

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

For CY 2006 and 2007

Report Prepared by the Interagency Committee on Ocean Science
and Resource Management Integration

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INTRODUCTION

In December 2004, President Bush signed Executive Order 13366 establishing the Committee on Ocean Policy and released his Administration's Ocean Action Plan to make our oceans, coasts, and Great Lakes cleaner, healthier, and more productive.

The U.S. Ocean Action Plan, together with E.O. 13366, established a coordinated ocean governance structure to enhance leadership and coordination among the federal agencies with ocean-related responsibilities and activities. To support the work of the cabinet-level Committee on Ocean Policy, the Ocean Action Plan created a deputies committee, the Interagency Committee on Ocean Science and Resource Management Integration (ICOSRMI), at the Undersecretary/Assistant Secretary level. Additionally, two subcommittees at the Deputy Assistant Secretary level were established within the coordinate ocean governance structure: the Subcommittee on Integrated Management of Ocean Resources (SIMOR) and the Joint Subcommittee on Ocean Science and Technology (JSOST). Further, a Committee on the Marine Transportation System was established to address coordination of the federal agencies with maritime-related responsibilities and activities.

To build on the coordinated ocean governance structure and enhance leadership and coordination in ocean policy at the federal level, the role and functions of the National Ocean Research Leadership Council and the Coastal America Partnership have been integrated into the coordinated ocean governance structure, specifically overseen by the Interagency Committee on Ocean Science and Resource Management Integration (ICOSRMI). Further, efforts to promote and collaborate with state governments on the development of regional initiatives have made progress across the country, including in the Gulf of Mexico, the Great Lakes, New England, and on the West Coast. Smaller scale initiatives have also seen significant progress and discussions continue in other parts of the country to collaborate with state and local governments in the development of new regional initiatives.

The 2007 Federal Ocean and Coastal Activities Report, submitted as per PL 106-256, provides an overview of select activities and accomplishments of Ocean Action

Plan implementation and other Administration efforts in the following thematic areas:

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

A copy of this report and additional information on the work of the Committee on Ocean Policy and its subordinate groups can be found at www.ocean.ceq.gov.

EXECUTIVE SUMMARY

The FY 2008 President’s Budget provides over \$9.5 billion in funding for federal ocean, coastal, and Great Lakes programs (see Tables 1 and 2). These programs support activities across the themes outlined in the U.S. Ocean Action Plan of:

- ▶ Enhancing the Use, Conservation, and Management of Ocean, Coastal, and Great Lakes Resources¹;
- ▶ Advancing Our Understanding of Oceans, Coasts, and Great Lakes;
- ▶ Supporting Maritime Transportation; and
- ▶ Advancing International Ocean Science and Policy.

There are many examples within each of these program areas accomplishing tangible results. This report includes a sampling of such programs intended to illustrate the diverse set of approaches being used to address ocean and coastal issues.

Enhancing the Use, Conservation, and Management of Ocean, Coastal, and Great Lakes Resources

Over \$4.7 billion was proposed in the FY 2008 President’s Budget to support federal programs that contribute to the responsible use and management of ocean, coastal, and Great Lakes resources. Among the efforts in this area are:

- ▶ Following a multi-year development process involving a variety of stakeholders and interests, the Papahānaumokuākea Marine National Monument was created to permanently protect pristine coral reefs and unique wildlife in a nearly 140,000 square mile area of U.S. waters.
- ▶ The Magnuson-Stevens Fishery Conservation and Management Reauthorization Act of 2006 was signed by the President to significantly strengthen a number of key fisheries management provisions.

- ▶ Federal agencies are supporting regional collaborations that benefit the nation’s ocean and coastal regions through increased coordination with federal, state, and local partnerships.
- ▶ Through a collaborative process involving more than 60 public and private partners, 10,000 acres of tidal wetlands are being restored in an area of the Laguna Atascosa National Wildlife Refuge in Texas known as the Bahia Grande.
- ▶ A number of initiatives are underway to continue advancing regional sediment management approaches through a range of partnerships with other federal agencies, state and local governments, the private sector, and other stakeholders, including development of a Regional Sediment Management Master Plan sediment management plan for the Gulf of Mexico and input to the California Sediment Management Master Plan.
- ▶ The 2007-2012 Outer Continental Shelf Oil (OCS) and Gas Leasing Program was approved, establishing the framework for the safe and environmentally sound development of oil and gas resources on the OCS.
- ▶ As part of the National Estuary Program (NEP) 20th Anniversary, the NEP Coastal Condition Report was released, providing an assessment of the overall ecological condition of NEP estuaries.
- ▶ Voluntary conservation programs created, restored or enhanced over 2,600 acres of wetlands in the Chesapeake Bay and stabilized 159,693 acres of watershed streambank shoreline.
- ▶ New regulations are providing full protection from fishing and anchoring in a new Research Natural Area of Dry Tortugas National Park.
- ▶ The pilot phase of the National Water Quality Monitoring Network for U.S. Coastal Waters and their Tributaries is moving forward, helping to provide information about the health of our oceans and coastal ecosystems and inland influences on coastal waters for improved resource management.

¹ For the purposes of this report the U.S. Ocean Action Plan themes of “enhancing the use and conservation of our ocean, coastal, and Great Lake 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 Lake resources.”

- ▶ Collaborative efforts are underway to provide scientific and technical information needed to make management decisions for the future of the Breton National Wildlife Refuge that was severely impacted by Hurricanes Katrina and Rita in 2005.
- ▶ An enhanced ship inspection program is helping to reduce aquatic nuisance species introduction by ballast water in the Great Lakes. In addition, a partnership of industry, universities, and government in the U.S. and Canada is developing laboratory, shore-based pilot and shipboard testing of alternative ballast water treatment solutions.
- ▶ New guidance now offers a consistent, environmentally protective, national approach for preparing obsolete and decommissioned military and commercial vessels for use as artificial reefs.
- ▶ A new Marine Debris Initiative is increasing public education and awareness; enhancing regional and local partnerships across the nation to clean up marine debris, turning debris into energy, recovering lost fishing gear, and recycling fishing lines; and, leading the global effort with international organizations to prevent fishing gear from becoming lost, developing environmentally friendly fishing gear, and promoting the annual International Coastal Cleanup worldwide.
- ▶ A five-year Integrated Ocean Observing System (IOOS) Strategic Plan describing the IOOS vision, goals and objectives for continued progress has been drafted. In addition, a statement on the nature of the relationship between IOOS and the Ocean Observatories Initiative has been developed.
- ▶ A Federal Oceanographic Fleet Status Report describing current fleet capacity and renewal activities will help agencies plan fleet development strategies over the next decade while providing a baseline for future planning activities.
- ▶ An Interagency Ocean and Coastal Mapping Inventory of federal, federally-funded and non-federal governmental ocean and coastal mapping and charting programs, operations and prioritized needs is being developed to reduce duplication of efforts and enable cooperative activities.
- ▶ There has been substantial progress toward completing milestones for implementing the Oceans and Human Health (OHH) Act and the Harmful Algal Bloom (HAB) and Hypoxia Research and Control Act:
 - ▷ Completion of a ten-year implementation plan for the national OHH research program, representing the first comprehensive national effort to prioritize OHH research and outline opportunities for advancement.
 - ▷ Completion of a Prediction and Response Report that specifically addresses both the state of research and methods for HAB prediction and response.
 - ▷ Preparation of a freshwater HAB assessment that examines causes, consequences, and economic costs, and establishes priorities and guidelines for a research program and makes recommendations to improve federal coordination.

Advancing Our Understanding of Oceans, Coasts, and Great Lakes

The FY 2008 President's Budget provides over \$1.3 billion for research and education efforts to increase our knowledge of the marine environment and enhance awareness of the importance of the ocean in our daily lives. The most pressing issue in advancing our understanding of oceans, coasts and Great Lakes is the need for national-level coordination of efforts among all sectors. Interagency successes and continued progress toward that goal include the following:

- ▶ The first coordinated, national effort to identify ocean research priorities linked to societal needs resulted in *Charting the Course for Ocean Science in the United States for the Next Decade: An Ocean Research Priorities Plan and Implementation Strategy*. This plan will guide research efforts for the ocean community, including the federal agencies, for the next decade.
- ▶ An implementation plan to guide future planning efforts to enhance ocean education has been prepared to increase federal coordination, develop a coordinated ocean education message, ensure the translation of data to useable forms for education, and ensure a well-prepared ocean workforce.
- ▶ The Georgia Aquarium was designated as the 19th Coastal Ecosystem Learning Center, helping the network further increase public awareness of ocean and coastal issues. In addition, the Veracruz Aquarium in Veracruz, Mexico was designated as

the network's first international center, expanding the network's reach over 25 million people annually.

- ▶ A new interagency board is addressing the need to enhance coordination of federal management and research activities with respect to deep-sea corals and other vulnerable ecosystems.
- ▶ A new interagency task force is working to identify scientific and technical requirements in assessing the extent and significance of effects from manmade sound on the marine environment.
- ▶ A strategic plan to foster ocean partnerships is being developed to work toward the goals of continuing and expanding ocean partnership dialogues, sponsoring ocean partnership activities, identifying and removing obstacles and disincentives to ocean partnerships, and facilitating opportunities for dialogue with the nation's leadership.

Supporting Maritime Transportation

Federal agencies support maritime transportation with programs totaling over \$2.6 billion in the FY 2008 President's Budget. The Committee on the Marine Transportation System (MTS) is an interagency forum working to enhance the safety, efficiency, vitality, and environmental health of U.S. waterways. Integrated Action Teams are addressing specific MTS improvement areas:

- ▶ The MTS Data Collection and Information Management team is working on an inventory to establish a single MTS data portal.
- ▶ The team on a National Strategy for the MTS is leading a coordinated effort involving public and private entities in developing a National Strategy to improve the MTS.
- ▶ The Risk Assessment of the MTS team is conducting scoping and review work toward an overall assessment of the current state of the MTS.
- ▶ The team on Navigation Technology Integration and Coordination is developing an inventory of existing federal technologies, data and services to determine how they may be integrated to enhance navigational safety and efficiency of maritime operations.

Advancing International Ocean Science and Policy

Federal agencies have identified over \$124 million of the FY 2008 President's Budget that directly support

international ocean science and policy. The range of efforts in this area includes:

- ▶ The Administration continues to encourage U.S. accession to the Convention on the Law of the Sea. In light of an article of the Convention on establishing an Extended Continental Shelf (ECS), an interagency task force is coordinating activities to establish the outer limit of the U.S. ECS, thereby potentially expanding the area over which the U.S. may exercise sovereign rights.
- ▶ The U.S. is jointly hosting with Mexico the Secretariat for the International Coral Reef Initiative, a partnership among governments and international, scientific, and civil society organizations seeking to stop and reverse the global degradation of coral reefs and related ecosystems.
- ▶ Under the auspices of the International Maritime Organization, a number of treaties are under development or being amended, including:
 - ▷ The 1996 Protocol to the London Dumping Convention, which prohibits ocean dumping of wastes except those specifically listed;
 - ▷ Negotiations on ship design, maintenance and recycling to minimize risks to human health and the environment during ship dismantlement;
 - ▷ Regulations under the International Convention for the Prevention of Pollution from Ships (MARPOL) regarding the release of garbage into the ocean and limits on emissions from ship exhausts; and
 - ▷ The International Convention on the Control of Harmful Anti-fouling Systems on Ships (AFS), which bans the application or use of tributyltin, an anti-fouling agent.
- ▶ The Administration continues to promote the sustainable management of global fisheries resources and has called for an end to destructive fishing practices on the high seas. The U.S. delegation to the 2006 United Nations General Assembly (UNGA) fisheries resolution negotiations successfully led an effort for an agreement on high seas practices in this area. The U.S. is now playing a leadership role in efforts to implement the UNGA mandate.
- ▶ The Large Marine Ecosystem concept for ecosystem-based management continues to be applied and expanded with international projects in Africa, Asia, Latin America and Eastern Europe, and the concept is being introduced in the Arctic.

2007 Federal Ocean and Coastal Activities Report to the U.S. Congress

Table 1: Estimated Federal Funding for Oceans and Coastal Activities

(Note: Dollars in Millions. Estimates for FY 2009 to FY 2012 were assumed equal to the President's 2008 Budget Request. Presidential budget requests for these programs are evaluated annually; as such, the budget projections herein for FY 2009 and beyond are subject to reassessment and change, and should not be construed as equivalent to budget requests.)

Agency	FY 2006 Actual	FY 2007 Enacted	FY 2008 Budget Request	FY 2009 Budget Projection	FY 2010 Budget Projection	FY 2011 Budget Projection	FY 2012 Budget Projection
Department of Agriculture	630	656	710	655	672	677	682
Department of Commerce	2,189	1,913	1,881	2,019	2,104	2,028	1,935
Department of Defense	1,596	1,513	1,455	1,414	1,433	1,402	1,373
Department of Energy	31	36	15	14	14	15	15
Environmental Protection Agency	681	967	741	741	741	741	356
Department of Health and Human Services	9	9	9	9	9	9	9
Department of Homeland Security	2,495	2,455	2,610	2,679	2,775	2,878	2,983
Department of the Interior	691	975	962	961	961	711	711
Marine Mammal Commission	3	3	2	2	3	3	3
National Aeronautics and Space Administration	127	165	139	90	56	51	50
National Science Foundation	383	413	437	445	451	458	465
Smithsonian Institution	1	1	1	1	1	1	1
Department of State and USAID	91	77	74	51	51	51	51
Department of Transportation	519	519	392	392	392	392	392
Department of Treasury	12	10	13	10	10	10	10
Total	9,456	9,711	9,440	9,482	9,671	9,424	9,034

Table 2: Estimated FY 2008 President's Budget for Ocean and Coastal Activities by Theme

(Dollars in Millions – numbers may not add due to rounding)

Agency	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, not elsewhere classified	Total
United States Department of Agriculture	707	0	0	0	3	710
Department of Commerce	982	200	555	9	135	1,881
Department of Defense	77	890	35	0	453	1,455
Department of Energy	0	0	5	0	10	15
Environmental Protection Agency	697	0	36	5	3	741
Department of Health and Human Services	0	0	9	0	0	9
Department of Homeland Security (FEMA+CG)	1417	1183	9	2	0	2610
Department of the Interior	844	6	99	6	7	962
Marine Mammal Commission	1	0	1	0	0	2
National Aeronautics and Space Administration	0	0	139	0	0	139
National Science Foundation	2	0	404	31	0	437
Smithsonian Institution	0	0	1	0	0	1
Department of State and USAID	27	0	7	33	7	74
Department of Transportation	22	370	0	0	0	392
Department of Treasury	0	0	0	0	13	13
Total	4,775	2,648	1,299	87	631	9,440

Enhancing the Use, Conservation, and Management of Ocean, Coastal, and Great Lake Resources

Introduction

The FY 2008 President's Budget provides over \$4.7 billion for programs that address use, conservation, and management of ocean and coastal resources. The agencies that participate most significantly in these programs are the Departments of Agriculture, Commerce (NOAA and NIST), Defense, Homeland Security, the Interior, State, Transportation, the Environmental Protection Agency, the Marine Mammal Commission, the National Science Foundation, and the U.S. Agency of International Development. These programs cover a wide variety of activities and responsibilities of the federal agencies. Some are carried out primarily by a single lead agency; others are collaborative efforts between several agencies. What follows are examples of the range of federal programs producing results and accomplishments in this area.

Papahānaumokuākea Marine National Monument

Protecting the Northwestern Hawaiian Islands coral reefs was a stated objective of the U.S. Ocean Action Plan (OAP), and an important element of promoting coral reef conservation and education. Following a multi-year development process involving a variety of stakeholders and interests, President George W. Bush created the world's largest marine conservation area off the coast of the Northwestern Hawaiian Islands on June 15, 2006. In order to permanently protect the area's pristine coral reefs and unique wildlife, the President used his authority under the Antiquities Act to designate the area a national monument. Papahānaumokuākea Marine National Monument encompasses nearly 140,000 square miles of U.S. waters, including 4,500 square miles of relatively undisturbed coral reef habitat that is home to more than 7,000 species. A quarter of the species found in the Northwestern Hawaiian Islands are found nowhere else on earth.

The Department of Commerce's National Oceanic and Atmospheric Administration (NOAA), the Department of the Interior's U.S. Fish and Wildlife Service (FWS), and the State of Hawaii's Department of Land and Natural Resources are the Co-Trustees managing the Monument. To implement provisions for the Monument from the Presidential Proclamation, the three management agencies have signed a Memorandum of Agreement providing for the general

terms and conditions for management and establishing relationships to effectively coordinate and implement management actions. The Co-Trustees are developing a joint permitting process for all activities that take place within the Monument.

Magnuson-Stevens Fishery Conservation and Management Reauthorization Act of 2006

The Magnuson-Stevens Fishery Conservation and Management Reauthorization Act of 2006 (MSRA), signed by the President on January 12, 2007, significantly strengthens a number of key fisheries management provisions. Two primary goals of the Act – ending overfishing and expanding the use of market-based systems for fisheries management (Limited Access Privilege Programs (LAPPs)) – are hallmark positions of the Administration and were embodied in the OAP. The National Marine Fisheries Service (NMFS) is actively working on MSRA implementation and has been tracking over 100 tasks associated with this Act. NMFS has completed a number of implementation tasks, including seeking public input on needed guidance for LAPPs, and defining the term “illegal, unreported, or unregulated (IUU)” fishing. Consistent with the OAP's commitment to review recommendations contained in the U.S. National Plan of Action for IUU fishing, NMFS also published an advance notice of proposed rulemaking and request for public comments on the development of procedures to certify whether nations whose fishing vessels have been identified as engaging in IUU fishing or bycatch of protected living marine resources are taking appropriate corrective action.

NMFS is actively implementing MSRA provisions that further address OAP priorities, including:

- ▶ Improving science and its role in fisheries management through establishment of a new program for marine recreational fishery information;
- ▶ Developing a bycatch reduction engineering program to foster implementation of the Administration's National Bycatch Strategy, and completing a National Bycatch Report that will

provide a comprehensive synthesis of the Agency's bycatch data and identify priorities to improve the collection of such data; and

- ▶ Conducting deep sea coral research to promote greater understanding and protection of deep-sea coral communities; and undertaking cooperative research and management to improve collection of scientific data.

NMFS is also preparing guidelines to establish a mechanism for specifying annual catch limits to end overfishing, revising and updating agency procedures for compliance with the National Environmental Policy Act, and drafting a report on steps taken to identify, monitor, and protect deep sea coral areas.

Anticipating the need for enhancing the ability to assess the health of the Nation's fish stocks, NOAA is currently procuring four new, state-of-the-art, acoustically quiet fishery survey vessels, and has drafted a fleet recapitalization plan for addressing long-term needs.

Federal Support of Regional Collaboration Initiatives

The OAP calls for federal support of state-led regional collaborations. Regional collaborations benefit the nation's ocean and coastal regions through increased coordination with federal, state, and local partnerships. By engaging multiple stakeholders on national, regional and local levels, there is an opportunity for decision makers to reduce duplication of efforts, minimize conflicts, and maximize limited resources. Since issuance of the OAP, and with support from SIMOR, such collaborations have made progress in identifying and beginning to address state ocean and coastal priority issues. By working together through regional alliances, participating states seek to realize the benefits of shared research, management, and policy coordination, as well as more effectively focusing the efforts of partners. Since 2003, four regional-led partnerships, multi-state in scale and multi-issue in scope, have developed: Gulf of Mexico Alliance; Northeast Regional Oceans Council; West Coast Governor's Agreement on Ocean Health; and Great Lakes Regional Collaboration.

As of 2007, SIMOR has helped facilitate the establishment of three federal interagency teams at the regional level to serve as federal focal points for engaging, respectively, the Gulf of Mexico Alliance, the Northeast Regional Oceans Council, and the West Coast Governors' Agreement on Ocean Health. In addition, SIMOR is seeking collaboration with the pre-existing Great Lakes Regional Collaboration. These federal

teams strive to be responsive to states in identifying and promoting opportunities for collaboration with regard to research and resource management planning, identification and propagation of best practices, and streamlined agency functions.

Restoration of the Bahia Grande in Texas

Conserving and restoring coastal habitat is a key element of the OAP. One of the largest estuary restoration project in North America occurred at the Laguna Atascosa National Wildlife Refuge, where the U.S. Fish & Wildlife Service worked with the National Oceanic and Atmospheric Administration, Ocean Trust and the Gulf of Mexico Foundation, U.S. Department of Agriculture's Natural Resources Conservation Service, and more than 60 other public and private partners in south Texas to restore 10,000 acres of tidal wetlands known as the Bahia Grande (Grand Bay).

Until the mid-1930s, these wetlands served as highly productive habitats for a wide variety of fish, shellfish, shorebirds, and waterfowl. Construction of the Brownsville Ship Channel severed the natural tidal connections, resulting in dry, sun-baked basins and over 70 years of dust affecting surrounding communities. In 2006 the project partners succeeded in restoring tidal connections to Bahia Grande. The response was immediate, as thousands of shorebirds, egrets, herons, and brown pelicans flocked to the newly flooded area to take advantage of the abundant fish. Efforts to construct additional channels and restore more functional, productive wetlands are planned, to further enhance the value of the Bahia Grande as wildlife habitat.

Regional Sediment Management

The U.S. Army Corps of Engineers has continued to implement the Regional Sediment Management approach, contributing to the OAP objective of fostering more effective management and conservation of our ocean and coastal resources through innovative science, management, and policy initiatives. It has initiated and supported a number of initiatives, including those summarized below, to advance regional sediment management approaches through a range of partnerships with other federal agencies, state and local governments, the private sector, and other stakeholders. The Corps will continue to apply this approach in 2008.

- ▶ *Improving Coordination of Dredging and Watershed Management:* In August 2006, the National Dredging Team (NDT) and SIMOR co-sponsored

a conference on “Managing Sediments in the Watershed – Bringing Dredged Material and Watershed Managers Together.” As a co-chair of the NDT, along with EPA, and a principal co-sponsor of the conference, the Corps helped a diverse array of participants better understand the interconnections among dredging, watershed, and sediment programs, perspectives, and interests. Discussions included identification of opportunities for collaboratively pursuing “next steps” in a number of regions.

- ▶ *Gulf Regional Sediment Management Master Plan:* Sediment resources are integral to accomplishing the Gulf of Mexico Alliance restoration and conservation objectives, and to addressing coastal erosion and flood risk management. The Corps and the U.S. Geological Survey (USGS) are co-leading development of a sediment management plan for the region that will help link sources of sediment with ecological and engineering sediment needs, provide a basis for assessing competing demands for sediment, and foster more cost effective sediment management.
- ▶ *West Coast Governors’ Agreement on Ocean Health:* Coastal erosion, competing sediment resource issues, and restoration of littoral sediment processes as a part of habitat restoration are integral to the West Coast issues. Corps involvement in regional sediment management initiatives associated with the California Sediment Management Master Plan, the Mouth of the Columbia River projects and studies, and the Lower Columbia Estuary Partnership are contributing to coordinated policy, projects, research, and data collection relevant to the West Coast Governors’ ocean and coastal priorities.

Outer Continental Oil and Gas Leasing Program

The OAP, taken in its entirety, engenders responsible use and stewardship of ocean and coastal resources to benefit all Americans. The 2007-2012 Outer Continental Shelf (OCS) Oil and Gas Leasing Program (Program) is the federal government’s primary mechanism for the management of offshore oil and gas resources. The Program, which became effective July 1, 2007 and runs through June 30, 2012, schedules 21 lease sales in eight planning areas. The Minerals Management Service (MMS) estimates that the Program could produce 10 billion barrels of oil and 45 trillion cubic feet of natural gas over 40 years,

generating almost \$170 billion, in today’s dollars, in net benefits for the nation.

The approval of the MMS Program establishes the framework for the safe and environmentally sound development of oil and gas resources on the OCS. The Outer Continental Shelf Lands Act (OCSLA) requires the Secretary of the Interior to develop a 5-year schedule of oil and natural gas lease sales in specific offshore areas. These specific areas are to be selected after an analysis comparing oil and gas bearing regions of the OCS and receipt of public comments, including comments from each coastal state governor.

The next step in the management of oil and gas resources is to conduct the lease sales specified in the Program, and to regulate the industry to maintain a safe and environmentally sound Program.

Management of the Outer Continental Shelf

On August 8, 2005, the President signed the Energy Policy Act. As part of the implementation process, during 2007, the MMS developed and published a draft Programmatic Environmental Impact Statement (EIS) analyzing the benefits and risks of the Alternative Energy Development and Production and Alternative Use of Facilities on the OCS. In addition, MMS held stakeholder meetings to gather input concerning potential alternative energy activities, issues, and needs in specific regions of the OCS, and hosted a public Alternative Energy Workshop to identify offshore alternative energy environmental information needs. It also published a final programmatic Environmental Assessment that analyzes the benefits and risks of the Coastal Impact Assistance Program (CIAP), which authorizes the Secretary of the Interior to distribute to producing states and coastal political subdivisions \$250 million for each of the fiscal years 2007 through 2010 to mitigate the impacts of OCS oil and gas activities.

These accomplishments are the first steps in establishing programs under the provisions of the Energy Policy Act of 2005. The next steps in management of alternative energy resources are to establish the regulatory program and then to conduct the Alternative Energy Program. The industry will also be regulated to maintain safe and environmentally sound development. The CIAP has published procedures for grant applications, and will be accepting proposals in 2008.

National Estuary Program 20th Anniversary

Established in 1987 under the Clean Water Act Amendments, the National Estuary Program (NEP) is a successful, community-based program designed to restore and maintain the water quality and ecological integrity of estuaries of national significance. For the past 20 years, the NEP program has effectively used a water-based planning approach to connect upstream pollution with downstream impacts. A unique voluntary program, it operates through broad-based partnerships and consensus building to achieve environmental results. The U.S. Environmental Protection Agency (EPA) provides technical and financial assistance and management guidance to the 28 NEPs across the country.

The NEP has made significant achievements in implementing effective and innovative management solutions for the benefit and protection of water quality and living resources in some of our Nation's most important estuaries over the last 20 years. For example, since the year 2000, the NEPs collectively have protected and restored nearly one million acres of habitat. Wetlands have constituted almost half of those acres. In addition, the NEPs have obtained significant funding by leveraging resources. EPA encourages and promotes the adoption of sustainable financing strategies by each of the 28 NEPs. By developing strategic alliances with implementing partners, the NEPs have leveraged approximately \$16.50 for every \$1 of EPA funding (where NEPs played a primary role in obtaining the funding).

In June 2007, as part of the NEP 20th Anniversary, EPA released the NEP Coastal Condition Report (NEP CCR), an assessment of the overall ecological condition of NEP estuaries. According to the NEP CCR, although population pressures in the NEPs were greater than those in non-NEP estuaries from 1990-2000, the NEP estuaries showed the same or better estuarine conditions than coastal waters overall.

The NEP CCR uses four key indicators of ecological health: water quality; sediment quality; benthic community condition; and fish tissue contaminants. The overall condition of the nation's NEPs is fair. The findings of the NEP CCR will serve as a benchmark for analyzing the progress of the NEPs and offer insights on what additional actions are needed to better protect, manage, and restore coastal ecosystems.

Natural Resources Conservation Service

The Natural Resources Conservation Service (NRCS) provides technical and financial assistance through a wide portfolio of voluntary programs to help private land owners and managers conserve soil, water, and other natural resources. Although improving ocean resource health is not the primary purpose for NRCS programs, benefits to ocean resources are often realized through watershed water quality enhancements, aquatic wildlife benefits, and watershed habitat restoration. The NRCS has been providing services within the Chesapeake Bay watershed for over 70 years and intends to continue its commitment to address watershed resource concerns.

In fiscal year 2006, NRCS committed an estimated \$80 million in federal dollars in the Chesapeake Bay watershed. This included nearly \$50 million in financial assistance provided directly to agricultural producers and other private landowners. The remaining funds supported technical assistance efforts to help farmers plan and implement conservation activities on their land. For example, \$30 million in the Environmental Quality Incentives Program (EQIP) went to help producers install conservation practices such as animal waste management systems and conservation tillage. Over \$4 million in Conservation Innovation Grants (CIG) went to entities developing innovative solutions to pressing conservation issues. An additional \$3 million was committed to restoring and protecting wetlands, and over \$6 million was obligated toward conservation easements to protect farmlands in perpetuity. As a result of NRCS efforts within the Bay, over 2,600 acres of wetlands were created, restored, or enhanced; 159,693 acres of watershed streambank shoreline were stabilized; and over 149,000 acres had a nutrient management system.

Ecosystem-Based Management in the Dry Tortugas

In a cooperative effort with the State of Florida to restore reef fish populations and protect coral reefs, the National Park Service (NPS) in January 2007 adopted regulations to provide full protection from fishing and anchoring in a new Research Natural Area (RNA) of Dry Tortugas National Park. The new RNA, together with the adjacent Tortugas Ecological Reserve managed by the NOAA Florida Keys National Marine Sanctuary, now comprises one of the largest fully protected marine reserves in the world (97 square miles). The RNA and Ecological Reserve will maintain key fish spawning areas and nurseries that support the multi-billion dol-

lar recreational and commercial fisheries throughout the Florida Keys.

This cooperative action with the State of Florida and NOAA represents major progress toward the OAP goals of integrating the existing network of marine managed areas, and enhancing the use and conservation of ocean, coastal and Great Lakes resources. To expand such cooperation, the Department of the Interior and NOAA signed a general agreement in August 2006 to coordinate science-based management of ocean and coastal resources among National Parks, National Wildlife Refuges, National Marine Sanctuaries and National Estuarine Research Reserves.

The NPS has a clear statutory mandate to employ the best available science to evaluate the RNA and integrate the results of research and monitoring into resource management planning. NPS has developed a five-year, joint plan with the Florida Fish and Wildlife Conservation Commission to conduct research and monitoring of fish and coral resources in the RNA, and the USGS Eastern Region has committed \$300,000 per year over three years for research at Dry Tortugas NP RNA and similar research at Virgin Islands National Park and Virgin Islands Coral Reef National Monument.

National Water Quality Monitoring Pilot

The pilot phase of the National Water Quality Monitoring Network (Network) for U.S. Coastal Waters and their Tributaries is moving forward. The OAP called for the design of such a Network to provide information about the health of our oceans and coastal ecosystems and inland influences on coastal waters for improved resource management. The Network is unique because it uses an integrated, multidisciplinary approach and addresses a broad range of water resources, from upland watersheds to offshore waters. The design was developed by 80 representatives working through the National Water Quality Monitoring Council and representing federal, state and local government organizations, universities, water associations, and the private sector.

The following three Pilot areas were selected from among 12 expressions of interest:

- ▶ Lake Michigan, led by the Great Lakes Commission;
- ▶ Delaware Bay, led by the Delaware River Basin Commission; and

- ▶ San Francisco Bay, led by the San Francisco Estuary Institute.

Each of these pilots is working closely with the federal agencies on the Network Interagency Working Group (USGS, NOAA, EPA, and the Office of Science and Technology Policy) and other experts to inventory ongoing monitoring activities, compare them to the National Network Design, and perform a gap analysis on what is missing. As of Fall 2007, the pilots have completed a preliminary review of nutrients, and are currently looking at contaminants.

Implementation of the Network will improve estimates of oceanic, atmospheric and land-based inputs to the U.S. coastal waters and estuaries, including those of freshwater, sediment, nutrients, and contaminants. The Network data will be critical in documenting the sources, amounts, timing and severity of natural and anthropogenic stressors on coastal ecosystems, which will provide essential data and information for implementing near-term priorities of *Charting the Course for Ocean Science in the United States for the Next Decade: An Ocean Research Priorities Plan and Implementation Strategy* (2007; <http://ocean.ceq.gov/about/docs/orppfinal.pdf>) and its overall theme to increase the pace, efficiency, and effectiveness of research and monitoring to support stewardship and science-based management of the Nation's coastal and estuarine resources. The Network is designed to augment existing monitoring programs and link observational capabilities, including the Integrated Ocean Observing System, in federal agencies, notably NOAA, USGS and EPA, and to facilitate management and dissemination of shared, quality-assured data to the broad community of users, including coastal states, Tribes, researchers, and non-governmental organizations.

The Network pilots are continuing their gap analysis, looking at other areas such as biology, wetlands, and beaches. The Network's Interagency Working Group will report to the Advisory Committee on Water Information with a synthesis of results from the Pilot Studies (Phase II) in early February 2008. In fiscal years 2008 and 2009, subject to resource availability, the effort will enter the demonstration project phase and begin to add sensors in the field, collect and analyze environmental samples, improve data sharing and management, and related activities to move towards a full Network implementation in identified regional areas.

Restoration of Louisiana Barrier Islands

Breton National Wildlife Refuge (NWR) was severely impacted by Hurricanes Katrina and Rita in 2005. The severity of damage brings into question what the future configuration of the NWR island chain will be, what protective function the islands will provide for the mainland wetlands and New Orleans, and whether the Breton NWR can continue to provide the same level of functional habitat for nesting birds and other wildlife as it did prior to the hurricanes.

USGS and academic partners are collaborating to offer science and technical advice to the FWS that will enable them to make reasonable restoration management decisions. The work proposed will build on a data effort in which baseline bathymetry and topography are currently being collected and analyzed under support from the Louisiana Department of Natural Resources and USGS. The enhanced effort will include shoreline, topographic and bathymetric change, geologic framework and sediment resource potential, and modeling to project island response to various restoration alternatives.

Further, this project will facilitate the use of ocean science and technology in the implementation of coastal management decisions, specifically of the FWS-managed wildlife refuge and designated wilderness area. In line with the President's cooperative conservation Executive Order, USGS is working with local agencies (the State of Louisiana) to provide for the restoration possibilities of the Chandeleur Islands, part of the Breton NWR. Under the coastal mapping activities and priorities, this project provides DOI and the State of Louisiana a new set of post-Katrina baseline data for the region.

Many other barrier islands in southeastern Louisiana were impacted by the active 2005 hurricane season. The Coastal Wetlands Planning, Protection, and Restoration Act (CWPPRA) Program Task Force composed of federal agencies (U.S. Environmental Protection Agency (EPA); the Department of Commerce, represented by NOAA Fisheries; the Department of the Interior, represented by the Fish and Wildlife Service; the U.S. Department of Agriculture, represented by the Natural Resources Conservation Service) and its state and local partners, placed a strong emphasis on restoring the critical framework of the barrier island system in the lower Barataria basin, whose fragile interior wetlands not only provide vital natural resources habitats, but also serve as an important storm surge buffer to New Orleans to the

north. Fortunately, many of these projects had already gone through the approval process and significant design, and resources were ready to begin restoration efforts soon after the storms.

Aquatic Nuisance Species Prevention

The Department of Transportation's (DOT) Saint Lawrence Seaway Development Corporation (SLSDC) and Maritime Administration (MARAD) are supporting efforts to reduce aquatic nuisance species introduction by ballast water in the Great Lakes. Through the enhanced ship inspection program, the SLSDC, with the U.S. Coast Guard (USCG) and Canadian partners, inspects all ocean-going vessels for safety and environmental compliance before they enter U.S. waters of the Seaway. During the 2006 season, Seaway inspectors conducted 82 ballast water inspections, as well as 57 ballast water exams for subsequent trip vessels. The coordinated inspections save vessels four hours per transit, resulting in economic, safety, and environmental benefits. In addition to meeting USCG requirements, vessels entering the Seaway must also agree to comply with voluntary management practices that reduce transfer of aquatic nuisance species within the Great Lakes. These activities contribute to achieving the OAP goal of preventing the spread of invasive species, and the cooperation is proposed to continue in future years.

Great Ships Initiative

DOT and NOAA are participating in the Great Ships Initiative (GSI), a partnership of industry, universities, and government in the U.S. and Canada that is developing laboratory, shore-based pilot and shipboard testing of alternative ballast water treatment solutions. The partnership opened the first freshwater ballast water laboratory testing facility in Superior, Wisconsin, in June 2007. The shore-based facility has completed its start up trials. The first large-scale testing will begin by December 2007. The testing will contribute to achieving the OAP goal of preventing the spread of invasive species. The initiative will help promising treatment solutions progress quickly to market availability and use on vessels, and serve to minimize the presence of live organisms in ballast water discharge from ships.

Artificial Reef Guidance

On May 12, 2006, EPA and MARAD issued a joint document entitled *National Guidance: Best Management Practices for Preparing Vessels Intended to Create Artificial Reefs* (BMP Guidance). The first of its kind,

this guidance offers a consistent, environmentally protective, national approach for preparing obsolete and decommissioned military and commercial vessels for use as artificial reefs. This guidance was developed to satisfy the mandate of Section 3516 of the National Defense Authorization Act for Fiscal Year 2004, which requires that MARAD and EPA jointly develop guidance recommending environmental best management practices (BMPs) to be used in the preparation of vessels for use as artificial reefs.

An interagency workgroup, chaired by EPA, was established to develop the guidance. The workgroup included representatives from USGS, U.S. Navy, MARAD, Corps of Engineers, NOAA, and FWS. The BMP Guidance identifies materials of concern that may be present aboard vessels, identifies where these materials may be found, and describes their potential adverse impacts if released into the marine environment. For each material of concern identified, this document provides a narrative description of the clean-up performance goal and information on methods for achieving those goals. EPA believes that achieving the clean-up performance goals provided in the BMP Guidance, if complemented with strategic reef site selection, will maximize the opportunity for vessels to benefit the environment as artificial reefs.

Advancing our Understanding of the Oceans, Coasts, and Great Lakes

Introduction

The FY 2008 President's Budget included over \$1.3 billion for science, research and education aimed at advancing our knowledge and awareness of ocean and coastal issues. The agencies that participate in these programs include the Departments of Commerce (NOAA), Defense, Energy, Health and Human Services, Homeland Security, the Interior, and State, and the Environmental Protection Agency, the Marine Mammal Commission, the National Aeronautics and Space Administration, the National Science Foundation, and the Smithsonian Institution.

Understanding the oceans, coasts and Great Lakes, our impact on them and their impact on us depends on sound science and innovative technology. Such understanding, in turn, provides a solid foundation necessary for making informed decisions regarding our relationship with the marine and Great Lakes environments.

Effective collaboration is essential when designing and conducting research efforts and effectively translating research results to useful products. The most pressing issue in advancing our understanding of oceans, coasts and Great Lakes is the need for national-level coordination of efforts among all sectors, including national-level development and implementation of research priorities. The need to establish a sound scientific foundation for decision-making transcends specific agency missions, management objectives or operational requirements. Advancing our understanding of the oceans, coasts and Great Lakes through research and technology is a universal need that requires the involvement and dedication of all sectors at all levels. Collaboration merges the lines of traditional disciplines, tapping the strength of interdisciplinary research to improve our ability to address societal concerns and better inform human interactions with the marine ecosystem.

Federal agencies have a responsibility to work with each other and the rest of the ocean community to conduct and employ science, including social sciences, and leverage resources, including intellectual resources, to achieve common goals of national importance. Given the fundamental and far-reaching value of and need

for coordination across sectors to advance the ocean sciences enterprise, the Bush Administration established the Joint Subcommittee on Ocean Science and Technology (JSOST – building from its predecessor the Joint Subcommittee on Oceans) to ensure collaboration and coordination among the federal agencies on the most pressing ocean issues facing the nation. The JSOST, along with its interagency working groups, task forces and boards, brings together 25 agencies to address national ocean science and technology issues. This section focuses on the interagency successes and continued progress of the JSOST and its subgroups toward that goal.

National Ocean Research Priorities

Recognizing the need to coordinate federal efforts and to link those efforts to other sectors, the Administration's Ocean Action Plan called for an Ocean Research Priorities Plan and Implementation Strategy that would "...seek enhanced collaboration, coordination, cooperation, and synergies..." The resulting document, *Charting the Course for Ocean Science in the United States for the Next Decade: An Ocean Research Priorities Plan and Implementation Strategy* (2007; <http://ocean.ceq.gov/about/docs/orppfinal.pdf>), is the culmination of a community-wide effort to focus attention on aspects of the ocean sciences enterprise that should be carried out in the next decade.

Charting the Course identifies national ocean research priorities for the next ten years and provides guidance to fortify and expand the scientific foundation to improve society's stewardship, use of and interaction with the ocean, coasts and Great Lakes. Developed with extensive input from the ocean community, the Plan represents the first coordinated, national effort to identify research priorities linked to understanding interactions between society and the ocean. Twenty national ocean research priorities evolved through broad-based community efforts and are oriented around the most compelling issues in key areas of interaction between society and the ocean. The Plan will guide research efforts for the ocean community, including the federal agencies, for the next decade.

By identifying national priorities and outlining an implementation strategy, this document will help

facilitate coordinated investment and effort in critical areas of ocean science, beginning with four near-term priorities. The near-term priorities reflect efforts to be pursued over the next two to five years and were developed to initiate rapid progress towards the 20 longer-term priorities. Demonstrating the Administration's commitment to implementing *Charting the Course*, the President's Fiscal Year 2008 budget provides \$40 million to address the four near-term ocean research priorities in the areas of Forecasting the Response of Coastal Ecosystems to Persistent Forcing and Extreme Events, Comparative Analysis of Marine Ecosystem Organization, Sensors for Marine Ecosystems, and Assessing Meridional Overturning Circulation Variability: Implications for Rapid Climate Change.

The near-term priorities are the immediate, primary focus for federal implementation of *Charting the Course*. These interagency efforts are developing implementation plans that build off of and include on-going activities at multiple agencies. Three of the four efforts are moving forward at least partially through the Broad Agency Announcement for proposals under the National Oceanographic Partnership Program (NOPP). Awards are anticipated in late spring of 2008.

The Implementation Strategy in *Charting the Course* provides direction to ensure the successful execution of the Plan. It also provides strategic guidance and mechanisms for federal agency actions and budgets and collaboration with other sectors. The JSOST is looking toward longer-term timeframes for planning and ensuring interagency integration and coordination mechanisms. Implementation progress also includes a National Research Council review of the final Plan that highlights avenues for community involvement throughout implementation, and continued dialogue with various ocean sectors through outreach briefings on the status of the Plan and next steps.

Ocean Observations and Related Activities

Ocean observing systems provide a significant amount of data on a range of oceanographic conditions that form the basis for information needed to develop forecasts, warnings, watches, and climate assessments, and guide regulatory policies and management decisions. Integrating the assets of many ocean and coastal observing systems will focus their collective power on providing improved insight on societal concerns relevant at local, regional, national, and global scales. Recent advances in observation, modeling and information technology now provide the means to help the

nation accomplish such an objective. In April 2006, the Joint Subcommittee on Ocean Science and Technology (JSOST) established the Interagency Working Group on Ocean Observations (IWGOO) to advise and assist the JSOST on matters related to ocean observations. The OAP notes the importance of the U.S. Integrated Ocean Observing System (IOOS). A function of the IWGOO is to integrate U.S. ocean observing efforts to assist in the development and implementation of the IOOS. This is the U.S. contribution to the Global Ocean Observing System (GOOS), a substantial component of the Global Earth Observing System of Systems (GEOSS) that optimizes the information generated by ocean and earth systems of all the nations in the world for use in advancing ocean science and management.

Developed under the leadership of the Ocean.US Executive Committee, the precursor to the IWGOO, the First U.S. IOOS Development Plan provides a guide to IOOS implementation. Meant to be the first of "living" development plans, it addresses many recommendations of the U.S. Commission on Ocean Policy, including emphasizing regional development, developing the capacity for ecosystem-based management, and linking IOOS data and information to applications. Approved by the National Ocean Research Leadership Council (NORLC)/Interagency Committee on Ocean Science and Resource Management Integration (ICOSRMI) in January 2006, the approved plan, and its addendum are available at (http://www.ocean.us/ocean-us_publications). Recognizing the critical importance of data and data management to the success of IOOS, the IOOS Data Management and Communications (DMAC) Steering Team followed the development plan with the establishment of the IOOS DMAC Guidelines/Standards Adoption Process in May 2006.

In response to Congressional interest and building on the IOOS development plan, the IWGOO has drafted a five-year Integrated Ocean Observing System Strategic Plan describing the IOOS vision, goals and objectives for continued progress in three critical strategic areas: organization and governance; integrated data management and development of data products; and capitalizing on expertise, capabilities, and interests through interdependent implementation. The strategic plan also characterizes the areas of highest priority for the U.S. contribution to GEOSS over the next five years. The next step is development of an implementation plan with roles and responsibilities for these actions to lay out the way ahead.

Responding to concerns expressed by the Ocean Research and Resources Advisory Panel (ORRAP) regarding the extent of interaction between IOOS and the Ocean Observatories Initiative (OOI), the IWGOO prepared a statement on the distinct but complementary nature of the two efforts. This document will serve as a starting point for continual dialog and exchange with the ORRAP and the ocean community as a whole on the current and future nature of the relationship between IOOS and OOI. It addresses steps to clarify potential confusion about their relationship and describes mechanisms to inform and strengthen planning to ensure that research and development necessary for IOOS is carried out, including (but not limited to) the transfer of research results from OOI to IOOS.

Oceanographic Facilities

The national oceanographic fleet is a critical component of the infrastructure that supports federal research and operational marine missions. The Ocean Action Plan called for the development of a “National Oceanographic Fleet Renewal Plan that will define an interagency strategy for Federally-owned oceanographic ships operated by both Federal and academic organizations.” The JSOST established the Interagency Working Group for Facilities (IWG-F; previously the Federal Oceanographic Facilities Committee under NOPP) in June 2006 to address this and other oceanographic facilities issues, including but not limited to ships. This group developed the Federal Oceanographic Fleet Status Report which describes current fleet capacity and renewal activities planned during the period 2007–2015. It highlights national capabilities and partnerships among federal agencies and academic institutions to support enhanced understanding and stewardship of the world’s oceans. The report will help agencies plan fleet development strategies over the next decade while providing a baseline for future planning activities. It also identifies infrastructure capabilities needed to assist in the implementation of *Charting the Course*.

Ocean and Coastal Mapping

Accurate images of our nation’s ocean and coastal areas, from the shoreline to the seafloor throughout the Exclusive Economic Zone and beyond, are a critical component in understanding marine processes and structures and how these processes and structures effect and are effected by human activities. The information mapping provides is vital to commercial navigation, scientific research, military operations, natural resource management, and understanding

global change. In June 2006, the Joint Subcommittee on Ocean Science and Technology (JSOST) established the Interagency Working Group on Ocean and Coastal Mapping (IWG-OCM) to facilitate the coordination and leveraging of mapping resources across the Federal sector and with State, industry, academic, and non-governmental mapping interests. This includes development of plans, strategies, tools and techniques; data management; development of information products; community interaction; and addressing research needs. As called for in the U.S. Ocean Action Plan, the IWG-OCM is developing an Interagency Ocean and Coastal Mapping Inventory of federal, federally-funded and non-federal governmental ocean and coastal mapping and charting programs, operations and prioritized needs. The inventory will offer a clearinghouse for data and interpretive information and a registry of completed and projected mapping activities to reduce duplication of efforts and enable cooperative activities.

Oceans and Human Health, Harmful Algal Blooms, and Hypoxia

The ocean is a source of numerous benefits to society ranging from food products and pharmaceuticals to oxygen production and recreational opportunities. But it can also be the source of health hazards in the form of disease-causing organisms, harmful algal blooms (HABs) and catastrophic events such as hurricanes and tsunamis. This close connection between ocean ecosystem conditions and human health has led several federal agencies to work on oceans and human health (OHH)-related problems for many years. To coordinate ongoing OHH research efforts and to ensure that federal investments in this emerging and important interdisciplinary scientific field are utilized as efficiently as possible, in 2004 the U.S. Congress passed the Oceans and Human Health Act (OHH 2004) that formally established an Interagency OHH Program. A specific concern in the relationship between oceans and human health is the impact of harmful algal blooms. HAB species produce toxins and/or large blooms that have the potential to harm humans and ecosystems. In 2004, in response to the growing concerns about HABs, Congress passed the Harmful Algal Bloom and Hypoxia Research and Control Act (HABHRCA 2004).

In July 2005, in keeping with the OAP highlight of implementing new OHH- and HAB-related legislation, the JSOST established the Interagency Working Group on Harmful Algal Blooms, Hypoxia, and Human Health (IWG-4H) to advise and assist the subcommittee with regard to interagency requirements of OHH 2004 and HABHRCA 2004. The IWG-4H also serves as

the Interagency Task Force on Harmful Algal Blooms and Hypoxia, which was reconvened as mandated by HABHRCA. There has been substantial progress toward completing milestones for implementation of HABHRCA 2004 and OHH 2004:

The OHH Act of 2004 explicitly calls for a ten-year implementation plan for the national OHH research program established in the act. In response, the IWG-4H completed the report *Interagency Oceans and Human Health Research Implementation Plan: A Prescription for the Future*. This interagency plan provides a framework, focusing on six actions, to ensure a productive and effective interagency program in OHH research. The compilation of research themes in the plan is the first comprehensive national effort to prioritize OHH research and outline opportunities to advance this interdisciplinary field. The activities outlined in the plan will foster a vibrant national research program targeted to minimize human health risks, maximize ocean benefits to humans, and maintain healthy and productive marine ecosystems and coastal communities.

As called for in HABHRCA 2004, the IWG-4H has prepared a *National Assessment of Efforts to Predict and Respond to Harmful Algal Blooms in U.S. Waters* (2007). This Prediction and Response Report specifically addresses both the state of research and methods for HAB prediction and response, especially at the federal level. It also identifies opportunities to advance prediction and response efforts. This report is the first step in a process to create an innovative research and development plan for HAB prediction and response. The final report is available at http://ocean.ceq.gov/about/docs/iwg4h_prprt_final.pdf.

The second report in the process, the *National Scientific Research, Development, Demonstration and Technology Transfer Plan for Reducing Impacts from Harmful Algal Blooms* (RDDTT Plan), will establish research priorities and a plan for peer-reviewed, competitive prevention, control, and mitigation efforts to advance current prediction and response capabilities. A community workshop in support of this second plan was held in June 2007. The workshop report, expected in late 2007, will inform the development of the RDDTT Plan.

Harmful algal blooms are not limited to marine ecosystems. Toxins from freshwater HABs can have a broad range of negative impacts on humans, animals and aquatic ecosystems. HABHRCA 2004 called for a *Scientific Assessment of Freshwater Harmful Algal*

Blooms to address this issue of growing national concern. The IWG-4H has prepared an assessment that examines the causes, consequences, and economic costs of freshwater HABs; establishes priorities and guidelines for a research program on freshwater HABs; and makes recommendations to improve coordination among Federal agencies with respect to research on HABs in freshwater environments.

Ocean Education

Ocean education is key to developing ocean stewardship, science literacy and future ocean leaders. By providing teachers, students and the public with access to relevant and current marine science, they will be better equipped to understand the importance of the ocean to daily life and global processes. To achieve these goals, and fulfill the OAP call for enhancing ocean education coordination, the ICOSRMI established the Interagency Working Group on Ocean Education (IWG-OE) to focus on coordinating formal and informal education programs across agencies, develop a coordinated ocean message, promote the use of ocean observation data in education, and attract a future workforce to marine science, technology and management.

The IWG-OE has developed an implementation plan to guide future planning efforts. The four primary tasks are: 1) Increase Coordination and Promote Collaboration; 2) Develop a Coordinated Ocean Education and Outreach Message; 3) Ensure data from Ocean and Earth Observing Systems are translated to useable forms for teachers, students and the public; and (4) Ensure a Well-Prepared Ocean Workforce. These efforts are designed to:

- ▶ Address lifelong learning through formal and informal education;
- ▶ Leverage resources by broadening and strengthening networks and investing in common messages;
- ▶ Recognize ocean education as a specific expression of Earth system science and environmental education and link to these important concepts; and
- ▶ Promote the *Ocean Literacy Essential Principles and Fundamental Concepts* (http://www.coexploration.org/oceanliteracy/documents/OceanLitConcepts_8.1.05.pdf; and http://www.ngsednet.org/community/resource_uploads/OceanLitChart.pdf) as a model

framework for organizing our efforts to increase understanding of the relevance of the ocean to our everyday lives.

In support of these focus areas, the IWG-OE, together with the National Marine Sanctuary Foundation and several other partners, convened a Conference on Ocean Literacy in June 2006 (<http://nmsfocean.org/chow2006/cool.html>). The Conference was held in conjunction with National Oceans Week, as proclaimed by the President for the week of June 4 through June 10, 2006 (<http://www.whitehouse.gov/news/releases/2006/06/20060602-6.html>).

The IWG-OE also developed a survey for taking inventory of federal agency ocean education programs for the purpose of finding areas for increased coordination and collaboration. Results of the survey are being used to initiate a “pilot” effort to coordinate ocean education activities in Hawaii. In addition, the National Oceanographic Partnership Program is funding a study to assess the ocean-related workforce. The study is expected to be complete in May 2008.

Ocean Education through Coastal America Activities

Coastal America, a partnership among federal, state and local governments and private alliances to collaboratively address coastal environmental problems, also conducts ocean education activities. Coastal America is under the aegis of ICOSRMI along with the JSOST but is a separate entity. The U.S. Ocean Action Plan calls for the expansion of Coastal America’s Coastal Ecosystem Learning Center (CELC) network to promote lifelong ocean education. On May 25, 2006 in Atlanta Georgia, Coastal America designated the Georgia Aquarium as its 19th Coastal Ecosystem Learning Center. As the largest aquarium in the world with over 3 million visitors a year, the Georgia Aquarium will help the network reach its goal of increasing public awareness of ocean and coastal issues.

The 2006 Gulf of Mexico Alliance Governors’ Action Plan, supported in the Ocean Action Plan, called for the designation of a CELC in Mexico to further expand the CELC network and increase ocean literacy in the broader Gulf of Mexico region. On June 14, 2007, Coastal America designated the Veracruz Aquarium located in Veracruz, Mexico as the network’s 20th CELC and first International CELC. The Veracruz Aquarium will work with the Gulf States and neighboring CELCs to conduct research and educate the public on issues such as harmful algal blooms in the Gulf of Mexico.

The incorporation of the Veracruz Aquarium into this dynamic network of aquaria and educational institutions expands the network to reach over 25 million people annually. With the addition of this International CELC the network will continue to work collaboratively to educate and inspire the public to protect, preserve, and restore our oceans and coasts.

Coastal America’s National Student Summit on Oceans and Coasts was held December 5-8, 2006. The Summit strongly supported the Ocean Action Plan’s goal to increase ocean education and to promote lifelong education. Held in Washington, D.C., the Summit offered high school students from across the country exposure to national ocean leaders. It also brought together formal and informal educators. The program was designed to give participants a unique experience in developing ocean policy recommendations from start to finish. Through Coastal America’s Coastal Ecosystem Learning Center network, teens across the nation became involved in cooperative conservation projects and mentorship efforts to promote sustainable coasts and oceans. Action plans developed by the students addressed issues such as tidal power, habitat restoration, wildlife conservation, fisheries management, non-point source pollution and ocean literacy programs. Coastal America is presently conducting a post summit analysis to evaluate student follow up and the effectiveness of the summit. Preliminary results indicate that students who participated in the three day summit demonstrated environmental stewardship by executing their action plans and implementing projects in their communities.

Deep-Sea Corals and other Vulnerable Marine Ecosystems

Deep-sea corals are known to occur throughout U.S. waters but little is known of their distribution, biology and ecological function as essential habitat for fish and other marine life. What is known is that these fragile organisms are vulnerable to human activities. Deep-sea corals, and other vulnerable deep-sea ecosystems, need to be explored, mapped, characterized, and monitored if they are to be understood and responsibly managed. In April 2007, the JSOST established an interim Board on Deep-Sea Corals and Other Vulnerable Marine Ecosystems to enhance interagency cooperation on these areas. The Board’s efforts are addressing the U.S. Ocean Action Plan direction to “*determine which agency or agencies should take the lead in coordinating the Federal government management and research activities with respect to deep-sea corals.*” Specific activities of this group include preparing an initial strategy

for mapping the locations of deep-sea coral, sponge, and chemosynthetic habitats, in coordination with the Board's member agencies and the non-Federal community.

Acoustics in the Marine Environment

Nationally and internationally diverse opinions are emerging on the relative significance of marine bio-acoustics as science and how to handle anthropogenic sound as an environmental quality issue. The result has been increased delays and costs of agency and agency-funded activities due to litigation, and loss of agency training time and operational capability. Better knowledge of the actual effects of anthropogenic sound in the marine environment is needed. At the direction of the ICOSRMI, the Interagency Task Force on Anthropogenic Sound and the Marine Environment was established under the JSOST in April 2007, to:

- 1) identify scientific and technical requirements in assessing the extent and significance of effects from manmade sound on the marine environment;
- 2) strengthen coordination among federal agencies to address scientific and technological aspects of this issue relating to various needs of the U.S. government;
- and 3) develop an interagency science and technology course of action for the purpose of minimizing adverse effects of human sound-producing activities. The recommended course of action will include recommendations for tracking implementation and progress and identify education and outreach opportunities with the public and non-governmental organizations related to the proposed plan.

Ocean Partnerships

Building relationships is essential to all areas of JSOST concern. Coordination among all sectors and across all disciplines is at the foundation of progress in advancing ocean sciences and understanding of the marine environment. In June 2006, recognizing the benefits of partnering on common research needs and sharing responsibility for efforts of mutual need, the JSOST established the Interagency Working Group on Ocean Partnerships (IWG-OP). Building on the success of the NOPP IWG, the role of the IWG-OP is to serve as a tool to foster relationships and encourage partnerships. To establish a framework for fulfilling this role, the IWG-OP has drafted a strategic plan with the goals of continuing and expanding ocean partnership dialogues, sponsoring ocean partnership activities, identifying and removing obstacles and disincentives to ocean partnerships, and facilitating opportunities for dialogue with the nation's leadership. The IWG-OP

focuses on those objectives felt to be too big for any single agency, that cut across multiple missions or that require government-private-academic partnerships for success. Through these goals, the IWG-OP will serve as a platform from which to better identify collaborative oceanographic ventures and explore and establish cost-sharing opportunities. For the federal ocean science and technology community, the IWG-OP will facilitate partnership opportunities and fiscal flexibility. By serving as a forum for discussion beyond the immediate fiscal year, the IWG-OP will assist in planning for future ocean science and technology.

Supporting Maritime Transportation

Introduction

The FY 2008 President' Budget provides over \$2.6 billion for programs that support maritime transportation. The agencies that conduct these programs are the Departments of Commerce, Defense, Homeland Security, the Interior, and Transportation. The Committee on the Marine Transportation System is a key interagency forum for improving federal Marine Transportation System coordination and policies. What follows is an overview of the Committee's efforts to enhance the safety, efficiency, vitality, and environmental health of U.S. waterways.

Committee on the Marine Transportation System

The Committee on the Marine Transportation System (CMTS) was established in response to the U.S. Ocean Action Plan's call to improve the U.S. Marine Transportation System (MTS). The CMTS is chaired by the Secretary of Transportation, and its membership includes cabinet secretaries and high level leadership from 18 Federal Departments and agencies. Approved in July 2005, the Charter states that policy recommendations to the CMTS are to be generated by a Coordinating Board of agency heads and directors, and that supporting interagency analyses be conducted by cross-agency Integrated Action Teams. The use of Integrated Action Teams and shorter-term task teams to support policy decisions to improve the MTS are aligned with the U.S. Ocean Action Plan and the CMTS Charter to:

- ▶ Improve Federal MTS coordination and policies;
- ▶ Promote the environmentally sound integration of marine transportation with other modes of transportation and with other ocean, coastal, and Great Lakes uses;
- ▶ Develop outcome-based goals and strategic objectives for the safety, security, efficiency, economic vitality, environmental health, and reliability of the MTS for commercial and national defense requirements, as well as a method for monitoring progress towards those goals;
- ▶ Coordinate budget and regulatory activities that impact the MTS; and
- ▶ Recommend strategies and implement plans to maintain and improve the MTS.

In fall 2005, the CMTS approved the start of three Integrated Action Teams to address specific MTS improvement areas: MTS Data Collection and Information Management led by MARAD; a National Strategy for the MTS led by USCG; and Risk Assessment of the MTS by the U.S. Army Corps of Engineers. In October 2006, the CMTS Coordinating Board approved an additional Integrated Action Team entitled, "Navigation Technology Integration and Coordination."

The Data Collection and Information Management Integrated Action Team was created to identify a set of data and information to be included in a single MTS data portal. It was envisioned that this portal will be used by state and Federal government, commercial and other interest group decision makers to make effective and timely decisions regarding the MTS. The first phase was to inventory the numerous and varied sources of MTS data from Federal sources. The initial inventory report indicated that there were over 100 different data bases from 12 different Federal agencies. By the end of 2006, the inventory had been scrubbed for duplications and consistency of terminology. It is expected that access to this information will be made available through a single source (CMTS web site at www.cmts.gov) by links to the various sources by the first quarter of 2008.

The National Strategy Integrated Action Team was directed to engage maritime industry in the process of developing a National Strategy for the improvement of the MTS, and defining Federal roles in the MTS. In June of 2006, the Team invited 46 industry and Federal experts to a workshop to identify the most critical needs of the MTS and to propose ways to address them. The results of their efforts were then combined with the relevant sections of previous reports on the MTS. Further outreach was conducted in the fall and winter of 2006, and the Team met continuously throughout the spring and summer of 2007. A final draft document is expected to be forwarded to the CMTS for approval in the first quarter of 2008.

A Framework for MTS Risk Management Assessment Integrated Action Team was established because of the cited need for an overall assessment of the cur-

rent state of the MTS. A draft scope of the assessment was finalized in late 2006 with the assistance of the Volpe Center. It included the perspectives provided at the National Strategy Workshop of June 2006 and the Marine Transportation System National Advisory Council which indicated that there was a need to address the immediate actionable items and not just a lengthy, detailed study. The scope also includes an expanded risk and reliability assessment across key components of the MTS. An initial infrastructure literature review is expected to be complete by the end of calendar year 2007.

The Navigation Technology Integration and Coordination Integrated Action Team was created to foster the beneficial integration of technologies, data and services being developed, collected or performed by Federal agencies that could be used to enhance navigational safety and efficiency of maritime operations. The Team will develop an inventory of technologies, data and services within the Federal government; facilitate the interagency coordination to assist with NOAA's development of a prototype dynamic navigational display that integrates electronic navigation charts, the Physical Oceanographic Real-Time System technologies and the USCG Automatic Identification System; and make recommendations for the effective integration of technologies, data, and services that could improve navigational safety and efficiencies. The inventory is expected to be completed by March 2008.

Advancing International Oceans Policy and Science

Introduction

The FY 2008 President's Budget provides \$124 million for programs related to international ocean issues. These programs are conducted by the Departments of Commerce, Homeland Security, the Interior, and State, and the Environmental Protection Agency, the National Science Foundation, and the U.S. Agency for International Development. These departments and agencies are responsible for a variety of activities in the international arena. What follows highlights the range of federal efforts achieving advances in this area.

Accession to the Convention on the Law of the Sea

On May 15, 2007, President Bush urged the Senate to give its advice and consent this year to U.S. accession to the Convention on the Law of the Sea. The Departments of State, Defense, and Homeland Security conducted extensive briefings for Senators, their staffs, and Senate Committee staffs in the spring and summer of 2007. The Administration worked with the Senate Foreign Relations Committee to schedule a hearing in September 2007.

One of the most important innovations of the Law of the Sea Convention is the possibility for a coastal nation to extend its continental shelf beyond 200 nautical miles, if it can demonstrate that the shelf meets specific criteria. In the spring of 2007, the ICOSRMI approved terms of reference for an interagency Extended Continental Shelf (ECS) Task Force, led by the State Department along with NOAA and the Department of the Interior. Its purpose is to coordinate the collection and analysis of all relevant data, and to prepare the necessary documentation, to establish the outer limit of the U.S. ECS in accordance with international law. This decade-long effort is expected to add an enormous area of extended shelf, where the U.S. can exercise sovereign rights over the living and non-living resources on and below the seabed.

International Coral Reef Initiative

The International Coral Reef Initiative (ICRI), established in 1994, is a partnership among governments and international, scientific, and civil society organization seeking to stop and reverse the global degradation of coral reefs and related ecosystems. The ICRI approach is to mobilize governments and a wide range of

other stakeholders in an effort to improve management practices, increase capacity and political support, and share information on the health of these fragile ecosystems. ICRI's successes include helping to establish marine protected areas in key coral reef regions and encouraging integrated coastal and watershed management.

The U.S. donates approximately \$2 million per year to ICRI or ICRI-related coral programs, which include local workshops on reef protection and management, and the Global Coral Reef Monitoring Network, which publishes a biannual report on "Status of the World's Coral Reefs." At the ICRI meeting in Cozumel, Mexico, October 21-23, 2006, representatives of the Governments of Mexico and the United States formally offered to host the 2007-2009 ICRI Secretariat. The joint Mexico-U.S. Secretariat began July 1, 2007, and will extend until June 30, 2009.

International Maritime Organization Conventions

Under the auspices of the International Maritime Organization (IMO), a number of treaties are under development or being amended. These include:

1996 Protocol to the London Dumping Convention –

This treaty entered into force in March 2006; the transmittal package will be sent to the Senate soon for advice and consent. The U.S. is a party to the London Convention and the 1996 Protocol is meant to update and eventually replace the Convention. Unlike the Convention, which lists substances that may not be dumped, the Protocol uses a "reverse list" approach, i.e., it prohibits ocean dumping of wastes except those specifically listed in an Annex. The Protocol was amended in February 2007 to allow for sequestration of carbon dioxide streams in sub-seabed geological formations.

Ship Recycling – Negotiations are ongoing for a cradle-to-grave approach on ship design, lifetime maintenance and recycling to minimize risks to human health and the environment during the eventual ship dismantlement process. Finalization of negotiations is tentatively anticipated in 2009.

MARPOL Annex V – Regulations in Annex V to the International Convention for the Prevention of Pollution from Ships (MARPOL) provide conditions, as well as prohibitions, for the release of garbage into the ocean. The IMO is

reviewing this Annex to develop amendments to the Annex and its guidelines. It currently is anticipated that such amendments will be considered by the IMO in October 2008.

MARPOL Annex VI – Regulations in Annex VI to MARPOL set limits on sulphur oxide and nitrogen oxide emissions from ship exhausts and prohibit deliberate emissions of ozone-depleting substances. The Senate gave its advice and consent for MARPOL Annex VI in April 2006. Legislation is contained in the engrossed bill H. R. 802, which has been referred to the Senate Commerce Committee. The IMO is considering adopting more stringent standards for ship exhaust emissions.

Anti-Fouling Systems on Ships – Negotiated in 2001, the International Convention on the Control of Harmful Anti-fouling Systems on Ships (AFS Convention) bans the application or use of tributyltin, an anti-fouling agent, and calls for its removal from existing systems by January 1, 2008. The treaty also establishes a detailed and science-based framework for considering future restrictions on antifouling systems. The AFS treaty is expected to go into force by the end of this year via ratifications from Panama and the Marshall Islands. The U.S. process for forwarding the AFS package to Congress is underway.

Vulnerable Marine Ecosystems

The U.S. is a leader in promoting measures to protect vulnerable marine ecosystems (VMEs) from the effects of destructive fishing practices, both in waters under U.S. jurisdiction and on the high seas. In October 2006, President Bush issued a memorandum to the Secretaries of State and Commerce promoting the sustainable management of global fisheries resources and calling for an end to destructive fishing practices on the high seas. The U.S. delegation to the 2006 United Nations General Assembly (UNGA) fisheries resolution negotiations led a successful effort for a groundbreaking agreement to prohibit vessels from engaging in destructive fishing practices on the high seas unless applicable conservation and management measures are in place within a specified timeframe. The consensus agreement calls for specific management measures to be implemented both by Regional Fisheries Management Organizations and Flag States to prevent bottom fishing from causing harm to VMEs.

The U.S. is now playing a leadership role in efforts to implement the UNGA mandate both in existing organizations for the Antarctic and Northwest Atlantic Ocean, as well as through the creation of new organiza-

tions or arrangements in areas where no management arrangement currently exists, including the South Pacific and Northwest Pacific Ocean. A key component of all these efforts is the adoption of interim measures, consistent with the UNGA mandate, pending the development of more permanent arrangements.

The 2006 UNGA resolution also requested that the Food and Agriculture Organization (FAO) develop standards and criteria for use by Regional Fisheries Management Organizations and Flag States in identifying VMEs and the impacts of fishing on such ecosystems. The development of such guidelines is well under way with an FAO Expert Workshop held in June 2007, followed by an Expert Consultation in September 2007, and a Technical Consultation in February 2008, with a goal of completing the Guidelines in the first quarter of 2008.

Use of Large Marine Ecosystems

In support of the U.S. Ocean Action Plan, the Large Marine Ecosystem (LME) concept for ecosystem-based management and its 5-module approach continues to be applied to 16 international projects in Africa, Asia, Latin America and Eastern Europe (<http://woodsmoke.edc.uri.edu/Portal/>). These LME projects are funded by the Global Environment Facility (GEF), the World Bank, participating countries, and other donors. Financial support to the participating countries has increased from \$650 million to \$1.8 billion in the past 12 months. NOAA continues to provide technical and scientific support to the projects through close coordination with U.N. agencies, non-governmental organizations and the Ministries of Fisheries and the Environment of 110 countries.

The operational strategies for the fourth replenishment of the GEF (2007-2010), developed during the last 4 months, will include an additional \$230 million to support the recovery of depleted fish stocks and the reduction and control of nutrient over-enrichment; and to assist countries in adapting to the effects of climate change. Supplemental World Bank Investment funds will further augment international LME activities and are expected over the next 24 months to bring the total funding of LME projects to \$3 billion. This unprecedented level of financial support provides developing countries with the means to operationalize the 5-module LME approach to marine resource assessment and management, and to acquire and operate advanced sampling systems for obtaining time series data on pro-

ductivity, coastal oceanography, nutrients, climatology, fish and fisheries, pollution, and ecosystem health.

NOAA also continues to expand its LME partnerships with international programs. The Second Global Conference on Large Marine Ecosystems was held in Qingdao, China, September 11-13, 2007 (<http://www.yfri.ac.cn/GLME-Conference2-Qingdao/homepage.htm>). The conference greatly enhanced the international marine science and management community's knowledge in the science and technology of marine ecology and the Large Marine Ecosystem approach. Progress has been made introducing the LME concept in the Arctic where the Arctic Council's Protection of the Marine Environment Program has agreed to utilize a suite of ecosystem indicators for assessing the 17 Arctic LMEs. Initial discussions have been held by NOAA with senior representatives of the United Nations Industrial Development Organization and the program managers of seven African LME projects encompassing the entire coast of Africa. These discussions have focused on linking funding from the G-8 to aid African science, education and economic development to existing LME projects important to the food security and economic development of 39 African coastal countries. In addition, in November 2006, the Global Ocean Observing System (GOOS) agreed to partner with the GEF-funded LME projects to gain access to coastal and marine observations made by the projects.

APPENDIX:
AGENCY SUMMARIES OF
ACTIVITIES AND FUNDING

DEPARTMENT OF AGRICULTURE

The U.S. Department of Agriculture (USDA) provides leadership on food, agriculture, natural resources, rural development, and related issues based on sound public policy, the best available science, and efficient management. The Department supports the achievement of this vision through the following strategic goals: enhance international competitiveness of American agriculture; enhance the competitiveness and sustainability of rural and farm economies; support increased economic opportunities and improved quality of life in rural America; enhance protection and safety of the Nation's agriculture and food supply; improve the Nation's health and nutrition; and protect and enhance the Nation's natural resource base and environment.

There are three primary agencies within USDA which manage programs that affect ocean, coastal and Great Lakes resources: the Agricultural Research Service (ARS), Cooperative State Research, Education, and Extension Service (CSREES) and the Natural Resources Conservation Service (NRCS). These organizations support activities to conserve wetlands, improve water quality and manage coasts and watersheds.

Agricultural Research Service (ARS)

Managing Coasts and Their Watersheds

The Agricultural Research Service (ARS) 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; Chesapeake Bay), this research has an impact on the health of coastal ecosystems. Managing the delivery of agriculturally derived pollutants (nutrients; pesticides) to aquatic ecosystems is important for controlling harmful algal blooms (e.g., *Pfiesteria*), reducing the size of the hypoxic zone that develops each year in the Gulf of Mexico, and maintaining healthy aquatic ecosystems and associated coastal and marine fisheries. A significant proportion of this research is supported through the Conservation Effects Assessment Project (CEAP), in collaboration with USDA's Natural Resource Conservation Service (NRCS) and Cooperative State Research, Education, and Extension Service (CSREES). ARS also works closely with the Environmental Protection Agency (EPA) and the US Geological Survey (USGS) via

interagency committees such as the Federal Agency Coordinating committee for the Chesapeake Bay, the Committee on Environment and Natural Resources (CENR) Subcommittee on Water Availability and Quality (SWAQ), and the Mississippi River Basin/Gulf of Mexico Hypoxia Task Force. In FY07, ARS began a new collaboration with NRCS and the National Oceanographic and Atmospheric Agency (NOAA), to explore land/water connections in a tropical coastal watershed (Jobos Bay, Puerto Rico), and outgrowth of NRCS/NOAA collaborations developed through the interagency Coral Reef Task Force.

Enhancing the Use and Conservation of Our Ocean, Coastal, and Great Lakes Resources

ARS is engaged in research programs directly related to marine aquaculture. These include developing aquaculture and livestock feed supplements from marine fish processing byproducts; developing marine shrimp feeds and culture technologies; studying food safety of farm-raised marine shellfish; integrating management of marine fish diseases using multi-disciplinary approaches; developing land-based culture systems for high-value marine finfish; developing fish feeds containing less fish meal; genetic improvement of shellfish and cold water marine fish; and habitat restoration. Cooperative research programs exist with state and Land Grant universities (University of Alaska, Oregon State University, University of Idaho, University of Maine, Mississippi State University, and Delaware State University), private research organizations (Freshwater Institute, Oceanic Institute and Harbor Branch Oceanographic Institute), private companies, and aquaculture industry associations.

Integrated research and demonstration projects are being conducted cooperatively between ARS, the Army Corps of Engineers, and the USDA Cooperative State Research, Education, and Extension Service (CSREES) scientists with assistance from the USDA-Natural Resources Conservation Service (NRCS), Economic Research Service (ERS), and National Agricultural Statistics Service (NASS) to develop alternative options and strategies to reduce sediment yield and nutrient use and availability for transport to surface waters; techniques for estimating soil nutrient status; and agricultural production systems that are both economically sound and environmentally benign.

Cooperative State Research, Education, and Extension Service

The Cooperative State Research, Education, and Extension Service provides federal leadership in creating and disseminating knowledge spanning the biological, physical, and social sciences related to agricultural research, economic analysis, statistics, extension, and higher education. CSREES' unique mission is to advance knowledge for agriculture, the environment, human health and well-being, and communities by supporting research, education, and extension programs in the Land-Grant University System and other partner organizations. CSREES doesn't perform actual research, education, and extension but rather helps fund it at the state and local level and provides program leadership in these areas.

The CSREES results-oriented vision is to improve economic, environmental, and social conditions through improved agricultural and other economic enterprises; safer, cleaner water, food, and air; enhanced stewardship and management of natural resources; healthier, more responsible, and more productive individuals, families, and communities; and a stable, secure, diverse, and affordable national food supply. Examples of programs that affect coastal and ocean resources are described below.

Natural Resources and Environment: Global Change and Climate Program

CSREES' Natural Resources and Environment programs are aimed at strengthening the nation's capacity to address critical environmental priorities and contribute to improved air, soil, and water quality; fish and wildlife management; enhanced aquatic and other ecosystems; the sustainable use and management of forests, rangelands, watersheds, and other renewable natural resources; and a better understanding of global climate change, including its impact on the diversity of plant and animal life. NRE programs also demonstrate the benefits and opportunities of sustainable development, and contribute to the economic viability of agriculture and rural communities realizing the impact of environmental policies and regulations.

CSREES recently established a global change and climate program that focuses on determining the effects of global change and climate on land-based systems. The program addresses two knowledge areas; Weather and Climate, and Alternative Uses of Land. Contributions from this research program include new tools to accurately measure greenhouse gases; methods for measuring and estimating carbon in ecosystems at different scales; and effective ways to sus-

tain productivity in a changing environment. Global change extension programs focus on technologies and practices to reduce carbon in the atmosphere and risk management practices to anticipate natural and human impacts on agricultural ecosystem dynamics. Education and extension activities provide robust scientific information for learning and decision support systems for citizens and public officials to evaluate the environmental and socioeconomic impacts of policy options for sustainable resource management.

Natural Resources and Environment: Water Quality Program

CSREES efforts cover a broad range of activity in this area. Research funded by CSREES provides the basic knowledge needed to address water quality and quantity issues in rural and agricultural watersheds. Extension and other outreach programs apply this knowledge to protect and improve water quality and assure the continued supply of safe and healthy water resources to communities across the nation. Education activities provide state-of-the-science learning opportunities for future leaders addressing water resource issues.

The goal of the National Water Quality Program (NWQP) is to protect or improve the quality of water resources throughout the U.S. and its territories, particularly in agriculturally managed watersheds. It seeks to address this goal at the national, regional, state, and local levels. NWQP brings university scientists, instructors, and extension educators into more effective and efficient partnerships with federal interagency priority programs to address water quality issues in U.S. agriculture. A key emphasis of the program is integration of extension, research, and education resources to solve water quality problems at the local level. NWQP is supported in part by the Section 406 National Integrated Water Quality Competitive Grants Program. This program includes regional water quality coordination projects and associated direct-funded projects to support integrated, multifunctional agricultural research, extension, and education activities. For example, the Land Grant Universities in Delaware, Maryland, Pennsylvania, Virginia and West Virginia and CSREES, working with EPA Region III, have formed a partnership to advance water quality protection and restoration efforts in the Mid-Atlantic by providing water quality science support, training and education. This regional program will be anchored by, and complement, state water quality programs and existing extension efforts.

National Research Initiative: Water and Watersheds Program

The National Research Initiative Competitive Grants Program (NRI) at CSREES is charged with funding research, education, and extension activities to address key problems of national and regional importance in biological, environmental, physical, and social sciences relevant to agriculture, food, the environment, and communities on a peer-reviewed, competitive basis. To address these problems, NRI advances scientific knowledge in support of agriculture, forestry, and related topics. The program also supports the integration of research, education, and extension to generate, translate, and transfer new technology and knowledge into practical applications focused on solving problems of national importance.

The Water and Watersheds program under the NRI supports projects to protect and enhance the natural resource base and environment by improving and maintaining healthy watershed habitat and water supply protection; enhance economic opportunities by reducing economic liability from water contamination; improve the quality of life in rural America through adequate clean water supplies; and protect food safety through clean irrigation and livestock drinking water supplies. The long-term goals for this program are: reduce pathogens such as bacteria, viruses, and protozoa in waters derived from agricultural and rural watersheds; and maintain adequate water supplies for agricultural crop and livestock production and rural use.

Animals and Animal Products: Aquaculture

The current CSREES aquaculture research and extension base is highly diverse in terms of funding mechanisms, areas of research, and species cultured. CSREES also provides leadership, on behalf of the Secretary of Agriculture, to facilitate the coordination of all federal programs in aquaculture. This is done through the Joint Subcommittee on Aquaculture, which reports to the National Science and Technology Council (NSTC) of the Office of Science and Technology Policy in the Office of the Science Advisor to the President.

CSREES' funding of scientific and technology transfer goals to support development of a globally competitive U.S. aquaculture industry includes: (1) improving the efficiency of U.S. aquaculture production; (2) improving aquaculture production systems; (3) improving the sustainability and environmental compatibility of aquaculture production; (4) ensuring and improving the quality, safety, and variety of aquaculture products for consumers; (5) improving the marketing of U.S. aquaculture products; and (6) improving informa-

tion dissemination, technology transfer, and access to global information and technology in aquaculture.

CSREES works in close partnership with and funds operating costs and grants for five regional aquaculture centers (RACs). The mission of the RACs is to support aquaculture research, development, demonstration, and extension education to enhance viable and profitable U.S. aquaculture production to benefit consumers, producers, service industries, and the American economy. The RACs encourage collaborative research and extension education aquaculture programs with regional or national application. RACs programs complement and strengthen existing aquaculture research and extension programs supported by USDA, the National Sea Grant Program, and other public institutions. Projects developed and funded by the RACs are based on aquaculture industry needs and are designed to affect commercial aquaculture development directly in all U.S. states and territories.

The centers, located in Hawaii, Massachusetts, Michigan, Mississippi and Washington, coordinate institutional resources with industry needs to fulfill their mission to support aquaculture research, development, demonstration and extension education to enhance viable and profitable U.S. aquaculture. The centers are associated with colleges and universities, state departments of agriculture, federal facilities, and nonprofit private research institutions. The five centers fund and oversee cooperative research, development and demonstration projects that directly address the concerns of industry in their regions.

Natural Resources Conservation Service (NRCS)

Coastal and Oceans Related Activities

Conservation Technical Assistance (CTA)

NRCS working in partnership with local conservation districts and others are major providers 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 landusers 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 off-site benefits to near-shore ocean habitats, including coral reef ecosystems, by reducing sediment and nutrient loading into receiving water bodies.

A significant proportion of CTA funds are used to assist farmers in the development of comprehensive nutrient management plans. These reduce 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 of 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 and environmental quality as compatible National goals. Through EQIP, farmers and ranchers may receive financial and technical help to install or implement structural and management conservation practices on eligible agricultural land. Producers engaged in livestock or crop production on eligible land may apply for the program. Eligible land includes cropland; rangeland; pasture; private non-industrial forestland; and other farm or ranch lands, as determined by the Secretary.

EQIP activities are carried out according to an EQIP 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 of certain conservation practices important to improving and maintaining the health of natural resources in the area. Incentive payments may be made to encourage a producer to adopt land management practices, 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. Limited resource farmers and beginning farmers may be eligible for up to 90 percent of the cost of conservation practices.

Wetlands 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 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 over 1.9 million acres enrolled in the program.

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.

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, not elsewhere classified	FY 2006 Actual	FY 2007 Enacted	FY 2008 Budget Request
Agricultural Research Service								
Managing Coasts and Their Watersheds					100%	1.9	3.9	3.3
Marine Aquaculture	100%					6.4	6.4	0.4
Cooperative State Research, Education and Extension Service								
Non-point Source (NS) Freshwater, Physical	95%		5%			0.8	0.9	0.6
NS Freshwater, Chemical	95%		5%			1.8	1.8	1.1
NS Estuarine Water, Physical	90%		10%			0.2	0.3	0.2
NS Estuarine Water, Chemical	100%					1.4	1.3	1.0
NS Marine, Physical	100%					0	0	0
NS Marine, Chemical	95%		5%			0.2	0.2	0.1
Habitat, Marine (HM), Freshwater	90%		10%			0.8	0.5	0.3
HM, Estuarine	90%		10%			0.7	0.7	0.6
HM, Marine	90%		10%			0	0.1	0
Natural Resources Conservation Service								
Conservation Planning & Tech Asst	100%					183.7	165.6	179.2
Wetlands Reserve Program	100%					64	96.5	152.4
Environmental Quality Incentives Program	100%					368.2	377.3	371
Department of Agriculture Total						630.1	655.5	710.2

*The FY 2008 President's Budget was used to allocate funding across functional areas.

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

The Department of Commerce's National Oceanic and Atmospheric Administration (NOAA) forecasts weather and climate, manages fisheries and coastal areas, provides navigation services, and researches atmospheric and oceanic issues. NOAA's mission is to describe and predict changes in the earth's environment, and to conserve and wisely manage America's coastal and marine resources to ensure sustainable economic opportunities. NOAA's four major goals are:

- ▶ Protect, restore, and manage the use of coastal and ocean resources through ecosystem-based management.
- ▶ Understand climate variability and change to enhance society's ability to plan and respond.
- ▶ Serve society's needs for weather and water information.
- ▶ Support the Nation's commerce with information for safe, efficient, and environmentally sound transportation.

Ocean and coastal programs within NOAA include:

National Ocean Service (NOS)

The National Ocean Service is the primary federal agency concerned with the study, preservation, and enhancement of America's coastal environment and resources. As such, the agency contributes in many ways to the themes outlined in the U.S. Ocean Action Plan. NOS supports maritime transportation through mapping, charting, and oceanographic activities, producing information to increase the efficiency and safety of marine commerce. NOS collects, manages, and maintains a variety of marine data important to navigators, including the nature and form of the coast, the depths of the water, general character and configuration of the sea bottom, locations of dangers to navigation, the rise and fall of the tides, and locations of aids to navigation. Products and services such as Electronic Navigational Charts, the Coast Pilot, Physical Oceanographic Real Time Systems, and oceanographic nowcast/forecast models provide mariners with the decision support tools needed for a complete understanding of the physical environment in which they operate.

Coastal ecosystems are subjected to a variety of stressors including climate change, extreme natural events, invasive species, land-use, and pollution. As a focal point for coastal resource research within NOAA, NOS advances our understanding of ocean, coastal, and Great Lakes resources by promoting a wide range of research, monitoring, and assessment activities to build the strong scientific foundation essential for sustainable use of coastal resources.

As a national leader for coastal stewardship, NOS programs play a critical role in enhancing the use, conservation, and management of our ocean, coastal, and Great Lakes resources. There are 13 designated national marine sanctuaries, ranging in size from one-quarter square mile in Fagatele Bay, American Samoa, to 5,300 square miles in Monterey Bay, CA. In partnership with the State of Hawaii and the Department of the Interior, the National Marine Sanctuary Program (NMSP) also administers and manages the Papahānaumokuākea Marine National Monument. NOS also works in close partnership with coastal states to manage the Nation's valuable coastal zones and nationally significant estuarine research reserves. Finally, acting on behalf of the U.S. Department of Commerce as a trustee for natural resources, NOS works to protect and restore coastal resources injured by releases of oil and other hazardous materials.

National Marine Fisheries Service (NOAA Fisheries)

NOAA's National Marine Fisheries Service (NMFS) has stewardship responsibility for the largest Exclusive Economic Zone in the world. Healthy and productive coastal, marine, and Great Lakes ecosystems create billions of dollars of value in recreational and commercial activity each year, as well as protecting and conserving protected resources and habitats of living marine resources. New legislation, evolving management philosophies, and scientific advances have created new opportunities for managing these resources.

The Magnuson-Stevens Fishery Conservation and Management Act (MSA) is the primary law governing marine fisheries management in U.S. federal waters. The Act was first enacted in 1976 and amended in 1996. President George W. Bush, through the U.S. Ocean Action Plan (OAP), gave top priority to reauthorizing the Magnuson-Stevens Act. The President called for an end to overfishing, increased use of market-based management tools,

creation of a national saltwater angler registry, and an emphasis on ecosystem approaches to management. Congress positively responded by passing the Magnuson-Stevens Fishery Conservation and Management Reauthorization Act of 2006 (MSRA), which the President signed on January 12, 2007.

This reauthorization, along with proposed legislation for marine aquaculture and marine mammals, are the primary management tools NMFS will use to meet its immediate and long-term goals, including advancing ecosystem approaches to managing living marine resources. NMFS' OAP objectives include:

- ▶ Doubling the number of Limited Access Privilege Programs (LAPPs) by 2010. LAPPs provide exclusive privileges to harvest a quantity of fish to facilitate market-based approaches to fisheries management. LAPPs move fisheries management away from inefficient regulatory practices, and they have been shown to lead to lengthened fishing seasons, improved product quality, and safer conditions for fishermen. NMFS is well on its way to meeting this objective, as 11 LAPPs will be operational by the end of 2007, including the adoption of the two newest LAPPs for Gulf of Mexico Red Snapper and Georges Bank Fixed Gear Fisheries.
- ▶ Securing passage of an offshore aquaculture bill to promote and facilitate the development of environmentally sustainable commercial opportunities, as called for in the National Offshore Aquaculture Act of 2007. Currently, over 80 percent of the seafood Americans consume is imported, and at least 40 percent of those imports are farmed seafood. NOAA's aquaculture efforts are focused on creating domestic seafood supply to meet the growing demand for seafood products, reduce dependence on seafood imports, provide jobs for economically depressed coastal communities, and increase regional food supply and security.
- ▶ Ending overfishing by 2011, reducing bycatch, and providing effective conservation under the Endangered Species Act and the Marine Mammal Protection Act. Overfishing occurs when more fish from a species are caught than is sustainable, endangering the species' long-term existence. NMFS, in partnership with the Regional Fishery Management Councils, will establish annual quotas in federally managed fisheries to end overfishing by 2010 for stocks currently undergoing overfishing and by 2011 for all other federally managed stocks. NMFS has already implemented several provisions to this end, including initiating

environmental scoping of the new fishing management provisions for establishing guidelines for annual catch limits and accountability measures.

- ▶ Improving the management of international living marine resources, including ending the practice of shark finning and other management strategies to conserve sharks, and defining illegal, unreported, or unregulated fishing or bycatch. As initial steps to implement the new provisions contained in MSRA, NMFS issued a final rule defining illegal, unreported, or unregulated fishing on April 12, 2007, and issued an advance notice of proposed rulemaking on June 11, 2007, on the certification of nations whose fishing vessels are engaged in illegal, unreported, or unregulated fishing or bycatch of protected living marine resources.
- ▶ Increasing the quality and accuracy of recreational fishing information and establishing a national registry for recreational fishermen (pursuant to the enacted provisions in MSRA), and implementing NMFS strategies to address the major findings in the National Research Council's Review of Recreational Survey Methods.
- ▶ Promoting the passage of proposed legislation to reauthorize the Marine Mammal Protection Act which, among other things, clarifies the threshold for when an activity constitutes harassment, expands provision of incidental take of marine mammals to include recreational as well as commercial fishing, prohibits the release of captive marine mammals into the wild, and enhances enforcement capabilities.
- ▶ Enhancing the use and conservation of ocean, coastal, and Great Lakes resources through NMFS leadership in support of the National Fish Action Plan, fostering local restoration projects, implementing the Coral Reef Local Action Plans, and protecting the Papahānaumokuākea Marine National Monument and similar initiatives to conserve marine ecosystems.
- ▶ NMFS also will work collaboratively with other agencies and organizations on ecosystem-based approaches to developing indicators of ecosystem status and trends, and on joint strategies to address priority regional ecosystem issues, including NOAA's effort to improve regional integration and collaborative science and management efforts.

Office of Oceanic and Atmospheric Research (NOAA Research)

The Office of Oceanic and Atmospheric Research (OAR) studies the Earth system from the deep ocean to the highest reaches of the atmosphere, provid-

ing products and services that help to explain, and, in some cases, to predict environmental changes at spatial scales from local to global and at time scales from days to centuries. OAR is integrated across the three central research themes of climate; weather and air quality; and ocean, coastal, and Great Lakes resources, reflecting the intimate connections between the land, ocean, and atmosphere.

OAR is an applied research organization that consists of 7 federal laboratories, their 13 Cooperative Institute research partners, the National Sea Grant College Program, the National Undersea Research Program, the NOAA Climate Program, and the Office of Ocean Exploration and Research. These programs are enhanced by formal partnerships with academia, industry, and governmental agencies.

The coupling of the oceans and atmosphere drives many natural cycles and events including weather systems, climate variability, and long-term environmental change. 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. The development and enhancement of sophisticated climate models is central to the work of NOAA's 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 scientists, in partnership with many of the Nation's top universities and other federal scientists, provide research-based information and predictive capabilities to assist management of U.S. territorial waters. The National Sea Grant College Program 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. OAR information has supported decisions regarding fisheries, coral reef, 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.

National Weather Service (NWS)

The National Weather Service's (NWS) mission is to provide weather, hydrologic, and climate forecasts and warnings for the United States, its territories, adjacent waters, and ocean areas for the protection of life and property and the enhancement of the national economy. It 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 and climate-change prediction. The NWS operates the National Data Buoy Center, which maintains a marine observational network of over 150 buoys and 55 coastal stations.
- ▶ **Marine Weather Services:** The NWS issues marine forecasts and warnings for the U.S. coastal, Great Lakes, offshore, and high seas waters.
- ▶ **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; the Pacific Tsunami Warning Center in Ewa Beach, Hawaii; and the Deep-ocean Assessment and Reporting of Tsunamis buoy network.
- ▶ **Storm Surge:** The Sea, Lake, and Overland Surges from Hurricanes (SLOSH) model provides an assessment of the storm surge expected from hurricanes hitting land along the U.S. East and Gulf coasts. The extratropical model provides expected storm surge for winter-type storms for the East, Gulf, and Northwest coasts, and Alaska's Bering Sea and Arctic coastlines.
- ▶ **Numerical Modeling Activities for the Ocean and the Ocean-Atmosphere Coupled System:** The NWS runs ocean data assimilation and numerical models that provide analysis and guidance forecasts to support weather and seasonal climate forecast and warning responsibilities.

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

The National Environmental Satellite, Data, and Information Service (NESDIS) ensures continuous operational availability and access to environmental satellite data and information from both NOAA and non-NOAA satellites. While NESDIS' remote sensing activities have focused on short-term weather warnings and forecasts, ocean applications have grown in importance as satellite sensor technologies have improved. Looking toward the future, the National Polar Orbiting Environmental Satellite System and the Geostationary Operational Environmental Satellite R-Series will 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, and to provide guidance for the development of future spacecraft and sensors. 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. NESDIS is also 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. national interests and to provide specialized meteorological and oceanographic services to United States government agencies. NESDIS also operates the Nation's oceanographic, climatic, and geophysical data centers, which provide for long-term stewardship, and access to critical environmental data and information. Data from multiple satellite sensors can be used to infer a variety of oceanic properties, ranging from surface wind speeds to small/large scale oceanic circulations. NOAA's National Data Centers manage the world's largest collection of publicly available climatic, oceanographic, and geophysical data and information. They house and operate several World Data Centers for Oceanography, Marine Geology, and Geophysics, as well as the NOAA Library. These World Data Centers are components of a global network of discipline centers that facilitate the international exchange of data. The NOAA Central Library maintains an extensive, multi-disciplinary research collection of all subjects related to the NOAA mission.

NOAA Marine and Aviation Operations

NOAA Marine and Aviation Operations' mission 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 20 research and survey vessels, provides guidance and

assistance for outsourced ship and aircraft support, conducts the NOAA Diving Program, and administers the NOAA Commissioned Corps. The NOAA Commissioned Corps – the smallest of the Nation's seven uniformed services – operates ships and aircraft, leads mobile field parties, manages research projects, conducts diving operations, and serves in program positions throughout NOAA.

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

National Institute of Standards and Technology

The National Institute of Standards and Technology (NIST) is a non-regulatory federal agency within the U.S. Commerce Department's Technology Administration. 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 are provided specifically to the ocean community through the National Marine Analytical Quality Assurance Program (NMAQAP) and through its work in marine health biosciences.

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 quality assurance exercises among various chemical laboratories (foreign and domestic) that analyze marine environmental samples (particularly for contaminants) to insure that coastal management decisions affecting changes in legislation, health, trade, and economics are based on valid measurements. Also under this program, NIST builds strategic collaborations within

the ocean science community to advance measurement technology for the solution of ocean issues. 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 professional scientists at this coastal facility who collaborate with the other HML partners and other national and international ocean science professionals to provide the science and biotechnology necessary for understand linkages between environmental condition and the health of marine organisms and humans.

Through its partnership with the HML, NIST provides scientific and technical research and services in the area of marine health biosciences by working to improve the quality of cell and tissue measurements for marine biological products. This includes research to aid in the development of a well-characterized marine animal cell lines that can be used in marine toxicological studies and developing standards for the production and generation of microarrays for commercially important marine organisms, including performance and analysis protocols.

Also through its partnership with the HML, NIST is collaborating with NOAA and members of the aquaculture community to develop new technologies and scientific information that will provide a basis for innovation and advance of domestic marine aquaculture. The focus of this work is to overcome measurement and technology barriers associated with marine aquaculture that are limiting to the domestic industry which is in significant competition with foreign sources of seafood. This competition will only increase as global and US demand for seafood products continue to increase.

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, not elsewhere classified	FY 2006 Actual	FY 2007 Enacted	FY 2008 Budget Request
National Oceanic and Atmospheric Administration								
National Ocean Service								
Operations, Research, and Facilities								
Mapping and Charting		100%				93.4	85.23	92.6
Tide and Current Data		100%				24.07	23.78	26.36
Ocean Assessment Program	100%					121.1	81.65	85.16
Response and Restoration	100%					36.5	33.84	23.37
National Centers for Coastal Ocean Science			100%			53.19	59.52	47.77
Coastal Management	100%					94.28	96.93	92.93
Marine Sanctuary Program	100%					38.76	46.33	43.76
Procurement, Acquisition, & Construction								
NERRS Construction & Acquisition	100%					16.2	7.17	7.17
Marine Sanctuaries Facilities	100%					15.97	9.85	5.49
Coastal and Estuarine Land Conservation Program	100%					38.41	27.47	15
Other NOS Construction/Acquisition	100%					20.71	10.32	0
National Marine Fisheries Service								
Operations, Research, and Facilities								
Protected Species Research and Management	51%		48%	1%		145.13	141.02	165.10
Fisheries Research and Management	45%		55%			288.62	301.58	325.34
Enforcement and Observers/Training	96%			4%		83.07	78.13	86.97
Habitat Conservation and Restoration	45%	10%	45%			174.77	43.54	50.42

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, not elsewhere classified	FY 2006 Actual	FY 2007 Enacted	FY 2008 Budget Request
Other Activities Supporting Fisheries	33%		67%			71.09	68.47	76.76
Alaska Composite	33%		67%			50.12	50.73	0.00
Other NMFS Accounts								
Other Accounts	36%		64%			34.85	14.37	24.55
Pacific Coastal Salmon Fund	88%		12%			66.57	66.57	66.83
Procurement, Acquisition, & Construction								
NMFS Construction	100%					29.92	11.19	0.00
Oceanic and Atmospheric Research								
Ocean, Coastal, & Great Lakes Research Laboratories and Joint Institutes			100%			22.8	22.8	20.2
National Sea Grant College Program	49%	1%	17%		33%	54.7	54.7	54.9
National Undersea Research Program			100%			9.1	11.6	0.0
Ocean Exploration			100%			14.2	15.8	0.0
Ocean Exploration and Research			100%			0.0	0.0	27.8
Other Ecosystem Programs			100%			5.5	4.5	2.6
Other Ocean, Coastal and Great Lakes Partnership Programs			100%			20.4	5.8	0.0
Climate Research Labs & Joint Institutes / AOML & PMEL			100%			13.4	14.1	14.5
Climate Research AMOC			100%			0.0	0.0	5.0
National Weather Service Operations, Research & Facilities								
U.S. Marine Observations			12%		90%	24.16	21.04	28.19
U.S. Marine Weather Program		15%			85%	18.84	18.84	18.84
U.S. Tropical Cyclone Program					100%	5.72	6.33	6.48
U.S. Tsunami Warning Program					100%	16.28	25.41	25.85

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, not elsewhere classified	FY 2006 Actual	FY 2007 Enacted	FY 2008 Budget Request
Storm Surge Program					100%	0.16	0.16	0.16
Marine Modeling					100%	1.70	1.70	2.84
NOAA Marine and Aviation Operations								
Operations, Research, & Facilities								
Marine Services	60%	25%	15%			95.5	93.4	114.7
Fleet Planning & Maint.	60%	25%	15%			15.0	17.0	17.2
Aircraft Services		100%				2.1	2.2	2.1
Procurement, Acquisition, & Construction								
Fleet Replacement	15%	76%	9%			65.4	32.6	4.4
National Environmental Satellite, Data, and Information Service								
Operations, Research, & Facilities								
Environmental Satellite Observing Systems								
Ocean Remote Sensing	65%		35%			3.93	3.86	3.86
Coral Reef Watch	100%					0.00	0.74	0.74
Other Environmental Satellite Observing Services	65%		35%			10.55	10.66	10.88
NOAA's Data Centers and Information Services								
Archive, Access, and Assessment			14%		86%	6.71	9.12	9.36
Coastal Data Development	100%					5.38	4.55	4.51
International Pacific Research Center			14%		86%	0.65	0.43	0.00
Pacific Ocean and Environmental Information Center			14%		86%	0.00	0.00	0.00

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, not elsewhere classified	FY 2006 Actual	FY 2007 Enacted	FY 2008 Budget Request
Procurement, Acquisition, & Construction								
Systems Acquisition								
GOES Series	100%					38.44	44.09	48.23
NOAA K-N'	33%	7%	60%			6.08	5.39	6.89
Polar Convergence	60%	20%	20%			79.15	84.38	82.83
Program Support								
Operations, Research & Facilities								
Corporate Services	40%	20%	25%	5%	10%	72.90	72.37	78.25
NOAA Education Program	100%					37.66	30.27	19.36
Facilities	40%	20%	25%	5%	10%	4.71	8.71	7.58
Procurement, Acquisition & Construction								
Corporate Services					100%	17.74	13.43	0.00
Construction					100%	19.74	15.77	23.25
NOAA Total						2185.323	1909.465	1877.062
National Institute of Standards and Technology								
Scientific and Technical Research and Services								
Marine Analytical Quality Assurance and Environmental Specimen Banking	100%					2.7	2.7	2.7
Marine Biosciences	100%					1.0	1.0	1.0
NIST Total						3.7	3.7	3.7
Department of Commerce Total						2189.0	1913.2	1880.8

*The FY 2008 President's Budget was used to allocate funding across functional areas.

DEPARTMENT OF DEFENSE

Defense Advanced Research Projects Agency (DARPA)

CEROS

The Center of Excellence for Research in Ocean Sciences (CEROS) encourages leading edge research and development in ocean sciences, by involving highly specialized small businesses with recognized expertise in ocean related research, and providing access to the ocean sciences expertise of the University of Hawaii. Major research areas of interest have included shallow water surveillance technologies, ocean environmental preservation, new ocean platform and ship concepts, ocean measurement instrumentation, and unique properties of the deep ocean environment. The funds were appropriated by the Congress and not requested by DARPA, and were provided to the CEROS, who in turn suballocated the funds to small businesses and the University of Hawaii.

Office of the Secretary of Defense

Strategic Environmental Research & Development Program (SERDP)

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 was created with a vision of bringing the capabilities and assets of the federal laboratories to bear on the environmental challenges faced by the Department of Defense. As such, SERDP is DOD's corporate environmental research and development program. To address the highest priority issues confronting the Army, Navy, and Air Force, SERDP focuses on cross-service requirements and pursues high-risk/high-payoff 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. The fate, transport and effects of energetic materials and other contaminants in the marine environment are areas of ongoing research. Finally,

SERDP has established 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 2005 Federal Ocean and Coastal Activities Report 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 mission of the Department of the Navy is to maintain, train and equip combat-ready Naval forces capable of winning wars, deterring aggression and maintaining freedom of the seas. Navy assets include 383,000 active duty personnel, over 157,000 ready reserve personnel, 186,000 civilian personnel, 308 ships and 4,100 aircraft. The U.S. Navy's ocean and coastal activities are performed by the Office of Naval Research and, for the Chief of Naval Operations, by the Oceanographer of the Navy.

Office of Naval Research (ONR)

The Office of Naval Research coordinates, executes, and promotes the science and technology programs of the United States Navy and Marine Corps through universities, government laboratories, and nonprofit and for-profit organizations. 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, and fosters continuing academic interest in naval relevant science from the high school through post-doctoral levels. It has programs in a number of ocean related activities.

Naval Ocean Sciences

Basic research areas included in this program are: coastal dynamics, ocean engineering, remote sensing, ocean biology/chemistry, marine geosciences, high latitude sciences, environmental optics, theories and computational research for ocean prediction and modeling, physical oceanography, and ocean acoustics. The basic research conducted in these areas is competitively selected to have a potential for major impact on future naval operations and warfare. Focus is upon observing, modeling, and predicting mostly small scale processes in the air/ocean/shore environments as they might affect naval operations as well as sensor and system performance in the world's oceans, primarily littoral regions around the globe. Principal investigators are primarily in the academic community but extensive ties exist 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, plus state and local entities, both public and private.

Applied Ocean Research

Applied oceanographic research is conducted in an integrated approach with the basic research program to allow new knowledge obtained in various oceanographic disciplines to be synthesized and exploited toward specific naval applications, such as nowcasts and forecasts of ocean variability or environmental effects on sensors, platforms, structures, and operations. Often the result is an environmental model, algorithm or technique to be tested for operational use. The products are designed to increase the naval operator's knowledge of the battlespace environment with the goal to unclutter the tactical picture, provide tools for tactical decisions, and provide a tactical advantage through exploitation of environmental variability. In addition, significant investments are made in instrumentational and observational methods such as drifters, floats and, most recently, autonomous underwater vehicles for adaptive sampling and data assimilation. Principal investigators are in the academic community, navy and other government labs, and private industry. A significant portion of these developments, especially the observational capabilities, have often proved very useful to agency programs, plus state and local entities, both public and private.

National Oceanographic Partnership Program

This program was established in Fiscal Year 1997 through Public Law 104-201 with the aims: 1) 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; (2) to 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 linkage exists with fourteen Federal agencies (Navy, NOAA, NSF, NASA, DoE, EPA, USCG, DoI/USGS, DARPA, DoI/MMS, OSTP, OMB, DOS & USACoE). Efforts funded under this program involve partnerships between various components of the national oceanographic community focusing most recently on a US ocean observing system.

Marine Mammals

This program provides both basic and applied research in response to the need to conduct naval activities in ways that minimize disruption to marine mammals and other protected marine life. Program areas include investigations of environmental consequences of underwater sound, predictive modeling and quantitative risk assessment for manmade sounds in the marine environment, and development of resources to monitor and mitigate potentially adverse interactions between naval activities and 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 not only presented in peer-reviewed professional literature and similar outlets for scientific information, but 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 high level of public interest in a relatively new, unfamiliar and technical subject, the Marine Mammal program devotes a significant portion of its effort to outreach and education from grade school through postgraduate levels of instruction.

Oceanographer of the Navy

The Chief of Naval Operations, through the Oceanographer of the Navy, sponsors operational Navy meteorology and oceanography services and related research and development. 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. The Oceanographer of the Navy sponsors programs in four closely related disci-

plines to provide worldwide, comprehensive, integrated weather and ocean support – 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 or strategic edge by exploiting the physical environment. Early in 2001, the Oceanographer of the Navy was also named the “Navigator of the Navy.” He serves as the Chief of Naval Operations’ focal point for the development of technical standards for navigation plans, data standards, training, and navigation system certification.

Oceanography Program

This program provides a wide array of essential operational oceanographic 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.

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 (SPAWAR) 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. This program includes the Oceanographer’s newly-acquired Space Meteorology and Oceanography (METOC) line.

Geospatial Information and Services

This program provides hydrographic data from nearshore areas to support the production of coastal,

combat, approach, harbor and special purpose nautical charts used to address littoral warfare requirements. Funding primarily supports national security interests and also benefits identification of natural hazards, cooperative efforts with other nations, maritime commerce, marine science, technology and education.

Environmental Compliance

Marine Mammals

Director, Environmental Readiness Division (CNO (N45)), plans, consolidates, and manages Navy’s marine mammal R&D program to support operational Fleet compliance with the Marine Mammal Protection Act (MMPA) and Endangered Species Act (ESA). This includes alignment, where possible, with Navy’s marine mammal S&T program to ensure efficient use of available technical advances and opportunities. Navy’s primary concern is the potential effect on marine mammals by the use of underwater projectors like sonars and sound generated from underwater explosions. The program addresses four areas: (1) Determining reliable marine mammal population abundance and distribution data worldwide; (2) refining passive acoustic monitoring techniques; (3) developing scientifically-based criteria and thresholds that define the effects of underwater sound on marine mammals; and (4) developing a methodology that removes inconsistencies in conclusions on the potential effects to marine mammals for similar activities and in similar environments due to the improper application of data or models.

U.S. Army Corps of Engineers

The Army Corps of Engineers (Corps) maintains regulatory, coastal storm damage reduction, environmental restoration, and research and development missions that significantly contribute to coastal and ocean activities of the Federal government. The Corps supports a coastal wave data collection program, conducts coastal 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 six programs:

- ▶ **Construction:** The Corps builds navigation projects, which generally consist of dredging entrance and exit channels and harbors to a greater depth and width to allow larger vessels to safely navigate in and out of the harbors and ports. 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 storm damage reduction projects, which generally consist of dredging sand from the ocean and placing it on the shore. Often this is done in conjunction with constructing groins to mitigate shore erosion. 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 programs such as the Aquatic Ecosystem Restoration (AER). The Aquatic Ecosystem Restoration contributes to the nation's environmental resources by restoring degraded significant ecosystem structure, function and process to a more natural condition.
- ▶ **Operation and Maintenance:** 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 navigation needs of general commerce where authorized by law; clearing and straightening channels; and removal of obstructions to navigation. Work to be accomplished 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. Generally, the Corps is not responsible for O&M of AER and SDR projects.
- ▶ **Mississippi River and Tributaries:** Under this program, Congress has authorized two structures, with levees and channels, to divert freshwater from the Mississippi River into coastal bays and marshes for fish and wildlife restoration.
- ▶ **General Investigations:** The Corps conducts studies, pre-construction engineering and design, data collection, interagency coordination and research activities to determine the need, engineering feasibility, economic justification, and the

environmental and social suitability of projects relating to storm damage reduction and restoration of aquatic coastal resources. These two business programs, storm damage reduction and aquatic coastal ecosystem restoration, provide the nation with a full range of opportunities. Specifically, the Storm Damage Reduction 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 Aquatic Ecosystem Restoration contributes to the nation's environmental resources by restoring degraded significant ecosystem structure, function and process to a more natural condition.

- ▶ **Regulatory Program:** The regulatory program administers laws pertaining to regulation of activities affecting U.S. waters, including wetlands in accordance with the Rivers and Harbors Appropriation Act of 1899, the Clean Water Act, and the Marine Protection, Research, and Sanctuaries Act of 1972.
- ▶ **Coastal Wetlands Restoration Trust Fund:** In 1990, the Coastal Wetlands Planning, Protection and Restoration Act (Public Law 101-646) authorized transfer of 18 percent of annual appropriation from the Aquatic Resources Trust Fund, Sport Fish Restoration Account, and the Coastal Restoration Trust Fund, for coastal wetlands activities; 70 percent of this amount is allocated to the Corps of Engineers for use by the Louisiana Coastal Wetlands Conservation and Restoration Task Force, chaired by the Secretary of the Army, to provide for the long term conservation, protection, and restoration of coastal wetlands in the State of Louisiana.

DEPARTMENT OF DEFENSE

Percentage of Funds Dedicated to Each Ocean-Related Program Function*

	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, not elsewhere classified	FY 2006 Actual	FY 2007 Enacted	FY 2008 Budget Request
Defense Advanced Research Projects Agency								
The Center of Excellence for Research in Ocean Sciences (CEROS)		30%			70%	0.00	0.00	0.00
Office of the Secretary of Defense								
Strategic Environmental Research & Development Program (SERDP)	100%					3.00	6.00	6.00
Environmental Security Technology Certification Program (ESTCP)	100%					1.00	3.00	3.00
Department of the Army								
Corps of Engineers								
Construction, General								
Environmental	100%					17.24	14.07	0.00
Shore Protection			100%			153.34	80.76	21.65
Navigation		100%				261.81	209.52	139.00
General Investigations								
Shore Protection	100%					7.18	5.37	0.77
Coastal Field Data			100%			18.65	7.52	13.30
Research and Development	50%	50%				4.62	5.00	4.43
Operation and Maintenance								
Channels and Harbors		100%				635.00	661.00	743.00
Protection of Navigation		100%				5.40	5.50	5.50
Coastal Wetlands Restoration Trust Fund	100%					63.00	76.00	64.00
FC, Miss. River & Tribs.	100%					1.02	3.98	1.50
Department of the Navy								
Office of Naval Research (ONR)								
Naval Ocean Sciences					100%	84.00	84.00	85.00
Applied Ocean Research					100%	31.00	26.80	22.00

DEPARTMENT OF DEFENSE

Percentage of Funds Dedicated to Each Ocean-Related Program Function*

	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, not elsewhere classified	FY 2006 Actual	FY 2007 Enacted	FY 2008 Budget Request
National Oceanographic Partnership Program					100%	10.00	10.00	10.00
Marine Mammals					100%	5.00	4.20	12.00
Environmental Compliance								
Marine Mammals					100%		4.60	4.70
Oceanographer of the Navy								
Oceanography Program					100%	171.90	181.50	178.60
Oceanography - Research and Development to Support Operations**					100%	38.40	42.90	56.70
Geospatial Information and Services					100%	84.20	81.40	83.80
Department of Defense Total						1595.76	1513.12	1454.95

*The FY 2008 President's Budget was used to allocate funding across functional areas.

** Includes the recently-acquired Space Meteorology and Oceanography (METOC) line, which was not included in the FY01 and FY03 versions of this biennial report.

DEPARTMENT OF ENERGY

Two Offices within the Department of Energy conduct ocean-related research: the Office of Science and the Office of Fossil Energy. The current programs within these offices are listed below.

Office of Science

The Biological and Environmental Research program within the Department of Energy's 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 river basins. Research is supported to validate and optimize the ocean and sea ice components of these models to include state-of-the-science knowledge and to ensure that these models operate on a range of computer architectures to maximize their utility to the scientific community.

Research is also supported to develop improved methods and tools for the diagnosis and intercomparison of the variety of climate models developed by scientists around the world. This intercomparison is increasingly important as climate models become more complex, yet the basis for the disagreements in the climate simulations among the models and relative to climate observations remain significant and poorly understood. The nature and causes of these disagreements must be accounted for in a systematic fashion in order to confidently use these models for simulation of global climate change.

Ocean carbon sequestration research concluded in Fiscal Year 2006, due to adverse effects on deep ocean biology and chemistry (e.g., mortality of invertebrates in the deep ocean) from injecting a relatively pure stream of carbon dioxide into the deep ocean as a possible strategy for sequestering carbon dioxide separated from fossil fuel power plants and industrial stack gases.

Finally, genomic research is supported on ocean microbes to identify and understand the nature and roles of these microbes in the global carbon cycle. The genomic DNA sequences of select ocean (and terrestrial) microbes are determined providing a wealth of new information of the role of the microbial world in the processing and sequestration of carbon dioxide in the ocean and terrestrial environments.

Office of Fossil Energy

Methane Hydrates: Hydrates are solid, ice-like materials containing molecules of gas bound in a lattice of water molecules. Methane hydrates are stable under conditions of low temperature and high pressure and thus, are found on ocean outer continental shelves and slopes at several hundred to several thousand feet deep, and under the permafrost in arctic regions. Developments in the last five years have demonstrated the possibility of methane production from hydrates. As much as 200,000 trillion cubic feet (Tcf) of methane may exist in hydrate systems in the U.S. permafrost regions and surrounding waters. This is over a hundred times greater than the estimated conventional U.S. gas resource. The resource is currently unproducible, and the volume that may be economically produced is unknown. However, these resources, if producible and economic, could have significant implications for U.S. energy security and global environmental issues, particularly global climate change and sea floor stability.

The Department of Energy, Office of Fossil Energy initiated the National Methane Hydrate Program in FY 2000. The program has worked on detecting, quantifying and sampling arctic and oceanic hydrates. Budget discipline necessitated close scrutiny of all Fossil Energy programs, using strict guidelines to determine their effectiveness and compare them to other programs offering more clearly demonstrated and substantial benefits. As a result the 2008 Budget proposes to conduct orderly termination of the program in FY 2008. However, several other government agencies, specifically Minerals Management Service (MMS), U.S. Geological Survey (USGS), National Oceanic and Atmospheric Administration (NOAA), National Science Foundation (NSF), and Naval Research Laboratory (NRL), support gas hydrate-related research that is relevant to their mission, focusing on resource characterization and basic research, rather than exploration and production.

Oil and Natural Gas Research and Development: Several oil and gas projects are applicable in both offshore and onshore environments. These projects include: 1) Deep Trek, a group of projects to develop advanced technologies in high-temperature materials and sensors to allow deep drilling (greater than 15,000 feet below the land surface or seafloor); and laboratory research and field tests of technologies to improve recovery from mature oil fields. Budget discipline necessitated close scrutiny of all Fossil Energy programs, using strict guidelines to determine their effectiveness and compare them to other programs offering more clearly demonstrated and substantial benefits. As a result the 2008 Budget proposes to conduct orderly termination of the program in FY 2008.

Ocean Carbon Sequestration:

Although ocean sequestration has huge potential for carbon storage, the scientific understanding to enable ocean sequestration to be considered as a real option is not yet available. A small level of funding in FY 2007 is provided to leading researchers in this area to develop the necessary scientific understanding of the feasibility of ocean sequestration. Work is focused on understanding the mechanisms of CO₂ uptake in the ocean and assessing the environmental impacts of CO₂ storage. The Program is also funding laboratory experiments aimed at learning more about the basics of CO₂ behavior in an ocean environment and also the formation and behavior of CO₂ hydrates and collaborating with other federal agencies. Ocean carbon sequestration research concluded in FY 2007, due to adverse effects on deep ocean biology and chemistry (e.g., mortality of invertebrates in the deep ocean) from injecting a relatively pure stream of carbon dioxide into the deep ocean as a possible strategy for sequestering carbon dioxide separated from fossil fuel power plants and industrial stack gases. Other types of ocean sequestration have been proposed, including alternative methods for injecting CO₂ or biological methods, that could avoid these adverse effects.

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, not elsewhere classified	FY 2006 Actual	FY 2007 Enacted	FY 2008 Budget Request
Office of Science								
Biological and Environmental Research								
Climate Change Research					100%	11.00	7.40	9.90
Genomics			100%			5.00	5.00	5.00
Office of Fossil Energy R&D								
Oil and Natural Gas Technology								
Methane Hydrates	100%					6.15	8.62	0
Natural Gas Technology	100%					7.8	0	0
Ultra-deepwater and Unconventional	100%					0	14.96	0
President's Coal Research Initiative								
Sequestration R&D				100%		0.927	0.331	0
Department of Energy Total						30.88	36.31	14.90

* The FY 2008 President's Budget was used to allocate funding across functional areas.

ENVIRONMENTAL PROTECTION AGENCY

The U.S. Environmental Protection Agency (EPA) is an independent agency within the Executive Branch. 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.

National Estuary Program

The National Estuary Program, established in 1987 by amendments to the Clean Water Act, currently consists of 28 estuaries of national significance. In each estuary a local, collaborative process develops and implements a comprehensive management plan. In addition to the many successes in the estuaries, the NEP return on investment is high. In 2006, the 28 local NEPs leveraged approximately \$18 million in base funding to generate nearly \$600 million (35:1). These funds protected or restored 140,000 acres of habitat and reduced point and non-point sources of pollution threatening the estuaries.

Regulation of Transportation of Material for Dumping into the Ocean

Under the Marine Protection, Research, and Sanctuaries Act (MPRSA or Ocean Dumping Act), EPA designates recommended sites for ocean dumping, and issues permits for such dumping (except for dredged material permits, on which EPA must concur with the Army Corps of Engineers). This Act serves to implement U.S. treaty obligations under the London Convention.

Vessel Pollution

Under Section 312 of the Clean Water Act, EPA sets performance standards for marine sanitation devices, and designates no-discharge zones for vessel sewage. Working with States, EPA has designated 118 no-discharge zones nationwide. Also under

Clean Water Act Section 312, EPA is working with the Department of Defense to develop Uniform National Discharge Standards to regulate discharges incidental to the normal operation of vessels of the Armed Forces. In addition, as set out in the Certain Alaska Cruise Ship Operations Act, EPA, working closely with the State of Alaska and the U.S. Coast Guard, is assessing the need for changes to gray and black water standards for cruise ships operating in Alaska. EPA is an active member of U.S. delegations to the International Maritime Organization and has assisted in drafting annexes to the international convention addressing pollution from vessels.

BEACH Program

EPA administers the Beaches Environmental Assessment and Coastal Health Act (BEACH Act), signed into law on October 10, 2000. During the past seven years, EPA has provided nearly \$62 million in BEACH Act grants. In 2007, EPA expects to award an additional \$9,900,000 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. EPA's Beach Program also operates a website on the Internet, called "Beach Watch," which is an online directory of information about monitoring and notification programs.

National Marine Debris Program

EPA supports efforts to mitigate marine debris and educate people about the impact of their actions through the International Coastal Cleanup Campaign, which is funded by EPA grants. EPA also supports the National Marine Debris Monitoring Program, which is a statistically based national monitoring program to assess trends and sources of marine debris at 130 beaches nationwide.

Ocean and Coastal Survey Work

EPA's ocean survey vessel (OSV) Bold acts as a platform from which EPA scientists gather data critical to guiding the Agency's coastal and ocean protection programs. EPA scientists aboard the OSV Bold perform a variety of functions including: surveillance in connection with the implementation of statuto-

rily required monitoring and assessment programs, evaluation of the effects of pollution, special pollution studies, oceanographic and biological studies, data collection and laboratory analysis, and training of professional personnel. The research vessel (RV) Lake Guardian is EPA's monitoring and research vessel on the Great Lakes, and is used with other federal and state agencies and universities to monitor the health of the Great Lakes ecosystem and study biological and chemical problems in them.

Invasive Species Program

Invasive species are one of the greatest threats to U.S. waters and ecosystems. EPA is funding pilot prevention, control, management, research, and education projects and is studying and providing input to national and international programs to address this issue as part of the Invasive Species Council, the Aquatic Nuisance Species Task Force, and international efforts to develop a treaty and implementing guidance to address introductions through ballast water.

Monitoring and Assessment

The National Coastal Condition Report (NCCR) describes the ecological health of U.S. coastal waters and the Great Lakes at a regional and national scale. First issued in 2002 and updated in 2004, the NCCR is a collaborative effort among EPA and other federal agencies, as well as state, regional, and local organizations. It is the only statistically-significant measure of U.S. water quality on a nationwide scale, clearly communicates water quality to the public; and provides managers with the information they need to target water quality actions wisely, and to effectively manage those actions to maximize benefits. EPA, National Oceanic and Atmospheric Administration, U.S. Geological Survey, and the U.S. Fish and Wildlife Service are jointly responsible for the National Coastal Condition Report II (NCCR II) that was produced using data from EPA's Environmental Monitoring and Assessment Program (EMAP). <http://www.epa.gov/owow/oceans/nccr/2005/downloads.html>. NCCRII demonstrates the type and applicability of information generated by EMAP for use in the construction of National Report Cards. Full assessments were completed for northeastern, southeastern, west coast, and Gulf of Mexico estuaries and partial assessments were completed for the Great Lakes. EPA is integrating a comprehensive coastal monitoring program across all coastal states (including Alaska and Hawaii), U.S. territories, and National Estuary Programs to provide a probabilistic assessment of estuarine conditions to be used in future NCCRs.

On June 5, 2007, EPA released its first *National Estuary Program Coastal Condition Report*, which ranks the ecological resources in the 28 estuaries of EPA's National Estuary Program (NEP). This report serves as a foundation for EPA's efforts to protect, manage and restore nationally significant estuaries. Overall, the NEPs are in fair condition and scored better than or equal to all other non-NEP US estuarine despite significant population pressures. The information in the report is based upon EPA-sponsored monitoring data collected from 28 NEPs between 199 and 2003, as well as monitoring data collected by the individual NEPs.

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. By controlling pollution before it reaches coastal and ocean waters, these programs also contribute to EPA's overall ocean and coastal protection activities. They include: water quality standards and criteria; point source discharge permit program; technical assistance/grant program to address non-point source pollution; total maximum daily load program; and water quality monitoring and reporting.

Great Lakes National Program Office.

Through a unique regional and Binational partnership, U.S. EPA's Great Lakes National Program Office cooperates with federal, state, tribal, and international agencies to carry out the responsibilities of the United States under the U.S./Canadian Great Lakes Water Quality Agreement to protect, maintain, and restore the chemical, biological, and physical integrity of the Great Lakes. The program monitors Lake ecosystem indicators; manages and provides public access to Great Lakes data; helps communities address contaminated sediments in their harbors; supports local protection and restoration of important habitats; promotes pollution prevention through activities and projects such as the Canada-U.S. Binational Toxics Strategy (BNS); and provides assistance for community-based Remedial Action Plans for Areas of Concern and for Lakewide Management Plans.

Great Lakes Research

EPA conducts research to integrate remote sensing technologies to protect air and water quality and ecological resources in the Great Lakes and surrounding Basin. Remotely-sensed landscape changes have been related to changes in urban and suburban

water quality and other coastal changes, including extent of wetlands and the impacts of invasive vegetation. Air quality monitoring has been integrated with satellite observations to evaluate regional air quality and to predict the impacts of wildfire smoke on air quality within the Great Lakes Basin. In support of the BEACH program, *in situ* and remote sensing sampling for pathogens and related measures help predict pathogen exposures at recreational beaches in response to meteorological events. Research is also conducted on Great Lakes issues, including the Lake Erie “dead zone,” impacts of invasive species, and contaminant sources and movement.

International Affairs

EPA helps shape 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.

Great Waters Program

Under the Great Waters program, in partnership with the Department of Commerce’s National Oceanic and Atmospheric Administration, EPA addresses 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. Using monitoring and advanced computer models, the Chesapeake Bay program identified air deposition as the source of nearly one-third of the nitrogen load to the Bay. (<http://www.chesapeakebay.net/status.cfm?sid=126>). EPA states in the *Third Report to Congress on Deposition of Air Pollutants to the Great Waters*, roughly 10 – 40 percent of the nitrogen deposited in the East and Gulf coast estuaries is transported via the atmosphere. Atmospheric deposition is also the principal source of mercury to several Great Waters, followed by riverine inputs. Over one third of the Great Waters have fish consumption advisories for mercury.

Gulf of Mexico Program

EPA’s efforts in the Gulf of Mexico directly support a collaborative, multi-organizational Gulf states-led partnership comprised of regional, business and industry, agriculture, state and local government, citizens, environmental and fishery interests, and numerous federal departments and agencies. The Gulf of Mexico Program is designed to assist the Gulf states and stakeholders in developing a regional, ecosystem-based framework for restoring and protect-

ing the Gulf of Mexico. In response to the U.S. Ocean Action Plan, thirteen federal agencies came together to form a Regional Partnership to provide support to the Gulf of Mexico Alliance, a partnership of the five Gulf states. The Alliance was formed to increase regional collaboration to enhance the environmental and economic health of the Gulf of Mexico. The Gulf states have identified five key priority coastal and ocean issues that are regionally significant and can be effectively addressed through cooperation at the local, state, and federal levels: water quality, coastal restoration and resiliency, habitat identification and characterization, nutrient reductions, and environmental education. The partnership will target specific federal, state, local, and private programs and identify processes and financial authorities in order to leverage the resources needed to support the Alliance.

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. An *Action Plan for Mitigating, Reducing, and Controlling Hypoxia in the Northern Gulf of Mexico* was signed in 2001. To address hypoxia in the northern Gulf of Mexico the *Plan* calls for a dual nutrient management strategy throughout the Mississippi watershed coupled with a comprehensive program of monitoring, interpretation, modeling, and research to facilitate continual improvements in scientific knowledge to address hypoxia in the northern Gulf of Mexico. The *Plan* also calls for a reassessment every five years of science and progress to reduce Gulf hypoxia every five years. The design process for the five-year reassessment of the Hypoxia Action Plan of 2001 was completed in June, 2005. The reassessment will be completed in Spring 2008.

Office of Research and Development Ocean and Coastal Activities

The Office of Research and Development (ORD) conducts a number of research activities designed to protect oceans and coasts, while ensuring human and ecological health. The data and findings from ORD research are used by a variety of clients including land and water resource managers, Program and Regional Offices, states and tribes. These entities are able to make scientifically defensible management decisions based on the data ORD provides.

ORD current research includes EPA’s Environmental Monitoring and Assessment Program (EMAP). With

cooperation between EPA, state, local, tribal and federal natural resource trustees, the series of National Coastal Condition Reports describe the condition of coastal resources (estuarine and intertidal ecosystems) for the Western, Northeast and Southeast United States. This is an ongoing effort to foster an integrated comprehensive coastal monitoring program across all coastal states (including Alaska and Hawaii) and Puerto Rico to provide probabilistic assessment of estuarine conditions. As these synoptic surveys are conducted over time, trends in condition of these systems will be evaluated. The surveys are a component of the multi-agency National Water Quality Monitoring Network. EMAP is also developing the monitoring framework to enable integrated Great Lakes assessment across coastal, nearshore, and offshore ecosystems. ORD also supports research addressing other significant coastal problems, such as invasive species, harmful algal blooms, nutrient loading, habitat alteration, and pollution of recreational waters.

ENVIRONMENTAL PROTECTION AGENCYPercentage 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, not elsewhere classified	FY 2006 Actual	FY 2007 Enacted	FY 2008 Budget Request
Office of Water								
Gulf of Mexico	60%		30%	10%		4.7	4.4	4.46
Great Lakes	80%		15%	5%		28.95	51.96	56.76
Chesapeake Bay	70%		30%			20.85	26.75	28.77
Water Quality standards**	100%					10.10	13.56	13.56
Marine ecosystems	30%		55%	5%	10%	10.04	12.82	12.86
Coastal ecosystems	55%		30%	5%	10%	23.78	24.90	19.77
BEACH program	100%					2.14	1.83	1.83
National Fish and Wildlife Contamination**	100%					0.07	0.06	0.06
BEACH program grants	100%					8.75	9.85	9.90
Clean Water SRF	100%					377.70	606.94	385.03
Section 106 grants	100%					93.71	104.18	104.18
Nonpoint source management	100%					89.25	99.64	97.02
Office of International Affairs**								
Marine Pollution and Arctic Programs								
Program Activities**				100%		0.3	0.4	0.2
Office of Air and Radiation								
STAG								
Section 105 Clean Air Grants	100%					1	1	1
Environmental Program Management								
Great Waters Program	100%					1	1	1
Office of Research and Development								
Oceans and Coastal Research			100%			8.3	8.1	4.3
Environmental Protection Agency Total						680.64	967.39	740.7

* The FY 2008 President's Budget was used to allocate funding across functional areas.

** FY 2007 Enacted and FY 2008 PB levels are estimates.

DEPARTMENT OF HEALTH AND HUMAN SERVICES

The Department of Health And Human Services (DHHS) is the U.S. government's principal agency for protecting the health of all Americans and providing essential human services, especially for those who are least able to help themselves. Within DHHS is the National Institutes of Health (NIH), the world's premier medical research organization, whose mission is to uncover new knowledge that will lead to better health for everyone. NIH includes 27 separate health institutes and centers, one of which is the National Institute of Environmental Health Sciences (NIEHS). NIEHS' mission is to use environmental sciences to understand human disease and improve human health. In furtherance of its mission, NIEHS supports research on a number of oceans-related issues, including harmful algal blooms and the effects of environmental chemicals on marine life.

NIEHS and the National Science Foundation (NSF) have collaboratively launched and support the Centers for Oceans and Human Health (OHH) that have established a new paradigm for linking the health and rich resources of the Earth's oceans with the health outcomes of the Earth's population. By harnessing the various talents, disciplines, and expertise of scientists supported by the collaborating agencies; combining the tools of genomics, proteomics, and metabolomics with physical oceanography; and stimulating inter-center cooperation and coordination, this program offers tremendous promise for developing more comprehensive linkages between oceans and human health as the world's population continues to depend on one of our greatest natural resources for food, commerce, transportation, and recreation. Supported by the physical and biological science resources of NIEHS and NSF, the Centers also demonstrate the capacity of federal research agencies to collaborate and leverage resources to foster high-quality interdisciplinary research. The following three research areas are considered high priority for this program: combating the spread of harmful algal blooms; studying marine organisms for sources of new drugs; and reducing morbidity due to water- and vector-borne disease.

For the past two decades, NIEHS has supported a set of Core Centers devoted to Marine and Freshwater Biomedical Sciences. This unique resource within NIH has conducted innovative research focused on development and application of aquatic organisms as models of human health effects resulting from exposure to environmental toxicants, and on studying the

mechanism of effects of toxins resulting from harmful algal blooms. Harmful algal blooms represent one of the most notorious marine hazards to man and animal alike. It is estimated that over 60,000 individual cases and clusters of human intoxication occur annually in the U.S. alone. Worldwide, harmful algal blooms cause a variety of acute, sub-acute, and chronic diseases in humans, as well as in other mammals, fish, and birds. Health effects in humans range from acute neurotoxic disorders (such as polyether seafood poisonings, e.g., neurotoxic shellfish poisoning and ciguatera fish poisoning) to chronic and persistent diseases (such as amnesic shellfish poisoning and chronic liver disease caused by the cyanobacterial toxins, the microcystins). Disease caused by exposure to environmental chemicals produced by harmful algal bloom organisms initiates with consumption of contaminated seafood or inhalation of toxins entrapped in sea spray. The oral route of intoxication is by far the better understood and more commonly recognized, and coastal states all have public health surveillance and monitoring systems in place to prevent human intoxications. However, exposure to aerosolized particles in Florida red tide is not uncommon and is an intoxication route that is much more difficult to quantify or control.

NIEHS is also funding various grants to better understand how harmful algal blooms (HABs) form, spread to new areas, and how the genes are involved in toxin production. Through the use of various genetic tools researchers are working to gain insights into the organisms involved in HABs. The results will provide a valuable molecular resource for scientists working to understand the ecology and toxicity of various HAB species and will provide the first detailed insights into the genomic structure of these fascinating organisms.

Florida red tides occur annually along the U.S. Gulf of Mexico coastline. Florida red tides release irritating natural environmental toxicants, or brevetoxins, into water and air with varying degrees of adverse health outcomes. NIEHS-funded investigators have shown that brevetoxins elicit neurotoxic, immunologic, and pulmonary effects. These researchers will attempt to further characterize exposure to the complex assemblage of materials aerosolized from organisms in seawater. The outcomes of this work will hopefully provide new insights into the mechanisms of action that these toxicants use and provide prevention and therapeutic strategies to protect human health.

Domoic Acid (DA) is a naturally occurring marine toxin that is responsible for Amnesic Shellfish Poisoning (ASP), or even death in humans who consume tainted shellfish. Within the past decade, rising levels of DA on the U.S. west coast have been responsible for outbreaks of toxicity affecting fish, shellfish, shorebirds and sea lions. The highest levels of DA ever recorded in the U.S. (exceeding established safety levels of 20 ppm by more than 280 ppm) were found in harvesting beaches of several subsistence level Native American Tribes within the past four years. The purpose of this NIEHS study, involving 625 Native Americans, is to determine the incidence and prevalence of DA-related illness and to identify both exposure and host factors associated with the occurrence of illness, including the effects of repeated “low” level exposure. The ultimate goal is to provide a rational basis for prevention and intervention efforts.

In addition to the aforementioned marine research efforts, there are several other NIEHS projects that focus on the effects of environmental chemicals on marine life. One of these projects addresses exposure to arsenic in marine waters from chromated copper arsenate (CCA)-treated wood used in building docks.

NIEHS and DHHS also participate in a number of interagency coordinating committees now addressing the broad scope of ocean science as a result of the President’s U.S. Ocean Action Plan. Future directions in oceans and human health are likely to be a key component of a current effort to develop a government-wide ocean research strategy.

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, not elsewhere classified	FY 2006 Actual	FY 2007 Enacted	FY 2008 Budget Request
National Institutes of Health								
National Institute of Environmental Health Sciences								
Ocean-related Extramural Research and Training			100%			8.7	8.8	8.6

* The FY 2008 President's Budget was used to allocate funding across functional areas.

DEPARTMENT OF HOMELAND SECURITY

United States Coast Guard

The United States Coast Guard (CG) is one of the five Armed Services of the United States and the Nations' primary maritime law enforcement agency. In addition, the CG provides a wide range of maritime safety, security, and environmental protection services. The CG protects vital interests of the United States from foreign and domestic threats, both natural and man-made, and serves in America's ports and inland waterways, along the coasts, on international waters, or in any other maritime region where the United State's interests are at risk.

The CG is a military, multi-mission, maritime service that possesses a unique blend of humanitarian, law enforcement, regulatory, diplomatic, and military capabilities. These characteristics are underscored by the CG's five fundamental roles: maritime security, maritime safety, protection of natural resources, maritime mobility, and national defense. Three of these roles, maritime safety, protection of natural resources and maritime mobility include programs that provide significant contributions to the theme areas outlines in the U.S. Ocean Action plan.

Maritime Safety

The CG has the lead responsibility for protecting the lives and safety of Americans in the maritime domain. In partnership with other federal agencies, state and local governments, maritime industries, and individual mariners, the CG preserves safety at sea through a focused program of prevention, response, and investigation.

Prevention activities include developing commercial and recreational vessel standards, enforcing compliance with these standards, licensing commercial mariners, operating the international Ice Patrol to protect ships transiting the North Atlantic shipping lanes, and educating the public about maritime safety. The CG develops operating and construction criteria for many types of vessels, from commercial ships to recreational boats, and serves as America's voice in the International Maritime Organization (IMO). The Port State Control program is key to the CG's safety enforcement program because approximately 95 percent of large passenger ships are foreign flagged

and over 90 percent of all international commercial freight arrives/departs on foreign flagged vessels.

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

As the lead agency for maritime search and rescue in U.S. waters, the CG coordinates its afloat and airborne units, as well as those of federal, state, and local responders. Using it also leverages the world's merchant fleet to rescue mariners in distress around the globe through the Automated Mutual-assistance Vessel Rescue system. When natural disasters, such as hurricanes and floods, threaten America the CG active duty and reserve members work closely with state and local first responders to apply its rescue and other operational capabilities in protecting life, property, and the environment.

Protection of Natural Resources

The U.S. Exclusive Economic Zone (EEZ) supports commercial and recreational fisheries worth more than \$32 billion annually. The CG serves as the primary agency for at-sea enforcement of laws and regulations for the management and conservation of living marine resources and their environment. It actively protects sensitive marine habitats and sanctuaries, marine mammals, and endangered marine species, and enforces laws protecting U.S. waters from the discharge of oil and other hazardous substances.

The CG has implemented a wide range of prevention programs, accompanied by enforcement, education, contingency planning, and emergency response activities in support of its many environmental protection mission areas. These areas include: maritime pollution law enforcement, offshore lightering zone enforcement, commercial fisheries enforcement, and commercial vessel inspection. The CG enforces international environmental and safety laws and treaties set forth by the IMO through its Port State Control Vessel

Inspection Program. The CG requires the owners and operators of vessels that carry oil and designated hazardous substances to submit Vessel Response Plans and/or Shipboard Oil Pollution Emergency Plans in accordance with the Oil Pollution Act of 1990 and the international convention MARPOL 73/78. These vessel-specific plans address spill response and mitigation procedures, required pollution prevention and cleanup equipment, and crew training requirements.

Pollution preparedness and response activities are aimed at minimizing the impacts of oil and hazardous substance spills on the marine environment. The CG works side by side with the Environmental Protection Agency (EPA) and 14 other federal departments and agencies as part of the National Response Team (NRT) and 13 Regional Response Teams. The NRT provides Federal resources, technical assistance, and policy guidance for pollution incidents in support of the Federal On-Scene Coordinators (FOSCs).

The CG also provides mission-critical command and control support and is typically the first responding agency to all marine environmental disasters. Under the National Oil and Hazardous Substances Pollution Contingency Plan, CG Captains of the Port (COPT) are the pre-designated FOSCs for oil and hazardous substance incidents in all coastal and some inland waterways. In addition, as response operations experts, the NSF and Strike Teams are available to advise foreign governments for pollution incidents worldwide.

The CG's first priority in living marine resources law enforcement is to protect the U.S. EEZ from incursions by foreign fishing vessels. In addition to protecting valuable domestic living marine resources from foreign poaching, this mission is in concert with the CG's Maritime Security Role, a component of which is to uphold U.S. maritime sovereignty and enforce U.S. law, international conventions, and treaties against criminal activities.

The two other principal priorities for living marine resources law enforcement fall under the CG's Maritime Stewardship Role, to ensure compliance with domestic laws and regulations for living marine resources within the U.S. EEZ, and to ensure compliance with international agreements for the management of living marine resources. The CG annually inspects over 6,000 U.S.-flagged commercial fishing vessels at sea to ensure compliance with dozens of federal fishery management plans. CG cutters and aircraft frequently conduct operations to enforce international agreements such as the United Nations moratorium on High Seas Driftnet Fishing.

Maritime Mobility

The U.S. Marine transportation system facilitates America's global reach into foreign markets and the Nation's engagement in world affairs, including protection of U.S. national interests, through a national and international regulatory framework governing trade and commerce. This system includes the waterways and ports through which more than 2 billion tons of America's foreign and domestic freight and 3.3 billion barrels of oil move each year, in addition to the international links that support U.S. economic and military security. It also includes international and domestic passenger services, commercial and recreational fisheries and recreational boating. The CG works to create a seamless inter-modal transportation system, through integration and coordination with port communities throughout the nation.

The CG carries out numerous port safety and security, waterways management, and commercial vessel safety missions and tasks. It provides a safe and efficient navigable waterway system to support domestic commerce, international trade, and the military sealift requirements for national defense. CG 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.

CG teams train the maritime forces of other nations throughout the world. Through these efforts, the CG forges vital alliances with foreign nations and gains access to overseas operating areas while promoting cooperation and compliance throughout the world.

The CG operates a polar icebreaking research vessel and maintains the Nation's two heavy polar icebreakers. These vessels enable the Service to resupply America's polar facilities, support the research requirements of the National Science Foundations and other federal agencies, project U.S. national presence and protect national interests in the Polar regions.

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, not elsewhere classified	FY 2006 Actual	FY 2007 Enacted	FY 2008 Budget Request
U.S. Coast Guard								
Operating Expenses								
Maritime Safety/								
Search and Rescue	100%					579.88	580.66	608.11
Recreational Boat Safety	100%					162.01	123.52	133.19
Commercial Vessel Safety	50%	49%		1%		157.84	157.72	170.38
Waterways Management	50%	49%	1%			82.80	84.41	90.74
Maritime Mobility/								
Bridge Administration		100%				20.12	20.66	19.69
Radio Navigation Aids		100%				121.63	121.43	130.54
Short Range Aids to Navigation		99%	1%			676.19	662.05	717.22
Ice Breaking - Domestic		100%				29.05	46.38	49.80
Protection of Natural Resources								
Marine Environmental Protection		99.5%	0.5%			132.42	137.89	145.58
Enforcement of Laws and Treaties (ELT) - Fish Domestic	100%					459.40	452.56	476.41
ELT - Marine Sanctuaries/ Protection of Living Marine Resources	100%					31.38	25.85	26.65
USCG Total						2,452.72	2,413.13	2,568.31

Federal Emergency Management Agency

The Federal Emergency Management Agency (FEMA) manages several programs that address ocean and coastal issues, the most important of which is the National Flood Insurance Program. Other FEMA programs that address coastal issues include the Hazard Mitigation Grant Program, the Flood Mitigation Assistance Program, Hazards-United States (HAZUS), and others. These programs are described, below.

Flood Hazard Mapping Program

Flood Map Modernization program is a multi-year Presidential initiative supported by Congress that is directed at digitizing and updating the Nation's over 100,000 flood-hazard identification maps. In 2002, 70% of the Nation's flood maps were over 10 years old. As of March 2007, the program has produced digitized GIS flood map products for 51% of the Nation's population. By 2010, 92% of the population will have flood hazard data in GIS format. These accomplishments will help FEMA comply with the National Flood Insurance Reform Act of 1994 that requires the review of all floodplain areas and flood risk zones every five years. Flood hazard data and maps are used to determine appropriate risk-based premium rates for the NFIP, guide floodplain management activities, complete flood hazard determinations for lending institutions, develop disaster response plans for Federal, State, and local emergency management personnel, and quantify flood risk (in terms of annualized economic losses). The Flood Map Modernization Program provides a technology-based, cost-effective process for updating, maintaining, storing, and distributing the flood hazard and risk information portrayed on the flood maps. Digital maps have tremendous advantages over paper maps, including ease of modification and updating, electronic access and transmission, and lower long-term production and maintenance costs. The Congress Appropriation Bill in 2003 set the mission of the program to modernize and digitalize flood maps by emphasizing quality over quantity in map production and the development of Cooperating Technical Partnerships with local and state governments for local risk awareness and community involvement. Flood Map Modernization directly supports the following DHS and FEMA goals and objectives:

- ▶ **DHS Objective 3.7:** to strengthen nationwide preparedness and mitigation against acts of terrorism, natural disasters, or other emergencies.
- ▶ **FEMA Goal 1:** to reduce loss of life and property.

- ▶ **FEMA Mitigation Goal:** to enable communities to reduce the loss of life and property through identifying hazards, assessing risks, and planning to reduce vulnerabilities to natural hazards.

The program improves the effectiveness of funding and grant allocation with up-to-date flood risk data as recommended by OMB's Mitigation Program Assessment Review Tool (PART) Review in 2005. The program supports the expanded E-Gov of the President's Management Agenda initiatives with a geospatial based infrastructure for flood hazard map production and collaboration.

Hazard Mitigation Grant Program

The Hazard Mitigation Grant Program (HMGP) was created in November 1988, by section 404 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act. This program assists states and local communities to implement long-term hazard mitigation measures following a major disaster declaration. Currently, available HMGP federal funding is based on the formula of 15% of the federal funds spent on disaster assistance programs for each disaster or an increased percentage if a State has an enhanced mitigation plan in effect. Under this program, FEMA can fund up to 75% of the eligible costs of mitigation projects.

The goals of the HMGP are to contribute to the development of a long-term, comprehensive mitigation program by funding measures designed to achieve the goals of State and local Mitigation Plans; and assist State and local governments in avoiding or lessening the impact of natural hazards through safer building practices and the improvement of existing structures and supporting infrastructure. Examples of coastal project types include property acquisition, structural elevation, wind retrofits, certain shoreline stabilization measures, and mitigation plans that meet FEMA's multi-hazard mitigation planning requirements, and which may address coastal zone management issues. Acquisition projects must be voluntary and the land deed restricted to open space in perpetuity.

All projects funded under the HMGP must conform to the FEMA-approved State and local Hazard Mitigation Plans, provide a beneficial impact, conform to environmental laws and regulations, solve a problem independently, and be cost-effective. In addition, projects should also contribute to a long-term solution. Project applications are reviewed and prioritized at the state level and then submitted to FEMA for final approval.

Flood Mitigation Assistance Program

In 1994, Congress enacted the National Flood Insurance Reform Act. This Act created FEMA's first significant pre-disaster opportunities for flood mitigation. The Act authorizes the Flood Mitigation Assistance (FMA) Program that provides funding to assist States and communities in implementing measures to reduce or eliminate the long-term risk of flood damage to buildings, manufactured homes, and other structures insurable under the NFIP.

The goals of the FMA program are to reduce the number of repetitively or substantially-damaged structures and the associated claims on the National Flood Insurance Fund; to encourage long-term, comprehensive mitigation planning; and to respond to the needs of communities participating in the NFIP. Up to \$34 million has been made available annually under the FMA program. Fees paid by flood insurance policyholders provide funding for the FMA Program. Examples of FMA projects include structure elevation and property acquisition.

States have the lead role in administering the FMA program, reviewing grant applications, setting mitigation funding priorities, and awarding planning and project grants to eligible applicants. States are also responsible for ensuring that projects are completed and that all performance and financial reporting requirements are met. Local governments and communities must have a FEMA-approved mitigation plan that addresses their flood hazards, including repetitive loss properties and continued compliance with NFIP floodplain management standards before they can receive project grant funds.

Pre-Disaster Mitigation Program

The Disaster Mitigation Act of 2000 amended the Robert T. Stafford Disaster Relief and Emergency Assistance Act by adding a new section 203, which established a Pre-Disaster Hazard Mitigation Program (PDM). Funding for the program is provided through the National Pre-Disaster Mitigation Fund to provide a consistent source of funding to State, Tribal, and local governments for pre-disaster hazard mitigation planning and mitigation projects primarily addressing natural hazards. Funding these plans and projects reduces overall risks to lives and property, while also reducing reliance on funding from actual disaster declarations. The PDM program is a nationally competitive program, with all eligible applications reviewed and ranked against established factors. Applicants and sub-applicants must have a FEMA-approved mitigation plan in order to receive project grants. PDM

planning grants are available to applicants and sub-applicants that do not have a FEMA-approved mitigation plan to enable them to meet the planning requirements. All projects funded under the PDM program must be cost effective, feasible, compliant with environmental and historic preservation requirements, and contribute to a long-term solution.

Hazard – United States (HAZUS)

HAZUS-MH is a powerful risk assessment software program for analyzing potential losses from floods, hurricane winds and earthquakes. In HAZUS-MH, current scientific and engineering knowledge is coupled with the latest geographic information systems (GIS) technology to produce estimates of hazard-related damage before, or after a disaster occurs.

FEMA has released HAZUS-MH MR2 (HAZUS-MH Version 1.2), an updated and revised version of HAZUS-MH. Included with the new release is an updated version of the Flood Information Tool (FIT), the Inventory Collection Survey Tool (InCAST), and the Building Inventory Tool (BIT). Federal, State and local government agencies and the private sector can order HAZUS-MH free-of-charge from the FEMA Distribution Center.

Potential loss estimates analyzed in HAZUS-MH include:

- ▶ Physical damage to residential and commercial buildings, schools, critical facilities, and infrastructure;
- ▶ Economic loss, including lost jobs, business interruptions, repair and reconstruction costs; and
- ▶ Social impacts, including estimates of shelter requirements, displaced households, and population exposed to scenario floods, earthquakes and hurricanes.

Hurricane Program

The National Hurricane Program (NHP) is a cooperative effort between Federal, State, and local governments to reduce the risk to lives and property from all hazards associated with hurricanes in the United States. The NHP is dedicated to providing the 22 threatened coastal state and territories with financial and technical assistance and support to all levels of government for hurricane mitigation, preparedness, response, and recovery. Grants are provided to the States to undertake a number of mitigation and preparedness activities. This involves emergency planning for hurricane evacuations.

The National Hurricane Program (NHP), housed under the Mitigation Division, conducts and supports many projects and activities that help protect communities and their residents from hurricane hazards. Established in 1985, the NHP also conducts assessments and provides tools and technical assistance to State and local agencies in developing hurricane evacuation plans. The program is a multi-agency partnership, involving the Federal Emergency Management Agency (FEMA), the National Oceanic & Atmospheric Association (NOAA), the National Weather Service (NWS), the U.S. Department of Transportation (USDOT), the U.S. Army Corps of Engineers (USACE), and numerous other Federal agencies.

Planning for Safe and Effective Evacuations

The National Hurricane Program (NHP) conducts Hurricane Evacuation Studies (HES) that guide the decision-making process for protecting the public when a hurricane threatens an area. These studies help State and local communities establish evacuation plans by determining the probable effects of a hurricane, predicting public response to the threat and advisories, and identifying appropriate shelters.

Specifically, NHP conducts hazard and vulnerability analyses for coastal communities considering different types of storm threats. This includes an assessment of storm surge and wind impacts, existing road and other transportation systems, the population (e.g., demographics, behavior analysis), and shelters. This information helps officials determine where individuals are most likely to go when evacuating from a storm.

Based on these studies, the NHP assists coastal communities by developing evacuation zones, which serve as a guide for determining where and when the public should be ordered to evacuate as a storm approaches. This recommendation is negotiated among decision-makers within each community. Once the evacuation zones are established, the NHP provides each community with corresponding evacuation maps and suggested clearance times for the various types of storm categories. The communities determine how to utilize these tools and recommendations, in developing their evacuation plans.

Sea, Lake, and Overland Surge from Hurricanes (SLOSH)

The greatest potential for loss of life related to a hurricane is from storm surge. It is imperative for emergency managers to understand storm

surge vulnerability, potential threat, and who should evacuate for specific storm threats.

SLOSH, which stands for Sea, Lake, and Overland Surge from Hurricanes, is a computerized model developed by the Federal Emergency Management Agency (FEMA), United States Army Corps of Engineers (USACE), and the National Weather Service (NWS) to estimate storm surge depths resulting from historical, hypothetical, or predicted hurricanes by taking into account a storm's pressure, size, forward speed, forecast track, wind speeds, and topographical data.

SLOSH is used to evaluate the threat from storm surge, and emergency managers use the data to determine which areas must be evacuated. SLOSH output is used by the National Hurricane Program (NHP) when conducting Hurricane Evacuation Studies as a hazard analysis tool for assisting with the creation of state and local hurricane evacuation plans or zones. SLOSH model results are combined with roadway network and traffic flow information, rainfall amounts, river flow, or wind-driven waves to determine a final analysis of at-risk areas. Storm surge also can affect rivers and inland lakes, potentially increasing the area that must be evacuated.

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, not elsewhere classified	FY 2006 Actual	FY 2007 Enacted	FY 2008 Budget Request
Federal Emergency Management Agency								
Disaster Relief Fund								
Hazard Mitigation Grant Program	100%					14.40	14.40	14.40
Flood Map Modernization Fund								
Coastal Studies	100%					7.50	7.50	7.50
¹Readiness, Mitigation, Response & Recovery								
HAZUS	100%					1.50	1.50	1.50
Hurricane Evacuation	100%					2.45	2.45	2.45
Pre-Disaster Mitigation (PDM)	100%					15.00	15.00	15.00
National Flood Mitigation Fund								
Flood Mitigation Assistance Program (FMA)	100%					1	1	1
FEMA Total						41.85	41.85	41.85
Department of Homeland Security Total						2,551.86	2,521.23	2,680.90

¹ Beginning in FY08, this account changes to Operations, Management and Administration.

* The FY 2008 President's Budget was used to allocate funding across functional areas.

DEPARTMENT OF THE INTERIOR

The Department of the Interior has eight Bureaus and offices within the Office of the Secretary that participate in programs relating to oceans, coasts, and the Great Lakes. The Bureau of Land Management (BLM), Minerals Management Service (MMS), Fish and Wildlife Service (FWS), National Park Service (NPS), US Geological Survey (USGS), Bureau of Reclamation, the Office of Insular Affairs, and the Natural Resource Damage Assessment and Restoration program, are involved in many ocean and coastal activities, including natural hazards, living and non-living marine resource management, operation of national parks and refuges, offshore leasing of oil and gas, restoration of natural resources, and marine science research, at an estimated 2007 funding level of \$975 million. The principle U.S. Ocean Action Plan theme for the Department's activities is "Enhancing use and conservation of our ocean, coastal, and Great Lakes resources." DOI is also active in the theme area of "Advancing our understanding of ocean, coastal, and Great Lakes resources."

U.S. Geological Survey

The USGS conducts a diverse range of activities and programs that provide research and information products for application to ocean and coastal issues. USGS activities link with the programs and missions of other federal and state agencies to define and address priority science needs.

USGS coastal and marine geology investigations provide the understanding of geology and geologic processes required to address issues such as coastal erosion, storm, tsunami, earthquake, landslide and sea-level rise hazards; impacts of coastal contaminants; and decline of wetland, coral and offshore marine habitats.

USGS also monitors the changes that occur on the land surface along the coasts using remote sensing, studies the connections between people and those changes, and provides the public with information they can use to address the consequences of those changes. USGS water monitoring programs such as the National Stream Flow Information Program and various elements of the Cooperative Water Program provide fundamental measures of the quality and quantity of water in many of the Nation's rivers, lakes, and estuaries.

Biological investigations quantify status and trends of critical biological resources in marine, coastal and

Great Lakes environments, including species at risk, shorebirds and water birds, sea ducks, pelagic seabirds, marine mammals, sea turtles and fish stocks. Research programs document declines in coral reef, coastal, wetland and marine habitats and ecosystems, and investigate impacts of contaminants, invasive species, pollution, human use and development, climate change and other human and natural stressors on marine, coastal and Great Lakes ecosystems.

In 2008, the USGS will begin implementation of the Oceans Research Priorities Plan and Implementation Strategy (ORPPIS) by conducting observations, research, sea floor mapping, and forecast models. Work on ORPPIS is integral to the U.S. Ocean Action Plan and will lead to decision-support tools to help policy makers anticipate and prepare for coastal ecosystem and community responses to extreme weather events, natural disasters, and human influences. The USGS will also build on pilot study results that will help begin the implementation of the interagency National Water Quality Monitoring Network. The network will address and integrate watershed, coastal waters, and ocean monitoring based on common criteria.

Bureau of Land Management

The BLM manages coastal land and facilities in Oregon, Washington, and California, and watersheds that flow to the Pacific Ocean. Coastal lands and facilities provide historic values, habitat, recreation, and environmental education opportunities. Examples include: 1) Yaquina Head lighthouse and disabled-accessible tide pools at the Salem District in Oregon; 2) California Coastal National Monument program, consisting of over 2,000 rocks and small islands spread along the California coastline; and, 3) Habitat protection for the snowy plover, a shore bird listed as Threatened under the Endangered Species Act at the Coos Bay District in Oregon.

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 lands as far inland as tributaries to the Columbia River in Idaho for spawning and rearing. The protection, restoration and monitoring of water quality and fish habitat is outlined in BLM resource management plans (RMPs). The RMPs provide guidance on the design and implementation

of activities such as timber sales, road construction, and cattle grazing to minimize impacts. Monitoring of land management actions is conducted to determine if the design criteria were effective. Adaptive management is used to adjust practices when monitoring indicates the desired outcomes were not met.

Examples of restoration actions for salmon habitat and water quality include erosion control, removing invasive riparian plants, planting native vegetation in riparian areas, replacing fish barrier culverts and screening water diversions, and placing boulders and logs within stream channels to create pools and provide hiding cover. The BLM also funds a variety of research projects to further our understanding of effects of land management activities on riparian conditions, water quality, and fish habitat.

Minerals Management Service

The Minerals Management Service (MMS) is responsible for environmentally safe and sound minerals resource management on more than 1.76 billion acres of the Outer Continental Shelf (OCS). At present, about 43 million acres are leased to private industry for oil and gas development. Production from these leases account for almost 30 percent of the Nation's domestic production of crude oil and 23 percent of its natural gas. In carrying out this function, MMS regularly works with federal, state, and local agencies and in consultation with the public. Additionally, MMS works in partnership with 14 coastal states to manage access to sand and gravel resources for coastal restoration and shore protection projects.

The MMS ensures that all activities on the OCS are conducted with appropriate environmental protection and impact mitigation by providing scientific information needed for critical program decisions which accommodate the exploration, development and production of petroleum energy resources and other marine minerals, with the protection of the human, marine and coastal environments. MMS also supports oil spill research, oil spill prevention and response planning activities.

Environmental Studies Program

The MMS Environmental Studies Program carries out mission-oriented research that nurtures scientific discovery in the marine environment and social sciences while focusing on activities that address national goals related to environmental quality, economic prosperity and sustainable development. The program includes studies of threatened and endangered spe-

cies in diverse areas ranging from the Gulf of Mexico to the Arctic waters of the Beaufort Sea, offshore Alaska. The research is designed to describe habitat, distribution, abundance, and behavior of species of concern, and the potential effects of OCS activities so that appropriate mitigating measures can be developed. Studies of deepwater ocean currents and deep sea ocean life are undertaken in the Gulf of Mexico to gather information on the physical processes and biological communities so that environmentally sound resource management decisions can be made with development of the appropriate protective measures.

The program conducts large scale oceanographic circulation and modeling and laboratory studies to improve understanding of the fate, transport, and effects of oil when spilled in the environment and other potential impact producing agents, including permitted discharges which may affect air and water quality, and sound. Social and economic research is supported to develop an understanding of how OCS activities affect community composition and infrastructure, employment, and culture. Research partnerships with stakeholders, academia, other federal agencies and international researchers and independent peer review are keystones for the program.

Offshore Resource Management

On August 8, 2005, the President signed the Energy Policy Act, as outlined in his U.S. Ocean Action Plan, to better manage energy development of the Outer Continental Shelf. The legislation includes an amendment to the Outer Continental Shelf Lands Act to establish a uniform permitting process coordinated across appropriate federal agencies and authorizes the establishment of an authorization process and regulatory framework for non-traditional energy projects including, but not limited to, renewable energy projects such as wind, wave, and solar energy. The Act also authorizes the permitting of oil and gas facilities on the Outer Continental Shelf to be converted to other approved uses; requires a comprehensive inventory of OCS oil and gas resources every 5 years, and establishes a new coastal impact assistance program with \$1 billion in grants for state and local coastal entities for 2007-2010. The Minerals Management Service is tasked with implementing these provisions of the Outer Continental Shelf Lands Act.

National Park Service

NPS funds 40 units in the National Park System that are listed on the Marine Managed Areas Inventory as containing submerged ocean and Great Lakes

resources. More than 57 million people visit these parks to experience beaches, coral reefs, kelp forests, wetlands, glaciers, historic shipwrecks and other valuable resources. Charged with conserving these natural and cultural resources unimpaired for the enjoyment of future generations, the National Parks are prone to fishing pressures, water quality impairment, coastal watershed degradation, invasive species and other threats in the coastal zone.

On December 1, 2006 the National Park Service announced the release of the Ocean Park Stewardship Action Plan at an event celebrating the 50th Anniversary of Virgin Islands National Park. The Plan establishes goals and priorities to restore and maintain ocean and coastal resources in the National Park System for current and future generations.

The four major elements of the Ocean Park Plan are:

1. Discover, map, and protect ocean parks;
2. Engage visitors in ocean park stewardship;
3. Increase National Park Service technical capacity for ocean exploration and marine resource stewardship;
4. Establish a seamless network of ocean parks, wildlife refuges, marine sanctuaries, and estuarine reserves under the 2006 general agreement between the National Oceanic and Atmospheric Administration and Department of the Interior.

NPS recognizes that effective ocean conservation involves cooperation among federal agencies, states, citizens, local communities, and academia, all working to maintain this shared ocean heritage. Objectives include mapping and characterizing marine species and habitats; evaluating and monitoring their condition; increasing the understanding of how marine ecosystems function, particularly in “no-take” marine reserves located in National Park System sites; connecting visitors, students and the public with park resources through ocean education and volunteer programs; and developing cooperative, science-based fishery management plans between parks and state agencies, such as the joint Fisheries Management Plan (FMP) between Biscayne National Park, Miami and the Florida Fish and Wildlife Conservation Commission.

NPS management policies require the agency to determine the quality of Park water resources and avoid, whenever possible, pollution of park waters by activities occurring within and outside (emphasis added) of parks. Under the Natural Resource Challenge, the NPS is working to meet these goals in coastal parks through vital signs monitoring of waters that chronically

exceed standards, and by working closely with EPA, USGS, NOAA, state agencies and local jurisdictions.

Fish and Wildlife Service

Endangered Species

The FWS Endangered Species program protects species in order to avoid adding species to the threatened and endangered species list. Activities include Section 7 consultations with federal agencies and their applicants to ensure 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, and implement recovery actions to reverse the decline of listed species and expedite species recovery.

Coastal Program

Since 1984, the U.S. Fish and Wildlife Service’s (FWS) Coastal Program has restored over 145,494 acres of coastal wetlands, 50,776 acres of coastal uplands, and 1,484 miles of coastal streamside habitat, and has provided communities with technical assistance that helped them identify and protect over 1.5 million acres of coastal habitat.

The FWS Coastal Program is a voluntary cooperative assistance program that provides technical and financial assistance to partners to support protection, restoration, and enhancement of coastal habitat. Examples of projects include restoration of tidal flows in coastal wetlands, removal of fish barriers in coastal river and streams, and control of invasive plants to restore native communities. These efforts support the Service’s mission to recover threatened and endangered species and conserve anadromous fish and migratory birds. The Coastal Program is implemented through a network of habitat restoration experts in 22 coastal areas around the nation, including the Great Lakes. The Coastal Program uses federal funds to leverage monetary and in-kind support from partners.

National Wildlife Refuge System

National Wildlife Refuge System marine programs span 169 refuges, including expansive estuarine systems above the Arctic Circle to remote atoll coral reefs below the Equator. Conservation initiatives support fishery, wildlife, and listed species. Refuge marine programs ensure the maintenance of biological integrity and environmental health of refuge

lands and waters. Projects include in-house and wider partnership efforts in habitat enhancement, restoration and reclamation; conservation area zoning; law enforcement; removal and control of exotic and invasive plant and animal species; removal of hazardous wastes; species re-establishment, reintroduction, and translocation to historic habitats; risk and threat reduction to protected species; scientific monitoring and research; and education and outreach efforts.

Marine Mammals

The Marine Mammal Protection Act assigns responsibility to the FWS for the conservation and management of polar bears, walrus, sea and marine otters, three species of manatees, and dugongs. The MMPA requires that marine mammals and the health and stability of their ecosystems be maintained at, or returned to, healthy population levels. The FWS implements the provisions of the MMPA by conducting population censuses and assessing population health, developing and implementing conservation plans, promulgating regulations, and by enhancing the public understanding of conservation activities. Many of these activities are conducted cooperatively with other federal and state agencies, Alaska Natives, researchers and universities, aquaria, non-governmental agencies and private interests. The FWS also works cooperatively with other countries for species that cross international boundaries.

Coastal Barrier Resources System

The FWS implements the Coastal Barrier Resources Act (CBRA), which discourages development on designated coastal barriers in the John H. Chafee Coastal Barrier Resources System (CBRS) by restricting certain federal expenditures in the CBRS. Projects include completing a Congressionally-directed Digital Mapping Pilot Project that includes digitally produced draft maps of some CBRS areas and a report to Congress describing the feasibility and costs for completing digital maps for all CBRS areas.

Anadromous Fish

Anadromous fish management supports the mission of the U.S. Fish and Wildlife Service by conserving and restoring inter-jurisdictional fish species and the habitats on which they depend. The program focuses on culturally and economically significant species, such as Pacific and Atlantic salmon, steelhead trout, American shad, sturgeon, American eel, and striped bass. The program works closely with state, federal, and tribal governments.

Aquatic Invasive Species

FWS ocean and coastal activities address aquatic invasive species including ecological surveys of coastal areas that are highly susceptible to invasions resulting from ballast water operations or areas that require additional study; conducting surveillance and assessing management approaches for reducing the risk of invasive species introductions; participating in cooperative efforts to manage infestations and conducting efforts to prevent dispersal; and conducting management activities to slow the dispersal of invasives.

National Fish Hatchery System

The National Fish Hatchery System propagates almost 80 million anadromous fish on an annual basis to aid in restoration efforts throughout the Atlantic, Gulf, and Pacific coasts. Thirty-four hatcheries play a vital role in restoring anadromous species such as Atlantic salmon, Atlantic and Gulf sturgeon, and striped bass in cooperation with the Atlantic States and the Gulf States Marine Fisheries Commissions. In the Pacific Northwest, production of Pacific salmon and steelhead trout throughout the region contributes to meeting obligations under the United States/Canada Pacific Salmon Treaty.

Wildlife Without Borders

The FWS Wildlife Without Borders-Russia and Wildlife Without Borders-Latin America and Caribbean initiatives support activities and small grants for the conservation of marine mammals, waterbirds, fish, and other marine species. Permit-related activities are required for sturgeon, polar bears, walrus, sea otters, manatees, whales, dolphins, sea turtles, corals, eels, marine fish and marine invertebrates. These activities require close coordination with other federal agencies, the states, parties to the Convention on International Trade in Endangered Species, and domestic and foreign scientific experts. Activities associated with conservation of turtles, coral, black coral, and Caspian Sea sturgeon, seahorses, whale, sharks, queen conch, Patagonian toothfish, Asian arrowana, polar bear, and sea otters include participation in regional and international meetings; permit findings; assessments pertaining to species status; and species listing as endangered or threatened.

Wetlands

National Coastal Wetland Conservation Grants awarded annually by the FWS are authorized by the Coastal, Wetlands Planning, Protection, and Restoration Act of 1990. The program is funded

through excise taxes on fishing equipment, and motorboat and small engine fuel. Eligible recipients are coastal states, territories, and commonwealths. The grants are nationally competitive and require a non-federal match. The grants are used to acquire, restore, and enhance coastal wetlands and adjacent habitat for long-term benefits to fish and wildlife.

Clean Vessel Act of 1992

The Clean Vessel Act of 1992 authorizes a FWS competitive grants program to states to survey for the number and location of operational pump-out stations and dump stations in coastal states for certain types of recreational vessels; plan for construction of stations and facilities (coastal states only); construct, renovate, operate, and maintain pump out and dump stations; and conduct programs to educate recreational boaters about the problem of waste discharge from vessels and the location of pump out and dump stations. States are reimbursed up to 75 percent of project costs.

Enforcement

FWS Law Enforcement plays a vital role in safeguarding marine resources in the United States and around the world, protecting endangered and threatened marine wildlife from illegal take and commercial exploitation; species of concern include sea turtles, manatees, walrus and sea otters. With state and federal counterparts, the Service prevents illegal commercialization of U.S. marine fisheries resources, such as clams, eels, oysters, and striped bass and investigates the unlawful take of migratory birds caused by oil spills in coastal waters and works with the fishing industry to reduce the toll that “by catch” takes on migratory bird populations.

Natural Resource Damage Assessment and Restoration Program

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. Damages are calculated based on the cost to restore or acquire equivalent resources. The DOI negotiates legal settlements or takes legal actions against responsible parties to use recovered funds to restore injured resources. The restoration program uses recovered funds. Such restoration activities are carried out consistent with a publicly-approved restoration plan, and are almost always carried out in conjunction with other fed-

eral, state, or tribal co-trustees, including partnerships with all DOI bureaus, NOAA, DOJ, U.S. Coast Guard, U.S. Forest Service, DOE, DOD, and EPA.

Office of Insular Affairs

With the majority of U.S. coral reefs located in the insular areas, the Office of Insular Affairs (OIA) plays a critical role in the national effort to develop effective programs to sustainably manage and protect U.S. coral reef resources. The goal of OIA’s 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 assisting 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 help meet priority needs. OIA has worked closely with the islands to identify and implement a broad scope of management actions – from education and outreach to the establishment of marine protected areas and increased enforcement. OIA has also supported the development and implementation of pioneering resource management efforts in the freely associated states, including the development of a blueprint for creating a national system of protected areas for the Federated States of Micronesia, natural resource assessments of the atolls of the Marshall Islands, and protection of critical marine resources in the Republic of Palau.

Bureau of Reclamation

Finally, though the Bureau of Reclamation’s core mission is as a water management agency, its activities often indirectly impact oceans and marine life. Dam operations impact anadromous fish runs, flow of riverine water to the oceans, and sediment loading to estuaries and deltas. In many cases, the Bureau of Reclamation cooperates with other federal agencies to mitigate these impacts. For example, in the Pacific Northwest, Reclamation operates its projects to reduce impacts to ocean going anadromous fish, such as salmon and steelhead. Reclamation is helping to build fish screens at irrigation diversions, removing barriers in streams, and increasing stream flows to improve salmon/steelhead survival in several major tributaries to the Columbia River.

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, not elsewhere classified	FY 2006 Actual	FY 2007 Enacted	FY 2008 Budget Request
U.S. Geological Survey								
Surveys, Investigations and Research								
Geologic Hazard Assessments								
Earthquake Hazards	75%		25%			9.10	9.10	9.10
Landslide Hazards	100%					0.40	0.40	0.40
Global Seismographic Network				100%		4.00	4.00	4.00
Geologic Landscape and Coastal Assessments								
Earth Surface Dynamics	40%		60%			3.00	3.00	3.00
National Cooperative Geologic Mapping	100%					1.63	1.63	1.63
Coastal and Marine Geology	55%		44%	1%		39.29	39.39	41.79
Geologic Resource Assessments								
Energy Resources	25%		65%	10%		0.50	1.00	1.00
Hydrologic Monitoring, Assessments, and Research								
Ground-Water Resources	50%		50%			1.00	1.00	1.00
National Water-Quality Assessment	40%		60%			6.20	6.30	6.30
National Stream Quality Accounting	25%		75%			0.44	0.44	0.44
Toxic Substances Hydrology	25%		75%			1.74	1.74	1.74
National Streamflow Information	60%	5%	35%			0.84	0.84	0.97
Hydrologic Networks and Analysis	20%		80%			3.04	3.04	3.04
Cooperative Water Program								
Cooperative Water Program	60%	5%	35%			3.19	3.19	3.10
Water Resources Research Act Program								
Water Resources Research Act	10%		90%			2.88	0.00	0.00

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, not elsewhere classified	FY 2006 Actual	FY 2007 Enacted	FY 2008 Budget Request
Biological Research and Monitoring								
Contaminants	100%					0.15	0.74	0.75
Fisheries and Aquatic Resources	85%		15%			8.62	9.50	9.50
Invasive Species	70%		30%			0.97	0.97	0.97
Status and Trends	100%					3.66	3.22	3.22
Terrestrial, Freshwater, and Marine Ecosystems	30%		70%			15.88	15.88	17.50
Wildlife and Terrestrial Resources	70%		30%			1.46	1.58	1.30
Mapping, Remote Sensing, and Geographic Investigations								
Land Remote Sensing	75%		25%			3.00	3.00	3.00
Geographic Analysis and Monitoring	25%		75%			1.60	0.10	0.10
Enterprise Information								
National Geospatial Program			100%			0.00	0.10	0.10
USGS Totals						110.96	110.16	113.95
Bureau of Land Management								
Management of Lands and Resources								
Manage & Monitor Salmon Habitat	100%					7.79	7.79	7.79
Science/R&D/Technology	100%					0.24	0.24	0.24
Education	100%					0.05	0.05	0.05
Law Enforcement	100%					0.03	0.03	0.03
Coastal Facilities Deferred Mtce.	100%					0.34	0.6	0
Subtotal						8.45	8.71	8.11

DEPARTMENT OF THE INTERIOR

Percentage of Funds Dedicated to Each Ocean-Related
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	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, not elsewhere classified	FY 2006 Actual	FY 2007 Enacted	FY 2008 Budget Request
Oregon & California Grant Lands								
Manage & Monitor Salmon Habitat	100%					19.88	19.88	19.88
Science/R&D/Technology	100%					1.01	1.01	1.01
Education	100%					0.47	0.47	0.47
Law Enforcement	100%					0.03	0.03	0.03
Coastal Facilities Deferred Mtce.	100%					0	0	0
Subtotal						21.39	21.39	21.39
Construction								
Coastal Facilities	100%					0	0	0
Subtotal						0	0	0
BLM Totals						29.84	30.1	29.5
Minerals Management Service								
ROMM - Royalties and Offshore Minerals Management - Outer Continental Shelf Lands								
Leasing & Environmental Program	100%					37.71	41.53	45.20
Resource Evaluation Program	100%					29.41	28.63	29.80
Regulatory Program	100%					51.47	52.63	56.07
Information Management Program	100%					30.18	30.00	28.89
Subtotal						148.77	152.79	159.96
ROMM - Minerals Revenue Management								
Compliance and Asset Management	100%					21.36	21.52	22.73
Revenue and Operations	100%					17.58	18.53	18.45
Subtotal						38.94	40.05	41.19
ROMM - General Administration								
General Administration	100%					23.43	24.23	24.23
ROMM Totals						211.14	217.07	225.37

DEPARTMENT OF THE INTERIOR

 Percentage of Funds Dedicated to Each Ocean-Related
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	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, not elsewhere classified	FY 2006 Actual	FY 2007 Enacted	FY 2008 Budget Request
Oil Spill Research	100%					6.90	6.90	6.40
Coastal Impact Assistance Program	100%					0.00	250.00	250.00
MMS Totals						218.04	473.97	481.77
National Park Service								
Operation of the National Park System								
Management	53%	10%	30%		7%	20.64	20.64	20.64
Fisheries and Aquatic Resources	63%	2%	28%		7%	3.94	3.94	4.16
Invasive Species	58%	2%	33%		7%	3.76	3.76	3.76
Status and Trends	43%	2%	48%		7%	7.45	7.45	7.67
Terrestrial, Freshwater, & Marine Ecosystems	65%	2%	30%		3%	10.54	10.54	10.81
Education	43%	2%	54%		1%	9.32	9.32	11.94
Law Enforcement	71%	3%	17%		9%	15.91	15.91	16.60
Coastal Facilities Deferred Maintenance	68%	7%	13%		12%	24.54	24.54	24.54
Everglades Restoration and Research								
Monitoring	45%	0%	55%		0%	0.89	0.89	0.89
Research	25%	0%	75%		0%	1.00	1.00	1.00
Restoration	72%	0%	28%		0%	2.74	2.74	2.74
NPS Totals						100.73	100.73	104.75

DEPARTMENT OF THE INTERIOR

Percentage of Funds Dedicated to Each Ocean-Related
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	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, not elsewhere classified	FY 2006 Actual	FY 2007 Enacted	FY 2008 Budget Request
Natural Resource Damage Assessment and Restoration Program								
Natural Resource Damage Assessment and Restoration (NRDA)								
Damage Assessments	100%					1.52	2.00	2.00
Restoration Implementation	100%					18.14	40.00	16.00
NRDAR Totals						19.66	42.00	18.00
Office of Insular Affairs								
Coral Reef Initiative	75%		10%	15%		0.50	0.50	0.50
OIA Total						0.50	0.50	0.50
Fish and Wildlife Service								
Resource Management								
Candidate Conservation	100%					0.04	0.04	0.04
Consultation	100%					2.54	2.54	2.54
Recovery	100%					8.73	3.93	2.32
¹ Coastal Program	100%					12.82	12.82	13.27
Partners for Fish and Wildlife	100%					12.30	12.30	12.50
National Wetlands Inventory	100%					1.44	1.49	1.48
Nat'l Conservation Training Center	40%		60%			0.03	0.03	0.03
Refuge Operations & Maintenance	78%		21%	1%		91.87	95.08	94.83
Marine Mammals Program	60%		35%	5%		4.37	3.16	2.53
² Anadromous Fisheries Management	100%					10.19	10.33	--
² Maintenance and Equipment	100%						--	5.61
² Aquatic Habitat and Species Conservation	100%						--	10.49
ANS Control Invasive Alien Species	85%		15%			1.13	1.13	1.13

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, not elsewhere classified	FY 2006 Actual	FY 2007 Enacted	FY 2008 Budget Request
Ballast Water Demonstration		100%				0.25	0.25	0.25
Hatchery Operations & Maintenance	100%					20.23	20.23	--
⁴ National Fish Hatchery Operations	100%							14.41
Division of International Conservation *	95%			5%		0.70	0.70	0.30
Division of Management Authority	100%					0.05	0.05	0.05
Division of Scientific Authority	50%			50%		0.03	0.03	0.03
Office of Law Enforcement	100%					1.06	1.00	1.00
Subtotal						167.78	165.11	162.81
Construction	100%					4.41	6.50	2.35
Sport Fish								
³ Coastal Wetlands Grants	100%					13.51	16.37	17.32
³ Clean Vessel Act Program	100%					10.98	12.51	12.82
Subtotal						24.49	28.88	30.14
North American Wetlands Conservation Fund								
³ Coastal and Great Lakes Grants	100%					13.51	16.37	17.32
Cooperative Endangered Species Fund								
³ Section 6 Grants to States	100%					0.65	0.60	0.60
FWS Totals						210.84	217.46	213.22
Department of Interior Total						690.57	974.91	961.68

¹ FY 2008 change for AK Sea Life Center

² Begin in 2008 subactivities Maintenance and Equip and Aquatic Habitat replace Anadromous Fisheries

³ 2007 and 2008 Grant amounts are estimates due to awards not complete.

⁴ Begin 2008 subactivity National Fish Hatchery Operations. Hatchery Maintenance now in Maintenance and Equipment

*The FY 2008 President's Budget was used to allocate funding across functional areas.

MARINE MAMMAL COMMISSION

The Marine Mammal Protection Act was the first legislation to mandate an ecosystem approach to the conservation of marine living resources. It was enacted 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 established a national policy to prevent such depletion and directed federal agencies to take measures to replenish marine mammal species or population stocks. Under the Act, the primary objective of their management should be to maintain the health and stability of the marine ecosystem and, when consistent with that primary objective, to obtain and maintain optimum sustainable populations of marine mammals. The Act also directed agencies to protect essential marine mammal habitats, including rookeries, mating grounds, and areas of similar significance, from adverse effects of human actions.

The Marine Mammal Commission (MMC) and its Committee of Scientific Advisors on Marine Mammals were created by the Act to oversee domestic and international actions of federal agencies for the purpose of furthering the policies and provisions of the Act and advising Congress and Executive Branch agencies. Because of its independent status and the scientific expertise of its Committee of Scientific Advisors, the Commission is able to provide objective, science-based advice.

The MMC works with representatives of federal and state agencies, affected industries, non-governmental organizations, and public interest groups. It provides information and advice on issues that include:

- ▶ promoting the adoption of science-based ecosystem-oriented approaches to conservation;
- ▶ encouraging regulatory agencies to develop, update, and implement recovery and conservation plans;
- ▶ reviewing the efficacy of recovery programs; and providing recommendations on priority research and management tasks;
- ▶ reducing the number of marine mammals taken incidental to human activities;
- ▶ identifying measures to improve the effectiveness of the MMPA; and
- ▶ working with Alaska Natives and others to minimize threats posed by environmental changes to Arctic marine mammals.

The Commission also provides reports to government agencies, private organizations, and scientists in the United States and elsewhere to focus attention on the most critical research and regulatory problems confounding marine mammal conservation. Recent projects have included:

- ▶ the 2003 Future Directions of Marine Mammal Research Consultation, which gathered scientists from around the world to discuss marine mammal research and develop priorities for filling information gaps;
- ▶ the 2007 report examining the issue of human-generated noise in the marine environment, and proposing research and management efforts to address sound effects;
- ▶ the project to assess the viability of the most endangered marine mammals and make recommendations regarding the cost-effectiveness of recovery programs;
- ▶ the review of the ecological role of killer whales in the North Pacific; and
- ▶ a review of the status of co-management efforts in Alaska and directions for advancing those efforts in the coming decade.

Finally, the MMC also manages an active research program that addresses issues of importance to the conservation of marine mammals and their habitat as espoused by the MMPA. These research projects complement the MMC's ongoing oversight of the complex issues involving the conservation, protection, and management of marine mammals and their habitats in the United States and abroad.

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, not elsewhere classified	FY 2006 Actual	FY 2007 Enacted	FY 2008 Budget Request
Marine Mammal Commission Total	50%		35%	15%		3.14	3.27	2.29

* The FY 2008 President's Budget was used to allocate funding across functional areas.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Improving understanding of the oceans via implementing technological advances and cutting-edge research is one component of the National Aeronautics and Space Administration's (NASA) Earth Science program. NASA develops space-borne global observing capabilities and research programs to expand understanding of the Earth system. 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 atmosphere in shaping the Earth's climate. NASA's Earth Science Program has many highly successful and critical missions in orbit, several pilot or new measurement-missions planned, an extensive research program for analysis of these data, and modeling/data assimilation activities in place to provide useful products for a wide variety of science investigations and applications. NASA engages the national and international science community in developing priority research requirements and participates in national programs (e.g., Climate Change Science Program). The Interagency Working Group on Ocean Partnerships (formerly the National Oceanographic Partnership Program (NOPP)) ensures that these contributions are shared with other agencies as appropriate. NASA also partners with other U.S. agencies to promote operational implementation of appropriate research results, and with other nations to leverage and extend Global Earth Observations. 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. The oceanography programs encompass core research within the sub-disciplines of Physical Oceanography and Ocean Biology and Biogeochemistry. 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. Ocean research and modeling activities focus on aquatic areas that range from global oceans to coastal areas and lakes. All NASA research data are available to researchers world-wide. Satellite observations that are dedicated to ocean science objectives provide the basic information upon which most of NASA's ocean research is based; however there is necessarily great synergy with

the global *in situ* networks of observations deployed by other agencies (e.g., National Oceanic and Atmospheric Administration (NOAA), National Science Foundation (NSF), and the U.S. Navy). Space-based Earth observations made by missions within NASA's Science Mission Directorate are categorized into two general areas: systematic measurements and exploratory measurements. In addition to the space and other remote sensing missions, calibration and validation activities (*in situ* observations) are required to establish and maintain climate and Earth System quality data records.

Systematic Measurements

Systematic measurements require long-term, sustained support to obtain long time series for scientific studies and environmental monitoring. Areas of observation include:

- ▶ **Ocean Surface Topography:** Measurements of the dynamic height of the surface of the ocean reflecting the accumulated temperature, salinity, and mass anomalies of the underlying water column. These measurements are the key inputs to global circulation models, and have enabled significant developments in global oceanography over the last decade. These data are assimilated into operational models used to predict El Niño (Jason under continual operations, the Ocean Surface Topography Mission (OSTM) under development).
- ▶ **Ocean Surface Winds:** Winds are the essential driving force of the upper ocean circulation. Observations of surface wind over the ocean are historically sparse because their source is a few ships and buoys. Measurement of vector winds at 25 km scale globally on a daily basis is now routine, thanks to satellite scatterometers. Weather services and oceanographers use these measurements in a broad array of science studies, and the measurements are routinely assimilated into operational forecast models (QuikSCAT, currently on extended operations).
- ▶ **Biology/Biogeochemistry:** measurements at particular wavelengths are combined using mathematical algorithms to estimate biological, ecological, chemical, and optical water properties, including phytoplankton (microscopic plant) biomass by proxy through the chlorophyll content of ocean surface waters, as well as allowing detection of characteristic signatures of features such as plant and algal groups, and subsequent interpretations of

primary productivity, the process by which plants take up carbon dioxide and produce oxygen. These measurements, which allow quantification of carbon pools, processes, sources, and sinks, are key to evaluating the carbon cycle in the ocean, as well as ecology (e.g. coral reef health and harmful algal blooms identification) and the oceanic uptake of gases. Sensors used include the Sea-viewing Wide Field-of-View Sensor (SeaWiFS), and Moderate Resolution Imaging Spectroradiometer (MODIS) on the Aqua platform. NASA's role is to provide new and better products in terms of absolute accuracy and stability of these observations for both climate requirements and improving understanding of the role of ocean biology and biogeochemistry in the Earth System.

- ▶ **Sea Surface Temperature (SST):** This quantity is routinely measured from operational meteorological satellites, using the Advanced Very High Resolution Radiometer (AVHRR). NASA's role is to provide new and better products in terms of absolute accuracy and stability for climate requirements (MODIS and ASTER on Terra, MODIS on Aqua, TMI on the Tropical Rainfall Measuring Mission (TRMM)).

Exploratory Measurements

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. These measurements, combined with the ocean surface topography data, enabled improved simulations of the ocean, and subsequently, better ocean circulation predictions. The Ice Cloud and land Elevation Satellite (ICESat), which provides high-accuracy, high-resolution observations of surface topography, shows promise for estimating sea ice thickness. Sea ice thickness remains the most critical unknown in determining ocean-atmosphere energy exchanges in climatically sensitive polar regions. 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.

Calibration and Validation

Vicarious calibration and validation activities are generally *in situ* observations, which are required to

establish and maintain the quality and usefulness of remotely sensed data. Each systematic and exploratory measurement described above has a calibration and validation component. The primary objectives of NASA's calibration and validation program are to:

- ▶ reduce measurement errors by identifying and characterizing true error sources, such as changes in the satellite sensors or platform;
- ▶ evaluate the various algorithms used by different ocean satellite missions to derive the key measurements;
- ▶ improve algorithms for data merging between various national and international sensors;
- ▶ improve satellite data processing;
- ▶ refine and develop new calibration and measurement protocols as technology advances; and

improve space-based ocean data for the next generation of NASA ocean research. For example, NASA's researchers work with the international community to provide a long-term ocean biology/biogeochemistry data set that encompasses measurements from several satellite instruments from the U.S. and international partners. For example, ocean biology and biogeochemistry data vicarious calibration was historically done by using a deep-water calibration site, the Marine Optical BuoY (MOBY), an internationally- utilized vicarious calibration site with standards traceable to the National Institute of Standards and Technology (NIST) and operated in partnership with NOAA. NASA is currently investing in new technologies and methods, from commercial instruments to modeled approaches, for future vicarious calibration for ocean biology and biogeochemistry. NASA also has a strong partnership with NOAA to provide *in situ* sea level measurements that support the calibration and validation of ocean surface topography measurements. High quality tide gauges other measurements are maintained at specific sites under satellite ground tracks to monitor and understand trends observed from the satellite platforms (such as global sea level rise).

Modeling

A high NASA priority is combining biological and physical models to facilitate the co-interpretation of ocean ecology, biogeochemistry and ocean surface topography data. NASA generally uses ocean models with an extensive heritage and adapts them for the special requirements of satellite data assimilation. NASA's oceanography modeling projects offer unique capabilities which include: developing efficient and technically advanced data assimilation techniques; optimizing estimates of the ocean circulation, a key

link to seasonal-to-interannual climate forecasting; and estimating the exchange of heat and CO₂ between the ocean and atmosphere, a key link to global long-term climate prediction. NASA's component of the IWG-OP funded several significant activities tying the global modeling and state estimation programs to coastal high-resolution modeling applications. NASA also invested in education and instrumentation projects, as well as the interagency funded Estimating the Circulation and Climate of the Ocean (ECCO) Project.

NASA's Role

NASA is at the forefront of science and technology research and development. 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, demonstrate the techniques' utility, and pioneer 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 is working with various agencies to transition research results, as appropriate to operational agencies. NOAA, the Navy, and private sector institutions are just a few organizations using these measurements for practical purposes. NASA's strength in oceanography has traditionally been in providing the global "blue water" view of the planet from space. However, the coastal zone often presents societal and practical ocean challenges. NASA plans to aggressively address coastal issues, e.g., instruments to provide better resolution for optically complex waters and coastal remote sensing; development of nested, high-resolution coastal models; and use of global model outputs as offshore boundary conditions. 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. NASA's programs also provide critical observations and research to understand and model the broader oceanic environment. NASA investments in ocean science and technology during the past decades have established a solid foundation for ocean monitoring and ocean conditions prediction in the next decade.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Percentage of Funds Dedicated to Each Ocean-Related Program Function*

Dollars in millions

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Science Mission Directorate								
Earth Systematic Missions								
Ocean Surface Topography Mission			100%			19.69	47.53	31.36
Ocean Winds Science Team (incl. QuikSCAT)			100%			9.40	8.61	8.787
Terra and Aqua (MODIS Ocean Science)			100%			6.40	6.00	5.00
Jason (Operations)			100%			6.77	4.86	4.255
Earth System Science Pathfinder								
Aquarius			100%			51.70	66.55	57
Earth Science Research								
Research and Analysis (Ocean Research Subset)			100%			20.60	19.70	20.309
EOS Science (Ocean Subset)			100%			5.30	4.80	5.3
Earth Science Multi-Mission Operations								
Multi-Mission Operations (Physical Oceanography DAAC)			100%			4.60	4.70	4.8
EOSDIS (REASoN/MEaSURES Ocean Subset)			100%			2.40	2.20	2
NASA Total						126.87	164.94	138.811

* The FY 2008 President's Budget was used to allocate funding across functional areas.

NOTES:

¹ Corporate G&A and Institutional Investments have been excluded from the figures above in order to maintain consistency with NASA's Climate Change Science Program reporting (in the FY06 budget structure, these two elements were booked at a program -- not project -- level).

² The projected budget runouts for operating missions (e.g., QuikSCAT, Terra, Aqua, and Jason) are reduced in the outyears, pending mission extension decisions informed by the FY07 and FY09 Senior Reviews; actual funding levels will reflect the results of these processes.

³ Projected funding levels for research activities (e.g., Research and Analysis, MODIS Ocean Science, REASoN/MEaSURES Ocean research) are estimates based on past performance; actual funding levels will be determined by peer-reviewed, competitive selections.

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 supports basic research and education to further understanding of the global oceans and their 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 U.S. Ocean Action Plan theme of “advancing our understanding of ocean, coastal, and Great Lakes resources.” Partnerships are fundamental to agency activities. The Division collaborates with other federal ocean agencies on a range of efforts. Collaboration 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 and 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, an international marine research program to expand exploration beneath the oceans. 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.

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 U.S. Ocean Action Plan theme of “advancing our understanding of ocean, coastal, and Great Lakes resources,” but specific efforts within the Arctic Research Programs and the U.S. Antarctic Program also support the Action Plan 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 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 newly-implemented Arctic Observing Network. 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. Two Antarctic programs fund ocean-related research: Antarctic Organisms and Ecosystems, and Antarctic Oceans and Atmospheric Science.

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” described in the U.S. Ocean Action Plan. The Division of Environmental Biology supports fundamental research on the systematics, population genetics, and diversity of marine organisms, and research on the terrestrial components of coastal communities and ecosystems. It also jointly supports a coastal Long-Term Ecological Research site with the Geosciences Directorate. The Division of Integrative Organismal Systems supports research aimed at an integrative understanding of organisms through innovative applications of systems level approaches including neural, behavioral, developmental, and physiological and structural systems. Specific ocean-related research includes studies on behavioral ecology, symbiosis and defense, organism-environment interactions, and processes, structures and integrity, of marine species. The Division of Molecular and Cellular Biosciences 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. The Division of Biological Infrastructure 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. The Division of Emerging Frontiers fosters new initiatives and catalyzes research at the boundaries of disciplines. This includes support for the study of marine pathogens and microbial genome sequencing of marine organisms.

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, not elsewhere classified	FY 2006 Actual	FY 2007 Enacted	FY 2008 Budget Request
Research and Related Activities Account								
Directorate for Geosciences								
Division of Ocean Sciences								
Ocean Section			100%			107.89	115.24	118.82
Integrative Programs Section			100%			105.77	112.37	117.33
Marine Geosciences Section			100%			75.43	80.29	93.14
Office of Polar Programs**								
USCG Polar Icebreaking								
Arctic Natural Sciences	14%		86%	53%		3.00	4.00	5.00
Arctic System Sciences	14%		86%			3.00	5.00	6.00
Arctic Observing Network			80%	20%			6.00	6.00
Antarctic Sciences Division								
Antarctic Earth Sciences ^{1/}			100%			0.00	0.00	0.00
Antarctic Organisms & Ecosystems ^{2/}			100%			6.26	6.00	6.00
Antarctic Oceans & Atmospheric Science ^{3/}			100%			4.06	4.00	4.50
Directorate for Biological Sciences***								
Division of Environmental Biology								
Systematic Biology & Biodiversity Inventories			100%			2.31	2.42	2.52
Population & Evolutionary Processes			100%			0.54	0.56	0.59
Ecosystem Science			100%			1.96	2.05	2.13
Ecological Biology			100%			0.28	0.29	0.30

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, not elsewhere classified	FY 2006 Actual	FY 2007 Enacted	FY 2008 Budget Request
Division of Integrative Organismal Systems^{4/}								
Developmental Systems			100%			0.60	0.63	0.65
Neural Systems			100%			1.02	1.07	1.11
Behavioral Systems			100%			0.25	0.26	0.27
Physiological and Structural Systems			100%			3.10	3.24	3.38
Division of Molecular & Cellular Biosciences								
Biomolecular Systems			100%			0.34	0.36	0.37
Microbial Observatories & Microbial Interactions			100%			2.96	3.10	3.22
Division of Biological Infrastructure								
Biological Databases and Informatics			100%			0.70	0.73	0.76
Biological Field Stations & Marine Laboratories			100%			0.83	0.87	0.90
Division of Emerging Frontiers								
Ecology of Infectious Diseases			100%			1.03	1.08	1.12
Microbial Genome Sequencing			100%			1.96	2.05	2.13
Center for Microbial Oceanography			100%				4.00	4.00
NSF Total						383.219	412.61	437.24

NOTES

* The FY 2008 President's Budget was used to allocate program funding across functional activities.

**OPP figures are estimates. OPP does not have a specific program that only funds marine and coastal activities. Proposals can be submitted to any of the OPP programs listed, so the level of support for this ocean and coastal research will fluctuate with the number, type and quality of proposals that are submitted each year.

***BIO does not have a specific program that only funds 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.

^{1/} New title replaces Antarctic Geology and Geophysics.

^{2/} New title replaces Antarctic Biology and Medicine.

^{3/} New title replaces Antarctic Oceans and Climate Systems.

^{4/} The Division of Integrative Organismal Biology has been reorganized to the Division of Integrative Organismal Systems (IOS), with the changes reflected in the investments shown.

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. Three organizations within the Smithsonian Institution contribute to coastal and ocean activities. All three contribute to the U.S. Ocean Action Plan theme of “Advancing our Understanding of Oceans, Coasts, and Great Lakes.

National Museum of Natural History (NMNH)

The NMNH manages a marine station on Carrie Bow Cay, located on the Meso-American 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 precursor to the Caribbean Coral Reef Ecosystems Program was established in 1972 and over 750 publications have resulted through FY 2007. The NMNH was first appropriated base federal funding for this program in 1985. Since 1999, improved facilities now include dry and wet labs, housing, generator, compressor, small boats and scuba cylinders, and essential facilities such as solar power, running-seawater system, and a weather station. The majority of recent Caribbean Coral Reef Ecosystems marine research can be described by the following four main areas of interest.

1. Biodiversity, morphology and developmental biology;
2. Species interactions and behavior;
3. Ecophysiology and responses to environmental change; and,
4. Processes linking species and environment.

Smithsonian Environmental Research Center (SERC)

The SERC Marine 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 subestuary as a model system of Chesapeake Bay. The long

term data are used to assess human impacts and natural variation in the Nation’s largest estuary.

Smithsonian Tropical Research Institute (STRI)

The STRI Marine Environmental Sciences Program monitors a variety of physical and biological parameters on the Atlantic and Pacific coasts of the Republic of Panama at Naos Island, Bocas del Toro, Galeta, San Blas and Golfo de Chiriqui. This monitoring is designed to reveal local long-term changes in the environment as well as to provide background data to support marine

research. The physical monitoring data is available for general non-commercial use (<http://www.stri.org/mesp/MESP.htm>). MESP sub-projects are:

1. Panama Reef Monitoring Network;
2. Marine Environmental Assessment Study; and,
3. Oil Spill Project.

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, not elsewhere classified	FY 2006 Actual	FY 2007 Enacted	FY 2008 Budget Request
National Museum of Natural History								
Caribbean Coral Reef Ecosystems Program			100%			0.09	0.09	0.09
Smithsonian Environmental Research Center								
Marine Environmental Sciences Program			100%			0.27	0.27	0.27
Smithsonian Tropical Research Institute								
Marine Environmental Sciences Program			100%			0.2	0.2	0.2
Smithsonian Total						0.56	0.56	0.56

*The FY 2008 President's Budget was used to allocate funding across functional areas.

DEPARTMENT OF STATE AND USAID

Department of State

The Department of State works around the world to protect and advance U.S. interests with respect to uses of the oceans 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 oceans-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.

To carry out this work, the Department of States participates in a range of organizations, agreements and arrangements at the global, regional and bilateral levels. At the global level, the Department is engaged at the United Nations and its subsidiary bodies, such as the International Maritime Organization (IMO) and the Food and Agriculture Organization (FAO). At the regional level the Department participates in an extensive list of regional organizations and arrangements. A representative (but not exhaustive) list of the global and regional organizations in which the Department participates on an active basis is included at the end of this section. The Department

also maintains extensive coordination at the bilateral level with countries and entities such as Canada, Mexico, Russia, Japan, China, Australia, the States of the Pacific Forum, and the European Commission.

In carrying out its work with respect to the conservation and management of living marine resources, the Department seeks to advance a number of key goals including: promoting science-based, sustainable fishery management, controlling fishing capacity, combating illegal, unregulated and unreported (IUU) fishing, strengthening regional fishery management organizations, securing equitable access for U.S. fishers to shared resources, increasing assistance to developing states, and improving food security. The Department has also undertaken efforts to establish new and strengthened international governance regimes to protect vulnerable marine ecosystems and fish stocks from destructive fishing practices.

Significant and recent successes by the United States in this regard include the negotiation and adoption of new regional conventions and bilateral treaties governing the conservation and management of shared living marine resources, a ban on shark-finning adopted by regional fisheries management organizations in the Atlantic and Pacific, a 98 percent reduction in dolphin mortality in the Eastern Pacific tuna fishery under the International Dolphin Conservation Program, the introduction of turtle excluder devices in the commercial shrimp fleets of more than 15 countries that export shrimp to the United States, and significant advances in combating IUU fishing.

Since September 11, the Department has redirected some of its work in the oceans arena to address issues of maritime security. The U.S. delegation to the IMO initiated amendments to the Convention for the Suppression of Unlawful Acts Against the Safety of Maritime Navigation, which were adopted in October 2005. The Department has prepared a strategy to involve international partners in enhancing maritime domain awareness. The Department is also bringing global attention to the issue of piracy by supporting regional initiatives to combat piracy and armed robbery at sea, and take other anti-terrorism actions.

The Department has also led interagency efforts to bring the Law of the Sea Convention before the U.S. Senate for its advice and consent. Recent achievements in protecting the marine environment include inter-

national agreements on air pollution from vessels, the use of anti-foulant paints, and the control of invasive species in ballast water. The Department responded to the tragedy of the Indian Ocean tsunami by working with the Intergovernmental Oceanographic Commission towards an early-warning system for the Indian Ocean. With respect to the polar regions, the Department is involved in efforts related to assessing marine shipping in the Arctic and promoting protection of and marine science research in the Arctic Ocean, through the Arctic Council and otherwise. In addition, the Department leads U.S. efforts to promote marine conservation in the Southern Ocean through the Commission on the Conservation of Marine Living Resources. Finally, the Department chairs the U.S. Extended Continental Shelf Task Force, an interagency group dedicated to delimiting, and securing U.S. sovereign rights to the natural resources of, more than one million square kilometers of continental shelf.

In coming years, the Department will remain fully engaged in efforts to protect and advance U.S. interests with respect to oceans issues consistent with U.S. domestic priorities and as part of an integrated and comprehensive U.S. foreign policy.

Global and Regional Organizations, Agreements and Arrangements in which the Department participates:

International Programs and Organizations

- ▶ United Nations Environment Program
- ▶ Cartagena Convention
- ▶ South Pacific Regional Environmental Program
- ▶ The Convention on International Trade in Endangered Species of Wild Flora and Fauna
- ▶ RAMSAR Convention on Wetlands of International Importance
- ▶ The World Conservation Union (IUCN)
- ▶ United Nations Food and Agriculture Organization, Department of Fisheries
- ▶ Intergovernmental Oceanographic Commission

Collaboration with International Organizations

- ▶ International Maritime Organization
- ▶ International Seabed Authority
- ▶ International Tribunal for the Law of the Sea
- ▶ International Union for the Conservation of Natural Resources
- ▶ Pacific Community International Fisheries

Commissions and Related Organizations

- ▶ International Sea Turtle Agreements
- ▶ International Whaling Commission
- ▶ International Council for the Exploration of the Seas
- ▶ North Pacific Marine Science Organization
- ▶ The Commission for the Conservation of Antarctic Marine Living Resources
- ▶ Inter-American Tropical Tuna Commission
- ▶ Western and Central Pacific Fisheries Commission
- ▶ International Commission for the Conservation of Atlantic Tunas
- ▶ Great Lakes Fishery Commission
- ▶ Pacific Salmon Commission
- ▶ Northwest Atlantic Fisheries Organization
- ▶ North Atlantic Salmon Conservation Organization

Other agreements and arrangements

- ▶ South Pacific Tuna Treaty and Associated Assistance Agreement
- ▶ Oceans, Environmental and Science initiatives
- ▶ Project to support the Food and Agriculture Organization of the United Nations International Plan of Action to deter and eliminate illegal, unregulated and unreported fishing
- ▶ Arctic Council
- ▶ Antarctic Treaty

U.S. Agency for International Development

The U.S. has strong political and economic interests in protecting international coastal ecosystems and resources. Healthy marine ecosystems are critical to U.S. diplomatic and development strategies to promote economic and food security, social stability and conflict prevention, democratic governance, improved human health, disaster and climate change mitigation, and biodiversity conservation in many countries. Coastal ecosystems have economic, social and cultural importance to many nations and entire regions; these extremely valuable ecosystems constitute the economic base and future hope for sustained development in many countries, particularly small island nations.

USAID is committed to assisting developing nations protect and manage their coastal areas. Recognizing that the conservation and sustainable use of coastal resources are critical to sustainable economic development, USAID works in over 25 countries on

projects that directly promote the protection and improved resource management of coastal and coral reef ecosystems. Agency programs build human and institutional capacity for resource management, while building strong governance processes.

Integrated Coastal Management and Seascape Approach to Management

USAID is a world leader in promoting the practice of integrated coastal management and large-scale seascape/landscape approaches to management, which address regional economic and ecological issues. The Agency recognizes that sound management of coastal resources must be at the forefront of sustainable development throughout the global community of nations. USAID's coastal management projects promote the essential elements of sustainable development -- protecting the world's environment, fostering balanced economic development, promoting democratic participation in governance, and improving the health and well-being of people in the world's developing nations.

USAID is supporting significant projects in ICM in the Philippines, Indonesia, Egypt, and Tanzania. USAID supports three marine ecoregions of global significance -- the East African Marine Ecoregion, the Meso-American Reef region, and the South East Asian Coral Triangle in Indonesia, the Philippines and Papua New Guinea -- in partnership with the World Wildlife Fund, the Nature Conservancy, the Wildlife Conservation Society, and the International Coral Reef Action Network.

Integrated Watershed Management

Successful integrated coastal management is best tackled at the ecosystem-scale, with the best management unit being the entire watershed adjacent to a coastal area. Success requires forging the right balance between competing human uses of water and natural resources, while ensuring that natural "assets", such as environmental health and productivity, are not compromised in the long term. For example, in Jamaica, watershed management is integrated with activities in wastewater and sanitation management, improved land use, and sound coastal tourism. In addition to Jamaica, major watershed management projects are supported in the Central American, Caribbean and Southeast Asian regions.

Coral Reef Ecosystems: Critical for Food Security, Economic Development and Coastal Protection

Coral reef and mangrove ecosystems play a critical but often undervalued role in the sustainable development options for coastal residents throughout the tropical world. Protection of coasts from storm surge and tsunamis, alternative livelihoods based on tourism, and significant contributions to fisheries exports and food security are but a few of the many ecological services and values of coral reef ecosystems. USAID's activities directly support coral reef and mangrove forest conservation in over 20 tropical countries throughout the world. Activities range from field programs in best management practices and monitoring, to the establishment and improvement of marine parks and reserves, to improvements in coastal tourism and fisheries management, to ICM and larger seascape approaches.

Management of Marine Protected Areas and Sustainable Fisheries

One especially effective management approach is the establishment of a series of ecological "no-take" reserves and/or multi-purpose marine protected areas that can result in early and sustained management dividends. Ecological reserves improve fishery yields and help build and maintain healthy fish populations. Ecological reserves have also proven very effective in the conservation of marine biodiversity and the generation of jobs and revenue through tourism. Such tools, when coupled with ongoing education, enforcement, and alternative livelihood schemes, offer the best hope for reducing or eliminating stress on coral reefs and other marine habitats.

USAID is supporting marine protected areas, fishery reserves, and marine national parks of regional and international significance in Indonesia, the Philippines, Papua New Guinea, Egypt, Kenya, Tanzania, Mozambique, Dominican Republic, Ecuador, Brazil, Honduras, Mexico and Panama, as well as several transboundary sites. Many of these parks are included in the *Parks-in-Peril Program*, a regional protected area management program in Latin America and Caribbean that is implemented in partnership with The Nature Conservancy; those sites situated along the coast afford protection to coastal watersheds, coral reefs and mangrove forests.

In 2006, USAID commissioned an assessment of opportunities to reform small-scale capture fisheries management and enhance sustainable use. Small-scale, near-shore capture fisheries include an estimated 96% of all fishers worldwide and produce about

60% of the global fish catch. Fisheries products are the world's most widely traded foods and developing countries will account for almost 80% of total food fish production by 2020. In comparison to other sectors of the world food economy, however, the fisheries sectors are poorly planned, inadequately funded, and neglected by all levels of government. Fisheries around the globe are over-capitalized and overfished due to weak governance, poor management, perverse subsidies, corruption, unrestricted access and destructive fishing practices. USAID is improving fisheries management in the Philippines by promoting an ecosystem-based approach to management and improved governance of these critical, but overexploited, resources. In addition, USAID provides core support to the International Center for Living Aquatic Resources Management (ICLARM) for research and management on sustainable fisheries and mariculture.

worldwide; and (4) implement the International Coral Reef Initiative's Framework for Action through expanded cooperation with ICRI partners.

International Leadership and Cooperation

USAID, in partnership with other federal agencies, was instrumental in establishing the International Coral Reef Initiative (ICRI) and in developing ICRI's Call to Action and Framework for Action, which are based upon integrated coastal management principles promoted in Agency projects worldwide. The Agency continues to support the goals and efforts of ICRI.

USAID also contributes technically and programmatically to the Global Program of Action (GPA) for the control of Land-Based Sources of Marine Pollution, the Meso-American Reef Alliance Initiative, the East Asia and Pacific Environmental Initiative, the Middle East Regional Cooperation (MERC) project of the Middle East Peace Process, the Convention on International Trade of Endangered Species of Fauna and Flora (CITES), the Asia Pacific Environmental Cooperation forum, and other regional and global efforts contributing to the conservation and sustainable use of coastal and coral reef resources.

Support for the Executive Order for the Protection of Coral Reefs

As co-chair of the International Working Group with the Department of State, USAID is an active participant and leader on the U.S. Coral Reef Task Force. USAID's activities support the international charge of the Executive Order to (1) assess the U.S. role in the international trade of coral reef species; (2) develop an appropriate, broad-based strategy for mitigating the negative impacts of trade; (3) develop and implement strategies and activities for the protection and sustainable use of coral reef resources

DEPARTMENT OF STATE AND USAIDPercentage 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, not elsewhere classified	FY 2006 Actual	FY 2007 Enacted**	FY 2008 Budget Request
Department of State:								
Bureau of Oceans and International Environmental and Scientific Affairs (OES)								
D&CP								
Oceans Affairs			100%					
Marine Conservation			100%					
Economic Support Fund								
Oceans, Environmental and Science Initiative	50%			50%				
South Pacific Islands Fisheries Fund				60%	40%	18	18	18
International Fisheries Commission								
Inter-American Tropical Tuna Commission - IATTC			50%	50%		1.9	1.7	1.8
Great Lakes Fishery Commission - GLFC	30%		30%	40%		14.7	14	12.1
International Pacific Halibut Commission - IPHC			50%	50%		2.9	2.8	2.3
Pacific Salmon Commission - PSC	30%		30%	40%		2.7	2.8	3
Other Fisheries Commission				100%		1.4	1.9	1.7
International Organizations and Programs								
United Nations Environment Program (UNEP) Fund				100%		5.8	5.8	5.2
UNEP Trust Funds				100%		2.7	2.7	2.7
Cartagena Convention				100%		0.4	0.4	0.4
South Pacific Regional Environment Program (SPREP)				100%		0.2	0.2	0.2
CITES				100%		1	1.1	1.1

DEPARTMENT OF STATE AND USAID

 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, not elsewhere classified	FY 2006 Actual	FY 2007 Enacted**	FY 2008 Budget Request
RAMSAR Convention on Wetlands of International Importance				100%		0.9	0.9	0.9
The World Conservation Union (IUCN)				100%		1	1	1
Intergovernmental Oceanographic Commission (IOC)				100%		0.1	0.2	0.2
State (OES) Total						53.7	53.5	50.6
U.S. Agency For International Development								
Bureau: Latin America and Caribbean								
Development Assistance								
Jamaica/ Strategic Objective (SO) 10	100%					0.815	0.615	0.615
Mexico/SO 22	100%					2.100	1.935	1.935
Honduras/SO 22	100%					2.700	2.014	2.014
Panama/SO 22	100%					4.137	2.279	2.279
Ecuador/SO 1	100%					0.430	0.542	0.542
El Salvador/ SO 22	100%					1.212	0.795	0.795
Dominican Republic/SO 3	100%					0.232	0.375	0.375
Central America Regional LAC Regional/SO 22	100%					1.705	1.937	1.937
	100%					2.200	0.000	0
Bureau: Asia and Near East								
Development Assistance								
Bangladesh/SO 5	100%					0.629	0.500	0.500
Bangladesh/SO 6	100%					0.417	0.000	0.000
Cambodia	100%					0.500	0.000	0.000
Indonesia	100%					3.949	4.000	4.000
Maldives/Tsunami Relief and Recovery Fund	100%					1.900	0.000	0.000
Philippines/SO 4	100%					2.360	2.360	2.360

DEPARTMENT OF STATE AND USAID

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, not elsewhere classified	FY 2006 Actual	FY 2007 Enacted**	FY 2008 Budget Request
Economic Support Fund								
Egypt	100%					2.200	2.000	2.000
Lebanon/SO 5	100%					4.100	0.700	0.000
Jordan	100%					0.347	0.000	0.000
Bureau: Africa								
Development Assistance								
Mozambique	100%					0.300	0.300	0.30
Senegal	100%					0.500	0.300	0.30
Tanzania/SO 8	100%					0.500	0.000	0.00
West African Regional Mission	100%					0.500	0.000	0.00
Bureau: Economic Growth, Agriculture and Trade								
Development Assistance								
Natural Resources Management SO 905-801 1.1	80%			20%		1.200	1.200	1.200
Natural Resources Management SO 905-801 1.4	80%			20%		1.110	0.750	1.000
WorldFish Center - Consultative Group on International Agricultural Research	50%			50%		0.340	0.290	0.290
Middle East Regional Cooperaton Program	60%			40%		0.690	0.600	0.600
USAID Total						37.073	23.492	23.042
Total						90.773	76.992	73.642

* The FY 2008 President's Budget was used to allocate funding across functional areas.

**USAID FY 2007 figures are estimates: budget had not yet been disbursed or obligated at the time data was collected.

***Specific data related to USAID obligations in coastal and ocean activities are not available beyond FY2008 at this time.

DEPARTMENT OF TRANSPORTATION

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, N.Y., and vessel traffic control areas of the St. Lawrence River and Lake Ontario. In addition, the SLSDC performs trade development functions designed to enhance Seaway System utilization.

The Great Lakes Great Lakes Seaway System, also known as “America’s Fourth Seacoast”, has been a vital waterborne transportation link for moving goods between the heartland of North America and international markets. The Seaway System, a binational waterway operated jointly by the U.S. and Canada, encompasses the St. Lawrence River and the five Great Lakes, and extends 2,300 miles from the Gulf of St. Lawrence in the Atlantic Ocean to the Western end of Lake Superior at the twin ports of Duluth, Minnesota, and Superior, Wisconsin.

For nearly 50 years, the St. Lawrence Seaway system has served as a vital transportation corridor for the international movement of bulk and general cargoes such as steel, iron ore, grain, and coal, serving a North American region that makes up one quarter of the U.S. population and nearly half of the Canadian population. Maritime commerce on the Great Lakes Seaway System is a critical transportation link for the continent’s agricultural and industrial heartland, annually sustaining more than 150,000 U.S. jobs, \$4.3 billion in personal income, \$3.4 billion in transportation-related business revenue, and \$1.3 billion in federal, state, and local taxes.

The binational waterway is expected to become an even more important commercial transportation route over the next decade as the U.S. and Canadian governments seek ways to ease highway and rail congestion, especially along North America’s East and West Coasts and Midwest region. In the past few years, the St. Lawrence Seaway has enjoyed significant growth in new business as the waterway has become a viable alternative for shippers look-

ing to avoid port, highway, and rail congestion. Each Seaway maximum size vessel carries roughly

25,000 metric tons, the equivalent of 870 semi-trucks. As congestion-related initiatives such as short sea shipping continue to develop, the St. Lawrence Seaway will further improve its position as a competitive alternative for shipments to and from the Midwest.

Major SLSDC programs include:

► **Foreign Flag Vessel Inspections and Ballast Water Exams:**

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. Inspections performed in Montreal eliminate duplicative inspections, allow for a seamless and efficient transit of the Seaway, and provide a better location for repair resources, if required. The SLSDC and the U.S. Coast Guard (USCG), in conjunction with Transport Canada and the SLSMC, signed a Memorandum of Understanding in March 1997 to develop the program of coordinated vessel inspection and enforcement activities to expedite the safe transit of shipping through the Great Lakes Seaway System. During the 2006 navigation season, the SLSDC achieved its internal performance goal of inspecting all ocean vessels with 252 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. During the 2006 season, Seaway marine inspectors conducted 82 ballast water inspections in conjunction with the ESI program, and performed an additional 57 ballast water exams for subsequent trip vessels at the U.S. Seaway locks in Massena, N.Y. Nationwide, considerable concern has been expressed regarding the introduction and spread of aquatic invasive species. In addition to ballast

water exams, the SLSDC is involved in several initiatives to combat the spread of invasive species in the Great Lakes Seaway System.

One such effort is 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. Announced on July 12, 2006, 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 will operate 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 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 objective of the Green Marine program is to build and maintain strong relations with key stakeholders and develop a greater awareness of the maritime industry’s activities, benefits and challenges. To accomplish this, activities will be 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.

The SLSDC also 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, will conduct research and publish findings on maritime issues including aquatic invasive species, as outlined in the Coast Guard and Maritime Transportation Act of 2004. 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.

- ▶ **Trade Development Initiatives:** Since 1985, when the SLSDC began its marketing program, the agency has performed trade development and promotional activities geared at generating trade to and from North America via the Great Lakes Seaway System. Program-wide activities include hosting overseas trade missions that promote the entire Seaway System at maritime and trade-related exhibitions, developing commodity-specific marketing plans, and working directly with ports, carriers, terminal operators, labor, and importers/exporters in the development of promotional materials and initiatives. Overseas trade missions, which include U.S. and Canadian maritime, government, industry, and labor delegates, have led to the development of new international cargo movements into the System.

The Maritime Administration

The Maritime Administration (MARAD), a component of the Department of Transportation, promotes a U.S. maritime industry for the continued security and prosperity of the Nation. MARAD’s programs seek to assure that the United States has efficient ports and terminals with modern intermodal connections; sufficient commercial shipping capacity to meet the needs of the nation’s growing economy and of the Department of Defense in times of national emergency; adequate shipbuilding and repair service and facilities, and an available professional workforce for employment in the U.S. marine transportation system. These focus areas support many of the ocean policy objectives, including the enhancement of marine-related commerce and transportation; the protection of the marine environment; advancement of merchant marine officer education and training; intergovernmental and private sector cooperation; and preservation of the role of the United States as a leader in ocean and coastal activities.

- ▶ **Marine Commerce and Transportation:** Although U.S.-flag vessels provide premium quality shipping services, their operating costs reflect America’s higher labor costs and its business operating environment, compared to competitors who often have the benefit of tax havens. The Federal Government, through MARAD’s Maritime Security Program (MSP), provides an annual subsidy to U.S.-flag operators to help ensure that an active U.S.-flag merchant fleet of militarily useful general cargo vessels continue to operate in international trade,

and that 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 (MSP) subsidizes the operating costs of 60 U.S.-flag merchant ships in commercial service to ensure sufficient U.S.-flag and U.S.-citizen crewed sea-lift capacity to support Department of Defense operations. The Voluntary Intermodal Sealift Agreement (VISA) program is the sealift emergency preparedness program for the U.S. Approximately 118 vessels participate in this program, including the MSP vessels. It provides contractual arrangements with private U.S.-flag ship operators to make intermodal transportation services available in times of national emergency.

MSP ships have contributed greatly to Operation Enduring Freedom (OEF) and Operation Iraqi Freedom (OIF). As of May 2007, a total of 79 U.S.-flag commercial ships, including 57 MSP ships, have either been employed by the Military Sealift Command (MSC), or the Military Surface Deployment and Distribution Command (SDDC) to transport military cargoes or personnel. In addition, 34 of the 57 MSP ships utilized by MSC and SDDC also supported the rebuilding of Iraq. Since September 11, 2001, SDDC reports that U.S.-flag commercial ships have delivered over 360,000 twenty foot equivalent units (TEUs) of containerized equipment and supplies to support U.S. troops in Iraq and Afghanistan.

The continued presence of U.S.-flag vessels in foreign trades provides legal standing for the U.S. Government to protect the interests of American businesses and consumers. As a result, the U.S. Government may directly intervene in disputes with foreign countries that regulate or otherwise restrict the operation of U.S.-flag ships, carriers, ports, and connecting intermodal operations abroad to assure that U.S. interests are protected.

The Maritime Guaranteed Loan Program (Title XI) helps sustain the growth and modernization of the U.S. merchant marine and U.S. shipyards by enabling eligible companies to obtain long-term financing on terms that would otherwise be available only to the most creditworthy concerns. The Title XI program provides for a full faith and credit loan guarantee by the federal government of up to 87½ percent of private sector debt incurred for the construction or reconstruction of ships in United States shipyards. Title XI loan guarantees can also be issued for the modernization of American yards to make them more competitive.

MARAD supports the Cabinet-level Committee on the Marine Transportation System (CMTS), which is chaired by the Secretary of Transportation. The purpose of CMTS is to improve Federal MTS coordination and policies; promote the environmentally sound integration of marine transportation with other modes of transportation and with other ocean, coastal, and Great Lakes uses; develop outcome-based goals for the MTS and a method for monitoring progress towards those goals; coordinate Federal annual budget requests and regulatory activities that impact the MTS; and recommend strategies and plans to maintain and improve the MTS.

MARAD is responsible for the support, organization, and management of the Marine Transportation System National Advisory Council, which provides non-Federal advice to the Secretary of Transportation on Marine Transportation System (MTS) issues. Under MARAD's leadership, this group provides valuable insights into the MTS and intermodal challenges, needs, and solutions from the state, private and public interest sectors.

MARAD programs also focus on enhancing marine-related commerce, particularly with regard to economic and security issues. Port economic activities include the excess Federal property conveyance program and port impact analyses. Port security activities include the National Port Readiness Network, port security training and other activities seeking to improve commercial and cargo security.

MARAD has responsibility for the processing and licensing of deepwater port applications for the importation of liquefied natural gas (LNG) into the United States. Overall, the Department of Energy projects that from 2006 to 2025, U.S. natural gas consumption will increase from 22.3 to 30.6 trillion cubic feet (tcf), or 37%, with all of this increase supported through importation of LNG. LNG imports are projected to become the primary source of the Nation's supply of natural gas. The development and construction of additional offshore deepwater port LNG facilities will reduce vessel traffic and congestion in our U.S. landside ports; improve the efficiency of the transport of imported LNG within the U.S.; expand our intermodal connections with other countries; and, create an additional level of security for our nation's energy industry by moving LNG import connections offshore.

MARAD negotiates specific bilateral maritime agreements to remove restrictions that impinge on U.S. maritime companies' access to foreign transportation markets, add to costs, limit

revenues, and impede efficient operations of the U.S. maritime industry in international trade. Such agreements are intended to achieve full market access for U.S. carriers in specific markets where full access is not assured by major global trade agreements. With respect to multilateral activities, MARAD is involved in trade negotiations launched under the umbrella of the World Trade Organization and participates in the Asia-Pacific Economic Cooperation (APEC) Transportation Working Group. MARAD works either directly, or in conjunction with the State Department and other government agencies, to negotiate these agreements, understandings and arrangements.

- ▶ **Environmental Protection:** MARAD programs provide support to the commercial and public sector in addressing environmental challenges related to maritime commerce. These activities cover a broad range of marine related environmental issues, including reducing port and vessel air emissions, reducing the introduction of aquatic nuisance species through ballast water discharges and the establishment of environmental management tools and practices. MARAD also supports the development of international marine environmental standards through membership in and participation on the U.S. delegations to the International Maritime Organization, Marine Environmental Protection Committee and the Conference of the Parties to the Basel Convention, and as the U.S. delegate to the International Organization for Standards, subcommittee on Marine Environmental Protection.

MARAD is the U.S. government's disposal agent for merchant type vessels 1,500 gross tons or more and has custody of a fleet of over one hundred obsolete ships owned by the Federal government that are designated for disposal. Due to the presence of onboard hazardous materials such as residual fuel, asbestos and solid polychlorinated biphenyls (PCBs) on these ships, they pose a risk to the surrounding environment and must be disposed of properly. In order to reduce environmental risk, MARAD seeks to continue its steady decrease in the total number of ships in the obsolete vessel inventory and the steady elimination of MARAD's higher priority vessels.

- ▶ **Advancement of Merchant Marine Officer Education:** Both the U.S. Merchant Marine Academy and the State Maritime Schools 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 State Maritime Schools. Graduates receive Bachelor of Science

degrees and U.S. Coast Guard licenses as deck or engineering officers. These maritime academies produce merchant marine officers to meet our domestic and international U.S.-flag crewing needs.

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, not elsewhere classified	FY 2006 Budget Actual	FY 2007 Budget Enacted	FY 2008 Budget Requested
Maritime Administration								
Operations and Training								
Cargo Preference		100%				1.96	1.96	3.75
Ports, Intermodal and Environmental Act	30%	70%				4.75	4.75	4.81
Maritime Academies		100%				72.33	72.33	71.46
Ship Disposal	100%					20.79	20.79	20.00
Maritime Guaranteed Loan Program								
Administrative Expenses-Title XI		100%				4.09	4.09	0.00
Ocean Freight Differential		100%				244.55	244.00	120.00
Maritime Security Program		100%				154.44	154.44	154.44
Maritime Administration Total						502.90	502.35	374.46
Saint Lawrence Seaway Development Corporation								
SLSDC Fund	5%	95%	0%	0%	0%	16.00	17.00	18.00
Department of Transportation Total						518.90	519.35	392.46

* The FY 2008 President's request was used to allocate program funding across functional activities.

** 2006 - Actual, 2007 - Enacted, 2008 - President's request, 2009-2012 - all funding is equal to the FY 2008 President's request

DEPARTMENT OF THE TREASURY

The Department of the Treasury is responsible for oversight of U.S. participation in the Global Environment Facility (GEF) which, among other things, 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.

Global Environment Facility

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 waters. In addition to addressing international water pollution and protecting fisheries, GEF funding is also focused on expanding clean energy production and efficient energy use; conserving biological diversity; phasing out ozone depleting substances, reducing persistent organic pollutants; and preventing desertification.

GEF Operations

The GEF focuses on innovative and cost-effective projects that can be duplicated elsewhere with financing from non-GEF sources. Since its inception, the GEF has approved over \$6.2 billion in grants, leveraging over \$20 billion in promised co-financing to support more than 1,800 projects in over 155 countries. These projects are implemented by developing countries through three implementing agencies (the World Bank the U.N. Development Program, and the U.N. Environment Program) and seven executing agencies – the four regional multilateral development banks, the Food and Agriculture Organization (FAO), the International Fund for Agriculture Development (IFAD), and the U.N. Industrial Development Organization (UNIDO). GEF projects are co-financed by developing country governments, bilateral aid agencies, the GEF implementing and executing agencies, private sector investors, and by 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 in practices, such as installation of new equipment on fishing boats to reduce by-catch of non-target species, including sea turtles and mammals.

During the GEF's Fourth Replenishment (which corresponds with U.S. fiscal year 2007 through 2011), the GEF will allocate approximately 12% of its resources to international waters activities. GEF operations to reverse the degradation of international waters are grouped into three categories: (1) international water bodies, (2) integrated land and water projects, and (3) projects that address contaminants, including nutrient over-enrichment and persistent toxic substances, including mercury. Its land and water resource management projects help countries put together plans to reduce pollution, conserve fish stocks, address water scarcity, and prevent conflicts over shared, transboundary resources.

Among other things, the GEF international waters program has facilitated international agreements that have enhanced the governance over international water bodies. A GEF project in the Pacific contributed to the conclusion of an international treaty regarding the conservation and management of tuna and other of highly migratory fish stocks in the Western and Central Pacific Ocean. Other international water bodies that have benefited from GEF assistance include the Black Sea and the Danube River in Europe, the regional seas in East Asia, and the international waters surrounding Africa. Projects have also sought to reduce the release of harmful organisms from ship ballast water and improve the safety of shipping traffic in Asia and East Africa.

DEPARTMENT OF THE 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, not elsewhere classified	FY 2006 Actual**	FY 2007 Enacted***	FY 2008 Budget Request
International Assistance Programs								
Multilateral Assistance								
Contributions to the International Bank for Reconstruction Development (IBRD)								
Global Environment Facility (GEF) Trust Fund					100%	11.88	9.50	12.82

* FY 2008 levels were used to allocate funding across functional areas.

** During the Third Replenishment of the GEF (US FY2003 - 2006), approximately 15% of all GEF funding was allocated to international waters activities, including oceans activities.

*** During the GEF-4 replenishment period (US FY07 - FY11), approximately 12% of funds are allocated to international waters activities, including oceans activities.