

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION



**BUDGET
ESTIMATES
FISCAL YEAR 2018**

CONGRESSIONAL SUBMISSION

PRIVILEGED

**The information contained herein must not be disclosed
outside the Agency until made public by the President or by
the Congress.**

**Budget Estimates, Fiscal Year 2018
Congressional Submission**

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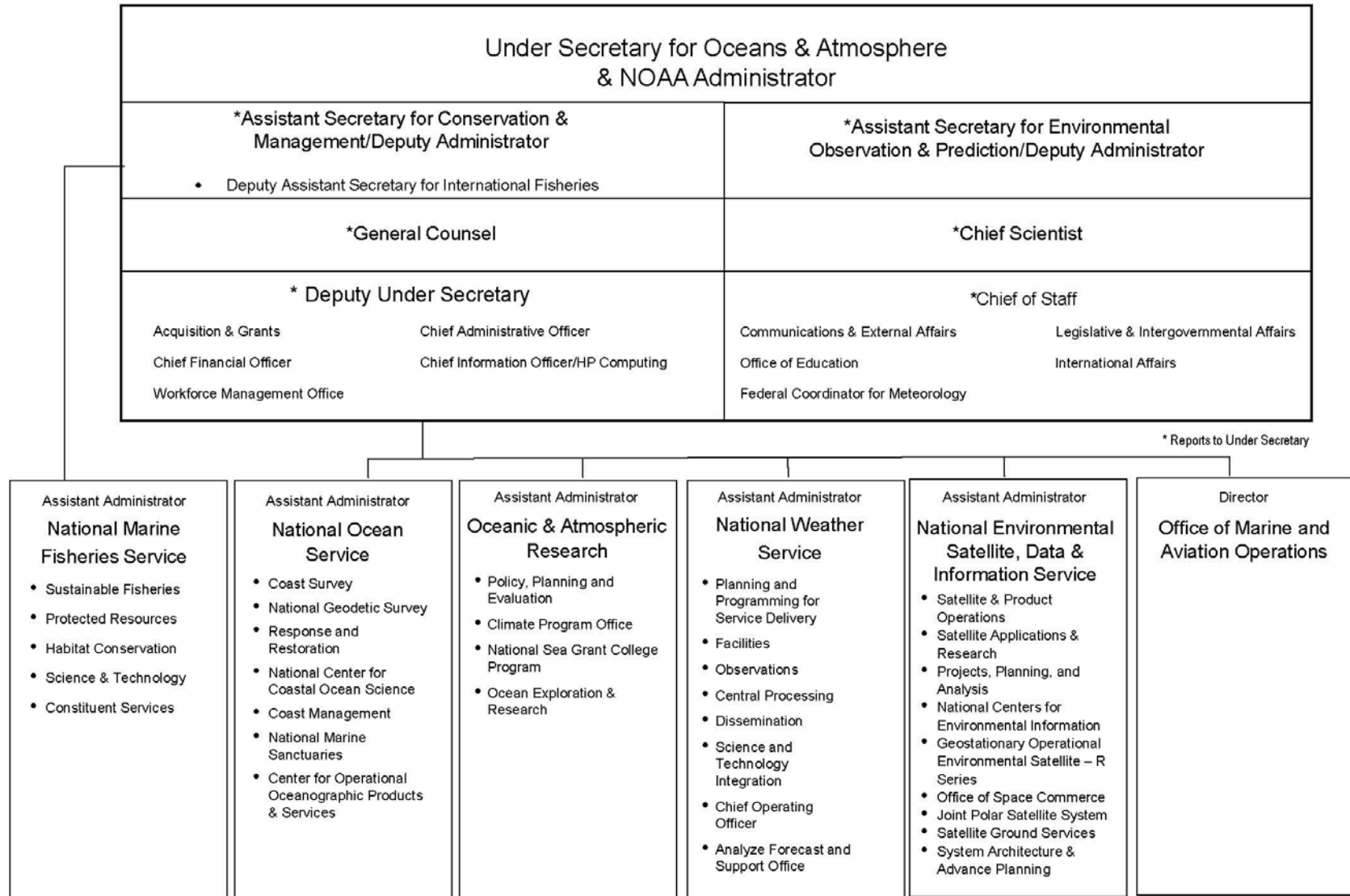
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U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC & ATMOSPHERIC ADMINISTRATION



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EXECUTIVE SUMMARY

For Fiscal Year (FY) 2018, the National Oceanic and Atmospheric Administration (NOAA) proposes a budget of \$4,775,302,000 in discretionary appropriations, a decrease of \$986,996,000 from the current FY 2017 Annualized Continuing Resolution (CR) level. This budget recognizes the broad Administration goals of enhancing programs that promote national security and public safety. As such, NOAA's FY 2018 budget prioritizes core government functions that provide the observational infrastructure, capabilities, and staff to produce timely and accurate weather forecasts and warnings; that recapitalize the NOAA fleet to ensure the continued collection of at-sea data vital to the U.S. economy for fisheries management and nautical charting; that support the government's legal obligations to manage and conserve marine resources; and that foster safe and efficient ocean and coastal navigation. To ensure we can sustain core functions and enable critical enhancements to our priorities in FY 2018, NOAA made tough choices to reduce a number of programs, including external grant programs, refinements in tsunami warnings, arctic research, and the future Polar Follow-On satellite program, which will serve as the next generation of NOAA's polar weather satellite constellation. The termination and re-scaling of programs, while challenging and impactful, is necessary as we move toward a more efficient government model that re-focuses on national security and core government functions.

As the Nation's premier environmental intelligence agency, NOAA operates an integrated observing system of land-based weather observing systems as well as ships, satellites, planes, and *in situ* stations, providing data, products, and services that first responders and emergency managers, men and women in our armed services, and millions of Americans depend on each day. These products and services include, for instance, daily weather warnings and forecasts, navigational tools to support the nearly \$4.6-trillion in economic activity generated at U.S. seaports, management of the nation's \$200-billion fisheries industry, and disaster response efforts. NOAA provides daily and long-term weather and marine forecasts critical for agricultural planning, emergency response to severe weather (which causes an estimated \$485-billion in annual economic impacts, and warning and mitigation of harmful algal blooms that negatively impact public health, tourism and the seafood industry. NOAA puts environmental information into the hands of the people and industries to support the U.S. economy and create jobs.

NOAA's FY 2018 budget maintains development of the current generation of polar orbiting satellites to sustain robust weather forecasting capabilities while promoting efficient operations. This budget invests \$775,777,000 in current generation polar weather satellite systems, which provide the primary data for NOAA's Numerical Weather Prediction models. With these funds NOAA will continue to operate and sustain existing polar weather satellites as well as continue development and launch preparation activities for launch of the JPSS-1 satellite, anticipated by the end of FY 2017, as well as the JPSS-2 satellite. NOAA will invest \$552,432,000 in operations and sustainment and development of the GOES-R series program of geostationary weather satellite systems, which support NOAA's weather forecasting, tracking, and monitoring of severe storms. NOAA's recent successful launch of the GOES-R satellite in November, 2016, which will become fully operational in Fall 2017, will be a game changer for weather forecasting, as data from this satellite provides imagery five times faster and at four times higher resolution than the previous geostationary satellite platform. Sustaining these systems is critical to the economy and public demand for high quality, timely, and accurate weather forecasts.

NOAA's FY 2018 budget also prioritizes at-sea monitoring infrastructure, investing \$75,000,000 in fleet recapitalization, which began in FY 2016. The FY 2018 Budget begins construction of a second NOAA (N/V) Class A Auxiliary General Purpose Oceanographic Research vessel (AGOR derivative) as part of NOAA's overall fleet recapitalization efforts. Currently, NOAA's fleet includes 16 research

and survey ships, which comprise 50 percent of the Federal Oceanographic Fleet. Every year, NOAA's ships conduct more than 100 missions critical to national security and public safety (e.g., emergency response, bathymetry, and weather buoy analysis) as well as the national economy (e.g., fisheries assessments and nautical charting). Communities and businesses rely on NOAA data to keep U.S. ports open to commerce, monitor the status of fish stocks, and plan for severe storm events. However, the NOAA ship fleet faces declining capacity without recapitalization. Eight of NOAA's ships currently exceed their design service life and are due to retire by 2028. The loss of these eight ships would undermine NOAA's mission, resulting in the absence of mapping capabilities on the West Coast and in the United States Arctic; a 75 percent loss of its hydrographic survey capability on the East Coast and in the Caribbean; and the inability to conduct fishery stock assessments in the Central, Southern and Western Pacific, and trawl-based stock assessments in the Gulf of Mexico. NOAA's ships are a vital national infrastructure critical to fulfilling the Nation's primary mission essential functions and legal mandates.

The Nation's commercial and recreational fisheries contribute more than \$200 billion to the Nation's economy and support nearly two million jobs. Assessments and monitoring efforts are the backbone of fisheries management and provide the assurance that NOAA is managing fisheries in a manner that maximizes fishing opportunity, while maintaining healthy stocks, so that the Nation's fisheries provide the maximum benefit to the U.S. economy and its fishing industry. NOAA is proud of its efforts to rebuild fisheries over the past two decades, rebuilding 41 fisheries stocks since 2000. In addition, overfishing rates are at their lowest levels in decades. Each rebuilt stock creates greater economic opportunity in the fishing industry. Recognizing the critical nature of NOAA's fisheries science, assessment, and monitoring efforts, NOAA's FY 2018 budget invests \$181,000,000 in its efforts to expand and update fisheries stock assessments. Stock assessments provide the technical basis for regional and local fishery management decisions.

NOAA's FY 2018 budget also continues investments in domestic seafood production through its National Marine Fisheries Aquaculture program. Currently, the U.S. imports more than 90 percent of its seafood, of which over half is from foreign-produced aquaculture. Only six percent of the seafood Americans consume is from domestic aquaculture. This reliance on foreign imports moves potential seafood jobs overseas and poses a risk to food security. Given wild fish stocks are at or near maximum harvest levels, the greatest opportunity to increase the seafood supply is through domestic aquaculture. The Nation has a large untapped potential for safe and sustainable aquaculture development, and seafood industry is increasingly calling for NOAA to take steps to help realize this potential. NOAA's FY 2018 budget invests \$6,288,000 in its aquaculture program to increase regulatory efficiency for the marine aquaculture sector and encourage sustainable marine aquaculture practices.

In addition to sustaining its critical core functions in activities described above, NOAA's FY 2018 budget requests increases in a number of programs to improve our modeling outputs and supercomputing functions, extend the service life of existing systems such as the NWS' Automated Surface Observing System and NOAA's ship fleet, enhance IT security, and improve our ability to get critical weather data into the hands of people at the local level.

A full-year 2017 appropriation was not enacted at the time the FY 2018 Budget was prepared; therefore, the Budget assumes the Department is operating under the Further Continuing Appropriations Act, 2017 (P.L. 114-254). The amounts included for 2017 reflect the annualized level provided by the continuing resolution. For more information about NOAA's Budget, please see NOAA's FY 2018 Congressional Justification or visit the Department of Commerce's Web site at: <http://www.osec.doc.gov/bmi/budget/>.

Department of Commerce
National Oceanic and Atmospheric Administration
FY 2018 PROGRAM INCREASES / DECREASES / TERMINATIONS
(Dollar amounts in thousands)
(Largest to Smallest)

Increases

Page No. in CJ	Appropriation	Budget Program	Activity/Subactivity	FTE	Budget Authority
NESDIS-81	PAC	NESDIS	MetOp-C Instrument Testing and Launch Support	0	12,033
OAR-66	PAC	OAR	Research & Development High Performance Computing Recapitalization	0	5,959
NWS-28	ORF	NWS	Advanced Weather Interactive Processing System Cyclical Refreshment	0	5,130
NESDIS-20	ORF	NESDIS	NESDIS IT Security	0	4,530
NWS-44	ORF	NWS	Enhance the Resilience and Reliability of Integrated Dissemination Program Applications	0	4,000
NWS-71	PAC	NWS	Automated Surface Observing System (ASOS) Service Life Extension	0	3,986
NESDIS-24	ORF	NESDIS	Jason-3 Operations	0	3,138
NESDIS-27	ORF	NESDIS	DSCOVOR Operations	0	2,421
OMAO-11	ORF	OMAO	Interim Facility for NOAA Aircraft	0	2,000
NWS-47	ORF	NWS	Restore Funding to Weather Information Distribution Services	0	1,996
OMAO-16	PAC	OMAO	Progressive Lifecycle Maintenance Program	0	1,200
NESDIS-77	PAC	NESDIS	Strengthening NOAA's Future Satellite Capabilities	0	1,007
NESDIS-36	ORF	NESDIS	Facilitate Commercial Space Marketplace	0	601
NESDIS-87	PAC	NESDIS	NESDIS Construction	0	226
NESDIS-33	ORF	NESDIS	Administer Statutory Function	1	202
Subtotal, Increases				1	48,429

Department of Commerce
National Oceanic and Atmospheric Administration
FY 2018 PROGRAM INCREASES / DECREASES / TERMINATIONS
(Dollar amounts in thousands)
(Largest to Smallest)

Decreases

Page No. in CJ	Appropriation	Budget Program	Activity/Subactivity	FTE	Budget Authority
NESDIS-58	PAC	NESDIS	GOES-R Series Decrease	0	(317,711)
NESDIS-66	PAC	NESDIS	Polar Follow On	0	(189,344)
NESDIS-62	PAC	NESDIS	Joint Polar Satellite System Decrease	0	(31,662)
OAR-14	ORF	OAR	Reduce Competitively Funded Research	(5)	(23,702)
OAR-60	ORF	OAR	Reduce Ocean Exploration	0	(12,500)
NWS-25	ORF	NWS	Reduce Surface and Marine Observations (National Mesonet Network)	0	(11,489)
NWS-30	ORF	NWS	Establishment of Regional Enterprise Application Development and Integration Teams	(74)	(10,100)
NWS-77	PAC	NWS	Re-architected NWS Telecommunications Gateway	0	(7,604)
NWS-75	PAC	NWS	Reduce Research and Development High Performance Computing	0	(6,000)
NMFS-35	ORF	NMFS	National Catch Share Program	0	(5,002)
NWS-55	ORF	NWS	Reduce the Investment in Numerical Weather Prediction Modeling	0	(5,000)
OMAO-19	PAC	OMAO	Fleet Recapitalization	0	(4,899)
NESDIS-71	PAC	NESDIS	Ground System to Process Radio Occultation Data	0	(3,981)
NESDIS-30	ORF	NESDIS	Decrease Data Products Developed	0	(3,629)
NWS-36	ORF	NWS	Reduce Tsunami Warning Program	0	(3,500)
NWS-79	PAC	NWS	Ground Readiness Project	0	(3,441)

Department of Commerce
National Oceanic and Atmospheric Administration
FY 2018 PROGRAM INCREASES / DECREASES / TERMINATIONS
(Dollar amounts in thousands)
(Largest to Smallest)

NESDIS-74	PAC	NESDIS	Satellite Ground Services Sustainment	0	(3,153)
NWS-57	ORF	NWS	Reduce the Investment in the National Water Model	0	(3,101)
NMFS-33	ORF	NMFS	Cooperative Research Program	0	(3,001)
NESDIS-45	ORF	NESDIS	Regional Climate Centers	0	(3,000)
NWS-25	ORF	NWS	Reduce Surface and Marine Observations (TAO & Buoy Network Density)	0	(2,500)
NWS-34	ORF	NWS	Slow Advanced Hydrologic Prediction System Expansion	0	(2,000)
NWS-59	ORF	NWS	Reduce Testing, Evaluation, and Implementation of Operations and Workforce Analysis Recommendations	0	(2,000)
NWS-41	ORF	NWS	Consolidate Climate Prediction Center/Weather Prediction Center Functions	(8)	(1,200)
NWS-49	ORF	NWS	Reduce Support for NextGen IT Web Services	0	(1,100)
NESDIS-68	PAC	NESDIS	Space Weather Follow On (SWFO)	0	(698)
Subtotal, Decreases				(87)	(661,317)

Department of Commerce
National Oceanic and Atmospheric Administration
FY 2018 PROGRAM INCREASES / DECREASES / TERMINATIONS
(Dollar amounts in thousands)
(Largest to Smallest)

Terminations

Page No. in CJ	Appropriation	Budget Program	Activity/Subactivity	FTE	Budget Authority
OAR-56	ORF	OAR	Terminate the National Sea Grant College Program	(14)	(72,940)
NOS-31	ORF	NOS	Eliminate Coastal Zone Management Grants and Regional Coastal Resilience Grants	0	(74,858)
NMFS-53	PCSRF	NMFS	Pacific Coastal Salmon Recovery Fund	(2)	(64,876)
NOS-35	ORF	NOS	Eliminate Federal Funding Support for National Estuarine Research Reserve Systems (NERRS)	0	(22,957)
MS-17	ORF	MS	NOAA Office of Education	(17)	(19,475)
NWS-25	ORF	NWS	Reduce Surface and Marine Observations (DART/Seismic)	0	(12,000)
NMFS-49	ORF	NMFS	Coastal Ecosystem Resiliency Grants	0	(10,000)
NOS-21	ORF	NOS	Eliminate NCCOS Competitive Funding Support for research on ecological threats	0	(8,983)
MS-23	ORF	MS	NOAA Bay-Watershed Education and Training (B-WET) Regional Program	0	(7,186)
OAR-19	ORF	OAR	Eliminate Arctic Research	0	(6,000)
NWS-36	ORF	NWS	Reduce Tsunami Warning Program (National Tsunami Hazard Mitigation Program Grants)	(25)	(6,000)
NOS-13	ORF	NOS	Eliminate Regional Geospatial Modeling Grants	0	(5,989)
OAR-39	ORF	OAR	Terminate the Joint Technology Transfer Initiative	0	(5,989)
OAR-34	ORF	OAR	Close the Unmanned Aircraft Systems Program Office	(3)	(5,375)
NMFS-31	ORF	NMFS	Reef Fish Stock Assessments	0	(5,000)
OAR-37	ORF	OAR	End Vortex-Southeast	0	(5,000)
NWS-51	ORF	NWS	Terminate Investment in Mid-Range Weather Outlooks	0	(5,000)

Department of Commerce
National Oceanic and Atmospheric Administration
FY 2018 PROGRAM INCREASES / DECREASES / TERMINATIONS
(Dollar amounts in thousands)
(Largest to Smallest)

OAR-30	ORF	OAR	Close the Air Resources Laboratory	(34)	(4,699)
NWS-53	ORF	NWS	Terminate Coastal Act	0	(4,629)
NMFS-11	ORF	NMFS	Prescott Grants Program	0	(3,044)
NMFS-37	ORF	NMFS	Interjurisdictional Fisheries Grants	(1)	(2,994)
OAR-52	ORF	OAR	Eliminate the Autonomous Underwater Vehicle Demonstration Testbed	0	(2,000)
NOS-11	ORF	NOS	Eliminate Single-Year Grant to Joint Ocean and Coastal Mapping Center	0	(1,996)
OAR-54	ORF	OAR	End Genomics Research	0	(1,880)
NWS-39	ORF	NWS	Terminate Aviation Science Research to Operations	0	(1,806)
NOS-40	PAC	NOS	Eliminate Federal Funding Support for National Estuarine Research Reserve Systems (NERRS) Construction	0	(1,697)
NESDIS-43	ORF	NESDIS	Termination of Big Earth Data Initiative	0	(1,686)
NWS-35	ORF	NWS	Reduce Tsunami Warning Program (Short-term Inundation Forecasting for Tsunamis (SIFT))	0	(1,500)
NWS-61	ORF	NWS	Terminate Aviation Science Research to Operations	0	(1,000)
OAR-41	ORF	OAR	Conclude Infrasonic Weather Monitoring Research	0	(500)

Subtotal,
Terminations

(96) (367,059)

Total, Increases, Decreases and Terminations

(182) (979,947)

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

Comparison by program/sub-program		FY 2016		FY 2017		FY 2018		FY 2018		Increase/ (Decrease)	
		Actuals		Currently Available		Base Program		Estimate		Personnel	Amount
		Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount
NATIONAL OCEAN SERVICE (NOS)											
Navigation, Observations and Positioning	Pos/BA	524	203,836	553	205,111	577	208,155	577	197,340	0	(10,815)
	FTE/OBL	519	208,140	527	209,468	532	208,155	519	197,340	(13)	(10,815)
Coastal Science and Assessment	Pos/BA	258	80,939	277	81,446	308	83,509	308	72,885	0	(10,624)
	FTE/OBL	256	82,186	264	82,475	272	83,509	264	72,885	(8)	(10,624)
Ocean and Coastal Management and Services	Pos/BA	320	211,276	340	212,597	362	214,597	362	114,786	0	(99,811)
	FTE/OBL	317	217,804	324	214,895	330	214,597	322	114,786	(8)	(99,811)
TOTAL NOS - ORF	Pos/BA	1,102	496,051	1,170	499,154	1,247	506,261	1,247	385,011	0	(121,250)
	FTE/OBL	1,092	508,130	1,115	506,838	1,134	506,261	1,105	385,011	(29)	(121,250)
TOTAL NOS - PAC	Pos/BA	2	3,669	3	3,693	3	3,693	3	1,996	0	(1,697)
	FTE/OBL	2	4,348	2	4,410	3	3,693	3	1,996	0	(1,697)
Damage Assessment and Restoration Revolving Fund	Pos/BA	34	12,437	15	5,962	15	5,968	15	5,968	0	0
	FTE/OBL	34	145,395	15	66,694	15	47,242	15	47,242	0	0
Sanctuaries Asset Forfeiture Fund	Pos/BA	0	125	0	120	0	120	0	120	0	0
	FTE/OBL	0	392	0	120	0	120	0	120	0	0
Gulf Coast Ecosystem Restoration Fund	Pos/BA	0	0	1	0	1	0	1	0	0	0
	FTE/OBL	0	422	1	7,239	1	5,703	1	5,703	0	0
TOTAL NOS	Pos/BA	1,138	512,282	1,189	508,929	1,266	516,042	1,266	393,095	0	(122,947)
	FTE/OBL	1,128	658,687	1,133	585,301	1,153	563,019	1,124	440,072	(29)	(122,947)

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

Comparison by program/sub-program		FY 2016		FY 2017		FY 2018		FY 2018		Increase/ (Decrease)	
		Actuals		Currently Available		Base Program		Estimate		Personnel	Amount
		Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount
NATIONAL MARINE FISHERIES SERVICES (NMFS)											
Protected Resources Science and Management	Pos/BA	763	180,907	851	182,064	851	185,678	841	179,020	(10)	(6,658)
	FTE/OBL	756	181,796	811	185,445	811	185,678	797	179,020	(14)	(6,658)
Fisheries Science and Management	Pos/BA	1,618	532,511	1,800	535,664	1,800	546,606	1,775	522,144	(25)	(24,462)
	FTE/OBL	1,604	533,485	1,713	552,147	1,713	546,606	1,682	522,144	(31)	(24,462)
Enforcement	Pos/BA	194	68,431	244	68,870	244	70,000	240	68,943	(4)	(1,057)
	FTE/OBL	192	69,604	232	72,724	232	70,000	228	68,943	(4)	(1,057)
Habitat Conservation & Restoration	Pos/BA	151	60,902	162	61,292	162	62,060	160	51,334	(2)	(10,726)
	FTE/OBL	150	57,978	154	70,828	154	62,060	152	51,334	(2)	(10,726)
TOTAL NMFS - ORF	Pos/BA	2,726	842,751	3,057	847,890	3,057	864,344	3,016	821,441	(41)	(42,903)
	FTE/OBL	2,702	842,863	2,910	881,144	2,910	864,344	2,859	821,441	(51)	(42,903)
TOTAL NMFS - PAC	Pos/BA	0	0	0	0	0	0	0	0	0	0
	FTE/OBL	0	0	0	1,888	0	0	0	0	0	0
Pacific Coastal Salmon Recovery Fund	Pos/BA	2	64,935	2	64,876	2	64,876	0	0	(2)	(64,876)
	FTE/OBL	2	64,904	2	64,907	2	64,876	0	0	(2)	(64,876)
Fishermen's Contingency Fund	Pos/BA	0	350	0	349	0	349	0	349	0	0
	FTE/OBL	0	110	0	349	0	349	0	349	0	0
Foreign Fishing Observer Fund	Pos/BA	0	0	0	0	0	0	0	0	0	0
	FTE/OBL	0	0	0	0	0	0	0	0	0	0
Fisheries Finance Program Account	Pos/BA	0	11,819	0	30,764	0	0	0	0	0	0
	FTE/OBL	0	11,819	0	30,764	0	0	0	0	0	0

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 (Dollar Amounts in Thousands)

Comparison by program/sub-program		FY 2016		FY 2017		FY 2018		FY 2018		Increase/ (Decrease)	
		Actuals		Currently Available		Base Program		Estimate		Personnel	Amount
		Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount
Federal Ship Financing	Pos/BA	0	0	0	0	0	0	0	0	0	0
	FTE/OBL	0	0	0	0	0	0	0	0	0	0
Promote and Develop Fisheries Products	Pos/BA	3	16,225	3	14,909	0	0	0	0	0	0
	FTE/OBL	3	15,256	3	17,323	0	0	0	0	0	0
Environmental Improvement and Restoration Fund	Pos/BA	0	8,118	0	6,451	0	1,869	0	1,869	0	0
	FTE/OBL	0	8,118	0	6,451	0	1,869	0	1,869	0	0
Limited Access System Administration Fund	Pos/BA	40	13,368	40	13,218	40	13,327	40	13,327	0	0
	FTE/OBL	40	11,833	40	14,250	40	14,493	40	14,493	0	0
Marine Mammal Unusual Mortality Event Fund	Pos/BA	0	0	0	0	0	0	0	0	0	0
	FTE/OBL	0	0	0	0	0	0	0	0	0	0
Western Pacific Sustainable Fisheries Fund	Pos/BA	0	391	0	622	0	650	0	650	0	0
	FTE/OBL	0	323	0	750	0	750	0	750	0	0
Fisheries Enforcement Asset Forfeiture Fund	Pos/BA	0	4,836	0	3,996	0	4,000	0	4,000	0	0
	FTE/OBL	0	2,647	0	3,537	0	3,628	0	3,628	0	0
North Pacific Observer Fund	Pos/BA	0	3,894	0	3,815	0	3,850	0	3,850	0	0
	FTE/OBL	0	5,145	0	3,867	0	3,850	0	3,850	0	0
Fisheries Disaster Assistance Fund	Pos/BA	0	0	0	0	0	0	0	0	0	0
	FTE/OBL	0	4,358	0	0	0	0	0	0	0	0
TOTAL NMFS	Pos/BA	2,771	966,687	3,102	986,890	3,099	953,265	3,056	845,486	(43)	(107,779)
	FTE/OBL	2,747	967,376	2,955	1,025,230	2,952	954,159	2,899	846,380	(53)	(107,779)

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Comparison by program/sub-program		FY 2016		FY 2017		FY 2018		FY 2018		Increase/ (Decrease)	
		Actuals		Currently Available		Base Program		Estimate		Personnel	Amount
		Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount
OFFICE OCEANIC AND ATMOSPHERIC RESEARCH (OAR)											
Climate Research											
Laboratories & Cooperative Institutes	Pos/BA	182	59,515	238	59,887	255	61,151	255	57,657	0	(3,494)
	FTE/OBL	180	59,797	227	61,254	233	61,151	229	57,657	(4)	(3,494)
Regional Climate Data & Information	Pos/BA	24	37,692	14	37,928	14	38,000	14	31,928	0	(6,072)
	FTE/OBL	24	38,674	13	38,774	13	38,000	13	31,928	0	(6,072)
Climate Competitive Research	Pos/BA	42	59,515	15	59,887	15	59,965	10	38,415	(5)	(21,550)
	FTE/OBL	42	59,719	14	60,660	14	59,965	9	38,415	(5)	(21,550)
Total: Climate Research	Pos/BA	248	156,722	267	157,702	284	159,116	279	128,000	(5)	(31,116)
	FTE/OBL	246	158,190	254	160,688	260	159,116	251	128,000	(9)	(31,116)
Weather & Air Chemistry Research											
Laboratories & Cooperative Institutes	Pos/BA	201	75,385	252	75,856	270	81,136	233	64,780	(37)	(16,356)
	FTE/OBL	199	74,459	227	77,679	235	81,136	192	64,780	(43)	(16,356)
Weather & Air Chemistry Research Programs	Pos/BA	8	26,939	11	27,107	11	27,168	11	20,107	0	(7,061)
	FTE/OBL	8	26,584	11	28,082	11	27,168	11	20,107	0	(7,061)
Total: Weather & Air Chemistry Research	Pos/BA	209	102,324	263	102,963	281	108,304	244	84,887	(37)	(23,417)
	FTE/OBL	207	101,043	238	105,761	246	108,304	203	84,887	(43)	(23,417)
Ocean, Coastal, and Great Lakes Research											
Laboratories & Cooperative Institutes	Pos/BA	113	31,741	124	31,939	139	32,595	139	28,059	0	(4,536)
	FTE/OBL	112	31,983	118	33,734	124	32,595	120	28,059	(4)	(4,536)
National Sea Grant College Program	Pos/BA	12	72,409	15	72,862	15	72,940	0	0	(15)	(72,940)
	FTE/OBL	12	73,672	14	73,514	14	72,940	0	0	(14)	(72,940)

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Comparison by program/sub-program		FY 2016		FY 2017		FY 2018		FY 2018		Increase/ (Decrease)	
		Actuals		Currently Available		Base Program		Estimate		Personnel	Amount
		Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount
Ocean Exploration and Research	Pos/BA	22	31,741	23	31,939	23	32,061	23	19,439	0	(12,622)
	FTE/OBL	22	31,449	22	33,476	22	32,061	22	19,439	0	(12,622)
Other Ecosystem Programs	Pos/BA	14	9,919	17	9,981	17	10,070	17	9,981	0	(89)
	FTE/OBL	14	9,786	16	10,247	16	10,070	16	9,981	0	(89)
Sustained Observations and Monitoring	Pos/BA	35	41,260	39	41,517	39	41,723	39	41,517	0	(206)
	FTE/OBL	35	41,652	37	41,854	37	41,723	37	41,517	0	(206)
Total: Ocean, Coastal, and Great Lakes Research	Pos/BA	196	187,070	218	188,238	233	189,389	218	98,996	(15)	(90,393)
	FTE/OBL	195	188,542	207	192,825	213	189,389	195	98,996	(18)	(90,393)
Innovative Research & Technology	Pos/BA	11	12,045	12	12,121	12	12,182	12	12,121	0	(61)
	FTE/OBL	11	11,634	11	13,175	11	12,182	11	12,121	0	(61)
TOTAL OAR - ORF	Pos/BA	664	458,161	760	461,024	810	468,991	753	324,004	(57)	(144,987)
	FTE/OBL	659	459,409	710	472,449	730	468,991	660	324,004	(70)	(144,987)
TOTAL OAR - PAC	Pos/BA	0	19,906	0	20,041	0	20,041	0	26,000	0	5,959
	FTE/OBL	0	20,007	0	20,121	0	20,041	0	26,000	0	5,959
TOTAL OAR	Pos/BA	664	478,067	760	481,065	810	489,032	753	350,004	(57)	(139,028)
	FTE/OBL	659	479,416	710	492,570	730	489,032	660	350,004	(70)	(139,028)
NATIONAL WEATHER SERVICE (NWS)											
Observations	Pos/BA	682	214,612	712	215,954	934	236,585	934	207,660	0	(28,925)
	FTE/OBL	676	210,953	678	226,294	890	236,585	890	207,660	0	(28,925)
Central Processing	Pos/BA	226	92,119	234	92,695	237	95,045	163	86,144	(74)	(8,901)
	FTE/OBL	224	89,991	223	101,835	229	95,045	155	86,144	(74)	(8,901)

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Comparison by program/sub-program		FY 2016		FY 2017		FY 2018		FY 2018		Increase/	
		Actuals		Currently Available		Base Program		Estimate		(Decrease)	
		Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount
Analyze, Forecast and Support	Pos/BA	2,854	490,017	2,981	495,094	2,919	491,693	2,886	476,099	(33)	(15,594)
	FTE/OBL	2,829	495,669	2,839	503,468	2,781	491,693	2,748	476,099	(33)	(15,594)
0											
Dissemination	Pos/BA	79	46,381	79	44,658	85	45,965	85	49,985	0	4,020
	FTE/OBL	78	46,509	75	48,943	81	45,965	81	49,985	0	4,020
0											
Science and Technology Integration	Pos/BA	416	137,702	422	138,563	445	137,702	445	116,168	0	(21,534)
	FTE/OBL	412	139,104	402	145,086	424	137,702	424	116,168	0	(21,534)
TOTAL NWS - ORF	Pos/BA	4,257	980,831	4,428	986,964	4,620	1,006,990	4,513	936,056	(107)	(70,934)
	FTE/OBL	4,219	982,226	4,217	1,025,626	4,405	1,006,990	4,298	936,056	(107)	(70,934)
TOTAL NWS - PAC	Pos/BA	32	134,150	25	135,059	25	135,059	25	122,000	0	(13,059)
	FTE/OBL	32	124,840	24	162,328	24	135,059	24	122,000	0	(13,059)
TOTAL NWS	Pos/BA	4,289	1,114,981	4,453	1,122,023	4,645	1,142,049	4,538	1,058,056	(107)	(83,993)
	FTE/OBL	4,251	1,107,066	4,241	1,187,954	4,429	1,142,049	4,322	1,058,056	(107)	(83,993)
NATIONAL ENVIRONMENTAL SATELLITE, DATA AND INFORMATION SERVICE (NESDIS)											
Environmental Satellite Observing Systems											
Office of Satellite and Product Operations	Pos/BA	163	100,099	236	101,807	244	136,798	244	145,730	0	8,932
	FTE/OBL	161	99,639	224	102,902	228	136,798	218	145,730	(10)	8,932
Product Development, Readiness & Application	Pos/BA	67	23,206	80	25,951	88	33,629	88	29,426	0	(4,203)
	FTE/OBL	66	22,971	76	26,892	78	33,629	75	29,426	(3)	(4,203)

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Comparison by program/sub-program		FY 2016		FY 2017		FY 2018		FY 2018		Increase/	
		Actuals		Currently Available		Base Program		Estimate		(Decrease)	
		Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount
Commercial Remote Sensing, Licensing and Enforcement	Pos/BA	3	992	5	998	6	998	7	1,200	1	202
	FTE/OBL	3	918	5	1,130	5	998	6	1,200	1	202
Office of Space Commerce	Pos/BA	2	595	3	599	5	599	5	1,200	0	601
	FTE/OBL	2	576	3	640	3	599	3	1,200	0	601
Group on Earth Observations (GEO)	Pos/BA	0	496	0	499	0	499	0	500	0	1
	FTE/OBL	0	506	0	506	0	499	0	500	0	1
Total: Environmental Satellite Observing Systems	Pos/BA	235	125,388	324	129,854	343	172,523	344	178,056	1	5,533
	FTE/OBL	232	124,610	308	132,070	314	172,523	302	178,056	(12)	5,533
National Environmental Information Office	Pos/BA	166	58,753	198	58,874	240	62,803	240	56,519	0	(6,284)
	FTE/OBL	164	60,906	189	60,206	193	62,803	184	56,519	(9)	(6,284)
TOTAL NESDIS - ORF	Pos/BA	401	184,141	522	188,728	583	235,326	584	234,575	1	(751)
	FTE/OBL	396	185,516	497	192,276	507	235,326	486	234,575	(21)	(751)
TOTAL NESDIS - PAC	Pos/BA	252	2,145,090	275	2,156,186	305	2,113,903	305	1,580,627	0	(533,276)
	FTE/OBL	249	2,136,169	262	2,172,397	305	2,113,903	305	1,580,627	0	(533,276)
TOTAL NESDIS	Pos/BA	653	2,329,231	797	2,344,914	888	2,349,229	889	1,815,202	1	(534,027)
	FTE/OBL	645	2,321,685	759	2,364,673	812	2,349,229	791	1,815,202	(21)	(534,027)
MISSION SUPPORT (MS)											
Executive Leadership	Pos/BA	115	26,836	125	26,949	145	28,087	145	27,027	0	(1,060)
	FTE/OBL	114	27,297	119	27,773	121	28,087	118	27,027	(3)	(1,060)
Mission Services and Management	Pos/BA	575	147,101	601	147,720	656	141,448	656	137,605	0	(3,843)
	FTE/OBL	570	147,142	572	161,613	572	141,448	556	137,605	(16)	(3,843)
										0	

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Comparison by program/sub-program		FY 2016		FY 2017		FY 2018		FY 2018		Increase/ (Decrease)	
		Actuals		Currently Available		Base Program		Estimate		Personnel	Amount
		Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount
IT Security	Pos/BA	1	8,250	3	8,284	14	10,044	14	9,984	0	(60)
	FTE/OBL	1	7,716	2	9,122	13	10,044	13	9,984	0	(60)
Payment to the DOC Working Capital Fund	Pos/BA	0	54,059	0	42,919	0	58,699	0	58,699	0	0
	FTE/OBL	0	54,809	0	42,931	0	58,699	0	58,699	0	0
Office of Education	Pos/BA	21	32,095	18	26,581	18	26,661	0	0	(18)	(26,661)
	FTE/OBL	21	32,490	17	26,809	17	26,661	0	0	(17)	(26,661)
TOTAL MISSION SUPPORT - ORF	Pos/BA	712	268,341	747	252,453	833	264,939	815	233,315	(18)	(31,624)
	FTE/OBL	706	269,454	710	268,248	723	264,939	687	233,315	(36)	(31,624)
TOTAL MISSION SUPPORT - PAC	Pos/BA		992	0	998	0	998	0	998	0	0
	FTE/OBL		1,169	0	1,156	0	998	0	998	0	0
Spectrum Relocation Fund -ORF	Pos/BA	0	0	0	0	0	0	0	0	0	0
	FTE/OBL	0	1,405	0	3,361	0	7,318	0	7,318	0	0
Spectrum Relocation Fund -PAC	Pos/BA	0	0	0	0	0	0	0	0	0	0
	FTE/OBL	0	14,094	0	94,450	0	17,836	0	17,836	0	0
TOTAL MISSION SUPPORT	Pos/BA	712	269,333	747	253,451	833	265,937	815	234,313	(18)	(31,624)
	FTE/OBL	706	286,122	710	367,215	723	291,091	687	259,467	(36)	(31,624)

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 (Dollar Amounts in Thousands)

Comparison by program/sub-program		FY 2016		FY 2017		FY 2018		FY 2018		Increase/	
		Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount
OFFICE OF MARINE AND AVIATION OPERATIONS (OMAO)											
Marine Operations & Maintenance	Pos/BA	829	177,391	869	178,500	885	182,662	869	178,614	(16)	(4,048)
	FTE/OBL	822	179,759	828	180,825	844	182,662	828	178,614	(16)	(4,048)
Aviation Operations	Pos/BA	112	32,032	127	32,232	127	32,283	127	34,232	0	1,949
	FTE/OBL	111	32,382	121	33,339	121	32,283	121	34,232	0	1,949
TOTAL OMAO - ORF	Pos/BA	941	209,423	996	210,732	1,012	214,945	996	212,846	(16)	(2,099)
	FTE/OBL	933	212,141	949	214,164	965	214,945	949	212,846	(16)	(2,099)
TOTAL OMAO - PAC	Pos/BA	0	91,650	6	91,577	8	91,577	8	87,878	0	(3,699)
	FTE/OBL	0	16,309	6	171,795	8	91,577	8	87,878	0	(3,699)
Medicare Eligible Retiree Health Care Fund	Pos/BA	0	1,936	0	1,936	0	1,603	0	1,603	0	0
	FTE/OBL	0	1,285	0	1,936	0	1,603	0	1,603	0	0
NOAA Corps Commissioned Officers Retirement	Pos/BA	0	29,375	0	29,375	0	29,375	0	29,375	0	0
	FTE/OBL	0	28,732	0	29,375	0	29,375	0	29,375	0	0
TOTAL OMAO	Pos/BA	941	332,384	1,002	333,620	1,020	337,500	1,004	331,702	(16)	(5,798)
	FTE/OBL	933	258,467	955	417,270	973	337,500	957	331,702	(16)	(5,798)
NOAA ORF (Discretionary)	Pos/BA	10,803	3,439,699	11,680	3,429,445	12,162	3,534,296	11,924	3,119,748	(238)	(414,548)
	FTE/OBL	10,707	3,459,739	11,108	3,560,745	11,374	3,561,796	11,044	3,147,248	(330)	(414,548)
NOAA PAC (Discretionary)	Pos/BA	286	2,395,457	309	2,394,554	341	2,352,271	341	1,806,499	0	(545,772)
	FTE/OBL	283	2,302,842	294	2,534,095	340	2,365,271	340	1,819,499	0	(545,772)
NOAA Other (Discretionary and Mandatory)	Pos/BA	79	167,809	61	176,393	58	125,987	56	61,111	(2)	(64,876)
	FTE/OBL	79	316,238	61	345,373	58	199,012	56	134,136	(2)	(64,876)

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Department of Commerce
National Oceanic and Atmospheric Administration
JUSTIFICATION OF PROPOSED LANGUAGE CHANGES
(Dollar Amounts in Thousands)

JUSTIFICATION OF PROPOSED LANGUAGE CHANGES

1. NOAA Cost Recovery Language

SEC. 110. *To carry out the responsibilities of the National Oceanic and Atmospheric Administration (NOAA), the Administrator of NOAA is authorized to: (1) enter into grants and cooperative agreements with; (2) use on a non-reimbursable basis land, services, equipment, personnel, and facilities provided by; and (3) receive and expend funds made available on a consensual basis from: a Federal agency, State or subdivision thereof, local government, tribal government, territory, or possession or any subdivisions 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 under the heading "National Oceanic and Atmospheric Administration—Operations, Research, and Facilities" and shall remain available until expended for such purposes: Provided further, That all funds within this section and their corresponding uses are subject to section 505 of this Act.*

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. These activities include, but are not limited to, scientific data collection and research that informs NOAA's decisions and utilization of land and facilities to support NOAA's research and operational activities. 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, Oil Pollution Act, Tsunami Warning and Education Act, and Weather Service Organic 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 also authorizes agreements and funding arrangements for the placement of scientific equipment on bridges and piers, educational kiosks in public places, use of piers, vessels, storage, freezer space, and warehouses for mission needs, and use of universities' and public organizations' laboratory and other space to increase collaboration.

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

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

5 USC 5348	15 USC 1514	16 USC 4701 et seq.	33 USC 3001 et seq.	
5 USC 4703	15 USC 1517	16 USC 5001 et seq.	33 USC 3044 et seq.	
7 USC 1622	15 USC 1537-40	31 USC 1105	33 USC 3045	
10 USC 1072	16 USC 661 et seq.	33 USC 706 et seq.	33 USC 3046	
10 USC 1111-1115	16 USC 757a et seq.	33 USC 883 a-i et seq.	33 USC 4001	
10 USC 2311	16 USC 1361	33 USC 891 et seq.	33 USC 3402	
12 USC 1715m	16 USC 1431 et seq.	33 USC 893 a-b,	33 USC 3501	
15 USC 313	16 USC 1447a et seq.	as amended	33 USC 3603	
15 USC 313a	16 USC 1451 et seq.	33 USC 1121-1131	33 USC 3703	
15 USC 313b	16 USC 1456a	33 USC 1251	42 USC 8902-05	
15 USC 313nt	16 USC 1456-1	33 USC 1321	42 USC 9601 et seq.	
15 USC 325	16 USC 1531 et seq.	33 USC 1441-44	43 USC 1347e	
15 USC 330b	16 USC 1801 et seq.	33 USC 2706	44 USC 1307	
15 USC 330e	16 USC 3645	33 USC 2712	49 USC 44720	
15 USC 1511 b-e	16 USC 4101 et seq.	33 USC 2801 et seq.		

Government Organization 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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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."

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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

“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.”

- (a) “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.”

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.”

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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.”

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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 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 1538 – Notice of reprogramming

(a) In general

The Secretary of Commerce shall provide notice to the Committee on Commerce, Science, and Transportation and Committee on Appropriations of the Senate and to the Committee on Merchant Marine and Fisheries, Committee on Science, Space, and Technology, and Committee on Appropriations of the House of Representatives, not less than 15 days before reprogramming funds available for a program, project, or activity of the National Oceanic and Atmospheric Administration in an amount greater than the lesser of \$250,000 or 5 percent of the total funding of such program, project, or activity if the reprogramming-

- (1) augments an existing program, project, or activity;
- (2) reduces by 5 percent or more (A) the funding for an existing program, project, or activity or (B) the numbers of personnel therefor as approved by Congress; or
- (3) results from any general savings from a reduction in personnel which would result in a change in an existing program, project, or activity.

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(b) Notice of reorganization

The Secretary of Commerce shall provide notice to the Committees on Merchant Marine and Fisheries, Science, Space, and Technology, and Appropriations of the House of Representatives, and the Committees on Commerce, Science, and Transportation and Appropriations of the Senate not later than 15 days before any major reorganization of any program, project, or activity of the National Oceanic and Atmospheric Administration.

15 USC 1539 – Financial Assistance

(a) Processing of applications

Within 12 months after October 29, 1992, the Secretary of Commerce shall develop and, after notice and opportunity for public comment, promulgate regulations or guidelines to ensure that a completed application for a grant, contract, or other financial assistance under a nondiscretionary assistance program shall be processed and approved or disapproved within 75 days after submission of the application to the responsible program office of the National Oceanic and Atmospheric Administration.

(b) Notification of applicant

Not later than 14 days after the date on which the Secretary of Commerce receives an application for a contract, grant, or other financial assistance provided under a nondiscretionary assistance program administered by the National Oceanic and Atmospheric Administration, the Secretary shall indicate in writing to the applicant whether or not the application is complete and, if not complete, shall specify the additional material that the applicant must provide to complete the application.

(c) Exemption

In the case of a program for which the recipient of a grant, contract, or other financial assistance is specified by statute to be, or has customarily been, a State or an interstate fishery commission, such financial assistance may be provided by the Secretary to that recipient on a sole-source basis, notwithstanding any other provision of law.

(d) “Nondiscretionary assistance program” defined

In this section, the term “nondiscretionary assistance program” means any program for providing financial assistance—

- (1)** under which the amount of funding for, and the intended recipient of, the financial assistance is specified by Congress; or
- (2)** the recipients of which have customarily been a State or an interstate fishery commission.

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.”

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Conservation

16 USC 46a - Marine Fisheries Program Authorization Act

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.

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."

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

(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.

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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 1456-1 – Coastal and Estuarine Land Conservation Program

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.

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,”.

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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” (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.”

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.”

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...”

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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 expend 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...”

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 893 et 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.”

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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.

33 USC 1251- Water Pollution Prevention and Control

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.

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.

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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 2712 – Use of Oil Spill Liability Trust Fund

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.”

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.”

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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

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

(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 ½ 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."

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33 USC 3046 - Retired Grade and Retired Pay

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.

33 USC 4001 - Harmful Algal Bloom and Hypoxia Research and Control Amendments Act of 2014

The President, through the Committee on Environment and Natural Resources of the National Science and Technology Council, shall establish an Inter-Agency Task Force on Harmful Algal Blooms and Hypoxia. The Task Force shall consist of a representative from—the Department of Commerce (who shall serve as Chairman of the Task Force) among others.

33 USC 3402 – Coordinated National Ocean Exploration Program

The Administrator of the National Oceanic and Atmospheric Administration shall, in consultation with the National Science Foundation and other appropriate Federal agencies, establish a coordinated national ocean exploration program within the National Oceanic and Atmospheric Administration that promotes collaboration with other Federal ocean and undersea research and exploration programs. To the extent appropriate, the Administrator shall seek to facilitate coordination of data and information management systems, outreach and education programs to improve public understanding of ocean and coastal resources, and development and transfer of technologies to facilitate ocean and undersea research and exploration.

33 USC 3501 – Ocean and Coastal Mapping Integration

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.

33 USC 3603 – Integrated Coastal and Ocean Observing System

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.

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33 USC 3703 – Federal Ocean Acidification Research and Monitoring

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.

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...."

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."

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APPROPRIATION LANGUAGE AND CODE CITATIONS

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....

Research and Development (R&D) Investments

The NOAA FY 2018 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.

The NOAA Research Council - an internal body composed of senior scientific personnel from every Line Office in the agency - developed NOAA's most recent Five-Year Research and Development Plan (FY 2013-2017). This plan guides NOAA's R&D activities and provides a common understanding among NOAA's leadership, its workforce, its partners, constituents and Congress on the value of NOAA's R&D activities.

NOAA requests \$430 million for investments (excluding equipment and facilities) in R&D in the FY 2018 Budget. The distribution by line offices is provided in the table below.

Line Office	Research	Development	Total R&D (excluding Equipment and Facilities)	Equipment and Facilities	Total R&D with Equipment and Facilities
NOS	\$46,998	\$12,161	\$59,159	\$0	\$59,159
NMFS	\$50,616	\$4,846	\$55,462	\$0	\$55,462
OAR	\$237,646	\$35,854	\$273,500	\$76,504	\$350,004
NWS	\$1,145	\$11,320	\$12,465	\$780	\$13,245
NESDIS	\$29,426	\$0	\$29,426	\$0	\$29,426
OMAO	\$0	\$0	\$0	\$164,306	\$164,306
Total	\$365,831	\$64,181	\$430,012	\$241,590	\$671,602

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NOAA Headquarters Administrative Costs

In FY 2018, NOAA's Line/Staff Office Headquarters will use \$318,992,155 and 1,299.8 FTE to support general management activities, financial and budgeting, and IT-related expenses, as well as to support facilities and other general operating costs. These funds also include support for service contracts, utilities, and rent charges from the GSA. Specifically, NOAA's Line/Staff Office Headquarters will use administrative funds to support the following:

Headquarters Administrative Support Type	Description	NOS Amount	NOS FTE	NMFS Amount	NMFS FTE	OAR Amount	OAR FTE	NWS Amount	NWS FTE	NESDIS Amount	NESDIS FTE	MS Amount	MS FTE	OMAO Amount	OMAO FTE	Total Amount	Total FTE
General Management & Direction/Executive Management	Includes Assistant Administrator's office, public affairs, information services	\$11,527,000	36	\$13,609,803	35.2	\$6,715,737	24.3	\$13,817,097	59	\$9,257,924	34.6	\$29,084,000	147	\$1,639,368	8.4	\$85,650,929	344.4
Budget & Finance	Includes Budget, Finance and Accounting	\$3,736,000	17	\$7,403,666	24.8	\$3,011,333	18.7	\$6,478,846	25	\$4,790,495	25.6	\$40,673,000	217	\$3,191,387	15.7	\$69,284,727	343.7
Facilities/Other Administrative (CAO Functions)	Includes Facilities and Security costs, as well as other CAO related activities	\$2,077,000	2.5	\$1,227,824	5.6	\$2,800,059	9.19	\$7,412,158	18	\$1,996,690	9.5	\$36,278,000	170	\$1,041,047	0.0	\$52,832,778	214.8
Human Resources	All HR services, including Equal Employment Opportunity	\$914,000	4.5	\$2,730,733	11.3	\$1,348,926	8	\$5,839,259	31	\$2,996,753	10.7	\$19,849,000	82	\$291,768	2.0	\$33,970,438	149.5
Acquisitions and Grants	Contracts, grants and procurement implementation	\$324,000	2	\$526,057	2.4	\$1,055,000	0	\$0	0	\$530,234	3	\$14,935,000	70	\$0	0.0	\$17,370,291	77.4
Information Technology	Includes IT-related expenses and other CIO related activities	\$7,050,000	13	\$7,175,001	17.5	\$1,761,063	5.12	\$5,927,862	19	\$11,152,200	25.9	\$25,107,000	86	\$1,709,865	3.4	\$59,882,991	169.9
Total		\$25,628,000	75.0	\$32,673,084	96.8	\$16,692,118	65.2	\$39,475,222	152.0	\$30,724,296	109.3	\$165,926,000	772.0	\$7,873,435	29.4	\$318,992,155	1,299.8

*Amounts above to not include NOAA's Direct Bill

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NATIONAL OCEAN SERVICE
Direct Obligations
(\$ in Thousands)

FY 2018 Proposed Operating Plan	POS	FTE	FY 2017 Annualized CR	POS	FTE	Calculated ATBs	Technical ATBs	POS	FTE	FY 2018 Base	POS	FTE	FY 2018 Program Changes (without Narratives)	FY 2018 Program Changes (with Narratives)	Total FY 2018 Program Changes	POS	FTE	FY 2018 President's Budget
Navigation, Observations and Positioning																		
Navigation, Observations and Positioning	544	518	148,718	24	5	2,830	214	568	523	151,762	0	(13)	(2,830)	(7,985)	(10,815)	568	510	140,947
Hydrographic Survey Priorities/Contracts	9	9	26,949	0	0	0	0	9	9	26,949	0	0	0	0	0	9	9	26,949
IOOS Regional Observations	0	0	29,444	0	0	0	0	0	0	29,444	0	0	0	0	0	0	0	29,444
Total, Navigation, Observations and Positioning	553	527	205,111	24	5	2,830	214	577	532	208,155	0	(13)	(2,830)	(7,985)	(10,815)	577	519	197,340
Coastal Science and Assessment																		
Coastal Science, Assessment, Response and Restoration	277	264	72,463	31	8	1,641	422	308	272	74,526	0	(8)	(1,641)	0	(1,641)	308	264	72,885
Competitive Research	0	0	8,983	0	0	0	0	0	0	8,983	0	0	0	(8,983)	(8,983)	0	0	0
Total, Coastal Science and Assessment	277	264	81,446	31	8	1,641	422	308	272	83,509	0	(8)	(1,641)	(8,983)	(10,624)	308	264	72,885
Ocean and Coastal Management and Services																		
Coastal Zone Management and Services	128	122	39,924	15	4	779	0	143	126	40,703	0	(3)	(779)	0	(779)	143	123	39,924
Coastal Management Grants	0	0	74,858	0	0	0	0	0	0	74,858	0	0	0	(74,858)	(74,858)	0	0	0
Coral Reef Program	22	21	25,951	2	1	96	4	24	22	26,051	0	0	(96)	0	(96)	24	22	25,955
National Estuarine Research Reserve System	0	0	22,957	0	0	0	0	0	0	22,957	0	0	0	(22,957)	(22,957)	0	0	0
Sanctuaries and Marine Protected Areas	190	181	48,907	5	1	1,121	0	195	182	50,028	0	(5)	(1,121)	0	(1,121)	195	177	48,907
Total, Ocean and Coastal Management and Services	340	324	212,597	22	6	1,996	4	362	330	214,597	0	(8)	(1,996)	(97,815)	(99,811)	362	322	114,786
Total, NOS - Discretionary ORF	1,170	1,115	499,154	77	19	6,467	640	1,247	1,134	506,261	0	(29)	(6,467)	(114,783)	(121,250)	1,247	1,105	385,011
Total, NOS - Discretionary PAC	3	2	3,693	0	1	0	0	3	3	3,693	0	0	0	(1,697)	(1,697)	3	3	1,996
Total, NOS - Other Discretionary Accounts	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Discretionary Total - NOS	1,173	1,117	502,847	77	20	6,467	640	1,250	1,137	509,954	0	(29)	(6,467)	(116,480)	(122,947)	1,250	1,108	387,007
Total, NOS - Mandatory Accounts	16	16	63,797	0	0	0	(36,006)	16	16	27,791	0	0	0	0	0	16	16	27,791
GRAND TOTAL NOS	1,189	1,133	566,644	77	20	6,467	(35,366)	1,266	1,153	537,745	0	(29)	(6,467)	(116,480)	(122,947)	1,266	1,124	414,798

NATIONAL MARINE FISHERIES SERVICE
Direct Obligations
(\$ in Thousands)

FY 2018 Proposed Operating Plan	POS	FTE	FY 2017 Annualized CR	POS	FTE	Calculated ATBs	Technical ATBs	POS	FTE	FY 2018 Base	POS	FTE	FY 2018 Program Changes (without Narratives)	FY 2018 Program Changes (with Narratives)	Total FY 2018 Program Changes	POS	FTE	FY 2018 President's Budget
Protected Resources Science and Management																		
Marine Mammals, Sea Turtles, and Other Species	487	464	110,037	0	0	2,029	0	487	464	112,066	(6)	(8)	(2,029)	(3,044)	(5,073)	481	456	106,993
Species Recovery Grants	3	3	5,989	0	0	7	0	3	3	5,996	0	0	(7)	0	(7)	3	3	5,989
Atlantic Salmon	23	22	6,151	0	0	91	0	23	22	6,242	0	0	(91)	0	(91)	23	22	6,151
Pacific Salmon	338	322	59,887	0	0	1,487	0	338	322	61,374	(4)	(6)	(1,487)	0	(1,487)	334	316	59,887
Total, Protected Resources Science and Management	851	811	182,064	0	0	3,614	0	851	811	185,678	(10)	(14)	(3,614)	(3,044)	(6,658)	841	797	179,020
Fisheries Science and Management																		
Fisheries and Ecosystem Science Programs and Services	625	595	139,225	0	0	2,573	2,098	625	595	143,896	(9)	(11)	(2,573)	0	(2,573)	616	584	141,323
Fisheries Data Collections, Surveys, and Assessments	480	457	162,962	0	0	2,106	0	480	457	165,068	(6)	(8)	(2,106)	(8,001)	(10,107)	474	449	154,961
Observers and Training	158	150	43,572	0	0	568	0	158	150	44,140	(3)	(3)	(568)	0	(568)	155	147	43,572
Fisheries Management Programs and Services	466	444	115,776	0	0	1,943	379	466	444	118,098	(6)	(8)	(1,943)	(5,002)	(6,945)	460	436	111,153
Aquaculture	24	23	6,288	0	0	107	0	24	23	6,395	0	0	(107)	0	(107)	24	23	6,288
Salmon Management Activities	33	31	31,440	0	0	160	0	33	31	31,600	0	0	(160)	0	(160)	33	31	31,440
Regional Councils and Fisheries Commissions	13	12	33,407	0	0	1,008	0	13	12	34,415	0	0	(1,008)	0	(1,008)	13	12	33,407
Interjurisdictional Fisheries Grants	1	1	2,994	0	0	0	0	1	1	2,994	(1)	(1)	0	(2,994)	(2,994)	0	0	0
Total, Fisheries Science and Management	1,800	1,713	535,664	0	0	8,465	2,477	1,800	1,713	546,606	(25)	(31)	(8,465)	(15,997)	(24,462)	1,775	1,682	522,144
Enforcement																		
Enforcement	244	232	68,870	0	0	1,057	73	244	232	70,000	(4)	(4)	(1,057)	0	(1,057)	240	228	68,943
Total, Enforcement	244	232	68,870	0	0	1,057	73	244	232	70,000	(4)	(4)	(1,057)	0	(1,057)	240	228	68,943
Habitat Conservation and Restoration																		
Habitat Conservation and Restoration	162	154	61,292	0	0	726	42	162	154	62,060	(2)	(2)	(726)	(10,000)	(10,726)	160	152	51,334
Subtotal, Habitat Conservation & Restoration	162	154	61,292	0	0	726	42	162	154	62,060	(2)	(2)	(726)	(10,000)	(10,726)	160	152	51,334
Total, NMFS - Discretionary ORF	3,057	2,910	847,890	0	0	13,862	2,592	3,057	2,910	864,344	(41)	(51)	(13,862)	(29,041)	(42,903)	3,016	2,859	821,441
Total, NMFS - Discretionary PAC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total, NMFS - Other Discretionary Accounts	2	2	65,225	0	0	0	0	2	2	65,225	(2)	(2)	0	(64,876)	(64,876)	0	0	349
Discretionary Total - NMFS	3,059	2,912	913,115	0	0	13,862	2,592	3,059	2,912	929,569	(43)	(53)	(13,862)	(93,917)	(107,779)	3,016	2,859	821,790
Total, NMFS - Mandatory Accounts	43	43	73,316	(3)	(3)	0	(49,992)	40	40	23,324	0	0	0	0	0	40	40	23,324
GRAND TOTAL NMFS	3,102	2,955	986,431	(3)	(3)	13,862	(47,400)	3,099	2,952	952,893	(43)	(53)	(13,862)	(93,917)	(107,779)	3,056	2,899	845,114

OFFICE of OCEANIC AND ATMOSPHERIC RESEARCH
Direct Obligations
(\$ in Thousands)

FY 2018 Proposed Operating Plan	POS	FTE	FY 2017 Annualized CR	POS	FTE	Calculated ATBs	Technical ATBs	POS	FTE	FY 2018 Base	POS	FTE	FY 2018 Program Changes (without Narratives)	FY 2018 Program Changes (with Narratives)	Total FY 2018 Program Changes	POS	FTE	FY 2018 President's Budget
Climate Research																		
Laboratories & Cooperative Institutes																		
Laboratories & Cooperative Institutes	238	227	59,887	17	6	1,264	0	255	233	61,151	0	(4)	(1,264)	(2,230)	(3,494)	255	229	57,657
Subtotal, Laboratories & Cooperative Institutes	238	227	59,887	17	6	1,264	0	255	233	61,151	0	(4)	(1,264)	(2,230)	(3,494)	255	229	57,657
Regional Climate Data & Information																		
Regional Climate Data & Information	14	13	37,928	0	0	72	0	14	13	38,000	0	0	(72)	(6,000)	(6,072)	14	13	31,928
Subtotal, Regional Climate Data & Information	14	13	37,928	0	0	72	0	14	13	38,000	0	0	(72)	(6,000)	(6,072)	14	13	31,928
Climate Competitive Research																		
Climate Competitive Research	15	14	59,887	0	0	78	0	15	14	59,965	(5)	(5)	(78)	(21,472)	(21,550)	10	9	38,415
Subtotal, Climate Competitive Research	15	14	59,887	0	0	78	0	15	14	59,965	(5)	(5)	(78)	(21,472)	(21,550)	10	9	38,415
Total, Climate Research	267	254	157,702	17	6	1,414	0	284	260	159,116	(5)	(9)	(1,414)	(29,702)	(31,116)	279	251	128,000
Weather & Air Chemistry Research																		
Laboratories & Cooperative Institutes																		
Laboratories & Cooperative Institutes	252	227	75,856	18	8	1,263	4,017	270	235	81,136	(37)	(43)	(1,282)	(15,074)	(16,356)	233	192	64,780
Subtotal, Laboratories & Cooperative Institutes	252	227	75,856	18	8	1,263	4,017	270	235	81,136	(37)	(43)	(1,282)	(15,074)	(16,356)	233	192	64,780
Weather & Air Chemistry Research Programs																		
U.S. Weather Research Program (USWRP)	9	9	7,985	0	0	50	0	9	9	8,035	0	0	(50)	(500)	(550)	9	9	7,485
Tornado Severe Storm Research / Phased Array Radar	2	2	13,133	0	0	11	0	2	2	13,144	0	0	(522)	0	(522)	2	2	12,622
Joint Technology Transfer Initiative	0	0	5,989	0	0	0	0	0	0	5,989	0	0	0	(5,989)	(5,989)	0	0	0
Subtotal, Weather & Air Chemistry Research Programs	11	11	27,107	0	0	61	0	11	11	27,168	0	0	(572)	(6,489)	(7,061)	11	11	20,107
Total, Weather & Air Chemistry Research	263	238	102,963	18	8	1,324	4,017	281	246	108,304	(37)	(43)	(1,854)	(21,563)	(23,417)	244	203	84,887
Ocean, Coastal, and Great Lakes Research																		
Laboratories & Cooperative Institutes																		
Laboratories & Cooperative Institutes	124	118	31,939	15	6	656	0	139	124	32,595	0	(4)	(656)	(3,880)	(4,536)	139	120	28,059
Subtotal, Laboratories & Cooperative Institutes	124	118	31,939	15	6	656	0	139	124	32,595	0	(4)	(656)	(3,880)	(4,536)	139	120	28,059

OFFICE of OCEANIC AND ATMOSPHERIC RESEARCH
Direct Obligations
(\$ in Thousands)

FY 2018 Proposed Operating Plan	POS	FTE	FY 2017 Annualized CR	POS	FTE	Calculated ATBs	Technical ATBs	POS	FTE	FY 2018 Base	POS	FTE	FY 2018 Program Changes (without Narratives)	FY 2018 Program Changes (with Narratives)	Total FY 2018 Program Changes	POS	FTE	FY 2018 President's Budget
National Sea Grant College Program																		
National Sea Grant College Program Base	14	13	63,879	0	0	72	0	14	13	63,951	(14)	(13)	0	(63,951)	(63,951)	0	0	0
Marine Aquaculture Program	1	1	8,983	0	0	6	0	1	1	8,989	(1)	(1)	0	(8,989)	(8,989)	0	0	0
Subtotal, National Sea Grant College Program	15	14	72,862	0	0	78	0	15	14	72,940	(15)	(14)	0	(72,940)	(72,940)	0	0	0
Ocean Exploration and Research																		
Ocean Exploration and Research	23	22	31,939	0	0	122	0	23	22	32,061	0	0	(122)	(12,500)	(12,622)	23	22	19,439
Subtotal, Ocean Exploration and Research	23	22	31,939	0	0	122	0	23	22	32,061	0	0	(122)	(12,500)	(12,622)	23	22	19,439
Other Ecosystems Programs																		
Integrated Ocean Acidification	17	16	9,981	0	0	89	0	17	16	10,070	0	0	(89)	0	(89)	17	16	9,981
Subtotal, Other Ecosystems Programs	17	16	9,981	0	0	89	0	17	16	10,070	0	0	(89)	0	(89)	17	16	9,981
Sustained Ocean Observations and Monitoring																		
Sustained Ocean Observations and Monitoring	39	37	41,517	0	0	206	0	39	37	41,723	0	0	(206)	0	(206)	39	37	41,517
Subtotal, Sustained Ocean Observations and Monitoring	39	37	41,517	0	0	206	0	39	37	41,723	0	0	(206)	0	(206)	39	37	41,517
Total, Ocean, Coastal, & Great Lakes Research	218	207	188,238	15	6	1,151	0	233	213	189,389	(15)	(18)	(1,073)	(89,320)	(90,393)	218	195	98,996
Innovative Research & Technology																		
High Performance Computing Initiatives	12	11	12,121	0	0	61	0	12	11	12,182	0	0	(61)	0	(61)	12	11	12,121
Total, Innovative Research & Technology	12	11	12,121	0	0	61	0	12	11	12,182	0	0	(61)	0	(61)	12	11	12,121
Total, OAR - Discretionary ORF	760	710	461,024	50	20	3,950	4,017	810	730	468,991	(57)	(70)	(4,402)	(140,585)	(144,987)	753	660	324,004
Total, OAR - Discretionary PAC	0	0	20,041	0	0	0	0	0	0	20,041	0	0	0	5,959	5,959	0	0	26,000
Discretionary Total - OAR	760	710	481,065	50	20	3,950	4,017	810	730	489,032	(57)	(70)	(4,402)	(134,626)	(139,028)	753	660	350,004

NATIONAL WEATHER SERVICE
Direct Obligations
(\$ in Thousands)

FY 2018 Proposed Operating Plan			FY 2017		Calculated		Technical		FY 2018				FY 2018	FY 2018	Total FY 2018			FY 2018
	POS	FTE	Annualized CR	POS	FTE	ATBs	ATBs	POS	FTE	Base	POS	FTE	Program Changes (without Narratives)	Program Changes (with Narratives)	Program Changes	POS	FTE	President's Budget
Observations	712	678	215,954	222	212	5,581	15,050	934	890	236,585	0	0	(2,936)	(25,989)	(28,925)	934	890	207,660
Central Processing	234	223	92,695	3	6	2,350		237	229	95,045	(74)	(74)	(1,931)	(6,970)	(8,901)	163	155	86,144
Analyze, Forecast and Support	2,981	2,839	495,094	(62)	(58)	8,286	(11,687)	2,919	2,781	491,693	(33)	(33)	(1,588)	(14,006)	(15,594)	2,886	2,748	476,099
Dissemination	79	75	44,658	6	6	1,264	43	85	81	45,965	0	0	(876)	4,896	4,020	85	81	49,985
Science and Technology Integration	422	402	138,563	23	22	1,889	(2,750)	445	424	137,702	0	0	(804)	(20,730)	(21,534)	445	424	116,168
Total, NWS - Discretionary ORF	4,428	4,217	986,964	192	188	19,370	656	4,620	4,405	1,006,990	(107)	(107)	(8,135)	(62,799)	(70,934)	4,513	4,298	936,056
Total, NWS - Discretionary PAC	25	24	135,059	0	0	0	0	25	24	135,059	0	0	0	(13,059)	(13,059)	25	24	122,000
Discretionary Total - NWS	4,453	4,241	1,122,023	192	188	19,370	656	4,645	4,429	1,142,049	(107)	(107)	(8,135)	(75,858)	(83,993)	4,538	4,322	1,058,056

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

FY 2018 Proposed Operating Plan	POS	FTE	FY 2017 Annualized CR	POS	FTE	Calculated ATBs	Technical ATBs	POS	FTE	FY 2018 Base	POS	FTE	FY 2018 Program Changes (without Narratives)	FY 2018 Program Changes (with Narratives)	Total FY 2018 Program Changes	POS	FTE	FY 2018 President's Budget
Environmental Satellite Observing Systems																		
Office of Satellite and Product Operations (OSPO)																		
Satellite and Product Operations	236	224	92,824	8	4	1,624	28,567	244	228	123,015	0	(10)	(1,624)	10,089	8,465	244	218	131,480
NSOF Operations	0	0	8,983	0	0		4,800	0	0	13,783	0	0	467	0	467	0	0	14,250
Subtotal, Office of Satellite and Product Operations (OSPO)	236	224	101,807	8	4	1,624	33,367	244	228	136,798	0	(10)	(1,157)	10,089	8,932	244	218	145,730
Product Development, Readiness & Application																		
Product Development, Readiness & Application	80	76	25,951	8	2	574	7,104	88	78	33,629	0	(3)	(574)	(3,629)	(4,203)	88	75	29,426
Subtotal, Product Development, Readiness & Application	80	76	25,951	8	2	574	7,104	88	78	33,629	0	(3)	(574)	(3,629)	(4,203)	88	75	29,426
Commercial Remote Sensing Regulatory Affairs	5	5	998	1	0	0	0	6	5	998	1	1	0	202	202	7	6	1,200
Office of Space Commerce	3	3	599	2	0	0	0	5	3	599	0	0	0	601	601	5	3	1,200
Group on Earth Observations (GEO)	0	0	499	0	0	0	0	0	0	499	0	0	1	0	1	0	0	500
Total, Environmental Satellite Observing Systems	324	308	129,854	19	6	2,198	40,471	343	314	172,523	1	(12)	(1,730)	7,263	5,533	344	302	178,056
National Centers for Environmental Information																		
National Centers for Environmental Information	198	189	58,874	42	4	1,598	2,331	240	193	62,803	0	(9)	(1,598)	(4,686)	(6,284)	240	184	56,519
Total, National Centers for Environmental Information	198	189	58,874	42	4	1,598	2,331	240	193	62,803	0	(9)	(1,598)	(4,686)	(6,284)	240	184	56,519
Total, NESDIS - Discretionary ORF	522	497	188,728	61	10	3,796	42,802	583	507	235,326	1	(21)	(3,328)	2,577	(751)	584	486	234,575
Total, NESDIS - Discretionary PAC	275	262	2,156,186	30	43	0	(42,283)	305	305	2,113,903	0	0	7	(533,283)	(533,276)	305	305	1,580,627
Discretionary Total - NESDIS	797	759	2,344,914	91	53	3,796	519	888	812	2,349,229	1	(21)	(3,321)	(530,706)	(534,027)	889	791	1,815,202

MISSION SUPPORT
Direct Obligations
(\$ in Thousands)

FY 2018 Proposed Operating Plan	POS	FTE	FY 2017 Annualized CR	POS	FTE	Calculated ATBs	Technical ATBs	POS	FTE	FY 2018 Base	POS	FTE	FY 2018 Program Changes (without Narratives)	FY 2018 Program Changes (with Narratives)	Total FY 2018 Program Changes	POS	FTE	FY 2018 President's Budget
Executive Leadership	125	119	26,949	20	2	1,060	78	145	121	28,087	0	(3)	(1,060)	0	(1,060)	145	118	27,027
Mission Services and Management	601	572	147,720	55	0	4,044	(10,316)	656	572	141,448	0	(16)	(3,843)	0	(3,843)	656	556	137,605
IT Security	3	2	8,284	11	11	60	1,700	14	13	10,044	0	0	(60)	0	(60)	14	13	9,984
Payment to the DOC Working Capital Fund	0	0	42,919	0	0	(4,182)	19,962	0	0	58,699	0	0	0	0	0	0	0	58,699
Office of Education	18	17	26,581	0	0	80	0	18	17	26,661	(18)	(17)	0	(26,661)	(26,661)	0	0	0
Total, MS - Discretionary ORF	747	710	252,453	86	13	1,062	11,424	833	723	264,939	(18)	(36)	(4,963)	(26,661)	(31,624)	815	687	233,315
Total, MS - Discretionary PAC	0	0	998	0	0	0	0	0	0	998	0	0	0	0	0	0	0	998
Discretionary Total - MS	747	710	253,451	86	13	1,062	11,424	833	723	265,937	(18)	(36)	(4,963)	(26,661)	(31,624)	815	687	234,313

OFFICE OF MARINE AND AVIATION OPERATIONS
Direct Obligations
(\$ in Thousands)

FY 2018 Proposed Operating Plan	POS	FTE	FY 2017 Annualized CR	POS	FTE	Calculated ATBs	Technical ATBs	POS	FTE	FY 2018 Base	POS	FTE	FY 2018 Program Changes (without Narratives)	FY 2018 Program Changes (with Narratives)	Total FY 2018 Program Changes	POS	FTE	FY 2018 President's Budget
Marine Operations and Maintenance	869	828	178,500	16	16	4,048	114	885	844	182,662	(16)	(16)	(4,048)	0	(4,048)	869	828	178,614
Aviation Operations and Aircraft Services	127	121	32,232	0	0	51	0	127	121	32,283	0	0	(51)	2,000	1,949	127	121	34,232
Total, OMAO - Discretionary ORF	996	949	210,732	16	16	4,099	114	1,012	965	214,945	(16)	(16)	(4,099)	2,000	(2,099)	996	949	212,846
Total, OMAO - Discretionary PAC	6	6	91,577	2	2	0	0	8	8	91,577	0	0	0	(3,699)	(3,699)	8	8	87,878
Total, OMAO - Other Discretionary Accounts	0	0	1,936	0	0	0	(333)	0	0	1,603	0	0	0	0	0	0	0	1,603
Discretionary Total - OMAO	1,002	955	304,245	18	18	4,099	(219)	1,020	973	308,125	(16)	(16)	(4,099)	(1,699)	(5,798)	1,004	957	302,327
Total, OMAO - Mandatory Accounts	0	0	29,375	0	0	0	0	0	0	29,375	0	0	0	0	0	0	0	29,375
GRAND TOTAL OMAO	1,002	955	333,620	18	18	4,099	(219)	1,020	973	337,500	(16)	(16)	(4,099)	(1,699)	(5,798)	1,004	957	331,702

ORF SUMMARY
LINE OFFICE DIRECT DISCRETIONARY OBLIGATIONS
(\$ in Thousands)

FY 2018 Proposed Operating Plan	POS	FTE	FY 2017 Annualized CR	POS	FTE	Calculated ATBs	Technical ATBs	POS	FTE	FY 2018 Base	POS	FTE	FY 2018 Program Changes (without Narratives)	FY 2018 Program Changes (with Narratives)	Total FY 2018 Program Changes	POS	FTE	FY 2018 President's Budget
National Ocean Service	1,170	1,115	499,154	77	19	6,467	640	1,247	1,134	506,261	0	(29)	(6,467)	(114,783)	(121,250)	1,247	1,105	385,011
National Marine Fisheries Service	3,057	2,910	847,890	0	0	13,862	2,592	3,057	2,910	864,344	(41)	(51)	(13,862)	(29,041)	(42,903)	3,016	2,859	821,441
Office of Oceanic and Atmospheric Research	760	710	461,024	50	20	3,950	4,017	810	730	468,991	(57)	(70)	(4,402)	(140,585)	(144,987)	753	660	324,004
National Weather Service	4,428	4,217	986,964	192	188	19,370	656	4,620	4,405	1,006,990	(107)	(107)	(8,135)	(62,799)	(70,934)	4,513	4,298	936,056
National Environmental Satellite, Data and Information Service	522	497	188,728	61	10	3,796	42,802	583	507	235,326	1	(21)	(3,328)	2,577	(751)	584	486	234,575
Mission Support	747	710	252,453	86	13	1,062	11,424	833	723	264,939	(18)	(36)	(4,963)	(26,661)	(31,624)	815	687	233,315
Office of Marine and Aviation Operations	996	949	210,732	16	16	4,099	114	1,012	965	214,945	(16)	(16)	(4,099)	2,000	(2,099)	996	949	212,846
SUBTOTAL LO DIRECT DISCRETIONARY ORF OBLIGATIONS	11,680	11,108	3,446,945	482	266	52,606	62,245	12,162	11,374	3,561,796	(238)	(330)	(45,256)	(369,292)	(414,548)	11,924	11,044	3,147,248

ORF ADJUSTMENTS
(\$ in Thousands)

FY 2018 Proposed Operating Plan	POS	FTE	FY 2017 Annualized CR	POS	FTE	Calculated ATBs	Technical ATBs	POS	FTE	FY 2018 Base	POS	FTE	FY 2018 Program Changes (without Narratives)	FY 2018 Program Changes (with Narratives)	Total FY 2018 Program Changes	POS	FTE	FY 2018 President's Budget
SUBTOTAL ORF DIRECT OBLIGATIONS	11,680	11,108	3,446,945	482	266	52,606	62,245	12,162	11,374	3,561,796	(238)	(330)	(45,256)	(369,292)	(414,548)	11,924	11,044	3,147,248
FINANCING																		
Deobligations	0	0	(17,500)	0	0	0	(10,000)	0	0	(27,500)	0	0	0	0	0	0	0	(27,500)
Total ORF Financing	0	0	(17,500)	0	0	0	(10,000)	0	0	(27,500)	0	0	0	0	0	0	0	(27,500)
SUBTOTAL ORF BUDGET AUTHORITY	11,680	11,108	3,429,445	482	266	52,606	52,245	12,162	11,374	3,534,296	(238)	(330)	(45,256)	(369,292)	(414,548)	11,924	11,044	3,119,748
TRANSFERS																		
Transfer from P&D to ORF	0	0	(130,164)	0	0	0	(24,035)	0	0	(154,199)	0	0	0	0	0	0	0	(154,199)
Total ORF Transfers	0	0	(130,164)	0	0	0	(24,035)	0	0	(154,199)	0	0	0	0	0	0	0	(154,199)
SUBTOTAL ORF APPROPRIATION	11,680	11,108	3,299,281	482	266	52,606	28,210	12,162	11,374	3,380,097	(238)	(330)	(45,256)	(369,292)	(414,548)	11,924	11,044	2,965,549

PROCUREMENT, ACQUISITION, AND CONSTRUCTION
Direct Discretionary Obligations
(\$ in Thousands)

FY 2018 Proposed Operating Plan													FY 2018 Program Changes (without Narratives)	FY 2018 Program Changes (with Narratives)	Total FY 2018 Program Changes			FY 2018 President's Budget
	POS	FTE	FY 2017 Annualized CR	POS	FTE	Calculated ATBs	Technical ATBs	POS	FTE	FY 2018 Base	POS	FTE				POS	FTE	
NOS																		
Construction																		
National Estuarine Research Reserve Construction (NERRS)	0	0	1,697	0	0	0	0	0	0	1,697	0	0	0	(1,697)	(1,697)	0	0	0
Marine Sanctuaries Construction Base	3	2	1,996	0	1	0	0	3	3	1,996	0	0	0	0	0	3	3	1,996
Subtotal, NOS Construction	3	2	3,693	0	1	0	0	3	3	3,693	0	0	0	(1,697)	(1,697)	3	3	1,996
Total, NOS - PAC	3	2	3,693	0	1	0	0	3	3	3,693	0	0	0	(1,697)	(1,697)	3	3	1,996
Total, NMFS - PAC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OAR																		
Systems Acquisition																		
Research Supercomputing/ CCRI	0	0	20,041	0	0	0	0	0	0	20,041	0	0	0	5,959	5,959	0	0	26,000
Subtotal, OAR Systems Acquisition	0	0	20,041	0	0	0	0	0	0	20,041	0	0	0	5,959	5,959	0	0	26,000
Total, OAR - PAC	0	0	20,041	0	0	0	0	0	0	20,041	0	0	0	5,959	5,959	0	0	26,000
NWS																		
Systems Acquisition																		
Observations	0	0	16,688	0	0	0	0	0	0	16,688	0	0	0	3,986	3,986	0	0	20,674
Central Processing	25	24	64,139	0	0	0	0	25	24	64,139	0	0	0	(6,000)	(6,000)	25	24	58,139
Dissemination	0	0	45,598	0	0	0	0	0	0	45,598	0	0	0	(11,045)	(11,045)	0	0	34,553
Subtotal, NWS Systems Acquisition	25	24	126,425	0	0	0	0	25	24	126,425	0	0	0	(13,059)	(13,059)	25	24	113,366
Construction																		
Facilities Construction and Major Repairs	0	0	8,634	0	0	0	0	0	0	8,634	0	0	0	0	0	0	0	8,634
Subtotal, NWS Construction	0	0	8,634	0	0	0	0	0	0	8,634	0	0	0	0	0	0	0	8,634
Total, NWS - PAC	25	24	135,059	0	0	0	0	25	24	135,059	0	0	0	(13,059)	(13,059)	25	24	122,000

PROCUREMENT, ACQUISITION, AND CONSTRUCTION
Direct Discretionary Obligations
(\$ in Thousands)

FY 2018 Proposed Operating Plan	POS	FTE	FY 2017 Annualized CR	POS	FTE	Calculated ATBs	Technical ATBs	POS	FTE	FY 2018 Base	POS	FTE	FY 2018 Program Changes (without Narratives)	FY 2018 Program Changes (with Narratives)	Total FY 2018 Program Changes	POS	FTE	FY 2018 President's Budget
NESDIS																		
Systems Acquisition																		
Geostationary Systems - R	63	60	870,143	0	3	0	(33,900)	63	63	836,243	0	0	0	(317,711)	(317,711)	63	63	518,532
Jason-3	1	1	7,444	(1)	(1)	0	(7,444)	0	0	0	0	0	0	0	0	0	0	0
Joint Polar Satellite System (JPSS)	63	60	807,439	15	18	0	0	78	78	807,439	0	0	0	(31,662)	(31,662)	78	78	775,777
Polar Follow On	25	24	369,300	1	2	0	0	26	26	369,300	0	0	0	(189,344)	(189,344)	26	26	179,956
Cooperative Data and Rescue Services (CDARS)	0	0	499	0	0	0	0	0	0	499	0	0	1	0	1	0	0	500
DSCOVN	2	2	3,194	(2)	(2)	0	(3,194)	0	0	0	0	0	0	0	0	0	0	0
Space Weather Follow On	0	0	1,198	1	1	0	0	1	1	1,198	0	0	0	(698)	(698)	1	1	500
COSMIC 2/GNSS RO	1	1	10,081	0	0	0	0	1	1	10,081	0	0	0	(3,981)	(3,981)	1	1	6,100
Satellite Ground Services	78	74	53,898	6	10	0	2,255	84	84	56,153	0	0	0	(3,153)	(3,153)	84	84	53,000
System Architecture and Advanced Planning	8	8	3,922	6	6	0	0	14	14	3,922	0	0	0	1,007	1,007	14	14	4,929
Projects, Planning and Analysis	34	32	25,152	2	4	0	0	36	36	25,152	0	0	0	12,033	12,033	36	36	37,185
Commercial Weather Data Pilot	0	0	2,994	2	2	0	0	2	2	2,994	0	0	6	0	6	2	2	3,000
Subtotal, NESDIS Systems Acquisition	275	262	2,155,264	30	43	0	(42,283)	305	305	2,112,981	0	0	7	(533,509)	(533,502)	305	305	1,579,479
Construction																		
Satellite CDA Facility	0	0	2,224	0	0	0	0	0	0	2,224	0	0	0	226	226	0	0	2,450
Subtotal, NESDIS Construction	0	0	2,224	0	0	0	0	0	0	2,224	0	0	0	226	226	0	0	2,450
Transfer to OIG	0	0	(1,302)	0	0	0	0	0	0	(1,302)	0	0	0	0	0	0	0	(1,302)
Total, NESDIS - PAC	275	262	2,156,186	30	43	0	(42,283)	305	305	2,113,903	0	0	7	(533,283)	(533,276)	305	305	1,580,627
Mission Support																		
Construction																		
NOAA Construction	0	0	998	0	0	0	0	0	0	998	0	0	0	0	0	0	0	998
Subtotal, Mission Support Construction	0	0	998	0	0	0	0	0	0	998	0	0	0	0	0	0	0	998
Total, Mission Support - PAC	0	0	998	0	0	0	0	0	0	998	0	0	0	0	0	0	0	998
OMAO																		
Fleet Replacement																		
Fleet Capital Improvements & Tech Infusion	1	1	11,678	0	0	0	0	1	1	11,678	0	0	0	1,200	1,200	1	1	12,878
New Vessel Construction	5	5	79,899	2	2	0	0	7	7	79,899	0	0	0	(4,899)	(4,899)	7	7	75,000
Subtotal, Fleet Replacement	6	6	91,577	2	2	0	0	8	8	91,577	0	0	0	(3,699)	(3,699)	8	8	87,878
Total, OMAO - PAC	6	6	91,577	2	2	0	0	8	8	91,577	0	0	0	(3,699)	(3,699)	8	8	87,878
GRAND TOTAL PAC DISCRETIONARY OBLIGATIONS	309	294	2,407,554	32	46	0	(42,283)	341	340	2,365,271	0	0	7	(545,779)	(545,772)	341	340	1,819,499

PAC ADJUSTMENTS
(\$ in Thousands)

FY 2018 Proposed Operating Plan	POS	FTE	FY 2017 Annualized CR	POS	FTE	Calculated ATBs	Technical ATBs	POS	FTE	FY 2018 Base	POS	FTE	FY 2018 Program Changes (without Narratives)	FY 2018 Program Changes (with Narratives)	Total FY 2018 Program Changes	POS	FTE	FY 2018 President's Budget
SUBTOTAL PAC DIRECT OBLIGATIONS	309	294	2,407,554	32	46	0	(42,283)	341	340	2,365,271	0	0	7	(545,779)	(545,772)	341	340	1,819,499
FINANCING																		
Deobligations	0	0	(13,000)	0	0	0	0	0	0	(13,000)	0	0	0	0	0	0	0	(13,000)
Total PAC Financing	0	0	(13,000)	0	0	0	0	0	0	(13,000)	0	0	0	0	0	0	0	(13,000)
SUBTOTAL PAC BUDGET AUTHORITY	309	294	2,394,554	32	46	0	(42,283)	341	340	2,352,271	0	0	7	(545,779)	(545,772)	341	340	1,806,499
TRANSFERS																		
Transfer to OIG	0	0	1,302	0	0	0	0	0	0	1,302	0	0	0	0	0	0	0	1,302
Total PAC Transfers	0	0	1,302	0	0	0	0	0	0	1,302	0	0	0	0	0	0	0	1,302
SUBTOTAL PAC APPROPRIATION	309	294	2,395,856	32	46	0	(42,283)	341	340	2,353,573	0	0	7	(545,779)	(545,772)	341	340	1,807,801

OTHER ACCOUNTS DISCRETIONARY
(\$ in Thousands)

FY 2018 Proposed Operating Plan	POS	FTE	FY 2017 Annualized CR	POS	FTE	Calculated ATBs	Technical ATBs	POS	FTE	FY 2018 Base	POS	FTE	FY 2018 Program Changes (without Narratives)	FY 2018 Program Changes (with Narratives)	Total FY 2018 Program Changes	POS	FTE	FY 2018 President's Budget
NMFS																		
Fishermen's Contingency Fund Obligations	0	0	349	0	0	0	0	0	0	349	0	0	0	0	0	0	0	349
Fishermen's Contingency Fund Budget Authority	0	0	349	0	0	0	0	0	0	349	0	0	0	0	0	0	0	349
Fishermen's Contingency Fund Appropriations	0	0	349	0	0	0	0	0	0	349	0	0	0	0	0	0	0	349
Foreign Fishing Observer Fund Obligations	0	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	0
Foreign Fishing Observer Fund Appropriation	0	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	0
Fisheries Finance Program Account Budget Authority	0	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	0
Promote and Develop Fisheries Obligations	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Promote and Develop Fisheries Budget Authority	0	0	(130,164)	0	0	0	(24,035)	0	0	(154,199)	0	0	0	0	0	0	0	(154,199)
Promote and Develop Fisheries Appropriation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pacific Coastal Salmon Recovery Fund Obligations	2	2	64,876	0	0	0	0	2	2	64,876	(2)	(2)	0	(64,876)	(64,876)	0	0	0
Pacific Coastal Salmon Recovery Fund Budget Authority	2	2	64,876	0	0	0	0	2	2	64,876	(2)	(2)	0	(64,876)	(64,876)	0	0	0
Pacific Coastal Salmon Recovery Fund Appropriation	2	2	64,876	0	0	0	0	2	2	64,876	(2)	(2)	0	(64,876)	(64,876)	0	0	0
Marine Mammal Unusual Mortality Event Fund Obligations	0	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	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	0
Subtotal, NMFS Other Discretionary Direct Obligations	2	2	65,225	0	0	0	0	2	2	65,225	(2)	(2)	0	(64,876)	(64,876)	0	0	349
Subtotal, NMFS Other Discretionary Budget Authority	2	2	(64,939)	0	0	0	(24,035)	2	2	(88,974)	(2)	(2)	0	(64,876)	(64,876)	0	0	(153,850)
Subtotal, NMFS Other Discretionary Appropriation	2	2	65,225	0	0	0	0	2	2	65,225	(2)	(2)	0	(64,876)	(64,876)	0	0	349
OMAO																		
Medicare Eligible Retiree Healthcare Fund Obligations	0	0	1,936	0	0	0	(333)	0	0	1,603	0	0	0	0	0	0	0	1,603
Medicare Eligible Retiree Healthcare Fund Budget Authority	0	0	1,936	0	0	0	(333)	0	0	1,603	0	0	0	0	0	0	0	1,603
Medicare Eligible Retiree Healthcare Fund Appropriation	0	0	1,936	0	0	0	(333)	0	0	1,603	0	0	0	0	0	0	0	1,603
Subtotal, OMAO Other Discretionary Direct Obligations	0	0	1,936	0	0	0	(333)	0	0	1,603	0	0	0	0	0	0	0	1,603
Subtotal, OMAO Other Discretionary Budget Authority	0	0	1,936	0	0	0	(333)	0	0	1,603	0	0	0	0	0	0	0	1,603
Subtotal, OMAO Other Discretionary Appropriation	0	0	1,936	0	0	0	(333)	0	0	1,603	0	0	0	0	0	0	0	1,603
TOTAL, OTHER DISCRETIONARY DIRECT OBLIGATIONS	2	2	67,161	0	0	0	(333)	2	2	66,828	(2)	(2)	0	(64,876)	(64,876)	0	0	1,952
TOTAL, OTHER DISCRETIONARY BUDGET AUTHORITY	2	2	(63,003)	0	0	0	(24,368)	2	2	(87,371)	(2)	(2)	0	(64,876)	(64,876)	0	0	(152,247)
TOTAL, OTHER DISCRETIONARY APPROPRIATION	2	2	67,161	0	0	0	(333)	2	2	66,828	(2)	(2)	0	(64,876)	(64,876)	0	0	1,952

SUMMARY OF DISCRETIONARY RESOURCES
(\$ in Thousands)

FY 2018 Proposed Operating Plan	POS	FTE	FY 2017 Annualized CR	POS	FTE	Calculated ATBs	Technical ATBs	POS	FTE	FY 2018 Base	POS	FTE	FY 2018 Program Changes (without Narratives)	FY 2018 Program Changes (with Narratives)	Total FY 2018 Program Changes	POS	FTE	FY 2018 President's Budget
Direct Discretionary Obligations																		
ORF Direct Obligations	11,680	11,108	3,446,945	482	266	52,606	62,245	12,162	11,374	3,561,796	(238)	(330)	(45,256)	(369,292)	(414,548)	11,924	11,044	3,147,248
PAC Direct Obligations	309	294	2,407,554	32	46	0	(42,283)	341	340	2,365,271	0	0	7	(545,779)	(545,772)	341	340	1,819,499
OTHER Direct Obligations	2	2	67,161	0	0	0	(333)	2	2	66,828	(2)	(2)	0	(64,876)	(64,876)	0	0	1,952
TOTAL Direct Discretionary Obligations	11,991	11,404	5,921,660	514	312	52,606	19,629	12,505	11,716	5,993,895	(240)	(332)	(45,249)	(979,947)	(1,025,196)	12,265	11,384	4,968,699
Discretionary Budget Authority																		
ORF Budget Authority	11,680	11,108	3,429,445	482	266	52,606	52,245	12,162	11,374	3,534,296	(238)	(330)	(45,256)	(369,292)	(414,548)	11,924	11,044	3,119,748
PAC Budget Authority	309	294	2,394,554	32	46	0	(42,283)	341	340	2,352,271	0	0	7	(545,779)	(545,772)	341	340	1,806,499
OTHER Budget Authority	2	2	(63,003)	0	0	0	(24,368)	2	2	(87,371)	(2)	(2)	0	(64,876)	(64,876)	0	0	(152,247)
TOTAL Discretionary Budget Authority	11,991	11,404	5,760,996	514	312	52,606	(14,406)	12,505	11,716	5,799,196	(240)	(332)	(45,249)	(979,947)	(1,025,196)	12,265	11,384	4,774,000
Discretionary Appropriations																		
ORF Appropriation	11,680	11,108	3,299,281	482	266	52,606	28,210	12,162	11,374	3,380,097	(238)	(330)	(45,256)	(369,292)	(414,548)	11,924	11,044	2,965,549
PAC Appropriation	309	294	2,395,856	32	46	0	(42,283)	341	340	2,353,573	0	0	7	(545,779)	(545,772)	341	340	1,807,801
OTHER Appropriation	2	2	67,161	0	0	0	(333)	2	2	66,828	(2)	(2)	0	(64,876)	(64,876)	0	0	1,952
TOTAL Discretionary Appropriation	11,991	11,404	5,762,298	514	312	52,606	(14,406)	12,505	11,716	5,800,498	(240)	(332)	(45,249)	(979,947)	(1,025,196)	12,265	11,384	4,775,302

GRAND TOTAL SUMMARY DISCRETIONARY APPROPRIATIONS
(\$ in Thousands)

FY 2018 Proposed Operating Plan													FY 2018 Program Changes (without Narratives)	FY 2018 Program Changes (with Narratives)	Total FY 2018 Program Changes			FY 2018 President's Budget
	POS	FTE	FY 2017 Annualized CR	POS	FTE	Calculated ATBs	Technical ATBs	POS	FTE	FY 2018 Base	POS	FTE				POS	FTE	
Operations, Research, and Facilities	11,680	11,108	3,299,281	482	266	52,606	28,210	12,162	11,374	3,380,097	(238)	(330)	(45,256)	(369,292)	(414,548)	11,924	11,044	2,965,549
Procurement, Acquisition, and Construction	309	294	2,395,856	32	46	0	(42,283)	341	340	2,353,573	0	0	7	(545,779)	(545,772)	341	340	1,807,801
Fisherman's Contingency Fund	0	0	349	0	0	0	0	0	0	349	0	0	0	0	0	0	0	349
Foreign Fishing Observer Fund	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fisheries Finance Program Account	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pacific Coastal Salmon Recovery Fund	2	2	64,876	0	0	0	0	2	2	64,876	(2)	(2)	0	(64,876)	(64,876)	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	0
Medicare Eligible Retiree Health Care Fund	0	0	1,936	0	0	0	(333)	0	0	1,603	0	0	0	0	0	0	0	1,603
GRAND TOTAL DISCRETIONARY APPROPRIATION	11,991	11,404	5,762,298	514	312	52,606	(14,406)	12,505	11,716	5,800,498	(240)	(332)	(45,249)	(979,947)	(1,025,196)	12,265	11,384	4,775,302

OTHER ACCOUNTS MANDATORY
(\$ in Thousands)

FY 2018 Proposed Operating Plan	POS	FTE	FY 2017 Annualized CR	POS	FTE	Calculated ATBs	Technical ATBs	POS	FTE	FY 2018 Base	POS	FTE	FY 2018 Program Changes (without Narratives)	FY 2018 Program Changes (with Narratives)	Total FY 2018 Program Changes	POS	FTE	FY 2018 President's Budget
NOS																		
Damage Assessment and Restoration Revolving Fund Obligations	15	15	56,962	0	0	0	(34,994)	15	15	21,968	0	0	0	0	0	15	15	21,968
Damage Assessment and Restoration Revolving Fund Budget Authority	15	15	5,962	0	0	0	6	15	15	5,968	0	0	0	0	0	15	15	5,968
Damage Assessment and Restoration Revolving Fund Appropriation	15	15	0	0	0	0	0	15	15	0	0	0	0	0	0	15	15	0
Sanctuaries Enforcement Asset Forfeiture Fund Obligations	0	0	120	0	0	0	0	0	0	120	0	0	0	0	0	0	0	120
Sanctuaries Enforcement Asset Forfeiture Fund Budget Authority	0	0	120	0	0	0	0	0	0	120	0	0	0	0	0	0	0	120
Sanctuaries Enforcement Asset Forfeiture Fund Appropriation	0	0	120	0	0	0	0	0	0	120	0	0	0	0	0	0	0	120
Gulf Coast Ecosystem Restoration Fund Obligations	1	1	6,715	0	0	0	(1,012)	1	1	5,703	0	0	0	0	0	1	1	5,703
Gulf Coast Ecosystem Restoration Fund Budget Authority	1	1	0	0	0	0	0	1	1	0	0	0	0	0	0	1	1	0
Gulf Coast Ecosystem Restoration Fund Appropriation	1	1	0	0	0	0	0	1	1	0	0	0	0	0	0	1	1	0
Subtotal, NOS Other Mandatory Direct Obligations	16	16	63,797	0	0	0	(36,006)	16	16	27,791	0	0	0	0	0	16	16	27,791
Subtotal, NOS Other Mandatory Budget Authority	16	16	6,082	0	0	0	6	16	16	6,088	0	0	0	0	0	16	16	6,088
Subtotal, NOS Other Mandatory Appropriation	16	16	120	0	0	0	0	16	16	120	0	0	0	0	0	16	16	120
NMFS																		
Promote and Develop Fisheries Obligations	3	3	14,909	(3)	(3)	0	(14,909)	0	0	0	0	0	0	0	0	0	0	0
Promote and Develop Fisheries Budget Authority	3	3	145,073	(3)	(3)	0	9,126	0	0	154,199	0	0	0	0	0	0	0	154,199
Promote and Develop Fisheries Appropriation	3	3	0	(3)	(3)	0	0	0	0	0	0	0	0	0	0	0	0	0
Fisheries Finance Program Account Obligations	0	0	30,764	0	0	0	(30,764)	0	0	0	0	0	0	0	0	0	0	0
Fisheries Finance Program Account Budget Authority	0	0	30,764	0	0	0	(30,764)	0	0	0	0	0	0	0	0	0	0	0
Fisheries Finance Program Account Appropriation	0	0	30,764	0	0	0	(30,764)	0	0	0	0	0	0	0	0	0	0	0
Federal Ship Financing Fund Obligations	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Federal Ship Financing Fund Budget Authority	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Federal Ship Financing Fund Appropriation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Environmental Improvement & Restoration Fund Obligations	0	0	6,451	0	0	0	(4,582)	0	0	1,869	0	0	0	0	0	0	0	1,869
Environmental Improvement & Restoration Fund Budget Authority	0	0	6,451	0	0	0	(4,582)	0	0	1,869	0	0	0	0	0	0	0	1,869
Environmental Improvement & Restoration Fund Appropriation	0	0	6,929	0	0	0	(4,921)	0	0	2,008	0	0	0	0	0	0	0	2,008
Limited Access System Administration Fund Obligations	40	40	13,218	0	0	0	109	40	40	13,327	0	0	0	0	0	40	40	13,327
Limited Access System Administration Fund Budget Authority	40	40	13,218	0	0	0	109	40	40	13,327	0	0	0	0	0	40	40	13,327
Limited Access System Administration Fund Appropriation	40	40	13,457	0	0	0	(140)	40	40	13,317	0	0	0	0	0	40	40	13,317

OTHER ACCOUNTS MANDATORY
(\$ in Thousands)

FY 2018 Proposed Operating Plan	POS	FTE	FY 2017 Annualized CR	POS	FTE	Calculated ATBs	Technical ATBs	POS	FTE	FY 2018 Base	POS	FTE	FY 2018 Program Changes (without Narratives)	FY 2018 Program Changes (with Narratives)	Total FY 2018 Program Changes	POS	FTE	FY 2018 President's Budget
Western Pacific Sustainable Fisheries Fund Obligations	0	0	622	0	0	0	28	0	0	650	0	0	0	0	0	0	0	650
Western Pacific Sustainable Fisheries Fund Budget Authority	0	0	622	0	0	0	28	0	0	650	0	0	0	0	0	0	0	650
Western Pacific Sustainable Fisheries Fund Appropriation	0	0	650	0	0	0	0	0	0	650	0	0	0	0	0	0	0	650
Fisheries Enforcement Asset Forfeiture Fund Obligations	0	0	3,537	0	0	0	91	0	0	3,628	0	0	0	0	0	0	0	3,628
Fisheries Enforcement Asset Forfeiture Fund Budget Authority	0	0	3,996	0	0	0	4	0	0	4,000	0	0	0	0	0	0	0	4,000
Fisheries Enforcement Asset Forfeiture Fund Appropriation	0	0	4,000	0	0	0	0	0	0	4,000	0	0	0	0	0	0	0	4,000
North Pacific Observer Fund Obligations	0	0	3,815	0	0	0	35	0	0	3,850	0	0	0	0	0	0	0	3,850
North Pacific Observer Fund Budget Authority	0	0	3,815	0	0	0	35	0	0	3,850	0	0	0	0	0	0	0	3,850
North Pacific Observer Fund Appropriation	0	0	3,850	0	0	0	0	0	0	3,850	0	0	0	0	0	0	0	3,850
Subtotal, NMFS Other Mandatory Direct Obligations	43	43	73,316	(3)	(3)	0	(49,992)	40	40	23,324	0	0	0	0	0	40	40	23,324
Subtotal, NMFS Other Mandatory Budget Authority	43	43	203,939	(3)	(3)	0	(26,044)	40	40	177,895	0	0	0	0	0	40	40	177,895
Subtotal, NMFS Other Mandatory Appropriation	43	43	59,650	(3)	(3)	0	(35,825)	40	40	23,825	0	0	0	0	0	40	40	23,825
OMAO																		
NOAA Corp Commissioned Officers Retirement Obligations	0	0	29,375	0	0	0	0	0	0	29,375	0	0	0	0	0	0	0	29,375
NOAA Corp Commissioned Officers Retirement Budget Authority	0	0	29,375	0	0	0	0	0	0	29,375	0	0	0	0	0	0	0	29,375
NOAA Corp Commissioned Officers Retirement Appropriation	0	0	29,375	0	0	0	0	0	0	29,375	0	0	0	0	0	0	0	29,375
Subtotal, OMAO Other Mandatory Direct Obligations	0	0	29,375	0	0	0	0	0	0	29,375	0	0	0	0	0	0	0	29,375
Subtotal, OMAO Other Mandatory Budget Authority	0	0	29,375	0	0	0	0	0	0	29,375	0	0	0	0	0	0	0	29,375
Subtotal, OMAO Other Mandatory Appropriation	0	0	29,375	0	0	0	0	0	0	29,375	0	0	0	0	0	0	0	29,375
TOTAL, OTHER MANDATORY DIRECT OBLIGATIONS	59	59	166,488	(3)	(3)	0	(85,998)	56	56	80,490	0	0	0	0	0	56	56	80,490
TOTAL, OTHER MANDATORY BUDGET AUTHORITY	59	59	239,396	(3)	(3)	0	(26,038)	56	56	213,358	0	0	0	0	0	56	56	213,358
TOTAL, OTHER MANDATORY APPROPRIATION	59	59	89,145	(3)	(3)	0	(35,825)	56	56	53,320	0	0	0	0	0	56	56	53,320

NOAA SUMMARY
(\$ in Thousands)

FY 2018 Proposed Operating Plan	POS	FTE	FY 2017 Annualized CR	POS	FTE	Calculated ATBs	Technical ATBs	POS	FTE	FY 2018 Base	POS	FTE	FY 2018 Program Changes (without Narratives)	FY 2018 Program Changes (with Narratives)	Total FY 2018 Program Changes	POS	FTE	FY 2018 President's Budget
TOTAL Direct Obligations (Discretionary & Mandatory)	12,050	11,463	6,088,148	511	309	52,606	(66,369)	12,561	11,772	6,074,385	(240)	(332)	(45,249)	(979,947)	(1,025,196)	12,321	11,440	5,049,189
TOTAL Budget Authority (Discretionary & Mandatory)	12,050	11,463	6,000,392	511	309	52,606	(40,444)	12,561	11,772	6,012,554	(240)	(332)	(45,249)	(979,947)	(1,025,196)	12,321	11,440	4,987,358
TOTAL Appropriation (Discretionary & Mandatory)	12,050	11,463	5,851,443	511	309	52,606	(50,231)	12,561	11,772	5,853,818	(240)	(332)	(45,249)	(979,947)	(1,025,196)	12,321	11,440	4,828,622
Reimbursable Financing	600	600	367,012	(150)	(150)	0	(125,012)	450	450	242,000	0	0	0	0	0	450	450	242,000
TOTAL OBLIGATIONS (Direct & Reimbursable)	12,650	12,063	6,455,160	361	159	52,606	(191,381)	13,011	12,222	6,316,385	(240)	(332)	(45,249)	(979,947)	(1,025,196)	12,771	11,890	5,291,189
Offsetting Receipts	0	0	(390)	0	0	0	(2,372)	0	0	(2,762)	0	0	0	0	0	0	0	(2,762)
TOTAL OBLIGATIONS (Direct, Reimbursable & Offsetting Receipts)	12,650	12,063	6,454,770	361	159	52,606	(193,753)	13,011	12,222	6,313,623	(240)	(332)	(45,249)	(979,947)	(1,025,196)	12,771	11,890	5,288,427

*Prior to the FY 2018 President's Budget Submission, offsetting receipts represented Fisheries Finance subsidy budget authority. Beginning with this submission, offsetting receipts now represent Fisheries Finance subsidy outlays

LINE OFFICE SUMMARY
(\$ in Thousands)

FY 2018 Proposed Operating Plan	POS	FTE	FY 2017 Annualized CR	POS	FTE	Calculated ATBs	Technical ATBs	POS	FTE	FY 2018 Base	POS	FTE	FY 2018 Program Changes (without Narratives)	FY 2018 Program Changes (with Narratives)	Total FY 2018 Program Changes	POS	FTE	FY 2018 President's Budget
National Ocean Service																		
ORF	1,170	1,115	499,154	77	19	6,467	640	1,247	1,134	506,261	0	(29)	(6,467)	(114,783)	(121,250)	1,247	1,105	385,011
PAC	3	2	3,693	0	1	0	0	3	3	3,693	0	0	0	(1,697)	(1,697)	3	3	1,996
OTHER	16	16	63,797	0	0	0	(36,006)	16	16	27,791	0	0	0	0	0	16	16	27,791
TOTAL, NOS	1,189	1,133	566,644	77	20	6,467	(35,366)	1,266	1,153	537,745	0	(29)	(6,467)	(116,480)	(122,947)	1,266	1,124	414,798
National Marine Fisheries Service																		
ORF	3,057	2,910	847,890	0	0	13,862	2,592	3,057	2,910	864,344	(41)	(51)	(13,862)	(29,041)	(42,903)	3,016	2,859	821,441
PAC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OTHER	45	45	138,541	(3)	(3)	0	(49,992)	42	42	88,549	(2)	(2)	0	(64,876)	(64,876)	40	40	23,673
TOTAL, NMFS	3,102	2,955	986,431	(3)	(3)	13,862	(47,400)	3,099	2,952	952,893	(43)	(53)	(13,862)	(93,917)	(107,779)	3,056	2,899	845,114
Oceanic and Atmospheric Research																		
ORF	760	710	461,024	50	20	3,950	4,017	810	730	468,991	(57)	(70)	(4,402)	(140,585)	(144,987)	753	660	324,004
PAC	0	0	20,041	0	0	0	0	0	0	20,041	0	0	0	5,959	5,959	0	0	26,000
TOTAL, OAR	760	710	481,065	50	20	3,950	4,017	810	730	489,032	(57)	(70)	(4,402)	(134,626)	(139,028)	753	660	350,004
National Weather Service																		
ORF	4,428	4,217	986,964	192	188	19,370	656	4,620	4,405	1,006,990	(107)	(107)	(8,135)	(62,799)	(70,934)	4,513	4,298	936,056
PAC	25	24	135,059	0	0	0	0	25	24	135,059	0	0	0	(13,059)	(13,059)	25	24	122,000
TOTAL, NWS	4,453	4,241	1,122,023	192	188	19,370	656	4,645	4,429	1,142,049	(107)	(107)	(8,135)	(75,858)	(83,993)	4,538	4,322	1,058,056
National Environmental Satellite, Data and Information Service																		
ORF	522	497	188,728	61	10	3,796	42,802	583	507	235,326	1	(21)	(3,328)	2,577	(751)	584	486	234,575
PAC	275	262	2,156,186	30	43	0	(42,283)	305	305	2,113,903	0	0	7	(533,283)	(533,276)	305	305	1,580,627
TOTAL, NESDIS	797	759	2,344,914	91	53	3,796	519	888	812	2,349,229	1	(21)	(3,321)	(530,706)	(534,027)	889	791	1,815,202
Mission Support																		
ORF	747	710	252,453	86	13	1,062	11,424	833	723	264,939	(18)	(36)	(4,963)	(26,661)	(31,624)	815	687	233,315
PAC	0	0	998	0	0	0	0	0	0	998	0	0	0	0	0	0	0	998
SUBTOTAL, Mission Support	747	710	253,451	86	13	1,062	11,424	833	723	265,937	(18)	(36)	(4,963)	(26,661)	(31,624)	815	687	234,313
Office of Marine and Aviation Operations																		
ORF	996	949	210,732	16	16	4,099	114	1,012	965	214,945	(16)	(16)	(4,099)	2,000	(2,099)	996	949	212,846
PAC	6	6	91,577	2	2	0	0	8	8	91,577	0	0	0	(3,699)	(3,699)	8	8	87,878
OTHER	0	0	31,311	0	0	0	(333)	0	0	30,978	0	0	0	0	0	0	0	30,978
TOTAL, OMAO	1,002	955	333,620	18	18	4,099	(219)	1,020	973	337,500	(16)	(16)	(4,099)	(1,699)	(5,798)	1,004	957	331,702

LINE OFFICE SUMMARY
(\$ in Thousands)

FY 2018 Proposed Operating Plan	POS	FTE	FY 2017 Annualized CR	POS	FTE	Calculated ATBs	Technical ATBs	POS	FTE	FY 2018 Base	POS	FTE	FY 2018 Program Changes (without Narratives)	FY 2018 Program Changes (with Narratives)	Total FY 2018 Program Changes	POS	FTE	FY 2018 President's Budget
DIRECT DISCRETIONARY OBLIGATIONS																		
ORF	11,680	11,108	3,446,945	482	266	52,606	62,245	12,162	11,374	3,561,796	(238)	(330)	(45,256)	(369,292)	(414,548)	11,924	11,044	3,147,248
PAC	309	294	2,407,554	32	46	0	(42,283)	341	340	2,365,271	0	0	7	(545,779)	(545,772)	341	340	1,819,499
OTHER	61	61	233,649	(3)	(3)	0	(86,331)	58	58	147,318	(2)	(2)	0	(64,876)	(64,876)	56	56	82,442
TOTAL, DIRECT DISCRETIONARY OBLIGATIONS	12,050	11,463	6,088,148	511	309	52,606	(66,369)	12,561	11,772	6,074,385	(240)	(332)	(45,249)	(979,947)	(1,025,196)	12,321	11,440	5,049,189
ORF Adjustments (Deobligations/Rescissions)	0	0	(17,500)	0	0	0	(10,000)	0	0	(27,500)	0	0	0	0	0	0	0	(27,500)
ORF Transfers	0	0	(130,164)	0	0	0	(24,035)	0	0	(154,199)	0	0	0	0	0	0	0	(154,199)
PAC Adjustments (Deobligations/Rescissions)	0	0	(13,000)	0	0	0	0	0	0	(13,000)	0	0	0	0	0	0	0	(13,000)
PAC Transfers	0	0	1,302	0	0	0	0	0	0	1,302	0	0	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	0
Mandatory Accounts Excluded	(59)	(59)	(166,488)	3	3	0	85,998	(56)	(56)	(80,490)	0	0	0	0	0	(56)	(56)	(80,490)
TOTAL, DISCRETIONARY APPROPRIATIONS	11,991	11,404	5,762,298	514	312	52,606	(14,406)	12,505	11,716	5,800,498	(240)	(332)	(45,249)	(979,947)	(1,025,196)	12,265	11,384	4,775,302

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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 2017 Annualized CR	11,680	11,108	3,299,281	3,429,445	3,560,745
less: Carryover	0	0	0	0	(113,800)
plus: 2018 Technical ATBs	482	266	80,816	104,851	114,851
FY 2018 Base	12,162	11,374	3,380,097	3,534,296	3,561,796
plus(or less): 2018 Program Changes	(238)	(330)	(414,548)	(414,548)	(414,548)
FY 2018 Estimate	11,924	11,044	2,965,549	3,119,748	3,147,248

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

Comparison by program		FY 2016		FY 2017		FY 2018		FY 2018		Increase/ (Decrease)	
		Actual		Annualized CR		Base Program		Estimate		Personnel	Amount
		Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount
National Ocean Service	Pos/BA	1,102	496,051	1,170	499,154	1,247	506,261	1,247	385,011	0	(121,250)
	FTE/OBL	1,092	508,130	1,115	506,838	1,134	506,261	1,105	385,011	(29)	(121,250)
National Marine Fisheries Service	Pos/BA	2,726	842,751	3,057	847,890	3,057	864,344	3,016	821,441	(41)	(42,903)
	FTE/OBL	2,702	842,863	2,910	881,144	2,910	864,344	2,859	821,441	(51)	(42,903)
Oceanic and Atmospheric Research	Pos/BA	664	458,161	760	461,024	810	468,991	753	324,004	(57)	(144,987)
	FTE/OBL	659	459,409	710	472,449	730	468,991	660	324,004	(70)	(144,987)
National Weather Service	Pos/BA	4,257	980,831	4,428	986,964	4,620	1,006,990	4,513	936,056	(107)	(70,934)
	FTE/OBL	4,219	982,226	4,217	1,025,626	4,405	1,006,990	4,298	936,056	(107)	(70,934)
National Environmental Satellite, Data, & Info Service	Pos/BA	401	184,141	522	188,728	583	235,326	584	234,575	1	(751)
	FTE/OBL	396	185,516	497	192,276	507	235,326	486	234,575	(21)	(751)
Mission Support	Pos/BA	712	268,341	747	252,453	833	264,939	815	233,315	(18)	(31,624)
	FTE/OBL	706	269,454	710	268,248	723	264,939	687	233,315	(36)	(31,624)
Office of Marine & Aviation Operations	Pos/BA	941	209,423	996	210,732	1,012	214,945	996	212,846	(16)	(2,099)
	FTE/OBL	933	212,141	949	214,164	965	214,945	949	212,846	(16)	(2,099)
Less Deobligations/Other	Pos/BA	0	0	0	(17,500)	0	(27,500)	0	(27,500)	0	0
	FTE/OBL	0	0	0	0	0	0	0	0	0	0
Total	Pos/BA	10,803	3,439,699	11,680	3,429,445	12,162	3,534,296	11,924	3,119,748	(238)	(414,548)
	FTE/OBL	10,707	3,459,739	11,108	3,560,745	11,374	3,561,796	11,044	3,147,248	(330)	(414,548)

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

	FY 2016		FY 2017		FY 2018		FY 2018		Increase/	
	FTE	Actual Amount	FTE	Annualized CR Amount	FTE	Base Program Amount	FTE	Estimate Amount	FTE	(Decrease) Amount
Direct Discretionary Obligation	10,707	3,459,739	11,108	3,560,745	11,374	3,561,796	11,044	3,147,248	(330)	(414,548)
Total Obligations	10,707	3,459,739	11,108	3,560,745	11,374	3,561,796	11,044	3,147,248	(330)	(414,548)
Adjustments to Obligations:										
Cash Refunds/Prior Year Recoveries	0	0	0	0	0	0	0	0	0	0
Deobligations/Prior Year Recov	0	(27,460)	0	(17,500)	0	(27,500)	0	(27,500)	0	0
Unobligated balance, EOY	0	113,800	0	0	0	0	0	0	0	0
Unobligated Balance Expiring	0	1,765	0	0	0	0	0	0	0	0
Unobligated Balance Adj SOY	0	(121,145)	0	(113,800)	0	0	0	0	0	0
Total Budget Authority	10,707	3,426,699	11,108	3,429,445	11,374	3,534,296	11,044	3,119,748	(330)	(414,548)
Financing from Transfers and Other:										
Transfer from P&D to ORF	0	(130,164)	0	(130,164)	0	(154,199)	0	(154,199)	0	0
Transfer from PCSRF to ORF	0	(65)	0	0	0	0	0	0	0	0
Rescission	0	13,000	0	0	0	0	0	0	0	0
Transfer from ORF to PAC	0	3,415	0	0	0	0	0	0	0	0
Transfer from PAC to ORF	0	(7,072)	0	0	0	0	0	0	0	0
Net Appropriation	10,707	3,305,813	11,108	3,299,281	11,374	3,380,097	11,044	2,965,549	(330)	(414,548)

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Department of Commerce
 National Oceanic and Atmospheric Administration
 Operations, Research, and Facilities
PROGRAM and PERFORMANCE: REIMBURSABLE OBLIGATIONS
 (Dollar Amounts in Thousands)

	Positions	FTE	Appropriation	Budget Authority	Reimbursable Obligations
FY 2017 Currently Available	600	600	0	367,013	493,887
less: obligations from prior year balances	0	0	0	0	0
less: 2018 Other Adjustments to Base	(150)	(150)	0	(125,013)	(251,887)
FY 2018 Base	450	450	0	242,000	242,000
less: 2018 Program Changes	0	0	0	0	0
FY 2018 Estimate	450	450	0	242,000	242,000

Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
PROGRAM and PERFORMANCE: REIMBURSABLE OBLIGATIONS
(Dollar Amounts in Thousands)

Comparison by program		FY 2016		FY 2017		FY 2018		FY 2018		Increase/ (Decrease)	
		Actuals		Currently Available		Base Program		Estimate		Personnel	Amount
		Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount
National Ocean Service	Pos/BA	20	21,331	22	33,823	17	29,000	17	29,000	0	0
	FTE/OBL	20	15,414	22	48,953	17	29,000	17	29,000	0	0
National Marine Fisheries Service	Pos/BA	258	88,835	283	108,791	212	69,000	212	69,000	0	0
	FTE/OBL	258	83,811	283	194,426	212	69,000	212	69,000	0	0
Oceanic and Atmospheric Research	Pos/BA	29	42,174	32	88,196	24	33,000	24	33,000	0	0
	FTE/OBL	29	54,083	32	103,072	24	33,000	24	33,000	0	0
National Weather Service	Pos/BA	175	68,575	192	80,636	144	75,000	144	75,000	0	0
	FTE/OBL	175	48,159	192	89,719	144	75,000	144	75,000	0	0
National Environmental Satellite, Data, and Information Service	Pos/BA	38	29,216	41	29,089	31	21,000	31	21,000	0	0
	FTE/OBL	38	28,121	41	31,114	31	21,000	31	21,000	0	0
Program Support	Pos/BA	27	14,862	30	26,478	0	0	0	0	0	0
	FTE/OBL	27	11,842	30	26,603	0	0	0	0	0	0
Mission Support	Pos/BA	0	0	0	0	21	12,000	21	12,000	0	0
	FTE/OBL	0	0	0	0	21	12,000	21	12,000	0	0
Office of Marine and Aviation Operations	Pos/BA	0	0	0	0	1	3,000	1	3,000	0	0
	FTE/OBL	0	0	0	0	1	3,000	1	3,000	0	0
Total	Pos/BA	547	264,993	600	367,013	450	242,000	450	242,000	0	0
	FTE/OBL	547	241,430	600	493,887	450	242,000	450	242,000	0	0

Department of Commerce
 National Oceanic and Atmospheric Administration
 Operations, Research, and Facilities
PROGRAM and PERFORMANCE: REIMBURSABLE OBLIGATIONS
 (Dollar Amounts in Thousands)

	FY 2016 Actuals		FY 2017 Currently Available		FY 2018 Base Program		FY 2018 Estimate		Increase/ (Decrease)	
	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount
Reimbursable Obligations	547	241,430	600	493,887	450	242,000	450	242,000	0	0
Total Obligations	547	241,430	600	493,887	450	242,000	450	242,000	0	0
Adjustments to Obligations:										
Deobligations	0	0	0	0	0	0	0	0	0	0
Unobligated balance, SOY Reimbursable	0	(103,312)	0	(126,874)	0	0	0	0	0	0
Unobligated balance, EOY Reimbursable	0	126,875	0	0	0	0	0	0	0	0
Unobligated balance, Expiring	0	0	0	0	0	0	0	0	0	0
Total Budget Authority	547	264,993	600	367,013	450	242,000	450	242,000	0	0

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

	FY 2016 Actual	FY 2017 Annualized CR	FY 2018 Base Program	FY 2018 Estimate	Increase/ (Decrease)
Direct Discretionary Obligation	3,459,739	3,560,745	3,561,796	3,147,248	(414,548)
Direct Mandatory Obligation	30,138	32,736	36,693	36,693	0
Reimbursable Obligation	241,430	493,887	242,000	242,000	0
Total Obligations	3,731,307	4,087,368	3,840,489	3,425,941	(414,548)
Adjustments and Obligations:					
Federal funds	(194,661)	(295,368)	(194,760)	(194,760)	0
Non-Federal Sources	(47,129)	(71,644)	(47,240)	(47,240)	0
Cash Refunds	0	0	0	0	0
Change Uncollected Customer Pmts from Fed.	(23,203)	0	0	0	0
Deobligation/Recoveries	(27,460)	(17,500)	(27,500)	(27,500)	0
Unobligated balance adjusted, SOY (Direct Disc.)	(121,145)	(113,800)	0	0	0
Unobligated balance adjusted, SOY (Mand.)	(45,442)	(44,037)	(40,676)	(40,676)	0
Unobligated balance, transferred to other accounts	0	0	0	0	0
Unobligated balance, EOY (Direct Disc.)	113,800	0	0	0	0
Unobligated balance, EOY (Mand.)	2,499	0	0	0	0
Unobligated balance, deferred	42,180	40,676	33,358	33,358	0
Unobligated balance, Not apportioned	0	0	0	0	0
Unobligated balance, Expiring Direct	1,765	0	0	0	0
Unobligated balance, SOY Reimbursable	(103,312)	(126,875)	0	0	0
Unobligated balance, EOY Reimbursable	126,875	0	0	0	0
Unobligated balance, Expired Reimbursable	0	0	0	0	0
Total Budget Authority	3,456,074	3,458,820	3,563,671	3,149,123	(414,548)
Financing from Transfers and Other:					
Transfer from P&D to ORF	(130,164)	(130,164)	(154,199)	(154,199)	0
Transfer from PCSRF to ORF	(65)	0	0	0	0
Appropriation (Mand.)	(29,375)	(29,375)	(29,375)	(29,375)	0
Spectrum Relocation Fund	0	0	0	0	0
NOAA Corps Retirement Pay (Mandatory)	0	0	0	0	0
Rescission	13,000	0	0	0	0
Transfer from PAC to ORF	(7,072)	0	0	0	0
Transfer from ORF to PAC	3,415	0	0	0	0
Net Appropriation	3,305,813	3,299,281	3,380,097	2,965,549	(414,548)

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

<u>Adjustments:</u>		FTE 263	Amount 37,462
Restoration of FY 2017 deobligations	17,500,000	0	
Adjustment for DOC Working Capital Fund	19,962,000	0	
Annualization of FTE	0	263	
			<hr/>
<u>Financing:</u>		0	(27,500)
In 2018, NOAA expects to realize recoveries of prior year obligations of \$27,500,000. This amount will be used to offset the budget authority in 2018.	(27,500,000)	0	
			<hr/>
<u>Transfers:</u>		3	42,283
NESDIS transfer from PAC Satellite Ground Systems PPA to ORF Satellite & Product Operations PPA.	1,200,000	0	
	33,900,000	0	
NESDIS transfer from PAC GOES-R PPA to ORF Satellite & Product Operations, NSOF Operations, Product Development, Readiness and Application, and National Centers for Environmental Information.	4,244,000	1	
NESDIS transfer from PAC Jason-3 PPA to ORF Satellite & Product Operations, Product Development, Readiness and Application, and National Centers for Environmental Information.	2,939,000	2	
NESDIS transfer from PAC DSCOVER PPA to ORF Satellite & Product Operations and National Centers for Environmental Information.			

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

Other Cost Changes:

Pay Raises

0 26,839

Full-year cost of 2018 pay increase and related costs:

The 2017 Budget includes a pay raise of 2.1% for civilians and a pay raise of 2.1% for military.

Total cost of 2017 pay raise 23,977,212

Less amount funded in 2017 (17,982,909)

Adjustment for FY 2018 of 2017 pay increase 5,994,303

2018 pay increase and related costs:

A general civilian pay raise of 1.9% and NOAA Corps pay raise of 1.9% is assumed to be effective January 1, 2018.

Total cost in 2018 of pay increase 27,792,704

Less amount not funded in 2018 (6,948,176)

Total cost of January 2018 pay increase 20,844,528

Total, adjustment for 2018 pay increase 26,838,831

Compensable Day

0

In FY 2018, there are 260 compensable days, same as FY 2017.

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

Civil Service Retirement System (CSRS) 0 (1,328)

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 6.5% in 2017 to 4.8% in 2018 for regular employees and will drop from 5.0% to 4.2% in 2018 for law enforcement employees. Contribution rates will remain the same at 7.0% for regular employees and 7.5% for law enforcement.

Regular:

2018 \$1,113,812,000 x 0.048 x .07	3,742,408
2017 \$1,113,812,000 x 0.065 x .07	(5,067,845)
Subtotal	(1,325,437)

Law Enforcement:

2018 \$4,528,000 x 0.042 x .075	14,263
2017 \$4,528,000 x 0.050 x .075	(16,980)
Subtotal	(2,717)

Total adjustment to base	(1,328,154)
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Department of Commerce
 National Oceanic and Atmospheric Administration
 Operations, Research, and Facilities
JUSTIFICATION OF CHANGES TO BASE
 (Dollar Amounts in Thousands)

Federal Employees Retirement System (FERS)

0 2,605

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 93.5% in 2017 to 95.2% in 2018 for regular employees. The estimated percentage of payroll for law enforcement employees covered by FERS will rise from 95.0% to 95.8% from FY 2017 to FY 2018. The contribution rate for FERS Regular is 13.7% for Non-RAE and 11.9% for RAE/FRAE while the FERS for Law Enforcement is 30.1% in 2018.

Regular Non-RAE:

2018 \$1,113,812,000 x 0.866 x 0.1370	132,144,883
2017 \$1,113,812,000 x 0.857 x 0.1370	<u>(130,771,553)</u>
Subtotal	1,373,330

Regular RAE/FRAE

2018 \$1,113,812,000 x 0.086 x 0.1190	13,122,933
2017 \$1,113,812,000 x 0.078 x 0.1190	<u>(11,902,195)</u>
Subtotal	1,220,738

Law Enforcement:

2018 \$4,528,000 x 0.958 x 0.301	1,305,685
2017 \$4,528,000 x 0.950 x 0.301	<u>(1,294,782)</u>
Subtotal	10,903

Total adjustment to base	2,604,971
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Department of Commerce
 National Oceanic and Atmospheric Administration
 Operations, Research, and Facilities
JUSTIFICATION OF CHANGES TO BASE
 (Dollar Amounts in Thousands)

<u>Thrift Savings Plan</u>	0	379
<p>The cost of agency contributions to the Thrift Savings Plan will also rise as FERS participation increases. The contribution rate is 2%.</p>		
<p>Regular:</p>		
2018 \$1,113,812,000 x 0.952 x 0.02	21,206,980	
2017 \$1,113,812,000 x 0.935 x 0.02	<u>(20,828,284)</u>	
Subtotal	378,969	
<p>Law Enforcement:</p>		
2018 \$4,528,000 x 0.958 x 0.02	86,756	
2017 \$4,528,000 x 0.950 x 0.02	<u>(86,032)</u>	
Subtotal	724	
Total adjustment to base	379,421	
<u>Federal Insurance Contribution Act (FICA)</u>	0	1,065
<p>The maximum salary subject to Old-Age, Survivors, Disability Insurance (OASDI) tax will increase from \$127,200 in 2017 to \$130,950 in 2018. The OASDI tax rate will remain at 6.2% in 2018.</p>		
<p>Regular:</p>		
2018 \$1,113,812,000 x .952 x .962 x .062	63,243,457	
2017 \$1,113,812,000 x .935 x .964 x .062	<u>(62,243,245)</u>	
Subtotal	1,000,212	

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

Law Enforcement:	
2018 \$4,528,000 x 0.958 x .962 x .062	258,725
2017 \$4,528,000 x 0.950 x .964 x .062	<u>(257,098)</u>
Subtotal	9,055
Other	
2018 \$70,705,000 x .952 x .962 x .062	4,014,707
2017 \$70,705,000 x .935 x .964 x .062	<u>(3,951,213)</u>
Subtotal	36,132
Total adjustment to base	1,065,333

<u>Health insurance premiums</u>	0	3,360
NOAA's contribution to Federal employees' health insurance premiums will increase. Applied against the 2017 estimate of \$86,144,000, the additional amount required is \$3,359,616.		
<u>Employees Compensation Fund</u>	0	(367)
In FY 2018, NOAA's contribution to Federal employees' compensation fund will decrease by \$367,000.		
<u>Travel</u>	0	363
The General Services Administration increased the standard per diem rate from \$140 to \$142 in FY 2018. Effective January 1, 2017, the mileage reimbursement rate for privately-owned automobiles decreased from 54 to 53.5 cents per mile.		
<u>Rental payments to GSA</u>	0	2,589
GSA rates are projected to increase by \$2,589,000 in 2018.		

Department of Commerce
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Operations, Research, and Facilities
JUSTIFICATION OF CHANGES TO BASE
(Dollar Amounts in Thousands)

<u>Rental Payments to Others</u>	0	669
Rental rates are projected to increase by \$668,640 in 2018		
<u>Postage</u>	0	2
Effective January 22, 2017, the U.S. Postal Service implemented a rate increase for shipping. The percentage increase of 4.3% was applied to the 2017 estimate of \$47,000 to arrive at an increase of \$2,021.		
<u>GPO Printing</u>	0	90
The General Pricing Level Adjustment percentage increase of 2.0% was applied to the 2017 estimate of \$4,481,000 to arrive at an increase of \$89,620.		
<u>PEPCO Electricity</u>	0	0
An increase of \$0 is requested for PEPCO Electricity.		
<u>NARA Storage & maintenance costs</u>	0	(255)
The estimated cost of NARA storage and maintenance for 2018 is projected to decrease by \$254,840.		
<u>Working Capital Fund</u>	0	(4,182)
NOAA request a decrease of \$4,281,000 for the Departmental Working Capital Fund.		
<u>Commerce Business System</u>	0	(855)
NOAA requests a decrease of \$855,000 for the Commerce Business System.		

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 Operations, Research, and Facilities
JUSTIFICATION OF CHANGES TO BASE
 (Dollar Amounts in Thousands)

<u>General Pricing Level Adjustment</u>	0	20,352
This request applies the General Pricing Level Adjustment percentage of 2.0% for FY 2018 to object classes where the prices the government pays are established through the market system. Factors are applied to transportation of things (\$293,780); communications, utilities and miscellaneous charges (excluding postage) (\$1,464,820); other contractual services (\$16,572,903); supplies and materials (\$1,312,754) and equipment (\$707,740).		
 <u>Grants</u>	 0	 958
Grants are projected to increase by 2.9% in 2018. This percentage was applied to the 2017 estimate of \$33,023,000 to arrive at an increase of \$957,667.		
 <u>Ship and Aircraft Fuel Costs</u>	 0	 322
 <u>Subtotal, Other Cost Changes</u>	 0	 52,606
 <u>Total Adjustments to Base</u>	 266	 104,851

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

Object Class	FY 2016 Actuals	FY 2017 Annualized CR	FY 2018 Base	FY 2018 Estimate	Increase / (Decrease)
11 Personnel compensation					
11.1 Full-time permanent	1,056,839	1,113,252	1,134,317	1,112,421	(21,896)
11.3 Other than full-time permanent	6,238	6,214	6,214	6,128	(86)
11.5 Other personnel compensation	58,404	58,177	58,177	58,176	(1)
11.6 Leave Surcharge	(4,118)	(4,102)	(4,102)	(4,102)	0
11.7 Military personnel	33,243	34,304	34,638	34,638	0
11.9 Total Personnel Compensation	1,150,606	1,207,845	1,229,244	1,207,261	(21,983)
12 Civilian personnel benefits	376,827	383,331	396,476	391,146	(5,330)
13 Benefits for former personnel	27,149	27,788	27,788	27,788	0
21 Travel and transportation of persons	44,550	44,377	44,740	41,937	(2,803)
22 Transportation of things	14,746	14,689	14,983	13,666	(1,317)
23.1 Rental payments to GSA	80,571	79,460	82,049	81,289	(760)
23.2 Rental payments to others	32,558	33,432	33,164	31,031	(2,133)
23.3 Communications, utilities and miscellaneous charges	73,574	73,288	74,755	71,158	(3,597)
24 Printing and reproduction	4,498	4,481	4,571	4,393	(178)
25.1 Advisory and assistance services	210,676	209,858	209,603	175,222	(34,381)
25.2 Other services from non-Federal sources	271,289	256,874	260,073	253,726	(6,347)

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

Object Class	FY 2016 Actuals	FY 2017 Annualized CR	FY 2018 Base	FY 2018 Estimate	Increase / (Decrease)
25.3 Other goods and services from Federal sources	382,332	343,574	417,347	388,126	(29,221)
25.5 Research and development contracts	15,164	15,105	15,105	8,711	(6,394)
26 Supplies and materials	90,593	84,241	85,584	76,416	(9,168)
31 Equipment	38,537	35,387	36,098	30,618	(5,480)
32 Lands and structures	3,023	3,011	3,011	3,011	0
33 Investments and loans	0	0	0	0	0
41 Grants, subsidies, and contributions	666,090	655,893	656,851	371,395	(285,456)
42 Insurance claims and indemnities	6,998	6,952	6,952	6,952	0
43 Interest and dividends	97	97	97	97	0
44 Refunds	0	0	0	0	0
99 Total Obligations	3,489,878	3,479,681	3,598,489	3,183,941	(414,548)

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

Object Class	FY 2016 Actuals	FY 2017 Annualized CR	FY 2018 Base	FY 2018 Estimate	Increase / (Decrease)
Cash Refund	0				
Deobligations/Prior Year Recoveries	(27,460)	(17,500)	(27,500)	(27,500)	0
Unobligated Balance, Start of Year	(121,145)	0	0	0	0
Rescission	0	0	0	0	0
Unobligated Balance, End of Year	113,800	0	0	0	0
Unobligated Balance, Expiring	1,765	0	0	0	0
Unobligated Balance, not apportioned	0	0	0	0	0
Subtotal Budget Authority	3,456,838	3,462,181	3,570,989	3,156,441	(414,548)
Less: NOAA Corps	(28,732)	(29,375)	(29,375)	(29,375)	0
Less: Spectrum Relocation	(1,405)	(3,361)	(7,318)	(7,318)	0
Total Discretionary ORF Budget Authority	3,426,701	3,429,445	3,534,296	3,119,748	(414,548)
Positions	10,803	11,680	12,162	11,924	(238)
FTE	10,707	11,108	11,374	11,044	(330)

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

	<u>2016 Actual</u>	<u>2017 Estimate</u>	<u>2018 Estimate</u>
Management and Professional Support Services	\$82,164	\$81,844	\$68,336
Studies, Analysis and Evaluations	\$33,708	\$33,578	\$28,036
Engineering and Technical Services	\$94,804	\$94,436	\$78,850
Total	<u>\$210,676</u>	<u>\$209,858</u>	<u>\$175,222</u>

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

	2016 <u>Actual</u>	2017 <u>Estimate</u>	2018 <u>Estimate</u>
Periodicals	\$2,182	\$2,173	\$2,130
Pamphlets	\$1,571	\$1,566	\$1,535
Audiovisuals	\$745	\$742	\$728
Total	\$4,498	\$4,481	\$4,393

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Department of Commerce
National Oceanic and Atmospheric Administration
Operations, Research, and Facilities
AVERAGE GRADE AND SALARY

	<u>2016</u> <u>Estimate</u>	<u>2017</u> <u>Estimate</u>	<u>2018</u> <u>Estimate</u>
Average executive and SES level pay plans	\$173,357	\$176,131	\$179,477
Average GS/GM grade	12	12	12
Average GS/GM salary	\$96,322	\$97,863	\$99,723
Average Pay Band salary	\$107,339	\$109,056	\$111,128
Average Commissioned Officers salary	\$112,464	\$114,263	\$116,434
Average salary for other positions (FWS/Wage Marine)	\$50,180	\$50,983	\$51,952

Average salaries provided here reflect Federal Civilian and Military pay raises for 2017 and 2018, 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 2017 Annualized CR	309	294	2,395,856	2,394,554	2,534,095
Less: Carryover	0	0	0	0	(126,541)
Plus: 2017 Other Adjustments to Base	32	46	(42,283)	(42,283)	(42,283)
FY 2018 Base	341	340	2,353,573	2,352,271	2,365,271
Plus (or less): 2018 Program Changes	0	0	(545,772)	(545,772)	(545,772)
FY 2018 Estimate	341	340	1,807,801	1,806,499	1,819,499

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

Comparison by program/sub-program		FY 2016		FY 2017		FY 2018		FY 2018		Increase/ (Decrease)	
		Actual		Annualized CR		Base Program		Estimate		Personnel	Amount
		Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount
National Ocean Service	Pos/BA	2	3,669	3	3,693	3	3,693	3	1,996	0	(1,697)
	FTE/OBL	2	4,348	2	4,410	3	3,693	3	1,996	0	(1,697)
National Marine Fisheries Service	Pos/BA	0	0	0	0	0	0	0	0	0	0
	FTE/OBL	0	0	0	1,888	0	0	0	0	0	0
Oceanic and Atmospheric Research	Pos/BA	0	19,906	0	20,041	0	20,041	0	26,000	0	5,959
	FTE/OBL	0	20,007	0	20,121	0	20,041	0	26,000	0	5,959
National Weather Service	Pos/BA	32	134,150	25	135,059	25	135,059	25	122,000	0	(13,059)
	FTE/OBL	32	124,840	24	162,328	24	135,059	24	122,000	0	(13,059)
National Environmental Satellite, Data, & Information Service	Pos/BA	252	2,145,090	275	2,156,186	305	2,113,903	305	1,580,627	0	(533,276)
	FTE/OBL	249	2,136,169	262	2,172,397	305	2,113,903	305	1,580,627	0	(533,276)
Mission Support	Pos/BA	0	992	0	998	0	998	0	998	0	0
	FTE/OBL	0	1,169	0	1,156	0	998	0	998	0	0
Office of Marine Aviation & Operations	Pos/BA	0	91,650	6	91,577	8	91,577	8	87,878	0	(3,699)
	FTE/OBL	0	16,309	6	171,795	8	91,577	8	87,878	0	(3,699)
Less Deobligations/Other	Pos/BA	0	0	0	(13,000)	0	(13,000)	0	(13,000)	0	0
	FTE/OBL	0	0	0	0	0	0	0	0	0	0
Total	Pos/BA	286	2,395,457	309	2,394,554	341	2,352,271	341	1,806,499	0	(545,772)
	FTE/OBL	283	2,302,842	294	2,534,095	340	2,365,271	340	1,819,499	0	(545,772)

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

	FY 2016		FY 2017		FY 2018		FY 2018		Increase/ (Decrease)	
	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount
Direct Discretionary Obligation	283	2,302,842	294	2,534,095	340	2,365,271	340	1,819,499	0	(545,772)
Total Obligations	283	2,302,842	294	2,534,095	340	2,365,271	340	1,819,499	0	(545,772)
Adjustments to Obligations:										
Cash Refunds	0	0	0	0	0	0	0	0	0	0
Deobligations	0	(4,253)	0	(13,000)	0	(13,000)	0	(13,000)	0	0
Unobligated Balance Expiring	0	191	0	0	0	0	0	0	0	0
Unobligated Balance Adj SOY	0	(29,864)	0	(126,541)	0	0	0	0	0	0
Unobligated balance, Adj EOY	0	126,541	0	0	0	0	0	0	0	0
Unobligated balance transferred from ORF	0	0	0	0	0	0	0	0	0	0
Total Budget Authority	283	2,395,457	294	2,394,554	340	2,352,271	340	1,806,499	0	(545,772)
Financing from Transfers and Other:										
Transfer from ORF to PAC	0	(3,415)	0	0	0	0	0	0	0	0
Transfer from PAC to ORF	0	7,072	0	0	0	0	0	0	0	0
Transfer to OIG	0	1,302	0	1,302	0	1,302	0	1,302	0	0
Net Appropriation	283	2,400,416	294	2,395,856	340	2,353,573	340	1,807,801	0	(545,772)

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

	FY 2016 Actual	FY 2017 Annualized CR	FY 2018 Base Program	FY 2018 Estimate	Increase/ (Decrease)
Direct Discretionary Obligation	2,302,842	2,534,095	2,365,271	1,819,499	(545,772)
Direct Mandatory Obligation	14,094	94,450	17,836	17,836	0
Total Obligations	2,316,936	2,628,545	2,383,107	1,837,335	(545,772)
Adjustments and Obligations:					
Cash Refund	0	0	0	0	0
Deobligations	(4,253)	(13,000)	(13,000)	(13,000)	0
Unobligated balance, adj. SOY (Disc.)	(29,864)	(126,541)	0	0	0
Unobligated balance, adj. SOY (Mand.)	(213,419)	(199,325)	(104,875)	(104,875)	0
Unobligated balance, EOY (Disc.)	126,541	0	0	0	0
Unobligated balance, EOY (Mand.)	125,534	31,084	13,248	13,248	0
Unobligated balance, deferred	73,791	73,791	73,791	73,791	0
Unobligated balance, expiring EOY	191	0	0	0	0
Total Budget Authority	2,395,457	2,394,554	2,352,271	1,806,499	(545,772)
Financing from Transfers and Other:					
Transfer from PAC to ORF	7,072	0	0	0	0
Transfer from ORF to PAC	(3,415)	0	0	0	0
Transfer to OIG	1,302	1,302	1,302	1,302	0
Net Appropriation	2,400,416	2,395,856	2,353,573	1,807,801	(545,772)

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

		FTE	Amount
<u>Adjustments:</u>		49	13,000
Restoration of FY 2017 deobligations	13,000,000	0	
Annualization of FTE	0	49	
<u>Financing:</u>		0	(13,000)
In 2018, NOAA expects to realize recoveries of prior year obligations of \$13,000,000. This amount will be used to offset the budget authority in 2018.	(13,000,000)	0	
<u>Transfers:</u>		(3)	(42,283)
NESDIS transfer from PAC Satellite Ground Systems PPA to ORF Satellite & Product Operations PPA.	(1,200,000)	0	
	(33,900,000)	0	
NESDIS transfer from PAC GOES-R PPA to ORF Satellite & Product Operations, NSOF Operations, Product Development, Readiness and Application, and National Centers for Environmental Information.	(4,244,000)	(1)	
NESDIS transfer from PAC Jason-3 PPA to ORF Satellite & Product Operations, Product Development, Readiness and Application, and National Centers for Environmental Information.	(2,939,000)	(2)	
NESDIS transfer from PAC DSCOVER PPA to ORF Satellite & Product Operations, National Centers for Environmental Information.			
<u>Total Adjustments to Base</u>		46	(42,283)

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

Object Class	FY 2016 Actual	FY 2017 Annualized CR	FY 2018 Base	FY 2018 Estimate	Increase / (Decrease)
11 Personnel compensation					
11.1 Full-time permanent	36,915	34,838	34,838	34,838	0
11.3 Other than full-time permanent	103	107	107	107	0
11.5 Other personnel compensation	1,088	1,131	1,131	1,131	0
11.6 Leave Surcharge	15	16	16	16	0
11.7 Military personnel	298	310	310	310	0
11.9 Total Personnel Compensation	38,419	36,401	36,401	36,401	0
12 Civilian personnel benefits	11,749	11,209	11,209	11,209	0
13 Benefits for former personnel	1	1	1	1	0
21 Travel and transportation of persons	2,313	2,403	2,403	2,353	(50)
22 Transportation of things	302	314	314	189	(125)
23.1 Rental payments to GSA	7,558	5,354	5,354	5,354	0
23.2 Rental payments to others	165	171	171	171	0
23.3 Communications, utilities and miscellaneous charges	10,514	10,925	10,925	7,484	(3,441)
24 Printing and reproduction	369	383	383	383	0

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

Object Class	FY 2016 Actual	FY 2017 Annualized CR	FY 2018 Base	FY 2018 Estimate	Increase / (Decrease)
25.1 Advisory and assistance services	65,043	67,587	67,587	67,337	(250)
25.2 Other services	131,267	136,401	136,401	128,362	(8,039)
25.3 Purchases of goods and services from Govt accounts	1,836,478	2,009,776	1,890,879	1,359,863	(531,016)
25.4 Operation and maintenance of facilities	0	0	0	0	0
25.5 Research and development contracts	27,368	28,438	28,438	28,438	0
26 Supplies and materials	12,854	13,357	13,357	13,357	0
31 Equipment	124,933	129,819	129,819	128,665	(1,154)
32 Lands and structures	203	211	211	211	0
33 Investments and loans	0	0	0	0	0
41 Grants, subsidies and contributions	47,367	49,220	49,220	47,523	(1,697)
42 Insurance claims and indemnities	0	0	0	0	0
43 Interest and dividends	33	34	34	34	0
44 Refunds	0	0	0	0	0
99 Total Obligations	2,316,936	2,502,004	2,383,107	1,837,335	(545,772)

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

Object Class	FY 2016 Actual	FY 2017 Annualized CR	FY 2018 Base	FY 2018 Estimate	Increase / (Decrease)
Cash Refund	0	0	0	0	0
Prior Year Recoveries	0	0	0	0	0
De-obligations	(4,253)	(13,000)	(13,000)	(13,000)	0
Unobligated Balance, expiring	191	0	0	0	0
Unobligated Balance, Start of Year	(29,864)	0	0	0	0
Unobligated Balance, End of Year	126,541	0	0	0	0
Unobligated Balance, not apportioned	0	0	0	0	0
Subtotal Budget Authority	2,409,551	2,489,004	2,370,107	1,824,335	(545,772)
Less: Spectrum Relocation	(14,094)	(94,450)	(17,836)	(17,836)	0
Total Discretionary PAC Budget Authority	2,395,457	2,394,554	2,352,271	1,806,499	(545,772)
Positions	286	309	341	341	0
FTE	283	294	340	340	0

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BUDGET PROGRAM: NATIONAL OCEAN SERVICE

For FY 2018, NOAA requests a total of \$414,798,000 and 1,124 FTE for the National Ocean Service, including a net decrease of \$122,947,000 and 29 FTE in program changes.

National Ocean Service Overview

The National Ocean Service (NOS) enables safe, sustainable, and efficient use of marine and coastal resources. Economic sectors that depend on NOS products and services include maritime commerce and marine transportation, fishing and aquaculture, energy development, coastal recreation, and more. Even inland economic activity depends on the commerce that flows through seaports.

In 2014, coastal and Great Lakes counties (10 percent of the land area of the U.S.) were home to 42 percent of our country's population and accounted for 48 percent of the U.S. gross domestic product.¹ These communities and their economies depend on marine resources, but also face unique environmental threats. Coastal storms threaten lives and destroy property. Tidal flooding damages infrastructure and forces costly adaptations. Ecological hazards such as harmful algal blooms disrupt fishing, water supplies and tourism. Production and transport of fossil fuels creates a constant risk of spills, including catastrophic ones like the Deepwater Horizon event. The same coastal industries that are the engines of thriving ocean economies also generate port congestion, marine pollution, and navigation hazards. Coastal communities, governments and businesses need reliable data and tools to help make informed decisions in the face of these threats.

NOS provides data and services that sustain lives and livelihoods, reduce risk, and facilitate adaptation to change. NOS's earth observations and navigation products are used daily by ship pilots, ports managers, surveyors, resource managers, and airports. When oil spills, chemical releases, and marine debris damage coastal resources, NOS's scientific expertise is essential to emergency response and long-term recovery. NOS plays a leading role in place-based protection of the Nation's special marine areas: the National Marine Sanctuaries System, the National Estuarine Research Reserve System (NERRS), and the National System of Marine Protected Areas. NOS also promotes smart resource management for the long term through technical assistance, applied research, and partnership building.

The National Ocean Service budget program includes three sub-programs within the Operations, Research, and Facilities (ORF) account:

- Navigation, Observations and Positioning (\$208,155,000 and 532 FTE)
- Coastal Science and Assessment (\$83,509,000 and 272 FTE)
- Ocean and Coastal Management and Services (\$214,597,000 and 330 FTE)

NOS Procurement, Acquisition, and Construction (PAC) activities (\$3,693,000 and 3 FTE) include the NERRS Construction and Land Acquisition Program and the National Marine Sanctuaries Construction Program.

NOS manages three other accounts:

- NOAA Damage Assessment and Restoration Revolving Fund

¹ National Ocean Economics Program, *State of the U.S. Ocean and Coastal Economies* (www.oceaneconomics.org)

- Sanctuaries Enforcement Asset Forfeiture Fund
- Gulf Coast Ecosystem Restoration Science, Observation, Monitoring & Technology Fund

Significant Adjustments:

Calculated Adjustments

NOAA’s FY 2018 Base includes a total of \$6,467,000 to account for inflationary adjustments to current programs for NOS activities. This includes the estimated 2018 Federal pay raise of 1.9 percent as well as inflationary increases for non-labor activities including service contracts, utilities, field office lease payments, and rent charges from the General Services Administration (GSA).

Technical Adjustments

NOAA also requests the following transfers for a net change of \$0 and 0 FTE to the agency:

From Office	PPA	To Office	PPA	Amount / FTE
MS	Mission Services and Management	NOS	Navigation, Observations and Positioning	\$212,000 / 0 FTE
MS	Mission Services and Management	NOS	Coastal Science, Assessment, Response and Restoration	\$406,000 / 0 FTE
MS	Mission Services and Management	NOS	Coral Reef Program	\$4,000 / 0 FTE

NOAA requests to transfer \$22,000 and 0 FTE to move funding for operations at the David Skaggs Research Center in Boulder, CO, from the Mission Support Facilities to NOS. This funding is currently appropriated to the Mission Services and Management PPA and then distributed to the Line and Staff Offices annually. This reallocation will increase efficiencies by eliminating the need for funding transfers subsequent to appropriation and will improve transparency.

NOAA requests to transfer \$600,000 and 0 FTE to move funding associated with NOAA’s Western Regional Center (WRC) management activities from Mission Support Facilities to NOS. Currently, costs for these activities are paid directly through the funding appropriated to the Mission Services and Management PPA. This reallocation supports NOAA’s plan to employ an integrated campus cost model to allocate the cost of services provided to the WRC tenants. The tenants will then be billed directly based on the approved cost model. An integrated cost model will provide greater transparency and a more accurate reflection of program operating costs.

Narrative Information:

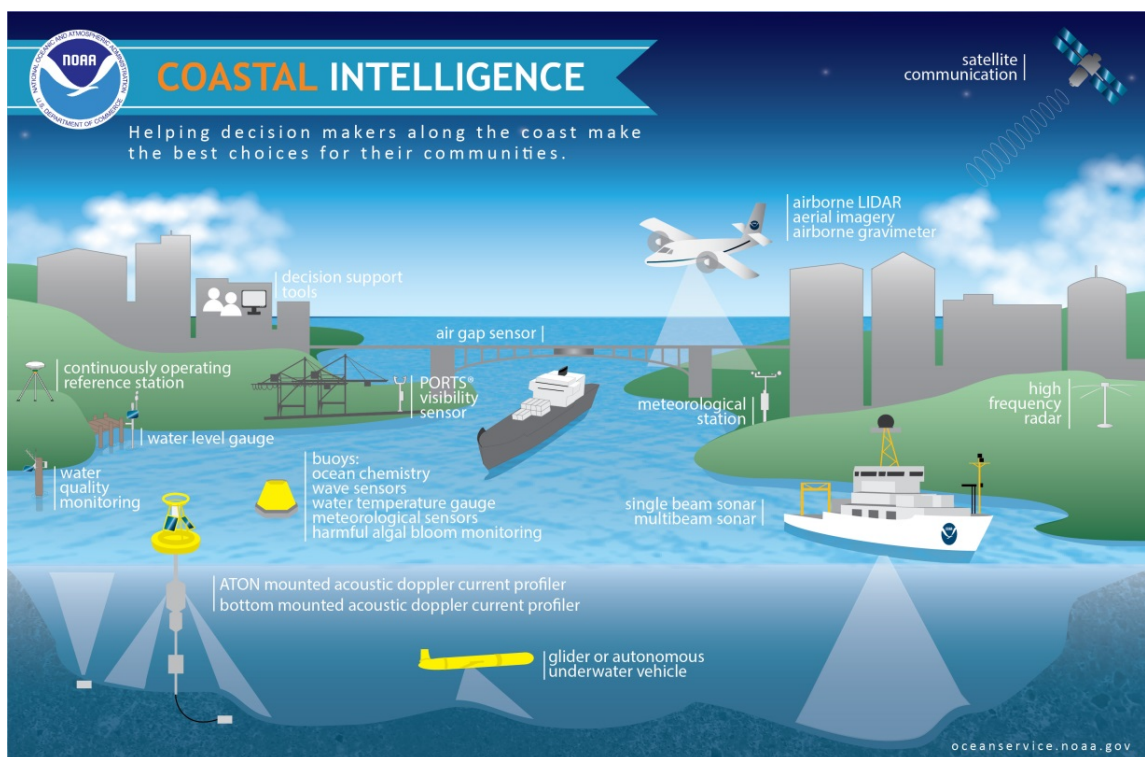
Following this section are base justification materials and program change narratives by sub-program for this line office. Please note program change narratives are only provided for program changes that represent greater than five percent of a program. Complete program changes by PPA can be found in the NOAA Control Table (p. Control Table-1 and Control Table-11). Please contact NOAA if details for any of these changes are required.

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

NOAA carries out the Navigation, Observations and Positioning sub-program under 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. These programs produce an integrated suite of physical oceanographic data and applications that enable the safe and efficient use of coastal areas and waterways. In addition to navigation applications, this foundational data informs many other NOAA mission areas and essential coastal economic activities such as hazard forecasting, emergency response, habitat restoration, fishing and coastal energy development, to name a few.

The following offices comprise the Navigation, Observation, and Positioning sub-program:

- **Office of Coast Survey (OCS):** The Office of Coast Survey is responsible for surveying and producing navigation charts in the Nation's waters. It is America's oldest scientific agency and NOAA's oldest mission, dating to the administration of Thomas Jefferson.
- **National Geodetic Survey (NGS):** The National Geodetic Survey provides the authoritative framework and sets standards for the all foundational positioning and geodesy activity.
- **Center for Operational Oceanographic Products and Services (CO-OPS):** CO-OPS produces oceanographic observations and forecasts of tides, currents, and water levels.
- **Integrated Ocean Observing System (IOOS):** NOAA IOOS leads the implementation and administration of a vast network of Federal and non-Federal observing systems that fulfill regional, national, and global needs. U.S. IOOS represents a partnership of 17 Federal agencies and 11 regional associations.



Navigation Services

NOAA surveys and charts the navigationally significant waters of the U.S. Exclusive Economic Zone (EEZ). Commercial shippers, fishers, the Navy, the U.S. Coast Guard, state and local governments, recreational boaters, and many others rely on NOAA's reference infrastructure and nautical charts to facilitate safe and efficient navigation. In 2016, U.S. seaports moved \$1.46 trillion of goods in international cargo², supporting agriculture, manufacturing, retail trade and other activities with a total economic impact to the national economy that exceeds \$4 trillion by the cargo annually³. NOAA also continually improves hydrography and charting technology through ongoing applied research and development. The importance of accurate charts will only increase given that the volume of traffic, and value of exports and imports via water, in U.S. seaports is expected to double by 2021 and double again shortly after 2030⁴. Through its leading role in the interagency Integrated Ocean and Coastal Mapping (IOCM) initiative, NOAA coordinates acquisition, management, quality control, and processing of ocean and coastal mapping data from multiple sources to maximize return on survey resources and reuse of data.

The following activities comprise NOAA's integrated suite of charting and navigation products and services generated through the combined efforts of the offices listed above:

- **Hydrographic Surveys.** NOAA acquires hydrographic data through the NOAA hydrographic fleet and contract surveyors in the 511,000 square nautical miles of navigationally significant U.S. waters. NOAA uses these data on depths and hazardous obstructions for nautical charting and other applications such as water modeling, fisheries management, marine debris mitigation, and coastal planning. Surveys using NOAA platforms and NOAA personnel are essential to maintaining the technical expertise necessary to oversee contracts, quality control data, develop survey technologies, and coordinate with the International Hydrographic Organization. At the same time NOAA also depends on private sector surveyors to provide critical capacity for meeting survey needs.
- **Marine Charts.** NOAA cartographers develop and maintain approximately 2,000 navigation products, including over 1,000 nautical charts, to ensure safe navigation in and around U.S. ports. The NOAA cartographers who compile these charts share their technical expertise with the International Hydrographic Organization to develop international data and mapping standards.
- **Tide and Tidal Current Predictions.** NOAA maintains and updates the official U.S. tide and current prediction tables, with over 3,000 entries each, which most large vessels have to carry along with NOAA marine charts when transiting through US ports, as mandated by the US Coast Guard. Each table has an update cycle of 25-30 years. The updates incorporate new data from NOAA's long-term and short-term water level gauges and current meters. NOAA uses real-time observations, meteorological forecasts, and astronomical predictions to produce forecasts and "nowcasts" (modeled data on where there are gaps in real-time observations) of tides and currents.
- **Applied Research and Development.** NOAA supports research and development on the cartographic, hydrographic and oceanographic sciences that underpin its mapping efforts. This research and development leads to new survey technologies, software,

² U.S. Department of Commerce, Census Bureau. (2016). FT920 U.S. Merchandise Trade: Selected Highlights, December 2016. p.1. Retrieved February 24, 2017 from https://www.census.gov/foreign-trade/Press-Release/ft920_index.html

³ Martin Associates. (2015, March). 2014 National Economic Impact of the U.S. Coastal Port System. Report prepared for the American Association of Port Authorities. Retrieved February 24, 2017 from <http://aapa.files.cms-plus.com/PDFs/Martin%20study%20executive%20summary%20final.pdf>

⁴ National Ocean Service. (2015). The Value of PORTS to the Nation: How Real-Time Observations Improve Safety and Economic Efficiency of Maritime Commerce. (U.S. Department of Commerce, NOAA Report) Washington, D.C.

models, and geospatial products and tools. For example, NOAA's Joint Hydrographic Center (JHC) develops remote sensing technologies and processes to improve data acquisition, processing, and charting. The JHC also supports the delimitation of the U.S. Extended Continental Shelf and sovereign rights beyond 200 nautical miles.

- **Navigation Response Teams (NRTs) and Regional Services.** Navigation Response Teams conduct hydrographic surveys in shallow waters and busy port areas to update charts and other products. NRTs also conduct rapid response surveys after maritime emergencies and natural disasters, thereby minimizing costly impacts of port closures and draft restrictions. NOAA regional navigation managers engage with customers and stakeholders to improve NOAA's responsiveness to their charting and navigation needs.
- **Shoreline Mapping.** The Coastal Mapping Program defines the Nation's 95,000-mile shoreline, the single largest data layer for nautical charts, and helps define U.S. maritime boundaries, including the EEZ. NOAA maps the shoreline by producing tidally coordinated, geo-referenced data from aerial photographs, high-resolution satellite imagery, and aerial topographic-bathymetric (topo-bathy) LIDAR.
- **Physical Oceanographic Real-Time System (PORTS[®]).** PORTS[®] provides users with data from real-time environmental observations, nowcasts, and forecasts to facilitate safe marine navigation and other uses. The program is described further under "Ocean and Coastal Observations" below.

NOAA's participation in a public-private partnership in the Port of Los Angeles/ Long Beach illustrates the potential benefits of collaborating with the private sector on developing innovative information infrastructure for navigation. In 2015 NOAA partnered with the Port of Los Angeles/ Long Beach, the Southern California Coastal Ocean Observing System (SCCOOS), California Office of Spill Prevention and Response, the Coastal Data Information Program at UCSD and private sector users and vendors to support development of an under keel clearance prediction system, PROTIDE. The system uses high-resolution foundational data and observations from NOAA-supported assets to produce forecasts that significantly reduce the uncertainty in under keel clearance, allowing port authorities to increase draft for vessels entering the port at specific times. The reduced need for lightering vessels will save industry approximately \$10 million per year.⁵

Ocean and Coastal Observations

NOAA produces critical oceanographic observations and forecasts related to tides, currents, and water levels. In particular, NOAA 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 Observation Program (NCOP). These two systems also provide the infrastructure and operational expertise that underpins NOAA's support for Physical Oceanographic Real Time Systems (PORTS[®]). In addition, emergency response agencies use NOS's water level predictions and tidal current models for oil spill response, storm and tsunami warnings, and other responses to coastal hazards.

Tides and Currents activities include:

- **Water Level Observations.** The NWLON consists of 210 long-term, continuously operating water level stations throughout the coastal U.S., the Great Lakes, and island possessions and territories. Information from the NWLON ranges from real-time, high frequency data (e.g., tsunami 1-minute data and storm surge) to long-term datasets

⁵ NOS Fiscal Year 2015 Annual Report: <http://oceanservice.noaa.gov/annualreport15/ocs.html>

(e.g., sea level and lake level trends). NWLON provides the framework for the national tidal datum network. Reference datums (such as the International Great Lakes Datum (IGLD) or Mean Lower Low Water (MLLW)) are used for navigation products and definitions of shoreline and marine boundaries. NWLON data forms the basis of the vertical reference framework for a variety of applications including marine boundaries, delineation of the national shoreline, and nautical charts. Additional applications of water level information include habitat restoration, emergency management, dredging, coastal planning and management, and construction projects.

- **Current Observations.** The NCOP collects, analyzes, and disseminates predictions of currents for navigation products and hazardous materials response. NOAA acquires data through deployments of current surveys of varying sampling durations. Channel dredging and changes in the configuration of ports and harbors over time have significantly altered the physical oceanography of many coastal areas, thereby necessitating continuous surveying to maintain data accuracy. The principal product generated by this program is information used to maintain and update the Tidal Current Tables.
- **Modeling and Forecasting.** NOAA's nowcast and forecast models provide critical information on water levels and other environmental variables. The National Operational Coastal Modeling Program (NOCMP) develops and maintains a national network of Operational Nowcast and Forecast Hydrodynamic Model Systems (OFS). These forecasts enable informed decision-making, particularly for vessel transit planning and execution. For example, on February 14, 2015, water levels in the northern portion of the Chesapeake Bay fell three feet below published predictions. The Chesapeake Bay Operational Forecast System successfully forecasted these extreme water level fluctuations and triggered a special marine weather statement through the National Weather Service to alert shipping interests of the conditions. These operational forecasts also provide the engine for ecological forecasts of harmful algal blooms and other ecological hazards. NOAA currently operates 13 regional nowcast/forecast models. In FY 2017, NOAA is developing models for the Gulf of Maine and Cook Inlet. NOAA will deploy a West Coast shelf model in FY 2018.
- **Physical Oceanographic Real Time Systems (PORTS®).** PORTS® provides real-time information to help mariners navigate safely and efficiently among U.S. seaports. For example, on April 3, 2016 the water levels in the Delaware River at the Newbold tide station just outside of Philadelphia were 6.29 feet below published predictions. In response to PORTS® data readings, the President of the Delaware River Pilots was able to delay the transits of two deep draft ships, thereby averting potential groundings. The 28 PORTS® systems in operation serve 61 of the busiest seaports in the Nation. Individual systems are designed to meet local needs with site-specific data and sensors; systems typically provide water levels, currents, salinity and meteorological data (e.g., wind, atmospheric pressure, visibility, and air and water temperatures) with some locations including sensors for waves and bridge clearance. PORTS® is a cost-shared program; local partners (for example, local port authorities, pilot associations, shippers, and the Department of Defense) provide funding for the sensor systems and ongoing maintenance. NOAA provides technical expertise for systems design, 24/7 quality control, data management and dissemination infrastructure, and ongoing data management. NOAA supported the initiation of new PORTS® in Savannah, GA and Cape Cod in FY 2016.

The Integrated Ocean Observing System (IOOS) program serves the dual functions of improving compatibility between Federal and regional observations and providing technical and funding support for regional observing systems. The vision of IOOS is a unified network of

Federal and non-Federal observing assets that serve coastal industries and decision-makers. By improving the accessibility and interoperability of ocean data, IOOS enables users of ocean data (modelers, researchers, meteorologists, and others) to focus their resources on developing products. Observations by NOS assets and partners are critical components of the U.S. IOOS and the Global Ocean Observing System (GOOS).

The IOOS Regional component responds to economic and environmental requirements of local communities and complements Federal ocean observations and models. NOAA supports IOOS Regional Associations through cooperative agreements for operations and maintenance, capital projects, and new sensor technology. IOOS Regional Associations deploy observing assets in accordance with nationally coordinated build-out plans. Recent focuses for investment include 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.

The Marine Sensor Innovation program supports research, development, testing, and evaluation of new sensor technology and observing strategies, and advances modeling through the Coastal and Ocean Modeling Testbed (COMT). Coordination among the research community and IOOS regional associations ensure that new observations improve operational models and forecasts.

Positioning and Geodesy

NOAA's Geodesy program defines and maintains the National Spatial Reference System (NSRS), the common reference framework for all positioning activities in the Nation. Accurate positioning underpins all NOAA's earth observations and mapping activities, as well as all transportation and infrastructure activity in the Nation. The foundational elements of this coordinate-based system—latitude, longitude, elevation, scale, gravity, and orientation – and their changes over time are essential to a wide range of important activities including mapping and charting, navigation, flood risk determination, transportation, land use, and ecosystem management. NOAA's authoritative spatial data, models, and tools are vital for the protection and management of natural resources and built infrastructure.

The NSRS improves the availability and accuracy of positional information necessary for accurate geographic information systems (GIS), active Global Positioning System (GPS) navigation and surveying, and better understanding of the Earth's geophysical dynamics. As examples, farmers use GPS applications that rely on NSRS to improve crop yields and mariners use GPS to position ships in navigation channels. In the future, autonomous vehicles will use GPS to navigate the air, land, and sea. NOAA improves the quality and accessibility of the NSRS by participating in the development of international geodetic standards, and guidelines.

A 2009 study estimated that the NSRS provides more than \$2.4 billion in potential annual benefits to the national economy.⁶ The estimated economic benefits of the NOAA Continuously Operating Reference Station (CORS) network (described below) alone were \$758 million per year. The same study estimated that a new geoid-based vertical reference system through the Gravity for the Re-Definition of the American Vertical Datum (GRAV-D) initiative would yield \$522 million in annual economic benefits, with approximately \$240 million from improved floodplain management alone.

⁶ Socio-Economic Benefits Study: Scoping the Value of CORS and GRAV-D, Levenson, 2009.

The NOAA Geodesy program comprises five major related elements:

- **Continuously Operating Reference Stations (CORS) and Passive Infrastructure.** CORS are a publicly available network of permanent GPS receivers that enable highly accurate positioning relative to the NSRS for surveyors and engineers. NOAA is working to establish a network of NOAA-owned CORS, using the most modern GPS receivers and antennas, which will enhance connection of the NSRS to the International Terrestrial Reference Frame (ITRF), creating a more consistent worldwide spatial reference frame to improve forecasts of global sea level rise and inform coastal infrastructure planning. NOAA also maintains a network of over one million permanent geodetic survey markers as part of the NSRS.
- **Modernization of the Vertical Datum.** NOAA 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. GRAV-D is a long-term 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 establish more accurate elevations for all positioning needs. This system can help communities improve resilience by determining where water flows, allowing them to make accurate inundation models and assessments.
- **Data Access and Capacity Building.** NOAA provides access to geodetic, shoreline, and aerial survey data, including data from partner organizations. As part of its technology transfer efforts, NOAA conducts workshops and hosts constituent forums around the country. NOAA also runs the Geodetic Advisor Program, which provides training and assistance to state and local geodetic and survey programs, GIS users, and coastal managers.
- **Research and Subject Matter Leadership.** NOAA develops standards, guidelines, and best practices for the surveying and positioning industry as well as a variety of models of geophysical and atmospheric phenomena that affect spatial measurements. These tools are crucial to scientific and commercial positioning activities.

Schedule and Milestones:

- Complete development of Automated Nautical Charting System II—one central database available for all formats of charts—by FY 2022
- Progressively implement data archive capability for NOAA charter mapping data from University-National Oceanographic Laboratory System (UNOLS) projects (FY 2018-2021)
- Annually increase topo-bathy shoreline data collection and reach full production levels in FY 2021
- Partner with NOAA/OAR/Ocean Acidification Program to deploy and operate ocean acidification sensors on regional IOOS platforms (buoys, shore stations, gliders)
- Transition demonstrated marine sensor tools and technologies into operations (on-going)

Deliverables:

- A total of 1,100 Electronic Navigational Charts (ENCs) made available to public by FY 2018
- Nine new editions of Coast Pilot published annually and updated weekly for download
- 120 hydrographic surveys (conducted by NOAA survey units, contractors, and other sources) evaluated and approved annually

- Enhanced procedures and technology to improve hydrographic survey efficiency via ellipsoidally-referenced surveying
- Greater than 95 percent of water level data made available to the public
- A highly-accurate gravity-based geoid based on GRAV-D data (FY 2022)
- 30 GPS satellites and ground station positions analyzed daily to ensure precise orbits
- “Quality Assurance of Real Time Oceanographic Data” (QARTOD) manuals issued for IOOS core variables
- Annual analysis of high frequency radar system performance and operational readiness
- Two or more emerging tools or technologies incorporated within two or more U.S. IOOS regions every three years

Performance Goals and Measurement Data:

Performance Measure: Hydrographic data acquired to support safe and efficient maritime commerce and for community resilience to storms and other coastal hazards (in square nautical miles) (indicator 3.3h)*	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
	3,296	2,287**	2,279	2,279	2,279	2,279	2,279
<p>Description: NOAA conducts hydrographic surveys to determine the depths bathymetry (depths) and bottom configurations of bodies of water, primarily in U.S. waters significant for navigation. This activity includes the detection, location, and identification of shoals, wrecks and obstructions with side scan, multi-beam sonar and bathymetric LIDAR. NOAA uses the data to produce nautical charts for safe and efficient navigation in support of commercial shipping and fishing, port economic growth, ferry transports and recreational boating. NOAA's hydrographic surveys are also essential for storm surge models, emergency evacuation planning, ecological forecast models, coastal zone management, etc.</p> <p>* This number represents estimated annual survey area based on anticipated fleet days at sea (DAS) and contract survey funds.</p> <p>** The FY 2017 target reflects DAS in the existing Fleet Allocation Plan.</p>							

Performance Measure: Percentage of National Shoreline and Priority Ports Shoreline updated with new aerial imagery and elevation data to improve navigation safety	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
	6.3%/ 21%	5.7%/ 25%	6.0%/ 33%	6.6%/ 33%	6.6%/ 33%	6.6%/ 33%	6.6%/ 33%
<p>Description: NOAA continuously updates the official U.S. national shoreline to provide a geographic reference that supports critical coastal activities ranging from navigation safety to emergency response. The shoreline is a key feature of nautical charts and must be updated periodically to reflect changes from storms, flooding, sea level change, erosion, and subsidence. Priority ports require more frequent updates because of their larger volumes of maritime activity. This measure tracks the percent of the entire shoreline and the percent of shoreline in priority ports that validated or updated annually using LIDAR, aerial, imagery and satellite imagery.</p>							

Performance Measure: Cumulative percent of U.S. and territories surveyed to improve vertical reference system for modernized height/elevation data (indicator 3.3i)	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
	55%	62%	70%	79%	87%	96%	100%
Description: Gravity for the Redefinition of the American Vertical Datum (GRAV-D) is collecting gravity observations for a new National Vertical Datum. This vertical reference system is the foundation for all observing systems and activities that require accurate heights. The measure indicates the percentage of the U.S. for which NOAA has the GRAV-D data necessary to support the new National Vertical Datum. The total area used to calculate the percentage includes U.S. territorial land and adjacent land and water areas necessary for final determination of a national vertical reference system.							

Performance Measure: Number of estuaries where NOAA tidal current measurements are collected annually to update the NOAA tidal current tables	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
	1	1	1	2	2	2	2
Description: The Coast and Geodetic Survey Act authorizes NOAA to conduct tide and current observations to update the NOAA annual tidal current prediction tables. This measure tracks the number of estuaries per year where NOAA will collect these tidal current measurements. Tidal current predictions enable safe navigation by providing the speed, direction, and timing of tidal currents at specific locations within and approaches to, navigationally-significant coastal waters.							

PROGRAM CHANGES FOR FY 2018:

NOAA requests a total decrease of \$10,815,000 and 13 FTE in FY 2018 program changes for the Navigation Observations and Positioning sub-program. Following this section are program change narratives for this sub-program that represent program changes greater than five percent of a program. Complete program changes by PPA can be found in the NOAA Control Table (p. Control Table-1).

PROGRAM CHANGES FOR FY 2018:

Navigation, Observations and Positioning: Eliminate Single-year Grant to Joint Ocean and Coastal Mapping Center (Base Funding: \$8,947,000 and 0 FTE; Program Change: -\$1,996,000 and 0 FTE): NOAA requests a decrease of \$1,996,000 and 0 FTE for a total of \$6,951,000 and 0 FTE to discontinue single-year cooperative agreements with academic institutions for joint ocean and coastal mapping centers. NOAA will continue to support applied research and development of survey, geospatial data management, and cartographic technologies through the Joint Hydrographic Center, the Coast Survey Development Laboratory, and other Navigation, Observation and Positioning programs.

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

Program: National Ocean Service
Sub-program: Navigation, Observations and Positioning
Program Change: Eliminate Single-year Grant to Joint Ocean and Coastal Mapping Center

Object Class		FY 2018 Decrease	FY 2018 Total Program
11	Personnel compensation		
11.1	Full-time permanent	0	62,035
11.3	Other than full-time permanent	0	352
11.5	Other personnel compensation	0	555
11.8	Special personnel services payments	0	1,279
11.9	Total personnel compensation	0	64,221
12	Civilian personnel benefits	0	18,260
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	4,584
23.2	Rental Payments to others	0	1,126
23.3	Communications, utilities and miscellaneous charges	0	1,702
24	Printing and reproduction	0	36
25.1	Advisory and assistance services	0	33,383
25.2	Other services	0	5,324
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	3,500
32	Lands and structures	0	0
33	Investments and loans	0	0
41	Grants, subsidies and contributions	(1,996)	11,536
42	Insurance claims and indemnities	0	0
43	Interest and dividends	0	0
44	Refunds	0	1
99	Total obligations	(1,996)	149,766

*Due to financial system limitation, the object class detail for the Program reflects the full Navigation, Observations and Positioning PPA.

Navigation, Observations and Positioning: Eliminate Regional Geospatial Modeling Grants (Base Funding: \$5,989,000 and 0 FTE; Program Change: -\$5,989,000 and 0 FTE):

NOAA requests a decrease of \$5,989,000 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 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	FY 2018 Decrease	FY 2018 Total Program
11 Personnel compensation		
11.1 Full-time permanent	0	62,035
11.3 Other than full-time permanent	0	352
11.5 Other personnel compensation	0	555
11.8 Special personnel services payments	0	1,279
11.9 Total personnel compensation	0	64,221
12 Civilian personnel benefits	0	18,260
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	4,584
23.2 Rental Payments to others	0	1,126
23.3 Communications, utilities and miscellaneous charges	0	1,702
24 Printing and reproduction	0	36
25.1 Advisory and assistance services	0	33,383
25.2 Other services	0	5,331
25.3 Purchases of goods & services from Govt 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	3,500
32 Lands and structures	0	0
33 Investments and loans	0	0
41 Grants, subsidies and contributions	(5,989)	7,536
42 Insurance claims and indemnities	0	0
43 Interest and dividends	0	0
44 Refunds	0	1
99 Total obligations	(5,989)	145,773

*Due to financial system limitation, the object class detail for the Program reflects the full Navigation, Observations and Positioning PPA.

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

Under the Coastal Science and Assessment sub-program, NOAA conducts applied research and delivers scientific information for disaster response and management, protection, and restoration of ocean and coastal resources. Communities and businesses that depend on coastal ecosystem services use NOAA data to mitigate adverse effects of natural resource damage and coastal ecosystem changes.

NOAA implements the activities of this sub-program under the Clean Water Act; Oil Pollution Act; Comprehensive Environmental Response, Compensation, and Liability Act; National Coastal Monitoring Act; Marine Debris Act; and Harmful Algal Bloom and Hypoxia Research and Control Act. The research from this sub-program also helps to inform NOAA's activities under the National Marine Sanctuaries Act, Coastal Zone Management Act, and international treaties and conventions.

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

- **National Centers for Coastal Ocean Science (NCCOS).** NCCOS builds the applied science foundation and delivers solutions for coastal management and resilient coastal ecosystems. NCCOS centers are located in Maryland, South Carolina, North Carolina, and Alaska.
- **Office of Response and Restoration (OR&R).** OR&R is a center of expertise in preparing for and responding to threats to coastal environments: oil and chemical spills, releases from hazardous waste sites, abandoned and grounded vessels, and marine debris. When coastal and marine natural resources suffer damages, OR&R is responsible for assessing the damage and ensuring that response and recovery actions mitigate harm to those resources and surrounding economies.

Coastal Science and Monitoring

NOAA's applied research, ecological assessment, and tool development build the scientific foundation for community, business, and regulatory decisionmaking. Studies to inform coastal management activities include biogeographic assessments, habitat mapping, and research on aquaculture siting and sustainability. Ecological forecasts such as harmful algal blooms and pathogens help communities safeguard drinking water and fisheries. Research on contaminants (including oil, hazardous chemicals, and microplastics) improves disaster response and restoration. Vulnerability assessments and shoreline stabilization tools help communities prepare for coastal inundation, storms, and flooding.

NOAA intramural research programs are necessary both to develop sustained expertise in key areas and to maintain critical partnerships with users in the emergency and resource management communities. For example, when natural resource damage occurs, NOAA has long-term monitoring datasets that establish a baseline of ecosystem conditions that existed before the event for assessing the extent of damages. The research in these areas also enables NOAA to develop resource protection strategies for marine protected areas.

The NCCOS Competitive Research Program, proposed for elimination in this Budget, conducts research, monitoring, and assessment activities through competitive extramural grants. This program has provided the only national competitive grants that are dedicated research topics under the Harmful Algal Bloom and Hypoxia Research and Control Act (HABHRCA). Grantee-

developed detection tools and forecast models for harmful algal blooms (HABs) have helped to protect public health and economic activities from poisonous seafood, unsafe drinking water supplies, and beachgoers' exposure to algal toxins. The grants also address a variety of other threats such as habitat loss, extensive shoreline modification, invasive species, and how they affect economically significant natural resources.

Close coordination among NOAA, grantee researchers, and user communities ensures that research findings and new technologies developed through this program are applied to resource management decisions. For example, the Mississippi River/Gulf of Mexico Hypoxia Task Force, which is composed of 18 Federal, state, and tribal agencies, uses monitoring and modeling from these grant-funded projects as the basis for hypoxia mitigation. The Great Lakes states use grantee research to evaluate prevention and control strategies for zebra mussels and other invasive species. Eleven states are using grantee-developed capabilities to address substantial inundation risks and impacts on the East Coast and Gulf Coast.

Ecological Forecasting

A current focus of NOS's applied science efforts is the monitoring and prediction of ecological phenomena such as harmful algal blooms (HABs), hypoxia, and marine pathogens. Their effects on human health and coastal economic activities such as fishing and tourism are increasing. For example, HABs can produce toxins that cause illness in populations that are exposed to them by air, drinking water, or direct contact. *Vibrio* bacteria in shellfish can cause food poisoning. By providing prediction and warning services, NOAA helps communities and businesses mitigate both the health risks and the economic losses from uncertainty.

NOAA's ecological forecast models synthesize the biology of algae and pathogens species, oceanographic and river data, and predictions of environmental conditions in a geographic area. NOAA provides an operational HAB forecast in the Gulf of Mexico and is transitioning a HAB forecast in Lake Erie to operations. The Gulf of Mexico HAB forecast is targeted at recreational beach visitors to minimize human health impacts from swimming or sunbathing near high-impact areas. The Lake Erie HAB forecast is targeted to municipal drinking water suppliers and recreational users in places such as Toledo, Ohio. NOAA's Ecological Forecasting Roadmap⁷ guides the transition of research to operational ecological forecasts, as resources allow.

Emergency Response, Assessment and Restoration of NOAA Trust Resources

Federal, state, and local agencies across the country depend on NOAA's science-based guidance and training to minimize environmental and economic impacts of oil and chemical spills, vessel groundings, hazardous waste releases, and national security events. NOAA also addresses persistent coastal hazards such as marine debris. NOAA emergency services include oil spill trajectory modeling, shoreline cleanup assessment, identification of sensitive resources, and information management. The Gulf of Mexico Disaster Response Center, with capacity to plan for and respond to all hazard types, is an example of NOAA's integrated regional emergency response capabilities.

After the initial response to an acute or chronic pollution event or grounding, NOAA and other natural resource trustees are responsible for determining the extent of damages to natural resources and for seeking compensation on behalf of the public for the loss of ecosystem services. NOS's Office of Response and Restoration, through its Assessment and Restoration

⁷ A Strategic Vision for NOAA's Ecological Forecasting Roadmap:
<http://oceanservice.noaa.gov/ecoforecasting/noaa-ecoforecasting-roadmap.pdf>

Division, works with NOAA's General Counsel for Natural Resources and the NMFS Office of Habitat Conservation to carry out the NOAA Damage Assessment, Remediation and Restoration Program (DARRP). NOS's role in the DARRP is to assess ecological risk and environmental and economic injury from pollution events and ship groundings. NOS also ensures that cleanup actions protect resources from further damage.

Through the DARRP, NOAA and co-trustees have secured more than \$10.3 billion for restoration from responsible parties at over 175 oil spills, Superfund sites and ship groundings, since 1998. This amount includes \$8.1 billion from the April 2016 settlement with BP for the Deepwater Horizon spill. These funds are reserved for ecosystem restoration and restoration of passive and active recreational use of the damaged resources, and does not include third party or private claims for property damage and lost business. In addition to securing resources for restoration, NOAA has also ensured that protection and restoration have been integrated into over 500 waste site cleanups to reduce further injuries and promote recovery. All these restoration projects provide economic benefits in the form of tourism, recreation (fishing, etc.), green jobs, coastal resiliency, property values and quality of life.

Getting to Restoration via a Natural Resources Damage Assessment



NOS, through the Marine Debris Program, is the Federal lead for addressing marine debris affecting the ocean and coastal environment and navigation safety in the United States. The program scope comprises prevention, research, monitoring, emergency response, removal, and regional coordination. NOAA chairs the Interagency Marine Debris Coordinating Committee and is engaged in international coordination as the chair of the United Nations Global Partnership on Marine Litter in support of the G-7 marine litter initiative. NOAA also provides science expertise for severe marine debris events.

Schedule and Milestones:

- Develop a new component of the Ecological Effects of Sea Level Rise (EESLR) program that includes research and development of integrated geophysical and socioeconomic tools for resilience planning. (EESLR competition in FY 2018; awards issued from FY 2019-2021)
- Sustain operational ecological forecasting services, develop enhanced capabilities for habitat and pathogens, and initiate transition to operations for selected HAB and hypoxia forecasts (ongoing).
- Develop, distribute, and promote the use of the high-quality ecological data, information, knowledge, and tools to support science-based decision-making and ecosystem-based management in NOAA-managed areas. (FY 2018-2020)
- 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 2018-2021)
- Resolve liability for four natural resource damage assessment cases annually (ongoing)
- Release updates to two publicly available emergency response tools (ongoing)

Deliverables:

- Predictive models and tools to evaluate natural infrastructure solutions for enhancing ecosystem services and mitigating the impacts of coastal inundation and flooding in 2-3 coastal regions (FY 2020)
- Assessments and models of shoreline and ecosystem responses to sea level rise and/or storms to inform planning and response in selected Gulf of Mexico, Atlantic, and Pacific coastal communities (FY 2018-2020)
- Pathogen forecasts in the Chesapeake Bay, Delaware Bay, and Pacific Northwest (FY 2018-2020)
- Geospatial data, mapping products, and integrated assessments to inform management, restoration, and research plans in the Gulf of Mexico and in selected National Marine Sanctuaries and Research Reserves (FY 2018-2020)
- Two research projects funded annually that address marine debris research and development priorities (ongoing)
- Improved spill trajectory models for Beaufort/Chukchi Seas (FY 2018-2019)
- Updated Arctic operational oceanographic and oil fate and behavior models to include oil-in-ice behavior to support oil spill response (FY 2019)
- Improved understanding of the behavior of oil in ice among responders and the public (FY 2020)
- Public release of updated and enhanced environmental sensitivity indexes (ESIs) that aid

public decision making during coastal disasters from oil spills to nuisance flooding (FY 2018-2022)

- Update Environmental Sensitivity Index (ESI) Maps for the NW Arctic, North Slope and Great Lakes (FY 2018-2020)

Performance Goals and Measurement Data:

Performance Measure: Percent of all coastal communities susceptible to harmful algal blooms verifying use of accurate HAB forecasts (indicator 3.3j)	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
	18%	23%	23%	23%	23%	23%	23%

Description: This measure indicates the combined coverage and utility of HAB forecasts for providing decision support to vulnerable communities through customer feedback after a forecasted HAB event. NOAA activity that supports applications of forecast information include efforts to understand causes of HABs and their impacts, forecast products, and training to decision makers. throughout the coastal U.S.

Performance Measure: Number of emergency responders (Federal, state, local) trained in technical and scientific elements of incident response (annually)	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
	2,054	2,000	2,000	2,000	2,000	2,000	2,000

Description: To protect coastal communities and ecosystems following oil and chemical spills and other incidents, emergency responders need technical expertise and an understanding of the relevant science. This measure tracks the number of emergency responders trained by OR&R in science of oil, chemical, and all hazards response. These trainings provide responders (including Federal, state, and local personnel) with tools and knowledge to make science-based decisions when pollution threatens our coasts and waterways. Techniques and tools include Shoreline Cleanup and Assessment Technique, Science of Oil Spills Classes, Environmental Response Management Application, CAMEO software and others.

Performance Measure: Metric tons of marine debris removed from coastal areas annually	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
	1,633	400	400	400	400	400	400

Description: Marine debris is a global issue with impacts including wildlife injury and death from entanglement or ingestion, exposure to toxic chemicals, vessel damage, economics loss, and habitat destruction. This measure reflects the metric tons of marine debris removed from coastal areas as a direct result of NOAA funding. NOAA's overall impact on marine debris is even greater than this number indicates. The Marine Debris Program's prevention, research, and emergency planning support also help reduce the impacts of debris across the country.

PROGRAM CHANGES FOR FY 2018:

NOAA requests a total decrease of \$10,624,000 and 8 FTE in FY 2018 program changes for the Coastal Science and Assessment sub-program. Following this section are program change narratives for this sub-program that represent program changes greater than five percent of a program. Complete program changes by PPA can be found in the NOAA Control Table (p. Control Table-1).

PROGRAM CHANGES FOR FY 2018:

Competitive Research: Eliminate NCCOS competitive funding support for research on ecological threats (Base Funding: \$8,983,000 and 0 FTE; Program Change: -\$8,983,000 and 0 FTE):

NOAA requests a decrease of \$8,983,000 and 0 FTE for a total of \$0 and 0 FTE to eliminate NCCOS competitive grants to academic research institutions.

Proposed Actions:

NOAA proposes to eliminate the NCCOS Competitive Research program, which provides grants to academic institutions to conduct ecological research that advances NOAA's missions. FY 2018 is scheduled to be the final year of funding for 35 of 50 open awards. To the extent possible, NOAA will use any FY 2017 appropriations for the program to complete funding cycles for existing projects. At least 13 projects will not receive complete funding under the baseline scenario, and will need to find alternative sources of funding to finish their research and technology transitions.

Resource Assessment:

The NCCOS Competitive Research Program conducts research, monitoring, and assessment activities through competitive extramural grants. The program executes three- to five-year cooperative agreements for peer-reviewed, interdisciplinary research investigations that address specific coastal management needs. This funding mechanism complements NCCOS intramural research by bringing together expertise from academic institutions, businesses, and government laboratories. Grantees generally research questions of different scopes and time scales than those that NOAA laboratories address, as well as contributing additional multi-disciplinary expertise.

Resource managers and stakeholders are part of the teams that synthesize and transition research findings into tools for coastal decision-making. The funding currently supports a diverse portfolio of 10 programs with 48 projects and 85 associated awards to 181 institutions and over 333 principal investigators. Topics include

- Harmful algal bloom (HAB) prediction and tools to prevent, control, or mitigate their occurrence and impacts;
- The causes and biological impacts of hypoxia (low oxygen) in coastal waters;
- Coastal ecosystems changes from inundation, coastal storms, and erosion;
- The economic value of protecting the shoreline from coastal storms using natural infrastructure;
- The combined effects of ocean acidification and hypoxia on economically and ecologically significant species and habitats.

NCCOS extramural research grants are responsible for much of the body of science that underpins NOAA forecasts of ecological hazards. NOAA currently produces operational forecasts for HABs off the Texas coast and West Florida Shelf, as well as operational weekly HAB bulletins for Lake Erie. In addition NOAA has experimental research models for HABs, hypoxia and marine pathogens in vulnerable coastal and Great Lakes areas around the country. A number of these capabilities, such as weekly HAB bulletins for the Gulf of Maine and seasonal hypoxia models for the Gulf of Mexico and Chesapeake Bay, would be eliminated under this proposal.

Performance Goals and Measurement Data:

Performance Measure: Cumulative number of coastal, marine and Great lakes forecasts capabilities developed and used for management (indicator 3.3d; NCCOS contribution only)	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
With Decrease	N/A	N/A	7	7	7	7	7
Without Decrease	7	7	10	11	13	14	14

Description: NOAA's forecast models allow resource managers to 1) Make decisions based on predicted environmental and socioeconomic impacts related to a particular issue; 2) Use 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. This measure counts discrete forecast capabilities, which may include multiple topics in a single geographic area.

Performance Measure: Annual number of coastal, marine, and Great Lakes ecosystem sites adequately characterized for management (indicator 3.3c)	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
With Decrease	N/A	N/A	8	8	8	8	8
Without Decrease	10	10	10	10	10	10	10

Description: This measure tracks the number of ecosystem characterizations that provide the scientific basis for most management and regulatory decisions concerning coastal and ocean resources. They also form the foundation for plans to manage those resources and evaluate the effectiveness of management actions. Users of these data include NOAA programs and other Federal, state, local, regional, and territorial entities. Ecological characterizations inform resource management decisions such as

1. Sites for place-based protection, including marine protected areas and habitat areas for managed species;
2. The location of offshore development such as wind farms, aquaculture operations, and the routing of undersea cables;
3. State and local management of marine resources; and
4. Restoration of damaged coastal and marine resources.

Ecological characterizations usually require several years to develop.

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

Program: National Ocean Service
Sub-program: Coastal Science and Assessment
Program Change: Eliminate NCCOS Competitive Funding Support for research on ecological threats

Object Class	FY 2018 Decrease	FY 2018 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	(8,983)	0
42 Insurance claims and indemnities	0	0
43 Interest and dividends	0	0
44 Refunds	0	0
99 Total obligations	(8,983)	0

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 use place-based, community, and regional approaches to achieve sound management and sustainable use of coastal and marine resources. These approaches emphasize collaboration across governments and sectors for capacity building, applied science, education, regulation, and direct management. NOAA conducts these activities under the Coastal Zone Management Act; the 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 carry out the activities within the Ocean and Coastal Management and Services sub-program:

- **Office for Coastal Management (OCM).** OCM supports implementation of states' coastal management programs, including technical assistance such as NOAA's Digital Coast Partnership, and the Coral Reef Conservation Program. The office also administers and supports regional partnerships of coastal states and activities under the Ocean Thermal Energy Conversion Act and the Deep Seabed Hard Mineral Resources Act.
- **Office of National Marine Sanctuaries (ONMS).** This program office is responsible for the stewardship and management of the National Marine Sanctuary System. Within ONMS, the National Marine Protected Areas Center is responsible for developing and coordinating a national system of marine protected areas to advance national conservation goals and to identify additional areas in need of protection.

Coastal Zone Management and Services

While NOAA and other Federal agencies possess significant science and data capabilities to support coastal resource management, most decisions that affect the resilience of coastal communities occur at state and local levels. NOAA makes its significant scientific expertise and data capabilities available to state and local decisionmakers.

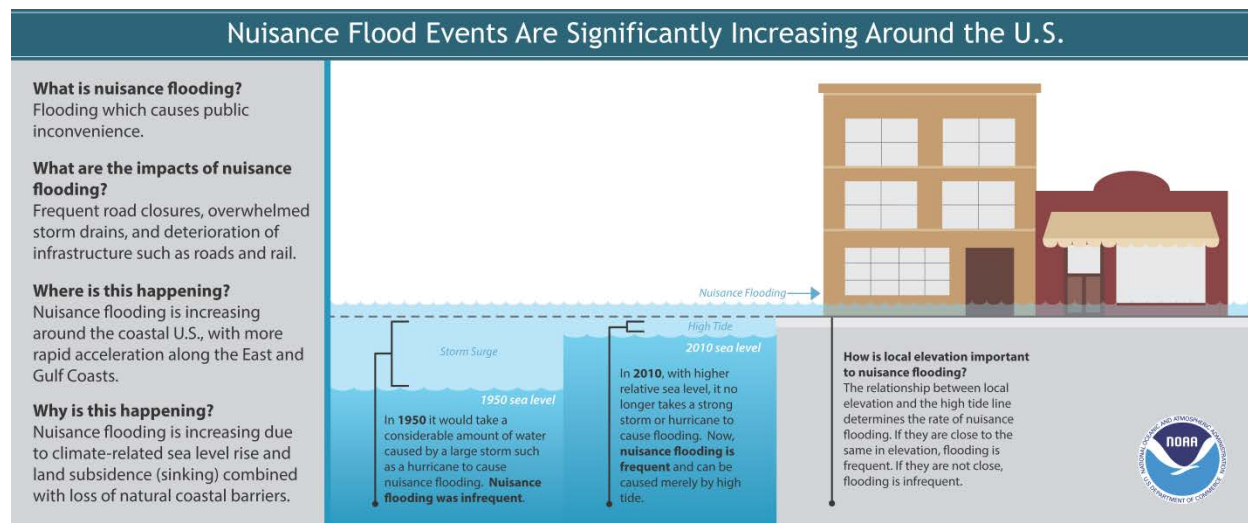
National Coastal Zone Management Program

The Nation's coasts are managed through a voluntary partnership program between NOAA and the coastal and Great Lakes states and territories. Authorized by the Coastal Zone Management Act of 1972, the National Coastal Zone Management (CZM) Program provides the basis for protecting, restoring, and responsibly developing the nation's diverse coastal zone. The 34 participating states' management plans balance competing demands of resource use, economic development, and conservation for 61,567 miles of coastline. This includes coastal access and tourism, as well as important decisions about where and how coastal homes, businesses, and infrastructure are built.

Coastal management programs lead this decision making process, weighing economic and environmental considerations. NOAA provides policy guidance and technical assistance, helping states, businesses, and stakeholders to navigate complex sets of laws and regulations

that govern our coasts. NOAA also assesses the performance of each state program approximately every seven years, measuring progress toward individual state and national program goals. Participating states gain authority to review Federal actions in state coastal waters and ensure that they are consistent with enforceable policies of their state programs.

NOAA’s training, mapping and decision support tools, are critical components of the CZM program that ensure that coastal resources continue to be an engine for economic growth. One such product is the Digital Coast, a NOAA-sponsored set of information, tools and training that helps communities address coastal issues. It is one of the most-used resources in the coastal management community. A NOAA internal study estimated cost-benefit ratio of 1:3 for Digital Coast, with net benefits of \$25 million.⁸ One tool in the Digital Coast portfolio, the Coastal Flooding Impacts Viewer tool, integrates flood projection maps, digital elevation models, and realistic visualizations to show planners and engineers how flooding affects landmarks and infrastructure. City planners for Charleston, South Carolina, used the tool to formulate their sea level rise strategy, which the city council adopted in May 2016. The city prioritized future investments that would reduce dramatic economic losses from flooding-related coastal property damage and tourism impacts.



Nuisance flooding is among the many increasing threats to coastal communities that NOAA addresses through CZM technical assistance activities and Coastal Management Grants.

Coastal Zone Management Grants, proposed for elimination in this Budget, assists states with their participation in the CZMP. Over the 45-year history of the Program, participating states and Federal agencies have partnered to streamline permitting and regulatory processes, reduce the costs associated with disasters, and address environmental risks with potentially catastrophic economic impacts. Steady support for these functions has helped states to balance multiple priorities along the coast in a transparent way, reducing regulatory uncertainty that might otherwise have hampered economic activity. States with more modest CZM programs have especially benefitted from consistent resources for these functions. Another major use of the Grants has been public infrastructure projects- such as beach access facilities, boat ramps, and fishing piers--for recreation and other uses.

⁸ Projected Benefits and Costs of the Digital Coast. NOAA, 2009. <https://coast.noaa.gov/data/digitalcoast/pdf/benefits-costs.pdf>

Over their long history, CZM grants have been especially important to giving participating states a baseline level of support to access NOAA's technical assistance resources. For example, the CZM program in California worked with NOAA to develop risk and vulnerability assessments of seismic and flood threats for transportation assets in Alameda and Contra Costa counties. Implementing the resulting plan will better protect at least \$6 billion in transportation infrastructure and four refineries that produce 800,000 barrels of gasoline a day--a quarter of the state's total refining capacity. A similar plan developed by Texas coastal management agencies will protect critical energy infrastructure and waterborne commerce worth \$25 billion annually passing through the Gulf Intracoastal Waterway. The 27 Texas refineries represent 29 percent of the Nation's refining capacity at more than 5.1 billion barrels of crude oil per day. The Georgia CZM program raised a causeway—the only road to Tybee Island—to mitigate flood risks that it identified using NOAA tools. The road is essential to recreation and tourism in the area. These are just a few examples. Zillow recently completed a study with Digital Coast tools that showed six feet of sea level rise would affect 1.9 million homes and \$882 billion in real estate value along east and Gulf coasts.

National Estuarine Research Reserve System

The National Estuarine Research Reserve System (NERRS) is a national network of state-managed protected areas established under the Coastal Zone Management Act. The NERRS is a partnership between participating states and NOAA. NOAA provides national guidance and technical assistance while state agencies and universities perform day-to-day operations and management of individual reserves with input from local partners.

The network of 29 unique reserves, located in 23 states and territories, protects over 1.3 million acres of state-owned estuarine lands and waters. They are economically significant areas that attract recreation and tourism activity, support commercial and recreational fisheries, and provide natural infrastructure for coastal protection and water quality. The sites provide meaningful, hands-on educational experiences for adults, children, and teachers. The NERRS contributes billions of dollars to the shellfish and seafood industry in participating states and tens of billions of dollars in ocean-dependent industries. Coastal wetlands such as those protected by the NERRS, provide \$26 billion in storm protection each year.

Reserves also serve as “living laboratories” for developing solutions to crucial issues such as climate adaptation, invasive species, habitat protection, and water quality. In 2016, reserves provided 82,000 hours of assistance to coastal decision-makers through 276 training programs. According to a survey by the National Estuarine Research Reserve Association, NERRS scientific and technical services reach over 2,500 municipalities and 570 businesses nationwide. NERRS science translates readily into actions on the ground. For example, the Jacques Cousteau NERR in New Jersey developed a community self-assessment process to help over 30 municipalities to reduce risk and costs associated with severe weather impacts, such as those resulting from Hurricane Sandy. Some communities in NJ reduced flood insurance premiums for their citizens by 5 to 20 percent as a result, with greater reductions possible in the future. For one community (Brigantine Beach), residents have saved over \$1 million annually thus far. Nationwide, similar actions could result in at least \$62 million per year in flood insurance premiums savings for coastal communities.

NOAA and the State of Hawaii designated the system's 29th reserve in January 2017. The new He'eia National Estuarine Research Reserve covers over 1,000 acres of land and water in Kane'ohe Bay in Oahu, Hawai'i. The University of Hawai'i's Institute of Marine Biology is managing the site in collaboration with a wide array of state and local partners.

Coral Reef Program

NOAA's Coral Reef Conservation Program brings together multidisciplinary expertise from across NOAA to conserve and restore coral reefs. The program has partnerships with state, jurisdictional and international coastal resource managers. Coral reefs are among the most biologically diverse ecosystems in the world, providing a range of economic benefits and vital ecosystem services such as food, recreation, marine habitat, medicines, coastal protection, climate regulation, and biodiversity. 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.⁹ Rapid declines in coral reefs – 19 percent of the world's reefs are effectively lost and up to 75 percent are seriously threatened – have dire consequences for approximately 500 million people who depend on them for their livelihoods.¹⁰

The Coral Program integrates coral protection efforts across NOAA and other agencies to address overfishing, harmful fishing practices, ocean temperature changes, ocean acidification, land-based sources of pollution¹¹, and other threats. The program's approaches include ecosystem-based management initiatives to build marine protected area (MPA) management capacity; monitoring and forecasting of threats to coral reefs; and partnerships to address and reduce impacts of land-based sources of pollution. Land-based sources of pollution are major threats to coral reef ecosystems. NOAA works with jurisdictions that are upstream of coral reefs to develop 'ridge to reef' watershed management plans. These plans ensure that coral reef ecosystems are integrated into watershed planning processes.

Sanctuaries and Marine Protected Areas

National Marine Sanctuaries

NOS serves as the trustee for a national system of 13 marine sanctuaries and Papahānaumokuākea Marine National Monument. The underwater parks range in size from the one square mile (Monitor National Marine Sanctuary near Cape Hatteras, North Carolina) to the 139,797 square miles (Papahānaumokuākea Marine National Monument along the northwestern portion of the Hawaiian Archipelago). Together, these areas encompass over 179,000 square miles of ecologically significant marine habitats and maritime heritage assets (such as shipwrecks). Unique habitats include deep ocean and nearshore 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 seagrass beds. Across all National Marine Sanctuaries, about \$8 billion annually is generated in local coastal and ocean dependent economies from diverse activities like commercial fishing, research and recreation/tourism-related activities.

NOAA protects these U.S. ecological and cultural assets through community engagement, applied management, research and monitoring, education, and outreach. It develops and implements comprehensive management plans to ensure effective protection and sustainable use of resources under sanctuary system protection. NOAA tailors each plan to the specific goals of each site and individual sanctuary and monument offices tailor daily operations and activities to the unique resources and needs of their communities. ONMS leverages partnerships to facilitate system-wide research and monitoring and to enforce the laws and regulations protecting sanctuary resources. It maintains a robust volunteer program, including

⁹ The Economics of Ecosystems and Biodiversity (TEEB), 2009.

¹⁰ Wilkinson, C. *Status of Coral Reefs of the World*, 2008.

¹¹ Burke et al. *Reefs at Risk Revisited*, 2011.

citizen science (projects in which volunteers partner with scientists), and uses formal processes to solicit and respond to communities input.

Marine Protected Area Coordination

The NOAA Marine Protected Areas (MPA) Center, part of the Office of National Marine Sanctuaries, provides science, policy, and management tools to advance the effective use of MPAs for national conservation and management objectives. The MPA Center coordinates the various Federal, state, and tribal MPA programs to develop a comprehensive and integrated national system of MPAs, including NERRs and sanctuaries. This coordination includes developing curricula, trainings, and virtual tools such as webinar series to improve management capacity of MPA programs. The Center also coordinates internationally with agencies that manage sister sites that share migratory species or have similar habitat and management challenges. The MPA Federal Advisory Committee includes representatives of industry, user groups, scientists, and others who advise on the management of the national system.

Schedule and Milestones:

- Analyze coastal land cover in coastal regions (in each region every five years) to better understand trends in and impacts of land use and other management decisions
- Provide trainings and workshops to build skills within coastal management communities and promote transparent decision-making (FY 2018-2022)
- Deliver technical assistance to coastal communities to use Digital Coast for decisions (FY 2018-2022)
- Implement best practices to reduce pollutant loadings in U.S. Coral Reef Task Force priority watershed sites and NOAA Habitat Focus Areas (FY 2018-2022)
- Conduct coral reef assessment and monitoring cruises in Pacific and Atlantic/Caribbean (FY 2018-2022)
- Implement additional sentinel monitoring activities 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 2018-2022)
- Implement information management protocols, infrastructure, and partnerships for ONMS Sentinel Monitoring Program (FY 2018-2019)
- Complete the boundary modification processes for Flower Garden Banks and Monitor national marine sanctuaries (FY 2018)

Deliverables:

- Data, mapping, tools, and information resources made available through Digital Coast to address competing uses of coastal resources and adaptation to coastal hazards and climate change
- On-site and interactive webinar training to introduce successful approaches and best practices to address future risks from coastal storms or other hazards
- Annual updates of Economics - National Ocean Watch data to characterize the economic and job impacts of ocean and coastal activity
- Forecasts and models that enable reef managers' monitoring of and response to coral bleaching events
- Improved coral bleaching forecasts and ocean acidification models

- Management strategies to improve coral reef protection through targeted research to better understand impacts of stressors to coral reefs
- Complete assessments on management effectiveness of 20 Marine Protected Areas (MPAs) in priority coral reef sites
- Marine acoustics programs to determine the distribution of marine mammals and vessel traffic patterns at Stellwagen Bank and Channel Islands sanctuaries
- Education initiatives at all sites to protect marine mammals from vessel strikes
- Rapid response marine mammal disentanglement and rescue operations
- New education, survey, and eradication programs to avoid and mitigate introduction of invasive species in multiple sanctuaries
- Final environmental impact statements for Flower Garden Banks and Monitor national marine sanctuaries (FY 2018)

Performance Goals and Measurement Data:

Performance Measure: Number of priority sites with completed and approved watershed management plans	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
	19	21	21	21	21	21	21
Description: Land-based sources of pollution (LBSP) are a major threat to coral reefs globally. NOAA's Coral Reef Conservation Program (CRCP) reduces LBSP from watersheds located upstream from coral reef areas by helping communities in those watersheds implement watershed management plans or conservation action plans to reduce pollution. In 2010, management priority setting processes were conducted by the CRCP for each of the U.S. coral reef jurisdictions and 19 coral reef geographic priority sites containing one or more watersheds. This measure tracks the cumulative number of watersheds within priority sites that have complete and approved watershed management plans (WMPs) or conservation action plans (CAPs).							

Performance Measure: Number of participants in focus area training activities (annual)	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
	1,839	1,159	1,182	1,182	1,182	1,182	1,182
Description: To effectively manage coastal communities and resources, decision-makers and managers need a diverse array of skills and knowledge. This measure tracks the number of participants trained by the NOAA Office for Coastal Management 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 natural resource environments managed by the Office of National Marine Sanctuaries (ONMS) in which water, habitat and living resource quality is stable or improving	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
	9	9	9	9	10	10	10
Description: Each natural resource protection site within the National Marine Sanctuary System periodically assesses the condition of those natural resources. ONMS works with independent experts to identify and document resource trends in <i>Condition Reports</i> (available on-line) produced during the management plan review cycle. This measure reports the number of environments, defined for each site in its respective <i>Condition Report</i> (e.g., nearshore, offshore, entire site), rated as having “stable” or “improving” water, habitat and living resource quality in its most current evaluation. An environment is considered to be maintaining or improving water, habitat and living resource quality if trends for no more than 20 percent of relevant <i>Condition Report</i> questions have been rated as declining. Targets reflect the long time horizons required to stabilize or improve an environment.							

PROGRAM CHANGES FOR FY 2018:

NOAA requests a total decrease of \$99,811,000 and 8 FTE in FY 2018 program changes for the Ocean and Coastal Management and Services sub-program. Following this section are program change narratives for this sub-program that represent program changes greater than five percent of a program. Complete program changes by PPA can be found in the NOAA Control Table (p. Control Table-1).

PROGRAM CHANGES FOR FY 2018:

Coastal Management Grants: Eliminate Coastal Zone Management Grants and Regional Coastal Resilience Grants (Base Funding: \$74,858,000 and 0 FTE; Program Change:

-\$74,858,000): NOAA requests a decrease of \$74,858,000 and 0 FTE for a total of \$0 and 0 FTE to eliminate two grant programs that support actions of states and other grantees under the Coastal Zone Management Act.

Proposed Actions:

NOAA proposes to eliminate grants to state governments under the Coastal Zone Management Program and grants to eligible applicants under the Regional Coastal Resilience Grant Program. NOAA will continue to support states' participation in the National CZM program by reviewing and supporting implementation of states' management plans, supporting Federal consistency reviews, and providing technical assistance services.

Resource Assessment:

NOAA currently provides financial assistance for implementation of states' CZM programs in the form of Coastal Zone Management Grants. States match most of the CZM Grants on a 1:1 basis. States spend these funds on a broad range of approved activities under the CZMA 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. State expenditures with CZM Grant funding and matching funds include salaries for 935 state government jobs. NOAA allocates the majority of CZM Grant funding using formulas based on shoreline lengths and coastal populations. NOAA also competitively awards a portion of the Coastal Zone Enhancement funding (CZMA Section 309) for projects of special merit.

The Regional Coastal Resilience Grants program provides competitive grants for collaborative activities that build community and ecosystem resilience to extreme weather, hazards and changing conditions. Eligible applicants include collaborative groups of states, tribes, local governments, public/private partnerships and nonprofit organizations. This program is coordinated with NMFS' Coastal Ecosystem Resilience Grants program which is also proposed for elimination (see NMFS-49).

In FY 2016, States provided \$57 million in matching funds for Coastal Zone Management Grants activities and projects, and recipients of Regional Coastal Resilience Grants provided \$2.5 million in matching funds.

Performance Goals and Measurement Data:

Performance Measure:	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
Number of communities that utilize Digital Coast (indicator 3.3a)							
With Decrease	N/A	N/A	5,000	5,000	5,000	5,000	5,000
Without Decrease	5,043	5,500	5,500	5,500	5,500	5,500	5,500

Description: Digital Coast is a web-based platform that provides public access to coastal data (e.g., coastal LIDAR, coastal land cover change, socioeconomic data, electronic nautical

charts, and emergency response imagery) and tools, training, and case studies useful to turn these data sets into actionable information. Communities can use this information to support coastal management activities such as conserving and restoring habitat, protecting from storms and coastal hazards, revitalizing urban waterfronts and ports, and providing public recreational access. For this measure, communities are defined as Census-designated places within coastal states including all Census-defined cities, towns, townships, boroughs, and incorporated municipalities. A community is considered to be using Digital Coast if it visits the website or downloads a dataset or tool each year.

Performance Measure: Percentage of U.S. coastal states and territories demonstrating 20 percent or more annual improvement in resilience capacity to weather and climate hazards (indicator 3.3g)	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
With Decrease	N/A	N/A	60%*	60%*	60%*	60%*	60%*
Without Decrease	74%	66%	71%	77%	77%	77%	77%

Description: This measure tracks a range of contributions that address coastal community risk, vulnerability, and resilience to coastal hazards. It does this by using a formula that incorporates a variety of NOAA-sponsored activities (such as training and technical assistance) in which communities have engaged to mitigate their susceptibility to coastal hazards. The Office for Coastal Management and NOAA Sea Grant provide the communities with this support. Each state or territory that achieves the capacity goal contributes about three percent to the annual figure. Hence, 60 percent means 21 of the 35 coastal states and territories achieved the goal. * This level of performance assumes that both CZM and Stewardship and Sea Grant PPAs are supported at FY 2017 Annualized CR levels.

Performance Measure: Annual number of new or improved public access sites through CZM program	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
With Decrease	N/A	N/A	0	0	0	0	0
Without Decrease	283	250	250	250	250	250	250

Description: The Coastal Zone Management program helps communities provide the public with recreational access to the coast by funding projects such as walking paths to the shore; publicly owned parks, beaches, piers that provide fishing access to coastal waters; boardwalks and trails associated with coastal habitat such as wetlands, forests, and marshes; access to historic areas or structures such as lighthouses; and boat launches, ramps, docks, and marinas. This measure tracks the number of sites where public recreational access has been created or improved each year.

Performance Measure: Number of coastal communities that complete projects to reduce future damage from or increase public awareness of hazards with assistance from OCM funding or staff (annual)	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
With Decrease	N/A	N/A	18	15	12	12	12
Without Decrease	95	85	95	105	115	115	115
<p>Description: NOAA's Coastal Zone Management program supports a variety of state and local efforts to ensure that coastal communities are aware of and prepared for coastal hazards (e.g., flooding, coastal storms). These efforts include the development or update of local coastal hazard plans, local coastal hazard mitigation policies, ordinances or codes, technical assistance, education and outreach, and on-the-ground projects to reduce future damage from hazards.</p> <p>This measure tracks the number of communities that complete awareness/preparedness projects with assistance from CZM funding or staff. Targets reflect the fact that some projects require multiple years to complete. The CZMA Performance Measure System Guidance defines a coastal community as a unit of local government or a special unit of government, such as a planning district. In coastal zones without local governments (e.g., U.S. territories), a coastal community may be an administrative body or organization that formally represents a local geographic area. This measure includes projects supported by Regional Coastal Resilience Grants.</p>							

Performance Measure: Number of participants in training events offered through CZM programs (annual)	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
With Decrease	N/A	N/A	1,500	1,500	1,500	1,500	1,500
Without Decrease	22,983	20,000	20,000	20,000	20,000	20,000	20,000
<p>Description: This measure captures training that provides scientific and technical information and skill-building opportunities to individuals who are responsible for making decisions that affect coastal resources. Using a range of approaches, CZM programs provide coastal decision-makers with the knowledge and tools they need to address critical resource management issues. Training includes events for audiences that focus on more technical subject matter than those provided through educational activities.</p>							

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

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

Object Class	FY 2018 Decrease	FY 2018 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 Govt 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	(74,858)	0
42 Insurance claims and indemnities	0	0
43 Interest and dividends	0	0
44 Refunds	0	0
99 Total obligations	(74,858)	0

National Estuarine Research Reserve System: Eliminate Federal Funding Support for NERRS (Base Funding: \$22,957,000 and 0 FTE; Program Change: -\$22,957,000 and 0 FTE): NOAA requests a decrease of \$22,957,000 and 0 FTE to eliminate Federal funding support to states for the operations and management of the National Estuarine Research Reserve System.

Proposed Actions:

NOAA proposes to discontinue NOAA grants to state agencies and academic institutions that support operations of the National Estuarine Research Reserve System (NERRS). Under this proposal, NOAA will continue to provide national-level system coordination and in-kind support to state governments that choose to continue operating the reserves using state funds.

Resource Assessment:

NOAA’s base provides Federal funding support to states for operation of NERRS. Federal NERRS funding (70 percent) is matched by states (30 percent) for reserve operations, research, monitoring, training and education. Matching funds from States for NERRS total approximately \$6.5 million per year for all types of NERRS grants. Reserves employ over 400 professionals.

Federal grants also support the NERR System-wide Monitoring Program (SWMP) and the NERRS Science Collaborative. The SWMP generates long term datasets on water quality, meteorological time series data as well as habitat data important to local and state decision-makers and Federal agencies. The NERRS Science Collaborative is the competitive grant program through which most of the NOAA-funded research undertaken at the reserves is accomplished. NOAA awards an average of \$3 million each year. All projects contribute to the national effort to make the coast more resilient to natural and man-made changes. A unique aspect is the community involvement in designing and carrying out each project. The interconnectivity of the reserve system often enables project findings from one reserve to inform conservation at other sites.

Performance Goals and Measurement Data:

Performance Measure:	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
Annual number of data points collected in national estuarine research reserves via monitoring stations (millions)							
With Decrease	N/A	N/A	0.0	0.0	0.0	0.0	0.0
Without Decrease	66.2	47.4	50.0	50.0	50.0	50.0	50.0

Description: The System-wide Monitoring Program (SWMP) of the National Estuarine Research Reserve System (NERRS) collects water quality and meteorological data to assess impacts of contaminant spills, measure impacts from stormwater and hurricanes, and identify conditions related to fish kills and shellfish diseases. The data help track short-term variability and long-term changes in coastal waters to understand the effects of human activities and natural events. This measure tracks the how much data the program collects each year.

Performance Measure: Number of communities that utilize Digital Coast (indicator 3.3a)	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
With Decrease	N/A	N/A	5,000	5,000	5,000	5,000	5,000
Without Decrease	5,043	5,500	5,500	5,500	5,500	5,500	5,500

Description: Digital Coast is a web-based platform that provides public access to coastal data (e.g., coastal LIDAR, coastal land cover change, socioeconomic data, ENC's, and emergency response imagery) and tools, training, and case studies useful to turn these data sets into actionable information. Communities can use this information to support coastal management activities such as conserving and restoring habitat, protecting from storms and coastal hazards, revitalizing urban waterfronts and ports, and providing public recreational access. For this measure, communities are defined as Census-designated places within coastal states including all Census-defined cities, towns, townships, boroughs, and incorporated municipalities. A community is considered to be using Digital Coast if it visits the website or downloads a dataset or tool each year.

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

Program: National Ocean Service
Sub-program: Ocean and Coastal Management and Services
Program Change: Eliminate Federal Funding Support for NERRS

Object Class	FY 2018 Decrease	FY 2018 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 Govt 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	(22,957)	0
42 Insurance claims and indemnities	0	0
43 Interest and dividends	0	0
44 Refunds	0	0
99 Total obligations	(22,957)	0

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

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

National Estuarine Research Reserve System Construction and Land 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. Through 2017, NOAA funded NERRS construction and land acquisition projects on a competitive basis. For PAC, NERRS funding has been matched 70:30 (Federal: state) for facilities construction and 1:1 for land acquisition.

Reserves are state-owned lands and onsite facilities operated and managed by the states. They provide opportunities for researchers as well as the public to better understand these estuarine areas. Facilities investments at the reserves aligned with system-wide construction plans that consider requirements for implementing core NERRS programs and external opportunities for partnerships. States also used these grants to acquire additional nearby critical habitat within, or adjacent to, reserve boundaries to increase protection and provide places for conducting long-term science, education, and demonstration programs.

National Marine Sanctuaries Construction

NOS administers the Nation’s system of 13 Marine Sanctuaries and the Papahānaumokuākea Marine National Monument under the National Marine Sanctuaries Act. PAC funding supports capital costs of maintaining the Sanctuary Program’s facilities and small boat fleet. Vessels for research, monitoring, enforcement and emergency response are essential to site management, especially in areas such as Florida Keys National Marine Sanctuary. Capital funding is critical to ensure these assets remain mission effective and to keep their life cycle costs under control.

The program’s comprehensive facilities plan prioritizes capital investment in facilities, exhibits and collaborative education and visibility projects. In order to establish better understanding and appreciation for sanctuary and other ocean resources by the public, the program develops and maintains a network of exhibits, signage, and kiosks. Whenever possible NOAA develops cooperative centers at existing aquaria, museums and other appropriate facilities to engage the public and environmental decision-makers on conservation issues. Capital requirements for sanctuary facilities include safety improvements, Americans with Disabilities Act upgrades, and capital maintenance.

Out-year Funding Estimates (\$ in Thousands):

National Marine Sanctuaries Construction	FY 2017 & Prior	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	CTC	Total
Change from FY 2018 Base	-	-	-	-	-	-		-
Total Request	112,361	1,996	1,996	1,996	1,996	1,996		Recurring

Schedule and Milestones:

- 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 2018-2022)

Deliverables:

- Completion of ongoing projects at one of three sites: Crissy Field in San Francisco, CA, Gulf of Farallones National Marine Sanctuary, Galveston, TX, Flower Gardens Banks National Marine Sanctuary, or Scituate, MA, Stellwagen Bank National Marine Sanctuary
- Construction of exhibits, signage, and kiosks

PROGRAM CHANGES FOR FY 2018:

National Estuarine Research Reserve Construction: Eliminate Federal Funding Support for NERRS Construction (Base Funding: \$1,697,000 and 0 FTE; Program Change:

-\$1,697,000 and 0 FTE): NOAA requests a decrease of \$1,697,000 to eliminate Federal funding support to states for National Estuarine Research Reserve System land acquisition and construction.

Proposed Actions:

NOAA proposes to discontinue grants to state agencies and academic institutions for construction and land acquisition activities within the National Estuarine Research Reserve System. Under this proposal, NOAA will continue to provide national-level system coordination and in-kind support to state governments that choose to continue operating the reserves using state funds.

Resource Assessment:

NOAA's base provides Federal funding support to states for capital construction and land acquisition expenses within the NERRS. States match Federal funding for facilities construction by providing 30 percent of the project cost, with the remaining 70 percent covered by the Federal grant. States match Federal grants for land acquisition 1:1. Matching funds from States for NERRS total approximately \$6.5 million per year for all types of NERRS grants. These activities will be eliminated under this proposal.

Performance Goals and Measurement Data:

Performance Measure:	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
Annual number of NERRS facility construction projects that improve safety or environmental sustainability							
With Decrease	N/A	N/A	0	0	0	0	0
Without Decrease	6	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 to address safety or inadequate facilities, improve environmental sustainability or public use/access. Recent examples of construction projects include dock and boardwalk replacements to provide safe access to reserve habitats at the Great Bay, Wells, and Chesapeake Bay, Virginia NERRS; sustainable technology at recreation and research facilities at the Mission Aransas and Weeks Bay NERRS that reduce reliance on energy and water utilities; updated exhibits at the Lake Superior, Jacques Cousteau, and Delaware NERRs that provide enhanced visitor awareness of reserve resources; and a new field station at the Rookery Bay NERR to provide dorms and enhanced access to the reserve for researchers.

Out-year Funding Estimates (\$ in Thousands):

NERRS Construction and Land Acquisition	FY 2017 & Prior	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	CTC	Total
Change from FY 2018 Base	-	(1,697)	(1,697)	(1,697)	(1,697)	(1,697)	-	-
Total Request	101,515	0	0	0	0	0	N/A	101,515

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

Program: National Ocean Service
Sub-program: NOS Construction
Program Change: Eliminate Federal Funding Support for NERRS Construction

Object Class	FY 2018 Decrease	FY 2018 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	(1,697)	0
42 Insurance claims and indemnities	0	0
43 Interest and dividends	0	0
44 Refunds	0	0
99 Total obligations	(1,697)	0

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 the 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 does the following:

- 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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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 2017 Currently Available	15	15	5,962	66,694
less: Obligations from prior year balances	0	0	0	(19,452)
plus: Technical ATBs	0	0	6	0
FY 2018 Base	15	15	5,968	47,242
plus: program changes	0	0	0	0
FY 2018 Estimate	15	15	5,968	47,242

		FY 2016 Actual		FY 2017 Currently Available		FY 2018 Base		FY 2018 Estimate		Increase/Decrease	
		Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount
Damage Assessment and Restoration Revolving Fund	Pos/BA	34	12,437	15	5,962	15	5,968	15	5,968	0	0
	FTE/OBL	34	145,395	15	66,694	15	47,242	15	47,242	0	0
Total: Damage Assessment and Restoration Revolving Fund	Pos/BA	34	12,437	15	5,962	15	5,968	15	5,968	0	0
	FTE/OBL	34	145,395	15	66,694	15	47,242	15	47,242	0	0

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

	FY 2016		FY 2017		FY 2018		FY 2018		Increase/ Decrease	
	Actual		Currently Available		Base Program		Estimate			
	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount
Direct Mandatory Obligation	34	145,395	15	66,694	15	47,242	15	47,242	0	0
Total Obligations	34	145,395	15	66,694	15	47,242	15	47,242	0	0
<i>Adjustments to Obligations:</i>										
Federal funds	0	0	0	0	0	0	0	0	0	0
Offsetting collections, mandatory	0	(57,382)	0	(45,000)	0	(10,000)	0	(10,000)	0	0
Change in uncollected payments, Fed	0	(28,480)	0	0	0	0	0	0	0	0
Recoveries	0	(24,899)	0	(1,000)	0	(1,000)	0	(1,000)	0	0
Unobligated balance, adj. SOY	0	(166,460)	0	(118,529)	0	(103,796)	0	(103,796)	0	0
Unobligated balance transferred (from DOI)	0	(2,717)	0	(6,000)	0	(6,000)	0	(6,000)	0	0
Unobligated balance, transferred (to ORF)	0	0	0	0	0	0	0	0	0	0
Unobligated balance, unapportioned	0	32,547	0	0	0	0	0	0	0	0
Unobligated balance, EOY	0	85,982	0	109,796	0	79,523	0	79,523	0	0
Total Budget Authority	34	12,437	15	5,962	15	5,968	15	5,968	0	0
<i>Financing from Transfers:</i>										
Appropriation (previously unavailable)	0	(406)	0	(406)	0	(412)	0	(412)	0	0
Transfer from DOI – CY	0	(12,437)	0	(5,968)	0	(5,968)	0	(5,968)	0	0
Appropriation temporarily reduced	0	406	0	412	0	412	0	412	0	0
Net Appropriation	34	0	15	0	15	0	15	0	0	0

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 2016 Actual	FY 2017 Currently Available	FY 2018 Base Program	FY 2018 Estimate	Increase/ Decrease
11 Personnel compensation					
11.1 Full-time permanent	3,722	1,885	1,998	1,998	0
11.3 Other than full time permanent	550	933	948	948	0
11.7 Other personnel compensation	0	0	0	0	0
11.8 Special personnel services payments	0	0	0	0	0
11.9 Total personnel compensation	4,272	2,818	2,916	2,916	0
12.1 Civilian personnel benefits	1,363	665	676	676	0
12.2 Military personnel benefits	7	7	7	7	0
21 Travel and transportation of persons	668	1,152	1,152	1,152	0
22 Transportation of things	11	54	54	54	0
23.1 Rental payments to GSA	79	149	149	149	0
23.2 Rental payments to others	22	6	6	6	0
23.3 Comm., util., misc. charges	43	59	59	59	0
24 Printing and reproduction	10	8	8	8	0
25.1 Advisory and assistance services	2,055	1,458	1,458	1,458	0
25.2 Other services	232	309	309	309	0
25.3 Other purchases of goods and services from gov't accounts	48,339	51,702	32,185	32,185	0
26 Supplies and materials	232	643	643	643	0
31 Equipment	254	261	261	261	0
41 Grants, subsidies and contributions	12,720	7,358	7,359	7,359	0
42 Insurance claims and indemnities	5	34	0	0	0
43 Interest and dividends	0	0	0	0	0
44 Refunds	75,084	0	0	0	0
99 Total Obligations	145,395	75,942	47,242	47,242	0

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 2016 Actual	FY 2017 Currently Available	FY 2018 Base Program	FY 2018 Estimate	Increase/ Decrease
Federal Funds	0	0	0	0	0
Less collections	(85,862)	(45,000)	(10,000)	(10,000)	0
Recoveries	(24,899)	(1,000)	(1,000)	(1,000)	0
Less unobligated balance, SOY	(166,460)	(111,209)	(111,209)	(111,209)	0
Plus unobligated balance transferred	(2,717)	(6,000)	(6,000)	(6,000)	0
Plus unobligated balance, unapportioned	32,547	0	0	0	0
Plus unobligated balance, EOY	85,982	109,796	79,523	79,523	0
Total Budget Authority	5,968	5,962	5,968	5,968	0
Transfers:					
Appropriation previously unavailable	(406)	(406)	(412)	(412)	
Transfer from DOI	(12,437)	(5,968)	(5,968)	(5,968)	0
Appropriation temporarily reduced	406	412	412	412	0
Net Appropriation	0	0	0	0	0
Personnel Data					
Full-Time equivalent Employment:					
Full-time permanent	34	15	15	15	0
Other than full time permanent	0	0	0	0	0
Total	34	15	15	15	0
Authorized Positions:					
Full-time permanent	34	15	15	15	0
Other than full time permanent	0	0	0	0	0
Total	34	15	15	15	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 2017 Currently Available	0	0	120	120
less: Obligations from prior year balances	0	0	0	0
plus: Technical ATBs	0	0	0	0
FY 2018 Base	0	0	120	120
plus: program changes	0	0	0	0
FY 2018 Estimate	0	0	120	120

		FY 2016 Actual		FY 2017 Currently Available		FY 2018 Base Program		FY 2018 Estimate		Increase/Decrease	
		Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount
Sanctuaries Enforcement Asset Forfeiture Fund	Pos/BA	0	125	0	120	0	120	0	120	0	0
	FTE/OBL	0	392	0	120	0	120	0	120	0	0
Total: Sanctuaries Enforcement Asset Forfeiture Fund	Pos/BA	0	125	0	120	0	120	0	120	0	0
	FTE/OBL	0	392	0	120	0	120	0	120	0	0

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

	FY 2016 Actual		FY 2017 Currently Available		FY 2018 Base Program		FY 2018 Estimate		Increase/ Decrease	
	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount
Direct Mandatory Obligation	0	392	0	120	0	120	0	120	0	0
Total Obligations	0	392	0	120	0	120	0	120	0	0
<i>Adjustments to Obligations:</i>										
Recoveries	0	0	0	0	0	0	0	0	0	0
Unobligated balance, SOY	0	(267)	0	0	0	0	0	0	0	0
Unobligated balance, adj. SOY	0	0	0	0	0	0	0	0	0	0
Unobligated balance, transferred	0	0	0	0	0	0	0	0	0	0
Unobligated balance, EOY	0	0	0	0	0	0	0	0	0	0
Unobligated balance, unapportioned	0	0	0	0	0	0	0	0	0	0
Total Budget Authority	0	125	0	120	0	120	0	120	0	0
<i>Financing from Transfers:</i>										
Appropriation previously unavailable	0	(13)	0	(8)	0	(8)	0	(8)	0	0
Appropriation temporarily reduced	0	8	0	8	0	8	0	8	0	0
Net Appropriation	0	120	0	120	0	120	0	120	0	0

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 2016 Actual	FY 2017 Currently Available	FY 2018 Base Program	FY 2018 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	10	3	3	3	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	9	3	3	3	0
25.1 Advisory and assistance services	0	0	0	0	0
25.2 Other services	3	1	1	1	0
25.3 Purchases of goods and services from Gov't accounts	93	29	29	29	0
26 Supplies and materials	277	84	84	84	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	392	120	120	120	0

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

	FY 2016 Actual	FY 2017 Currently Available	FY 2018 Base Program	FY 2018 Estimate	Increase/ Decrease
Less recoveries	0	0	0	0	0
Less unobligated balance, SOY	(267)	0	0	0	0
Less unobligated balance, adj SOY	0	0	0	0	0
Less unobligated balance, transferred	0	0	0	0	0
Plus unobligated balance, EOY	0	0	0	0	0
Plus unobligated balance, unapportioned	0	0	0	0	0
Total Budget Authority	125	120	120	120	0
Transfers:					
Appropriation previously unavailable	(13)	(8)	(8)	(8)	0
Appropriation temporarily reduced	8	8	8	8	0
Mandatory Appropriation	120	120	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 2017 Currently Available	1	1	0	7,239
less: Obligations from prior year balances	0	0	0	(523)
plus: Technical ATBs	0	0	0	(1,013)
FY 2018 Base	1	1	0	5,703
plus: program changes	0	0	0	0
FY 2018 Estimate	1	1	0	5,703

		FY 2016 Actual		FY 2017 Currently Available		FY 2018 Base Program		FY 2018 Estimate		Increase/ (Decrease)	
		Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount
Gulf Coast	Pos/BA	1	0	1	0	1	0	1	0	0	0
Restoration Fund	FTE/OBL	1	422	1	7,239	1	5,703	1	5,703	0	0
<hr/>											
Total: Gulf Coast	Pos/BA	1	0	1	0	1	0	1	0	0	0
Restoration Fund	FTE/OBL	1	422	1	7,239	1	5,703	1	5,703	0	0

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 2016		FY 2017		FY 2018		FY 2018		Increase/ Decrease	
	Actual		Currently Available		Base Program		Estimate		Decrease	
	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount
Direct Mandatory Obligation	0	422	0	7,239	0	5,703	0	5,703	0	0
Total Obligations	0	422	0	7,239	0	5,703	0	5,703	0	0
<i>Adjustments to Obligations:</i>										
New offsetting collections	0	(833)	0	(6,715)	0	(5,703)	0	(5,703)	0	0
Unobligated balance, adj. SOY	0	(111)	0	(523)	0	0	0	0	0	0
Unobligated balance, EOY	0	523	0	0	0	0	0	0	0	0
Total Budget Authority	0	0	0	0	0	0	0	0	0	0
<i>Financing from Transfers:</i>										
Transfer from Other Accounts	0	0	0	0	0	0	0	0	0	0
Appropriation temporarily reduced	0	0	0	0	0	0	0	0	0	0
Net Appropriation	0	0	0	0	0	0	0	0	0	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)

Object Class	FY 2016 Actual	FY2017 Currently Available	FY 2018 Base Program	FY 2018 Estimate	Increase/ Decrease
11 Personnel compensation					
11.1 Full-time permanent	85	86	87	87	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	85	86	87	87	0
12.1 Civilian personnel Benefits	32	32	32	32	0
13 Benefits for former personnel	0	0	0	0	0
21 Travel and transportation of persons	22	22	22	22	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	2	0	0	0	0
25.3 Other purchases of goods and services from Gov't accounts	281	405	405	405	0
26 Supplies and materials	0	1	1	1	0
31 Equipment	0	4	4	4	0
41 Grants, subsidies and contributions	297	6,689	5,153	5,153	0
42 Insurance claims and indemnities	0	0	0	0	0
43 Interest and dividends	0	0	0	0	0
99 Total Obligations	422	7,239	5,703	5,703	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 2016 Actual	FY 2017 Currently Available	FY 2018 Base Program	FY 2018 Estimate	Increase/ Decrease
Federal Funds	0	0	0	0	0
Less offsetting collections	(833)	(5,715)	(5,703)	(5,703)	0
Less unobligated balance, SOY	(111)	(523)	0	0	0
Plus unobligated balance, EOY	523	0	0	0	0
Plus unobligated balance transferred	0	0	0	0	0
Total Budget Authority	0	0	0	0	0
Transfers:					
Transfers from Other Accounts	0	0	0	0	0
Appropriation temporarily reduced	0	0	0	0	0
Mandatory Budget Authority	0	0	0	0	0

BUDGET PROGRAM: NATIONAL MARINE FISHERIES SERVICE

For FY 2018, NOAA requests a total of \$845,114,000 and 2,899 FTE for the National Marine Fisheries Service, including a decrease of \$107,779,000 and 53 FTE in program changes.

National Marine Fisheries Service Overview

NOAA's 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 to commercial and recreational marine fisheries and aquaculture industries, which generate \$214 billion in sales impact, and support over 1.8 million jobs economy-wide.¹ NMFS also provides 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 for the Nation's benefit. 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 strong scientific and research capabilities to support the challenging public policy decision process associated with NMFS' stewardship responsibilities.

The NMFS budget is organized into four sub-programs under the Operations, Research, and Facilities appropriation account (\$864,344,000 and 2,910 FTE):

- Protected Resources Science and Management (\$185,678,000 and 811 FTE) includes: Marine Mammals, Sea Turtles, and Other Species; Species Recovery Grants; Atlantic Salmon; and Pacific Salmon
- Fisheries Science and Management (\$546,606,000 and 1,713 FTE) includes: Fisheries and Ecosystem Science Programs and Services; Fisheries Data Collections, Surveys, and Assessments; Observers and Training; Fisheries Management Programs and Services; Aquaculture; Salmon Management Activities; Regional Councils and Fisheries Commissions; and Interjurisdictional Fisheries Grants
- Enforcement (\$70,000,000 and 232 FTE)
- Habitat Conservation and Restoration (\$62,060,000 and 154 FTE)

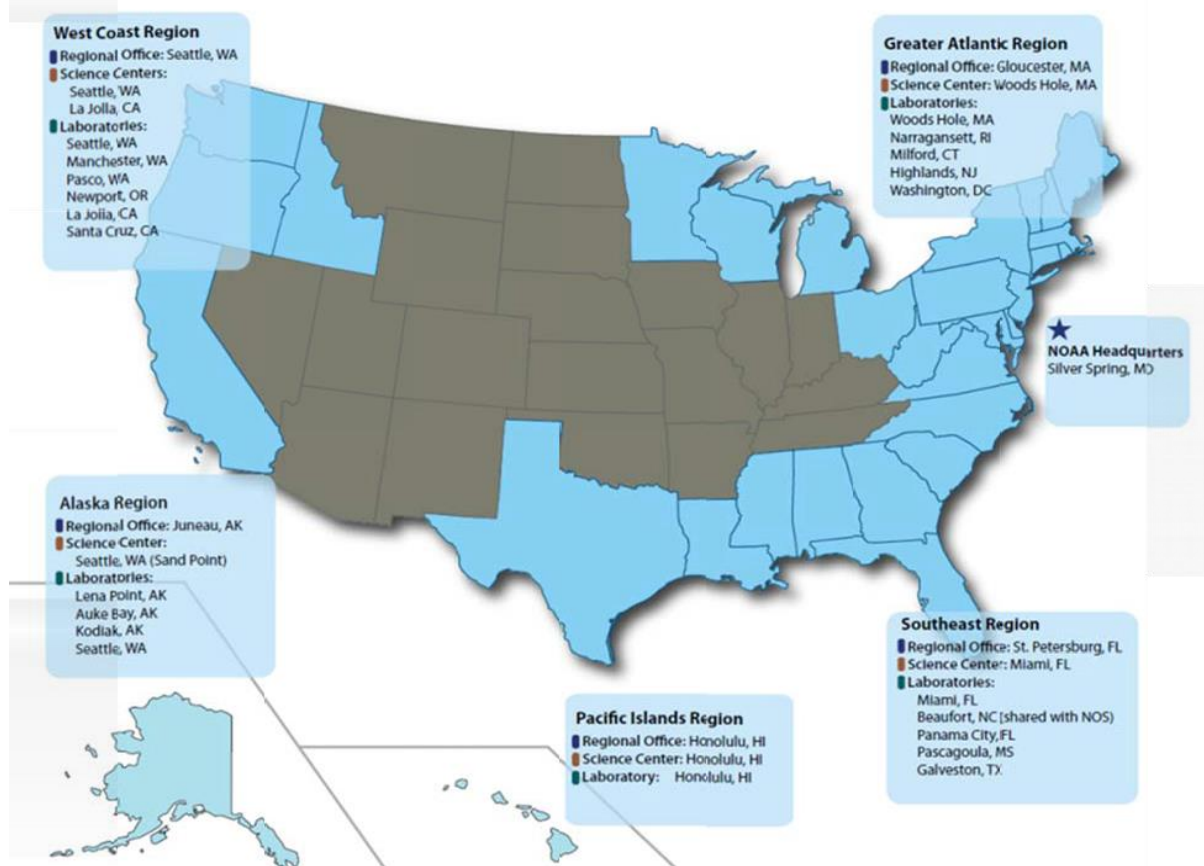
The NMFS budget also includes the following other accounts:

- Pacific Coastal Salmon Recovery Fund (discretionary)
- Fishermen's Contingency Fund (discretionary)
- Foreign Fishing Observer Fund (discretionary)

¹ National Marine Fisheries Service. 2016. Fisheries Economics of the United States, 2014. U.S. Dept. Commerce, NOAA Tech. Memo. NMFS-F/SPO-163, 237p. Available at: https://www.st.nmfs.noaa.gov/economics/publications/feus/fisheries_economics_2014/index.

- Marine Mammal Unusual Mortality Event Fund (discretionary)
- Fisheries Finance Program Account (discretionary and mandatory)
- Promote and Develop American Fishery Products & Research Pertaining to American Fisheries (discretionary and mandatory)
- Federal Ship Financing Fund (mandatory)
- Environmental Improvement and Restoration Fund (mandatory)
- Limited Access System Administration Fund (mandatory)
- Western Pacific Sustainable Fisheries Fund (mandatory)
- Fisheries Enforcement Asset Forfeiture Fund (mandatory)
- North Pacific Observer Fund (mandatory)

NMFS consists of Headquarters offices in Silver Spring, MD and five Regional Offices as well as six Science Centers in significant coastal areas around the country. Major NMFS facilities and laboratories are located at the following sites:



Significant Adjustments:

Calculated Adjustments

NOAA's FY 2018 Base includes a total of \$13,862,000 to account for the full funding requirement for inflationary adjustments to current programs for NMFS activities. This includes the estimated 2018 Federal pay raise of 1.9 percent as well as inflationary increases for non-labor activities, including service contracts, utilities, field office lease payments, and rent charges from the General Services Administration (GSA).

Technical Adjustments

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
MS	Mission Services and Management	NMFS	Fisheries and Ecosystem Science Programs and Services	\$2,098,000/0 FTE
MS	Mission Services and Management	NMFS	Fisheries Management Programs and Services	\$379,000/0 FTE
MS	Mission Services and Management	NMFS	Enforcement	\$73,000/0 FTE
MS	Mission Services and Management	NMFS	Habitat Conservation and Restoration	\$42,000/0 FTE
			Total:	\$2,592,000/0 FTE

NOAA requests to transfer \$2,592,000 and 0 FTE to move funding associated with NOAA’s Western Regional Center (WRC) management activities from Mission Support Facilities to NMFS. Currently, costs for these activities are paid directly through the funding appropriated to the Mission Services and Management PPA. This reallocation supports NOAA’s plan to employ an integrated campus cost model to allocate the cost of services provided to the WRC tenants. The tenants will then be billed directly based on the approved cost model. An integrated cost model will provide greater transparency and a more accurate reflection of program operating costs.

Narrative Information:

Following this section are base justification materials and program change narratives by sub-program for this line office. Please note program change narratives are only provided for program changes that represent greater than five percent of a program. Complete program changes by PPA can be found in the NOAA Control Table (p. Control Table - 2). Please contact the NOAA if details for any of these changes are required.

**APPROPRIATION ACCOUNT: OPERATIONS, RESEARCH, AND FACILITIES
SUB-PROGRAM: PROTECTED RESOURCES SCIENCE AND MANAGEMENT**

The mission of the Protected Resources Science and Management sub-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, in partnership with internal and external stakeholders, uses best available science to develop and implement best practices and conservation actions to reduce threats to protected species and their marine and coastal ecosystems. Protected species include those listed under the Endangered Species Act (ESA) and marine mammals covered by the Marine Mammal Protection Act (MMPA).

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 (i.e., fish that migrate from the sea to freshwater to spawn), 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.

Programs related to protected species are administered through the following budget line items:

Marine Mammals, Sea Turtles, and Other Species

Under the legislative authority of the ESA and MMPA, this budget line supports activities that conserve and recover species threatened or endangered with extinction, as well as most marine mammals. The programs under this budget line aim to sustain marine and anadromous species and the ecosystems on which they depend, and to enable economic development in a manner compatible with species conservation and recovery.

In addition to work supporting all ESA-listed species, NOAA continues to focus on the “Species in the Spotlight: Survive to Thrive” initiative,² an innovative approach to marshal public and private support to slow, halt, and reverse the population decline of eight of our most endangered species—Hawaiian monk seals, southern resident killer whales, white abalone, Cook Inlet beluga whales, Atlantic salmon, Pacific leatherback turtles, Sacramento River winter-run Chinook, and Central California Coast coho.

In FY 2016, NMFS removed 9 of 14 distinct population segments of humpback whales from the Federal list of threatened and endangered species. After an extensive scientific review, and careful consideration of public comments, we found that international conservation efforts to protect and conserve whales are proving successful for most humpback populations. Now that nine populations no longer warrant listing, NOAA can concentrate its efforts on the four populations identified as endangered and one population identified as threatened.

² http://www.nmfs.noaa.gov/stories/2015/05/05_14_15species_in_the_spotlight.html

Major components of this budget line include:

Listing (ESA Section 4): 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 deadlines that must be met, including 90 days for an initial determination and 12 months for determining whether the listing or reclassification is warranted. If warranted, NMFS must 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 within one year after the date of publishing the proposed rule. The ESA also requires that critical habitat be designated concurrently with the final listing.

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

Recovery (ESA Section 4): The ESA requires NMFS to use all methods and procedures to bring listed species to the point where the protections of the ESA are no longer necessary. Recovery is the process of conserving these species and ecosystems as well as ensuring that listed species remain functioning members of the ecosystems we all depend upon. Actions taken to recover these species provide communities with healthier ecosystems, cleaner water, greater opportunities for recreation, and the opportunity for current and future generations to share the benefits of diverse and healthy natural resources. Actions to achieve species recovery may require one or more of the following:

- restoring or preserving habitat;
- minimizing or offsetting threats to species; and/or,
- enhancing population numbers.

Species Stock Assessment and Monitoring (ESA Section 4, MMPA Sections 115 and 117): This program supports protected species stock assessment and monitoring activities using a variety of observation and survey methods, including use of marine acoustics, unmanned systems, surveys (ship, aerial, and shore-based), and telemetry. To adequately support management decisions, assessments are comprehensive and include estimates of abundance and distribution, as well as analysis of historical trends, serious injury and mortality levels, life history and demographics, and impacts of human activities (e.g., noise, climate, habitat, and ecosystem change). Collection of these basic assessment data enable NMFS to be as targeted as possible in prescribing mitigation measures that affect commercial and recreational activities.

Research (ESA Section 4, MMPA Sections 115 and 117): NMFS conducts research to inform conservation and management actions, focusing on the biology, behavior, and health of marine mammal species; genetic differentiation; ecosystem interactions; and effects of human activities on the recovery and conservation of protected species. Effective conservation requires understanding how human and natural factors influence the viability of marine species and their ecosystems.

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 enables authorization for lawful activities—such as construction of roads and bridges, commercial fishing, or defense readiness training—in a manner that is compatible with species conservation and recovery.

In FY 2016, NOAA completed the biological opinion on the Deepwater Horizon Oil Spill Programmatic Damage Assessment and Restoration Plan and Programmatic Environmental Impact Statement—a framework for a comprehensive programmatic restoration plan that will guide the development of subsequent restoration plans and project-level actions. This unprecedented achievement enabled settlement with BP and will streamline the approval process for routine restoration projects, such as construction of living shorelines, removal of derelict fishing gear and other marine debris, and oyster reef creation and enhancement

Permits and Authorizations (ESA Section 10 and MMPA Sections 101 and 104): Under the ESA and MMPA, NMFS issues permits and authorizations (often with required mitigation measures) to allow activities that may result in the direct and indirect take of a protected species. Permits and take authorizations cover scientific research and the incidental take and harassment of marine mammals by otherwise lawful activities such as seismic surveys, construction activities, or military readiness training exercises when those activities are deemed to have negligible impact on the species.

Conservation Planning (ESA Section 10): When non-Federal entities—such as states, counties, local governments, and private landowners—wish to conduct an otherwise lawful activity that might incidentally, but not intentionally, “take” a listed species, an incidental take permit must first be obtained from NMFS. To receive a permit, the applicant must submit a Conservation Plan designed to offset harmful effects that a proposed activity might have on listed species.

Bycatch Reduction (ESA Section 4, MMPA Section 118): Fishing gear can accidentally capture protected species, such as marine mammals, seabirds, and sea turtles. NMFS works with the fishing industry and others through Take Reduction Teams or other means to modify fishing gear or practices to minimize bycatch and its impact.

Co-Management with Alaska Native Organizations (MMPA Section 119): Co-management promotes full and equal participation by Alaska Natives in decisions affecting the subsistence management of marine mammals (to the maximum extent allowed by law) as a tool for conserving marine mammal populations in Alaska. NMFS has entered into agreements with Alaska Native groups to manage harvested marine mammal stocks in Alaska. These agreements provide funding for cooperative management of these stocks.

Marine Mammal Health and Stranding Response Program (MMPA Title IV): NMFS is the lead Federal agency to coordinate marine mammal stranding networks, responses, and investigations of marine mammal mortality events. The Prescott Grants 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 of dead marine mammals. To date the program has led to significant improvements within the stranding network, enabling members to expand response coverage over wider geographic

areas; enhance capabilities and data collection; upgrade rehabilitation facilities; evaluate rehabilitation success; increase understanding of the causes of disease and mortality, and provide safer operations for both animals and people. In FY 2016, NOAA awarded 32 grants to members in 17 states. Examples of awards include: maintaining a rehabilitation program and determining health status and trends for critically endangered Hawaiian monk seals in Kona, Hawaii; expanding a rehabilitation facility to increase pinniped rescue capability by over 40% in Santa Barbara, CA; and, supporting post mortality surveillance for the mid-Atlantic bottlenose dolphin in Morehead City, NC. More information on past accomplishments is available at the program's website.³

Species Recovery Grants (ESA Section 6)

Recovery and conservation actions for listed species under NMFS jurisdiction are implemented through Species Recovery Grants, which are awarded to states and Tribes. For listed species, funding supports activities such as reducing or removing significant sources of mortality and injury, assessing and monitoring species status and trends, developing conservation plans, conserving habitat, and engaging the public in conservation efforts. Funding may also support monitoring of candidate species and recently de-listed species.

Atlantic Salmon (ESA Sections 4, 7, 10)

These programs provide funding for the conservation and recovery of ESA-listed Atlantic salmon in the Northeast. Gulf of Maine Atlantic salmon are co-managed by NMFS, USFWS, the Maine Department of Marine Resources, and the Penobscot Indian Nation. Under the ESA, the Essential Fish Habitat provisions under Magnuson-Stevens Act, and a joint Statement of Cooperation with the co-managers, NMFS is responsible for marine stock assessments, designating critical habitat, estuary and marine interagency Section 7 consultations and habitat conservation planning, and minimizing dam impacts.

Pacific Salmon (ESA, All Sections)

Under the legislative authority of the ESA, NMFS conducts interagency Section 7 consultations, habitat conservation planning, and listing and recovery actions to protect and recover threatened and endangered Pacific salmon and steelhead. NMFS also conducts research, monitoring, and analysis to provide managers and regional stakeholders the tools and information necessary to advance salmonid recovery to ensure biological sustainability of Pacific salmonids and the ecosystems on which they depend. Partnerships among Federal, state, local, and tribal entities, together with non-governmental and private organizations are key to restoring healthy salmon runs and securing the economic and cultural benefits they provide.

In FY 2016, NOAA and the Sonoma County Water Agency signed NOAA's first-ever "Safe Harbor Agreement." The agreement offers private landowners in northern California's Russian River watershed incentives to enhance their property for the benefit of Federally protected salmon and steelhead (e.g., restore or maintain habitat). A safe harbor agreement assures landowners that additional land, water, and/or natural resource use restrictions will not be imposed as a result of their voluntary conservation actions to benefit covered species.

³ <http://www.nmfs.noaa.gov/pr/health/prescott/>

Schedule and Milestones:

FY 2018–2022

- Review listing petitions and issue 90-day findings, conduct ESA status reviews and issue 12-month findings, and promulgate ESA protective regulations
- Prepare recovery plans and implement recovery actions identified in the plans to improve the status of ESA-listed species
- Designate critical habitat
- Provide technical assistance, consultation, and authorization services for all Federal agencies' proposed actions (ESA Section 7)
- Work with Take Reduction Teams (TRTs) 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
- Research effects of human activities on the conservation and recovery of protected species
- Analyze protected species survey data to determine population trends
- Solicit proposals and award Species Recovery Grants to states and Tribes for conservation and recovery activities with a focus on Species in the Spotlight
- Participate in international and regional agreements to further the U.S. policy on protected species conservation

Deliverables:

FY 2018–2022

- ESA proposed and final listing regulations, Section 4(d) rules, and critical habitat regulations
- Formal and informal consultation with other Federal agencies
- Recovery plans for newly listed species with specific actions to prevent species extinction
- Timely issuance of MMPA and ESA permits, including scientific research permits and incidental harassment authorizations
- Improved or newly developed abundance and fishery mortality estimates for stocks in Alaska, the Pacific Islands, and the Gulf of Mexico to inform management decisions
- MMPA List of Fisheries classifying U.S. commercial fisheries into one of three Categories according to the level of incidental mortality or serious injury of marine mammals
- Marine Mammal Stock Assessment Reports

Performance Goals and Measurement Data:

Performance Measure: Number of protected species designated as threatened, endangered or depleted with stable or increasing population levels (Indicator 3.4)	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
	31/89*	30/95	30/96	30/96	31/96	31/96	31/96

Description: This measure tracks progress toward the recovery of endangered, threatened, or depleted protected species under NMFS’ jurisdiction. These species are listed as threatened or endangered under the Endangered Species Act (ESA) or as depleted under the Marine Mammal Protection Act (MMPA). Recovery of threatened, endangered, or depleted species can take decades. It may not be possible to recover or de-list a species in the near term, but progress can be made to stabilize or increase the species population. For some species, this means trying to stop steep population declines, while for others it means trying to increase their numbers.

* NOAA begins tracking newly listed species a full fiscal year after they were listed. As of FY 2016, this measure tracks 89 species/stocks designated as threatened, endangered, or depleted. In this year we began tracking 14 coral species and three scalloped hammerhead shark distinct population segment (DPS). In FY 2017, we began tracking six DPS of green turtle (rather than one breeding population and one globally listed species) and three DPS of humpback whale (rather than one globally listed species of humpback whale) for a total of six newly listed species. In FY 2018, we will begin tracking Nassau grouper.

Performance Measure: Percent of protected species with adequate population assessments and forecasts (Indicator 3.4)	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
	19.2% (82/428)	19.9% (85/428)	21.3% (91/428)	24.3% (104/428)	26.2% (112/428)	24.3% (104/428)	24.3% (104/428)

Description: This measure tracks the percentage of protected species stocks for which adequate assessments are available. Assessments are vital to determine the scientific basis for supporting and evaluating the impact of management actions. To be deemed adequate, assessments must be based on recent quantitative or qualitative analysis sufficient to determine current stock status based on a variety of data category levels such as life history, stock structure, abundance, threats, assessment quality, assessment frequency, and conservation status. Stock status projections are highly dependent on survey frequencies, assessment timeframes, and fiscal constraints. This measure covers the protected species stocks covered by the MMPA or listed under the ESA. The number of such stocks continues to increase as new species are listed and as new stocks of listed species and marine mammals are identified—the latter typically indicates increased knowledge about population stock structure. Denominators are shown for reference.

Performance Measure:	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
Number and percentage of actions ongoing or completed to recover endangered and threatened species (cumulative) (Indicator 3.4)	2233/ 4542* (49.2%)	2575/ 9683** (26.6%)	2620/ 9683 (27.1%)	2666/ 9683 (27.5%)	2708/ 9683 (28.0%)	2751/ 9683 (28.4%)	2792/ 9683 (28.8%)
<p>Description: This measure tracks the progress of ongoing or completed recovery actions included in NMFS approved recovery plans for species listed as threatened or endangered under the ESA. The ESA requires NMFS to prepare recovery plans for each endangered or threatened species. The plans include a list of actions necessary to remove species from the ESA. These recovery actions may include items that can be completed in a year or others, including monitoring, that may take many years to complete or are 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. Denominators are shown for reference.</p> <p>* The increase in the total number of actions in FY 2016 is due to the addition of one new recovery plan with new recovery actions.</p> <p>**The large increase in FY 2017 is due to the addition of multiple new Pacific salmon recovery plans with thousands of new recovery actions.</p>							

PROGRAM CHANGES FOR FY 2018:

NOAA requests a total decrease of \$6,658,000 and 14 FTE in FY 2018 program changes for the Protected Resources Science and Management sub-program. Following this section are program change narratives for this sub-program that represent program changes greater than five percent of a program. Complete program changes by PPA can be found in the NOAA Control Table (p. Control Table - 2).

PROGRAM CHANGES FOR FY 2018:

Marine Mammals, Sea Turtles, and Other Species: Prescott Grants Program (Base Funding: \$3,044,000 and 0 FTE; Program Change: -\$3,044,000 and 0 FTE): NOAA requests a decrease of \$3,044,000 and 0 FTE for a total of \$0 and 0 FTE for the John H. Prescott Marine Mammal Rescue Assistance Grants Program.

Proposed Actions:

The Prescott Grants Program provides competitive grants to marine mammal stranding network organizations to rescue, rehabilitate, or investigate sick or injured marine mammals and to determine the cause of death or disease in dead marine mammals. This reduction would eliminate funding for the grant program in FY 2018. This is the only Federal funding source for the network; however, some members may still operate depending on private funding. NOAA will continue to support related activities such as the rescue of large whales entangled in fishing gear and the coordination network responses to unusual marine mammal mortality events.

Resource Assessment:

The Prescott Grants Program provides grants or cooperative agreements to eligible stranding network participants for:

- recovery and treatment (i.e., rehabilitation) of stranded marine mammals;
- data collection from living or dead stranded marine mammals; and,
- facility upgrades, operations costs, and staffing needs.

The more than 100 stranding network partners are volunteers and trained professionals from nonprofit organizations; aquaria; universities; and coastal state, local, and Tribal governments. In addition to response activities, the network provides data helping NOAA establish links between marine mammal health and the condition of coastal ecosystems. The program has expanded response coverage over wider geographic areas; upgraded rehabilitation facilities; increased understanding of the causes of disease and mortality, and provided safer operations for both animals and people. In FY 2016, NOAA awarded 32 grants to members in 17 states. Applicants provide a minimum of 25 percent non-Federal cost match. To date, the network has leveraged over \$16.8 million in non-Federal funding. More information on past accomplishments is available at the program’s website.⁴

Performance Goals and Measurement Data:

Performance Measure:	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
Percentage of stranding network organizations that have Prescott Grants to improve rapid response to marine mammal strandings (annual)							
With Decrease	N/A	N/A	0%	0%	0%	0%	0%
Without Decrease	23%	23%	23%	23%	23%	23%	23%
Description: Percentage of stranding network organizations that have Prescott Grants to improve their rapid response. Rapid responses enable a higher probability of decreasing pain, saving individuals, and determining cause of death, type of disease, and other types of injuries.							

⁴ <http://www.nmfs.noaa.gov/pr/health/prescott/>

PROGRAM CHANGE DETAIL BY OBJECT CLASS

(Dollar amounts in thousands)

Program: National Marine Fisheries Service
Sub-program: Protected Resources Science and Management
Program Change: Prescott Grants Program

Object Class		FY 2018 Decrease	FY 2018 Total Program⁵
11	Personnel compensation		
11.1	Full-time permanent	\$0	\$44,698
11.3	Other than full-time permanent	0	620
11.5	Other personnel compensation	0	841
11.8	Special personnel services payments	0	279
11.9	Total personnel compensation	0	46,438
12	Civilian personnel benefits	0	15,626
13	Benefits for former personnel	0	24
21	Travel and transportation of persons	0	2,546
22	Transportation of things	0	301
23.1	Rental payments to GSA	0	1,273
23.2	Rental Payments to others	0	614
23.3	Communications, utilities and miscellaneous charges	0	1,165
25.1	Advisory and assistance services	0	3,751
25.2	Other services	0	18,190
25.3	Purchases of goods & services from Gov't accounts	0	1,849
25.4	Operation and maintenance of facilities	0	0
25.5	Research and development contracts	0	4
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	2,314
31	Equipment	0	680
32	Lands and structures	0	0
33	Investments and loans	0	0
41	Grants, subsidies and contributions	(3,044)	13,722
42	Insurance claims and indemnities	0	3
43	Interest and dividends	0	3
44	Refunds	0	0
99	Total obligations	(3,044)	109,022

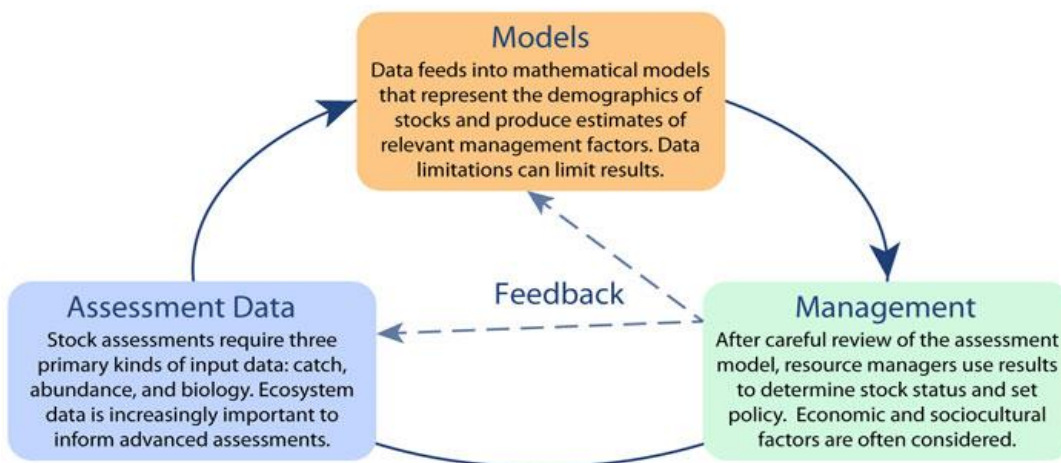
⁵ Due to financial system limitations, the object class detail for the Program reflects the Marine Mammals, Sea Turtles, and Other Species PPA.

**APPROPRIATION ACCOUNT: OPERATIONS, RESEARCH, AND FACILITIES
SUB-PROGRAM: FISHERIES SCIENCE AND MANAGEMENT**

The Fisheries Science and Management sub-program encompasses scientific and management activities to ensure sustainability and apply an ecosystem-based management approach to the stewardship of the Nation’s marine fishery resources. Sustainable fisheries play an important role in the Nation’s economy by providing opportunities for commercial, recreational, and subsistence fishing, and sustainable seafood for the nation. Combined, U.S. commercial and recreational saltwater fishing generated more than \$214 billion in sales and supported 1.8 million jobs in 2014.⁶ By ending overfishing and rebuilding stocks, we are strengthening the value of U.S. fisheries to the economy, our communities, and marine ecosystems.

In partnership with the eight Regional Fishery Management Councils and state and Federal partners, NMFS manages marine fisheries, including aquaculture, using the best available science. NMFS actions result in sustainable fisheries harvest and production, rebuilding of depleted fish stocks, conservation and restoration of essential fish habitats, and other support for fishing communities. NMFS’ science, which is rigorously peer-reviewed, ensures management decisions are based on the highest-quality scientific information. NMFS conducts science on species’ responses to environmental changes; impacts of fishing and other human activities on fisheries and their habitat; and social, cultural, and economic behaviors that influence interactions between humans and marine fisheries.

This sub-program supports the regulatory process, which involves extensive analysis of alternatives to meet a number of statutory requirements and agency priorities, and involves Regional Councils, Interstate Marine Fisheries Commissions, and states.



Science informing management: Managers need high quality science to make important decisions to ensure sustainable fisheries, healthy ecosystems, and productive coastal communities. Data feeds into mathematical models that estimate stock biomass, fishing effort, and other reference points.

⁶ National Marine Fisheries Service. 2016. Fisheries Economics of the United States, 2014. U.S. Dept. Commerce, NOAA Tech. Memo. NMFS-F/SPO-163, 237p. Available at: https://www.st.nmfs.noaa.gov/economics/publications/feus/fisheries_economics_2014/index.

Fisheries and Ecosystem Science Programs and Services

This budget line supports NMFS science to prevent and eliminate overfishing, rebuild overfished stocks, support sustainable aquaculture, conserve and restore habitats, and support fishing communities.

Fisheries Science Base Activities

These funds support science used for the analysis and decision-making needed for ecosystem approaches to fisheries management, Fishery Management Plans (FMP) and regulatory implementation, and enforcement to ensure compliance with regulations. Major activities include the following:

- *Regional Science and Operations:* Supports core survey and science work in the regional Science Centers (Centers) such as fishery catch monitoring, survey and stock assessments, charters for survey vessels, fuel, supplies, etc. Also supports research projects at the Centers, including collaborative research with other institutions on topics such as pelagic fisheries and groundfish.
- *Recreational Fisheries Information:* Supports the Marine Recreational Information Program's (MRIP) work to improve and expand NMFS' data collection efforts for monitoring recreational fisheries impacts. MRIP has improved sampling design and accuracy of shoreside angler surveys. This data is fundamental to successfully targeting improvements to recreational fishing.
- *Marine National Monuments:* Supports science and management activities, including the development of collaborative 15 year management plans for the Marianas Trench, Rose Atoll, and the Pacific Remote Islands Marine National Monuments. The Pacific Monuments encompass nearly 481,000 square miles, making it the world's largest marine reserve.
- *West Coast Groundfish Management and Research:* Provides the key stock assessment science support for management of more than 80 fish stocks along the coasts of Washington, Oregon, and California.
- *Electronic Monitoring and Electronic Reporting:* Supports the development and implementation of electronic monitoring (EM) and reporting (ER) working with industry to integrate technology into data collections and observations to improve the timeliness, quality, integration, cost effectiveness, and accessibility of fishery-dependent data. See Fisheries Management Base description below for implementation of management measures of EM/ER. These funds have facilitated pre-implementation of additional EM programs on the East Coast, including the Northeast groundfish fishery in 2016 (with full implementation in 2019) and the herring and mackerel fisheries in 2017. EM will be implemented in the West Coast whiting and fixed gear fisheries in 2018, with further expansion in the bottom trawl fishery and non-whiting midwater trawl fishery planned for 2019. EM pre-implementation will continue in the Alaska small boat fixed gear and pot fisheries in 2017, with full implementation in 2018. ER will be implemented in the South Atlantic and Gulf of Mexico commercial fisheries and the HMS pelagic longline fishery in 2017, and in the for-hire fisheries in the Gulf of Mexico, South Atlantic, and mid-Atlantic in 2018 and 2019.
- *Aquaculture:* Conducts science to support a substantial increase in sustainable domestic aquaculture, enabling important contributions to the U.S. seafood supply, job creation in coastal communities, and reduced reliance on imported seafood (currently 90% of U.S. seafood is imported). Marine aquaculture is also used to enhance commercial and recreational fisheries and restore habitats.

Economics and Social Science Research

This program supports NMFS economists and social scientists conducting legislatively mandated (e.g., NEPA, 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, increasingly, a number of commercial and recreational fisheries decision support tools. This work addresses traditional fishery management issues (e.g., effects of rebuilding programs, catch share programs, aquaculture, and fishery allocation decisions on fishermen and communities) and emerging coastal and marine resource management issues such as ecosystem services trade-offs and valuation, and community resilience.

Fisheries Oceanography

Ecosystem-based approaches to management rely upon research that integrates biological, socio-economic, environmental, and oceanographic data into predictive models that improve NOAA's ability to manage resources over the long-term. Fisheries Oceanography funds are distributed between two efforts: Fisheries and the Environment (FATE) and Integrated Ecosystem Assessment (IEA) programs. FATE projects analyze the response of living marine resources to environmental change. The IEA program conducts research and develops products to enhance scientific advice for better managing the Nation's resources and achieving ecological and societal objectives. IEAs assess ecosystem status and trends relative to ecosystem management goals, analyze risks and uncertainty, and evaluate trade-offs between management options.

Antarctic Research

The U.S. Antarctic Marine Living Resources Convention Act requires that the Department of Commerce conduct 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's Antarctic Ecosystem Research Division implements the U.S. Antarctic Marine Living Resources program. This program is NOAA's only dedicated, long-term ecological presence in the Antarctic, with observations dating back to 1986.

Climate Regimes & Ecosystem Productivity

The Climate Regimes & Ecosystem Productivity (CREP) program provides decision-makers with information on how climate variability and change are impacting U.S. marine ecosystems and the communities and economies that depend on them. CREP is implemented in the North Pacific region through the North Pacific Climate Regimes and Ecosystem Productivity (NPCREP) project and the recently implemented distributed biological observatory (DBO). NPCREP provides information, assessments, and projections of climate-related impacts on living marine resources of the Bering Sea and Gulf of Alaska. This area includes some of the Nation's richest commercial fishing grounds—6 billion pounds of seafood were landed in Alaska, totaling 62 percent of U.S. landings, with a value of \$1.8 billion in 2015⁷—as well as protected species and other resources that native communities depend on. The DBO is an array of sensors designed to detect changes in nutrients, productivity, and biological abundances and diversity along a latitudinal gradient extending from the northern Bering Sea to the Chukchi and Beaufort Seas.

Information Analysis and Dissemination

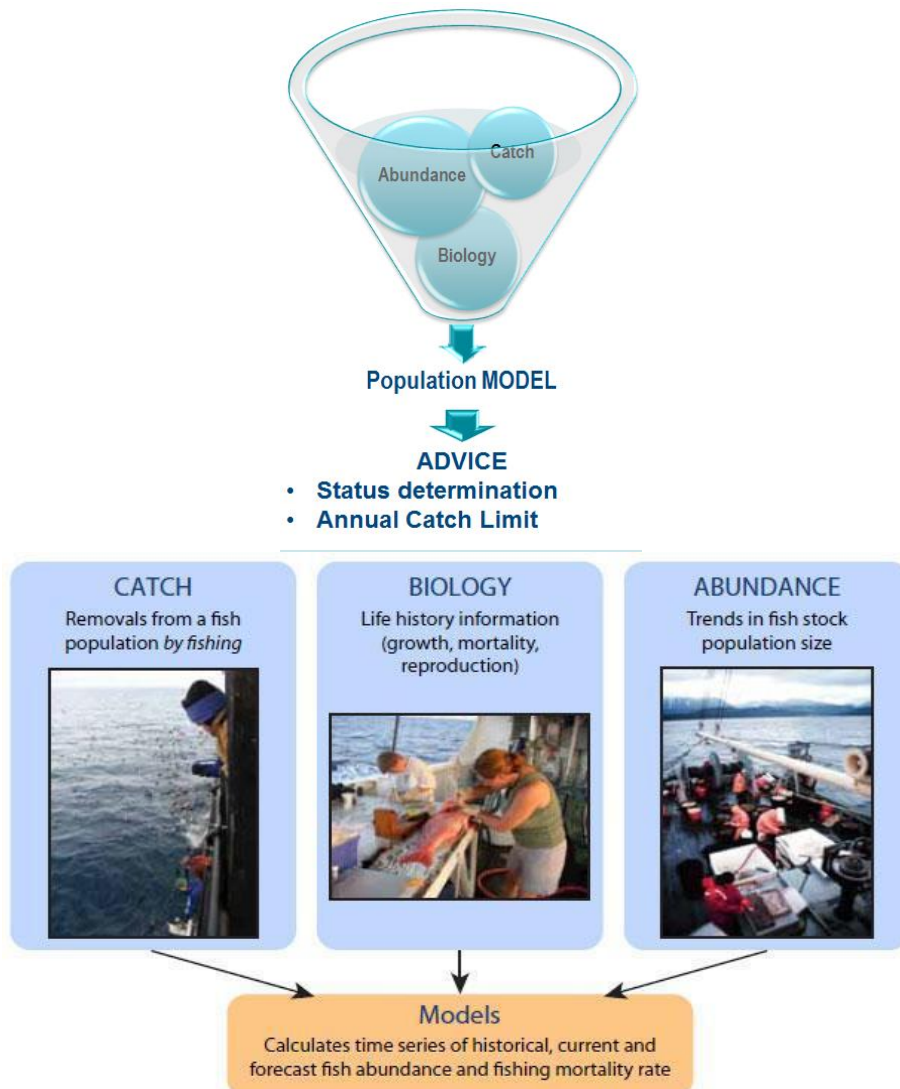
Requirements and directives for data collection, management, and dissemination are included in the MSA, MMPA, ESA, Aquaculture Act of 1980, Data Quality Act, and other

⁷ National Marine Fisheries Service. 2016. Fisheries of the United States, 2015. U.S. Department of Commerce, NOAA Current Fishery Statistics No.2014. Available at: <http://www.st.nmfs.noaa.gov/Assets/commercial/fus/fus15/documents/FUS2015.pdf>

policies and directives. The information analysis and dissemination program supports the NMFS infrastructure and staff that process, analyze, and produce data and disseminate it to resource managers and other users.

Fisheries Data Collections, Surveys, and Assessments

One of NMFS' core functions is to provide accurate and timely assessments of fish and shellfish stocks that support commercial and recreational fisheries. Stock assessment models estimate a stock's status over time and forecast future dynamics to advise fishery managers in their development of sustainable harvest levels. Assessment models are most reliable when they incorporate high quality data on fishery removals, stock abundance and biology, and ecosystem and environmental variability (see figure below). Funds support data collection, data management, and fisheries stock assessment production.



Expand Annual Stock Assessments (EASA)

Stock assessments provide the technical basis for fishery management decisions, such as setting annual catch limits (ACLs) to achieve optimum yield from the fishery while avoiding overfishing and ecosystem harm. Assessment activities include: catch monitoring and surveys; data analysis and stock assessment modeling; advanced sampling technologies; habitat, climate and other ecosystem indicators; and stock assessment model improvements. In addition, NMFS is addressing critical gaps in stock assessments as identified in program reviews and the implementation of the new stock assessment improvement plan and prioritization process. This process defines target frequency and assessment levels for each stock and facilitates the implementation of a next generation stock assessment framework. This framework includes assessments linked to climate, ecosystem, and habitat dynamics where appropriate, and provides baseline monitoring for all Federally-managed fish stocks.

Fisheries Statistics

Accurate data and reliable statistics on fishing effort and catch are essential for assessing fish stocks, as well as for monitoring performance relative to wild fishery management targets and aquaculture objectives. Funds are used to manage and conduct data collection, data processing, statistical analysis, information management, and statistical reporting activities for commercial and recreational fisheries.

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. These 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, Gulf of Mexico Fisheries Information Network, Alaska Fisheries Information Network, Pacific Fisheries Information Network, Recreational Fisheries Information Network, National Fisheries Information System, and the Marine Fisheries Initiative.

Survey and Monitoring Projects

Projects include support for bluefin tuna tagging research, red snapper monitoring and research, West Coast groundfish surveys, Alaska extended jurisdiction programs, Maine and New Hampshire inshore trawl surveys, 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 FSSI Stocks with Adequate Population Assessments and Forecasts (performance indicator 3.4)*.

American Fisheries Act (AFA)

NMFS collects data to support the following management measures for the AFA: 1) regulations that limit access and allocate Bering Sea and Aleutian Islands (BSAI) pollock to the fishing and processing sectors of the BSAI pollock fishery, 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.

Cooperative Research

Cooperative research enables commercial and recreational fishermen to become involved in collecting fundamental fisheries information that supports 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.

Marine Resources Monitoring, Assessment, and Prediction Program (MARMAP)

MARMAP is a cooperative fisheries project of NMFS and the South Carolina Marine Resources Research Institute (MRRRI). For more than 40 years, the MRRRI has conducted fishery-independent surveys and research on groundfish, reef fish, and coastal pelagic fishes between Cape Lookout, North Carolina and Cape Canaveral, Florida.

Southeast Area Monitoring and 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 in three areas: 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.

Observers and Training

This program provides information and analyses on the biological, ecological, economic, and social aspects of the Nation's fisheries resources. The scientific data collected by observer programs provide 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. The authority to place observers on commercial fishing and processing vessels is provided by the MSA, MMPA, and ESA. Fisheries observer programs are proven, unbiased, and valuable sources of information on the Nation's fisheries, and are a reliable and cost-effective means to collect fishery-dependent data.

Observers monitor fishing activities for 57 fisheries (including 10 catch share fisheries) across all five NMFS regions, and collect data for a range of conservation and management issues in various fisheries. This includes information on fishing practices, vessel and gear characteristics, fishing locations and times, environmental conditions within the fishing grounds, catch and bycatch, and socio-economic data.

Fisheries Management Programs and Services

Under the MSA and other fisheries legislation, this budget line supports: efficiently preventing and eliminating overfishing, rebuilding overfished stocks, supporting sustainable aquaculture, conserving and restoring habitats, and other research to support fishing communities. As a result of this work 41 fish stocks have been rebuilt and the number of stocks experiencing overfishing, or determined to be overfished are at near all-time lows.



Change in percentage of stocks subject to overfishing and overfished from 2007 through 2016 as shown in the Annual Report to Congress: Status of Stocks 2016.

Fisheries Management Base

These funds support NMFS staff efforts to deliver the following services, including analysis and decision-making to support fisheries management and regulatory implementation:

- *Annual Catch Limits (ACLs) and Accountability Measures (AMs)*: ACLs and AMs prevent overfishing. NMFS monitors catch levels for domestic fisheries and makes adjustments to management when those levels are exceeded. NMFS reports on the percent of fish stocks that have exceeded their ACLs, which informs improvements to ACL management systems.
- *International Requirements of the MSA*: The international requirements of the MSA include strengthening the effectiveness of international fishery management organizations in conserving and managing fish stocks under their respective jurisdictions.
- *Illegal, Unreported, and Unregulated (IUU) Fishing*: NMFS publishes a biennial report identifying nations whose vessels are engaging in IUU fishing and bycatch of protected living marine resources and of certain sharks on the high seas. The identification of these nations allows the U.S. to take corrective actions. [Note: Enforcement actions required to prosecute and deter IUU fisheries actions are covered in the NMFS Enforcement Sub-program.
- *National Standard Guidance*: NMFS develops and promulgates guidelines to assist in the implementation of MSA National Standards, principles that must be followed in any FMP to ensure sustainable and responsible fishery management.
- *Regional Fishery Management Councils Support*: NMFS assists in the development, review, and implementation of Council-proposed actions. NMFS staff assists the Councils with Secretarial approval and implementation of FMPs and amendments, and preparing analytical documents in support of rulemaking.
- *Electronic Monitoring and Reporting*: NMFS coordinates with partners to develop, analyze, and incorporate electronic technologies into fishery management. Funding will expedite the use of electronic solutions where appropriate to improve the timeliness, quality, integration, and accessibility of fishery-dependent data for

fishery managers, stock assessment scientists, the fishing industry, and other key stakeholders. This work is in conjunction with and directly complements the electronic technology activities under the Fisheries and Ecosystem Science Programs and Services PPA.

National Catch Share Program

Funding supports operation of catch share programs. “Catch share” is a general term for strategies that allocate a specific portion of the total allowable fishery catch to individuals, cooperatives, communities, or other entities. The term includes specific programs defined in law, such as limited access privilege (LAP) and individual fishing quota (IFQ) programs. These programs allow fishermen to maximize their flexibility to time delivery of catch to the market.

The MSA allows some or all of the incremental operational costs for the catch share programs that meet the definition of a LAP program to be recovered once the catch share program is operational, but the total amount of cost recovery is capped at a maximum of three percent of the ex-vessel value of the fishery.



Catch share programs have been used in the U.S. since 1990 and now include 16 fisheries, which includes every region except the Pacific Islands

Reducing Bycatch

NMFS supports research on gear technologies that reduce bycatch and bycatch mortality. Reducing bycatch can save fishing jobs by preventing fishery closures due to interactions with endangered species or attainment of strict bycatch quotas. This funding supports the Bycatch Reduction Engineering Program external competitive grants program, which supports innovative gear designs and fishing techniques to minimize bycatch.

Product Quality and Safety

NMFS helps ensure that the Nation's seafood industry is economically sustainable and complies with food regulations. Funding supports the National Seafood Inspection Laboratory, which provides an analysis laboratory, data management, and regulatory compliance risk analysis. 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.

Aquaculture

The U.S. is a major consumer of aquaculture products, yet is a minor producer. The Nation imports more than 90 percent of its seafood, of which over half is from foreign-produced aquaculture. Only six percent of the seafood Americans consume is from domestic aquaculture.⁸ This reliance on foreign imports moves potential seafood jobs overseas and poses a risk to food security. Given wild fish stocks are at or near maximum harvest levels, the single greatest opportunity to increase the seafood supply is through domestic aquaculture. The Nation has a large untapped potential for sustainable aquaculture development, and seafood industry leaders are increasingly calling for NOAA and other Federal agencies to take steps to help realize this potential.

NMFS' mission includes supporting: growth of domestic marine aquaculture to increase and sustain the nation's seafood supply, job creation in coastal communities, and restoration of fisheries, marine species, and habitats. Agency activities are guided by the Aquaculture Act of 1980, the 2011 Department of Commerce and NOAA Aquaculture Policies, the inter-agency 2014 Strategic Plan for Federal Aquaculture Research, and NMFS' 2016 Marine Aquaculture Strategic Plan. The Department of Commerce has highlighted the seafood trade deficit as a priority to address in order for the U.S. to become a net exporter of seafood.

NMFS is one of three line offices that support NOAA's Marine Aquaculture Program. Each line office has distinct and complementary roles:

- NMFS leads the program and focuses on developing policies, regulations, and science-based tools to support efficient management and permitting systems.
- The Office of Oceanic and Atmospheric Research's (OAR) National Sea Grant College Program supports industry development and extension with integrated research and technology transfers primarily through competitive grants.
- The National Ocean Service (NOS) supports development of coastal planning tools to inform siting decisions.

NMFS' activities are led by the Office of Aquaculture and are aligned with four strategic goals:

- 1) Regulatory efficiency: Develop coordinated, consistent, and efficient regulatory processes for the marine aquaculture sector.

⁸ National Marine Fisheries Service. 2015. Fisheries of the United States, 2014. U.S. Department of Commerce, NOAA Current Fishery Statistics No.2014. Available at: <http://www.st.nmfs.noaa.gov/commercial-fisheries/fus/fus14/index>.

- 2) Tools for sustainable management: Encourage environmentally sustainable marine aquaculture using best available science.
- 3) Technology development and transfer: Develop technologies and provide extension services for the marine aquaculture sector.
- 4) Informed public: Improve public understanding of marine aquaculture.

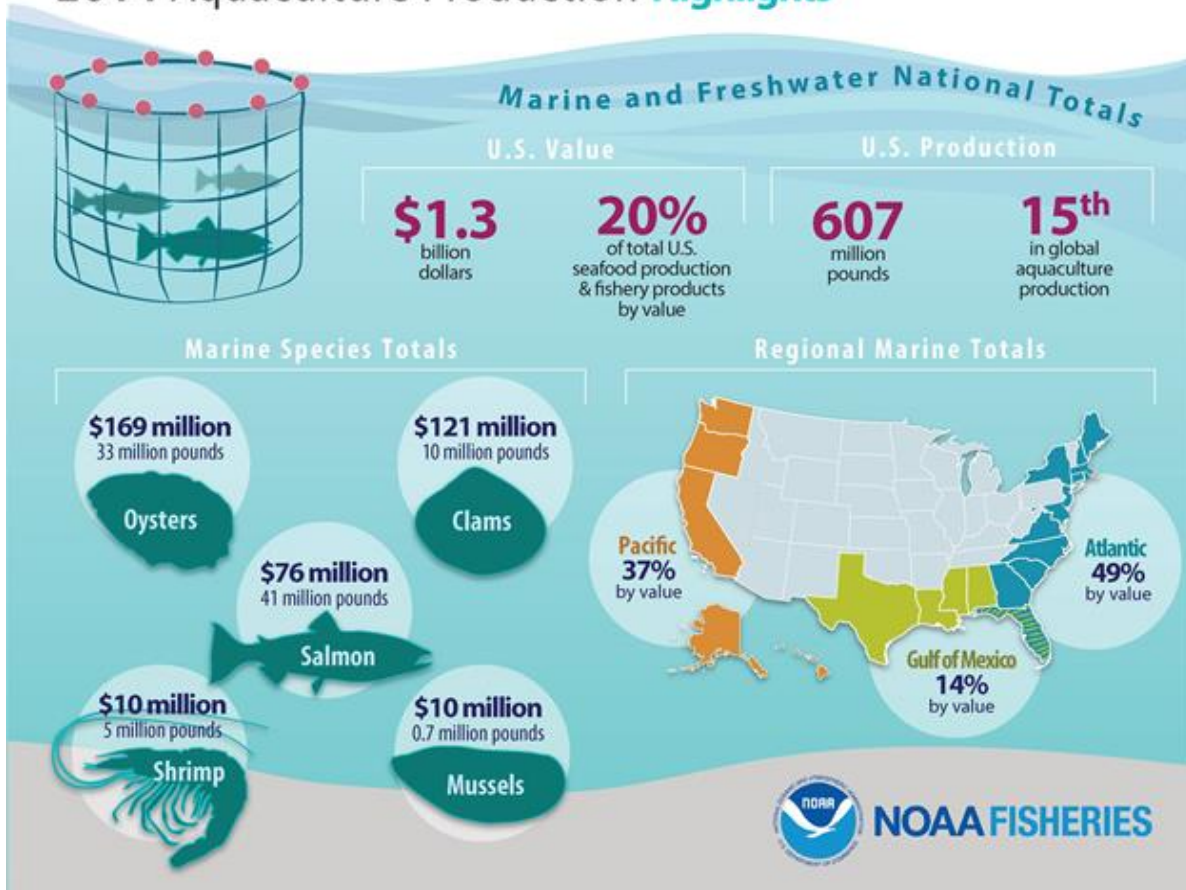
Examples of specific results to date include:

- An improved regulatory environment for marine aquaculture leading to several new permits and the first ever regional management plan for aquaculture in Federal waters, as well as record-high shellfish production in several states;
- Publication of several scientific articles demonstrating that the environmental effects of aquaculture are minimal when responsibly managed;
- Refinement and application of genetic risk assessment models and tools for aquaculture siting, aiding in key management decisions; and
- Advancement of rearing techniques for new aquaculture species with high potential for domestic production (e.g., sablefish).

U.S. marine aquaculture production has grown at an average annual rate of three percent per year over the last five years,⁹ supporting more jobs in coastal communities (see figure below). This expansion is a result, in part, of the investments and efforts of NOAA and its partners. NMFS' goal is to support a 50% increase in the volume of domestic aquaculture production by 2020 (from 2016 levels). Significant growth is needed over the next several years to meet this goal.

⁹ National Marine Fisheries Service. 2016. Fisheries of the United States, 2015. U.S. Department of Commerce, NOAA Current Fishery Statistics No.2015. Available at: <http://www.st.nmfs.noaa.gov/commercial-fisheries/fus/fus15/index>.

2014 Aquaculture Production Highlights



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 USFWS, 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 required to implement the 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 FMPs aimed at preventing and eliminating overfishing and rebuilding overfished stocks for the Nation's fisheries. The funding is divided among the eight Councils and is used for their operating costs (e.g., staff, rent, public meetings, Council member salaries, and travel). Funding also supports the activities of the Interstate Marine Fisheries Commissions, and International Fisheries Commissions. Funds provide critical operational support to the

commissions and states for development and implementation of sustainable fishery management measures.

Interjurisdictional Fisheries Grants

The Interjurisdictional Fisheries Act of 1986 (IFA) is a formula-based financial assistance program to promote state activities in support of the management of interjurisdictional fisheries resources. 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. EEZ; 2) are managed under an interstate FMP; or (3) migrate between the waters under the jurisdiction of two or more states bordering on the Great Lakes. Past examples of projects funded through these grants include research on: blue crab spawning in Florida; American lobster settlement in Maine; and, fishery catch statics, stock status, and management actions for state of Alaska managed fisheries including sablefish, lingcod, black and blue rockfish, and Pacific cod.

Schedule and Milestones:

Fisheries and Ecosystem Science Programs and Services (FY 2018–2022)

- *Economics and Social Science:* Expand implementation of an integrated Bioeconomic Length-structured Angler Simulation Tool, the Social Indicator Toolbox, and FishSET—a spatial economics toolbox; assess the economic performance of fisheries; and predict the cost/benefits of stock rebuilding programs
- *Fisheries Oceanography:* Continue to work with resource managers to provide ecosystem-based science information and trade-off analyses, to inform management decisions for evolving constituent-defined management issues in IEA regions
- *Antarctic Research:* Conduct research surveys to estimate the biomass of Antarctic krill and fishes; continue annual studies and assessments of krill-dependent predators to determine the impacts of krill fishing and climate change; complete stock assessments for 26 targeted stocks, and provide scientific advice to the U.S. Delegation to the Commission for the Conservation of Antarctic Marine Living Resources
- *Climate Regimes & Ecosystem Productivity:* Incorporate long-term observations of climate-related impacts on the Bering Sea ecosystem in integrated ecosystem assessments. Deliver Bering Sea ecosystem forecasts to help living marine resource managers incorporate climate-related impacts into management decisions
- *Information Analysis and Dissemination:* Improve population dynamics/assessment/management model development and data analysis tools to support fisheries science programs and improve data dissemination and sharing of integrated data and analyses (climatology, socio-economic, ecosystem, fishery-dependent, and fishery-independent), both internally and externally

Fisheries Data Collections, Surveys, and Assessments (FY 2018–2022)

- *Fisheries Monitoring, Assessment, and Forecasting:* Conduct and expand fishery-independent surveys; develop advanced sampling technologies to enhance data collection for stock assessments; improve timely delivery of fish stock assessments to fishery managers; and further the implementation of the next-generation stock assessment framework
- *Cooperative Research:* Issue awards for cooperative research from the Northeast Research Set-Aside, and the Southeast CRP competitive grants; and conduct cooperative research surveys nationwide
- *MARMAP:* 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
- *SEAMAP*: Conduct groundfish and plankton surveys in state and Federal waters, inshore and offshore longline surveys, and reef fish surveys in offshore waters

Observers and Training (FY 2018–2022)

- Provide coverage in 57 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 39 and the number of sea days observed annually at 78,000
- Coordinate observer program activities at the national level by developing new standards, policies, and procedures to improve observer programs

Fisheries Management Programs and Services (FY 2018–2022)

- *Illegal, Unreported, and Unregulated (IUU) Fishing*: Address MSA mandates to implement IUU/bycatch identification, monitoring, and certification procedures, and foreign nation capacity building. Submit biennial status reports to Congress
- *Reducing Bycatch*: Develop technological solutions and investigate changes in fishing practices designed to minimize bycatch of fish and protected species
- *Regional Fishery Management Councils Support*: Develop fishery management measures, using public input and the best available science and tools such as ACLs and AMs
- *Electronic Monitoring and Reporting*: Implement EM and ER options in key fisheries identified by 2020
- *National Catch Share Program*: Work with interested Regional Councils to support catch share programs, the use of technology, and when appropriate, to improve the cost-effectiveness of these programs

Aquaculture (FY 2018–2022)

- Implement regulations for the Gulf of Mexico FMP for Aquaculture and begin permitting of offshore finfish operations in the Gulf of Mexico
- Advance Science Center research to support environmentally sound aquaculture practices such as genetics and tools for aquaculture siting
- Research sustainable finfish aquaculture feeds
- Provide support to the Nation’s shellfish farmers through improved technical and science-based production tools and techniques (e.g., disease prevention and treatment)
- Develop science-based tools for management that ensure the efficient review of aquaculture permit applications

Salmon Management Activities (FY 2018–2022)

- 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

Regional Councils and Fisheries Commissions (FY 2018–2022)

- Continue to revise FMPs and amendments to prevent overfishing, rebuild overfished fisheries, and promote sustainability
- Complete socioeconomic analyses for fishery management actions

- Work with Councils to implement electronic technologies for fishery monitoring

Deliverables:

Fisheries and Ecosystem Science Programs and Services (FY 2018–2022)

- *Economics and Social Science*: Assessments of the benefits/cost-effectiveness of fisheries rebuilding programs, habitat and protected species recovery programs, and decision support tools; and, improved quantitative models for conducting benefit-cost analyses and predicting how fishery participants will respond to changes in management measures
- *Ecosystem Science*: Updated ecosystem-status reports and risk and vulnerability assessments delivered to resource managers in the IEA regions; and delivery of environmental indicators and predicted impacts on managed species to appropriate stock assessment scientists and Regional FMCs through the FATE program
- *Antarctic Research*: Complete 26 stock assessments for targeted stocks of krill, fishes, and crabs managed by the Commission for the Conservation of Antarctic Marine Living Resources
- *Information Analysis and Dissemination*: Technical expertise and capacity infrastructure for data collection, processing, sharing, and archiving for Integrated Ocean Observing System, NOAA Environmental Data Management Committee, NMFS Enterprise Data Management, NMFS Fisheries Information Systems, NMFS Marine Recreational Information Program, and GeoSpatial One Stop

Fisheries Data Collections, Surveys, and Assessments (FY 2018–2022)

- *Fisheries Monitoring, Assessment, and Forecasting*: Fishery-independent surveys to provide ongoing data for stock assessments; stock assessment reports based on a next-generation stock assessment framework for key stocks; and more precise estimates of recreational catch through improved surveys
- *Cooperative Research*: Conduct approximately 50 cooperative research projects, in partnership with stakeholders; and document the individual project final reports of the results, with data archived at the Fisheries Science Centers and added to the NMFS InPort Centralized documentation (metadata) repository
- *MARMAP*: 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; resulting data provided for use in stock assessments and in support of other research and management needs
- *SEAMAP*: Surveys in inshore and offshore waters conducted and fishery, habitat, biological, and environmental data provided to Regional Councils for incorporation into regional species stock assessments and for development of effective fisheries and habitat management strategies

Observers and Training (FY 2018–2022)

- Information on catch, bycatch, discards, and biological data necessary for in-season monitoring and stock assessments. Also information on fishing effort, fishing gear, and specific fishing techniques that minimize bycatch
- Annual reports and biennial updates to the National Bycatch Report; the latest online update was published in February 2016 and the next comprehensive report is scheduled for 2017

Fisheries Management Programs and Services (FY 2018–2022)

- Development of fisheries regulations, FMPs, 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) and certain shark catches on the high seas. May also result in recommendations to the Secretary of Commerce, after coordination with other Federal agencies, on possible fishery-product trade prohibitions and port restrictions on nations whose vessels engage in the above
- Improvements in fishing gear and fishing practices to reduce bycatch
- Implementation of cost-effective electronic technology applications that complement observer coverage, improve data collection and analysis, and lower the economic and time burden on fishermen for compliance with recordkeeping and reporting regulations

Aquaculture (FY 2018–2022)

- Increased domestic aquaculture production and associated jobs
- More efficient aquaculture permitting systems in state and Federal waters
- Report on interagency efforts to establish a coordinated permitting system for Federal waters
- Reports on research and development to support environmentally sound aquaculture practices
- Permits issued for aquaculture operations in the Gulf of Mexico and in other regions in Federal waters
- Application of science-based tools for management that ensure the efficient review of aquaculture permit applications

Salmon Management Activities (FY 2018–2022)

- Maintenance of salmon smolt production as required under the Mitchell Act
- Broad range of salmon stock assessment and fishery monitoring programs in the Snake and Columbia Rivers

Regional Councils and Commissions (FY 2018–2022)

- Draft amendments to FMPs
- Collection and analysis of socioeconomic data on the impacts of fishery management actions

Performance Goals and Measurement Data:
Fisheries and Ecosystem Science Programs and Services

Performance Measure: The number of Federally managed fisheries with electronic monitoring technology in place (cumulative)	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
	5	5	9	12	12	12	12

Description: NMFS will work with the Regional Councils and the Highly Migratory Species (HMS) Advisory Panel to identify the appropriate fisheries for electronic monitoring technology, and increase the number with implemented electronic monitoring systems each year. Electronic monitoring improves data collection and analysis, and makes it faster and cheaper for fishermen to comply with recordkeeping and reporting regulations. For more information: <https://www.st.nmfs.noaa.gov/advanced-technology/electronic-monitoring/index>

Fisheries Data Collections, Surveys, and Assessments

Performance Measure: Percentage of FSSI stocks with adequate population assessments and forecasts (Indicator 3.4)	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
	62.3% (124/199)	63.8% (127/199)	64.8% (129/199)	64.3% (128/199)	64.3% (128/199)	64.3% (128/199)	64.3% (128/199)

Description: This measure tracks the percentage of FSSI fish stocks for which adequate assessments are available. Assessments are vital to determine the scientific basis for supporting and evaluating the impact of fishery management actions. To be deemed adequate, 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.

Observers and Training

Performance Measure: Fisheries with adequate observer coverage	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
	38	39	39	39	39	39	39

Description: Total number of fisheries with adequate observer coverage as defined in the FMP. While 53 fisheries currently have observer programs, the number of fisheries with adequate or near adequate observer coverage are dependent on funding, fishing effort, changes in management and/or regulations, and observer program priorities. Managers face difficulty accurately managing fisheries and protected species without the critical data provided by observers. In addition, inadequate observer coverage may prevent commercial fisheries from being opened.

Performance Measure: Number of sea days observed	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
	73,743	78,000	78,000	78,000	78,000	78,000	78,000

Description: These values represent the total number of observer days at sea. Observers collect catch and bycatch data to inform a range of conservation and management issues. Some sea days are industry-funded; however, they still rely on Federal funding for related on-shore program costs (e.g., data QA/QC and analysis). Failure to meet these targets will impact the ability to monitor Federal fisheries, assess fish populations, set fishing quotas, inform management, and support compliance with fishing and safety regulations.

Fisheries Management Programs and Services

Performance Measure: Fish Stock Sustainability Index (Indicator 3.4) (cumulative)	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
	754	754	763	769.5	773	779.5	785.5

Description: NMFS measures the performance of U.S. Federal fisheries through the Fish Stock Sustainability Index (FSSI). The FSSI is an index of sustainability for domestic commercial and recreational fish stocks in the U.S. The index is comprised of 199 stocks, representing 85 percent of the total catch of all stocks. These 199 fish stocks were selected for their importance to commercial and recreational fisheries, including considerations of economic, ecological, and social value. The index is scored on a 1,000 point scale, with each stock given a score between 0 and 4 (0=status unknown, 4=meets all sustainable fishing criteria). The FSSI increases when NMFS determines that the status of a stock has improved; it is either no longer subject to overfishing, is no longer overfished, its biomass has increased at least 80 percent of target, or it is rebuilt. These are all factors that contribute to sustainably managed fisheries. For more information:
http://www.nmfs.noaa.gov/sfa/fisheries_eco/status_of_fisheries/fssi.html

Performance Measure: Percent of stocks for which catch is below the specified annual catch limit (ACL) (cumulative) (Indicator 3.4)	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
	90.7%	82%	83%	84%	86%	88%	90%

Description: This measure tracks the percentage of fish stocks that are below their annual catch limit (ACL). In 2007, Congress enacted a requirement to use ACLs to end and prevent overfishing. The use of ACLs has been successful in ending and preventing overfishing, as stock assessments have shown the number of stocks subject to overfishing continuing to decline. 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 the ACL, NMFS will report that the stock is below its ACL. For more information:
http://www.nmfs.noaa.gov/sfa/management/acls_ams/index.html.

PROGRAM CHANGES FOR FY 2018:

NOAA requests a total decrease of \$24,462,000 and 31 FTE in FY 2018 program changes for the Fisheries Science and Management sub-program. Following this section are program change narratives for this sub-program that represent program changes greater than five percent of a program. Complete program changes by PPA can be found in the NOAA Control Table (p. Control Table - 2).

PROGRAM CHANGES FOR FY 2018:

Fisheries Data Collections, Surveys, and Assessments: Reef Fish Stock Assessments (Base Funding: \$75,843,000 and 193 FTE; Program Change: -\$5,000,000 and 0 FTE):

NOAA requests a decrease of \$5,000,000 and 0 FTE for a total of \$70,843,000 and 193 FTE to eliminate funding for agency-independent reef fish assessments in the Gulf of Mexico.

Proposed Actions:

NOAA proposes a reduction of \$5.0 million in grants for development and implementation of agency-independent and alternative approaches to research and stock assessments for reef fish in the Gulf of Mexico. Congress initially provided this funding in FY 2016. NOAA will continue to produce stock assessments for the Gulf of Mexico reef fish complex as part of its national stock assessment process.

NOAA anticipates awarding a final grant for this assessment work by September 2017, and that partners will begin implementation in October 2017. The independent estimate of red snapper abundance will be complete in 2019. NMFS will use new information and data gathered from this independent estimate to improve its stock assessment as appropriate.

Resource Assessment:

In FY 2016, Congress directed NOAA to invest \$10.0 million in agency-independent, alternative approaches to stock assessments for reef fish in the Gulf of Mexico through \$5.0 million from OAR's National Sea Grant Program PPA and \$5.0 million from NMFS' Fisheries Data Collections, Surveys, and Assessments PPA. Through this partnership, NOAA is providing \$10.0 million in external grants for research on innovative strategies to improve abundance estimates for Gulf of Mexico red snapper and other reef fish. NOAA released a Phase I request for proposals in May 2016 using \$500,000 of this funding to develop experimental designs for the abundance estimates. In March 2017, NOAA announced a Phase II request for proposals using the remaining \$9.5 million to implement the resulting experimental design.

PROGRAM CHANGE DETAIL BY OBJECT CLASS

(Dollar amounts in thousands)

Program: National Marine Fisheries Service
Sub-program: Fisheries Science and Management
Program Change: Reef Fish Stock Assessments

Object Class		FY 2018 Decrease	FY 2018 Total Program¹⁰
11	Personnel compensation		
11.1	Full-time permanent	\$0	\$46,847
11.3	Other than full-time permanent	0	541
11.5	Other personnel compensation	0	2,329
11.8	Special personnel services payments	0	280
11.9	Total personnel compensation	0	49,997
12	Civilian personnel benefits	0	15,792
13	Benefits for former personnel	0	6
21	Travel and transportation of persons	0	2,341
22	Transportation of things	0	600
23.1	Rental payments to GSA	0	1,598
23.2	Rental Payments to others	0	509
23.3	Communications, utilities and miscellaneous charges	0	6,190
25.1	Advisory and assistance services	0	9,699
25.2	Other services	0	20,789
25.3	Purchases of goods & services from Gov't accounts	0	665
25.4	Operation and maintenance of facilities	0	0
25.5	Research and development contracts	0	16
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	5,009
31	Equipment	0	885
32	Lands and structures	0	0
33	Investments and loans	0	0
41	Grants, subsidies and contributions	(5,000)	45,397
42	Insurance claims and indemnities	0	0
43	Interest and dividends	0	2
44	Refunds	0	0
99	Total obligations	(5,000)	160,068

¹⁰ Due to financial system limitations, the object class detail for the Program reflects the Fisheries Data Collections, Surveys, and Assessments PPA.

Fisheries Data Collections, Surveys, and Assessments: Cooperative Research Program (Base Funding: \$12,073,000 and 22 FTE; Program Change: -\$3,001,000 and 0 FTE):

NOAA requests a decrease of \$3,001,000 and 0 FTE for a total of \$9,072,000 and 22 FTE for the Cooperative Research program.

Proposed Actions:

NOAA proposes to reduce funding for the Cooperative Research program, which will lead to approximately ten fewer projects funded in FY 2018 (see performance measure below). The program will continue to execute cooperative research with industry, fishermen, and other stakeholders as available funding allows. Benefits of cooperative research include increased data quantity and quality, inclusion of stakeholders' knowledge in science and management, improved relevance of research to fisheries management, and reduced science costs through leveraging and cost sharing. NOAA values cooperative research as an important part of the business of collecting data to support science and management activities.

Resource Assessment:

Since 2001, the Cooperative Research program has provided a means for commercial and recreational fishermen to participate in the collection of fundamental fisheries information to support the development and evaluation of management options. This work involves regional partnerships with a broad range of external stakeholders, including state and Tribal managers and scientists (e.g., interstate fishery commissions), fishing industry participants (e.g., commercial and recreational fishermen), and educational institutions. Partnerships occur in all phases of the program, including design, research, analysis, and communication of results.

Cooperative research assists scientists and managers by providing information to supplement the data currently collected through existing Federal research programs. The information provided can cover a wide range of research areas, including, but not limited to: fishery dependent data; life history studies; conservation engineering; species abundance and distribution; habitat studies; and, socio-economic studies.

Performance Goals and Measurement Data:

Performance Measure: Number of Cooperative Research projects funded (annual)	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
With Decrease	N/A	N/A	29	29	29	29	29
Without Decrease	39	39	39	39	39	39	39
Description: Number of Cooperative Research projects conducted annually that provide information to scientists and managers to inform fisheries management. These projects are also an important form of stakeholder engagement that allows commercial and recreational fishermen to be involved in the management of the fisheries in which they operate.							

PROGRAM CHANGE DETAIL BY OBJECT CLASS

(Dollar amounts in thousands)

Program: National Marine Fisheries Service
Sub-program: Fisheries Science and Management
Program Change: Cooperative Research Program

Object Class		FY 2018 Decrease	FY 2018 Total Program¹¹
11	Personnel compensation		
11.1	Full-time permanent	\$0	\$46,847
11.3	Other than full-time permanent	0	541
11.5	Other personnel compensation	0	2,329
11.8	Special personnel services payments	0	280
11.9	Total personnel compensation	0	49,997
12	Civilian personnel benefits	0	15,792
13	Benefits for former personnel	0	6
21	Travel and transportation of persons	0	2,341
22	Transportation of things	0	600
23.1	Rental payments to GSA	0	1,598
23.2	Rental Payments to others	0	509
23.3	Communications, utilities and miscellaneous charges	0	6,190
25.1	Advisory and assistance services	0	9,699
25.2	Other services	(1,500)	19,289
25.3	Purchases of goods & services from Gov't accounts	0	665
25.4	Operation and maintenance of facilities	0	0
25.5	Research and development contracts	0	16
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	5,009
31	Equipment	0	885
32	Lands and structures	0	0
33	Investments and loans	0	0
41	Grants, subsidies and contributions	(1,501)	48,896
42	Insurance claims and indemnities	0	0
43	Interest and dividends	0	2
44	Refunds	0	0
99	Total obligations	(3,001)	162,067

¹¹ Due to financial system limitations, the object class detail for the Program reflects the Fisheries Data Collections, Surveys, and Assessments PPA.

Fisheries Management Programs and Services: National Catch Share Program (Base Funding: \$25,208,000 and 74 FTE; Program Change: -\$5,002,000 and 0 FTE): NOAA requests a decrease of \$5,002,000 and 0 FTE for a total of \$20,206,000 and 74 FTE to reduce support for catch share programs.

Proposed Actions:

NOAA requests a reduction of \$5.0 million to decrease support for: implementation of new catch share programs; data collection improvements for recently implemented programs; and, national-level coordination to improve efficiency in the development and implementation of catch share programs. NOAA will reduce its investment in specific tools, which support more consistent data collection and increase program efficiencies and performance. NOAA will continue to provide support for the 16 programs currently under catch share management.

Resource Assessment:

“Catch share” programs allocate a specific portion of the total allowable fishery catch to individuals, cooperatives, communities, or other entities. The National Catch Share Program implements improvements requested by the fishing industry and the Regional Councils. Types of improvements may include enhancing data collection efficiency and effectiveness, and accuracy and timeliness of analyses on the biological, ecological, and socio-economic aspects of catch share fisheries. Further, the Magnuson-Stevens Act requires that catch shares be regularly reviewed to ensure programs are meeting their stated goals and the goals of the Act.

Performance Goals and Measurement Data:

Performance Measure: Number of key objectives met by catch share programs	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2020 Target
With Decrease	N/A	N/A	19	19	19	19	19
Without Decrease	16	16	19	20	20	20	20
<p>Description: The four key objectives, below, are expected outcomes of implementing catch share programs, which demonstrate improvements in the ecological and economic health of that fishery. Each objective is measured for each catch share program (i.e., 1 program would score a total of 4, 2 programs would total 8, etc., if all the objectives are achieved for each new catch share program). NMFS must wait until the first year of a program is complete in order to analyze the data and determine whether catch share program have achieved objectives. The key objectives that are tracked for catch share programs implemented in 2010 or later are:</p> <ul style="list-style-type: none"> • Increased revenue per vessel* • Increased or full utilization of target species* • Decreased bycatch* • ACL not exceeded <p>*Changes to objectives will be determined by comparing the performance under the catch share program with the average performance prior to implementation.</p>							

PROGRAM CHANGE DETAIL BY OBJECT CLASS

(Dollar amounts in thousands)

Program: National Marine Fisheries Service
Sub-program: Fisheries Science and Management
Program Change: National Catch Share Program

Object Class		FY 2018 Decrease	FY 2018 Total Program¹²
11	Personnel compensation		
11.1	Full-time permanent	\$0	\$43,260
11.3	Other than full-time permanent	0	270
11.5	Other personnel compensation	0	802
11.8	Special personnel services payments	0	457
11.9	Total personnel compensation	<hr/> 0	44,789
12	Civilian personnel benefits	0	14,941
13	Benefits for former personnel	0	9
21	Travel and transportation of persons	0	2,108
22	Transportation of things	0	228
23.1	Rental payments to GSA	0	2,231
23.2	Rental Payments to others	0	931
23.3	Communications, utilities and miscellaneous charges	0	2,482
25.1	Advisory and assistance services	0	6,336
25.2	Other services	0	18,194
25.3	Purchases of goods & services from Gov't accounts	0	1,562
25.4	Operation and maintenance of facilities	0	0
25.5	Research and development contracts	0	3
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	1,971
31	Equipment	0	1,484
32	Lands and structures	0	0
33	Investments and loans	0	0
41	Grants, subsidies and contributions	(5,002)	15,392
42	Insurance claims and indemnities	0	1
43	Interest and dividends	0	1
44	Refunds	0	0
99	Total obligations	<hr/> (5,002)	113,096

¹² Due to financial system limitations, the object class detail for the Program reflects the Fisheries Management Programs and Services PPA.

Interjurisdictional Fisheries Grants (Base Funding: \$2,994,000 and 1 FTE: Program Change: -2,994,000 and -1 FTE): NOAA requests a decrease of \$2,994,000 and 1 FTE for a total of \$0 and 0 FTE for the Interjurisdictional Fisheries Grants program.

Proposed Actions:

The Interjurisdictional Fisheries Act of 1986 (IFA) is a financial assistance program to promote state activities in support of the management of interjurisdictional fisheries resources. This reduction would eliminate funding for this grant program in FY 2018.

Resources Assessment:

The Interjurisdictional Fisheries Grant Program is authorized under the Interjurisdictional Fisheries Act of 1986 (IFA). Grants are non-competitive, formula-based, and provide support to 38 states and territories to aid in the state/Federal management of U.S. fisheries. The purposes of the IFA are to promote:

- state activities in support of the management of interjurisdictional resources;
- the management of interjurisdictional fisheries resources throughout their range of habitat; and,
- research used to inform ecosystem and interspecies approaches to the conservation and management of interjurisdictional fishery resources.

Projects supported by these grants respond to fishery research needs under the Magnuson-Stevens Act, Atlantic Coastal Fisheries Cooperative Management Act, Great Lakes Fisheries Commission's Joint Strategic Plan, and a variety of multi-jurisdictional fisheries management planning programs. Many of the efforts are long-term research and data collection. This work helps to improve the quantity and quality of fisheries information used in interstate and Federal fishery management programs carried out in U.S. waters. Examples of projects funded through these grants include research on: blue crab spawning in Florida; American lobster settlement in Maine; and, fishery catch statics, stock status, and management actions for state of Alaska managed fisheries including sablefish, lingcod, black and blue rockfish, and Pacific cod.

PROGRAM CHANGE PERSONNEL DETAIL

Program: National Marine Fisheries Service
Sub-Program: Fisheries Science and Management
Program Change: Interjurisdictional Fisheries Grants

Title:	Location	Grade	Number of Positions	Annual Salary	Total Salaries
Grants Management Specialist	Various	ZA-IV	-1	112,871	(112,871)
Total			<u>-1</u>		<u>(112,871)</u>
less Lapse		0%	<u>0</u>		
Total full-time permanent (FTE)			-1		(112,871)
2018 Pay Adjustment (1.9%)					<u>(2,145)</u>
TOTAL					<u>(115,016)</u>

Personnel Data

	<u>Number</u>
Full-Time Equivalent Employmen	
Full-time permanent	-1
Other than full-time permanent	0
Total	<u>-1</u>

Authorized Positions:

Full-time permanent	-1
Other than full-time permanent	0
Total	<u>-1</u>

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

Program: National Marine Fisheries Service
Sub-program: Fisheries Science and Management
Program Change: Interjurisdictional Fisheries Grants

Object Class	FY 2018 Decrease	FY 2018 Total Program
11 Personnel compensation		
11.1 Full-time permanent	(\$115)	\$0
11.3 Other than full-time permanent	0	0
11.5 Other personnel compensation	(1)	0
11.8 Special personnel services payments	0	0
11.9 Total personnel compensation	(116)	0
12 Civilian personnel benefits	(34)	0
13 Benefits for former personnel	0	0
21 Travel and transportation of persons	(3)	0
22 Transportation of things	0	0
23.1 Rental payments to GSA	(5)	0
23.2 Rental Payments to others	(2)	0
23.3 Communications, utilities and miscellaneous charges	(5)	0
25.1 Advisory and assistance services	(3)	0
25.2 Other services	(22)	0
25.3 Purchases of goods & services from Gov't accounts	(1)	0
26 Supplies and materials	(3)	0
31 Equipment	(3)	0
32 Lands and structures	0	0
33 Investments and loans	0	0
41 Grants, subsidies and contributions	(2,794)	0
42 Insurance claims and indemnities	0	0
43 Interest and dividends	0	0
44 Refunds	0	0
99 Total obligations	(2,994)	0

APPROPRIATION ACCOUNT: OPERATIONS, RESEARCH, AND FACILITIES SUB-PROGRAM: ENFORCEMENT

NOAA's Office of Law Enforcement (OLE) is the only conservation enforcement program (Federal or state) 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 protects and monitors the world's largest EEZ including 13 National Marine Sanctuaries, and four Marine National Monuments (Figure 1).



Figure 1. NOAA Office of Law Enforcement's Jurisdiction

OLE enforces more than 35 Federal statutes and international agreements related to living marine resources in order to protect marine fisheries, wildlife, and habitat and ensure these global resources are available for future generations to use and enjoy (Figure 2). OLE's work supports NMFS' core mission mandates of maximizing productivity of sustainable fisheries and fishing communities; and the protection, recovery, and conservation of protected species. OLE provides direct support for enforcement activities in the NMFS headquarters' Offices of Sustainable Fisheries and Protected Resources, NMFS Regional Offices, and the National Ocean Service's (NOS) Office of National Marine Sanctuaries.



Figure 2. NOAA Enforcement Efforts by Law

NOAA's Enforcement Program supports critical collaborations and leverages 28 Joint Enforcement Agreements (JEAs) with 27 coastal states and territories, and partnerships with other Federal agencies such as the U.S. Coast Guard. OLE refers enforcement cases that document violations to NOAA's Office of General Counsel or the U.S. Department of Justice for review and potential prosecution under their jurisdiction.

NOAA cannot meet the mandate to end overfishing without OLE's efforts. These efforts ensure that the millions of people who enjoy and rely on these marine resources understand and comply with the regulations necessary to ensure their sustainability and allow fair competition now and for future generations. OLE supports two objectives:

- (1) Enforce laws and regulations that govern:
 - a. commercial fisheries,
 - b. international and interstate commerce in marine resources, and
 - c. human interactions with marine mammals and threatened and endangered species.

- (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
- (4) Outreach and education strategies designed to increase and enhance voluntary compliance with environmental laws and regulations.

One example of where OLE has successfully employed this suite of enforcement methods is in the actions taken to support a healthy striped bass population in the Mid-Atlantic region. The Atlantic striped bass (*Morone saxatilis*) has formed the basis of one of the most important fisheries on the Atlantic Coast for centuries. According to the Atlantic States Marine Fisheries Commission, overfishing and poor environmental conditions led to the collapse of the Atlantic striped bass fishery in the 1980s. The Atlantic Coastal Fisheries Cooperative Management Act was issued to ensure the sustainability of the species by setting restrictions on fishing for Atlantic striped bass in the U.S. EEZ.

NOAA's OLE raised awareness of these regulations and increased targeted enforcement efforts to protect the species from illegal poaching activities. In 2015, OLE joined state and Federal marine law enforcement organizations in a focused enforcement effort, targeting vessels illegally retaining and fishing for striped bass in the EEZ. OLE built on these efforts by providing valuable and informative messages to the public and the media. The office put together a proactive outreach plan with online messaging, social media posts, and text messages. During the first month of the fisheries closure alone, the social media posts went viral, and the web story was viewed over 1,084 times, picked up by 12 external websites and further distributed through the networks of the Atlantic States Marine Fisheries Commission, and NMFS Regional Offices. These efforts proved an effective way for NOAA to reach people and share the information they need to ensure voluntary compliance.

Major components of the Enforcement budget line include:

Enforcement and Surveillance:

NOAA's Enforcement Program ensures compliance with marine natural resource laws using enforcement tools designed to encourage people to meet their legal obligations, both domestically and internationally. Special agents and enforcement officers work to deter, detect, investigate, and document any violations of Federal laws and regulations. NOAA's approach to fisheries enforcement emphasizes compliance assistance. OLE assists regulated parties in understanding and complying with fishery regulations through contact during monitoring and inspections, and increases public awareness and understanding of enforcement goals and objectives through participation in community meetings, trade shows, and on-the-dock informational visits. Personal interactions between enforcement officers and the community have proven effective in maintaining dialog on often complex regulations, and allow NOAA's investigative efforts and subsequent prosecution to focus on cases that go beyond misunderstandings and/or clerical errors.

This program responds to 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 critical elements in NOAA's enforcement approach. Most commercial and recreational fishermen comply with conservation measures, and OLE's role is to ensure fair competition and a level playing field. In recent years, additional investments in the Enforcement Program have been made to strengthen NOAA's efforts to detect and deter Illegal, Unreported and Unregulated (IUU) fishing and enforce restrictions on imports of illegally-harvested and improperly-documented seafood.

Cooperative Agreements with States:

The Cooperative Enforcement Program leverages the resources of coastal state and U.S. territorial marine conservation law enforcement agencies to provide direct support for the Federal enforcement mission. These partners execute Joint Enforcement Agreements (JEA) with NOAA to support Federal enforcement efforts near shore and at sea, as well as provide 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, the breadth of laws and regulations within NOAA's stewardship responsibilities, the amount of regulated commercial activity (fishing and both domestic and international trade), and the amount of recreational use of the marine environment. This cooperative program allows OLE 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 FY 2016, JEA partnerships committed to 137,662 base hours of labor, increasing the number of hours dedicated to Federal marine conservation enforcement activities by a factor of five 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. This communications system remotely reports vessel positions and provides an infrastructure for the communication of electronic monitoring data. The program supports a growing number of regulations that require vessels to report in the VMS, and it allows OLE to monitor compliance and track violators over vast expanses. The VMS data serve as valuable evidence and are vital to NMFS' scientific community and fisheries managers. Efficiencies realized by this electronic monitoring method and the data it produces are a significant advance to 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 resources, environmental, and species conservation laws. Prior to VMS implementation, the only methods used to police protected areas were surface and air patrols, which are costly and do not provide the round-the-clock coverage provided by VMS.

Implementation of the High Seas Driftnet Fisheries Enforcement Act:

The High Seas Driftnet Fisheries Enforcement Act sets U.S. policy to enforce the United Nations' worldwide moratorium on large-scale driftnet fishing beyond the EEZ of any nation. Renegade large-scale high seas driftnet fishing indiscriminately kills massive amounts of fish and other marine life such as whales and turtles with 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 to 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. OLE conducts investigation and enforcement required to prosecute and deter these illegal actions. Additionally, NOAA participates in scientific research as part of a multi-national cooperative marine ecosystem research program on driftnet-affected species. The results of this research reduce uncertainty in population assessments for these species

and inform related fishery management and enforcement decisions.

Schedule and Milestones:

OLE measures outputs in terms of incidents (documentation of possible violations) initiated, man-hours of patrol for monitoring and inspection work, and man-hours of outreach to the regulated community and the public.

During FY 2018, OLE plans to:

- Continue to advance enforcement and compliance assistance efforts in support of NOAA’s Office of Law Enforcement Operational Priorities
- Finalize the hiring and deployment of enforcement personnel at strategic Ports of Entry
- Establish consistent international IUU enforcement training and technical assistance

Deliverables:

FY 2018–2022

- Execution of 28 Joint Enforcement Agreements annually with the Cooperative Enforcement Program’s state and U.S. territory partners
- Monitoring of and compliance assistance to approximately 4,450 vessels under the VMS requirements of 23 FMPs, two international convention areas, and the Papahānaumokuākea National Monument
- Review of progress toward and determine next set of strategic 5-year national and regional Operational Enforcement Priorities
- Advancement of IUU training course for NOAA, Federal, state, and territory partners based on the FY 2016 Pilot

Performance Goals and Measurement Data:

Performance Measure:	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
Civil and criminal investigations initiated	5,190	5,115	5,115	5,115	5,115	5115	5115
Description: Total number of civil and criminal investigations initiated to identify those responsible for violations and to support the effective prosecution of violations of Federal marine resource law.							

Performance Measure:	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
Man hours of patrol, monitoring, and inspections	23,868	36,284	48,700	48,700	48,700	48,700	48,700
Description: Total number of hours spent on patrol, monitoring, and inspections in areas of regulated activity to deter or detect violations of resource protection laws.							

Performance Measure:	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
Man hours of outreach on Federal marine resource laws, rules, and regulations	12,428	18,000	20,400	20,400	20,400	20,400	20,400
Description: Total number of hours spent on outreach to educate the public and those involved in regulated commercial activity of Federal marine resource laws, rules, and regulations.							

PROGRAM CHANGES FOR FY 2018:

NOAA requests a decrease of \$1,057,000 and 4 FTE in FY 2018 program changes for the Enforcement sub-program. Narratives are only provided for program changes which are greater than five percent of a program. Complete program changes by PPA can be found in the NOAA Control Table (p. Control Table - 2).

APPROPRIATION ACCOUNT: OPERATIONS, RESEARCH, AND FACILITIES

SUB-PROGRAM: HABITAT CONSERVATION AND RESTORATION

Activities within the Habitat Conservation and Restoration sub-program include protection and restoration of habitat to sustain commercial and recreational fisheries, recover protected species, and maintain resilient coastal ecosystems and communities, under the following primary mandates: Magnuson-Stevens Act (MSA), Federal Power Act, Energy Policy Act of 2005; Endangered Species Act; Oil Pollution Act; and Comprehensive Environmental Response, Compensation and Liability Act.

Healthy habitat provides significant and essential ecosystem, community, and economic benefits. Habitat is the foundation for resilient fisheries and fishing-based communities and industries, as well as key to supporting and recovering endangered and threatened species. In 2014, the U.S. commercial and recreational saltwater fishing industries generated more than \$214 billion in sales and supported 1.83 million jobs.¹³

Coastal communities rely on healthy habitat for a wide variety of additional socio-economic needs including, recreation, tourism, and as natural infrastructure that protects life and property by reducing effects of storm damage, erosion, and coastal flooding. The Nation's ocean and coastal resources annually provide non-market value (e.g., storm surge protection, wildlife viewing, beach visits, snorkeling) of over \$100 billion.¹⁴ Habitat conservation projects often also result in improved infrastructure (e.g., new or modified bridges, culverts, agricultural levees), enhance public safety (e.g., removal of obsolete dams that have become safety hazards), and support a diversified coastal economy.

However, we are facing continued widespread loss and deterioration of vital habitats for managed fisheries, as well as threatened and endangered species. This substantial habitat loss is also increasing risks to communities and the economy from coastal storms, droughts, and other extreme weather. For example, we are losing coastal wetlands—prime nurseries for many species—at the rate of about 80,000 acres per year. This rate of loss is 20,000 more acres per year than was lost during the 6-year period of 1998–2004.¹⁵ More than 60 percent of coastal rivers and bays are moderately to severely degraded by nutrient runoff,¹⁶ and there are over six million barriers to fish passage within the rivers of the United States.¹⁷ In addition, each year as many as 150 oil spills and hazardous substance releases¹⁸ occur across the Nation.

¹³ National Marine Fisheries Service. 2016. Fisheries Economics of the United States, 2014. U.S. Dept. Commerce, NOAA Tech. Memo. NMFS-F/SPO-163, 237p. Available at: https://www.st.nmfs.noaa.gov/economics/publications/feus/fisheries_economics_2014/index.

¹⁴ The National Ocean Economics Program and the Center for the Blue Economy. 2014. State of the U.S. Ocean and Coastal Economies. 84p. Available at: <http://www.oceaneconomics.org/Download/>.

¹⁵ 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.). Available at: http://www.habitat.noaa.gov/pdf/Coastal_Watershed.pdf.

¹⁶ Howarth, Robert, Donald Anderson, James Cloern, Chris Elfring, Charles Hopkinson, Brian Lapointe, Tom Malone, Nancy Marcus, Karen McGlathery, Andrew Sharpley, and Dan Walker. 2000. Nutrient Pollution of Coastal Rivers, Bays, and Seas. *Issues in Ecology* (7). Available at: <http://www.esa.org/esa/science/issues/>.

¹⁷ U.S. Fish and Wildlife Service. 2011. National Fish Passage Program Annual Report and Future Outlook. Available at: <https://www.fws.gov/fisheries/whatwedo/nfpp/nfpp.html>.

¹⁸ Oil Spills. May 2017. U.S. Dept. of Commerce, NOAA, Damage Assessment, Remediation, and Restoration Program. Retrieved from <https://darrp.noaa.gov/oil-spills>.

NOAA Habitat Blueprint: NOAA developed the Habitat Blueprint principles to increase the effectiveness of its habitat conservation efforts for the benefit of fisheries, coastal and marine life, and the coastal communities and economies they support. These principles emphasize strengthening internal and external partnerships, implementing habitat conservation for multiple benefits, and focusing work where it can have the greatest impact. In ten Habitat Focus Areas (HFA) across the country, we are bringing together a wide variety of partners to leverage resources and make measurable progress toward discrete habitat-related objectives. (<https://www.habitatblueprint.noaa.gov>). To date, NOAA has directly invested over \$7 million in multi-year partnership agreements for projects that support HFA objectives. In response, other sources (including other NOAA programs and external partners) have invested at least \$66 million to advance HFA objectives.

Program Components: Major components of this Habitat Conservation and Restoration budget line include:

Sustainable Habitat Management

NOAA protects healthy habitats from loss and degradation. NMFS conducts thousands of consultations each year with Federal agencies whose proposed actions may affect Essential Fish Habitat (EFH) for Federally-managed species, so actions can be taken to avoid, minimize, or compensate for marine, coastal, and riverine habitat impacts. For example, proposed actions can include construction projects, applications for dredging and filling wetlands, waste discharge permits, and renewable energy proposals. Our unique role and responsibility under the Federal Power Act also requires fish passage at hydropower dams licensed by the Federal Energy Regulatory Commission (FERC). In addition, NOAA identifies and maps locations of deep-sea corals in coordination with other Federal agencies and research institutions through its Deep Sea Coral Research and Technology Program, authorized under the MSA.

Each year, NOAA protects more than 100,000 acres of Essential Fish Habitat from non-fishing impacts. Since 2004, we have opened passage along more than 1,570 miles of streams and rivers that had been blocked by hydropower dams, improving fish passage for Federally listed species (such as Pacific and Atlantic salmon), numerous managed fish, and species such as river herring that serve as important food sources for offshore commercial and recreational fish stocks. Since 2011, NOAA has mapped more than 345,000 square kilometers of seafloor through deep-sea coral habitat surveys.

Fisheries Habitat Restoration

The NOAA Restoration Center (RC) works closely with partners to restore injured, degraded, or lost priority coastal, marine, and riverine habitat nationwide. Every year, NOAA responds to as many as 150 oil spills and hazardous substance releases across the Nation through our Damage Assessment Remediation and Restoration Program (DARRP). The NOAA RC leads the restoration planning and implementation for these events (most notably the Deepwater Horizon (DWH) oil spill) as part of NOAA's Natural Resource Damage Assess (NRDA) and Restoration Trustee responsibilities under OPA and CERCLA. The Community-based Restoration Program (CRP) provides technical and financial assistance for the implementation of community-driven habitat restoration. Habitat restoration projects are selected through a competitive solicitation process that leverages substantial investments from partners.

In addition to improving habitat for managed fishery and protected resources, 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 for, and monitor projects. And, unlike other economic sectors, restoration jobs cannot 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.¹⁹

Chesapeake Bay Protection and Restoration

The NOAA Chesapeake Bay Office (NCBO) conducts work in fisheries, observations, education, and oyster restoration in support of the 2014 Chesapeake Bay Agreement. Chesapeake Bay fish and shellfish play a critical role in the culture, economy, and ecology of the region. The office promotes ecosystem-based management through modeling, monitoring, and research to identify the most important factors influencing Chesapeake Bay fisheries. NCBO collects and integrates information about the Bay from buoys, satellites, shipboard mapping technologies, and other sources. These observations improve fisheries and protected resource management, weather forecasts, on-the-water safety, and public health. By supporting learning in classrooms and communities, NCBO also improves knowledge and understanding of the Chesapeake Bay ecosystem.

Oysters were once a major economic driver of the Chesapeake Bay region. Today, at levels of less than 1% of their historic populations, they still provide significant commercial and ecological benefits. NCBO is working closely with state, Federal, academic, and not-for-profit partners to restore native oysters in ten tributaries of the Chesapeake Bay. As part of NOAA's Habitat Blueprint, NCBO leads the Choptank River Watershed HFA. Recent successes in large-scale oyster restoration in Harris Creek, a tributary within the Choptank River HFA, are being replicated in two neighboring tributaries, improving water quality, fish habitat, and oyster populations throughout the watershed. NCBO fisheries research and monitoring allows the agency to track progress associated with this work and ensure the efficient and effective use of resources. Related education and outreach efforts have built community support for the restoration projects to ensure they are self-sustaining, continue to grow, and remain healthy into the future.

Schedules and Milestones:

FY 2018–2022

- Develop management options for protecting deep-sea corals in partnership with the Regional Fishery Management Councils and National Marine Sanctuaries
- Participate in the re-licensing process for an estimated 125 hydroelectric projects
- Identify and protect essential fish habitat through consultations and partnerships
- Develop restoration plans, conduct habitat assessments, and implement priority restoration projects critical for NOAA trust resources
- Establish partnerships and leverage resources in selected Habitat Focus Areas under the NOAA Habitat Blueprint framework
- Contribute to major ecosystem restoration efforts, including Chesapeake Bay, Puget Sound, Gulf of Mexico, Great Lakes, and San Francisco Bay/Delta

¹⁹ 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*. Available at: <http://www.tandfonline.com/doi/abs/10.1080/09640560600946974>.

Deliverables:

FY 2018–2022

- Accurate deep-sea coral habitat distribution maps that allow managers to better protect these biologically rich ecosystems
- 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
- Development of maps and habitat assessments annually to support oyster restoration in the Chesapeake Bay

PROGRAM CHANGES FOR FY 2018:

NOAA requests a total decrease of \$10,726,000 and 2 FTE in FY 2018 program changes for the Habitat Conservation and Restoration sub-program. Following this section are program change narratives for this sub-program that represent program changes greater than five percent of a program. Complete program changes by PPA can be found in the NOAA Control Table (p. Control Table - 2).

PROGRAM CHANGES FOR FY 2018:

Habitat Conservation and Restoration: Coastal Ecosystem Resiliency Grants (Base Funding: \$10,000,000 and 0 FTE; Program Change: -\$10,000,000 and 0 FTE): NOAA requests a decrease of \$10,000,000 and 0 FTE for a total of \$0 and 0 FTE for Coastal Ecosystem Resiliency Grants.

Proposed Actions:

The Coastal Ecosystem Resiliency Grants program supports on-the-ground habitat restoration projects that reduce communities' vulnerability to extreme weather, while supporting protected and managed species. This reduction would eliminate funding for this grants program in FY 2018. This program is coordinated with NOS' Regional Coastal Resilience Grants program, which is also proposed for elimination (see NOS-32).

Resource Assessment:

The NMFS Habitat Program includes \$10.0 million for Coastal Ecosystem Resiliency Grants. Grants provide funding to improve and restore coastal habitat, such as wetlands, rivers, and shorelines, providing naturally resilient features for flood reduction and protection, as well as habitat to enhance fisheries productivity. Eligible applicants include nonprofit and private entities, institutions of higher education, and state, territorial, Tribal, and local governments, and regional organizations.

In FY 2016, NMFS funded eleven projects (e.g., dam removals, wetlands, coral reefs) that will enhance fish habitat and protect life and property, by removing safety hazards, protecting infrastructure, and reducing flooding on roadways, residential and commercial properties, and agricultural lands. An example includes the Mountain View Restoration Project in California, which will restore 710 acres of former salt evaporation ponds in the South San Francisco Bay. The project will restore wetlands, supporting sustainable fisheries and the recovery of protected species such as steelhead, and improve protection to Bay communities in the face of extreme weather. The Kilisut Harbor Restoration Project in Washington will restore tidal connection by replacing the state route 116 causeway with a bridge. This work will restore 27 acres of tidal marsh, provide passage for protected species such as Hood Canal summer chum and Puget Sound Chinook, and support tribal and other fisheries. Approximately 400 households will benefit from the improved infrastructure provided by the bridge, which also carries utilities.

Performance Goals and Measurement Data:

Performance Measure: Number of habitat acres restored (annual) (Indicator 3.4)	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
With Decrease	N/A	N/A	7,800	4,000	4,000	4,000	4,000
Without Decrease	8,844	4,290	7,800	8,000	8,000	8,000	8,000
<p>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 species (i.e., species that migrate from the sea to freshwater to spawn). 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 the Species Recovery Grants. Examples of projects that contribute to this measure include hydrologic reconnection of wetlands, shellfish and coral reef restoration, and dam removal and fish passage. This measure does not include PCSRF acres. See PCSRF Program Change (p. NMFS - 53).</p>							

Performance Measure: Number of stream miles made accessible for ocean, coastal, and Great Lakes resources (annual)	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
With Decrease	N/A	N/A	160	100	100	100	100
Without Decrease	156	196	160	160	160	160	160
<p>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 species (i.e., species that migrate from the sea to freshwater to spawn). 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 the Species Recovery Grants. Examples of projects that contribute to this measure include hydrologic reconnection of wetlands, shellfish and coral reef restoration, and dam removal and fish passage. This measure does not include PCSRF stream miles. See PCSRF Program Change (p. NMFS - 53).</p>							

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

Budget Program: National Marine Fisheries Service
Sub-Program: Habitat Conservation and Restoration
Program Change: Coastal Ecosystem Resiliency Grants

Object Class	FY 2018	FY 2018
	Decrease	Total Program²⁰
11 Personnel compensation		
11.1 Full-time permanent	\$0	\$16,712
11.3 Other than full-time permanent	0	286
11.5 Other personnel compensation	0	229
11.8 Special personnel services payments	0	9
11.9 Total personnel compensation	0	17,236
12 Civilian personnel benefits	0	5,924
13 Benefits for former personnel	0	1
21 Travel and transportation of persons	0	779
22 Transportation of things	0	147
23.1 Rental payments to GSA	0	879
23.2 Rental Payments to others	0	344
23.3 Communications, utilities and miscellaneous charges	0	899
24 Printing and reproduction	0	169
25.1 Advisory and assistance services	0	1,108
25.2 Other services	0	9,920
25.3 Purchases of goods & services from Gov't accounts	0	393
25.4 Operation and maintenance of facilities	0	0
25.5 Research and development contracts	0	1
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	632
31 Equipment	0	346
32 Lands and structures	0	0
33 Investments and loans	0	0
41 Grants, subsidies and contributions	(10,000)	13,282
42 Insurance claims and indemnities	0	0
43 Interest and dividends	0	0
44 Refunds	0	0
99 Total obligations	(10,000)	52,060

²⁰ Due to financial system limitations, the object class detail for the Program reflects the Habitat Conservation and Restoration PPA.

APPROPRIATION ACCOUNT: PACIFIC COASTAL SALMON RECOVERY FUND

The Pacific Coastal Salmon Recovery Fund (PCSRF) was established by Congress in FY 2000 to protect, restore, and conserve Pacific salmon and steelhead and their habitats through competitive funding to states and Tribes. The Congressionally authorized activities include:

- 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 proposes to eliminate funding for the PCSRF program in FY 2018 (see Program Change below p. NMFS - 53). Key accomplishments for PCSRF-funded activities from FY 2000 to 2016 include:

- more than 1,080,000 acres of habitat restored, and
- passage restored to over 9,500 stream miles of salmon habitat.

Since 2000, PCSRF has funded more than 12,800 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 implement priority actions specified in NOAA's ESA recovery plans and are federally coordinated among NOAA, EPA, and USDA/NRCS to maximize the collective benefits of the agencies' grant programs. Actions range from single-site culvert replacement to hundreds of acres of habitat acquisition and restoration. Activities also include robust planning and monitoring programs to inform strategic prioritization of projects and track salmon conservation accomplishments.

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 nearly 3,200 barriers to fish passage along streams, restoring access to high-quality habitat. PCSRF projects provide a number of socio-economic benefits, including enhanced water quality, recreation opportunities, flood control, and coastline protection, as well as support green jobs and local economies.

PROGRAM CHANGES FOR FY 2018:

Pacific Coastal Salmon Recovery Fund: (Base Funding: \$64,876,000 and 2 FTE; Program Change: -\$64,876,000 and -2 FTE): NOAA requests a decrease of \$64,876,000 and 2 FTE for a total of \$0 and 0 FTE for the Pacific Coastal Salmon Recovery Fund.

Proposed Actions:

The Pacific Coastal Salmon Recovery Fund (PCSRF) was established by Congress in FY 2000 to protect, restore, and conserve Pacific salmonids and their habitats. This reduction will eliminate funding for this grant program in FY 2018. The agency will continue its Federal commitment to advancing Pacific salmon and steelhead recovery and Tribal treaty fishing rights through other NOAA programs as resources allow.

Resource Assessment:

The congressionally authorized activities for PCSRF include:

- 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.

The PCSRF program provides competitive funding to states and Tribes of the Pacific Coast region. 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.

From FY 2000 to FY 2016, states, Tribes, and their partners undertook over 12,800 projects, resulting in significant changes in salmon habitat conditions and availability. Partners have restored and protected access to nearly 1.1 million acres of spawning and rearing habitat for salmon, and reestablished access to over 9,500 miles of previously inaccessible streams.

More information on past program accomplishments can be found in the PCSRF base narrative above (p. NMFS - 52) and the program's website.²¹

²¹http://www.westcoast.fisheries.noaa.gov/protected_species/salmon_steelhead/recovery_planning_and_implementation/pacific_coastal_salmon_recovery_fund.html

Performance Goals and Measurement Data:

Performance Measure: Number of habitat acres restored (annual) (Indicator 3.4)	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
With Decrease	N/A	N/A	14,300	0	0	0	0
Without Decrease	12,388	6,760	14,300	14,400	14,400	14,000	14,400
<p>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 species (i.e., species that migrate from the sea to freshwater to spawn). 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 the Species Recovery Grants. Examples of projects that contribute to this measure include hydrologic reconnection of wetlands, shellfish and coral reef restoration, and dam removal and fish passage.</p> <p>PCSRF FY 2017 target represents the expected acres restored from funded projects with an anticipated completion date within the fiscal year. FY 2018–2022 targets are based on formula projections of acres restored based on program appropriations and past program performance. As of March 2016, the formula was revised to reflect more recent project data and to improve target accuracy. These FY 2018–2022 out-year targets represent accomplishments with funding from prior years. The PCSRF awards 5-year grants, and in developing the out-year targets NMFS apportions expected performance accomplishments across all fiscal years during which the grant is open based on past program performance, 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. This measure does not include Habitat Program acres. See Coastal Ecosystem Resiliency Grants Program Change (p. NMFS - 49).</p>							

Performance Measure: Number of stream miles made accessible for ocean, coastal, and Great Lakes resources (annual)	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
With Decrease	N/A	N/A	460	0	0	0	0
Without Decrease	394	460	460	460	460	460	460
<p>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 species (i.e., species that migrate from the sea to freshwater to spawn). 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 the Species Recovery Grants. Examples of projects that contribute to this measure include hydrologic reconnection of wetlands, shellfish and coral reef restoration, and dam removal and fish passage.</p>							

PCSRF FY 2017 target represents the expected acres restored from funded projects with an anticipated completion date within the fiscal year. FY 2018–2022 targets are based on formula projections of acres restored based on program appropriations and past program performance. As of March 2016, the formula was revised to reflect more recent project data and to improve target accuracy. These FY 2018–2022 out-year targets represent accomplishments with funding from prior years. The PCSRF awards 5-year grants, and in developing the out-year targets NMFS apportions expected performance accomplishments across all fiscal years during which the grant is open based on past program performance. Out-year target setting is now based on minimum stream miles made accessible by FY 2006-FY 2008 awards, 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. This measure does not include Habitat Program stream miles. See Coastal Ecosystem Resiliency Grants Program Change (p. NMFS - 49).

PROGRAM CHANGE PERSONNEL DETAIL

Program: National Marine Fisheries Service
Sub-Program: Pacific Coastal Salmon Recovery Fund
Program Change: Pacific Coastal Salmon Recovery Fund

Title:	Location	Grade	Number of Positions	Annual Salary	Total Salaries
Supervisory Fish Biologist	Portland, OR	ZP-V	-1	161,900	(161,900)
Grants Specialist	Portland, OR	ZA-IV	-1	139,729	(139,729)
Total			<u>-2</u>		<u>(301,629)</u>
less Lapse		0%	<u>0</u>		
Total full-time permanent (FTE)			<u>-2</u>		<u>(301,629)</u>
2018 Pay Adjustment (1.9%)					<u>(5,731)</u>
TOTAL					<u>(307,360)</u>

Personnel Data

	<u>Number</u>
Full-Time Equivalent Employment	
Full-time permanent	-2
Other than full-time permanent	0
Total	<u>-2</u>
Authorized Positions:	
Full-time permanent	-2
Other than full-time permanent	0
Total	<u>-2</u>

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: Pacific Coastal Salmon Recovery Fund

Object Class	FY 2018 Decrease	FY 2018 Total Program
11 Personnel compensation		
11.1 Full-time permanent	(\$307)	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	(307)	0
12 Civilian personnel benefits	(103)	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	(1)	0
23.3 Communications, utilities and miscellaneous charges	0	0
24 Printing and reproduction	0	0
25.1 Advisory and assistance services	(1)	0
25.2 Other services	(189)	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	(102)	0
31 Equipment	(25)	0
32 Lands and structures	0	0
33 Investments and loans	0	0
41 Grants, subsidies and contributions	(64,148)	0
42 Insurance claims and indemnities	0	0
43 Interest and dividends	0	0
44 Refunds	0	0
99 Total obligations	(64,876)	0

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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 2017 Annualized CR	2	2	64,876	64,907
less: Obligations from Prior Year Balances	0	0	0	(31)
plus: Other Adjustments-to-Base	0	0	0	0
FY 2018 Base	2	2	64,876	64,876
plus: 2018 Program Changes	(2)	(2)	(64,876)	(64,876)
FY 2018 Estimate	0	0	0	0

		FY 2016 Actuals Personnel Amount	FY 2017 Annualized CR Personnel Amount	FY 2018 Base Program Personnel Amount	FY 2018 Estimate Personnel Amount	Increase/ (Decrease) Personnel Amount
Pacific Coastal Salmon Recovery Account	Pos/BA	2 64,935	2 64,876	2 64,876	0 0	(2) (64,876)
	FTE/OBL	2 64,904	2 64,907	2 64,876	0 0	(2) (64,876)
Total: Pacific Coastal Salmon Recovery Account	Pos/BA	2 64,935	2 64,876	2 64,876	0 0	(2) (64,876)
	FTE/OBL	2 64,904	2 64,907	2 64,876	0 0	(2) (64,876)

Department of Commerce
National Oceanic and Atmospheric Administration
Pacific Coastal Salmon Recovery
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	FY 2016 Actuals		FY 2017 Annualized CR		FY 2018 Base Program		FY 2018 Estimate		Increase/ (Decrease)	
	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount
Direct Discretionary Obligation	2	64,904	2	64,907	2	64,876	0	0	(2)	(64,876)
Total Obligations	2	64,904	2	64,907	2	64,876	0	0	0	0
Adjustments to Obligations:										
Recoveries	0	(18)	0	0	0	0	0	0	0	0
Unobligated balance, unapportioned	0	18	0	0	0	0	0	0	0	0
Unobligated balance, adj. SOY	0	0	0	(31)	0	0	0	0	0	0
Unobligated balance, adj. EOY	0	31	0	0	0	0	0	0	0	0
Total Budget Authority	2	64,935	2	64,876	2	64,876	0	0	(2)	(64,876)
Financing from Transfers and Other:										
Transfer to ORF	0	65	0	0	0	0	0	0	0	0
Net Appropriation	2	65,000	2	64,876	2	64,876	0	0	(2)	(64,876)

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 2016 Actuals	FY 2017 Annualized CR	FY 2018 Base	FY 2018 Estimate	Increase/ (Decrease)
11 Personnel compensation					
11.1 Full-time permanent	280	307	307	0	(307)
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	280	307	307	0	(307)
12.1 Civilian personnel benefits	97	103	103	0	(103)
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	1	1	1	0	(1)
23.3 Commun., util., misc. charges	0	0	0	0	0
24 Printing and reproduction	0	0	0	0	0
25.1 Advisory and assistance services	1	1	1	0	(1)
25.2 Other services	189	189	189	0	(189)
26 Supplies and materials	56	102	102	0	(102)
31 Equipment	25	25	25	0	(25)
32 Lands and structures	0	0	0	0	0
33 Investments and loans	0	0	0	0	0
41 Grants, subsidies and contributions	64,255	64,179	64,148	0	(64,148)
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	64,904	64,907	64,876	0	(64,876)

Department of Commerce
 National Oceanic and Atmospheric Administration
 Pacific Coastal Salmon Recovery
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
 (Dollar amounts in thousands)

Less prior year recoveries	(18)	0	0	0	0
Plus unobligated balance, unapportioned	18	0	0	0	0
Less unobligated balance, SOY	0	(31)	0	0	0
Plus unobligated balance, EOY	31	0	0	0	0
Total Budget Authority	64,935	64,876	64,876	0	(64,876)

APPROPRIATION ACCOUNT: FISHERMEN'S CONTINGENCY FUND

For FY 2018, NMFS requests a total of \$349,000 for the Fishermen's Contingency Fund.

JUSTIFICATION FOR FY 2018:

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 (OCS). 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 OCS.

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 \$349,000, to be derived from receipts collected pursuant to that Act, to remain available until expended.

PROGRAM CHANGE FOR FY 2018:

No program change is requested for this account.

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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 2017 Annualized CR	0	0	349	349
plus: Obligations from prior year balances	0	0	0	0
plus: Other Adjustments-to-Base	0	0	0	0
FY 2018 Base	0	0	349	349
plus: 2018 Program Changes	0	0	0	0
FY 2018 Estimate	0	0	349	349

		FY 2016 Actuals Personnel Amount	FY 2017 Annualized CR Personnel Amount	FY 2018 Base Program Personnel Amount	FY 2018 Estimate Personnel Amount	Increase/ (Decrease) Personnel Amount
Fishermen's Contingency Fund	Pos/BA	0	350	0	349	0
	FTE/OBL	0	110	0	349	0
Total: Fishermen's Contingency Fund	Pos/BA	0	350	0	349	0
	FTE/OBL	0	110	0	349	0

Department of Commerce
National Oceanic and Atmospheric Administration
Fishermen's Contingency Fund
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	FY 2016 Actuals		FY 2017 Annualized CR		FY 2018 Base Program		FY 2018 Estimate		Increase/ (Decrease)	
	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount
Direct Discretionary Obligation	0	110	0	349	0	349	0	349	0	0
Total Obligations	0	110	0	349	0	349	0	349	0	0
Adjustments to Obligations:										
Unobligated balance, adj. SOY	0	(760)	0	(1,000)	0	(1,000)	0	(1,000)	0	0
Unobligated balance, EOY	0	1,000	0	1,000	0	1,000	0	1,000	0	0
Total Budget Authority	0	350	0	349	0	349	0	349	0	0
Financing from Transfers and Other:										
Temporarily Reduced	0	0	0	0	0	0	0	0	0	0
Unapportioned	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	350	0	349	0	349	0	349	0	0

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 2016 Actuals	FY 2017 Annualize CR	FY 2018 Base	FY 2018 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
11.5 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	110	349	349	349	0
43 Interest and dividends	0	0	0	0	0
44 Refunds	0	0	0	0	0
99 Total Obligations	110	349	349	349	0

Department of Commerce
 National Oceanic and Atmospheric Administration
 Fishermen's Contingency Fund
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
 (Dollar amounts in thousands)

Less prior year recoveries	0	0	0	0	0
Less unobligated balance, SOY	(760)	(1,000)	(1,000)	(1,000)	0
Less unapportioned	0	0	0	0	0
Plus unobligated balance, EOY	1,000	1,000	1,000	1,000	0
Unobligated balance, rescission	0	0	0	0	0
Total Budget Authority	350	349	349	349	0

APPROPRIATION ACCOUNT: FOREIGN FISHING OBSERVER FUND

For FY 2018, NMFS requests a total of \$0 for the Foreign Fishing Observer Fund.

JUSTIFICATION FOR FY 2018:

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 MSA). 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, and other costs incurred in placing observers aboard foreign fishing vessels. The observer program is conducted primarily through contracts with the private sector. NOAA 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 2018:

No program change is requested for this account.

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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 2017 Annualized CR	0	0	0	0
less: Obligations from prior year balances	0	0	0	0
Plus: 2018 Adjustments to Base	0	0	0	0
FY 2018 Base	0	0	0	0
plus: 2018 Program Changes	0	0	0	0
FY 2018 Estimate	0	0	0	0

		FY 2016 Actuals Personnel Amount	FY 2017 Annualized CR Personnel Amount	FY 2018 Base Program Personnel Amount	FY 2018 Estimate Personnel Amount	Increase/ (Decrease) Personnel Amount
Foreign Fishing Observer Fund	Pos/BA	0	0	0	0	0
	FTE/OBL	0	0	0	0	0
Total: Foreign Fishing Observer Fund	Pos/BA	0	0	0	0	0
	FTE/OBL	0	0	0	0	0

Department of Commerce
National Oceanic and Atmospheric Administration
Foreign Fishing Observer Fund
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	FY 2016 Actuals		FY 2017 Annualized CR		FY 2018 Base Program		FY 2018 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	(522)	0	(522)	0	(522)	0	0
Unobligated balance, EOY	0	522	0	522	0	522	0	522	0	0
Total Budget Authority	0	0	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	0	0	0	0	0	0	0	0	0

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 2016 Actuals	FY 2017 Annualized CR	FY 2018 Base	FY 2018 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
11.5 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

Department of Commerce
 National Oceanic and Atmospheric Administration
 Foreign Fishing Observer Fund
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
 (Dollar amounts in thousands)

Less prior year recoveries	0	0	0	0	0
Less unobligated balance, SOY	(522)	(522)	(522)	(522)	0
Plus unobligated balance, EOY	522	522	522	522	0
Unobligated balance, rescission	0	0	0	0	0
Total Budget Authority	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>

APPROPRIATION ACCOUNT: FISHERIES FINANCE PROGRAM ACCOUNT

For FY 2018, NMFS requests a total of \$0 for the Fisheries Finance Program Account.

JUSTIFICATION FOR FY 2018:

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. Types of activities for financing include 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 financing 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 MSA; 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 fish harvesting.

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. In FY 2017, NOAA developed new loan subsidy models, which included a number of improvements for the overall budget formulation and re-estimate processes.

PROPOSED LEGISLATION:

Subject to section 502 of the Congressional Budget Act of 1974, during fiscal year 2018, 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 2018:

No program change is requested for this account.

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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 2017 Annualized CR	0	0	30,764	30,764
less: 2018 Adjustments to Base	0	0	(30,764)	(30,764)
less: Negative Subsidy Receipts Adjustment	0	0	0	0
FY 2018 Base	0	0	0	0
plus: 2018 Program Changes	0	0	0	0
FY 2018 Estimate	0	0	0	0

		FY 2016 Actuals Personnel Amount	FY 2017 Annualized CR Personnel Amount	FY 2018 Base Program Personnel Amount	FY 2018 Estimate Personnel Amount	Increase/ Decrease Personnel Amount
Fisheries Finance Program Account	Pos/BA	0	11,819	0	30,764	0
	FTE/OBL	0	11,819	0	30,764	0
Total: Fisheries Finance Program Account	Pos/BA	0	11,819	0	30,764	0
	FTE/OBL	0	11,819	0	30,764	0

Department of Commerce
National Oceanic and Atmospheric Administration
Fisheries Finance Program Account
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	FY 2016 Actuals		FY 2017 Annualized CR		FY 2018 Base Program		FY 2018 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	11,819	0	30,764	0	0	0	0	0	0
Total Obligations	0	11,819	0	30,764	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	11,819	0	30,764	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	11,819	0	30,764	0	0	0	0	0	0

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 2016 Actuals	FY 2017 Annualized CR	FY 2018 Base	FY 2018 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
11.5 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	11,819	30,764	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	11,819	30,764	0	0	0

Department of Commerce
 National Oceanic and Atmospheric Administration
 Fisheries Finance Program Account
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
 (Dollar amounts in thousands)

Less prior year recoveries	0	0	0	0	0
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	11,819	30,764	0	0	0

APPROPRIATION ACCOUNT: PROMOTE AND DEVELOP FISHERIES PRODUCTS

For FY 2018, NOAA requests \$0 funding for the Saltonstall-Kennedy (S-K) Grant Program. NOAA estimates that a total of \$154,867,577 will be transferred from the Department of Agriculture to the Promote and Develop account. After accounting for sequestration the remaining \$154,199,000 will be transferred from the Promote and Develop account to the Operations, Research, and Facilities (ORF) account.

JUSTIFICATION FOR FY 2018:

NOAA will transfer \$154,199,000 from the Promote and Develop account to offset the appropriations requirements of the NMFS ORF account. The transfer to ORF will support data collection, data management, and fisheries stock assessment production within the Fisheries Data Collections, Surveys, and Assessments PPA, which includes the Expand Annual Stock Assessments, Fish Information Networks, Survey and Monitoring Projects, Cooperative Research sub-activities. With this transfer, there will be no funding for the Saltonstall-Kennedy program in FY 2018.

The Promote and Develop account funds are derived from a transfer of thirty percent of duties on imported fisheries products from the Department of Agriculture. Any funds remaining in this account after the ORF transfer are available to carry out the purposes of the S-K program. 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. The S-K program provides funding to address the needs of fishing communities, support economic opportunities, and build and maintain resilient and sustainable fisheries, and has addressed impediments to the management, development, and utilization of the Nation's living marine resources. In FY 2016, 50 competitive awards were funded nationwide. Projects address topics such as bycatch reduction; how aquaculture can advance fishery restoration and support local economic growth; and, what methods can improve fisheries management. More information on past accomplishments is available at the program's website.²²

²² http://www.nmfs.noaa.gov/mb/financial_services/skhome.htm

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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 2017 Annualized CR	3	3	14,909	17,323
less: Obligations from prior year balances	0	0	0	(2,414)
plus: 2018 Adjustments to Base	(3)	(3)	(14,909)	(14,909)
FY 2018 Base	0	0	0	0
plus: 2018 Program Changes	0	0	0	0
FY 2018 Estimate	0	0	0	0

		FY 2016 Actuals Personnel Amount	FY 2017 Annualized CR Personnel Amount	FY 2018 Base Program Personnel Amount	FY 2018 Estimate Personnel Amount	Increase/ (Decrease) Personnel Amount
Promote and Develop Fisheries Products	Pos/BA	3	16,225	3	14,909	0
	FTE/OBL	3	15,256	3	17,323	0
Total: Promote and Develop Fisheries Products	Pos/BA	3	16,225	3	14,909	0
	FTE/OBL	3	15,256	3	17,323	0

Department of Commerce
National Oceanic and Atmospheric Administration
Promote and Develop Fisheries Products
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	FY 2016		FY 2017		FY 2018		FY 2018		Increase/ (Decrease)	
	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount
Direct Discretionary Obligation	3	15,256	3	17,323	0	0	0	0	0	0
Total Obligations	3	15,256	3	17,323	0	0	0	0	0	0
Adjustments to Obligations:										
Unobligated balance, adj. SOY	0	(1,083)	0	(2,414)	0	0	0	0	0	0
Recoveries	0	(362)	0	0	0	0	0	0	0	0
Unobligated balance, adj. EOY	0	2,414	0	0	0	0	0	0	0	0
Total Budget Authority	3	16,225	3	14,909	0	0	0	0	0	0
Financing from Transfers and Other:										
Transfer from USDA	(3)	(145,811)	(3)	(145,175)	0	(154,868)	0	(154,868)	0	0
Appropriations previously unavailable	0	(10,493)	0	(9,915)	0	(10,017)	0	(10,017)	0	0
Permanently Reduced	0	0	0	0	0	0	0	0	0	0
Temporarily Reduced	0	9,915	0	10,017	0	10,686	0	10,686	0	0
Transfer to ORF	0	130,164	0	130,164	0	154,199	0	154,199	0	0
Net Appropriation	0	0	0	0	0	0	0	0	0	0

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 2016 Actuals	FY 2017 Annualized CR	FY 2018 Base	FY 2018 Estimate	Increase/ (Decrease)
11 Personnel compensation					
11.1 Full-time permanent	364	364	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	364	364	0	0	0
12.1 Civilian personnel benefits	93	109	0	0	0
13 Benefits for former personnel	0	0	0	0	0
21 Travel and transportation of persons	40	40	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	1,205	1,205	0	0	0
Purchases of Goods/Services					
25.3 from Govt accounts	0	0	0	0	0
26 Supplies and materials	4	67	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	13,550	15,538	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	15,256	17,323	0	0	0

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	(1,083)	(2,414)	0	0	0
Plus unobligated balance, EOY	2,414	0	0	0	0
Recoveries	(362)	0	0	0	0
Total Budget Authority	16,225	14,909	0	0	0

APPROPRIATION ACCOUNT: FEDERAL SHIP FINANCING FUND

For FY 2018, NMFS estimates a total of \$0 for the Federal Ship Financing Fund Account.

JUSTIFICATION FOR FY 2018:

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. Administrative expenses are charged to the ORF account.

PROGRAM CHANGE FOR FY 2018:

No program change is requested for this account.

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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 2017 Annualized CR	0	0	0	0
FY 2018 Base	0	0	0	0
plus: 2018 Program Changes	0	0	0	0
FY 2018 Estimate	0	0	0	0

		FY 2016 Actuals Personnel Amount	FY 2017 Annualized CR Personnel Amount	FY 2018 Base Program Personnel Amount	FY 2018 Estimate Personnel Amount	Increase/ (Decrease) Personnel Amount
Federal Ship Financing Fund	Pos/BA	0	0	0	0	0
	FTE/OBL	0	0	0	0	0
Total: Federal Ship Financing Fund	Pos/BA	0	0	0	0	0
	FTE/OBL	0	0	0	0	0

Department of Commerce
 National Oceanic and Atmospheric Administration
 Federal Ship Financing Fund
SUMMARY OF RESOURCE REQUIREMENTS
 (Dollar amounts in thousands)

	FY 2016 Actuals		FY 2017 Annualized CR		FY 2018 Base Program		FY 2018 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:										
Transfer to Treasury (mandatory)	0	142	0	0	0	0	0	0	0	0
Offsetting collections (mandatory)	0	(142)	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	0	0	0	0	0	0	0	0	0

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 2016 Actuals	FY 2017 Annualized CR	FY 2018 Base	FY 2018 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
11.5 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

Department of Commerce
 National Oceanic and Atmospheric Administration
 Federal Ship Financing Fund
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
 (Dollar amounts in thousands)

Less prior year recoveries	0	0	0	0	0
Less unobligated balance, SOY	0	0	0	0	0
Plus unobligated balance, transferred	142	0	0	0	0
Plus unobligated balance, EOY	0	0	0	0	0
Offsetting Collections	(142)	0	0	0	0
Total Budget Authority	0	0	0	0	0

APPROPRIATION ACCOUNT: ENVIRONMENTAL IMPROVEMENT AND RESTORATION FUND

For FY 2018, NMFS estimates obligating \$1,869,000 in the Environmental Improvement and Restoration Fund.

JUSTIFICATION FOR FY 2018:

The Environmental Improvement and 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 2018:

No program change is requested for this account.

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

	Positions	FTE	Budget Authority	Direct Obligations
FY 2017 Annualized CR	0	0	6,451	6,451
less: obligations from prior year balances	0	0	0	0
plus: 2018 Adjustments to Base	0	0	(4,582)	(4,582)
FY 2018 Base	0	0	1,869	1,869
plus: 2018 Program Changes	0	0	0	0
FY 2018 Estimate	0	0	1,869	1,869

		FY 2016 Actuals Personnel Amount	FY 2017 Annualized CR Personnel Amount	FY 2018 Base Program Personnel Amount	FY 2018 Estimate Personnel Amount	Increase/ (Decrease) Personnel Amount					
	Pos/BA	0	8,118	0	6,451	0	1,869	0	1,869	0	0
Environmental Improvement and Restoration Fund	FTE/OBL	0	8,118	0	6,451	0	1,869	0	1,869	0	0
Total: Environmental Improvement and Restoration Fund	Pos/BA	0	8,118	0	6,451	0	1,869	0	1,869	0	0

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

	FY 2016 Actuals		FY 2017 Annualized CR		FY 2018 Base Program		FY 2018 Estimate		Increase/ (Decrease)	
	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount
Direct Mandatory Obligation	0	8,118	0	6,451	0	1,869	0	1,869	0	0
Total Obligations	0	8,118	0	6,451	0	1,869	0	1,869	0	0
Adjustments to Obligations:										
Unobligated balance, adj. SOY	0	0	0	0	0	0	0	0	0	0
Unobligated balance, unapportioned	0	0	0	0	0	0	0	0	0	0
Unobligated balance, transferred	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	8,118	0	6,451	0	1,869	0	1,869	0	0
Financing from Transfers and Other:										
Appropriation previously unavailable	0	0	0	0	0	0	0	0	0	0
Permanently Reduced	0	592	0	478	0	139	0	139	0	0
Net Mandatory Appropriation	0	8,710	0	6,929	0	2,008	0	2,008	0	0

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

Object Class	FY 2016 Actuals	FY 2017 Annualized CR	FY 2018 Base	FY 2018 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
11.5 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	8,118	6,451	1,869	1,869	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	8,118	6,451	1,869	1,869	0

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

Less unobligated balance, SOY	0	0	0	0	0
Plus unobligated balance, unapportioned	0	0	0	0	0
Less unobligated balance, transferred	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	8,118	6,451	1,869	1,869	0

APPROPRIATION ACCOUNT: LIMITED ACCESS SYSTEM ADMINISTRATION

For FY 2018, NMFS estimates obligating \$14,493,000 in the Limited Access System Administration account.

JUSTIFICATION FOR FY 2018:

Under the authority of MSA Section 304(d)(2)(A), NMFS must collect a fee to recover the incremental costs of management, data collection, and enforcement of Limited Access Privilege (LAP) programs. Funds collected under this authority are deposited into the "Limited Access System Administrative Fund" (LASAF). Fees cannot 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 is available, without appropriation or fiscal year limitation, only for the purposes of administering the central registry system; and administering and implementing the MSA in the fishery in which the fees were collected. Sums in the fund that are not currently needed for these purposes are kept on deposit or invested in obligations of, or guaranteed by, the United States. 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 2018:

No program change is requested for this account.

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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 2017 Annualized CR	40	40	13,218	14,250
Adjustments to Base	0	0	109	243
less: Obligations from Prior Year Balances	0	0	0	0
FY 2018 Base	40	40	13,327	14,493
plus: 2018 Program Changes	0	0	0	0
FY 2018 Estimate	40	40	13,327	14,493

		FY 2016 Actuals Personnel Amount	FY 2017 Annualized CR Personnel Amount	FY 2018 Base Program Personnel Amount	FY 2018 Estimate Personnel Amount	Increase/ (Decrease) Personnel Amount
Limited Access System Administration Fund	Pos/BA	40 13,368	40 13,218	40 13,327	40 13,327	0 0
	FTE/OBL	40 11,833	40 14,250	40 14,493	40 14,493	0 0
Total: Limited Access System Administration Fund	Pos/BA	40 13,368	40 13,218	40 13,327	40 13,327	0 0
	FTE/OBL	40 11,833	40 14,250	40 14,493	40 14,493	0 0

Department of Commerce
National Oceanic and Atmospheric Administration
Limited Access System Administration Fund
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	FY 2016		FY 2017		FY 2018		FY 2018		Increase/ (Decrease)	
	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount
Direct Discretionary Obligation	40	11,833	40	14,250	40	14,493	40	14,493	0	0
Total Obligations	40	11,833	40	14,250	40	14,493	40	14,493	0	0
Adjustments to Obligations:										
Recoveries	0	(32)	0	0	0	0	0	0	0	0
Unobligated balance, adj. SOY	0	(12,164)	0	(13,731)	0	(12,699)	0	(12,699)	0	0
Unobligated balance, unapportioned	0	3,152	0	0	0	0	0	0	0	0
Unobligated balance, EOY	0	10,579	0	12,699	0	11,533	0	11,533	0	0
Total Budget Authority	40	13,368	40	13,218	40	13,327	40	13,327	0	0
Financing from Transfers and Other:										
Appropriations previously unavailable	0	(757)	0	(690)	0	(929)	0	(929)	0	0
Temporarily Reduced	0	690	0	929	0	919	0	919	0	0
Net Appropriation	40	13,301	40	13,457	40	13,317	40	13,317	0	0

Department of Commerce
National Oceanic and Atmospheric Administration
Limited Access System Administration Fund
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
(Dollar amounts in thousands)

Object Class	FY 2016 Actuals	FY 2017 Annualized CR	FY 2018 Base	FY 2018 Estimate	Increase/ (Decrease)
11 Personnel compensation					
11.1 Full-time permanent	3,579	3,691	3,691	3,691	0
11.3 Other than full-time permanent	423	526	526	526	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	4,002	4,217	4,217	4,217	0
12.1 Civilian personnel benefits	1,598	1,617	1,617	1,617	0
13 Benefits for former personnel	0	0	0	0	0
21 Travel and transportation of persons	45	78	78	78	0
22 Transportation of things	8	8	8	8	0
23.1 Rental payments to GSA	391	443	443	443	0
23.2 Rental payments to others	5	6	6	6	0
23.3 Commun., util., misc. charges	420	924	924	924	0
24 Printing and reproduction	5	5	5	5	0
25.1 Advisory and assistance services	2	3	3	3	0
25.2 Other services	2,657	4,050	4,293	4,293	0
25.3 Purchases of goods/services from govt account:	2	3	3	3	0
26 Supplies and materials	89	89	89	89	0
31 Equipment	59	125	125	125	0
32 Lands and structures	9	0	0	0	0
33 Investments and loans	0	0	0	0	0
41 Grants, subsidies and contributions	2,541	2,682	2,682	2,682	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	11,833	14,250	14,493	14,493	0

Department of Commerce
National Oceanic and Atmospheric Administration
Limited Access System Administration Fund
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
(Dollar amounts in thousands)

Recoveries	(32)	0	0	0	0
Less unobligated balance, SOY	(12,164)	(13,731)	(12,699)	(12,699)	0
Unobligated balance, unapportioned	3,152	0	0	0	0
Plus unobligated balance, EOY	10,579	12,699	11,533	11,533	0
Unobligated balance, rescission	0	0	0	0	0
Total Budget Authority	13,368	13,218	13,327	13,327	0

APPROPRIATION ACCOUNT: MARINE MAMMAL UNUSUAL MORTALITY EVENT FUND

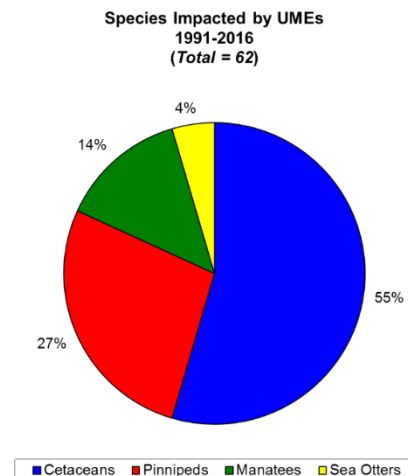
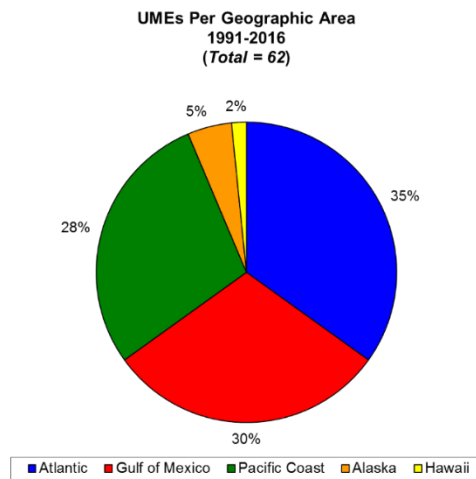
For FY 2018, NMFS estimates obligating \$0 from the Marine Mammal Unusual Mortality Event Fund.

JUSTIFICATION FOR FY 2018:

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.

MMPA Section 405 (16 U.S.C. 1421d) establishes the Marine Mammal Unusual Mortality Event Fund and describes its purposes and how donations can be made to the Fund. The Fund is an emergency response fund used to help cover expenses incurred by the volunteer Marine Mammal Stranding Network during a UME. Specifically, 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.”

Since UMEs are unpredictable emergency events caused by any number of circumstances (natural or human-caused), it is impossible to anticipate how many UMEs may occur in a given year or how much funding will be needed. During the past 26 years (1991– 2016), NOAA declared 62 UMEs, an average of 2.4 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, equipment, and laboratory needs. For example, a UME involving large whales offshore can cost well over several \$100,000s in expenses because of the considerable logistical challenges and needs (e.g., ship time or aerial support, number of personnel, safety equipment, etc.).

To date, Congress has appropriated funding for UMEs on one occasion in 2005. Some of those funds were transferred to the National Fish and Wildlife Foundation (NFWF) since they have the ability to quickly distribute funds within 30 days of invoicing to our partners during a UME. Therefore, at this time there are sufficient funds held at NFWF to meet our expected expenses in FY 2018 and no expenditures from the Marine Mammal Unusual Mortality Event Fund are anticipated. Additionally, the UME Contingency fund is listed on Pay.gov allowing the public to donate to the Fund year round.

PROGRAM CHANGE FOR FY 2018:

No program change is requested for this account.

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 2017 Annualized CR	0	0	0	0
Adjustments to Base	0	0	0	0
FY 2018 Base	0	0	0	0
plus: 2018 Program Changes	0	0	0	0
FY 2018 Estimate	0	0	0	0

		FY 2016 Actuals Personnel Amount		FY 2017 Annualized CR Personnel Amount		FY 2018 Base Program Personnel Amount		FY 2018 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	0	0	0	0	0	0	0	0	0
Total: Marine Mammal Unusual Mortality Event Fund	Pos/BA	0	0	0	0	0	0	0	0	0	0
	FTE/OBL	0	0	0	0	0	0	0	0	0	0

Department of Commerce
National Oceanic and Atmospheric Administration
Marine Mammal Unusual Mortality Event Fund
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	FY 2016 Actuals		FY 2017 Annualized CR		FY 2018 Base Program		FY 2018 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:										
Recoveries	0	0	0	0	0	0	0	0	0	0
Collections	0	0	0	0	0	0	0	0	0	0
Unobligated balance, adj. SOY	0	(24)	0	(24)	0	(24)	0	(24)	0	0
Unobligated balance, unapportioned	0	1	0	0	0	0	0	0	0	0
Unobligated balance, EOY	0	23	0	24	0	24	0	24	0	0
Total Budget Authority	0	0	0	0	0	0	0	0	0	0
Financing from Transfers and Other:										
Appropriation previously unavailable	0	0	0	0	0	0	0	0	0	0
Net Appropriation	0	0	0	0	0	0	0	0	0	0

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 2016 Actuals	FY 2017 Annualized CR	FY 2018 Base	FY 2018 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
11.5 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

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 prior year recoveries	0	0	0	0	0
Less unobligated balance, SOY	(24)	(24)	(24)	(24)	0
Plus unobligated balance, EOY	23	24	24	24	0
Less collections	0	0	0	0	0
Unobligated balance, unapportioned	1	0	0	0	0
Total Budget Authority	0	0	0	0	0

APPROPRIATION ACCOUNT: WESTERN PACIFIC SUSTAINABLE FISHERIES FUND

For FY 2018, NMFS estimates obligating \$750,000 in the Western Pacific Sustainable Fisheries Fund.

JUSTIFICATION FOR FY 2018:

Section 204(e) of the 2006 amendments to the MSA 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 through 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). Funds are available to:

- The Western Pacific Council for the purpose of carrying out implementation of a marine conservation plan (see below for more info on marine conservation plans)
- The Secretary of State for mutually agreed upon travel expenses for no more than 2 Federal representatives incurred as a direct result of negotiations and entering into a Pacific Insular Area fishery agreement. These fishery agreements authorize foreign fishing within the exclusive economic zone adjacent to a Pacific Insular Area other than American Samoa, Guam, or the Northern Mariana Islands, at the request of the Western Pacific Council)
- The Western Pacific Council to meet conservation and management objectives in the State of Hawaii if monies remain in the Western Pacific Sustainable Fisheries Fund after the funding requirements of subparagraphs (A) and (B) have been satisfied.

In the case of violations by foreign vessels occurring in these areas, amounts received by the Secretary attributable to fines and penalties are deposited into the Western Pacific Sustainable Fisheries Fund to be used for fisheries enforcement and for implementation of a marine conservation plan. 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 are deposited in the Western Pacific Sustainable Fisheries Fund.

PROGRAM CHANGE FOR FY 2018:

No program change is requested for this account.

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Department of Commerce
 National Oceanic and Atmospheric Administration
 Western Pacific Sustainable Fisheries Fund
SUMMARY OF RESOURCE REQUIREMENTS
 (Dollar amounts in thousands)

	Positions	FTE	Budget Authority	Direct Obligations
FY 2017 Annualized CR	0	0	622	750
Adjustments to Base	0	0	28	0
FY 2018 Base	0	0	650	750
plus: 2018 Program Changes	0	0	0	0
FY 2018 Estimate	0	0	650	750

		FY 2016 Actuals		FY 2017 Annualized CR		FY 2018 Base Program		FY 2018 Estimate		Increase/ (Decrease)	
		Personnel Amount		Personnel Amount		Personnel Amount		Personnel Amount		Personnel Amount	
Western Pacific Sustainable Fisheries Fund	Pos/BA	0	651	0	622	0	650	0	650	0	0
	FTE/OBL	0	323	0	750	0	750	0	750	0	0
Total: Western Pacific Sustainable Fisheries Fund	Pos/BA	0	651	0	622	0	650	0	650	0	0
	FTE/OBL	0	323	0	750	0	750	0	750	0	0

Department of Commerce
National Oceanic and Atmospheric Administration
Western Pacific Sustainable Fisheries Fund
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	FY 2016 Actuals		FY 2017 Annualized CR		FY 2018 Base Program		FY 2018 Estimate		Increase/ (Decrease)	
	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount
Direct Discretionary Obligation	0	323	0	750	0	750	0	750	0	0
Total Obligations	0	323	0	750	0	750	0	750	0	0
Adjustments to Obligations:										
Recoveries	0	0	0	0	0	0	0	0	0	0
Unobligated balance, adj. SOY	0	(90)	0	(418)	0	(290)	0	(290)	0	0
Unobligated balance, unapportioned	0	400	0	0	0	0	0	0	0	0
Unobligated balance, EOY	0	18	0	290	0	190	0	190	0	0
Total Budget Authority	0	391	0	622	0	650	0	650	0	0
Financing from Transfers and Other:										
Appropriation previously unavailable	0	(18)	0	(17)	0	(45)	0	(45)	0	0
Temporarily Reduced	0	17	0	45	0	45	0	45	0	0
Net Appropriation	0	650	0	650	0	650	0	650	0	0

Department of Commerce
National Oceanic and Atmospheric Administration
Western Pacific Sustainable Fisheries Fund
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
(Dollar amounts in thousands)

Object Class	FY 2016 Actuals	FY 2017 Annualized CR	FY 2018 Base	FY 2018 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
11.5 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	323	750	750	750	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	323	750	750	750	0

Department of Commerce
National Oceanic and Atmospheric Administration
Western Pacific Sustainable Fisheries Fund
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
(Dollar amounts in thousands)

Recoveries	0	0	0	0	0
Less unobligated balance, SOY	(90)	(418)	(290)	(290)	0
Plus unobligated balance, EOY	18	290	190	190	0
Unobligated balance, unapportioned	400	0	0	0	0
Total Budget Authority	<u>651</u>	<u>622</u>	<u>650</u>	<u>650</u>	<u>0</u>

APPROPRIATION ACCOUNT: FISHERIES ASSET FORFEITURE FUND

For FY 2018, NMFS estimates it will collect \$4,000,000 in fines, penalties, and forfeitures proceeds.

JUSTIFICATION FOR FY 2018:

Section 311(e)(1) of the MSA authorizes the Secretary of Commerce to pay certain enforcement-related expenses from fines, penalties, and forfeiture proceeds received for violations of the MSA, MMPA, National Marine Sanctuaries Act, or any other marine resource law enforced by the Secretary. Pursuant to this authority, NOAA has established a Civil Monetary Penalty/Asset Forfeiture Fund (AFF) where these proceeds are deposited. 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.

PROGRAM CHANGE FOR FY 2018:

No program change is requested for this account.

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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 2017 Annualized CR	0	0	3,996	3,537
Adjustments to Base			4	91
less: Obligations from Prior Year Balances	0	0	0	0
FY 2018 Base	0	0	4,000	3,628
plus: 2018 Program Changes	0	0	0	0
FY 2018 Estimate	0	0	4,000	3,628

		FY 2016 Actuals		FY 2017 Annualized CR		FY 2018 Base Program		FY 2018 Estimate		Increase/ (Decrease)	
		Personnel Amount		Personnel Amount		Personnel Amount		Personnel Amount		Personnel Amount	
Fisheries Asset Forfeiture Fund	Pos/BA	0	4,836	0	3,996	0	4,000	0	4,000	0	0
	FTE/OBL	0	2,647	0	3,537	0	3,628	0	3,628	0	0
Total: Fisheries Asset Forfeiture Fund	Pos/BA	0	4,836	0	3,996	0	4,000	0	4,000	0	0
	FTE/OBL	0	2,647	0	3,537	0	3,628	0	3,628	0	0

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

	FY 2016 Actuals		FY 2017 Annualized CR		FY 2018 Base Program		FY 2018 Estimate		Increase/ (Decrease)	
	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount
Direct Mandatory Obligation	0	2,647	0	3,537	0	3,628	0	3,628	0	0
Total Obligations	0	2,647	0	3,537	0	3,628	0	3,628	0	0
Adjustments to Obligations:										
Recoveries	0	0)	0	0	0	0	0	0	0	0
Unobligated balance, adj. SOY	0	(14,393)	0	(16,582)	0	(17,041)	0	(17,041)	0	0
Unobligated balance, unapportioned	0	816	0	0	0	0	0	0	0	0
Unobligated balance, EOY	0	15,766	0	17,041	0	17,413	0	17,413	0	0
Total Budget Authority	0	4,836	0	3,996	0	4,000	0	4,000	0	0
Financing from Transfers and Other:										
Mandatory Appropriation Temporarily Reduced	0	272	0	276	0	276	0	276	0	0
Appropriations previously unavailable	0	(292)	0	(272)	0	(276)	0	(276)	0	0
Net Appropriation	0	4,816	0	4,000	0	4,000	0	4,000	0	0

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 2016 Actuals	FY 2017 Annualized CR	FY 2018 Base	FY 2018 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
11.5 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	950	950	950	950	0
22 Transportation of things	0	1	1	1	0
23.1 Rental payments to GSA	0	0	0	0	0
23.2 Rental payments to others	2	23	23	23	0
23.3 Commun., util., misc. charges	0	0	0	0	0
24 Printing and reproduction	8	8	8	8	0
25.1 Advisory and assistance services	48	77	81	81	
25.2 Other services	362	584	607	607	0
25.3 Purchases of goods/services from govt accounts	986	1,590	1,654	1,654	
26 Supplies and materials	20	24	24	24	0
31 Equipment	21	30	30	30	0
32 Lands and structures	0	0	0	0	0
33 Investments and loans	0	0	0	0	0
41 Grants, subsidies and contributions	250	250	250	250	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	2,647	3,537	3,628	3,628	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	(14,393)	(16,582)	(17,041)	(17,041)	0
Recoveries	(1)	0	0	0	0
Plus unobligated balance, EOY	15,766	17,041	17,413	17,413	0
Unobligated balance, unapportioned	816	0	0	0	0
Total Budget Authority	4,835	3,996	4,000	4,000	0

APPROPRIATION ACCOUNT: NORTH PACIFIC OBSERVER FUND

For FY 2018, NMFS estimates obligating \$3,850,000 for the North Pacific Observer Fund.

JUSTIFICATION FOR FY 2018:

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) full coverage category and (2) partial coverage.

Vessels and processors in the full coverage category ($\geq 100\%$ 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 North Pacific 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 \$3.9 million to be collected in fees from the FY 2017 season, to be used in FY 2018 for observer coverage.

PROGRAM CHANGE FOR FY 2018:

No program change is requested for this account.

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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 2017 Annualized CR	0	0	3,815	3,867
Adjustments to Base	0	0	35	(17)
less: Obligations from Prior Year Balances	0	0	0	0
FY 2018 Base	0	0	3,850	3,850
plus: 2018 Program Changes	0	0	0	0
FY 2018 Estimate	0	0	3,850	3,850

		FY 2016 Actuals		FY 2017 Annualized CR		FY 2018 Base Program		FY 2018 Estimate		Increase/ (Decrease)	
		Personnel Amount		Personnel Amount		Personnel Amount		Personnel Amount		Personnel Amount	
North Pacific Observer Fund	Pos/BA	0	3,894	0	3,815	0	3,850	0	3,850	0	0
	FTE/OBL	0	5,145	0	3,867	0	3,850	0	3,850	0	0
Total: North Pacific Observer Fund	Pos/BA	0	3,894	0	3,815	0	3,850	0	3,850	0	0
	FTE/OBL	0	5,145	0	3,867	0	3,850	0	3,850	0	0

Department of Commerce
National Oceanic and Atmospheric Administration
North Pacific Observer Fund
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

	FY 2016 Actuals		FY 2017 Annualized CR		FY 2018 Base Program		FY 2018 Estimate		Increase/ (Decrease)	
	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount
Direct Mandatory Obligation	0	5,145	0	3,867	0	3,850	0	3,850	0	0
Total Obligations	0	5,145	0	3,867	0	3,850	0	3,850	0	0
Adjustments to Obligations:										
Recoveries	0	(48)	0	0	0	0	0	0	0	0
Unobligated balance, SOY	0	(1,255)	0	(52)	0	0	0	0	0	0
Unobligated balance, EOY	0	52	0	0	0	0	0	0	0	0
Total Budget Authority	0	3,894	0	3,815	0	3,850	0	3,850	0	0
Financing from Transfers and Other:										
Appropriation previously unavailable	0	(350)	0	(231)	0	(266)	0	(266)	0	0
Temporarily Reduced	0	231	0	266	0	266	0	266	0	0
Net Appropriation	0	3,775	0	3,850	0	3,850	0	3,850	0	0

Department of Commerce
National Oceanic and Atmospheric Administration
North Pacific Observer Fund
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
(Dollar amounts in thousands)

Object Class	FY 2016 Actuals	FY 2017 Annualized CR	FY 2018 Base	FY 2018 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
11.5 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	5,145	3,867	3,850	3,850	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	5,145	3,867	3,850	3,850	0

Department of Commerce
 National Oceanic and Atmospheric Administration
 North Pacific Observer Fund
SUMMARY OF REQUIREMENTS BY OBJECT CLASS
 (Dollar amounts in thousands)

Recoveries	(48)	0	0	0	0
Less unobligated balance, SOY	(1,255)	(52)	0	0	0
Plus unobligated balance, EOY	52	0	0	0	0
Unobligated balance, rescission	0	0	0	0	0
Total Budget Authority	3,894	3,815	3,850	3,850	0

BUDGET PROGRAM: OCEANIC AND ATMOSPHERIC RESEARCH

For FY 2018, NOAA requests a total of \$350,004,000 and 660 FTE for the Office of Oceanic and Atmospheric Research, including a net decrease of \$139,028,000, and a decrease of 70 FTE in program changes.

Oceanic and Atmospheric Research Overview

Oceanic and Atmospheric Research (OAR) is NOAA's central research Line Office charged with improving the understanding of changes in the Earth's environment. OAR integrates and conducts research across NOAA to advance NOAA's mission by providing better forecasts and improving understanding of the Earth and its processes. OAR conducts research on ocean acidification, aquaculture, severe weather, climate, and deep sea environments and develops technology that is transitioned into operations at one of the other NOAA Line Offices or that improve the scope and efficiency of our observing systems. OAR also provides information to individuals, businesses, and communities to reduce vulnerability to extreme weather and climate, prepare for drought and water resource challenges, protect and preserve coasts and coastal infrastructure from inundation, and identify and manage risks to marine ecosystems and the services they provide.

NOAA manages OAR's budget line items in four sub-programs. This management structure enables improved coordination across budget lines that fall within a single research portfolio, providing great opportunity for collaboration between OAR's labs, programs, cooperative institutes, and extramural partners on shared areas of research. In this way, the OAR budget is organized into the following four Operations, Research, and Facilities (ORF) sub-programs:

- **Climate Research (\$159,116,000 and 260 FTE)** includes foundational long-term observations and research focused on gaining greater understanding of our Earth's system, including research seasonal (3 months – 2 years) and sub-seasonal (2 weeks to 3 months) outlooks, and enhancing communities' ability to respond to climate variability and change.
- **Weather & Air Chemistry Research (\$108,304,000 and 246 FTE)** includes research focused on improving our understanding and forecasting capabilities for near-term (minutes to 2 weeks) severe storm and weather events that endanger lives and property.
- **Ocean, Coastal and Great Lakes Research (\$189,389,000 and 213 FTE)** includes research and grant programs focused on improving understanding of habitats, processes, and resources in the oceanic, coastal, and Great Lakes environments.
- **Innovative Research and Technology (\$12,182,000 and 11 FTE)** includes high performance computing initiatives, which advance computing, communications, and information technologies throughout NOAA.

The OAR budget is organized into one Procurement, Acquisition, and Construction (PAC) sub-program totaling \$20,041,000 and 0 FTE.

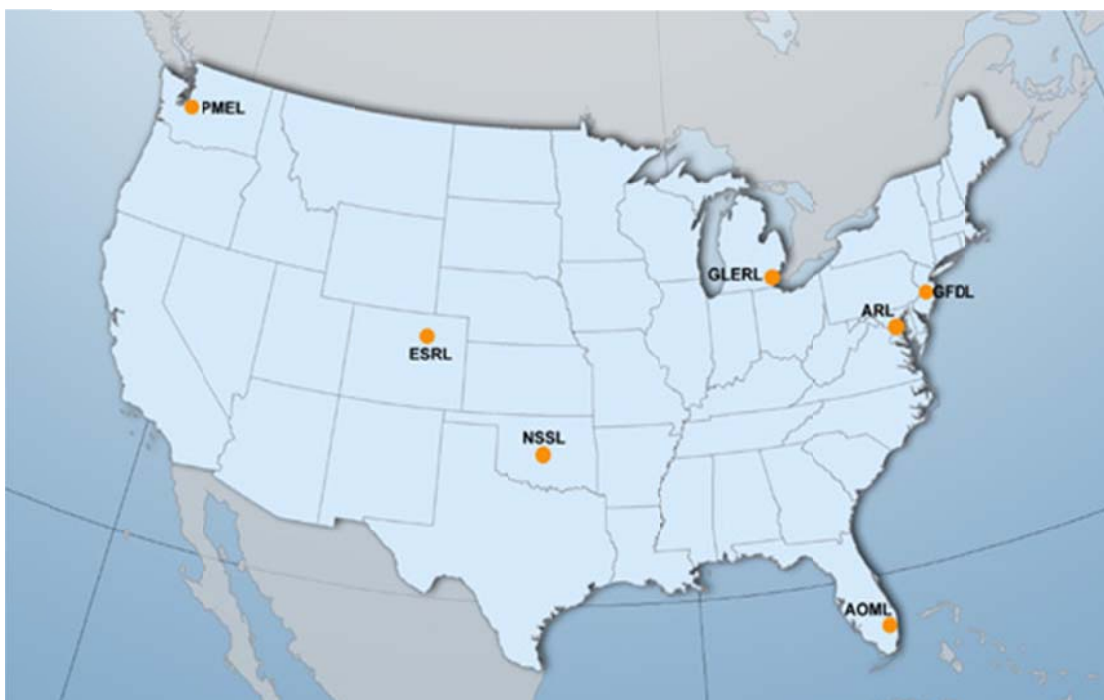
- **Systems Acquisition** includes NOAA's investments in infrastructure for Research and Development High Performance Computing. OAR manages a high performance computing system, which provides a platform to characterize and quantify weather and climate variations and change at a range of temporal and spatial scales.

OAR's Organizational Components:

OAR operates through a national network of laboratories, other university-based research institutes, and specialized programs. These centers of expertise collaborate across NOAA's weather, climate, and ocean research to apply an integrated approach to global and local scientific challenges. OAR consists of the following organizational components:

OAR LABORATORIES

OAR has ten laboratories across the United States providing the research foundation for NOAA products and services that support decision making by policymakers and the public. These laboratories collaborate with numerous external partners, including NOAA-funded Cooperative Institutes at academic and scientific institutions.



Map displaying the location of OAR's ten laboratories.

OAR's labs include:

Air Resources Laboratory (ARL), College Park, Maryland

ARL conducts research on atmospheric dispersion, atmospheric chemistry, climate composition, and the complex behavior of the atmosphere near the Earth's surface, providing weather forecasters' direct access to dispersion estimates of airborne hazardous materials to predict the transport of acid rain, volcanic ash, wildfires, air chemistry, mercury contamination, and radioactive material.

Atlantic Oceanographic and Meteorological Laboratory (AOML), Miami, Florida

AOML conducts research that protects coastal populations and ecosystems with more accurate forecasting of hurricanes, better understanding of the role of oceans in climate, and protection from environmental degradation.

Earth System Research Laboratories (ESRL), Boulder, Colorado

Four laboratories, formerly divisions, within ESRL pursue a broad and comprehensive understanding of the Earth system, including the atmosphere, ocean, and the climate system.

Chemical Sciences Research Laboratory (CSRL)

CSRL focuses on quantifying manmade and natural emissions, understanding processes that alter the atmosphere's composition and the distribution of pollutants, and offering information and practical applications to local decision makers and the public.

Global Monitoring Research Laboratory (GMRL)

GMRL sustains long-term observation of atmospheric compounds from over 100 sites around the world and identifies emerging trends in compound location and concentration. It also validates the NASA and NOAA satellite data of greenhouse gases, ozone, radiation, aerosols, and many other atmospheric compounds.

Global Systems Research Laboratory (GSRL)

GSRL improves weather and water by developing and integrating next-generation Earth system models at storm-to-global scales and advances new modeling.

Physical Sciences Research Laboratory (PSRL)

PSRL conducts physical science research that advances NOAA's abilities to observe, understand, and predict the physical behavior of the Earth system, improving forecasts and seasonal outlooks.

Geophysical Fluid Dynamics Laboratory (GFDL), Princeton, New Jersey

GFDL modeling research provides the foundation for our Nation's weather prediction, seasonal forecasting and ocean modeling.

Great Lakes Environmental Research Laboratory (GLERL), Ann Arbor Michigan

GLERL develops information and tools for coastal decision makers managing 95 percent of our country's surface freshwater. GLERL advances forecasts of environmental change in the Great Lakes through environmental observation, ecosystem process studies, and integrated modeling.

National Severe Storms Laboratory (NSSL), Norman, Oklahoma

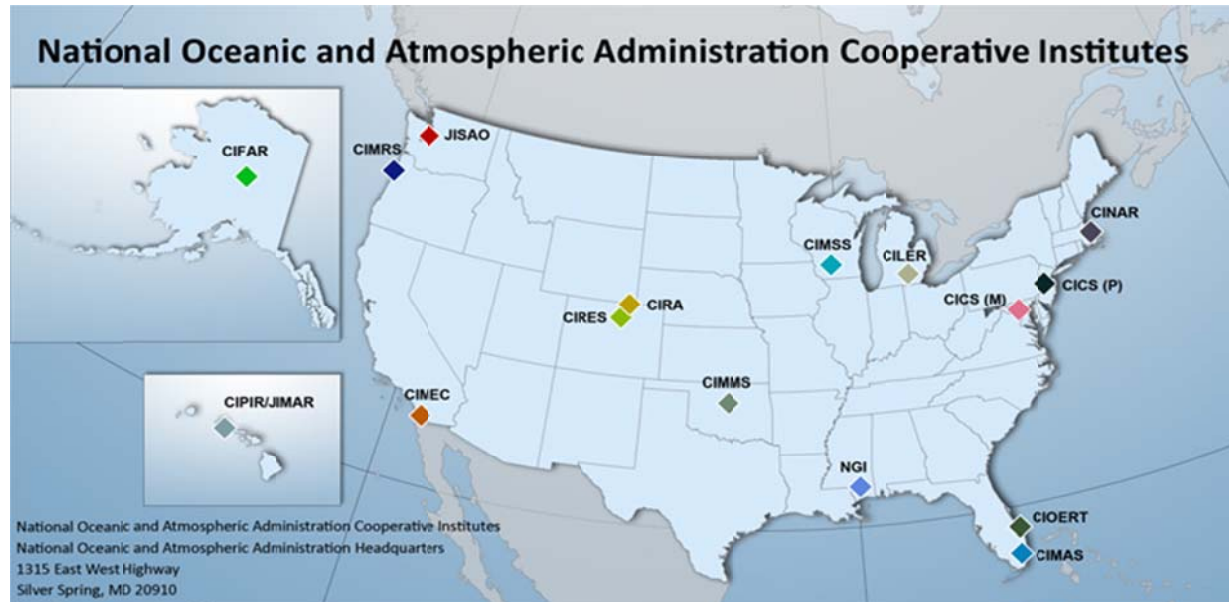
NSSL focuses on understating the causes of severe weather, such as tornadoes, flash floods, hail, damaging winds, and winter weather, in order to improve the lead time and accuracy of severe weather forecasts and warnings.

Pacific Marine Environmental Laboratory (PMEL), Seattle, Washington

PMEL explores the complex physical and geochemical processes operating in the world's oceans, including the processes driving ocean circulation and the global climate system.

OAR COOPERATIVE INSTITUTES

OAR Cooperative Institutes (CIs) are long-term collaborations between NOAA and academic and scientific institutions dedicated to advancing oceanic and atmospheric research. CIs are co-located with one or more NOAA facilities to promote scientific exchange and technology transfer. Each CI was competitively selected to address a specific research theme within NOAA's mission, such as weather forecast improvement and ecosystem forecasting. These partnerships help maximize scientific breadth, quality, productivity, and return on investment. NOAA currently supports 16 CIs consisting of 42 universities and research institutions across 23 states and the District of Columbia.



Map displaying the location of NOAA's Cooperative Institutes

NOAA's Cooperative Institutes and their host institution are:

- CI for Alaska Research (CIFAR), University of Alaska - Fairbanks
- CI for Climate and Satellites (CICS-M), University of Maryland - College Park
- CI for Climate Science (CICS-P), Princeton University
- CI for Limnology and Ecosystem Research (CILER), University of Michigan
- CI for Marine and Atmospheric Studies (CIMAS), University of Miami
- CI for Marine Ecosystems & Climate (CIMEC), University of California - San Diego
- CI for Marine Resources Studies (CIMRS), Oregon State University
- CI for Mesoscale Meteorological Studies (CIMMS), University of Oklahoma
- CI for the North Atlantic Region (CINAR), Woods Hole Oceanographic Institution
- CI for Ocean Exploration, Research & Technology (CIOERT), Florida Atlantic University
- CI for Research in the Atmosphere (CIRA), Colorado State University
- CI for Research in Environmental Sciences (CIRES), University of Colorado
- CI for Meteorological Satellite Studies (CIMSS), University of Wisconsin - Madison
- CI for the Pacific Island Region (CIPIR), University of Hawaii
- Joint Institute for the Study of the Atmosphere & Ocean (JISAO), University of Washington
- Northern Gulf Institute (NGI), Mississippi State University

OAR PROGRAMS

OAR Programs manage competitive and noncompetitive awards for intramural and extramural research that focus on specific topics and emerging areas of research. They also foster collaboration across NOAA, with other agencies, and academic institutions. OAR's programs include:

Climate Program Office (CPO)

CPO supports activities that advance our understanding of Earth's climate system and helps communities apply this knowledge to mitigate risks and improve community resilience and preparedness throughout the Nation.

National Sea Grant College Program (NSGCP)

The National Sea Grant College Program is a Federal-state partnership that focuses on maintaining resilient communities and economies, sustainable fisheries and aquaculture, healthy coastal ecosystems, and environmental literacy and workforce development.

NOAA Ocean Acidification Program (OAP)

The OAP aims to improve understanding of how ocean chemistry is changing, how variable that change is by region, and how ocean acidification affects marine life, people, and the economy.

Ocean Exploration and Research (OER)

OER, the only Federal program dedicated to ocean exploration, leads efforts to explore and characterize deep-water areas of the U.S. and other poorly known ocean areas so the Nation can successfully manage its oceanic resources.

Office of Weather and Air Quality (OWAQ)

OWAQ improves predictions and warnings for the public and weather sensitive U.S. industries by facilitating cutting-edge research and transitioning this research to National Weather Service (NWS) operations.

Unmanned Aircraft Systems (UAS) Program

The UAS program examines innovative UAS technologies that collect data from dangerous or remote areas, such as the poles, oceans, wildlands, volcanic islands, and wildfires to bridge the information gap between instruments on Earth's surface and on satellites.

PERFORMANCE:

Performance evaluation is an integral part of OAR's business process. OAR uses the performance management process to align resources, systems, and workforce to achieve research-based objectives and priorities for the Nation. The effectiveness of these investments is assessed using numerous internal and external performance measures including the Government Performance and Results Act (GPRA) and other performance measures. In the table below is a list of OAR-led GPRA metrics that cross multiple laboratories and programs.

OAR GPRA measures	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
Annual number of peer-reviewed publications related to environmental understanding and prediction (<i>NOAA total</i>) - Indicator 3.1	1697	1500	1500	1500	1500	1500	1500
Uncertainty of the North American (NA) carbon sink to better understand the contribution of human activities toward increasing atmospheric CO2 and methane - Indicator 3.1	400 M tons Carbon/ Yr	400 M tons Carbon/ Yr	400 M tons Carbon/ Yr	400 M tons Carbon/ Yr	390 M tons Carbon/ Yr	385 M tons Carbon/ Yr	380 M tons Carbon/ Yr
Number of forecast and mission improvements, based on OAR research, to weather applications at operational U.S. weather services and in the U.S. weather commercial sector - Indicator 3.1	9	9	retired	retired	retired	retired	retired
Annual economic and societal benefits from Sea Grant activities as measured by jobs created/retained (<i>reported by each individual Sea Grant College</i>) - Indicator 3.1	20,770	20,770	20,770	20,770	20,770	20,770	20,770
Annual number of Climate Program Office peer-reviewed publications related to climate understanding and prediction - Indicator 3.1	847	300	retired	retired	retired	retired	retired
Number of research and development (R&D) capabilities transitioning to applications (from TRL 8 to TRL 9) to improve efficiency, accuracy, or precision of forecasts - Indicator 3.1 & APG	4	8	retired	retired	retired	retired	retired

Significant Adjustments:

Calculated Adjustments

NOAA's FY 2018 Base includes an increase of \$3,950,000 and 0 FTE to account for the full funding requirement for inflationary adjustments to current programs for OMAO activities. This includes the estimated 2018 Federal and military pay raises of 1.9 percent as well as inflationary increases for non-labor activities, including service contracts, utilities, field office lease payments, and rent charges from the General Services Administration (GSA).

Technical Adjustments

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
MS	Mission Services and Management	OAR	Weather & Air Chemistry Laboratories & Cooperative Institutes	\$4,017,000/0FTE

NOAA requests to transfer \$2,872,000 and 0 FTE to move funding for operations at the David Skaggs Research Center in Boulder, CO, from the Mission Support Facilities to OAR. This funding is currently appropriated to the Mission Services and Management PPA and then distributed to the Line and Staff Offices annually. This reallocation will increase efficiencies by eliminating the need for funding transfers subsequent to appropriation and will improve transparency.

NOAA requests to transfer \$1,145,000 and 0 FTE to move funding associated with NOAA's Western Regional Center (WRC) management activities from Mission Support Facilities to OAR. Currently, costs for these activities are paid directly through the funding appropriated to the Mission Services and Management PPA. This reallocation supports NOAA's plan to employ an integrated campus cost model to allocate the cost of services to the WRC tenants. The tenants will then be billed directly based on the approved cost model. An integrated cost model will provide greater transparency and a more accurate reflection of program operating costs.

Narrative Information:

Following this section are base justification materials and program change narratives by sub-program for this line office. Please note program change narratives are only provided for program changes that represent greater than five percent of a program. Complete program changes by PPA can be found in the NOAA Control Table (p. Control Table – 3, p. Control Table - 4). Please contact NOAA if details for any of these changes are required.

APPROPRIATION ACCOUNT: OPERATIONS, RESEARCH, AND FACILITIES

SUB-PROGRAM: CLIMATE RESEARCH

The mission of the Climate Research in OAR is to monitor and understand Earth's climate system to predict potential changes in global climate, as well as understand and communicate to the public and decision-makers near-term, regional climate variations that are of societal and economic importance. Although the study of the Earth's climate can span a period of years to decades, NOAA's climate focus is also on better understanding and providing information on seasonal (3 months to 2 years) and sub-seasonal (2 weeks to 3 months) outlooks for farmers, fishermen, emergency responders, other industry workers, and the American people regarding what to expect in two weeks, next month, or next season. In 2016, the United States experienced 16 climate and weather disasters, including flooding in Louisiana and hurricanes on the Southeast coast. Combined, these events claimed 129 lives and cost \$46 billion in damages.¹ Businesses, policy leaders, resource managers and citizens are increasingly asking for information to help them address challenges like these. The long-term observing, monitoring, research, and modeling capabilities performed in OAR's Climate Research provides the science that Americans need to understand how, where, and when Earth's conditions are changing. NOAA's climate research activities are authorized under the National Climate Program Act, the Global Change Research Act, and the Weather Research and Forecasting Innovation Act.

The following three Programs, Projects and Activities (PPA) are included in the Climate Research Portfolio:

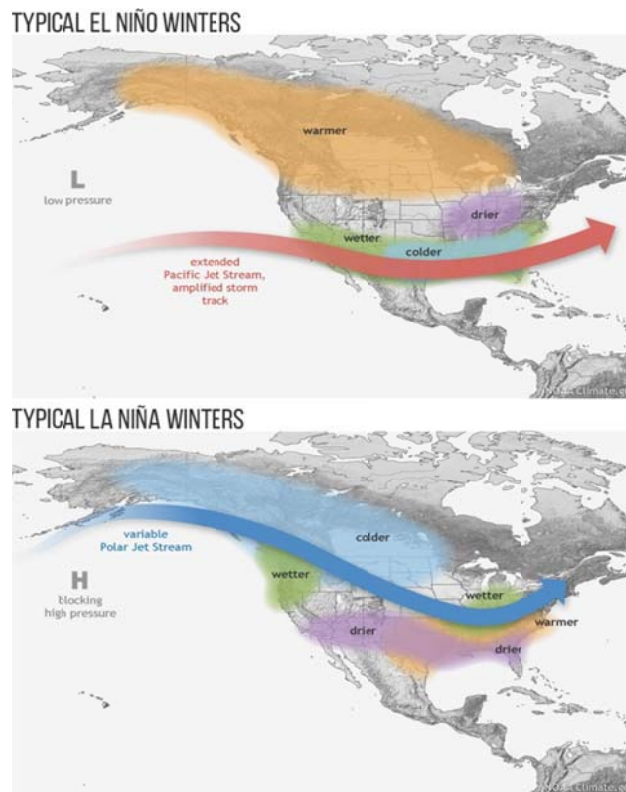
- *Laboratories & Cooperative Institutes:* OAR's Laboratory and Cooperative Institutes primarily support Earth System science research, modeling, and technology development and maintain long-term atmospheric observation networks and infrastructure, including a network of tall towers and the Atmospheric Baseline Observatories (ABOs) which collect data on the atmosphere's composition.
- *Regional Climate Data & Information:* OAR supports activities that improve resilience and preparedness throughout the Nation with research that advances our understanding of climate-related risks and vulnerabilities across sectors and regions and with the development of tools to enable more informed decision making.
- *Climate Competitive Research:* OAR's funds high-priority climate science through a competitive selection process to advance understanding of the Earth's climate system and climate impacts on society.

Overall, OAR's Climate Research objectives are to:

- Describe and understand the state of the oceans and climate through sustained atmospheric and oceanic observations and research;
- Understand and predict ocean and climate variability and change from weeks to decades to centennial timescales; and
- Incorporate research into information and products that help decision makers and communities plan for and respond to climate variability and change.

¹ NOAA National Centers for Environmental Information (NCEI) U.S. Billion-Dollar Weather and Climate Disasters (2017). <https://www.ncdc.noaa.gov/billions/>

In FY 2016 OAR's Climate Research increased deep ocean temperature observations and sustained thousands of buoys and other platforms; addressed requests from farmers, ranchers, natural resource managers, and others in improving drought monitoring and prediction information by developing the Water Resources Dashboard as part of the U.S. Climate Resilience Toolkit and launching two new Drought Early Warning Systems (DEWS) in the Pacific Northwest and Midwest; deployed new instrumentation for measuring sulfur dioxide, an important gas from natural (e.g., volcanoes) and anthropogenic (e.g., fossil fuels) sources that can influence acid rain, air chemistry, visibility, and climate change; coordinated a rapid response effort to map coastal flooding during Hurricane Joaquin using a new smartphone app; funded scientists to track various impacts of El Niño, including beach and cliff erosion rates and the impacts on native and commercial oysters; and rapidly mobilized to quantify the release of methane from a 112-day gas leak in Aliso Canyon near Los Angeles.



NOAA Climate Research

OAR's Climate Research is collaborative and crosscutting and therefore is often funded through multiple PPAs. Some specific activities include:

Global Observations

To better document and understand global processes, OAR provides an array of observational capabilities. For example, OAR's six ABOs have been collecting 250 measurements of atmospheric trends for over 50 years such that measurements conducted in the 1960s are exactly comparable to those made today and 100 years from now. These observations and supplemental measurements help identify trends and anomalies in the atmosphere, like radioactive dust releases and transport of mercury in the air from China to the U.S., and their impacts. With this information, decision-makers are better able to address global atmospheric challenges. For example, OAR's long-term and on-going measurements of ozone, UV, and ozone-depleting compounds help policymakers identify successes and needs to repair the ozone layer. OAR also supports the Global Ocean Observing System including the drifting buoy network, Argo profiling floats, tropical moored arrays in the Atlantic, and ocean carbon networks, and continually researches new climate observing strategies. In addition, OAR supports Arctic-based observations, such as seasonal sea ice coverage, ocean acidification, and Arctic to mid-latitude weather/climate linkages.

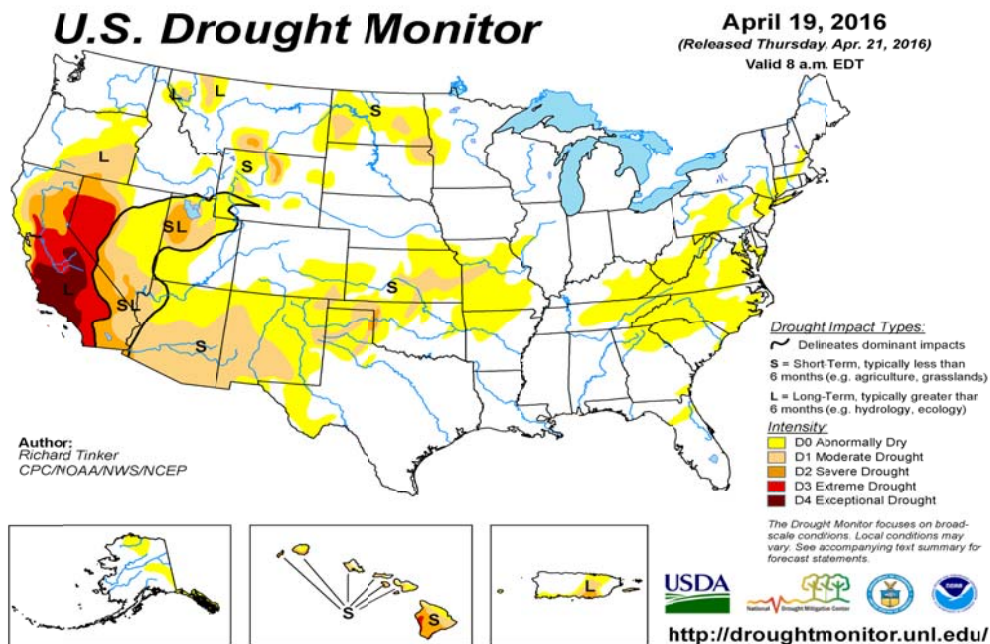
Predicting Future Change

OAR's Climate Research predicts future change to inform decision making. The Earth System comprises many physical, chemical and biological processes that need to be dynamically integrated to better predict their behavior over scales from local to global and periods of minutes

to millennia. OAR research produces state-of-the-art models of the Earth System to better predict climate extremes and variability impacting the U.S., such as changes in the risk for heavy rainfall and snow events during an El Niño, frequency of high-impact weather events, and ocean dynamics like the Meridional Overturning Circulation. In the Arctic OAR predicts and models future scenarios of Arctic Ocean changes in sea-ice extent, ecosystem evolution, ocean acidification, and Arctic to mid-latitude weather/climate linkages. These models, data, simulations, and results are publicly available online to facilitate independent evaluation.

Assessing Impacts

OAR Climate Research provides in-depth analysis of climate change impacts on the United States. OAR assesses the multitude of ways climate change is already affecting and will increasingly affect the lives of Americans. For example, the National Climate Assessment details the changes various geographic regions and economic sectors are experiencing and can expect to experience in the future. Past assessments have included studies of how climate impacts tornadoes, sea level, and drought. This research is pointing to more effective ways to meet environmental management and policy goals while avoiding costly overregulation.



The U.S. Drought Monitor (pictured above) is a weekly map based on measurements of climatic, hydrologic, and soil conditions as well as reported impacts and observations collected from more than 350 contributors around the U.S.

Supporting Decisions

OAR Climate Research also delivers resources and tools to foster resilience and preparedness throughout the U.S. and abroad, across sectors and regions. In particular, Regional Integrated Sciences and Assessments support external research teams who collaborate with regional decision makers (such as water utilities, coastal managers, and city and state planners) to develop information for science-based management of natural resources, infrastructure, transportation, and public health. This program works closely with other areas of OAR Climate

Research, including the NOAA-led National Integrated Drought Information System (NIDIS), established by the National Integrated Drought Information System Act of 2006. NIDIS provides accessible drought information for the Nation through improved drought monitoring and forecasting capabilities. In addition, the NOAA Climate.gov Portal provides easy public access to NOAA and its partners' climate data and information services. Climate.gov also hosts and supports the U.S. Climate Resilience Toolkit (toolkit.climate.gov).

Competitive Research

OAR funds high-priority climate science through a competitive selection process focused on four areas to advance the understanding, modeling, and prediction of Earth's climate system and to foster effective decision making:

- Earth System Science provides process-level understanding of NOAA's Earth climate system through observation, modeling, research analysis, and field studies to support the development of improved climate models and predictions.
- Modeling, Analysis, Predictions, and Projections improve models of Earth system processes, and tests model capabilities to make them more relevant to decision makers for topics such as extreme heat, high water levels, drought, and tornado outbreaks.
- Climate and Societal Interactions enables scientists and decision makers to effectively co-produce and utilize climate information in risk management, adaptation and development.
- Climate and U.S. Fish Stocks advances understanding and projection of the impacts of climate variability and change on fish stocks, prey availability, and habitat to support sustainable fisheries management.

Schedule and Milestone Highlights:

FY 2018 – 2022

Laboratories and Cooperative Institutes PPA:

- Publish updates on Annual Greenhouse and Ozone Depleting Gas Indices
- Apply new Earth system modeling for tipping point prediction in global estuarine, coastal, and benthic ecosystems
- Deploy and maintain an array of 1,200 surface drifters
- Maintain 38 existing CO₂ and OA moorings and deploy an average of 1 additional mooring each year to the network
- Complete 1-2 hydrography cruises annually including inventorying climatically important chemistry (e.g. CO₂, etc.), servicing moorings, and monitoring coastal and deep ocean boundary currents
- Long term global records of greenhouse gases, stratospheric ozone, and aerosols

Regional Climate Data & Information PPA:

- Improve drought indicators and indices in support of the Regional Drought Early Warning Information System
- Conduct climate training for tribal communities in the Southern U.S.
- Lead and support the quadrennial National Climate Assessment and the Scientific Assessment of Ozone Depletion, under the Montreal Protocol on Substances that Deplete the Ozone Layer
- Test experimental drought indicators based on decision making needs in the NIDIS Pilot regions

Climate Competitive Research PPA:

- Expand Earth system data collection for cryospheric, boundary layer properties, hydrometeorological, and oceanic process studies
- Increase cumulative number of science-based adaptation tools and technologies that are used by NOAA partners and stakeholders to improve ecosystem-based management of fisheries from two to five

Deliverable Highlights:

Laboratories and Cooperative Institutes PPA:

- Long term global records of atmospheric compounds, up to 55 trace gases, stratospheric ozone, aerosols, and surface radiation
- Updated status of South Pole Ozone hole

Regional Climate Data & Information PPA:

- Forty total interoperable drought systems accessible through the U.S. Drought Portal
- Increased skill and capacity among stakeholders in businesses and communities to build resilience to climate-related impacts
- 647K unique visits to NOAA Climate.gov in 2016 (62.5 percent more than previous year)
- Climate training workshops and reports directed to the needs of resource managers

Climate Competitive Research PPA:

- Competitively awarded in 2015 \$48 million to 53 projects conducted by NOAA laboratories and operational centers, universities, and other research partners

Performance Goals and Measurement Data:

Laboratories & Cooperative Institutes Performance	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
Measure: Percentage uncertainty in 21st century sea level rise estimates (0-1m = 100% uncertainty) to enable government and industry to mitigate the impact of projected sea level rise	65%	65%	60%	50%	50%	45%	45%
Description: 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. This metric is calculated using the IPCC 4th Assessment Report estimates for the range of 21st century global-mean sea level rise. Uncertainties in sea-level rise estimates will be reduced through improved modeling efforts that will capture more accurate measurements of ice-sheet discharge, thermal expansion, and regional anomalies due to ocean circulation and heat storage.							

Regional Climate Data & Information Performance Measure:	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 20120 Target	FY 2021 Target	FY 2022 Target
Number of states and territories that incorporate NOAA drought early warning information into their drought adaptation and mitigation plans. (Cumulative)	20	25	22	26	26	26	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: establishing local or regional drought planning/management groups; establishing drought indicators and setting management triggers in state and territory drought adaptation and mitigation plans.							

PROGRAM CHANGES FOR FY 2018:

NOAA requests a total decrease of \$31,116,000 and 9 FTE in FY 2018 program changes for the Climate Research sub-program. Narratives are only provided for program changes which are greater than five percent of a program. Complete program changes by PPA can be found in the NOAA Control Table (p. Control Table – 3, p. Control Table - 4).

Program Changes for FY 2018:

Climate Research: Reduce Competitively Funded Research: (Base Funding: \$97,815,000 and 27 FTE; Program Change -\$23,702,000 and -5 FTE): NOAA requests a decrease of \$23,702,000 and 5 FTE for a total of \$74,113 and 23 FTE to reduce competitively funded climate research.

Proposed Actions:

NOAA’s budget proposes to decrease competitively funded research that advances understanding of the Earth’s climate system and enhances regional decision-making capabilities. This research links basic climate science to risk management, tool development, and decision-making needs of communities across the Nation such as NOAA’s water reservoir visualization tool that helps water managers and cattle ranchers in the southern U.S. plan for changes in reservoir water levels.

In addition, NOAA’s budget reduces competitive research grants to cooperative institutes, universities, NOAA research laboratories, and other partners. NOAA laboratories receive a portion of their financial support through NOAA’s competitively awarded grants. The FY 2018 budget request will reduce extramural grant competitions that fund research in all 50 states and support NOAA laboratories and nine Cooperative Institutes (CI) focused on climate research. This decrease will reduce competitive funding, including for the Atmospheric Chemistry, Carbon Cycle & Climate (AC4) program, the Modeling, Analysis, Predictions & Projections (MAPP) data archive, the International Research & Applications (IRAP) program, the Coastal & Ocean Climate Applications (COCA) program, and the Sectoral Applications Research Program (SARP).

The proposed budget decreases in competitively funded climate research are necessary to enable NOAA to fund other priority programs and activities.

Resources Assessment:

Both the Climate Competitive Research and Regional Climate Data and Information PPAs support competitively funded climate research. OAR will continue to support other programs funded under these PPAs, including RISAs, NIDIS, and sustained assessments within remaining funds.

Climate Research Program Changes by PPAs: Competitively Funded Research	
PPA: Regional Climate Data and Information	PPA: Climate Competitive Research
Base: \$37,928,000	Base: \$59,887,000
Program Change: -\$2,230,000	Program Change: -\$21,472,000

Regional Climate Data & Information Performance Measure: Annual number of regionally and sectorally focused climate impact and adaptation studies communicated to decision makers.	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
With decrease	31	31	0	0	0	0	0
Without decrease	NA	NA	31	31	31	31	31
<p>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.).</p>							

PROGRAM CHANGE PERSONNEL DETAIL

Program: Office of Oceanic and Atmospheric Research
Sub-program: Climate Competitive Research
Program Change: Reduce Competitively Funded Research

Title:	Location	Grade	Number of Positions	Annual Salary	Total Salaries
Physical Scientist	Silver Spring, MD	ZP-5	(1)	\$161,900	\$ (161,900)
Physical Scientist	Silver Spring, MD	ZP-4	(1)	\$154,498	\$ (154,498)
Program Analyst	Silver Spring, MD	ZA-4	(1)	\$125,119	\$ (125,119)
Physical Scientist	Silver Spring, MD	ZP-3	(1)	\$109,950	\$ (109,950)
Program Analyst	Silver Spring, MD	ZA-3	(1)	\$109,950	\$ (109,950)
Subtotal			<u>(5)</u>		<u>\$ (661,417)</u>
Less Lapse	0%		<u>0</u>		<u>\$0</u>
Total Full-time permanent:			(5)		(\$661,417)
2017 Pay Adjustment	1.6%				(\$10,583)
TOTAL			(5)		(\$672,000)
Personnel Data			Number		
Full-time Equivalent Employment					
Full-time permanent			(5)		
Other than full-time permanent			0		
Total			<u>(5)</u>		
Authorized Positions:					
Full-time permanent			(5)		
Other than full-time permanent			0		
Total			<u>(5)</u>		

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

Budget Program: Office of Oceanic and Atmospheric Research
Sub-program: Regional Climate Data and Information
Program Change: Reduce Competitively Funded Research

Object Class	FY 2018 Decrease	FY 2018 Total Program
11 Personnel compensation		
11.1 Full-time permanent	\$0	\$18,567
11.3 Other than full-time permanent	0	0
11.5 Other personnel compensation	0	0
11.6 Leave Surcharge Full-Time	0	0
11.8 Special personnel services payments	0	48
11.9 Total personnel compensation	<u>\$0</u>	<u>\$18,615</u>
12 Civilian personnel benefits	0	8,561
13 Benefits for former personnel	0	102
21 Travel and transportation of persons	(20)	645
22 Transportation of things	(10)	132
23.1 Rental payments to GSA	0	235
23.2 Rental Payments to others	0	168
23.3 Communications, utilities and misc charges	0	258
24 Printing and reproduction	0	154
25.1 Advisory and assistance services	0	147
25.2 Other services	0	123
25.3 Purchases of goods & services from Gov't accounts	0	315
25.4 Operation and maintenance of facilities	0	200
25.5 Research and development contracts	(25)	987
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	(100)	645
31 Equipment	(27)	547
32 Lands and structures	0	3
33 Investments and loans	0	0
41 Grants, subsidies and contributions	(2,048)	3,861
42 Insurance claims and indemnities	0	0
43 Interest and dividends	0	0
44 Refunds	0	0
99 Total obligations	<u>(2,230)</u>	<u>35,698</u>

Due to financial system limitations, the object class detail for the Program reflects the Regional Climate Data and Information PPA.

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

Budget Program: Office of Oceanic and Atmospheric Research
Sub-program: Climate Competitive Research
Program Change: Reduce Competitively Funded Research

Object Class	FY 2018 Decrease	FY 2018 Total Program
11 Personnel compensation		
11.1 Full-time permanent	(\$672)	\$19,835
11.3 Other than full-time permanent	0	0
11.5 Other personnel compensation	0	0
11.6 Leave Surcharge Full-Time	0	0
11.8 Special personnel services payments	0	82
11.9 Total personnel compensation	(\$672)	\$19,917
12 Civilian personnel benefits	(575)	5,324
13 Benefits for former personnel	0	35
21 Travel and transportation of persons	(257)	45
22 Transportation of things	(102)	24
23.1 Rental payments to GSA	0	213
23.2 Rental Payments to others	0	385
23.3 Communications, utilities and misc charges	(9)	654
24 Printing and reproduction	(6)	296
25.1 Advisory and assistance services	(14)	768
25.2 Other services	(679)	391
25.3 Purchases of goods & services from Gov't accounts	(372)	223
25.4 Operation and maintenance of facilities	0	189
25.5 Research and development contracts	(500)	1,453
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	(379)	235
31 Equipment	(1,195)	756
32 Lands and structures	0	3
33 Investments and loans	0	0
41 Grants, subsidies and contributions	(16,712)	7,504
42 Insurance claims and indemnities	0	0
43 Interest and dividends	0	0
44 Refunds	0	0
99 Total obligations	(21,472)	38,415

Due to financial system limitations, the object class detail for the Program reflects the Climate Competitive Research PPA.

Climate Research: Eliminate Arctic Research: (Base Funding: \$6,000,000 and 0 FTE; Program Change: -\$6,000,000 and 0 FTE): NOAA requests a decrease of \$6,000,000 and 0 FTE for a total of \$0 and 0 FTE to eliminate Arctic research within the Office of Oceanic and Atmospheric research (OAR).

Proposed Actions:

NOAA’s budget proposes to terminate improvements to sea ice modeling and predictions that support the safety of fishermen, commercial shippers, cruise ships, and local communities. Many other Arctic research products, including future scenarios for changes to Arctic Ocean sea-ice extent, ecosystem and fisheries vulnerabilities, and ocean acidification will also be eliminated. This proposed decrease will reduce support for research related to mid-latitude weather and other Arctic projects conducted with other NOAA Line Offices.

Climate Research Program Changes: Arctic Research	
PPA: Climate Laboratories and Cooperative Institutes	PPA: Regional Climate Data and Information
Base: \$59,887,000	Base: \$37,928,000
Program Change: -\$2,230,000	Program Change: -\$3,770,000

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

Budget Program: Office of Oceanic and Atmospheric Research
Sub-program: Climate Laboratories and Cooperative Institutes
Program Change: Eliminate Arctic Research

Object Class		FY 2018 Decrease	FY 2018 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
11.8	Special personnel services payments	0	0
11.9	Total personnel compensation	<u>\$0</u>	<u>\$0</u>
12	Civilian personnel benefits	0	0
13	Benefits for former personnel	0	0
21	Travel and transportation of persons	(20)	0
22	Transportation of things	(10)	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	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	(25)	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	(100)	0
31	Equipment	(27)	0
32	Lands and structures	0	0
33	Investments and loans	0	0
41	Grants, subsidies and contributions	(2,048)	0
42	Insurance claims and indemnities	0	0
43	Interest and dividends	0	0
44	Refunds	0	0
99	Total obligations	<u>(2,230)</u>	<u>0</u>

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

Budget Program: Office of Oceanic and Atmospheric Research
Sub-program: Regional Climate Data and Information
Program Change: Eliminate Arctic Research

Object Class	FY 2018 Decrease	FY 2018 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
11.8 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	(257)	0
22 Transportation of things	(102)	0
23.1 Rental payments to GSA	0	0
23.2 Rental Payments to others	0	0
23.3 Communications, utilities and misc charges	(9)	0
24 Printing and reproduction	(6)	0
25.1 Advisory and assistance services	(9)	0
25.2 Other services	(26)	0
25.3 Purchases of goods & services from Gov't accounts	(102)	0
25.4 Operation and maintenance of facilities	0	0
25.5 Research and development contracts	(497)	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	(284)	0
31 Equipment	0	0
32 Lands and structures	0	0
33 Investments and loans	0	0
41 Grants, subsidies and contributions	(2,478)	0
42 Insurance claims and indemnities	0	0
43 Interest and dividends	0	0
44 Refunds	0	0
99 Total obligations	(3,770)	0

APPROPRIATION ACCOUNT: OPERATIONS, RESEARCH, AND FACILITIES
SUB-PROGRAM: WEATHER & AIR CHEMISTRY RESEARCH

Weather & Air Chemistry Research in OAR continually improves capabilities to provide more accurate and timely warnings and forecasts of various high-impact weather, water, and air quality events by prioritizing improvements in weather data observation, modeling, computing, forecasting, and warnings for the protection of life and property and for the enhancement of the national economy. OAR's weather research laboratories, programs, and partners are key contributors to advancing the National Weather Service (NWS) prediction capabilities. In addition, scientists working within OAR's Weather & Air Chemistry Research study atmospheric chemistry to accurately characterize atmospheric composition and predict meteorological processes to more effectively understand their role in severe weather. NOAA's weather research activities are authorized under the Weather Service Modernization Act, the National Oceanic and Atmospheric Administration Authorization Act, and the Weather Research and Forecasting Innovation Act.

The following two PPA's are included in the Weather & Air Chemistry Research:

- Laboratories & Cooperative Institutes: OAR's Laboratories & Cooperative Institutes primarily support weather forecasting improvement and air chemistry research, modeling, and technology development.
- Weather & Air Quality Research Programs: Primarily encourages cooperation with external experts in weather and air chemistry research by improving predictions and warnings for the public and weather sensitive U.S. industries with cutting-edge research, analysis techniques, and observing platforms.

Overall, OAR's Weather Research supports:

- Research and development that provides the Nation with 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 chemistry; and
- Research that provides the scientific basis for informed management decisions about weather, water, and air chemistry.

In FY 2016 OAR's Weather Research scientists flew 30 hurricane research flights; teamed up with NASA to remotely operate three 24-hour missions conducting high-altitude observations of three different Pacific weather systems using the Global Hawk Unmanned Aircraft System; advanced the transition of hurricane model improvements to the NWS; launched a land, sea, and airborne research effort to better observe and document the environmental responses to the strong 2016 El Niño; and brought together researchers across the Southeastern U.S. to study the formation of tornadoes in the region's hilly and tree-lined terrain as part of the VORTEX-SE project. In the past, OAR has also successfully transitioned weather research results into operations or commercialization, saving lives and property. Some examples include the Next Generation Weather Radar (NEXRAD) that has reduced deaths from severe weather by 34 percent and injuries by 45 percent, saving the Nation almost \$3.2 billion.²

² Simmons, K.M., and D. Sutter. (2011). *Economic and Societal Impacts of Tornadoes*. Boston, MA: American Meteorological Society.

OAR's Weather Research Portfolio is collaborative and crosscutting and therefore is often funded through multiple PPAs. Some specific activities include:

Tornado Severe Storm Research / Phased Array Radar

OAR is working to couple weather forecast model information with dual-polarized radar observations to better determine the type and intensity of precipitation, and add the ability to classify hail size and detect tornado debris. Other radar research includes developing phased array radar, which can reduce the time to scan a weather system from 4-5 minutes to less than one minute, providing earlier weather predictions. OAR is currently working with NWS and the Federal Aviation Administration to demonstrate Multi-function Phased Array Radar (MPAR), one potential application for phased array radar. MPAR has the potential to simultaneously perform aircraft tracking, wind profiling, and weather surveillance in the same radar system.



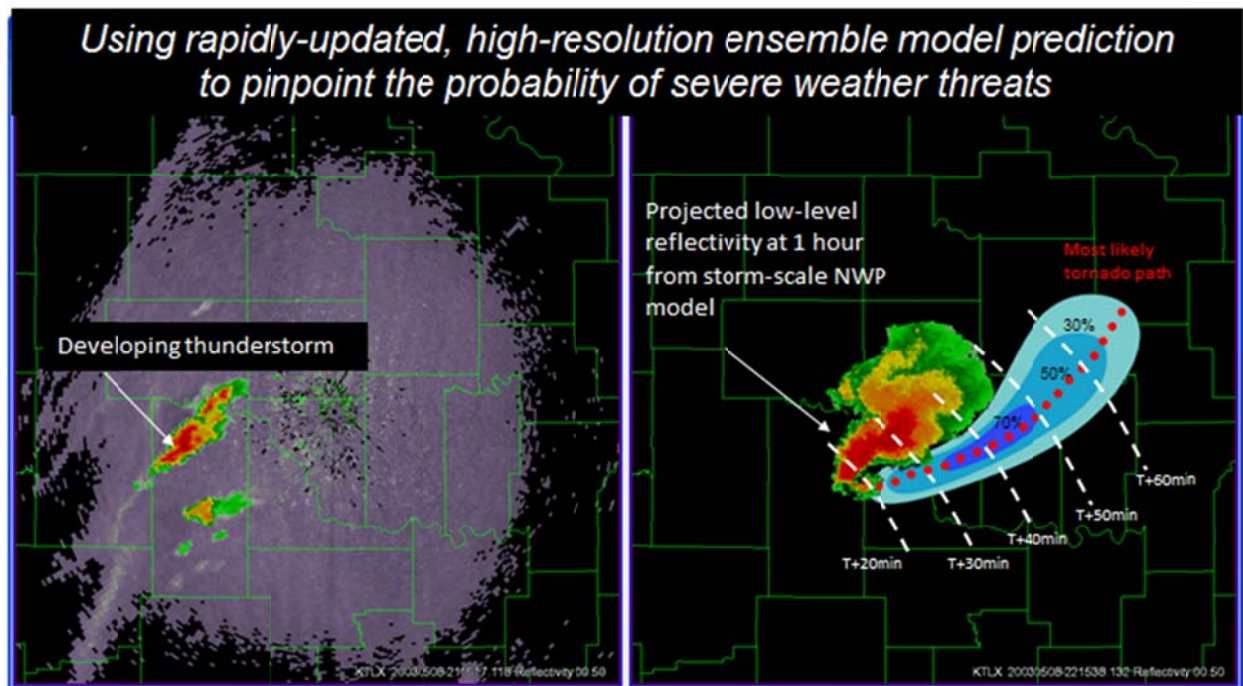
Experiments bring together researchers, forecasters and academics to discuss and try new technologies. Forecasters and researchers get to walk in each other's shoes.

Forecaster and Researcher Collaboration

Researchers and forecasters work side-by-side throughout the year in the NOAA Hazardous Weather Testbed (HWT) to develop, test, and evaluate new forecast and warning strategies. Participants explore innovative radar and satellite technologies, decision support systems, and new weather and water prediction models. Each year, the HWT draws as many as 60 researchers and forecasters together for six to eight weeks to review emerging ideas and answer the question, "What do forecasters need?" HWT scientists also test new concepts and tools with forecasters in simulated settings and with real-time forecasts. This collaborative approach promotes effective transfer of research into forecasting and warning operations.

Earlier Warnings

Currently, NWS does not issue warnings for local severe weather until they see an early signal on radar, or the weather hazard is spotted. This approach provides the public with an average tornado warnings lead time of 13 minutes. However, hospitals, nursing homes, large venue operators, aviation officials, and others require 30 minutes of lead time or more to move citizens to safety. Through its Warn-On-Forecast project, OAR is working to combine high-resolution surface satellite, and radar data into an optimal set of analyses to initialize ultra-high resolution computer models that will predict specific weather hazards 30-60 minutes before they form. This allows decision-makers to take more effective action to mitigate damage and reduce injuries and loss of life.



U.S. Weather Research Program

Through a competitive grant program, the U.S. Weather Research Program (USWRP) provides continuous improvements to understand, predict, and communicate information associated with hazardous weather and air quality events. Results of this research are transferred to NWS after demonstration in several NOAA testbeds. Projects are selected using a peer-review process with NWS participation.

Improved Flood & Drought Predictions

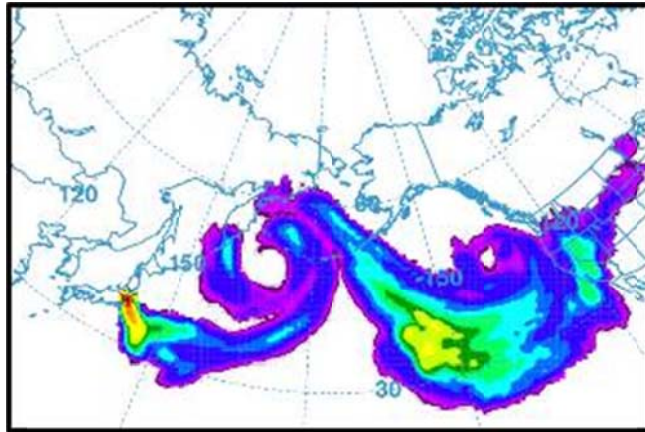
Accurate rain and snowfall predictions help water and emergency manager's better balance water supply needs. Partnering with NWS and other Federal, state, and local water resource agencies, OAR researches the extreme precipitation and weather conditions that can lead to flooding by evaluating new observations and modeling tools to improve these forecasts. Results from OAR's Hydrometeorology Testbed (HMT) enable forecasters to predict precipitation variables like intensity, amount, and impacts more accurately and at higher resolutions, and to customize information to support local and regional decision-making. For example, the HMT in the West Coast discovered that the bulk of heavy precipitation associated with land-falling winter storms often occurs within "atmospheric rivers," which are corridors of concentrated water vapor transport. These results led the state of California and the HMT to launch a 100-station network of high tech sensors integrated with prediction models to improve lead times and forecast accuracy. Other regional efforts are underway in North Carolina, as well as pilots in the Pacific Northwest and Rocky Mountain West.

The Flooded Locations And Simulated Hydrographs (FLASH) project introduces a new paradigm in flash flood prediction. FLASH produces flash-flooding forecasts up to 6 hours in advance with a 5-min update cycle. The primary goal of the FLASH project is to improve the

accuracy, timing, and specificity of flash flood warnings in the U.S., thus saving lives and protecting infrastructure.

Air Chemistry

Whether it's ground-level ozone, fine particulate matter, or other airborne substances, air pollution can have significant impact on the environment and human health. OAR Weather Research & Air Chemistry provides a strong scientific understanding of these air chemistry problems to help all stakeholders make effective management decisions. With long-term monitoring of chemicals like mercury, nitrogen and other compounds, OAR provides data to identify sources and evaluate the effectiveness of emission controls. Data from these observations, along with model evaluations and other studies, help improve predictions of



Example of a specialized HYSPLIT model simulation of radioactive Cesium particles from the Japanese Daiichi Nuclear.

where airborne substances will go and where they came from. NWS uses OAR-developed air chemistry models to issue air quality warnings so that people can limit their exposure to air pollution. OAR's atmospheric dispersion models also predict impacts during emergencies, like the 2011 Fukushima, Japan disaster. In 2016, over 1 million atmospheric dispersion simulations were performed using OAR's freely available Hybrid Single-Particle Lagrangian Integrated Trajectory (HYSPLIT) model. Use of the HYSPLIT model by outside users has been steadily increasing since 2009.

Unmanned Aircraft Systems

UAS program is working to advance the technological readiness of UAS systems and build capability for their application across the agency. Working with a large and diverse range of partners UAS is demonstrating the utility of the technology for the agency from observing high impact weather events like hurricanes with the use of NASA's UAS Global Hawk, to using a thirteen pound Puma UAS to test the potential to provide a rapid response capability for oil spills in the Arctic and for monitoring marine life, possible fishing violations, and conducting marine debris surveys. Recent transition of UAS technologies into operations yielded a 37 percent reduction in hurricane track error in the NWS's National Centers for Environmental Prediction operational forecast model for Hurricane Matthew seven days before impact.

Schedule and Milestone Highlights:

FY 2018 – 2022

Laboratories & Cooperative Institutes PPA:

- Install domestic and international Science On a Sphere systems for educational exhibits in science museums and other venues for a cumulative total of 185 systems
- High-quality hurricane observations from airborne (manned and unmanned) experiments for use in hurricane regional model data assimilation and evaluation

Weather & Air Quality Research Programs PPA:

- Adapt dual-polarization techniques to advance the Multi-Radar Multi-Sensor (MRMS) in operational use for improved cool season precipitation estimation
- Complete annual competitive grant process to select USWRP-funded and demonstration projects
- Evaluate readiness of OWAQ-supported research to be transitioned into operations
- Build and evaluate Advanced Technology Demonstrator as a proof-of-concept for MPAR
- Review industry proposals for MPAR pre-production contract award, provided that NOAA accepts MPAR as its solution for its future radar system
- Improved tornado warning decision performance evaluated and quantified in collaboration with NWS forecasters within the HWT
- Test/evaluation of dual-polarization panel characteristics and performance on phased array radar systems including the ATD

Deliverable Highlights:

Laboratories & Cooperative Institutes PPA:

- Tsunami observation, mitigation, and forecast tools
- Probabilistic products incorporated into flash flood forecasting system
- A total of 100,000 stations feeding observations data to the Meteorological Assimilation Data Ingest System (MADIS)
- Improved skill and reliability of flood and water supply forecasts

Weather & Air Quality Research Programs PPA:

- Prototype phased array radar products available for transfer into NOAA operations
- Improved tornado warning decision performance produced in collaboration with NWS forecasters within the NOAA hazardous weather testbed (HWT)

Performance Goals and Measurement Data:

Laboratories & Cooperative Institutes Performance Measure: Reduction in uncertainty of hurricane development, movement, and intensity through use of airborne experiments. (Cumulative)	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
	13%	15%	17%	19%	20%	21%	22%

Description: Data collected in and about the hurricane environment from manned and unmanned hurricane research 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.

Laboratories & Cooperative Institutes Performance Measure: Percent reduction in error of track and intensity guidance of the Hurricane Weather Research and Forecast (HWRF) model system. (Cumulative)	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
	37%	42%	47%	52%	57%	60%	63%

Description: Use of new hurricane observing systems, improved model nesting capability, and advanced physics packages applicable at 1-km horizontal resolution will reduce error in hurricane track and intensity forecasts. 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.

Laboratories & Cooperative Institutes Performance Measure: To improve the safety of Americans through improved NWS warnings, the number of Warn-on-Forecast tornado predictions with lead times exceeding 20 minutes. (Cumulative)	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
	6	7	8	9	10	11	12

Description: The Warn-on-Forecast program is working to combine high-resolution models and data with 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 minutes. Some of our most vulnerable groups, such as hospitals and nursing homes, as well as aviation officials and large event operators, require more advanced notice to move citizens to safety. The ultimate goal is to reach 30 minutes of lead time for tornadoes.

Laboratories & Cooperative Institutes Performance Measure: Increased ability to detect flash floods and decreased number of flash flood false alarms generated, as measured by Critical Success Index (CSI) skill scores	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 20120 Target	FY 2021 Target	FY 2022 Target
	0.27	0.29	0.31	0.33	0.35	0.36	0.37

Description: The Critical Success Index (CSI) skill score measures the accuracy of the flash flood guidance tool. Higher CSI scores show a combined higher probability of detection and reduced number of false alarms. Improved flash flood guidance will result in more precise and timely Flash Flood warnings and provide the public with better damage mitigation and safety options.

Laboratories & Cooperative Institutes Performance Measure: Percent improvement in accuracy of the 3-hour cloud ceiling for aviation operational forecasts. (Cumulative)	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
	8%	9%	10%	10%	10%	11%	11%

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 are derived from operational implementation of new models called the Rapid Refresh (2012) and High Resolution Rapid Refresh (2014) at the NWS.

Weather & Air Quality Research Programs Performance Measure: Annual number of research and development results transferred into operations through weather-related testbed evaluations that will lead to improved weather forecasts and warnings	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
	3	10	10	10	10	10	10
Description: Evaluation of new scientific findings or development of forecaster tools for use in operations that will lead to improved weather forecasts and warnings. 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.							

PROGRAM CHANGES FOR FY 2018:

NOAA requests a total decrease of \$23,417,000 and 43 FTE in FY 2018 program changes for the Weather & Air Chemistry Research sub-program. Following this section are program change narratives for this sub-program that represent program changes greater than five percent of a program. Complete program changes by PPA can be found in the NOAA Control Table (p. Control Table – 3, p. Control Table - 4).

Program Changes for FY 2018:

Weather and Air Chemistry Labs and Cooperative Institutes: Close the Air Resources Laboratory (Base Funding: \$4,699,000 and 34 FTE; Program Change: -\$4,699,000 and – 34 FTE); NOAA requests a decrease of \$4,699,000 and 0 FTE for a total of \$0 and 0 FTE to close the Air Resources Laboratory (ARL).

Proposed Actions:

NOAA’s budget proposes to eliminate ARL’s research on air chemistry, mercury deposition, and atmospheric dispersion of harmful materials in order to fund other priority programs. ARL’s headquarters in College Park, MD will be closed, as will satellite campuses in Oak Ridge, TN, Idaho Falls, ID, Las Vegas, NV, and Mercury, NV. With the termination of the Air Resources Laboratory, NOAA will explore a range of options to address staffing, including transfers, Voluntary Early Retirement Authority (VERA) and Voluntary Separation Incentive Payments (VSIP), and other options will be requested and/or explored.

NOAA also will end ARL’s applied research and observational data collection that is being used to study and project effects of air chemistry on human health and the environment. NOAA will no longer support the Hybrid Single Particle Lagrangian Integrated Trajectory (HYSPPLIT) model, which is used for emergency response applications and by researchers to study topics ranging from mercury deposition to anthrax bioterrorism. The budget also ends ARL’s support for agencies to predict where airborne hazardous materials – like acid rain, wildfire smoke, mercury contamination, or radioactive materials – will go.

Resource Assessment:

ARL has historically been funded out of both the Weather and Air Chemistry Research Laboratories and Cooperative Institutes PPA and the Climate Research Laboratories and Cooperative Institutes PPA. The U.S. Climate Reference Network (CRN) and other observational networks managed by ARL under OAR’s Climate Research will be consolidated into other NOAA laboratories.

Performance Goals and Measurement Data:

Performance Measure: Expand number of dispersion and air quality prediction system updates made available to National Weather Service (NWS). (Cumulative)	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
With decrease	N/A	N/A	0	0	0	0	0
Without decrease	7	8	9	10	11	12	13
Description: The updates of dispersion and air quality modeling systems, made available to the NWS for operational use, will improve the accuracy and usefulness of its predictions. NWS uses these modeling systems, such as HYSPLIT, for applications ranging from local chemical releases to international radiological incidents to smoke predictions.							

PROGRAM CHANGE PERSONNEL DETAIL

Program: Office of Oceanic and Atmospheric Research
Sub-program: Weather and Air Chemistry Laboratories and Cooperative Institutes
Program Change: Close the Air Resources Laboratory

Title:	Location	Grade	Number of Positions	Annual Salary	Total Salaries
Supervisory Physical Scientist	Various	ZP-5	(4)	\$ 119,285.00	(477,140)
Physical Scientist/Meteorologist/IT Specialist/Electronics Engineer	Various	ZP-4	(14)	\$ 85,816.00	(1,201,424)
Management & Program Analyst	Various	ZA-4	(2)	\$ 85,816.00	(171,632)
Meteorological Technician	Various	ZT-4	(2)	\$ 60,210.00	(120,420)
Physical Scientist/Meteorologist	Various	ZP-3	(6)	\$ 60,210.00	(361,260)
Administrative Officer/Program Analyst/Budget Analyst	Various	ZA-3	(5)	\$ 60,210.00	(301,050)
Program Specialist	Various	ZA-2	(1)	\$ 40,684.00	(40,684)
Subtotal			<u>(34)</u>		<u>(2,673,610)</u>
Less Lapse	0%		<u>0</u>		<u>\$0</u>
Total Full-time permanent:			(34)		(\$2,673,610)
2017 Pay Adjustment	1.6%				(\$42,778)
TOTAL			(34)		<u>(\$2,716,388)</u>

Personnel Data

	<u>Number</u>
Full-time Equivalent Employment	
Full-time permanent	(34)
Other than full-time permanent	0
Total	<u>(34)</u>
Authorized Positions:	
Full-time permanent	(34)
Other than full-time permanent	0
Total	<u>(34)</u>

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

Budget Program: Office of Oceanic and Atmospheric Research
Sub-program: Weather and Air Chemistry Laboratories and Cooperative Institutes
Program Change: Air Resources Laboratory

Object Class	FY 2018 Decrease	FY 2018 Total Program
11 Personnel compensation		
11.1 Full-time permanent	(\$2,716)	\$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
11.8 Special personnel services payments	0	0
11.9 Total personnel compensation	(\$2,716)	\$0
12 Civilian personnel benefits	(474)	0
13 Benefits for former personnel	0	0
21 Travel and transportation of persons	(34)	0
22 Transportation of things	(2)	0
23.1 Rental payments to GSA	0	0
23.2 Rental Payments to others	0	0
23.3 Communications, utilities and misc charges	(7)	0
24 Printing and reproduction	(5)	0
25.1 Advisory and assistance services	(11)	0
25.2 Other services	(370)	0
25.3 Purchases of goods & services from Gov't accounts	(307)	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	(313)	0
31 Equipment	(161)	0
32 Lands and structures	0	0
33 Investments and loans	0	0
41 Grants, subsidies and contributions	(299)	0
42 Insurance claims and indemnities	0	0
43 Interest and dividends	0	0
44 Refunds	0	0
99 Total obligations	(4,699)	0

Weather and Air Chemistry Labs and Cooperative Institutes: Close the Unmanned Aircraft Systems Program Office (Base Funding: \$5,375,000 and 3 FTE; Program Change -\$5,375,000 and - 3 FTE): NOAA requests a decrease of \$5,375,000 and 3 FTE for a total of \$0 and 0 FTE to terminate the Unmanned Aircraft Systems (UAS) program office.

Proposed Actions:

NOAA's budget proposes to close its program office dedicated to the research, development, and transition to application of new UAS observing strategies. In addition, NOAA will discontinue intramural grants to examine innovative UAS technologies to improve the efficiency and safety of observing operations across NOAA for weather prediction, earth system monitoring, and environmental research.

Resource Assessment:

Other NOAA programs may continue to independently explore the use of UAS to meet their missions. In accordance with NOAA policy, programs will continue to seek approval from the Office of Marine and Aviation operations for the use of UAS.

PROGRAM CHANGE PERSONNEL DETAIL

Program: Office of Oceanic and Atmospheric Research
Sub-program: Weather and Air Chemistry Laboratories and Cooperative Institutes
Program Change: Close the Unmanned Aircraft Systems Program Office

Title:	Location	Grade	of Positions	Salary	Salaries
Supervisory Physical Scientist	Silver Spring, MD	ZP-5	(1)	\$161,900	(\$161,900)
Management & Program Analyst	Silver Spring, MD	ZA-4	(1)	\$116,588	(\$116,588)
Management & Program Analyst	Silver Spring, MD	ZA-3	(1)	\$109,950	(\$109,950)
Subtotal			<u>(3)</u>		<u>(\$388,438)</u>
Less Lapse	0%		<u>0</u>		<u>\$0</u>
Total Full-time permanent:			(3)		(\$388,438)
2017 Pay Adjustment	1.6%				(\$6,215)
TOTAL			(3)		\$ (394,653)

Personnel Data

Number

Full-time Equivalent Employment
 Full-time permanent
 Other than full-time permanent
Total

(3)
 0
0
 (3)

Authorized Positions:

Full-time permanent
 Other than full-time permanent
Total

(3)
 0
0
 (3)

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

Budget Program: Office of Oceanic and Atmospheric Research
Sub-program: Weather and Air Chemistry Laboratories and Cooperative Institutes
Program Change: Close the Unmanned Aircraft Systems Program Office

Object Class	FY 2018 Decrease	FY 2018 Total Program
11 Personnel compensation		
11.1 Full-time permanent	(\$395)	\$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
11.8 Special personnel services payments	0	0
11.9 Total personnel compensation	(\$395)	\$0
12 Civilian personnel benefits	(151)	0
13 Benefits for former personnel	0	0
21 Travel and transportation of persons	(183)	0
22 Transportation of things	0	0
23.1 Rental payments to GSA	(37)	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	0	0
25.2 Other services	(370)	0
25.3 Purchases of goods & services from Gov't accounts	(1,880)	0
25.4 Operation and maintenance of facilities	0	0
25.5 Research and development contracts	(1,479)	0
25.6 Medical care	0	0
25.7 Operation and maintenance of equipment	(150)	0
25.8 Subsistence and support of persons	0	0
26 Supplies and materials	(84)	0
31 Equipment	(169)	0
32 Lands and structures	0	0
33 Investments and loans	0	0
41 Grants, subsidies and contributions	(477)	0
42 Insurance claims and indemnities	0	0
43 Interest and dividends	0	0
44 Refunds	0	0
99 Total obligations	(5,375)	0

Weather and Air Chemistry Labs and Cooperative Institutes: End Vortex-Southeast (Base Funding: \$5,000,000 and 0 FTE; Program Change: -\$5,000,000 and 0 FTE): NOAA requests a decrease of \$5,000,000 and 0 FTE for a total of \$0 and 0 FTE to terminate Vortex-Southeast (VORTEX-SE), a project that seeks to improve tornado forecasts in the southeastern U.S.

Proposed Actions:

NOAA has used congressionally directed funding for field campaigns, science workshops, and data collection under VORTEX-SE to understand how to anticipate, detect, issue warnings against, and response to forecast information regarding tornadoes in the Southeastern United States. In FY 2018, NOAA proposes to eliminate support for this project in order to fund other priority programs.

Resource Assessment:

FY 2017 funding will be used to host a workshop focused on VORTEX-SE's first published scientific findings and host a third field campaign in 2018.

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

Budget Program: Office of Oceanic and Atmospheric Research
Sub-program: Weather and Air Chemistry Laboratories and Cooperative Institutes
Program Change: End Vortex SE

Object Class		FY 2018 Decrease	FY 2018 Total Program
11	Personnel compensation		
11.1	Full-time permanent	\$0	\$31,884
11.3	Other than full-time permanent	0	0
11.5	Other personnel compensation	0	0
11.6	Leave Surcharge Full-Time	0	0
11.8	Special personnel services payments	0	82
11.9	Total personnel compensation	<u>\$0</u>	<u>\$31,966</u>
12	Civilian personnel benefits	0	8,561
13	Benefits for former personnel	0	407
21	Travel and transportation of persons	(215)	1,345
22	Transportation of things	(100)	567
23.1	Rental payments to GSA	0	1,469
23.2	Rental Payments to others	0	2,879
23.3	Communications, utilities and misc charges	0	1,012
24	Printing and reproduction	0	296
25.1	Advisory and assistance services	0	876
25.2	Other services	0	391
25.3	Purchases of goods & services from Gov't accounts	0	420
25.4	Operation and maintenance of facilities	0	350
25.5	Research and development contracts	(500)	2,345
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	1,287
31	Equipment	(1,000)	1,236
32	Lands and structures	0	3
33	Investments and loans	0	0
41	Grants, subsidies and contributions	(3,185)	14,322
42	Insurance claims and indemnities	0	0
43	Interest and dividends	0	0
44	Refunds	0	0
99	Total obligations	<u>(5,000)</u>	<u>69,732</u>

Due to financial system limitations, the object class detail for the Program reflects the Weather and Air Chemistry Laboratories and Cooperative Institutes PPA.

Weather and Air Chemistry Research Programs: Terminate the Joint Technology Transfer Initiative (Base Funding: \$5,989,000 and 0 FTE; Program Change: -\$5,989,000 and 0 FTE):

NOAA requests a reduction of \$5,989,000 and 0 FTE for a total of \$0 and 0 FTE to terminate the Joint Technology Transfer Initiative (JTTI).

NOAA has used congressionally directed funding to fund demonstration projects in relevant test environments and evaluations for commercial potential or possible patent protections. This proposed budget reduction will end JTTI's funding to transition the latest technological advances due to weather research into products and services actively used by communities and businesses.

Resource Assessment:

Current JTTI projects have been fully funded and will be completed, but NOAA will not award funding to new projects through this program.

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 Programs
Program Change: Terminate the Joint technology Transfer Initiative

Object Class	FY 2018 Decrease	FY 2018 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
11.8 Special personnel services payments	0	0
11.9 Total personnel compensation	<u>\$0</u>	<u>\$0</u>
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 misc 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	(5,989)	0
42 Insurance claims and indemnities	0	0
43 Interest and dividends	0	0
44 Refunds	0	0
99 Total obligations	<u>(5,989)</u>	<u>0</u>

Weather and Air Chemistry Research Programs: Conclude Infrasonic Weather Monitoring Research (Base Funding: \$500,000 and 0 FTE; Program Change: -\$500,000 and 0 FTE):

NOAA requests a decrease of \$500,000 and 0 FTE for a total of \$0 and 0 FTE to conclude infrasonic monitoring research. NOAA has completed an evaluation of this technology using congressionally directed funding in FY 2016 and FY 2017.

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 Programs
Program Change: Conclude Infrasonic Weather Monitoring Research

Object Class	FY 2018 Decrease	FY 2018 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
11.8 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 misc 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	(500)	0
42 Insurance claims and indemnities	0	0
43 Interest and dividends	0	0
44 Refunds	0	0
99 Total obligations	(500)	0

APPROPRIATION ACCOUNT: OPERATIONS, RESEARCH, AND FACILITIES
SUB-PROGRAM: OCEAN, COASTAL, AND GREAT LAKES RESEARCH

The Ocean, Coastal, and Great Lakes Research in OAR provides science to coastal communities from a wide network of university partners, develops technology to advance the Nation's oceans and Great Lakes observations, and coordinates multi-partner ocean exploration missions to characterize our natural resources and improve our understanding of the changes occurring in the oceans and Great Lakes. OAR's ocean, coastal, and Great Lakes laboratories, programs, and partners have been key contributors to advancing NOAA's National Marine Fisheries Service (NMFS), National Ocean Service (NOS), and National Weather Service (NWS) by providing research to better understand our oceans and Great Lakes natural resources and the influence of the oceans and Great Lakes on the Earth's weather and climate through technological advancements in modeling, computing, observing, and information dissemination.

The following five PPA's are included in the Ocean, Coastal, & Great Lakes Research portfolio:

- **Laboratories & Cooperative Institutes:** Primarily supports foundational ocean observation networks and research, modeling, and technology development at OAR's laboratories and cooperative institutes.
- **National Sea Grant College Program:** Established by Congress through the National Sea Grant College Program Act, the National Sea Grant Collage Program is a Federal-state partnership that turns research into actions that support science-based sustainable practices. This partnership ensures that coastal communities remain engines of economic growth. The Sea Grant programs form a dynamic national network of more than 300 participating institutions represented by more than 2,300 scientists, engineers and outreach experts based at universities across the country.
- **Ocean Exploration and Research:** Established by Congress through the Ocean Exploration Act, Ocean Exploration and Research is the only Federal organization dedicated to ocean exploration.
- **Other Ecosystems Programs:** Includes Integrated Ocean Acidification, which was authorized under the Federal Ocean Acidification Research and Monitoring Act to better understanding ocean acidification (OA) and the consequences of OA on marine resources to enable communities to mitigate, prepare, and adapt to changes.
- **Sustained Ocean Observations and Monitoring:** A global system for observations, modelling, and analysis of marine and ocean variables to support operational ocean services worldwide.

Overall, OAR's Ocean, Coastal, and Great Lakes Research supports:

- Improving 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;
- Improving 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;

- Translating 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
- Developing and using cutting edge technology for understanding and exploring the ocean, coasts and Great Lakes.

In FY 2015 and 2016 OAR's Ocean and Coastal Research deployed 75 tsunami forecasts models to the National Centers for Environmental Prediction (NCEP); successfully predicted the eruption of the submarine volcano Axial Seamount; deployed the Ron Brown on its first Arctic cruise in a new collaboration between NOS and Ecosystems & Fisheries- Oceanography Coordinated Investigations (EcoFOCI); established baseline noise in the deepest part of the Pacific by deploying a full-ocean depth hydrophone for 22 days; reported first signs of algal toxins in northern Alaska marine mammals; sampled along 16 transects from Mexico to Canada to study West Coast ocean acidification; piloted a satellite-based tool to assess probability of Bluefin tuna larvae; and launched the experimental 5-day forecast Harmful Algal Blooms Tracker in Lake Erie.

Much of the research performed within OAR's Ocean, Coastal, & Great Lakes Research is collaborative and crosscutting and therefore is often funded through multiple PPAs. Some specific activities include:

Resilient Communities and Economies

OAR's Ocean, Coastal and Great Lakes Research works through the National Sea Grant College Program 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.

Sustainable Fisheries and Aquaculture

The National Sea Grant Marine Aquaculture Grant Program is the only U.S. government grant program dedicated to supporting marine aquaculture development. OAR's marine aquaculture work ensures safe, secure and sustainable supplies of domestic seafood and decreases reliance on seafood imports through aquaculture research, extension, and grants. As a part of the cross-NOAA Program, OAR



33

University-based Sea Grant programs in every coastal and Great Lakes state, plus Puerto Rico and Guam

More than

3,000

scientists, engineers, educators, students and outreach experts

350

Sea Grant extension agents live and work in coastal communities to provide local and subject matter expertise

1,100

Graduate students have participated in the John A Knauss Marine Policy Fellowship Program since 1979

450

Peer-reviewed scientific journal articles published annually

5,000

businesses created or retained annually

11,300 jobs

created or retained annually

OER supported an *Okeanos Explorer* mission to characterize poorly known habitats along the Pacific floor near the Hawaiian Islands. During the expedition, NOAA scientists discovered what might be a new species of octopus at a depth of about 2.5 miles. Due to the octopus's ghostlike appearance, social media dubbed it with the nickname Casper.



works with aquaculture partners in the National Marine Fisheries Service (NMFS) and the National Ocean Service (NOS) in coordination with state fisheries managers, seafood processors, fishing associations and consumer groups. These grants tackle some of the top challenges to marine aquaculture like reducing fishmeal and fish oil in aquaculture feeds, increasing seafood safety and quality, diversifying species and products. OAR's aquaculture competition is authorized under the National Aquaculture Act of 1980.

Ocean Exploration

OAR leads efforts to explore and characterize deep-water areas of the U.S. Exclusive Economic Zone, Extended Continental Shelf, and other poorly known ocean areas and phenomena. In the last eight years, the *Okeanos Explorer*, NOAA's ship assigned to exploration, has mapped over 1,000,000 square kilometers of the seafloor at high resolution. Data collected from ocean exploration expeditions have been critical for science-based decisions on issues like deepwater fisheries management, potential oil and gas development or deep-sea mining, marine protected area establishment and management, determination of the U.S. Extended Continental Shelf, and nautical charting.

Ocean Chemistry and Ocean Acidification

Research across OAR labs, programs, and Cooperative Institutes aims to improve our understanding of how (and how fast) ocean chemistry is changing, how variable that change is by region, and what impacts these changes are having on marine life, people, and the local, regional, and national economies. Ocean Acidification (OA) refers to changes in the chemistry of the ocean due to rising atmospheric carbon dioxide; currently, ocean chemistry is changing faster than any period in the past 55 million years. OAR's Ocean Acidification Program (OAP) maintains long-term OA monitoring, conducts research to enhance the conservation of marine ecosystems sensitive to OA, and promotes OA educational opportunities. By better understanding and predicting OA, OAP also informs national and international carbon mitigation discussions and enables local communities to better mitigate, prepare, and adapt to changes caused by OA.

Sustained Ocean Observations and Monitoring (SOOM)

SOOM supports NOAA's contribution to the sustained Global Ocean Observing System (GOOS) by maintaining over 3,950 platforms that report environmental weather/climate information to global prediction centers and researchers. GOOS is a permanent global system for observations, modelling, and analysis of marine and ocean variables to support operational ocean services worldwide. The U.S. Integrated Ocean Observing System (IOOS) is the U.S. regional contribution to GOOS and SOOM activities contribute unique and essential global

measurements and capabilities to the IOOS enterprise. SOOM's contribution helps describe the present state of the oceans, monitors long-term changes, supports operational services worldwide and is the basis for forecasting climate variability and change. SOOM also supports research to develop new data products from these observations to address a broad range of stakeholder needs.

Schedule and Milestone Highlights:

FY 2018 – 2022

Laboratories & Cooperative Institutes PPA:

- Continue collection and analysis of acoustic data from Ocean Noise Reference Stations, in coordination with NMFS and NOS
- Demonstrate/test new ocean observing/communication technologies

Ocean Exploration and Research PPA:

- Develop an annual extramural competition for conducting the next phase of research into the potential resources and natural habitats in areas identified through the ECS Mapping Initiative
- Develop an annual extramural competition for the exploration of unknown and poorly known ocean areas where there is a high potential for discovery

Other Ecosystems Programs PPA:

- Conduct Ocean Acidification coastal observing and process research cruises and deploy OA sensors on NOAA research and volunteer observing ships
- Develop a coastal early-warning system that can identify episodic low pH events and alert managers of potentially impacted resources
- Partner with IOOS Marine Sensor Program to develop marine sensors that can assist coastal industries with both scientific and monitoring capacity
- Optimize observing systems in each of the eight large marine ecosystem regions
- Increase number of living marine resources characterized for vulnerability to ocean acidification

Sustained Ocean Observations and Monitoring PPA:

- Maintain NOAA's contribution of 1500 active Argo ocean profiling floats and implement Deep (6000 meters) Argo array
- Maintain Global Ocean Observing System (GOOS)

Deliverable Highlights:

Laboratories & Cooperative Institutes PPA:

- Technical Report to describe current and chemical distributions in coastal waters in relation to known point sources, to assessing relative strengths of land-based sources of pollution over southeast Florida reef tracks
- Pre-operational forecast products to alert the over two million coastal Lake Erie residents of algal toxins in drinking water
- An annual, synthetic, ecosystem-based assessment of the eastern Bering Sea for the North Pacific Fisheries Management Council

Ocean Exploration and Research PPA:

- Complete Bureau of Ocean Energy Management (BOEM)-NOAA Partnership expedition to explore and characterize habitats and ecosystems the Arctic and other key areas within the U.S. Exclusive Economic Zone (EEZ) 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

Other Ecosystems Programs PPA:

- Regional biogeochemical and ecological models

Sustained Ocean Observations and Monitoring PPA:

- 1,000 drifting buoys deployed annually
- 250 Argo Array Buoys deployed annually

Performance Goals and Measurement Data:

Other Ecosystems Programs Performance Measure: Number of industry partners receiving ocean acidification adaptation technologies and methods. (Cumulative)	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
	9	9	10	10	12	12	14
Description: NOAA provides industry partners with scientific and monitoring support to help them adapt to ocean acidification. The estimated economic costs of ocean acidification on the global shellfish industry could be over \$100 billion.							

Sustained Ocean Observations and Monitoring Performance Measure: Percent error reduction of ocean and meridional heat transport estimates	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
	1.9	2.2	2.5	2.8	3.1	3.4	3.7
Description: As a result of AOML 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.							

Sustained Ocean Observations and Monitoring Performance Measure: Increase number of data collection platforms deployed by the Pacific Marine Environmental Laboratory in support of the Global Ocean Observing System (GOOS). (Cumulative)	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
	921	959	996	1029	1057	1081	1121
Description: This measure represents a significant portion of the Pacific Marine Environmental Laboratory's (PMEL) contribution to the Global Ocean Observing System (GOOS). GOOS is designed to: 1) Monitor, understand, and predict weather and climate; 2) Describe and forecast the state of the ocean, including living resources; 3) Improve management of marine and coastal ecosystems and resources; 4) Mitigate damage from natural hazards and pollution; 5) Protect life and property on coasts and at sea; and 6) Enable scientific research. Fully-implemented GOOS will provide ocean data that all nations can use to provide improved ocean-related analytical and predictive forecasts.							

PROGRAM CHANGES FOR FY 2018:

NOAA requests a total decrease of \$90,393,000 and 18 FTE in FY 2018 program changes for the Ocean, Coastal, & Great Lakes Research sub-program. Narratives are only provided for program changes which are greater than five percent of a program. Complete program changes by PPA can be found in the NOAA Control Table (p. Control Table – 3, p. Control Table - 4).

Program Changes for FY 2018:

Ocean, Coastal, and Great Lakes Laboratories and Cooperative Institutes: Eliminate the Autonomous Underwater Vehicle Demonstration Testbed (Base Funding: \$2,000,000 and 0 FTE: Program Change: -\$2,000,000 and 0 FTE): NOAA requests a decrease of \$2,000,000 and 0 FTE for a total of \$0 to eliminate the autonomous underwater vehicle (AUV) demonstration testbed.

Proposed Actions:

NOAA's budget proposes to terminate the AUV demonstration testbed, slowing the pace of evaluating new technologies for ocean observations. Without testbed funding, testing and evaluations in the marine environment will be performed with vessels of opportunity, which leverage cruises planned for another purpose to conduct scientific research.

Resource Assessment:

Through this project, NOAA has acquired promising AUVs and related technology. NOAA will maintain these, and will continue to develop innovative instrumentation.

Performance Goals and Measurement Data:

Performance Measure: Number of new technologies demonstration/testing (annual)	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
With decrease	N/A	N/A	0	0	0	0	0
Without decrease	2	2	2	2	2	2	2
Description: NOAA funds, on average, two technologies per year for demonstration. Through this project, NOAA has partnered with researchers and industry to test promising AUVs and related technology at meeting NOAA's observational needs.							

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 Laboratories and Cooperative Institutes
Program Change: Autonomous Underwater Vehicle Demonstration

Object Class		FY 2018 Decrease	FY 2018 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
11.8	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 misc 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	(1,800)	0
32	Lands and structures	0	0
33	Investments and loans	0	0
41	Grants, subsidies and contributions	(200)	0
42	Insurance claims and indemnities	0	0
43	Interest and dividends	0	0
44	Refunds	0	0
99	Total obligations	(2,000)	0

Ocean, Coastal, and Great Lakes Laboratories and Cooperative Institutes: End Genomics Research (Base Funding: \$1,880,000 and 0 FTE; Program Change: -\$1,880,000 and 0 FTE): NOAA requests a decrease of \$1,880,000 and 0 FTE for a total of \$0 and 0 FTE to eliminate the environmental genomics program at the Atlantic Oceanographic and Meteorological Laboratory (AOML).

Proposed Actions:

NOAA's budget proposes to terminate AOML's environmental genomics program, which studies Deoxyribonucleic acid (DNA), Ribonucleic acid (RNA), and proteins to better understand what organisms are where, what they are doing, and how they are affected by changing ocean conditions.

Environmental genomics research scheduled at the recently built Future Reefs lab, where NOAA scientists and partners research how coral genomics can help inform restoration efforts, will be halted. NOAA will discontinue funding for 5 post-doctoral researchers, and the work will be stopped at the end of 2017. Terminating this program will slow development of new DNA sampling tools and advances in other AOML research areas, including coral monitoring and restoration, fisheries assessments for species, such as Bluefin tuna larvae, and recruitment models of endangered species.

Resource Assessment:

Environmental genomics research currently scheduled at the Future Reefs lab will end. Scheduled research included long-term studies to understand how coral genomics are linked to resilience.

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 Laboratories and Cooperative Institutes
Program Change: End Genomics Research

Object Class		FY 2018 Decrease	FY 2018 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
11.8	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	(60)	0
22	Transportation of things	(40)	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	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	(354)	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	(405)	0
31	Equipment	0	0
32	Lands and structures	0	0
33	Investments and loans	0	0
41	Grants, subsidies and contributions	(1,021)	0
42	Insurance claims and indemnities	0	0
43	Interest and dividends	0	0
44	Refunds	0	0
99	Total obligations	(1,880)	0

National Sea Grant College Program: Terminate the National Sea Grant College Program (Base Funding \$72,940,000 and 14 FTE; Program Change: -72,940,000 and -14 FTE):

NOAA requests a decrease of \$72,940,000 and 0 FTE for a total of \$0 and 0 FTE to terminate the National Sea Grant College Program Base and the Marine Aquaculture Program.

Proposed Actions:

NOAA’s budget proposes to terminate the National Sea Grant College Program and dismantle the network of 33 Sea Grant programs located in coastal States and territories. With the termination of the NOAA Sea Grant Program, NOAA will explore a range of options to address staffing; including transfers, Voluntary Early Retirement Authority (VERA) and Voluntary Separation Incentive Payments (VSIP) and other options will be requested and/or explored. Additionally, more than 3,000 scientists, researchers, students, and outreach experts from more than over 300 institutions will lose support from NOAA’s Sea Grant funding.

NOAA will also terminate the Sea Grant’s Marine Aquaculture Program.

National Sea Grant College Program Changes: National Sea Grant College Program and Marine Aquaculture Program	
PPA: National Sea Grant College Program	PPA: Marine Aquaculture Program
Base: \$63,951,000 and 13 FTE	Base: \$8,989,000 and 1 FTE
Program Change: -\$63,951,000 and -13 FTE	Program Change: -\$8,989,000 and -1 FTE

Resource Assessment:

As a result of this termination, support will be withdrawn for the larger cross-NOAA Aquaculture Program, impacting aquaculture partners in the National Marine Fisheries Service (NMFS) and the National Ocean Service (NOS), as well as state partnerships with fisheries managers, seafood processors, fishing associations, maritime-related business, and consumer groups.

Performance Goals and Measurement Data:

National Sea Grant College Program Performance Measure: Coastal communities that have adopted/implemented sustainable development practices and policies as a result of Sea Grant activities (per year)	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
With Decrease	N/A	N/A	0	0	0	0	0
Without Decrease	534	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 into implementation.							

Performance Measure: Annual economic and societal benefits derived from Sea Grant activities	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
With Decrease:							
Jobs created/retained	N/A	9,445	0	0	0	0	0
Businesses created/retained	N/A	1,965	0	0	0	0	0
Economic benefit (millions of dollars)	N/A	\$315	0	0	0	0	0
Without Decrease:							
Jobs created/retained	20,770	20,770	20,770	20,770	20,770	20,770	20,770
Businesses created/retained	2,000	2,000	2,000	2,000	2,000	2,000	2,000
Economic benefit (millions of dollars)	\$320	\$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.							

National Sea Grant College Program Performance Measure: Annual number of coastal communities that adopt/implement hazard resiliency practices to prepare for and respond to/minimize coastal hazardous events (per year)	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
With Decrease	N/A	N/A	0	0	0	0	0
Without Decrease	255	200	200	200	200	200	200
<p>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.</p>							

PROGRAM CHANGE PERSONNEL DETAIL

Program: Office of Oceanic and Atmospheric Research
Sub-program: Weather and Air Chemistry Laboratories and Cooperative Institutes
Program Change: Terminate National Sea Grant College Program

Title:	Location	Grade	Number of Positions	Annual Salary	Total Salaries
Director, National Sea Grant College Program	Silver Spring, MD	SES	(1)	\$167,904	(\$167,904)
Supervisory Management & Program Analyst	Various	ZA-5	(1)	\$ 119,285	(\$119,285)
Management Analysis Officer	Various	ZA-4	(3)	\$ 85,816	(\$257,448)
Management & Program Analyst	Various	ZA-3	(8)	\$ 60,210	(\$481,680)
Secretary - Office Administrator	Silver Spring, MD	ZS-4	(1)	\$ 44,941	(\$44,941)
Subtotal			<u>(14)</u>		<u>(\$1,071,258)</u>
Less Lapse	0%		<u>0</u>		<u>\$0</u>
Total Full-time permanent:			(14)		(\$1,071,258)
2017 Pay Adjustment	1.6%				(\$17,140)
TOTAL			(14)		<u>(\$1,088,398)</u>

Personnel Data

	Number
Full-time Equivalent Employment	
Full-time permanent	(14)
Other than full-time permanent	0
Total	<u>(14)</u>
Authorized Positions:	
Full-time permanent	(14)
Other than full-time permanent	0
Total	<u>(14)</u>

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: Terminate the National Sea Grant College Program

Object Class		FY 2018 Decrease	FY 2018 Total Program
11	Personnel compensation		
11.1	Full-time permanent	(\$1,088)	\$0
11.3	Other than full-time permanent	(86)	0
11.5	Other personnel compensation	0	0
11.6	Leave Surcharge Full-Time	0	0
11.8	Special personnel services payments	0	0
11.9	Total personnel compensation	(\$1,174)	\$0
12	Civilian personnel benefits	(348)	0
13	Benefits for former personnel	0	0
21	Travel and transportation of persons	(48)	0
22	Transportation of things	(102)	0
23.1	Rental payments to GSA	(263)	0
23.2	Rental Payments to others	(1,000)	0
23.3	Communications, utilities and misc charges	(48)	0
24	Printing and reproduction	0	0
25.1	Advisory and assistance services	(724)	0
25.2	Other services	0	0
25.3	Purchases of goods & services from Gov't accounts	(1,465)	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	(67,770)	0
42	Insurance claims and indemnities	0	0
43	Interest and dividends	0	0
44	Refunds	0	0
99	Total obligations	(72,942)	0

Ocean Exploration and Research (OER): Reduce Ocean Exploration (Base Funding: \$31,939,000 and 22 FTE; Program Change: -\$12,500,000 and -0 FTE): NOAA requests a decrease of \$12,500,000 and \$0 FTE for a total of \$19,439,000 and 22 FTE for ocean exploration and research.

Proposed Actions:

NOAA’s budget proposes to reduce mapping and exploration of unknown and poorly understood areas of the ocean. The OER program will reduce funding to the Cooperative Institute for Ocean Exploration, Research and Technology and the Global Foundation for Ocean Exploration, cutting exploration, education, and outreach activities. In addition, OER will limit funding for extramural grants and eliminate financial support for the interagency Biodiversity Observation Network.

Resource Assessment:

NOAA will continue to fund a limited number of days for Extended Continental Shelf mapping and conduct a limited number of exploration missions aboard the NOAA vessel *Okeanos Explorer* and Ocean Exploration Trust-operated vessel *Nautilus*. NOAA will prioritize limited resources for activities that have direct impacts on the nation’s security, economy, environmental health, and ability to meet increasing demands for seafood and raw materials.

Performance Measure: Number of coastal, marine and Great Lakes ecological characterizations that meet management needs – number of bathymetric expeditions per year. (Annual)	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
With Decrease	N/A	2	0	0	0	0	0
Without Decrease	4	1	2	2	2	2	2
Description: Conduct joint expeditions with the Department of Interior’s Bureau of Ocean Energy Management, U.S. Geological Survey 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. This measure includes only the OER contribution in the number of bathymetric expeditions per year. Ecological characterizations are intensive efforts that can extend beyond one year to execute and used to help managers better coordinate conservation efforts using limited resources.							

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: Reduce Ocean Exploration

Object Class		FY 2018 Decrease	FY 2018 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	(60)	252
22	Transportation of things	(40)	42
23.1	Rental payments to GSA	0	252
23.2	Rental Payments to others	0	49
23.3	Communications, utilities and miscellaneous charges	(800)	693
24	Printing and reproduction	0	18
25.1	Advisory and assistance services	(80)	1,725
25.2	Other services	(713)	0
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	(200)	0
25.8	Subsistence and support of persons	0	0
26	Supplies and materials	(300)	0
31	Equipment	(1,200)	0
32	Lands and structures	0	0
33	Investments and loans	0	0
41	Grants, subsidies and contributions	(9,107)	7,945
42	Insurance claims and indemnities	0	0
43	Interest and dividends	0	1
44	Refunds	0	0
99	Total obligations	(12,500)	19,439

APPROPRIATION ACCOUNT: OPERATIONS, RESEARCH, AND FACILITIES INNOVATIVE RESEARCH AND TECHNOLOGY

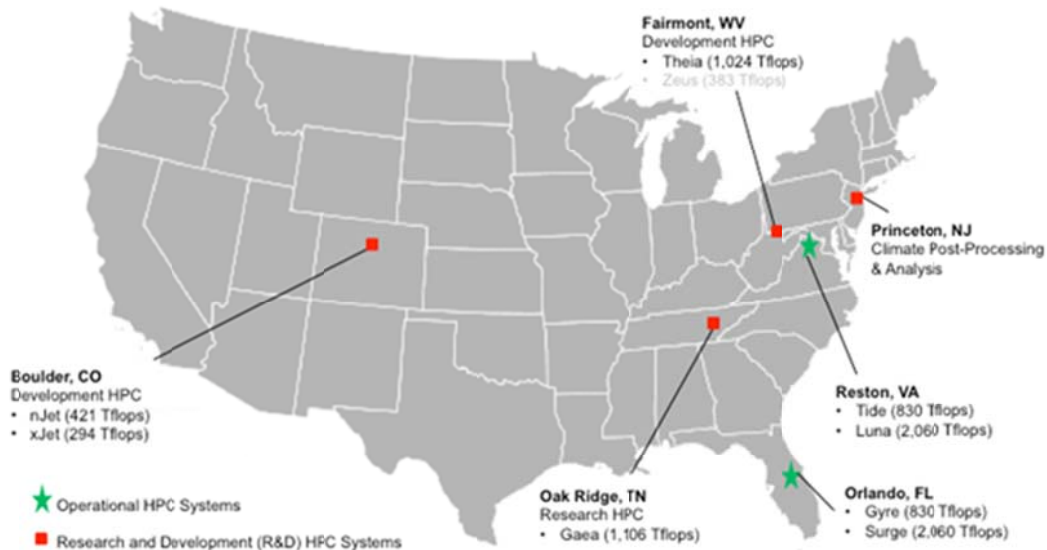
The Innovative Research and Technology accelerates the adoption and transition of advanced computing and technology throughout NOAA. Innovative Research and Technology supports High Performance Computing (HPC) Initiatives through major improvements in weather and climate forecasting, ecosystem and ocean modeling, and environmental information dissemination.

The Innovative Research and Technology portfolio currently supports OAR's High Performance Computing Initiatives PPA. In FY 2015 OAR's High Performance Computing installed a new supercomputer, Theia, which is nearly 3 times the size of the old supercomputer, Zeus.

High Performance Computing

HPC Initiatives, established through the High-Performance Computing Act of 1991, improve the accuracy and timeliness of NOAA's short-term weather warnings, forecasts, hurricane forecast improvements, as well as regional and global climate predictions. HPC Initiatives provides necessary computational and network resources required to advance in environmental modeling capabilities across NOAA. In fact, every NOAA line office uses R&D HPC systems. Benefits of HPC Initiatives 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.



Map of NOAA's High Performance Computing Enterprise

Schedule and Milestones:

FY 2018 – 2022

- Complete migration of at least one operational model and one research model to next-generation architecture software structure
- Test impact of assimilation of new and proposed satellite observations using observing system simulation experiment (OSSE) and observing system experiments (OSE) approaches using the operational Hurricane Weather Research and Forecast (HWRF) hybrid data assimilation system to improve hurricane intensity guidance
- Quantitative evaluation of (a) (statistically) downscaled climate projections for the U.S. and (b) their suitability for use in climate impacts and decision-making applications published in the peer-reviewed literature
- Participate in NITRD interagency activities

Deliverable Highlights:

- HPC System availability – Maximum number of computational hours made available to scientists
- 11 HPC and advanced networking R&D projects
- New prediction systems with higher resolution transitioned into operational units within NOAA
- A new Earth System model, based on CM4 and called ESM4, used to publish high resolution information on the link between climate and oceanic ecosystems

Performance Goals and Measurement Data:

High Performance Computing Initiatives Performance Measure:	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
Maintain High Performance Computing / R&D System Availability	99%	96%	96%	96%	96%	96%	96%
<p>Description: HPC Initiatives provides NOAA researchers with a reliable computing resource that allows them to plan, with a high degree of confidence, their project milestones and deliverables. System outages can adversely affect NOAA initiatives, causing delays in implementing operational improvements for both hurricane track and intensity predictions. Ensuring high system availability enables NOAA to maximize its investment in these resources.</p>							

PROGRAM CHANGES FOR FY 2018:

NOAA requests a total decrease of \$61,000 and 0 FTE in FY 2018 program changes for the Innovative Research & Technology sub-program. Narratives are only provided for program changes which are greater than five percent of a program. Complete program changes by PPA can be found in the NOAA Control Table (p. Control Table – 3, p. Control Table - 4).

APPROPRIATION ACCOUNT: PROCUREMENT, ACQUISITION, AND CONSTRUCTION OAR SYSTEMS ACQUISITION

Research Supercomputing

Research Supercomputing provides sustained capability to the NOAA Research and Development (R&D) High Performance Computing System (HPC) to advance Earth system science and accelerate the development of regional and sub-regional information products and services as described in the NOAA High Performance Computing Strategic Plan 2015-2020.³

NOAA's R&D HPC provides computational resources to support advances in environmental modeling crucial for understanding critical Earth system modeling issues. This investment includes the supercomputing systems, associated storage devices, advanced data communications, hardware and software engineering services, security, and necessary data center space. NOAA currently operates three R&D HPCs:

- Gaea - Located at Oak Ridge National Laboratory in Oak Ridge, Tennessee, Gaea is primarily used for long-term climate and weather predictions and projections. The recapitalization effort for Gaea began in FY 2016.
- Theia - Located in Fairmont, West Virginia, is used for weather research and development.
- Jet - Located in Boulder, Colorado, is primarily used for hurricane research.

NOAA's R&D HPC also provides 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, engineers 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 allow NOAA to take advantage of next-generation research computing technologies, but also help NOAA to more efficiently use its existing high performance computing assets.

Schedule and Milestone and Deliverable Highlights:

FY 2018- 2022

- High-resolution Earth System Model integrations publicly available for use in regional decision-making through federated data services
- Exploratory application of Earth System Models and subsequent demonstration of Earth System modeling applications using exascale high-performance computing platforms, which would be capable of at least one exaflop, or a thousand petaflops
- High-resolution integrations for prediction of seasonal tornado risks at multi-month lead times
- 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
- 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

³ http://www.cio.noaa.gov/it_plans/HPCStrategy_Final_Draft_080913.pdf

Performance Goals and Measurement Data:

Performance Measure: Maintain High Performance Computing / R&D System Availability	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
	99%	96%	96%	96%	96%	96%	96%
<p>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 HPC program provides NOAA researchers with a reliable computing resource that allows them to plan, with a high degree of confidence, their project milestones and deliverables. System outages can adversely affect NOAA initiatives such as causing delays in implementing operational improvements for hurricane track and intensity predictions. Ensuring high system availability enables NOAA to maximize its investment in these resources.</p>							

Performance Measure: Percent of mission-critical applications updated to run on new, fine-grained computing technologies	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
	15%	30%	60%	80%	100%	100%	100%
<p>Description: NOAA models are currently written to maximize efficiency on scalar computer architectures. It is expected that next-generation high-performance computing (HPC) 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.</p>							

Program Changes for FY 2018:

Research Supercomputing: Research & Development High Performance Computing Recapitalization (Base Funding: \$20,041,000 and 0 FTE; Program Change: +\$5,959,000 and 0 FTE): NOAA requests an increase of \$5,959,000 and 0 FTE for a total of \$26,000,000 and 0 FTE to continue recapitalization of its research and development (R&D) high performance computing (HPC) infrastructure.

Proposed Actions:

This planned increase will complete recapitalization of NOAA's R&D HPC resources for NOAA's supercomputer at Department of Energy's Oak Ridge National Laboratory in Oak Ridge, Tennessee, Gaea, and enable more sustainable funding for regular refresh and recapitalization of HPC resources.

NOAA's R&D HPC assets are part of the critical infrastructure required for NOAA to accomplish its mission. The FY 2018 request builds upon the FY 2016 and FY 2017 requests to help sustain NOAA's R&D HPC capacity and is consistent with NOAA's PAC out-year profile for the HPC program. Regular recapitalization and refresh for Gaea will provide more stable computing capacity of NOAA's weather and climate research. Under this plan, Gaea's users will have greater certainty and longer lead times as they plan and execute NOAA's long-term environmental modeling activities. This recapitalization will directly support NOAA's missions in weather, climate, oceans, and coasts.

Statement of Need and Economic Benefits:

NOAA's HPC resources are oversubscribed. Demand for them continues to grow. NOAA's environmental modeling enterprise underpins most of the products and services NOAA provides to the Nation. There is growing R&D HPC user base in the geospatial, coastal, and ecosystems research communities within NOAA. Every NOAA line office uses R&D HPC systems. Before making HPC investments, NOAA goes through a careful decision-making process that weighs the costs and benefits of owning or leasing an asset.

Existing HPC systems require maintenance through refresh and recapitalization to sustain current computing capacity. NOAA's current R&D HPC systems, Gaea and Theia, were purchased under the American Recovery and Reinvestment Act (ARRA), 2009 and the Disaster Relief Appropriations Act, 2013 respectively. While NOAA's research community has benefited from these emergency supplemental funding sources, they are not a sustainable, efficient way to provide HPC capacity. The computing can meet the short-term needs of some programs, but, as HPC systems age, they are no longer able to meet the same computing demands without a refresh or large capital purchase. This strategy opens NOAA to the risk of reduced computing capability when these systems require costly maintenance at the end of their lives or NOAA must procure additional HPC capability without new funding. Without stable resources for refresh and recapitalization, NOAA would not complete new applications that address climate modeling, the physical dynamics of high-impact weather events, the dynamics of complex ecosystems, and the ability to model and predict the future states of these systems.

Several reports (e.g., the Federal Plan for High-End Computing⁴ and A National Strategy for Advancing Climate Modeling from the National Research Council)⁵ recommend the U.S. adopt a high-performance computing strategy, like the model proposed here, that promotes tiers of performance. Increased capacity from regular refresh of NOAA's full R&D HPC system will advance NOAA's modeling capability by:

- Increasing model resolution for more accurate representation of physical processes, dynamics, and advanced data assimilation techniques. This will improve NOAA's regional and local predictions of severe weather, extreme events including floods and drought, and seasonal climate variability.
- Using sophisticated representations of nature in NOAA models to include fully interactive chemistry and aerosols in high-resolution coupled models to better understand and predict the impact of pollution on human health, ocean acidification, and the recovery of the stratospheric ozone layer.
- Expanding ensemble-based prediction systems to reduce forecast uncertainty.

Resource Assessment:

Funding from the Consolidated Appropriations Act, 2016 enabled NOAA to begin the recapitalization of Gaea, one of NOAA's three R&D supercomputers. The proposed planned increase in FY 2018 will continue this larger effort to transition to a sustainable funding model for R&D HPC, which will provide regular technical refresh and recapitalization of NOAA's R&D HPC resources.

Schedule and Milestones:

FY 2018

- Delivery and acceptance of Gaea replacement system, including additional capacity for sea level rise work

FY 2020

- Begin planning for tech refresh of Gaea

FY 2022

- Delivery of tech refresh for Gaea system

Deliverables:

- High-resolution (3-10 km) ocean models accounting for ocean eddy circulations, ocean-ice interactions and global and regional sea-level rise
- High-resolution (1-3km) storm-resolving regional models embedded in coarse resolution (15km) global models
- Coupled climate models using state-of-the-art atmosphere, ocean, biosphere, and cryosphere components to accelerate the delivery of high-resolution regional climate information
- Fully interactive atmospheric chemistry, aerosol, and cloud physics in high-resolution coupled models
- Complete biogeochemical cycle modeling (e.g., for nitrogen and phosphorous) with improved representation of open ocean and coastal mechanisms

⁴ High-End Computing Revitalization Task Force. Federal Plan for High-end Computing. Executive Office of the President, Office of Science and Technology Policy, 2004.

⁵ National Research Council. A National Strategy for Advancing Climate Modeling. The National Academies Press, 2012.

Performance Goals and Measurement Data

Performance Measure: Number of key physical processes that improve model performance, understanding of uncertainties, and confidence in climate change projections and predictions. (Cumulative)	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
With Increase	N/A	3	3	4	5	6	7
Without Increase	3	3	3	3	3	3	3
<p>Description: Increased R&D HPC capacity will allow models to be run with greater complexity and at greater resolution. This will improve the treatment of key physical processes, including cloud formation and precipitation in climate models to reflect greater confident projections of key climate change impacts. Inputs to this cumulative index are (1) Improved cloud and water vapor observations; (2) improved aerosol precipitation susceptibility index; (3) improved parameterizations and modeling of clouds, aerosols, and water vapor; and (4) number of products transitioned that include new parameterizations.</p>							

Performance Measure: Expand number of new seasonal-to- decadal prototype forecasts and predictions for global-to-regional scales (Cumulative)	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
With Increase	N/A	3	4	6	8	10	12
Without Increase	1	2	3	4	5	6	7
<p>Description: Increased R&D HPC capacity will allow models to be run at greater resolution and with new data assimilation schemes. Running the models at high resolution will improve their representation of seasonal-to-decadal predictability. This will result in an expanded number of seasonal-to-decadal prototype forecasts made with the high resolution coupled climate model.</p>							

Performance Measure: Reduce 10-day wind forecast error (baseline FY 2013). (Cumulative)	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
With Increase	N/A	3%	3%	10%	10%	10%	10%
Without Increase	3%	3%	3%	3%	3%	3%	3%
Description: Increased R&D HPC capacity will allow weather models to run at higher resolution and to assimilate more data, which will result in reduced forecast error. Understanding these winds at upper (250mb) and lower (850mb) levels of the atmosphere is important to aviation forecasting. Forecasting winds at these levels is also important for winter storm and tropical storm prediction. These wind metrics would be applied in the northern and southern hemispheres and in the tropics. They would be compared against both gridded analysis data and against weather observations such as from radiosondes.							

Outyear Funding Estimates (\$ in Thousands)

Research Supercomputing	FY 2017 & Prior	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	CTC	Total
Change from FY 2018 Base		5,959	10,300	14,300	14,300	14,300		
Total Request	359,144	26,000	30,341	34,341	34,341	34,341	N/A	Recurring

Out years are estimates only. Future requests will be determined through the annual budget process.

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BUDGET PROGRAM: NATIONAL WEATHER SERVICE

For FY 2018, NOAA requests a total of \$1,058,056,000 and 4,322 FTE for the National Weather Service, including a net decrease of \$83,993,000 and a decrease of 107 FTE in program changes.

National Weather Service Overview

The National Weather Service (NWS) (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. During life-threatening weather situations, NWS is the United States' sole authoritative source for warnings. NWS forecasters also issue a variety of forecasts and warnings every day affecting and including aviation, marine, fire, weather, climate, space weather, rivers, and floods. NWS disseminates data and products relied upon by the public, other government agencies, the private sector, and the global community.

The FY 2018 budget submission continues to make the United States a Weather-Ready Nation (WRN) in which NWS operations help the public best prepare for and respond to extreme weather events (pages NWS-1,21). At current funding levels, the evolution to a WRN involves sixteen distinct projects, but advancements in quality, consistency, and effectiveness across all portfolios are driven by the goal of building a Weather-Ready Nation. In FY 2017, NWS completed its Operations and Workforce Analysis (OWA) and now seeks to test and evaluate the efficacy of the recommendations generated, including Impact-Based Decision Support Services (IDSS). OWA concepts are intended to improve consistency across forecast boundaries, break down barriers to enhance forecast collaboration, and enable forecast staff to work more closely with core partners locally to connect weather forecasts and on-the-ground impacts: a focus on the "last mile" of the NWS' service delivery. NWS forecasters will work with local partners and communities to understand and manage risk, formulate emergency response plans, and promote community resilience and public safety.

As NWS evolves, it will better support public and private users including emergency managers and businesses to make faster, smarter decisions that save lives and protect livelihoods. NWS' evolution to a WRN is guided by the 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.

The NWS budget is organized into five Operations, Research, and Facilities (ORF) Programs, Projects, and Activities (PPAs):

- **Observations (\$236,585,000 and 890 FTE)** supports the observing systems (such as the Next Generation Weather Radar (NEXRAD), the Automated Surface Observing System (ASOS), and Radiosondes) that collect data necessary to provide weather forecasts, warnings, and outlooks.
- **Central Processing (\$95,045,000 and 229 FTE)** supports the information technology necessary to process weather data and run weather models in support of national centers and field operations. These include the Weather and Climate Operational Supercomputing System (WCOSS), the Advanced Weather Interactive Processing System (AWIPS), the Advanced Hydrologic Prediction Service (AHPS), and other hydrology information technology initiatives.

- **Analyze, Forecast, and Support (\$491,693,000 and 2,781 FTE)** supports a distributed network of Weather Forecast Offices (WFO) and specialized centers comprising a workforce of meteorologists, hydrologists, climatologists, and space physicists whose expertise convert observational data and model outputs to timely and accurate weather forecasts, warnings, and outlooks.
- **Dissemination (\$45,965,000 and 81 FTE)** supports operations of the communication infrastructure – such as the Integrated Dissemination Program (IDP) systems, Telecommunications Gateway, Hazcollect Extended, and NOAA Weather Radio – required to distribute forecasts, warnings, and other products to customers and partners and the American public.
- **Science and Technology Integration (\$137,702,000 and 424 FTE)** supports research and research-to-operation activities that advance weather and climate prediction and improve NWS product and information in the future.

The NWS is organized into two Procurement, Acquisition, and Construction (PAC) sub-programs and four PPAs:

- **Systems Acquisition**
 - Observations (\$16,688,000 and 0 FTE) supports enhancement and life-cycle replacement of systems (such as NEXRAD and ASOS) that collect and process observations necessary to provide weather forecasts, warnings, and outlooks.
 - Central (\$64,139,000 and 24 FTE) Processing provides operational and developmental high performance computing (HPC) capacity and forecast and process improvements within AWIPS.
 - Dissemination (\$45,598,000 and 0 FTE) enhances infrastructure and expands capacity of NWS dissemination systems to meet new satellite and model data requirements, including the IDP and Telecommunications Gateway and upgrading select NOAA Weather Radio locations.
- **Construction**
 - Facilities Construction & Major Repairs (\$8,634,000 and 0 FTE) includes upgrades and improvements to NOAA's Forecast Offices and facilities to improve safety and functionality and relocation of forecast offices when opportunities for collaboration with partners present themselves.

NWS forecasts, predicts, provides outlooks, and communicates effects of changing weather, seasonal to sub-seasonal climate, and water to the American public. Weather and water impact every sector of the economy and businesses rely on NOAA's information to improve commerce. Timely and accurate warnings for weather-related hazards – provided reliably and on time every time – are necessary for public safety. NWS measures satisfaction with NOAA information and warning services through surveys 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 enhances observation capabilities and outputs by (1) improving assimilation of data collected by NWS and others; (2) improving research community collaboration through creative approaches; (3) improving the techniques used by expert forecasters; (4) making NWS information available quickly, efficiently, and in useful forms; (5) incorporating forecast uncertainty to help customers make better-informed decisions; (6) leveraging emerging technologies to disseminate information; and (7) maintaining an up-to-date technology base and a trained workforce to integrate 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 United States and its territories, 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 IDP systems, Telecommunications Gateway, and the OneNWS Network. 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.

NWS launched its WRN initiative to build community resilience in the face of increasing vulnerability to extreme weather and water events. The initiative improves support for 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 cause frequent multi-billion dollar weather disasters. The devastating impacts of extreme events can be reduced through improved readiness. The WRN initiative helps 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 that delivers 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 NWS' business process. The effectiveness of NWS 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 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
Tornado Warnings Lead Time, Indicator 3.2b	9	13	13	13	13	13	13
Tornado Warnings Accuracy, Indicator 3.2b	61	72	72	72	72	72	72
Tornado Warnings False Alarm Ratio, Indicator 3.2b	69	71	71	71	71	71	71
Flash Flood Warnings Lead Time, Indicator 3.2c	72	63	63	65	65	65	65
Flash Flood Warnings Lead Accuracy, Indicator 3.2c	80	76	76	76	76	76	76
48-hour Hurricane Track Error in nautical miles, Indicator 3.2d	61	68	65	61	57	54	54
48-hour Hurricane Intensity Error in knots, Indicator 3.2e	10	12	12	11	11	10	10
Accuracy (%) (Threat score) of Day 1 precipitation forecasts, Indicator 3.2f	36	33	33	33	33	33	33
Winter Storm Warnings Lead Time, Indicator 3.2g	21	20	20	20	20	20	20
Winter Storm Warnings Accuracy, Indicator 3.2g	85	90	90	90	90	90	90

Performance Measure	FY 2016 Actuals	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
Marine Wind Speed Forecast Accuracy, Indicator 3.2h	80	78	79	79	80	80	80
Marine Wave Height Forecast Accuracy, Indicator 3.2h	85	81	82	82	83	83	83
Aviation Forecast IFR Accuracy, Indicator 3.2i	63	65	65	65	65	65	65
Aviation Forecast IFR False Alarm Ratio, Indicator 3.2i	38	38	38	38	38	38	38
Geomagnetic Storm Forecast Accuracy, Indicator 3.2j	68	40	40	40	40	40	40
U.S. Seasonal Temp. Forecast Skill, Indicator 3.1e	24	26	26	26	26	27	27

Significant Adjustments:

Calculated Adjustments

NOAA's FY 2018 Base includes a total of \$19,370,000 and 0 FTE to account for the full funding requirement for inflationary adjustments to current programs for NWS activities. This includes the estimated 2018 Federal pay raise of 1.9 percent as well as inflationary increases for non-labor activities including service contracts, utilities, field office lease payments, and rent charges from the General Services Administration (GSA).

Technical Adjustments

From Office	PPA	To Office	PPA	Amount
MS	Mission Services and Management	NWS	Analyze, Forecast and Support (ORF)	\$613,000/ 0 FTE
MS	Mission Services and Management	NWS	Dissemination (ORF)	\$43,000/ 0 FTE
NWS	Analyze, Forecast and Support (ORF)	NWS	Observations (ORF)	\$15,050,000/ 129 FTE
NWS	Science and Technology Integration (ORF)	NWS	Analyze, Forecast and Support (ORF)	\$2,750,000/ 18 FTE

NOAA requests to transfer \$501,000 and 0 FTE to move funding for operations at the David Skaggs Research Center in Boulder, CO, from the Mission Support Facilities to NWS. This funding is currently appropriated to the Mission Services and Management PPA and then

distributed to the Line and Staff Offices annually. This reallocation will increase efficiencies by eliminating the need for funding transfers subsequent to appropriation and will improve transparency.

NOAA requests to transfer \$155,000 and 0 FTE to move funding associated with NOAA's Western Regional Center (WRC) management activities from Mission Support Facilities to NWS, Analyze, Forecast and Support (ORF). Currently, costs for these activities are paid directly through the funding appropriated to the Mission Services and Management PPA. This reallocation supports NOAA's plan to employ an integrated campus cost model to allocate the cost of services provided to the WRC tenants. The tenants will then be billed directly based on the approved cost model. An integrated cost model will provide greater transparency and a more accurate reflection of program operating costs.

NWS requests a technical adjustment to move \$15,050,000 and 129 FTE from the Analyze, Forecast and Support PPA in ORF to the ORF Observations PPA. This adjustment corrects the misalignment of Observations Program Leads (118 FTE) and Port Meteorological Officers (11 FTE) within the Analyze, Forecast and Support PPA. The transfer is required to properly align these activities with the appropriate PPA, Observations.

NWS requests a technical adjustment to move \$2,750,000 and 18 FTE from the Science and Technology Integration PPA in ORF to the ORF Analyze, Forecast and Support PPA. This adjustment corrects the misalignment of Space Weather forecasters within the Science and Technology Integration PPA and properly aligns the forecasters and their activities Analyze, Forecast and Support.

Narrative Information:

Following this section are base justification materials and program change narratives by sub-program for this line office. Please note program change narratives are only provided for program changes that represent greater than five percent of a program. Complete program changes by PPA can be found in the NOAA Control Table (p. Control Table – 5; p. Control Table - 11). Please contact NOAA if details for any of these changes are required.

**APPROPRIATION ACCOUNT: OPERATIONS, RESEARCH, AND FACILITIES
SUB-PROGRAMs: OBSERVATIONS; CENTRAL PROCESSING; ANALYZE, FORECAST
AND SUPPORT; DISSEMINATION; SCIENCE AND TECHNOLOGY INTEGRATION**

The objectives of the sub-programs are to:

- Provide timely 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; and
- Improve services by integrating new advances in science and technology.

NWS has 4,241 FTEs in 122 WFOs, 13 River Forecast Centers (RFC), 9 National Centers for Environmental Prediction (NCEP), and other support offices around the country. NWS supports a national infrastructure to gather and process data worldwide from the land, sea, air and space. This infrastructure collects data from technologies such as Doppler weather radars, satellites operated by NOAA's National Environmental Satellite, Data, and Information Service (NESDIS), marine data buoys, 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 these data and issue forecasts and warnings. High-speed communications unify the infrastructure and enable forecast and warning dissemination to the public.

Trained community volunteers also enhance NWS operations. Cooperative observers collect weather data that become part of the Nation's climate records and citizen storm spotters provide visual confirmation of severe weather events. As environmental information becomes more sophisticated and accessible, the environmental literacy of the public becomes more important. NWS outreach and education activities seek to ensure public understanding of NWS' information and its effective integration into decision making.

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. NWS integrates in-situ and remotely-sensed data from satellites and radars, NOAA systems, commercial sources, Federal and even international partners.

In 2017, NWS will maintain an average, cross platform buoy data availability rate of 85 percent, a NEXRAD system availability rate of 99 percent and an ASOS system availability rate of 98 percent. In FY 2018, NWS will continue to maintain its critical observing systems while improving their sustainability through configuration management.

Funding from this PPA is used to operate and maintain all NWS observing systems, evaluate observational requirements, engineer technical solutions, and perform systems development and testing. Together, these systems enable forecasters to identify emerging threats, characterize their severity, and provide detailed warnings and forecasts.

Observing systems must measure a broad array of parameters to support forecasting in the varied mission service areas of the NWS including aviation weather, severe weather, space weather, tropical weather, tsunami and more. All of these systems have strengths and weaknesses in monitoring the environment, so individual systems in the overall suite must complement each other. By gathering information from multiple sources, NWS ensures the most complete data picture possible.

Specific activities in the Observations PPA include:

- Manage operations and maintenance of NWS observational systems;
- Provide holistic, on-going assessments/analyses of the observing systems portfolio;
- Identify and validate NWS' observation requirements;
- Seek solutions to fulfill NWS' observation requirements;
- Develop a strategy to maximize effectiveness while minimizing cost; and,
- Coordinate NWS' observing system activities with NOAA and its partners.

To achieve these goals, NWS maintains the following programs:

Upper Air (UA) Observations Program provides a vertical profile of meteorological data across the Earth's atmosphere. To provide humidity, pressure, and other data that shape weather forecasts, NWS operates a radiosonde network, acquires observations from private and commercial aircraft, acquires lightning data from commercial vendors, and operates a wind profiler network in Alaska. In addition, the program provides for critical, terrestrial-based space weather observations.

- Each year, NWS launches over 78,000 radiosondes from locations throughout the United States and its possessions, including the Caribbean and Pacific Island nations. Radiosondes provide atmospheric profiles of pressure, temperature, relative humidity and winds aloft. These data are critical inputs for NWS weather prediction models and forecaster operations supporting severe storm, aviation and marine forecasts, and climate and other research uses. Radiosondes also serve to provide a reference for satellite sounding data.
- NWS leverages private-public partnerships to obtain additional data for more comprehensive upper air observations. Meteorological Data, Collection and Reporting System (MDCRS)-equipped aircraft currently provide temperature and wind information.
- The Alaskan NOAA Profiler Network (NPN) consists of three Doppler radar sites providing continuous vertical wind profile data. The most critical use of the Alaska profiler network is to support the production of aviation warnings of volcanic ash, which can cause catastrophic engine failure for aircraft in flight.
- NWS supports the National Solar Observatory's (NSO) Global Oscillation Network Group (GONG) solar observatories. GONG consists of six ground-based observatories strategically placed around the globe, so that at least one site has the opportunity to observe the sun at all times in support of NWS' space weather mission.

Radar Observations Program provides meteorological data about clouds and precipitation that can predict storm impacts and severity. To produce timely and accurate storm data, NWS operates 122 NEXRADs and acquires supplementary radar data from other sources.

- NEXRAD is a tri-agency weather radar system with NWS, the U.S. Department of Defense (DOD) and the Federal Aviation Administration (FAA). NEXRAD is the primary tool used by NOAA's meteorologists for issuing warnings for flash floods, tornadoes, and severe thunderstorms.

- NWS leverages other radar data sources such as the FAA's Terminal Doppler Weather Radar (TDWR) to supplement the NEXRAD network to ensure adequate national radar coverage.

Surface Observations Program provides meteorological data at the Earth's surface. To provide on-the-ground observations, NWS operates the ASOS, the Cooperative Observer Program (COOP) and the National Mesonet Program.

- 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 tri-agency automated surface observation system with NWS, FAA, and DOD and consists of 976 operational systems.
- COOP is a network of volunteer observers providing a significant and cost effective source of meteorological and climatological 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 National Mesonet Program is a network of automated weather stations installed closely together in order to gather "mesoscale meteorological" observations such as temperature, humidity, lightning and atmospheric pressure. Due to their proximity to each other, Mesonet data can identify small scale features at the surface that can indicate rapidly deteriorating weather conditions not shown by other observations. This consortium of 23 individual networks – or mesonets – provides data coverage in all 50 states. This consortium of 23 individual networks – or mesonets – provides data coverage in all 50 states. The types of included meteorological data have expanded to include TAMDAR profiles, road measurements, soil moisture, solar, etc.

Marine Observations Program provides real-time meteorological, climatological and tsunami data in the open ocean and coastal zones surrounding the United States. 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 is a network of 149 meteorological and ocean observing platforms that provide real-time marine meteorological, oceanographic, and geophysical observations. The network includes 101 moored Coastal Weather Buoys (CWB) and 48 land-based Coastal Marine Automated Networks (C-MAN) stations deployed in coastal and offshore waters from the western Atlantic, Gulf of Mexico, and Caribbean Sea to the western Pacific around Hawaii, to the Bering Sea, and in the Great Lakes.. This network provides forecasters and the public with frequent, high-quality marine observations for forecast and warning preparation (including for hurricanes) and to verify forecasts after they are produced. Other users rely on the observations and forecasts for commercial and recreational activities.
- The TAO array is designed for the study of seasonal and year-to-year climatic variations related to El Niño and the Southern Oscillation (ENSO) that can have tremendous impact on the Nation's weather. Like shorter-term forecasting, the study of this variability enables more rapid prediction of climate anomalies that may result in hazardous weather conditions within the US. The array consists of 55 moored ocean buoys and four Acoustic Doppler Current Profilers (ADCP) in the equatorial Pacific.
- DART® stations, located largely along the 'ring of fire' throughout the Pacific Ocean, Atlantic Ocean, Caribbean Sea and Gulf of Mexico, collect observational data that is used by NWS' Tsunami Warning Centers to prepare and refine tsunami watches and warnings covering all U.S. territories and coastal states.

- NWS supports the maintenance of a number of the tsunami-capable tide gauges operated by both the NOS Center for Operational Oceanographic Products and Services (CO-OPS), and the University of Hawaii Sea Level Network. These sensors provide the NWS Tsunami Warning Centers with coastal water-level information updated every minute in key tsunami threat regions. NWS also supports maintenance of a number of coastal sea-level gauges and seismic networks to support tsunami detection, forecast, and warning.
- NWS operates the Volunteer Observing Ship (VOS) program, which obtains ship-based weather and oceanographic observations used in marine weather forecasts in both coastal and high seas areas, as well as informs local surface conditions. The VOS program is supported by Port Meteorological Officers (PMO) located at twelve major port cities across the county.

Systems Engineering and Support provides systems acquisition, engineering and logistics support for NWS mission critical observing systems as well as functional expertise necessary to design, acquire, test and provide life cycle support. Actions include:

- Perform system engineering and acquisition to support operational weather systems;
- Plan, coordinate, and implement hardware modifications, retrofits and rehabilitation programs to meet changing program requirements and improving system performance;
- Direct product identification, configuration control, auditing, and status accounting for all systems that are under formal NWS Configuration Management control;
- Prescribe and manage efficient logistics stocking levels and ensuring procurement of initial and replenishment spares for depot-level stock;
- Provide maintenance, repair, quality assurance, and warehousing of new and reconditioned parts;
- Develop and maintain software for Surface and Upper Air systems; and,
- Perform system and operational tests and evaluation of alternative systems.

Schedule and Milestones:

FY 2018 – 2022

- Maintain the tri-agency NEXRAD radar network
- Maintain the tri-agency ASOS system
- Operate and maintain weather/ocean buoy, C-MAN, DART® stations and TAO array
- Sustain data processing of the National Solar Observatory's Global Oscillation Network Group (GONG) and observatory support
- Sustain critical observing system networks and the operations and maintenance of (tsunami-reporting) seismic sensors and sea-level stations
- Improve and maintain paperless reporting of COOP data
- Deploy NEXRAD Radar Product Generator (RPG) and Radar Data Acquisition (RDA) Software Builds
- Develop and test NEXRAD RPG and RDA Software Builds
- Develop, test, and deploy TDWR SPG Builds
- Develop, test, and deploy NOAA Profiler Network Software Builds

Deliverables:

- Support operations of 102 radiosonde stations in the United States and possessions, Caribbean, and Pacific Island nations
- Maintain National Mesonet Program Office
- Leverage data flow from aircraft observations commercial data purchases
- Support operations of three Wind Profiler systems in Alaska

- Support operations of 122 NEXRAD systems at 96 percent availability
- Support operations of 45 TDWR Supplemental Product Generator (SPG) systems
- Support operations of 309 NWS ASOS units and maintenance of 570 FAA ASOS units under a reimbursable funding arrangement
- 500 Wireless Temperature Systems on shelf at NLSC with deployment criteria
- 100 Soil Temperature Systems on shelf at NLSC with deployment criteria
- Paperless COOP data reporting system online within NWS IT infrastructure
- Hourly marine weather wind speed and direction, air and sea temperature, atmospheric pressure, and detailed wave information
- Support operations of 39 DART® with data availability of 80 percent
- Support operations of the TAO buoy array at 80 percent data availability (assumes adequate ship time provided by OMAO)
- Support operations of 101 CWB systems at 80 percent data availability (assumes adequate ship time provided by the U.S. Coast Guard)
- Support operations of 47 C-MAN stations at 80 percent data availability
- Continuity of GONG data to the Space Weather Prediction Center

CENTRAL PROCESSING

Central Processing is the next step in the NWS forecast process. Through this PPA, NWS ingests data obtained from observing infrastructure, and delivers it in a usable form to NWS modelers and meteorologists. Activities include managing the WCOSS, AWIPS, hydrology information technology initiatives, and the IT infrastructure that supports national centers and field operations. Together these ensure the uninterrupted flow of information from collection of observations to central guidance production and local access to all essential weather and climate data products.

In 2015, NWS completed the deployment of AWIPS II. AWIPS II is an underlying software design enhancement that enables the AWIPS software – NWS’ primary forecasting software – to more rapidly integrate new data sources and forecast capabilities into operations while improving system maintainability. In 2018, NWS will continue to integrate new forecast capabilities into AWIPS and model improvements onto WCOSS.

In general, activities in the Central Processing portfolio include the following:

- Operate NWS’ IT processing infrastructure;
- Sustain reliability of NWS’ IT processing by keeping infrastructure up to date
- Identify NWS’ processing requirements and gaps;
- Review NWS’ processing system capabilities;
- Seek solutions to fulfill NWS processing requirements;
- Coordinate NWS’ processing system activities across NOAA; and,
- Maintain a 24/7 help desk for all forecast systems.

To achieve these goals, NWS maintains the following programs:

NCEP Central Operations (NCO) provides support for WCOSS including the software and infrastructure that forms the basis for predictions from NCEP Centers and WFOs through its Weather and Climate Computing Infrastructure Services (WCCIS) program. WCCIS provides the following services:

- Performs quality assurance of incoming observations and outgoing products;
- Transitions and disseminates numerical weather and climate prediction models from development into operational use by forecasters at NCEP and the WFOs;
- Performs 24/7 system maintenance and administration service;
- Performs software development for data processing, display, interaction, and product generation; and,
- Monitors the creation of all products in the NCEP production suite on a 24/7 basis.

AWIPS is the information processing, display, and telecommunications system that is the cornerstone of NWS field operations. AWIPS provides the following services:

- Integrates and displays observing data (meteorological, hydrological, satellite, and radar) at NWS field offices;
- Process and displays data at operational sites;
- Provides an interactive communications system to connect NWS field locations;
- Initiates the dissemination of weather and flood warnings and forecasts in a rapid and highly reliable manner; and,
- Provides the communication interface for the public to see NOAA's data.

Hydrology Information Technology Initiatives gather advanced and localized information about water resource concerns including drought and flooding.

- The Advanced Hydrologic Prediction System (AHPS) is a web-based suite of graphical river-forecast products that provide advanced information on the magnitude and likelihood of floods and droughts. In 2018, advanced river forecast information will be provided at 4,011 locations throughout the United States to enable government agencies, private institutions, and individuals to make more informed decisions about risk-based policies and actions to mitigate the dangers posed by floods and droughts.
- Community Hydrologic Prediction System (CHPS) is the information technology infrastructure that all 13 RFCs use to access hydrologic models. These tools enable products that community leaders and emergency managers use to effectively respond to flooding events.

National Centers and Regional IT Infrastructure maintain information technology infrastructure and standards that 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;
- security; and
- data center power and cooling.

Schedule and Milestones:

FY 2018-FY 2022

- Manage HPC usage, reliability, and resources including a major system upgrade
- Support scheduled improvements to NCEP production suite
- Complete AWIPS contract transition
- Deploy updated AWIPS hardware infrastructure at National Centers
- Maintain updated AWIPS architecture and infrastructure at National Centers, RFCs, and WFOs
- Continue to improve flood lead time and accuracy improvement

Deliverables:

- WCOSS capacity substantially increased and meeting or exceeding reliability metrics
- 43 million numerical prediction products produced per day for weather, climate, ocean, river, and space-weather forecasts
- AWIPS 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, and to support the national economy. The Analyze, Forecast and Support (AFS) PPA leverages the Observations and Central Processing PPAs outputs by applying expertise to the observed data and model outputs, resulting in forecasts, warnings, and Impact-based Decision Support Services (IDSS) for the Nation.

NWS' distributed network of forecast offices, specialized centers, and associated workforce of meteorologists, hydrologists, climatologists, and space physicists is supported through the AFS PPA. This expert workforce monitors the weather, water, climate and space weather from our oceans to the surface of the sun, 24 hours a day, seven days a week. These professionals provide information in a collaborative forecast process which enables forecasts and warnings to benefit from the NWS' fully integrated forecast process. Forecasts globally support agriculture, transportation, energy production and water management among other missions. Alerts, provided days in advance, of pending winter storms or hurricanes, wildland fire conditions, tornado outbreaks, heat waves or river floods enable the public, industry, 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 decision makers to keep the public out of harm's way to protect their lives and livelihoods.

NOAA's network of WFOs, RFCs, and specialized centers house the NOAA equipment and expertise that results in weather forecasts, warnings, and the provision of IDSS. Like any other physical asset, this infrastructure must be maintained to support NWS mission delivery and efforts to build a Weather-Ready Nation. As such, NWS is conducting facility condition assessments (FCAs) for all leased and owned facilities. With two-thirds of the assessments complete, NWS has a comprehensive analysis of site conditions, itemized deferred maintenance, and projected life cycle cost for the next ten years. In some instances, the FCA identifies issues that might significantly affect operational readiness, service delivery, or occupant safety. The NWS now is in the process of prioritizing and addressing (within base resources) deferred maintenance and capital expenditures.

In August 2016, NOAA implemented the first version of the National Water Model (NWM), a continental-scale model that combines data from USGS stream gauges with outputs from NOAA's atmospheric weather models to greatly improve flood forecasting. The NWM simulates conditions for 2.7 million stream reaches nationwide every hour (a 700-fold increase over the ~3600 locations previously available every few hours). The model also improves NOAA's ability to meet the needs of stakeholders by providing more frequent, accurate, and expanded water information. The experimental NWM supports future improvements to hydrologic forecasting by leveraging collaboration with the public, private, and academic sectors.

Also in FY 2016, NWS met or exceeded all but three of its 16 field-based GPRA performance measures. In addition, NOAA operationalized the 'Potential Storm Surge Flooding Map' (www.nhc.noaa.gov/surge/inundation) for use during the 2016 Hurricane Season, which improves understanding of and preparation for the storm surge flooding threat caused by tropical cyclones. To achieve these goals, NWS maintains the following programs:

Weather and Climate Services and Warnings provide real-time meteorological and climatological products and services to the public. To achieve this requirement, NWS operates WFOs and other field offices within the continental United States, Alaska, Hawaii, and U.S. territories.

- WFOs issue warnings, advisories, statements, and forecasts for their geographic area of responsibility 24/7 at multiple time scales, from alerting for immediate threats, to monthly climate reports. These forecasts include aviation, fire weather, marine, severe and tropical weather and the prediction of winter storms. WFOs also issue warnings for tornadoes, blizzards, large hail, flash floods (including dam failures) and projected tsunami impacts. WFOs control broadcasts of weather information on the NOAA Weather Radio All Hazards stations, provide weather spotter training to communities, and foster close ties with both the media and the emergency management community. Staff at WFOs have a close relationship with local government officials and emergency managers and provide IDSS to support their decision making both remotely and during hazardous conditions at their operations centers.
- Weather Service Offices (WSO) are located within Alaska and Pacific Regions and provide expert hydro-meteorological data in support of local, regional, national, and global weather, hydrologic, climatic, and warning programs. WSOs support the mission of their associated WFO through public service, education, and outreach. They differ from WFOs in that they do not issue forecasts or warnings, are responsible primarily for observations and data collection, and are not run 24 hours a day.
- Through an interagency agreement with the FAA, NWS forecasters are embedded within all 21 Air Route Traffic Control Centers and at the Air Traffic Control System Command Center to provide direct decision support services to air traffic managers promoting aviation safety.

National Centers provide specialized forecast guidance and products for NWS field offices and other direct users (such as FEMA HQ) through NCEP. Each National Center depends on data from the Observations PPA, model output from Central Processing's supercomputers, and innovations from the Science and Technology Integration PPA to provide expert analysis and prediction services to the local WFO and RFC infrastructure and other core partners. The National Centers provide an integrated suite of numerical weather and environmental forecast guidance, at scales ranging from local to global, at various time frames. National Centers also issue watches and warnings which include tornado watches, hurricane warnings, space weather alerts and seasonal predictions for El Niño and La Niña events. NWS Forecasters and the weather enterprise use this information and the suite of weather model output as the basis for consistent forecast products, advisories and warnings. The AFS PPA supports seven NCEP National Centers:

- Aviation Weather Center (AWC) delivers consistent, timely and accurate weather information to support safe air navigation for the world airspace system. AWC provides aviation warnings and forecasts of hazardous flight conditions at all levels within domestic and international airspace.

- Climate Prediction Center (CPC) delivers real-time products and information on timescales from weeks two-to-four to sub-seasonal and seasonal, integrating observed weather with longer-term climate variability. This includes predictions for the onset and duration of El Niño and La Niña events, which can have a significant impact on the nation's weather from the potential extremes of flood, drought, excessive heat or cold, and severe weather. Better predictions of these events could save the U.S. billions of dollars in damage costs. Application of CPC services provides social and economic benefits to agriculture, energy, transportation, water resources, and public health. CPC works with scientific partners around the world to understand and predict modes of natural global climate variability.
- National Hurricane Center (NHC) issues watches, warnings, forecasts and analyses of hazardous tropical weather (e.g., tropical storms and hurricanes), and increases understanding of these hazards. NHC also provides marine forecasts for a large part of the southwest North Atlantic, Caribbean Sea, Gulf of Mexico and the eastern North Pacific.
- Ocean Prediction Center (OPC) issues marine warnings, forecasts, and guidance for maritime users and continually monitors and analyzes maritime data for protection of life and property, safety at sea, and enhancement of economic opportunity. OPC issues gale and storm warnings for the Atlantic and Pacific Oceans, north of 30 Degrees North.
- Space Weather Prediction Center (SWPC) provides real-time monitoring and forecasting of solar and geophysical events and disturbances such as geomagnetic storms and solar flares. SWPC researchers and partners develop advanced models to improve understanding of the space weather environment and predict future events. Model improvements enable better prediction of these events and their potential impact on Earth. Impacts could include disruptions to satellite communications, impacts to the terrestrial electric grid and communication outages to cross polar airline flights. SWPC supports the Space Weather Operations, Research and Mitigation (SWORM) national space weather strategy.
- Storm Prediction Center (SPC) provides forecasts and watches for tornadoes, severe thunderstorms, large hail, lightning, wildfire potential, and heavy precipitation for the United States.
- Weather Prediction Center (WPC) is responsible for preparing a variety of analyses, national guidance products, and reliable national forecasts through a collaborative forecast process that ensures consistency and accuracy.

Hydrologic Services and Warnings provides hydrologic data, analysis, forecast information, and decision support services through the Office of Water Prediction (OWP), RFCs, and WFOs to address the Nation's growing water resources challenges. The OWP serves as a cornerstone for Integrated Water Resources Science and Services (IWRSS) and a central hub to integrate and advance national and regional hydrologic field operations and services.

- RFCs provide daily river stage data, river forecasts and flash flood guidance for emergency and water management. A wide range of users depend on these forecasts including those in agriculture, hydroelectric dam operation, and water supply resources. The information is also the basis for river and flash flood warnings, watches, and advisories issued by the WFOs. NWS operates 13 RFCs.
- IWRSS is a new business model for interagency collaboration consisting of a consortium of Federal agencies including NOAA, the U.S. Army Corps of Engineers (USACE), the U.S. Geological Survey (USGS), and the Federal Emergency Management Agency (FEMA) with complementary missions in water science, observation, management, prediction and response. IWRSS' overarching objective is to enable a broad, integrative

national water resources information system to serve as a reliable and authoritative means for water-related planning, preparedness and response activities.

- The OWP National Water Center (NWC) acts as a catalyst for interagency activities as they relate to the transformation of NOAA's water prediction capability and decision support services. Moreover, it serves as an operational forecasting center, which is envisioned to be staffed with personnel from multiple federal agencies. The goal is to establish an integrated and common operating picture for water resources. The NWC is focused on developing new national water prediction capabilities such as the National Water Model (NWM). A second new transformational hydrologic forecasting capability is the Hydrologic Ensemble Forecasting Service (HEFS), which produces reliable and skillful ensemble streamflow forecasts at lead times ranging from one hour to one year. HEFS is particularly useful for long-range water resource planning and risk-based water resources decision-making.

Tsunami Warning Program provides reliable, 24/7 monitoring of seismic events that could generate a tsunami that could impact the Atlantic or Pacific coastlines. In the event of a tsunami, the program generates timely and precise warnings, predictions of wave impact times and heights, and operational tools for emergency managers and public officials to guide rapid, critical decisions in which lives and property are at stake. The program uses DART® moorings from the observations program as critical input and verification of tsunami forecasts.

Tsunami forecast modeling research seeks to develop faster and more reliable tsunami forecasts. Inundation modeling assists communities with their efforts to assess risk and mitigate potential impacts.

Tsunami hazard mitigation grants have enabled partner states to support coastal communities with life-saving products and services such as coastal inundation maps, evacuation plans and maps, preparedness training and mitigation workshops, evacuation drills, warning infrastructure (e.g., sirens), and tsunami evacuation signs.

The program coordinates with a variety of national and international partners and is supported by the Pacific Tsunami Warning Center (PTWC) in Hawaii and the National Tsunami Warning Center (NTWC) in Alaska. Ongoing work in the Tsunami Warning Program includes

- performing innovative research to speed earthquake detection and improve the reliability of predictions of tsunami track, speed, height, onset times and potential coastal impact;
- issuing tsunami watches and warnings for all U.S. communities at risk and for international areas by agreement or compact; and
- increasing community preparedness and public tsunami education through the TsunamiReady™ program and outreach.

Pacific Island Compact is part of the U.S. Compact of Free Association (COFA) with the Republic of the Marshall Islands (RMI), the Federated States of Micronesia (FSM), and the Republic of Palau (ROP) in which the U.S. government provides basic government and commerce services including weather services to these island nations. The Compact provides the necessary funding to support the NWS WSOs and associated weather warning, forecast, and observation services for these islands. This continued investment preserves critical weather observation infrastructure and services 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.

Schedule and Milestones:

FY 2018 – 2022

- 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 foundational data sets
- Operate the NWC to support water resource decision making across the Nation
- 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
- Operate Tsunami Warning Centers (TWCs) 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

Deliverables:

- Operations and maintenance of all WFOs, RFCs, National Centers, and Tsunami Warning Centers
- Operations and maintenance of field operational support from National Headquarters
- Operations and maintenance of OCONUS WSOs that provide weather warnings, forecasts, and observation services to participants of the Pacific Island Compact and remote portions of Alaska
- Improved hydrological forecasts
- 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
- Deployments of IMETs to support decision makers at wildland fires
- Continued support of StormReady and TsunamiReady™ Communities
- Street-level water information for every stream reach in the CONUS, at 2.7 million locations, touching virtually every citizen's local stream
- A predictive 15-hr-to-7-day national water forecast for the entire Nation
- A 30-day water outlook for the entire Nation (excluding storm influences)

DISSEMINATION

The ability to communicate warnings and forecasts to the American public is essential to protect property and save lives. To be effective, NWS requires scalable, robust, secure, 24x7 operational dissemination infrastructure, an optimized network that meets capacity requirements, and a sophisticated suite of communications systems to meet varied customer needs in a timely, reliable and authoritative manner.

Funding from this PPA is used to support the NOAA Weather Radio Program and the Integrated Dissemination Program (IDP). Dissemination maintains communication technology required by NWS for collecting, tailoring, and distribution of data and products. The resilient IDP infrastructure (in two separate locations) collects and distributes data products internally and externally and transmits experimental and developmental model products to enable research to operations (R2O) for the STI and AFS PPAs. Information is provided to multiple users in a

variety of formats including through satellite broadcast and terrestrial networks, internet, radio, and social media. Current major systems include the NWS Telecommunications Gateway (NWSTG) integrated with each IDP system, the OneNWS Network, NOAA Weather Radio (NWR), the Emergency Managers Weather Information Network (EMWIN), and an extensive network connecting NWS sites to one another and to NWS partners.

In 2017, NWS will maintain a NWR system availability rate of 96 percent and have a maximum transit time for warning messages of one second or less for system latency. In 2018, NWS will augment infrastructure as needed to support requirements, retain and preserve existing IDP capabilities and resilience, and optimize NextGen IT Web and GIS-based Services to accommodate additional data providers and increased data throughput.

To ensure a WRN and optimize the delivery of scalable and agile dissemination capabilities, the NWS organized this PPA around infrastructure, networks, web services and other warning-delivery services.

In general, activities in the Dissemination portfolio will:

- Operate NWS' information technology (IT) dissemination infrastructure and services;
- Identify NWS' dissemination requirements and gaps;
- Analyze NWS' system capabilities;
- Build, maintain, and support a scalable and geographically diverse redundant NWS dissemination architecture (IDP), consistent with and part of the emerging NOAA enterprise architecture; and,
- 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 within the IDP provides a scalable, robust, secure dissemination IT infrastructure in two geographically diverse locations for NWS, NOAA and Federal partners.

- The NWSTG is the Nation's hub for the collection and distribution of weather data and products. The NWSTG automatically collects and distributes a wide variety of environmental data such as observations, analysis, and forecast products. These time-perishable data products are distributed to ensure the fastest availability of the information fully integrated within IDP in College Park, MD and Boulder, CO.
- The Next Generation Air Transportation System (NextGen) is a multi-agency collaborative effort spanning FAA, NOAA, Department of Defense, and the National Aeronautics and Space Administration with the goal of increasing the capacity, efficiency, and safety of the Nation's air traffic system. NOAA's NextGen IT Web services provide users with flexible access to observational weather data, hazardous-weather information, and other weather forecast products required for air traffic management. NOAA provides data discovery services, data format translation, and dissemination services to improve the accuracy and availability of weather information.

Terrestrial and Satellite Networking Services ensures the required networking capacity and reliability to deliver critical weather data for both internal and external partners. 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 known as the OneNWS Network.

- The Satellite Broadcast Network (SBN) transmits critical weather data from satellites, models, observations systems and other sources, to all field office forecasters and external partners across the northwestern hemisphere. The SBN offers the capability to provide internal and external users with open access to much of NOAA's real-time environmental data.

Weather Information Distribution Services provides the capabilities to communicate weather-related warnings directly to emergency managers and the American public. These services include providing NWS data and product access for international partners via the World Meteorological Organization (WMO) Information Systems (WIS) and the robust NWS Global Information System Centres (GISC). NWS operates several weather warning services systems:

- NOAA Weather Radio (NWR) is a national warning network consisting of 1,029 transmitter stations with a broadcast coverage that reaches more than 98 percent of the Nation's population, providing critical weather and other hazard information to the U.S. public and media outlets. NWR is the only NWS dissemination system capable of reaching individuals at nominal cost (individual purchase of NOAA weather radio) in both rural and urban locations as well as across the coastal marine waters to serve the boater community.
- 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 that provides the public 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 2018 – 2022

- Maintain NWR service at 96 percent availability
- Maintain IDP/NWSTG services and GISC services
- Execute approved Roadmap for future Weather Distribution Services to support a WRN
- Operate and maintain NWS Network bandwidth/reliability
- Manage IDP system usage, reliability, and resources

FY 2018

- Augment Dissemination Infrastructure to support operational requirements
- Maintain/Enhance Geospatial Enterprise Services
- Maintain existing NextGen IT Web Services to accommodate data providers, users and increase data throughput
- Maintain/Enhance data services to the international community under the auspices of the WMO (on-going)

FY 2019

- Conduct (first year) of five year refresh of Dissemination Infrastructure hardware
- Augment Dissemination Infrastructure to support operational requirements
- Maintain existing NextGen IT Web Services to accommodate data providers, users and increase data throughput
- Maintain/Enhance Geospatial Enterprise Services

FY 2020

- Conduct (second year) of five year refresh of Dissemination Infrastructure hardware

- Augment Dissemination Infrastructure to support operational requirements
- Maintain existing NextGen IT Web Services to accommodate data providers, users and increase data throughput
- Maintain/Enhance Geospatial Enterprise Services

FY 2021

- Conduct (third year) of five year refresh of Dissemination Infrastructure hardware
- Augment Dissemination Infrastructure to support operational requirements
- Maintain existing NextGen IT Web Services to accommodate data providers, users and increase data throughput
- Maintain/Enhance Geospatial Enterprise Services

FY 2022

- Conduct (fourth year) of five year refresh of Dissemination Infrastructure hardware
- Augment Dissemination Infrastructure to support operational requirements
- Maintain existing NextGen IT Web Services to accommodate data providers, users and increase data throughput
- Maintain/Enhance Geospatial Enterprise Services

Deliverables:

- NWSTG functionality and continued 24x7 support at 99.8 percent availability
- Achieve a maximum transit time for warning messages less than one second
- NWR service availability at 96 percent
- Integration of enhanced weather data and web services operationally supported on IDP system with resilience
- 24x7 support of SBN
- Operational Terrestrial and Satellite Networking Services

SCIENCE AND TECHNOLOGY INTEGRATION

NWS improves the overall quality of the environmental information needed to safeguard life and livelihoods by integrating new science and technology into its operations. Funding in NWS' STI PPA leverages the entire weather enterprise including users, research communities, partner agencies, and industry to provide improved weather forecast guidance for the Nation. This includes engaging partners in outreach efforts, supporting targeted development efforts, improving a suite of forecast guidance models and post-processing, continuously training the workforce on scientific advances, and infusing new science into operations. Transition of new research into operations (R2O) is a fundamental activity of this portfolio. NWS identifies and transfers new science concepts and techniques to improved operational warning, forecast, and decision support services, thus enabling the NWS vision to build a Weather-Ready Nation through improved products and services.

In 2016, NWS upgraded the Hurricane Weather Research and Forecasting (HWRF) model, enabling global coverage for tropical cyclone predictions. Additionally, NWS implemented significant enhancements to its Global Forecast System (GFS) and Global Data Assimilation System (GDAS) computer numerical weather prediction (NWP) systems. The GFS/GDAS upgrade is anticipated to produce more accurate forecasts out to 10 days at high resolution and out to 16 days at lower resolution. In 2017, NWS will work to link the terrestrial and coastal water models to improve ability to assess flood risk nationwide. For FY 2018, key actions included in the STI portfolio include the following:

- Accelerate applications of advanced observing capabilities including data assimilation;

- Develop advanced operational numerical forecast models and applications of HPC 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 R2O 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 and local forecast issues through partnership with the university research community.

To achieve these goals, NWS maintains the following programs:

Weather-Ready Nation is a nationwide initiative to build community resilience in the face of increasing vulnerability to extreme weather, water, and climate events. 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 the following:

- 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.
- Incorporate and integrate social science into forecasting process to develop more effective decision support capabilities, improving the effectiveness of warnings and forecasts, and better conveying forecast risk and uncertainty.
- Transition new aviation weather science and develop high-resolution probabilistic weather information consistent across space and time for all National Airspace System managers to support safe air traffic operations.
- Extend warning and forecast lead times for tornado, hurricane, storm surge, fire weather, and winter storms with increased certainty and confidence. Develop and improve models, tools and data sets to forecast and monitor in real-time climate variations.
- Under the provisions of the Coastal Act, develop the capability to make a post-storm determination that damages were caused by either water or wind.
- Improve space weather warning and forecast for geomagnetic and radiation storms and ionospheric disturbances to protect the reliability and resilience of the Nation's electric power system, satellite navigation and telecommunication infrastructure, and support aviation and space flight safety.

Operational Environmental Prediction Modeling Suite is the foundation for all warning, forecast and decision support services. The Environmental Modeling Center (EMC) 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 underpin all NOAA forecast capabilities. The operational modeling suite provides the basic numerical guidance that NWS forecasters rely on in making 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 collaborates 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.

Improving Effectiveness of Warning and Forecasts aims to accelerate the transition of advanced modeling research into operations. This program is focused on improving warning and forecast lead-times and accuracy of severe weather events associated with hurricanes, tornados, flash floods and other severe weather hazards. Major efforts include:

- Improving the accuracy and reliability of hurricane track and intensity forecasts, through the Hurricane Forecast Improvement Project (HFIP) to reduce unnecessary evacuations. This effort also focuses on advanced data assimilation and improved global atmospheric ocean models, which underpin forecast systems for all severe weather.
- The Next Generation Global Prediction System (NGGPS) will form the backbone of NOAA's future operational numerical weather prediction capability meeting the public's evolving needs for more accurate, more specific, and longer lead time weather forecasts. NGGPS will result in significant advancements for warning and forecasts skill across multiple service areas.
- Develop and evaluate national air quality forecast models to provide national pollutant forecast information for states, local communities, commercial sectors, the Environmental Protection Agency, and the Department of State.
- Extend forecast of extreme and high impact weather to four weeks through the development of improved outlooks and transitioning into modeling operations of advancements in prediction science coming from the scientific research community

Hydrology and Water Resource Programs leverage NOAA 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 research in atmosphere, watershed, estuary 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 summit-to-sea forecasts.
- Through partnerships, especially the 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.
- Under this program NWS initiated an effort in FY 2015 to develop and test new centralized national hydrologic modeling and forecast capabilities to be deployed at the NWC.

Training Infrastructure is critical to preparing the current and future workforce for WRN. Effective training leads to better integration of new models, transition of science and technology into operations, and improved service to the Nation. The NWS workforce must remain agile and flexible to meet core partner needs. NWS uses 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.
- Identify and address local training needs, facilitate professional development, and 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 IDSS.

Improve Operational Forecast Products and Services through a continuous infusion of science and technology. This is critical for improving services and ensuring the current and future workforce is prepared to meet the requirements of a WRN. These actions include:

- Centrally manage national and regional implementation of research to operations transition at the local level including applications that improving model guidance;
- Maintain local science and training expertise through the Science and Operations Officers (SOO) and the Development and Operations Hydrologists (DOH) to lead coordinated improvements of operations through adopting new science and technology by the forecasting staff, and addressing local forecast and warning issues;
- Maintain close connections with the research community to enable and accelerate research to operations, including sponsoring the collaborative science and technology applied research (CSTAR) program, supporting testbeds, and supporting visiting scientists programs to improve NWS services.
- Leverage testbeds and operational proving grounds to establish a centralized development and testing environment (CDTE) enabling applications in real time; and,
- Provide operational platforms for broad research and development community across NWS, academia, core partners, and the weather enterprise to conduct demonstration, simulation, verification, and validation of new science and service capabilities.

Schedule and Milestones:

FY 2018 – 2022

- 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
- Demonstrate high resolution large watershed modeling with nested hyper-resolution modeling over three regional areas

FY 2018

- Implement the experimental version of the Next Generation Global Modeling System
- Implement high resolution, ensemble storm surge model
- Extending operational weather outlooks from 16 days to 30 days
- Implement results from workforce analysis

FY 2019

- Implement the operational Next Generation Global Modeling System Version 1.0
- Implement version 12 of the operational Global Ensemble Forecast System
- Implement operational seasonal Arctic sea ice outlook
- Implement version 3 of the operational Seasonal Forecast System
- Implement results from workforce analysis

FY 2020

- Complete transition of Operational Models to next-generation HPC systems
- Initiate operational probability-based forecasts of high impact weather for extended ranges (weeks 3 and 4)
- Implement results from workforce analysis

FY 2021

- Run transitioned Operational Models on next-generation HPC systems
- Run operational probability-based forecasts of high impact weather for extended ranges (weeks 3 and 4)

- Implement results from workforce analysis

FY 2022

- Run operational probability-based forecasts of high impact weather for extended ranges (weeks 3 and 4)
- Implement results from workforce analysis

Deliverables:

- Annual upgrades to operational NOAA Hurricane Forecast System
- 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 the NOAA Environmental Modeling System (NEMS) infrastructure
- Upgraded ocean, atmosphere, sea ice, land surface, wave component models
- 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 from research ocean remote sensing satellites
- Week-2, 3 & 4 to seasonal outlook tools/products for local decision support services
- New NWS experimental products focused on extreme events
- Global operational coupled atmosphere-ocean-land-wave-sea ice prediction system extending today's operational weather outlooks from 16 days out to 30 days
- Improved forecasts are provided to the Nation's critical infrastructure to ensure lives and property are protected from the effects of space weather
- Comprehensive analyses of workforce
- Evaluation of NWS testing/demonstration plans and results
- Improved public access to Federal water information
- Atmosphere, coastal, and terrestrial modeling components integrated into the community WRF-Hydro Earth system modeling framework

PROGRAM CHANGES FOR FY 2018:

NOAA requests a total net decrease of \$70,934,000 in FY 2018 program changes for the National Weather Service ORF sub-programs. Following this section are program change narratives for this sub-program that represent program changes greater than five percent of a program. Complete program changes by PPA can be found in the NOAA Control Table (p. Control Table – 5).

PROGRAM CHANGES FOR FY 2018:

Observations: Reduce Surface and Marine Observations (Base Funding: \$92,829,000 and 99 FTE; Program Change: -\$25,989,000 and 0 FTE): NOAA requests a decrease of \$25,989,000 and 0 FTE for a total of \$66,840,000 and 99 FTE. This program change reduces the scope and operations of surface and marine observations platforms.

Proposed Actions:

NOAA will reduce the National Mesonet Program (within the Surface Observations Program) and the Deep-ocean Assessment and Reporting of Tsunamis (DART®), Tropical Atmosphere Ocean (TAO), and the Weather and Oceans Platforms (within the Marine Observations Program). Specific changes include the following:

Surface Observations Program (decrease of \$11,489,000 for a total of \$35,422,000): The National Mesonet Program (page NWS-9) gathers “mesoscale meteorological” observations that can identify rapidly deteriorating weather conditions not identified by other observation platforms. NOAA will reduce the geographic scope from all 50 states to prioritize states most susceptible to tornadoes and severe weather and limit the observations to surface meteorological observations and lightning.

The Marine Observations Program (decrease of \$14,500,000 for a total of \$31,418,000): DART® moorings (page NWS-9) collect data that is used by NWS’ Tsunami Warning Centers to prepare and refine tsunami watches and warnings covering all U.S. territories and coastal states. In addition, NOAA funds targeted water level and seismic gauges to address gaps in leveraged data sets from partners such as the US Geological Survey. NOAA will eliminate funding (\$12 million) for the DART® mooring network as well as the targeted seismic and water level data. This termination is anticipated to have a 20 percent or greater impact on the accuracy, certainty, and timeliness of NOAA’s tsunami watches and warnings.

The Weather and Ocean Platform (page NWS-9) network provides forecasters with frequent, high-quality marine observations for forecast and warning preparation (including for hurricanes) and verifies forecasts after they are produced. NOAA will eliminate seven buoys (\$1.2 million) that are farthest from U.S. shores in the Atlantic Ocean and the most costly to operate while maintaining 80 percent network availability for the remaining network of 142 meteorological and ocean observing platforms. The ocean surface data provided by these buoys currently is the only ground-truth measurement of surface weather conditions in tropical cyclones. Instead, NOAA would rely on satellite and aircraft data to obtain this information.

The TAO array (page NWS-9) studies and monitors climactic variations that have profound impacts on the Nation’s weather. NOAA will reduce the 55-buoy array by 15 (\$1.3 million) while maintaining 80 percent availability for the remaining network. This reduction may delay recognition of the onset of an El Niño and the Southern Oscillation (ENSO) phenomenon and increase the uncertainty of seasonal weather forecasts issued around the world, in turn delaying the ability to mitigate impacts of drought or other conditions signaled by the ENSO phenomenon.

Resource Assessment:

The Surface Observation Program provides meteorological observations from on-the-ground stations and the Marine Observation Program provides meteorological, climatological, and tsunami data in the open ocean and coastal zones. This 12 percent reduction to these portfolios will eliminate more costly and/or lesser priority observations. This will reduce observation

diversity, while maintaining most core functions. The elimination of the tsunami observation data is consistent with overall cuts to the Tsunami Warning Program.

Schedule and Milestones:

FY 2018-2022

- Reduce scope of the National Mesonet Program to highest priority geographic extent and observations that support severe weather watches and warnings
- Terminate the Tsunami DART® moorings as well as the targeted seismic, and water level gage support, most particularly in Alaska, Hawaii, and Puerto Rico
- Reduce Weather and Ocean Platform network by seven buoys and maintain the remaining 142 at 80 percent availability
- Reduce TAO Array by 15 buoys, maintaining the remaining 40 at 80 percent availability

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

Budget Program: National Weather Service
Sub-program: Observations
Program Change: Reduce Surface and Marine Observations

Object Class	FY 2018 Decrease	FY 2018 Total Program
11 Personnel compensation		
11.1 Full-time permanent	\$0	\$74,397
11.3 Other than full-time permanent	0	110
11.5 Other personnel compensation	0	2,309
11.6 Leave Surcharge Full-Time	0	0
11.8 Special personnel services payments	0	0
11.9 Total personnel compensation	0	76,816
12 Civilian personnel benefits	0	29,100
13 Benefits for former personnel	0	66
21 Travel and transportation of persons	(85)	1,868
22 Transportation of things	(275)	3,719
23.1 Rental payments to GSA	0	5,623
23.2 Rental Payments to others	(1,131)	3,102
23.3 Communications, utilities and misc charges	(507)	11,860
24 Printing and reproduction	0	30
25.1 Advisory and assistance services	(14,963)	25,695
25.2 Other services	(5,510)	18,329
25.3 Purchases of goods & services from Gov't accounts	0	3,982
25.4 Operation and maintenance of facilities	0	0
25.5 Research and development contracts	0	424
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	(2,869)	23,942
31 Equipment	(59)	2,453
32 Lands and structures	0	2
33 Investments and loans	0	0
41 Grants, subsidies and contributions	(590)	3,583
42 Insurance claims and indemnities	0	1
43 Interest and dividends	0	1
44 Refunds	0	0
99 Total obligations	(25,989)	210,596

* Due to financial system limitations, the object class detail for Total Program reflects the full Observations PPA.

Central Processing: Advanced Weather Interactive Processing System Cyclical Refreshment: (Base Funding: \$34,002,000 and 36 FTE; Program Change: \$5,130,000 and 0 FTE): NOAA requests an increase of \$5,130,000 for a total of \$39,132,000 to fully fund the cyclical refreshment of Advanced Weather Interactive Processing System (AWIPS) Information Technology (IT) hardware.

Proposed Actions:

AWIPS (page NWS-12) integrates and displays meteorological, hydrological, satellite, and radar data at NWS field offices. AWIPS enables increasingly accurate weather predictions and dispenses time-sensitive, highly reliable warnings and advisories. This request provides the funding levels required for minimal AWIPS IT cyclical replacement including servers, workstations, monitors, and printers. Without increased funding, NWS will induce risk by extending cyclical hardware replacement from three-to-five years out to six-to-eight years.

Statement of Need and Economic Benefits:

AWIPS has been designated a Primary Mission Essential Function (PMEF) system and 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.

By deferring cyclical replacement of computer equipment, AWIPS equipment will fail at higher rates and experience more component degradation. Failed equipment may impede timely critical weather forecasts and may increase system downtime. Increased downtime results in more frequent and longer service backups (which require transferring functions to adjacent WFOs for execution). This investment minimizes inefficiencies, potential loss of data, and costs associated with system degradation.

Resource Assessment:

AWIPS resources support the information processing, display, and telecommunications system that is the cornerstone of NWS field operations. AWIPS integrates and displays observing data at NWS field offices; provides an interactive communications system to connect field locations; initiates the dissemination warnings and forecasts; and, serves as the communication interface for public-facing NOAAs data.

Schedule and Milestones:

FY 2018-2022

- AWIPS cyclical hardware replacement interval of three-to-five years

Deliverables:

- AWIPS hardware availability of 98 percent

Performance Goals and Measurement Data:

Performance Measure:	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
AWIPS Hardware Availability							
With increase	N/A	N/A	98%	98%	98%	98%	98%
Without increase	98%	96%	94%	92%	88%	84%	84%
Description: Approximately 3,100 pieces of critical AWIPS hardware infrastructure are in use every day at the NWS field offices and National Centers. This metric measures availability of this hardware to support NWS operations.							

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

Budget Program: National Weather Service
Sub-program: Central Processing
Program Change: Advanced Weather Interactive Processing System Cyclical Refreshment

Object Class	Increase	Total Program
11 Personnel compensation		
11.1 Full-time permanent	\$0	\$17,071
11.3 Other than full-time permanent	0	0
11.5 Other personnel compensation	0	636
11.6 Leave Surcharge Full-Time	0	0
11.8 Special personnel services payments	0	0
11.9 Total personnel compensation	0	17,707
12 Civilian personnel benefits	0	5,142
13 Benefits for former personnel	0	12
21 Travel and transportation of persons	0	542
22 Transportation of things	0	93
23.1 Rental payments to GSA	0	2,240
23.2 Rental Payments to others	0	0
23.3 Communications, utilities and misc charges	0	230
24 Printing and reproduction	0	8
25.1 Advisory and assistance services	575	24,128
25.2 Other services	1,880	39,648
25.3 Purchases of goods & services from Gov't accounts	0	500
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	425	2,090
31 Equipment	2,250	7,800
32 Lands and structures	0	0
33 Investments and loans	0	0
41 Grants, subsidies and contributions	0	35
42 Insurance claims and indemnities	0	0
43 Interest and dividends	0	0
44 Refunds	0	0
99 Total obligations	5,130	100,175

* Due to financial system limitations, the object class detail for Total Program reflects the full Central Processing PPA.

Central Processing: Establishment of Regional Enterprise Application Development and Integration Teams: (Base Funding: \$17,803,000 and 122 FTE; Program Change: - \$10,100,000 and -74 FTE): NOAA requests a decrease of \$10,100,000 and 74 FTE for a total of \$7,703,000 and 48 FTE to reflect the significant efficiencies that can be achieved by transitioning to a new information technology (IT) service delivery model for the NWS forecast offices.

Proposed Actions:

The NWS has realized efficiencies in the delivery of IT support services to field offices through investments in open source software and implementation of IT best practices. In FY 2018, NWS proposes to initiate a phased consolidation of its 122 Information Technology Officer (ITO) full-time equivalents (FTE). Consolidating IT support functions is a critical part of evolving the NWS, including a right-sized workforce and appropriate organizational structure. ITO officers were hired at each WFO in 2000 to support the initial installation of AWIPS, which required frequent software installation and technology upgrades. The deployment of AWIPS II, with simplified software code and strengthened system performance, has since reduced the need for on-site local maintenance. The latest follow-on contract for AWIPS, currently under competitive acquisition, will further reduce the hardware footprint through virtualization and greatly reduce maintenance needs.

These advances in technology allow NWS to decouple from a one-to-one WFO to ITO relationship and establish Regional Enterprise Application Development and Integration (READI) teams. The READI team concept has several benefits, including increased support up to 24-hour coverage (from 9 a.m. to 5 p.m., Monday through Friday, which is 24 percent of a WFOs operating hours). READI teams will ensure the working order of all computer applications and software, including regular maintenance and installation, at all WFOs remotely.

The concept enables NWS to reduce its IT workforce without impacting its mission to protect lives and property and enables the agency to provide a higher degree of consistency in service delivery. NWS will seek to reduce ITO staffing through attrition or the transitioning of staff into other positions for which they are qualified and will work diligently to mitigate any impact to affected employees.

Implementation:

Upon approval, NWS will cease recruiting and hiring personnel into the legacy ITO positions and employees encumbering 74 of the 122 ITO positions will be assigned to the NWS budget Portfolio and program for which their educational background and skill sets most closely support. This will achieve the planned FTE reduction and will provide NWS the ability to phase in changes in IT support and employee position duties. Due to existing and projected NWS personnel vacancies across all of the portfolios, there will be sufficient FTE personnel capacity and budget authority to absorb these incumbent staff during FY 2018. However, the NWS may need to make future adjustments to the annual portfolio budget spend plans to mitigate temporary imbalances in existing staff to current vacancies during the implementation period.

In the interim, these incumbent ITO employees will continue to perform their local ITO functions until the READI teams are established. Therefore, the employees' organizational assignment and position description will not change immediately but will be transitioned to established NWS position billets over a four-year implementation period. Final placement of employees into established billets in the proper grade, series, and position description will depend on 1) establishment and successful implementation of the READI team; and 2) alignment of staff to requirements first using voluntary personnel reassignments and then directed reassignments

where necessary. In many cases, the employees will be able to quickly fill corresponding vacancies in their assigned portfolio once the READI team is established. Examples include IT specialists in Central Processing or meteorologist forecaster positions under Analyze, Forecast and Support where the employee qualifications and operational skills are commensurate with a vacancy in the same series and grade. All existing ITO employees will have a job in the NWS and will retain their current grade and salary.

Resource Assessment:

NWS currently co-located one ITO with each WFO, resulting in a total of 122 ITOs in the field. NWS detailed the plan for IT support consolidation and related cost savings in its report, '*Evolving Information Technology Service Delivery at National Weather Service Field Offices,*' submitted to Congress in March 2016.

Schedule and Milestones:

FY 2018

- 74 ITO FTE redirected to other NWS budget portfolios
- Initiate limited scope implementation
- Test and evaluation of READI team concept

FY 2018-2022

- Phased transition to full implementation
- Phased transition of former ITO into other NWS positions

Deliverables:

- READI teams meeting or exceeding current service levels

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	(74)	\$95,155	(\$7,041,470)
Subtotal			<u>(74)</u>		<u>(\$7,041,470)</u>
Less Lapse	0%		<u>0</u>		<u>\$0</u>
Total Full-time permanent:			(74)		(\$7,041,470)
2018 Pay Adjustment	1.9%				<u>(\$133,788)</u>
TOTAL			(74)		<u>(\$7,175,258)</u>

Personnel Data

Full-time Equivalent Employment
 Full-time permanent
 Other than full-time permanent
Total

Number

(74)
 0
(74)

Authorized Positions:

Full-time permanent
 Other than full-time permanent
Total

(74)
 0
(74)

*Based on "Rest of US" pay scale

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 2018 Decrease	FY 2018 Total Program
11 Personnel compensation		
11.1 Full-time permanent	(\$7,175)	\$17,071
11.3 Other than full-time permanent	0	0
11.5 Other personnel compensation	0	636
11.6 Leave Surcharge Full-Time	0	0
11.8 Special personnel services payments	0	0
11.9 Total personnel compensation	(7,175)	17,707
12 Civilian personnel benefits	(2,925)	5,142
13 Benefits for former personnel	0	12
21 Travel and transportation of persons	0	542
22 Transportation of things	0	93
23.1 Rental payments to GSA	0	2,240
23.2 Rental Payments to others	0	0
23.3 Communications, utilities and misc charges	0	230
24 Printing and reproduction	0	8
25.1 Advisory and assistance services	0	8,898
25.2 Other services	0	39,648
25.3 Purchases of goods & services from Gov't accounts	0	500
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	2,090
31 Equipment	0	7,800
32 Lands and structures	0	0
33 Investments and loans	0	0
41 Grants, subsidies and contributions	0	35
42 Insurance claims and indemnities	0	0
43 Interest and dividends	0	0
44 Refunds	0	0
99 Total obligations	(10,100)	84,945

* Due to financial system limitations, the object class detail for Total Program reflects the full Central Processing PPA.

Central Processing: Slow Advanced Hydrologic Prediction Services Expansion: (Base Funding: \$6,200,000 and 0 FTE; Program Change: -\$2,000,000 and 0 FTE): NOAA requests a decrease of \$2,000,000 and 0 FTE for a total of \$4,200,000 and 0 FTE to slow the expansion of new technology at Advanced Hydrologic Prediction Services (AHPS) forecast locations.

Proposed Actions

AHPS (page NWS-12) is a web-based suite of graphical river-forecast products that provide advanced information on the magnitude and likelihood of floods and droughts for specific locations. The Hydrologic Ensemble Forecast Service (HEFS) is the key piece of the AHPS program providing forecast likelihood (uncertainty) information. NOAA will forgo the additional development needed to address limitations in the first version of HEFS – such as the ability to incorporate the effects of reservoir regulation and improve performance for large precipitation events. Training and implementation support also will be reduced for the HEFS. As a result, there will be fewer AHPS forecast locations with HEFS-based uncertainty information.

HEFS is an operational ensemble prediction service that leverages the skill in weather and climate forecasts to produce reliable ensemble forecasts of precipitation, temperature, and streamflow at forecast lead times ranging from one hour to one year. HEFS provides uncertainty ranges for hydrologic forecasts at all-time scales and enables better risk-informed decisions to support water management.

Resource Assessment:

AHPS funding is has supported the development of HEFS, which is one of the core services of the program. NWS currently has implemented 130 locations with uncertainty information integrated into AHPS, with an additional 226 locations being enhanced in FY2017.

Schedule and Milestones:

FY 2018-2022:

- Sustain existing support to continue HEFS implementation
- Maintain HEFS services

Deliverables:

- HEFS services at 1,500 water forecast service locations

Performance Goals and Measurement Data:

Performance Measure: Number of AHPS forecast locations with HEFS integration	FY 2016 Target	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
With decrease	N/A	N/A	582	834	1,058	1,279	1,500
Without decrease	130	356	582	1,216	1,991	2,361	2,734
Description: This measures total number of AHPS forecast locations with HEFS fully integrated. Prior to this decrease, NWS would have integrated HEFS at all 4,011 AHPS locations by FY 2024. Emergency managers will not have relevant information on the uncertainty of AHPS forecast at locations where HEFS is not integrated.							

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

Budget Program: National Weather Service
Sub-program: Central Processing
Program Change: Slow Advanced Hydrologic Prediction Services Expansion

Object Class		FY 2018 Decrease	FY 2018 Total Program
11	Personnel compensation		
11.1	Full-time permanent	\$0	\$17,071
11.3	Other than full-time permanent	0	0
11.5	Other personnel compensation	0	636
11.6	Leave Surcharge Full-Time	0	0
11.8	Special personnel services payments	0	0
11.9	Total personnel compensation	0	17,707
12	Civilian personnel benefits	0	5,142
13	Benefits for former personnel	0	12
21	Travel and transportation of persons	0	542
22	Transportation of things	0	93
23.1	Rental payments to GSA	0	2,240
23.2	Rental Payments to others	0	0
23.3	Communications, utilities and misc charges	0	230
24	Printing and reproduction	0	8
25.1	Advisory and assistance services	0	16,998
25.2	Other services	(2,000)	39,648
25.3	Purchases of goods & services from Gov't accounts	0	500
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	2,090
31	Equipment	0	7,800
32	Lands and structures	0	0
33	Investments and loans	0	0
41	Grants, subsidies and contributions	0	35
42	Insurance claims and indemnities	0	0
43	Interest and dividends	0	0
44	Refunds	0	0
99	Total obligations	(2,000)	93,045

* Due to financial system limitations, the object class detail for Total Program reflects the full Central Processing PPA.

Analyze, Forecast and Support: Reduce Tsunami Warning Program (Base Funding: \$19,481,000 and 40 FTE; Program Change: -\$11,000,000 and -25 FTE): NOAA requests a decrease of \$11,000,000 and 25 FTE for a total of \$8,481,000 and 15 FTE. This program change streamlines NOAA's Tsunami Research and Operational Warning program and merges the Pacific Tsunami Warning Center (PTWC) in Hawaii and the National Tsunami Warning Center (NTWC) in Alaska.

Proposed Actions:

NOAA proposes to continue to fund critical tsunami program components to ensure high-quality tsunami watches, warnings, and advisories. This reduction eliminates partner funding for education and awareness programs including grant funding to local education, awareness, and inundation and evacuation map development. NOAA will continue to explore options in the 2010 National Academies of Sciences report, *Tsunami Warning and Preparedness: An Assessment of the U.S. Tsunami Program and the Nation's Preparedness Efforts*, to merge the two Tsunami Warning Centers or co-locate them with (1) academic or scientific institutions or (2) warning or mission-critical centers such as the National Centers for Environmental Prediction.¹

This program change request is in coordination with the elimination of the DART® stations that provide tsunami observations and the sea level and seismic networks formerly supported through the NWS Observations PPA. Warnings will still be issued; however timeliness and accuracy will be reduced.

Resources Assessment:

The Tsunami Warning Program generates timely and precise tsunami-related data, conducts modeling research to improve warnings, and assists coastal communities with efforts to assess and communicate risk and mitigate potential impacts. The program communicates with a variety of national and international partners.

Schedule and Milestones:

FY 2018-2022

- Merge the Pacific Tsunami Warning Center (PTWC) in Hawaii and the National Tsunami Warning Center (NTWC) in Alaska
- Operate the Tsunami Warning Center (TWC) to monitor and predict the development, onset, and impacts of tsunamis along the Nation's coasts

Deliverables:

- Continued 24/7 operations and maintenance of a Tsunami Warning Center

¹ <https://www.nap.edu/read/12628/chapter/8#188> and <http://dels.nas.edu/Report/Tsunami-Warning-Preparedness-Assessment/12628>

PROGRAM CHANGE PERSONNEL DETAIL

Program: National Weather Service
Sub-program: Analyze, Forecast, and Support
Program Change: Reduce Tsunami Warning Program

Title:	Location	Grade	Number of Positions	Annual Salary	Total Salaries
Admin Support Assistant	TBD	GS-08	(1)	\$63,259	(63,259)
Computer Scientist	TBD	GS-13	(1)	\$119,486	(119,486)
Director	TBD	GS-15	(1)	\$167,432	(167,432)
Electronics Systems Analyst	TBD	GS-13	(1)	\$119,486	(119,486)
Electronics Technician	TBD	GS-12	(1)	\$101,324	(101,324)
Electronics Technician	TBD	GS-11	(1)	\$84,534	(84,534)
Geophysicist	TBD	GS-14	(2)	\$141,379	(282,758)
IT Specialist	TBD	GS-13	(2)	\$119,486	(238,972)
Oceanographer	TBD	GS-14	(1)	\$141,379	(141,379)
Oceanographer	TBD	GS-13	(2)	\$119,486	(238,972)
Oceanographer	TBD	GS-12	(1)	\$101,324	(101,324)
Physical Scientist	TBD	GS-14	(3)	\$141,379	(424,137)
Physical Scientist	TBD	GS-13	(7)	\$119,486	(836,402)
Tsunami Warning Science Officer	TBD	GS-14	(1)	\$141,379	(141,379)
Subtotal			<u>(25)</u>		<u>(\$3,060,844)</u>
Less Lapse	0%		<u>0</u>		<u>\$0</u>
Total Full-time permanent:			<u>(25)</u>		<u>(\$3,060,844)</u>
2018 Pay Adjustment	1.9%				<u>(\$58,156)</u>
TOTAL			<u>(25)</u>		<u>(\$3,119,000)</u>

Personnel Data

Full-time Equivalent Employment
 Full-time permanent
 Other than full-time permanent
Total

Number

(25)
 0
0
 (25)

Authorized Positions:
 Full-time permanent
 Other than full-time permanent
Total

(25)
 0
0
 (25)

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

Budget Program: National Weather Service
Sub-program: Analyze, Forecast, and Support
Program Change: Reduce Tsunami Warning Program

Object Class		FY 2018 Decrease	FY 2018 Total Program
11	Personnel compensation		
11.1	Full-time permanent	(\$3,119)	\$278,485
11.3	Other than full-time permanent	0	790
11.5	Other personnel compensation	0	23,013
11.6	Leave Surcharge Full-Time	0	0
11.8	Special personnel services payments	0	0
11.9	Total personnel compensation	<u>(3,119)</u>	302,288
12	Civilian personnel benefits	(381)	102,777
13	Benefits for former personnel	0	237
21	Travel and transportation of persons	0	5,074
22	Transportation of things	0	3,169
23.1	Rental payments to GSA	0	4,464
23.2	Rental Payments to others	0	5,528
23.3	Communications, utilities and misc charges	0	11,396
24	Printing and reproduction	0	112
25.1	Advisory and assistance services	0	12,713
25.2	Other services	0	17,369
25.3	Purchases of goods & services from Gov't accounts	0	1,657
25.4	Operation and maintenance of facilities	0	0
25.5	Research and development contracts	(1,500)	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	4,358
31	Equipment	0	1,909
32	Lands and structures	0	1,304
33	Investments and loans	0	
41	Grants, subsidies and contributions	(6,000)	6,338
42	Insurance claims and indemnities	0	0
43	Interest and dividends	0	0
44	Refunds	0	0
99	Total obligations	<u>(11,000)</u>	<u>480,693</u>

* Due to financial system limitations, the object class detail for Total Program reflects the full AFS PPA.

Analyze, Forecast and Support: Terminate Aviation Science Research to Operations (Base Funding: \$1,806,000 and 0 FTE; Program Change: -\$1,806,000 and 0 FTE): NOAA requests a decrease of \$1,806,000 and 0 FTE to eliminate NOAA's aviation science research-to-operations (R2O) effort.

Proposed Actions:

NOAA proposes to terminate its aviation science research and development and R2O transition efforts. This program change is in coordination with the decrease aviation science R2O termination request from the Science and Technology Integration PPA.

With this reduction, NOAA will be able maintain current levels of operational aviation weather forecast products and services. However, NOAA will terminate efforts to develop and implement key aviation tools and capabilities required by the Federal Aviation Administration (FAA) to support the Next Generation Air Transportation System (NextGen) (page NWS-18). NOAA will terminate support for the development and implementation of the following:

- Automated aviation forecast verification tools associated with gridded aviation forecasts, predictions of thunderstorms and verification of forecasts in airport approach areas (based on FAA requirements);
- Aviation forecast verification capabilities to meet obligations to the FAA for implementing the Quality Management System (QMS) for aviation weather services;
- Gridded turbulence and icing products to meet its ICAO requirements for World Area Forecast System (WAFS);
- Digital aviation service tools for improved consistency of aviation weather information across the National Airspace System;
- Briefing tools to improve decision support services at Air Route Traffic Control Centers (ARTCCs); and
- New data capabilities to satisfy FAA requirements to provide data into their new Aviation Weather Display at ARTCCs.

NWS will be unable to satisfy current and future requirements set by domestic (FAA) and international (ICAO) stakeholders.

Resource Assessment:

NOAA provides operational weather forecast products and services for aviation as well as develops and implements aviation tools and capabilities required by the FAA in support of NextGen aviation forecasting, verification, service, and collaboration.

Schedule and Milestones:

FY 2018 – FY 2022

- Maintain currently deployed aviation products and services

Deliverables:

- N/A – no new innovations transitioned to operations

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

Budget Program: National Weather Service
Sub-program: Analyze, Forecast and Support
Program Change: Terminate Aviation Science Research to Operations

Object Class		FY 2018 Decrease	FY 2018 Total Program
11	Personnel compensation		
11.1	Full-time permanent	\$0	\$278,485
11.3	Other than full-time permanent	0	790
11.5	Other personnel compensation	0	23,013
11.6	Leave Surcharge Full-Time	0	0
11.8	Special personnel services payments	0	0
11.9	Total personnel compensation	0	302,288
12	Civilian personnel benefits	0	102,777
13	Benefits for former personnel	0	237
21	Travel and transportation of persons	0	5,074
22	Transportation of things	0	3,169
23.1	Rental payments to GSA	0	4,464
23.2	Rental Payments to others	0	5,528
23.3	Communications, utilities and misc charges	0	11,396
24	Printing and reproduction	0	112
25.1	Advisory and assistance services	0	22,213
25.2	Other services	0	17,369
25.3	Purchases of goods & services from Gov't accounts	0	1,657
25.4	Operation and maintenance of facilities	0	0
25.5	Research and development contracts	(1,500)	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	4,358
31	Equipment	0	1,909
32	Lands and structures	0	1,304
33	Investments and loans	0	
41	Grants, subsidies and contributions	0	6,338
42	Insurance claims and indemnities	0	0
43	Interest and dividends	0	0
44	Refunds	0	0
99	Total obligations	(1,500)	490,193

* Due to financial system limitations, the object class detail for Total Program reflects the full AFS PPA.

Analyze, Forecast and Support: Consolidate Climate Prediction Center/Weather Prediction Center Functions (Base Funding: \$4,029,000 and 28 FTE; Program Change: - \$1,200,000 and -8 FTE): NOAA requests a decrease of \$1,200,000 and 8 FTE for a total of \$2,829,000 and 20 FTE to consolidate functions at the National Centers for Environmental Prediction (NCEP) Climate Prediction Center (CPC) and Weather Prediction Center (WPC).

Proposed Actions:

NOAA proposes to consolidate NCEP's CPC (page NWS-14) into the WPC. Specifically, this consolidation will result in the following:

- Create one national center that will span the continuum of prediction services from the present through existing sub-seasonal and seasonal time domains
- Eliminate overlap between the ever-changing transition at the weather and climate domains to develop a more continuous suite of products
- Improve efficiency and create more staffing flexibility as the WPC's contributions toward Evolving the NWS expands
- Promote consistency in presentation of data and forecast information with increased ability to respond to extreme weather.
- Continue base products, such as routine monthly and seasonal predictions of temperature and precipitation and El Nino/La Nina products will continue.

While some efficiency will be realized, this consolidation will limit some of NOAA's products and services such as climate prediction products with domains over hemispheres other than North America/Arctic. Some of these global climate predictions provide information that can lead to understanding of international phenomena like flood and drought that could impact food supplies. These global forecast products have supported national security planning and execution activities at the Department of Defense and the United States Agency for International Development including food security and disaster risk reduction, as well as pandemic health planning.

Resource Assessment:

Resources support CPC and WPC mission areas that include real-time products and information on timescales from weeks to sub-seasonal and seasonal, integrating observed weather with longer-term climate variability and national forecasts in support of the NWS mission.

Schedule and Milestones:

FY 2018-2022

- Weather Prediction Center provides a continuum of products and services from near term through sub-seasonal to seasonal timeframes

Deliverables:

- Operations of the Weather Prediction Center providing weather and climate predictions from near term through sub-seasonal to seasonal timeframes

PROGRAM CHANGE PERSONNEL DETAIL

Program: National Weather Service
Sub-program: Analyze, Forecast and Support
Program Change: Consolidate CPC/WPC Functions

Title:	Location	Grade	Number of Positions	Annual Salary	Total Salaries
Director	Maryland	SES	(1)	\$220,802	(\$220,802)
Lead Physical Scientist	Maryland	GS-14	(2)	\$164,344	(\$328,688)
Physical Scientist	Maryland	GS-13	(4)	\$138,919	(\$555,676)
Admin Assistant	Maryland	GS-08	(1)	\$72,459	(\$72,459)
Subtotal			<u>(8)</u>		<u>(\$1,177,625)</u>
Less Lapse	0%		<u>0</u>		<u>\$0</u>
Total Full-time permanent:			(8)		(\$1,177,625)
2018 Pay Adjustment	1.9%				<u>(\$22,375)</u>
TOTAL			(8)		<u>(\$1,200,000)</u>

Personnel Data

	Number
Full-time Equivalent Employment	
Full-time permanent	(8)
Other than full-time permanent	<u>0</u>
Total	(8)
Authorized Positions:	
Full-time permanent	(8)
Other than full-time permanent	<u>0</u>
Total	(8)

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

Budget Program: National Weather Service
Sub-program: Analyze, Forecast and Support
Program Change: Consolidate Climate Prediction Center/Weather Prediction Center Functions

Object Class		FY 2018 Decrease	FY 2018 Total Program
11	Personnel compensation		
11.1	Full-time permanent	(\$1,200)	\$278,485
11.3	Other than full-time permanent	0	790
11.5	Other personnel compensation	0	23,013
11.6	Leave Surcharge Full-Time	0	0
11.8	Special personnel services payments	0	0
11.9	Total personnel compensation	<u>(1,200)</u>	<u>302,288</u>
12	Civilian personnel benefits	0	102,777
13	Benefits for former personnel	0	237
21	Travel and transportation of persons	0	5,074
22	Transportation of things	0	3,169
23.1	Rental payments to GSA	0	4,464
23.2	Rental Payments to others	0	5,528
23.3	Communications, utilities and misc charges	0	11,396
24	Printing and reproduction	0	112
25.1	Advisory and assistance services	0	22,513
25.2	Other services	0	17,369
25.3	Purchases of goods & services from Gov't accounts	0	1,657
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	4,358
31	Equipment	0	1,909
32	Lands and structures	0	1,304
33	Investments and loans	0	
41	Grants, subsidies and contributions	0	6,338
42	Insurance claims and indemnities	0	0
43	Interest and dividends	0	0
44	Refunds	0	0
99	Total obligations	<u>(1,200)</u>	<u>490,493</u>

* Due to financial system limitations, the object class detail for Total Program reflects the full AFS PPA.

Dissemination: Enhance the Resilience and Reliability of Integrated Dissemination Program Applications: (Base Funding: \$14,565,000 and 81 FTE; Program Change:

\$4,000,000 and 0 FTE): NOAA requests an increase of \$4,000,000 for a total of \$18,565,000 and 81 FTE to fund upgrades and enhancements to operational applications on the Integrated Dissemination Program (IDP) systems in College Park, MD and Boulder, CO.

Proposed Actions:

The Integrated Dissemination Program systems funded within the Information Technology (IT) Infrastructure and Virtualized Applications project provide scalable, robust, secure, and commonly shared IT infrastructure to ensure resilience and reliability during critical weather events. This request addresses the operations and maintenance of the IDP infrastructure (page NWS-17) as well as the contractor services required to sustain web and GIS services and enhancements of existing applications. Most importantly, the requested funding will help integrate targeted mission-critical applications into the dissemination infrastructure providing a higher level of redundancy and reliability than what exists currently for our partners and customers.

By increasing and enhancing the resilience of these existing applications – designed to protect life and property and enhance the national economy – the entire weather enterprise will benefit, with operational dissemination services running within a 24x7 supported environment. While the onboarding of new applications will be at a slower rate than in FY 2017, applications in support of hydrologic services (such as Advanced Hydrologic Prediction Service and hydrologic model *WRF-Hydro*), transitioning NWS National Center and River Forecast Center websites, and damage assessment tools would provide greater resilience when the weather enterprise needs it most.

Statement of Need and Economic Benefits:

NOAA is building community resilience to increasing vulnerability to extreme weather and water events. To support this resilience, this request provides funding for steady state operations and maintenance of the IDP systems. For the first time in NWS history, infrastructure in two geographically diverse locations with 100 percent backup capability exists to provide the weather enterprise with timely and reliable watches, warnings, data, and web services.

Resource Assessment:

Dissemination IT Infrastructure and Virtualized Application Services within IDP provides a secure dissemination IT infrastructure in two geographically diverse locations for NWS, NOAA and Federal partners. Resources are used to sustain this secure IT infrastructure in addition to supporting the operations of IT Infrastructure and Virtualized Applications on IDP.

Schedule and Milestones:

FY 2018-2022

- IDP systems providing mission-critical dissemination services to support WRN.

Deliverables:

- Providing 99.8 percent uptime capability of IDP systems.

Performance Goals and Measurement Data:

Performance Measure: Number of applications that must be maintained in IDP	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
With increase*	7	30	36	42	48	54	60
Without increase	N/A	N/A	30	30	30	30	30
Description: Increased O&M funding levels will provide the reliability and performance required of critical targeted life-saving dissemination services to support the entire weather enterprise and the American public.							

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

Budget Program: National Weather Service
Sub-program: Dissemination
Program Change: Enhance the Resilience and Reliability of Integrated Dissemination Program Applications

Object Class		FY 2018 Increase	FY 2018 Total Program
11	Personnel compensation		
11.1	Full-time permanent	\$0	\$9,400
11.3	Other than full-time permanent	0	0
11.5	Other personnel compensation	0	0
11.6	Leave Surcharge Full-Time	0	0
11.8	Special personnel services payments	0	0
11.9	Total personnel compensation	0	9,400
12	Civilian personnel benefits	0	2,800
13	Benefits for former personnel	0	0
21	Travel and transportation of persons	0	165
22	Transportation of things	0	62
23.1	Rental payments to GSA	0	840
23.2	Rental Payments to others	0	0
23.3	Communications, utilities and misc charges	0	8,100
24	Printing and reproduction	0	0
25.1	Advisory and assistance services	0	
25.2	Other services	4,000	27,198
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	300
25.8	Subsistence and support of persons	0	0
26	Supplies and materials	0	500
31	Equipment	0	250
32	Lands and structures	0	0
33	Investments and loans	0	0
41	Grants, subsidies and contributions	0	350
42	Insurance claims and indemnities	0	0
43	Interest and dividends	0	0
44	Refunds	0	0
99	Total obligations	4,000	49,965

* Due to financial system limitations, the object class detail for Total Program reflects the full Dissemination PPA.

Dissemination: Restore Funding to Weather Information Distribution Services: (Base Funding: \$14,840,000 and 0 FTE; Program Change: \$1,996,000 and 0 FTE): NOAA requests an increase of \$1,996,000 for a total of \$16,836,000 and 0 FTE to fully fund the operations and maintenance of the NOAA Weather Radio platform supported by Weather Information Distribution Services (WIDS).

Proposed Actions:

WIDS (page NWS-19) supports systems that distribute weather-related warnings directly to emergency managers and the public. These include, but are not limited to, NOAA Weather Radio (NWR), Emergency Managers Weather Information Network (EMWIN), Hydrometeorological Automated Data System (HADS), Centralized Automated Data Acquisition System (CADAS), Geospatial and Web services. This request restores baseline funding for maintenance, equipment, leases, utilities, and telecommunications for NWR. Without this funding, NOAA Weather Radio would decommission transmitter sites at highest-cost locations in rural areas (due to remoteness) and urban areas (due to high-cost leased space at transmitter sites). In these locations, the public would need to rely on potentially less reliable modalities such as television and cell phone “apps” to obtain dissemination alerting services for weather-related warnings.

Statement of Need and Economic Benefits:

Improving weather decision services and sector-relevant information to support economic productivity can only happen if weather information is communicated and delivered to users with clear, accessible, actionable information made available across multi-source, multi-platform channels. NWR infrastructure is a national warning network consisting of 1,029 transmitter stations with a broadcast coverage that reaches more than 98 percent of the Nation’s population providing critical weather and other hazard information to the U.S. public and media outlets.

Resource Assessment:

Current resources are not sufficient to support minimal levels of O&M support for NWR. NWR lease costs, including tower and ground, have increased significantly over the last several years as NWS competes with the growing cellular industry.

Schedule and Milestones:

FY 2018-2022

- NWR operating from 1,029 transmitters

Deliverables:

- Over 98 percent of the Nation’s population having access to NWR

Performance Goals and Measurement Data:

Performance Measure:	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022
Number of NWR Transmitter Stations	Actual	Target	Target	Target	Target	Target	Target
With increase	N/A	N/A	1,029	1,029	1,029	1,029	1,029
Without increase	1,029	913	794	794	794	794	794
Description: Reduced O&M funding levels require reduction to number of NWR transmitters. Reduction of transmitter stations corresponds to reduction in percentage of U.S. population having access to critical NWR alerts, warnings and information.							

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

Budget Program: National Weather Service
Sub-program: Dissemination
Program Change: Restore Funding to Weather Information Distribution Services

Object Class		FY 2018 Increase	FY 2018 Total Program
11	Personnel compensation		
11.1	Full-time permanent	\$0	\$9,400
11.3	Other than full-time permanent	0	0
11.5	Other personnel compensation	0	0
11.6	Leave Surcharge Full-Time	0	0
11.8	Special personnel services payments	0	0
11.9	Total personnel compensation	0	9,400
12	Civilian personnel benefits	0	2,800
13	Benefits for former personnel	0	0
21	Travel and transportation of persons	0	165
22	Transportation of things	0	62
23.1	Rental payments to GSA	0	840
23.2	Rental Payments to others	0	0
23.3	Communications, utilities and misc charges	0	8,100
24	Printing and reproduction	0	0
25.1	Advisory and assistance services	0	
25.2	Other services	1,996	25,194
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	300
25.8	Subsistence and support of persons	0	0
26	Supplies and materials	0	500
31	Equipment	0	250
32	Lands and structures	0	0
33	Investments and loans	0	0
41	Grants, subsidies and contributions	0	350
42	Insurance claims and indemnities	0	0
43	Interest and dividends	0	0
44	Refunds	0	0
99	Total obligations	1,996	47,961

* Due to financial system limitations, the object class detail for Total Program reflects the full Dissemination PPA.

Dissemination: Reduce Support for NextGen IT Web Services: (Base Funding: \$14,893,000 and 82 FTE; Program Change: -\$1,100,000 and 0 FTE): NOAA requests a decrease of \$1,100,000 for a total of \$13,793,000 and 82 FTE to reduce NOAA IT support to the Federal Aviation Administration (FAA) Next Generation Air Transportation System (NextGen) program.

Proposed Action:

NOAA provides NextGen IT web services (page NWS-18) to FAA and other aviation users. In FY 2017, support contractors delivered the initial IT Web services to support the NextGen program. In FY 2018, NOAA will reduce funding to the NextGen program but will maintain the existing NextGen IT Web Services support to accommodate data providers and users and increase data throughput. However, enhancements such as providing Himawari satellite data, new ensemble model parameters, new observations, volcanic ash advisories, and graphical aviation products such as G-AIRMETs would not be provided to the user community.

Resource Assessment:

Dissemination funding will be used to sustain only steady-state NextGen IT Web Services. Enhancements to NextGen IT Web Services will be discontinued.

Schedule and Milestones:

FY 2018 – FY 2022

- Maintain existing NextGen IT Web Services support to accommodate data providers, users and increase data throughput
- Discontinue enhancements to the NextGen program

Deliverables:

- Steady-state of existing NextGen IT Web Services support

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

Budget Program: National Weather Service
Sub-program: Dissemination
Program Change: Reduce Support for NextGen IT Web Services

Object Class	FY 2018 Decrease	FY 2018 Total Program
11 Personnel compensation		
11.1 Full-time permanent	\$0	\$9,400
11.3 Other than full-time permanent	0	0
11.5 Other personnel compensation	0	0
11.6 Leave Surcharge Full-Time	0	0
11.8 Special personnel services payments	0	0
11.9 Total personnel compensation	0	9,400
12 Civilian personnel benefits	0	2,800
13 Benefits for former personnel	0	0
21 Travel and transportation of persons	0	165
22 Transportation of things	0	62
23.1 Rental payments to GSA	0	840
23.2 Rental Payments to others	0	0
23.3 Communications, utilities and misc charges	0	8,100
24 Printing and reproduction	0	0
25.1 Advisory and assistance services	0	
25.2 Other services	(1,100)	22,098
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	300
25.8 Subsistence and support of persons	0	0
26 Supplies and materials	0	500
31 Equipment	0	250
32 Lands and structures	0	0
33 Investments and loans	0	0
41 Grants, subsidies and contributions	0	350
42 Insurance claims and indemnities	0	0
43 Interest and dividends	0	0
44 Refunds	0	0
99 Total obligations	(1,100)	44,865

* Due to financial system limitations, the object class detail for Total Program reflects the full Dissemination PPA.

Science and Technology Integration: Terminate Investment in Mid-Range Weather Outlooks: (Base Funding \$5,000,000 and 0 FTE: Program Change: -\$5,000,000 and 0 FTE)

NOAA requests a decrease of \$5,000,000 and 0 FTE to terminate development, testing, and implementation of experimental products to extend operational weather outlooks from 16 days to 30 days.

Proposed Actions:

NOAA proposes to halt efforts associated with the testing and implementation of new operational outlook products, including those for temperature and precipitation, designed to extend weather outlooks from the current 16 days into the weeks three and four (mid-range). As a result, NOAA will eliminate efforts to support the transition of new research (needed to extend the predictability of extreme or high-impact weather beyond 10 days) into operational use. As well, NOAA will eliminate efforts to develop and implement improved coupled global weather prediction models (including component models of ocean, sea-ice, wave, and land-surface models) for extending weather predictions beyond 14 days. Specifically, NOAA will terminate support for the development and implementation of the following multi-model coupled earth system modeling efforts:

- Operational coupled ocean-atmosphere-wave-sea ice forecast system for the seasonal arctic sea-ice outlook.
- Operational Seasonal Forecast System version 3, the next iteration of a fully coupled model representing the interaction between the Earth's atmosphere, oceans, land, and sea ice.
- Operationalizing currently experimental probability-based forecasts of high impact weather for week three and four.
- Global operational coupled atmosphere-ocean-land-wave-sea ice prediction system.

Resource Assessment:

NOAA received funding for mid-range weather outlooks in the FY 2016 Omnibus Appropriations Act. NWS has started testing and implementing new operational outlook products including those for temperature and precipitation designed to extend weather outlooks from the current 16 days into the weeks three and four (mid-range).

Performance Goals and Measurement Data:

Performance Measure:	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022
Weeks 3-4 temperature outlook accuracy	Actual	Target	Target	Target	Target	Target	Target
With Decrease	N/A	N/A	0	0	0	0	0
Without Decrease	N/A	N/A	0	5	8	10	12
Description: This measures the Heidke Skill Score, which measures the skill of a probabilistic forecast relative to chance. Daily week three and four outlooks for U.S. surface temperature will no longer be reported, so the skill score is zero.							

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

Budget Program: National Weather Service
Sub-program: Science and Technology Integration
Program Change: Terminate Investment in Mid-Range Weather Outlooks

Object Class	FY 2018 Decrease	FY 2018 Total Program
11 Personnel compensation		
11.1 Full-time permanent	\$0	\$44,310
11.3 Other than full-time permanent	0	162
11.5 Other personnel compensation	0	1,239
11.6 Leave Surcharge Full-Time	0	0
11.8 Special personnel services payments	0	0
11.9 Total personnel compensation	0	45,711
12 Civilian personnel benefits	0	13,256
13 Benefits for former personnel	0	26
21 Travel and transportation of persons	(50)	1,383
22 Transportation of things	(5)	305
23.1 Rental payments to GSA	0	4,361
23.2 Rental Payments to others	0	57
23.3 Communications, utilities and misc charges	0	662
24 Printing and reproduction	0	89
25.1 Advisory and assistance services	(4,150)	35,673
25.2 Other services	(750)	11,407
25.3 Purchases of goods & services from Gov't accounts	0	2,852
25.4 Operation and maintenance of facilities	0	0
25.5 Research and development contracts	0	55
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	(25)	965
31 Equipment	(20)	1,646
32 Lands and structures	0	0
33 Investments and loans	0	0
41 Grants, subsidies and contributions	0	14,254
42 Insurance claims and indemnities	0	0
43 Interest and dividends	0	0
44 Refunds	0	0
99 Total obligations	(5,000)	\$132,702

* Due to financial system limitations, the object class detail for Total Program reflects the full STI PPA.

Science and Technology Integration: Terminate Coastal Act (Base Funding: \$4,629,000 and 0 FTE; Program Change: -\$4,629,000 and 0 FTE): NOAA requests a decrease of \$4,629,000 and 0 FTE to terminate actions associated with the implementation of the Consumer Option for an Alternative System To Allocate Losses (COASTAL) Act of 2012.

Proposed Actions:

NOAA proposes to terminate efforts associated with the Consumer Option for an Alternative System to Allocate Losses (COASTAL) Act implementation within NWS. This includes efforts to develop the capability to produce detailed “post-storm assessments” in the aftermath of a damaging tropical cyclone that strikes the U.S. or its territories, using output from the Named Storm Event Model (NSEM) that indicate the strength and timing of damaging winds and water at a given location. This also terminates efforts to create a Coastal Wind and Water Event Database (CWWED) to provide the public access to “covered data” (the observations collected during the storm to assist with the assessment). This includes ending developmental efforts necessary for building NSEM and CWWED (including high-resolution hurricane model-based post storm assessments, coastal storm surge and wave model upgrades, and integration), as well as execution and maintenance requirements.

Resource Assessment:

NOAA uses COASTAL Act funds to develop the capability to make a post-storm determination that damages were caused by either water or wind.

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

Budget Program: National Weather Service
Sub-program: Science and Technology Integration
Program Change: Terminate Coastal Act

Object Class		FY 2018 Decrease	FY 2018 Total Program
11	Personnel compensation		
11.1	Full-time permanent	\$0	\$44,310
11.3	Other than full-time permanent	0	162
11.5	Other personnel compensation	0	1,239
11.6	Leave Surcharge Full-Time	0	0
11.8	Special personnel services payments	0	0
11.9	Total personnel compensation	0	45,711
12	Civilian personnel benefits	0	13,256
13	Benefits for former personnel	0	26
21	Travel and transportation of persons	0	1,383
22	Transportation of things	0	305
23.1	Rental payments to GSA	0	4,361
23.2	Rental Payments to others	0	57
23.3	Communications, utilities and misc charges	0	662
24	Printing and reproduction	0	89
25.1	Advisory and assistance services	(3,000)	36,044
25.2	Other services	0	11,407
25.3	Purchases of goods & services from Gov't accounts	0	2,852
25.4	Operation and maintenance of facilities	0	0
25.5	Research and development contracts	0	55
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	965
31	Equipment	0	1,646
32	Lands and structures	0	0
33	Investments and loans	0	0
41	Grants, subsidies and contributions	(1,629)	14,254
42	Insurance claims and indemnities	0	0
43	Interest and dividends	0	0
44	Refunds	0	0
99	Total obligations	(4,629)	\$133,073

* Due to financial system limitations, the object class detail for Total Program reflects the full STI PPA.

Science and Technology Integration: Reduce the Investment in Numerical Weather Prediction Modeling (Base Funding \$14,500,000 and 0 FTE: Program Change: -\$5,000,000 and 0 FTE.) NOAA requests a reduction of \$5,000,000 and 0 FTE for a total of \$9,500,000 and 0 FTE to decelerate investment that would transition advanced modeling research into operations for improved warnings and forecasts.

Proposed Actions:

NOAA proposes to slow down the development of the Next Generation Global Prediction System (NGGPS) (page NWS-22) including reducing support to the unified data assimilation development; eliminating support to the development of the Unified Global Coupled System; reducing support to the collaborative research activities for the Hurricane Forecast Improvement Project (HFIP); reducing support to NOAA's testbeds including the Development Test Center, Global Modeling Test Bed, and Joint Center for Satellite Data Assimilation; and slowing the effort to transition new physics into the global forecast system and hurricane forecast system. NOAA also will reduce the development of the NOAA Environmental Modeling System (NEMS) infrastructure by 20 percent. NEMS streamlines the interaction of analysis, forecast, and post-processing systems within NCEP.

Schedule and Milestones

- Implement Next Generation Global Modeling System
- Complete transition of Operational Models to next-generation High Performance Computing Systems

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

Budget Program: National Weather Service
Sub-program: Science and Technology Integration
Program Change: Reduce the Investment in Numerical Weather Prediction Modeling

Object Class	FY 2018 Decrease	FY 2018 Total Program
11 Personnel compensation		
11.1 Full-time permanent	\$0	\$44,310
11.3 Other than full-time permanent	0	162
11.5 Other personnel compensation	0	1,239
11.6 Leave Surcharge Full-Time	0	0
11.8 Special personnel services payments	0	0
11.9 Total personnel compensation	0	45,711
12 Civilian personnel benefits	0	13,256
13 Benefits for former personnel	0	26
21 Travel and transportation of persons	0	1,383
22 Transportation of things	0	305
23.1 Rental payments to GSA	0	4,361
23.2 Rental Payments to others	0	57
23.3 Communications, utilities and misc charges	0	662
24 Printing and reproduction	0	89
25.1 Advisory and assistance services	(3,000)	35,673
25.2 Other services	0	11,407
25.3 Purchases of goods & services from Gov't accounts	0	2,852
25.4 Operation and maintenance of facilities	0	0
25.5 Research and development contracts	0	55
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	965
31 Equipment	0	1,646
32 Lands and structures	0	0
33 Investments and loans	0	0
41 Grants, subsidies and contributions	(2,000)	14,254
42 Insurance claims and indemnities	0	0
43 Interest and dividends	0	0
44 Refunds	0	0
99 Total obligations	(5,000)	\$132,702

* Due to financial system limitations, the object class detail for Total Program reflects the full STI PPA.

Science and Technology Integration: Reduce the Investment in the National Water Model (Base Funding: \$6,000,000 and 0 FTE: Program Change: -\$3,101,000 and 0 FTE). NOAA requests a reduction of \$3,101,000 and 0 FTE for a total of \$2,899,000 and 0 FTE to reduce investment in the National Water Model and delay future model upgrades.

Proposed Actions:

In FY 2016, NOAA launched the first centralized operational National Water Model (page NWS-13). In 2018, NOAA will slow upgrades to the National Water Model. This reduction will significantly delay development of centralized water prediction products and services at the National Water Center including the following:

- Slow by 50 percent the development of new features in, and services provided by, the National Water Model including the development of nested hyper-resolution modeling and enhanced hydro-meteorological forcing.
- Reduce rate at which real-time flood forecast inundation mapping is developed, tested and implemented regionally.
- Scale back the number of basins subjected to detailed testing and evaluation.
- Double the time needed to achieve a national operational capability by slowing the region by region deployment.

Schedule and Milestone

FY 2018 – FY 2022

- Demonstrate high resolution large watershed modeling with nested hyper-resolution modeling - Reduced from three regional areas to one regional area.
- Initial provision of national water prediction products (based on NWM)
- Develop atmosphere, coastal, and terrestrial modeling components for community national water modeling framework, with one-way coupling for demonstration regions
- Develop medium range forecasts with zero to three day ensemble-based guidance into the framework to produce predictions out zero to seven days

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

Budget Program: National Weather Service
Sub-program: Science and Technology Integration
Program Change: Reduce the Investment in the National Water Model

Object Class	Decrease	Total Program
11 Personnel compensation		
11.1 Full-time permanent	\$0	\$44,310
11.3 Other than full-time permanent	0	162
11.5 Other personnel compensation	0	1,239
11.6 Leave Surcharge Full-Time	0	0
11.8 Special personnel services payments	0	0
11.9 Total personnel compensation	0	45,711
12 Civilian personnel benefits	0	13,256
13 Benefits for former personnel	0	26
21 Travel and transportation of persons	0	1,383
22 Transportation of things	0	305
23.1 Rental payments to GSA	0	4,361
23.2 Rental Payments to others	0	57
23.3 Communications, utilities and misc charges	0	662
24 Printing and reproduction	0	89
25.1 Advisory and assistance services	(601)	37,572
25.2 Other services	0	11,407
25.3 Purchases of goods & services from Gov't accounts	0	2,852
25.4 Operation and maintenance of facilities	0	0
25.5 Research and development contracts	0	55
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	965
31 Equipment	0	1,646
32 Lands and structures	0	0
33 Investments and loans	0	0
41 Grants, subsidies and contributions	(2,500)	14,254
42 Insurance claims and indemnities	0	0
43 Interest and dividends	0	0
44 Refunds	0	0
99 Total obligations	(3,101)	\$134,601

* Due to financial system limitations, the object class detail for Total Program reflects the full STI PPA.

Science and Technology Integration: Reduce Testing, Evaluation, and Implementation of Operations and Workforce Analysis Recommendations (Base Funding: \$3,000,000 and 2 FTE; Program Change: -\$2,000,000 and 0 FTE): NOAA requests a decrease of \$2,000,000 and 0 FTE for a total of \$1,000,000 and 2 FTE as the Operations and Workforce Analysis (OWA) is completed and NOAA's efforts shift to testing, evaluation, and implementation phases.

Proposed Actions:

NOAA completed its OWA (page NWS-1) with FY 2017 resources and proposes to conduct testing, evaluation, and implementation of the recommendations, with particular emphasis on the three recommendations that have the highest likelihood of success. NOAA will use its current staffing and capacity for the Operations Proving Ground (OPG) to conduct testing, demonstration, and transition into operations of new operational and forecast processes, workflows, and supporting tools and technologies. NOAA will prioritize field demonstrations aimed at supporting consistent implementation of Impact-Based Decision Support Services (IDSS).

Resource Assessment:

Resources are being used to address recommendations of 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. Funds have been used to (1) analyze workforce and infrastructure; (2) enhance capacity for testing and demonstration; (3) improve mechanisms to seek stakeholder advice; and (4) improve capability to evaluate progress.

Schedule and milestones:

The first set of actions for consideration includes initiating the following:

- Auto-Launchers beginning in Alaska
- Deliver tools for demonstration
- Begin implementation of enhanced, consistent IDSS
- Collaborative Forecast Process
- GS 5-12 Career Progression

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

Budget Program: National Weather Service
Sub-program: Science and Technology Integration
Program Change: Reduce Testing, Evaluation, and Implementation of Operations and Workforce Analysis Recommendations

Object Class		Decrease	Total Program
11	Personnel compensation		
11.1	Full-time permanent	\$0	\$44,310
11.3	Other than full-time permanent	0	162
11.5	Other personnel compensation	0	1,239
11.6	Leave Surcharge Full-Time	0	0
11.8	Special personnel services payments	0	0
11.9	Total personnel compensation	0	45,711
12	Civilian personnel benefits	0	13,256
13	Benefits for former personnel	0	26
21	Travel and transportation of persons	0	1,383
22	Transportation of things	0	305
23.1	Rental payments to GSA	0	4,361
23.2	Rental Payments to others	0	57
23.3	Communications, utilities and misc charges	0	662
24	Printing and reproduction	0	89
25.1	Advisory and assistance services	(1,500)	38,673
25.2	Other services	0	11,407
25.3	Purchases of goods & services from Gov't accounts	0	2,852
25.4	Operation and maintenance of facilities	0	0
25.5	Research and development contracts	0	55
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	965
31	Equipment	0	1,646
32	Lands and structures	0	0
33	Investments and loans	0	0
41	Grants, subsidies and contributions	(500)	14,254
42	Insurance claims and indemnities	0	0
43	Interest and dividends	0	0
44	Refunds	0	0
99	Total obligations	(2,000)	\$135,702

* Due to financial system limitations, the object class detail for Total Program reflects the full STI PPA.

Science and Technology Integration: Terminate Aviation Science Research to Operations (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 to eliminate NOAA's aviation science research-to-operations (R2O) effort.

Proposed Actions:

NOAA proposes to terminate aviation science research and development and R2O transition efforts within NWS. This program change is in coordination with the decrease aviation science R2O termination request in the Analyze, Forecast and Support PPA.

The NWS will maintain the current level of operational aviation weather forecast products and services. However this reduction will terminate efforts to develop and implement key aviation tools and capabilities. Specifically, NWS will terminate support for the development and implementation of the following:

- Automated aviation forecast verification tools associated with gridded aviation forecasts to meet obligations to the FAA for implementing the Quality Management System (QMS) for aviation weather services;
- Digital aviation service tools for improved consistency of aviation weather information across the National Airspace System;
- Collaborative aviation weather statement (CAWS) and convective forecast planning guidance (CCFP) to support FAA for effective traffic flow management;
- Local aviation model statistical guidance supporting aviation weather services by CWSU, WFOs and FAA; and
- Integrated support for impacted air-traffic environment (INSITE) tool supporting Aviation Weather Center and ATCSCC to improve management of National Airspace System.

Resource Assessment:

NOAA provides operational weather forecast products and services for aviation as well as develops and implements aviation tools and capabilities required by the FAA in support of the Next Generation Air Transportation System (NextGen). Aviation forecast, verification, service, and collaboration capabilities that require new research or transition resources will remain at current levels. NWS will be unable to satisfy current and future improvements requested by domestic (FAA) and international (ICAO) stakeholders.

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

Program Change: Terminate Aviation Science Research to Operations
Budget Program: National Weather Service
Sub-program: Science and Technology Integration

Object Class	FY 2018 Decrease	FY 2018 Total Program
11 Personnel compensation		
11.1 Full-time permanent	\$0	\$44,310
11.3 Other than full-time permanent	0	162
11.5 Other personnel compensation	0	1,239
11.6 Leave Surcharge Full-Time	0	0
11.8 Special personnel services payments	0	0
11.9 Total personnel compensation	0	45,711
12 Civilian personnel benefits	0	13,256
13 Benefits for former personnel	0	26
21 Travel and transportation of persons	0	1,383
22 Transportation of things	0	305
23.1 Rental payments to GSA	0	4,361
23.2 Rental Payments to others	0	57
23.3 Communications, utilities and misc charges	0	662
24 Printing and reproduction	0	89
25.1 Advisory and assistance services	(500)	39,673
25.2 Other services	0	11,407
25.3 Purchases of goods & services from Gov't accounts	0	2,852
25.4 Operation and maintenance of facilities	0	0
25.5 Research and development contracts	0	55
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	965
31 Equipment	0	1,646
32 Lands and structures	0	0
33 Investments and loans	0	0
41 Grants, subsidies and contributions	(500)	14,254
42 Insurance claims and indemnities	0	0
43 Interest and dividends	0	0
44 Refunds	0	0
99 Total obligations	(1,000)	\$136,702

* Due to financial system limitations, the object class detail for Total Program reflects the full STI PPA.

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 capacity operations and development;
- Develop forecaster tools for improved decision support; and
- Enhance NOAA's dissemination capabilities for weather and climate services and products.

OBSERVATIONS

The Observations Programs, Projects, and Activities (PPA) supports the life-cycle of all NWS observing system investments by providing technical solutions to address NWS operational observational requirements. With Procurement, Acquisition, and Construction (PAC) funding, NOAA improves current observational capabilities, provides large scale recapitalization of significant observational systems, and engineers technical solutions for systems to meet evolving requirements and demands.

In FY 2017, NWS initiated an Automated Surface Observing System (ASOS) Service Life Extension Program (SLEP) with acquisition planning for the production and installation of the upgraded Acquisition Control Unit (ACU) and Data Collection Package (DCP), primarily relying on reimbursable funding from tri-agency partners (FAA, DOD).

In FY 2018, NWS will continue its Next Generation Weather Radar (NEXRAD) SLEP, completing the signal processor deployment and initiating pedestal refurbishments to extend overall service life and reduce average time between failures.

Specifically with the PAC appropriation, the funds in the Observations PPA are used to:

- Implement improved sensors to the current observational suite; and
- Extend the service life of the nation's weather radar network.

To achieve these goals, NWS maintains the following programs:

NEXRAD SLEP is an effort to sustain the aging NEXRAD infrastructure that underpins severe weather forecast and warning services for high-impact events critical for a WRN. NEXRAD is a tri-agency Program with the DOD and Transportation (DOT). Though the system is nearing end of life, the Federal government is 20-25 years away from full deployment of the next generation of weather radar design. Therefore, NWS is undertaking a technology refresh effort to sustain NEXRAD fleet availability until the current network is replaced.

ASOS SLEP is a cost effective approach to maintaining the aging ASOS infrastructure that provides critical aviation weather parameters at airports supporting the air transportation industry and provides high quality meteorological data supporting NWS's forecast and warning mission. The original capital investment for this system was \$227 million and was initiated in the mid-1980s. In addition to extending its longevity, the ASOS SLEP enhances overall system capabilities by enabling high speed/high resolution data transmissions; provides greater safety, data consistency, and accuracy; and allow for remote and cost effective maintenance, logistics, and training. ASOS is tri-agency effort supporting meteorological observational requirements of DOC, DOD and DOT.

In FY 2017, NWS focused on preparations for replacing the Acquisition Control Unit (ACU) and Data Collection Package (DCP) in coordination with tri-agency partners who have already begun to fund this initiative.

Schedule and Milestones:

FY 2018

NEXRAD SLEP

- Complete deployment of Signal Processor Replacement modification
- 12 transmitters modified
- 13 pedestals rebuilt
- Develop Shelter Refurbishment RFP based on responses to RFI

FY 2019

NEXRAD SLEP

- 40 transmitters modified
- 38 pedestals rebuilt
- Refurbish shelters at 9 radar sites

FY 2020

NEXRAD SLEP

- 55 transmitters modified
- 60 pedestals rebuilt
- Refurbish shelters at 26 radar sites

FY 2021

NEXRAD SLEP

- 87 transmitters modified
- 83 pedestals rebuilt
- Refurbish shelters at 47 radar sites

FY 2022

NEXRAD SLEP

- Complete modifications of transmitters
- 106 pedestals rebuilt
- Refurbish shelters at 68 radar sites

Deliverables:

- New signal processor replacing obsolete hardware; implementation of new signal processor software replacing obsolete antenna control cards
- Refurbished pedestals with expected service life to at least 2030
- Refurbished transmitters with expected service life to at least 2030
- Refurbished radar shelters

NEXRAD Out-year Funding Estimates (\$ in thousands):

NEXRAD SLEP	FY 2017 & Prior*	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	CTC	Total
Change from FY 2018 Base		0	(3,758)	(710)	(255)	(133)	N/A	N/A
Total Request	43,793	16,667	12,909	12,199	11,944	11,811	5,768	115,091

* Reflects back to FY 2015. Out-years are estimates. Future requests will be determined through annual budget process.

Out-Year Funding Estimates (\$ in thousands):

Observations	FY 2017 & Prior*	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	CTC	Total
Change from FY 2018 Base	N/A	3,986	(6,000)	(6,000)	(6,000)	(6,000)	N/A	N/A
Total Request	51,348	20,674	22,909	22,199	21,944	20,611	10,493	168,391

* Out-years are estimates. Future requests will be determined through annual budget process.

CENTRAL PROCESSING

The Central Processing PPA ensures the uninterrupted flow of information from the 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.

In FY 2016, NWS upgraded its HPC capacity from 776 trillion floating point operations per second (TeraFLOPS) to 2,800 TFLOPS. In FY 2018, NWS will continue to develop new Advanced Weather Interactive Processing System forecast capabilities and upgrade the Weather and Climate Operational Supercomputing System.

Central Processing objectives are achieved through the following programs:

WCROSS supports (a) weather and climate forecasting capabilities 24/7 (b) numerical environmental prediction model development and testing, and (c) dissemination of operational products using a wide area network. These products include national and global weather, water, climate and space weather guidance, forecasts, warnings and analyses to a broad range of users and partners including other NOAA programs, government agencies, military and the general public.

WCROSS is composed of primary and backup operational supercomputing systems, storage resources, wide area network, support services, and developmental R&D computing systems. The primary system runs the NCEP production suite. The backup is used to thoroughly test new 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. In accordance with NOAA Critical Infrastructure Protection plans, implementation and maintenance of a redundant WCROSS architecture ensures uninterrupted flow of weather and climate data and products, such as storm watch and warning services to the public.

WCROSS also provides NWS access to developmental computing systems through the NOAA-wide enterprise Research and Development High Performance Computing System.

AWIPS is an information processing, display, and telecommunications system that is the cornerstone of NWS field operations. AWIPS provides the following services:

- Integrates and displays meteorological and hydrological data, satellite, and radar data at NWS field offices;
- Acquires and processes data from sensors and local sources;

- Provides computational and display functions at operational sites;
- Provides an interactive communications system to interconnect NWS operational sites;
- Initiates the dissemination of weather and flood warnings and forecasts in a rapid and highly reliable manner; and,
- Provides the communication interface for internal and external users of much of NOAA's real-time environmental data.

Sustained investments in the AWIPS hardware, communications, and software infrastructure, are necessary for integrating many other programs such as NEXRAD, weather satellites, other weather radars, sensors, and instruments. NWS GPRA goals are based on the effective use of these technology investments along with advanced decision assistance tools, forecast preparation and advanced database capabilities. As the NWS continues to evolve toward an IDSS-based WRN, improvements to AWIPS technology will be needed to ensure NWS meteorologists and hydrologists have the necessary tools and technology. Continued AWIPS improvements produce increased performance in the GPRA goals of Tornado Warning Lead Time, Flash Flood Warning Lead Time and Winter Storm Warning Lead Time.

Schedule and Milestones:

FY 2018 – FY 2022

- Provide Operations and Maintenance support for WCOSS
- Provide Operations and Maintenance support for R&D HPC System
- Provide computational resources to support HFIP

FY 2018

- Implement Phase 3 upgrade of WCOSS

FY 2019

- Development of integrated training capabilities within AWIPS infrastructure
- Phased implementation of new forecast tools and capabilities into AWIPS

FY 2020

- Phased implementation of new forecast tools and capabilities into AWIPS

FY 2021

- Transition to a new WCOSS computing configuration
- Phased implementation of new forecast tools and capabilities into AWIPS

FY 2022

- Phased implementation of new forecast tools and capabilities into AWIPS

Deliverables:

- Operational WCOSS with full backup capability
- Production Suite On-Time Product Generation at 99 percent
- WCOSS capacity at 4.2 TFLOPS, in each the primary and backup systems (Phase 3 upgrade)
- New forecast tools and capabilities for IDSS/WRN operations
- Weather Event Simulator integration into AWIPS

Out-Year Funding Estimates (\$ in thousands):

Central Processing	FY 2017 & Prior*	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	CTC	Total
Change from FY 2018 Base	N/A	(6,000)	(6,000)	(6,000)	(6,000)	(6,000)	N/A	N/A
Total Request	258,058	58,139	58,139	58,139	58,139	58,139	N/A	Recurring

* Out-years are estimates. Future requests will be determined through annual budget process.

DISSEMINATION

The NOAA Integrated Dissemination Program (IDP) is a multi-year NWS response to organizational and technical dissemination challenges created through the years as individual efforts built stovepipes across the NWS enterprise. These weaknesses resulted in telecommunications, web sites and other system outages with near-national impacts during severe weather events. These outages elevated to Congressional levels and highlighted the urgent need for organizational change and the development of a reliable and scalable NWS dissemination infrastructure to sustain 24x7 mission operations.

To ensure a WRN and optimize the delivery of scalable and agile dissemination capabilities, the Dissemination PPA is organized around infrastructure, networks, web services and warning dissemination services.

In FY 2016, NWS successfully built and operationalized a geographically diverse IDP system in Boulder, CO to provide 100 percent redundant capability to the IDP system in College Park, MD and transitioned seven (7) critical applications to both systems. In FY 2017, NWS successfully completed the NWS Telecommunications Gateway (NWSTG) transition to IDP and began the network upgrades necessary for impending data flow increases. In FY 2018, NWS will extend current effort and further preserve the IDP capabilities and resilience by improving stability, scalability, and enhancements of the IDP systems. Furthermore, in FY 2018, NWS will finalize the completion of the network capacity upgrades to take full advantage of GOES-16 and JPSS in support of the Ground Readiness Program (GRP).

Specific to the PAC appropriation, funding within the Dissemination PPA:

- Procures NWS' IT dissemination infrastructure and services
- Closes NWS' dissemination requirements and gaps
- Enhances NWS' dissemination system capabilities
- Builds a scalable NWS dissemination architecture as part of the emerging NOAA enterprise architecture.
- Develops a strategy to maximize effectiveness while minimizing cost
- Builds an underlying network infrastructure for NWS offices to use new dissemination services critical for Impact-based Decision Support Services

To achieve these goals, NWS manages the following programs:

NWS Telecommunications Gateway (NWSTG)

Within the IDP systems, the NWSTG 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 NWS field units and external users.

However, current technology has delays in the collecting and disseminating of data. Upgrading the NWSSTG with up-to-date technology will ensure reliable delivery of NWS products to users and will fully capitalize on better observation data and prediction models to improve services.

Weather and environmental disturbances can disrupt virtually every major public infrastructure system including transportation systems, power grids, telecommunications, and emergency response systems that protect the public. Facing these interruptions, users could be cut off from government services. Minutes (sometimes seconds) count in saving lives and the performance of the NWS dissemination systems to supply necessary information quickly is crucial. Therefore, NWSSTG was 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 (NWR)

NWR provides the NWS with the capability to quickly disseminate severe and high impact weather warnings, watches and forecasts and non-weather emergency messages to the public. NWS is currently refurbishing four hundred (400) NWR station transmitters replacing 1970's-installed vacuum tube technology. Newer, solid-state transmitters have a mean time between failures of over 1,000 hours, a 67 percent improvement of over the older models.

Ground Readiness Project (GRP)

The GRP enables NWS to utilize an expected three-fold increase in environmental satellite, radar, and model data that will accompany the operational GOES-16 satellite, radar upgrades, and planned model improvements. These advances in geostationary weather satellites, polar-orbiting satellites, satellite ground systems, and numerical weather prediction supercomputing systems are scheduled to come online by 2017 and will lead to great improvements in weather warnings and forecasts. This data increase far exceeds the capacity of NWS current IT infrastructure to transmit the data to forecast offices, between systems, and to customers. NWS is thus updating its information technology (IT) infrastructure with the GRP to ensure adequate processing, delivery and exploitation of new environmental satellite, model, and radar data. Without these upgrades, NWS would not be able to use the new data to improve the accuracy and timeliness of weather warnings and forecasts.

NWS is taking a holistic, enterprise-based approach to managing and integrating the necessary IT infrastructure redesign and upgrades. NWS primary dissemination capabilities include both a Satellite Broadcast Network (SBN) and extensive terrestrial communication circuits, the OneNWS Network. The SBN is a key component of the NWS AWIPS communication network that feeds data to all NWS WFOs and 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 GOES-R series.

Part of the GRP included the installation of eight (8) GOES-16/Himawari-8 Re-Broadcast Antennas located at NWS National Centers, Pacific Region, and Alaska Region. In FY 2017, these direct readout (DRO) antennas provided Initial Operating Capability (IOC) of high-resolution high-cadence satellite imagery in support of the NWS forecast and warning process. In FY 2018, Full Operating Capability (FOC) of the GOES-16 imagery and products will be achieved along with further enhancements to receive broadcasts.

Improve Dissemination Reliability Project

The improved dissemination reliability project mitigates risk to mission operations during severe weather events by upgrading network capabilities to reduce single points of failure and increase

website capacity. Many NWS field networks and websites have little or no redundancy, resulting in outages, such as when a communication line is damaged. As a result, events between 2013 and 2015 led to numerous outages, delaying NWS' ability to disseminate its forecasts and warnings to emergency managers, first responders and the public. By acquiring upgraded communication paths to NWS Field Offices and increasing website capacity, NWS will make network infrastructure more resilient and robust while decreasing the risk of network outages. Specific activities, spanning multiple years, include:

- Reducing Enterprise Single Points of Failure: Acquire robust and reliable networking capabilities by upgrading networking lines (such as aging copper lines) with fiber optics and providing two physical network paths at a subset of mission-critical NWS locations.
- Providing Robust and High Capacity Websites: Increase website capacity for NWS Field Offices at the primary and back-up integrated dissemination sites to ensure the Field Office websites keep up with growing requirements and increased use during severe weather events. NWS will acquire computing and storage to augment the IT dissemination infrastructure currently being stood-up at the primary and back-up sites providing 100 percent backup capabilities.

Schedule and Milestones:

FY 2018-2022:

- Provide processing and storage resources to support WRN
- Phased implementation of new applications and capabilities into IDP
- Upgrade NWR telecoms to digital Enterprise Systems
- Replace obsolete transmitter site monitoring equipment
- Conduct transmitter
- Begin to implement alternative communication paths to NWS Field Offices
- Integrate website operations to College Park, MD and Boulder, CO
- Transition from the GSA Networx contract to GSA Enterprise Infrastructure Solutions contract based on the budget

Deliverables:

- Operational IDP with full backup and failover capability
- Completion of OneNWS Network upgrades
- Full Operating Capability of GOES-16 dissemination services
- 100 percent solid state transmitter network for all 1029 stations
- Replacement of obsolete and end-of-life NWR site components
- 96 percent or better NWR station availability
- Robust and high capacity websites for NWS Field Offices
- Implement new Enterprise GIS capabilities on IDP
- Enable AWIPS access to IDP services

Out-Year Funding Estimates (\$ in thousands):

Dissemination	FY 2017 & Prior*	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	CTC	Total
Change from FY 2018 Base	N/A	(11,045)	(9,634)	(9,634)	(9,634)	(9,634)	N/A	N/A
Total Request	170,438	34,553	34,553	34,553	34,553	34,553	N/A	Recurring

* Out-years are estimates. Future requests will be determined through annual budget process.

PROGRAM CHANGES FOR FY 2018:

Observations: Automated Surface Observing System (ASOS) Service Life Extension

Program: (Base Funding: \$0 and 0 FTE; Program Change: +\$3,986,000 and 0 FTE): NOAA requests an increase of \$3,986,000 and 0 FTEs for a total of \$3,986,000 and 0 FTEs to support NOAA's portion of the SLEP on the aging ASOS, which serves as the Nation's primary surface weather observing network. This is a multi-year, tri-agency effort that is anticipated to be completed in 2024.

Proposed Actions:

NOAA proposes to continue the ASOS SLEP (page NWS-65) in coordination with its tri-agency partners. This increase will support production of the Acquisition Control Unit (ACU) and Data Collection Package (DCP) and deployment of the new operating system software. It will also begin addressing the needs for upgrading ASOS telecommunications.

Due to the delay in initial funding for NOAA's contribution to the program, the funding profile has been commensurately delayed and the following sensor replacements will be removed from program scope:

- Ice Free Wind Sensor (IFWS)
- Automated Weighing Precipitation Accumulation Gauge (AWPAG)
- Dew-point Sensor (DTS1)

NOAA will pursue an alternate strategy to bulk purchase of these sensors, which will be to replace them as they fail. This reduces up-front costs, but will take more time and be more expensive overall.

Statement of Need and Economic Benefits:

ASOS is a tri-agency effort supporting meteorological observational requirements of the Departments of Commerce (DOC), U.S. Department of Defense (DOD) and Transportation (DOT). This request covers SLEP requirements for 309 NWS owned and operated ASOS sites. The DOD and DOT are participating in this effort and costs will be shared in accordance with existing interagency agreements. Performing a SLEP is critical to ensuring availability of the observing system until at least 2040. This request is necessary to ensure cross government synchronization to maximize cost and deployment efficiencies.

ASOS serves two important surface observation roles by providing critical aviation weather parameters at airports supporting the air transportation industry and by providing high quality meteorological data supporting forecasts and warnings. Data from the ASOS is required by DOT for flights to land at all domestic airports. This investment mitigates high operational and aviation safety risks by extending ASOS useful life. Without this investment, ASOS availability will degrade rapidly, causing data outages and regional gaps. These gaps would negatively impact NOAA's ability to provide aviation and general forecasts.

Resource Assessment:

Observations resources have been supporting the Next Generation Weather Radar (NEXRAD) SLEP since FY 2015 and will continue this support until completion. Observations have also started supporting the ASOS SLEP and will continue this support until completion.

Schedule and Milestones:**FY 2018**

ACU-DCP Replacement

- Begin to procure, assemble, test, and ship production units
- Begin installation of the new hardware
- Telecommunications upgrade
- Validate requirements
- Develop a detailed implementation plan and strategy

FY 2019

ACU-DCP Replacement

- Continue to procure, assemble, test, and ship production units
- Continue installation of the new hardware
- Telecommunications Upgrade
- Award contract for technology insertion
- Test and verify of proposed links and networks
- Develop software and hardware

FY 2020

ACU-DCP Replacement

- Continue to procure, assemble, test, and ship production units
- Continue installation of the new hardware
- Telecommunications Upgrade
- Test final design and architecture

FY 2021

ACU-DCP Replacement

- Complete procurement, assembly, test, and shipment of production units
- Complete installation of the new hardware
- Telecommunications upgrade
- Award contract for architecture implementation

FY 2022

Telecommunications Upgrade

- Implement architecture

Deliverables:

- Total refreshment of ACU-DCU with expected service life to at least 2040
- Increased data flow and remote maintenance capabilities

Performance Goals and Measurement Data:

Performance Measure: ASOS service availability	FY 2016 Target	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
With Increase	N/A	N/A	98.3%	98.3%	98.4%	98.4%	98.4%
Without Increase	98.4%	98.4%	98.3%	98.0%	96.0%	94.0%	92.0%
Description: This represents the percentage of time the ASOS fleet is meeting operational mission requirements. Scheduled maintenance time is excluded. ASOS operational availability levels below 96 percent have significant adverse impact on the National Airspace System leading to flight delays and cancellations.							

Out-Year Funding Estimates (\$ in thousands):

ASOS	FY 2017 & Prior*	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	CTC	Total
Change from FY 2018 Base	N/A	3,986	5,993	0	0	(1,200)	N/A	N/A
Total Request	0	3,986	10,000	10,000	10,000	8,800	10,493	53,300

* Out-years are estimates. Future requests will be determined through annual budget process.

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

Budget Program: National Weather Service
Sub-program: Systems Acquisition/Observations
Program Change: Automated Surface Observing System (ASOS) Service Life Extension Program

Object Class		FY 2018 Increase	FY 2018 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
11.8	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	50	500
22	Transportation of things	125	128
23.1	Rental payments to GSA	0	0
23.2	Rental Payments to others	0	628
23.3	Communications, utilities and misc charges	0	525
24	Printing and reproduction	0	0
25.1	Advisory and assistance services	250	1,725
25.2	Other services	961	8,376
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	6,060
31	Equipment	2,600	2,732
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	3,986	20,674

* Due to financial system limitations, the object class detail for Total Program reflects the full Systems Acquisition/OBS PPA.

Central Processing: Reduce Research and Development High Performance Computing: (Base Funding: \$9,800,000 and 0 FTE; Program Change: -\$6,000,000 and 0 FTE): NOAA requests a decrease of \$6,000,000 and 0 FTE for a total of \$3,800,000 and 0 FTE to reduce the NWS contribution to NOAA’s Research and Development High Performance Computing System (R&D HPCS). This request dovetails with the ‘Research and Development High Performance Computing Recapitalization’ request from the Office of Oceanic and Atmospheric Research (page OAR-67).

Proposed Actions

NOAA’s OAR research supercomputing investment will help sustain NOAA’s R&D HPC capacity and, along with regular recapitalization, will provide more sustainable computing capacity of NOAA’s weather and climate research. Simultaneously, NOAA proposes to eliminate the “Jet” supercomputing system and associated contract support in Boulder, CO and reduce NWS’s supercomputing use (and, to a lesser degree, capacity) and associated contract support in Fairmont, WV. Major transition projects including hurricane forecast improvement, the Next Generation Global Prediction System, and storm surge modeling will need to compete for space on NOAA’s remaining supercomputing assets, potentially resulting in delays to implementation of and upgrades to operational models and improvements to forecasts and warnings, as NWS priorities will compete with other NOAA priorities.

Resource Assessment:

The R&D HPCS enterprise approach enables each NOAA program requiring resources to achieve its computing needs by sharing in the cost of investment. The NWS currently uses a portion of the R&D HPC to accomplish transition to operations projects resulting in operational model improvements, mostly in Boulder and Fairmont. OAR’s request for additional resources ensures continued recapitalization of other supercomputing assets, primarily for Gaea at the Department of Energy’s Oak Ridge National Laboratory in Oak Ridge, Tennessee.

Schedule and Milestones:

FY 2018:

- Eliminate existing R&D supercomputing system in Boulder, Colorado
- Reduce supercomputing capacity and use in Fairmont, West Virginia

Out-Year Funding Estimates (\$ in thousands):

Research and Development High Performance Computing	FY 2017 & Prior*	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	CTC	Total
Change from FY 2018 Base		(6,000)	(6,000)	(6,000)	(6,000)	(6,000)	N/A	N/A
Total Request	39,200	3,800	3,800	3,800	3,800	3,800	N/A	Recurring

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

Budget Program: National Weather Service
Sub-program: Systems Acquisition/Central Processing
Program Change: Reduce Research and Development High Performance Computing

Object Class		FY 2018 Decrease	FY 2018 Total Program
11	Personnel compensation		
11.1	Full-time permanent	\$0	\$1,886
11.3	Other than full-time permanent	0	86
11.5	Other personnel compensation	0	43
11.6	Leave Surcharge Full-Time	0	0
11.8	Special personnel services payments	0	0
11.9	Total personnel compensation	0	2,015
12	Civilian personnel benefits	0	639
13	Benefits for former personnel	0	1
21	Travel and transportation of persons	0	162
22	Transportation of things	0	0
23.1	Rental payments to GSA	0	0
23.2	Rental Payments to others	0	4
23.3	Communications, utilities and misc charges	0	819
24	Printing and reproduction	0	0
25.1	Advisory and assistance services	0	2,787
25.2	Other services	(6,000)	44,976
25.3	Purchases of goods & services from Gov't accounts	0	2
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	835
31	Equipment	0	3,418
32	Lands and structures	0	0
33	Investments and loans	0	0
41	Grants, subsidies and contributions	0	2,474
42	Insurance claims and indemnities	0	0
43	Interest and dividends	0	7
44	Refunds	0	0
99	Total obligations	(6,000)	58,139

* Due to financial system limitations, the object class detail for Total Program reflects the full System Acquisition/CP PPA.

Dissemination: Re-architected NWS Telecommunications Gateway: (Base Funding: \$10,793,000 and 0 FTE; Program Change: -\$7,604,000 and 0 FTE): NOAA requests a planned reduction of \$7,604,000 and 0 FTE for a total of \$3,189,000 and 0 FTE to reflect the completion of a re-architected NWS Telecommunications Gateway (NWSTG) at the Integrated Dissemination Program (IDP) information technology (IT) infrastructure primary and backup sites in College Park, MD and Boulder, CO.

Proposed Action:

The re-architected NWSTG (page NWS-69) fully eliminates a single point of failure for the collection and dissemination of timely weather, climate, and hydrologic products. The re-architected NWSTG capability will ensure modern, scalable, extensible, and reliable dissemination and infrastructure services using best practices and provide 100 percent backup capability of the applications transitioned in FY 2016 and FY 2017. NOAA will continue to maintain and refresh hardware to support dissemination of timely products.

Resource Assessment:

Dissemination has recently completed several high profile projects including re-architected NWSTG, Ground Readiness Project, the improved dissemination reliability project, and NOAA Weather Radio transmitter refurbishment projects. Dissemination resources are being used to support sustainment activities associated with these completed projects.

Schedule and Milestones:

FY 2018

- Operationalize Re-architected NWSTG capabilities at dissemination IT infrastructure primary and backup sites

FY 2019 - 2022

- Technology refresh and upgrades of existing IDP/NWSTG capabilities

Deliverables:

- Completed dissemination IT infrastructure for dissemination services at primary and backup sites
- Completed capabilities to support continuation of full porting and testing of Re-architected NWSTG capabilities onto dissemination IT infrastructure

Out-year Funding Estimates (\$ in thousands):

NWSTG	FY 2017 & Prior*	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	CTC	Total
Change from FY 2018 Base		(7,604)	(7,604)	(7,604)	(7,604)	(7,604)	N/A	N/A
Total Request	51,399	3,189	3,189	3,189	3,189	3,189	N/A	Recurring

* Reflects back to FY 2014.Out-years are estimates. Future requests will be determined through annual budget process.

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

Budget Program: National Weather Service
Sub-program: Systems Acquisition/Dissemination
Program Change: Re-architected NWS Telecommunications Gateway

Object Class		FY 2018 Decrease	FY 2018 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
11.8	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 misc charges	0	14,553
24	Printing and reproduction	0	0
25.1	Advisory and assistance services	0	0
25.2	Other services	(3,000)	23,441
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	(4,604)	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	(7,604)	37,994

* Due to financial system limitations, the object class detail for Total Program reflects the full Systems Acquisition/DISS PPA.

Dissemination: Ground Readiness Project: (Base Funding: \$19,591,000 and 0 FTE; Program Change: -\$3,441,000 and 0 FTE): NOAA requests a planned reduction of \$3,441,000 and 0 FTE for a total of \$16,150,000 and 0 FTE to reflect the completion of the NWS Ground Readiness Project (GRP), which will ensure utilization of the substantial increase in environmental satellite, radar, and model data to improve weather warnings and forecasts.

Proposed Action:

The GRP (page NWS-69) investment was critical to NOAA Weather-Ready Nation evolution as it prepared for the three-fold increase in data volume from new environmental satellites and increased data from models and radar.

Improvements to IT infrastructure associated with GRP ensure that data and information are available, accessible, and timely. In FY 2018, Full Operational Capability (FOC) of GOES-16 satellite dissemination services is planned as are associated network bandwidth capacity upgrades and OneNWS Network to accommodate the additional data volume.

Resource Assessment:

Dissemination has recently completed several high profile projects including re-architected GRP, the NWS Telecommunications Gateway, the improved dissemination reliability project, and NOAA Weather Radio transmitter refurbishment projects. Dissemination resources are being used to support sustainment activities associated with these completed projects.

Schedule and Milestones:

FY 2018

- Conduct refresh and operations and maintenance activities as new satellite, model and radar data sets become available
- Conduct JPSS readiness testing activities
- Conduct overall network and communication infrastructure upgrade, maintenance and improvement activities
- Continue JPSS pre- and -post-launch testing

FY 2019 – 2022

- Conduct 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
- GOES-R Rebroadcast (GRB) antennas and product generation capabilities
- Satellite data processed and distributed within targeted time of 98.5 percent

Out-year Funding Estimates (\$ in thousands):

GRP	FY 2017 & Prior*	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	CTC	Total
Change from FY 2018 Base		(3,441)	(3,441)	(3,441)	(3,441)	(3,441)	N/A	N/A
Total Request	76,293	16,150	16,150	16,150	16,150	16,150	N/A	Recurring

* Reflects back to FY 2014. Out-years are estimates. Future requests will be determined through annual budget process.

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

Budget Program: National Weather Service
Sub-program: Systems Acquisition/Dissemination
Program Change: Ground Readiness Project

Object Class		FY 2018 Decrease	FY 2018 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
11.8	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 misc charges	(3,441)	14,553
24	Printing and reproduction	0	0
25.1	Advisory and assistance services	0	0
25.2	Other services	0	27,604
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	(3,441)	42,157

* Due to financial system limitations, the object class detail for Total Program reflects the full Systems Acquisition/DISS PPA.

**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 WFO, 13 RFC, 18 Weather Service Offices (WSO) and associated employee housing units, 9 National Centers; and 2 Tsunami Warning Centers. Of the WFOs and WFO/RFCs, 37 are leased. To support these facilities, the Facilities Construction & Major Repairs PPA account is managed by NWS Headquarters Office of Facilities.

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; and
- Maintain compliance with Federal law and national and local building codes.

NWS facilities are reaching and exceeding twenty five years in age and need typical capital improvements to maintain their structural and operational integrity, (e.g., heating, ventilating, and air conditioning systems (HVAC), roof and uninterruptible power supply replacements). This effort is essential to not only maintaining compliance with Federal law and national and local building codes, but also ensuring uninterrupted forecasts for local communities. In addition, recent NWS investments in facilities have addressed required tenant improvements and moving costs associated with expiring forecast office leases. A select number of expiring forecast office leases have resulted in forced relocations.

In FY2016, NWS successfully vacated the GSA Bannister Federal Complex in Kansas City, MO and conducted a ribbon cutting ceremony at the new National Logistics and Reconditioning Center facility in Grandview, MO. In addition, the Phoenix WFO relocated within the complex of its collaboration partner, Salt River Project. In 2017, NWS is building out WFO Davenport in its new location, and initiating tenant improvements to relocate Cleveland, Boston/Taunton, Sacramento and Burlington WFOs. In FY 2018, NWS will finalize its forced relocations from select leased forecast offices and will begin construction of major facility upgrades at three WFOs initiated in FY 2017. In 2018, NWS will focus on major system replacement at government owned facilities to address deferred maintenance.

Schedule and Milestones:

FY 2018 – 2022

- Award contracts for highest priority facilities for the replacement of multiple major systems
- Design and build out tenant improvements for relocation of five WFOs.

Deliverables:

- Up to twelve (12) highest priority major system replacements annually to ensure continued operational stability and service delivery capability
- Select WFOs and WFO/RFCs operating in newly leased facilities

Out-year Funding Estimates (\$ in thousands):

Facilities Construction and Major Repairs	FY 2017 & Prior*	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	CTC	Total
Change from FY 2018 Base		0	0	0	0	0	N/A	N/A
Total Request	37,266	8,634	8,634	8,634	8,634	8,634	N/A	Recurring

*Reflects back to FY 2014. Out-years are estimates. Future requests will be determined through annual budget process.

Program Changes for FY 2018:

None.

BUDGET PROGRAM: NATIONAL ENVIRONMENTAL SATELLITE, DATA, AND INFORMATION SERVICE

For FY 2018, NOAA requests a total of \$1,815,202,000 and 791 FTE for the National Environmental Satellite, Data and Information Service (NESDIS) including a net decrease of \$534,027,000 and a decrease of 21 FTE in program changes.

NESDIS OVERVIEW

NESDIS (<http://www.nesdis.noaa.gov/>) provides timely access to global environmental data from satellites and other sources to enhance the Nation's economy, security, environment, and quality of life. To fulfill its responsibilities, NESDIS procures, launches, and manages the Nation's civil operational environmental satellites. Along with managing and operating satellites in real time, NESDIS develops and distributes products and information based on satellite data. NOAA satellite based observations support a broad range of environmental monitoring for weather, climate, oceans, coasts, and ecosystems impacting the general public and their decision-making. Satellite based observations assist with disaster mitigation through monitoring severe weather, precipitation, fires and smoke, volcano eruptions, dust storms and other air quality issues. NOAA satellite data underpin weather and other environmental forecasts, saving lives and property. NESDIS also works toward developing the next generation of satellites in order to continue meeting primary mission essential functions without incurring gaps in data coverage

NOAA satellites are essential to the agency's integrated observing system, which is the foundation of the environmental intelligence that the agency provides. NESDIS maintains primary constellations of environmental satellites in the polar and geostationary orbits, and at Lagrange point 1. NESDIS ensures the continuity of space-based data to meet NOAA's primary mission essential functions. Along with operating its satellites in real time, NESDIS manages the global data gathered by these satellites and other sources to develop and distribute products and information that support a broad range of environmental monitoring for weather, climate, coasts, oceans, and ecosystems.

NOAA satellites, along with those of its partners, provide uninterrupted global coverage critical for generating short- and long-term weather forecasts and for monitoring planetary change. NESDIS is committed to the international effort to establish a global observing system that meets the Nation and the world's need for environmental intelligence. A fully implemented global observing system will yield increasingly accurate and reliable warnings of severe weather and other environmental events in the United States and all around the world.

The NESDIS budget is organized into two Operations, Research, and Facilities (ORF) sub-programs: (1) Environmental Satellite Observing Systems (\$172,523,000 and 314 FTE); and (2) National Centers for Environmental Information (\$62,803,000 and 193 FTE).

The *Environmental Satellite Observing Systems* sub-program: (1) provides secure and efficient command and control of NOAA and non-NOAA operational environmental satellites; and (2) ensures secure, timely, and uninterrupted delivery of data to users, including product processing, development, and distribution. Below are the Programs, Projects, and Activities (PPAs) included in the Environmental Satellite Observing Systems sub-program:

- Satellite and Product Operations
- NSOF Operations

- Product Development, Readiness & Application
- Commercial Remote Sensing Regulatory Affairs
- Office of Space Commerce
- Group on Earth Observations

The *National Centers for Environmental Information* sub-program includes the National Centers for Environmental Information PPA. The National Centers for Environmental Information are the Nation's leading authority for historical and near-real time atmospheric, space weather, climate, coastal, oceanographic, and geophysical environmental data and information.

The NESDIS budget is organized into two Procurement, Acquisition, and Construction (PAC) sub-programs: (1) Systems Acquisition (\$2,112,981,000 and 305 FTE) and (2) Construction (\$2,224,000 and 0 FTE).

The *Systems Acquisition* sub-program acquires satellites and related instruments for all NOAA satellite programs to maintain long-term satellite data continuity. Below are the PPAs included in the Systems Acquisition sub-program:

- Geostationary Systems – R
- Jason-3
- Joint Polar Satellite System (JPSS)
- Polar Follow On
- Cooperative Data and Rescue Services (CDARS)
- DSCOVER
- Space Weather Follow On
- COSMIC 2/GNSS RO
- Satellite Ground Services
- System Architecture and Advanced Planning
- Projects, Planning and Analysis
- Commercial Weather Data Pilot

The *Construction* sub-program includes the Satellite CDA Facility PPA and supports the operation and critical infrastructure at satellite command and data acquisition facilities.

Management of Observing System Delivery

The primary focus for NESDIS is providing uninterrupted, accurate, calibrated, and validated satellite observations supporting high impact environmental intelligence products and services. NESDIS is focused on delivering the highly capable Geostationary Operational Environmental Satellite-R (GOES-R) Series and Joint Polar Satellite System (JPSS) satellites currently in advanced stages of development and test to ensure those continued services in the near term, and is conducting a comprehensive architecture analysis to define the observing system options and programmatic approaches for the future. The sustained observing system of the future will likely feature significant changes from our present system, including an evolving mix of government and commercial assets, and small, medium, and large satellites to meet observing needs. The NESDIS strategic approach will enable efficient transitions of research or innovative concepts to operational status, ensuring the NOAA observing portfolio includes current technology while providing continuous service to the Nation. Managing our observing system delivery and development within a fixed topline NESDIS budget is a long term imperative.

NESDIS seeks to manage its existing observing system commitments within and across the NOAA satellite budget portfolio in order to ensure resources are being maximized. Looking into the future NESDIS will, for future commitments, work to manage programs' budgets so they do not peak at the same time and are appropriately phased. This will reduce significant year to year NESDIS top line budget requirements, ensure robustness across the constellation with advance planning, and provide programmatic flexibility to enable long term continuity in satellite observations. Future budgets organized to thematic rather than hardware based portfolios could further enable NESDIS to be flexible, responsive, and sustainable.

In the FY 2018 budget, NOAA will seek to ensure the reliability and continuity of performance from the polar and geostationary constellations through continuous and rigorous risk management of the observing system portfolios. NOAA expects such active risk management could include some reallocation of resources across complementary components within the separate polar and geostationary constellations, in response to issues and opportunities. As in past years, the Budget's proposed appropriations language does not include the proviso that would require NOAA to treat individual programs, projects, and activities as subject to reprogramming requirements set forth in Section 505 of the annual appropriations bill. Instead, and recognizing the need for transparency and accountability, NOAA seeks reconsideration of these limits and looks forward to engaging with Congress on a more flexible reprogramming threshold that accounts for the challenges and opportunities in managing a diverse and dynamic satellite portfolio. Furthermore, NOAA will begin to assess new categorization of its programs, projects, and activities that aligns with NESDIS's new strategic plan, provides sufficient transparency, and offers an appropriate level of flexibility to execute more efficient portfolio management decisions. In the meantime, the FY 2018 Budget includes five-year PAC profiles which highlight the initial portfolio planning.

Significant Adjustments:

Calculated Adjustments

NOAA's FY 2018 Base includes a total of \$3,796,000 and 0 FTE to account for the full funding requirement for inflationary adjustments to current programs for NESDIS activities. This includes the estimated 2018 Federal pay raise of 1.9 percent as well as inflationary increases for non-labor activities, including service contracts, utilities, field office lease payments, and rent charges from the General Services Administration (GSA).

Technical Adjustments

NOAA proposes to change the name of the Office of Space Commercialization PPA to the Office of Space Commerce to be consistent with the name change in the 2015 U.S. Commercial Space Launch Competitiveness Act (Public Law 114-90).

NOAA requests to transfer \$519,000 and 0 FTE to move funding for operations at the David Skaggs Research Center in Boulder, CO, from Mission Support Facilities to NESDIS. This funding is currently appropriated to the Mission Services and Management PPA and then distributed to the Line and Staff Offices annually. This reallocation will increase efficiencies by eliminating the need for funding transfers subsequent to appropriation and will improve transparency. This transfer will result in a net change of \$0 and 0 FTE to the agency.

From Office	PPA	To Office	PPA	Amount/FTE
MS	Mission Services and Management (ORF)	NESDIS	National Centers for Environmental Information (ORF)	\$519,000/ 0 FTE

NOAA requests a technical adjustment to transfer \$1,313,000 and 1 FTE from the Jason-3 PPA and \$2,031,000 and 2 FTE from the Deep Space Climate Observatory (DSCOVR) PPA to the Satellite and Product Operations PPA in NESDIS. Following the successful launches of the DSCOVR satellite on February 11, 2015, and the Jason-3 satellite on January 17, 2016, NOAA will consolidate and streamline the satellite post-anomaly support through one budget line and one servicing organization. These responsibilities include assessing satellite and ground station anomalies and supporting appropriate recovery actions for those anomalies.

From Office	PPA	To Office	PPA	Amount /FTE
NESDIS	Jason-3 (PAC)	NESDIS	Satellite and Product Operations (ORF)	\$1,313,000/ 1 FTE
NESDIS	DSCOVR (PAC)	NESDIS	Satellite and Product Operations (ORF)	\$2,031,000/ 2 FTE

NOAA requests a technical adjustment to move \$1,200,000 and 0 FTE from the Satellite Ground Services PPA in PAC to the Satellite and Product Operations PPA in ORF. This adjustment transfers the funding to operate and maintain the backup facility at Wallops, VA, in the event of a failure to the NSOF Environmental Satellite Processing Center. This back-up facility was completed and will be operational by the end of FY 2017. This technical adjustment in FY 2018 along with the operational phase requirements in each out-year will be reduced from the Satellite Ground Services profile.

From Office	PPA	To Office	PPA	Amount (\$000)/FTE
NESDIS	Satellite Ground Services (PAC)	NESDIS	Satellite and Product Operations (ORF)	\$1,200/ 0 FTE

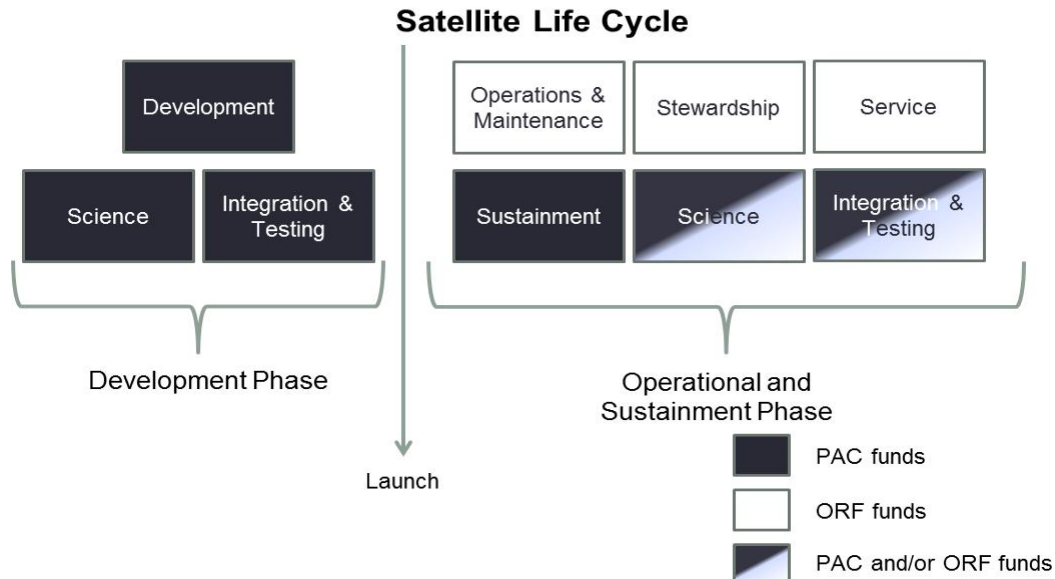
FY 2018 Operational Phase Transfers

The NOAA satellite budget profiles in the PAC account are formulated to reflect the full life cycle cost of our satellite programs including design, development, and operations. The Operational Phase Transfer is required to transfer the funding for operational functions currently budgeted within the PAC life cycle costs to the appropriate PPAs in the ORF account.

Once a satellite is launched and becomes operational, the program transitions from the development phase to the operational phase of the life cycle. At that time, the operational phase budget within the PAC account is required in the ORF account to fund the following operational

functions: satellite operations, ground maintenance, product processing and distribution, algorithm maintenance, data stewardship, data center operations, and facility operations and maintenance.

As demonstrated in the figure below, once a satellite is launched and becomes operational, the program ends its development phase, which is budgeted and managed from mission specific PPAs in PAC.



In FY 2018, NOAA requests a technical adjustment to transfer the operational phase funding from the PAC account to the appropriate PPAs in the ORF account to support operational functions for the GOES-R, Jason-3, DSCOVR and to the appropriate PPA in the PAC account (Satellite Ground Services) to provide sustainment of the ground systems. The Operational Phase Transfers are detailed by program below. The FY 2018 Operational Phase Transfer results in a net change of zero to the NESDIS budget.

GOES-R Series:

NOAA requests a technical adjustment to move \$33,900,000 and 0 FTE from the Geostationary Systems - R PPA in PAC to the following PPAs within ORF: Satellite and Product Operations (\$21,690,000); NSOF Operations (\$4,800,000); Product Development, Readiness and Application (\$6,000,000); and the National Centers for Environmental Information (\$1,410,000). This adjustment will transfer the operational phase funding currently budgeted in the GOES-R Series life cycle cost from PAC to the ORF account. In addition to the one time technical adjustment in FY 2018, the GOES-R Series profile will be reduced by the operational transfer amount in each outyear through FY 2036 to fund operational requirements through the projected GOES-R Series mission life. Please see NESDIS-8 for a detailed breakout of the GOES-R Series life cycle cost by PPA.

From Office	PPA	To Office	PPA	Amount /FTE
NESDIS	Geostationary Systems – R (PAC)	NESDIS	Satellite and Product Operations (ORF)	\$21,690,000/ 0 FTE
NESDIS	Geostationary Systems – R (PAC)	NESDIS	NSOF Operations (ORF)	\$4,800,000/ 0 FTE
NESDIS	Geostationary Systems – R (PAC)	NESDIS	Product Development, Readiness & Application (ORF)	\$6,000,000/ 0 FTE
NESDIS	Geostationary Systems – R (PAC)	NESDIS	National Centers for Environmental Information (ORF)	\$1,410,000/ 0 FTE

Jason-3:

NOAA requests a technical adjustment to move \$2,931,000 and 0 FTE from the Jason-3 PPA in PAC to the following PPAs within ORF: Satellite and Product Operations (\$1,777,000); Product Development, Readiness and Application (\$1,104,000); and the National Centers for Environmental Information (\$50,000). This adjustment will transfer the operational phase funding currently budgeted in the Jason-3 life cycle cost from PAC to the ORF account. In addition to the one-time technical adjustment in FY 2018, the Jason-3 profile will be reduced by the operational transfer amount in each outyear through FY 2022 to fund operational requirements through the projected Jason-3 mission life.

In addition, NOAA requests a technical adjustment to transfer \$3,200,000 and 0 FTE from the Jason-3 PPA in PAC to the Satellite Ground Services (SGS) PPA within PAC, to transition the sustainment of the Jason-3 ground system to SGS. The current ground system is over 5-years old, and is in need of a technical refresh, which SGS will support. Please see NESDIS-9 for a detailed breakout of the Jason-3 life cycle cost by PPA.

From Office	PPA	To Office	PPA	Amount /FTE
NESDIS	Jason-3 (PAC)	NESDIS	Satellite and Product Operations (ORF)	\$1,777,000/ 0 FTE
NESDIS	Jason-3 (PAC)	NESDIS	Product Development, Readiness & Application (ORF)	\$1,104,000/ 0 FTE
NESDIS	Jason-3 (PAC)	NESDIS	National Centers for Environmental Information (ORF)	\$50,000/ 0 FTE
NESDIS	Jason-3 (PAC)	NESDIS	Satellite Ground Services (PAC)	\$3,200,000/ 0 FTE

DSCOVER:

NOAA requests a technical adjustment to move \$908,000 and 0 FTE from the DSCOVER PPA in PAC to the following PPAs within ORF: Satellite and Product Operations (\$556,000) and the National Centers for Environmental Information (\$352,000). This adjustment will transfer the operational phase funding currently budgeted in the DSCOVER life cycle cost from the PAC to the ORF account. In addition to the one-time technical adjustment in FY 2018, the DSCOVER profile will be reduced by the operational transfer amount in each outyear through FY 2022 to fund operational requirements through the projected DSCOVER mission life.

NOAA also requests a technical adjustment to transfer \$255,000 from the DSCOVER PPA to transition the sustainment of the DSCOVER ground system to Satellite Ground Services PPA. Please see NESDIS-10 for a detailed breakout of the DSCOVER life cycle cost by PPA.

From Office	PPA	To Office	PPA	Amount /FTE
NESDIS	DSCOVER (PAC)	NESDIS	Satellite and Product Operations (ORF)	\$556,000/ 0 FTE
NESDIS	DSCOVER (PAC)	NESDIS	National Centers for Environmental Information (ORF)	\$352,000/ 0 FTE
NESDIS	DSCOVER (PAC)	NESDIS	Satellite Ground Services (PAC)	\$255,000/ 0 FTE

These transfers are critical to ensure that to ensure that Satellite and Product Operations, NOAA Satellite Operations Facility, Product Development, Readiness & Application, National Centers for Environmental Information, and Satellite Ground Services have sufficient funding to support their respective responsibilities to operate the GOES-16 satellite and sustain the Jason-3 and DSCOVER ground systems.

Life Cycle Costs:

The following tables provide the details of the total life cycle costs of NOAA satellites that have planned technical adjustments and Operational Phase Transfers.

GOES-R Life Cycle Cost (LCC)* (\$ in thousands):

*The table reflects the requested funding levels in the ORF and PAC accounts for the total GOES-R LCC as presented in the FY 2018 President's Budget submission. Table has been updated to reflect the final 2016 Spend Plan and the FY 2017 President's Budget, as well the FY 2017 requested Operational Phase Transfers that currently remain in PAC.

GOES-R LCC	FY 2017 & Prior	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	CTC	Total
GOES-R LCC (PAC & ORF)	7,697,348	552,432	442,879	330,274	326,400	326,400	1,152,326	10,828,059
<i>Procurement, Acquisition, and Construction (PAC)</i>								
Total PAC	7,697,348	518,532	408,979	296,374	292,500	292,500	677,726	10,183,959
GOES-R Series	7,697,348	518,532	408,979	296,374	292,500	292,500	677,726	10,183,959
<i>Operations, Research and Facilities (ORF)</i>								
Total ORF	0	33,900	33,900	33,900	33,900	33,900	474,600	644,100
Satellite and Product Operations (SPO)	0	21,690	21,690	21,690	21,690	21,690	303,660	412,110
NSOF Operations	0	4,800	4,800	4,800	4,800	4,800	67,200	91,200
Product Development, Readiness & Application (PDR&A)	0	6,000	6,000	6,000	6,000	6,000	84,000	114,000
National Centers for Environmental Information (NCEI)	0	1,410	1,410	1,410	1,410	1,410	19,740	26,790

*Jason-3 Life Cycle Cost** (\$ in thousands):

*The table reflects the requested funding levels in the ORF and PAC accounts for the total Jason-3 life cycle cost as presented in the FY 2018 President's Budget, including the completion of the FY 2018 technical adjustments and Operational Phase Transfers. Table has been updated to reflect the final 2016 Spend Plan and the FY 2017 annualized continuing resolution.

Jason-3 LCC	FY 2017 & Prior	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	CTC	Total
Jason-3 LCC (PAC & ORF)	163,015	10,582	8,372	7,607	7,382	7,382	0	204,340
<i>Procurement, Acquisition, and Construction (PAC)</i>								
Total PAC	163,015	3,200	990	225	0	0	0	167,430
Jason-3	163,015	0	0	0	0	0	0	163,015
Satellite Ground Services (SGS)	N/A	3,200	990	225	0	0	0	4,415
<i>Operations, Research and Facilities (ORF)</i>								
Total ORF	0	7,382	7,382	7,382	7,382	7,382		36,910
Satellite and Product Operations (SPO) additional base transfer	0	4,451	4,451	4,451	4,451	4,451	0	22,255
Satellite and Product Operations (SPO)	0	1,777	1,777	1,777	1,777	1,777	0	8,885
Product Development, Readiness & Application (PDR&A)	0	1,104	1,104	1,104	1,104	1,104	0	5,520
National Centers for Environmental Information (NCEI)	0	50	50	50	50	50	0	250

DSCOVER Life Cycle Cost* (\$ in thousands):

*The table reflects the requested funding levels in the ORF and PAC accounts for the total DSCOVER life cycle cost as presented in the FY 2018 President's Budget, including the completion of the FY 2018 Operational Phase Transfer. The table accounts for the FY 2016 DSCOVER reprogramming, the final 2016 Spend Plan and the FY 2017 annualized continuing resolution.

DSCOVER LCC	FY 2017 & Prior	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	CTC	Total
DSCOVER LCC (PAC & ORF)	108,106	5,615	5,615	5,615	5,615	5,615	0	136,181
<i>Procurement, Acquisition and Construction (PAC)</i>								
Total PAC	108,106	255	255	255	255	255	0	109,381
DSCOVER	108,106	0	0	0	0	0	0	108,106
Satellite Ground Services (SGS)	0	255	255	255	255	255	0	1,275
<i>Operations, Research and Facilities (ORF)</i>								
Total ORF		5,360	5,360	5,360	5,360	5,360	0	26,800
Satellite and Product Operations (SPO)	0	3,605	3,605	3,605	3,605	3,605	0	18,025
Satellite Product Operations (SPO)	0	1,403	1,403	1,403	1,403	1,403	0	7,015
National Centers for Environmental Information (NCEI)	0	352	352	352	352	352	0	1,760

Narrative Information:

Following this section are base justification materials and program change narratives by sub-program for this line office. Please note program change narratives are only provided for program changes that represent greater than five percent of a program. Complete program changes by PPA can be found in the NOAA Control Table (p. Control Table – 6, p. Control Table - 12). Please contact NOAA if details for any of these changes are required.

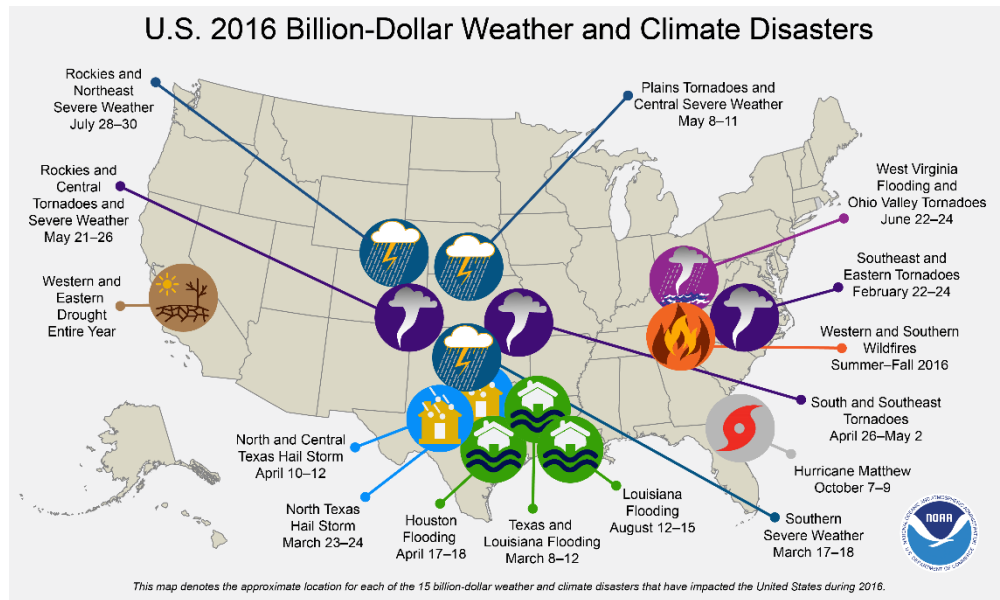
APPROPRIATION ACCOUNT: OPERATIONS, RESEARCH, AND FACILITIES SUB-PROGRAM: ENVIRONMENTAL SATELLITE OBSERVING SYSTEMS

NOAA manages environmental satellites and related ground systems to provide timely and accurate environmental data for forecasts and warnings to ensure the safety of U.S. citizens, public property, and infrastructure.

Billions of dollars in damage are incurred each year due to natural disasters and extreme weather events such as tornadoes, hurricanes, floods, and drought. In 2016 alone, there were 15 weather and climate disaster events with losses exceeding \$1 billion each across the United States and directly resulting in over 130 deaths.¹

Businesses, communities, governments, and the general public have come to rely on NOAA satellites data and products to

provide reliable, accurate information to make decisions regarding public safety and emergency preparedness. This allows decision makers to reduce the losses incurred by these destructive events, making it imperative to ensure the continuity of these satellite systems.



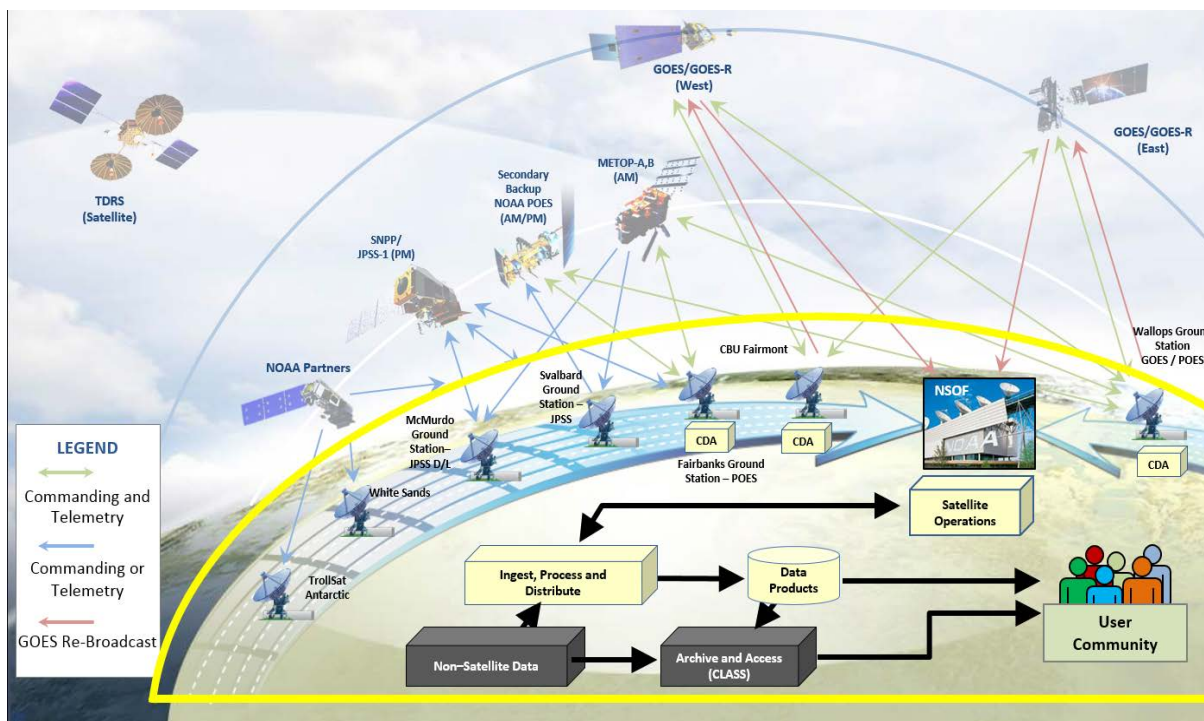
The goals of NOAA's Environmental Satellite Observing Systems sub-program are to:

- Maintain and operate a system of polar-orbiting satellites which provide global imaging and sounding for medium and long-range weather forecasting and climate analysis crucial to numerical weather prediction models.
- Maintain and operate a system of geostationary satellites to provide near-continuous environmental observations of the Earth's Western Hemisphere critical for weather forecasting and severe storm tracking.
- Supply data and operational products to the public and decision-makers.
- Operate and maintain the mission control center for the Search and Rescue satellite system.
- Provide operational weather and environmental satellite observations for Alaska and the polar regions, which include monitoring global sea ice conditions to support safe and effective marine transportation.

¹ Credit National Centers for Environmental Information (NCEI): <http://www.ncdc.noaa.gov/billions/>

OFFICE OF SATELLITE AND PRODUCT OPERATIONS (OSPO) (<http://www.ospo.noaa.gov/>)

OSPO manages and directs NOAA's command and control of the suite of on-orbit satellites that supply the environmental data critical for developing weather and climate products used daily by industry and citizens across the Nation. To this end, OSPO works with NOAA's National Weather Service (NWS) to supply the satellite data that makes up approximately 93 percent of the information used in numerical weather prediction models.



Maintaining the operations and data acquisition from NOAA and our partner satellites is a 24/7 process. OSPO manages and directs operation of the central ground facilities which ingest, process, and distribute environmental satellite data and derived products to users.

In FY 2016, OSPO operated a total of 15 on-orbit satellites including: legacy Geostationary Operational Environmental Satellites (GOES) and Polar-orbiting Operational Environmental Satellites (POES) satellites; Suomi National Polar-orbiting Partnership (Suomi NPP); Department of Defense (DOD) Defense Meteorological Satellite Program (DMSP); Deep Space Climate Observatory (DSCOVR); as well as other non-NOAA operational environmental satellites.

OSPO's role in satellite operations is to monitor satellite health and safety; satellite operations and data acquisition to meet user needs; provide support during launch, activation, and evaluation of new satellites; assess satellite and ground station anomalies; and support appropriate recovery actions for those anomalies.

OSPO supports:

- NOAA Satellite Operations Facility (NSOF), the home for NOAA's 24 hours a day, 365 days a year environmental satellite operations. Through NSOF, NOAA operates the ground systems that command, control, and acquire data from on-orbit satellites. Each day, NSOF processes more than 16 billion bytes of environmental satellite data from on-orbit NOAA and DOD satellites including Jason 3 and DSCOVR. Once GOES-16 is

transitioned to NESDIS for operations, that number will rise to 10-12 terabytes per day.

- NOAA's Search and Rescue Satellite Aided Tracking (SARSAT) system and coordinates participation in the International COSPAS-SARSAT Program.
- The Comprehensive Large Array data Stewardship System (CLASS) Operations Systems (Data Center Operations) supporting the long-term preservation of and access to the ever-increasing input of data from our observing systems (e.g., satellites, radar, and other ground observations).
- The Satellite Operations Control Center (SOCC)/Command and Data Acquisition (CDA) Facilities serving as the vital link between satellites and users by providing uninterrupted availability of critical observations and real-time delivery of satellite data to product processing centers.
- The Command and Data Acquisition (CDA) at Wallops, Virginia and the Fairbanks Command and Data Acquisition (FCDAS) providing infrastructure and computing resources necessary to operate the Local Area Network (LAN). This separate LAN is necessary to ensure low level day-to-day functions do not impact the high availability systems delivering mission critical satellite data.
- NOAA's contribution to the U.S. National Ice Center (NIC) monitoring global sea ice conditions in the polar regions, Great Lakes, Arctic and North Atlantic waters to support safe and effective transportation for the civil and military maritime communities. The NIC is a multi-agency operational center operated by NOAA, the United States Navy, and United States Coast Guard.

Schedule and Milestones:

FY 2018 - FY 2022

- Maintain Satellite Operation Facilities at Suitland, MD; Wallops, VA; and Fairbanks, AK
- Process and distribute environmental data from Suomi NPP and JPSS-1, Geostationary Environmental Satellites (GOES-R Series, and legacy GOES - 13, 14, 15), Polar-Orbiting Operational Environmental Satellites (POES - NOAA 19, 18,15), MetOp-A and B
- 24/7 operations and anomaly support for the DSCOVR satellite and Jason-3

FY 2018

- Command and control 10 NOAA satellites and support 7 non-NOAA satellites
- Process and distribute GOES-R series, Suomi NPP/JPSS-1, legacy GOES, POES and MetOp data
- Maintain infrastructure for 11 National/Mission High and Moderate Critical IT Systems

FY 2019

- Command and control 11 NOAA satellites and support 7 non-NOAA satellites
- Process and distribute GOES-R series, Suomi NPP/JPSS-1, legacy GOES, POES and MetOp data
- Bring GOES-S into operation
- Maintain infrastructure for 13 National/Mission High and Moderate Critical IT Systems

FY 2020

- Command and control 11 NOAA satellites and support 7 non-NOAA satellites
- Process and distribute GOES-R series, Suomi NPP/JPSS-1, legacy GOES, POES and MetOp data
- Maintain infrastructure for 14 National/Mission High and Moderate Critical IT Systems

FY 2021

- Command and control 11 NOAA satellites and support 7 non-NOAA satellites
- Process and distribute GOES-R series, Suomi NPP/JPSS-1, legacy GOES, POES and MetOp data

- Accept handover of GOES-T from NASA after completion of on-orbit testing
- Maintain infrastructure for 14 National/Mission High and Moderate Critical IT Systems

FY 2022

- Command and control 11 NOAA satellites and support 7 non-NOAA satellites
- Process and distribute new JPSS products to users
- Process and distribute GOES-R series, Suomi NPP/JPSS-1, legacy GOES, POES and MetOp data
- Maintain infrastructure for 13 National/Mission High and Moderate Critical IT Systems

Deliverables:

- Maintain infrastructure for National/Mission High and Moderate Critical IT Systems
- Delivery of Suomi NPP, JPSS, GOES, DSCOVR, MetOp data and products to users

Performance Goals and Measurement Data:

Performance Measure: Percentage of NOAA-managed satellite data processed and distributed within targeted time	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
	99.3%	98.5%	98.5%	98.5%	98.5%	98.5%	98.5%

Description: This measure includes data from NOAA’s satellites: legacy GOES and POES, and GOES-16 starting in FY 2017. 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 (JPSS-1 in FY 2018) satellite data ingested, processed, and distributed within targeted time	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
	100%	99%	99%	99%	99%	99%	99%

Description: The goal is to reach 99 percent of all available Suomi NPP data processed by the Suomi NPP Production Environment within 180 minutes from the time of observation. Suomi NPP delivers key observations for inclusion in the Nation’s weather forecasts and for assessing environmental hazards such as droughts, forest fires, etc.

Performance Measure: Percentage of ice and snow products produced and delivered within targeted time	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
	99.5%	98%	98%	98%	98%	98%	98%

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 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
	96.4%	95%	95%	95%	95%	95%	95%

Description: 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. These percentage rates assume there is at least one operational SARSAT in the early AM, mid AM and PM polar orbits.

Performance Measure:	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
Percent of System Availability or "Up Time" for data archive and access	99.7%	99%	99%	99%	99%	99%	99%
Description: Comprehensive Large Array data Stewardship System (CLASS) is NOAA's premiere on-line facility for the distribution of NOAA and DOD POES data as well as NOAA's GOES data. Each CLASS node operates 24 hours a day, 7 days a week. This performance measure tracks the cumulative "Up Time" or percent of system availability for all nodes.							

PRODUCT DEVELOPMENT, READINESS & APPLICATION (PDR&A)

<http://www.star.nesdis.noaa.gov/star/index.php>

PDR&A supports NOAA's mission by advancing satellite technology, producing data products, and performing research and outreach.

PDR&A capitalizes on NOAA's investment in the acquisition and management of the Nation's operational environmental satellites by offering state-of-the-art satellite-based information. PDR&A leads a comprehensive and rigorous calibration and validation of all data in NOAA's satellite operations to assure the accuracy of satellite products to meet user performance requirements. Doing so fills the critical role of combining NOAA's environmental satellite measurements with other available information to create fit for purpose data, products, and services that various user communities can employ directly.

Additionally, PDR&A investigates advanced sensor technology for future NOAA satellite missions and tests new and innovative satellite-based products for NOAA operational systems. It is imperative to maintain the capacity of PDR&A to address the important science questions and issues that drive user-defined products and requirements. As NOAA prepares for the launches of JPSS and GOES-R Series satellites in the next decade, a litany of new capabilities are forthcoming. Using PDR&A's expertise, these capabilities will be translated into high-quality satellite products to be used to enhance the Nation's ability to remotely monitor the Earth.

See the PDR&A Program Change for additional proposed schedule and milestones, deliverables, and performance goals and measurement data.

COMMERCIAL REMOTE SENSING REGULATORY AFFAIRS (CRSRA)

[\(http://www.nesdis.noaa.gov/CRSRA/\)](http://www.nesdis.noaa.gov/CRSRA/)

NOAA's authority to regulate private remote sensing systems is found in the National and Commercial Space Programs Act, which has been codified in Title 51 of the U.S. Code ["the Act"]. The Act provides that, in consultation with other appropriate United States Government agencies, the Secretary of Commerce is authorized to issue regulations and to license commercial sector parties to operate remote sensing space systems.² The statutory authority to issue licenses has been delegated from the Secretary of Commerce to the NOAA Administrator and re-delegated to the Assistant Administrator for Satellite and Information Services.³

CRSRA manages interagency coordination review of license applications, amendments, and foreign agreements as well as enforcement and compliance of the licenses with periodic audits and on-site inspections. In addition, the office serves on Presidential policy groups such as space transportation, marine domain awareness and the upcoming review and redrafting of National Space Policy Directives (NSPD). CRSRA is also an integral part of National Security Presidential Directive 27 ([NSPD-27](#)), the President's Commercial Remote Sensing Policy. CRSRA directly supports the Department of State during international engagement meetings on space policy at domestic and international locations.

Schedule and Milestones:

FY 2018

- Examine methodology for licensing of private space systems and determine if the existing license format is relevant or needs to be updated to better address changes in space systems and their operations
- Review regulations and update if appropriate; publish any new or updated regulations

FY 2019 - FY 2022

- Review regulations and update if appropriate; republish any new regulations

Deliverables:

Licensing deliverables

- Issuance of new licenses, waivers, and/or amendments to licenses
- Review and approval of foreign agreements and data protection plans

Compliance deliverables

- Quarterly and annual audits
- Annual on-site inspections

² 51 U.S.C. § 60121 (a)(1)

³ Department of Commerce Organization Order (DOO) 10-15 §3(01)(qq), Under Secretary of Commerce for Oceans and Atmosphere and Administrator of the National Oceanic and Atmospheric Administration. Department of Commerce Organization Order (DOO) 25-5 §10(2)(o), National Oceanic and Atmospheric Administration.

Performance Goals and Measurement Data:

Performance Measure: Number of annual licensing actions for private sector partners to operate private remote sensing space systems	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
	15	15	15	15	15	15	15

Description: Licensing of private remote sensing systems is the responsibility of NOAA according to the National and Commercial Space Programs Act. It is also consistent with the goals of the National Space Policy to energize competitive domestic industries and advance the development of satellite manufacturing and satellite-based services. Licensing actions include award of new licenses, amendments to existing licenses, award of new foreign agreements, amendments to existing foreign agreements, as well as review and approval of any waiver to a license. Additional administrative actions not included in this total would include determination if a license is necessary, and closures and updates to existing licenses.

Performance Measure: Number of annual paper audits performed in accordance with the National and Commercial Space Programs Act	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
	65	60	60	60	60	60	60

Description: Audits are the review of records, licenses, data protection plans and agreements. Each license requires an annual inspection, and if a license is associated with an on-orbit satellite, that license then requires quarterly audits. The audits and inspections serve as the verification of license compliance.

Performance Measure: Number of annual site inspections performed in accordance with the National and Commercial Space Programs Act	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
	28	25	25	25	25	25	25

Description: Onsite inspections of ground stations associated with the collection of satellite data serve as the verification for licensee compliance. NOAA will prioritize enforcement based on national security. Each licensee may have multiple facilities and each station, whether foreign or domestic, must be inspected in person. The inspector must also complete a written report. The number of onsite inspections performed is dependent on resources available to support travel.

OFFICE OF SPACE COMMERCE (OSC) [Formerly Office of Space Commercialization]
(<http://www.space.commerce.gov>)

Recognizing the growing impact that space commerce has on our national interests, OSC was established by law ([51 U.S.C. § 50702](#)) to serve as an advocate, resource, and voice for the U.S. commercial space industry within the Executive branch. To streamline the process for easier engagement with NOAA, OSC was designated by the NOAA Commercial Space Policy as the single point of entry for commercial providers.

The 2018 *America First: A Budget Blueprint to Make America Great Again* and the U.S. Commercial Space Launch Competitiveness Act of 2015 call on the U.S. Government to explore the use of commercial based space products and services to fulfill government needs and encourage a pro-growth environment for developing of commercial space industry through private sector investment and partnerships. Through OSC, the Department of Commerce (DOC) responds to these Administration priorities and legislative requirements to promote the U.S. Government as a customer of commercial space goods and services. As private sector roles evolve, OSC will continue to play a critical role in creating a robust and responsive U.S. commercial space industry that is internationally competitive.

Since 2005, the OSC budget has upheld a statutory responsibility to provide support to Federal Government organizations working on Space-based Positioning Navigation and Timing (PNT) policy. This includes the National Coordination Office (NCO) for the National Executive Commitment for PNT, which is currently hosted at DOC. Established by presidential directive, this entity coordinates Global Positioning System (GPS) - related matters across multiple Federal agencies to ensure the system addresses national priorities as well as military requirements.

Schedule and Milestones:

FY 2018 – FY 2022

- Participate in at least one to two major policy decisions per quarter
- Maintain Memorandum of Agreements and contracts needed to support NCO operations
- Assess technical feasibility of at least one commercial data proposal annually
- Coordinate space commerce policy issues and actions within NOAA and DOC

Deliverables:

- Opportunities for commercial solutions for key NOAA and other civil government data acquisition requirements
- Coordinate between government and industry on space-related issues and enhanced engagement in inter-agency space-related policy activities
- Create an environment that enables increase space commerce investment

GROUP ON EARTH OBSERVATIONS (GEO)

(<http://www.nesdisia.noaa.gov/globaleocoordination.html>)

The intergovernmental GEO is a voluntary partnership of 103 governments, the European Commission, and 106 participating organizations comprised of international bodies that strives to improve the world's observation systems and provide policy makers and scientists with accurate and useful data that can be used to make informed decisions on issues affecting the planet. The activities of GEO directly support important Administration priorities including: (1) science-based decision making; (2) open data initiatives; (3) catalyzing innovation and emergence of new businesses, products and services through the use of open data; (4) increasing international cooperation on the application of science and technology in the Earth observation domain; and (5) promoting public-private partnerships for maximizing the economic value of civil Earth observations.

NOAA supports the activities of the GEO Secretariat in Geneva, Switzerland, where GEO's activities are coordinated and implemented. Program resources also support the domestic cooperative activities of the USGEO Subcommittee, including: analysis and planning of programmatic undertakings in support of the assessment of Federal Earth observation activities; coordination in support of fostering improved data management and interoperability; as well as the planning and coordination of preparations for U.S. Government participation in major meetings and events of GEO and liaison with the GEO Secretariat.

Schedule and Milestones:

FY 2018 – FY 2022

- Support U.S. programmatic contributions to the GEO Work Programme and the participation of USGEO leadership in regular meetings of the GEO Executive Committee and annual GEO Plenary sessions
- Annual U.S. government participation in the implementation of GEOSS through a grant to the GEO Trust Fund
- Support the participation of the U.S. lead expert contributors to key initiatives of the GEO Work Programme, including Marine Biodiversity Observation Network, GEO Global Water Sustainability, and AmeriGEOSS regional coordination working group

Deliverables:

- Reports for the Executive Office of the President as requested
- Participation in major GEO meetings and activities to promote international engagement and coordination with stakeholders and outreach

PROGRAM CHANGES FOR FY 2018:

NOAA requests a net total increase of \$5,533,000 and decrease of 12 FTE in FY 2018 program changes for the Environmental Satellite Observing Systems sub-program. Following this section are program change narratives for this sub-program that represent program changes greater than five percent of a program. Complete program changes by PPA can be found in the NOAA Control Table (p. Control Table - 6).

PROGRAM CHANGES FOR FY 2018:

Satellite and Product Operations: NESDIS IT Security: (Base Funding: \$5,708,000 and 0 FTE; Program Change: +\$4,530,000 and 0 FTE): NOAA requests an increase of \$4,530,000 and 0 FTE for a total of \$10,238,000 and 0 FTE to improve data flow resiliency across NOAA's critical Information Technology (IT) systems and infrastructure.

Proposed Actions:

Recent reports by the DOC Office of Inspector General (OIG) have raised concerns regarding the vulnerabilities and deficiencies of NOAA's IT systems.⁴ This initiative will implement vulnerability management against the latest threats on satellite ground systems to lower the operational risk which will ensure continuity of critical satellite data flow to key customers such as the National Weather Service by:

- Ensuring compliance with NOAA and DOC IT security regulations and implement security controls necessary to protect the information systems and ensure data integrity in support of NOAA's Mission.
- Maintaining sustained, timely compliance with FISMA requirements and NESDIS Web Policy and implement improved resiliency and security separation in NESDIS public service segment (public web site).
- Reducing system failure risk by conducting timely refresh and integration with enterprise service providers.
- Migrating NOAA National Critical Systems to enterprise security services.
- Migrating NESDIS high impact systems to enterprise security services.
- Moving NOAA high impact networks into NOAA OCIO's secure active directory.
- Automating patching and continuous monitoring through NOAA-wide enterprise services.
- Addressing current and predicted personnel shortages necessary for some testing of patches, DOC Top-5 documentation, and Assessment and Authorization (A&A) requirements.

While NOAA continues to work to fully implement the action plan on its IT systems in response to the 2014 Commerce OIG report, full funding of this request is essential to NOAA's efforts to safeguard our mission critical IT systems.

Statement of Need and Economic Benefits:

NOAA uses complex IT systems to produce weather forecasts; issue advisories, watches, and warnings; and disseminate environmental information. IT system failures caused by cyber-attack, equipment malfunctions, or disasters threaten NOAA's ability to collect and process raw meteorological data, analyze and model weather, and disseminate the information and warnings that save lives and preserve property. Interruptions to one IT system can disrupt seemingly unrelated systems and cut-off or reduce the quality of warnings, information products and forecasts. The National Critical and High Impact systems that provide critical infrastructure services to the American people, which this increase will help secure, include:

- Environmental Satellite Processing Center (ESPC)
- Geostationary Operational Environmental Satellite (GOES) Ground Segment
- Polar-orbiting Operational Environmental Satellite (POES) Ground Segment
- Data Collection System (DCS)

⁴ DOC OIG July 2014 report ([OIG-14-025-A](#)) entitled: *Significant Security Deficiencies in NOAA's Information Systems Create Risks in Its National Critical Mission* included a number of recommendations to NOAA to address known deficiencies that resulted in NOAA systems being vulnerable to attacks and highlighted the absence of a clear picture of the complex interrelationships and data interdependencies among NOAA IT systems.

- Constellation Observing System for Meteorology, Ionosphere & Climate (COSMIC)
- Jason
- Search and Rescue Satellite Aided Tracking (SARSAT)
- NOAA Satellite Operations Facility (NSOF) Administrative Local Area Network (LAN)
- Wallop Command and Data Acquisition (WCDAS) Admin LAN
- Fairbanks Command and Data Acquisition (FCDAS) Admin LAN

Resource Assessment:

The current resources for IT Security in SPO maintain many Federal Information Security Management Act (FISMA) NESDIS high-impact systems and support system resilience and cyber security. However, these funds are insufficient to address emerging vulnerabilities and deficiencies, leaving NESDIS IT systems susceptible to new attacks.

Schedule and Milestones:

FY 2018 - FY 2022

- Conduct annual penetration testing on all IT systems
- Continuously monitor all IT Systems
- Assess and authorize required IT Systems

Deliverables:

- Simplified process for conducting testing and monitoring systems

Performance Goals and Measurement Data:

Performance Measure (NESDIS Mission Systems): Number of IT Mission Systems supporting Primary Mission Essential Functions (PMEF)	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
With Increase	N/A	N/A	12	14	14	14	14
Without Increase	11	12	12	12	12	12	12

Description: This measure tracks improvement of security controls through implementation of common architecture and security modernization of NESDIS systems that support DOC Primary Mission Essential Functions (PMEFs). Recent cyber-threats required NOAA to take certain systems offline to perform unscheduled maintenance activities. This unscheduled maintenance activity interrupted the timely flow of some PMEF information to the National Weather Service (NWS), Department of Defense (DOD), European Organization for the Exploitation of Meteorological Satellites (EUMESTAT), NESDIS Satellite Analysis Branch (SAB), and National Ice Center (NIC). To address this risk, NESDIS will use these funds to improve documentation of data flow dependencies and upgrade and consolidate mission system components to a secure configuration. These changes will improve system robustness and resiliency to the effects of cyber-threats.

Performance Measure (NESDIS PMEF): Percent of System Availability, "Up Time" for satellite command and control, data received, processed, and distributed	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
With Increase	N/A	N/A	98.5%	98.5%	98.5%	98.5%	98.5%
Without Increase	99.3%	95%	95%	95%	95%	95%	95%
Description: This measure tracks the "Up Time" or operational availability of the NESDIS PMEF systems to receive satellite instrument data, generate products and deliver to the primary customer (NWS).							

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

Budget Program: NESDIS
Sub-program: Environmental Observing Satellite Systems
Program Change: NESDIS IT Security

Object Class		FY 2018 Increase	FY 2018 Total Program
11	Personnel compensation		
11.1	Full-time permanent	\$0	\$32,884
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	32,884
12	Civilian personnel benefits	0	8,221
13	Benefits for former personnel	0	0
21	Travel and transportation of persons	0	650
22	Transportation of things	0	3,898
23.1	Rental payments to GSA	0	35
23.2	Rental Payments to others	0	1,300
23.3	Communications, utilities and miscellaneous charges	0	3,713
24	Printing and reproduction	0	15
25.1	Advisory and assistance services	0	8,600
25.2	Other services	4,530	70,165
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	1,354
31	Equipment	0	645
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	4,530	131,480

Due to financial system limitations, the object class detail for the Total Program reflects the Satellite and Product Operations PPA.

Satellite and Production Operations: Jason-3 Operations: (Base Funding: \$3,090,000 and 1 FTE; Program Change: +\$3,138,000 and 0 FTE): After a technical transfer of \$3,090,000 from the Jason-3 PAC PPA to the Satellite and Production Operations (SPO) ORF PPA to streamline satellite operations (See p. NESDIS – 4 and p. NESDIS - 6 for more information on the proposed FY 2018 Technical Adjustments), NOAA requests an increase of \$3,138,000 and 0 FTE for a total of \$6,228,000 and 3 FTE for technical and engineering assistance and a planned system refresh of the current ground system.

Proposed Actions:

The additional funding requested will be used for technical and engineering assistance, to monitor U.S. instruments, and to conduct a planned system refresh on the current ground system, which was built and implemented as part of the Jason-2 mission. With Jason-3 in orbit and operational, the planned system refresh of this ground system is critical to ensure the continuity of ground operations from one satellite mission to the other. Technical and engineering assistance, monitoring of U.S. instruments, and continued on-orbit support along with the planned ground system refresh are critical to maintaining the production of Jason-3 altimetry products and ensure the continuity of the 20-year record of sea level observations.

Statement of Need and Economic Benefits:

Jason-3 was declared the primary ocean altimetry satellite on July 1, 2016, and operational users are now receiving verified near-real time products. Jason satellite data support scientific, commercial, and operational applications and are critical for fisheries managers, marine navigators, researchers, long-range planners, and others that rely on real time marine and weather forecasts for public safety, commerce, and environmental purposes.

Resource Assessment:

Following the successful launch of Jason-3 on January 17, 2016, NOAA assumed responsibility for sustaining post-launch activities to assure continued observations from the U.S. instruments aboard the satellite. After completing the FY 2018 Technical Adjustments, resources to support the operations of the launched Jason-3 satellite are budgeted for within the SPO ORF account. Current resources for Jason-3 within this line are described in the SPO narrative. Please see NESDIS - 9 for a detailed breakout of the Jason-3 budget by PPA.

Schedule and Milestones:

FY 2018 – FY 2022

- NASA's Jet Propulsion Laboratory continues to monitor performance of U.S. instruments on Jason-3

Deliverables:

- Continue more than 20 years of sea level observations, a critical climate monitoring variable, and provide operational ocean weather products using Jason-3 observations

Performance Goals and Measurement Data:

Performance Measure: Number of ocean science products produced	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
With Increase	N/A	5	5	5	5	5	5
Without Increase	N/A	5	5	3	3	2	1
<p>Description: Jason-3 altimetry products will provide important data for ocean climatology studies and ocean weather forecasting. Products are Sea Level Height, Ocean Heat Content (to enable Hurricane Intensity Forecasts), Ocean Wave height, Ocean Surface Wind Speed and Ocean Surface Current.</p> <p>Note: Jason-2 creates five data products. These products will be the same five that are generated by the Jason-3 mission.</p>							

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

Budget Program: NESDIS
Sub-program: Environmental Observing Satellite Systems
Program Change: Jason-3 Operations

Object Class		FY 2018 Increase	FY 2018 Total Program
11	Personnel compensation		
11.1	Full-time permanent	\$0	\$32,884
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	32,884
12	Civilian personnel benefits	0	8,221
13	Benefits for former personnel	0	0
21	Travel and transportation of persons	0	650
22	Transportation of things	0	3,898
23.1	Rental payments to GSA	0	35
23.2	Rental Payments to others	0	1,300
23.3	Communications, utilities and miscellaneous charges	0	3,713
24	Printing and reproduction	0	15
25.1	Advisory and assistance services	0	8,600
25.2	Other services	3,138	70,165
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	1,354
31	Equipment	0	645
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	3,138	131,480

Due to financial system limitations, the object class detail for the Total Program reflects the Satellite and Product Operations PPA.

Satellite and Product Operations: DSCOVR Operations: (Base Funding: \$2,587,000 and 1 FTE; Program Change: +\$2,421,000 and 0 FTE): After a technical transfer of \$2,587,000 from the DSCOVR PPA to the Satellite and Product Operations (SPO) ORF PPA to streamline satellite operations (See p. NESDIS – 4 and p. NESDIS - 7 for more information on the proposed FY 2018 Technical Adjustments), NOAA requests an increase of \$2,421,000 and 0 FTE for a total of \$5,008,000 and 3 FTE to continue on-orbit support for the DSCOVR satellite.

Proposed Actions:

The DSCOVR satellite was successfully handed over from NASA to NOAA for operational command and control on October 28, 2015. Anomalies on the DSCOVR satellite, which have been more frequent than anticipated, have resulted in an increase in the day to day anomaly support required to continue operations of the DSCOVR satellite.

NOAA's Space Weather Prediction Center (SWPC) began using data from DSCOVR in its space weather forecasts in July 2016. Without this request, SPO will not have the resources to conduct timely recovery actions when an anomaly occurs. The delays in bringing the spacecraft and instruments back online after anomalies are the main threat to SWPC's ability to warn of incoming storms and gauge their severity. This request mitigates the risk of a delay or disruption in the flow of real-time solar wind data due to anomalies.

Statement of Need and Economic Benefit:

DSCOVR allows for the continuity of solar wind data and has replaced NASA's Advanced Composition Explorer (ACE) research satellite as the Nation's operational space weather satellite. NOAA uses DSCOVR data to issue space weather forecasts and alerts of approaching geomagnetic storms with potentially calamitous consequences for terrestrial electrical grids, communications, Global Positioning System (GPS) navigation, air travel, satellite operations, and human spaceflight.

Resource Assessment:

After completing the FY 2018 Technical Adjustments, resources to support the operations of the launched DSCOVR satellite are budgeted for within the SPO ORF account. Current resources for DSCOVR within this line are described in the SPO narrative. Please see NESDIS - 10 for a detailed breakout of the DSCOVR budget by PPA. However, given that the DSCOVR satellite has had more frequent anomalies than anticipated, remaining at the current funding level increases risk to SWPC's ability to issue space weather forecasts and warnings. Current resources are insufficient to address the requirement for additional anomaly support to identify and recover from anomalies on the DSCOVR satellite.

Schedule and Milestones:

FY 2018 – FY 2022

- 24/7 operations and anomaly support for the DSCOVR Satellite

Deliverables:

- Provide timely access to operational solar wind data for geomagnetic storm warnings

Performance Goals and Measurement Data:

Performance Measure: Error in Geomagnetic Storm magnitude warning (G-scale)	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
With Increase	N/A	±0.5	±0.5	±0.5	±0.5	±0.5	±0.5
Without Increase	N/A	±1.5	±1.5	±1.5	±1.5	±1.5	±1.5
Description: This metric is a Space Weather Prediction Center (SWPC) performance measure. It measures the level of error in NOAA's ability to accurately predict the magnitude of an incoming geomagnetic storm detected by the DSCOVR satellite. Prediction of the magnitude depends on an accurate measurement of the solar wind speed, density, and temperature.							

Performance Measure: Percentage of warnings issued prior to geomagnetic storm	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
With Increase	N/A	100%	100%	100%	100%	100%	100%
Without Increase	N/A	80%	80%	80%	80%	80%	80%
Description: This metric 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 metric assumes that the DSCOVR satellite will continue to experience unexpected shutdowns of the solar wind measurement instrumentation, but will be unable to recover from them as quickly without the requested increase. This would leave SWPC unable to issue warnings of incoming geomagnetic storms about 20 percent of the time.							

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

Budget Program: NESDIS
Sub-program: Environmental Observing Satellite Systems
Program Change: DSCOVN Operations

Object Class		FY 2018 Increase	FY 2018 Total Program
11	Personnel compensation		
11.1	Full-time permanent	\$0	\$32,884
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	32,884
12	Civilian personnel benefits	0	8,221
13	Benefits for former personnel	0	0
21	Travel and transportation of persons	0	650
22	Transportation of things	0	3,898
23.1	Rental payments to GSA	0	35
23.2	Rental Payments to others	0	1,300
23.3	Communications, utilities and miscellaneous charges	0	3,713
24	Printing and reproduction	0	15
25.1	Advisory and assistance services	0	8,600
25.2	Other services	2,421	70,165
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	1,354
31	Equipment	0	645
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	2,421	131,480

Due to financial system limitations, the object class detail for the Total Program reflects the Satellite and Product Operations PPA.

Product Development, Readiness & Application: Decrease Data Products Developed: (Base Funding: \$33,629,000 and 78 FTE; Program Change: -\$3,629,000 and 0 FTE): NOAA requests a decrease of \$3,629,000 and 0 FTE for a total of \$29,426,000 and 78 FTE to reduce the number of Product Development, Readiness & Application (PDR&A) Program data products, applications, techniques and systems developed.

Proposed Actions:

NOAA will reduce the number of products, applications, techniques and systems developed by PDR&A in order to fully support other existing NOAA priorities and requirements within the Operations, Research, and Facilities appropriations account. PDR&A will continue, at a reduced pace, to identify new requirements for satellite data and environmental information, determine what information is necessary to meet those requirements, and conduct research to provide those answers and support new sensor technology, products and applications.

NESDIS will continue to focus on calibration and validation in order to provide accurate products to customers.

Resource Assessment:

PDR&A is planning to continue to identify new requirements for satellite data and environmental information, determine what information is necessary to meet those requirements, and conduct research to provide those answers and support new sensor technology, products and applications, but at a reduced rate.

Schedule and Milestones:

FY 2018 - FY 2022

- Perform post-launch checkout, including instrument and/or product quality assessment of recently launched satellites including GOES-16 and JPSS-1

FY 2021

- Develop of JPSS-2 science algorithms
- Deliver JPSS-2 Sensor Data Record/Environmental Data Record algorithm software packages to Ground System

Performance Goals and Measurement Data:

Performance Measure: Number of Products, applications, techniques, systems developed and/or transitioned to operations per year	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
With decrease	N/A	14	11	11	11	11	11
Without decrease	14	14	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. To apply the research to operational needs, satellite information products that meet the requirements of customers are developed and tested (e.g., National Weather Service). After extensive evaluation, products that satisfy the requirements are transferred to operations for customer use.

Performance Measure: Number of sensors/instruments evaluated for quality and performance per year	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
With decrease	N/A	31*	31	31	31	31	31
Without decrease	31	31	31	31	31	31	31
Description: Advanced satellite instruments on board GOES-R Series, JPSS, and MetOp satellites are fully assessed and characterized. Sensor quality on current NOAA and MetOp satellites are updated to meet the requirements of customers for use in numerical weather prediction and other environmental applications. Number of sensors/estimates may fluctuate with the launch of new satellites.							

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

Budget Program: NESDIS
Sub-program: Environmental Observing Satellite Systems
Program Change: Decrease Data Products Developed

Object Class		FY 2018	FY 2018
		Decrease	Total Program
11	Personnel compensation		
11.1	Full-time permanent	\$0	\$11,515
11.3	Other than full-time permanent	0	109
11.5	Other personnel compensation	0	0
11.8	Special personnel services payments	0	105
11.9	Total personnel compensation	0	11,729
12	Civilian personnel benefits	0	3,594
13	Benefits for former personnel	0	0
21	Travel and transportation of persons	0	213
22	Transportation of things	0	4
23.1	Rental payments to GSA	0	0
23.2	Rental Payments to others	0	2,320
23.3	Communications, utilities and miscellaneous charges	0	0
24	Printing and reproduction	0	14
25.1	Advisory and assistance services	0	0
25.2	Other services	-3,629	6,901
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	125
31	Equipment	0	722
32	Lands and structures	0	0
33	Investments and loans	0	0
41	Grants, subsidies and contributions	0	3,804
42	Insurance claims and indemnities	0	0
43	Interest and dividends	0	0
44	Refunds	0	0
99	Total obligations	-3,629	29,426

Commercial Remote Sensing Regulatory Affairs: Administer Statutory Function: (Base Funding: \$998,000 and 5 FTE; Program Change: +\$202,000 and 1 FTE): NOAA requests an increase of \$202,000 and 1 FTE for a total of \$1,200,000 and 6 FTE to enable the Commercial Remote Sensing Regulatory Affairs (CRSRA) to improve implementation of its statutory authority to regulate commercial remote sensing systems. Delegated by the Secretary of Commerce, NOAA licenses U.S. companies that sell satellite imagery, otherwise known as commercial remote sensing. This funding request will allow CRSRA to implement a more effective regulatory structure for the commercial remote sensing industry, including a necessary increase in capacity to address the growing demand for commercial remote sensing licenses.

PROGRAM CHANGE PERSONNEL DETAIL
(Dollar amounts in thousands)

Budget Program: NESDIS
Sub-program: Environmental Observing Satellite Systems
Program Change: Administer Statutory Function

Title:	Location	Grade	Number of Positions	Annual Salary	Total Salaries
Program Analyst	Silver Spring, MD	12	1	85,035	85,035
Subtotal			<u>1</u>		<u>85,035</u>
less Lapse		25%	<u>0</u>		<u>21,259</u>
Total full-time permanent (FTE)			1		63,776
2018 Pay Adjustment (1.9%)					<u>1,212</u>
TOTAL					64,988

Personnel Data

Full-Time Equivalent Employment

- Full-time permanent
- Other than full-time permanent
- Total

Number

1

0

1

Authorized Positions:

- Full-time permanent
- Other than full-time permanent
- Total

1

0

1

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

Budget Program: NESDIS
Sub-program: Environmental Observing Satellite Systems
Program Change: Administer Statutory Function

Object Class		FY 2018 Increase	FY 2018 Total Program
11	Personnel compensation		
11.1	Full-time permanent	\$65	\$695
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	65	695
12	Civilian personnel benefits	16	174
13	Benefits for former personnel	0	0
21	Travel and transportation of persons	121	320
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	10
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	1
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	202	1,200

Office of Space Commerce: Facilitate Commercial Space Marketplace: (Base Funding: \$599,000 and 3 FTE; Program Change: +\$601,000 and 0 FTE): NOAA requests an increase of \$601,000 and 0 FTE for a total of \$1,200,000 and 3 FTE to evaluate commercial opportunities for NOAA, including commercial data buys.

Proposed Actions:

The Office of Space Commerce (OSC) will use the requested funds to execute NOAA's commitment to encourage a robust and transparent marketplace for commercial space businesses to provide environmental data and other space services to NOAA. The [NOAA Commercial Space Policy](#) designates the Office of Space Commerce as a single point of entry for commercial providers to streamline the process for easier engagement with NOAA.

With this funding request, OSC will:

- Collect and publish NOAA requirements, standards and other information that commercial providers need to enter the marketplace for NOAA;
- Organize meetings to discuss business models with commercial providers;
- Travel to vendor sites, partners, stakeholders, and relevant conferences to facilitate communication, guidance and engagement;

Beyond facilitating the evaluation and purchase of commercial data at NOAA, this funding level enables OSC to fulfill its statutory functions as related to the National Coordination Office (NCO) and address increasing requirements. The request will support OSC's longstanding mandate to host and fulfill staffing commitments to the NCO. Remaining at current resource levels may require cuts that will leave the current NCO staff without a base of operations to execute their responsibilities under the U.S. Space-Based Positioning, Navigation, and Timing Policy (NSPD-39).

Statement of Need and Economic Benefits:

NOAA stands to gain significant economic benefits from the use of commercial space services as a supplement to its development and operation of government owned satellite systems. Such benefits include cost savings from not having to operate and maintain commercial satellites, avoidance of cost overruns due to schedule delays in satellite programs, predictable budgeting, and potential acquisition of new data sets at lower unit costs. Adding commercial data to NOAA's portfolio of inputs will also mitigate risks of data continuity gaps and should lead to improved forecasts, which would bring U.S. economic benefits in terms of property and lives saved from extreme weather events. Encouraging the development of a new industry and market for commercial satellite data will also generate U.S. economic benefits in terms of jobs and revenues.

Commercial providers and financial markets are seeking positive signals from NOAA that it is prepared to engage in commercial partnerships. This investment to equip OSC with the appropriate resources to serve as NOAA's "front door" for commercial vendors is essential to sending a strong signal that NOAA is serious about commercial space solutions.

Resource Assessment:

Current resources are insufficient for OSC to fulfill its new role as the NOAA entry point for commercial space providers as defined by the NOAA Commercial Space Policy.

Schedule and Milestones:

FY 2018

- Hire full time director
- Assess technical feasibility of at least one commercial data proposal
- Renew Memorandum of Agreements and contracts to support NCO operations

FY 2019 – FY 2022

- Organize 1 workshop annually
- Assess technical feasibility of at least one commercial data proposal annually
- Maintain Memorandum of Agreements and contracts needed to support NCO operations

Deliverables:

- Online publication of NOAA requirements, standards, and other information needed by commercial data providers and required by NOAA Commercial Space Policy
- Report on industry workshop
- Report on technical assessment
- National Coordination Office MOA's/contracts
- Fulfill statutory functions to support of the National Coordination Office
- Support Commercial Weather Data Pilot efforts to purchase and evaluate commercial satellite data products

Performance Goals and Measurement Data:

Performance Measure: Ability to serve as NOAA's entry point for commercial data providers	FY 2016 Target	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
With Increase	N/A	N/A	60%	60%	60%	60%	60%
Without Increase	N/A	N/A	10%	10%	10%	10%	10%
Description: This measure represents an overall rating of OSC's responsiveness to commercial space service providers seeking to do business with NOAA. OSC facilitates meetings with NOAA leadership, performs technical assessments of proposed commercial capabilities, and provides needed data and information to industry.							

Performance Measure: Number of tools, reports, requirements, developed by NOAA to facilitate commercial space industry into marketplace	FY 2016 Target	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
With Increase	N/A	N/A	1	2	3	4	4
Without Increase	N/A	1	1	1	1	1	1
Description: NOAA will develop, distribute, and implement tools that meet the needs of the commercial space industry. Providing these tools sends a positive signal to industry that NOAA increasingly understands and is prepared to engage in commercial partnerships. OSC identifies commercial solutions for key NOAA and other civil government data acquisition requirements. OSC also acts as a broad industry advocate 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. This helps to ensure NOAA's improved ability to understand capabilities and needs of the industry.							

PROGRAM CHANGE DETAIL BY OBJECT CLASS

(Dollar amounts in thousands)

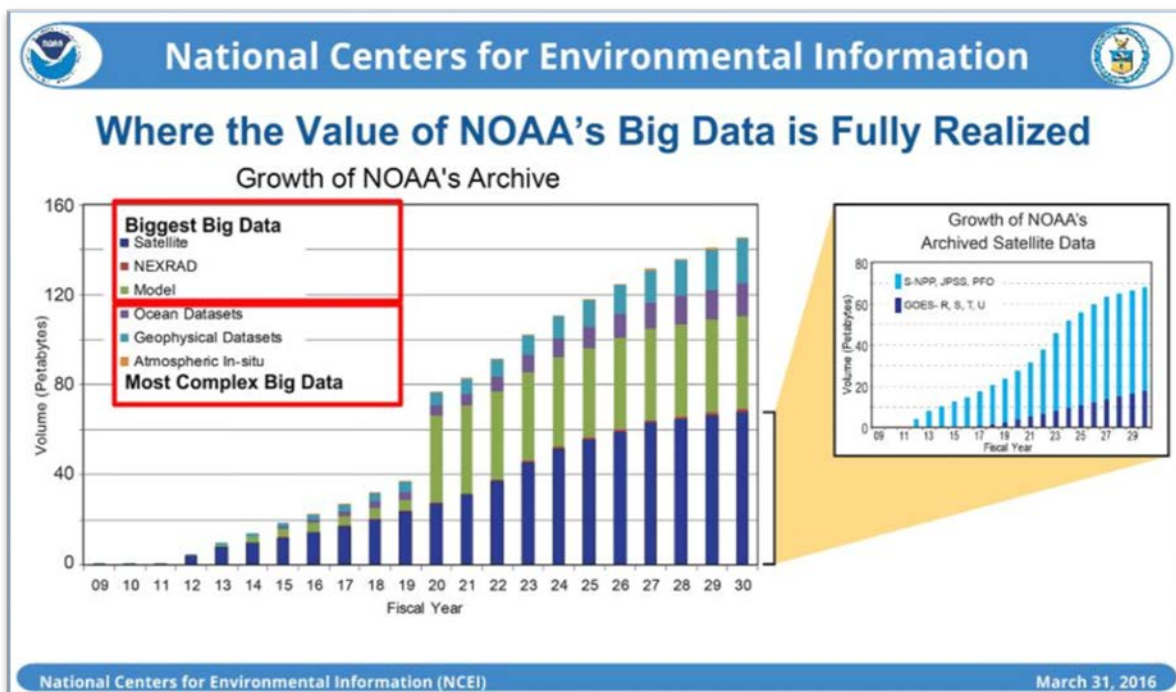
Budget Program: NESDIS
Sub-program: Environmental Satellite Observing Systems
Program Change: Facilitate Commercial Space Marketplace

Object Class		FY 2018 Increase	FY 2018 Total Program
11	Personnel compensation		
11.1	Full-time permanent	\$0	\$388
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	388
12	Civilian personnel benefits	0	97
13	Benefits for former personnel	0	0
21	Travel and transportation of persons	20	25
22	Transportation of things	0	0
23.1	Rental payments to GSA	45	123
23.2	Rental Payments to others	0	0
23.3	Communications, utilities and miscellaneous	0	5
24	Printing and reproduction	0	0
25.1	Advisory and assistance services	0	0
25.2	Other services	175	175
25.3	Purchases of goods & services from Gov't accounts	0	5
25.4	Operation and maintenance of facilities	0	0
25.5	Research and development contracts	342	342
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	10	10
31	Equipment	9	30
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	601	1,200

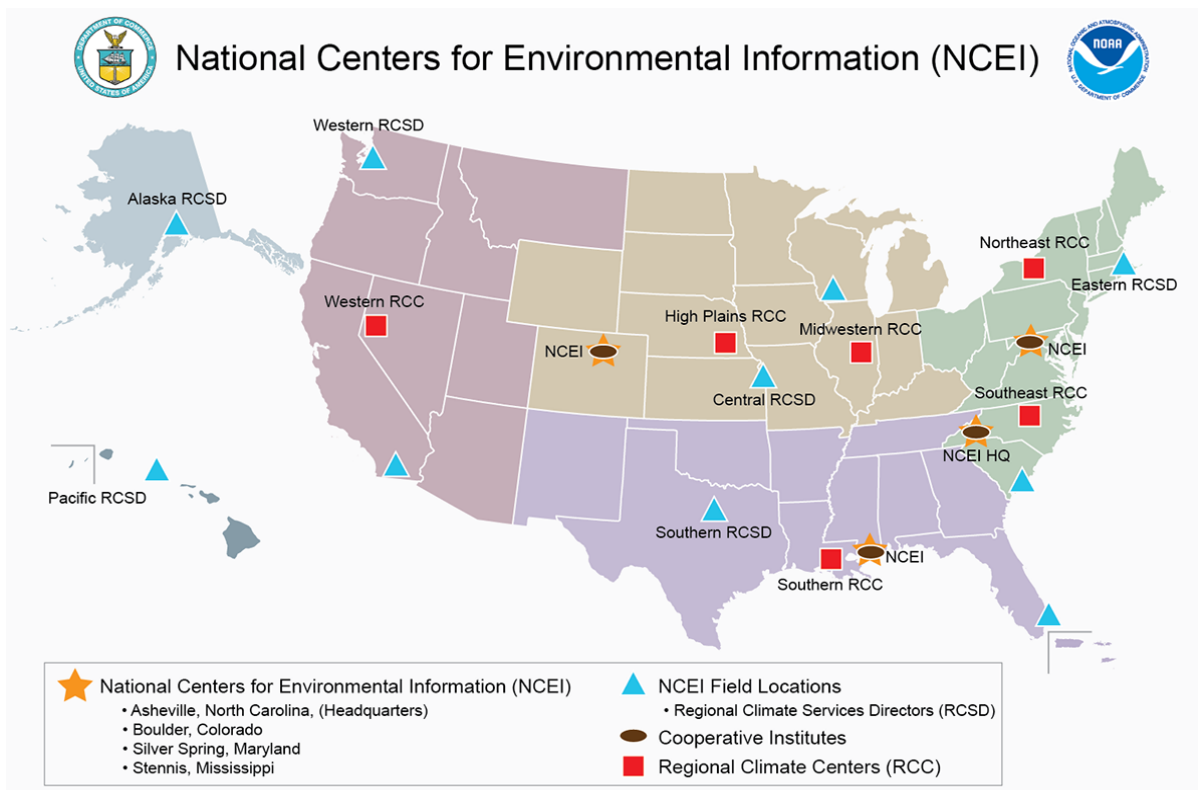
APPROPRIATION ACCOUNT: OPERATIONS, RESEARCH, AND FACILITIES
SUB-PROGRAM: NATIONAL CENTERS FOR ENVIRONMENTAL INFORMATION
[\(https://www.ncei.noaa.gov/\)](https://www.ncei.noaa.gov/)

NOAA’s National Centers for Environmental Information (NCEI) are responsible for hosting and providing access to one of the most significant environmental archives on earth, with comprehensive historical to near-real time oceanic, atmospheric, and geophysical data and information. The Nation’s wide range of business, education, and government needs, including policies and decisions that have an impact on water and energy management, manufacturing, transportation, defense, food production, public health, coastal resource management, and many other socio-economic issues, are dependent on access to these reliable and accurate long-term records. NCEI’s authoritative data and information puts today’s environmentally driven events into perspective, allowing decision makers to make confident, data- and information-driven determinations.

The demand for this high-value environmental data and information has dramatically increased in recent years. NCEI is continually working to foster innovative and value-added strategies, including the development of newly integrated products and services that span the science disciplines and enable better data discovery.



The actual and expected growth of NCEI-stewarded data shows that data holdings are increasing in both volume and complexity.



NCEI has a nationwide presence. NCEI's headquarters are in Asheville, NC, with major presences in Boulder, CO; Stennis Space Center, MS; and Silver Spring, MD. NCEI works with many partners, including all NOAA Line Offices as well as Cooperative Institutes, state and Federal agencies, national and international contributors, and users of NCEI data.

By preserving, stewarding, and maximizing the utility of the Federal government's billion-dollar investment in high-quality environmental data, NCEI remains committed to providing products and services to private industry, governments, academia and the general public. NCEI:

- Transforms complex, long-term data from a variety of legacy and modern observing systems into consistent use-inspired, operational products to meet the needs of government, academia, and U.S. industry.
- Provides data preservation and access services that enable full use of the Nation's multi-billion dollar investment in satellite, ship, aircraft and in-situ observations.
- Advances and enables environmental science and decision making for resilient ocean and coastal communities, the Arctic, and space weather through derived products, authoritative assessments, and information services in support of customer requirements.
- Provides authoritative U.S. and global retrospective weather and climate data for decision making through use-inspired applied science, products, services, and assessments and monitoring.
- Maintains the Nation's archive of environmental information, as well as international data holdings through the World Data System, leveraging data portals and cloud services to maximize the availability and accessibility of official, archived records.
- Conducts integrated scientific analyses of coastal and marine environmental data sets to better understand historical trends, anomalies, and the frequency of event occurrences.
- Provides regional climate services in coordination with other NOAA and federal entities to ensure that broad national comprehensive data and information, products, and services are available to public and private sector users at the local, state, regional, and Federal levels.

Schedule and Milestones:

FY 2018 – FY 2022

- Transition additional Reference Environmental Data Records (REDR) from research to operations including those developed for coastal environments
- Receive a minimum of 98 percent of all U.S. Climate Reference Network ([USCRN](#)) data in a timely fashion, including operational space weather data products acquired and archived from available GOES-16 and GOES-S series spacecraft
- 9 new USCRN stations installed in Alaska for monitoring, for a total of 29 stations by 2022
- Review and adjudicate requirements from U.S. sectors, and use them to validate existing product lines and develop and refine future development. Provide access to regional and Large Marine Ecosystem data, climatologies, and products for use in ecosystem, baselines, monitoring, and assessments
- Address increasing number of user need summaries reported through the Customer Engagement Requirements Exchange (CEREx) system

Deliverables:

FY 2018 – FY 2022

- Annual reporting of adjudicated requirements available to the public via the web
- Archive of regional and Large Marine Ecosystem data, climatologies, and products expands across all NOAA’s designated Regional Ecosystems, excluding the Great Lakes
- Access to regional and Large Marine Ecosystem data, climatologies, and products expands across all NOAA’s designated Regional Ecosystems, excluding the Great Lakes
- Annual reporting of user feedback submitted through the CEREx system

Performance Goals and Measurement Data:

Performance Measure:	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
Percent annual increase of NOAA Environmental data sets publicly available via standard web services	N/A	1%	2%	3%	4%	5%	6%

Description: Traditionally, NCEI shared data with the public by downloading, printing, and mailing information. As of FY 2016, NOAA has provided public access to 345 environmental data sets via standard web services. By increasing the amount of data available electronically, NCEI enables a growing innovation base sourced by NOAA, and is working to increase web-based access to additional environmental data sets across NOAA each. NCEI’s end-to-end management for the entire weather, climatic, oceanographic and geophysical data portfolio supports NOAA’s data access requirements as described in [NOAA Administrative Order 212-15](#) and the Public Access to Research Results ([PARR](#)).

Performance Measure: Volume of data preserved, stewarded and made accessible to the public by NCEI (Petabyte (PB))	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
	14.5PB	16PB	18.5PB	21PB	23.5PB	26PB	28.5PB
Description: Total volume of data preserved, stewarded and made accessible to the public by NCEI through the implementation of national and international standards and leading practices in data and information management. A second, secure copy of inactive data is also maintained for disaster recovery purposes. The expected volumes are dependent on the programs that deliver the data to NCEI. For reference, the Library of Congress' printed collection equals 10 Terabytes (TB). 1 PB is equal to 1,000 TB.							

Performance Measure: Number of Reference Environmental Data Records developed, transitioned, and operationally sustained to established quality standard (Cumulative Total)	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
	35	38	41	44	47	50	53
Description: Research grade Reference Environmental Data Records (REDRs) are scientifically-based measurements of the Earth's environment with sufficient length, consistency, and continuity to provide insurance, defense, financial, transportation, water resource, and energy industries, academia, government stakeholders and decision-makers with timely, relevant, and reliable information. REDR product "operational" status means it is actively supported and maintained by 1) continuously extending the period-of-record by incorporating new observations, 2) scientific stewardship for product integrity, quality assurance, discoverability, access, and user support, and 3) scientific upgrades driven by evolving user community needs, observatory changes and sensor improvements, and IT advances.							

PROGRAM CHANGES FOR FY 2018:

NOAA requests a total decrease of \$6,284,000 and 9 FTE in FY 2018 program changes for the National Centers for Environmental Information sub-program. Narratives are only provided for program changes which are greater than five percent of a program. Complete program changes by PPA can be found in the NOAA Control Table (p. Control Table - 6).

PROGRAM CHANGES FOR FY 2018:

National Centers for Environmental Information: Termination of Big Earth Data Initiative: (Base Funding: \$1,686,000 and 0 FTE; Program Change: -\$1,686,000 and 0 FTE): NOAA requests a decrease of \$1,686,000 and 0 FTE for a total of \$0 and 0 FTE for the termination of the Big Earth Data Initiative (BEDI) program.

Proposed Actions:

In FY 2018, NOAA requests to terminate the BEDI in order to fully support other existing NOAA data stewardship priorities in NOAA's Environmental Data Management (EDM) Framework. The BEDI was proposed in FY 2014 to increase the accessibility and interoperability of NOAA's high-value environmental observations in concert with other federal agencies. NOAA is proposing to leverage other existing programs and partnerships to continue to improve data discovery, access, compatibility, and documentation⁵.

Resource Assessment:

Prior year appropriations were used to develop the architecture, technical requirements, and interoperability approach necessary to start the BEDI, begin prioritizing high-value data sets, and set up contracts and cooperative agreements with NOAA partners to initiate the implementation of BEDI.

⁵ NOAA's Next Generation Strategic Plan calls for "an increased focus on information management standards and strategies to improve access, interoperability, and usability of NOAA's environmental information resources"

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

Budget Program: NESDIS
Sub-program: National Centers for Environmental Information (NCEI)
Program Change: Termination of Big Earth Data Initiative

Object Class		FY 2018 Decrease	FY 2018 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	-4	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	-1,682	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	0	0
42	Insurance claims and indemnities	0	0
43	Interest and dividends	0	0
44	Refunds	0	0
99	Total obligations	-1,686	0

National Centers for Environmental Information: Regional Climate Centers: (Base Funding: \$3,650,000 and 0 FTE; Program Change: -\$3,000,000 and 0 FTE): NOAA requests a decrease of \$3,000,000 and 0 FTE for a total of \$650,000 and 0 FTE for the Regional Climate Centers (RCC) Program.

Proposed Actions:

In FY 2018, NOAA requests to decrease funding for the RCC Program in order to fully support other existing NOAA priorities. NOAA will prioritize the efforts under the Regional Climate Service Directors and RCCs to provide the most efficient approach with reduced funding to produce and deliver climate data, information, and knowledge for decision makers and other users at the local, state, regional, and national levels.

Located at major research institutions, RCCs are designed to respond quickly to emerging issues, such as droughts and floods. The RCCs respond annually to millions of requests for data and information from citizens, state and federal agencies, and weather-sensitive businesses (agriculture, transportation, risk management, etc.), especially through RCC online data systems. Information is tailored to specific regional needs. NOAA will make a determination on program delivery upon analysis of historical and projected requests, aligned with the overall NOAA management of Regional Services.

Resource Assessment:

The RCC Program is a federal-state cooperative effort that provides day-to-day climate services to a wide range of users, including government agencies, businesses and farmers. Recent funding was used to provide enhanced region- and sector-specific response and monitoring of extreme events such as severe coastal storms and droughts, the development of tools, special climate analyses and blended data sets allowing cross-border climate monitoring, and new product development.

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

Budget Program: NESDIS
Sub-program: National Centers for Environmental Information (NCEI)
Program Change: Regional Climate Centers (RCC)

Object Class		FY 2018 Decrease	FY 2018 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	-3,000	650
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	-3,000	650

**APPROPRIATION ACCOUNT: PROCUREMENT, ACQUISITION, AND CONSTRUCTION
SUB-PROGRAM: NESDIS SYSTEMS ACQUISITION**

NOAA's satellite portfolio provides the backbone for the operational data products that support NOAA's work related to weather, climate, oceans, coasts and ecosystems. NOAA satellite data drives critical decision-making and impacts national security and various sectors of the economy including, agriculture, transportation, energy, construction, infrastructure, emergency management, and hazard mitigation. NOAA maintains two primary constellations of environmental satellites that produce crucial set of observations: polar-orbiting and geostationary satellites.

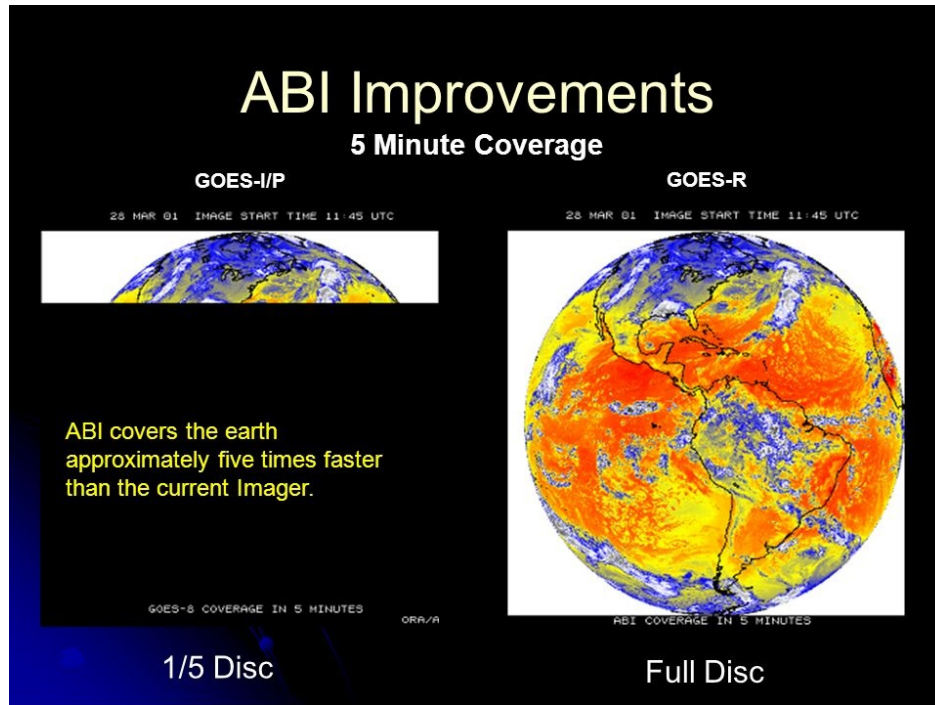
The FY 2018 request enables NOAA satellite programs to continue to meet milestones, as well as to plan for future programs and comprehensive engineering solutions.

GEOSTATIONARY SYSTEMS - R (<http://www.goes-r.gov>)

Geostationary Operational Environmental Satellites – R (GOES-R) Series observations will provide coverage of the western hemisphere from a geostationary orbit, allowing continuous monitoring from the same angle during the tracking/detection of severe storms, tropical cyclones, volcanic eruptions, fire hot spots, cloud and atmospheric moisture changes, lightning, currents flow dynamics, and atmospheric smoke and dust.

The GOES-R Series program will provide end-to-end system development and integration through the acquisition and deployment of the space, ground system, and satellite launch. NOAA will maintain two operational GOES satellites designated as GOES East and GOES West, and will further maintain one on-orbit spare positioned midway between them. This on-orbit spare allows NOAA to quickly replace a failed satellite and ensure continuous coverage within the geostationary orbit.

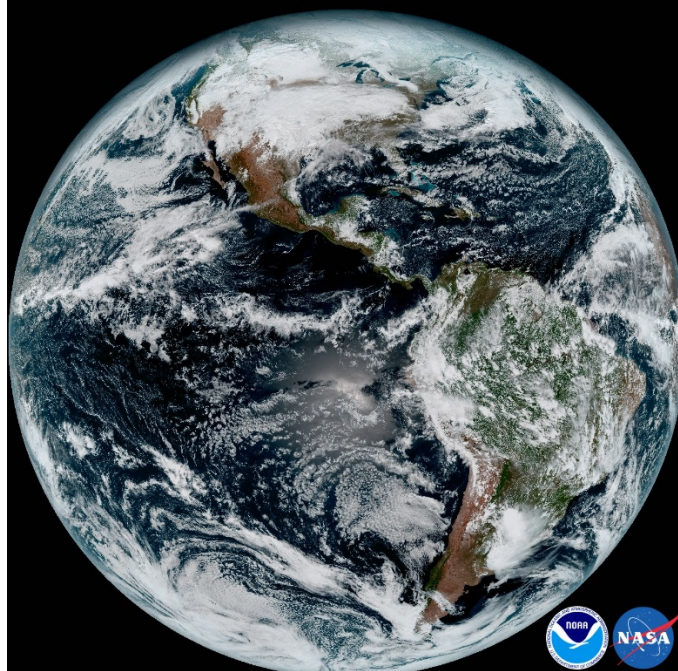
The GOES program, which has provided essential observational data since 1975, supports the National Weather Service (NWS) in forecasting, tracking, and monitoring severe storms. The GOES-R Series launched the first satellite on November 19, 2016. GOES-R, which became GOES-16 when it reached geostationary orbit, is still in testing and is not yet fully operational. Once it is, it will provide significant enhancements to all operational users of geostationary observations, in particular NWS. For example, calculating the probability that a developing storm will produce severe weather within the next hour will be improved in the GOES-R Series era, given the additional information from the Advanced Baseline Imager (ABI) and total lightning data from the Geostationary Lightning Mapper (GLM). The products resulting from this data will improve as a result of more frequent images, a factor of four improvement in spatial resolution, more spectral bands for inferring cloud properties, and lightning mapping. The increased quantity, quality, and accuracy of satellite data that the GOES-R Series will provide will enable NWS to issue improved and timely weather advisories to the public, protecting life and property.



The ABI launched on GOES-16 November 19, 2016 is the primary instrument on GOES-16 for imaging Earth's weather, oceans and environment. Due to the instrument's two scan modes, it has the ability to continuously take an image of the entire planet every five minutes.

The GOES-R Series will provide data that will enhance a number of NOAA products and services, including:

- Cloud images and precipitation estimates for hurricanes and other coastal storms;
- NOAA Coast Watch sea surface temperature (SST) products for locating fish as well as protected marine species
- New research products on ocean surface currents that support both ecosystem management and marine navigation safety
- SST and precipitation data for the Nation's Climate Reference Network
- Images of the United States and adjacent ocean areas to enable the detection, tracking, and intensity changes of hurricanes and other major weather events
- Improved numerical weather prediction models and flood/drought assessments



This composite color full-disk visible image from GOES-16 was captured at 1:07pm EST on January 15, 2017, and created using several of the 16 spectral channels available on the ABI. The image shows the complete full disk of the Western Hemisphere, capturing higher resolution images of weather patterns and atmospheric phenomena that will allow forecasters to pinpoint the location of severe weather with greater accuracy, ultimately saving lives.

The schedule, milestones, deliverables, and outyear funding estimates are provided with the program change requested for this activity. See NESDIS - 8 for a detailed breakout of the GOES-R Series LCC by PPA.

JOINT POLAR SATELLITE SYSTEM (JPSS)

The Joint Polar Satellite System (JPSS) program of record consists of three satellite missions: the Joint NOAA / NASA Suomi National Polar-orbiting Partnership (Suomi NPP), the JPSS-1 and JPSS-2 satellites. The JPSS program of record also includes a major redevelopment of the JPSS ground segment prior to JPSS-1 launch; and operations, maintenance and sustainment of the JPSS missions through FY 2025. The satellites' most important function is to provide the global meteorological observations to enable short-term (0-3 days), and mid-range (3-7 days) warnings of severe weather events critical for emergency managers and communities to make timely decisions to protect life and property. In addition, they provide a wide range of global environmental observations needed for short term, mid-range, and seasonal monitoring and forecasting of weather and a wide variety of environmental phenomena. The global measurements gathered by JPSS meet NOAA's requirement to provide global environmental data that are critical for:

- Medium range weather forecasts (3-7 days)
- Supporting operational and short-term forecasts in Alaska
- Severe storm and flood warnings
- Tropical cyclone and hurricane warnings
- Hydrologic forecasts

- Ocean surface temperature, ocean color for ocean monitoring e.g., reef conditions, harmful algal bloom warnings, etc.
- Aviation forecasts (domestic, military, and international)
- Ice monitoring and forecasting
- Ozone monitoring
- Environmental air quality monitoring
- Detection and analysis of wildfires and volcanic eruptions including volcanic ash warnings for Aviation Safety
- Short-term and mesoscale forecasts
- Seasonal and inter-annual climate forecasts
- Decadal-scale monitoring of climate variability
- Assessment of long-term global environmental change

NOAA, with the Department of Defense, make up the U.S. contribution to the U.S. / European partnership of operational civilian polar-orbiting satellites that together provide the primary input data for all Numerical Weather Prediction (NWP) models. Polar satellites overall contribute ~85 percent of all data for NWP models.

The schedule, milestones, deliverables, and outyear funding estimates are provided with the program change requested for this activity.

POLAR FOLLOW ON (PFO)

PFO adds two missions to JPSS: PFO/JPSS-3 and JPSS-4, which will extend operations of the NOAA polar satellite system through FY 2038 to ensure that NOAA continues to provide accurate and timely weather forecasts and warnings beyond JPSS-2. The full PFO/JPSS-3 and -4 missions are comprised of the Advanced Technology Microwave Sounder (ATMS), Cross-track Infrared Sounder (CrIS), Visible Infrared Imaging Radiometer Suite (VIIRS), and the Ozone Mapping Profiler Suite-Nadir (OMPS-N) instruments.

NOAA is developing PFO/JPSS-3 and JPSS-4 instruments and spacecraft buses as copies of JPSS-2. This allows NOAA to take advantage of JPSS-2 instrument development to reduce cost and risk. In addition, NOAA has exercised simultaneous instrument block buys for PFO/JPSS-3 and JPSS-4 instruments on the current contracts for the most efficient acquisition strategy. The PFO/JPSS-3 and JPSS-4 spacecraft buses can be procured as options on the JPSS-2 spacecraft contract, thereby reducing risk and cost. NOAA manages all JPSS satellites as an integrated polar satellite program.

The schedule, milestones, deliverables, and outyear funding estimates are provided with the program change requested for this activity.

COOPERATIVE DATA AND RESCUE SERVICES (CDARS) [Formerly Solar Irradiance, Data and Rescue (SIDAR)] (<http://www.sarsat.noaa.gov/>) (<http://www.noaasis.noaa.gov/ARGOS/>)

The CDARS program supports the space-based components of both the Argos and Search and Rescue systems. The instruments that are currently meeting the requirements for this system are onboard satellites (e.g. MetOp-A, NOAA-15, 18 and 19) that are operating past their design lives. If NOAA is not able to deliver these instruments to space before a gap in services occurs, there will be an increase in wait times for SARSAT, which could threaten the lives of mariners

and other users around the world, and possible data loss for Argos, which will jeopardize critical environmental data records.

The Argos system provides worldwide coverage that gives the satellite the unique ability to geographically locate a data source from anywhere on earth. Argos Advanced Data Collection System (A-DCS), part of Argos, collects, processes, and disseminates environmental data from fixed and mobile platforms worldwide. Each month, this system provides key environmental data from more than 21,000 active Argos platforms globally.

The Search and Rescue Satellite Aided Tracking (SARSAT) System is employed to detect and locate mariners, aviators, and recreational enthusiasts in distress almost anywhere in the world at any time and in almost any condition. The SARSAT system consists of two instruments: a Search and Rescue Repeater (SARR), which is a real-time transponder, and a Search and Rescue Processor (SARP) used for storing and processing beacon alert signals. Together these instruments provide a means to collect beacon alerts from remote locations to support the COSPAS-SARSAT International satellite program that is coordinated by the United States, Russia, France, and Canada.

The CDARS program includes the contract costs for instrument integration onto the host spacecraft, the CDARS specific equipment required for integration, the launch vehicle, and satellite operations. The French Space Agency (CNES) and the Department of National Defence (DND) are jointly providing the SARSAT instruments and CNES is providing the A-DCS instrument.

Schedule and Milestones:

FY 2018

- Review of CDARS strategy to account for shift in funding profile

FY 2019

- HoPS contract award for the A-DCS & SARSAT instruments
- Preliminary Design Review for Host Spacecraft

FY 2020 – FY 2022

- Critical Design Review for Host Spacecraft
- Delivery of A-DCS and SARSAT instruments to the hosted payload contractor
- Complete integration of A-DCS and SARSAT instruments on commercial spacecraft
- Launch of commercial spacecraft to the desired sun synchronous orbit, initiation of instrument operations and post-launch support – TBD (dependent on CDARS re-plan in FY 2018)

Deliverables:

- Updated CDARS launch readiness and projected launch dates and review schedule

Mission	Launch Readiness Date (LRD)*	Launch Commitment Date (LCD)	Target Launch Date (LD)**
CDARS	TBD	TBD	TBD

* Launch readiness will be determined during FY 2018 as part of the CDARS re-plan.

**The actual launch date is only known after coordination with the launch services provider.

Outyear Funding Estimates* (\$ in thousands):

CDARS	FY 2017 & Prior	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	CTC	Total**
Change from FY 2018 Base	N/A	0	32,600	32,600	32,500	2,400	N/A	N/A
Total LCC Request	8,300	500	33,100	33,100	33,100	2,900	9,600	120,600

*Outyears are estimates. Future requests will be determined after the HoPS contract delivery order is awarded and through the annual budget process.

**This funding profile is based on cost feedback received from commercial vendors within NOAA's FY 2016 Request for Information (RFI). The funding profile is subject to change pending the review of the CDARS program in FY 2018 and the final HoPS contract award in FY 2019.

SPACE WEATHER FOLLOW ON (SWFO)

NOAA's SWFO program is planned to investigate both commercial and government options to ensure continuity of space weather observations through year 2032 and adds important capabilities to the current DSCOVR satellite system to further reduce the Nation's vulnerability to space weather events.

There are three major types of space weather events: radio blackout, solar radiation storms, and geomagnetic storms. Satellites are mostly impacted by solar radiation storms. Commercial airlines are grounded during both radiation and/or geomagnetic storms. These storms cause a communication blackout and some impacts to navigation (GPS) accuracy. The most extreme geomagnetic storms have resulted in severe impacts to commercial power grids and impacted hundreds of millions of people. Satellite data are critical to providing accurate and early warnings of potentially destructive space weather events.

NOAA will be relying on the DSCOVR spacecraft, a single string mission that launched in February 2015, to provide solar wind data through FY 2022. DSCOVR replaces NASA's Advanced Composition Explorer (ACE) as the Nation's operational space weather satellite. Loss of DSCOVR without a replacement will significantly reduce NOAA's ability to provide short-term warnings (15-45 minutes) of space weather storms.

There is a very high risk of a data gap for coronal mass ejection (CME) imagery as the Solar and Heliospheric Observatory (SOHO) and Solar Terrestrial Relations Observatory (STEREO) missions, launched in 1995 and 2006 respectively, are significantly past their mission design lifetimes. CME imagery is currently used operationally and is a key observation for improving space weather forecasts. Without CME imagery the 1-4 day lead time of likely storm conditions could be degraded and could affect the accuracy of geomagnetic storm watches issued to customers.

See the Program Changes for the proposed schedule and milestones, deliverables, performance goals and measurement data, and the budget profile.

CONSTELLATION OBSERVING SYSTEM for METEOROLOGY, IONOSPHERE, and CLIMATE (COSMIC-2)/Global Navigation Satellite System Radio Occultation (GNSS RO)

COSMIC is a six-satellite constellation that was launched to the polar orbit in 2006 in a joint collaboration between Taiwan, National Science Foundation, NASA, United States Air Force (USAF), and University Corporation for Atmospheric Research (UCAR). It was a research effort to explore a new, inexpensive atmospheric sounding technique, GNSS RO, to obtain global atmospheric temperature profiles, which were not available globally from other sources. The results of the research were so positive that NOAA started using GNSS RO data operationally. GNSS RO has been proven to be a cost-effective means of increasing the volume of quality global atmospheric soundings, providing temperature, water vapor, and pressure profiles, which result in more accurate long-range weather forecasts.

The COSMIC design life was reached in April 2011. Two satellites have failed and two satellites are not fully operational, leaving only two of the original six satellites in full-time operation.

COSMIC-2 is a continuation of the partnership between the United States (NOAA and USAF) and Taiwan to produce an operational constellation of GNSS RO satellites. COSMIC-2A is currently scheduled to be launched to the equatorial orbit by the USAF in 2017. The USAF is providing six RO sensors and Taiwan will procure and operate the spacecraft for the GNSS RO satellites. NOAA, through the GNSS RO Ground System program, will provide the ground reception system for processing data from COSMIC-2A.

See the Program Changes for the proposed schedule and milestones, deliverables, performance goals and measurement data, and the budget profile.

SATELLITE GROUND SERVICES (SGS)

NOAA's satellite programs were largely developed to have stand-alone ground systems with unique designs for each mission, resulting in inefficient staffing and hardware redundancy. As its long term goal, SGS is working to transition NOAA's stand-alone ground system model into one with enterprise-wide common services capable of supporting all of NOAA's satellite systems as defined in the February 2015 Ground Enterprise Architecture Services (GEARS) Concept of Operations.

In FY 2018, SGS is providing sustainment, including periodic technology refresh and hardware/software upgrades, to the existing unique ground systems as well as those in development. These refresh cycles and upgrades are more significant and happen less frequently than more minor changes addressed as part of routine satellite operations. Each year sustainment projects may include antennas, command and control, data ingest, product generation, product distribution, and archival activities. SGS also actively supports the GOES-R Series and JPSS Program offices by providing engineering and project management for all ground system design, development, integration and testing, and infrastructure. SGS staff are also participating in the completion of the new GOES-R Series ground system.

See the Program Changes for the proposed schedule and milestones, deliverables, performance goals and measurement data, and the budget profile.

See NESDIS – 6-7 for more information on the proposed FY 2018 Operational Phase Transfer to ensure ground system sustainment requirements currently budgeted in the DSCOVR and Jason-3 PPAs are adequately funded within SGS.

SYSTEM ARCHITECTURE AND ADVANCED PLANNING (SAAP)

SAAP provides NOAA with the comprehensive analysis, technical recommendations, risk assessment, and systems engineering guidance necessary to inform decisions for current and future NOAA satellite architectures and end to end system integration. SAAP identifies opportunities to streamline functions to provide best value for current and future NOAA space enterprise investments. To accomplish this, SAAP evaluates observation requirements, current satellite systems, ground systems, flight operations, product generation and distribution, data archiving, IT infrastructure, end user validation, emerging technologies and commercial opportunities, and enterprise system integration. SAAP fulfills the critical role of overseeing change and configuration management to ensure that the basic requirements of the NESDIS enterprise are met in support of NOAA’s environmental intelligence mission. As an outcome of these analyses, SAAP may recommend elimination, consolidation, or restructure of the architecture of current programs to adopt forward-looking approaches to NESDIS’ space-based observational requirements.

SAAP will make recommendations to the NOAA Assistant Administrator for Satellite and Information Services for the next generation satellite architecture based in response to validated and prioritized end user requirements. The selected architecture will be the basis for requirements that flow to future programs. SAAP will continue to refine the future NOAA Satellite Observing System Architecture.

See the SAAP Program Change for additional proposed schedule and milestones, deliverables, performance goals and measurement data, and the budget profile.

PROJECTS, PLANNING, AND ANALYSIS (PPA)

PPA works in collaboration with domestic and foreign organizations to evaluate and develop space-based earth and solar observations collection methods that advance NOAA’s various missions. This includes managing the flight projects and partnerships for Space Weather Follow On), radio occultation (COSMIC), legacy geostationary (GOES-N Series), and the legacy polar (POES/Metop) satellite missions.

PPA’s role in developing and maintaining our partnership-based flight project systems is increasingly important as U.S. forecasting continues to depend on the collaborations and contributions of the world’s space agencies to the global observing system. Our long-standing international partnership with EUMETSAT for example, allows NOAA to share the cost and responsibility of operating satellites to provide the high-quality, timely, global observations required for weather and environmental prediction. This partnership makes up the majority of data used by both the U.S. and European weather model and has been so successful that EUMETSAT and NOAA recently signed the Joint Polar System Agreement to continue to share the responsibility of operating polar weather satellites in their respective orbits for the next twenty years.

PPA plays a mission assurance role by integrating systems engineering, science planning and product development into its missions. These are the real-time products that serve NOAA's mission and fulfill international agreements.

PPA's core responsibilities include:

- Project management and execution of flight projects that deliver unique environmental observations such as radio occultation and detection of solar geomagnetic storms not made available by the GOES-R Series and JPSS Program satellites.
- On-orbit anomaly support through validation and transition to operations for MetOp, POES, and GOES-N Series.
- Provision of NOAA instruments to be integrated and launched on the MetOp-C satellite.
- Conducting pre-formulation activities to match available technologies with observational requirements.
- Conceptual and detailed engineering for these flight project activities.
- Acquisition of partnership-based flight project systems (e.g., spacecraft, instruments, and launch services).
- Integration, installation, and acceptance of NOAA civil operational environmental satellites systems for flight projects and partnerships.

PPA also contains the Technology, Planning, and Integration for Observations (TPIO) Office, which is responsible for validating NOAA observation analysis and requirements, conducting observing system impact and portfolio analyses, and coordinating NOAA's data management activities.

Deliverables:

FY 2018 – FY 2022

- Support operating missions and support planning and analyses of new missions/gap mitigation
- Engineering support for the on-orbit POES satellites and support to EUMETSAT for U.S. instruments for the on-orbit MetOp satellites
- Management and administration of GOES and POES flight projects, MetOp, and COSMIC-2A
- Enhance search and rescue efforts by accelerating the number of ground segment components that are commissioned and operational for the international Medium Earth Orbit Search and Rescue (MEOSAR) satellite system

See the Program Changes for the proposed schedule and milestones, deliverables, performance goals and measurement data, and the budget profile for MetOp-C.

COMMERCIAL WEATHER DATA PILOT (CWDP)

The NOAA Commercial Space Policy calls for NOAA to undertake projects as appropriate to demonstrate the viability of assimilating commercial data into NOAA meteorological models. The NESDIS Commercial Space Activities Assessment Process calls for these demonstration projects to be completed prior to the purchase of commercial data for operational use.

In FY 2016 and FY 2017 NESDIS began a Pilot to purchase, evaluate, and calibrate available commercial satellite data. The focus of the FY 2016 pilot was radio occultation data, and the FY 2017 pilot is in pre-acquisition planning. The Pilot will continue to assess new data products

entering the market, to include space weather studies. If a data purchase is evaluated, assessed and determined to be cost effective and operationally viable for meeting a NOAA observation requirement, NESDIS will pursue it further as part of the observation architecture. In FY 2018, NESDIS is committed to researching other sources/types of data available in the commercial sector.

NESDIS will continue to:

- Test commercially available data to assess the accuracy, value and impact of the commercial data - to the extent possible such testing will be conducted in parallel with established, validated observations on NOAA operational products and deliverables;
- Evaluate the necessary ground systems, IT security interfaces, and data processing for ingestion of the commercial data selected; and
- Deliver assessment report(s) on the viability of the pilot data set(s) to meet NOAA observation requirements.

Schedule and Milestones:

FY 2018

- Complete assessment of data purchased in FY 2017
- Conduct market research and award a new contract for an additional data type

FY 2019

- Complete assessment of data purchased in FY 2018
- Conduct market research and award a new contract for additional data

FY 2020

- Complete assessment of data purchased in FY 2019
- Conduct market research and award a new contract for additional data

FY 2021

- Complete assessment of data purchased in FY 2020
- Conduct market research and award a new contract for additional data

FY 2022

- Complete assessment of data purchased in FY 2021
- Conduct market research and award a new contract for additional data

Deliverables:

- Complete the assessment and evaluation of the new data purchased in the prior year

Performance Goals and Measurement Data:

Performance Measure:	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
Number of contracts awarded to purchase and evaluate commercial data (cumulative)	2	3	4	5	6	7	8
Description: Each year the data pilot seeks to find a source (or sources) of data, purchase it through a contract vehicle and evaluate it for potential operational use. In the first year contracts were awarded to two companies, and in future years it is more likely single contracts will be awarded for a greater volume of data.							

Outyear Funding Estimates* (\$ in thousands):

CDWP	FY 2017 & Prior	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	CTC	Total**
Change from FY 2018 Base	N/A	0	0	0	0	0	N/A	Recurrin g
Total LCC Request	5,988	3,000	3,000	3,000	3,000	3,000	N/A	Recurrin g

PROGRAM CHANGES FOR FY 2018:

NOAA requests a total net decrease of \$553,502,000 and 0 FTE in FY 2018 program changes for the Systems Acquisition sub-program. Following this section are program change narratives for this sub-program that represent program changes greater than five percent of a program. Complete program changes by PPA can be found in the NOAA Control Table (p. Control Table - 12).

PROGRAM CHANGES FOR FY 2018:

Geostationary Systems – R: GOES-R Series Decrease: (Base Funding: \$836,243,000 and 63 FTE; Program Change: -\$317,711,000 and 0 FTE): NOAA requests a planned decrease of \$317,711,000 and 0 FTE for a total of \$518,532,000 and 63 FTE to continue satellite engineering development, production, integration, and launch activities to complete the four-satellite Geostationary Operational Environmental Satellite - R (GOES-R) Series program.

Proposed Actions:

Following the successful launch of the GOES-16 satellite on November 19, 2016, NOAA proposes a planned reduction of \$317,711,000 to the GOES-R Series program in FY 2018. The remaining funding will sustain the continuity of the GOES-R Series geostationary observing platforms, including the instruments, satellite, and launch vehicle activities currently under contract to meet the GOES-S launch commitment date of Q4 FY 2018. Remaining funds will also be used to continue the development activities for GOES-T and GOES-U, including ground system check out.

Resource Assessment:

GOES-16 (formerly GOES-R) successfully launched on November 19, 2016, and GOES-S is anticipated to launch in Q4 FY 2018. After completing the FY 2018 Operational Phase Transfer, resources to support the operations of the recently launched GOES-16 satellite are budgeted for within the ORF account. Please see NESDIS – 8 for a detailed breakout of the GOES-R Series life cycle cost by PPA.

Schedule and Milestones:

FY 2018

- GOES-16 Post Launch Testing Product Validation
- Ship GOES-S satellite to Kennedy Space Center (KSC)
- Complete GOES-S launch vehicle integration and testing (I&T)
- Launch GOES-S
- Continue GOES-T I&T
- Begin GOES-U I&T

FY 2019

- Post GOES-S launch check-out and calibration activities
- Complete GOES-T I&T
- Continue GOES-U spacecraft satellite-level I&T

FY 2020

- Continue GOES-U I&T
- Continuation of launch service activities to support GOES-T launch

FY 2021

- Complete GOES-U I&T

FY 2022

- Store GOES-U

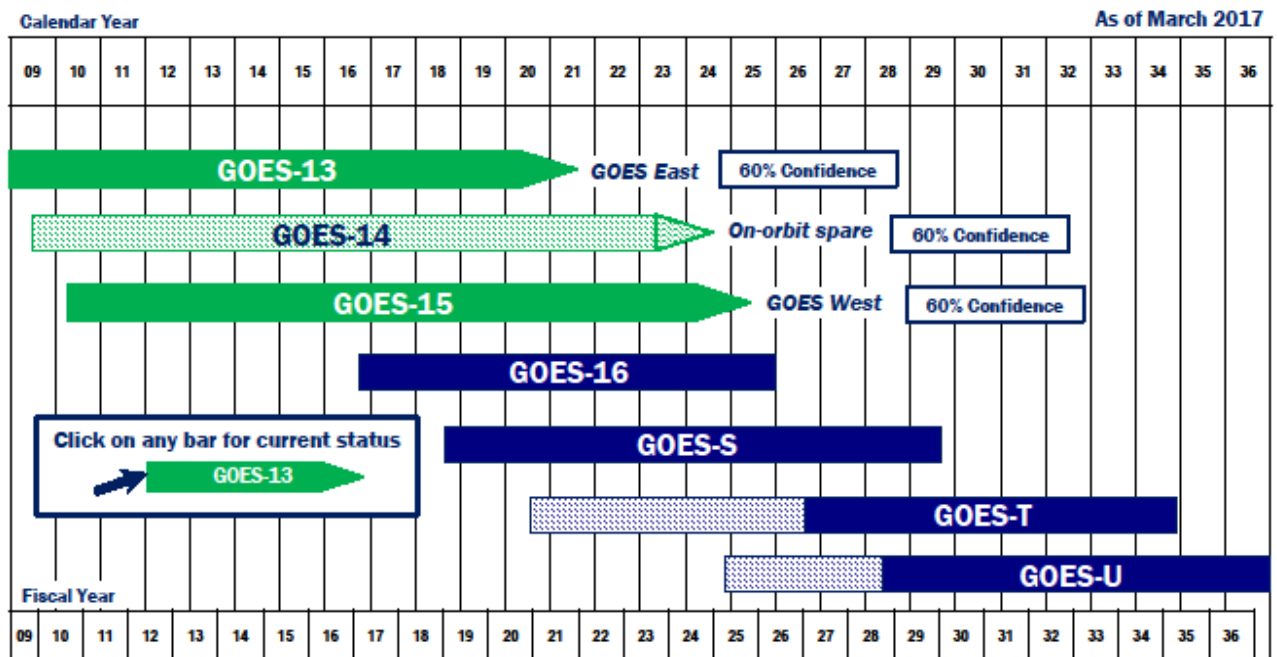
Deliverables:

Spacecraft	Launch Readiness Date (LRD)	Launch Commitment Date (LCD)	Target Launch Date (LD)*
GOES-S	Q4 FY 2018	Q4 FY 2018	TBD
GOES-T	Q3 FY 2019	Q4 FY 2020	TBD
GOES-U	Q1 FY 2021	Q1 FY 2025	TBD

*The actual launch date will be identified after coordination with the launch services provider and will be determined based on the health and performance of on-orbit assets.



NOAA Geostationary Satellite Programs Continuity of Weather Observations



Approved: Stephen Job
Assistant Administrator for Satellite and Information Services

	In orbit, operational		Planned in-orbit Storage
	In orbit, storage		Planned Mission Life
Reliability analysis-based extended weather observation life estimate (60% confidence) for satellites on orbit for a minimum of one year – Most recent analysis: March 2017			

Outyear Funding Estimates* (\$ in thousands):

Following the FY 2018 Operational Phase Transfer, the life cycle cost for the GOES-R Series program has been allotted to several PPAs across the ORF and PAC accounts.

Beginning in the FY 2018 President's Budget, the table below has been adjusted to display both the ORF and PAC components of the GOES-R Series life cycle cost. However, it is important to note that the ORF funds displayed below do not represent a new request for the FY 2018 President's Budget. The ORF component of the GOES-R Series LCC is budgeted for within the ORF account. See NESDIS - 8 for a more detailed breakout of the GOES-R Series LCC by PPA.

GOES-R Series	FY 2017 & Prior**	FY 2018	FY 2019***	FY 2020	FY 2021	FY 2022	CTC	Total
Change from FY 2018 Base	N/A	(317,702)	(427,255)	(539,860)	(543,734)	(543,734)	N/A	N/A
Total GOES-R Series PAC Request	7,697,348	518,532	408,979	296,374	292,500	292,500	677,726	10,183,959
Total GOES-R Series ORF Request	N/A****	33,900	33,900	33,900	33,900	33,900	474,600	644,100
GOES-R Series LCC	7,697,348	552,432	442,879	330,274	326,400	326,400	1,152,326	10,828,059

*Outyears are estimates. Future requests will be determined through the annual budget process.

**The FY 2017 & Prior column has been adjusted for deobligations and reprogrammings in FY 2016, and reflects the GOES-R Series budget profile. The differences have been restored in the outyears and the GOES-R Series life cycle cost is not affected.

***Rephasing in FY 2019-2022 is a result of the CIO-mandated new requirement to replace IBM servers used in the GOES-R Series Ground System due to IBM sale of its x86 business to Lenovo, a Chinese-owned company. The required replacement of Lenovo equipment drives a server hardware architecture change, which exceeds the current budget allocated to periodic ground refresh. These numbers may continue to shift as the server replacement plan is finalized.

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

Budget Program: NESDIS
Sub-program: Systems Acquisition
Program Change: GOES-R Series Decrease

Object Class		FY 2018 Decrease	FY 2018 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	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	(317,711)	297,323
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	0
44	Refunds	0	0
99	Total obligations	(317,711)	518,532

Joint Polar Satellite System: Joint Polar Satellite System Decrease: (Base Funding: \$807,439,000 and 78 FTE; Program Change: -\$31,662,000 and 0 FTE): NOAA requests a decrease of \$31,662,000 and 0 FTE for a total of \$775,777,000 and 78 FTE for the Joint Polar Satellite System (JPSS). These funds will be used to operate and sustain the Suomi National Polar-orbiting Partnership (Suomi NPP) and JPSS-1 satellites; continue development of the instruments and spacecraft for JPSS-2; and continue operations, maintenance, and sustainment of the ground system for JPSS.

Proposed Actions:

Following the successful launch of the JPSS-1 satellite in FY 2017, this reduction includes a planned decrease of \$61,654,000 to the established budget profile and a rephrasing of \$30,000,000 from FY 2019 into FY 2018 for the replacement of IBM hardware within the JPSS Ground System, consistent with [Public Law](#) and cyber-security mandates.

To keep NOAA's commitment to build a robust polar orbiting weather satellite program as rapidly as practicable; during FY 2018 NOAA will continue to prioritize maintaining the accelerated JPSS-2 launch commitment date of Q1 FY 2022.

FY 2018 funds will be used to:

- Operate the Suomi NPP and JPSS-1 satellites;
- Continue operations, maintenance and sustainment of the JPSS ground system for JPSS missions;
- Continue the development and build of JPSS-2 spacecraft and ATMS, CrIS, VIIRS and OMPS instruments, targeting a LCD of Q1 FY 2022; and
- Prepare the JPSS Ground System for JPSS-2 and begin replacement of IBM/Lenovo hardware.

Resource Assessment:

JPSS program of record consists of three polar satellite missions the Joint NOAA / NASA Suomi NPP, the JPSS-1 and JPSS-2 satellites. The satellites' most important function is to provide the global meteorological observation to enable short-term (0-3 days), mid-range (3-7 days) warnings of severe weather events critical for emergency managers and communities to make timely decisions to protect life and property.

Schedule and Milestones:

FY 2018

- Sustain and maintain operations of Suomi NPP and JPSS-1
- Continue build of JPSS-2 instruments and spacecraft
- JPSS-2 spacecraft bus integration and test
- Prepare launch services for the JPSS-2 mission
- Prepare technology refresh and security updates to JPSS ground system
- Prepare ground system to support JPSS-2

FY 2019

- Sustain and maintain operations of Suomi NPP and JPSS-1
- Complete build of JPSS-2 instruments and spacecraft
- Integrate JPSS-2 instruments onto spacecraft bus
- Begin implementing technology refresh and security updates to JPSS ground
- Continue to prepare ground system and operations for JPSS-2

FY 2020

- Sustain and maintain operations of Suomi NPP and JPSS-1

- JPSS-2 satellite integration and test in preparation for JPSS-2 launch
- Sustain and maintain ground system to support Suomi NPP, JPSS-1, JPSS-2

FY 2021

- Sustain and maintain operations of Suomi NPP and JPSS-1
- Deliver JPSS-2 satellite to launch site
- Begin launch site integration and test in preparation for JPSS-2 launch
- Sustain and maintain ground system to support Suomi NPP, JPSS-1, JPSS-2

FY 2022

- Launch, commission and operate JPSS-2
- Sustain and maintain operations of Suomi NPP, JPSS-1, and JPSS-2
- Sustain and maintain ground system to support Suomi NPP, JPSS-1, JPSS-2

Deliverables:

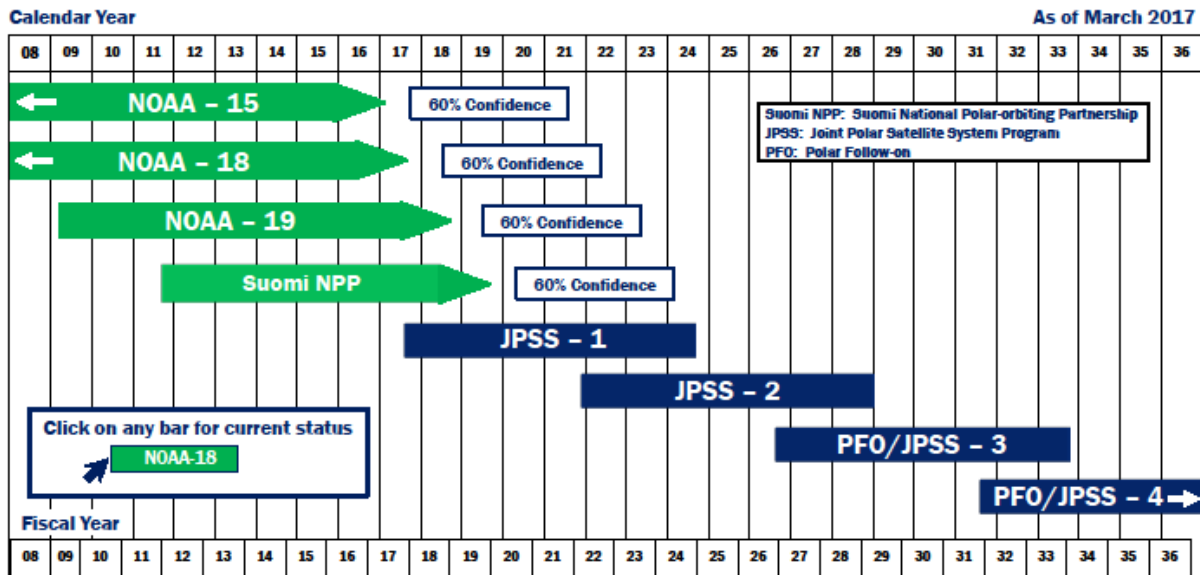
- On-orbit support for Suomi NPP and JPSS-1
- Continued development of JPSS-2 instruments, spacecraft and ground system

Spacecraft	Launch Readiness Date (LRD)	Launch Commitment Date (LCD)	Target Launch Date (LD)*
JPSS-2	Q4 FY 2021	Q1 FY 2022	TBD

*The actual planned launch date is only known after coordination with the launch services provider.



NOAA Polar Satellite Programs Continuity of Weather Observations



Approved: 
Assistant Administrator for Satellite and Information Services

- ▶ In orbit and operating
- ← Launched before Jan 2008
- ▶ Reliability analysis-based extended weather observation life estimate (60% confidence) for satellites on orbit for a minimum of one year – Most recent analysis: July 2016
- ▶ Planned Mission Life, from Planned Launch Date
- ← Planned Mission Life Beyond 2036

* The flyout chart does not reflect re-plan of PFO/JPSS-3 and PFO/JPSS-4 resulting from modified budget profiles. New PFO launch dates will be determined as part of the PFO Program re-plan expected to occur in FY 2018 and flyout charts will be adjusted accordingly.

Outyear Funding Estimates* (\$ in thousands):

JPSS	FY 2017 & Prior**	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	CTC	Total
Change from FY 2018 Base	N/A	(31,654)	(259,396)	(362,349)	(431,370)	(544,418)	N/A	N/A
Total Request	8,435,249	775,777	548,035	445,082	376,061	263,013	478,908	11,322,125

*Outyears are estimates. Future requests will be determined through the annual budget process. The outyears have been adjusted to reflect a refinement to JPSS Program of Record estimates and assumptions as part of the recent update of the PFO Program Office Estimate. This action does not affect the life cycle cost for the JPSS program.

**The FY 2017 & Prior column accounts for the final FY 2016 Spend Plan and additional adjustments, including \$5.8 million in FY2016 for the NOAA deobligations assessment. It reflects the JPSS POR budget profile. The differences have been restored in the CTC and the JPSS life cycle cost is not affected.

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

Budget Program: NESDIS
Sub-program: Systems Acquisition
Program Change: Joint Polar Satellite System Decrease

Object Class		FY 2018 Decrease	FY 2018 Total Program
11	Personnel compensation		
11.1	Full-time permanent	\$0	\$12,507
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	12,571
12	Civilian personnel benefits	0	2,679
13	Benefits for former personnel	0	0
21	Travel and transportation of persons	0	313
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 miscellaneous charges	0	100
24	Printing and reproduction	0	0
25.1	Advisory and assistance services	0	0
25.2	Other services	0	7,700
25.3	Purchases of goods & services from Gov't accounts	(31,662)	738,797
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	100
31	Equipment	0	270
32	Lands and structures	0	0
33	Investments and loans	0	0
41	Grants, subsidies and contributions	0	13,200
42	Insurance claims and indemnities	0	0
43	Interest and dividends	0	0
44	Refunds	0	0
99	Total obligations	(31,662)	775,777

Polar Follow On: Polar Follow On: (Base Funding: \$369,300,000 and 26 FTE; Program Change: -189,344,000 and 0 FTE): NOAA requests a decrease of \$189,344,000 and 0 FTE for a total of \$179,956,000 and 26 FTE to continue development activities for the Polar Follow On (PFO)/ Joint Polar Satellite System (JPSS) JPSS-3 and JPSS-4 missions to plan for continuity of polar observations beyond JPSS-2.

Proposed Actions:

At this funding level, NOAA will continue development of the PFO/JPSS-3 and -4 missions to maintain synergies with JPSS-2 while initiating a re-plan of the PFO program. NOAA will work to improve its constellation strategy for polar weather satellite continuity while seeking cost efficiencies, managing system technical risks, and leveraging partnerships. NOAA will update its constellation availability analysis to refine existing gap analysis and identify new launch dates for the PFO/JPSS-3 and -4 missions, consistent with the revised budget profile.

Resource Assessment:

PFO is being developed as an additional two missions to JPSS. The full PFO/JPSS-3 and 4 missions including instruments and spacecraft buses are copies of JPSS-2. This allows NOAA to take advantage of JPSS-2 instrument development to reduce cost and risk. NOAA manages all JPSS satellites as an integrated polar satellite program.

Schedule and Milestones:

FY 2018

- Continue specification and procurement of critical long lead parts and subsystems for PFO/JPSS-3 and JPSS-4 instruments
- Complete constellation availability and gap analysis consistent with new budget profile
- Update requirements documents to reflect new risk posture
- Identify additional partnership opportunities to improve resiliency of the satellite weather enterprise
- Identify additional alternative system approaches to mitigate against possible polar observing system gaps;
- Initiate alternative gap mitigations if found feasible; develop new plan with updated PFO/JPSS-3 and -4 launch readiness and projected launch dates; annual budget and life-cycle cost estimates; and updated review schedule

Deliverables:

Spacecraft	Launch Readiness Date (LRD)
JPSS-3	TBD
JPSS-4	TBD

*Launch dates (LD) will be determined based on annual appropriations, the performance of on-orbit assets, and the PFO program replan that will take place during FY 2018.

Outyear Funding Estimates* (\$ in thousands):

Polar Follow On	FY 2017 & Prior	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	CTC	Total
Change from FY 2018 Base	N/A	(189,344)	TBD	TBD	TBD	TBD	N/A	N/A
Total Request	738,547	179,956	TBD	TBD	TBD	TBD	TBD	TBD

*Outyear estimates are notional and will be updated as part of re-plan to be submitted in the FY 2019 President's Budget request.

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

Budget Program: NESDIS
Sub-program: Systems Acquisition
Program Change: Polar Follow On

Object Class		FY 2018	FY 2018
		Decrease	Total Program
11	Personnel compensation		
11.1	Full-time permanent	\$0	\$1,725
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	1,725
12	Civilian personnel benefits	0	465
13	Benefits for former personnel	0	0
21	Travel and transportation of persons	0	75
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	(8,000)	8,236
25.3	Purchases of goods & services from Gov't accounts	(181,344)	169,359
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	16
31	Equipment	0	80
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	(189,344)	179,956

Space Weather Follow On (SWFO): SWFO: (Base Funding: \$1,198,000 and 1 FTE; Program Change: -\$698,000 and 0 FTE): NOAA requests a decrease of \$698,000 and 0 FTE for a total of \$500,000 and 1 FTE to conduct mission analyses for future space weather missions.

Proposed Actions:

The requested funding is needed to analyze the current space weather approach which could include the compact coronagraph (CCOR) instrument and potential opportunities for incorporating commercial abilities. In FY 2017, NOAA will deliver the first flight CCOR. The FY 2018 request will allow work to continue, with the focus on a CCOR gap filler. This will enable NOAA to mature the design of the mechanical detector/electrical, optical and software elements within the preliminary design phase. All of this work will lead to missions that ensure the continuity of solar wind data and coronal mass ejection (CME) imagery, the National Weather Service’s (NWS) highest priority space weather observations.

Resource Assessment:

Base funds are being used to begin formulation studies that will determine the best possible architecture and way forward for the SWFO Program.

Schedule and Milestones:

FY 2018

- Investigate commercial options, select solar wind and CME imager mission options, and initiate preliminary major mission documents (Program Plan, Acquisition Plan, and Concept of Operations)

FY 2019 – FY 2022

- Milestones will be depended upon the preliminary major mission documents produced in FY 2018

Deliverables:

- Provide timely access to operational solar wind data and CME imagery for short and long—term warnings of geomagnetic storms

Outyear Funding Estimates* (\$ in thousands):

Space Weather FO	FY 2017 & Prior	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	CTC	Total
Change from FY 2017 Base	N/A	(698)	32,502	193,802	152,802	87,802	N/A	N/A
Total Request	2,396	500	33,700	195,000	154,000	89,000	TBD	TBD

*Outyears are estimates only. Future requests will depend on the major mission documents and program decisions to be made in FY 2018 and decisions on future funding 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: Space Weather Follow On (SWFO)

Object Class		FY 2018	FY 2018
		Decrease	Total Program
11	Personnel compensation		
11.1	Full-time permanent	\$0	\$139
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	139
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	-698	281
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	-698	500

COSMIC-2/Global Navigation Satellite System Radio Occultation: Ground System to Process Radio Occultation Data: (Base Funding:\$10,081,000 and 1 FTE; Program Change: -\$3,981,000 and 0 FTE): NOAA requests a decrease of \$3,981,000 and 0 FTE for a total of \$6,100,000 and 1 FTE for ground reception and processing of Global Navigation Satellite System Radio Occultation (GNSS RO) satellite data.

Proposed Actions

FY 2018 funding will support ground system development necessary for the launch and operation of the COSMIC-2A constellation in the equatorial low earth orbit. COSMIC-2A data will be received by a combination of international ground stations (Taiwan, Brazil, Australia), Air Force Mark IV-B ground stations (Hawaii, Honduras, Guam, Kuwait) and commercial ground stations (Ghana and Mauritius). Data latency, or the time it takes to receive the data, is greatly improved for weather applications with each additional ground reception station.

In FY 2018, NOAA will continue to fund the procurement of services for at least one additional commercial ground station to reduce data latency and increase data reliability at low cost. NOAA will also continue to provide data processing and archiving of COSMIC-2A data.

Resource Assessment:

COSMIC-2 is a continuation to produce an operational constellation of GNSS RO satellites. COSMIC-2A is scheduled to be launched into equatorial orbit by the USAF in 2017. The USAF is providing six RO sensors and Taiwan will procure and operate the spacecraft for the GNSS RO satellites. NOAA will provide the ground reception system for processing data from COSMIC-2A.

Schedule and Milestones:

FY 2018 – FY 2022 Schedule and Milestones are preliminary and will be subject to change based on the COSMIC-2A launch schedule.

FY 2018

- Reception and processing of equatorial low earth orbit satellite RO data from COSMIC-2A mission
- Complete antenna refresh at Fairbanks ground station

FY 2019 – FY 2022

- Continued processing of equatorial low earth orbit satellite RO data from COSMIC-2A

Deliverables:

- Reception and processing of RO data; improved quality control algorithms for GNSS RO data in NWS operational data assimilation systems
- GNSS RO data for assimilation into the NWS predictive weather models

Performance Goals and Measurement Data:

Performance Measure: Percent of COSMIC-2 data that can be disseminated to the user community within 45 minutes of observation by the spacecraft sensor	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
With decrease	N/A	N/A	30%	95%	95%	95%	95%
Without decrease	N/A	N/A	30%	95%	95%	95%	95%

Description: COSMIC -2 provides near real-time radio occultation data which is used to increase the accuracy of hurricane predictions and improve long-range weather forecasts. A low data latency is needed to ensure accurate and current information is provided to the NWS for use in numerical weather prediction models. If the data latency is longer than 45 minutes, the data will result in less accurate model results and less accurate weather forecasts. The mission requires ~19 months after launch to get all six COSMIC-2A spacecraft moved from the initial launch orbit to the final mission orbit. The full performance measure of 95 percent will not be achieved until spacecrafts are operating in their final mission orbit in FY 2019.

Outyear Funding Estimates* (\$ in thousands):

COSMIC-2 Ground System	FY 2017 & Prior	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	CTC	Total
Change from FY 2018 Base	N/A	(3,981)	TBD	TBD	TBD	TBD	N/A	N/A
Total Request**	27,757	6,100	TBD	TBD	TBD	TBD	TBD	TBD

**Outyear estimates are notional and will be updated in the FY 2019 President's Budget request.

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

Budget Program: NESDIS
Sub-program: Systems Acquisition
Program Change: Ground System to Process Radio Occultation Data

Object Class	FY 2018 Decrease	FY 2018 Total Program
Personnel compensation		
Full-time permanent	\$0	\$139
Other than full-time permanent	0	0
Other personnel compensation	0	0
Special personnel services payments	0	0
Total personnel compensation	0	139
Civilian personnel benefits	0	55
Benefits for former personnel	0	0
Travel and transportation of persons	0	25
Transportation of things	0	0
Rental payments to GSA	0	0
Rental Payments to others	0	0
Communications, utilities and miscellaneous charges	0	0
Printing and reproduction	0	0
Advisory and assistance services	0	0
Other services	0	0
Purchases of goods & services from Gov't accounts	-3,981	5,881
Operation and maintenance of facilities	0	0
Research and development contracts	0	0
Medical care	0	0
Operation and maintenance of equipment	0	0
Subsistence and support of persons	0	0
Supplies and materials	0	0
Equipment	0	0
Lands and structures	0	0
Investments and loans	0	0
Grants, subsidies and contributions	0	0
Insurance claims and indemnities	0	0
Interest and dividends	0	0
Refunds	0	0
Total obligations	-3,981	6,100

Satellite Ground Services: Satellite Ground Services Sustainment: (Base Funding: \$56,153,000 and 84 FTE; Program Change: -\$3,153,000 and 0 FTE): After an adjustment of \$3,455,000 for the FY 2018 Operational Phase Transfer from Jason-3 and DSCOVR, an FY 2018 transfer to the Office of Satellite and Product Operations (OSPO) of \$1,200,000 to support the backup facility at Wallops, VA, NOAA requests a decrease of \$3,153,000 and 0 FTE for a total of \$53,000,000 and 84 FTE for the sustainment, including technology refresh and hardware and software upgrades, to the existing ground systems as well as those in development.

Proposed Actions:

In order to fully support other existing NOAA priorities within the Procurement, Acquisition and Construction (PAC) portfolio NOAA will decrease Ground Enterprise Architecture Services (GEARS) activities that transition NOAA's individual ground systems into an enterprise-wide solution.

The intention of GEARS was to implement a single set of common ground services, consolidating hardware, eliminating duplicate software, and streamlining the development of new algorithms and products. Without sufficient funding, these efforts will not move forward as quickly, and it will be more challenging to integrate the new GOES-R and JPSS ground systems which need to move forward as planned.

Resource Assessment:

SGS is providing ground system sustainment, including technology refresh and hardware and software for each existing legacy mission and GOES-R, and provides labor to support the GOES-R and JPSS programs in completing each new ground system.

Schedule and Milestones:

FY 2018

- Continue to sustain operational satellite ground services
- Continue to sustain enterprise distribution and archive services

FY 2019

- Begin transition and sustainment of GOES-R Ground Segment
- Begin transition and sustainment of JPSS Ground Segment
- Continue to sustain operational satellite ground services
- Continue to sustain enterprise distribution and archive services
- Initial Operating Capability of Mission Science Network

FY 2020

- Continue to sustain operational satellite ground services
- Continue to sustain enterprise distribution and archive services
- Final Operating Capability of Mission Science Network

FY 2021

- Continue to sustain operational satellite ground services
- Continue to sustain enterprise distribution and archive services
- Initial operating capability of future archive service
- Initial operating capability of secure ingest service

FY 2022

- Continue to sustain operational satellite ground services
- Continue to sustain enterprise distribution and archive services
- Final operating capability of future archive service
- Final operating capability of secure ingest service

Deliverables:

- Continued sustainment of operational satellite ground services
- Continued sustainment of enterprise distribution and archive services
- Achieve final operating capability of Mission Science Network
- Achieve final operating capability of future archive service
- Achieve final operating capability of secure ingest service

Outyear Funding Estimates* (\$ in thousands):

Satellite Ground Services Core	FY 2017 & Prior	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	CTC	Total
Change from FY 2018 Base	N/A	(3,153)	24,821	38,847	38,847	38,847	N/A	N/A
Total Request*	N/A	53,000	80,974	95,000	95,000	95,000	N/A	Recurring

*Outyears are estimates only. Future requests will be determined through the annual budget process. This profile assumes completion of the FY 2018 Operational Phase Transfer.

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

Budget Program: NESDIS
Sub-program: Systems Acquisition
Program Change: Satellite Ground Services Sustainment

Object Class		FY 2018	FY 2018
		Decrease	Total Program
11	Personnel compensation		
11.1	Full-time permanent	\$0	\$10,880
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	10,880
12	Civilian personnel benefits	0	3,305
13	Benefits for former personnel	0	0
21	Travel and transportation of persons	0	110
22	Transportation of things	0	20
23.1	Rental payments to GSA	0	500
23.2	Rental Payments to others	0	0
23.3	Communications, utilities and miscellaneous charges	0	200
24	Printing and reproduction	0	1
25.1	Advisory and assistance services	0	5,380
25.2	Other services	-3,153	10,054
25.3	Purchases of goods & services from Gov't accounts	0	22,300
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	50
31	Equipment	0	200
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	-3,153	53,000

System Architecture and Advanced Planning: Strengthening NOAA's Future Satellite Capabilities: (Base Funding: \$3,922,000 and 14 FTE; Program Change: +\$1,007,000 and 0 FTE): NOAA requests an increase of \$1,007,000 and 0 FTE for a total of \$4,929,000 and 14 FTE to fulfill duties of the NESDIS Chief Engineer and to begin pre-acquisition activities resulting from the NOAA Satellite Observing System Architecture (NSOSA) study.

Proposed Actions:

System Architecture and Advanced Planning (SAAP) provides essential systems engineering and architecture analysis that inform all NESDIS system acquisition decisions.

In FY 2018, SAAP's Systems Engineering responsibilities include assessing satellite constellation health and developing the NESDIS Flyout Charts that inform future launch planning. Secondly, SAAP oversees the NESDIS Enterprise Risk process to proactively identify and mitigate risks of capability gaps. Lastly, SAAP develops all NESDIS-level guidance for acquisition programs.

The requested funding increase will allow SAAP to formalize the management and prioritization of NOAA satellite observing requirements as they flow from end users (validated by the NOAA Observing System Council) to the appropriate implementation program in NESDIS. In addition, SAAP will codify the end-to-end NESDIS product lifecycle, from user needs through an enterprise process for planning, budgeting, development, test, and operations (including data archival, discoverability, and end user readiness). Without this funding increase, NESDIS will continue to lack a comprehensive approach to prioritizing, analyzing alternatives, and acquiring and managing new data sources and satellite products across the NESDIS enterprise.

As the NESDIS chief systems architect, SAAP will complete the NOAA Satellite Observing System Architecture Study in late FY 2017. The results of the study will provide new architecture work which will begin in FY 2018 and focus on detailed implementation options and roadmaps to specify the evolution of the satellite architecture. SAAP will initiate the critical investment opportunities identified in the NSOSA study, which enables pre-acquisition activities such as, selected technology studies, system obsolescence analysis, industry and commercial sector engagement, and program planning.

Statement of Need and Economic Benefits:

The continuity of observations from NOAA's space borne capabilities is vital to our ability to understand, predict and warn of changes in weather and the environment – the key capabilities that enable NOAA to meet its mission to deliver timely, actionable, and reliable information to protect citizens, businesses and communities. The weather forecasting system relies on an assured and uninterrupted flow of high-quality data from our environmental satellites. These assured data and information products are used by the National Weather Service to produce Weather Predictions, Federal Emergency Management Agency to track and respond to Weather related natural disasters, the Department of Defense in its mission execution and by U.S. citizens, local governments, and commercial interests.

Resource Assessment:

System Architecture and Advanced Planning (SAAP) is working to inform decisions for current and future NOAA satellite architectures and end to end system integration. SAAP identifies opportunities to streamline functions to provide best value for current and future NOAA space enterprise investments.

Schedule and Milestones:

FY 2018

- Finalize NSOSA Study and begin the concept formulation phase of the first operational systems identified by observational architecture plan. This includes drafting Concepts of Operation, specifications, acquisition documents
- Support the end-to-end mission validation of JPSS-1 system and products
- Support the launch and end-to-end mission validation of GOES-S system and products

FY 2019

- Begin awarding contracts for additional commercial data buys to evaluate new data sources, based on lessons learned from previous commercial data pilot projects and emerging commercial opportunities
- Begin implementation of technology insertion/maturation plans
- Begin collaboration efforts between NESDIS and NASA in technology-to-operations demonstrations
- Execute latest security controls and monitoring capabilities for NESDIS systems

FY 2020

- Oversee the technology development efforts of the components needed to meet NOAA's mission needs, phased by need date
- Demonstrate effectiveness of commercial data buys made in previous years and assess new commercial data sources through sample data purchases
- Continue collaboration with NASA to execute technology-to-operations demonstrations
- Support the launch and end-to-end mission validation of GOES-T systems and products
- Develop Level 1 Requirements documentation for programs to follow the current
- Execute latest security controls and monitoring capabilities for NESDIS systems

FY 2021

- Oversee the previously initiated technology development efforts
- Initiate next phase of technology development efforts
- Demonstrate effectiveness of commercial data buys made in previous years and assess new commercial data sources through sample data purchases
- Oversee execution of initial technology-to-operations collaborations with NASA and initiate next efforts
- Support the launch and end-to-end mission validation of JPSS-2 systems and products
- Complete Level 1 Requirements documentation for follow-on programs
- Execute latest security controls and monitoring capabilities for NESDIS systems

FY 2022

- Support the evolution of GOES-R and JPSS ground systems to common services
- Govern the implementation of the new NESDIS architecture as the observational, ground, data products, and service-providing systems are being developed to meet the plan
- Complete near term technology development efforts and insert them into the operational systems' development flow as planned
- Initiate new tech development efforts as needed
- Institutionalize the use of commercial data buys to meet as much of NOAA mission needs as feasible

- Execute latest security controls and monitoring capabilities for NESDIS systems

Deliverables:

- NESDIS Program End-to-End Mission Validation reports and lessons learned
- NESDIS Future Architecture Report
- NESDIS Level 0 Requirements Documents
- Fully populated NESDOCS library, including configuration control of enterprise policies and procedures
- Level 1 Requirements Documents for the next generation of programs in Pre-Formulation
- Active enterprise risk management
- Active enterprise configuration control/management

Performance Goals and Measurement Data:

Performance Measure:	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
Systems engineering policy and procedure documentation milestones completed							
With increase	75%	100%	100%	100%	100%	100%	100%
Without increase	75%	75%	75%	75%	75%	75%	75%

Description: The development of NESDIS policies and procedures ensures a robust framework for a rational, repeatable methodology for documentation of NESDIS' requirements management, acquisition, operations, science, architecture and data management mission areas. In FY 2018 SAAP plans to continue the documentation of these critical policies and procedures. If NESDIS does not meet this performance goal, programmatic planning and acquisition of the next generation satellite series (ready to launch by approximately 2028-2031) may be delayed; placing the continuity of critical environmental observations at risk.

Outyear Funding Estimates* (\$ in thousands):

SAAP	FY 2017 & Prior	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	CTC	Total
Change from FY 2018 Base	N/A	1,007	TBD	TBD	TBD	TBD	N/A	N/A
Total Request	N/A	4,929	TBD	TBD	TBD	TBD	N/A	Recurring

*Outyears are estimates. 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: Strengthening NOAA's Future Satellite Capabilities

Object Class		FY 2018 Increase	FY 2018 Total Program
11	Personnel compensation		
11.1	Full-time permanent	\$0	\$724
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	724
12	Civilian personnel benefits	0	159
13	Benefits for former personnel	0	0
21	Travel and transportation of persons	0	24
22	Transportation of things	0	0
23.1	Rental payments to GSA	0	131
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	1,007	3,751
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	2
31	Equipment	0	138
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	1,007	4,929

Projects, Planning and Analysis (PPA): MetOp-C Instrument Testing and Launch Support: (Base Funding: \$2,000,000 and 0 FTE; Program Change: +\$12,033,000 and 0 FTE): NOAA requests an increase of \$12,033,000 and 0 FTE for a total of \$14,033,000 and 0 FTE to fund MetOp-C instrument testing and launch support.

Proposed Actions:

Increased funding supports the pre-launch testing and Ground Support Equipment (GSE) of MetOp-C, which are critical to support the U.S.-instruments that provide mid-morning polar observations for weather forecasting. Additionally, resources will be used to support launch activities for the scheduled October 2018 launch.

Statement of Need and Economic Benefits:

The launch of the NOAA suite of U.S. instruments - Advanced Microwave Sounding Unit – A (AMSU A), Advanced Very High Resolution Radiometer (AVHRR), and Space Environment Monitor (SEM) - on MetOp-C is critical to maintaining the quality of Numerical Weather Prediction (NWP) models. These three instruments, currently flying on MetOp-A and –B in the mid-morning orbit, provide polar observations similar to Joint Polar Satellite System (JPSS) in the afternoon orbit.

Together, the MetOp and JPSS satellite constellations provide the timely coverage of the globe. Forecasters rely on data collected from the two different complementary orbits (mid-morning and afternoon) to produce the 3-7 day outlook. Therefore, delay or loss of access to the data from MetOp-C in the mid-morning orbit would directly impact the quality of NWP model forecasts.

NOAA recently published the Mitigation Plan for Potential Afternoon Polar-orbiting Satellite Data Gaps in which MetOp was an important component in mitigating the impact of a gap in KPP data. The plan details a process in which maintaining KPP data requires the support of MetOp-C's instruments AMSU-A and AVHRR through environmental testing and launch.

The specific benefits and uses of the NOAA provided instruments are outlined below:

- a. Advanced Microwave Sounding Unit A (AMSU-A) data: AMSU observations in the mid-morning orbit have been shown to provide measurable improvement to the 3-7 day forecast accuracy. The NWS NWP models are optimized to use the Metop and Suomi NPP data; without the initial AMSU data from the Metop satellite, U.S. forecasts would experience an immediate deterioration.
- b. Advanced Very High Resolution Radiometer (AVHRR) data: Access to these data by U.S. and international users is important to ensure timely access to refreshed data that are used for agriculture, land management, fisheries protection, ocean monitoring and weather forecasting.
- c. Space Environment Monitor (SEM): SEM data are used by NWS Space Weather Prediction Center (SWPC) to develop alerts that warn about the flux of charged particles from solar terrestrial phenomena such as solar outbursts and solar wind occurrences on long-range communication systems at high-altitudes, power distribution systems, protection of satellite circuits and solar panels, and need to shelter human beings.

Resource Assessment: There are insufficient funds in PPA to support the accommodation of the NOAA instrument suite for launch on MetOp-C in October 2018. NOAA funding supports

critical NASA and contractor support during the launch campaign, working in concert with the European Space Agency (ESA) and its development contractors.

Schedule and Milestones:

FY 2018

- Conduct Electro-Magnetic Interference and Compatibility testing in Toulouse, France
- Monitor U.S. instrument performance during MetOp-C dynamics testing in France
- MetOp-C Post-mechanical testing Satellite Health Check (SHC)
- MetOp-C Satellite System Validation Test (SVT) in France
- Final MetOp-C pre-ship instrument cleaning and inspection and packing EGSE
- Support MetOp-C Flight Acceptance Review (FAR) and Pre-ship Review
- Final pre-launch cleaning and inspection at launch site in French Guiana

FY 2019

- MetOp-C launch in Kourrou
- Perform Satellite In-Orbit Verification (SIOV) and post-launch evaluation of U.S. instruments

FY 2020 – FY 2022

- Assist NESDIS OSPO by providing engineering services to support on-orbit anomalies of U.S. instruments on MetOp
- Perform calibration and validation of satellite and instruments

Deliverables:

FY 2018 – FY 2022

- Spacecraft Environmental testing (EMI/EMC) completed prior to launch
- Provide funding towards launch campaign
- Support post-launch activities
- Support to EUMETSAT for U.S. instruments for the on-orbit MetOp satellites

Performance Goals and Measurement Data:

Performance Measure: Number of MetOp-C pre-launch tests and post launch activities completed on time	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
With Increase	N/A	N/A	7	2	N/A	N/A	N/A
Without Increase	N/A	N/A	1	0	N/A	N/A	N/A
Description: The work to prepare for launch includes spacecraft environmental testing and the launch campaign and typically begins approximately 18 months before launch.							

Outyear Funding Estimates* (\$ in thousands):

PPA (MetOp-C)	FY 2017 & Prior	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	CTC	Total
Change from FY 2018 MetOp-C Base	N/A	12,033	0	0	0	0	N/A	N/A
MetOp-C Request	115,329**	14,033	2,000	2,000	2,000	2,000	8,104	145,466
Change from FY 2018 PPA Base	N/A	12,033	11,848	11,848	11,848	32,631	N/A	N/A
Total PPA Request	N/A	37,185	37,000	37,000	37,000	57,783	N/A	Recurring

*Outyears are estimates only. Future requests will be determined through the annual budget process.

**MetOp-C efforts began before the NESDIS reorganization that created the Projects, Planning and Analysis (PPA) PPA.

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

Budget Program: NESDIS
Sub-program: Systems Acquisition
Program Change: MetOp-C Instrument Testing and Launch Support

Object Class		FY 2018	FY 2018
		Increase	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	12,033	14,033
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	12,033	14,033

**APPROPRIATION ACCOUNT: PROCUREMENT, ACQUISITION, AND CONSTRUCTION
SUB-PROGRAM: NESDIS CONSTRUCTION**

SATELLITE COMMAND AND DATA ACQUISITION (CDA) FACILITY

To support its mission requirement to ensure that the control, health and safety of NOAA satellites can be maintained at all times, and that the satellites are available to provide timely and essential environmental data to a wide range of users, NESDIS operates and maintains Command and Data Acquisition (CDA) Stations at Fairbanks, AK and Wallops, VA; NOAA Satellite Operations Facility (NSOF) at Suitland, MD; and the NESDIS Consolidated Backup (CBU) at Fairmont, WV. These facilities provide power and cooling to the satellite ground systems uninterrupted 24 hours per day, 365 days per year.

The objectives of the Satellite CDA Facility PPA are to:

- Support repairs and renew facilities that contain critical infrastructure;
- Maintain structural integrity through capital improvements; and
- Ensure availability of power and cooling necessary for NOAA's satellite ground system.

Schedule and Milestones:

FY 2018

- Fairbanks CDA Station Electrical Distribution Renewal
- Fairbanks CDA Station Independent Research Facility Roof Replacement
- Replacement of Fairbanks CDA Station Uninterruptible Power Supply (UPS)
- Demolition of Fairbanks CDA Station Old Operations Buildings
- New Fairbanks CDA Station Core Security Fence
- Suitland NSOF UPS Capacitors
- Suitland NSOF Building Automation Upgrade
- Complete Wallops CDA Station Water Supply Alterations
- Complete Wallops CDA Station road repairs

FY 2019 – FY 2022

- Replace UPS Battery (Fairbanks CDA, Fairmont CBU, and Suitland NSOF)
- Replace UPS Capacitor (Fairmont CBU and Suitland NSOF)
- Repair paving at Fairbanks CDA Station
- Building Automation Upgrade (Fairmont CBU and Suitland NSOF)
- Upgrade Water Treatment at Fairbanks CDA Station
- Replace the facility roof (Fairbanks CDA Station and Wallops CDA)
- Provide an Engine-Generator replacement at Fairbanks CDA Station
- Replace the backup groundwater well at Fairbanks CDA Station
- Repair the redundant switchgear and cooling systems at Fairbanks CDA Station
- Provide essential building renovations at Fairbanks CDA Station
- Replace the Computer Room Air Conditioner at Wallops CDA Station
- Replace the Physical Access Control and closed circuit television at Wallops CDA Station

Deliverables:

- Replacement of failed and obsolete components
- Reliability improvements based on results of single point of failure analysis at Fairbanks CDA Station

- Implement recommended countermeasure from anti-terrorism risk assessment at Fairbanks CDA Station
- UPS battery and capacitor replacements at all CDA facilities
- Maintain 99.99 percent uptime for power and cooling

PROGRAM CHANGE FOR FY 2018:

Satellite CDA Facility: NESDIS Construction: (Base Funding: \$2,224,000 and 0 FTE; Program Change: +\$226,000 and 0 FTE): NOAA requests an increase of \$226,000 and 0 FTE for a total of \$2,450,000 and 0 FTE to accelerate electrical infrastructure renewal at the Fairbanks Command and Data Acquisition Station. Infrastructure failures since early 2015 have interrupted and damaged satellite ground systems at the Fairbanks Command and Data Acquisition Station (FCDAS). A study of infrastructure systems at the FCDAS, done in 2016 by the U.S. Army Corps of Engineers, recommended projects necessary to mitigate specific weaknesses. The increase would enable earlier improvements such as replacement of more failed and obsolete components, construction of redundant distribution, and expansion of status monitoring. This funding will allow NESDIS to repair and renew infrastructure at a rate which maintains a higher level of reliability than in the past. Known and anticipated requirements are similar to improvements completed at other CDA facilities, which have contributed to higher availability of power and cooling necessary for NOAA’s satellite operations.

Outyear Funding Estimates (\$ in thousands):

Satellite CDA	FY 2017 & Prior	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	CTC	Total
Change from FY 2018 Base	N/A	226	226	226	226	226	N/A	N/A
Total Request	N/A	2,450	2,450	2,450	2,450	2,450	N/A	Recurring

*This funding profile has been extended beyond FY 2018 to support ongoing renewal projects critical to maintaining the operation of CDA facilities.

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

Budget Program: NESDIS
Sub-program: Construction
Program Change: NESDIS Construction

Object Class		FY 2018 Increase	FY 2018 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	0	0
25.3	Purchases of goods & services from Gov't	226	2,450
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	226	2,450

BUDGET PROGRAM: NOAA MISSION SUPPORT

For FY 2018, NOAA requests a total of \$234,313,000 and 687 FTE for Mission Support, including a net decrease of \$31,624,000 and 36 FTE in program changes.

Mission Support Overview

NOAA's Mission Support services are the backbone of NOAA's programs and mission. These services provide the planning, administrative, financial, procurement, information technology, human resources, and infrastructure services that are essential to the safe and successful execution of NOAA's mission.

The Mission Support budget is organized into five sub-programs within the Operations, Research and Facilities (ORF) account:

- Executive Leadership (\$28,087,000 and 121 FTE) provides centralized executive management as well as policy formulation and direction.
- Mission Services and Management (\$141,448,000 and 572 FTE) includes such activities as financial reporting, budgeting, information technology, acquisition and grants, human resource services, and facilities management.
- IT Security (\$10,044,000 and 13 FTE) leads priority cyber security initiatives.
- Payment to the DOC Working Capital Fund (\$58,699,000 and 0 FTE) provides centralized services to NOAA's Line Offices and Staff Offices.
- Office of Education (\$26,661,000 and 17 FTE) 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 Mission Support budget is organized under one sub-program within the Procurement, Acquisition, and Construction (PAC) account:

- NOAA Construction (\$998,000 and 0 FTE) provides for restoration of capital assets including alteration or modification of properties.

Significant Inflationary Adjustments:

Calculated Adjustments

NOAA's FY 2018 Base includes a net increase of \$1,062,000 and 0 FTE to account for the full funding requirement for inflationary adjustments to current programs for Mission Support activities. This includes the estimated 2018 Federal pay raise of 1.9 percent as well as inflationary increases for non-labor activities including service contracts, utilities, field office lease payments, and rent charges from the General Services Administration (GSA).

Technical Adjustments

NOAA also requests the following transfers for a net change of \$0 and 0 FTE to the agency:

Transfer Related to the David Skaggs Research Center, Boulder, CO				
From Office	PPA	To Office	PPA	Amount / FTE
MS	Mission Services and Management	OAR	Weather and Air Chemistry Labs and Cis	\$ 2,872,000 / 0 FTE
MS	Mission Services and Management	NWS	Multiple	\$ 501,000 / 0 FTE
MS	Mission Services and Management	NESDIS	National Centers for Environmental Information	\$ 519,000 / 0 FTE
MS	Mission Services and Management	NOS	Navigation, Observations and Positioning	\$ 22,000 / 0 FTE
Total				\$ 3,914,000/ 0 FTE

NOAA requests to transfer \$3,914,000 and 0 FTE to move funding for rent at the David Skaggs Research Center in Boulder, CO, from the Mission Support Facilities to the Line and Staff Offices located at the Boulder campus. An additional \$287,000 will remain in the Mission Services and Management PPA to support the Staff Offices rent funded within this line. This funding is currently appropriated within the Mission Services and Management PPA and then distributed to the Line and Staff Offices annually. This reallocation will increase efficiency and improve transparency by eliminating the need for funding transfers subsequent receipt of appropriation.

Transfer Related to the Western Regional Center, Seattle, WA				
From Office	PPA	To Office	PPA	Amount / FTE
MS	Mission Services and Management	MS	Executive Leadership	\$ 78,000 / 0 FTE
MS	Mission Services and Management	NMFS	Multiple	\$ 2,592,000 / 0 FTE
MS	Mission Services and Management	OAR	Weather and Air Chemistry Labs and Cis	\$ 1,145,000 / 0 FTE
MS	Mission Services and Management	NWS	Analyze, Forecast and Support	\$ 155,000 / 0 FTE
MS	Mission Services and Management	OMAO	Marine Operations and Maintenance	\$ 114,000 / 0 FTE
MS	Mission Services and Management	NOS	Multiple	\$ 618,000 / 0 FTE
Total				\$ 4,702,000 / 0 FTE

NOAA requests to transfer \$4,702,000 and 0 FTE to move funding associated with NOAA's Western Regional Center (WRC) facilities management activities from Mission Support Facilities to the Line and Staff Offices. An additional \$497,000 and 0 FTE for the Western Regional Center will remain in the Mission Services and Management PPA to fund the Staff Offices portion of WRC operations. Currently, costs for these activities are paid directly through the

funding appropriated within Mission Services and Management. This reallocation supports NOAA's plan to employ an integrated campus cost model whereby WRC tenants will be billed directly for the cost of services provided. An integrated cost model will provide WRC tenants with greater transparency and control of operating expenses resulting in direct incentives to reduce costs.

Transfer Related to IT Security PPA				
From Office	PPA	To Office	PPA	Amount / FTE
MS	Mission Services and Management	MS	IT Security	\$ 1,700,000 / 11 FTE
<i>Total</i>				\$ 1,700,000 / 11 FTE

NOAA requests to transfer \$1,700,000 and 11 FTE from the Mission Services and Management PPA to the IT Security PPA in order to align and consolidate IT security costs. The 11 FTE work in the OCIO Cyber Security Division and work full time on OCIO and NOAA enterprise cybersecurity efforts. This will be in line with the other restructuring efforts across Mission Support to improve transparency by streamlining offices and sub-programs under appropriate PPAs.

Department of Commerce Enterprise Services Initiative:

In efforts to support the commitment of Operational Excellence, Department of Commerce's leadership set a goal to improve customer service and enhance the delivery of the Human Resources, Acquisition, Financial Management and Information Technology mission-enabling functional areas with Human Resources being the first functional area to transition to the Enterprise Services model. In FY 2017, NOAA's Workforce Management Office (WFMO) started transitioning to an Enterprise Services model to streamline the delivery of human resources services. This new delivery model will result in outsourcing many of the traditional time-consuming transactional tasks, such as Personnel Action Requests (PAR) processing, staffing, recruitment, classification, separations, and compensation allowing WFMO to focus more on workforce planning and retention and there by strengthen mission delivery and improve customer service.

Narrative Information:

Following this section are base justification materials and program change narratives by sub-program for this line office. Please note program change narratives are only provided for program changes that represent greater than five percent of a program. Complete program changes by PPA can be found in the NOAA Control Table (p. Control Table-7). Please contact the NOAA if details for any of these changes are required.

**APPROPRIATION ACCOUNT: OPERATIONS, RESEARCH, AND FACILITIES
SUB-PROGRAM: EXECUTIVE LEADERSHIP, MISSION SERVICES AND MANAGEMENT, IT
SECURITY, DOC WORKING CAPITAL FUND**

The objectives of these Mission Support sub-programs are to

- Develop policies regarding the administration of NOAA programs with Federal agencies, the Congress, and private industry; and
- Develop and implement policy, planning, and program oversight.

Executive Leadership

Executive Leadership 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 (USAO): 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 includes following offices:

Office of Legislative and Intergovernmental Affairs (OLIA): This office serves as the primary liaison for NOAA with the members and staff of Congress. The office is 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.

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.

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.

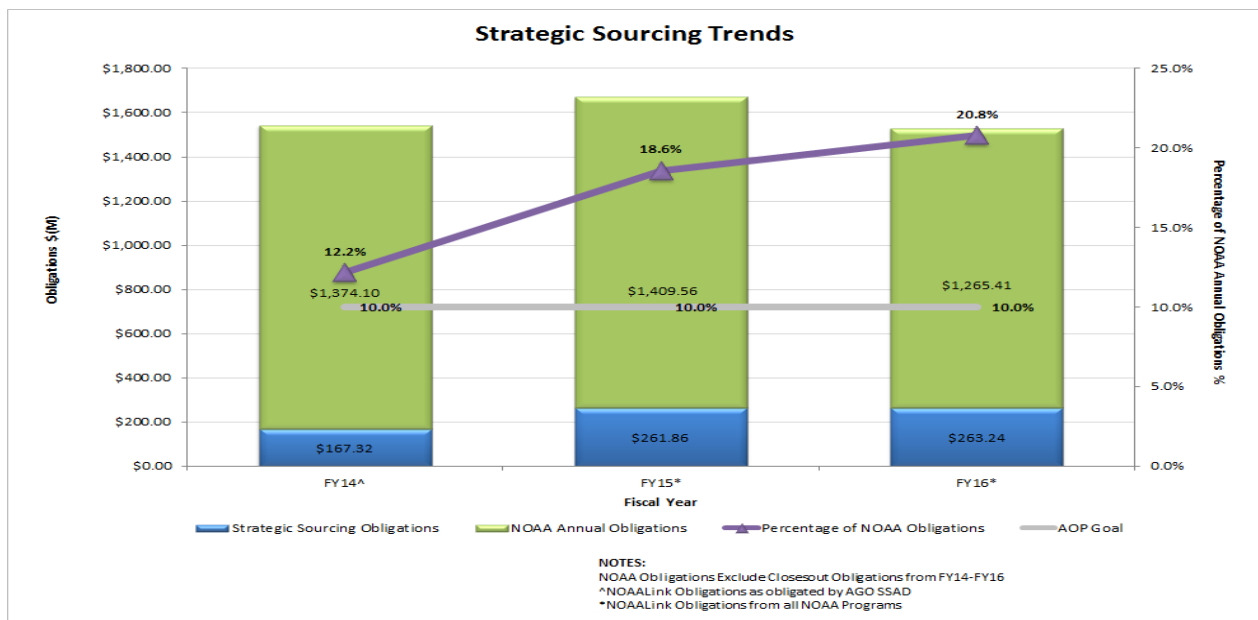
Office of General Counsel (OGC): OGC provides legal advice, review, and representation on a host of complex matters arising from the fulfillment of NOAA's mission. NOAA OGC ensures NOAA management decisions are made with necessary consideration of proper legal requirements, procedures, and options.

Mission Services and Management

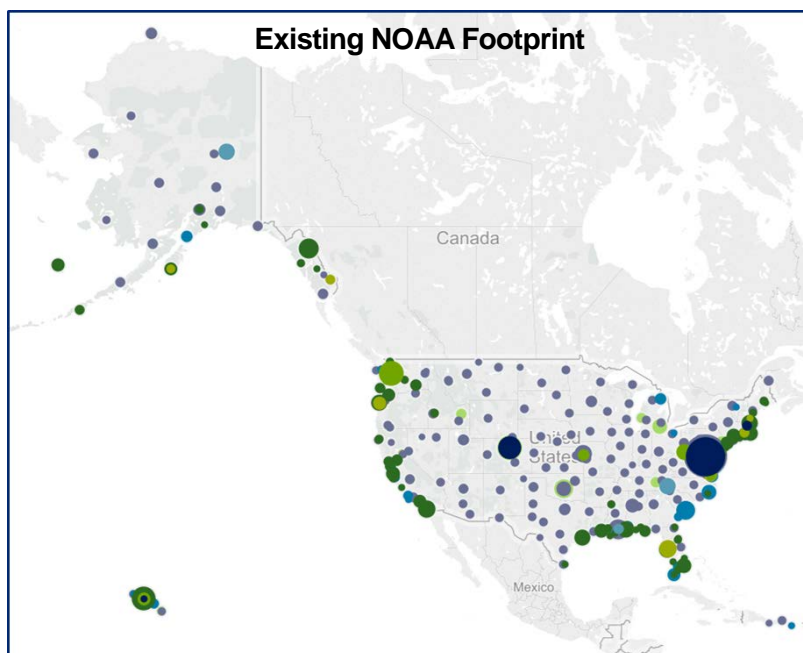
Mission Services and Management is the mission-enabling arm of NOAA that supports all operational activities and is essential to its success.

Acquisition and Grants Office (AGO): AGO provides high-value services to NOAA Line and Staff Offices, compliant with laws and regulations, on time, and at the best value to the government through the planning, solicitation, award, administration, and closeout of nearly 27,000 acquisition and financial assistance transactions annually. NOAA's ability to accomplish its mission and achieve its goals depends significantly on AGO's ability to process over \$3 billion annually in accordance with statutory and regulatory requirements. In FY 2016 for example, \$1.265 billion was obligated via 12,783 acquisition transactions, \$921.7 million was obligated via 4,107 financial assistance transactions, and \$1.203 billion was transferred to other Federal agencies (primarily the National Aeronautics and Space Administration).

In FY 2016, the NOAA Acquisition and Grants Office (AGO) obtained approval to transition a significant part of the funding required to provide acquisition services to NOAA Clients to a fee for service basis. Throughout FY 2016, AGO, with the assistance of the Office of the Chief Financial Officer (OCFO), successfully planned and executed the process and systems changes required to support full implementation beginning October 1, 2016. Furthermore, NOAA continued its strong support of small businesses, obligating approximately \$743 million out of \$1.3 billion to small businesses equating to a 59.8 percent overall small business achievement for the year, the highest it has been. AGO also continued to place emphasis on NOAA's two key strategic sourcing initiatives NOAALink program and ProTech Acquisition Initiative to improve efficiency and reduce costs.



Office of Chief Administrative Officer (OCAO): The national scope of NOAA's mission requires a diverse portfolio of geographically distributed facilities. OCAO supports NOAA-wide activities by managing assets in terms of risk and maintenance, and ensuring efficient use of government resources. OCAO oversees a portfolio of over \$5 billion in owned and leased facilities, administers the real and personal property portfolios including 177,000 personal property assets valued at over \$8.2 billion, manages the Safety and Occupational Health program, coordinates security and anti-terrorism risk protection, and ensures best business practices around records and financial controls.



In FY 2016, OCAO expedited and awarded a 10-year lease to the City of Lakeland, Florida, to house the NOAA Aircraft Operations Center (AOC) at Lakeland Linder Regional Airport, serving as the main base for NOAA's aircraft fleet, including the "hurricane hunter" planes. OCAO managed two Energy Savings Performance Contracts (ESPC's): one for \$9 million at the Western Regional Center (WRC) in Seattle, WA, and one for \$1 million at the Atlantic Oceanographic and Meteorological Laboratory (AOML) in Miami, FL. An ESPC is a partnership between an agency and an energy service company that enables the agency to reduce energy and operating costs through facility improvements without up-front capital investment.

Office of the Chief Financial Officer (OCFO): OCFO serves as NOAA's principal financial manager. NOAA has annual appropriated resources of almost \$6 billion and recorded capital asset value in excess of \$7 billion. OCFO is responsible under the CFO Act to provide the leadership necessary for NOAA to obtain an annual 'unqualified opinion' on the audit of its consolidated financial statements. The areas under the direction of the OCFO are the Budget Office, the Finance Office, Performance, Risk and Social Science Office (PRSSO), the DOC Working Capital Fund (WCF), Common Services and the NOAA Direct Bill. The Budget Office provides oversight, management, outreach and communication of the budget process, which includes coordinating the preparation of budget submissions, and allocating and controlling the execution of all budgetary resources. The Finance Office ensures that the consolidated financial statements and reports are accurate, manages and operates the financial management system, and is responsible for the timely payment of bills. The PRSS Office leads and deploys best

practices from social science integration and enterprise performance and risk management to advance NOAA's mission.

DOC Accounting System (CBS application): The CBS application requires that the application (along with associated interfaces and feeder systems) be operated, maintained, and enhanced. Changes to the system 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 and training. Ongoing maintenance and support of CBS allows NOAA to maintain compliance with legal, regulatory and executive requirements such as the OMB Circular A-123 and the Federal Information Security Management Act (FISMA) and allows NOAA managers to have access to financial data necessary to make informed decisions. The current CBS servers / SAN hardware and Oracle Portal product have reached end of life and will no longer be supported in FY 2017. DOC has a plan in place to upgrade the existing CBS technical architecture (i.e., hardware, system software, supporting infrastructure) to ensure the operability of CBS through FY 2025. NOAA has been asked to support DOC in re-baselining the DOC CBS capital asset plan through FY 2025. CBS no longer has a planned "retirement" date and therefore, budget planning must include updating the technical architecture and supporting application software components (i.e., Oracle products, Tibco, etc.) through FY 2025.

Common Services (CS) account: The Common Services 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 (MOU) and/or Interagency Agreements (IA). 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.

NOAA Direct Bill Process: The NOAA Direct Bill process enables NOAA Line and Staff Office service providers to assess other Line and Staff Offices for their proportionate share of the costs of enterprise-wide programs or services. Direct Bill proposals are only for unique services/products that provide an enterprise-wide benefit or that consolidate funding for enterprise solutions.

Office of the Chief Information Officer (OCIO): NOAA OCIO's operating model is 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, and big data. OCIO provides the enterprise IT infrastructure that connects and manages networks, telecommunications, systems, and people to enable NOAA to provide data observation, ingestion, assimilation and modeling, processing, dissemination, and archiving capabilities at greater scales. NOAA OCIO has established three organizational goals: (1) advance the mission using innovative IT; (2) protect the mission; and (3) achieve excellence in IT service delivery. During FY 2016, NOAA OCIO awarded a new Unified Messaging Service contract, providing unlimited storage for email and collaboration services to all NOAA users and including a Data Loss Prevention service. Additionally, NOAA completed the modification of its interagency agreement with the Department of Energy to enhance Research and Development

High Performance Computing. The compute capacity was doubled to advance NOAA's ability to provide regional and local weather and climate information.

Program, Planning and Integration (PPI): The planning and social science functions of PPI transitioned to the OCFO in FY 2015 and FY 2016 respectively. In FY 2016, the NOAA NEPA Coordinator and associated functions moved to the OGC and the regional collaboration function moved to the USAO. These transitions sustainably and efficiently maintain all the PPI functions in other management structures within NOAA and the office will be abolished.

Workforce Management Office (WFMO): WFMO provides human capital policies, programs, consultative services, and processes that facilitate the 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 in human capital functions including strategic human capital planning, labor-management and employee relations, accountability and quality assurance, performance management and incentive awards, executive resources, leadership development programs, training and career development, human resources data management, and HR information technology systems. WFMO also oversees staffing, classification, recruitment and hiring actions as well as personnel action processing services and compensation and benefits through the Department's new Enterprise Services model of human resources delivery, which was initiated in FY17Q1. These services have been outsourced to provide focused, efficient and cost-effective products to NOAA organizations and employees. WFMO has implemented the NOAA Strategic Human Capital Management Plan; reinstated the NOAA Diversity & Inclusion Management Advisory Council; transitioned human capital services to a new service delivery model; engaged new vendors and partners and provided detailed and improved personnel staffing support; instituted new technologies including the first instance of HR Connect (a multi-faceted human capital transactions software application supporting all of NOAA), and reinvigorated the NOAA Human Resource Directors Advisory Committee (HRDAC). Each of these achievements has provided improved transparency of human capital actions and greater consistency of services while 1) capitalizing on economies of scale and efficiency and 2) improving the quality of services provided. WFMO has also taken distinct actions to improve employee and labor relations for NOAA including preparing the National Weather Service to renegotiate the 2001 National Weather Service/(National Weather Service Employee Organization Collective Bargaining Agreement and completely eliminating a large historical backlog of inquiries from employees based on allegations of harassment.

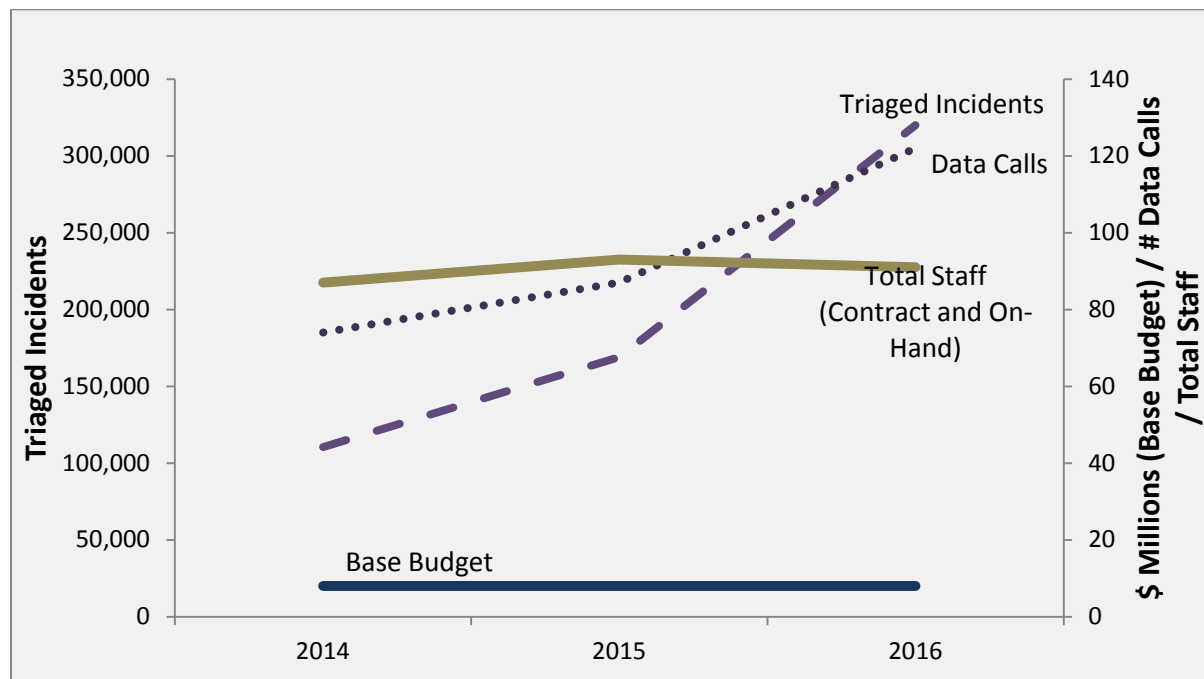
In FY 2018, NOAA will continue the process of charging customers (Line and Staff Offices) directly for transactional services identified under the Enterprise Services model. WFMO will continue to implement a robust consultative services approach which includes providing human capital expert advisors dedicated to each Line and Staff office to ensure mission alignment, unity of purpose and customer satisfaction. In addition, WFMO has developed specific centers of expertise to advance strategic development in human capital policy, programs evaluation, and human resource analytics to support all of NOAA.

IT Security

NOAA's IT Security Program has the mission to defend NOAA's data, networks, equipment, intellectual property and personnel against threats from hackers, nation states, and non-nation state groups who wish to do harm to NOAA interests. Hackers could potentially damage or degrade NOAA's ability to keep 330 million Americans, as well as others, safe and informed of

weather, environmental, and economic events. The cyber security environment reduces the cost of espionage, and is a low cost, low risk, effective way to steal hard-won research information.

IT Security's interconnected nature poses particular risks to IT equipment and infrastructure. Through a vulnerability management and risk based approach, OCIO implements NOAA's IT Security Program to achieve defense in depth via a common prevention, response, and mitigation strategy to manage mission risk related to cyber security threats. The total number and the sophistication of attempts against NOAA systems increases year by year (420 billion events in FY 2014 to 1.1 trillion for FY 2016) and is not likely to decrease in the foreseeable future. Current high priority risks include national/international/non-state actors, social engineering, advanced persistent threats, botnets, and precision targeted malware. Future considerations include insider threats, classified environments, distributed denial of service attacks, DHS dashboards and risk scoring. Initiatives include Trusted Internet Connection (TIC) capability and use, continuous monitoring of Federal information systems, and strong authentication using government issued identity credentials. During FY 2016, OCIO expanded the 2.0 version of Trusted Internet Connection (TIC) to create a wider, stronger, upgraded perimeter against cyber intrusions. OCIO supported the development of the initial operating capability of the DOC Enterprise Security Operations Center (ESOC), leveraging existing core capabilities within the NOAA Cyber Security Center. With all DOC offices and bureaus providing telemetry to an ESOC, DOC has the ability to correlate, identify, and defend against sophisticated cyber attacks.



Payment to the Department of Commerce (DOC) Working Capital Fund (WCF)

The DOC WCF provides centralized services to NOAA's Line and Staff Offices in the most efficient and economical manner. Organizational units within DOC provide the administrative, legal, information technology, financial, and policy support needed to accomplish NOAA's overall mission. The WCF was established pursuant to 5 USC 607 (15 USC 1521). Unlike other DOC bureaus, the NOAA contribution to the WCF is provided by specific allocation within the NOAA appropriation.

Schedule and Deliverables:

CFO

Description of Milestone	Planned Completion Date
Submit final Annual Performance Plan Report (APPR) for President's Budget submission within 5 days of due date	Q2 Annually
Identify corrective action plans for Audit Findings	1-30 days after receipt of Final Findings, annually
Complete Congressional Budget Submission	Q2 Annually
Execution review and analysis	Monthly

OCIO

Activity	Description of Milestone	Planned Completion
Portfolio Management	Prepare OCIO Annual Operating Plan	Annually
	Update NOAA Information Resource Management Strategic Plan	Annually
	Maintain and/or improve the overall ratings of NOAA Major Investments on the Federal IT Dashboard	Quarterly
Cyber Security	Update NOAA Cyber Security Roadmap	Annually
	Complete Contingency Plan updates and testing in accordance with DOC policy, NIST guidance, and NOAA policy	Quarterly
	Administer annual NOAA IT security awareness training	Annually
	Complete annual FISMA Report	Annually
Enterprise Architecture	Facilitate implementation of an enterprise-wide data management architecture	Quarterly
	Update Data Center Optimization Initiative (DCOI) Inventory and Implementation Plan	Annually
Shared Services	Deliver cost-effective, customer-focused IT services for the enterprise	Quarterly
	Update NOAA Enterprise IT Service Catalog	Annually
Homeland Security	Plan & conduct annual NOAA HQ Continuity of Operations (COOP) exercise	Annually
	Update NOAA COOP Plan	Annually

Performance Goals and Measurement Data:

WFMO

Performance Measure: Number of NOAA Pathways and Fellowship programs participants converted into full-time equivalent positions (career or excepted service)	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
	1	15	25	35	50	50	50

Description: NOAA invests significant resources in recruiting and training entry-level positions, interns and fellows in technical fields like fisheries modeling, meteorology, etc. with the goal of converting them into full-time, permanent staff. NOAA has faced difficulty in retaining skilled, high performing interns and fellows due to an inefficient onboarding process. Through efficiency gains with the Pathways Program and other Fellowships initiatives, NOAA can increase the number of candidates that stay at NOAA. This will allow NOAA to retain a greater share of the impact of resources expended in training and mentoring Pathways and Fellowship participants, and support bringing new talent to NOAA.

Performance Measure: Number of days from submission of hiring package to onboarding of a new position (80-day hiring model)	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
	165	150	130	100	80	80	80

Description: Due to under-resourcing of WFMO, the time to onboard new employees is nearly double the targeted level. This has resulted in an increased backlog of hiring actions and presents a potential risk to mission execution for NOAA overall. With the implementation of new technologies and systems (*HR Connect*) and linking to the Department of Commerce's Enterprise Services initiative, WFMO will be able to reallocate resources toward reduction of the onboarding time beginning in FY 2017. Subsequent gains in efficiency and decreased hiring barriers will allow a more fully-staffed NOAA to better meet mission needs.

Performance Measure: Number of Vacancy Announcements resulting in multiple selections	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
	22	25	35	50	50	50	50

Description: Implementing the roles of the HR Business Partners and Advisors will allow WFMO to more effectively support Line and Staff Offices in their planning for hires and succession management. Over time, this closer engagement will result in increased efficiency in onboarding and retention. NOAA expects to see a more robust effort to make multiple selections from individual vacancy announcements and bring on new personnel through the use of shared certificates, global recruitment, and increased recognition of the utility of using multiple hiring flexibilities, such as Pathways, VRA, VEOA, and Schedule A appointments.

CFO

Performance Measure: Expend CFO Office Funding by Year End	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
	100%	92%	92%	92%	92%	92%	92%
Description: This performance measure relates to the target levels for the CFO Office to expend all appropriated funding by the end of Fiscal year.							

Performance Measure: Prompt Payment of Vendor Invoices without penalty	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 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.							

OCIO

Performance Measure: Percent of security events flagged for follow-up that are addressed by NOAA cybersecurity experts (annual)	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
	100%	100%	100%	99%	98%	97%	96%
Description: Cyber Threats continue to increase. There are over 20 billion possible security events recorded on NOAA networks each week. Automated processing narrows down that total to approximately 1000 events per week that require human engagement to close or move forward as a possible network intrusion. These attempts threaten weather forecasts, satellite systems and other fundamental services provided each day to the American people, and the number of possible security events is projected to increase over time. At current staffing levels, CIO is able to address all of the cybersecurity threats each week. However, assuming static workforce numbers, there soon will be an increasing backlog of possible IT security threats to process. When an IT security threat is in backlog status, any potential negative consequences will be unknown to and unaddressed by NOAA.							

Performance Measure: Percentage of required Trusted Internet Connection (TIC) 2.0 capabilities that have been implemented at each TIC Access Point	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
	84%	100%*	100%*	100%*	100%*	100%*	100%*
Description: The goal of Trusted Internet Connection (TIC) is to protect the data and information entering and exiting Federal networks and to identify network connections that may pose a security risk. It is a requirement from OMB. NOAA uses security measures such as proxies, gateways, routers, firewalls, guards and encrypted tunnels to prevent and detect malicious and unauthorized communications. Each year, NOAA is evaluated by DHS. This cross-agency measure tracks the percentage of 60 critical capabilities that have been implemented. Department of Homeland Security sets the target at 100 percent, but with current resources, NOAA has been able to implement just over 84 percent of the required capabilities over the last two years. This is a significant improvement over prior years.							

* = DHS sets the goal at 100 percent, but this may not be achievable for both policy as well as technical reasons

AGO

Performance Measure: Timeliness of acquisition actions	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
	89.1%	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 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
	96%	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: Client Satisfaction	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
	93.2%	90%	90%	90%	90%	90%	90%

Description: This measure tracks the percentage of clients rating AGO 4 or above on a scale of 1-5 (Measures customer satisfaction with AGO reflecting the percentage of survey question responses response of 4 or higher using a scale of 1 through 5).

OCAO

Performance Measure: Percent of commercial leases that have been resolved by the expiration date	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
	55%	60%	60%	60%	60%	60%	60%

Description: In FY 2017, NOAA will report on how many leases are resolved out of the 78 commercial leases expiring that year. NOAA leases three asset types: buildings, land, and structures. OCAO estimates that 60 percent of leases will be resolved in out-years due to expected workload and predicted staffing shortfalls. To stay in good standing with the private sector and minimize mission and financial risk, it is important NOAA's leases not lapse and cause NOAA to occupy space as a holdover tenant.

Performance Measure: Percent of audits and administrative referrals assigned to a lead office within three business days	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
	95%	95%	95%	95%	95%	95%	95%
Description: OCAO strives to assign incoming audits and administrative referrals to the lead NOAA office in a timely manner. NOAA currently has 35 GAO and OIG reviews in progress and 27 open administrative referrals. On average NOAA receives around 36 audits and 60 referrals a year. It is critical that NOAA be responsive to audit reports and administrative referrals in order to preserve program funding and reflect the bureau's willingness to address allegations of waste, fraud, and abuse.							

Performance Measure: Reduce accidents with associated injury and/or damage costs	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
	289	226	219	212	205	205	205
Description: NOAA's OCAO runs a highly effective safety program. Operating an ocean-going fleet, dealing with wild animals, inclement weather and other hazards in duty stations all over the country brings a lot of risk to NOAA personnel and property. This measure focuses on reducing the total number of accidents that have injuries and/or costs (damage and worker compensation costs). Reducing the number of accidents and injuries each year will result in savings for NOAA each year in direct costs and in follow-on expenses related to workers compensation, lawsuits, and in temporary loss of access to resources like personnel and time. In FY 2016, NOAA launched a safety initiative with new reporting tools and a Safety Program action plan. FY 2015 is the baseline year with 240 accidents; NOAA did not meet the three percent reduction target in FY 2016.							

PROGRAM CHANGES FOR FY 2018:

NOAA requests a net decrease of \$4,963,000 and 19 FTE in FY 2018 program changes for these sub-programs. Narratives are only provided for program changes which are greater than five percent of a program. Complete program changes by PPA can be found in the NOAA Control Table (p. Control Table-7).

APPROPRIATION ACCOUNT: OPERATIONS, RESEARCH, AND FACILITIES
SUB-PROGRAM: OFFICE OF EDUCATION

Office of Education

The Office of Education (OED) provides advice and counsel to the Under Secretary of Commerce for Oceans and Atmosphere in matters pertaining to education, coordinates education activities throughout NOAA through the NOAA Education Council and represents the Agency in inter-agency education initiatives. The office fosters American competitiveness in science, technology, engineering, and mathematics (STEM) by providing quality educational opportunities for the next generation, including competitive scholarships, internships and professional training for post-secondary students. The Office of Education also supports Educational Partnership Program with Minority Serving Institutions (EPP/MSI) grants, Ernest F. Hollings (Hollings) Scholarships, Competitive Education Grants, Bay-Watershed Education and Training Program, and Education Council and Interagency working group efforts.

Educational Partnership Program

EPP/MSI provides financial assistance, through competitive processes, to students and to MSIs that train students and conduct research in NOAA mission sciences. The program's goal is to increase the number of students, particularly from underrepresented groups, who are trained and earn degrees in sciences directly related to NOAA's mission. Long term goals of the program include increasing the diversity of the STEM and NOAA workforce and fostering American competitiveness in STEM fields. Among EPP's accomplishments:

- Over 1,900 degrees granted to higher education students in NOAA mission fields since 2001
- 75 percent of graduates are from underrepresented minority groups
- 230 PhDs granted in NOAA mission disciplines
- 368 students in NOAA mission fields currently in the pipeline

Ernest F. Hollings Scholarship Program

The NOAA Hollings scholarship program increases undergraduate training in oceanic and atmospheric science, research, technology, and education, catalyzing scientific research and improving environmental literacy. It recruits and prepares students for careers with NOAA and other natural resource and science agencies at the Federal, state and local levels of government and the private sector, as well as careers as science and environmental educators in the United States.

Based on the FY 2018 Request of \$4.78 billion, NOAA estimates it will have \$4.8 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: www.oesd.noaa.gov/scholarships/hollings.html

Competitive Education Grants

NOAA's Competitive Education Grants program is the longest standing and most comprehensive national grants program focused on environmental literacy. This program improves and expands the learning, understanding, and application of Earth systems science and advances science, technology, engineering, and mathematics (STEM) education. Multi-year grants and cooperative agreements are competitively awarded to a variety of educational institutions and organizations within the United States to support formal, informal, and

community education projects and programs aligned with NOAA's mission. Competitive Education Grants accomplishments include the following:

- \$67 million provided through 121 awards since the program's inception in 2005.
- In FY 2016, more than 150 institutions advanced NOAA's mission to enhance awareness and understanding of Earth systems science through NOAA-supported formal (K-12) and informal education initiatives that both inspire and prepare people to make the best social, economic, and environmental decisions.
- In FY 2016, more than 45 million people visited institutions hosting NOAA-supported exhibits and/or programs (including NOAA Science On a Sphere®) designed to increase their knowledge of the systems of the natural world and ability to use scientific evidence to make informed decisions regarding environmental issues.
- In FY 2016, more than 40,000 youth and adults participated in NOAA-supported, informal education programs that enhance ecosystem stewardship and promote informed decision making.
- In FY 2016, more than 1,750 educators participated in NOAA-supported professional development programs using evidence-based practices conveying Earth systems science in compelling and relevant ways.

Bay-Watershed Education and Training (B-WET)

B-WET is an environmental education program that promotes locally relevant, experiential learning in the K-12 environment through competitive funding that promotes Meaningful Watershed Educational Experiences (MWEEs). B-WET currently serves seven areas of the country: California, Chesapeake Bay, Great Lakes, Gulf of Mexico, Hawai'i, New England, and the Pacific Northwest. B-WET accomplishments include the following:

- B-WET grants reached an estimated 48,000 students and 3,600 teachers in 2016 through 98 new and continuing awards.
- Since the program's inception in 2002 NOAA has awarded over \$74 million to support more than 630 projects.
- B-WET has created a cross-region, internal evaluation system to monitor program implementation and outcomes on an ongoing basis. Data collection began in 2014. This effort complements the excellent project-level evaluation work conducted by B-WET grantees.

PROGRAM CHANGES FOR FY 2018:

Office of Education: NOAA Office of Education (Base Funding: \$19,475,000 and 17 FTE; Program Change: -\$19,475,000 and -17 FTE): NOAA requests a decrease of \$19,475,000 and 17 FTE for a total of \$0 and 0 FTE to terminate the NOAA Office of Education.

Proposed Actions:

NOAA proposes to eliminate funding for the Office of Education. This will terminate coordination activities provided by the Office of Education (\$2,071,000) as well as the Competitive Education Grants Program (\$3,000,000) and the Educational Partnership Program for Minority Serving Institutions (EPP/MSI) (\$14,404,000).

Resource Assessment:

The Office of Education coordinates education efforts across the agency through the Education Council and Education Working Group. The Office participates in 10 annual STEM education conferences that reach approximately 20,000 formal and informal educators and participates at the National Science and Engineering Fair, as well as at over 250 regional high school science fairs.

The Competitive Education Grants Program supports 150 institutions per year that advance its mission to enhance awareness and understanding of Earth systems science through NOAA-supported formal (K-12) and informal education initiatives that both inspire and prepare people to make the best social, economic, and environmental decisions.

Each year NOAA’s EPP/MSI program supports cooperative agreements with four EPP Cooperative Science Centers (CSCs) at Minority Serving Institutions, including funds for 28 institutions graduating students from underrepresented groups in NOAA mission sciences. This program also provides undergraduate scholarships to 5-12 students from Minority Serving Institutions each year. Over 75 percent of supported students are from underrepresented groups. Since program inception in 2001, 50 percent of all African Americans receiving PhDs in Atmospheric Sciences and Marine Sciences graduated from CSC institutions.

Performance Goals and Measurement Data:

Competitive Education Grants

Performance Measure:	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
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)							
With Decrease	N/A	N/A	0	0	0	0	0
Without Decrease	46,350	56,125	54,350	48,350	48,350	48,350	48,350
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 science or services. NOAA 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.

Performance Measure: Institutions served by Competitive Education Grants	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
With Decrease	N/A	N/A	0	0	0	0	0
Without Decrease	23	25	15	18	21	21	21

Description: Number of institutions with active multi-year NOAA Competitive Education Grants that support STEM-related education exhibits and programs.
Note: The program supports multi-year funded (MYF) awards. A significant number of them closed in FY 2018. Assuming no funding decrease, an average of three MYF awards is projected per fiscal year starting FY 2018, each three years in duration.

Performance Measure: K-12 teachers and staff served by Competitive Education Grants	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
With Decrease	N/A	N/A	0	0	0	0	0
Without Decrease	5,000	2,500	1,500	1,800	2,100	2,100	2,100

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.
Note: The program supports multi-year funded (MYF) awards. A significant number of them closed in FY 2018. Assuming no funding decrease, an average of three MYF awards is projected per fiscal year starting in FY 2018, each three years in duration.

Performance Measure: K-12 students served by Competitive Education Grants	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
With Decrease	N/A	N/A	0	0	0	0	0
Without Decrease	1,500	2,000	1,200	1,440	1,680	1,680	1,680

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.
Note: The program supports multi-year funded (MYF) awards. A significant number of them closed in FY 2018. Assuming no funding decrease, an average of three MYF awards is projected per fiscal year starting in FY 2018, each three years in duration.

EPP/MSI

Performance Measure: Number of EPP students supported with NOAA funding who are awarded NOAA mission-related STEM post-secondary degrees	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
With Decrease	N/A	N/A	0	0	0	0	0
Without Decrease	149	100	105	130	130	130	130

Description: The NOAA Cooperative Science Centers (CSC) develops programs to educate and graduate postsecondary students for the next-generation NOAA mission workforce and to increase the number of qualified individuals with the knowledge and skills to support NOAA mission careers. CSC graduates will lead innovation and develop technologies to enhance NOAA services and stewardship while supporting global competitiveness to advance national economic growth.

<http://www.epp.noaa.gov>

Note: New cooperative agreements for the EPP CSC were awarded at the end of FY 2016. Current students graduating were supported under the FY 2011 award which is ramping down and closing out. CSC students who begin support in FY 2017 will graduate in later years of the 5-year award. Assuming no funding decrease, an average number of EPP students with a combination of BS, MS and PhD degrees are expected to graduate in different time frames. It is hard to project for the out-years as this average is not consistent for every year because the mix of degrees changes over time.

Performance Measure: Number of EPP students from underrepresented communities supported by NOAA funding who are awarded NOAA mission-related STEM post-secondary degrees	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
With Decrease	N/A	N/A	0	0	0	0	0
Without Decrease	104	70	80	100	100	100	100

Description: The NOAA Cooperative Science Centers (CSC) develop NOAA mission-focused higher education and research programs to increase the number of post-secondary students, from traditionally underrepresented communities, who complete degrees in NOAA mission-relevant STEM disciplines and are eligible to enter the NOAA mission related scientific, management and policy professional workforce or advanced education.

Note: New cooperative agreements for the EPP CSC were awarded at the end of FY 2016. Current students graduating were supported under the FY 2011 award which is ramping down and closing out. CSC students who begin support in FY 2017 will graduate in later years of the 5-year award. Assuming no funding decrease, a number of EPP students with a combination of BS, MS and PhD degrees are expected to graduate in different time frames. It is hard to project for the out-years as this number is not consistent for every year because the mix of degrees changes over time.

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 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
With Decrease	NA	N/A	0	0	0	0	0
Without Decrease	69	60	60	60	60	60	60

Description: The NOAA CSC programs provide post-secondary education and training aligned with NOAA priorities to develop candidates for the future NOAA mission workforce. In collaboration and with mentoring by NOAA scientists, CSC graduates may pursue careers at NOAA and become part of the scientific and technological workforce at other Federal, state, local and tribal agencies, the private sector, academia and the Non-Governmental Organization community. Currently, 102 CSC graduates have been hired by NOAA.

Performance Measure: Number of collaborative research projects undertaken between NOAA and EPP in support of NOAA mission	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
With Decrease	NA	N/A	0	0	0	0	0
Without Decrease	253	200	200	200	200	200	200
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.							

PROGRAM CHANGE PERSONNEL DETAIL

Program: Mission Support
Sub-Program: Office of Education
Program Change: NOAA Office of Education

Title:	Location	Grade	Number of Positions	Annual Salary	Total Salaries
Office Director	Washington, DC/Silver Spring, MD	ES	-1	186,995	(186,995)
Supervisory Program Manager	Washington, DC/Silver Spring, MD	ZA-V	-2	155,205	(310,410)
Program Specialist	Washington, DC/Silver Spring, MD	ZA-IV	-2	134,334	(268,668)
Policy Analyst	Washington, DC/Silver Spring, MD	ZA-IV	-5	134,334	(671,670)
Administrative Specialist	Washington, DC/Silver Spring, MD	ZA-II	-1	71,201	(71,201)
Senior Policy Analyst	Washington, DC/Silver Spring, MD	ZA-IV	-2	134,334	(268,668)
Outreach Specialist	Washington, DC/Silver Spring, MD	ZA-IV	-1	94,796	(94,796)
IT Specialist	Washington, DC/Silver Spring, MD	ZP-III	-1	87,967	(87,967)
Secretary	Washington, DC/Silver Spring, MD	ZS-IV	-1	64,697	(64,697)
Budget Analyst	Washington, DC/Silver Spring, MD	ZA-IV	-1	94,796	(94,796)
Total			<u>-17</u>		<u>(2,119,868)</u>
less Lapse		0%	<u>0</u>		
Total full-time permanent (FTE)			-17		(2,119,868)
2018 Pay Adjustment (1.9%)					<u>(40,277)</u>
TOTAL					<u>(2,160,145)</u>

Personnel Data

	<u>Number</u>
Full-Time Equivalent Employment	
Full-time permanent	-17
Other than full-time permanent	<u>0</u>
Total	-17
Authorized Positions:	
Full-time permanent	-17
Other than full-time permanent	<u>0</u>
Total	-17

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

Budget Program: Mission Support
Sub-program: Office of Education
Program Change: NOAA Office of Education

Object Class		FY 2018 Decrease	FY 2018 Total Program
11	Personnel compensation		0
11.1	Full-time permanent	(\$2,160)	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	(2,160)	0
12	Civilian personnel benefits	(458)	0
13	Benefits for former personnel	0	0
21	Travel and transportation of persons	(200)	0
22	Transportation of things	0	0
23.1	Rental payments to GSA	0	0
23.2	Rental Payments to others	(500)	0
23.3	Communications, utilities and miscellaneous	0	0
24	Printing and reproduction	(23)	0
25.1	Advisory and assistance services	0	0
25.2	Other services	(4,414)	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	(150)	0
31	Equipment	(200)	0
32	Lands and structures	0	0
33	Investments and loans	0	0
41	Grants, subsidies and contributions	(11,370)	0
42	Insurance claims and indemnities	0	0
43	Interest and dividends	0	0
44	Refunds	0	0
99	Total obligations	(19,475)	0

Office of Education: NOAA Bay-Watershed Education and Training (B-WET) Regional Program (Base Funding: \$7,186,000 and 0 FTE; Program Change: -\$7,186,000 and 0 FTE):

NOAA requests a decrease of \$7,186,000 and 0 FTE for a total of \$0 and 0 FTE to terminate the Bay-Watershed Education and Training (B-WET) Regional Program. NOAA's operating plan for FY 2017 provided \$7,186,000 for B-WET regional programs, which promote place-based, experiential learning in K-12 Science, Technology, Education, & Mathematics (STEM) education. With these funds, NOAA supported Meaningful Watershed Educational Experiences (MWEE) through competitive funding to local and state education offices and government agencies, academic institutions, and nonprofit organizations. MWEEs integrate field experiences with multi-disciplinary classroom activities and instruction in NOAA-related sciences.

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

Budget Program: Mission Support
Sub-program: Office of Education
Program Change: NOAA Bay-Watershed Education and Training (B-WET) Regional Program

Object Class		FY 2018 Decrease	FY 2018 Total Program
11	Personnel compensation		0
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	(886)	0
25.3	Purchases of goods & services from Govt 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	(6,300)	0
42	Insurance claims and indemnities	0	0
43	Interest and dividends	0	0
44	Refunds	0	0
99	Total obligations	(7,186)	0

**APPROPRIATION ACCOUNT: PROCUREMENT, ACQUISITION, AND CONSTRUCTION
SUB-PROGRAM: CONSTRUCTION**

The Construction sub-program ensures that NOAA has safe and modern facilities to support NOAA's critical science, service, and stewardship mission. NOAA's facilities constitute a significant capital investment with over 700 different facilities (both owned and leased) with a current replacement value (CRV) of over \$5 billion. Of that, more than 50 percent (455) are owned and operated by NOAA, with a CRV of approximately \$2.4 billion. These facilities require maintenance, repair, and investment to keep them safe and secure.

Construction acquisition and project planning enables NOAA to complete the analyses, pre-design work, and initial preparation that make the actual construction phase of projects more efficient and effective. Activities include Business Case Analyses, NEPA planning, special environmental studies, condition surveys, site work, and any other preliminary development needed to ensure successful acquisition and completion of construction projects within budget and on schedule.

Constructing new facilities and reinvesting in existing facilities ensures NOAA facilities align with the mission and facility conditions improve. Conducting and effectively managing construction projects on facilities that have major deferred maintenance issues corrects health and life safety issues, averts emergency repairs and associated costs, reduces energy costs through creation of more efficient and sustainable building systems, and brings facilities up to modern standards to make them easier to maintain.

Schedule and Milestones/Deliverables:

- Continue Office of Marine and Aviation Operations (OMAO) U.S. Naval Station (NAVSTA) Newport Pier project initiative in Newport Rhode Island.
 - Planned activities include Project Management and completion of design phase.

Out-year Funding Estimates (\$ in Thousands):

NOAA Construction	FY 2017 & Prior	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	CTC	Total
Change from FY 2018 Base	-	-	-	13,709	13,964	711		-
Total Request	1,996	998	998	14,707	14,962	1,709		Recurring

*Increases in FY 2020-FY2022 reflect estimated funding for the Mukilteo Research Station

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BUDGET PROGRAM: OFFICE OF MARINE AND AVIATION OPERATIONS

For FY 2018, NOAA requests a total of \$331,702,000 and 957 FTE for the Office of Marine and Aviation Operations, including a net decrease of \$5,798,000 and 16 FTE in program changes.

Office of Marine and Aviation Operations Overview

NOAA's Office of Marine and Aviation Operations (OMAO) manages a variety 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 missions. OMAO also administers the NOAA-wide Diving Program, the Small Boat Program, and plays a role in Unmanned Aircraft System (UAS) operations. The staff includes civilians along with the NOAA Commissioned Officer Corps (NOAA Corps).

The NOAA fleet operates throughout the world supporting a wide array of NOAA missions including fisheries research, nautical charting, hurricane reconnaissance and research, snow surveys, and specialized atmospheric and ocean research. NOAA ships range from large oceanographic research vessels capable of exploring the world's deepest oceans to smaller ships responsible for charting the shallow bays and inlets of the United States. NOAA aircraft range from the four engine WP-3D, capable of penetrating hurricanes, to the De Havilland Twin Otters, well-suited for water resource management data collection and marine mammal surveys where slower airspeeds and low altitudes are essential.

In addition to research and monitoring activities, NOAA ships and aircraft provide an emergency response capability. Following major natural and environmental disasters, NOAA ships and aircraft readily conduct emergency navigation hazard surveys that help ports reopen quickly and obtain aerial images of disaster-torn areas. Emergency hazard surveys provide critical information for first responders, disaster response, and residents; this information provided by NOAA assets is often the only source of data.

OMAO is charged with the safe and efficient operation and maintenance of the NOAA fleet. OMAO develops annual fleet allocation plans, conducts progressive lifecycle maintenance, and provides centralized fleet management including: standard procedures, safety inspections, and medical services in partnership with the U.S. Public Health Service Commissioned Corps. OMAO maintains a safe field environment through the coordination of training and certification of officers, crew members, and scientists in at-sea and airborne safety procedures.

OMAO's Headquarters in Silver Spring, Maryland is responsible for the formulation of policies and procedures; development of operating plans and budgets; strategic planning and performance measure management; oversight of safety and regulatory compliance; program management of ship and aircraft acquisitions; and management of IT infrastructure and security.

The NOAA Commissioned Personnel Center (CPC), also headquartered in Silver Spring, Maryland, provides NOAA a specialized workforce – the NOAA Corps. The NOAA Corps is one of the Nation's seven uniformed services and has the skills to plan, prepare, and execute the acquisition of environmental and scientific data on land, at sea, and in the air. The NOAA Corps commands and supports the fleet, and provides support to NOAA's Line Offices. CPC is responsible for active duty Corps officers and associated human resource activities that include recruitment, appointment, training, assignment, promotion, separation, retirement, and officer entitlements. There are currently 321 authorized NOAA Corps officers.

OMAO's budget has two sub-programs under the Operations, Research, and Facilities (ORF) account:

- Marine Operations and Maintenance (\$182,662,000 and 844 FTE)
- Aviation Operations and Aircraft Services (\$32,283,000 and 121 FTE)

OMAO's budget has one sub-program in the Procurement, Acquisition, and Construction account:

- Fleet Replacement (\$91,577,000 and 6 FTE), which includes the Fleet Capital Improvements and Technology Infusion and the New Vessel Construction Program, Project, or Activity (PPA) lines.

The OMAO budget also includes the following other mandatory and discretionary accounts:

- NOAA Commissioned Officer Corps Retirement Pay
- Medicare-Eligible Retiree Healthcare Fund

Significant Inflationary Adjustments:

Calculated Adjustments

NOAA's FY 2018 Base includes a total of \$4,099,000 and 0 FTE to account for the full funding requirement for inflationary adjustments to current programs for OMAO activities. This includes the estimated 2018 Federal and military pay raises of 1.9 percent as well as inflationary increases for non-labor activities, including service contracts, utilities, field office lease payments, and rent charges from the General Services Administration (GSA).

Technical Adjustments

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
MS	Mission Services and Management	OMAO	Marine Operations and Maintenance	\$114,000/0 FTE

NOAA requests to transfer \$114,000 and 0 FTE to move funding associated with NOAA's Western Regional Center (WRC) management activities from Mission Support Facilities to OMAO. Currently, costs for these activities are paid directly through the funding appropriated to the Mission Services and Management PPA. This reallocation supports NOAA's plan to employ an integrated campus cost model to allocate the cost of services provided to the WRC tenants. The tenants will then be billed directly based on the approved cost model. An integrated cost model will provide greater transparency and a more accurate reflection of program operating costs.

Narrative Information:

Following this section are base justification materials and program change narratives by sub-program for this line office. Please note program change narratives are only provided for program changes that represent greater than five percent of a program. Complete program changes by PPA can be found in the NOAA Control Table (p. Control Table – 8, Control Table - 12). Please contact NOAA if details for any of these changes are required.

APPROPRIATION ACCOUNT: OPERATIONS, RESEARCH, AND FACILITIES
SUB-PROGRAM: MARINE OPERATIONS AND MAINTENANCE

The objectives of the Marine Operations and Maintenance sub-program 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, and equipment necessary to meet user requirements and schedules
- Develop annual ship allocation schedules with the guidance of the Fleet Council
- Manage and coordinate scheduling, port services, operating procedures, and engineering support for NOAA's ships
- Prioritize tasks and determine availability for dockside and drydock repairs, and planning for periodic depot-level capital investments across the Fleet
- Train and qualify NOAA divers, including employees, volunteers and contractors diving in support of NOAA's mission. Train and certify NOAA Corps officers, crew, and scientists in at-sea safety requirements for their positions
- Provide oversight and support to enhance safety of NOAA's small-boat operations

Marine Operations and Maintenance (MOM) supports centralized management for NOAA's 16 active research and survey vessels. Marine Operations (MO), based in Newport, Oregon, manages OMAO's three Marine Centers located in Norfolk, Virginia, Newport, Oregon, and Honolulu, Hawaii.

NOAA's ships fulfill multiple missions in support of NOAA's programs in nautical charting, bathymetric mapping, fishery stock assessments and research, ecosystem assessments, marine environmental baseline assessments, coastal-ocean circulation, tending tsunami buoys, and oceanographic research and weather forecasts. NOAA research and survey vessels are diverse in size and associated range, endurance and scientific berths. The table below outlines the diversity of the NOAA Fleet and primary mission area(s) of each vessel.

Ship	Length	Class	Primary Mission	Homeport	Ship Age (years)
<i>Rainier</i>	231 ft.	Ocean	2	Newport, OR	49
<i>Fairweather</i>	231 ft.	Ocean	2	Ketchikan, AK	49
<i>Oregon II</i>	170 ft.	Regional	1	Pascagoula, MS	49
<i>Hi'ialakai</i>	224 ft.	Ocean	1, 2, 3	Honolulu, HI	32
<i>Oscar Elton Sette</i>	224 ft.	Ocean	3	Honolulu, HI	29
<i>Okeanos Explorer</i>	224 ft.	Ocean	1, 2	Davisville, RI	28
<i>Gordon Gunter</i>	224 ft.	Ocean	1	Pascagoula, MS	27
<i>Nancy Foster</i>	187 ft.	Ocean	1	Charleston, SC	26
<i>Thomas Jefferson</i>	208 ft.	Ocean	2	Norfolk, VA	25
<i>Ronald H. Brown</i>	274 ft.	Global	3	Charleston, SC	20
<i>Oscar Dyson</i>	209 ft.	Ocean	1	Kodiak, AK	13
<i>Henry B. Bigelow</i>	209 ft.	Ocean	1	Newport, RI	11
<i>Pisces</i>	209 ft.	Ocean	1	Pascagoula, MS	9
<i>Bell M. Shimada</i>	209 ft.	Ocean	1	Newport, OR	8
<i>Ferdinand R. Hassler</i>	124 ft.	Regional	2	New Castle, NH	7
<i>Reuben Lasker</i> ¹	209 ft.	Ocean	1	San Diego, CA	4

Mission 1: Assessment and Management of Living Marine Resources

Mission 2: Charting and Mapping

Mission 3: Oceanographic Monitoring, Research, and Modeling

Given the diverse portfolio of NOAA program requirements and responsibilities, no one vessel type meets all of NOAA's mission requirements. So MOM makes sure the right ship is ready where NOAA needs it, when NOAA needs it. This includes working through NOAA's Fleet Council to balance ship schedules with input from across NOAA.

In FY 2018, OMAO plans to provide approximately 2,710 Days at Sea (DAS) to support NOAA's highest-priority requirements (assuming a fuel price of \$2.63 per gallon). Additional DAS may be funded by programs as determined during the year of budget execution, based on the availability of vessels and funds. Program funded days at sea (PFD) are established through Service Level Agreements (SLA) with NOAA programs as well as reimbursable agreements with other agencies, such as the Environmental Protection Agency and Bureau of Ocean Energy Management. PFD are scheduled based on availability of ships and program funds.

Regular maintenance allows NOAA ships to meet the rigorous demands of NOAA's scientific, forecasting, and regulatory missions. MOM funding provides for general operational maintenance and repair of NOAA ships, including critical scientific and technical equipment necessary to meet ongoing stakeholder requirements.

The NOAA fleet must adhere to various requirements and regulations related to safety and emissions put forth by the three following organizations. The American Bureau of Shipping (ABS) certifies ships as seaworthy. OMAO uses ABS rules to design its maintenance program and conduct Ship Structure and Machinery Evaluations (SSME) on the NOAA Fleet. Under the

¹ NOAA Ship *Reuben Lasker* did not start operations until 2014

Clean Air Act, the Environmental Protection Agency (EPA) issues regulations governing airborne emissions that affect ship engine and exhaust components. The U.S. Coast Guard (USCG) issues regulations on all discharges from ships so that marine environments are protected from harmful discharges.

In addition to vessel management, the Marine Operations and Maintenance sub-program supports the following activities:

NOAA Dive Program: The NOAA Dive Center (NDC) provides diver certification, technical advice, and a standardized equipment program. The NDC, in cooperation with the NOAA Diving Control and Safety Board (NDCSB), issues safe diving standards and practices, according to the Standards of Training, Certification and Watchkeeping for Seafarers and the International Maritime Organization conventions. NOAA maintains approximately 375 divers who perform over 11,000 dives annually in support of NOAA's mission. Fleet divers help maintain NOAA's ships with tasks such as cleaning propellers and sea strainers, surveying hulls for damage, and installing transducers. NOAA divers' work includes installation of observing systems such as tide gauges. Scientists trained as divers also study and describe the habitats and species that NOAA is mandated to protect and manage. These activities enable NOAA to meet requirements and mandates, enhance customer service, operational safety, and facilitate self-sufficiency at sea.

NOAA Small Boat Program (SBP): The SBP is designed to reduce risk, promote standardization, and enhance the safety of NOAA's small-boat operations. It enforces the policy of the safety program and ensures compliance through onsite inspections, risk assessments and marine incident investigations. NOAA maintains approximately 400 small boats, which are operated and funded within the Line Offices. The SBP provides technical and marine engineering assistance to Line Office field units as needed and to the NOAA Small Boat Safety Board to ensure compliance with the NOAA Small Boat Standards and Procedures Manual requirements.

Schedule and Milestones/Deliverables:

- Annual ship schedules and milestones are governed by the Fleet Allocation Plan (FAP) (<http://www.oma.noaa.gov/shipallocation.html>) as agreed to and signed by the NOAA Fleet Council. The FAP 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.
- The equivalent of 2,710 DAS.² Charter vessels will be used when NOAA vessels are unable to meet the Line Office (LO) requirements based on schedule or capability.
- More detailed deliverables are determined on a project-by-project basis as documented in sailing instructions.
- Program-Funded DAS as scheduled.

² Assuming a fuel price of \$2.63 per gallon. A fuel estimate of \$2.63 per gallon is consistent with the Defense Logistics Agency (DLA) Energy Standard Rate for FY 2018 (effective February 1, 2016). 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 Goals and Measurement Data:

Performance Measure: OMAO funded Days at Sea	FY 2016 Actual	*FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
16 Active Ships	2,417	2,600	2,710	2,710	2,710	2,710	2,710

Description: OMAO base-funded Days at Sea support NOAA requirements such as nautical charting, bathymetric mapping, fisheries stock assessments and research, ecosystem assessments, marine environmental baseline assessments, coastal-ocean circulation, and oceanographic and atmospheric research. For FY 2018 and forward, NOAA assumes a fuel rate of \$2.63 per gallon consistent with Defense Logistics Agency (DLA) standard fuel prices for 2016.

FY 2016 Actuals reflect DAS performed with funding from OMAO with in the fiscal year. In addition to OMAO funded hours, 188 DAS were funded by programs through Service Level Agreements (SLA) and reimbursable agreements. In 2017, NOAA estimates 90 program-funded DAS will be provided. Beginning in FY 2017, targets use an updated fleet model to estimate DAS. The model uses estimates for variable and fixed costs. Updates to major cost drivers were made to such areas as ship complement, fuel, maintenance, salary, and shoreside support. These updates were made to increase the accuracy of NOAA's estimated DAS in out-years, and better align projection with actuals and the fleet allocation process by using comparable data.

Performance Measure:	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
Fleet Utilization							
16 Active Ships	66%	71%	74%	74%	74%	74%	74%

Description: The Fleet Utilization Rate is calculated by taking the base-funded Days at Sea (DAS) and dividing it by the maximum operating tempo of 3,676 DAS. This maximum operational tempo accounts for weather, seasonal ocean navigability, mechanical, resupply, and other factors that prevent ships from being at sea 365 days per year. In FY 2018 and forward, NOAA assumes 16 active ships at a fuel rate of \$2.63 per gallon consistent with DLA standard fuel prices for FY 2016.

Performance Measure: Hydrographic data acquired to support safe and efficient maritime commerce and for community resilience to storms and other coastal hazards (in square nautical miles) (indicator 3.3h)*	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
	3,296	2,287**	2,279	2,279	2,279	2,279	2,279
<p>Description: NOAA conducts hydrographic surveys to determine the depths bathymetry (depths) and bottom configurations of bodies of water, primarily in U.S. waters significant for navigation. This activity includes the detection, location, and identification of shoals, wrecks and obstructions with side scan, multi-beam sonar and bathymetric LIDAR. NOAA uses the data to produce nautical charts for safe and efficient navigation in support of commercial shipping and fishing, port economic growth, ferry transports and recreational boating. NOAA's hydrographic surveys are also essential for storm surge models, emergency evacuation planning, ecological forecast models, coastal zone management, etc.</p> <p>* This number represents estimated annual survey area based on anticipated fleet days at sea (DAS) and contract survey funds.</p>							

PROGRAM CHANGES FOR FY 2018:

NOAA requests a decrease of \$4,048,000 and 16 FTE in FY 2018 program changes for the Marine Operations and Maintenance sub-program. Narratives are only provided for program changes which are greater than five percent of a program. Complete program changes by PPA can be found in the NOAA Control Table (p. Control Table – 8, Control Table - 12).

APPROPRIATION ACCOUNT: OPERATIONS, RESEARCH, AND FACILITIES
SUB-PROGRAM: AVIATION OPERATIONS AND AIRCRAFT SERVICES

The Aviation Operations and Aircraft Services sub-program:

- Provides NOAA with centralized aircraft systems management and coordination of airborne flight time;
- Works with the Fleet Council to develop annual flight time allocation schedules based on data collection requirements;
- Modifies, maintains, and operates aircraft with a workforce of specially-trained civilians and NOAA Corps officers to meet data collection requirements;
- Maintains the airworthiness and operating standards of aircraft for optimum safety along with standardization of scientific systems and aircraft;
- Operates aircraft safely and in compliance with Federal Aviation Administration (FAA) regulations;
- Provides standards and policy development, engineering and technical support, training, certification and oversight of NOAA's Unmanned Aircraft Systems transitions and operations.
- Develops and operates prototype and operational scientific-research instrumentation aboard NOAA aircraft; and
- Provides centralized expertise in aviation safety to arrange for safe commercial aviation services for NOAA programs using contracted aircraft.

OMAO's Aircraft Operations Center (AOC) 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 coastal mapping, flood prediction, hurricane prediction modeling, marine mammal population assessments, coastal erosion surveys, oil spill investigations and air quality studies. AOC flight crews operate in some of the world's most demanding flight regimes, including flying into the eye of a hurricane and at low altitudes over mountainous terrain and open ocean areas.

AOC is relocating to Lakeland Linder Regional Airport in Lakeland, Florida from MacDill Air Force Base in Tampa, Florida. NOAA plans to occupy the new facility beginning in June 2017; a ribbon cutting is scheduled for June 2nd.

The variety and versatility of NOAA's aircraft provides scientists with the airborne platforms necessary to collect essential environmental and geographic data. The fleet is equipped with comprehensive data collection systems that are capable of assessing severe weather, coastal and marine resources, and the environment. NOAA aircraft collect Snow Water Equivalent measurements used by the National Weather Service to issue river and flood forecasts, water supply forecasts, and spring flood outlooks. OMAO also ensures that contracted aviation operations are conducted safely by providing technical support, services, and equipment to NOAA programs.

AOC's support of NOAA's missions also includes the oversight of Unmanned Aircraft Systems (UAS). Operated by remote pilots and ranging in wingspan from less than six feet to more than 115 feet, UAS collect data in all of NOAA's areas of responsibility. NOAA UAS are used in such varied missions as gathering atmospheric data for air quality studies and tropical storm research, providing maps of coastal regions, and collecting images to help determine the health

of marine mammals. The FAA defines UAS of all sizes as aircraft and as such they are subject to Federal Aviation Regulations. Effective May 2015, NOAA Administrative Order 216-104A: Management and Utilization of Aircraft includes UAS and designates AOC responsible for their management and operational control. AOC ensures that safety and compliance with aviation regulations and policy is maintained.

With current resources, AOC plans to support approximately 3,320 OMAO-funded flight hours in support of NOAA scientific airborne requirements in FY 2018. Additional flight hours may also be funded by programs as determined based on the availability of aircraft and funds during the year of budget execution. Program funded flight hours are established through Service Level Agreements (SLA) with NOAA programs and reimbursable agreements with other agencies. These planned flight hours represent a decrease in flight hours from previous years due to increased operational costs.

NOAA's Aircraft Fleet detail for FY 2018, including information for the current program, is provided below:

Aircraft	Type	Mission	Location	Status
HEAVY: (2) Lockheed WP-3D	4-engine turbo prop	Air quality (OAR) Hurricane research (OAR) Hurricane reconnaissance (NWS) Ocean winds (NESDIS, NWS) Hurricane intensity forecasting (NWS) Atmospheric research (OAR)	Lakeland Linder Regional Airport, FL	N42: Active N43: Active
MID: (1) Gulfstream G-IV	2-engine turbo jet	Hurricane surveillance (NWS) Hurricane intensity forecasting (NWS) Atmospheric research (OAR)	Lakeland Linder Regional Airport, FL	N49: Active
LIGHT: (4) Dehavilland Twin Otter DHC-6	2-engine turbo prop	Aerial surveys (NMFS) Atmospheric research (OAR) Snow/Water Resources Surveys (NWS)	Lakeland Linder Regional Airport, FL	N46: Active N48: Active N55: Active N57: Active
(1) King Air	2-engine turbo prop	Photogrammetry (NOS) Multi-spectral scanner (NOS) Airborne bathymetric LIDAR (NOS, NWS) Post-storm damage assessment (NOS)	Lakeland Linder Regional Airport, FL	N68: Active

(1) Jet Prop Commander AC/695	2-engine turbo prop	Fisheries observations (NMFS) Marine mammal observations (NMFS) Snow/Water Resources Surveys (NWS)	Lakeland Linder Regional Airport, FL	N45: Active
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Schedule and Milestones/Deliverables:

- Meet annual aircraft schedules and milestones as governed by the Aircraft Allocation Plan (<http://www.oma.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.
- Provide 3,320 flight hours, which includes 2,820 mission hours to support NOAA's highest priority requirements and 500 hours for training, maintenance flights, and calibration testing. Detailed deliverables are determined on a project-by-project basis as documented in flight instructions agreed to by OMAO and the supported Line Office.
- Perform Program-funded Hours as scheduled.

PROGRAM CHANGES FOR FY 2018:

NOAA requests a net increase of \$1,949,000 in FY 2018 program changes for the Aviation Operations and Aircraft Services sub-program. Following this section are program change narratives for this sub-program that represent program changes greater than five percent of a program. Complete program changes by PPA can be found in the NOAA Control Table (p. Control Table – 8, Control Table - 12).

Aircraft Operations and Aviation Services: Interim Facility for NOAA Aircraft (Base Funding: \$32,283,000 and 121 FTE; Program Change: +\$2,000,000 and 0 FTE): NOAA requests an increase of \$2,000,000 and 0 FTE for a total of \$34,283,000 and 121 FTE for increased lease and fuel costs for NOAA's Aircraft Operations Center (AOC) at Lakeland Linder Regional Airport.

Proposed Actions:

On February 1, 2016, the United States Air Force (USAF) notified NOAA that they needed the AOC's current hangar at the MacDill Air Force Base to meet Department of Defense mission requirements. NOAA went through a competitive bidding process, including issuing a request for information and down selecting a site based on eligible bidders. NOAA has begun relocating the AOC to Lakeland Linder Regional Airport in Lakeland, Florida, and will be fully operational at this site in June 2017. The details of the AOC interim lease agreement are in the process of being finalized.

NOAA will incur higher operational costs at the Lakeland site. At the new facility, NOAA is required to make monthly lease payments. In addition, access to military fuel prices will not be available at Lakeland resulting in significantly higher fuel costs. Without increased funding, OMAO will be required to reduce its aircraft variable operations budget to support lease payments and higher fuel costs at the new location.

Statement of Need and Economic Benefits:

AOC aircraft are flown in support of NOAA's mission to promote global environmental assessment, prediction and stewardship of the Earth's environment and provide scientists with the airborne platforms necessary to collect the environmental and geographic data essential to their research. NOAA provides a wide range of specialized airborne environmental data collection capabilities vital to understanding the Earth, conserving and managing coastal and marine resources, and protecting lives and property. NOAA's aircraft operate throughout the United States and around the world; over open oceans, mountains, coastal wetlands, and Arctic pack ice.

Without increased funding, NOAA would be required to reduce its variable operations budget by more than 30 percent, resulting in approximately 715 fewer flight hours. With this requested increase, flight hours can be maintained, which directly impact NOAA products and services that support American health, safety, and local economies, including hurricane surveillance, research, and reconnaissance that extend forecast and warning lead times. These flight hours will also continue to support research necessary to improve hurricane forecast models and critical storm tracking operations needed to alert people in danger of being in a hurricane's path. An increase in funds will support soil moisture and snow projections, which are critical for decisions on water supply and flood prediction; emergency response for events including flooding and tornadoes; coastal mapping, integral to safe navigation and efficient transport of commercial products; and the marine mammal, sea turtle, and seabird protected species surveys.

Resource Assessment:

Operating costs for the AOC are funded through the Aircraft Operations and Aviation Services PPA. The aircraft variable operations budget supports OMAO's flight hours and pays the fuel, maintenance, travel, premium pay and other costs associated with the many NOAA projects conducted on OMAO's aircraft. NOAA must balance all of these activities within available resources under this PPA.

Schedule and Milestones/Deliverables:

- Maintain planned flight hours of 4,035
- Maintain availability of hurricane surveillance flight hours critical for national security
- Maintain snow and soil moisture survey flight hours critical for national water and agriculture security
- Maintain coastal mapping flight hours critical for national security

Performance Goals and Measurement Data:

Performance Measure: OMAO Funded Flight Hours	FY 2016 Actual	FY 2017 Target	FY 2018 Target	FY 2019 Target	FY 2020 Target	FY 2021 Target	FY 2022 Target
With Increase	N/A	N/A	4,035	4,035	4,035	4,035	4,035
Without Increase	5,224	3,947	3,320	3,320	3,320	3,320	3,320
<p>Description: Number of OMAO funded flight hours in support of NOAA’s mission such as hurricane surveillance, emergency response, water supply and flood prediction, air quality studies, marine mammal population surveys, coastal erosion surveys, oil spill investigations and coastal mapping. Without this increase, there will be a reduction of 30 percent of the variable operations budget, reducing flight hours by about 715.</p> <p>OMAO funded hours include both mission and non-mission hours. Non-mission hours are for training, maintenance, and calibration flights. Non-mission hours are calculated at 15 percent of the total OMAO, program and reimbursable flight hours.</p>							

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

Budget Program: Office of Marine and Aviation Operations
Sub-program: Aviation Operations and Aircraft Services
Program Change: Interim Facility for NOAA Aircraft

Object Class		FY 2018 Increase	FY 2018 Total Program
11	Personnel compensation		
11.1	Full-time permanent	\$0	\$7,904
11.3	Other than full-time permanent	0	0
11.5	Other personnel compensation	0	370
11.6	Leave Surcharge Full-Time	0	0
11.8	Special personnel services payments	0	7,372
11.9	Total personnel compensation	\$0	\$15,646
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 misc charges	0	293
24	Printing and reproduction	0	0
25.1	Advisory and assistance services	0	266
25.2	Other services	2,000	7,307
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	0
31	Equipment	0	3,349
32	Lands and structures	0	128
33	Investments and loans	0	0
41	Grants, subsidies and contributions	0	0
42	Insurance claims and indemnities	0	90
43	Interest and dividends	0	0
44	Refunds	0	0
99	Total obligations	2,000	34,283

APPROPRIATION ACCOUNT: PROCUREMENT, ACQUISITION, AND CONSTRUCTION SUB-PROGRAM: FLEET REPLACEMENT

OMAO's Procurement, Acquisition, and Construction (PAC) activities ensure that NOAA will have the necessary aircraft and ship platforms in support of NOAA's missions. Through investment in new vessel construction, NOAA's ships will continue to advance coastal and worldwide ocean survey and data collection and promote global environmental assessment, prediction, and stewardship of the Earth's environment. Fleet Replacement allows NOAA to maintain its current fleet at a higher state of readiness, to extend service life, and to avoid mechanical, structural, and mission equipment obsolescence.

FLEET CAPITAL IMPROVEMENT AND TECHNOLOGY INFUSION

The Fleet Capital Improvement and Tech Infusion program allows NOAA to plan and perform cyclic depot-level capital investments across the fleet each year and is designed to maintain and extend the service life of NOAA's fleet. It ensures that the required upgrades to aircraft and ship-board systems and mission equipment are in line with both safety requirements and the needs of the programs. During the maintenance cycle, aircraft and ships receive regular upgrades and replacements of mission support equipment and technology infusions such as data processing and storage capacity, multi-beam sonars and sensors, and UAS launch and recovery systems.

OMAO 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 requirements, which guides future capital investment decision making. At the same time, OMAO uses manufacturer-provided information for new ships to develop maintenance profiles.

NEW VESSEL CONSTRUCTION

The New Vessel Construction program includes vessel acquisition, instrumentation and service life extensions. These activities support the proper oversight of ship acquisition and instrumentation activities including a rigorous analysis of mission requirements, current fleet service life assessments, detailed design and construction, and supplemental options to meet prioritized requirements. Fleet recapitalization provides a clear path forward, leading to capability (platform) requirements, preliminary costs and timelines.

Between 2017 and 2018, eight of NOAA's ships are due to retire by 2028; all eight have already exceeded their design service lives. In 2016, NOAA convened an Independent Review Team (IRT) to assess the state of recapitalization planning for NOAA's fleet and a Tiger Team of senior-level internal subject experts to complete the NOAA Fleet Plan. NOAA released the Fleet Plan in October 2016 (<https://www.oma.noaa.gov/find/media/documents/noaa-fleet-plan-building-noaas-21st-century-fleet-0>).

The Fleet Plan assesses NOAA's current and future at-sea observational infrastructure needs in carrying out its mission of protecting lives, livelihoods, and valuable natural resources for the American public. It identifies an integrated approach consisting of best management practices and long-term recapitalization levers to extend and sustain capabilities. The plan includes the critical long-term strategy of designing and constructing up to eight new ships specifically designed to meet NOAA core capability requirements within each mission objective.

The future NOAA Fleet will consist of three to five³ distinct vessel types that each focus on a core mission with secondary missions that make the best use of the vessel's capabilities.

Ship	Primary Mission	Secondary Mission(s)
N/V CLASS A	Oceanographic Monitoring, Research & Modeling	Assessment and Management of Living Marine Resources (no trawl), Charting and Surveying
N/V CLASS B	Charting and Surveying	Assessment and Management of Living Marine Resources (no trawl), Oceanographic Monitoring, Research & Modeling
N/V CLASS C	Assessment and Management of Living Marine Resources (trawl-capable, shallow-draft)	Charting and Surveying
N/V CLASS D	Assessment and Management of Living Marine Resources (trawl capable, near-shore and deep ocean, longer endurance)	Charting and Surveying, Oceanographic Monitoring, Research & Modeling

Standardization is critical for efficient maintenance, upgrades and optimal crewing models. Each vessel type will incorporate the latest technologies during construction and accommodate new technologies as they become available. Across the fleet, core equipment types will be standardized as much as possible to reduce operation and maintenance costs.

New ship construction consists of four acquisition phases: requirements analysis, concept design, preliminary design, and detailed design and construction. Efforts will be made throughout the process to leverage design aspects of previous ship classes and to create standardization across the fleet to meet multiple core mission requirements.

Schedule and Milestones:

- Identify Top Level Requirements 4th Quarter 2017
- Update Management Plan 1st Quarter 2018
- Complete Specifications Update 3rd Quarter 2018

Deliverables:

- One AGOR vessel, adapted for NOAA's at-sea data collection
- More specific deliverables TBD

³This will depend on the ability to leverage aspects of previous ship class designs, such as the FSV and AGOR to meet mission requirements, regulatory and environmental requirements, regionally driven specifications, and acquisition regulations.

Fleet Capital Improvements and Technology Infusion: Progressive Lifecycle Maintenance Program (Base Funding: \$11,678,000 and 1 FTE; Program Change: \$1,200,000 and 0 FTE): NOAA requests an increase of \$1,200,000 and 0 FTE for a total of \$12,878,000 and 1 FTE to increase capital repairs to NOAA’s ship fleet under the Progressive Lifecycle Maintenance.

Proposed Actions:

With this funding, NOAA will continue to address its growing backlog of needed repairs and help extend the service life of its ships. As a core component of NOAA’s Fleet Plan, progressive lifecycle maintenance is a stabilized capital investment that proactively maintains vessels before systems fail. It addresses needed repairs that improve the material condition of the ships, and provides sustained critical technology refresh. Progressive maintenance ensures NOAA ships remain capable of collecting environmental data to support NOAA’s mission to provide accurate and reliable information to the public.

Funding in FY 2018 will allow NOAA to increase the replacement of unsupported navigational equipment, propulsion control, drive systems and crane and ship control systems. NOAA will also begin to upgrade galley spaces and equipment, critical interior communication systems, and air conditioning and refrigeration systems.

The chart below lists the types of capital investments that will vary from year-to-year based on the 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
Refrigeration systems	Space renovation	Propulsion & generation systems	Blast hull	Multi-beam sonars and sensors
HVAC refurbishment	Government furnished equipment	overhaul	Refurbish props/shafts	Ship-board electronic data processing and storage
Environmental equipment replace		Re-piping	Refurbish valves/ piping	UAS Launch/ Recovery System
		Fire suppression upgrades		Small boats and launches
		Machinery monitoring upgrades		Cranes, winches, davits

Statement of Need and Economic Benefits:

A proactive maintenance program is significantly less costly than reactive repairs. NOAA ship costs increase dramatically as systems age in the harsh marine environment. 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, particularly with the introduction of new control technologies. Other maintenance

challenges, like hull corrosion and machinery support due to the obsolescence of parts have occurred sooner than the 20 to 25 years of expected service life. This can reduce the reliability of ships and impair the safety of NOAA crews.

Resource Assessment:

Capital investment for ships ranges from \$7 million to \$15 million annually, varying from year-to-year based on the ships and the results of SSMEs. In FY 2016, NOAA’s deferred maintenance back log was \$28.4 million, an increase of 24 percent from \$23.0 million in FY 2014. Without additional funds, this backlog is expected to grow even more. Funds provided for progressive maintenance will reduce this backlog by accomplishing additional repairs and increasing the reliability of NOAA’s ships.

Schedule and Milestones/Deliverables:

- Conduct progressive lifecycle maintenance.
- Improve material condition of ships
- Prolong service life of NOAA vessels
- Continue ship mission availability and readiness.

Out-year Funding Estimates (\$ in thousands):

Progressive Lifecycle Maintenance	FY 2017 and prior	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	CTC	Total
Change from FY 2018 Base		1,200	5,022	5,022	5,022	5,022		
Total Request	34,570	12,878	16,700	16,700	16,700	16,700		Recurring

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

Budget Program: Office of Marine and Aviation Operations
Sub-program: OMAO Fleet Replacement
Program Change: Progressive Lifecycle Maintenance Program

Object Class	FY 2018 Increase	FY 2018 Total Program
Personnel compensation		
Full-time permanent	0	0
Other than full-time permanent	0	0
Other personnel compensation	0	0
Special personnel services payments	0	0
Total personnel compensation	0	0
Civilian personnel benefits	0	0
Benefits for former personnel	0	0
Travel and transportation of persons	0	0
Transportation of things	0	0
Rental payments to GSA	0	0
Rental Payments to others	0	0
Communications, utilities and miscellaneous charges	0	0
Printing and reproduction	0	0
Advisory and assistance services	0	0
Other services	1,200	9,975
Purchases of goods & services from Gov't accounts	0	455
Operation and maintenance of facilities	0	0
Research and development contracts	0	0
Medical care	0	0
Operation and maintenance of equipment	0	0
Subsistence and support of persons	0	0
Supplies and materials	0	958
Equipment	0	1,490
Lands and structures	0	0
Investments and loans	0	0
Grants, subsidies and contributions	0	0
Insurance claims and indemnities	0	0
Interest and dividends	0	0
Refunds	0	0
Total obligations	1,200	12,878

New Vessel Construction: Fleet Recapitalization (Base Funding: \$79,899,000 and 7 FTE; Program Change: -\$4,899,000 and 0 FTE): NOAA requests a planned programmatic decrease of \$4,899,000 and 0 FTE for a total of \$75,000,000 and 7 FTE as part of the ongoing multi-year NOAA ship fleet recapitalization initiative.

Proposed Actions:

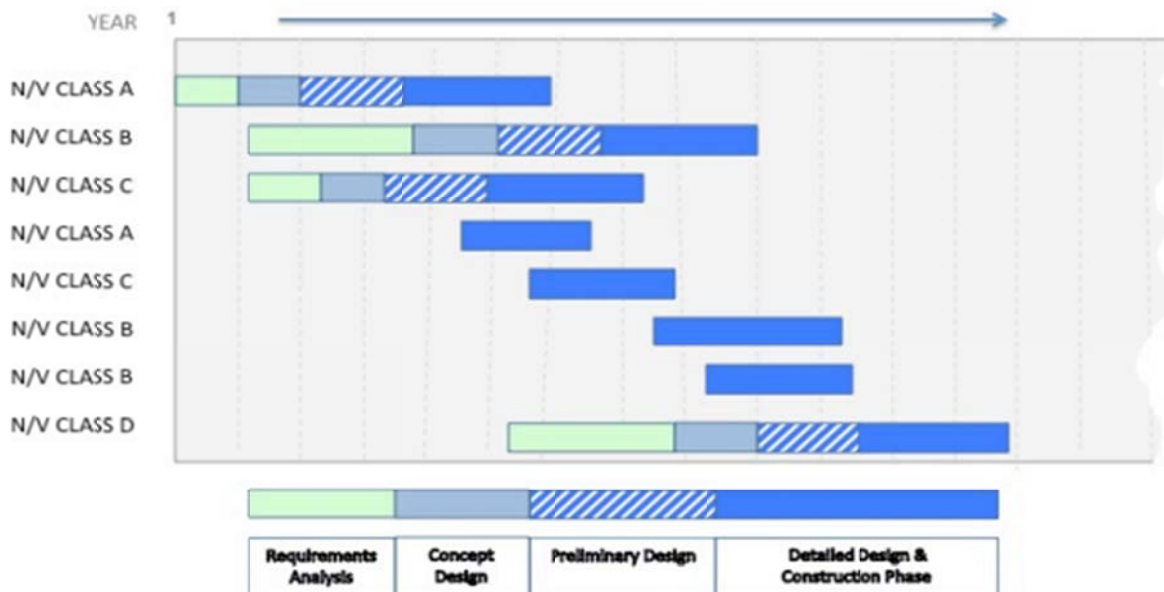
The \$75 million request in FY 2018 begins construction of a second NOAA (N/V) Class A Auxiliary General Purpose Oceanographic Research vessel (AGOR derivative) as part of NOAA’s overall fleet recapitalization efforts. The N/V Class A is a survey vessel which primarily supports oceanographic monitoring, research, and modeling. NOAA will also continue planning for the N/V Class B, with the primary mission of charting and surveying, and the N/V Class C, with the primary mission of assessment and management of living marine resources.

Statement of Need and Economic Benefits:

The funding in FY 2018 continues the effort to recapitalize the NOAA Fleet; replacing up to eight of NOAA’s 16 vessels that have already exceeded their service lives and are expected to be retired by 2028. Recapitalization is required to meet NOAA’s prioritized at-sea data requirements. Despite the steady advancement of sampling and remote sensing technologies, NOAA’s ships will remain fundamental for at-sea data collection for the foreseeable future. NOAA ships are the only observational platforms that meet the agency’s unique at-sea data collection requirements, such as mapping the ocean floor to update nautical charts, surveying fishery stocks to manage fisheries sustainably, and servicing weather buoys.

Since 2007, the NOAA fleet has declined from 19 ships to the current fleet of 16 ships. Without recapitalization, the fleet will decrease to eight ships by 2028. The chart below outlines the timeline for the design and construction of the eight ships needed to replace vessels that will reach the end of their design service life between 2017 and 2028.

NOAA Notional Long-Term Fleet Recapitalization Strategy



The FY 2018 request advances acquisition of the second N/V Class A (AGOR variant), and acquisition planning for N/V Class B and N/V Class C.

Funding provided in FY 2016 begin the first three phases of the acquisition process – the requirements analysis, concept design, and preliminary design for two N/V Class A (AGOR variant) vessels. It also supports construction of the first vessel. Funding provided in FY 2017 is being used to complete the construction of the first vessel. These vessels are critical for producing national products and services that directly support the U.S. economy, including nautical charts, commercial fishery quotas and weather forecasts.

The N/V Class B vessels are critical to providing data for current and accurate nautical charts. The N/V Class C vessels, whose primary missions are assessing and managing Fisheries stocks, will ensure the health and economic prosperity of the seafood industry. N/V Class C vessels also provide protected species and habitat data which can impact ecological forecasting directly linked to emergency planning, coastal management, and tourism.

The planning and design phases for these ship capabilities will leverage common hull, machinery, and configurations across vessel designs to gain economies during acquisition and reduce life cycle and fleet management costs. Efforts will be made to create standardization across the fleet to meet multiple core mission requirements.

Resource Assessment:

Funding from the FY 2017 Continuing Resolution will supplement the FY 2016 funding of \$80.0 million for New Vessel Construction and allow NOAA to complete the design, acquisition and construction of a N/V Class A vessel. Specific vessel design and capabilities will be optimized based on NOAA prioritized at-sea data collection and mission requirements.

In March of 2017, NOAA entered an Interagency Agreement (IAA) with the United States Navy for assisted acquisition for the N/V Class A (AGOR variant). Under the IAA, the Navy will provide technical, program management and planning activities needed to acquire AGOR ships adapted to meet NOAA's at-sea scientific needs.

Schedule and Milestones:

- Continue acquisition process for the second N/V Class A, AGOR variant
- Continue the planning process for the N/V Class B and N/V Class C vessels

Deliverables:

FY 2018

- Complete Concept Design for N/V Class A

FY 2021

- Complete Detail Design for N/V Class A
- Begin construction of first N/V Class A
- Begin construction of second N/V Class A

FY 2023

- First N/V Class A Vessel is operational

FY 2024

- Second N/V Class A Vessel is operational

Outyear Funding Estimates – Fleet Recapitalization (\$ in thousands):

Fleet Recapitalization	FY 2017 & Prior	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	CTC	Total
Change from FY 2018 Base	0	(4,899)	101	101	101	101	TBD	TBD
Total Request	159,949	75,000	80,000	80,000	80,000	80,000	TBD	TBD

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

Budget Program: Office of Marine and Aviation Operations
Sub-program: Fleet Replacement
Program Change: Fleet Recapitalization

Object Class		FY 2018 Decrease	FY 2018 Total Program
11	Personnel compensation		
11.1	Full-time permanent	0	351
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	351
12	Civilian personnel benefits	0	95
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	(4,899)	74,554
25.3	Purchases of goods & services from Govt 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	(4,899)	75,000

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 (USCG), 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 the Office of Marine and Aviation Operations (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 USCG, in accordance with a Memorandum of Agreement between the USCG and NOAA, with funds certified by the Commissioned Personnel Center within OMAO.

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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 2017 Planning	0	0	29,375	29,375
plus: 2018 Adjustments to Base	0	0	0	0
FY 2018 Base	0	0	29,375	29,375
plus 2018 Program Changes	0	0	0	0
FY 2018 Estimate	0	0	29,375	29,375

		FY 2016		FY 2017		FY 2018		FY 2018		Increase/	
		Actuals		Annualized CR		Base Program		Estimate		(Decrease)	
		Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount
NOAA Corps	POS/BA	0	29,375	0	29,375	0	29,375	0	29,375	0	-
Retirement Pay	FTE/OBL	0	28,732	0	29,375	0	29,375	0	29,375	0	-
Total: NOAA Corps	POS/BA	0	29,375	0	29,375	0	29,375	0	29,375	0	-
Retirement Pay	FTE/OBL	0	28,932	0	29,375	0	29,375	0	29,375	0	-

Department of Commerce
National Oceanic and Atmospheric Administration
NOAA Corps Retirement Pay (Mandatory)
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

Exhibit 5

	FY 2016		FY 2017		FY 2018		FY 2018		Increase/ (Decrease)	
	Actual		Annualized CR		Base		Estimate			
	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount
Direct Discretionary Obligation	0	28,732	0	29,375	0	29,375	0	29,375	0	0
Total Obligations	0	28,732	0	29,375	0	29,375	0	29,375	0	0
Adjustments to Obligations:										
Unobligated balance	0	643	0	0	0	0	0	0	0	0
Total Budget Authority	0	29,375	0	29,375	0	29,375	0	29,375	0	0
Financing from Transfers and Other:										
Net Appropriation	0	29,375	0	29,375	0	29,375	0	29,375	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)

Exhibit 16

	FY 2016	FY 2017	FY 2018	FY 2018	Increase
	Actual	Currently Available	Base	Estimate	(Decrease)
Object Class					
Benefits for Former Personnel	26,232	26,875	26,875	26,875	0
Other purchases of goods and services from Govt accounts	2,500	2,500	2,500	2,500	0
Total Obligations	28,732	29,375	29,375	29,375	0
Less prior year recoveries	0	0	0	0	0
Less unobligated balance, SOY	0	0	0	0	0
Plus unobligated balance, EOY	643	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	29,375	29,375	29,375	29,375	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 2018, payments to the accrual fund are estimated at \$1,603,000.

In the FY 2018 President's Budget, DoD will propose additional TRICARE consolidation and modernization initiatives. Those proposals would restore FY 2017 benefit change grandfathering guidelines, increase co-pays for pharmaceuticals, index future fees to National Health Expenditures vice COLA (similar to the reforms proposed in the FY 2017 President's Budget).

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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 2017 Annualized CR	0	0	1,936	1,936
plus: 2018 Adjustments to Base	0	0	(333)	(333)
FY 2018 Base	0	0	1,603	1,603
plus 2018 Program Changes	0	0	0	0
FY 2018 Estimate	0	0	1,603	1,603

		FY 2016		FY 2017		FY 2018		FY 2018		Increase/Decrease	
		Actual		Annualized CR		Base Program		Estimate		Personnel	Amount
		Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount		
Medicare Eligible	Pos/BA	0	1,936	0	1,936	0	1,603	0	1,603	0	0
Health Fund Contribution	FTE/OBL	0	1,285	0	1,936	0	1,603	0	1,603	0	0
NOAA Corps											
Total: Medicare Eligible	Pos/BA	0	1,936	0	1,936	0	1,603	0	1,603	0	0
Retiree Health Fund	FTE/OBL	0	1,285	0	1,936	0	1,603	0	1,603	0	0

Department of Commerce
National Oceanic and Atmospheric Administration
Medicare Retiree Health Fund Contribution – NOAA Corps
SUMMARY OF RESOURCE REQUIREMENTS
(Dollar amounts in thousands)

Exhibit 5

	FY 2016		FY 2017		FY 2018		FY 2018		Increase/ Decrease	
	Actual		Annualized CR		Base		Estimate		FTE	Amount
	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount		
Direct Discretionary Obligation	0	1,285	0	1,936	0	1,603	0	1,603	0	0
Total Obligations	0	1,285	0	1,936	0	1,603	0	1,603	0	0
Adjustments to Obligations:										
Unobligated balance	0	651	0	0	0	0	0	0	0	0
Total Budget Authority	0	1,936	0	1,936	0	1,603	0	1,603	0	0
Financing from Transfers and Other:										
Net Appropriation	0	1,936	0	1,936	0	1,603	0	1,603	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)

Exhibit 16

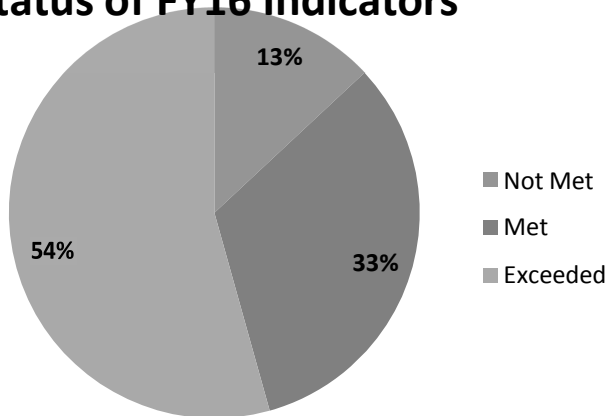
	FY 2016 Actual	FY 2017 Currently Available	FY 2018 Base	FY 2018 Estimate	Increase (Decrease)
Object Class					
Other purchases of goods and services from Gov't accounts	1,285	1,936	1,603	1,603	0
Total Obligations	1,285	1,936	1,603	1,603	0
Less prior year recoveries	0	0	0	0	0
Less unobligated balance, SOY	0	0	0	0	0
Plus unobligated balance, EOY	651	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	1,936	1,936	1,603	1,603	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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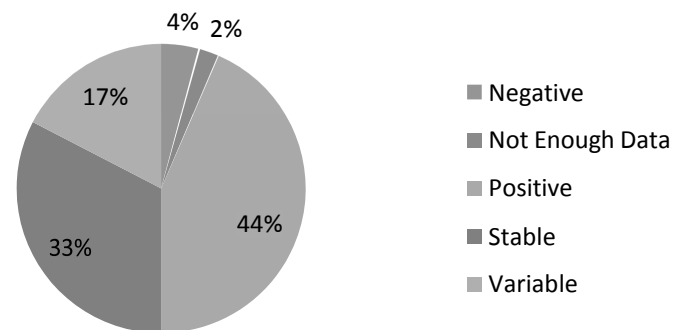
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Summary of FY 2016 Indicator Performance

Status of FY16 Indicators



Trends of Indicators - FY16



Indicator	FY16 Target	FY16 Actual	Status	Trend
3.1: Annual number of peer-reviewed publications related to environmental understanding and prediction	1500	1697	Exceeded	Variable
3.1: Annual economic and societal benefits from Sea Grant activities as measured by jobs created/retained (reported by each individual Sea Grant College)	9600	20,770	Exceeded	Positive
3.1: Key milestones completed on time for satellites and ship deployments	3	3	Met	Stable
3.1: Number of comparative greenhouse gas emissions studies completed	9	23	Exceeded	Positive

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3.1: Percentage of data processed and delivered to the user community (relative to all data transmitted to NOAA from NOAA-managed satellites)	98.5%	99.3%	Exceeded	Stable
3.1: Number of research and development (R&D) capabilities transitioning to applications (from TRL 8 to TRL 9) to improve efficiency, accuracy, or precision of forecasts	7	4	Not Met	Not enough Data
3.1: U.S. Temperature Forecast Skill	25	24	Met	Stable
3.1: Uncertainty of the North American (NA) carbon sink to better understand the contribution of human activities toward increasing atmospheric CO2 and methane	405	400	Exceeded	Stable
3.1: Percentage of ingested data safely archived per National Archives & Records Administration (NARA) standards	98%	98%	Met	Stable
3.1: Number of forecast and mission improvements, based on NOAA research, to weather applications at operational US weather services and in the US weather commercial sector	9	9	Met	Stable
3.1: Annual number of Climate Program Office peer-reviewed publications related to climate understanding and prediction	300	847	Exceeded	Positive
3.2: Severe Weather Warnings Tornadoes - Storm Based Lead Time (Minutes)	13	9	Not Met	Variable
3.2: Severe Weather Warnings Tornadoes - Storm Based Accuracy (%)	72	61	Not Met	Positive
3.2: Severe Weather Warnings Tornadoes - Storm Based False Alarm Ratio (%)	71	69	Met	Negative
3.2: Severe Weather Warnings for Flash Floods - Lead Time (minutes)	61	72	Exceeded	Variable
3.2: Severe Weather Warnings for Flash Floods - Accuracy (%)	76	80	Exceeded	Stable
3.2: Hurricane Forecast Track Error (48-Hour) (nautical miles)	71	61	Exceeded	Variable

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3.2: Hurricane Forecast Intensity Error (48 hour) (knots)	12	10	Exceeded	Variable
3.2: Accuracy (%) (Threat Score) of Day 1 Precipitation Forecasts	32	36	Exceeded	Positive
3.2: Winter Storm Warnings - Lead Time (Hours)	20	21	Exceeded	Stable
3.2: Winter Storm Warnings - Accuracy (%)	90	85	Met	Stable
3.2: Marine Wind - Percentage of Accurate Forecasts	78	80	Exceeded	Positive
3.2: Marine Wave Heights - Percentage of Accurate Forecasts	81	85	Exceeded	Positive
3.2: Aviation Ceiling/Visibility Forecast Accuracy Instrument Flight Rules (IFR)	65	63	Met	Stable
3.2: Aviation Ceiling/Visibility False Alarm Ratio (%) Instrument Flight Rules (IFR)	38	38	Met	Positive
3.2: Geomagnetic Storm Forecast Accuracy (%)	53	68	Exceeded	Positive
3.2: American Customer Satisfaction Index for NOAA's National Weather Service	81	82	Exceeded	Positive
3.2: Number of StormReady Communities	100	189	Exceeded	Positive
3.2: Number of TsunamiReady Communities	10	10	Met	Positive
3.3: Supporting: Number of communities that utilize Digital Coast	5500	5043	Met	Positive
3.3: Annual number of Coastal, Marine, and Great Lakes Ecological Characterizations that Meet Management Needs	48	48	Met	Stable
3.3: Cumulative number of coastal, marine and Great Lakes issue-based forecasting capabilities developed and used for management	92	91	Met	Positive

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3.3: Percentage of Tools, Technologies, and Information Services that are used by NOAA Partners/Customers to Improve Ecosystem-based Management	91	100	Exceeded	Positive
3.3: Percentage of U.S. coastal states and territories demonstrating annual improvement in resilience capacity to weather and climate hazards	60	74	Exceeded	Positive
3.3: Hydrographic data acquired to support safe and efficient maritime commerce and for community resilience to storms and other coastal hazards (in square nautical miles) Reduce the Hydrographic Survey Backlog within Navigationally Significant Areas (square nautical miles surveyed per year)	2509	3296	Exceeded	Variable
3.3: Cumulative percent of U.S. and territories surveyed to improve vertical reference system for modernized height/elevation data	53	55	Exceeded	Positive
3.3: Percent of all coastal communities susceptible to harmful algal blooms verifying use of accurate HAB forecasts	18	18	Met	Stable
3.4: Supporting: Fish Stock Sustainability Index (FSSI)	758	754	Not Met	Positive
3.4: Percent of Stocks For Which Catch is below the Specified Annual Catch Limit (ACL)	81	90.7	Exceeded	Stable
3.4: Percentage of FSSI Fish Stocks with Adequate Population Assessments and Forecasts	61.3	62.3	Exceeded	Stable
3.4: Percentage of Protected Species Stocks with Adequate Population Assessments and Forecasts	20.7	19.2	Not Met	Variable
3.4: Number of Protected Species Designated as Threatened, Endangered or Depleted with Stable or Increasing Population Levels	31	31	Met	Stable
3.4: Number and Percentage of Actions Ongoing or Completed to Recover Endangered and Threatened Species	49.1	49.2	Met	Positive

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3.4: Number of Habitat Acres Restored	23,922	21,232	Not Met	Negative
3.4: Annual Number of Coastal, Marine, and Great Lakes Habitat Acres Acquired or Designated for Long-term Protection	1650	283,384,171	Exceeded	Variable
4.1: Number of archival datasets to which permanent, citable Digital Object Identifiers (DOIs) have been assigned	40	452	Exceeded	Positive

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Recurring Indicators

Objective 3.1

Strategic Goal 3	Environment: Help communities and businesses prepare for and prosper in a changing environment							
Objective 3.1#	<i>Advance the understanding and predictions of changes in the environment</i>							
Indicator	Annual number of peer-reviewed publications related to environmental understanding and prediction							
Category	Key							
Type	Output							
Description	The annual number of peer reviewed publications is an indicator of productivity and relevance and is tracked using on-line resources. Peer review is one of the important procedures used to ensure that the quality of published information meets the standards of the scientific and technical community.							
	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Target	1200	1200	1200	1200	1500	1500	1700	1100
Actual	1210	1800	1676	1759	1860	1697		
Status	Exceeded	Exceeded	Exceeded	Exceeded	Exceeded	Exceeded		
Trend	Variable							
Explanation (if not met in FY 2016)	n/a							
Actions to be taken / Future Plans	None							
Adjustments to targets	The FY2015 target was increased to 1500 due to exceeding the FY2012-2014 target of 1200. The FY17 target was increased to 1700 due to exceeding the FY2015-2016 target of 1500.							
Notes	NOAA-wide data collection began in FY2011 through the DOC Balanced Scorecard reporting. Budget narrative performance measures are chosen as the best indicators of progress in execution of a particular program, project, or activity (PPA) Budget Category. Their targets may contribute to a broader NOAA-wide corporate measure that is tracking a strategic goal or enterprise objective (captured and evaluated within a line or staff office annual operating plan). As such, the publications measure components found in the budget submission are only a subset of the NOAA total count shown.							
Information Gaps	The publication count is not currently capturing publications produced with NOAA grant support, NOAA's cooperative institutes, book chapters, and conference proceedings. In addition, publications not found in Thomson Reuters Web of Science or produced prior to FY 2011 have not been captured.							

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Strategic Goal 3	Environment: Help communities and businesses prepare for and prosper in a changing environment							
Objective 3.1#	<i>Advance the understanding and predictions of changes in the environment</i>							
Indicator	Annual economic and societal benefits from Sea Grant activities as measured by jobs created/retained (reported by each individual Sea Grant College)							
Category	Supporting (Non-Strategic Plan)							
Type	Customer Service							
Description	This measure highlights change in jobs that communities or businesses generate or save due to Sea Grant assistance (i.e., providing information to help communities, industries or businesses expand, make better decisions or avoid mistakes). Sea Grant provides the information and training that informs business decisions, and in some cases firms create or sustain jobs as a result. A job created is a new position created and filled as a result of Sea Grant activities. An existing position that is filled with a Sea Grant-trained applicant should not be reported in this measure. A job sustained is an existing, filled position that is sustained as a direct result of Sea Grant activities. A job cannot be reported as both created and sustained in the same year.							
	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Target	3,700	4,000	4,000	9,600	9,600	9,600	20,770	0
Actual	4,375	3,800	15,000	17,500	10,700	20,770		
Status	Exceeded	Not Met	Exceeded	Exceeded	Exceeded	Exceeded		
Trend	Positive							
Explanation (if not met in FY 2016)	n/a							
Actions to be taken / Future Plans	None							
Adjustments to targets	None							
Notes	None							
Information Gaps	Current efforts are focused on better defining the measure standards.							

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Strategic Goal 3	Environment: Help communities and businesses prepare for and prosper in a changing environment							
Objective 3.1#	<i>Advance the understanding and predictions of changes in the environment</i>							
Indicator	<i>Key milestones completed on time for satellites and ship deployments</i>							
Category	<i>Key</i>							
Description	<i>Key activities for the development and launch of weather satellites and fleet modernization and products are identified and</i>							
	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Target				SAT: 7 SHIPS: 0	SAT: 2 SHIPS: 0	SAT: 3 SHIPS: 0	SAT: 2 SHIPS: 0	SAT: 2 SHIPS: 0
Actual				SAT: 7 SHIPS: 0	SAT: 2 SHIPS: 0	SAT: 3 SHIPS: 0		
Status				Met	Met	Met		
Notes	Data collection begins in FY2014 through the DOC Strategic Plan reporting.							
Information Gaps								

Strategic Goal 3	Environment: Help communities and businesses prepare for and prosper in a changing environment							
Objective 3.1#	<i>Advance the understanding and predictions of changes in the environment</i>							
Indicator	Percentage of data processed and delivered to the user community (relative to all data transmitted to NOAA from NOAA-managed satellites)							
Category	Supporting							
Description	Ensures that NOAA provides real time (or near real time) availability of critical satellite data and products without gaps.							
	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Target	98.5%	98.5%	98.5%	98.5%	98.5%	98.5%	98.5%	98.5%
Actual	99.73%	99.60%	99.50%	99.7%	99.35%	99.3%		
Status	Exceeded	Exceeded	Exceeded	Exceeded	Exceeded	Exceeded		
Notes	On time data and imagery provided increases timeliness and accuracy of public warnings and forecasts of climate and weather events							
Information Gaps								

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Strategic Goal 3	Environment: Help communities and businesses prepare for and prosper in a changing environment							
Objective 3.1#	Advance the understanding and predictions of changes in the environment							
Indicator	NEW: Annual number of OAR R&D products transitioned to a new stage(s) (development, demonstration, or application).							
Category	Supporting (Non-Strategic Plan)							
Type	Output							
Description	<p>The measure captures the count of significant and discrete OAR research and development products that have transitioned to development, demonstration, or an application. Products include transitions occurring within OAR and applying group(s) outside of OAR. This includes research, development, and demonstration performed and supported by OAR as well as utilization of OAR R&D products by external parties. The stages are defined as:</p> <ol style="list-style-type: none"> 1. <u>Development</u>: when OAR research is used to start or enhance significant new development activities (e.g., modeling efforts begin to incorporate OAR field study findings into a predictive model.) 2. <u>Demonstration</u>: when a demonstration of OAR research and/or development starts with the purpose of demonstrating that the R&D is appropriate for transition to operation or other applications (e.g., a new version of a tool for forecasters begins evaluation in a NOAA testbed.) 3. <u>Application</u>: Examples of applications and the types of products transitioned include the following: <ul style="list-style-type: none"> • Transitions to operations (e.g., new observing technologies enter operations, updated models enter operations) • Providing information for decision-makers (e.g., completion of peer-reviewed assessments, external development of resource management policies based on OAR research findings). • Transition to commercial applications(e.g., patent, new technology used in a commercial product) <p>Note that this measure counts the number of products that advance, not the number of uses of those products. If a product advances through multiple stages in a year, it may be listed for each stage to which it advances. If multiple OAR labs/programs contribute to an advancement (including providing financial resources), they can each count the advancement.</p>							
	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Target	n/a	n/a	n/a	n/a	65	65	65	42
Actual	n/a	n/a	n/a	66	72	65		
Status					Exceeded	Met		NEW
Trend	Stable							
Explanation (if not met in FY 2016)	n/a							

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Actions to be taken / Future Plans	None
Adjustments to targets	None
Notes	This is a pilot measure. As the measure is developed and implemented, changes will be made to refine it.

Strategic Goal 3	Environment: Help communities and businesses prepare for and prosper in a changing environment							
Objective 3.1#	<i>Advance the understanding and predictions of changes in the environment</i>							
Indicator	U.S. Temperature Forecasts Skill							
Category	Key							
Type	Output							
Description	<p>Seasonal outlooks are used by sectors of the U. S. economy, such as energy, agriculture, transportation, etc. as one factor in resource decision making.). Seasonal outlooks are reported as either above normal, near normal, below normal or, where no definite seasonal guidance can be provided, equal chances.</p> <p>This is the cumulative skill calculated for regions where predictions are made. These forecasts are verified using a 48 month running mean of Heidke Skill score computed for seasonal outlooks for each 3-month seasonal mean (e.g., January-February-March mean; February-March-April mean; March-April-May mean; and so on). Specific calculations for this measure may be found at: http://www.cpc.ncep.noaa.gov/products/predictions/90day/skill_exp.html and http://www.cpc.noaa.gov/products/predictions/long_range/tools/briefing/seas_veri.grid.php</p>							
	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Target	21	21	22	23	24	25	26	26
Actual	22	29	26	26	25	24		
Status	Exceeded	Exceeded	Exceeded	Exceeded	Exceeded	Exceeded		
Trend	Stable							
Explanation (if not met in FY 2016)	n/a							

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Actions to be taken / Future Plans	To meet out-year goals and improve seasonal predictions: <ul style="list-style-type: none"> • NOAA’s Climate Test Bed (CTB) is focusing on accelerating improvements to operational seasonal climate predictions; and • NOAA will continue the successful collaborative forecast process, which includes research scientist and experimental forecast tools in operational seasonal forecast discussions each month. This infuses cutting-edge science into the operational process.
Adjustments to targets	No changes were made to this indicator since the previous Congressional submission. This indicator is based on a 4-year running mean of the annual score. Because of natural variability of climate regimes, the skill score can fluctuate considerably from one season to another. For example, for the periods influenced by a strong El Niño Southern Oscillation (ENSO) forcing, the skill score tends to be high. To reduce the effects of natural variability, this measure is based on averaging 48 consecutive individual seasons. The upgraded version of the NWS climate forecast system (CFS) was placed into operation during FY 2011. This version is being run at higher resolution and is anticipated to contribute to improve NWS performance.
Notes	NWS began reporting this measure in its Congressional Justification beginning in FY 2003. These data are available from 1995 to present.
Information Gaps	None

Objective 3.2

Strategic Goal 3	Environment: Help communities and businesses prepare for and prosper in a changing environment
Objective 3.2#	<i>Build a Weather-Ready Nation</i>
Indicator	Severe Weather Warnings Tornadoes - Storm Based Lead Time (Minutes), Accuracy (%), and False Alarm Ratio (%)
Category	Supporting (Non-Strategic Plan)
Type	Output
Description	Tornado warnings are enable the public to get out of harm’s way and mitigate preventable loss. NWS forecasters issue approximately 3,300 Tornado Warnings per year, primarily between the Rockies and Appalachian Mountains. Tornado warning statistics are based on a comparison of warnings issued and weather spotter observations of tornadoes and/or storm damage surveys from Weather Forecast Offices in the United States. Metrics includes all warned tornado events and all unwarned tornado events.

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	<p>The lead time for a tornado warning is the difference between the time the warning was issued and the time the tornado affected the area for which the warning was issued. The lead times for all tornado occurrences within the U.S. are averaged to get this statistic for a given fiscal year. This average includes all warned events with zero lead times and all unwarned events. Accuracy or probability of detection (POD) is the percentage of time a tornado actually occurred in an area that was covered by a tornado warning. The difference between the accuracy percentage figure and 100% represents the percentage of events occurring without warning. The false alarm ratio is the percentage of times a tornado warning was issued, but no tornado occurrence was verified.</p> <p>Tornado Warning Lead Time for an individual event is available to an accuracy of a minute corresponding to the time a tornado has touched down. Although the timing of the warning transmission is recorded to the nearest second, typically there is only an estimate to the nearest minute of when a tornado touches down. While we can compute the average tornado warning lead time to a precision of 30 second increments or less, the reporting of this value implies greater accuracy in the data than currently exists.</p> <p>The annual variation of tornado warning lead time, accuracy, and false alarm ratio is closely tied to the variation in storm type during a given year. Discrete, persistent long track tornadic supercell storms, often associated with tornado outbreaks, are usually easier to detect and track on radar than tornadoes that develop within squall lines, tropical storms, or disorganized storm systems. There is considerable year-to-year variability in tornado outbreaks, and years with more frequent outbreaks, such as 2011, typically exhibit better performance. Changes in performance can be detected over a period of several years although they can be influenced by the frequency of tornado outbreak occurrence.</p>							
	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Lead Time (min)								
Target	12	13	13	13	13	13	13	13
Actual	15	11	9	9	8	9		
Status	Exceeded	Not Met	Not Met	Not Met	Not Met	Not Met		
Trend	Directional: Variable							
Accuracy (%)								
Target	70	72	72	72	72	72	72	72
Actual	75	69	57	60	58	61		
Status	Exceeded	Met	Not Met	Not Met	Not Met	Not Met		
Trend	Directional: Positive							

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False Alarm Ratio (%)							
Target	72	72	72	72	72	71	71 71
Actual	73	73	74	70	70	69	
Status	Met	Met	Met	Met	Met	Met	
Trend	Directional: Negative						
Explanation (if not met in FY 2016)	The lower Lead Time and Accuracy numbers are largely due to the low number of events in FY16, and an overall lack of organized severe convection. There were less than 2300 tornado warnings issued in FY16, and that is over 1000 fewer warnings than the long term average.						
Actions to be taken / Future Plans	Improvements in NWS national Tornado average lead-time and accuracy goals are based on upgrading high resolution models for forecaster situational awareness and operationally implementing tools such Multi-Radar Multi-Sensor System (MRMS), and the advanced radar scanning methods Automated Volume Scan Evaluation and Termination (AVSET) and Supplemental Adaptive Intra-Volume Low-Level Scan (SAILS).						
Adjustments to targets	No changes were made to this indicator since the previous Congressional submission.						
Notes	NWS began reporting this measure in its Congressional Justification beginning in FY 2000 for compliance with Government Performance and Results Act (GPRA) for 1993. These data are available from 1986 to present. Historically, tornado warnings were issued and verified on a countywide basis. Starting in FY 2008, the storm-based warnings were implemented with verification based solely for the areas impacted by the warning and event.						
Information Gaps	None						

Strategic Goal 3	Environment: Help communities and businesses prepare for and prosper in a changing environment
Objective 3.2#	<i>Build a Weather-Ready Nation</i>
Indicator	Severe Weather Warnings for Flash Floods - Lead Time (minutes) and Accuracy (%)
Category	Supporting (Non-Strategic Plan)
Type	Output
Description	For each reported flash flood event, the flash flood warning lead-time is the difference in minutes between the issuance of a

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	<p>flash flood warning and the onset of a geographically corresponding flash flood event. The lead-times for all flash flood events, within the United States and territories served by the National Weather Service, are averaged to calculate the national average flash flood warning lead-time metric for a given fiscal year. This average includes all warned events with zero lead times and all unwarned events. The flash flood warning accuracy (probability of detection for storm-based warnings) represents the percentage, in both space and time, for which a flash flood event was warned.</p> <p>Both flash flood warning lead-time and accuracy metrics are cumulative over the fiscal year and, when reported prior to the end of the year, represent the year-to-date performance.</p>							
	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Lead Time (min)								
Target	38	42	58	60	61	61	63	63
Actual	73	53	63	54	64	72		
Status	Exceeded	Exceeded	Exceeded	Met	Exceeded	Exceeded		
Trend	Variable							
Accuracy (%)								
Target	72	74	74	74	76	76	76	76
Actual	80	76	78	78	79	80		
Status	Exceeded	Exceeded	Exceeded	Exceeded	Exceeded	Exceeded		
Trend	Stable							
Explanation (if not met in FY 2016)	N/A							
Actions to be taken / Future Plans	Implementation of new water resource capabilities including distributed hydrologic modeling which will provide stream flow predictions at ungauged locations. Current flash flood detection capabilities are largely based on decision assistance tools which utilize precipitation estimates, rather than overland and streamflow modeling. (FY2018-FY2020)							
Adjustments to targets	No changes were made to this indicator since the previous Congressional submission.							
Notes	NWS began reporting this measure in its Congressional Justification beginning in FY 2000 for compliance with GPRA. These data are available from 1986 to present. Historically, flash flood warnings were issued and verified on a countywide basis. Starting in FY 2010, the storm-based warnings were implemented with verification based solely for the areas impacted by the							

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	warning and event.
Information Gaps	None

Strategic Goal 3	Environment: Help communities and businesses prepare for and prosper in a changing environment							
Objective 3.2#	<i>Build a Weather-Ready Nation</i>							
Indicator	Hurricane Forecast Track Error (48-Hour)							
Category	Supporting (Non-Strategic Plan)							
Type	Output							
Description	The public, private sectors, emergency managers, and government institutions at all levels in this country and abroad use NOAA tropical cyclone forecasts to make decisions regarding the protection of life and property. This goal measures the difference between the projected and actual location of the center of tropical cyclones in nautical miles (nm) for the Atlantic Basin, averaged over all the 48-hour forecasts occurring during the calendar year. Because tropical cyclones are relatively rare events, this measure can show significant annual volatility. Projecting the long-term trend, and basing out-year goals on that trend, is preferred over making large upward or downward changes to the targets each year.							
	CY 2011	FY 2012	CY 2013	CY 2014	CY 2015	CY 2016	CY 2017	CY 2018
Target	106	84	83	81	77	71	68	65
Actual	71	69	103	65	77	61		
Status	Exceeded	Exceeded	Not Met	Exceeded	Met	Exceeded		
Trend	Variable							
Explanation (if not met in FY 2016)	N/A							
Actions to be taken / Future Plans	TBD							
Adjustments to targets	Targets for FY 2017 and beyond were adjusted to reflect the FY 2015 and FY 2017 decreases in the HFIP. These revised targets additionally reflect recent performance trends and improvements in Hurricane Weather Research and Forecasting model.							
Notes	NWS began reporting this measure in its Congressional Justification beginning in FY 2003. These data are available from 1970 to present. CY 2016 GPRA final values will be available after the verification period.							

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	* Annual Hurricane Season begins June 1 and ends November 30. The final values are produced after a 60-day verification and validation period. Calendar Year (CY) 2016 Hurricane GPRA will be available in February 2017.
Information Gaps	None

Strategic Goal 3	Environment: Help communities and businesses prepare for and prosper in a changing environment							
Objective 3.2#	<i>Build a Weather-Ready Nation</i>							
Indicator	Hurricane Forecast Intensity Error (48 hour)							
Category	Supporting (Non-Strategic Plan)							
Type	Output							
Description	The public, private sectors, emergency managers, and government institutions at all levels in this country and abroad use NOAA tropical cyclone forecasts to make decisions regarding the protection of life and property. This measure represents the difference between the projected intensity of these storms and the actual intensity in knots (kt) for Atlantic Basin tropical cyclones (i.e., tropical depressions, tropical storms, and hurricanes). The measure is validated by computing the average difference (error) for all the 48-hour forecasts occurring during a calendar year. Because tropical cyclones are relatively rare events, this measure can show significant annual volatility. Projecting the long-term trend, and basing out-year goals on that trend, is preferred over making large upward or downward changes to the targets each year.							
	CY 2011	CY 2012	CY 2013	CY 2014	CY 2015	CY 2016	CY 2017	CY 2018
Target	13	15	12	12	12	12	12	12
Actual	14	12	10.5	10	11	10		
Status	Not Met	Exceeded	Exceeded	Exceeded	Exceeded	Exceeded		
Trend	Variable							
Explanation (if not met in FY 2016)	N/A							
Actions to be taken / Future Plans	TBD							
Adjustments to	Targets for FY 2017 and beyond were adjusted to reflect performance trends, anticipated impacts of model upgrades and FY							

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targets	2017 decreases in the HFIP.
Notes	NWS began reporting this measure in its Congressional Justification beginning in FY 2003. These data are available from 1970 to present CY 2016 GPRA final values will be available after the verification period. * Annually Hurricane Season begins June 1 and ends November 30. The final values are produced after a 60 day verification and validation period. Calendar Year (CY) 2016 Hurricane GPRA will be available in February 2017.
Information Gaps	None

Strategic Goal 3	Environment: Help communities and businesses prepare for and prosper in a changing environment							
Objective 3.2 #	<i>Build a Weather-Ready Nation</i>							
Indicator	Accuracy (%) (Threat Score) of Day 1 Precipitation Forecasts							
Category	Supporting (Non-Strategic Plan)							
Type	Output							
Description	Precipitation forecasts and other foundational general weather guidance developed by the Weather Prediction Center are used extensively by the weather enterprise, the military, international interests, and NWS WFOs and RFCs to inform daily weather forecast. This information is used by government entities, economic sectors, and the general public to manage daily lives and activities and make resource decisions. This performance measure tracks the ability of the weather forecasters of NOAA's Weather Prediction Center (WPC) to predict accurately the occurrence of one inch or more of precipitation (rain or the water equivalent of melted snow or ice pellets) twenty-four hours in advance across the contiguous U.S. Through this measure, the WPC focuses on relatively heavy amounts of precipitation because of the major safety and economic impacts such heavy precipitation can have in producing flooding, alleviating drought, and affecting river navigation.							
	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Target	30	31	31	32	32	32	33	33
Actual	34	33	33	33	33	36		
Status	Exceeded	Exceeded	Exceeded	Exceeded	Exceeded	Exceeded		
Trend	Positive							
Explanation (if not met in FY 2016)	N/A							
Actions to be	The NCEP Central Computer System will continue to be upgraded in its computational speed and memory storage capabilities							

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taken / Future Plans	allowing the running of more sophisticated numerical modeling systems of the hydrosphere. During the next several years, NCEP will implement a number of numerical weather prediction enhancements aimed at improving heavy precipitation forecasts, including increasing numerical model resolution, increasing the number of ensemble forecast members for both short- and medium-range forecast models, and improving the assimilation of satellite and other observational data used as the starting point for the numerical forecasts.
Adjustments to targets	No changes were made to this indicator since the previous Congressional submission.
Notes	NWS began reporting this measure in its Congressional Justification beginning in FY 2000 for compliance with GPRA. These data are available from 1993 to present.
Information Gaps	None

Strategic Goal 3	Environment: Help communities and businesses prepare for and prosper in a changing environment							
Objective 3.2#	<i>Build a Weather-Ready Nation</i>							
Indicator	Winter Storm Warnings - Lead Time (Hours) and Accuracy (%)							
Category	Supporting (Non-Strategic Plan)							
Type	Output							
Description	A winter storm warning provides NOAA customers and partners advanced notice of a hazardous winter weather event that endangers life or property, or provides an impediment to commerce. Winter storm warnings are issued for winter weather phenomena like blizzards, ice storms, heavy sleet, and heavy snow. This performance indicator measures the accuracy and advance warning lead time of winter storm events. Improving the accuracy and advance warnings of winter storms enables the public to take the necessary steps to prepare for disruptive winter weather conditions.							
	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Lead Time (hours)								
Target	15	19	20	20	20	20	20	20
Actual	20	18	22	22	21	21		
Status	Exceeded	Met	Exceeded	Exceeded	Exceeded	Exceeded		
Trend	Stable							
Accuracy (%)								
Target	90	90	90	90	90	90	90	90

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Actual	83	89	89	89	85	85		
Status	Not Met	Not Met	Met	Met	Met	Met		
Trend	Stable							
Explanation (if not met in FY 2016)								
Actions to be taken / Future Plans	<p>Actions include:</p> <ul style="list-style-type: none"> • As forecasters work with higher resolution models such as Weather Research and Forecasting (WRF) model, they learn more about model tendencies, allowing more precise and timely warnings. • Deploy advanced ensemble modeling techniques. Ensemble techniques provide forecasters with probabilistic information applicable to issuing winter storm warnings. • Dual polarization radars, satellite upgrades, and access to Terminal Doppler Weather Radar (TDWR) – Enables forecasters to observe the formation/dissipation of mesoscale snow bands, which result in locally higher snow accumulation (i.e., lake effect snow). • Develop additional training and coordination support with National Centers. Implementation advanced ensemble modeling techniques providing probabilistic information applicable to issuing winter storm warnings. 							
Adjustments to targets	No changes were made to this indicator since the previous Congressional submission.							
Notes	NWS began reporting this measure in its Congressional Justification beginning in FY 2001. These data are available from 1998 to present. From 1998 through 2006 statistics were calculated manually. Automated verification with additional quality control began in October 2007 to present.							
Information Gaps	None.							

Strategic Goal 3	Environment: Help communities and businesses prepare for and prosper in a changing environment
Objective 3.2#	<i>Build a Weather-Ready Nation</i>
Indicator	Marine Wind - Percentage of Accurate Forecasts & Marine Wave Heights - Percentage of Accurate Forecasts
Category	Supporting (Non-Strategic Plan)
Type	Output
Description	<p>These performance indicators measure the accuracy of wind speed and wave height forecasts, which are important for marine commerce. These measures represent the percentage of accurate forecasts; accuracy is defined in terms of error. For the Day 1 marine wind speed forecast, errors less than 5 knots are defined as accurate. Since FY2014, a higher threshold of forecast errors has been used to define correct forecasts whenever higher wind speeds have occurred. Hence, wind speed forecasts with errors less than (7 knots, 10 knots, 15 knots) are accurate forecasts when the observed wind speed equals or exceeds (20 knots, 34 knots, 48 knots) respectively.</p> <p>For the Day 1 wave height forecast, errors less than 2 feet are defined as accurate. Since FY2014, a higher threshold of</p>

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	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Wind (%)								
Target	69	71	74	74	75	78	78	79
Actual	75	76	76	78	80	80		
Status	Exceeded	Exceeded	Exceeded	Exceeded	Exceeded	Exceeded		
Trend	Directional: Positive							
Wave Height (%)								
Target	74	75	75	76	76	81	81	82
Actual	77	78	81	84	84	85		
Status	Exceeded	Exceeded	Exceeded	Exceeded	Exceeded	Exceeded		
Trend	Directional: Positive							
Explanation (if not met in FY 2016)	N/A							
Actions to be taken / Future Plans	TBD							
Adjustments to targets	Targets for FY 2016 were raised to reflect performance.							
Notes	NWS began reporting this measure in its Congressional Justification beginning in FY 2001. Legacy statistics are available from FY 1994 through FY 2012. New marine verification program began FY 2013. Beginning in FY 2013, Wind and Wave verification extended out to 5 and 7 days respectively, while the legacy program was limited to verifying Day 1.							
Information Gaps	None							

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Strategic Goal 3	Environment: Help communities and businesses prepare for and prosper in a changing environment							
Objective 3.2#	<i>Build a Weather-Ready Nation</i>							
Indicator	Aviation Ceiling/Visibility Forecast Accuracy & False Alarm Ratio (%) Instrument Flight Rules (IFR)							
Category	Supporting (Non-Strategic Plan)							
Type	Output							
Description	<p>Visibility and cloud ceiling forecasts are critical for aircraft safety and efficiency. When visibility or cloud ceilings are low, pilots rely on instruments to navigate instead of visual reconnaissance. Instrument Flight Rule (IFR) thresholds—visibility less than three statute miles and/or cloud ceilings at, or below, 1000 feet—are set by the Federal Aviation Administration for safety. NWS assesses the quality of IFR threshold forecasts in response to these requirements. Fundamental statistical metrics, specifically Probability of Detection (POD) and False Alarm Ratio (FAR), are used to track IFR forecast performance. Probability of Detection (POD), also known as Accuracy, is a ratio that describes the number of times IFR is correctly forecasted compared to the total number of IFR occurrences. FAR is a ratio that describes the number of IFR forecasts when IFR was not observed compared to the total number of forecast attempts. These two metrics must always be used in conjunction, as one can be improved at the expense of the other. Greater accuracy and a minimized FAR result in safer flights and fewer flight delays; and conversely, poorer accuracy and an increased FAR result in a greater incidence of unnecessary flight delays.</p>							
	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Accuracy (%)								
Target	65	65	65	65	65	65	65	65
Actual	63	61	62	62	65	63		
Status	Met	Not Met	Not Met	Met	Met	Met		
Trend	Stable							
False Alarm Ratio (%)								
Target	41	40	38	38	38	38	38	38
Actual	39	39	37	36	34	38		
Status	Exceeded	Exceeded	Exceeded	Exceeded	Exceeded	Met		
Trend	Positive							
Explanation (if not								

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met in FY 2016)	
Actions to be taken / Future Plans	Operational emphasis focuses on detecting (Instrument Flight Rules) IFR conditions and making accurate and precise forecasts. Results of improvements to Aerodrome Forecast (TAF) products at 30 busiest airports indicate focused attention on the TAF improves the accuracy. Additional training and coordination on impact of the TAF on air traffic will continue to highlight the importance of providing timely and accurate forecasts. Other efforts are centering on refining performance measures, such as lead time to occurrence and cessation, impacts to operations measures, and other quantitative methods to reveal ways to improve forecast skill and technique. Significant improvement in forecast skill is not achievable without infusion of new science and technology.
Adjustments to targets	No changes were made to this indicator since the previous Congressional submission.
Notes	NWS began reporting accuracy and false alarm rated for aviation forecast metrics for ceiling and visibility in its Congressional Justification beginning in FY 2001. Data for aviation performance measure with IFR thresholds—visibility less than three statute miles and/or cloud ceilings at, or below, 1000 feet are available since 2005.
Information Gaps	None

Strategic Goal 3	Environment: Help communities and businesses prepare for and prosper in a changing environment
Objective 3.2#	<i>Build a Weather-Ready Nation</i>
Indicator	Geomagnetic Storm Forecast Accuracy (%)
Category	Supporting (Non-Strategic Plan)
Type	Output
Description	<p>This performance measures tracks the ability of forecasters at NOAA's Space Weather Prediction (SWPC) to accurately predict geomagnetic storms which potentially disrupt power systems, spacecraft operations, and navigation systems. The NOAA geomagnetic storm scale (G-scale) ranges from the G1 or minor level where weak power grid fluctuations can occur to the G5 or extreme level. During a G5 event, where aurora may be visible over most of the United States, the power grid can experience equipment damage causing system collapse or blackout; significant satellite damage can occur; and global positioning systems may be inaccurate or temporarily unavailable.</p> <p>Geomagnetic Storm Forecast Accuracy is the percentage that the geomagnetic storm forecast is correct over a 24-hour period. This measure is averaged over the 60 most recent geomagnetic storms. The 24 hour geomagnetic storm forecast is</p>

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	considered accurate if a G1 or greater storm event was correctly predicted. This calculation also includes geomagnetic storms which were not forecast. This measure is verified based on ground-based magnetometer observations. Due to the nature of the approximately 11-year solar cycle and variability of geomagnetic storm occurrence, this metric is assessed over the 60 most recent geomagnetic storms to maintain statistical significance.							
	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Target				51	53	53	40	40
Actual				40	57	68		
Status				Not Met	Exceeded	Exceeded		
Trend	Positive							
Explanation (if not met in FY 2016)	N/A							
Actions to be taken / Future Plans	In FY2017, NOAA plans to continue to improve the WSA-Enlil Solar Wind prediction model by updating the model physics and by improving how the model is initialized. This model serves as the primary guidance for geomagnetic storm forecasting. Additionally, advanced ensemble modeling techniques are being explored to improve geomagnetic storm predictions. The degree of expected improvement is not yet known or well-validated.							
Adjustments to targets	<p>Targets for FY 2017 and beyond were reduced to reflect current performance trends. This re-baselining occurred because the current solar Cycle (Solar Cycle 24, or January 2009 through the present) has been less active than the solar cycles of the past several decades and largely devoid of strong geomagnetic storms. The strong storms are more easily forecast, because the most significant impacts at Earth and the solar eruptions that drive them are generally obvious. The lower-level storms we have predominantly seen this solar cycle are usually not driven by significant eruptions and therefore are much more difficult to forecast and often trigger the lowest end of this forecast measure.</p> <p>Given the lower number of strong storms compared with historical averages, forecasting performance in this measure has suffered and performance targets have not been met. Given the observed decrease in overall solar cycle intensity, and the fact that these conditions are expected to persist through FY2021 and beyond, performance targets have been modified accordingly. It should be noted that despite the decrease in overall solar cycle intensity, severe to extreme storming is still possible at any phase of the solar cycle and independent of overall solar cycle intensity.</p> <p>New targets have been established consistent with the performance observed to date in Solar Cycle 24.</p>							
Notes	NWS began reporting this measure in its Congressional Justification beginning in FY 2013. In FY 2013, this measure was the average over 30 storms and represented the percentage of days that a geomagnetic storm event at Earth was correctly							

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	forecasted by the Space Weather Prediction Center (SWPC). These data are available from 2009 to present.
Information Gaps	None

Strategic Goal 3	Environment: Help communities and businesses prepare for and prosper in a changing environment							
Objective 3.2#	<i>Build a Weather-Ready Nation</i>							
Indicator	American Customer Satisfaction Index							
Category	Key							
Description	<p>Weather information users are surveyed continuously by means of a web-based, pop-up survey on NWS web pages throughout the Nation. A sample size of approximately 6,000 responses is collected quarterly for a maximum of 24,000 annual responses.</p> <p>The Customer Satisfaction Index (ACSI) score is calculated as a weighted average of three survey questions that measure different facets of satisfaction with NWS services. ACSI researchers use proprietary software technology to estimate the weighting. The three questions include the overall satisfaction of NWS services, expectations of service, and a comparison to an ideal organization. Indexes are reported on a 0 to 100 scale.</p> <p>The ACSI was started in the United States in 1994 by researchers at the University of Michigan, in conjunction with the American Society for Quality in Milwaukee, Wisconsin, and CFI Group in Ann Arbor, Michigan. The Index was developed to provide information on satisfaction with the quality of products and services available to consumers. The survey data serve as inputs to an econometric model that benchmarks customer satisfaction with more than 300 companies in 43 industries and 10 economic sectors, as well as various services of federal and local government agencies.</p>							
	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Actual	84	84	82	84	80	82		
Notes	Scores in the 80s are considered excellent by CFI Group. The NWS exceeded those scores.							
Information Gaps	None							

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Objective 3.3

Strategic Goal 3	Environment: Help communities and businesses prepare for and prosper in a changing environment							
Objective 3.3#	<i>Strengthen the resiliency of communities and regions</i>							
Indicator	Number of communities that utilize Digital Coast							
Category	Supporting (Strategic Plan)							
Type	Output							
Description	<p>Digital Coast is a web-platform providing coastal geospatial information. 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. The number of communities using Digital Coast is based on Census-designated places within coastal states, including all Census-defined cities, towns, townships, boroughs, and incorporated municipalities.</p> <p>In 2015, new green infrastructure tools were added to help coastal communities consider natural and nature-based systems to absorb and filter excess water and reduce flooding. These tools include an interactive interface, a guide for spatial analysts and a cost-benefit algorithm to determine solutions providing the best value for financial investment.</p>							
	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Target	1,975	2,807	3,275	4,750	5,375	5,500	5,500	5,000
Actual	2,835	4,663	5,221	5,249	6,330	5,043		
Status	Exceeded	Exceeded	Exceeded	Exceeded	Exceeded	Met		
Trend	Positive							
Explanation (if not met in FY 2016)								
Actions to be taken / Future	None							
Plans								
Adjustments to targets	The FY17 target has been updated to resolve an inconsistency between the FY18 budget submission and APPR.							

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Notes	Data goes back to FY2011.
Information Gaps	None

Strategic Goal 3	Environment: Help communities and businesses prepare for and prosper in a changing environment							
Objective 3.3#	<i>Strengthen the resiliency of communities and regions</i>							
Indicator	Annual number of Coastal, Marine, and Great Lakes Ecological Characterizations that Meet Management Needs							
Category	Supporting (Non-Strategic Plan)							
Type	Output							
Description	<p>Sound management of coastal, marine, and Great Lakes ecosystems require scientifically based-information on their condition. To provide this information, ecosystem characterizations are: 1) inclusive of the identification of the ecosystem boundaries, spatial extent, and biological, chemical, and physical characteristics that improve understanding of the history, current state, and future condition of ecosystems, cornerstones to ecosystem-based approaches to management; 2) the basis for many coastal and ocean forecasts, assessments, and management plans; and 3) conducted in response to user community demand and priorities, including NOAA management programs, significance of issue, and consequences of management action or inaction.</p> <p>Key parameters for characterizing conditions and developing assessments of their present “health” will be identified with the key indicator being characterizations <i>that meet management needs</i> (whether conducted in essential fish habitat, National Marine Sanctuaries, National Estuarine Research Reserves, the Great Lakes, the depths of the oceans, the coastal zone, and coral reef ecosystems, where there are different management needs and associated ecological characterizations). “Management” is defined as Federal, state, local, regional, territorial, or other entities that need accurate, useful data to make science-based, ecologically sound decisions when conducting comprehensive ocean and coastal planning and management, including coastal and marine spatial planning multiple uses of ocean and coastal resources. As a result, the American public can better improve the long-term protection and management of coastal, marine, and Great Lakes resources.</p> <p>In 2015, NCCOS models, mapping products, and spatial analyses of deep-sea coral ecosystems informed a near-unanimous vote by the Mid-Atlantic Fishery Management Council (MAFMC) to protect more than 38,000 square miles of seafloor, stretching from New York to Virginia, from bottom fishing activities.</p>							
	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Target	50	51	48	48	48	48	48	TBD
Actual	50	51	48	48	48	48		
Status	Met	Met	Met	Met	Met	Met		
Trend	Stable							

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Explanation (if not met in FY 2016)	
Actions to be taken / Future Plans	It is not known at this time if this measure will continue to be implemented after FY17. Therefore, a FY18 target was not provided.
Adjustments to targets	
Notes	Data goes back to FY2006.
Information Gaps	None

Strategic Goal 3	Environment: Help communities and businesses prepare for and prosper in a changing environment							
Objective 3.3#	<i>Strengthen the resiliency of communities and regions</i>							
Indicator	Cumulative number of coastal, marine and Great Lakes issue-based forecasting capabilities developed and used for management							
Category	Supporting (Strategic Plan)							
Type	Output							
Description	Geographically specific forecasts will allow resource managers to: make decisions based on predicted environmental and socioeconomic impacts; predict the impacts of ecosystem stressors; and evaluate the potential options to mitigate those stressors to better manage ecosystem use and condition.							
	In 2015, NOS improved its Red Tide Forecasts for Florida and Texas to more accurately locate harmful algal blooms (HABs) that cause severe respiratory irritation in people, produce large fish kills and discolored water. With this improved							
	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Target	45	55	63	69	73	92	113	TBD
Actual	55	58	63	69	73	91		
Status	Exceeded	Exceeded	Met	Met	Met	Met		
Trend	Positive							
Explanation (if not met in FY 2016)								

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Actions to be taken / Future Plans	It is likely this measure will be replaced by “Percent of all coastal communities susceptible to harmful algal blooms verifying use of accurate HAB forecasts.” As such, an FY18 target was not provided.
Adjustments to targets	FY2017 target revised based on reassessment of capacity of NOS to develop and support additional forecasts.
Notes	Data goes back to FY2006.
Information Gaps	None

Strategic Goal 3	Environment: Help communities and businesses prepare for and prosper in a changing environment							
Objective 3.3#	<i>Strengthen the resiliency of communities and regions</i>							
Indicator	Percentage of Tools, Technologies, and Information Services that are used by NOAA Partners/Customers to Improve Ecosystem-based Management							
Category	Supporting (Non-Strategic Plan)							
Type	Output							
	This measure tracks NOAA’s success in providing tools, technologies, and information services such as those for coastal and							
	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Target	87%	88%	89%	90%	87%	91%	91%	91%
Actual	88%	88%	91%	100%	89%	100%		
Status	Exceeded	Met	Exceeded	Exceeded	Exceeded	Exceeded		
Trend	Positive							
Explanation (if not met in FY 2016)								
Actions to be taken / Future Plans								
Adjustments to	None							
Notes	Data goes back to FY2007.							
Information Gaps	None							

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Strategic Goal 3	Environment: Help communities and businesses prepare for and prosper in a changing environment							
Objective 3.3#	<i>Strengthen the resiliency of communities and regions</i>							
Indicator	Percentage of U.S. coastal states and territories demonstrating annual improvement in resilience capacity to weather and climate hazards							
Category	Key							
Type	Outcome							
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. An index of a range of activities to mitigate coastal community risk and vulnerability to coastal hazards. It measures improvement in the Nation's capacity for end to end preparedness, response, recovery and resilience to hazards.							
	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Target	36%	34%	40%	46%	51%	60%	66%	TBD
Actual	43%	46%	57%	54%	60%	74%		
Status	Exceeded	Exceeded	Exceeded	Exceeded	Exceeded	Exceeded		
Trend	Positive							
Explanation (if not met in FY 2016)								
Actions to be taken / Future Plans	NOS may need to relook at future targets if the trend for exceeding continues. A NOAA team will continue to engage state and local partners to critique and improve data collection, verification, and reporting for the measure.							
Adjustments to targets	The FY17 target has been updated to resolve an inconsistency between the FY18 budget submission and APPR.							
Notes	Data goes back to FY2011. An FY18 target is not possible to calculate at this time as the cumulative impact of multiple program changes is not known.							

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Information Gaps	None
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Strategic Goal 3	Environment: Help communities and businesses prepare for and prosper in a changing environment
Objective 3.3#	<i>Strengthen the resiliency of communities and regions</i>
Indicator	Hydrographic data acquired to support safe and efficient maritime commerce and for community resilience to storms and other coastal hazards (in square nautical miles)
Category	Supporting (Non-Strategic Plan)
Type	Output
Description	<p>NOAA conducts hydrographic surveys to determine the bathymetry of 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 actionable information include recreational boaters, the commercial fishing industry, port authorities, coastal zone managers, marine spatial and emergency planners. In 2015, NOS approved a GPS water level buoy that will be incorporated in hydrographic survey project planning to support three operational scenarios: tidal reconnaissance, tidal datum computation, and water level determination.</p> <p>Presently NOAA has the capacity to survey roughly 3,000 SNM of navigationally significant Exclusive Economic Zone (EEZ) waters, evaluate 12% of priority port area shoreline for change each year, and map 3% of the 95,000 miles of U.S. open coastal shoreline; this capacity does fall short of the 10,000 SNM and 20% to 10% total annual requirement.</p> <ul style="list-style-type: none"> • The 50-year re-survey cycle is revised to consider that in addition to re-survey areas, the Nation’s need to define emerging critical areas. In 2004, NOAA created this category to allow for designation of areas that currently meet the definition of critical area, but can be tracked separately from the 43,000 SNM estimate.

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	<p>NOAA delineated emerging critical areas in the Gulf of Mexico and in Alaskan waters surrounding Kodiak Island which had areas which were surveyed in the 1800's using leadline technology and are now experiencing an increase in commercial traffic.</p> <ul style="list-style-type: none"> NOAA is assessing emerging survey needs of the Arctic that had not been considered in previous assessments of the Hydrographic Priorities (approx. 1 million SNM). Arctic maritime community plan to address this vast (40,000 SNM) critical area survey requirement and efforts to understand changing requirements, have precluded integration of these Arctic SNM into priority areas described in NOAA's Hydrographic Survey Priorities (http://www.nauticalcharts.noaa.gov/hsd/docs/NHSP_2011.pdf), but is working to add them. <p>Finally, NOAA needs to consider impacts of Panama Canal expansion, to be completed in 2014, making it wider and deeper, allowing huge freighters from Asia to head straight to terminals on the Gulf and East Coast. With the increase in maximum ship size from 4,400 TEUs (max of 1,000 ft. lengths by 100 ft. widths) to 12,600 TEU ships (1,400 ft. lengths by 160 ft. widths), NOAA must ensure areas transited by these vessels are surveyed soon and regularly especially with many ports looking to dredge so that they can accommodate these vessels. Dredging only includes the channels maintained by the USACE, NOAA is accountable for areas surrounding and out of the ports.</p>							
	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Target	2,400	2,200	3,000	2,671	2,556	2,509	2,287	2,279
w/supplemental			120	258				
Total Target	2,400	2,200	3,120	2,929	2,556	2,509	2,287	2,279
Actual (Original)	2,278	2,947	2,285	2,207	3,135	3,296		
Impact of Recovery Funds								
Total Actual (Adjustments reflecting Original and Recovery Act Funds)	2,278	2,947	2,285	2,207	3,135	3,296		
Status	Met	Exceeded	Not Met	Not Met	Exceeded	Exceeded		
Trend	Variable							
Explanation (if not met in FY 2016)								
Actions to be taken /	None							
Adjustments to targets	This performance measure is shared with OMAO. Due to changes in expected days at sea (DAS) in the Fleet Allocation							

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Notes	Data goes back to FY2003.
Information Gaps	None

Strategic Goal 3	Environment: Help communities and businesses prepare for and prosper in a changing environment							
Objective 3.3#	<i>Strengthen the resiliency of communities and regions</i>							
Indicator	Cumulative percent of U.S. and territories surveyed to improve vertical reference system for modernized height/elevation data							
Category	Supporting (Non-Strategic Plan)							
Type	Outcome							
Description	<p>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. The need for foundational coast to coast intelligence networks is particularly important 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. In FY15, LIDAR data was collected to update charted depths for St. Croix, US Virgin Islands, along a shoreline last charted 35 years ago.</p> <p>“Enabled” is technically defined as having GRAV-D data necessary to support a 1 cm geoid supporting 2 cm orthometric heights (heights relative to sea-level) necessary to define a new national vertical datum. NGS will calculate the percentage of area enabled with regards 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.</p>							
	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Target		20%	28%	36%	45%	53%	62%	70%
Actual	14.7%	23.9%	31%	36%	45%	55%		
Status		Exceeded	Exceeded	Met	Met	Exceeded		
Trend	Positive							

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Explanation (if not met in FY 2016)	
Actions to be taken / Future Plans	None
Adjustments to targets	
Notes	Data goes back to FY2010.
Information Gaps	None

Strategic Goal 3	Environment: Help communities and businesses prepare for and prosper in a changing environment							
Objective 3.3#	<i>Strengthen the resiliency of communities and regions</i>							
Indicator	Percent of all coastal communities susceptible to harmful algal blooms verifying use of accurate HAB forecasts.							
Category	Supporting (Non-Strategic Plan)							
Type	Outcome							
Description	This measure tracks the communities (currently using operational forecasts) within a coastal region vulnerable to harmful algal blooms (HAB) and the utility and accuracy of HAB forecasts. Utility and accuracy are verified through customer feedback responses before and after a forecast HAB event. This measure informs on-going NOAA efforts to characterize causes of HABs and their impacts to humans and coastal ecosystems, develop products that detect and forecast HAB species and toxins, and collaborate with stakeholders to develop HAB mitigation strategies. NCCOS, CO-OPS, and partners are developing operational forecasts to meet the needs of all vulnerable communities throughout the coastal U.S.							
	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Target		TBD	18%	18%	18%	18%	23%	23%
Actual		18%	18%	18%	18%	18%		
Status			Met	Met	Met	Met		
Trend	Stable							

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Explanation (if not met in FY 2016)	
Actions to be taken / Future Plans	NOAA is beginning to develop a realistic metric that describes vulnerability of coastal communities to HAB. As an example, aerosolized versions of some highly potent algal toxins (brevetoxins in the Gulf of Mexico) tend to affect a larger number of people (triggering respiratory ailments and aggravation from toxin exposure via air they breathe) and for an extended period of time. Toxins transferred to humans (and wildlife) through ingestion of tainted food would cause a different mode of exposure and levels of susceptibility and risk.
Adjustments to targets	The FY2012-2016 targets and actuals were updated from 11% to 18% to reflect a change in the calculations underlying this metric. This change was implemented after a review of the data found a more accurate method of assessing progress towards this metric. This accounting change does not reflect an increase in the number of forecasts provided to coastal communities.
Notes	Data goes back to FY2009.
Information Gaps	Describe any information gaps that apply to this indicator including the identification of where information is missing, incomplete, preliminary or estimated.

Strategic Goal 3	Environment: Help communities and businesses prepare for and prosper in a changing environment							
Objective 3.4#	<i>Foster healthy habitats and sustainable marine resources, habitats, and ecosystems</i>							
Indicator	Fish Stock Sustainability Index (FSSI) (cumulative)							
Category	Key (Strategic Plan)							
Type	Outcome							
Description	<p>NMFS measures the performance of U.S. Federal fisheries through the Fish Stock Sustainability Index (FSSI). The FSSI is an index of sustainability for domestic commercial and recreational fish stocks in the U.S. The index is comprised of 199 stocks, representing 85% of the total catch of all stocks. These 199 stocks were selected for their importance to commercial and recreational fisheries, including considerations of economic, ecological and social value. The index is scored on a 1,000-point scale, with each stock given a score between 0 and 4 (0=status unknown; 4=meets all sustainable fishing criteria). The FSSI increases when NMFS determines that the status of a stock has improved: it is either no longer subject to overfishing, is no longer overfished, its biomass has increased to at least 80 percent of target, or it is rebuilt. These are all factors that contribute to sustainably managed fisheries. For more information:</p> <p>http://www.nmfs.noaa.gov/sfa/fisheries_eco/status_of_fisheries/fssi.html</p>							
	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018

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Target (FSSI 1)*	586.0	603.5	617.0	NA			
Actual (FSSI 1)*	587.0	606.0	618.5	640.5			
Target (FSSI 2)*				756 (602/796)	749 (596.5/796)	758 (603.5/796)	754 (600.5/796) 763 (607.5/796)
Actual (FSSI 2)*	658.5 (524.5/796)	689 (548.5/796)	719 (572.5/796)	746 (594/796)	761.5 (606.5/796)	754 (600.5/796)	
Status	Exceeded	Exceeded	Exceeded	Met	Exceeded	Not Met	
Trend	Positive						
Explanation (if not met in FY 2016)	The FY 2016 target was not met because two stocks in the Caribbean and one in Alaska that previously had not been subject to overfishing, had catch that exceeded their overfishing limits and were therefore added to the list of stocks subject to overfishing. In addition, one assessment was rejected because the results were too uncertain to be considered adequate, therefore missing points that were anticipated.						
Actions to be taken / Future Plans							
	The FY 2017 target of 768.5 was revised to 754 because 1) the stocks in the Caribbean that were added to the overfishing list in FY 2016 will not have management measures in place yet to remove them from the overfishing list by FY 2017; 2) two stock assessments that had been tentatively scheduled for FY 2017 were						
	* In FY 2014, NOAA revised the number and make-up of stocks in the index, as well as the score calculation methodology, in order to allow more flexibility regarding the number of stocks in the index. Although these changes resulted in a general increase in scores (since the maximum score increased from						
Information Gaps							

Strategic Goal 3	Environment: Help communities and businesses prepare for and prosper in a changing environment
Objective 3.4#	<i>Foster healthy habitats and sustainable marine resources, habitats, and ecosystems</i>

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Indicator	Percent of Stocks For Which Catch is below the Specified Annual Catch Limit (ACL) (cumulative)
Category	Supporting
Type	Intermediate Outcome
Description	This measure tracks the percentage of fish stocks that are below their annual catch limit (ACL) in a given year. In 2007, Congress enacted a requirement to use ACLs to end and prevent overfishing. The use of ACLs has been successful in ending and preventing overfishing, as stock assessments have shown the number of stocks subject to overfishing continuing to decline. 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 the ACL, NOAA will report that the stock did not exceed its ACL. For more information: http://www.nmfs.noaa.gov/sfa/management/acls_ams/index.html

	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Target					79.5%	81%	82%	83%
Actual				91%	89.7%	90.7%		
Status					Exceeded	Exceeded		
Trend	Stable							
Explanation (if not met in FY 2016)								
Actions to be taken / Future Plans								
Adjustments to targets								
Notes								
Information Gaps								

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Strategic Goal 3	Environment: Help communities and businesses prepare for and prosper in a changing environment							
Objective 3.4#	<i>Foster healthy habitats and sustainable marine resources, habitats, and ecosystems</i>							
Indicator	Percentage of FSSI Stocks with Adequate Population Assessments and Forecasts (cumulative)							
Category	Supporting (Non-Strategic Plan)							
Type	Output							
Description	This measure tracks the percentage of FSSI fish stocks for which adequate assessments are available. Assessments are vital to determine the scientific basis for supporting and evaluating the impact of fishery management actions. To be deemed adequate, 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. Since the important fish stocks tracked by this measure are the same as those in the Fish Stock Sustainability Index (FSSI), actual data for years prior to FY 2014 are not comparable to data for FY 2014 and beyond due to the recent revisions to FSSI (see above).							
	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Target	60.4%* (139/230)	57.4%* (132/230)	57.0%* (131/230)	64.8% (129/199)	67.3% (134/199)	61.3% (122/199)	63.8% (127/199)	64.8% (129/199)
Actual	57.4%* (132/230)	56.1%* (129/230)	58.3%* (134/230)	63.8% (127/199)	65.3% (130/199)	62.3% (124/199)		
Status	Exceeded	Met	Exceeded	Met	Met	Exceeded		
Trend	Stable							
Explanation (if not met in FY 2016)								
Actions to be taken / Future Plans								
Adjustments to targets	The FY 2017 target has been reduced from 64.3% to 63.3% as a result of a change in the assessment schedule as well as one assessment having been rejected in FY 2016.							
Notes	<ol style="list-style-type: none"> 1. Since this measure covers the same fish stocks as the FSSI, actual data for years prior to FY 2014 are not comparable to data for FY 2014 and beyond. Data for these years was calculated with a different set of fish stocks. Denominators have been provided for reference. 2. The actuals for FY 2015 and FY 2016, and the target for FY 2017 have increased by 1 due to a previously unreported stock assessment that emerged during an analysis of accounting practices and assessment reporting associated with rejected assessments, and assessment reporting levels. This analysis was conducted to ensure consistency between past and current accounting methodologies, and to make sure that stock assessment activities are not missed. 							

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Information Gaps	
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Strategic Goal 3	Environment: Help communities and businesses prepare for and prosper in a changing environment							
Objective 3.4#	<i>Foster healthy habitats and sustainable marine resources, habitats, and ecosystems</i>							
Indicator	Percentage of Protected Species Stocks with Adequate Population Assessments and Forecasts (cumulative)							
Category	Supporting (Non-Strategic Plan)							
Type	Output							
	This measure tracks the percentage of protected species stocks for which adequate assessments are available. Assessments							
	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Target	18.6% (73/392)	19.5% (78/400)	22.0% (88/400)	18.9% (78/412)	21.6% (89/412)	20.7% (89/429)	19.9% (85/428)	21.3% (91/428)
Actual	17.6% (69/392)	19.3% (77/400)	19.0% (76/400)	15.0% (62/412)	18.7% (77/412)	19.2% (82/428)		
Status	Met	Met	Not Met	Not Met	Not Met	Not Met		
Trend	Variable							
Explanation (if not met in FY 2016)	The FY 2016 target was missed because assessments of seven shortnose sturgeon stocks were not completed during the year as was anticipated when the target was set.							
Actions to be taken / Future Plans								
Adjustments to targets								
Notes								
Information Gaps								

Strategic Goal 3	Environment: Help communities and businesses prepare for and prosper in a changing environment							
Objective 3.4#	<i>Foster healthy habitats and sustainable marine resources, habitats, and ecosystems</i>							
Indicator	<i>Number of Protected Species Designated as Threatened, Endangered or Depleted with Stable or Increasing Population Levels (cumulative)</i>							

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Category	Key							
Type	Outcome							
	<i>This measure tracks progress toward the recovery of endangered, threatened, or depleted protected species under NMFS' jurisdiction. These species are listed as threatened or endangered under the Endangered Species Act (ESA) or as depleted under the Marine Mammals Protection Act (MMPA).</i>							
	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Target	28	28	27	28 (84)	34 (74)	31 (90)	30 (95)	30 (96)
Actual	29	29	30	37 (84)	31 (73)	31 (89)		
Status	Exceeded	Exceeded	Exceeded	Exceeded	Met	Met		
Trend	Stable							
Explanation (if not met in FY 2016)								
Actions to be taken / Future Plans								
Adjustments to targets	The FY 2017 target has been adjusted upward from 26 to 30 because four of the six newly-designated green turtle distinct population segments (see notes below) are stable or increasing.							
Notes	The numbers in parentheses denote the total number of species that are listed as threatened, endangered, or depleted. This number increases when new species are listed or when existing listed species are split into separate stocks, and decreases when species are de-listed or when separate stocks of a listed species are merged. This number decreased from 90 when the FY 2016 target was set to 89 because on March 11, 2016, the U.S. District Court for the District of Alaska issued a decision vacating NMFS's December 28, 2012, listing of the Arctic ringed seal as threatened. Therefore, at this time, Arctic ringed seals are not listed as a threatened species under the ESA. This number increases from 89 to 95 in FY 2017 because two populations of green turtles have been split into six distinct population segments (DPS), while one globally listed species of humpback whale has been separated into three DPS's for a net increase of six listed species.							
Information Gaps								

Strategic Goal 3	Environment: Help communities and businesses prepare for and prosper in a changing environment
Objective 3.4#	<i>Foster healthy habitats and sustainable marine resources, habitats, and ecosystems</i>

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Indicator	Number and Percentage of Actions Ongoing or Completed to Recover Endangered and Threatened Species (Cumulative)							
Category	Supporting (Strategic Plan)							
Type	Output							
Description	This measure tracks the progress of ongoing or completed recovery actions included in NMFS approved recovery plans for species listed as threatened or endangered under the Endangered Species Act (ESA). The ESA requires NMFS to prepare recovery plans for each endangered or threatened species. The plans include a list of actions necessary to remove species from the ESA. These recovery actions may include items that can be completed in a year; or other actions, including monitoring, that may take many years to complete or are 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. Denominators are shown as a reference.							
	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Target			44.6% (1,875/4,202)	44.4% (1,979/4,457)	46.2% (2,070/4,482)	49.1% (2,229/4,542)	26.6% (2,575/9,683)	27.1% 2,620/9,683
Actual		44.3% (1,862/4,202)	45.1% (1,897/4,202)	45.2% (2,013/4,457)	48.1% (2,157/4,482)	49.2% (2,233/4,542)		
Status			Exceeded	Exceeded	Exceeded	Met		
Trend	Positive							
Explanation (if not met in FY 2016)								
Actions to be taken / Future								
	The FY 2017 target has been increased to 26.6% from 24.0% because a larger-than-anticipated number of the actions in the							
	The numbers in parentheses are the raw numbers used to derive the percentages. The numerator is the total number of							
Information Gaps								

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Strategic Goal 3	Environment: Help communities and businesses prepare for and prosper in a changing environment							
Objective 3.4#	<i>Foster healthy habitats and sustainable marine resources, habitats, and ecosystems</i>							
Indicator	Number of Habitat Acres Restored (annual)							
Category	Supporting (Strategic Plan)							
Type	Output							
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 species (i.e., species that migrate from the sea to freshwater to spawn). 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 the Species Recovery Grants. Examples of projects that contribute to this measure include hydrologic reconnection of wetlands, shellfish and coral reef restoration, and dam removal and fish passage.							
	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Target	8,888 (RC)	80,007 (6,007 RC + 74,000	60,228 (8,228 RC + 52,000	40,820 (11,820 RC + 29,000	32,460 (9,460 RC + 23,000	23,922 (8,522 RC + 15,400	11,050 (4,290 RC + 6,760	22,100 (7,800 RC + 14,300
		PCSRF)	PCSRF)	PCSRF)	PCSRF)	PCSRF)	PCSRF)	PCSRF)
Actual	79,381 (15,420 + 63,961 PCSRF)	58,120 (8,242 + 49,878 PCSRF)	46,656 (9,005 RC + 37,712 PCSRF – 61 joint)	31,311 (9,354 RC + 22,007 PCSRF – 50 joint)	22,975 (10,363 RC + 12,688 PCSRF – 76 joint)	21,232 (8,844 RC + 12,388 PCSRF)		
Status	Exceeded	Not Met	Not Met	Not Met	Not Met	Not Met		
Trend	Negative							
Explanation (if not met in FY 2016)	The shortfall was due to an overly optimistic target caused by two factors: 1) acquisition acres (2,200) were unintentionally included, and 2) targeted acres were based on grantee proposals, which over-projected acreage based on acres affected rather than acres treated, which is the standard for “restored”. This was due to confusion among grantees regarding the definition of “acres restored”.							
Actions to be taken / Future Plans	Our efforts to increase understanding among grantees of what constitutes a “restored” acre are continuing, and practices are being instituted to avoid such overestimation in the future.							

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Adjustments to targets	The FY 17 target was reduced as of November 2, 2016 to reflect estimates of actual acres to be completed rather than mathematical projections based on previous years, which is how the out-year targets were set previously. The out-year target dropped significantly due in part to natural variability and in part to the confusion among grantees mentioned above regarding whether to report acres affected or acres treated. As understanding increases that the appropriate measure is acres affected, we expect both targets and actual values to decrease.
Notes	Acres reported for this measure are restored under two programs, the NMFS Habitat Program Restoration Center (RC) and the Pacific Coastal Salmon Recovery Fund (PCSRF). The numbers in parentheses report the individual total acres targeted or restored for these programs. In some cases, there were acres restored by both programs together, which have been reported as joint acres in order to eliminate double counting. Prior to FY 2011, PCSRF acres were not comparable to RC acres and so were not reported together.
Information Gaps	

Objective 3.4#	<i>Foster healthy habitats and sustainable marine resources, habitats, and ecosystems</i>
Indicator	Annual Number of Coastal, Marine, and Great Lakes Habitat Acres Acquired or Designated for Long-term Protection.
Category	Supporting (Strategic Plan)
Type	Outcome

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Description	<p>In the DOC Strategic Plan the measures “Number of Habitat Acres Restored” and “Annual Number of Coastal, Marine, and Great Lakes Habitat Acres Acquired or Designated for Long-term Protection” are combined as “Habitat Acres Conserved”.</p> <p>NOAA protects and restores key habitats that provide critical ecosystem functions through and in support of the statutory responsibilities enhance coastal and marine resource conservation through place based management. These habitats support the health of endangered or threatened species and essential fish habitat, reduce coastal pollution, buffer the impacts of coastal storms and flooding, and provide the public with recreational access to the coast among other societal or economic benefits. NOAA maintains the health of coastal, marine and Great Lakes habitats by designating and managing important areas for long-term conservation and by providing support to state and local governments to protect additional key habitats by purchasing land from willing sellers. This <i>long-term protection</i> measure tracks the number of acres acquired with NOAA funds by state or local government agencies from willing sellers particularly through the Coastal and Estuarine Land Conservation Program (CELCP) and Coastal Zone Management Program (CZMP), and the number of acres designated for long-term protection by NOAA or by state partners, such as through the Office of National Marine Sanctuaries Program (ONMS) and National Estuarine Research Reserve System (NERRS). In FY 2010, NOAA protected acres through CELCP with funds from EPA’s Great Lakes Restoration Initiative (GRLI).</p> <p>This measure is used to show one of the many ways in which NOAA provides protection to important habitats. NOAA is investigating ways in which to improve it. In 2012, a pilot effort was initiated to include acres protected via the Coastal Zone Management (CZM) Program. NOAA is evaluating the recent history of acres captured by the pilot to help determine appropriate targets. NOAA is working on new business rules that will describe an improved methodology for developing better targets for these large increases.</p>							
	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Target	19,219	69,550	2,500 (CELCP)	1,300 (CELCP)	250 (CELCP)	1650	800	800
Actual	17,274	8,694,070	2,772	5,673	4,250,256	283,384,171		
Status	Not Met	Exceeded	Exceeded	Exceeded	Exceeded	Exceeded		
Trend	Variable							
Explanation (if not)								
Actions to be	NOAA continues to harmonize habitat management to fulfill diverse but complementary requirements of 8 distinct mandates							
Adjustments to	None							
Notes	Data goes back to FY2006. In some years, designations of monuments and expansion of sanctuaries have been much larger							
Information Gaps	None							

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Non-Recurring Indicators

The following table is used for indicators that are discontinued beginning in FY 2018.

Strategic Goal 3										
Environment: Help communities and businesses prepare for and prosper in a changing environment										
Objective 3.1#										
Advance the understanding and predictions of changes in the environment										
Indicator										
APG: Number of research and development (R&D) capabilities transitioning to applications (from TRL 8 to TRL 9) to improve efficiency, accuracy, or precision of forecasts										
Category										
Supporting (Non-Strategic Plan)										
Type										
Output										
Description										
The goal is a targeted count of discrete NOAA R&D products that have transitioned to operations in a NOAA service or to applications beyond NOAA in the public or commercial sectors. To standardize reporting, NOAA will use Technical Readiness Levels (TRLs) similar to those applied at NASA and other federal agencies to track system maturity. A complete transition will be evidenced by a capability that has progressed to TRL 9 (“mission qualified”) from a lower level.										
		FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	
Target							7	8	N/A	
Actual							4			
Status							Not Met	RETIRED		
Trend		Not enough data								
Explanation (if not met in FY 2016)		<p>1. Integrate a radiological interface to run HYSPLIT (Hybrid Single Particle Lagrangian Integrated Trajectory model) with measurement data to improve accuracy of plume dispersion forecasts</p> <p>Status: Delayed indefinitely</p> <p>Rationale: HYSPLIT model relied upon EPA data (requiring a Memorandum of Agreement (MOA) with DOC) for validation and testing. The MOA was delayed a year in the clearance process, but was cleared in FY17 Q1 providing the necessary data. OAR integrated the model with routinely-updated EPA data in FY17 Q1 and the model can be run in demonstration mode by approved users via a protected NOAA webpage (non-operational). Discussions are ongoing between OAR and NWS to determine whether or not HYSPLIT will become operational.</p>								

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	<p>2. Incorporate National Air Quality Forecasting Capability (NAQFC) model with operational global aerosol transport model to improve forecasting accuracy of smoke and dust plumes originating outside the continental US Status: Delayed to Q2 (FY17) UPDATE: Completed in FY17 Q1</p> <p>3. Incorporate US Department of Transportation Clarus road weather observations into Meteorological Assimilation Data Ingest System (MADIS) to improve accuracy of forecasts by providing higher quality atmospheric observations from public and non-public Status: Delayed to Q2 (FY17) UPDATE: Completed in FY17 Q1.</p>
Actions to be taken / Future Plans	Retirement.
Adjustments to targets	
Notes	This is the FY16-17 Agency Priority Goal (APG) “By September 30, 2017, the Department of Commerce will transition twelve (12) research and development (R&D) capabilities to applications (from TRL 8 to TRL 9) to improve efficiency, accuracy, or precision of forecasts to reduce adverse effects of environmental events on people and property. This measure is being retired for FY18 as the APG closes at the end of FY17.
Information Gaps	

Strategic Goal 3	Environment: Help communities and businesses prepare for and prosper in a changing environment							
Objective 3.1#	<i>Advance the understanding and predictions of changes in the environment</i>							
Indicator	Number of comparative greenhouse gas emissions studies completed							
Category	Supporting							
Description	Scientific studies comparing top-down and bottom-up emission estimation methodologies provide the means to improve the quality of GHG emissions data.							
	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Actual				15	17	23		RETIRED
Notes	Data collection begins in FY2014 through the DOC Strategic Plan reporting.							

Strategic Goal 3	Environment: Help communities and businesses prepare for and prosper in a changing environment							
Objective 3.1#	<i>Advance the understanding and predictions of changes in the environment</i>							

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Indicator	Annual number of Climate Program Office peer-reviewed publications related to climate understanding and prediction							
Category	Supporting (Non-Strategic Plan)							
Type	Output							
Description	This measure tracks the publications that result from awards made by OAR's Climate Program Office. This includes publications of climate related work that contributes to the understanding of the climate system and includes research on climate observations, climate modeling, earth system science and processes, and climate and societal interactions and applications. Publications are made throughout the fiscal year but are reported once a year as part of the grant agreement.							
	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Target				100	275	300	300	N/A
Actual				100	747	847		
Status				Met	Exceeded	Exceeded		RETIRED
Trend	Positive							
Explanation (if not met in FY 2016)	n/a							
Actions to be taken / Future Plans	Retirement							
Adjustments to targets	The FY2018 target has been increased to better reflect the FY2015-2016 actual values,							
Notes	Quarterly reporting mechanism on number of publications by CPO-funded awards as reported by CPO program managers as part of grants management and grants database. The number of climate program office publications is captured in the number of NOAA publications. Therefore, this measure should be retired to streamline reporting.							
Information Gaps								

Objective 3.1#	<i>Advance the understanding and predictions of changes in the environment</i>							
Indicator	Uncertainty of the North American (NA) carbon sink to better understand the contribution of human activities toward increasing atmospheric CO2 and methane							
Category	Supporting (Non-Strategic)							
Type	Intermediate Outcome							

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Description	To provide scientific guidance to policymakers concerned with managing emissions of carbon dioxide, NOAA needs to assess and quantify the source 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. Ecosystems across North America uptake one billion tons of atmospheric carbon (mainly as carbon dioxide) per year. That is about 1/2 of the current emissions from burning fossil fuels on the continent. To enable evaluation of annual changes in this ecosystem uptake, we must improve our carbon measurements to a level of uncertainty that is about 1/3 of the total, or 300 million tons per year. Having this information to this degree of certainty or better will support improved forecasts of future climate change and will provide verification for carbon dioxide emission reduction and mitigation efforts. Obtaining this minimum level of uncertainty requires the expanded observation network and improved modeling effort proposed here. The basis (flux estimates) for the measure is publicly available on the web (http://carbontracker.noaa.gov).							
	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Target	400 M tons Carbon/Yr	400 M tons Carbon/Yr	405 M tons Carbon/Yr	410 M tons Carbon/Yr	410 M tons Carbon/Yr	405 M tons Carbon/Yr	400 M tons Carbon/Yr	N/A
Actual	400 M tons Carbon/Yr	400 M tons Carbon/Yr	405 M tons Carbon/Yr	405 M tons Carbon/Yr	410 M tons Carbon/Yr	400 M tons Carbon/Yr		
Status	Met	Met	Met	Met	Met	Exceeded		RETIRED
Trend			Stable					
Explanation (if not met in FY 2016)			n/a					
Actions to be taken / Future Plans			Retirement.					
Adjustments to targets	The FY2016 target has been adjusted from 395 million tons to 405 million tons of carbon per year. The uncertainty has started to increase as the network contracts and modeling efforts stagnate.							
Notes	Carbon Tracker has been producing carbon measurements since FY2007. A declining target indicates a positive trend in the accuracy of carbon measurements. The accuracy of the North American Carbon Sink will be tracked internally as a routine							
	In FY 2012, NOAA reduced observations and Carbon Tracker enhancements. With fewer observations across the North							

Strategic Goal 3	Environment: Help communities and businesses prepare for and prosper in a changing environment
Objective 3.1#	<i>Advance the understanding and predictions of changes in the environment</i>
Indicator	Number of forecast and mission improvements, based on NOAA research, to weather applications at operational US weather services and in the US weather commercial sector.
Category	Supporting (Non-Strategic Plan)

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Type	Output							
Description	<p>The measure captures the count of significant and discrete NOAA research and development products that have transitioned to application at operational US weather services and in the US weather commercial sector. Examples of applications and the types of products transitioned include the following:</p> <ol style="list-style-type: none"> 1. Transitions to operations (e.g., new observing technologies enter operations, updated models enter operations) 2. Providing information for decision-makers (e.g., completion of peer-reviewed assessments, external development of OAR resource management policies based on research findings.) 3. Transition to commercial applications(e.g., patent, new technology used in a commercial product) 							
	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Target	N/A	N/A	N/A	11	12	9	9	N/A
Actual	N/A	N/A	N/A	11	12	9		
Status				Met	Met	Met		RETIRED
Trend	Stable							
Explanation (if not met in FY 2016)	n/a							
Actions to be taken / Future Plans	Retirement							
Actions to targets	None							
Notes	The number of forecast and mission improvements will be captured in the new R2A Index							
Information Gaps								

Strategic Goal 4	Data: Maximize the positive impacts of Commerce data on society							
Objective 4.1#	<i>Deliver increasing amounts of data to governments, businesses and the public in formats that are easier to access and use</i>							
Indicator	Number of archival datasets to which permanent, citable Digital Object Identifiers (DOI) have been assigned							
Category	Key							
Type	Output							
Description	NOAA will assign identifiers to datasets stored in its archives. These identifiers are persistent, which means they do not change even if the actual storage location of the data changes (i.e., we can reorganize the web server but the ID stays the same). The identifiers are also citable, which means that if someone uses the data for research or a derived product they can provide a reference to the data so that other people can see it for themselves (this is equivalent to an article citing another paper or book). NOAA will use the international standard Digital Object Identifier scheme which is in wide use by both scientific publishers and other science data agencies worldwide.							
	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018

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Target		40	40	N/A
Actual		183	452	
Status		Exceeded	Exceeded	RETIRED RETIRED
Trend	Positive			
Explanation (if not met in FY 2015)	N/A			
Actions to be taken / Future Plans				
Notes	To date, NOAA has assigned approximately 1,200 Digital Object Identifiers (DOIs) to 600 datasets and accumulated 500 DOI citations. Since success criteria have been exceeded overwhelmingly and original estimates of impact surpassed without			
Adjustments to Information Gaps				

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Other Indicators

Strategic Goal 3	Environment: Help communities and businesses prepare for and prosper in a changing environment							
Objective 3.1#	<i>Advance the understanding and predictions of changes in the environment</i>							
Indicator	Percentage of ingested data safely archived per National Archives & Records Administration (NARA) standards							
Description	Ensures that NOAA safely archives critical data and information according to NARA standards.							
	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Target	98%	98%	98%	98%	98%	98%	98%	98%
Actual	99%	99%	99%	99%	100%	98%		
Status	Exceeded	Exceeded	Exceeded	Exceeded	Exceeded	Met		
Notes	Consistent long-term stewardship of NOAA's geophysical, oceans, coastal, weather and climate data							
Information Gaps								

Strategic Goal 3	Environment: Help communities and businesses prepare for and prosper in a changing environment							
Objective 3.2#	<i>Build a Weather-Ready Nation</i>							
Indicator	Number of StormReady Communities							
Description	Americans live in the most severe weather-prone country on Earth. StormReady and TsunamiReady support a Weather-Ready Nation by preparing communities for the occurrence of high impact environmental events. On an							

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	<p>annual basis NWS target 100 new StormReady Communities and 10 new TsunamiReady communities pending funding availability.</p> <p>StormReady supports NWS’ disaster risk reduction strategy and is offered to provide guidance and incentive to officials who want to improve their hazardous weather and flood operations. A long-term goal for the program is to make every county or county-equivalent in the United States StormReady. The 2010 U.S. Census identifies 3,234 county or county-equivalents in the United States. We are 34 percent of the way there with 1,092 county or county-equivalents currently recognized as StormReady.</p> <p>A StormReady Community is defined as a local government* entity or facility** that has the authority and ability to adopt the StormReady recognition guidelines for the residents and visitors within its jurisdiction.</p> <p>*The term “local government” means – (A) A county, parish, borough, municipality, city, town, township, local public authority, school district, special district, intrastate district, council of governments (regardless of whether the council of governments is incorporated as a nonprofit corporation under State law), regional or interstate government entity, or agency or instrumentality of a local government; (B) An Indian tribe or authorized tribal organization, or Alaska Native village or organization; and a rural community, unincorporated town or village, or other public entity, which has the ability to achieve StormReady recognition. **The term “facility” for a StormReady community exclusively means - universities, military installations, state/national parks, power plants/utilities, transportation centers (e.g. airports), theme parks/entertainment complex, and large event venues (e.g. stadiums).</p>							
	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Actual (cumulative):	1,719	1,909	2,090	2,242	2,409	2,597		
Notes								
Information Gaps	None							

Objective 3.2#	<i>Build a Weather-Ready Nation</i>
Indicator	Number of TsunamiReady Communities

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Description	<p>A TsunamiReady County or Community or Tribe is defined as a coastal local government entity* that has the authority and ability to adopt the TsunamiReady recognition guidelines for the residents and visitors within its jurisdiction.</p> <p>*The term “local government” here means –</p> <p>(A) a county, parish (LA), borough (AK), or municipality (PR)</p> <p>(B) an incorporated municipality, city, town, or township</p> <p>(C) an Indian tribe or authorized tribal organization, or Alaska Native village or organization</p> <p>(D) a military installation</p> <p><i>Describe the indicator including how the indicator reflects the bureau’s program. It may be that there are significant changes between years as a result of additional funding in a given year. Note that change in the description.</i></p>							
	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Actual (cumulative)	95	122	155	177	189	199		
Notes								
Information Gaps	None							

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Resource Requirements Table

Funding for the Resource Requirements table reflects total direct obligations for each program activity within each goal and objective. Reimbursable obligations are included insofar that amounts can be reasonably be predicted with little variance from year to year, and could reasonably affect the performance of indicators. Funding and FTE appear at the objective level.

	FY 2011 Actual	FY 2012 Actual	FY 2013 Actual	FY 2014 Actual	FY 2015 Actual	FY 2016 Actual	FY 2017 Request	FY 2018 Base	Increase/ Decrease	FY 2018 Request
Objective 3.1: Advance the understanding and prediction of changes in the environment through world class science and observations										
Oceanic and Atmospheric Research										
Direct	428,369	377,294	378,569	478,886	450,889	479,416	481,065	489,032	(139,028)	350,004
FTE	752	741	666	699	580	659	710	730	(70)	660
National Environmental Satellite, Data and Information Service										
Direct	1,451,736	1,852,640	1,888,099	2,077,695	2,218,920	2,321,685	2,344,914	2,349,229	(534,027)	1,815,202
FTE	790	742	765	674	741	645	759	812	(21)	791
Office of Marine and Aviation Operations										
Direct	186,040	183,553	184,153	218,516	252,284	228,450	304,245	308,125	(5,798)	302,327
FTE	889	962	938	932	922	933	955	973	(16)	957
Other - Discretionary and Mandatory	26,118	26,485	26,665	27,462	27,906	30,017	29,375	29,375		29,375
FTE	0	0	0	0	0	0	0	0		0
Subtotal Funding	2,092,263	2,439,972	2,477,486	2,802,559	2,949,999	3,059,568	3,159,599	3,175,761	(678,853)	2,496,908
Subtotal FTE	2,431	2,445	2,369	2,305	2,243	2,237	2,424	2,515	(107)	2,408
Objective 3.2: Improve preparedness, response, and recovery from weather and water events by building a Weather-Ready Nation										

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National Weather Service										
Direct	988,442	988,859	945,803	1,058,910	1,158,848	1,107,066	1,122,023	1,142,049	(83,993)	1,058,056
FTE	4,712	4,679	4,465	4,356	4,288	4,251	4,241	4,429	(107)	4,322
Subtotal Funding	988,442	988,859	945,803	1,058,910	1,158,848	1,107,066	1,122,023	1,142,049	(83,993)	1,058,056
Subtotal FTE	4,712	4,679	4,465	4,356	4,288	4,251	4,241	4,429	(107)	4,322
Objective 3.3: Strengthen the resiliency of communities and regions by delivering targeted services to build capacity										
National Ocean Service										
Direct	392,829	277,880	293,345	400,207	381,370	414,784	405,032	410,918	(98,773)	312,145
FTE	1,034	779	737	889	918	895	915	933	(24)	909
Subtotal Funding	392,829	277,880	293,345	400,207	381,370	414,784	405,032	410,918	(98,773)	312,145
Subtotal FTE	1,034	779	737	889	918	895	915	933	(24)	909
Objective 3.4: Foster healthy and sustainable marine resources, habitats, and ecosystems through improved management and partnerships										
National Ocean Service										
Direct	94,749	97,368	91,299	93,458	96,791	97,694	97,815	99,036	(24,174)	74,862
FTE	212	222	207	190	209	199	202	204	(5)	199
National Marine Fisheries Service										
Direct	858,700	796,434	773,699	806,830	817,924	842,863	847,890	864,344	(42,903)	821,441
FTE	2,888	2,950	2,905	2,802	2,702	2,702	2,910	2,910	(51)	2,859
Subtotal Funding	1,142,781	1,160,385	1,086,729	1,188,785	1,251,357	1,211,279	1,148,043	1,079,720	(131,953)	947,767
Subtotal FTE	3,170	3,274	3,205	3,082	3,003	2,981	3,173	3,172	(58)	3,114
Objective 5.4: Improve facilities, support services, and IT products and services to drive mission success										
Mission Support										

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Direct	287,431	250,837	231,669	247,356	269,288	286,122	253,451	265,937	(31,624)	234,313
FTE	923	874	808	761	751	708	710	723	(36)	687
Subtotal Funding	287,431	490,946	472,656	247,356	269,288	286,122	253,451	265,937	(31,624)	234,313
Subtotal FTE	923	1,836	1,835	761	751	708	710	723	(36)	687
Sub Total Direct Funding	4,903,746	5,219,299	5,126,331	5,697,817	6,010,862	6,078,819	6,088,148	6,074,385	(1,025,196)	5,049,189
Sub Total FTE	12,270	12,233	11,747	11,393	11,203	11,072	11,463	11,772	(332)	11,440
Reimbursable	451,040	228,748	260,124	217,112	204,254	241,430	367,012	242,000	0	242,000
FTE	831	676	641	604	567	547	600	450	0	450
Total Funding	5,354,786	5,448,047	5,386,455	5,914,929	6,215,116	6,320,249	6,455,160	6,316,385	(1,025,196)	5,291,189
Total FTE	13,101	12,909	12,388	11,997	11,770	11,619	12,063	12,222	(332)	11,890

Note: Funding amounts shown are in obligations since at this time [NOAA / EDA] cannot break out funding by strategic goal and objective by Budget Authority.