



## Memorandum to the Biden-Harris Administration

Date: January 2021

From: Robert W. Dickey, Ph.D.  
President, National Association of Marine Laboratories

Subject: Nation's Recovery Tied to Resilience of Ocean, Coastal, and Great Lakes

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The National Association of Marine Laboratories (NAML) is a network of place-based marine and Great Lakes laboratories. The research and education activities we carry out contribute to your Administration's priorities and the increased resiliency of our coastal communities. We recommend major investments in research infrastructure, innovation, research and development, education, and clean energy to generate the knowledge, new technologies, and people that will enhance the resilience of our coastal communities and economy.

NAML labs operate on the frontline of a rapidly changing environment. The ocean, coasts, and the Great Lakes are vital resources and an integral part of our national identity and our nation's future. The ocean and our Great Lakes fuel our economy with an estimated 3 million jobs, give mobility to our commerce and Armed Forces, feed our nation, secure our borders, and provide places for recreation. Understanding the physical, chemical, biological, and geological changes in the ocean and our Great Lakes is vital to the survival and prosperity of our country. The U.S. depends on our healthy marine and freshwater resources, yet many human activities and natural events impact coastal community resilience, thereby jeopardizing jobs, wages, our gross domestic product, human health, and well-being.

At the same time, deadly and expensive weather- and climate- related hazards have increased at an alarming rate. Since 1980, the Nation experienced 285 weather and climate disasters where overall damages reached or exceeded \$1 billion. The total cost of these 285 events exceeds \$1.875 trillion. Over the last five years (2016-2020), the Nation was subjected to 81 events that resulted in nearly 4000 deaths and damages that exceed \$600 billion. Weather and climate hazards challenge the resilience of coastal communities via damage to critical infrastructure, disrupt water and food supplies, and cause social instability, unemployment, and governance challenges.

The ocean science and technology enterprise -- through its use and support of NAML laboratories -- provides the knowledge and training for decision makers concerned about the economic and environmental resilience of our coastal communities. To support the vital role of marine and Great Lakes laboratories in the ocean enterprise, we recommend prioritizing the Federal Government's investment in extramural, merit-based, competitive programs at NSF, NOAA, NASA, EPA, DOI, USGS, and other ocean, coastal, and Great Lakes related agencies. Investments in federally funded extramural research, education and infrastructure (physical, cyber-related, data management, etc.) of our ocean and Great Lakes are essential for new knowledge, a diverse workforce, an ocean-literate society, and technological innovations needed to power the nation's economy, improve human health, and sustain a strong national defense and vibrant society. Suggestions for increased support include:

- Investigate shifting environmental regimes such as sea level rise, harmful algal blooms, hypoxia, and ocean acidification to improve coastal resilience and inform risk management of critical defense, transportation, civic and business infrastructure along U.S. coastlines.
- Ocean exploration, research, and technology development to advance national security, commerce, and domestic energy independence.
- Supporting U.S. aquaculture will reduce our dependence on imported seafood, advance seafood security, and expand opportunities for economic growth.
- Big data, sustained ocean observations, predictive ecosystem models, next-generation DNA sequencing technology (“omics”), are all needed for comprehensive understanding of ecosystems fueling adaptive management strategies to sustain the social-economic productivity of U.S. exclusive economic zones.
- Marine infrastructure - ships, autonomous vehicles, laboratory refurbishment, data analysis, observational capabilities, and instrumentation – is vital to understand the complex four-dimensional ocean; and
- STEM is the foundation – biological, chemical, geological and physical marine sciences, ocean engineering and marine policy education and training - of a diverse constituency is key to long-term advancement of human and environment health and social-economic objectives.

The NAML network of place-based marine and Great Lakes laboratories is a world renowned valuable national asset. The labs’ geographic network includes estuaries, the coastal zone, the Great Lakes and inland watersheds, the global ocean including polar regions, and the sea floor. NAML labs provide scientists, students, public and civic leaders with leading edge science, environmental and coastal intelligence, and professional training that contributes to the understanding, management, and stewardship of our ocean, coastal zones and Great Lakes. The NAML network stands ready to assist the new Administration by offering ocean and Great Lakes research and solutions that strengthen economic and environmental resilience.

Thank you for the opportunity to provide these views.