



Alaska Ocean Observing System

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The Honorable Jared Huffman
Chair,
Subcommittee on Water, Oceans and Wildlife
House Natural Resources Committee

Dear Representative Huffman:

Thank you for providing me the opportunity to testify May 8 before the Subcommittee on Water, Oceans, and Wildlife on reauthorization of the Integrated Coastal Ocean Observing System Act and the National Sea Grant College Program. Attached are my responses to the subcommittee's follow-up questions. If you have any additional questions, please don't hesitate to contact me.

Sincerely,

A handwritten signature in black ink that reads 'Molly McCammon'.

Molly McCammon, Executive Director
Alaska Ocean Observing System

Responses from Molly McCammon to questions from Rep. Jenniffer González-Colón of Puerto Rico

1. Ms. McCammon, as you are aware, in Puerto Rico we have one of the Nation's 11 IOOS Regional Associations: the Caribbean Coastal Ocean Observing System, or CARICOOS.

CARICOOS' assets were vital when Hurricane Maria struck the U.S. Caribbean in 2017. For example, while Puerto Rico was without power & communications, CARICOOS' buoys kept reporting data via satellite, providing crucial information that was utilized by NOAA's National Hurricane Center in Miami and other stakeholders.

Can you discuss the role IOOS and the network of regional coastal observing systems play in helping coastal communities across the United States prepare for and respond to natural disasters and extreme weather events?

The IOOS network of regional coastal observing systems provides a variety of data and information to assist communities in preparing and responding to extreme events. Real-time data and models provide emergency managers with information before, during and after events to aid decision-making, preparation and recovery. Weather data from ocean moorings and shore stations augment observations made by Federal agencies and improve models and forecasts and provide valuable local information. In remote areas like Alaska and the Caribbean, these weather observations provide some of the only available information. Alaska is also piloting the use of alternative technologies to monitor water levels to be used in storm surge and flooding models and forecasts. These tools and a new data integration portal are being developed so they can be used in other areas of the U.S. in need of additional water level observations.

Underwater profiling gliders operate along the Atlantic coast during hurricane season to monitor the heat content of the ocean, a major driver of storm intensity. Land-based high frequency radars detect the speed and direction of surface currents that provide critical information to mariners, search and rescue operations and emergency response teams.

On the west coast and Pacific Islands, the IOOS Regional Associations, along with several state and federal partners, also provide alerts and information on tsunamis.

2. Are there any other specific examples you can think of in which IOOS assets, perhaps in Alaska or any of the other regions, proved crucial during disasters?

All eleven IOOS regional data portals are certified for complying with federal data standards and IOOS data are made available through a variety of pathways so the data are seamlessly accessed by many stakeholders, including Federal agencies. The regional systems are a trusted source of information about key oceanographic features that impact storms, flooding and other extreme events and enhance warnings and forecasts.

Some examples include:

- *The Northeastern Regional Association of Coastal Ocean Observing Systems (NERACOOS) operates tide gauges along the New England coast. The data are critical*

to NOAA, emergency managers and the US Geological Survey who issue flood warnings and initiate evacuation orders for communities.

- In Alaska, AOOS is working with NOAA to develop low-cost, low-power water level sensors to serve the state's extensive coastline which has little access to power. These new data streams are being used to pilot a new Tier B Water Level data portal that can be used throughout the U.S.
- In Florida, the City of Sanibel and Lee County depend on IOOS data for emergency operations.
- In North Carolina, the buoys operated by the Southeast Coastal Ocean Observing Regional Association (SECOORA) provided the first line of observations as Hurricane Florence moved toward the coast. According to the local forecast office, the mooring data helped characterize the hurricane's eye wall and conditions that would be felt during the passage of the storm.

These are just a few examples of the way IOOS data and information minimize the impact of extreme storms. Through the IOOS data management system, the data are provided automatically to national and global data systems and used by modelers and forecasters to improve warnings and alerts. As a trusted source of regional information, emergency managers and others depend on the data to inform local decisions.

3. Can you discuss how important IOOS data is to help promote beach safety? In Puerto Rico, for example, CARICOOS provides estimates of breaking wave heights for many of the most popular beaches on the Island and helps monitor water quality.

In addition to the online tool that CARICOOS operates for breaking waves, all RAs have developed data and information tools for beach and water safety. These vary from providing real-time information on beach and ocean conditions via live videos from webcams to information on real-time and forecasted weather and sea conditions available through a "text-a-buoy" app in the Great Lakes and through regional data portals elsewhere. Forecasts on ocean currents provided by the Mid Atlantic Regional Association for Coastal Ocean Observation System (MARACOOS) and SECOORA are used to predict dangerous rip tides. In the Northeast, NERACOOS supports a coastal flooding and erosion forecast tool. In Hawaii, the Pacific Islands Ocean Observing System (PacIOOS) supports a Hawaii Beach Safety tool that provides warnings of dangerous beach conditions. SECOORA's "[How's the Beach?](#)" app posts daily swimming advisories for Myrtle Beach, SC and Sarasota, FL based on the relationships between bacteria level and rainfall, salinity, wind conditions, and water temperature.

Several RAs support forecasts and warnings about possible nearshore harmful algal blooms. The Gulf of Mexico Coastal Ocean Observing System (GCOOS) provides data for forecasts that predict respiratory risk due to red tides along the west coast of Florida. The Southern California Coastal Ocean Observing System (SCCOOS) publishes a monthly [California Harmful Algal Bloom Bulletin](#), which provides predictions for where ocean conditions are likely to promote algal growth. This experimental product gives the public and resource managers a quick outlook of recent toxic algal blooms in coastal California, offering information on water quality. The Alaska Ocean Observing System and Alaska Sea Grant are taking the lead in

supporting the Alaska Harmful Algal Bloom Network and developing new observing capabilities for the Arctic, which is starting to experience HAB events.

4. Ms. McCammon, in your statement you also discuss the importance of the National Sea Grant Program. Puerto Rico Sea Grant is one of the 33 Sea Grant college programs across the United States. Based at the University of Puerto Rico, the program produces vital research to assess coastline erosion, develops strategies for the sustainable use of fisheries, and its reef restoration efforts has contributed to the Island's growing tourism-based economy. As executive director of one of the Nation's 11 IOOS Regional Associations, can you discuss how the Sea Grant Program complements the IOOS?

Sea Grant's network of local and regional extension agents works closely with fishermen, aquaculturists, state agencies, local agencies, citizens and businesses to understand their needs and to develop science and information services to address those needs. The need for information and services about our oceans and coasts is rapidly increasing since nearly half the U.S. population lives on or near the coasts. The Sea Grant and IOOS programs work collaboratively to ensure stakeholders have the information and understanding they need to respond to changing environmental conditions and to make decisions about their lives and livelihoods.

The examples of collaboration include sharing information on emerging issues and changing conditions, pooling resources to address issues such as harmful algal blooms, ocean acidification, and sea level rise and minimizing the impact of disasters and extreme weather events. Sea Grant's expertise in education often informs how IOOS designs the delivery of information to ensure it is readily accessible and relevant. IOOS information provides critical support for research and outreach and education that Sea Grant conducts. In addition, both programs draw from their connections with NOAA and other federal agencies to bring Federal expertise and resources to bear on local problems. Together, the two programs are greater than the sum of their parts, in terms of their impact and usefulness to the coastal and Great Lake communities we serve.

5. In your written statement you provide a list of collaborations between the National Sea Grant and the IOOS programs. Can you elaborate on how such partnerships strengthen and empower coastal communities and stakeholders across the U.S.?

Central to the effectiveness of both the IOOS and Sea Grant programs is their commitment to making research, observations and information relevant to the needs of local stakeholders. Both programs address national issues, goals and policies that manifest themselves differently at the local and regional scale depending on the region's unique geography, oceanography, communities and economies. Through their outreach to stakeholders, Sea Grant and IOOS seek to understand the issues facing coastal communities and design and implement research and observing program specifically to address those needs. The needs for such tailored information, research, observations, and education is growing as changing conditions in our oceans and Great Lakes offer both challenges and opportunities.

Looking to the future, IOOS and Sea Grant are poised to enhance their strategic partnerships to achieve mutual goals, expand opportunities to minimize the impact of extreme weather and to use research, extension and observing capabilities to increase economic opportunities for fisheries, tourism, aquaculture, and maritime commerce.

6. What actions can we pursue in Congress to strengthen the National Sea Grant Program and the Integrated Ocean Observing System?

Reauthorizing the Integrated Ocean Observing System and National Sea Grant program for an additional five years with appropriate funding levels will demonstrate Congress' strong and bipartisan support for these programs. Such an endorsement is critical for the continuation of these programs and to ensure stakeholders have uninterrupted access to data, information, research and education. Reauthorization of both programs would send an important message to NOAA and the Administration about the importance of these program to the nation's economy and the health of the oceans and Great Lakes. The reauthorizations would also strengthen the nation's ability to address the challenges and opportunities of ensuring healthy coastal economies and environments to adapt to future changing circumstances.