2. TITLE PAGE

Southeast Coastal Ocean Observing Regional Association (SECOORA)
Ocean Data You Can Trust: Powering Resilient, Informed Coastal Communities

Submitted to the FY 2026 Implementation of the U.S. Integrated Ocean Observing System (IOOS) funding opportunity number NOAA-NOS-IOOS-2025-30552

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PERIOD OF PERFORMANCE: September 1, 2026 – August 31, 2031
TOTAL FUNDS REQUESTED: $24,616,925
TOTAL HOLDBACK FOR NOAA NCCOS: $383,075 (POC Brandon Puckett, NOAA NCCOS Beaufort Lab)

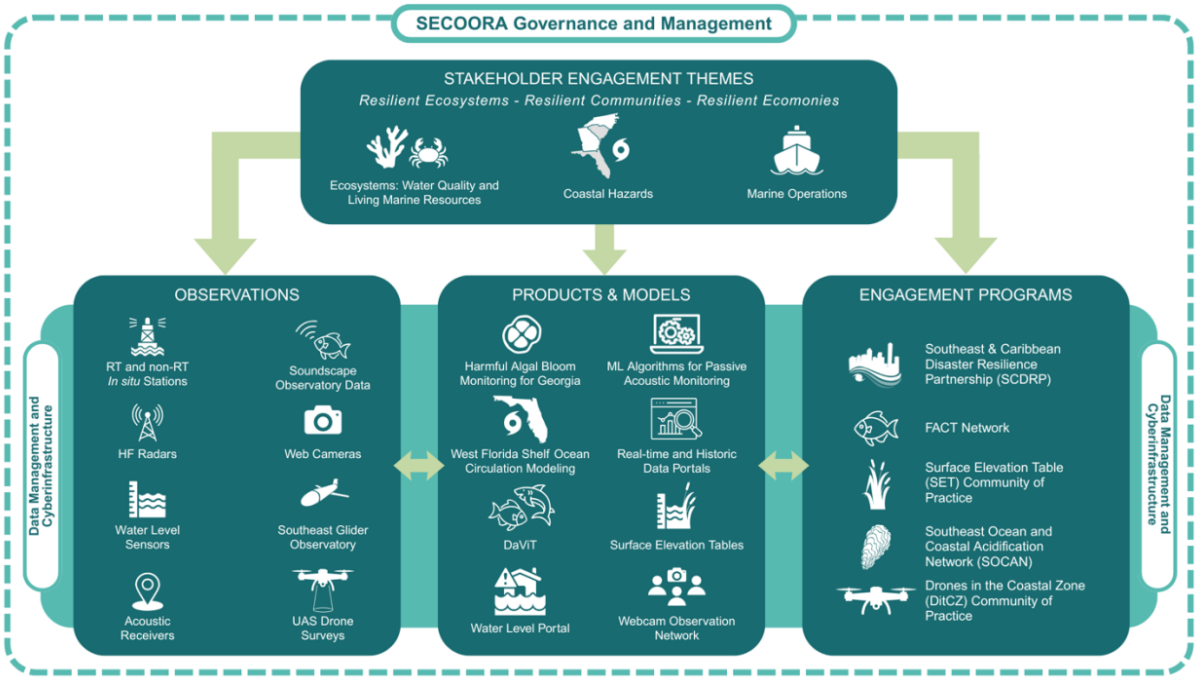


Figure 1: SECOORA Regional Coastal Ocean Observing System

3. ABSTRACT

SECOORA is a mature IOOS Regional Association with a 20-year history of providing sustained coastal and ocean observations, engaging with coastal communities, and delivering decision support tools that advance safety, economic growth, environmental stewardship, and community resilience in the southeast US. During 2026-2031, SECOORA will expand the operation of critical coastal ocean observing, modeling, data management, and product delivery projects to address regional priorities. Underpinning these projects is a strong outreach and engagement portfolio that supports workforce development, user-driven communities of practice, K-12 educator opportunities, and professional development opportunities. Throughout the 5-year period of the award, SECOORA will achieve our mission to empower people and communities with reliable coastal and ocean information while simultaneously supporting national priorities of maritime dominance and seafood competitiveness.

4. 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, drone habitat assessments, water quality stations, 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 (DMAC) 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 for SECOORA is $4,923,385 per year and $76,615 per year for NOAA NCOOS for a total of $5,000,000 per year for five years. 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 (Element 9).

Academic	
FL 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 Citadel - 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, NBC Universal - FL
Jacobs	Tybee Oyster Company - GA*
Moffat & Nichol	

5. 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.

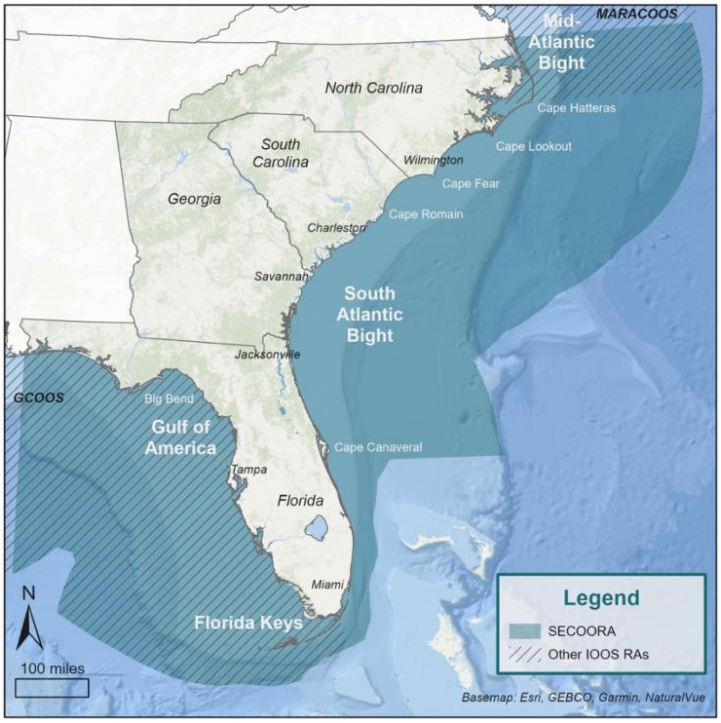


Figure 1: SECOORA Regional Footprint

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, drone-based habitat mapping, High Frequency Radar (HFR), 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 U.S. Integrated Ocean Observing System (U.S. 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, hosts 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 Operations, 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, 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 guide 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, two Project Managers, 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 an 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 is 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 that 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. 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 fishers, and beachgoers. Primary users of real-time meteorological and oceanographic buoy data includes ports and ship pilots in NC, SC and FL; NOAA's NWS 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. See the Environmental Compliance Questionnaire (ECQ) for buoys and non real-time stations to review maps and locations of assets.
Project 5: High Frequency Radar (HFR) Evaluation and Operations	
Background	Just as the winds in the atmosphere provide information about where and when weather systems occur, ocean currents determine the movement of oceanic events (NOAA 2015). HFR is used to measure the speed and direction of ocean surface currents. 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 will hire a contractor to assess HFR needs and operational capabilities in the SE. This evaluation will

	provide recommendations regarding priorities and operational processes for continued HFR investment based on stakeholder needs, site suitability, and partner engagement. SECOORA is committed to funding two WERA HFR operated by Florida Institute of Technology (FIT) on the east coast of FL, specifically Hightower Beach Park and Treasure Shores Park. Additionally, based on the contractor evaluation and recommendations, SECOORA may continue to fund existing HFR installations or may work with stakeholders to site and deploy new stations within the region.
Audience	US Coast Guard, NWS, Ports
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).
Approach	FIT HFR operators will maintain the existing Hightower Beach Park and Treasure Shores Park stations. This includes monthly maintenance visits (e.g., checking antennas, cables, routers/modems, and radar systems) and downloading data from computers. Routine maintenance ensures that hourly surface current radial vector velocity data files are shared with the HFR DAC national servers located at the NOAA National Data Buoy Center (NDBC) and the IOOS HFR Network (https://hfradar.ioos.us/hfrnet/). HFR are sited along shorelines, making them exposed during extra-tropical events and nor'easters. FIT operators will evaluate sites pre- and post storm event to address any system outages and make necessary repairs so that station downtime is reduced. The SECOORA contractor will complete the HFR needs assessment during Year 1 of this award. Based on their recommendations, in Years 2-5, SECOORA will work with stakeholders and HFR operators to prioritize HFR installations identified as high priority to support maritime commerce and domain awareness, and that have high probability of operational success.
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. See ECQ for buoys and non real-time stations to review maps and locations of assets.
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.
Project 7: Coastal and Ocean Acidification Monitoring in the Indian River Lagoon	
Background	Little is known about the pH dynamics in the Indian River Lagoon (IRL) which serves as a buffer between land and the coastal ocean on the east coast of Florida. The IRL is an important ecosystem comprising many aquatic organisms and is one of the most biologically diverse systems along the U.S. coastline. SECOORA will expand OA monitoring into the IRL by partnering with the Indian River Lagoon Observation Network (IRLON) housed at Florida Atlantic University (FAU). The IRLON team will integrate pH sensors into the existing autonomous sensor network. The proposed work will restore and sustain IRLON's carbonate chemistry monitoring capacity by transitioning from ISFET-based sensors to SAMI-pH spectrophotometric technology. This transition will enable near real-time estimation of aragonite saturation state (Ω_{ar}) by integrating continuous SAMI-pH data with co-located pCO2, temperature and salinity observations.
Audience	The IRLON team collaborates with local and national stakeholders through the Indian River Lagoon National Estuary Program, Brevard County Natural Resource Management, the St. John's River Water Management District (SJRWMD), the South Florida Water Management District, and the FL Department of Environmental Protection (FLDEP).
Benefits	The expansion of pH sensors into the IRLON will enhance the ability to monitor water quality, harmful algal blooms, and coastal acidification, thus creating a network of ecosystem moorings (NOAA 2018) within the IRL. This will support audience member objectives of restoring and protecting water quality, improving ecosystem health, and sustaining resilience of natural systems. Improved observations will strengthen the ability to evaluate management actions, assess progress toward nutrient load reductions, and anticipate ecosystem responses under changing climatic and hydrologic conditions.

	Collaboration among SECOORA, Harbor Branch, and regional management agencies will support delivery of actionable science for decision-makers and the public and advance understanding and stewardship of the IRL.
Approach	There are 11 active sites distributed throughout the IRL from Titusville to Jensen Beach, FL and the St. Lucie Estuary. Sites span major inlets, canal discharges, and salinity gradients, including the Sebastian, Fort Pierce, and St. Lucie Inlets, and both forks of the St. Lucie Estuary. Each site is configured with in-water sensors enclosed in a cage attached to a U.S. Coast Guard Aid to Navigation (ATON) positioned approximately one meter from the bottom. Above-water sensors are also attached to the same ATONs and measure meteorological properties. Measurements are hourly and transmitted to the IRLON data portal via cellular-based telemetry. IRLON staff monitor data daily and perform site visits every three weeks, or sooner if issues arise, for cleaning and servicing. All sensors are returned annually to manufacturers for calibration. All IRLON data are collected hourly, undergo IOOS QARTOD quality-control checks, and are publicly available in near real time through the SECOORA data portal.
Project 8: Water Quality Monitoring	
Background	Coastal hypoxia and related water quality (WQ) degradation can lead to significant losses in commercial and recreational fisheries by reducing harvestable biomass, shifting fish distributions, and increasing mortality in economically valuable species (Breitburg et al., 2018). The expansion of water quality sensors provides fishers, resource managers, and coastal industries actionable intelligence to minimize these losses (Diaz and Rosenberg, 2008). Timely hypoxia forecasts can help commercial fleets adjust fishing grounds to avoid unproductive or high-mortality areas, safeguard catch quality and reduce fuel costs from unplanned relocations (Rabalais et al., 2002). For coastal communities dependent on fisheries and tourism, these capabilities can help stabilize revenues, preserve jobs, and sustain the long-term economic viability of the region's marine-dependent sectors. Partners at FIT will install 3 new WQ stations along the east coast of FL, specifically the St. John's River Mouth at the Mayport Pilots Dock, the Trident Pier in Cape Canaveral, and at the Dania Naval Facility in Port Everglades. The WQ sensors will measure dissolved oxygen, temperature, salinity, turbidity, chlorophyll-a, pH, nutrients, and ocean acidification parameters. Each sensor will collect data within the lower water layers where hypoxia risk is greatest.
Audience	This project supports environmental monitoring and decision making for Port Canaveral, Port Everglades, U.S. Naval Station Mayport, Sebastian Inlet District, SJRWMD, Brevard County Natural Resource Management, and area commercial and recreational fishers.
Benefits	The project aligns with the current Administration's Executive Orders on "Seafood Competitiveness" by expanding water quality data for key stakeholders/audience members in the SECOORA region. The continuous monitoring of dissolved oxygen, temperature, salinity, and other critical parameters will improve the early detection and forecasting of hypoxic events, particularly in areas that serve as essential fish habitat for economically important species. The actionable data will provide fishermen and management communities with more insight into fisheries health.
Approach	WQ sensors will be installed in Year 1. Post installation, preventive maintenance, redundancy in sensor deployment, and real-time diagnostic systems will ensure high data reliability and uptime. Each WQ station will undergo a routine maintenance cycle every 4–

	6 weeks. Maintenance operations include: sensor retrieval, physical inspection, and antifouling treatment (e.g., copper-alloy guard, wiper calibration); laboratory recalibration of all parameters (DO, temperature, salinity, turbidity, chlorophyll-a, pH, and nutrients); cleaning of optical sensors using manufacturer-approved protocols; verification of telemetry performance and data transmission integrity before redeployment. Maintenance events will be logged ensuring traceability of calibration and service history. Each station will transmit real-time data using cellular or satellite telemetry to FIT's coastal server where the data undergo QARTOD QC and are then shared to SECOORA.
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, 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 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.

Project 10: Estuarine Soundscape Observing Network	
Background	Passive acoustic recorders, known as hydrophones, allow for continuous and long-term sampling of the underwater soundscape. These sounds help to better understand the behavior of soniferous (i.e., sound emitting) species. The long-term goal is to 'eavesdrop' on key behaviors of marine animals that can change rapidly or gradually in response to environmental changes and human impacts. The University of South Carolina Beaufort (USCB) created the Estuarine Soundscape Observatory Network in the Southeast (ESONS, https://sound.secoora.org/). The USCB lab has been collecting sound data for over a decade in three core locations: 1) the May River (MAY) since 2013, 2) Charleston Harbor since 2017, and 3) Chechessee Creek/Colleton River (CCC) since 2019. Through long-term monitoring, the ESONS team has characterized the diversity of estuarine sound producers in the SE US—from snapping shrimp to fish to marine mammals—and established baseline soundscape patterns. The team will evaluate how extreme weather and vessel noise influence estuarine species and their acoustic behaviors using over 12 years of near continuous recordings (2-minute files from 10 stations). In the out-years the team will also extend the soundscape monitoring locations to northern FL.
Audience	State and federal coastal resource managers including SC Department of Natural Resources, FL Fish and Wildlife Commission (FL FWC), South Atlantic Fishery Management Council (SAFMC), Port and maritime stakeholders (e.g., Charleston Harbor), National Estuarine Research Reserve System (NERRS) managers, public outreach, education, and conservation organizations such as USCB/Pritchards Island, Montage Palmetto Bluff, Port Royal Sound Foundation, Coastal Discovery Museum, SC Aquarium, the MBON Biotracks project, NOAA NCEI.
Benefits	ESONS provides long-term, high-resolution estuarine soundscape indicators enabling managers to distinguish natural climate variability from anthropogenic noise impacts. The project supports fisheries stock assessments and ecosystem-based management (including SAFMC spotted seatrout assessments) by linking fish courtship acoustics to abundance and recruitment. The team delivers actionable vessel-noise exposure metrics to support quieter, more efficient maritime operations and improves understanding of extreme weather impacts on fish and dolphin behavior. The team supports marine mammal conservation and dredging-noise assessments. ESONS archives quality-controlled acoustic datasets at NOAA NCEI for national reuse, including advancing AI-based acoustic detection approaches. Finally, ESONS produces interactive visualizations and narrative products on the SECOORA-hosted ESONS website for managers, scientists, and the public.
Approach	The project team will 1) maintain ESONS hydrophones in SC; 2) analyze extreme weather impacts on soundscapes and marine life; 3) quantify chronic vessel noise; 4) with FL stakeholders, identify sites and install hydrophones in the Nassau River; 5) Archive data with NCEI.
Project 11: Right Whale Acoustic Glider Monitoring	
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 Skidaway Institute of Oceanography (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. See ECQ for gliders to review maps of glider operational areas and sensors on-board gliders.
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.
Project 12: Drone Based Oyster Reef Monitoring	
Background	Eastern oysters (Crassostrea virginica) and the intertidal reefs that they form present unique management challenges as one of the very few ecosystem engineers that are directly subjected to harvest. While supporting a suite of ecosystem services (Grabowski, et al. 2012), oysters represent a major fishery in the U.S., ranking 8th in landings value among domestic species. Considering the life history of oysters, harvest pressure can create a significant negative feedback loop as it removes much of the hard substrate available for larval settlement (Soniat et al. 2014). In the SE U.S., where intertidal oyster reefs predominate (Bahr and Lanier 1981), little is known about harvest impacts on reef condition. Remote sensing through Uncrewed Aircraft Systems (UAS) are becoming a widely used observing platform in coastal and ocean monitoring. UAS offer a rapid, non-destructive, and cost-effective means of capturing high-resolution spatial and temporal data, allowing researchers and fishery managers to monitor changes in reef extent and structural characteristics at user-defined temporal frequencies across entire reefscapes.

Audience	NOAA National Centers for Coastal Ocean Science (NCCOS), SC DNR, GA DNR, FLDEP, NC Department of Marine Fisheries, NC Coastal Reserve and National Estuarine Research Reserve (NERR), North Inlet-Winyah Bay NERR, Sapelo Island NERR, Guana-Tolomato-Matanzas (GTM) NERR, and Apalachicola NERR.
Benefits	The audience members have unanimously expressed the need for more rapid and less disruptive forms of monitoring intertidal oyster resources along the SE coast to better understand fishery impact and general condition of oyster reefs in their areas of interest. This project will build upon existing NERRS collaborations to provide an uncrewed aircraft-based reef condition index for audience members to integrate within their management practices and research endeavors. This will enhance monitoring programs' ability to assess harvest impacts and other potential stressors on reef condition.
Approach	The NERRS team members will conduct UAS flights two times each year within known oyster reef locations in each of their states. See Drone ECQ for nominal UAS flight areas. The technical lead for this project is from NOAA NCCOS and will steer the team in synthesizing UAS collected imagery using standardized workflows and developing and testing the reef condition index. The project team will develop oyster metrics and reef condition training tools for use by state management agencies. The project team will host training workshops for the management community so that feedback on the project design, developed metrics, and implantation can be co-designed by the project team and audience members.
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). Working closely with partners, the SECOORA glider observatory 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	Six (6) 25-35 day glider missions will occur annually between June and November. 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 and keeping citizens informed of hazardous conditions. Communities can use the data when designing resilience and adaptation strategies to sea level rise and water weather impacts, i.e. extreme rainfall.
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 install and operate up to 20 new water level sensors across the SECOORA region and will continue to maintain 29 existing sensors and share data from over 60 partner water level sensors within the region. See Water Level ECQ for locations of sensors.
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 RAs.
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 and maintain 10 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 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 SE region. The Data Management Plan (Proposal Element 6) 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 SE 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.

SECOORA recompetes its DMAC services every five years. A competition is currently underway with proposals due 3/31/2026 and the DMAC provider selected by 6/30/2026. SECOORA will ensure that the selected partner, whether the current DMAC contractor (Tetra Tech) or another qualified provider, has the demonstrated capability to satisfy all DMAC requirements of this award.

Objective B. Enhance Automatic Sound Detection for Passive Acoustic Monitoring (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 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 AI techniques to provide a foundation for a scalable real-time marine PAM network. See the ECQ for PAM stations that lists locations of sensors used for this project.

Objective C. Maintain and Enhance Data Product Delivery

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 that 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 SE 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 will include 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's 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/).

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
5	HFR evaluation	HFR needs assessment	x	x								
	HFR operations	Maintain existing 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 DMAC, and maintain sensors	x	x	x							
8	Water Quality	Add 3 water quality stations on east coast of FL, integrate data into SECOORA DMAC, and maintain sensors			x	x	x	x	x	x	x	x
9	HAB Monitoring	Continue HAB monitoring in GA	x	x	x	x	x	x				
		Conduct oyster larvae experiments with varying HAB cell densities		x	x	x	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	WebCameras	Maintain existing SECOORA web cameras and add 10 new web cameras	x	x	x	x	x	x	x	x	x	x
3. DMAC												
16	DMAC	Manage the SECOORA DMAC system to national standards	x	x	x	x	x	x	x	x	x	x

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
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	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 mentorship program	x	x	x	x	x	x	x	x	x	x
		Support the SET CoP & continued development of the SET data visualization tool	x	x	x	x	x	x	x	x	x	x
		FACT (ATN Node) data management and data product support	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 Travel 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

The following pages include:

- Element 6: SECOORA Data Management Plan
- Element 7: References Cited
- Element 8: CVs and Resumes
- Element 9: Letters of Support

SECOORA has uploaded Element 15 Environmental Compliance Questionnaires (ECQs) as separate documents within grants.gov.

- Element 15: ECQ Buoys and Non real-time stations
- Element 15: ECQ Cameras
- Element 15: ECQ Drones
- Element 15: ECQ Gliders
- Element 15: ECQ PAM
- Element 15: ECQ Water Level

6. SECOORA DATA MANAGEMENT PLAN

SECOORA operates a mature, certified Regional Coastal Observing System (RCOS) with a formal Data Management Plan maintained in alignment with the NOAA Environmental Data Management Framework and updated on a regular basis as part of SECOORA's RCOS certification process. The plan is published openly at secoora.org. This Data Management Plan describes how data and metadata collected or managed under this award are disseminated, quality controlled, and preserved in accordance with NOAA/IOOS requirements. SECOORA adheres to NOAA data sharing directives: environmental data and information collected or created under NOAA grants or cooperative agreements is made discoverable by and accessible to the general public in a timely fashion, free of charge.

Open Data Sharing and Data Publishing

All data managed by SECOORA under this award are shared openly as a matter of policy. SECOORA implements the full suite of NOAA/IOOS data and metadata standards, including the IOOS Metadata Profile, Climate Forecast conventions, and ISO 19115/19110 metadata formats. Data are served through OPeNDAP-based protocols including THREDDS and ERDDAP, as well as Open Geospatial Consortium protocols, WMS, WCS, and WFS, through GeoServer. These standard, interoperable services enable discovery and reuse by national and regional cyberinfrastructures and support downstream uses including model validation and assimilation by SECOORA modeling partners. An ontological database (OnDB) functions as the system's unified metadatabase, managing the provenance, context, and properties of all datasets and ensuring metadata is published in standards-compliant formats.

Catalog Registration

All metadata curated within the metadata database is published openly in machine-readable, standards-compliant formats and is routinely harvested by the IOOS Data Catalog, ensuring regional datasets are discoverable at the national level. SECOORA maintains catalog registrations for all active data streams and updates records as new datasets are added or existing datasets are modified.

Provision of Data to the Global Telecommunications System (GTS)

SECOORA satisfies the GTS data provision requirement through its operational relationship with NOAA's National Data Buoy Center (NDBC). Buoy and in situ observational data served through SECOORA's ERDDAP data service is harvested by NDBC, which serves as the conduit for transmitting these data to the Global Telecommunications System. This arrangement ensures timely, routine delivery of SECOORA observational data to the international operational oceanography and weather forecasting communities.

Data Assembly, Quality Control, and Near-Term Storage

SECOORA operates automated data harvesting systems that ingest data from sensor networks, mobile platforms, satellites, and modeling centers, transforming heterogeneous inputs into standardized representations. Real-time in situ observations are processed using IOOS QARTOD tests, with quality flags generated, visualized, and distributed through SECOORA data services. SECOORA maintains storage sufficient to support near-term operational needs including data dissemination, visualization, and product development, with capacity to house the full volume of SECOORA-funded observational data holdings.

For research teams, the Research Workspace provides a secure environment for sharing datasets, authoring and executing server-side code, generating metadata, and publishing data products with Digital Object Identifiers (DOIs) to national repositories.

Long-Term Preservation

SECOORA satisfies long-term data preservation requirements through submission to NOAA's National Centers for Environmental Information (NCEI), which serves as the permanent archive for all NOAA-funded environmental data. Submission to NCEI is SECOORA's primary mechanism for ensuring data collected under this award are preserved beyond the active operational period. In addition, SECOORA submits glider data to the IOOS Glider DAC and high-frequency radar data to the IOOS HFR DAC, both of which maintain national data collections and contribute to long-term data availability. Data products generated through the Research Workspace are published to the DataONE network with DOIs, providing an additional preservation pathway for research-grade outputs.

Data Types, Volumes, and Timeline

SECOORA collects and manages data across a range of observational platforms and types, including fixed and mobile in situ sensors, high-frequency radar surface current data, coastal video imagery, glider profiles, and regional modeling outputs. Data volumes are substantial and grow each award period as new platforms and data types are incorporated. SECOORA targets dissemination of all real-time data within operationally appropriate latencies and submission of data to national preservation repositories within two years of collection, consistent with NOAA data sharing directives. Costs associated with data preparation, quality control, and repository submission are included in the project budget.

SECOORA's full data management plan and data provider data sharing plans are all available online: https://secoora.org/wp-content/uploads/2022/05/00_SECOORA_DMAC_Plan_2022-05-06.pdf

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8. CV AND RESUMES

Name: Deborah (Debra) Lee Hernandez

Title: Executive Director
Southeast Coastal Ocean Observing Regional Association (SECOORA)

Contact Info:
Business Mailing Address: PO Box 13856, Charleston, SC 29422
Email Address: debra@secoora.org
Mobile number: 843.906.8686

Professional Preparation:

Institution		Location	Major	Degree
Undergraduate:	Clemson University	Clemson, SC.	Civil Engineering	Bachelor of Science
Graduate:	Clemson University	Clemson, SC.	Civil Engineering	Master of Science

Work Experience:

Ms. Hernandez currently serves as Executive Director of the Southeast Coastal Ocean Observing Regional Association (SECOORA). SECOORA is one of eleven regional partners in the U.S. Integrated Ocean Observing System and is a nonprofit operating in the states of NC, SC, GA and FL to coalesce the efforts of multiple observing interests and deliver user defined products that save lives, conserve the coastal and marine environment and support the economic vitality of our coastal regions. Since joining SECOORA she has been lead PI on several multi-year regional observing projects, as well as related marine policy and science programs. Her experience includes coastal and ocean engineering, management and policy. Prior to joining SECOORA, Ms. Hernandez led her own consulting firm and worked in state coastal management as an environmental engineer and coastal policy expert. Her professional interests include improving the linkages between scientists and decision-makers, and facilitating discussions of public policy issues related to the coast and environment. She was also a licensed professional engineer for many years, and is a life-long resident of Charleston, SC.

Appointments:

11/2008 – Present	Executive Director, SECOORA, Charleston, S.C.
2/2006 – 10/2011	President, Hernandez and Company, LLC, Isle of Palms, S.C.
1/2000 – 2/2006	Director of Program and Policy Development, S.C. Department of Health and Environmental Control (DHEC), Office of Ocean and Coastal Resource Management (OCRM), Charleston, S.C.
3/1998 – 1/2000	Assistant Director of Planning, S.C. DHEC OCRM, Charleston, S.C.
1/1988 – 2/1998	Environmental Engineer / Manager of Non-point Source and Special Projects, S.C. DHEC OCRM, Charleston, S.C.

Publications:

1. Unlocking the Full Potential of Offshore Wind Energy Data with Observing Systems, Rome N, Yarincik K, Brenner J, Hernandez D, Kritzer J, Kuska G, Pearson R, Ruhl H, MTS Journal, Volume 57, Number 3, 27 September 2023, pp. 69-72(4), Marine Technology Society, https://doi.org/10.4031/MTSJ.57.3.6
2. U.S. Coastal Communities' Need for Water Level Observations, Elko N, Hernandez D, Yarincik K, Shore & Beach Coastal Observation, Vol. 3 (2023).
3. Acidification in the U.S. Southeast: Causes, Potential Consequences and the Role of the Southeast Ocean and Coastal Acidification Network. Hall ER, Wickes L, Burnett LE, Scott GI, Hernandez D, Yates KK, Barbero L, Reimer JJ, Baalousha M, Mintz J, Cai W-J, Craig JK, DeVoe MR, Fisher WS, Hathaway TK, Jewett EB, Johnson Z, Keener P, Mordecai RS, Noakes S, Phillips C, Sandifer PA,

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4. The U.S. Integrated Ocean Observing System: Governance Successes and Lessons from Two Decades of Growth. Jessica Snowden, Debra Hernandez, Josie Quintrell, Alexandra Harper, Ru Morrison, Julio Morell, Lynne Leonard. Frontiers in Marine Science. 6:242. DOI: 10.3389/fmars.2019.00242
5. From the Oceans to the Cloud: Opportunities and Challenges for Data, Models, Computation and Workflows. Tiffany C. Vance, Micah Wengren, Eugene Burger, Debra Hernandez, Timothy Kearns, Nazila Merati, Kevin O'Brien, Jon O'Neil, Jim Potemra, Richard P. Signell, Kyle Wilcox. Frontiers in Marine Science. DOI: 10.3389/fmars.2019.00211
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7. Integrating Environmental Monitoring and Observing Systems in Support of Science to Inform Decision-making: Case Studies for the Southeast. Chapter 22 in Coastal Ocean Observing Systems: Advances and Syntheses. Porter, D.E., J. Dorton, L. Leonard, H. Kelsey, D. Ramage, J. Cothran, A. Jones, C. Galvarino, V. Subramanian and D. Hernandez. Y. Liu, H. Kerkering and R. Weisberg (eds.). Elsevier Press. DOI:10.1016/B978-0-12-802022-7.00022-5
8. A Case History of the Science and Management Collaboration in Understanding Hypoxia Events in Long Bay, South Carolina, USA. D. Sanger, D. Hernandez, S. Libes, G. Voulgaris, B. Davis, E. Smith, R. Shuford, D. Porter, E. Koepfler and J. Bennett, Environmental Management, Volume 46, Number 3, 340-350, DOI: 10.1007/s00267-010-9529-8
9. Establishing A Minimum Standard for Collaborative Research in Federal Environmental Agencies, K. Matso, M. Dix, B. Chicoski, D. Hernandez, and J. Schubel, Integrated Environmental Assessment and Management, Manuscript Number: IEAM_2007-070

Synergistic Activities:

2022 – present:	The Citadel Near Center for Climate Studies Advisory Board, Charleston, SC
2020, January 7-10	Delegate and Cross-Cutting Theme Champion, UN Decade on Ocean Science for Sustainable Development, North Atlantic Regional Workshop, Nova Scotia, Canada
2016 – present:	Southeast and Caribbean Disaster Resilience Partnership, Advisory Board, Southeast US
2016 – present:	Integrated Ocean Observing System Association, Executive Committee, Washington, DC
2015 – present:	Southeast Ocean and Coastal Acidification Network, Executive Committee, Southeast US
2014 – present:	NOAA Southeast and Caribbean Regional Team, Southeast US
2012 – 2014:	National Academy of Sciences Panel to Review the National Climate Assessment, Washington, DC
2008 – present:	Integrated Ocean Observing System Association Board, Washington, DC
2006 – 2011:	National Academy of Sciences Ocean Studies Board, Washington, DC
2005 – 2008:	Ocean Research and Resources Advisory Panel (ORRAP), Vice-Chair, Washington, DC
2002 – 2004:	Coastal States Organization, Washington, D.C., Chair
2005 – 2010:	Coastal States Stewardship Foundation, Vice-Chair, Washington, DC
2005 – present:	South Carolina Sea Grant Consortium Program Advisory Board, Charleston, SC

1995 – 1999 Isle of Palms City Council, Isle of Palms, SC

Collaborators and Other Affiliations:
Drs. L. Leonard and J. Long–UNC-W, Drs. B. Blanton, R. Luettich, M. Piehler and H. Seim–UNC-CH, Dr. D. Johnston–Duke, Dr. M. Muglia–East Carolina U, Drs. R. He and N. Nelson–NCSU, J. Warrillow–Fathom Science LLC, Dr. N. Elko–ASBPA and SCBA, Dr. Brian Glazer, UH and Hohonu, Dr. P. Gayes–CCU, Drs. D. Porter and G. Voulgaris–USC, Dr. E. Montie–USC Beaufort, Dr. D. Sanger and T. Smart–SCDNR, Drs. C. Edwards, D. Savidge and W. Savidge–UGA SkIO, Drs. K. Cobb, E. DiLorenzo-UDel, Dr. R. Clark–GaTech, C. Kalinowsky–GADNR, Dr. Q. White–JU, Dr. S. Lazurus–FIT, J. Murley–Miami Dade County, Drs. N. Hammerschlag and L. Shay–UM, Dr. T. Troxler–FIU, Drs. L. McEachron and J. Young–FL FWCC FWRI, Drs. C. Hu, C. Lembke, C. Merz, G. Mitchum, R. Weisberg–USF, Drs. M. Crosby, E. Hall, and J. Locascio–Mote Marine Lab, R. Cole–RDSea International, Dr. A. Pang–UCSC, Drs. G. Dusek, C. Taylor, J. Snowden and T. Vance–NOAA, Dr. J. Morrell–CariCOOS and UPR, Dr. B. Kirkpatrick–GCOOS and TAMU, J. Quintrell–formerly IOOS Association, K. Yarincik-IOOS Association, J. Dorton–SECOORA, R. Bochenek, K. Wilcox–Axiom Data Science, Dr. C. Lautenbacher, Jr.–GeoOptics, P. Barrineau–Coastal Science and Engineering, E. VanderKloet–Ocean Tracking Network, Dr. S. Lovelace–SCSGC, Dr. Jenna Brown, USGS, N. Rome-UCAR, J. Kritzer-NERACOOS, Dr. H. Ruhl-MBARI and CeNCOOS, Dr. J. Brenner-TAMU and GCOOS, R. Pearson-GLOS.

Member: The Oceanography Society, Marine Technology Society, IOOS Association, GCOOS

Jennifer Dorton
115 Longleaf Drive, Wilmington, NC 28401 ● jdorton@secoora.org ● (910) 443-1708

PROFESSIONAL EXPERIENCE

Deputy Director
***Southeast Coastal Ocean Observing Regional Association (SECOORA)*, 2017 – present**

- Build strong, mutually beneficial relationships with the SECOORA Executive Director, Board of Directors, and 6 remote staff and contractors to execute programmatic implementation plans that align with the SECOORA strategic plan.
- Direct the $7M million-dollar annual grant portfolio, overseeing 70 funded projects across the southeast region (NC, SC, GA, & FL). Ensure projects operate cohesively and are integrated for maximum impact.
- Track and assess project team goals and performance objectives and implement risk mitigation strategies, as needed.
- Lead environmental compliance for all SECOORA federal awards, with an understanding of ocean and coastal policy laws and frameworks governing marine and coastal resource protection (e.g., National Environmental Policy Act, Coastal Zone Management Act, Magnuson-Stevens Act).
- Manage the SECOORA data management contractor which also includes prioritizing data submissions to the SECOORA data catalog and managing the development of data products and services.
- Established the SECOORA Water Level Network and authored technical documents to provide guidance to SECOORA staff and partners: Standard Operating Procedures for a Southeast Water Level Network (see Technical Assistance).
- Author SECOORA technical and planning documents such as the SECOORA High Frequency Radar Observing System Gap Analysis. Co-authored the 2026-2030 SECOORA Regional Coastal Ocean Observing System Plan based on industry and stakeholder-identified focus areas for the four-state region.
- Directly supervise two field technicians. Empower employees to take ownership in projects and foster employee growth related to shared decision making, problem-solving, and communication skills.
- Serve as the voice for SECOORA on national project teams and at conferences, workshops, and strategic convenings.
- Engage with congressional leaders to advocate for annual National Oceanic and Atmospheric Administration (NOAA) funding which supports SECOORA. Coordinate with stakeholders on grassroots advocacy initiatives and develop tailored advocacy materials to share with congressional offices.
- Work with the communications staff to develop stories and social media content that highlight the people and places SECOORA is devoted to serving.
- Responsible for planning for technical workshops and virtual meetings; executing tasks which include soliciting event sponsors, leading technical steering

committees, facilitating complex and nuanced discussions during the workshop, and preparing workshop reports.

Independent Contractor, Division of Research and Economic Development
NC Agricultural and Technical University, Greensboro, NC **2020-2021**

- Provided grant writing assistance for faculty with emphasis on development of ~15 grant proposals for submission to National Science Foundation, NASA, Department of Transportation, and community foundations.
- Reviewed proposals for coherence and compliance with sponsor requirements (both in the project narrative and budget/justification).

University Program Specialist/Project Coordinator
University of North Carolina Wilmington, Wilmington, NC **2004 –2017**

- Managed 7 federal grant projects, ranging in total support from $30,000 - $2.5M, supporting climate science, coastal resilience, and weather forecasting initiatives.
- Supervised a team of three highly skilled employees and one data management contractor who were responsible for maintaining coastal and offshore mooring equipment and providing data management and web design capabilities. Facilitated access to training and skill development opportunities and conducted annual employee performance evaluations.
- Collaborated with NOAA National Weather Service (NWS) offices in the Gulf and southeast US, the Eastern Region Headquarters, Southern Region Headquarters, and Office of the Chief Information Officer (OCIO) to develop an integrated marine weather and forecasting product.
- Coordinator for the NOAA in the Carolinas initiative to identify opportunities for collaboration across NOAA line offices in North Carolina and South Carolina.
- Authored the 20-year NC Sea Grant research portfolio review, providing data-driven recommendations for future funding strategies and program improvements.
- Responsible for planning, execution, and closure of small-scale and state-wide scientific research symposia and events for North Carolina Sea Grant.

Contractor/Environmental Program Manager for the NSF Ocean Observatories Initiative (OOI)
Raytheon, Washington DC **2011 - 2012**

- Participated on the OOI Environmental Compliance Team, addressing NEPA compliance requirements. This included identify stakeholders of interest, assisting with planning public meetings near locations of planned observing system installations, and the preparation of the Site-Specific Environmental Assessment.
- Consulted with state and federal permitting agencies (e.g., US Coast Guard, US Army Corp of Engineers, State regulatory agencies) and provided guidance to OOI project personnel on permits required to deploy ocean observing infrastructure in US waters.
- Served on OOI Source Selection Evaluation Boards for instrument procurements, reviewing instrument requirements and RFQ submissions. Drafted Memorandums of Understanding between NSF and instrumentation vendors to

purchase sensors for monitor essential ocean variables in coastal and deep-water environments.

EDUCATION

- M.S. Recreation and Leisure Services Administration, East Carolina University, 2000
- B.S. Health Policy & Administration and Business Administration (double major), University of North Carolina Chapel Hill, 1996
- Project Management Certification, PMP number 1892171, 2016

SYNERGIST ACTIVITIES AND CONTINUING EDUCATION

- NOAA National Weather Service Meteorological Development Lab reviewer, 2025
- Eckerd College, Center for Creative Learning, Maximizing Your Leadership Potential, 2023
- Data Analysis using Excel, UNCW Swain Center, 2016

AWARDS

- Recipient of the NOAA in the Carolinas Leadership Award, February 2012
- Recipient of the NOAA National Weather Service Public Service Award, April 2007

Natalie R. Cohen, Assistant Professor
University of Georgia Skidaway Institute of Oceanography
10 Ocean Science Circle, Savannah GA 31411
cohen@uga.edu | CohenLabUGA.com

Academic History

April 2021 – present	Courtesy Faculty Appointment, Institute of Bioinformatics, University of Georgia
Dec. 2020 – present	Assistant Professor, Department of Marine Sciences and Skidaway Institute of Oceanography, University of Georgia
2017-2020	Postdoctoral Fellow, Marine Chemistry & Geochemistry, Woods Hole Oceanographic Institution

Education

- University of North Carolina at Chapel Hill, Marine Sciences, Ph. D. 2017
- Pennsylvania State University, Biology, B.S., Minor in Marine Sciences. 2010

Federal & Regional Research Grants

- National Science Foundation, Office of Polar Programs: "Collaborative Research: Mixotrophic grazing as a strategy to meet nutritional requirements in the iron and manganese deficient Southern Ocean" Lead PI. 2023-2027
- National Science Foundation, Office of Polar Programs: "Collaborative Research: Adaptations of Southern Ocean diatoms to manganese scarcity: Can physiological ingenuity overcome unfavorable chemistry?" Co-PI. 2023-2027
- Southeast Coastal Ocean Observing Regional Association (SECOORA): "Monitoring & identifying environmental drivers of periodic harmful algal blooms in a model estuary of coastal GA" Lead PI. 2023-2026

Select Fellowships, Awards & Honors

2026	PI recipient of UGA Gordon & Betty Moore Foundation Postdoctoral Fellowship
2024	Alfred P. Sloan Research Fellow in Earth System Science
2024	Simons Early Career Investigator in Aquatic Microbial Ecology & Evolution
2023	UGA Office of Research Internal Research Support Co-funding Program Award
2022	UGA Covid Research Recovery Impact Funding Award ($15,300)
2017-2020	Simons Postdoctoral Fellowship in Marine Microbial Ecology
2019	ASLO Early Career Travel Grant

Select Publications – Submitted & Preprints

1. **Cook CCZ**, Ewton EM, Marchetti A, Menden-Deuer S, Millette NC, Slomka S, Speciale EV, Wilken S, **Cohen NR**. Evaluating acidotropic dyes for detecting mixotrophy in protists: insights from cultures and field communities *Submitted, preprint available: https://www.biorxiv.org/content/10.1101/2025.09.29.679303v1*
2. **Cohen NR**, Alexander H, Durham BP, Peng X, Saito M. Marine microeukaryote metabolism revealed through multi-omics. *Submitted to Annual Review of Marine Science*

Select Publications – Peer-reviewed

3. **Quirk, L.E**., Sunda, W.G., **Cohen, N.R.** Iron physiology and metabolism of model phytoplankton taxa in a western boundary continental shelf ecosystem. (2025) *Limnology & Oceanography* 70: 3335-3354
4. **Cohen, N.R**., Krinos, A.I., Kell, R.M., Chmiel, R. J., Moran, D.M., McIlvin, M.R., Lopez, P.Z., Barth, A., Stone, J., Alanis, B.A., Chan, E.W., Breier, J.A., Jakuba, M.V., Johnson, R., Alexander, H., Saito, M.A. (2024) Microeukaryote metabolism across the western North Atlantic Ocean revealed through autonomous underwater profiling. *Nature Communications* 15:7325
5. **Cohen, N.R.**, Alexander, H., Krinos, A.I., Hu, S.K., and Lampe, R.H. (2022) Marine Microeukaryote Metatranscriptomics: Sample Processing and Bioinformatic Workflow Recommendations for Ecological Applications. *Frontiers in Marine Science* 9.
6. **Cohen, N.R.**, McIlvin, M.R., Moran, D.M., Held, N.A., Saunders, J.K., Hawco, N.J., et al. (2021) Dinoflagellates alter their carbon and nutrient metabolic strategies across environmental gradients in the central Pacific Ocean. *Nature Microbiology* 6:173–186 Cover article and News & Views highlight

Select Invited Talks

2025 Microeukaryote physiology and molecular ecology: from the Georgia coast to the Southern Ocean. *Scripps Institution of Oceanography*, San Diego, CA

2025 Using the FlowCam to track harmful algal bloom dynamics in a coastal Georgia estuary. Marine Technology Society Member Webinar. *Virtual, presented with graduate student Mallory Mintz*

2025 Microeukaryote physiology and molecular ecology across the North Atlantic Ocean. *Seoul National University*, Seoul, South Korea

2024 HAB Monitoring updates in the Skidaway River Estuary. *Marine Extension & GA Sea Grant*, Savannah GA

2021 Linking microbial metabolism and micronutrient availability across ocean gradients. Institute of Bioinformatics, *University of Georgia*. Virtual

Select Conference Presentations

- Exploring the potential for zinc toxicity in low manganese Southern Ocean phytoplankton. *Aquatic Sciences Meeting (ASLO)* Charlotte, NC. March 2025. Poster presentation.
- Shared peptides among diverse lineages of marine microeukaryotes. *American Society for Mass Spectrometry (ASMS)* Anaheim, CA. June 2024. *Poster presentation*
- Comparing microeukaryote metatranscriptomes and metaproteomes captured using an autonomous underwater vehicle. *Aquatic Sciences Meeting (ASLO)* Mallorca, Spain. June 2023. Oral presentation

Workshops led while at University of Georgia

2025 **Croucher Summer Course Invited Guest Lecturer** "Global Climate Change and Marine Ecosystems" *Hong Kong University of Science & Technology*, Hong Kong

2023 **UGA Software Carpentries**: Programming with Python. Two-day virtual coding workshop with 14 participants. March 6-7

2022 **UGA Software Carpentries**: Programming with Python. One-day virtual coding workshop with 30 participants. March 10

Research Supervision

MS students:
Lucy Quirk (*UGA Department of Marine Sciences)* August 2021-May 2024
Ph.D students:
Elizabeth Wu (*UGA Department of Marine Sciences)* January 2025-present
Mallory Mintz (*UGA Department of Marine Sciences)* January 2023-present
Claire Cook (*UGA Department of Marine Sciences)* August 2022-present

Postdoctoral researchers:
Sean Anderson May 2025-present

Undergraduate supervision
Reagan Campbell, Skidaway Undergraduate Internship Spring-Summer 2026
Mary Reed, Skidaway Undergraduate Internship Summer 2025
Felipe Quintana, Skidaway Undergraduate Internship Summer 2024
Erin Murphy, Marine Extension & GA Sea Grant Winter 2023-24
Neha Shah, Skidaway Undergraduate Internship Summer 2023
Lavon Young, Savannah State University REU Summer 2023
Elizabeth Szink, Skidaway Undergraduate Internship Summer 2022
Charlotte Greene, Skidaway Undergraduate Internship Summer 2021

Select Scientific Leadership

- **Steering Committee Member**, Intercomparison of metatranscriptomic methods for characterizing microbial eukaryotes: Ocean Carbon & Biogeochemistry working group
- **Conference Session Co-convener,** SS08 Integrating and developing 'omics technologies in aquatic community ecology – ASLO Aquatic Sciences Meeting 2025. Charlotte, NC. March 2025
- **Conference Session Co-convener,** ME006 Mixotrophs & Mixotrophy – Ocean Sciences Meeting 2024. New Orleans LA. February 2024

Science communication

- Invited *Marine Technology Society* webinar: Using FlowCam to Track Harmful Algal Bloom Dynamics in a Coastal Georgia Estuary (virtual, ~300 registered, 160 live attendees):
  https://www.fluidimaging.com/webinar-track-hab-dynamics-in-coastal-georgia-estuary
  https://www.youtube.com/watch?v=DG44YRfveL8
- FlowCam case study research highlight: https://www.fluidimaging.com/blog/flowcam-protects-shellfish-hatcheries-from-habs
  https://ecomagazine.com/in-depth/expanding-coastal-hab-research/
- HABs media coverage with graduate student Mallory Mintz (2023-2024):
  https://gacoast.uga.edu/education/college-students/research-trainee-program/
  https://gacoast.uga.edu/student-researchers-address-coastal-issues/
  https://gacoast.uga.edu/georgia-researchers-and-residents-work-together-to-monitor-harmful-algal-blooms
  https://www.savannahnow.com/story/news/environment/2023/07/25/university-of-georgia-researcher-monitors-savannah-waterways-for-harmful-algal-blooms/70456678007/
  https://thecurrentga.org/2023/07/18/tracking-algal-blooms-on-the-georgia-coast/
  https://www.gpb.org/news/2023/07/19/tracking-algal-blooms-on-the-georgia-coast

Biographical Sketch

Catherine R. Edwards

Skidaway Institute of Oceanography, University of Georgia 10
Ocean Science Circle, Savannah, GA, 31411
e-mail:catherine.edwards@skio.uga.edu; tel: 912 598-2471

(a) Professional Preparation

University of North Carolina at Chapel Hill; Physics; B.S., 1999
University of North Carolina at Chapel Hill, Marine Sciences (Physical Oceanography); Ph.D., 2008

(b) Appointments

2020–present: **Associate Professor**, Department of Marine Sciences, Skidaway Institute of Oceanography, University of Georgia

2013–2020: **Assistant Professor**, Department of Marine Sciences, Skidaway Institute of Oceanography, University of Georgia

2019–present: **Adjunct Associate Professor**, College of Engineering, University of Georgia

2012–present: **Adjunct Assistant/Associate Professor**, Georgia Institute of Technology

2010–2013: **Assistant Professor**, Skidaway Institute of Oceanography

2009–2010: **Postdoctoral Scholar**, Center for Oceanic and Atmospheric Prediction Studies, Florida State University

2008–2009: **Research Scientist**, Renaissance Computing Institute, University of North Carolina at Chapel Hill

1999–2003: **Oceanographer**, Ocean Dynamics and Prediction Branch, Naval Research Laboratory, Stennis Space Center, MS

(c) Products

Recent Publications (* denotes advised student author)

1. McQuarrie, F.M.*, C.B. Woodson, and **C.R. Edwards**, Modeling the Detectability of High-Frequency Transmissions on a Coastal Reef with Significant Interference, *Animal Biotelemetry*, submitted.
2. McQuarrie, F.M.*, C.B. Woodson, and **C.R. Edwards**, A reef's high frequency soundscape and the effect on telemetry efforts: a biotic and abiotic balance, *J. Mar. Sci. Eng.*, 13(3), 517; https://doi.org/10.3390/jmse13030517, 2025.
3. Indeck, K.L., M.F. Baumgartner, L. Lecavalier, F. Whoriskey, D. Durette-Morin, N.R. Pettigrew, J.M. McSweeney, L.H. Thorne, K.L. Gallagher, **C.R. Edwards**, E. Meyer-Gutbrod, and K.T.A Davies, Glider surveillance for near real-time detection and spatial management of North Atlantic right whales, *Oceanogr.*, doi:10.5670/oceanog.2025e111, 2025.

4. Chiodi, A., H. Hristova, G. Foltz, J. Zhang, C. Mordy, **C.R. Edwards**, and other authors, Surface ocean warming in the core of Hurricane Sam and its representation in forecast models, *Front. Mar. Sci*., doi: 10.3389/fmars.2023.1297974, 2023.
5. Seim, H.E., and **C.R. Edwards**, Upper slope jets and Gulf Stream filaments inshore of the Charleston Bump during Winter 2012, *J. Phys. Oceanogr.*, 49, 1423-1438, 2019.
6. Chang, D.*, F. Zhang, and **C.R. Edwards**, Real-time guidance of underwater gliders assisted by pre-dictive ocean models, *J. Atmos. Ocean. Tech.*, 32(3), 562-578, 2015.
7. Hou, M.*, S. Cho*, H. Zhou, **C.R. Edwards**, and F. Zhang, Bounded cost path planning for underwater vehicles in a partitioned flow field model, *Front. in Robotics and AI*, 8, 203, doi:10.3389/frobt.2021.575267, 2021.
8. Chang, D.*, **C.R. Edwards**, W. Wu, and F. Zhang, Motion tomography: Mapping flow fields using autonomous underwater vehicles, *Int. J. Robotics Res.*, 36(3), 320-336, 2017.
9. Chang, D.*, **C.R. Edwards**, F. Zhang, and J. Sun, A data assimilation framework for data-driven flow models enabled by motion tomography, *Int. J. Intelligent Robotics and Applications*, 3(2), 158-177, 2019.

(d) Synergistic Activities

1. Member, U.S. Integrated Ocean Observing System Advisory Committee, National Oceanographic and Atmospheric Administration, 2021-present.
2. Member, Gray's Reef National Marine Sanctuary Science Advisory Group, Ecological Connectivity Working Group, 2014-present
3. Session developer/leader, volunteer, fundraiser, Girls Engineer It Day (annual day of hands-on activities for 350+ students and their parents), Society of Women Engineers, 2012-present.
4. Invited speaker, "Eavesdropping Underwater: Monitoring right whales off Georgia's coast", "Robotic acoustic telemetry: New directions in fisheries management using AUVs", "Robotic Oceanography at Skidaway Institute of Oceanography", "Alexa, Map Fish Habitats! Developing Intelligent Systems for Robotic Fisheries", Evening at Skidaway lectures, several local Rotary Clubs, PEO chapters, Skidaway Marine Science Day, regional coastal symposia, and other public presentations, 2011 to present.
5. Research highlighted in local, regional, and national media (Science Magazine, WIRED, Forbes, Savannah Morning News, Charleston Post Courier, All Things Considered/National Public Radio, statewide Georgia Public Broadcasting, The Weather Channel Weather Geeks podcast and broad-cast, local television affiliates, online, and other outlets).

BIOGRAPHICAL SKETCH – EMILY R. HALL, PH.D.

Senior Scientist/ Program Manager
Ocean Acidification Program
Chemical and Physical Ecology Program
Mote Marine Laboratory,
1600 Ken Thompson Parkway
Sarasota, FL 34236
emily8@mote.org

PROFESSIONAL PREPARATAION

Mercer University	B.S., Environmental Science, 1999
Mercer University	B.A., Spanish, 1999
University of Florida	M.S., Environmental Engineering Sciences, 2001
University of Florida	Ph.D., Environmental Engineering Sciences, 2004

PROFESSIONAL APPOINTMENTS

2021-present	Program Manager/Senior Scientist, Ocean Acidification Program and Chemical and Physical Ecology Program, Mote Marine Laboratory
2018-2021	Program Manager/Staff Scientist, Chemical and Physical Ecology Program, Mote Marine Laboratory
2011-2021	Program Manager/Staff Scientist, Ocean Acidification Program, Mote Marine Laboratory
2013-2018	Courtesy Professor, Biology Program, University of South Florida-Sarasota Manatee
2009-2018	Adjunct Professor, Environmental Studies Department, Ringling College of Art and Design
2007-2011	Staff Scientist, Chemical Ecology Program, Mote Marine Laboratory
2005-2007	Postdoctoral Scientist, Chemical Ecology Program, Mote Marine Laboratory
2004-2005	Postdoctoral Associate, Fisheries and Aquatic Sciences, Environmental Engineering Sciences, University of Florida
1999-2004	Research and Teaching Assistant / Graduate Student, Environmental Engineering Sciences, University of Florida

RELEVANT PUBLICATIONS

2025 Wright-Fairbanks, E.K., Lord, N., Dugan, D., Goldsmith, K., **Hall, E.R**., Harper, A., Reimer, J.J., Siedlecki, S., Turner, E.J., Vreeland-Dawson, J. and Wakefield, K., 2025. Management considerations for establishing a coastal acidification monitoring system from US Coastal Acidification Networks. Environmental Monitoring and Assessment, 197(9), p.990.

2025 Lankes JD, Page HN, Quasunella A, Torkelson JF, Lemaire C, Nowicki RJ, Blasius L and **Hall ER** (2025) Quantifying coral-algal interactions in an acidified ocean: *Sargassum* spp. exposure mitigates low pH effects on *Acropora cervicornis* health. Front. Mar. Sci. 12:1487102. doi: 10.3389/fmars.2025.1487102

2024 **Hall, E.R**., Yates, K.K., Hubbard, K.A., Garrett, M.J. and Frankle, J.D. Nutrient and carbonate chemistry patterns associated with *Karenia brevis* blooms in three West Florida Shelf estuaries 2020-2023. Frontiers in Marine Science, 11, p.1331285.

2022 Osborne, E., Hu, X., **Hall, E.R.**, Yates, K., Vreeland-Dawson, J., Shamberger, K., Barbero, L., Hernandez-Ayon, J.M., Gomez, F.A., Hicks, T. and Xu, Y.Y. Ocean acidification in the Gulf of Mexico: Drivers, impacts, and unknowns. Progress in Oceanography, 209, p.102882.

2020 **Hall, E.R.**, Wickes, L., Burnett, L.E., Scott, G.I., Hernandez, D., Yates, K.K., Barbero, L., Reimer, J.J., Baalousha, M., Mintz, J. and Cai, W.J., 2020. Acidification in the US Southeast: Causes, potential consequences and the role of the southeast ocean and coastal acidification network. Frontiers in Marine Science, 7, p.548

OTHER RELEVANT PUBLICATIONS

2024 MacVittie, S., Cuyler, E., Rose, B.J., **Hall, E.R.** and Krediet, C.J. Holobiont-level responses to elevated temperature and reduced pH in *Aiptasia*. Bulletin of Marine Science, 100(4), pp.693-708.

2024 Dilworth, J., Million, W.C., Ruggeri, M., **Hall, E.R.**, Dungan, A.M., Muller, E.M. and Kenkel, C.D. Synergistic response to climate stressors in coral is associated with genotypic variation in baseline expression. Proceedings of the Royal Society B, 291(2019), p.20232447.

2023 Klepac, C.N., Eaton, K.R., Petrik, C.G., Arick, L.N., **Hall, E.R.** and Muller, E.M. Symbiont composition and coral genotype determines massive coral species performance under end-of-century climate scenarios. Frontiers in Marine Science, 10, p.1026426.

2022 Glibert, P.M., Cai, W.J., **Hall, E.R**., Li, M., Main, K.L., Rose, K.A., Testa, J.M. and Vidyarathna, N.K. Stressing over the complexities of multiple stressors in marine and estuarine systems. Ocean-Land-Atmosphere Research, 2022, DOI:10.34133/2022/9787258

2022 Burnham, K.A., Nowicki, R.J., **Hall, E.R**., Pi, J. and Page, H.N., 2022. Effects of ocean acidification on the performance and interaction of fleshy macroalgae and a grazing sea urchin. Journal of Experimental Marine Biology and Ecology, 547, p.151662.

2021 Muller, E.M., Dungan, A.M., Million, W.C., Eaton, K.R., Petrik, C., Bartels, E., **Hall, E.R.** and Kenkel, C.D. Heritable variation and lack of tradeoffs suggest adaptive capacity in *Acropora cervicornis* despite negative synergism under climate change scenarios. Proceedings of the Royal Society B, 288(1960), p.20210923.

2021 Page, H.N., Hewett, C., Tompkins, H. and **Hall, E.R**. Ocean acidification and direct interactions affect coral, macroalga, and sponge growth in the Florida Keys. Journal of Marine Science and Engineering, 9(7), p.739.

2018 **Hall, E.R.,** Muller, E.M., Goulet, T., Bellworthy, J., Ritchie, K.B. and Fine, M. Eutrophication may compromise the resilience of the Red Sea coral *Stylophora pistillata* to global change. Marine pollution bulletin, 131, pp.701-711.

2017 Muller, E.M., Leporacci, N.M., Macartney, K.J., Shea, A.G., Crane, R.E., **Hall, E.R.** and Ritchie, K.B. Low pH reduces the virulence of black band disease on *Orbicella faveolata*. PLoS One, 12(6), p.e0178869.

Nisse Goldberg- CV

Professional preparation

Institution	Major	Degree	Year
University of California, Santa Cruz	Marine Biology	B.A. with honors	1994
Moss Landing Marine Laboratories	Marine Sciences	M.Sc.	2001
University of Western Australia	Plant Biology	Ph.D. with Distinction	2005
University of Western Australia	Plant Biology	Postdoc.	2005

Appointments

Chair of the Department of Biology and Marine Science, Jacksonville University, 2016 to 2023

Division Chair, Science and Mathematics, Jacksonville University, spring 2018 to spring 2020

Professor of Biology and Marine Science, Jacksonville University, 2018 to present.

Associate Professor of Biology and Marine Science, Jacksonville University, 2013 to 2018.

Assistant Professor of Biology and Marine Science, Jacksonville University, 2007 to 2013.

Selected publications

Goldberg, N., 2024. Distribution of the Cuban treefrog (Anura, Hylidae, *Osteopilus septentrionalis)* in Florida using geolocated records from an invasive species monitoring app. Management of Biological Invasions, 15(3), pp.445-454.

Goldberg, N.A. and Heine, J.N., 2024. Laguncularia racemosa phenology and resilience near its northern limit along the eastern coast of the USA. Aquatic Botany, 194, p.103791.

Goldberg, N. and Watkins, R.L., 2022. Gopher tortoise (*Gopherus polyphemus*) distribution and flood hazards using mitigation permits (2009-2021) in the lower St. Johns River basin, Florida. Florida Scientist, 85(3/4), pp.137-143.

Bielmyer-Fraser, G., Llazar, K., Ward, A., Trent, T., **Goldberg, N.** 2022. Metal analysis of submerged aquatic vegetation in the lower St. Johns River, Florida. Environmental Monitoring and Assessment. 194: 492, pp.12

Goldberg, N. and Watkins, R.L., 2021. Spatial comparisons in wetland loss, mitigation, and flood hazards among watersheds in the lower St. Johns River basin, northeastern Florida, USA. Natural Hazards, 109(2), pp.1743-1757.

Goldberg, N. and Schlieper, J., 2021. Seasonal and Annual Abundance and Distribution of the Avian Community in Huguenot Memorial Park, Florida, from 2017 to 2020. Florida Field Naturalist, 49: 110-124

Goldberg, NA, Heine, JN, 2021. Growth and Survivorship of Red Mangrove Seedlings Under a Mangrove Canopy and in a Saltmarsh Community in Northeastern Florida. *Flora* 278: 151804.

Goldberg, N, Trent, T. 2020. Patterns in submerged aquatic vegetation in the lower St. Johns River, Florida, from 2001 to 2019. *Journal of Aquatic Plant Management* 58: 135-145.

Goldberg, NA, Trent, T. and Hendrickson, J. 2018. Temporal and Spatial Changes in *Vallisneria americana* Michaux (Tape-grass) Beds in the Lower St. Johns River, Florida, from 2002–2011. *Southeastern Naturalist* 17: 396-410.

Goldberg, N, Heine, J. 2018. Effects of Hurricane Matthew on *Rhizophora mangle* L. survivorship and reproduction at its northern range limit in northeastern Florida. *Florida Scientist* 81: 55-60.

Goldberg, N, Heine, J. 2017. Life on the leading edge: Phenology and demography of the red mangrove Rhizophora mangle at the northern limit of its expanding range. *Flora* 235: 76-82.

Goldberg, NA and Castellon, T. 2017. Experiential learning in an undergraduate ecology course: a case study with *Gopherus polyphemus* Daudin (gopher tortoise). *Florida Scientist* 80: 117-127.

Reports (2013-Present)

Goldberg, N. 4.2. Wetlands. In: *State of the River Report for the Lower St. Johns River Basin, FL: Water quality, fisheries, aquatic life, and contaminants*. http://www.sjrreport.com/home.

Goldberg, N. 4.3. Macroinvertebrates. In: *State of the River Report for the Lower St. Johns River Basin, FL: Water quality, fisheries, aquatic life, and contaminants*. http://www.sjrreport.com/home.

Goldberg, N. 4.5. Non-native aquatic species. In: *State of the River Report for the Lower St. Johns River Basin, FL: Water quality, fisheries, aquatic life, and contaminants*. http://www.sjrreport.com/home.

Selected presentations

2021 Root to Stem FSCJ's Fourth Annual Science Symposium, October 2021, Scientific Literacy and the St. Johns River Health" with Dr. Pinto and Dr. Zoellner

2020 WJCT SJR Report, Wetlands and Non-natives.

AAC&U 2017 Diversity, Learning & Student Success, March, 2017: Using Experience to Solve Big Questions, workshop, with L. Atkins.

Community

SECOORA, SET Coordinator, 2023-present

Association of Southeastern Biologists, Global Change Committee officer, spring 2022-present

Scientific Committee on Antarctic Research, DEI Committee member, 2025

National Association of Marine Laboratories, DEI Committee member, fall 2022-present

Tree Hill Nature Center, Board officer- Treasurer, fall 2021-present

Green Dot, campus member

BIOGRAPHICAL SKETCH

Lynn A. Leonard
Professor, Department of Earth and Ocean Sciences
Associate Director Research & Innovation, Center for Marine Science
University of North Carolina Wilmington
910-962-2338 lynnl@uncw.edu

Education

College of William and Mary	Williamsburg, VA	Geology	BS with Honors	1986
Duke University	Durham, NC	Geology	MS	1988
University of South Florida	St. Petersburg, FL	Marine Science	PhD	1994

Professional Appointments

2021 – pres.	Assoc. Director Research & Innovation, Center for Marine Science UNCW
2004 – pres.	Professor with Tenure, Department of Earth and Ocean Sciences
2019 – 2021	Interim Director, Center for Marine Science, UNCW
2008 - 2017	Chair, Department of Earth and Ocean Sciences, UNCW
2005 – pres.	Director, Coastal Ocean Research & Monitoring Program, UNCW
1999 - 2004	Assoc. Professor w/Tenure, Department of Earth Sciences, UNCW
1994-1999	Assist. Professor, Department of Earth Sciences, UNCW

Publications (Relevant Examples)

Bresnahan, P., Hovis, M., Frensley B.T., Polk, M., Moran, E., Harris, C., Lebby, K., Settin, B., Davidson, J., Kasney, C., Anderson, S., O'Connor, C., Halls, J., Leonard, L., Dorton, J., Alsbrooks, C. and Wells, D. 2026. Hydrological connectivity: improving coastal literacy and resilience in classrooms and communities in the City of Wilmington. Frontiers in Water 7:1719742. doi: 10.3389/frwa.2025.1719742

Hovis, M., Polk, M., Bresnahan, P., Kasney, C., Davidson, J., Frensley B.T., Halls, J., Moran, E., Lebby, K., Harris, C., and Leonard L. 2026. Community Voices in Action: A Framework for Flood Resilience Workshops in a Coastal Community. Community Science, 5(1). https://doi.org/10.1029/2025CSJ000161

Corbitt, E.R., Leonard, L.., Mallin, M., and Mead. R. 2025. Occurrence and distribution of Per- and Polyfluoroalkyl Substances (PFAS) in Tidal Salt Marsh Creeks. Marine Pollution Bulletin, 216, 117932. https://doi.org/10.1016/j.marpolbul.2025.117932.

Cahl, D., Voulgaris, G., and Leonard L. 2022. A Comparison of Beamforming and DirectionFinding Algorithms (Beamscan and MUSIC) on a Linear Array HF Radar in a Medium to Low Wave Energy Environment. Journal of Atmospheric and Oceanic Technology. https://doi.org/10.1175/JTECH-D-22-0005.1

Beckman, J.N.; Long, J.W.; Hawkes, A.D.; Leonard, L.A.; Ghoneim, E. 2021. Investigating Controls on Barrier Island Overwash and Evolution during Extreme Storms. Water, *13*, 2829. https://doi.org/10.3390/w13202829

Eulie, D.O., Leonard, L., and Polk, M. 2020. Sediment deposition and availability in riparian wetlands. J. Coastal Research. DOI: 10.2112/JCOASTRES-D-20-00020.1

Snowden, J., Hernandez, D., Quintrell, J., Harper, A., Morrison, R., Morell, J., and Leonard, L. 2019. "The U.S. Integrated Ocean Observing System: Governance Successes and Lessons from Two Decades of Growth", Front. Mar. Sci. DOI: 10.3389/fmars.2019.00242.

Bushnell, M., Thomas, J., Burger, E., Heitsenrether, R., Galvarino, C., Dorton J., and Leonard L. 2018. Status and Near-Term Plans for the U.S. IOOS Quality Assurance/Quality Control of Real-time Oceanography Data (QARTOD) Project. Oceans 18, MTS-IEEE. Technical Paper Proceedings.

Ghoneim, E. Dorofeeva, A., Benedetti, M., Gamble, D., Leonard, L., and AbuBakr, M. 2017. Vegetation Drought Analysis in Tunisia: A Geospatial Investigation. J Atmos Earth Sci 1: 002.

Porter, D., Dorton, J., Leonard, L., Kelsey, H., Ramage, D., Cothran, J., Jones, A., Galvarino, C., Subramanian, V., and D. Hernandez. 2015. Integrating Environmental Monitoring and Observing Systems in Support of Science to Inform Decision Making: Case Studies for the Southeast. Coastal Ocean Observing Systems: Advances and Syntheses. Elsevier. p. 418-428. DOI: 10.1016/B978-0-12-802022-7.00022-5.

Ensign, S., Siporin, K., Piehler, M., Doyle, M., and L. Leonard 2012. Hydrologic versus biogeochemical controls of denitrification in tidal freshwater wetlands. Estuaries and Coasts, s12237-012-9491-1.

Larsen, L.G., N. Aumen, C. Bernhardt, V. Engel, T. Givnish, S. Hagerthey, J. Harvey, L. Leonard, P. McCormick, C. McVoy, G. Noe, M. Nungesser, K. Rutchey, F. Sklar, T. Troxler, J. Volin, and D. Willard. 2011. Recent and historic drivers of landscape change in the Everglades ridge, slough, and tree island mosaic. *Critical Reviews in Environmental Science & Technology,* 1547-6537, Volume 41, Issue S1, 2011, pp. 344 – 381.

Extramural Funding Since 2021: (>$20M Total):

2025. Planning Enhanced Flod Safety and Resilience for New Hanover County: Phase I. PIs: Ken Halanych, L. Leonard, Phil Bresnahan. New Hanover County Endowment ($500,000)

2024. Hydrological Connectivity: Improving Coastal Literacy and Resilience in Classrooms and Communities in the City of Wilmington. PIs: Phil Bresnahan (lead), Craig Harris, Joanne Halls, Lynn Leonard, Troy Frensley, and Erin Moran. North Carolina Sea Grant and Water Resources Research Institute Community Collaborative. ($24,916)

2024. Disaster Relief: Hurricane Ian. PI- Leonard, Chris LaClair (Co-PI). NOAA/SECOORA. ($30,327).

2024. Reserve Research Support Services: North Carolina Coastal Reserve and National Estuarine Research Reserve. PI- Leonard North Carolina Department of Environment and Natural Resources – Division of Environmental Quality ($15,953).

2023. Filling the Gap: SECOORA Members Partnering to Affordably Increase Observations and Build Capacity Along the Florida East Coast. PI- Leonard, Chris LaClair (Co-PI), Jordon Beckler (Co-PI). NOAA/SECOORA. ($288,828).

2023. Optimization & Enhancement of SECOORA Observing Elements to Deliver Actionable Coastal and Ocean Information in the Carolinas. PI- Leonard NOAA/SECOORA ($329,362 + ship support).

2022. Testing a Novel Strategy to Measure Underwater Radiated Noise of Vessels in Shallow Coastal Ocean Environments. PI- Leonard, Eric Montie (Co-PI), Jamie Winebrake (Co-PI). U.S. Dept. of Transportation Maritime Administration. ($431,235).

2022. Optimization & Enhancement of SECOORA Observing Elements to Deliver Actionable Coastal and Ocean Information in the Carolinas. PI- Leonard NOAA/SECOORA ($329,362 + ship support).

2022. MRI: The acquisition of a novel multi sensor-equipped unmanned aerial system (UAS) observatory for coastal mapping. PIs: Narcisa Pricope (lead), Lynn Leonard (Co-PI), Devon Eulie (Co-PI), Phil Bresnahan (Co-PI), and Joanne Halls (Co-PI. National Science Foundation ($850,863)

2021. Optimization & Enhancement of SECOORA Observing Elements to Deliver Actionable Coastal and Ocean Information in the Carolinas. PI- Leonard NOAA/SECOORA ($329,362 + ship support).

2021. Reserve Monitoring and Stewardship Programs. PI- Leonard North Carolina Department of Environment and Natural Resources – Division of Coastal Management. ($253,123).

Select Synergistic Activities

2024-25	UNCW Flood Resiliency Working Group Lead
2015 - pres.	UNCW Liaison, New Hanover County Public Schools Marine Science Academy
2005 - pres.	Director, Coastal Ocean Research Monitoring Program
2020 - pres.	SECOORA E&O committee
2019 – 2022.	NC Sentinel Site Core Management Team
2023, 2025	NC STEM EXPO presenter/volunteer
2019 - pres.	SECOORA Science committee
2019/21/23	UNCW Global Marine Science Summit, Organizer
2018, 2019	NC School of Science Summer Ventures Faculty, Coastal Oceanography
2018 - pres.	NC Estuarine Research Reserve-Masonboro Island, Local Advisory Committee
2018 - 19	SECOORA Annual Meeting Planning Committee
2012 - 15	NOAA Integrated Ocean Observing System Federal Advisory Committee
2013 - 16	Cape Fear Community College MARTECH Program Advisory Committee

Yonggang Liu
Associate Professor
Director, Ocean Circulation Lab
College of Marine Science, University of South Florida
140 7th Avenue South St. Petersburg, Florida 33701
yliu@usf.edu, 727-553-3508, Google Scholar: j-DRSIQAAAAJ

(a) Professional Preparation

Chengdu Institute of Meteorology, China	Meteorology	B.S.	1993
2nd Institute of Oceanography, SOA, China	Physical Oceanography	M.S.	1996
University of South Florida	Physical Oceanography	Ph.D.	2006

(b) Professional Experiences

University of South Florida	*Associate Professor*	8/2024 – present
University of South Florida	*Associate Research Professor*	5/2022 – 7/2024
University of South Florida	*Associate in Research*	2008 – 2022
University of Washington	*Postdoctoral Associate*	2006 – 2008
2nd Institute of Oceanography, China	*Res. Assistant, Assist. Scientist*	1996 – 2000

(c) Products

(c1) Five Related Recent Publications

Liu, Y., Weisberg, R.H., Sorinas, L., Law, J.A., Nickerson, A.K. (2025), Rapid intensification of Hurricane Ian in relation to anomalously warm subsurface water on the wide continental shelf, *Geophysical Research Letters*, 52, e2024GL113192, doi:10.1029/2024GL113192

Weisberg, R.H., and **Y. Liu** (2025), Coordinated observing and modeling for the West Florida Shelf with harmful algal bloom application, *Oceanography*, 38(1), 72-75, doi:10.5670/oceanog.2025e107

Law, J., Weisberg, R.H., **Liu, Y.,** Mayer, D.A., Donovan, J.C. (2024), Mean circulation and its seasonal cycle on the West Florida Shelf as evidenced by multi-decadal time series, *Deep-Sea Research Part II*, 213, 105346, doi:10.1016/j.dsr2.2023.105346

Liu, Y., Weisberg, R.H., Zheng, L., Sun, Y., Chen, J., Law, J.A., Hu, C., Cannizzaro, J.P., Frazer, T.K. (2024), A tracer model nowcast/forecast study of the Tampa Bay, Piney Point effluent plume: Rapid response to an environmental hazard, *Marine Pollution Bulletin*, 15840, doi:10.1016/j.marpolbul.2023.115840

Liu, Y., Weisberg, R.H., Zheng, L., Hubbard, K.A., Muhlbach, E.G., Garrett, M.J., Hu, C., Cannizzaro, J.P., Xie, Y., Chen, J., John, S., Liu, L.Y. (2023), Short-term forecast of *Karenia brevis* trajectory on the West Florida Shelf, *Deep-Sea Research Part II*, 211, 105335, doi:10.1016/j.dsr2.2023.105335

(c2) Other Recent Publications

Keith, K., M. Kerr, L.Y. Liu, **Y. Liu,** J.P. Kilborn, G. Zape, E.B. Peebles, C.D. Stallings, and M. Breitbart (**2025**), Spatial and temporal heterogeneity of fish spawning dynamics on the West Florida Shelf during fall, *Fisheries Oceanography*, **34,** e12731, doi:10.1111/fog.12731

Nguyen, B.V.V., **Liu, Y.,** Stallings, C.D., Breitbart, M., Murawski, S.A., Weisberg, R.H., Kerr, M., Bonnelycke, E.-M. S., Peebles, E.B. (2024), Retention and export of planktonic fish eggs in the northeastern Gulf of Mexico, *Fisheries Oceanography*, doi:10.1111/fog.12655

Sorinas, L., Weisberg, R.H., **Liu, Y.,** Law, J. (2023), Ocean-atmosphere heat exchange seasonal cycle on the West Florida Shelf derived from long term moored data*, Deep-Sea Research Part II*, 212, doi:10.1016/j.dsr2.2023.105341

Chen, J., Weisberg, R.H., **Liu, Y.,** Zheng, L., Law, J., Gilbert, S., Murawski, S.A. (2023), A Tampa Bay coastal ocean model (TBCOM) nowcast/forecast system, *Deep-Sea Research Part II*, 211, 105322, doi:10.1016/j.dsr2.2023.105322

Liu, Y., Weisberg, R.H., Zheng, L., Heil, C.A., Hubbard, K.A. (2022), Termination of the 2018 Florida red tide event: A tracer model perspective, *Estuarine, Coastal and Shelf Science*, 272, 107901, doi:10.1016/j.ecss.2022.107901

(c3) Other Significant Publications

Liu, Y., Weisberg, R.H., Lenes, J.M., Zheng, L., Hubbard, K., Walsh, J.J. (2016), Offshore forcing on the "pressure point" of the West Florida Shelf: Anomalous upwelling and its influence on harmful algal blooms, *J. Geophysical Research Oceans*, 121, 5501-5515, doi:10.1002/2016JC011938

Liu, Y., Kerkering, H., Weisberg, R.H. (Eds) (2015), *Coastal Ocean Observing Systems*, 461 PP., Elsevier (Academic Press), London, UK

Liu, Y., MacFadyen, A., Ji, Z.-G., Weisberg, R.H. (Eds) (2011), *Monitoring and Modeling the Deepwater Horizon Oil Spill: A Record-Breaking Enterprise*, *Geophysical Monograph Series*, 195, AGU, Washington, D.C.

Liu, Y., Liang, X.S., Weisberg, R.H. (2007), Rectification of the bias in the wavelet power spectrum, *Journal of Atmospheric and Oceanic Technology*, 24(12), 2093–2102, doi:10.1175/2007JTECHO511.1

Liu, Y., Weisberg, R.H., Mooers, C.N.K. (2006), Performance evaluation of the Self-Organizing Map for feature extraction, *Journal of Geophysical Research*, 111, C05018, doi:10.1029/2005jc003117

(d) Synergistic Activities:

Science Committee, Southeast Coastal Ocean Observing Regional Association 2022 – present

Technical Advisory Committee, Nutrients and Red Tide State of the Science Symposium, University of Florida and Florida Sea Grant 2024 – 2025

Associate Editor, *Artificial Intelligence for the Earth Systems*, AMS journal 2022 – present

Guest Editor, *Ocean Science* special issue 2024 – 2025

Scientific Committee, the 55th International Liege Colloquium on Ocean Dynamics 2023 – 2024

(e) Data and Software Archives:

USF Coastal Ocean Monitoring and Prediction System (COMPS) moored met/ocean data: https://comps.marine.usf.edu:81/

USF Tampa Bay Observing Network (TBON) water quality data: https://tbon.marine.usf.edu:81/

Rectified wavelet analysis method: http://ocgweb.marine.usf.edu/~liu/wavelet.html

Skill score of trajectory model: http://ocgweb.marine.usf.edu/~liu/skill_score_drifter.html

LUCAS GLEN MCEACHRON Lucas.McEachron@myfwc.com
Curriculum Vitae (727) 365-3362

EDUCATION

Ph.D. Interdisciplinary Ecology, University of Florida.
Topic: "Reef fish spatial distributions throughout the Florida Keys in the context of matrix effects, trophic dynamics, and complementary modeling techniques."
M.S. Geography, Florida State University.
B.S Wildlife Biology, Colorado State University.

EXPERIENCE

Research Administrator, Center for Spatial Analysis, Florida Fish and Wildlife Conservation Commission (FWC), St. Petersburg, FL, 2021 – Current.
- Designed and executed GIS, remote sensing, and AI-based projects to support ecosystem-based management.
- Supervised and mentored 25 scientists; promoted marine and terrestrial geospatial research initiatives.
- Managed public-facing GIS products, decision support tools, and GIS infrastructure migration from on-prem to cloud.
- Created marine ecosystem (Ecopath with Ecosim) and species distribution models to assess ecosystem status, climate impacts, and fishing impacts.
- Streamlined South Florida's environmental monitoring efforts; consolidated 80 water quality programs into seven core programs.
- Grew autonomous capabilities (drones and AI-enabled ocean observing buoys).
- Represented FWC on eight advisory boards and science consortia.
- Co-Investigator with the Marine Biodiversity Observation Network for 10+ years.
- Served as an instructor for graduate and undergraduate Remote Sensing of the Environment at the University of South Florida in a dual appointment.

Associate Research Scientist, Center for Spatial Analysis, Florida Fish and Wildlife Conservation Commission, St. Petersburg, FL, 2015 – 2021.
- Led a seascape ecology research team to support marine spatial planning through competitive grant acquisitions and collaborative partnerships.
- Principal investigator for large-scale coastal mapping initiatives; leveraged active acoustics, LiDAR, and satellite imagery to develop high-resolution benthic habitat maps for South Florida.

Assistant Research Scientist/Marine Research Associate, Center for Spatial Analysis, Florida Fish and Wildlife Conservation Commission, St. Petersburg, FL, Assistant 2008 – 2015, Associate 2006 – 2008.
- Applied spatial models to inform regulatory and restoration policies for fish, coral, and seagrass communities.
- Led scientific diving operations (200+ AAUS dives) to validate spatial products and conduct ecosystem assessments.

RECENT PUBLICATIONS

Muller-Karger, F., Canonico, G., VanSumeren, H., Myers, C., Ogburn, M., Hammerschlag, Neil, Pendleton, L., Motyka, J., Thompson, L., Montes, E., **McEachron, L.,** Pearlman, J., Brenner, J., Williams, B., Kavanaugh, M., and Biddle, M. 2025. A prosperous economy requires ocean biodiversity information, technology, and innovation. Marine Technology Society Journal, 59.

Dobbelaere, T., Holstein, D., Gramer, L., **McEachron, L.,** and Hanert, E. 2024. Investigating the link between the Port of Miami dredging and the onset of the stony coral tissue loss disease epidemics. Marine Pollution Bulletin, 207.

Dobbelaere, T., Holstein, D., Muller, E., Gramer, L., **McEachron, L.,** Williams, S., and Hanert, E. 2022. Connecting the dots: Transmission of Stony Coral Tissue Loss Disease from the Marquesas to the Dry Tortugas. Frontiers in Marine Science, 9.

Medina, M., Estes, C., Best, B., Stallings, C.D., Montes, E., **McEachron, L.,** and Muller-Karger, F.E. 2021. Reef-fish abundance, biomass, and biodiversity inside and outside no-take marine zones in the Florida Keys National Marine Sanctuary: 1999-2018. Oceanography 34.

Moura, A., Beck, B., Duffey, R., **McEachron, L.,** Miller, M., Moore, J., Moulding, A., and Winters, R.S. 2021. Integrating coral restoration data with a novel coral sample registry. Frontiers in Marine Science, 934.

RECENT GRANT-FUNDED RESEARCH

Muller-Karger, F., Otis, D., Rueda-Roa, A., Murray, T., Kavanaugh, M., Brenner, J., Simoniello, C., Dorton, J., Montes, E., Kelble, C., Montenero, K., Thompson, L., Trinanes, J., Hammerschlag, N., **McEachron, L.,** Best, B., Brown, J., Benson, A. The Southeast US Marine Biodiversity Observation Network (MBON): Toward operational marine life data for conservation and sustainability. NOAA. 2022 – 2027.

McEachron, L., Reed, D., Bochenek, R., Lopez, J., Montes, E., Muller-Karger, F. Augmenting ocean observing through artificial intelligence: Annotation, data standards, andapplications. Southeast Coastal Ocean Observing Regional Association. NOAA. 2021 – 2026.

McEachron, L., Duffey, D., Bruckner, A., Bohnsack, K., Kelble, C., Fine, A., Otis, D., Murray, T., Muller-Karger, F. Florida's Coral Reef water quality data compilation, analysis, and decision support. Florida DEP. 2020 – 2025.

Florida Fish and Wildlife Research Institute. Hurricane Irma fishery disaster grant to support coral rescue, coral nursery expansion, and coral genetic registry. NOAA. 2019 – 2023.

RECENT PRESENTATIONS

Kochan, D., **McEachron, L.**, Denton, T., Burnsed, S., Bickford, J., Lowerre-Barbieri, S. Developing a Machine Learning-Powered Boat Detector for Underwater Acoustic Data. *Florida Keys Marine Science Conference*, Fort Lauderdale, FL, October 2025.

Holstein, D., Dobbelaere, T., Gramer, L., **McEachron, L.,** Muller, E., Williams, S., Hanert, E. A reef's network is its net worth - the benefits of population connectivity to coral restoration in an age of change and emergent disease. *Reef Futures*, Quintana Roo, MX December 2024.

McEachron, L., Kochan, D., Alcaraz, N., Gentry, L., Montes, E., Otis, D. Building a gateway for marine AI applications to promote annotations, repeatable use cases, and data standards. *Ocean Sciences*, New Orleans, LA, February 2024.

Holstein, D., Bloomberg, J., Brandt, M., Ennis, R., Farmer, B., Limber, B., Meiling, S., Rosin, A., Smith, T., Dobbelaere, T., Hanert, E., Gramer, L., **McEachron, L.,** Muller, E., Williams, S. Spatially and temporally realistic disease dispersal and epidemic modeling of SCTLD in Florida and the US Virgin Islands. *International Coral Reef Symposium*, Bremen, DE July 2022.

SYNERGISTIC ACTIVITIES

Member

- Ecopath Research and Development Consortium, 2025 – Current.
- Ocean Life Forum 2.0 Working Group, National Oceanographic Partnership Program, 2025.
- Ecosystem Science and Management Working Group, NOAA Science Advisory Board, 2024 – Current.
- Doctoral Committee, Jessica Keller, University of Florida, 2023 – Current.
- GIS Managers and Imagery Workgroups, State of Florida Geographic Information Office, Florida Department of Environmental Protection, 2021 – Current.
- Florida Keys and South Florida Ecosystem Connectivity Team, Florida Keys National Marine Sanctuary Advisory Council, 2021 – Current.
- Southeast Coastal Ocean Observing Regional Association, 2020 – Current.
- Gulf of Mexico Coastal Ocean Observing System, 2020 – Current.
- Ecosystem Based-Management and Marine Spatial Planning Panel, IOC-UNESCO Marine Spatial Planning Global Initiative, 2020.
- Ecopath Modeling Team and Model Review Workgroup, South Atlantic Fishery Management Council, 2019 – Current.
- Marine Biodiversity Observation Network, IOC-UNESCO Marine Spatial Planning Forum, 2019.
- Modeling Community of Practice, Florida Institute of Oceanography, 2018.
- Food Webs and Connectivity Writing Team, South Atlantic Fishery Management Council, 2015.
- Planning Team, Southeast Acoustics Consortium, 2014 – Current.

Claire McGrath
Claire@secoora.org
(301) 875-7555
Title: Director, Southeast & Caribbean Disaster Resilience Partnership (SCDRP)
Development & Events Coordinator, Southeast Coastal Ocean Observing Regional Association (SECOORA)

Summary: Collaborative nonprofit professional with 10 years of experience leading programs, building cross-sector partnerships, and managing initiatives that strengthen community resilience and social impact. Experienced in strategic program development, stakeholder engagement, event and partnership management, and grant support. Adept at bringing diverse groups together to advance shared goals and mission-driven work.

WORK EXPERIENCE

Southeast and Caribbean Disaster Resilience Partnership (SCDRP)

- Director - February 2026 - Present
- Interim Director - July 2025-February 2026
- Program Coordinator - May 2024-July 2025

Southeast Coastal Ocean Observing Regional Association (SECOORA)

- Development & Events Coordinator - November 2025 - Present
- Events Specialist - January 2025-November 2025

L'Arche Jacksonville

- Community Project Manager (Contract) - January 2023 - January 2025
- Director of Community Life - July 2018 - January 2023
- Outreach Coordinator - October 2016 - July 2018
- House Coordinator - July 2015 - July 2018

North Guana Outpost

- Lead Kayak Guide - April 2024 - Present

Environmental Traveling Companions

- Sea Kayak Guide/Program Intern - April 2023 - November 2023

Student Conservation Association

- Crew Leader - June 2022-August 2022

EDUCATION

Mount St. Mary's University, Emmitsburg, Maryland— Bachelor of Science in Biology, Psychology Minor, August 2011 - May 2015

VOLUNTEER

Board of Directors, L'Arche Jacksonville

September 2025 - Present

Certifications

CPR/First Aid (American Heart Association)
Wilderness First Aid (Solo)

Erin L. Meyer-Gutbrod

Assistant Professor
School of Earth, Ocean and Environment
University of South Carolina
Columbia, SC 29208

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Phone: (216) 548-9082
E-mail: emgutbrod@seoe.sc.edu
Office: 701 Sumter St. EWS 407

RESEARCH INTERESTS

Population, Community and Ecosystem Dynamics
Anthropogenic Impacts on Marine Ecosystems
Demographic, Spatial, and Statistical Modeling
Quantitative Approaches to Conservation Forecasting and Management

EDUCATION

Ph.D. Cornell University, Earth and Atmospheric Sciences 2016
Ocean Resources and Ecosystems Program
Committee: Charles Greene (Chair), Patrick Sullivan, Bruce Monger, Christopher Clark

B.S. University of Notre Dame, Physics Department 2008
Dual major: Physics, Philosophy; Minor: Spanish

PROFESSIONAL EXPERIENCE

Assistant Professor, School of the Earth, Ocean and Environment 2020 - present
University of South Carolina

Adjunct Professor, Department of Biological Sciences 2020 - present
University of South Carolina

Postdoctoral Scholar, Marine Science Institute; University of California, Santa Barbara 2017 - 2020
Research funded by the Bureau of Ocean Energy Management assessing the net environmental benefit of oil platform decommissioning scenarios on southern California marine ecosystems

Postdoctoral Associate, Cornell University 2016 - 2017
Joint appointment with the Atkinson Center for a Sustainable Future and the Environmental Defense Fund. Collaboration with the Center for Computational Sustainability. Development of a Mobile Ocean Observing Network to enhance fishery acoustic stock assessment

Research Assistant, Cornell University Spring 2010, 2011
Worked with mechanical and electrical engineers to implement active sonar on the Liquid Robotics Wave Glider, an unmanned, robotic, oceanographic and atmospheric sensing platform.:. Conducted field trials at Kawaihae Harbor, HI to test multiple echo sounder configurations on the Wave Glider sensing system.

SELECTED GRANTS AND FELLOWSHIPS

NOAA / SECOORA ($210k total; $70k to USC) Lead PI: Edwards 2025-2027
Near real-time glider-based passive acoustic monitoring of right whales in the Southeast US

Maine Community Foundation ($150,523 total; $65,715 to USC) 2024-2026
Real-time Acoustic Detections of right whales in the Southeast US to mitigate vessel strikes

NSF ($1.2M total; $323k to USC) Lead PI: **Meyer-Gutbrod** 2023-2026
Climate and adaptation deficits: Mechanisms of response to climate change by the endangered North Atlantic right whale

California State Lands Commission Lead: UCSB; ($18k to **Meyer-Gutbrod**) 2023-2024
Platform Holly Decommissioning Project Environmental Impact Report Preparation: Santa Barbara County, California

Bureau of Ocean Energy Management ($474,728 total; $14,833 to USC) 2021-2023
Assessing Population Effects of Offshore Wind Development on North Atlantic Right Whales

Department of Defense ($182,500) Lead PI: **Meyer-Gutbrod** 2012-2015
National Defense Science and Engineering Graduate Fellowship

PROFESSIONAL ACTIVITIES AND AWARDS

Lead Analyst for Southeast US Real-Time Passive Acoustic Monitoring 2022-now
Platforms: Norfolk buoy, Charleston buoy, Savannah buoy, UGA glider
Triggered 15 NOAA Slow Zones for right whale vessel strike risk reduction

USC McCausland Faculty Fellow ($40,000) 2025

Marine Mammal Commission – Committee of Scientific Advisors 2024-now

Atlantic Large Whale Take Reduction Team 2024-now

North Atlantic Right Whale Consortium Board 2024-now

Atlantic Scientific Review Group (NOAA & US FWS) 2024-now

Regional Wildlife Science Collaborative for Offshore Wind 2021-now
Marine Mammal Subcommittee

National Academy of Sciences Committee – Offshore wind / right whale prey 2023-2024

Press coverage >200 news articles and podcasts, including NYTimes, NPR, Forbes, CBC

TEACHING EXPERIENCE

Biology of Marine Organisms (MSCI 311 - USC) 2021, 2022, 2023, 2024, 2025

Marine Data Science with R (MSCI 709 - USC) 2021, 2022, 2023, 2025, 2026

Hands-on, project-oriented exposure to current approaches for research in marine science, ecology and environmental science using R, RStudio, RMarkdown, Git and GitHub. Covers programming, data manipulation and visualization, linear models, GLMs, spatial analysis

SELECTED PUBLICATIONS (PEER-REVIEWED)

Telford, K.A., John Calambokidis, Kiirsten Flynn, Jasmine Witt, Alie Perez, John Durban, Holly Fearnbach, **Erin L. Meyer-Gutbrod**. 2025. How robust is *Eschrichtius robustus*? A novel photographic index of body condition from boat-based photographs of gray whales. Marine Mammal Science. https://doi.org/10.1111/mms.70091

Indeck, K.L., M.F. Baumgartner, L. Lecavalier, F. Whoriskey, D. Durette-Morin, N.R. Pettigrew, J.M. McSweeney, L.H. Thorne, K.L. Gallagher, C.R. Edwards, **E. Meyer-Gutbrod**, and K.T.A. Davies. 2025. Glider surveillance for near-real-time detection and spatial management of North Atlantic right whales. In *Frontiers in Ocean Observing*. *Oceanography* 38. https://doi.org/10.5670/oceanog.2025.306

Enrico Pirotta, Peter L. Tyack, Jeffrey Adams, Michael Asaro, Phil J. Bouchet, Daniel Crocker, John W. Durban, Ailsa J. Hall, Catriona M. Harris, Amy R. Knowlton, Scott D. Kraus, Caroline Lehoux, Daniel Linden, Caroline P. Good, **Erin Meyer-Gutbrod**, Alicia S. Miller, Carolyn A. Miller, Patrick J. O. Miller, Michael J. Moore, Chris Orphanides, Eric M. Patterson, Heather M. Pettis, Theoni Photopoulou, Stéphane Plourde, Nicholas R. Record, Jessica V. Redfern, Jason J. Roberts, Robert S. Schick, Burton Shank, Laura Solinger, Brandon L. Southall, Marisa L. Trego, Len Thomas. 2025. The multiple scales of combined stressor effects in an endangered, long-lived species: lessons learnt and ways forward. *Ecological Applications*. http://dx.doi.org/10.1002/eap.70144

Meyer-Gutbrod, E.L., Davies, K.T.A.D., Johnson, C.L., Plourde, S., Sorochan, K.A., Kenney, R.D., Christian Ramp, Gosselin, J.F., Lawson, J.W., Greene, C.H. 2023. Redefining North Atlantic right whale habitat-use patterns under climate change. *Limnology & Oceanography*. https://doi.org/10.1002/lno.12242

Meyer-Gutbrod, E.L., C.H. Greene, K.T.A. Davies, and D.G. Johns. 2021. Ocean regime shift is driving collapse of the North Atlantic right whale population. *Oceanography* 34(3):22–31, https://doi.org/10.5670/oceanog.2021.308. https://doi.org/10.5670/oceanog.2021.308

Meyer-Gutbrod, E.L., Love, M.S., Schroeder, D.M., Claisse, J.T., Kui, L., and Miller, R.J., 2020. Forecasting the legacy of offshore oil and gas platforms on fish community structure and productivity. *Ecological Applications*. https://doi.org/10.1002/eap.2185

Meyer-Gutbrod, E.L., C.H. Greene, and K.T.A. Davies. (2018). Marine species range shifts necessitate advanced policy planning: The case of the North Atlantic right whale. *Oceanography* 31(2). https://doi.org/10.5670/oceanog.2018.209

Meyer-Gutbrod, E. L., & Greene, C. H. (2018). Uncertain recovery of the North Atlantic right whale in a changing ocean. *Global change biology*, 24(1), 455-464. https://doi.org/10.1111/gcb.13929

Meyer-Gutbrod EL, Greene CH, Sullivan PJ, Pershing AJ (2015) Climate-associated changes in prey availability drive reproductive dynamics of the North Atlantic right whale population. *Marine Ecology Progress Series*. 535:243-258. https://doi.org/10.3354/meps11372

Meyer-Gutbrod EL, Greene CH, McGarry LP (2015) Wave Glider Technology For Fisheries Research. *Sea Technology.* 56(12):16-19.

Greene CH, **Meyer-Gutbrod E**, Monger BC, et al. (2013) Remote climate forcing of decadal-scale regime shifts in Northwest Atlantic shelf ecosystems. *Limnology and Oceanography*. 58:803-816. https://doi.org/10.4319/lo.2013.58.3.0803

Eric W. Montie
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EDUCATIONAL BACKGROUND

MIT/WHOI	PhD, Biological Oceanography	2006
Clemson University	MS, Environmental Toxicology	1999
Harvard University	Post-baccalaureate studies (Biochemistry)	1994
Univ. Rhode Island	BS, Zoology	1993

APPOINTMENTS AND PROFESSIONAL EXPERIENCES

USC Beaufort	Professor of Biology	2025 - Present
USC Beaufort	MS Computational Science Advisor	2022 - Present
College of Charleston	MS Marine Biology Advisor	2016 – Present
USC Beaufort	Associate Professor of Biology	2016 – 2025
USC Beaufort	Assistant Professor of Biology	2011 – 2016
Univ. South Florida	Research Associate (Neuroimaging)	2008 – 2010
Univ. South Florida	Postdoctoral Fellow (Marine Bioacoustics)	2007 – 2008
WHOI	Postdoctoral Investigator (Marine Chemistry)	2006 – 2007
NOAA/NOS	Research Biologist (Marine Mammals)	1999 – 2000

DISTINGUISHED AWARDS

2021 Governor's Award for Excellence in Scientific Research at a PUI
2013 Breakthrough Rising Star, USC Columbia (15 selected of 2000 faculty)
2003 EPA STAR Fellowship

RESEARCH INTERESTS

- Sensory and neurobiology of aquatic animals
- Bioacoustics and marine soundscapes
- Population ecology of fish and marine mammals
- Impacts of stressors on marine organisms and ecosystems (i.e., chemical pollution, noise pollution, dredging, climate change)

RELEVANT PUBLICATIONS

1. Wall, C.C, McKenna M., Hatch, L.T., Van Parijs, S.M., Bochenek, R., Dugan, P., Parcerisas, C., Ryan, J., Anderson, C.D., Becker, K., Berchok, C., Biddle, M., Boebel, O., Canino, A., Canonico, G., Cline, D., Davis, G.E., Frasier, K., Gedamke, J., Haver, S.M., Khazmutdinova, K., Kinneging, N., Kumar, A., Marian, A., Miksis-Olds, J., **Montie, E.W.**, Ponirakis, D., Rice, A.N., Rowell, T.J., Rueda, C., Shumchenia, E., Shyka, T., Staaterman, E., Thomisch, K. (2025). Big data, sound science, lasting impact: a framework for passive acoustic monitoring. *Big Earth Data*, 1–35.
2. Flem, S., Berns, G., Iglis, B., Niederhut, D., **Montie, E.W.**, Deacon, T., Miller, K.L., Tyack, P., Cook, P.F. (2025). Lateralized cerebellar connectivity differentiates auditory pathways in echolocating and non-echolocating whales. *PLoS ONE* 20(6): e0323617.
3. Ji, Y., Marian, A.D., **Montie, E.W.** (2024). Deep-Learning-Based detection of recreational vessels in an estuarine soundscape in the May River, South Carolina, USA. *PLoS ONE* 19(7), e0302497.
4. Tribble, C., Monczak, A., Transue, L., Marian, A., Fair, P., Balmer, B., Ballenger, J., Baker, H., Weinpress-Galipeau, M., Robertson, A., Strand, A., **Montie, E.W.** (2023). Enhancing interpretation of cetacean acoustic monitoring: investigating factors that influence vocalization patterns of Atlantic bottlenose dolphins in an urbanized estuary, Charleston Harbor, South Carolina, USA. *Aquatic Mammals*, 49(6), 519-549.
5. Transue, L., Monczak, A., Tribble, C., Marian, A., Fair, P., Ballenger, J., Balmer, B., **Montie, E.W.** (2023). The biological and anthropogenic soundscape of an urbanized port – the Charleston Harbor estuary, South Carolina, USA. *PLoS ONE* 18(4), e0283848. **(PRESS RELEASE)**
6. Monczak, A., McKinney, B., Soueidan, J., Marian, A., Seder, A., May, E., Morgenstern, T., Roumillat, W., **Montie, E.W**. (2022). Sciaenid courtship sounds correlate with juvenile appearance and abundance in the May River, South Carolina, USA. *Marine Ecology Progress Series*, 693, 1-17. **(FEATURE ARTICLE).**
7. Song, Z., Salas, A.K., **Montie, E.W**., Laferriere, A., Zhang, Y., Mooney, T.A. (2021). Sound pressure and particle motion components of the snaps produced by two snapping shrimp species (*Alpheus heterochaelis* and *Alpheus angulosus). The Journal of the Acoustical Society of America* 150, 3288-3301
8. Soueidan, J., Warren, A., Pearson, M., **Montie, E.W.** (2021). A changing estuary: understanding historical patterns in salinity and fecal coliform levels in the May River, SC. *Marine Pollution Bulletin* 168, 112384
9. Marian, A.D., Monczak, A., Balmer, B.C., Hart, L.B., Soueidan, J., **Montie, E.W.** (2021). Long-term passive acoustics to assess spatial and temporal vocalization

patterns of Atlantic common bottlenose dolphins (*Tursiops truncatus*) in the May River estuary, South Carolina. *Marine Mammal Science* 37, 1060-1084.

10. Monczak, A., McKinney, B., Mueller, C., **Montie, E.W.** (2020). What's all that racket! Soundscapes, phenology, and biodiversity in estuaries. *PLoS ONE* 15(9), e0236874.
11. Mueller, C., Monczak, A., Soueidan, J., McKinney, B., Smott, S., Mills, T., Ji, Y., **Montie, E.W**. (2020). Sound characterization and fine-scale spatial mapping of an estuarine soundscape in the southeastern USA. *Marine Ecology Progress Series* 645, 1-23. **(FEATURE ARTICLE)**.
12. Monczak, A., Mueller, C., Miller, M.E., Ji, Y., Borgianini, S.A., **Montie, E.W.** (2019) Sound patterns of snapping shrimp, fish, and dolphins in an estuarine soundscape of the southeastern USA. *Marine Ecology Progress Series* 609, 49-68.
13. Monczak, A., Ji, Y., Soueidan, J., **Montie, E.W.** (2019). Automatic detection, classification, and quantification of sciaenid fish calls in an estuarine soundscape in the Southeast United States. *PLoS ONE* 14(1), e0209914.
14. Smott, S., Monczak, A., Miller, M., **Montie, E.W.** (2018). Boat noise in an estuarine soundscape – a potential risk on the acoustic communication and reproduction of soniferous fish in the May River, South Carolina. *Marine Pollution Bulletin* 133, 246-260.
15. Monczak, A., Berry, A., Kehrer, C., **Montie, E.W.** (2017). Long-term acoustic monitoring of fish calling provides baseline estimates of reproductive timelines in the May River estuary, southeastern USA. *Marine Ecology Progress Series* 581, 1-19. **(FEATURE ARTICLE)**.
16. **Montie, E.W.**, Hoover, M., Kehrer, C., Yost, J., Brenkert, K., O'Donnell, T., Denson, M.R. (2017). Acoustic monitoring indicates a positive relationship between calling frequency and spawning in captive spotted seatrout (*Cynoscion nebulosus*). *PeerJ* 5:e2944; DOI 10.7717/peerj.2944.
17. **Montie, E.W.**, Kehrer, C., Yost, J., Brenkert, K., O'Donnell, T., Denson, M.R. (2016). Long-term monitoring of captive red drum (*Sciaenops ocellatus*) reveals that calling incidence and structure correlate with egg deposition. *Journal of Fish Biology* 88, 1776-1795.
18. Colon-Perez, L.M., Spindler, C., Goicochea, S., Triplett, W., Parekh, M., **Montie, E**., Carney, P., Price, C., Mareci, T. (2015). Dimensionless, scale invariant, edge weight metric for the study of complex structural networks. *PLOS ONE*. 10(7): e0131493. doi:10.1371/journal.pone.0131493.
19. **Montie, E.W.**, Vega, S., & Powell, M. (2015). Seasonal and spatial patterns of fish sound production in the May River, South Carolina. *Transactions of the American Fisheries Society* 144, 705-716.

TIMOTHY S. MOORE

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Florida Atlantic University
Ft Pierce, FL, 34946
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PROFESSIONAL PREPARATION:

University of New Hampshire, Durham NH USA	*Ph.D. Earth Science*	01/2002 - 05/2008
University of Rhode Island, Narragansett, RI	*M.S. Biological Oceanography*	01/1993 - 12/1995
Worcester Polytechnic Institute, Worcester, MA	*B.S. Electrical Engineering*	08/1984 - 12/1988

APPOINTMENTS AND POSITIONS:

Associate Research Professor, Harbor Branch Oceanographic Institute,
Florida Atlantic University Fort Pierce, FL 2019 - present
Assistant Research Professor, *University of New Hampshire*
Durham, NH 2014 - 2019
Research Scientist, *University of New Hampshire*
Durham, NH 1996 - 2014
Electronics Engineer, *Naval Undersea Warfare Center,*
Newport, RI 1989-1996

PRODUCTS

Jiang, M., Brereton, A., Beckler, J., **Moore, T.**, Brewton, R., Hu, C., Lapointe, B., McFarland, M. Modeling water quality and cyanobacteria blooms in Lake Okeechobee: I. Model descriptions, seasonal cycles, and spatial patterns, Ecological Modelling, 502, 2025, https://doi.org/10.1016/j.ecolmodel.2025.111018.

Kolluru, S., Rivero-Calle, S., Bresnahan, P., Kratzer, S., **Moore, T**., Schroeder, T., Bailey, S., Holmes, A., Morrison, J., Feldman, G., Hong, L., Higa, H., and Arai, K. Accuracy of Seahawk-Hawkeye Ocean Color Cubesat Remote Sensing Reflectance Products in Globally Distributed Aquatic Sites. http://dx.doi.org/10.2139/ssrn.5248913

Moore, T.S., Kolluru, S., Tonizzo, A. and Twardowski, M.S. A bio-optical inversion scheme based on the radiative transfer equation, *Optics Express*, 32, 41270-41296 (2024).

Barua, R., Sanborn, D., Nyman, L., McFarland, M., **Moore, T**., Hong, J., Garrett, M. and Nayak, A. In situ inline digital holographic microscopy for rapid detection and monitoring of the

harmful dinoflagellate, *Karenia brevis*, *accepted, Harmful Algae Mar;123:102401* (2023), doi: 10.1016/j.hal.2023.102401.

Smith, B., Pahlevan, N., Schalles, J., Ruberg, S., Errera, R., Ma, R., Giardino, C., Bresciani, M., Barbosa, C., **Moore, T.** and Fernandez, V., A Chlorophyll-a Algorithm for Landsat-8 Based on Mixture Density Networks, *Frontiers Remote Sensing,* 266, doi: 10.1016/j.rse.2021.112693 (2021).

Zhai, S., Twardowski, M., Hedley, J., McFarland, M., Nayak, A. and **Moore, T**. Optical backscattering and linear polarization properties of the colony forming cyanobacterium *Microcystis, Optics Express*, 28, doi:10.1364/OE.405871 (2020).

Moore, T.S. and Brown, C.W. Incorporating Environmental Data in Abundance-based Algorithms for Deriving Phytoplankton Size Classes in the Atlantic Ocean, *Remote Sensing of Environment*, 240, doi: 10.1016/j.rse.2020.111689, (2020).

Beckler J.S., Arutunian, E., **Moore, T**., Currier, B., Milbrandt, E. and Duncan, S. Coastal Harmful algae bloom monitoring via a sustainable, sail-powered mobile platform. *Front. Mar. Sci.* 6:587. doi: 10.3389/fmars.2019.00587, (2019).

Sathyendrenath, S., R.J.W. Brewin, C. Brockmann, V. Brotas, B. Calton, A. Chuprin, P. Cipollini, A. Cuoto, J. Dingle, R. Doerffer, C. Donlon, M. Dowell, A. Farman, M. Grant, S. Groom, A. Horseman, T. Jackson, H. Krasemann, S. Lavender, V. Martinez-Vicente, C. Mazeran, F. Melin, **T. Moore**, et al.. An Ocean-Colour Time Series for Use in Climate Studies: The Experience of the Ocean-Colour Climate Change Initiative (OC-CCI), *Sensors*, 19, doi: 10.3390/s19194285, (2019).

Moore, T.S., J. Churchill, J. Sullivan, M. Twardowski, M. McFarland, A. Nayak, N. Stockley, T. Johengen, S. Ruberg. Vertical distributions of blooming cyanobacteria populations in a freshwater lake from LIDAR observations, *Remote Sensing of Environment*, in press, (2019).

Moore, T.S., H. Feng, S. Ruberg, K. Beadle, S. Constant, R. Miller, T. Johengen, P. DiGiacomo, V. Lance, B. Holben and M. Wang. SeaPRISM observations in the western basin of Lake Erie in the summer of 2016, *Journal of Great Lakes Research*, https://doi.org/10.1016/j.jglr.2018.10.008, (2018).

Malayeri, H.Z., M. Twardowski, J. Sullivan, **T.S. Moore** and H. Choi. Correlation of cyanobacterial harmful bloom monitoring parameters: A case study on western Lake Erie, *AIMS Environmental Science*, 5(1): 24-34. doi: 10.3934/environsci.2018.1.24 (2018).

Eleveld MA, Ruescas AB, Hommersom A, **Moore TS**, Peters SWM, Brockmann C. An Optical Classification Tool for Global Lake Waters. *Remote Sensing*. 2017; 9(5):420. https://doi.org/10.3390/rs9050420

Moore, T.S., C. Mouw, J. Sullivan, M. Twardowski, A. Burtner, A. Ciochetto, M. McFarland, A. Nayak, D. Paladino, N. Stockley, T. Johengen, A. Yu, S. Ruberg, and A. Weidemann. Bio-optical properties of cyanobacteria blooms in western Lake Erie, *Frontiers in Marine Science* 4:300 (2017).

Trochta, J.T., C.B. Mouw, and **T.S. Moore**. "Remote sensing of physical cycles in Lake Superior using a spatio-temporal analysis of optical water typologies", *Remote Sensing of Environment*, 171, 149-161, 2015.

Moore, T.S., J.W. Campbell, and H. Feng. "Characterizing the uncertainties in spectral remote sensing reflectance for SeaWiFS and MODIS-Aqua based on global *in situ* matchup data sets", *Remote Sensing of Environment*, 159, 14-27, 2015

Justin Tyler Ridge

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National Estuarine Research Reserve
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Beaufort, NC 28516

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252-515-5427

EDUCATION

The University of North Carolina at Chapel Hill, Marine Sciences **Ph.D., 2017**
Florida Institute of Technology, Melbourne, FL, Biological Oceanography **M.S., 2010**
Hanover College, Hanover, IN, Biology **B.A., 2007**

PROFESSIONAL EXPERIENCE

Research Coordinator, North Carolina Coastal Reserve and NERR **2023-present**
Instructor, Environment+, Duke University **2022-present**

- Primary Instructor for the Quantitative Analysis of UAS Data online course
- Primary instructor for the NERRS UAS Data Analysis online course

Research Scientist, Duke University **2019-2023**

- Developing and testing remote sensing methods for mapping and assessing coastal ecosystems
- Enhancing natural resource management on Department of Defense lands through commercial drone technology demonstrations and training
- Instructor for the Drones in Marine Science summer course

Postdoctoral Associate, Duke University **2017-2019**

- Establishing remote sensing techniques and best practices for obtaining ecologically relevant data for oyster reefs and wetlands, including ecogeomorphology and community dynamics

RELEVANT PUBLICATIONS

Geesin, M. E., Tso, G. L., Sirianni, H., Narayan, S., Baillie, C. J., Malali, P. D., Puckett, B.J., **Ridge, J.T.,** & Gittman, R. K. (2025). Assessing the effects of engineered oyster reefs on shoreline change using drones. *Frontiers in Ecology and Evolution*, 13, 1616227**.**

Ridge, J. T., DiGiacomo, A. E., Rodriguez, A. B., Himmelstein, J. D., & Johnston, D. W. 2023. Comparison of 3D structural metrics on oyster reefs using unoccupied aircraft photogrammetry and terrestrial LiDAR across a tidal elevation gradient. *Remote Sensing in Ecology and Conservation*.

DiGiacomo, AE, Giannelli, R, Puckett, B., **Ridge, J. T**., & Davis, J. 2022. Considerations and Tradeoffs of UAS-based Coastal Wetland Monitoring in the Southeastern United States. *Frontiers in Remote Sensing*, 81.

Windle, A. E., Puckett, B., Huebert, K. B., Knorek, Z., Johnston, D. W., & **Ridge, J. T**. 2022. Estimation of Intertidal Oyster Reef Density Using Spectral and Structural Characteristics

Derived from Unoccupied Aircraft Systems and Structure from Motion Photogrammetry. *Remote Sensing*, *14*(9), 2163.

Gray, PC, Diego F. Chamorro, **Justin T. Ridge**, Hannah Rae Kerner, Emily A. Ury, David W. Johnston. 2021. Temporally Generalizable Land Cover Classification: A Recurrent Convolutional Neural Network Unveils Major Coastal Change through Time. *Remote Sensing* 13

Bost, Molly C., Antonio B. Rodriguez, **Justin T. Ridge**, Carson B. Miller, Stephen R. Fegley. 2021. Natural Intertidal Oyster Reef Growth Across Two Landscape Settings and Tidal Ranges. *Estuaries and Coasts*. 44(8), pp.2118-2131.

Ridge, Justin T., and David W. Johnston. 2020. Unoccupied Aircraft Systems (UAS) for Marine Ecosystem Restoration. *Frontiers in Marine Science* 7

DiGiacomo, Alexandra E., Walker E. Harrison, David W. Johnston, **Justin T. Ridge**. 2020. Elasmobranch Use of Nearshore Estuarine Habitats Responds to Fine-Scale , Intra-Seasonal Environmental Variation : Observing Coastal Shark Density in a Temperate Estuary Utilizing Unoccupied Aircraft Systems (UAS). *Drones* 4

Ridge, Justin T., Patrick C. Gray, Anna E. Windle, David W. Johnston. 2020. Deep Learning for Coastal Conservation: Automated Detection of Shellfish Reefs. *Remote Sensing in Ecology and Conservation* 6, 431-440

DiGiacomo, Alexandra E.; Clara N. Bird, Virginia G. Pan, Kelly Dobroski, Claire Atkins-Davis, David W. Johnston, **Justin T. Ridge**. 2020 Modeling Salt Marsh Vegetation Height Using Unoccupied Aircraft Systems and Structure from Motion. *Remote Sensing 12*, 2333.

OTHER PUBLICATIONS

North Carolina SET Community of Practice. 2024. Surface Elevation Trends in North Carolina's Coastal Wetlands.

Davis, J., R. Giannelli, C. Falvo, B. Puckett, **J. Ridge**, and E. Smith. 2022. BEST PRACTICES FOR INCORPORATING UAS IMAGE COLLECTION INTO WETLAND MONITORING EFFORTS: A Guide for Entry Level Users. NOAA Technical Memorandum NOS NCCOS 308, Silver Spring, MD. 26 pps.

Taylor, J. Christopher, David W. Johnston, **Justin T. Ridge**, Whitney Jenkins, Abbey Wakely, Debra Hernandez, Stephanie Robinson, John McCombs, Scott Eastman, and Kaitlyn Dietz. 2021. "Drones in the Coastal Zone: Report of a Regional Workshop for the US Southeast and Caribbean."

SYNERGISTIC ACTIVITIES

Member – North Carolina Coastal Federation Salt Marsh Steering Committee (as part of the implementation of the Salt Marsh Action Plan developed in coordination with the South Atlantic Salt Marsh Initiative [SASMI]) (2023-present)

Member – North Carolina Living Shorelines Research Subcommittee (2020-present)

Member – Albemarle-Pamlico National Estuary Partnership - Water Resources Monitoring & Assessment group. (2023-present)

Member – North Carolina Wetlands Mapping Interagency Workgroup (2021-present)

Teaching and Leading For Equity – completed multiple workshop series run by The Equity Paradigm as well as the Duke Human Rights Center and Franklin Humanities Center to identify systemic racism and develop a framework for applying a racial equity lens to our professional community. (2020-2022)

Joy Young

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Educational History

Middle Tennessee State University	Biology	B.S. 2006
Florida Atlantic University	Integrative Biology	Ph.D. 2015

Appointments

Florida Fish and Wildlife Research Institute (2008 – 2025)

Assistant Research Scientist, 2016 – present
Fish and Wildlife Biologist II, 2008 – 2016

The FACT Network (2008 – present)

Executive Director, 2023- present
Steering Committee Chair, 2021 – 2023
Senior Data Manager, 2018 – present
Data Manager, 2008 – 2018

Other Appointments

Chair, International Data Management Committee, Ocean Tracking Network, 2017 – present
Steering Group Member, Animal Tracking Network, The U.S. IOOS, Jan 2017 – present
Affiliate Scientist, Department of Biology, Florida Atlantic University, 2015 – present

Publications

1. Gallagher, R.M., **Young, J.M**., Crear, D.P., Krause, J.R., Perkinson, M., Yost, J.R., Ruderhausen, P.J., Darden, T.L., Allen, J.M., Whittington, J.A., Weng, K., Watson, A., Poland, S., Markwith, A., Waterson, C., Hager, C., and Buckel, J.A. 2024. Metapopulation structure and spawning site fidelity of cobia *Rachycentron canadum* on the U.S. east coast determined via acoustic telemetry, genetic ancestry, and network analysis. Canadian Journal of Fisheries and Aquatic Sciences. *In press*
2. Lowerre-Barbieri, S., Friess, C., Griffin, L.P., [and 27 others including **Young, J.**]. 2021. Movescapes and eco-evolutionary movement strategies in marine fish: Assessing a connectivity hotspot. Fish and Fisheries. DOI: 10.1111/faf.12589
3. Friess, C., Lowerre-Barbieri, S., Poulakis, G., [and 33 others including **Young, J**.]. 2020. Regional-scale variability in the movement ecology of marine fishes revealed by an integrative acoustic tracking network. Marine Ecology Progress Series. DOI: 10.3354/meps13637
4. **Young, J.M**., Yeiser, B.G., Whittington, J.A., and Dutka-Gianelli, J. 2020. Maturation of female common snook Centropomus undecimalis: implications for managing protandrous fishes. Journal of Fish Biology [online]. DOI: 10.1111/(ISSN)1095-8649
5. **Young, J.M**., Bowers, M.E., Reyier, E.A., Morley, D., Ault, E.R., Pye, J.D., Gallagher, R.M., and Ellis, R.D. 2020. The FACT Network: Philosophy, evolution, and management of a

collaborative coastal tracking network. Marine and Coastal Fisheries: Dynamics, Management, and Ecosystem Science [online serial]. DOI: 10.1002/mcf2.10100.

6. Bangley, C.W., Whoriskey, F.G., **Young, J.M**., and Ogburn, M.B.. 2020. Networked animal telemetry in the Northwest Atlantic and Caribbean waters. *Marine and Coastal Fisheries: Dynamics, Management, and Ecosystem Science* 12:339-347. DOI: 10.1002/mcf2.10128
7. Williams, B.L., K. Roberson, **J. Young**, and M.S. Kendall. 2019. Using acoustic telemetry to understand connectivity of Gray's Reef National Marine Sanctuary to the U. S. Atlantic coastal ocean. NOAA Technical Memorandum NOS NCCOS 259. Silver Spring, MD. 81 pp. DOI:10:25923/r2ma-5m96
8. Boucek, R., Barrientos, C., Bush, M.R., Gandy, D.A., Wilson, K.L., and **Young, J.M**. 2017. Trophic state indicators are a better predictor of Florida Bass condition compared to temperature in Florida's freshwater bodies. *Environmental Biology of Fishes* 1-12. DOI 10.1007/s10641-017-0635-9
9. **Young, J.M**., Yeiser, B.G., Ault, E.R., Whittington, J.A., and Dutka-Gianelli, J. 2016 Spawning site fidelity, catchment, and dispersal of common snook along the east coast of Florida. *Transactions of the American Fisheries Society* 145(2): 400-415. DOI: 10.1080/00028487.2015.1131741
10. Stevens, P.W., Blewett, D.A., Boucek, R.E., Rehage, J.S., Winner, B.L., **Young, J.M**., Whittington, J.A., and Paperno, R. 2016. Resilience of a tropical sport fish population to a severe cold event varies across five estuaries in southern Florida. *Ecosphere* 7(8): e01400.10.1002/ecs2.1400

Awarded Grants

1 Jul 2022 – 30 Jun 2023 (PI). "Improving the accuracy of publicly available animal movement information." NOAA Award No. NA21NOS0120097. Award: $80,000

1 Sept 2021 – 31 Aug 2024 (PI). "Reproductive characteristics and spawning migrations of Gulf of Mexico Cobia (*Rachycentron canadum*) along the Florida peninsula." Marine Fisheries Initiative. NOAA Award No. NA21NMF4330503. Award: $522,166

1 Sept 2021 – 31 Aug 2023 (Collaborating investigator). "Greater Amberjack Abundance in the Gulf of Mexico and South Atlantic." Sea Grant. Award: $84,083

1 Jan 2021 – 31 Dec 2021 (PI). "Incorporating acoustic telemetry data into coastal management." SECOORA 2020 RFP to Enhance Regional Ocean Data Sharing. NOAA Award No. NA16NOS0120028. Amended Award: $80,882

1 Feb 2019 – 31 Jan 2020 (Co-PI). Co-PI: SECOORA. "Enhancing the fisheries acoustic tracking network in South Florida." The Curtis and Edith Munson Foundation. Award: $36,175

1 Sept 2018 – 31 Aug 2019 (Collaborating investigator) PI: Matt Perkinson. "Combining acoustic telemetry and pop-up satellite archival tagging to improve data on cobia (*Rachycentron canadum)* migratory behavior and stock structure." Cooperative Research Program Award, NOAA. Award: $249,751

1 Sept 2018 – 31 Aug 2020 (Collaborating investigator) PI: Kevin Weng. "Understanding stock boundary and seasonal migration phenology of Atlantic cobia under a changing climate to inform management. Saltonstall-Kennedy Grant Program Award, NOAA. Award: $297,683

1 Jan 2016 – 31 Dec 2016 (Collaborating investigator) PI: Karl Brenkert. "Determining the stock boundary between South Atlantic and Gulf of Mexico managed stocks of Coastal Migratory Pelagic Cobia, *Rachycentron canadum*, through the use of acoustic telemetry and population genetics." Cooperative Research Program Award, NOAA. Award: $239,158

Gary A. Zarillo, Ph.D. PG
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Professional Experience

Dr. Zarillo has more than 40 years of experience in coastal ocean processes, marine geology, and sedimentology. Dr. Zarillo also has experience in the application of statistics and time-series analysis to environmental studies and the application of remote sensing methods in coastal and terrestrial environments. He has conducted applied and basic research on tidal inlet hydraulics, dynamics of barrier island systems, sediment transport mechanics, and the hydrodynamics of coastal and estuarine environments. Dr. Zarillo has applied 3D process and environmental models to coastal and estuarine environments for more than 25 years. Dr. Zarillo's current research is focused on adaptive management for coastal resiliency and coastal ocean sea-level processes

Professional Preparation

Ph.D. Geology, University of Georgia.
M.S. Geology, University of Rhode Island.
B.S. Geology, University of Rhode Island

Professional Registration

Professional Geologist - State of Florida (No. 1038) Licensed Geologist - State of North Carolina (No. 1001)

Appointments

Professor, Department of Ocean Engineering, Florida Institute of Technology, 1996-Present. Research Scientist. GKSS Research Center, Geesthacht, Germany, 1997-1998.

Associate Professor, Department of Oceanography/Ocean Engineering, Florida Tech, 1987-1996.

Assistant Professor, Marine Sciences Research Center, State University of New York at Stony Brook, 1982-l987.

Research Assoc. & Assistant Director Coastal Research Div., Department of Geology, University of South Carolina, 1979 -1982.

Principal Scientist: Scientific Environmental Applications, Inc. 1989-Present

Recent Refereed Publications

Reid Nichols, C., Donelson Wright, L., Zarillo, G. 2025. Integrated Coastal Resilience. Synthesis Lectures on Ocean Systems Engineering. Springer, Cham. https://doi.org/10.1007/978-3-031-68153-0_4

Construction of a Real-Time Forecast Model with Deep Learning Techniques for Coastal Engineering and Processes: Nested in a Basin Scale Suite of Models

Habib, M.A and Zarillo, 2024. Gulf Stream Effects on Sea Level Oscillations: Enhancing Performance of a Coastal and Estuarine Model Nested into Global Model through Modified Boundary Conditions. *J. Mar. Sci. Eng.* 2024, *12*(5), 775; https://doi.org/10.3390/jmse12050775

Zarillo, G.A. 2023 Inter-Annual Sea Level Change along a Barrier Island Coast. Front. Environ. Sci., 22 Sec. Interdisciplinary Climate Studies Volume 11 https://doi.org/10.3389/fenvs.2023.1107458

Habib, M. A., and Zarillo, G. A. 2023. Construction of a Real-Time Forecast Model for Coastal Engineering and Processes Nested in a Basin Scale Model. Journal of Marine Science and Engineering, 11(7), 1263

Rosario-Llantín, JA., Zarillo, G.A. 2022. Flushing rates and hydrodynamical characteristics of Mosquito Lagoon (Florida, USA). *Environ Sci Pollut Res* (2022). https://doi.org/10.1007/s11356-021-12367-1

Wright, L.D., D'Elia, C., Draayer, J., Nichols, R., Resio, D., Weiss, R., Zarillo, G. et al. 2020. Assessing and Planning for the Impacts of Storms, Flooding and Sea Level Rise on Vulnerable Gulf of Mexico Coastal Communities: A White Paper and Program Prospectus. Washington DC, Southeastern Universities Research Association. 28 pp. https:.//doi.org: 10.13140/RG.2.2.14809.47201

Nichols,C.R., Wright, L. D., Bainbridge, S.D., Cosby, Hénaff, A., Loftis,, J.D., Cocquempot,L., Katragadda, S., Mendez, G.R., Letortu, P., Le Dantec, N, Resio D., and Zarillo. G.A, 2019.

Collaborative Science to Enhance Coastal Resilience and Adaptation Frontiers in Marine Science, Front. Mar. Si https://doi.org/10.3389/fmars.2019.00404

Nichols C.R., Zarillo G., Delia C.F. (2019) Case Studies of Threatened and Vulnerable Coasts: Mid Atlantic Bight and Chesapeake Bay. Chapter 15 in: Wright L. Nichols C. (eds) Tomorrow's Coasts: Complex and Impermanent. Coastal Research Library, vol 27. Springer, Cham, 241-259

Wright, L.D. Zarillo. G. 2019. Case Studies of Threatened and Vulnerable Coasts: Florida: Chapter 15 in: Wright L. Nichols C. (eds) Tomorrow's Coasts: Complex and Impermanent. Coastal Research Library, vol 27. Springer, Cham, 221-239.

Recent Projects

Indian River Lagoon Circulation and Water Quality/HAB Forecast Model. FDEP Innovation Grant Program

Real Time and Forecast Coastal Processes Model of Sebastian Inlet Area, East Central Florida Coast https://realtimefl.github.io/Sebastian_Inlet/

Real Time and Forecast Coastal Processes Model of Port Everglades Area, SE Florida https://realtimefl.github.io/Real-Time-Forecast-Port-Everglades/

Restore Lagoon Inflow Research 20-22: Task 1- Modeling . Sponsored by Florida State Legislature and Florida Department of Education. $343,453

Hydrologic and Water Quality Model for Management and Forecasting within Brevard County Waters of the Indian River Lagoon. Florida Department of Environmental Protection. 2014-2018. $404,200

Hydrologic Model of Mosquito Lagoon Canaveral National Seashore- U.S. National Park Service, $190,000.