December 16, 2019

NOAA Research Council
Office of Labs and Cooperative Institutes, NOAA Research
1315 East-West Highway
Silver Spring, MD 20910

Dear NOAA Research Council:

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 appreciate the opportunity to provide comments on the four draft National Oceanic and Atmospheric Administration (NOAA) Science and Technology Strategies: Unmanned Systems (UxS), Artificial Intelligence (AI), ‘Omics, and Cloud. These four emerging technologies play an increasingly critical role in helping us understand our ocean and in ensuring data accessibility. The role of ocean science and technology in underpinning a healthy, sustainable, and productive ocean is essential to strengthening our national and homeland security; growing our economy; and ensuring food, water, and energy security — a concept I refer to as ocean security.

Rather than address specifics of each strategy, I’d like to highlight a few crosscutting themes that are crucial to the success of each. While most of these were touched on to some extent in individual drafts, their adequate inclusion in each is crucial to advancing all of these technologies and strengthening our ocean security.

Leverage Partnerships to Build Capacity and Facilitate Innovation

I am encouraged to see not only direct support for research and development (R&D) but a holistic approach to building NOAA’s technological capabilities, specifically through support for partnerships. Leveraging the combined power of public and private interests will help ensure new technologies are used in the most effective manner and in service of the best science. I am specifically pleased to see integration with other federal agencies, the private sector, and academia through implementation of the Commercial...
Engagement Through Science and Technology (CENOTE) Act (P.L. 115-394) and formal MOUs as described in Goal 4 of the UxS strategy, as well as through the National Oceanographic Partnership Program (NOPP) in the UxS and AI strategies. These partnerships ensure premier science unites with the most advanced technology to grow our knowledge of the marine environment. The past successes of existing programs, such as NOPP, show that these vehicles have significant potential to further boost the role technology has in ocean security moving forward, and I urge adoption of these programs as tools to achieve optimal success in all four strategies.

However, I further believe the strategies can do more to adequately advance partnerships by ensuring successful existing collaborations are acknowledged and are part of the strategies moving forward. For example, the UxS draft doesn’t mention extramural partnerships, which, through cooperative institutes and the Integrated Ocean Observing System (IOOS) Regional Associations, have played a vital role in augmenting NOAA’s ocean observing capacity. Each of the strategies would surely benefit from utilizing the full potential of the entire ocean sciences community, and I suggest they encompass explicit references to all partners moving forward.

Grow the Blue Technology Workforce Through Education At All Levels
Investment in workforce development also represents a key aspect of advancing ocean science R&D. Providing timely training opportunities in emerging technology creates a more adaptive and agile workforce that is better equipped to keep pace with rapid technological advancements and produce the most effective, qualified, and highly trained workers. I am pleased to see inclusion of efforts to promote professional development opportunities, such as hands-on training and formal certifications in the UxS and AI strategies, and suggest these programs would be beneficial to ‘Omics and Cloud as well. I also strongly support the call to expand recruiting efforts by targeting fellowships, rotational assignments, and interservice transfers as stated in the AI, ‘Omics, and UxS strategies.

While I am pleased to see opportunities for entry-level technicians to senior-level professionals, I recommend acknowledging the importance of earlier investments in workforce development in each strategy. Objective 5.5 of the AI strategy encourages “graduate programs and cooperative student training,” and I believe this type of engagement would be beneficial to the other three strategies. Involving graduate and undergraduate students with developing ocean technologies builds a stronger pipeline of potential scientists and managers. Even engagement of middle and high school students through outreach activities, such as the National Ocean Sciences Bowl and activities of NOAA’s Office of Education, will help ensure the long-term sustainability of NOAA’s technological proficiency and the ocean science workforce as a whole. After all, if students don’t recognize ocean science and technology as potential career paths, we won’t have a workforce to be training.
Use Interoperability as a Guiding Principle for All Strategic Planning

Several of the draft strategy goals call for improved coordination and operational capabilities across NOAA, which will certainly serve to centralize valuable data and increase efficiency within the agency. For example, the Cloud strategy asserts a need for consensus and open standards-based frameworks and solutions, and Objective 1.3 of the UxS strategy calls for implementation of a robust and encompassing data enterprise. These are important steps in ensuring information is exchanged as efficiently as possible.

However, I believe each of the strategies would be well-served by a stronger call for interoperability, both across the federal government and with non-federal partners. Objective 3.2 of the ‘Omics draft and the guiding principles of the Cloud strategy reference interoperability as important for simplifying data use. Improvements in information exchange and transparency would not only make data more accessible within NOAA but would also promote collaboration with other federal agencies and academic and private partners. Therefore, I suggest integrating broader and more robust interoperability efforts into each of the strategies to ensure a unified approach.

Ensuring National Leadership to Strategically Guide the Nation

Finally, I encourage consideration of the broader context in which to implement these draft strategies. As the paramount federal leader of marine science and the blue economy, NOAA should place more emphasis on the agency’s leadership in formulation of a national strategy for ocean health and sustainability moving forward. NOAA is uniquely poised to unify the knowledge and resources of different sectors. While partnerships, workforce development, and R&D investments within NOAA provide an essential foundation, articulation of a national vision would provide a strong, shared plan of action to which all sectors can contribute. This vision may include interoperability and data-sharing across agencies and even collaboration with international partners to address the challenges of our shared ocean. I recommend this leadership also include robust, early investment in ocean science and technology education.

Thank you again for the opportunity to provide comments and for your work in advancing these technologies. I appreciate all NOAA has done to advance our ocean security, and I would be happy to meet with agency leadership at any time to discuss this topic and these recommendations in more detail.

Respectfully,

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