NATIONAL ASSOCIATION OF MARINE LABORATORIES
FY 2020 PUBLIC POLICY AGENDA
March 2019

Ocean, Coastal, and Great Lakes Research Priorities – Global ocean systems, including the Great Lakes and coastal zones of the world, are predominant geophysical and biologically diverse features of our planet. Their roles in regulating global climate and life support are existential functions that require continual investigation to further our understanding of those systems. The ocean science and technology enterprise exists to advance our knowledge of these dynamic systems and the ways in which their physical, chemical, geological and biological attributes have changed, and will continue to change, over time. Accordingly, the research and development, observation, modeling and knowedge dissimination by the ocean science and technology community are critical to understanding and managing our ocean, coastal and Great Lakes resources. 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, EPA, DOI, and other ocean, coastal and Great Lakes related agencies. Investments through these agencies enable the development of knowledge, a 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 address the security-related issues in this Agenda. Expanded support in the form of research, infrastructure and education must be focused on:

- U.S.-based aquaculture to reduce the ever-increasing demand for foreign imports, to advance seafood security and to expand opportunities for economic growth;
- Defining the impacts and causative factors for shifting environmental regimes to improve coastal resiliency and inform risk management of critical defense, transportation, civic and business infrastructure along U.S. coastlines;
- 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; and
- Discovery and education and training 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 future well-being of the U.S. is in large part dependent on our ocean, coastal and Great Lakes resources:

- The U.S. ocean economy, which includes six economic sectors that depend on the ocean, is estimated to have contributed more than $320 billion to the U.S. Gross Domestic Product (GDP) and supported 3.2 million jobs directly dependent on these resources in 2015;
- 42% of the U.S. labor force is employed in coastal watersheds;
- In 2014, counties adjacent to the shore contributed 43% percent of the U.S. GDP;
- The offshore mineral industry contributed over 170,000 jobs in 2013 and $122 billion, the majority of which was predominantly from the oil and gas sector;
- Approximately 88,000 square miles of the Nation's coastal wetlands provide nursery areas for commercially harvested fishery species and places of refuge for migrating birds;
- In 2015, the commercial and recreational fishing industry supported 1.6 million jobs and contributed $208 billion in sales to the U.S. economy; and
- Ocean measurements, observations and forecasting generate about $7 billion in revenues annually.

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 recycling agent that absorbs carbon dioxide and produces oxygen; and home to many thousands of flora and fauna, many with pharmaceutical value.

America is a major consumer of aquaculture products. The U.S. currently imports more than 90% of its seafood, leading to a $14 billion seafood trade deficit. Given that the World Bank projects a nearly 50% increase in worldwide fish consumption between 2006 and 2030, the Nation has an opportunity to meet this demand, ensure food security, create new industries and provide jobs by maximizing sustainable wild and aquaculture harvest. NAML laboratories are leaders in developing and supporting innovative methods that will improve and encourage U.S. aquaculture products that complement and help sustain existing wild-capture commercial fisheries.

Much of the U.S. commercial and industrial base, defense infrastructure, and population is located along the U.S. coastline. An improved understanding of the threats to those vital areas resulting from changes to broad-scale weather and environmental conditions as well as anthropogenic activities is crucial to enhance coastal resiliency. Operating directly on the land/ocean interface themselves, NAML laboratories have a unique insight into this issue, with the institutional capacity to provide sound, science-based guidance. Advancement of our understanding of and predictive capacity for this key science priority will allow communities to more effectively plan for, and rebound from, future catastrophic events, whether they be episodic in nature (e.g., hurricanes and seasonal flooding) or progressive (e.g., sea level rise).

America's coastlines and offshore areas contain untapped renewable and non-renewable energy sources to help power the Nation and much of the world. In addition to generating electricity, power generated at sea (from waves, currents or wind) could be used to serve the needs of other existing or emerging ocean industries (aquaculture, ocean mineral mining, oceanographic research or military missions). These are a few of the issues that can be addressed through a vibrant ocean science and technology enterprise – that is in a significant way fueled by the talent, capabilities and national network of NAML laboratories.

Conclusion -- 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. 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 human activities and natural events have the potential to damage these resources, thereby jeopardizing jobs, wages and gross domestic product (as well as human health and well-being). Marine laboratories operate at this interface of human socioeconomics and the natural aquatic world and provide access to the full spectrum of marine and Great Lakes habitats. Marine and Great Lakes science laboratories play pivotal roles in the national priorities identified in *Science and Technology for America's Oceans: A Decadal Vision* and *Sea Change: 2015-2025 Decadal Survey of Ocean Sciences*. These reports emphasize the need to understand oceans in the earth system, promote the blue economy, and advance monitoring and predictive modeling capabilities. NAML laboratories bring a high degree of relevance to these national priorities at lower cost, higher return on investment and with the important benefit of training succeeding generations of marine and related science professionals.

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