



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

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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. Trembl 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/Trembl)	\$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

Goals and Milestones	2011-2012 Quarter			
	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

Goals and Milestones	2011-2012 Quarter			
	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		

Goals and Milestones	2011-2012 Quarter			
	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, <i>SECOORA Observatories and RTD in K-16 Summer 2012</i>	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