

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

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Important Note on SECOORA's 1 October 2012 – 30 November 2013 Progress Report

During this reporting period, SECOORA submitted the revised scope of work and funding request for [Year 3](#) (June 1, 2013 – May 31, 2014). After the contractual review and account establishment for the Year 3 award, funding for SECOORA sub-awards were disbursed to partner institutions. The administration of the NOAA IOOS award and sub-awards are being continued by SECOORA. This report details the progress and accomplishments over the reporting period. The Florida Institute of Oceanography maintained SEAKEYS observing network was shutdown in December 2012 and is no longer funded by SECOORA. Support to maintain NOAA's Ocean Acidification Gray's Reef National Marine Sanctuary buoy was added to the Year 3 Scope of Work. We have also added the following new tasks in Year 3 that further address the integration of our existing on-going projects and user needs: (1) accurate wave estimates from High Frequency Radars; (2) model skill assessment, and (3) enhance and develop new data products.

LONG-TERM GOAL

The long-term goal of this project is to integrate and augment existing observational, modeling, data management and education assets in the Southeast Coastal Ocean Observing Regional Association (SECOORA) domain to create an end-to-end Regional Coastal Ocean Observing System (RCOOS) in support of user-defined needs for improved coastal and ocean decision making.

OBJECTIVES

SECOORA will:

1. Ensure that stakeholder needs are met through assessment and governance mechanisms that effectively prioritize the distribution of RCOOS-related funding and other resources that are required to meet critical regional needs.
2. Coordinate and execute an operations plan for a fully instrumented RCOOS in the SE with defined service levels, commensurate with funding, that provides coordinated monitoring, assessment and prediction.

3. Maintain an observing subsystem that includes moored and coastal stations, high frequency radars (HFR), gliders and storm event monitoring subcomponents.
4. Support a multi-scale, multi-resolution modeling framework that includes shelf and estuarine circulation, estuarine and surge/inundation prediction, addresses user-defined modeling needs, and uses the observing subsystem for verification, assimilation, and operation.
5. Build upon the SECOORA Data Management and Communication (DMAC) infrastructure to optimize existing operations, facilitate technology evolution / transfer, and address structural / project management complexities.
6. Support an education and outreach (E&O) program partnered with other RAs and marine education efforts that engages diverse education and stakeholder audiences to understand the benefits of ocean observing to society.

APPROACH AND WORK PLAN

SECOORA is a [membership](#)-based organization that attracts and invites stakeholders with interests in coastal and ocean data and information. These members not only help prioritize SECOORA activities, but participate in developing stakeholder-based products. SECOORA will be responsible for fiscal and overall project management. SECOORA is an independent nonprofit 501(c)(3) organization that has implemented a strategy to sustain observations in the SECOORA domain, and supports the development and implementation of predictive models and decision-making tools as identified by a broad user community. As described in the funded [IOOS descope proposals](#), SECOORA is focusing on the following goals during this period of the five-year Regional Coastal and Ocean Observing System (RCOOS) project:

1. Sustain SECOORA as a Regional Information Coordination Entity (RICE).
2. Sustain and expand a coastal and ocean observing subsystem for the Southeast (SE).
3. Support a multi-scale modeling subsystem.
4. Support the Data Management and Communication (DMAC) subsystem.
5. Support an education and outreach subsystem.

Specific approaches and goals include the following:

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

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. Fourteen PIs and 17 sub-awards (Year 2) and thirteen PIs and 16 sub-awards (Year 3) contribute to this project necessitating a significant investment of effort for project and fiscal management, technical communications, and task coordination for effective operations and success of implementing a RCOOS for the SE. Responsibilities will be shared among SECOORA's Executive Director (D. Hernandez), the RCOOS manager (V. Subramanian), Business Manager (M. Lee), Bookkeeper (Chiaki Kight), Program Manager (Jennifer Dorton) and a Communication Specialist (Abbey Wakely). The Bookkeeper is a part-time employee and the Program Manager and Communication Specialist are part-time contractors with SECOORA.

SECOORA will continue to seek new members through our website, outreach via newsletters and direct recruitment by staff. SECOORA will also host a Board meeting in December 2013 and an annual member, RCOOS PIs and stakeholder meeting in May 2014. SECOORA will partner with stakeholders, specifically through the engagement of SECOORA Board and member institutions, IOOS Association, IOOS and the Governors' South Atlantic Alliance.

SECOORA will utilize the Build Out Plan (developed in Year 2) to implement a RCOOS that leverages, integrates and augments existing observational, modeling, data management, education and scientific assets within the region. Hernandez and Subramanian will coordinate these efforts with ongoing SECOORA RCOOS projects, other proposal efforts, IOOS efforts including the Cost Analysis Requirements Document, RICE Certification process, the National Inventory of Observation Assets, and the RA Gaps Analysis.

Additional coordination responsibilities include working closely with the neighboring Regional Associations and state and federal government agencies to ensure that messages, products, and projects are coordinated and resources are leveraged. Staff will attend IOOS Association, US IOOS, coastal ocean observing system related conferences and other RA meetings as funding allows.

2. Sustain and expand a coastal and ocean observing subsystem for the Southeast (SE)

The observing subsystem provides the basis for the RCOOS by providing observations specific to use of data in numerical models and the development of data products. SECOORA is supporting the maintenance of existing sub-regional observing systems deployed as part of pre-SECOORA programs, which include the operation and maintenance of offshore moored stations, coastal stations, a Gray's reef ocean acidification buoy and HF Radar sites. Assets in the SECOORA footprint have been purchased through a mix of state, federal, research, and IOOS funding. Primary partners include the University of South Florida (B. Weisberg, M. Luther and C. Merz), University of Georgia (Scott Noakes), University of North Carolina System (L. Leonard and H. Seim), UGA Skidaway Institute of Oceanography (D. Savidge), University of Miami (N. Shay) and the University of South Carolina (G. Voulgaris). In Year 3, SECOORA will fund an applied research project to evaluate the feasibility of delivering accurate wave estimates from high frequency radar data for broad use by stakeholders.

Each observing asset collects and provides near-real-time data for multiple users, enabling the development of 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).

3. Support a multi-scale modeling subsystem

In support of user-identified modeling needs, all the modeling components funded during Year 1 and Year 2 are continued in Year 3. In Year 3, SECOORA will support a model skill assessment that will allow routine systematic comparison of model data to the real-time observations, providing comprehensive error covariance skill assessment metrics for both observations and models, and displays via graphed output of these analyses.

The modeling component includes the following (primary partners):

- Regional and sub-regional circulation modeling (North Carolina State University, R. He)
- Forecasting of storm surge, inundation, and coastal circulation (University of Florida, P. Sheng; North Carolina State University, L. Xie)
- Species-specific habitat models that enhance South Atlantic Fisheries Marine Council stock assessments (ROFFS, M. Roffer; University of Miami, B. Muhling; SAFMC, R. Pugliese)
- Improved models in support of issuing beach swimming advisories (University of South Carolina, D. Porter).

4. Support the Data Management and Communication (DMAC) subsystem.

Key strengths of SECOORA's DMAC enterprise are the effective working relationships and collaborations with data providers, RCOOS PIs, other RA DMAC coordinators, IOOS DMAC and stakeholders fostered by the SECOORA staff, and regional technical personnel responsible for operating and upgrading the data management system of SECOORA. Building on previous work, SECOORA will continue to recruit new data, integrate and optimize access to regionally-aggregated data and information via a web interface that supports SECOORA's thematic priorities. In Year 3, University of South Carolina (D. Porter) will be the primary partner maintaining and supporting the SECOORA DMAC subsystem. The University of North Carolina at Chapel Hill (H. Seim) will be funded to support IOOS Vocabulary efforts. In Year 3, SECOORA will hire a Product Development Support Services Contractor who will be responsible for data product upgrades, developing new data products and providing data management support services.

5. Support an education and outreach subsystem.

Due to funding limitations, the primary focus of the Education and Outreach (E&O) subsystem is to provide outreach to stakeholders regarding observing technologies, data, products, and services. Outreach activities are

provided by all SECOORA staff, as well as the RCOOS PIs. Resources for formal educators are maintained on the SECOORA website, and we continue to promote the Basic Observation Buoy as a STEM education tool. Note that Goals 1, 3 and 4 include outreach activities that complement and contribute to the E&O subsystem.

WORK COMPLETED AND ASSOCIATED RESULTS

For the current reporting period, the progress to date and associated results for each goal are as follows:

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

SECOORA provides a network and structure for engagement of regional stakeholders. We have approximately 50 members, a 17 person Board (reduced from 23), and hold monthly Executive Committee and four to five per year full Board member conference calls. We also held the SECOORA annual Members, Board and PIs meetings (May 13 - 15, 2013) in Jacksonville, FL. Presentations and 2013 annual meeting materials can be accessed via [SECOORA May meeting website](#). We will be holding a Board Meeting (December 4 – 5, 2013) in Charleston, SC. We continue to host monthly conference calls between PIs to ensure coordination, collaboration among PIs within each RCOOS subcomponent and among PIs across the various RCOOS subcomponents.

SECOORA continues to provide the fiscal and overall project management for this project. SECOORA submitted the [Year 3 descope proposal](#) to the NOAA IOOS® Program Office on August 22, 2013, and established sub-awards. The FY13 SECOORA A-133 audit was conducted by the firm Elliott Davis, LLC and was finalized on September 23, 2013. There were no negative findings. The management of sub-awards to primary partner institutions is being continued. SECOORA has bi-monthly administration meetings to ensure efficient and effective fiscal operations. The Finance and Audit Committee meets once a quarter.

During this reporting period, SECOORA received a Governors' South Atlantic Alliance (GSAA) Year 2 award and established the GSAA partner sub-awards in January 2013. The GSAA Regional Information Management System (RIMS) project team deployed the new GSAA Portal: <http://gsaaportal.org>. Throughout the summer of 2013, project team members met with State Agency representatives (e.g. FL DEP, SCDNR) to provide a project overview, hands on training, and discuss future data integration and visualization opportunities. The team is in the process of collecting and implementing any upgrades suggested by the agency representatives. SECOORA continued to actively participate in GSAA, IOOS Association and IOOS Program Office activities (progress reports, meetings, conference calls and input to requests) on moving IOOS forward.

2. Sustain and expand a coastal and ocean observing subsystem for the Southeast (SE)

SECOORA continued to fund and sustain existing sub-regional observing networks, established previously via federal and state grants. Specific progress and results to date include the following.

University of South Florida Coastal Ocean Monitoring and Prediction System (COMPS) three surface and two subsurface moorings, along with one near shore tower installation are maintained for real time and delayed mode observations (surface meteorology and water column currents and T/S on surface moorings, water column V and bottom T/S on subsurface moorings, and surface meteorology, water column currents and waves on the near shore tower). One of the surface moorings was pulled out of the water during this reporting period. Support is continued for USF COMPS coastal stations that collect physical and meteorological data in real-time. Work is being carried out to consolidate Egmont Key and Anna Maria stations into one and it is expected that USF will maintain 5 coastal stations (Shell Point, Aripeka, Fred Howard Park, Big Carlos Pass and the consolidated Egmont/Anna Maria site). The real-time data collected by the moorings and coastal stations are delivered to SECOORA and NDBC, and made available via Global Telecommunication System (GTS).

University of North Carolina Wilmington (UNCW) continues to operate and maintain six oceanographic buoys and two wave buoys in Onslow and Long Bay and one pier station in Brunswick County, NC. These stations collect and provide hourly reports of the following variables: wind velocity, barometric pressure, sea surface temperature, atmospheric temperature, solar radiation, sea level, in-water velocity, salinity, and waves. All data collected are provided to SECOORA and NDBC and made available via GTS.

SECOORA received funds in Year 3 to provide support to NOAA's Ocean Acidification Program NDBC Gray's Reef National Marine Sanctuary (GRNMS) buoy (41008) maintained by University of Georgia. The GRNMS buoy is part of international efforts to quantify the effects of ocean acidification on the world's oceans. The sensors include pCO₂, pH, dissolved oxygen (DO), salinity and water temperature. To date, seven years of mostly continuous monitoring data have been collected at Gray's Reef National Marine Sanctuary (GRNMS). Seasonal fluctuations in seawater and atmospheric pCO₂ are apparent throughout the time series. Elevated seawater pCO₂ concentrations and decreased atmospheric pCO₂ are present during the summer months. In winter months, just the opposite occurs as seawater pCO₂ is lower and atmospheric pCO₂ is higher. However, aside from the seasonal cyclical pattern, there is an overall upward trend in both seawater and atmospheric pCO₂. Seawater pCO₂ has increased 63 uatm over the time series resulting in an average of 2.4% increase per year. The atmospheric pCO₂ has increased by 20 uatm over the time series resulting in an average of 0.789% increase per year. The annual atmospheric pCO₂ increase at GRNMS is in line with that measured at the Mauna Loa Observatory in Hawaii, however the annual seawater pCO₂ increase was higher than expected. The overall trend for seawater temperature at GRNMS has been neutral to slightly positive. Higher summer water temperatures have been offset by lower winter temperatures. As expected, the pH decreased with the increase in seawater pCO₂. Data from these sensors are sent to the SECOORA data portal, NDBC and National Ocean Acidification data portal maintained by the NOAA Pacific Environmental Marine Laboratory (PMEL) and archived at the National Oceanographic Data Center.

The SEAKEYS network was shut down in December 2012 and this network is no longer funded by SECOORA.

The University of Miami operates WERA HF-radar installations on Key Biscayne (Crandon), Virginia Key and Dania Beach. These radars are estimating significant wave heights for the National Weather Service marine forecast models and provide mean radials at hourly intervals to SECOORA and the US National HF Radar network archive. The principal investigator is currently working with Broad Key Florida personnel on site identification and associated logistics to deploy an eight element WERA HF-radar system. The performance metrics of the system indicate operation for 70.4%, 85.8% and 70.5% for the period October 2012 to November 2013 for Key Biscayne, Virginia Key and Dania Beach, respectively.

The University of North Carolina Chapel Hill operates two CODAR-radar installations on the Outer Banks of North Carolina. Hourly data from the systems are delivered to SECOORA and the US National HF Radar network archive. Work is being carried out to extract Gulf Stream position information, and the CODAR software was upgraded to new version (SS7). The performance metrics of the system indicate operation for 98.5% and 95.1% for the period October 2012 through November 2013 for the Duck, NC and Cape Hatteras, NC stations, respectively.

Skidaway Institute of Oceanography (SKIO) continued to operate two WERA HF-radars on St. Catherine's Island and Jekyll Island, GA for this reporting period. The data are being continuously provided to SECOORA and the US National HFR Network archive in near-real time. Estimates of wave and wind parameters are also made as experimental products. SKIO has established improved QA/QC for their archived data and plans to implement these QA/QC practices for the near real-time data. The performance metrics of the system indicate operation for 98.2% and 97.1% for the period October 2012 through November 2013 for the St.Catherine's, GA and Jekyll Island, GA stations, respectively.

The University of South Carolina currently maintains, operates and delivers data from two priority radar sites (Fort Caswell and Georgetown) covering Long Bay, SC. The sites provide half-hourly surface current maps via the PI's and the SECOORA web sites and estimates of significant waves heights on an experimental basis. The performance metrics of the system indicate operation for 95.9% and 97.5% for the period October 2012 to November 2013 for the Fort Caswell, NC and Georgetown, SC stations, respectively. The data from each station are provided in near real-time to SECOORA and the US National HF Radar network.

The College of Marine Science (CMS), University of South Florida (USF) currently operates, maintains and delivers data from three CODAR priority radar sites (Naples, Venice and Reddington Shores). Acquisition of CODAR equipment spares for installing the fourth site is in progress. USF maintains the two co-located WERA stations and assessment of CODAR and WERA HF Radars in mapping currents were performed. The data from the stations are provided in near real-time to SECOORA and the US National HF Radar network maintained by the Scripps Institution. The performance metrics of the CODAR systems indicate operation for 97.6%, 90.8% and 91.7%, for the period October 2012 to November 2013 for the Reddington Shore, Venice and Naples, respectively. The

performance metrics of the WERA systems indicate operation for 92.6% and 95.9% for the period October 2012 to November 2013 for the Fort DeSoto and Venice, respectively.

In Year 3, SECOORA will fund an applied research project to evaluate the feasibility of delivering accurate wave estimates from high frequency radar for broad use by stakeholders.

3. Support a multi-scale modeling subsystem

The North Carolina State University-enhanced South Atlantic Bight Gulf of Mexico (SABGOM) model continues to run on a 24/7-basis, providing 3-D regional ocean predictions. The model provides daily 84 hour nowcast/forecast, and model output (temperature, salinity and currents) is made available via the SECOORA web site and the NCSU PI's website. The NCSU SABGOM modeling team worked with the SECOORA data management team to standardize model output and data products via the establishment of THREDDS server and SECOORA's interactive map display.

The North Carolina State University Coastal Marine Environment Prediction System (CMEPS) maintained the near-real-time CMAEPS forecast system and provides atmospheric, sea surface wave, and storm surge forecasts for the SECOORA region, and high-resolution storm surge forecasts for the Northern Florida Coast domain. Test runs are completed for the high-resolution storm surge forecasts for the Georgia and South Carolina (GASC) domain and the South Carolina and North Carolina (SCNC) domain. Exposing the model data and products via THREDDS server (SECOORA) as well as PI's web site is in progress.

The University of Florida has completed a 2D Forecasting system coupled with a SWAN wave model for the entire Florida coast and provides a 2 to 3 day forecast depending on the forecast wind fields. The model current fields were compared with SECOORA HF Radar observations and more validation will be performed. Implementation of 3D baroclinic quasi-operational 24/7 nowcast/forecast system for the entire Florida coast is in progress. The 3D model data will be served via SECOORA THREDDS server as well as the PI's website.

The University of South Carolina and University of Maryland continued to enhance and support the decision support web and mobile app tools for issuance of beach swimming advisories by the South Carolina Department of Health and Environmental Control (SCDHEC). The beach swimming forecast, advisory and data are available via the [SECOORA web site \(Beach Swimming Advisory Portlet\)](#) as shown below in Figure 1.

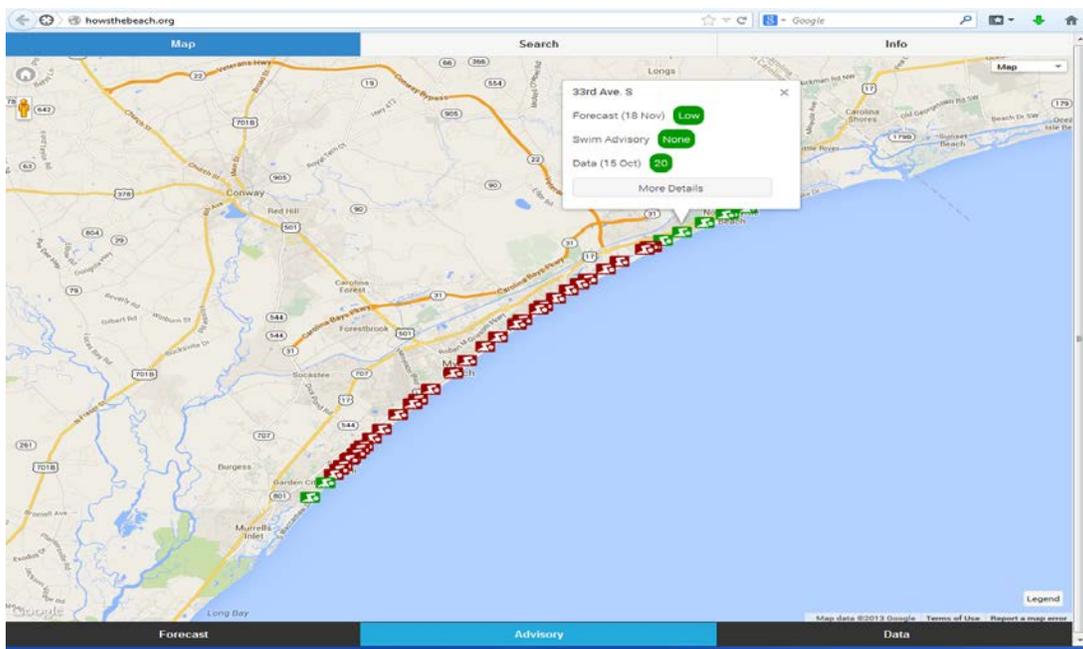


Figure 1. Beach Swimming Advisory Portlet – A collaborative effort funded by SECOORA

Roffer's Ocean Fishing Forecasting Service, Inc (ROFFS Inc.), the University of Miami Cooperative Institute for Marine and Atmospheric Studies (CIMAS) and the South Atlantic Fisheries Management Council (SAFMC) are developing data products derived from satellite and in situ observations for fisheries stock assessment. SCDNR MARMAP Chevron Fishery Independent trap survey data (catch, effort and hydrographic station data) were analyzed using neural networks and Habitat model predictions were overlaid on observed catches for June and July 2008. *Balistes* (trigger), *Pagrus* (porgy) and *Rhomboplites* (snapper) were most abundant in the central northern study area and *Centropristis* (seabass) was most common in shallower waters throughout the SE survey region. Comparisons of Snapper and Trigger models with bottom temperatures show that both the species are more likely to be found where bottom temperatures are warmer at moderate longitudes. We have recently rerun predictive habitat models for four reef-associated fish species of commercial interest, using catch data from fisheries independent trap surveys completed along the South Atlantic coast. Results showed the potential influence of cold events from topographically-induced upwelling along the Florida and Georgia coasts on sampled abundances of gray triggerfish and vermilion snapper, with catches of these species largely absent where bottom temperatures were below 18C. Upcoming collaborations with staff from the South Atlantic Fishery Management Council and South Carolina Department of Natural Resources will investigate the potential of multivariate habitat indices for standardizing trap catch time series, and accounting for these types of environmental events.

4. Support the Data Management and Communication (DMAC) subsystem

In Year 3, the University of South Carolina (D. Porter) will be the primary partner who will maintain and support the SECOORA DMAC subsystem and the University of North Carolina at Chapel Hill (H. Seim) will be funded to support IOOS Vocabulary efforts. The details of on-going data management activities during this reporting period are described in this section.

The SECOORA DMAC infrastructure and operations were consolidated from two hubs (University of North Carolina – Chapel Hill and University of South Carolina) to a single hub – the University of South Carolina during this reporting period. The University of South Carolina hosts and maintains the hardware and software related to SECOORA's [Data and Maps](#) section of the website.

We continue to recruit new data from data providers and also provide services on data management related solutions to data collectors and providers within the region. We also maintain a [Wiki site](#) in which documentation and notes on technologies we use are made available. During this reporting period, we added data from USACE/Scripps stations offshore of New River Inlet and Wilmington Harbor. Their NDBC identifiers are: 41109 and 41108 respectively. We also added data from the Florida Institute of Technology (FIT) Sebastian Inlet State Park (NDBC Identifier: SIPF1) station.

We worked with SABGOM model PI, ROFFSTM and FWC/FWRI to make SABGOM model data accessible via GIS format. We are working with other SECOORA member institution modelers and SECOORA funded modelers to standardize their model outputs (ROMS, SWAN and FVCOM) to be served via the SECOORA website. The University of South Carolina is helping the data providers and modelers on the installation of THREDDS servers as well as providing software assistance for HF Radar data processing and creation of netCDF and shape files.

SECOORA is participating in the IOOS Sensor Observation Service (SOS) reference implementation activity and is in the process of implementing ncSOS and registering our services on the IOOS Service Registry. SECOORA is also engaged with the National Oceanographic Data Center on developing a Submission Information Form for SECOORA's in-situ data in order to facilitate archiving.

We held a virtual data management meeting (December 17, 2012) between the two funded hubs (UNC -CH and USC) and SECOORA Staff in order to prioritize data management activities.

SECOORA and GCOOS-RA together with Hassan Moustahfid of the IOOS Program Office co-hosted the IOOS Biological Data Project Workshop II (March 21-22, 2013) in St. Petersburg, FL to demonstrate the ERDDAP services deployed by SECOORA and GCOOS-RA. This was a multi-institutional collaborative (data providers and customers) initiative to demonstrate easy access to biological observations. SECOORA used SCDNR MARMAP

and FWC/FWRI Fisheries Independent Management data and the ERDDAP instance for both. These can be accessed via the SECOORA [ERDDAP server](#).

We have implemented a new interactive model map that integrates and provides visualization of observations and model data. Based on our end users and RCOOS PIs input, we are in the process of improving our data portal for easy data discovery, download and visualization. We also have developed software to post the member deployed glider tracks on the SECOORA website.

The GSAA Regional Information Management System (RIMS) project team deployed the new GSAA Portal: <http://gsaaportal.org>.

SECOORA continues to work and advance the Eye on Earth collaboration project with the Northwest Association of Networked Ocean Observing System (NANOOS), the IOOS Program Office and ESRI.

[SECOORA Asset Inventory](#) application was completed and the VMware image of the application is running on USC server infrastructure. The application was demonstrated on an IOOS RA DMAC conference call where some data providers in our region explained its utilization.

IOOS Parameter Vocabulary work was continued during this reporting period as follows:

- Published IOOS Parameter Vocabulary (v2.0) with relationships to CF standard names (v19) and IOOS core variables list;
- Published IOOS Platform Vocabulary with mappings to MMI platform ontology and SEAVOX platform classes;
- Registered vocabularies and mapping under IOOS.
- Improving and testing of the SPARQL queries and Investigate the quality of information of ESRI Geoportal side response of catalog search of metadata records are in progress.

5. Support an education and outreach subsystem

The primary focus of SECOORA's Education and Outreach (E&O) subsystem is to engage stakeholders regarding observing technologies, data, products, and services. Note that Goals 1, 3, and 4 include outreach activities that complement and contribute to the E&O subsystem. We have listed work carried out during this reporting period below. No separately funded Education and Outreach PIs were funded in Year 2 or Year 3.

SECOORA continues to maintain and periodically updates the [SECOORA classroom web site](#). The SECOORA classroom web pages are tailored to the public, teachers and other educators in order to enable learning about coastal ocean observing systems and related information on how to incorporate the same into classroom and other educational programs.

SECOORA staff constantly engage in advocating the implementation of regional coastal ocean observing systems to address coastal zone issues by giving talks at institutions and meeting with stakeholders. The week of August 5, 2013, Debra Hernandez and Vembu Subramanian held a series of meetings with SECOORA members, Senator Rubio staffers, and stakeholders (Private, state, federal) in Southwest Florida and Miami. The meetings were aimed at understanding ongoing coastal ocean observing activities, recruiting new members to SECOORA, creating support for IOOS/SECOORA, and identifying gaps and opportunities for collaboration. For more details on the Florida Outreach Visits summary, please visit the [SECOORA website](#).

On August 5, Debra Hernandez held a demonstration of the recently launched beta version of The Governors' South Atlantic Alliance (GSAA) Coast and Ocean Portal, available at www.gsaaportal.org. Over 25 participants attended the demo, which included scientists and managers from USGS, FWC/FWRI/NOAA/USF, and CMS/Tampa Port Authority. The participants were given a questionnaire to provide feedback on the GSAA portal.

Following is a list of meetings SECOORA staff attended and/or gave lectures: Florida Gulf Coast University; SRI International; West Central Florida American Meteorological Society Chapter Meeting; University of Tampa, National Weather Service (Tampa), University of South Florida C-IMAGE (GoMRI funded project) Data Management Meeting; NOAA-NWS Tampa Weather Ready Network (WRN) Stakeholders meeting; National

Weather Association meeting; Clean Gulf 2013; Earthcube Real-time data workshop, June 2013; Earthcube Articulating cyberinfrastructure needs of the Ocean Ecosystem Dynamics Community, October 2013; Our Global Estuary, October 2013; GSAA Meetings; IOOS Association and IOOS DMAC meetings and Coastal Hazards Summit. Outreach efforts with Florida Gulf Coast University, SRI International, Liquid Robotics and HACH Hydromet resulted in new membership to SECOORA.

SECOORA continued to engage in marketing and outreach activities via e-newsletter, e-mails and website. We provide materials to RCOOS PIs and Board members who attend science meetings, provide information to governmental representatives, among others. During this reporting period, we provided a SECOORA Coastal Ocean Observing activities in Florida flyer to our board member Jyotika Virmani for distribution at the Florida Oceans Day (April 3-4, 2013) sponsored by FIO, Mote Marine Lab and the Florida Ocean Alliance. We also met with the National Weather Service (NWS) in Tampa regarding utilization of our Marine Weather Portal product in their Marine Weather Pages. In addition to [Wilmington NWS](#), the NWS Brownsville (<http://www.srh.noaa.gov/bro/?n=marine>) and Corpus Christy (<http://www.srh.noaa.gov/crp/?n=marine>) WFOs in Texas are currently using our Marine Weather Portal Product.

During this reporting period we conducted our SECOORA Board meeting in Atlanta, GA (December 5-6, 2012). We also held SECOORA Annual Meetings in Jacksonville, Florida (May 13-15, 2013). We held our Board Members meeting on Day 1, Annual Stakeholders meeting on Day 2 and RCOOS PIs meeting on Day 3. Presentations and 2013 annual meeting materials can be accessed via the [SECOORA website](#).

IMPACT AND APPLICATIONS and TRANSITIONS

The coastal and ocean data monitoring and associated models and decision-support tools supported by SECOORA are all being collected/developed to address specific user-described needs relevant to all four of the NOPP evaluation factors. Monitoring data are used by federal, state, academic, private and local agencies for a wide range of applications including weather forecasting, beach swimming advisories, water quality predictions, and search and rescue. Developed numerical models are made available for use by federal and state agencies to support coastal evacuation orders, issuance of beach swimming advisories, storm surge inundation and rip tide advisories, and fisheries management. SECOORA has partnered with private industry to support the development of commercial products related to commercial and recreational fishing. SECOORA staff outreach efforts with the Florida Gulf Coast University, SRI International, Liquid Robotics and HACH Hydromet resulted in new membership to SECOORA. Two undergraduate students from the Florida Gulf Coast University Marine Science Program worked with the University of South Florida on configuring the oceanographic instruments and deployment and servicing of buoys. We also provided support to Florida Gulf Coast University on an internal proposal to procure and deploy Basic Observation Buoys in Estero Bay, FL by marine science undergraduate students.

RELATED PROJECTS

SECOORA and its partners received Year 2 funding from NOAA Regional Ocean Partnership grant through the Governors' South Atlantic Alliance (Alliance). Partners include: Duke University, NC Department of Environment and Natural Resources, SC Department of Health & Environmental Control Office of Ocean and Coastal Resource Management, South Carolina Department of Natural Resources, The Nature Conservancy, GA Department of Natural Resources, Georgia Institute of Technology, and FL Department of Environmental Protection, and University of South Carolina. The team has built a regional information management system to support coastal and marine planning and other information management needs for the Alliance. Project team members include state managers who have identified current state and regional data sets and planning tools, and are assessing products and tools against decision-making needs. The GSAA Regional Information Management System (RIMS) project team deployed the new GSAA Portal: <http://gsaaportal.org>. North Carolina State University (NCSU) and Skidaway Institute of Oceanography (SKIO), University of Georgia from SECOORA participated in the Glider Palooza for the Fall 2013 season (September - November 2013). Thirteen to sixteen Slocum Gliders are being deployed covering from South Nova Scotia, Canada to Georgia waters by academic and research institutions. NCSU Glider Salacia was be equipped with CTD and Vemco instruments and SKIO Glider Modena was be equipped with a pumped CTD, Aanderaa oxygen optode, an Ecopuck triplet (CDOM, chl-a, turbidity), and a Vemco VMT receiver operating at 69

kHz. The data collected by the glider systems along with data from ocean satellites, High Frequency Radar and in-situ moorings supported an ensemble of ocean models.

PUBLICATIONS AND PRESENTATIONS

- Liu, Y. and R.H. Weisberg, and C.R. Merz (2013), Assessment of CODAR and WERA HF Radars in Mapping Currents on the West Florida (submitted for publication)
- Zheng, L. and R.H. Weisberg (2012), Modeling the West Florida Coastal Ocean by Downscaling from the Deep Ocean Across the Continental Shelf and into the Estuaries, *Ocean Modeling*, 48 (2012), 10 - 29, doi:10.1016/j.ocemod.2012.02.002.
- Weisberg, R.H., L.Zheng, Y.Liu, C. Lembke, J.M. Lenes and J.J. Walsh (2013), Why a red tide was not observed on the West Florida Continental Shelf in 2012. *Harmful Algae* (Accepted)
- Putnam, N.F and R. He (2013), Tracking the Long-distance Dispersal of Marine Organisms: Sensitivity of Ocean Model Resolutions, *Journal of the Royal Society Interfaces*, doi:10:20120979
- Xue, Z, R. He., Fennel, K., Cai, W.J., S. Lohrenz (2013), Modeling Ocean Circulation and Biogeochemical Variability in the Gulf of Mexico, *Biogeosciences Discuss*, 10, 7785-7830.
- Tang, Q., L. Xie, G. M. Lackmann, and B. Liu, 2013: Modeling the impacts of the large-scale atmospheric environment on inland flooding during the landfall of Hurricane Floyd (1999). *Advances in Meteorology*, (in press)
- Li, R., L. Xie, B. Liu, and C. Guan, 2013: On the sensitivity of hurricane storm surge simulation to domain size. *Ocean Modelling*, 67, 1-12.
- Lynn Leonard and Jennifer Dorton, 2013: Approached to understanding and meeting the needs of decision makers in the Carolinas, 2012 Coastal and Estuarine Research Federation (CERF),
- Debra Hernandez, Vembu Subramanian, Jennifer Dorton, Dwayne Porter, Charlton Galvarino, Jeremy Cothran Dan Ramage: SECOORA's Regional Coastal Ocean Observing System: Providing critical marine weather data and information products for weather forecasters and the marine community. 38 th National Weather Association Annual Meeting, Charleston, SC, 12 – 17, October 2013
- Vembu Subramanian, Debra Hernandez, Dwayne Porter, Jeremy Cothran, Dan Ramage and Jennifer Dorton: South East Coastal Ocean Observing Regional Association Data Management System: Fostering data access and visualization of coastal observations in the Southeast US. Coastal and Estuarine Research Federation 2013, SanDiego, California, 3 – 7, November, 2013.
- J. Martinez-Pedraja and L. K. Shay: Interoperability of SeaSondes and Wellen Radars in Mapping Radial Surface Currents, 2013: *Journal of Atmospheric and Oceanic Technology*, Volume 30, pp 2664-2675.

OUTREACH MATERIALS

UNCW Lynn Leonard

US IOOS Advisory Committee Meetings (<http://www.ioos.noaa.gov/advisorycommittee/welcome.html>)

ROFFS Inc. Mitch Roffer

Visit with Senator Bill Nelson (FL) and Congressman Marco Rubio (FL), April 2013

Invited lecture on “Habitat modeling for fisheries independent trap surveys” South Atlantic Fisheries Management Council Habitat and Environmental Protection Advisory Panel meeting in St. Petersburg, FL. Nov. 5 - 6, 2013

UM, Nick Shay

Invited talk on Resolving submesoscale surface current variability along a western boundary current using HF radar measurements, 2013 Gordon Research Conference, June 9-14, 2013.

National HF Radar Technical Steering Team Annual Meeting, Boulder, CO. April 2013

NCSU, Ruoying He

Discussion lead on Interannual and Long-Term Changes in the Coastal Ocean, 2013 Gordon Research Conference, June 9-14, 2013.

SKIO, Dana Savidge

Invited talk on Radar research: Access to a range of scales, 2013 Gordon Research Conference, June 9-14, 2013.

SECOORA Board Member, Vice Admiral Conrad Lautenbacher (Ret),
[Statement of Testimony](#) in support of the US IOOS, March 2013

Numerous outreach materials have been developed for specific audiences and are available at www.secoora.org.