Southeast Coastal Ocean Observing Regional Association

SECOORA and Observing In Action: North Carolina

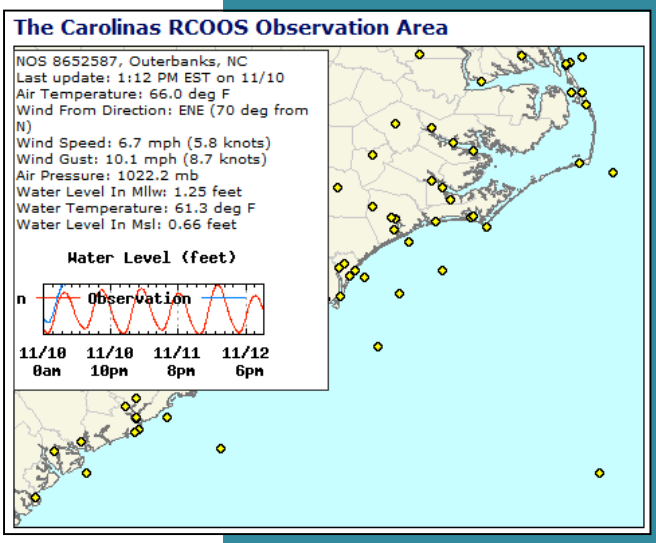
Monitoring the Southeast's Coasts

Shore birds and sea oats at Cape Hatteras National Seashore. Photo: Captain Albert E. Theberge, NOAA Corps (ret.)

The ocean and coastal waters of the southeast U.S. help drive local weather and regional climate conditions, support ecologically and economically significant ecosystems (which include important fisheries), and provide tourism, boating, and other recreational opportunities. The oceans and coasts annually provide over $675 billion dollars worth of economic impact in the southeast U.S.*

There are no state boundaries for ocean currents, marine wildlife, and weather patterns, so it is critical for states to work together to develop, implement and maintain a robust coastal and ocean observing system. SECOORA, the Southeast Coastal Ocean Observing Regional Association, is assisting NC, SC, GA and FL to integrate extensive and widely scattered information and data acquired in the RA footprint. SECOORA provides opportunities to leverage resources across the region and to pool expertise in addressing national and regional needs and response (e.g. Deep Water Horizon Oil Spill). Because SECOORA is one of 11 Regional Associations established through the Integrated Ocean Observing System (IOOS), it also brings national ideas and resources to the table.

If you are a commercial shipping vessel, a recreational fisherman, a kayaker, or a beachcomber, you need information on tides, winds, and other ocean conditions. SECOORA is funding North Carolina institutions to collect this information, which includes high frequency radar used for measuring surface currents, South Atlantic Bight and Gulf of Mexico Circulation nowcast and forecast models, and coastal and offshore buoy systems. This map is an example of how users can access coastal and ocean observations along the North Carolina coast. Each station provides information, such as the latest observed air temperature, wind speed, sea temperature, and water level.



Map from Carolina RCOOS (*www.carolinasrcoos.org*)

SECOORA Members in North Carolina

- DownEast Instrumentation
- Duke University
- East Carolina University
- North Carolina Sea Grant
- North Carolina State University
- University North Carolina - Chapel Hill (UNC-C)
- University North Carolina - Coastal Studies Institute
- University North Carolina - Wilmington

*National Ocean Economics Program. J. Kildow, C. Colgan, J. Scorse, *State of the U.S. Ocean and Coastal Economies,* June 2009.

Applications of Coastal and Ocean Observing Data in North Carolina

Coastal ocean observing in the Carolinas includes oceanographic and land based observing systems, data management and analyses, model development, and outreach and partnership activities. These partnerships, which include state and federal agencies, such as the US Army Corps of Engineers and the National Estuarine Research Reserves, provide a cost effective way to increase observational capabilities and data for application development, coastal model validation and benchmarking. SECOORA members use coastal and ocean observations to address a variety of management issues. The following examples highlight how North Carolina is applying these resources to real world issues.

Marine Spatial Planning For Offshore Wind Energy

The UNC-C completed a study that confirms that, because of a promising wind resource, large areas offshore of the North Carolina coastline are potentially well-suited for wind energy development and worthy of further investigation. This 9-month study was requested by the North Carolina General Assembly to assess the feasibility of installing wind turbines in the sounds and off the coast of North Carolina. To view the full report, brochures, or maps, visit the UNC Energy Services Web site: http://www.climate.unc.edu/coastal-wind.

Providing Easy Access to Weather and Wave Forecasts via the Marine Weather Portal

The National Weather Service's (NWS) Marine Weather Portal began in North Carolina and has been expanded to cover the coastal region from North Carolina to Texas. This web portal provides marine observations, forecasts, and warnings for coastal and offshore waters. Since coastal ocean observing system audiences already rely on the NWS Weather Forecast Offices for marine observations and forecast needs, this partnership provides an efficient way to disseminate coastal and ocean observing information to the public. http://forecast.weather.gov/mwp/

Modeling Waves Improves Swimmer and Mariner Safety

Since the nearshore coastal ocean (0-5 miles) is the most heavily used part of the vast ocean, accurate wave forecasting can greatly increase safety in this area for boaters, fishers, and recreational users. The UNC and the U.S. Army Corps of Engineers recently set up the SWAN (Simulating Waves Nearshore) wave model at three east coast NWS Weather Forecast Offices, providing direct access to model results through their forecasting tools. Improving NWS wave forecasts will undoubtedly lead to better safety and planning. http://www.frf.usace.army.mil/eve/modeling/modelMainPageFrame.pl?type=doc&chapter=quickStart

Southeast Coastal Ocean Observing Regional Association

SECOORA and Ocean Observing In Action: *South Carolina*

Monitoring the Southeast's Coasts

The ocean and coastal waters of the southeast U.S. help drive local weather and regional climate conditions, support ecologically and economically significant ecosystems (which include important fisheries), and provide tourism, boating, and other recreational opportunities. The oceans and coasts annually provide over $675 billion dollars worth of economic impact in the southeast U.S.*

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The SEALAND COMMITMENT in the ship channel off Sullivans Island heading for the Wando River container terminal. One of SECOORA's key priorities is providing data to promote safe and efficient maritime transportation and recreational boating. Photo: NOAA Photo Library

SECOORA Members in South Carolina

Coastal Carolina University

Research Planning, Inc. (RPI)

South Atlantic Fishery Management Council

South Carolina Department of Natural Resources

South Carolina Sea Grant Consortium

University of South Carolina

For More Information

Southeast Coastal Ocean Observing Regional Association
http://www.secoora.org/

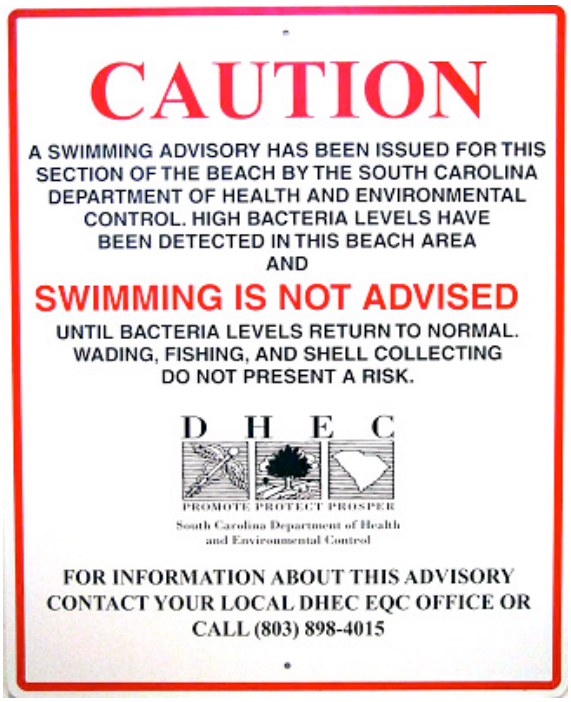
U.S. Integrated Ocean Observing System (IOOS)
http://ioos.gov

*National Ocean Economics Program. J. Kildow, C. Colgan, J. Scorse, *State of the U.S. Ocean and Coastal Economies,* June 2009.

Applications of Coastal and Ocean Observing Data in South Carolina

SECOORA members use coastal and ocean observations to address a variety of management issues. The following examples highlight how South Carolina is applying these resources to real world issues.

Improving Beach Swimming Advisories



The South Carolina Department of Health & Environmental Control (SCDHEC) routinely samples water quality at ocean beaches and uses the results to inform the public of potential health risks. The primary contaminant used for issuing beach swimming advisories is the human-derived bacterium *Enterococcus*. High levels of this indicate a greater chance of human pathogens being present. However, the data used to make determinations on issuing swimming advisories is typically at least 24 hours old. Timely decisions are not possible, and errors can occur: advisories are posted when the water is safe, and decisions not to issue advisories can be made even though water quality is poor, potentially putting the public at risk. The University of South Carolina (USC) has recently collaborated with SCDHEC, NOAA, Raytheon, Inc., and the University of Maryland to implement decision support models to improve beach advisory accuracy. Using a variety of modeling techniques and ocean observing variables (wind, weather, current, salinity, etc.), the research team created one of the first marine/*Enterococcus* predictive models that indicates the need for advisories when the hazard is actually present. This model is now being used to support decisions on issuing beach swimming advisories, resulting in improved public health protection.

Engaging with Regional and State Policy Agencies

The South Atlantic Alliance (SAA) is a partnership among the States of North Carolina, South Carolina, Georgia, and Florida. The mission of this Alliance is to implement science-based policies and solutions that enhance and protect the value of coastal and ocean resources of the southeastern United States to support the region's culture and economy now and for future generations. The priority issues of the SAA are Healthy Ecosystems, Working Waterfronts, Clean Coastal and Ocean Waters, and Disaster-resilient Communities. SECOORA's priority issue areas are Ecosystems, Marine Operations, Coastal Hazards, and Climate Change. Given the significant overlap in our two organizations' priorities, we are working closely with the South Atlantic Alliance to align our resources and objectives to help address the objectives and actions defined in the SAA action plan.

SECOORA has also been engaged in wind energy development in South Carolina through engagement with the Regulatory Task Force for Coastal Clean Energy via workshops on Offshore Wind Energy Development and participation in the working groups.

Southeast Coastal Ocean Observing Regional Association

SECOORA and Observing In Action: Georgia

Monitoring the Southeast's Coasts

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SECOORA members use coastal and ocean observations to address a variety of management issues.

HIGH FREQUENCY RADAR ON JEKYLL ISLAND, GA

A High Frequency (HF) Radar installation along the GA/SC coast was installed on Jekyll Island, GA with primary funding from the Georgia Research Alliance, the Office of Naval Research grant funding for the SEACOOS project, plus a significant contribution from SkIO. This is the third HF Radar that SECOORA is partially supporting. The three systems work together to create a detailed map of surface ocean currents across an area stretching more than 125 miles off shore from SC to North FL. They facilitate collaborative work across the southern border into Florida. The new site will approximately double the shelf area over which wave heights and directional wave spectra can be estimated, and will significantly increase the shore parallel extent of shelf-edge Gulf Stream surface current observations.

Photo of the WERA 12-antenna receive (Rx) site. Seven antennas are mounted on a public boardwalk and five are in the dune woods/scrub. Photo: Trent Moore, Skidaway Institute of Oceanography

SECOORA Members in Georgia

Georgia Aquarium

Kennesaw State University

Skidaway Institute of Oceanography (SkIO)

For More Information

Southeast Coastal Ocean Observing Regional Association
http://www.secoora.org/

U.S. Integrated Ocean Observing System(IOOS)
http://ioos.gov

*National Ocean Economics Program. J. Kildow, C. Colgan, J. Scorse, *State of the U.S. Ocean and Coastal Economies,* June 2009.

Basic Observation Buoys Workshops

Three interactive workshops (January 2009, March 2010, and December 2010) have introduced the concept of a scaled-down, functional platform for collecting information on water conditions and chemistry to over ten regional university scientists and informal and formal educators in FL, GA, SC, NC and VA. These workshops have been hosted by Skidaway Institute of Oceanography, University of North Carolina, Jacksonville University and were co-sponsored by NOAA's Chesapeake Bay Office, IOOS, SECOORA, Kennesaw State University, and COSEE SE. The goals were to test various design platforms, advance the next generation of BOBs with a focus on sensor instrumentation, and develop regional strategies for outreach.

Angela Bliss from University of Georgia and Jim Nelson from Skidaway Institute of Oceanography assemble a BOB, a Basic Observation Buoy designed to teach students from kindergarten through graduate school about observing technologies. Image Credit: Lundie Spence, COSEE-SE

Member of the Southeast Atlantic Marine Debris Initiative Consortium

SECOORA is a member of the southeast (SE) Atlantic-Marine Debris Initiative (SEA-MDI) Consortium, housed at University of Georgia. This regional partnership with NOAA's Marine Debris Division aims to create collaborative regional strategies addressing Marine Debris prevention, reduction and mitigation. This program will enhance existing programs and partnerships by increasing involvement of organizations, industry, and/or communities in preventing marine debris, and combining resources with national and regional partners to increase the geographic scope and pace of marine debris prevention activities through the use of culturally relevant outreach methods, information on alternative disposal methods, and the development and dissemination of tools and innovative products to address marine debris.

Southeast Coastal Ocean Observing Regional Association

SECOORA and Ocean Observing In Action: *Florida*

Monitoring the Southeast's Coasts

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Applications of Coastal and Ocean Observing Data in Florida

The following examples highlight how Florida is applying coastal and ocean observations to real world issues.

Using Radar for Coral Modeling

The University of Miami's Rosenstiel School for Marine and Atmospheric Sciences is providing WERA High Frequency (HF) Radar data to NOAA's Integrated Coral Observing Network program, whose mission is twofold: to install instrumented arrays at the world's most important coral reef areas to amass long-term data sets, and to integrate and utilize those and other data for purposes of ecological forecasting for coral reef areas. The HF radar data are critical for researchers modeling spawning and larval drift of the mustard coral in the Florida Keys. Scientists' predictions have been verified two years in a row through the use of this HF radar data, the only real-time display of ocean current patterns bordering that area and reaching north above to Port Everglades.

The medium and long-range Wellen Radars (WERA) deployed along the Florida Straits and the South Atlantic Bight have a spatial resolution of 1.2 to 3 km and sample at time scales of minutes. Photo: Nick Shay/WERA System/Crandon Park

SECOORA Members in Florida

- Dialytics
- Florida Atlantic University
- Florida Coastal Ocean Observing System Consortium
- Florida Fish and Wildlife Research Institute (FFWRI)
- Florida Institute of Oceanography (FIO)
- Florida Institute of Technology
- Florida International University - International Hurricane Research Center (FIU)
- Florida Sea Grant
- Florida State University
- Harbor Branch Oceanographic Institute
- Indian River State College
- Jacksonville University Marine Science Research Institute
- NortekUSA
- Nova Southeastern University (NSU
- Resolve Marine Group
- Roffer's Ocean Fishing Forecasting Service, Inc. (ROFFS™)
- University of Miami Rosenstiel School of Marine and Atmospheric Science (UM)
- University of Florida (UF)
- University of North Florida
- University of South Florida (USF)

*National Ocean Economics Program. J. Kildow, C. Colgan, J. Scorse, *State of the U.S. Ocean and Coastal Economies*, June 2009.

St. John's River State of the River Report

In 2006, Mayor John Peyton led the formation of the St. Johns River Accord, an agreement among local agencies to seek funding for a massive effort to clean up the river expected to cost $700 million over ten years. As part of this effort, the City of Jacksonville's Environmental Protection Board funded two years of study by SECOORA-member universities, Jacksonville University and the University of North Florida, to produce a compilation of the known science about the river in an online-accessible public report. The result was a 195-page report on the health of the river titled the "State of the River Report for the Lower St. Johns River Basin" and a short public brochure. This annual report is now in its fourth year.

Supporting Recreational Opportunities

Fred Howard Park, located on the Gulf of Mexico in the City of Tarpon Springs, is a popular destination for kite surfers, wind surfers, kayakers, and beachcombers. Knowing the weather and wind conditions in the area is a big deciding factor to help visitors plan their activities in the park. The Fred Howard Park meteorological/tidal station fills this data need. It is a part of the University of South Florida's (USF) Coastal Ocean Monitoring and Prediction System (COMPS). Located on the southwest corner of the second causeway bridge, it became an operational COMPS weather station in June 2004.In September 2008, the causeway bridges needed replacement, and the station was removed during construction for over a year. During the down time, the COMPS program received many inquiries about the status of the station and when/if it would be back online. Through a partnership of USF funding and Pinellas County support, the site's meteorological measurement capability was restored. Unfortunately, limited follow-on operation and maintenance funds exist. To address this need, the nonprofit group Friends of Fred Howard Park raised over $1,500 through donations of profits from wind surfing lessons held at the park to support continued station operation. Finally, SECOORA provided funding for restoring the in-water water level and temperature/conductivity sensors, of value to emergency managers as well as recreational users. SECOORA and member organizations like USF are working together with stakeholders to provide these critical observations.

Fred Howard Park meteorological/tidal station.

Member Support for Deep Water Horizon Gulf Oil Spill Response and Restoration

- Members were interviewed in numerous newspaper articles and appeared on television to explain the potential impacts and movement of the spill.
- Board member Dr. Robert Weisberg testified before the Subcommittee on Insular Affairs, Oceans, and Wildlife, Committee on Natural Resources, U.S. House of Representatives. (*http://resourcescommittee.house.gov/UploadedFiles/WeisbergTestimony06.15.10.pdf)*
- ROFFS™ delivered regularly updated alerts to the public and kept legislators, emergency managers, and the fishing community abreast of the changing nature of the spill.
- USF, UM, and North Carolina State University provided output from circulation models for the response efforts.
- Florida Fish and Wildlife Conservation Commission contributed scientific guidance and GIS mapping assistance to decision-makers developing response and cleanup strategies.
- FIU is characterizing the oil and assessing its impacts on organisms, as well as leading an effort to determine the impacts of the spill on deep-sea environments including top predators, like sharks, and other scavengers.
- SECOORA Vice Chair, Dr. Richard Dodge, NSU, and Dr. William Hogarth, FIO, were appointed to the Gulf of Mexico Research Initiative Research Board that will administer $500M in research funding from BP to the Gulf of Mexico Alliance.

Southeast Coastal Ocean Observing Regional Association (SECOORA): Coordinated Monitoring, Prediction and Assessment to Support Decision-Makers Needs for Coastal and Ocean Data and Tools

Revised Scope of Work - Year 1

TOPIC AREA 1: Continued Development of Regional Coastal Ocean Observing Systems
AWARD TYPE: Cooperative Agreement
PROJECT DURATION: June 1, 2011 – May 31, 2016

This revised grant proposal is submitted in response to the Funding Opportunity Title:
Continued Development of Regional Coastal Ocean Observing Systems

Revision Submitted: May 6, 2011
Year 1: June 1, 2011 - May 31, 2012
Funding Request: $2, 047,500

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Introduction

SECOORA will be receiving $2,047,500 in Year 1 of its five-year Regional Coastal and Ocean Observing System (RCOOS) project. This slight decrease from our FY10 award level represents 51% of the funding that was requested. This revised scope of work describes the activities that will be undertaken with this level of funding, and provides a rationale for not proceeding with others activities originally proposed. The major goals and objectives remain the same, minus those not funded. The goal numbering from the original proposal has been changed to consolidate the Regional Association (RA) management and coordination activities. Specific milestones are listed in Table 7.

Table 1. Major Goals and Objectives

Goals	Objectives
Goal 1: Sustain SECOORA as a Regional Information Coordination Entity	1.1 Ensure Stakeholders Inform RA Priorities and RCOOS Development and Implementation. 1.2 Coordinate and Implement a Conceptual Operations Plan for a Southeast (SE) RCOOS.
Goal 2: Sustain an Observing Subsystem for the SE	2.1: Sustain Moored and Coastal Stations. 2.2: Maintain High Frequency Radar (HFR) Operations. 2.3: Support Glider Operations. (NOT FUNDED IN YEAR 1) 2.4: Support Hurricane Wind & Water Level Measurements. (NOT FUNDED IN YEAR 1)
Goal 3: Support a Multi-Scale Multi-Resolution Modeling Subsystem	3.1: Support Regional and South Atlantic Bight (SAB) Subregional Circulation Modeling. 3.2: Implement Forecasting of Storm Surge, Inundation, and Coastal Circulation. 3.3: Develop a Nearshore Circulation Model for Rip Current Forecasting. (NOT FUNDED IN YEAR 1.) 3.4: Provide Species-specific Habitat Models that Integrate Remotely Sensed and In Situ Data to Enhance South Atlantic Fisheries Management Council (SAFMC) Stock Assessments. 3.5: Improve Beach/Shellfish Water Quality Advisories.
Goal 4: Enhance the Data Management and Communication (DMAC) Subsystem	4.1: Service Data Providers and Capture Data. 4.2: Provide Information to Users and Stakeholders Rapidly and Effectively. 4.3: Coordinate/Collaborate data management efforts with U.S Integrated Ocean Observing System (IOOS®) and other RAs. 4.4: Achieve Operational Status.
Goal 5: Support a Targeted and Leveraged Education and Outreach Subsystem	5.1: Provide Tools and Opportunities for Observing Related Science Education 5.2: Increase Understanding of and Support for Observing Through Targeted Stakeholder Outreach.

Goal 1: Sustain SECOORA as a Regional Information Coordination Entity (RICE)

SECOORA is an independently operating 501(c)(3). We will provide fiscal management for this award. Susannah Sheldon is SECOORA's Program Manager and serves as fiscal manager, with assistance from an accountant, bookkeeper, and oversight of the Executive Director. We will be responsible for overall project management. Project Management includes fiduciary oversight of all sub-awards, preparation and submission of financial and progress reports, and ensuring coordination and collaboration both among PIs within each RCOOS subcomponent and among PIs across the various RCOOS subcomponents. Sixteen PIs and 13 separate sub-awards contribute to this project necessitating a significant investment of effort for project and fiscal management, technical communications, and task coordination for effective operations. Responsibilities will be shared among the RCOOS manager (V. Subramanian), SECOORA's Executive Director (D. Hernandez), and two Program Managers (S. Sheldon and M. Treml via contract).

SECOORA is a membership-based organization that seeks and invites stakeholders with interests in coastal and ocean data and information to help prioritize our activities and participate in developing stakeholder-based products. With Year 1 funding, SECOORA will continue to seek new members through our Web site, outreach via newsletters and direct recruitment by staff. We will also host an annual member and stakeholder meeting in Spring 2012. SECOORA will partner with stakeholders, specifically through the engagement of the South Atlantic Alliance. As opportunity allows, joint meetings will be held to solidify the relationship between the two organizations.

SECOORA will focus on facilitating the development of a Conceptual Operations Plan for a fully instrumented RCOOS with defined service levels, commensurate with funding, that provides coordinated monitoring, assessment and prediction. Hernandez and Subramanian will coordinate these efforts with ongoing IOOS efforts including the Cost Analysis Requirements Document, the National Inventory of Observation Assets, and the RA Gaps Analysis.

Additional coordination responsibilities include working closely with the Gulf of Mexico Coastal Ocean Observing System (GCOOS) in the FL region. We will continue to interact with GCOOS to ensure that messages, products, and projects are coordinated and resources are leveraged. Staff will attend NFRA, IOOS, and other RA meetings as funding allows.

Table 2. RICE Activities

Institution	Funding	Activity
SECOORA	$201,120	Ensure Continued and Efficient Governance, Management and Operations of the RA. Provide forums, i.e. workshops, meetings, that enable stakeholder assessment and engagement. Coordinate with the South Atlantic Alliance (SAA). Ensure SECOORA plans and gaps analysis align with National Federation of Regional Alliances (NFRA) and IOOS office guidance and/or requirements. Refine and maintain RCOOS Conceptual Operations Plan.
TOTAL	**$201,120**	

Goal 2: Sustain an Observing Subsystem for the SE

The observing subsystem provides the basis for the RCOOS by supporting and integrating existing assets and observations specific to the development of products identified in this proposal. In most cases, we propose to maintain existing systems deployed as part of pre-SECOORA programs. For all observing assets, the decreased funding greatly impacts spare parts and technician support for maintenance of assets and management of data. It also limits principal investigator (PI) time and ability to interface with stakeholders. SECOORA can support the operation and maintenance of offshore moored sta-

tions, coastal stations, and HFR sites, with the caveat that assets in the SECOORA footprint have been purchased through a mix of state, research, and IOOS funding. Operations are not sustainable at current funding levels. We anticipate that in the near future some installations may be withdrawn from operational efforts.

Each observing asset will provide near-real-time data for multiple users, and provide information required to support proposed and existing stakeholder products (e.g., those required for oil spill response, National Weather Service Marine Weather Portal, Beach/Shellfish Water Quality Advisories, and search and rescue (SAR) operation surface current requests.) Table 3 below provides specific information on the PI's, funding, and assets for the Observing Subsystem. Note that funding is not available for **Objective 2.3: Support Glider Operations** in Year 1 and **Objective 2.4: Support Hurricane Wind and Water Level Measurements** has a Year 3 start date.

Table 3. Observing Subsystem Activities

Institution	Funding	Activity
Objective 2.1: Sustain Moored and Coastal Stations		
University of South Florida (Weisberg)	$142,500	Funding COMPS surface moorings: C14 and C10 measure wind velocity, relative humidity, barometric pressure, sea surface temperature (SST), air temperature (AT), incoming short and long-wave radiation, in-water velocity and temperature/salinity (T/S). C12 and C13 measure wind velocity, relative humidity, barometric pressure, SST, AT, in-water velocity and T/S. C11 and C15 measure in-water velocity and T. C21 measures wind velocity, relative humidity, pressure, SST, AT. In-water velocity and T, plus sea level (SL) and waves will be added.
University of South Florida (Merz)	$47,493	Funding COMPS in-shore tidal meteorological: consists of seven stations located along the Gulf of Mexico's West Florida Coast from Shell Point south to Big Carlos Pass. These stations typically are outfitted with wind velocity, relative humidity, AT, barometric pressure, and precipitation sensors. Marine instrumentation includes: Water Level, T, and S.
Florida Institute of Oceanography (Virmani)	$52,251	Funding supports approximately 50% of the costs of operating seven stations in the SEAKEYs Network in Florida Keys and Florida Bay with wind velocity, relative humidity, AT, barometric pressure, and precipitation sensors.
University of North Carolina - Wilmington (Leonard)	$339,999	Oceanographic data from seven real-time moorings operated through partnerships between UNCW and USC will be maintained along NC and SC. Six systems measure wind velocity, barometric pressure, SST, AT, solar radiation, sea level, in-water velocity, and T/S. Two of the moorings also measure surface-waves. In addition, one coastal pier station that measures wind velocity, barometric pressure, SST, AT, solar radiation, sea level, S, water-column currents, and surface waves also will be supported.
TOTAL MOORED AND COASTAL	**$582,243**	
Institution	Funding	Activity
Objective 2.2: Maintain High Frequency Radar Operations		
University of South FL (Weisberg)	$95,000	Support three CODAR and two WERA radar arrays. Location: West Florida Shelf

Institution	Funding	Activity
Objective 2.1: Sustain Moored and Coastal Stations		
Skidaway Institute of Oceanography (SkIO) (Savidge)	$87,398	Support two WERA radar arrays. Location: St. Catherine's and Jekyll Island, GA
University of Miami (Shay)	$77,000	Support three WERA radar arrays. Location: Crandon, Virginia Key and Dania Beach
University of NC - Chapel Hill (Seim)	$74,046	Support two CODAR radar arrays. Location: Outer Banks of NC
University of South Carolina (Voulgaris)	$34,398	Re-install, operate and maintain 1 HF radar surface current measurement system in SC (potentially Long Bay).
TOTAL HFR	**$367, 842**	

Goal 3: Support a Multi-Scale Multi-Resolution Modeling Subsystem

Most modeling components are supported with the funding currently available, although start times and durations vary. The modeling components include the following:

Objective 3.1: Support Regional and SAB Subregional Circulation Modeling.
Since the glider observatory has been eliminated, incorporation of that data was removed from SAB modeling work.

Objective 3.2: Implement Forecasting of Storm Surge, Inundation, and Coastal Circulation.

Objective 3.3: Develop a Nearshore Circulation Model for Rip Current Forecasting. (Proposed for a Year 3 start.)

Objective 3.4: Provide Species-specific Habitat Models that Integrate Remotely Sensed and In Situ Data to Enhance SAFMC Stock Assessments.
This project has drastically cut percent time and satellite overhead.

Objective 3.5: Improve Beach/Shellfish Water Quality Advisories.
This project has had to remove a primary PI (Kelsey).

All projects except Objective 3.3, rip current modeling, will be initiated in Year 1 and all will be re-assessed in Year 3 for continued funding.

Table 4. Modeling and Related Product Development

Institution	Funding	Activity
North Carolina State University (He)	$ 151,000	Support Regional and SAB Subregional Circulation Modeling.
University of Florida (Sheng) and North Carolina State University (Xie)	$128,250 and $61,746	Provide real-time forecasting of inundation and storm surge.
ROFFS (Roffer), University of Miami CIMAS (Muhling), and SAFMC (Pugliese)	$80,752	Develop data products derived from satellite and in situ observations for fisheries stock assessment.
University of South Carolina (Porter)	$27,201	Provide a decision support tool for beach/shellfish water quality advisories.
TOTAL MODELING	**$448,949**	

Goal 4: Enhance the DMAC Subsystem

Some of the key strengths of SECOORA's DMAC enterprise are the effective working relationships and collaborations fostered by the Data Management Coordinating Committee (DMCC), which is comprised of regional technical personnel responsible for operating and upgrading the data management system of SECOORA. Building on previous work, SECOORA will optimize access to regionally-aggregated information via a web interface that supports SECOORA's thematic priorities. This will be accomplished through continued salary support for members of the DMCC to allow them to enhance the work accomplished under previous SECOORA RCOOS grants, and to incorporate the progress made by the complementary Carolinas RCOOS data management effort.

Table 5. Data Management and Communication

Institution	Funding	Activity
University of SC (Porter)	$172,751	Enhance dissemination of data products. Implement QA/QC flags. Implement data/product/service usage statistics (metrics). Document DMAC interruptions & identify operational remedies. Coordination with IOOS DMAC and with other RAs. Optimize servers to address, within expected funding scenarios, issues of redundancy and uninterrupted operations.
University of NC – Chapel Hill (Seim)	$102,995	
University of South Florida (Weisberg)	$16,600	
TOTAL DMAC	**$292,346**	

Goal 5: Support a Targeted and Leveraged Education and Outreach Subsystem

The primary focus of the Education and Outreach (E&O) subsystem is to engage formal and informal education audiences and stakeholders regarding observing technologies, data, products, and services. Through this subsystem, SECOORA will transition from opportunistic stakeholder engagement to a deliberate E&O engagement program designed to increase our understanding of stakeholder needs and requirements, and showcase results from investments in product development. Note that Goals 1 and 3 include outreach activities that complement and contribute to the E&O subsystem.

Table 6. Education and Outreach Activities

Institution	Funding	Activity
Kennesaw State University (Adams)	$46,750	Conduct EARTH / SECOORA Workshop. Develop aquatic observatory module for Master of Arts in Teaching pre-service teachers. Support existing BOB activities.
University of North Florida (Welsh)	$10,000	Support advanced BOB activities.

Institution	Funding	Activity
University of North Carolina - Wilmington (Leonard)	$46,750	Conduct community outreach to formal and informal education centers. Develop and maintain web portal for BOB and other outreach activities. Develop prototype STEM Education products.
COSSEE-SE (Spence)	$15,125	Develop BOB for elementary level students. Support EARTH / SECOORA workshop.
SECOORA (Hernandez/Treml)	$36,375	Manage regional BOB Sustainability Fund. Support EARTH / SECOORA workshop. Develop success stories and related outreach information.
TOTAL EDUCATION AND OUTREACH	**$155,000**	

Milestone Chart

Table 7. Milestones for Year 1 by Quarter

	2011-2012 Quarter			
Goals and Milestones	**1**	**2**	**3**	**4**
Goal 1: Sustain SECOORA as a regional information coordination entity				
A. Provide timely grant reports to NOAA		x		x
B. Hold Board Meeting Fall 2011 and Member Meeting May 2012		x		x
C. Host joint meeting with SAA in Fall 2011		x		
D. Publish e-newsletters and other outreach material	x	x	x	x
E. Complete joint FL materials with GCOOS	x			
F. Release a new version of the SECOORA Web site, focused on data, maps, and SECOORA in the states	x			
G. Work with NFRA and IOOS office to effectively respond to NOAA and other National level requirements	x	x	x	x
H. Refine and maintain RCOOS Conceptual Operations Plan	x	x	x	x
I. Support regional collaboration	x	x	x	x
J. Evaluate mechanisms to track operational statistics, product usage, and outcome measures and metrics	x	x	x	x
Goal 2: Sustain an Observing Subsystem for the SE				
A. Operate and maintain moored and coastal stations (COMPS, SEA-KEYS, and Carolina RCOOS)	x	x	x	x
B. Report moored and coastal stations data to secoora.org	x	x	x	x
C. Maintain HFR operations				
i. Hourly surface current maps from the various regions via individual and SECOORA web sites	x	x	x	x
ii. Estimates of significant wave heights from the HF radar data	x	x	x	x
iii. Develop/report performance metrics of CODARs and WERAs throughout the SE including accuracy estimates of the surface currents	x	x	x	x
iv. Provide the radial currents to the National Servers	x	x	x	x

	2011-2012 Quarter			
Goals and Milestones	**1**	**2**	**3**	**4**
(SIO/Rutgers) for the National HF radar network				
D. Update Asset inventory/ provide performance metrics		x	x	x
Goal 3: Support a multi-scale multi-resolution Modeling Subsystem				
A. Support and enhance SABGOM model	x	x	x	x
i. Implement ocean data assimilation to SABGOM model			x	x
B. Provide real-time forecasting of inundation and storm surge				
i. Host kickoff meeting	x			
ii. Begin forecasting in Domain 1 and 2	x	x	x	x
iii. Establish Necessary Data Standards with DMAC	x	x	x	x
iv. Workshops with District Partners			x	
C. Develop data products derived from satellite & in situ observations for fisheries stock assessment				
i. Set communication and data exchange/storage strategies and protocols			x	x
ii. Assemble satellite derived environmental datasets and in situ environmental datasets			x	x
iii. Develop and refine satellite data products and provide to SEAMAP cruises as needed			x	x
iv. Team meetings in Charleston and Miami			x	x
D. Provide decision support tool for beach/shellfish WQ advisories				
i. Develop Geographic Information Systems-based modules to extract and visualize radar derived rainfall data and modeled currents and salinity estimates over user specified boundaries (e.g. watershed boundaries)	x	x	x	
ii. Integrate additional data required from state field programs, remote sensing sources, and observing systems platforms			x	x
Goal 4: Implement a DMAC Subsystem				
A. Develop data aggregation techniques for new data providers within one quarter (3 months) of data provider coming onboard	x	x	x	x
B. Provide Quarterly Google Analytics reports to analyze users and uses of data and Web site	x	x	x	x
C. Attend IOOS bi-weekly conference calls with IOOS/RA representatives and review IOOS certification documents as needed	x	x	x	x
D. Enhance SECOORA data inventory to allow user maintenance	x	x	x	x
Improve “searchability” of information through enhancements to Web site and Interactive Maps	x	x		
E. Provide alert capabilities for new providers and enhance alerts for ongoing datasets or applications as needed	x	x	x	x
Goal 5: Support a targeted and leveraged Education and Outreach Subsystem				
A. Develop Aquatic Observatory Module for Master of Arts in Teaching pre-service teachers at KSU	x	x	x	x
B. Supporting Basic Observation Buoy Efforts				
i. Assist FL Smithsonian Marine Station with expanding their BOB program	x			
ii. Sustain Hilton Head BOB Monitoring Station and develop stakeholder applications for water data	x	x	x	x
iii. Conduct one Advanced BOB (Buoy) Workshop at UNF		x		
iv. Construct one additional Advanced BOB for the GTMNERR and briefly deploy the data buoy to monitor wa-	x	x		

	2011-2012 Quarter			
Goals and Milestones	**1**	**2**	**3**	**4**
ter quality in an additional location.				
v. Develop the elementary version of the Basic Observation Buoy, BAB, for southeastern online distribution in partnership with Doug Levin, NOAA IOOS.	x	x	x	x
vi. Develop and Monitor Regional BOB Sustainability Fund for SE. (Southeast users must apply for funding and it will serve to help establish new BOB partners and sustain established BOB users.) This effort will ensure that the tangibles for the BOB program are represented on the SECOORA data portal	x	x	x	x
vii. Develop and maintain web portal for BOB and other outreach activities	x	x	x	x
C. Develop prototype STEM educational products focusing on Observatory/Modeling applications	x	x	x	x
D. Plan and develop EARTH 2012, *SECOORA Observatories and RTD in K-16 Summer 2012*	x	x	x	x
E. Conduct community outreach highlighting the importance of observatories and SECOORA's products. Specific focus will be on the engagement of water quality agencies and decision makers related to the water quality modeling efforts.	x	x	x	x
F. Develop success stories with PIs to highlight on Web site, newsletters, one-pagers, etc.	x	x	x	x