



National Association of Marine Laboratories

Official Written Testimony for Fiscal Year 2010
Submitted to the Subcommittee on Commerce, Justice and Science
Committee on Appropriations
United States House of Representatives

Submitted by Dr. James Sanders
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I am pleased to submit this statement on behalf of the National Association of Marine Laboratories. We are a consortium of 120 coastal institutions dedicated to research, education and outreach designed to help the nation better understand the importance of our oceans, coastal regions and Great Lakes, and to ensure their wise use. I will focus my remarks on the three federal science agencies of particular importance to marine science, education and outreach: the National Science Foundation (\$7 billion), the National Oceanic and Atmospheric Administration (\$5 billion), and National Aeronautics and Space Administration (\$18.7 billion). Specifically, I will address the role that each of these agencies plays in supporting extramural ocean, coastal and Great Lakes research; in fostering education, diversity and an ocean-literate America; and in ensuring sustainable ocean infrastructure.

The member laboratories of the National Association of Marine Laboratories (NAML) employ thousands of scientists, engineers, and professionals nationwide. NAML labs conduct high quality research on natural and social science issues that affect our nation's coasts and translate that science to diverse, formal and informal education programs, fostering the next generation of ocean-literate Americans and improving decision-making on important challenges facing our country.

RECOMMENDATIONS FOR A ROBUST OCEAN SCIENCE & EDUCATION ENTERPRISE

On behalf of the marine laboratory community, I thank you for recognizing the value of the American research enterprise to the nation's economic growth and sustainability, as reflected in the American Recovery and Reinvestment Act of 2009 (Public Law 111-5). By specifically investing in science, you are stimulating the economy today as well as making a down payment on future prosperity. As budgets are developed for FY 2010, we hope you will continue to invest in science and provide the resources to keep U.S. discovery at the forefront of innovation.

If we are to re-energize our economy and get Americans back to work, we must re-invest in the American scientific enterprise and maintain our Nation's scientific standing on the global stage. The ocean sciences can and must lead the way in innovation. Our oceans control climate and provide food, transport, and recreation. They are fundamental to the well-being of our planet and our nation. The ocean sciences span a landscape of disciplines, from physics to geology, chemistry to biology, and mathematical modeling to sociology. Marine laboratories are our nation's "windows to the sea," uniquely situated where land and ocean meet and providing a rich environmental mosaic that sustains our communities, captures our imaginations, and stimulates

us to life-long learning. Our NAML marine labs are embedded in smaller communities and capitalize on the attraction of the coasts and oceans to encourage scientific awareness and literacy.

The U.S. Commission on Ocean Policy (2004) estimated that ocean-related activities contribute more than \$117 billion to American prosperity and support well over two million jobs. Coastal watershed counties extend this value dramatically to more than \$4.5 trillion, or one-half of the Nation's gross domestic product, accounting for 60 million jobs. Every year millions of people visit America's coasts, spending billions of dollars and directly supporting jobs, making coastal tourism one of the Nation's most vital business sectors.

But, new environmental pressures, especially those related to global climate change, threaten to undermine and even reverse the prosperity of coastal America, compromise the health of coastal communities, and test the sustainability of critical coastal and oceanic ecosystems. The pressures on our coasts threaten industries of national importance, including our traditional fisheries and energy resources. The environmental benefits and impacts of emerging growth industries, renewable energy and offshore aquaculture, must also be understood. Now, more than ever, sound scientific data are needed to incorporate these and other complex issues into planning the vital, resilient communities of the coming century.

I. EXTRAMURAL OCEAN, COASTAL AND GREAT LAKES RESEARCH

For FY 2010, NAML strongly urges the Subcommittee to appropriate \$7 billion for the National Science Foundation, \$5 billion for the National Oceanic and Atmospheric Administration, and \$18.7 billion for the National Aeronautics and Space Administration. In addition, we hope Congress will maintain and strengthen its support for cutting-edge, extramural ocean, coastal, and Great Lakes research and education across the federal funding agencies.

As our nation begins to emerge from the current economic crisis, it is critically important that the research budgets at the major federal science agencies are both cost-effective and commensurate with the unprecedented environmental challenges and potential opportunities that we will continue to face. In the face of these challenges, the federal science enterprise must take advantage of the vast and diverse talents of the extramural academic community. Programs that fully engage this community in competitive, merit-based research will produce an extremely cost-effective return on investment and, at the same time, distribute economic benefits over a broad array of communities.

National Science Foundation. NSF funds vital basic research that enhances the public understanding of the Nation's oceans, coastal areas, and the Great Lakes. Over 90 percent of NSF's budget goes directly to support research at institutions in all 50 states. A robust NSF fuels the economy, boosts American intellectual competitiveness and provides manpower and knowledge that are important for national security and economic competitiveness. NAML has enthusiastically supported congressional efforts to enhance NSF's budget in the context of the America COMPETES Act. We urge that science at NSF continue to be viewed as a wise and effective investment in the Nation's scientific pre-eminence and that the Committee appropriate

\$7 billion for NSF for FY 2010, consistent with the preliminary details of the President's Budget Request.

National Oceanic and Atmospheric Administration. NOAA is a leader in ocean, coastal and Great Lakes research and many NAML labs are collocated with or linked to NOAA laboratories. Through extramural support for investigators at marine labs and universities, NOAA gains access to world-class expertise and unique research facilities. As NOAA and its sister federal agencies take on the challenges of global climate change and other emerging issues, we hope NOAA will leverage its internal scientific expertise by effectively and extensively engaging the talent of the academic research community. To be effective, NOAA extramural programs urgently need increased funding. This includes programs like the National Sea Grant College Program, the Ocean Exploration Program, and the National Undersea Research Program, as well as NOAA-directed programs such as the National Estuarine Research Reserve System, the Competitive Research Program within NOAA's Climate Program Office, and the NOAA joint and cooperative institutes. A healthy NOAA budget coupled with solid partnerships in the extramural research community will further enhance NOAA's success in accomplishing its mission. To allow NOAA to meaningfully enhance its partnership with the extramural research community, NAML recommends a NOAA budget of \$5 billion for FY 2010.

National Aeronautics and Space Administration. Support for earth science and Earth observation within NASA has been unsteady in recent years despite fervent support from the community. A 2007 report by the National Academy of Sciences called on NASA to "renew its investment in Earth observing systems and restore its leadership in Earth science and applications." 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 adjust to emerging issues like climate change mitigation and adaptation. NASA's support for Earth observation and research is vital in helping us better understand our planetary processes and especially their human impacts. Within the \$18.7 billion requested for FY 2010, NAML urges the Committee to provide \$4.7 billion for the Science Mission Directorate, a \$200 million increase over the FY 2009 enacted level.

II. EDUCATION, DIVERSITY AND AN OCEAN LITERATE AMERICA

Within the requests above, NAML urges enhanced and sustained investment in formal and informal education programs at NSF, NOAA and NASA for FY 2010.

American students are being eclipsed by peers in other industrialized countries. As a result, ocean literacy and workforce diversity have become a focus of discussion at the federal level and throughout the environmental community. A number of watershed events have occurred over the last few years, such as the 2004 U.S. Commission on Ocean Policy report, which recommends federal investments to promote lifelong formal and informal ocean education; the 2007 National Academy of Sciences report, *Rising Above the Gathering Storm*, and the subsequent enactment of the America COMPETES Act, which places a premium on formal and informal science education across the government, and provides a broad mandate for NOAA to educate the public; and, most recently, the 2009-2029 NOAA Education Strategic Plan which will guide NOAA's education investments and goals for the next two decades.

To cope with inevitable change, the American public must be encouraged to understand natural systems and their relationship to human welfare. Coastal, ocean, and Great Lakes education programs are demonstrably successful in entraining Americans of all age levels. Marine laboratories provide unique, place-based, hands-on environments for learning about and experiencing the natural environment. Further, marine labs are committed to enhancing diversity, by providing relevant learning opportunities for underrepresented groups.

Federal partnership programs that have allowed NAML labs to address the ocean education needs of the nation include: the Centers for Ocean Science Education Excellence (COSEE) program and the Research Experiences for Undergraduates (REU) program at NSF; and the Office of Education, the Ocean Exploration Program, the National Undersea Research Program, the Educational Partnership Program with Minority Serving Institutions, the Ernest F. Hollings Undergraduate Scholarship Program and the National Sea Grant College Program at NOAA. NAML recommends that these programs be meaningfully enhanced in FY 2010.

III. SUSTAINABLE OCEAN INFRASTRUCTURE

NAML recommends enhanced investment in infrastructure programs across the federal government that support and enable cutting-edge federal research.

To ensure understanding and wise use of the oceans, advancement of the scientific enterprise will require support for infrastructure and instrumentation, including long term planning for the next generation of infrastructure. This support is essential to the operation of marine labs and many other academic facilities. NSF is the only agency that routinely provides essential support for basic laboratory facilities, instrumentation, support systems, computing and related cyber infrastructure through the Major Research Instrumentation (MRI) program and the Field Stations and Marine Laboratories (FSML) program. The FSML program is of particular importance as it is the only source of federal funding dedicated to the modernization of marine laboratories and field stations. While funding decisions within the FSML program are made at the agency, Congressional support for a more robust FSML program would be helpful as we seek to upgrade aging facilities and build a network of “21st Century” marine labs that will enable our nation’s leadership in coastal science for today and tomorrow. In order to provide realistic support for the nation’s coastal and inland field laboratories, this program, which has been level funded for many years, should be doubled to \$5 million for FY 2010 with sustained growth in the future.

There is an urgent need to maintain and enhance infrastructure at all scales. The full understanding of our oceans and their wise use depend on an inter-linked network of complementary observation systems. These range from satellites, to ocean- and ice-capable ships, to the predominantly fixed instrument arrays of the Ocean Observatories Initiative (OOI) and Integrated Ocean Observing Systems (IOOS), to smaller “coastal” ships and other vehicles, to the marine labs which provide fixed “windows on the sea” along our coasts. At hand is the next generation of infrastructure and technology that enable genomic and proteomic sensors, increasingly “smart” and versatile robotic devices, nanotechnology, and advanced computational approaches. As federal research budgets grow, and as research foci shift to address emerging questions, support for critical, relevant infrastructure that enables this science must keep pace.

Thank you for the opportunity to express these views on behalf of the National Association of Marine Laboratories. We hope the Committee will take these points into consideration as you move forward in the FY 2010 appropriations process.

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