



## Progress Report

**Project Title:** Southeast Coastal Ocean Observing Regional Association (SECOORA):  
Delivering actionable coastal and ocean information from high-quality science and observations for the  
Southeast

**Award number:** #NA21NOS0120097

**Period of Activity:** 01/01/2024 – 06/30/2024

**Principal Investigator(s):** Debra Hernandez, SECOORA Executive Director

### I. PROJECT MILESTONES:

Milestone Table. Milestones from the SECOORA Year 3 Descope table are identified by SECOORA subsystem in Section II Progress and Accomplishments. High-level milestones/deliverables, accomplishments and any issues are included for each project. Status of each milestone/deliverable is reported as complete, on-track, or delayed. If the milestone is delayed, a justification for the delay and description of activities employed or to be employed to mitigate the delay are provided.

### II. Progress and Accomplishments

Project and Task(s)	Status
<b>GOVERNANCE SUBSYSTEM</b>	
<b>Maintain the SECOORA governance and operational structure through implementation of SECOORA <a href="#">bylaws</a> and <a href="#">Strategic Plan</a>.</b>	
Accomplishments: <ul style="list-style-type: none"> <li>The SECOORA Annual Meeting and Board Meeting was held May 7-8 in Charleston, SC. There were 80 participants which included ~12 undergraduate students from member institutions. The meeting website provides an overview, meeting agenda, and meeting materials, including PI presentations: <a href="https://secoora.org/2024-annual-meeting/">https://secoora.org/2024-annual-meeting/</a>.</li> <li>SECOORA adopted a revised Strategic Plan which covers the period 2024-2029. The Plan was presented at the Annual Meeting: <a href="https://secoora.org/wp-content/uploads/2024/05/New-Strategic-Plan-Flyer.pdf">https://secoora.org/wp-content/uploads/2024/05/New-Strategic-Plan-Flyer.pdf</a>.</li> <li>One new board member was elected, Dr. Scott Harris, College of Charleston, who took the place of Dr. Susan Lovelace, SC Sea Grant Consortium, whose term expired.</li> </ul>	On-track
<b>Maintain SECOORA’s Certification as a RICE</b>	
The RCOS MOA between SECOORA and NOAA was executed on 8/22/22. All documents submitted for certification are found here: <a href="https://secoora.org/certification/">https://secoora.org/certification/</a> . The	On-track



<p>SECOORA By-Laws are available here: <a href="https://secoora.org/resources/by-laws/">https://secoora.org/resources/by-laws/</a>. The audit for Years 2022 and 2023 is available here: <a href="https://secoora.org/wp-content/uploads/2024/07/Audit-FINAL-2023-Southeast-Coastal-FS-2023-Final.pdf">https://secoora.org/wp-content/uploads/2024/07/Audit-FINAL-2023-Southeast-Coastal-FS-2023-Final.pdf</a></p> <p>Two SECOORA water level data providers revised Data Sharing Plans in June. The plans are located in Appendix F of the SECOORA DMAC plan and can be found here: <a href="http://secoora.org/wp-content/uploads/2022/05/0-APPENDIX_F_FundedDataStreamsInventory.pdf">http://secoora.org/wp-content/uploads/2022/05/0-APPENDIX_F_FundedDataStreamsInventory.pdf</a>. Updates were made to the following:</p> <ul style="list-style-type: none"> <li>• Coastal Carolina University/Florida Atlantic University</li> <li>• Florida International University</li> <li>• ASBPA/Hohonu Water Level Stations</li> </ul>	
<p><b>Update the SECOORA RCOOS Plan</b></p>	
<p>The SECOORA Science Committee and the Deputy Director are in the process of updating the SECOORA RCOOS Plan for the 2025-2030 period. The Science Committee met June 17 to determine the strategy for Plan updates and they have provided initial feedback and suggested revisions to the document. The Science Committee has also identified subject matter experts to update individual sections of the plan. Subject matter expert reviews are due August 9. SECOORA staff hope to have the 2025-2030 RCOOS Plan available for the Board of Directors review and approval by early December 2024.</p>	<p>On-track</p>
<p><b>OBSERVING SUBSYSTEM</b></p>	
<p><b>HF Radar Operations &amp; Maintenance</b></p>	
<p>SECOORA HF Radar (HFR) operators provide surface current data in near real-time from 20 HFRs with a targeted up-time of 85%. Hourly data is provided to SECOORA and to the <a href="#">HFR National Network</a>. Operational and quality metrics are routinely checked. These include assessment of daily variations in coverage and uptime using metrics such as database latency, range of coverage, and number of solutions as implemented by the National HFR Network. The SECOORA HFR network supports both operational and research communities by providing high quality, ocean surface current data in near real-time. PIs in the SECOORA region operate CODAR and WERA systems. Progress report details are found in the following google drive worksheets:</p> <ul style="list-style-type: none"> <li>• The HFR report that details HFR operators, system status, and IT infrastructure needs by site is available here – review the worksheet titled “1-6 2024”: <a href="https://docs.google.com/spreadsheets/d/1L1w00TPG1K7xXyh_iXXw6T7JaGT8rLZwnZ_MWfrnIXOI/edit?usp=sharing">https://docs.google.com/spreadsheets/d/1L1w00TPG1K7xXyh_iXXw6T7JaGT8rLZwnZ_MWfrnIXOI/edit?usp=sharing</a></li> </ul> <p>Accomplishments: Four HFR have been deployed off the east, central coast of FL. The news story is available here: <a href="https://secoora.org/measuring-surface-currents-on-the-east-coast-of-florida-with-high-frequency-radars/">https://secoora.org/measuring-surface-currents-on-the-east-coast-of-florida-with-high-frequency-radars/</a></p> <ul style="list-style-type: none"> <li>• Hightower Beach Park (installed by Florida Institute of Technology (FIT))</li> <li>• Treasure Shores Park (installed by FIT)</li> <li>• Canaveral National Seashore (installed by University of Georgia Skidaway Institute of Oceanography (SKIO))</li> </ul>	<p>On-track</p>

<ul style="list-style-type: none"> <li>• Kennedy Space Center (installed by SkIO)</li> </ul> <p>Issues: SkIO has not reinstalled the CAT HFR which was destroyed by a wildfire in 2022. The JEK HFR went down in October 2023. SkIO staff have said they are prioritizing repairs to JEK; however, the reinstallation for CAT is stalled due to issues getting power and internet at the site.</p>																					
<b>SECOORA Glider Network</b>																					
<p>The SECOORA glider team includes SkIO, the University of South Florida (USF), UNC-Chapel Hill (UNC-CH), and Georgia Tech. See table <b>IOOS, NOAA, Other Agency Funding</b> for details on Navy glider support and the OMAO Saildrone-Glider project.</p> <p>Accomplishments:</p> <ul style="list-style-type: none"> <li>• Three SECOORA supported mission was completed (see table below). All data are submitted to the National Glider DAC and the glider data can be found on the SECOORA Data Portal.</li> <li>• The January 2024 Angus mission supported passive acoustic monitoring of critically endangered right whales in the migration corridor off GA/FL. These efforts integrated a custom 50m pump to enable efficient flight in 10-11m waters within the migration corridor.</li> </ul> <table border="1" data-bbox="203 909 1230 1045"> <thead> <tr> <th>Team Lead</th> <th>Glider Name</th> <th>Deployment Date</th> <th>Recovery Date</th> <th>Days in Water</th> </tr> </thead> <tbody> <tr> <td>SkIO</td> <td><a href="#">Angus</a></td> <td>1/11/24</td> <td>2/9/2024</td> <td>29</td> </tr> <tr> <td>USF</td> <td><a href="#">Bass</a></td> <td>3/31/24</td> <td>4/8/24</td> <td>9</td> </tr> <tr> <td>USF</td> <td><a href="#">Bass</a></td> <td>6/15/24</td> <td>6/27/24</td> <td>12</td> </tr> </tbody> </table> <p>Issues:</p> <ul style="list-style-type: none"> <li>• Repeated fin issues on the G1 Bass glider reduced the number of days per mission and required extra expense to recover the glider as it was farther offshore than the normal recovery location.</li> </ul>	Team Lead	Glider Name	Deployment Date	Recovery Date	Days in Water	SkIO	<a href="#">Angus</a>	1/11/24	2/9/2024	29	USF	<a href="#">Bass</a>	3/31/24	4/8/24	9	USF	<a href="#">Bass</a>	6/15/24	6/27/24	12	On-track
Team Lead	Glider Name	Deployment Date	Recovery Date	Days in Water																	
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<b>Sustain the SECOORA Real-Time and Non-Real-Time Mooring Network</b>																					
<p>All real-time moorings/instrumentation have a targeted up-time of 85%.</p> <p>UNCW maintains 12 real-time moorings and 1 non-real-time mooring (OB27M) along the coasts of NC and SC. OB27M data is provided to SECOORA via Research Workspace twice a year. Real-time quality-controlled (QC) data is provided to SECOORA and Axiom Data Science makes the data available to NDBC via ERDDAP server. Non-real time data from the seafloor OB27M station are provided to Axiom twice each year.</p> <p>Accomplishments:</p> <ul style="list-style-type: none"> <li>• UNCW conducted a buoy turnaround cruise aboard the R/V Savannah May 16-17. The CAP2, CAP2WAVE, FRP2 and CHR60 buoys were replaced. Two students from Savannah State University participated on the buoy turnaround cruise where they assisted UNCW technicians in buoy loading, assembly, and deck work.</li> <li>• A re-design of the power/charge controller system has proved to be reliable and is being implemented across the buoy fleet. This change requires procurement of additional electronics enclosures and connectors, but greatly increases power system efficiency and provides additional protection to the electronics from the elements.</li> </ul>	On-track																				

- The FRP2WAVE buoy has been very successful. Data have proved useful to the US Coast Guard, NWS forecasters, the local Fripp Island rescue organization, and local mariners. The wave buoy fills an observational gap with limited resources and has led to increased engagement with a stakeholder organization.
- UNCW supports the FACT Network (ATN) by incorporating acoustic receivers on 4 existing Onslow Bay, NC moorings. The ILM3 Vemco was swapped on 01/03/24. The OB27 Vemco receiver was swapped on 04/09/24. All data were downloaded and provided to FACT.
- UNCW up-time statistics for 1/1/24 – 6/30/24 for real-time moorings:

	ILM2	ILM3	LEJ3	SUN2	CAP2	FRP2	CHR60
Air Temperature	100%	99%	99%	100%	99%	61%	25%
Air Pressure	100%	99%	99%	100%	99%	61%	25%
Wind Speed, Gust, Direction	100%	99%	99%	100%	99%	61%	25%
Salinity	100%	97%	99%	100%	27%	48%	25%
Surface Water Temperature	100%	97%	99%	100%	27%	48%	25%
Waves	91%	N/A	100%	89%	88%	96%	91%
ILM2, LEJ3, SUN2, CAP2, & CHR60 have two buoys on site: a met buoy and a wave buoy							

Issues:

- The CAP2 CTD experienced a malfunction and was unable to be repaired at sea. Two of the rods connecting the upper and lower portion of the buoy failed, resulting in the lower portion of the buoy being unstable, creating unsafe conditions for divers to work under the buoy. The missing data from this deployment period will be uploaded into the UNCW buoy database for CAP2 where it will be archived and shared with SECOORA. The entire buoy was replaced on 5/16 and data transmissions restored.
- FRP2 experienced failures of both primary and secondary met sensors and its CTD during this reporting period. Due to a limited supply of met sensors on hand, UNCW decided to wait until the R/V Savannah cruise, May 16-17, and swapped the entire FRP2 buoy at that time.
- The CHR60 buoy broke free from its mooring during a storm in January 2024. Vessels in the Charleston area (e.g., USCG buoy tenders, NOAA Nancy Foster) were unable to assist in recovery. UNCW hired the R/V Shearwater (Duke University Marine Laboratory) to recover the buoy when it drifted north into Long Bay, SC. The buoy was replaced during the R/V Savannah cruise on 5/16.

USF maintains 2 real-time buoys (C10 & C12) and 2 non-real time moorings (C11 & C15) with SECOORA funding and leverages SECOORA funding with other grants to maintain 2 additional real-time buoys (C13 and C22). All systems are located on the West Florida Shelf (WFS) and, together with modeling efforts, help describe and understand the circulation of the WFS and the role that circulation plays in shelf ecology and other matters of societal concern (e.g., HAB bloom dynamics). QC flags based on QARTOD standards are provided to SECOORA with the real-time data. Real-time data flows to SECOORA and Axiom makes the data available to NDBC via ERDDAP server. Non-real-time data are shared via Research Workspace annually.

Accomplishments:

- No service trips were required during this reporting period.

USF up-time statistics for 1/1/24-6/30/24 for real-time buoys:



USF	C10	C12	C13	C22
Wind	99%	99%	89%	99%
Air Pressure	99%	99%	89%	99%
Water Temperature	99%	99%	89%	99%
Salinity (Surface)	99%	99%	89%	99%
Air Temperature	99%	99%	89%	99%
Relative Humidity	99%	99%	89%	99%
Longwave Radiation	99%	N/A	N/A	N/A
Shortwave Radiation	99%	N/A	N/A	N/A
Currents (ADCP)	98%	99%	70%	93%

Issues:

- The C13 ADCP experienced battery failure. USF was unable to service the buoy due to poor weather conditions and limited offshore vessel availability.
- The damage to moorings and loss of equipment due to Hurricane Ian remain an issue. USF continues to operate without sufficient spares as replacement of damaged and lost equipment has not been possible since the Hurricane Ian DRSA funds have not been made available. USF has heavily leveraged other programs to keep observational elements in the field and transmitting data in real time.

**Expand the SECOORA Real-time Observing Network**

Water Level Initiative: The SECOORA water level team members funded through the IOOS Core award include partners from the American Shore and Beach Preservation Association (ASBPA)/Hohonu and Georgia Tech. Partners from Coastal Carolina University (CCU)/Florida Atlantic University (FAU), and Florida International University (FIU) are funded through the SECOORA BIL award.

Water level sensor locations can be viewed here: <https://wl.secoora.org>.

**SECOORA Accomplishments**

- SECOORA hosted an in-person water level team meeting on May 7. The meeting focused on data management requirements, metadata, and data quality control.
- SECOORA’s water level sensor comparison between the team member water level sensors deployed at Fernandina Beach, FL to the NOAA NWLON station at Fernandina Beach is complete. NOAA CO-OPS compared approximately one year of data from each SECOORA team member sensor against the NWLON station data for the same period. Overall, the results between the NWLON sensor and the Hohonu and Georgia Tech sensors look acceptable. There are issues with the CCU/FAU sensor mounting design which may have introduced noise into the data. This information is valuable as it can help CCU/FAU refine their deployment methods. SECOORA, the water level team, and CO-OPS are developing a paper that will include the Fernandina Beach analysis.

**Georgia Tech Accomplishments**

- The Georgia Tech team continued to work on the Semi-implicit Cross-scale Hydroscience Integrated System Model (SCHISM) of the GA coast to include the following improvements:
  - Integrated real-time operational forecasts for inundation



- Improved inundation layer performance and accuracy
- Added replay feature to look back at inundation with previous storm events
- Improved data caching for more responsive user experience
- Began redesign project to explore building more components on ArcGIS
- Developed new QA/QC data stream for use in the portal event replay
- Conducted Earth Day community outreach events that included activities with water level sensor kits for K-12 students. See success stories for more information (p. 18)

**ASBPA/Hohonu Accomplishments**

- Hohonu developed a short video demonstrating sensor replacement methodology: <https://hohonu.notion.site/Standard-Procedure-for-Sensor-Replacements-c8215d831e2e4336877a669d301899ce>.
- A sensor that was replaced with a new hardware model at Sullivan's Island by the local sponsor was surveyed during this reporting period. The resurvey showed that the difference in sensor elevation was 0.06 ft. This suggests that the methodology for community members to replace sensors is reasonable but requires a follow up survey.
- The Isle of Palms, SC, Sullivan's Island, SC, Folly Beach, SC, and Seabrook Island, SC are using data from their SECOORA sensors to inform sea level rise adaptation plans, drainage infrastructure master plans, and other resilience work.

Station Name	Owner	Uptime (%)
St Mary's Waterfront Pavilion, GA	GT	85%
Fernandina Beach, FL	GT	85%
North River Causeway, GA	GT	40%
Meeting Street Boat Ramp, GA	GT	50%
Montgomery Cross Road at Vernon River, GA	GT	50%
Tybee Island 4 H Center Dock, GA	GT	85%
Hunt Drive at Burnside Island, GA	GT	85%
Shipyards Road, Savannah, GA	GT	60%
Solomon Bridge, Savannah, GA	GT	80%
Hwy 80 at Chimney Creek, GA	GT	50%
Turner Creek Boat Ramp, GA	GT	50%
Walthour Road, Savannah, GA	GT	50%
Lazaretto Creek Fishing Pier, Savannah, GA	GT	60%
Catalina Drive, Savannah, GA	GT	40%
Hwy 17 at Salt Creek, Savannah, GA	GT	60%
UGA Marine Extension, GA	GT	80%
Currituck County, NC	Hohonu	100%
Fernandina Beach, FL	Hohonu	100%
Holden Beach, NC	Hohonu	93%
Surf City, NC	Hohonu	82%
North Topsail Beach, NC	Hohonu	47%
Topsail Beach, NC	Hohonu	97%
Emerald Isle, NC	Hohonu	32%
Fort Raleigh National Historic Site, NC	Hohonu	64%
Collington Creek Inn, Kill Devil Hills, NC	Hohonu	100%
Washington Acres Boat Ramp, NC	Hohonu	100%

Snow's Cut Bridge, NC	Hohonu	10%
Duck, NC	Hohonu	99%
Hammocks Beach State Park, NC	Hohonu	98%
New Bern, NC	Hohonu	98%
Cape Lookout National Seashore, NC	Hohonu	97%
Ocean Isle Beach, NC	Hohonu	94%
Hilton Head, SC	Hohonu	92%
Beaufort, SC	Hohonu	96%
Oyster Landing (N Inlet Estuary), SC	Hohonu	81%
North Myrtle Beach, SC	Hohonu	72%
The Citadel, Ashley River, SC	Hohonu	100%
Fripp Island, SC	Hohonu	0%
Marine Corp Recruit Depot Parris Island, SC	Hohonu	100%
Georgetown, SC	Hohonu	100%
Port Royal Sound Foundation SC	Hohonu	56%
Mexico Beach, FL	Hohonu	71%
Captiva Island, FL	Hohonu	0%
Sanibel, FL	Hohonu	70%
John's Pass, FL	Hohonu	24%

**Georgia Tech Issues:**

- One of the Georgia Tech LoRaWAN gateways was out of service due to a lightning strike. Then, construction on the building where the gateway is located, limited access to the roof. Replacement was made in April and which fixed service issues for 6 sites.
- Many of the Georgia Tech sensors are now using solar power (85% uptime or better); however, sensors that have not been converted to solar are still regularly failing to meet the 85% up time standard.

**ASBPA/Hohonu Issues:**

- Station down times can largely be attributed to ASBPA/Hohonu continuing to have older 2G models failing. ASBPA/Hohonu continues to phase these older models out with newer LTE models which will reduce station downtime.

**SECOORA Biological Data Collection**

University of South Carolina Beaufort (USCB) operates and maintains the SC estuarine soundscape observatory (<https://sound.secoora.org/>). The team operates passive acoustic recorders located in the May River (3 stations), Charleston Harbor (3 stations), Chechessee Creek (1 station), Colleton River (1 station), and North Inlet-Winyah Bay NERR (1 station, decommissioned on 6/29/23). The team plans to move the equipment that was originally deployed at North Inlet-Winyah Bay NERR to a research area off Pritchard’s Island, SC. Potential site locations are currently being evaluated.

Each platform consists of a passive acoustic recorder (DSG-Oceans or Loggerhead Instruments LS1), water level logger (HOBO), and a water temperature logger (HOBO). The DSG-Oceans or LS1s (gain set to 14 dB; HTI 96-min sensitivity -180 dBV re 1 µPa) record sound for 2 min every 1 hour (24 wav files/day) at a sampling rate of 80 or 96 kHz,

On-track





<p>respectively. Specific accomplishments include:</p> <ul style="list-style-type: none"> <li>• The team manually reviewed 45,745 sound (or wav) files for biological sounds and noise occurrences during this project period. For manual review, the team subsamples and analyzes wav files every two hours, which equates to 12 wav files/day at each station.</li> <li>• USCB performed sound pressure level (SPL) analysis on 37,754 wav files. SPL analysis is completed on every wav file (i.e., every 20 mins or 1 hour).</li> <li>• Five student posters were presented using SC estuarine soundscape data at two university events, USC Discover Day and USCB Student Research &amp; Scholarship Day.</li> <li>• The USCB team provided soundscape data from this project to support Sound CoOp (PI Dr. Carrie Wall-Bell, NOAA NCEI). The team also provided soundscape data to Liz Ferguson and Dr. Neil Hammerschlag to support the BioSound Exploratory Project.</li> </ul>	
<b>DMAC AND MODELING &amp; ANALYSIS SUBSYSTEMS</b>	
<b>SECOORA DMAC subsystem</b>	
<p>Axiom Data Science is the SECOORA data management team. Axiom provides the following support on an on-going, annual basis:</p> <ul style="list-style-type: none"> <li>• Maintain, operate, and develop SECOORA cyberinfrastructure to sustain long-term data stewardship for partners and stakeholders.</li> <li>• Maintain IOOS compliant services and applications for integration with national products. <ul style="list-style-type: none"> <li>○ THREDDS 4.6.15 - <a href="https://thredds.secoora.org">https://thredds.secoora.org</a></li> <li>○ ERDDAP 2.02 - <a href="https://erddap.secoora.org">https://erddap.secoora.org</a></li> <li>○ SECOORA ISO WAF - <a href="https://thredds.secoora.org/iso">https://thredds.secoora.org/iso</a></li> <li>○ NCEI Archive - <a href="https://ncei.axiomdatascience.com/secoora/">https://ncei.axiomdatascience.com/secoora/</a></li> </ul> </li> <li>• Maintain the Glider System for the management of SECOORA glider assets. The SECOORA glider data is available for visualization in the portal (<a href="#">here</a>), and data is submitted to the National Glider DAC (GDAC) during glider missions.</li> <li>• Support data ingestion and data standardization for the Water Level Network. Data are flowing from PIs to Axiom via transfer pathways (e.g., APIs) and are then ingested into the ERDDAP server and displayed on the SECOORA website.</li> <li>• Promote data standardization and automation through Research Workspace (RW) and standardized data ingestion processes for SECOORA-operated and non-SECOORA data assets, including moored sensors, ship-based sensors, gliders, HFR, models, and historical legacy time series data sets.</li> <li>• Promote data discovery and public access through the SECOORA data catalog and data portal (<a href="https://portal.secoora.org">https://portal.secoora.org</a>). <ul style="list-style-type: none"> <li>○ Model data &amp; virtual sensor updates have improved the handling of gridded data and stability of virtual sensor functionality on the data portal.</li> <li>○ Axiom is working on mobile-friendly views of the long-term time series data sets. This was demonstrated on a cross-RA Axiom users group call in May.</li> <li>○ Axiom is also adding opportunities for custom dashboards, webpages, and plots based on user identified needs. Axiom demo'd dashboards for <a href="#">Tampa Bay</a> and <a href="#">Miami</a> to SECOORA staff in June.</li> <li>○ Work with Biscayne Bay National Park Service (NPS) to access and archive non</li> </ul> </li> </ul>	<p>On-track</p>



<p>real-time water quality data for Biscayne Bay and the Dry Tortugas has stalled. Access to their non real-time data would be useful for our South Florida MBON partners. We will continue to reach out to the NPS staff during the next reporting period; however, if we are unable to get them to re-engage, we will no longer pursue access to this data set.</p> <ul style="list-style-type: none"> <li>○ Axiom is providing Florida Institute of Technology (FIT) HFR data for two stations to the HFR DAC. FIT was unable to provide the data to the HFR DAC due to firewall issues and Axiom stepped in with a solution to push the data to the DAC.</li> <li>● Strengthen data stewardship within SECOORA to improve data quality, access, attribution, exchange, delivery, and storage. <ul style="list-style-type: none"> <li>○ Axiom is investigating ways to best ingest 6-minute water level data to reduce data latency. There is a need to improve the lag time between ERDDAP services and other services so that data is available via the portal and catalog in a more timely manner. This workflow will be transferable to other Axiom RAs who are implementing water level programs.</li> </ul> </li> <li>● Implement real-time sensor QARTOD compliant quality control systems.</li> <li>● Annually archive physical oceanographic, biogeochemical, and meteorological data with NOAA’s NCEI. <ul style="list-style-type: none"> <li>○ Axiom worked with Drs. Hans Paerl and Nathan Hall, UNC Institute of Marine Science, to archive long term water quality data from the Pamlico Sound, NC region. The data was submitted 4/27/23 and the final doi was minted 6/18/24. The doi link: <a href="https://www.ncei.noaa.gov/access/metadata/landing-page/bin/iso?id=gov.noaa.nodc:0294041">https://www.ncei.noaa.gov/access/metadata/landing-page/bin/iso?id=gov.noaa.nodc:0294041</a></li> </ul> </li> </ul>	
<b>CNAPS Model</b>	
<p>The <a href="#">CNAPS</a> model is operated and maintained by NC State University (NCSU) and Fathom Science. Specific accomplishments include:</p> <ul style="list-style-type: none"> <li>● The project team worked with the Axiom to establish a pathway for hosting CNAPS 30-year reanalysis (1993-2022) product. The data is accessible via an Axiom THREDDS server: <a href="https://thredds.secoora.org/thredds/catalog/catalog.html">https://thredds.secoora.org/thredds/catalog/catalog.html</a></li> <li>● NCSU/Fathom continues to maintain the CNAPS nowcast/forecast system which is available here: <a href="http://omgsrv1.meas.ncsu.edu:8080/CNAPS">http://omgsrv1.meas.ncsu.edu:8080/CNAPS</a>. The CNAPS model simulation from pre-processing, execution, and post-processing takes place 100% on AWS and the team is hosting a THREDDS server on AWS. The only thing that remains on-campus at NCSU is the omgsrv1 server that downloads a subset of data from AWS, draws the images, and hosts the website. The decision to keep the resource on campus was largely based on continuity of the site web address.</li> <li>● Appendix A provides a Hurricane Beryl figure that shows CNAPS predicted the storm track with high accuracy.</li> </ul>	On-Track
<b>WFS Model</b>	
<p>The USF team continues to provide the West Florida Coastal Ocean Model (WFCOM) and the Tampa Bay Coastal Ocean Model (TBCOM) daily nowcast/forecast systems. These models produce simulated currents, water temperature, and sea surface height fields. The models enable researchers to better understand the role that the circulation plays in</p>	On-track

<p>shelf ecology. Real time data and model simulations (including daily automated nowcasts/forecasts for currents and particle trajectories, including short-term red tide tracking joint with the Florida Wildlife Research Institute) are publicly available online (<a href="http://ocgweb.marine.usf.edu">http://ocgweb.marine.usf.edu</a>), as well as being transmitted via THREDDS server to NOAA GOODS.</p>	
<p><b>AI Portal</b></p>	
<p>Florida Wildlife Research Institute (FWRI) and Axiom Data Science are building an artificial intelligence annotation data portal (AI portal). Accomplishments for the reporting period:</p> <ul style="list-style-type: none"> <li>• Support for the publication of taxonomic occurrence data derived from imagery, video, and acoustic data was provided through the Standardizing Marine BioData Working Group (<a href="https://github.com/ioos/bio_data_guide">https://github.com/ioos/bio_data_guide</a>). This Working Group hosts open monthly meetings to discuss standards and provide technical support in the formatting of taxonomic occurrence data into Darwin Core format for submission into open databases like OBIS and GBIF. Documentation for publication into this format was created as a curriculum for the annual BioData Mobilization Workshop (<a href="https://ioos.github.io/bio_mobilization_workshop/">https://ioos.github.io/bio_mobilization_workshop/</a>).</li> <li>• The beta Marine AI Gateway site has 3 main areas (<a href="https://axiommultisstg.wpenginepowered.com/secoora-ai/">https://axiommultisstg.wpenginepowered.com/secoora-ai/</a>): 1) a beta version interactive decision tree diagram to advise data holders on applying AI to existing datasets; 2) case studies that use video, acoustic classification, and imagery with pages in development for each that include code, data, and products associated with each case study; and 3) a community resources area that allows for users to add to their project via links to their content on their preferred platform. Their content can include slides, interactive examples, records, input datasets, and example pipelines.</li> <li>• Case study updates (item 2 above): <ul style="list-style-type: none"> <li>○ The video case study for coral spawning is complete and the landing page is being reformatted.</li> <li>○ Progress on the benthic imagery use case continues and it is currently linked in the Marine AI Gateway via the community resources area as a Github page and example dataset (<a href="https://github.com/eqmh/mosaic-tiling/tree/main?tab=readme-ov-file">https://github.com/eqmh/mosaic-tiling/tree/main?tab=readme-ov-file</a>). During the next reporting period, the project team will generate Python scripts using PyTorch to crop large batches of photo-quadrat benthic imagery automatically and standardize image XY dimensions. This step is required prior to processing imagery on CoralNet (<a href="https://coralnet.ucsd.edu/">https://coralnet.ucsd.edu/</a>). CoralNet is a web solution for coral reef analysis from imagery.</li> <li>○ The Acoustics use case is the least developed and currently exists as a series of Python code using the Google PERCH model to classify boat noise from biological sound. This code is the basis for the in-development Acoustics landing page.</li> </ul> </li> <li>• Team members developed a multi-part “AI for Ecology” interactive demonstration for the FWRI Marine Quest 3-day outreach event. AI for Ecology was developed using the YOLOv8 computer vision model (You Only Look Once, <a href="https://yolov8.com">https://yolov8.com</a>) and was comprised of 5 activities built using real-life ecological monitoring. computer vision modules. The activities included 1) counter of visitors entering and exiting the room 2) counter of visitors currently in each quadrant of the room 3) animal visual detection</li> </ul>	<p>On-track</p>

<p>and classification 4) pose matching and 5) acoustic detection and recognition (Appendix B). The people counters allowed visitors to examine how scientists can use cameras to count animals autonomously, like counting manatees from drone imagery or the number of fish passing in front of an underwater camera (Appendix B, Fig.1). For the animal detector and classifier, visitors held up large pieces of cardboard animal cutouts to explore how cameras use AI to identify animals (Appendix B, Figs.2, 3). The pose matching activity used a Google pose landmark detection model (<a href="https://ai.google.dev/edge/mediapipe/solutions/vision/pose_landmarker/python">https://ai.google.dev/edge/mediapipe/solutions/vision/pose_landmarker/python</a>) to automatically detect and map the orientation of visitors' bodies and limbs from a camera. Visitors were challenged to match the poses in reference images (Appendix B, Figs. 4, 5). The final activity was exploring acoustics with AI through speech-to-text and singing to notes. The tools adapted for this activity were the OpenAI Whisper speech to text module (<a href="https://platform.openai.com/docs/guides/speech-to-text">https://platform.openai.com/docs/guides/speech-to-text</a>) and the Google SPICE pitch detection module (<a href="https://www.kaggle.com/models/google/spice">https://www.kaggle.com/models/google/spice</a>). Visitors spoke and sang into a microphone and saw how their audio was processed by the modules (Appendix B, Fig. 6).</p>	
<b>SEAMAP-SA Data and Analysis</b>	
<p>The SCDNR SEAMAP-SA staff and Axiom are converting fishery and turtle data into DarwinCore format for ingestion into the SECOORA data portal and sharing on the MBON data portal. Accomplishments:</p> <ul style="list-style-type: none"> <li>• Final versions of data and code table structure and extraction report structure were approved by SEAMAP-SA coordinators and Data Management Workgroup and provided to Axiom.</li> <li>• The administrative interface is being finalized and will be reviewed and tested by the SEAMAP-SA/SCDNR data managers.</li> <li>• Testing of the SEAMAP-SA portal has begun with a newly provided SEAMAP-SA survey dataset. The data structure and extraction reports appear to be working correctly for the first dataset. During the next reporting period, each SEAMAP-SA survey team will prepare a single year of their data for testing, and lastly their complete dataset for provision and final test upload.</li> <li>• A plan for developing training videos for data access, summarization, and visualization tools will be developed when SEAMAP-SA data ingestion and portal testing are complete.</li> </ul>	On-track
<b>OUTREACH, ENGAGEMENT, PRODUCT DESIGN SUBSYSTEM</b>	
<b>Support Community Driven Networks</b>	
See "NOAA, IOOS, Other Agency Funding" table, starting on page 13	
<b>SECOORA Outreach and Engagement</b>	
<ul style="list-style-type: none"> <li>• The new outreach one-pager can be accessed here: <a href="https://secoora.org/wp-content/uploads/2024/07/2024-SECOORA-One-Pager-Flyer.pdf">https://secoora.org/wp-content/uploads/2024/07/2024-SECOORA-One-Pager-Flyer.pdf</a></li> <li>• SECOORA hosted 3 webinars for the Coastal Observing in Your Community Webinar Series. Speakers included Dr. Joseph Zhang (VIMS), Dr. Phil Bresnahan (UNC</li> </ul>	On-track

<p>Wilmington), and Dr. Doug Marcy (NOAA OCM). <a href="https://secoora.org/webinar-series-index/">https://secoora.org/webinar-series-index/</a></p> <ul style="list-style-type: none"> <li>• SECOORA collaborated with GCOOS on 3 webinars in an MBON/OA webinar series: <a href="https://secoora.org/gcoos-secoora-joint-webinar-series-building-synergy-across-the-us-mbon-ocean-acidification-networks/">https://secoora.org/gcoos-secoora-joint-webinar-series-building-synergy-across-the-us-mbon-ocean-acidification-networks/</a></li> <li>• Details on media engagement and outreach for SECOORA staff and project PIs are found here (on the tab labeled 1/1/24-6/30/24): <a href="https://docs.google.com/spreadsheets/d/189a6FgoOAjMvGxDxmYuf0QnEoHuPXgpNqjMWN5YFv94/edit?usp=sharing">https://docs.google.com/spreadsheets/d/189a6FgoOAjMvGxDxmYuf0QnEoHuPXgpNqjMWN5YFv94/edit?usp=sharing</a></li> </ul>	
<p><b>Product Development</b></p>	
<p>Water Level Network User Interface (SECOORA): SECOORA contracted Second Creek Consulting to develop a website and individual water level station pages. After iterative feedback from the Sea Grant community, the new website, the Southeast Water Level Network, is available here: <a href="https://wl.secoora.org">https://wl.secoora.org</a>. The site is easy to navigate and individual station pages provide access to water level data as well as water level predictions for stations that are tidally influenced. UTide was used for tidal analysis to determine predicted tidal values. A link to documentation for UTide is on the “documentation” tab on the website. Stations pages also incorporate additional observations when available. For example, the Beaufort, SC station page also includes nearby camera imagery from the SC Department of Transportation. Future updates includes individual station information so that the station operator can provide more descriptive details of the station. Flooding thresholds for each station are also being evaluated. This will allow community members to determine when flooding is occurring.</p>	<p>On-track</p>
<p>SECOORA developed data products and websites:</p> <ul style="list-style-type: none"> <li>• The SECOORA Hurricane Resources page (<a href="https://secoora.org/hurricane-resources/">https://secoora.org/hurricane-resources/</a>) was updated for the 2024 Hurricane season and Axiom updated the <a href="#">Eyes on the Storm</a> site. The site will display real-time storm information for storms predicted to impact the southeast region.</li> <li>• The SECOORA Products and Models page (<a href="https://secoora.org/products-and-models/">https://secoora.org/products-and-models/</a>) was updated to include Estuarine Soundscape Observatory Network in the Southeast (ESONS) and add Florida to the ShellCast resources.</li> </ul>	<p>On-Track</p>
<p>The How’s the Beach (HTB) project team is comprised of representative from three existing products: HTB (University of South Carolina (UofSC)), ShellCast (NCSU), and Beach Condition Reporting System (BCRS, Mote Marine Laboratory). Specific accomplishments this period include:</p> <ul style="list-style-type: none"> <li>• The HTB team is planning a water quality monitoring workshop that will bring together water quality data providers, resource managers, public health officials, and grass roots organizations. The group has developed a draft agenda, reviewed stakeholders to invite, and explored potential dates for the event. At this time, the meeting dates and locations are still TBD.</li> <li>• The ShellCast expansion to FL is complete. Data is available for NC, SC, and FL and is found here: <a href="https://ncsu-shellcast.appspot.com/">https://ncsu-shellcast.appspot.com/</a>. Regulators at NC Division of Marine Fisheries, SC Department of Health and Environmental Control (SC DHEC), and FL</li> </ul>	<p>On-track</p>



<p>Department of Agriculture and Consumer Services provided feedback on additional ShellCast improvements. Based on SC DHEC feedback, a script was developed to facilitate sending automated daily email reports with ShellCast forecasts to regulators.</p> <ul style="list-style-type: none"> <li>• The BCRS DataFetch API is complete and shared with partners, facilitating data exchange.</li> <li>• Outreach materials for BCRS are being translated into Spanish to enhance accessibility, broaden audience engagement, and ensure greater inclusion within the program. The Spanish translation documents include a BCRS Summary, BCRS Field Reporting Guide, and text for a rack card. The initial translations are available here: <a href="https://drive.google.com/drive/folders/1Tckj9apwBTag_T3npolI56llursqKcl7?usp=sharing">https://drive.google.com/drive/folders/1Tckj9apwBTag_T3npolI56llursqKcl7?usp=sharing</a></li> </ul>	
<p>The UNCW developed Situational Awareness Tool (SAST) is being tested by NWS offices in Wilmington, NC and Charleston, SC. Users set up alert thresholds based on real-time buoy data and alerts are triggered with thresholds are met or exceeded. The SAST sent out 2,298 automated alerts during this reporting period.</p>	On-track

IOOS, NOAA, Other Agency Funding	
Funding Area/Recipient	Task and status update – See Appendix J for ASAP draws by funding line
<p>Regional Ocean Data Sharing Initiative, Lead PI Debra Hernandez, SECOORA</p>	<p>Status: On-track</p> <p>Accomplishments:</p> <ul style="list-style-type: none"> <li>• The Drones in the Coastal Zone Community of Practice (<a href="https://secoora.org/drone-network/">https://secoora.org/drone-network/</a>) hosted an in-person meeting in Beaufort, NC, Feb 6 – 8, 2024: <a href="https://secoora.org/drones-in-the-coastal-zone-2024-meeting/">https://secoora.org/drones-in-the-coastal-zone-2024-meeting/</a>. There were approximately 80 attendees and the meeting included tours of the NOAA Beaufort Lab and Duke University Marine Lab.</li> <li>• Florida Sea Grant (FLSG) worked with FAU to identify the locations for 4 new water level sensors. All four sites provide access to water level data as well as meteorological data and were installed by FAU in May 2024: <ul style="list-style-type: none"> <li>○ Two in Bay county: <a href="#">Grand Lagoon</a> and <a href="#">Camp Helen State Park</a>.</li> <li>○ Two in Gulf county: <a href="#">Blacks Island</a> and <a href="#">T.H. Stone Memorial St. Joseph Peninsula State Park</a>.</li> </ul> </li> <li>• FLSG hosted several community meetings about the new water level stations in the following locations: Lion's Park in Niceville, FL (May 21); Sylvania/WE Combs Heights Community, FL (April 9).</li> <li>• The FLSG team is conducting meetings in Santa Rosa and Escambia counties to find appropriate locations for additional water level sensor deployments. This includes contacting county agencies and determining what types of permits or location agreements are required.</li> <li>• Georgia Sea Grant (GASG) has focused on maintaining conversations with City of Brunswick and increasing communications with partners in St. Mary's and Tybee Island. GASG is highlighting the Southeast Water Level</li> </ul>



	<p>Network website to access the water level data and information. GASG is also working with community partners to determine the best ways to visualize critical flood thresholds.</p> <ul style="list-style-type: none"> <li>• GASG leveraged two outreach events in May and June in partnership with Coastal Outreach Soccer and UGA Marine Extension &amp; GASG’s Young Professionals extracurricular STEM program. Both events introduced students to water level sensor technologies and students performed a simple coding exercise using the data. There was a total of 15 participants in each event, all middle and high school age residents of Brunswick, GA. A third outreach event is planned for July 2024.</li> <li>• SC Sea Grant (SCSG) leads bi-monthly calls with all the South Atlantic Sea Grant Programs so that everyone remains coordinated and provides updates on how community engagement and sensor installations are progressing. SCSG works directly with CCU to identify underserved communities in need of water level sensors in SC.</li> <li>• SECOORA worked with NC Sea Grant (NCSG), the town of Belhaven, NC, Beaufort County Emergency Management, and the NC Department of Emergency Management (NCEM) to install two water level sensors in underserved communities within Beaufort County, NC: <a href="#">Belhaven</a> (which includes DOT cameras and water level data) and the <a href="#">Bayside</a> community located in Chocowinity, NC. Both sensors were installed in March 2024. Vertical elevations surveys were conducted by NCEM staff. The data from the sensors are available via the SECOORA data portal, the <a href="#">Southeast Water Level Network</a> website, and via <a href="#">NC FIMAN</a>, an NCEM-run flood mapping program. These two stations will be managed by the SECOORA WL Project manager and highlights a community partnership with NC Sea Grant, the town of Belhaven, Beaufort County, NC and NCEM. Both sensors fill critical gaps in water level data.</li> <li>• SECOORA worked with NCSG partners to develop signage for the two water level sensors installed in Beaufort County. The signs were installed near the two water level sensors to increase community awareness of the stations and their data. The content of each sign includes narrative about the sensor and water level monitoring, logos for partners, and a QR code that links to the station page for that sensor. Signs are found here: <a href="#">Belhaven</a> and <a href="#">Bayside</a>.</li> <li>• Site visits conducted with partners at the City of Wilmington, UNCW, SECOORA, and NCSG in November 2023 led to a Community Collaborative Research Grant (CCRG) proposal that was selected for funding in April 2024. An in-person kick-off meeting was held on May 30. As part of this effort, SECOORA will install a water level sensor in an urban underserved area of Wilmington on Burnt Mill Creek. UNCW will install two sensors farther upstream on the same creek. This effort includes community engagement meetings as well as an elementary school educational component where students will get to build sensors.</li> </ul>
SECOORA – Water level within region, Lead PI SECOORA	<p>On-track</p> <p>See NCSG update above and page 5 for specific SECOORA accomplishments</p>



UNC-Chapel Hill, Lead PIs Brian Blanton & Rick Leuttich	See Appendix C
SECOORA – SECART support for SCDRP and Hernandez travel	Accomplishments: <ul style="list-style-type: none"> <li>• SCDRP support – Complete <ul style="list-style-type: none"> <li>○ SCDRP hosted their 8<sup>th</sup> annual meeting Jan 23-24, 2024 in Savannah, GA: <a href="https://www.scdrp.secoora.org/copy-of-2024-annual-meeting">https://www.scdrp.secoora.org/copy-of-2024-annual-meeting</a></li> <li>○ SCDRP hosts monthly partnership meetings the 4<sup>th</sup> Thursday of each month.</li> <li>○ Claire McGrath was contracted as SCDRP Program Coordinator.</li> </ul> </li> <li>• SECART travel support for Hernandez– Delayed <ul style="list-style-type: none"> <li>○ The SECART meeting is scheduled for August 27 – 29, 2024.</li> </ul> </li> </ul>
Filipe Fernandes	Status: Year 3 - Complete See Appendix D
SECOORA/FACT Data Wrangler & FACT Acoustic Telemetry Network DM improvements, Lead PI Joy Young, Fisheries Data Solutions	Status: On-track See Appendix E
Ocean Acidification, Grey’s Reef, Lead PI Scott Noakes, UGA	Status: Year 3 - Complete See Appendix F
Ocean Acidification, SOCAN Network, Lead PIs Emily Hall (Mote Marine Lab) and Janet Reimer	Status: On-track See Appendix G
One time System add on – Gliders to support Navy glider shipment, Lead PI Catherine Edwards, UGA SkIO	Status: Year 3 - Complete See Appendix H
One time System add on – OMAO-OAR RFP Sairdrone-Glider project funds to support UGA, Lead PI Catherine Edwards, UGA SkIO	Status: On-track See Appendix I
One time System add on - HFR Program Spin-up and O&M -	Status: Complete SECOORA purchased a new A/C unit and paid for CODAR remote technical support time for FAU PI Baxley. The remaining funds were issued to FAU as



Florida Atlantic University	a subaward. The FAU team purchased upgraded CODAR software for HILL and HAUL HFR. The new software allows antenna pattern measurements (APM) to be made using AIS signals from vessels
One time System add on - KSC WERA HFR Site - Installation Costs	Status: Complete
SECOORA/HFR system wide support for retuning/testing/ additional work by SECOORA HFR operators	Status: Complete Accomplishments: Funding was used by SECOORA to purchase supplies required by multiple HFR operators. The most needed items were antenna coils and A/C units.
HABS – partial funding of pan regional Sargassum project, lead PI, Chuanmin Hu, USF	See Appendix J
Harmful Algal Blooms (HABs) – funding from Yrs 1-2: 1) Lead PI Michael Parsons, Florida Gulf Coast University (FGCU) 2) Natalie Cohen, UGA SkIO	See Appendix K: Parsons See Appendix L: Cohen
SECOORA/Vembu Scholarship	Status: Complete Accomplishments: SECOORA awarded two Vembu Ocean Scholars awards – one to Emma Graves, graduate student from USF and Emma Graves, undergraduate student from USF. Both attended the Ocean Sciences Meeting in New Orleans, LA in February 2024.
Integration and evaluation of models to couple with NWM (PI Liu, University of South Florida)	See Appendix M
Marine Biodiversity Observations Network, Lead PI Neil Hammerschlag, UM – funding from Yrs 1&2	See Appendix N

### III. PROJECT CHALLENGES/MODIFICATIONS:

- Equipment and supply costs are increasing due to inflation and continued supply chain shortages. Multiple vendors are quoting 10%-15% price increases over 2022 and 2023 pricing. SECOORA anticipates continued higher than normal costs for the upcoming year.
- Labor costs are also increasing given the ~10% cost of living increase. SECOORA anticipates continued higher costs for the remainder of the award.

### IV. PUBLICATIONS:

See Google Drive links for a list of Peer Reviewed Publications. There are two worksheets found in this file. The 2021-2022 worksheet lists Year 1 publications and the 2022-2023 worksheet lists publications for Years 2 and 3. The items highlighted in green on the 2022-2023 worksheet are publications from this most recent report period.

[https://docs.google.com/spreadsheets/d/1k1Z\\_u7oITH24HyqNxF17bpb73gYMubSpDJeD6J2XaPo/edit?usp=sharing](https://docs.google.com/spreadsheets/d/1k1Z_u7oITH24HyqNxF17bpb73gYMubSpDJeD6J2XaPo/edit?usp=sharing)

### V. BUDGET SUMMARY:

- Were the oldest ASAP TAS BETC accounting lines invoiced first?
  - This is Year 3 of the award. SECOORA is spending Year 1, 2, and 3 ASAP TAS BETC lines first. See **Appendix O**.
- Give details on any delays with initiating a contract/subaward. Note any issues with the previous year funds or other issues that occurred during the reporting period. Will this result with a work stoppage or cause significant problems with the partnership?
  - SECOORA has issued all subawards and subcontracts related to this award.
- Give a brief update on project invoicing for the reporting period. Were there any delays with invoicing or payment?
  - SECOORA continues to receive all year invoices. There is always a delay between when a subawardee conducts work and when SECOORA is given an invoice for that work. SECOORA regularly monitors invoicing frequencies with subawardees/subcontractors. Most subawardees invoice quarterly.
- Provide details on any property or equipment charged directly to the award having a useful life of more than one year and an acquisition cost of \$5,000 or more per unit during the period.
  - No equipment was purchased by SECOORA during this reporting period.
- Include changes in key scientific, technical or management personnel, not included in certification.
  - No changes have been made this reporting period.
- Include changes to the organizational structure such as: changes in status or partners organizations and points of contact.
  - No changes to organizational structure have been made this reporting period.
- Provide an update about travel completed during the reporting period.  
Examples of travel completed during the reporting period include:
  - All SECOORA staff participated in the SECOORA Annual meeting and a staff retreat, May 6-10 in Charleston, SC.
  - Dorton presented at the NC Coastal Zone Management meeting held in Mateo, NC, April 24-25.
  - Hernandez and Dorton participated in the IOOS Association Meeting held in Washington, DC, March 11-14.
  - Hernandez participated in and presented at the Ocean Sciences meeting, held in New Orleans, LA, Feb. 19-22.
  - Alsbrooks participated in water level station maintenance with the FAU team in Florida, Jan 20 – 24.
  - Hernandez participated in the SCDRP Annual meeting in Savannah, GA, Jan 22-24.

- What are the total travel expenditures to date on the award though the reporting period?
  - Total travel expenditures through May 31, 2024 equal \$105,531.
- Are there any plans to initiate a new partnership (contract or subaward) during the next reporting period?
  - No

## VII. SUCCESS STORIES

Success Story	Brief Description	Contact
SC Communities using water level data to make decisions.	The Isle of Palms, the Town of Sullivan's Island, the City of Folly Beach, and the Town of Seabrook Island are using data from their SECOORA sensors to inform sea level rise adaptation plans, drainage infrastructure masterplans, and other resilience work.	Nicole Elko, ASBPA (nicole.elko@asbpa.org)
Florida Marine Quest - AI for Ecology	FL FWRI Team members developed a multi-part "AI for Ecology" interactive demonstration for FWRI's annual Marine Quest. Marine Quest is a three-day outreach event hosted at FWRI Headquarters in St. Petersburg, FL, with the first two days dedicated to student field trip groups and the third day open to the general public. (See Appendix B)	Luke McEachron, FWS (Lucas.McEachron@myfwc.com)
Georgia Tech Smart Sensors K-12 Outreach Events	The team led hands on design activities and semester long projects with Effingham Career Academy and Jenkins High School. Outside of the school system, the team hosted a table and student hands on activities with the floodplain simulation table and sensor kits at the Earth Day Savannah event in Daffin Park.	Russ Clark, Georgia Tech (russ.clark@gatech.edu)
Two Water Level Sensors Installed in North Carolina Communities	The two water level sensors installed near Chocowinity in Beaufort County and the Town of Belhaven were surveyed in partnership with NC DPS and have been integrated into the SECOORA data portal as well as the state's Flood Inundation Mapping Network (FIMAN). <a href="https://secoora.org/secoora-partners-with-north-carolina-communities-to-install-new-water-level-sensors/">https://secoora.org/secoora-partners-with-north-carolina-communities-to-install-new-water-level-sensors/</a>	Cayla Cothron, NC Sea Grant (cdcothro@ncsu.edu)
New Water Level Sensor in SC Community	A water level sensor was installed on private property in Williamsburg County, near a County-owned Park, in May 2024.	Ke'Ziyah Williamson, SC Sea Grant (keziyah.williamson@scseagrant.org)

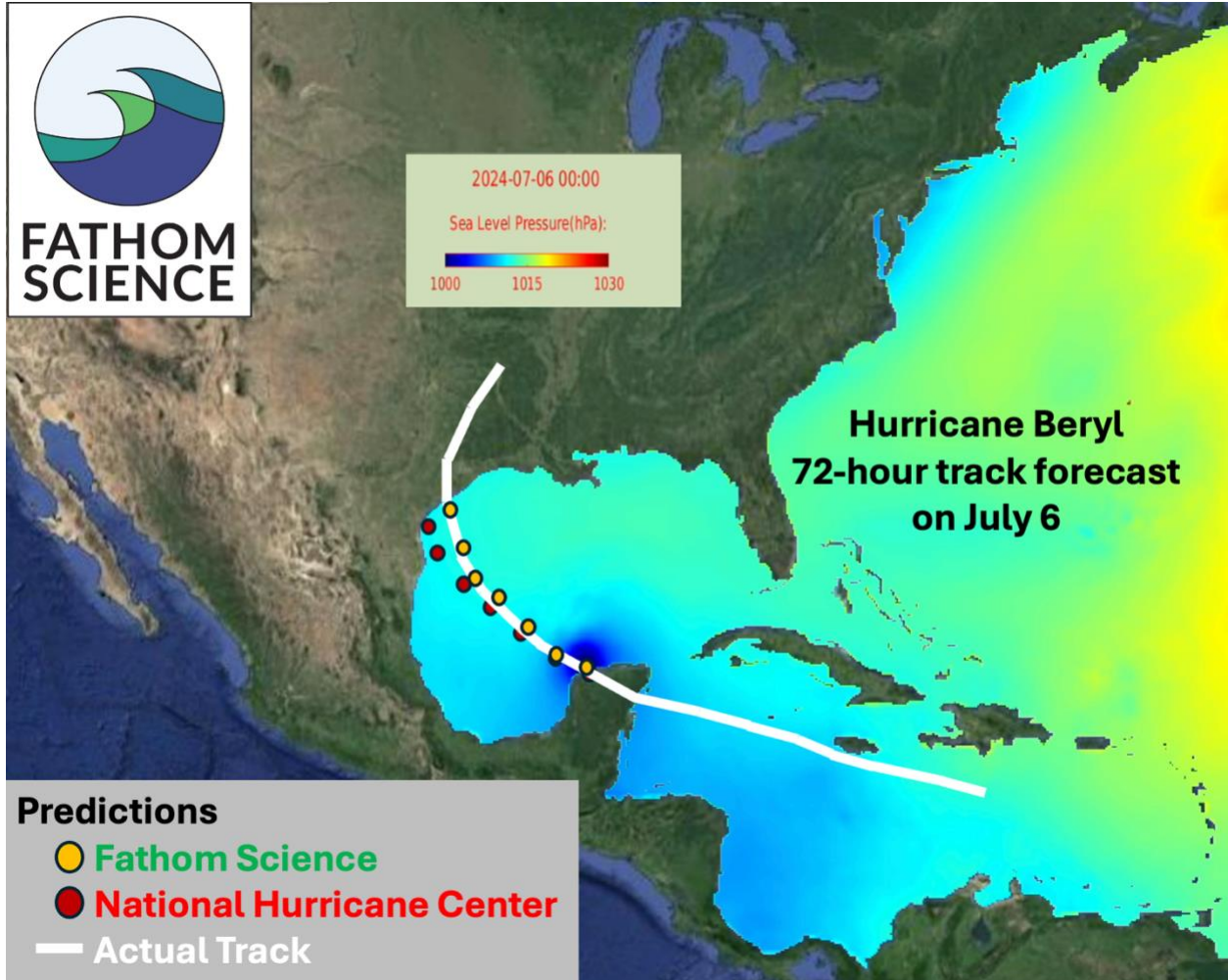


Fripp Island Sea Rescue Partnership	The FRP2 wave buoy continues to provide important data for successful public safety operations. The Fripp Island Sea Rescue (FISR) organization has committed to being an engaged stakeholder, providing vessel assistance, cleaning and maintenance operations and logistical support in efforts to sustain the FRP2WAVE deployment.	Lynn Leonard, UNCW (lynnl@uncw.edu)
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End Report

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Appendix A: Hurricane Beryl storm track and CNAPS model prediction



The CNAPS forecast track is shown in yellow dots and the model successfully predicted the hurricane landfall location based on the actual track (white line).







Figure 2. Demonstration of the animal detector and classifier activity. Students held up large cutouts of pieces of animals in front of a webcam, where the YOLOv8 classifier would draw a bounding box and attempt to identify the animal. Here, students held up the three pieces of a coyote, which was incorrectly identified as a cow. Usually, the module could correctly recognize the coyote with relatively high confidence. Photo Credit: Carol Davis, FWRI.





Figure 3. Students mix the coyote head with the body of the manatee to challenge the animal detection module. Photo Credit: Carol Davis, FWRI.



Figure 4. Demonstration of the pose detection and matching activity as powered by the Google Pose detection module. Students were scored on their ability to match the pose of a reference image. In the photo above, the student only scored a 33% on their ability to match the reference image of a grandma performing 'the dab.' Photo Credit: Carol Davis, FWRI.



Figure 5. Demonstration of a student scoring an 88% to match the 'crane kick' pose. Photo Credit: Carol Davis, FWRI.





Figure 6. Visitors at the acoustic classification station learning how sound is processed by computer vision into images called 'spectrograms.' Participants could speak or sing into the microphone and 'see' their sounds before they were converted to text or notes. Photo Credit: Carol Davis, FWRI.

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Brian Blanton, Multi-decadal reanalyses of coastal water level to support NOAA sea level and flood risk products  
**SECOORA PROGRESS REPORT: JANUARY 1 - JUNE 30, 2024**

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**PROGRESS TOWARDS OBJECTIVES**

1

Provide a summary of progress towards meeting your project objectives for the six month reporting period. Pay special attention to the six month reporting period accomplishments and the broader impacts related to those findings. Indicate if you anticipate any substantive changes to the project Scope of Work (SOW) as you complete the information below. List each objective and text that describes progress towards meeting the objectives. For each objective provide one of the following indicators: "Complete" and date of completion "On-Track" "Delayed" and anticipated date of completion If an objective is delayed, a justification for the delay (e.g., COVID travel restrictions, late receipt of contract) must be provided along with a new completion date and description of activities employed or to be employed to mitigate the delay.

This SECOORA/IOOS/NOAA project is computing a long-term reanalysis of coastal water levels for the US eastern and Gulf of Mexico coasts, using a data assimilation (DA) scheme for the ADCIRC model (Asher et al, 2019). This DA approach corrects model predictions based on errors between a prior solution and observations of water levels. Using NOAA/NOS gauge observations, time-series of prior errors (prediction - observations) are determined and used to compute a sequence of dynamic water level correction surfaces on the ADCIRC grid. The long-term simulation is then rerun by incorporating the error surfaces into a new (posterior) prediction of coastal water levels. The atmospheric forcing is from the ECMWF's ERA5 reanalysis (Hersbach et al, 2022). The reanalysis simulation period is 1979-2022, and the simulations include the wind-wave model SWAN.

In this performance period (1 Jan - 30 Jun 2024), we have been heavily analyzing the most recent version of the reanalysis posterior. [Note that NOAA has named this dataset the Coastal Ocean Reanalysis - Gulf of Mexico and East Coasts (CORA-GEC) and labeled this version V1.0.] Overall, the performance of the posterior is significantly better than the prior. The V1.0 dataset is also provides better temporal coverage in relatively data-poor areas (such as the Gulf of Mexico in the first decades of the analysis period) due to the error model approach for the low-frequency (sub 30d period) errors and the use of long-term SLR rates where available. However, it has also been noted that the SLR amounts, over the period 1979-2022 in the CORA-GEC, may not reflect recent (from about 1995 forward) increases in the rates. This is being examined by the entire team

(NOAA+UNC/RENCI) to determine an alternative approach to handling SLR in the reanalysis process. Post-doc T Asher continued to engage with government agencies (FEMA, USACE, and NOAA) and with the broader research community through conferences, presentations, meetings, and one-on-one interactions. He has also been involved in a more frequently held "technical team" meeting that discusses various scenarios and use cases for the datasets, access to the datasets, and related topics.

Progress has also been made on the incorporation of high-resolution hurricane winds into the ERA5 synoptic meteorology.

Typically, the representation of a tropical cyclone in a model such as ERA5 is relatively poor due to the spatial resolution of the model (~25km in this case). In order to embed a higher resolution vortex field in ERA5, we first need to remove the hurricane representation in ERA5. We have developed a method to remove a hurricane vortex from a large-scale synoptic field, based on the approach outlined in Kurihara et al (1995) [Improvements in the GFDL Hurricane Prediction System, Monthly Weather Review] and related work.

The UNC research group has continued to engage with the NOAA NCDIS team through frequent virtual meetings where progress and status toward the overall objectives of the reanalysis project are described and discussed. Additional, more detailed technical discussions have been held to determine dataset readiness and access.

Also during this reporting period, RENCi participated in several discussions on carrying out a coastal reanalysis for the western US coast (east Pacific Ocean, CORA-PAC). We also conducted some tests using a basic ADCIRC grid for the Pacific Ocean to ensure that all of the needed components to the simulation system were available. Postdoc T. Asher began the development of a new ADCIRC grid for the eastern Pacific. Initial tests of this new grid indicated that it would be suitable for a first version of the CORA-PAC.

Task Progress:

1. Complete computation of V2 (NOAA version 1.0) dataset. 75% complete. This task is somewhat delayed due to the above-noted SLR rate issue that arose during analysis of the first version of the dataset.
2. Incorporate tropical cyclones. Blend ADCIRC GAHM vortex winds and pressures into the ERA5 reanalysis. 50% complete. Delayed. This task has previously been delayed in order to address key issues in the first version of the dataset. In this reporting period, we have outlined a general approach for inserting the higher resolution tropical cyclone winds into ERA5, and begun some initial tests of blending Hurricane Florence (2018) with ERA5, using ADCIRC's NWS 13 functionality.
3. Data access and post-processing. This is an ongoing and on-track task. In this period, we placed the new reanalysis dataset to RENCi THREDDS Data Server that host the datasets for both direct end-user access and for upload by the RPS team. The url to the TDS is: <https://tdsres.apps.renci.org/thredds/catalog/ReanalysisV2/ADCIRC/ERA5/hsofs.V2/catalog.html>
4. Documentation: Develop and maintain project documentation for end-users of the datasets. Ongoing and on-track.

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**PUBLICATIONS & CONFERENCE PRESENTATIONS**

- 2 Please list any published scientific papers, conference papers, or notable presentations given within the reporting period related to this award. This may include presentations at non-traditional venues. Do not include publications outside of the six month reporting period. For presentations, include the title, name(s) of the presenter(s), date the presentation was made, and the venue (e.g., CERF, AGU). Also note whether the materials presented (e.g., PowerPoint® slides) remain available to SECOORA and IOOS and, if so, how they may be accessed (i.e., list the website address or online file sharing link such as Google Drive).
- Rose, L., Widlansky, M.J., Feng, X., Thompson, P., Asher, T.G., Dusek, G., Blanton, B., Luettich Jr, R.A., Callahan, J., Brooks, W. and Keeney, A., 2024. Assessment of water levels from 43 years of NOAA's Coastal Ocean Reanalysis (CORa) for the Gulf of Mexico and East Coasts. *Frontiers in Marine Science*, 11, p.1381228.

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**MEDIA ENGAGEMENT, EDUCATION, AND OUTREACH**

- 3 Please list any media coverage related to this award and include links to news stories and media coverage. Only include media coverage conducted within this six month reporting period.
- None in this period.
- 
- 4 Describe education or outreach materials related to this award that have been developed within this six month reporting period.
- None in this period.
- 
- 5 Upload outreach and education materials developed during the reporting period. Please combine multiple outreach/education materials into one document.

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**PRODUCT DEVELOPMENT & DELIVERY**

- 6 Please provide a brief description of the status of all products or tools (or major upgrades to existing products) currently available or under development as part of this award. Include weblinks where available. Use this section to report instances in which IOOS-funded science related to this project has been transitioned to support products developed by your organization or even beyond your organization. For example, this might include models, apps, mapping tools, etc. that are being used by state or federal agencies to assist with decision support. Also describe who is using the products and the number of users. Only report on work conducted within the six month reporting cycle.

The primary product/deliverable of this project is the 44-year posterior simulation of water levels and waves for the US east coast and Gulf of Mexico. The ADCIRC model output files, in native netCDF and reorganized netCDF files for more efficient time series extraction, are posted on the primary RENCi research THREDDS Data Server. This is primarily to support "early access" for end-users developing analyses and to provide a dataset for RPS to develop more customized access methods and approaches for longer-term access. The Jupyter/Python notebook (previously described) continues to be used for time-series extraction from the large data files. The data that the notebook accesses has been replaced with version 2 (NOAA version 1.0). The python code is hosted in a GitHub repository at <https://github.com/RENCi/EDSReanalysis.git> and in an interactive Binder notebook at

<https://tinyurl.com/RenciReanalysis>.

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**SUCCESS STORIES**

- 7 Briefly describe any success stories that help convey either the value of your project and/or the impact that it has made. Success stories should include how your project has benefited local/regional stakeholders. These stories may be used by SECOORA and the IOOS Office to respond to data calls, support presentations, or used as independent stories. Provide contact details (email addresses) for the PI and stakeholder(s) impacted.

None in this period.

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**LEVERAGED FUNDING**

- 8 Provide a brief summary on project leveraging (i.e., how you leveraged your SECOORA award to receive other funding). Also include the proposal/project title, funding agency, amount of funding received, project start date and duration of the project. Only report on leveraging activities within the six month reporting cycle.

None in this period.

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Filipe Fernandes

Python Data Analysis Tools for Oceanographers

Progress and Accomplishments: Reporting period (January 1, 2024 - June 30, 2024)

The tasks were divided into:

1. Assist in the development of the IOOS.us Documentation and Demonstration sub pages;
2. Support current and continue developing important software packages to the IOOS enterprise;
3. Ensure software deployment via conda-forge packages and updates.

1) Assist in the development of the IOOS.us Documentation and Demonstration sub pages

The IOOS Documentation pages use GitHub Actions (GHA) to sync data among them but the sync was disabled if the pages was not updated with a some days. We added the sync theme and keep alive GHA to all IOOS pages and subpages. We also introduced linkchecker in some pages to prevent link rot: [conventions-for-observing-asset-identifiers #2](#), [erddap-gold-standard #74](#), [ioos-atn-data #81](#), [ioos-documentation-jekyll-skeleton #19](#), [ioos-metadata #43](#), [ioos-metadata #44](#), [ioos-metadata #46](#), [ioos.github.io #9](#), [mbon-docs #54](#), [ncei-archiving-cookbook #7](#), [lider-dac #354](#), [BioData-Training-Workshop #34](#), [glider-dac #330](#), and [glider-dac #331](#).

We implemented a GitHub Action to convert .cdl files to .nc and vice-versa to make them available in the ERDDAP gold standard repository ([erddap-gold-standard #70](#)).

There are a few maintenance Pull Requests (PR) ranging from fixing typos to minor HTML fixes and updates: [ioos-code-sprint #30](#), [#59](#), [ioos-metadata #42](#), [marinebon/map-of-activities #14](#), [#19](#), [ocefpaf/glider\\_metrics #2](#), [ioos/ioos\\_metrics #81](#), and [ioos/.github #9](#).

IOOS was selected again as a Google Summer of Code organization and the documentation on the ideas page and proposal were updated ([ioos/gsoc #40](#), [gsoc #49](#), and [gsoc #52](#)). We were contemplated with 6 slots for 2024.

We created a gallery page for the IOOS CodeLab page ([ioos/ioos\\_code\\_lab #181](#)) and several small fixes to correct notebooks that were no longer running: [ioos/ioos\\_code\\_lab #179](#), [#183](#), [#188](#), [#189](#), [#194](#), [#196](#), [#197](#), [#198](#), [#199](#), [#200](#), [#204](#), and [#208](#).

2) Support current and continue developing important software packages to the IOOS enterprise

This activity can be divided into three sections: (a) packages from the IOOS GitHub organization, (b) packages from third party organizations that are important for IOOS, and (c) pangeo/cloud support.

- a) *compliance-checker*: The most important changes note are the removal of *pkg\_resources*, which improved speed when *compliance-checker* was installed alongside other packages that also registered *pkg\_resources*, the support for *zarr* files, support for numpy 2.0, and some bugfixes including a segfault in the test system: [ioos/compliance-checker #1060](#), [#1069](#), [#1070](#), [#1071](#), [#1072](#), [#1073](#), [#1074](#), [#1075](#), [#1076](#), [#1077](#), [#1078](#), [#1083](#), [#1084](#), [#1087](#), [#1092](#), and [#1095](#).

During the IOOS Code Sprint we also tackled many issues and brought all *compliance-checkers* plugins up to speed with the latest testing framework, GHA, and documentation: [ioos/cc-plugin-glider #52](#), [#53](#), [#54](#), [#56](#), [#57](#), [#58](#), [#59](#), [#63](#), [ioos/cc-plugin-ncei #53](#), [#54](#), [#55](#), and [uw-farlab/cc-plugin-og #2](#).

Major refactor in the *ioos-metrics* repository to transform the various scripts and notebooks into a package: [ioos/ioos\\_metrics #53](#), [#54](#), [#56](#), [#61](#), [#63](#), [#65](#), [#67](#), [#72](#), [#73](#) and [#80](#).

*ciso*: This library required some CI updates, modern wheel support, and numpy 2.0 updates: [ioos/ciso #34](#), [#37](#), [#40](#), [#43](#), [#44](#), and [#47](#).

*erddapy* and *gliderpy*: some important updates, like timeouts for requests, increased max ItemsPerPage, added a download file functionality and more: [ioos/erddapy #327](#), [#328](#), [#329](#), [#333](#), [#334](#), [#335](#), [#336](#), [#338](#), [#340](#), [#342](#), [ioos/gliderpy #101](#), [#80](#), [#91](#), [#92](#), [#94](#), and [#95](#).

*ioos\_qc*: the highlights are *numpy* 2.0 support, modern Python support, and better linting: [ioos/ioos\\_qc #104](#), [#105](#), [#111](#), [#114](#), [#116](#), [#117](#), [#118](#), [#119](#), [#121](#), [#122](#), and [#123](#).

- b) Various packages third party organizations had their CIS updated, compatibility fixes, or other maintenance changes: [jobis/pyobis #147](#), [pygridgen/pygridgen #57](#), [pyoceans/pocean-core #85](#), [#97](#), [#99](#), [pyoceans/python-seawater #18](#), [#20](#), [#21](#), [python-visualization/foium #1935](#), [#1936](#), [#1967](#), [#1968](#), [#1977](#), [#1978](#), [rcaneill/xnemogcm #70](#), [SciTools/cf-units #423](#), [TEOS-10/GSW-C #65](#), [TEOS-10/GSW-Matlab #22](#), [#23](#), [TEOS-10/GSW-Python #154](#), [#155](#), [#159](#), [#163](#), [#164](#), [#165](#), [#166](#), [#169](#), [Unidata/cftime #324](#), [#340](#), [Unidata/netcdf4-python #1319](#), [#1332](#), [#1339](#), [#1340](#), [wesleybowman/UTide #122](#), and [#123](#).

- c) Use meson-python to build the Fortran Extension wheel for [xgcm/xcape #55](#).

### 3) Ensure software deployment via conda-forge packages and updates

This effort can be separated into (a) infrastructure maintenance, (b) new packages, and (c) packages updates.

#### a) Infrastructure maintenance

- i) Mark *minizip* and *ioos\_metrics* as broken: [conda-forge/admin-requests #1020](#) and [#992](#);
- ii) Add *esi-core* and *ciso* to *osx\_arm64* migration: [conda-forge/conda-forge-pinning-feedstock #5472](#), and [#6066](#).

- iii) Patch *parcels* for bad *zarr* version: [conda-forge/conda-forge-repodata-patches-feedstock #730](#) and [#732](#).
- b) New packages to conda-forge: [pandas-bokeh](#), [random-user-agent](#), [multipart](#), [alpha-shapes](#), [dataflows-tabulator](#), [jalali-core](#), [sciencebasepy](#), [ioos\\_metrics](#), [cads-api-client](#), [FireHR](#), [pymodis](#), [pygbif](#), [msbox](#), and [fast-barnes-py](#)
- c) See the list of updated feedstocks (Pull request links)

### **Pull Requests links**

- [conda-forge/adios\\_db-feedstock #4](#)
- [conda-forge/aws-cdk.cloud-assembly-schema-feedstock #68](#)
- [conda-forge/cf\\_units-feedstock #60](#)
- [conda-forge/cftime-feedstock #53](#)
- [conda-forge/compliance-checker-feedstock #45](#)
- [conda-forge/gliderpy-feedstock #9](#)
- [conda-forge/ioos\\_metrics-feedstock #1](#)
- [conda-forge/ioos\\_metrics-feedstock #3](#)
- [conda-forge/ioos\\_metrics-feedstock #4](#)
- [conda-forge/markdown-checklist-feedstock #5](#)
- [conda-forge/parcels-feedstock #106](#)
- [conda-forge/pyhdf-feedstock #50](#)
- [conda-forge/python-pdal-feedstock #104](#)
- [conda-forge/pywavelets-feedstock #56](#)
- [conda-forge/safer-feedstock #27](#)

Joy Young, FACT Data Wrangler

## SECOORA PROGRESS REPORT: JANUARY 1 - JUNE 30, 2024

### 2021-2026 SECOORA PROGRESS REPORT

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#### PROGRESS TOWARDS OBJECTIVES

1

Provide a summary of progress towards meeting your project objectives for the six month reporting period. Pay special attention to the six month reporting period accomplishments and the broader impacts related to those findings. Indicate if you anticipate any substantive changes to the project Scope of Work (SOW) as you complete the information below. List each objective and text that describes progress towards meeting the objectives. For each objective provide one of the following indicators: “Complete” and date of completion “On-Track” “Delayed” and anticipated date of completion If an objective is delayed, a justification for the delay (e.g., COVID travel restrictions, late receipt of contract) must be provided along with a new completion date and description of activities employed or to be employed to mitigate the delay.

Data Wrangler

Priority 1: Conduct two major (i.e. inter-network matching) telemetry data processing events.

- Completed: Two major data matching event were completed in February and June 2024.

Fast FACTS for the June 2024 data push:

Fact Issues June push: 132

New and updated Tags June Push: 592

New and updated detections: 16, 953,336

FACT db facts:

Total Detections: 333,881,563

Total tags: Active Tags: 3,752 Total Tags: 11,063

Species count: 135

Project count: 207

Contributor count: 324

Institution count: 112

- Completed 30 March 2024: Collect and upload environmental data from array owners in conjunction with data processing.

Collection and processing of temperature data was conducted in March 2024 and uploaded to Research Workspace. Updates of the temperature data from the June data push will be published in July 2024.

Priority 2:

- Completed 30 June 2024: Work with PIs to resolve incomplete telemetry datasets (based on process under priority 1).

During the two data push events, approximately 20% of issues were classified as data fixes. An issue is a specific task for a project, for example loading tag metadata for project ABCD.

- Delayed. Produce one manuscript using data derived from the FACT/SECOORA node. Two manuscripts are in progress. The first is being written but lead by a graduate student who was delayed writing his dissertation. The second manuscript was submitted but has been resubmitted. Expected response August 2024.

- Completed June 2024: Present results of the collaborative manuscript at a national scientific conference.

Results on a collaborative paper on cobia movements was presented at the World Fisheries Congress. See conference presentations for details.

DaViT Mini-proposal

## Appendix E - FACT

Priority 1: Augment researchers' detection extracts with species level QC flags

- Completed: Identify machine readable sources for home range and maximum swim velocity for species within the FACT Network.

A student was engaged to evaluate and integrate external authorities on species home range, and analyzed the species coverage of OBIS/GBIF, IUCN, and AquaMaps' predictive mapping tool. OBIS's coverage of FACT species was found to be the most robust and a workflow in R to produce concave polygons from OBIS occurrence data was delivered.

- Completed: Identify appropriate QC filters from the remora toolkit. Remora's QC process was refactored to allow each of the tests to run independently and aggregate only selected QC tests toward a cumulative QC score. This is important to do since some of the QC testing done by Remora's default configuration was redundant to OTN and FACT data QC processes and was inflating the final aggregate scores.

- On-track: Include coding for the QC flags as a step-in processing detection extracts.

The tailored QC tests and the OBIS-derived homerange dataset allow a 5-point QC test to be run against each individual detection recorded across the FACT network and the resulting QC columns to be included in detection extract files, creating a reliable subset of the data to feed the visualization tool. Still to come - deploying this workflow into the detection extract process in order to create QC flag columns on Research Workspace that can be read by the DaViT visualization process for filtering purposes, and amending DaViT's data ingestion step to act on these QC flags when creating species polygons for the DaViT tool.

Priority 2: Improve the accuracy of visuals on the DaViT tool.

- On track: Adapt the DaViT to ingest detections based on QC flags to reduce false detections used to calculate range and distribution.

QAQC flags have been added using adapted Remora software. Testing is in progress to bring the flagged detections into the DaViT.

- Completed: Change the algorithm used to calculate range and distribution to stay within the confines of the acoustic networks.

Distribution visuals are now created using kernel density estimates from averaged daily locations.

Priority 3: Improve the effectiveness of the DaViT in communicating animal movement information to the public.

- On-track: Incorporate suggestions from the 2022 annual SECOORA meeting including (but not limited to): updated explanations of range and distribution to illustrate metrics are calculated within the network, include a depiction of the network, allow selection of multiple months, make disclaimers more pronounced, change numbers to worlds for months, and include pictures for all species.

Most all changes have been implemented. We are still lacking photos for 16 species including four shark species and 12 boney fish species. A receiver map was posted on the website, but the link broke during the website changover. It is now fixed.

- On-track: Create and link additional web pages for projects depicted in the DaViT tool.

One new project page was created (<https://secoora.org/fact/projects/greater-amberjack-project/>). Project personnel decided that dedicated project pages would stand alone from the DaViT because the pages often include multiple projects. Going forward, we will use a geoserver to create code-based project pages that will be linked to the citations displayed with data layers in the DaViT.

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## **PUBLICATIONS & CONFERENCE PRESENTATIONS**

2

Please list any published scientific papers, conference papers, or notable presentations given within the reporting period related to this award. This may include presentations at non-traditional venues. Do not include publications outside of the six month reporting period. For presentations, include the title, name(s) of the presenter(s), date the presentation was made, and the venue (e.g., CERF, AGU). Also note whether the materials presented (e.g., PowerPoint® slides) remain available to SECOORA and IOOS and, if so, how they may be accessed (i.e., list the website address or online file sharing link such as Google Drive).

Publications

Facilitated the publication of several manuscripts by providing detection data or were mentioned as a network.

Bowers, M. E., & Kajiura, S. M. (2024). A novel process to infer the reliability of ecological information derived from passive acoustic telemetry track reconstruction. *Methods in Ecology and Evolution*.

Hawkes, L. A., Davies, P., Hall, A. E., Horton, T. W., Stamp, T., Witt, M. J., & Sheehan, E. V. (2024). People behind the “pings”; limiting authorship threatens collaboration in telemetry. *Journal of Fish Biology*.

## Appendix E - FACT

Kendall, M. S., Siceloff, L., O'Donnell, P., Jessen, B., Williams, B. L., Winship, A. J., & Ellis, R. D. (2024). What controls home range relocations by estuarine fishes downstream from watersheds with altered freshwater flow?. *Hydrobiologia*, 851(1), 223-241.

### Presentations

Young, J.M. January 2024. Data 101: Foundation of data management, loading, and extracts. FACT annual meeting. St. Augustine, FL.

Young, J.M. February 2024. See what's tracking: The FACT DaViT. Regional Wildlife Science Collaborative for Offshore Wind meeting. Virtual.

Young, J.M. February 2024. Building a collaborative tracking network in the southeast United States, the FACT Network. World Fisheries Congress. Seattle, WA.

Young, J.M. April 2024. Overview of the FACT Network. Presentation at the Animal Telemetry Network. Virtual.

Young, J.M., May 2024. The DaViT: Bridging the gap to open data. SECOORA Annual Meeting. Charleston, SC.

Young, J.M. May 2024. Fast facts: The FACT Network. Annual SECOORA Meeting. Charleston, SC.

Young, J.M. June 2024. The DaViT. Presentation at the Atlantic Cooperative Telemetry Network meeting. New Haven, CT.

Young, J.M. June 2024. The VEMBU. Presentation at the Atlantic Cooperative Telemetry Network meeting. New Haven, CT.

Young, J.M. June 2024. Building a collaborative tracking network in the southeast United States, the FACT Network. Presentation at the Atlantic Cooperative Telemetry Network meeting. New Haven, CT.

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## **MEDIA ENGAGEMENT, EDUCATION, AND OUTREACH**

3 Please list any media coverage related to this award and include links to news stories and media coverage. Only include media coverage conducted within this six month reporting period.

The FACT Network maintains active social media accounts on Facebook, X, and Instagram. Since Jan 2024, 23 posts have been made to Instagram which included reminders to submit data, related job opportunities, and promoting research projects.

4 Describe education or outreach materials related to this award that have been developed within this six month reporting period.

The DaViT website <https://secoora.org/fact/data-visualization-tool/>

5 Upload outreach and education materials developed during the reporting period. Please combine multiple outreach/education materials into one document.

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## **PRODUCT DEVELOPMENT & DELIVERY**

6 Please provide a brief description of the status of all products or tools (or major upgrades to existing products) currently available or under development as part of this award. Include weblinks where available. Use this section to report instances in which IOOS-funded science related to this project has been transitioned to support products developed by your organization or even beyond your organization. For example, this might include models, apps, mapping tools, etc. that are being used by state or federal agencies to assist with decision support. Also describe who is using the products and the number of users. Only report on work conducted within the six month reporting cycle.

Improvements to the DaViT, as listed in the objectives, may be observed on the website listed under outreach materials.

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## **SUCCESS STORIES**

7 Briefly describe any success stories that help convey either the value of your project and/or the impact that it has made. Success stories should include how your project has benefited local/regional stakeholders. These stories may be used by SECOORA and the IOOS Office to respond to data calls, support presentations, or used as independent stories. Provide contact details (email addresses) for the PI and stakeholder(s) impacted.

Since Jan 2024, 16 new tag projects have opted into the DaViT, expanding our number of different species displayed and adding to the effective depiction of distribution of species.

The June 2024 data matching event resulted in 440 new detections extracts created, benefiting 194 projects with new or modified

## Appendix E - FACT

data.

In January 2024, the FACT meeting held its annual meeting in St. Augustine, FL. While the rain and cold was less than ideal by Florida standards, we had some 70 participants over three days. The meeting including professional and student scientific talks, data processing workshops and a scientific lecture by Dr. Robert Lennox. It was a great success. Two students were provided with travel awards and the raffle auction raised over \$500 for future student travel funds.

In June 2024, the FACT network was contacted to assist in two synthesis efforts. The first, a combined look at cobia detection to determine mortality rates for the Southeast Data, Assessment, and Review process and the second by NOAA to redefine Essential Fish Habitat for Highly Migratory Species. We reached out to FACT members and have been facilitating the sharing of approved data with the groups. Final transfer is expected in July 2024.

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### **LEVERAGED FUNDING**

8

Provide a brief summary on project leveraging (i.e., how you leveraged your SECOORA award to receive other funding). Also include the proposal/project title, funding agency, amount of funding received, project start date and duration of the project. Only report on leveraging activities within the six month reporting cycle.

None at this time.

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## SECOORA PROGRESS REPORT: JANUARY 1 - JUNE 30, 2024

### Scott Noakes, Grey's Reef OA mooring

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#### **ACCOMPLISHMENTS TOWARDS OBJECTIVES**

- 1 Provide a summary of progress towards meeting your project objectives for the six month reporting period. Indicate if you anticipate any substantive changes to the project Scope of Work (SOW) as you complete the information below. List each objective and describe progress towards meeting the objectives. For each objective provide one of the following indicators: “Complete” and date of completion “On-Track” “Delayed” and anticipated date of completion If the milestone is delayed, a justification for the delay (e.g., COVID travel delays, manufacture turnaround times for repairs, NEPA compliance taking longer than anticipated) must be provided along with a new completion date and description of activities employed to mitigate the delay.

In February, the Seabird stopped transmitting data. After discussions with PMEL, it was determined that there were not any Seabird instruments available to send. Since no Seabirds were available, it was decided to schedule the full system servicing in May. PMEL started gathering MAPCO2 components for testing. The MAPCO2 and SAMI-pH deployed at Gray's Reef were still operational so only the water quality data was not being collected at this time.

On March 21, 2024, we traveled offshore on the Latitude 31 vessel Triton's Grace to collect water samples at the Gray's Reef buoy. The first set of samples were collected at 0959 and the last set was collected at 1201. A total of three sample sets were collected during this trip. Salinity ranged from 32 to 32.3 ppt and temperature ranged from 15.9 to 16.3 C. The samples were sent to Mote Marine Laboratory in Sarasota, Florida for analyses.

The replacement MAPCO2, Seabird and SAMI-pH were delivered to UGA in early May. Latitude 31 (Triton's Grace) was once again contracted to head offshore for the MAPCO2 servicing. On May 26, we headed out to the Gray's Reef buoy to exchange the MAPCO2. The seas were calm so both the Seabird and SAMI were replaced under the buoy. All MAPCO2 components on the buoy were replaced. The MAPCO2 system was started in FAST mode at 1247 (1647 GMT) with all components reporting. The MAPCO2 successfully reported data by iridium satellite later in the day. In addition to replacement of the MAPCO2, three water sample sets were collected between 1255 and 1454. Salinity ranged from 34.4 to 34.5 ppt and temperature ranged from 26.7 to 27.7 C.. The boat returned to the Kilkenny Marina by 1700. To date, all MAPCO2 components have been precleaned and returned to PMEL for servicing. The data website has been updated and continues to plot and log data daily.

- 2 Up-time statistics for each sensor/station should be uploaded as a Word or Excel document
  - 3 Describe any problems/delays related to low (below 85%) up-time and provide a description of activities employed to mitigate the problem/delays.
- 

#### **PUBLICATIONS & CONFERENCE PRESENTATIONS**

- 4 Please list any published scientific papers, conference papers, or notable presentations given within this six month reporting period related to this award. This may include presentations provided at at non-traditional venues. Do not include publications outside of the six month reporting period. For presentations, include the title, name(s) of the presenter(s), date the presentation was made, and the venue (e.g., CERF, AGU). Also note whether the materials presented (e.g., PowerPoint® slides) remain available to SECOORA and IOOS and, if so, how they may be accessed (i.e., list the website address or online file sharing link such as Google Drive).
-

**MEDIA ENGAGEMENT, EDUCATION, AND OUTREACH**

- 5 Please list any media coverage related to this award conducted within this six month reporting period. Include links to news stories and media coverage.  

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- 6 Describe educational or outreach materials related to this award that have been developed within this six month reporting period.  

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- 7 Upload outreach and education materials developed during the reporting period. Please combine multiple outreach/education materials into one document.  

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**PRODUCT DEVELOPMENT & DELIVERY**

- 8 Please provide a brief description of the status of all products or tools (or major upgrades to existing products) currently available or under development as part of your award. Only report on work conducted within the six month reporting cycle. Include weblinks where available. Use this section to report instances in which IOOS-funded science related to this project has been transitioned to support products developed by your organization or even beyond your organization. For example, this might include models, apps, mapping tools, etc. that are being used by state or federal agencies to assist with decision support. Also describe who is using the product(s) and the number of users. Only report on work conducted within the six month reporting cycle.  

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**SUCCESS STORIES**

- 9 Briefly note any success stories that help convey either the value of your project and/or the impact that it has made. An example could be how you work with stakeholders during emergency events to provide them with data or products for decision support. These stories may be used by SECOORA and the IOOS Office to respond to data calls, support presentations, or independent stories. Provide contact details (email addresses) for the PI and stakeholder(s) impacted.  

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**LEVERAGED FUNDING**

- 10 Provide a brief summary on project leveraging (i.e., how you leveraged your SECOORA award to receive other funding). Also include the proposal/project title, funding agency, amount of funding received, project start date, and duration of the project. Only report on leveraging activities within the six month reporting cycle.  

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## Emily Hall and Janet Reimer, Southeast Ocean and Coastal Acidification Network

### SECOORA PROGRESS REPORT: JANUARY 1 - JUNE 30, 2024

#### 2021-2026 SECOORA PROGRESS REPORT

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##### PROGRESS TOWARDS OBJECTIVES

- 1 Provide a summary of progress towards meeting your project objectives for the six month reporting period. Pay special attention to the six month reporting period accomplishments and the broader impacts related to those findings. Indicate if you anticipate any substantive changes to the project Scope of Work (SOW) as you complete the information below. List each objective and text that describes progress towards meeting the objectives. For each objective provide one of the following indicators: “Complete” and date of completion “On-Track” “Delayed” and anticipated date of completion If an objective is delayed, a justification for the delay (e.g., COVID travel restrictions, late receipt of contract) must be provided along with a new completion date and description of activities employed or to be employed to mitigate the delay.
1. Work with stakeholder workgroup to plan Summer 2024 Townhall (Completed: SOCAN is partnering with MBON and GCAN. The first webinar was held on April 11, 2024
    - a. Webinar links will be found on the SOCAN website (Delayed): SOCAN has requested files and/or links to YouTube and is expected to complete the website upload in July 2024
  2. Submit funding proposals with collaborators 2024 (Delayed): We did not find any appropriate opportunities for submission. SOCAN is partnering with Mote Marine Lab and the USGS on a proposal that will be submitted in August 2024.
  3. Submit abstracts to meetings 2024 (Completed): SOCAN submitted abstracts to four meetings (see dates in section 2)
  4. Partner with Coastal Carolina University PIs from Sea Grant project on manuscript writing (On-Track): outlines for the two papers have been discussed.
  5. Social media: In the month of June 2024, the SOCAN Facebook page reached 224 people (On-Track): Metric tracking began in June 2024. SOCAN shares relevant posts by other organizations as well as creates original content as needed.
  6. SOCAN will collaborate with GCAN to turn the Stakeholder Feedback Project Report into a peer-reviewed manuscript (On Track): SOCAN and GCAN have begun discussions of the content of the paper. It is still in development.
- CAN Collaboration On track  
Restructure
- 

##### PUBLICATIONS & CONFERENCE PRESENTATIONS

- 2 Please list any published scientific papers, conference papers, or notable presentations given within the reporting period related to this award. This may include presentations at non-traditional venues. Do not include publications outside of the six month reporting period. For presentations, include the title, name(s) of the presenter(s), date the presentation was made, and the venue (e.g., CERF, AGU). Also note whether the materials presented (e.g., PowerPoint® slides) remain available to SECOORA and IOOS and, if so, how they may be accessed (i.e., list the website address or online file sharing link such as Google Drive).
- Final report to NOAA OAP
- PRESENTATIONS
- June 2024: SECOORA Annual meeting: Dr. Janet Reimer presented "Southeast Coastal Ocean Acidification Network"
- February 2024: Coral Life Cycle Workshop Dr. Emily Hall was part of a panel discussion
- February 2024: Gulf of Mexico Alliance Annual Meeting: Dr. Emily Hall presented "Coastal Acidification Network Stakeholder Feedback Project"
- January 2024: Presentation to the 5th Annual Coral Knowledge Exchange: Dr. Emily Hall presented "Ocean Acidification in the Florida Keys"
-

**MEDIA ENGAGEMENT, EDUCATION, AND OUTREACH**

- 3 Please list any media coverage related to this award and include links to news stories and media coverage. Only include media coverage conducted within this six month reporting period.  
None
- 
- 4 Describe education or outreach materials related to this award that have been developed within this six month reporting period.  
The SOCAN website was updated with project updates for the South Carolina Sea Grant (<https://socan.secoora.org/coastal-carolina>) and the SOCAN-GCAN-CHNEP (<https://socan.secoora.org/gcan>) projects and additional peer-reviewed paper links were added to the reference section.  
SOCAN partnered with GCAN and MBON to host acidification webinars (the first webinar was held on April 11).  
SOCAN sent two Constant Contact emails: January: 307 sends; 56% open rate; 6% click rate and April: 307 sends; 49% open rate; 5% click rate.  
SOCAN partnered with the Ocean Acidification Alliance and the Aquarium Conservation Partnership to create a StoryMap (<https://storymaps.arcgis.com/collections/304a83b174c347b0bb86872d6e385fdd?item=5>). The StoryMap was released on January 8, 2024.  
SOCAN partnered with the other US CANs to collectively write a commitment to Ocean Acidification Research for Sustainability (OARS): <https://oars-commitments.org/coastal-acidification-networks-cans/> (completed June 11, 2024).
- 
- 5 Upload outreach and education materials developed during the reporting period. Please combine multiple outreach/education materials into one document.

**PRODUCT DEVELOPMENT & DELIVERY**

- 6 Please provide a brief description of the status of all products or tools (or major upgrades to existing products) currently available or under development as part of this award. Include weblinks where available. Use this section to report instances in which IOOS-funded science related to this project has been transitioned to support products developed by your organization or even beyond your organization. For example, this might include models, apps, mapping tools, etc. that are being used by state or federal agencies to assist with decision support. Also describe who is using the products and the number of users. Only report on work conducted within the six month reporting cycle.  
Aquarium Conservation Partnership StoryMap:  
<https://storymaps.arcgis.com/collections/304a83b174c347b0bb86872d6e385fdd?item=5>  
OARS Commitment: <https://oars-commitments.org/coastal-acidification-networks-cans/>

**SUCCESS STORIES**

- 7 Briefly describe any success stories that help convey either the value of your project and/or the impact that it has made. Success stories should include how your project has benefited local/regional stakeholders. These stories may be used by SECOORA and the IOOS Office to respond to data calls, support presentations, or used as independent stories. Provide contact details (email addresses) for the PI and stakeholder(s) impacted.  
None

**LEVERAGED FUNDING**

- 8 Provide a brief summary on project leveraging (i.e., how you leveraged your SECOORA award to receive other funding). Also include the proposal/project title, funding agency, amount of funding received, project start date and duration of the project. Only report on leveraging activities within the six month reporting cycle.  
None

**Catherine Edwards, Navy Glider**

**SECOORA GLIDER AND OTHER UNCREWED SYSTEMS PROGRESS REPORT: JAN 1 - JUNE 30, 2024**

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**PROGRESS TOWARDS MEETING OBJECTIVES**

- 1 Provide a summary of progress towards meeting your project objectives for the six month reporting period. Pay special attention to the six month reporting period accomplishments and the broader impacts related to those findings. Indicate if you anticipate any substantive changes to the project Scope of Work (SOW) as you complete the information below. List each objective and text that describes progress towards meeting the objectives. For each objective provide one of the following indicators: “Complete” and date of completion “On-Track” “Delayed” and anticipated date of completion. If an objective is delayed, a justification for the delay must be provided along with a new completion date and description of activities employed or to be employed to mitigate the delay.
- Objective: SkIO will support IOOS Hurricane Glider efforts by assisting with Navy glider operations during Hurricane Season. SkIO will coordinate deployment, recovery, and logistical activities with IOOS and the Navy for 1-2 gliders. On-Track.
- \* SkIO coordinated the logistics to return ship 2 Navy gliders used in the 2023 season.
  - \* PI Edwards designed and executed pre-season briefings with GOC personnel re piloting strategy in the Gulf Stream, and has coordinated with the Saildrone team for 2024 operations to coordinate 2024 gliders with a Saildrone in the Sargasso Sea.
  - \* PI Edwards and SECOORA observatory co-PI Lembke participated in weekly meetings with Hurricane Glider efforts, and maintained effective communications with NAVO/GOC pilots and managers.
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- 2 Describe any specific accomplishments/successes achieved during the six-month period.
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- 3 Describe any major problems/delays that are outside of your control that prevented project objectives from being accomplished (e.g., COVID travel delays, manufacture turnaround times for repairs).
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**PUBLICATIONS AND CONFERENCE PRESENTATIONS**

- 4 Please list published scientific papers, conference papers, or notable presentations given within this six month reporting period related to this award. This may include presentations at non-traditional venues. Do not include publications or presentations outside of the six month reporting period. For presentations, include the title, name(s) of the presenter, date the presentation was made, and the venue (e.g., CERF, AGU). Also note whether the materials presented (e.g., PowerPoint® slides) remain available to SECOORA and IOOS and, if so, how they may be accessed (i.e., list the website address or online file sharing link such as Google Drive).
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**MEDIA ENGAGEMENT, EDUCATION, AND OUTREACH MATERIALS**

- 5 Please list any media coverage related to this award and provide links to the stories (e.g., newspaper articles, TV interviews). Only provide updates on media coverage that occurred within six month reporting period.  

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- 6 Describe educational or outreach materials related to this award that have been developed within this six month reporting period. (200 words or less)  

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- 7 Attach education and outreach materials developed during this six month reporting period.  

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**PRODUCT DEVELOPMENT & DELIVERY**

- 8 Please provide a brief description of the status of all products or tools (or major upgrades to existing products) currently available or under development as part of this glider award. Include weblinks where available. Use this section to report instances in which IOOS-funded science related to this project has been transitioned to support products developed by your organization (e.g. Georgia Tech’s glider path planning tool) or even beyond your organization. For example, this might include apps, mapping tools, etc. Also describe the user for the developed products and the number of users. Only report on work conducted within the six month reporting cycle.  

---

**LEVERAGED FUNDING**

- 9 Provide a brief summary on project leveraging (i.e., how you leveraged your SECOORA award to receive other funding). Also include the proposal/project title, funding agency, amount of funding received, project start date and duration of the project. Only report on leveraging activities within the six month reporting cycle.  

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Catherine Edwards (OMAO project): A coordinated observing strategy for Saildrones and gliders during the Atlantic hurricane season and advancement of data assimilation for the coupled hurricane forecast system

**SECOORA GLIDER AND OTHER UNCREWED SYSTEMS PROGRESS REPORT: JAN 1 - JUNE 30, 2024**

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**PROGRESS TOWARDS MEETING OBJECTIVES**

- 1 Provide a summary of progress towards meeting your project objectives for the six month reporting period. Pay special attention to the six month reporting period accomplishments and the broader impacts related to those findings. Indicate if you anticipate any substantive changes to the project Scope of Work (SOW) as you complete the information below. List each objective and text that describes progress towards meeting the objectives. For each objective provide one of the following indicators: “Complete” and date of completion “On-Track” “Delayed” and anticipated date of completion If an objective is delayed, a justification for the delay must be provided along with a new completion date and description of activities employed or to be employed to mitigate the delay.
  1. SkIO will support Saildrone/glider coordination efforts by using past and future data from both platforms. On-Track. Edwards has coordinated with project leads, mission pilots, and the larger team in advance of hurricane season 2024. Operations will commence in July 2024.
  2. Glider data from prior hurricane seasons will be post-processed to publication quality and shared with collaborators. These data, together with data collected in recent Saildrone missions, will be analyzed for trends related to successful colocation of the vehicles given the regional context. On Track. SkIO technician A. Vincent has tested and begun implementation of a standardized method to bin glider data from past missions, and is in the process of applying the method to past glider missions, prioritizing hurricane seasons 2021-present, when Saildrone data are also available. Vincent and SkIO undergraduate intern X. Giomi have visualized and processed data from 2021, and are working on standardizing methods for later years.
  3. PI Edwards will work with the NOAA AOML/PMEL Saildrone team to coordinate deployments in hurricane season 2023, explore spatial and regional trends in collocated data, and leverage this insight for to develop strategies for colocation and data assimilation in future hurricane seasons. On Track. SkIO technician Vincent has conducted preliminary statistical analyses of co-located saildrone missions, and has used 2021 as a case study to consider along- vs cross-track error, testing the hypothesis that alongshore position differences between the two instruments is less significant driver of cross-platform error than cross-shore differences in position.
- 2 Describe any specific accomplishments/successes achieved during the six-month period.
- 3 Describe any major problems/delays that are outside of your control that prevented project objectives from being accomplished (e.g., COVID travel delays, manufacture turnaround times for repairs).

Funding arrived late, with delays in processing at UGA. The award was processed 5 months into this 6 month reporting period.

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**PUBLICATIONS AND CONFERENCE PRESENTATIONS**

- 4 Please list published scientific papers, conference papers, or notable presentations given within this six month reporting period related to this award. This may include presentations at non-traditional venues. Do not include publications or presentations outside of the six month reporting period. For presentations, include the title, name(s) of the presenter, date the presentation was made, and the venue (e.g., CERF, AGU). Also note whether the materials presented (e.g., PowerPoint® slides) remain available to SECOORA and IOOS and, if so, how they may be accessed (i.e., list the website address or online file sharing link such as Google Drive).
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**MEDIA ENGAGEMENT, EDUCATION, AND OUTREACH MATERIALS**

- 5 Please list any media coverage related to this award and provide links to the stories (e.g., newspaper articles, TV interviews). Only provide updates on media coverage that occurred within six month reporting period.
- 
- 6 Describe educational or outreach materials related to this award that have been developed within this six month reporting period. (200 words or less)
- 
- 7 Attach education and outreach materials developed during this six month reporting period.
- 

**PRODUCT DEVELOPMENT & DELIVERY**

- 8 Please provide a brief description of the status of all products or tools (or major upgrades to existing products) currently available or under development as part of this glider award. Include weblinks where available. Use this section to report instances in which IOOS-funded science related to this project has been transitioned to support products developed by your organization (e.g. Georgia Tech’s glider path planning tool) or even beyond your organization. For example, this might include apps, mapping tools, etc. Also describe the user for the developed products and the number of users. Only report on work conducted within the six month reporting cycle.
- 

**LEVERAGED FUNDING**

- 9 Provide a brief summary on project leveraging (i.e., how you leveraged your SECOORA award to receive other funding). Also include the proposal/project title, funding agency, amount of funding received, project start date and duration of the project. Only report on leveraging activities within the six month reporting cycle.
-

Chuanmin Hu, Monitoring and forecasting pelagic Sargassum in the South Atlantic Bight

**SECOORA PROGRESS REPORT: JANUARY 1 - JUNE 30, 2024**

**2021-2026 SECOORA PROGRESS REPORT**

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**PROGRESS TOWARDS OBJECTIVES**

1

Provide a summary of progress towards meeting your project objectives for the six month reporting period. Pay special attention to the six month reporting period accomplishments and the broader impacts related to those findings. Indicate if you anticipate any substantive changes to the project Scope of Work (SOW) as you complete the information below. List each objective and text that describes progress towards meeting the objectives. For each objective provide one of the following indicators: “Complete” and date of completion “On-Track” “Delayed” and anticipated date of completion If an objective is delayed, a justification for the delay (e.g., COVID travel restrictions, late receipt of contract) must be provided along with a new completion date and description of activities employed or to be employed to mitigate the delay.

Year 3 geographic scope continued to be: Florida Keys and beaches along the east coast of Florida, and meanwhile included the Florid Panhandle area.

Year 3 objectives continued from Year 2, including:

1) to develop and validate algorithms suitable for high-resolution satellite data to map and quantify Sargassum distribution and abundance

Status: On track. A deep-learning model has been developed to delineate Sargassum image features from Sentinel-2 imagery. A student thesis has been finished to focus on this work.

2) to generate prototype high-resolution imagery products to map and quantify Sargassum distribution and abundance

Status: On track. Quicklook Sentinel-2 imagery have been generated in near-realtime for several regions in the Florida Keys and SE coast of Florida. SuperDove images have been generated in near real-time for a selected area near Key West.

Despite the late start of the project and late arrival of Year 3 funding, significant progress has been made on Objective #1 during this period. Specifically, we implemented and tested a Deep Learning algorithm to apply to Sentinel-2 MSI data (10 m) resolution to detect and quantify Sargassum in the Florida Keys. Results showed advantage over the MODIS-based detection because these new maps cover coastal waters up to the shoreline. A master’s thesis has been finished from this work. Once fully validated, the algorithm will be implemented to automatic production.

On Objective #2 – We continued the data downloading and processing flow in near real-time in an automatic fashion for both Sentinel-2 and SuperDove, for selected regions in the Florida Keys and along the SE coast of Florida. Quicklook images have been generated continuously. Computer codes have been debugged to assure smooth operations. This framework is now ready to implement for other selected regions.

---

**PUBLICATIONS & CONFERENCE PRESENTATIONS**

2

Please list any published scientific papers, conference papers, or notable presentations given within the reporting period related to this award. This may include presentations at non-traditional venues. Do not include publications outside of the six month reporting period. For presentations, include the title, name(s) of the presenter(s), date the presentation was made, and the venue (e.g., CERF, AGU). Also note whether the materials presented (e.g., PowerPoint® slides) remain available to SECOORA and IOOS and, if so, how they may be accessed (i.e., list the website address or online file sharing link such as Google Drive).

Zhang, Y., C. Hu, D. J. McGillicuddy, Jr., B. B. Barnes, Y. Liu, V. H. Kourafalou, S. Zhang, and F. J. Hernandez (2024). Pelagic Sargassum in the Gulf of Mexico driven by ocean currents and eddies. *Harmful Algae*, 132, 102566, <https://doi.org/10.1016/j.hal.2023.102566>.

Zhang, Y., Hu, C., McGillicuddy, D.J., Liu, Y., Barnes, B.B., and Kourafalou, V.H., 2024. Mesoscale eddies in the Gulf of

Mexico: A three-dimensional characterization based on global HYCOM. Deep-Sea Research Part II, p.105380.  
<https://doi.org/10.1016/j.dsr2.2024.105380>

Presentations:

Monitoring and forecasting pelagic Sargassum in the South Atlantic Bight. Brian Barnes, Chuanmin Hu, Yuyuan Xie, Yonggang Liu, Sully Sullivan. May 7-8, 2024, Charleston, SC, USA.

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### **MEDIA ENGAGEMENT, EDUCATION, AND OUTREACH**

- 3 Please list any media coverage related to this award and include links to news stories and media coverage. Only include media coverage conducted within this six month reporting period.

During this reporting period, C. Hu has continuously been interviewed by numerous public media channels (television, newspaper, radio, online) on Sargassum inundation. An incomplete list is compiled and provided below.

<https://www.usatoday.com/story/news/nation/2024/01/24/sargassum-seaweed-map-forecast-2024/72310094007/>

<https://www.wptv.com/news/state/new-sargassum-blob-raises-concerns-in-florida>

<https://sargassummonitoring.com/en/record-sargassum-proliferation-in-the-tropical-atlantic-ocean-sargassum-monitoring-predictions/>

<https://www.sun-sentinel.com/2024/03/04/stink-free-beaches-masses-of-seaweed-likely-wont-reach-florida-until-may-researchers-say/>

<https://www.tcpalm.com/story/news/2024/04/17/sargassum-seaweed-florida-beaches-forecast-biggest-impact-health-effects-water-quality-map/73341998007/>

<https://stthomassource.com/content/2024/06/06/sargassum-seaweed-may-soon-appear-on-beaches-across-the-usvi/>

<https://theworld.org/segments/2024/04/11/why-is-sargassum-seaweed-spreading-across-the-caribbean>

<https://www.jacksonville.com/story/news/2024/05/31/florida-beaches-sargassum-seaweed-summer-forecast-east-west-coast/73903905007/>

- 
- 4 Describe education or outreach materials related to this award that have been developed within this six month reporting period.

C. Hu's group has been generating and distributing monthly Sargassum bulletins to many groups, where all historical bulletins can be found at the SaWS page: <https://optics.marine.usf.edu/projects/saws.html>. During this reporting period we revised the layout of the bulletin to include historical statistics, so the current Sargassum situation can be put in historical perspective. A sample bulletin is provided below.

- 
- 5 Upload outreach and education materials developed during the reporting period. Please combine multiple outreach/education materials into one document.

[Sargassum\\_outlook\\_2024\\_bulletin05\\_USF.pdf](#)

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### **PRODUCT DEVELOPMENT & DELIVERY**

- 6 Please provide a brief description of the status of all products or tools (or major upgrades to existing products) currently available or under development as part of this award. Include weblinks where available. Use this section to report instances in which IOOS-funded science related to this project has been transitioned to support products developed by your organization or even beyond your organization. For example, this might include models, apps, mapping tools, etc. that are being used by state or federal agencies to assist with decision support. Also describe who is using the products and the number of users. Only report on work conducted within the six month reporting cycle.

The new data products from MODIS, based on the machine learning algorithm, have been generated and made available online on a daily basis. These have been downloaded by many stakeholders. We also worked on the newest PACE satellite data, and started to produce quick-look imagery for the Gulf of Mexico and Caribbean Sea.

The workflow to download, process, and make available high-resolution data from Sentinel-2 sensors has been implemented and tested. We have been working to make sure the workflow works smoothly, and have expanded the previous site to include several sites in the Florida Keys and SE Florida coast. During this period we also continued running computer codes to download

PlanetScope/SuperDove data automatically, and to generate quicklook images for a selected site in the Florida Keys.

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### **SUCCESS STORIES**

7

Briefly describe any success stories that help convey either the value of your project and/or the impact that it has made. Success stories should include how your project has benefited local/regional stakeholders. These stories may be used by SECOORA and the IOOS Office to respond to data calls, support presentations, or used as independent stories. Provide contact details (email addresses) for the PI and stakeholder(s) impacted.

During this reporting period, although Sargassum started high in January, the momentum to grow slowed down in the following months. Back in March, we predicted in our monthly bulletins that this year Florida will be largely free of Sargassum inundation to at least late May or early June, and the prediction was updated one month later to add confidence for at least late June. These predictions have been used in many interviews (see weblinks above) to give people (especially travelers) a peace of mind for vacation planning.

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### **LEVERAGED FUNDING**

8

Provide a brief summary on project leveraging (i.e., how you leveraged your SECOORA award to receive other funding). Also include the proposal/project title, funding agency, amount of funding received, project start date and duration of the project. Only report on leveraging activities within the six month reporting cycle.

The NOAA MERHAB proposal has been funded, with funds being distributed to co-PI institutions during this reporting this period. C. Hu served as a non-funded co-PI but will supervise postdocs and students. The MERHAB project will combine high-resolution satellite data and high-resolution numerical models for several regions to improve Sargassum monitoring and forecasting. This is the project that we leveraged on and will continue to leverage on.

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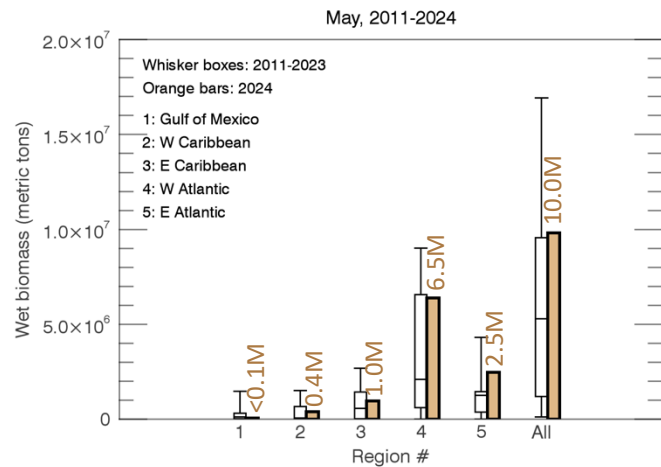
### Outlook of 2024 *Sargassum* blooms

A perspective for the Caribbean Sea and Gulf of Mexico\*  
May 31, 2024, by University of South Florida Optical Oceanography Lab  
([bbarnes4@usf.edu](mailto:bbarnes4@usf.edu), [yuyuan@usf.edu](mailto:yuyuan@usf.edu), [huc@usf.edu](mailto:huc@usf.edu))

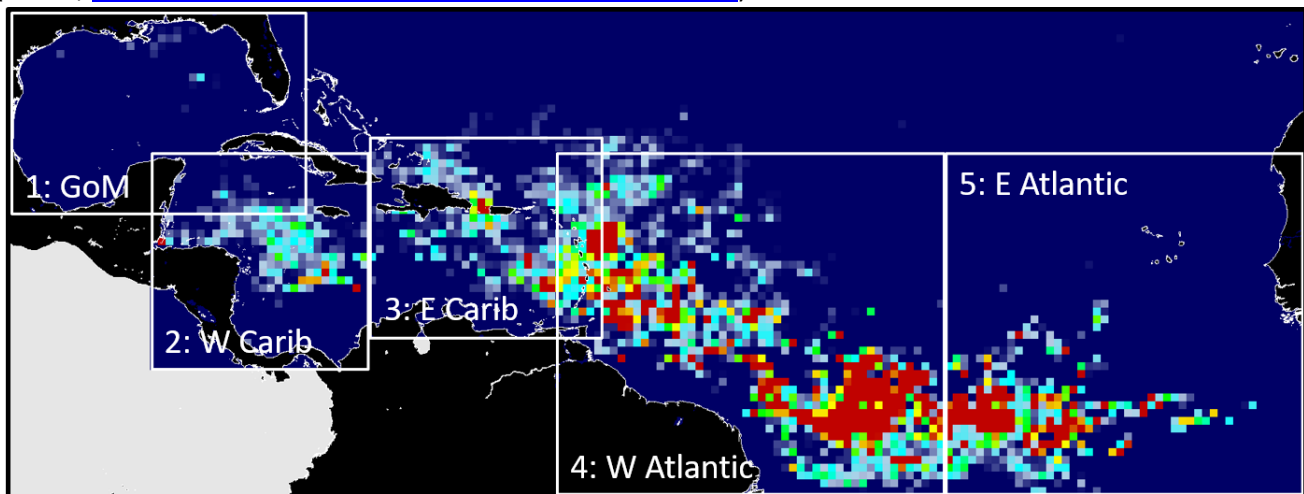
The map below shows average *Sargassum* abundance for the month of May 2024, with warm colors representing higher abundance. The *Sargassum* abundance for each region is compared with historical values in the same month of 2011 – 2023 in the whisker box plot below, where horizontal bars in each vertical box indicate minimum, 25%, 50%, 75%, and maximal historical values, respectively.

As predicted last month, *Sargassum* amount increased in May in every region except the E Atlantic, with a total biomass of 10.0 million metric tons. The W Atlantic region showed the largest increase of 1.9M tons in the last month, making it in the 75 percentile of historical levels for the month of May. The western Caribbean Sea (CS) experienced the largest relative increase (400%) to 0.4M tons, but it is still below the 75 percentile of historical levels, and most of this mass was restricted to the southern portion of this region still far away from Cancun. Total *Sargassum* amount in the eastern CS doubled to 1.0M tons, making it slightly above the 50 percentile of historical levels

*Sargassum* abundance in the Gulf of Mexico (GoM) remained low, but small amounts were found near the Mississippi River delta and in the Straits of Florida.



**Looking ahead:** As in previous years, we expect continuous increases of *Sargassum* in the central west Atlantic, the CS, and the GoM over the next month. Many Caribbean nations and islands will see increased *Sargassum* inundations in June, including the coastal regions along the Mexican Caribbean coast. The southeast coast of Florida (including the Florida Keys) may experience increased amounts of *Sargassum* but not to an alarming level. We will closely monitor and track *Sargassum* throughout the central Atlantic, and will provide more summary updates at the end of each month. Meanwhile, all previous monthly bulletins as well as daily updates through near real-time imagery can be found under the *Sargassum* Watch System (SaWS, <https://optics.marine.usf.edu/projects/saws.html>).



Disclaimer: The information bulletin is meant to provide a general outlook of current bloom condition and future bloom probability for the Caribbean Sea and Gulf of Mexico. By no means should it be used for commercial purpose, or used for predicting bloom conditions for a specific location or beach. The authors of this bulletin, as well as USF and the Federal funding agencies, take no responsibility for improper use or interpretation of the bulletin.



## **SECOORA PROGRESS REPORT: JANUARY 1 - JUNE 30, 2024**

Michael Parsons, Expansion of the Estero Bay HAB Water Quality Monitoring Network

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### **2021-2026 SECOORA PROGRESS REPORT**

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#### **PROGRESS TOWARDS OBJECTIVES**

1

Provide a summary of progress towards meeting your project objectives for the six month reporting period. Pay special attention to the six month reporting period accomplishments and the broader impacts related to those findings. Indicate if you anticipate any substantive changes to the project Scope of Work (SOW) as you complete the information below. List each objective and text that describes progress towards meeting the objectives. For each objective provide one of the following indicators: “Complete” and date of completion “On-Track” “Delayed” and anticipated date of completion If an objective is delayed, a justification for the delay (e.g., COVID travel restrictions, late receipt of contract) must be provided along with a new completion date and description of activities employed or to be employed to mitigate the delay.

The first objective to utilize a long-term augmented water quality sensor network as an early warning system for potential harmful algal blooms (HABs) and acute water quality events (e.g., run-off) is On-Track. There are YSI EXO2 sondes deployed at four live streaming fixed stations continually collecting water quality data every ten minutes with Vester Field Station operating as of February 28th, 2022, Gulf Star Marina as of April 13th, 2023, New Pass Bridge as of October 31st, 2023, and Sanibel Island’s city dock as of December 23rd, 2023. During the last 6-month time period, January 2024 to June 2024, there have not been any significant HAB events or deleterious water quality impacts to the study area of Estero Bay and the greater southwest Florida region. Several diel chlorophyll-a peaks were detected with the Gulf Star Marina sonde in June 2024, reaching over 120 µg L-1 on June 19th (Figure 1 - uploaded in section 5: educational materials). Chlorophyll concentrations are typically <10 µg L-1 at this site otherwise.

The second objective to use other tools to determine HABs, such as an Imaging FlowCytoBot (IFCB), is currently on-track. We have run over 20 samples collected during “elevated” chlorophyll conditions (>20 µg L-1) on the IFCB to determine baseline and “bloom-specific” phytoplankton community assemblages. We are using data such as these to build a database library of the phytoplankton community in the southwest Florida region, which alongside continuous environmental multiparameter sonde data, will address an important knowledge gap that the currently funded project is fulfilling.

Along with the analysis of IFCB samples and increased sonde deployments, we have been deploying YSI ProSample P autosamplers at Vester Field Station and Gulf Star Marina on a routinely basis collecting water samples every hour for 24 hours at each site. A total of 23 deployments have been completed since December 2023 and will continue through the remainder of the project. All twenty-four sample bottles of water are analyzed and recorded using a Turner Trilogy fluorometer for color dissolved organic matter (ppb), turbidity (NTU), and chlorophyll-a in vivo (µg L-1). Samples that have the highest and lowest chlorophyll-a concentrations will be preserved for IFCB analysis, total dissolved nitrogen, total dissolved phosphorous, inorganic nutrients (NH3, NO2, NO3, PO4, and SiO2), and extracted chlorophyll-a (EPA Method 445.0). Please note that water samples were collected during the chlorophyll peaks recorded in Figure 1, and these samples are currently being analyzed.

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#### **PUBLICATIONS & CONFERENCE PRESENTATIONS**

2

Please list any published scientific papers, conference papers, or notable presentations given within the reporting period related to this award. This may include presentations at non-traditional venues. Do not include publications outside of the six month reporting period. For presentations, include the title, name(s) of the presenter(s), date the presentation was made, and the venue (e.g., CERF, AGU). Also note whether the materials presented (e.g., PowerPoint® slides) remain available to SECOORA and IOOS and, if so, how they may be accessed (i.e., list the website address or online file sharing link such as Google Drive).

On May 7th 2024, graduate student Kayla Hughes, was able to present her research on this project at the 2024 SECOORA Annual Meeting in Charleston, SC. This presentation focused on an overview of the project and accomplishments so far such as

## Appendix K: FGCU Estero Bay HABs

recording live data during Category 4 Hurricane Ian. Her presentation was titled “Expansion of the Estero Bay HAB Water Quality Monitoring Network”. Co-authors on the presentation were Adam Catusus and Dr. Michael Parsons. SECOORA has a copy of this presentation.

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### **MEDIA ENGAGEMENT, EDUCATION, AND OUTREACH**

- 3 Please list any media coverage related to this award and include links to news stories and media coverage. Only include media coverage conducted within this six month reporting period.  
None to report to date.
- 
- 4 Describe education or outreach materials related to this award that have been developed within this six month reporting period.  
None to report to date.
- 
- 5 Upload outreach and education materials developed during the reporting period. Please combine multiple outreach/education materials into one document.  
SECOORA\_2024\_1\_progress\_report\_Figure\_1.pdf
- 

### **PRODUCT DEVELOPMENT & DELIVERY**

- 6 Please provide a brief description of the status of all products or tools (or major upgrades to existing products) currently available or under development as part of this award. Include weblinks where available. Use this section to report instances in which IOOS-funded science related to this project has been transitioned to support products developed by your organization or even beyond your organization. For example, this might include models, apps, mapping tools, etc. that are being used by state or federal agencies to assist with decision support. Also describe who is using the products and the number of users. Only report on work conducted within the six month reporting cycle.
- The main output created and continually ongoing is the live streaming data logger fixed station output that is hosted and supported by WQdatalive.com. The public portal that can be accessed by any user online to visualize water quality data for the four fixed stations, Vester Field Station, Gulf Star Marina, New Pass Bridge, and Sanibel Island’s City Dock. The other output that can be accessed online by any other user is on the Vester Field Station website, which shows current water quality at the four fixed stations. The general user that would be able to access these data streams is the general public (boaters, fishermen, beachgoers, etc.), Local resource managers (Lee County, Estero Bay Aquatic Preserve, etc.) state resource managers (Florida Fish and Wildlife Commission, Southwest Florida Water Management District, Florida Department of Environmental Protection).
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### **SUCCESS STORIES**

- 7 Briefly describe any success stories that help convey either the value of your project and/or the impact that it has made. Success stories should include how your project has benefited local/regional stakeholders. These stories may be used by SECOORA and the IOOS Office to respond to data calls, support presentations, or used as independent stories. Provide contact details (email addresses) for the PI and stakeholder(s) impacted.
- The monitoring capabilities that the Florida Gulf Coast University team [Dr. Michael Parsons (PI), Adam Catusus (Co-PI), and Kayla Hughes (graduate student)] has developed through SECOORA funding has garnered interest from local city and town resource managers who have great concern regarding their local water quality. For example, the city of Fort Myers Beach, Florida, which was significantly damaged by Hurricane Ian, invested in a fixed live streaming data logging station similar to what our team is using (YSI EXOII and X2 live data logger). This future station will be linked to the public portal along with the currently operating stations (for a total of 5 live streaming stations), which will also be posted to the Fort Myers Beach city website for public use in the future when the station is fully operational. For any questions or comments please reach out to our Fort Myers Beach contact, Mr. Adam Knight adam.knight@fmbgov.com.
- 

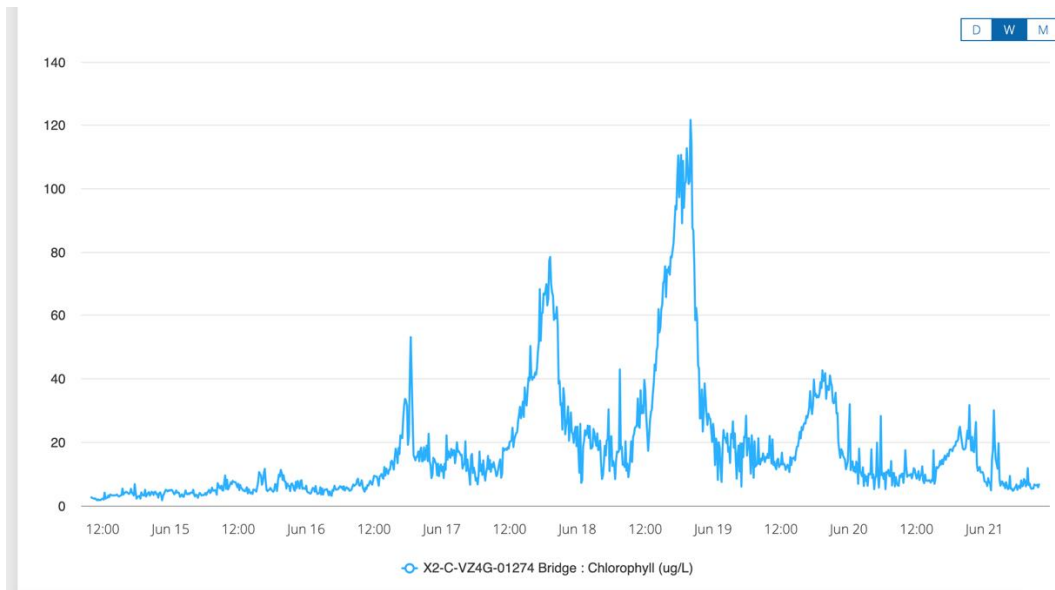
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**LEVERAGED FUNDING**

- 8 Provide a brief summary on project leveraging (i.e., how you leveraged your SECOORA award to receive other funding). Also include the proposal/project title, funding agency, amount of funding received, project start date and duration of the project. Only report on leveraging activities within the six month reporting cycle.

None to report (besides the new sonde system purchased by Fort Myers Beach mentioned above).

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**Figure 1.** Chlorophyll-*a* spikes at Gulf Star Marina from June 16, 2024 to June 21, 2024.

Natalie Cohen, Establishing a monitoring program and identifying environmental drivers of periodic harmful algal blooms in a model estuary of coastal GA

## **SECOORA PROGRESS REPORT: JANUARY 1 - JUNE 30, 2024**

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### **PROGRESS TOWARDS OBJECTIVES**

- 1 Provide a summary of progress towards meeting your project objectives for the six month reporting period. Pay special attention to the six month reporting period accomplishments and the broader impacts related to those findings. Indicate if you anticipate any substantive changes to the project Scope of Work (SOW) as you complete the information below. List each objective and text that describes progress towards meeting the objectives. For each objective provide one of the following indicators: “Complete” and date of completion “On-Track” “Delayed” and anticipated date of completion If an objective is delayed, a justification for the delay (e.g., COVID travel restrictions, late receipt of contract) must be provided along with a new completion date and description of activities employed or to be employed to mitigate the delay.

Monitoring: On Track.

Over the past 6 months, we have continued estuary monitoring through the second winter-spring-summer sampling period. Using Year 1 data, we have identified key variables correlating with HAB species *Akashiwo* abundance, including high temperatures and low nutrient concentrations.

Molecular level gene sequencing: On Track

RNA was extracted from before, during, and after the summer 2023 bloom event. Sequencing was performed at the UGA core facility, and metatranscriptomic investigations are underway to examine taxonomic and functional metabolism signatures associated with bloom events.

### **PUBLICATIONS & CONFERENCE PRESENTATIONS**

- 2 Please list any published scientific papers, conference papers, or notable presentations given within the reporting period related to this award. This may include presentations at non-traditional venues. Do not include publications outside of the six month reporting period. For presentations, include the title, name(s) of the presenter(s), date the presentation was made, and the venue (e.g., CERF, AGU). Also note whether the materials presented (e.g., PowerPoint® slides) remain available to SECOORA and IOOS and, if so, how they may be accessed (i.e., list the website address or online file sharing link such as Google Drive).

Mintz, M., Quirk, L., Higgins, K., Harvey, L., Cohen, N. Marine Sciences Student Research Symposium. Athens, GA. “*Akashiwo sanguinea* Blooms in Coastal Georgia: Insights from high-resolution monitoring efforts” May 2024.

Mintz, M., Quirk, L., Higgins, K., Harvey, L., Cohen, N. Secoora annual meeting. Charleston, SC. “*Akashiwo sanguinea* Blooms in Coastal Georgia: Insights from high-resolution monitoring efforts” May 2024.

Mintz, M., Quirk, L., Higgins, K., Cohen, N. Southern Association for Marine Laboratories (SAML) Georgetown, SC. “*Akashiwo sanguinea* Blooms in Coastal Georgia: Insights from high-resolution monitoring efforts” April 2024.

Mintz, M., Quirk, L., Higgins, K., Cohen, N. Ocean Sciences Meeting (OSM). New Orleans, LA. “*Akashiwo sanguinea* Blooms in Coastal Georgia: Insights from high-resolution monitoring efforts” February 2024. Mintz received NAML travel award to help support attendance.

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**MEDIA ENGAGEMENT, EDUCATION, AND OUTREACH**

- 3 Please list any media coverage related to this award and include links to news stories and media coverage. Only include media coverage conducted within this six month reporting period.

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- 4 Describe education or outreach materials related to this award that have been developed within this six month reporting period.  
<https://secoora.org/georgia-harmful-algal-blooms/>  
An informational website that links to near real time Akashiwo cell densities

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- 5 Upload outreach and education materials developed during the reporting period. Please combine multiple outreach/education materials into one document.

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**PRODUCT DEVELOPMENT & DELIVERY**

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**SUCCESS STORIES**

- 7 Briefly describe any success stories that help convey either the value of your project and/or the impact that it has made. Success stories should include how your project has benefited local/regional stakeholders. These stories may be used by SECOORA and the IOOS Office to respond to data calls, support presentations, or used as independent stories. Provide contact details (email addresses) for the PI and stakeholder(s) impacted.

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**LEVERAGED FUNDING**

- 8 Provide a brief summary on project leveraging (i.e., how you leveraged your SECOORA award to receive other funding). Also include the proposal/project title, funding agency, amount of funding received, project start date and duration of the project. Only report on leveraging activities within the six month reporting cycle.  
Mallory Mintz received a Georgia Sea Grant Traineeship that provided stipend support for this project, which originally only budgeted for partial student support. She was also able to receive a National Association of Marine Laboratories (NAML) travel award to support her participation at an international oceanography meeting.

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## Yonggang Liu, New York Harbor - Cook Inlet Model Testing

### SECOORA PROGRESS REPORT: JANUARY 1 - JUNE 30, 2024

#### 2021-2026 SECOORA PROGRESS REPORT

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##### PROGRESS TOWARDS OBJECTIVES

1

Provide a summary of progress towards meeting your project objectives for the six month reporting period. Pay special attention to the six month reporting period accomplishments and the broader impacts related to those findings. Indicate if you anticipate any substantive changes to the project Scope of Work (SOW) as you complete the information below. List each objective and text that describes progress towards meeting the objectives. For each objective provide one of the following indicators: “Complete” and date of completion “On-Track” “Delayed” and anticipated date of completion If an objective is delayed, a justification for the delay (e.g., COVID travel restrictions, late receipt of contract) must be provided along with a new completion date and description of activities employed or to be employed to mitigate the delay.

The National Water Initiative is funding a coastal model evaluation in response to a series of white papers that were written by the NOAA Unified Forecast System Coastal Application Team (UFS CAT) focused on total water level, navigation, and risk reduction. The USF will work as a tester to configure and test Finite Volume Community Model (FVCOM) on NSF funded Texas Advanced Computing Center (TACC).

Round 2: USF will configure an FVCOM application for the New York Harbor/ Cook Inlet region for 3D wind-driven circulation simulation, and evaluation against available observations. The outcome is providing skill assessment documentation and evaluating the model in the context of operations (stability, code management, ease of operation, etc.)

Round 3: will evaluate the model's skill using the 3-D configuration coupled with wave processes. Testers will build upon their work from Round 2 and incorporate wave processes by coupling to a wave model or feeding wave data into the hydrodynamic model. The skill assessment metrics will remain the same as in Round 2, with only minor adjustments.

Here is a list of activities performed by USF team during this reporting period:

- The entire USF team (Dr. Yonggang Liu, PI; Dr. Sebin John, postdoc; Orion Witmer, graduate student) attended monthly UFS CAT Water Quantity model evaluation online meetings and participated in discussions for FVCOM application in New York Harbor and Cook-Inlet region.
- Dr. Yonggang Liu participated in the monthly online PI meetings.
- Implemented 3D model simulation of the New York Harbor – Cook Inlet region for the three-month periods in both 2021 and 2022. Completed model evaluations against the available observations using both required and suggested metrics.
- Provided update of the Round II work of USF team in March monthly meetings 3/26/2024.
- Submitted a progress report to NOAA USF CAT on 6/13/2024. The report documents all the detailed information about the model configuration, performance, and model/data comparison results using the required metrics.
- Dr. Liu suggested a metric for velocity data comparison – vector correlation analysis. He also shared with the UFS CAT community the MATLAB code for the method and provided a brief documentation on how to use the method for model evaluation.
- Provided another update of the Round II and III work of USF team in June monthly meetings: 6/25/2024.

This project is on-track towards meeting the objectives.

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## **PUBLICATIONS & CONFERENCE PRESENTATIONS**

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Conference presentation:

- Liu, Y., R.H. Weisberg, J. Law, J. Chen, L. Zheng, S. John, K. Qiao (2024), Coastal ocean response to Hurricanes Ian and Idalia revealed through coordinated observations and models. The 55th Liege Colloquium on Ocean Dynamics – Ocean Extremes, Liege, Belgium, 5/27-31/2024 (talk)

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## **MEDIA ENGAGEMENT, EDUCATION, AND OUTREACH**

- 3 Please list any media coverage related to this award and include links to news stories and media coverage. Only include media coverage conducted within this six month reporting period.

- The Ocean Circulation Lab braces for a busy hurricane season (USF CMS News, 6/5/2024)  
<https://www.usf.edu/marine-science/news/2024/the-ocean-circulation-lab-braces-for-a-busy-hurricane-season.aspx>
- Tampa Bay has been record-breaking hot this year. What that means for summer. (Tampa Bay Times, 6/4/2024)  
<https://www.tampabay.com/news/environment/2024/06/04/florida-heat-wave-advisory-index-drought-water-temps/>
- Hurricane preparedness takes many forms - USF providing support on all fronts (USF News, 5/6/2024)  
<https://www.usf.edu/news/2024/hurricane-preparedness-takes-many-forms-usf-providing-support.aspx>
- USF experts ready to contribute to hurricane- and storm-related coverage (USF News, 4/17/2024)  
<https://www.usf.edu/news/2024/usf-experts-ready-to-contribute-to-hurricane-and-storm-related-coverage.aspx>
- Liege Colloquium on X (x.com, 5/29/2024)  
<https://x.com/LiegeOcean/status/1796193096146780449>

- 
- 4 Describe education or outreach materials related to this award that have been developed within this six month reporting period.

- As an experienced coastal ocean modeling group, the Ocean Circulation Lab at University of South Florida provided valuable guidance and help to the other groups working on this FVCOM evaluation project.
- Dr. Yonggang Liu, Environmental and Water Resources Engineering Seminar, Coastal Ocean Observing, Modeling and Applications on the West Florida Shelf, USF Department of Civil and Environmental Engineering, 4/5/2024
- Dr. Yonggang Liu, Panelist, Red Tide Forum, co-hosted by Barrier Island Parks Society and Mote Marine Laboratory, Boca Grande FL, 3/19/2024
- Dr. Yonggang Liu was invited to serve on the Scientific Committee of the 55th International Liege Colloquium on Ocean Dynamics – Ocean Extremes, Liege, Belgium, May 26 – 30, 2024.

- 
- 5 Upload outreach and education materials developed during the reporting period. Please combine multiple outreach/education materials into one document.

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## **PRODUCT DEVELOPMENT & DELIVERY**

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**SUCCESS STORIES**

- 7 Briefly describe any success stories that help convey either the value of your project and/or the impact that it has made. Success stories should include how your project has benefited local/regional stakeholders. These stories may be used by SECOORA and the IOOS Office to respond to data calls, support presentations, or used as independent stories. Provide contact details (email addresses) for the PI and stakeholder(s) impacted.

One of the purposes of this project is to train more coastal ocean modelers, as there are not many qualified modelers available in the U.S. Both a postdoc and a graduate student from University of South Florida (Ocean Circulation Lab) actively participated in this project during this reporting time period.

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**LEVERAGED FUNDING**

- 8 Provide a brief summary on project leveraging (i.e., how you leveraged your SECOORA award to receive other funding). Also include the proposal/project title, funding agency, amount of funding received, project start date and duration of the project. Only report on leveraging activities within the six month reporting cycle.
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## Neil Hammerschal, MBON/ATN joint BioTrack project

### SECOORA PROGRESS REPORT: JANUARY 1 - JUNE 30, 2024

#### 2021-2026 SECOORA PROGRESS REPORT

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##### PROGRESS TOWARDS OBJECTIVES

1

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Objective 1: (Complete):

Objective 2 (Complete): Expand the occupancy model resulting from Objective 1, to expand the modeling area spatially to include the Northeast region, northern Caribbean Sea, and western Gulf of Mexico.

A set of Integrated spatial occupancy models were fit for 68 species for the whole study area combining acoustic telemetry data and data from Ocean Biodiversity Information System (OBIS). Our predictions, based on a set of spatial and environmental variables, produced distribution maps with 10-km resolution (hexagonal grid cells) for both summer and winter seasons.

Spatially explicit biodiversity indicators (species richness, ecoregion-weighted number of species) were generated for the whole study area by overlapping latent occurrence parameters from individual species’ distribution models.

Objective 3 (On track): Archive data and code used to generate integrated occupancy models and associated products created in Objectives 1 and 2, such that project can be replicated.

The codes and data to generate individual species distribution models and multispecies biodiversity indicators were shared among different members of the data analysis team and have proven to be fully reproducible. All the codes, data and metadata are now under final stages of organization to be archived by the PI.

Objective 4 (Complete): Integrate acoustic telemetry data with OBIS data, that incorporates environmental covariates and probability of detections, to create a function spatial occupancy model for the Southeast region that identify shared multi-species hotspots within the continental shelf for the species tagged.

A set of Integrated spatial occupancy models were fit for 68 species for the whole study area combining acoustic telemetry data and data from Ocean Biodiversity Information System (OBIS). Our predictions, based on a set of spatial and environmental variables, produced distribution maps with 10-km resolution (hexagonal grid cells) for both summer and winter seasons.

Spatially explicit biodiversity indicators (species richness, ecoregion-weighted number of species) were generated for the whole study area by overlapping latent occurrence parameters from individual species’ distribution models.

Objective 5 (delayed): Generate data visualizations of the resulting biodiversity maps linked among MBON, ATN and SECOORA.

As more complex parametrizations were incorporated into the models (i.e. expanded study area, seasonality, and spatial autocorrelation), they became way more computationally demanding. This has caused delays for this objective. We had to figure out alternatives to run all the models with the minimum number of iterations (>200,000) necessary generate robust outputs. This process took weeks to conclude and to have all the necessary adjustments incorporated. We are now partnering with colleagues from University of Florida for a final run. On the meantime, the species’ level maps that are now ready to be shared with all collaborators for feedback. This objective should be fully completed by the fall of 2024. Visualizations of biodiversity hotspots will be then made available to MBON, ATN and SECOORA as maps and shapefiles.

### **PUBLICATIONS & CONFERENCE PRESENTATIONS**

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- Thiago B. A. Couto. Combining acoustic telemetry and other types of data to generate marine biodiversity indicators. UK Centre of Excellence in Environmental Data Science (CEEDS) Seminar: Feb 27th, 2024 (Lancaster, UK).

<https://ceeds.ac.uk/news/ceeds-seminar-data-integration-environmental-science>

Slides: <https://docs.google.com/presentation/d/1ePtS08ib694Y9M12XWfXkIfvvejVkvzA/edit?usp=sharing&ouid=114797030080097639942&rtpof=true&sd=true>

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### **MEDIA ENGAGEMENT, EDUCATION, AND OUTREACH**

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### **SUCCESS STORIES**

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Account Detail Profile Inquiry

Date: 07/08/2024  
Time: 11:49 AM

<b>ALC/Region:</b> 13140001	<b>Agency Short Name:</b> NOAA	<b>Account ID:</b> FNA21NOS0120097
<b>Recipient ID:</b> 4530798	<b>Recipient Short Name:</b> SECOORA	

Inquiry Results:

<b>Account Type:</b> Control Account	<b>Account ID:</b> FNA21NOS0120097	<b>Description:</b> NOAACOOPNOS
<b>Available Balance:</b> \$8,630,853.24	<b>Total Cumulative Draw Limit:</b> \$18,492,126.00	

Account Detail ID	Account Status	Cumulative Draw Limit	Draws/RP/BE To Date
FY 23 OAP-T-004-008	OPEN	\$67,466.00	-\$12,251.97
FY 24 NATDMAC 024-008-004	OPEN	\$165,000.00	-\$0.00
FY 24 REG024-008-002	OPEN	\$3,509,694.00	-\$0.00
FY21CETACEAN2021-X-000-005	OPEN	\$350,000.00	-\$350,000.00
FY21NATDMAC021-T-000-002	OPEN	\$90,000.00	-\$90,000.00
FY21NCDIS021-T-000-009	OPEN	\$190,000.00	-\$190,000.00
FY21NOSHQ021-X-000-001	OPEN	\$10,000.00	-\$10,000.00
FY21OAP021-T-000-007	OPEN	\$71,365.00	-\$71,076.77
FY21OCM021-T-000-006	OPEN	\$244,444.00	-\$204,574.03
FY21OMAO021-T-000-008	OPEN	\$10,000.00	-\$10,000.00
FY21REG021-T-000-003	OPEN	\$3,576,136.00	-\$3,453,675.22
FY21SECART021-T-000-004	OPEN	\$10,500.00	-\$10,382.39
FY22 COOPS NCDIS022-T-002-001	OPEN	\$357,500.00	-\$357,500.00
FY22 OAP 022-T-002-003	OPEN	\$76,915.00	-\$67,650.02
FY22 OCM WATER 022-T-002-005	OPEN	\$197,144.00	-\$161,862.69
FY22 OCMROP022-T-002-006	OPEN	\$244,400.00	-\$128,957.86
FY22 OMAOBATTERY022-T-002-007	OPEN	\$30,000.00	-\$30,000.00
FY22 SECART022-T-002-002	OPEN	\$4,800.00	-\$4,800.00
FY22F4DISCRETION022-T-002-009	OPEN	\$150,000.00	-\$150,000.00
FY22NATDMAC022-T-002-004	OPEN	\$159,153.00	-\$129,697.59
FY22REG022-T-001-001	OPEN	\$3,061,136.00	-\$2,777,091.58
FY22REG022-T-002-008	OPEN	\$324,201.00	-\$147,668.74
FY23 NATL DMAC023-T-004-005	OPEN	\$165,000.00	-\$71,875.00
FY23 REGIONAL023-008-001	OPEN	\$40,000.00	-\$0.00
FY23 REGIONAL023-T-003-002	OPEN	\$3,061,136.00	-\$980,543.96
FY23 REGIONAL023-T-004-001	OPEN	\$521,100.00	-\$192,520.16
FY23 SEACART023-T-003-001	OPEN	\$3,800.00	-\$0.00
FY23NCDIS OCM023-T-004-009	OPEN	\$195,400.00	-\$195,400.00
FY23NCDIS023-T-004-003	OPEN	\$132,500.00	-\$4,517.18
FY23OCM023-T-004-004	OPEN	\$100,000.00	-\$0.00
FY23OMAO023-T-004-006	OPEN	\$40,000.00	-\$6,563.65
FY23ROP023-T-004-007	OPEN	\$249,760.00	-\$52,663.95





**Account Detail Profile Inquiry**

Date: 07/08/2024  
Time: 11:49 AM

Account Detail ID	Account Status	Cumulative Draw Limit	Draws/RP/BE To Date
FY23UGA023-T-004-002	OPEN	\$51,882.00	-\$0.00
FY24 AOML DC 024-008-007	OPEN	\$54,844.00	-\$0.00
FY24 CORA 024-008-003	OPEN	\$325,000.00	-\$0.00
FY24 OAP 024-008-008	OPEN	\$183,090.00	-\$0.00
FY24 OCM WATER 024-008-005	OPEN	\$150,000.00	-\$0.00
FY24 OMAO OPS 024-008-006	OPEN	\$66,000.00	-\$0.00
FY24 SECART 024-008-010	OPEN	\$3,000.00	-\$0.00
FY24- OCM ROP 024-008-009	OPEN	\$249,760.00	-\$0.00