SECOORA YEAR 1 DESCOPE PROPOSAL SUMMARY

Title: Ocean Data You Can Trust: Powering Resilient, Informed Coastal Communities

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PROPOSAL SUMMARY

SECOORA presents a five-year regional program for 2026 - 2031 that advances an integrated coastal ocean observing, modeling, data management, and engagement enterprise for the Southeast United States. The program supports the mission of the United States Integrated Ocean Observing System (U.S. IOOS) and responds to national priorities, especially those outlined by Executive Orders 14269 Restoring America's Maritime Dominance and accompanying Maritime Action Plan, and 13921 Restoring American Seafood Competitiveness, and broadly described as community resilience, maritime safety, healthy ecosystems, environmental intelligence, and open data infrastructure.

SECOORA invests in a unified set of engagement, observing, and data management capabilities. Observing components include buoys, moorings, gliders, soundscape observatories, acoustic telemetry networks, water quality sampling, High Frequency Radar, water level stations, and the WebCOOS coastal camera network. These assets inform decisions about coastal hazards, public health, ecosystems and living marine resources, and marine operations. The program is guided by regional user needs, a strong partnership and engagement network, and a commitment to high reliability. SECOORA's robust Data Management and Cyberinfrastructure system provides real time data services, data archives, and visualization tools. Product development activities undertaken over the 5-year period will provide information and actionable tools that serve emergency managers, weather forecasters, mariners, planners, resource managers, and the public.

Beyond observing and cyberinfrastructure, SECOORA maintains a strong outreach and engagement portfolio. For example, the Southeast and Caribbean Disaster Resilience Partnership provides regional convening for emergency managers and resilience professionals. SECOORA's engagement programs support education, professional development, and community outreach. The total request is $4,776,800 for year 1. For this proposal, SECOORA has five goals that align with SECOORA's Strategic Plan and Regional Coastal Ocean Observing System Plan:

1. Continue successful operation of the SECOORA governance and management subsystem.
2. Provide sustained ocean and coastal observations that address the thematic areas Coastal Hazards, Ecosystems, and Marine Operations.
3. Maintain the DMAC subsystem and develop and operate user driven products.
4. Provide sustained ocean and coastal models
5. Support engagement, education, and partnership building across the region.

The investments proposed support a reliable, integrated system that delivers data, analyses, tools, and engagement activities to strengthen communities and ecosystems across the Southeast.

PARTNERS

Table 1. SECOORA Regional Partners. Organizations supporting regional priorities and contributing to U.S. IOOS national goals. Partners marked with an asterisk (*) provided Letters of Support for the original 5-year proposal.

Academic	
Florida State University Coastal and Marine Laboratory	University of GA
GA Southern University	University of GA - Skidaway Institute of Oceanography
GA Tech	University of GA Marine Extension and GA Sea Grant
Medical University of SC*	University of MD*
NC EcoTech	University of Miami
NC State University	University of NC
Ocean Tracking Network - Canada	University of SC
Scripps Coastal Data Information Program (CDIP) - CA	University of SC Beaufort*
The Cital - SC	University of South FL
University of CO Boulder*	
Federal	
Marine Biodiversity Observation Network (MBON)	NOAA NWS Tampa Bay - FL
National Park Service	NOAA NWS Wilmington - NC*
NOAA AOML	NOAA Ocean Acidification Program
NOAA Disaster Preparedness Program	NOAA Office of Response and Restoration
NOAA Fisheries	South Atlantic Fisheries Management Council
NOAA National Centers for Coastal Ocean Science	United States Coast Guard
NOAA National Centers for Environmental Information	United States Fish and Wildlife Service
NOAA NWS Charleston - SC*	United States Geological Survey
NOAA NWS Newport - NC*	US Virgin Islands Coastal Zone Management Program
State	
FL Department of Environmental Protection	SC Department of Environmental Services
FL Sea Grant	SC Department of Natural Resources*
FWC Fish and Wildlife Research Institute - FL	SC Geological Survey*
GA Department of Natural Resources	SC Ports Authority*
GA Ports Authority	SC Sea Grant Consortium
NC Department of Environmental Quality	
Local Government & Regional Special Districts	
Brevard County - FL	Montage Palmetto Bluff - SC
City of Wilmington - NC*	Pinellas County Environmental Management - FL
Chatham Emergency Management Agency - GA	Sebastian Inlet District - FL
Collier County Pollution Control - FL	South FL Water Management District - FL
Miami-Dade Aviation Department - FL	St. Johns River Water Management District - FL
Monroe County - FL*	
Non-Governmental Organizations	
Apalachicola National Estuarine Research Reserve - FL	Indian River Lagoon National Estuary Program - FL
Bald Head Island Conservancy - NC	Mote Marine Lab - FL
Carolina Wetlands Association - NC	North Carolina Coastal Federation - NC
Coastal and Heartland National Estuary Partnership - FL	Port Royal Sound Foundation - SC
Coastal Discovery Museum - SC	Southeast Climate & Energy Network
Edisto Island Open Land Trust - SC	St. Andrew & St. Joseph Bays Estuary Program - FL
Fripp Island Sea Rescue - SC*	Tampa Bay Estuary Program - FL
Gulf of America Coastal Ocean Observing System	The Nature Conservancy
IRL (Indian River Lagoon) Council - FL	US Coast Guard Auxiliary - NC
Private Sector	
Cape Fear Pilot Association - NC*	NovaForge Consulting Partners LLC
Charleston Branch Pilots - SC	Savannah Pilots Association - GA
Double O Fishing Charters - FL	Telemundo 49, NBCUniversal - FL
Jacobs	Tybee Oyster Company - GA*
Moffat & Nichol	

PROPOSAL NARRATIVE AND MILESTONES SCHEDULE

BACKGROUND

The ocean and coastal waters of the United States southeast (SE) help drive local and regional economic and weather conditions, support ecologically and economically significant ecosystems (which include important fisheries), and provide tourism, boating, and other recreational opportunities. In 2024, the marine economy for the SECOORA four-state region contributed $51.6B to the SE region's gross domestic product and provided over 706,760 jobs with over $25.5 billion in wages (NOAA 2024).

The Southeast Coastal Ocean Observing Regional Association (SECOORA) supports a coordinated regional effort to measure, analyze, and understand ocean and coastal conditions across North Carolina, South Carolina, Georgia, and Florida. The region contains rapidly growing coastal populations, major ports, commercial and recreational fisheries, estuarine and coral reefs ecosystems. These resources face increasing pressure from continuing development, sea level rise, storm impacts, marine heat waves, harmful algal blooms, coastal and ocean acidification, and habitat loss.

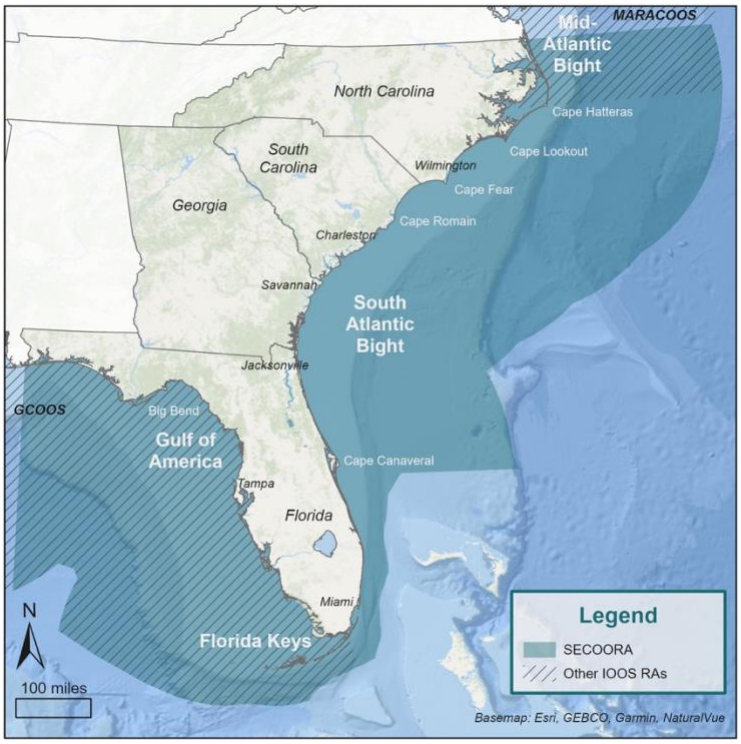

Figure 1: SECOORA Regional Footprint

Over the last 20 years SECOORA has matured to provide a reliable system that delivers sustained observations, coastal community engagement, and decision support tools that advance safety, economic growth, environmental stewardship, and community resilience. The program operates within the United States Integrated Ocean Observing System (U.S. IOOS) and aligns with national priorities for open data, mission driven research, hazard readiness, and workforce development.

The proposed SECOORA observing portfolio includes continuation of existing observing systems as well as new observatories that will address stakeholder needs within the three U.S. IOOS societal benefit areas of Maritime Operations, Ecosystems, and Coastal Hazards. The observing subsystem includes buoys, seafloor moorings, gliders, acidification sensors, soundscape observatories, acoustic telemetry arrays, High Frequency Radar (HFR), water quality sampling, water level stations, and web-cameras. SECOORA modeling investments provide forecasts of circulation, surge, and water quality. SECOORA's Data Management and Cyberinfrastructure (DMAC) provides the backbone for real time data services, archives, and multi-modal data workflows. Product development and engagement ensure that the system meets stakeholder needs and serves the public.

SECOORA MISSION

SECOORA is one of 11 US Integrated Ocean Observing System (IOOS) regional associations (RAs). SECOORA was incorporated in 2007 and has a history of sustaining long-term observations critical for the coastal SE. SECOORA's mission is to *empower people and communities with reliable coastal and ocean information*. Our members include a cross-section of regional interests from private industry, academia, non-governmental organizations (NGOs), and state and federal government. The results of our most recent comprehensive stakeholder engagement effort are reflected in our 2026-2030 Regional Coastal Ocean

Observing System Strategic Operational Plan (RCOOS Plan), approved by the SECOORA Board of Directors 12/10/2024. The RCOOS Plan covers the period 2026-2030 and presents stakeholder identified priorities for all the RCOOS subsystems, excluding governance and management.

SECOORA is a certified Regional Coastal Observing System (RCOS). This certification acknowledges SECOORA meets National Oceanic and Atmospheric Administration (NOAA) standards for DMAC and RA management. In simple terms, this means that users can have confidence that ocean and coastal data and information from SECOORA meets rigorous quality control and assurance standards.

SECOORA will continue efforts to ensure a strong and sustained IOOS. In partnership with the NOAA, the IOOS Program Office, and other federal programs and offices, SECOORA addresses critical national priorities through projects supporting the Animal Telemetry Network (ATN), Marine Biodiversity Observation Network (MBON), Coastal Ocean and Modeling Testbed (COMT), and Ocean Technology Transition (OTT) program.

SECOORA is a member of the IOOS Association, working with 10 other RAs to assure the needs and positions of on-the-ground users in the regions are adequately reflected in national policy and priority setting. SECOORA is actively engaged with other RAs and these cross-RA collaborations help ensure efficient integration of expertise and resources, limit redundancy, and improve effective transfer of knowledge. Important pan-regional collaboration to operate gliders during hurricane season, improve forecasting of *Sargassum* inundation, and understand trends in marine heat waves will continue with GCOOS, CARICOOS, and MARACOOS.

AUDIENCE

SECOORA engages stakeholders across the Southeast including NOAA's National Weather Service (NWS) and Southeast River Forecast Center, US Coast Guard (USCG), state agencies, ports, pilots, fisheries managers, shellfish growers, coastal engineers, state and local resilience offices, scientists, educators, and community groups. Input from these users guides our RCOOS design and helps SECOORA prioritize investments in data products and data management services. For example, partners at NWS offices around the southeast rely on SECOORA supported buoy data for marine, coastal zone flooding, and hurricane forecasts. State and federal agencies use FACT telemetry data for management decisions, marsh elevation trends to evaluate marsh health and response to sea level rise, and carbonate chemistry to evaluate water quality and ecosystem impacts from changing pH levels.

SECOORA engagement activities ensure that we stay connected to the communities we support. We are home to five engagement programs, aka communities of practice, focused on resiliency, animal telemetry, coastal and ocean acidification, surface elevation tables, and drone use in coastal zones. Additionally, SECOORA works closely with our PIs to coordinate stakeholder communications, host workshops and trainings for the Communities of Practice (CoP) that SECOORA supports, host monthly webinars, and keep in touch with our colleagues and stakeholders through newsletters, social media posts, and annual meetings. Finally, SECOORA has always invested in student and early career outreach programs through the Vembu Subramanian Ocean Scholars award and K-12 Curriculum development opportunities.

GOALS AND PROJECTS

For this proposal, we have five goals that align with SECOORA's Strategic Plan and RCOOS Plan:

1. Continue operation of the SECOORA governance and management subsystem.
2. Provide sustained ocean and coastal observations that support Marine Operation, Ecosystems, and Coastal Hazards decision-making.
3. Maintain the DMAC subsystem and develop and operate user driven products.
4. Provide sustained ocean and coastal models.

5. Support engagement, education, and partnership building across the region.

SECOORA will maintain priority observing assets and enhance the observing subsystem to provide data streams and modeling capabilities required by stakeholders in the Southeast region. This aligns with SECOORA's RCOOS Plan objectives to invest in data, models, and products that support the thematic areas of Coastal Hazards and Climate Variability, Ecosystems, and Marine Operations. SECOORA will continue to foster CoPs and stakeholder engagement that expand awareness of U.S. IOOS, SECOORA, and our investments.

Goal 1: Continue operation of the SECOORA governance and management subsystem
Objective A. Maintain SECOORA's Governance and Management Structure
Project 1. Maintain the SECOORA governance enterprise
SECOORA is a 501(c)3 not-for-profit organization incorporated under the laws of the State of South Carolina in 2007. SECOORA has a proven record of transparent operations, which are governed by the Board of Directors and implemented by the SECOORA Executive Director. The SECOORA by-laws govern SECOORA operations and can only be amended by the members. The by-laws also stipulate both geographic and sector (i.e., academic, private, public/nonprofit) representation on the Board. Members represent a broad range of stakeholders and experts with interests in the economic, social and ecological health of the coast and ocean. Per the by-laws SECOORA hosts annual Board elections, members meetings and bi-annual meetings of the Board of the Directors. SECOORA's 2024-2029 Strategic Plan and our by-laws govern implementation of the governance and management subsystem. The strategic goals guide annual work plan development for SECOORA staff, thus assuring that annual priorities align with SECOORA goals and that work is on track to meet the goals. Progress is shared with the Board monthly, with members bimonthly via newsletters, and during annual meetings. SECOORA's 2026-2030 Regional Coastal Ocean Observing System Strategic Operational Plan (RCOOS Plan) presents stakeholder identified priorities for all the RCOOS subsystems, excluding governance and management. The Deputy Director leads implementation of the RCOOS Plan, which includes these priorities for the 2026 - 2030 period: sustain critical observing, modeling, product, and service activities while also seeking opportunities to add new multidisciplinary observing assets. Additional plans are available to provide in-depth insights into specific focus areas within RCOOS subcomponents. These plans include the Modeling Framework, Harmful Algal Bloom Plan, and the High Frequency Radar (HFR) Plan. (Note the HFR Plan is scheduled for revision during Year 1 of this project.) The projects outlined within this proposal are responsive to and align with the RCOOS Plan priorities within the following focus areas: Coastal Hazards, Ecosystems, and Marine Operations.
Project 2. Maintain SECOORA's management system

SECOORA's management system is under the direction of the Executive Director, and includes a Deputy Director, Chief Financial Officer, Director of Communications and External Affairs, Program and Development Manager, and an Observing System Lead, and key supporting contractors. SECOORA maintains systematic reporting, auditing, evaluation, fiscal oversight, and transparent management practices, working closely with NOAA IOOS staff to align annual work plans and reporting with national program requirements.

SECOORA is certified by NOAA as a Regional Coastal Ocean System (RCOS), which means that we can prioritize, gather, manage, and distribute observation data for the SE, and have the data management architecture, policies and procedures to support these activities. Additionally, our operations align with the guiding principles included in the U.S. IOOS Enterprise Strategic Plan 2022-2025 (NOAA 2022). SECOORA will work with IOOS to renew its RCOS certification in 2027 and maintain certification for the subsequent 5-year period. SECOORA's Certification web page has extensive details on our operations and policies, and the site will be maintained and documents updated as needed throughout the five-year award period (secoora.org/certification).

Project 3: Influence and maintain awareness of national and regional policy

SECOORA will participate and engage with these groups throughout 2026-3031.

- IOOS Association: a national nonprofit organization established to advance U.S. IOOS and the nation's coastal observation information needs by working with the 11 Regional Associations, U.S. IOOS, NOAA federal agencies, and other partners. SECOORA's Executive Director currently serves on the Executive Committee of the Association.
- NOAA Southeast and Caribbean Regional Collaboration Team (SECART): a means for NOAA and partners to engage at a regional scale (NC, SC, GA, FL, Puerto Rico, and the U.S. Virgin Islands) to identify common priorities and collaboration opportunities.
- Regional Ocean Data Sharing efforts: SECOORA supports efforts aimed at meeting the nation's Ocean Policy, coordinating discussions to address gaps in regional data.

Goal 2: Provide sustained ocean and coastal observations that address the thematic areas Marine Operations, Ecosystems, and Coastal Hazards	
Objective 1. Sustain user-justified observing systems to support Marine Operations	
Project 4.A: East Coast Regional Coastal Ocean Moored Observing Project 4.B: West Florida Shelf Moored Observing	
Background	The National Strategy for a Sustained Network of Coastal Moorings states, "meteorological measurements and in-situ oceanographic observations of physical, chemical, and biological conditions throughout the water column...provide the backbone of coastal intelligence (NOAA 2017)." Moored stations, frequently referred to as buoys, provide time-series measurements at the water surface and/or at one or multiple depths within the water column. These platforms are used to deploy sensors that allow scientists and stakeholders to monitor environmental conditions. Project 4.A: East Coast Regional Coastal Ocean Moored Observing: The University of North Carolina Wilmington (UNCW) maintains an existing network of 16 coastal and shelf buoys that provide meteorological, wave, water temperature, salinity, and other data. Additionally, they maintain 1 non real-time bottom mooring in Onslow Bay, NC that collects bottom water temperature, salinity, and water column current data. In Year 1, SECOORA and UNCW will complete the permitting process for a new met-ocean buoy that will be deployed off Georgia in Year 2. An ECQ will be submitted by Feb 2027. These systems support marine and coastal zone forecasts, ship piloting into/out of area ports, emergency

	response, and ecosystem assessments (NOAA 2009). The program provides continuous operations and maintenance, sensor replacement, calibration, and data delivery. Project 4.B: West Florida Shelf Moored Observing: The University of South Florida (USF) maintains an existing array of 4 West Florida Shelf (WFS) real-time buoys that provide meteorological, water column currents, water temperature, salinity, and other data and 3 non real-time seafloor moorings that provide bottom water temperature, salinity, and water column currents. The buoys and non real-time systems are in key locations for marine heat monitoring, hurricane forecasting, and vessel piloting. The program provides continuous operations and maintenance, sensor replacement, calibration, and data delivery.
Audience	Meteorological and in-situ physical oceanographic observations collected in real-time are critical to a wide user community including federal, state, and local governments, academic and industry partners, commercial and recreational boaters, surfers and fishermen, and beachgoers. Primary users of real-time meteorological and oceanographic buoy data includes ports and ship pilots in NC, SC and FL; NOAA's National Weather Service Offices in NC, SC, and FL; NASA; search and rescue groups such as the US Coast Guard and Fripp Island Sea Rescue; and local data users including lifeguards at area beaches, surf shops, SCUBA operations, and charter fishing companies.
Benefits	Real-time buoy observations allow users to: monitor, prepare for, and respond to weather events threatening coastal communities; support efficient and safe marine transportation; provide information for search and rescue response; and inform offshore resource use and siting. For example, the NWS use hourly buoy data to develop marine and surf zone forecasts which are used by beach lifeguards, surf shops, SCUBA operations, charter fishing companies, and boaters/mariners to make go/no go decisions.
Approach	SECOORA buoy operators are located at USF and UNCW. Buoy turnaround cruises occur annually to swap deployed buoys with new, refurbished buoys and calibrated sensors to assure data continuity. All real-time data flows from the buoys to the operators where the data undergo QARTOD Quality Control (QC) tests on the fly. Data from the UNCW and USF real-time buoys are ingested into the SECOORA DMAC system and data is pushed to NOAA's NDBC ERDDAP server where it is then ingested into the Global Telecommunications System (GTS). Buoys, by design, are deployed at sea and can be damaged by hurricanes, nor'easters, or other weather systems. UNCW and USF buoy operators use small vessels to address post-storm sensor outages as all sensors onboard can be swapped at sea, reducing station downtime. Non real-time sensors are swapped annually and data are downloaded, QC'd using QARTOD tests, and submitted to SECOORA for archive.
Background	HFR is used to measure the velocity of ocean surface currents currents and, as a capability under development, the height, period, and direction of waves. HFR can measure currents over a large region of the coastal ocean, from a few kilometers out to ~200 km offshore, and can operate under most weather conditions (NOAA 2015). SECOORA is in the process of evaluating our HFR investments. Due to a host of issues with the existing HFR systems within the region (e.g. low up-time statistics, PI retirement, age of systems, sites no longer suited for HFR installations), SECOORA hired a contractor to assess HFR needs and operational capabilities in the SE This evaluation was shared with the IOOS Office and the resulting 2026 report "Evaluating SECOORA's High Frequency Radar Network"

	provided recommendations regarding priorities and operational efficiencies for continued HFR investment based on stakeholder needs, site suitability, and partner engagement. SECOORA is committed to funding HFR in Florida. Year 1 funding will support: 1) Two WERA HFR operated by Florida Institute of Technology (FIT) on the east coast of FL, specifically Hightower Beach Park and Treasure Shores Park. 2) Four WERA HFR operated by the University of Miami (UM) located at Crandon Park, Virginia Key, North Key Largo, and Dania Beach. 3) SECOORA will provide travel and supplies to UM, FIT, and the University of South Florida (USF) to assist with HFR maintenance. USF operate two WERA and six CODAR HFR. While USF is not receiving a Year 1 subaward (as they have operational support from another SECOORA grant), SECOORA may use HFR funding to support the eight HFR they maintain. 4) Evaluate feasibility of FIT assuming operation of the WERA installations at Canaveral National Seashore and Kennedy Space Center. Provide support to an HFR operator/contractor if an agreement can be established where SECOORA can assume operation of these two sites.
Audience	NOAA National Ocean Service, US Coast Guard, National Weather Service
Benefits	Monitoring coastal current speed and direction is essential for oil spill and point source pollution tracking and prediction, search and rescue, marine navigation, and HAB forecasts (NOAA 2015). Wave data from HFR would be a considerable additional benefit those audiences as well as mariners in general.
Approach	FIT HFR operators will maintain the existing Hightower Beach Park and Treasure Shores Park stations. UM will maintain the existing HFR deployed at Virgina Key, Dania Beach, Crandon Park, and North Key Largo. SECOORA will use supplies funding to support the University of South Florida HFR operator to maintain the HFR located at: Venice (co-located WERA and CODAR), Naples, Fort de Soto, Marathon, Redington Shores, Key West, Dry Tortugas. Each HFR team is responsible for complying with quality assurance and quality control (QA/QC) measures and reporting if requested by the IOOS Office, monthly maintenance visits (e.g., checking antennas, cables, routers/modems, and radar systems), downloading data from computers, data quality assurance and quality control (QA/QC), and ensuring that hourly surface current radial vector velocity data files are shared with the IOOS HFR data assembly center (DAC) national servers located at the NOAA National Data Buoy Center (NDBC) and the IOOS HFR National Network (HFRNet, https://hfradar.ioos.us/hfrnet/). HFR operators, in Year 1, SECOORA will hire Coastal Observing Technology LLC to lead the implementation of those recommendations outlined in the SECOORA HFR evaluation that can be reasonably implemented with available funding. This includes documenting QA/QC tests and procedures, establishing monthly calls with SECOORA HFR operators, developing an issues log for each HFR installation, and documenting timelines and mitigation strategies for short-term and long-term system outages. The contractor will also ensure that HFR operators are communicating QC issues and known and unforeseen HFR outages with the IOOS Surface Currents Program Manager and SECOORA Staff so that timelines and remediations for outages are addressed.

Objective 2. Sustain and invest in observations to support Ecosystems: Living Marine Resources and Water Quality	
Project 6: Ocean Acidification Monitoring in the Florida Keys	
Background	The SE is the only continental U.S. region with expansive shallow-water coral reefs. Florida's coral reef, the third largest barrier reef system in the world, is made up of zones of living coral reefs and associated habitats that parallel the Keys. The Florida Keys National Marine Sanctuary (FKNMS) alone supports over 43,000 jobs and contributes $4.4 billion to the state's economy (TBD Economics, 2019). Florida's coral reefs represent one of the most vulnerable habitats to coastal and ocean acidification (COA) in the U.S. Not only are the reefs themselves vulnerable to the negative effects of COA but the people and communities whose livelihoods depend on tourism could also be negatively impacted (National Science and Technology Council, 2023). Monitoring and understanding COA in the FL Keys will help build more resilient coastal communities. The SeapHOx, deployed by Mote Marine Laboratory (MML) is located at Looe Key, within the FKNMS and directly measures climate-quality pH providing a unique time series of data from the seafloor, near iconic FL Keys coral reefs.
Audience	FKNMS, Southeast Coastal and Ocean Acidification Network (SOCAN), Cooperative Institute for Marine and Atmospheric Studies (University of Miami), NOAA AOML, NOAA OAP. MML provides QC'd data to SECOORA as well as coral reef restoration teams and managers working within the FKNMS. NOAA AOML manages the carbonate chemistry monitoring at Cheeca Rocks (also within the FKNMS) and data will be shared between MML and AOML to evaluate OA signals across the FKNMS. The MML team will collaborates with NOAA OAP on COA data support and product development.
Benefits	The data generated by the SeapHOx fills a critical COA knowledge gap within the SECOORA domain, specifically the Florida Keys (Enochs et. al., 2020). The project enhances the overall understanding of how decreasing pH affects the role of coral reefs in restoration efforts, protecting shorelines from coastal hazards, and coral reef dissolution and accretion. All COA data and stakeholder informational products will be on the SOCAN website (www.socan.secoora.org). The data, once synthesized, will be searchable and accessible for download to the public through the SECOORA data portal and data catalog.
Approach	To better understand COA and the impacts to coral reefs, MML will operate a seafloor mounted SeapHOx (carbonate chemistry sensor that measures pH and pCO2) deployed at Looe Key. Monthly validation samples (water collected in a container and taken to the lab for processing) are collected at Looe Key and the SeapHOx is cleaned by SCUBA divers and checked for other maintenance needs. Validation is the verification that the measured values by the SeapHOx remain accurate throughout the autonomous deployment and internal consistency ensures that all methods for measuring carbonate chemistry parameters arrive at the same values (Patsavas et al., 2015, Reimer et al., 2017). The MML team will use pH and pCO2 time series to calculate the other carbonate system parameters including total alkalinity, dissolved inorganic carbon, hydrogen ion concentration ([H+]), Revelle Factor (the measure of the buffering capacity of seawater), and the calcium carbonate mineral saturation state. These time series support ocean chemistry studies and FKNMS coral reef management and restoration planning. All data are uploaded to the SECOORA DMAC annually. See ECQ for buoys and non real-time stations to review maps and locations of assets.
CANCELED: Project 7: Coastal and Ocean Acidification Monitoring in the Indian River Lagoon	
CANCELED: Project 8: Water Quality Monitoring	

Project 9: Continued HAB monitoring in Georgia	
Background	Harmful Algal Blooms (HABs) occur when algae - photosynthetic eukaryotic organisms or prokaryotic organisms and macroalgae that live in marine and freshwater environments - experience increased growth while producing toxic or harmful effects on people, fish, shellfish, marine mammals, birds, and submerged habitats. HABs can be caused by a multitude of organisms including phytoplankton, macroalgae, and benthic microalgae (NOAA 2025). Prior to 2023, HAB events were known to occur in coastal Georgia (Pfeiler, 2020), but the seasonal timing, relationships to environmental conditions, and ecological impacts had not been examined. The project team, led by UGA Skidaway Institute of Oceanography (SkIO), focuses their monitoring in the Skidaway River Estuary and over the past three years has begun to fill in key knowledge gaps regarding the bloom window, spatial extent, and consequences of *Akashiwo sanguinea* blooms in Georgia. Monitoring HAB blooms and better resolving HAB species ecology directly aids in efforts to predict HAB events in coastal states and responses to a warming shoreline. In addition to continuing the A. sanguinea monitoring time series in the Skidaway River Estuary to improve predictive capabilities, the project team will add a second water sampling site and investigate potential mechanisms underpinning oyster harm. This represents a large gap in our understanding of the ecological impacts of these HAB events, with relevance both for aquaculture operations and shellfish.
Audience	End-users of the project are aquaculture stakeholders, specifically the Georgia Shellfish Growers Association, UGA Marine Extension & GA Sea Grant Shellfish Lab, Tybee Oyster Company, and other commercial aquaculture industry members. Secondary end-users are other HAB researchers and residents/community members of the local estuary ecosystem with an interest in public health monitoring.
Benefits	This 3-year project will 1) identify the drivers of HABs in coastal Georgia, 2) determine whether the GA estuary-blooming dinoflagellate A. sanguinea directly harms oysters, and 3) determine the impacts of consistent A. sanguinea presence on oyster development. This information will directly aid aquaculture management efforts on how HABs could impair harvest efforts. User needs are the backbone of this effort and the GA Shellfish Lab Hatchery Manager is helping direct the study design. Society as whole benefits from this work as we are characterizing the conditions conducive to *A. sanguinea* blooms in the SE.
Approach	The UGA team will 1) continue performing routine HAB monitoring and share weekly (Oct -May) and 2-3 times per week (June - Sept) A. sanguinea cell densities to SECOORA; 2) conduct oyster larvae experiments using high and low A. sanguinea densities; 3) perform statistical analysis to determine drivers of HAB blooms; 4) share all quality-controlled data with SECOORA for archival with NOAA NCEI.
CANCELED Project 10: Estuarine Soundscape Observing Network	
Project 11: Right Whale Acoustic Glider Monitoring (YEARS 3-5 ONLY)	
Background	Critically endangered North Atlantic right whales experience high mortality rates due to vessel strikes and entanglement in fishing gear (Knowlton et al. 2012, Redfern et al. 2024), and only 372 animals remain in the species (Linden 2024). Vessel strikes account for 15 out of the 27 known causes of mortality since the 2017 Unexpected Mortality Event (UME) began (NOAA 2026); however, true mortality rates are estimated to be much higher, since most mortalities and injuries are never observed (Pace et al. 2021). Mother/calf pairs are especially vulnerable to vessel strikes in the SE US calving ground

	because they swim near the surface, at slow speeds, and close to shore. Glider-based passive acoustic monitoring for baleen whales has been operating in the Northeast US and Canadian shelves for over a decade, providing an alternative, and complementary platform from visual surveys. These efforts have expanded monitoring capabilities, leading to meaningful mitigation of whale vessel strikes and entanglement in fishing gear (Indeck et al. 2025). Right whale monitoring in the SE US calving ground is primarily conducted via aerial surveys, which leaves gaps when flights cannot operate due to logistical, weather, and financial constraints. The SECOORA glider operators at UGA's SkIO will work with a soundscape ecologist from the University of South Carolina to optimize the use of glider-based near real-time passive acoustic detections to complement existing aerial surveys and integrate this technology into existing maritime communication networks.
Audience	FL FWC, Clearwater Marine Aquarium Research Institute (CMARI), and the NOAA Fisheries Southeast Regional Office (SERO), Georgia Department of Natural Resources (GA DNR), South Carolina DNR (SC DNR).
Benefits	The gliders provide North Atlantic right whale detections and limited acoustic data in near-real time. The soundscape analysis team will check/confirm suspected detections in near-real time through the robots4whales interface. Detection data are shared with audience members through Robots4Whales, informing aerial monitoring, state and national management efforts, and real time alerts that increase safety and compliance with the Marine Mammal Protection Act (MMPA).
Approach	The project team will use passive acoustic sensors on gliders deployed in waters off SC and GA, within the right whale calving grounds, to detect whales in near real-time. The team will conduct three (3) 21-28 day glider missions in Years 3-5, between December and February, to acoustically monitor right whales. All data will comply with IOOS DMAC standards, including metadata documentation, version control of detection algorithms, and archival of raw and processed acoustic files. Glider detections of whales will be automatically broadcast through Robots4Whales, WhaleMap, Whale Alert, and the EWS notifications program. Alerts will be automatically forwarded to project partners at FL FWC, CMARI, and NOAA Fisheries SERO, GA DNR, SC DNR, and NOAA right whale aerial surveillance crews in the SE and Mid-Atlantic regions to guide flight plans. See ECQ for gliders to review maps of glider operational areas and sensors on-board gliders.
CANCELED Project 12: Drone Based Oyster Reef Monitoring	
Objective C. Sustain and invest in observations to inform Coastal Hazards decision-making	
Project 13: Regional Hurricane Glider Observatory	
Background	Gliders are considered an essential part of coastal observing systems (Rudnick, 2004; Seim et al., 2009), with a broad base of end-users and multiple interfaces with other data and model streams. Taking advantage of buoyancy and altitude to "fly", gliders collect physical, chemical, and biological data for 3-5 weeks, proving to be useful tools in regional and global observing systems (Testor et al., 2019). In 2016, SECOORA established a cooperative regional glider observing system with PIs from UGA SkIO, USF, and UNC-CH. The team conducts transect- and mapping-style missions in the South Atlantic Bight (SAB). The SECOORA glider team has built a base of glider operations for regional efforts, providing a near real-time inflow of 3-D observations of temperature, salinity, density, dissolved-oxygen, and bio-optical variables for dissemination to end-users.
Audience	Primary users include the U.S. Navy and NOAA for ingestion into models, the hurricane glider coordination team led by IOOS, and academic partners.

Benefits	The provision of near real-time inflow of 3-D observations of temperature, salinity, density, dissolved-oxygen, and bio-optical variables are valuable data for ingestion into hurricane intensity models run by NOAA and the U.S. Navy.
Approach	SECOORA will purchase a new Teledyne Webb deep water Slocum G3 glider to support the glider team. Older G1 gliders are no longer supported by the manufacturer, and they are becoming hard to maintain. Currently the SECOORA glider fleet has four G1 gliders; therefore, the new G3 glider will improve performance capabilities and reliability. SECOORA will also invest in refurbishment and maintenance of the two SECOORA-owned gliders, Franklin and Unit 1091. Five (5) 25-35 day glider missions will occur annually between May and November to support the national hurricane glider efforts. The gliders are operated by SkIO and USF, collecting data to help better predict conditions favorable to hurricane intensification. Real-time telemetered data are submitted to the National Glider Data Assembly Center (NGDAC) and Global Telemetry System (GTS) through SECOORA, making them available to the U.S. Navy and NOAA for ingestion into their models, the hurricane gliders team led by IOOS, and academic partners. UNC-CH post processes and quality controls glider data from each mission. These quality-controlled data are submitted to SECOORA for archive and shared with the NGDAC. See ECQ for gliders to review maps of glider operational areas and sensors on-board gliders.
Project 14: Southeast Water Level Network	
Background	Within the SE U.S., coastal communities need water level data to support flood monitoring but the current NOAA National Water Level Observation Network (NWLON) does not provide the coverage required for community decision making. Since 2021, SECOORA has partnered with communities to install water level sensors within NWLON gaps (NOAA 2014) to help better predict localized flooding.
Audience	City/Town staff; State agencies such NC Department of Emergency Management, SC Office of Resiliency; GA Sea Grant; FL Sea Grant; NOAA CO-OPS, NOAA NWS Eastern Region and Southern Region weather forecast offices; Albemarle-Pamlico National Estuary Partnership; State Departments of Transportation, and community members. These user groups help site water level sensors and provide feedback on station performance.
Benefits	The SECOORA water level network provides real-time local water level data to town managers, emergency managers, design engineers, and the public. These data are vital for monitoring coastal flooding, keeping citizens informed of hazardous conditions. Communities can use the data when designing resilience and adaptation strategies to sea level rise and other climate impacts.
Approach	Real-time water level sensors measure the height of the water and send that data to help communities with decisions related to flooding and tidal changes. Ultrasonic and radar sensors sit above the water level, so they can be easily attached to a dock piling or similar above water structure. These sensors send an ultrasonic pulse to the surface of the water, which is used to measure the height of the water level. SECOORA will work with partners to maintain up to 60 water level sensors across the SECOORA region and share data from an additional 30-40 partner water level sensors within the region.
Project 15: SE WebCOOS Camera Network	
Background	Shore-based web cameras are transforming coastal environmental monitoring. Improvements in camera technology and image processing capabilities enable widespread use of camera systems by researchers and for a growing range of environmental

	monitoring applications. Dusek et al. (2019) states web camera video imagery can help with coastal monitoring efforts, including: coastal morphological change, hydrodynamics, human impacts on coastal resources, recreation and weather observations, and ecological, environmental, and water quality observations. AI/ML algorithms for a variety of coastal applications, including shoreline change, beach usage, ecological monitoring, and rip currents have been developed through SECOORA's WebCOOS program, which has grown from a pilot project in the SE to a national program across all IOOS Regional Associations.
Audience	Local governments, universities/researchers, NOAA NWS, NERRS, USCG, boat operators, broadcast meteorologists, and beach users. End users are involved in the site selection process as priority location, views, and applications of interest are determined with local input, and in partnership with local camera hosts.
Benefits	Benefits include increased awareness of coastal and shoreline conditions through live stream, and archived imagery and video, plus derived products including animations that sync water level readings with camera imagery to provide context and evidence of flood extent, and algorithms for object, rip current, and shoreline detection. These applications are relevant to issues affecting the coast (flooding, erosion, rip currents, beach usage), and user needs are being addressed in an ongoing website update to webcoos.org. Information is delivered through webcoos.org and camera-specific web pages within that website.
Approach	The project team will continue operations and maintenance of 20 existing SECOORA-owned cameras and install 2 new SECOORA-owned cameras. Video streams and imagery are ingested to webcoos.org, and algorithms related to flooding, erosion, rip currents, and object detection are applied as relevant. Automated and manual QC checks on imagery and video stream are implemented. Federal partners at NOAA CO-OPS are part of the science team and contribute to code and technical solutions. See Camera ECQ for camera locations.

Goal 3: Maintain the DMAC subsystem and develop and operate user driven products
Objective A. Maintain SECOORA's DMAC
Project 16: Manage SECOORA DMAC System to National Standards
SECOORA recompetes its DMAC services every five years and selected Tetra Tech to continue leading our DMAC efforts. SECOORA has built and sustained a mature, operational Data Assembly Center (DAC) grounded in open-source technologies, sustained infrastructure investment, and active participation in national IOOS DMAC standards development. The SECOORA Data System is designed, governed, and operated to meet NOAA/IOOS DMAC mandates and to serve the observing, modeling, and engagement needs of the Southeast region. The Data Management Plan (Proposal Element 6 from the original proposal) provides full details on how SECOORA addresses the IOOS DMAC Data Standards and Requirements, NOAA Administrative Orders, and data sharing and preservation obligations. *Core Data System Architecture*: The SECOORA Data System is built around four integrated components that together provide a flexible, scalable foundation for the next award period. Purpose-built data ingestion pipelines bring new data types into the system with minimal disruption to existing operations. An ontological database (OnDB) serves as the architectural backbone — a unified metadata-base describing the provenance, context, and properties of every dataset, tying together ingestion, quality control, storage, analysis, and delivery into a coherent whole. A significant High-Performance Computing (HPC) infrastructure, available to SECOORA and its partners, supports computationally intensive

workflows including ocean circulation modeling, AI/ML training pipelines, and visualization of large datasets, with storage capacity sufficient to house the observational holdings for SECOORA. A web portal provides end-users access to visualize and interact with SECOORA's full data holdings. SECOORA currently serves over 2,000 datasets through this portal, many of which originate from regional partners operating independently of SECOORA funding — reflecting a long-standing commitment to serving as a data steward for the broader Southeast observing community regardless of funding relationships.

Emerging Technology Integration: AI/ML. SECOORA has made meaningful investments in AI/ML infrastructure and capacity. The WebCOOS coastal video imagery pipeline (webcoos.org) ingests and processes webcam imagery of coastal environments — capturing phenomena such as coastal change and rip current activity — and applies AI/ML-driven analysis workflows directly against this data. This is a capability unique among the IOOS RAs. Complementing this operational work, SECOORA has developed an AI resource page that consolidates approaches for incorporating AI/ML into scientific and operational workflows. SECOORA intends to maintain and grow this resource over the next award period, applying instructional material and emerging best practices to new applications across the regional data system.

Cloud Computing and Hybrid Architecture. The SECOORA Data System employs a hybrid architecture combining local HPC with cloud deployment capabilities, providing the flexibility to meet variable computational demands cost-effectively. This architecture positions SECOORA to scale efficiently as data volumes and analytical workload demands grow over the next five years.

Pan-Regional Interoperability. SECOORA actively contributes to pan-regional DMAC capabilities. WebCOOS is a leading example: SECOORA led the development of this coastal video imagery management and analysis capability, and as other RAs have begun deploying web cameras, they are partnering with SECOORA to ensure their data is managed according to WebCOOS best practices. This model — SECOORA developing a capability and then extending it to benefit the broader IOOS enterprise — reflects the kind of inter-regional collaboration the IOOS Program Office has identified as a national priority, and SECOORA intends to pursue similar opportunities in the next award period.

National DMAC Participation: SECOORA commits to allocating staff and financial resources to attend the annual IOOS DMAC Meeting and participate in national code sprints and working groups. The SECOORA DMAC team contributes directly to national DMAC operations through implementing and testing IOOS metadata standards, advancing the ioos_qc quality control library, and integrating new data assets into national infrastructure.

Looking Ahead: The SECOORA Data System is engineered for the growth demands of the next award period. The hybrid HPC and cloud architecture provides cost-effective scalability, and the metadata database-centered design ensures that new data types, workflows, and delivery mechanisms can be integrated systematically as regional priorities evolve. SECOORA is actively positioned to expand into new modes of data product delivery — including mobile interfaces and user-tailored data services — broadening access for an increasingly diverse regional user community. The SECOORA Data System is not simply an operational system being sustained; it is a platform being grown.

Objective B. Enhance Automatic Sound Detection for PAM
Project 17. Standardize regional PAM databases and train machine learning models for sound detection and classification

Passive acoustics refers to the non-invasive recording of sound, usually with fixed microphones, from biological, geophysical, and anthropogenic sources (Krause et al. 2011, Pijanowski et al. 2011). Currently, processing PAM data requires a person to manually listen to and annotate different sound files (e.g., match sounds to species names within files). In the SECOORA-supported Montie Lab (USCB, ESONS), students manually review 43,800 annual sound files from 10 stations each year, requiring approximately 6 months processing time before associated spectrograms are summarized to understand acoustic patterns. ML can automate this process by using annotations to train a model that detects and classifies patterns instead of requiring a person (e.g., Shiu et al. 2020, Hamard et al. 2024). Automated acoustic classification is of significant interest given the resources required to process large datasets, but standardization across PAM programs remains challenging because acoustic data providers often use non-standard labels, classify patterns at different resolutions, and create deficient metadata.

Florida Fish and Wildlife Research Institute (FWRI) will lead efforts to standardize regional passive acoustic monitoring (PAM) databases into a benchmark dataset; train machine learning (ML) models for automated anthropogenic and biological sound detection; deploy a real-time edge application; and create standards and cloud resources for future PAM databases. The goal is to decrease PAM data processing time for detecting species-specific and anthropogenic sounds throughout the SECOORA region using artificial intelligence (AI) techniques to provide a foundation for a scalable real-time marine PAM network.

Objective C. Maintain and enhance data product delivery

ON HOLD UNTIL YEAR 2: Project 18. Maintain and develop user driven products

SECOORA has existing user-driven products that will be maintained and will add TBD new products. Existing products include:

1) The SECOORA Water Level Network data access portal (https://wl.secoora.org)
2) WebCOOS (https://webcoos.org/)
3) SET portal (https://oceansmap.com/secoora-set/).

In February 2026, SECOORA kicked off a data user analysis that will continue through April 2026. The information gleaned through interviews and survey will enable SECOORA to enhance existing products (e.g., add new data layers to the water level site) and develop newly defined products to expand the use of SECOORA provided data. SECOORA will issue an RFP for software developers to design, test, and launch new products identified through the user analysis efforts. To be determined contractors will be hired to develop new products via a competitive process.

Goal 4: Provide sustained ocean and coastal models that address the thematic areas Marine Operations, Ecosystems, and Coastal Hazards

Objective A. Support Modeling to Meet Regional User Needs

Project 19. Support FVCOM modeling and analysis

The West Florida Coastal Ocean Model (WFCOM) is an application of the open-source Finite Volume Community Model (FVCOM) designed to downscale from the deep ocean across the continental shelf and into estuaries. WFCOM spans the northeastern Gulf of America coastal ocean from just west of the Mississippi River mouth (Louisiana coast) to the southeast of the Florida Keys (Miami area). Unlike Southeast Coastal Operational Forecast System (SECOFS), which excludes the Mississippi River and much of its critical freshwater influence, WFCOM's broader domain provides complete coverage of the TBOFS area and strategically overlaps with the eastern part of The Northern Gulf of America Operational Forecast System (NGOFS2) and the western part of SECOFS. Geographic coverage enables WFCOM to support ecosystem applications, such as red tide and fisheries, that require accurate

simulation of freshwater inputs on the West Florida Shelf, a factor especially important for ecological studies in this region. SECOFS, currently scheduled in the NOAA NOS implementation plan for FY28 and beyond, may be less suitable for these purposes due to its more limited domain.

As a realistic forecast system, WFCOM has been extensively evaluated against COMPS observations over the past 15 years and has been successfully applied across disciplines, including HABs and fisheries. Some of these applications are unique and pioneering worldwide, for example, the daily automated red tide trajectory forecast (https://ocl.marine.usf.edu/Models/WFCOM4/HAB_tracking/) and the coastal water level (storm surge) forecast guidance products (https://ocl.marine.usf.edu/Models/SeaLevel/). These could be added to the NOAA NOS implementation plan. Note that WFCOM performed better than NOAA's STOFS-3D in forecasting the peak water levels caused by Hurricane Helene (as presented at CERF, AGU, and AMS meetings). In addition to outperforming NOAA models in some situations, WFCOM is trusted by local decision makers during emergencies. In 2021, untreated wastewater was discharged into Tampa Bay, and WFCOM was chosen to provide guidance during the local response (Liu et al., 2024). The WFCOM is a trusted source of guidance, in part, due to longstanding relationships with local decision makers and deep knowledge of local oceanography. Engagement from regional partners, including state resource agencies, fisheries management councils, tourism bureaus, and local governments, will help ensure that these models serve as essential shared assets for the broader Gulf community and an effective supplement to NOAA NOS operational forecast systems.

GOAL 5: Engagement

Objective A: Support SECOORA Engagement Programs

Project 20. Support regional programs driven by needs for information, collaboration and learning

Engagement programs inform and amplify SECOORA's impact. These community-driven programs are focused on priority societal issues aligned with SECOORA's mission and Strategic Plan. SECOORA supports these programs by providing fiscal and administrative support; hosting webpages, listservs, webinars and in-person meetings; providing data management expertise and enabling access to and collaboration with SECOORA funded partners. Supported programs include the following:

Resilience Program: Southeast and Caribbean Disaster Resilience Partnership (SCDRP)
Audience: Public, private, government and nongovernmental organizations (NGOs) focused on disaster resilience, i.e. local emergency managers, resilience scientists, planners, sustainability and infrastructure planners, engineers, federal, state and local agency representatives from emergency and resilience programs.
Benefits: SCDRP creates opportunities for dialogue about capacity development in disaster resilience between scientists, high-level decision makers, local implementers, and other stakeholders.
Approach: This 10-year old program shares resources, catalogues existing activities, hosts meetings and monthly webinars, hosts a job board and funding opportunities catalog on its website, and collaborates within the program to submit additional funding requests to ensure sustainability of efforts. It provides professional development, learning and networking opportunities to improve resilience of communities throughout the Southeast and Caribbean.
An Advisory Board leads program activities.

Marsh Change Program: Surface Elevation Table (SET) CoP
Audience: Membership is comprised of federal (e.g., NOAA NCCOS, NOAA NERRS, U.S. Fish and Wildlife Service) and state agency representatives (SC DNR, FWRI), NGOs, and academic partners.

Benefits: The goal of this program is to foster regional collaboration for coordinated SET management. The program unites stakeholders to deepen understanding of marsh response to rising sea levels and enhance coastal management practices such as restoration and mitigation activities.
Approach: The CoP has developed a data visualization tool to map SETs across the region and identify whether marshes are gaining or losing sediment. The team will continue expanding their efforts to recruit new members and gain access to additional SET data from the region, as well as facilitate community standards for data collection and station maintenance.

Animal Telemetry Program: The FACT Network
Audience: FACT is a grassroots collaboration of marine scientists from the Bahamas to the Carolinas using acoustic telemetry and other technologies to better understand and conserve our region's important fish and sea turtle species.
Benefits: Scientists and fisheries managers benefit from access to data defining life histories and ranges of important fisheries. Researchers can track tagged individuals that move beyond the range of their individual receiver networks, creating cost-savings and improved understanding.
Approach: SECOORA hosts the FACT database, which currently houses 385.3 million animal detections and metadata for 12,323 tags from 234 projects and 375 researchers, making it one of the largest aggregates of telemetry data in the world. SECOORA works with FACT to expand its capabilities in the areas of researcher networking, data stewardship, data product development, and network support.

Drone Program: Drones in the Coastal Zone CoP
Audience: This network for drone experts and enthusiasts includes private, public, NGO and government drone operators.
Benefits: The primary benefits are to drone operators, and the management community that is served by drone products including coastal and estuarine managers, emergency and disaster response professionals, fisheries managers, and others. Networking provides access to other drone experts in the region for problem-solving and recommendations on hardware, software, methods and regulations.
Approach: Through quarterly virtual meetings, members actively discuss crucial drone-related hot topics, present research, and explore areas such as technology advancements and regulations. SECOORA hosts a webpage that includes resources for the community.

Project 21. Make information about SECOORA and partner activities readily available

SECOORA's broader strategy centers on community engagement and student development to support a U.S. IOOS-relevant workforce.

Community Engagement: SECOORA will maintain and enhance the engagement subsystem to address priority issues in the region. This includes continuing the Coastal Ocean Observing in Your Community webinar series, website updates with news stories and extreme event pages such as the Florida Red Tide Resources Page and the Hurricane Resources Page, quarterly newsletters, social media posts, and hosting and participating in workshops and meetings.

Student Development: According to the OceanObs'19 Living Action Plan (UCAR 2019), ocean science outreach and communication activities, including formal and informal education opportunities, are needed to increase ocean literacy. SECOORA Education and Outreach Committee provides guidance on prioritizing educational and outreach needs. Annually, SECOORA will host the Vembu Subramanian Ocean Scholars Award, providing financial support and structured mentorship tied to participation in SECOORA Annual Meeting. This strengthens pathways into the U.S. IOOS workforce through professional networking, exposure to applied observing programs, and engagement with IOOS leadership. Awardees will also present virtual seminars to support regional knowledge sharing and communication skills. Also, SECOORA staff and PIs actively support students in the classroom through

data workshops, opportunities for curriculum support, and hosting field trips to coastal monitoring stations throughout the region (https://secoora.org/education-and-outreach/classroom-activities/).

Work conducted as part of **Table 2. Non-Core Funding (IOOS, NOAA, Other Agency One-Time Funding).** These activities were not part of the original SECOORA proposal and SECOORA works only as the fiscal agent to provide funding to these awardees as directed by the IOOS program office. As such, we are not assigning SECOORA project numbers to these activities as we do not know if funding for any of them will continue past Year 1.

Table 2. Non-Core Funding (IOOS, NOAA, Other Agency One-Time Funding)
Improving coastal flood modeling infrastructure by including inland hydrologic extremes through coupling using next-generation NOAA inland hydrologic model (SECOFS)
The Virginia Institute of Marine Science (VIMS), in collaboration with NOAA, is advancing the Southeast Coastal Operational Forecast System (SECOFS), a prototype three-dimensional coastal forecasting system spanning Virginia to Florida and the Caribbean, including Puerto Rico and the U.S. Virgin Islands. SECOFS integrates inland hydrology from the Next Generation National Water Model (NWM) with ocean circulation modeling to improve predictions of coastal conditions and support understanding of interactions among riverine inputs, tides, winds, waves, temperature, and salinity. The project will advance coupled modeling capabilities, including testing a NOAA Unified Forecast System (UFS)-enabled application that links ocean circulation and wave models. VIMS and NOAA will also develop standardized infrastructure and metrics for evaluating coastal flood model performance, supporting model validation, operational acceptance, and the integration of new observations. Additionally, the project will advance methods for translating two- and three-dimensional ocean model outputs into UFS applications, supporting the transition of research capabilities into operational services. Through collaboration and coastal ocean modeling workshops, the team will help align development with NOAA priorities and user needs. SECOFS will fill existing gaps in operational navigation and coastal forecasting coverage, supporting safer navigation, improved coastal flood risk assessment, and applications benefiting both coastal communities and marine users.
Curation of and CI/CD support for IOOS open-source GitHub repositories and support for DMAC technical implementation tasks
This project supports the technical implementation of the IOOS DMAC system (PI Filipe Fernandes), including the following activities: demonstrating the value of IOOS data and services; monitoring operation of the DMAC enterprise; ensuring DMAC standards and best practices are up-to-date and DMAC data and services are relevant to potential user communities; and, improving the operation of the IOOS GitHub organization and NOAA/NOS and other GitHub organizations/repositories as identified (e.g. OR&R) and software libraries therein.
2027 hurricane season glider deployments and recoveries using Navy gliders
SkIO will lead the SECOORA region efforts to assist with Navy glider operations during the 2027 hurricane season. SkIO will coordinate deployment, recovery, and logistical activities with IOOS and the U.S. Navy for at least 2 glider missions. Planning and updates will be provided on the weekly IOOS Glider team calls hosted by the NOAA IOOS office.
Harmful Algal Bloom (Sargassum Monitoring and Forecasting)

A prototype Sargassum monitoring and forecasting system is established at USF that uses high-resolution satellite images and high-resolution numerical models for selected sites within SECOORA domain. To maintain operation of the system, the USF team will:

- Continue satellite data downloading, processing, archiving, and online sharing. This will include Sentinel-2 and Planet-SuperDove sensors. Customized images will be made continuously, with data stored and backed up at USF/Tampa computer cluster. Currently, the algorithms for Sentinel-2 sensors have matured, but algorithms for Planet-SuperDove sensors are still being refined and finalized.
- Continue operation of the high-resolution numerical model to track Sargassum transport. This will include integrating satellite images with the customized FVCOM numerical model, with data products made available online. Currently, the FVCOM numerical model has been extended to include the east coast of Florida, which will provide the capacity to integrate the high-resolution satellite data products to track Sargassum transport.
- Explore expanding forecast coverage. Currently, the integrated observation-modeling covers the entire Florida Keys and the southeast coast of Florida (including Miami Beach). The domain may be extended further north.

Harmful Algal Bloom (Mini-proposal)

Via a competitive mini-proposal process, SECOORA will solicit proposals for pilot projects focused on increasing HABS observing and forecasting activities in the southeast. This pilot will have to address observing needs identified in the SECOORA HAB Plan and the project should be scaled for 1-year with the opportunity to scale to a multi-year project if funding allows.

CORA: National coverage of 40 yr ADCIRC reanalysis with tides and ERA5 atmospheric forcing

This project advances long-term coastal water level reanalysis and storm surge prediction capabilities to improve coastal flood hazard assessments and support regional modeling. Building on previous efforts, UNC-Chapel Hill (PI Dr. Blanton), in collaboration with NOAA and project partners, will extend existing reanalysis datasets for the Gulf and Eastern US Coast (GEC) through 2025 and develop a multi-decadal storm surge simulation for Northern Alaska (NAK). Using the ADCIRC+SWAN modeling system, astronomical tides, and meteorological forcing from ECMWF's ERA5 reanalysis, the team will compare modeled water levels with NOAA tide gauge observations to evaluate prediction accuracy.

The project will also develop a preliminary ADCIRC computational grid for the Pacific Islands (PI) region and conduct initial performance validation. To improve hurricane-related storm surge predictions in the GEC region, the team will develop enhanced wind and atmospheric pressure forcing datasets using the GAHM2026 tropical cyclone vortex model and demonstrate their impact on simulated water levels.

Additional activities include processing meteorological and water level observations, supporting simulations on NOAA high-performance computing resources, improving data accessibility through cloud-based platforms, and maintaining documentation for end users. These efforts will strengthen the accuracy, availability, and utility of coastal water level datasets for flood risk assessment, coastal planning, and operational forecasting.

Advancements to NOAA's Storm and Tide Operational Forecast System (STOFS) 2D Global water level model

This project, led by UNC-CH (PI Dr. Bunya), is aimed at advancing the skill of the Storm and Tide Operational Forecast System (STOFS) 2D+ Global model. The project's central goal is to improve the model's ability to accurately and efficiently represent fine-scale channels and complex floodplain topography, which is a critical capability for forecasting total water levels and compound flooding events.

The project team will develop and implement advanced subgrid (SG) elements within the ADCIRC solver. The SG methodology uses a porosity function to define water volume at a high resolution, allowing the model to accurately capture water conveyance and total water levels in small-scale features that would otherwise be computationally prohibitive to resolve with a standard two-dimensional mesh.
OAP investment in the National Ocean Acidification Observing Network (NOA-ON) Time-Series of Gray's Reef Mooring offshore Georgia, USA
Ocean acidification and water quality monitoring at the Gray's Reef National Marine Sanctuary (GRNMS) is part of NOAA's international effort to quantify the effects of ocean acidification. UGA will continue to maintain and oversee the long-term operation of the OA sensors at GRNMS and work with NOAA PMEL to ensure data integrity. These sensors include pCO2, pH, DO, salinity, chlorophyll, turbidity and water temperature. Sensors are mounted under the Gray's Reef NDBC mooring and on the seafloor. The entire system including the MAPCO2, equilibrator, battery pack, and air block will be replaced once during the year, typically scheduled in early fall. Work includes vessel trips to and from the buoy location, and diving on the site to inspect and/or replace parts. As needed, additional trips (typically 2-3) will be made to replace sensors that have failed. Partners for the OA project include the UGA, NOAA PMEL, NOAA NDBC, and the USCG, which provides vessel support for mooring maintenance.

Appendices - all uploaded separetely:
Appendix A: Modeling Breakdown
Appendix B: Environmental Compliance Table
Appendix C: HAB monitoring ECQ
Appendix D: HFR ECQ

MILESTONE CHART

MILESTONE CHART 2026–2031												
Project #	Brief Project Description	Milestones	Reporting Period									
			9/26–2/27	3/27–8/27	9/27–2/28	3/28–8/28	9/28–2/29	3/29–8/29	9/29–2/30	3/30–8/30	9/30–2/31	3/31–8/31
1 .GOVERNANCE AND MANAGEMENT												
1	Maintain governance	Hold bi-annual in person Board Meetings	x	x	x	x	x	x	x	x	x	x
		Host the SECOORA Annual Meeting		x		x		x		x		x
2	Maintain management	Manage progress reporting, financial reporting, and annual audit	x	x	x	x	x	x	x	x	x	x
		Develop RCOS renewal application and submit for approval	x	x	x							
3	Policy	Participate in regional and national activities to elevate awareness of SECOORA & IOOS	x	x	x	x	x	x	x	x	x	x
2. OBSERVING												
4A & 4B	Buoy & sensor maintenance	Maintain existing real-time buoys and non real-time sensors in NC, SC, & FL	x	x	x	x	x	x	x	x	x	x
4A	Buoy installation	Install and maintain a new met-ocean buoy off GA			x	x	x	x	x	x	x	x
5	~~HFR evaluation~~	~~HFR needs assessment~~	~~x~~	~~x~~								
	HFR operations	Maintain Florida HFR	x	x	x	x	x	x	x	x	x	x
6	OA FL Keys	Maintain existing OA sensor at Looe Key, FL	x	x	x	x	x	x	x	x	x	x
7	~~IRLON pH~~	~~Add 11 pH sensors to the IRLON sites, integrate data into SECOORA data management system, and maintain sensors~~	~~x~~	~~x~~	~~x~~							
8	~~Water Quality~~	~~Add 3 water quality stations on east coast of FL, integrate data into SECOORA data management system, and maintain sensors~~			~~x~~	~~x~~	~~x~~	~~x~~	~~x~~	~~x~~	~~x~~	~~x~~
9	HAB Monitoring	Continue HAB monitoring in GA at the SkIO dock	x	x	x	x	x	x				
		Add HAB monitoring site in Bull River	x	x	x	x	x	x				
		Conduct lab-based oyster larvae experiments with varying HAB cell densities	x	x								
10	~~PAM Monitoring~~	~~Maintain hydrophones in SC and analyze extreme weather impacts on soundscapes and marine life~~	~~x~~	~~x~~	~~x~~	~~x~~	~~x~~	~~x~~	~~x~~	~~x~~	~~x~~	~~x~~
		~~Expand soundscape monitoring to FL~~							~~x~~	~~x~~	~~x~~	~~x~~
11	Right Whale Monitoring	Conduct 3 glider missions to monitor right whales and share PAM data via whale monitoring communities					x	x	x	x	x	x
12	~~Oyster Monitoring~~	~~Conduct UAS missions 2x/yr at each oyster reef location & synthesize the data~~		~~x~~	~~x~~	~~x~~	~~x~~	~~x~~	~~x~~	~~x~~	~~x~~	~~x~~
		~~Develop oyster metrics and reef condition training tools for use by state management agencies~~			~~x~~	~~x~~	~~x~~	~~x~~	~~x~~	~~x~~	~~x~~	~~x~~
13	Hurricane Gliders	Conduct 6 hurricane glider missions annually and share data with the NGDAC		x	x	x	x	x	x	x	x	x
14	Water Level	Maintain existing SECOORA water level sensors and add ~20 new water level sensors	x	x	x	x	x	x	x	x	x	x
15	WebCams	Maintain existing SECOORA web cameras	x	x	x	x	x	x	x	x	x	x
3. DMAC												

MILESTONE CHART 2026–2031												
Project #	Brief Project Description	Milestones	Reporting Period									
			9/26–2/27	3/27–8/27	9/27–2/28	3/28–8/28	9/28–2/29	3/29–8/29	9/29–2/30	3/30–8/30	9/30–2/31	3/31–8/31
16	DMAC	Manage the SECOORA DMAC system to national standards	x	x	x	x	x	x	x	x	x	x
17	PAM AI/ML	Standardize PAM databases and train ML models for automatic sound detection	x	x	x	x	x	x	x	x	x	x
		Create standards and cloud resources for future PAM databases					x	x	x	x	x	x
18	Products	Maintain and develop user driven products			x	x	x	x	x	x	x	x
4. MODELING AND ANALYSIS												
19	Modeling	Support FVCOM modeling and analysis for circulation, storm surge, and ecosystems applications	x	x	x	x	x	x	x	x	x	x
5. ENGAGEMENT												
20	CoP Support	Support SCDRP staff, annual meeting, and their mentorship program	x	x	x	x	x	x	x	x	x	x
		Support the SET CoP	x	x	x	x	x	x	x	x	x	x
		FACT (ATN Node) data management	x	x	x	x	x	x	x	x	x	x
		Drones in the Coastal Zone CoP networking support	x	x	x	x	x	x	x	x	x	x
21	Community & Student Engagement	Coastal Ocean in Your Community Webinar Series	x	x	x	x	x	x	x	x	x	x
		Extreme event resource pages	x	x	x	x	x	x	x	x	x	x
		Social media and newsletter engagement	x	x	x	x	x	x	x	x	x	x
		Annual Vembu Subramanian Ocean Scholars Award to support workforce development	x	x	x	x	x	x	x	x	x	x
		Student engagement (e.g., field trips, data workshops, curriculum opportunities)	x	x	x	x	x	x	x	x	x	x
Table 2. Non-Core Funding (IOOS, NOAA, Other Agency One-Time Funding)												
	Modeling	Improving coastal flood modeling infrastructure by including inland hydrologic extremes through coupling using next-generation NOAA inland hydrologic model (SECOFS)	x	x								
	CI/CD support for IOOS	Curation of and CI/CD support for IOOS open-source GitHub repositories and support for DMAC technical implementation tasks	x	x								
	Navy Gliders	2027 hurricane season glider deployments and recoveries using Navy gliders	x	x								
	HABS	Sargassum monitoring and forecasting	x	x								
		HABS mini-proposal opportunity	x	x								
	Modeling	CORA: National coverage of 40 yr ADCIRC reanalysis with tides and ERA5 atmospheric forcing	x	x								
	Modeling	Advancements to NOAA's Storm and Tide Operational Forecast System (STOFS) 2D Global water level model	x	x								
	OA	OAP investment in the NOA-ON Time-Series in GRNMS	x	x								

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