May 15, 2020

The Honorable Mitch McConnell  
Majority Leader  
United States Senate  
Washington, D.C. 20510

The Honorable Charles Schumer  
Minority Leader  
United States Senate  
Washington, D.C. 20510

The Honorable Nancy Pelosi  
Speaker of the House  
United States House of Representatives  
Washington, D.C. 20515

The Honorable Kevin McCarthy  
Minority Leader  
United States House of Representatives  
Washington, D.C. 20515

Dear Leader McConnell, Leader Schumer, Speaker Pelosi, and Leader McCarthy:

As our nation, and our world, strive to return to a new, post-COVID normal, ensuring the ability of America's economy to recover is of paramount importance. As the world’s leading maritime nation, the success of our national economy is deeply tied to that of the maritime, or “blue” economy, and a resilient national recovery must include a significant revitalization of the blue economy. The blue economy has weathered previous recessions better than the overall economy; by 2016, employment had increased by 14.5 percent compared to pre-recession levels (2007), dwarfing the 4.8 percent employment growth of the national economy. During that same time frame, inflation-adjusted gross domestic product in the blue economy was 18.8 percent higher than pre-recession levels, compared to a 10.7 percent increase in the U.S. economy as a whole\(^1\). This is not a fluke; projections show the growth of the blue economy is likely to outpace that of the global economy, more than doubling its contribution to global value from $1.5 trillion in 2010 to $3 trillion in 2030\(^2\). While the blue economy is a strong pillar of our economy, it is not exempt from the negative impacts of COVID, and it’s clear that revitalizing it will be critical to ensuring our economic prosperity during the post-COVID years.

Additionally, the ongoing global crisis surrounding COVID-19, given its likely link to wildlife, has made the connection between the environment and human health abundantly clear. This environment includes our ocean, most of which remains unknown and unexplored, and which has so much potential to be either the cause of or the solution to our next global health crisis. Now, more than ever, there’s an enhanced need for investment in ocean science and technology, which will aid in our economic recovery as it helps us explore and understand the water that covers 71 percent of our Earth’s surface. As a maritime nation, not just our health and our economic prosperity but our national, homeland, energy, food, and water securities depend on a healthy ocean — which in turn depends on ocean science and technology. I refer to this concept as “ocean security,” the understanding of which enables us to know the path of hurricanes, safely operate autonomous vehicles, manage fish stocks, and much more.

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We now find ourselves in the unique position of needing to support those individuals who have lost jobs, who have had school plans derailed, or who have missed out on career opportunities and those businesses that have shut down or drastically reduced in size while at the same time thinking ahead to lay the necessary framework to allow for the revitalization of the blue and national economies. If we make strategic investments in the blue economy now, we can quickly and effectively rebuild the economy as a whole that we want and need for tomorrow — one that better serves our nation and fulfills the needs of the post-COVID world.

To more fully explore and address these needs, on behalf of the Consortium for Ocean Leadership, which represents our nation’s leading ocean science, research, and technology organizations from academia, industry, and the larger nonprofit sector (to include philanthropy, associations, and aquariums), I have put together needs and opportunities for the ocean science and technology community as they relate to the near-term (now until we have settled into a more widespread effort to open businesses, assuming approximately three months), mid-term (from the end of the near-term until a vaccine is developed), and long-term (post-vaccine creation and implementation).

**Near-Term Needs and Opportunities**

These needs and opportunities are ones that should be addressed immediately in upcoming stimulus and recovery packages.

**Support the Current Workforce and Ensure Continuity of Operations**

The ocean workforce is broad, spanning academia, private industry, philanthropy, aquariums, government, labs, nonprofits, science associations, and more. While some of the workforce operational continuity needs align with other sectors, such as helping people and businesses recover from lost jobs, furloughs, and salary reductions, there are many that are unique to this sector. These include aquariums, which need to stay operational and support their animals and their employees; key academic technical facilities, such as laboratories, that must be kept operational to ensure a readiness to return to full operations; American-organized or staffed nonprofits conducting vital research at home and abroad (at sea, in biodiverse habitats, or other in situ locations); and ocean observations that must be kept running (not least because we are about to enter the 2020 hurricane season). Specific actions Congress can take to support this workforce and ensure continuity of operations include:

- **Increasing extramural research opportunities across the National Oceanic and Atmospheric Administration (NOAA) to improve the effectiveness of observations, monitoring, and modeling to better manage infrastructure, agricultural resources, fisheries, water resources, and natural disaster planning and response.** NOAA’s competitive research programs and regional information serve a suite of scientific needs from short-term weather forecasting to long-term oceanic and atmospheric analysis and support research teams that expand and build the nation’s capacity to prepare for and adapt to climate variability and change.

- **Promoting opportunities for growth of innovative and blue technologies, including through the advancement of NOAA’s new technology strategies: Unmanned Systems, Artificial Intelligence, ‘Omics, and Cloud.** Blue technologies offer an opportunity for new, high-paying jobs, and doing all we can to accelerate and increase the associated job opportunities will benefit both job seekers and our knowledge of the ocean environment.
• Providing funding to academic technical facilities and other such centers to ensure they remain operational to the needed extent so they can effectively ramp up in the future without a loss to the scientific enterprise.

• Appropriating $300 million (the amount the Department of Defense (DOD) has received in unfunded proposals each of the past three years) to the DOD’s Defense University Research Instrumentation Program to help ensure universities have the appropriate equipment needed to conduct cutting edge research import to DOD and our nation.

• Appropriating $200 million to the Marine Sanctuary Waterfront Development Program for aquarium and research partners in existing and proposed sanctuary communities to work with commercial, charter, and recreational fishermen or other coastal organizations to provide services in support of sanctuary priorities, pursuant to SEC 309 [16 U.S.C. 1140]. These funds should be available for research, conservation, restoration, technical assistance, training, species recovery, sustainable tourism, and education and outreach programs designed to benefit coastal communities impacted by COVID-19.

• Extending the Paycheck Protection Program and loan forgiveness through December 2020 and making nonprofits, including aquariums and other museums, with greater than 500 employees eligible for loan forgiveness, as requested by the nation’s museum community. Nonprofit museums and aquariums often employ many part-time and temporary employees to fulfill their public outreach and education missions; this expansion would allow more people to receive paychecks for longer\textsuperscript{3}.

• Increasing the emergency supplemental appropriations to at least $6 billion for the Institute of Museums and Library Services — Office of Museum Services to provide direct economic relief for nonprofit museums, including aquariums and zoos, as requested by the nation’s museum community, for general operating support and payroll\textsuperscript{4}.

• Expanding the universal charitable deduction provision in the CARES Act by removing the $300 cap and by extending the CARES Act removal of the 60 percent limit on Adjusted Gross Income that may be deducted through charitable gifts of cash, as requested by the nation’s museum community\textsuperscript{5}.

Keep Students (High School – Graduate) and Postdocs in the STEM/Ocean-STEM Pipelines
The need for more funding to support the research enterprise is critical. This includes those in the STEM pipeline, including undergraduate students mid-science degree, graduate students and postdocs who can no longer complete their data collection, highly specialized technical workers not able to work anymore, early career scientists missing out on opportunities to enter the workforce, and so many more. This workforce also includes small businesses that are vital to the ocean research enterprise. Specific actions to support the STEM and ocean-STEM pipelines include:

• Providing $26 billion in supplemental appropriations for the major research agencies, which include, among others, the National Science Foundation (NSF), National Aeronautics and Space Administration (NASA), National Institute of Standards and Technology (NIST), and NOAA; this is the amount recommended in the April 7 letter from the Association of American


\textsuperscript{4} Ibid.

\textsuperscript{5} Ibid.
Universities (AAU), Association of Public and Land-Grant Universities (APLU), Association of American Medical Colleges (AAMC), and the American Council on Education (ACE)\(^6\). This would cover requests for research grant and contract supplements; emergency relief to sustain personnel and base operating costs for core research facilities and user-funded research services; and additional graduate student and postdoc fellowships, traineeships, and research assistantships.

- **Providing temporary regulatory and audit flexibility during the pandemic and for a year afterwards**, as requested by AAU, APLU, AAMC, and ACE\(^7\).
- **Urging or requiring federal research agencies to immediately implement uniform guidance and policies that provide flexibility for research institutions to cover salaries, benefits, and tuition support for graduate students and research personnel engaged in federally sponsored research grants and contracts**, if they have not already per the guidance provided by the Office of Management and Budget (OMB) as requested by AAU, APLU, AAMC, and ACE\(^8\).
- **Providing an additional $46.6 billion for higher education students and institutions in the Education Stabilization Fund** (a higher education emergency relief fund, established by the CARES Act, that divides money equally between students and the institutions that serve them) to help students begin or continue their education and universities to begin filling pandemic-related financial gaps, as requested by AAU\(^9\).
- **Increasing funding in FY 2021 for programs cancelled for this year that are supported by federal research agencies, such as NSF’s Research Experience for Undergraduates**, to allow more students to participate when such programs can operate again.
- **Encouraging federal agencies to provide additional support, including through innovative partnerships, for undergraduate and graduate students in the science pipeline in the form of scholarships and fellowships.**
- **Encouraging federal agencies to offer extensions and supplements to student fellowships and thesis and dissertation grants for those looking at delayed graduations, extending the term for all federal postdocs by one year, and providing supplemental postdoctoral fellowship programs to increase the number of postdocs in the next cohort.**
- **Instructing federal agencies to create new initiatives to bridge gaps and help address the potential delayed career progression many early career scientists are experiencing** due to missed opportunities to network and connect with other scientists and program managers at conferences and other events.
- **Expanding and increasing funding for important workforce development and training programs** like the Sea Grant College Program; the Education Partnership Program; the Environmental Literacy Program; Bay-Watershed Education and Training Grants; education offices at our federal agencies; and public science and formal and informal educational activities at museums, aquariums, and zoos.

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\(^7\) Ibid.

\(^8\) Ibid.

• Directing federal agencies to find ways to expand support of virtual opportunities for students in the ocean-STEM pipeline. While this is critical to maintaining those in the pipeline today, it is also an opportunity to enhance future opportunities for students and ultimately grow the ocean science workforce as part of a larger, maritime economic revitalization.

• Promoting opportunities to use blue technology (e.g., coding) as a classroom element and through informal education opportunities.

**Maintain Ocean Observing Capabilities**

Ocean observations touch every part of our lives: weather forecasts, maritime commerce, national and homeland security, ecosystem health monitoring, and disaster response all depend on data from ocean observing systems. Our people and our nation are at risk without them. For our national and homeland security, as well as our economic prosperity, we must take the needed steps to maintain ocean observing systems and their associated human infrastructure. Specific actions to maintaining our ocean observing capabilities and infrastructure include:

• Allocating $25 million to the Integrated Ocean Observing System (IOOS) regional coastal observing network for restoring, sustaining, and building resiliency for critical observations in support of weather forecasting, safe and efficient marine operation, and search and rescue missions, in agreement with the request from the IOOS Association. This includes $12 million for high frequency radars, $7 million for gliders, and $6 million for coastal moorings.

• Consideration of how to address the needs of the global observing community, not just the coastal system.

• Increasing funding to fill the infrastructure and equipment needs of other ocean and atmospheric observing programs. This includes modernizing research vessels, observing platforms, and unmanned surface and subsurface vehicles; deploying artificial intelligence and quantum computing technologies; and operationalizing observations of emerging technologies such as environmental DNA and ‘omics for ecosystem and fisheries observing programs. In addition to reviving the academic research fleet (see below), the rapid insertion of these new technologies could help to advance the gaps in ocean monitoring caused by COVID-19. This will be made even more important in light of the increased cost that will be associated with oceanographic research cruises as re-opening is phased in. Ensuring sensors and other technologies can perform the needed observations and monitoring will be critical.

• Encouraging federal agencies to use every opportunity to deploy sensors and other technologies. Whatever is being put in the water — be it an oil platform, port infrastructure, offshore wind farm, etc. — should have technology enabling ocean observations.

**Maintain Readiness of the Academic Research Fleet and Supporting Infrastructure**

Ensuring the readiness of the Academic Research Fleet (ARF) and supporting infrastructure includes maintaining the workforce and associated subcontractors. The ARF consists of 18 vessels supporting 59 University-National Oceanographic Laboratory System (UNOLS) partner institutions that are utilized for at-sea research across multiple federal agencies, including, from 2015-2019, ACOE, DOE, EPA, Inst/State, BOEM, NASA, Navy, NOAA, NSF, and USGS.\(^{10}\) The fleet is on stand down until at least July 1 due to

COVID-19, with a number of additional costs anticipated for operations to both ramp-down and ramp-up fleet readiness in addition to the impacts to research projects. Specific actions to maintain the readiness of the ARF and supporting infrastructure include:

- **Providing $50 million for the ARF.** Funds could be used to address ramp-down and ramp-up costs and to modernize cyber infrastructure across the ARF, allowing for more rapid provision of crucial ocean data across the ocean science enterprise, as it currently takes up to a year for datasets to be shared with the larger science community. Funding would also enable data streams to be accessed in real-time and in perpetuity and two-way communications between scientists on land and at sea.

*Stimulate Shovel-Ready Research Infrastructure*

There are many existing opportunities and developed proposals that will advance ocean science as well as provide economic stimuli related to workforce. Many of these exist under the framework of NSF’s Mid-scale Research Infrastructure Big Idea, which was created to avoid missing opportunities to fund experimental research capabilities with a total project cost between $6 million and $70 million. The response to the 2019 solicitation was overwhelming, with significantly more requests than funding. Similarly, since 2015, NOAA’s Coastal Resilience Grants have provided $35.8 million in federal funds (with $22.3 million in matching funds) to 48 projects that help coastal communities and ecosystems prepare for and recover from extreme weather events, changing ocean conditions, and climate hazards. However, the agency has received a total of 411 proposals requesting $327 million. Specific actions to address these shovel-ready infrastructure projects include:

- **Providing a one-time infusion of funding for NSF’s Mid-scale Research Infrastructure program,** as requested by the Coalition for National Science Funding (CNSF).  
- **Establishing a grant program to modernize and enhance university research labs and address maintenance backlogs,** as requested by CNSF.  
- **Providing a one-time infusion of funding to NOAA’s Coastal Resilience Grants** to ensure our coastal communities are prepared for the 2020 hurricane season.

*Invest in Telework Capabilities, Including Remote Networking Infrastructure and Tools to Ensure Cybersecurity*

To say the jump to telework left many individuals and businesses, as well as our government, scrambling to get set up effectively and securely would be an understatement. It’s clear there need to be more widespread investments in telework capabilities, including remote networking infrastructure and tools that ensure cybersecurity. This will enable more work to be done remotely, which will in turn allow social distancing to continue. This includes:

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1213 April 2020. [https://cnsf.us/statements/CNSF%20HSST%20infrastructure%204.13.20%20final.pdf](https://cnsf.us/statements/CNSF%20HSST%20infrastructure%204.13.20%20final.pdf)
13Ibid.
- Providing appropriations and direction to federal agencies to invest in secure, effective telework capabilities and to develop needed infrastructure to ensure its stability.

**Mid-term Needs and Opportunities**

Mid-term needs are those that will occur as our nation settles into a partially open stage while scientists continue their work to find a vaccine. During this time, we expect that things won’t be “back to normal” but that we will instead be learning what the new normal looks like until a vaccine is developed and will be working to meet immediate needs and develop the ideas and infrastructure necessary to carry us into the future. Many of the needs and opportunities addressed in the near-term section will likely have to be continued and expanded (e.g., fellowship and scholarships to keep students in the STEM pipeline) while others that are for discrete actions (e.g. ramp-down of ARF) may not need to be addressed again, assuming adequate resources were supplied in the near-term. During this time, it will be important to advance effective partnership projects to ensure effective coordination and resource use. I suggest appropriating $10 million to NOAA specifically for a National Oceanographic Partnership Program (NOPP) program focused on recovery. This could include topics such as fishery enhancements, ocean exploration and mapping, coastal health and resilience monitoring, ocean modeling and predictions, and other projects as identified by NOPP leadership. Below are other examples of needs and opportunities to be addressed in the mid-term, in addition to the likely carry-over of many of those described above.

**Maintain Ocean Observing Capabilities**

- Provide $75.65 million over the next one to three years for IOOS, in agreement with the request from the IOOS Association. This includes $32 million for high frequency radars, $11.57 million for gliders, $25 million for coastal moorings, $5 million for shore stations, and $2.15 million for modeling/computing capacity to reach full resiliency.
- Provide additional support by extending observational programs, ocean and otherwise, that currently have assets deployed to maintain important time series through and beyond the crisis to track recovery and return to pre-COVID-19 levels.

**Return the Academic Research Fleet to Full Operation**

- Provide funding for COVID-19 testing and adjustments to allow for social distancing to enable safe and healthy research cruises. Once ships begin operating again, the close conditions and at-sea remoteness will make COVID-19 testing critical to avoid some of the catastrophes that have struck cruise and Navy ships alike.
- Have flexible funding available to move schedules around as research priorities and opportunities shift. This includes maintenance periods, location and duration of deployments, etc.

**Facilitate Testing and Evaluation of Innovative Technologies**

Technological advances hold great potential to create jobs, educate STEM students, and provide us with novel information about our ocean environment. Testing and evaluating these innovative technologies, to include those described in the Department of Energy (DOE)'s *Powering the Blue Economy™* initiative and related actions, is one of these mid-term opportunities that will lead to even larger dividends in the long-term. Specific actions to ensure testing and evaluation of innovative technologies include:
• Investing in partnership mechanisms that allow for greater testing and evaluation of new technologies. This includes supporting existing programs, such as NOPP, and looking for new partnership opportunities, such as pilot projects in the national marine sanctuary system.

• Advancing public-private partnerships for DOE to address thematic topics from their *Powering the Blue Economy™* report: *Power at Sea* and *Resilient Coastal Communities*.

• Providing funding to continue prize competitions that are part of *Powering the Blue Economy™*.

• Creating opportunities to accelerate a rapid transition from research to operations for new technologies that have demonstrated a high degree of readiness but that may not have gone through the existing processes necessary for operational transition.

**Enhance New Capabilities to Cohesively Support Telework**

• Provide support for establishing a government-wide platform that ensures both privacy and security to enable effective communication across agencies and sectors. Individual agencies are currently making their own decisions on processes and platforms; a more unified approach by an agency such as the National Security Agency would be more effective and secure than the current piecemeal approach.

• Show encouragement to advance innovative ideas such as NOAA’s Cloud Strategy and consider broader implementation across multiple agencies.

**Long-term Needs and Opportunities**

Even before we move into a post-COVID vaccine world, we need to be making investments that will help stabilize ocean science and technology to serve as a foundation for the new blue economy, which in turn will provide jobs and ensure the prosperity of our economy as a whole. Additionally, as we move into a post-COVID world, it’s critical that the necessary increases to COVID-19 funding don’t come at the expense of understanding our ocean. This includes increased investment in multi-sector partnership efforts, such as those under NOPP, that coordinate efforts between sectors and ensure wise use of funds.

Over the coming months, we should be thinking about how we advance new technologies and science-led initiatives towards rapid growth of the blue economy in specific areas, such as aquaculture, fisheries growth, renewable ocean energy, and ocean-related tourism, among others. What transformational technology do we need to invest in to ensure the stability and success of our people and our economy today and tomorrow? For example, people who have lost jobs in the travel industry due to the pandemic won’t have the same job to go back to as many will remain leery of travel. But what could we do with a virtual travel experience to both provide jobs as well as a new type of recreation?

We should also be considering if the workforce of today meets the needs for the future, and if not, what sorts of education and training are necessary to transform the workforce? Do we have the needed technology and partnerships to achieve the ocean mapping and exploration goals set out a mere six months ago in the presidential *Memorandum on Ocean Mapping of the United States Exclusive Economic Zone and the Shoreline and Nearshore of Alaska*? What changes need to occur to ocean-STEM to ensure it meets the national security and maritime needs of the future? Given our rapid, forced insertion into virtual learning models, how can we profoundly use and advance these models toward
more effective STEM initiatives at all levels that bridge geographic constraints and boundaries – nationally and globally?

Thank you for your consideration of this request, and I would be happy to talk with you in more detail at any time. We will be in touch over the coming months, particularly related to more specific mid- and long-term needs.

Respectfully,

Jonathan W. White, RADM (Ret.), USN
President and CEO
Consortium for Ocean Leadership

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**Consortium for Ocean Leadership Member Institutions**

Alaska Ocean Observing System • Alaska Sealive Center • Aquarium of the Pacific • ARCUS • ASV Global, LLC • Bermuda Institute of Ocean Sciences • Bigelow Laboratory for Ocean Sciences • Chevron USA • College of William & Mary • Consumer Energy Alliance • Cooperative Institute for Research in Environmental Sciences • Dauphin Island Sea Lab • Duke University • Earth2Ocean • East Carolina University • Eastman Chemical Company • Esri • Estuaries & Ocean Science Center, San Francisco State University • Exocetus • FAU Harbor Branch Oceanographic Institute • Florida Institute of Oceanography • Harte Research Institute • Hubbs-SeaWorld Research Institute • IEEE Oceanic Engineering Society • Institute for Global Environmental Strategies • Institute for Marine and Antarctic Studies (UTAS) • JASCO • Johns Hopkins University APL • L-3 MariPro, Inc. • Lamont-Doherty Earth Observatory • Liquid Robotics, Inc. • Louisiana State University • Louisiana Universities Marine Consortium • MARACOOS • Marine Technology Society • Massachusetts Institute of Technology • MBARI • MIST Cluster program • Mote Marine Laboratory Urban Coast Institute • Moore Foundation • Moss Landing Marine Laboratories • Mystic Aquarium • National Aquarium • NERACOOS • New England Aquarium • NOIA • North Carolina State University • North Pacific Research Board • Nova Southeastern University • Old Dominion University • Oregon State University • Pennsylvania State University • Rutgers University • Saildrone • Savannah State University • Sea-Bird Scientific • Severn Marine Technologies, LLC • Shell • Skidaway Institute of Oceanography of UGA • Sonardyne, Inc. • South Carolina Sea Grant Consortium • Stanford University • Stony Brook University • SURA • Teledyne CARIS • Texas A&M University • The IOOS Association • U.S. Arctic Research Commission • U.S. Naval Postgraduate School • UCSD Scripps Institution of Oceanography • University of Alaska Fairbanks • University of California, Davis • University of California, Santa Barbara • University of California, Santa Cruz • University of Delaware • University of Florida • University of Hawaii • University of Maine • University of Maryland Center for Environmental Science • University of Massachusetts, Dartmouth • University of Miami • University of New Hampshire • University of North Carolina, Chapel Hill • University of North Carolina, Wilmington • University of Rhode Island • University of South Carolina • University of South Florida • University of Southern California • University of Southern Mississippi • University of Texas at Austin • University of Washington • University of Wisconsin, Milwaukee • Vulcan, Inc. • Woods Hole Oceanographic Institution