FY 2012 PUBLIC POLICY AGENDA

The **National Association of Marine Laboratories (NAML)** *is a nonprofit organization representing the ocean, coastal and Great Lakes interests of about 120 member laboratories that employ more than 10,000 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.*

Recommendations for a Robust Ocean Research & Education Enterprise

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

Marine and Coastal laboratories are vital, cost-effective, community based "windows on the sea". They connect communities with cutting edge marine, coastal and social sciences, providing many thousands of students and citizens nationwide with meaningful, science-based learning experiences

The member institutions of the National Association of Marine Labs (NAML) work together to improve the quality, effectiveness and relevance of ocean, coastal and Great Lakes research, education and outreach. NAML labs provide reliable and relevant information to support wise local coastal management and the understanding and protection of natural resources. In particular, NAML seeks to:

- Promote and support basic and applied research of the highest quality from the unique perspective of coastal laboratories.
- Encourage wise utilization and conservation of marine and coastal habitats and resources using ecosystem-based management approaches.
- Recognize, encourage and support the unique role that coastal laboratories play in conducting education, outreach, and public service.
- Promote the efficient exchange of information, constructive cooperation, and productive coordination among NAML member institutions and across regional associations.
- Facilitate and coordinate the exchange of information and utilization of expertise between NAML member institutions and government agencies.

Oceans, Coasts, and Great Lakes Are Important for the Nation

Ocean-related activities contribute more than $117 billion to American prosperity and support well over two million jobs. Activities in coastal watershed counties extend this value dramatically to more than $4.5 trillion, or one-half of the Nation's GDP, accounting for 60 million jobs. Every year hundreds of millions of people visit America's coasts, spending billions of dollars and directly supporting millions of jobs, making coastal tourism one of the Nation's fastest-growing business sectors.

Meeting the Nation's stewardship responsibilities for the oceans, coasts, and the Great Lakes requires a robust ocean science and education enterprise. Increasingly, our coastal areas are facing challenges that threaten our fisheries resources, impact recreational and commercial values and change fundamental ecosystems. The Deepwater Horizon-British Petroleum oil spill in the Gulf of Mexico and its continuing impact on the natural resources of the region emphasizes the Nation's need for a robust ocean and coastal sciences enterprise. NAML believes that maintaining our nation's scientific leadership will be essential if we are to re-energize the economy and get Americans back to work. It is vitally important that we reinvest in the national research enterprise that has been responsible for our long-term prosperity and technological preeminence. Because they are so strongly inter-disciplinary, the marine sciences have often led the way in innovation. The ocean sciences span a landscape of disciplines, from physics to geology, chemistry to biology, engineering to social sciences, and modeling to observation.

The National Ocean Policy for the Stewardship of the Ocean, Coasts, and Great Lakes was established on July 19, 2010 by executive order. It calls for the best available science and knowledge to inform decisions affecting the ocean, our coasts, and the Great Lakes and foster the public understanding of the value of these resources. Marine Laboratories can contribute to this effort because they stand at intersection of scientific endeavors and public outreach. The NAML public policy agenda seeks to enhance the efforts of Marine Laboratories to conduct science and foster wise stewardship of these oceanic, coastal, and Great Lakes resources.

NAML's Public Policy Priorities

OCEAN, COASTAL AND GREAT LAKES RESEARCH

Federally-funded, peer-reviewed extramural research support ensures that the federal science enterprise benefits greatly from its extramural partnerships with the vast and diverse talents of the academic research community. The America COMPETES Act (Public Law 110-069) was enacted in 2007 to stimulate U.S. innovation and competitiveness through investments in the science, technology, engineering and mathematics (the "STEM disciplines"). As the Nation seeks to boost its economy, NAML strongly supports the reauthorization of this important legislation coupled with the appropriations essential for a sustained interagency investment in our nation's marine research and education enterprise.

In a time of change, it is critically important that the research budgets at the major federal science agencies — namely the National Science Foundation, the National Oceanic and Atmospheric Administration (NOAA), the National Aeronautics and Space Administration(NASA), the Department of Energy (DOE), the Environmental Protection Agency (EPA), the NIH's National Institute for Environmental Health Sciences (NIEHS), and the Department of Interior (DOI) — be strengthened to the maximum extent possible. Programs that enhance agency internal research capabilities and engage the extramural community in competitive, merit-based research provide highly cost-effective returns on investment and distribute economic and societal benefits over a broader array of communities.

National Science Foundation -- NSF funds vital basic research that enhances the public understanding of the Nation's oceans, coasts , and Great Lakes. Over 90 percent of NSF's budget directly supports research at universities and laboratories in all 50 states. A robust NSF fuels the economy, boosts competitiveness, supports a scientific and technologically literate workforce and provides new knowledge -- all of which are essential for national security and economic competitiveness. NAML supports proposals to double the NSF budget in the context of the America COMPETES Act. Marine labs believe that science and engineering research, education, and related infrastructure support provided by NSF should be viewed as a wise and priority investment for the long term health of the Nation.

National Oceanic and Atmospheric Administration -- NOAA is a critical leader in ocean, coastal and Great Lakes research and many NAML labs are co-located with, or linked to, NOAA laboratories. NOAA's extramural support for research at marine labs and universities greatly expands its access to world-class expertise and unique facilities, complementing and expanding the work carried out within NOAA labs. NOAA's extramural partnerships contribute invaluable information to our coastal resource managers. NOAA's internal and partnership education activities are also of vital importance to the communities that NAML serves.

NAML strongly recommends that the Administration and Congress maintain and, if possible expand NOAA support. In particular, NOAA's competitive, peer-reviewed programs including: the National Sea Grant College Program; the Ocean Exploration and National Undersea Research programs; the National Estuarine Research Reserve System; the Competitive Research Program within NOAA's Climate Program Office; and the more directed cooperative institute programs, are highly cost effective partners that greatly expand NOAA's capabilities. A robust NOAA budget, as recommended by the Friends of NOAA Coalition, coupled with solid support for extramural partnerships will greatly strengthen NOAA's ability to serve pressing national needs.

National Aeronautics and Space Administration - A balanced investment in NASA that will maintain a strong and vibrant earth and space science enterprise is critical, especially as priorities shift and research foci adapt to emerging issues like climate mitigation and adaptation. NASA's support for earth observations and research is vital in helping us better understand our planet and its processes.

Department of Energy -- DOE, through its Energy Efficiency and Renewable Energy division, has initiated significant efforts to understand and develop sources of renewable marine energy from tidal, wave, and current sources. Environmental effects and conflicts with existing ocean uses must be evaluated as these energy sources develop in U. S. coastal areas. The Nation's marine laboratories are uniquely distributed and serve as ideal locations for much of the research needed to rationally develop this energy source and opportunities to partner with the Department in these areas should be strongly encouraged.

Environmental Protection Agency -- EPA is an important source of support for marine laboratories and EPA's own labs are a critical part of the marine science community. EPA's Office of Research and Development and Office of Water provide essential resources to marine labs nationwide, funding research grants in various environmental science and engineering disciplines and engaging the Nation's best scientists and engineers in targeted research complementary to EPA and other federal research activities.

Unfortunately, support for research has declined dramatically over the past several years, and the EPA's Science Advisory Board has called for renewed investments. Given the emerging importance of issues related to global climate change, enhanced support for research programs at EPA will be essential in helping us to mitigate and adapt to environmental change.

National Institute for Environmental Health Sciences -- NIEHS, within the National Institutes of Health, supports important research via the Oceans and Human Health (OHH) program, a joint initiative with NSF. Ocean-related human illnesses are primarily caused by consumption of contaminated seafood, and additionally caused by inhalation of aerosolized toxins as a consequence of harmful algal bloom (HAB) outbreaks. Adverse health outcomes range from acute neurotoxic disorders to more chronic diseases such as liver disease caused by shellfish poisoning. Presently it is not known what is responsible for or triggers outbreaks of HABs. Methodologies for early detection or remote sensing of outbreaks would provide a major mechanism for reducing and preventing exposures to marine toxins released by HABs. Additionally, worldwide, human activities associated with point and non-point sources of pollution result in the discharge of billions of gallons of wastewater into oceans and coastal waterways. OHH and other NIEHS activities, such as the recently initiated study to assess the health effects of the Deepwater Horizon-British Petroleum oil spill in the Gulf of Mexico are of critical importance to the Nation and should be strongly supported.

Department of Interior -- DOI is an important federal player with respect to the ocean and coastal community. Through the research supported and conducted by the U.S. Geological Survey (USGS) via the Coastal and Marine Geology program or the support provided by the Bureau of Ocean Energy Management, Regulation and Enforcement (BOEMRE) through the Coastal Impact Assistance Program, USGS and BOEMRE need sound marine science to inform the management of ocean and coastal resources.

EDUCATION, DIVERSITY AND AN OCEAN LITERATE AMERICA

American students are in danger of being eclipsed by their peers in other industrialized countries. The U.S. has taken notice and ocean literacy and workforce diversity have become a focus of discussion at the federal level and throughout the environmental community thanks to a number of watershed events over the last several years. This includes the 2004 U. S. Commission on Ocean Policy report, which made recommendations about the importance of education and public awareness (literacy), the 2007 National Academy of Sciences report, *Rising Above the Gathering Storm,* and the 2010 update, *Rising Above the Gathering Storm, Revisited: Rapidly Approaching Category 5,* which fueled the development of the America COMPETES Act. This legislation places a high priority on formal and informal education in science across the government, including a mandate for NOAA's and NASA's education programs. In September 2010, the President's Council of Advisors on Science and Technology (PCAST) released an important new report, *Prepare and Inspire: K-12 Education in Science, Technology, Engineering, and Math (STEM) for America's Future*, which makes specific recommendations to better prepare America's K-12 students in STEM subjects.

Engaging the demographically large sector of individuals from groups that have been historically underrepresented in ocean science research education and outreach (e.g., African Americans, Hispanic Americans, Pacific Islanders, and Native Americans) from a wider variety of colleges and universities in programs at marine laboratories and oceanographic institutions will be particularly important in filling the STEM pipeline for future ocean workforce needs.

Marine laboratories play an important role in formal education and workforce development by providing students with a place to learn, using a hands-on approach. Marine labs serve as primary training grounds for experiential ocean education and are committed to enhancing diversity within the field of ocean, coastal and Great Lakes research and education. By fostering relationships with community colleges and minority-serving institutions (MSIs), marine labs provide distinctive learning opportunities for underrepresented groups, allowing students to achieve a greater understanding of oceans and coastal ecosystems and providing them with a sense of stewardship for these important environments.

NAML and its member laboratories continue to strongly support partnerships with the Federal Government to address the ocean education needs of the Nation. Examples include the Centers for Ocean Science Education Excellence (COSEE), the Louis Stokes Alliance for Minority Participation, and the Research Experiences for Undergraduates programs at NSF, the Expanding Partnerships Program (EPP) in the NOAA Education Office, the Ocean Exploration and National Undersea Research programs, and National Sea Grant College Program within NOAA, and the Science to Achieve Results (STAR) Fellowship program at

EPA. Environmental literacy ensures that the American public is equipped with a fundamental understanding of natural systems and an appreciation for the relationship between human activities and the environment.

Investment is needed today in coastal, ocean, and Great Lakes education programs that support learning—both formal and informal—at all age levels, by all disciplines, and for all Americans.

SUSTAINABLE OCEAN INFRASTRUCTURE

Support for infrastructure and instrumentation – including long term planning for the next generation of research infrastructure – is essential to the operation of marine labs and to the advancement of the research and education enterprise. NSF in particular provides essential support for basic laboratory facilities, instrumentation, support systems, computing and related cyber-infrastructure, and ship access through its Major Research Instrumentation (MRI) program and the Field Stations and Marine Laboratories (FSML) program. In addition the Ocean Observatories Initiative (OOI) at NSF and the Integrated Ocean Observing Systems (IOOS) initiative at NOAA will provide vital infrastructure support for coastal and ocean observing. However, there is an urgent need for significantly enhanced infrastructure investments at all scales, from traditional systems such as laboratory improvements and modernization, ships, observation systems, and satellites, to the next generation infrastructure and technology that enable genomic, proteomic, robotic, nanotechnology, and other advanced computational approaches. As federal support for research and education undergoes increased scrutiny, support for research infrastructure and instrumentation must not be neglected. Finally, NAML strongly supports Congressional calls for NSF to examine the need for a mid-scale instrumentation program and the development of an initiative that responds to that identified need. Such a provision is included in the legislation reauthorizing America COMPETES.

For more information, please visit www.NAML.org or contact:

Dr. Ivar Babb, NAML President, 860-405-9101; ivar.babb@uconn.edu