

**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**

Award Number: NA11NOS0120033

**Reporting Period: 1 December 2015 – 31 May 2016**

**Date submitted: 23 June 2016**

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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 4 and Year 5 awards and subawards are being continued by SECOORA. We submitted a one-year (June 1, 2016 – May 31, 2017) no-cost extension request to NOAA, which was approved. For the Year 5 award, SECOORA issued no cost extensions to eleven subawardees during this reporting. We received notice of the new NOAA Year 1 (FY16) cooperative award during this reporting period. After the contractual review and account establishment for the Year 1 award, we will be submitting our Year 1 descope proposal to NOAA on or before July 31, 2016. Specific details regarding progress made on goals and objectives in each subsystem 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 2015 and Annual Meeting 2016:** Held December 3-4, 2015 Board meeting and Annual meeting (Stakeholders, Members Business, Board and RCOOS PI) May 18-20, 2016.
- C. Publish e-newsletters and other outreach material:** SECOORA continued to engage in marketing and outreach activities via e-newsletter, e-mails, social media and website updates. During this reporting period, SECOORA sent 1 e-newsletter, 2 emails outlining staff updates to the Board and produced 18 stories highlighting members' work. SECOORA newsletters, stories and videos were published on our [website](#). We continue to engage in outreach and education events as well as provide materials to RCOOS PIs and Board members who attend science meetings, provide information to governmental representatives, etc. SECOORA staff and Members engaged in in-person coastal ocean observing and marine science related scientific, stakeholder and outreach events. During this reporting period, SECOORA and the National Oceanic and Atmospheric Administration's Ocean Acidification Program continue to facilitate Southeast Ocean and Coastal Acidification Network ([SOCAN](#)) to support and encourage discussions on ocean and coastal acidification in the Southeast region. We, together with the IOOS Association and other RAs, provided congressional outreach support emphasizing the importance of US Integrated Ocean Observing System (US IOOS) and all the RAs. We also produced our second annual report highlighting 2015 activities, which can be accessed via our [website](#).
- D. Coordinate with neighboring RAs:** We continue to work closely with the neighboring Regional Associations, local and state and federal government agencies to ensure that messages, products, and projects are coordinated, and resources are leveraged.
- E. SECOORA Website 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, Megan Lee and Abbey Wakely attended the monthly IOOS Association calls. Debra Hernandez and Conrad C. Lautenbacher attended the IOOS Spring meeting (March 1-3, 2016). Debra and Conrad visited 12 congressional offices in DC: Senator Lindsey Grahams (R-SC), Senator Thom Tillis (R NC), Congressman David Price (D-NC 4), Congressman Bill Posey (R-FL 8), Congressman Tom Rice (R-SC 7), Congressman Jeff Duncan (R-SC 3), Congressman Sanford Bishop (D-GA 2), Congresswoman Debbie Wasserman Schultz (D-FL 23), Congressman Patrick Murphy (D-FL 18),

Congressman Ander Crenshaw (R-FL 4), Congresswoman Ileana Ros-Lehtinen (R-FL 27), and Congressman Mark Sanford (R-SC 1). Abbey Wakely attended the IOOS/IOOS Association Education and Outreach calls. Vembu Subramanian attended the monthly IOOS RA DMAC calls. 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. 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 include:

- a. Southeast Ocean and Coastal Acidification Network (SOCAN) state-of-the-science webinar series on ocean acidification;
- b. Sensor Observation Service (SOS) and Catalog efforts – SECOORA, IOOS and all other RAs;
- c. SECOORA in-situ data archival efforts – National Center for Environmental Information (NCEI);
- d. IOOS Association and congressional outreach efforts;
- e. Modeling Strategy;
- f. Glider Strategy;
- g. QARTOD manuals;
- h. Governors’ South Atlantic Alliance meetings;
- i. Weather Ready Nation (WRN) Ambassador;
- j. NERRS – US IOOS Collaborative initiative;
- k. SouthEast Acoustics Consortium (SEAC) Meeting;
- l. Florida Atlantic Coast Telemetry (FACT) Meeting;
- m. Gulf of Mexico Coastal Ocean Observing System (GCOOS-RA) meeting;
- n. Gulf of Mexico Research Institute Oil Spill Meeting;
- o. Florida Institute of Oceanography Center for Excellence Meeting; and
- p. Southeast States Resiliency Meeting.

**H. 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 website. We utilize 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. 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. We currently have 42 members, and provide support for 20 in-situ stations, 15 High Frequency Radar stations and 5 modeling projects. We developed and released our [2015 annual report](#) that highlights key accomplishments and our observing system impacts in the southeast region. Since December 1, 2015 to May 31, 2016, we observed a less than 1% increase in subscription to our newsletter, from 693 to 696, Facebook “likes” have grown 7% (from 270 to 289) and Twitter “followers” have grown 20% (265 to 317). During the reporting period SECOORA shared approximately 119 Facebook posts and 135 Twitter “tweets”, referring a combined 414 sessions to SECOORA website. Website sessions have increased 8% in the report period (70,675 sessions to 76,961 sessions).

SECOORA Activities	Progress
<ul style="list-style-type: none"> <li>• Ensure continued and efficient Governance, Management and Operations of the RA.</li> <li>• Provide forums, i.e. workshops, meetings, that enable stakeholder assessment and engagement.</li> <li>• Coordinate with the Governor’s South Atlantic Alliance (GSAA).</li> <li>• Ensure SECOORA plans and gaps analysis align with IOOS Association and IOOS office guidance and/or requirements.</li> <li>• Refine and maintain RCOOS Conceptual Operations Plan.</li> <li>• Develop materials for RA Certification.</li> </ul>	<p><b>Staff fiscal activities:</b></p> <ul style="list-style-type: none"> <li>• Provided fiscal and overall project management for Year 4 and 5 awards, and continued to manage primary partner institutions’ subawards.</li> <li>• Held bi-monthly administration meetings to ensure efficient and effective fiscal operations.</li> <li>• A part-time Bookkeeper (Chiaki Kight) and Business Manager (Megan Lee) managed the contracts and financials for these awards.</li> <li>• SECOORA staff held a staff retreat at Charleston, Dec. 1-2, 2015.</li> <li>• Megan Lee attended the NOAA OMB training webinar, March 8-9, 2016.</li> <li>• Preparations are underway for FY16 SECOORA A-133 audit.</li> </ul> <p><b>SECOORA Board and PI Coordination</b></p> <ul style="list-style-type: none"> <li>• Continued to hold conference calls/webinars 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.</li> <li>• Executive Committee continued to meet monthly. The Finance and Audit Committee met every quarter.</li> <li>• Held Winter Board meeting (Dec. 3-4, 2015 – Charleston, SC) and SECOORA Annual Members and Board meetings (May 18-20, 2016 – Raleigh, NC). Presentations and 2016 annual meeting materials are available via our website.</li> </ul> <p><b>External Coordination Activities:</b></p> <ul style="list-style-type: none"> <li>• Continued to actively participate in the Governors’ South Atlantic Alliance (GSAA), which currently means participating in regular Transition Team and Executive Planning Team conference calls and meetings.</li> <li>• Participated in monthly IOOS Association and IOOS conference calls, including Debra’s participation on the IOOS Association Executive Committee.</li> <li>• Debra and Conrad attended the IOOS Association Spring Meeting held in Washington D.C. (March 2016).</li> <li>• Continued coordinating the Southeast Ocean and Coastal Acidification Network (<a href="#">SOCAN</a>) Steering Team with National Oceanic and Atmospheric Administration’s Ocean Acidification Program.</li> <li>• Debra and Vembu attended Florida Institute of Oceanography, Florida Center for Excellence Meeting, St. Petersburg, FL. (January 2016).</li> <li>• Vembu and Abbey attended the Clam Bayou, Gulfport, St. Petersburg, FL Data Users meeting at the USF COMPS Clam Bayou site (December 16, 2015). New College of Florida Sarasota faculty and librarians attended the meeting. Xylem YSI technicians, USGS, and FWC/FWRI were also present. USF and YSI gave a tour of the site.</li> <li>• December 7-8, 2015 Vembu and Abbey attended the Indian River Lagoon (IRL) Data Users Workshop. Vembu participated on the Steering Committee for the meeting.</li> <li>• December 8, Megan attended a fundraising webinar hosted by Network for Good entitled “Turn Year-End Donors into Year-Round Supporters.” Megan also attended other various fundraising/marketing webinars over this reporting period.</li> <li>• Debra and Abbey coordinated and held the Southeast Ocean and Coastal Acidification Network (SOCAN) first in-person Steering Committee Meeting held in Charleston, SC (January, 12 - 13, 2016).</li> <li>• Debra attended the IOOS and National Estuarine Research Reserve System (NERRS) workshop held at Guana Tolomato Matanzas National Estuarine Research Reserve in St. Augustine, FL (January 21-22, 2016).</li> <li>• Debra and Vembu attended the Gulf of Mexico Research Institute Oil Spill</li> </ul>

SECOORA Activities	Progress
	<p>Meeting (February, 1-4, 2016).</p> <ul style="list-style-type: none"> <li>• Vembu attended the SouthEast Acoustics Consortium (SEAC) Meeting, St. Petersburg, FL (February 22-24, 2016).</li> <li>• Debra attended the Gulf of Mexico Coastal Ocean Observing System (GCOOS-RA) meeting, New Orleans, LA (March, 31 – April 1, 2016).</li> <li>• Debra attended the Southeast States Coastal Resiliency meeting (April 18, 2016), Savannah, GA.</li> <li>• Other meetings, conference calls and activities: West Central Florida American Meteorological Society events; Florida Atlantic Coast Telemetry (FACT) meeting (December 17, 2015); Florida Institute of Oceanography, FWC/FWRI, USGS and University of South Florida outreach meetings; NOAA Southeast and Caribbean Regional Collaboration Team (SECART)</li> <li>• <b>Efforts to Leverage IOOS Funding:</b></li> <li>• Continued partnership with GSAA.</li> <li>• The PIs that receive SECOORA subawards also leverage either their institutional funds or external grants to carry out their projects.</li> <li>• Donate to SECOORA: We continue to participate in Amazon’s charitable opportunity, AmazonSmile. Amazon will donate 0.5% of the price of your eligible AmazonSmile purchases to Southeast Coastal Ocean Observing Regional Association whenever you shop on AmazonSmile. Funds generated will be invested to educate students and the public about coastal ocean observing activities in the Southeast.</li> </ul>

**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:** University of South Florida Coastal Ocean Monitoring and Prediction System (COMPS) and University of North Carolina Wilmington Coastal Ocean Research and Monitoring Program (CORMP) 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 websites:** Ongoing.
  - ii. **Estimates of significant wave heights from the HF radar data:** Estimates of significant wave heights from the HF radar data are provided on an experimental basis by WERA HF Radar operators 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:** University of Georgia (UGA) is funded to maintain the ocean acidification sensors on the NOAA’s GRNMS buoy and the University of Delaware to collect and validate ocean acidification field data.

## Objective 2.1: Sustain Moored and Coastal Stations

Institution/Activities	Progress
University of South Florida (USF) (Weisberg) Support COMPS moorings	Three real time surface moorings (C10, C12 and C13) were maintained for the present reporting period 12/1/15-5/31/16, along with two (non-real-time) subsurface (C11 and C15) moorings. The up-time for these moored observations is over 90%. Telemetry outages were due to either power limitations (more prevalent in winter months) or antenna issues, but these were minimal. The improved performance continues by virtue of the electronics re-engineering of systems completed last year. The two main issues at present are related to 1) met sensor failures, specifically relative humidity and barometric pressure sensors and 2) parting of the inductive cable after 2-5 months resulting in a loss of real-time CTD data. The met sensor issue will be addressed with more robust sensors once next year's funding is released. Unfortunately the inductive cables are prone to parting, although we are experimenting with anti-chafing materials to extend the life of the cables. USF continues to provide the moored observations through SECOORA data management channels as well of making these available to National Data Buoy Center (NDBC) and Global Telecommunication System (GTS) via NDBC.
University of South Florida (USF) (Luther) Support in-shore tidal meteorological stations	University of South Florida College of Marine Science continues to maintain the COMPS in-shore Coastal Stations to the extent possible with the funding provided. Integration of the Clam Bayou station, located on Boca Ciega Bay in St. Petersburg, FL, into the COMPS In-shore stations network is progressing. Data from these sites are sent to SECOORA and the NOAA NDBC and to the GTS via NDBC. Progress toward the objectives for the reporting period are: <ul style="list-style-type: none"> <li>• Complete installation of the COMPS Egmont Key and Anna Maria site into a single nearby site. No new progress to report in this period.</li> <li>• General upkeep of six (6) COMPS network in-shore sites (Shell Point, Aripeka, Fred Howard Park, Clam Bayou, Big Carlos Pass, and the consolidated Egmont Key/Anna Maria site): All sites (except Egmont Key/Anna Maria) are functioning. The Shell Point site has experienced occasional water level sensor issues. Upgrades to the Big Carlos Pass site are underway to replace the meteorological sensor mast and to accommodate the acoustic fish sensing systems to be installed in collaboration with Mote Marine Lab. The complete system has been assembled and is being tested on our docks. Right-of-Way Permit has been obtained from Lee county for the mast installation. Satellite decoder for the GOES telemetry is under development. We are proceeding and hope to have the system deployed soon.</li> <li>• USF continues to provide data to SECOORA and GTS via the NOAA National Data Buoy Center.</li> </ul>



University of North Carolina - Wilmington (Leonard) Support Carolina RCOOS network	<p>CORMP mooring technicians completed a mooring turnaround cruise March 23-24, 2016. The R/V <i>Savannah</i>, based out of Skidaway Institute of Oceanography, was used to turnaround the FRP2 and SUN2 moorings. The below are the mooring statistics for the period covered in this progress report. Buoy statistics for December 1, 2015 – May 16, 2016. Note that ILM2 and LEJ3 have co-located WaveRider buoys which provide spectral wave data and water temperature. SUN2 has a co-located acoustic system (comprised of an ADCP and Nemo) to provide wave data and surface and bottom water currents.</p> <table border="1" data-bbox="457 388 1318 741"> <thead> <tr> <th></th> <th>ILM2</th> <th>ILM3</th> <th>LEJ3</th> <th>SUN2</th> <th>CAP2</th> <th>FRP2</th> </tr> </thead> <tbody> <tr> <td>Air Temperature</td> <td>87%</td> <td>98%</td> <td>56%</td> <td>95%</td> <td>99%</td> <td>99%</td> </tr> <tr> <td>Air Pressure</td> <td>86%</td> <td>98%</td> <td>56%</td> <td>95%</td> <td>99%</td> <td>99%</td> </tr> <tr> <td>Wind Speed, Gust, Direction</td> <td>86%</td> <td>99%</td> <td>56%</td> <td>93%</td> <td>99%</td> <td>99%</td> </tr> <tr> <td>Salinity</td> <td>86%</td> <td>89%</td> <td>56%</td> <td>90%</td> <td>98%</td> <td>99%</td> </tr> <tr> <td>Surface Water Temperature</td> <td>86%</td> <td>89%</td> <td>99%</td> <td>95%</td> <td>98%</td> <td>99%</td> </tr> <tr> <td>Waves</td> <td>99%</td> <td>N/A</td> <td>99%</td> <td>57%</td> <td>N/A</td> <td>N/A</td> </tr> <tr> <td>Currents</td> <td>N/A</td> <td>N/A</td> <td>N/A</td> <td>57%</td> <td>N/A</td> <td>N/A</td> </tr> </tbody> </table> <p>Discussion of Low Buoy Statistics: SUN2 – The WaveRider buoy at SUN2 uses an ADCP with NEMO upgrade to provide wave and current data. The ADCP requires batteries for operation. The batteries were expended and the surface structure for the buoy needed to be refurbished. UNCW project personnel decided to recover the mooring during the scheduled Spring turnaround cruise since we were going to the SUN2 location. The mooring was inoperable for approximately a month and a half before redeployment on April 11. LEJ3 - The LEJ3 mooring stopped reporting on 2/26/2016. Due to weather and sea conditions, CORMP personnel were unable to reach the mooring until 3/8/2016. When they arrived on site, the only thing remaining was the foam hull for the mooring. The damaged buoy was reported to the USCG Aids to Navigation Office in Portsmouth, VA; however, they were unable to determine if a large vessel or barge may have run over the buoy. The buoy was redeployed on May 9, 2016. All data collected are provided to SECOORA and NDBC and made available via GTS. UNCW is working with Second Creek Consulting to establish QARTOD standards for all moorings. QARTOD tests for real-time meteorological data and CTD data are in place. We will next bring the current data (SUN2Wave station) into QARTOD. Note that the QA/QC for the ILM2Wave and LEJ3Wave moorings is handled by Coastal Data Information Program (CDIP). Second Creek Consulting created a mooring data quality Dashboard where the quality flags for each mooring can be viewed. UNCW has been working with USF and SECOORA to update metadata records into a standard format. The new metadata records are based on the NDBC metadata format and both groups are tailoring the metadata worksheets to meet our needs.</p>		ILM2	ILM3	LEJ3	SUN2	CAP2	FRP2	Air Temperature	87%	98%	56%	95%	99%	99%	Air Pressure	86%	98%	56%	95%	99%	99%	Wind Speed, Gust, Direction	86%	99%	56%	93%	99%	99%	Salinity	86%	89%	56%	90%	98%	99%	Surface Water Temperature	86%	89%	99%	95%	98%	99%	Waves	99%	N/A	99%	57%	N/A	N/A	Currents	N/A	N/A	N/A	57%	N/A	N/A
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**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.

<p>University of South FL (Weisberg) Support four CODAR stations on the West Florida Shelf</p>	<p>USF continues to operate and maintain the US IOOS/SECOORA identified priority CODAR system HF Radar sites (Naples, Venice and Redington Shores), along with two WERA HF Radar sites (Venice and Ft. DeSoto Park) overlooking our moored array. Additionally, USF continue to procure components for installing a fourth CODAR site. The data are also being posted on the USF College of Marine Science Ocean Circulation Group web site. USF continues to work with other SECOORA region HF Radar operators to standardize operations, data delivery, display and dissemination, maintain data integrity and provenance, provide accuracy estimates of surface currents and develop common data products for stakeholders. USF continues to maintain the 2 co-located WERA stations. Operational uptime and average range statistics of three priority codar sites for this reporting period: NAPL – 99%, 189Km, VENI – 98.8%, 169km and RDSR – 77%, 192km. With the exception of the Red Shore CODAR all sites exceeded 90% up-times. The Red Shore CODAR site has been down since April 22 when the A/C unit failed within the instrumented enclosure (note: the Red Shore received data percentage prior to the shutdown (December 1, 2015 and April 22, 2016) was 97.0%). The site was turned off to prevent high temperature system component damage and remained off through the contract end due to insufficient contract funds to cover the required repair cost. It is anticipated that the site will be back up shortly after the beginning of the follow-on funding grant is in place. However, until that happens, some of the missing Red Shore coverage area is being supplied by the Ft DeSoto WERA HF Radar system.</p>
<p>University of South Carolina (Voulgaris) Support two WERA radar arrays in Long Bay, SC</p>	<p>University of South Carolina has been responsible for the continuous operation and maintenance of the WERA system radar sites located at Georgetown, SC (GTN) and Fort Caswell, NC (CSW). The operation of the two systems was continued with one 10 day interruption during the reporting period, due to a complete system failure of the GTN site. Four major incidents occurred during this period: (i) The primary computer at the GTN site catastrophically failed on December 3rd, 2015. A new computer was configured and put in place on December 7th, and all systems brought back online by December 13th. Various small issues emerged following the replacement of the computer but were all rectified by December 24th, 2015. The period between December 3rd and 13th, during which the new computer was put in place, there was no data collected nor transmitted to HFRnet from this site. (ii) A power outage due to a cut line by the power service company resulted in the failure of the UPS at the CSW site on January 19th, 2016. The UPS was configured to automatically power up upon main power restoration and this did not occur. New batteries were installed in the UPS to rectify that issue. The system was down about 24 hours and the station was not operational during that period. (iii) Beach erosion during a storm event compromised the TX antennas at the CSW site. This was documented on February 26th, 2016, and plans to affect repairs were put in place. New TX antennas were put in place during the period March 8th and 11th, 2016, with the older antennas recovered and brought back for refurbishment. There was minimal down time. Support structures for multiple receive antennas were also repaired. It was also apparent that the radar electronic housing requires some repairs and the parts have been procured and plans have been made for the repairs to take place in June 2016. (iv) Internal temperature fluctuations were documented by the GTN system for a number of days in early May 2016. It was determined that the AC unit wasn't able to effectively keep the system cool enough to prevent the automatic shutdown when temperature thresholds were eclipsed. A new AC unit was put in place on May 5th, 2016 and the issue was resolved. Operational uptime and average range statistics of two priority HF Radar sites for this reporting period: CSW – 96.9%, 180km and GTN – 90.4%, 229km. We worked with SECOORA's new DMAC provider (Axiom) to provide them direct access to our HF Radar data through our servers. Also we provide the grid maps required for correctly displaying the data on a spatial domain. Following data collection and after local processing of the raw data the estimated surface currents (radial velocities) are transmitted to the National HF Radar network.</p>



	<p>The time elapsed between data collection and receipt of the radial velocities by the National Network is less than 1 hr. (see median values in Table). The systems operate on the experimental frequency of 8.35 MHz and they obtained coverage with an average range of 233 and 173 km for the GTN and CSW stations, respectively (see Table below).</p>																																													
	<table border="1"> <thead> <tr> <th data-bbox="466 298 597 352">Station ID</th> <th data-bbox="597 298 794 352">Parameter</th> <th data-bbox="794 298 940 352">Minimum</th> <th data-bbox="940 298 1094 352">Maximum</th> <th data-bbox="1094 298 1219 352">Median</th> <th data-bbox="1219 298 1351 352">Mean</th> <th data-bbox="1351 298 1476 352">St. Dev.</th> </tr> </thead> <tbody> <tr> <td data-bbox="466 352 597 489" rowspan="3">GTN</td> <td data-bbox="597 352 794 401">Latency (hrs)</td> <td data-bbox="794 352 940 401">0.56</td> <td data-bbox="940 352 1094 401">8.09</td> <td data-bbox="1094 352 1219 401">0.65</td> <td data-bbox="1219 352 1351 401">0.72</td> <td data-bbox="1351 352 1476 401">0.41</td> </tr> <tr> <td data-bbox="597 401 794 449">Range (km)</td> <td data-bbox="794 401 940 449">125.70</td> <td data-bbox="940 401 1094 449">236.1</td> <td data-bbox="1094 401 1219 449">233.40</td> <td data-bbox="1219 401 1351 449">230.43</td> <td data-bbox="1351 401 1476 449">8.46</td> </tr> <tr> <td data-bbox="597 449 794 489"># Solutions</td> <td data-bbox="794 449 940 489">146.0</td> <td data-bbox="940 449 1094 489">5,410.0</td> <td data-bbox="1094 449 1219 489">2,987.0</td> <td data-bbox="1219 449 1351 489">2,948.68</td> <td data-bbox="1351 449 1476 489">962.97</td> </tr> <tr> <td data-bbox="466 489 597 636" rowspan="3">CSW</td> <td data-bbox="597 489 794 537">Latency (hrs)</td> <td data-bbox="794 489 940 537">0.54</td> <td data-bbox="940 489 1094 537">5.60</td> <td data-bbox="1094 489 1219 537">0.62</td> <td data-bbox="1219 489 1351 537">0.66</td> <td data-bbox="1351 489 1476 537">0.24</td> </tr> <tr> <td data-bbox="597 537 794 585">Range (km)</td> <td data-bbox="794 537 940 585">6.40</td> <td data-bbox="940 537 1094 585">236.0</td> <td data-bbox="1094 537 1219 585">173.50</td> <td data-bbox="1219 537 1351 585">167.09</td> <td data-bbox="1351 537 1476 585">37.15</td> </tr> <tr> <td data-bbox="597 585 794 636"># Solutions</td> <td data-bbox="794 585 940 636">2.0</td> <td data-bbox="940 585 1094 636">4,548.0</td> <td data-bbox="1094 585 1219 636">2,209.0</td> <td data-bbox="1219 585 1351 636">2,086.59</td> <td data-bbox="1351 585 1476 636">791.41</td> </tr> </tbody> </table>	Station ID	Parameter	Minimum	Maximum	Median	Mean	St. Dev.	GTN	Latency (hrs)	0.56	8.09	0.65	0.72	0.41	Range (km)	125.70	236.1	233.40	230.43	8.46	# Solutions	146.0	5,410.0	2,987.0	2,948.68	962.97	CSW	Latency (hrs)	0.54	5.60	0.62	0.66	0.24	Range (km)	6.40	236.0	173.50	167.09	37.15	# Solutions	2.0	4,548.0	2,209.0	2,086.59	791.41
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<p>Skidaway Institute of Oceanography (SKIO) (Savidge) Support two WERA radar arrays on St. Catherine's and Jekyll Island, GA</p>	<p>IOOS priority radars of the WERA variety continue to be operated and maintained on St. Catherine's and Jekyll Islands, with data provided to SECOORA and the national HFRnet archive. Specific maintenance activities since December 2015 include the following. Newly designed rack-mounted power distribution unit and power amplifier were tested and installed at the Jekyll Island radar site during the 2016 winter/spring months. The power amplifier replaces a model designed for outside installation at the transmit antennas and with the new power distribution unit operating parameters may be adjusted from Skidaway using the latest version of a remote-control software package for the radar systems. A new Frequency Control Rack is ordered for the St. Catherine's site. The rack incorporates power supply functionality and an upgraded computer design for the old PC104 architecture, while retaining backwards compatibility with its various modular components. Finally, new 64-bit control computers are bought to replace the 10-year-old computers that are still running using replacement power supplies and hard drives. These upgrades are planned for late summer or early fall. Operational uptime and average range statistics of two priority HF Radar sites for this reporting period: CAT – 99.7%, 189km and JEK – 99.6%, 188km.</p>																																													
<p>University of Miami (Shay) Support three WERA radar arrays at Crandon, Virginia Key and Dania Beach and HF Radar Waves Project</p>	<p>Operated existing HF radar instrument installations at Key Biscayne, Virginia Key and Dania Beach (Crandon operates at 16 MHz, Dania Beach and Virginia Key transmit at 12 MHz); UM has had to suddenly shut down the Dania Beach Site over the Memorial Day weekend for US Navy operations for a week to ten days at the South Florida Test Facility. Details are forthcoming. No damages reported at the sites during the holiday. Estimated significant wave heights for the National Weather Service marine forecast models and engaged stakeholder groups such as the NWS and United States Coast Guard (for currents). Site selection for the installation of fourth WERA site is in progress. A letter will be drafted depending on the outcome of the survey next week to secure a permit at one of these sites. Our preference for installing the site is Elliot Key. (1 Dec 2015 – 31 May 2016): CDN – 75%, 131km, STF – 93.0%, 90km and VIR – 92%, 120km.</p>																																													

University of NC - Chapel Hill (Seim) Support three CODAR radar arrays on the Outer Banks of NC	The University of North Carolina Chapel Hill operates 3 CODAR-radar installations on the Outer Banks of North Carolina with SECOORA/IOOS funds. Some maintenance and upfits occurred during the reporting period. The solar panel array at Core Banks (CORE) was damaged by strong winds and was repaired in February 2016. Sand buildup on the access road to the Hatteras (HATY) site is preventing refueling of the generator and UNCCH is in negotiations with the National Park Service to find ways to maintain the site. A new receive antenna has been purchased for HATY and will be installed in the next month. It will replace a corroding unit that is about 10 years old. AIS tracking software to help create a beam pattern has been installed at Duck (DUCK) site, though the system antenna needs to be relocated to improve coverage. The Duck transmit antenna will be moved soon because of coastal erosion, with a transmit cable replacement being relocated and buried in PVC to avoid it being severed in the future. UNCCH is preparing a manuscript describing QC implementation and validation of the results against independent measurements. They anticipate submitting the manuscript in the next few months. They continue to develop Gulf Stream landward edge tracking and property tracking techniques with the NC radars, and compare them with existing data products. Recent work has focused on comparison to high resolution SST imagery and detailed comparison with the radar velocity fields. Operational uptime statistics of priority HF Radar sites for this reporting period: DUCK – 99.9%, 209km, HATY – 99.9%, 178km and CORE – 98.3%, 200 km.
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**Objective 2.5: Maintain the sensors on NOAA Gray’s Reef National Marine Sanctuary (GRNMS) buoy**

Institution/Activities	Progress
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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

The University of Georgia (UGA) continues to monitor the carbon dioxide in surficial waters offshore Georgia at the Gray’s Reef National Marine Sanctuary (GRNMS). To date, the Gray’s Reef National Marine Sanctuary (GRNMS) buoy has been reporting data nearly continuously since 2006 when the MAPCO2 system was installed (Figure 1).

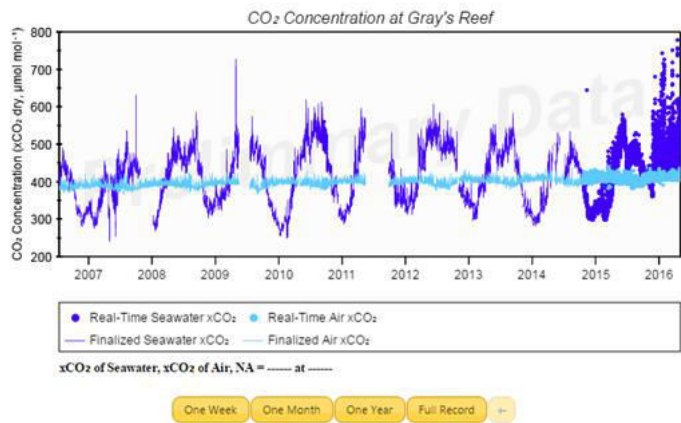


Figure 1. GRNMS pCO2 data and website display.

The system requires annual visits to the buoy to replace all components. Periodically individual components need to be replaced as needed due to biological fouling, weak batteries, or storm damage. Both sensors mounted under the buoy were replaced in December 2015. These sensors would have normally been replaced during the October servicing, but due to rough sea conditions, had to be delayed. The National Ocean Acidification buoy [website](#) has also recently been redesigned and is more interactive than during previous versions. Visitors to the website can now readily change from weekly, monthly, yearly or the entire data set.

It has been several years since the NDBC replaced the GRNMS buoy so a new buoy was prepared for deployment. Originally it was scheduled to deploy later in 2016, but the existing buoy sustained damage from an unknown cause. On April 1, the weather systems on the buoy stopped transmitting. Upon further inspection, one of the anemometers was missing and there was potential damage to the antenna. As a result of the damage, NDBC moved up the replacement of the GRNMS buoy to May 23. The USCGC Maria Bray, a buoy tender based in Jacksonville, Florida was commissioned to change out the buoy. The Bray deployed the new buoy first and NDBC performed a dual system test comparing data from both buoys before recovering the old buoy. The new buoy was equipped with a freshly serviced MAPCO2 system, battery pack and span gas. A new SAMI-pH and Seabird V16 sonde were also installed on the buoy bridle. The installation of the MAPCO2 system on the new buoy will serve as the annual system overhaul that typically takes place during September or October. In addition to the new weather system installed on the buoy, the GRNMS 41008 buoy was also equipped with a camera system. This camera will allow scientists to visually see the sea conditions prior to heading offshore to work on the buoy.

University of Delaware Ocean Acidification Field Support:

UDEL conducted one cruise dedicated to the South Atlantic Bight (SAB) (April 17 to 22, 2016) that also included a five hour ground-truthing pass at the Gray's Reef (GR) mooring. This cruise repeated the same transects as the 2014 Georgia Coastal Ecology Long Term Ecological Research (GCE-LTER) cruises. Data collected around the mooring and throughout the SAB include underway  $p\text{CO}_2$ , underway pH, and underway Oxygen to Argon ( $\text{O}_2/\text{Ar}$ ) ratios, as well as discrete water samples (~200 with additional 25 specifically at the GR mooring) for dissolved inorganic carbon (DIC), total alkalinity (TA), and spectrophotometric pH. Other field activities at the GR mooring include the collection of discrete DIC-TA samples during the routine maintenance trips to service and clean the sensors on the mooring. These field samples were collected in April 2015, June 2015, October 2015, and March 2016. Also in March 2016, a cruise that went close to the mooring on the R/V Savannah also collected 10 discrete water samples for DIC-TA. Finally, as part of the East Coast Ocean Acidification (ECO) cruise in July 2015, a three hour ground-truthing pass at the GR mooring was built into the cruise plan (same as data listed above). All water samples were analyzed at the University of Delaware in the Cai Lab. **Data Synthesis:** These data, as well as other ground-truthing data going back to July of 2007 were presented at the Ocean Sciences Meeting as an oral presentation (" $p\text{CO}_2$  time series ground truthing and internal consistency at the Gray's Reef mooring (NDBC-41008) in the South Atlantic Bight"; abstract number IS51A-01) in February 2016. Initial results for ground-truthing show that underway cruise, discrete water samples for calculated  $p\text{CO}_2$ , and mooring  $p\text{CO}_2$  all agree well, therefore not only verifying data quality, but allowing us to develop other methods to interpolate spatio-temporal coverage in the SAB. UDEL has synthesized all ground-truthing data through the end of the GR mooring deployment ending in October of 2014. The 2015 time series data has just become available and further synthesis is underway. A manuscript, with a working title of " $p\text{CO}_2$  time series at a coastal mooring: ground truthing, seasonal cycles, and annual net air-sea  $\text{CO}_2$  exchange", is now in preparation and we expect to submit it in July 2016.

### 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. Model predictions are served in public domain at <a href="http://omgsrv1.meas.ncsu.edu:8080/ocean-circulation/">http://omgsrv1.meas.ncsu.edu:8080/ocean-circulation/</a> and SECOORA interactive <a href="#">maps portal</a> . SABGOM model has been coupled with biogeochemical prediction model. PI and his team are working with other project scientists funded by SECOORA on model coupling, model skill assessments, long-term analysis, and generations of several value-added products. PI and his team are also testing data assimilation (DA) schemes within the SABGOM modeling system using 3Dvar and 4Dvar data assimilation schemes. The DA system, once fully implement, will be able to assimilate observations including satellite sea surface temperature, sea surface height, HF Radar surface currents, glider observed hydrography to improve SECOORA regional ocean circulation predictions.
B. Implement Forecasting of Storm Surge, Inundation and Coastal Circulation	
Institution/Activities	Progress
University of Florida (Sheng) - Participation in the National Hurricane Center Joint Hurricane Testbed North Carolina State University (Xie) Provide real-time forecasting of inundation and storm surge.	University of Florida: Since no significant storm activity was observed during the 2015 hurricane season we were unable to test the system in real time. UF has been conducting tests using historical products comparing results with other JHT products based on official NHC tracks. UF is performing maintenance of the forecasting system in preparation for the 2016 hurricane season where we may be able to test it in real time. The 2016 hurricane season is expected to be an active one due to the transition from El Nino into La Nina.  North Carolina State University: The PI has submitted the final progress report for the project during this reporting period.
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
ROFFS (Roffer), University of Miami CIMAS (Muhling), and SAFMC (Pugliese) Develop data products derived from satellite and in situ observations for fisheries stock assessment.	ROFFS™ staff worked on the planning and other documents related to the “Climate Variability and Fisheries Workshop: Setting Science Priorities.” This included numerous telephone conferences with the meeting organizer, Heidi Stiller (NOAA), the workshop Steering Committee and Debra Hernandez. Roffer and Hall produced a 208 page vulnerability assessment that was used as part of the workshop materials entitled “Roffer and Hall 2015 Fish Species Environmental Vulnerabilities Consolidation.” A pdf copy and spreadsheet summary is available on the SECOORA <a href="#">website</a> . . The workshop was held October 26-28, 2015 in St. Petersburg, Florida to advance our understanding of the impacts of climate variability on fisheries resources and management in the large marine ecosystems of the Gulf of Mexico, South Atlantic and Caribbean Sea.

	<p>More than 55 experts from fishery management councils, federal and state fisheries and climate entities, academia and private industry attended. The Agenda for the meeting can be found on the SECOORA <a href="#">website</a>. Sharon Whidden (ROFFS™) provided staff support at the workshop. Roffer was one of the facilitators at the meeting and made a few presentations. In addition, he wrote the “Executive Workshop Report” which can be found on the SECOORA <a href="#">website</a>). The Southeast Fisheries Science Center, National Marine Fisheries Service, NOAA used the workshop and resultant documents for their climate action planning meeting that occurred immediately after the workshop. They continue to use the results of the meeting in deliberations. Roffer, as a result of this workshop was invited by Roger Pugliese to participate in the South Atlantic Fisheries Management Council’s writing team for the “Ecosystem based fisheries management II”. He continues to work with the Council on this project. Roffer continues to work with IOOS and other colleagues on subjects related to climate variability and fisheries management.</p>
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#### 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>During this reporting period, the PI and his team continued to work on the transferability of their beach water quality modeling approach to Sarasota beach areas in FL. Statistical models were developed for each of the 12 sampling sites (five marine sites are located on Anna Maria Island, two on Longboat Key, three on Lido Key, one on the causeway to Anna Maria Island, and one on Ringling Causeway) in our study area west of Sarasota, FL. The EPA’s Virtual Beach (VB) statistical modeling toolbox was utilized for this effort. VB was used to create multiple linear regression models from roughly 82 variables. 18 models were created for each sample site. These models consisted of in situ model runs using the C10 buoy, the C10 buoy at 1m, and C10 buoy model runs with associated HYCOM modeled data. Models were further enhanced using both AO and non-AO wind components developed from the VB modeling software. Once standard models were created, input variables were transformed and run to develop additional predictive models. Then, island-wide models were created in which models were created for each of the barrier islands in our study area (12 models for each of the following barrier islands: Anna Maria Island, Longboat Key, and Lido Key). These models were also created using in situ data from the C10 buoy, data from the C10 buoy at 1m, and C10 buoy data with associated HYCOM modeled data. Island-wide models had low predictive power and were not analyzed further. Site specific models were utilized instead and were brought into production for web development. Here, near-real-time data was/is utilized to provide daily predictions of bacteria concentration with results highlighted in a web interface.</p>

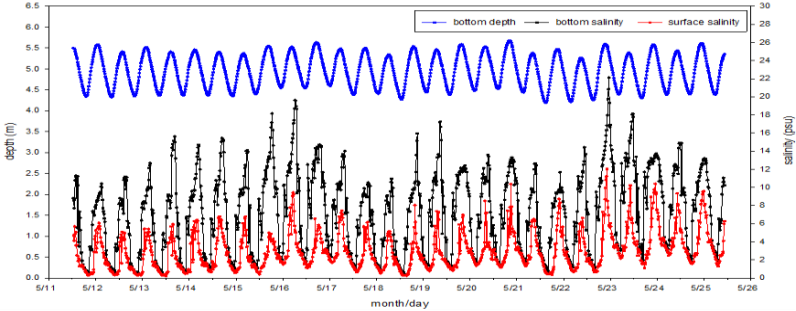
#### E. SECOORA Model Skill Assessment

Institution/Activities	Progress
<p>Independent Contractor (Filipe Pires Alvarenga Fernandes, Oceanographer, Brazil) and Collaborator and consultant (Richard Signell, USGS): Python Data Analysis Tools for Oceanographers Services</p>	<p>Integration of the Model Skill Assessment Tool into the new SECOORA data portal is in progress. Work is being carried out to produce the skill metrics tool docker image for easy deployment and integration into SECOORA’s new data portal and generate results in JSON format for easy ingestion into DMAC system.</p>

#### Goal 4: Enhance the DMAC Subsystem

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

Institution	Progress
University of SC (Porter) <ul style="list-style-type: none"> <li>• Maintain SECOORA DMAC Infrastructure</li> <li>• Develop and deliver the materials/documentation needed to enable transition of DMAC services from USC to Axiom</li> <li>• Develop and provide a final project report</li> </ul>	A. Maintenance of SECOORA DMAC infrastructure <ul style="list-style-type: none"> <li>• Continued monitoring and maintenance.</li> </ul> B. Maintenance and upgrade of SECOORA website and interactive data portal <ul style="list-style-type: none"> <li>• SECOORA website and data portal - continued maintenance</li> <li>• GSAA Data Portal - Project is now in maintenance mode, updates to data endpoints and server software performed</li> </ul> C. Servicing Assisting regional data providers - Maintaining USF COMPS and UNCW CORMP salinity feeds as pulled into water quality models. UNCW CORMP buoy data feed changed from older telemetry based feed to SOS web service.
Axiom Data Science, LLC (Wilcox) SECOORA DMAC operations transition.	SECOORA data portal was transitioned and went live during the reporting period. The portal can be accessed via <a href="http://portal.secoora.org">portal.secoora.org</a> . Axiom is currently working on addressing the bugs in the data portal. Axiom conducted a data portal demo webinar to SECOORA PIs and participated in a break-out session at the May 2016 SECOORA annual PIs meeting, which focused on the SECOORA data portal and website. Stakeholders and PIs spent time on using the data portal and website, and have provided suggestions and comments on improving both. Axiom will be implementing the recommended functionalities and usability to improve access of data and information via SECOORA data portal and website. Axiom also a) participated as a partner with SECOORA on BOEM white paper on Atlantic Deepwater Ecosystem Observatory Network (ADEON), b) worked with Ocean Tracking Network (OTN) software team to establish a SECOORA data node that will be used by Florida Atlantic Coast Telemetry (FACT) network, and c) is working with SECOORA staff on redesigning of the SECOORA content website.
RCOOS Integration Projects	
Institution/Activities	Progress
Trap Puckett, RPS Evans Hamilton, John’s Island, SC – Rip current model validation	RPS completed the review and analysis of the field data collected in the fall of 2015 for the rip current study at Emerald Isle, NC. This included the wave and current data collected at 2 stations and the video monitoring of the surf zone conducted during the same time period. The data and a data report on field data collection (wave and camera imagery) for the period August 25, 2015 – November 12, 2015 was delivered to SECOORA and NOAA National Ocean Service (NOS) Rip Current Model Validation Team.
James Locascio, Mote Marine Laboratory, Sarasota, FL – Ocean Observing Experiment: Incorporation of Passive Acoustics and Acoustic Telemetry on an Established Regional Coastal Ocean Observatory to Measure Fish Sound Production and Behavior as an Indicator of Ecosystem Function	The hardware and software upgrades to the Big Carlos Pass (BCP) were completed and deployed on the USF dock test site in December, 2015 to ensure the system was functioning properly. The new permit from Lee County Department of Transportation necessary to install the new mast at the BCP station was issued in April, 2016. Prior to deployment at the BCP field site, the decoder for the new GOES files and web page development are required and work on this task has been recently started by members of the USF ocean circulation group.

Institution	Progress
<p>Baruch Institute, University of South Carolina (Smith)</p> <p>Instrumentation support for a water quality monitoring station in the central channel of Winyah Bay</p>	<p>Construction of the piling-based infrastructure to support the water quality monitoring station was completed during this reporting period. YSI EXO2 data sondes deployments in surface and bottom waters began on May 11, 2016 (Fig. 1). NOAA GOES ID numbers for data telemetry have been acquired and installation of satellite telemetry equipment is planned for the week of June 6, weather permitting.</p>  <p>Figure 1: Example time-series data from first deployment of YSI EXO2 sondes at Winyah Bay station, showing salinity values measured in surface (red symbols) and bottom (black symbols) waters, together with water depth measured by the bottom sonde (blue symbols).</p>
<p>Skidaway Institute of Oceanography (SkIO) (Savidge)</p> <p>South Atlantic Bight Synoptic Offshore Observational Network (SABSOON) Tower Data recovery project</p>	<p>Quality-Control of archived SABSOON data for 3 offshore towers was accomplished. Up to 10 years (1999-2009) of in-water and meteorological information is being scrutinized. Inspected elements include: near-surface and near-bottom water temperature, conductivity, salinity, depth, chlorophyll, PAR, water level, wave, meteorological variables and ADCP currents. Various QC flags are being assigned to suspect data by parameter.</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. No Education and Outreach PIs were funded in Year 5.

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 1 e-newsletter and 2 Annual Meeting registration emails, referring 243 sessions to our website during this reporting period. We sent 2 emails outlining staff activities to the Board. Regional and local coastal ocean observing related stories highlighting Members work, SECOORA newsletters and more were published on our <a href="#">website</a>. 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 61 outreach events, including meeting with 12 congressional staffers. During this reporting period, we developed the <a href="#">2015 SECOORA Annual Report</a> which can be accessed via our <a href="#">website</a>.</p>
<p>SECOORA In-Person Outreach: SECOORA staff constantly engaged in either delivering a talk at institutions or visiting institutions and attending meetings to emphasize the benefits and 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: Weather Ready Nation events; West Central Florida American Meteorological Society events; Florida Atlantic Coast Telemetry (FACT) events; USF Clam Bayou Water Quality station tour with New College of Florida Faculty, Sarasota; Florida Institute of Technology; FWC/FWRI, USGS and University of South Florida outreach meetings; NOAA Southeast and Caribbean Regional Collaboration Team (SECART); Florida Institute of Oceanography; Southeast</p>



## Education and Outreach Activities (SECOORA staff and RCOOS PIs)

Coastal Ocean Acidification Network; NERRS-IOOS meeting; IOOS Association meetings; Gulf of Mexico Research Institute (GoMRI) meeting; SouthEast Acoustics Consortium (SEAC) meeting; Southeast states Coastal Resiliency meeting; GCOOS-RA annual meeting.

May 2016 Annual Members and Stakeholders Meeting: During this reporting period we conducted our SECOORA Annual Meetings in Raleigh, NC (May 18-20, 2016). We held Board and Members Business meetings on Day 1 and Stakeholders meeting on Day 2. RCOOS PI meeting was held on Day 3. A meeting summary and all meeting materials will be made available on the website.

## Scope of Work

**Scope of work remains as proposed in the Year 5 descope proposal. Request for a one-year no-cost extension (June 1, 2016 – May 31, 2017) of the remaining funds was submitted to NOAA/US IOOS and SECOORA received approval on that request.**

## Personnel and Organizational Structure

At the May 2016 Annual meeting we held the election for the Board of Directors. Michael Crosby, Mote Marine Laboratory (Sustaining Member Seat): Lisa Adams, Kennesaw State University (At Large Seat- Georgia): Quinton White, Jacksonville University (At Large Seat- Florida), Mitch Roffer, Roffer's Ocean Fishing Forecasting Service, Inc. (Industry/Private Sector) and Rick DeVoe, SC Sea Grant Consortium (Public Agencies/ Non-Profit/ Other Sector) were elected/re-elected to the Board.

## Budget Analysis

SECOORA's financial records as of March 31, 2016 show the following has been expensed: over \$2.1M of Year 4 funds and over \$900K of Year 5 funds. SECOORA received a no cost extension for one year (June 1, 2016 – May 31, 2017). There were thirteen no cost extensions granted for Year 5 subawardees with end dates of November 30, 2016. IOOS Year 4 and Year 5 funds are being drawn down rapidly. Overall, we are within budget and on track with spending. 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

Scott Noakes and Dwight Gledhill. Storm Events Responsible for pCO<sub>2</sub>-rich Water Intrusion in the South Atlantic Bight. Poster presentation at the 2016 Ocean Sciences meeting, Feb 21 – 26, 2016. Presentation URL: <https://agu.confex.com/agu/os16/meetingapp.cgi/Paper/88818>.

Al-Attabi, Z. and G. Voulgaris, 2016. Comparison Between HF Radar Measurements of Waves and In-Situ Measurements off Cape Hatteras, NC. Paper 12-14. Southeastern Section GSA - 65th Annual Meeting (31 March–1 April 2016, Columbia, SC).

Cahl, D and G. Voulgaris, 2016. HF radar Lagrangian trajectory calculations accounting for Stokes' drift and the nonlinear Bragg wave phase speed correction term. Abstract ID: EC44B-1247. 2016 Ocean Science Meeting, 21-26 February, New Orleans, LA.

Cahl, D.L. and Voulgaris, G., 2016. Modern Measurement Methods in Oceanography. Graduate student day 2016 at University of South Carolina, Columbia, SC.

Meyers, Steven D., Monica Wilson and Mark E Luther, 2016; Observations of Hysteresis in the Annual Exchange Circulation of Tampa Bay; Poster presented at the 2016 Ocean Sciences Meeting, New Orleans, LA; Feb. 21-26, 2016.

Meyers, Steven D., Amanda J. Moss, and Mark E. Luther, 2016. Changes in Residence Time due to Large-Scale Infrastructure in a Coastal Plain Estuary. Poster presented at the 2016 Ocean Sciences Meeting, New Orleans, LA, Feb. 21-26, 2016.

Scudder, J., and M. E. Luther, 2016. Water Quality, Water Level, and Meteorological Monitoring at the USF COMPS Clam Bayou Station: A Successful Collaborative Effort as Demonstrated by the Continuous Monitoring Record during the 2015 St. Petersburg Sewage Overflow Event. Oral presentation at the 10th National Water Quality Monitoring Conference, Tampa, Florida, May 2 - 6, 2016.

Neet, M., R.H. Kelsey, D.E. Porter, D. Ramage and A. Jones. 2015. Model performance results in Myrtle Beach, SC using Virtual Beach and R regression software. South Carolina Water Resources Journal. Vol. 2, Issue 1. pp. 80-85.

Neet, M., D.E. Porter, H. Kelsey and D. Ramage. 2016. Utilizing Virtual Beach for bacteria forecast modeling in Sarasota, FL. Recreational Waters Conference. New Orleans, LA. April 2016.

Porter, D.E. 2016. The role of environmental monitoring and data management in supporting science to inform decision making: integrating NAML, NERRS and IOOS activities. Southern Association of Marine Laboratories Annual Meeting. Port Aransas, TX. May 2016. Invited presentation.

Bane, J., R. He, M. Muglia, C. Lowcher, Y. Gong, S. Haines (2016): Marine Hydrokinetic Energy Potential in Western Boundary Currents, Invited paper to, Annual Review of Marine Science, in press.

Ledwell, J. R., R. He, Z. Xue, S. F. DiMarco, L. Spencer, and P. Chapman (2016) Dispersion of a tracer in the deep Gulf of Mexico, Journal of Geophysical Research - Oceans, 121, 1110-1132, doi:10.1002/2015JC011405. [PDF]

He, J., R. He, and Y. Zhang. (2015) Impacts of air-sea interactions on regional air quality predictions using WRF/Chem v3.6.1 coupled with ROMS v3.7: southeastern US example, Geoscientific Model Development Discussion, 8, 9965-10009, doi:10.5194/gmdd-8-9965-2015. [PDF]

Huang, W.-J., W.-J. Cai, Y. Wang, X. Hu, B. Chen, S. E. Lohrenz, S. Chakraborty, R. He, J. Brandes, and C. S. Hopkinson (2015) The response of inorganic carbon distributions and dynamics to upwelling-favorable winds on the northern Gulf of Mexico during summer, Continental Shelf Research, 111(2015) 211-222, doi: 10.1016/j.csr.2015.08.020. [PDF]

Tian, H., W. Ren, J. Yang, B. Tao, W.-J. Cai, S. E. Lohrenz, C. S. Hopkinson, M. Liu, Q. Yang, C. Lu, B. Zhang, K. Banger, S. Pan, R. He, and Z. Xue (2015) Climate extremes dominating seasonal and interannual variations in carbon export from the Mississippi River basin, Global Biogeochemical Sciences, 29, doi: 10.1002/2014GB005068. [PDF]

Hu, C., B. Murch, A. A. Corcoran, L. Zheng, B. B. Barnes, R. H. Weisberg, K. Atwood, and J. M. Lenes (2016). Developing a smart semantic Web with linked data and models for near-real-time monitoring of red tides in the eastern Gulf of Mexico. IEEE Systems Journal. In press, Doi:10.1109/JSYST.2015.2440782.

Weisberg, R.H., L.Y. Zheng, Y. Liu, A. Corcoran, C. Lembke, C. Hu, J. Lenes, and J. Walsh (2016). *Kerenia brevis* blooms on the west Florida shelf: A comparative study of the robust 2012 bloom and the nearly null 2013 event. Continental Shelf Research, 120, 106-121, <http://dx.doi.org/10.1016/j.csr.2016.03.011>

Liu, Y., R.H. Weisberg, S. Vignudelli, G.T. Mitchum (2016). Patterns of the Loop Current System and Regions of Sea Surface Height Variability in the Eastern Gulf of Mexico Revealed by the Self-Organizing Maps, J. Geophys. Res., doi:10.1002/2015JC011493, in press.

Liu, Y., R.H. Weisberg and J. Lenes, Gulf of Mexico Loop Current Interactions with the West Florida Shelf and its Influence on Harmful Algae Blooms Weisberg, Presented on 2/24/2016 at the Ocean Sciences Meeting in New Orleans, LA.

Weisberg, R.H., Y. Liu and L. Zheng. The Control of West Florida Continental Shelf Material Property Distributions by a Combination of Deep-Ocean and Local Forcing. Presented on 2/23/2016 at the Ocean Sciences Meeting in New Orleans, LA.

Roarty, H., J. Kohut, L. Palamara, W. Brown, H. Seim, L. Atkinson, M. Smith, S. Glenn, 2016. Observations of the Surface Circulation over the Mid Atlantic Bight Continental Shelf, Ocean Sciences Meeting, 21-26 February, 2016, New Orleans, LA.

Muglia, M., H. Seim and S. Haines, 2016. Estimating Gulf Stream position with HF radar off Cape Hatteras NC, Ocean Sciences Meeting, 21-26 February, 2016, New Orleans, LA.

## June 2016 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 4 and Year 5 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, December 1-2, 2015
- Federal Financial Report for IOOS funds was submitted during this reporting period.
- Preparations are underway for FY16 SECOORA A-133 audit.

#### SECOORA Board and PI Coordination

- Continued to hold 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 (December 3-4, 2015 – Charleston, SC) and SECOORA annual Members and Board meetings (May 18-20, 2016 – Raleigh, NC). Annual meeting notes are available and Presentations and 2016 annual meeting materials can be accessed via SECOORA website.

#### External Coordination Activities:

- Continue to actively participate in the Governors' South Atlantic Alliance (GSAA) and GSAA Regional Information Management System (RIMS) portal is being maintained.
- Debra continues to participate on regular GSAA Transition Team and Executive Planning Team calls and meetings.
- Participate in monthly IOOS Association and IOOS conference calls, including Debra's participation on the IOOS Association Executive Committee.
- Debra and Conrad attended the IOOS Association Spring Meeting held in Washington D.C. (March 2016).
- Continue to coordinate and host Southeast Ocean and Coastal Acidification Network ([SOCAN](#)) webinars with National Oceanic and Atmospheric Administration's Ocean Acidification Program.
- Vembu and Abbey attended the Clam Bayou, Gulfport, St. Petersburg, FL Data Users meeting at the USF COMPS Clam Bayou site (December 16, 2015). New College of Florida Sarasota faculty and librarians attended the meeting. Xylem YSI technicians, USGS, and FWC/FWRI were also present. USF and YSI gave a tour of the site.
- December 7-8, 2015 Vembu and Abbey attended the Indian River Lagoon (IRL) Data Users Workshop. Vembu participated on the Steering Committee for the meeting.
- December 8, Megan attended a fundraising webinar hosted by Network for Good entitled "Turn Year-End Donors into Year-Round Supporters." Megan also attended other various fundraising/marketing webinars over this reporting period.
- Megan attended the NOAA OMB training webinar, March 8-9, 2016.
- Debra and Abbey coordinated and held the Southeast Ocean and Coastal Acidification Network (SOCAN) first in-person Steering Committee Meeting held in Charleston, SC (January, 12 - 13, 2016).
- Debra attended the IOOS and National Estuarine Research Reserve System (NERRS) workshop held at Guana Tolomato Matanzas National Estuarine Research Reserve in St. Augustine, FL (January 21-22, 2016).

- Debra and Vembu attended the Gulf of Mexico Research Institute Oil Spill Meeting (February, 1-4, 2016).
- Vembu attended the SouthEast Acoustics Consortium (SEAC) Meeting, St. Petersburg, FL (February 22-24, 2016).
- Debra attended the Gulf of Mexico Coastal Ocean Observing System (GCOOS-RA) meeting, New Orleans, LA (March, 31 – April 1, 2016).
- Debra attended the Southeast States Coastal Resiliency meeting (April 18, 2016), Savannah, GA.
- Other meetings, conference calls and activities: West Central Florida American Meteorological Society events; Florida Atlantic Coast Telemetry (FACT) meeting (December 17, 2015); Florida Institute of Oceanography, FWC/FWRI, USGS and University of South Florida outreach meetings; NOAA Southeast and Caribbean Regional Collaboration Team (SECART)

### Efforts to Leverage IOOS Funding

- Continued partnership with GSAA.
- The PIs that receive SECOORA subawards also leverage either their institutional funds or external grants to carry out their projects.
- Donate to SECOORA: We continue to participate in Amazon’s charitable opportunity, AmazonSmile. Amazon will donate 0.5% of the price of your eligible AmazonSmile purchases to Southeast Coastal Ocean Observing Regional Association whenever you shop on AmazonSmile. Funds generated will be invested to educate students and the public about coastal ocean observing activities in the Southeast.

### Update to RA Membership, Board of Directors and Committee Members

#### RA Membership

The following organization joined/rejoined SECOORA:

- Metanomy Inc., FL
- Dialytics, FL
- Surfline, CA

#### Board of Directors

The following Board Members are rotating off of the SECOORA Board of Directors at the end of June 2016:

Nick Shay – University of Miami

Roger Pugleise - SAFMC

Conrad Lautenbacher - GeoOptics

The following members were elected/re-elected to serve on the SECOORA Board (starting July 1, 2016) at the May 2016 Members Business meeting:

Michael Crosby, Mote Marine Laboratory (Sustaining Member Seat)

Lisa Adams, Kennesaw State University (At Large Seat- Georgia Seat)

Quinton White, Jacksonville University (At Large Seat- Florida Seat)

Mitch Roffer, Roffer's Ocean Fishing Forecasting Service, Inc. (Industry/Private Sector Seat)

Rick DeVoe, SC Sea Grant Consortium (Public Agencies/ Non-Profit/ Other Sector Seat)

#### SECOORA Committees

##### Finance and Accounting Committee: Chair: Peter Hamilton

Members:

Rick DeVoe – South Carolina Sea Grant Consortium

Conrad Lautenbacher – GeoOptics

Peter Hamilton – Leidos Corp.

##### Board Development Committee: Chair: Mitch Roffer

Members:

Peter Hamilton

Nick Shay

Mitch Roffer

**Note:** The RA membership, Board of Directors and Committee members are on the SECOORA website, 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				10	4	1		16

\* includes Sea Grant and territorial governments

\*\* includes Fishery Management Councils

\*\*\* "bi-national" International Joint Commission