

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

Program Performance Report

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Project Summary

Southeast Coastal Ocean Observing Regional Association (SECOORA) and its members are integrating and augmenting existing observational, modeling, data management and education assets in the southeastern US 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.

With this grant funding SECOORA is:

1. Sustaining SECOORA as a Regional Information Coordination Entity (RICE). This will ensure that stakeholder needs are met through assessment and governance mechanisms that effectively prioritize the distribution of RCOOS-related funding, as well as coordinate projects and other resources that are required to meet critical regional needs;
2. Sustaining and expanding a coastal and ocean observing subsystem for the Southeast that provides coordinated monitoring, assessment and prediction, and includes moored and coastal stations, and high frequency radars (HFR);
3. Supporting a multi-scale modeling subsystem that includes regional ocean, shelf and estuarine circulation (nowcast/forecast); estuarine and surge/inundation prediction (nowcast/forecast); beach/shellfish water quality advisories; species specific habitat models; and which uses the observing subsystem for validation, assimilation, and operation;
4. Supporting the Data Management and Communication (DMAC) subsystem to optimize operations, improve access to regional data, facilitate technology evolution/transfer, and address structural/project management complexities; and
5. Supporting an education and outreach subsystem by SECOORA core staff partnered with other RAs and marine education efforts that engages diverse education and stakeholder audiences to understand the benefits of ocean observing to society.

Progress and Accomplishments

SECOORA Project Contractual Subawards Update

The administration of the NOAA Year 3 (FY13) award and subawards are being continued by SECOORA. For the Year 3 award, SECOORA issued no cost extensions to seven subawardees during this reporting period as they were behind schedule in expending their funds. We kicked-off the following RCOOS integration projects in this reporting period: (1) waves estimation from High-Frequency Radars; (2) development of an on-line model skill assessment tool, and (3) development of new data products. Reviews of the multi-scale multi-resolution modeling subsystem (goal 4) projects for continued funding in Year 4 were performed. An amendment was added to the subaward to University of Georgia on maintenance of NOAA's Ocean Acidification Gray's Reef National Marine Sanctuary buoy. We received notice of the NOAA Year 4 (FY14) award during this reporting period. After the contractual review and account establishment for the Year 4 award, we will be submitting our Year 4 descope proposal to NOAA and issuing year 4 subawards on or before August 15, 2014. Specific details regarding progress made on goals and objectives in each subsystem projects are detailed in the following sections.

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

Milestones: The following provides updates for this goal. Additional details are described in the table that follows.

- A. Provide timely grant reports to NOAA:** Ongoing.
- B. Hold Board Meeting Fall 2013 and Annual Meeting 2014:** Held Dec. 4-5, 2013 Board meeting and Annual meeting (RCOOS PIs, stakeholders, members and Board) May 13-15, 2014.
- C. Publish e-newsletters and other outreach material:** Compiled and distributed relevant news via facebook, twitter, e-newsletters and emails to members. We continue to post event-based news (extreme events, project updates, red tide, etc.) and outreach materials on the "Latest News" and "SECOORA highlights" sections of our web site.
- D. Coordinate with neighboring RAs:** We continue to work 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.
- E. SECOORA Web site updates focused on data portal expansion, and PI project news:** Ongoing.
- F. Work with IOOS Association and U.S. IOOS Program Office to effectively respond to NOAA and other National level requirements:** Debra Hernandez, Vembu Subramanian and Megan Lee attended the monthly IOOS Association calls. Debra Hernandez and George Maul attended the IOOS Spring meeting (March 4-6, 2014). Megan Lee and Abbey Wakely attended the IOOS/IOOS Association Education and Outreach calls. Vembu Subramanian attended the monthly IOOS RA DMAC calls. Dave Easter, our regional POC, periodically attended SECOORA staff calls to insure effective coordination and updates on SECOORA projects and activities. SECOORA staff continues to coordinate input on RA certification, QARTOD manuals, the glider strategy, animal telemetry network and the modeling strategy; and submitted comments as appropriate to the IOOS program office.
- G. Refine and maintain RCOOS Conceptual Operations Plan:** No action to report.
- H. Support local, regional and national collaboration:** SECOORA staff and PIs regularly collaborate through co-sponsored meetings, participation in working groups and committees, and through coordination with regional and national colleagues. Some meetings and coordination activities of note include:
 - a. GCOOS-RA Annual Meeting March 17, 2014;

- b. Integrated Tracking of Aquatic Animals in the Gulf of Mexico (iTAG) workshop May 29-30, 2014, St. Petersburg, FL - Co-sponsored with GCOOS-RA;
 - c. International Radiowave Oceanography Workshop May 12-14, 2014, Savannah, GA – Co-sponsored with CODAR and Helzel;
 - d. NOAA’s Ecological Forecasting Road Map SE regional webinar (Feb. 21) and Annual Meeting (Apr. 2-3);
 - e. IOOS Modeling Strategy;
 - f. SECOORA Fisheries Habitat Modeling - South Carolina Department of Natural Resources (SCDNR) and South Atlantic Fisheries Management Council (SAFMC);
 - g. IOOS Vocabulary efforts and Catalog efforts – SECOORA, IOOS and all other RAs;
 - h. SECOORA in-situ data archival efforts – National Oceanographic Data Center;
 - i. IOOS Association and congressional outreach efforts;
 - j. Navy Hurricane Exercise, Fleet Weather Center Norfolk Ops (HURREX (May 5-15) input coordination with MARACOOS, Weatherflow and other SECOORA members;
 - k. HF Radar Steering team,
 - l. Modeling Strategy
 - m. Glider Strategy;
 - n. GSAA Data Portal and Meetings;
 - o. Weather Ready Nation (WRN) Ambassador; and
 - p. Beach swimming advisory – SECOORA, GCOOS-RA, Florida Department of Health, South Carolina Department of Health & Environmental Control (SCDHEC) and NERACOOS.
- I. Evaluate mechanisms to track operational statistics, product usage, and outcome measures and metrics:** We continue to use Google Analytics to track our data and products access via our web site. We started utilizing the National Data Buoy Center (NDBC) Quarterly Partner Statistics (<http://www.ndbc.noaa.gov/partnerstats/>) report, which shows the number of hits and data requests on each monitoring station supported by SECOORA. In 2013, the SECOORA funded in-situ coastal and buoy stations had 1.7 million web page views and data requests on NDBC web site. Marine Weather Portal web pages, a product that was integrated into SECOORA web site in early 2012 continue to redirect visitors to SECOORA data portal and web site. Since January 1 2014 to May 31 2014, we saw a 2% increase in subscription to our newsletter, from 632 to 646, Facebook “likes” have grown 80% (from 59 to 106) and Twitter “followers” have grown 86% (57 to 106). During the reporting period SECOORA shared approximately 124 Facebook posts and 135 Twitter “tweets”, referring a combined 68 sessions to SECOORA website. Our HF Radar operators use the National HF Radar site for reporting the priority radar site uptime statistics. We will continue to work with our in-situ observations data providers to refine and standardize the performance statistics of our in-situ observing stations.

SECOORA Activities	Progress
<ul style="list-style-type: none"> • 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 Governor’s 	<p>Staff fiscal activities:</p> <ul style="list-style-type: none"> • Provided fiscal and overall project management for Year 2, 3 and 4 awards, and continued to manage primary partner institutions subawards. • Held bi-monthly administration meetings to ensure efficient and effective fiscal operations. • A part-time Bookkeeper (Chiaki Kight) and Business Manager (Megan Lee) managed the contracts and financials for these awards. • SECOORA staff held a staff retreat at Charleston, Feb. 4 -5, 2014.

SECOORA Activities	Progress
<p>South Atlantic Alliance (GSAA).</p> <ul style="list-style-type: none"> • Ensure SECOORA plans and gaps analysis align with IOOS Association and IOOS office guidance and/or requirements. • Refine and maintain RCOOS Conceptual Operations Plan. • Develop materials for RA Certification (No Activity). 	<ul style="list-style-type: none"> • Preparations are underway for FY14 SECOORA A-133 audit. <p>SECOORA Board and PI Coordination</p> <ul style="list-style-type: none"> • Continued to hold monthly conference calls with RCOOS PIs to ensure in-reach, coordination and collaboration within each RCOOS subcomponent and among PIs. Also held DMAC activities prioritization and coordination meetings and calls. • Executive Committee continued to meet monthly. The Finance and Audit Committee met every quarter. • Held Fall Board meeting (Dec. 4-5, 2013 – Charleston, SC), SECOORA data management and Product development contractor meeting (Feb 3, 2014), and SECOORA Annual Members, Board and PIs meetings (May 13-15, 2014 – Savannah, GA). Presentations and 2014 annual meeting materials can be accessed via SECOORA web site. <p>External Coordination Activities:</p> <ul style="list-style-type: none"> • Attended GSAA Issue Area Technical Team Meeting in Savannah (Feb. 24 -26, 2014) and coordinated SECOORA/GSAA Regional Information Management System team participation. • Debra continued to participate on monthly “Partner Arm” calls of the GSAA. • Participated in monthly IOOS Association and IOOS conference calls, including Debra’s participation on the IOOS Association Executive Committee. • Debra and George Maul attended the IOOS Association Spring Meeting held in Washington D.C. (March 2014). • SECOORA co-hosted an Ecological Forecasting in the SE webinar with NOAA’s Ecological Forecasting Roadmap team on Feb. 21, 2014. Debra attended the NOAA’s Ecological Forecasting meeting in Washington D.C (April 2 -3, 2014). • Debra, Vembu, Steve Woll (Weatherflow), SECOORA PIs together with MARACOOS held conference calls and meetings with U.S. Navy Fleet weather center Norfolk, VA Operations Center on providing data and model products for their May 2014 HURricane EXercise (HURREX). • Debra attended the National Integrated Drought Information System USGS Realtime Salinity Drought Index Workshop held at the NOAA Center for Coastal Environmental Health and Biomolecular Research on January 7, 2014. • Debra and Megan attended the SC Offshore Wind Regulatory task force meeting in Charleston on Feb. 27. • Debra traveled to NC (March 17- 19, 2014) to meet with SECOORA members and potential new members. • Debra attended the Carolinas Climate Resilience conference in Charlotte, NC on April 28-29, 2014. • Vembu continued to meet with National Weather Service, Tampa office on Marine Weather Portal and attended Weather Ready Nation stakeholders meeting and conference calls. • Vembu attended a SURA Coastal and Environmental Research Committee (CERC) Spring 2014 Advance meeting held in St. Petersburg on Feb. 17, 2014. • Vembu attended the West Central Florida American Meteorological Society meeting talk on Numerical Modeling at the National Weather Service, Ruskin. • Vembu attended the Marine Technology Society (MTS) Tech Surge Ocean Sensor meeting (March 31 – April 2, 2014). • Vembu attended the GCOOS-RA Annual meeting (March 17, 2014). • SECOORA and GCOOS-RA co-sponsored Integrated Tracking of Aquatic Animals in the Gulf of Mexico (iTAG) workshop May 29-30, 2014- St. Petersburg, FL. <p>Efforts to Leverage IOOS Funding:</p> <ul style="list-style-type: none"> • Continued partnership with GSAA, and launched the Regional Information Management System portal for the GSAA.

SECOORA Activities	Progress
	<ul style="list-style-type: none"> The PIs that receive SECOORA subawards also leverage either their institutional funds or external grants to carry out their projects.

Goal 2: Sustain an Observing Subsystem for the SE

Milestones: The following provides updates for this goal. Additional details are included in the table that follows.

- A. Operate and maintain moored and coastal stations:** COMPS and Carolina RCOOS assets are maintained.
- B. Report moored and coastal stations data to secoora.org and NDBC:** Ongoing.
- C. Operate and Maintain Priority Radars**
 - i. **Hourly surface current maps from the various subregions via individual and SECOORA web sites:** Ongoing.
 - ii. **Estimates of significant wave heights from the HF radar data:** Estimates of significant wave heights from the HF Radar data are carried out on an experimental basis by WERA HF Radar operators ([USF](#), [UM](#), [SKIO](#), [USC](#)) within the region.
 - iii. **Develop/report performance metrics of CODARs and WERAs throughout the SE including accuracy estimates of the surface currents:** HF Radar operators in our region use the National HFR site to report the site performance metrics. The work on accuracy estimates of the surface currents is being continued.
 - iv. **Provide the radial currents to the National Servers (SIO/Rutgers) for the National HF radar network:** Ongoing.
- D. Maintain the sensors on Gray’s Reef National Marine Sanctuary (GRNMS) Buoy 41008:** Ongoing. An amendment was added to the University of Georgia subaward. Wei-Jun Cai, University of Delaware is funded to perform the collection of underway pCO₂ data and bulk water samples for analyses during the spring and summer 2014 cruises at the Gray’s Reef mooring site.
- E. HF Radar Waves Project:** Nick Shay, University of Miami is funded to carry out the estimation of waves from high frequency radars.

Objective 2.1: Sustain Moored and Coastal Stations	
Institution/Activities	Progress
University of South Florida (Weisberg) Support COMPS moorings	Support is continued for 3 surface moorings (C10, C12 and C13), 2 subsurface moorings (C11 and C15) and one offshore tower. USF has deployed new data loggers at C10 and C13 moorings, which should lead to much improved data returns from moorings. Data acquired from the moorings are sent to SECOORA and NDBC. USF technical personnel demonstrated the implementation of Quality Control tests outlined in the IOOS Manual for Real-Time Quality Control of In-Situ Current Measurements for buoys on at the May 2014 IOOS DMAC Webinar.

University of South Florida (Luther) Support in-shore tidal meteorological stations	Support is continued for USF COMPS Coastal Stations. Data acquired from the stations are sent to SECOORA and NDBC. Periodic station repair, maintenance visits to stations and tidal well surveys are continued. Work is being carried out to consolidate Egmont Key and Anna Maria stations into a single station. In March 2014, USF together with YSI installed a new generation water quality sensor at Clam Bayou station. This site will become a part of the already existing COMPS coastal station funded by SECOORA. In Year 4 it is expected that USF will maintain 7 coastal stations (Shell Point, Aripeka, Fred Howard Park, Big Carlos Pass, Clam Bayou and the consolidated Egmont/Anna Maria site).
University of North Carolina - Wilmington (Leonard) Support Carolina RCOOS network	University of North Carolina Wilmington (UNCW) continued to operate and maintain 7 nearshore real-time moorings and 1 coastal pier station. Periodic buoy turnarounds and station maintenance are continued. The currents data from OCP1 (Ocean Crest Pier station) and LEJ3 (nearshore mooring) are not being collected due to instrument issues. LEJ3 is the NDBC buoy which the Carolinas RCOOS deployed in 2005 and NDBC does not anticipate repairing the ADCP system. All data collected are provided to SECOORA and NDBC and made available via Global Telecommunication System (GTS).
Objective 2.2: Maintain High Frequency Radar Operations	
Institution/Activities	Progress
HF Radar data delivery from all SECOORA priority stations	The data from all radars are being continuously provided to SECOORA and the US National HFR Network in near real-time.
University of South FL (Weisberg) Support four CODAR stations on the West Florida Shelf	USF currently operates, maintains and delivers data from three CODAR priority radar sites (Naples, Venice and Reddington Shores). Acquisition of CODAR equipment for installing the fourth site is in progress. USF maintains the 2 co-located WERA stations and assessment of CODAR and WERA HF Radars in mapping currents were performed. Operational uptime and average range statistics of three priority codar sites for this reporting period: NAPL – 99.7%, 187km, VENI – 94.1%, 171km and RDSR – 99%,183km.
University of South Carolina (Voulgaris) Support two WERA radar arrays in Long Bay, SC	USC currently maintains, operates and delivers data from 2 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. Operational uptime and average range statistics of two priority HF Radar sites for this reporting period: CSW – 99.4%, 191km and GTN – 97.3%, 231km.
Skidaway Institute of Oceanography (SkIO) (Savidge) Support two WERA radar arrays on St. Catherine's and Jekyll Island, GA	SkIO continued to operate 2 WERA HF-radars on St. Catherine's Island and Jekyll Island GA for this reporting period. Estimates of wave and wind parameters are also made, as experimental products. SkIO organized and hosted the 2014 International Radiowave Oceanography Workshop in Savannah, GA (May 11-15, 2014). Operational uptime and average range statistics of two priority HF Radar sites for this reporting period: CAT – 94%, 194km and JEK – 97.9%, 204km.
University of Miami (Shay) Support three WERA radar arrays at Crandon, Virginia Key and Dania Beach	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. Re-establishment of cables and connections at Crandon park site is expected to get completed in summer 2014. Discussions are underway with Ocean Reef Club, Key Largo to establish the fourth WERA site at Key Largo, FL. Operational uptime statistics of two operational priority HF Radar sites for this reporting period: STF – 59%, 113km and 87.2%, 106km.

<p>University of NC - Chapel Hill (Seim) Support two CODAR radar arrays on the Outer Banks of NC</p>	<p>The University of North Carolina Chapel Hill operates 2 CODAR-radar installations on the Outer Banks of North Carolina with SECOORA/IOOS funds. With funding from the State of North Carolina, UNC-CH has added another HF Radar CODAR site on Core Banks. The installation of this additional site increases the HF Radar coverage in the Outer Banks. Hourly data from these sites are delivered to SECOORA and the US National HF Radar network archive. Operational uptime statistics of two priority HF Radar sites for this reporting period: DUCK – 100%, 223km and HATY – 99.7%, 188km.</p>
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Objective 2.5: Maintain the sensors on NOAA Gray’s Reef National Marine Sanctuary (GRNMS) buoy

Institution/Activities	Progress
<p>University of Georgia (Noakes) and University of Delaware (Wei-Jun Cai) Support to NOAA’s Ocean Acidification Program NDBC Gray’s Reef National Marine Sanctuary (GRNMS) buoy</p>	<p>Support is provided for NOAA’s Ocean Acidification Program NDBC Gray’s Reef National Marine Sanctuary (GRNMS) buoy (41008) maintained by University of Georgia. An amendment was added to the University of Georgia subaward. Wei-Jun Cai, University of Delaware is funded to perform the collection of underway pCO₂ data and bulk water samples for analyses during the spring and summer 2014 cruises at the Gray’s Reef mooring site. Reprogrammed the Seabird and replaced the SAMI-pH sensor on the GRNMS buoy to get the water quality and pH data streaming restored. The analyses of the time series data collected at the site show that Seawater CO₂ is currently increasing at a rate of 2.7% per year and the atmospheric CO₂ is currently increasing at a rate of 0.77% per year with an average CO₂ of 391.7ppm. The results were presented at the 2014 Ocean Sciences meeting in Honolulu, HI.</p>

Objective 2.6: HF Radar Waves Project

Institution/Activities	Progress
<p>University of Miami (Shay) Wave estimates from WERA High Frequency Radars</p>	<p>The objective of this project is to deploy an Acoustic Wave and Current Profiler (AWAC) in the HF Radar footprint in the FL Straits to obtain wave measurements, which can be compared to the WERA HF Radar derived significant wave height measurements. The work will also include a careful assessment of the errors in wave extraction algorithms. In April 2014, University of Miami (UM) Rosenstiel School of Marine & Atmospheric Science, deployed a subsurface mooring in the Straits of Florida. The mooring is equipped with a NortekUSA acoustic wave and current profiler (AWAC) instrument. AWAC profiler is located at 25.93N and 79.88W in the UM maintained High Frequency radar footprint (between Dania Beach and Virginia Keys stations). The AWAC is expected to provide a three-month time series. The measurements obtained during the spring and summer transition period will allow proper calibration of the HF Radar wave measurement algorithm. The data from AWAC, coupled with the HF radar, satellite sea surface temperature and local wind velocity observations will provide a comprehensive four-dimensional (x, y, z, t) dataset to resolve the flow-field evolution at the shelf-break.</p>

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

Milestones: The following table provides progress on the modeling subsystem projects.

A. Support Regional SABGOM model	
Institution/Activities	Progress
North Carolina State University (He) Support and enhance SABGOM model	The North Carolina State University 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) and associated products are made available via the SECOORA web site and the NCSU PI's web site. Comparisons of model derived ocean circulation, marine weather, ocean wave and marine ecosystem variables with available observations are being performed. Work is in progress on coupling SABGOM with physical-biogeochemical modeling system to produce both short-term and long-term predictions of ocean physical, biogeochemical states to assist interdisciplinary observations and data analysis (ocean acidification, ecological forecasting, marine biodiversity observing network). NCSU modeling team is working with SECOORA data management team and product development contractor to make model derived marine ecosystem variables (surface Chl-a and zooplankton concentrations) as well as hindcast model run data available via SECOORA web site.
B. Implement Forecasting of Storm Surge, Inundation and Coastal Circulation	
Institution/Activities	Progress
University of Florida (Sheng) and North Carolina State University (Xie) Provide real-time forecasting of inundation and storm surge.	UF completed 3D baroclinic circulation, storm surge and inundation forecasting system coupled with SWAN wave model for the entire Florida coast, and provides 2 to 3 day forecasts depending on available forecast wind fields. The model current fields were compared with SECOORA HF Radar observations in the FL Straits region, and further appropriate comparisons of model variables with other available in-situ observations are being performed. NCSU maintains the near-real-time CMAEPS forecast system and provides atmospheric, sea surface wave and storm surge forecasts for the SECOORA region. The high-resolution storm surge forecasts are being carried out for the Northern Florida Coast, Georgia and South Carolina (GASC) and South Carolina and North Carolina (SCNC) domains. Continued to maintain the CMAEPS web and THREDDS data server to serve forecasts output. The UF and NCSU model data are made available SECOORA THREDDS server as well as the PIs' web sites.

C. Provide Species Specific Habitat Models that integrate remotely sensed data and in-situ data to enhance South Atlantic Fisheries Management Council Stock Assessments

Institution/Activities	Progress
<p>ROFFS (Roffer), University of Miami CIMAS (Muhling), and SAFMC (Pugliese) Develop data products derived from satellite and in situ observations for fisheries stock assessment.</p>	<p>Roffer’s Ocean Fishing Forecasting Service, Inc. (ROFFS Inc.) together with the University of Miami Cooperative Institute for Marine and Atmospheric Studies (CIMAS), South Carolina Department of Natural Resources MARMAP survey team and the South Atlantic Fisheries Management Council (SAFMC) refined the habitat model during this reporting period. Using the SCDNR MARMAP Chevron Fishery Independent trap survey (gray trigger fish, black seabass, red porgy and vermillion snapper), positional variables (latitude and longitude), sampling variables (date, time and soak duration), environmental variables (bottom temperature, surface temperature, water depth, wind speed and moon phase) and biological variable (predator biomass) datasets, probabilities of occurrence were computed and the results indicate that for each species the important variables were found to be different. Spatial habitat model predictions overlaid with observed catches in June – August 2008 show good agreement with MARMAP survey catch data. Triggerfish, red porgy and vermilion snapper were most abundant in central northern study area (South Atlantic Bight), while the black seabass was most common in shallow waters over the entire region. Interannual comparisons show good fit of the model compared with the observed catch data (fish/hr.) for the months of June – August. The effect of relatively cooler bottom temperatures during the summer of 2003 for triggerfish and snapper became apparent especially when comparing 2003 to 2002. Efforts are underway to become involved in the regional stock assessment process by engaging and collaborating with SCDNR, SAFMC committees and SouthEast Data, Assessment, and Review (SEDAR) process to evaluate the utility of the model for future stock assessments. The project team also organized and conducted a special session on Habitat modeling and Ecosystem-based resource management at the Ocean Sciences meeting in Hawaii (Feb. 2014), and also, presented a poster titled “Habitat Modeling for Fisheries Independent Trap Surveys” at the Ocean Science meeting.</p>

D. Improve Beach/Shellfish water quality advisories

Institution/Activities	Progress
<p>University of South Carolina (Porter) Provide a decision support tool for beach/shellfish water quality advisories.</p>	<p>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). Evaluation of SABGOM model and HF Radar data to incorporate in the modeling effort is in progress. Plans are underway to demonstrate the geographic transferability of modeling approach.</p>

E. SECOORA Model Skill Assessment	
Institution/Activities	Progress
Independent Contractor (Filipe Pires Alvarenga Fernandes, Oceanographer, Brazil) Collaborator and consultant role (Richard Signell, USGS) Development of Model Skill Assessment on-line tool	The Model Skill Assessment contract was established in May 2014 and the work has begun to develop an on-line tool for numerical model skill assessment. Workplan development has been completed and identification and familiarization of SECOORA numerical model outputs and appropriate observations in the SECOORA region are in progress.

Goal 4: Enhance the DMAC Subsystem

Milestones: Updates on activities are described in “progress” column of the following table.

Institution	Progress
University of South Carolina (Porter), University of NC – Chapel Hill (Seim) <ul style="list-style-type: none"> Maintain SECOORA DMAC Infrastructure. Assess and Advance IOOS recommended SOS implementation. Maintain and upgrade interactive maps and data portal. Service and provide support to data providers. Recruit and integrate new data to SECOORA data portal. Support data providers and RCOOS Manager on implementation of QA/QC flags based on the published QARTOD manuals. Collaborate with SECOORA product development contractor. University of North Carolina – CH (Seim) <ul style="list-style-type: none"> Improve and test SPARQL queries. Investigate the quality of information of ESRI Geoportal side response of catalog search of metadata records. Second Creek Consulting (Charlton Galvarino) Product Development Support Services	<p>Support and service for data providers in the region and RCOOS PIs were continued during this reporting period. Bi-weekly conference calls are being held between SECOORA and USC data management team, and the data management tasks that are being carried out and the progress being made are made available via Google Docs.</p> <p>Maintenance of SECOORA Data Management server infrastructure The University of South Carolina hosts and maintains the hardware and software related to SECOORA’s Data and Maps section of the web site. This activity includes maintenance of equipment, development and documentation of code and tools to facilitate wider use, increased public awareness and access to SECOORA data, products and services.</p> <p>Servicing Data Providers and RCOOS subsystem PIs 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. We also started contributing to the IOOS established documentation and code sharing github site. We worked with data providers and PIs on: THREDDS data server installation and making model and observations available via the same; added Florida Atlantic University LOBO and Florida Institute of Technology (FIT) Sebastian inlet station data; Glider deployment track posting on SECOORA web site in coordination with IOOS glider DAC and glider operators.</p> <p>IOOS Program Office DMAC Activities SECOORA RCOOS Manager and USC Data Management continued to participate on monthly IOOS DMAC calls. Working with National Data Buoy Center on regional data push using established Sensor Observation Service (SOS). We have started to archive our in-situ observations at National Oceanographic Data Center. We have implemented the netCDF version (ncSOS) and have registered our SOS, THREDDS and ERDDAP on IOOS Catalog registry. We continued to provide input on QARTOD manuals as well as other data management related issues. SECOORA RCOOS Manager worked with USF technical personnel to demonstrate the implementation of quality control tests outlined in the IOOS Manual for Real-Time Quality Control of In-Situ Current Measurements for buoys on the West Florida Shelf at the May 2014 IOOS DMAC Webinar.</p>

Institution	Progress
	<p>IOOS Parameter Vocabulary No progress to report on this activity during this reporting period. A new set of tasks have been developed on this activity, and the progress on the new set of tasks will be reported in the December 2014 IOOS semi-annual progress report.</p> <p>Upgrade of SECOORA Interactive map Based on our end users and RCOOS PIs input, we are actively engaged in improving our interactive model map that integrates and provides visualization of observations and model data. To address the easy discovery of data via our data portal and to assist the development of new data products and access to our data holdings, we are currently implementing a SECOORA data catalog.</p> <p>Product Development Second Creek Consulting was awarded the product development support service contract, and the contract was established in January 2014. The contractor tasks are: review existing data and information products made available via SECOORA web site (SECOORA Data Portal); develop a workplan document or presentation with recommendations or options to improve the data portal user interface, and organize, optimize and streamline SECOORA product accessibility; and development and delivery/integration of two products.</p>

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

The primary focus of SECOORA's Education and Outreach (E&O) subsystem is to engage stakeholders in 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. We hired Abbey Wakely, a part-time Communication Specialist to work with SECOORA staff and member organizations on SECOORA outreach activities. No Education and Outreach PIs were funded in Year 3.

Education and Outreach Activities (SECOORA staff and RCOOS PIs)
<p>SECOORA continued to engage in marketing and outreach activities via e-newsletter, e-mails, social-media and website. SECOORA sent two e-newsletters, referring 156 sessions to our website during this reporting period. We sent 7 emails outlining staff activities to the Board. Eight stories highlighting Members work, SECOORA newsletters and more were published on our website. We continue to engage in outreach and education events as well as provide materials to RCOOS PI and board members, who attend science meetings, provide information to governmental representatives, etc. SECOORA staff and members engaged in 43 in-person outreach events, including meeting with 8 congressional staffers. During this reporting period, we developed new outreach rack cards and one-pagers for each state, which can be accessed via our web site.</p>
<p>SECOORA In-Person Outreach: SECOORA staff constantly engaged in either delivering a talk at institutions or visiting institutions and attending meetings to promote the need for the implementation of regional coastal ocean observing systems to address coastal zone issues. The following are some outreach activities that occurred during this reporting period: NOAA Ecological Forecasting webinar and meeting; Weather Ready Nation events; Weather Forecast Office visits: Tampa, Miami and Charleston; Wilmington Sector USCG; North Carolina Sea Grant; North Carolina Member institutes as well as potential new member organizations; Ocean Acidification Office in Charleston; GSAA meetings; Our Global Estuary meeting; Congressional Offices; North Carolina Coastal Management and Sentinel Site Programs; South Carolina Maritime Association; GCOOS-RA Annual Meeting; Integrated Tracking of Aquatic Animals in the Gulf of Mexico (ITAG) workshop; SURA Coastal and Environmental Research Committee (CERC) Spring 2014; Fleet weather center, Norfolk, VA; Florida Gulf Coast University; West Central Florida American Meteorological Society Meetings; and International Radio Oceanography Working Group meeting.</p>

Education and Outreach Activities (SECOORA staff and RCOOS PIs)

May 2014 Annual Members and Stakeholders Meeting summary: During this reporting period we conducted our SECOORA Annual Meetings in Savannah, Georgia (May 13-15, 2014). We held our RCOOS PIs meeting on Day 1, Annual Member and Stakeholders meeting on Day 2 and Board meeting on Day 3. A [meeting summary](#) and all [meeting materials](#) are available via the SECOORA web site.

Scope of Work

Scope of work remains as proposed for Year 3. The Education and Outreach subcomponent remains unfunded as outlined in the revised scope of work for Year 2. Three new subcontracts were awarded during the reporting period: HF Radar Waves Project (University of Miami); Model Skill Assessment (Filipe Fernandes, Oceanographer, Brazil); and Product Development Support Services (Second Creek Consulting, LLC.)

Personnel and Organizational Structure

No major changes in SECOORA personnel or organizational structure were made during this reporting period. A part-time Communication Specialist was hired to assist staff and members on outreach efforts. At the May 2014 Annual meeting we held the election for the Board of Directors. Lynn Leonard, UNCW (Academic/Research/Education Sector), Jim Nelson, UGA Skidaway Institute of Oceanography (Academic/Research/Education Sector), Timothy Short, SRI International (Public Agencies/ Non-Profit/ Other Sector), Bill Hogarth, FIO (Florida At Large seat), Kathleen O'Keife, FWRI (Florida At Large seat) and Peter Hamilton, Leidos Corporation (Industry/ Private Sector seat) were elected to the Board. Robert Weisberg (USF), Peter Sheng (UF) and George Maul (FIT) are rotating off the Board of Directors at the end of June 2014.

Budget Analysis

SECOORA's financial records as of April 30, 2014 show the following has been expensed: over \$2.1M of Year 2 funds and over \$1M of Year 3 funds. There were five no cost extensions granted for Year 2 subawardees with end dates of August 31, 2014. We anticipate that IOOS Year 2 subaward funds will be expensed by August 31, 2014. IOOS Year 3 funds are being drawn down rapidly. Overall, we are within budget and on track with spending. Megan Lee continues to manage no cost extensions with the Year 3 awards. SECOORA continues to receive invoices regularly from our subawardees and we process them at one of two bi-monthly meetings. All invoices are paid within forty-five days. SECOORA continues to draw from ASAP monthly. As a reminder SECOORA, pays out its monthly operational costs (i.e. payroll, etc.) and then conducts the ASAP draws in the middle of the following month for both the preceding month's operation expenses and the subawardee invoices.

Publications and Presentations

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 2010. *Harmful Algae* (2014). <http://dx.doi.org/10.1016/j.hal.2014.04.010>

Liu, Y., R. H. Weisberg, and C. R. Merz, 2014: Assessment of CODAR SeaSonde and WERA HF Radars in Mapping Surface Currents on the West Florida Shelf. *J. Atmos. Oceanic Technol.*, 31, 1363–1382, doi:10.1175/JTECH-D-13-00107.1. <http://journals.ametsoc.org/doi/abs/10.1175/JTECH-D-13-00107.1>

Habitat Modeling Fisheries Independent Trap Surveys (2014): Poster presented at 2014 Ocean Sciences Meeting, Hawaii.

Zambon, J, He, R., Warner, J. (2014), Numerical Investigation of Hurricane Ivan Using the Coupled Ocean-Atmosphere-Wave-Sediment Transport (COAWST) Model, *Ocean Dynamics*.

Xue, Z*, J. Zambon, Z. Yao, Y. Liu and He, R. (2014) An Integrated Ocean Circulation, Wave, Atmosphere, and Marine Ecosystem Prediction System for the South Atlantic Bight and Gulf of Mexico, *Journal of Operational Oceanography*.

Liu, T. and Sheng, Y. P. (2014), Three dimensional simulation of transport and fate of oil spill under wave induced circulation. *Marine Pollution Bulletin*, Vol. 80, Issues 1–2, 15 March 2014, pp. 148–159.

Xie, L., and B. Liu, 2014: Marine meteorology. *Encyclopedia of Atmospheric Sciences*, 2nd Edition, Edited by G. North, F. Zhang, and J. Pyle, Elsevier Ltd., in press.

Xie, K., and B. Liu, 2014: An ENSO-forecast independent statistical model for the prediction of annual Atlantic tropical cyclone frequency in April. *Advances in Meteorology*, Vol. 2014, 248148, doi: 10.1155/2014/248148.

June 2014 SECOORA Annual Supplemental Information

Education and Outreach Activities (IOOS Education and Outreach Inventory Tool)

During this reporting period, we used the [2012-2013 IOOS Cloud/Education and Outreach](#) Inventory Tool (Google Collaboration tool spread sheet) and updated the SECOORA Education and Outreach activities.

Regional Ocean Governance Organization Activities

Staff fiscal activities:

- Provided fiscal and overall project management for Year 2 and Year 3 awards, and continued to manage primary partner institutions subawards.
- Added three subawards (HF Radar Waves Project, Model Skill Assessment and Product Development) with Year 3 funds during this reporting period.
- Held bi-monthly administration meetings to ensure efficient and effective fiscal operations.
- A part time Bookkeeper (Chiaki Kight) and Business Manager (Megan Lee) managed the contracts and financials for these awards.
- SECOORA staff held a staff retreat at Charleston, Feb .4 -5, 2014
- Federal Financial Report for IOOS funds was submitted during this reporting period.
- Preparations are underway for FY14 SECOORA A-133 audit.
- We have hired a part-time SECOORA Communications Specialist to assist SECOORA staff and members on outreach materials and activities.

SECOORA Board and PI Coordination

- Continued to hold monthly conference calls with RCOOS PIs to ensure in-reach, coordination and collaboration within each RCOOS subcomponent and among PIs. Also held DMAC activities prioritization and coordination meetings and calls.
- Executive Committee continued to meet monthly. The Finance and Audit Committee met every quarter. Board conference calls were held when needed.
- Held Board meeting (Dec. 4-5, 2013 – Charleston, SC), SECOORA data management meeting (Feb. 3, 2014 – Columbia, SC), and SECOORA annual Members, Board and PIs meetings (May 13-15, 2014 – Savannah, Georgia). Presentations and 2014 annual meeting materials can be accessed via [SECOORA May meeting web site](#).

External Coordination Activities:

- Attended the GSAA Issue Area Technical Team Meeting in Savannah (Feb. 24-26, 2014) and coordinated SECOORA/GSAA Regional Information Management System team participation.
- Executive Director continued to participate on quarterly “Partner Arm” calls of the GSAA.
- Participated in monthly IOOS Association and IOOS conference calls, including Debra Hernandez participation on the IOOS Association Executive Committee.
- Debra Hernandez and George Maul attended the IOOS Association Spring Meeting held in Washington D.C. (March 2014).
- Debra attended NOAA’s Ecological Forecasting meeting in Washington D.C (April 2 -3, 2014).
- Debra, Vembu, Steve Woll (Weatherflow), and other SECOORA members together with MARACOOS held conference calls and meetings with U.S. Navy Fleet weather center Norfolk, VA Operations Center on providing data and model products for their May 2014 HURricane EXercise (HURREX).
- Debra attended the National Integrated Drought Information System USGS Realtime Salinity Drought Index Workshop held at the NOAA Center for Coastal Environmental Health and Biomolecular Research on January 7, 2014.
- Debra and Megan attended the SC Offshore Wind Regulatory task force meeting in Charleston on Feb. 27.
- Debra traveled to NC (March 17- 19, 2014) to meet with SECOORA members and potential new members.
- Debra attended the Carolinas Climate Resilience conference in Charlotte, NC on April 28-29, 2014.
- Vembu continued to meet with National Weather Service, Tampa office on Marine Weather Portal and attended Weather Ready Nation stakeholders meeting and conference calls.
- Vembu attended a SURA Coastal and Environmental Research Committee (CERC) Spring 2014 Advance meeting held in St. Petersburg on Feb. 17, 2014.

- Vembu attended the West Central Florida American Meteorological Society Meeting talk on Numerical Modeling at the National Weather Service, Ruskin.
- Vembu attended the Marine Technology Society (MTS) Tech Surge Ocean Sensor meeting (March 31 – April 2, 2014).
- Vembu attended the GCOOS-RA Annual meeting (March 17, 2014).
SECOORA and GCOOS-RA co-sponsored Integrated Tracking of Aquatic Animals in the Gulf of Mexico (iTAG) workshop May 29-30, 2014, St. Petersburg, FL.

Efforts to Leverage IOOS Funding

- Continued partnership with GSAA, and launched the Regional Information Management System Portal for the GSAA.
- The PIs that receive SECOORA subawards also leverage either their institutional funds or external grants to carrying out their projects.

Update to RA Membership, Board of Directors and Committee Members

RA Membership

During this reporting period, the following organization joined SECOORA:

- NOAA Ocean Acidification Program

Board of Directors

The following Board Members are rotating off of the SECOORA Board of Directors at the end of June 2014:

George Maul – FIT

Robert Weisberg – USF

Peter Sheng - UF

The following members were elected/re-elected to serve on the SECOORA Board (starting July 1, 2014) at the May 2014 Board meeting:

Lynn Leonard, UNCW (Academic/Research/Education Sector)

Jim Nelson, UGA Skidaway Institute of Oceanography (Academic/Research/Education Sector)

Timothy Short, SRI International (Public Agencies/ Non-Profit/ Other Sector)

Bill Hogarth, FIO (Florida At Large seat)

Kathleen O’Keife, FWRI (Florida At Large seat)

Peter Hamilton, Leidos Corporation (Industry/ Private Sector seat)

SECOORA Committees

Finance and Accounting Committee: Chair: John Proni

Members:

Rick DeVoe – South Carolina Sea Grant Consortium

John Proni – Florida International University

Conrad Lautenbacher – GeoOptics

Peter Sheng – University of Florida

Board Development Committee: Chair: Mitch Roffer

Members:

Peter Hamilton

Nick Shay

Mitch Roffer

Jim Fourqurean (replaced Mike Heithaus)

Bob VanDolah

Note: The RA membership, Board of Directors and Committee members are on the SECOORA web site, which is updated on July 1 of every year and periodically updated as and when necessary, and provided in IOOS PO template in Appendix A.

Appendix A: Updates to SECOORA Board Membership

Region	Type of Governance	Distribution of Governance Board Membership								Total Number of Board Members
		Government				Non-Government			Foreign (all sectors)	
		State*	Local	Tribal	Federal	Research Institute	Industry	NGO**		
SECOORA	501(c)(3)	1				11	4	1		17

* includes Sea Grant and territorial governments

** includes Fishery Management Councils

*** "bi-national" International Joint Commission