Expanding Community Flood Resilience Through Partnerships with US Integrated Ocean Observing System Regional Associations

Debra Hernandez[1], Abbey Wakely[1], Jennifer Dorton[1], Holly Kent[2], Molly McCammon[2], Sheyna Wisdom[2], and Josie Quintrell[3]

[1]Southeast Coastal Ocean Observing Regional Association (SECOORA), [2]Alaska Ocean Observing System (AOOS), [3]IOOS Association

Abstract

Coastal communities face compound threats of storm surge, extreme rainfall, and rising sea level. Additional high-density water level observing, and modeling are necessary for decision-making, e.g., flood forecasting, informed emergency response, ecosystem management.

The 11 US Integrated Ocean Observing System Regional Associations (RAs) are a network for addressing national issues at local scales. RAs conduct community engagement, observing, modeling, information products, and data management. Partnerships between communities and RAs provide an effective framework for tailoring solutions to local needs while simultaneously providing national-scale consistency and interoperability to effectively share best practices and leverage resources to address flooding issues. All RAs have five-year operating plans that address monitoring and forecasting water levels. Two examples of expanding water level networks in Alaska and the Southeast are presented.

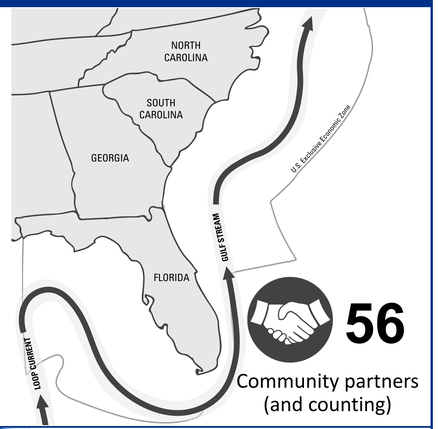
Alaska's extensive and remote shorelines are some of the most under-instrumented coastal areas in the US. Augmentation of the existing water level network in Alaska requires collaborative, opportunistic, and innovative instrumentation in close coordination with established monitoring strategies. The Alaska Ocean Observing System established the Alaska Water Level Watch (AWLW) to improve the quality, coverage, and accessibility to these observations in Alaska's coastal zone. AWLW is a partnership with the state of Alaska, federal agencies and private sector to install, test, and maintain alternative affordable water level technologies in remote areas.

The Southeast US is plagued with nuisance flooding, which leads to inconveniences and public safety challenges, and is becoming increasingly common as sea levels rise (Sweet et al., 2019). The current density of water level data is not adequate to understand variations at the appropriate spatial and temporal scales required for decision making. In partnership with communities, academia, and government, the Southeast Coastal Ocean Observing Regional Association (SECOORA) has initiated a regional water level network to install 200 new stations over the next five years. These stations will provide localized flooding alerts, support flooding and storm surge modeling, and augment long-term sea level rise monitoring.

SECOORA

Southeast Coastal Ocean Observing Regional Association

Water Level Partnership is deploying ~200 sensors to provide decision-support for communities.



56
Community partners (and counting)

Low-cost water level sensors being deployed in North Carolina by Mike Muglia, East Carolina University – Coastal Studies Institute

> "The Kiawah Island community is regularly faced with nuisance flooding challenges related to sea level rise. A water level monitoring sensor in our community will allow our stormwater engineers and emergency management staff to plan for and manage nuisance flooding."

Resilience Specialist of the Kiawah Island Community Association in South Carolina

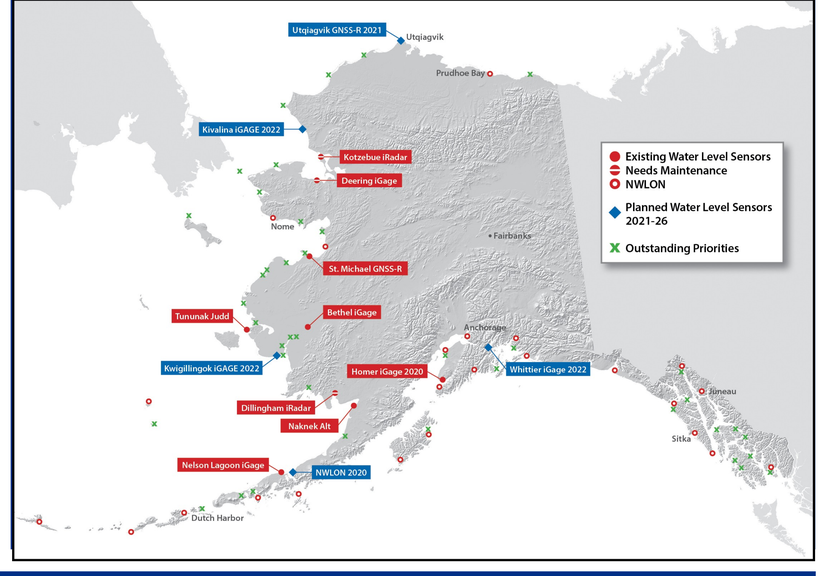
AOOS

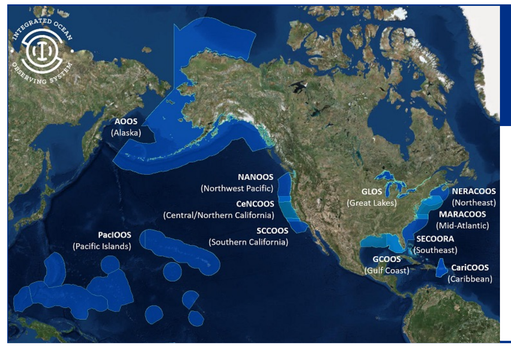
Alaska Ocean Observing System

New pilot technologies can help fill water level gaps.

GNSS/GPS reflectometry water level station with remote power module in St. Michaels, Alaska

Water Level and Datum Observations AOOS





IOOS Regional Associations provide tailored solutions specific to the unique characteristics of each region while providing integration with federal programs and agencies.

- Data Management Expertise
- Modeling and Observing Infrastructure
- Sustained Regional Presence and Network
- Federally Certified