

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

For Fiscal Years 2010 and 2011

Prepared by

The White House Council on Environmental Quality and
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TABLE OF CONTENTS

Introduction.....	1
Federal Funding Summary.....	3
Federal Agency Highlights.....	4

Appendix: Agency Budget Tables and Narratives

Department of Agriculture	A2
Department of Commerce	A11
Department of Defense	A20
Department of Energy	A26
Environmental Protection Agency	A30
Department of Health and Human Services	A36
Department of Homeland Security	A42
Department of the Interior	A48
Marine Mammal Commission	A66
National Aeronautics and Space Administration	A68
National Science Foundation	A73
Smithsonian Institution	A77
Department of State and USAID	A79
Department of Transportation	A85
Department of Treasury	A91

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 provides an overview of Federal programs related to ocean, coastal, and Great Lakes activities for Fiscal Years (FY) 2010 and 2011.

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, and they 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.

Two bipartisan ocean commissions recognized that if Americans are to enjoy the maximum benefit from our ocean resources, Federal agencies managing ocean-related activities need to share data and coordinate better. On July 19, 2010, President Barack Obama signed an Executive Order (E.O.) establishing for the first time a national policy for the stewardship of the ocean, our coasts, and the Great Lakes – commonly referred to as the National Ocean Policy (Policy).¹ The E.O. adopted the Final Recommendations of the Interagency Ocean Policy Task Force and directed Federal agencies to implement them under the guidance of the National Ocean Council (NOC).

¹ Executive Order 13547, *Stewardship of the Ocean, Our Coasts, and the Great Lakes*, July 19, 2010, can be found at <http://www.whitehouse.gov/files/documents/2010stewardship-eo.pdf>

Highlighting Efforts in Support of the National Ocean Policy

The National Ocean Policy provides a framework to pursue national and regional stewardship goals through coordinated actions across the Federal Government informed by State, tribal, and local authorities, stakeholders, and the public. This report for FY 2010 and 2011 provides narrative examples of department and agency activities that align with the Policy.

In January of 2012, the NOC sought public comment on a draft National Ocean Policy Implementation Plan (Plan) that identified specific actions Federal agencies would take to carry forward the National Ocean Policy. The final Implementation Plan, released in April 2013, reflects stakeholder and public comments.

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 information on activities in 2010 and 2011 that work to carry forward the National Ocean Policy. Consistent with the last report, these activities are organized by the nine national priority objectives identified in the Executive Order that established the National Ocean Policy, and are presented in the "Federal Agency Highlights" section. The next report may organize these activities differently based on the Implementation Plan.

Agency Budget Information

Budgetary data from all agencies involved in ocean and coastal activities are collected in the Appendix, with information provided for the FY 2010 and FY 2011 actual obligations and the FY 2012 enacted level. Consistent with past reports, the agency budget information as presented in the

Appendix is presented to support four ocean policy-related themes. The themes are:²

- Enhancing the Use, Conservation and Management of Ocean, Coastal, and Great Lakes Resources,
- Advancing Our Understanding of Oceans, Coasts, and Great Lakes,
- Supporting Maritime Transportation, and
- Advancing International Ocean Science and Policy.

Looking Ahead

As implementation of the National Ocean Policy continues, the information presented in future reports will evolve with the implementation of the Policy to reflect how existing Federal ocean and coastal activities and programs align with the Policy and the themes in the Implementation Plan.

² *These four themes are based on the U.S. Ocean Action Plan of 2004. Consistent with past reports, the themes of “enhancing the use and conservation of our ocean, coastal, and Great Lakes resources” and “managing coasts and their watersheds” have been combined into the single category of “enhancing the use, conservation and management of ocean, coastal, and Great Lakes resources.”*

FEDERAL FUNDING SUMMARY

Table 1 shows the amount of funding for ocean and coastal activities for FY 2010 (actual), FY 2011 (actual), and FY 2012 (enacted). Consistent with past reports, these figures are based on subjective determinations regarding the various agency programs that align, in whole or in part, with each of the four thematic areas of (1) enhancing the use, conservation and management of ocean, coastal, and Great Lakes resources, (2)

supporting maritime transportation, (3) advancing our understanding of oceans, coasts, and Great Lakes, and (4) advancing international ocean science policy. These data are intended to provide a general understanding of the investments the Federal Government is making in ocean and coastal activities. Funding for future fiscal years will be determined through the Administration's annual budget process.

Table 1: Summary of Funding by Agency
(Dollars in Millions)

Agency	FY 2010 Actual Obligations	FY 2011 Actual Obligations	FY 2012 Enacted
Department of Agriculture	544.0	552.5	591.7
Department of Commerce	2,544.9	2,187.5	2,116.6
Department of Defense	814.0	863.1	1,759.7
Department of Energy	94.6	97.8	126.4
Environmental Protection Agency	2,062.8	1,526.6	1,475.6
Department of Health and Human Services	81.6	99.2	82.6
Department of Homeland Security	3,557.5	3,598.3	3,644.9
Department of the Interior	730.7	886.4	934.2
Marine Mammal Commission	3.3	3.3	3.3
National Aeronautics and Space Administration	104.5	100.6	85.6
National Science Foundation	531.0	552.2	527.2
Smithsonian Institution	3.1	2.9	3.1
Department of State	72.5	68.6	54.5
Department of Transportation	574.2	573.0	559.2
Department of Treasury	8.0	9.0	12.0
U.S. Agency for International Development	38.1	51.1	47.3
TOTAL	11,764.7	11,172.1	12,023.9

FEDERAL AGENCY HIGHLIGHTS

Listed below are examples of Federal agency activities for FY 2010 and 2011 that support the National Ocean Policy's priority objectives. It is important to note that this list is not exhaustive in that it only represents a portion of those activities that most closely align with each objective.

HOW WE DO BUSINESS

Ecosystem-Based Management (EBM)

National Oceanic and Atmospheric Administration (NOAA) - National Marine Fisheries Service (NMFS): NMFS continued the advancement of ecosystem-based management through the creation of Integrated Ecosystem Assessments (IEA) for large marine ecosystems. IEAs bring scientific and technological rigor to resource management decisions by incorporating diverse sources of data, including socio-economic data, into ecosystem models that evaluate trade-offs between ecosystem and societal goals. The multi-line office initiative leverages existing data and expertise to provide a more comprehensive science-based decision-making framework for NOAA's management of coastal and marine ecosystem resources, with the potential to inform comprehensive regional marine planning.

U.S. Department of State (DOS): At the May 2011 Arctic Council Ministerial meeting, the United States successfully worked with other Arctic nations to establish an Arctic ecosystem-based management framework to improve future Arctic activities and multilateral decision-making. The National Ocean Policy was one of the bases the United States included in its proposal for an ecosystem-based management initiative.

Marine Planning

National Oceanic and Atmospheric Administration (NOAA) and the Bureau of Ocean Energy Management (BOEM): NOAA and BOEM are concentrating their efforts in data collection and aggregation to inform timely ocean

management decisions. Both agencies were primary contributors to the development of ocean.data.gov. In addition, the Energy Policy Act of 2005 directed Federal agencies to develop an outer continental shelf mapping initiative to assist in renewable energy use decision-making. NOAA and BOEM collaborated to develop the Multipurpose Marine Cadastre, a multi-purpose online information system that provides the necessary geospatial framework for broader regional marine planning initiatives including renewable energy siting.

U.S. Coast Guard (USCG): Consistent with the goals and principles of marine planning, the USCG initiated a comprehensive Atlantic Coast Port Access Route Study (ACPARS) to promote safe, efficient maritime operations in conjunction with the development and production of renewable offshore energy. Among other things, this ACPARS supports DOI's Smart from the Start initiative to establish large wind energy areas off the Atlantic Coast. For the first time, this ACPARS will include all coastwise shipping routes from Maine to Florida and the approaches to U.S. Atlantic coastal ports throughout the Exclusive Economic Zone. The data gathered during the ACPARS process will determine if the establishment of new vessel routing measures or modification or elimination of existing routing measures will promote safe and efficient maritime navigation in the Atlantic coastal region.

U.S. Department of Defense (DOD): At the regional level, marine planning provides the Navy, Marine Corps and the Army Corps of Engineers (and to a lesser extent, the Army and Air Force) a previously unavailable avenue for proactively engaging in planning with our Federal, State, local, and tribal partners. The Department has significantly benefited from marine planning programs such as California's Blue Ribbon Task Force, Rhode Island's Ocean Special Area Management Plan, and DOI's Smart from the Start Initiative. DOD supports CMSP efforts in every region identified by the Executive Order. Accordingly, both the DOD and the Joint

Staff have appointed representatives for all nine Regional Planning Bodies established by EO 13547 and will serve as the Federal Co-lead for CMSP efforts in the South Atlantic and Gulf of Mexico Regions.

Inform Decisions and Improve Understanding

National Science Foundation (NSF): In 2010, numerous NSF science directorates provided researchers with Grants for Rapid Research Response (RAPID) funding in response to the Deepwater Horizon oil spill. This support enabled mobilization of equipment and personnel to collect data and samples from this sudden, unprecedented event. These projects have identified how the spill drove evolutionary responses of exposed populations and impacted regional ecology. Combined with prior work in the Gulf, these projects will enable us to better understand the impacts of the spill as they play out over many years.

National Oceanic and Atmospheric Administration (NOAA) - National Marine Fisheries Service (NMFS): NMFS's vision for sustainable seafood includes aquaculture as a complement to wild-caught fisheries in meeting seafood demand and sustaining jobs and working waterfronts in coastal communities. Shellfish make up about two-thirds of all commercial marine aquaculture in the U.S. as well as deliver critical ecosystem services through commercial and restoration shellfish projects. Shellfish aquaculture represents a quadruple win: the industry creates jobs, improves the environment, provides healthy food, and invites partnerships. With last year's release of the DOC's national marine aquaculture policies, NOAA announced a National Shellfish Initiative in partnership with the shellfish industry and restoration community to increase shellfish aquaculture. This initiative is one of the milestones of the National Ocean Policy Implementation Plan and includes pilot projects to identify ways to simultaneously maximize the ecosystem benefits and commercial value of shellfish aquaculture.

National Park Service (NPS): A new Marine Research and Education Center (MREC) is being planned for St. Croix, U.S. Virgin Islands.

MREC will galvanize scholarly interest and expand public education on important issues affecting the health of tropical marine ecosystems. The MREC campus will occupy about eight acres of NPS's Salt River Bay National Historical Park and Ecological Preserve. The campus will house 48 undergraduate students, 12 researchers and graduate students, and 12 lab modules to support marine science research projects.

National Oceanic and Atmospheric Administration (NOAA), the Bureau of Ocean Energy Management (BOEM), and the U.S. Geological Survey (USGS): Since 2005, NOAA has partnered with BOEM on multi-disciplinary exploration and research projects in the Gulf of Mexico and mid-Atlantic, including the baseline characterization of potential U.S. deep-water lease blocks. The objective of these projects has been to discover, explore, and characterize deep biological communities in areas that have the potential to be leased for offshore oil and gas exploration. The first project focused on chemosynthetic communities in the deep Gulf and building on its success, the second project focused on hard-bottom and artificial substrate communities in the same area. The current project, Atlantic Deepwater Canyons, is looking for deep communities in the mid-Atlantic. USGS integrated into the team for the second project through a separate agreement with BOEM and is a partner in the current project as well. This partnership has resulted in thousands of square kilometers being mapped and explored throughout the Gulf and mid-Atlantic, and discovery and characterization of new deep-water ecosystems.

Coordinate and Support

Departments of Energy (DOE) and the Interior (DOI): In February of 2011, the Departments of Energy and the Interior released the first-ever interagency plan on offshore wind energy. The plan demonstrates a strong Federal family commitment to expeditiously develop a sustainable, world-class offshore wind industry in a way that reduces conflict with other ocean uses and protects resources. The plan focuses on overcoming three key challenges: (1) the

relatively high cost of offshore wind energy; (2) technical challenges surrounding installation, operations, and grid interconnection; and (3) the lack of site data and experience with project permitting processes.

U.S. Fish and Wildlife Service (FWS): The National Fish Habitat Partnership (NFHAP) Board released a first-of-its-kind report, as called for in the National Fish Habitat Action Plan, an effort to protect, restore, and enhance our Nation's aquatic habitats. The report, titled "Through a Fish's Eye: The Status of Fish Habitats in the United States 2010," summarizes the results of a nationwide assessment of the human effects on fish habitat in the rivers and estuaries of the United States. The report includes the National Fish Habitat Action Plan map and data web tool. Developed by the U.S. Geological Survey's Biological Informatics Program under guidance of the NFHAP Science and Data Committee, this tool not only enables users to see multiple views depicting the condition of stream and coastal habitats across the country, but also means that users are only a mouse click away from more detailed information at finer scales, as well as the option to download data files.

National Oceanic and Atmospheric Administration (NOAA): NOAA's Regional Ocean Partnership Funding Program is a competitive grant program established in FY 2011 that provides funding to advance effective ocean management and implement activities in the actions plans of existing and emerging Regional Ocean Partnerships. Regional Ocean Partnerships are largely State-led initiatives and involve collaboration between governors on coastal issues of shared importance. In FY 2011, NOAA awarded approximately \$6.2M in competitive grants to eight regions to both develop and coordinate Regional Ocean Partnership efforts and to implement the priorities identified by each of the regions. Regions receiving funding included: Northeast, Mid-Atlantic, Southeast, Caribbean Islands, Gulf of Mexico, West Coast, Alaska, Hawaii, and the Pacific Islands.

U.S. Department of State (DOS): The Extended Continental Shelf (ECS) Task Force, led by the DOS, coordinates the collection and analysis of data among a dozen Federal agencies in an effort to establish the outer limit of the U.S. ECS. This effort will delineate an enormous area where the United States can exercise sovereign rights over the resources on and below the seabed. Data analysis and collection will be completed for fifteen areas off the U.S. coast where there may be extended shelf. In June 2010, the ECS Project completed a month-long bathymetric cruise off the coast of Kingman Reef and Palmyra, and two month-long cruises off the Northern Mariana Islands, as well as the third United States-Canada joint expedition to the Arctic Ocean. In 2011, the fourth and final collaborative Arctic cruise with Canada was completed and two seismic data collection cruises were carried out, one in the Gulf of Alaska and one in the Bering Sea.

AREAS OF SPECIAL EMPHASIS

Resiliency and Adaptation to Climate Change and Ocean Acidification

National Science Foundation (NSF): Coral reef ecosystems hold significant cultural and economic value, both nationally and internationally. Ocean acidification (the decrease in seawater pH), driven by the increase in atmospheric CO₂, is expected to negatively impact organisms that precipitate calcium carbonate, such as coral. Increasing evidence indicates that calcifying corals may be able to maintain rates of calcification and mitigate loss of their calcium carbonate skeletons as seawater pH declines, but the extent of this physiological resilience, whether it varies over species, and ranges of pH is unknown. This research, using a unique set of coral tissue cultures, is focused on determining the molecular basis for calcification in corals in order to understand how corals will respond to ocean acidification in the next century. The project is being conducted by a research team at Rutgers working with scientists in Taiwan and Israel, and will engage K-12 teachers in developing lesson plans.

U.S. Department of Commerce (DOC): DOC's Ocean Acidification and Monitoring Network consists of dedicated ocean acidification (OA) research cruises, ships of opportunity, wave gliders, and 31 fixed OA moorings around the continental U.S., Hawaii, and Alaska – all of which measure parameters that allow changes in atmospheric CO₂ and the ocean's carbonate chemistry to be quantified. Programs, both within the agency, outside academic institutions, and private industry are integral contributors to this monitoring network. The real-time data provided from fixed platforms is accessible and has been used to map rates and dynamics of OA in certain ecologically and commercially important ecosystems and fisheries, and can be used to predict future changes in OA. New autonomous technologies are being developed to improve spatial and temporal resolution of these products. There are efforts to begin implementation and standardization of an international OA monitoring network with representation from OA scientists and data managers from around the world.

Department of State (DOS): DOS takes a lead role in promoting international actions to reduce the impact of short-lived climate forcers (SLCFs include black carbon, methane, and tropospheric ozone) on the Arctic. SLCFs exert a powerful warming effect on the Arctic and accelerate the melting of Arctic sea ice. The U.S. is co-chairing with Norway and Sweden, the Arctic Council's SLCF Task Force, which is developing recommendations for mitigation policies that the eight Arctic States could take to reduce the warming impact of SLCFs. In addition, the Department of State announced the creation of a \$5 million fund to finance projects with international partners to demonstrate the feasibility of early action to reduce SLCF impacts.

Regional Ecosystem Protection and Restoration

National Park Service (NPS): Oyster reefs are in decline; more than 85 percent have been lost world-wide. Overharvest, poor water quality, and disease are just a few of the stressors on these habitats. Oyster reefs (*Crassostrea virginica*) at NPS units in Georgia (Cumberland Island NS)

and Florida (Timucuan Ecological & Historic Preserve and Cape Canaveral NS) are in decline. Threats include invasive species, loss of top-level predators, and environmental stresses (e.g., boat wakes, overharvest, poor water quality) and disease. The NPS has partnered with university researchers to quantify the growth and viability of the reef systems in these parks to help park managers develop plans to protect these special habitats to develop long-term restoration goals. Similar work is occurring along much of the southeast Atlantic coast and in the Gulf of Mexico, and NPS results will contribute to understanding the status of oyster reefs on a regional scale.

National Oceanic and Atmospheric Administration (NOAA): NOAA was on-scene for the April 2010 Deepwater Horizon oil spill from the earliest moments of the crisis. NOAA's Office of Response and Restoration (OR&R) immediately mobilized and launched response efforts, coordinating with existing State and local partners to assess the extent of the spill and ecological impacts on local ecosystems. NOAA, DOI, five states, and members of the Trustee Council reached an unprecedented agreement with BP in 2011 to provide \$1 billion for early restoration projects in the Gulf of Mexico. The Trustees will use the money to fund projects such as the rebuilding of coastal marshes, replenishment of damaged beaches, conservation of sensitive areas of ocean habitat for injured wildlife, and restoration of barrier islands and wetlands that provide natural protection from storms. To ensure a swift and coordinated response to future oil spills, OR&R continues to train State and local emergency responders throughout the U.S. with over 700 responders trained in 2011.

U.S. Fish and Wildlife Service (FWS): In FY 2012, The Nature Conservancy and other private and public partners provided over \$2 million to match a \$1,000,000 National American Wetlands Conservation Act (NAWCA) grant that will protect 3,730 acres, including 2,951 wetland acres and 780 acres of associated uplands, to benefit breeding, migrating, and wintering birds. Waterfowl species that will benefit from this project include the American black duck, mottled

duck, mallard, American wigeon and wood duck. The project area will also support neo-tropical migratory birds during the breeding season and migration, including the swallow-tailed kite, prothonotary warbler, black-throated green warbler, Swainsons warbler, and wood thrush. This project represents the first of a three-phase effort to permanently protect strategic tracts in the Santee Delta and Winyah Bay region of northern coastal South Carolina.

Water Quality and Sustainable Practices on Land

U.S. Department of Justice (DOJ): DOJ is securing significant commitments for projects that resolve liability for damages to ocean and coastal natural resources under statutes such as the Clean Water Act, the Oil Pollution Act, the National Marine Sanctuaries Act, and the Park System Resource Protection Act. For example, in September 2011, DOJ signed and lodged a consent decree that requires Regal Stone Limited and Fleet Management Ltd., the owners and operators of the M/V COSCO BUSAN, to pay \$44.4 million for natural resource damages and penalties and to reimburse Federal, State, and local governmental entities for response costs incurred as a result of the 53,000 gallon oil spill that occurred when the vessel struck the San Francisco-Oakland Bay Bridge in 2007. The event killed thousands of birds, impacted a significant portion of the Bay's 2008 herring spawn, spoiled miles of shoreline habitat, and closed the bay and area beaches to recreation and fishing. Of the settlement amount, approximately \$9.75 million will go to the National Park Service to improve coastal access and facilities surrounding the impacted area, and approximately \$9 million will be disbursed to local governments or through a grant program to fund shoreline recreational projects in the impacted area.

Natural Resources Conservation Service (NRCS): The Bay Delta region, located in the Sacramento and San Joaquin watersheds of California, encompasses over 38 million acres and is one of the most important estuary systems in the Nation. This area provides drinking water for more than 23 million people and irrigation water to four

million acres of farmland, and is a region with general economic activities estimated at over \$400 billion annually. However, increased demand for limited water resources and declining water quality threaten the continued economic and environmental well-being of the Bay Delta area. The NRCS Bay Delta Initiative accelerates agency investment by addressing the critical water quantity, water quality, and habitat restoration needs as outlined in the Administration's Interim Federal Action Plan for the Bay Delta area. In FY 2011, NRCS made a \$21.5 million investment with the Wetlands Reserve Program (WRP) in the Bay Delta Initiative and, through WRP, provided assistance to 48 landowners and restored over 21,000 acres of wetlands. These projects can be expected to reap water quality and habitat benefits. Also in FY 2011, NRCS provided over \$6.5 million in Environmental Quality Incentives Program funding in collaboration with the Bureau of Reclamation to achieve water conservation for both district water delivery and on-farm water use efficiency.

National Oceanic and Atmospheric Administration (NOAA): In 2011, scientists from NOAA's Great Lakes Environmental Research Laboratory (GLERL) were instrumental in detecting, delineating the extent, characterizing the toxicity, and predicting the expansion of a massive harmful algal bloom in Lake Erie. GLERL's Observing Systems, Ecology, and Modeling research groups all contributed to the effort. The algal bloom was tracked by satellite, field measurements were made from buoys and vessels, and models were used to forecast how the bloom would grow and move. Hundreds of drinking water and beach managers, fishermen, and boaters were informed of the bloom's status and forecast extent by a weekly bulletin. A meeting of the International Joint Commission was hosted by GLERL in March 2012 to communicate the state of knowledge about the 2011 bloom, and to discuss expectations and appropriate management actions in the U.S. and Canada for 2012 and beyond.

Changing Conditions in the Arctic

National Park Service (NPS): ShoreZone is a mapping project involving the Alaska Department of Natural Resources, U.S. Fish and Wildlife Service, National Park Service, and Bureau of Ocean Energy Management. It collects high-resolution images of the coast along with biological and geological information, which is available online to the public. It will map the area from Point Hope to Point Wales, which includes Bering Land Bridge and Cape Krusenstern NM. The U.S. Coast Guard and spill response units use ShoreZone to identify locations for immediate response strategies.

National Oceanic and Atmospheric Administration (NOAA): As multi-year sea-ice continues to disappear at a rapid rate, vessel traffic in the Arctic is on the rise. This is leading to new maritime concerns, especially in areas increasingly transited by the offshore oil and gas industry, cruise liners, military craft, tugs and barges, and fishing vessels. Keeping all of this new ocean traffic moving smoothly is important to the U.S. economy, environment, and national security. That is why the Office of Coast Survey (OCS) is hard at work updating Arctic nautical charts. Working with stakeholders and government partners in FY 2011, OCS analyzed Arctic maritime operations and navigational needs to set priorities for better charts and additional hydrographic surveys. The Arctic Nautical Charting Plan, issued by OCS in June 2011, provides a detailed scheme for additional nautical chart coverage in U.S. Arctic waters and reports on what additional resources would be necessary to produce and maintain the charts.

U.S. Fish and Wildlife Service (FWS): The Arctic Landscape Conservation Cooperative (LCC), led by FWS, is a conservation science partnership to improve conservation planning and design at the landscape scale and inform a strategic response to climate change impacts. In FY 2011, the Arctic LCC provided over \$1.4 million to 21 projects that address the impacts of climate change and landscape level threats in the Arctic. Most notable among these is the Alaska Integrated Ecosystem Model, which will provide the most comprehensive view of future landscape conditions available. Another project seeks to assess how rising sea-levels and the likelihood of

increased overwash and flooding with seawater of protected lagoon systems will affect those ecosystems.

National Science Foundation (NSF): NSF funded the deployment of the first autonomous, ice-supported atmospheric chemistry measurement system in the Arctic Ocean. The first O-Buoy, as it is known, has been operating on an ice floe since September 2009 and another was deployed a year later. The O-Buoy is a potentially transformative system for acquisition of long-term, ocean-based datasets needed to quantify seasonal and inter-annual variability in the atmosphere above fast-changing Arctic sea-ice cover. Logistical challenges of long-term observations in the Arctic have produced very few measurements of ozone (O₃), bromine monoxide (BrO), carbon dioxide (CO₂) and meteorological variables over Arctic sea ice. Recent technical developments have allowed the researchers to meet the data acquisition challenges. This autonomous, buoy-based instrument platform will be deployed as part of the Arctic Observing Network.

Observations, Mapping, and Infrastructure

U.S. Army Corps of Engineers (USACE): USACE navigation data are distributed to States, academia, and industry, and to USGS and NOAA where they remain available for download through Federal data archives. As of December 2010, there had been 8,565 individual downloads of over 375 billion data points from the National Coastal Mapping public distribution website. The data were used to assess regional and project hurricane impacts. The 2011 USACE survey season included bathymetric and topographic lidar data collection on over 1.5 billion lidar elevations and depths, 630,000 aerial photos, and 2,000 hyperspectral image strips for 600 miles of shoreline in the Great Lakes, Northeast, and Gulf of Mexico regions. This data supports the operation and maintenance of coastal navigation projects that contribute to the Nation's marine transportation system, which provides direct value to coastal navigation, flood risk management, and aquatic ecosystem restoration.

National Aeronautics and Space Administration (NASA): In 2010 and 2011, NASA continued to improve our understanding of the ocean via the implementation of technological advances and cutting-edge research as a component of NASA's Earth Science program. NASA develops space-borne, global-observing capabilities and research programs to expand understanding of the Earth system. While data from the Earth Systematic and Pathfinder Missions do not necessarily directly support management or policy making, the fundamental and applied research they are used to support can inform management and policy decisions for water quality, climate impacts and adaptation, as well as Earth's resilience (e.g., within high latitude regions such as the Arctic). NASA programs are coordinated with complementary domestic and international programs that have an interest in using or utilizing NASA satellite observations or data. Many of the systematic missions have science teams associated with them, whose members support mission science objectives.

National Science Foundation (NSF): The Ocean Observatories Initiative (OOI) is a multi-scale observatory system that will enable researchers to study complex, interlinked physical, chemical, biological, and geological processes operating throughout the global ocean. OOI will be composed of a vast network of interactive nodes and over 770 sensors that will enable the study of complex-ocean processes, such as climate variability, ocean circulation, carbon cycling, and ocean acidification. The system will operate across coastal, regional, and global spatial scales and a continuum of time scales. Open access data streams from the air-sea interface through the water column to the seafloor will be openly available to educators and researchers in any discipline, making oceanography available to citizens and scholars who might never go to sea. The OOI will provide a cyber-infrastructure, which will deliver all OOI data to the research community, educators, students, and the public via the Internet.

APPENDIX: 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 habitats, 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.

Wetland Reserve Program (WRP)

The Wetlands Reserve Program is a voluntary program that provides technical and financial assistance to eligible landowners to restore, enhance, and protect wetlands. 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. There are 2.6 million acres on 13,000 easements or agreements enrolled in the WRP. 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 guarantee 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.

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. In FY 2010 and 2011, NRCS made a \$40 million investment with the Environmental Quality Incentives Program in targeted watersheds in the eight state Great Lakes basin. \$1 million was provided for the Wildlife Habitat Incentives Program during the same two-year period. NRCS also allocated \$4 million to purchase conservation easements through the Farm and Ranchland Protection Program (FRPP) and \$3.7 million to the Emergency Watershed Protection Program-Flood Plain Easements (EWP-FPE).

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 sciences and technologies 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 and new, 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 mapping shellfish aquaculture operations, eelgrass beds, and burrowing shrimp populations at an estuarine landscape scale. The account supports spatial analyses in order to quantify the interaction between oyster aquaculture practices, fish utilization of these estuarine habitats as predators and parasite hosts, and burrowing shrimp recruitment and movement.

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 improving water quality in the Chesapeake Bay watershed.

United States Forest Service

The 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

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 basins 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 monitoring plots 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. Crayfish are important ecologically by serving as food for fish, mammals, and birds; and by recycling decaying matter by eating both live and dead animal and plant material. Southern Research Station continues to maintain and add to a website 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 and 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 and 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 planting 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 that have been 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): MAPSS is a landscape- to global-scale vegetation distribution model that was developed to stimulate 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 habitats of

the Pacific salmon; and conservation and restoration of the habitats.

Coastal headwater riparian management

research: Understanding the 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 River basin: 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 hill slope 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 & 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 increase 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 and 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.

2010-2011 Federal Ocean and Coastal Activities Report to the U.S. Congress

DEPARTMENT OF AGRICULTURE								
	Percentage of Funds Dedicated to Each Ocean-Related Program Function					Dollars in Millions		
	Enhance the use, conservation, and management of ocean coastal and Great Lakes resources	Supporting Maritime Transportation	Advancing our understanding of oceans, coasts, and Great Lakes	Advancing International Ocean Science and Policy	Other	FY 2010 Actual	FY 2011 Actual	FY 2012 Enacted
Natural Resources Conservation Service								
Conservation Technical Assistance	100%					69.50	70.80	66.30
Environmental Quality Program	100%					176.10	184.60	210.00
Wetlands Reserve Program	100%					201.60	182.10	226.30
Chesapeake Bay Watershed Initiative	100%					44.00	72.50	51.60
National Institute of Food and Agriculture								
Habitat Marine (HM), Freshwater	100%					2.50	2.50	2.50
HM, Estuary	100%					0.05	0.05	0.05
HM, Marine	100%					0.05	0.05	0.05
Non-point Source (NS) Estuarine Water, Physical	100%					1.30	1.30	1.30
NS Estuarine Water, Chemical	100%					1.10	1.10	1.10
NS Freshwater, Chemical	100%					3.10	3.10	3.10
NS Freshwater, Physical	100%					3.20	3.20	3.20
NS Marine, Physical	100%					0.02	0.02	0.02
NS Marine, Chemical	100%					0.08	0.08	0.08
Point Pollution	100%					0.03	0.03	0.03
Agricultural Research Service								
Managing Coasts and Their Watersheds					100%	4.00	3.90	3.40
Marine Aquaculture	100%					8.70	5.60	3.20
Economic Research Service								
Economic Research Service	25%				75%	0.37	0.50	0.42
Forest Service								
<i>Gulf of Mexico / Research & Development</i>								
FPL - Water basin coming into contact with treated wood	100%					0.01	0.01	0.02
NRS - Perennialization of agricultural landscapes	100%					0.02	0.02	0.02
SRS - Center for Forest Watershed Research	100%					1.90	2.10	1.70
SRS - Center for Bottomland Hardwood Research	100%					4.60	4.10	4.70
SRS - Restoration of Mississippi Barrier Islands	100%					0.03	0.03	0.00
SRS - Hurricane Resilience & Restoration of Coastal Plain Forests	100%					0.05	0.06	0.06
SRS - Crayfish of Mississippi	50%		50%			0.05	0.03	0.03
SRS - Alabama shad research			100%			0.02	0.02	0.02
WO - National Agroforestry Center	100%					0.68	0.68	0.68
<i>Gulf of Mexico / State & Private Forestry</i>								
Gulf - State and Private Forestry			100%			0.50	0.50	0.50
<i>Great Lakes / Research & Development</i>								
NRS - NW Indian Urban Waters Pilot	90%		10%			0.00	0.07	0.20
NRS - Influence of Fire on Mercury Cycling in W. Great Lakes	100%					0.07	0.07	0.07
<i>Great Lakes / State & Private Forestry</i>								
Great Lakes - State and Private Forestry	100%					6.90	3.90	3.10
Brownfields Restoration	100%					2.00	1.80	1.30
Emerald Ash Borer - Forest Habitat Restoration/Prevention	100%					3.00	1.40	1.30
Ecosystem Services Program Development	100%					0.65	0.25	0.19
Urban and Community Forestry Assessment	100%					1.00	0.30	0.19
Terrestrial Invasive Species Control	100%					0.25	0.15	0.12
<i>Pacific Ocean / Research & Development</i>								
PNW - Mapped Atmosphere Plant Soil System	50%		50%			0.40	0.40	0.00
PNW - Land and Watershed Management Program (Pacific Salmon)	50%		50%			1.10	1.10	0.90
PNW - Coastal headwater riparian management research			100%			0.10	0.10	0.09
PNW - Role of salmon ecology in the success of population recovery			100%			0.13	0.13	0.11
PNW - Scientific review of Columbia Basin Salmon restoration			100%			0.04	0.04	0.03
PNW - Assessing the risk of climate change and wildfire to salmon habitat in the interior columbia			100%			0.13	0.13	0.11
PNW - How watershed processes affect Alaska coastal flux	100%					0.10	0.10	0.09
PNW - Yellow cedar decline in Alaska coastal forest ecosystem	50%		50%			0.11	0.11	0.09

2010-2011 Federal Ocean and Coastal Activities Report to the U.S. Congress

DEPARTMENT OF AGRICULTURE (continued)								
	Percentage of Funds Dedicated to Each Ocean-Related Program Function					Dollars in Millions		
	Enhance the use, conservation, and management of ocean coastal and Great Lakes resources	Supporting Maritime Transportation	Advancing our understanding of oceans, coasts, and Great Lakes	Advancing International Ocean Science and Policy	Other	FY 2010 Actual	FY 2011 Actual	FY 2012 Enacted
Forest Service (continued)								
<i>Pacific Ocean / Research & Development (continued)</i>								
PNW - Assessing the risk of climate change, timber harvest, and wildfire to Marbled Murrelet habitat and their population	100%					0.25	0.25	0.25
PSW - Wetlands research at Institute of Pacific Islands Forestry			100%			0.50	0.50	0.50
PSW - Cumulative effects of forest management on hillslope processes, fishery resources & downstream environments			100%			0.60	0.60	0.60
PSW - Maintaining faunal diversity in forest ecosystems of coastal & intermountain west			100%			0.20	0.20	0.20
<i>Chesapeake / Research & Development</i>								
NRS - Baltimore Ecosystem Study	50%		50%			1.00	1.00	1.00
NRS - Chesapeake Bay Scientific & Tech Advisory Committee			100%			0.02	0.02	0.02
<i>Chesapeake / State & Private Forestry</i>								
Chesapeake - State and Private Forestry	100%					1.90	0.90	0.90
TOTAL						543.99	552.47	591.72

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration (NOAA)

National Ocean Service (NOS)

NOS primarily focuses on observing, measuring, assessing, and managing the Nation's coasts, oceans, and Great Lakes, as well as conducting response and restoration activities to protect vital coastal and ocean resources. NOS also works with coastal communities to enhance their resilience to disasters and the impacts of a changing climate.

As a national leader for ocean and coastal stewardship, NOS promotes a wide range of research and operational activities aimed at better understanding ocean, coastal, and Great Lakes ecosystems. NOS provides improvements in the quality, quantity, geographic distribution, and timeliness of ocean and coastal observations. Observations by NOS assets and partners are critical components of the Nation's Integrated Ocean Observing System (IOOS), as well as fundamental contributors to the Global Earth Observation System of Systems (GEOSS) and Global Sea Level Observing System (GLOSS). NOS mapping, charting, geodetic, and oceanographic activities build on marine and coastal observations collected to increase the efficiency and safety of maritime commerce, support ocean and coastal resource management, and address coastal flooding, sea level rise, and water quality concerns.

NOS also protects and manages the special marine areas of the Nation's marine sanctuaries, the Papahānaumokuākea and Rose Atoll Marine National Monuments, and through partnerships with coastal states, manages and protects the Nation's valuable coastal zones and nationally significant estuarine reserves. NOS helps Federal, State, local, and international managers build the suite of skills and capacity needed to protect, restore, and use coastal ecosystems by

providing financial and technical assistance and other applied research and capacity-building resources.

Mapping and Charting: The Office of Coast Survey is an integral part of NOAA's overall mission to support the Nation's commerce with information for safe, efficient, and environmentally sound transportation. The Office of Coast Survey works closely with NOAA's Office of Marine and Aviation Operations (OMAO) to chart the 3.4 million square nautical miles in the U.S. Exclusive Economic Zone.

Geodesy: NOAA's Geodesy Program provides a common reference framework, the National Spatial Reference System (NSRS), for establishing the coordinate positions of all geographic and geospatial data. NSRS provides the underlying positioning framework for transportation, mapping, charting, and a multitude of scientific and engineering applications.

Tides and Currents: The Tide and Current Data Program is managed end-to-end by the NOS Center for Operational Oceanographic Products and Services (CO-OPS). CO-OPS adheres to international standards used by other countries and entities seeking to provide similar geospatial reference systems and data. Observations, forecasts and other water level and current products and services are generated and distributed to the marine transportation community and other users.

Ocean Assessment Program: Within this program, NOAA supports a number of offices that provide the data and tools that the Nation needs to manage its ocean and coastal resources. For example, the NOAA Coastal Services Center works with other Federal agencies and local and State governments to bring information, services, and technology to the Nation's coastal resource managers. The Center is a partner in over 100 ongoing projects geared to site-specific coastal issues.

Coastal Management: The Office of Ocean and Coastal Resource Management (OCRM) provides national leadership, strategic direction, and guidance to State and territory coastal programs, and to estuarine research reserves. OCRM works with State and territory coastal resource managers to implement the Coastal Zone Management Act, with a range of partners to develop a scientifically-based national system of marine protected areas and estuarine reserves, and with numerous stakeholders to protect, sustain, and restore coral reef ecosystems.

Office of Response and Restoration (OR&R): NOAA's OR&R protects coastal and marine resources, mitigates threats, reduces harm, and restores ecological function. The OR&R provides comprehensive solutions to environmental hazards caused by oil, chemicals, and marine debris and served as NOAA's front line during the Deepwater Horizon BP oil spill response. OR&R also conducts oil spill and other hazard research to improve our ability to respond to events in the future.

National Centers for Coastal Ocean Science: NOS' National Centers for Coastal Ocean Science (NCCOS) conduct research, monitoring, and assessments to build the scientific foundation essential for sustainable use of coastal resources. Coordinating activities with partner organizations, NCCOS ensures research activities meet the highest priority science needs, provide a balanced response to local, regional and national issues, and are utilized by decision makers to sustain the viability of coastal ecosystems and communities.

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

Fisheries Research and Management: The Office of Sustainable Fisheries, the NOAA regional offices, and the Regional Fishery Management Councils all work cooperatively to manage fish stocks important to commercial, recreational, and subsistence fisheries. NOAA Fisheries Service's Science Centers and the Office of Science and Technology provides the research and technology development activities (including field surveys and catch monitoring, biology, ecology, economic and social sciences, oceanography, engineering, and other disciplines) and the analyses of these data to inform the conservation and management of living marine resources.

Protected Species Research and Management: NOAA's Office of Protected Resources works to conserve, protect, and recover species under the Endangered Species Act (ESA) and the Marine Mammal Protection Act (MMPA). Different divisions of the program focus on developing policies and regulations to implement the provisions of the ESA or MMPA to protect and recover endangered and threatened marine and

anadromous species, marine mammals, sea turtles, and the habitat required by each of these animals.

Enforcement and Observers: 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 is charged with enforcing NOAA's natural resource protection laws and improving 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 85,000 miles of U.S. Coastline, the country's 13 National Marine Sanctuaries and its two Marine National Monuments. OLE is responsible for carrying out more than 35 Federal statutes and international agreements related to living marine resources.

The goal of the Observer Programs is to provide accurate and timely information and analyses on the biological, ecological, economic, and social aspects of the Nation's fisheries. The scientific data collected by observer programs are critical input for population assessments of threatened and endangered species such as sea turtles, seabirds, and marine mammals, and for effective management of the Nation's fish stocks.

Habitat Conservation and Restoration: The Habitat Conservation and Restoration Program's mission is to protect and restore habitats for a broad range of societal benefits. This includes conserving habitat for living marine resources such as stocks of commercial and recreational fisheries, protected species, increasing the resiliency of coastal communities, providing for the public's use and enjoyment, and supporting the biodiversity on which marine and coastal ecosystems depend. 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)

The Office of Oceanic and Atmospheric Research (OAR) leads NOAA's research enterprise, the driving force behind NOAA environmental products and services that protect life and property and promote sustainable economic growth. It consists of Federal laboratories, Cooperative Institutes, the National Sea Grant College Program, the NOAA Climate Program Office, the Office of Weather and Air Quality, and the Office of Ocean Exploration and Research. These programs are enhanced by formal and informal partnerships with academia, industry, and governmental agencies.

OAR has world-class observational, modeling, and technology-development capabilities used to understand ocean-atmosphere systems. These capabilities better characterize the role of the oceans in weather and climate, and support modeling efforts to predict major coastal storms and hurricanes. Developing and enhancing sophisticated climate models further advances NOAA's ability to provide climate services. OAR also provides sustained *in situ* observations for understanding the role of the oceans in climate variability and potential change. OAR is a world leader in monitoring and understanding the influence of natural and anthropogenic atmospheric constituents, including greenhouse gases and aerosols, that may affect climate or influence air quality.

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: Sea Grant fosters scientific and economic advances in sustainable marine aquaculture, marine biotechnology, commercial and recreational fishing, aquatic nuisance species

research and outreach, marine education, seafood technology, and harmful algal blooms.

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.

Other Ecosystem Programs – Ocean Acidification: NOAA’s investment in the research described in the NOAA Ocean and Great Lakes Acidification Research Plan accelerates understanding to a pace that can adequately inform national and international mitigation and adaptation decision-making that will best conserve marine ecosystems and sustain the critical services that oceans, coastal, and Great Lakes ecosystems provide to the national economy.

Climate Research Laboratories & Cooperative Institutes/AOML & PMEL: OAR’s Climate Observations and Monitoring program provides and interprets oceanographic data and conducts research relevant to decadal climate change and coastal ecosystems. OAR’s Climate Observations and Analysis program provides core

infrastructure activities (including research, technology development and observing system implementation) that are central to meeting NOAA’s climate goals and has a strong history of innovation to meet the challenge of fielding a robust, accurate observation activity.

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 as well as 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:

Marine Observations: 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 150 data collection buoys and 55 coastal stations.

Marine Weather Services: The NWS issues marine forecasts and warnings for the U.S. coastal, Great Lakes, offshore areas, as well as for high-sea areas of international waters that are the responsibility of the U.S.

Tropical Cyclone Support: The NWS issues forecasts, watches, and warnings for tropical cyclones for the United States and its territories. It operates the National Hurricane Center in Miami, Florida, and the Central Pacific Hurricane Center in Honolulu, Hawaii.

Tsunami Program: The NWS operates the West Coast/Alaska Tsunami Warning Center in Palmer, Alaska and the Pacific Tsunami Warning Center in Ewa Beach, Hawaii; hosts the International Tsunami Information Center; maintains the Deep-ocean Assessment and Reporting of Tsunamis buoy station network; operates a local network of seismic stations; and contributes to the national water level network.

Arctic Ocean Marine Weather Service: With the permanent Arctic sea-ice cover diminishing, the Arctic Ocean is anticipated to become seasonally navigable. In 2009, the National Weather Service (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. 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.

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

The National Environmental Satellite, Data, and Information Service 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. Implementation of the U.S. Academic Fleet and NOAA Rolling-deck to Repository (R2R) efforts as part of the Integrated Ocean and Coastal Mapping Program further ensures data collected aboard the university and NOAA fleet will be described, managed, and available for re-use.

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 to 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 Organization 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 12 aircraft and the NOAA fleet of 18 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, 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 ocean research and scientific monitoring community.

Through NIST's National Marine Analytical Quality Assurance Program (NMAQAP) and its work in marine health biosciences, NIST is a strategic partner with NOAA. As a major part of these strategic collaborations, NIST is a 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. Through NMAQAP, NIST conducts a cryogenic banking program of marine-environmental specimens for the assessment of long-term trends

in environmental quality. NIST also 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.

Through NIST's Biosciences NMR activities at the HML, NIST is advancing the science of NMR-based metabolomics measurements to be applied to marine animal health, disease research, and development of improved monitoring techniques for commercial aquaculture operations.

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.

2010-2011 Federal Ocean and Coastal Activities Report to the U.S. Congress

DEPARTMENT OF COMMERCE								
	Percentage of Funds Dedicated to Each Ocean-Related Program Function					Dollars in Millions		
	Enhance the use, conservation, and management of ocean coastal and Great Lakes resources	Supporting Maritime Transportation	Advancing our understanding of oceans, coasts, and Great Lakes	Advancing International Ocean Science and Policy	Other	FY 2010 Actual	FY 2011 Actual	FY 2012 Enacted
National Oceanic and Atmospheric Administration								
National Ocean Service (NOS)								
<i>Operations, Research and Facilities</i>								
Mapping and Charting		100%				96.70	92.10	91.70
Geodesy		100%				37.00	33.10	28.80
Tide and Current Data		100%				33.20	29.80	27.40
Ocean Assessment Program	100%					112.00	88.90	91.80
Coastal Management	100%					104.90	106.90	101.10
Response and Restoration	100%					28.10	24.50	26.60
National Centers for Coastal Ocean Science			100%			54.70	55.30	44.90
Marine Sanctuary Program	100%					53.00	44.90	47.10
<i>Procurement, Acquisition and Construction</i>								
Coastal and Estuarine Land Conservation Program	100%					20.70	10.40	3.00
NERRS Construction & Acquisition	100%					6.90	4.00	1.00
Marine Sanctuaries Facilities	100%					14.10	5.40	4.00
Other NOS Construction/Acquisition	100%					0.90	2.20	0.00
National Marine Fisheries Service								
<i>Operations, Research and Facilities</i>								
Fisheries Research and Management	45%		55%			462.60	441.90	426.10
Protected Species Research and Management	51%		48%	1%		203.20	190.50	174.20
Enforcement and Observers/Training	96%			4%		105.70	107.40	105.40
Habitat Conservation and Restoration	45%	10%	45%			70.60	42.90	41.70
Other Activities Supporting Fisheries	33%		67%			100.80	74.50	57.50
<i>Other NMFS Accounts</i>								
Other Accounts	36%		64%			35.30	31.10	25.30
Pacific Coastal Salmon Fund	88%		12%			79.90	79.80	65.00
<i>Procurement, Acquisition and Construction</i>								
NMFS Construction			100%			2.10	1.50	0.00
Oceanic and Atmospheric Research								
National Sea Grant College Program	53%		47%			63.20	61.40	62.20
Ocean, Coastal, & Great Lakes Research Laboratories and Joint Institutes	29%	3%	63%	5%		21.90	22.00	22.80
Ocean Exploration			100%			22.40	18.20	19.40
Other Ecosystem Programs - Ocean Acidification	9%		91%			0.00	6.40	6.20
Climate Research Labs & Joint Institutes / AOML & PMEL	8%		82%	10%		15.10	15.10	14.50
National Undersea Research Program			100%			8.90	7.40	4.00
Other Ocean, Coastal and Great Lakes Partnership Programs	53%		47%			15.00	0.00	0.00
National Weather Service								
U.S. Marine Observations	10%		10%		80%	31.10	31.20	35.20
U.S. Marine Weather Program		30%			70%	18.70	18.80	18.80
U.S. Tropical Cyclone Program					100%	20.60	20.70	20.70
U.S. Tsunami Warning Program					100%	23.20	23.20	23.50
Storm Surge Program					100%	0.20	0.20	0.20
Marine Modeling		30%			70%	3.30	3.40	3.40
National Environmental Satellite, Data, and Information Service (NESDIS)								
<i>Operations, Research and Facilities</i>								
Ocean Remote Sensing	53%	11%	30%		6%	3.80	3.90	3.90
Ice Services		100%				2.20	2.20	2.20
Other Environmental Observing Services	65%		35%			10.90	10.90	10.90
Archive, Access and Assessment	20%	32%	32%	12%	5%	17.80	18.30	18.40
Climate Database Modernization Program (CDMP)	30%		60%	10%		0.30	0.00	0.00
International Pacific Research Center (IPRC) (U. of HI)			25%	75%		1.50	0.00	0.00
Integrated Data and Envir. App. (IDEA) Center (formerly Pacific Ocean and Envir. Info. Ctr.)	10%	20%	20%	50%		3.00	0.00	0.00
<i>Procurement, Acquisition and Construction</i>								
GOES Series	30%		60%	10%		89.20	86.50	79.70
POES			25%	75%		2.60	2.40	1.90
JPSS	10%	20%	20%	50%		45.90	51.90	110.90
Jason-3	5%	15%	80%			20.00	20.00	19.70

2010-2011 Federal Ocean and Coastal Activities Report to the U.S. Congress

DEPARTMENT OF COMMERCE (continued)								
	Percentage of Funds Dedicated to Each Ocean-Related Program Function					Dollars in Millions		
	Enhance the use, conservation, and management of ocean coastal and Great Lakes resources	Supporting Maritime Transportation	Advancing our understanding of oceans, coasts, and Great Lakes	Advancing International Ocean Science and Policy	Other	FY 2010 Actual	FY 2011 Actual	FY 2012 Enacted
Program Support								
<i>Operations, Research and Facilities</i>								
NOAA Education Program	50%		50%			59.50	29.50	25.10
Corporate Services	40%	20%	25%	5%	10%	75.60	75.60	74.60
Facilities					100%	12.10	11.60	9.80
<i>Procurement, Acquisition and Construction</i>								
Construction					100%	95.20	15.00	0.00
Office of Marine and Aviation Operations								
<i>Operations, Research and Facilities</i>								
Marine Services	57%	25%	18%			120.90	130.10	128.30
Aircraft Services	25%	60%	15%			3.50	3.50	3.50
Fleet Planning & Maintenance	45%	29%	26%			28.10	23.60	27.00
<i>Procurement, Acquisition and Construction</i>								
Fleet Replacement		100%				81.60	2.20	2.00
National Institute of Standards and Technology								
<i>Scientific Technical Research and Services</i>								
Biosciences NMR	100%					0.70	0.70	0.70
Marine Analytical Quality Assurance Program	100%					2.70	2.70	2.70
Marine Biosciences	100%					1.00	1.00	1.00
Pacific Islands Biorepository	100%					0.80	0.80	0.80
TOTAL						2544.90	2177.60	2116.60

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 surges 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 that 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 the operational DoD enterprise, as well as for other Federal, State, and local agencies.

National Ocean Partnership Program

This program was established in FY 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 exist among 14 Federal agencies (Navy, NOAA, NSF, NASA, DoE, EPA, USCG, DoI/USGS, DoI/BOEM, DARPA, OSTP, OMB, DOS & USACoE). 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. The Oceanographer of the Navy also funded through its SCN, two new research vessels (one in FY 2011; one in FY 2012), to be operated by civilian research institutions in coordination with the University National Oceanographic Laboratory System (UNOLS).

CNO Energy and Environmental Readiness - Living Marine Resources

This program provides applied research support for operational Navy environmental compliance needs related to effects of Navy activities on marine mammals and protected marine species, with the current, highest priorities related to the effects of Navy sonars and other sound sources on marine mammals. Program areas include:

development of capabilities to assess the abundance and habitat requirements of species of interest on Navy ranges and usage areas, transition of new research findings by ONR Marine Mammals Program and other research programs into science-based, risk-assessment criteria and regulatory thresholds, development of sound exposure data and models, and development, test, and evaluation of new technologies for monitoring and mitigating the environmental effects of at-sea Navy activities. The Living Marine Resources Program works closely with Navy operational commands (fleets and acquisition programs) to identify applied science needs and to transition successfully developed and validated work products to operational applications.

U.S. Army Corps of Engineers

The Army Corps of Engineers (Corps) 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 Corps 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 Corps' Coastal and Hydraulics Laboratory is renowned for the contributions to ocean and coastal science.

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

Construction

The Corps builds navigation projects, which generally consist of dredging entrance and exit channels as well as harbors to a greater depth

and width to allow larger vessels to safely navigate in and out of the harbors and ports. These projects may also include structures such as breakwaters and jetties that are integral to their functioning. The Navigation program mission is to provide safe, reliable, efficient, effective, and environmentally-sustainable, waterborne-transportation systems for movement of commerce, national security needs, and recreation. The Corps also constructs coastal, storm-damage-reduction projects, which generally consist of “soft” engineering structures like beach nourishment, which involves dredging sand from the ocean inlets and placing it on the shore. The Storm Damage Reduction (SDR) program contributes to the national effort to reduce flood risk by protecting lives, homes, business, agricultural areas, public infrastructure, and critical environmental areas. Further, the Corps 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 Corps also works with local and regional partners to develop and implement Regional Sediment Management Plans, which focus on managing sediment transport within the watershed to benefit navigation and wildlife habitat.

Operation and Maintenance

The objective of the Corps is to ensure reliable mission achievement in order to return value back to national investment. These projects were built to meet national needs through prioritized investments of Federal funds, and to recognize this, the Corps ensures that 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, including maintenance of harbor channels provided by a State, municipality, or other public agency that serve the 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 Corps 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.

2010-2011 Federal Ocean and Coastal Activities Report to the U.S. Congress

DEPARTMENT OF DEFENSE								
	Percentage of Funds Dedicated to Each Ocean-Related Program Function					Dollars in Millions		
	Enhance the use, conservation, and management of ocean coastal and Great Lakes resources	Supporting Maritime Transportation	Advancing our understanding of oceans, coasts, and Great Lakes	Advancing International Ocean Science and Policy	Other	FY 2010 Actual	FY 2011 Actual	FY 2012 Enacted
Office of the Secretary of Defense Sciences								
Strategic Environmental Research and Development Program	50%		50%			8.40	10.10	8.00
Environmental Security Technology Certification Program	100%					3.90	2.60	4.00
Department of Navy								
<i>Office of Naval Research</i>								
Naval Ocean Sciences					100%	78.52	82.57	84.63
Applied Ocean Research					100%	23.76	18.50	17.97
National Oceanographic Partnership Program					100%	8.23	8.42	8.61
Marine Mammals					100%	11.41	11.68	11.90
<i>Oceanographer of the Navy</i>								
Naval Oceanography Operations					100%	324.08	319.81	231.78
Naval Oceanography Acquisition					100%	66.05	158.77	166.78
Naval Oceanography R & D					100%	94.25	87.96	34.12
<i>CNO Energy and Environmental Readiness</i>								
Living Marine Resources					100%	7.81	7.65	8.16
Department of Army - Corps of Engineers								
<i>Construction</i>								
Environment	100%					45.15	33.81	70.28
Flood Risk Management			100%			10.30	24.30	6.90
Navigation		100%				305.11*	245.50**	166.16
Others		49%			51%	9.47	12.72	9.69
<i>Investigations</i>								
Environment	100%					16.07	13.34	17.14
Flood Risk Management	8%		92%			3.18	3.58	2.48
Navigation		100%				12.50^	7.40^^	16.90
Others			100%			4.50	4.00	3.60
<i>Operations and Maintenance</i>								
Environment					100%	0.50	1.60	1.00
Flood Risk Management			100%			7.40	10.10	8.30
Navigation		100%				1429.10 ^o	1114.17 ^{oo}	791.42
Others		44%	44%		12%	0.40	0.60	4.87
<i>Coastal Wetlands Restoration</i>								
Aquatic Resource Trust Fund - Sport Fish Restoration Account	100%					90.60	51.00	85.00
TOTAL						813.98	863.11	1759.69

* Includes \$119.12M American Reinvestment and Recovery Act (ARRA) and \$0.33M Supplemental appropriations

** Includes \$87.76M ARRA appropriations

^ Includes \$1.70M ARRA appropriations

^^ Includes \$0.46M ARRA appropriations

^o Includes \$387.94M ARRA and \$236.05M Supplemental appropriations

^{oo} Includes \$155.74M ARRA and \$133.78M Supplemental appropriations

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 U.S. 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. 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 15 km. Research is supported to project dynamical 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 inter-comparison of the variety of climate models developed by scientists around

the world. This inter-comparison 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.

The Biological and Environmental Research program within the Department of Energy's Office of Science supports research 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. 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 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.

Methane Hydrates Research

DOE is evaluating methane hydrates as a future energy resource for the Nation. Research on technologies to locate, characterize, and safely extract natural gas from methane-hydrate formations is ongoing. Significant scientific work must be completed before methane hydrates can be considered a producible, natural-gas-resource. The present challenge is to determine whether methane-hydrate deposits can yield methane gas at the rates necessary to make high-cost Arctic or deepwater production commercially viable. To that end, the methane-hydrate program has conducted the first field trial of an alternative production technology. This arctic test involved injection of CO₂ and other gases into the hydrate structure, exchange of the CO₂ for methane within the reservoir, and the subsequent permanent storage of CO₂ within the reservoir. Testing concluded in March 2012 and analysis of the test data is ongoing.

Natural Gas Technology

DOE is currently conducting research under its unconventional natural gas program in the following areas:

- Ensure isolation of producing formations and wellbores from shallower formations, particularly near-surface aquifers.
- Develop means for managing the fluid-use associated with shale gas development.
- Maximize the efficiency of hydraulic-fracturing operations to ensure that the minimum amount of fluid is used to

completely stimulate the reservoir zone and the need for re-fracture treatments is minimized.

- Minimize surface disruption associated with shale gas development.

DOE is also enhancing the Risk Based Data Management System by adding new components relevant to environmental topics associated with hydraulic fracturing to enhance the protection of ground-water resources, and supporting STRONGER (the State Review of Oil and Natural Gas Environmental Regulation).

Ultra-Deepwater and Unconventional Natural Gas

DOE is engaged in research to extend the scientific understanding of the various processes and phenomena that directly impact the design and operation of an ultra-deepwater production system. This effort involves understanding and quantifying the safety and environmental risks involved; developing “enabling” technologies that facilitate the development of additional technical advances to reduce and mitigate risk and protect the environment; enhancing existing technologies to help lower overall risk; pursuing “Grand Challenges” (long-term, high-risk research, on applied science, and on key leveraging and transformational technologies capable of “leapfrogging” over conventional more risk-prone pathways); and accomplishing ultra-deepwater resource development in a safe and environmentally sustainable manner.

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 currents, rivers, and ocean thermal gradients [i.e., marine and hydrokinetic (MHK) technologies]. The program works to

promote the development and deployment of these new technologies, known as marine and hydrokinetic 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 and testing in laboratory and open-water settings. The Program also 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. From FY 2008 to FY 2011, the Water Power Program announced awards totaling more than \$87 million for 73 projects focused on MHK energy.

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

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 2011, DOE launched the Offshore Wind Innovation and Demonstration Initiative, which developed a national offshore wind strategy in partnership with the U.S. Department of the Interior that aims to overcome some of these challenges and advance the state of commercial offshore wind development in the United States. The strategy's primary objectives are to reduce the cost of offshore wind energy to ensure cost-competitiveness with other electrical generation sources, and to reduce the timelines and uncertainties associated with U.S. offshore wind project development. These objectives are met by focusing project investments in three key areas: the removal of market barriers to facilitate deployment and reduce technical challenges facing the entire industry; the development of innovative technologies that lower the cost of energy of offshore wind farms; and the demonstration of advanced technologies that verify innovative designs and technology developments and validate full performance and cost under real operating and market conditions.

environmentally sustainable and cost-effective electricity. Through support for public, private,

2010-2011 Federal Ocean and Coastal Activities Report to the U.S. Congress

DEPARTMENT OF ENERGY								
	Percentage of Funds Dedicated to Each Ocean-Related Program Function					Dollars in Millions		
	Enhance the use, conservation, and management of ocean coastal and Great Lakes resources	Supporting Maritime Transportation	Advancing our understanding of oceans, coasts, and Great Lakes	Advancing International Ocean Science and Policy	Other	FY 2010 Actual	FY 2011 Actual	FY 2012 Enacted
Office of Science								
<i>Biological and Environmental Research</i>								
Climate Research Activities			100%			9.00	9.00	9.00
Genomics Research Activities			100%			7.00	4.00	1.00
Office of Fossil Energy R&D								
<i>Oil and Natural Gas Technology</i>								
Methane Hydrates	50%		50%			5.00	0.00	5.00
Natural Gas Technology	100%					17.00	19.00	19.00
Ultra-deepwater and Unconventional (Royalty Trust Funds)	100%					17.00	19.00	19.00
Office of Energy Efficiency & Renewable Energy								
<i>Water Power Program</i>								
Water Power Program	97%		1%	2%		36.00	21.50	34.00
<i>Wind Power Program</i>								
Wind Power Program - Offshore Wind	100%					3.60	25.30	39.40
TOTAL						94.60	97.80	126.40

ENVIRONMENTAL PROTECTION AGENCY

The U.S. Environmental Protection Agency (EPA) protects human health and safeguards the natural environment upon which all life depends. 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. 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: 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

U.S./Canada Great Lakes Water Quality Agreement, and the Clean Water Act (CWA). As the primary means of accomplishing this goal, the EPA leads the Interagency Task Force, consisting of 16 Federal organizations, in implementation of the FY 2010 to FY 2014 Great Lakes Restoration Initiative Action Plan (Action Plan). The Action Plan targets five focus areas:

- 1) Eliminating or mitigating toxic substances and restoring designated Areas of Concern;
- 2) Preventing and reducing the destructive impacts of invasive species;
- 3) Improving nearshore health and reducing nonpoint source pollution;
- 4) Improving habitat and reducing species loss; and
- 5) Emphasizing and instilling concepts of accountability, education, monitoring, evaluation, communication, and partnership through implementation of the Initiative.

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 include:

- The anticipated delisting of the Presque Isle, Pennsylvania AOC in 2012, now that all necessary management actions are complete. Fourteen Beneficial Use Impairments at nine different AOCs have been removed.
- One million cubic yards of contaminated sediments have been remediated in the basin.
- GLRI has been central to keeping self-sustaining Asian carp populations out of the Great Lakes. No new invasive species populations have been detected in the Great Lakes.
- The Lake Erie watersnake has been delisted under the Endangered Species Act.
- Swimming bans and advisories are at a five-year low at Chicago's beaches.

Through implementation of on-the-ground and in-the-water actions pursuant to the Action Plan, EPA expects to continue to achieve substantial results through both Federal projects and projects done in conjunction with States, tribes, municipalities, universities, and other organizations. 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, 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 EPA and including senior representatives of the departments of Agriculture, Commerce, Defense, Homeland Security, the Interior, Transportation and other agencies. On March 30, 2012, the FLC released its second E.O. Action Plan describing how the agencies will work to meet the expectations of the E.O.

On December 29, 2010, 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 strategy. The TMDL is supported by rigorous accountability measures to ensure cleanup commitments are met, including short- and long-term benchmarks, a tracking and accounting system for jurisdiction activities, and Federal contingency actions that can be employed, if necessary, to spur progress.

Mississippi River/Gulf of Mexico Watershed Nutrient Task Force: EPA serves as the chair of the Mississippi River/Gulf of Mexico Watershed Nutrient Task Force, which is composed of senior representatives from Federal, State, and tribal agencies and organizations. *Gulf Hypoxia Action Plan 2008 for Reducing, Mitigating, and Controlling Hypoxia in the Northern Gulf of Mexico and Improving Water Quality in the Mississippi River Basin*, signed in June 2008, presents a Framework for Action in addressing hypoxia in the northern Gulf of Mexico and actions to accelerate the reduction of nitrogen and phosphorus as well as to advance the science, track progress, and raise awareness.

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 rests on partnerships with Federal, tribal, State, local, and community entities. Aside from base NEP grants, the Agency also provides additional support for several "Large Aquatic Ecosystems", including Long Island Sound, Puget Sound, San Francisco Bay, and South Florida.

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), 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 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. EPA carries out this work through its Marine Ecosystems activities.

Vessel Pollution: Under Section 312 of the Clean Water Act, 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 – 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, EPA has developed and is implementing a general permit for discharges from non-recreational vessels under CWA Section 402. EPA carries out this work through its Marine Ecosystems activities.

BEACH Program Grants: EPA administers the Beaches Environmental Assessment and Coastal Health Act (BEACH Act), signed into law on October 10, 2000. In 2012, EPA expects to award an additional \$9,864,000 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: EPA is required to conduct research and develop recreational waters criteria in a consent decree and settlement agreement. EPA Office of Water will use the results of these studies in the development of Recreational Waters Criteria to protect human health. 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: EPA has a number of programs and regulatory tools that have the ability to address land-based sources of marine debris, including: marine debris monitoring efforts; solid waste and storm-water management programs; pollution prevention programs; sustainable materials management (life cycle-and systems-based analysis); and waste reduction efforts. EPA annually supports the International Coastal Cleanup Campaign and has funded the National Marine Debris Monitoring Program, a statistically-based national monitoring program that assesses trends and sources of marine debris. EPA is using these results to focus on regulatory and voluntary efforts to reduce marine debris.

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 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 CWA 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

EPA helps shape the U.S. Government's positions on marine pollution issues. 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, EPA analyzes the impacts of air deposition to coastal waters. 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

Oil Spills Mitigation Research: As part of the Federal Government's response to the Deepwater Horizon oil spill, the U.S. Environmental Protection Agency (EPA) received a \$2 million supplemental Congressional appropriation in FY 2010 for a grant or grants for "a study on the potential human and environmental risks and impacts of the release of crude oil and the application of dispersants, surface washing agents, bioremediation agents, and other mitigation measures listed in the National Contingency Plan Product List (40 C.F.R. Part 300 Subpart J)." To implement this appropriation through its Science to Achieve Results (STAR) grant program, EPA sought applications proposing to develop a research program, including an effective community outreach program component, to mitigate the impact of oil spills.

Grant applications must address one or more of the following topics: (1) development of cost-effective innovative technologies to mitigate the impact of oil spills; (2) development of effective oil dispersants, surface-washing agents, bioremediation agents, and other mitigation measures ("dispersants/agents/measures") with low environmental impact; and (3) investigation of the effects of oil spills and application of dispersants/agents/measures on the environment. Applicants must also submit a community outreach program plan, the objective of which is

to help impacted Gulf Coast communities effectively participate in the study and use its results.

Safe and Sustainable Water Resources

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

National Coastal Condition Reports: EPA cooperates with State, local, tribal, and Federal natural resource trustees to produce the series of National Coastal Condition Reports (NCCR I-IV). These reports describe the condition of coastal resources (estuarine and intertidal ecosystems) for the conterminous United States. A Great Lakes assessment of the coastal, nearshore, and offshore ecosystems has been conducted using the same monitoring framework as the marine coastal areas and is incorporated into NCCR IV. The NCCRs 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 Office of Water's National Aquatic Resource Surveys, but ORD still 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 Assistance (OECA)

Vessel General Permit (VGP) Implementation

– **OECA and the Regions:** In FY 2011, 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. In FY 2012 and beyond, EPA is reviewing Coast Guard inspection data for appropriate response to correct violations of the permit. EPA will work with the Coast Guard to implement and enforce requirements in a revised permit for large commercial vessels and a new permit for smaller vessels.

2010-2011 Federal Ocean and Coastal Activities Report to the U.S. Congress

ENVIRONMENTAL PROTECTION AGENCY									
	Percentage of Funds Dedicated to Each Ocean-Related Program Function					Dollars in Millions			
	Enhance the use, conservation, and management of ocean coastal and Great Lakes resources	Supporting Maritime Transportation	Advancing our understanding of oceans, coasts, and Great Lakes	Advancing International Ocean Science and Policy	Other	FY 2010 Actual	FY 2011 Actual	FY 2012 Enacted	
Office of Water									
Gulf of Mexico	65%		30%	5%		6.00	5.00	5.00	
Great Lakes	84%	2%	11%	3%		475.00	299.00	299.00	
Chesapeake Bay	70%		30%			50.00	49.00	53.00	
Coastal Ecosystems	100%					99.00	77.00	69.00	
BEACH Program	100%					2.00	2.00	2.00	
BEACH Program Grants	100%					10.00	10.00	10.00	
Clean Water SRF	100%					1176.00	852.00	816.00	
Marine Ecosystems	97%			3%		13.00	12.00	13.00	
Nonpoint Source Management	100%					100.00	88.00	82.00	
Section 106 Grants	100%					108.00	112.00	112.00	
Water Quality Standards	100%					14.00	12.00	12.00	
Office of International and Tribal Affairs									
Program Activities	50%			50%		0.10	0.10	0.10	
Office of Air and Radiation									
Air STAG Grants	100%					1.00	1.00	1.00	
Office of Research and Development*									
Beaches (Recreational Water Quality Criteria)	75%		25%			2.50	2.40	1.10	
Ecosystems Services Research (National Coastal Conditions Report and Place Based Ecosystems research)	10%		90%			6.00	5.00	0.00	
National Coastal Conditions Report	10%		90%			0.00	0.00	0.30	
Oil Spill Supplement**					100%	0.00	0.00	0.00	
Office of Enforcement and Compliance Assistance									
Vessel General Permit		100%				0.20	0.10	0.10	
TOTAL						2062.80	1526.60	1475.60	

* EPA realigned its research programs in FY 2012. There is no longer a Human Health and Ecosystems program/project.

** Congressional 2-year supplement to EPA budget to provide grants to study innovations in oil spill mitigation, dispersants, and community outreach. Resources totalling \$2M were providing in FY 2010 but will be spent in FY 2012 and as such are not included in the resource table.

DEPARTMENT OF HEALTH AND HUMAN SERVICES

National Institutes of Health

National Institute of Environmental Health Sciences (NIEHS)

Deepwater Horizon Activities: The National Institutes of Health (NIH) is supporting 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. This event poses unpredictable risk 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.

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.

National Toxicology Program Research Study: The NIEHS National Toxicology Program (NTP) is working with other Federal partners to identify and conduct studies to further our understanding of the chemistry, biological fate, and toxicologic effects of the crude oil and dispersant constituents. Research will focus on constituents most likely to represent a potential long-term human health hazard. Such information can be used to better understand exposures among impacted populations and elucidate any potential health effects.

Gulf Research Study and Follow-up: NIEHS, a component of NIH, has undertaken the Gulf Long-term Follow-up Study (GuLF STUDY), a

health study of individuals who helped with the oil spill clean-up, took training, signed up 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.

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, \$25.2 million program will support 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.

In addition, research will seek 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

NIH 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 will identify the acute and long-term effects of the health risks of exposures to oil and dispersant related toxicants following the DWH disaster. This grant will support 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. This is commonly known as HAZWOPER training. This 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 and continues to be 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 is 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 and continues to be provided to individuals who will have minimal contact with oil spill products. These courses provide training on safe work practices, personal protective equipment, decontamination, heat stress, and other common hazards for cleanup work.

Fogarty International Center (FIC)

International Cooperative Biodiversity Groups (ICBG) Program: The 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 institutes of the National Institutes of Health (NIH), the Biological Sciences Directorate of the National Science Foundation, the U.S. Department of Agriculture at the National Institute for Food and Agriculture, the Department of Energy in the Office of Biological and Environmental Research and the National Oceanographic and Atmospheric Administration (NOAA) Oceans and Human Health Program. 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 products are found both on land and in water 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.

FIC has programs that span the globe. The ICBGs have worked in nine 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. To date, more than 5,000 species of plants, animals, and fungi have been collected to examine biological activity in 19 different therapeutic areas. Numerous publications in chemistry, biodiversity policy, conservation and ethnobiology 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

Current partial ocean-related funding includes:

Madagascar: The goals of this grant are to achieve the threefold mission of biodiversity conservation, economic development, and drug discovery in Madagascar. Plants will be collected by botanists, microbial strain isolation from soil and marine samples will be performed by scientists and the marine organisms will be extracted.

Panama: For this next grant, the over-arching goal is to discover new lead compounds from Panamanian microorganisms for the treatment of cancer, Central Nervous System (CNS) disorders, tropical diseases, and agricultural pests, employing a spectrum of innovative as well as traditional bioassays. This proposal seeks to discover new medicines from Panama's rich biodiversity of terrestrial and marine microorganisms. An aim of this grant is to inventory the biodiversity of terrestrial plants and marine algae in Panama, and to integrate our drug discovery and conservation efforts to develop innovative new economic products from the biodiverse marine and terrestrial habitats of Panama.

Costa Rica: This grant involves cooperation between the U.S. and Costa Rica with the intent to improve human health through the discovery of bioactive natural products from Costa Rica's rich biodiversity using ecologically-driven approaches. Investigators seek to contribute to the development of a bioenergy program toward discovery of cellulases and other enzymes for applications in biofuel production and focus upon natural product and biosynthetic enzyme-related research on unexplored and under-explored microorganisms such as marine sediment bacteria and insect microbial endosymbionts.

Current full ocean-related funding includes:

South Pacific: Overall goals of this grant are to: (1) coordinate investigations of South Pacific organisms as pharmaceutical resources for treating diseases of importance in the Pacific Islands and United States and for novel bioenergy applications; (2) support sustainable uses of the biodiversity upon which such bioprospecting depends; (3) understand the processes degrading coral reef ecosystems and initiate locally-appropriate conservation measures to enhance reef resilience to both local and global pressures; (4) leverage NIH, University of the South Pacific (USP), and other resources to develop the South Pacific Center for Biodiversity Conservation and Drug Discovery (SPCBCDD) into a self-sustaining institution serving the 12 countries that operate USP (Cook Islands, Fiji, Kiribati, Marshall Islands, Nauru, Niue, Samoa, Solomon Islands, Tokelau, Tonga, Tuvalu and Vanuatu); and (5) develop "green" culturing of coral reef live rock as an environmentally appropriate and economically viable substitute for the present destructive practices of live rock mining from Fijian reefs. Drug discovery will focus on (1) phylogenetically distinct and chemically rich marine actinomycetes making metabolites that are active in biomedical screens and that hosts novel metabolic pathways valuable for sustainable energy development, and (2) on chemically-rich coral reef macroorganisms that commonly upregulate defensive chemistry in response to attack from natural enemies, simulated attack, or other stresses. Extracts from these organisms will be bioassayed against relevant models including: drug resistant bacteria, fungi, TB, Malaria, psychological disorders, and cancer. Additionally, we will evaluate patterns in tropical reef biodiversity and conduct field experiments to determine the relative impacts of common stresses (e.g., overfishing, nutrification) causing seaweed replacement of corals and precipitating the dramatic loss of biodiversity that is occurring on coral reefs worldwide. Toward this end, scientists will identify the processes and mechanisms involved, elucidate those critical herbivores that control the most aggressive seaweeds, and work with village leaders to develop effective resource management strategies based on this scientific input. They will continue to develop a web-based foundation for funding

conservation of Fijian coral reef and mangrove systems.

Recovery Act-Funded NIH Challenge Grants in Health and Science Research Program:

Recovery Act funding was used to support an initiative focused on research dealing with specific scientific health research challenges in biomedical and behavioral research that would benefit from a significant infusion of two-year funding and accelerate the advancement of that topical area. Each Institute had specific Challenge topics within a broad challenge area. As one of its areas of scientific inquiry, FIC sought applications proposing building and testing models to predict the health effects of climate change. The intent was to encourage researchers to pursue quantitative and predictive models of effects of climate change on disease burden and health outcomes. The approaches included statistical, spatial or other modeling methods to quantify the current impacts of climate on a diversity of communicable or non-communicable diseases, or project impacts of different climate and socio-economic scenarios on health. New and innovative approaches to develop projections of changes in disease-burden in specific regions or populations to facilitate public health planning were welcomed. Existing databases on population and environmental variables, such as air quality and climatologic episodes to test the utility of these models were encouraged where possible.

Bangladesh: Overall, this grant will elucidate the link between cholera and climate change by developing a climate change cholera prediction model in South Asia. Global Climate Models will be downscaled to form the models that will enable forecasting cholera outbreaks 2 to 3 months in advance of the occurrence. The proposed Cholera Climate Change Prediction Model (CCPM) will integrate hydrological, ecological, microbiological, and oceanic determinants of cholera occurrences and transmission. Tools that will be used include chlorophyll measurements by satellites and remote sensing to track phytoplankton blooms preceding outbreaks. The sea surface-temperature, precipitation, zooplankton/phytoplankton density, seasonality,

variability, and extremity in climate and the El Nino Seasonal Oscillation will also be measured. Once tested and validated in these regions, the proposed cholera tracking and prediction model will have the capabilities and functionalities to be useful for many regions of the world. It will also provide information about outbreak of cholera for other cholera-prone regions of the world to U.S. aid agencies.

National Library of Medicine

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/oilspills.html>) became the first HHS web page devoted to the oil spill and 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.

Travel Related to the Deepwater Horizon Oil Spill: NLM provided a senior toxicologist as an advisor to the Deepwater Horizon Unified Area Command, who provided information concerning the adverse effects on health from the oil, as well as the dispersants.

Gulf Oil Spill Summit: An NLM staff member attended the Gulf Oil Spill Summit on June 17, 2010.

Enhance and Update Emergency Response and Toxicology Databases: NLM completed updates to four emergency response and toxicology databases and websites:

- 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>)
- 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 biodistribution, residue persistence, metabolism, efficacy, and environmental effects of drugs and other chemicals used in aquaculture.

The Office of Regulatory Affairs (ORA) is responsible for ensuring that domestic, foreign, and imported fish and fishery products are safe and wholesome. Domestic and foreign establishments involved in the production, storage and distribution of fish and fishery products are inspected for ensuring that seafood is produced and handled under the current Good Manufacturing Practices, the seafood Hazard Analysis and Critical Control Point (HACCP), and the Food, Drug, and Cosmetic Act (FD&C Act). As 80 percent of the seafood eaten by American consumers is imported, the ORA Import Seafood Program continues to help ensure the safety of the imported seafood supply in the U.S. by using an approach that incorporates both sample collection and analysis and seafood HACCP review of importers' records for safety by investigators specially trained in HACCP.

FDA has also provided support on the 2010 Deepwater Horizon (DWH) disaster response efforts. For example, FDA laboratories developed a sampling method to test for chemicals that the EPA indicated might be present. This sampling method shortened the sample time from two weeks to 48 hours.

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

Great Lakes Restoration – Brownfield – Reimbursable from EPA

ATSDR is conducting four community health projects that address potential contamination

from brownfields/land reuse sites in effort to improve community health. The projects integrate 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 action throughout the restoration process.

2010-2011 Federal Ocean and Coastal Activities Report to the U.S. Congress

DEPARTMENT OF HEALTH AND HUMAN SERVICES								
	Percentage of Funds Dedicated to Each Ocean-Related Program Function					Dollars in Millions		
	Enhance the use, conservation, and management of ocean coastal and Great Lakes resources	Supporting Maritime Transportation	Advancing our understanding of oceans, coasts, and Great Lakes	Advancing International Ocean Science and Policy	Other	FY 2010 Actual	FY 2011 Actual	FY 2012 Enacted
National Institutes of Health								
<i>Office of the Director</i>								
Deepwater Horizon - National Toxicology Program (NTP) Research Study - (NIEHS)			100%			2.00	0.00	0.00
Deepwater Horizon - Staff Support					100%	0.00	0.00	0.00
National Institutes of Environmental Health Sciences								
Ocean-Related Extramural Research and Training			100%			9.00	9.80	11.80
Deepwater Horizon - National Toxicology Program Research Study			100%			0.00	0.00	0.30
Deepwater Horizon - Gulf Research Study and Follow-up			100%			8.00	14.50	3.00
Deepwater Horizon - Academic Consortia			100%			0.00	4.80	5.40
Deepwater Horizon - Unsolicited Grants			100%			0.00	0.60	0.20
Deepwater Horizon - Safety Training			100%			0.40	0.10	0.00
Deepwater Horizon - Support to Research Efforts			100%			0.20	0.50	0.00
Fogarty International Center								
<i>Division of International Training & Research</i>								
International Cooperative Biodiversity Program	40%		40%	20%		4.20	4.10	3.90
Recovery Act-Funded NIH Challenge Grant in Health and Science Research: Models on the Health Effects of Climate Change			100%			0.50	0.00	0.00
National Library of Medicine								
Deepwater Horizon - Oil Spill and Health Effects Health Information Comprehensive Web Page					100%	0.00	0.00	0.00
Deepwater Horizon - Travel Related to Oil Spill (IOM Conference, Committee Meetings, etc.)					100%	0.00	0.00	0.00
Deepwater Horizon - Enhance and Update Emergency Response and Toxicology Databases (WISER, HSDC, ChemIDPlus)					100%	0.00	0.00	0.00
Food and Drug Administration								
Division of Seafood Science & Technology					100%	3.00	3.00	3.00
Division of Seafood Safety					100%	5.00	5.00	5.00
Center for Veterinary Medicine					100%	2.00	2.00	2.00
Office of Regulatory Affairs - Seafood Safety					100%	39.14	47.14	43.85
Office of Regulatory Affairs - Deepwater Horizon					100%	4.86	2.86	0.15
Agency for Toxic Substances and Disease Registry								
<i>Division of Health Studies</i>								
Great Lakes Human Health Effects Research Program - Reimbursable from EPA					100%	1.80	4.40	3.70
Great Lakes Human Health Effects Research Program - Trust Fund					100%	1.00	0.20	0.00
Great Lakes Restoration - Brownsfield - Reimbursable from EPA	100%					0.50	0.20	0.30
TOTAL						81.60	99.20	82.60

DEPARTMENT OF HOMELAND SECURITY

Federal Emergency Management Agency

Flood Map Modernization Fund

The Flood Map modernization program (known as MapMod) provides a technology based, cost-effective process for updating, maintaining, storing, and distributing the flood hazard and risk information contained in flood maps. The MapMod program is finishing operations, and has been replaced by the “RiskMAP” program, which will continue to upgrade flood hazard data. RiskMAP combines flood hazard mapping, risk assessment tools, and Hazard Mitigation Planning into one program. The intent of this integrated program is to encourage beneficial partnerships and innovative uses of flood hazard and risk assessment data to reduce flood losses.

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 (the “Stafford Act”), as amended, 42 U.S.C. § 5170c. The HMGP provides grants to states and local governments to implement long-term hazard mitigation measures after a major disaster declaration. The purpose of the HMGP is to reduce the loss of life and property due to natural disasters and to enable mitigation measures to be implemented during the immediate recovery from a disaster as well as to eliminate or reduce long-term risk in the future. The Sandy Recovery Improvement Act, Pub. L. 113-2, div. B, § 1104, 127 STAT. 43 (Jan. 29, 2013), amended the HMGP.

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, Indian tribal governments, communities, and universities 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.

National Flood Insurance Fund (NFIF)

Flood Mitigation Assistance Program: The Flood Mitigation Assistance (FMA) program is authorized by section 1366 of the National Flood Insurance Act of 1968 (NFIA), as amended, 42 U.S.C. 4104c, to plan and execute activities designed to reduce the risk of flood damage to structures insured under the National Flood Insurance Program (NFIP). FEMA’s Federal Insurance and Mitigation Administration administers the Unified Hazard Mitigation Assistance (HMA) Programs that present a critical opportunity to reduce risk to individuals and property from natural hazards while simultaneously reducing reliance on Federal disaster funds. The HMA programs are administered with States, territories, and tribal governments who in turn work with their local governments and in some cases private non-profit organizations. Three types of FMA grants are available to states and communities:

- Planning grants to prepare flood mitigation plans;
- Project grants to NFIP-participating communities, with approved flood mitigation plans, to implement measures to reduce flood losses. Project grants are used for activities such as elevation, acquisition, or relocation of NFIP-insured structures. States are encouraged to prioritize FMA funds for applications that include repetitive loss structures; these include structures that have incurred flood-related damaged on two

occasions, in which the cost of repair on the average was at least 25 percent of the market value of the structure at the time of the flood event.

- Management cost grants for States to help administer the FMA program and activities. Up to ten percent of project grants may be awarded to states for management cost grants.

The goal of the Flood Mitigation Assistance (FMA) program is to reduce flood damages to eligible structures, and the resulting insurance payments under the NFIP. The Biggert-Waters Flood Insurance Reform Act of 2012 (BW12), Pub. L. 112-141, (July 6, 2012)(Section 100225), amended Section 1366 of the NFIA, and merged the Repetitive Flood Claim (RFC) program and the Severe Repetitive Loss (SRL) program into one program under FMA. FMA projects include property acquisition and structure relocation or demolition, structure elevation, dry flood-proofing, and minor localized flood reduction projects.

Under BW12, a repetitive loss structure is a structure that has incurred flood-related damage on two occasions, and the cost of repair averages at least 25 percent of the value of the structure at the time of the flood event. [42 U.S.C. § 4104c(h)(2)] A severe repetitive loss structure under BW12 is a structure that has incurred flood-related damage for which four or more separate claims payments have been made over \$5,000 each, and the cumulative amount of the claims payments exceeded \$20,000; or for which at least two separate claims payments have been made, with the cumulative amount exceeding the value of the insured structure. [42 U.S.C. § 4104c(h)(3)]

The goal of the FMA is to maximize savings to the NFIF, by contributing towards projects such as property acquisition and demolition or relocation of a structure, structure elevation, mitigation reconstruction, and dry flood-proofing.

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 U.S. 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, outer continental shelf, and inland from the U.S. Exclusive Economic Zone (EEZ) to inland waters. The Living Marine Resources and Other Law Enforcement statutory missions support ocean and coastal activities within the Maritime Law Enforcement program. The Coast Guard protects sensitive marine habitats and sanctuaries, marine mammals, and endangered marine species. The Coast Guard also prevents incursions by foreign fishing vessels 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, and protects the marine environment. 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, 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.

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 ensure 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.

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 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. Every 3 years, the Coast Guard plans for and participates in a Spill of National Significance (SONS) exercise.

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 13 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 and Ice Operations statutory missions support 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, domestic and international icebreaking and patrol services, technical assistance and advice, vessel

safety standards and inspection, and bridge
administration standards and inspection.

2010-2011 Federal Ocean and Coastal Activities Report to the U.S. Congress

DEPARTMENT OF HOMELAND SECURITY								
	Percentage of Funds Dedicated to Each Ocean-Related Program Function					Dollars in Millions		
	Enhance the use, conservation, and management of ocean coastal and Great Lakes resources	Supporting Maritime Transportation	Advancing our understanding of oceans, coasts, and Great Lakes	Advancing International Ocean Science and Policy	Other	FY 2010 Actual	FY 2011 Actual	FY 2012 Enacted
Federal Emergency Management Agency								
<i>Flood Map Modernization Fund</i>								
Flood Map Modernization Fund Coastal Flood Insurance Studies	100%					45.00	69.00	69.00
<i>Disaster Relief Fund</i>								
Hazard Mitigation Grant Program*	100%					23.00	2.00	3.00
<i>Pre-Disaster Mitigation Fund</i>								
Pre-Disaster Mitigation Program	100%					100.00	50.00	36.00
<i>National Flood Insurance Fund</i>								
National Flood Insurance Fund Flood Mitigation Assistance Program	100%					40.00	40.00	40.00
Repetitive Flood Claims Program	100%					10.00	10.00	10.00
Severe Repetitive Loss Program	100%					70.00	70.00	10.00
Flood Related Grants Program	100%					0.00	0.00	0.00
<i>Management & Administration</i>								
Management & Administration HAZUS	100%					1.00	0.00	0.00
U.S. Coast Guard								
<i>Maritime Law Enforcement</i>								
Living Marine Fisheries	100%					40.35	26.54	31.75
Marine Environmental Protection		99.50%	0.50%			254.32	165.59	165.50
Domestic Fisheries	100%					578.60	616.34	595.81
<i>Maritime Prevention</i>								
Recreational Boating Safety	100%					313.96	336.85	277.64
Commercial Vessel Safety	50%	49%	1%			150.09	121.33	130.38
<i>Maritime Response</i>								
Search and Rescue	100%					807.48	745.99	808.60
<i>Maritime Transportation System Management</i>								
Waterways Management	50%	49%	1%			78.83	121.63	132.40
Radio Navigation Aids		100%				116.26	174.08	195.23
Short Range Aids to Navigation		99%	1%			868.97	979.01	1070.71
Ice Breaking - Domestic		100%				48.55	57.24	54.72
Bridge Administration		100%				11.09	12.75	14.19
TOTAL						3557.51	3598.33	3644.93

*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 and Aquatic Resources; Terrestrial, Freshwater, and Marine Ecosystems; Invasives; and Wildlife, Terrestrial, and Endangered Resources Programs. 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. 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 Research and Development Program

Changes in climate and land use have the potential to have significant impacts on the natural resources and infrastructure of our Nation. The Climate Research and Development Program (R&D) supports multidisciplinary research needed to address complex issues associated with climate and land use change. This includes research to improve the understanding of patterns and controls on sea level rise and its 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 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 assisting resource managers in devising sustainable management strategies to protect critical coastal habitats. The Climate R&D Program supports sea-level research including field work and analyses designed to address the following questions: (1) Why is sea level rising? What are relative contributions from thermal expansion of oceans, glacial isostatic adjustment, melting ice sheets and glaciers, and natural climate variability?; (2) How variable are rates of sea-level rise (past, present, and future)?; (3) Will sea-level rise be the same everywhere? How much regional variability have we seen in the past and the present? What are the implications for future patterns of sea-level rise?; and (4) How will coasts and coastal ecosystems respond to sea-level rise?

Energy, Minerals, and Environmental Health

The mission of the USGS Energy Resources Program is to understand the processes critical to the formation, accumulation, occurrence, and alteration of geologically based energy resources; to conduct scientifically robust assessments of those resources; and to study the impact of energy resource occurrence and/or production and use on both environmental and human health. Energy Resource Program activities address the distribution of gas hydrate and conventional energy resources in marine systems, and the consequences of hydrate release 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, 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

Ecosystem health, and efforts to better ensure, protect, and restore that health are intimately linked to the quantity and quality of water available. The Cooperative Water Program conducts data collection and investigations with respect to surface and groundwater quantity and quality that form the foundation for water-resources management and planning activities nationwide, through partnerships with over 1,000 State and local agencies.

The National Streamflow Information Program (NSIP) implements the USGS plan to ensure reliable and consistent acquisition and delivery of streamflow information at key sites. The Water Information Coordination Program (WICP) ensures the availability of cost effective water information required to make effective decisions for natural resources management and environmental protection.

The National Water Quality Assessment Program (NAWQA) provides an understanding of water-

quality of the Nation's surface water and groundwater, and how those conditions may vary locally, regionally, and nationally; whether conditions are getting better or worse over time; and how water quality is affected by natural features and human activities.

The National Streamflow Quality Accounting Network (NASQAN) focuses on the water quality of four of the Nation's largest river systems—the Mississippi (including the Missouri and Ohio), the Columbia, the Colorado, and the Rio Grande. NASQAN quantifies the delivery of water and nutrients to coastal receiving waters from these major basins and sub-basins therein.

The Groundwater Resources Program provides objective scientific information and interdisciplinary understanding necessary to assess and quantify availability and sustainability of the Nation's groundwater resources. Program activities include monitoring, modeling and research to understand the influence of coastal groundwater delivery systems on the health of coastal ecosystems.

The Hydrologic Networks and Analysis program provides data of the quantity and quality of water in the Nation's streams, lakes, and aquifers for wise planning, development, utilization, and protection of the Nation's water resources. The program supports the design and development of the National Water Quality Monitoring Network with a focus on understanding the impacts of hydrologic systems on the health of coastal receiving waters.

The Water Resources Research Act Program provides an institutional mechanism for promoting State, regional, and national coordination of water resources research, training and coordination, and information and technology transfer.

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 participates in interagency/intergovernmental efforts to coordinate the acquisition and provision of foundational geospatial information including orthoimagery, elevation, and hydrography (surface-water features such as rivers and lakes). In coastal settings the NGP, in collaboration with the Coastal and Marine Geology Program, 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 and Synthesis (CSAS) is to develop national data products through analysis and synthesis to enable USGS science, lead strategic research and informatics partnerships, and to create innovative tools and technologies that mobilize data for scientific discovery and rapid response to societal issues. The CSAS 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 CSAS is working with NOAA and the USFWS to develop and house the data delivery system supporting the National Fish Habitat Action Plan (NFHAP). The initial product includes delivery of the national coastal and inland assessments through data visualization and web-mapping capabilities in a unified viewer. The full system will facilitate 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 will improve coordination between Federal partners and enhance their support to regional, State, tribal, and local organizations working to improve the Nation's fish habitat.

The CSAS also houses the Ocean Biogeographic Information System (OBIS-USA), compiling and providing access to data that indicate where and when in history (1800 to present) marine species occurred within our national waters. Information on the location and time of species occurrence informs users on ecosystem status and health from specific regions to the global ocean.

Bureau of Land Management

Education

The BLM has an active and extensive youth education program. In coastal areas, BLM has a number of educational outreach initiatives designed to inform students of targeted age groups on good stewardship of watersheds that flow into tidal waters and are crucial to salmon lifecycles. Students are taught through programs such as Outdoor Week and Water Days, important components of a healthy stream and riparian habitat and the causes of impairment to the habitat and thus to the salmon. This knowledge of watershed stewardship is passed on to family members and retained into adulthood years. Other initiatives are directed at student interns and expose them to the numerous mandates under which the BLM operates such as the Federal Land Policy and Management Act (FLPMA). Many of these interns decide to continue in careers directed at the management of coastal watersheds at the BLM or in other environmental agencies organizations. BLM also operates the Campbell Creek Science Center within the city limits of Anchorage, Alaska and the Lower Potomac Field Station outside of Washington, DC in Virginia, which provide youth and adult outdoor experiences aimed at teaching good stewardship towards public lands. Their location on coastal resources provides formal and informal teaching opportunities,

which reach tens of thousands of children and adults each year.

Watershed and Habitat Management

The BLM manages coastal land and facilities in Oregon, Washington, California, and Alaska. These lands often include extensive watersheds that flow to the Pacific Ocean, Bering Sea, and Arctic Ocean. 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 shortening of the winter oil exploration and production season (winter) when heavy equipment can cross the tundra with minimal impacts.

Coastal Management

The 1,100 miles of California coastline, the California Coastal National Monument, comprises more than 20,000 small islands, rocks, exposed reefs, and pinnacles between Mexico and Oregon. The BLM also manages coastal areas and islands in Oregon and Washington such as the San Juan Islands. The scenic qualities and critical habitat of this public resource are protected as part of the National Landscape Conservation System, administered by the BLM. BLM provides public outreach through information centers in these areas; conducts consultation and coordination with local stakeholders, multiple agencies, and environmental groups; and conducts studies aimed at maintaining the sustainability of the resource values the public seeks.

Bureau of Ocean Energy Management

The Bureau of Ocean Energy Management (BOEM) manages the development of the Nation's offshore energy and mineral resources in an environmentally and economically

responsible way. Its functions include offshore leasing, resource evaluation, review and administration of oil and gas exploration and development plans, renewable energy leasing and development, and environmental studies.

In FY 2012, the Department of the Interior completed the reorganization of BOEMRE into BOEM and the Bureau of Safety and Environmental Enforcement (BSEE). While certain BOEM and BSEE functions remain closely linked and interdependent, the two bureaus now operate independently. Both agencies are committed to ongoing interagency coordination, and by design, the reorganization process focused on identifying areas of overlap where coordination is particularly critical.

In the new configuration, budget activities for BOEM are funded through the Ocean Energy Management (OEM) account and support resource evaluation, planning, and leasing of the Nation's offshore energy and mineral resources in an appropriately balanced way that promotes economic development, energy independence, and environmental protection.

Bureau Mission

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 Outer Continental Shelf (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 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

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.

Conventional Energy

BOEM's conventional energy activities include: OCS oil and gas leasing, including developing the Five Year OCS Oil and Gas Leasing Program, surveying OCS boundaries, implementing the lease sale process, administering leases, and reviewing exploration and development plans. Resource evaluation is a critical component of the program that provides the information needed to support program decision making. This includes technical and economic analysis, tract evaluation, assessment and modeling, conservation of resources, reserves inventories, geological and geophysical permitting, data acquisition, and fair market value determinations.

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.

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.

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

Environmental Studies and Assessments

One of the cornerstones of the reorganization was to increase the emphasis on sound environmental science as a basis for resource development decisions. 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

OCS sand resources are often needed to replenish shorelines and restore wetlands damaged by coastal storms and rising sea levels. BOEM's Marine Minerals Program supports the development of OCS sand and gravel and the environmental analyses necessary to permit the conveyance of marine mineral resources. To date, BOEM has conveyed the rights to 73 million cubic yards of OCS sediment to restore and protect 202 miles of coastline in six states.

Executive Direction and General Support Services

Funds for the Executive Direction and General Support Services support administration, policy decision-making and shared support services for the Bureau. These activities provide the leadership and resources necessary for informed decision-making and sound policy.

Bureau of Safety and Environmental Enforcement

The Bureau of Safety and Environmental Enforcement (BSEE) is responsible for managing exploration, development, and production operations for oil and natural gas on the Outer Continental Shelf (OCS). BSEE's regulation and oversight of Federal offshore resources is intended to ensure that the OCS remains a solid contributor to the Nation's energy needs through facilitation of safe, environmentally-responsible oil and gas development and the conservation of resources. In carrying out its OCS responsibilities, BSEE regularly works with Federal, State, and local agencies and in consultation with the public. BSEE is responsible for fostering safe and environmentally sound offshore energy operations. In general, BSEE will pursue these objectives through its powers to issue rules and regulations, inspect operations, and pursue enforcement actions.

The functions of BSEE include oil and gas permitting, facility inspections, regulations and standards development, safety and oil spill response research, field operations, environmental compliance and enforcement, review of operator oil spill response plans, production and development, conservation, and operation of a national training program for inspectors.

On October 1, 2011, BSEE began to function independently. In the new configuration, budget activities for BSEE are funded through the Offshore Safety and Environmental Enforcement (OSEE) account which will support safety, protect the environment, and conserve resources offshore through vigorous regulatory oversight and enforcement. The OSEE account activities are described below.

Environmental Enforcement Activity

This activity funds environmental compliance activities related to issuing permits associated with plans; inspections of environmental measures and enforcement of incidences of noncompliance; and monitoring industry compliance with mitigation and other

environmental requirements through office and field inspections.

Operations, Safety and Regulation Activity

This activity funds OCS permit application reviews, inspections of OCS facilities including critical high-risk activities, offshore operator oil spill planning and preparedness compliance, accident investigations, civil penalties and operator disqualification, operator training and audit programs, annual operator performance reviews, verification of oil and gas production levels to help ensure the public receives a fair return, and the Technology Assessment and Research and Oil Spill Response Research Programs.

Administrative Operations Activity

This activity funds general administration and ethics, equal employment opportunity services, emergency management, finance, human resources, procurement, and information management.

General Support Services Activity

This activity funds shared activities and related support services for the Bureau. These include expenses such as: rental and security of office space, workers' compensation and unemployment compensation, voice and data communications, centrally provided services funded by the Department's Working Capital Fund, annual building maintenance contracts, mail services, and printing costs.

Executive Direction Activity

This activity funds Bureau-wide leadership, direction, management, coordination, communications strategies, and outreach. This activity includes functions such as budget formulation, congressional and public affairs, policy and analysis, and regulations. The Office of the Director is funded within this activity and is responsible for providing general policy

guidance and overall leadership within the BSEE organization. The Office of the Director also oversees administrative direction and coordination, providing oversight of all administrative functions within BSEE.

Technology Assessment and Research (TA&R) Program

The TA&R Program supports research associated with offshore operational safety and engineering research (OSER) for oil, gas, and renewable energy development. The OSER issues for oil and gas include the complete spectrum of operations and oil spill prevention ranging from the drilling of exploratory wells to the removal and decommissioning of platforms. The OSER for renewable energy consists primarily of the siting, installation, inspection, and removal of offshore wind towers, platforms, and farms. The TA&R Program was established to ensure that oil and gas activities employ the Best Available and Safest Technologies (BAST) as required by the 1978 Outer Continental Shelf Lands Act. With the passage of EPAct, the TA&R Program has further expanded to include research to ensure that renewable energy activities will be conducted safely.

The TA&R Program operates through contracts with universities, private firms, and government laboratories to assess safety-related technologies and to perform necessary applied research. Many projects are jointly funded with industry, other government organizations, and international regulatory organizations as a means to minimize overlap and leverage funds.

Oil Spill Research Program

The OSRR program supports oil spill prevention, planning, preparedness, and response functions through applied research. The Oil Spill Research (OSR) appropriation funds the OSRR program as well as the operation and maintenance of Ohmsett (the National Oil Spill Response and Renewable Energy Test Facility) as directed by the Oil Pollution Act of 1990; oil spill prevention and response planning; and regulation of oil spill financial responsibility.

The OSRR research program operates through contracts with universities, private firms, and government laboratories to assess safety-related technologies and to perform necessary applied research. Many projects are jointly funded with industry, other Government organizations, and international regulatory organizations as a means to minimize overlap and leverage funds.

National Park Service

Operation of the National Park System – Natural Resources

The National Park System contains over 84 ocean, coastal, and Great Lakes parks across 22 states and four territories. The parks conserve 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: NPS has completed assessments of watershed conditions in 32 ocean, coastal, and Great Lakes parks. The 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. NPS collaborated with USGS to develop hazard assessments for future sea level change for 22 coastal parks. NPS is also working with USGS and university partners to provide storm vulnerability assessments to coastal parks to prepare for and respond to storm damage caused by hurricanes, typhoons, and nor'easters. 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 in St. John, USVI.

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. 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) and Lake Superior (Apostle Islands and Pictured Rocks National Lakeshores, Grand Portage National Monument, and Isle Royale National Park). The main focus areas are: toxic substances; invasive species; nearshore health and nonpoint source pollution; habitat and wildlife protection and restoration; and accountability, monitoring, evaluation, communication and partnerships. Projects include comprehensive natural resource assessments, a comprehensive shoreline restoration and management plan, removal of invasive species, restoring wetland and dune habitats, restoring natural stream flows and

shoreline processes, and establishing the Great Lakes Watershed Sustainable Living Program to interpret the impacts of climate change and promote stewardship of protected resources.

Ecosystem Protection: Working with State agencies, NPS created 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), and Channel Islands National Park (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 to allow the coral reef to recover from consumptive activities and offer visitors an opportunity to see 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 and increasing ecological resilience of coral reefs and kelp forests 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.

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 190 universities, 45 non-Federal research partners, NPS and 12 other Federal agencies across the U.S. Six CESU networks 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.

Fish and Wildlife Service

Habitat Conservation

Coastal Program: The Coastal Program is a voluntary, partnership-based, habitat conservation program that focuses its activities on priority coastal habitats in the U.S. The Coastal Program field staffs 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. In FY 2010, the Coastal Program protected and or restored 30,334 acres of coastal wetlands, 25,819 acres of uplands, restored 100 miles of stream/shoreline, and removed 28 fish barriers that reopened 276 miles of stream habitat. In FY 2011, the Coastal Program protected and/or restored 33,182 acres of coastal wetlands, 23,897 acres of coastal uplands, restored 277 miles of stream/shoreline, and removed 35 fish barriers that reopened 15 miles of stream habitat. In FY 2012, the Coastal Program continued to efficiently and effectively leverage non-Federal funds to support coastal habitat protection and restoration projects that benefited conservation and recovery of Federal-trust species.

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 to

protect, enhance, and restore important fish and wildlife habitats on private lands. The Partners program leverages non-Federal funds at a ratio of four to one and works in coastal as well as interior areas. The Partners Program is delivered by locally-based habitat restoration experts. An example of the types of coastal projects the Partners Program conducts is the removal of physical barriers to fish migration. In FY 2010 and FY 2011, the Partners Program removed hundreds of fish barriers and opened up hundreds of miles of stream and shoreline habitat. The Partners Program is working in the Matanuska-Susitna Valley with the Alaska Department of Fish and Game and Friends of the Mat Su to enhance salmon spawning habitat in the Little Susitna River.

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. An on-the-ground presence in more than 80 field offices, CPA biologists act as the 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 (increasing 25-30 percent annually), hydrokinetic energy generation, harbor construction, military facilities, transportation, coastal development, and hydropower licensing processes that alone directly influence migratory fish passage/populations by reopening 7,000 river miles since 2007.

National Wetlands Inventory: In FY 2010 and FY 2011, the National Wetlands Inventory (NWI)

supported water quality and sustainable land use planning by mapping the Nation's wetlands and increasing geospatial data for 94 million acres. This data is made available to planners through the Wetlands Mapper and the Wetlands Layer of the National Spatial Data Infrastructure, and on the new GeoPlatform.gov and Data.gov. In FY 2012, NWI continued to update wetlands and deep water geospatial data for coastal areas, including North Carolina and Chesapeake Bay, and various National Wildlife Refuges along the Atlantic, Gulf, and Pacific Coasts (data were used to run Sea Level Affecting Marshes Model simulations on the impacts of estimated sea-level rise on coastal habitats for each coastal Refuge). In FY 2011, NWI published the *Status and Trends of Wetlands in the Conterminous United States 2004 to 2009* (Dahl, T.E., 2011). *Status and Trends* is completed every 5 years and is provided to Congress and the public. A more detailed report, derived from the 2011 report, will be produced and is being expanded to cover the West Coast. In FY 2012, NWI began to support the Coastal Barrier Resources Act Program (CBRA).

Coastal Barrier Resources System: In FY 2010 and FY 2011, the Coastal Barrier Resources Act (CBRA) Program collaborated with the Federal Emergency Management Agency (FEMA) through the Federal Interagency Floodplain Management Task Force to improve the administration of CBRA. The Task Force developed the Coastal Barrier Resources System (CBRS) digital conversion concept to replace outdated CBRS paper maps and imprecise CBRS boundaries depicted on FEMA's old flood insurance rate maps. In FY 2011, the Service also worked with FEMA on a partnership to conduct geomorphic and structure assessments associated with the CBRS. These assessments will facilitate digital conversion of paper CBRS maps and improve the integrity of the CBRS data and mapping products maintained by the Service and FEMA. In FY 2010 and FY 2011, the program completed portions of the CBRS mapping pilot project, including completing recommended maps for 68 pilot project units using modern aerial imagery and digital boundaries. Additionally, in FY 2010 and 2011, the Service continued work on development of an online

CBRA mapper and information management system (GeoCBRA) that will make CBRS maps and data more accessible to the public. The Service continued work on these activities in FY 2012.

Fisheries and Aquatic Resource Conservation

Marine Mammals: The Service's 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. In FY 2010 and FY 2011, the Service conducted stock assessment and conservation management for stocks of sea otters, polar bears, and walrus in Alaska, stocks of sea otters in Washington and California, and stocks of manatees in Florida and Puerto Rico; managed marine mammal incidental take, including working with industry to minimize potential impacts of expanding offshore and terrestrial oil and gas activities on polar bear and walrus populations by providing technical assistance and incidental take authorizations pursuant to the MMPA supporting the goals and strategies established under the Russia-United States Polar Bear Bilateral Agreement; and continued to support Marine Mammal-focused Cooperative Agreements. In FY 2012, the Service continued with these efforts, specifically working to finalize a determination on the southern sea-otter translocation program, and re-issuing Incidental Take Regulations for oil and gas industry activities in the Chukchi/Bering Sea.

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). In FY 2010 and FY 2011, the program and the Task Force supported monitoring and assessment of the trends of marine invasive species in coastal Alaska waters and conducted outreach. In coordination with the Task Force, the program helped prevent the establishment of Asian carp in the Great Lakes by providing technical assistance, risk assessments, monitoring, and staff for rapid-response actions. The program supported a study of lionfish

impacts on the Florida Keys commercial lobster fishery, lionfish public outreach and control programs for Florida, and a ciguatera survey for invasive lionfish in the U.S. Virgin Islands. The program also supported detection and monitoring surveys for Chinese mitten crab and *Caulerpa* (a seaweed) as part of implementing the National Management Plans for Chinese mitten crab and *Caulerpa*, as well as monitoring for European green crab and *Undaria pinnatifida* (an invasive kelp).

National Fish Habitat Action Plan (NFHAP): The Service 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. The Service approves projects and funding levels that are allocated to the Regions for administration and the Service's Fish and Wildlife Conservation Offices provide local technical assistance to FHPs on the projects. NFHAP projects are leveraged as much as 3:1 with partner funding.

Environmental Contaminants: The Environmental Contaminants Program conducts investigations, both on- and off-National Wildlife Refuges, 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.

National Wildlife Refuge System

The Service maintains 180 National Wildlife Refuges (NWRs) located in the ocean, coastal areas, and Great Lakes that protect a wide diversity of marine habitats. In FY 2011, the FWS continued to complete sea-level rise analysis for the coastal refuges utilizing the Sea Level Affecting Marshes Model (SLAMM). 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, the staff at Midway Atoll NWR coordinated with the National Oceanic and Atmospheric Administration (NOAA), U.S. Coast Guard, and other Federal agencies to monitor shorelines for marine debris created by the Japanese Tsunami. In FY 2011, the FWS collaborated with The Nature Conservancy and the Island Conservancy to conduct a rat removal project at Palmyra Atoll NWR to rebalance the atoll's terrestrial ecosystem and prevent the extinction of the Central Pacific moist tropical island ecotype. In FY 2011, the FWS published a Notice of Intent (NOI) to prepare a monument management plan and an environmental assessment for the Pacific Remote Islands Marine National Monument, as well as, updated Comprehensive Conservation Plans for the seven NWRs within the monument. The FWS also released a NOI to begin the development of a management plan for the Marianas Trench Marine National Monument.

International Affairs

Division of International Conservation: The Service is responsible for the U.S. implementation of the Ramsar Wetlands Convention. 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 160 members have designated 2,000 wetland sites as Wetlands of

International Importance, totaling 200 million hectares, which constitutes the largest network of protected areas in the world. The United States has designated two “Crown Jewels” as Wetlands of International Importance; Palmyra Atoll, a NWR (204,127 hectares), 960 miles south of Honolulu, Hawaii, and the Everglades National Park, where one of the planet’s largest wetland restoration projects is currently underway. The Division continues to engage in the development of guidelines and products to support conservation of coastal wetlands 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.

Division of Management Authority: Program staff has been actively engaged for over 10 years in implementation of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) relative to marine species. There is a lack of consistent interpretation and a harmonized approach for implementing CITES provisions, which pertain to trade in species taken on the high seas. As members of a CITES working group, including serving as Vice Chairman, program staff have contributed to significant progress on the development of guidance to the CITES Parties (member countries) on this issue.

Division of Scientific Authority: In 2010, the United States submitted two proposals to list six shark species under CITES and a proposal to include all pink and red corals was submitted to the 15th meeting of the Conference of the Parties. The United States also strongly supported a proposal submitted by Monaco to include North Atlantic bluefin tuna in the CITES Appendices. While none of these proposals were adopted, significant attention was drawn to issue of over-exploitation of marine resources. For some species, important conservation measures were taken by regional fisheries management organizations in direct response to the potential for CITES action. Several marine species are being evaluated against the CITES criteria and are under active consideration.

Endangered Species Program

The Service protects species listed as threatened or endangered under the Endangered Species Act. It also has a candidate conservation program designed in order 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.

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 source of the funds is excise taxes on fishing equipment, motorboat and small engine fuels, import duties, and interest are collected and appropriated from the Sport Fish Restoration and Boating Trust Fund. Since its inception in 1950, this program has awarded more than \$7.32 billion to State fish and wildlife agencies for their fisheries conservation and boating access efforts.

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.

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 2010, the program

assisted 25 projects in 11 states that protected and/or restored 6,100 acres of coastal wetland habitat and adjacent uplands. In FY 2011, the Service funded 24 projects in 12 states to protect 6,000 acres of coastal wetland habitat and adjacent uplands. In FY 2012 the program assisted 26 projects in 12 states to protect and/or restore 14,000 acres of 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) program offers financial assistance to States to create infrastructure for collecting septic waste from Marine Sanitation Devices (MSDs) and portable toilets on board recreational vessels. During FY 2011 and FY 2012, CVA provided \$15.4 million to thirteen coastal 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. CVA regulations were revised in 2012 to include sustainable practices and environmental considerations as project factors for award consideration.

The Boating Infrastructure Grant program helps States develop, renovate, and improve public facilities to increase public access to U.S. waters for recreational boats over 26 feet long (non-trailerable recreational boats).

Migratory Birds Program

North American Wetlands Conservation Act (NAWCA) Grant Program: Grants made through the NAWCA program have supported over 2,000 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 more

than 4,600 partners, who have contributed over \$2.2 billion in non-Federal matching funding over the life of the program.

Natural Resource Damage Assessment and Restoration

The 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 U.S. insular areas for their long-term economic and social benefit through enhanced local management and protection. OIA's 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. This flexibility is not available

in any other Federal budget due to the nature of the appropriations process.

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 utilizes 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). In recent years, the 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.

2010-2011 Federal Ocean and Coastal Activities Report to the U.S. Congress

DEPARTMENT OF THE INTERIOR								
	Percentage of Funds Dedicated to Each Ocean-Related Program Function					Dollars in Millions		
	Enhance the use, conservation, and management of ocean coastal and Great Lakes resources	Supporting Maritime Transportation	Advancing our understanding of oceans, coasts, and Great Lakes	Advancing International Ocean Science and Policy	Other	FY 2010 Actual	FY 2011 Actual	FY 2012 Enacted
U.S. Geological Survey								
<i>Ecosystems</i>								
Status and Trends	100%					3.00	2.50	2.40
Fisheries: Aquatic and Endangered Resources	85%		15%			9.00	9.00	8.90
Terrestrial, Freshwater, and Marine Environments	40%		60%			17.00	18.00	18.80
Invasive Species	40%		60%			1.00	1.00	3.30
Wildlife: Terrestrial and Endangered Resources	60%		40%			4.00	4.00	3.80
<i>Climate and Land Use Change</i>								
Climate Research and Development			100%			1.60	1.50	2.00
<i>Energy Minerals and Environmental Health</i>								
Toxic Substances Hydrology	100%					0.60	0.60	0.60
Contaminants	100%					0.50	0.50	0.50
Energy Resources	25%		65%	10%		1.00	1.00	1.00
<i>Natural Hazards</i>								
Earthquake Hazards					100%	9.10	9.10	9.10
Landslide Hazards	100%					0.40	0.40	0.40
Coastal and Marine Geology	55%		44%	1%		46.20	44.70	42.80
Global Seismographic Network	100%					5.80	5.40	5.40
<i>Water Resources</i>								
Cooperative Water Program	60%	5%	35%			3.20	3.20	3.00
National Streamflow Information	40%		60%			0.80	0.80	0.80
National Water Quality Assessment	40%		60%			6.90	6.90	6.90
Groundwater Resources	50%		50%			0.90	0.90	0.90
Hydrologic Networks and Analysis	40%		60%			3.50	3.50	3.50
Water Resources Research Act	10%		90%			2.60	2.60	2.60
<i>Core Science Systems</i>								
National Cooperative Geologic Mapping	100%					1.60	1.60	5.00
National Geospatial Program	100%					0.10	0.00	0.00
Science Synthesis, Analysis and Research	100%					0.00	0.00	0.00
Bureau of Land Management								
<i>Management of Lands and Resources</i>								
Law Enforcement	100%					0.03	0.03	0.03
Science/R&D/Technology	100%					0.05	0.05	0.24
Education	100%					0.05	0.05	0.05
Manage & Monitor	100%					7.79	7.79	7.79
<i>Oregon & California Grant Lands</i>								
Law Enforcement	100%					0.03	0.03	0.03
Science/R&D/Technology	100%					1.01	1.01	1.01
Education	100%					0.47	0.47	0.47
Manage & Monitor Salmon Habitat	100%					21.34	19.88	19.88
Bureau of Ocean Energy Management *								
Renewable Energy	100%					22.43	23.14	22.68
Conventional Energy	100%					66.04	48.94	47.24
Environmental Assessment	100%					30.75	51.89	62.02
General Support Services	100%					10.73	19.14	12.78
Executive Direction	100%					1.59	17.88	16.05
Bureau of Safety and Environmental Enforcement *								
<i>Offshore Safety and Environmental Enforcement</i>								
Environmental Enforcement	100%					0.00	1.03	4.10
Operations, Safety and Regulation	100%					64.10	82.52	132.08
Administrative Operations	100%					9.84	18.26	15.54
General Support Services	100%					12.39	19.46	12.61
Executive Direction	100%					4.68	12.23	18.12
<i>Oil Spill Response Research Program</i>								
Oil Spill Research	100%					6.34	11.74	14.90

2010-2011 Federal Ocean and Coastal Activities Report to the U.S. Congress

DEPARTMENT OF THE INTERIOR (continued)								
	Percentage of Funds Dedicated to Each Ocean-Related Program Function					Dollars in Millions		
	Enhance the use, conservation, and management of ocean coastal and Great Lakes resources	Supporting Maritime Transportation	Advancing our understanding of oceans, coasts, and Great Lakes	Advancing International Ocean Science and Policy	Other	FY 2010 Actual	FY 2011 Actual	FY 2012 Enacted
National Park Service								
<i>Operation of the National Park System</i>								
Natural Resource Stewardship	74%	1%	22%		3%	79.69	80.98	79.63
Everglades Restoration and Research	55%		45%			4.79	4.96	4.91
Fish and Wildlife Service								
<i>Resource Management - Habitat Conservation</i>								
Coastal Program	100%					15.31	14.75	14.68
Partners for Fish and Wildlife	100%					13.30	13.30	13.30
Conservation Planning Assistance	100%					0.00	0.51	0.18
National Wetlands Inventory	100%					1.18	1.18	1.18
Coastal Barrier Resources Program	100%					0.59	0.39	0.39
<i>Resource Management - Fisheries and Aquatic Resource Conservation</i>								
Marine Mammals Program	70%		25%	5%		5.55	5.93	5.93
Aquatic Nuisance Species Control - Invasive Species	67%		33%			0.30	0.30	1.90
Aquatic Habitat and Species Conservation	100%					11.18	11.49	11.41
Maintenance and Equipment Hatcheries	100%					5.76	5.76	5.76
National Fish Hatchery Operations	100%					14.94	14.94	14.94
<i>Resource Management - Other</i>								
National Conservation Training Center	40%		60%			0.03	0.03	0.03
Consultation	100%					3.76	3.76	3.76
Landscape Conservation	100%					0.00	0.75	0.75
Law Enforcement	100%					1.00	1.00	1.00
National Wildlife Refuge Operations and Maintenance	78%		21%	1%		120.77	119.98	116.66
Adaptive Science			100%			0.00	1.00	1.00
Recovery	100%					3.08	3.68	3.68
Candidate Conservation	100%					0.04	0.04	0.04
<i>International Affairs</i>								
Division of International Conservation	30%		25%	30%	15%	0.30	0.30	0.30
Division of Management Authority	80%			20%		0.05	0.05	0.25
Division of Scientific Authority	50%		50%			0.03	0.03	0.05
<i>Wildlife and Sport Fish Restoration</i>								
Coastal Wetlands Grants	100%					18.12	17.66	16.98
Clean Vessel Act Program	100%					8.34	7.31	8.12
<i>Migratory Birds Program</i>								
North American Wetlands Conservation Act Grant Program - Coastal and Great Lakes Grants	100%					18.12	17.66	16.98
Natural Resource Damage Assessment and Restoration Program								
DOI / ORDA / NRDA Program - Damage Assessments	100%					2.10	22.00	14.00
DOI / ORDA / NRDA Program - Restoration Implementation	100%					22.50	25.20	26.00
Office of Insular Affairs								
Coral Reef Initiative	65%		25%	10%		1.00	1.00	1.00
General Technical Assistance	30%		50%		20%	0.00	2.60	0.00
Office of the Secretary								
Office of Natural Resources Revenue**	100%					N/A	54.70	59.70
Ocean and Coastal Activities Oversight	100%					0.40	0.40	0.40
TOTAL						730.69	886.38	934.23

* The information for FY 2010 and FY 2011 are for comparison purposes only as these activities were carried out in the old organization of MMS/BOEMRE. In FY 2012 the Bureau of Ocean Energy Management, Regulation, and Enforcement (BOEMRE) reorganized into the Bureau of Ocean Energy Management (BOEM) and the Bureau of Safety and Environmental Enforcement (BSEE).

** The Department reorganized the revenue management function of the former Minerals Management Service (MMS) to the Office of Natural Resources Revenue within the Office of the Secretary. Approximately one-half of the ONRR program funding is related to the Outer Continental Shelf (OCS).

MARINE MAMMAL COMMISSION

Congress passed the Marine Mammal Protection Act in 1972 in response to growing concern that certain species and population stocks of marine mammals were in danger of extinction or depletion as a result of human activities. The Act created the Marine Mammal Commission, consisting of three members appointed by the President with the consent of the Senate and its nine-member Committee of Scientific Advisors on Marine Mammals. The Act established a national policy to prevent such depletion and directed Federal agencies to take measures to replenish marine-mammal species or population stocks.

The Commission conducts special projects and prepares special reports, either at the request of Congress or independently, to evaluate marine

mammal conservation issues and identify effective and cost-effective solutions. The Marine Mammal Commission manages a research program to address issues of importance to the protection and conservation of marine mammals and their habitat in accordance with the Marine Mammal Protection Act. The research program is managed to avoid redundancy with studies carried out by other agencies, although Commission research funds often are used as seed money to encourage additional support by other agencies with larger research budgets. The program also focuses on key studies that could provide significant advances in knowledge, management, or conservation of marine mammals, such as investigating responses of marine mammals to climate change.

MARINE MAMMAL COMMISSION								
	Percentage of Funds Dedicated to Each Ocean-Related Program Function				Dollars in Millions			
	Enhance the use, conservation, and management of ocean coastal and Great Lakes resources	Supporting Maritime Transportation	Advancing our understanding of oceans, coasts, and Great Lakes	Advancing International Ocean Science and Policy	Other	FY 2010 Actual	FY 2011 Actual	FY 2012 Enacted
Marine Mammal Commission	70%		25%	5%		3.25	3.25	3.25
TOTAL						3.25	3.25	3.25

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 new and better products in terms of absolute accuracy and stability of observations for both climate requirements (MODIS and ASTER on Terra, MODIS on Aqua, TMI on the Tropical Rainfall Measuring Mission (TRMM)) and 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. Five of the on-orbit missions involved significant international or interagency collaboration in development, and a four satellite A-Train formation flying constellation (Aqua, CloudSat, CALIPSO, and Aura) consists of both NASA and international missions.

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 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.

2010-2011 Federal Ocean and Coastal Activities Report to the U.S. Congress

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION								
	Percentage of Funds Dedicated to Each Ocean-Related Program Function					Dollars in Millions		
	Enhance the use, conservation, and management of ocean coastal and Great Lakes resources	Supporting Maritime Transportation	Advancing our understanding of oceans, coasts, and Great Lakes	Advancing International Ocean Science and Policy	Other	FY 2010 Actual	FY 2011 Actual	FY 2012 Enacted
Science Mission Directorate								
<i>Earth Systematic Missions</i>								
Ocean Surface Topography Mission			100%			6.70	6.10	7.50
Ocean Winds Science Team			100%			3.80	3.20	4.70
QuikSCAT			100%			2.40	3.60	3.60
Terra and Aqua (Ocean Science)*			100%			4.80	4.20	3.70
Jason			100%			4.50	4.60	4.50
Suomi NPP (subset)*			100%			0.70	1.30	1.20
<i>Earth System Science Pathfinder</i>								
Aquarius			100%			22.30	23.90	4.20
Ocean Salinity Science Team			100%			1.00	2.50	2.10
<i>Earth Science Research</i>								
Research and Analysis (Ocean Research Subset)			100%			24.70	23.20	26.40
Interdisciplinary Science (Ocean Subset)			100%			8.50	7.90	9.00
<i>Earth Science Multi-Mission Operations</i>								
Multi-Mission Operations (Physical Oceanography DAAC)			100%			7.20	7.60	6.90
EOSDIS (REASoN/MEaSURES Ocean Subset)*			100%			1.10	1.30	1.20
NSIDC DAAC			100%			5.50	6.10	6.30
<i>Applied Sciences</i>								
Pathways	100%					10.00	2.20	1.30
Space Technology								
Small Business Innovative Research (SBIR)**		10%	90%			1.30	2.90	3.00
TOTAL						104.50	100.60	85.60

*Outyear projections include predictions based upon continued competitive selections with awards.

**FY 2012 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 in the Directorate for Geosciences (GEO) supports basic research and education to further understanding of the global ocean and its interactions with the Earth and atmosphere. The Division also supports the operation, maintenance, acquisition, construction, and conversion of major shared-use oceanographic facilities needed to conduct this research. Through these efforts, the Division contributes to the theme of “advancing our understanding of ocean, coastal, and Great Lakes resources.” Partnerships are fundamental to agency activities, and the Division collaborates with other Federal ocean agencies on a range of efforts. This often involves joint funding of individual projects, special competitions, or entire programs. Partnerships also extend to specific research programs within the Division selected for emphasis on the basis of special scientific opportunities, such as oceans, human health, global change, and coastal processes.

The Division supports research and education activities through three Sections. The Ocean Section funds research on biological, chemical, and physical processes occurring within the water column from the air/sea interface to the ocean floor.

The Marine Geosciences Section supports research on processes that occur on and below the seafloor and at the interface with water,

sediment, and rocks. This includes the Integrated Ocean Drilling Program (IODP), an international marine research program to expand exploration beneath the oceans.

The *JOIDES Resolution*, a drill ship that is the U.S. contribution to the IODP platform array, underwent a modernization to extend its life and enhance its science capabilities. The vessel supports expeditions to understand Earth’s history by examining the seafloor.

The Integrative Programs Section supports activities, including oceanographic facilities necessary to advance NSF-funded research and training of oceanographers across disciplines. Examples of research and training support include technology development and dedicated educational activities. The Section provides significant support to facilities and technologies that enable access to various regions of the ocean and ensure effective research and communication capabilities.

NSF is supporting construction of the Research Vessel *SIKULIAQ* (formerly known as the Alaska Region Research Vessel – ARRV). The *SIKULIAQ* is a 261-foot research ship specifically designed to operate in seasonal Arctic sea-ice and open waters surrounding Alaska. The vessel will support research expeditions to explore such timely issues as sea-ice recession, changing ocean currents, Arctic habitats, and ocean acidification.

NSF is also supporting the construction of the Ocean Observatories Initiative (OOI). OOI will allow continuous interactive connectivity to seafloor, water column, 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. The *SIKULIAQ* and OOI are both managed by GEO, but funded through NSF’s Major Research Equipment and Facilities Construction (MREFC) account.

Climate variability research is a priority across the Directorate for Geosciences. The Division of Ocean Sciences is contributing to this effort with a research program emphasizing the impact of increased atmospheric carbon dioxide on ocean acidification.

Office of Polar Programs (Ocean-Related Research)

NSF's polar programs, most of which are supported through the Office of Polar Programs, provide support for investigations in a range of scientific disciplines, including a number of areas of ocean-related research. The majority of this work contributes to the theme of "advancing our understanding of ocean, coastal, and Great Lakes resources," but specific efforts within the U.S. Antarctic Program also support 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 Division: NSF's polar programs, most of which are supported through the Office of Polar Programs, provide support for investigations in a range of scientific disciplines, including a number of areas of ocean-related research. The majority of this work contributes to the theme of "advancing our understanding of ocean, coastal, and Great Lakes resources," but specific efforts within the Arctic Research Programs also support the themes of "enhancing the use and conservation of our ocean, coastal, and Great Lakes resources" and "advancing international ocean science and policy."

The goal of the NSF Arctic Research Programs is to gain a better understanding of the Earth's biological, geological, chemical, and associated social processes, and the interactions of ocean, land, atmosphere, biological, and human systems. Ocean-related research is supported within the Arctic Natural Sciences and Arctic System Science programs, and the Arctic Observing Network.

Antarctic Sciences Division: 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, as well as support for the broader operations and logistics infrastructure that make it possible to conduct science on the remote and uninhabited continent. Four Antarctic programs fund ocean-related research: Antarctic Earth Sciences, Antarctic Organisms and Ecosystems, Antarctic Oceans and Atmospheric Science, and Antarctic Integrated System Science.

U.S. Coast Guard Polar Activities: USGC Polar Icebreaking funding was transferred to USGC (\$54.0 million in FY 2010, Pub.L. 111-117; and \$54.0 million, less the 0.2% rescission, in FY 2011, Pub.L. 112-10). As of FY 2012, it is no longer included in the NSF budget.

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 five divisions 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, and diversity of marine organisms, and research on the terrestrial components of coastal communities and ecosystems. DEB funds projects that focus on the ecology and ecosystem dynamics of the world's Great Lakes, excluding the Laurentian Great Lakes, and coastal zones.

The Dimensions of Biodiversity program focuses on the integration of genetic,

taxonomic/phylogenetic, and functional dimensions of biodiversity and includes joint support for research on marine biodiversity. DEB jointly supports five coastal Long-Term Ecological Research sites in Florida, Georgia, California, Massachusetts, and Virginia with the Geosciences Directorate. The Long-Term Ecological Research community has identified “Climate effects on coastal ecosystems” as a grand challenge research focus.

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 participates 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 marine species. In addition, the Division funds some microbial observatories that focus on marine and near-shore ecosystems.

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.

Division of Emerging Frontiers: The Office of Emerging Frontiers researchers contribute to informing decisions and improving understanding, principally through the Ocean Acidification (OA) Program.

2010-2011 Federal Ocean and Coastal Activities Report to the U.S. Congress

NATIONAL SCIENCE FOUNDATION								
	Percentage of Funds Dedicated to Each Ocean-Related Program Function					Dollars in Millions		
	Enhance the use, conservation, and management of ocean coastal and Great Lakes resources	Supporting Maritime Transportation	Advancing our understanding of oceans, coasts, and Great Lakes	Advancing International Ocean Science and Policy	Other	FY 2010 Actual	FY 2011 Actual	FY 2012 Enacted
National Science Foundation*								
Directorate for Geosciences								
<i>Division of Ocean Sciences</i>								
Marine Geosciences Section			100%			94.08	93.86	89.31
Ocean Section			100%			127.08	129.84	120.87
Integrative Programs Section			100%			128.72	128.51	141.72
Major Research Equipment and Facilities Construction								
Alaska Region Research Vessel (ARRV)			100%			33.23	0.00	0.00
Ocean Observatories Initiative (OOI)			100%			20.19	65.00	102.80
Office of Polar Programs								
<i>Arctic Sciences Division</i>								
Arctic Natural Science	5%		95%			6.00	6.00	6.00
Arctic System Science	5%		95%			6.00	6.00	5.00
Arctic Observing Network			80%	20%		6.00	6.00	6.00
<i>Antarctic Sciences Division</i>								
Antarctic Earth Sciences			100%			3.00	3.00	3.00
Antarctic Organisms & Ecosystems			80%	20%		6.00	10.00	10.00
Antarctic Oceans & Atmospheric Science			80%	20%		5.00	7.50	7.50
Antarctic Integrated System Science			100%			2.00	2.00	2.00
<i>USCG Polar Activities</i>								
USCG Polar Icebreaking**			47%	53%		54.00	53.89	0.00
Directorate for Biological Sciences^								
<i>Division of Environmental Biology</i>								
Systematic Biology & Biodiversity Inventories			100%			7.96	7.14	2.50
Population & Community Ecology			100%			0.85	0.60	0.50
Evolutionary Processes			100%			1.95	4.50	2.00
Ecosystem Science			100%			5.77	4.69	3.00
<i>Division of Integrative Organismal Systems</i>								
Neural Systems			100%			3.37	3.50	3.50
Behavioral Systems			100%			0.05	1.42	1.40
Developmental Systems			100%			2.62	3.51	3.50
Physiological & Structural Systems			100%			3.40	3.60	3.50
<i>Division of Molecular & Cellular Biosciences</i>								
Biomolecular Systems			100%			2.86	0.64	0.50
Cellular Systems			100%			1.05	0.70	0.24
Genes & Genome Systems			100%			0.22	0.17	0.24
Networks & Regulation^^			100%			0.00	0.66	1.24
<i>Division of Biological Infrastructure</i>								
Center for Microbial Oceanography			100%			4.00	4.00	4.00
Advances in Biological Informatics			100%			0.78	0.53	0.95
Improvements in Facilities, Communications, and Equipment at Biological Field Stations & Marine Laboratories			100%			0.89	2.40	0.97
<i>Division of Emerging Frontiers</i>								
Ocean Acidification			100%			3.89	2.58	5.00
TOTAL						530.96	552.24	527.24

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

** USCG Polar Icebreaking funding was transferred to the USCG (\$54M in FY 2010, Pub.L. 111-117; and \$54M, less the 0.2% recission, in FY 2011, Pub.L. 112-10). As of FY 2012, it is no longer included in the NSF budget.

^ With the exception of the Center for Microbial Oceanography 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.

^^ The Networks and Regulation cluster of programs was initiated in 2011.

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 communities respond to changing environmental conditions (such as El Niño), outbreaks of disease in marine organisms, oil spills, and other natural and human disturbances. STRI is expanding its environmental program to include sites in Bocas del Toro on the Caribbean coast in western Panama. 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.

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 U.S. 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.

2010-2011 Federal Ocean and Coastal Activities Report to the U.S. Congress

SMITHSONIAN INSTITUTION								
	Percentage of Funds Dedicated to Each Ocean-Related Program Function					Dollars in Millions		
	Enhance the use, conservation, and management of ocean coastal and Great Lakes resources	Supporting Maritime Transportation	Advancing our understanding of oceans, coasts, and Great Lakes	Advancing International Ocean Science and Policy	Other	FY 2010 Actual	FY 2011 Actual	FY 2012 Enacted
Smithsonian Environmental Research Center								
Marine Environmental Sciences Program			100%			0.30	0.30	0.30
Smithsonian Tropical Research Institute								
Marine Research Program			100%			2.60	2.40	2.60
National Museum of Natural History								
Caribbean Coral Reef Ecosystems Program			100%			0.20	0.20	0.20
TOTAL						3.10	2.90	3.10

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 Convention, including 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 U.S. 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 U.S. 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 \$18 million in Economic Support Funds (ESF) annually to certain Pacific Island States under the 2003 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 U.S. tuna vessels to fish in a broad area of the Pacific, including the 200-mile zones of the Pacific Island Parties, which contributes \$400-\$600 million annually to the U.S. economy.

The United States provides these funds to the Parties to the Treaty through the Pacific 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 a vital component of the political and economic relationship between the United States and the Pacific Island Parties.

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 U.S.-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 U.S. 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 a helping hand to those people overseas struggling to make a better life, recover from a disaster, or striving to live in a free and democratic country. The U.S.

Agency for International Development (USAID) has been the principal U.S. agency to extend economic and social assistance to developing countries since 1961. While it is an independent agency, USAID 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.

Healthy and productive marine ecosystems are critical to U.S. diplomatic and development strategies to promote global food security, adaptation to climate change, biodiversity conservation, 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 the 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, improving resilience of coastal resources, and establishing science-based decision-making processes will be 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 amount of causes for local and regional conflict. In these regards, 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 changes that lead 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.

To achieve these objectives, USAID works in close partnership with international and local non-government organizations, private voluntary organizations, indigenous organizations, universities, American businesses, international agencies, other governments, and other 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 to countries in sub-Saharan Africa, Asia, Middle East, Pacific, Latin America, and Caribbean. Agency programs build human and institutional capacity for resource management, while building strong governance processes to ensure long-term impacts and stakeholder ownership.

USAID also hosts AAAS Fellows in Washington, DC, and at USAID missions.

Examples of USAID activities include the following:

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 USAID, DOS, DOJ and NOAA, along with non-governmental groups and U.S. universities.

El Salvador Central America Mission:

The goal of the Marine Aquatic Resources and Economic Alternative (MAREA) program is to strengthen Central American coastal and marine-resources management to reduce environmental threats, conserve biodiversity, and improve livelihoods. The two specific objectives of this program are to promote effective monitoring and enforcement of coastal and marine-resource policies and legislation, and to foster rights-based and market-based mechanisms, as well as management incentives for the conservation and sustainable use of coastal and marine resources and ecosystems. An emphasis is placed upon ecosystem-based approaches to management.

Ghana Mission: The goal of the Integrated Coastal and Fisheries Governance Program (ICFG) Program is to support the government of Ghana in achieving its 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, strengthens 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.

2010-2011 Federal Ocean and Coastal Activities Report to the U.S. Congress

DEPARTMENT OF STATE								
	Percentage of Funds Dedicated to Each Ocean-Related Program Function					Dollars in Millions		
	Enhance the use, conservation, and management of ocean coastal and Great Lakes resources	Supporting Maritime Transportation	Advancing our understanding of oceans, coasts, and Great Lakes	Advancing International Ocean Science and Policy	Other	FY 2010 Actual	FY 2011 Actual	FY 2012 Enacted
Bureau of Oceans and International Environmental and Scientific Affairs (OES)								
<i>Economic Support Funds, OES Partnerships</i>								
South Pacific Forum Fisheries	40%			60%		18.00	18.00	18.00
International Crane Foundation		100%				0.20	0.00	0.00
U.S. Army Corps of Engineers		40%			60%	0.00	0.00	0.00
NOAA	100%					0.00	0.00	0.00
<i>Diplomatic & Consular Affairs</i>								
Arctic Council			100%			0.07	0.06	0.08
Sea Grant Fellow			50%	50%		0.05	0.05	0.05
Extended Continental Shelf and Boundary			100%			0.10	0.10	0.10
International Fisheries Commission								
InterAmerican Tropical Tuna Commission (IATTC)			50%	50%		1.90	1.90	2.00
Great Lakes Fishery Commission (GLFC)	30%		30%	40%		28.20	24.30	23.70
International Pacific Halibut Commission (IPHC)			50%	50%		3.30	3.30	4.50
Pacific Salmon Commission (PSC)	30%		30%	40%		18.30	18.30	3.30
Other Marine Conservation Organizations				100%		2.30	2.60	2.80
TOTAL						72.42	68.61	54.53

2010-2011 Federal Ocean and Coastal Activities Report to the U.S. Congress

U.S. AGENCY FOR INTERNATIONAL DEVELOPMENT								
	Percentage of Funds Dedicated to Each Ocean-Related Program Function					Dollars in Millions		
	Enhance the use, conservation, and management of ocean coastal and Great Lakes resources	Supporting Maritime Transportation	Advancing our understanding of oceans, coasts, and Great Lakes	Advancing International Ocean Science and Policy	Other	FY 2010 Actual	FY 2011 Actual	FY 2012 Enacted
Latin America and Caribbean Bureau								
<i>Development Assistance</i>								
Dominican Republic	100%					0.30	0.20	0.00
Barbados and Eastern Caribbean Regional	100%					5.00	5.00	5.00
Ecuador	100%					0.10	0.10	0.50
El Salvador	100%					1.33	0.85	0.00
Honduras	100%					0.00	0.00	0.00
Jamaica	100%					0.00	0.00	0.00
Nicaragua	100%					0.00	0.00	0.00
Panama	100%					0.00	0.00	0.00
USAID Latin America and Caribbean Regional (LAC)	100%					0.00	0.00	0.00
USAID Central America Regional	100%					3.00	2.00	3.00
<i>Economic Support Fund</i>								
Colombia	100%					0.00	1.25	1.25
Haiti	100%					0.00	0.00	0.00
Mexico	100%					0.10	0.00	0.00
Africa Bureau								
<i>Development Assistance</i>								
Ghana	100%					2.35	2.75	2.75
Senegal	100%					0.50	1.00	1.70
West African Regional Mission	100%					0.50	0.50	0.50
Asia Bureau								
<i>Development Assistance</i>								
Bangladesh	100%					3.00	5.00	5.00
Indonesia	100%					5.00	8.90	9.70
Maldives	100%					1.00	0.00	0.00
Philippines	100%					4.50	16.30	8.40
Regional Development Mission/Asia	100%					4.00	5.80	4.30
Europe and Eurasia Bureau								
<i>Freedom Support Act</i>								
Russia	100%					0.12	0.13	0.13
Economic Growth, Education and Environment Bureau								
<i>Development Assistance</i>								
Natural Resource Management	100%					2.15	1.20	1.29
Global Health Bureau								
<i>Global Health Programs - USAID</i>								
Population and Environment	100%					0.18	0.13	0.15
TOTAL						33.13	51.10	43.66

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 U.S. Department of Transportation, is responsible for the operations and maintenance of the U.S. 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 find workable and effective solutions to the aquatic invasive species challenge as they relate to the Great Lakes St. Lawrence Seaway System. The aim of the BWC is not to take away from any preexisting efforts in this regard, but rather to complement those efforts.

In September 2009, the BWC held its first meeting in Detroit, Michigan, as an information-sharing forum on ballast water issues for the Great Lakes Seaway System. The forum was attended by representatives from State and provincial governments (Minnesota, Wisconsin, Illinois, Ohio, Michigan, New York, and Ontario); U.S. and Canadian regulatory agencies; senior executives from the U.S.-flag laker, Canadian-flag laker, and international fleets; and the leading academic ballast water researchers from Canada and the United States.

Over the past two years, the BWC has met several additional times. In FY 2010 two meetings were held: one in May 2010 in Montreal, Quebec, and another in July 2010 in Duluth, Minnesota. In FY 2011, two full BWC meetings were convened – one in Toronto, Ontario, in January 2011 and the other in Baltimore, Maryland, in September 2011. The BWC has attracted the active participation of over 100 different individuals in the U.S. and Canada, most of them the senior representatives of their organizations.

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 U.S. waters. During the 2011 navigation season, the SLSDC achieved its internal performance goal of inspecting all ocean vessels with 231 inspections completed, 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 2011, 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 7,203 ballast tanks, during 396 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. The Maritime Administration also funds the Great Ships Initiative.

“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 U.S. 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 U.S. 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. Through the ARP's first three years (FYs 2009-11), the SLSDC was able to maintain the original schedule and overall cost estimates.

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, are

more fuel-efficient and less impactful on the environment than rail and highway freight transport.

Environmental Initiatives

Ballast Water and Related Technologies:

MARAD has contributed 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 has also worked to coordinate and provide Federal support for the development of a network of independent facilities for testing and verification of technologies. The Environmental Spending Plan for 2012 is specifically designed to address the Congressional expectation of establishing the verification and certification infrastructure in the U.S.

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. The Saint Lawrence Seaway Development Corporation also funds the Great Ships Initiative.

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 USCG testing protocols. MERC is also conducting research associated with hull bio-fouling.

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.

Air Emissions/Energy: MARAD's port and vessel air emissions and energy efforts, like those of ballast water, have been ongoing since the early 2000s. The breadth and intensity of those efforts, however, has not yet matched that of ballast water, which have been cooperative efforts that involve other Federal, State, and local government partners.

In 2011, MARAD entered into a Cooperative Agreement with the Great Lakes Maritime Research Institute (GLMRI) to facilitate the investigation of the feasibility of using LNG as a marine fuel in the Great Lakes Region.

Other Discharges: MARAD has more recently engaged in efforts to address other discharges from vessels such as those being addressed by the recently issued Vessel General Permit.

Marine Generated Noise: Marine generated noise has been an ongoing issue in which MARAD is also engaged. However, it has taken on new importance as concerns have grown regarding the potential impacts of marine-generated noise on marine mammals and endangered marine species. The issue is also gaining attention with the focus on port improvements and expansion, which adds additional traffic into sensitive estuaries.

Operations and Training

The FY 2009 DOD 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.

MARAD programs also help ensure the readiness of sealift capacity to respond to national crises and DOD 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 \$9.98 million in grants in FY 2012 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 U.S. 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 U.S. 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 U.S. food aid by U.S.-flag vessels.

Ship Disposal Program: MARAD is the U.S. 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 proper 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.

U.S. Committee on the Marine Transportation System (CMTS)

The U.S. CMTS was authorized in December 2012 and directed in 46 U.S.C. 55502(b) for the purpose of "Assessing the adequacy of the marine

transportation system (MTS); promoting integration of the MTS with other modes of transportation and other uses of the marine environment; and Coordinating, improving the coordination of, and making recommendations with regard to Federal policies that impact the MTS." In 2010, the CMTS was directed by Congress to coordinate transportation policies in the U.S. Arctic to support safety and security. In response, the CMTS has developed a U.S. Arctic Marine Transportation System recommendation paper to be issued in 2013. Also of note, the eNavigation Strategic Action Plan (2012) offers a strategy to coordinate the Federal role for navigation safety services and is updating the 2008 National Strategy for the MTS to reflect current needs of the MTS and Administration policies. The CMTS is an ex-officio member of the National Ocean Council's interagency policy committees.

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 Marine Research Institute (2010 and earlier).

2010-2011 Federal Ocean and Coastal Activities Report to the U.S. Congress

DEPARTMENT OF TRANSPORTATION								
	Percentage of Funds Dedicated to Each Ocean-Related Program Function					Dollars in Millions		
	Enhance the use, conservation, and management of ocean coastal and Great Lakes resources	Supporting Maritime Transportation	Advancing our understanding of oceans, coasts, and Great Lakes	Advancing International Ocean Science and Policy	Other	FY 2010 Actual	FY 2011 Actual	FY 2012 Enacted
Saint Lawrence Seaway Development								
Agency Operations		90%		10%		17.00	17.00	18.00
Asset Renewal Program		100%				18.00	16.00	16.00
Maritime Administration								
<i>Operations and Training</i>								
MARAD Academies		100%				90.00	96.00	102.00
MARAD Operations		100%				60.00	61.00	54.00
Assistance to Small Shipyards		100%				15.00	10.00	10.00
Maritime Security Program		100%				174.00	174.00	174.00
Maritime Guaranteed Loan Program		100%				9.00	9.00	4.00
Ocean Freight Differential		100%				175.00	175.00	175.00
Ship Disposal	100%					15.00	15.00	6.00
Office of the Secretary								
<i>Transportation Planning Research & Development</i>								
Great Lakes Maritime Research Institute	15%	85%				0.45	0.00	0.00
National Export Initiative					100%	0.00	0.00	0.20
Panama Canal Expansion Study		100%				0.75	0.00	0.00
TOTAL						574.20	573.00	559.20

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, 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 10 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								
	Percentage of Funds Dedicated to Each Ocean-Related Program Function				Dollars in Millions			
	Enhance the use, conservation, and management of ocean coastal and Great Lakes resources	Supporting Maritime Transportation	Advancing our understanding of oceans, coasts, and Great Lakes	Advancing International Ocean Science and Policy	Other	FY 2010 Actual	FY 2011 Actual	FY 2012 Enacted
International Assistance Programs								
Global Environment Facility	75%			25%		8.00	9.00	12.00
TOTAL						8.00	9.00	12.00