JOINT OCEAN COMMISSION INITIATIVE

Testimony
By
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Before
The U.S. Senate Committee on Commerce, Science, and Transportation
National Ocean Policy Study

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Chairman Sununu, Senator Boxer, and Members of the National Ocean Policy Study, we are pleased to appear before you today in our respective capacities as the Co-Chair and Task Force member of the Joint Ocean Commission Initiative, a collaborative effort of members of the U.S. Commission on Ocean Policy and the Pew Oceans Commission, The purpose of the Joint Initiative is to advance the pace of change for meaningful ocean policy reform, and we are delighted to have the opportunity to join a discussion about how to improve ocean policy and governance and to share some of our thoughts about priorities for legislative action.

As many of you know, the Joint Ocean Commission Initiative delivered a report to the Senate on June 13, outlining just that—our priorities for Congressional action needed to address the many pressing issues we are facing with regard to our oceans. We request that a copy of our report be submitted as part of the public record for this hearing. We delivered that report pursuant to a letter requesting our input from a bipartisan group of ten Senators, a number of you among them. We welcomed the opportunity to provide that input, just as we welcome the opportunity to share some of our findings and recommendations with you today.

The State of our Oceans

Implicit in the topic for this hearing is "what is the state of our oceans?" and we have to report to you that the state is not good, and getting worse. There are many problems besetting our oceans and coasts, including:

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- Overexploited fisheries that bring economic hardship to fishing communities and businesses and jeopardize the living marine resources held in trust for the benefit of all U.S. citizens
- Enormous human, environmental, and economic impacts associated with hurricanes and other increasingly frequent and intense storms
- Increasing frequency and size of harmful algal blooms in many of our coastal areas, including the Northeast and Florida
- Massive Dead Zones in the Gulf of Mexico, as well as in the Chesapeake Bay and most recently off the coast of Oregon
- Continued loss of coastal wetlands, despite conservation commitments
- Growing problems due to introduction of invasive species, and
- Continuing loss of coral reefs

And these problems are exacerbated by a dysfunctional, out-of-date, and inadequate system of ocean and coastal governance. For example:

- Fragmented laws, confusing and overlapping jurisdictions, and the absence of a coherent national ocean policy hinder our management efforts.
- A lack of federal support for emerging regional ocean and coastal governance initiatives that hampers the ability of these initiatives to help solve important ocean and coastal problems.
- A dearth of U.S. leadership in international ocean and coastal forums threatens our national economic and security interests.
- Dwindling U.S. investment in ocean and coastal research, science, and education compromises our ability to tackle such problems as global warming, resource depletion, harmful algal blooms, invasive species, and nonpoint source water pollution, to name just a few.

Yet, we are also here to report to you that we are in a time of unprecedented opportunity. Today, as never before, we recognize the links among the land, air, oceans, and human activities. We have access to advanced technology and timely information on a wide variety of scales. We recognize the detrimental impacts wrought by human influences. We can and should act now to ensure that the ocean, coasts, and Great Lakes are healthy and productive and that our use of their resources is both profitable and sustainable.

As is made clear in the reports of the Pew Oceans Commission, U.S. Commission on Ocean Policy, and now the Joint Ocean Commission Initiative, our nation's leaders need to take action now to reform ocean governance, pursue ecosystem-based management, improve fisheries management, rely more heavily on science in making management decisions, and adequately fund ocean and coastal programs. These recommendations reflect the conviction of the two Commissions that our nation can change its course and achieve a new ocean blueprint for the 21st century.

The reports of the two Commissions bring into sharp focus the importance of our oceans and coasts to our nation's natural heritage, security, and economy. With an offshore ocean jurisdiction larger than the total land mass of the United States, U.S. waters support rich and diverse systems of ocean life, provide a protective buffer, and support important commerce, trade, energy, and mineral resources. The economic contributions the oceans make are staggering:

- More than $1 trillion, or one-tenth, of the nation's annual gross domestic product (GDP) is generated within nearshore areas, the relatively narrow strip of land immediately adjacent to the coast.
- When considering all coastal watershed counties, the contribution swells to over $6.1 trillion, more than half of the nation's GDP.
- In 2003, ocean-related economic activity contributed more than $119 billion to American prosperity and supported well over 2.2 million jobs.
- More than 13 million jobs are related to trade transported by the network of inland waterways and ports that support U.S. waterborne commerce.
- Annually, the nation's ports handle more than $700 billion in goods, and the cruise industry and its passengers account for $11 billion in spending.
- The commercial fishing industry's total value exceeds $28 billion annually, with the recreational saltwater fishing industry valued at around $20 billion, and the annual U.S. retail trade in ornamental fish worth another $3 billion.
- Nationwide retail expenditures on recreational boating exceeded $30 billion in 2002.

Of course, these figures capture only a small part of our oceans' worth and potential.
Also consider that born of the sea are clouds that bring life-sustaining water to our fields and aquifers and drifting microscopic plants that generate much of the oxygen we breathe. The oceans host great biological diversity with vast medical potential and are a frontier for exciting exploration and effective education. Other ocean assets, such as functioning coastal habitats, contribute to the health of our environment and the sustainability of commercial and recreational resources. Still others assist in what our nation's founders referred to as the "pursuit of happiness."

At the dawn of the 21st century, it is clear that these invaluable and life-sustaining assets are vulnerable to the activities of humans. Our failure to properly manage the human activities that adversely affect our oceans and coasts is compromising the health of these systems and diminishing our ability to fully realize their potential.

Priorities for Congressional Action

Upon the release of the reports by the two Commissions, the President and Congress publicly embraced the major recommendations of the U.S. Commission on Ocean Policy and the Pew Oceans Commission. The President issued the U.S. Ocean Action Plan and established the Committee on Ocean Policy. Congress held hearings and introduced ocean-related legislation. At the state level, several Governors demonstrated strong leadership by initiating strategies for coordinating ocean and coastal science and policy in regions that include the Great Lakes, Northeast, Gulf of Mexico, West Coast, and Southeast, and states that include California, Washington, Massachusetts, New York, Florida, New Jersey, Alaska, and Hawaii.

These actions set high expectations for significant progress toward ocean policy reform. Results, however, have been slow in coming. There has been concerted attention to ocean and coastal issues by Congress, including, of course, hard work by the Senate Commerce Committee's National Ocean Policy

Study, as well as the full Commerce Committee, and a number of bills that have made significant progress through the legislative process in the 109th Congress. The Joint Initiative strongly urges Congress to enact ocean and coastal legislation that has already progressed significantly, and in so doing demonstrate progress toward implementing the recommendations of the U.S. Commission on Ocean Policy and the Pew Oceans Commission. It is vitally important to realize some near term successes while continuing the essential work of achieving the broader comprehensive reforms necessary to reverse the decline of our oceans. If enacted, these bills will demonstrate progress, address important issues, and show that Congress is serious about restoring the vitality of our oceans. These bills are summarized in Appendix A to this written testimony, and include:

- Magnuson-Stevens Fishery Conservation and Management Act
- Marine Debris Research, Prevention and Reduction Act
- Tsunami Preparedness Act
- National Ocean Exploration Program Act
- Coastal Estuarine Land Protection Act
- Coral Reef Conservation Amendments Act
- Ocean and Coastal Mapping Integration Act
- Ocean and Coastal Observing System Act of 2005
- Coastal Zone Enhancement Reauthorization Act
- Ballast Water Management Act of 2005
- Water Resources Development Act of 2005
- Flood Insurance Reform and Modernization Act of 2006

In addition to passing pending bills such as the ones mentioned above, outlined below are several additional legislative proposals that the Joint Ocean Commission Initiative believes provide a solid framework for action by Congress. Many of these actions can and should be carried out right away, signaling progress and paving the way for some of the more challenging and long-term measures that will be needed to achieve meaningful ocean policy reform.

Congress should adopt a statement of national ocean policy, acknowledging in legislation the importance of oceans to the nation's economic and ecological health and adopting a national policy to protect, maintain, and restore marine ecosystems so that they remain healthy, resilient, and able to deliver the services people want and need.

A statement of national ocean policy should include recognition that it is the policy of the United States to establish and maintain for the benefit of the nation a coordinated, comprehensive, and long-range national program of ocean and atmospheric research, conservation, management, education, monitoring, and assessment. A new declaration of national ocean policy should incorporate provisions relating, but not limited to, the following concepts:

- acknowledge the linkage of ocean, land, and atmospheric systems
- protect, maintain, and restore the long-term health, productivity, and diversity of the ocean environment
- protect life and property against natural and manmade hazards

- ensure responsible management and sustainable use of fishery resources and other ocean and coastal resources held in the public trust, using ecosystem-based management and a balanced precautionary and adaptive approach
- assure sustainable coastal development based on responsible state and community management and planning
- develop improved scientific information and use of the best scientific information available to make decisions concerning natural, social, and economic processes affecting ocean and atmospheric environments
- enhance sustainable ocean-related and coastal-dependent commerce and transportation, balancing multiple uses of the ocean environment
- provide for continued investment in and improvement of technologies for use in ocean and climate-related activities
- expand human knowledge of marine and atmospheric environments and ecosystem
- facilitate a collaborative approach that encourages the participation of diverse stakeholders and the public in ocean and atmospheric science and policy
- promote close cooperation among all levels of government, academia, nongovernmental organizations, the private sector, and other stakeholders based on this policy to ensure coherent, accountable, and effective planning, regulation, and management of activities affecting the oceans and the atmosphere
- enhance and preserve the role of the United States as a global leader in ocean, atmospheric, and climate-related activities

Congress should establish the National Oceanic and Atmospheric Administration (NOAA) in law and work with the Administration to identify and act upon opportunities to improve federal agency coordination on ocean and coastal issues. Congress should pass a strong organic act establishing NOAA as the lead civilian ocean agency and restructuring the agency to enhance its ability to fulfill its core mission to further our understanding of oceans and coasts and apply that knowledge to effectively manage our marine resources on an ecosystem basis. Specifically, a NOAA organic act should:

- Establish NOAA as the lead civilian ocean agency by statute
- Set forth core missions of: assessment, prediction, and operations; ecosystem-based management of ocean and coastal areas and resources; and science, research, and education
- Call for reorganization of the agency along functional lines to better equip it to carry out its core mission and remain science-based, but with its management programs better connected to make use of that science in decision making
- Establish leadership roles and accountability mechanisms for implementation of major elements of the agency's mission

NOAA was established in 1970 by a presidential reorganization order and has operated under that authority since that time. Over the years, several bills have been introduced that can provide the basis for an act that would codify NOAA. Most recently these include the National Ocean Policy Leadership Act (S. 2647), which was introduced by former Senator Ernest F. Hollings in the 108th Congress. The Bush Administration has put forward simple organic act language, and Congressman Vernon recently reintroduced his National Oceanic and Atmospheric Administration Act (H.R. 5450), which reported

out of the House Committee on Science in June and was referred to the House Committee on Resources, which is expected to consider the legislation by addressing NOAA's resource and conservation activities, issues that fall under that committee's jurisdiction. By building on these bills, Congress can codify and strengthen NOAA and thereby enhance its mission, improve its structure, and better enable it to carry out existing and new responsibilities in a manner that is consistent with ecosystem-based management.

In addition, although NOAA plays a very important role and should be strengthened to carry out its mission, there are a number of other federal agencies with ocean and coastal responsibilities and important ocean science and research programs, including the National Science Foundation (NSF) and the National Aeronautics and Space Administration (NASA). Congress should take action to enhance federal agency coordination and leadership by conducting oversight of the Administration's implementation of the U.S. Ocean Action Plan to evaluate whether modifications or improvement are needed and work with the Administration to identify opportunities to strengthen the interagency processes for coordinating ocean and coastal issues. .
In this regard, the Joint Initiative recommends Congressional actions that include:

- Require the Administration to prepare a progress report outlining priorities, activities, and results achieved by the Committee on Ocean Policy and its related subcommittees, including implementation of the U.S. Ocean Action Plan and the overall effectiveness of the interagency structure.
- Schedule a National Ocean Policy Study oversight hearing on national ocean governance with discussion of the progress of the interagency structure as a topic.
- Based on the results of the progress report and the oversight hearing, pass legislation that would:
  - Codify a permanent federal coordinating committee with staff support provided by an Office of Ocean Policy in the Executive Office of the President to oversee the federal government's implementation of a national ocean policy, resolve interagency disputes, and coordinate ocean budgets (or manage the integrated oceans budget).
  - Call upon the President to appoint an Assistant to the President to provide leadership and support for implementation of the national ocean policy.
  - Establish a nonfederal Council of Advisors to provide advice on ocean and coastal issues.

Congress should foster ecosystem-based regional governance. Congress should pass legislation to create a national framework to support regional approaches and collaboration and enable coordinated, integrated ecosystem-based management that builds on existing regional and ecosystem-based efforts. This framework should guide the development and implementation of processes that involve federal, state, tribal, and local governments, as well as the private sector, nongovernmental organizations, and academic institutions, working together toward regional actions that advance national ocean and coastal interests. Regional governance mechanisms will vary to meet needs of different regions, but should be encouraged to possess the following characteristics:

- Regional governance entities that are manageable in size (approximately 20-25 representatives) with a mix of federal agency and state representatives.

- Regional entities that are advised and supported by a citizens' advisory committee.
- Development of regional ocean strategic plans that:
  - Identify short and long term goals
  - Assess the region's social, economic, and ecological characteristics to guide progress toward those goals
  - Determine priority issues and solutions to address them
  - Identify indicators of management efforts
  - Analyze gaps in authority
  - Identify and prioritize research, data, and information needs
  - Commit to dedicated public education and outreach efforts
  - Implement solutions or policies to address priority problems

In addition, Congress should improve federal coordination of regional activities by calling upon the President to direct federal agencies to identify opportunities to further coordinate existing programs and activities to assist and support more effective implementation of regional approaches. Improving coordination of federal agency activities at the regional level would be an important complement to state, local, and tribal efforts to address ocean and coastal resource management issues on a regional basis. Enhanced coordination would enable federal agencies to better address state and local needs while also furthering national goals and priorities.

Congress can further enable the transition toward an ecosystem-based approach by expressly acknowledging that management of all marine resources should be carried out in an ecosystem-based approach, and by calling upon federal agencies to develop guidelines that enable improved coordination and analysis to assist in the transition toward an integrated management approach that considers the entire ecosystem. Such an express acknowledgment should be part of ocean, coastal, and water laws currently up for reauthorization. These include the Magnuson-Stevens Fishery Conservation and Management Act, the Coastal Zone Management Act (CZMA), the National Marine Sanctuaries Act, the Clean Water Act, and other statutory regimes governing the use and management of ocean and coastal resources.

Through reauthorization or passage of these statutes, Congress can provide that management goals should be set to ensure that ocean and coastal ecosystems remain productive with respect to all resources. For example, through language included in the reauthorization of the Magnuson-Stevens Act, Congress can acknowledge that a first step toward effective ecosystem-based management of fisheries is to enable coordinated analysis of cumulative impacts of activities on fishery resources, as well as the impacts of fishing activities on other sectors, by developing guidelines for Regional Fishery Management Councils and other state and federal agencies and management entities to perform such analyses.

Likewise, through reauthorization of the CZMA, Congress can require that state coastal programs work with federal, state, and local agencies to provide for periodic assessments of the state's natural, cultural, and economic resources, and based on those assessments, set specific, measurable goals that reflect the growing understanding of ocean and coastal environments and the need to manage growth in regions

under pressure from coastal development. Congress can also direct that states redefine the landward reach of their coastal zones to include coastal watersheds, thus better enabling coastal programs to look across political boundaries and incorporate a coastal watershed focus and the basic tenets of ecosystem-based management.

Statutory acknowledgement of the need to incorporate ecosystem-based management into marine resource management regimes is intended be a first step toward ecosystem-based management by enabling improved coordination and analysis among agencies managing marine resources and providing for a transition toward an integrated management approach that considers the entire ecosystem.

Congress should reauthorize an improved Magnuson-Stevens Fishery Conservation and Management Act that incorporates a stronger reliance on science to guide management actions to ensure the long-term sustainability of U.S. fisheries. Further, it should reinforce the principle that fishery resources are held in the public trust for the benefit of all U.S. citizens and need to be managed in a way that considers the relationships between and among all components of the marine ecosystem. In addition, care should be taken to avoid changes that compromise existing conservation provisions or allow exemptions to established review processes that help ensure that fishery-related actions are considered in a broad ecosystem context.

Progress on the reauthorization of the Magnuson-Stevens Act is promising. We applaud Senator Stevens, the Chairman of your parent Committee, and the many other Senators who helped move S. 2012 through the Senate. We have high expectations that House will move its reauthorization bill to the floor after the August break and a resolution of the few differences between the House and the Senate will be reached before adjournment.

We are pleased that both bills address recommendations made by the U.S. Commission on Ocean Policy and the Pew Oceans Commission. We would simply reiterate that, while progress on these bills is encouraging, the Joint Initiative believes that a final bill should reflect the principles outlined above, and therefore should:

- Avoid any rollback of existing law that could result in increased fishing pressure on vulnerable stocks and threaten their ability to rebuild.
- Show greater movement toward ecosystem-based management.
- Strengthen provisions to ensure that the best available science is used to make management decisions.
- Retain the provision in S. 2012 that strengthens the ability of the United States and international fishery management organizations to combat illegal, unreported, and unregulated fishing.

In addition, the Joint Initiative supports provisions in Senate Bill 2012 that strengthens the ability of the United States and international fishery management organizations to combat illegal, unreported, and unregulated fishing. The Joint Initiative encourages the House and Senate to work together to enact a strong Magnuson-Stevens reauthorization bill in 2006.

The United States should accede to the United Nations Convention on the Law of the Sea. The United States Senate should provide its advice and consent to U.S. accession to the convention so that the United States can once again assume a leadership position in international forums deciding such vital ocean matters as jurisdictional claims over the continental margin with it vast energy resources, deep seabed mining, scientific research, and environmental protection.

The Joint Initiative agrees with the President that accession supports vital U.S. national security, economic, and international leadership interests and that rapid Senate approval is needed. As a party, the United States would be in the best position to lead future applications of this framework for regional and international cooperation in protecting and preserving the marine environment. U.S. accession to the convention would send a clear message in support of our efforts to foster international approaches while significantly furthering our own national interests. As the lone industrialized nation not part of the convention, we jeopardize our role as a world leader by failing to join.

The convention has been thoroughly reviewed in Senate hearings and public forums, and U.S. accession is supported by a broad coalition of ocean interests. The Navy and Coast Guard have testified that joining the convention will strengthen our ability to defend freedoms of navigation and overflight essential to military mobility and our homeland security efforts. All major U.S. industries, including offshore energy, maritime transportation and commerce, underwater cable communications, and shipbuilding support U.S. accession to the convention because its provisions help protect vital U.S. economic interests and provide the certainty and stability crucial for investment in global maritime enterprises. Environmental organizations strongly support the convention as well.

The Senate should adopt a Sense of the Senate Resolution that supports the Administration's position in the World Trade Organization (WTO) negotiations calling for an end to fishing subsidies that promote overcapitalization and subsequently contribute to the global depletion of fish stocks. Such an action would send a strong signal to the WTO negotiations, where legally binding language on fish subsidies is currently being developed, and would further reinforce the Senate's leadership role in ocean and coastal policy reform. In addition, the U.S. Commission on Ocean Policy and the Pew Oceans Commission reports both identified overcapitalization of the global commercial fishing fleet as a major contributor to the widespread depletion of economically important fish stocks. At the global level, a significant factor in the continued overcapitalization of the commercial fishing fleet is the system of fishing subsidies that exists in many countries. Fishing subsidies that support overcapitalization harm the competitiveness of U.S. exports in the international seafood market and promote illegal, unregulated, and unreported (IUU) fishing, which further harms our domestic commercial fisheries, both ecologically and economically. According to the Office of the U.S. Trade Representative, the international commercial fishing industry receives annual subsidies of at least $15 billion, equivalent to more than 20 percent of the value of the world's commercial fish catch.

Congress should expand innovation and competitiveness legislation to incorporate ocean science and education consistent with the Bush Administration's Ocean Research Priorities Plan and Implementation Strategy. The innovation and competitiveness initiative being pursued as a result of the recommendations issued by the National Academies in its report, *Rising Above the Gathering Storm*,

highlights the importance of improving and maintaining strong research and education programs. Ocean-related research and education programs in agencies across the federal government hold immense potential for propelling the economic interest of the United States and should be incorporated into this initiative.

The Ocean Research Priorities Plan and Implementation Strategy will identify the best investment opportunities in marine science. Our oceans are rich in energy resources, marine biotechnology is a rapidly growing industry that is capitalizing on the vast biological and genetic diversity of marine life, and advanced underwater vehicles are opening up an era of ocean exploration that has captured the imagination of a new generation of school-aged children. Cutting-edge research using massive oceanic and atmospheric data sets and a new focus on promoting multi-disciplinary studies in support of ocean science are laying the groundwork for technological advances and a sophisticated workforce that will allow our nation to be a leader in the global shift toward a service sector that provides environmentally-sensitive technologies and policies.

Congress and the President have proposed legislative and funding initiatives to implement innovation and competitiveness activities, with a focus on programs in the Department of Energy, NSF, and the National Institute of Standards and Technology. Congress should expand its vision and include enhanced programs for ocean-related research and education as part of the initiative. Congress should target the initiatives identified by the President's Committee on Ocean Policy is its Ocean Research Priorities Plan and Implementation Strategy, which is currently in development. This strategy, developed with input from the ocean community and subject to a comprehensive review by a special National Academies review committee, will identify ocean-related research and education priorities government-wide, providing Congress with an ocean science funding roadmap. This strategy is scheduled to be completed at the end of the year. However, the other priority recommendations described in this section offer immediate opportunities to focus and strengthen currently uncoordinated programs and platforms from which new initiatives can be launched.

Congress should enact legislation to authorize and fund the Integrated Ocean Observing System (IOOS). The IOOS is the domestic element of the international Global Ocean Observing System, which is part of the Global Earth Observing System of Systems. Congress should authorize and fund a comprehensive and sustained national IOOS that will support and enhance our ability to understand and manage ocean and coastal resources in a number of ways, including: protecting lives and livelihoods from natural hazards; supporting national defense and homeland security efforts; safeguarding public health; developing new energy resources; adapting to climate change; and conserving biodiversity. Congress needs to consider both ground- and space-based research (NASA, NSF) and operational (NOAA) ocean-observing assets in developing the budget for the IOOS. Implementation of the IOOS should be carried out in a manner that recognizes, nurtures, and makes use of existing nonfederal infrastructure and capacity.

Together, IOOS, the international Global Ocean Observing System, and the multi-dimensional Global Earth Observing System of Systems offer scientists and managers a more complete view of atmospheric, terrestrial, and oceanic interactions occurring at the global, national, and regional scales.

IOOS, broadly speaking, provides the infrastructure and tools needed to translate science into products and services needed by decision makers. IOOS supports the hardware, software, data management, synthesis, and modeling activities that integrate the data and information generated by the research community. IOOS also helps ensure that research efforts are directed toward issues and questions that are limiting the capacity of decision makers to make informed policy and regulatory decisions. For example, IOOS supports activities such as the enhanced water quality monitoring system called for in the President's Ocean Action Plan, ecosystem modeling that supports multi-species management of our ocean fisheries, and forecasting and tracking harmful algal blooms.

IOOS is also where disparate data sets are integrated to detect short- and long-term shifts in the health and productivity of key ecosystems and where socioeconomic trends are analyzed. This information is then synthesized and translated into products that are understandable to decision makers, who then use it to guide their decisions. Hidden inside this process are infrastructure requirements (e.g., ships, satellites, sensors, laboratories, computer soft- and hardware) and the development of tools (e.g., new or expanded ecosystem models) that are increasingly sophisticated and costly. Consequently, a comprehensive IOOS requires Congress to pass authorizing legislation that will guide both the activities of federal agencies and the numerous state and private sector partners who are also deeply vested in the system. Without a clear specification of the roles and responsibilities of the various players and increased funding to implement such a system, the ocean will continue to be the weak link in a global observing system that is already driving major economic policy making.

Congress should establish a New Ecosystem Research Initiative to foster scientific cooperation and integration by rewarding interagency and multidisciplinary research that addresses ecosystem questions. Decision makers need information that will help them manage human activities and natural resources in a manner that provides the greatest benefit to the nation. While there is broad agreement among scientists and natural resource managers that the United States must transition toward ecosystem-based management, there is considerable confusion about what this process entails. Will specific ecosystem concerns, such as the fate or habitat needs of an endangered species, or a regime-wide phenomenon, such as climate change, take precedent over human priorities? Are we headed toward dramatic ecological regime shifts induced by human activities, or are these changes being driven by natural processes?

These are legitimate questions that require the government to develop a more coherent and broad-based research program. Such a program must be based on multidisciplinary approaches and the cooperation of scientists from differing disciplines within and outside the government. An Ecosystem Research Initiative should integrate ongoing basic and applied ecosystem research across the spectrum of federal agencies currently engaged in such research. The consolidation of ecosystem-related research activities under a broad interagency cross-cutting initiative—perhaps modeled on the Climate Change Research Program—is key to delivering usable information to managers and policy makers. For the initiative to be successful, it must be granted an appropriate level of discretionary funding authority to direct existing and new resources toward high priority research areas through a competitive process.

Congress should support an enhanced National Ocean Exploration Program. It should enact a National Ocean Exploration Program Act that supports an expanded national ocean exploration program. A robust exploration program that coordinates, enhances, and strengthens activities across federal agencies is a missing link in a national strategy to better understand the Earth's environment. Exploration focuses on curiosity-driven research of ocean-related processes, properties, and places that are poorly known or understood. Put into context, more than 1,500 people have climbed to the summit of Mt. Everest, more than 300 have journeyed into space, 12 have walked on the moon, but only 2 people have descended and returned in a single dive to the deepest part of the ocean, spending less than 30 minutes on the ocean bottom, 95 percent of which remains unexplored.

The opportunity is ripe to develop a multi-agency exploration initiative given the placement of NOAA, NSF, and NASA in the same Congressional appropriations subcommittee, augmented by the support and guidance provided by the Navy. Such an initiative should work across the spectrum of the biological, chemical, and geological sciences and be guided by a competitive process coordinated by NOAA and NSF with strong guidance from the research community. It should ensure that resulting technological and scientific advances, like other basic research programs, will generate returns far in excess of their costs.

The discovery of new ecosystems and species has the potential for accelerating our understanding of the origin of life and evolutionary processes on Earth and possibly on other planets as well. An expanded national ocean exploration initiative will allow Congress and the Administration to create a legacy that will be recognized by future generations as a turning point in the development of a national ocean policy.

Congress should support a National Ocean Education Strategy. Congress should mandate the development of a national ocean education and outreach strategy that coalesces and integrates the existing array of independently conceived and implemented education and outreach programs and activities. There are growing numbers of ocean-related education and outreach activities occurring at all levels of government and within the nongovernmental sector. The lack of a coherent strategy for aligning these activities is compromising their effectiveness and limiting their capacity to generate additional funding support. Congress should work with the President to establish a governing body responsible for developing a national ocean education and outreach strategy. The strategy should enhance educational achievement in the natural and social sciences, increase ocean awareness, include a five-year plan for formal and informal activities, and facilitate links among federal, state, local, and nongovernmental programs. NOAA and NSF should be given the lead for this activity, and Congress should look for opportunities to increase support for successful programs within these and other agencies, such as the NSF Centers for Ocean Science Education Excellence.

Congress should establish an Ocean Trust Fund in the U.S. Treasury as a dedicated source of funds for improved management and understanding of ocean and coastal resources by federal and state governments. Both Commissions addressed the need for stable funding for implementing their recommendations, making the case that our oceans, coasts, and Great Lakes are major contributors to the U.S. economy, with half the nation's GDP generated in coastal watersheds. Maintaining the economic and ecological viability of our oceans and coasts requires decision makers at the national and state governmental levels to have access to unbiased, credible, and up-to-date information to make informed decisions. Unfortunately, chronic under-investment has left much of our ocean-related infrastructure in woefully poor condition. In addition, federal and state ocean and coastal agencies need more financial resources to meet the challenges that were so clearly documented in the reports of the two Commissions.

Given this acknowledged under-investment, each Commission was well aware of the budget implications inherent in its set of recommendations. Implementation costs outlined in the two reports arrived at similar projections—it will cost approximately $3–4 billion in new funds annually to meet the needs of a comprehensive ocean policy. A portion of those funds should be allocated to *all* coastal states to help sustain their renewable coastal resources. The other portion should be used to support the programs and activities of the various federal agencies with ocean and coastal responsibilities. To address these needs and to demonstrate a national commitment to a new national ocean policy, each Commission recommended that an Ocean Trust Fund, composed of *dedicated* resources, be established in the U.S. Treasury.

However, each Commission had a somewhat different approach to the sources of and uses for the funds. The U.S. Commission on Ocean Policy proposed a dedicated fund in the U.S. Treasury to be composed of all "unallocated" receipts from outer continental shelf (OCS) oil and gas development and resource rents from other new and emerging federal offshore activities. The U.S. Commission made clear that its proposal would not affect programs that currently receive OCS oil and gas revenues, specifically the Land and Water Conservation Fund and two additional programs. Rather, only after revenues for those programs were allocated in accordance with law, would any remaining offshore proceeds be deposited in the Trust Fund to be used by all coastal states and federal ocean agencies for a range of purposes. Generally, those purposes for the coastal states (to receive $1 billion annually) would focus on the conservation and sustainable development of renewable ocean resources, including any new responsibilities that arise as a result of the U.S. Commission's recommendations and the enhancement of programs that are currently underfunded. Additionally, the U.S. Commission recognized that the OCS producing states should be compensated for the impacts of energy activity in adjacent federal waters. Finally, the remainder of the funds would be distributed among federal agencies to address the new or expanded activities assigned to them as a result of Commission recommendations.

The Pew Oceans Commission recommended that Congress create a permanent, dedicated fund for coastal conservation. It looked at a broad range of potential sources of ocean-related revenues, but ultimately recommended using general revenues with the additional suggestion that Congress consider tapping proceeds derived from OCS oil and gas development for habitat protection. The Pew

Commission went on to maintain that this should be done in a way that does not encourage additional OCS energy development. We are aware that recently the House, and on Monday of this week, the Senate, each took action to move bills that, in part, would share a portion of OCS oil and gas receipts with "producing" or "adjacent" coastal states. As noted above, these bills indirectly address one of the key issues reviewed by each of our Commissions – the source of ocean-related financial resources dedicated to carry out a range of ocean and coastal activities, including those occasioned by offshore energy activity and those needed to implement a new and comprehensive national ocean policy (Ocean Trust Fund). With respect to such sources and the eligible uses of the revenues, the Joint Initiative recognizes that there are several options to consider and difficult decisions to be made. We stand ready to engage with Congress in an ongoing discussion about how to resolve these important issues. In the end, establishing a dedicated Ocean Trust Fund is one of the most important early steps Congress could take to demonstrate its commitment to a new national ocean policy.

Congress should increase base funding for core ocean and coastal programs. The loss of funding for some key ocean and coastal programs in FY 2006 and the lack of enhanced funding to address high-priority challenges identified in the Commissions' reports must be reversed if we are to preserve the economic benefits derived from ocean-dependent activities and protect the health and productivity of ocean and coastal ecosystems. Congress should increase funding for ocean and coastal activities throughout the federal government in FY 2007 and beyond, with an initial focus on enhancing core base programs and support for a few broad initiatives. To this end, the Joint Initiative would like to convey our deep appreciation for support provided for ocean-related programs in the FY 2007 Commerce, Justice, Science appropriations bill reported out of the Committee on Appropriations this month. We are heartened by the Senate's strong action and available to help secure the needed support for the spending bill as it goes before the full Senate and into conference with the House of Representatives. Details related to the Joint Initiative's funding recommendations are provided in Appendix B to this written testimony.

Further, Congress should direct that the Administration develop an integrated ocean budget. The lack of a coherent listing and analysis of ocean and coastal programs distributed throughout the federal government hampers the ability of Congress and the Administration to evaluate, coordinate, and integrate ocean- and coastal-related science, management, and education programs within agencies across the federal government. To address this problem, either as separate legislation or as part of an appropriations bill, Congress should direct the President to submit an integrated ocean budget, making it easier to track support for and analyze the progress of departmentally isolated but highly interactive ocean and coastal programs, and thus facilitating greater coordination among federal programs.

Conclusion

We close by commending this National Ocean Policy Study and its staff for your commitment to making meaningful change in the way we manage our oceans and coasts. The time is ripe for Congress again to act boldly to transform a dysfunctional federal management regime into a truly effective and farsighted system for managing our magnificent oceans and coasts to benefit current and future

generations. The members of the Joint Ocean Commission Initiative stand ready to assist the Congress in every way possible to meet this formidable challenge.

Appendix A
Pending Ocean and Coastal Legislation in the 109th Congress

The following lists a number of bills that have progressed significantly through the 109th Congress, passage of which would signal progress and demonstrate Congressional commitment to addressing the need to improve management of our oceans and coasts. This list does *not* include reauthorization of the Magnuson-Stevens Fishery Conservation and Management Act, which is discussed in the body of this testimony.

Marine Debris Research, Prevention and Reduction Act (S. 362) establishes within NOAA a Marine Debris Prevention and Removal Program that would reduce the adverse impacts of lost and discarded fishing gear on living marine resources and navigation safety and would encourage outreach and education of the public and other stakeholders in the fishing, fishing gear manufacturing, and plastic and waste management industries. This bill has been approved by the Senate and in the House was referred to the Committee on Transportation and Infrastructure and additionally to the Committee on Resources. Both Committees have reported the bill and it was placed on the House calendar on July 24, 2006.

Tsunami Preparedness Act (S. 50) directs the Administrator of NOAA to improve our nation's tsunami detection, forecast, warning, preparedness, and mitigation capacity through improved sensing technology, data collection and analysis abilities, and information and communication systems. The bill directs the Administrator to take a strong international leadership role to facilitate the development of a global warning system. This bill was passed by the Senate in July 2005. In the House, it was referred to the Committees on Resources, Science, and Transportation and Infrastructure.

National Ocean Exploration Program Act (S. 39) calls for the Secretary of Commerce to develop within NOAA a coordinated national ocean exploration program that will increase scientific knowledge for the informed management, use, and preservation of oceanic, coastal, and large lake resources through undersea research, exploration, education, and technology development. This bill was passed by the Senate in July 2005. In the House, it was referred to the House Committees on Resources and Science.

Coastal and Estuarine Land Protection Act (S. 1215) would codify an existing federal program in NOAA by which coastal states can compete for matching funds to acquire land or easements for the protection of sensitive coastal ecosystems with the goal of better ensuring the ecological and economic health of coastal communities. This bill has been reported out of the Senate Commerce Committee and placed on the Senate calendar. A companion bill in the House, H.R. 3187, has been referred to the Committee on Resources.

Coral Reef Conservation Amendments Act of 2005 (S. 1390) enhances funding for coral reef conservation, creates a community-based planning grants program to implement locally designed coral management and protection plans, and strengthens federal authority to undertake emergency response actions to prevent or mitigate imminent coral reef destruction from vessel or other physical damage. This bill was passed by unanimous consent in the Senate and has been referred to the Committee on Resources in the House.

Ocean and Coastal Mapping Integration Act (S. 364) directs the Administrator of NOAA to establish a program to develop a coordinated and comprehensive federal ocean and coastal mapping plan for the Great Lakes and Coastal State waters, the territorial sea, the exclusive economic zone, and the continental shelf of the United States. The mapping plan should enhance ecosystem approaches in decision-making, establish research priorities, and advance ocean and coastal science. This bill has been reported out of the Senate Commerce Committee and placed on the Senate calendar.

In addition, the following bills should be high priorities for Congress to work on this year. The Joint Initiative is working to provide input on specifics of each of these bills and stands ready to work with Congressional staff to ensure that these bills incorporate the principles embodied by the two Commissions in their reports.

Ocean and Coastal Observation System Act of 2005 (S. 361) calls on the President to establish an integrated system for ocean and coastal observation that would provide data and information for the timely detection and prediction of changes in the ocean and coastal environment that impact the nation's social, economic, and ecological systems. This bill was passed by the Senate in July 2005. In the House, it was referred to the House Committees on Resources and Science.

Coastal Zone Enhancement Reauthorization Act (S. 360) would improve the planning and coordinating capabilities of coastal states, support community-based planning to address pressing development issues in the coastal zone, protect coastal habitats, and encourage the development and use of innovative technology in coastal and estuarine management. This bill was the subject of a hearing by the Senate Committee on Commerce, Science, and Transportation and was reported favorably by the Committee. It is currently on the Senate legislative calendar.

Ballast Water Management Act of 2005 (S. 363) is designed to prevent ballast water introductions of nonindigenous species, and address aquatic nuisance species and the significant adverse environmental and economic harm that results from these releases. The bill was reported from the Senate Committee on Commerce, Science, and Transportation in November 2005 and is currently on the Senate legislative calendar.

The Flood Insurance Reform and Modernization Act of 2006 (S. 3589) would forgive nearly $24 billion owed to the U.S. Treasury by the National Flood Insurance Program for the 2005 hurricane season. It would also phase out premium subsidies on all non-primary residences and severe repetitive loss properties and calls for new standards that program officials must use to complete a floodplains map modernization process. This bill was introduced at mark up and reported out of the Senate Committee on Banking, Housing, and Urban Affairs and was placed on the Senate calendar.

Water Resources Development Act of 2005 (S. 728) would reauthorize the act and reform the U.S. Army Corps of Engineers. The bill was reported by the Senate Committee on Environment and Public Works in April 2005, and is on the Senate legislative calendar. It underwent Senate floor action in July 2006 and was returned to the Senate calendar.

Appendix B
Overarching Initiatives for Funding Integrated Ocean and Coastal Governance

As Congress considers ocean-related funding during the FY 2007 appropriations process and beyond, its funding priorities should recognize and support programs and activities that strengthen the long-term economic health of the nation. The ocean and coastal economies of the coastal states generate roughly three-quarters of the nation's annual GDP, exceeding $7.0 trillion in 2000. The "ocean economy" alone, meaning those activities that rely specifically on the oceans to support production, generated approximately $120 billion in 2000. Thus, the ocean economy was almost 2.5 times larger than the agricultural economy in terms of output and over 150 percent larger than employment in the farm sector. [2]

Unfortunately, underinvestment in core ocean and coastal science, management, and education programs have left the nation vulnerable to both chronic and catastrophic threats along our coasts. Poor water quality due to nonpoint source pollution, ecologic degradation associated with invasive species and habitat loss, and inappropriate land use that has resulted in escalating costs associated natural hazards are all evidence of the inadequacies of current ocean and coastal governance and funding regimes.

Further exacerbating the situation is the fact that the funding regime for federal ocean-related programs is in disarray. NOAA, the nation's lead civilian ocean agency, has a $3.9 billion budget consisting of hundreds of budget lines, which support important but discrete activities. Ocean and coastal programs in other agencies, such as DOI, EPA, and NASA, are often considered lower priorities and suffer from chronic underinvestment. The lack of emphasis on enhancing core ocean programs and activities across the government is clearly illustrated by the Administration's 2005 Ocean and Coastal Activities Report to the U.S. Congress[3] outyear budget projection for FY 2010, which shows decreases in most agencies' ocean budgets, with NOAA decreasing by $60 million, Department of Defense by $180 million, NASA by $90 million, Department of Transportation by $120 million, and USDA by $100 million, while the ocean budget for DHS increases by $500 million.

Due to the wide distribution of ocean-related programs throughout the federal system and the lack of a coherent process for monitoring their support, the Joint Initiative recommends that Congress begin moving toward a more comprehensive funding regime for ocean-related programs that is capable of focusing on high priority, large-scale initiatives that provide the agencies with increased flexibility and discretionary funding authority to respond to existing and emerging challenges. This will require a significant shift in the Administration budget formulation process, as well as how Congress exercises its fiscal oversight of federal ocean programs and activities.

Following the approach outlined above, the Joint Initiative has identified four broad functional categories for organizing ocean and coastal funding. These are:

- Ocean Governance and Coastal Management
- Ocean Science and Research
- Monitoring, Observing, and Mapping

- Ocean Education and Outreach

Outlined below, the Joint Ocean Commission Initiative recommends $715 million in new funding above FY 2006 levels to cover the costs of implementing a new national ocean policy consistent with the recommendations of the two Commissions. In addition, recommended new funds for implementing a strengthened Magnuson-Stevens fisheries act ($29 million) and for implementation costs related to accession to the United Nations Convention on the Law of the Sea ($3 million) bring the overall new funding needed to a total of $747 million.

Funding Category 1: Ocean Governance and Coastal Management

Congress should provide funds to support new governance efforts at both the federal and regional levels, with additional emphasis on expanding support for watershed initiatives that support ecosystem-based management. Moving toward an ecosystem-based management approach will demand major changes to the current federal approach to ocean management and governance. The coordination and integration required as part of this process has demanded considerable additional effort by managers given the increasing complexity of the issues being addressed, such as evaluating cumulative impacts on coastal watersheds. This process should mature over time, but it will languish unless managers are provided with additional funding to help facilitate the communication and coordination needed to make it successful. While funding is needed across a broad spectrum of ocean management activities, the Joint Initiative believes that the greatest potential for short-term gains is associated with the support for the following actions.

Support for the new interagency coordination efforts. The President established the Committee on Ocean Policy and its supporting science and policy coordination subcommittees to facilitate greater interagency collaboration and communication. The costs associated with these efforts have been borne by the member agencies, which provide staff and funding to support the interagency effort. While this is a functional approach, providing both CEQ and the Office of Science and Technology Policy with $500,000 each to support a small permanent staff dedicated to supporting interagency cooperation, as recommended by both Commissions, would greatly increase the effectiveness of the current effort to integrate federal programs and also enhance federal, state, and regional partnerships. *Total: +$1 million*

Support regional coordination. Efforts to develop regional ocean and coastal coordination strategies are increasing around the nation. Great progress has been made in the Great Lakes and the Gulf of Mexico, and efforts are beginning to emerge on the West Coast and in the Southeast. Funding for these efforts has come from a mixture of sources, but there is no coherent federal strategy for supporting these efforts. The U.S. Commission on Ocean Policy estimated the cost supporting regional coordination efforts at roughly $5 million the first year, rising to $12 million in the third year. *Total: +$5 million*

Support watershed-related activities. There is growing recognition of the value of a watershed approach and the importance of addressing the cumulative impacts of all activities that take place within a watershed. EPA has reoriented federal and state clean water programs to address certain problems on a

watershed basis and has developed extensive guidance for use by states, tribes, and territories, including the development of an online Watershed Academy and a targeted watershed grant

program that encourages community-based approaches. USDA has chosen high priority watersheds in which agricultural runoff is a major source of pollution as the basis for distributing funds under its conservation programs. NOAA's Coastal Zone Management Program has been instrumental in guiding state efforts to watershed management approaches, and the opportunity exists for Congress to strengthen its support for watershed management during the reauthorization of the CZMA. The transition toward watershed management would benefit from additional resources for these programs, and the Joint Initiative suggests providing an additional $20 million for the NOAA Coastal Zone Management Program, $5 million for the EPA watershed grant program, and $4 million for USDA's Watershed Surveys and Planning account, above their FY 2006 funded levels. The U.S. Army Corps of Engineers also requires greater ability to use its funding to support watershed-wide feasibility studies and impact analyses prior to making final determinations on proposed coastal projects. *Total: +$29 million*

Other established conservation and management programs have made significant contributions toward maintaining and improving the quality of coastal resources and could make even greater contributions with additional fiscal resources. These include the EPA National Estuary Program; the DOI Coastal Program, Coastal Barrier Resources System, and Coastal Wetland Grants Program; and NOAA's Coastal and Estuarine Land Conservation Program and National Marine Sanctuaries Program. While the Joint Initiative has not identified discrete levels of funding applicable to each of these programs, the need clearly exceeds $50 million, recognizing that the U.S. Commission suggested at least an additional $35 million in support for the Coastal Estuarine land and Conservation Program and the +$10 million funding cut endured by the National Marine Sanctuary Program in FY 2006. *Total: +$50 million*

Total for Ocean Governance and Coastal Management: + $85 million.

Funding Category 2: Ocean Science and Research

Congress should encourage greater interagency collaboration in support of all dimensions of ocean science, from exploration and basic research to applied research, by supporting a number of overarching initiatives, including ocean exploration, ecosystem research, ocean observing, and education, the Administration is currently developing an *Ocean Research and Priorities Plan and Implementation Strategy*[4] that will eventually provide a roadmap to assist Congress in prioritizing ocean science and research funding. However, given the overwhelming need to take meaningful action promptly, priority should be given to supporting endeavors that offer frameworks capable of providing focus and continuity for ocean science and research programs. The Joint Initiative strongly encourages Congress to support an enhanced ocean research and education program, establishment of a new ecosystem research initiative, the implementation of an integrated ocean observing system, and a national ocean education strategy.

Congress should expand the national innovation and competitiveness initiative to include oceans. The President's American Competitiveness Initiative provides an excellent opportunity for Congress to draw upon the scientific and educational resources and expertise of the ocean community to contribute toward this broad national initiative. Thus, in the context of supporting an enhanced national research enterprise, Congress should increase resources for ocean research and exploration programs in NOAA, NSF, and the Navy, as well as other ocean and coastal programs in federal agencies, as part of the innovation and competitiveness initiative.

Ocean science and exploration are closely related endeavors. Explorers discover the new places, species, and phenomena that other scientists then study and explain. Many experts have pointed out that we now know more about the surface of the moon—and increasingly the surface of Mars—than we do about the bottom of the ocean, despite the huge potential for answering fundamental questions about our planet and discovering new forms of life in the soup of biological diversity contained within our oceans. This effort, in turn, has the potential to not only support a new economic enterprise in marine biotechnology, but also allow us to begin to address the growing health-related concerns associated with harmful algal blooms, seafood-related illnesses, and water-borne chemical contaminants.

Congress should support the development of an expanded ocean research and exploration initiative. The Joint Initiative recommends that Congress support an expanded ocean exploration initiative that incorporates many of the basic ocean research programs and activities within the federal government. Currently, ocean exploration is supported by a broad array of federal programs housed in NSF, NOAA, and the Navy, while basic ocean research is spread across many federal agencies. Unfortunately, ocean research and exploration funding has stagnated or decreased, resulting in a steady real dollar decline in support for basic research over the past decades. This decline compromises our nation's economic and national security and was the basis for the both Commissions' support for doubling the federal ocean and coastal research budget from its current level of $650 million per year to $1.3 billion over the next five years.

Congress must reverse this decline by enhancing ocean research funding. Under an ocean research and exploration initiative, Congress should strongly consider enhancing the NSF Geosciences Directorate account by $42 million, the NSF Major Research Equipment and Facilities Construction Account by $50 million, the NSF Polar Programs by $50 million, and the Navy's 6.1 account by $50 million from FY 2006 enacted levels. These programs are the foundation of ocean research and exploration, and enhanced support is crucial. In addition, there are numerous other basic research programs that merit increased support from their FY 2006 funding levels, including, but not limited to: NOAA Ocean Exploration (+$36 million); NOAA/National Centers for Ocean Coastal Science (+$25 million); NOAA/Ocean Human Health (+$15 million); NOAA/National Undersea Research Program (+$11 million); DOI/USGS Coastal and Marine Geology Program (+$10 million); and EPA/ORD Ocean and Coastal Research (+$10 million). Other areas of ocean-related research of great importance that would benefit from additional funding include ocean and coastal remote sensing, arctic research, atmospheric deposition, economic and social analysis, invasive species, and coral reefs. *Total: +$299 million*

Congress should complement its ocean research and exploration initiative with an ecosystem research initiative. Such an initiative would greatly assist the nation as we transition toward an ecosystem-based management approach. The initiative would stimulate multidisciplinary approaches and scientific cooperation among federal and nonfederal research entities. The Joint Initiative envisions this initiative as having an applied research focus, addressing issues that will directly benefit managers and policy makers who must understand and balance economic, social, and environmental factors when making decisions that will affect the health and productivity of coastal ecosystem.

The Joint Initiative recognizes that budgetary initiatives are primarily a responsibility of the Executive Branch. Thus, we recommend that Congress strongly encourage the Administration to consider developing and supporting an ecosystem research budget initiative. Such an initiative would help identify and begin the process of coordinating the broad suite of ecosystem-related research activities taking place throughout the government. Examples of programs and activities that could possibly be coordinated under this initiative include: aquatic invasive species research; ocean remote sensing; marine mammal research; development of fishery ecosystem plans; habitat restoration; coral reef research; and marine protected areas, including the National Estuarine Research Reserve System. Congress should ensure that funding for these activities and programs is protected, and preferably enhanced, as part of concerted national effort to support federal, state, and regional efforts to restore the health and productivity of our oceans, coasts, and Great Lakes.

Funding Total for Ocean Science and Research: +$299 million

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Funding Category 3: Monitoring, Observing, and Mapping

Congress should increase funding for the implementation of an Integrated Ocean Observing System (IOOS) and other scientific tools and infrastructure that are the backbone of the ocean science enterprise. A critical component of a robust ocean science enterprise is the set of tools that allow scientists to collect, monitor, observe, map, model, analyze, and synthesize data, and then translate and communicate their findings in useable and understandable forms to managers and policymakers. An important tool to achieve well-informed, science-based ocean and coastal management with an ecosystem focus is the national IOOS. As the ocean component of the President's Global Earth Observing System of Systems, a fully operating IOOS will provide critical information for: protecting human lives and property from marine hazards; improving ocean health; predicting global climate change; enhancing the nation's security; and providing for the protection, sustainable use, and enjoyment of ocean resources.

Many of the elements of a national system are already in place, but they operate independently. Support for IOOS is the process through which these elements are interconnected into global and coastal observation networks. Congress should place a high priority on the passage of legislation mandating the implementation of an IOOS and should increase the level of funding in support of global and regional IOOS programs, providing the community with the flexibility to direct funding toward activities and infrastructure that will allow for the orderly and coherent development of an effective and efficient program.

There are many elements that constitute the IOOS, some infrastructure-related, others programmatic activities that develop more effective tools for translating and sharing the information generated.

One very important element is the need to create a national base map that is seamless across the shoreline and can incorporate new geospatial data of all types as they are collected. Another is the need to reinforce the network of infrastructure and technology used to support science and exploration, such as research vessels, satellites, buoys, and sensors, as well as computer hardware and software. A third is establishing a data management and communication center where federal and state agencies can coordinate the collection, archiving, fusion, modeling, and distribution of IOOS-related information and products.

Congress should increase its support for the IOOS. The U.S. Commission on Ocean Policy identified four components that are essential for the IOOS, including: data management and communications; enhancing regional coastal information systems; accelerating implementation of the global ocean observing system; and enhancing and integrating existing federally-supported observing programs. The first year cost was calculated at $138 million, with the annual cost increasing to roughly $500 million in the fifth year. The Joint Initiative strongly recommends that Congress bolster the funding commitment to IOOS, with new funding being targeted among the three areas described above. *Total: +$138 million*

Other monitoring-related activities and suggested levels of increased financial support they require are provided below. The funding levels are generally based on guidance provided in Chapter 30 and Appendix G of the U.S. Commission on Ocean Policy report and represent increases above enacted funding levels: develop a national monitoring network ($10 million); implement improved sediment research monitoring, assessment, and technologies ($12 million); expand federal mapping and charting and data integration ($50 million); establish a NOAA/Navy ocean and coastal information management and communication partnership ($20 million); develop regional approaches to address atmospheric deposition ($3 million); modernize NPDES monitoring, strengthen enforcement, and implement stormwater programs ($7 million); increase ballast water research and demonstration programs ($2 million); implement early detection and notification plans for aquatic invasive species ($30 million); expand marine debris monitoring ($5 million); create and fund a national program for social science and economic research ($5 million); and increase support for data management software ($7 million). *Total: +$151 million*

Total for Monitoring, Observing, and Mapping: +$289 million

Funding Category 4: Ocean Education and Outreach

Congress should increase funding for established ocean education programs.We recommend the establishment of a national ocean education strategy, with NOAA and NSF being given the lead in coordinating the program. The strategy should enhance educational achievement in the physical,

natural, and social sciences, increase ocean awareness, include a five-year plan for formal and informal activities, and facilitate links among federal, state, local, and nongovernmental programs. It is our understanding that the Administration's Ocean Research Priorities Plan and Implementation Strategy will include recommendations for advancing federal ocean education programs. The Joint Initiative feels strongly that Congress should increase funding for existing federal ocean education initiatives in NOAA, NSF, and the Navy in FY 2007. Doing so will contribute directly to the objectives of the innovation and competitiveness initiative supported by Congress by enticing more students at all levels of education into scientific and technical professions. An increased investment in ocean-related education will play a key role in stimulating a new generation of engineers and scientists who will help this nation maintain its technological lead in an increasingly competitive world while also helping to establish a new ocean stewardship ethic.

Congress should make funding for formal and informal education a priority and provide support above the FY 2006 enacted level for the following programs: NOAA Education Initiatives ($12 million); NSF Centers for Ocean Science and Education Excellence ($10 million); and NOAA Sea Grant ($20 million). We anticipate identifying a broader suite of programs across other federal agencies when the Administration completes its Ocean Research Priorities Plan and Implementation Strategy, one component of which will address ocean-related education funding needs.

Total for Ocean Education and Outreach: +$42 million

The Joint Initiative recognizes that expanding beyond relatively rigid mission-driven responsibilities toward multi-agency, multi-discipline funding initiatives that are not rewarded in the federal budget formulation process will require a major change in the Executive Branch budget formulation process. It will also require Congress to reconsider how it authorizes and funds such initiatives. A sustained and successful transition toward ecosystem-based management is as dependent upon the willingness of Congress to reconsider its institutional policy-setting and funding processes as it is upon the ocean science community to demonstrate its capacity for collaborating and coordinating in a meaningful way through the federal budget process. Thus, Congress should look toward developing oversight mechanisms that will strengthen its capacity to evaluate and guide interagency cooperation and funding.

In this appendix, the Joint Initiative makes a number of funding recommendations, both general and specific, and we want to emphasize that current funding levels are clearly inadequate given the state of our oceans and coasts. It is not our intent to develop a comprehensive budget analysis in this document. Rather, we will continue to work with the ocean community to build upon these funding recommendations in the coming months and provide Congress with additional information that we hope will be helpful in the appropriations process.