Opportunities & innovations in monitoring for improving coastal hazard resilience

Debra Hernandez SECOORA

Coastal Observations and Modeling Systems



www.secoora.org



A IDOS Integrated Ocean Observing System

Overview

- SECOORA 101
- Data Management capabilities
- SE Observing System Strategic Operations Plan
- Ongoing Modeling and Observing Projects
- Gaps & Opportunities







AOOS (Alaska)

> NANOOS (Northwest Pacific) CeNCOOS (Central/Northern California)

PacIOOS (Pacific Islands) SCCOOS (Southern California) GLOS (Great Lakes)

NERACOOS (Northeast) MARACOOS (Mid-Atlantic) SECOORA

GCOOS (Gulf Coast)

CariCOOS (Caribbean)





Who We Are: A Coastal Ocean Science Non-Profit

www.secoora.org/about

SECOORA Members



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Southeast Coastal Ocean Observing

gional Association



Who We Are: A Coastal Ocean Science Non-Profit

MISSION

SECOORA's mission is to observe, understand, and increase awareness of our coastal ocean; promoting knowledge, economic and environmental health through strong regional partnerships. 5 YEAR SECOORA is the recognized leader, valued partner, and go to source for VISION coastal ocean information in the southeast.







SECOORA Core Investments

Observations



Data Management



Data Management



Models & Data Products

SECOORA Data Portal Marine Weather Portal





How's the Beach? App



Education & Outreach





Student Awards

Science Festivals

Certification & Data Management



SECOORA meets federal standards for:

- Data gathering
- Data management
- Long-term archiving

Operate:

- inclusively
- transparently
- solicit input





Axiom Data Science maintains SECOORA's data management system, data catalog, and data portal. Axiom assures that all data management systems are highly redundant to assure data are always available.

portal.secoora.org











This document presents the Southeast Coastal Ocean Observing Regional Association (SECOORA) priorities for contributing to our improved understanding, management, and stewardship of valued coastal ocean resources. It will serve as a guide for future investments in SECOORA's regional coastal ocean observing system (RCOOS).



Regional Coastal Ocean Observing System Plan

- Finalized December 2019
- Guidance for SECOORA future research and technology investments including 2020 IOOS proposal development.









Marine Operations Marine Safety; Rip Currents; Offshore Resources Ecosystems: Living Marine Resources and Water Quality Fisheries Fisheries; Ocean Sound; Public Health; HABs; Coral Health; Coastal and Ocean Acidification

Coastal Hazards and Climate Variability Storm Tracking and Forecasting; Coastal Flooding and Sea Level Rise

https://secoora.org/regional-coastal-ocean-observing-systemstrategic-operational-plan/





Regional Coastal Ocean Observing System Plan

Coastal Flooding and Sea Level Rise



Challenges

- Meeting demand for water level data with the current limited spatial coverage.
- Installation, maintenance, and calibration of webcams to • accurately determine water level and flood extent.
- Fully coupling terrestrial water inputs and coastal ocean • dynamics to understand storm surge and water quality impacts.

The SECOORA footprint spans the eastern side of Gulf of Mexico to South Atlantic Bight and is connected by the Loop Current-Florida Current-Gulf

Daniel Pullen Photography

Regional Coastal Ocean Observing System Plan

🌾 Coastal Flooding and Sea Level Rise 🌾





Supporting the Southeast & Caribbean Disaster Resilience Partnership SECOORA Southeast Coastal Ocean Observing Regional Association

Regional Coastal Ocean Observing System Plan

Coastal Flooding and Sea Level Rise

Identified Future Investment Opportunities

Observing Assets

- Invest in additional buoys and coastal stations that collect meteorological and physical oceanographic core variables.
- Install webcam to observe real-time water level changes.
- Use drones to monitor shoreline change and flooding hotspots.
- Partner with organizations and communities to install
 low cost water level sensors

Modeling

 Incorporate coastal ecosystem data into models to address impacts of storm surge and sea level rise on natural environments (e.g. marsh, mangroves) and built environment.

Data Management and Communications

- Partner with SWaTH network to share water level and wave data, post-storm event.
- Work with partners to standardize beach camera image processing for coastal flooding and shoreline change detection.



Integrated Coastal Water Predictive Capability to Promote Resilience to Water Risks

Goal

Deliver new water intelligence products and information vital for decision making both during high-impact events, such as hurricanes, nor'easters, and storm surge, and for routine water management.

Focusing on Two river-ocean subsystems:

- Pamlico Sound in North Carolina
- St Johns River in Florida







Building an Observing Network with Low-Cost Webcams



- \$1.1 million grant to launch a sustained network of low-cost webcams throughout the Southeast
- Build off a successful pilot project WebCAT
- Standardized data processing and management methodology



Example of a product using web camera data. Time-average (top), time-variance (bottom) and time-stack (right) images are calculated from video segments from the Miami, FL camera. These products support identification of morphological features, shoreline position and wave runup and overwash. Credit: Dusek et al., 2019.

Gaps and Opportunities

Gaps/Challenges

Data

- Observations
- Metadata & standards
- Accessibility

Models

- Requirements
 - Resolution
 - Products, communication formats
- Coupling

Opportunities

- New, lower cost sensors
- Community-driven data standards
- Data assembly center/portal
 - portal.secoora.org, others
- Partnership



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Q&A

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Back up slides

Coastal Observations and Modeling Systems



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