

Testimony for the Record
Dr. Nancy Rabalais
President, National Association of Marine Laboratories
Before the
Subcommittee on Commerce, Justice, and Science, and Related Agencies
Committee on Appropriations
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The National Association of Marine Laboratories (NAML) is pleased to submit testimony to the Subcommittee with a series of recommendations that we believe would strengthen the Nation's research and education enterprise. NAML is a nonprofit organization representing the ocean, coastal and Great Lakes interests of member laboratories that employ thousands of scientists, engineers and professionals nationwide. NAML labs conduct high quality research and education in the natural and social sciences and translate that science to improve decision-making on important issues facing our country. NAML requests the subcommittee to:

- Provide strong support for competitive, merit-based ocean, coastal, and Great Lakes research, infrastructure and education programs at the National Oceanic and Atmospheric Administration (NOAA), the National Science Foundation (NSF), and the National Aeronautics and Space Administration (NASA). This issue is discussed in detail on page 3 of this statement;
- Support the research infrastructure of marine laboratories that will lead to better integration of environmental data networks into federal information and observing system networks and in so doing achieve cost effective science-based decision making regarding the management of marine, coastal and Great Lakes ecosystems and related resources;
- Increase the co-location of federal scientists and federal research infrastructure initiatives at NAML laboratories as well as increased coordination and cooperation between NOAA's ocean, coastal and Great Lakes research and education programs.
- Advance a diverse, distributed ocean science education agenda through strong support for ongoing programs within NSF, NOAA, and NASA. NAML is concerned that the Administration's STEM education consolidation plan will terminate K-12 STEM education and fellowship activities within the Sea Grant program as well as terminate important ocean literacy activities in the Office of Education at NOAA. NAML urges the committee to reinstate these activities within NOAA.

The Role of Marine Laboratories in the Nation's Research and Education Enterprise

Ocean, coastal and Great Lakes marine laboratories are vital, cost-effective, place-based "windows on the sea." They connect communities with cutting edge marine, coastal and social sciences, while also providing students and citizens with meaningful learning experiences. The members of the National Association of Marine Laboratories (NAML) work together to improve the quality and relevance of ocean, coastal and Great Lakes research, education and outreach. In particular, NAML laboratories compete for support for the:

- Conduct of basic and applied research of the highest quality making use of the unique capabilities of coastal laboratories;
- Revitalization of research infrastructure through increased cost-effective networking of capabilities;
- Unique role that coastal laboratories play in conducting education, outreach and public service;
- Encouragement of wise use and conservation of marine and coastal habitats and resources using ecosystem-based management approaches;
- Coastal and other observing systems that collect front line data needed to improve predictions of natural and human-caused disasters, the management of marine resources, research, and education; and increased public ocean and Great Lakes literacy to promote greater environmental stewardship.

Oceans, Coasts and Great Lakes - Vital for Economic Growth and Enhanced Coastal Resiliency

The ocean, coasts, coastal watersheds, and the Great Lakes play a central role in the well being of the Nation. Over 8.5 million people reside in the 100-year coastal flood hazard area. More than half of the United States population lives in 673 coastal watershed counties, and these counties generate 58% (\$8.3 trillion) of the Nation's gross domestic product (GDP)—even though they comprise only 25% of the Nation's land area. Every day, the marine environment supplies a multitude of products and services that enhance and support the lives and livelihoods of citizens. In 2011, Americans, on average, ate 15 pounds of fish and shellfish per person – 4.7 billion pounds all together – making the U.S. second in the world in total seafood consumption. Offshore oil production in Federal waters accounts for 24% of total U.S. crude oil production. If American coastal watershed counties were considered an individual country, that country would have a GDP higher than that of China. The United States has jurisdiction over 3.4 million square miles of oceans – an expanse greater than the land area of all 50 states combined. This vast marine area offers many environmental resources and economic opportunities, but also presents threats such as damaging tsunamis and hurricanes, industrial accidents and outbreaks of water borne pathogens. The 2010 Gulf of Mexico *Deepwater Horizon* oil spill, the 2011 Japanese earthquake and tsunami, and the 2012 Superstorm Sandy are vivid reminders that our understanding of our oceans and coastal areas is far from complete. Developing sufficient capabilities to sustain ocean-based economies and protect our coasts and coastal communities from natural and man-made hazards will require a sustained investment in research, infrastructure and education and training. NOAA's budget request contains several programs designed to reduce coastal and community vulnerability to future storms, inundation and sea level rise. NAML encourages the Committee to support these resilience programs

NAML Priority -- Investing in Research

NAML believes America is driven by innovation — advances in ideas, products and processes that create new industries and jobs, contribute to our nation's health and security, and support a high standard of living. In the past half-century, educated people and the knowledge they produce have increasingly driven innovation. It is essential that the nation reaffirms and revitalizes the unique partnership that has existed between the Federal Government, the states and business and industry with the nation's research and education enterprise. In doing so, we

encourage the innovation that leads to high-quality jobs, increased incomes, security, health, and prosperity for the nation. Investing in the nation's research enterprise should be seen as a high priority that has contributed significantly to our long-term prosperity and technological preeminence through interdisciplinary research spanning a landscape of disciplines, from physics to geology, chemistry to biology, engineering to social sciences and modeling to observation. NAML believes that research and education programs at the major federal science agencies with ocean and coastal responsibilities should be viewed as priority investments in the future health and well being of the Nation.

Programs that support the extramural community via competitive, merit-based research provide highly cost-effective returns on investment, leverage additional resources to meet science and management priorities, and distribute economic and societal benefits over a broad array of communities. While NOAA has acknowledged his assertion on many occasions, its support for its extramural partners has continued to decline. From background information developed for the NOAA Science Advisory Board's R&D Portfolio Review Task Force support by the Office of Oceanic and Atmospheric Research (OAR) for extramural R&D has declined by \$60M since 2005 – from \$171.6M to \$107.1M while the percentage of OAR's research activities to support extramural programs has dropped from just over 50% down to 34% of the total. In the National Ocean Service (NOS), support for extramural R&D has declined from a level of \$21.6M in 2005 to \$13.7M in 2011 while intramural support has grown from a level of \$53M in 2005 to a level of \$58M in 2011. Moreover NOAA has repeatedly proposed the termination of numerous extramural programs – such as the John H. Prescott Marine Mammal Grants program – and the consolidation of research programs – such as Ocean Exploration and Research -- which has led to the dramatic reduction in extramural research and education support.

Beyond cutting back on its extramural support, NOAA now seeks permission to “receive and expend funds made available by, any...private organization, or individual (proposed Section 108 of the General Provisions in the NOAA Section of the *Appendix to the FY 2015 Budget*).” This would enable NOAA to compete against non-federal and private entities for private sector support. Thus not only is NOAA cutting back its own support, it intends to further exacerbate the situation by competing against its partners for the limited available non-federal resources needed to fill the gaps created by NOAA's decision to scale back its extramural support.

NAML urges the Committee to restore to the maximum extent possible NOAA support for its extramural research, education, and other related programs while also limiting NOAA's ability to compete with the private sector for non-federal resources needed for research, education, and conservation programs.

Much attention has been justifiably focused on the need for our Nation to continue its support of premier basic research programs. It is also important to maintain strong support for mission-oriented ocean, coastal and Great Lakes research, observing and monitoring programs. Further, NAML believes that developing exchange programs between federal agencies and marine laboratories – such as co-location of federal scientists and federal research infrastructure initiatives at NAML laboratories -- will further strengthen the capacity of both sectors while also reducing costs by eliminating duplicative activities.

NAML Priority -- Investing in Research Infrastructure

NAML believes that a comprehensive range of ocean and coastal research infrastructure will be needed to meet growing demands for scientific information and to enable the safe, efficient, and environmentally sustainable use of the ocean. Institutional barriers have inhibited collaborative efforts to plan for the deployment, operation and maintenance of high-cost critical infrastructure assets such as ships, satellites, observing systems and cyber-infrastructure for data sharing, networking and collaborative use of available facilities. Marine laboratories often play a critical role in supporting studies that extend across decades. Marine laboratories can provide the infrastructure to collect data throughout a lifetime, and even maintain important data streams that extend well beyond any single researcher. Marine laboratories are often a hotbed of sensor development and testing. With technology changing rapidly, marine laboratories provide the expertise to maintain a level of standardization that ensures such data can be interpreted accurately even as protocols change in response to improving technology. Marine laboratories are playing an increasing important role in supporting networks that extend beyond any single lab. Because environmental processes occur on a wide range of spatial and temporal scales, data streams are standardized and networked to varying degrees to facilitate cross-site and long-term analyses. Finally, given the complexity and interconnected nature of many environmental processes, marine laboratories provide important opportunities to weave together the work of many researchers across diverse disciplines to detect patterns and understand processes that would not be apparent from any single study or data stream.

NAML Priority – Science, Technology, Engineering and Mathematics (STEM) Education

NAML's education mission is two-fold: to enhance ocean STEM education to ensure that all citizens recognize the role of the oceans, coasts and Great Lakes in their own lives and the impacts they themselves have on these environments; and to provide formal research and training opportunities at K-12, college, and post-graduate levels to ensure a technically-qualified, and ethnically diverse workforce capable of solving problems and answering questions related to the protection, restoration and management of coastal and ocean resources, climate variability and society's needs. An informed and engaged public is essential to understand complex ocean- and coastal-related issues, balance the use and conservation of marine resources, and maximize future benefits from the ocean. The public should be armed not only with the knowledge and skills needed to make informed choices, but also with a sense of excitement about the marine environment. Public understanding of human impacts on the marine environment should be balanced with recognition of the benefits to be derived from well-managed ocean resources. Inland communities need to be just as involved as seaside communities, because of the connection among the ocean, the atmosphere and the land. Ocean-related education also has the potential to help stem the tide of science illiteracy threatening to undermine the nation's health, safety and security. The scientific literacy of U.S. high school graduates is well below the international average. This progressive loss of literacy weakens the nation's ability to maintain its traditionally strong foundation in science and mathematics. NAML laboratories seek to expand the engagement of individuals from groups that have been historically under-represented in ocean research, education and outreach. This is particularly important in fulfilling the goal of achieving a diversified STEM pipeline to meet future science and ocean workforce needs.

NAML remains concerned with certain elements of the Administration's STEM Education Consolidation proposal for FY15. A total of 31 STEM education programs at nine key R&D mission agencies (including NOAA, NSF, and NASA) will be impacted by this proposal. It is important for mission agencies to help support the next generation of scientific and technical talent – much of which will be needed by these agencies in future years. We urge the Subcommittee to reject these particular consolidation proposals and support the continuation of these programs within their current agencies.

NAML appreciates the opportunity to present these views to the Subcommittee as it begins work on the development of the FY 2015 appropriations bill.

Thank you.