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Good afternoon Chairman Gilchrest, Ranking Member Rahall, and Members of the Fisheries and Oceans Subcommittee of the House Resources Committee. Thank you for the opportunity to discuss implementation of an integrated and sustained ocean observing system, and provide testimony on H.R. 1489, the Coastal Ocean Observation System Integration and Implementation Act of 2005. I am Dick West, President of the Consortium for Oceanographic Research and Education (CORE). I am appearing today on behalf of CORE's 82 member institutions, who work together to develop and promote a common vision and goals for the ocean sciences community.

With the release of the report of the U.S. Commission on Ocean Policy (Commission) and the Administration's response in the U.S. Ocean Action Plan, this is an extraordinary time for the entire ocean sciences community. On one hand, we have the first comprehensive report on national ocean policy in more than 35 years – one that identifies both serious problems and exciting new opportunities. On the other hand, this compelling document has been released at a time when our nation faces many competing challenges and we are forced to make difficult fiscal decisions in order to meet tight budget constraints. In response to the Commission, CORE's members have adopted two strategies. The first is to make sure that Americans understand the critical role of the oceans in our environmental, economic and national security. The second is to support the strengthening of ocean policies and resource investments to a degree commensurate with the importance of the oceans in our lives. Support for integrated and sustained ocean and coastal observing is a cornerstone of both these strategies.

I would like to thank the members and staff of the Fisheries and Oceans Subcommittee, and the full Resources Committee, for their long-term leadership and continued attention to ocean science issues. In particular, we appreciate Congressman Gilchrest's willingness to sponsor coastal observing legislation and move forward quickly to start acting on the Commission's findings. This is a very timely and important hearing given the nature and scope of the proposals being discussed in both the House and Senate.

#### CORE and Ocean Observing Issues

CORE is a Washington DC-based non-profit association representing the nation's leading oceanographic research institutions, universities, laboratories, aquaria and industry partners. CORE was established a decade ago to promote and advance ocean science research and education. As an organization, CORE fosters membership of U.S. institutions actively involved in ocean research and education; seeks support for the development of partnerships; builds critical links among government agencies, academia and marine industries; and actively works with policy and decision makers on ocean research and education issues. CORE has a long-standing interest in ocean observing issues and I am pleased to have the opportunity to discuss the proposed legislation.

Support for an integrated ocean observing system and enactment of ocean observing legislation have been priorities for CORE since it was established in 1994. In 1997, CORE was awarded the contract to serve as the program office for the National Oceanographic Partnership Program (NOPP). NOPP is a multi-agency program enacted by Congress to facilitate partnerships among industry, academia and government. Under the guidance of the National Ocean Research Leadership Council (NORLC), NOPP has supported forty-eight cutting-edge research and education projects and assisted in planning for development of a sustained, integrated ocean observing system. As part of this effort, the NOPP office has supported production of several reports on development of a national ocean observing system. For example, NOPP's Ocean Research Advisory Panel convened a working group of experts, chaired by Dr. Robert Frosch, to produce the 1999 report "An Integrated Ocean Observing System: A Strategy for Implementing the First Steps of a U.S. Plan".

CORE and its member institutions have frequently communicated to Congress and the Administration on the value and importance of ocean observing to our nation's economic future, national security and quality of life. CORE sent a 1999 community letter to the Congress and Administration on enhanced ocean observation, with 1,832 signatories. This was followed by a letter to the President in 2001 from the CORE membership urging implementation of the system. CORE's member institutions are partners in nearly all the developing regional associations and associated regional observing systems, and both the Alaska Ocean Observing System (AOOS) and Gulf of Maine Ocean Observing System (GoMOOS) are associate members of CORE.

## Need for Integrated Coastal and Ocean Observing

The oceans play a critical role in regulating climate and weather, stimulating our economy, buttressing national security and providing choice locations for work and play. Annually over \$700 billion in goods move through our ports; \$28 billion is netted by the commercial fishing industry; \$20 billion by marine anglers; and another \$30 billion by recreational boaters. While we extract substantial value from the oceans, our knowledge of how this economically important and life-giving system works is limited. In addition, human-caused environmental change adds another layer of complexity and unpredictability. What is needed is a system that can measure the oceans' vital signs, an Integrated Ocean Observing System (IOOS). Science and technology have made such a system possible; now national and global environmental, economic and national security issues make it imperative. IOOS will provide measurable benefits to: (1) monitor coastal pollution; (2) understand connections between oceans and human health; (3) support homeland defense and protect against terrorist attacks; (4) measure and explain both human-caused and natural environmental change, including climate change; (5) warn and protect against marine hazards; (6) provide better information to support sustainable resource management; and (7) improve understanding of ecosystem-level interactions and changes.

Diverse sectors of the U.S. economy use ocean information and will tangibly benefit from more integrated, timely and sustained observations and forecasts:

- Fishermen, the oil industry, shippers and other mariners use real-time information to ensure the safety and efficiency of their operations;
- Emergency responders use real-time information to respond to and plan for natural and man-made catastrophic events, such as hurricanes, tsunamis, floods, landslides, oil spills and harmful algal blooms;
- Search and rescue personnel use real-time information about ocean currents and improved predictions of water movement to track and assist distressed vessels and mariners;
- Coastal and resource managers use information to balance multiple coastal needs for economic development, public health safeguards, resource conservation, pollution prevention and control, and recreation;
- Military sailors, soldiers and aviators use information to improve battlefield awareness, threat detection, and safe and efficient operation of ships and aircraft in the marine environment; and
- Researchers and educators use observations to improve our understanding of our oceans and coasts, better predict environmental changes, and to improve public ocean literacy.

Today, we stand at a confluence of events that highlight the need for and should promote acceleration of integration in ocean and coastal observing. Evolving technologies in computers, information management systems, communications, sensors, and platforms – combined with recognition of interrelationships among the oceans' physical, biological and chemical systems and topped off by mounting evidence that human activities could have significant and unpredictable impacts on the global environment – are creating both the opportunity and demand for an IOOS. Moreover, advances in ocean modeling now have us on the threshold of making timely and accurate predictions of ocean processes. Coupling such models with IOOS is essential. The tragic losses of life and property associated with the recent Indian Ocean tsunami and last fall's multiple hurricane landfalls in the southeastern U.S. also reflect the urgency of the need for better ocean observations and predictions.

## Vision for an Integrated Observing System for Our Coasts and Oceans

The ocean science community strongly supports the creation of an integrated ocean and coastal observing system that extends across watersheds to the coasts, reaches to the outer edge of our exclusive economic zone, and provides critical global coverage. IOOS will be the U.S. contribution to the international ocean observing system and the ocean portion of the Global Earth Observation System of Systems (GEOSS). A fully implemented IOOS would ultimately provide for interconnected, operational global and coastal components. The global component would focus on the physical observations associated with climate and weather prediction, including tsunami detection. The coastal component would address the complex physical and ecological observations needed to assess and manage coastal regions. The coastal system will consist of a federal "national backbone" of observations and data management, integrated with information from regional coastal observing systems, as well as with ocean prediction systems.

In addition to the operational components, IOOS will require sustained national commitments to support training and education, research, pilot projects and related infrastructure. The full potential of an IOOS investment will not be realized without a complementary effort to build a fully trained and well-educated workforce to implement and maintain the system. Research and pilot programs will be essential to develop system enhancements and incorporate new technologies. As an example of the required infrastructure, the Ocean Observatories Initiative currently being planned by the National Science Foundation will provide crucial oceanographic research capabilities.

While NOAA is responsible for the majority of the nation's ocean observing effort, significant investments and observations

are made by other federal agencies, most notably the U.S. Geological Survey (USGS), the National Aeronautics and Space Administration (NASA), the Navy, National Science Foundation (NSF) and the Environmental Protection Agency (EPA). In addition, there are substantial coastal ocean observing efforts by state and local agencies which would also be integrated into the national system. Many elements of a national system are already in place, but most now operate independently, the information they provide is not effectively integrated, and additional investments are required to address region-specific needs.

One critical subset of the ocean observing system that already exists is the evolving network of coastal observing systems. Many of the existing and planned regionally-based coastal ocean observing systems are the result of the planning and work of consortia of academic institutions, federal and state agencies, non-governmental institutions and private industry. These regional associations are in different stages of development, but some already design and operate regional coastal observing systems. A necessary next step is to establish an information management mechanism that connects all regional associations to a common national backbone in a way that makes all data readily accessible to and usable by all intended users. The task of ensuring interoperability and accessibility must be planned, coordinated and carried out at the federal level.

While many of the functions of IOOS will ultimately serve operational purposes, the path to that goal will involve significant investments in research and development. It is important to note the importance of fully integrating research and development, operational systems, and information and prediction systems from design through operation and evaluation. Scientists must be involved throughout the process, not just in the initial gathering of requirements. The member institutions of CORE are the source for much of the research expertise and capabilities that will be required for development of a fully operational system and have endorsed merit-based competition for allocation of available funds.

Finally, if our goal is to establish a “national weather service” for the oceans, we must recognize the federal role in integrating and maintaining an operational observing system. Without a definite plan to ensure that we maintain the “I” in IOOS, we run the risk of ending up with a regionally effective, but nationally dysfunctional patchwork of systems that will not meet our national needs. While NOAA is responsible for most ocean observing efforts, other agencies will have critical IOOS responsibilities and all must be engaged in order to successfully integrate national ocean observing efforts.

#### H.R. 1489, The Coastal Ocean Observation System Integration and Implementation Act

CORE supports H.R. 1489, the Coastal Ocean Observation System Integration and Implementation Act of 2005, as an important step towards creating a national ocean observing system. We thank you, Chairman Gilchrest, for your leadership on the issue. We also appreciate the House Oceans Caucus efforts to move forward legislatively. The CORE membership would like to work with you to address three concerns with H.R. 1489 as it was introduced.

1. Structure of the system. While the coastal ocean observing system is an essential component of IOOS, it must be defined within the context of the broader GEOSS. The integrated ocean observing system will also include elements of the existing and proposed global system, including the tsunami warning system that is currently the subject of separate legislative action. It will be necessary to coordinate these elements to develop a coherent and effective operating system. In addition, while CORE supports designation of NOAA as the executive agent for ocean observing system integration, other agencies have significant ocean observing assets that are not and should not be managed by NOAA. In order to pull together the existing systems, effective interagency mechanisms are required at both a high-level – particularly for coordinated agency budget decisions – and at a working level to do the “nuts and bolts” integration work. CORE urges that the mechanisms for interagency coordination be clarified consistent with the recommendations of the Commission report and the Administration’s Ocean Action Plan.

CORE also recommends that you consider clarification of the term “unit of the System” so that the language reflects the structure of the emerging regional associations. Specifically referencing the regional associations in the bill and including clear guidance for their roles and activities would facilitate their ability to coordinate with and obtain support from federal agencies. With respect to regional associations, CORE supports the provisions that would extend to them federal protection for civil liabilities. Such language could focus on liabilities associated with provision of inaccurate data as a way to limit risk for both the system operators and the government.

2. Research and pilot programs. CORE endorses the bill’s effort to address the need for a process to transition from research to operations and strongly supports explicit provisions for funding both research and pilot projects on new technologies. However, research needs for ocean observing extend beyond new technology, and include such essential activities as developing new products that synthesize and provide decision support tools from observing system data. CORE recommends a broader authorization of research activities that encompasses all aspects of the IOOS, with NOAA research and development efforts complementing those of other agencies such as NSF’s Ocean Observatories initiative. A competitive, extramural, ocean observing research program is crucial to continuously improve and optimize the benefits

derived from the observing system. Similarly, the pilot programs called for in the bill should provide a valuable mechanism for developing and integrating new scientific knowledge and technologies into operational systems. Such projects currently are run effectively under NOPP, and CORE recommends its continued use for this purpose. In addition, NOAA should be authorized to support education and training programs needed to ensure the availability of a well-trained workforce. Finally, CORE requests clarifying language allowing contracts, grants and cooperative agreements, particularly with respect to research-related activities, to be entered into by academic, government and private industry institutions, without the need for those institutions to have formal designation.

3. Funding investments. The authorized appropriations levels in H.R. 1489 are low with respect both to current spending and to future funding needs for development of the coastal ocean observing system. In addition, sustained funding for research and pilot programs will be essential to the success of the system. In fiscal year (FY) 2005, Congress provided approximately \$30 million above the Administration budget request for NOAA to support regional ocean observing activities, with more funding through the Department of the Navy. In addition, \$24.5 million was provided to NOAA to implement coastal and global IOOS components. The Commission recommended that \$138 million be provided in FY 2006 as IOOS start-up costs, suggesting \$18 million for data systems, \$50 million for development of regional observing systems, and \$40 million to enhance existing federal activities. CORE requests that the authorized funding levels build on FY 2005 support for integrated coastal observing activities, with \$75 million to continue development of and research in regional observing systems and to accelerate the integration of national and regional ocean observing networks. We also note that the inclusion of the global components of IOOS in the legislation would require higher authorized funding levels.

## Conclusion

Providing the legislative mandates and resources to develop an integrated coastal and ocean observing system – greater than the sum of its parts – will leverage existing public, academic and industry capabilities to provide significant short- and long-term benefits to the nation. An integrated system will allow more efficient, “one-stop” access to ocean information, reduce data gaps and redundancies, link research and operations, and facilitate education and outreach. Developing and sustaining an integrated ocean observing system will ultimately ensure that the American public receives the greatest return for its investment in the form of useful information, reliable forecasts, and timely warnings. CORE and its member institutions are prepared to work in partnership with the Congress and the Administration to maintain and enhance support for the scientific programs and infrastructure needed to improve our ocean observing capabilities and to continue addressing the critical issues facing this nation. The following list summarizes our recommendations for any legislative action on coastal and ocean observing:

- Authorize and appropriate sufficient funds to implement and sustain an integrated ocean and coastal observing system consistent with recommendations of the U.S. Commission on Ocean Policy;
- Create an integrated observing system that serves U.S. global interests and the entire U.S. coastline, including the Great Lakes, consisting of a federal backbone of observations and data management and regional coastal observing systems run by regional associations;
- Designate NOAA as the executive agent for system integration, with clear mandates and mechanisms for interagency, academic and private sector partnerships;
- Give oversight responsibility to the interagency National Ocean Research Leadership Council, or its successor; and
- Establish research and development and education programs coordinated through the National Oceanographic Partnership Program.

The U.S. Commission on Ocean Policy strongly advocates immediate steps to implement an integrated ocean and coastal observing system and CORE fully agrees with these recommendations. While the U.S. Ocean Action plan supports the Commission’s recommendations on ocean observing in principle, the Administration has not yet put forward the budget requests necessary to start moving forward. Congressional action to authorize the system is needed to provide the national framework, authority and impetus to move the ocean observing system from vision to reality.

Mr. Chairman and Members of the Subcommittee, on behalf of all the CORE member institutions, I thank you for the opportunity to come before this Committee to present our views. I would be pleased to answer any questions that you or other Members may have.