REPORT ON THE IMPLEMENTATION OF THE NATIONAL OCEAN POLICY

March 2015

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Introduction

In 2010, President Obama established the National Policy for the Stewardship of the Ocean, Our Coasts, and the Great Lakes. In doing so, he created our first National Ocean Policy which provides a comprehensive and collaborative framework for ensuring the long-term health, resilience, safety, and productivity of our coastal and marine ecosystems and communities, as well as the global mobility of our Armed Forces and the maintenance of informational peace and security. The National Ocean Policy is intended to ensure the many Federal agencies involved in ocean activities deliver to the American people the kind of government action they deserve and expect: effectively collaborating inside and outside of Federal government; supporting our State, Tribal and local partners; providing easy access to information; and using taxpayer dollars efficiently and effectively.

In 2013, after extensive input from stakeholders, businesses, scientists and the public, the National Ocean Council released the National Ocean Policy Implementation Plan, translating the National Ocean Policy into a set of on-the-ground actions to bolster our ocean economy, strengthen our security, improve ocean health, support local communities, and provide better science and information about the ocean and its resources. The Plan is a roadmap for coordinated, science-based action to manage, align, and better understand the many different uses of and resources provided by the ocean, our coasts, and Great Lakes.

Federal agencies have made tremendous progress in carrying out the actions described in the National Ocean Policy Implementation Plan and are working every day to improve the economic and ecological sustainability and health of our ocean, bolster safety and security, and gain insights on how the ocean influences and is influenced by human activity. Agencies have either completed or are making significant progress on most of the actions laid out in the Implementation Plan, and have taken a number of related actions that further the objectives and principals of the Policy. Together, through increased awareness, commitment, and action we are beginning to think and act differently in how we provide benefits to and continue to receive benefits from these vital parts of our world.

The following pages highlight just some of these important activities. For further detail on the specific actions contained in the Implementation Plan, see the Appendix.

Ocean Economy

The National Ocean Policy Implementation Plan makes clear that a healthy and safe marine environment is critical for supporting a healthy economy in the United States. Sectors such as tourism and recreation, shipping, marine construction, energy development, aquaculture, and commercial fishing make up an "ocean economy" that is an increasingly large portion of our total Gross Domestic Product. This ocean economy depends on the health and safety of our ocean and coastal ecosystems and the products and services they provide.

Fostering marine aquaculture will create employment and business opportunities in coastal communities; provide safe, sustainable seafood; and complement NOAA's comprehensive strategy for maintaining healthy and productive marine populations, species, and ecosystems and vibrant coastal communities. Credit: NOAA.

Aquaculture

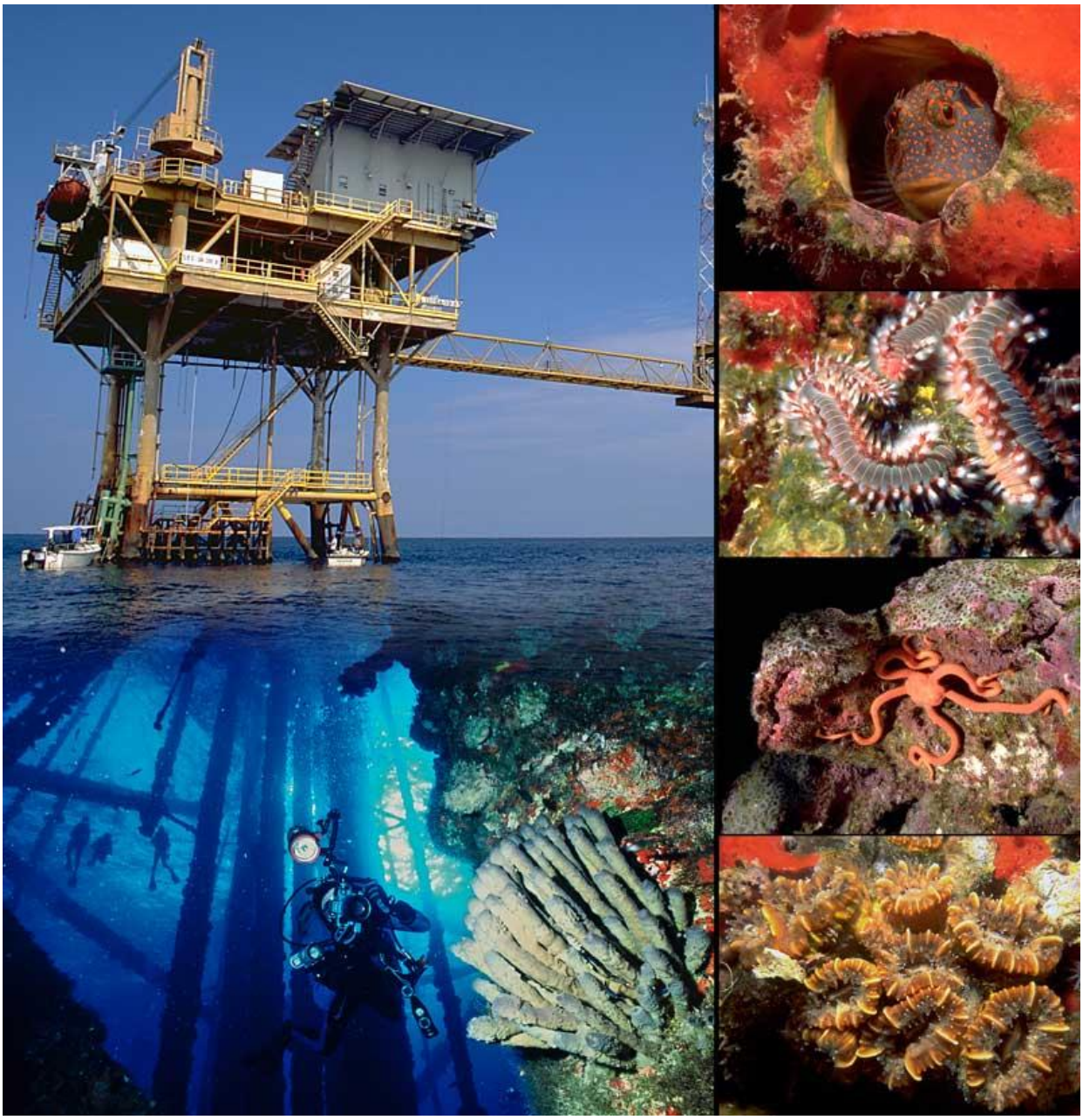
Sustainable aquaculture development contributes to the Nation's seafood supply, supports job creation in coastal communities, enhances important commercial and recreational fisheries, and helps restore species and habitat. The National Ocean Policy Implementation Plan directs Federal agencies to work with partners to implement regulatory efficiencies for marine aquaculture and expand activities under the pre-existing National Oceanic and Atmospheric Administration (NOAA) National Shellfish Initiative. The Aquaculture Regulatory Task Force under the Federal Interagency Working Group on Aquaculture and its component agencies are tasked with carrying out these objectives and have achieved a number of important milestones in developing this industry.

- **Offshore Aquaculture Proposed Rule**: In August 2014, NOAA released a proposed rule for regulating offshore marine aquaculture in the Gulf of Mexico. This proposed rule marked the first time a regional fishery management council has approved a comprehensive regulatory program for aquaculture in Federal waters.
- **Aquaculture Permits**: Several other permitting "firsts" occurred in Federal waters since April, 2013, including:
    - a short-term permit to farm Almaco jack in Federal waters off of Hawaii;
    - the first-ever permit for commercial shellfish production in Federal waters was issued for waters off of California; and
    - the first permits in New England for offshore mussel farms in Federal waters were issued. Several additional applications for aquaculture operations in Federal waters are in various stages of the permitting process in California, Hawaii, and Massachusetts.
- **Expansion of the National Shellfish Initiative (NSI):** Launched in 2011, the NSI aims to increase numbers of shellfish in our Nation's coastal waters for commercial and restoration purposes. As directed by the National Ocean Policy Implementation Plan, agencies have worked through the NSI to improve permitting; coordinate and leverage state and private efforts on shellfish aquaculture and restoration; and understand and predict the effects of ocean acidification. Notable progress has occurred in states as diverse as Maryland, Connecticut, Massachusetts, California, Washington, and Hawaii.
- **Shellfish Growers Guide:** The Aquaculture Regulatory Task Force is developing a framework to streamline Federal agency review of shellfish aquaculture permitting. As the first of several related planned efforts, in early 2015 the Task Force released a guide to help shellfish growers navigate the permit process in the United States and understand how to secure the permits they need.

The crew of the U.S. Coast Guard Cutter *Rush* escorts the suspected high seas drift net fishing vessel *Da Cheng* in the North Pacific Ocean. Global losses attributable to the black market of illegal fishing are estimated to be $10 to $23 billion annually. Credit: U.S. Coast Guard.

Illegal, Unreported, and Unregulated (IUU) Seafood Fraud Task Force

The United States is a global leader in sustainable seafood and effective management of our ocean resources. Effective management and enforcement of regulations have supported near record highs in seafood landings and revenue for our domestic fishing industry. Unfortunately, the related global issues of IUU fishing and seafood fraud continue to undermine the economic and environmental sustainability of fisheries and fish stocks, both in the United States and abroad. Global losses attributable to the black market of illegal fishing are estimated to be $10 to $23 billion annually. To address these issues, the President created a Federal Task Force to provide recommendations for combatting IUU fishing and seafood fraud. This Task Force submitted its final recommendations to the National Ocean Council in December 2014, and agencies are expected to announce implementing actions in early 2015. The Task Force developed 15 recommendations, divided into four categories: international action; strengthening enforcement; partnerships; and traceability. These recommendations are an important step in constructing a more systematic, coordinated program for tackling IUU and seafood fraud domestically, while also increasing our leadership role in this area internationally.



In the photo on the left, an underwater photographer takes a picture of sponges and corals attached to a leg of an oil and gas platform in the coral reefs at Flower Garden Banks National Marine Sanctuary in the Gulf of Mexico. On the right, from top to bottom, are a reef fish, polychaete, echinoderm, and a stony coral, all found on the platform's hard underwater structures. Credit: Texas Parks and Wildlife Department, Rudy Rosen.

Rigs to Reefs

In 2013, the Bureau of Safety and Environmental Enforcement and the National Ocean Council convened an interagency working group with representatives from the Bureau of Ocean Energy Management, U.S. Coast Guard, National Oceanic and Atmospheric Administration, Environmental Protection Agency and U.S. Army Corps of Engineers to engage Gulf Coast State agencies, the oil and gas industry, commercial

and recreational fishing groups, diving groups, and the general public to discuss needed changes to the artificial reefing process, commonly known as "Rigs to Reefs." The resulting Federal policy provides States the greatest flexibility in their artificial reef planning, while balancing environmental and safety concerns with the various other uses for Outer Continental Shelf lands. The process has generated more than $100 million for States, which helps these local economies be more sustainable, while producing a variety of ancillary benefits, such as capital improvement projects.

The WindFloat Pacific Offshore Wind Demonstration Project. Credit: Principle Power/WindFloat Pacific.

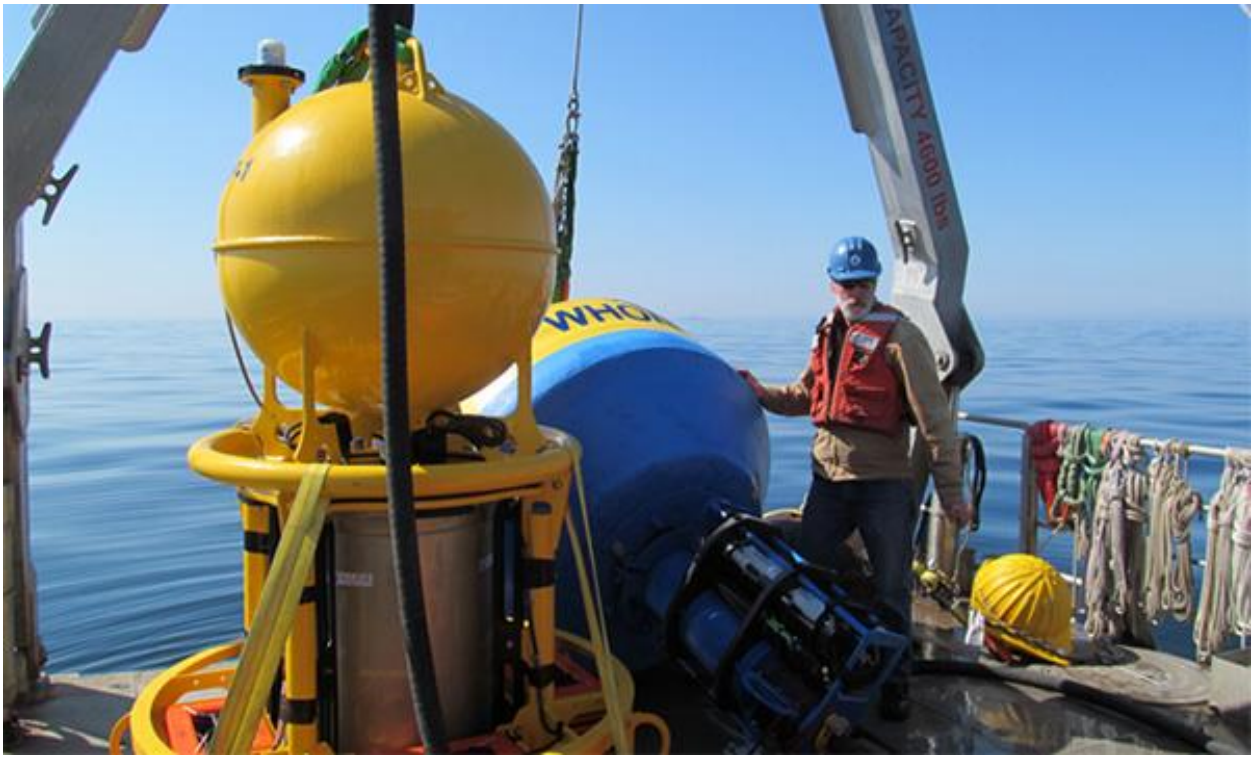
WindFloat Pacific Offshore Wind Demonstration Project

A key goal of the National Ocean Policy is to improve efficiency across Federal agencies, including permitting, planning, and approval processes, in order to save time and money for ocean-based industries and decision makers at all levels of government while at the same time protecting health, safety, and the environment. The WindFloat Pacific Offshore Wind Demonstration Project represents a unique opportunity to show how Federal agencies, led by the Department of the Interior and the Bureau of Ocean Energy Management, are working with State and Tribal governments, the private sector, and stakeholders to streamline processes and reduce duplicative efforts while ensuring appropriate environmental and other required safeguards. The project's goal is to address key challenges associated with installing utility-scale offshore wind turbines, connecting offshore turbines to the power grid, and navigating new permitting and approval processes. With Department of Energy funding, the 30-megawatt demonstration project represents a significant first step toward commercial offshore wind

energy production on the United States West Coast. Coordination and communication among Federal agencies, State offices, Tribal authorities, and stakeholders is an important piece of the process. Positive steps have been taken to heighten awareness of the scope of the reviews among agencies, which will contribute to communication and coordination at appropriate points. This demonstration project is designed to present all interested parties with the ability to provide input and a streamlined approach for government at all levels to work with the private sector to identify and resolve issues more quickly. Lessons from this demonstration project will help future projects and support one of the fundamental planks of the National Ocean Policy: efficiency.

Safety and Security

Our Nation's oceans, coasts, and Great Lakes are all critical to our safety and security. Safe, secure, and productive access to, and use of, our maritime domain are essential to maintaining military strength, a strong economy, and a high quality of life for all Americans. For many, our waters directly sustain life and culture. Federal agencies are working together through the National Ocean Policy to improve our overall maritime domain awareness, be responsible stewards and enhance the safety and security of our ports and waterways.

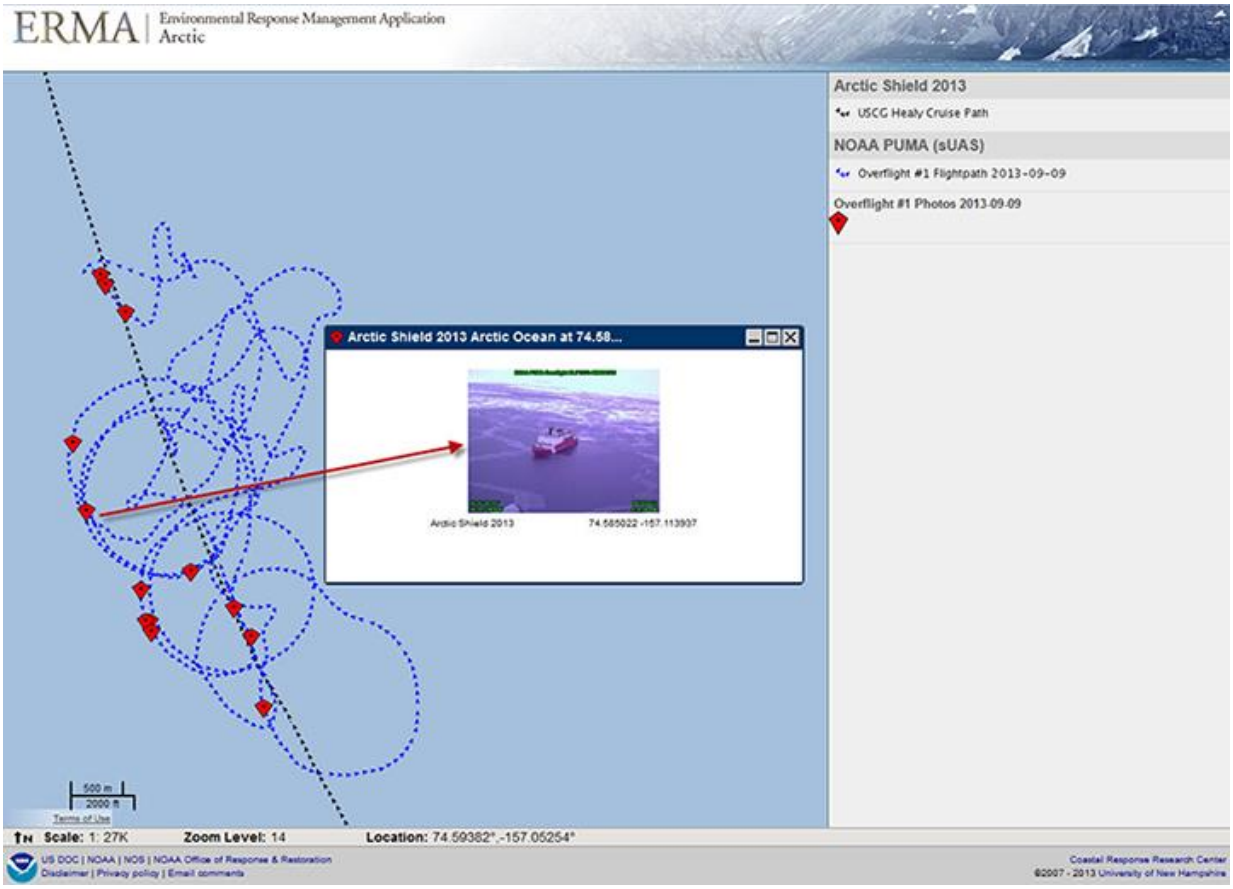


The Environmental Sample Processor (left) is an underwater robot that that can remotely measure paralytic shellfish toxins. Here, the robot and a surface buoy with communication hardware (right) are readied for deployment in the Gulf of Maine. The sampling equipment for this new tool is encased in a yellow steel housing to protect it from crushing ocean pressure. Credit: Woods Hole Oceanographic Institution.

Rapid Detection Techniques for Harmful Algal Blooms

Harmful algal blooms have significant adverse economic, public health-related, and ecological consequences. The Nation witnessed a stark example of this reality during the summer of 2014 when three counties in Ohio and one in Michigan were unable to use tap water as a result of harmful algal blooms. Algal toxins are among the most diverse and potent natural products. Potential effects of consuming them include severe and life-threatening respiratory and gastro-intestinal ailments, paralysis, and amnesia. Rapid, reliable screening methods are needed to protect human health and assure seafood safety in commerce and trade. The National Oceanic and Atmospheric Administration,

Environmental Protection Agency, U.S. Geological Survey, and other agencies are supporting research to identify toxins, pathogens, and toxic chemicals that impact human and wildlife health, and based on that research, develop rapid assessment and detection methods and operational forecasting applications. For example, sensors and testing kits are being developed for a wide variety of algal toxins including paralytic shellfish toxins (Pacific Northwest, Gulf of Maine), neurotoxic shellfish toxins (Gulf of Mexico), and Ciguatera fish poisoning (Caribbean and Tropical Pacific). Other tools such as the Environmental Sample Processor (ESP) allow harmful algal blooms, their toxins, and other parameters to be measured in the water in near real-time and the data transmitted to shore. The ESP has been proven for multiple sensing applications and is recognized for its promise in advancing ocean observing and forecasting.



A view from Arctic ERMA®, NOAA's online mapping tool for environmental disasters. The view includes the path of the U.S. Coast Guard icebreaker *Healy*, the flight of the unmanned aerial system *Puma*, and the photos and their location taken by *Puma*. Credit: NOAA.

Arctic: Environmental Response Management Application

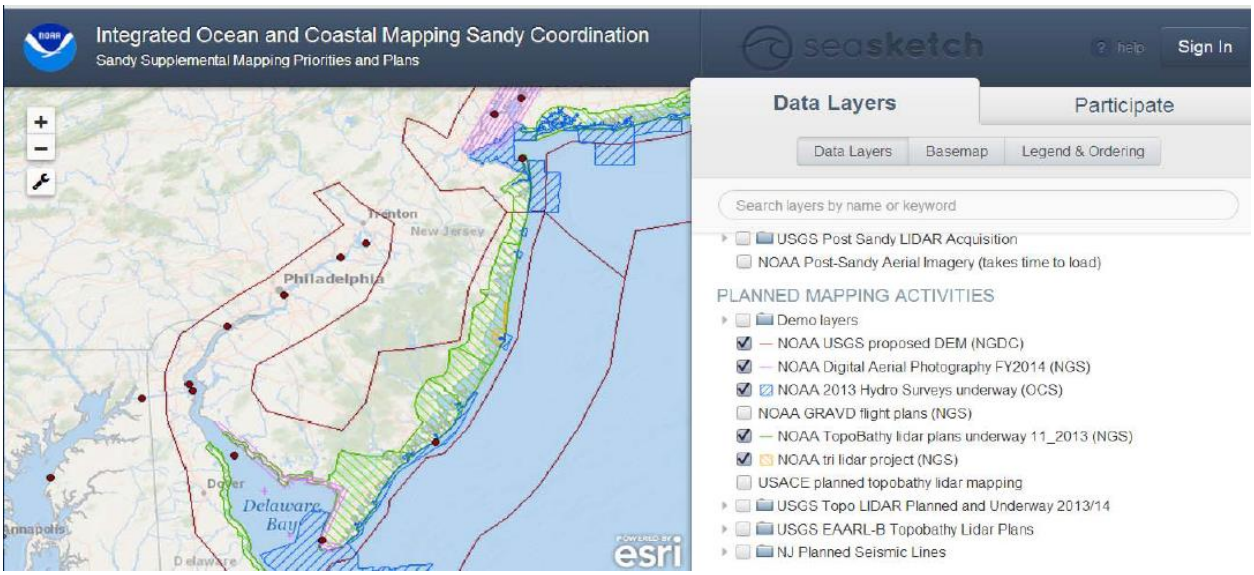
The National Oceanic and Atmospheric Administration and the University of New Hampshire, along with the Environmental Protection Agency, the U.S. Coast Guard, and the Department of the Interior, have developed an Arctic Environmental Response Management Application (ERMA®), a web-based GIS tool that assists both emergency responders and environmental resource managers in dealing with incidents

that may harm the environment. ERMA integrates and synthesizes data—some of which happens in real time—into a single interactive map, providing a quick visualization of the situation and improving communication and coordination among responders and environmental stakeholders. ERMA brings together all of the available information needed for an effective emergency response in the Arctic's distinctive conditions, such as the extent and concentration of sea ice, locations of ports and pipelines, and vulnerable environmental resources, thus meeting one of the National Ocean Policy's goal of providing maritime safety and security in a changing Arctic.

Using state-of-the-art echo sounding technology, NOAA Ship *Fairweather* is detecting navigational dangers in critical Arctic waterways. Credit: NOAA.

Arctic: Sea Ice Mapping

Another example of furthering the National Ocean Policy's goal of providing maritime safety and security in the Arctic is the work the National Oceanic and Atmospheric Administration (NOAA) is conducting to deliver tactical-scale Arctic sea ice analysis and forecasts in geographic information system-enabled broad-scale format to meet U.S. Coast Guard and other user requirements. The National Aeronautics and Space Administration worked with NOAA and other partners on the IceBridge sea ice and snow thickness product, and the Sea Ice Outlook, an international effort to annually estimate the September Arctic sea ice minimum. Although platform limitations impacted NOAA's hydrographic survey and gravity data acquisition schedules for 2014, preliminary plans for the Fiscal Year 2015 survey schedule are available at the Federal interagency mapping coordination site.



The Integrated Ocean and Coastal Mapping Sandy Coordination site uses SeaSketch, a geographic information system-based tool to aid mapping coordination within and across agencies. Credit: NOAA.

Hurricane Sandy Mapping

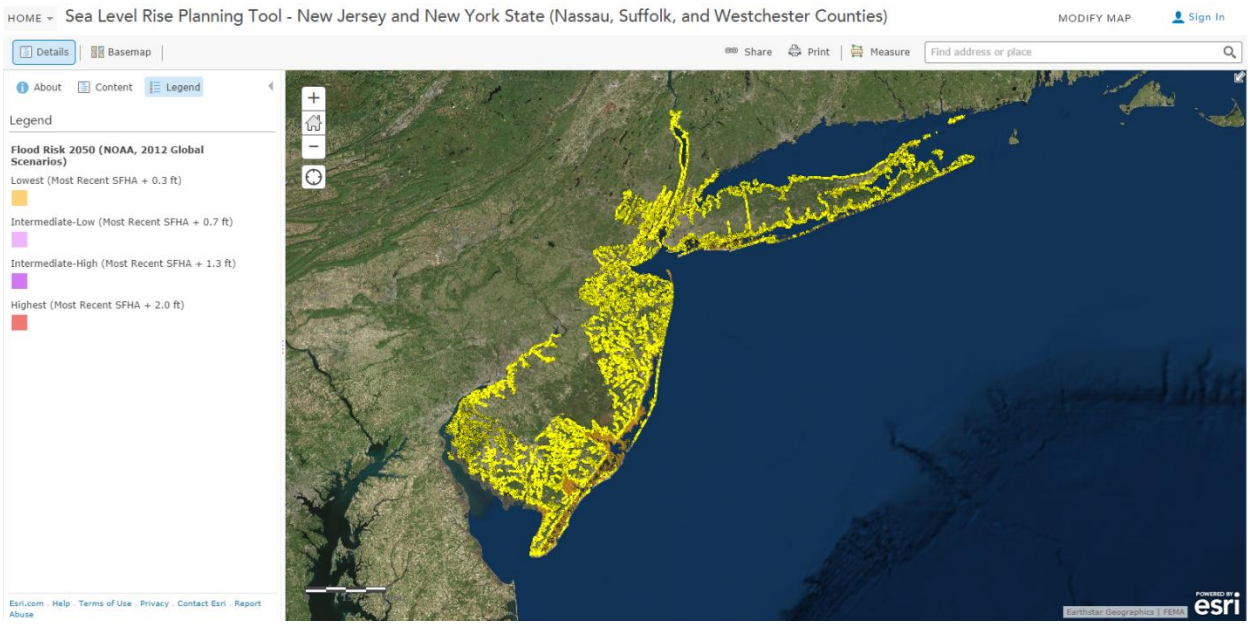
To aid collaboration on post-Hurricane Sandy data acquisition and support interagency mapping coordination during the Sandy recovery effort, the National Oceanic and Atmospheric Administration developed an Integrated Ocean and Coastal Mapping (IOCM) Sandy Coordination site, using SeaSketch, a user-friendly geographic information system tool. Developed by the McClintock Lab at the Center for Marine Assessment and Planning in the Marine Science Institute at the University of California Santa Barbara, SeaSketch was adopted for use by the Interagency Working Group on Ocean and Coastal Mapping. The IOCM site displays Federal and State mapping requirements and plans acquired through engagement with many partners on various levels. The purpose in developing the site was to gather as much information as possible about mapping needs and plans to support decision-making and restoration in Sandy-impacted coastal areas while eliminating overlaps and redundant efforts.

Coastal and Ocean Resilience

Climate change, ocean acidification, and the destruction of coastal habitats threaten our Nation's valuable coastal and ocean ecosystems. Federal agencies are working together with other national, State, Tribal and local efforts to understand, minimize and adapt to the impacts as well as to avoid them altogether. Strengthening the resilience of coastal communities is a key in this effort.

Risk Assessment Workbook

Identifying and managing risks associated with environmental change is essential. The National Ocean Policy calls on agencies to improve the resilience of coastal communities and enhance communities' ability to adapt to the impacts from climate change, extreme weather events, and ocean acidification. The Environmental Protection Agency's *Being Prepared for Climate Change: A Workbook for Developing Risk-Based Adaptation Plans* provides much needed guidance for conducting risk-based climate change vulnerability assessments and developing adaptation action plans. This new Workbook helps meet the need for a step-by-step application of risk management methods at a watershed scale, provides decision support tools, helps people plan climate change adaptation strategies, and builds the capacity of local environmental managers. It is designed to assist organizations that manage environmental resources to voluntarily prepare broad, risk-based adaptation plans. When users have finished going through the Workbook, they will have produced a planning document that can guide their responses to climate change risks.



The Sea Level Rise Planning Tool was designed to help state and local officials, community planners, and infrastructure managers understand possible future flood risks from sea level rise for use in planning decisions**.** Credit: NOAA.

Decision Support Tools – Sea Level Rise Tool for Sandy Recovery

The National Oceanic and Atmospheric Administration, Federal Emergency Management Agency, U.S. Army Corps of Engineers, and U.S. Global Change Research Program partnered to create an interactive sea level rise mapping and calculator tool that helps city planners identify and prepare for future flood risks. This team released the tool less than a year after Hurricane Sandy, allowing state and local planners to make better informed decisions that consider the risk in location and design of redevelopment projects. The tool uses the most up-to-date scientific information by providing assessments of future risks beyond current conditions. Expansion of this tool is being investigated in other pilot locations (San Francisco, Tampa, and Washington, D.C.) to determine the best science-based approach to mapping future flood risk in different coastal regions.

Quilceda marsh, owned by the Tulalip Tribes, looking southwest down Steamboat Slough of the Snohomish River toward Port Gardner, Washington. Credit: K. O'Connell.

Snohomish Blue Carbon Project

The National Oceanic and Atmospheric Administration, by providing funding support, partnered with Restore America's Estuaries (RAE) to perform a landscape assessment in the Snohomish estuary of Puget Sound, Washington, to demonstrate the potential for carbon sequestration if watershed-wide restoration occurred. This assessment developed and verified methodology for measuring carbon in

watershed restoration projects. RAE's study, Coastal Blue Carbon Opportunity Assessment for the Snohomish Estuary, determined that planned and ongoing restoration projects in the Snohomish estuary will result in at least 2.55 million tons of carbon dioxide sequestered from the atmosphere over the next 100 years. This is equivalent to one year's worth of emissions for 500,000 average passenger cars. The report is the first estuary-wide estimate of the carbon sequestration benefits of tidal wetland restoration.

Local high school students pull invasive cottonwood as part of a U.S. Army Corps 63rd Street Beach ecosystem restoration project in Chicago, Illinois. Credit: U.S. Army Corps of Engineers.

The Great Lakes Restoration Initiative

The National Ocean Policy has provided strong incentives for interagency coordination and leveraging resources, as well as promoting Federal engagement with stakeholders to strengthen science and promote environmental stewardship. An example is the collaboration between the Environmental Protection Agency and the National Oceanic and Atmospheric Administration under the Great Lakes Restoration Initiative. In addition to coordinated and complementary water quality monitoring and assessment activities, the Initiative is advancing foundational research to determine biological effects of legacy contaminants at different biological scales, including biochemical and genetic markers. This work also benefits from complementary research by other agencies represented in the Great Lakes Interagency Task Force and at academic institutions. The primary geographic focus of the studies is designated "areas of concern" (AOCs), which have undergone significant environmental degradation as determined under the United States-Canada Great Lakes Water Quality Agreement. This work lays the foundation for an adaptive management strategy in the AOCs, including control of legacy contaminants, and it will support new approaches for improving water quality in the AOCs.

Local Choices

One of the foundations of the National Ocean Policy is its respect for regions, States, Tribes, and local communities. From regional partners to the Governance Coordinating Committee, the collaborative effort strengthens the choices made under the National Ocean Policy. Using science and data to provide the information necessary to make good choices, the development of data portals is a tremendous step forward in decision making.

Regional Planning

The National Ocean Policy recognizes the challenge of balancing the needs of multiple communities as efforts are made to support and grow marine economies, protect and conserve the environment, and sustain unique social and cultural identities. Regional marine planning offers one approach for regions to identify these needs and to use science-based decision making to address overlaps and potential conflicts in a proactive manner. To accomplish this, the National Ocean Policy promotes the establishment of regional partnerships among the Federal government, States, and Tribes, with substantial public engagement. These Regional Planning Bodies can serve as venues for conflict resolution, data sharing, and proactive planning. To date, five Regional Planning Bodies have been established in the Northeast, Mid-Atlantic, Caribbean, Pacific Islands, and West Coast. The Regions have committed to the development of Marine Plans in both the Northeast and Mid-Atlantic by 2016 in collaboration with the National Ocean Council. Through this shared process, Federal agencies are committed to better supporting regional priorities to enhance regional economic, environmental, social, and cultural well-being.

Data Portals

One of the critical components of developing effective partnerships on ocean use is ensuring that all parties have an accurate understanding of the resources and uses in question. To address this issue, four regions, the Northeast, Mid-Atlantic, South Atlantic, and West Coast have developed regional data portals that provide users, including the public, stakeholders, and planners, the ability to view multiple layers of data superimposed on maps and charts. These tools, using the ocean.data.gov site (discussed below in Science and Information) as a clearinghouse, will allow everyone to start from the same baseline level of information when considering ocean and coastal proposed uses.

Governance Coordinating Committee

The National Ocean Policy established a Governance Coordinating Committee (GCC) in 2011, which is comprised of State, Tribal, and local government representatives, and serves as a forum for inter-jurisdictional cooperation with the National Ocean Council. The GCC plays a significant role in the ongoing dialogue and outreach across governments, and is a critical part of the collaborative approach of the National Ocean Policy. The Council will be announcing a new slate of representatives in early 2015, who will bring key expertise and insight throughout their two-year terms.

Earth Day volunteers at Gloucester Harbor, in Gloucester, Massachusetts, sort through and count debris items found along the shoreline. Credit: NOAA.

Shoreline Monitoring

As part of its Marine Debris Monitoring and Assessment Project, the National Oceanic and Atmospheric Administration (NOAA) has published technical guidance and methods for monitoring marine debris on shorelines, surface waters, and the seafloor. Shoreline monitoring protocols are now being used by more than 40 Federal and non-Federal entities nationwide, primarily as part of citizen science, volunteer-led efforts. Shoreline monitoring data are submitted to NOAA and provided to other partners through an online database which currently houses data from more than 100 shoreline sites. Standardized and consistent monitoring and assessment of the abundance and types of marine debris present in the environment will guide efforts to address and mitigate the impacts of marine debris. Marine debris monitoring data will be used to evaluate the effectiveness of existing marine debris prevention efforts, quantify the sources and impacts of debris, and help local communities identify targets for mitigation.

Science and Information

Scientific and technological advances allow us to better understand our world. Building our knowledge allows us to respond more appropriately to new challenges, adapt to changing conditions, and take advantage of emerging opportunities for the benefit of our Nation. Strong science, technology, and engineering capabilities, along with informed people and communities, are the foundation for improving our understanding of the marine environment—from the coasts to the deep sea. This foundation informs our decisions about how best to manage the activities that affect the valuable and multiple resources the marine environment provides.

Members of the winning 2014 National Ocean Sciences Bowl (NOSB) team assist a lobsterman returning lobster traps in Casco Bay, Maine. NOSB is an academic competition that introduces high school students to ocean science, preparing them for ocean science-related and other STEM careers. Credit: Consortium for Ocean Leadership/NOSB.

Ocean STEM Curriculum

A diverse workforce with interdisciplinary skills and training is needed to maintain the Nation's place as a world leader in ocean science and to ensure informed management and use of ocean, coastal, and Great Lakes resources. Agencies are working toward the systematic inclusion of ocean concepts into mainstream K-12 learning, to provide America's students with the science, technology, engineering, and mathematics (STEM) knowledge and skills needed to ensure a high quality and ocean-conscious workforce of the future. One example is a partnership led by the Lawrence Hall of Science and the Carolina Biological Supply Company to develop the Ocean Sciences Curriculum for grades 3-5 and 6-8.

With funding and scientific guidance from the National Oceanic and Atmospheric Administration, these in-depth, kit-based curriculum units deliver science content and opportunities for students to engage in investigations and make evidence-based explanations. In addition to extensive vetting by scientists, the curriculum sequences were designed in accordance with the latest research on learning and tested in classrooms across the United States.

Science on a Sphere is a six-foot diameter sphere that seems to float in mid-air and displays planetary data in vivid color on the animated globe. Credit: Science Central, Fort Wayne, Indiana.

Ocean Literacy

Increased public understanding of ocean and coastal science and the importance of the ocean in the functioning of our planet will empower people and communities to be better stewards of ocean resources and systems, and increase awareness of opportunities related to these resources. It will also provide avenues for the public to engage in the issues facing the ocean, our coasts, and the Great Lakes. Agencies are developing social media platforms, mobile apps, and other interactive approaches to ensure that content that incorporates the latest ocean science reaches students, teachers, and the public. Following are several examples.

- Federal agencies are engaging students, teachers, and communities in ocean issues, discoveries, and opportunities through new or improved social media presence such as Facebook, Twitter, and Flickr. Examples on Facebook include the National Oceanic and Atmospheric Administration's Higher Education Facebook Page, Bureau of Ocean Energy Management's Facebook Page, and U.S. Geological Survey's Facebook Page. Another example is the Department of Defense's STEM2Stern blog.
- The Environmental Protection Agency's How's My Waterway mobile app allows users to learn the condition of local streams, lakes, and other waters anywhere in the United States quickly and in plain language. The information made available through this app feeds into the Smithsonian's Waterways Program, which integrates programming from other agencies.
- One hundred and fifty videos are now available through multimedia Ocean Today kiosks at aquariums, museums, and learning centers throughout the world.
- More than 400 visualizations are available for Science on A Sphere, a six foot diameter sphere that displays information on our planet to enhance informal educational programs in science centers, universities, and museums across the country. The National Oceanic and Atmospheric Administration invented the sphere as an educational tool to help illustrate Earth System Science to people of all ages. Thirteen new spheres were built and placed around the world in 2013, and nine in 2014, including one built in a high school.

Ocean.data.gov

The website ocean.data.gov serves as a central hub and access point for all Federal ocean-related data. The National Ocean Council's Data and Information Working Group manages agency participation in the portal and has developed a number of interactive tools to aid access and interpretation including a regional planning network with links to all of the nine regional efforts and associated products. In addition, the site's Map Gallery was enhanced to ensure the user's ability to intuitively access national, regional and State maps, and offers a helpful way to visualize human uses, natural processes, living and non-living resources, and jurisdictional boundaries. Members of the working group also serve as "Data Ambassadors" to assist regional, State, and local planning efforts.

Climate Data Initiative and Climate Resilience Toolkit

In March 2014, the Administration launched the Climate Data Initiative, a key deliverable of the President's Climate Action Plan. The Climate Data Initiative aligns with the National Ocean Policy through its emphasis on providing increased access to high value data sets and tools to support coastal

resilience. Along with the Initiative's launch, the Administration released climate.data.gov with resources to help companies, communities, and citizens understand and prepare for the impacts of coastal flooding and sea level rise. The National Oceanic and Atmospheric Administration and National Aeronautics and Space Administration also launched the Coastal Flooding Innovation Challenge. The purpose of the challenge was to engage business, stakeholder, and innovator communities to use open government data and other data to create tools and provide information so communities can prepare for coastal floods. Additionally, in response to early input from the State, Local, and Tribal Leaders Task Force on Climate Preparedness and Resilience, the Administration developed the **Climate Resilience Toolkit**, a website that provides centralized, easy-to-use information, tools, and best practices to help communities prepare for and increase their resilience to the impacts of climate change. The Climate Resilience Toolkit provides information from across the Federal government to meet the information needs of communities, interested citizens, businesses, resource managers, planners, and policy leaders at all levels.

Deep-diving submersible *Alvin*. Credit: Rod Catanach and Woods Hole Oceanographic Institution.

Research and Discovery - *Alvin*

After a three-year overhaul and major upgrade funded by the National Science Foundation, the Nation's oldest and deepest-diving research submersible, *Alvin*, has returned to work exploring the ocean's

depths. With a new personnel sphere; more viewports; new lighting and high-definition imaging systems; and an improved command-and-control system, the sub is capable of reaching depths up to 4,500 meters under the sea surface. *Alvin* has revolutionized oceanography throughout the course of its history, allowing scientists to routinely conduct research in deep ocean environments. The state-of-the-art upgrades provide access to even greater depths and will enable cutting edge scientific discoveries and insights to continue, advancing the kinds of scientific progress called for in the National Ocean Policy.

The National Science Foundation-funded Research Vessel *Sikuliaq* leaving Sturgeon Bay. Credit: University of Alaska photo by Val Ihde.

Research and Discovery - *Sikuliaq*

The newest ship in the United States Academic Research Fleet, the National Science Foundation-funded Research Vessel *Sikuliaq*, is a technologically-advanced, ice-capable vessel that will support science to advance the National Ocean Policy by collecting critical observations and data about marine life, the ocean, the atmosphere, and global climate. The 261-foot ship is designed to weather harsh conditions; it is outfitted with state-of-the-art equipment to allow researchers to work in ice-covered waters not previously accessible on a routine basis, and play an essential role in understanding the Arctic Ocean system and how it is changing. The vessel design strives to have the lowest possible environmental impact, including a low underwater radiated noise signature for marine mammal and fisheries work. *Sikuliaq* will be able to accommodate up to 24 scientists and students at a time, including those with disabilities, providing scientists from around the world with unique and important research opportunities.

Coastal wetland within Narragansett Bay National Estuarine Research Reserve. Stressors associated with development–both residential and infrastructure–are key factors in wetland loss. Credit: NOAA.

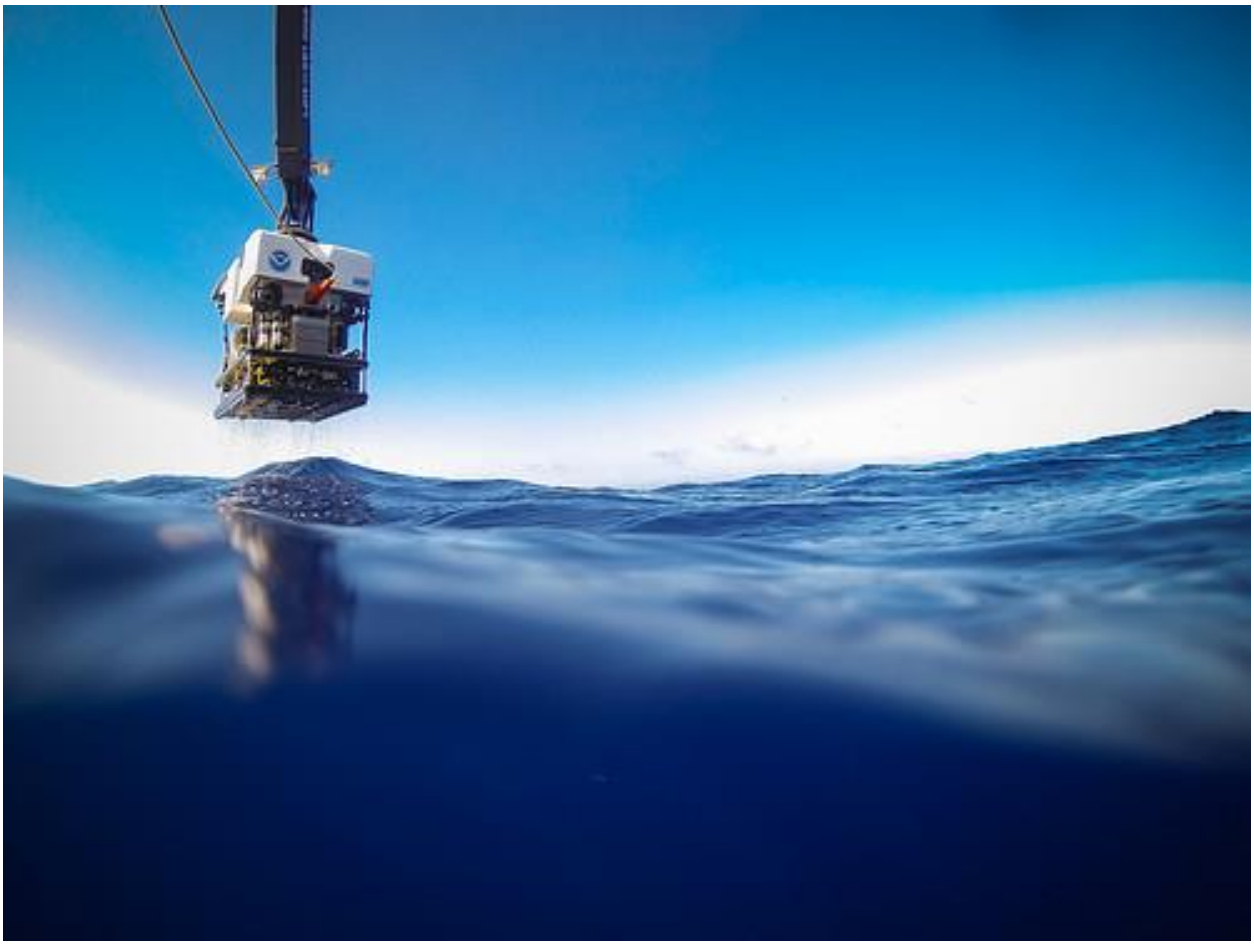
Wetlands Report

The U.S. Fish and Wildlife Service (USFWS)/National Oceanic and Atmospheric Administration (NOAA) report, Status and Trends of Wetlands in the Coastal Watersheds of the Conterminous United States, 2004 to 2009, demonstrated that stressors associated with development–both residential and infrastructure–were key factors in wetland loss. The report also revealed that the loss of wetlands in coastal watersheds is increasing to a level of 80,000 acres per year, or seven football fields an hour. The Interagency Coastal Wetlands Workgroup, chaired by the Environmental Protection Agency, with NOAA, USFWS, U.S. Geological Survey, U.S. Army Corps of Engineers, and the U.S. Department of Agriculture participating, is using the findings of the report to guide pilot studies on wetland loss in one coastal county (Horry County, South Carolina) and four coastal watersheds (Cape Fear River, North Carolina; Tampa Bay, Florida; Galveston Bay, Texas; and San Francisco Bay, California). The Workgroup is also developing strategies to address the major causes of wetland loss outlined in the report: development, drainage associated with some kinds of timber management in the southeast United States, and lack of sufficient restoration in coastal watersheds.

The U.S. Navy's Research Vessel *Sally Ride* is prepared for a christening ceremony at Dakota Creek Industries, Inc. shipyard in Anacortes, Washington. *Sally Ride* is the second in the Neil Armstrong-class of research vessels and features a modern suite of oceanographic and acoustic ocean mapping equipment. Credit: U.S. Navy photo by John F. Williams.

Fleet Report

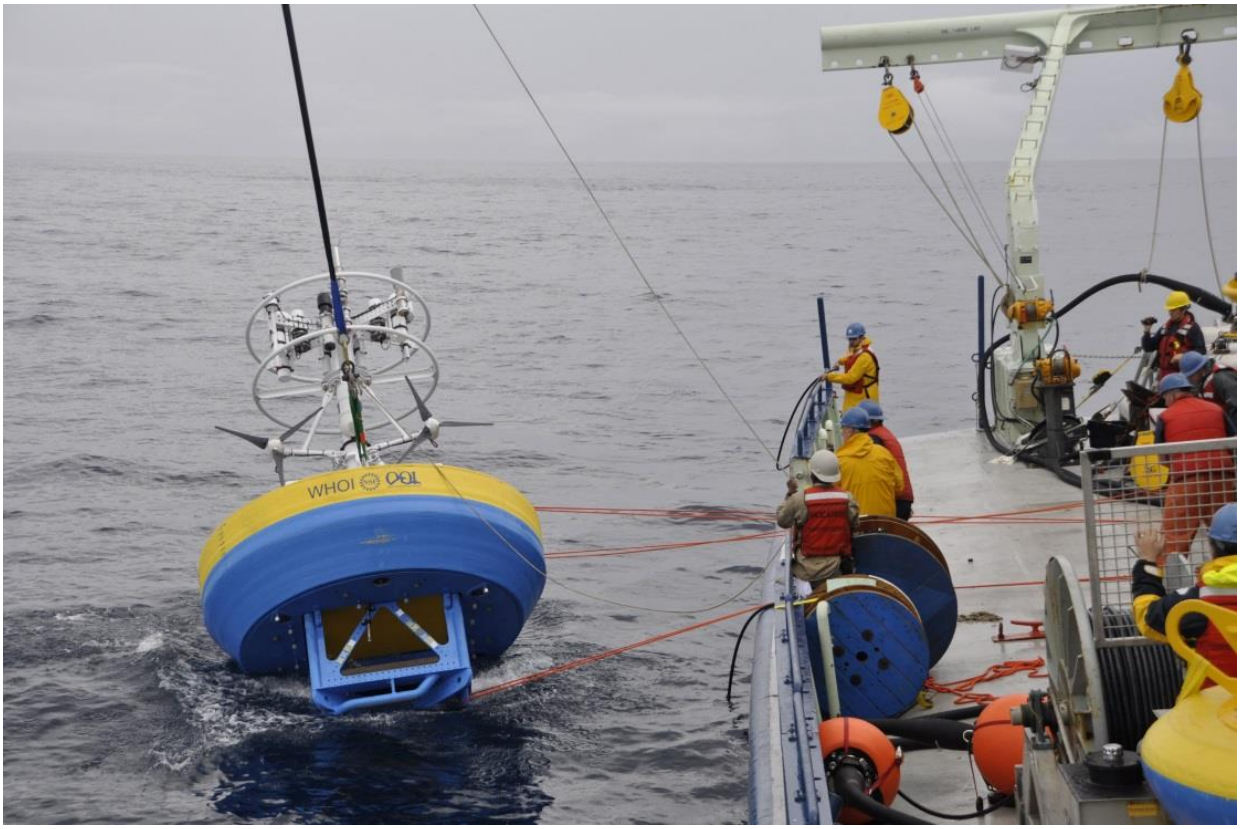
The ships in the Federal Oceanographic Research and Survey Fleet are sophisticated and technologically-advanced national assets that allow us to access and better understand the ocean, the Great Lakes, and United States coastal waters. From these vessels, we collect information that protects lives and property from hazards such as hurricanes and tsunamis, records and projects global climate change and ocean acidification, informs decisions on the use and protection of existing resources and the discovery of new resources, promotes cutting-edge research such as cures for human disease, and enhances national safety and security. As called for in the National Ocean Policy, Federal agencies have completed an update of the Federal Oceanographic Fleet Status Report, which documents the comprehensive review conducted of the Nation's Research and Survey Fleet. Federal agencies are using this inventory and status report to coordinate the Fleet's capacity to support a wide range of requirements worldwide, including in the Arctic. Strengthened Federal coordination in scheduling, operating, and modernizing the Fleet has already improved efficiency by increasing ship-to-shore transmission of data; incorporating green technologies into ship design and operations; and integrating diverse perspectives and interagency expertise into ship design and operations.



Remotely operated vehicle *Deep Discoverer* is recovered from a dive during an expedition. Credit: NOAA *Okeanos Explorer* Program, Gulf of Mexico 2014 Expedition.

Research and Discovery - OCEANEX

Between February and October 2014, the National Oceanic and Atmospheric Administration (NOAA) Ocean Exploration and Research conducted three major cruises in the Gulf of Mexico and three major cruises in the North Atlantic. All cruises engaged NOAA, interagency, and academic partners to systematically collect baseline information to support science and management needs. All exploratory cruises had an open data policy and included integrated data management. Data from all cruises through July 2014 are currently available through the NOAA Data Centers.



The Ocean Observatories Initiative team lowers a test mooring equipped with a sensor package during an at-sea test. The test is intended to provide valuable data for the Pioneer Array that will be located off the East Coast. Credit: Woods Hole Oceanographic Institution.

Research and Discovery – Ocean Observatories Initiative (OOI)

New approaches are crucial to bettering our scientific understanding of changes at work in our ocean. Funded by the National Science Foundation, the OOI goal is to install instruments and transformational technology in critically under-measured ocean locations to provide long term data sets to researchers, educators, policymakers, and the public. Coastal-scale assets will expand existing observations for the United States east and west coasts, creating focused observing regions. Cabled observing platforms will cover a single region in the Northeast Pacific Ocean with a high speed optical and high power grid. A global component will examine planetary-scale changes using moored buoys in the open ocean linked to shore by satellite. This long-term effort will provide 25 to 30 years of sustained ocean measurements and near-real time interactive capability to study climate variability, ocean circulation, ecosystem dynamics, air-sea exchange, seafloor processes, and plate-scale geodynamics. The first global site in the Gulf of Alaska—along with key pieces of the coastal OOI infrastructure off the coast of New England and in the Northeast Pacific—have been deployed. Construction of the regional cabled component in the Northeast Pacific is nearing completion. Approximately 200 instruments have been deployed on dozens of moorings and gliders throughout the OOI system. Preliminary data already are available.

Appendix

To translate President Obama's National Policy for the Stewardship of the Ocean, Our Coasts, and the Great Lakes into on-the-ground actions to benefit the American people, the National Ocean Council released the National Ocean Policy Implementation Plan. The Implementation Plan describes specific actions Federal agencies will take to address key ocean challenges, give states and communities greater input in Federal decisions, streamline Federal operations, save taxpayer dollars, and promote economic growth. Responding to the reporting and accountability requirements of the National Ocean Policy, this Appendix presents the status of specific actions taken by Federal agencies to achieve the nine National Priority Objectives of the National Ocean Policy.

To date, the Federal agencies have made tremendous progress toward improving the economic and ecological sustainability and health of our ocean, bolstering safety and security, and gaining insights on how the ocean influences and is influenced by human activity. Agencies have completed or are making excellent progress on 77 percent of the Implementation Plan actions, and have taken a number of other actions that further the objectives and principles of the Policy and provide benefits to a broad range of ocean users, stakeholders, and the public. Agencies are better coordinating across the Federal government and with their non-federal partners, and are engaging communities in regions around the country. Collaborative discussions are taking place about the future of our ocean, coasts, and the Great Lakes. Agencies are talking about how to use them to support economic, recreational, cultural, and other activities, how to gain more knowledge of them, and how to work collectively to ensure their health, resiliency, and sustainability. Together, through increased awareness, commitment, and action we are beginning to think and act differently in how we provide benefits to and continue to receive benefits from these vital parts of our world.

The following spreadsheet lists the status of all 214 actions set out in the Implementation Plan. Of the total actions, approximately one-third have been completed, and only four percent have not yet been started. Of those not yet started, only one of them is overdue; the rest all have due dates of 2015 or later. Of the nine Priority Objectives, “Marine Planning” is the furthest along in completing its actions. “Ecosystem-Based Management” has the lowest percentage of completed or substantially completed actions, but like all Priority Objectives, is still making steady progress.

Spreadsheet Key
Blue = Objective 100% complete, but may include ongoing actions.
Green = Objective 50% - 99% complete
Yellow = Objective 1% - 49% complete
Red = Objective 0% complete

Theme	Priority Objective	Action	Status Snapshot	Due Date*	Responsible Agencies	Current Status
Coastal and Ocean Resilience	Water Quality and Sustainable Practices on Land	Provide results of integrated modeling and resulting tool kits for communicating hypoxia-related information to coastal managers and other stakeholders.	100%	2013	DOI – USGS; NOAA; USDA	Completed. Gulf of Mexico and Chesapeake Bay hypoxia zone forecasts are issued through press releases posted on the web in June and July, respectively.
Coastal and Ocean Resilience	Water Quality and Sustainable Practices on Land	Establish integrated interagency monitoring, modeling, and assessment partnerships in priority watersheds to better evaluate the effectiveness of land treatment practices (e. g., Mississippi River Basin Healthy Watersheds Initiative, Chesapeake Bay Initiative, and Great Lakes Restoration Initiative).	100%	2013	DOI; EPA; NOAA; USACE; USDA	Completed. USDA-EPA set a research-modeling-monitoring framework in place for Northern Gulf of Mexico and formed a partnership for the National water quality initiative aimed at combining monitoring techniques in priority watersheds.
Coastal and Ocean Resilience	Water Quality and Sustainable Practices on Land	Facilitate removal of trash and marine debris and hazards to navigation caused by marine debris through community-based grants, state coastal managers, and other means.	100%	2014	DOI; EPA; NOAA; USCG	Completed. In FY14, the NOAA Marine Debris Program offered various grants aimed at reducing the impact and volume of marine debris while also promoting better education, communication, and cooridnation among citizens, NGOs, and public agencies. Prevention, education, and outreach grants provided $600,000 in funding. Community-based Marine Debris removal grants provided $2,000,000 in funding.
Coastal and Ocean Resilience	Water Quality and Sustainable Practices on Land	Implement environmental market pilot projects (e. g. , USDA Chesapeake Bay Watershed Initiative) between Federal and regional partners for nutrient and sediment reduction.	100%	2013	DOI; EPA; USDA	Completed. To date, multiple projects have been undertaken as part of this ongoing effort. For example, the USDA and the NRCS awarded 12 conservation innovation grants for water quality credit trading.

Coastal and Ocean Resilience	Water Quality and Sustainable Practices on Land	Inventory and evaluate best management practices to address storm water runoff from the Federal-aid highway system, the efficiency of measures implemented to reduce sediments and common pollutants found in highway storm water runoff, and the costs associated with construction, operation, and maintenance. Results of research completed by 2015 could be used in future establishment of performance measures used at a national level.	100%	2015	DOT	Completed. Project was successfully completed in December 2014; documents and web information are in production.
Coastal and Ocean Resilience	Water Quality and Sustainable Practices on Land	To minimize impacts of hypoxia, support state development of at least 12 state-wide nutrient reduction strategies through webinars, grant funding, and an online data tool.	100%	2013	EPA	Completed. All 12 hypoxia task force states completed nutrient reduction strategies.
Coastal and Ocean Resilience	Water Quality and Sustainable Practices on Land	Establish a marine debris monitoring protocol—including consistent nomenclature, sampling methods, source attribution, and data reporting requirements—for use by Federal agencies and non-Federal entities, including non-governmental organizations and volunteer groups.	100%	2013	EPA; NOAA	Completed. NOAA's Marine Debris Program published monitoring technical protocols through a NOAA technical memorandum that provides consistent nomenclature, sampling methods, and overall guidance on measuring the concentration and distribution of marine debris in the field. It has also created, and manages, a data portal (md-map.net), where field-collected monitoring data can be stored and and shared among groups collecting these data.

Coastal and Ocean Resilience	Water Quality and Sustainable Practices on Land	Identify and promote non-regulatory measures to reduce marine debris, such as market-based incentives, use of litter receptacles along shorelines, and use of litter traps in rivers and estuaries.	100%	2013	EPA; NOAA	Completed. Numerous watershed-based models exist for different coastal bays, estuaries, and great lakes and continue to improve. Improvements will likely continue with increased scientific knowledge, insights, and computational capacities.
Coastal and Ocean Resilience	Water Quality and Sustainable Practices on Land	Support State certainty programs for reducing nutrient and sediment loads that will accelerate the adoption of voluntary conservation efforts.	100%	2013	EPA; USDA	Completed. In Minnesota, the state, EPA, and USDA signed a memorandum of understanding in 2012 to develop a new state program for farmers designed to increase the voluntary adoption of conservation practices. Similar initiatives are underway in various stages of development and locations.
Coastal and Ocean Resilience	Water Quality and Sustainable Practices on Land	Provide more reliable models for HAB forecasts and coordinated training for State and local officials to improve regional capabilities for HAB monitoring, assessment, forecasting, and response.	100%	2014	HHS – CDC; NOAA	The CDC is in the process of contributing data from the harmful algal blooms module to the National Outbreak Reporting System. Additionally, NOAA has made significant progress through its Ecological Forecasting Roadmap initiative.
Coastal and Ocean Resilience	Water Quality and Sustainable Practices on Land	Advance the development and application of scenario-based ecosystem models to quantitatively evaluate hypoxia causes and impacts using an integrative modeling approach, and develop outreach products to communicate advanced understanding to coastal managers and other stakeholders.	100%	2013	NOAA; USDA	A white paper titled "modeling approaches for scenario forecasts of gulf of Mexico hypoxia" was finalized in December 2014. See white paper here: http://www2.coastalscience. noaa. gov/publications/detail.aspx?resource= WZFA6NrZ8oBLUI7HzHZeLey7RjDGXfagONI XrpHdEEk=.

Coastal and Ocean Resilience	Water Quality and Sustainable Practices on Land	Develop quantitative performance measures to evaluate the effectiveness of restoration efforts, National Forest BMPs, and systems of conservation practices for mitigating hypoxia and other water quality impairments through watershed nutrient-loading reductions.	100%	2013	NOAA; USDA	Completed. In 2013, two states, Minnesota and Wisconsin, developed state nutrient strategies with quantitative reduction goals. The Gulf of Mexico Hypoxia task force plans to reduce the size of the hypoxia zone to 5000km2 before 2015 by cutting total watershed nutrient loading. The Hypoxia Task Force Coordinating Committee formed a Goal Committee to reassess the Coastal Goal and develop approaches for states to incorporate reductions strategies.
Coastal and Ocean Resilience	Water Quality and Sustainable Practices on Land	Develop pilot projects to increase access to the Urban Waters Federal Partnership for nearby residents, implement environmental improvements in or near these areas, and increase economic activity in or near urban water bodies.	100%	2015	Urban Waters Federal Partnership	Completed. Multiple pilot locations are now fully developed or developing location coalitions of many Federal agencies, private non-profits, for-profit companies and state and local agencies. These location coalitions have workplans, regular meetings and communication efforts, and real projects. Indeed, EPA provided funding for small grants in 17 locations in 2014, and 19 locations have at least one grant to a local organization from the National Fish and Wildlife Foundation 5-Star and Urban Waters Grant Program.
Coastal and Ocean Resilience	Water Quality and Sustainable Practices on Land	Develop a national hypoxia data portal to support State and regional efforts for seamless data sharing and information dissemination, building on the success of the EPA/USGS data portal, and link to ocean. data. gov.	90%	2015	DOI – USGS; EPA; NOAA	The Gulf of Mexico coastal ocean observing system is developing a hypoxia data portal. Plans to link the hypoxia data portal to the water quality data portal are underway.

Coastal and Ocean Resilience	Water Quality and Sustainable Practices on Land	Establish baseline levels of selected contaminants in bays, estuaries, and Great Lakes waters, sentinel species, and people living in coastal communities and, where sufficient data exist, describe temporal trends and an assessment of the effectiveness of Federal programs designed to abate degradation of water quality.	90%	2014	DOI – USGS; EPA; NOAA; USACE	Federal agency collaborations recently produced consensus on levels of concerns for several groups of toxic contaminants, thresholds of adverse biological effects, and spatial extent of biological impairment sin a number of coastal bays and estuaries. Next steps include conducting a regional assessment of the distribution and severity of contaminants that may be used in decision-making for water quality management.
Coastal and Ocean Resilience	Water Quality and Sustainable Practices on Land	Protect, restore, or enhance 100,000 acres of wetlands, wetland-associated uplands, and high-priority coastal, upland, urban, and island habitat.	90%	2014	DOI; EPA; NOAA; USACE; USDA	The USDA and the NRCS created, restored or enhanced over 100,000 acres of wetlands nationwide in 2012 and 2013. Wetland habitat conservation continues with multiple agencies in several different locations, including EPA and their National Estuary Program.

Coastal and Ocean Resilience	Water Quality and Sustainable Practices on Land	Improve management of water pollutants and other constituents in discharges (e. g. , invasive species, pathogens, toxics, sediments) from vessels and ocean dumping using existing authorities.	85%	2015	EPA; USCG	The USCG is finalizing a ballast discharge compliance and enforcement policy. EPA is developing regulations for the EPA-DOD Uniform National Discharge Standards rulemaking to control operational discharges from Armed Forces vessels. USACE and EPA share regulatory responsiblity for ocean dumping of dredged material under the Ocean Dumping Act and are working to improve dredged material management. EPA is evaluating Ocean Dumping Act permitting requests for non-dredged materials and ocean dump site designation requests, and is monitoring ocean dump sites to ensure environmentally acceptable conditions are achieved.
Coastal and Ocean Resilience	Water Quality and Sustainable Practices on Land	Promote green infrastructure and low-impact development approaches in urban and suburban areas to reduce impacts of discharges of toxics, pathogens, pesticides, nutrients, and sediments from newly developed and existing sites.	80%	2015	EPA	EPA released the 2013 green infrastructure strategic agenda, 2014 technical assistance grants advancing green infrastructure adoption in select communities, and completed the first ever campus rain works challenge.
Coastal and Ocean Resilience	Water Quality and Sustainable Practices on Land	Target State Clean Water Act Section 319 grant programs to priority areas identified by states as they develop comprehensive strategies to reduce nitrogen and phosphorus pollution and encourage the use of Clean Water State Revolving Fund funding to high-priority projects in each state, including those that address nutrient pollution.	80%	2015	EPA	In 2013, EPA released the final Nonpoint Source Program and Grants Guidelines for States and Territories applicable for FY14 and subsequent Section 319 grant awards, a revision to the prior guidance issued in 2004.

Coastal and Ocean Resilience	Water Quality and Sustainable Practices on Land	Improve analytical and forecast models by incorporating more realistic hydrological characterization of the coastal watershed and of human-use activities.	80%	2015	EPA; NOAA	Numerous watershed-based models exist for different coastal bays, estuaries, and great lakes and continue to improve. Improvements will likely continue with increased scientific knowledge, insights, and computational capacities.
Coastal and Ocean Resilience	Water Quality and Sustainable Practices on Land	Develop, working with the seafood industry, new, rapid assessment methods to detect HAB toxins, petrochemicals, industrial and residential chemical contaminants, microbial contamination and spoilage in seafood.	80%	2014	HHS – FDA; EPA; NOAA	This action ecompasses development of a broad range of sensors for a vareity of chemicals and toxins. In some cases research is in early stages, and development and application is far into the future. However, progress continues and several miniture sensors could see routine applications.
Coastal and Ocean Resilience	Water Quality and Sustainable Practices on Land	Enhance contaminant monitoring and disease surveillance programs in a pilot region, ensuring broader agency participation by providing a continuum of observations from the watershed to the coastal ocean, and producing a government-wide monitoring portfolio that links across states, tribes, regions, academia, and other stakeholders and volunteer organizations.	75%	2014	DOI – USGS; EPA; NOAA	Improvements to monitoring, assessment, and modeling studies in Lake Michigan and Chesapeake Bay are complete. Improvements provide great focus on water quality related issues. Chesapeake Bay serves as the pilot region for this action.
Coastal and Ocean Resilience	Water Quality and Sustainable Practices on Land	Improve analytical and forecast models by developing or enhancing models that simulate contaminant transport, fate, and effects; take a holistic "atmosphere-watershed-coastal ocean" approach and offer scenario-based outcomes of reducing contaminant loading.	75%	2016	DOI – USGS; EPA; NOAA	Several Federal agencies retain extensive water quality-related modeling and forecasting expertise and capacity. Next steps involve transitioning these models to meet the operational needs of coastal resource managers.

Coastal and Ocean Resilience	Water Quality and Sustainable Practices on Land	Identify principal sources of debris and areas of accumulation in coastal waters, along shorelines, and in marine areas in each region.	75%	2016	EPA; NOAA	A number of marine debris identification initiatives are underway. For example, the NOAA marine debris program developed the marine debris monitoring and assessment project, and the EPA developed strategic regional trash free planning efforts.
Coastal and Ocean Resilience	Water Quality and Sustainable Practices on Land	Develop and publish a suite of tools and best practices to assist states and localities in responding to marine debris resulting from natural hazards (e. g. , tsunamis, hurricanes, floods).	75%	2014	IMDCC	NOAA's marine debris program submitted a report to congress outlining interagency response plans to severe marine debris events. See report here: http://marinedebris. noaa. gov/about-our-program/interagency-marine-debris-coordinating-committee. EPA's trash free waters Mid-Atlantic planning group is developing a best practices database to support trash prevention and material reuse strategies.
Coastal and Ocean Resilience	Water Quality and Sustainable Practices on Land	Develop, coordinate, and integrate stakeholder/partner monitoring programs to encourage community involvement, education, and stewardship in the protection of healthy watersheds.	50%	2015	DOI; EPA; NOAA; USDA	Multiple observer programs, data reporting networks, and training programs increase public literacy about the environment and preparedness in responding to natural hazards, including harmful algal blooms. Still, much work remains in stricking a dialog and continuity within and between volunteer-based programs. The Hypoxia Task Force is developing a collaborative water quality monitoring network for the Mississippi River basin that is based upon existing monitoring program.

Coastal and Ocean Resilience	Water Quality and Sustainable Practices on Land	Develop tools (e. g. , climate change models) and water quality protection measures (e. g. , BMPs) aimed at assessing and mitigating the impact of future climate change and ocean acidification within existing ocean and coastal programs (e. g. , National Wildlife Refuge System, National Park System, National Forests, National Estuarine Research Reserves, National Estuary Program, and State counterpart areas).	50%	2015	DOI; EPA; NOAA; USDA - USFS	Individual tools exist; however, full model development and deployment requires additional time and resources.
Coastal and Ocean Resilience	Water Quality and Sustainable Practices on Land	Establish a Health Early Warning System (i. e. , a disease/toxin/pathogen surveillance system) to provide effective procedures for information dissemination and to alert public health officials and managers to protect against emerging threats to human, wildlife, and ecosystem health posed by degraded water quality.	50%	2014	HHS – CDC; EPA; NOAA	A few specific elements of an early health warning system are established; however, a comprehensive system is far from complete.
Coastal and Ocean Resilience	Water Quality and Sustainable Practices on Land	Protect 2 million acres of lands identified as high conservation priorities, with at least 35 percent being forestlands of highest value for maintaining water quality.	30%	2025	USDA	Approximately 600,000 acres protected since 2011. In 2014, at least 106,000 additional acres were protected. More protections are needed to achieve the two million acre target by 2025.
Coastal and Ocean Resilience	Water Quality and Sustainable Practices on Land	Improve infrastructure, including availability of standards and probes, shared-use facilities, monitoring platforms, and training, to develop the expertise necessary for state-of-the-art national capabilities for HAB monitoring and detection and improving accuracy of HAB forecasting.	25%	2014	DOC – NIST; HHS – FDA; DOI – USGS; NOAA	NOAA's national research programs, notably the recent marine sensors initiative, account for some progress under this action. Next steps include securing additional funding for long-term infrastructure capacity.

Coastal and Ocean Resilience	Water Quality and Sustainable Practices on Land	Initiate a showcase project linking healthy watershed protection to estuary or Great Lakes water body protection, and evaluate the success in protecting and conserving high-quality coastal waters.	0%	2017	DOI; EPA; NOAA; USDA	A showcase project has yet to be identified.
Coastal and Ocean Resilience	Resiliency and Adaptation to Climate Change and Ocean Acidification	Implement the National Fish, Wildlife, and Plants Climate Adaptation Strategy to help guide development and application of vulnerability assessments for coastal and ocean living resources and environments	100%	2013	CEQ; DOI; NOAA; USACE	Completed. The strategy was released in 2013 and is available at: http://www.wildlifeadaptationstrategy. gov/strategy.php. The USFWS and NOAA are currently implementing the strategy and expect to produce a report highlighting their efforts in 2014 with a more detailed assessment in 2015.
Coastal and Ocean Resilience	Resiliency and Adaptation to Climate Change and Ocean Acidification	Provide guidance to waterfront property owners on environmentally responsible management options for shoreline erosion	100%	2015	DOI; EPA; FEMA; NOAA; USACE	Completed. US army corps of engineers published reports on best management practices for risk informed decisions for shoreline erosion, see here: http://chl.erdc.usace.army.mil/chl.aspx?p=s&a=ARTICLES;199. EPA's "rolling easements" guidance is complete, see here: http://www2.epa.gov/sites/production/files/documents/rollingeasementsprimer.pdf.
Coastal and Ocean Resilience	Resiliency and Adaptation to Climate Change and Ocean Acidification	Provide guidance for performing comprehensive, risk-based vulnerability assessments of climate change impacts for voluntary adoption by coastal programs	100%	2013	DOI; EPA; NOAA	Completed. Guidance document complete and can be found at: http://www2.epa.gov/cre/being-prepared-climate-change-workbook-developing-risk-based-adaptation-plans.

Coastal and Ocean Resilience	Resiliency and Adaptation to Climate Change and Ocean Acidification	Integrate climate information, tools, and services on coasts and oceans into the online interagency global change information system	100%	2014	DOI; EPA; NOAA; USGCRP	Completed. The global change information system was co-deployed with the National Climate Assessment website for the national climate assessment roll-out on May 6th, 2014.
Coastal and Ocean Resilience	Resiliency and Adaptation to Climate Change and Ocean Acidification	Develop an interagency coordinating framework to strengthen the institutions, mechanisms, and capacities for systematically enhancing resilience to hazards	100%	2013	DOT; FEMA; USCG	Completed. See National Mitigation Framework at: http://www. fema. gov/national-mitigation-framework.
Coastal and Ocean Resilience	Resiliency and Adaptation to Climate Change and Ocean Acidification	Develop a draft framework for indicators of community and ecosystem impacts (physical, biological, chemical, cultural, social, and economic) to track changes in vulnerability and resiliency through time as part of the sustained National Climate Assessment process	100%	2013	NOAA; USGCRP	Completed. Draft framework is complete and available at: http://www. globalchange. gov/what-we-do/assessment/indicators-system. Framework spurred the development of a more sophisticated indictaor system currently being reviewed by the U. S. Global Change Research Program.
Coastal and Ocean Resilience	Resiliency and Adaptation to Climate Change and Ocean Acidification	Develop and disseminate a suite of regional climate projections for coastal and marine regions of the United States.	100%	2014	NOAA; USGCRP	Completed. Climatologies for the 8 US regions defined by the national climate assessment, including coastal areas, are published and available at scenarios.globalchange.gov.
Coastal and Ocean Resilience	Resiliency and Adaptation to Climate Change and Ocean Acidification	As part of the U. S. National Climate Assessment, develop national syntheses and assessments of coastal and ocean vulnerability to climate change, ocean acidification, and sea-level change, in cooperation with relevant stakeholders (communities, ecosystem managers, etc.) and tribes.	100%	2013	NOAA; USGCRP	Completed. The 2012 national climate assessment technical input report on ocean and marine resources featured ocean acidification. The technical input report contributed to the 2013 national climate assessment published by Island Press: http://www.islandpress. org/oceans-and-marine-resources-changing-climate.

Coastal and Ocean Resilience	Resiliency and Adaptation to Climate Change and Ocean Acidification	Integrate ocean, coastal, and Great Lakes climate change and ocean acidification risks, impacts, and vulnerabilities into national and international climate assessments	100%	2014	USGCRP	Completed. See national climate assessment chapter on oceans and marine resources: http://nca2014.globalchange.gov/report/regions/oceans.
Coastal and Ocean Resilience	Resiliency and Adaptation to Climate Change and Ocean Acidification	Produce an inventory and assessment of observations and monitoring capabilities in networks and systems of ocean, coastal, and Great Lakes protected areas, research sites, and observing systems.	75%	2014	DOD; DOI; EPA; NOAA	NOAA/IOOS developed a gap analysis of the IOOS system requirements and capabilities. See analysis at: http://www.ioos.noaa.gov/library/us_ioos_blueprint_ver1.pdf. Additional surveys to be completed in the future. See survey next steps at: http://www. ioos.noaa.gov/ioos_in_action/yearonereport_st_1114.pdf.
Coastal and Ocean Resilience	Resiliency and Adaptation to Climate Change and Ocean Acidification	Develop tools and conduct training courses for decision-makers and managers at all levels on how to design and implement vulnerability assessments for coastal and ocean infrastructure, communities, and natural and cultural resources	70%	2013	DOT; EPA; FEMA; NOAA; USACE	EPA is conducting ad-hoc training and developing a course based on the "Being Prepared for Climate Change" work book, see here: http://www2.epa.gov/sites/production/files/2014-09/documents/being_prepared_workbook_508.pdf.
Coastal and Ocean Resilience	Resiliency and Adaptation to Climate Change and Ocean Acidification	Develop and disseminate methods, best practices, and standards for assessing the resiliency of natural resources, cultural resources, populations, and infrastructure in a changing climate.	50%	2013	DOI; DOT; EPA; FEMA; NOAA	A number of initiatives aimed at improving coastal decision makers methods for assessing resiliency exist or are underway. For example, a coastal community resilience index was recently pilot tested and implemented in 39 Gulf of Mexico communities.

Coastal and Ocean Resilience	Resiliency and Adaptation to Climate Change and Ocean Acidification	Develop best practices for climate change and ocean acidification vulnerability assessments for Federally-managed cultural and natural resources, tailored to different ecosystems and landscapes as needed.	50%	2014	DOI; DOT; EPA; NOAA	NMFS completed a new methodology to assess the climate vulnerability of fish stocks, see here: http://www. st.nmfs.noaa. gov/ecosystems/climate/activities/assessing-vulnerability-of-fish-stocks. The methodology has been piloted in two regions and is being updated for final testing and review. USGS published data and methodologies involved with vulnerability assessment and evaluation of the sensitivity of such assessments to future sea-level rise and other coastal change drivers.
Coastal and Ocean Resilience	Resiliency and Adaptation to Climate Change and Ocean Acidification	Develop regional- and local-scale, decision-relevant models and projections for selected areas that assess changes in climate to changes in the physical, chemical, and biological conditions of coastal and marine ecosystems	50%	2014	DOI; NOAA	A variety of joint-Federal-university partnerships and stakeholder cooperatives exist nationally to address climate modeling. Significant coordination among these initiatives is required to complete this action.
Coastal and Ocean Resilience	Resiliency and Adaptation to Climate Change and Ocean Acidification	Conduct targeted research and disseminate findings to address valuable information needs related to the direct and indirect impacts of climate change, ocean acidification, and other stressors on key species, habitats, and ecosystems.	50%	2014	DOI; NOAA; NSF; USACE	The vulnerability assessments registry is currently under construction. Meanwhile, the ocean acidification workgroup is monitoring various efforts including: NOAA and the NSF respective ocean acificiaiton research programs.

Coastal and Ocean Resilience	Resiliency and Adaptation to Climate Change and Ocean Acidification	Conduct targeted research and disseminate findings to address valuable information needs related to the direct and indirect impacts of climate change, ocean acidification, and other stressors on coastal communities, infrastructure, and economies.	50%	2014	DOT; NOAA; NSF	USGCRP is releasing a pilot indicators system in 2014 with a second phase includoing over 100 indicators expected in 2015. NOAA continues to update and expand its coastal community social indicators to assist fishing and other reosurce dependent communities in assessing risk and opportunities to increase reslience, (for more information see: http://www.st.nmfs.noaa.gov/humandimensions/social-indicators/index). NSF continues funding targeted climate change and response reserach through its Coastal Science, Engineering, and Education for Science program. EPA Region 1 is helping lead a joint project to develop an Integrated Sentinel Monitoring Network for Climate Change in Northeast US Ocean and Coastal Ecosystems. The ISMN will integrate observing and monitoring across the region to assess ecosystem change in response to climate change and other stressors, and help governments and communities respond and adapt to change.
Coastal and Ocean Resilience	Resiliency and Adaptation to Climate Change and Ocean Acidification	Create and implement an interagency plan for coordinated monitoring of the impacts of climate change and ocean acidification through existing networks using standardized and/or interoperable techniques, databases, and indicators whenever and wherever possible, to maximize integration of information across networks and agencies, leveraging existing protocols where practicable and relevant.	50%	2020	EPA; IOOC; IWG-OA; USGCRP	The interagency work group on ocean acidification strategic research plan is complete, see here: ftp://ftp.oar.noaa.gov/OA/IWGOA%20documents/IWGOA%20Strategic%20Plan.pdf. Next steps involve implementing the research plan and establishing a National ocean acidification office.

Coastal and Ocean Resilience	Resiliency and Adaptation to Climate Change and Ocean Acidification	Build partnerships with both Federal and non-Federal entities (e. g. , State agencies, tribal agencies, and academic institutions) to integrate existing observing activities into sentinel site networks.	50%	2014	EPA; NOAA	The NOAA Sentinel Site Program directly engages local, state, and Federal managers as part of the cooperative team improving mangement of data products. For more information, see http://oceanservice. noaa. gov/sentinelsites/.
Coastal and Ocean Resilience	Resiliency and Adaptation to Climate Change and Ocean Acidification	Foster and apply ecosystem-based approaches to adaptation, using the adaptive services of natural systems to help reduce vulnerabilities and risks to people and the built environment.	25%	2013	DOI; NOAA	The climate change/ocean acidification and ecosystem-based mangement working groups are working on identifying overlapping responsibilities and agreeing on next steps.
Coastal and Ocean Resilience	Resiliency and Adaptation to Climate Change and Ocean Acidification	In support of the work of the Technical Mapping Advisory Council, develop recommendations to ensure that flood insurance rate maps incorporate the best available climate science and provide these to FEMA.	25%	2013	NOC	The Technical Mapping Advisory Council (TMAC) is currently preparing recommendations for incorporating climate science in flood insurance rate maps to the FEMA administrator. TMAC will produce a report accompanying the recommendations. For more, see: https://www.fema.gov/national-flood-insurance-program-flood-hazard-mapping/technical-mapping-advisory-council.

Coastal and Ocean Resilience	Resiliency and Adaptation to Climate Change and Ocean Acidification	Initiate a framework for identifying, documenting, and communicating coastal and ocean adaptation strategies and related activities.	10%	2013	NOAA; USGCRP	Multiple efforts contributing to this action are underway. Coordinating agencies and research agendas involved in such efforts is required to initiate this frame work. One example includes the National fish, wildlife and plants climate adaption plans developed by Federal, state, and tribal partners with input from many other diverse groups from across the nation. This strategy provides a unified approach—reflecting shared principles and science-based practices—for reducing the negative impacts of climate change on fish, wildlife, plants, and the natural systems upon which they depend.
Coastal and Ocean Resilience	Resiliency and Adaptation to Climate Change and Ocean Acidification	Integrate and strengthen sentinel site networks to track the impacts of climate change and ocean acidification on living marine resources (e. g. , fisheries and marine protected species), protected areas, and coastal and Great Lakes communities in selected areas.	5%	2015	DOI; EPA; NOAA	EPA Region 1 is helping lead a joint Northeast Regional Ocean Council and Northeast Regional Association of Coastal Ocean Observing Systems project to develop an Integrated Sentinel Monitoring Network for Climate Change in Northeast US Ocean and Coastal Ecosystems. The ISMN will integrate observing and monitoring across the region to assess ecosystem change in response to climate change and other stressors, and help governments and communities respond and adapt to change.
Coastal and Ocean Resilience	Resiliency and Adaptation to Climate Change and Ocean Acidification	Develop and incorporate adaptation strategies for coastal and ocean species and habitats into future planning and management processes, such as fisheries, protected species, coral reefs, or shellfish aquaculture	0%	2016	DOI; EPA; NOAA	NOAA fisheries climate science strategy is underway. Target completion is set for fall 2014.

Coastal and Ocean Resilience	Regional Ecosystem Protection and Restoration	Develop a pilot assessment selection strategy and identify coastal watersheds for pilot assessments using updated wetland inventories and geospatial data.	100%	2013	DOI – USFWS; EPA; NOAA; USACE	Completed. The implementation methodology is completed and has been applied to the following four sites: Cape Fear Watershed (NC), Tampa Bay Watershed (FL), and Galveston Bay Watershed (TX). The methodology may be refined as guided by the pilot sites.
Coastal and Ocean Resilience	Regional Ecosystem Protection and Restoration	Document the status and trends of coastal wetlands using the most recent data from 2004 to 2009, including status and trends across the U. S. coastal regions.	100%	2013	DOI – USFWS; NOAA	Completed. Status and trends of wetlands in US coastal watersheds is complete and available at: http://www.fws.gov/wetlands/Documents/Status-and-Trends-of-Wetlands-In-the-Coastal-Watersheds-of-the-Conterminous-US-2004-to-2009.pdf.
Coastal and Ocean Resilience	Regional Ecosystem Protection and Restoration	Develop methods and models to improve the assessment of carbon sequestration capacities for different coastal wetland types (e. g. , mangroves and sea grasses).	100%	2013	DOI – USGS	Completed. The USGS is augmenting existing methodologies to produce carbon sequestration estimates at finer scales for specific ecosystems. Preliminary estimates of geographic and temporal distributions of carbon stock and net fluxes in wetlands are expected in 2014.
Coastal and Ocean Resilience	Regional Ecosystem Protection and Restoration	Identify coastal wetland demonstration sites appropriate for carbon sequestration and emission research, with emphasis on sites already identified for the purposes of long-term ecological research.	100%	2013	DOI – USGS; EPA; NOAA; NSF; USACE; USDA	Completed. Demonstration site identification is complete. The USGS is collaborating with the FWS to identify new demonstration sites on pocosion wetalnds in the Atlantic coastal ecosystems.

Coastal and Ocean Resilience	Regional Ecosystem Protection and Restoration	Assess the role of coastal habitat carbon storage and sequestration for incorporation into habitat protection, restoration, management, and adaptation efforts.	100%	2013	DOI; NOAA	Completed. A policy manuscript was submitted to and published by the marine policy journal. See paper here: http://thebluecarboninitiative.org/wp-content/uploads/Sutton-Grier-et-al.-2013-Marine-Policy.-Incorporating-ES-into-US-nat-res-regs_operationalizing-Carbon-services. pdf.
Coastal and Ocean Resilience	Regional Ecosystem Protection and Restoration	Reactivate and repopulate the Site Evaluation List (SEL) with marine areas that have been identified as nationally significant due to their conservation, recreational, ecological, historical, scientific, cultural, archaeological, educational, or aesthetic qualities.	100%	2013	NOAA	Completed. The final rule reactivating the sanctuary nomination process, formally the site evaluation list, was published June 13, 2014. https://www.Federalregister.gov/articles/2014/06/13/2014-13807/re-establishing-the-sanctuary-nomination-process.
Coastal and Ocean Resilience	Regional Ecosystem Protection and Restoration	Review, revise, and approve minimum ecological monitoring data standards for coastal and estuarine habitat restoration projects.	99%	2014	DOI; EPA; NOAA; USACE; USDA	Formal approval of data standards are pending meeting with the estuary habitat restoration council meeting.
Coastal and Ocean Resilience	Regional Ecosystem Protection and Restoration	Develop a protocol for carbon sequestration as an ecosystem service that can be incorporated into existing Federal policies.	85%	2015	DOI – USGS; NOAA; USDA	The formal draft methodology was submitted to the Verified Carbon Standard for approval. The landscape assessment report and analysis was completed in February and was followed by a rollout and briefings to Federal agencies and partners.
Coastal and Ocean Resilience	Regional Ecosystem Protection and Restoration	Develop mechanisms to facilitate public–private partnerships to address invasive species, such as Memoranda of Understanding and related joint planning documents, and submit them for review and approval by participating entities.	85%	2013	NISC	An interagency work group has been formed to identify mechanisms to facilitate public-private partnership to address invasive species.

Coastal and Ocean Resilience	Regional Ecosystem Protection and Restoration	Complete State/territory-specific coral bleaching response plans and/or resilience/adaptation strategies to better coordinate action to address the impacts of climate change and ocean acidification on coral reef ecosystems.	85%	2014	USCRTF	Hawaii and Florida have coral bleaching response plans in place. USVI, Guam, Northern Marina Islands, and American Samoa plans are in draft phase but positioned to respond to particular climate change events. Puerto Rico is continuing to draft their plan.
Coastal and Ocean Resilience	Regional Ecosystem Protection and Restoration	Analyze potential models and identify strategic gaps and opportunities, with the Aquatic Nuisance Species Task Force (ANSTF), to improve our ability to conduct Early Detection Rapid Response operations.	75%	2013	NISC	An interagency work group has been formed to analyze potential models and identify strategic gaps and opportunities to conduct Early Detection Rapid Response operations.
Coastal and Ocean Resilience	Regional Ecosystem Protection and Restoration	For each coastal watershed selected for a pilot assessment, complete analyses of data and information from the 2011 Status and Trends of Wetlands in the Conterminous United States, NOAA's Coastal Change Analysis Program, Clean Water Act Section 404 program, State regulatory programs, and geospatial sources.	70%	2014	DOI – USFWS; EPA; NOAA; USACE	Pilot site analysis and an initial draft summary document has been completed for two pilot locations (Cape Fear, NC and Tampa Bay, FL). Data has been analyzed for the third pilot site Galveston Bay, TX) and a draft summary document is scheduled for completion by end of CY14. Analysis for final pilot location (San Francisco Bay, CA) will commence beginning of CY15.
Coastal and Ocean Resilience	Regional Ecosystem Protection and Restoration	Complete and disseminate a reference handbook to include a review of existing policies, agency and State/territory roles and responsibilities, a compendium of best practices, science-based methodologies for quantifying ecosystem services, and protocols for use when responding, assessing, mitigating, and restoring coral reef ecosystems.	70%	2014	USCRTF	Handbook rough draft will be circulated before the end CY14. Final draft expected by February '15.

Coastal and Ocean Resilience	Regional Ecosystem Protection and Restoration	Develop the processes for requesting Early Detection Rapid Response proposals and evaluation criteria in concert with the Invasive Species Advisory Committee, Aquatic Nuisance Species regional panels, and Federal invasive species program experts.	50%	2013	ANSTF; NISC	Funding agreements are in place. Next steps include creating a model for requesting proposals and criteria for their evaluation.
Coastal and Ocean Resilience	Regional Ecosystem Protection and Restoration	To support long-term sustainability of ocean resources, evaluate cultural resources for additional protection under the National Historic Preservation Act.	50%	2014	DOI; NOAA	Scoping exercises are complete and proved successful. International partnerships to assist US cultural resource evaluations are under cultivation.
Coastal and Ocean Resilience	Regional Ecosystem Protection and Restoration	Identify priority species and their high-value habitats that would benefit most from habitat assessments and conservation actions.	40%	2015	NFHP Federal Caucus	Regional prioritization lists are complete for the Southwest and Northwest regions, available at http://www.st.nmfs.noaa.gov/Assets/ecosystems/habitat/pdf/WestCoast_HAP.pdf. Prioritization efforts are underway for the Pacific Islands, Northeast, and Alaska regions, with results anticipated in 2015.
Coastal and Ocean Resilience	Regional Ecosystem Protection and Restoration	Identify potential Federal and non-Federal funding sources that can contribute to the funding of a pilot-scale request for proposals to address invasive species.	35%	2013	NISC	Linkages between invasive species early detection and rapid response efforts and funding programs are being explored.

Coastal and Ocean Resilience	Regional Ecosystem Protection and Restoration	Implement coordinated projects in targeted locations to reduce land-based pollutants impacting coral reef ecosystems. Provide information and tools necessary for managers and decision-makers to identify and implement the most effective and efficient management practices in upstream environments.	30%	2014	USCRTF	Waste management plans (wmp) have been completed for Guánica Bay, Puerto Rico, and two sub watersheds on West Maui (Ka'anapali and Kahekili). Draft wmps for the Kahana, Honokahua, and Honolua watersheds are currently out for public comment. Faga'alu village developed a local management plan for their watershed and with help from the DOI expect to complete a wmp.
Coastal and Ocean Resilience	Regional Ecosystem Protection and Restoration	As part of the National Fish Habitat Assessment, complete a marine fish habitat assessment that includes an analysis of the links between estuarine and upland habitats to inform future habitat conservation work under the National Fish Habitat Partnership.	25%	2013	NOAA	Preliminary marine fish habitat assessment results are anticipated in June 2015 for inclusion in the 2015 National Fish Habitat Assessment. Some results are expected post report.
Coastal and Ocean Resilience	Regional Ecosystem Protection and Restoration	Review the initial round of pilot-scale proposals to address invasive species, report on the pilot program's effectiveness, and make recommendations for its continued improvement.	0%	2014	ANSTF; NISC	Work has not yet begun.
Coastal and Ocean Resilience	Ecosystem based Management	Develop guidance for all Federal agencies about how to implement EBM under existing regulatory and legislative authorities, such as the National Environmental Policy Act (NEPA), into agency-specific programs and associated actions (e. g. , risk analyses and permit reviews).	80%	2013/2015	NOC Legal Working Group; ORM-IPC; OST-IPC	The National Ocean Council Legal Working Group is reviewing relevant documents and will produce a draft legal guidance document in 2015.

Coastal and Ocean Resilience	Ecosystem based Management	Develop ecosystem-based management (EBM) principles, goals, and performance measures; produce a policy statement; and coordinate adoption by NOC member agencies	80%	2013/2014/2015	ORM-IPC; OST-IPC	A draft guidance document/consensus statement is under review by the Ecosystem-Based Management Subgroup.
Coastal and Ocean Resilience	Ecosystem based Management	Complete formal interagency partnership agreements (e. g. , Memoranda of Agreement) between NOC agencies regarding coordination and leveraging efforts to achieve EBM.	60%	2013/2014/2016	NOC	A draft interagency memoranda of agreement is under development. Example memoranda of understandings, collected through an interagency ecosystem based management survey, will support this effort.
Coastal and Ocean Resilience	Ecosystem based Management	Strengthen existing agency and interagency EBM efforts, focusing on increasing collaboration with experts, practitioners, and stakeholders, efficiency, consistency, and transparency of management efforts across agencies.	30%	2013/2015	ORM-IPC	Some efforts are already under way, including interagency outreach to regional planning bodies; collaboration with the ocean research advisory panel; and stakeholder outreach through regular conversations with environmental non-governmental orgnaizations and industry groups.
Coastal and Ocean Resilience	Ecosystem based Management	Incorporate EBM into Federal agency environmental planning and review processes using a phased approach.	20%	2016	NOC Agencies	Legal guidance is currently under development to support this action.
Local Choices	Marine Planning	Continue to make non-classified agency data, decision-support tools, and visualization capabilities of relevance to marine planning publicly available in machine-readable formats through ocean.data.gov.	100%	2013	DOD; DOE; DOI; EPA; NOAA; USACE; USCG	As of June 15th, 2014, ocean. data. gov includes 367 datasets contributed from Federal, state, and academic sources. Additionally, there are 16 decision support tools with background and use information available on the ocean tools page.
Local Choices	Marine Planning	Federal agencies will participate on and work with Regional Planning Bodies to determine initial steps needed to support regional planning to advance regional interests.	100%	2014	Federal RPB Members	All four Regional Planning Bodies have made progress on taking initial steps.

Local Choices	Marine Planning	Provide guidance and information to Federal, State, and tribal agency RPB co-leads and members; also make this available to stakeholders and the public.	100%	2013	NOC Office	In 2013, the National Ocean Council released the marine planning handbook. See handbook here: http://www.whitehouse.gov//sites/default/files/final_marine_planning_handbook.pdf.
Local Choices	Marine Planning	Assist regional, State, and tribal partners who want to hold marine planning workshops.	100%	2013	NOC Office; RPB Federal Co-leads	Marine planning workshops held in the Northeast, Mid-Atlantic, Caribbean, and Pacific Island regions.
Local Choices	Marine Planning	As an initial step, agencies will routinely share results of individual agency engagement with interested tribal authorities in support of tribal involvement in priority-setting and planning for each region.	100%	2014	ORM-IPC	Agencies are sharing information through engagement in regional planning bodies, regional ocean partnerships, and other forums.
Local Choices	Marine Planning	Continue to build out the national marine planning data portal (ocean. data. gov), and develop and implement a governance strategy for the national information management system that ensures high data quality and standards-based data management for maximum data utility and interoperability.	90%	2014	Ocean. data. gov Portal Working Group	Federal departments, bureaus, and agnecies continue to contribute both geospatial and non-spatial data and information to the data. gov catalog (catalog. data. gov) for subsequent inclusion in the Ocean Community (ocean. data. gov). During Quarter 2 of FY2015, the NOC Data and Information Working Group hopes to further engage with the Integrated Ocean Observing System (IOOS) Program and associated Regional Associations (IOOS RAs) to ensure that the real-time scientific data and information that results from their infrastructure and efforts is also accessible to the marine planning community via derived data products such as regional climatologies.

Local Choices	Marine Planning	Federal agencies in regions that do not establish a Regional Planning Body will collaborate to identify and address priority science, information, and ocean management issues and coordinate with non-Federal partners and stakeholders as appropriate.	85%	2014	Regional Federal Agency Representatives	Progress is being made in each of the five regions that have not stood up a Regional Planning Body. The South Atlantic will soon begin developing a charter. For the Gulf of Mexico, Great Lakes, and Alaska, related Federal and state bodies are actively discussing how marine planning will proceed within the context of current efforts. In Alaska, this includes numerous bodies focused on Arctic and climate change. Intergovernmental cooperation in the region is ongoing outside the RPB structure. For the Great Lakes, this includes efforts focused on alternative energy. For the Gulf of Mexico, this includes efforts focused on recovery from the Deepwater oil spill. On the West coast, agencies are working to resolve issues associated with having numerous potential tribal partners and how the tribes will be represented in the planning process.
Local Choices	Marine Planning	RPBs will develop marine plans.	45%	2017	Regional Planning Bodies	Existing RPBs are moving forward with regional ocean planning. The Northeast and the Mid-Atlantic RPBs project a 2016 completion date. The Pacific Islands RPB has finalized a stakeholder engagement plan, and Caribbean RPB has approved a charter during the May '14 meeting.
Local Choices	Resiliency and Adaptation to Climate Change and Ocean Acidification	Provide guidance on the effective use of regional climate and sea-level rise scenarios, including associated uncertainties.	100%	2013	USGCRP	Completed. Information on the regional scenarios can be found at: http://scenarios. globalchange.gov/.

Local Choices	Resiliency and Adaptation to Climate Change and Ocean Acidification	Provide coastal inundation and sea-level change decision-support tools to local, State, tribal, and Federal managers.	90%	2015	DOI; NOAA; USACE	All states excluding AK and LA are mapped in NOAA's sea level rise viewer. For more information, see: http://coast.noaa.gov/digitalcoast/tools/slr.
Local Choices	Resiliency and Adaptation to Climate Change and Ocean Acidification	Collaborate with State, tribal, local, and community efforts on developing climate change and ocean acidification vulnerability assessments.	80%	2014	DOI – USGS; EPA; NOAA	An interactive support site providing flood hazard maps showing areas most prone to flooding for 32 counties in NJ, NY, PA, and DE is nearing completion. By 2020, EPA expects to develop 28 National Estuary Management plans with risk-based climate change vulnerability assessments and climate-resilient investments built in.
Local Choices	Resiliency and Adaptation to Climate Change and Ocean Acidification	Provide accessible, standardized guidance and training for incorporating climate change and ocean acidification information into ecosystem management, restoration, and marine planning activities.	50%	2014	DOI; EPA; NOAA	NOAA's Ocean acidification program participated in the California ocean acidification network, helped launch the Northeast Coastal acidification network in 2013, and is participating in activities in preparation of the Chesapeake Bay ocean acidification network launch expected in 2014. NOAA is also developing guidance for climate smart conservation and will continue training efforts on design and execution of vulnerability assessments.
Local Choices	Resiliency and Adaptation to Climate Change and Ocean Acidification	Develop adaptation strategies in consultation with tribes and with tribal and State Historic Preservation Offices that are consistent with State, tribal, and local land use laws and policies to address the impacts of climate change on coastal and ocean cultural resources	0%	2013	DOI; NOAA; USDA	Work has not yet begun.

Local Choices	Inform Decisions and Improve Understanding	Develop and complete an assessment of existing and needed decision-support tools and training to support ocean and coastal decision-makers	80%	2013/2014/2015	ORM-IPC; OST-IPC	Many ecosystem-based management (EBM) training materials have already been developed by external partners, and are being evaluated for their utility to Federal managers. The forthcoming NOAA EBM website will act serve as a pilot platform for disseminating training materials and tools.
Local Choices	Inform Decisions and Improve Understanding	Develop and provide decision-support tools and information services to meet the needs of Federal, State, Tribal, regional, and local ocean, coastal, and Great Lakes resource managers, policymakers, and stakeholders.	40%	2016	DOD; DOE; DOI; EPA; NOAA	Existing Federal and non Federal decision support tools will be reviewed and adapted to meet the needs of resource managers and stakeholders.
Local Choices	Inform Decisions and Improve Understanding	Provide EBM training curricula to meet the needs of Federal, State, Tribal, regional, and local ocean, coastal, and Great Lakes resource managers, policymakers, and stakeholders.	40%	2016	DOI; DOT; NOAA; USACE; USDA	Existing Federal and non-Federal training resources will be reviewed and adapted as needed, and made available for formal and informal trainings.
Local Choices	Ecosystem based Management	Develop criteria for identifying priority geographic areas for pilot implementation of ecosystem-based management (EBM), and use those criteria to identify three locations for pilot projects.	80%	2013	ORM-IPC	Criteria developed and available. Next steps include development and implementation of pilot projects.
Local Choices	Ecosystem based Management	Determine what additional data and tools are needed for implementing EBM in the selected pilot project locations, and conduct EBM pilot projects in the identified areas, ensuring that EBM data and tools (e. g. , integrated ecosystem assessments) are available for use, data/tool gaps are filled, and data are collected in accordance with ocean.data.gov requirements.	0%	2016	ORM-IPC	Work has not yet begun.

Local Choices	Ecosystem based Management	Provide results of pilot projects, and compile and disseminate initial EBM best practices and case studies to Federal agencies, non-Federal partners, and stakeholders, and refine best practices based on results of pilot projects.	0%	2017	ORM-IPC	Work has not yet begun.
Local Choices	Coordinate and Support	Identify grant and non-monetary opportunities (including tools, resources, and in-kind services) to support the continued development and organization of regional alliances and existing Regional Ocean Partnerships (ROPs), including data collection and analysis needed to advance regional efforts.	100%	2013	DOI; EPA; NOAA; USACE	A work plan created by BOEM and NOAA representative was submitted to ORM-IPC Mar 26.
Local Choices	Coordinate and Support	In coordination with ROPs, compile best management practices (BMPs) that are broadly applicable for all ROPs (e. g. , how to effectively engage stakeholders, develop partnerships, identify priorities, develop regional action plans, and measure success).	100%	2013	DOI; EPA; NOAA; USACE	A work plan created by BOEM and NOAA representative was submitted to ORM-IPC Mar 26.
Local Choices	Coordinate and Support	Identify and prioritize specific opportunities to partner with non-Federal entities, stakeholders, and organizations, including inter-tribal organizations, on National Ocean Policy priorities.	100%	2013	ORM-IPC; OST-IPC	The Intergovernmental Working Group on Ocean Partnerships (IWG-OP) meets monthly to identify and support opportunities to partner on specific ocean projects. The IWG-OP provides an annual report to Congress of its accomplishments, and minutes are produced at each monthly meeting.
Safety and Security	Resiliency and Adaptation to Climate Change and Ocean Acidification	Update USACE guidance on incorporating sea-level rise into project planning	100%	2013	NOAA; USACE	Completed.

Safety and Security	Resiliency and Adaptation to Climate Change and Ocean Acidification	Develop best practices for climate change and ocean acidification vulnerability assessments for Federally-funded and/or Federally-managed coastal and ocean facilities and infrastructure in high-hazard areas.	50%	2014	DOD; DOI; DOT; EPA; NOAA	The Critical Facilities Tool is available for all States except Alaska, and will be migrated into Roadmap for Adapting to Coastal Risk mapping application. Data development to support the geographic expansion of the Coastal Flood Exposure Mapper has been completed. DoD is currently developing a screening-level sea level rise installation vulnerability assessment of all DoD infrastructure within 2 km of the coast. USGS/BLM developed a proposal for analyses of 5 representative sites in the California Coastal National Monument and adjacent coastline to assess vulnerability of geological, biological, and cultural resources to rising sea-levels. The NPS Hurricane Sandy Rapid Review team produced a draft document, Siting and Design Considerations/Adapting to Climate Change and Natural Hazard Risk, to better prepare and respond to sea-level rise and storm events.
Safety and Security	Observations, Mapping, and Infrastructure	Identify observation priorities for all National Ocean Policy priority objectives that can be accomplished with unmanned and/or satellite remote sensing systems.	100%	2013	IOOC; IWG-FI	Completed.
Safety and Security	Observations, Mapping, and Infrastructure	Update the National Surface Current Mapping Plan and prioritization of new radar sites.	100%	2014	NOAA	Completed.

Safety and Security	Observations, Mapping, and Infrastructure	Demonstrate capability for coordinated unmanned and satellite remote sensor sampling in a specific region of environmental interest as a step toward a fully operational capability.	95%	2017	DOD; NASA; NOAA; NSF	In progress.
Safety and Security	Observations, Mapping, and Infrastructure	Develop a national modeling strategy to determine how regional-scale models supported by IOOS® regions can be integrated into Federal efforts.	75%	2014	IOOC	The IOOC Modeling Task Team has a draft of the national modeling strategy, scheduled to publish in early 2015.
Safety and Security	Observations, Mapping, and Infrastructure	Complete an inventory of available Federal and non-Federal unmanned undersea vehicles (both tethered and autonomous) and satellite remote sensing systems.	75%	2013	IWG-FI	The IWG-FI Subcommitte for Unmanned Systems (SUS) is preparing an inventory of unmanned airborne, sea surface, and subsurface unmanned vehicles that should be complete for the next SUS meeting in January, 2015. The SUS identified an appropriate inventory of satellite observations systems under the direction of the Committee on Earth Observation Satellites.
Safety and Security	Observations, Mapping, and Infrastructure	Complete an analysis and selection of performance measurements for unmanned and satellite remote sensing system utilization.	50%	2014	DOD; NASA; NOAA; NSF	In progress.

Safety and Security	Inform Decisions and Improve Understanding	Conduct Waterway Analysis and Management System (WAMS) assessments and Port Access Route Studies (PARS), beginning with the ongoing Atlantic Coast PARS and Bering Strait PARS, and focusing on other areas indicated by risk/return analysis, to support decisions waterways management.	40%	2014/2015	USCG	Assessments are ongoing and studies are conducted on an as needed basis. The Coast Guard is working to complete the Atlantic Coast Port Access Route Study (ACPARS), and is developing marine planning policies concerning wind farms to be used to aid in the completion of the ACPARS. The Bering Strait Port Access Route Study has developed proposed routing measures for US waters. These proposed routes have been released, and the Coast Guard is seeking public comment. The Bering Strait PARS will come to a conclusion in 2015.
Safety and Security	Coordinate and Support	Exchange information, expertise, and science on matters related to the National Ocean Policy with international organizations and bodies [e. g. , International Maritime Organization (IMO), Intergovernmental Oceanographic Commission (IOC)] that address ocean and maritime issues contained in the Policy and with countries that may have an interest in	100%	2013	DOD; DOJ; DOI; DOT; DOS; EPA; NASA; NOAA; NSF; USACE; USCG	Completed. The Interagency Working Group on the Intergovernmental Oceanographic Commission (IOC) meets regularly to exchange information, expertise, and science pertaining to U. S. interests and participation in the IOC. During annual meetings of the IOC and other international forums, the U. S. Government raises the importance of having a National Ocean Policy and of the importance of science-based decision making.
Safety and Security	Changing Conditions in the Arctic	Deliver tactical-scale sea Arctic ice analysis and forecasts in formats that meet additional user requirements.	100%	2014	DOD; NOAA	Completed. NOAA National Weather Service now publishes all products in formats that are all geospatially enabled.
Safety and Security	Changing Conditions in the Arctic	Deliver tactical-scale sea ice analysis and forecasts in GIS-enabled broad-scale format to meet USCG requirements.	100%	2013	DOD; NOAA; USCG	Completed.

Safety and Security	Changing Conditions in the Arctic	Expand Volunteer Observing Ship and coastal community participation in the Arctic sea ice observation program, and catalog user requirements for sea ice products, services, and delivery.	100%	2013	NOAA	Completed. Ongoing annually.
Safety and Security	Changing Conditions in the Arctic	In cooperation with other Arctic countries, develop international guidelines for both spill prevention and for spill response activities in the Arctic, such as the provision of improved sea ice forecasts for mariners and the use of mechanical recovery, dispersants, and in situ burning following major spill events.	95%	2013	DOD; DOJ; DOI; DOT; DOS; NOAA; USCG	Largely completed; follow-on implementation ongoing. U. S. agencies are supporting the emerging Arctic Council Working Group on oil spill prevention to build upon the identification of options. The U. S. Government plans to build on past exercises during the U. S. Chairmanship of the Arctic Council (beginning April 2015). Through the Arctic Council's Task Force on Oil Pollution Prevention, the U. S. is leading efforts to establish a new forum in which oil and gas regulators will share experience and expertise toward the shared goal of preventing oil pollution in the Arctic Ocean.
Safety and Security	Changing Conditions in the Arctic	Complete inventory of existing DHS, DOD, and partner communication capabilities (e. g. , satellites, land-based systems, and submarine cables) in the Arctic region.	95%	2013	DOD; USCG	Since communication capabilities can always be improved, implementation work related to this milestone is ongoing, but mostly completed. DOD, DHS, and other partners now have an excellent understanding of the communications capabilities, limitations, and gaps in the region. However, more work still needs to be done to develop a complete inventory and to enhance communication capabilities in the Arctic region.

Safety and Security	Changing Conditions in the Arctic	Establish and strengthen partnerships with industry (e. g. , oil companies, ship operators), other governments (e. g. , Canada, Russia, Norway), and Alaska Native organizations to build on existing and new Arctic communications solutions and capabilities, such as the Canadian Space Agency Polar Communication and Weather Mission.	85%	2013	DOD; NOAA; USCG	Since communication capabilities can always be improved, implementation work related to this milestone is ongoing. DOC's National Telecommunications & Information Administration has interviewed Alaska state government, academic, and industry telecommunications experts, residents in remote Arctic Alaska communities, and key terrestrial and satellite communications carriers in the Alaskan Arctic. Federal agencies have strengthened their communications partnerships with industry, other governments, and Alaska Native organizations . DoD and USCG have worked together to identify communications gaps and assessed telecommunications and other capabilities and requirements.

Safety and Security	Changing Conditions in the Arctic	Identify options to minimize and/or mitigate the risk associated with vessel use and carriage of heavy-grade fuel oil in the Arctic.	85%	2013	DOJ; DOT; DOS; NOAA; USCG	There have been ongoing efforts at the International Maritime Organization and the Arctic Council to identify and build upon the available information concerning risks associated with vessel activity involving heavy-grade fuel oil in the Arctic region. The Arctic Council and its member States are working to implement the May 2013 "Agreement on Cooperation on Marine Oil Pollution Preparedness and Response in the Arctic. " In addition, the IMO is in the process of developing a mandatory Polar Code which will, among other things, respond to the risks associated with heavy-grade fuel oil. The United States successfully championed the approval and adoption of the amendments to the Convention on the Safety of Life at Sea (SOLAS) by the IMO Maritime Safety Committee (MSC), and approval of amendments to the Marine Pollution Convention (MARPOL) by the IMO Marine Environment Protection Committee (MEPC) in 2014.
Safety and Security	Changing Conditions in the Arctic	Compile integrated datasets needed to populate an Arctic oil spill planning, coordination, and response tool such as the Emergency Response Management Application (ERMA®) and complete and deploy a public and responder Arctic ERMA®.	85%	2013	NOAA	Ongoing. NOAA, with funding from BSEE, completed the Arctic ERMA, allowing the exchange of information and a common operating picture in areas where internet connectivity is lacking or non-existent. This tool was successfully tested during Arctic Shield in 2014. The data collection is ongoing. NOAA OR&R continues to work with Environment Canada to complete an oil library to inform Arctic spill response.

Safety and Security	Changing Conditions in the Arctic	Improve oil spill prevention, containment, and response infrastructure, plans, and technology for use in ice-covered Arctic seas, using all available sources, such as Federal agencies, industry, academia, and international partners.	80%	2013	DOI – BSEE; DOT; NOAA; USCG	For more than 25 years, Federal agencies (BSEE, NOAA, Coast Guard, EPA) have aggressively maintained a comprehensive, long-term research program dedicated to improving maritime oil-spill-response options. DOI's Oil Spill Response Research program is a cooperative effort bringing together funding and expertise from research partners in government agencies, industry, and the international community. BSEE also maintains a specific focus on understanding and improving oil spill response in the Arctic, and funds research projects to improve mechanical recovery, non-mechanical response options, and remote sensing. NOAA and Coast Guard are active participants on the Alaska Regional Response Team, which deals with the development of oil spill response plans. The National Academy of Science's Arctic Spill Response Assessment was published in August 2014. The Plan for Incorporation of National Academy of Sciences Arctic Spill Response assessment was completed in November 2014.
Safety and Security	Changing Conditions in the Arctic	Prepare the material that could support a U. S. submission on the Extended Continental Shelf delimitation in Arctic waters.	80%	2015	DOJ; DOI – USGS; DOS; NOAA	Underway. In March 2015, the Arctic team will meet to prepare a pre-decisional draft document supporting an eventual submission.

Safety and Security	Changing Conditions in the Arctic	Initiate interagency research and integration of data to improve models for spill trajectory, oil fate, and weathering, and natural resource maps based on Arctic conditions in order to feed scenario development and risk assessment.	75%	2013	DOI – BSEE; DOI – BOEM; NOAA; USCG	These efforts have been initiated. Specific examples include: NOAA is working with Canada to improve oil in ice behavior and fate modeling with funds from BSEE. BOEM Alaska Environmental Studies Program has over 10 research studies on spill trajectory, fate, and weathering that are ongoing or completed, and is starting to develop Applications for Mapping Spilled Oil in Arctic Waters. BSEE established an Interagency Agreement with NOAA in September 2013 to improve oil fate modeling in the Arctic which will include modeling a blowout under ice; expected completion September 2015.
Safety and Security	Changing Conditions in the Arctic	Complete scientifically based field or test tank experiments and tests of response tools for U. S. Arctic marine waters.	75%	2013	DOI – BSEE; EPA; USCG	BSEE-sponsored tests completed in August, 2013. Additionally BSEE has initiated two projects to enhance simulated testing: Development of Surrogate Ice Modules for Simulated Arctic Environment Testing, and Environmentally Benign Oil Simulants to Mimic the Behavior of Oil Droplets in the Ocean. Development of Double Helix Oil/Water Separation Skimmer Technology estimated completion March 2016, Development of Universal Submiersible Skimmer Delivery System estimated completion May 2016.

Safety and Security	Changing Conditions in the Arctic	Establish baselines of the: 1) performance capabilities of mid-frequency (MF), high-frequency (HF), very high-frequency (VHF), and ultra high-frequency (UHF) communications systems to air and surface vessels in the Arctic. 2) performance of air-, surface-, and available shore-based sensors	70%	2013	DOD	Efforts to improve the reliability and reach of communications in the Arctic region will continue.
Safety and Security	Changing Conditions in the Arctic	Identify, analyze, rank, and implement the most cost-effective options to reduce communication gaps and boost Federal capabilities in the Arctic Operational Region, commensurate with available resources and user needs.	70%	2014	DOD; DOT; NOAA; USCG	NORAD/NORTHCOM completed an Arctic Baseline Assessment for Domain Awareness Report in 2013. This assessment addressed the performance of air, surface, and available shore-based sensors and communications systems in the Arctic region. Under the National Strategy for the Arctic Region, the National Telecommunications and Information Agency (DOC) is tasked with studying existing and future communications systems and capabilities in the region. The NTIA submitted a Notice of Inquiry in the Federal Register regarding the availability of telecommunication services in the Arctic. DoD and USCG have worked together to identify communications gaps, and assessed telecommunications and other capabilities and requirements. Substantial efforts have recently been undertaken to improve space-based communication capabilities.

Safety and Security	Changing Conditions in the Arctic	Participate in joint training and workshops with other Arctic nations on oil spill response activities in the Arctic, such as the use of mechanical recovery, dispersants, and in situ burning following major spill events.	60%	2013	DOI – BSEE; DOT; NOAA; USCG	NOAA Office of Response and Restoration participated in CANUSNORTH and CANUSLANT drills with Canada, and Arctic Shield with USCG in 2014; will participate again in 2015. NOAA also participated in a tabletop drill with Russia orchestrated by the World Wildlife Fund.
Safety and Security	Changing Conditions in the Arctic	Conduct airborne gravity data collection over the State of Alaska (including the Aleutians by 2019) to help correct meters-level errors in Arctic positioning.	60%	2013	NOAA	In FY15, NOAA's Gravity for the Redefinition of the American Vertical Datum (GRAV-D) project will be surveying from Juneau, Alaska with the goal of covering most if not all of the southeastern peninsula. This work is scheduled to begin in April.
Safety and Security	Changing Conditions in the Arctic	Identify Arctic resource and infrastructure shortfalls for high-risk scenarios and assess strategies to address those shortfalls. Complete a resource-neutral plan to address the significant logistical issues (e. g. , housing and feeding personnel, staging and deploying equipment, and managing waste) that would be involved in a large-scale oil spill response in the Arctic during any season.	55%	2014	ARRT; DOI – BSEE; DOT; NOAA; USCG	The Alaska Regional Response Team is currently working on an Arctic Logistics Concept of Operations (CONOP) Overview of Project. The Arctic Logistics CONOP will serve as an annex to the Alaska Unified Plan and be approved by the Alaska Regional Response Team (ARRT), National Response Team (NRT), and the Spill of National Significance (SONS) Executive Steering Committee (ESC). The team has completed the first major milestone (developing a robust scenario, including descriptions of AK responsibilities and Federal agency mandates under the NCP), presented the scenario to the SONS ESC, and is now working on defining agency response based on the scenario and logistics required to execute the response.

Safety and Security	Changing Conditions in the Arctic	Develop better maps of the ice edge, and make field data available early enough in the year to be useful for seasonal ice forecasts.	55%	2013	NASA	Ongoing.
Safety and Security	Changing Conditions in the Arctic	Establish mapping guidelines, standards, vessel of opportunity protocols, and standard operating procedures to facilitate integrated ocean and coastal mapping and acquisition of Arctic hydrographic, shoreline, habitat mapping, and water column data in the Bering, Chukchi, and Beaufort Seas.	50%	2013	DOD; IWG-OCM; NOAA	Seven planned NOAA hydrographic surveys in Arctic for FY15. NOAA will continue to provide support & guidance to USCG regarding track-line data acquisition.
Safety and Security	Changing Conditions in the Arctic	Initiate a study of the marginal ice zone to better measure the rate of Arctic sea ice melt and regrowth.	50%	2014	DOD; NOAA	The Office of Naval Research marginal ice zone project is ongoing through FY17. A major milestone was accomplished in FY14 with the completion of a large field experiment in the Beaufort Sea north of Alaska.
Safety and Security	Changing Conditions in the Arctic	Coordinate with international partners to improve Arctic sea ice forecasting through generalization of buoy/ mooring data from a single point to a broader area and satellite data calibration using this buoy/mooring data.	50%	2014	DOD; NOAA; NSF	Ongoing. Important contributions include the NOAA Science Challenge Workshop on Predicting Arctic Weather and Climate and Related Impacts: Status and Requirements for Progress that took place in May 2014. The workshop was coordinated with and included participation of Environment Canada (EC) and the Canadian ice Service and did bring Arctic sea ice modelers and observational experts together to discuss forecasting improvements.

Safety and Security	Changing Conditions in the Arctic	Refine, in collaboration with native communities and stakeholders, a priority list of Arctic maritime regions and shorelines for surveying.	50%	2013	DOI – USGS; NOAA	Ongoing. Arctic Nautical Charting Plan completed; channels remain open to native communities and stakeholders through NOAA Alaska Navigation Manager. NOAA and IWG-OCM using Seasketch online collaboration tool to gather requirements, share mapping plans. See http://www.seasketch.org/#projecthomepage/5272840f6ec5f42d210016e4/about.
Safety and Security	Changing Conditions in the Arctic	Update nautical charts, Environmental Sensitivity Index maps, and other Arctic feature maps with mapping data acquired during annual field seasons.	40%	2014	NOAA	Underway, with other agencies, including USCG, DOI USGS and BOEM. NOAA issued a new nautical chart for the Delong Mountain Terminal on the western coast of Alaska in the Arctic. This is NOAA's third new Arctic chart issued in the past three years. As of the beginning of FY15, USGS has completed approximately 50% of Alaska high-resolution Interferometric Synthetic Aperture Radar (IfSAR) elevation data acquisition, working in conjunction with Federal and State partners. Over 2000 new maps covering over 17% of the State of Alaska have been generated.
Safety and Security	Changing Conditions in the Arctic	Conduct coordinated interagency Arctic ocean and coastal mapping operations and incorporate results intoocean. data. gov and Arctic-specific data portals.	25%	2013	IWG-OCM; NOAA	Arctic transit survey currently planned for during FY15 transits to/from Arctic. This project will support the development of Arctic Transit corridor between Dutch Harbor and the Bering Strait in collaboration with the USCG. All data will be provided to the appropriate data portals and made available via NOAA's National Geophysical Data Center.

Science and Information	Regional Ecosystem Protection and Restoration	Complete the initial build-out of the Chesapeake System and initiate its use for collaborative conservation efforts, including development of data standards.	100%	2013	DOD; DOI – USGS; DOI – NPS	Completed.
Science and Information	Regional Ecosystem Protection and Restoration	Institute collaborative partnership(s) (e. g. , State, tribal, local, private, academic) within the Chesapeake Bay to augment an initial system prototype that will provide watershed-wide decision-support tools to promote strategic coastal land conservation, restoration planning, and decision-making.	100%	2013	DOD; DOI – USGS; DOI – NPS	Completed.
Science and Information	Regional Ecosystem Protection and Restoration	Make the Chesapeake System infrastructure available for other regional initiatives.	100%	2014	DOI – USGS; DOI – NPS	Completed. LandScope America provides a common nationwide platform for displaying and using data layers that inform strategic conservation decisions.
Science and Information	Observations, Mapping, and Infrastructure	Within existing statutory authorities, create a program for the notification, collection, and organization of Federal and non-Federal ocean observing systems that will reduce redundancies in collection, provide a central database for public information and connect to privately held information, and assist in prioritizing areas in need of additional collection.	100%	2013	IOOC Member Agencies	Completed.

Science and Information	Observations, Mapping, and Infrastructure	Assess the capabilities for oceanographic ships to support multi-mission agency activities in the Arctic.	100%	2013	IWG-FI	Completed. The assessment information in NOAA's Arctic ERMA Project data base was completed and is regularly updated. The University-National Oceanographic Laboratory System Office is in contact with the ERMA group and is presently working to populate information for the U. S. Academic Research Fleet into the existing ERMA data base.
Science and Information	Observations, Mapping, and Infrastructure	Identify at-sea survey (oceanographic and living marine resource) and research mission requirements to support national science and data needs.	100%	2013	IWG-FI	Completed. NOAA has completed the Fleet Composition: 2012-2027 Report which reexamines how the NOAA Fleet supports a balanced approach in identifying the necessary platform support to enable NOAA programs and Line Offices to meet their at-sea data collection requirements.
Science and Information	Observations, Mapping, and Infrastructure	Update the Federal Oceanographic Fleet Status Report.	100%	2013	IWG-FI	Completed.
Science and Information	Observations, Mapping, and Infrastructure	Complete a detailed inventory of non-fleet operational ocean observation assets for the 11 Integrated Ocean Observing System (IOOS®) Regions and develop/release build-out plans within available resources.	100%	2013	NOAA	Completed.
Science and Information	Observations, Mapping, and Infrastructure	Develop a strategic plan for how IOOS® can best address the need for operational biological observations, in the context of what is currently being done or planned.	95%	2014	NOAA	On track for completion by end of March, 2015.

Science and Information	Observations, Mapping, and Infrastructure	Adopt recommended best practices and standards (such as the Coastal and Marine Ecological Classification Standard) to ensure consistent terminology for coastal and marine ecological features when describing and delivering ocean and coastal mapping data and derived products.	85%	2013	IWG-OCM	Implemented Coastal and Marine Ecological Classification Standards in NOAA's National Marine Sanctuaries, National Estuarine Research Reserves, and in the NOAA Ocean Exploration program.
Science and Information	Observations, Mapping, and Infrastructure	Construct and deploy the Ocean Observatories Initiative as a long-term platform for testing and developing innovative ocean sensors and communication standards.	85%	2015	NSF	The OOI System is in the construction phase. Projected completion of construction is scheduled for June, 2015.
Science and Information	Observations, Mapping, and Infrastructure	Identify the limitations of existing methodologies for integrating observational data, including coastal and global ocean remote and in situ data, physical and biological data, and ocean observations and socioeconomic data.	60%	2013/2016	DOE; DOI – USGS; NASA; NOAA; NSF	Partially fulfilled by IOOS Summit Report, Biological Integration and Observation Task Team, and Data Management Steering Team. The IOOS Program Office is conducting an industry study that may contribute to the socioeconomic requirements of this action.
Science and Information	Observations, Mapping, and Infrastructure	Identify the limitations of existing methodologies integrating short-term and sustained long-term ocean observational data, and develop initial activities to improve integration.	60%	2016	NASA; NOAA; NSF	Partially fulfilled by IOOS Summit Report, Biological Integration and Observation Task Team, and Data Management Steering Team.

Science and Information	Observations, Mapping, and Infrastructure	Complete analysis and selection of Fleet utilization performance measurements and an evaluation of a prototype Fleet schedule portal.	50%	2013	IWG-FI	Fleet Metrics Sub-Group has completed a report, "Federal Fleet Performance Measures: Status, Issues, and Recommendations" that is undergoing review. On schedule for defining baseline measurments. The University-National Oceanographic Laboratory System office has submitted a proposal to NSF, ONR, and NOAA for funding the development of a website.
Science and Information	Observations, Mapping, and Infrastructure	Identify the existing data services and systems, as well as the requirements to support integrated discovery and access through an information management system and integrative functions required for the management system.	40%	2013	IOOC Member Agencies	The Interagency Ocean Observation Committee Biological Integration and Observation and the IOOS Modeling Task Teams are focusing on various IOOS requirements and identifying these data service and systems. In addition, the IOOS Summit resulted in specific recommendations on identifying data services and systems. The next step is to compile this information and make it available through the IOOC website.
Science and Information	Observations, Mapping, and Infrastructure	Begin implementing well-accepted international standards for data transmission formats, metadata, and version control via the Global Telecommunications System (GTS), as well as best practices for observing and data quality	40%	2016	NOAA; USACE	Codes used to report oceanographic and marine meteorological data on the Global Telecommunications System (GTS) are being revised to utilize a new standard data template that will allow for more complete data and metadata reporting.
Science and Information	Observations, Mapping, and Infrastructure	Extend the current data standards within the biological domain to allow for increased interoperability between marine biological data and physical and social data within an ocean observation context.	30%	2020	DOC; DOI; EPA; NASA; NOAA; NSF; USDA	The IOOC is working with IOOS stakeholders to establish a Glider Task Team that will address the requirements outlined in the IOOS Glider Plan released in August 2014.

Science and Information	Observations, Mapping, and Infrastructure	Develop a national sub-surface ocean observation and monitoring plan that will address use of new autonomous underwater vehicle technologies and sustained monitoring and operational observations in the water column to support decision-making.	20%	2015	IOOC	The development of such a plan is currently on the IOOS Program Office calendar within the due date.
Science and Information	Observations, Mapping, and Infrastructure	Implement a fully coordinated, nationally integrated system for ocean and coastal data that includes international partners under the Global Earth Observation System of Systems framework and supports the Global Climate Observing System Implementation Plan.	15%	2016	IOOC Member Agencies; USGCRP	There are many ongoing efforts that contribute to this milestone, and current efforts are focused on identifying those contributions.
Science and Information	Observations, Mapping, and Infrastructure	Implement data and modeling techniques to support a global mapping capability for temporal changes.	0%	2017	DOI – USGS; NASA	Not yet begun.
Science and Information	Water Quality and Sustainable Practices on Land	Implement the design of the National Water Quality Monitoring Network for U. S. coastal waters and their tributaries through the National Water Quality Monitoring Council.	70%	2017	DOI; EPA; NOAA; USDA	Water quality monitoring data from a wide range of freshwater monitoring programs were to used to develop regional models. These then can be used to run various watershed-management scenarios to determine the best approaches to reduce nutrient loads to estuaries, and can be used to prioritize watersheds for restoration and best management practices.
Science and Information	Resiliency and Adaptation to Climate Change and Ocean Acidification	Develop an interagency plan for topographic [primarily Light Detection and Ranging (LiDAR) or equivalent accuracy] and shallow bathymetric mapping to ensure comprehensive and accurate elevation information for coastlines	80%	2013	DOI – USGS; IWG-OCM; NOAA; USACE	A 4th component was added to include a long term survey plan to map and re-map every 8 years.

Science and Information	Inform Decisions and Improve Understanding	Incorporate, in collaboration with the Department of Education, ocean and coastal criteria into the Green Ribbon Schools initiative.	100%	2013	CEQ	Completed. The Green Ribbon School Initiative first started in 2011, and has evolved to adopt more general criteria, not just ocean/coastal criteria.
Science and Information	Inform Decisions and Improve Understanding	Develop social media capabilities to promote ocean and coastal stewardship.	100%	2013	CEQ; DOD; DOI; EPA; NOAA	Completed. See examples such as NOAA's Higher Ed Facebook page, NOAA View, BOEM's use of Facebook, Twitter, and Flickr, EPA's How's My Waterway mobile app, DOD's STEM2Stern Facebook page; Smithsonian's use of Facebook, Twitter, Flickr, Tumblr, and Pinterest.

Science and Information	Inform Decisions and Improve Understanding	Conduct expeditions in poorly known or unknown regions of the oceans and Great Lakes.	100%	2014	NASA; NOAA; NSF	Completed. NOAA systematic ocean exploration for the 2014 Field Season is 100% complete. Planning is underway for the 2015/2016 Field Season. NSF is continuing to support the International Ocean Discovery Program to recover geological data and samples from beneath the ocean floor to study the history and dynamics of Planet Earth. After a three-year overhaul and major upgrade, the United States' oldest and deepest-diving research submersible, Alvin, has returned to work exploring the ocean's depths. NASA is conducting field studies in remote ocean locations in support of its Aquarius mission to measure ocean surface salinity and Earth's water cycle (>http://Spurs.jpl.nasa.gov<). NASA's Impacts of Climate on the Eco-Systems and Chemistry of the Arctic Pacific Environment (ICESCAPE) program (2009-2014, >https://www.espo.nasa.gov/icescape/<), co-funded by NASA's Cryospheric Sciences and Ocean Biology and Biogeochemistry programs, is in synthesis phase.

Science and Information	Inform Decisions and Improve Understanding	Implement Science for an Ocean Nation: An Update of the Ocean Research Priorities Plan and use the document to inform the prioritization of Federal research activities.	100%	2013	OST-IPC	Completed. The NSF budget request has included language that notes research emphases in the Division of Ocean Sciences will be guided by "Science for an Ocean Nation: Update of the Ocean Research Priorities Plan." The 6 themes in the report track well with EPA's ocean and coastal priorities and with their responsibilities under the NOP Implementation Plan. The NOAA Five Year R&D Plan, published in September, 2013, is being used to help guide R&D and articulate to NOAA stakeholders where NOAA is investing its resources. The development of this plan was a cross-NOAA effort that engaged many stakeholders and leveraged foundational documents such as the Ocean Research Priorities Plan (ORPP). NOAA has purposely taken great effort to align these important planning tools wherever possible. The net result is a set of ocean research and development goals and objectives that are being used in the planning, programming, execution, and evaluation processes.
Science and Information	Inform Decisions and Improve Understanding	Coordinate a review of recent and ongoing social indicator efforts that characterize human interactions with the ocean, our coasts, and Great Lakes, with synthesis and recommendations for application to inform long-term trend analyses and integrated ecosystem assessments for coastal communities.	90%	2013	IWG-OSS; NOAA	NOAA's "The Social and Economic Footprint of Marine Ecosystems" report completed in 2013. See http://www.st.nmfs.noaa.gov/economics/news/social-and-economic-footprint-of-marine-ecosystems. A report to specifically address this action is near completion and expected to released in early 2015.

Science and Information	Inform Decisions and Improve Understanding	Develop content to deliver the latest ocean science content to aquariums, museums, science centers, and National Parks, including working through coordinated exhibit networks such as the Coastal Ecosystem Learning Center networks.	80%	2014	NASA; NOAA	NOAA uses a wide variety of avenues to deliver ocean science content, including 42 Ocean Today kiosks in 40 locations nation-wide, over 485 visualizations for Science on A Sphere, and live feed from R/V Okeanos Explorer available to museums and other informal learning centers. The Smithsonian Institute renovation of the Sant Ocean Hall in the National Museum of Natural History to increase messaging on human/ocean connections and impacts. NASA continues to coordinate with NOAA, NPS, and FWS in providing ocean content for interpretation through the Earth to Sky Partnership.
Science and Information	Inform Decisions and Improve Understanding	Develop a 5-year strategy for ocean exploration under the Omnibus Public Land Management Act of 2009's ocean exploration provisions.	75%	2013	NOAA	The NOAA Office of Ocean Exploration and Research (OER) currently operates under a strategic plan approved by the NOAA Administrator in 2013. A draft five-year strategy for ocean exploration, along with other supporting documentation, is currently under review by the newly-established Ocean Exploration Advisory Board. Recommendations received from the OEAB will be taken under full consideration by OER and NOAA as a whole and incorporated, as appropriate, into the Final Strategic Plan.

Science and Information	Inform Decisions and Improve Understanding	Engage students in ocean sciences by supporting the National Ocean Science Bowl and other competitions.	50%	2017	DOD; DOI; DOT; EPA; NASA; NOAA; NSF; USACE	NOAA, NASA, and BOEM had funds appropriated for the NOSB in FY14. Other agencies that previously supported NOSB were not able to do so. For FY15 it expected that Federal funding support for NOSB will be at least at the FY14 levels.
Science and Information	Inform Decisions and Improve Understanding	Enhance incorporation of native and traditional observations and knowledge, along with information on native peoples and their cultural traditions, into ocean education materials.	50%	2017	DOI; NSF	Ongoing, but incomplete due to elimination of Ceners for Ocean Sciences Education Excellence program. BOEM has five ongoing studies related to inventorying and analyzing submerged archaeological sites or determining impacts to cultural resources from potential offshore energy and marine minerals development. Additional studies may be started.

Science and Information	Inform Decisions and Improve Understanding	Execute infrastructure and demonstration projects that deliver ocean observing data for formal and informal education, including ocean technology programs for post-secondary education.	50%	2017	NASA; NOAA; NSF	A continuing Ocean Observatories Initiative (OOI) grant to develop education infrastructure for making use of OOI data for educational purposes has been impacted. Scaled-back activities include education software being made available for educators to use in drafting curricula based on OOI data, though customer service support will not be available. Funding for development of educational products using OOI has been consolidated into the "Improving Undergraduate Science Education" program, which addresses all science fields rather than being dedicated to ocean education. Improvements in Facilities, Communications, and Equipment at Biological Field Stations and Marine Laboratories may fund projects that utilize ocean observing data. NOAA, with partners, maintains the Data in the Classroom website (http://dataintheclassroom.noaa. gov), and supports the development of ocean data visualizations for Science on A Sphere.
Science and Information	Inform Decisions and Improve Understanding	Identify and collaborate with an ongoing project to employ public input and use socioeconomic and natural sciences to identify, develop, and apply valuation frameworks for ecosystem services.	40%	2014/2015	IWG-OSS	IWG-OSS engaging with ecosystem services scientists across agencies to identify planned efforts and potential for collaboration. There are ongoing efforts from other partner Federal agencies and organizations to accomplish this goal.

Science and Information	Inform Decisions and Improve Understanding	To facilitate improved science based decision making, deliver an information portal for agencies and stakeholders to access decision-support tools and share the results of and lessons learned from EBM pilot studies.	20%	2016	DOI; NOAA	Subgroup met with the Data & Information Working Group. Further conversations will help define the path forward on this action. Additionally the NOAA EBM website currently being developed may serve as an example for other agencies or cross-agency level portal for information sharing.
Science and Information	Inform Decisions and Improve Understanding	Coordinate a review of recent and ongoing efforts related to social science data collection and analysis methods and best practices, with synthesis and recommendations for application to inform ocean, coastal, and Great Lakes decision-making.	15%	2014/2016	IWG-OSS	Working Group is coordinating across multiple efforts aimed at identification, compilation, delivery, and guidance with regard to human dimensions best practices to inform decisions in multiple contexts. Also is identifying relevant case studies and methodologies in development of social and economic indicators.
Science and Information	Ecosystem based Management	Inventory programs and projects that use ecosystem-based management (EBM), analyze their successes and shortcomings, and identify and fully describe the key characteristics of effective EBM efforts.	100%	2013	ORM-IPC	Completed. An interagency questionnaire was completed by projects and programs which employ or inform EBM approaches has been completed including over 60 responces from 13 Federal entities. Analysis of many aspects of the questionnaire have been completed and a report will be presented to the IPCs at the joint meeting in January 2015. In additon to fulfilling this action, the questionnaire will also be useful in advancing many other EBM actions.
Science and Information	Ecosystem based Management	Engage partners and stakeholders and establish a process for EBM, including monitoring.	100%	2013	ORM-IPC; OST-IPC	Completed. Engagement with industry groups and non-governmental organizations has occurred, but is also ongoing.

Science and Information	Ecosystem based Management	Develop and initiate an outreach and education program to inform stakeholders, Federal managers, scientists, and the public of the benefits, principles, best practices, and available decision-support tools of ecosystem-based management.	60%	2013/2014/2015	DOI; NOAA	EBM resources are being developed and made available through NOAA's Digital Coast website. Additionally, a NOAA EBM website is under development. This site will provide a pilot platform to educate the public and share information on EBM best practices, and current uses for Federal managers and the public. A workshop and a seminar are also in development.
Science and Information	Ecosystem based Management	Develop introductory and advanced training materials for Federal managers and scientists to obtain a common understanding of ecosystem-based management (EBM) principles, best practices, and latest decision-support tools.	60%	2013/2014/2016	ORM-IPC; OST-IPC	Many training materials and courses are already being used in Federal agencies. These resourses will be adapted as needed to be appropriate for the broad Federal family. The forthcoming NOAA EBM website will also contain a library of online training resources, that can act as a pilot platform. A proposed workshop and seminar series will further develop trainings and uncover additional existing resources.
Science and Information	Ecosystem based Management	Provide formal training on EBM principles, best practices, and latest decision-support tools to Federal managers and scientists.	50%	2013/2014/2015)	DOI; DOT; EPA; NOAA; USDA	A 2015 workshop will serve as an initial training opportunity and framewwork to further refine trainings and training needs. The forthcoming NOAA EBM website and EBM seminar series will also serve as pilot projects for further training opportunities.
Science and Information	Ecosystem based Management	Phase EBM principles and goals into the Federal programs for the restoration of ocean, coastal, and Great Lakes ecosystems, to the extent practicable.	40%	2013/2014-2017	DOI; NOAA	Numerous existing programs employing EBM have been identified. Training will help other programs expand their use of EBM practices.

Science and Information	Ecosystem based Management	Develop national guidelines and best practices for EBM implementation in collaboration with non-Federal partners and stakeholders.	40%	2013/2016	ORM-IPC; OST-IPC	An analysis of recent EBM questionnaire shed light on the current best practices, the analysis showed broad use of all identified best management practices. The anticipated EBM workshop and targetted outreach to non-Federal partners will further advance the development of national guidelines for implementation.
Science and Information	Ecosystem based Management	Using ocean. data. gov and other data sources, identify regional information gaps that impede science-based EBM, and develop a plan to fill them. In addition to necessary basic natural and socioeconomic data, this should focus on gaps in synergistic and cumulative ecosystem effects of various human and natural forces.	20%	2013/2015	OST-IPC	Subgroup met with a representative of the Data & Information Working Group. Further conversations will help define the path forward on this action.
Science and Information	Changing Conditions in the Arctic	Conduct multi-year distributed biological observatory (DBO) research cruises with Federal, State, and international partners to document change in distribution, abundance, biomass, species composition, and rates of primary production at two of five stations along the DBO latitudinal gradient.	60%	2014	NOAA; NSF	Ongoing, as the Interagency Arctic Research Policy Committee DBO Collaboration Team. See http://www.iarpccollaborations.org/teams/Distributed-Biological-Observatory. The DBO completed its fifth'pilot study' field season, with provisional results presented at the Autumn 2014 Pacific Arctic Group meeting and the 2nd DBO Data Workshop.
Science and Information	Changing Conditions in the Arctic	Based on the pilot phase analysis, execute DBO plans and prepare annual assessments on physical and ecological state of Pacific Arctic marine environment.	32%	2015	DOI – USFWS; NOAA	The DBO network is in/moving out of the pilot phase in the Chukchi Sea, but is only in the planning stages in the Beaufort Sea.

The Ocean Economy	Water Quality and Sustainable Practices on Land	Conduct a preliminary assessment of the economic costs and benefits of debris removal from coastal areas dependent on tourism	100%	2015	EPA; NOAA	Completed. NOAA's research study on the economic costs of marine debris imposed on recreationists in Orange County, California was completed in June, 2014, and will be used to assess the degree to which marine debris impacts beach visitation decisions and used to estimate welfare gains to beach visitors associated with reductions in marine debris concentrations. EPA's "Trash Free Waters" initiative is assessing cost studies done to date, and will provide analysis of aggregate direct and indirect costs of trash to the U. S. , in support of future outreach and planning.
The Ocean Economy	Water Quality and Sustainable Practices on Land	Identify ecologically at-risk species in eutrophic and upwelling driven hypoxic systems to obtain a vulnerability analysis based on available data.	80%	2014	NOAA	NOAA, EPA, the Northern Gulf Institute, and the Restore the Mississippi River Delta Coalition convened the 5th Annual Hypoxia Reserach Coordination Workshop in July 2014. The initial report has been completed, and the follow-on Ecosystem Modeling Adaptive Management Framework effort is still underway and scheduled for completion during the first half of 2015.
The Ocean Economy	Water Quality and Sustainable Practices on Land	Develop and deploy rapid, field-based detection systems for various harmful algal blooms (HAB)-causing species and their toxins.	50%	2015	HHS – FDA; DOI – USGS; NOAA	R&D on Environmental Sample Processors is ongoing, supported through the Harmful Algal Bloom and Hypoxia Research and Control Act mandated national HAB competitive programs and the IOOS Marine Sensor Innovation Program.

The Ocean Economy	Water Quality and Sustainable Practices on Land	Produce an interagency report on socioeconomic benefits to coastal communities of restoring hypoxic zones.	15%	2015	DOC; EPA; NOAA	The series of Hypoxia Research Coordination Workshops are providing input towards this deliverable.
The Ocean Economy	Resiliency and Adaptation to Climate Change and Ocean Acidification	Integrate relevant socioeconomic monitoring information (e. g. , U. S. Census and Bureau of Labor Statistics data) with ecosystem monitoring information to understand changes and impacts to communities and their environments in selected areas	100%	2013	DOC; DOL; NOAA	Completed. Additional information on the National Estuarine Research Reserves Climate Sensitivity Report can be found at: http://nerrs.noaa. gov/News. aspx?id=405.
The Ocean Economy	Resiliency and Adaptation to Climate Change and Ocean Acidification	Provide and integrate county-level coastal and ocean job trends data via NOAA's Digital Coast to enable decision-makers and planners to better assess the economic impacts of climate change and ocean acidification.	70%	2015	DOI; NOAA; USACE	NOAA's Digital Coast website provides access to two data sets (Economics: National Ocean Watch and Spatial Trends in Coastal Economics) that provide coastal and ocean job trends. Both are being delivered through the new Quick Report Tool (see http://coast.noaa. gov/digitalcoast/data/enow).
The Ocean Economy	Regional Ecosystem Protection and Restoration	Provide quantitative data on coastal habitat carbon sequestration and facilitate the use of results from pilot projects to support private-sector development of greenhouse gas offset protocols for use in voluntary carbon markets.	100%	2015	DOI – USGS	Completed. The USGS has a data portal (www. landcarbon. org) for distributing data products, and is making progress on fine-scale data collection that will enable private sector engagement in financing and developing carbon capture markets. The USGS is actively conducting collaboritive research on coastal wetland sites, and has supported two blue carbon workshops.

The Ocean Economy	Regional Ecosystem Protection and Restoration	Identify actions Federal agencies can take, in coordination with State, tribal, regional, and local agencies, to improve the management of coastal wetlands and reduce losses nationwide.	0%	2015	DOI – USFWS; EPA; NOAA; USACE	To be initiated after completion of assessment of selected coastal watersheds.
The Ocean Economy	Observations, Mapping, and Infrastructure	Develop an inventory of both Federal and non-Federal IOOS® capabilities by comparing observing requirements with standardized requirement specifications.	100%	2014	NOAA	Completed.
The Ocean Economy	Observations, Mapping, and Infrastructure	Obtain modern high-resolution seafloor mapping data in key coastal and shelf waters, including the National Shoreline, in accordance with the national priorities and standards.	85%	2014	IWG-OCM	NOAA ships and contract partners concluded hydrographic survey operations in the Northern Gulf of Mexico, Eastern Long Island Sound, approaches to Chesapeake Bay, and Kodiak Island, AK. The FY 2014 survey operations provided updated hydrographic data to support nautical charting products. Hydrographic work will continue in 2015.
The Ocean Economy	Observations, Mapping, and Infrastructure	Develop an annually updated National Ocean and Coastal Mapping Plan, using the Ocean and Coastal Mapping Inventory, that defines priority mapping needs and gaps, and implement the plan through interagency collaboration in planning, budgeting, and execution.	85%	2017	IWG-OCM	A 4th component to the Plan was added to include a long-term survey plan to map and re-map every 8 years.

The Ocean Economy	Observations, Mapping, and Infrastructure	Integrate existing and emerging coastal and seafloor mapping guidelines, best practices, and standards to ensure interoperability of data.	85%	2013	IWG-OCM; NOAA	NOAA is working actively with partners to develop a method for displaying water column sonar data, but this is in its infancy. NOAA continues to support data collection on non-hydro vessels to ensure data will support multiple uses and that shared techniques and methodology will be integrated into other shared programs.
The Ocean Economy	Observations, Mapping, and Infrastructure	Develop, evaluate, and expand an integrated geospatial database of Federal and non-Federal, certified and non-certified ocean observation data to provide access to public information and provide extracts or contact information for privately held information.	60%	2013	IOOC Member Agencies	The Integrated Ocean Observing System (IOOS) Data Integration Framework systems integration test is underway. Certification standards were issued and regional associations are undergoing the process.
The Ocean Economy	Observations, Mapping, and Infrastructure	Complete a strategic plan for recommended future Physical Oceanographic Real-Time System (PORTS®) installations.	60%	2015	NOAA	The report "An Assessment of the Value of the Physical Oceanographic Real-Time System (PORTS) to the U. S. Economy" has been reviewed by a second economist and found to be sound. It can be found at http://tidesandcurrents. noaa. gov/publications/ASSESSMENT_OF_THE_VALUE_OF_PORTS_TO_THE_US_ECONOMY. pdf. The condensed "The Value of PORTS to the Nation" glossy summarizing the results has been completed to help engage stakeholders. It is posted at http://tidesandcurrents.noaa.gov/publications/Value_of_PORTS_to_the_Nation_Aug_2014.pdf.

The Ocean Economy	Observations, Mapping, and Infrastructure	Improve and implement airborne and other techniques for coastal elevation, bathymetric mapping, and nautical charting, including low-lying coastal areas with turbid waters.	40%	2017	DOI – USGS; IWG-OCM; NOAA; USACE	NOAA is currently reviewing data from Great and Little Egg, NJ lidar surveys, and survey work will continue in 2015.
The Ocean Economy	Observations, Mapping, and Infrastructure	Improve and implement technology and techniques for acoustic characterization of seafloor properties to enable multiple uses of data for nautical charting and marine habitat mapping.	40%	2014	IWG-OCM; NOAA	Data integration is still undergoing testing and development, in its second phase now. This research will continue in 2015 under a Disaster Recovery Act (Sandy Supplemental funding) grant and contract.
The Ocean Economy	Observations, Mapping, and Infrastructure	Improve and implement coastal change analysis products and a sustained and seamless description of coastal and marine elevation extending from on-shore coastal areas (Coastal National Elevation Dataset) through the U. S. Exclusive Economic Zone (EEZ) and extended continental shelf, including elevation models and derived map products, for local, State, and Federal managers.	35%	2017	DOI – USGS; IWG-OCM; NOAA; USACE	NOAA's National Geophysical Data Center and DOI's USGS developed a "Framework Requirements for Digital Elevation Models." Using this framework, NGDC developed models for the NJ coastal area. NGDC and USGS are working on developing models for the Sandy-impacted area.
The Ocean Economy	Observations, Mapping, and Infrastructure	Update the National Operational Wave Observation Plan.	20%	2015	NOAA; USACE	Update on the report is in progress.
The Ocean Economy	Inform Decisions and Improve Understanding	Through leveraging existing research priorities provide scientific information on the environmental health effects of finfish aquaculture.	100%	2013	Aquaculture Regulatory Task Force	Completed. All four aformentioned products have been published and released via NOAA Fisheries press releases and posted to the NOAA Fisheries Office of Aquaculture website.

The Ocean Economy	Inform Decisions and Improve Understanding	Complete an initial analysis of ocean and coastal economic statistics and jobs that builds on existing programs and includes information on rural communities and the roles of transportation, shipping, and numerous other sectors in economic contribution and job creation across the United States.	100%	2013	DOC; DOE; DOL; DOI; DOT; USACE	Completed. DOC and DOT resources are available online.
The Ocean Economy	Inform Decisions and Improve Understanding	Develop programs that enhance undergraduate education on ocean research and management using authentic research experiences.	100%	2014	HHS – FDA; NSF	Completed. The original ocean-specific program intended to address this action was terminated in FY14 due to STEM consolidation efforts. For FY15 and FY16 under NSF's framework for "Improving Undergraduate STEM Education: Pathways into Geoscience," proposals will be accepted for projects that improve undergraduate geoscience education.
The Ocean Economy	Inform Decisions and Improve Understanding	Through the National Shellfish Initiative develop pilot projects to identify ways to both maximize the environmental sustainability and ecosystem benefits (e. g. , nutrient filtration, carbon sequestration, fish habitat) and the commercial value of shellfish aquaculture. This would help develop a comprehensive plan to sustainably increase shellfish production and restored populations in U. S. waters.	100%	2013	NOAA; USDA – ARS; USDA – NIFA	Completed. Efforts are underway with partners in several states including WA, CA, and OR (along with additional efforts in HI, CT, and AK) to expand opportunities for shellfish farming and restoration. Specific successes include the completion of a native shellfish hatchery at the Manchester Laboratory in WA and agreements to carry out operations, as well as the issuance of the first permit for offshore mussel aquaculture for Federal waters in MA.

The Ocean Economy	Inform Decisions and Improve Understanding	Provide scholarship, fellowship, and internship opportunities in ocean, coastal, and Great Lakes programs to students, including underrepresented groups, working with professional societies, nonprofits, and minority-serving institutions.	80%	2016	DOT; EPA; NOAA; NSF	NSF has ongoing Research Experiences for Undergraduates programs. In FY14, pilot program allows NSF Graduate Research Fellows to do internships at Federal agencies. In FY14, NOAA awarded 52 Knauss Fellowships, 106 Hollings Scholarships, and 7 Educational Partnership Program Scholarships.
The Ocean Economy	Inform Decisions and Improve Understanding	Make available education and training tools that can be used to improve national and international educational opportunities on ocean issues.	80%	2014	EPA; NASA	EPA's "How's My Waterway" website increaeses availability of water pollution data for teachers and public audiences, and is part of the Smithsonian Institute's "Waterways" site, which integrates programs from other agencies. The Smithsonian's "Q?rius" engages students and teachers onsite and online with investigations, school programs, webcasts and specimens, and the Ocean Portal (http://ocean. si. edu/) website provides content, media and teacher resources with national and international relevancy and reach. Through NASA ocean surface topography and salinity missions, NASA continues to make available education and training tools.

The Ocean Economy	Inform Decisions and Improve Understanding	Establish an interagency aquaculture initiative that supports jobs and innovation through the National Science and Technology Council's Interagency Working Group on Aquaculture and other partnerships.	50%	2013	DOC; NOAA; USDA – ARS; USDA – NIFA	A draft "Aqauculture Jobs and Innovation Initiative" was discussed at the January 2014 meeting of the Interagency Working Group on Aquaculture (IWGA). Several followup meetings have occurred, most recently, on December 19, 2014 between the IWGA Executive Committee and the Office of Science Technology and Policy. Discussions are ongoing between NOAA, USDA, and OSTP and interested aquaculture stakeholders. These discussions have the goal of advancing the industry and create jobs, although a formalized initiative has not yet been established.
The Ocean Economy	Inform Decisions and Improve Understanding	Compile and make available relevant climate, water, wind, and weather data; environmental models of seasonal and extreme conditions; and other information to support development of the Nation's coastal and offshore renewable energy, including wind, ocean thermal, and hydrokinetic (e. g. , waves, tidal energy) resources.	20%	2017	DOC; DOE; DOI; NOAA; NSF	The parties involved have met several times to discuss how to move forward, and have agreed upon leveraging ocean. data. gov for this action. However, the group needs to understand more about the status and planning of this platform, given that there is a working group dedicated to this. Then the group can determine how best to move forward.
The Ocean Economy	Inform Decisions and Improve Understanding	Develop an analysis of the contribution and impacts (including job creation) of emerging uses–including renewable energy, aquaculture, and biotechnology–on the economies of the communities and regions dependent on marine and coastal resources.	20%	2015	DOC; DOE; DOL; DOI; FERC; NOAA	The action has been subdivided into three subparts: renewable energy, aquaculture, and biotechnology, led by NOAA's Fisheries Office of Aquaculture and DOE. Existing resources include NMFS's Fisheries of the United States Report and USDA's census of agriculture.

The Ocean Economy	Inform Decisions and Improve Understanding	To the extent they may be discovered, develop new natural products and biotechnological processes from marine environments and evaluate their potential for commercial development.	20%	2017	DOC; DOE; HHS – NIH; DOI; NOAA; NSF	Agency POCs for this action were only recently identified, and organizational meetings are underway.
The Ocean Economy	Inform Decisions and Improve Understanding	Provide content and professional development opportunities to support ocean content in Next Generation Science Standards.	20%	2013	IWG-OE	Ongoing effort to align ocean literacy principles and other materials to the National Academy of Sciences' framework for the NGSS. NOAA's Education Council's Working Group on NGSS has developed and tested a process for identifying resources that may be useful in meeting the goals of the NGSS.
The Ocean Economy	Inform Decisions and Improve Understanding	Complete studies of future ocean workforce requirements.	0%	2016	DOC; DOL; DOT; NOAA	No funds are available; action is on hold.

The Ocean Economy	Coordinate and Support	Develop and implement permitting regulatory efficiencies for aquaculture.	100%	2013	DOI – USFWS; EPA; NOAA; USACE; USCG; USDA	Completed. Implementing regulatory efficiencies for aquaculture remains high-priority ongoing activity for NOAA Fisheries Office of Aquaculture and the Interagency Working Group on Aquaculture Regulatory Task Force. The Interagency Regulatory Task Force and on-the ground regional efforts have resulted in several successes in 2013 and 2014. In October 2014, NOAA/ NMFS sought nominations for a seperate Aquaculture Task Force, as a subcomittee of the agency's Marine Fisheries Advisory Committee. The task force will be made up of individuals from industry, academia, NGOs, and other stakeholders, and willl work on several discrete projects, including assisting the Interagency Regulatory Task Force on developing a mock permit process for the Gulf Aquaculture Plan.
The Ocean Economy	Coordinate and Support	Identify pilot projects, in collaboration with relevant stakeholders, to streamline permitting processes and reduce duplicative efforts, while ensuring appropriate environmental and other required safeguards.	100%	2013	NOC	Completed. One pilot project identified was the WindFloat Offshore wind project in Coos Bay, OR. DOE selected this project to receive up to $ 47 million in matching grant funding over the next four years.

The Ocean Economy	Coordinate and Support	Identify and make available best management practices to inform and improve Federal permitting processes for aquaculture.	75%	2015	DOI – USFWS; EPA; NOAA; USACE; USCG; USDA	Existing best management practices (BMPs) on shellfish aquaculture are available via a "shellfish portal" on the NMFS Aquaculture website. NOAA continues ongoing efforts to develop new science products that will either serve as BMPs or will inform development of BMPs. The Interagency Regulatory Task Force will continue work identified in its work plan, including making existing BMP's available for finfish aquaculture.
				*Includes original date and any extensions granted		

List of Acronyms	
BOEM	Bureau of Ocean Energy Management
BSEE	Bureau of Safety and Environmental Enforcement
CDC	Centers for Disease Control
CEQ	Council on Environmental Quality
DHS	Department of Homeland Security
DOC	Department of Commerce
DOD	Department of Defense
DOE	Department of Energy
DOI	Department of the Interior
DOJ	Department of Justice
DOL	Department of Labor
DOS	Department of State
DOT	Department of Transportation
EBM	Ecosystem Based Management
EPA	Environmental Protection Agency
ERMA	Emergency Response Management Application
FDA	Food and Drug Administration
FERC	Federal Energy Regulatory Commission
HHS	Department of Health and Human Services
IMDCC	Interagency Marine Debris Coordinating Committee
IMO	International Maritime Organization
IOC	Intergovernmental Oceanographic Commission
IOOC	Interagency Ocean Observation Committee
IWG-FI	Interagency Working Group on Facilities and Infrastructure
IWG-OCM	Interagency Committee on Ocean and Coastal Mapping
IWG-OE	Interagency Working Group on Ocean Education
IWG-OSS	Interagency Working Group on Ocean Social Science
NASA	National Aeronautics and Space Administration
NIH	National Institutes of Health
NISC	National Invasive Species Council
NIST	National Institute of Standards and Technology
NOAA	National Oceanic and Atmospheric Administration
NOC	National Ocean Council
NPS	National Park Service
NSF	National Science Foundation
ORM-IPC	Ocean Resource Management Interagency Policy Committee
OST-IPC	Ocean Science and Technology Interagency Policy Committee
USACE	U.S. Army Corps of Engineers
USCG	U.S. Coast Guard
USCRTF	U.S. Coral Reef Task Force
USDA	U.S. Department of Agriculture
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGCRP	U.S. Global Change Research Program
USGS	U.S. Geological Survey