Statement for the Record from
The National Association of Marine Laboratories
for the
Subcommittee on Commerce, Justice, Science, and Related Agencies
Committee on Appropriations
House of Representatives
April 27, 2018

In support of FY 2019 Appropriations for the Nation's Ocean, Coastal, and Great Lakes Research, Education, Conservation, and Resource Management Enterprise

Mr. Chairman and Members of the Subcommittee, this Subcommittee is uniquely responsible for the health of the ocean, coastal, and Great Lakes enterprise through your oversight and resource decision-making responsibilities related to NOAA, NSF, NASA, and other agencies. That enterprise is a critical part of the security of the Nation as it relates to economic, environmental, national, homeland, energy, conservation resources, and food security issues. **In FY 2019 the Administration has proposed the elimination of most of the funding for this Subcommittee's extramural ocean, coastal, and Great Lakes research, conservation, observing, and education programs. We urge the Subcommittee to restore funding and strengthen these programs consistent with the new spending levels in the Bipartisan Budget Act of 2018.**

U.S. leadership in science and technology is being challenged by our international competitors. Investing in science and technology that relates to our oceans, coasts, and Great Lakes will help sustain U.S. leadership and contribute significantly to national security, economic security, food and energy security, and the security of our natural resources. In the R&D Chapter of the FY 2019 Budget Request, the Administration acknowledged that "Innovation in science and technology has been a cornerstone of America's economic progress since the founding of this nation". The National Association of Marine Laboratories (NAML) strongly urges the Nation's decision makers to significantly strengthen the Federal Government's investment in extramural, merit-based, competitive research, infrastructure, and education programs at NSF, NOAA, NASA, and other ocean, coastal, and Great Lakes related agencies to develop the knowledge, the diverse workforce, and the technological innovations needed to power the nation's economy, create jobs, improve health, and strengthen national security.

NAML recommends expanded support for Federal agencies and programs that fund research, infrastructure, and education activities focused on:

- U.S.-based aquaculture to reduce the ever-increasing demand for foreign imports, to advance seafood security and opportunities for economic growth.
- Oceanographic and geochemical exploration and associated technology development to advance national security, commerce and domestic energy independence.
- Data collection and adaptive management strategies to increase productivity and sustainability of marine fisheries and social-economic productivity of U.S. exclusive economic zones.
- Comprehensive understanding of ecosystems which support fisheries and other social-economic drivers.
- Defining the impacts and causative factors for shifting environmental regimes to inform risk management of critical defense, transportation, civic and business infrastructure along U.S. coastlines.

- Discovery and innovation in biological, chemical, geological and physical marine sciences to support advancement of human and environment health and social-economic objectives.

The Importance of Oceans, Coasts, and Great Lakes to National, Economic, and Environmental Security

The security of the U.S. is in large part dependent on our ocean, coastal, and Great Lakes resources:

- Fourteen percent of U.S. coastal counties produce 45% of the nation's gross domestic product (GDP), with close to one in 45 jobs directly dependent on the resources of the oceans and Great Lakes;
- In 2014, the ocean economy's 149,000 business establishments employed about 3.1 million people, paid $123 billion in wages, and produced $352 billion in goods and services. This accounted for about 2.3 percent of the nation's employment and 2.0 percent of its gross domestic product;
- Offshore mineral extraction represents 43%, and tourism and recreation account for 31%, of the ocean economy contributions to GDP. Tourism and recreation account for 72% of the ocean economy jobs; and
- In summer 2017, the first ship to traverse the Arctic Northern Sea Route without assistance from ice-breaking vessels completed its journey. That transformational moment drives home both the opportunity and the imperative for the United States, a Nation with an important Arctic presence, to ready itself for the new Arctic.

The oceans are a primary source of food for over one billion people; a globally significant regulator of the earth's weather and climate; the basic source of water for the hydrologic cycle; a cleaning agent that absorbs carbon dioxide and generates oxygen; and home to thousands of flora and fauna, many with pharmaceutical value. A wide gulf often separates science from the people who need it to protect and support their well-being.

In 2014, the ocean economy employed more people in the U.S. than the telecommunications, crop production, and building construction industries combined. Additionally, if the nation's coastal counties were considered an individual country, they would rank number three in global GDP, behind only the U.S. and China. The Great Lakes alone generated nearly $5 trillion in economic output or about 30% of combined U.S. and Canadian economic production.

The United States is the leading global importer of fish and fishery products, with 91% of the seafood we eat originating abroad – half of which is from aquaculture. Driven by imports, the U.S. seafood trade deficit grew to over $14 billion in 2016. NAML laboratories are leaders in developing and supporting innovative methods that will improve and encourage sustainable U.S. aquaculture products that complement, not compete with, existing US commercial fisheries.

The U.S. marine transportation system is a major driver of the U.S. economy and its impact reaches into the heartland of the nation. America's seaports are crucial generators of economic development and well-paying jobs, regionally and nationally, throughout all supply chains that use the ports. Long-term sustainability of such critical ocean-front infrastructure in the wake of shifting - and dynamic - environmental conditions is a significant concern addressed by marine laboratories, which typically share the same geographic proximity to the water.

All the issues identified above – and more – can be addressed, in part, through a vibrant ocean science and technology enterprise. Such an enterprise is fueled by the support provided by NAML laboratories.

The Role of Marine and Great Lakes Laboratories in America's Research and Education Enterprise

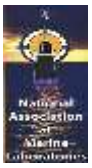
NAML advocates for the importance of marine and freshwater science and education to America's health, security and productivity. NAML seeks to: champion the national value of marine and Great Lakes research, infrastructure, monitoring and observing, education, and outreach; advocate for robust merit-based federal funding programs to address societal needs; enhance the capabilities and networking of Marine and Great Lakes laboratories to serve the Nation's coastal information needs; and contribute to the education and training of a diverse workforce for the future.

The national network of Marine and Great Lakes science laboratories are place-based national assets. Their geographic reach includes estuaries, the coastal zone, the Great Lakes and inland watersheds, all the oceans of the world including polar regions, and the sea floor. They connect scientists, students, public and civic leaders with leading edge science, environmental intelligence, and professional training that contributes to the management and stewardship of our oceans, coastal zones and Great Lakes. NAML laboratories share common mission elements and broad expertise:

- To produce and assimilate knowledge of world oceans, coastal zones, Great Lakes and watersheds;
- To train future generations of marine and freshwater scientists, resource managers, and civic leaders;
- To inspire public and civic understanding and stewardship of marine and freshwater resources; and
- To inform preservation, restoration, management and utilization of marine and freshwater resources.

The intersection of ocean, coastal zone and Great Lakes natural resources and U.S. economic activity is complex and highly interdependent. The U.S. depends on healthy marine and freshwater resources, yet many economic activities have the potential to damage these resources, putting jobs, wages and gross domestic product (as well as human health and well-being) at risk. Marine Laboratories operate at this interface of human socioeconomics and the natural aquatic world. They provide access to the full spectrum of marine and Great Lakes habitats. Often affiliated with universities, marine laboratories are research, monitoring and placed-based teaching platforms that support faculty scientists, graduate and undergraduate students, and public/civic outreach activities to promote stewardship and informed environmental and business management practices. Programs such as NSF's ocean, earth, polar, and biological research programs, NOAA's ocean and coastal programs, Sea Grant, EPA's Wetlands, Oceans and Watersheds, and other mission agency programs rely on marine and Great Lakes laboratories to contribute access, knowledge, data, and technologies to help improve management of these natural assets and sustain their development as socioeconomic drivers.

Marine and Great Lakes science laboratories play a vital role in the decadal science priority themes identified in *Sea Change: 2015-2025 Decadal Survey of Ocean Sciences*. The report indicates that Marine and Great Lake science laboratories are ***critical*** or ***important*** for several of the priority questions, including studies of coastal food webs, ecosystem biodiversity, and human impacts on coastal environments. NSF support of field stations and marine laboratories provides much-needed infrastructure and capital improvements that enhance the quality of scientific research and engagement with the public. Recent efforts by NSF to promote networking and data sharing among field laboratories will provide further opportunities for research and education. ***Sea Change identifies marine and Great Lakes laboratories as having a high degree of relevance towards priority research questions with lower costs than other marine infrastructure.***



We urge the Subcommittee to continue to support its portfolio of ocean and coastal programs and we offer the following specific programmatic recommendations:

- National Sea Grant College Program, $85 million for research, education, extension, and outreach activities, including Marine Aquaculture, STEM education, and Sea Grant fellowship programs within the NOAA Operations, Research, and Facilities (ORF) account within the Office of Oceanic and Atmospheric Research;

- National Estuarine Research Reserve System, $27 million in NOAA's Operations, Research and Facilities account within the National Ocean Service;

- National Estuarine Research Reserve System, $1.7 million for the Procurement, Acquisition and Construction account within the National Ocean Service;

- Sanctuaries and Marine Protected Areas, $57 million within the National Oceanic and Atmospheric Administration's (NOAA) Operations, Research, and Facilities (ORF) account in the National Ocean Service;

- Marine Sanctuaries Construction, $8.5 million within NOAA's Procurement, Acquisition, and Construction (PAC) account in the National Ocean Service;

- Coastal Zone Management Grants, $75 million within NOAA's Operations, Research, and Facilities (ORF) account, National Ocean Service (under Coastal Management Grants line);

- Coastal Resilience Grants, $15 million within NOAAs Operations, Research, and Facilities account, National Ocean Service (under Coastal Management Grants line);

- Regional Integrated Ocean Observing System (IOOS), $37.7 million within NOAA's Operations, Research, and Facilities account, National Ocean Service; and

- Digital Coast Program, $5 million within NOAA's Operations, Research, and Facilities account, National Ocean Service.

We appreciate the funding constraints and the many worthy competing claims the Subcommittee must confront. Our coasts are home to 40 percent of the nation's population. Annually our coastal counties produce more than $7.6 trillion in goods and services, employ 53.6 million people, and pay $3 trillion in wages. Coastal wetlands conservation measures prevented an estimated $625 million in property damages during Hurricane Sandy. Ocean, coastal, and Great Lakes research, education, conservation, and resource management practices funded by this Subcommittee are investments in the future health and well-being of our coastal communities' economies which will result in returns of improved quality of life, environment and economic resilience many times over the federal investment.

Thank you for the opportunity to submit these recommendations.