

Statement Testimony of
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Committee on Appropriations
Subcommittee on Commerce, Justice, Science and Related Agencies
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Chairman Wolf, Ranking Member Fattah, and Members of the Subcommittee, thank you for the opportunity to appear before you today. I am Vice Admiral Conrad Lautenbacher (Ret), former Administrator of NOAA and a current Director on the Board of the South East Coastal Ocean Observing Regional Association (SECOORA). SECOORA is one of 11 regional observing systems partnered in the U.S. Integrated Ocean Observing System (IOOS).

I am pleased to testify in support of the U.S. Integrated Ocean Observing System (IOOS). Congress mandated this program in 2009, and significant progress has been made since then.¹ IOOS has proven uniquely capable of efficiently meeting our nation's needs for coastal and ocean observations, both now and for the future. In FY 14, we are requesting an investment of \$46.5 million for IOOS. This request includes:

- *\$6.5 million to support the U.S IOOS Program Office (administratively housed within NOAA's National Ocean Service) to serve central functions of system architect, coordination of the Federal agencies, standard development and program administration;*
- *\$40 million to support regional observing systems, including*
 - *\$25 million for the 11 Regional Associations to*
 - *continue operation of buoys, gliders, and other observing assets,*
 - *deliver of data and decision-support products, including nowcast/forecast models, and*
 - *upgrade operational capability for extreme event response,*
 - *\$5 million to sustain priority high frequency radar systems, and*
 - *\$10 million to support innovations in sensor technology.*

Together, the national program and regional systems are sustaining and working to upgrade our Nation's capability to deliver reliable ocean observations and products, including model innovations that support our Nation's weather forecasting enterprise.

Background

As the NOAA Administrator from 2001-2008, I oversaw the establishment of the U.S. IOOS Program Office, which is housed in NOAA, in recognition of our critical need for a reliable coastal ocean observing system to improve weather forecasting, facilitate safe and efficient marine operations, protect and maintain water quality, critical fish habitat and ecosystems, detect changes in our coastal ecosystems and coastal climate, and provide daily tactical support of

¹ Integrated Coastal Ocean Observing System Act of 2009

military operations worldwide.

IOOS is user-driven, science-based and policy neutral. It is a partnership of federal agencies, regional observing systems and the private sector that uses state-of-the-art data integration and communication to build a “system of systems” to provide timely and reliable information to those who depend on it for their lives and livelihoods.

I now serve on the Board of one of the 11 regional observing systems - SECOORA. SECOORA is a nonprofit operating in the marine waters of the southeast states of North Carolina, South Carolina, Georgia and Florida. We support operation of 12 offshore buoys, 15 high frequency radar systems, nine nearshore monitoring stations, and provide single portal access to most of the available real-time data being collected in the southeast. Additionally, our partners in the academic sector are providing nowcast/forecast models of ocean circulation, water level, currents, surge and inundation, and water quality. We include stakeholders from the private sector, academia, state agencies, marine operators, and federal agencies. Our outreach and product delivery meet the needs of an even broader array of decision makers including National Weather Service Weather Forecast Offices, recreational and commercial mariners and fishers, the U. S. Coast Guard, and coastal planners and managers, to name but a few. We are on the ground and efficiently operating to provide critical marine and coastal data that saves lives, protects property and provides jobs.

Our nation’s health, prosperity and security are directly linked to the ocean, making support for IOOS critical both now and for the future. U. S. IOOS is a unique national capability that has repeatedly demonstrated its value. This capability is necessary to meet our nation’s current and future needs for sustained ocean observations and products.

U. S. IOOS has been tested by extreme events and proven its worth. I provide three examples.

Superstorm Sandy: IOOS Responds to Extreme Events

We learned firsthand during Superstorm Sandy how important weather forecasts are – accurately forecasting the trajectory and **intensity** of these storms saves property and saves lives. Evacuating the wrong neighborhoods and communities costs between \$1 million to \$50 million per mile of coastline (Whitehead, JC 2003 Ocean and Coastal Management pm 1069-1083) but not evacuating leaves lives and property at risk. Decision makers at all levels, ranging from the private sector to US Navy Headquarters, relied on IOOS information.

IOOS supports marine transportation: Prior to landfall, the marine transportation industry began to make preparations based on forecast products derived from IOOS observations. In the Port of NY and NJ, all vessels were moved from anchorages in the Harbor. Many vessels were diverted from the Port of NY and NJ to other east coast ports that had the capacity to handle the cargo volumes and types. In just two ports, more than 23,000 TEUs were safely delivered and then trucked or shipped via rail to the NY-NJ metropolitan region. This ensured that the critical Christmas shopping season occurred without disruption. Further, 6700 containers were diverted to Virginia due to Hurricane Sandy. The cost estimate for these containers is approximately \$1 Billion (Marine Technology Society TechSurge Event 2012).

IOOS supports our military readiness: Navy's Atlantic Fleet Headquarters sortied approximately 80 ships out of Hampton Roads ports and shipyards at a cost of 10M 2-3 days prior to the onset of 50 knot sustained winds associated with Sandy. All safely exited with no damage or loss of life. NOAA advanced warnings from IOOS observations were deemed crucial to a safe evacuation in a timely and orderly fashion. Based on historic damage to the fleet from past hurricanes, a storm of Sandy's magnitude otherwise could have caused \$500M in damage to ships and pier facilities. Sustained winds of 50 knots or greater causes damage to both the pier and the ship (Marine Technology Society TechSurge Event 2012).

IOOS supports local communities: In Hoboken, New Jersey, 1,700 buildings were severely flooded, impacting up to 34,000 people. These people were spared discomfort, injury, or worse from advanced warnings provided by NOAA. All information came from (IOOS) high-resolution storm surge forecasts. The Mayor ordered an evacuation of "all ground floor apartments" by midnight Sunday night. This single decision saved a significant number of lives, because there are thousands of street-level and basement-level apartments in the city. The Mayor also advised against leaving cars in low-lying areas of town – advice that saved thousands of cars from damage, as any car left on all but a few streets in the city were at least partially submerged in salt water (Marine Technology Society TechSurge Event 2012).

IOOS supports the energy sector: Buckeye Partner Pipeline in NJ was the first utility company to come back online, within 48 hours. Per Patrick Hodgins, Houston –based Director, Buckeye Partners Pipeline was the only utility to use an industry service provider, Impact Weather (www.impactweather.com), to lead their prep work, which started 7 days prior. Impact Weather, like the vast majority of private firms, does not collect their own data but relies exclusively on NOAA products and services (Marine Technology Society TechSurge Event 2012).

Superstorm Sandy was unprecedented in its size and impact on the mid-Atlantic and northeastern regions of our country. We can all hope that this type of storm is not a new normal. Both before and during the storm U.S. IOOS provided critical data that helped emergency managers prepare to protect lives and property, and enabled scientists and weather forecasters to better understand the storm's track, intensity and the resulting storm surge.

However, our understanding and forecasts of hurricane and extratropical storm *intensity* must be improved. While significant gains have been made in recent years to forecasts of storm tracks, little improvement has been demonstrated over the past 20 years for storm intensity – **in large part due to a lack of real-time data along the storm paths**. Recent extreme events, including Superstorm Sandy and last year's Hurricane Irene, tragically reflect the need for enhancement of the nation's observing and forecasting capabilities to meet the growing demands for accurate predictions of impacts.

This FY 14 budget request will provide a small initial investment in extreme event readiness for each of the 11 IOOS Regional Associations. The critical infrastructure that supports the nation's readiness for the next extreme weather event, whether it's a hurricane baring down on the east coast, tsunami and flood on the west coast or extreme thunder storms in the Great Lakes region must be operational and ready to deliver. I am suggesting that we begin to make the necessary investment.

This request is in addition to funding of \$22.5 million that was requested through the Sandy Supplemental Appropriations Process to improve hurricane intensity forecasting in the five IOOS regions along the North Atlantic Storm Pathway. Assuming the funding appropriated by this Congress and initiated by this committee through H.R. 152 (\$25 million to improve weather forecasting and hurricane intensity forecasting capabilities, to include data assimilation from ocean observing platforms and satellites) is applied by NOAA in the regions (IOOS Caribbean, IOOS Gulf of Mexico, IOOS Southeast, IOOS Mid-Atlantic, and IOOS Northeast) to address hurricane intensity forecast improvements, then the additional funding we are requesting will begin to fill some of the most critical gaps in our national observing system, repair and upgrade aging systems that have been operating for over 10 years, and harden a portion of our communication systems to bolster reliability during events.

Deepwater Horizon Oil Spill

IOOS also demonstrated its value during the tragic Deepwater Horizon Oil Spill. The IOOS data management system rapidly and efficiently allowed for the seamless integration of data from non-federal sources for use by the Unified Area Command. Prior to this, valuable non-federal information collected by universities, state agencies or private companies was not assessable to federal responders. The IOOS data management system, based on interoperable standards and services, now allows for the integration of data from all relevant sources. In fact, approximately 75% of the data now served by NOAA's National Weather Service through the National Data Buoy Center is from non-federal sources, most of which is directly attributable to the work being done and supported by the Regional Associations.

Information on surface currents from regional radars and models were provided to NOAA to assist with their daily projection of the location of the oil slick. Much of the oil from the spill remained subsurface where, despite the availability of technology, we lacked the ability to readily monitor the flow of oil. IOOS, through its regional network, redeployed several underwater gliders from around the country to assist with subsurface monitoring efforts. This unique and flexible capability is one of the hallmarks of the IOOS system.

We must learn from these experiences and invest in critical observing assets so that when the next event – a spill, a hurricane, a flood - happens, we are able to provide emergency managers and others with the best possible information. Without this capability, response and recovery operations will be negatively impacted, and federal responders will be forced to deploy people and ships during the event at much higher cost, and with higher risks to lives and property.

Real-time Surface Current Information Aids Search and Rescue

One of the unique capabilities IOOS funding supports is the nation's surface current observing network, a system of land-based radars. These radar systems are able to detect the speed and direction of ocean currents regardless of cloud coverage. This information is relayed in real time to the Coast Guard's environmental data server for use in search and rescue operations. The results of a four-day test in July 2009 showed that when HF radar data were ingested into the Search and Rescue system, the search area was decreased by 66% over a 96-hour period. This decrease in search area represents significant savings, both in lives and decreased search and rescue operational cost. A National Surface Current Mapping Plan

estimates that \$20 million is needed to build out this system nationwide. Our request to maintain current funding levels of \$5 million will insure the priority radars currently operating continue to do so.

Wise Investment

An independent cost estimate of the IOOS system, conducted by the Jet Propulsion Laboratory Science and Technology Directorate and submitted to Congress on November 9, 2012, estimates that the *fully developed* system – federal and regional, including weather and ocean satellites - to address key societal needs in next 15 years cost \$54 billion. The regional component, as identified in regional build out plans, is estimated at \$534 million annually to fulfill needs of users for timely and quality information. At current funding levels for the regional systems near \$25 million a year, we are only beginning to build the capacity necessary to meet user demands.

Conclusion: IOOS Leads to Innovative Solutions

In tight fiscal times, IOOS provides a pathway for bringing forward new solutions, and will play an ever-increasing role in meeting our Nation's need for coastal ocean data and information. IOOS is a flexible system that can facilitate the transition from research and development to operations. IOOS's capability to move vital observing assets from research institutions into operations in support of federal response missions has been demonstrated, and will continue to be deployed to address unexpected events around the country. Regional observations are efficiently filling critical gaps not currently being met by our federal partners. IOOS is harnessing the flexibility and innovation of private and academic research and development capability.

The networked capability represented by IOOS works, and has repeatedly demonstrated its value. **IOOS is unique; IOOS is efficient; and IOOS is the future.**

In closing, I want to thank Chairman Wolf, Ranking Member Fattah, and Members of the Subcommittee for allowing me to provide input on fiscal year 2014 appropriations. I ask for the Committee's support for \$46.5 million for U.S. IOOS to assure the critical ocean observations, data communications, and modeling infrastructure needed to support our Nation's ocean and coastal decision-makers remains operational.