FEDERAL OCEAN AND COASTAL ACTIVITIES REPORT TO THE U.S. CONGRESS

For Fiscal Years 2012 through 2015

Prepared by
The White House Council on Environmental Quality
and
The White House Office of Science
and Technology Policy

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INTRODUCTION

The Oceans Act of 2000 requires that a report of Federal ocean and coastal activities be submitted to Congress every two years. This report covers expenditures from Fiscal Year (FY) 2012 through FY 2015, and funding proposed in the FY 2016 President's Budget. This also addresses report language that accompanied P.L. 113-235, which directed the President to identify Federal funding by agency and account for FYs 2012-2015, and FY 2016 proposed, that has supported the National Ocean Policy (NOP) developed under Executive Order 13547.

In March 2015, the National Ocean Council released the *Report on the Implementation of the National Ocean Policy*,[1] which provided a summary report of actions taken to implement the NOP and the outcomes of those actions, including highlights of agency activities since 2012. It is important to note that the NOP did not create any new authorities or programs. Instead, it provided a framework to pursue National and regional stewardship goals through coordinated and leveraged actions across the Federal Government informed by state, tribal, and local authorities, stakeholders, and the public. Because NOP activities are part of agencies' core missions, it is not possible to separate NOP funding from base program funding in a meaningful way, but these activities are captured within the totals reported here.

The ocean, our coasts, and the Great Lakes deeply impact the lives of all Americans, whether we live and work in the country's heartland or along its shores. America's rich and productive coastal regions and waters support tens of millions of jobs and contribute trillions of dollars to the National economy each year. They also host a growing number of important activities, including commerce, transportation, energy development, national security, recreation, and science, as well as provide a wealth of natural resources and ecological benefits. Yet the ocean, coasts and Great Lakes face a wide range of threats from human activities. The Administration believes that coordination and collaboration across all levels of government and with stakeholders and the public can help ensure continued economic benefits that also improve the sustainability and resilience of ocean resources.

In recognition of the importance of the ocean's economy and natural resources, the FY 2016 President's Budget proposes $12.5 billion, a $277 million increase over FY 2015 levels, for ocean and coastal activities. The President's Budget increased investments in critical programs ranging from science to navigation to security. These include:

- $30 million for the National Oceanic and Atmospheric Administration's ocean acidification research (an increase of $21 million over FY 2015);
- A projected $1.05 billion for the U.S. Coast Guard's Short Range Aids to Navigation and $642 million for Domestic Fisheries Enforcement;
- $370 million for the National Science Foundation's Division of Ocean Sciences (an increase of $18 million over FY 2015);
- $211 million for the Maritime Administration's Maritime Security program (an increase of $25 million over FY 2015).

Agency Budget Information

For this report, the Council on Environmental Quality (CEQ), Office of Science and Technology Policy (OSTP), and the Office of Management and Budget (OMB) worked with departments and agencies to identify and provide budgetary information on expenditures from FY

[1] The *Report on the Implementation of the National Ocean Policy* can be found at: https://www.whitehouse.gov/sites/default/files/docs/nop_highlights__annual_report_final_-_150310.pdf

2012 through FY 2015, and the FY 2016 Budget,
that support ocean and coastal activities.

FEDERAL FUNDING SUMMARY

The below table summarizes agency funding for ocean and coastal activities for FY 2012 through FY 2015, and the FY 2016 Budget. These data are intended to provide a general understanding of the investments the Federal Government is making in ocean and coastal activities.

Summary of Funding by Agency
(Dollars in Millions)

Agency	FY 2012 Enacted	FY 2013 Enacted	FY2014 Enacted	FY2015 Enacted	FY 2016 Budget
Department of Agriculture	591.9	491.6	392.0	395.1	405.3
Department of Commerce	2,116.6	2,189.0	2,425.7	2,373.8	2,600.9
Department of Defense	1,759.9	1,652.6	2,256.8	2,236.9	1,919.0
Department of Energy	112.4	106.1	109.5	152.8	98.2
Department of Health and Human Services	80.7	83.1	76.4	71.9	65.4
Department of Homeland Security	4,091.8	4,244.7	3,478.4	3,451.7	3,988.8
Department of the Interior	941.6	888.7	945.4	934.5	972.4
Department of State	100.4	85.5	106.4	110.4	94.3
Department of Transportation	558.7	403.6	408.8	373.4	443.9
Department of Treasury	6.3	12.5	21.6	5.5	-
Environmental Protection Agency	1,475.6	1,719.1	1,524.4	1,533.0	1,294.5
Marine Mammal Commission	3.0	2.9	3.3	3.3	3.4
National Aeronautics and Space Administration	87.6	86.1	92.7	87.5	118.8
National Science Foundation	532.9	513.2	489.2	457.4	459.7
Smithsonian Institution	3.1	3.1	3.1	3.1	3.1
TOTAL	**12,462.5**	**12,481.7**	**12,333.7**	**12,190.2**	**12,467.6**

AGENCY BUDGET TABLES AND NARRATIVES

DEPARTMENT OF AGRICULTURE

Natural Resources Conservation Service (NRCS)

Conservation Technical Assistance (CTA)

NRCS, working in partnership with local conservation districts and others, is a major provider of technical assistance. CTA is based on effective, science-based technology. Assistance is provided to land users voluntarily applying conservation and to those who must comply with local or State laws and regulations. CTA helps landowners and land users make informed decisions about how to improve soil and water quality, improve and conserve wetlands, enhance fish and wildlife habitat, and reduce flooding. Land-based conservation practices applied through the CTA program provide benefits to near-shore ocean habitats, including coral reef ecosystems, by reducing sediment and nutrient loading into receiving water bodies.

Coastal and ocean ecosystems can be impacted by runoff from agricultural operations. A significant portion of CTA funds are used to assist farmers in the development of Comprehensive Nutrient Management Plans (CNMPs). Nutrient management reduces animal waste runoff to water bodies through the development and implementation of practices related to the handling and storing of animal manure and the application of the manure on land. The process for developing such management plans also encourages landowners to assess and address the condition of all natural resources on their property.

Environmental Quality Incentives Program (EQIP)

The Environmental Quality Incentives Program (EQIP) is a voluntary conservation program that promotes agricultural production, forest management and environmental quality as compatible goals. EQIP is not an "oceans" program, but does provide major benefits to improving water resources including ocean and near-shore coastal ecosystems. Through EQIP, producers may receive financial and technical assistance to install or implement conservation practices to address soil, water, and air quality, wildlife habitat, surface and groundwater conservation, energy conservation, and related natural resource concerns on eligible land. Eligible land includes cropland, grassland, rangeland, pasture, non-industrial private forest land; and other agricultural lands, as determined by the Secretary.

EQIP activities are carried out according to a plan of operations developed in conjunction with the producer. Practices are subject to NRCS technical standards adapted for local conditions. EQIP may pay up to 75 percent of the costs incurred to install or implement conservation practices important to improving and maintaining the health of natural resources in the area. Payments may be made to encourage a producer to adopt conservation practices that improve water quality, such as nutrient management, manure management, integrated pest management, irrigation water management, and wildlife habitat management, or to develop a CNMP and components of a CNMP. Socially disadvantaged, limited resource and beginning farmers and ranchers may be eligible to receive up to 90 percent of the cost incurred to install or implement conservation practices.

Producers within ocean and coastal watersheds are eligible for EQIP financial and technical assistance to address water quality resource concerns. Through the implementation of various conservation practices, NRCS helps producers to control soil erosion and manage nutrient runoff and drainage water for improved water quality. As erosion and runoff from agricultural operations may impact ocean and coastal ecosystem health, EQIP is an integral tool for improving these ecosystems.

Agricultural Conservation Easement Program (ACEP)

The Agricultural Conservation Easement Program (ACEP) provides financial and technical assistance to help conserve agricultural lands and wetlands and their related benefits. Under the Wetlands Reserve Easements (WRE) component of ACEP, NRCS helps to restore, protect and enhance enrolled wetlands. Enacted by the 2014 Farm Bill, ACEP-WRE replaces the Wetlands Reserve Program (WRP), which had similar goals. Although this program is not an "oceans" program, restoring wetlands and associated upland buffer areas on the Nation's landscape benefits the ocean waters. Once restored, wetlands filter nutrients and sediment from surface runoff that flows into ocean receiving waters. Landowners enjoy the benefits that come from both new and improved wildlife habitat, better water quality, and increased biodiversity. Landowners can choose either permanent or 30-year easements or restoration cost-share agreements that generally last 10 years. In all instances landowners maintain fee title ownership and control of access to the land. A total of 2.6 million acres on 13,000 easements have been enrolled in the program since the inception of WRP in 1990. The number of projects offered from landowners always exceeds the program's acreage enrollment authority. Therefore, NRCS State Conservationists determine project selection priority within broad national guidelines.

Chesapeake Bay Watershed Initiative

Through the Chesapeake Bay Watershed Initiative (CBWI), farmers, ranchers and forestland owners voluntarily install conservation practices on hundreds of thousands of acres annually to support rural economies, protect wildlife habitat and improve water quality in the Watershed. The Chesapeake Bay Watershed, the largest estuary in North America, covers 64,000 square miles and receives inflow from over 150 rivers and streams. More than 300 species of fish, shellfish and crab species and a wide array of other wildlife call the Bay home. With almost 30 percent of the watershed in agriculture, the region's over 83,000 farms provide more than $10 billion of agricultural production annually. The CBWI is a focused effort to reduce nitrogen, phosphorus and sediment loads coming from private lands. Farmers and forest landowners are planting stream buffers, restoring wetlands, properly managing manure, and implementing other conservation practices as part of CBWI.

With the enactment of the 2014 Farm Bill, CBWI was consolidated with three other programs into the Regional Conservation Partnership Program (RCPP), which receives funding through the Agricultural Conservation Easement Program (ACEP), Environmental Quality Incentives Program (EQIP), Conservation Stewardship Program (CSP) or the Healthy Forests Reserve Program (HFRP). The Chesapeake Bay Watershed is one of eight Critical Conservation Areas named by the Secretary of Agriculture which will continue a focus upon the Chesapeake Bay Watershed.

Great Lakes Restoration Initiative

NRCS is one of 11 Federal agencies supporting the Great Lakes Restoration Initiative (GLRI). NRCS is helping landowners and land users to plan and implement activities to improve and protect the natural resources in locally identified watersheds within the eight GLRI states -- Illinois, Indiana, Michigan, Minnesota, New York, Ohio, Pennsylvania, and Wisconsin. NRCS conservation professionals are providing technical and financial assistance to landowners and producers to install scientifically-proven conservation practices on the land.

In 2010 and 2011, NRCS received $50.4 million for the Initiative through Interagency Agreements with the Environmental Protection Agency (EPA). NRCS funding from EPA has been primarily focused in three conservation programs: Environmental Quality Incentives Program (EQIP), Wildlife Habitat Incentives Program (WHIP) and Conservation Technical Assistance (CTA). NRCS is focusing on the following topic areas: invasive terrestrial species control; nearshore and non-point source pollution; habitat and wildlife protection and restoration; and

accountability, education, monitoring, evaluation, communication and partnerships.

The NRCS Great Lakes Restoration Initiative strives to accelerate agency investment addressing the critical water quality, invasive species and habitat restoration needs as outlined in the Great Lakes Restoration Initiative multi-year action plan.

National Institute of Food and Agriculture (NIFA)

NIFA supports a national program area in aquaculture including marine aquaculture in partnership with recipients of competitively-awarded grants, other Federal agencies and diverse stakeholders, including those directly involved in commercial marine aquaculture. Regional Aquaculture Centers provide multi-state problem-solving and integrated research and extension approaches to advance a responsible and sustainable marine aquaculture sector in our Nation. Marine aquaculture creates new economic opportunities for renewed working waterfronts in coastal communities and connects our Nation's heartland of feed grain production to new and improved feed formulations for marine finfish. Improved science and technology are needed for this emerging sector that offers a variety of shellfish and fish products for our seafood markets. Science is addressing critical conservation and protection issues related to integrating marine aquaculture production into our coastal waters. New and improved practices, data and scientific knowledge are improving permitting processes for locating farming operations to minimize potential multi-user conflicts and address marine environmental and conservation goals.

Agricultural Research Service

The Agricultural Research Service (ARS) provides research and technical information to develop sustainable aquaculture programs that will provide opportunities for fish farmers and healthy, high quality seafood for consumers. ARS also conducts a significant amount of research on developing best management practices to minimize the delivery of agriculturally derived pollutants to aquatic ecosystems. In several regions of the U.S. (e.g. the Mississippi River Basin and the Chesapeake Bay), this research has an impact on the health of coastal ecosystems.

Managing Coasts and Their Watersheds Account

This account supports fundamental and applied research on the processes that control the quality of waters exported from agricultural lands, new and improved technologies for managing the Nation's agricultural water resources, in watersheds draining into priority marine, estuarine, and coastal ecosystems (e.g., Chesapeake Bay; Mississippi River Basin/Gulf of Mexico; Great Lakes), to maintain the health of the American people.

The Marine Aquaculture Account

This account supports the genetic improvement of marine species to increase aquaculture production efficiency, product quality and aquatic animal health. Species include the Atlantic salmon and both the Pacific and Eastern oysters. Efforts to improve oyster farming include the development of sustainable burrowing shrimp-control strategies.

Economic Research Service

The Economic Research Service (ERS) provides economic and other social science research and analysis to inform public and private decision making on agriculture, food, natural resources, and rural America. The Agency's mission is to anticipate food, agricultural, agri-environmental, and rural development issues that are on the horizon, and to conduct sound, peer-reviewed economic research. Most of the agency's research is conducted by a highly-trained staff of economists and social scientists through an intramural program of research, market outlook, and analysis.

ERS provides data and conducts periodic analysis on U.S. imports and exports of fish and shellfish that may be products of aquaculture, such as salmon, shrimp, and oysters. Further information is available in the ERS-USDA Aquaculture web briefing room at http://www.ers.usda.gov/Briefing/Aquaculture/. In addition, ERS provides analysis of farm management practices that affect water quality, and alternative policy mechanisms for persuading farmers to adopt management practices that improve water quality. The goal of this research is to inform policy makers and program managers on policy choices that can be used to address water quality issues, including those associated with salt water ecosystems. ERS is currently assessing policy approaches for reducing the size of the hypoxic zone in the Gulf of Mexico.

Office of the Chief Economist-Office of Environmental Markets

The Office of Environmental Markets was established to facilitate the participation of farmers, ranchers and forest landowners in emerging markets for water quality, carbon sequestration, wetlands, biodiversity, and other ecosystem services. It facilitates coordination of environmental markets and the development of consistent standards and science-based tools to measure and verify environmental performance.

The Office of Environmental Markets chairs the Chesapeake Bay Environmental Markets Team, a collaboration of 12 Federal agencies working to remove barriers to establishing markets for water quality and other ecosystem services in the Chesapeake Bay.

United States Forest Service

The U.S. Forest Service provides research and technology tools to understand basic ecosystem processes in nearly all forest and rangeland ecosystems. Emerging research includes the human dimensions in exploring the urban ecosystem. The Forest Service uses this research to develop sustainable ecosystem-based management plans and decision tools. These tools are integrated into training and educational programs to transfer scientific knowledge to the public, State and private organization, and other Federal agencies. Examples of regional efforts contributing to ocean, coastal and Great Lakes issues are noted below.

Gulf of Mexico Research and Development

U.S. Forest Service scientists have developed a conceptual approach that builds the likelihood of hurricane damage into forest management. This has resulted in an adaptive strategy that owners and managers can use in the short term to respond to hurricane damage, and in the long term to manage recovery efforts. Studies are also designing agroforestry and riparian forest buffer systems for use within agricultural systems to reduce non-point source pollution, stabilize stream banks, and restore other ecological functions, which will reduce nitrogen fertilizer runoff causing widespread hypoxia in the Gulf of Mexico.

Water basin coming into contact with treated wood: Minimize the environmental impact of existing preservative−treatments to ensure that treated wood and its disposal does not adversely affect water quality. Realistically evaluate and predict releases of wood preservative from treated wood installations in aquatic environments.

Perennialization of agricultural landscapes: Forest Service researchers are exploring the ecological, social and economic aspects of perennialization of agricultural landscapes by examining nutrient, water and carbon cycling processes and biodiversity-function relationships in different configurations of annual and perennial plants, and by understanding how stakeholders make conservation decisions.

Center for Forest Watershed Research: Changes in historical and contemporary disturbance regimes, invasive species, climatic extremes, and human population growth and resultant land use change are putting considerable

stresses on upland, wetland, and aquatic ecosystems from the mountains to the coast. The rapid demise of Southern Appalachian hemlock trees due to infestation by the wooly adelgid has the potential to alter temperature and chemical regimes and impact aquatic species in cold water streams that are often lined with hemlock. Fundamental knowledge of ecosystem structure and function is required to restore, enhance, or maintain healthy watersheds and sustainable hydrologic cycles across the southeastern landscape.

Center for Bottomland Hardwood Research: Re-establishment of bottomland hardwood forest ecosystems on the Lower Mississippi Alluvial Valley previously converted to agriculture, particularly on flooded and marginally productive sites, which will protect freshwater resources and habitats for terrestrial and aquatic fauna and short rotation woody crops for the Nation's bioenergy needs.

Restoration of Mississippi Barrier Islands: Research in the development of complex plantations are being explored in the context of afforestation in the Lower Mississippi Alluvial Valley.

Hurricane Resilience & Restoration of Coastal Plain Forests: Re-establishing abandoned and augmenting existing monitoring plots, improving hurricane storm surge model performance in mangroves, developing plans for remotely sensed surveys of vegetation to identify areas affected by oil spillage, establishing baseline information on the type and extent of damage, identifying physiological impacts and mechanisms of oil on mangrove systems and to experimentally assess planned restoration strategies.

Crayfishes of Mississippi: Mississippi possesses one of the richest collections of crayfish in the world. Seventeen species of the State's crayfish are found nowhere else, and at least 10 species have yet to be scientifically described and named. Crayfishes are important ecologically by serving as food for fish and many mammals and birds, and by recycling decaying matter by eating live and dead animal and plant material. Southern Research Station continues to maintain and add to a Web site about the crayfish of Mississippi developed together with the Mississippi Museum of Natural Science, Smithsonian National Museum of Natural History, and the Illinois Natural History Survey. The site serves as a resource for scientists, managers, planners, teachers and students. SRS continues to study crayfish to further understand their unique ecological roles in the natural world.

National Agroforestry Center: Research is conducted and tools and technologies are developed and delivered that assist in designing and locating agroforestry and riparian forest buffer systems for use within agricultural cropland to reduce non-point source pollution of surface waters, stabilize stream banks, and restore other ecological functions. These buffers reduce the input of sediment, fertilizers, pesticides, and livestock waste into surface waters and can be strategically placed within a watershed to optimize benefits. Most agroforestry practices are eligible for Farm Bill conservation programs. An important contribution of upland and riparian forest buffers is their role in reducing nitrogen fertilizer runoff which has been documented to cause widespread hypoxia in important estuarine ecosystems such as the Gulf of Mexico and the Chesapeake Bay.

Gulf State & Private Forestry

The work involves providing technical assistance and incentives payments to private forest landowners for proper forest management in the Mississippi River basin. This includes forest management for water quality such as pre-harvest planning, streamside and wetland area management, road construction and maintenance, timber harvesting, re-vegetation, and chemical management.

Great Lakes Research & Development

NW Indiana Urban Waters Pilot: In 2011, the Northwest Indiana area was one of seven pilot locations selected across the country for the new Urban Waters Federal Partnership. The goal of the national Urban Waters Partnership initiative is to reconnect urban areas, particularly those that

are under-served or economically distressed, with their waterways and to improve collaboration among the Federal agencies and local partner organizations working to improve those waters. Specifically, the Urban Waters Federal Partnership is attempting to: coordinate across Federal agencies to energize existing water-related programs and create meaningful new ones; ensure that local communities are full partners in restoring and protecting their waterways; and work with local officials and effective community-based organizations to leverage area expertise and funding. The Northwest Indiana Partnership territory includes the Indiana Dunes National Lakeshore and adjacent areas. The partnership has identified priority projects, and work is underway on several, either with Federal funding or technical assistance.

Influence of Fire on Mercury Cycling in W. Great Lakes: Studies which assessed the influence of fire on the deposition of mercury in aquatic ecosystems shows that conifer canopies are very important contributors of mercury inputs to watersheds, and fires mobilize considerable stored mercury that is deposited locally.

Great Lakes State & Private Forestry Unit-Great Lakes Restoration Initiative

Brownfields Restoration: Restore brownfields and reduce toxic substances by utilizing the planting of trees and vegetables to take up or trap contaminants and reduce storm water runoff.

Emerald Ash Border - Forest Habitat Restoration/Prevention: Prevention in areas not yet impacted by and forest habitat restoration and rehabilitation in areas impacted by the Emerald Ash Borer. Also, the development of seed collection protocols to protect and restore culturally significant black ash swamps in tribal areas.

Ecosystem Services Program Development: Create and deploy one or more payments for ecosystem services programs (structured in the form of payments or rebates) that will incentivize measurable actions that result in carbon storage, water, and /or biodiversity benefits and will compensate private individuals and entities for land stewardship that provides public benefits.

Urban and Community Forestry Assessment Tools: Utilize management plans and tree assessment tools such as i-Tree Urban Tree Canopy Assessment and Hazard Risk Assessment, to plant trees in urban areas and to assess and protect ecosystem and stream health.

Terrestrial Invasive Species Control: Establish and enhance four weed management areas in PA, WI and NY to help plan and carry out programs for the reduction of invasive plants within the Great Lakes basin.

Pacific Ocean Research & Development

Mapped Atmosphere Plant Soil System: MAPSS (Mapped Atmosphere-Plant-Soil System) is a landscape- to global-scale vegetation distribution model that stimulates the potential biosphere impacts and biosphere-atmosphere feedbacks from climate change.

Land and Watershed Management Program (Pacific Salmon): Investigations of the cumulative effects of land management on watersheds, riparian zones, and fish habitat of the Pacific salmon; and conservation and restoration of the habitats.

Coastal headwater riparian management research: Understanding of structure, function, and processes of aquatic and riparian ecological systems.

Assessing risk of invasive aquatic species in coastal watersheds: Invasion of streams by Atlantic salmon escaped from marine salmon farms, and the potential impact to native fishes inhabiting streams.

Scientific review of Columbia Basin Salmon restoration: Use of science in the assessment and evaluation phases of one large-scale (multi-region) ecosystem management effort on Federal lands in the Columbia River basin.

Role of salmon ecology in the success of population recovery program: Nutrients derived from salmon make up a large portion of those plants and animals living in aquatic and terrestrial habitats associated with salmon populations.

Assessing the risk of climate change and wildfire to salmon habitat in the interior Columbia: Use of science in the assessment and evaluation phases of one large-scale (multi-region) ecosystem management effort on Federal lands in the Columbia River basin.

How watershed processes affect Alaska coastal flux: Stream biogeochemistry, hyporheic ecology, wetland-stream interactions, effects of marine derived nutrients on streams, and indicators of watershed condition.

Yellow cedar decline in Alaska coastal forest ecosystem: Tree death results from freezing injury and is related to cedar's premature loss of cold resistance in spring.

Assessing the risk of climate change, timber harvest, and wildfire to Marbled Murrelet habitat and their population: Pacific Northwest scientists are gathering data on ocean indicators such as sea surface temperature, chlorophyll, and water depth to better understand the role that coastal waters play in structuring the spatial and temporal distribution of marbled murrelets along the coast of the Pacific Northwest. This information will help land use planners and conservation biologists assess the relative strengths of marine versus terrestrial forest factors in setting conservation objectives for this threatened bird.

Wetlands research at Institute of Pacific Islands Forestry: Provide Pacific Islanders with the understanding they need to be able to appreciate and conserve their forested wetlands and to determine the best management practices that contribute to sustainable patterns of use.

Cumulative effects of forest management on hillslope processes, fishery resources and downstream environments: Gain a better understanding of the physical and biological processes that integrate terrestrial, riparian, and aquatic ecosystems at the watershed scale. Study the production and transport of watershed products such as water, sediment, woody debris, nutrients, and heat.

Maintaining faunal diversity in forest ecosystems of coastal and intermountain west: Improve understanding of the interplay among species, habitat conditions, and resource management at multiple spatial scales and levels of ecological organization. Efforts are often focused on issues of immediate regional and national interest.

Chesapeake Bay Research & Development

Baltimore Ecosystem Study: FS research in Baltimore has shown the strong interactions among social, ecological, and hydrological systems in urban and surrounding areas, including the relationship of water quality to urban land uses. This knowledge has helped improve water quality through urban planning, ecological restoration, and the development of best management practices and has supported the successful implementation of the Urban Waters Federal Partnership in the Baltimore pilot project.

Chesapeake Bay Scientific and Technical Advisory Committee: The Scientific and Technical Advisory Committee provides independent scientific and technical advice based on the long term data from urban, and forested ecosystem projects in the area, to the Chesapeake Bay Program.

Chesapeake State & Private Forestry Atlantic Ocean Research and Development

State and Private Forestry leads the effort to demonstrate how trees and forests improve the health of the Chesapeake watershed by coordinating with partners and providing grants to exemplary conservation and restoration projects at the local, State, and regional scales.

DEPARTMENT OF AGRICULTURE					
(dollars in millions)	FY 2012 Enacted	FY 2013 Enacted	FY 2014 Enacted	FY 2015 Enacted	FY 2016 Budget
Natural Resources Conservation Service					
Conservation Techincal Assistance	66.3	60.8	64.3	67.3	66.0
Environmental Quality Incentives Program	210.0	206.1	202.5	202.1	202.5
Wetlands Reserve Program	226.3	140.8	6.3	-	-
Agricultural Conservation Easement Program	-	-	82.1	88.3	100.8
Chesapeake Bay Watershed Initiative	51.6	49.4	-	-	-
National Institute of Food and Agriculture					
Habitat Marine (HM), Freshwater	2.5	1.3	2.1	2.1	2.1
HM, Estuary	0.1	1.1	0.6	0.6	0.6
HM, Marine	0.1	0.2	0.1	0.1	0.1
Non-point Source (NS) Estuarine Water, Physical	1.3	1.0	0.2	0.2	0.2
NS Estuarine Water, Chemical	1.1	1.3	1.2	1.2	1.2
NS Freshwater, Chemical	3.1	1.8	2.4	2.4	2.4
NS Freshwater, Physical	3.2	1.2	2.2	2.2	2.2
NS Marine, Physical	-	-	-	-	-
NS Marine, Chemical	0.1	0.2	0.1	0.1	0.1
Point Pollution	-	-	-	-	-
Agricultural Research Service					
Managing Coasts and Their Watersheds	3.4	4.0	4.8	4.8	5.8
Marine Aquaculture	3.2	3.3	3.7	3.7	2.9
Economic Research Service					
Economic Research Service	0.4	0.4	0.4	0.4	0.4
Office of the Chief Economist					
Cheasapeake Bay Environmental Markets Team	0.4	0.4	0.4	0.4	0.4
Forest Service					
Gulf of Mexico / Research & Development					
NRS - Perennialization of agricultural landscapes	0.0	0.1	0.1	0.1	0.1
SRS - Center for Forest Watershed Research	1.7	1.7	1.7	1.7	1.7
SRS - Center for Bottomland Hardwood Research	4.7	4.7	4.7	4.7	4.7
SRS - Restoration of Mississippi Barrier Islands	-	-	-	-	-
SRS - Hurricane Resilience & Restoration of Coastal Plain Forests	0.1	0.1	0.1	0.1	0.1
SRS - Crayfish of Mississippi	-	-	-	-	-
SRS - Alabama shad research	-	-	-	-	-
WO - National Agroforestry Center	0.7	0.7	0.7	0.7	0.7
Gulf of Mexico / State & Private Forestry					
Gulf - State and Private Forestry	0.5	0.6	0.6	0.6	0.6
Great Lakes / Research & Development					
FPL - Water basin coming into contact with treated wood	-	-	-	-	-
NRS - NW Indian Urban Waters Pilot	0.2	0.2	0.2	0.2	0.2
NRS - Influence of Fire on Mercury Cycling in W.Great Lakes	0.1	0.1	0.1	0.1	0.1
Great Lakes / State & Private Forestry					
Great Lakes - State and Private Forestry	3.1	2.5	2.7	2.7	2.2
Brownfields Restoration	1.3	1.2	1.2	1.5	1.0
Emerald Ash Borer - Forest Habitat Restoration/Prevention	1.3	1.0	1.2	1.0	1.0
Ecosystem Services Program Development	0.2	0.1	0.1	-	-
Urban and Community Forestry Assessment	0.2	0.1	0.1	-	-
Terrestrial Invasive Species Control	0.1	0.1	0.1	0.2	0.2

DEPARTMENT OF AGRICULTURE (continued)					
(dollars in millions)	FY 2012 Enacted	FY 2013 Enacted	FY 2014 Enacted	FY 2015 Enacted	FY 2016 Budget
Forest Service (continued)					
Pacific Ocean / Research & Development					
PNW - Mapped Atmosphere Plant Soil System	-	-	-	-	-
PNW - Land and Watershed Management Program (Pacific	0.9	0.9	0.9	0.9	0.9
PNW - Coastal headwater riparian management research	0.1	0.1	0.1	0.1	0.1
PNW - Role of salmon ecology in the success of population	0.1	0.1	0.1	0.1	0.1
PNW - Scientific review of Columbia Basin Salmon restoration	-	-	-	-	-
PNW - Assessing the risk of climate change and wildfire to	0.1	0.1	0.1	0.1	0.1
PNW - How watershed processes affect Alaska coastal flux	0.1	0.1	0.1	0.1	0.1
PNW - Yellow cedar decline in Alaska coastal forest ecosystem	0.1	0.1	0.1	0.1	0.1
Pacific Ocean / Research & Development (continued)					
PNW - Assessing the risk of climate change, timber harvest, and	0.3	0.2	0.3	0.2	0.2
PNW - Urban Forestry and Urban Waters Research Alliance	-	0.3	0.2	0.2	0.2
PNW - Climate Change and Impacts to Coastal Tribal	-	-	-	0.1	0.1
PSW - Wetlands research at Institute of Pacific Islands Forestry	0.5	0.5	0.5	0.5	0.5
PSW - Cumulative effects of forest management on hillslope	0.6	0.6	0.6	0.6	0.6
PSW - Maintaining faunal diversity in forest ecosystems of	0.2	0.2	0.2	0.2	0.2
Chesapeake / Research & Development					
NRS - Baltimore Ecosystem Study	1.0	1.0	1.0	1.0	1.0
NRS - Chesapeake Bay Scientific & Tech Advisory Committee	-	-	-	-	-
Chesapeake / State & Private Forestry					
Chesapeake - State and Private Forestry	0.9	1.1	1.0	1.6	1.0
TOTAL	**591.9**	**491.6**	**392.0**	**395.1**	**405.3**

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration (NOAA)

National Ocean Service (NOS)

The National Ocean Service (NOS) is responsible for enabling and promoting the sustainable, safe, and efficient use of coastal resources and places. As marine resources face increasing threats, NOS's science-based products and services support the Nation's economic and ecological well-being. In addition to informing smart resource management and stewardship, NOS directly enables the safe and efficient operation of all oceangoing economic activity, including maritime commerce, offshore energy development, fishing, aquaculture, and tourism.

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

For example, NOS's physical oceanographic activities—mapping, observations, and positioning—are essential to not only maritime commerce, but also to the management of coastal resources and mitigation of coastal threats. NOS provides scientific expertise to enable sound decision-making when coastal resources are damaged by releases of oil, chemicals, and marine debris. NOS serves multiple roles with respect to marine protected areas: steward of the National Marine Sanctuaries System, the main federal partner to state-managed National Estuarine Research Reserves, and the coordinator of the National System of Marine Protected Areas. NOS also fosters the sustainable use of coastal ecosystem services through financial and technical assistance, applied research, effective policies, and partnership-building.

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. NOAA also represents these programs for the Department of Commerce on the interagency Committee on the Marine Transportation System.

NOS's integrated suite of physical oceanographic data and applications is essential to safe, efficient, and sustainable uses of busy coastal areas and waterways. Positioning and geodetic control provide the foundational data layer for mapping of underwater features and other coastal environmental observations. In addition to enabling safe navigation these activities provide actionable environmental intelligence in the coastal landscape: storm surge forecasting, ecological forecasting, coastal industries, habitat restoration, coastal ocean science and oil spill response, to name just a few applications.

Coastal Science and Assessment: The activities under the Coastal Science and Assessment sub-program provide a scientific foundation for sustainable management, protection, and restoration of ocean and coastal resources, especially NOAA's public trust resources. NOS focuses these research capabilities on monitoring, predicting and mitigating coastal ecosystem changes. Burgeoning coastal development and increasing climate variability exacerbate stressors on coastal ecosystem services. NOS research and

advisory services enable Federal, state, local, and private industry actions to mitigate the cumulative effects of these stressors and enhance resilience. Furthermore the increasing coastal human activity increases the risks of spills, ship groundings and other emergencies that damage sensitive ecosystems. These assessments support judgments and settlements that fund restoration of ocean and coastal public trust resources.

NOS implements the activities of this sub-program under the Clean Water Act; Oil Pollution Act; the Comprehensive Environmental Response, Compensation, and Liability Act; the National Coastal Monitoring Act; the Marine Debris Act; and the Harmful Algal Bloom and Hypoxia Research and Control Act. The research conducted in this sub-program also helps to inform NOAA's activities under the National Marine Sanctuaries Act and the Coastal Zone Management Act. This sub-program also supports NOAA's and the Nation's obligations under international treaties and conventions, and increases effectiveness of international programs for coastal environmental science and technology, integrated coastal zone management, and sustainability of coastal resources. NOAA's Ecological Forecasting Roadmap guides the transition of mature research into operational ecological forecasts, particularly in the areas of harmful algal blooms (HABs), hypoxia, and pathogens.

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, regulation, and direct management.

While NOAA and other federal agencies possess significant science, data and resources for managing coastal resources, the majority of decisions that affect the resilience of coastal communities occur on the state and local level. Voluntary partnerships between NOAA and coastal and Great Lakes states form the basis of NOS's approach under the Coastal Zone Management Act (CZMA). NOAA provides financial assistance, policy guidance, regional coordination, technical assistance, and other support to implement 34 state coastal zone management programs. The CZMA also authorizes NOAA to support research, monitoring, education, training and stewardship at 28 National Estuarine Research Reserves. The National Estuarine Research Reserve System (NERRS) is a national network of state-managed protected areas established under the Coastal Zone Management Act. The 28 reserves in 22 states and territories protect over 1.3 million acres of state-owned estuarine lands and waters. In addition to providing long-term protection and creating opportunities for public education, NERR sites serve as "living laboratories" for research. Reserve sites represent the diversity of estuarine systems of the United States and are economically significant areas for recreation, fishing, and ecotourism.

Program activity provides funding for cooperative agreements with states in support of the Coastal Zone Management Program. It also includes the Regional Coastal Resilience Grant program. See the program activity description for NOS's Coastal Zone Management and Services for program descriptions.

NOS's Coral Reef Conservation Program protects, conserves, and restores coral reefs. It brings together multidisciplinary expertise from over 30 NOAA offices and 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: 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 an average of $130,000 per hectare of reef, reaching $1,200,000 in some cases. Therefore, declines in coral reef habitats have dire consequences for approximately 500 million people who depend on them for their livelihoods.

Under the National Marine Sanctuary Act, NOS manages and operates the Nation's system of 13 marine sanctuaries and the Papahānaumokuākea Marine National Monument. The sanctuaries range in size from one square mile near Cape Hatteras, North Carolina, to over 13,500 square miles in the waters off America Samoa. Together, these sanctuaries and the Monument encompass over 172,000 square miles of special marine places. Unique sanctuaries habitats include deep ocean and near-shore coral reefs, live bottom, whale migration corridors, deep-sea canyons, areas of deep water upwelling, submerged banks that rise close to the ocean surface, kelp forests, and sea grass beds. The sanctuary system also protects maritime heritage assets such as shipwrecks. The NOAA Marine Protected Areas (MPA) Center, part of the Office of National Marine Sanctuaries, fills a long-standing need for science, policy, and management tools to advance the effective use of MPAs for national conservation and management objectives. The NOAA Sentinel Site Program (SSP) uses existing capacity of range of NOAA programs to answer critical coastal management science questions using place-based approaches.

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

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

National Marine Fisheries Service (NMFS)

The National Marine Fisheries Service (NMFS) is responsible for the management and conservation of living marine resources under the Magnuson-Stevens Fishery Conservation Management Act within the U.S. Exclusive Economic Zone (EEZ)—the area extending generally from 3 to 200 nautical miles offshore and, for marine mammals and species listed under the Endangered Species Act, in all waters including State waters. NMFS provides critical support, and scientific and policy leadership in

the international arena, and plays a key role in the management of living marine resources in coastal areas under State jurisdiction. NMFS implements science-based conservation and management actions aimed at sustaining long-term use and promoting the health of coastal and marine ecosystems. Programmatic authority for fisheries management, species protection, and habitat conservation activities is derived primarily from the Magnuson-Stevens Fishery Conservation and Management Act (MSA), Marine Mammal Protection Act (MMPA), and Endangered Species Act (ESA). Other acts provide additional authority for enforcement, seafood safety, habitat restoration, and cooperative efforts with states, tribes, interstate fishery commissions, and other countries. All of these activities rely on a strong scientific and research competency to support the challenging public policy decision process associated with NMFS's stewardship responsibility.

Fisheries Research and Management: NMFS, in partnership with the Regional Fishery Management Councils and state and Federal partners manages marine fisheries using the best available science to inform sound management and conservation actions. NMFS actions result in sustainable fisheries harvest (wild) and production (farmed), and rebuilding of depleted stocks. NMFS's science quality assurance activities, combined with rigorous peer-review program, ensure that management decisions are based on the highest quality scientific information. This includes species responses to environmental changes, species interactions, and fishing and other human activities that affect species and their habitat. Social, cultural, and economic behaviors and incentives that influence interactions between humans and marine fisheries are also important components influencing management decisions.

Protected Species Research and Management: NMFS works to assess, understand, and protect the health of protected species, the ecosystems that sustain them, and the communities that value and depend on them. NMFS, in partnership with internal and external stakeholders, uses the best available science from assessment and monitoring programs to develop and implement best practices and conservation actions to reduce threats to protect species and their marine and coastal ecosystems under ESA and MMPA. Having better understanding about protected species abundance and distribution patterns can help avoid unnecessary regulation restrictions on industry and other users of living marine resources.

Enforcement: NOAA's Office of Law Enforcement (OLE) is the only Federal law enforcement program that is exclusively dedicated to Federal fisheries and marine resource enforcement. OLE enforces NOAA's natural resource protection laws and improves compliance with Federal regulations to conserve and protect our Nation's living marine resources and their natural habitat. OLE's jurisdiction spans more than three million square miles of ocean, more than 95,000 miles of U.S. Coastline, 13 National Marine Sanctuaries and four Marine National Monuments. OLE is responsible for carrying out more than 35 Federal statutes and international agreements related to living marine resources.

Habitat Conservation and Restoration: The Habitat Conservation and Restoration Program's mission is to protect and restore ecosystems that provide important societal and ecological benefits. The program contributes to rebuilding fisheries, recovering protected species, and improving the resiliency of coastal communities. The program provides technical support for many Federal programs on matters such as minimizing adverse impacts, restoration, and post hoc evaluation.

Oceanic and Atmospheric Research (OAR or NOAA Research)

Oceanic and Atmospheric Research (OAR) is NOAA's central research Line Office. It provides the Nation with critical environmental information through technology development and related services that support informed decision-making and promote healthy, productive, and resilient ecosystems, communities, and economies. OAR's role is three-fold: to integrate research across the agency; to improve current

NOAA operational products and services; and to conduct innovative research for the development of the next generation of products and services. Scientific and technological advancements in atmosphere, ocean, coasts and climate predictions are continuously adopted from OAR to improve services across NOAA. OAR is relied upon by NOAA to coordinate and develop research and technology for emerging and integrative subjects such as ocean acidification, aquaculture, warn-on-forecast of severe weather, climate change, ocean exploration and observing systems, behavior of the Earth system, fine-grain computing of prediction models, unmanned aircraft systems, and autonomous underwater vehicles. OAR works with partners to prioritize its Research to Operations (R2O) and Applications (R2A) transition activities, which range from outreach to targeted development. OAR, in partnership with academic and Federal scientists, provides research-based information and predictive capabilities to assist management of U.S. territorial waters. OAR information supports decisions regarding fisheries, coral reefs, and water resource management; the biotechnological and geological potential of hydrothermal vent systems; depleted populations of exploited or protected species; and development and understanding of the physical, chemical, and biological aspects of the oceans and Great Lakes.

The National Sea Grant College Program: The National Sea Grant College Program is a Federal-state partnership that turns research into action supporting science-based environmentally sustainable practices to ensure our coastal communities remain engines of economic growth in a rapidly changing world. The 33 Sea Grant programs are located in every coastal and Great Lakes state, Lake Champlain, Puerto Rico, and Guam, forming a 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, Sea Grant works to provide research and outreach that help build and grow innovative businesses along America's oceans and Great Lakes, protect against environmental destruction and natural disasters, and build leadership capacity.

Ocean, Coastal, & Great Lakes Research Laboratories & Cooperative Institutes: Ocean, Coastal and Great Lakes Research develop innovative management tools through a better understanding of our ocean, coastal, and Great Lakes habitats and resources. The research serves to increase understanding of coastal and marine processes for the purpose of protecting and restoring ecosystems. Efforts include predicting, monitoring, and mitigating the effects of change on ecosystems over time (e.g., invasive species, human activities such as energy production, land-based sources of pollution, climate change) and gaining a better understanding of the current state of those systems in order to help decision makers manage the resources.

Ocean Exploration: Ocean Exploration efforts focus on the first step of the scientific process– initial investigation of the unknown to characterize natural features and phenomena. Areas to be explored are identified by working with other NOAA programs and Federal agencies, as well as the academic community, and emphasis is given to areas where there is consensus that the potential for discovery is high. OER supports a continuum of ocean science that makes discoveries via exploration and research, and transitions the new knowledge and capabilities to the rest of NOAA, and the national and international science, technology, and ocean management communities. OER integrates science, education, and outreach to raise awareness and increase ocean science literacy.

Other Ecosystem Programs – Ocean Acidification: The Ocean Acidification Program (OAP) is a highly leveraged, interdisciplinary program to improve the Nation’s understanding of OA. This understanding is critical to ensuring that U.S. marine dependent industries are resilient to ocean acidification by being provided accurate and timely environmental intelligence about how OA will affect living marine resources. OAP coordinates, directs, and funds activities across the agency, including: monitoring changing ocean chemistry in response to OA, conducting research on the impacts of OA on commercially and ecologically important biological systems/ecosystems, assessing socio-economic

impacts of OA, researching adaptive strategies, promoting robust data management and dissemination, and engaging the public to foster greater understanding of OA impacts and potential mitigation.

Climate Research Laboratories & Cooperative Institutes/AOML & PMEL: AOML conducts research based on ocean and atmospheric observations and models to understand and characterize the role of the oceans in climate variability and change. Techniques vary from shipboard-conducted process studies, autonomous platforms, numerical and theoretical models, long-term continuous time series, and satellite-derived observations and products. AOML's research related to ocean dynamics includes the Meridional Overturning Circulation, western boundary currents, and Gulf of Mexico and Caribbean Sea oceanography. PMEL improves scientific understanding of the changing climate system and its impacts by providing the core capabilities of research, technology development, and observing system implementation that are central to meeting NOAA's climate goals. PMEL also engages in two climate and ecosystem research activities that are more broadly focused—Ocean Acidification (OA) and Ecosystems-Fisheries Oceanography Coordinated Investigations (EcoFOCI).

National Weather Service (NWS)

The mission of the National Weather Service is to provide weather, hydrologic, 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. NWS supports the infrastructure of critical ocean observations; telecommunication and data management functions; and the provision of a number of advisory, warning, and forecast services. Most NWS ocean program activities support the national observation infrastructure and related advisories, warnings, and forecasts needed for the safety of life and the overall quality of the earth's environment. Important ocean-related activities supported within the NWS are the following:

Observations: Through the Office of Observations, NWS provides continuous, real-time monitoring of ocean and atmospheric elements supports weather, water, and seasonal climate prediction. The NWS operates the National Data Buoy Center, which designs, develops, operates, and maintains a marine observational network of over 200 data collection buoys, including Deep-ocean Assessment and Reporting of Tsunamis (DART) buoys, and 55 coastal stations. The Voluntary Observing Ship (VOS) program adds an additional 6,000+ highly leveraged weather observations per day from volunteer crew members on nearly 1,000 commercial ships around the world.

Analyze, Forecast, and Support: Through the Analyze, Forecast, and Support Office (AFS), the NWS issues marine forecasts, warnings, and advisories for the Nation's coastal waters, offshore and high seas forecasts for the open ocean, and the near-shore and open waters of the Great Lakes. Marine services also include the issuance of coastal flood products, severe storm warnings of coastal hazards (i.e. heavy surf advisories and warnings for the occurrence of rip currents).

NWS's National Hurricane Center in Miami, Florida, and the Central Pacific Hurricane Center in Honolulu, Hawaii issues watches, warnings and other supporting products linked to the evolution, track, and impacts of tropical storms and hurricanes in the Atlantic, Caribbean, Gulf of Mexico, and the central and eastern Pacific Ocean.

NWS operates the National Tsunami Warning Center in Palmer, Alaska and the Pacific Tsunami Warning Center in Honolulu, Hawaii; hosts the International Tsunami Information Center and the Caribbean Tsunami Warning Program; and operates a local network of seismic stations; and contributes to the national water level network. The NWS currently provides operational marine weather and sea ice forecast services for the new offshore marine zone to ensure weather and sea ice safety for the expected increase in maritime commercial and recreational activities in the Arctic.

In 2009, NWS Alaska Region established a new experimental offshore marine weather service zone in the Arctic Ocean north of Alaska that extends out to 200 nautical miles from Alaska's north shore to cover the entire U.S. exclusive economic zone (EEZ) in the Arctic Ocean.

Science and Technology Integration: The Office of Science and Technology Integration (STI) analyzes NWS service improvement requirements and manages applied research and development that support development of science and technology solutions to address requirements. STI partners include NOAA Line Offices including the Office of Oceanic and Atmospheric Research (OAR), Federal, state and local agencies, and the external research community. NOAA develops, transitions, and executes operational marine models to support operational ocean, coastal, hurricane and associated storm surge and wave forecast services. The operational marine modeling suite includes global and regional, ocean and wave prediction models, coupled atmosphere-ocean-wave-sea-ice models, tropical and extratropical storm surge models, and coupled hurricane forecast models. STI continues to enhance and expand the suite of the warning and forecast products to meet the needs of the coastal and emergency management communities. NHC issues the experimental coastal inundation graphic products, storm surge warnings, as well as forecast graphic products associated with land falling hurricanes. These experimental service products are anticipated to become operational products in the next two years.

National Environmental Satellite, Data, and Information Service (NESDIS)

The National Environmental Satellite, Data, and Information Service (NESDIS) ensures continuous operational availability and access to environmental satellite data and information from both NOAA and non-NOAA satellites as well as global *in situ* observation networks.

Environmental Satellite Observing Systems: NESDIS's remote sensing activities address an expanded suite of ocean, coastal, and terrestrial sensing needs. NESDIS also supports research partnerships to enable the transition of remote sensing products into operational availability. These products and services range from worldwide operational sea ice analyses and forecasts; search and rescue of aviators, mariners, and land-based users in distress; and the detection and prediction of coral reef bleaching and harmful algal blooms.

Ocean Remote Sensing: The Ocean Remote Sensing program directly addresses NOAA's mission to describe and predict changes in the Earth's environment by supporting integrated, quality, end-to-end ocean remote sensing research and applications. ORS provides the oceanographic user community with a suite of multi-disciplinary, high-quality space-based data, products, and services sourced from domestic and international satellite constellations. These data, products, and services support the U.S. Integrated Ocean Observing System (IOOS), which is part of the international Global Ocean Observing System (GOOS).

National Ice Center: NESDIS is the home of the National Ice Center, a multi-agency operational center whose mission is to provide the highest quality strategic and tactical ice services tailored to meet the operational requirements of U.S. interests and to provide specialized meteorological and oceanographic services to U.S. government agencies. Comprehensive ice forecasts will be essential to advancing U.S. interests in the Arctic.

NOAA Data Centers and Information Services: NOAA's National Data Centers provide stewardship and access to the world's largest collection of publicly available national and international climatic, oceanographic, and geophysical data and information. The National Oceanographic Data Center (NODC) provides scientific stewardship to marine data. The National Climatic Data Center (NCDC) focuses on stewardship and access to the Nation's resource of global climate and weather related data and information, and assesses and monitors

climate variation and change. The National Geophysical Data Center focuses on Nation's geophysical data, ensuring quality, integrity, and accessibility. In 2015, Congressional language approved the consolidation of NOAA's National Data Centers to foster the development of newly integrated products and services and enable better data discovery.

Joint Polar Satellite System (JPSS): JPSS addresses NOAA's requirements to provide global environmental data such as cloud imagery, sea surface temperature, atmospheric profiles of temperature and moisture, atmospheric ozone concentrations, search and rescue, direct read-out, and data collection services. These data are used in numerical weather prediction models primarily for 2-7 day forecasts and for climate monitoring. The JPSS satellites include the Visible Infrared Radiometer Suite instrument, a technological advanced sensor designed to collect radiometric imagery in visible and infrared wavelengths of the land, atmosphere, ice, and ocean.

Satellite Altimetry Mission – Jason-3: Jason-3 is a joint satellite altimetry mission between NOAA, the European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT), and the Centre National d'Etudes Spatiales (CNES). NOAA, with assistance from NASA, will provide three instruments: Advanced Microwave Radiometer, GPS Payload, (GPSP), Laser Retroreflector Array (LRA), Launch Vehicle, and Launch Services, in addition to Ground System and Operations. Jason-3 will provide continuity of precise measurement of sea [ocean] surface heights for applications in ocean climatology and ocean weather.

Office of Education

NOAA's Office of Education provides advice and counsel to the Under Secretary of Commerce for Oceans and Atmosphere in matters pertaining to education. The office, in conjunction with the Education Council, coordinates educational activities across NOAA and develops NOAA's Education Strategic Plan and policy. These efforts help to ensure that NOAA's education programs and activities are based on NOAA science and support the agency's cross-cutting priority of promoting environmental literacy.

The Office of Education directly implements and manages scholarship programs aimed at fostering American competitiveness in science by providing quality educational opportunities for the next generation. The Office of Education has also offered competitive grant programs at the national and regional level to promote environmental literacy efforts through collaboration with external partners.

Office of Marine and Aviation Operations (OMAO)

The mission of NOAA's Office of Marine and Aviation Operations is to provide high-quality ship and aircraft operations and scientific support to NOAA. It operates and maintains nine aircraft and the NOAA fleet of 16 commissioned research and survey vessels, provides guidance and assistance for outsourced ship and aircraft support, conducts the NOAA Diving Program, and administers the NOAA Commissioned Corps. The NOAA Commissioned Corps – the smallest of the Nation's seven uniformed services – operates ships and aircraft, leads mobile field parties, manages research projects, conducts diving operations, and serves in program positions throughout NOAA.

The NOAA fleet provides platforms for the collection of oceanographic and atmospheric data required to meet NOAA's environmental and scientific missions. The fleet conducts complex hydrographic surveys to support nautical charting; oceanographic and atmospheric research to study global climate change; fisheries-stock and marine-mammal assessments; and monitoring of coastal habitats and pollution trends. NOAA's aircraft collect environmental and geographic data for NOAA hurricane and other severe-weather and atmospheric research; provide aerial support for coastal and aeronautical charting and remote sensing projects; conduct aerial surveys to help predict flooding potential from snow melt; and provide support to NOAA's fishery- research and marine-mammal assessment programs.

National Institute of Standards and Technology

The National Institute of Standards and Technology (NIST) is a non-regulatory Federal agency within the U.S. Department of Commerce. NIST promotes U.S. innovation and industrial competitiveness by advancing measurement science, standards, and technology in ways that enhance economic security and improve quality of life. NIST laboratories conduct research that advances the Nation's technology infrastructure and is needed by U.S. industry to continually improve products and services. NIST Scientific and Technical Research and Services activities develop and provide the tools for advanced measurements, quality assurance, quality control procedures and products (such as Standard Reference Materials) that are applied to measurements by the coastal and ocean research and scientific monitoring and assessment community.

NIST is a strategic partner with NOAA through the NOAA/NMFS Marine Mammal Health and Strading Response Program (MMHSRP) and the National Ocean Service. NIST maintains the NIST Marine Environmental Specimen Bank (NIST Marine ESB) that houses the National Marine Mammal Tissue Bank collection in addition to archives of seabird eggs, sea turtles and coral specimens collected in collaboration with NOAA, the Department of Interior, the Department of Defense, tribal, state, and local organizations collected from the lower 48 states, Alaska and Hawaii. Data from samples inform partners on current conditions and time trends of contamination and health status of marine organisms. Through the Pacific Islands Biorepository Program, NIST is expanding ongoing environmental specimen banking programs and their associated analytical environmental chemistry activities into the U.S. Pacific Islands Region to address environmental issues, many of which are unique to this vast region.

NIST administers and coordinates the National Marine Analytical Quality Assurance Program (NMAQAP) and its work in marine health biosciences. NIST develops and administers chemical measurement quality assurance exercises among various chemical laboratories (foreign and domestic) that analyze marine environmental samples (particularly for contaminants) and develops analytical reference and control materials to insure that coastal management decisions affecting changes in legislation, health, trade, and economics are based on valid chemical measurements. Also under this program, NIST builds strategic collaborations within the ocean science community to advance measurement technology for the solution of ocean issues.

NIST is a strategic partner in NOAA's Hollings Marine Laboratory (HML) and maintains laboratories and a staff of scientists at this coastal research facility who collaborate with the other HML partners and other national and international ocean science professionals to provide the science necessary for understanding linkages between environmental conditions and the health of marine organisms and humans. The NIST research laboratories in the HML encompass the NIST Marine ESB, and research facilities with efforts in biosciences (metabolomics, lipidomics, proteomics), contaminant chemistry, environmental forensics, marine debris, aquaculture, seafood safety, marine disease and chemical tracers used as proxies of ocean acidification and coastal land use.

DEPARTMENT OF COMMERCE					
(dollars in millions)	FY 2012 Enacted	FY 2013 Enacted	FY 2014 Enacted	FY 2015 Enacted	FY 2016 Budget
National Oceanic and Atmospheric Administration					
National Ocean Service (NOS)					
Operations, Research and Facilities					
Mapping and Charting	91.7	86.3	-	-	-
Geodesy	28.8	27.2	-	-	-
Tide and Current Data	27.4	27.1	-	-	-
Ocean Assessment Program	91.8	92.7	-	-	-
Coastal Management	101.1	92.8	-	-	-
Response and Restoration	26.6	28.5	-	-	-
National Centers for Coastal Ocean Science	44.9	42.3	-	-	-
Marine Sanctuary Program	47.1	45.6	-	-	-
Navigation, Observations and Positioning	-	-	189.2	192.5	195.5
Coastal Science and Assessment	-	-	79.4	80.0	85.6
Ocean and Coastal Management and Services			202.6	208.6	266.0
Procurement, Acquisition and Construction					
Coastal and Estuarine Land Conservation Program	3.0	-	-	-	-
NERRS Construction & Acquisition	1.0	-	1.7	1.7	1.7
Marine Sanctuaries Facilities	4.0	-	2.0	2.0	2.0
Other NOS Construction/Acquisition	-	-	-	-	-
National Marine Fisheries Service					
Operations, Research and Facilities					
Fisheries Research and Management	426.1	414.0	425.4	428.2	-
Protected Species Research and Management	174.2	165.5	176.4	178.7	-
Enforcement and Observers/Training	105.4	102.7	105.8	108.0	-
Habitat Conservation and Restoration	41.7	38.8	41.6	47.0	-
Other Activities Supporting Fisheries	57.5	56.1	60.0	60.2	-
Protected Resources Science and Management	-	-	-	-	214.2
Fisheries Science and Management	-	-	-	-	546.1
Enforcement	-	-	-	-	70.0
Habitat Conservation and Restoration	-	-	-	-	57.9
Other NMFS Accounts					
Other Accounts	25.3	44.9	128.5	71.0	43.9
Pacific Coastal Salmon Fund	65.0	60.4	65.0	65.0	58.0
Procurement, Acquisition and Construction					
NMFS Construction	-	-	-	-	-
Oceanic and Atmospheric Research					
National Sea Grant College Program	62.2	57.6	67.2	67.3	68.5
Ocean, Coastal, & Great Lakes Research Laboratories & Cooperative Institutes	22.8	23.8	26.2	27.0	27.0
Ocean Exploration	19.4	21.0	26.0	28.0	19.3
Other Ecosystem Programs - Ocean Acidification	6.2	6.0	6.0	8.5	30.0
Climate Research Laboratories & Cooperative Institutes / AOML & PMEL	14.5	14.0	9.7	9.8	10.0
National Undersea Research Program	4.0	-	-	-	-
Sustained Observations and Monitoring	-	-	41.0	41.3	41.6
Other Ocean, Coastal and Great Lakes Partnership Programs	-	-	-	-	-

DEPARTMENT OF COMMERCE (continued)					
(dollars in millions)	FY 2012 Enacted	FY 2013 Enacted	FY 2014 Enacted	FY 2015 Enacted	FY 2016 Budget
National Weather Service					
U.S. Marine Observations	35.2	35.2	31.4	-	-
U.S. Marine Weather Program	18.8	18.8	18.8	-	-
U.S. Tropical Cyclone Program	20.7	20.7	20.7	-	-
U.S. Tsunami Warning Program	23.5	23.5	27	-	-
Storm Surge Program	0.2	0.3	0.3	-	-
Marine Modeling	3.4	3.4	3.5	-	-
Observations	-	-	-	33.6	33.6
Analyze, Forecast and Support	-	-	-	61.5	56
Science and Technology Integration	-	-	-	3.9	3.9
National Environmental Satellite, Data, and Information Service (NESDIS)					
Operations, Research and Facilities					
Ocean Remote Sensing	3.9	3.9	3.9	3.9	4.0
Ice Services	2.2	1.8	1.8	1.8	1.8
Other Environmental Observing Services	10.9	10.9	10.9	10.9	10.9
Archive, Access and Assessment	18.4	22.9	22.9	-	-
Archive (activity)	-	-	-	3.5	3.5
National Centers for Environmental Information (NCEI)	-	-	-	22.9	21.5
Climate Database Modernization Program (CDMP)	-	-	-	-	-
International Pacific Research Center (IPRC) (U. of HI)	-	-	-	-	-
Integrated Data and Envir. App. (IDEA) Center (formerly Pacific Ocean and Envir. Info. Ctr.)	-	-	-	-	-
Procurement, Acquisition and Construction					
GOES Series	79.7	141.9	166.9	171.8	155.8
POES	1.9	1.9	1.9	1.9	1.9
JPSS	110.9	114.9	119.6	78.6	72.6
Jason-3	19.7	30.0	18.5	25.7	7.5
Program Support					
Operations, Research and Facilities					
NOAA Education Program	25.1	25.3	27.2	27.6	16.4
Corporate Services	74.6	75.1	75.0	73.2	87.0
Facilities	9.8	9.8	9.2	9.2	10.0
Procurement, Acquisition and Construction					
Construction	-	-	-	-	1.0
Office of Marine and Aviation Operations					
Operations, Research and Facilities					
Marine Services	128.3	-	-	-	-
Aircraft Services	3.5	28.2	31.2	31.6	32.3
Fleet Planning & Maintenance	27.0	-	-	-	-
Marine Operations & Maintenance	-	154.7	169.7	175.0	178.8
Procurement, Acquisition and Construction					
Fleet Replacement	2.0	12.5	5.2	6.0	158.7
National Institute of Standards and Technology					
Scientific Technical Research and Services					
Biosciences NMR	0.7	0.7	0.7	0.7	0.7
Marine Analytical Quality Assurance Program	2.7	3.2	3.6	3.6	3.6
Marine Biosciences	1.0	1.3	1.3	1.3	1.3
Pacific Islands Biorepository	0.8	0.8	0.8	0.8	0.8
Total	**2,116.6**	**2,189.0**	**2,425.7**	**2,373.8**	**2,600.9**

DEPARTMENT OF DEFENSE

Office of the Secretary of Defense Sciences

Strategic Environmental Research & Development Program (SERDP)

SERDP is DOD's environmental research and development program. SERDP was established by the Defense Authorization Act of 1991 as a partnership among the Department of Defense (DOD), the Department of Energy (DOE), and the Environmental Protection Agency (EPA). The Program brings the capabilities and assets of the Federal laboratories, together with top researchers in academia and industry, to bear on the environmental challenges faced by the Department of Defense. To address the highest priority issues confronting the Army, Navy, and Air Force, SERDP focuses on cross-service requirements and pursues solutions to the Department's most intractable problems. SERDP invests in science and technology that improves our understanding of marine mammals, their populations, locations and behavior. In addition, SERDP invests in technologies to detect and remediate unexploded ordnance in marine and estuarine settings, as well as science to improve our understanding of the fate, transport and effects of energetic materials and other contaminants in the marine environment. Researchers supported by SERDP are developing the methodologies and tools needed to assess the physical effects of sea level rise and storm surge and their impacts to mission-essential infrastructure. Finally, SERDP is operating the Defense Coastal/Estuarine Research Project at Marine Corps Base Camp Lejeune.

Environmental Security Technology Certification Program (ESTCP)

The ESTCP's goal is to demonstrate and validate promising, innovative technologies that target the Department of Defense's most urgent environmental needs. These technologies provide a return on investment through cost savings and improved efficiency. The current cost of environmental remediation and regulatory compliance in the Department is significant. Innovative technology offers the opportunity to reduce costs and environmental risks. For example, the Department of Defense is responsible for a large number of contaminated sites and ranges with unexploded ordnance in coastal and estuarine environments. Advanced technologies will improve our ability to assess, monitor, and remediate contaminated sediments and unexploded ordnance at these sites.

Department of the Navy

The U.S. Navy's ocean and coastal activities are performed by the Office of Naval Research and the Oceanographer of the Navy. Through their research and coordination with other agencies, universities and research organizations, they develop and maintain expertise in wide ranging areas of ocean science to ensure that the Navy meets its mission of maintaining, training and equipping combat-ready forces capable of winning wars, deterring aggression and maintaining freedom of the seas.

Office of Naval Research (ONR)

The Office of Naval Research executes, transitions, and promotes science and technology (S&T) for the for the benefit of the United States Navy and Marine Corps. ONR's extramural programs use universities, government laboratories, non-profit organizations, and business both small and large. It provides technical advice to the Chief of Naval Operations and the Secretary of the Navy, works with industry to improve technology manufacturing processes while reducing fleet costs or extending fleet capabilities, provides graduate and post-graduate S&T training, and fosters continuing academic interest in naval relevant science from the grade school to

professional levels. It has programs in a number of ocean related areas.

Naval Ocean Sciences

Basic research areas included in this program are physical oceanography, Arctic and global prediction, littoral geosciences and optics, ocean engineering and marine systems, undersea signal processing, and ocean acoustics. The basic research supported in these areas is competitively selected to have potential for significant future impact on naval operations and warfare. Research directions focus on physical process elucidation, modeling, and predicting processes in the air/ocean/shore/ice environments as they might affect naval operations and sensor and system performance in the world's oceans with emphasis on littoral regions around the globe. Principal investigators are primarily in the academic community but they collaborate with Navy labs, university/Navy labs, other government labs and private industry. Much of the knowledge gained in this research is useful to other agency programs and to state and local entities, both public and private.

Applied Ocean Research

Applied oceanographic research at ONR is focused on maturing the knowledge gained under our basic research programs into improved capabilities for observing, predicting, and adapting to the ocean environment. The research within the various oceanographic disciplines is synthesized into a coherent methodology that provides naval operators with an enhanced awareness of the present and future ocean environment. This is achieved through the advancement of observational capabilities of the ocean via new platforms and sensors, improvements in predictive models of the oceanic environment, and tools to enable adaptation to the ocean's variability.

Improvements in this methodology are targets for potential transition to the Navy's operational meteorology/oceanography community, whether resulting from better environmental models, new observational tools, or a better understanding of the impact that the variable oceanic environment will have on naval sensors, systems, or platforms. A current major investment in this area is on extending the lead time of skillful ocean forecasts to provide both tactical and strategic exploitation of ocean variability by naval operators. Additional significant investments are made in improving the capability to observe the ocean in situ through the development of better sensing platforms such as underwater gliders, floats, surface drifters, and autonomous underwater vehicles.

The enhanced exploitation of remote sensing of the ocean is another area of interest, with the development of new methodologies to extract ocean information and assimilate this information in environmental models a key aspect of the research under this program. The capabilities developed via this applied oceanographic research effort often prove useful for both the operational DoD enterprise as well as other Federal, state and local agencies.

National Ocean Partnership Program

This program was established in Fiscal Year 1997 through Public Law 104-201 with the aims to: promote the national goals of assuring national security, advancing economic development, protecting quality of life, and strengthening science education and communication through improved knowledge of the ocean; and coordinate and strengthen oceanographic efforts in support of those goals by identifying and carrying out partnerships among Federal agencies, academia, and industry in the areas of data, resources, education, and communication. Strong links exists among the participating Federal agencies (Navy, NOAA, NSF, NASA, DOE, EPA, USCG, DOI, DARPA, OSTP, State and US Army Corps). Efforts funded under this program involve partnerships between various components of the oceanographic community, focusing most recently on the implementation of an U.S. integrated ocean observation system, study of waves, of tropical cyclones, bio sensors, and Arctic processes.

Marine Mammals

This program provides both basic and applied research to better understand and characterize the potential effects of Navy sound exposure on marine mammals in an effort to minimize disruption to marine mammals and other protected marine life during naval activities. Program areas include: development of resources to monitor and mitigate potentially adverse interactions between naval activities and the marine environment; investigations of the overall ecology of marine mammals including the development of sensors and tags that can provide the data needed to understand the relationship between marine mammals and their environment; investigations of the effects of sound on marine life including understanding how they hear, behavioral response studies to understand how anthropogenic sound effects their behavior, understanding their physiology including how they have evolved for diving, how they respond to stress, and what are the population consequences of acoustic disturbance; and predictive modeling and quantitative risk assessment for anthropogenic sounds in the marine environment. Principal investigators include members of the academic community, government labs, and private industry. The Marine Mammal Program works closely with Federal, state, and non-U.S. agencies charged with conservation and management of the marine environment to better facilitate the dissemination of program results. Results from this program are presented in peer-reviewed professional literature and similar outlets for scientific information, and are summarized in annual reports provided to the U.S. Marine Mammal Commission and the National Academy of Sciences and made publicly available on the Program website. Recognizing the public interest in marine mammals, the program includes efforts for outreach and education to allow new knowledge to reach a broad audience.

Oceanographer of the Navy

The Chief of Naval Operations, through the Oceanographer of the Navy, sponsors operational Navy Meteorology and Oceanography (METOC) services and related research and development. In 2012, the Oceanographer of the Navy acquired responsibility for funding the Navy's meteorology and oceanography Operations & Maintenance (O&M, N) funding from the Chief of Naval Operations (N43).

The Navy provides meteorological services for Navy and joint forces, meteorological products to the Marine Corps, and oceanographic support to all elements of the Department of Defense, as well as to allied and coalition partners. The Navy sponsors programs in four closely related disciplines to provide worldwide, comprehensive, integrated weather and ocean support, namely: meteorology, oceanography, geospatial information and services, and precise time and astrometry. All are used to protect ships, aircraft, fighting forces, and shore establishments from adverse ocean and weather conditions, and to provide a decisive tactical, operational, and strategic edge by exploiting the physical environment. The Oceanographer of the Navy is also the Director of Oceanography, Space, and Maritime Domain Awareness for the Navy.

Navy Oceanography Operations

This program provides a wide array of essential tactical, operational strategic METOC products and services to operating forces afloat and ashore. These services include collecting and processing environmental data using resources such as oceanographic ships, aircraft, satellites, and computing systems. These products and services enhance the performance of active and passive sensor and weapon systems; optimize the effectiveness of the sea control mission for mine counter-measures; and identify the environmental effects that influence the performance of fixed and mobile warfare systems and tactics. General and tailored oceanographic, acoustic, and meteorological forecasts are provided daily to fleet commanders and individual operating units from the Meteorology and Oceanography Command's numerical modeling and forecasting centers and

from forecasting support activities located worldwide. Funding primarily supports national security interests and also benefits maritime commerce.

Naval Oceanography - Research and Development to Support Operations

This program enables the warfighter of the future to effectively carry out their mission by transitioning to operational use research performed by the Office of Naval Research. The Space and Naval Warfare Systems Command is the primary office responsible for transitioning Naval research to operational use. All research and development funded by the Oceanographer of the Navy is in direct support of the Naval mission.

Naval Oceanography Acquisition

This funds new and replacement meteorological equipment for all Navy and Marine Corps Air Stations, all Navy ships, USMC Operational Forces units and other activities required to provide weather observations and provides safety of flight capabilities. The procurement has been thoroughly coordinated with other DOD and civilian agencies. Program also funds replacement of Survey Vessel shipboard mission equipment, deep and multi-beam SONARs, Side Scan SONARs, Hydrographic Survey Launches, Ship Moving Vessel Profilers, Unmanned Under Water Gliders, and Autonomous Underwater Vehicles.

CNO Energy and Environmental Readiness - Living Marine Resources

The Living Marine Resources (LMR) program is responsible for applied research and works to address the Navy's key research needs and transition the results and technologies for use within the Navy's at-sea environmental compliance and permitting processes, with the goals of improving marine species impact analysis (including marine mammal take estimates), mitigation measures and monitoring capabilities. The current, highest research priority is related to the effects of Navy sonars and other sound sources on marine mammals. Key points of the LMR mission statement are: improve the best available science regarding the potential impacts to marine species from Navy activities; expand the technology and methods available to the U.S. Navy marine species monitoring program; preserve core Navy readiness capabilities. This mission is accomplished through the following five primary investment areas: 1) Data to support risk threshold criteria; 2) Improved collection and processing of protected species data in areas of Navy interest; 3) Monitoring & Mitigation Technology Demonstrations; 4) Standards and Metrics; 5) Education and Outreach, Emergent Opportunities. The LMR program includes representatives from relevant Navy Fleet and System Command (SYSCOM) activities affected by at-sea issues as well as members of the Navy's research and implementation community in the identification of research needs and selected projects. This unique feature enables the LMR program to invest in priority research needs and ensure the transition of the outcomes to the appropriate Navy programs.

U.S. Army Corps of Engineers

The U.S. Army Corps of Engineers (USACE) carries out regulatory, coastal storm damage reduction, navigation, environmental restoration, and research and development missions that are significant components of Federal coastal and ocean activities, and include the planning, design, engineering, and operation of the relevant infrastructure. The USACE supports a coastal wave data collection program, conducts coastal and inland mapping and surveying, provides hindcast data bases of waves and water levels, provides analytical tools for evaluating the water and sediment elements of several coastal-ocean linked watersheds, tracks several indicator (target) species, monitors habitats, and develops engineering guidance documents that are used widely in both the public and private sectors. The Coastal and Hydraulics Laboratory, which is part of USACE's Engineer Research and Development Center (ERDC) is renowned

for its contributions to ocean and coastal science.

Funding for the USACE ocean and coastal activities is provided through the following programs:

Construction

The mission of the USACE commercial navigation program is to facilitate commercial navigation by providing safe, reliable, highly cost-effective and environmentally sustainable waterborne transportation systems. Under its coastal navigation program, USACE studies and constructs improvements to navigation channels and related features, such as turning basins, breakwaters, and jetties; and also maintains these channels and features. In addition, the navigation program supports commercial navigation on the inland waterways.

The USACE also provides coastal flood protection using a combination of structural, non-structural, natural, and nature-based features.

The Storm Damage Reduction (SDR) program contributes to the national effort to reduce flood risk by protecting lives, homes, businesses, agricultural areas, public infrastructure, and critical environmental areas. Further, USACE protects and restores the environment through the restoration of aquatic ecosystems working with partners and stakeholders to restore degraded ecosystem structure, function, and processes to more natural conditions.

Investigation

In addition to the planning studies for coastal storm damage reduction, ecosystem restoration, and navigation, the USACE also works with local and regional partners to develop and implement Regional Sediment Management Plans, which focus on managing sediment transport within a watershed to benefit navigation and wildlife habitat.

Operation and Maintenance

The outcome of USACE's efforts is to ensure reliable mission achievement so as to return value back to the national investment. These projects were built to meet national needs through prioritized investments of Federal funds, and to recognize this, the USACE ensures reliable performance and maximum sustainable operating life is achieved through its Operation and Maintenance programs.

This general area provides funding for the operation, maintenance, and care of existing harbors and related works. The work includes maintenance of harbor channels provided by a state, municipality or other public agency, that serve navigation needs of general commerce where authorized by law; clearing and straightening channels: and removal of obstructions to navigation. This work consists of dredging, repair, and operation of structures and other facilities. Related activities include aquatic plant control, monitoring of completed coastal projects, removal of sunken vessels, and the collection of domestic waterborne commerce statistics.

Coastal Wetlands Restoration

The USACE uses funds transferred annually from the Sport Fish Restoration Account of the Aquatic Resource Trust Fund for the planning, protection, and restoration of coastal wetlands in Louisiana.

DEPARTMENT OF DEFENSE					
(dollars in millions)	FY 2012 Enacted	FY 2013 Enacted	FY 2014 Enacted	FY 2015 Enacted	FY 2016 Budget
Office of the Secretary of Defense Sciences					
Strategic Environmental Research and Development Program	8.0	9.4	9.9	8.2	7.0
Environmental Security Technology Certification Program	4.0	2.1	1.3	1.2	2.0
Department of Navy					
Office of Naval Research					
Naval Ocean Sciences	84.4	78.7	93.8	90.8	82.9
Applied Ocean Research	19.9	31.3	19.6	39.6	16.7
National Oceanographic Partnership Program	8.6	7.6	8.1	8.0	7.7
Marine Mammals	12.0	10.1	11.1	8.1	8.2
Oceanographer of the Navy					
Naval Oceanography Operations	231.8	204.1	203.4	190.2	191.0
Naval Oceanography Acquisition	166.8	83.9	179.3	137.0	134.9
Naval Oceanography R & D	32.5	40.3	29.0	36.3	44.5
CNO Energy and Environmental Readiness					
Living Marine Resources	8.2	6.5	6.6	3.9	5.3
Department of Army - Corps of Engineers					
Construction					
Environment	70.3	331.4	333.0	325.0	358.0
Flood Risk Management	6.9	0.4	-	-	-
Navigation	166.2	151.6	199.4	174.8	81.0
Others	9.7	1.0	9.2	3.1	2.0
Investigations					
Environment	17.1	12.8	17.5	6.8	16.3
Flood Risk Management	2.5	4.9	5.1	5.5	2.1
Navigation	16.9	3.8	2.5	6.7	-
Others	3.6	17.7	17.3	16.3	-
Operations and Maintenance					
Environment	1.0	4.6	4.9	5.0	6.0
Flood Risk Management	8.3	-	-	-	-
Navigation	791.4	570.0	1034.5	1091.9	878.8
Others	4.9	-	-	-	-
Coastal Wetlands Restoration					
Aquatic Resource Trust Fund - Sport Fish Restoration Account	85.0	80.3	71.4	78.6	74.6
TOTAL	**1,759.9**	**1,652.6**	**2,256.8**	**2,236.9**	**1,919.0**

DEPARTMENT OF ENERGY

Office of Science

The Office of Science account supports research programs in condensed matter and materials physics, chemistry, biology, climate and environmental sciences, applied mathematics, computational science, high energy physics, nuclear physics, plasma physics and fusion energy sciences. The account also provides the Nation's researchers with state-of-the-art user facilities offering capabilities that are unmatched anywhere in the world and enable United States researchers and industries to remain at the forefront of science, technology, and innovation.

Biological and Environmental Research

The Biological and Environmental Research (BER) program within the Department of Energy's (DOE) Office of Science supports research to understand the physical, chemical, and biological processes affecting the Earth's atmosphere, land, and oceans and how these processes may be affected, either directly or indirectly, by changes in radiative forcing of climate resulting from energy production and use, primarily the emission of carbon dioxide and aerosols from fossil fuel combustion. This research is aimed at achieving systems level understanding of plants, microbes, and microbial communities in various environments relevant to DOE missions in energy, climate, and the environment.

Research is conducted to develop, improve, evaluate, and apply state-of-the-science coupled ocean-land-sea ice models that simulate climate variability and change over decadal to centennial time scales. The goal is to achieve understanding of regional climate variability and change on scales as small as 10 km. Research is supported to project dynamic change for the ocean, land ice, and sea ice components of these models by including state-of-the-science knowledge and to ensure that these models operate on a range of computer architectures to maximize their utility to the scientific community. Research is also supported to develop improved methods and tools for the diagnosis and intercomparison of the variety of climate models developed by scientists around the world. This intercomparison is increasingly important as climate models become more complex, so that biases and uncertainties within and between models can be scientifically described and resolved. The nature and causes of differences between models and their outputs must be accounted for in a systematic fashion in order to confidently use these models for simulation of global climate change. A data management activity is also supported to collect, quality assure, and make ocean carbon data available to the research community. Data include discrete measurements from a variety of platforms (e.g., research ships, commercial ships, buoys), and measurements are collected from deep and shallow waters from all oceans. All ocean carbon data originate from individual investigators and groups.

Advancing our knowledge of biological components of the global carbon cycle is crucial to predicting potential climate change impacts and assessing the viability of potential adaptation and mitigation strategies. Genomic science research in this area is targeted towards linking biogeochemical processes relevant to carbon cycling to key functional activities encoded in the genomes of organisms that mediate these processes. Activities include extending genomics driven research and analytical capabilities to field experiments in terrestrial ecosystems and understanding systems biology of important model organisms from either terrestrial or ocean systems.

Office of Fossil Energy R&D

The Office of Fossil Energy conducts R&D on technologies to improve the environmentally sound exploration and production of hydrocarbon resources and to enable

sequestration of carbon dioxide in the ocean environment. Specifically, the program is focused on electrical component design, reservoir modeling, and drilling technologies for use in high temperature and high pressure environments. In addition, the program conducts R&D to improve our understanding of hydrate formations, their role in the global carbon cycle, and their potential as an energy resource.

Carbon Storage Program

The DOE Carbon Storage program advances the development and validation of technologies that enable safe, cost-effective, permanent geologic storage of carbon dioxide (CO_2). The program also supports the development of best practices for commercial implementation of carbon capture and storage technologies. The technologies being developed and the small- and large-scale injection projects conducted through this program will benefit the existing and future fleet of fossil fuel power-generating facilities and other industrial CO_2 sources, including petroleum refineries and chemical manufacturing.

The DOE initiated activities in FY 2015 to investigate the offshore carbon storage potential in the United States. The newly awarded research projects will assess the prospective geologic storage potential of offshore subsurface depleted oil and natural gas reservoirs and saline formations on the East Coast and the Gulf of Mexico. These projects will use existing geologic and geophysical data to conduct a prospective storage resource assessment that will approximate the amount of CO_2 that can be safely stored. Additionally, the studies will investigate key input parameters and evaluate risk factors to reduce uncertainty for offshore resource assessment and efficiency estimates.

Methane Hydrates Research

Research has been conducted on technologies to locate, characterize, and safely extract natural gas from methane-hydrate formations. A total of 21 research projects were funded through FY 2012 and FY 2013 Funding Opportunity Announcements to address these research needs.

Work to understand issues of sustainability of flow, subsidence, seal integrity, and potential for unintended release of methane has been ongoing with international, interagency, and State partners.

A second high priority within the program is the research project to confirm Gulf of Mexico (GOM) resource occurrence, the nature of GOM gas hydrate reservoir systems and the potential impacts of gas hydrate production.

Unconventional Fossil Energy Technologies

DOE has conducted research on offshore oil spill prevention through the development of technologies that identify geologic hazards, safe drilling and completion, competent connections from seafloor to surface facilities, and subsea reliability and automated safety systems. The program includes both research that is cost-shared with the private sector, and research conducted at the National Laboratories. Projects within the portfolio range from that of feasibility studies to demonstration of prototypes. Research has been coordinated with the other agency members of the Interagency Coordinating Committee for Oil Pollution Research, and with the Department of the Interior/Bureau of Safety and Environmental Enforcement.

Office of Energy Efficiency & Renewable Energy

Water Power Program

The U.S. Department of Energy's Water Power Program supports the development of advanced water-power devices that capture energy from waves, tides, ocean and river currents, and ocean thermal gradients. The program works to promote the development and deployment of these new technologies, known as marine and hydrokinetic (MHK) power technologies, to assess the potential extractable energy from

these resources and to help industry harness this renewable, emissions-free resource to generate environmentally sustainable and cost-effective electricity.

Through support for public, private, and nonprofit efforts, the Water Power Program promotes MHK technology development, market acceleration and deployment, and testing in laboratory and open-water settings. The Program supports projects to reduce the time and cost associated with siting water power projects; to better quantify the potential magnitude, costs, and benefits of water-power generation; and to identify and address other barriers to deployment.

Wind Power Program

The key activity that supports the Federal ocean activities within the Wind Energy Program is Offshore Wind. The Wind Program helps industry develop, demonstrate, and deploy offshore wind technologies that can harness this renewable, emissions-free resource to generate environmentally sustainable and cost-effective electricity. Through support for public, private, and nonprofit efforts, the Wind Program promotes the responsible development of a world-class offshore wind industry in the United States and works to remove the market barriers currently inhibiting its growth.

In 2012, DOE launched the Offshore Wind Advanced Technology Demonstration Project initiative and selected seven projects in 2012 to each receive $4 million to complete the first phase of their projects, which included engineering, site evaluation, and planning. In May 2014, the DOE Wind Program selected three of these projects to advance to the second phase of the demonstration, which includes follow-on design, fabrication, and a deployment target to achieve commercial operation. Dominion Virginia Power plans to install two 6-megawatt direct-drive wind turbines on twisted jacket foundations 26 miles off the coast of Virginia Beach, Virginia. Fishermen's Energy of New Jersey plans to install up to 6 wind turbines on twisted jacket foundations with a total capacity of at least 20 megawatts in state waters approximately three miles off the coast of Atlantic City, New Jersey. Principle Power plans to install a wind farm that will have a capacity of up to 30 megawatts approximately 18 miles off the coast of Coos Bay, Oregon in over 1,000 feet of water, demonstrating the use of domestically-developed semi-submersible floating foundations. University of Maine and Lake Erie Energy Development Corporation have been funded by the department to continue to advance the design and engineering of their innovative offshore wind substructures, concrete floating semi-submersible and icebreaking foundation, respectively.

DEPARTMENT OF ENERGY					
(dollars in millions)	FY 2012 Enacted	FY 2013 Enacted	FY 2014 Enacted	FY 2015 Enacted	FY 2016 Budget
Office of Science					
Biological and Environmental Research					
Climate Research Activities	9.0	11.9	9.7	12.2	11.3
Genomics Research Activities	1.0	3.1	3.5	3.5	2.8
Office of Fossil Energy R&D					
Coal					
Carbon Storage	-	-	-	13.8	3.0
Oil and Natural Gas Technology					
Methane Hydrates	10.0	5.0	8.0	15.0	-
Unconventional Fossil Energy Technologies	-	-	5.0	2.0	-
Ultra-deepwater and Unconventional (Royalty Trust Funds)	19.0	19.0	-	-	-
Office of Energy Efficiency & Renewable Energy					
Water Power Program					
Water Power Program	34.0	35.5	41.3	41.1	40.8
Wind Power Program					
Wind Power Program - Offshore Wind	39.4	31.6	42.0	65.2	40.3
TOTAL	**112.4**	**106.1**	**109.5**	**152.8**	**98.2**

DEPARTMENT OF HEALTH AND HUMAN SERVICES

National Institutes of Health (NIH)

National Institute of Environmental Health Sciences (NIEHS)

Deepwater Horizon Activities: NIH supports several research projects associated with the release of millions of gallons of crude oil into the Gulf of Mexico following the 2010 Deepwater Horizon (DWH) disaster, which posed unknown risks to the over 130,000 workers trained and potentially involved in various cleanup activities and to the people living along the Gulf Coast. To date, there have been very limited studies on the human health effects of oil spills, especially long-term effects. Studies have primarily evaluated acute physical and psychological effects and alterations in specific physiological functions of workers, community volunteers involved with cleanup, and the general population.[2]

Furthermore, there are only limited studies and understanding of the toxicology of the numerous, and frequently changing, chemical constituents of oil spills, including the oil released during the DWH disaster and the dispersant used in the clean-up effort.

National Toxicology Program Research Study: The NIEHS National Toxicology Program (NTP) has established a research program to increase understanding of polycyclic aromatic compounds (PACs), widespread environmental contaminants that are naturally present in crude oil and also formed during the incomplete burning of gas, coal, and other organic matter. The DWH disaster brought to light knowledge gaps on the ecological and human health hazards of these compounds. NTP is studying both individual PACs and PAC mixtures, to gain a better understanding of how exposures to these compounds may affect human health.

Gulf Research Study and Follow-up: NIEHS, a component of NIH, has undertaken the Gulf Long-term Follow-up Study (GuLF STUDY), a human health study of individuals who participated in the oil spill clean-up response, took the required safety training, volunteered to work, or were sent to the Gulf to help in some way after the DWH disaster. Funds for this large research study have been made available by the NIH Office of the Director and the NIH Common Fund, as well as NIEHS; beginning in fiscal year 2016, the NIEHS Intramural Research Program will continue supporting this effort as funds are available. Under this effort, a cohort of 32,608 adults involved in some aspect of oil spill clean-up were enrolled via telephone interviews and are being followed over time. Home visits to collect biological and environmental samples and measure lung function and other characteristics were completed with 11,193 of the enrollees living in the Gulf States. Telephone follow-up of the entire cohort is ongoing along with clinic exams that target about 3,000 of the participants who live within 60 miles of a study clinic(s) in New Orleans, LA or Mobile, AL.

Great Lakes Research: As part of the ongoing collaboration with the National Science Foundation program on Oceans, Great Lakes and Human Health, the NIEHS provided research support to grants that are engaged in novel approaches to predicting harmful algal bloom (HAB) events capable of producing cyanotoxins and microcystins. This collaborative effort also supports research on the detection of freshwater HAB toxins in drinking water supplies in Lake Erie.

[2] Deepwater Horizon activities Include SAMHSA contributions to NIEHS programs

Academic Consortia: NIEHS is also leading a trans-NIH effort to create a network of community and university partnerships that seeks to identify personal and community health effects stemming from the DWH disaster and to enhance community resiliency to potential disasters. The five-year (FYs 2011-2015), $25.2 million program is supporting population-based and laboratory research, which will ultimately develop the scientific evidence base needed to promote health and well-being for people living along the Gulf Coast, who are at greatest risk for potential adverse physical, psychological and behavioral health effects from recurring manmade and natural disaster events.

In addition, researchers are seeking to develop new strategies to enhance capacity to respond to future disasters and prevent or minimize adverse health effects arising from them. Ultimately, research findings from the Deepwater Horizon Research Consortia should contribute to the evidence base needed to improve preparedness and response aimed at minimizing disaster-related health impacts. In contrast to NIEHS' worker-focused GuLF STUDY, these studies will concentrate on the range of potential acute and long-term health effects to the general public.

Many other NIH components are contributing support to the program, including the National Cancer Institute (NCI); National Center for Advancing Translational Sciences (NCATS); National Heart, Lung, and Blood Institute (NHLBI); National Institute of Mental Health (NIMH); National Institute on Minority Health and Health Disparities (NIMHD); National Institute of Nursing Research (NINR); and the Office of Behavioral and Social Sciences Research (OBSSR).

Unsolicited Grants: NIEHS also supports two investigator initiated research grants related to the DWH disaster. The first grant employs passive sampling devices in the Gulf of Mexico to measure contaminants from the DWH disaster in an effort to connect environmental exposures with biological response. The second grant is identifying the acute and long-term effects of the health risks of exposures to oil and dispersant related toxicants following the DWH disaster. This grant is supporting a feasibility study to determine participation rates, barriers to participation, and the ability to obtain biological samples from family members of cleanup workers in four of the most exposed parishes in Southeast Louisiana.

Safety Training: Two different levels of training for oil spill workers have been developed and supported by the NIEHS Superfund Worker Training Program (WTP). The first is a 40-hour Training Course on Hazardous Waste Operations and Emergency Response (HAZWOPER). HAZWOPER is part of the regular, ongoing worker training offered through NIEHS WTP and the Occupational Safety and Health Administration (OSHA) (http://www.osha.gov/). This extensive training was delivered to individuals likely to have direct contact with oil spill products. More than 1,000 people in the Gulf Coast region have completed the HAZWOPER training.

The second are short (two and four hour) training courses on Safety and Health Awareness. NIEHS WTP, together with OSHA, helped develop several short educational courses, including some online training, which focus on the necessary hazard awareness and safety training for all oil spill workers hired by BP. This training was provided to individuals who had minimal contact with oil spill products. These courses provided training on safe work practices, personal protective equipment, decontamination, heat stress, and other common hazards for cleanup work. Additional resources and training curricula mentioned here can be found at the NIEHS National Clearinghouse for Worker Safety and Health Training Oil Spill Response page at http://tools.niehs.nih.gov/wetp/index.cfm?id=2495.

NIEHS WTP continues to work with Gulf Coast communities, clinicians, and the Substance Abuse and Mental Health Services Administration to develop and provide additional types of training, including training that addresses the mental health impact experienced by cleanup workers and emergency responders.

For more on this resiliency training, visit Resiliency Worker Training Program at http://tools.niehs.nih.gov/wetp/index.cfm?id=2528.

Oceans and Human Health Program: The Oceans and Human Health Program (OHH) is composed of multi-project centers and individual research projects. The goal of the OHH Centers is to provide linkages between members of the ocean sciences and biomedical communities in order to support interdisciplinary research in areas where improved understanding of marine processes and systems has potential to reduce public health risks. These OHH Centers are a collaborative venture with the National Science Foundation (NSF). The OHH Centers will conduct research to better address harmful algal bloom (HAB) research, marine pollution, and aspects of global climate change that influence ocean-related human health outcomes as well as develop statistical and bio-informatic tools.

In addition, as part of this overall Program, NIEHS grantees are examining the health effects of consuming seafood containing pollutants such as polychlorinated biphenyl and mercury, identifying indicators of recreational water contamination and illness, and exploring how climate change might affect the formation and transfer of methyl mercury in fish and shellfish that humans consume.

Fogarty International Center (FIC)

International Cooperative Biodiversity Groups (ICBG) Program: ICBG is a unique effort that addresses the interdependent issues of drug discovery, biodiversity conservation and sustainable economic growth. Funding for this program has been provided by the various NIH Institutes, the Biological Sciences Directorate and the Geosciences Directorate of the National Science Foundation, the Department of Agriculture in the National Institute for Food and Agriculture, and the Department of Energy in the Office of Biological and Environmental Research.

Efforts to examine the medicinal potential of the earth's plants, animals, and microorganisms are urgently needed, since enduring habitat destruction and the resulting diminishment of biodiversity will make it increasingly difficult to do so in the future. Forty to fifty percent of currently used drugs have an origin in natural products. Such natural projects are found both on land and marine environments. The FIC-managed ICBG Program is designed to guide natural products drug discovery in such a way that local communities and other source country organizations can derive direct benefits from their own diverse biological resources. Benefit-sharing may provide clear incentives for preservation and sustainable use of that biodiversity.

The newest ICBG funding announcement focused on microbial and marine source organisms, greater involvement of funded consortia with government contract resources, and greater use of molecular and genomic tools. It also featured new target health areas including neurological disorders and stroke, pain, and inflammatory processes with an emphasis on supporting the scientific basis for integrated conservation and development efforts through research and research training rather than through direct implementation activities. The new ICBG grants started in FY 2014.

FIC has programs that span the globe. ICBGs have worked in 22 countries in Latin America, Africa, Southeast and Central Asia, and the Pacific Islands, building research capacity in more than 20 different institutions and training hundreds of individuals. More than 5,000 species of plants, animals, and fungi have been collected to examine biological activity in 24 different therapeutic areas through this program. Numerous publications in chemistry, biodiversity policy, conservation and ethno-biology have emerged from the funded investigators. Broad public attention to the program and its timing relative to international developments associated with the U.N. Convention on Biological Diversity have allowed the ICBG program to offer useful working models for national and international policy

discussions related to biodiversity conservation incentive measures, technology transfer, intellectual property, and benefit-sharing.

In the funding period for FY 2012-2016, ocean-related funding included:

Costa Rica: The grant described in this grant involved programs located in the United States and Costa Rica that focus on the discovery of bioactive natural products from Costa Rica's rich biodiversity using ecologically-driven approaches. The project has contributed to the development of a bioenergy program toward discovery of cellulases and other enzymes for applications in biofuel production with an emphasis on natural product and biosynthetic enzyme-related research on unexplored and under-explored microorganisms such as marine bacteria and insect microbial endosymbionts. The project has improved the research capacity and economic opportunities for Costa Rica and contributed to its National Biodiversity Strategy through gathering data for its biodiversity inventory, intensive screening of its natural products in medically relevant assays, high throughput testing of its hydrolytic enzymes, sharing of resources, clear benefit-sharing, and training of students and visiting scientists.

Fiji and the Solomon Islands: This grant focused on the discovery and development of small molecule drug leads from cultured marine microbes and diverse coral reef organisms collected from Fiji and the Solomon Islands. Drug discovery efforts focused on four major disease areas of relevance to the United States and low and middle income countries: infectious disease including tuberculosis and drug- resistant pathogens; neglected tropical diseases including hookworms and roundworms; cancer; and neurodegenerative and central nervous system disorders. Screening in these therapeutic areas was performed in collaboration with pharmaceutical companies, academic groups, and various testing centers and government resources that are available to facilitate drug discovery and development.

Papua New Guinea (PNG): This grant used marine and terrestrial microbes and marine invertebrate animals as source organisms for drug discovery, enabling the creation of a diverse chemical screening library. The documentation and preservation of traditional knowledge concerning medicinal plant use in PNG was a second emphasis of this work. Medicinal plant surveys were complemented by projects in support of the Traditional Medicines Taskforce, student projects to provide pharmacologic validation and chemical standardization of medicinal plants, and the identification of novel bioactive molecules. This research provided professional development, educational opportunities and technology transfer for collaborating scientists and students. Conservation and biodiversity studies centered on a forest dynamics plot that was established in Wanang, PNG.

Philippines: This grant focused on mollusks and their microbial symbionts. Mollusks are one of the most diverse groups of marine animals, and their associated bacteria represent even more chemical diversity. The enhanced understanding of the interactions between mollusk symbionts and their hosts enables the discovery of the most novel and useful molecules that may hold therapeutic potential against the diseases of the nervous system, cancer, parasites, and infectious diseases. The project documented and described Philippine mollusk biodiversity and supported the training and infrastructure that provided the foundation for conservation of Philippine biodiversity.

Panama: This grant focused on the discovery of new lead compounds from Panamanian plants and marine algae for the treatment of several tropical diseases and cancer using a variety of innovative and traditional bioassays. This endeavor was tied to the development of scientific training and capacity building in a biodiversity-rich yet economically-developing country, and fostered tangible results in biodiversity conservation and infrastructure development.

Madagascar: This grant utilized the medicinal components of Madagascan plants and marine organisms to find drug leads for cancer, neurological, and infectious (malaria and

tuberculosis) diseases. The project included training in botanical methods, microbial techniques, and natural products isolation. The project also incorporated economic development and biodiversity conservation initiatives.

National Library of Medicine (NLM)

NLM, in collaboration with other Federal agencies and non-governmental organizations, develops and provides access to health information resources and technology for environmental health, toxicology and disaster medicine and public health. Several of these resources contain information pertaining to health issues in coastal areas and oceans.

Oil Spill and Health Effects Health Information Comprehensive Web Page: In response to the Deepwater Horizon oil spill, the Crude Oil Spills and Health Web page (http://disasterinfo.nlm.nih.gov/dimrc/gulfoilspill_2010.html) became the first HHS web page devoted to the oil spill and the effects on health (launched April 27, 2010). The site contained comprehensive resources regarding the Gulf Oil Spill, with links to NLM databases and numerous agencies, to include: PubMed (references to the biomedical literature), TOXNET, ChemIDPlus, Federal and state response agencies, multi-language resources, and social media sites. NLM worked with government agencies, industry, academia, and non-governmental organizations to publicize, cite, and encourage use of the webpage via traditional methods and social media. The webpage meets NLM's mission to collect, organize, and disseminate health information from multiple sources. This web page is no longer updated. More recent resources on the Gulf Oil Spill are found in PubMed(http://www.ncbi.nlm.nih.gov/pubmed/?term=((gulf+AND+oil)+OR+deepwater+horizon)) and the Disaster Lit database (http://disasterlit.nlm.nih.gov/search/?searchTerms=%28gulf+AND+oil%29+OR+%22deepwater+horizon%22&search.x=29&search.y=12&search=Search), and the Crude Oil Spills and Health web page (https://sis.nlm.nih.gov/dimrc/oilspills.html).

Enhance and Update Emergency Response and Toxicology Databases: A number of emergency response and toxicology databases and websites contain information about toxic chemicals that could affect oceans and coastal areas:

- Hazardous Substances Data Bank (HSDB) – comprehensive toxicological information on components of crude oil including toluene, benzene, petroleum distillates, etc. (http://toxnet.nlm.nih.gov)
- Wireless Information System for Emergency Responders (WISER) – consolidated information on chemical/physical properties, human health effects, emergency medical treatment, clean-up procedures, etc., on crude oil components including toluene, benzene, petroleum distillates and more. WISER is available as standalone application for the iPhone/iPod Touch, Microsoft Windows PCs, Windows Mobile devices, Palm OS PDAs, and via the Web as WebWISER. (http://wiser.nlm.nih.gov)
- ChemIDPlus – chemical dictionary database was updated to include additional information about Crude Oil/Petroleum (CAS RN 8002-05-9) and several dispersants. (http://chem.sis.nlm.nih.gov/chemidplus/chemidlite.jsp)
- TOXMAP – environmental health maps with the locations of toxic chemical releases and hazardous waste sites including coastal locations. (http://tomap.nlm.nih.gov).
- Tox Town – graphical interface displaying and describing environmental health hazards in and near a port. (http://toxtown.nlm.nih.gov/text_version/neighborhoods.php?id=5 or http://toxtown.nlm.nih.gov/flash/port/flash.php).
- Disaster Recovery and Environmental Health Resources – a list of selected web links on environmental health effects of disasters and the disaster recovery process.

(http://disasterinfo.nlm.nih.gov/dimrc/disasterrecovery.html)

Food and Drug Administration

The Center for Food Safety and Applied Nutrition, Office of Food Safety, Divisions of Seafood Science and Technology and Seafood Safety provide expert policy, scientific advice, and assistance on seafood related issues, including aquaculture technologies and the safety of imported seafood. These activities support informed decisions and improved understanding of the public health impact of seafood commodities.

The Center for Veterinary Medicine (CVM), Office of New Animal Drug Evaluation works with various government agencies and aquaculture associations to increase the number of safe and effective drugs that can be used by the aquaculture industry. The Minor Use and Minor Species Animal Health Act of 2004 plays a critical role in making more medications legally available to veterinarians and animal owners to treat minor animal species such as fish. Additionally, CVM's Office of Research explores the bio-distribution, residue persistence, metabolism, efficacy, and environmental effects of drugs and other chemicals used in aquaculture.

The Office of Regulatory Affairs (ORA) is responsible for the safety of domestic and imported fish and fishery products. Domestic and foreign establishments involved in the production, storage and distribution of fish and fishery products are inspected to ensure that seafood is produced and handled under the current Good Manufacturing Practices, Title 21 Code of Federal Regulation Part 123 (Fish and Fisheries Products), and the Food, Drug, and Cosmetic Act (FD&C Act). As almost 90 percent of the seafood eaten by American consumers is imported, the ORA Import Seafood Products Program continues to help ensure the safety of the imported seafood supply in the U.S. by using an approach that incorporates field exams, sample collection and analysis of imported products both at the border and in domestic commerce, foreign inspections and seafood Hazard Analysis and Critical Control Point (HACCP) review of importers' records for safety by investigators specially trained.

Centers for Disease Control – Agency for Toxic Substances and Disease Registry (ATSDR)

Great Lakes Restoration – Brownfields – Reimbursable from EPA

ATSDR conducted four community health projects that addressed potential contamination from brownfields/land reuse sites in effort to improve community health. The projects integrated community health assessment methods and/or public health expertise to address impacts of Brownfields/land reuse sites on the community's overall health status.

Great Lakes Human Health Effects Research Program – Reimbursable from EPA

ATSDR is conducting bio-monitoring for environmental contaminants in Great Lakes populations. The purpose of this project is to assess residents' body burdens of priority contaminants in the Great Lakes ecosystem, particularly those who are at highest exposure risk. The primary focus is on assessing unique, baseline, exposure information on priority contaminants to determine the prevalence of potentially toxic levels in vulnerable populations. The data also allows for geographic comparisons. Determining which Great Lakes contaminants are getting into human populations informs public health officials and guides environmental public health actions throughout the restoration process.

Engaging Healthcare in Great Lakes Environmental Exposure Risk Reduction

This project engages healthcare system leaders working in health insurance programs, HMOs, and vertically integrated healthcare organizations in identifying way to incorporate and sustain patient environmental exposure assessment and risk reduction counseling in clinical settings serving children and women of reproductive age. Risk reduction counseling will focus on ways to lower the patient's environmental exposure risks to contaminants in the Great Lakes, including risks associated with eating predatory fish having high levels mercury and PCB contamination.

DEPARTMENT OF HEALTH AND HUMAN SERVICES					
(dollars in millions)	FY 2012 Enacted	FY 2013 Enacted	FY 2014 Enacted	FY 2015 Enacted	FY 2016 Budget
National Institutes of Health					
Office of the Director					
Deepwater Horizon - National Toxicology Program (NTP) Research Study - (NIEHS)	-	-	-	-	-
Deepwater Horizon - Staff Support	-	-	-	-	-
National Institutes of Environmental Health Sciences					
Ocean-Related Extramural Research and Training	7.6	8.0	7.6	4.5	4.5
Deepwater Horizon - NIH 1/					
Deepwater Horizon - National Toxicology Program	0.3	0.3	-	-	-
Deepwater Horizon - GuLF Research Study and Follow-up					
NIEHS	3.6	2.5	2.4	2.0	3.4
Common Fund	0.5	5.5	2.5	3.0	-
Deepwater Horizon - Academic Consortia					
NIEHS	2.8	2.6	2.4	2.4	-
NHLBI	1.0	1.0	1.0	1.0	-
NCI	0.8	0.8	0.8	0.8	-
NCRR/NCATS	0.2	0.2	0.2	0.2	-
NIMH	0.2	0.1	0.2	0.2	-
NIHMD	0.1	0.1	0.1	0.1	-
NINR	0.1	0.1	0.1	0.1	-
OBSSR	0.3	0.2	0.2	0.3	-
Deepwater Horizon - SAMHSA 1/					
Deepwater Horizon - GuLF Research Study and Follow-up	-	1.4	0.1	-	-
Deepwater Horizon - Academic Consortia	-	1.5	-	-	-
Deepwater Horizon - Safety Training	-	0.4	-	-	-
Fogarty International Center					
Division of International Training & Research					
International Cooperative Biodiversity Program	3.9	3.1	2.5	2.0	1.0
Recovery Act-Funded NIH Challenge Grant in Health and Science Research: Models on the Health Effects of Climate	-	-	-	-	-
National Library of Medicine					
Deepwater Horizon - Oil Spill and Health Effects Health Information Comprehensive Web Page	-	-	-	-	-
Deepwater Horizon - Travel Related to Oil Spill (IOM Conference, Committee Meetings, etc.)	-	-	-	-	-
Deepwater Horizon - Enhance and Update Emergency Response and Toxicology Databases (WISER, HSDC,	-	-	-	-	-

DEPARTMENT OF HEALTH AND HUMAN SERVICES (continued)					
(dollars in millions)	FY 2012 Enacted	FY 2013 Enacted	FY 2014 Enacted	FY 2015 Enacted	FY 2016 Budget
Food and Drug Administration					
Division of Seafood Science & Technology	4.3	4.4	4.4	4.4	5.2
Division of Seafood Safety	4.6	4.6	4.6	4.5	4.5
Center for Veterinary Medicine	2.5	2.4	2.8	2.6	2.6
Office of Regulatory Affairs - Seafood Safety	43.9	43.9	43.9	43.9	43.9
Office of Regulatory Affairs - Deepwater Horizon	0.2	-	-	-	-
Agency for Toxic Substances and Disease Registry					
Division of Health Studies					
Great Lakes Human Health Effects Research Program -	3.7	-	-	-	-
Great Lakes Human Health Effects Research Program - Trust	-	-	-	-	-
Great Lakes Restoration - Brownsfields - Reimbursable from	0.3	-	-	-	-
Engaging Healthcare in Great Lakes Environmental Exposure Risk Reduction	-	0.3	0.5	-	0.3
TOTAL	**80.7**	**83.1**	**76.4**	**71.9**	**65.4**

DEPARTMENT OF HOMELAND SECURITY

Federal Emergency Management Agency

Flood Hazard Mapping and Risk Analysis Fund

The mission of the Flood Hazard Mapping and Risk Analysis fund (Risk MAP) is to deliver quality data that increases public awareness and leads to action that reduces risk to life and property through collaboration with state, local, and tribal entities. Risk MAP drives national actions to reduce flood risk by addressing flood hazard data update needs, supporting local government hazard mitigation planning, and providing the flood risk data needed to manage the National Flood Insurance Program (NFIP) financial exposure. Due to the inter-related nature of coastal and non-coastal activities, the entire program's enacted/budgeted amounts have been provided in their respective tables.

Salaries & Expenses Appropriation and Disaster Relief Fund

The Hazard Mitigation Grant Program (HMGP) is authorized by Section 404 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, as amended (the Stafford Act), Title 42, U.S. Code (U.S.C.) 5170c. The key purpose of HMGP is to ensure that the opportunity to take critical mitigation measures to reduce the risk of loss of life and property from future disasters is not lost during the reconstruction process following a disaster. HMGP is available, when authorized under a Presidential major disaster declaration, in the areas of the state requested by the Governor. Indian Tribal governments may also submit a request for a major disaster declaration within their impacted area. The amount of HMGP funding available to the applicant is based upon the estimated total of Federal assistance, subject to the sliding scale formula outlined in 44 CFR Section 206.432(b), that FEMA provides for disaster recovery under the Presidential major disaster declaration. Applications for HMGP are processed through the National Emergency Management Information System (NEMIS) Mitigation module (NEMIS-MT). The Risk Reduction Division will continue to maintain and enhance the NEMIS-MT system by:

- Repairing user created and system generated errors
- Operating & maintaining the legacy HMGP-NEMIS system
- Maintaining DHS-mandated IT security requirements on an ongoing basis
- Providing helpdesk support to state and FEMA program users

Pre-Disaster Mitigation Fund

The Pre-Disaster Mitigation (PDM) program is authorized by section 203 of the Stafford Act, 42 U.S.C. § 5133. The PDM program provides funds to states, territories, and Indian tribal governments for hazard mitigation planning and execution of mitigation projects. The goals of the PDM program are to reduce risks to people and structures, and to reduce the expenses of recovery from future disasters. PDM grants are awarded on a competitive basis. Due to the inter-related nature of coastal and non-coastal activities, the entire program's enacted/budgeted amounts have been provided in their respective tables.

National Flood Insurance Fund (NFIF)

National Flood Insurance Fund: Established in the U.S. Treasury by the National Flood Insurance Act of 1968, the National Flood Insurance Fund (NFIF) is a premium and fee-generated fund that supports the National Flood Insurance Program (NFIP). The Act, as amended, authorizes the Federal Government to provide flood insurance on a national basis.

Flood Management and Insurance Operations: Flood Management supports the overall management of National Flood Insurance Fund. FEMA makes consumer-oriented flood insurance available to reduce the Nation's vulnerability to flood hazards and accelerate recovery from floods, mitigate future flood losses, and reduce personal and national costs of flood disasters. FEMA administers NFIP so that insurance and floodplain management policies and operations are mutually reinforcing. Further, FEMA works to increase the NFIP policy base so that more people are indemnified by insurance from future financial losses from flood, facilitating their recovery, rebuilding communities, and reducing costs to taxpayers.

Flood Insurance Operations provides for all aspects of managing the insurance program including: (1) development and oversight of insurance coverage policy and regulations; (2) analysis and evaluation of insurance risks and claims data used to determine actuarial premium rates; and (3) oversight of insurance companies that write flood insurance policies and adjust claims.

Floodplain Management and Flood Mapping: The mission of the Risk Mapping, Assessment, and Planning (MAP) Program is to deliver quality data that increases public awareness and leads to action that reduces risk to life and property through collaboration with State, local, and tribal entities. Risk MAP promotes public and private sector awareness and understanding of community specific risks through an integrated flood risk management approach that weaves flood hazard data developed to manage the National Flood Insurance Program (NFIP) financial exposure into watershed-based risk assessments that serve as the foundation for local Hazard Mitigation Plans and support community actions to reduce risk. These activities enable Risk MAP program to be a primary strategy for how FEMA delivers information necessary for flood risk reduction and disaster-resilient, sustainable community development.

Floodplain Management funds salaries and expenses for the implementation staff at FEMA's Headquarters and ten Regional offices to administer and deliver floodplain management activities that reduce flood risk. These activities include development of policy, guidance, regulations, and publications, administration of the Community Assistance Program-State Support Services Element (CAP-SSSE) grant program, as well as the provision of compliance monitoring and technical assistance.

Flood-Related Grants: NFIF supports flood hazard reduction efforts facilitated through its flood-related grants and assistance program, Flood Mitigation Assistance (FMA). The FMA provides grants to states, communities and Indian Tribal Governments to reduce the risk of flood damage to existing buildings and infrastructure. Flood-Related grants fund activities that decrease or eliminate risk of flood damage to structures insured under NFIP. Flood-related grants also fund activities that decrease the long-term risk of flood damage to structures insured under NFIP that have experienced losses from previous flood damage.

Due to the inter-related nature of coastal and non-coastal activities, the entire program's enacted/budgeted amounts have been provided in their respective tables.

U.S. Coast Guard

Maritime Law Enforcement

The Maritime Law Enforcement program preserves America's jurisdictional rights within our maritime borders and suppresses violations of Federal law on, under and over the high-seas. The Coast Guard is the lead Federal maritime law enforcement agency for enforcing national and international law on the high-seas and in the U.S. Exclusive Economic Zone (EEZ), and on the waters over which the United States has jurisdiction. The Living Marine Resources and Other Law Enforcement statutory missions are carried out under the auspices of the Maritime Law Enforcement program.

The Coast Guard protects sensitive marine habitats and sanctuaries, marine mammals, and endangered marine species. The Coast Guard also deters, detects, and interdicts incursions by foreign vessels fishing in the U.S. EEZ, thus protecting our valuable stocks of domestic living marine resources from foreign poaching.

Maritime Prevention

The Maritime Prevention program reduces personnel casualties and property losses, minimizes security risks, protects the marine environment, and safeguards maritime commerce. The Coast Guard develops and enforces federal marine safety, security, and environmental regulations. It reviews vessel and maritime facility security plans, conducts security inspections, and enforces Transportation Worker Identification Credential (TWIC) regulations. The Coast Guard conducts compulsory, as well as voluntary vessel safety exams and inspections, certifies and licenses U.S. mariners, and promotes best practices by investigating marine casualties and sharing its findings. It provides grants to States to improve recreational boating safety and supports a variety of government and non-government boating safety efforts in partnership with other Federal agencies, State and local governments, marine industries and associations. The Marine Safety and Marine Environmental Protection (prevention activities) statutory missions support ocean and coastal activities within the Coast Guard's Maritime Prevention program.

The Coast Guard serves as America's voice in the International Maritime Organization (IMO) and enforces international environmental and safety laws and treaties set forth by the IMO through its Port State Control Vessel Inspection Program. Owners and operators of vessels and facilities that carry or handle oil and designated hazardous substances are required by the Coast Guard to submit Response Plans in accordance with the Oil Pollution Act of 1990 and the IMO's highly successful International Convention for the Prevention of Pollution from Ships, MARPOL 73/78. These vessel and facility plans address spill response and mitigation procedures, required pollution prevention and cleanup equipment, and crew training requirements.

As the National Recreational Boating Safety Coordinator, the Coast Guard works to minimize loss of life, personnel injury, property damage, and environmental harm associated with recreational boating. The Coast Guard's boating safety program involves public education programs, regulation of boating design and construction, approval of boating safety equipment, and vessel safety checks of recreational boats for compliance with Federal and State safety requirements. The all-volunteer Coast Guard Auxiliary plays a central role in executing many aspects of this program.

Maritime Response

The Maritime Response program mitigates the consequences of marine casualties and disastrous events. The Coast Guard minimizes loss of life, injury, and property loss by searching for and rescuing persons in distress in the maritime environment. Coast Guard preparedness efforts for all threats and all hazards ensures incident response and recovery resources are fully ready and capable to minimize impact of disasters to people, the environment and the economy. The Search and Rescue and Marine Environmental Protection (response activities) statutory missions support ocean and coastal activities within the Maritime Response program.

As the lead agency for maritime search and rescue in waters over which the United States has jurisdiction, the Coast Guard coordinates its afloat and airborne units, as well as those of Federal, State, Tribal, and local responders. The Coast Guard coordinates worldwide merchant fleet voluntary assistance to assist mariners and vessels in distress through the Automated Mutual-assistance Vessel Rescue (AMVER) system.

To ensure all coastal areas are prepared to respond to oil spills, the Coast Guard works closely with Area Committees to draft Area

Contingency Plans. Area Contingency Plans lay out a framework for how agencies and industry within the Area will work together during a response, and highlight environmentally sensitive areas and provide specific ways to protect them from harm. The Coast Guard participates in regular oil spill exercises to ensure that the plans are adequate and realistic. Additionally, the Coast Guard plans for and participates in Spill of National Significance (SONS) exercises in consultation with the National Response Team. The SONS exercises typically include a 3-year progressive series of discussion-based exercises that focus on current and emerging spill response policy issues and are attended by senior leaders across the whole of government.

The Coast Guard also serves as the Chair for the Interagency Coordinating Committee on Oil Pollution Research. In this role, the Coast Guard works with 15 other Federal partners to ensure that oil pollution Research and Development projects are coordinated across Federal and academic entities, and takes into account the knowledge base and best practices of other stakeholders.

Marine Transportation System Management

The Marine Transportation System Management program ensures a safe, secure, efficient, and environmentally sound waterways system. The Coast Guard minimizes disruptions to maritime commerce by assessing and mitigating risks to safe navigation and by providing waterways restoration capabilities after extreme weather events, marine accidents or terrorist incidents. The Coast Guard works in concert with other Federal agencies, state and local governments, marine industries, maritime associations, and the international community to optimize balanced use and champion development of the Nation's Marine Transportation System. The Aids to Navigation statutory mission supports ocean and coastal activities within the Maritime Prevention program.

The Coast Guard provides a safe and efficient navigable waterway system to support domestic commerce, international trade, and the military sealift requirements critical to our national defense posture. Coast Guard services include long-and short-range aids to navigation, access to a range of navigational information through Notices to Mariners, vessel traffic services, technical assistance and advice, vessel safety standards and inspection, and bridge administration standards and inspection. Coast Guard teams also train the maritime forces of other nations throughout the world.

Icebreaking

Coast Guard icebreaking provides access through ice-impacted domestic and international waters. The mission is conducted in the Polar Regions, the Great Lakes and along northeastern and mid-Atlantic regions of the U.S. coast.

Domestic ice operations aid communities in emergency situations and facilitate safe commercial navigation through ice laden waters of the Nation's MTS. Domestic icebreaking activity allows for the transport of goods vital to U.S. manufacturing and electricity generation, including: coal, salt, home heating oil, petrochemicals, and bulk cargo. The Coast Guard also provides isolated island communities the ability to obtain vital goods and services, such as food and medical care, and prevents ice-related flooding in shoreline and riverside communities.

Coast Guard international ice operations support science activities in both Polar Regions and a range of Coast Guard missions in the Arctic. The Coast Guard operates the only U.S.-flagged heavy icebreaker capable of providing a year-round surface presence in both Polar Regions vital to exercising national sovereignty in the Arctic and supporting the resupply of the McMurdo Research Station and treaty enforcement requirements of the U.S. Antarctic Program.

DEPARTMENT OF HOMELAND SECURITY					
(dollars in millions)	FY 2012 Enacted	FY 2013 Enacted	FY 2014 Enacted	FY 2015 Enacted	FY 2016 Budget
Federal Emergency Management Agency					
*Flood Hazard Mitigation and Risk Analysis**					
Flood Hazard Mitigation and Risk Analysis	97.7	90.2	95.2	100.0	278.6
'Previously known as Flood Map Modernization Fund					
*Pre-Disaster Mitigation Fund**					
Pre-Disaster Mitigation Program	35.5	14.8	25.0	25.0	200.0
*National Flood Insurance Fund */***					
Flood Mitigation and Flood Insurance Operations (Discretionary)	22.0	22.0	22.0	23.8	25.2
Flood Plain Management and Flood Mapping (Discretionary)	149.0	149.0	154.3	155.5	155.9
Severe Repetitive Loss (Mandatory)	10.0	-	-	-	-
'Program only directly called out in enacted 2012 bill					
Flood Related Grants (Mandatory)	40.0	120.0	100.0	150.0	175.0
'Previously known as Flood Mitgation Assistance Grants					
Disaster Relief Fund/****					
Hazard Mitigation Grant Program	125.0	764.0	26.0	-	-
*Salaries & Expenses**					
Hazard Mitigation Grant Program	2.9	2.3	1.2	1.2	1.2
U.S. Coast Guard					
Maritime Law Enforcement					
Living Marine Fisheries	32.9	25.6	26.4	26.9	28.2
Marine Environmental Protection	171.8	125.6	174.9	154.8	160.8
Domestic Fisheries	618.6	618.6	557.3	546.3	642.4
Maritime Prevention					
Recreational Boating Safety	288.2	236.0	239.8	236.6	233.2
Comercial Vessel Safety	135.4	147.7	146.9	134.2	139.1
Maritime Response					
Search and Rescue	839.5	741.1	750.0	686.2	699.4
Maritime Transportation System Management					
Waterways Management	137.5	76.7	76.6	90.8	94.7
Radio Navigation Aids	202.7	109.3	109.4	25.9	25.9
Short Range Aids to Navigation	1111.6	938.6	910.3	1017.0	1048.3
Ice Breaking - Domestic	56.8	51.9	51.8	58.6	61.2
Bridge Administration	14.7	11.3	11.3	18.9	19.7
TOTAL	**4,091.8**	**4,244.7**	**3,478.4**	**3,451.7**	**3,988.8**

* Due to the inter-related nature of coastal and non-coastal activities, the entire program's enacted/budgeted amounts have been provided.

** The National Flood Insurance Fund (NFIF) is a premium and fee-generated fund that supports the National Flood Insurance Program (NFIP). All amounts represent authorized Budget Authority for the respective year.

*** The amount of HMGP funding available to the Applicant is based upon the total Federal assistance to be provided by FEMA for disaster recovery under the major disaster declarations authorized by the President.

DEPARTMENT OF THE INTERIOR

U.S. Geological Survey

Ecosystems

The programs within the Ecosystem Mission Area include: Status and Trends; Fisheries Program; Wildlife Program; Environments Program**;** and Invasive Species. These programs work collaboratively to provide an advanced understanding of ecosystem structure, function, patterns, and processes to better understand the interactions of terrestrial, freshwater, and marine ecosystems.

Effective development and implementation of *ecosystem-based management strategies* for coastal ecosystems, coastal habitats, and species of concern rely on understanding ecosystem condition, change, causes of change, and the connections between and among species, including humans and the environment. United States Geological Survey (USGS) scientists study the interactions of coastal and estuarine fisheries, wildlife, and other aquatic and marine species, how changes in habitat affect resident and migratory species, and improve restoration and mitigation strategies for ecosystem resilience to disturbance. USGS researchers work with DOI partners to conserve and restore important coastal and marine resources.

Climate

Changes in climate and land use have the potential to significantly affect the natural resources and infrastructure of our Nation, its coasts, and adjacent oceans. The Climate Research and Development Program (R&D) supports multidisciplinary research designed to improve the understanding of the rates, causes, and consequences of climate and land use change. This research provides answers to questions regarding sea level rise, the natural variability in ocean temperature over long time scales (decadal and longer) and how that varies on a regional basis. Projects include paleoceanographic research in the Arctic Ocean, eastern Pacific Ocean, and Gulf of Mexico that documents long-term (decadal-to millennial-scale) patterns of ocean temperature, salinity, and sea ice. This research is providing evidence for the timing and conditions associated with sea-ice formation, on the stability of arctic sea ice over long time scales, and how ocean and coastal systems respond to different modes of climate variability, such as El Niño Southern Oscillation. Such evidence is being used to evaluate the relative impacts of natural climate variability and human alteration of the system. The Climate R&D Program also conducts research on long-term patterns of sea level change and the impacts on coastal ecosystems. Geologic studies of past intervals of high sea level are providing analogs for the potential magnitude and rates of sea level rise associated with projected intervals of extended warmth. Research on the West Antarctic Ice Sheet and North American glaciers is providing critical documentation of past and current rates of ice melting and the potential contribution of melting glaciers to sea-level rise. Research on coastal wetland response to rising sea levels is providing critical data to help forecast impacts of different sea level-scenarios and assist resource managers in devising sustainable management strategies to protect critical coastal habitats.

The National Climate Change and Wildlife Science Center and DOI Climate Science Centers support multiple facets of research needed to understand complex issues related to climate change effects on ecosystems and the services they provide. This includes research on the impacts of potential changes to the timing of freshwater delivery from streams to nearshore habitats due to climate change on economically important species such as herring and salmon in Alaska. Multi-disciplinary research is also being conducted to better understand the effect of climate variability on inundation events in Pacific island communities and coastal wildlife refuges on the East Coast. The research efforts focus on understanding the role of climate variability on

the frequency of inundation events and integrating the expertise of specialists in global-change science, coastal dynamics, resource economics and decision science. The overarching goal is to help communities and decision-makers do the necessary adaptation planning to increase their resilience against sea level changes and the potentially increasing number of coastal storm events due to climate change.

Energy and Minerals, and Environmental Health

The Energy and Minerals, and Environmental Health mission area consists of four programs: the Energy Resources Program; the Mineral Resources Program; the Contaminant Biology Program; and the Toxic Substances Hydrology Program. The mission of the USGS Energy Resources Program is to conduct research and assessments to advance the understanding of energy resources and key impacts and issues, in order to provide science for informed decision making for: understanding the fundamental Earth processes that form energy resources; understanding the environmental behavior of energy resources and their waste products; providing inventories and assessments of energy resources; understanding the effects of energy resource development on natural resources and society; and understanding the reliability and availability of energy supplies. Energy Resources Program activities address the distribution of gas hydrates and conventional energy resources in marine systems, and the consequences of the release of methane trapped in hydrate deposits on climate change and sea-floor stability. The program also supports research on geologic carbon sequestration potential.

The Toxic Substances Hydrology Program and Contaminant Biology Program are research and development programs that provide scientific information on environmental contamination to improve characterization and management of contaminated ecosystems and sites, to protect human and environmental health, and to reduce potential future contamination problems. The Programs include development of methods to assess environmental occurrence and ecological effects of emerging and understudied environmental contaminants, including algal toxins, methylmercury, pharmaceuticals and personal care products, and pesticides and other industrial chemicals suspected of being endocrine disruptors. The activities include characterization of the sources and/or causes of contamination, which provides the knowledge basis for prevention and mitigation actions, and occurrence and effects in aquatic ecosystems, including selected coastal ecosystems. The Contaminant Biology Program investigates the effects and exposure of environmental contaminants to the Nation's living resources, particularly those under the stewardship of the Department of the Interior.

Natural Hazards

The Earthquake Hazards Program (EHP), Volcano Hazards Program (VHP), the Global Seismographic Network (GSN), and Landslides Hazard Program (LHP) provide information and products for hazard-loss reduction, including hazard and risk assessments and monitoring.

Assessments of hazard, risk, and vulnerability are integral to management and policy to ensure safe communities, vital economies, and healthy ecosystems.

The Coastal and Marine Geology Program (CMGP) conducts research on changes in the coastal and marine environment, whether naturally occurring or human induced. Changes in this environment can endanger our quality of life, threaten property, pose risk to fragile environments, and affect livelihoods. The CMGP provides regional understanding of coastal and marine settings, processes, and forecasts of future vulnerability to natural and human-influenced processes including erosion, storms, and sea-level rise. CMGP-supported geologic and geophysical mapping provides information resources on coastal and marine habitats and resource occurrence which, coupled with process-based models, supports forecasts of ecosystem vulnerability. Collaborative mapping activities include coastal elevation and land-

cover mapping, regional sea-floor and habitat mapping with State and Federal Partners, and specialized mapping of coral reef and other habitats.

CMGP provides national assessments of shoreline change and regional assessments of erosion, storm, sea-level rise, and tsunami vulnerability. CMGP studies, collaboratively with other USGS programs, provide understanding of the environmental setting and processes to inform regional restoration projects; fate, transport and effect of contaminants and pathogens in coastal and marine settings; energy resource (gas hydrate) occurrence and processes, and the susceptibility of sensitive ecosystems (shallow and deep corals, wetlands) to environmental change including ocean acidification.

Water Resources

The Ocean Action Plan funding supports ongoing activities in three areas of water quality investigation in the National Water Quality Program. The first area focuses on nutrient, carbon, pesticide, and suspended sediment concentrations that are monitored at four, large-river/coastal stations sampled as part of the USGS National Water Quality Network for Rivers and Streams. These sites include: the Mississippi River at Vicksburg, MS, the Apalachicola River near Sumatra, FL, the Brazos River near Rosharon, TX, and the Hudson River near Poughkeepsie, NY. Funding also supports operation of a continuous water-quality monitoring station on the Atchafalaya River at Morgan City, LA that increases the accuracy of nitrogen load estimates to the Gulf of Mexico.

The second area focuses on maintaining the Water Quality Portal, a cooperative data service sponsored by the USGS, the United States Environmental Protection Agency (EPA), and the National Water Quality Monitoring Council along with over 400 states, Tribes, and other Federal and local partners. The portal provides users with access to results of more than 260 million water quality and aquatic biological samples in all 50 states and United States Territories in one place.

The third and final area focuses on supporting syntheses of current and historical water quality activities and conditions in coastal receiving waters such as Puget Sound and Albemarle Sound. The purpose of these studies is to identify data gaps and technological needs that can be used to inform monitoring plans addressing key water quality issues in these areas such as sediment-born contaminant loads from large rivers and eutrophication in relation to harmful algal blooms, algal toxins, and primary production. Lastly, a USGS Great Lakes Water Quality Rapid Response Plan is being developed that describes protocols, techniques, and equipment for cost-effective data collection, evaluation of new contaminant detection technologies, and rapid data dissemination to guide response efforts in response to floods, natural disasters, spills, combined sewer overflows, and urban flooding. The USGS plan will identify pathways for coordination with other agencies such as the National Oceanographic and Atmospheric Administration, the EPA, and the Coast Guard, and affected state and local governments during response efforts.

Core Science Systems

The National Cooperative Geologic Mapping Program (NCGMP) produces accurate geologic maps and 3-D geologic frameworks that provide critical data for sustaining and improving the quality of life, economic vitality, and ecological health of the Nation. Geologic maps are indispensable for understanding Earth-surface processes and ground-water availability and quality, supporting land-management decisions, understanding hazard vulnerability and mitigating hazard impacts, assisting in ecological and climatic monitoring and modeling, and understanding onshore-offshore sedimentary processes.

The National Geospatial Program (NGP) organizes, maintains, and publishes the geospatial baseline of the Nation's topography, natural landscape, and built environment. The NGP leads and manages interagency/intergovernmental efforts to coordinate the acquisition and provision of foundational topographic information comprised of elevation and hydrography

(surface-water features such as rivers and lakes) data. In coastal settings the NGP, in collaboration with the Coastal and Marine Geology Program and National Oceanic and Atmospheric Administration (NOAA), is working to develop high-resolution elevation models (including nearshore bathymetry) in response to requirements of coastal zone managers.

The mission of the Core Science Analytics, Synthesis and Libraries (CSASL) is to accelerate research and decision-making through data science, information delivery, advanced computing and biodiversity analytics. The CSASL provides credible, applicable, unbiased information for science-based decision-making, particularly as it pertains to the conservation, management, and use of the Nation's biological resources.

The CSASL works with NOAA, U.S. Fish and Wildlife Service (USFWS), and the other partners of the National Fish Habitat Partnership to develop and operate the data management and distribution systems supporting the National Fish Habitat Action Plan (NFHAP). The operational NFHAP Data System provides the data from the 2010 national coastal and inland assessments and an interactive data catalog and map-based visualization system for the assessment results. The presentation and distribution of the 2015 assessment will build on these capabilities, augmented by a collaboration with the U.S. Global Change Research Program to leverage the technologies behind the Global Change Information System and the 2014 National Climate Assessment.

Beyond the assessments themselves, the NFHAP Data System facilitates the transfer of data between and among the Fish Habitat Partnerships and the National Fish Habitat Board to help inform decisions for implementing conservation actions by improving understanding of landscape-scale processes from headwaters to the coasts and oceans. Development and support of the NFHAP Data System improves coordination between Federal partners and enhances their support to regional, state, tribal, and local organizations working to improve the Nation's fish habitat.

The CSASL develops and operates the Ocean Biogeographic Information System (OBIS-USA), the U.S. node to the International OBIS, the global assemblage of marine biological data operated by the International Oceanographic Commission. OBIS-USA integrates data that indicate where and when in history (1800 to present) marine species occurred within our national waters. The OBIS-USA data model includes information on sampling events and the discovered absence of species in areas where they may have been found previously along with measurement data such as species abundance. These observations and measurements, along with the ability to link directly with environmental conditions coming from the Integrated Ocean Observing System, provide a rich source of data for distribution and marine habitat modeling. Together, these data inform policy makers and ocean planners on ecosystem status and health from specific regions to the global ocean.

Bureau of Land Management

Education

The Bureau of Land Management (BLM) has an active and extensive youth education program, and in coastal areas BLM has a number of educational outreach initiatives designed to inform students of targeted age groups on good stewardship of watersheds and ocean environments. One program is the interagency Hands on the Land (HOL) network of outdoor classrooms, which provides field-based education on stream and riparian habitats and healthy watersheds. At the BLM's Campbell Creek Science Center in Anchorage, Alaska, for example, curriculum-correlated programs teach 2nd graders about the life cycle of the salmon and engage 6th graders in collecting data about riparian areas. In addition, each year hundreds of 4th graders participate in Water Discovery Days, a free water education festival. At Jupiter Inlet Outstanding Natural Area in Florida, students from a local environmental high school have been involved for years in service-learning projects ranging from reintroducing native mangroves to constructing a tidal wetland to long-term

ecological monitoring. Along the Pacific coast BLM supports numerous HOL sites, including several in the California Coastal National Monument. In the Lost Coast Headlands near Arcata, students engage in service-learning projects such as installing wildlife enhancements and removing non-native weeds. In the nearby Trinidad Bay area, students take part in monthly lessons about the coastal environment and participate in citizen science projects as well as community outreach. At the King Range National Conservation Area, elementary students investigate tide pools while high school students are involved in a long-range NOAA-sponsored Phytoplankton Monitoring Program. On the shores of Humboldt Bay hundreds of students have celebrated Kids Ocean Day with beach cleanup projects and a conservation-themed aerial art display for more than 10 years. Farther north along coastal Oregon, students and families participate in tide pool explorations and shorebird hikes at sites such as Coos Bay and Yaquina Head Outstanding Natural Area.

Other initiatives are directed at student interns and many of these interns decide to continue in careers directed at the management of coastal watersheds at the BLM or other environmental agencies or organizations. Yaquina Head is one of several BLM sites that have engaged bilingual interns from Environment for the Americas to expand outreach about shorebirds and other natural resources to Spanish-speaking visitors and communities. In fact, many BLM education and partnership efforts are designed to provide work and training opportunities for young people and generate interest in natural resource careers. Youth crews are engaged in habitat restoration projects in riparian areas and interns are often involved in water quality monitoring as well as assessments and inventories of aquatic resources. Reaching some 300,000 students annually, BLM's education and youth engagement programs will help to create the next generation of public land stewards.

Watershed and Habitat Management

The BLM manages coastal land and facilities in Alabama, Alaska, California, Florida, Oregon, and Washington. These lands often include extensive watersheds that flow to the Pacific Ocean, Bering Sea, and Arctic Ocean and small parcels of important and significant habitats on the Gulf and Atlantic. A focal point of BLM land management is the protection and restoration of water quality and fish habitat. Anadromous fish, such as Pacific salmon, utilize habitat on BLM-managed lands for spawning and rearing as far inland as the tributaries of the Columbia River in Idaho/Washington and the Yukon River in Alaska. The protection, restoration, and monitoring of water quality and fish habitat is outlined in BLM Resource Management Plans and Integrated Activity Plans. The BLM also funds a variety of research projects to further understanding of the effects of land management activities on riparian conditions, water quality, and fish habitat.

The North Slope Science Initiative (NSSI) is a collaborative, science-based program that is integrating inventory, monitoring, and research activities across the North Slope of Alaska and its adjacent seas. The mission is to improve scientific and regulatory understanding of terrestrial, aquatic, and marine ecosystems in the context of energy development and climate change. While sponsored and primarily funded by BLM, the NSSI is directed by an Oversight Group made up by leadership representatives of member organizations, including Federal and state agencies, the Arctic Slope Regional Corporation, and the North Slope Borough. The NSSI is supported by a small BLM staff and has two advisory groups: a Senior Staff Committee and a Science Technical Advisory Panel. The NSSI is also working on a circumpolar scale with the Arctic Council, the eight Arctic member countries, and its various working groups.

Oil and Gas Management

Of the 3,600 miles of coastline BLM manages in Alaska, much forms the northern edge of the 23.5 million acres of Alaska facing the Arctic Ocean. Known as the National Petroleum Reserve - Alaska (NPR-A), this land is located on the seaward side of the Brooks Range, (the North Slope). All of this area drains northward into

the Arctic Ocean. These lands were set aside in the early 20th Century as an oil reserve. The BLM's management of this area protects surface values consistent with oil and gas development and is formed by an Integrated Activity Plan, taking into account environmental consequences of resource development, Environmental Impact Statements, and consultations with tribes, communities and Alaska Native Corporations concerning subsistence hunting and fishing rights. Of major concern are fish and caribou populations and migrations, climate change, permafrost changes, and a shorting of the winter oil exploration and production season (winter) when heavy equipment can cross the tundra with minimal impacts.

Coastal Management

BLM coastal management is highlighted with six coastal landscapes designated for protection, as part of the BLM administered National Landscape Conservation System. Jupiter Inlet Lighthouse Outstanding Natural Area (FL), Piedras Blancas Outstanding Natural Area (CA), Yaquina Head Outstanding Natural Area (OR), the King Range National Conservation Area (CA), California Coastal National Monument (CA), and San Juan Islands National Monument (WA). These landscapes are set aside for their outstanding natural habitats, historic settings, and archaeological sites. Though not significant in size, these places are renowned for their public investment and engagement. Each of these designated areas has dedicated youth stewardship programming, highly developed citizen science initiatives, and interpretation accomplished in relationship with the community. Collaboration with local, county, state, and tribal governments is a standard of accomplishment, as well as coordination with local and national stakeholders and environmental groups. Management decisions are science-based and focus on maintaining the sustainability of the resource values identified in designating language.

In addition to these National Conservation Lands the BLM engages in costal management in other areas such as the beaches of Fort Morgan, AL, and BLM-administered lands on the Pacific coast outside the National Conservation Lands units. Coastal management is equally important in these areas and the BLM continues to work extensively with partners and local communities to ensure the protection of these environments.

Bureau of Ocean Energy Management

The Bureau of Ocean Energy Management (BOEM) is responsible for managing the Nation's offshore resources in a balanced way that promotes efficient and environmentally responsible energy and mineral development through oil and gas leasing, renewable energy development, and marine mineral leasing, all of which are guided by rigorous, science-informed environmental review and study. BOEM plays an important role in advancing the President's all-of-the-above approach to comprehensive energy strategy for expanding responsible development of domestic energy resources as part of a broad effort to secure the Nation's energy future, benefit the economy, and create jobs.

BOEM currently manages about 6,000 active oil and gas leases on nearly 33 million acres on the Outer Continental Shelf (OCS). In FY 2014, OCS leases provided 519 million barrels of oil and 1.2 trillion cubic feet of natural gas to energy markets, accounting for about 16 percent of domestic oil production and five percent of domestic natural gas production, almost all of which is produced in the Gulf of Mexico. Annually, this production generates billions of dollars in revenue for state and local governments, while supporting hundreds of thousands of jobs. During FY 2014, OCS leasing and production generated $7.4 billion in revenue for the Federal Treasury and state governments. The overall level of activity on the OCS related to this production, leasing revenue, drilling, and development of new projects is estimated to support employment of about 700,000 direct, indirect, and induced jobs.

Bureau Mission

The mission of the Bureau of Ocean Energy Management is to manage development of the

Nation's offshore energy and mineral resources in an environmentally and economically responsible way. BOEM is responsible for both conventional and renewable energy leasing policies and programs. For conventional energy, this applies to all OCS leasing and development issues for oil, gas and other marine minerals. This includes developing a Five Year OCS Oil and Gas Leasing Program and designing individual oil and gas lease sales in a way that makes oil and gas resources available, protects communities and the environment, ensures fair value to the American taxpayer, and provides incentives for diligent development of leases. On the renewable side, BOEM manages offshore leasing and oversees all activities for renewable energy and alternate-use projects. BOEM is also responsible for managing the development of all OCS minerals other than oil, gas, and sulfur. Specifically, BOEM conveys the rights to OCS sediment – including sand and gravel – that is used for coastal restoration and preservation projects.

Renewable Energy

The Energy Policy Act of 2005 authorizes DOI to grant leases, easements, or rights-of-way for activities on the OCS that produce or support production, transportation, or transmission of energy from renewable sources. Renewable energy and alternate-use projects can include wind, wave, and ocean current projects, as well as projects that make alternative use of existing oil and natural gas platforms in Federal waters.

BOEM manages renewable energy leasing activities for the OCS, including program development and implementation; environmental analysis, assessment, and compliance work in support of competitive and non-competitive leasing actions; review of site assessment and construction and operations plans; consultation with state and local governments, Federal agencies, Tribes, and other stakeholders; and development of a multi-purpose marine cadastre. BOEM's renewable energy program is also committed to advancing the Department's "Smart from the Start" initiative, which aims to facilitate efficient and environmentally responsible siting, leasing, and construction of new wind energy projects in the Atlantic. BOEM is also working to facilitate renewable energy off the Pacific Coast.

Conventional Energy

Conventional energy development begins with BOEM's commitment to the responsible development of the Five Year Outer Continental Shelf Oil and Natural Gas Leasing Program that includes assessments of the oil and gas resource potential on the OCS, inventories of oil and gas reserves, and economic evaluations of OCS submerged lands to ensure the receipt of fair market value for taxpayers on OCS leases. Carrying out these responsibilities requires balancing the energy demands and mineral needs of the Nation with the protection of the human, marine, and coastal environments. As the Nation's offshore energy and mineral resource manager, BOEM administers a comprehensive oil and gas leasing program that begins with a progressive cycle of resource, economic and environmental analyses that provide decision makers with key information necessary for making informed decisions on the size, timing and location of OCS conventional energy leasing. BOEM's responsibilities are broad, beginning with identifying and calculating appropriate boundaries and legal descriptions; identifying, inventorying, and assessing the Nation's offshore energy and mineral endowment; developing a transparent, systematic, and comprehensive schedule for OCS oil and gas resource offerings; developing appropriate financial terms to ensure the Nation receives fair market value for its OCS resources; and carefully reviewing requests for approval of industry plans to explore, develop, and produce leased resources.

Leasing and Plan Administration

BOEM conducts in-depth reviews of exploration plans, development and production plans, and development operation coordination documents to ensure that plan activities are conducted in accordance with applicable laws, regulations, and lease terms. BOEM is committed to ensuring that its process for reviewing and approving plans is

rigorous, efficient, and transparent to industry. BOEM works collaboratively with industry throughout the review of plans to ensure that operators comply with rigorous operational and environmental requirements and that the review process is efficient.

Resource Evaluation

BOEM's resource evaluation program supports numerous Bureau activities, both energy and non-energy (e.g., marine minerals), through critical technical analyses. The primary objective is to identify areas of the OCS that are most promising for oil and gas development. This program includes: fair market value determination, which is focused on thoroughly assessing the oil and gas potential and associated economic value of OCS tracts offered for lease; resource assessment, which is focused on identifying geologic plays on the OCS that offer the highest potential for hydrocarbon resources; reserves inventory, or the identification of resources that can be extracted using current technology; and acquisition and analysis of geological and geophysical (G&G) data, as well as permitting of G&G activity to ensure that pre-lease exploration, prospecting, and scientific research operations in Federal waters do not interfere with each other, with lease operations, or with other uses of the area are conducted in a balanced way that protects wildlife and the environment, as well as cultural and archaeological resources, and minimizes conflicts with other uses of the OCS.

Economic Evaluation

BOEM conducts economic, statistical, engineering, and cost-benefit analyses for the Department of the Interior, other Federal agencies, and Congress. Through its economics division in headquarters and in the regions, BOEM evaluates, recommends, designs, and implements policies and legislation relating to lease terms, bidding systems, auction designs, rulemaking, revenue forecasts, post-sale bid adequacy determinations, and revenue sharing with the states.

Environmental Science

Science is critical to BOEM's mission to manage offshore energy and mineral resources in an environmentally and economically responsible way. A fundamental component of this mission is the direction set forth by numerous and diverse legislative statutes. For instance, the OCS Lands Act requires BOEM to consider the impacts from OCS development on the marine, coastal, and human environments. BOEM's science is intended to inform decision-makers and the public about potential environmental impacts of OCS energy and mineral resource development, how to prevent or mitigate those impacts, and how to monitor impacts and measures for continued environmental protection. Therefore, the valuable data collected through BOEM's environmental programs is used not only within BOEM but also by stakeholders including other Federal agencies and state and local governments.

BOEM's environmental programs support a full spectrum of environmental analysis and coordination, from identifying and funding environmental studies to interagency coordination on environmental issues to environmental assessments of potential effects from Bureau-proposed or authorized activities in compliance with environmental statutes. The scope of BOEM's environmental activities extends throughout the Bureau – to renewable and conventional energy activities and in every region. Environmental studies and assessments are integrally connected, as BOEM's research program is specifically designed to target key policy needs and to support the environmental reviews that the agency conducts in order to support decision-making.

Marine Minerals Program

BOEM is responsible for the policy and guidance for the development of all OCS minerals other than oil, gas, and sulphur under Section 8(k) of the OCS Lands Act and is the sole responsible steward of OCS sand and gravel resources critical for the long-term success and cost-effectiveness of many shore protection, beach nourishment, and wetlands restoration projects along the Gulf

and Atlantic coasts. The OCS Lands Act, as amended, authorizes BOEM to convey, on a noncompetitive basis, the rights to OCS sediment resources to Federal, state, and local government agencies for shore protection, beach or wetlands restoration projects, or for use in construction projects funded or authorized by the Federal Government. In addition to being a statutory responsibility, activities of the Marine Minerals Program also reflect a strategic investment in advanced planning, sand resource identification and evaluation, stakeholder coordination, and environmental assessment and monitoring so that, when they are needed, OCS sand resources can be made available in an environmentally responsible and sustainable way. Through the conveyance of marine mineral resources, BOEM is actively involved in protecting and improving coastal resources and the environment locally, regionally and nationally. To date, BOEM (and its predecessor, the Minerals Management Service) has executed 48 negotiated agreements and conveyed the rights to more than 109 million cubic yards of OCS sediment to restore over 269 miles of coastline restoration in seven states along the Atlantic and Gulf of Mexico coasts.

Bureau of Safety and Environmental Enforcement

The Bureau of Safety and Environmental Enforcement (BSEE) is responsible for the oversight of exploration, development, and production operations for oil and natural gas on the Outer Continental Shelf (OCS). The BSEE's regulation and oversight of Federal offshore resources is intended to ensure that energy development on the OCS is conducted in a safe and environmentally responsible manner and that offshore operators are prepared to respond to an oil spill should one occur.

The functions of BSEE include oil and gas permitting, facility inspections, regulations and standards development, safety research, data collection, technology assessments, field operations, incident investigation, environmental compliance and enforcement, oil spill prevention and preparedness, review of operator oil spill response plans, oversight of production and development plans, and resource conservation efforts.

The Outer Continental Shelf (OCS) is a major source of energy for the United States. In FY 2014, OCS leases offshore California, Alaska, and in the Gulf of Mexico provided 528 million barrels of oil and 1.23 trillion cubic feet of natural gas, accounting for about 16 percent of the Nation's domestic oil production and about five percent of domestic natural gas production.

The BSEE was established on October 1, 2011, to ensure the safe and responsible development of our Nation's offshore energy resources. The BSEE's continued focus is on safety and goes beyond simple compliance with regulations towards the adoption, by everyone, of a meaningful culture of safety that permeates all offshore activities. The BSEE advocates that every decision and every action must be taken with offshore workers and the environment in mind and risks to both must be appropriately identified and mitigated.

Risk management is an integral component of a culture of safety. It is the lens through which BSEE views the interaction between technology, processes, and the human element. It also forms the foundation for how BSEE enforces its regulations and the industry standards that they incorporate. Risk management is the foundational principle on which BSEE has built its approach to safety on the OCS. To better assess and manage risk, the Bureau has strengthened both its regulations and programs in the following areas:

Oil Spill Preparedness: This includes preparedness in the event of a blowout and worst case discharge from an uncontrolled release. Deepwater operators are now required to have readily available the specialized equipment and systems necessary to control a subsea blowout, such as containment domes and capping stacks. Additionally, BSEE conducts annual table top exercises to test how quickly an operator can mobilize vessels, capping stacks, and specialized equipment needed to cap a well. The Bureau was also responsible for including new Incident Command System functions within the U.S.

Coast Guard Incident Management Handbook and the development of specific job aids to assist both the Federal government and private responders in understanding and incorporating these new functions into their oil spill response plans.

Well Design: The BSEE published a drilling safety rule that required operators applying for a drilling permit to meet new standards for well design, casing, and cementing. The Bureau is in the process of finalizing a proposed production safety systems rule that will provide the first updates to regulations for production safety systems since the late 1980s.

***Well Control*:** New rules were established to strengthen requirements for blowout preventer (BOP) maintenance and testing. In April 2015, BSEE released a comprehensive proposed rule that will address a myriad of systems and processes, including BOPs, involved in well control operations. This proposed rule is intended to account for all aspects of well control operations, which will reduce risks that could lead to the technical and operational failures such as those that resulted in the loss of well control and explosion aboard the Deepwater Horizon.

Culture of Safety: The Safety and Environmental Management System (SEMS) program is the cornerstone of BSEE's hybrid regulatory approach, which combines prescriptive and performance-based rules. The goal of the SEMS program is to encourage the offshore oil and gas industry to adopt an approach to safety that looks beyond baseline compliance with regulations towards a culture of safety that promotes continuous improvement in safety and environmental performance. The SEMS program is meant to be a tool through which companies actively manage and improve safety performance related to human behavior, organizational structure, leadership, standards, processes, and procedures – not simply a compilation of required documentation.

Arctic Exploration: As part of the Administration's commitment to developing America's domestic energy resources safely, the Department of the Interior (DOI) has proposed regulations to help ensure that any future exploration in the Arctic is done responsibly and subject to the highest standards of safety and environmental protection. The proposed regulations utilize performance-based standards to ensure that operators have taken the necessary steps for proper internal controls and planning for oil spill preparedness, containment, and response. In addition, the proposed regulations support the Administration's coordinated and deliberative approach to the Arctic by requiring specialized practices for conducting exploratory drilling operations in this unique and challenging environment. In July 2015, BSEE awarded Shell conditional approval of two Applications for Permits to Drill (APD) to conduct limited exploratory drilling activities in the Chukchi Sea offshore Alaska. In order to drill, BSEE requires that a capping stack be on hand and deployable within 24 hours.

Research and Collaboration: The newly established Offshore Energy Safety Institute (OESI) provides an independent forum for dialogue, shared learning, and cooperative research among academia, government, industry, and other stakeholders. The OESI is a neutral ground for the exploration of issues of offshore risk that are of common concern to industry and regulators. Although OESI was established by BSEE, it is not an extension of the Bureau. The BSEE operates as one of many participants, with others coming from industry and academia. Additionally, BSEE also participates in the Interagency Coordinating Committee on Oil Pollution Research (ICCOPR) which provides a forum for research collaboration that looks at oil spill prevention, preparedness, and response. The ICCOPR, which is comprised of staff from all 15 Federal agencies and is a congressionally-mandated body, provides a venue in which agencies share their latest research, regulations, and policies; explore opportunities for collaboration on research; and identify emerging issues that need national attention.

In addition to participating with OESI, BSEE is leveraging the resources of our interagency partners and working with others to conduct important research related to new and emerging technologies as well as operations in frontier

areas to further our efforts to reduce risks across all offshore operations. The BSEE also conducts important oil spill response research, much of which is conducted at the Ohmsett facility. Ohmsett is the state-of-the-art, testing facility for offshore response technology and a world-class training site for oil spill response personnel. It provides the Bureau, as well as other facility users, a unique training environment that simulates real-world conditions in a safe and contained environment.

Technology Assessment: The Engineering Technology Assessment Center (ETAC) will strengthen BSEE's ability to assess novel and emerging technologies by keeping pace with an increasingly complex industry. Through the Center, the Bureau works more closely with Original Equipment Manufacturers (OEM) and participates more fully with standards-setting bodies such as the American Petroleum Institute (API). The Center will serve as the primary liaison between BSEE and the OESI, and BSEE anticipates that Federal staff engineers from the Center will work with OESI on joint industry projects.

Data Collection and Sharing: The BSEE and the Bureau of Transportation Statistics (BTS) signed an interagency agreement (IAA) in November, 2013, to develop a voluntary confidential near-miss reporting system for use on the OCS. SafeOCS, launched in May of 2015, is managed by BTS and has the potential to help prevent catastrophic incidents that endanger lives and the environment. The trend information that will be received and shared will be broadly beneficial to all who take safety seriously.

These achievements represent important steps to promote offshore safety, and to protect life, property, and the environment. As planned, the Bureau continues to define and implement reforms and to hire the personnel needed to ensure the safe and responsible development of our Nation's offshore energy resources.

Environmental Compliance Program

The BSEE Environmental Compliance Program (ECP) is an integral part of the Bureau's overall increased safety initiative. The ECP is responsible for the Bureau's own compliance with several environmental statutues − such as the National Environmental Policy Act (NEPA), Endangered Species Act (ESA), National Historic Preservation Act (NHPA), and Tribal consultation requirements − and the offshore industry's compliance with all applicable environmental standards associated with OCS operations in order to reduce/negate impacts to the marine, coastal, and human environments. Similar to the offshore (safety) inspection program, the ECP assures that industry is adopting an overall and comprehensive approach to environmental protection measures.

Additionally, BSEE's Rigs-to-Reefs (R2R) policy is another component of the Bureau's ECP. The R2R policy allows BSEE to support and encourage the reuse of obsolete oil and gas structures as artificial reefs under the National Artificial Reef Plan. Under the R2R policy, instead of requiring the removal of an offshore facility, BSEE may allow a facility to be converted into an artificial reef if the owner meets stringent requirements. Working with the National Ocean Council, BSEE convened an interagency working group consisting of multiple government representatives to engage Gulf Coast State agencies, the oil and gas industry, commercial and recreational fishing groups, diving groups, and the general public in a discussion to address needed changes to the artificial reefing process. The resulting R2R policy provided the States flexibility in their artificial reef planning while balancing environmental and safety concerns against other uses for OCS lands. The process has generated more than $100 million for local economies while producing a variety of ancillary benefits, such as capital improvement projects.

Operations, Safety and Regulation

The BSEE works to ensure that energy and mineral development activities are conducted in a safe and environmentally sound manner, with safety being at the forefront of all activity on the OCS. The Bureau continually seeks operational improvements that will reduce the risks to

offshore personnel and the environment. Coordinated efforts target the areas of greatest risk for compliance and enforcement actions. Additionally, BSEE continues to evaluate procedures and regulations to stay abreast of the latest technological advances in order to promote safe and clean operations and conserve the Nation's natural resources. To execute on its mission of vigorous regulatory oversight and enforcement, the Bureau engages in the following activities: regulatory development; participation in standards development; review and approval of OCS permits; inspections, investigations, and risk management; Safety and Environmental Management Systems (SEMS); real-time monitoring; conservation management; emerging technologies evaluations; compliance and enforcement; and oil spill response planning and preparedness.

Emerging Technologies and Best Available and Safest Technologies (BAST)

The BSEE continues to promote the evaluation of emerging technologies, ranging from the drilling of oil and gas wells in search of new reserves to the decommissioning of platforms and related infrastructure once production operations have ceased. In addition, the Bureau is in the process of defining a methodology for the determination of BAST for existing and emerging technologies in order to increase the performance of critical safety and process control equipment, systems, barriers, and technologies. These efforts further the investigation and development of new technologies, provide added focus on incidents involving equipment with quality control/quality assurance concerns, and the prevention of oil pollution. The Bureau's efforts are focused on high-risk components and systems, such as well control devices (e.g., BOPs) and downhole barriers to ensure that industry is applying BAST in those areas where overall risks may be reduced. In doing so, BSEE leverages the expertise of Federal partners, such as the Department of Energy's National Laboratory System, to collaborate on studies and technical evaluations where possible. The results of these studies and technical evaluations provide the Bureau with information to aid the current and future inspection workforce to develop improved rules and regulations, as well as provide regional engineers with the tools to improve the way the use of BOPs and other critical safety equipment and barriers are assessed and approved. The BSEE also continues to promote dialogue with industry and other stakeholders as well as the OESI to gather information from experts to inform and assist the Bureau in advancing and developing the BAST.

Oil Spill Preparedness

The Bureau oversees Ohmsett – the National Oil Spill Response Research and Renewable Energy Test Facility, as well as oil spill prevention, abatement, planning, preparedness, and response functions for all facilities seaward of the coastline of the U.S. that handle, store, or transport oil. The BSEE seeks to improve the ability to effectively remove oil from water and protect the environment when oil is discharged from offshore oil facilities which include fixed and floating exploration, development, and production facilities and subsea infrastructure such as pipelines, wellheads, and manifolds. Funding is dedicated to finding new and more efficient ways to prevent or reduce the rate of oil being discharged from a source, locate spilled oil, recover or treat oil that is spilled, and communicate a common operations picture to both the spill responders and the public during spill responses. The Bureau also recognizes the unique challenges presented to operators in Arctic environments and continues to fund studies to understand these implications and advance response technologies and procedures to ensure the least impact to the environment and to human safety.

In addition, BSEE is the lead agency for ensuring the highest oil spill response preparedness standard in the offshore environment through innovative research and an effective regulatory oversight program. The BSEE compliance staff provides continuous Federal oversight that requires reoccurring compliance actions during the entire lifecycle of offshore oil and gas facilities, from drilling a well to

decommissioning and removal. To do so, the Bureau conducts annual plan reviews to ensure that the approved Oil Spill Response Plans (OSRPs) remain current.

National Park Service

Operation of the National Park System – Natural Resources

The National Park System contains over 87 ocean, coastal, and Great Lakes parks across 26 states and four territories. The parks conserve over 11,200 miles of coast and 2.5 million acres of ocean, coastal, and Great Lakes waters, including coral reefs, kelp forests, glaciers, estuaries, beaches, wetlands, historic forts, and shipwrecks. They attract over 86 million visits each year and generate $3.5 billion in economic benefits for local communities.

Coastal Park Assessments: The National Park Service (NPS) has completed assessments of watershed conditions in 41 ocean, coastal, and Great Lakes parks. These assessments characterize the status of wetland, riparian, marine, estuarine, and lake resources and are accomplished through partnerships with universities in Cooperative Ecosystem Studies Unit networks and Federal agencies. Based on these assessments, regional water quality synthesis reports providing regional perspectives on water quality to park managers have been completed for the Southeast and Gulf Coast parks, and is in progress for parks in the Pacific Northwest.

NPS is also working with USGS and university partners to provide storm vulnerability assessments to more than 50 coastal parks to prepare for and respond to storm damage caused by hurricanes, typhoons, and nor'easters. NPS is working with NOAA to identify data gaps in sea level rise monitoring and provide water level monitoring network coverage for all NPS coastal parks. Updated geologic maps are used to predict storm surge and inundation impacts, shoreline change, and vulnerability to sea-level rise. Thirteen NPS Inventory & Monitoring Networks developed geospatial databases, implemented monitoring plans, and assessed condition of resources in ocean and coastal parks. For example, the South Florida/Caribbean network documented the decline of coral colonies in Virgin Islands parks during warm water and bleaching events and detected a disease outbreak in 2005-2006 that resulted in the loss of 60 percent of live coral at sites adjacent to the island of St. John (U.S. Virgin Islands).

Habitat Restoration: Coastal watersheds provide ecological services and benefits, including coastal protection, floodwater retention, water quality improvement, wildlife habitat, tourism, and recreational opportunities. Point Reyes National Seashore (California) is restoring natural hydrologic and shoreline processes by removing levees and fill from marsh habitat and restoring natural hydrologic connectivity, floodplain processes and tidal inundation. More than 70 miles of the Elwha River and its tributaries in Olympic National Park (Washington) are being restored by the removal of two dams that interrupted sediment and debris flows and created barriers to salmon migration. Restoration activities are also being planned or are underway in other coastal parks including the 1,100-acre Herring River estuary in Cape Cod National Seashore (Massachusetts), canal backfilling at Jean Lafitte National Historical Park (Louisiana), and the Aimakapa wetland, important to the endangered Hawaiian stilt and the Hawaiian coot, in Kaloko-Honokohau National Historic Park (Hawaii).

Several Federal and state agencies and tribes are engaged in the restoration. The Comprehensive Everglades Restoration Plan is a partnership of State, Federal, and local agencies and tribes to restore the natural ecological systems in central and south Florida by restoring the quality, quantity and timing of water flows. The restoration affects the distribution and abundance of coastal wetlands and wildlife in Everglades National Park, Big Cypress National Preserve and Biscayne National Park (Florida).

Great Lakes Restoration Initiative: The NPS is working with EPA and other Federal and State agencies to restore and sustain the ecological,

recreational, and economic value of Great Lakes resources in and around national parks in Lake Michigan (Indiana Dunes and Sleeping Bear Dunes National Lakeshores), Lake Superior (Apostle Islands and Pictured Rocks National Lakeshores, Grand Portage National Monument, and Isle Royale National Park), and Lake Erie (Cuyahoga Valley National Park). The main focus areas are: toxic substances and Areas of Concern; invasive species; nonpoint source pollution impacts on nearshore health; habitats and species protection and restoration; and foundations for future restoration actions. Projects include restoring contaminated sites, shoreline restoration and management planning, removal of invasive species, restoring wetland, dune and upland habitats, restoring natural stream flows and shoreline processes, collecting baseline information about fish habitat and changes to the nearshore ecosystem, and fostering public understanding of ecosystem issues.

Ecosystem Protection: Working with State and federal partner agencies, NPS is managing fully-protected marine reserves at Virgin Islands Coral Reef National Monument, Buck Island Reef National Monument (U.S. Virgin Islands), Dry Tortugas National Park (Florida), Channel Islands National Park and Point Reyes National Seashore (California). Studies of the reserves by NPS and State and Federal partners show positive results in restoring depleted marine species. Biscayne National Park (Florida) has proposed establishing a marine reserve in six percent of the park to allow the coral reef to recover from consumptive activities and offer visitors an opportunity to experience an intact and un-fished coral reef ecosystem. As the oceans are altered by climate change, the marine reserves will enrich our scientific understanding of the potential of protected areas for restoring marine ecosystems, such as coral reefs and kelp forests, and increasing their ecological resilience to climate change.

Water Quality: Estuaries in coastal National Parks are productive habitats and nurseries for fish and wildlife, including recreationally important species. Estuarine degradation results mainly from population growth and development in coastal watersheds beyond park boundaries. NPS has increased the number of cooperative estuarine monitoring and assessments with NOAA, EPA, and state and local agencies to address these problems. An assessment conducted in Southeast Atlantic coastal estuaries based on EPA data indicated that only 34 percent of sites within parks had good water quality. As a result, Timucuan Ecological & Historic Preserve (Florida) became a founding member of the Three River Conservation Coalition, a partnership among land management and regulatory agencies and nonprofits that works to improve water quality by supporting low-impact development and by sharing water-quality information. The NPS now monitors water and sediment quality in Southeast Atlantic coastal parks using EPA protocols to identify water-quality problems; track nutrient (nitrogen and phosphorus) levels; and assess long-term effects of natural events, such as storms, on water quality. The NPS has joined with other Federal agencies in responding to water quality issues associated with ocean acidification and harmful algal blooms.

Chesapeake Bay: The NPS Chesapeake Bay Office administers three national initiatives to connect people with special places and stories of the Chesapeake Bay. The NPS works through a variety of partnerships, including the Chesapeake Bay Gateways Network, the Captain John Smith Chesapeake National Historic Trail and the Star Spangled Banner National Historic Trail, to foster stewardship of the Chesapeake. The NPS is a partner in the watershed-wide Chesapeake Bay Program—a partnership of state governments and Federal agencies. The Gateways Network connects people with the Chesapeake Bay and its rivers through more than 160 parks, wildlife refuges, museums, and historic communities and trails. The network serves an effective role in educating the public on restoration initiatives and environmental stewardship.

Education and Outreach: Eight National Park Service Research Learning Centers (RLCs) are galvanizing local organizations, schools, universities, government agencies and citizens to participate in park-based ocean research, education, and volunteer projects. For example, students and volunteers experience the scientific

process by conducting the Tomales Bay Biodiversity Inventory at the Pacific Coast Science and Learning Center at Point Reyes National Seashore (California). Cooperative Ecosystem Studies Units (CESU) are public-private partnerships involving 269 universities, 87 non-Federal research partners, NPS and 14 other Federal agencies across the ten CESUs are based on the coasts and Great Lakes and provide park managers with high-quality research, technical assistance, and education. In a partnership with the Ventura County, California, Office of Education, NPS broadcasts "Channel Islands Live!" an interactive underwater video program connecting children in school classrooms via the Internet with scuba diving interpreters in the kelp forest at Channel Islands National Park.

Everglades Restoration and Research: The restoration, preservation and protection of Federal interest lands in South Florida is critical to the health of the ecological systems supported by the Everglades' "river of grass" and directly affects the distribution and abundance of native vegetation and wildlife in Everglades National Park, Biscayne National Park, and Big Cypress National Preserve. The Comprehensive Everglades Restoration Plan (CERP) represents a partnership of Federal, State, and tribal agencies and implements projects that are essential to the restoration, protection, and preservation of the natural ecological systems in central and south Florida. It includes feasibility studies, pilot projects for seepage management and in-ground reservoirs, and restoration projects.

U.S. Fish and Wildlife Service

Habitat Conservation

Coastal Program: The U.S. Fish and Wildlife Service (USFWS) Coastal Program is a voluntary, partnership-based, habitat conservation program that focuses its activities on priority coastal habitats in the United States. The Coastal Program field staff work in 24 priority areas around the country, including the Great Lakes to provide technical and financial resources to deliver habitat protection and restoration on public and private lands. Since 1984, USFWS staff and conservation partners have protected over 2,079,600 acres of priority coastal habitat and have restored over 509,750 acres of critical wetland and upland habitat and 2,200 miles of stream habitat. From FY 2002 to FY 2014, USFWS worked with thousands of partners to deliver 3,578 habitat conservation projects designed specifically to benefit Federal trust species. In FY 2014 specifically, the Coastal Program completed 80 projects on or adjacent to a National Wildlife Refuge, protecting and/or restoring 32,410 acres of important habitat, and removed or installed 16 fish barriers.

Partners for Fish and Wildlife: The Partners for Fish and Wildlife Program is a voluntary direct Federal assistance program that works with private landowners and other organizations on the coast and interior areas to protect, enhance, and restore important fish and wildlife habitats on private lands. The Program's strong partnerships help leverage program dollars at a ratio of 4:1 or greater, and has led to the voluntary restoration of over 3,991,891 upland habitat acres and 1,207,553 wetland acres on private land, since its inception in 1987. These acres, along with 12,501 miles of enhanced stream habitat, provide valuable habitat for Federal trust species. In FY 2014, the Program worked with 1,107 private landowners and 820 partners to implement projects across the nation, including almost 100 fish barrier removal or installation projects. Since the start of the program, Partners biologists have worked with 17,000 private landowners and almost 5,800 partner groups.

Ecological Services

Endangered Species Program: USFWS protects species listed as threatened or endangered under the Endangered Species Act. It also has a candidate conservation program designed to avoid adding species to the threatened and endangered species list, and a recovery program designed to restore species which are listed. Activities include consultations with Federal agencies and their permit applicants to ensure agency and permittee

activities are compatible with the conservation needs of listed species. The recovery program works with Federal, state, tribal, and non-government entities to take immediate action to prevent the extinction of species, prepare recovery plans to ensure coordinated, effective recovery actions to reverse the decline of listed species, and expedite species recovery.

Conservation Planning Assistance: The Conservation Planning Assistance program (CPA) works collaboratively with industry, agencies, and others to achieve sustainable development compatible with the conservation of fish and wildlife. CPA biologists act as the on-the-ground unified voice of the Service in development planning. This network of professionals has expertise in several authorities including the Clean Water Act, NEPA, Federal Power Act, Fish and Wildlife Coordination Act, and Migratory Bird Treaty Act that give the Service mechanisms for engagement on many projects where the Service's recommendations would otherwise not be delivered. CPA's field staff directly influence coastal and marine conservation through multiple processes at all scales. CPA reviews and negotiates stewardship features of large-scale Federal coastal protection projects, navigation/dredging/beneficial-use projects, levees, beach nourishment, coastal oil and gas exploration/infrastructure, offshore wind power, hydrokinetic energy generation, harbor construction, military facilities, transportation, coastal development, and hydropower licensing processes that alone directly influence migratory fish passage/populations by continuing to reopen stream miles to fish passage. From FY 2013 to the present, the program has opened 420 additional miles.

National Wetlands Inventory: USFWS is the principle Federal agency monitoring and reporting changes to the Nation's wetlands. Through the National Wetlands Inventory (NWI), the Service maintains a series of maps to show wetlands and adjacent deep-water habitats. NWI developed the National Wetlands Classification and National Wetlands Mapping Standards and provides online Wetland Mapping training to assist cooperators and data contributors in successfully submitting standards-compliant wetlands geospatial data to the National Wetlands Inventory. This information becomes part of the NWI-managed Wetlands Layer of the National Spatial Data Infrastructure (NSDI) and is used extensively to make resource management decisions at the Federal, State, tribal, territorial, and local government levels and the private sector.

Coastal Barrier Resources System: The Coastal Barrier Resources System (CBRS) Program conserves coastal habitats by restricting Federal funding that encourages new development and prohibits the sale of federally-backed flood insurance for most structures located within the CBRS. USFWS staff determine whether properties are located "in" or "out" of the CBRS, consult with Federal agencies regarding infrastructure projects proposed within the CBRS, and prepare modernized CBRS maps. This program saves millions in taxpayer dollars by reducing the intensity of development in hurricane-prone and biologically sensitive areas, and preserving essential spawning, nesting, nursery, and feeding habitat for many threatened and endangered species.

Environmental Contaminants: The Environmental Contaminants Program conducts investigations to assess impacts of contaminants on DOI trust resources. The program encourages partnerships with other Federal and State agencies as well as with academic institutions. Investigations generate new data regarding the occurrence and effects of common water pollutants (such as nutrients, ammonia, selenium, mercury and other metals), legacy pollutants (i.e. PCBs, dioxins, DDT, and other organochlorine pesticides), and contaminants of emerging concern, like current use pesticides, pharmaceuticals, and personal care products. This information is intended to support science-based management decisions to protect National Wildlife Refuges, endangered species, migratory birds, and other fish and wildlife species, as well as inform agencies with regulatory authority for pollution control, such as the EPA.

Marine Mammals: USFWS Marine Mammal Program conducts activities in support of its responsibilities under the Marine Mammal Protection Act (MMPA) and other authorities,

mandates, and conservation plans and strategies. Meeting the USFWS mandate for the conservation of marine mammals requires communication and cooperation with other Federal agencies, State governments, Alaska Native Organizations, scientists from numerous institutions and organizations, industry groups, and nongovernmental organizations. Through active collaboration and coordination, the Service is able to enhance the effectiveness of implementing the MMPA and achieve its goals of optimum sustainable population levels for marine mammal stocks. In FY 2016, the Service will continue working with partners to sustain efforts to survey and assess population statuses and trends for sea otters, Pacific walruses, polar bears, and West Indian manatees and will continue supporting response efforts for stranded or beached marine mammals. USFWS will also continue efforts to maintain current stock assessment reports for all 10 marine mammal stocks under the conservation and management jurisdiction of the USFWS.

Fish and Aquatic Conservation

Aquatic Invasive Species: The Aquatic Invasive Species Program provides support for Federal ocean activities through its leadership of the Federal Interagency Aquatic Nuisance Species Task Force (Task Force). The Task Force provides a national infrastructure and forum for collaborative discussion and decision making, both at the Task Force and within its six Regional Panels. These Panels are uniquely positioned to coordinate and prioritize regional invasive species management issues and to provide crucial recommendations back to the Task Force. For the last couple of years, the Service has dedicated significant funds to preventing Asian carp from establishing in the Great Lakes and the Upper Mississippi River and its tributaries. The Service also focuses significant funding and efforts in controlling and managing quagga and zebra mussels.

National Fish Habitat Action Plan (NFHAP): USFWS partners with states, tribes, NGOs, and other stakeholders in implementing NFHAP. NFHAP fosters locally-driven and scientifically-based partnerships to protect, restore, and enhance aquatic habitats and reverse the decline of fish and other aquatic species in both coastal and inland areas. NFHAP's mission and goals are primarily implemented by Fish Habitat Partnerships (FHPs), which are formed and fully operating around geographic areas, keystone species, or system types. FHPs identify projects that strategically focus on fish-habitat management and funding. USFWS approves projects and funding levels that are allocated to the Regions for administration and the USFWS Fish and Wildlife Conservation Offices provide local technical assistance to FHPs on the projects. Since 2006, the Service has provided $26.5 million of Action Plan funds to support 671 fish habitat conservation projects in 45 States, leveraging $67.1 million in partner contributions.

National Fish Passage Program: The National Fish Passage Program (Program), a voluntary, non-regulatory initiative in the USFWS that provides funding and technical assistance to reconnect aquatic habitats. Each year an Annual Report is completed detailing the successes of the Program. These reports provide example projects as well as details relating to the benefits we have had on the ground.

National Wildlife Refuge System

USFWS manages 180 National Wildlife Refuges (NWRs) and four Marine National Monuments located in the ocean, coastal areas, and Great Lakes that protect a wide diversity of marine habitats. In FY 2014, the USFWS continued completing sea-level rise analysis for the coastal refuges utilizing the Sea Level Affecting Marshes Model (SLAMM) and made the data and analyses available online to the public. Additionally, the USFWS maintains a number of Surface Elevation Tables (SET) sites to monitor sea level rise along the Atlantic, Gulf, and Pacific Coasts that are integrated with efforts from States and other partners.

Refuge operations focus on maintaining the biological integrity, diversity, and environmental health of the refuge resources for the benefit of present and future generations of Americans. For

example, an invasive plant removal project at Midway Atoll NWR has contributed to record numbers of albatross nesting in 2014. A collaboration that began in 2011 between FWS, The Nature Conservancy, and Island Conservation to remove rats at Palmyra Atoll NWR has been continuously monitored and resulted in restoring tropical island habitat, including regrowth of very rare native forest, and an increasing in numbers of land crabs (including two species thought to be extirpated) and seabirds. Additionally in 2013-14, shipwrecks causing damage to coral reefs were removed from Palmyra Atoll NWR and Kingman NWR. These shipwrecks provided nutrients to aggressively invasive corallimorphs and algae, smothering large areas of coral and degrading the ecosystem, which is now recovering.

As part of the U.S. Coral Reef Task Force, the FWS works with multiple Federal agencies and territorial governments to preserve and protect coral reef systems. For example, the FWS is working with the Task Force to protect coral reefs and coastal watersheds on Maui, American Samoa, and Puerto Rico. The FWS also works to collaboratively address broad scale landscape/seascape issues through landscape conservation cooperatives to ensure the sustainability of the economy, land, water, wildlife, cultural and other marine resources in the face of climate change and other large scale issues.

International Affairs

Division of International Conservation: USFWS is responsible for the implementation of the Ramsar Wetlands Convention in the United States. Ramsar's goal is the conservation and wise use of wetlands through national, regional, and international actions, and is the oldest global multi-lateral environmental agreement. Ramsar's 168 signatory nation members have designated 2,186 wetland sites as Wetlands of International Importance, totaling 515,645,000 acres, and constituting the largest network of protected areas in the world. The U.S. has designated 37 sites of over 4,594,000 acres. Two of these are considered "Crown Jewels" as Wetlands of International Importance: 1) Palmyra Atoll NWR (680 acres of above-water forest lands and over 515,000 acres of submerged lands and open water, including over 16,000 acres of coral reef habitat), 960 miles south of Honolulu, Hawaii; and 2) Everglades National Park, where one of the planet's largest wetland restoration projects is currently underway. Program staff continues engaging in the development of guidelines and products to support conservation of coastal wetlands and are actively engaged in nominating under-represented marine wetland sites and "Blue Carbon" sequestering mechanisms. The notion of wetlands as carbon sinks has triggered increasing interest in developing ways to assess the magnitude of carbon storage as an indication of the importance of particular wetlands.

The U.S.-Mexico Kemp's Ridley Recovery Team is providing recommendations to the primary agencies responsible for recovery of this species. The team has determined that the greatest threats to this species currently occur in the marine environment. The recommendations include maintaining and bringing greater funding stability to the highly successful nesting beach program, improving Turtle Excluder Devices compliance, and addressing unresolved fisheries by-catch in both countries. Another important activity is strengthening the ability to monitor vital population rates through more intensive nesting beach tagging and research programs so causes of decline can be determined when abrupt changes in nesting are observed.

Division of Management Authority and Division of Scientific Authority: In 2013 at the 16th Meeting of the Conference of the Parties to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), the United States and several other co-proponent countries submitted successful proposals to include oceanic whitetip shark and three species of hammerhead sharks in CITES Appendix II. The United States also strongly supported successful proposals to include porbeagle sharks and manta rays in the CITES Appendices. Since the listing of these wide-ranging commercially traded sharks, the divisions have been working closely with our co-

proponents to raise the capacity of CITES Parties to implement the listings. This includes supporting workshops in Brazil, Guatemala, El Salvador, Germany, and Colombia and working with NOAA to design and implement a domestic process for permitting the export of listed shark species. This has yielded positive CITES findings and CITES export permits for United States-harvested porbeagle and hammerhead sharks based on NOAA's management of the species.

Wildlife and Sport Fish Restoration

The Wildlife and Sport Fish Restoration Program provides grants to the states, the District of Columbia, and insular areas for fishery projects, boating access, and aquatic education. The Program is authorized by the Sport Fish Restoration Act (Dingell-Johnson) of 1950. The funds are collected from excise taxes on fishing equipment, motorboat and small engine fuels, import duties, and interest and appropriated from the Sport Fish Restoration and Boating Trust Fund. This stable source of funding has been and remains critical to the recovery of many of the Nation's sport fish species. The various programs enhance the country's sport-fish resources in both fresh and salt waters, and are the cornerstone of fisheries recreation and conservation efforts in the United States. Since its inception in 1950, this program has awarded almost $8.0 billion to State fish and wildlife agencies for their fisheries conservation and boating access efforts.

The National Coastal Wetlands Conservation Grant (Coastal Grants) Program provides grants of up to $1 million to assist coastal states to protect and restore coastal wetlands; grants are matched at least 1:1. In FY 2014, the program provided $16.5 million for 21 projects in 12 states and Puerto Rico that protected and/or restored coastal wetland habitat and adjacent uplands.

The Sport Fish Restoration Account also supports the Clean Vessel Act Program and the Boating Infrastructure Grants. The Clean Vessel Act (CVA) grant program is a nationally competitive program for the construction, renovation, operation, and maintenance of sewage pumpout stations and dump stations, as well as for educational programs designed to inform boaters about the importance of proper disposal of their onboard sewage. In FY 2014, CVA provided $16.6 million to 21 states. Land-based pumpouts and dump stations have kept thousands of gallons of septic waste out of recreational waters. CVA also funds projects such as pumpout boats, floating restrooms, and portable pumpouts that allow boaters to access various types of disposal facilities. CVA-funded projects support State designated No Discharge Zones as an integral part in maintaining local water quality.

The Boating Infrastructure Grant program helps states develop, renovate, and improve public facilities to increase public access to United States waters for recreational boats over 26 feet long (non-trailerable recreational boats). In FY 2014, the grant program provided $16.8 million to 29 states and the District of Columbia.

The Coastal Impact Assistance Program (CIAP), authorized by Section 384 of the Energy Policy Act of 2005 (Act), was transferred from the Bureau of Ocean Energy Management, Regulation and Enforcement (BOEMRE) to the Wildlife and Sport Fish Restoration Program (WSFR) on October 1, 2011. The Act gave the Secretary of Interior authority to distribute about $1 billion derived from qualified Outer Continental Shelf revenues to six oil and gas producing States and 67 affected Coastal Political Subdivisions (counties, parishes and boroughs). The CIAP funds were appropriated in Fiscal Years 2007-2010, and were allocated to Alabama, Alaska, California, Louisiana, Mississippi, and Texas through a formula prescribed in the Act. States were required to prepare a State CIAP Plan for all proposed projects, involving public review and Governor approval. Projects must address one or more of the following eligible purposes: conservation, protection, or restoration of coastal areas, including wetlands; mitigation of damage to fish, wildlife, or natural resources; planning assistance and the administrative costs of complying with this section; implementation of a federally-approved marine, coastal or comprehensive conservation management plan; or mitigation of

the impact of Outer Continental Shelf activities through funding of onshore infrastructure projects and public service needs. During WSFR administration of CIAP from FY 2012 through FY 2015, $557.7 million was awarded. Cumulatively, CIAP has awarded 766 grants for $960.3 million (99% of funds available). All grant-funded activities must be completed by December 31, 2016.

Migratory Birds Program

North American Wetlands Conservation Act (NAWCA) Grant Program: Grants made through the NAWCA program have supported over 2,400 projects improving the health and integrity of wetland and wetland-associated landscapes in all 50 states, Puerto Rico, the U.S. Virgin Islands, 13 Canadian provinces and territories, and 31 Mexican states and the Federal District of Mexico. Nearly 30 million acres have been protected, restored, and enhanced by almost 4,000 partners. In FY 2014, NAWCA provided nearly $1.24 billion for over 2,400 projects to partners who provided over $2.9 billion in non-Federal matching funding.

Natural Resource Damage Assessment and Restoration

The Natural Resource Damage Assessment and Restoration (NRDAR) restoration program's mission is to restore natural resources injured as the result of oil spills or hazardous substances releases. It assesses the injuries to natural resources for which the Department is designated a trustee on behalf of the public. The DOI negotiates legal settlements or takes legal actions against responsible parties to use recovered funds to restore injured resources. Using funds received in settlement, trustees plan and implement ecological restoration of injured natural resources caused by oil spills or the release of hazardous substances into oceans, coastal, and Great Lakes environments. All such restoration actions are implemented in concert with other affected Federal, state, and tribal co-trustees, as well as local and regional-level, non-governmental organizations.

Office of Insular Affairs

Coral Reef Initiative and Technical Assistance Programs

The goal of the Coral Reef Initiative program is to improve the health of coral reefs in the United States insular areas for their long-term economic and social benefit through enhanced local management and protection. The Office of Insular Affairs' (OIA) primary role is to assist the insular areas in identifying causes for coral reef decline, assessing needs for improving local management and protection, and as available, providing technical and financial assistance to meet priority needs.

The purpose of the technical assistance program is to fund priority projects for which there are little to no funds available from other Federal agencies. The program provides the flexibility needed to respond to urgent, immediate needs in the insular areas.

Office of the Secretary

The Office of Natural Resources Revenue (ONRR)

The Secretary formally established ONRR from what was the Minerals Revenue Management program. Through ONRR, the Department uses its financial systems and human resources to collect, account for, substantiate, and disburse revenues associated with mineral and offshore renewable energy production from leased Federal and Indian lands. Annually, nearly $900 million in outer continental shelf (OCS) receipts are transferred to the Land and Water Conservation Fund (LWCF) and $150 million to the Historic Preservation Fund (HPF)[3]. In recent years, the

[3] The authorizations for deposits of receipts into the Land and Water Conservation Fund as provided in 54 U.S.C. 200302 and the Historic Preservation Fund as provided in 54 U.S.C. 303102 expired on September 30, 2015. Therefore, as of the time of this report's

OCS revenues have accounted for almost 100 percent of the deposits to the LWCF, and the entire amount to the HPF.

DOI Senior Ocean Policy Team:
The Department has a Senior Ocean Policy Team, chaired by the Chief of Staff, which includes representatives from bureaus and offices that have ocean and coastal responsibilities. The team, supported by a small Ocean and Coastal Activities coordination team, ensures that the Department has a coordinated approach, including but not limited to, budgeting, leveraging internal resources, and developing plans to implement ocean policies, so as to more effectively fulfill the Department's statutory responsibilities for ocean-related matters. This includes strengthening internal partnerships, identifying and fostering external partnerships, and shared stewardship to more effectively advance the Department's ocean, coastal, and Great Lakes mission, coordination with the National Ocean Council and its subordinate committees, facilitating implementation of EO 13547 within the Department, and ensuring ocean and coastal-related initiatives are communicated to key audiences effectively by the Department's bureaus and offices in order to strengthen the stewardship of America's ocean and coastal resources.

publication, ONRR has ceased making deposits into both funds.

DEPARTMENT OF THE INTERIOR					
(dollars in millions)	FY 2012 Enacted	FY 2013 Enacted	FY 2014 Enacted	FY 2015 Enacted	FY 2016 Budget
U.S. Geological Survey					
Ecosystems					
Status and Trends	2.4	2.4	3.4	4.4	4.4
Fisheries Program	8.9	9.9	10.9	11.6	11.8
Wildlife Program	3.8	5.8	6.8	7.1	7.1
Environments Program	18.7	13.8	11.8	7.5	7.5
Invasive Species	3.3	3.3	3.3	3.6	4.6
Climate and Land Use Change					
NCCWSC/DOI Climate Science Centers	0.0	0.7	0.7	0.6	0.6
Climate Research and Development	2.0	2.0	2.0	3.0	3.0
Energy Minerals and Environmental Health					
Energy Resources	1.0	1.0	1.0	1.0	1.0
Contaminant Biology	0.5	0.5	0.5	0.5	0.5
Toxic Substances Hydrology	0.6	0.5	0.6	-	-
Natural Hazards					
Earthquake and Landslide Hazards & Global Seismic Network	14.9	14.0	14.9	10.8	15.6
Coastal and Marine Geology	42.8	40.3	41.3	40.3	45.2
Water Resources					
National Water Quality Assessment Program	17.7	16.8	16.8	1.0	1.0
Core Science Systems					
National Cooperative Geologic Mapping	5.0	4.7	4.7	4.7	5.2
National Geospatial Program	-	-	-	-	1.0
Bureau of Land Management					
Management of Lands and Resources					
Science/R&D/Technology	0.2	0.2	0.2	0.2	0.2
Education	0.1	0.1	0.1	0.1	0.1
Manage & Monitor	7.8	7.9	8.0	8.0	8.0
Oregon & California Grant Lands					
Science/R&D/Technology	1.0	1.0	1.0	1.0	1.0
Education	0.5	0.5	0.5	0.5	0.5
Manage & Monitor Salmon Habitat	19.9	20.2	20.5	20.5	20.5
Bureau of Ocean Energy Management*					
Renewable Energy	22.7	18.5	23.7	23.1	24.3
Conventional Energy	47.2	46.1	49.4	49.6	59.9
Environmental Assessment	62.0	60.6	63.2	65.7	68.0
General Support Services	12.8	12.1	14.3	15.0	0.0
Executive Direction	16.1	15.2	16.3	16.3	18.7
Bureau of Safety and Environmental Enforcement*					
Offshore Safety and Environmental Enforcement					
Office of Safety and Environmental Enforcement	182.5	173.2	187.7	189.7	189.8
Oil Spill Response Research Program					
Oil Spill Research	14.9	14.1	14.9	14.9	14.9
Disaster Relief Appropriations Act, 2013 (P.L. 113-2)	-	2.9	-	-	-

DEPARTMENT OF THE INTERIOR (continued)					
(dollars in millions)	FY 2012 Enacted	FY 2013 Enacted	FY 2014 Enacted	FY 2015 Enacted	FY 2016 Budget
National Park Service					
Operation of the National Park System					
Natural Resource Stewardship	87.3	82.1	88.5	88.5	89.8
Everglades Restoration and Research	4.9	4.6	4.9	5.0	5.0
Fish and Wildlife Service					
Resource Management - Habitat Conservation					
Coastal Program	14.7	-	-	-	-
Partners for Fish and Wildlife	13.3	-	-	-	-
Conservation Planning Assistance	0.2	-	-	-	-
National Wetlands Inventory	1.2	-	-	-	-
Coastal Barrier Resources Program	0.4	-	-	-	-
Resource Management - Fisheries and Aquatic Resource Conservation					
Marine Mammals Program	5.9	-	-	-	-
Aquatic Nuisance Species Control - Invasive Species	1.9	-	-	-	-
Aquatic Habitat and Species Conservation	11.4	-	-	-	-
Maintenance and Equipment Hatcheries	5.8	-	-	-	-
National Fish Hatchery Operations	14.9	-	-	-	-
Resource Management - Other					
National Conservation Training Center	-	-	-	-	-
Consultation	3.8	-	-	-	-
Landscape Conservation	0.8	-	-	-	-
Law Enforcement	1.0	-	-	-	-
National Wildlife Refuge Operations and Maintenance	116.7	-	-	-	-
Adaptive Science	1.0	-	-	-	-
Recovery	3.7	-	-	-	-
Candidate Conservation	-	-	-	-	-
International Affairs					
Division of International Conservation	0.3	-	-	-	-
Division of Management Authority	0.3	-	-	-	-
Division of Scientific Authority	-	-	-	-	-
Wildlife and Sport Fish Restoration					
Coastal Wetlands Grants	17.0	-	-	-	-
Clean Vessel Act Program	8.1	-	-	-	-
Migratory Birds Program					
North American Wetlands Conservation Act Grant Program -	17.0	-	-	-	-
Resource Management	-	181.5	193.9	194.9	207.9
Sport Fish Restoration Account	-	25.6	22.2	25.0	25.8
North American Wetlands Conservation Fund	-	17.2	15.0	16.9	17.4
Natural Resource Damage Assessment and Restoration Program					
DOI / ORDA / NRDA Program - Damage Assessments	14.0	1.6	1.6	1.6	1.6
DOI / ORDA / NRDA Program - Restoration Implementation	26.0	30.0	40.0	40.0	45.0

DEPARTMENT OF THE INTERIOR (continued)					
(dollars in millions)	FY 2012 Enacted	FY 2013 Enacted	FY 2014 Enacted	FY 2015 Enacted	FY 2016 Budget
Coral Reef Initiative	1.0	1.0	1.0	1.0	1.0
Office of the Secretary					
Office of Natural Resources Revenue**	59.7	56.6	59.7	60.8	64.4
Ocean and Coastal Activities Oversight	0.4	-	-	-	-
TOTAL	**941.6**	**888.7**	**945.4**	**934.5**	**972.4**

* FY 2012 reported programs and numbers rolled into the Resource Management, Sport Fish Recreation Account, and North American Wetlands Conservation Fund for FYs 2013-2016.

** The Department reorganized the revenue management function of the former Minerals Management Service (MMS) to the Office of Natural Resources.

DEPARTMENT OF STATE AND USAID

The Department of State works around the world to protect and advance U.S. interests with respect to uses of the ocean and conservation and management of marine resources. In this regard, the Department works to: (1) negotiate and implement agreements to protect the world's oceans and to conserve and manage marine living and non-living resources; (2) raise awareness of the environmental and economic costs associated with a lack of effective long-term conservation and management of such resources both at home and around the world; and (3) advance the United States' strategic goals by addressing challenges that require international consultation and coordination.

The Department works in close coordination with multiple stakeholders, both within and outside government, to protect and advance U.S. interests in the following ocean-related areas: commercial fisheries, including mitigating their impacts on the marine environment, marine mammals, seabirds, sea turtles, and non-target fish stocks; aquaculture; aquatic invasive species; biodiversity; coral reefs; marine debris; Antarctic and Arctic affairs; homeland security, including maritime domain awareness; the law of the sea ; deep seabed mining, marine scientific research, maritime boundaries and national maritime claims, continental shelf claims, marine pollution, commercial and military navigation/transport; regional seas programs; small island developing States; underwater cultural heritage; and whales.

Within the Department, primary responsibility for these issues rests with the Bureau of Oceans and International Environmental and Scientific Affairs (OES), supported by other bureaus and an extensive network of Missions around the globe.

Department of State: Bureau of Oceans, Environment and Science (OES)

International Fisheries Commissions

The international commissions and programs funded by this account were established by treaties and agreements negotiated by the United States and ratified by the President, with the advice and consent of the Senate. The United States entered into these treaties to protect its access to shared international fisheries resources and to support other vital economic and environmental interests. The commissions and organizations funded by this account enable the United States to promote critical U.S. economic and conservation interests. Each facilitates international cooperation by conducting or coordinating scientific studies of fish stocks and other living-marine resources and establishing common management measures to be implemented by member governments based on their results. Many also oversee the allocation of fishing rights to their members. U.S. funding of the International Fisheries Commissions account supports the Department's strategic goals of securing a sustainable global environment and ensuring economic prosperity and security by funding United States shares of operating expenses for ten international fisheries commissions and organizations, the International Whaling Commission, two international marine science organizations, the Antarctic Treaty, and international sea turtle conservation initiatives. The account also provides for travel expenses of the United States Commissioners and their advisors, as well as compensation to non-government employees of the Pacific Salmon Commission for days actually worked as U.S. commissioners, panel members, advisors, and/or alternates.

Economic Support Funds (ESF), OES Partnerships

The United States contributes $21 million in Economic Support Funds (ESF) annually to certain Pacific Island States under the 2013 Economic Assistance Agreement (EAA) associated with the 1987 Multilateral Treaty on Fisheries between the Governments of Certain Pacific Island States and the United States ("the Treaty"). The Treaty sets forth the terms and conditions for United States tuna vessels to fish in a broad area of the Western and Central Pacific, which is estimated to contribute at least $500 million annually to the economy. The United States provides the Economic Support Funds to the Parties to the Treaty through the Pacific Islands Forum Fisheries Agency (the Administrator of the Treaty), to be used solely for economic development. This targeted aid assists developing countries while also providing tangible benefits to an important sector of the U.S. economy and is considered an important component of the political and economic relationship between the United States and the Pacific Island Parties. In addition, the United States provides Economic Support Funds for efforts such as the Our Ocean Conference which was hosted in Chile in 2015; support of a new climate-smart insurance product for the Caribbean Oceans and Aquaculture Facility to help improve sustainable livelihoods in the fisheries sector and in coastal rural communities; and support of a regional training program to address marine debris management and mitigation in the Southeast Pacific regions.

Diplomatic & Consular Programs

OES annually funds a Sea Grant Fellow for the Office of Marine Conservation. The Knauss Marine Policy Fellowship Program is administered by NOAA and provides a valuable opportunity both for Fellows to gain experience in public policy related to the ocean, and for host offices to gain fresh perspectives and connections with emerging professionals in the ocean policy and science fields. OES also participates in the American Association for the Advancement of Science (AAAS) Science & Technology Policy Fellows and Jefferson Science Fellows programs. These AAAS Fellows are all Ph.D.-level scientists and many are leaders in their academic fields. Fellows are placed within the various OES offices. The Department of State leads United States participation in the Arctic Council and overall Arctic foreign policy. Funds under this account are used to support United States led projects and initiatives through expertise in other Federal agencies which in turn informs decision-making and improves understanding in responding to changing conditions in the Arctic. The Extended Continental Shelf (ECS) Task Force, led by the Department, uses the funds under this account to coordinate and support efforts related to the collection and analysis of data among a dozen Federal agencies that will establish the outer limit of the United States ECS. The ECS effort will delineate an enormous area where the U.S. can exercise sovereign rights over the resources on and below the seabed.

The U.S. Agency for International Development

The United States has a long history of extending assistance to governments, communities and individuals in the developing world struggling to make a better life, recover from a disaster, or striving to build a free and democratic country. The U.S. Agency for International Development (USAID) has been the principal U.S. foreign assistance agency providing non-military aid to the developing world since 1961. While USAID is an independent agency, the Agency receives foreign policy guidance from the Secretary of State.

Development Assistance Accounts

U.S. foreign assistance has always had the two-fold purpose of furthering America's foreign policy interests while improving the lives of the citizens of the developing world. Sound and equitable development is recognized as one of the three key pillars – Diplomacy, Development, and Defense - of a strong U.S. national security strategy.

Biodiversity conservation is central to international development efforts because the goods and services provided by biodiverse ecosystems are essential to human well-being. Healthy and productive marine ecosystems are critical to U.S. diplomatic and development strategies to promote global food

security, biodiversity conservation, climate change adaptation and mitigation, economic security and competitiveness, social stability and conflict prevention, improved human health, and disaster mitigation. U.S. assistance also aims to empower communities and stakeholders to participate in decision-making affecting their interests, contributing to efforts to build the foundations of transparent, responsive, and accountable governance.

USAID assistance to developing countries contributes to U.S. and international policy interests by promoting ocean stewardship with respect to the management, sustainable use, and conservation of coastal and marine resources. Maintaining ecosystem integrity through an ecosystem-based approach to management, improving resilience of coastal resources, and establishing science-based decision-making processes are critical to achieving global food security and adapting to climate change. Sustainably managing fisheries can ease competition for these critical and high-value resources and result in lessening the causes of local and regional conflict. To this end, USAID works to: (1) build the necessary capacity for local communities, institutions and governments to manage and conserve their resources; (2) raise awareness and promote behavioral change that leads to sustainable resource use and resilient ecosystems and communities; (3) promote open, transparent, and participatory governance and policy frameworks; (4) build public-private partnerships and alliances to address local and global challenges; (5) integrate population, health, and environment approaches for increased impacts; and (6) promote international leadership and coordination in advancing successful management and conservation approaches.

As part of the Agency's marine conservation efforts, USAID is responding to the 2013 Executive Order to *Combat Wildlife Trafficking,* i.e. the illegal take and trade in terrestrial and marine animals, and the 2014 *Presidential Memorandum for a Comprehensive Framework to Combat Illegal, Unreported, and Unregulated Fishing and Seafood Fraud.* Wildlife trafficking, illegal fishing and trade are clearly *development* issues as they undermine security, law and order, food security, and USAID's mission to eliminate extreme poverty. Current and planned USAID programs are well positioned to assist in the development and implementation of a comprehensive framework to combat wildlife trafficking of endangered marine species and illegal, unreported, and unregulated fishing. USAID programs in these areas can assist host country governments, the private sector and local communities to move towards sustainable fishing, strengthen supply chains and develop voluntary traceability systems, enhance transparency and accountability, and promote sustainable sourcing through science, technology and innovation.

USAID also works in coastal environments including carbon-rich mangroves and peatlands which are a high priority in climate change mitigation strategies throughout the world. Tropical wetlands provide a wide range of ecosystem services and the high growth rates and rich soils of mangrove forests and peatlands offset the emission of greenhouse gases (GHGs) through carbon sequestration. Many countries do not have sufficient information to include wetlands in their national reporting to the United Nations nor to develop plans for avoiding GHG emissions from wetland conservation. The Global Climate Change Initiative is supporting the research of scientific approaches and methodologies to generate knowledge that is relevant to policymakers and practitioners regarding wetlands management as it relates to global climate and local livelihoods.

To achieve its objectives, USAID works in close partnership with international and local non-government organizations, private voluntary organizations, indigenous groups, universities, American businesses, international agencies, other governments, and U.S. government agencies. USAID works in over 30 countries on projects that directly promote the conservation and improved resource management of coastal and marine ecosystems. Assistance is provided sub-Saharan Africa, Asia, the Middle East, the Pacific, and Latin America and the Caribbean. Agency programs build human and institutional capacity for resource management, while building strong governance processes to ensure long-term impacts and stakeholder ownership.

Bureau for Economic Growth, Education, and Environment

Office of Forestry and Biodiversity

The Office of Forestry and Biodiversity (FAB) helps USAID overseas offices – the USAID missions − to design and implement conservation programs that enhance the sustainability of rural livelihoods, improve health outcomes, promote gender equality, enhance local governance over natural resources, and increase government transparency and accountability. Programs and staff provide technical and international leadership, training and project assistance to support the conservation and sustainable use of biodiversity, including fisheries, coral reefs, coastal wetlands and mangrove forests. The FAB Office manages projects which advance state-of-the-art forestry and biodiversity conservation programming and provides technical assistance to USAID missions.

For example, the FAB Office's *Global FISH Alliance*, a coalition of 11 non-governmental and governmental partners that ended in 2014, promoted locally-driven reform of fisheries in Honduras, Mozambique and Cambodia. Also part of FAB's programming is the Measuring Impact program that strengthens agency staff capacity building on coastal and marine program design, monitoring and evaluation. In addition, the *Strengthening Tenure and Resource Rights* (STARR) program supports a learning agenda on marine tenure arrangements for wild fisheries management in developing countries.

Office of Global Climate Change

The Office of Global Climate Change (GCC) helps countries to accelerate the transition to low emission, climate resilient development. GCC staff provides support to missions to design climate change programs in three areas: clean energy, sustainable landscapes, and adaptation. Sustainable landscapes activities include managing and monitoring mangrove ecosystems so they capture carbon and play a productive role for coastal livelihoods and support marine species. Adaptation activities include improving the resilience of marine fisheries and coastal zones to climate change impacts like rising ocean temperatures, sea level rise, and storm surge. The GCC Office also manages programs that pilot innovative approaches to integrating climate change into development, including in marine and coastal areas, among other sectors.

For example, the SERVIR program is a joint initiative of USAID and NASA that strengthens regional institutions' abilities to improve access to scientific data and analysis, improve the capacity of analysts and decision-makers to use these data and analysis, and provide tailored tools to inform decision-making related to food security, land use, water, disaster management, weather and climate. SERVIR has developed automated tools that monitor harmful algal blooms in Central America, and has mapped coral reefs and seagrass meadows in East Africa using remote sensing techniques to inform management.

In addition, *Sustainable Wetlands Adaptation and Mitigation* (SWAMP) is a collaborative effort between the Center for International Forestry Research (CIFOR) and the U.S. Forest Service (USFS) with support from USAID Global Climate Change Office. SWAMP seeks to provide policy makers with credible information to make sound decisions relating to the role of tropical wetlands in climate change adaptation and mitigation strategies.

USAID, in collaboration with NOAA and the Western Indian Ocean Marine Science Association (WIOMSA), has supported a three-year capacity building program on climate change for marine protected area managers in Eastern and Southern Africa. Participants from ten countries have been trained in vulnerability assessment, scenario planning, and the design of relevant adaptation strategies. A mentor program component is creating a cadre of local experts who can continue to build capacity to understand and respond to climate change issues in marine and coastal areas in the region.

Africa Bureau

USAID Ghana: The Integrated Coastal and Fisheries Governance Program (ICFG) Program supported the Government of Ghana's fisheries development objectives of poverty reduction, food

security, sustainable management, and biodiversity conservation. ICFG, concentrated in the six coastal districts of the Western Region of Ghana, strengthened local capacity at the community and district government levels to address over-fishing, increase social and economic benefits to artisanal fishing communities, incentivize an integrated coastal resources management and fisheries agenda, and harmonize policies and management plans at the trans-boundary level to conserve the Guinea and Canary currents' large marine ecosystems.

The objective of the Sustainable Fisheries Management Project (SFMP), the mission's follow-on program to the ICFG, is to rebuild marine fisheries stocks and catches through adoption of responsible fishing practices. The project contributes to the Government of Ghana's fisheries development objectives and USAID's Feed the Future Initiative. Working closely with the Ministry of Fisheries and Aquaculture Development and the Fisheries Commission, USAID/Ghana SFMP aims to end overfishing of key stocks important to local food security through a multi-pronged approach that will benefit over 100,000 people.

USAID Senegal: The Collaborative Management for a Sustainable Fisheries Future (COMFISH) in Senegal is a five-year project that began in 2011. The project promotes sustainable fisheries co-management and to the Government of Senegal's efforts to reform its fisheries sector. Poor management of the fisheries is decreasing the resilience of both the fisheries and the communities who depend upon them.

Asia Bureau

USAID Bangladesh: The Bangladesh Enhanced Coastal Fisheries (B-ECOFISH) activity aims to strengthen community-based fish sanctuaries and livelihood development with poor, climate-vulnerable populations in the Meghna River estuary of Bangladesh. The activity will conduct biological and socio-economic assessments, introduce science and technology applications to track the location and volume of wild catch fisheries, develop marine protected area management plans, support enhanced fisheries enforcement and protection (e.g., community-based patrols), develop a sustainable financing policy to pay for fisheries management and community development, and support women's empowerment organizations with microfinance and technical assistance.

USAID Philippines: The Ecosystems Improved for Sustainable Fisheries (ECOFISH) activity aims to conserve biological diversity, enhance ecosystem productivity, and restore the profitability of fisheries in eight marine key biodiversity areas (MKBA) using an ecosystem-based approach for fisheries management. ECOFISH supports the Government of the Philippines (GOP) to improve sustainable fisheries management through capacity development and constituency building among local governments. Technical support through the program is developing catch monitoring protocols in the eight MKBAs as inputs to the National Stock Assessment Program and the State of the Marine Resources Report. MKBA monitoring will be conducted to measure results that will be a basis for refining fisheries management and initiating inter-government fisheries management planning. ECOFISH supports the GOP's national registration program on fishing boats and gear; the establishment and strengthening of networks of marine protected areas; public-private partnerships to promote sustainable fisheries; enhanced reporting of maritime law violations and coordination with maritime law enforcement agencies; and pursuit of livelihood opportunities in fishing communities.

USAID Regional Development Mission in Asia: USAID is a major supporter of the Coral Triangle Initiative for Coral Reefs, Fisheries and Food Security, (CTI-CFF), a multi-national, country-led initiative to safeguard the region's natural assets. The global center of marine biodiversity, the Coral Triangle, is within the territories of Indonesia, Malaysia, Papua New Guinea, Philippines, Timor Leste, and Solomon Islands. USAID supports the CTI to designate and effectively managing priority seascapes, apply an ecosystem-based approach to the management of fisheries and other marine resources, establish networks of marine-protected areas, implement measures to strengthen resilience and adaptation to climate change, and strengthen measures to protect threatened marine species. The coordinated U.S. response involves multiple agencies,

along with non-governmental groups and U.S. universities.

The Oceans and Fisheries Partnership (OCEANS) program works collaboratively with the Association of South East Asian Nations to promote sustainable and legal fisheries, conserve marine biodiversity, and improve food security. OCEANS focuses on reducing illegal, unregulated and unreported fishing by market mechanisms, supply chain management, and a catch documentation and traceability system for seafood. Replication and scaling up of the catch documentation and traceability system will be achieved through regional platforms such as the Coral Triangle Initiative for Coral Reefs, Fisheries and Food Security, the Regional Plan of Action for Combating Illegal, Unreported and Unregulated Fishing, and the ASEAN-Southeast Asian Fisheries Development Center Strategic Partnership.

USAID Sri Lanka and Maldives: USAID's Reefs Generate Environmental and Economic Resiliency for Atoll Ecosystems (REGENERATE) project in the Maldives aims to strengthen sustainable management of coastal resources, particularly coral reefs, thereby enhancing Maldives' resiliency to the adverse effects of climate change. REGENERATE focuses on improving the national information system for monitoring climate change impacts on coral reef ecosystems; developing a system for monitoring reef fisheries; conducting an atoll-wide baseline assessment of existing data and information systems; training and education to stakeholders; and investments in science and people through the development and improvements in national marine and coastal resource management and the establishment of marine protected areas.

Latin America and Caribbean Bureau

USAID Caribbean Development Program: The Caribbean Marine Biodiversity Activity (CMBA) is addressing major threats to conservation of coastal and marine biodiversity in the Caribbean − including overfishing and invasive species − by applying a model for marine area management that incorporates lessons from past experience while simultaneously developing innovations that could stimulate conservation breakthroughs. To achieve sustained biodiversity conservation, maintain critical ecosystem services, and realize tangible improvements in human wellbeing for communities adjacent to marine protected areas, the activity addresses direct and indirect threats to coastal and marine biodiversity. Regional efforts advance the goals of the Caribbean Challenge Initiative. National efforts support the establishment of protected area trust funds in targeted countries, along with national policy action to promote sustainable fisheries. In addition, the project supports completing marine spatial plans and creating strong spatial plan governance mechanisms. Marine protected areas are supported in the Dominican Republic, Haiti, Jamaica, Grenada, and St. Vincent and the Grenadines.

USAID Central America Regional Mission: The *Marine Aquatic Resources and Economic Alternative* (MAREA) program, which ended in 2015, strengthened Central American coastal and marine resources management to reduce environmental threats, conserve biodiversity, and improve livelihoods. The program promoted effective monitoring and enforcement of coastal and marine-resource policies and legislation, rights-based and market-based mechanisms, and management incentives for the conservation and sustainable use of coastal and marine resources and ecosystems. An emphasis was placed upon ecosystem-based approaches to management to preserve ecosystem productivity. MAREA supported work in Belize, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, and Panama.

DEPARTMENT OF STATE					
(dollars in millions)	**FY 2012 Enacted**	**FY 2013 Enacted**	**FY 2014 Enacted**	**FY 2015 Enacted**	**FY 2016 Budget**
Bureau of Oceans and International Environmental and Scientific Affairs (OES)					
Economic Support Funds, OES Partnerships					
South Pacific Forum Fisheries	18.0	21.0	21.0	21.0	-
International Crane Foundation	0.4	-	-	-	-
U.S. Army Corps of Engineers	-	0.1	0.1	-	-
NOAA	-	-	-	-	-
Caribbean Oceans and Aquaculture Facility	-	-	5.0	-	-
Our Ocean Conference in Chile	-	-	-	0.2	-
Diplomatic & Consular Affairs					
Arctic Council	0.1	0.1	0.3	1.1	1.6
Sea Grant Fellow	0.1	0.1	0.1	0.1	0.1
Extended Continental Shelf and Boundary	-	-	0.4	1.0	1.0
International Fisheries Commission					
InterAmerican Tropical Tuna Commission (IATTC)	2.0	1.7	1.7	1.8	21.0
Great Lakes Fishery Commission (GLFC)	24.0	21.6	23.7	25.0	20.0
International Pacific Halibut Commission (IPHC)	4.5	4.2	4.4	4.2	4.2
Pacific Salmon Commission (PSC)	3.3	2.6	3.1	2.8	3.1
Other Marine Conservation Organizations	3.0	2.7	3.0	3.0	3.1
TOTAL	**55.3**	**54.0**	**62.8**	**60.2**	**54.1**

U.S. AGENCY FOR INTERNATIONAL DEVELOPMENT					
(dollars in millions)	FY 2012 Enacted	FY 2013 Enacted	FY 2014 Enacted	FY 2015 Enacted	FY 2016 Budget
Latin America and Caribbean Bureau					
Development Assistance					
Dominican Republic Mission	0.9	0.2	0.6	1.7	1.8
Barbados and Eastern Caribbean Regional Mission	5.0	-	-	1.0	1.5
Ecuador Mission	0.5	1.2	-	-	-
Caribbean Development Program	-	1.9	1.8	4.0	4.0
Central America Regional Mission	3.0	2.7	3.0	4.5	-
Economic Support Fund					
Colombia Mission	1.3	2.0	2.0	2.0	-
Mexico Mission	0.6	-	-	-	-
Africa Bureau					
Development Assistance					
Ghana Mission	2.7	3.3	2.3	3.2	3.2
Madagascar Mission	-	-	0.5	2.0	2.0
Senegal Mission	1.7	1.5	2.7	2.2	-
Tanzania Mission	-	0.3	0.3	-	-
West Africa Regional Mission	0.5	1.0	3.4	5.3	6.0
Asia Bureau					
Development Assistance					
Bangladesh Mission	5.0	2.3	2.8	2.0	2.0
Indonesia Mission	9.7	4.6	6.1	4.5	4.0
Sri Lanka and Maldives Mission	-	2.0	2.0	2.0	3.0
Philippines Mission	8.4	4.0	7.9	6.6	6.6
Timor Leste Mission	-	-	0.2	-	-
Regional Development Mission/Asia	4.3	2.8	4.9	5.8	5.4
Europe and Eurasia Bureau					
Freedom Support Act					
Russia Mission	0.1	-	-	-	-
Economic Growth, Education and Environment Bureau					
Development Assistance					
Forestry and Biodiversity Office	1.3	1.0	0.7	0.7	0.7
Global Climate Change Office	-	0.7	2.4	2.7	-
Global Health Bureau					
Global Health Programs - USAID					
Population and Environment	0.1	-	-	-	-
TOTAL	**45.1**	**31.5**	**43.6**	**50.2**	**40.2**

DEPARTMENT OF TRANSPORTATION

In anticipation of the expected doubling of freight and passenger transportation by 2050, DOT will foster smart, strategic investments that will serve the traveling public and facilitate freight movement, including improving the performance of freight rail and maritime trade networks. Some DOT activities are supported by more than one DOT element. For example both the Saint Lawrence Seaway Development Corporation and the Maritime Administration support the Great Ships Initiative, and these administrations and the Office of the Secretary have funded the Great Lakes Maritime Research Institute.

Saint Lawrence Seaway Development Corporation

The Saint Lawrence Seaway Development Corporation (SLSDC), a wholly-owned government corporation within the Department of Transportation, is responsible for the operations and maintenance of the United States portion of the St. Lawrence Seaway. This responsibility includes maintaining and operating the two U.S. Seaway locks in Massena, NY, and vessel traffic control areas of the St. Lawrence River and Lake Ontario. The SLSDC coordinates its activities with its Canadian counterpart, the St. Lawrence Seaway Management Corporation (SLSMC), particularly with respect to rules and regulations, overall day-to-day operations, traffic management, navigation aids, safety, environmental programs, operating dates, and trade development programs. The SLSDC's activities and budgetary resources are split between two programs – Agency Operations and Asset Renewal Program (ARP).

Agency Operations

The SLSDC's agency operations program consists of all agency activities, except for capital and non-capital infrastructure improvements. Primary program activities include lock operations and maintenance, vessel traffic control, vessel safety and environmental inspections, and customer outreach. The SLSDC has taken a pro-active approach in recent years in addressing the issue of aquatic invasive species on the Great Lakes St. Lawrence Seaway System. The SLSDC, its Canadian counterpart, and other U.S. and Canadian Federal partners, continue to make notable progress in ballast water management and related efforts to prevent any new introductions of aquatic invasive species via commercial ships entering Seaway waters.

Great Lakes/Seaway Ballast Water Collaborative: In late FY 2009, the SLSDC initiated the Great Lakes Ballast Water Collaborative (BWC), in conjunction with the International Joint Commission, to bring together industry and State and Federal regulators on the issue of ballast water and invasive species in the region. One of the primary goals of the BWC is to share relevant, useful, and accurate information and foster better communication and collaboration among the key stakeholders engaged in the effort to reduce the risk of introduction and spread of aquatic nuisance species.

A particular emphasis of the BWC has been to bring state representatives together with marine industry representatives and respected scientists to share information and find workable and effective solutions to the aquatic invasive species challenge.

Reports from these meetings are available on the binational Seaway website and have been cited by the Environmental Protection Agency Science Advisory Board, the California State Lands Commission, and the Wisconsin Department of Natural Resources. The wide-spread use of the reports and the robust attendance at Collaborative meetings are indicative of the need that was filled by Collaborative activities.

The BWC plays a key role in developing stronger connections among scientists, regulators, environmental non-governmental organizations (NGOs), and Seaway users. It has been instrumental in developing a more uniform regulatory approach for ballast water for the Great Lakes and for the entire country.

Foreign-Flag Vessel Safety and Ballast Inspections: The SLSDC continues to perform its Enhanced Seaway Inspection (ESI) program, inspecting all ocean vessels for safety and environmental protection issues in Montreal, Quebec, before they enter United States waters. During the 2014 navigation season, the SLSDC achieved its internal performance goal of inspecting 100 percent of ocean vessels, all performed by SLSDC marine inspectors.

The ballast water exchange program continues to be an important function of the ship inspection program. These inspections are carried out concurrently with the ESIs by SLSDC personnel in Montreal, and by USCG and Corporation staff at Snell Lock in Massena. These programs support the Oil Pollution Act of 1990 and the Non-Indigenous Aquatic Nuisance Prevention and Control Act of 1990.

In 2014, 100 percent of vessels bound for the Great Lakes Seaway from outside the Exclusive Economic Zone (EEZ) received ballast management exams on each Seaway transit. All 8,497 ballast tanks, during 454 vessel transits, were assessed. Vessels that did not exchange their ballast water or flush their ballast tanks were required to either retain the ballast water and residuals on board, treat the ballast water in an environmentally sound and approved manner, or return to sea to conduct a ballast water exchange.

Vessels that were unable to exchange their ballast water/residuals, and that were required to retain them onboard, received a verification boarding during their outbound transit prior to exiting the Seaway. In addition, 100 percent of ballast water reporting forms were screened to assess ballast water history, compliance, voyage information and proposed discharge location. Since 2006, ballast water management requirements in the Great Lakes and the St. Lawrence Seaway System have been the most stringent in the world.

Great Ships Initiative: The SLSDC continues to work closely with the Great Ships Initiative (GSI), which is focusing resources and expertise on producing solutions to the problem of ship-mediated invasive species in the Great Lakes. The GSI program is an industry-led cooperative effort initiated by the Northeast-Midwest Institute, in collaboration with the American Great Lakes Ports Association. It operates on two fronts: (1) activating a set of "technology incubators" to accelerate the identification and verification of treatment alternatives to stop organism introductions by ocean-going ships; and (2) monitoring Great Lakes ports and harbors for new introductions of invasive species by ships.

"Green Marine" Program: The SLSDC is also involved in the "Green Marine" program, a marine industry partnership program aimed at demonstrating and communicating the maritime industry's commitment to addressing a number of key environmental issues. The Green Marine program builds and maintains strong relations with key stakeholders and develops a greater awareness of the maritime industry's activities, benefits and challenges. Activities are directed towards strengthening the industry's environmental standards and performance through a process of continuous improvement, helping the maritime industry to speak with one voice, and strengthening industry involvement in regulatory processes and improving regulatory outcomes.

Great Lakes Maritime Research Institute: The SLSDC serves on the advisory board of the Great Lakes Maritime Research Institute (GLMRI), a National Maritime Enhancement Institute established in 2004. The GLMRI's mission is to conduct research to support the advancement of the Great Lakes marine transportation system. The GLMRI, a consortium between the University of Wisconsin-Superior and the University of Minnesota-Duluth, conducts research and publishes findings on maritime issues including aquatic invasive species. The Maritime Administration also supports the GLMRI. The Office of the Secretary's Transportation Planning, Research and Development account has also provided funds to the GLMRI. In addition, the SLSDC plays a key role on the Great Lakes Regional Waterways Management Forum, a group of U.S. and Canadian Federal representatives who work cooperatively to identify and resolve waterways management issues that involve the Great Lakes region. Over the past few years, the SLSDC has played an active role on the Forum's ballast water working group. The ballast water working group was developed to

harmonize efforts between the USCG, Transport Canada, and the two Seaway Corporations to coordinate and exchange compliance and research efforts for reducing aquatic nuisance species invasions via ballast water in the Great Lakes.

Asset Renewal Program

The SLSDC's multi-year ARP was initiated in FY 2009 and focuses on improving United States Seaway infrastructure, conducting maintenance dredging, investing in new technologies, purchasing new equipment, and refurbishing old facilities. The program marks the first time in the Seaway's history that a coordinated effort to rehabilitate and modernize the Seaway infrastructure has taken place. None of the ARP projects result in increases to the authorized depth or width of the navigation channel or the dimensions of the two existing U.S. locks. In the first six years of the ARP (FYs 2009-2013), the SLSDC obligated $94 million on 43 separate ARP projects.

Maritime Administration

The Maritime Administration (MARAD) supports national economic and environmental outcomes. MARAD programs advance economic competitiveness by sustaining a viable U.S. merchant marine for commerce, emergency response, and national security. A viable U.S. Merchant Marine provides transportation options for businesses to reach their suppliers and customers that, measured on a per ton basis, is more fuel-efficient and less impactful on the environment than rail and highway freight transport.

Environmental Initiatives

Aquatic Invasive Species -- Ballast Water and Related Technologies: MARAD contributes funding and ship platforms for scientific, technical, engineering, and marine architectural support to develop technical and scientific protocols for ballast water treatment technology testing and verification. MARAD coordinates and provides Federal support for three independent facilities that test and verify the efficacy of ballast water management systems (BWMS). The Environmental Spending Plan for 2015 is specifically designed to address the Congressional expectation of maintaining this verification and certification infrastructure in the United States.

Great Ships Initiative: MARAD continues to fund the Great Ships Initiative (GSI). With funding from the Great Lakes Restoration Initiative (GLRI), MARAD was able to upgrade the facility in order to conduct ballast water management system (BWMS) testing in accordance with International Maritime Organization (IMO) guidelines and U.S. Coast Guard protocols. The facility is focused on verifying the efficacy of BWMS in fresh water. The testing is conducted at the land-based level as well as bench scale. In 2012, the facility was approved as a sub-laboratory for conducting tests for U.S. Coast Guard approval.

Maritime Environmental Resource Center (MERC): MARAD continues to fund the development and operation of a barge-based ballast water management system (BWMS) test facility based in the Chesapeake Bay. The MERC facility is capable of testing BWMS according to International Maritime Organization (IMO) guidelines and U.S. Coast Guard testing protocols. In 2012, the facility was approved as a sub-laboratory for conducting tests for U.S. Coast Guard approval. MERC is also conducting research associated with hull bio- fouling as well as compliance monitoring tools for ballast water discharges.

***Golden Bear* Facility:** MARAD is also sponsoring BWMS testing aboard its vessel Training Ship *Golden Bear* based at the California Maritime Academy in Vallejo, California. The facility is capable of testing BWMS in accordance with IMO guidelines. In 2013, the facility was approved as a sub-laboratory for conducting tests for U.S. Coast Guard approval.

Air Emissions/Alternative Fuels and Energy for Maritime Applications: MARAD's port and vessel air emissions and energy efforts, like those of ballast water, have been ongoing since the early 2000s and are similarly based on stakeholder collaboration.

Since 2010, MARAD has funded research on various aspects of the use of Natural Gas (NG) as a maritime propulsion fuel, energy efficiency improvements for vessel operations, the use of "drop-in" bio-diesel fuel for ships, fuel cells for marine applications, including ship board auxiliary power and power for refrigerated containers, and exhaust scrubbers to remove sulfur.

MARAD's 2015 Environmental Spend Plan includes funding for air emissions testing for a vessel conversion from diesel fuel to LNG; testing and demonstration of LNG applications for inland tug operations, and emissions testing and related research on the installation and operation of sulfur scrubbers aboard a United States flagged vessel.

Operations and Training: MARAD programs also help ensure the readiness of sealift capacity to respond to national crises and Department of Defense mobilizations. The U.S. Merchant Marine Academy and state maritime academies educate and graduate merchant marine officers ready to serve the maritime industry and Armed Forces. Both the U.S. Merchant Marine Academy and the state maritime academies support marine–related commerce by educating young men and women to become officers in the American merchant marine. The U.S. Merchant Marine Academy is a federally-operated institution. MARAD provides funding and other assistance to the six state maritime academies.

Assistance to Shipyards: MARAD's Title XI and Assistance to Small Shipyards programs provide loan guarantees and grants supporting the industry, providing an engine for capacity and economic growth. MARAD awarded $9.458 million in grants in FY 2013 to support capital improvements at qualified shipyards to improve the ability of domestic shipyards to compete for domestic and international commercial ship construction.

MARAD's Maritime Security Program (MSP): MSP assists U.S.-flag operators to ensure that an active U.S.-flag merchant fleet of militarily useful general cargo vessels continue to operate in international trade, and the trained personnel needed to operate both active commercial and government-owned reserve vessels, are available to meet United States economic and national security requirements. The Maritime Security Program sustains a fleet of commercial vessels capable of supporting national security and Federal emergency response requirements.

The Maritime Guaranteed Loan Program (Title XI): The Maritime Guaranteed Loan Program authorizes MARAD to guarantee up to 87.5 percent of the obligations on private sector debt financing for ships constructed, reconstructed, or reconditioned in the United States, including vessels for export, and to guarantee shipyard obligations of indebtedness for eligible domestic and exports vessels and for shipyard modernization and improvement. Guarantees in force and commitments to guarantee include a significant portion of the U.S.-flag fleet, including vessels on the coastal and inland waterways.

The Cargo Preference Program: The Cargo Preference Program oversees the administration of and compliance with United States cargo preference laws and regulations. Those laws require shippers to use U.S.-flag vessels to transport specified shares of any government-impelled ocean-borne cargoes. The ocean freight revenue provided to the U.S. flag merchant fleet by the Cargo Preference Program provides an economic incentive to remain under the U.S. flag to support mobility, national economic and system capacity, and defense needs. The Cargo Preference Program supports the transport of DOD cargoes, civilian agency cargoes, and United States food aid by U.S.-flag vessels.

Ship Disposal Program: MARAD is the United States government's disposal agent for merchant type vessels 1,500 gross tons or more and is the owner of approximately 50 obsolete ships designated for disposal. The presence of hazardous materials onboard the ships such as residual fuel, ex-foliating paint, asbestos, and solid polychlorinated biphenyls (PCBs) pose a risk to the surrounding environment. The Ship Disposal Program ensures disposal of the obsolete vessels through qualified ship recycling facilities that protect the environment and worker health and safety during the recycling process.

The Nuclear Ship *Savannah*, the world's first nuclear-powered merchant ship is owned and maintained by MARAD, and is licensed and

regulated by the United States Nuclear Regulatory Commission (NRC). MARAD programs support both the disposal of obsolete ships from the National Defense Reserve Fleet (NDRF) and management of the inactive Nuclear Ship *Savannah*.

Port of Guam Improvement Enterprise Fund: The FY 2009 Department of Defense authorization created the Port of Guam Improvement Enterprise Fund with the intent of consolidating all resources dedicated to the Guam Port Improvement project within the Fund. The project will affect the substantial improvement of the Jose D. Leon Guerrero Commercial Port to provide modern and efficient transportation access to the island of Guam and to the region to meet the Department of Defense requirements for the Guam build-up needed for the relocation of troops from Okinawa.

Office of the Secretary

Transportation Planning, Research and Development

The Transportation Planning, Research and Development (TPR&D) account finances research activities and studies concerned with planning, analysis, and information development needed to support the Secretary's responsibilities in the formulation of national transportation policies. The program is carried out primarily through contracts with other Federal agencies, educational institutions, non-profit research organizations, and private firms. Activities support the development of transportation policy, coordination of national-level transportation planning, and such issues as regulatory modernization, energy conservation, and environmental and safety impacts of transportation. These funds have supported studies on ballast water and marine transportation performed by the Great Lakes Maritime Research Institute (2010 and earlier).

DEPARTMENT OF TRANSPORTATION					
(dollars in millions)	FY 2012 Enacted	FY 2013 Enacted	FY 2014 Enacted	FY 2015 Enacted	FY 2016 Budget
Saint Lawrence Seaway Development Corporation					
Agency Operations	18.0	16.3	17.0	17.7	18.3
Asset Renewal Program	16.0	14.2	14.0	14.3	18.2
Maritime Administration					
Operations and Training					
MARAD Academies	102.3	98.0	96.8	97.7	130.6
MARAD Operations	54.0	50.1	51.2	50.4	54.1
Assistance to Small Shipyards	10.0	9.5	-	-	-
Maritime Security Program	174.0	160.3	186.0	186.0	211.0
Maritime Guaranteed Loan Program (Title XI)	3.7	3.5	38.5	3.1	3.1
Ocean Freight Differential	175.0	46.5	-	-	-
Ship Disposal	5.5	5.2	4.8	4.0	8.0
Office of the Secretary					
Transportation Planning Research & Development					
Great Lakes Maritime Research Institute	-	-	-	-	-
National Export Initiative	0.2	-	0.5	0.2	0.6
Panama Canal Expansion Study	-	-	-	-	-
TOTAL	**558.7**	**403.6**	**408.8**	**373.4**	**443.9**

DEPARTMENT OF TREASURY

Global Environment Facility

The Department of the Treasury is responsible for oversight of U.S. participation in the Global Environment Facility (GEF) which, among others, funds projects to address international water pollution and over fishing. Other portions of the GEF portfolio also advance U.S. objectives on oceans policy by supporting marine and coastal biodiversity projects, phasing-out the use and manufacture of persistent organic pollutants (POPs), and by fighting desertification, which can impact ocean and coastal ecosystem health.

The GEF was created in 1991 to help developing countries address global environmental problems that may affect the United States and the rest of the world, including those related to international water pollution and protecting fisheries. GEF funding is also focused on expanding clean energy production and efficient energy use, conserving biological diversity, reducing deforestation, phasing out ozone depleting substances, reducing persistent organic pollutants, and preventing land degradation and desertification.

GEF Operations

The GEF focuses on innovative and cost-effective projects that can be replicated elsewhere with financing from non-GEF sources. These projects are implemented by developing countries through ten implementing agencies (the World Bank, the U.N. Development Program, the U.N. Environment Program, the four regional multilateral development banks, the Food and Agricultural Organization (FAO), the International Fund for Agricultural Development (IFAD), and the U.N. Industrial Development Organization (UNIDO)). GEF projects are co-financed by developing country governments, bilateral aid agencies, GEF implementing agencies, private sector investors, and non-governmental organizations.

GEF operations generally take two forms: (1) Technical assistance to help developing countries develop and implement environmentally sound policies and practices; and (2) direct investments to demonstrate innovative technologies or improve management practices, such as installation of new equipment on fishing boats to reduce by-catch of non-target species, including sea turtles and mammals. GEF operations to reverse the degradation of international waters are grouped into four primary objectives: (1) catalyze multi-state cooperation to balance conflicting uses in trans-boundary basins; (2) catalyze multi-state cooperation to rebuild marine fisheries and reduce pollution of coasts and large marine ecosystems; (3) support foundational capacity building, portfolio learning, and targeted research needs for joint, ecosystem-based management of trans-boundary water systems; and (4) promote effective management of marine areas beyond national jurisdiction.

Among others, the GEF international waters program has facilitated international agreements that have enhanced the governance over international bodies of water.

DEPARTMENT OF TREASURY					
(dollars in millions)	**FY 2012 Enacted**	**FY 2013 Enacted**	**FY 2014 Enacted**	**FY 2015 Enacted**	**FY 2016 Budget**
International Assistance Programs					
Global Environment Facility Total Appropriation	89.8	124.8	143.8	136.6	168.3
Amount towards ocean and coastal	6.3	12.5	21.6	5.5	*
TOTAL	**6.3**	**12.5**	**21.6**	**5.5**	*

*Unknown

ENVIRONMENTAL PROTECTION AGENCY

The U.S. Environmental Protection Agency (EPA) protects human health and safeguards the natural environment upon which all life depends. The EPA contributes to the protection of our Nation's ocean and coastal resources by striving to ensure that our waters are successfully managed, protected, and restored to sustain healthy biological communities and to protect human health. The EPA's ocean and coastal protection activities emphasize habitat protection, partnerships, programs addressing ocean-based and land-based sources of coastal and ocean pollution, and water quality monitoring and assessment. Whenever possible, these activities are implemented on an integrated watershed basis, addressing air, land, and ecosystem relationships.

Office of Water

Place-based Programs

Gulf of Mexico Program: The EPA's efforts in the Gulf of Mexico directly support a collaborative, multi-organizational partnership comprised of numerous Federal departments and agencies, state and local government, citizens, environmental and fishery interests, agriculture interests, regional and local business councils, and industry. The EPA's Gulf of Mexico Program assists all partners and stakeholders, especially the Gulf States, in the development and implementation of a regional, ecosystem-based approach for protecting, enhancing, and restoring the Gulf of Mexico.

Great Lakes Restoration Initiative: The Great Lakes are the largest system of surface freshwater on earth, containing 20 percent of the world's surface freshwater and 95 percent of the surface freshwater in the United States. The goal of the EPA's Great Lakes program is to restore and maintain the environmental integrity of the Great Lakes ecosystem, as mandated by the Great Lakes Restoration Initiative (GLRI), the Canada Great Lakes Water Quality Agreement, and the Clean Water Act (CWA). Using funds appropriated to the EPA to supplement their base funding, the Federal GLRI agencies fund work directly or through others such as states, tribes, cities, universities, and non-governmental organizations to implement the FY 2010 to FY 2014 GLRI Action Plan and the FY 2015 to FY 2019 GLRI Action Plan II (Action Plan II). The Action Plan II targets five focus areas:

1) Toxic Substances and Areas of Concern;
2) Invasive Species;
3) Nonpoint Source Pollution Impacts on Nearshore Health;
4) Habitats and Species; and
5) Foundations for Future Restoration Actions.

The Action Plan uses outcome-oriented performance goals and measures to target the most significant problems and track progress in addressing them. Highlights of progress since GLRI started include:

- In 2013, the Presque Isle, Pennsylvania Area of Concern (AOC) was delisted. Federal agencies and their partners also have completed management actions necessary for delisting five additional AOCs. Forty-two Beneficial Use Impairments (BUIs) have been removed at 17 AOCs – four times the total number of BUIs removed in the preceding 22 years.
- Approximately five million cubic yards of contaminated sediments have been remediated.
- GLRI has been central to the Administration's coordinated efforts to keep self-sustaining Asian carp populations out of the Great Lakes.
- Over one million acres of agricultural land in the Great Lakes watershed were put into USDA conservation contracts to reduce erosion and loadings of nutrients and/or pesticides.

- More than 115 thousand acres of wetland, coastal, upland, and island habitat have been protected, restored, or enhanced.

Through this coordinated interagency process, implementation of the GLRI is helping to restore the Great Lakes ecosystem, enhance the economic health of the region, and ultimately improve the public health of the area's 30 million Americans.

Chesapeake Bay Program: The Chesapeake Bay Program is a unique regional partnership that has led and directed the restoration of the Chesapeake Bay since 1983. Each Bay Program partner agrees to use its own resources to implement projects and activities that advance Bay restoration. The partnership defines its collective actions through formal, voluntary agreements and provides general policy direction through consensus documents, typically called directives.

In response to President Obama's Executive Order on Chesapeake Bay Protection and Restoration (E.O. 13508), signed on May 12, 2009, the EPA and the other agencies identified in the E.O. released on May 12, 2010, a strategy to coordinate, expand and bring greater accountability to efforts to help speed the Bay's recovery. The strategy is managed by a high-level Federal Leadership Committee (FLC) for the Chesapeake Bay, chaired by the EPA and including senior representatives of the departments of Agriculture, Commerce, Defense, Homeland Security, the Interior, Transportation and other agencies.

On December 29, 2010, the EPA established the Chesapeake Bay Total Maximum Daily Load (TMDL), a historic and comprehensive "pollution diet" with rigorous accountability measures to initiate sweeping actions to restore clean water in the Chesapeake Bay and the region's streams, creeks, and rivers. The TMDL is required under Federal law and responds to consent decrees in Virginia and Washington D.C. dating to the late 1990s. It also is a keystone commitment of the E.O. strategy. The TMDL is supported by rigorous accountability measures to ensure restoration commitments are met, including short- and long-term benchmarks, a tracking and accounting system for jurisdiction activities, and Federal actions that can be employed, if necessary, to spur progress.

On June 16, 2014, Chesapeake Bay Program partners signed the new Chesapeake Bay Watershed Agreement, which builds on many of the goals and outcomes established under the E.O. 13508. The Agreement provides for the first time the Bay's headwater states (Delaware, New York, and West Virginia) with full partnership in the Bay program, joining Pennsylvania, Maryland, Virginia, and Washington, DC. The Agreement establishes 10 goals (for sustainable fisheries, water quality, healthy watersheds, vital habitats, toxic contaminants, land conservation, stewardship, environmental literacy, public access, and climate resiliency) and 31 associated outcomes. As part of the Agreement, the EPA and its partners developed management strategies in FY 2015 and plan to prepare biennial workplans and implement the strategies in FY 2016.

Mississippi River/Gulf of Mexico Watershed Nutrient Task Force: The EPA serves as the Federal co-chair of the Mississippi River/Gulf of Mexico Watershed Nutrient Task Force, a Federal/State partnership working collaboratively to reduce nutrients in the Mississippi River Basin and to shrink the size of the Gulf hypoxic zone. The Task Force continues to implement the 2008 Action Plan and 2015 New Goal Framework. All the Task Force states have developed nutrient reduction strategies required by the 2008 Action Plan. The Task Force and Land Grant Universities in the Task Force states sealed an important partnership in 2014. This group of extension and research experts and scientists are ready to lend assistance to the important outreach and research needs of the Task Force states as they implement strategies.

National Estuary Program/Coastal Ecosystems: The National Estuary Program (NEP), established in 1987 by amendments to the Clean Water Act, currently includes place-based partnership programs in 28 "estuaries of national significance." Each program uses a local, collaborative, stakeholder-driven process to develop and implement its comprehensive, long-term management plan for estuary protection and restoration. The plan's development and implementation rest on partnerships with Federal, tribal, State, local, and community entities. Aside from base NEP grants, the agency also provides additional support for several geographical areas,

including Long Island Sound, Puget Sound, and San Francisco Bay.

Coastal and Marine Pollution Control Programs

Regulation of Material for Dumping into the Ocean: Under the Marine Protection, Research, and Sanctuaries Act (MPRSA or Ocean Dumping Act), the EPA develops regulations and standards for ocean dumping, designates and manages sites for ocean dumping, issues permits for such dumping (except for dredged material permits, on which the EPA must concur with the Army Corps of Engineers), and develops national regulatory guidance. This Act serves to implement U.S. treaty obligations under the London Convention. The EPA carries out this work through its Marine Ecosystems activities.

Vessel Pollution: Under Section 312 of the Clean Water Act, the EPA promulgates regulations to control pollution from vessels and to limit the spread of aquatic nuisance species by vessels.

The agency establishes performance standards for marine sanitation devices, designates no-discharge zones for vessel sewage, develops management practices for recreational vessels, and works with the Department of Defense to develop Uniform National Discharge Standards to regulate vessels of the Armed Forces. Under Title XIV – Certain Alaskan Cruise Ship Operations – the EPA works closely with the State of Alaska and the U.S. Coast Guard to assess the need for changes to gray and black water standards for cruise ships operating in Alaska. In addition, the EPA has developed and is implementing a general permit for discharges from non-recreational vessels under CWA Section 402. The EPA carries out this work through its Marine Ecosystems activities.

BEACH Program Grants: The EPA administers the Beaches Environmental Assessment and Coastal Health Act (BEACH Act), signed into law on October 10, 2000. In 2015, the EPA expects to award an additional $9,486,388 in grants to eligible States. These funds support microbiological testing and monitoring of coastal recreation waters, including the Great Lakes waters, and support notifying the public of possible exposure to disease-causing microorganisms in coastal recreation waters.

Recreational Water Criteria: The EPA is required to conduct research and develop recreational waters criteria in a consent decree and settlement agreement. The EPA's Office of Water will use the results of these studies in the development of Recreational Waters Criteria to protect human health. The EPA is conducting research to: (1) assess human health risks in recreational waters; (2) develop indicators and methods to evaluate how well they singly or in combination correlate with swimming- related illnesses; and (3) evaluate the suitability of indicators, methods and models for use in different types of waters and for different Clean Water Act programs.

National Marine Debris Program: The EPA supports efforts to reduce land-based sources of marine litter through projects that include: pollution prevention programs; sustainable materials management (life cycle-and systems-based analysis); and waste reduction efforts.

Other Clean Water Act Programs: In addition to the Clean Water Act programs discussed above, there are numerous other programs, established under the Clean Water Act, to control pollution in all surface waters within the Act's jurisdiction. Though not solely focused on coastal and ocean waters, these programs also contribute to the EPA's overall ocean and coastal protection efforts by controlling pollution before it reaches coastal and ocean waters. They include: water quality standards and criteria; point source discharge permit program; wastewater infrastructure improvements via the Clean Water State Revolving Fund; technical assistance/grant program to address nonpoint source pollution; total maximum daily load program; and water quality monitoring and reporting.

Office of International and Tribal Affairs

The EPA helps shape the U.S. Government's positions on marine pollution issues. The EPA also

participates in treaty negotiations and advises technical programs that protect both environmental and economic interests throughout the world's oceans.

Office of Air and Radiation

Great Waters Program: Under the Great Waters program, in partnership with the Department of Commerce's National Oceanic and Atmospheric Administration, the EPA analyzes the impacts of air deposition to coastal waters. The EPA regulates air emissions from area, stationary, and mobile sources and establishes National Ambient Air Quality Standards to protect public health and the environment.

Office of Research and Development

Safe and Sustainable Water Resources

Recreational Water Criteria: The EPA was required to conduct research and develop recreational waters criteria in a consent decree and settlement agreement. In August 2007, the EPA's Office of Research and Development collaborated with the EPA's Office of Water to develop the EPA's Critical Path Science Plan (CPSP). CPSP articulates the essential research and science that the EPA conducted between 2007 and the end of 2010 to establish the scientific foundation for new or revised recreational water quality criteria. Since 2010, research has been conducted to develop and test the performance of quantitative tools for recreational water quality assessments.

National Coastal Condition Assessment Reports: The EPA cooperates with State, local, tribal, and Federal natural resource trustees to produce a series of National Coastal Condition Assessment (NCCA) reports (formerly National Coastal Condition reports, or NCCR). These reports describe the condition of coastal resources (estuarine and intertidal ecosystems) for the conterminous United States, including the Great Lakes. The coastal assessments help sustain an ongoing effort to foster an integrated comprehensive coastal monitoring program across all coastal states (including Alaska and Hawaii) and Puerto Rico and to provide probabilistic assessment of estuarine conditions. Trends in the condition of these systems will be evaluated as synoptic surveys and are conducted over time. These surveys are conducted by the EPA's Office of Water's (OW) National Aquatic Resource Surveys, but the EPA's Office of Research and Development (ORD) provides technical support to OW for survey design, data analysis, and interpretation of results. While OW is responsible for the production of these reports, these efforts are the result of an ongoing OW-ORD partnership.

Office of Enforcement and Compliance Assurance (OECA)

Vessel General Permit (VGP) Implementation – OECA and the Regions: In FY 2011, the EPA entered into a Memorandum of Agreement with the U.S. Coast Guard to cooperate and coordinate on implementing and enforcing the Vessel General Permit for large commercial vessels. The EPA reviews Coast Guard inspection data for appropriate response to correct violations of the permit. The EPA works with the Coast Guard to implement and enforce requirements in a revised permit for large commercial vessels and a new permit for smaller vessels.

ENVIRONMENTAL PROTECTION AGENCY					
(dollars in millions)	FY 2012 Enacted	FY 2013 Enacted	FY 2014 Enacted	FY 2015 Enacted	FY 2016 Budget
Office of Water					
Gulf of Mexico	5.0	4.8	3.9	4.1	3.8
Great Lakes	299.0	283.7	300.0	300.0	250.0
Chesapeake Bay	53.0	54.3	70.0	73.0	70.0
Coastal Ecosystems	69.0	63.2	60.5	65.1	65.5
BEACH Program	2.0	2.6	1.9	2.0	0.8
BEACH Program Grants	10.0	9.7	9.5	9.5	-
Clean Water SRF	816.0	1,036.6	811.4	811.4	625.0
Marine Ecosystems	13.0	12.3	11.9	10.6	10.5
Nonpoint Source Management	82.0	115.7	115.8	117.5	120.5
Section 106 Grants	112.0	106.2	108.5	108.5	117.1
Water Quality Standards	12.0	27.2	29.2	28.4	29.7
Office of International and Tribal Affairs					
Program Activities	0.1	-	-	-	-
Office of Air and Radiation					
Air STAG Grants	1.0	1.0	1.0	1.0	1.0
Office of Research and Development*					
Beaches (Recreational Water Quality Criteria)	1.1	1.1	-	1.1	-
National Coastal Conditions Assessment Report**	0.3	0.6	0.6	0.6	0.6
Office of Enforcement and Compliance Assistance					
Vessel General Permit	0.1	0.1	0.1	0.1	0.1
TOTAL	**1,475.6**	**1,719.1**	**1,524.4**	**1,533.0**	**1,294.5**

* In previous reports, EPA reported on Ecosystems Services Research and the FY 2010 Oil Spill Supplement,

** Formerly the National Coastal Condition Report (NCCR)

MARINE MAMMAL COMMISSION

The Marine Mammal Commission (Commission) is an independent government agency charged by the Marine Mammal Protection Act (MMPA) to further the conservation of marine mammals and their environment. The Commission works to ensure that marine mammal populations are restored and maintained as functioning elements of healthy marine ecosystems in the world's oceans. We provide science-based oversight of domestic and international policies and actions of Federal agencies with mandates to address human impacts on marine mammals and their ecosystems. The Commission's role is unique, as the only United States entity that provides comprehensive oversight of all science, policy, and management actions affecting marine mammals. Work is centered on five strategic objectives outlined in the FY 2015-2019 Strategic Plan and pays special attention to particular species considered to be most vulnerable to human activities. The Commission consists of three members appointed by the President with the advice and consent of the Senate. The Commission is assisted by a nine-member Committee of Scientific Advisors and 14 full-time permanent staff.

The Commission reviews and makes recommendations on the domestic and international policies and actions of Federal agencies to ensure that they are consistent with the MMPA. Marine mammals are subject to multiple human-related risk factors including direct and indirect fishery interactions; vessel strikes; noise; disease; contaminants; marine debris; harmful algal blooms; dead zones; coastal development; and climate change. To characterize risk factors and minimize harm to marine mammals from human activities, we consult with other Federal agencies, state agencies, tribal organizations and other key partners.

One of their top priorities is to increasingly partner with other agencies and organizations to leverage external resources and expertise. One way this is accomplished is through their research grants program. Making use of the best available science, developed at universities and other research institutions around the world, is critically important to inform management decisions and conservation measures that impact marine mammals. The Commission helps to develop and coordinate multi-agency and international research and management initiatives to facilitate marine mammal protection and conservation. They also regularly convene workshops that bring together marine mammal science, policy and management experts to discuss pressing issues related to our core mission to conserve marine mammals and their ecosystems.

MARINE MAMMAL COMMISSION					
(dollars in millions)	**FY 2012 Enacted**	**FY 2013 Enacted**	**FY 2014 Enacted**	**FY 2015 Enacted**	**FY 2016 Budget**
Marine Mammal Commission	3.0	2.9	3.3	3.3	3.4
TOTAL	**3.0**	**2.9**	**3.3**	**3.3**	**3.4**

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

NASA's primary role in oceans and coastal activities is developing the next generation of techniques and capabilities for satellite-based global and coastal ocean observation, demonstrating the techniques' utility, and pioneering the utilization of the acquired data. In addition to developing and implementing observing capabilities, NASA develops and implements data systems and computing advances in connection with ocean and Earth-system modeling.

NASA provides ocean products characterized by absolute accuracy and stability of observations to meet climate requirements (e.g. sea surface temperature from MODIS and ASTER on Terra, MODIS on Aqua, and GMI on the Global Precipitation Measurement (GPM) mission; sea level from the Jason series; and surface winds from QuikScat and RapidScat scatterometers). NASA missions are also improving understanding of the role of ocean biology and biogeochemistry in the Earth system. NASA develops and implements satellite missions to explore new techniques or new geophysical variables. The Gravity Recovery and Climate Experiment (GRACE) mission, launched in March 2002, contributes to oceanography by measuring the time varying gravity field.

NASA is examining other exploratory measurements such as: (a) ocean surface salinity from space; (b) reflected signals from the Global Positioning System satellites for sea level and wind vector measurement; (c) Lidar to estimate oceanic plant groups and particle types (unknowns in carbon cycle, ecological, and biogeochemical models); and (d) pulse and probe laser techniques to study phytoplankton photosynthetic efficiency or changes in plant biochemistry as a response to environmental variability or change.

Additionally, understanding of the ice-covered Polar Regions, believed to be the most vulnerable to changes in climate, is a high priority within NASA's research activities. NASA has led the way in using satellite sensors to derive ice concentration extent, temperature, and motion to understand high-latitude oceanographic processes, particularly in the context of significant climate changes in the Arctic and Antarctic.

The primary objectives of NASA's ocean research programs are to describe, understand, and predict the time-varying three-dimensional circulation of the ocean and the biological regimes of the upper-ocean. Aspects of ocean modeling (e.g., global circulation, air/sea gas exchange, carbon cycle, ecology) are also supported by the programs in partnership with the Global Modeling and Analysis Program. Research and modeling activities for the high-latitude ice-covered oceans are supported by the Cryospheric Sciences Program. Ocean-relevant research is integrated with other aspects of the Earth system through NASA's interdisciplinary program.

Science Mission Directorate

NASA's Science Mission Directorate (SMD) conducts scientific exploration enabled by the use of space observatories and space probes that view the Earth from space, observe and visit other bodies in the solar system, and gaze out into the galaxy and beyond. NASA's science program seeks answers to profound questions that touch us all: how and why are Earth's climate and the environment changing? How and why does the Sun vary and affect Earth and the rest of the solar system? How do planets and life originate? How does the universe work, and what are its origin and destiny? Are we alone?

From space, NASA satellites can view Earth as a planet and enable its study as a complex, dynamic system with diverse components: the oceans, atmosphere, continents, ice sheets, and life itself.

The Nation's scientific community can thereby observe and track global-scale changes, connecting causes to effects. They can study regional changes in their global context, as well as observe the role that human civilization plays as a force of change. Through partnerships with agencies that maintain forecasting and decision support systems, NASA improves national capabilities to predict climate, weather, and natural hazards, manage resources, and craft environmental policy.

Earth Systematic Missions (ESM) includes a broad range of multi-disciplinary science investigations aimed at developing a scientific understanding of the Earth system and its response to natural and human-induced forces and changes. Understanding these forces will help in determining how to predict future changes, possibly to mitigate them if possible, and how to adapt where mitigation are not possible. The regional consequences of these forces e.g. changes in precipitation patterns, length of growing seasons, severity of storms, change of sea level, must be understood to determine which aspects of climate change are most harmful and how to adapt to those changes that cannot be mitigated.

The ESM program develops Earth observing research satellite missions, manages the operation of NASA facility research missions once on orbit, and produces standard mission products in support of NASA and National research, applications, and policy communities.

Interagency and international partnerships are a central element throughout the ESM program. Several of the on-orbit missions provide data products in near-real time for use by U.S. and international meteorological agencies and disaster responders.

Earth System Science Pathfinder: Earth System Science Pathfinder (ESSP) provides an innovative approach to Earth-science research by providing frequent, regular, competitively selected opportunities that accommodate new and emerging scientific priorities and measurement capabilities. These opportunities represent a series of relatively low-to-moderate cost, small-to-medium sized missions. They are competitively selected, principal investigator lead missions that focus on scientific objectives to support a selected subset of studies of the atmosphere, oceans, land surface, polar- ice regions, or solid Earth. Projects include development and operation of space missions, space-based remote sensing instruments for missions of opportunity, extended duration airborne science missions, and conducting science research utilizing data from these missions. ESSP projects include developmental, high-risk, high-return Earth-science missions and often involve partnerships with other U.S. agencies and/or with international science and space organizations. This portfolio of missions and investigations provides opportunity for investment in innovative Earth science that enhances NASA's capability for better understanding the current state of the Earth system and to enable continual improvement in the prediction of future changes.

Earth Science Research: NASA's ability to study the Earth's oceans from space has become essential to progress in oceanographic research, given the global reach of the Earth's oceans and their extensive interactions with the land and atmosphere in shaping the Earth's climate, carbon and other biogeochemical cycles, as well as Earth's ecology.

NASA's Earth Science Research program supports research activities that address the Earth system to characterize its properties on a broad range of spatial and temporal scales, to understand the naturally occurring and human-induced processes that drive them, and to improve our capability for predicting its future evolution. The focus of the Earth Science Research program is the use of space-based measurements to provide information not available by other means.

NASA's program is an end-to-end one that starts with the development of observational techniques and the instrument technology needed to implement them; tests them in the laboratory and from an appropriate set of surface-, balloon-,aircraft-, and/or space-based platforms; uses the results to increase basic process knowledge;

incorporates results into complex computational models that can be used to more fully characterize the present state and future evolution of the Earth system; and develops partnerships with other national and international organizations that can use the generated information in environmental forecasting and in policy, business, and management decisions.

Earth Science Multi-Mission Operations: The Earth Science Multi-Mission Operations program acquires, preserves, and distributes observational data from operating spacecraft to support Earth Science focus areas in conformance with national science objectives. The Earth Science focus areas are: climate variability and change; atmospheric composition; carbon cycle, ecosystems, and biogeochemistry; water and energy cycles; weather; and Earth surface and interior. NASA's principal Earth Science information system is EOSDIS, which has been operational since August 1994. EOSDIS acquires, processes, archives, and distributes Earth Science data and information products created from satellite data, which arrive at the rate of more than four trillion bytes (four terabytes) per day. Having successfully created this system, NASA is using IT advances to expand its capabilities while providing continuous service to the user community.

EOSDIS project management is working with additional decadal survey mission teams to understand their mission data characteristics and guide further improvements and system evolution, in order to support new data types and better characterization (e.g. quantitative error information) of all NASA archived data. A system plan for 2015 and beyond will take into account evolutionary needs for new missions being developed in response to the National Academies decadal survey. These very modest investments will enable the system to keep technologically current, and incorporate new research data and services. NASA Earth Science information is archived at eight Distributed Active Archive Centers (DAACs) and four disciplinary data centers located across the United States. The DAACs specialize by topic area, and make their data available to researchers around the world.

Applied Sciences: The NASA Applied Sciences program leverages NASA Earth-science satellite measurements and new scientific knowledge to enable innovative and practical uses by public- and private-sector organizations. The Applied Sciences program supports applied research and applications projects to enable near-term uses of Earth-science knowledge, discover and demonstrate new applications, and facilitate adoption of applications by non-NASA stakeholder organizations.

Applied research and applications projects are designed to improve decision-making activities to help the Nation better manage its resources, improve quality of life, and strengthen the economy. NASA develops Earth-science applications in collaboration with end-users in public, private, and academic organizations.

The program's primary outcomes are the routine, sustained uses of NASA Earth science products in user organizations' policy, business, and management decisions to serve society; the impacts are the resulting socioeconomic benefits from the improved decisions. The program enables operational users to imagine and anticipate possible applications from upcoming satellite missions and to provide input to mission development teams to increase the societal benefits of NASA missions.

Space Technology

A critical component to advancing our future in space is the rapid development and infusion of new space technologies that can enable new missions for NASA, benefit the overall aerospace industry, and other government agencies.

NASA's Space Technology investments enable future human and scientific exploration of near-Earth asteroids, the Moon, and Mars, just as current and past mission successes were supported by previous technology investments. This budget request funds the development of pioneering technologies that will increase our Nation's capability to operate in space and enable deep space exploration. Significant progress in technology areas such as space power systems,

entry, descent, and landing systems, propulsion, radiation protection, and cryogenic fluid handling are essential for human exploration beyond low Earth orbit. By investing in high-payoff transformative technology, Space Technology will mature the capabilities required for NASA's future, provide new capabilities, and lower the cost for other government agencies and private industry. Developing these solutions will stimulate the growth of the Nation's innovation economy, creating high-tech jobs.

Small Business Innovative Research: NASA's Small Business Innovative Research (SBIR) and Small Business Technology Transfer (STTR) programs support early-stage research and development. They provide the small business sector with an opportunity to compete for funding to develop technology for NASA, and to commercialize that technology to spur economic growth. Research and technologies funded by competitively-awarded SBIR and STTR contracts have made important contributions to numerous NASA programs and projects. The Agency is actively working to increase the number of NASA-funded SBIR and STTR technologies used in NASA's missions and projects. Some of NASA's high-profile programs benefiting directly from SBIR technologies include the Next Generation Air Transportation System; smart sensors that assess launch vehicle structural health, three dimensional flash LIDAR technologies to assist with collision avoidance and navigation for space applications, and end-of-arm tooling on Mars surface rovers and landers. The Laser Transmitter for Space-Based Atmospheric and Oceanographic LIDAR is a specific ocean and coastal example.

The SBIR program was established by Congress in 1982 and reauthorized in 2011 to increase research and development opportunities for small business concerns. The program stimulates U.S. technological innovation, employs small businesses to meet Federal research and development needs, increases private-sector commercialization of innovations derived from Federal research and development, and encourages and facilitates participation by socially disadvantaged businesses.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION					
(dollars in millions)	FY 2012 Enacted	FY 2013 Enacted	FY 2014 Enacted	FY 2015 Enacted	FY 2016 Budget
Science Mission Directorate					
Earth Systematic Missions					
Altimetry Follow On	-	-	-	-	36.0
OST Science Team	6.3	5.8	6.0	6.1	6.2
Ocean Surface Topography Mission	1.1	1.2	1.2	2.2	2.3
Ocean Winds Science Team	4.7	4.4	4.4	4.5	4.6
QuikSCAT	3.6	3.7	3.5	1.6	-
Terra and Aqua (Ocean Science)*	3.9	3.2	6.7	4.3	4.4
Jason	4.5	4.6	4.6	-	-
Suomi NPP (subset)*	1.2	1.3	2.3	2.0	2.0
Earth System Science Pathfinder					
Aquarius	4.2	4.7	4.7	3.9	5.5
Ocean Salinity Science Team	2.5	2.2	3.3	2.7	3.0
Earth Science Research					
Research and Analysis (Ocean Research Subset)	27.1	26.9	26.3	27.9	23.8
Interdisciplinary Science (Ocean Subset)*	10.8	9.1	10.0	11.5	9.4
Earth Science Multi-Mission Operations					
Physical Oceanography DAAC	7.0	7.0	7.3	7.8	8.8
EOSDIS (REASoN/MEaSUREs Ocean Subset)*	1.2	1.9	3.4	3.7	3.1
NSIDC DAAC	6.4	6.9	7.3	7.4	7.5
Applied Sciences					
Pathways	2.0	1.4	1.5	1.4	1.3
Space Technology					
Small Business Innovative Research (SBIR)**	1.1	1.8	0.2	0.5	0.9
TOTAL	**87.6**	**86.1**	**92.7**	**87.5**	**118.8**

*Outyear projections include predictions based upon continued competitive selections with awards.
**FY 2015 and 2016 figures are estimates. Actual figures will vary depending on the number and types of proposals competitively selected for funding.

NATIONAL SCIENCE FOUNDATION

The National Science Foundation (NSF) is the largest Federal supporter of academic, basic research in the ocean sciences, with investments in disciplinary and interdisciplinary research and education efforts. NSF also supports academic research vessels, instrumentation, and other facilities necessary to access the marine environment. The NSF Directorates and Programs with the most direct interest in ocean sciences are described below.

Directorate for Geosciences

Division of Ocean Sciences: The Division of Ocean Sciences (OCE) within the Directorate for Geosciences (GEO) supports research, infrastructure, and education to advance understanding of all aspects of the global oceans and ocean basins, including their interactions with people and the integrated Earth system. These activities provide knowledge critical to addressing many of our nation's most pressing challenges involving earth processes. OCE supports and promotes collaboration and facilitates development of a diverse scientific and educational community, including international efforts. OCE works with the U.S. and international ocean sciences academic communities to direct funding towards advancing the frontiers of knowledge, developing the next generation of researchers, and stimulating technological innovation. OCE also supports the operation, maintenance, acquisition, construction, and conversion of major shared-use oceanographic facilities needed to conduct this research, including international and private sector collaboration where needed.

OCE supports basic ocean research, education, and infrastructure activities, including: research on biological and physical processes occurring within the ocean from the air/sea interface to the ocean floor; research on processes that occur on and below the seafloor and at the interface with water, sediment, and ocean crust; research on chemical processes from the sea surface to the sea floor; and activities and oceanographic facilities necessary to advance NSF-funded research and train oceanographers across disciplines, including significant support to facilities and technologies that enable access to various regions of the ocean and ensure effective research and communication capabilities. One example is the International Ocean Discovery Program (IODP), an international marine research program to expand exploration beneath the oceans. The *JOIDES Resolution*, a research drill ship that is the United States contribution to the IODP platform array, supports expeditions to understand Earth's history by examining the seafloor, and is the only vessel of its kind in the world devoted solely to basic science research.

NSF funding for oceanographic facilities also includes specialized vehicles, vessels, and installations. State-of-the-art upgrades to the human-occupied submersible "Alvin" will allow human presence at even deeper ocean depths, enabling cutting edge scientific discoveries and insights on the deep sea and seafloor to continue. The newly constructed research vessel *Sikuliaq* is a 261-foot research ship specifically designed to operate in seasonal Arctic sea-ice and open waters surrounding Alaska. The vessel will enable research expeditions to explore such timely issues as sea-ice decrease, changing ocean currents, Arctic habitats, and ocean acidification. The Ocean Observatories Initiative (OOI) will allow continuous interactive connectivity to seafloor, ocean, and air-sea sensors, providing the means to collect unique, sustained time-series data sets that shed light on complex, interlinked processes throughout the global ocean. Construction of *Sikuliaq* and OOI was managed by GEO, but funded through NSF's Major Research Equipment and Facilities Construction account.

Division of Polar Programs (Ocean-Related Research): NSF supports polar research primarily through the Division of Polar Programs, which funds investigations in a range of scientific disciplines, including a number of

areas of ocean-related research and the related ship time. The majority of this work contributes to the theme of "advancing our understanding of ocean, coastal, and Great Lakes resources," but some efforts in the Arctic and Antarctic are relevant to the themes of "enhancing the use and conservation of our ocean, coastal, and Great Lakes resources" and "advancing international ocean science and policy."

Arctic Sciences Section: The goal of the NSF Arctic Sciences Section is to support research to understand Arctic atmospheric, oceanic, cryospheric, and terrestrial processes, and to study the Arctic as an integrated natural/human system. Ocean-related research is supported within the Arctic Natural Sciences, Arctic System Science, and Arctic Observing Network programs.

Antarctic Sciences Section: NSF is charged with managing all U.S. activities in the Antarctic as a single, integrated program. Funding for the U.S. Antarctic Program includes research and the science support directly linked to specific research projects. Four Antarctic programs fund ocean-related research: Antarctic Earth Sciences (e.g. marine geology, paleoclimate records, etc.), Antarctic Organisms and Ecosystems (e.g. biology of marine birds and mammals, marine biochemistry, biological oceanography), Antarctic Oceans and Atmospheric Science (e.g. physical and chemical oceanography, ocean-atmosphere interaction), and Antarctic Integrated System Science (e.g. ocean-ice sheet interaction, marine biochemistry with respect to ocean-atmosphere interactions). In addition, the Antarctic Glaciology program occasionally supports projects to understand ocean-ice sheet or ocean glacier interaction and thus relates to coastal processes.

Antarctic Infrastructure & Logistics Section: NSF is charged with managing all U.S. activities in the Antarctic as a single, integrated program. Funding for the U.S. Antarctic Program includes support for the broader operations and logistics infrastructure that make it possible to conduct science on the remote and uninhabited continent.

Directorate for Biological Sciences (Ocean-Related Research)

The Directorate for Biological Sciences provides support for research to advance understanding of the underlying principles and mechanisms governing life. The Directorate is organized into four divisions and a sub-activity that fund research on marine organisms and research related to marine ecosystems. The Directorate also supports marine-research infrastructure. Through these efforts, Biological Sciences contributes to the theme of "advancing our understanding of ocean, coastal, and Great Lakes resources."

Division of Environmental Biology: The Division of Environmental Biology (DEB) supports fundamental research on the systematics, population genetics, evolution and diversity of marine and Great Lakes organisms, and ecological research on the coastal communities and ecosystems. DEB also participated in the Coastal SEES Program as part of NSF's Science, Engineering and Education for Sustainability (SEES) emphasis area.

DEB supports the Dimensions of Biodiversity program, which focuses on the integration of genetic, phylogenetic, and functional dimensions of biodiversity and includes joint support for research on marine biodiversity. DEB also jointly supports five coastal Long-Term Ecological Research sites in Florida, Georgia, California, Massachusetts, and Virginia with the Geosciences Directorate.

Division of Integrative Organismal Systems: The Division of Integrative Organismal Systems (IOS) supports research aimed at an integrative understanding of organisms through innovative applications of systems-level approaches in neuroscience, animal behavior, developmental biology, and physiology. Specific ocean-related research includes studies on behavioral ecology, marine symbioses, mechanisms of chemical interactions between organisms, development of marine organisms, biomechanics of marine species, and neural, physiological, and

behavioral adaptations to marine and freshwater environments.

IOS participated in the Ocean Acidification Program (OA) as part of NSF's Science, Engineering, and Education for Sustainability (SEES) emphasis area. In particular, BIO supports OA proposals aimed at elucidating poorly understood physiological mechanisms, such as calcification in marine organisms, thereby expanding basic knowledge that will aid in understanding the resilience of marine ecosystems as the oceans change. Also emphasized is support of projects aimed at understanding how multiple stressors, such as acidification, nutrient variability and increasing ocean temperatures, interactively influence the capacity of organisms to adjust physiologically or adapt evolutionarily to these changes.

Division of Molecular & Cellular Biosciences: The Division of Molecular and Cellular Biosciences (MCB) supports research to enhance fundamental understanding of life processes at the molecular, subcellular, and cellular levels. Experimental organisms used include various marine species, especially marine microbes.

Division of Biological Infrastructure: The Division of Biological Infrastructure (DBI) supports activities that provide infrastructure for biological research. This includes improvement of marine research laboratories and living collections of marine organisms widely used in basic biological research.

In addition, DBI also supports the Center for Microbial Oceanography Research and Education (C-MORE), which focuses on the identities, roles and impacts of microorganisms in the world's largest biome – the ocean – including increased understanding of potential responses to global environmental variability and climate change.

Sub-activity for Emerging Frontiers: Emerging Frontiers researchers contribute to informing decisions and improving understanding of ocean science, principally through participation in the Ocean Acidification (OA) Program and the Coastal SEES Program, which both ended in FY 2014.

NATIONAL SCIENCE FOUNDATION					
(dollars in millions)	FY 2012 Enacted	FY 2013 Enacted	FY 2014 Enacted	FY 2015 Enacted	FY 2016 Budget
Directorate for Geosciences					
Division of Ocean Sciences [1]	351.8	343.8	356.3	356.0	369.6
Major Research Equipment and Facilities Construction					
Alaska Region Research Vessel (ARRV)	-	-	-	-	-
Ocean Observatories Initiative (OOI)	102.8	65.0	27.5	-	-
Division of Polar Programs					
Arctic Sciences Section [2]					
Arctic Natural Science	6.0	6.0	5.5	14.4	6.0
Arctic System Science	5.0	5.5	5.5	5.0	5.0
Arctic Observing Network	6.0	10.0	6.5	10.5	6.0
Antarctic Sciences Section					
Antarctic Earth Sciences	3.0	4.6	4.6	4.0	3.5
Antarctic Organisms & Ecosystems	5.0	5.4	4.8	7.0	7.5
Antarctic Oceans & Atmospheric Science	3.75	3.7	3.8	4.3	4.0
Antarctic Integrated System Science	2.0	2.6	3.4	4.0	4.0
Antarctic Glaciology	-	-	-	0.3	0.2
Antarctic Infrastructure and Logistics	14.5	30.1	31.5	27.9	28.9
Directorate for Biological Sciences[3]					
Division of Environmental Biology					
Systematic Biology & Biodiversity Inventories	2.5	2.5	1.3	1.0	1.0
Population & Community Ecology	0.5	0.3	0.9	0.8	0.6
Evolutionary Processes	2.0	3.5	2.2	2.4	2.0
Ecosystem Science	3.0	5.0	3.7	4.0	4.0
Division of Integrative Organismal Systems					
Neural Systems	3.5	4.1	4.4	2.3	4.2
Behavioral Systems	1.4	0.8	0.6	0.3	0.7
Developmental Systems	3.5	2.3	2.7	1.9	2.4
Physiological & Structural Systems	3.5	4.6	5.5	3.9	5.0
Division of Molecular & Cellular Biosciences [4]					
Molecular Biophysics (previously named Biomolecular Systems)	0.5	0.6	0.6	0.6	0.6
Cellular Dynamics and Function (previously named Cellular Systems)	0.2	0.2	0.4	0.4	0.4
Genetic Mechanisms (previously named Genes & Genome Systems)	0.2	0.1	0.1	0.1	0.1
Systems and Synthetic Biology (previously named Networks & Regulation)	1.2	0.8	1.2	0.7	1.0

NATIONAL SCIENCE FOUNDATION (continued)					
(dollars in millions)	FY 2012 Enacted	FY 2013 Enacted	FY 2014 Enacted	FY 2015 Enacted	FY 2016 Budget
Division of Biological Infrastructure					
Center for Microbial Oceanography	4.0	4.0	3.3	2.6	0.0
Advances in Biological Informatics	1.0	1.0	1.0	1.0	1.0
Improvements in Facilities, Communications, and Equipment at Biological Field Stations & Marine Laboratories	1.0	2.0	2.0	2.0	2.0
Division of Emerging Frontiers					
Coastal SEES	-	0.8	6.0	-	-
Ocean Acidification	5.0	4.0	4.0	-	-
TOTAL	**532.9**	**513.2**	**489.2**	**457.4**	**459.7**

Funding levels shown in this table are direct program costs. It is not feasible to associate agency administrative costs with these categories.

[1] The sections within the Division of Ocean Sciences have undergone major shifts in composition and no longer exist as budgetary units. Going forward, funding for ocean and coastal activities in OCE will be reported as one number.

[2] The increased funding in FY 2015 Enacted for the Arctic Natural Science and Arctic Observatory Network lines is due to incorporated costs for ship time needed to conduct the research.

[3] With the exception of the Center for Microbial Oceanography, and BIO participation in the Coastal SEES and the Ocean Acidification activity, BIO does not have other specific programs that only fund marine and coastal activities. Proposals can be submitted to most any BIO program, so the level of support for this activity will fluctuate with the number, type and quality of proposals that are submitted each year. Therefore, even large changes in the percent of marine or coastal activities by a program does not necessarily reflect a change in the program's focus or policy.

[4] The cluster names in the Division of Molecular and Cellular Biosciences were changed in 2013.

SMITHSONIAN INSTITUTION

In 1829, James Smithson, a British scientist, bequeathed his estate to the American people for the "increase and diffusion of knowledge." Today the Smithsonian Institution supports that goal through its operation of national museums and research institutes. Its unique structure allows the Institution to leverage its base Federal funding to develop programs which are supplemented by its Trust operations. Three organizations within the Smithsonian Institution contribute to the majority of its research in coastal and ocean activities, with additional educational and exhibit programs coming from other units such as the Smithsonian National Zoo and the Smithsonian Traveling Exhibition Service. The Smithsonian has a series of long-term coastal research stations focusing on biological diversity, ecology, and the land/sea interface. It houses the secretariats of global projects on biological diversity information (the Encyclopedia of Life) and identifications (the Consortium for the Barcode of Life), which enable researchers and the public to access information about the coastal environments.

Smithsonian Environmental Research Center

The Smithsonian Environmental Research Center (SERC) Environmental Sciences Program measures long-term changes in water quality and nutrient loading, as well as species composition and population dynamics of fish, invertebrates, plankton, and marshes in the Rhode River sub-estuary as a model system of the Nation's largest estuary. The long-term data are used to assess human impacts and natural variation in the Nation's largest estuary. It works closely with NOAA and universities in the Chesapeake Bay and other coastal bays and estuaries nationally. SERC also houses the U.S. National Ballast Information Clearinghouse and is a global resource for identifications and management of coastal invasive species.

Smithsonian Tropical Research Institute

Smithsonian Tropical Research Institute (STRI) Marine Research Program is located within 100 kilometers of the Atlantic and Pacific Oceans, which offers unparalleled opportunities for marine studies by Smithsonian and visiting scientists. Researchers at STRI are studying how modern-reef species and coastal ecosystems respond to changing environmental conditions (such as El Niño), outbreaks of disease in marine organisms, oil spills, and other natural and human disturbances. STRI researchers also aim to understand the evolution of marine organisms and the evolution of ecological relationships, work that is enhanced by the rich fossil record of certain marine organisms. STRI has expanded its environmental monitoring program to include sites in Bocas del Toro on the Caribbean coast in western Panama. Projects supported by the Marine Research Program have provided critical and valuable information for the implementation of management plans and policies for conservation of marine resources.

National Museum of Natural History

The National Museum of Natural History (NMNH) maintains active research in marine and coastal science in all of its departments—from anthropology to zoology. It holds the national collections, and works closely with USG agencies to curate and manage active collections from the United States coastal zone and Antarctica. Full time researchers from NOAA and the U.S. Fish and Wildlife Service are housed at the Natural History Museum, sharing its infrastructure and facilities. It manages a marine field-station on Carrie Bow Cay, located on the Mesoamerican Barrier Reef in central Belize. This laboratory is part of the Smithsonian Marine Science Network that supports the Institution's marine scientists' research projects on a year-round basis. The majority of recent Caribbean coral reef ecosystems marine research involves

biodiversity, morphology and developmental biology; species interactions and behavior; ecophysiology and responses to environmental change; and processes linking species and environment. Natural History also has a long-term research station in Fort Pierce Florida. The Sant Ocean Hall at the museum is the largest exhibit on the natural history of oceans and the human interactions with the seas. Its accompanying Ocean Portal (ocean.si.edu) is an internet focal point for marine and coastal information, and works with partners from NOAA, NSF, and the Department of State.

SMITHSONIAN INSTITUTION					
(dollars in millions)	FY 2012 Enacted	FY 2013 Enacted	FY 2014 Enacted	FY 2015 Enacted	FY 2016 Budget
Smithsonian Environmental Research Center					
Marine Environmental Sciences Program	0.3	0.3	0.3	0.3	0.3
Smithsonian Tropical Research Institute					
Marine Research Program	2.6	2.6	2.6	2.6	2.6
National Museum of Natural History					
Caribbean Coral Reef Ecosystems Program	0.2	0.2	0.2	0.2	0.2
TOTAL	**3.1**	**3.1**	**3.1**	**3.1**	**3.1**