in December 2014 ($103,000);
- Tenant Improvements (TI) of the new leased industrial facility in March, 2015 ($6,351,000); and
- Relocation, move and related support in FY 2015 ($1,606,000).

GSA will provide $1,584,340 of the funding for the requirements development needs and move costs. NOAA will amortize the remaining TI costs over the lease term.

Investment in the forced NLSC/NRC relocation mitigates operational risks by funding the relocation and TI of a new facility that will continue to provide year round, 24x7 operational support to the NWS mission. Key NWS observational infrastructure such as Next Generation Weather Radars and Automated Surface Observing Systems depend on the parts coming from NRC/NLSC to maintain 96 percent availability needed to support weather forecast activities. This initiative will be consistent with efforts to reduce the Federal footprint..

Statement of Need and Economic Benefits:
The NLSC/NRC is the hub that provides mission critical components through which NWS equipment and Tri-Agency Federal Aviation Administration and Department of Defense equipment pass for repair, quality inspection, warehousing, and distribution. The NWS mission requires 24/7, 365 day operational support which is currently provide by NLSC/NRC. The total capital inventory managed in this facility is valued at over $130 million. NLSC manages over 12,000 stock items and ships an average of 130 line items daily to over 14,500 customer sites world-wide. NRC makes over 12,000 repairs each year to critical components of the weather enterprise infrastructure including components of observation systems.

NLSC/NRC is housed within Bannister Federal Complex, a GSA owned facility. With the 2014 departure of its largest tenant, Department of Energy, GSA has opted to sell the Bannister Federal Complex, requiring NWS' relocation from this facility. NLSC/NRC currently occupies 315,525 square feet at the Bannister Federal Complex.

GSA will help NOAA locate a new facility. However, costs associated with rent and tenant improvements are NOAA's responsibility. GSA and NOAA continue to negotiate the specifics of the relocation.

Resources Assessment

This is a new initiative and does not have current funding.

Schedule and Milestones:
FY 2015
- Conduct move and TI for NRC/NLSC TI

Deliverables:
- NRC/NLSC fully operational at new location and under new lease

Outyear Funding Estimates ($ in thousands):

Facilities Construction & Major Repairs	FY 2014 & Prior	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	CTC	Total
Change from FY 2015 Base		5,710	(4,841)	(4,841)	(4,841)	(4,841)	0	
Total Request	12,587	13,710	3,159	3,159	3,159	3,159	N/A	Recurring

Outyears are estimates only. Future requests will be determined through the annual budget process.
*Includes Disaster Relief Appropriations Act, 2013.
**FY 2014 & Prior is back to FY 2012

PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Budget Program: National Weather Service
Sub-program: Construction
Program Change: Relocation of the National Logistics Supply Center/National Reconditioning Center

	Object Class	FY 2015 Increase	FY 2015 Total Program
11	Personnel compensation		
11.1	Full-time permanent	$0	$0
11.3	Other than full-time permanent	0	0
11.5	Other personnel compensation	0	0
11.6	Leave Surcharge Full-Time	0	0
11.7	Military personnel	0	0
11.8	Special personnel services payments	0	0
11.9	Total personnel compensation	0	0
12.1	Civilian personnel benefits	0	0
12.2	Military personnel benefits	0	0
12.3	Civilian personnel benefits	0	0
13	Benefits for former personnel	0	0
21	Travel and transportation of persons	0	26
22	Transportation of things	0	0
23.1	Rental payments to GSA	0	0
23.2	Rental Payments to others	0	0
23.3	Communications, utilities and misc. charges	0	0
24	Printing and reproduction	0	0
25.1	Advisory and assistance services	1,709	4,205
25.2	Other services	0	2,603
25.3	Purchases of goods & services from Gov't accounts	0	315
25.4	Operation and maintenance of facilities	0	0
25.5	Research and development contracts	0	0
25.6	Medical care	0	0
25.7	Operation and maintenance of equipment	0	0
25.8	Subsistence and support of persons	0	0
26	Supplies and materials	0	210
31	Equipment	0	0
32	Lands and structures	6,351	6,351
33	Investments and loans	0	0
41	Grants, subsidies and contributions	0	0
42	Insurance claims and indemnities	0	0
43	Interest and dividends	0	0
44	Refunds	0	0
99	Total obligations	8,060	13,710

BUDGET PROGRAM: NATIONAL ENVIRONMENTAL SATELLITE, DATA, AND INFORMATION SERVICE

For FY 2015, NOAA requests a total of $2,247,926,000 and 909 FTE for the National Environmental Satellite, Data and Information Service (NESDIS). This funding includes a net increase of $161,909,000 and 2 FTE in program changes.

NESDIS OVERVIEW

NESDIS is responsible for the procurement, launch, and operation of the Nation's civil operational environmental satellites. Along with providing for the health, safety and management of the satellites, NESDIS manages the product development and distribution of the corresponding data.

In FY 2015, NOAA is proposing to restructure NESDIS Operations, Research and Facilities (ORF) and Procurement, Acquisition, and Construction (PAC) account projects, programs and activities (PPAs) as part of a broader effort to reorganize several of its components to best fulfill its critically important mission, and to examine more cost-effective means of providing its products and services. The new budget structure strengthens both the satellite and data management sides of NESDIS and better coordinates systems engineering and common ground services. NOAA believes that this approach prioritizes the need to sustain core competencies in its key overarching functions of remote and in-situ observations relevant to the environment, delivery of critical and value added data, and its stewardship. This restructure is reflected in the crosswalk tables provided in the ORF and PAC Exhibits 18 and 19 (pages ORF-22 and ORF-25) (pages PAC-14 and PAC-17) and in the tables accompanying this narrative (page NESDIS-7 and NESDIS-8).

NESDIS proposes two sub-programs in the restructuring under the Operations, Research and Facilities account: 1) Environmental Satellite Observing Systems, with $121,542,000 and 386 FTE and 2) National Environmental Information Office, with $67,067,000 and 289 FTE.

The goals of the Environmental Satellite Observing Systems sub-program include: (1) maintaining a system of polar-orbiting satellites to obtain global environmental data; (2) maintaining a system of geostationary satellites to provide near-continuous environmental observations of the Earth's Western Hemisphere; (3) acquiring, processing, and analyzing data from NOAA, the Department of Defense (DOD), and other Earth-observing satellites; (4) supplying data and interpretations to users; (5) introducing new technology and processes to improve environmental satellite system capabilities; (6) determining requirements for future satellite systems; (7) serving as the lead U.S. agency for the Search and Rescue satellite system, including operating and maintaining the mission control center; (8) monitoring global sea ice conditions to support safe and effective marine transportation; and (9) demonstrating better ways to use and distribute environmental data from NOAA, the National Aeronautic and Space Administration (NASA), and other satellites, aircraft, and laboratory investigations.

The Environmental Satellite Observing Systems sub-program includes the following budget Line Items and PPAs for FY 2015:

- Satellite and Product Operations and NOAA Satellite Operations Facility (NSOF) operations;
- Product Development, Readiness, and Application (PDR&A);
- Commercial Remote Sensing Regulatory Affairs (CRSRA);
- Office of Space Commercialization (OSC); and
- Group on Earth Observations (GEO).

The goal of the National Environmental Information Office (NEIO) sub-program is: 1) to provide the Nation with the long-term archive of and access to past, present, and future environmental observations and associated data recorded across the U.S. and globally; and 2) to provide worldwide environmental data and information products and services in the atmospheric, oceanographic, marine, solid Earth, and solar-terrestrial sciences to meet the needs of users.

The National Environmental Information Office sub-program includes the National Environmental Information Office budget Line Item and PPA for FY 2015.

NESDIS proposes two sub-programs in the restructuring under the Procurement, Acquisition and Construction account: 1) Systems Acquisition and 2) Construction.

The Systems Acquisition sub-program ($1,894,738,000 and 232 FTE) includes the PPAs below:
- Geostationary Systems – R Series;
- Altimetry Mission – Jason-3;
- Polar Orbiting Systems – Joint Polar Satellite System (JPSS);
- Deep Space Climate Observatory (DSCOVR);
- COSMIC 2/Global Navigation Satellite System Radio Occultation (GNSS RO);
- Satellite Ground Services (SGS);
- Systems Architecture and Advanced Planning (SAAP); and,
- Projects, Planning and Analysis (PPA).

The Construction sub-program includes the Satellite CDA Facility ($2,228,000 and 0 FTE).

Specifically, the major NESDIS changes include:

- Creating four new organizational elements with associated PPAs:
  Within ORF:
  1. National Environmental Information Office (NEIO), which will be the official data management entity for weather, climate, oceanographic, and geophysical information from both U.S. and international sources. NEIO will merge funding for the following: National Climatic Data Center, National Oceanographic Data Center, and National Geophysical Data Center, Coastal Data Development, Regional Climate Services, and Environmental Data Systems Modernization. NEIO will be a new Financial Management Center.

  Within PAC:
  2. Satellite and Ground Services (SGS), which will plan, acquire, develop, integrate, transition to operations, and sustain common ground services for NOAA's environmental systems. SGS will merge funding from the following former PPAs: Earth Observation Systems (EOS) and Advanced Polar Data Processing, Distribution and, Archiving Systems, Critical Infrastructure Protection (CIP) -

Single Point of Failure, Comprehensive Large Array Data Stewardship System (CLASS), NPOESS Preparatory Data Exploitation (NDE), and the Enterprise Ground System, as well as portions of other major satellite acquisition programs: GOES-N, GOES-R, POES and JPSS. SGS will be a new Financial Management Center.

3. System Architecture and Advanced Planning (SAAP), which will provide enterprise-level system architecture, advanced system and technology planning, management and technology policies and procedures; and system validation, assurance, and adjudication to ensure the comprehensive solutions meet the mission objective. SAAP will merge funding from portions of major satellite acquisition programs: GOES-N, GOES-R, POES and JPSS. SAAP will be a new Financial Management Center.
4. Projects, Planning, and Analysis (PPA), which will be realigned to serve as project management for opportunities to use and exploit foreign and/or domestic data. PPA will assume the responsibilities, some of which have been modified, of the previous Office of Systems Development (OSD). PPA will merge funding from portions of major satellite acquisition programs: GOES-N, GOES-R, POES and JPSS. PPA will operate the Financial Management Center of the former office, OSD.

- Other proposed restructures:
    1. Combine the Satellite Command and Control and Product Processing and Distribution PPAs to create the Satellite and Product Operations PPA, within the OSPO budget Line Item.
    2. Combine the Product Development, Readiness & Application (PDR&A) PPA with the Ocean Remote Sensing and Joint Center for Satellite Data Assimilation PPAs to create one PPA and Line Item, called Product Development, Readiness & Application.
    3. Split funding for the former Geostationary Operational Environmental Satellite – N Series and the Polar Operational Environmental Satellite PPAs among the new PPAs organized under PAC: SGS, SAAP, and PPA.

Other offices that will be modified include:

- Within NESDIS Headquarters:
    - Rename the Chief Information Division the Chief Information Officer, including two branches:
        - Cyber Security Program and Solutions Branch
        - IT Architecture and Services Branch
    - Within the International and Interagency Affairs Division:
        - Eliminate the Satellite Activities Branch and the Applications and Information Services Branch
        - Consolidate all staff and activities
    - Rename the Chief Financial Officer/Chief Administrative Officer Division the Chief Financial Officer/Chief Administrative Officer, and include a Finance and Accountability Branch
    - Within the Chief of Staff, establish a Communications Branch
- Rename the NOAA Ice Center the National Ice Center
- Within the JPSS Program Office, eliminate the Ground System Division

Research and Development Investments:
The NOAA FY 2015 Budget estimates for R&D investments are the result of an integrated requirements-based strategic planning process. This planning provides the structure to link NOAA's strategic vision with programmatic detail and budget development, with the goal of maximizing resources while optimizing capabilities. NESDIS requests $26,000,000 in R&D in the FY 2015 budget.

NOAA's R&D planning is tied to the goals, enterprises, and associated objectives outlined in NOAA's Next Generation Strategic Plan. Specifically, NOAA's Science and Technology Enterprise and underlying objectives include a holistic understanding of the Earth system through research; accurate and reliable data from observing systems; and an integrated environmental modeling system. These provide the basis for a set of internal implementation plans covering a 7-year period which guide NOAA's research and development activities. The NOAA Research Council - an internal body composed of senior scientific personnel from every Line Office in the agency - informs the annual updates to these implementation plans, and has developed the next 5-Year Research and Development Plan for NOAA (FY 2013-2017). This plan will guide NOAA's R&D activities over the next five years. The plan provides a common understanding among NOAA's leadership, its workforce, its partners, constituents and Congress on the value of NOAA's R&D activities. As such, the Plan is a framework with which NOAA and the public can monitor and evaluate the Agency's progress and learn from past experience.

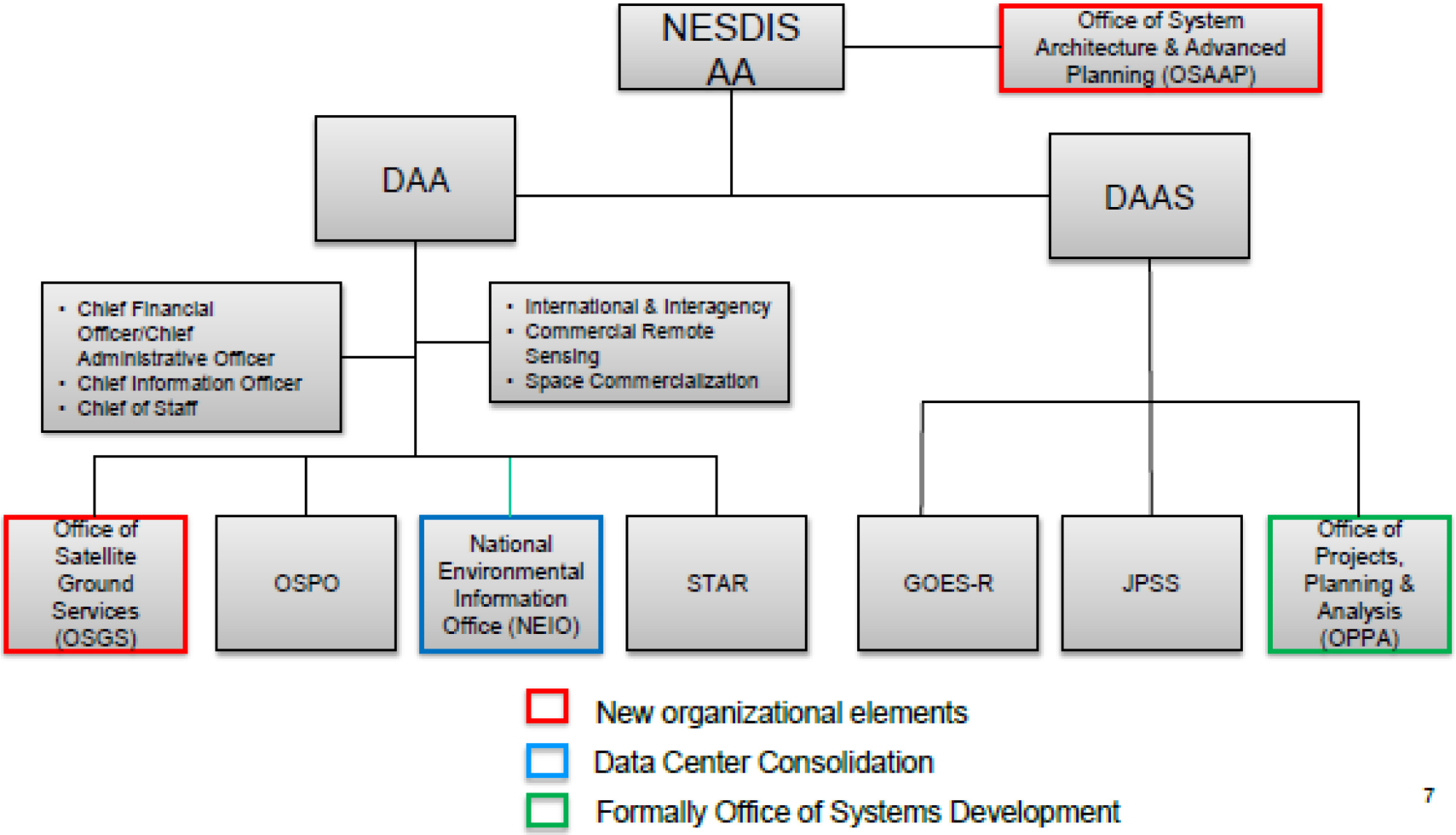
Significant Inflationary Adjustments:
NOAA's FY 2015 Base includes a total of $3,186,000 and 0 FTE to account for the full funding requirement for inflationary adjustments to current programs for NESDIS activities. This includes the estimated 2015 Federal pay raise of 1.0 percent as well as inflationary increases for non-labor activities, including service contracts, utilities, field office lease payments, and rent charges from the General Service Administration (GSA). NESDIS will offset $1,744,000 of its inflationary costs through program management efficiencies.

Headquarters Administrative Costs:
In FY 2015, NESDIS Line Office headquarters will use $25,484,200 to support general management activities, financial and budgeting, and IT related expenses, as well as supporting facilities and other general operating costs. These funds also include support for service contracts, utilities, and rent charges from the General Services Administration. Specifically, NESDIS will use headquarters administrative funds to support the following:

Headquarters Program Support Type	**Description**	**FY 2015 Amount**	**FY 2015 FTE associated with NESDIS Line Office HQ**
General Management & Direction/Executive Management	Includes Assistant Administrator's office, public affairs, information services	7,934,700	40
Budget & Finance	Includes Budget, Finance and Accounting	3,433,700	19
Facilities/Other Administrative (CAO Functions)	Includes Facilities and Security costs, as well as other CAO related activities	2,944,100	8
Human Resources	All HR services, including Equal Employment Opportunity	1,190,000	7
Acquisitions and Grants		383,300	2
Information Technology	Includes IT-related expenses and other CIO related activities	9,598,400	18
Total		**25,484,200**	**94**

Narrative Information:
Following this section are base justification materials and program change narratives by sub-program for this line office. Please note that no program change narrative is provided for program changes of less than $100,000, however, a summary exhibit is provided at the end of each sub-program showing the object class detail for the small program changes. Please contact the Department of Commerce if details for any of these changes are required.

NESDIS ORGANIZATIONAL CHART



PROPOSED NESDIS BUDGET RESTRUCTURE
ORF

Current Subprogram (Line Item)	**Current PPAs**	**Proposed Subprogram (Line Item)**	**Proposed PPA**
Environmental Satellite Observing Systems (Office of Satellite and Product Operations)	Satellite Command and Control	Environmental Satellite Observing Systems (Office of Satellite and Program Product Operations)	Satellite and Product Operations
Environmental Satellite Observing Systems (Office of Satellite and Product Operations)	Product Processing and Distribution	Environmental Satellite Observing Systems (Office of Satellite and Program Product Operations)	Satellite and Product Operations
Environmental Satellite Observing Systems (Product Development, Readiness, & Application)	Product Development, Readiness & Application	Environmental Satellite Observing Systems (Product Development, Readiness, & Application)	Product Development, Readiness & Application
Environmental Satellite Observing Systems (Product Development, Readiness, & Application)	Ocean Remote Sensing	Environmental Satellite Observing Systems (Product Development, Readiness & Application)	Product Development, Readiness & Application
Environmental Satellite Observing Systems (Product Development, Readiness, & Application)	Joint Center for Satellite Data Assimilation	Environmental Satellite Observing Systems (Product Development, Readiness & Application)	Product Development, Readiness & Application
Data Centers & Information Services (Archive, Access, and Assessment)	Archive, Access, and Assessment	National Environmental Information Office (National Environmental Information Office)	National Environmental Information Office
Data Centers & Information Services	Coastal Data Development	National Environmental Information Office (National Environmental Information Office)	National Environmental Information Office
Data Centers & Information Services	Regional Climate Services	National Environmental Information Office (National Environmental Information Office)	National Environmental Information Office
Data Centers & Information Services	Environmental Data Systems Modernization	National Environmental Information Office (National Environmental Information Office)	National Environmental Information Office

PROPOSED NESDIS BUDGET RESTRUCTURE
PAC

Current Sub-program (Line Item)	**Current PPAs**	**Proposed Sub-program (Line Item)**	**Proposed PPA**
Systems Acquisition	GOES-N	Systems Acquisition	Satellite Ground Services; Systems Architecture & Advanced Planning; Projects, Planning & Analysis
Systems Acquisition	GOES-R	Systems Acquisition	Satellite Ground Services; Systems Architecture & Advanced Planning; Projects, Planning & Analysis; GOES-R
Systems Acquisition	Polar Orbiting Systems - POES	Systems Acquisition	Satellite Ground Services; Systems Architecture & Advanced Planning; Projects, Planning & Analysis
Systems Acquisition	Joint Polar Satellite System (JPSS)	Systems Acquisition	Satellite Ground Services; Systems Architecture & Advanced Planning; JPSS
Systems Acquisition	Earth Observing Systems (EOS)	Systems Acquisition	Satellite Ground Services
Systems Acquisition	Critical Infrastructure Protection (CIP) - Single Point of Failure	Systems Acquisition	Satellite Ground Services
Systems Acquisition	Comprehensive Large Array Data Stewardship System (CLASS)	Systems Acquisition	Satellite Ground Services
Systems Acquisition	NPOESS Preparatory Data Exploitation	Systems Acquisition	Satellite Ground Services
Systems Acquisition	Enterprise Ground System	Systems Acquisition	Satellite Ground Services

APPROPRIATION ACCOUNT: OPERATIONS, RESEARCH AND FACILITIES

SUB-PROGRAM: ENVIRONMENTAL SATELLITE OBSERVING SYSTEMS

The objectives of Environmental Satellite Observing Systems are to:

- Provide secure and efficient command and control of NOAA, DOD, and other non-NOAA operational environmental satellites; and
- To ensure timely and uninterrupted delivery of data to users, including product processing, development, and distribution.

To achieve these objectives, NOAA meets the Nation's requirement to provide an environmental satellite system capable of providing timely and accurate environmental data. Early warning of major weather events saves countless lives and prevents substantial property damage. Billions of dollars in damage are incurred each year due to natural disasters. These losses would be significantly worse if NOAA satellite data and services were unavailable due to interference with, or the failure of, critical satellite command and data acquisition infrastructure.

OFFICE OF SATELLITE AND PRODUCT OPERATIONS (http://www.ospo.noaa.gov/)

The Office of Satellite and Product Operations (OSPO) budget Line Item manages and directs NOAA's 24x7 environmental satellite operations, acquisition, product processing and the distribution of environmental data and derived products to domestic and foreign users, and associated services. OSPO provides efficient and secure command and control of NOAA, DOD, and other non-NOAA operational environmental satellites to ensure timely and uninterrupted delivery of data to users. Through OSPO, NOAA operates the ground systems that command, control, and acquire data from NOAA's on-orbit satellites 24 hours per day, 365 days per year. OSPO monitors satellite health and safety; schedules satellite operations and data acquisition to meet user needs; evaluates satellite systems performance; commands spacecraft; supports NASA during launch, activation, and evaluation of new satellites; and assesses satellite and ground station anomalies.

OSPO provides products and services using data from NOAA, the Department of Defense (DOD), and NASA environmental satellites, as well as foreign and commercial spacecraft to national and international customers and users on a 24/7 basis. OSPO products enable NOAA to accurately track the location, extent, and duration of severe weather such as hurricanes, tornadoes, and winter storms; support development of flash flood warnings; track volcanic ash clouds and severe winds that threaten aviation safety; detect remote wild land fires; monitor coastal ecosystem health; identify and monitor maritime hazards from sea ice; and assist in search and rescue activities. OSPO is the operational interface with NOAA's National Weather Service (NWS) and supplies the satellite data that makes up approximately 93 percent of the information used in numerical weather prediction models. OSPO provides approximately 450 operational products organized into three categories: Atmospheric, Oceanographic, and Terrestrial.

Additionally, OSPO provides the Nation with specialized expertise and computing systems that process, analyze, and distribute satellite-derived products and services that protect U.S. lives and property while enhancing the Nation's environmental, national, homeland, and economic security. The program processes data from Earth-observing satellites to provide the highest quality products and services to its users. OSPO is constantly assessing and using data from advanced satellite sensors to improve operational support to its customers. It also supports activities to improve the effectiveness and interoperability of national systems for sharing natural disaster information. By

using maps and data generated by remote- and land-based sensors, this information is made widely accessible to all government agencies and other entities involved in managing and mitigating the impacts of disasters. OSPO products are widely used by all branches of the U.S. Armed Services and the Department of Homeland Security.

OSPO includes Satellite Operations Control Center (SOCC)/Command and Data Acquisition (CDA) Facilities, which provide the vital link between the satellites and every data user. SOCC/CDA operations provide uninterrupted availability of critical information and support NOAA's critical national support functions that are not available commercially, such as real-time hurricane support. The program ensures acquisition and near real-time delivery of satellite data to product processing centers that, in turn, support NOAA's National Weather Service (NWS) mission to protect lives and property caused by severe weather events.

OSPO manages NOAA's Search and Rescue Satellite Aided Tracking (SARSAT) system and coordinates participation in the International COSPAS-SARSAT Program. SARSAT has contributed to the rescue of more than 33,000 people worldwide, including more than 7,000 people in the U.S., since its inception in 1982. OSPO also manages NOAA's contribution to the joint U.S. National Ice Center (NIC), which monitors global sea ice conditions to support safe and effective maritime transportation in the polar regions, Great Lakes, Arctic, and North Atlantic waters. NOAA, the U.S. Navy, and the U.S. Coast Guard jointly operate the U.S. NIC to support the civil and military maritime communities. This service is critical to NWS warnings in ice-prone sea lanes, U.S. Coast Guard ice breaking missions, civilian and military shipping, and commercial fishing communities

NOAA SATELLITE OPERATIONS FACILITY (NSOF) Operations

The Office of Satellite and Product Operations PPA supports the NOAA Satellite Operations Facility (NSOF), a modern, state-of-the-art-facility and infrastructure that supports uninterrupted 24/7 command, control and communications for NOAA's satellite program operations. The NSOF houses high technology equipment, including 16 antennae, which control Geostationary Operational Environmental Satellites (GOES), Polar-orbiting Operational Environmental Satellites (POES), and DOD's Defense Meteorological Satellite Program (DMSP) environmental satellites. Data from other non-NOAA operational and research satellites are also received to support specific NOAA missions. In addition to satellite operations, the 24/7 critical operations at NSOF provide environmental data used to develop weather and climate products, as well as other information products used daily by industry and citizens across the Nation.

Schedule and Milestones:

Satellite and Product Operations

- FY 2015:
    - Command and Control 8 NOAA Satellites and support 13 non-NOAA Satellites
    - Maintain Satellite Operation Facilities at Suitland, MD; Wallops, Virginia; and Fairbanks, Alaska
    - Conduct annual penetration testing on all IT systems
    - Continuous Monitoring of all IT Systems
    - Assessment and Authorization for required IT Systems
    - Transition high resolution information transmissions into operations
- FY 2016:
    - Command and Control 8 NOAA Satellites and support 12 non-NOAA Satellites
    - Maintain Satellite Operation Facilities at Suitland, MD; Wallops, Virginia; and Fairbanks, Alaska

    - Conduct annual penetration testing on all IT systems
    - Continuous Monitoring of all IT Systems
    - Assessment and Authorization for required IT Systems
    - Distribute validated GOES-R products
- FY 2017:
    - Command and Control 9 NOAA Satellites and support 12 non-NOAA Satellites
    - Maintain Satellite Operation Facilities at Suitland, MD; Wallops, Virginia; and Fairbanks, Alaska
    - Conduct annual penetration testing on all IT systems
    - Continuous Monitoring of all IT Systems
    - Assessment and Authorization for required IT Systems
    - Process and distribute 71 Suomi National Polar-orbiting Partnership (Suomi NPP) products (cumulative) to users within 100% of targeted time; Bring GOES-16 (GOES-R) into operation; Bring Metop-C into operation
- FY 2018:
    - Command and Control 9 NOAA Satellites and support 11 non-NOAA Satellites
    - Maintain Satellite Operation Facilities at Suitland, MD; Wallops, Virginia; and Fairbanks, Alaska
    - Conduct annual penetration testing on all IT systems
    - Continuous Monitoring of all IT Systems
    - Assessment and Authorization for required IT Systems
    - Process and distribute new JPSS products to users within 98.5% of targeted time
- FY 2019:
    - Command and Control 9 NOAA Satellites and support 11 non-NOAA Satellites
    - Maintain Satellite Operation Facilities at Suitland, MD; Wallops, Virginia; and Fairbanks, Alaska
    - Conduct annual penetration testing on all IT systems
    - Continuous Monitoring of all IT Systems
    - Assessment and Authorization for required IT Systems
    - Process and distribute new JPSS products to users within 98.5% of targeted time

Deliverables:
Satellite and Product Operations

	FY 2014	**FY 2015**	**FY 2016**	**FY 2017**	**FY 2018**	**FY 2019**
Infrastructure Maintained # of National/Mission Critical Systems)	8	8	8	9	9	9

- Delivery of Suomi NPP data to users
- New products transitioned into operations
- Upgraded system architecture to meet security needs and to facilitate transition of research products into operations

Performance Goals and Measurement Data:
Satellite and Product Operations

Performance Measure: Percentage of GOES satellite data successfully acquired to meet customer quality and timeliness requirements	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	99.8%	99.0%	99.0%	99.0%	99.0%	99.0%	99.0%
Description: Data from NOAA's GOES satellites are received on a daily basis and compiled monthly. This measure is the percentage of GOES datasets received against what was scheduled to be completed.							

Performance Measure: Percentage of POES satellite data successfully acquired to meet customer quality and timeliness requirements	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	99.8%	99.0%	99.0%	99.0%	99.0%	99.0%	99.0%
Description: Data from NOAA's POES satellites are received on a daily basis and compiled monthly. This measure is the percentage of POES datasets received against what was scheduled to be completed.							

Performance Measure: Percentage of NOAA-managed Satellite Data processed and distributed within targeted time	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	99.55%	98.5%	98.5%	98.5%	98.5%	98.5%	98.5%
Description: This measure includes data from NOAA's GOES and POES satellites. It tracks the processing and distribution of environmental data to the users. This measure is used to track timeliness and customer satisfaction. The targeted time varies per satellite: GOES is 15 minutes, POES is 180 minutes (which is based on Advanced Television Infra-Red Observation Satellite Operational Vertical Sounder timeliness).							

Performance Measure: Percent of Suomi NPP Satellite Data ingested, processed and distributed within targeted time	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	N/A	98%	98%	98%	98%	98%	98%
Description: The goal is to reach 98 percent of all available Suomi NPP data processed by the Suomi NPP Production Environment within 150 minutes from the time of observation.							

Performance Measure: Number of environmental products implemented into operations	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	14	14	14	14	14	14	14
Description: This measures the number of validated environmental products (both new and enhanced) that are transitioned from research into operations. Efficiency in managing Research To Operation program resources is reflected by the number of new satellite products that are developed and implemented within the defined schedule and cost criteria for each separate product project.							

Performance Measure: Percentage of ice and snow products produced and delivered within targeted time	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	99%	99%	99%	99%	99%	99%	99%
Description: Percentage of Imagery required daily by the National Ice Center (NIC) to generate weekly critical ice forecast and other ice products needed for safe marine transportation.							

Performance Measure: Transmission percentage rate of SARSAT distress alert and location information to search and rescue authorities within targeted time	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	95.7%	95%	95%	95%	95%	95%	95%
Description: Performance measure is important to beacon user customer group. The ability to deliver distress alerts in a timely fashion directly affects the chances of survival for the individual(s) in distress. Baseline performance was derived from historical data. The target performance is included in the Interagency SARSAT Operational Requirements document.							

PRODUCT DEVELOPMENT, READINESS & APPLICATION
(http://www.star.nesdis.noaa.gov/star/index.php)

The goal of NOAA's Product Development, Readiness, and Application (PDR&A) budget Line Item and PPA is to provide applications-focused research that will develop and evaluate prototype products, algorithms, and pre-operational products to improve existing operational satellite products and services using data from current and next generation environmental satellites.

PDR&A enhances the accuracy of current satellite products and develops new satellite products to meet user requirements. Activities range from planning new satellite instruments to developing new satellite products and applications. This includes transitioning new satellite products to operations, improving satellite products as instruments degrade, and performing calibration/validation activities between instruments.

The Nation needs enhanced satellite data to improve and extend weather forecasts, expand environmental monitoring and assessment capabilities, and to provide new and improved tools for scientifically based ecosystems management. In the next few years, the number and quality of satellite instruments will grow significantly, providing enhanced data capable of allowing major improvements in weather prediction accuracy. To make these improvements, it is necessary to have both a targeted research program and a cadre of scientists and computing

systems dedicated to development of improved satellite data products. The PDR&A activities ensure the highest accuracy of NOAA's current operational environmental satellite data and products via a robust and rigorous satellite data calibration/validation program. This effort improves product quality for the benefit of all users. PDR&A also incorporates the latest academic findings into its work through competitively awarded Cooperative Institutes with academic institutions (Universities of Wisconsin, Maryland, Colorado State, Oregon State, and the City College of New York). The academic expertise and the results of academic findings are infused into product development, readiness, and applications that either led to improvements in existing products or to the development of new products or sensors.

PDR&A targets the development of ocean related products and their transition to operations. Its scope includes developing new and improved ocean remote sensing data, products, and capabilities; ensuring continuity of data streams and specifying requirements for next generation satellite sensors; improving the understanding of ocean dynamics; and addressing research and operational needs related to marine ecosystems.

PDR&A facilitates the delivery and implementation of multiple satellite ocean data streams with continued science maintenance and improvements in research, data acquisition, calibration, and validation, which are required to maintain and enhance satellite-based tools and products utilized by the global and coastal oceans user community.

PDR&A increases forecast prediction capabilities using advanced satellite assimilation methods. Its scope is to accelerate and improve the quantitative use of research and operational satellite data in weather, ocean, climate and environmental analysis and prediction systems. PDR&A accelerates the application of satellite data for improving weather forecasts and other environmental models. The PDR&A was established to speed the development of new satellite data assimilation science into operational capabilities. NOAA (NWS, OAR, and NESDIS), NASA, and DOD are partners in this coordinated national effort to more fully realize the potential of the vast quantities of new satellite data that are becoming available. The program is also a risk reduction measure designed to accelerate the JPSS and GOES-R data utilization for the development of numerical weather prediction models and forecast models that will lead to increased accuracy and longer-range forecasts. In the next few years, the number and quality of satellite instruments will grow significantly, providing an exponential increase in higher quality data capable of allowing major improvements in the accuracy of weather prediction.

Schedule and Milestones:

PDR&A

- FY 2015: Provide near-real time ocean surface wind data to the National Hurricane and Central Pacific Hurricane Centers in support of operational wind nowcasts, forecasts, and warnings (These data will come from scatterometers on foreign satellites, such as the Advanced Scatterometer (ASCAT) instrument on EUMETSAT's Metop satellite)
- FY 2016: Post-launch checkout of GOES-R
- FY 2017: Post-launch checkout of JPSS-1
- FY 2018: Initial data exploitation of GCOM-C2 mission
- FY 2019: Continue data exploitation of GCOM-C2 mission

Deliverables:
PDR&A

- FY 2015: Near-real time ocean surface wind data
- FY 2016: Analyses of GOES-R post-launch check out
- FY 2017: Analyses of JPSS-1 post-launch check out
- FY 2018: Initial GCOM-C2 mission products
- FY 2019: Continue data exploitation of GCOM-C2 mission

Performance Goals and Measurement Data:
PDR&A

Performance Measure: Number of products, applications, techniques, and systems developed	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	13	13	14	14	14	14	14
Description: As new requirements for satellite data and environmental information are identified and understood, research is performed that leads to the creation of new information products, applications, processing techniques, and systems.							

Performance Measure: Number of new satellite products developed and transitioned to operations	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	14	13	14	14	14	14	14
Description: To apply its research to operational needs, satellite information products are developed and tested that meet the requirements of customers (e.g. the National Weather Service). After an extensive evaluation, the products that satisfy the requirements are transferred to operations for customer use.							

Performance Measure: Number of refereed papers published	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	169	90	90	90	90	90	90
Description: To assure that research is valid, high-quality, and up-to-date, scientific results are published in peer-reviewed journals.							

COMMERCIAL REMOTE SENSING REGULATORY AFFAIRS (CRSRA)
(http://www.nesdis.noaa.gov/CRSRA/)

The Nation requires a consistent and transparent regulatory process for licensing private remote sensing space systems in order to promote U.S. technological competitiveness and economic security, while ensuring satellite operation is consistent with our national security, intelligence, and foreign policy needs. NOAA's CRSRA program supports these requirements while furthering the Nation's homeland security and national security missions.

The CRSRA program coordinates interagency review of satellite license applications, amendments, and significant foreign agreements. NOAA licenses private remote sensing space systems and performs associated monitoring and compliance pursuant to the Secretary of Commerce's statutory responsibilities. Prior to issuing licenses, NOAA must consult with DOD

and the Department of State to ensure license compliance with national security and foreign policy, respectively. NOAA works closely with other U.S. Government agencies to implement policy and ensure international coordination. Major monitoring and compliance activities supported by NOAA include review of quarterly license reports, on-site inspections, audits, license violation enforcement, and implementation of restrictions during national security and foreign policy crises.

DOC's CRSRA, managed by NOAA, is responsible for enforcement and ensuring compliance with the terms of the license agreements. Worldwide commercial remote sensing space data sales were estimated to be $735 million in 2007 and are expected to increase to $2.5-$3.4 billion by 2017.

Dramatic future growth is expected due to growing civil and military user requirements, improvements in aerospace and information technologies, and e-commerce. From 1996 to 2010 NOAA CRSRA issued a total of 26 new licenses. From January 2010 to January 2014 NOAA CRSRA has issued 22 new licenses. There are currently nine new licenses in various stages of review and process. NOAA has been contacted by at least four additional private entities that require licenses. Thus by the end of 2014 and over the last four years, we are likely to license more satellite systems (35) than in the first 14 years of regulating the industry.

In 2010, NOAA CRSRA had 26 domestic and international operating locations requiring inspections. Currently we have 50 with at least four additional locations pending operational approval. Thus by the early FY 2014, and over a 3-year period, we will have nearly doubled the number of sights requiring inspections.

Schedule and Milestones:

CRSRA

- FY 2015: Examine methodology for licensing of private space systems and determine if the existing license format is relevant or needs to change to better address changes in space systems and their operations
- FY 2016-2019: Review regulations for currency and update if appropriate; republish any new regulations

Deliverables:

CRSRA

- Issuance of new licenses, waivers and or amendments to licenses
- Review and approval of foreign agreements
- Quarterly and annual audits
- Annual inspections with appropriate documentation for the record

Performance Goals and Measurement Data:
CRSRA

Performance Measure: Process all regulatory actions within statutory time lines and conduct all required audits and inspections	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	40 audits and inspections of domestic and foreign ground stations. Process at least 12 new licenses (Target 4)	50 audits and inspections of domestic and foreign ground stations. Process at least 9 new licenses.	54 audits and inspections of domestic and foreign ground stations. Process at least 6 new licenses.	65 audits and inspections of domestic and foreign ground stations. Process at least 6 new licenses.	75 + audits and inspections of domestic and foreign ground stations. Process at least 6 new licenses	75 + audits and inspections of domestic and foreign ground stations. Process at least 6 new licenses	75+ audits and inspections of domestic and foreign ground stations. Process at least 6 new licenses
Description: Regulatory actions include the submission of new licenses, the amendment of an existing license (both are 120 days by law), review, and approval of any waiver to a license or a foreign agreement (60 days). Audits and inspections are the quarterly and annual review of records, licenses, data protection plans and agreements, and the annual onsite inspection of the company and any station associated with the collection of satellite data. It is the verification for enforcement.							

OFFICE OF SPACE COMMERCIALIZATION (OSC)
(http://www.space.commerce.gov):

OSC, managed by NOAA for DOC, is responsible for developing space-related policies and promotion of the capabilities of the U.S. commercial space industry. OSC represents DOC negotiations with foreign countries to ensure free and fair trade internationally in the areas of space commerce. OSC assists U.S. commercial providers in their efforts to expand their business with the U.S. Government and promotes commercial provider investment by performing economic analysis on space and space-related markets. OSC identifies commercial solutions for key NOAA and other civil government data acquisition requirements. OSC also acts as a broad industry advocate within the Executive Branch to ensure the Federal Government uses commercially available space goods and services to meet its requirements, avoids legal and regulatory impediments, and does not compete with the U.S. commercial space industry. The 2004 U.S. Space-Based Positioning, Navigation, and Timing (PNT) Policy established, through Presidential Directive, a permanent National PNT Executive Committee (EXCOM) to manage the Global Positioning System (GPS) and its U.S. Government augmentations as a national asset. The policy further directed the EXCOM to establish the National Space-Based PNT Coordination Office (NCO) to serve as the Secretariat and perform those functions delegated by the Executive Committee. The Deputy Secretary of Commerce is a member of the Executive Committee and OSC provides management, personnel and facility support to the NCO in addition to performing studies and related activities to meet Executive Committee tasking and responsibilities.

Schedule and Milestones:
OSC
- FY 2015-2019: Accomplish two major policy decisions and commercial industry activities per quarter

Deliverables:
OSC
- Increased opportunities for commercial solutions for key NOAA and other civil government data acquisition requirements
- Improved coordination between government and industry on space-related issues and enhance engagement in interagency space-related policy activities

Performance Goals and Measurement Data:
OSC

Performance Measure: Number of major policy decisions supported and industry studies and related activities executed	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	10	8	8	8	8	8	8
Description: The target represents specific actions planned to be executed during the year that deal with commercial space issues and industry studies of the market.							

GROUP ON EARTH OBSERVATIONS (GEO)
(http://www.noaa.gov/eos.html):

The intergovernmental Group on Earth Observations (GEO) is a voluntary international partnership of governments and international organizations that provides a framework where these partners can collaborate globally on Earth observations. Its mission is the implementation of a Global Earth Observation System of Systems (GEOSS). The U.S. Government is a founding member of GEO. The U.S. government participation in GEO is in direct support of the implementation of the National Civil Earth Observation Strategy released by the White House in April 2013. The interagency U.S. Group on Earth Observations (USGEO) established by the Executive Office of the President as a Subcommittee under the Committee on Environment, Natural Resources, and Sustainability (CENRS) of the National Science and Technology Council (NSTC), chaired by the Office of Science and Technology Policy (OSTP), facilitates domestic coordination of Earth observation initiatives, as well as engagement with the intergovernmental GEO aimed at advancing U.S. goals and objectives relating to Earth observations. The NOAA Administrator currently leads the U.S. government representation in GEO and is a Co-chair of GEO.

Program resources support the activities of the GEO Secretariat staff in Geneva, who coordinate the implementation of the GEO Work Plan with its major tasks that span nine societal benefit areas. The work plan is updated annually, with major revisions every three years. Tasks range from data integration and management, to water cycle observations, to Earth observations for climate change adaptation. Program resources also support the domestic cooperative activities of USGEO, including preparations for U.S. Government participation in major GEO meetings and events; coordination, planning and assessment of Federal Earth observation activities; fostering of improved data management and interoperability; as well as the planning and coordination of meetings focused on Federal agency investments in Earth observations, workshops, and other forums.

Global environmental and resource issues are among the great global challenges of our time, including mitigating and adapting to climate change and supporting global food security through sustainable agriculture. Integrated Earth observations are the indispensable foundation for addressing these challenges, of which GEO is a critically important forum for international engagement and cooperation on Earth observations.

The GEOSS endeavor is resulting in unprecedented global access to environmental information, and promises to advance its integration into new data products for the benefit of societies and economies worldwide. It represents a commitment to three important Administration principles: science-based decision making, open access to data and information, and increased international cooperation on science and technology.

In addition to the funding provided in the GEO PPA, NESDIS Headquarters funds labor/ benefits, travel, and supplements the USGEO grant.

Schedule and Milestones:
GEO
- FY 2015-2019: Support annual meeting of member governments and participating international organizations at GEO Plenary and associated Executive Committee and related meetings

Deliverables:
GEO
- Support the development of U.S. positions and contributions to the implementation of the GEOSS Implementation Plan through preparations for U.S. Government participation in major GEO meetings and events
- Development of reports for the Executive Office of the President as requested;
- Planning and coordination meetings focused on Federal agency investments in Earth observations, workshops, and other forums

Performance Goals and Measurement Data:
GEO

Performance Measure: Number of grants provided in support of annual USG participation in the implementation of GEOSS	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	1	1	1	1	1	1	1
Performance Measure: Number of contracts and MOUs provided in support of national Earth observation portfolio	3	3	2	2	2	2	2
Description: Provide support for annual participation in the implementation of GEOSS and coordination of national Earth observation portfolio by USGEO, a NSTC Subcommittee, by providing a grant to GEO Secretariat and funds for USGEO Secretariat and Program Office through Interagency Agreements.							

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PROGRAM CHANGES FOR FY 2015:

No Program Changes are requested for this sub-program.

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APPROPRIATION ACCOUNT: OPERATIONS, RESEARCH AND FACILITIES
SUB-PROGRAM: NATIONAL ENVIRONMENTAL INFORMATION OFFICE

The National Environmental Information Office (NEIO) is the official data management entity for climatological, oceanographic, and geophysical information in the United States, with additional global environmental data management commitments defined by international agreement and scientific need. Its core responsibilities include science-based data synthesis and stewardship of its holdings, including both remotely- and directly-sensed climate, oceanographic, and geophysical data records and related and derived environmental information. The NEIO performs data synthesis (description, monitoring, modeling, and assessment) and data and information dissemination to promote the scientific integrity and usefulness of NEIO products and services. As a part of this responsibility, the program analyzes long-term environmental trends through monitoring and assessment at multiple temporal and spatial scales. The NEIO includes NOAA's three National Data Centers: the National Climatic Data Center (NCDC), the National Oceanographic Data Center (NODC), and the National Geophysical Data Center (NGDC).

To guarantee stewardship, the NEIO performs essential data management functions including: data acquisition and archival rescue; quality assurance, control, and validation; metadata cataloging, reprocessing, secure storage, retrieval, dissemination, and archival. The program performs quality assurance and reanalysis of historical data to establish and update baseline data sets or standards for global/national environmental monitoring using current information technologies.

To support regional, national, and international collaboration, the NEIO develops proposals for data-centric applied science projects to better understand the cross-sectoral issues and effects of Earth system variation. The NEIO supports other NOAA Line/Staff Offices, and national and international contributors to and/or users of environmental data and information. Additionally, NEIO operates the NOAA Central Library (including Regional Libraries), which provides information and research support to NOAA staff and the public.

Access to long time series of environmental data is critical to satisfying the Nation's wide range of needs related to the national security, the economy, the environment, and public safety. Business and government policies and decisions impacting water and energy management, manufacturing, transportation, food production, public health, and many other socio-economic issues depend on quality climate and weather, ocean and coastal, geophysical and space weather data records. Collectively, through the NOAA National Data Centers, the NEIO receives over two petabytes(PB) of new data annually; provide access to an archive exceeding 8.7 PBs (uncompressed, single copy) with over four PBs downloaded annually by customers; support over one billion web contacts/hits per year; and provide data transfers to over 15 million customers.

Comprehensive Large Array data Stewardship System (CLASS) - Operations Systems (Data Center Operations)

The NEIO supports the Comprehensive Large Array data Stewardship System (CLASS) - Operations Systems (Data Center Operations). The new NOAA Enterprise Archive System, CLASS, will soon reach full operational capability, replacing the current legacy archive systems and equipping the NOAA Data Centers with the needed scalability and reliability to support long-term preservation of and access to the ever increasing input of data from our billion dollar observing systems (e.g., satellites, radars, climate models). As new observing systems are fielded with increasing volume, velocity and variety of data, the operations and sustainment budget will need to grow incrementally to maintain NOAA data preservation and stewardship activities. This FY 2015 request supports the requisite operations and maintenance, as well as the sustainment engineering costs, with the following outcomes:

- Continued support for the development of NOAA's Enterprise Archive System, which is a critical component of NOAA's Data Center Consolidation plan. It will help centralize data management capabilities, reduce overall systems overhead, and provide additional archival storage from other NOAA line offices and programs.
- Fulfillment of NOAA's Congressional mandate to preserve the Nation's Weather and Climate Data.
- Operational maintenance and engineering support to keep up with the continually increasing data volumes from the new generation of NOAA's environmental observations (including GOES-R, JPSS, weather radars, etc.) and climate model output.
- Support the migration of data and information from the current legacy archive systems to the new enterprise archive infrastructure.
- Essential support of the environmental data needs of the Nation's public, private, and academic sectors.

Coastal Data Development

The NEIO supports the National Coastal Data Development Center (NCDDC), a division of NODC located in Stennis, MS, supports marine environmental and ecosystems stewardship by providing access to the Nation's coastal data resources with a focus on the Gulf of Mexico. NODC/NCDDC accomplishes this mission by using established and emerging technologies to support end-to-end data management for NOAA and NOAA's partners in Federal, state, local, academic, and other organizations. NCDDC focuses on development of products and services intended to bring together scientists and coastal managers to act as an important source of coastal ecological and observational data and information for the American public at large. NCDDC actively supports Gulf of Mexico restoration efforts, and is a participant in the Resources and Ecosystems Sustainability, Tourist Opportunity and Revived Economics of the Gulf of States Act (RESTORE Act Science Program).

Regional Climate Services

The Regional Climate Services' focus is defining requirements of NOAA climate information users and feeding those requirements back into NOAA's core research infrastructure and translation efforts of emerging research to create more accessible and consistent experimental application within each of the regions. Each Regional Climate Service Director (RCSD) is located within one of the six NWS-defined Regional areas. They are charged with coordinating and organizing relationships and projects within their respective region across NOAA business units, as well as other agencies and non-agencies (government, private, academic, research). The RCSD action plans align with the NOAA goals for Climate Smart Nation, Weather Ready Nation, Healthy Oceans, and Resilient Coastal Communities and

Economics. Each Regional Climate Center (RCC) provides a range of services and products to NOAA, as well as to state and local agencies, and to regional businesses, among other stakeholders. Each RCC is located on a university campus and is funded from multiple public and private sector sources, as well as NOAA.

The merit-based, competitively selected RCCs ensure effective support for critical NOAA climate services, including:

- Weekly input to the *U.S. Drought Monitor* and other contributions to NIDIS;
- Operation of specialized climate data tools: *Datzilla*, a NOAA reporting and tracking system for observational errors, and *Weather Coder 3*, an operational NWS system to collect and process thousands of daily observations through the Applied Climate Information System (ACIS);
- Contributions to the development of the *NOAA Climate Portal*;
- Support *State of the Climate* reports by providing monthly summaries of regional climate anomalies;
- Acting as a regional hub for State Climatologists for climate information (e.g., support state adaptation programs); and,
- Supporting applied climate research and service development programs to support NOAA and other Federal agencies (e.g., USDA, DOI, and the Department of Homeland Security).

<u>Environmental Data Systems Modernization (EDSM)</u>
The NEIO supports the Environmental Data System Modernization. The goal of EDSM is to provide increased access and utility to environmental data, information, products, and services through the use of innovative technologies and techniques.

Environmental data and information under the stewardship of NOAA are vital to a wide range of weather sensitive sectors of the economy. Business and government leaders, as well as researchers, have critical needs for quality long time-series of historical and recent national and global data to evaluate the current status of the environment, to assess long-term environmental trends, and to predict future environmental conditions and events.

EDSM supports an integrated suite of functions to preserve and exploit the full scientific value of NOAA's environmental, such as:

- Sustain and Operate timely/convenient access to the full range of data in the NOAA Enterprise Archive system (integrated into the Data Center infrastructure),
- Sustain and Improve Data Center IT infrastructure that supports customer services and data management functions,
- Improve the Integrity and Fidelity of the historical climate record, a function of Scientific Data Stewardship, and
- Integrate Observing Systems activities, such as the Integrated Surface Data structure for easier and more timely access to similar data from different observing systems; improved integrate metadata documentation and access; near real time monitoring of observing systems performance; and “Health of the Network – (HON)” to detect and correct potential data problems before they become a part of the long term climate records.

NOAA is developing an integrated, national and global observing system that will bring together all aspects of environmental monitoring on common platforms to ensure data quality, to manage data efficiently for the long-term, and to make these data easily and readily accessible. NOAA plans to accomplish these goals through a program of Scientific Data Stewardship/Integrated Observations System.

Schedule, Milestones and Deliverables:
National Environmental Information Office

Milestones/Deliverables (Climatic Data Services)	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
Data available through the NOAA Enterprise Archive System (NEAS) (Cumulative Total PBs, single copy, uncompressed)	10.8	12.9	16.6	20.3	25.6	30.9
Volume of data delivered online to customers (Total PB/yr)	3	4.5	6	8	9.5	11
Research Climate Data Sets Transitioned to Operations (transferred to ARC) (Cumulative Total #)	3	4	4	5	6	7
Climate Data Sets Upgraded/ Updated within the Applied Research Center (ARC) (Cumulative Total #)	64	71	78	84	89	89
Paleoclimate Reconstructions (Cumulative Total #)	24	27	30	33	36	36
Climate Extremes Indices providing socioeconomic impacts information (Cumulative Total #)	3	3	3	3	3	3
NOAA Enterprise Archive System availability (per node, combined-2 nodes)	95/99%	95/99%	95/99%	95/99%	95/99%	95/99%

Operations Readiness Schedule (NCDC)	**FY 2014**	**FY 2015**	**FY 2016**	**FY 2017**	**FY 2018**	**FY 2019**
Next Generation Archive Initial Operational Capability at Data Centers	EOC	EOC	EOC	EOC	EOC	EOC
Expand/Operate & Maintain Capability/ Capacity	X	X	X	X	X	X
Major Data Generating Programs						
NOAA POES (*Historical*/Current to End of Life for NOAA-19) Migration completed/new data goes directly to CLASS	End	X	X	X	X	X
NOAA GOES (*Historical*/Current to End of Life for GOES-14/15) Migration completed/new data goes directly to CLASS	X	X	X	X	X	X
DoD (*Historical*/Current DMSP & New DWSS)	X	X	X	X	X	X
EUMETSAT (*Historical*/Current & New - MetOp, GCOM, EPS)	X	X	X	X	X	X
Jason (Jason-2 and future Jason-3)	X	X	X	X	X	X
WxRadar-NEXRAD (*Historical*/Current & Dual Polar FY 2012/ Future Phased Array FY 2020)	X	X	X	X	X	X
NCEP Models/Reanalysis Products (New, not previously archived) (Historical/Current & Future)	X	X	X	X	X	X
Suomi National Polar Orbiting Partnership (NPP) (New)	X	X	X	X	X	X
Joint Polar Satellite System (JPSS) (New)				X	X	X
GOES R, S, T, U (New)			X	X	X	X
Other *Historical* and Current and New Long time series Decades/ 100+ years. Many data sets (*in-situ and more*)	X	X	X	X	X	X

"X" indicates observing systems data currently going into the NEAS as well as Start dates such as future JPSS and GOES-R.
Table based on system LRD, NESDIS Satellite "Fly-Out" Plan, and NEXRAD schedule.
(IOC – Initial Operational Capability, EOC – Enhanced Operational Capability)

Milestones/Deliverables (Oceonographic Data Services)	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
Number of authoritative global and coastal ocean data sets products produced. (Total #/yr)	2	1	2	2	2	2
Number of data streams automated to the archive (Cumulative Total)	21	23	25	28	31	34

Deliverables (Geophysical Data Services excluding CLASS)	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
Cumulative total of data ingested and placed in the archive [In Terabytes (TB)]	739	799	863	932	1,000	1,080
Volume of data and information delivered online to customers (TB/yr)*	60	63	65	68	70	73

*The way in which "data and information delivered online" is measured was recently changed. This change allows NGDC to track data actually delivered, versus data requested. Previously, if a client requested a file, but disconnected before the full file was delivered, the entire file would still be counted as "data delivered." This new measurement for "data delivered" is more reflective of actual data use, as it shows only the data that is actually received. Consequently, the volume targets have decreased, as compared to the previous measurement methodology.

Climate Data Records

FY2015:

- Sustain 20 existing operational CDRs;
- Transition to operations 3 extreme events-related CDRs tailored for end-user requirements;
- Complete transition to operations for 5 CDRs awarded in FY 2009 and FY 2011;
- Investigate the feasibility of adapting existing operational CDRs for application in catastrophic risk assessment and extreme weather events, consistent with USGCRP priorities;
- Complete one end user engagement decision support project;
- Initiate one end user engagement decision support project;
- Continue development of blended in-situ and satellite CDRs to help consolidate products.

FY2016:

- Sustain 25 existing operational CDRs;
- Sustain 3 extreme events-related CDRs tailored for end-user requirements;
- Complete transition to operations for 3 CDRs awarded in FY 2009 and FY 2011;
- Adapt one existing operational CDR for application in catastrophic risk assessment and extreme weather events, consistent with USGCRP priorities;
- Initiate one end user engagement decision support project;
- Deliver one blended in-situ and satellite CDR product.

FY 2017:

- Sustain 28 existing operational CDRs;
- Sustain 3 extreme events-related CDRs tailored for end-user requirements;
- Adapt one existing operational CDRs for application in catastrophic risk assessment and extreme weather events, consistent with USGCRP priorities;
- Initiate one end user engagement decision support project;
- Complete one end user engagement decision support project;
- Deliver one additional blended in-situ and satellite CDR product.

FY 2018:

- Sustain 28 existing operational CDRs;
- Sustain 3 extreme events-related CDRs tailored for end-user requirements;
- Adapt one existing operational CDRs for application in catastrophic risk assessment and extreme weather events, consistent with USGCRP priorities;
- Initiate one end user engagement decision support project;
- Complete one end user engagement decision support project;
- Deliver one additional blended in-situ and satellite CDR product.

FY 2019:

- Sustain 28 existing operational CDRs;
- Sustain 3 extreme events-related CDRs tailored for end-user requirements;
- Sustain one end user engagement decision support project;
- Adapt one existing operational CDR for application in catastrophic risk assessment and extreme weather events, consistent with USGCRP priorities;
- Initiate one end user engagement decision support project;
- Complete one end user engagement decision support project;
- Deliver one additional blended in-situ and satellite CDR product.

Performance Measurement and Data:
National Environmental Information Office

Performance Measure: Annual percentage of U.S. states and territories that use NOAA climate information and services to improve decision-making in the face of a changing climate (Cumulative Total %) (Measure 16d) (Climatic Data Services)	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	22%	24%	25%	27%	29%	31%	33%
Description: This measure is an indicator of societal benefit derived from the use of NOAA climate information in public decision making in states and territories. This performance measure will track the numbers of states and territories that are benefiting from the inclusion of NOAA climate information in their decision making processes. It will also show how these decisions will lead to better results or improved decisions based on inclusion of this climate information.							

Performance Measure: Safe Storage (NCDC Primary and Security archive), climate data from NOAA/other observing systems consistent with NARA standards (Cum Total PBs) (Climatic Data Services)	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	11.8	19.3	27.7	36.6	43.6	54.4	71.4
Description: This measure reflects the amount of data safely stored by NCDC that is derived from NOAA observing systems.							

Performance Measure*: Number of high-priority research grade CDRs developed and transitioned to operational quality standards. (Cumulative Total)	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	12	17	20	25	28	28	28
Description: CDRs will be developed to address high priority Essential Climate Variables (ECVs). These ECVs span a variety of sectors from food, water, and energy security to housing, finance, insurance, banking, health and well-being. *Assumes funding level of $9.1M in FY 2014 and FY 2015.							

Performance Measure*: Number of Completed End User Engagement Decision Support Projects / Demonstrations. (Cumulative Total) (Climate Data Record)	**FY 2013 Actual**	**FY 2014* Target**	**FY 2015* Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	1	1	2	2	3	4	5

Description: End User Engagement Decision Support Projects simultaneously demonstrate the value of operational CDRs for operational decision-making and create new operational user(s) for CDRs. These projects are an important indication of the societal and economic benefit of CDRs and potentially result in entirely new operational user communities and uses for operational CDRs.
*Assumes funding level of $9.1M in FY 2014 and FY 2015.

Performance Measure: State of the Climate Annual Report 42 Essential Climate Variables (ECVs) (% & Cum # ECVs fully assessed) (Climatic Data Services)	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	69% 29 of 42	71% 30 of 42	74% 31 of 42	77% 32 of 42	79% 33 of 42	80% 34 of 42	83% 35 of 42

Description: Track the increase in the number of essential climate variables that have a quantitative analysis and assessment of long-term trends and variations in climate performed and published in future annual issues of the Annual State of the Climate Report. The target of 100% is 42 essential climate variables that have a quantitative analysis performed. With adequate observing systems in place under the stewardship of NOAA, a comprehensive and quantitative analysis of atmospheric, ocean, and select terrestrial variables considered essential can be performed.

Performance Measure: Volume of ocean data archived for safe and secure storage (Cum Total TBs) (Oceanographic Data Services)	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	262	288	316	348	383	421	463

Description: This measure reflects the amount of oceanographic data securely stored with 100% confident data integrity by NODC. It measures data observed from ships, buoys, satellites, and other ocean and coastal platforms (including stored back-ups and the NODC archive within the CLASS infrastructure).

Performance Measure: Percent of System Availability, "Up Time" for data archive and access	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	99	99	99	99	99	99	99

Description: Each CLASS node operates 24x7. The cumulative up-time for all nodes is targeted at 99%.

Deliverables:
Comprehensive Large Array data Stewardship System (CLASS) - Operations Systems (Data Center Operations

- FY 2014-2019: Operate/sustain new generation Enterprise Archive System (a.k.a. CLASS) with minimum system availability of 95% for each node (NCDC, Asheville, NC and NGDC, Boulder, CO) and overall combined 99% up time.
- FY 2014-2019: Safe storage and access for historical data migrated from legacy systems to new system.
- FY 2014: Additional storage to accommodate anticipated data volume growth (NPP/NEXRAD Dual-Polarization Radar, etc.).
- FY 2015: Additional archival infrastructure to support GOES-R requirements.
- FY 2016: Additional archival infrastructure to support JPSS-1 requirements.

Deliverables:
Coastal Data Development

Deliverables (Coastal Data Development)	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
Number of regional products (multiple data elements) produced. (Total #/yr)	2	2	2	3	3	3

Schedule and Milestones:
Regional Climate Services

- Establish and implement a continuous process for characterizing regional customer and partner requirements, starting with an initial baseline assessment of needs for products, services, tools, and capacity building.
- Develop and implement a continuous system for conducting product and service delivery to the customers and partners of the climate service network.
- Establish a regionally based process for new product and service development, focusing on closing high priority gaps, and transitioning these new products and services into practical applications through active engagement with academic, private, and federal, state and local sectors in the regions.

Deliverables:
Regional Climate Services

- Integrated tools and outreach that enhance risk management strategies for decision makers, such as GIS-enabled NOAA climate data products focused initially on coastal inundation and water management .
- Competency-building training sessions for professional development to enhance use of regionally or sectorally relevant climate products and services; including feedback by user evaluations and surveys.
- Updated regional contributions to the Climate Services Portal.

Performance Measurement and Data:
Regional Climate Services

Performance Measure: New regional products and services provided and used by the public, private sector, and decision support communities for climate related decisions (Cumulative Total)	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	8	8	9	9	10	10	10
Description: Regional Climate Services build and strengthen regional partnerships to better assess and deliver regionally-focused climate science and information products and services to help people make informed decisions in their lives, businesses and communities. Specifically, their mission is to integrate the work of various NOAA partners engaged in developing and delivering climate science and services at the regional level, including the Regional Integrated Sciences and Assessment programs, Regional Climate Centers, state climatologists and many partners across the private and public sector. Integrating the work of these assets increase value to users and support more efficient, cost-effective delivery of services.							

Output (Cumulative Total):	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
Number of customer requirements activities conducted	4	6	7	8	9	10
Number of products or tools ready for transition	4	6	6	8	8	9
Number of collaboration meetings held in each region	6	8	8	10	10	10
Number of new application projects/products used	6	8	8	10	10	10
Total	20	28	29	36	37	39

Deliverables:

Environmental Data System Modernization

Deliverables	FY 2013 Actual	FY 2014 Target	FY 2015 Target	FY 2016 Target	FY 2017 Target	FY 2018 Target	FY 2019 Target
Observing systems regularly monitored (at the time of ingest/QC processing) on an operational basis for nominal system status and for random and time-dependent errors (Cum Total # of systems monitored)	7	7	7	7	7	7	7

FY 2015-2019:

- Safe storage and basic internal archive access for historical data migrated from legacy systems to new system
- Operate/Sustain new generation Enterprise Archive System (CLASS)

PROGRAM CHANGES FOR FY 2015:

National Environmental Information Office: Big Earth Data Initiative (Base Funding: $0 and 0 FTE; Program Change: + $2,000,000 and 0 FTE): NOAA requests an increase of $2,000,000 and 0 FTE for a total of $2,000,000 and 0 FTE to increase the accessibility and interoperability of NOAA's high-value environmental observations in concert with other Federal agencies, with a focus on Climate Data Records.

Proposed Actions:
The Federal government invests several billion dollars annually across numerous Federal agencies to collect information about the Earth from satellite, airborne, terrestrial, and ocean-based systems. This information can be used to achieve broad benefits ranging from climate change resilience planning to natural disaster impact mitigation to commercial supply chain management to natural resource management. Access to and use of these data are fundamental to supporting decision-making, scientific discovery, and technological innovation. The Big Earth Data Initiative in the FY 2015 President's Budget invests in standardizing and optimizing the management of data from federal Earth observations systems. Interagency coordination for this effort will be accomplished through the USGEO Subcommittee of the National Science and Technology Council (NSTC), led by the Office of Science and Technology Policy (OSTP).

NOAA's participation in the Big Earth Data Initiative will focus on four specific objectives:

- **Data discoverability,** by providing interoperable catalog services or searchable inventories of datasets
- **Data access,** by providing interoperable, open-standard online services to retrieve data and derived products
- **Data compatibility,** by providing data in a small set of well-known formats appropriate to the various data types and using common vocabularies
- **Data documentation,** by augmenting metadata content and adopting international standards for metadata format

Specific to NOAA, this project will be managed by NOAA's Technology Planning and Integration for Observations (TPIO) program with oversight and approval by the NOAA CIO and NOAA Observing System Council (NOSC). TPIO will provide resources and guidance to data providers from all NOAA Line Offices for improving metadata, converting or offering data in standard formats, establishing or sharing online services for data access, and ensuring that data are registered in an appropriate catalog. Datasets will be prioritized for inclusion based on importance of the data and level of effort required. Planning will also include elaboration of the technical architecture needed to accomplish the stated objectives. Cross-NOAA coordination will involve the Environmental Data Management (EDM), Geographic Information System (GIS), and Enterprise Architecture (EA) Committees, as well as the Chief Information Officer (CIO) Council and the NOAA Observing Systems Council (NOSC). Interagency coordination on architecture and standards will be conducted through the U.S. Group on Earth Observations (USGEO) and the Federal Geographic Data Committee (FGDC).

Statement of Need and Economic Benefits:
NOAA produces a tremendous diversity of Earth observations that constitute a significant national asset and contribution to the Nation's economy. These data are often made available only to specific end users. This project is intended to maximize the discoverability and accessibility of selected high-value environmental observations by providing open, machine-readable data formats, metadata, and online services, and to adopt uniform data management practices in concert with other agencies. The Big Earth Data Initiative is in alignment with the U.S. Digital Government Strategy, which directs

agencies to "unlock the power of government data to spur innovation" and NOAA's Next Generation Strategic Plan, which calls for "an increased focus on information management standards and strategies to improve access, interoperability, and usability of NOAA's environmental information resources."

Resources Assessment:
No resources currently exist for this initiative.

Schedule and Milestones:

- FY 2015: High-value NOAA datasets identified in Federal level US Earth Observations Assessment-I (EOA-I, 2012) and also those identified through NOAA Observing Systems Integration Analysis –II (NOSIA-II, 2013) made accessible, documented, compatible, and cataloged. NOAA, NASA, and USGS agreement on standards and architecture
- FY 2016: Additional high-value NOAA datasets contributing to National Climate Assessment and EOA-II, to be conducted in 2014-15, made accessible, documented, compatible, and cataloged. Further improvements made to datasets and online service functions, if needed
- FY 2017: Cooperative agreements established with value-added distributors or resellers to produce tailored products from NOAA data for domain-specific customers
- FY 2018: Feedback mechanisms established for user comments on NOAA data. Additional datasets available

Deliverables:

- High-value datasets from NESDIS, NWS, NOS, NMFS, OAR and OMAO which are
    - made accessible on-line via interoperable services;
    - discoverable through NOAA catalog or inventory;
    - documented with relevant metadata to support understanding and reuse; and
    - available in compatible formats to facilitate ingest and integration across Federal agencies.

Performance Goals and Measurement Data:
N/A

PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Budget Program: NESDIS
Sub-program: National Environmental Information Office
Program Change: Big Earth Data Initiative

	Object Class	FY 2015 Increase	FY 2015 Total Program
11	Personnel compensation		
11.1	Full-time permanent	$0	$0
11.3	Other than full-time permanent	0	0
11.5	Other personnel compensation	0	0
11.8	Special personnel services payments	0	0
11.9	Total personnel compensation	0	0
12	Civilian personnel benefits	0	0
13	Benefits for former personnel	0	0
21	Travel and transportation of persons	20	20
22	Transportation of things	0	0
23.1	Rental payments to GSA	0	0
23.2	Rental Payments to others	0	0
23.3	Communications, utilities and miscellaneous charges	0	0
24	Printing and reproduction	0	0
25.1	Advisory and assistance services	0	0
25.2	Other services	1,980	1,980
25.3	Purchases of goods & services from Gov't accounts	0	0
25.4	Operation and maintenance of facilities	0	0
25.5	Research and development contracts	0	0
25.6	Medical care	0	0
25.7	Operation and maintenance of equipment	0	0
25.8	Subsistence and support of persons	0	0
26	Supplies and materials	0	0
31	Equipment	0	0
32	Lands and structures	0	0
33	Investments and loans	0	0
41	Grants, subsidies and contributions	0	0
42	Insurance claims and indemnities	0	0
43	Interest and dividends	0	0
44	Refunds	0	0
99	Total obligations	2,000	2,000

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APPROPRIATION ACCOUNT: PROCUREMENT, ACQUISITION, AND CONSTRUCTION
SUB-PROGRAM: NESDIS SYSTEMS ACQUISITION

Geostationary Operational Environmental Satellite Program

The goals of the Geostationary Operational Environmental Satellite (GOES) program are to continue the procurement of spacecraft, instruments, launch services, and ground systems equipment; provide satellite and instrument anomaly support to the on-orbit GOES satellites; and maintain the ground system for GOES satellite operations.

GOES data provide:

- Cloud images and precipitation estimates for hurricanes and other coastal storms;
- NOAA Coast Watch sea surface temperature (SST) products for locating commercial and sport fish as well as protected marine species;
- New research products, such as ocean surface currents, that support both ecosystems management and safety of marine navigation;
- Primary information in the Nation's Climate Reference Network, providing reference quality data for surface temperature and precipitation monitoring;
- Images of the United States and adjacent ocean areas to enable the detection of hurricanes and other major weather events;
- Data collection from remote fixed in-situ observing platforms such as buoys and rain gauges for use in numerical weather prediction models and flood/drought assessments;
- Weather information to emergency managers for use during severe weather and other disasters;
- A means to obtain quantitative environmental data such as temperature, moisture, wind, radiation and solar energy particle flux for use in weather predictions, hydrometerological flux, climate long term trending, ecosystems management, commercial economic gain, and transportation safety;
- Unique monitoring capabilities that support air, land, and marine transportation.

The GOES system provides an uninterrupted, continuous flow of data and information that meets customers' spatial, temporal and accuracy requirements, providing significant customer benefit within an established life cycle cost target. The procurement of GOES satellites is a cooperative venture between NOAA and NASA. Historically, NOAA defines requirements, manages, funds, implements system integration, procures ground segments, and operates the GOES satellites. NASA serves as the agency with multi-disciplinary engineering expertise, develops detailed system specifications, procures and launches the spacecraft, and assists NOAA in system integration.

NOAA GOES satellite systems are designed, developed, acquired, and operated as a single end-to-end system. The system includes the observing platform (space-based instruments); command and control of the platform; product generation and distribution; archive and access; and user interface. GOES contributes to an Integrated Global Observation System, which is an end-to-end approach linking requirements to services. The system delivers critical real-time data and information needed for sound decision making, addresses needs to support expanded climate services, and works with global partners.

The GOES program operates a two-satellite constellation in geosynchronous orbit above the equator and observes about 60 percent of the Earth with at least one satellite placed in on-orbit storage. GOES observations allow continuous monitoring from the same angle during the tracking/detection of severe storms, atmospheric moisture changes, mesoscale scanning, currents flow dynamics, and atmospheric chemicals (particles) that cannot be achieved from a non-stationary orbit without increased error rates and lost data segments. NOAA maintains an on-orbit spare to complement the

two operational GOES satellites. This on-orbit spare philosophy allows NOAA to quickly replace a failed satellite by re-positioning an on-orbit satellite to ensure there is no loss in continuous coverage. To facilitate this strategy, NOAA plans the launch of the next satellite to coincide with the planned switchover of the on-orbit spare to operational status.

A primary function of the GOES program is supporting the NWS in forecasting, tracking, and monitoring severe storms. The improved accuracy of the NWS forecasts by using GOES data results in dissemination of timely weather forecasting and advisories to impacted areas to ensure authorities and the public are equipped with decision-making information to protect lives and property.

GOES-R SERIES
(http://www.goes-r.gov/)

The GOES-R program will provide end-to-end system integration through the acquisition, deployment, maintenance, and operations of the space, ground, and launch segments.

The needs and benefits of GOES-R series satellites are as follows:

- Maintains continuous real-time observations for severe storms, hurricanes, and weather monitoring to the Nation;
- Needed as a backup to GOES-14 or -15 as part of a system of two operational satellites and an on-orbit spare;
- Provides advances in NOAA's observation capabilities for all NOAA mission goals including improvements to coastal, space weather, and lightning observations; and,
- Incorporates key enhancements in spatial and spectral information, coverage, and timeliness.

The GOES-R Series will provide enhancements directly applicable to stakeholders such as NWS. Increased quantity, quality, and accuracy of satellite data that are processed and distributed within targeted time is a key objective for NWS to issue timely advisories to the public that protect life and property. Once GOES-R becomes operational in FY 2017, data from GOES-R satellites will not only sustain the geostationary coverage currently in place, but will also enhance NWS performance with a 10 percent improvement in the accuracy of hurricane intensity forecasts in the 24-to 48-hour time frames, and a five percent improvement in hurricane track forecast out to day five.

The 2006 NOAA Economics Statistics report indicates that lightning activity causes $4 to 5 billion in losses each year and that lightning has consistently been one of the top three causes of weather-related deaths. The GOES-R GLM instrument is the first ever operational satellite lighting detection system aboard a geostationary satellite. The GLM detects severe weather by mapping both cloud-to-ground and cloud-to-cloud lighting strikes. By having the GLM capability on GOES-R, NWS aims to provide more accurate severe weather warnings, with the potential to save lives.

The GOES-R Series will also carry a number of solar/space monitoring instruments that will provide improved detection of approaching space weather hazards. These space storms endanger billions worth of commercial and government satellite systems and ground based power grids.

Current funding is used for the following activities:

- Completion of GOES-R satellite, ground system, and flight-to-ground integration and test activities;
- Begin GOES-R satellite pre-ship, ship and launch base activities;
- GOES-R launch service activities, including launch vehicle integration and test, shipment to launch base and launch base activities;
- Delivery of GOES-S suite of instruments: Advanced Baseline Imager (ABI), Solar Ultra Violet Imager (SUVI), Extreme Ultra Violet /X-Ray Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS), Geostationary Lightning Mapper (GLM), and Magnetometer;
- Completion of fabrication of GOES-S spacecraft hardware and initiation of satellite-level integration;
- GOES-S launch service activities;
- Fabrication, assembly, and integration of GOES T&U instruments and spacecraft hardware.

See the Program Change for the proposed schedule/milestones, deliverables, performance goals and measurement data, launch dates and the budget profile.

SATELLITE ALTIMETRY MISSION – JASON-3

Jason-3 is a joint satellite altimetry mission between NOAA, the European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT), and the Centre National d'Etudes Spatiales (CNES), the French Space Agency. Jason-3 will provide continuity of precise measurement of sea [ocean] surface heights for applications in,

- Ocean Climatology: global sea-level rise, decadal variability in the ocean, seasonal/inter-annual variability, and coastal variability & its impact on ecosystems; and,
- Ocean Weather: operational oceanography, surface wave forecasting and evaluation, and hurricane intensity forecasting.

Jason-3 is a multi-year development and integration effort that started in FY 2010. NOAA is providing a microwave radiometer, precision orbit determination components [e.g., GPS, Laser Retroreflector Array (LRA)], launch services, ground system and operations, and associated engineering services for Jason-3. In July 2012, the launch services contract was selected and the Falcon 9 v1.0 rocket was chosen as the launch vehicle from Space X. Through an interagency agreement, NASA is NOAA's acquisition and development agent, but NOAA will retain overall program management responsibility. EUMETSAT and CNES have provided the spacecraft, altimeter, and additional precision orbit components.

Jason-3 will follow in the tradition of the previous altimetry missions, Topex/Poseidon, Jason-1 and – Jason-2. The Jason series has been transitioned as a research endeavor from NASA and CNES to NOAA and EUMETSAT for joint implementation as a sustained and systematic (i.e., operational) capability.

See the Program Change for the proposed schedule/milestones, deliverables, performance goals and measurement data, and the budget profile.

JOINT POLAR SATELLITE SYSTEM (JPSS)

JPSS will address NOAA's requirements to provide global environmental data such as cloud imagery, sea surface temperature, atmospheric profiles of temperature and moisture, atmospheric ozone concentrations, search and rescue, direct read-out, and data collection services. These data are used in numerical weather prediction models primarily for 2-10 day forecasts, for supporting operational forecasts in Alaska, and for environmental monitoring and forecasting. Specifically, JPSS data will improve weather forecasts, environmental monitoring, and warning lead times for severe storms, benefiting public safety, protection of property, and all weather-sensitive economic activity, such as agriculture, transportation, and energy production.

JPSS will provide continuity of polar satellite coverage and will improve the Nation's ability to collect and distribute higher resolution data and weather products. This is achieved through the modernization of sensors and systems to ensure improved performance, compatibility, supportability, and maintainability. NOAA has partnered with NASA to implement the JPSS Program, using its space acquisition expertise and acquisition authority to develop the satellites.

See the Program Change for the proposed schedule/milestones, deliverables, performance goals and measurement data, and the budget profile.

DEEP SPACE CLIMATE OBSERVATORY (DSCOVR)

Refurbishment of NASA's DSCOVR satellite will allow NOAA to maintain continuity of solar wind data used for geomagnetic storm warnings. NOAA will manage the DSCOVR mission as an operational sentinel to give notice of approaching solar storms with potentially calamitous consequences for terrestrial electrical grids, communications, GPS navigation, air travel, satellite operations and human spaceflight. This program is being conducted in partnership with the U.S. Air Force (USAF), which will provide the launch vehicle and services.

NOAA has an operational requirement for continuous solar wind data. These data are the sole source of geomagnetic storm alerts. Geomagnetic storms are the costliest form of space weather and have the greatest potential economic impact on the largest number of customers.

See the Program Change for the proposed schedule/milestones, deliverables, performance goals and measurement data, and the budget profile.

COSMIC-2/Global Navigation Satellite System Radio Occultation (GNSS RO)

Constellation Observing System for Meteorology, Ionosphere, and Climate (COSMIC) is a six satellite constellation that was launched in 2006 in a joint collaboration between Taiwan, National Science Foundation, NASA, USAF, and University Corporation for Atmospheric Research (UCAR) as a proof-of-concept for a new, inexpensive atmospheric sounding technique using the U.S. Global Positioning System (GPS) as a sounding signal source. The results were so positive that NOAA started using this data operationally. COSMIC design life was reached in April 2011; one satellite has failed and 2 satellites are in degraded operation, leaving effectively four of the original six satellites in operation.

COSMIC data has demonstrated an 8+ hour forecast improvement starting at day four in the forecast model. This GNSS RO data helps to eliminate bias for artificial offsets in other observing systems by helping to create consistent measurements from different systems. This advances the overall impact on operational weather models and makes GNSS RO a calibration anchor for the total observing system.

See the Program Change for the proposed schedule/milestones, deliverables, performance goals and measurement data, and the budget profile.

SATELLITE GROUND SERVICES (SGS)

The goal of NOAA's Satellite Ground Services (SGS) is to provide and serve as the single organization for planning and execution of all common ground services. SGS is a consolidated effort of different ground components that will position NESDIS to effectively and efficiently develop and maintain its core ground systems capabilities. SGS is composed of the following:

- Comprehensive Large Array Data Stewardship System (CLASS) development,
- Satellite Product Development,
- Common Ground Services Architecture,
- NPOESS Preparatory Data Exploitation (NDE), and
- Ground Systems.

SGS plans, acquires, develops, integrates, transitions to operations and sustains common ground services for NOAA's environmental satellite systems. SGS core responsibilities include: directing and conducting analyses; defining and designing systems; and developing, acquiring, transitioning, and sustaining activities for new and existing satellite ground systems. For example, SGS provides IT hardware upgrades for real time satellite control and telemetry processing system (Polar Acquisition Control System) and antenna tracking components (both electronic and mechanical). As part of this responsibility, SGS assists in the development and maintenance of Level 1 requirements and leads the development and maintenance of lower-level requirements. SGS develops and sustains command and data acquisition, communications, command and control, product generation and distribution, enterprise management, algorithm operationalization, and data archival services for NOAA's environmental satellites. SGS provides engineering and project management for ground systems architecture, design, development, integration and testing, infrastructure, and facilities. In addition, SGS participates in system verification and validation efforts and also in life cycle reviews for satellite acquisition programs and projects.

COMPREHENSIVE LARGE ARRAY DATA STEWARDSHIP SYSTEM (CLASS) DEVELOPMENT

CLASS is the NOAA Enterprise System IT capability for the Data Centers, providing archival storage for NOAA's environmental data. It is currently utilized by the NOAA Data Centers for their archive and distribution of operational environmental satellite data from NOAA's Geostationary and Polar (GOES and POES) operational satellites, the Suomi NPP satellite, and derived data products. CLASS is under development to support additional satellite data streams, including GOES-R and JPSS, as well as NOAA's in-situ, NEXRAD and modeled data. The system is being evolved to provide a configurable set of tools for data ingest to allow rapid response to new requirements, additional tools for data management and stewardship by data center experts, and generalized access interfaces to allow tailored tools for expanded data access.

In the near term, efforts will focus upon operations and maintenance of CLASS components that have transitioned from development to operational status. Longer-term plans for CLASS include expanding the safe storage/access capacity to meet the data influx expected from the operational introduction of data from radar, models, and new satellites. The current CLASS configuration can provide services for approximately four petabytes (PBs) of data. Management of these data can be accomplished through expanding storage capacity at the Data Centers and automating the means of data ingest, quality control, and access through phased systems procurement. The early implementation of this archive and access system has paved the way to accommodate additional massive data volumes from the new generation of earth-observing satellites.

Deliverables:
CLASS Development

- Safe Storage and Access Capability/Capacities "just in time" ready to meet phased-in introduction of new major observing systems (Satellites, Radars, Model Data, Other)
- Long-term, safe storage that meets the NOAA Data Centers' legislative requirements.

Performance Goals and Measurement Data:
CLASS Development

Performance Measure:	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
Measure 1: CLASS Development System components integrated into the Data Centers' operational architecture (CLASS Operations System) ready to support NEW Satellite Launches/RADAR DP and PH Upgrades, Model Data, etc. (Cum # systems the CLASS Ops System is ready to support)	9	10	10	11 GOES-R	12 JPSS-1	12	12
Measure 2: Annual Increase - New Data/Year (PB/FY)*	N/A	5.3	5.1	5.2	8.8	7.4	8.0
Measure 3: Cumulative Total Data (PB)*	N/A	16.7	21.8	27.0	35.8	43.2	51.2
Description: Measure 1 measures the cumulative number of systems ready to be supported by the CLASS Ops System. Measure 2 measures the annual increase of new data archived and distributed as measured in petabytes per year (PB/FY). Measure 3 measures the cumulative total data archived and distributed as measured in petabytes (PB).							

SATELLITE PRODUCT DEVELOPMENT

NESDIS develops and distributes environmental satellite data products and services for all NOAA line offices as well as for a wide range of Federal Government agencies, international users, state and local governments, and the general public. The environmental satellite data products and services include meteorological, climatic, terrestrial, oceanographic, and solar-geophysical areas.

NESDIS is responsible for the oversight and guidance necessary to effectively manage the product life cycle process. This includes the production of an observational environmental parameter from satellite sensor data, developing a satellite product, and transitioning this capability into operations.

NESDIS manages the project management for algorithm science and related activities that include support for both the GOES-R and JPSS satellite programs. NESDIS leads the strategic objective of the enterprise algorithm approach to enable cost effective development of interoperable multi-sensor and multiplatform algorithms, pre and post-launch instrument calibration and validation, long term science maintenance, user outreach and value added applications.

Schedule and Milestones:
Satellite Product Development
FY2015-2019: June each year we will hold the Annual Review for Polar and Geostationary Satellite Product Development for the upcoming Fiscal year

Deliverables:
Satellite Product Development
FY 2015
- Transition the following satellites' products to NESDIS/OSPO operations: SNPP, GCOM-W1, Megha-Tropiques, Cryosat-2, SARAL, DMSP F18, Oceansat-2, Metosat-11, Himawari-8

FY 2016
- Transition the following satellites' products to NESDIS/OSPO operations: SNPP, DMSP F-19, Sentinel-1a, Oceansat-3, Himawari 8, GOES-R

FY 2017
- Transition the following satellites' products to NESDIS/OSPO operations: GCOM-W2, Sentinel-1b, Oceansat-3, Himawari 9, GOES-R

FY 2018
- Transition the following satellites' products to NESDIS/OSPO operations: JPSS-1, GCOM-W2, MetOp-C, Himawari 9, GOES-R, GOES-S

FY 2019
- Transition the following satellites' products to NESDIS/OSPO operations: JPSS-1, MetOp-C, GOES-S

Performance Goals and Measurement Data:
Satellite Product Development

Performance Measure: Percentage of required Low-Earth Orbiting satellite product capabilities transitioned into NESDIS OSPO operations						
Satellite	**Launch**	**FY 2015**	**FY 2016**	**FY 2017**	**FY 2018**	**FY 2019**
SNPP	Oct 2011	90%	100%			
JPSS-1	Q2 FY 2017				50%	100%
GCOM-W1	May 2012	100%				
GCOM-W2	2016			80%	100%	
MetOp-C	2018				75%	100%
Megha-Tropiques	Oct 2011	100%				
Cryosat-2	Apr 2010	100%				
SARAL	Feb 2013	100%				
DMSP F18	Oct 2009	100%				
DMSP F19	Jan 2014		100%			
GPM	Feb 2014		50%	100%		
Sentinel-1a	Early 2014		100%			
Sentinel-1b	2015			100%		
Oceansat-2	Sep 2009	100%				
Oceansat-3	2014		75%	100%		

Performance Measure: Percentage of required Geostationary satellite product capabilities transitioned into NESDIS OSPO operations						
Satellites	**Launch**	**FY 2015**	**FY 2016**	**FY 2017**	**FY 2018**	**FY 2019**
Meteosat-11	2015	100%				
Himawari-8	2014	50%	100%			
Himawari-9	2016			50%	100%	
GOES-R	Q2 FY 2016		25%	75%	100%	
GOES-S	Q3 FY 2017				25%	75%

COMMON GROUND SERVICES ARCHITECTURE

NOAA provides satellite operations, data collection, data processing, distribution and archive for multiple satellites and will be adding new satellites (e.g., JPSS, GOES-R) in the future. Many of the ground systems (GS), or ground system components, were developed and are operated specifically for each mission or mission set. The GS variations are usually driven by the latest technology at the time of the GS development rather than differences in mission requirements. As a result of the GS technology differences, the staffing for operations and maintenance of each mission is unique with little cross-staffing.

The goal of the enterprise ground services is to develop a common design and architectural features that are implemented across the Enterprise Ground System to allow for cost savings. This will be achieved by reducing staff redundancies, increasing uniformity of infrastructure among sites, and developing common ground services in areas such as command and control, product processing, product generation, and product distribution.

Schedule and Milestones:

- FY 2015: Complete risk reduction prototype/demonstrations; develop overarching acquisition strategy for acquiring common services
- FY 2015 – FY 2019: Migrate legacy data distribution to centralized common distribution services; define a common algorithm product generation platform; and centralize, where possible, product generation services

Deliverables:

- Level 0 and 1 requirements document for satellite common ground services
- To-be NESDIS satellite ground architecture
- Roadmap for to-be architecture implementation
- Quality Management System
- Defined requirements and a proof of concept for Homeland Security Presidential Directive-12 solution for mission programs
- Configuration control of the enterprise technical reference model (TRM) and engineering standards
- Active risk management via end to end ground system readiness management process

Performance Goals and Measurement Data:
Performance measures for the Common Ground Services Architecture are in development.

NPOESS PREPARATORY DATA EXPLOITATION (NDE)

The NDE Project is developing and implementing capabilities to process and distribute Suomi National Polar-orbiting Partnership (S-NPP) and future Joint Polar Satellite System (JPSS) products and services, once the data have been delivered to NOAA. NOAA must implement capabilities to process the observations into useful products that meet the requirements of NOAA's operational centers and other civilian users. The NDE Project will generate measurements of atmospheric and surface properties with smaller biases and less noise that will improve and extend the NWS's capability to provide weather forecasts and warnings. NESDIS and the NWS collaborated to establish a priority for NDE product developments. As a result, the NDE Project will provide the capability to generate the following data products for NOAA within three years after the S-NPP launch; microwave and infrared atmospheric and surface radiances, imagery over Alaska, sea surface temperature, polar winds, land surface emissivity, aerosol optical thickness, vegetation

fraction, ozone total content and profiles, atmospheric temperature/moisture/pressure, cloud top height and cover, active fires, land surface temperature and sea ice characterization.

The NDE system will be enhanced to support the ingest, processing and dissemination of observations from the sensors of JPSS satellite missions JPSS-1 and JPSS-2. NDE will expand upon operational NDE capabilities to include new interfaces to support connection to the modified JPSS 1 & JPSS 2 product generation environment, expanded dissemination capability to support dissemination to DoD, and automated reconciliation of data receipt. NDE will also support the ingest, processing and dissemination of observations of Global Change Observation Mission-W (GCOM-W). The continued NDE development will also build on the operational NDE platform and migrate the architecture towards an enterprise product generation solution. This migration includes the adoption of an enhanced computing environment as well as the sharing of common storage, IT services, and business logic with PDA. The NDE architecture will demonstrate a proof-of-concept for enterprise operational algorithm processing utilizing both legacy and emerging GOES/POES data sources.

Schedule and Milestones:

NPOESS Preparatory Data Exploitation (NDE)

- FY 2015: Complete installation of the NDE Remote Backup System in Fairmont, WV
- FY 2016: Augment NDE Production Environment s to prepare for JPSS-1 launch
- FY 2017: Evaluate new Production Environment using JPSS-1 data
- FY 2018: Integrate first set of JPSS-1 products into new Production Environment
- FY 2019: None

Deliverables:

NPOESS Preparatory Data Exploitation (NDE)

The NDE Production Environment will enable NESDIS Operations to generate and deliver 67 products, based on S- NPP observations, to the NWS and other users through 2017. An additional six products are planned for delivery in FY 2017-2018, based on JPSS observations.

Performance Goals and Measurement Data:

NPOESS Preparatory Data Exploitation (NDE)

Performance Measure: Number of new Science Products Tested within NDE Science Algorithm Development and Integration Environment (SADIE)	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	3	18	14	0	3	19	0
Description: NDE integrates new science algorithms, developed by NOAA scientists, into the NDE SADIE to conduct functional and end-to-end testing of the products generated from those algorithms. Once it is determined that the code is ready for operations, NDE will transition the algorithms to the Production Environment for routine operations. The process of testing new algorithms and integrating them into operations takes approximately one year. All algorithms listed in FY 2012 to FY 2016 will generate new operational products from Suomi NPP one year later.							

Ground Systems

Ground Systems consist of the ground segments for the GOES-N, POES, and Jason-2 satellite systems. These systems are described in more detail below.

GOES-N
GOES-N satellites measure the Earth's atmosphere, its surface, cloud cover, and the solar and geosynchronous space environment; and provide a platform for the Imager, Sounder, Solar X-Ray Imager (SXI), and space environment monitoring instruments. The GOES-N Series program includes GOES-13, GOES-14, and GOES-15 satellites, launched May 2006, June 2009, and March 2010, respectively. The system also supports land and ocean-based Data Collection Platforms, transmits Imager and Sounder data, relays Low Rate Information Transmission data, relays GOES variable reformatted Imager and Sounder data, relays Emergency Managers Weather Information Network broadcasts, and participates in the international COSPAS[1]-Search and Rescue Satellite-Aided Tracking (SARSAT) system. The base resources will maintain the ground system for GOES-N satellite operations necessary for a continuous flow of environmental data collected from the GOES satellites to users. This system includes the observing platform (space-based instruments); command and control of the platform; product generation and distribution; archive and access; and the user interface.

The GOES-N Series program aids the public by generating timely and accurate environmental data/weather information. A primary function of the GOES Program is supporting the NWS in forecasting, tracking, and monitoring severe storms. The accuracy of the NWS forecasts using GOES data for severe storms results in weather forecasting/advisories to impacted areas to ensure authorities and the public are equipped with decision-making information to protect lives and property.

Spacecraft	Date Launched	Operational Date
GOES-13	May 2006	2010-2015
GOES-14	June 2009	2015-2020
GOES-15	March 2010	2012-2017

Schedule and Milestones:
Ground System: GOES
- GOES-14 has a planned operational date of FY 2015

Deliverables:
Ground System: GOES
- Continued operational support and maintenance of the GOES ground systems and on-orbit assets

Performance Goals and Measurement Data:
Ground System: GOES

[1] COSPAS is an acronym for the Russian words "Cosmicheskaya Sistyema Poiska Avariynich Sudov," which means "Space System for the Search of Vessels in Distress." It is indicative of the maritime origins of this distress alerting system.

Performance Measure: Percentage of NOAA-managed satellite data processed and distributed within 15 minutes	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	99%	98%	98%	98%	98%	98%	98%
Description: This measure includes observations from the primary geostationary spacecraft tracked from observation through availability to the user. This measure is used to track timeliness and customer satisfaction. The targeted time for GOES is 15 minutes.							

POES
POES is NOAA's current operational polar satellite system, with the last satellite in the series (NOAA-19) launched on February 6, 2009. As part of an international agreement with the European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT), the POES program also includes the European Polar Weather Satellite program, Metop. Metop satellites carry U.S. instruments and provide data services coverage from a mid-morning polar orbit through 2020. POES provides the afternoon orbit. This mission requires the capability to acquire global data from satellites, and the capability to process and disseminate environmental data on an extensive spatial range (global, regional and local) within a variety of time scales (minutes to days) to central processing centers and distributed direct users. Continued funding supports the sustainment of the ground system for both legacy systems operations.

Polar satellites provide a continuous flow of global weather and environmental observations in support of the following operational requirements:

- Environmental monitoring, and weather and marine forecasting;
- Climate assessment and change prediction;
- Detecting weather systems and significant environmental events such as volcanic eruptions, oil spills, and wildfires;
- Measuring atmospheric ozone and the space environment;
- Collecting environmental data from other surface platforms such as buoys;
- Performing search and rescue functions; and,
- Sea surface heights for ocean weather and ocean climatology.

The current polar ground system also supports the multi-agency (NOAA, NASA, EUMETSAT, CNES) altimetry mission, Jason-2, which flies on a polar orbit.

Schedule and Milestones:
Ground System: POES
FY 2015

- Connect consolidated analyst workstations (CAWS) port to Linux
- Re-host and re-connect product monitor (RPM) port to Linux
- Integrate Mission Monitoring Information System (IMMS)
- Continue ground systems operations support for NOAA-15, 16, 18, 19, MetOp and Jason-2 and 3

FY 2016
- Refresh of GOES Enterprise Management System (GEMS)
- Ground system upgrades for support of MetOp-C
- Continue ground systems operations support for NOAA-15, 16, 18, 19, MetOp and Jason-2 and 3

FY 2017
- Complete GEMS Refresh
- Continue ground systems operations support for NOAA-15, 16, 18, 19, MetOp and Jason-2 and 3

FY 2018
- Data Collection System (DCS) Acquisition & Data Distribution System (DADDS) refresh
- Continue ground systems operations support for NOAA-15, 16, 18, 19, MetOp and Jason-2 and 3

FY 2019
- Continue ground systems operations support for NOAA-15, 16, 18, 19, MetOp and Jason-2 and 3
- Refresh of the Integrated Mission Monitoring System (IMMS), Spacecraft Support Ground System (SSGS), Satellite Information Management System (SIMS)

Deliverables:
Ground System: POES
- Continued operational support and maintenance of the POES ground systems and on-orbit assets, including Jason-2 and 3 and MetOp-A, -B, -C

Performance Goals and Measurement Data:
Ground System: POES

Performance Measure: Percentage of NOAA managed satellite data processed and distributed within 60 minutes	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	99%	92%*	95%	95%	95%	95%	95%
Description: Provide the necessary polar observations from the primary polar spacecraft tracked from observation through availability to the user. This measure is used to track timeliness and customer satisfaction. Note that in 2017, NOAA-19 will have exceeded its design life and Suomi NPP will be close to its nominal end of life; for FY 2017 this measure assumes performance from the JPSS program. This measure assumes that the PACS hardware and POES Back-up system will be completed in FY 2015. *Due to the age of the current hardware, the FY 2014 target has dropped to 92%.							

Outyear Funding Estimates ($ in thousands):

Satellite Ground Services	FY 2014 & Prior	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	CTC	Total
Change from FY 2015 Base	-	2,983	5,808	5,808	5,808	5,808	N/A	
Total Request*	-	52,717	55,542	55,542	55,542	55,542	N/A	Recurring

*Outyears are estimates only. Future requests will be determined through the annual budget process.

SYSTEM ARCHITECTURE AND ADVANCED PLANNING (SAAP)

The System Architecture and Advanced Planning (SAAP) program applies systems engineering principles to balance the demands of high technical quality and to meet cost and schedule requirements across NESDIS to ensure and enable the success of its mission, vision, and objectives. Its core responsibilities include enterprise-level system architecture, advanced system and technology planning, management and technical policies and procedures, and system validation, assurance, and adjudication to ensure that comprehensive solutions meet mission objectives. SAAP performs systems engineering design, analysis, and evaluation of space flight, ground, data, and archive segments. As part of this responsibility, the program defines policies and procedures for systems engineering related to acquisitions, operations, archiving, and sustainment for implementation throughout NESDIS. SAAP also establishes and administers the quality management system across NESDIS. It does this by identifying best practices and providing overall systems assurance and configuration management to ensure compliance to the NESDIS quality management system through the life cycle of each NESDIS enterprise.

In addition to performing top-level requirements definition, traceability, and final validation and verification, the program serves as principal advocate for ensuring and enabling the success and mitigating risk of the NESDIS enterprise. This will enable NESDIS to meet its mission, vision, and objectives through systems analysis of current and future enterprise architectures. SAAP maintains enterprise lessons learned toward process improvement for future NESDIS implementation and serves as the expert technical liaison relating to the end-to-end systems architecture.

Schedule and Milestones:

SAAP

- FY 2015: Complete SAAP initiatives to evaluate follow-on architectures for earth observations and ground infrastructures, refine the NOAA requirements development process, establish an initial NESDIS quality management system, and apply systems assurance and risk management across the NESDIS enterprise
- FY 2016: Support the launch and mission validation of GOES-R
- FY 2017: Support the launch and mission validation of GOES-S and JPSS-1
- FY 2019: Support the launch and mission validation of GOES-T
- FY 2015-19: Continue systems engineering enterprise oversight/insight on the program builds of GOES-R and JPSS series satellites and ground infrastructure development for satellite operations, data product generation, data product distribution, and data archive and preservation

Deliverables:
SAAP

- Level 0 and 1 requirements document for satellite common ground services and archive
- Follow-on NESDIS architectures and implementation roadmap
- NESDIS quality management system, including configuration control of enterprise technical reference model (TRM) and engineering standards
- Active enterprise risk management
- Mission requirements validation plans and compliance following satellite calibration and validation

Performance Goals and Measurement Data:
SAAP

Performance Measure: Systems engineering initiatives completed	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	N/A	N/A	5	4	4	4	4
Description: This measure includes the completion of all systems engineering initiatives as specified in schedules/milestones with deliverables noted. The oversight and insight will enable and aid the enterprise in developing follow-on strategies. FY 2016-2019 initiatives are estimates and will be refined from the 2015 activities and supporting contributions to the satellite series development.							

Outyear Funding Estimates ($ in thousands):

SAAP	**FY 2014 & Prior**	**FY 2015**	**FY 2016**	**FY 2017**	**FY 2018**	**FY 2019**	**CTC**	**Total**
Change from FY 2015 Base		0	342	342	342	342	N/A	
Total Request*	0	4,587	4,929	4,929	4,929	4,929	N/A	Recurring

*Outyears are estimates only. Future requests will be determined through the annual budget process.

PROJECTS, PLANNING, AND ANALYSIS (PPA)

The focus of Projects, Planning, and Analysis (PPA) is on flight projects (data exploitation, and execution of domestic, international, and commercial partnerships) in order to meet NOAA observation requirements. PPA's core responsibilities include: project management and integration lead for data exploitation opportunities; providing on-orbit anomaly support and sustainment for existing operational systems; conducting studies of requirements definition; planning of overall project and partnership systems; performing conceptual and detailed engineering for these flight project activities; developing and managing the acquisition of partnership-based flight project systems (spacecraft, instruments, and launch services); and coordinating the integration, installation, and acceptance of NOAA civil operational environmental satellites systems for flight projects and partnerships. For example, PPA will support the procurement, maintenance and testing of the U.S. instruments on the European MetOp satellites.

As part of this responsibility, the program administers a comprehensive requirements identification and analysis process, and translates requirements for data, products, and services

into flight projects, exploitation, and partnerships. It establishes partnership-based flight project system objectives, as well as performance, engineering, and cost criteria. PPA also develops interface standards and uses technical and engineering consultation for system capability, development, implementation, and deployment to serve the environmental remote-sensing satellite user community. PPA performs end-to-end system design studies for flight projects and partnerships, and integrates NESDIS's space and ground concept of operations as applicable. For example, PPA provides continued support for MetOp's data product development activities. In a broader role, the program represents NOAA at international forums; provides technical representation at these venues ensures continued foreign contributions; and develops cost-sharing alternatives with international partners. Also, PPA provides oversight to the systems acquisition process for flight projects, exploitation initiatives, and partnerships.

Schedule and Milestones:

- FY 2014 - 2015: Support annual reactivation and testing of NOAA instruments on MetOp-C
- FY 2015: Begin on orbit support of for GOES-14
- FY 2016: Prepare to support the launch of MetOp-C
- FY 2017: Post-launch support of MetOp-C

Deliverables:

- Engineering support for the on-orbit POES satellites and support to EUMETSAT for U.S. instruments for Metop satellites, either in orbit or waiting to be launched
- Continued on-orbit anomaly support for GOES on-orbit assets
- Continued analysis, identification and validation of NOAA's comprehensive environmental observation requirements
- Continued support for assessing all NOAA observing systems impacts to key NOAA products
- Continued support of NOAA's environmental data management strategy and policy (NAO 212-15) facilitating and implementing the end-to-end data process for all NOAA's environmental data

Performance Goals and Measurement Data:

Performance Measure: Percentage of NOAA managed polar satellite data processed and distributed within 60 minutes	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	92%	92%*	95%	95%	95%	95%	95%
Description: Provide the necessary polar observations from the primary polar spacecraft tracked from observation through availability to the user. This measure is used to track timeliness and customer satisfaction. Note that in 2017, NOAA-19 will have exceeded its design life and Suomi NPP will be close to its nominal end of life; for FY 2017 this measure assumes performance from the JPSS program. This measure assumes that the PACS hardware and POES Back-up system will be completed in FY 2015. *Due to the age of the current hardware, the FY 2014 target could drop as low as 92%.							

Performance Measure: Percentage of NOAA-managed geostationary satellite data processed and distributed within 15 minutes	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	98%	98%	98%	98%	98%	98%	98%
Description: This measure includes observations from the primary geostationary spacecraft tracked from observation through availability to the user. This measure is used to track timeliness and customer satisfaction. The targeted time for GOES is 15 minutes.							

Outyear Funding Estimates ($ in thousands):

Projects, Planning, and Analysis	**FY 2014 & Prior**	**FY 2015**	**FY 2016**	**FY 2017**	**FY 2018**	**FY 2019**	**CTC**	**Total**
Change from FY 2015 Base	-	0	0	0	0	0	N/A	
Total Request*	0	33,488	33,488	33,488	33,488	33,488	N/A	Recurring

*Outyears are estimates only. Future requests will be determined through the annual budget process.

PROGRAM CHANGES FOR FY 2015:

Geostationary Operational Environmental Satellite - R (GOES-R): GOES-R (Base Funding: $941,899,000 and 48 FTE; Program Change: +$38,939,000 and 0 FTE): NESDIS requests an increase of $38,939,000 and 0 FTE for a total of $980,838,000 and 48 FTE to continue satellite engineering development, production, integration, testing, and launch activities for the four-satellite GOES-R Series Program.

Proposed Actions:
NOAA needs the requested increase in funding to maintain instruments, satellite, and ground system developments that are all currently under contract in order to meet the planned launch dates of the 2nd Quarter FY 2016 for GOES-R and 3rd Quarter FY 2017 for GOES-S. The funds will also be used to continue the development activities for GOES-T and -U to maintain their launch schedules.

The period between FY 2015 and FY 2017 is one of the most critical junctures in the program. In FY 2015, the GOES-R spacecraft will complete Integration & Test (I&T), ship the integrated spacecraft to the launch base, and initiate launch processing. The Ground Segment will complete final I&T activities including critical interface testing with the GOES-R spacecraft and external interfaces, as well as final certification and validation testing for operations. Additionally, GOES-S will be starting satellite-level I&T activities.

FY 2015 funding will support:

- Completion of GOES-R satellite, ground system, and flight-to-ground integration and test activities;
- Begin GOES-R satellite pre-ship, ship, launch base activities, and GOES-R launch service activities, including launch vehicle integration and test;
- Delivery of GOES-S suite of instruments: Advanced Baseline Imager (ABI), Solar Ultra Violet Imager (SUVI), Extreme Ultra Violet /X-Ray Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS), Geostationary Lightning Mapper (GLM), and Magnetometer;
- Completion of fabrication of GOES-S spacecraft hardware and initiation of satellite-level integration;
- GOES-S launch service activities; and
- Continue fabrication, assembly, and integration of GOES T&U instruments and spacecraft hardware.

Currently, NOAA's geostationary satellites include two operational satellites, GOES-East and GOES-West, and one spare satellite on orbit. Without the requested increase, GOES-S activities will be delayed in order to maintain GOES-R launch readiness.

Statement of Need and Economic Benefits:
The GOES-R Series will minimize losses to life, land, and the economy by giving early warning for severe weather events, which can cause significant impacts to people and property. One study[2] estimated the impact of improved data from the GOES-R Series on selected sectors of the economy as having a combined annual value in the first year of satellite operations that exceeds $921 million (in 2010 dollars). Benefits for selected industries (in 2005 dollars) include, for the first year of satellite operations:

- Coastal Emergency Management: Tropical cyclone forecasts enhanced by improved ABI technology aboard GOES-R are expected to produce annual net economic benefits of $450 million in the first year of satellite operation.
- Recreational Boating: The improved tropical forecasts are also expected to prevent annual losses to the recreational boating industry valued at $31 million in the first year of satellite operations.
- Aviation: The new ABI technology will enhance the tracking of volcanic ash plumes. This will provide advance warning to pilots, who then can be routed around the damaging and deadly plumes. The annual net economic benefit to the airline industry from these enhancements is $58 million in the first year of satellite operation.
- Energy Providers: One large cost of providing energy relates to the ability to forecast demand and then to supply the necessary energy on time. GOES-R data will allow for more accurate temperature forecasts, thereby enabling energy providers to better prepare for changes in demand. Annual savings for the energy sector is expected to be $256 million.
- Agriculture: Improved information from GOES-R will enable researchers and forecasters to produce more accurate forecasts, resulting in irrigation water being used more efficiently. The annual net economic benefit for agriculture is valued at $30 million.

Resource Assessment:
Resources are described in the Systems Acquisition narrative.

Schedule and Milestones:

- FY 2015: Complete GOES-R I&T; prepare to ship GOES-R to launch site. Begin integration of the GOES-S spacecraft. Continue fabrication, assembly, integration of GOES T&U instruments and spacecraft. Training & Testing of Ground System.
- FY 2016: Launch GOES-R and prepare for GOES-S launch.
- FY 2017: Launch GOES-S.
- FY 2018: Prepare for GOES-T launch.
- FY 2019: Launch GOES-T.

[2] Centrec Consulting Group, LLC. (2007, February 27). An Investigation of the Economic and Social Value of Selected NOAA Data and Products for Geostationary Operational Environmental Satellites (GOES). Report to NOAA's National Climatic Data Center. Savoy, IL

Deliverables:

Spacecraft	Launch Readiness Dates	Planned Operational Date
GOES-R	Q2 FY 2016	Q2 FY 2017
GOES-S	Q3 FY 2017	Q4 FY 2020
GOES-T	Q3 FY 2019	Q2 FY 2025
GOES-U	Q1 FY 2025	Q4 FY 2028

Performance Goals and Measurement Data:

Performance Measure: Percent of GOES-R Program milestones completed on time	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With Increase	N/A	N/A	75%	75%	75%	75%	75%
Without Increase	70%	70%	70%	70%	75%	75%	75%
Description: Percent of projected milestones to be completed annually to meet the planned operational date for GOES-R series (GOES-R, -S, -T, and –U). This includes key decision points, major reviews, testing, and delivery for the spacecraft, instruments (ABI, GLM, EXIS, SUVI, and SEISS), as well as antenna and ground segments.							

Performance Measure: Cumulative percent of GOES-R satellite milestones completed on time	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With Increase	N/A	N/A	97%	99%	100%	N/A	N/A
Without Increase	73	79%	95%	99%	99%	100%	N/A
Description: Cumulative percent of projected milestones to be completed for the program to meet the planned operational date of GOES-R. This includes key decision points, major reviews, testing, and delivery for the spacecraft, instruments (ABI, GLM, EXIS, SUVI, and SEISS), as well as antenna and ground segments.							

Outyear Funding Estimates ($ in thousands):*

GOES-R	FY 2014 & Prior	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	CTC	Total
Change from FY 2015 Base		38,939	(55,108)	(158,510)	(418,850)	(592,867)		
Total Request**	5,111,024	980,838	886,791	783,389	523,049	349,032	2,195,419	10,829,542

*Outyears are estimates only. Future requests will be determined through the annual budget process.

**The GOES-R lifecycle cost has been adjusted to account for the transfer of a total of $181M through 2036 from the GOES-R program to the new PAC offices (SGS, SAAP, and PPA) under the PPA restructure in FY 2015.

PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Budget Program: NESDIS
Sub-program: Systems Acquisition
Program Change: GOES-R

	Object Class	FY 2015 Increase	FY 2015 Total Program
11	Personnel compensation		
11.1	Full-time permanent	$0	$6,921
11.3	Other than full-time permanent	0	46
11.5	Other personnel compensation	0	89
11.8	Special personnel services payments	0	0
11.9	Total personnel compensation	0	7,056
12	Civilian personnel benefits	0	1,855
13	Benefits for former personnel	0	0
21	Travel and transportation of persons	0	364
22	Transportation of things	0	1
23.1	Rental payments to GSA	0	2,226
23.2	Rental Payments to others	0	0
23.3	Communications, utilities and miscellaneous charges	0	313
24	Printing and reproduction	0	0
25.1	Advisory and assistance services	0	0
25.2	Other services	0	0
25.3	Purchases of goods & services from Gov't accounts	38,939	759,628
25.4	Operation and maintenance of facilities	0	0
25.5	Research and development contracts	0	0
25.6	Medical care	0	0
25.7	Operation and maintenance of equipment	0	0
25.8	Subsistence and support of persons	0	0
26	Supplies and materials	0	107
31	Equipment	0	198,895
32	Lands and structures	0	0
33	Investments and loans	0	0
41	Grants, subsidies and contributions	0	10,392
42	Insurance claims and indemnities	0	0
43	Interest and dividends	0	1
44	Refunds	0	0
99	Total obligations	38,939	980,838

Jason - 3: Jason - 3 (Base Funding: $18,500,000 and 3 FTE; Program Change: $7,156, 000 and 0 FTE): NOAA requests an increase of $7,156, 000 and 0 FTE for a total of $25,656,000 and 3 FTE to continue the development of the Jason-3 satellite in partnership with European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT) and Centre National d`Etudes Spatiales (CNES), NOAA's European partners.

Proposed Actions:

Jason-3 would use requested funds as part of efforts to develop and initiate a re-plan to launch Jason-3.

Base funding does not fully support launch services, launch vehicle procurement, and associated engineering services for the program. As a result, the program is initiating a re-plan within its current budget profile that will include launch delays beyond Q2 FY 2015 and increased lifecycle costs. Meanwhile, NOAA's European partners have indicated that if Jason-3 is not launched by Q2 FY 2015, they will be forced to cancel the program.

NOAA's European partners have provided the spacecraft, altimeter and precision orbit components, and NASA, on behalf of NOAA, has completed the mission instruments build and has delivered the completed instrument to CNES for satellite integration. NASA also completed spacecraft integration and testing in FY 2013.

The Administration is developing a FY 2014 reprogramming package that will maintain a Q2 FY 2015 Jason-3 launch.

Statement of Need and Economic Benefits:

The Jason-3 Altimetry mission is needed to provide continuity of precise measurement of sea surface heights for applications in the areas of Ocean Climatology and Ocean Weather.

Ocean Climatology Benefits From Space Based Altimetry:

- Global sea-level rise: This is a fundamental indicator of climate change. An altimeter time series of several decades will be needed to distinguish signals related to anthropogenic (human impact) warming from those related to natural variability, as well as to clarify whether the rate of sea-level rise is accelerating.

- Decadal variability in the ocean: This has been shown to have an impact on fishery regime changes and correlates with droughts on land and changes in hurricane activity.

- Seasonal/inter-annual variability: On seasonal to inter-annual timescales, ocean-atmosphere interactions in the tropical Pacific, the El Nino / Southern Oscillation (ENSO) phenomena, currently provide much of the signal for seasonal forecasts.

Ocean Weather Benefits From Space Based Altimetry:

- Operational Oceanography: Input to operational integrative services based on global and regional ocean models provide real time and prognostic information on the state of the global ocean. This capability helps its users understand and monitor the world's marine environment and facilitate a safe, non-polluting and sustainable human exploitation of the ocean environment.

- Surface wave forecasting and evaluation: Accurate surface wave forecasts are a major requirement for offshore operators. Over the last decade altimeter-derived significant wave height data have been critical for improvements in wave prediction systems.

- Hurricane intensity forecasting: The knowledge of the upper ocean heat content (OHC) is a critical factor in forecasting the intensity of hurricanes as they approach the U.S. east and Gulf coasts where high OHC is quite variable.

- Coastal variability and its impact on ecosystems: Satellite altimetry provides observations for modeling the ocean basin and the broader coastal area. Coastal forecasting is needed in responding to environmental problems, such as oil spills and harmful algae blooms, as well as forecasting tides and currents important to commercial shipping.

While its latest projections for Global sea-level rise (GSLR) over the coming century range from 28 to 79 cm, the Intergovernmental Panel for Climate Change (IPCC) states "…the upper values of the ranges given are not to be considered upper bounds…" for GSLR, because existing models are unable to account for uncertainties such as changes in ice sheet flow. Additionally, the U.S. Climate Change Science Program has recently stated that these uncertainties "…will likely lead to sea-level projections for the end of the 21st century that substantially exceed the [latest IPCC] projection." This will impact the 146 million people worldwide living within 1 meter of mean high water, so it is critical that systematic observations of global sea level be collected on a continuing basis until these uncertainties are successfully addressed.

Resource Assessment:
The resources for this activity are described in the Systems Acquisition narrative.

Schedule and Milestones:
FY 2015: Initiate re-plan of the overall mission development
FY 2016- 2019: TBD

Deliverables:
- TBD

Performance Goals and Measurement Data:

Performance Measure: Number of ocean science products produced*	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With Increase	5	5	5	5	5	5	5
Without Increase	5	5	5	5	5	5	5

Description: Jason-3 altimetry products will provide important data for ocean climatology studies and ocean weather forecasting as defined above under the Statement of Need and Economic Benefits. Products are Sea Level Height, El Nino Forecasting, Hurricane Intensity Forecasting, Ocean Waveheight Forecast, and Ocean Surface Current.
*Jason-2 creates 5 data products currently. These products will be the same 5 that will presumably continue to be produced under the Jason-3 mission.

Outyear Funding Estimates ($ in thousands):

Jason-3	**FY 2014 & prior**	**FY 2015**	**FY 2016**	**FY 2017**	**FY 2018**	**FY 2019**	**Total**
Change from FY 2015 Base		7,156					
Total Request	108,160	25,656	TBD	TBD	TBD	TBD	TBD

PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Budget Program: NESDIS
Sub-program: Systems Acquisition
Program Change: Jason-3

	Object Class	FY 2015 Increase	FY 2015 Total Program
11	Personnel compensation		
11.1	Full-time permanent	$0	$630
11.3	Other than full-time permanent	0	0
11.5	Other personnel compensation	0	0
11.8	Special personnel services payments	0	0
11.9	Total personnel compensation	0	630
12	Civilian personnel benefits	0	70
13	Benefits for former personnel	0	0
21	Travel and transportation of persons	0	25
22	Transportation of things	0	0
23.1	Rental payments to GSA	0	35
23.2	Rental Payments to others	0	0
23.3	Communications, utilities and miscellaneous charges	0	5
24	Printing and reproduction	0	0
25.1	Advisory and assistance services	0	0
25.2	Other services	0	0
25.3	Purchases of goods & services from Gov't accounts	7,156	24,879
25.4	Operation and maintenance of facilities	0	0
25.5	Research and development contracts	0	0
25.6	Medical care	0	0
25.7	Operation and maintenance of equipment	0	0
25.8	Subsistence and support of persons	0	0
26	Supplies and materials	0	5
31	Equipment	0	7
32	Lands and structures	0	0
33	Investments and loans	0	0
41	Grants, subsidies and contributions	0	0
42	Insurance claims and indemnities	0	0
43	Interest and dividends	0	0
44	Refunds	0	0
99	Total obligations	7,156	25,656

Joint Polar Satellite System (JPSS): JPSS (Base Funding: $820,855,000 and 68 FTE; Program Change: $95,412,000 and 0 FTE): NOAA requests an increase of $95,412,000 and 0 FTE for a total of $916,267,000 and 68 FTE in FY 2015. These funds are necessary to continue the build of the JPSS-1 and JPSS-2 satellite missions. Additionally, these funds enable JPSS to pursue the procurement of ATMS and CrIS spares to reduce schedule risk.

Proposed Actions:

Continuity of Polar Weather Observations
Support for the FY 2015 priority to maintain the critical polar weather satellite observations in the United States' afternoon orbit include the following activities: operate and sustain the Suomi-National Polar-orbiting Partnership (S-NPP) satellite which was launched October 28, 2011, maintain the planned launch of JPSS-1 by no later than 2st quarter of FY 2017, and launch JPSS-2 by the 1st quarter of FY 2022; add robustness to the JPSS flight segment; and continue re-development of the common ground system for the JPSS missions (S-NPP, JPSS-1, JPSS-2).

The requested increase in funds are necessary to continue to maintain S-NPP operations, complete development of the JPSS-1 spacecraft, and support the integration of the Visible/Infrared Imager/Radiometer Suite (VIIRS), Cross-track Infrared Sounder (CrIS), Advanced Technology Microwave Sounder (ATMS), Clouds and Earth's Radiant Energy System (CERES), and the Ozone Mapping Profiler Suite-Nadir (OMPS-N).

These funds are also necessary to continue building the JPSS-2 instruments, and initiate work on the JPSS-2 bus. The JPSS-2 manifest includes VIIRS, CrIS, ATMS, and OMPS-N. JPSS-2 will also include accommodations for the NASA Radiation Budget Instrument (RBI), provided the development and integration of RBI are of no impact to the JPSS-2 mission and schedule.

FY 2015 funds will be used to support the following activities:

- Completion of the JPSS-1 bus; and initiate development of the JPSS-2 spacecraft bus
- Completion and delivery of the CrIS and VIIRS instruments; integration and test of the JPSS-1 instruments onto the bus, followed by satellite/observatory environmental and performance testing and;
- Continued ground system operations for S-NPP under the Block 1.2X, continued development of the new Block 2.0 upgrade, and integrated testing of the Block 2.0 with the JPSS-1 flight segment to continue progression toward JPSS-1 launch readiness;
- Continue with preparation for launch vehicle and services for JPSS-1 launch in 2017;
- Continuing the build of instruments for JPSS-2;
- Complete procurement of the JPSS-2 spacecraft bus.

Gap Mitigation
NOAA acknowledges there is a high risk of a loss in satellite environmental coverage in the early afternoon orbit, should the S-NPP satellite fail prior to the planned launch of JPSS-1. In 2013, NASA evaluated options to accelerate the JPSS-1 launch readiness date by 3 to 6 months and determined it would result in substantial increases in cost, schedule and technical risk and would require removal of instruments or other hardware. NOAA concluded it could not support acceleration of JPSS-1 and is continuing to work with NASA to examine the costs and viability of accelerating the planned launch readiness date of JPSS-2.

NOAA is pursuing a more robust sparing strategy for the ATMS and CrIS instruments, which are considered necessary to developing weather forecasts and may enable options to accelerate JPSS-2 schedules and reduce risk of a data gap between JPSS-1 and JPSS-2. The requested increase in funds would be used to procure spares to support JPSS-2 and additional CrIS and ATMS builds with the best practicable schedule and risk posture. The instruments for JPSS-2 define the critical path and long-lead parts are the pacing items. Without spares for these system elements, even a minor flaw or anomaly can result in months, even years of schedule slip. NOAA has identified that such delays were contributors to cost growth and schedule delays in the predecessor program. This strategy supports the Administration's efforts to find cost savings and efficiencies within NOAA satellite programs, while strengthening satellite management and the likelihood of successful missions.

NOAA recognizes the need to build redundancy into the JPSS program to maintain observations in the event of a loss of a satellite in the afternoon polar orbit. The formulation and acceleration of follow-on missions is a critical component of NOAA's strategy to reduce the likelihood of a gap in satellite data through a more robust JPSS architecture. Consistent with the flexibility included in the FY 2014 Omnibus Appropriations and NESDIS Enterprise Independent Review Team (IRT) recommendations, NOAA will utilize JPSS funds to pursue procurements for JPSS-2 and future follow-on missions as an integrated program to ensure the continuity of polar observations.

The following are important details of the strategy JPSS developed to address the potential risk of a gap in environmental observations:

- Identified NWS's critical input into Numerical Weather Prediction, which is the observational data provided by the Advanced Technology Microwave Sounder (ATMS) and Cross-track Infrared Sounder (CrIS) sensors.
- Implementing a robust sparing strategy for ATMS and CrIS to protect or potentially accelerate the JPSS-2 development and acquisition schedule. This strategy will reduce risk to schedule and risk to life-cycle costs increases from instrument development and integration. Key spares will be critical Line Replaceable Units (LRUs) for the ATMS and CrIS instruments. These units will be prioritized according to criticality and lead time. Making these purchases in a timely manner will provide protection against potential cost increases from parts obsolescence and replacement lead times.

FY 2015 funds will be used to support the following activities:
- Initiate acquisition of additional copies of ATMS and CrIS sensors
- Leverage existing acquisitions and contracts to initiate activities for follow-on missions to JPSS-2 and potential gap mitigation missions consistent with the flexibility provided in the FY 2014 Omnibus Appropriation Act
- Implementation of the pre-procurement actions and procurement actions required to support contract Authority To Proceed (ATP) for follow-on instruments by early FY 2016 and award the JPSS-2 spacecraft bus contract with options to procure spacecraft for future polar missions
- Begin to conduct studies to assess and plan follow-on missions to ensure polar continuity

Statement of Need and Economic Benefits:
The 2014 President's Budget request increased the focus of the JPSS program on NOAA's core weather mission and strengthened the likelihood of mission success and delivery of polar satellite observations to the National Weather Service The modern sensors and systems on JPSS will improve performance and capability which will translate into better weather forecasts,

environmental monitoring, and warning lead times for severe storms, benefiting public safety, protection of property and other weather-sensitive economic activity, such as agriculture, transportation, and energy production. In FY 2015, the life cycle cost remains at $11.3 billion through 2025.

Resource Assessment:
The resources for this activity are described in the Systems Acquisition narrative.

Schedule and Milestones:

- FY 2015: Instruments integration onto JPSS-1; award contract for JPSS-2 spacecraft bus and start to build JPSS-2 spacecraft; continue to build JPSS-2 instruments and initiate acquisition of AMTS and CrIS spares; continue JPSS-1 launch service preparation; continue ground system upgrades to support JPSS-1 and sustain S-NPP Operations.
- FY 2016: Continue JPSS-1 integration and testing; continue JPSS-2 spacecraft and instrument builds; continue preparation of JPSS-1 launch services; validate ground system readiness for JPSS-1; transition Ground Block 2.0 to operations for S-NPP; continue operations and sustainment S-NPP.
- FY 2017: Launch and operate JPSS-1; commission JPSS-1; begin Calibration/Validation of JPSS-1 data products; continue build of JPSS-2. Continue to operate and sustain S-NPP.
- FY 2018: Continue build of JPSS-2 instruments and spacecraft; plan for launch services for the JPSS-2 mission; and continue to operate and sustain S-NPP and JPSS-1.
- FY 2019:Continue build of JPSS-2 instruments, spacecraft, and continue maintenance, and operations of S-NPP and JPSS-1.

Deliverables:
The major activities and outcomes planned in FY 2015 are the continued development of the JPSS-1 spacecraft, including integration and test with VIIRS, CrIS, ATMS, and OMPS-Nadir instruments to support a Quarter 2 FY 2017 launch of JPSS-1.

Performance Goals and Measurement Data:

Performance Measure: Percent of JPSS Program milestones completed on time.	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With Increase	100%	75%	75%	75%	75%	75%	75%
Without Increase	N/A	N/A	65%	70%	N/A	N/A	N/A
Description: Percentage of projected annual program oversight and technical management milestones completed each year to meet the launch readiness dates for JPSS-1 & JPSS-2. This includes key decision points, major reviews, testing, and delivery to the spacecrafts for the following instruments: VIIRS, CrIS, ATMS, CERES, and OMPS-Nadir (JPSS-1 Satellite) and VIIRS, CrIS, ATMS, and OMPS-Nadir (JPSS-2 Satellite), as well as antenna and ground segments.							

Outyear Funding Estimates ($ in thousands)*:

JPSS	**FY 2014 & Prior****	**FY 2015**	**FY 2016**	**FY 2017**	**FY 2018**	**FY 2019**	**CTC**	**Total**
Change from FY 2015 Base		95,412	13,111	(23,609)	(110,078)	(254,138)		
Total Request ***	5,937,015	916,267	833,966	797,246	710,777	566,717	1,561,417	11,323,405

*Outyears are estimates only. Future requests will be determined through the annual budget process.

**The FY14 & Prior column accounts for deobligation reduction to the JPSS program in FY 2013 amounting to a total of $12.6M.

*** The JPSS lifecycle cost has been adjusted to account for the transfer of a total of $25.6M through 2025 from the JPSS program to the new PAC offices (SGS and SAAP) under the PPA restructure in FY 2015.

PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Budget Program: NESDIS
Sub-program: Systems Acquisition
Program Change: Joint Polar Satellite System (JPSS)

	Object Class	FY 2015 Increase	FY 2015 Total Program
11	Personnel compensation		
11.1	Full-time permanent	$0	$11,634
11.3	Other than full-time permanent	0	0
11.5	Other personnel compensation	0	64
11.8	Special personnel services payments	0	0
11.9	Total personnel compensation	0	11,698
12	Civilian personnel benefits	0	2,443
13	Benefits for former personnel	0	0
21	Travel and transportation of persons	0	210
22	Transportation of things	0	47
23.1	Rental payments to GSA	0	0
23.2	Rental Payments to others	0	0
23.3	Communications, utilities and	0	1,186
24	Printing and reproduction	0	0
25.1	Advisory and assistance services	0	0
25.2	Other services	0	0
25.3	Purchases of goods & services from Gov't	95,412	883,902
25.4	Operation and maintenance of facilities	0	0
25.5	Research and development contracts	0	0
25.6	Medical care	0	0
25.7	Operation and maintenance of equipment	0	0
25.8	Subsistence and support of persons	0	0
26	Supplies and materials	0	358
31	Equipment	0	1,449
32	Lands and structures	0	0
33	Investments and loans	0	0
41	Grants, subsidies and contributions	0	14,972
42	Insurance claims and indemnities	0	0
43	Interest and dividends	0	2
44	Refunds	0	0
99	Total obligations	95,412	916,267

Solar Irradiance, Data and Rescue (SIDAR): Solar Irradiance, Data and Rescue (SIDAR) (Base Funding: $0 and 0 FTE; Program Change: +$15,000,000 and +2 FTE): NOAA requests an increase of $15,000,000 and 2 FTE for a total of $15,000,000 and 2 FTE to implement the acquisition strategy for hosting the already purchased and built Total Solar Irradiance Sensor (TSIS). TSIS will provide measurements of the variability in the Sun's total output. As part of the SIDAR project, NOAA will also continue support to two international partnerships: satellite search and rescue via the Search and Rescue Satellite Aided Tracking (SARSAT) system, and environmental data collection and relay via the Advanced Data Collection System (ADCS). This program was previously known as the Polar Free Flyer.

Proposed Actions:
This request will develop and initiate an acquisition strategy to fly the TSIS instrument. TSIS was built by the Laboratory for Atmospheric and Space Physics at the University of Colorado at Boulder and consists of a suite of two instruments, the Total Irradiance Monitor (TIM) and the Spectral Irradiance Monitor (SIM). TIM is an active radiometer that monitors changes in Total Solar Irradiance at the top of the Earth's atmosphere. SIM is a prism spectrometer that monitors changes in Solar Spectral Irradiance as a function of wavelength.

In order to accomplish this important goal of providing continuity for solar irradiance measurements, NOAA is pursuing an acquisition strategy for best schedule and cost parameters to launch the TSIS. NOAA is reviewing options to field TSIS, including but not limited to, as a hosted payload. Although the revised acquisition strategy is expected to further reduce the costs as compared to the predecessor Polar Free Flyer program, it does so with additional risks. By hosting TSIS on another satellite NOAA would have less control over the launch schedules as the launch schedules would also be affected by the other partners. In the worst case scenario, this reduced control could lead to a break in continuity of solar irradiance.

As part of the SIDAR project, NOAA intends to continue an important collaboration with the French Space Agancy (CNES) and the Canadian Department of National Defense (DND). CNES and DND are jointly providing the SARSAT instrument and CNES is providing the ADCS instruments. The SARSAT and ADCS instruments have already been built and paid for by our Canadian and French partners, which have already contributed approximately $100M to the project.

NOAA will finalize our acquisition strategy for SIDAR in FY 2014. Funds in FY 2015 would implement the revised acquisition strategy.

Statement of Need and Economic Benefits:
The Total Solar Irradiance (TSI) Climate Data Record is important to understanding the Earth's climate variability. The TSI is currently sustained with data from NASA's Solar Radiation and Climate Experiment (SORCE) and the recently (November 2013) launched TSI Calibration Transfer Experiment (TCTE). SORCE is expected to reach end of mission life shortly and the successor to both SORCE and TCTE (design life of 18 months) is NOAA's TSIS. Accurate Climate and long term Weather modeling require knowledge of the TSI over time and without a continuous, long term record of TSI we will not be able to attribute changes in the climate between natural processes, mainly changes in the sun's output, and man-made processes.

Currently, TSIS provides the only source of data that can accurately determine the amount of the sun's energy reaching Earth and how that energy varies over time. The combination of TSIS and the Clouds and the Earth's Radiant Energy System (CERES), on Terra, Aqua, Suomi-NPP, and JPSS-1, provides the only known way of accurately determining the Earth's energy balance, the key

component of climate change. It is critical to have overlapping (e.g., simultaneous solar observations) measurements from the predecessor (TCTE) and successor (TSIS) instruments to maintain accuracy of the TSI climate data record (CDR). When the overlap of TSI data does not occur between the instruments there is uncertainty as to the cause of changes in the measured solar output, thereby reducing its accuracy and usefulness of the long term TSI CDR.

The SARSAT instruments, consisting of a Search and Rescue Repeater (SARR), a real-time transponder), and a Search and Rescue Processor (SARP), used for storing and downloading beacon alert signals from remote locations, support the COSPAS-SARSAT International satellite program, coordinated by the United States, Russia, France and Canada. Each nation contributes to a system designed to detect and locate emergency beacons from survivors in distress (aviators, mariners, hikers, etc.), whose lives are in imminent danger. SARSAT covers nearly the Earth's entire surface and is credited with saving over 33,000 people worldwide, including more than 7,000 people in the U.S., from the time of its inception in 1982.

A-DCS is part of the Argos system that collects, processes, and disseminates environmental data from fixed and mobile platforms worldwide. What makes Argos unique is the ability to geographically locate the source of the data anywhere on the Earth. A major Argos application for NOAA is the relay of environmental ocean data (i.e., temperature, wind, and salinity) from moored and drifting buoys in the tropical Pacific Ocean, often the first method of detecting the El-Nino Southern Oscillation. Argos transmitters have also routinely been deployed on a large number of marine mammals and sea turtles to track their migration. This system also relays data from the National Weather Service river gauges, which inform flood forecasts.

Resource Assessment:
There are currently no resources for this activity.

Schedule and Milestones:
- FY 2015: Initiate acquisition strategy
- FY 2016 – FY 2019: Continue implementation of acquisition strategy

Deliverables:
- Accommodation of TSIS with LRD dependent on final acquisition approach selected.
- Accommodation of ADCS instruments and SARSAT, TBD.

Outyear Funding Estimates ($ in thousands):

Solar Irradiance, Data and Rescue (SIDAR)	FY 2014 & Prior	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	CTC	Total
Change from FY 2015 Base	-	15,000						
Total Request	0	15,000	TBD	TBD	TBD	TBD	TBD	TBD

PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Budget Program: NESDIS
Sub-program: Systems Acquisition
Program Change: Solar Irradiance, Data and Rescue (SIDAR)

	Object Class	FY 2015 Increase	FY 2015 Total Program
11	Personnel compensation		
11.1	Full-time permanent	$0	$0
11.3	Other than full-time permanent	0	0
11.5	Other personnel compensation	0	0
11.8	Special personnel services payments	0	0
11.9	Total personnel compensation	$0	0
12	Civilian personnel benefits	0	0
13	Benefits for former personnel	0	0
21	Travel and transportation of persons	0	0
22	Transportation of things	0	0
23.1	Rental payments to GSA	0	0
23.2	Rental Payments to others	0	0
23.3	Communications, utilities and miscellaneous	0	0
24	Printing and reproduction	0	0
25.1	Advisory and assistance services	0	0
25.2	Other services	15,000	15,000
25.3	Purchases of goods & services from Gov't accounts	0	0
25.4	Operation and maintenance of facilities	0	0
25.5	Research and development contracts	0	0
25.6	Medical care	0	0
25.7	Operation and maintenance of equipment	0	0
25.8	Subsistence and support of persons	0	0
26	Supplies and materials	0	0
31	Equipment	0	0
32	Lands and structures	0	0
33	Investments and loans	0	0
41	Grants, subsidies and contributions	0	0
42	Insurance claims and indemnities	0	0
43	Interest and dividends	0	0
44	Refunds	0	0
99	Total obligations	15,000	15,000

Deep Space Climate Observatory (DSCOVR): DSCOVR (Base Funding: $23,675,000 and 4 FTE; Program Change: -$2,575,000 and 0 FTE): NOAA requests a decrease of $2,575,000 and 0 FTE for a total of $21,100,000 and 4 FTE to complete the refurbishment of the DSCOVR satellite and sensors for solar wind observations, and deliver the spacecraft to the United States Air Force (USAF) for launch.

Proposed Actions:
This proposal provides for an increase within the lifecycle of the DSCOVR satellite. The impacts from FY 2013 sequestration and the selection of a Falcon 9 launch vehicle, have caused an additional launch delay of three months. These impacts are described below.

The USAF launch contract has an Initial Launch Capability of November 15, 2014 that runs through the end of the contractual 60-day launch window (approximately January 13, 2015). NOAA and its partner agencies have been monitoring launch vehicle development closely, and recently attended a tri-agency certification discussion with SpaceX, the launch provider. Based on these discussions and the delays in certification of the Falcon 9 v1.1 launch vehicle, NOAA is planning for an additional three month delay beyond the launch window; however, the selection of the Falcon 9 v1.1 launch vehicle enables the spacecraft to reach the La Grangian 1 Point 90 days earlier than anticipated.

The launch readiness delay brings the planned launch date to April 2015. This slip will cost the program approximately $2 million per month to retain contractor staff beyond their original end of work date, totaling to $6 million. Due to funding reductions within the FY 2013 final spend plan, NASA has replanned its integration and testing, flight software and flight dynamics development, and propulsion subsystem work. This replan results in an additional $7.3 million needed within FY 2015, $5.0 million of which is directed toward the replanned work and $2.3 million of which will be dedicated to requirements for IT security development, updating the 15 year old spacecraft security system. This $7.3 million, in addition to the $6.0 million for labor, amounts to a $13.3 million increase above the planned request for FY 2015 within the FY 2014 President's Budget. Additionally, the total life cycle cost increase from these changes is $10.7 million above the planned profile.

NASA/Goddard Space Flight Center (GSFC), under a reimbursable agreement, will complete the refurbishment of DSCOVR, which is currently housed at GSFC in Greenbelt, Maryland. FY 2015 funds are necessary to complete the development of the data processing and archive systems, ship the satellite to its launch site, process its payload, and begin satellite operations and data processing operations after the U.S. Air Force launch. DSCOVR solar wind sensors will be checked out during transit to its final orbit. Operations and data processing will continue after the satellite reaches its duty station, the LaGrange Point (L1).

DSCOVR will also carry two earth remote sensing instruments. The Earth Polychromatic Camera (EPIC) that will take continuous full disc images of the earth, and the NIST Advanced Radiometer (NISTAR) that will take continuous full disc measurements of the earth's radiation balance. This will be the first time continuous full disc measurements of earth (or any other planet) have been taken from deep space. NASA will provide funds and support for integration and testing of these sensors.

Statement of Need and Economic Benefits:
Without timely and accurate alerts and warnings, space weather has demonstrated the potential to disrupt significant portions of the infrastructure system, including transportation systems, power grids, telecommunications, and GPS. NOAA will supply geomagnetic storm warnings to support key industries such as the commercial airline, electric power, and GPS industries. Our national security and economic wellbeing, now dependent on advanced technologies, are at significant risk without accurate advance warning of impending geomagnetic storms. Aircraft that fly polar routes now

include space weather as an integral part of pilots' weather pre-briefs, which provides the current status of the flight environment including potential impacts to critical communication and navigation systems, and the potential for hazardous solar radiation exposure.

The frequency and intensity of geomagnetic storms will increase significantly as the next solar maximum approaches in 2013 and lasts for several years. A Solar Maximum is the peak of the 11 year sunspot cycle, and is associated with large increases in all categories of solar activity. Strong storms with the potential to impact critical elements of our Nation's infrastructure can occur over 100 times during a solar cycle. The Nation's advanced technology service providers will be looking to NOAA for the alerts, watches and warnings needed to protect lives and livelihood and ensure continuity of critical operations.

Resource Assessment:
The resources for this activity are described in the Systems Acquisition narrative.

Schedule and Milestones:

- FY 2015: Continue to perform spacecraft and sensor environmental testing; Launch spacecraft
- FY 2015-2019: Maintenance and Operations

The DSCOVR mission expected end of life is 2019.

Deliverables:

- Launch and operate the DSCOVR satellite
- Provide timely access to operational solar wind data for geomagnetic storm warnings
- Fly EPIC and NISTAR active on the DSCOVR satellite

Performance Goals and Measurement Data:

Performance Measure: Lead Time Geomagnetic Storm Warnings (minutes)	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With Decrease	N/A	N/A	40	40	40	40	40
Without Decrease	24*	40	40	40	40	40	40
Description: This measure is a Space Weather Prediction Center (SWPC) performance measure that represents the average number of minutes of warning before geomagnetic storm arrival Once SWPC receives real-time data regarding geomagnetic storm arrival, the alert is posted on their website and email alerts are sent to customers that subscribe. SWPC will also contact high impact customers such as FEMA, Coast Guard, power distributors, airlines, etc. This measure also assumes that NASA's Advanced Composition Explorer satellite continues until the launch of DSCOVR. *The FY13 Actual of 24 Minutes Lead Time represents the average of two categories of geomagnetic storm warnings, at 13 minutes and 35 minutes, respectively. The target remains at 40 minutes.							

Performance Measure: Percentage of warnings issued prior to geomagnetic storm	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With Decrease	N/A	N/A	100%	100%	100%	100%	100%
Without Decrease	94%	100%	100%	100%	100%	100%	100%
Description: This measure is a SWPC performance measure that ensures issuance of warnings for all geomagnetic storms. Once SWPC receives real-time data regarding geomagnetic storm arrival, the alert is posted on their website and email alerts are sent to customers. SWPC will also contact high impact customers such as FEMA, Coast Guard, power distributors, airlines, etc. This measure also assumes NASA's Advanced Composition Explorer satellite continues until the launch of DSCOVR.							

Performance Measure: Percentage of alerts delivered within 10 minutes of onset of geomagnetic storm	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With Decrease	N/A	N/A	98%	98%	98%	98%	98%
Without Decrease	95%	98%	98%	98%	98%	98%	98%
Description: This measure is a SWPC performance measure that ensures issuance of warnings for all geomagnetic storms. Once SWPC receives real-time data regarding geomagnetic storm arrival, the alert is posted on their website and email alerts are sent to customers. SWPC will also contact high impact customers such as FEMA, Coast Guard, power distributors, airlines, etc. This measure also assumes NASA's Advanced Composition Explorer satellite continues until the launch of DSCOVR.							

Outyear Funding Estimates ($ in thousands):*

DSCOVR	**FY 2014 & Prior**	**FY 2015**	**FY 2016**	**FY 2017**	**FY 2018**	**FY 2019**	**CTC**	**Total**
Change from FY 2015 Base		(2,575)	(20,475)	(21,275)	(21,606)			
Total Request	76,031	21,100	3,200	2,400	2,069	0	0	104,800

*Outyears are estimates only. Future requests will be determined through the annual budget process.

PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Budget Program: NESDIS
Sub-program: Systems Acquisition
Program Change: DSCOVR

	Object Class	FY 2015 Decrease	FY 2015 Total Program
11	Personnel compensation		
11.1	Full-time permanent	$0	$490
11.3	Other than full-time permanent	0	3
11.5	Other personnel compensation	0	0
11.8	Special personnel services payments	0	0
11.9	Total personnel compensation	0	493
12	Civilian personnel benefits	0	70
13	Benefits for former personnel	0	0
21	Travel and transportation of persons	0	7
22	Transportation of things	0	0
23.1	Rental payments to GSA	0	28
23.2	Rental Payments to others	0	0
23.3	Communications, utilities and miscellaneous charges	0	6
24	Printing and reproduction	0	0
25.1	Advisory and assistance services	0	352
25.2	Other services	0	54
25.3	Purchases of goods & services from Gov't accounts	(2,575)	18,775
25.4	Operation and maintenance of facilities	0	0
25.5	Research and development contracts	0	10
25.6	Medical care	0	0
25.7	Operation and maintenance of equipment	0	0
25.8	Subsistence and support of persons	0	0
26	Supplies and materials	0	13
31	Equipment	0	86
32	Lands and structures	0	0
33	Investments and loans	0	0
41	Grants, subsidies and contributions	0	1,206
42	Insurance claims and indemnities	0	0
43	Interest and dividends	0	0
44	Refunds	0	0
99	Total obligations	(2,575)	21,100

COSMIC 2/Global Navigation Satellite System Radio Occultation (GNSS RO): GNSS RO Ground System: (Base Funding: $2,000,000 and 1 FTE; Program Change: +$4,800,000 and 0 FTE): NOAA requests an increase of $4,800,000 and 0 FTE for a total of $6,800,000 and 1 FTE for ground reception and processing of GNSS RO satellite data from GNSS RO satellites provided by Taiwan and the U.S. Air Force (USAF).

Proposed Actions:
The GNSS RO ground system is part of an international partnership between Taiwan's National Space Organization (NSPO), USAF, and Brazil for a Constellation Observing System for Meteorology, Ionosphere, and Climate (COSMIC) follow-on. In this COSMIC follow-on partnership, NSPO has agreed to procure 12 satellite buses and integration of instruments, USAF will procure the instruments and provide the launch services. Together, NOAA, Taiwan and Brazil will provide the ground system. In addition to the COSMIC follow-on partnership, NOAA will continue to support the reception and processing of COSMIC and foreign satellite radio occultation data.

There are two launches planned for FY 2016 and FY 2018, respectively. The first launch of six satellites is planned for an equatorial low earth orbit (24 degree inclination) and the second is planned to a higher inclination low earth orbit (72 degree inclination). The two different orbits are necessary in order to meet the NOAA signed Level 1 Requirement Document for GNSS RO data, with the main requirements being 45 minute average data latency and over 8,000 soundings for the system per day.

Data will be received at NOAA's Fairbanks ground station and through contracted commercial receiving stations. Data latency is greatly improved for weather applications with each additional ground reception station. This equatorial ground reception system requires a minimum of 4 ground reception stations, two ground stations on each side of the globe, to achieve the threshold data latency for Numerical Weather Prediction applications. NOAA will need to have a competitive solicitation for at least two equatorial ground reception stations, because Taiwan and Brazil have both agreed to supply one ground reception station in their countries. NOAA is investigating the possibility of teaming with other international and domestic partners to increase the number of ground reception stations to achieve low data latency and high data reliability at low cost.

NOAA will coordinate the downlink and supply of data directly to the University Corporation for Atmospheric Research (UCAR) for processing. NOAA will utilize a Memorandum of Agreement with UCAR who will process the data, create RO products and disseminate them to NESDIS at the NOAA Satellite Operations Facility. NESDIS will distribute the products to the customer base and archive the data.

With a base of $2 million, the ground processing system at UCAR may not be operationally ready at the time of the FY 2016 launch. The revised outyear funding estimate seeks to reduce this risk to the ground system development in FY 2016.

Statement of Need and Economic Benefits:
GNSS RO is a cost effective means of obtaining global atmospheric temperature profiles. This data is currently used to determine high accuracy atmospheric temperatures at various altitudes that improve weather forecasts. This environmental data is not available globally from other sources and losing this capability will result in a significant degradation of performance of the NOAA Numerical Weather Models. In addition, GNSS RO data provides unique advantages that can be leveraged to improve what NOAA does now with other sensors.

GNSS RO significantly increases the volume of quality global atmospheric soundings; providing temperature, water vapor, and pressure profiles which will result in more accurate long range forecasts. GNSS RO data also provides unique advantages that can be leveraged to improve data collected from existing NOAA sensors. For example, COSMIC data fills a void of ionospheric electron density profiles where they do not exist now and can lead to improved NOAA space weather services.

The GNSS RO COSMIC follow-on is expected to provide 10 times the number of daily soundings that COSMIC currently provides, which will increase the benefits to weather forecasting. Specifically:

- GNSS RO data provides valuable information on moisture in the tropics, which is important to hurricane track and intensity forecasts. Based on data assimilation research experiments using the current COSMIC data on five 2008 West Pacific typhoons, 48 hour track errors were improved by approximately 11 percent (from 168 nm to 149 nm on average). Increases in forecast performance will impact evacuation and preparedness decisions that directly correlate to saving lives and mitigating the impact of property damage.
- Based on a study by Cucurull, L., J.C. Derber, 2008, the documented benefits of COSMIC and other GNSS RO observations on the European Metop satellite include a reduction in total global forecast error of approximately 9 percent.

Resource Assessment:
The resources for this activity are described in the Systems Acquisition narrative.

This program change assumes current resources of $2,000,000. In FY 2014, these funds will allow NOAA to continue the reception and processing of COSMIC and foreign satellite radio occultation data, begin algorithm development for COSMIC-2, incorporate GNSS RO satellite data into NWS operational data assimilation systems, and initiate the contract for an equatorial ground station service.

Schedule and Milestones:
FY 2015

- Continued reception and processing of COSMIC and foreign satellite RO data
- Algorithm development for COSMIC follow-on mission
- Develop improved, instrument specific, quality control algorithms for GNSS RO data and test in NWS operational systems
- Establishment of complete ground network for equatorial satellite data reception

FY 2016

- USAF Launches first six satellites - Reception of equatorial low earth orbit satellite RO data from COSMIC follow-on mission
- Continued reception and processing of COSMIC and foreign satellite RO data
- Continue evaluation and improvement of NWS operational quality control algorithms
- Antenna refresh at Fairbanks ground station

FY 2017

- Reception of equatorial low earth orbit satellite RO data from COSMIC follow-on mission
- Continued reception and processing of COSMIC and foreign satellite RO data
- Continue evaluation and improvement of NWS operational quality control algorithms
- Antenna refresh at Fairbanks ground station

FY 2018

- USAF Launches second set of satellites – Reception of polar low earth orbit satellite RO data from COSMIC follow-on mission
- Reception of equatorial low earth orbit satellite RO data from COSMIC follow-on mission
- Continued reception and processing of COSMIC and foreign satellite RO data
- Continue evaluation and improvement of NWS operational quality control algorithms
- Antenna refresh at Fairbanks ground station

FY 2019

- Reception of polar and equatorial low earth orbit satellite RO data from COSMIC follow-on mission
- Continued reception and processing of COSMIC and foreign satellite RO data
- Continue evaluation and improvement of NWS operational quality control algorithms

Deliverables:
RO data; improved quality control algorithms for GNSS RO data in NWS operational data assimilation systems.

Outyear Funding Estimates ($ in thousands):*

COSMIC 2/GNSS RO	FY 2014 & Prior	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	CTC	Total
Change from FY 2015 Base		4,800	8,100	6,100	6,100	6,100		
Total Request	2,000	6,800	10,100	8,100	8,100	8,100	23,200	66,400

* Outyears are estimates only. Future requests will be determined through the annual budget process.

PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Budget Program: NESDIS
Sub-program: Systems Acquisition
Program Change: GNSS RO Ground System

	Object Class	FY 2015 Increase	FY 2015 Total Program
11	Personnel compensation		
11.1	Full-time permanent	$0	$137
11.3	Other than full-time permanent	0	0
11.5	Other personnel compensation	0	0
11.8	Special personnel services payments	0	0
11.9	Total personnel compensation	0	137
12	Civilian personnel benefits	0	55
13	Benefits for former personnel	0	0
21	Travel and transportation of persons	0	25
22	Transportation of things	0	0
23.1	Rental payments to GSA	0	0
23.2	Rental Payments to others	0	0
23.3	Communications, utilities and miscellaneous charges	0	0
24	Printing and reproduction	0	0
25.1	Advisory and assistance services	0	0
25.2	Other services	4,800	6,583
25.3	Purchases of goods & services from Gov't accounts	0	0
25.4	Operation and maintenance of facilities	0	0
25.5	Research and development contracts	0	0
25.6	Medical care	0	0
25.7	Operation and maintenance of equipment	0	0
25.8	Subsistence and support of persons	0	0
26	Supplies and materials	0	0
31	Equipment	0	0
32	Lands and structures	0	0
33	Investments and loans	0	0
41	Grants, subsidies and contributions	0	0
42	Insurance claims and indemnities	0	0
43	Interest and dividends	0	0
44	Refunds	0	0
99	Total obligations	4,800	6,800

Satellite Ground Services: Enterprise Ground System: (Base Funding: $3,000,000 and 0 FTE; Program Change: +$2,983,000 and 0 FTE): NOAA requests an increase of $2,983,000 and 0 FTE for a total of $5,983,000 and 0 FTE to continue a NESDIS Enterprise Ground System program.

Proposed Actions:
This increase will continue the transition within NESDIS from its stovepipe architecture into an enterprise architecture based on common ground services. In FY 2015, this funding will continue to transition independent ground services into a unified set of common ground services.

During this change, NOAA will continue to implement capabilities to process satellite observations into useful products that meet the requirements of NOAA's operational centers and other external users. The NESDIS Enterprise Ground System program will continue to transition the legacy satellite programs as well as begin the transition of the next generation of polar and geostationary satellite programs into the common ground services.

Statement of Need and Economic Benefits:
This initiative directly links to key findings and recommendations of the 2012 Satellite Enterprise Independent Review Team, namely: establishing a core competency of system engineering, implementing engineering standards and configuration control, and establishing integrated management of the ground enterprise. By doing so, NESDIS will be able to more effectively and efficiently manage satellite throughput across its infrastructure.

This funding request will strengthen NESDIS Systems Engineering and promulgate Enterprise Ground Services & Systems. It will position NESDIS to more effectively and efficiently develop and maintain its core ground systems capabilities while evolving the system to an Enterprise Architecture. NESDIS expects to realize efficiencies in systems development, satellite operations and systems O&M. The premise behind this request is to merge or replace current disparate systems and, via common architectures and shared resources, procure common ground services such as command and control, product generation, distribution and security solutions.

Schedule and Milestones:
FY 2015: Development of a transition roadmap based on the common ground architecture which will include mission management, product generation, product distribution, and archive services; refinement of level 0 and 1 requirements for satellite ground common services NESDIS Technical Reference Model (TRM).

FY 2016 – FY 2019: Milestones are in development. With sufficient funding NESDIS would anticipate performing the following activities: Migrate legacy data distribution to centralized common distribution services; define a common algorithm product generation platform; and centralize, where possible, product generation services.

Deliverables:
- Transition roadmap describing the process and steps for transition from the current architecture to the future architecture
- Risk assessment and mitigation plan for the transition to common ground services
- Prototyping and demonstration of candidate ground service implementations

Performance Goals and Measurement Data:
Performance Measures are currently in development for this initiative.

Outyear Funding Estimates ($ in thousands):

Enterprise Ground System	FY 2014 & Prior	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	CTC	Total
Change from FY 2014 Base	0	2,983	TBD	TBD	TBD	TBD		
Total Request*	3,000	5,983	TBD	TBD	TBD	TBD	TBD	TBD

*FY 2015 represents the second year for this program. Outyear funding is still to be determined.

PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Budget Program: NESDIS
Sub-program: Systems Acquisition
Program Change: Enterprise Ground System

	Object Class	FY 2015 Increase	FY 2015 Total Program
11	Personnel compensation		
11.1	Full-time permanent	$0	$0
11.3	Other than full-time permanent	0	0
11.5	Other personnel compensation	0	0
11.8	Special personnel services payments	0	0
11.9	Total personnel compensation	0	0
12	Civilian personnel benefits	0	0
13	Benefits for former personnel	0	0
21	Travel and transportation of persons	0	0
22	Transportation of things	0	0
23.1	Rental payments to GSA	0	0
23.2	Rental Payments to others	0	0
23.3	Communications, utilities and miscellaneous charges	0	0
24	Printing and reproduction	0	0
25.1	Advisory and assistance services	0	0
25.2	Other services	0	
25.3	Purchases of goods & services from Gov't accounts	2,983	5,983
25.4	Operation and maintenance of facilities	0	0
25.5	Research and development contracts	0	0
25.6	Medical care	0	0
25.7	Operation and maintenance of equipment	0	0
25.8	Subsistence and support of persons	0	0
26	Supplies and materials	0	0
31	Equipment	0	0
32	Lands and structures	0	0
33	Investments and loans	0	0
41	Grants, subsidies and contributions	0	0
42	Insurance claims and indemnities	0	0
43	Interest and dividends	0	0
44	Refunds	0	0
99	Total obligations	2,983	5,983

APPROPRIATION ACCOUNT: PROCUREMENT, ACQUISITION, AND CONSTRUCTION
SUB-PROGRAM: NESDIS CONSTRUCTION

SATELLITE COMMAND AND DATA ACQUISITION (CDA) FACILITY

The Satellite CDA Facilities Program ensures that power and cooling infrastructure is available 99.99 percent of the year, supporting the continuous collection, processing and distribution of environmental data for the issuance of life saving NWS watches and short-term warnings to the public. This program supports the operation of critical infrastructure at the Wallops, VA, Fairbanks, AK Command and Data Acquisitions Stations (CDAS), the NOAA Satellite Operations Facility (NSOF) in Suitland, MD and the NESDIS Consolidated Backup (CBU) in Fairmont, WV to enable the continuation of the current 99 percent data availability for NOAA environmental satellite systems. The NSOF and the CDAS facilities have been determined house National Critical Infrastructure elements by Presidential Decision Directive.

The Wallops and Fairbanks CDA facilities continue to undergo significant infrastructure and building upgrades to replace aging equipment. The program is updating major electrical, mechanical, and control systems operating well past their design lives, based on a Facilities Master Planning Process that began for the Stations in 1998. Both facilities require annual repair and replacement of aging infrastructure components to ensure the high level of reliability and redundancy necessary to protect the health and safety of the satellites and satellite ground system. The Wallops facility, on the Atlantic coast, is subject to a corrosive salt air environment and lies in the path of hurricanes that hit the U.S. East Coast. The Fairbanks facility is located in the sub-Artic environment and is subject to extreme winter weather. Further, the facilities must be maintained at the highest operating standards to ensure the safety of the employees and satellite operators who maintain operations under all environmental conditions.

The NSOF facilities infrastructure is a complex system designed to ensure that power and cooling are available for NOAA's satellite operations without fail and can be maintained and repaired without impacting the satellite missions. The complexity of the infrastructure demands the highest level of repair, replacement, and rehabilitation to ensure that facility support is provided to the multiple satellite missions operating at this location.

The NESDIS CBU facility primary function will be to support contingency operations and perform all of the critical functions of NSOF and Wallops CDA. The facility will consist of two complementary ground systems that will support contingency operations and perform all of the vital functions necessary for operating the satellites and producing and distributing critical environmental satellite data. In addition, the CBU will also serve as a backup during system or equipment testing and/or maintenance.

Existing buildings and aging infrastructure continue to require resources to continue reliable operations. Equipment failures have direct impacts on the operational readiness of NOAA satellites and timely repairs are essential to restore lost power and cooling capacity. Funding for this budget line item is for repair and replacement of critical infrastructure components necessary to maintain the operational integrity of facilities.

Schedule and Milestones:

- FY 2015: Complete rehabilitation of the existing power and mechanical plant, septic system, and water supply line at the Fairbanks satellite facility.
- FY 2016-2019: Complete design and begin rehabilitation of the Wallops facility Operations Building infrastructure. At the CDAS, NSOF, and CBU Facilities, replace UPS batteries and

capacitors. At all satellite facilities, refresh equipment to maintain physical security controls required to protect IT High Impact mission system in accordance with Federal standards At the NSOF, add redundant cooling in critical Communication Rooms to ensure hardware supporting operational data inflow and distribution is maintained 24x7.

Deliverables:
This program will complete the Electrical Distribution System upgrades at the Wallops facility , providing a modernized, robust and reliable Electrical Distribution System with increased capacity to meet current and future mission requirements.

Outyear Funding Estimates ($ in thousands):*

Satellite CDA	FY 2014 & Prior	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	Total
Change from FY 2015 Base		(62)	-	-	222		
Total Request	22,069	2,166	2,228	2,228	2,450	0	31,141

*Outyears are estimates only. Future requests will be determined through the annual budget process.

PROGRAM CHANGES FOR FY 2015:

Satellite Command and Data Acquisition Facility: (Base Funding: $2,228,000 and 0 FTE; Program Change: -$62,000 and 0 FTE): NOAA requests an increase of $62,000 and 0 FTE for a total of $2,166,000 and 0 FTE.

The following exhibit shows the summary object class detail for the Satellite Command and Data Acquisition Facility program change decrease of $62,000.

PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Budget Program: NESDIS
Sub-program: Construction
Program Change: Satellite CDA Facility

	Object Class	FY 2015 Decrease	FY 2015 Total Program
11	Personnel compensation		
11.1	Full-time permanent	$0	$0
11.3	Other than full-time permanent	0	0
11.5	Other personnel compensation	0	0
11.8	Special personnel services payments	0	0
11.9	Total personnel compensation	0	0
12	Civilian personnel benefits	0	0
13	Benefits for former personnel	0	0
21	Travel and transportation of persons	0	0
22	Transportation of things	0	0
23.1	Rental payments to GSA	0	0
23.2	Rental Payments to others	0	0
23.3	Communications, utilities and miscellaneous charges	0	0
24	Printing and reproduction	0	0
25.1	Advisory and assistance services	0	0
25.2	Other services	0	0
25.3	Purchases of goods & services from Gov't accounts	(62)	2,166
25.4	Operation and maintenance of facilities	0	0
25.5	Research and development contracts	0	0
25.6	Medical care	0	0
25.7	Operation and maintenance of equipment	0	0
25.8	Subsistence and support of persons	0	0
26	Supplies and materials	0	0
31	Equipment	0	0
32	Lands and structures	0	0
33	Investments and loans	0	0
41	Grants, subsidies and contributions	0	0
42	Insurance claims and indemnities	0	0
43	Interest and dividends	0	0
44	Refunds	0	0
99	Total obligations	(62)	2,166

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BUDGET PROGRAM: NOAA PROGRAM SUPPORT

For FY 2015, NOAA requests a total of $273,930,000 and 947 FTE for Program Support, including an increase of $784,000 in net program changes.

Program Support Overview

The Program Support Operations, Research, and Facilities (ORF) account ($273,146,000 and 887 FTE) includes three sub-programs.

- Corporate Services ($220,530,000 and 816 FTE) includes the Under Secretary and Associate Offices, NOAA Wide Corporate Services & Agency Management, and IT Security
- NOAA Education Program ($27,200,000 and 26 FTE) includes the Office of Education
- Facilities ($25,000,000 and 45 FTE) includes NOAA's ongoing facilities management and maintenance activities

NOAA's Program Support provides the planning, administrative, financial, procurement, information technology, human resources, and infrastructure services that are essential to the safe and successful performance of NOAA's mission.

Within the Corporate Services sub-program, there are three line items: 1) NOAA's Under Secretary and Associate Offices; 2) NOAA Wide Corporate Services and Agency Management; and 3) IT Security. The Under Secretary and Associate Offices budget line item funds centralized executive management as well as policy formulation and direction. In addition, there are various staff offices, including the offices of the Principal Deputy Under Secretary for Oceans and Atmosphere and the Deputy Under Secretary for Operations; Legislative and Intergovernmental Affairs; Communications and External Affairs; International Affairs; the Federal Coordinator for Meteorology; and the General Counsel. The NOAA Wide Corporate Services and Agency Management budget line item funds such activities as financial reporting, budgeting, information technology, acquisitions and grants, and human resource services. The IT Security budget line item funds priority cyber security initiatives.

The NOAA Education Program provides expert support of education activities to NOAA Line, Program, and Staff Offices, while promoting NOAA services and products, and their benefits to the public. The Office of Education (OEd) identifies opportunities for the deployment of coordinated interagency/intergovernmental policy strategies that recognize the importance of linking education, economic and environmental goals. The Office of Education also manages Competitive Education Grants, Education Partnership Program with Minority Serving Institutions (EPP/MSI) and the Ernest F. Hollings Scholarship Program, which is funded through a legislatively mandated set-aside of one-tenth of one percent of NOAA's annual appropriation.

The Facilities sub-program provides funds to address facilities management; repair, restoration and other construction; and environmental compliance and safety activities NOAA-wide. NOAA continues to focus on compliance with Executive Order 13327 (Federal Real Property Asset Management). NOAA effectively manages its facilities portfolio through investments in strategic long-range facility planning and modernization; annual facility condition assessments; and targeted repair and restoration projects to address facility maintenance, repair, safety, and compliance issues. The goal is to conduct required maintenance and periodic life-cycle replacement of major building systems and components in order to maintain NOAA-owned facilities at a safe and effective operational state. Funds for new construction and selected major facility projects are requested separately in the Procurement, Acquisition and Construction account.

Significant Inflationary Adjustments:
NOAA's FY 2015 Base includes a total of $14,960,000 and 0 FTE to account for the full funding requirement for inflationary adjustments to current programs for Program Support activities. This includes the estimated 2015 Federal pay raise of 1.0 percent as well as inflationary increases for non-labor activities, including service contracts, utilities, field office lease payments, and rent charges from the General Service Administration (GSA). Program Support will offset $416,000 of its inflationary costs through program management efficiencies.

NOAA also requests the following transfer for a net change of $0 and 0 FTE to the agency:

From Office	PPA	To Office	PPA	Amount /FTE
PS	BWET Regional Programs	PS	Office of Education	$0/1 FTE
PS	Educational Partnership Program/Minority Serving Institutions	PS	Office of Education	$14,400,000/ 11 FTE
PS	NOAA Wide Corporate Services and Agency Management Base	NOAA WCF	NOAA Working Capital Fund	$0/55 FTE

NOAA requests a technical adjustment of $14,400,000 and 11 FTE from the Educational Partnership Program with Minority Serving Institutions (EPP/MSI) PPA and $0 and 1 FTE from the BWET Regional Programs PPA to the Office of Education PPA (renamed from the NOAA Education Program Base), for a net change to NOAA of $0 and 0 FTE. These adjustments will improve the ability of the Office of Education to manage EPP/MSI and sustain office activities.

NOAA requests a technical adjustment of $0 and 55 FTE from NOAA Wide Corporate Services and Agency Management Base to the NOAA Working Capital Fund for a net change to NOAA of $0 and 0 FTE.

NOAA also requests a technical adjustment of $13,686,000 and 0 FTE to fully fund NOAAs portion of the DOC Working Capital Fund.

Headquarters Administrative Costs:
In FY 2015, Program Support Staff and Corporate Offices will use $173,040,000 to support general management activities, financial management and budgeting, and IT related expenses, as well as supporting facilities and other general operating costs. These funds also include support for service contracts, utilities, and rent charges from the General Services Administration. Specifically, Program Support will use headquarters administrative funds to support the following:

Headquarters Program Support Type	Description	FY 2015 Amount	FY 2015 FTE associated with PS HQ
General Management & Direction/Executive Management	Includes Under Secretary's office, public affairs, information services	$31,947,000	163
Budget & Finance	Includes Budget, Finance and Accounting	$39,728,000	217
Facilities/Other Administrative Functions (CAO Functions)	Includes Facilities and Security costs, as well as other CAO related activities	$45,591,000	177
Human Resources	All HR services, including EEO	$15,995,000	141
Acquisitions and Grants		$13,545,000	107
Information Technology	Includes IT-related expenses and other CIO related activities	$26,234,000	65
Total		**$173,040,000**	**870**

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APPROPRIATION ACCOUNT: OPERATIONS, RESEARCH, AND FACILITIES
SUB-PROGRAM: CORPORATE SERVICES

The objectives of the Corporate Services sub-program are to:

- Develop policies regarding the administration of NOAA programs with Federal agencies, the Congress, and private industry
- Provide oversight of the implementation of information technology policies
- Develop and implement policy, planning, and program oversight

NOAA conducts activities in several program areas within the Under Secretary and Associate Offices and NOAA Wide Corporate Services and Agency Management to achieve these objectives. These activities are composed of three primary programs:

1. **NOAA's Under Secretary and Associate Offices (USAO)**
   USAO supports the leadership and management of NOAA, and represents NOAA at the executive level with other Federal agencies, Congress, NOAA stakeholders, and private industry.

   The Offices of the Under Secretary/Assistant Secretary and Deputy Under Secretary: These offices support NOAA's leadership. Program activities consist of formulating and executing policies for achieving NOAA objectives, responding to Executive Branch policy decisions, and exercising delegated authority in committing NOAA to courses of action. USAO also consists of the following additional Staff Offices covering specific areas of activities:

   Office of Legislative and Intergovernmental Affairs (OLIA): This office is responsible for devising and implementing the legislative strategy to carry out NOAA's initiatives requiring Congressional action. OLIA articulates the views of NOAA, including its components, on Congressional legislative initiatives. OLIA responds to requests and inquiries from Congressional committees, individual congressional members, and their staff. It coordinates Congressional oversight activities involving NOAA, as well as the appearances of NOAA's witnesses and the interagency clearance of all Congressional testimony. OLIA serves as the primary liaison for NOAA with the members and staff of Congress. The office is also responsible for the planning, direction, and coordination of legislative programs that are of immediate concern to the Office of the Under Secretary.

   Office of Communications and External Affairs: This office is the principal point of contact for NOAA programs with the public and the news media. Its staff advises NOAA and other Departmental officials on all aspects of media relations and communication issues. The Office ensures that information provided to the news media by NOAA is current, complete, and accurate. It also ensures that all applicable laws, regulations and policies involving the release of information to the public are followed so that maximum disclosure is made without jeopardizing investigations and prosecutions, violating rights of individuals, or compromising national security. Activities address a variety of unique audiences: media relations; non-government organizations; state, tribal, territorial, regional and local government; and the general public.

   Office of International Affairs (OIA): This office coordinates NOAA and other leadership officials' relationship with international programs, as directed by the Office of the Under Secretary. The Director of the Office of International Affairs exercises a leadership role in

establishing policies, guidelines, and procedures for NOAA's international programs. Within DOC, NOAA OIA works closely with the International Trade Administration on a broad spectrum of issues including seafood exports, export control issues, and information exchange on countries and regions. Outside of DOC, NOAA OIA works closely with the State Department, the U.S. Agency for International Development, and others, to represent U.S. interests abroad in NOAA mission areas.

Office of the Federal Coordinator for Meteorology (OFCM): This office establishes procedures for systematic and continuing review of national basic specialized meteorological and oceanographic requirements for services and supporting research. It also brings Federal agencies concerned with international activities and programs in meteorological and oceanographic programs into close consultation and coordination.

Office of General Counsel (OGC): NOAA's Office of General Counsel provides legal advice, review, and representation on a host of complex matters arising from the fulfillment of NOAA's mission to understand and predict changes in Earth's environment and conserve and manage coastal and marine resources to meet our Nation's economic, social, and environmental needs. In doing so, NOAA OGC ensures NOAA management decisions are made with necessary consideration of proper legal requirements, procedures, and options. NOAA OGC's activities conducted with program resources include Magnuson-Stevens Reauthorization Act implementation; National Marine Sanctuaries Act consistency appeals; enforcement of fisheries and species conservation regulations; natural resource damage assessment and recovery, including litigation to recover damages in connection with the Deepwater Horizon oil spill; support of legislative proposals, including Coral Reef Conservation and Coastal Zone Management legislation; and support of Law of the Sea Convention implementation obligations.

2. NOAA Wide Corporate Services and Agency Management

Acquisition and Grants Office (AGO): AGO supports NOAA Line and Staff Offices and a number of other DOC bureaus, providing the planning, solicitation, award, administration, and close-out of approximately 15,000 acquisition and 4,000 financial assistance actions annually. Of these, approximately 200 acquisition actions and 250 grant awards are of high societal impact, and involve major systems or are high risk programs. Through these functions, AGO helps NOAA execute its day-to-day responsibilities and assists the agency in providing critical services to the Nation. The success of DOC and NOAA in their accomplishment of missions and goals is largely dependent on AGO's ability to obligate over $2 billion annually in accordance with statutory and regulatory requirements.

Office of Chief Administrative Officer (OCAO): OCAO is responsible for NOAA's facility management program, including: capital investment planning and management for NOAA's substantial facility portfolio totaling over $5 billion in owned and leased facilities; facility construction, repair and modernization and corporate campus facility operations; as well as real and personal property management. The OCAO manages NOAA's safety, environmental compliance, and energy efficiency/sustainability programs; ensures continued NOAA-wide compliance with Export Administration Regulations; and oversees NOAA's Office of Inspector General and Government Accountability Office audit coordination and resolution program. The OCAO also manages NOAA's vessel, aircraft and fleet management, mail operations,competitive sourcing program, administrative issuances program, civil rights program, and compliance with Homeland Security Presidential Directive (HSPD–12) requirements.

Office of the Chief Financial Officer (CFO): The CFO serves as the principal financial manager for an organization with annual appropriated resources of about $5.5 billion and whose recorded capital asset value exceeds $7 billion. The CFO's Office also has the responsibility under the CFO Act to provide the leadership necessary for NOAA to obtain a yearly-unqualified opinion in the audit of its consolidated financial statements. The areas under the direction of the CFO are the Budget Office, the Finance Office, the DOC Working Capital Fund (WCF), and Common Services.

The Budget Office (BO): is responsible for the oversight and management of NOAA's budget process. The office develops overall guidance, reviews proposals, and prepares supporting justification and documentation. This includes coordinating the preparation of NOAA budget submissions to DOC, OMB and the Congress, including data on budget authority, obligations, outlays, permanent positions, and full-time equivalent employment. The Budget Office also provides for the proper allocation and control of the execution of all budgetary resources as required under the Congressional Budget and Impoundment Act of 1974 (31 U.S.C. 11) and related statutes, and as specified by OMB. The Budget Office also maintains a staff that focuses on outreach and communication, particularly with the staff of Congressional Appropriations committees, as well as other Executive Branch agencies.

The Finance Office: works to ensure that NOAA's consolidated financial statements and reports accurately reflect NOAA's fiduciary status at the end of the fiscal year, as required of all government agencies under the CFO Act of 1990. It operates NOAA's financial management system the Commerce Business System (CBS) to ensure that NOAA managers have access to timely financial data necessary to make informed programmatic decisions. The Finance Office is also responsible for ensuring that NOAA's bills are paid in a timely manner. In addition, the Finance Office:

- Provides accounting and payments services. The Finance Office plans, designs, and coordinates standards, practices, and procedures on financial operations with the objective of providing financial management service and support to NOAA programs.
- Prepares internal and external accounting and financial reports on NOAA appropriations, including the audited financial statements required by the CFO Act. The objective is to maintain the Department's clean financial opinion without any material weaknesses and to correct any findings.
- Manages NOAA's financial management system. The objective is to plan, develop, and implement changes to CBS throughout NOAA to ensure that NOAA programs have all necessary financial information.

The DOC Accounting System (CBS application): supports the NOAA CFO in ensuring compliance with legal/regulatory/executive requirements, and enables NOAA program managers to execute the budget while enforcing funds control. The CBS application requires that the application, along with associated interfaces and feeder systems, be operated, maintained and enhanced. Based on the maintenance and enhancements that are designed, developed and implemented, these need to be tested to ensure that integrity, availability, and confidentiality are maintained within the context of a secure application environment. The CBS user community, which consists of over 10,000 users across the agency, requires ongoing helpdesk services, training, and, depends on system maintenance and enhancement releases. Ongoing maintenance and support of CBS allows NOAA to maintain compliance with OMB Circular A-123 and the Federal Information Security Management Act (FISMA).

The NOAA implementation of the CBS application develops interfaces, maintains the NOAA Data Warehouse and portal (including associated feeder systems), and conducts quality assurance tests to ensure that the CBS application and all associated feeder systems produce reliable, accurate, and verifiable data. This helps to ensure NOAA compliance with legal, regulatory, and executive requirements; and allows NOAA managers to have access to the financial data necessary to make informed programmatic decisions and perform funds management.

The Common Services (CS): account supports the NOAA CFO in providing resources for NOAA-wide activities and services provided through the DOC and other agencies through Memoranda of Understanding and/or Interagency Agreements. CS funds the Departmental Management Advances and Reimbursements (A&R) accounts providing a centralized funding source for special services and tasks provided by the DOC; off-site health services at the Census Bureau Health Unit; OPM USAJobs portal usage and maintenance; and other miscellaneous services and products.

Office of the Chief Information Officer (OCIO): NOAA OCIO is organized on an operating model focused on service delivery, customer support, innovation, and security with a mission to provide a secure and agile information enterprise with advanced computing capability that propels NOAA's scientific and operational missions. The cornerstone of the operating model is delivering shared enterprise information services through technology advancements, including cloud computing, mobile devices, big data, and grid computing. This allows OCIO to provide information ingestion, processing, and dissemination capabilities to NOAA at greater scales. NOAA OCIO has established four organizational goals to be achieved in FY 2015 and beyond. They are: 1) deliver world-class information services to end users, enabling innovation, improving science, and providing greater customer satisfaction; 2) improve the efficiency of delivering information services across bureau operations and management by employing agile and innovative methodologies, processes, and tools; 3) provide worldwide, secure access to data, information, and systems and continuously protect these assets from loss or unauthorized access; 4) and enable and equip a high performance information services workforce that is highly motivated, customer service oriented, diverse, and focused on transformative goals.

Workforce Management Office (WFMO): The Workforce Management Office provides policies, programs, and processes that facilitate the recruitment, hiring, development, and retention of a diverse, highly skilled, motivated, and effective workforce capable of accomplishing the Agency's mission. This office provides NOAA-wide leadership workforce management functions including strategic human capital planning, labor-management and employee relations, performance management and incentive awards, executive resources, distance learning, leadership development, training and career development, as well as human resources data management and automation initiatives.

Program Planning and Integration (PPI): The Office of Program Planning and Integration (PPI) was established in June 2002 to foster integration and strategic management among NOAA Line Offices, Staff Offices, and councils. PPI ensures that agency investments and actions are guided by the NOAA strategic plan; are based on sound social and economic analysis; adhere to executive and legislative science, technology and environmental policy; respond to regionally-specific stakeholder needs; and integrate the full breadth of NOAA's resources, knowledge and talent to meet its stated mission goal.

PPI has several facets that work together to corporately assist the development and execution of NOAA's strategy to achieve NOAA's goals. In particular, PPI leads the

development of the strategic plan and promotes cross-NOAA collaborations to achieve objectives. With the implementation of NOAA's Next Generation Strategic Plan in FY 2011, NOAA used the opportunity to reassess the budget formulation process and to take steps to implement processes that provide organizational efficiencies. PPI leads NOAA's system for Strategy, Execution and Evaluation (SEE) in order to align strategic priorities to the budget and provide meaningful evaluation of the budget execution. In addition, PPI coordinates NOAA's internal and external collaborative networks by promoting coordination of NOAA's diverse assets within eight Regions and encourages collaboration with internal stakeholders and external partners to respond to stakeholders' unique regional challenges and requirements. PPI also coordinates all NOAA activities implementing the National Environmental Policy Act (NEPA) and ecology and environmental conservation matters, and serves as the focal point for Department NEPA compliance and implementation. PPI ensures that information regarding the social science benefits of NOAA's programs is collected corporately and clearly conveyed to the public.

Payment to the DOC Working Capital Fund (WCF): The DOC WCF provides centralized services to the Line Offices and Staff Offices in the most efficient and economical manner possible by the DOC to NOAA. Organizational units within DOC provide the administrative, legal, information technology and financial policy support needed to accomplish NOAA's overall mission. The DOC Working Capital Fund was established pursuant to 5 USC 607 (15 USC 1521). Unlike other DOC bureaus, the NOAA contribution to the DOC WCF is provided by specific allocation within the NOAA appropriation.

3. <u>IT Security</u>

Federal cyber security priority areas include Trusted Internet Connection (TIC) capability and use, continuous monitoring of Federal information systems, and strong authentication using government issued identity credentials. NOAA's cyber security efforts include routing external network traffic through established Trusted Internet Connection Access Providers (TICAPs), providing continuous monitoring across the enterprise using multiple resources, and adopting the DoD Common Access Card (CAC) to ensure only authorized employees have access to Federal information systems.

Schedule and Deliverables:

CFO Schedule and Deliverables:

Deliverables	FY 2013 Actual	FY 2014 Target	FY 2015 Target	FY 2016 Target	FY 2017 Target	FY 2018 Target	FY 2019 Target
Provide Enacted Fund Availability Table	Q1	Q1	Q1	Q1	Q1	Q1	Q1
Provide funding allocations to NOAA Line Offices	15 days after enactment	15 days after enactment	15 days after enactment	15 days after enactment	15 days after enactment	15 days after enactment	15 days after enactment
Complete apportionment submission to DOC	10 days after enactment	10 days after enactment	10 days after enactment	10 days after enactment	10 days after enactment	10 days after enactment	10 days after enactment
Identify corrective action plans for Audit Findings	1-30 days after receipt of Final Findings	1-30 days after receipt of Final Findings	1-30 days after receipt of Final Findings	1-30 days after receipt of Final Findings	1-30 days after receipt of Final Findings	1-30 days after receipt of Final Findings	1-30 days after receipt of Final Findings
Review of Execution spend plan for Staff Offices	monthly	monthly	Monthly	monthly	monthly	monthly	monthly
Complete Direct Bill analysis and distribution of Direct Bill Funds	Q2	Q2	Q2	Q2	Q2	Q2	Q2
Complete Blue Book for President's Budget Request	Q2	Q2	Q2	Q2	Q2	Q2	Q2
Document and track all Congressional Appropriation Reports	monthly	monthly	Monthly	monthly	monthly	monthly	monthly
Complete Congressional Budget Submission	Q2	Q2	Q2	Q2	Q2	Q2	Q2

OCIO Schedule and Deliverables:

Activity	Description of Milestone	Planned Completion Date
Portfolio Management	Prepare IT Implementation Plan	Q1 Annually
	Prepare NOAA Operational IT Plan	Q2 Annually
	Prepare NOAA Strategic IT Plan	Q3 Annually
	Maintain and/or improve the overall ratings of NOAA Major Investments on the Federal IT Dashboard	Quarterly
Cyber Security	Complete Risk Management Framework (RMF) and Continuous Monitoring packages in accordance with the CIO Council-approved schedule	Quarterly
	Complete Contingency Plan updates and testing in accordance with DOC policy, NIST Guidance, and NOAA policy	Quarterly
	Administer annual NOAA IT security awareness training	Q3 Annually
	Complete annual FISMA Report	Q4 Annually
Enterprise Architecture	Leverage service-based IT across multiple goals and business needs	Quarterly
	Facilitate implementation of an enterprise-wide data management architecture	Quarterly
	Facilitate planning and transition to mission services upon an enterprise infrastructure services architecture	Quarterly
	Update Data Center Consolidation Inventory and Implementation Plan	Q4 Annually
Shared Services	Provide cost-effective IT infrastructure services across the enterprise	Quarterly
	Deliver customer-focused IT services for the enterprise	Quarterly
Homeland Security	Plan & conduct annual NOAA HQ Continuity of Operations (COOP) exercise	Q3 Annually
	Update NOAA COOP Plan	Q4 Annually

PPI Schedule and Milestones:

- Corporate Portfolio Analysis – 2nd Quarter
- Annual Guidance Memorandum – 4th Quarter
- Progress to Plan – 4th Quarter
- NEPA Analysis/Reviews – All Quarters
- Economic Statistics – All Quarters
- Performance Measure Analysis – 4th Quarter

PPI Deliverables:

1. Corporate Portfolio Analysis - Analyzes Implementation Plans to identify key issues and corporate priorities for the next budget formulation phase; draws attention to long term concerns for Leadership; concludes with NEP/NEC Decision Memo.
2. Annual Guidance Memorandum - Provides NOAA wide annual guidance focusing analytical attention based on the Strategic Plan, Administration priorities, recent execution/evaluation, fiscal and policy environment. It also identifies NOAA's near term priorities and initial fiscal guidance for planning cycles.
3. Progress to Plan - Assesses progress toward NGSP objectives; evaluates executed programs to determine what has been working and what might be changed for better performance.
4. NEPA Analysis and Reviews - NOAA is charged by the White House Council on Environmental Quality (CEQ) regulations with implementing NEPA policy from a corporate (NOAA-wide) perspective. NOAA actions requiring NEPA review include: Fisheries management and regulations, Endangered Species Act/Marine Mammal Protection Act permits/authorizations, Habitat restoration plans, National Marine Sanctuaries and National Estuarine Research Reserves site designation and management, NOAA-wide administered grant programs, and construction activities such as science laboratories, ground stations for, satellites and NWS Weather Forecast Offices.
5. Economic Statistics - Ensures that information regarding the social science benefits of NOAA's programs is corporately collected and clearly conveyed via appropriate media such as Web sites and printed materials.
6. Performance Measure Analysis – The Government Performance and Results Act (GPRA), enacted by Congress in 1993, instituted formal requirements for strategic planning and performance measurement in the Federal government. GPRA requires that agencies develop strategic plans, annual performance plans, and annual program performance reports.

Performance Goals and Measurement Data: AGO

Performance Measure: Timeliness of acquisition actions	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	87%	85%	85%	85%	85%	85%	85%
Description: This measure tracks the percentage of on-time acquisition actions as measured against NOAA's published Procurement Action Lead Time (PALT) schedule. Timeliness is measured against the published procurement action lead time metrics (for each acquisition package) and is measured from the receipt of a requisition to the date of award. The dates are tracked in the CRequest/CBuy procurement system. Percentages represent meeting the published PALT for that transaction.							

Performance Measure: Timeliness of grants actions	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	100%	85%	85%	85%	85%	85%	85%
Description: This measure tracks the percentage of on-time grants actions as measured against NOAA's published Procurement Action Lead Time (PALT) schedule. Timeliness is measured against the published lead time metrics (for each grant application) and is measured from the receipt of an application to the date of award. The dates are tracked in the Grants Online system. Percentages represent meeting the published PALT for that transaction.							

Performance Measure: Customer Satisfaction with Service	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	4.5	3.5	3.5	3.5	3.5	3.5	3.5
Description: This measure is the average customer rating on customer satisfaction surveys. This measure tracks the satisfaction level of AGO customers based on a rating of 1 through 5, with 5 representing the highest satisfaction level. Performance will be tracked through DOC Office of Acquisition Management surveys, semi-annual customer surveys, individual action customer surveys, and outreach by the Director of AGO.							

OGC

Performance Measure: Availability of legal support to programs	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	99.9%	99.9%	99.9%	99.9%	99.9%	99.9%	99.9%
Description: This measure serves as an indicator of the availability of legal resources to support program requirements.							

CFO

Performance Measure: Complete End of Year Execution Reviews for NOAA Line Offices	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	100%	100%	100%	100%	100%	100%	100%
Description: This performance measure relates to the Target levels for the Budget Office to complete the End of Year Execution Reviews for all NOAA Line Offices.							

Performance Measure: Expend Budget Office Funding by Year End	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	99.8%	99.8%	99.8%	99.8%	99.8%	99.8%	99.8%
Description: This performance measure relates to the Target levels for the Budget Office to expend all appropriated funding by the end of Fiscal year.							

Performance Measure: Prompt Payment of Vendor Invoices without penalty	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	98%	98%	98%	98%	98%	98%	98%
Description: This performance measure relates to the target levels for the Finance Office to pay all the vendor invoices promptly and without any penalties.							

Performance Measure: Financial Statements and Regulatory reports due date	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	100%	100%	100%	100%	100%	100%	100%
Description: This performance measure relates to the Target levels for the Finance Office to submit all the Financial Statements and Regulatory Reports by the due date. Previously, the performance targets for this measure were reported at 98%, which was an error. This reflects the correct targets.							

OCIO

Performance Measure: Percentage of systems in operation with full Authorization to Operate (ATO)	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	100%	100%	100%	*	*	*	*
Description: The Certification and Accreditation (C&A) process requires a fully-tested system with a complete set of security documentation (e.g., approved security plan, risk assessment, disaster recovery plans, security testing), prior to being deemed certified. All systems in NOAA (approximately 120-150 at any given point in time) have been inventoried for their relative ranking as National Critical, Mission Critical, or Business Essential. This IT measure reports the percentage of NOAA IT Systems that have completed the C&A process and operate under a Full Authorization to Operate (ATO). Systems with full Authorization to Operate have completed Certification & Accreditation (C&A) prescribed by FISMA – security controls are in place for those systems and their FISMA documentation has been verified. * Target is updated annually in accordance with the DOC Balanced Scorecard (BSC).							

Performance Measure: Percentage of Plans of Action and Milestones (POA&Ms) closed on- time	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	63%	100%	100%	*	*	*	*

Description: This IT measure reports the total number of POA&Ms closed as scheduled or ahead of schedule divided by the total number of POA&Ms scheduled to be closed during the quarter, as a percentage, for all of NOAA's FISMA reportable systems.
*Target is updated annually in accordance with the DOC Balanced Scorecard (BSC).

Performance Measure: Web Operations Center (WOC) Availability	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	99%	99%	99%	99%	99%	99%	99%

Description: This IT measure reports the availability of the Web Operations Center (WOC), which is operated and maintained by OCIO, expressed as the percentage of uptime in a given year. Network engineers monitor the system and measure the percentage of time that it is available. Availability is inversely proportional to the total downtime in a given year, and the total downtime is simply the sum of the duration of each outage. Decreasing the duration and/or frequency of outages increases availability.

Performance Measure: Availability of Unified Messaging Service (UMS)	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	99.9%	99.9%	99.9%	99.9%	99.9%	99.9%	99.9%

Description: This IT measure reports the availability of the NOAA Unified Messaging Service (UMS), which is operated and maintained by OCIO, expressed as the percentage of uptime in a given year. Network engineers monitor the system and measure the percentage of time that it is available. Availability is inversely proportional to the total downtime in a given year, and the total downtime is simply the sum of the duration of each outage. Decreasing the duration and/or frequency of outages increases availability.

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PROGRAM CHANGES FOR FY 2015:

NOAA-Wide Corporate Services & Agency Management Base: Building Capacity to Provide NOAA-Wide Corporate Services: (Base Funding: $113,139,000 and 639 FTE; Program Change: +12,000,000 and +60 FTE): NOAA requests an increase of $12,000,000 and 60 FTE for a total of $125,139,000 and 699 FTE to integrate new Departmental business systems at NOAA and mitigate risk of non-compliance with the regulatory areas for which the Corporate Services units have agency oversight.

Proposed Actions:
NOAA requests an increase of $12,000,000 to both efficiently and effectively implement and integrate Departmental business systems on behalf of NOAA and address the increasing risk of failure of performing critical oversight, guidance and advisory services through the corporate services business lines. This request is composed of two parts: $4.6 million for contractor support for NOAA integration of new Departmental business systems, $7.4 million for the hire of up to 80 entry- and mid-level employees through FY 2016, 60 FTE in FY 2015 and 20 FTE in FY 2016, including support costs associated with personnel. This funding request will support the management and execution of NOAA-level activities needed for the timely transition to the Department of Commerce's mandatory suite of business applications, in accordance with OMB Memorandum M-13-08. This increase will also allow NOAA Corporate Services to augment its workforce over the next two fiscal years with up to 80 FTE, which will strengthen oversight and compliance in the financial, human resources, facilities, information technology, and acquisition and grants business lines. As evidenced in Office of Inspector General[1] and Government Accountability Office[2] reports of the last few years, the drop of FTE in this PPA has impaired its ability to provide crucial corporate services, including sound financial management oversight.

This program increase will be focused on:

- NOAA transition efforts to ensure smooth and timely migration of business operations to the Department of Commerce Business Application Solutions (BAS) for finance, acquisition, real property, personal property, and to HR Connect; and
- Infusing the workforce with entry- and mid-level employees to mitigate risk of non-compliance, address succession needs and lessen the loss of institutional knowledge.

The $4.6 million request for NOAA migration efforts to new BAS systems would be allocated approximately 30 percent for project management and 70 percent for change management to the integration of the following systems:

- Core Financial System (Financial Systems) - $1.5M
- Comprizon Suite (Acquisition System) - $1.5M
- Sunflower (Personal Property and Fleet Systems) and Federal Real Property Management (Real Property System) - $0.6M
- Data Warehouse (Management Information System) - $0.6M

Additionally, a level of change management will occur in FY 2015 for the HR Connect system (Human Resources interface to the National Finance Center) requiring $0.4M.

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[1] U.S. Department of Commerce, Office of Inspector General *Semiannual Report to Congress, March 2013.*
[2] U.S. Government Accountability Office *NOAA Needs to Better Document Its Policies and Procedures for Providing Management and Administration Service,* January 2011.

The FTE would be distributed across functional areas where NOAA continues to face the most compliance risk. The funding request includes an estimate for the hire of 60 FTE in FY 2015 and 20 FTE in FY 2016 for a total of 80 FTE over the next two fiscal years. These numbers would be proportionally scalable for more mid-level/more expensive hires if a modified approach at the time of hire is required. The plan is to allocate the 80 FTE as follows:

- 30 in Human Resources
- 20 in Acquisition
- 17 in Finance
- 5 in Property
- 5 in Safety and Environmental Compliance
- 3 in Systems Engineering and Technical Assistance

Statement of Need and Economic Benefits:
This investment will build the capability of NOAA Corporate Services to effectively perform in a leaner, rapidly changing and technologically integrated business operating environment. Strengthening the workforce will reduce audit findings in the corporate services business lines, improve the bureau's overall hiring timeliness, and increase compliance with regulatory statutes. Funding system implementation efforts will facilitate quicker progression in the adoption of Departmental integrated business applications by NOAA.

The FTE funded in this request will add hours of productivity in corporate services and additional gains in productivity will be seen in reduction of rework. The improved service interaction with NOAA's Line Offices will reduce rework from their staff as well. Improved business processes for tracking and monitoring agency compliance, and properly implemented business applications will provide transparency and accountability of bureau operations to the Department and ultimately, to the public.

A positive cost benefit analysis is feasible over the life cycle of the initiative. This increase will result in savings derived from many avenues, including improved workflow efficiencies, reduced line office work and overhead cost, and gained automation processing efficiencies. Improved compliance can be monitored through avoided litigation costs or improved FOIA responsiveness.

Resource Assessment:
The resources for this activity are described in the narrative for NOAA Wide Corporate Services and Agency Management.

Actual FTE counts for the Corporate Services PPA continue to fall below the levels of a sustainable workforce. Funding limitations over the past several years have caused serious erosion to FTE within this PPA, and with an average annual separation rate of 118 employees or 16 percent of the workforce size (Chart 1) NOAA cannot stabilize the knowledge base or resource levels to maintain consistent support levels. The corporate services area has a high turnover rate due to mobility opportunities in the Federal environment for the management operations and administrative skillsets and to the retirement eligibility of the workforce. As of FY 2013, 19 percent of the workforce is retirement eligible, and each year that number increases (Chart 2). It is anticipated the current attrition pattern will continue for at least the next 3-5 years and without a focused workforce planning effort, NOAA's mission areas will continue to see further decline in support to its Line Offices, and increased costs to programs as de-centralized solutions for obtaining support will be utilized.

Chart 1: Corporate Services Employee Attrition Rate

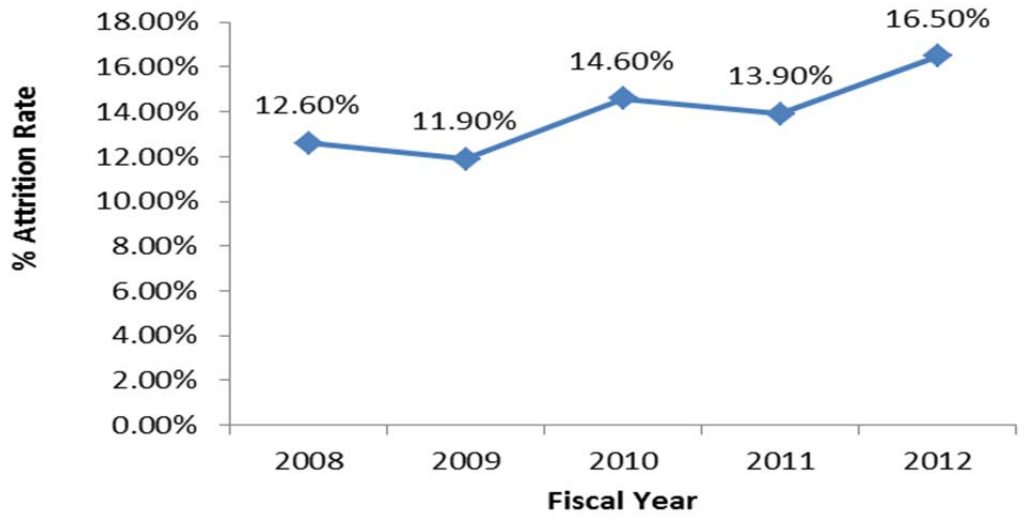
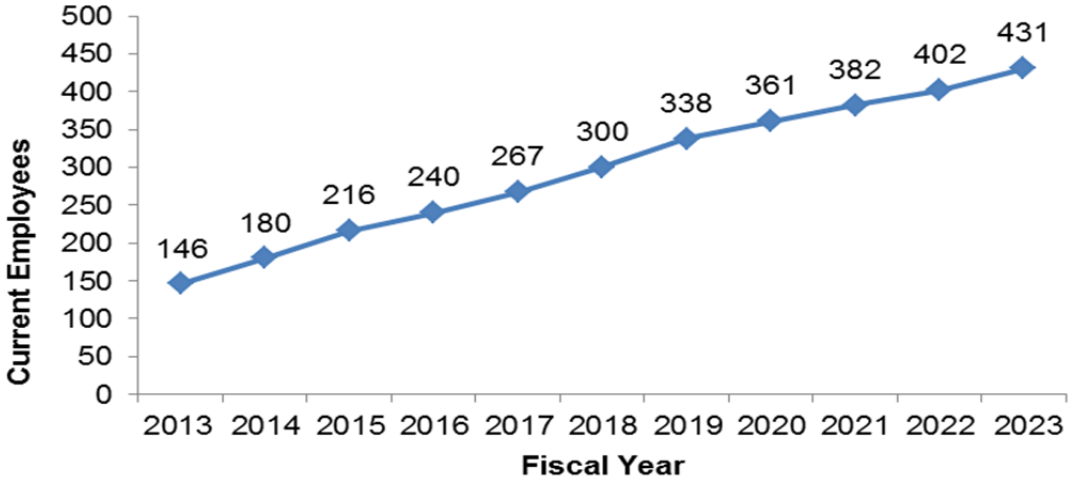


Chart 2: Profile of Current Employees Retirement Eligibility



Schedule and Milestones:

- Recruit and onboard up to 80 FTE, 60 in FY 2015 and 20 in FY 2016, in human resources, acquisition, finance, property, safety and environmental compliance, and systems engineering and technical assistance.
- Define requirements and compete contracts for human resources support services, project management support services, systems technology refresh, and systems engineering and consolidation planning.

Performance Goals and Measurement Data:

Improved performance is anticipated in the following activities executed by Corporate Services program areas:

- Reduced audit findings (CFO Measure)
- Reduced time to hire or increased compliance with DOC's 80-day hiring requirements
- Increased timeliness in FOIA response
- Increased compliance with regulatory statutes
- Systems implementation milestones met

PROGRAM CHANGE PERSONNEL DETAIL

Budget Program: Program Support
Sub-Program: Corporate Services
Program Change: Building Capacity to Provide NOAA-Wide Corporate Services

Title:	Location	Grade	Number of Positions	Annual Salary	Total Salaries
HR Specialist	Silver Spring, MD	ZA-III	25	83,692	2,092,300
HR Specialist	Silver Spring, MD	ZA-IV	5	118,236	591,180
Contract Specialist	Silver Spring, MD	GS-9	15	59,967	899,505
Contract Specialist	Silver Spring, MD	GS-12	5	86,963	434,815
Program Support Specialist	Germantown, MD	ZA-II	10	60,916	609,160
Program Support Specialist	Germantown, MD	ZA-III	7	83,692	585,844
Facility Operations Specialist	Silver Spring, MD	ZA-III	5	83,692	418,458
Facility Operations Specialist	Silver Spring, MD	ZA-IV	5	118,236	591,180
Mgmt & Program Analyst	Silver Spring, MD	GS-12	3	86,963	260,889
Subtotal			80		6,483,331
less Lapse	25%		(20)		(1,620,833)
Total full-time permanent (FTE)			60		4,862,498
2015 Pay Adjustment	1.00%				48,625
TOTAL					4,911,123

Personnel Data	Number
Full-Time Equivalent Employment	
Full-time permanent	60
Other than full-time permanent	0
Total	60
Authorized Positions:	
Full-time permanent	80
Other than full-time permanent	0
Total	80

PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Budget Program: Program Support
Subprogram: Corporate Services
Program Change: Building Capacity to Provide NOAA-Wide Corporate Services

	Object Class	2015 Increase	2015 Total Program
11	Personnel compensation		
11.1	Full-time permanent	4,911	65,633
11.3	Other than full-time permanent	0	479
11.5	Other personnel compensation	0	0
11.8	Special personnel services payments	0	390
11.9	Total personnel compensation	4,911	66,502
12	Civilian personnel benefits	1,621	19,211
13	Benefits for former personnel	0	257
21	Travel and transportation of persons	120	534
22	Transportation of things	3	256
23.1	Rental payments to GSA	450	7,434
23.2	Rental Payments to others	0	845
23.3	Communications, utilities and misc. charges	60	4,026
24	Printing and reproduction	2	10
25.1	Advisory and assistance services	4,623	11,016
25.2	Other services	0	12,631
25.3	Purchases of goods & services from Gov't	0	0
25.4	Operation and maintenance of facilities	0	0
25.5	Research and development contracts	0	0
25.6	Medical care	0	0
25.7	Operation and maintenance of equipment	0	0
25.8	Subsistence and support of persons	0	0
26	Supplies and materials	90	922
31	Equipment	120	1,420
32	Lands and structures	0	0
33	Investments and loans	0	0
41	Grants, subsidies and contributions	0	72
42	Insurance claims and indemnities	0	1
43	Interest and dividends	0	2
44	Refunds	0	0
99	Total obligations	12,000	125,139

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APPROPRIATION ACCOUNT: OPERATIONS, RESEARCH, AND FACILITIES
SUB-PROGRAM: NOAA EDUCATION PROGRAM

The objectives of this sub-program are to:

- Provide advice and counsel to the Under Secretary of Commerce for Oceans and Atmosphere in matters pertaining to education
- Coordinate educational activities across NOAA
- Develop NOAA's Education Strategic Plan and policy to help ensure that NOAA's education programs and activities are based on NOAA science and support the agency's cross-cutting priority of promoting environmental literacy

NOAA Office of Education
This activity includes the Office of Education (renamed from NOAA Education Program Base).

The Office of Education coordinates education activities throughout NOAA through the NOAA Education Council and its working groups. The Office also represents the Agency in inter-agency education initiatives (e.g., Co-STEM, Interagency Working Group on Ocean Education, etc.) Office of Education also supports EPP/MSI grants, Hollings Scholarships, CSC agreements, and Education Council and Interagency working group efforts. The Competitive Educational Grants promote public environmental literacy and fund a broad range of informal and formal education projects implemented on state to national scales.

Educational Partnership Program/Minority Serving Institutions
The Educational Partnership Program/Minority Serving Institutions (EPP/MSI) provides financial assistance, through competitive processes, to students and to Minority Serving Institutions that train students and conduct research in NOAA mission sciences. The program's goal is to increase the number of students, particularly from underrepresented communities, who are trained and graduate in sciences directly related to NOAA's mission. In FY 2013, 101 EPP students graduated in NOAA mission fields, including 66 students from underrepresented groups. Twenty-nine of these students were hired by NOAA, NOAA contractors and other natural resource and science agencies at the Federal, state, local and tribal levels; private sector and academia. The program resulted in 92 collaborative research projects undertaken by NOAA and EPP in support of the NOAA mission.

Ernest F. Hollings Scholarship Program
The National Oceanic and Atmospheric Administration (NOAA) Ernest F. Hollings (Hollings) scholarship program is designed to:

1. increase undergraduate training in oceanic and atmospheric science, research, technology, and education and foster multidisciplinary training opportunities;
2. increase public understanding and support for stewardship of the ocean and atmosphere and improve environmental literacy;
3. recruit and prepare students for public service careers with NOAA and other natural resource and science agencies at the Federal, state and local levels of government; and
4. recruit and prepare students for careers as teachers and educators in oceanic and atmospheric science and to improve scientific and environmental education in the United States.

Based on FY 2015 President's Request of $5.5 billion, NOAA estimates it will have $5.5 million for scholarships. Actual funding will be determined as provided in statute at one-tenth of one percent of the annual appropriation. For more information, please visit the Hollings Scholarship website: http://www.oesd.noaa.gov/scholarships/hollings.html

Schedule and Milestones:
FY 2015 – 2019

Educational Partnership Program
- April: Award EPP Undergraduate Scholarships
- August: Fund 4th of 5-Year Cooperative Science Centers financial awards

OED Student Opportunities
- April: Award Hollings Undergraduate Scholarships

Intra/Inter-agency Coordination of STEM Education Activities
- Lead monthly Education Council meetings
- Co-lead bi-monthly Interagency Working Group on Ocean Education meetings
- Lead two monthly education working group meetings
- Participate in 12 meetings of Interagency Working Group on STEM Graduate Fellowships
- Participate in three quarterly meetings of the Committee on Equal Opportunity in Science and Engineering

Competitive Education Grants
- January: Publish Federal Funding Opportunity
- March: Receive and process applications
- May: Conduct peer-review and select subset of applications for funding
- June: Conduct negotiations and submit award packages to Grants Management Division
- September: Issue awards
- October-December: Review progress reports and conduct site visits

Deliverables:
Educational Partnership Program
- Award 9 EPP Undergraduate Scholarships
- Award 4 Cooperative Science Centers Cooperative Agreements

OED Student Opportunities
- Award 110 Hollings Scholarships

Intra/Inter-agency Coordination of STEM Education Activities
- Chair 12 Education Council meetings
- Chair 12 Interagency Working Group on Ocean Education meetings
- Chair 24 education working group meetings

Competitive Education Grants
- Award 12 new competitive education grants
- Review progress reports and conduct sites visits for a portfolio consisting of more than 40 education grants
- Solicit and review more than 150 grant applications annually

Performance Goals and Measurement Data:
Consistent with the recommendations from the National Research Council study of NOAA's education program conducted in 2010, as well as the Department's review through the Balanced Scorecard process, the Office of Education has refined the performance measures for education programs. As the Office of Education progresses in implementing NOAA Education's Monitoring and Evaluation framework, it is anticipated that performance measure will continue to be refined.

Performance Measure: Number of EPP students supported with NOAA funding who are awarded NOAA mission-related STEM post-secondary degrees	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	101	87	83	88	71	64	56

Description: This metric represents all components of EPP including the Cooperative Science Centers and Scholarships. The NOAA EPP supports development of programs to educate and graduate students for the next-generation workforce and to increase the number of competent individuals with the knowledge and skills to support NOAA STEM activities. EPP graduates will lead innovation and technologies to enhance NOAA services and stewardship while supporting global competitiveness to advance national economic growth.
*****Cooperative Science Center Awards end in FY 2016.

Performance Measure: Number of EPP students from underrepresented communities supported by NOAA funding who are awarded NOAA mission-related STEM post-secondary degrees	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	66	69	66	70	56	51	44

Description: It represents all components of EPP using the NOAA-wide Education metrics. The NOAA EPP funding is developing education/engagement and research programs to increase the number of undergraduate and graduate students, from underrepresented communities, who complete degrees in NOAA mission-relevant STEM disciplines and are prepared to enter NOAA mission-relevant STEM careers or advanced education.
http://www.epp.noaa.gov/docs/csc_contributions_STEM_pool.pdf

Performance Measure: Number of EPP students hired by NOAA, NOAA contractors and other natural resource and science agencies at the Federal, State, local and tribal levels; private sector and academia	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	29	40	40	40	30	10	10

Description: The EPP aligns with NOAA mission priorities and includes education, engagement, and NOAA STEM research programs to develop students with NOAA mission-critical STEM knowledge and skills. With the collaboration and mentoring by NOAA scientists, program graduates may pursue careers at NOAA and become part of the scientific and technological workforce at resource management agencies, private sector and academia.
http://www.epp.noaa.gov

Performance Measure: Number of collaborative research projects undertaken between NOAA and EPP in support of NOAA mission	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	92	90	80	50	30	20	20

Description: Each NOAA Cooperative Science Center (CSC) aligns with specific NOAA Line Organizations and collaborates with NOAA scientists and engineers conducting research to better understand the significance of changes in the Earth's oceans, coasts, Great Lakes, weather, and climate. Each Graduate Sciences Program trainee has a NOAA research mentor and works in a NOAA Line Organization supporting the NOAA mission. The data tracked represent the total number of CSC research projects that include a NOAA collaborator, and number of GSP trainee collaborations.

Performance Measure: Institutions served by Competitive Education Grants (actual numbers, NOT in thousands)	**FY 2013 Actual**	**FY 2014 Estimate**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	51	60	62	60	48	48	48

Description: Number of institutions with active multi-year NOAA Competitive Education Grants that support STEM-related education exhibits and programs

Performance Measure: K-12 students served by Competitive Education Grants (in thousands)	**FY 2013 Actual**	**FY 2014 Estimate**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	61.7	61.7	61.7	61.7	61.7	61.7	61.7

Description: Number of K-12 students that benefit from learning materials, hands-on experiential activities, and other STEM education programming and resources supported by NOAA's Competitive Education Grants

Performance Measure: K-12 teachers and staff served by Competitive Education Grants (in thousands)	**FY 2013 Actual**	**FY 2014 Estimate**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	11.5	11.5	11.5	11.5	11.5	11.5	11.5

Description: Number of K-12 teachers and informal education staff that benefit from professional development opportunities and curriculum materials supported by NOAA's Competitive Education Grants

Performance Measure: Number of people that visit informal learning institutions with a NOAA-funded exhibit or program that integrates NOAA sciences data and other information (in thousands)	**FY 2013 Actual**	**FY 2014 Estimate**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	50,409	57,296	64,183	71,071	77,958	84,845	91732

Description: This performance measure measures the number of people (annually) that visit museums, zoos and aquariums with high quality and effective STEM exhibits or programs incorporating NOAA's science or services. NOAA's science products and services are unique among the federal government and academia. The exhibits and programs funded through Competitive Education Grants incorporate these unique assets and capabilities into interactive exhibits that immerse the general public in these real-world and current issues. NOAA's products and services are essential to explaining critical STEM issues such as climate change, oil spills, extreme weather and weather safety, appropriate management of coastal environments, and overfishing.

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PROGRAM CHANGES FOR FY 2015:

BWET Regional Programs: NOAA Bay-Watershed Education and Training (B-WET) Regional Programs (Base Funding: $7,200,000 and 0 FTE; Program Change: -$7,200,000 and 0 FTE): NOAA requests a decrease of $7,200,000 and 0 FTE for a total of $0 and 0 FTE to terminate BWET Meaningful Watershed Educational Experiences (MWEE).

As a part of the Administration's STEM reorganization proposal, NOAA proposes to terminate some STEM education programs within the Office of Education, including the B-WET Program.
In 2014, the President's Budget proposed a government-wide STEM reorganization to create a coherent framework for delivering STEM education to more students and more teachers more effectively while reducing fragmentation, and the Administration published a Five-Year Federal Strategic Plan on STEM Education to help align the reorganization with key goals and strategies. The areas of priority for this plan include: improving pre-kindergarten-through-grade-twelve (pre-K-12) instruction; increasing and sustaining youth and public engagement with STEM; enhancing undergraduate STEM education; creating a national strategy around graduate fellowships; and better serving groups historically underrepresented in STEM.

Over the past year, agencies have made considerable progress towards a stronger and more cohesive infrastructure for delivering STEM education. For example, in implementing the Strategic Plan, mission agencies have increased coordination with the lead agencies (the Department of Education, the National Science Foundation, and the Smithsonian Institution) and are identifying ways to leverage existing resources to improve the reach of agency assets.

The 2015 Budget builds on these efforts by proposing a fresh reorganization with targeted adjustments to enable more strategic investment in STEM education with a focus on building and using evidence-based practices and finding new models for leveraging assets and expertise.

PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Budget Program: Program Support
Subprogram: NOAA Education Program
Program Change: NOAA BWET Regional Programs

	Object Class	2015 Decrease	2015 Total Program
11	Personnel compensation		
11.1	Full-time permanent	0	0
11.3	Other than full-time permanent	0	0
11.5	Other personnel compensation	0	0
11.8	Special personnel services payments	0	0
11.9	Total personnel compensation	0	0
12	Civilian personnel benefits	0	0
13	Benefits for former personnel	0	0
21	Travel and transportation of persons	0	0
22	Transportation of things	0	0
23.1	Rental payments to GSA	0	0
23.2	Rental Payments to others	0	0
23.3	Communications, utilities and miscellaneous charges	0	0
24	Printing and reproduction	0	0
25.1	Advisory and assistance services	0	0
25.2	Other services	0	0
25.3	Purchases of goods & services from Gov't accounts	0	0
25.4	Operation and maintenance of facilities	0	0
25.5	Research and development contracts	0	0
25.6	Medical care	0	0
25.7	Operation and maintenance of equipment	0	0
25.8	Subsistence and support of persons	0	0
26	Supplies and materials	0	0
31	Equipment	0	0
32	Lands and structures	0	0
33	Investments and loans	0	0
41	Grants, subsidies and contributions	(7,200)	0
42	Insurance claims and indemnities	0	0
43	Interest and dividends	0	0
44	Refunds	0	0
99	Total obligations	(7,200)	0

Office of Education: Office of Education (Base Funding: $20,000,000 and 26 FTE; Program Change: -$3,600,000 and 0 FTE): NOAA requests a decrease of $3,600,000 and 0 FTE for a total of $16,400,000 and 26 FTE to fund NOAA's Office of Education.

Proposed Actions:
NOAA proposes a reduction of $3,600,000 and 0 FTE to terminate NOAA's Competitive Education Grants (-$3,600,000). NOAA also will combine education activities into one Office of Education line, consolidating administrative, managerial, and Educational Partnership Program for Minority Serving Institutions (EPP/MSI) activities. Of the $16,400,000 remaining, NOAA will use $2,000,000 for Office of Education operations, including administrative support for EPP/MSI; $12,400,000 to support EPP/MSI, and $2,000,000 to develop and execute an efficient, streamlined process to help lead STEM agencies, such as the National Science Foundation and Department of Education, translate NOAA expertise into materials and strategies to support former NOAA STEM education goals in the reorganization process that will also benefit EPP/MSI STEM outreach.

In 2014, the President's Budget proposed a government-wide STEM reorganization to create a coherent framework for delivering STEM education to more students and more teachers more effectively while reducing fragmentation, and the Administration published a Five-Year Federal Strategic Plan on STEM Education to help align the reorganization with key goals and strategies. The areas of priority for this plan include: improving pre-kindergarten-through-grade-twelve (pre-K-12) instruction; increasing and sustaining youth and public engagement with STEM; enhancing undergraduate STEM education; creating a national strategy around graduate fellowships; and better serving groups historically underrepresented in STEM.

Over the past year, agencies have made considerable progress towards a stronger and more cohesive infrastructure for delivering STEM education. For example, in implementing the Strategic Plan, mission agencies have increased coordination with the lead agencies (the Department of Education, the National Science Foundation, and the Smithsonian Institution) and are identifying ways to leverage existing resources to improve the reach of agency assets.

The 2015 Budget builds on these efforts by proposing a fresh reorganization with targeted adjustments to enable more strategic investment in STEM education with a focus on building and using evidence-based practices and finding new models for leveraging assets and expertise.

In accordance with the Administration's STEM education initiative, the Competitive Education Grants will be terminated from NOAA; however, due to the multi-year nature of prior year awards, NOAA will still support teacher development, and formal and informal education initiatives through the existing grant periods (3-5 years).

Resource Assessment:
The resources for this program are described in the narrative for the NOAA Education Program.

Schedule and Milestones:
Educational Partnership Program
- Award EPP Undergraduate Scholarships
- Fund Cooperative Agreement for 3rd of 5-Year Cooperative Science Centers awards

OED Student Opportunities
- Award Hollings Undergraduate Scholarships

Education Program Base

- Lead monthly Education Council meetings
- Co-lead bi-monthly Interagency Working Group on Ocean Education meetings
- Lead two monthly education working group meetings
- Participate in 12 meetings of Interagency Working Group on STEM Graduate Fellowships
- Participate in three quarterly meetings of the Committee on Equal Opportunity in Science and Engineering
- Assist OMB and lead STEM agencies in executing administrations STEM efforts
- Publish Federal Funding Opportunity
- Process applications
- Conduct panel review
- Submit selection packages to GMD
- Make awards

Deliverables:

Educational Partnership Program

- Award 10 EPP Undergraduate Scholarships
- Award 4 Cooperative Science Centers Cooperative Agreements

Education Program Base

- Chair 12 Education Council meetings
- Chair 12 Interagency Working Group on Ocean Education meetings
- Chair 24 education working group meetings
- Award 4 new competitive education grants
- Review progress reports and conduct sites visits for a portfolio consisting of more than 40 education grants
- Solicit and review more than 100 grant applications annually

Performance Goals and Measurement Data:

Consistent with the recommendations from the National Research Council study of NOAA's education program conducted in 2010, as well as the Department's review through the Balanced Scorecard process, the Office of Education has refined the performance measures for education programs. Office of Education has also hired a full-time evaluator responsible for the implementation of NOAA Education's Monitoring and Evaluation framework. As this process progresses it is anticipated that the performance measures will continue to be refined.

Educational Partnership Program

Performance Measure: Number of EPP students supported with NOAA funding who are awarded NOAA mission-related STEM post-secondary degrees	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With Decrease	N/A	N/A	90	78	75	75	75
Without Decrease	101	95	95	95	90	90	90
Description: This metric represents all components of EPP including the Cooperative Science Centers and Scholarships. The NOAA EPP supports development of programs to educate and graduate students, at the undergraduate, masters and doctoral levels, for the next-generation workforce and to increase the number of competent individuals with the knowledge and skills to support NOAA STEM activities. EPP graduates will lead innovation and technologies to enhance NOAA services and stewardship while supporting global competitiveness to advance national economic growth.							

*Cooperative Science Center awards end in 2016

Performance Measure: Number of EPP students from underrepresented communities supported by NOAA funding who are awarded NOAA mission-related STEM post-secondary degrees	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With Decrease	N/A	N/A	70	60	60	60	60
Without Decrease	66	75	75	75	67	67	67
Description: This metric covers the CSC and Scholarship components of EPP. NOAA EPP funding is used to develop education/engagement and research programs to increase the number of undergraduate and graduate students from underrepresented communities who complete degrees in NOAA mission-relevant STEM disciplines and are prepared to enter NOAA mission-relevant STEM careers or advanced education. http://www.epp.noaa.gov/docs/csc_contributions_STEM_pool.pdf							

*** NOTE:** Cooperative Science Center Awards end in FY 2016

Performance Measure: Number of EPP students hired by NOAA, NOAA contractors and other natural resource and science agencies at the Federal, State, local and tribal levels; private sector and academia	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With Decrease	N/A	N/A	40	40	35	35	35
Without Decrease	42	40	45	45	40	40	40
Description: The EPP aligns with NOAA mission priorities and includes education, engagement, and NOAA STEM research programs to develop students with NOAA mission-critical STEM knowledge and skills. With the collaboration and mentoring by NOAA scientists, program graduates may pursue careers at NOAA and become part of the scientific and technological workforce at resource management agencies, private sector and academia. http://www.epp.noaa.gov							

* Cooperative Science Center Awards end in FY 2016

Performance Measure: Number of collaborative research projects undertaken between NOAA and EPP in support of NOAA mission	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With Decrease	N/A	N/A	90	85	85	85	85
Without Decrease	89	90	95	95	95	95	95
Description: Each NOAA CSC aligns with specific NOAA Line Offices and collaborates with NOAA scientists and engineers conducting research to better understand the significance of changes in the Earth's ocean, coasts, Great Lakes, weather, and climate. The data tracked represent the total number of CSC research projects that include a NOAA collaborator.							

Office of Education

Performance Measure: Institutions served by Competitive Education Grants (actual numbers, NOT in thousands)	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With Decrease	N/A	N/A	26	12	6	3	0
Without Decrease	51	60	62	60	48	48	48
Description: Number of institutions with active multi-year NOAA Competitive Education Grants that support STEM-related education exhibits and programs							

Performance Measure: K-12 Students served by Competitive Education Grants (in thousands)	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With Decrease	N/A	N/A	0	0	0	0	0
Without Decrease	61.7	61.7	61.7	61.7	61.7	61.7	61.7
Description: Number of K-12 students that benefit from learning materials, hands-on experiential activities, and other STEM education programming and resources supported by NOAA's Competitive Education Grants							

Performance Measure: K-12 teachers and staff served by Competitive Education Grants (in thousands)	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With Decrease	N/A	N/A	0	0	0	0	0
Without Decrease	11.5	11.5	11.5	11.5	11.5	11.5	11.5
Description: Number of K-12 teachers and informal education staff that benefit from professional development opportunities and curriculum materials supported by NOAA's Competitive Education Grants							

Performance Measure: Number of people that visit informal learning institutions with a NOAA-funded exhibit or program that integrates NOAA sciences, data and other information (in thousands)	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With Decrease	N/A	N/A	39,112	22,912	9,885	6,887	2,971
Without Decrease	50,409	57,296	64,183	71,071	77,958	84,845	91,732
Description: This performance measure measures the number of people (annually) that visit museums, zoos and aquariums with high quality and effective STEM exhibits or programs incorporating NOAA's science or services. NOAA's science products and services are unique among the federal government and academia. The exhibits and programs funded through Competitive Education Grants incorporate these unique assets and capabilities into interactive exhibits that immerse the general public in these real-world and current issues. NOAA's products and services are essential to explaining critical STEM issues such as climate change, oil spills, extreme weather and weather safety, appropriate management of coastal environments, and overfishing.							

PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Budget Program: Program Support
Subprogram: NOAA Education Program
Program Change: Office of Education

	Object Class	2015 Decrease	2015 Total Program
11	Personnel compensation		
11.1	Full-time permanent	0	2,110
11.3	Other than full-time permanent	0	49
11.5	Other personnel compensation	0	0
11.8	Special personnel services payments	0	0
11.9	Total personnel compensation	0	2,159
12	Civilian personnel benefits	0	589
13	Benefits for former personnel	0	0
21	Travel and transportation of persons	0	158
22	Transportation of things	0	4
23.1	Rental payments to GSA	0	90
23.2	Rental Payments to others	0	229
23.3	Communications, utilities and miscellaneous charges	0	71
24	Printing and reproduction	0	6
25.1	Advisory and assistance services	0	92
25.2	Other services	0	642
25.3	Purchases of goods & services from Gov't accounts	0	1,762
25.4	Operation and maintenance of facilities	0	0
25.5	Research and development contracts	0	0
25.6	Medical care	0	0
25.7	Operation and maintenance of equipment	0	0
25.8	Subsistence and support of persons	0	0
26	Supplies and materials	0	61
31	Equipment	0	33
32	Lands and structures	0	0
33	Investments and loans	0	0
41	Grants, subsidies and contributions	(3,600)	10,504
42	Insurance claims and indemnities	0	0
43	Interest and dividends	0	0
44	Refunds	0	0
99	Total obligations	(3,600)	16,400

APPROPRIATION ACCOUNT: OPERATIONS, RESEARCH, AND FACILITIES
SUB-PROGRAM: NOAA FACILITIES PROGRAM

The objectives of the Facilities Program sub-program are to:

- Provide effective long-range facility planning and capital investment planning
- Manage and execute NOAA's facility assessment and restoration program
- Manage NOAA's safety, environmental compliance, and energy efficiency programs
- Manage NOAA's lease and real property acquisition and disposal program
- Manage and execute NOAA's facility construction and modernization program

The NOAA Facilities Program supports objectives under the DOC Strategic Goal of "Observe, protect, and manage the Earth's resources to promote environmental stewardship" and the NOAA Next Generation Strategic Plan Goal of "Modern, safe, and sustainable facilities." The program supports NOAA's mission by providing program direction and oversight to NOAA to ensure NOAA's facilities support current and future mission requirements.

The NOAA Facilities Program is the focal point for facility planning, project planning formulation and development, and project management oversight. This program supports an integrated capital investment planning process; integrated facility condition inspection program; systems and technology tools to enable efficiency in project and facility management planning; and investments required to keep facilities in an adequate condition, fix substandard/aging facilities, renovate facilities to meet mission needs, and dispose of facilities that are no longer required.

As NOAA-owned facilities age, investments in maintenance, repairs and modernization increase. NOAA's owned capital assets total more than 400 buildings, in addition to piers and other structures, which are valued at approximately $3 billion. These facilities are aging, with an average age of 30 years and with more than 100 buildings over 40 years old. NOAA's facilities are often subject to the extremes of weather and climate conditions, and are, therefore, more prone to needing unplanned repairs while simultaneously remaining in operation.

The Facilities Program provides funding to conduct facility condition inspections and supports investments in facility repairs and modernization. Funds also support operations at the David Skaggs Research Center in Boulder, Colorado. This facility houses staff and programs from three NOAA Line Offices (Office of Oceanic and Atmospheric Research, National Environmental Satellite, Data, and Information Service, and National Weather Service) as well as NOAA's Regional corporate services capability.

This program oversees a centrally-managed and integrated national project construction program. The Chief Administrative Officer (CAO) has responsibility for policy development and guidance, long-term facility planning, and construction program planning and execution.

The Facilities Program provides the resources necessary to comply with existing Federal, state, and local laws, regulations and safety requirements; and identify environmental compliance and safety issues requiring remediation. NOAA is responsible for ensuring continued compliance with applicable environmental and safety laws. NOAA continues to implement a management system to increase awareness, oversight and assessment; and ensure compliance with applicable laws and regulations.

Schedule and Milestones:

- Resolve 75 percent of commercial leases expiring in FY 2015 on or before the lease expiration date
- Continue to use the facility capital investment planning process to target efforts on facility optimization
- Provide adequate facility management services to the NOAA corporate campuses in Silver Spring, Seattle, and Boulder

Performance Goals and Measurement Data:

Performance Measure: Improve NOAA owned facility portfolio Facility Condition Index	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	81%	80%	79%	78%	77%	76%	76%
Description: An FCI of 80-84 percent is a poor facility condition. An FCI of 80 percent or lower is an unacceptable facility condition. In FY 2015 NOAA facilities will be in unacceptable condition. This measure shows the average condition of NOAA-owned facilities. The actuals and targets in this table are based on the 2010 real property condition assessment done through the Integrated Facilities Inspection Program (IFIP), a facility assessment model that uses survey data for each facility to identify the characteristics of the current inventory and estimate the deficiencies within the NOAA facility portfolio.							

PROGRAM CHANGES FOR FY 2015:

There are no program changes requested for this sub program in 2015.

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BUDGET PROGRAM: OFFICE OF MARINE AND AVIATION OPERATIONS

For FY 2015, NOAA requests a total of $244,037,000 and 949 FTE for the Office of Marine and Aviation Operations, including an increase of $4,851,000 and 0 FTE in net program changes.

Office of Marine and Aviation Operations Overview

NOAA's Office of Marine and Aviation Operations (OMAO) supports an array of specialized ships and aircraft that play a critical role in the in-situ collection of oceanographic, atmospheric, hydrographic, and fisheries data in support of NOAA's environmental and scientific missions. OMAO administers the NOAA-wide Diving Program and Small Boat Program and is composed of civilians and the NOAA Commissioned Corps (NOAA Corps) officers.

The NOAA Fleet operates throughout the world supporting the full range of NOAA missions, such as fisheries research, nautical charting, hurricane reconnaissance and research, snow surveys, and specialized atmospheric and ocean research. NOAA ships range from global class oceanographic research vessels capable of exploring the world's deepest ocean to regional class ships responsible for charting the shallow bays and inlets of the United States. NOAA aircraft range from the four engine P-3, capable of penetrating hurricanes, to the small twin engine Twin Otters, well suited for marine mammal surveys where slower airspeeds and higher endurance are essential.

In addition to the research and monitoring activities critical to NOAA's mission, OMAO ships and aircraft provide immediate response capabilities for unpredictable events. Following major natural and environmental disasters, NOAA ships and aircraft can conduct emergency navigation hazard surveys that help ports reopen quickly and obtain aerial images of disaster-torn areas. Emergency hazard surveys enable residents and emergency workers verification of the condition of houses, bridges and roads.

OMAO is charged with the safe and efficient operation and maintenance of the NOAA Fleet. OMAO develops annual fleet allocation plans, conducts life cycle maintenance, and provides centralized fleet management including standard procedures, safety inspections, and medical services in partnership with the Public Health Service. OMAO coordinates the training and certification of officers, crew members, and scientists in at-sea and airborne safety and procedures.

The NOAA Corps commands and supports the fleet, as well as provides support to NOAA Line Offices. OMAO manages the recruitment, training, personnel assignments, and payroll for the NOAA Corps.

The Office of Marine and Aviation Operations has two sub-programs under the Operations, Research and Facilities (ORF) account ($203,781,000 and 949 FTE):

- Marine Operations and Maintenance ($172,181,000 and 828 FTE)
- Aviation Operations ($31,600,000 and 121 FTE)

In addition, OMAO has one sub-program in the Procurement, Acquisition and Construction account ($5,200,000 and 0 FTE):

- Fleet Replacement ($5,200,000 and 0 FTE), which includes Fleet Capital Improvements and Technology Infusion and New Vessel Construction

The OMAO budget includes the following other accounts:

- NOAA Corp Commissioned Officers Retirement Pay ($28,269,000 and 0 FTE)
- Medicare Eligible Retiree Healthcare Fund ($1,936,000 and 0 FTE)

Research and Development (R&D) Investments:
The NOAA FY 2015 Budget estimates for R&D investments are the result of an integrated requirements-based strategic planning process. This process provides the structure to link NOAA's strategic vision with programmatic detail and budget development, with the goal of maximizing resources while optimizing capabilities. OMAO observing infrastructure investments, such as ships and aircraft, support R&D activities of other NOAA Line Offices in the FY 2015 budget.

NOAA's R&D planning is tied to the goals, enterprises, and associated objectives outlined in NOAA's Next Generation Strategic Plan. Specifically, NOAA's Science and Technology Enterprise and underlying objectives include a holistic understanding of the Earth system through research; accurate and reliable data from observing systems; and an integrated environmental modeling system. These provide the basis for a set of internal implementation plans covering a 7-year period that guide NOAA's research and development activities. The NOAA Research Council - an internal body composed of senior scientific personnel from every Line Office in the agency - informs the annual updates to these implementation plans, and has developed the next 5-Year Research and Development Plan for NOAA (FY 2013-2017). This plan will guide NOAA's R&D activities over the next five years. The plan provides a common understanding among NOAA's leadership, its workforce, its partners, constituents and Congress on the value of NOAA's R&D activities. As such, the Plan is a framework with which NOAA and the public can monitor and evaluate the Agency's progress and learn from past experience.

Significant Inflationary Adjustments:
NOAA requests a total of $2,581,000 and 0 FTE to account for the full funding requirement for inflationary adjustments to current programs for OMAO activities. This includes the estimated 2015 Federal pay raise of 1.0 percent and Military pay raise of 1.0 percent as well as inflationary increases for non-labor activities, including service contracts, utilities, field office lease payments, and rent charges from the General Service Administration (GSA).

Headquarters Administrative Costs:
In FY 2015, OMAO Line Office headquarters will use $7,262,000 in funds to support general management activities, financial and budgeting, and IT related expenses, as well as supporting facilities and other general operating costs. These funds also include support for service contracts, utilities, and rent charges from the General Services Administration. Specifically, OMAO will use headquarters administrative funds to support the following:

Headquarters Program Support Type	Description	FY 2015 Amount	FY 2015 FTE associated with OMAO HQ
General Management & Direction/Executive Management	Includes Assistant Administrator's office, Public Affairs, Information Services	$1,208,000	5.4
Budget & Finance	Includes Budget, Finance and Accounting	$2,061,000	14.0
Facilities/Other Administrative (CAO Functions)	Includes Facilities and Security costs, as well as other CAO related activities	$952,000	0

Human Resources	All HR services, including EEO	$142,000	1.0
Acquisitions and Grants	Includes Procurement Services, Acquisitions, and Grants Management	0	0
Information Technology	Includes IT-related expenses and other CIO related activities	$2,899,000	9.8
Total		**$7,262,000**	**30.2**

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APPROPRIATION ACCOUNT: OPERATIONS, RESEARCH AND FACILITIES
SUB-PROGRAM: MARINE OPERATIONS AND MAINTENANCE

The Marine Operations and Maintenance (MOM) sub-program funds centralized management for NOAA's 16 active research and survey ships. Research and survey vessels are categorized by class – Global, Ocean, and Regional – based on size. NOAA has one Global Class Vessel, the *Ronald H. Brown*; one Ocean Research Vessel, the *Okeanos Explorer*; twelve Ocean Survey Vessels; and two Regional Class Vessels; the *Ferdinand R. Hassler* and the *Oregon II.* Global Class vessels are the largest and most capable, with the ability to work worldwide with the greatest endurance and to accommodate large groups of scientists. Ocean Class vessels are designed to support integrated interdisciplinary research and survey missions and generally operate from their home port, but may occasionally work worldwide. Regional class vessels operate on the continental shelf and in the open ocean of specific geographic regions. These vessels have features that allow them to work within specific regional environments. For instance, some have the capability to work in shallow areas like estuaries and bays, or under seasonally harsh weather conditions.

NOAA vessels range in length from 124 to 274 feet and are capable of conducting operations that support NOAA's programs in nautical charting, bathymetric mapping, fisheries research, ecosystem assessments, marine environmental baseline assessments, coastal-ocean circulation, and oceanographic and atmospheric research. In FY 2015, OMAO base funding will provide approximately 2,950 Days at Sea (DAS) to support NOAA's highest priority programs.

Regular maintenance allows NOAA ships to meet the rigorous demands of scientific, forecasting, and regulatory missions of NOAA. MOM funding provides for general maintenance and repair of NOAA ships including critical scientific and technical equipment necessary to meet stakeholder requirements.

The NOAA Fleet is subject to various requirements and regulations related to safety and emissions put forth by three organizations. The American Bureau of Shipping (ABS) certifies ships as seaworthy. The MOM program uses ABS rules to design its maintenance program and conduct Ship Structure and Machinery Evaluations (SSME) on the NOAA Fleet. Under the Clean Air Act, the Environmental Protection Agency (EPA) promulgates regulations governing airborne emissions that affect ship engine and exhaust components. The United States Coast Guard (USCG) promulgates regulations on all discharges from ships so that marine environments are protected from harmful discharges.

The objectives of MOM are to:

- Ensure the operational readiness and maximum capability of the NOAA fleet in support of present and future NOAA data collection;
- Provide properly trained personnel, as well as fuel, warehousing, laboratory and deck equipment, and other scientific equipment necessary to meet user requirements and schedules;
- Develop, with the guidance of the Fleet Council, annual ship allocation schedules based on program requirements and available funds;
- Provide centralized management and coordination of scheduling, port services, operating procedures, and engineering support for NOAA's ships;
- Conduct Work Definition Conferences to prioritize tasks and determine availability for dockside and drydock repairs in addition to planning cyclic depot-level capital investments across the fleet as part of the Progressive Lifecycle Maintenance Plan;
- Train and qualify NOAA personnel to ensure safe and effective diving operations;

- Train and certify NOAA Commissioned Corps officers, crew, and scientists in at-sea safety requirements for their positions according to the Standards of Training, Certification and Watch keeping for Seafarers and the International Maritime Organization conventions;
- Provide NOAA Corps officers trained as engineers and scientists in NOAA program disciplines to provide mobile operational and other support; and
- Provide oversight and support to enhance safety of NOAA's small-boat operations.

FY 2013 Program Accomplishments:

- NOAA ships played a major role before and after Hurricane Sandy made landfall in the Mid-Atlantic. NOAA Ships *Thomas Jefferson* and *Ferdinand R. Hassler* conducted harbor and shipping channel surveys in affected areas to ensure they were safe for navigation. The ships continued to support post-storm surveys throughout calendar year 2013.
- NOAA Ship *Okeanos Explorer* successfully conducted 46 remotely operated vehicle dives, reaching depths of 4,000 meters.
- NOAA Ship *Bell M. Shimada* became the first NOAA ship to visit the Exploratorium's new facility in San Francisco as part of a five-year partnership between NOAA and the Exploratorium to bring cutting edge climate and ocean science to the public.
- NOAA Ship *Rainier* conducted her Chatham Strait hydrographic survey project in southeast Alaska. It had been 116 years since the last survey, when the *Patterson*, a steam powered sailing vessel, surveyed the narrow entrance's seafloor. The *Rainier* used complete multibeam sonar coverage, and had the use of radar and GPS to inform her exact location.

NOAA Fleet detail as of FY 2015 is provided below:

Vessel	Length	Class	Mission	Home Port	Status
Ronald H. Brown	274 ft.	Global	1,4	Norfolk, VA	Active
Rainier	231 ft	Ocean	3	Newport, OR	Active
Fairweather	231 ft	Ocean	3	Ketchikan, AK	Active
Ka'imimoana[1]	224 ft.	Ocean	1	Honolulu, HI	Inactive
McArthur II[1]	224 ft	Ocean	1,2,4	Newport, OR	Inactive
Oregon II	175 ft	Regional	2	Pascagoula, MS	Active
Thomas Jefferson	208 ft	Ocean	3	Norfolk, VA	Active
Gordon Gunter	224 ft.	Ocean	2	Pascagoula, MS	Active
Oscar Elton Sette	224 ft	Ocean	2	Honolulu, HI	Active
Nancy Foster	187 ft	Ocean	1,4	Norfolk, VA	Active
Hi'ialakai	224 ft	Ocean	1,4	Honolulu, HI	Active
Oscar Dyson	208 ft.	Ocean	2	Kodiak, AK	Active
Henry B. Bigelow	208 ft	Ocean	2	Newport, RI	Active
Pisces	208 ft.	Ocean	2	Pascagoula, MS	Active
Bell M. Shimada	208 ft.	Ocean	2	Newport, OR	Active
Okeanos Explorer	224 ft	Ocean	1	Davisville, RI	Active
Ferdinand R. Hassler	124 ft	Regional	3	New Castle, NH	Active
Reuben Lasker	208.6 ft	Ocean	2	San Diego, CA	Active

Mission: 1= Oceanographic Research 3 = Hydrographic Surveys
2 = Fisheries Research 4 = Environmental Assessment

[1] These ships are currently proposed to be inactive in the FY 2015 operating plan.

The MOM sub-program also includes:

The Marine Operations Center (MOC): The Marine Operations Center, based in Newport, Oregon, manages three OMAO Marine Centers – Newport, Oregon; Norfolk, Virginia; and Honolulu, HI. The Marine Centers provide regional fleet management, maintenance, warehousing, supplies, repair facilities, data-processing facilities, operational support, and administrative support for NOAA's vessels. The vessels are assisted by a small support staff at the home port of most ships. NOAA vessels are staffed by NOAA Corps officers, civilian Wage Mariners and civilian Electronics Technicians. NOAA vessels are strategically deployed based on the size, range, laboratory space, equipment, and accommodations necessary to meet project requirements. Programs supported by ships are organizationally housed within NOAA's National Marine Fisheries Services (NMFS), Office of Oceanic and Atmospheric Research (OAR), National Ocean Service (NOS), and National Weather Service (NWS).

The NOAA Commissioned Personnel Center (CPC): CPC, headquartered in Silver Spring, Maryland, is responsible for providing a specialized workforce to NOAA that has the skills to plan, prepare, and execute the acquisition of environmental and scientific data on land, at and under the sea, and in the air. The NOAA Corps is a unique personnel system within NOAA. CPC is responsible for active duty NOAA Corps officers and associated human resource activities that include recruitment, appointment, training, assignments, promotion, separation, retirement, and officer entitlements.

OMAO Headquarters (HQ): OMAO Headquarters consists of the Executive Affairs Division (EAD), Resource Management Division (RMD), Program Services and Outsourcing Division (PSOD), Platform Acquisition Division (PAD), Information Management Division (IMD), Safety and Environmental Compliance Division (SECD), and Health Services. Located in Silver Spring, Maryland, HQ is responsible for the formulation of policies and procedures; development of operating plans and budgets; strategic planning; management of ship and aircraft acquisitions; management of IT infrastructure and IT security; and management of the NOAA Corps. Management of the NOAA Corps includes providing direction for labor relations activities, medical affairs, training, safety, and other personnel matters unique to commissioned officers and vessel employees assigned to the fleet.

OMAO Headquarters administers the following NOAA-wide activities:

NOAA Dive Program: The NOAA Dive Center (NDC) provides diver training, safety standards, certification, technical advice, and a standardized equipment program. It also publishes the NOAA Diving Manual. NOAA has more than 400 divers who perform over 15,000 dives annually in support of NOAA's programs. NOAA divers play a support role for various projects. Fleet diving activities include ship husbandry tasks such as clearing screws and sea strainers, conducting hull surveys for damage, and installing transducers. Ship divers also install tide gauges and other data gathering equipment and investigate multi-beam contacts. These activities provide cost savings to the NOAA fleet, enhance customer service, and facilitate self-sufficiency on the seas.

NOAA Small Boat Program (SBP): The SBP is designed to reduce risk, promote standardization, and enhance the safety of NOAA's small boats. NOAA maintains over 400 small boats, which are operated and funded within the Line Office programs. The SBP monitors and conducts small-boat inspections, facilitates small boat activities by hosting workshops and sharing related information, and provides technical and engineering assistance to NOAA Line Offices concerning small boats.

Schedule and Milestones:

- Annual ship schedules and milestones are governed by the Fleet Allocation Plan (http://www.omao.noaa.gov/shipallocation.html) as agreed to and signed by the NOAA Fleet Council. The Fleet Allocation Plan details the objective and duration of individual NOAA projects.
- All ships have a set drydock and dockside repair maintenance period based on ABS scheduling by ship class.

Deliverables:

FY 2015:

- At the requested funding level, OMAO will provide 2,950 DAS for 16 Active vessels (assuming a fuel price of $3.80 per gallon[1]) in FY 2015. Detailed deliverables are determined on a project-by-project basis as documented in sailing instructions agreed to by OMAO and the respective line office.
- Perform Program Funded DAS (PFD) as scheduled. In addition to OMAO funded DAS, OMAO conducts missions funded through Service Level Agreements (SLA) with NOAA programs and reimbursable agreements. PFD are scheduled based on availability of ships and program funds.

Performance Goals and Measurement Data:

Performance Measure: OMAO funded Days at Sea	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
16 Active Ships	1,702	2,599	2,950	2,950	2,950	2,950	2,950
Description: OMAO funded Days at Sea (includes mission days only). A mission day is defined as when ship is at sea incident to the scientific mission. FY 2014 is based on the final appropriation Fleet Allocation Plan (signed). For FY 2015 and forward, NOAA assumes a fuel rate of $3.80 per gallon consistent with DLA standard fuel prices for FY 2014.							

Performance Measure: Program funded Days at Sea	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	447	76	TBD	TBD	TBD	TBD	TBD
Description: OMAO conducts missions funded through reimbursable agreements and Service Level Agreements (SLA) with NOAA programs. Program funded days (PFD) are scheduled based on availability of ships and program funds; therefore out year targets are to be determined.							

Performance Measure: Reimbursable Days at Sea	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	47	27	TBD	TBD	TBD	TBD	TBD
Description: OMAO conducts missions funded through reimbursable agreements. OMAO began a five year agreement with the Environmental Protection Agency in FY 2013 to conduct EPA projects on NOAA ships. Out year targets are to be determined.							

[1] A fuel estimate of $3.80 per gallon is consistent with the Defense Logistics Agency (DLA) Energy Standard Rate. OMAO purchases around 90% of fuel annually from DLA fuel sources through the SEA Card® program and through direct purchases from DLA fuel depots.

Performance Measure: Fleet Utilization	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
16 Active Ships	61%	72%	78%	78%	78%	78%	78%

Description: Days at Sea (includes mission days only). A mission day is defined as when a ship is at sea incident to the scientific mission. The Fleet utilization rate is calculated by taking the actual days at sea from Marine Operations and Maintenance funding and dividing it by the maximum operating tempo of 235 days at sea per active ship. In FY 2015 and forward, NOAA assumes 16 active ships at a fuel rate of $3.80 per gallon consistent with DLA standard fuel prices for FY 2014. Not included in the calculation are the ships proposed for inactive status in FY 2015. This reflects NOAA's practice of reinvesting fixed cost savings from non-active ships into the active fleet, thereby increasing overall days at sea.
*FY 2013 Actual Fleet Utilization Rate considers only OMAO funded Days at Sea.

Performance Measure: Reduce the hydrographic survey backlog within navigationally significant areas (Measure 18f)	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	2,285	2,709	2,853	2,853	2,853	2,853	2,853

Description: NOAA conducts hydrographic surveys to determine bathymetry primarily in U.S. waters significant for navigation. This activity includes the detection, location, and identification of wrecks and obstructions with side scan and multi-beam sonar technology. NOAA uses the data to produce nautical charts in a variety of formats for safe and efficient navigation. In addition to the commercial shipping industry, other user communities that benefit from this service include recreational boaters, the commercial fishing industry, port authorities, coastal zone managers, and marine spatial and emergency planners.

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PROGRAM CHANGES FOR FY 2015:

Marine Operations and Maintenance: Increase in Marine Operations and Maintenance Days at Sea (Base Funding: $172,181,000 and 828 FTE; Program Change: $2,851,000 and 0 FTE):
NOAA requests an increase of $2,851,000 and 0 FTE for a total of $175,032,000 and 828 FTE to support additional days at sea (DAS) for fishery, hydrographic, and marine ecosystems surveys.

Proposed Actions:
NOAA requests an increase to Marine Operations and Maintenance (MOM) to more fully utilize its fleet in support of mission-critical nautical charting, bathymetric mapping, fisheries research, ecosystem assessments, coastal-ocean circulation, and oceanographic and atmospheric research. At this funding level, OMAO will conduct approximately 3,170 base DAS with a utilization rate of 84 percent assuming a fuel rate of $3.80 per gallon[1]. This request adds approximately 220 DAS to the base funded target of 2,950 DAS in FY 2015. The requested funding will ensure full ship crew complements, address maintenance requirements, as well as fund increased variable costs for fuel, crew overtime, ship logistics and provisioning.

Statement of Need and Economic Benefits:
NOAA strives to utilize the fleet at a 100 percent utilization rate to maximize the use of these federal capital assets in meeting the agency's mission. NOAA accounts for maintenance schedules, safety inspections, and personnel capacity within utilization rate calculations, so barring unforeseen issues, each ship is capable of meeting its designated maximum operating tempo. Under-utilization of the NOAA fleet directly translates into lost opportunities for in-situ observations that are the foundation of our scientific understanding of the environment. Without a fully funded fleet, program offices pay for additional DAS to meet their research or observing requirements. In FY 2013, programs purchased 447 DAS to supplement OMAO's base funded days at sea. When critical science dollars are spent on ship operations, programs are left with less funding to analyze the data gathered on the ship. This delays the delivery of the research or observational findings to NOAA's stakeholders.

The National Marine Fisheries Services (NMFS), the Office of Oceanic and Atmospheric Research (OAR), the National Ocean Service (NOS), and the National Weather Service (NWS) all rely on OMAO for ship time. Programs related to nautical charting, fish and mammal surveys, climate studies, and ocean health will receive additional ship time with this increase in funding. The final allocation of ship time will be determined by NOAA's Fleet Council using the Prioritization, Allocation and Scheduling (PAS) process. This ensures support to NOAA's highest priority programs. OMAO will continue to conduct NOAA's highest priority missions while utilizing NOAA's fleet in support of science, service and stewardship.

Resources Assessment:
The resources for this activity are described in the Marine Operations and Maintenance narrative.

Schedule and Milestones:

- Ships annual schedules and milestones are governed by the Fleet Allocation Plan (http://www.omao.noaa.gov/shipallocation.html) as agreed to and signed by the NOAA Fleet Council. The Fleet Allocation Plan details the objective and duration of individual NOAA projects.
- All ships have a set drydock and dockside repair maintenance period based on American Bureau of Shipping scheduling by ship class.

Deliverables:

FY 2015:

- At the requested funding level, the program will provide approximately 3,170 OMAO-funded DAS in FY 2015 for 16 active vessels, assuming a fuel rate of $3.80 per gallon. Detailed deliverables are determined on a project-by-project basis as documented in sailing instructions agreed to by OMAO and the respective line office.
- Perform Program Funded DAS (PFD) as scheduled. In addition to the OMAO-funded funded DAS, OMAO conducts missions funded DAS through Service Level Agreements (SLA) with NOAA programs and reimbursable agreements. PFD are scheduled based on availability of ships and program funds.

Performance Goals and Measurement Data:

Performance Measure: OMAO Funded Days at Sea with 16 active ships	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With Increase	N/A	N/A	3,170	3,170	3,170	3,170	3,170
Without Increase	1,702	2,599	2,950	2,950	2,950	2,950	2,950
Description: Days at Sea (includes mission days only). A mission day is defined as when ship is at sea incident to the scientific mission. For FY 2015 and forward, NOAA assumes a fuel rate of $3.80 per gallon consistent with DLA standard fuel prices for FY 2014.							

Performance Measure: Fleet Utilization with 16 active ships	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With Increase	N/A	N/A	84%	84%	84%	84%	84%
Without Increase	61%	72%	78%	78%	78%	78%	78%
Description: Days at Sea (includes mission days only). A mission day is defined as when a ship is at sea incident to the scientific mission. Fleet utilization rate is calculated by taking the actual days at sea from base Marine Operations and Maintenance funding and dividing it by the maximum operating tempo of 235 days at sea per active ship. In FY 2015 and forward, NOAA assumes 16 active ships at a fuel rate of $3.80 per gallon consistent with DLA standard fuel prices for FY 2014. Not included in the calculation are the ships proposed for inactive status in FY 2015. This reflects NOAA's practice of reinvesting fixed cost savings from non-active ships into the active fleet, thereby increasing overall days at sea.							

Performance Measure: Reduce the hydrographic survey backlog within navigationally significant areas (square nautical miles per year) (Measure 18f)	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With Increase	N/A	N/A	2,981	2,981	2,981	2,981	2,981
Without Increase	2,285	2,709	2,853	2,853	2,853	2,853	2,853
Description: NOAA Ships *Fairweather, Ferdinand R. Hassler, Rainier*, and *Thomas Jefferson* conduct hydrographic surveys to determine bathymetry primarily in U.S. waters significant for navigation. This activity includes the detection, location, and identification of wrecks and obstructions with side scan and multi-beam sonar technology. NOAA uses the data to produce nautical charts in a variety of formats for safe and efficient navigation, in addition to the commercial shipping industry; other user communities that benefit include recreational boaters, the commercial fishing industry, port authorities, coastal zone managers, and marine spatial and emergency planners.							

PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Budget Program: Office of Marine and Aviation Operations
Sub-program: Marine Operations and Maintenance
Program Change: Increase in Marine Operations and Maintenance Days at Sea

	Object Class	FY 2015 Increase	FY 2015 Total Program
11	Personnel compensation		
11.1	Full-time permanent	$0	$35,539
11.3	Other than full-time permanent	0	0
11.5	Other personnel compensation	713	9,551
11.8	Special personnel services payments	0	22,499
11.9	Total personnel compensation	713	67,589
12	Civilian personnel benefits	0	17,280
13	Benefits for former personnel	0	0
21	Travel and transportation of persons	0	3,848
22	Transportation of things	0	1,915
23.1	Rental payments to GSA	0	1,101
23.2	Rental Payments to others	0	3,698
23.3	Communications, utilities and miscellaneous charges	0	3,221
24	Printing and reproduction	0	36
25.1	Advisory and assistance services	0	1,856
25.2	Other services	484	32,270
25.3	Purchases of goods & services from Gov't accounts	0	14,389
25.4	Operation and maintenance of facilities	0	0
25.5	Research and development contracts	0	0
25.6	Medical care	0	0
25.7	Operation and maintenance of equipment	0	0
25.8	Subsistence and support of persons	0	0
26	Supplies and materials	1,654	23,214
31	Equipment	0	1,534
32	Lands and structures	0	0
33	Investments and loans	0	0
41	Grants, subsidies and contributions	0	3,084
42	Insurance claims and indemnities	0	0
43	Interest and dividends	0	0
44	Refunds	0	0
99	Total obligations	2,851	175,032

Marine Operations and Maintenance: Teacher at Sea Program (Base Funding: $172,181,000 and 0 FTE; Program Change: $0 and 0 FTE): OMAO requests a decrease of $0 and 0 FTE to terminate the Teacher at Sea Program at NOAA which is part of the Administration's reorganization of STEM education. The Teacher at Sea funding will be reinvested within the Marine Operations and Maintenance program.

Proposed Actions:
As part of the Administration's comprehensive reorganization of STEM education programs to increase the impact of Federal investments, NOAA proposes to terminate funding for the Teacher at Sea Program. This termination of funding will also eliminate the Teacher in the Air Program, which is a part of the larger Teacher at Sea Program. NOAA proposes to reinvest funding previously used for Teacher-at-Sea in the Marine Operations and Maintenance program, in order to more fully utilize its fleet in support of mission-critical nautical charting, bathymetric mapping, fisheries research, ecosystem assessments, coastal-ocean circulation, and oceanographic and atmospheric research.

In 2014, the President's Budget proposed a government-wide STEM reorganization to create a coherent framework for delivering STEM education to more students and more teachers more effectively while reducing fragmentation, and the Administration published a Five-Year Federal Strategic Plan on STEM Education to help align the reorganization with key goals and strategies. The areas of priority for this plan include: improving pre-kindergarten-through-grade-twelve (pre-K-12) instruction; increasing and sustaining youth and public engagement with STEM; enhancing undergraduate STEM education; creating a national strategy around graduate fellowships; and better serving groups historically underrepresented in STEM.

Over the past year, agencies have made considerable progress towards a stronger and more cohesive infrastructure for delivering STEM education. For example, in implementing the Strategic Plan, mission agencies have increased coordination with the lead agencies (the Department of Education, the National Science Foundation, and the Smithsonian Institution) and are identifying ways to leverage existing resources to improve the reach of agency assets.

The 2015 Budget builds on these efforts by proposing a fresh reorganization with targeted adjustments to enable more strategic investment in STEM education with a focus on building and using evidence-based practices and finding new models for leveraging assets and expertise.

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APPROPRIATION ACCOUNT: OPERATIONS, RESEARCH AND FACILITIES
SUB-PROGRAM: AVIATION OPERATIONS

OMAO's Aircraft Operations Center (AOC), located at MacDill Air Force Base in Tampa, Florida, operates NOAA's Aircraft Fleet in support of NOAA's mission to promote global environmental assessment, prediction and stewardship of the Earth's environment. The aircraft operate throughout the United States and around the world over open oceans, mountains, coastal wetlands, and the Arctic. AOC provides capable, mission-ready aircraft and professional crews to meet NOAA's scientific mission by assisting with global climate change and air quality studies, marine mammal population assessments, coastal erosion surveys, oil spill investigations, coastal mapping, flood prediction, and hurricane prediction modeling. AOC flight crews operate in some of the world's most demanding flight regimes, including flying into the eye of a hurricane.

The variety and versatility of NOAA's aircraft provide scientists with the airborne platforms necessary to collect essential environmental and geographic data. The Fleet is equipped with comprehensive data-collection systems in support of missions related to the Earth's environment, coastal and marine resources, and severe weather. OMAO also ensures that outsourced aviation operations are conducted safely by providing technical support, services and equipment to NOAA programs. In FY 2015, AOC will provide approximately 2,670 OMAO funded flight hours in support of NOAA's mission. Additional flight hours may also be funded by programs as determined in the year of budget execution, based on the availability of aircraft and funds.

The objectives of the Aviation Operations sub-program are to:

- Provide NOAA with centralized aircraft systems management and coordination of airborne data collection flight time;
- Modify, maintain, and operate the aircraft with a combined work force of specially trained civilians and officers of the NOAA Corps to meet airborne data-collection requirements;
- Maintain the airworthiness and operating standards of the aircraft for optimum safety along with standardization of scientific systems and aircraft;
- Operate the aircraft safely and in compliance with Federal Aviation Administration regulations regarding use of airspace, control of air traffic, and aircraft registration;
- Develop and operate prototype and operational scientific-research instrumentation aboard NOAA aircraft; conduct applied research to ensure validity of data collected; recommend and implement specialized modifications, equipment or personnel for particular missions or projects;
- Develop, with the guidance of NOAA's Fleet Council, annual flight-time allocation schedules based on airborne data-collection requirements; and
- Provide centralized expertise in aviation safety to arrange for safe commercial aviation services for NOAA programs using outsourced aircraft.

FY 2013 Program Accomplishments:

- NOAA's aircraft were integral to the Hurricane Sandy response. NOAA's WP-3D and G-IV flew 77 flight hours during 10 missions over four days. A total of 236 Sondes, used in hurricane research and intensity forecasting, were launched with a 96.6 percent success rate.
- The King Air and Twin Otters flew 85 flight hours over 24 missions in response to Hurricane Sandy. Over 3000 nautical miles were flown and 12,000 images taken. The imagery was used to locate marine debris, clear entrances to NY and NJ seaports, and clean up HAZMAT spills in Sandy Hook, NJ. The Army Corps of Engineers used the data to facilitate

beach/dune repairs along Atlantic City and Seaside Heights. Private citizens used the imagery to assess damage to homes and communities.

- An OMAO WP-3D Orion operating out of Fairbanks, Alaska successfully conducted a series of flights over the Chukchi Sea as part of a mission to study ice, weather, and climate in the Arctic.
- OMAO secured funding in the Disaster Relief Appropriations Act, 2013 for WP-3D re-winging and released a Request for Proposal (RFP) in July 2013.

NOAA's Aircraft Fleet detail as of FY 2015, including information for the current program, is provided below. (Note: Missions and support fluctuate based on program priorities.)

Aircraft	Type	Mission	Location	Status
HEAVY:				
(3) Lockheed WP-3D	4-engine turbo prop	Air quality (OAR) Hurricane research (OAR) Hurricane reconnaissance (NWS) Ocean winds (NESDIS, NWS) Hurricane intensity forecasting (NWS) Climate research (OAR)	MacDill AFB, FL	N42: Active N43: Active N44: Inactive
MID:				
(1) Gulfstream G-IV	2-engine turbo jet	Hurricane surveillance (NWS) Hurricane intensity forecasting (NWS) Atmospheric research (OAR)	MacDill AFB, FL	Active
LIGHT:				
(4) Dehavilland Twin Otter DHC-6	2-engine turbo prop	Aerial surveys (NMFS) Atmospheric research (OAR)	MacDill AFB, FL	All 4 active
(1) King Air	2-engine turbo prop	Photogrammetry (NOS) Multi-spectral scanner (NOS) Airborne bathymetric LIDAR (NOS, NWS) Post-storm damage assessment (NOS)	MacDill AFB, FL	Active
(1) Jet Prop Commander AC/695	2-engine turbo prop	Snow surveys (NWS) Fisheries observations (NMFS) Marine mammal observations (NMFS)	Minneapolis, MN	Active

Schedule and Milestones:
Aircraft Services annual schedule and milestones are governed by the Aircraft Allocation Plan (http://www.omao.noaa.gov/airallocation.html) as agreed to and signed by the NOAA Fleet Council. The Aircraft Allocation Plan details the individual NOAA projects to be conducted on each aircraft and the timeframe for each project.

Deliverables:

- At the requested funding level, OMAO will provide 2,670 flight hours in FY 2015. Detailed deliverables are determined on a project by project basis as documented in flight instructions agreed to by OMAO and the contracting line office.
- Perform Program Funded Hours as scheduled. In addition to the OMAO funded flight hours, OMAO conducts missions funded through Service Level Agreements (SLA) with NOAA programs and reimbursable agreements. Program funded hours are scheduled based on availability of planes and program funds. OMAO does not anticipate future reimbursable flight hours.

Performance Goals and Measurement Data:

Performance Measure: OMAO funded Flight Hours	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	2,503	2,670	2,670	2,670	2,670	2,670	2,670
Description: Number of OMAO funded flight hours. FY 2014 is based on the draft version of the Omnibus Aircraft Allocation Plan (unsigned). For FY 2015 and forward, NOAA assumes a fuel rate of $3.81 per gallon.							

Performance Measure: Program funded flight hours	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	1,316	1,805	TBD	TBD	TBD	TBD	TBD
Description: OMAO conducts missions funded Service Level Agreements (SLA) with NOAA programs. Program funded hours are scheduled based on availability of planes and program funds, therefore out year targets are to be determined.							

Performance Measure: Reimbursable flight hours	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	44	156	N/A	N/A	N/A	N/A	N/A
Description: OMAO conducts reimbursable funded missions based on the availability of planes.							

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PROGRAM CHANGES FOR FY 2015:

Aircraft Services: Study for Alternatives to WP-3D (Funding: $31,600,000 and 121 FTE; Program Change: -$1,000,000 and 0 FTE): NOAA requests a decrease of $1,000,000 and 0 FTE for a total of $30,600,000 and 121 FTE to account for the reduction of one time funding provided in FY 2014 for a study of alternatives to the WP-3D as a platform for NOAA research.

Proposed Actions:
In FY 2014, NOAA sought one-time funding to support a third-party study to investigate potential replacement of the WP-3D observing and research platform. The requested funding in 2014 is sufficient to complete the study and no further funding is required.

Resource Assessment:
The resources for this activity are described in the Aviation Operations narrative.

Schedule and Milestones:
N/A

Deliverables:
N/A

PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Budget Program: Office of Marine and Aviation Operations
Sub-program: Aviation Operations
Program Change: Study of Alternatives to the WP-3D

	Object Class	FY 2015 Decrease	FY 2015 Total Program
11	Personnel compensation		
11.1	Full-time permanent	$0	$6,595
11.3	Other than full-time permanent	0	0
11.5	Other personnel compensation	0	370
11.8	Special personnel services payments	0	7,372
11.9	Total personnel compensation	0	14,337
12	Civilian personnel benefits	0	2,419
13	Benefits for former personnel	0	0
21	Travel and transportation of persons	0	1,599
22	Transportation of things	0	134
23.1	Rental payments to GSA	0	0
23.2	Rental Payments to others	0	0
23.3	Communications, utilities and miscellaneous charges	0	293
24	Printing and reproduction	0	0
25.1	Advisory and assistance services	0	266
25.2	Other services	(1,000)	4,756
25.3	Purchases of goods & services from Gov't accounts	0	3,052
25.4	Operation and maintenance of facilities	0	0
25.5	Research and development contracts	0	0
25.6	Medical care	0	0
25.7	Operation and maintenance of equipment	0	0
25.8	Subsistence and support of persons	0	0
26	Supplies and materials	0	3,528
31	Equipment	0	128
32	Lands and structures	0	0
33	Investments and loans	0	0
41	Grants, subsidies and contributions	0	90
42	Insurance claims and indemnities	0	0
43	Interest and dividends	0	0
44	Refunds	0	0
99	Total obligations	(1,000)	30,600

Aircraft Services: Flight Hour Increase (Base Funding: $31,600,000 and 121 FTE; Program Change: +$1,000,000 and 0 FTE): NOAA requests an increase of $1,000,000 and 0 FTE for a total of $32,600,000 and 121 FTE for additional flight hours in support of hurricane reconnaissance, hurricane surveillance and high impact weather.

Proposed Actions:
OMAO will provide an additional 125 flight hours to the base funded target of 2,670 flight hours, for a total of 2,795 flight hours for critical in-situ observations supporting NOAA's mission to promote global environmental assessment, prediction and stewardship of the Earth's environment. The flight hours will primarily support hurricane reconnaissance and research missions aimed at improving hurricane intensity forecasts. Further hours could support water resource surveys or be allocated to provide data to support the Aeronautical Survey Program (ASP), the Coastal Mapping Program (CMP) and emergency response efforts through the use of remotely sensed data. The requested funds will provide for increased variable costs for fuel and crew overtime in addition to the costs for logistics, maintenance, mission support equipment and aircraft systems support required for the planned flight hours.

Statement of Need and Economic Benefits:
The aircraft fleet collects data that impact a broad range of activities in the U.S. OMAO provides aircraft with unique observing capabilities including three tail mounted Doppler radars. These radars are designed to observe the structure of severe weather and provide the data necessary to improve severe weather prediction.

OMAO provides NOAA scientists the in-situ observations that are necessary to continue improvements to hurricane track and intensity forecasts. As a member of the Interagency National Hurricane Operations Plan (NHOP), OMAO is responsible for augmenting Air Force Reserve capabilities typically flying 10 percent of total hurricane operation flight hours. The increased hours will support NOAA's unique research function, providing more accurate hurricane intensity and track forecasts to help state and federal planners mitigate losses of property and life from these devastating storms.

The National Environmental Satellite, Data and Information Service (NESDIS), the National Marine Fisheries Services (NMFS), the National Ocean Service (NOS), the National Weather Service (NWS), and the Office of Oceanic and Atmospheric Research (OAR) all rely on OMAO for aircraft time. The final allocation of aircraft time will be determined by NOAA's Fleet Council using the Prioritization, Allocation and Scheduling (PAS) process. This ensures support to NOAA's highest priority programs. OMAO will continue to conduct NOAA's highest priority missions while utilizing NOAA's fleet in support of science, service and stewardship.

Resource Assessment:
The resources for this activity are described in the Aviation Operations narrative.

Schedule and Milestones:
Aircraft annual schedules and milestones are governed by the Aircraft Allocation Plan (http://www.omao.noaa.gov/airallocation.html) as agreed to and signed by the NOAA Fleet Council. The Aircraft Allocation Plan details the objective and duration of individual NOAA projects.

Deliverables:
FY 2015:

- At the requested funding level, the program will provide approximately 2,795 flight hours in FY 2015.

- Perform program funded flight hours as scheduled. In addition to the base funded flight hours, OMAO conducts flight hours funded through Service Level Agreements (SLA) with NOAA programs and reimbursable agreements. Program funded flight hours are scheduled based on availability of aircraft and program funds.
- The allocation of hours is determined by the Fleet Council using the PAS process. The hours as stated in the deliverables are not confirmed until the process is finalized.

Performance Goals and Measurement Data:

Performance Measure: OMAO Funded Flight Hours	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With Increase	N/A	N/A	2,795	2,795	2,795	2,795	2,795
Without Increase	2,503	2,670	2,670	2,670	2,670	2,670	2,670
Description: Number of OMAO funded flight hours. FY 2014 is based on the draft version of the Omnibus Aircraft Allocation Plan (unsigned). For FY 2015 and forward, NOAA assumes a fuel rate of $3.81 per gallon.							

PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Budget Program: Office of Marine and Aviation Operations
Sub-program: Aviation Operations
Program Change: Flight Hour Increase

	Object Class	FY 2015 Increase	FY 2015 Total Program
11	Personnel compensation		
11.1	Full-time permanent	$0	$6,595
11.3	Other than full-time permanent	0	0
11.5	Other personnel compensation	25	395
11.8	Special personnel services payments	0	7,372
11.9	Total personnel compensation	25	14,362
12	Civilian personnel benefits	0	2,419
13	Benefits for former personnel	0	0
21	Travel and transportation of persons	0	1,599
22	Transportation of things	0	134
23.1	Rental payments to GSA	0	0
23.2	Rental Payments to others	0	0
23.3	Communications, utilities and miscellaneous charges	0	293
24	Printing and reproduction	0	0
25.1	Advisory and assistance services	0	266
25.2	Other services	350	6,106
25.3	Purchases of goods & services from Gov't accounts	0	3,052
25.4	Operation and maintenance of facilities	0	0
25.5	Research and development contracts	0	0
25.6	Medical care	0	0
25.7	Operation and maintenance of equipment	0	0
25.8	Subsistence and support of persons	0	0
26	Supplies and materials	625	4,153
31	Equipment	0	128
32	Lands and structures	0	0
33	Investments and loans	0	0
41	Grants, subsidies and contributions	0	90
42	Insurance claims and indemnities	0	0
43	Interest and dividends	0	0
44	Refunds	0	0
99	Total obligations	1,000	32,600

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APPROPRIATION ACCOUNT: PROCUREMENT, ACQUISITION AND CONSTRUCTION
SUB-PROGRAM: FLEET REPLACEMENT PROGRAM

The Fleet Replacement Program (FRP) develops requirements and acquisition strategies and monitors the modernization and construction of the ships in order to meet NOAA's Days at Sea (DAS) in-situ observing requirements. FRP oversees government and contractual resources necessary to design, equip, construct or modernize the ships and ship-board systems. NOAA ships face challenges similar to other observational infrastructure, including expanded mission requirements, age and obsolescence, and finite resources for recapitalization. NOAA has successfully developed, adapted, and fielded a number of technologies that have enhanced the capabilities of NOAA ships and is currently evaluating a number of technologies that have the potential to more effectively and efficiently meet collection requirements. NOAA's FRP receives sustained funding for ongoing activities related to modernization and current ship construction activities as delineated in the 2008 Ship Recapitalization Plan and contains two budget lines: Fleet Capital Investment and Technology Infusion, and New Vessel Construction.

Fleet Capital Improvement and Technology Infusion (FCITI) is designed to maintain and extend the service life of the ship fleet by ensuring required upgrades to ship board systems and mission equipment are in line with the needs of the programs and safety requirements. FCITI monitors the material condition of the ships using a Ship Structure and Machinery Evaluation (SSME), which captures the ship's condition. The SSME documents the results of inspections and identifies future work data, which will guide future capital investment decision making. At the same time, OMAO uses manufacturer provided information for new ships to develop maintenance profiles. As information is gathered through these means, the investment decision model will be continually updated.

In FY 2014, OMAO will begin implementation of a Progressive fleet lifecycle plan. Progressive lifecycle maintenance improves the material condition of the NOAA ship fleet by stabilizing capital investment. This allows OMAO to plan and perform cyclic depot-level capital investments across the fleet each year. Under this progressive lifecycle maintenance program, former Major Repair Periods (MRPs) would be broken into smaller components to allow OMAO to focus on key ship board systems throughout the fleet on a more frequent basis. During the maintenance cycle, each ship in the NOAA fleet would receive regular upgrades and replacements of mission support equipment and technology infusions such as data processing capacity. The result is a fleet maintained at a higher state of readiness; extension of ship service life; and avoidance of mechanical, structural, and mission equipment obsolescence.

New Vessel Construction (NVC) receives funding to ensure proper oversight of ship construction activities by enabling a cadre of government experts to evaluate requirements, review proposals, and monitor progress towards achieving goals.

NOAA Ship Recapitalization Plan
In 2008, NOAA submitted a Ship Recapitalization Plan to Congress (http://www.omao.noaa.gov/publications/08_ship_recap_plan.pdf), which described a process to systematically replace or upgrade the fleet in order to meet the ever changing and evolving demands of the scientific community. The plan examined 10 of the fleet's 19 ships that would reach the end of their useful service life over the next 15 years (2010 to 2024).

For the past five years, the Ship Recapitalization Plan has served as a guide for planned investments, but events since 2008 have led NOAA to reassess the current recapitalization strategy. Through an internal review process, NOAA has revalidated at-sea data collection requirements and

re-evaluated current and future in-situ ocean observing platforms. This effort supported internal planning as well as the *Federal Oceanographic Fleet Status Report* (http://www.whitehouse.gov/sites/default/files/federal_oceanographic_fleet_status_report.pdf) released in May 2013 by the National Ocean Council chaired by the Council on Environmental Quality and the Office of Science and Technology Policy (OSTP) that reviewed existing fleet infrastructure and modernization plans of the Federal fleet of oceanographic-survey and research vessels.

The objectives of the Fleet Replacement Program are to:

- Ensure the proper maintenance and safety of NOAA ships within American Bureau of Shipping, U.S. Coast Guard, Environmental Protection Agency, and applicable international requirements.
- Ensure proper oversight of the design and construction of new ships that meet all applicable federal regulations.

FY 2013 Program Accomplishments:

- NOAA Ship *Ferdinand R. Hassler*, a seafloor mapping vessel that supports the Office of Coast Survey mission to update nautical charts and detect dangers to navigation, arrived at its New Castle, N.H. homeport August 2013 and began delivering hydrographic survey products.

Schedule and Milestones:
FY 2015 to FY 2019 – Conduct progressive lifecycle maintenance on T-AGOS ships

Deliverables:
Cyclic capital investments in the NOAA fleet to improve material condition, prolong service life and ensure continuity of ship mission availability and readiness.

Performance Goals and Measurement Data:

Performance Measure: Lost Days at Sea Due to Maintenance	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
	114	205	205	202	200	194	189
Description: Based on FY 2015 funding of progressive maintenance, the targets assume a 1.3 percent improvement on lost DAS in FY 2016 and FY 2017 and a 2.7 percent improvement from FY 2018 forward.							

Outyear Funding Estimates ($ in thousands):

Progressive Lifecycle Maintenance	**FY 2014 & Prior**	**FY 2015**	**FY 2016**	**FY 2017**	**FY 2018**	**FY 2019**	**CTC**	**Total**
Change from FY 2015 Base		0	0	0	0	0		
Total Request	5,200	5,200	5,200	5,200	5,200	5,200		Recurring

PROGRAM CHANGES FOR FY 2015:

Fleet Capital Improvement and Technology Infusion: Progressive Lifecycle Maintenance Program (Base Funding: $5,200,000 and 0 FTE; Program Change: $2,000,000 and 0 FTE): NOAA requests $2,000,000 and 0 FTE for a total of $7,200,000 and 0 FTE to increase funding available for capital repairs to NOAA's ship fleet under the Progressive Lifecycle Maintenance program.

Proposed Actions:
In FY 2014, NOAA implemented the Progressive Lifecycle Maintenance program to improve the material condition of the NOAA ship fleet by stabilizing capital investment. An increase in funding to this program in FY 2015 will allow OMAO to plan and perform cyclic depot-level capital investments across the fleet each year with a greater capacity to address needed repairs. This progressive lifecycle maintenance model emulates established benchmarks and best practices from industries as diverse as the aviation industry and the United States Coast Guard (USCG) Surface Forces Logistics Centers. The chart below shows the approach for ship capital investment in the Progressive Lifecycle Maintenance program by rotating the type and intensity of capital investment throughout the fleet.

Under this program, former Major Repair Periods (MRPs) are broken into smaller components allowing OMAO to focus on key ship-board systems throughout the fleet on a regular basis. During the maintenance cycle, each ship in the NOAA fleet would receive regular upgrades and replacements of mission support equipment and technology infusions such as data processing capacity. This approach eliminates the accumulation of capital repairs that would typically occur prior to an MRP. The result is a fleet maintained at a higher state of readiness, an extension of ship service life, and avoidance of mechanical, structural, and mission equipment obsolescence. The chart below lists the annual ranges of capital investments in thousands of dollars that will vary from year to year based on the ships and results of Ship Structure and Machinery Evaluations (SSMEs) that assess the material condition of the ships and determine priority repairs.

Crew Space Refurbishment	Science/Mission Space Refurbishment	Shipboard Systems	Underwater Body	Mission Systems Refresh
$3,000 - $5,000	$1,000 - $3,000	$1,000 - $3,000	$500 - $2,000	$1,000 - $3,000
• Refrigeration systems • HVAC refurbishment. • Environmental equipment replace	• Space renovation • Government furnished equipment	• Propulsion & generation systems overhaul • re-piping; • fire suppression upgrades • machinery monitoring upgrades	• Blast hull • refurbish props/shafts; • refurbish valves/piping	• Multi-beam sonars and sensors • Ship-Board electronic data processing and storage, • UAS Launch/ Recovery System; • Cranes, winches, davit replace

Statement of Need and Economic Benefits:
Prior to FY 2014, fleet capital investment was planned and budgeted as a major repair period. This resulted in significant budget requests for a specific ship in a given year, and limited the ability of OMAO to plan future investments and acquisitions. The advantages of a capital investment program are that it:

- Eliminates budget variability in a constrained fiscal environment
- Reduces risk and uncertainty ensuring mission function continuity and availability
- Reduces disruption to crews and operational schedules
- Improves reliability, adds Days at Sea back to operational capacity
- Improves procurement planning, competitiveness, and flexibility
- Avoids accumulation of repairs helping to reduce future liability and costs.

For NOAA ships, costs increase dramatically as corrosion issues manifest themselves, and the ability to support machinery and equipment becomes difficult as manufacturers move to new technologies. Support for older machinery and equipment has been the greatest challenge in recent years with new control technologies and added environmental requirements being introduced. Corrosion and machinery support issues have occurred sooner than the 20 to 25 years of expected service life of NOAA ships as OMAO is already experiencing these issues with the newer Fisheries Survey Vessels. Progressive maintenance funds will allow OMAO to address these issues on ships, achieve service life extension, and reduce the need for substantial structural repairs. The funds will also allow for an assessment of available technologies to meet requirements necessary to maintain ship machinery and equipment for the second twenty years of a ship's service life. The cost to address these repairs to keep vessels operational is many times less costly than acquiring a new vessel of similar capability.

Resources Assessment:
OMAO was provided with $5,200,000 in FY 2014 for the Progressive Lifecycle Maintenance program.

Schedule and Milestones:
FY 2015 to FY 2019 – Conduct progressive lifecycle maintenance on T-AGOS ships

Deliverables:
Cyclic capital investments in the NOAA fleet to improve material condition, prolong service life and ensure continuity of ship mission availability and readiness.

Performance Goals and Measurement Data:

Performance Measure: Lost Days at Sea Due to Maintenance	**FY 2013 Actual**	**FY 2014 Target**	**FY 2015 Target**	**FY 2016 Target**	**FY 2017 Target**	**FY 2018 Target**	**FY 2019 Target**
With Increase	N/A	N/A	201	199	191	184	177
Without Increase	114	205	205	202	200	194	189
Description: Without increase and based on FY 2015 funding of progressive maintenance, the targets assume a 1.3 percent improvement on lost DAS in FY 2016 and FY 2017 and a 2.7 percent improvement from FY 2018 forward. With increase the targets assume a 1.8 percent improvement on lost DAS in FY 2016 and FY 2017 and a 3.7 percent improvement from FY 2018 forward.							

Outyear Funding Estimates ($ in thousands):

Progressive Lifecycle Maintenance	FY 2014 & Prior	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	CTC	Total
Change from FY 2015 Base		2,000	2,000	2,000	2,000	2,000		
Total Request	5,200	7,200	7,200	7,200	7,200	7,200		Recurring

PROGRAM CHANGE DETAIL BY OBJECT CLASS
(Dollar amounts in thousands)

Budget Program: Office of Marine and Aviation Operations
Subprogram: OMAO Fleet Replacement
Program Change: Progressive Lifecycle Maintenance Program

	Object Class	FY 2015 Increase	FY 2015 Total Program
11	Personnel compensation		
11.1	Full-time permanent	$0	$0
11.3	Other than full-time permanent	0	0
11.5	Other personnel compensation	0	0
11.8	Special personnel services payments	0	0
11.9	Total personnel compensation	0	0
12	Civilian personnel benefits	0	0
13	Benefits for former personnel	0	0
21	Travel and transportation of persons	0	0
22	Transportation of things	0	0
23.1	Rental payments to GSA	0	0
23.2	Rental Payments to others	0	0
23.3	Communications, utilities and miscellaneous charges	0	0
24	Printing and reproduction	0	0
25.1	Advisory and assistance services	0	0
25.2	Other services	2,000	4,296
25.3	Purchases of goods & services from Gov't accounts	0	455
25.4	Operation and maintenance of facilities	0	0
25.5	Research and development contracts	0	0
25.6	Medical care	0	0
25.7	Operation and maintenance of equipment	0	0
25.8	Subsistence and support of persons	0	0
26	Supplies and materials	0	958
31	Equipment	0	1,490
32	Lands and structures	0	0
33	Investments and loans	0	0
41	Grants, subsidies and contributions	0	0
42	Insurance claims and indemnities	0	0
43	Interest and dividends	0	0
44	Refunds	0	0
99	Total obligations	2,000	7,200

APPROPRIATION ACCOUNT: NOAA Corps Retirement Pay (Mandatory)

The retirement system for the uniformed services provides a measure of financial security after release from active duty for service members and their survivors. It is an important factor in the choice of a career in the uniformed services, and the legal mandate for rates to be paid is the same for all uniformed services, see 10 USC. Retired pay is an entitlement to NOAA Commissioned Corps officers under 33 USCA 3044, 33 USCA 3045, and 33 USCA 3046. Retired pay funds are transferred to the U.S. Coast Guard, which handles the payments each year as adjusted pursuant to the Department of Defense Authorization legislation. Healthcare funds for non-Medicare-eligible retirees, dependents, and annuitants are administered by OMAO.

Legal authority for retirement of NOAA Commissioned Corps officers is contained in 33 USCA 3044. Retired officers of the NOAA Commissioned Corps receive retirement benefits that are administered by the U.S. Coast Guard (USCG), in accordance with a Memorandum of Agreement between the USCG and NOAA, with funds certified by the Commissioned Personnel Center within the Office of Marine and Aviation Operations.

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Exhibit 5

Department of Commerce
National Oceanic and Atmospheric Administration
NOAA Corps Retirement Pay (Mandatory)
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	Positions	FTE	Budget Authority	Direct Obligations
FY 2014 Enacted	0	0	28,269	28,269
plus: 2015 Adjustments to Base	0	0	0	0
FY 2015 Base	0	0	28,269	28,269
plus: 2015 Program Changes	0	0	0	0
FY 2015 Estimate	0	0	28,269	28,269

		FY 2013 Actuals		FY 2014 Enacted		FY 2015 Base		FY 2015 Estimate		Increase/ Decrease	
		Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount
NOAA Corps Retirement Pay	Pos/BA	0	28,269	0	28,269	0	28,269	0	28,269	0	0
	FTE/OBL	0	25,243	0	28,269	0	28,269	0	28,269	0	0
Total: NOAA Corps Retirement Pay	Pos/BA	0	28,269	0	28,269	0	28,269	0	28,269	0	0
	FTE/OBL	0	25,243	0	28,269	0	28,269	0	28,269	0	0

Exhibit 5

Department of Commerce
National Oceanic and Atmospheric Administration
NOAA Corps Retirement Pay (Mandatory)
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	FY 2013 Actuals		FY 2014 Enacted		FY 2015 Base		FY 2015 Estimate		Increase/ Decrease	
	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount
Direct Mandatory Obligation	0	25,243	0	28,269	0	28,269	0	28,269	0	0
Total Obligations	**0**	**25,243**	**0**	**28,269**	**0**	**28,269**	**0**	**28,269**	**0**	**0**
Adjustments to Obligations:										
Unobligated balance	0	3,026	0	0	0	0	0	0	0	0
Total Budget Authority	**0**	**28,269**	**0**	**28,269**	**0**	**28,269**	**0**	**28,269**	**0**	**0**
Financing from Transfers and Other:										
Net Appropriation	**0**	**28,269**	**0**	**28,269**	**0**	**28,269**	**0**	**28,269**	**0**	**0**

Department of Commerce
National Oceanic and Atmospheric Administration
NOAA Corps Retirement Pay (Mandatory)
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
(Dollar amounts in thousands)

	FY 2013 Actuals	FY 2014 Enacted	FY 2015 Base	FY 2015 Estimate	Increase/ (Decrease) over 2015 Base
Object Class					
Other purchases of goods and services from Gov't accounts	25,243	28,269	28,269	28,269	0
Total Obligations	25,243	28,269	28,269	28,269	0
Less prior year recoveries	0	0	0	0	0
Less unobligated balance, SOY	0	0	0	0	0
Plus unobligated balance, EOY	3,026	0	0	0	0
Offsetting collections, Mandatory	0	0	0	0	0
Less: Previously Unavail. Unoblig. Bal.	0	0	0	0	0
Total Budget Authority Mandatory	28,269	28,269	28,269	28,269	0
Personnel Data					
Full-Time equivalent Employment:					
Full-time permanent	0	0	0	0	0
Other than full-time permanent	0	0	0	0	0
Total	0	0	0	0	0
Authorized Positions:					
Full-time permanent	0	0	0	0	0
Other than full-time permanent	0	0	0	0	0
Total	0	0	0	0	0

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APPROPRIATION ACCOUNT: Medicare-Eligible Retiree Healthcare Fund Contribution - NOAA Corps

The FY 2003 Department of Defense Authorization Act requires all uniformed services, including NOAA, to participate in an accrual fund for Medicare-eligible retirees. Payments into this accrual fund will cover the future health care benefits of present, active-duty NOAA officers and their dependents and annuitants. For FY 2015, payments to the accrual fund are estimated at $1,936,000.

In the FY 2015 Budget, the Department of Defense proposes replacing the current three TRICARE plans with a consolidated TRICARE Health Plan starting in 2016. This proposal would require all beneficiaries to pay an annual enrollment fee to be eligible for TRICARE and also includes higher deductibles and catastrophic caps. The proposal would implement new military treatment facility fees and other fee increases. In 2015, the proposal would increase co-pays for pharmaceuticals and implement an enrollment fee for new TRICARE-for-Life. This proposal would apply to the NOAA Commissioned Corps and has negligible budget impact on NOAA.

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Exhibit 5

Department of Commerce
National Oceanic and Atmospheric Administration
Medicare Eligible Retiree Health Fund Contribution – NOAA Corps
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	Positions	FTE	Budget Authority	Direct Obligations
FY 2014 Enacted	0	0	1,936	1,936
plus: 2015 Adjustments to Base	0	0	0	0
FY 2015 Base	0	0	1,936	1,936
plus: 2015 Program Changes	0	0	0	0
FY 2015 Estimate	0	0	1,936	1,936

		FY 2013 Actuals		FY 2014 Enacted		FY 2015 Base		FY 2015 Estimate		Increase/ Decrease	
		Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount
Medicare Eligible Retiree Health Fund Contribution - NOAA Corps	Pos/BA	0	1,805	0	1,936	0	1,936	0	1,936	0	0
	FTE/OBL	0	1,422	0	1,936	0	1,936	0	1,936	0	0
Total: Medicare Eligible Retiree Health Fund	Pos/BA	0	1,805	0	1,936	0	1,936	0	1,936	0	0
	FTE/OBL	0	1,422	0	1,936	0	1,936	0	1,936	0	0

Exhibit 5

Department of Commerce
National Oceanic and Atmospheric Administration
Medicare Eligible Retiree Health Fund Contribution – NOAA Corps
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	FY 2013 Actuals		FY 2014 Enacted		FY 2015 Base		FY 2015 Estimate		Increase/ Decrease	
	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount
Direct Discretionary Obligation	0	1,422	0	1,936	0	1,936	0	1,936	0	0
Total Obligations	**0**	**1,422**	**0**	**1,936**	**0**	**1,936**	**0**	**1,936**	**0**	**0**
Adjustments to Obligations:										
Unobligated balance	0	383	0	0	0	0	0	0	0	0
Total Budget Authority	**0**	**1,805**	**0**	**1,936**	**0**	**1,936**	**0**	**1,936**	**0**	**0**
Financing from Transfers and Other:										
Net Appropriation	**0**	**1,805**	**0**	**1,936**	**0**	**1,936**	**0**	**1,936**	**0**	**0**

Department of Commerce
National Oceanic and Atmospheric Administration
Medicare Eligible Retiree Health Fund Contribution – NOAA Corps
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
(Dollar amounts in thousands)

	FY 2013 Actuals	FY 2014 Enacted	FY 2015 Base	FY 2015 Estimate	Increase/ (Decrease) over 2015 Base
Object Class					
Other purchases of goods and services from Gov't accounts	1,422	1,936	1,936	1,936	0
Total Obligations	1,422	1,936	1,936	1,936	0
Less prior year recoveries	0	0	0	0	0
Less unobligated balance, SOY	0	0	0	0	0
Plus unobligated balance, EOY	0	0	0	0	0
Offsetting collections, Mandatory	0	0	0	0	0
Less: Previously Unavail. Unoblig. Bal.	0	0	0	0	0
Total Budget Authority Mandatory	1,422	1,936	1,936	1,936	0
Personnel Data					
Full-Time equivalent Employment:					
Full-time permanent	0	0	0	0	0
Other than full-time permanent	0	0	0	0	0
Total	0	0	0	0	0
Authorized Positions:					
Full-time permanent	0	0	0	0	0
Other than full-time permanent	0	0	0	0	0
Total	0	0	0	0	0

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