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U.S. DEPARTMENT OF COMMERCE**

**BEFORE THE  
COMMITTEE ON NATURAL RESOURCES  
SUBCOMMITTEE ON FISHERIES, WILDLIFE AND OCEANS  
U.S. HOUSE OF REPRESENTATIVES**

**June 5, 2007**

Good morning, Madam Chairwoman and Members of the Committee. I am Craig McLean, Deputy Assistant Administrator for Programs and Administration in the Office of Oceanic and Atmospheric Research at the National Oceanic and Atmospheric Administration (NOAA), within the Department of Commerce. Thank you for inviting me to discuss H.R. 1834 and H.R. 2400 and the role of NOAA in ocean exploration, undersea research, and ocean and coastal mapping.

In 2007, NOAA is very proud to be celebrating 200 years of science, service and stewardship to our nation. Much of America's scientific heritage is rooted in NOAA and its predecessor agencies — from the establishment of the Survey of the Coast in 1807 by Thomas Jefferson, to the formation of the Weather Bureau and the Commission of Fish and Fisheries in the 1870s. We continue to honor this legacy as we work with federal, state, tribal, and international partners, as well as Congress and other stakeholders, to fulfill our mission to conserve, manage, and protect our nation's ocean, coastal, and Great Lakes' resources. NOAA would like to thank Representative Brown and his co-sponsors for recognizing NOAA and its predecessor agencies with House Concurrent Resolution 147 which acknowledges the 200th anniversary of the Coast Survey, celebrates NOAA's heritage, and recognizes NOAA and its predecessor agencies for 200 years of research, service to the people of the United States, and stewardship of the marine environment.

I am pleased to be here today to discuss H.R. 1834, an act to establish a coordinated national ocean exploration program within NOAA and H.R. 2400, an act to establish an integrated federal ocean and coastal mapping plan. NOAA generally supports the intent of both pieces of legislation; in fact, NOAA is part of existing efforts to achieve many of the goals expressed in the legislation. We are concerned that elements of the proposed bills, in particular H.R. 2400, duplicate existing interagency initiatives, and we recommend that the bills be amended to support ongoing collaborative efforts. Today, I will outline our current ocean exploration, undersea research, and integrated mapping programs and outline the connections between the legislation goals and existing efforts.

**U.S. Ocean Action Plan**

As the Members of this Committee are well-aware, on December 17, 2004, the President released the *U.S. Ocean Action Plan* in response to the U.S. Commission on Ocean Policy. The Commission's report recognized that our oceans, coasts, and Great Lakes sustain an abundance of natural wonders while contributing significantly to the economy, supporting numerous beneficial uses such as food production, development of energy and mineral resources, research and education, recreation and tourism, transportation of goods and people, and the discovery of novel medicines. Along with numerous State, Tribal, and local programs our oceans, coasts, and Great Lakes are governed by over 20 Federal agencies administering over 140 Federal laws. The *U.S. Ocean Action Plan* recognizes that these activities would benefit substantially from more systematic collaboration and better integration of effort.

The Administration supports the need for enhanced coordination and strongly values the local input that is essential in managing and protecting our Nation's ocean, coastal, and Great Lakes resources. Consistent with the *U.S. Ocean Action Plan* recommendations, the Administration believes that these activities would benefit from a more systematic collaboration and better integration of effort. To improve coordination and integration of ocean, coastal and Great Lakes' policy, the Plan establishes a detailed Federal interagency coordinating structure while facilitating regional, State, and local participation. The Administration has taken substantial steps to implement effective coordinating mechanisms that address these goals through broad collaboration and that reflect the need for integration of science, technology, management, and policy elements. The *U.S. Ocean Action Plan* governance structure includes the Interagency Committee on Ocean Science and Resource Management Integration (ICOSRMI) that reports directly to the Committee on Ocean Policy and two important subcommittees. The Joint Subcommittee on Ocean Science and Technology (JSOST) and the Subcommittee on Integrated Management of Ocean Resources (SIMOR) have been established underneath the oversight of the ICOSRMI to assure coordinated implementation of the Plan across all Federal agencies. NOAA has taken a leadership role in both SIMOR and the JSOST, serving as co-chair on each respective group and further supporting their activities

### **NOAA's Vision and Mission**

NOAA's vision is an informed society that uses a comprehensive understanding of the role of the oceans, coasts, and atmosphere in the global ecosystem to make the best social and economic decisions. NOAA pursues this vision through its mission to understand and predict changes in the Earth's environment and conserve and manage coastal and marine resources to meet our nation's economic, social, and environmental needs. NOAA's ocean exploration program contributes to this mission by discovering new ocean resources, promoting ocean education and ocean literacy, and identifying ocean issues with the potential to become the basis for future NOAA missions. NOAA's undersea research program contributes to NOAA's mission by providing undersea scientists inside and outside NOAA with advanced technologies and the expertise needed to work in the undersea environment through partnerships with the academic community. NOAA's mapping programs contribute to NOAA's mission by providing world-class

information products and services to aid domestic and global commerce, understand ecosystems, promote safe and efficient marine and air transportation, and add to our understanding of the world's oceans.

### **NOAA's Office of Ocean Exploration and National Undersea Research Program**

National interest in establishing a comprehensive ocean exploration and undersea research program stretches back over 40 years, when, in the late 1960's, the Stratton Commission initiated the International Decade of Ocean Exploration. The resulting programs dramatically enhanced understanding of the global climate system, geochemical cycling, ocean circulation, plate geodynamics, and life in extreme environments. In 1971, NOAA established the Manned Undersea Science and Technology (MUST) program, which pioneered exploration from undersea habitats. MUST was transitioned in 1980 from a primarily NOAA-based program to the extramural National Undersea Research Program (NURP) in recognition of a national need to support and conduct complex undersea observational and manipulative tasks in support of ocean research activities.

NURP has served NOAA and the nation for over 25 years as an underwater research and technology program. NURP places scientists underwater using advanced technologies, either directly or remotely, and focuses its considerable expertise and connections to the academic community on NOAA's undersea research agenda. In recent years, the program has functioned through a network of 6 regional centers and an institute, hosted primarily by universities. Two centers are located on the West Coast in Hawaii and Alaska, and four are located on the East Coast in North Carolina, New Jersey, Connecticut, and Florida.

Through regional competitive processes, the program sponsors undersea research, which is applicable to NOAA's stewardship and management missions. The program also fosters innovative uses of existing technologies to meet undersea exploration and research challenges. Through ownership or leasing, NURP has provided undersea systems that work from the coast to the deep sea including the Aquarius, the world's only underwater science laboratory; undersea remotely operated vehicles (ROVs) and autonomous undersea vehicles (AUVs); and human occupied submersibles. While using advanced undersea technologies to investigate new research questions and develop information of immediate use to natural resource managers, the program often identifies new habitats, species, and phenomena.

NOAA's Office of Ocean Exploration (OE) was created in 2001 in response to the Report of the President's Panel on Ocean Exploration. The mission of the program is to conduct interdisciplinary ocean exploration expeditions and projects that provide scientific information as well as technical and educational leadership that contributes to NOAA's evolving environmental and economic missions. The program pursues this mission by focusing on four key areas: exploring unknown and poorly known areas of the ocean, ocean mapping, promoting new technology, and education and outreach.

OE has leveraged federal funding, equipment, and expertise to assemble interdisciplinary teams of scientist-explorers in support of more than 100 ocean expeditions and projects to unknown and poorly known areas of the ocean. These ocean expeditions have discovered many new marine ecosystems (including fish and coral habitats); new species of micro and macro-organisms; and chemical and geological processes that impact the oceans such as large quantities of carbon dioxide produced by underwater volcanoes. These expeditions have also mapped thousands of square miles of ocean floor for the first time, where they discovered new landforms, including large submarine volcanoes, seamounts, and extensive areas of deep water coral reef and sponge habitats. These discoveries have expanded our understanding of the oceans and their untapped economic potential from mineral resources to novel compounds for use in pharmaceutical and industrial applications. In addition, the ocean exploration program is a leader in promoting ocean literacy dedicating 10 percent of its budget to education and outreach. These efforts are inspiring whole new generations to explore and work in the oceans which will help ensure the United States remains a global leader in ocean science and technology.

NOAA's ocean exploration program is a national program that provides the opportunity of discovery to our partners in academia, federal and state agencies, and industry. No other federal dedicated source of funding or logistics exists for discovery-based ocean science. The economic and social benefits of discovery are significant and the promise of future discovery is clear; wherever the program has looked, new discoveries and information have been found.

### **The Office of Ocean Exploration and Research**

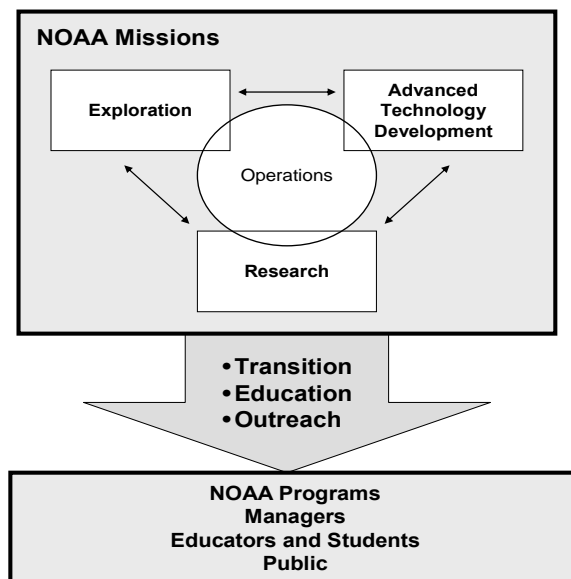
In FY 2006, with the concurrence of the Appropriations Committees, NOAA began to formalize the existing partnerships and synergies between NURP and OE by merging them into a single program. The result is the Office of Ocean Exploration and Research. By creating a single Office of Ocean Exploration and Research, NOAA is capitalizing on the application of both extramural and intramural resources and attention to the challenges of ocean exploration and undersea technology and research. In addition to increased efficiencies, the merger will provide a new focus for NOAA's undersea technology development efforts. Overall, the Office of Ocean Exploration and Research will provide a more robust program of ocean discovery.

The Office of Ocean Exploration and Research will focus on four core activities: exploration, advanced technology development, focused research, and a program of education and outreach.

- **Ocean Exploration** – The central objective of the Office of Ocean Exploration and Research is to generate and expand interdisciplinary scientific investigations into new territories and apply new research capabilities in the process.
- **Develop Advanced Underwater Technology** – This element of the program will challenge technicians and scientists to expand the scope and efficiency of exploration and research through the development, testing, and application of new technologies and through innovative uses of existing technologies.

- **Research** – The Office of Ocean Exploration and Research’s focused research will concentrate on those discoveries deemed to have particular relevance to NOAA missions and exploration activities. It will include research to support technology development, and priority research conducted with unique undersea technologies. Focus areas will include extreme and unique environments, ecosystem frontiers of the continental shelf, new resources from the sea, and ocean dynamics - episodic events to long-term changes.
- **Education and Outreach** – The Office of Ocean Exploration and Research will involve the active and creative engagement of a wide variety of audiences by innovative means, including new telepresence technologies. These activities will be rigorously evaluated for efficacy.

*Conceptual Model for the NOAA’s Office of Ocean Exploration and Research*



The priorities for the Office of Ocean Exploration and Research will be driven primarily by the NOAA strategic goals, particularly the Ecosystem Goal; NOAA’s 5-year research plan and 20-year research vision; and the ocean research priorities identified by the Joint Subcommittee on Ocean Science and Technology in *Charting the Course of Ocean Science*, as well as by additional input from external stakeholders. The program will continue to develop relationships with other federal agencies, academia, non-profit institutions, and private industry to leverage resources and gain perspective on priorities.

Currently, implementation planning for the Office of Ocean Exploration and Research includes redefining centralized and distributed functions, identifying key capabilities, and integrating these capabilities internally and with extramural partners. These plans will be recorded in strategic and business plans for the Office of Ocean Exploration and Research to be completed in October 2007. The existing NURP institutional relationships will evolve towards NOAA’s cooperative institute model with competitive

establishment of revised partnerships. The first cooperative institute will be competed for award in FY 2008, and will address the full range of the Office of Ocean Exploration and Research functions on the U.S. East Coast. A second cooperative institute is planned to be established in FY 2009 to address the new exploration telepresence capabilities, a satellite-based communications technology that allows shore-side scientists, teachers, and students to connect in near real-time with scientists at sea and to view images from the ocean and seafloor using high-speed Internet. As NOAA moves forward with implementing the Office of Ocean Exploration and Research, it will continue to solicit and respond to input from the extramural ocean exploration and undersea research community.

### **NOAA's Views on H.R. 1834**

NOAA supports the intent of H.R. 1834 to establish a coordinated national ocean exploration program, although we recommend changes in this bill to align with the President's FY 2008 Budget Request and to better support ongoing collaborative efforts. This legislation recognizes the importance of science-based ocean exploration, and undersea technology development as a vital national activity and addresses federal efforts to pursue and support it. H.R. 1834 recognizes the critical components of NOAA's current ocean exploration activities, including the development of new undersea technologies, outreach, and education. As part of its responsibilities NOAA supports the authorization of interdisciplinary exploration and targeted research to expand our knowledge of the ocean's living and nonliving resources.

We do recommend that the following changes to the bill be considered to reflect the advantages a combined ocean exploration and undersea research program offers the nation.

As written the bill authorizes two distinct programs in two separate Acts with separate authorization for appropriations. Constructing the bill to have one short title, "National Ocean Exploration and Undersea Research Program Act," and be referenced as one Act with the purpose "to authorize ocean exploration and undersea research within the National Oceanic and Atmospheric Administration" would align the legislation with NOAA's Office of Ocean Exploration and Research. In addition, including a separate Title IV to provide authorization of appropriations for the Act (rather than separate authorizations for Titles I and II) would recognize the benefit of combining resources to address our nation's pressing ocean exploration and undersea research challenges. In such a title, the Administration requests that the authorization levels be consistent with the President's FY 2008 Budget Request, which provides \$27,763,000 for the Office of Ocean Exploration and Research.

NOAA believes its undersea research and technology development enterprise would be strengthened by a competitive process for establishing extramural undersea research centers. To that end, NOAA recommends the Committee refer to the undersea research centers and national technology institute as "competitively-awarded" and not refer to the centers as "regional." In view of the need to compete the undersea centers and national

institute, there is a potential conflict of interest with authorization of a Center of Council Directors and as such NOAA cannot support such authorization. As written the Council of Center Directors would conflict with a federal manager's responsibilities to manage the program. In addition, NOAA routinely consults with its extramural partners and constituents to help us determine appropriate program direction. The proposed changes offered here would align the legislation with the Office of Ocean Exploration and Research's goal of serving the entire nation's undersea research and technology development needs in partnership with the most qualified extramural institutions.

NOAA also requests that particular named equipment, such as those listed in section 205(a)(3), not be enacted into law so that the Office of Ocean Exploration and Research can best maintain the flexibility required to meet rapidly changing technological developments and needs.

In addition to the above recommendations designed to align the legislation with the creation of the Office of Ocean Exploration and Research, NOAA has two additional recommendations. While NOAA agrees with the goal of Section 104, to provide the ocean exploration community with an avenue for advising NOAA, such a statutory requirement would duplicate existing efforts. NOAA currently receives input from ocean exploration stakeholders through its Science Advisory Board's Ocean Exploration Advisory Working Group. Similarly, while NOAA agrees with the goal of Section 105, to promote coordination, such a statutory requirement is unnecessary and would duplicate existing efforts.

NOAA currently coordinates with other federal agencies on ocean exploration activities through several avenues including the National Science and Technology Council's Joint Subcommittee on Ocean Science and Technology (JSOST). The functions of JSOST include identifying national ocean science and technology priorities and facilitating the coordination of interdisciplinary ocean research, ocean technology, and infrastructure development. A recent example of successful coordination through the JSOST is the release of *Charting the Course for Ocean Science in the United States in the Next Decade: An Ocean Research Priorities Plan and Implementation Strategy (Charting the Course for Ocean Science)*. *Charting the Course for Ocean Science* identifies national ocean research priorities for the next ten years to ensure that the management, use, and protection of our ocean ecosystem is based on the strongest available science to promote health and sustainability. Developed with extensive input from the ocean community, this document represents the first national effort to identify research priorities, and has a focus on understanding interactions between society and the ocean. The successful pursuit of these national priorities rests on the active engagement and collaboration with public and private sector partners at local, state, regional, Federal, and international levels. NOAA will continue to work collaboratively with our partners, and therefore we recommend deletion of the statutory requirements in Section 104 and 105.

We appreciate the efforts of this Committee in considering this legislation to promote the importance of ocean exploration and undersea research, and would welcome the opportunity to further discuss the bill with the Committee.

## NOAA and Integrated Ocean and Coastal Mapping

NOAA has a long history of mapping and charting ocean and coastal waters of the U.S. for the production of nautical charts in support of marine navigation. Today, NOAA continues this very important mission and conducts a variety of other mapping and geospatial activities including habitat, resource, exploration and coastal inundation mapping. Other programs and capabilities related to geological characterization, terrestrial mapping to link on-land processes to the response of coastal ecosystems, mapping to characterize and manage non-living marine resources and assess offshore hazard potential are provided by other federal agencies, including the USGS and Minerals Management Service within the Department of the Interior. These partner agencies, through their research and resource management missions, provide access to tools and essential capabilities essential to the development of multi-purpose mapping products supporting NOAA's mission and broad federal policy objectives.

As our mapping requirements and applications have grown we have become increasingly aware of the need to better coordinate mapping efforts to increase efficiency, maximize NOAA resources devoted to mapping, and take full advantage of new technologies such as multibeam sonar and Geographic Information Systems (GIS). NOAA sees great benefit in the concept of "map once, use many times." In fact, we have already begun efforts within NOAA and with other federal agencies to better coordinate mapping efforts. We believe the most effective way to improve advanced ocean and coastal mapping is through the coordination of existing programs and not through the creation of a new program.

H.R. 2400 proposes activities consistent with the *U.S. Ocean Action Plan* and requests an inventory similar to that described below. NOAA agrees that developing a full inventory of federal and federally-funded ocean and coastal mapping programs is an important first step toward better coordination. Such an inventory should include the data and metadata collected, the data management and dissemination practices used, and product development.

The *U.S. Ocean Action Plan* calls for the coordination of federal and federally-supported mapping activities for the U.S. coastal and marine environment and, where appropriate, to engage non-federal entities in their efforts. The *Plan* provides that, through the Committee on Ocean Policy, the JSOST will lead the effort to coordinate federal and federally-supported mapping activities for the U.S. coastal and marine environment. The *Plan* further provides that these activities should include, but are not limited to, the following:

- developing an annual inventory of federal, federally-funded, and non-federal governmental ocean and coastal mapping and charting programs, operations, and prioritized needs;
- assessing and reporting on common and shared needs for development of coordinated programs;



- coordinating and leveraging resources and efforts across the federal sector and with industry, academic, non-governmental organizations, and non-federal government entities;
- setting priorities for standards development and developing strategies for promulgation of standards for data acquisition, data, metadata, tools and products;
- assessing and reporting on research and development needs for more effective development, delivery, and application of geospatial data, tools, products, and services; and
- developing shared and standardized mechanisms for processing, archiving, and distribution of geospatial data, tools, products, and services.

The Director of the NOAA Office of Coast Survey serves as co-chair of the JSOST interagency working group on ocean and coastal mapping. The other co-chairs on the interagency working group are the U.S. Geological Survey (USGS), the Minerals Management Service, and the U.S. Army Corps of Engineers. On September 11-13, 2007, NOAA's Coastal Services Center, in partnership with USGS, will host approximately 30 participants for an interagency working group technical workshop that will recommend a design for the IOCM inventory suggested by the *U.S. Ocean Action Plan* and a process for building it. The IOCM inventory will offer a clearinghouse for data and interpretive information, and a registry of completed and projected mapping activities, which will reduce duplication of efforts and enable cooperative activities.

Major products and recommendations from the technical workshop will be:

- a summary of existing activities and agency concerns related to coastal and ocean mapping;
- technical requirements for the inventory (website, services, metadata standards, connections, and links);
- technical process for building and maintaining the inventory;
- identification of technical experts to support the development of the inventory;
- an implementation strategy outlining tasks, roles and responsibilities, and timeframes; and
- next steps for the inventory project.

### **NOAA Views on H.R. 2400**

In reviewing H.R. 2400, NOAA considered the issues currently affecting the implementation of ocean and coastal mapping integration. NOAA applauds the Committee's recognition of the need to improve coordination of mapping activities of federal agencies and non-federal entities, and appreciates the efforts of the Committee to promote and support the mapping activities and programs of NOAA. We note that the goals expressed in this bill are currently being accomplished under the *U.S. Ocean Action Plan*.

The primary challenges to implementing ocean and coastal mapping integration center around coordinating the application of specific agency capabilities to effectively meet both tactical mission- and/or agency-specific needs while effectively addressing broad needs for integrated programs and products. In order to integrate ocean and coastal

mapping activities, common data standards and specifications need to be applied consistently across the federal government. Procedures and authority for establishment of data standards are currently vested with the Federal Geographic Data Committee (FGDC). The FGDC provides the mechanism to ensure that resulting standards reflect the best technical knowledge and serve the widest array of Federal needs. Under the FGDC, the Marine Boundary Working Group is working to develop a centralized location for marine boundary data, information, and agencies of responsibility in order to eliminate uncertainty regarding the acquisition and use of marine boundary data.

The bill calls for a coordinated and comprehensive federal ocean and coastal mapping plan developed by a new NOAA program and an Interagency Committee on Ocean and Coastal Mapping. As described above NOAA is already working through the interagency governance structure established by Executive Order 13366 and the *U.S. Ocean Action Plan* to develop an IOCM inventory and to better coordinate mapping activities. Specifically, the establishment of an Interagency Committee on Ocean and Coastal Mapping, as outlined in H.R. 2400, would seem to duplicate the responsibilities of the Interagency Working Group on Ocean and Coastal Mapping already established within the JSOST.

The Interagency Working Group on Ocean and Coastal Mapping should be maintained as the focus for federal planning with respect to ocean and coastal mapping. The working group has a prominent position within the Administration's established ocean governance structure with explicit links to both research/technological (through the JSOST) and resource management (through the Subcommittee on Integrated Management of Ocean Resources, or SIMOR) oversight bodies. This ensures that (1) mapping considerations reflect both research and application needs and (2) the working group activities are broadly shared with all appropriate Federal agencies. The collaborative structure of the working group allows for the sharing of information and critical technical expertise related to mapping, across all agencies. Finally, the current working group is co-chaired by multiple federal agencies, ensuring that planning and coordination reflects the distinct and complementary roles of these agencies and others as providers and users of mapping and charting products.

NOAA has recently established a NOAA Integrated Ocean Observing System (IOOS) Program. The IOOS Program serves as the central focal point for the administration of NOAA's IOOS activities and is working to build an initial operating capability for data integration central to the overall development of a U.S. IOOS. In building this initial operating capability for data integration, NOAA will be working with other Federal, regional, and academic partners in setting data standards and developing a framework for the integration of a suite of oceanographic variables. These variables include many of those collected through ocean and coastal mapping efforts. In order to avoid duplication of effort, there would need to be close coordination between IOOS and the ocean and coastal mapping integration initiatives set forth in H.R. 2400.

Additionally, the Administration requests that authorization levels be consistent with the President's FY 2008 Budget Request, which provides funding to a number of Federal

agencies for ocean mapping activities working with the FGDC and the Interagency Working Group Ocean and Coastal Mapping.

We appreciate the efforts of this Committee in considering this legislation to promote the importance of ocean mapping, and would welcome the opportunity to further discuss the bill with the Committee.

### **NOAA's Views on H. Res. 186**

The National Oceanic and Atmospheric Administration would like to thank Representative Pallone and his co-sponsors for their support for National Clean Beaches Week expressed in House Resolution 186. NOAA shares with them the recognition of the value of American beaches and their role in American culture.

### **Conclusion**

NOAA supports elevating the importance of ocean exploration based on sound scientific research and the importance of further integrating ocean and coastal mapping as vital national activities, and endorses the strengthening of federal efforts to pursue and support these activities. H.R. 1834 recognizes the critical components of NOAA's current ocean exploration activities, including the development of new undersea technologies. H.R. 2400 calls for a coordinated and comprehensive federal ocean and coastal mapping program as envisioned by the *U.S. Ocean Action Plan*. These bills require additional work, but we are encouraged that the House of Representatives is considering these important issues. The U.S.'s strength and leadership in the oceans depends on our nation's ability to generate and harness the latest in scientific information and technological developments, and to apply this knowledge and technology to real world applications such as ecosystem-based management of our coastal and marine resources. A national ocean exploration and undersea research program and an integrated mapping effort are vital to sustaining the scientific advancement and innovation needed to maintain our nation's competitive edge in ocean science and technology.