

# Plumbing the Depths & the Shallows: UGA's Coastal Research Units

**Merryl Alber**, Director, UGA Marine Institute

**Clark Alexander**, Director, UGA Skidaway Institute of Oceanography

**Mona Behl**, Associate Director, Marine Extension & Georgia Sea Grant

*May 13, 2025*

*Research* **Live**



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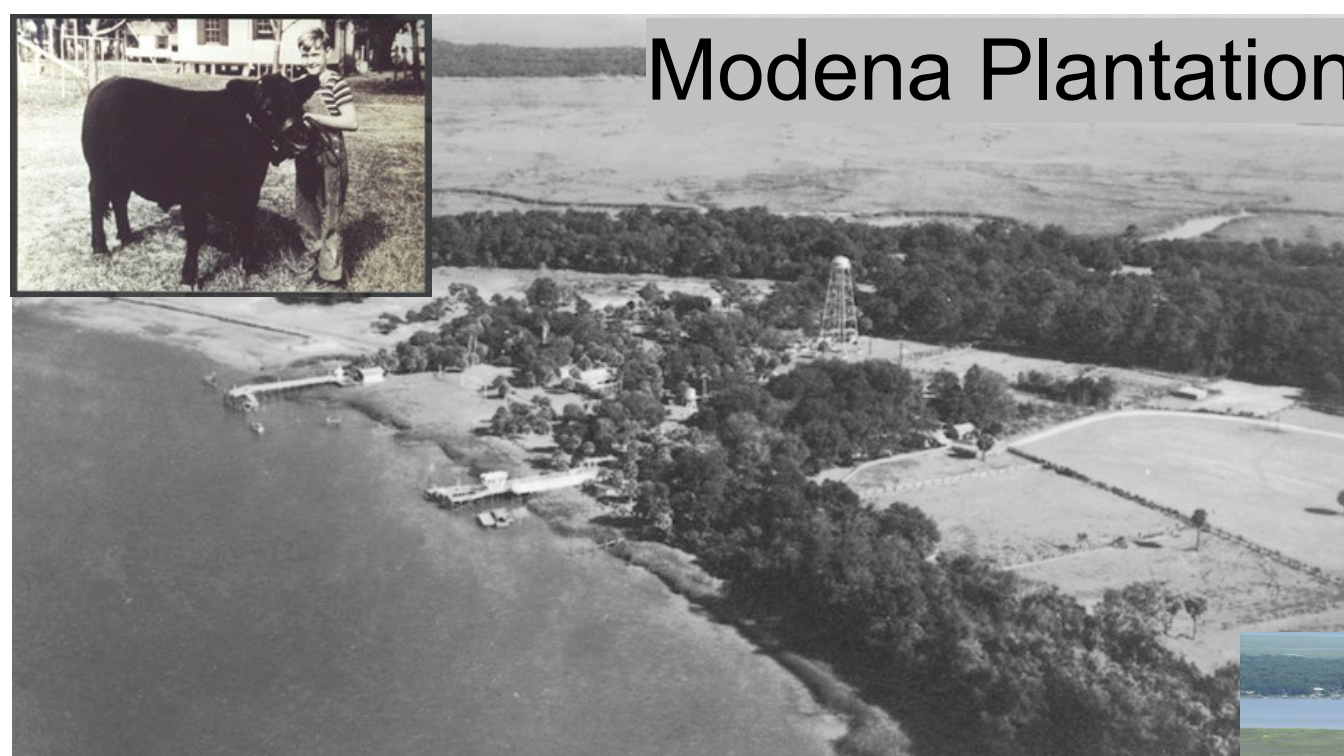


Skidaway Institute  
of Oceanography  
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**Clark Alexander**  
**Director**



# Modena Plantation



From cattle ranch to  
oceanographic research on  
Skidaway Island.



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# University of Georgia Skidaway Marine Science Campus



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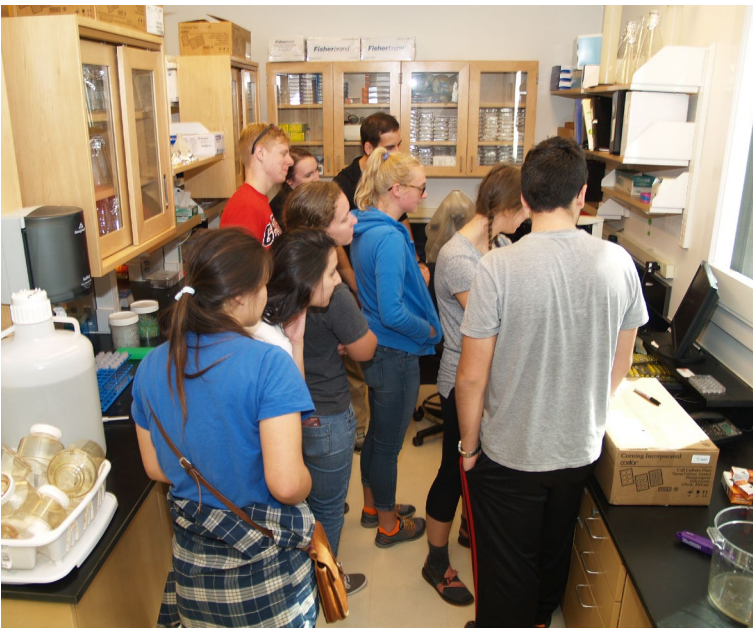
**Founded 1968 on land donated to the state of Georgia  
Joined UGA in 2013 to consolidate marine programs in the state**



**The Skidaway Institute serves as a hub for technologically advanced coastal and marine research and education in GA.**

The Institute's primary goals are:

- Conduct leading-edge research on coastal and marine systems to further our understanding of marine and environmental processes
- Train tomorrow's scientists and citizens
- Serve as a trusted expert resource for state and federal resource and policy management agencies





# Quick Skidaway Institute Facts

- 10 faculty – T/TT in UGA Dept. of Marine Sciences
- 3 Post-docs
- 17 graduate students
- 25 support staff
- 700 acre campus
- Provide water, sewer, utilities, fuel and network services to all campus partners
- \$3.5M state budget; \$8.5M operating



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# Special Facilities

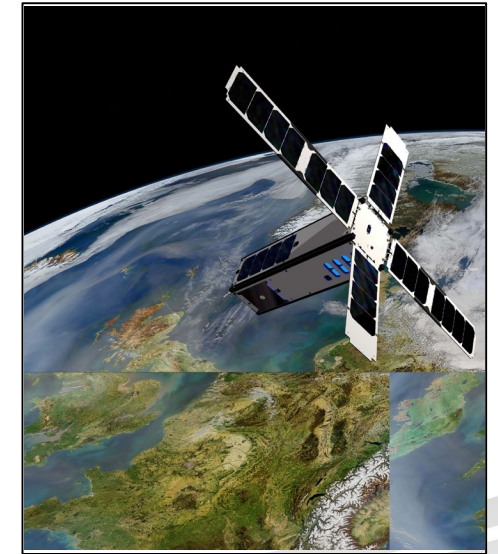
- The 104-foot Research Vessel *Savannah* and small boat fleet
- Advanced chemical, biological, geological and physical labs
- Specialized environmental chambers, flowing seawater system
- State-of-the-art interactive classrooms
- New hands-on teaching lab
- On-site skilled design and build support
- On-campus housing (35 long-term visitors)





Institute research spans the oceanographic disciplines and the globe:

- 4 biologists
- 3 chemists
- 2 physicists
- 1 geologist

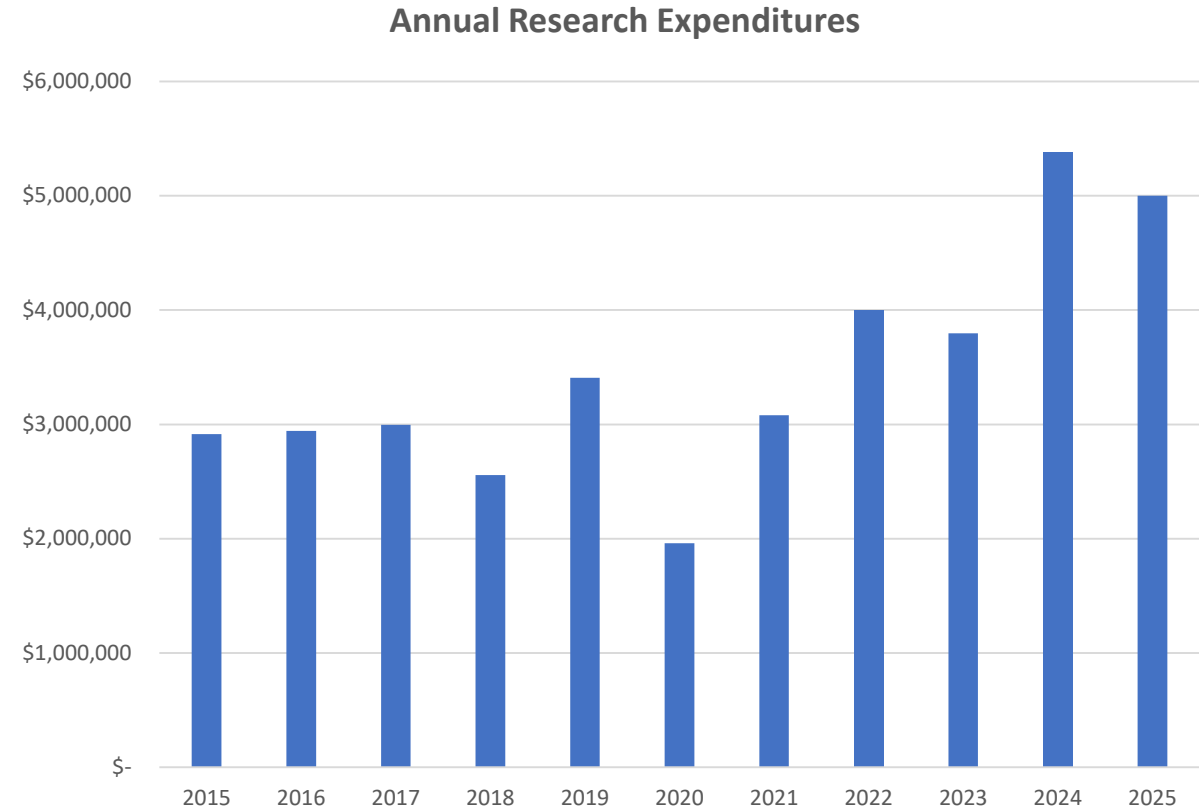


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## Research Supported by:

- Federal: NSF, NOAA, NASA, ONR, EPA, NPS, USACE, DOE, BOEM, USGS
- Foundation: Simons, Sloan, Moore
- State: Georgia Coastal Management Program, Georgia Sea Grant, DNR-CRD, UGA



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# Biological Oceanography



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- **Cohen Lab**
  - Molecular ecology, physiology and functional diversity of marine microbiomes
- **Frischer Lab**
  - Black Gill disease in shrimp, zooplankton nutrition
- **Greer Lab**
  - Zooplankton ecology, imaging technology and machine learning
- **Rivero-Calle Lab**
  - Bio-optical and satellite oceanography; phytoplankton productivity



# Chemical Oceanography

- **Brandes Lab**

- Marine carbon cycling and microplastics
- New Isotope RMS and Raman microscope

- **Buck Lab**

- Trace element geochemistry
- Clean labs and ICP-MS

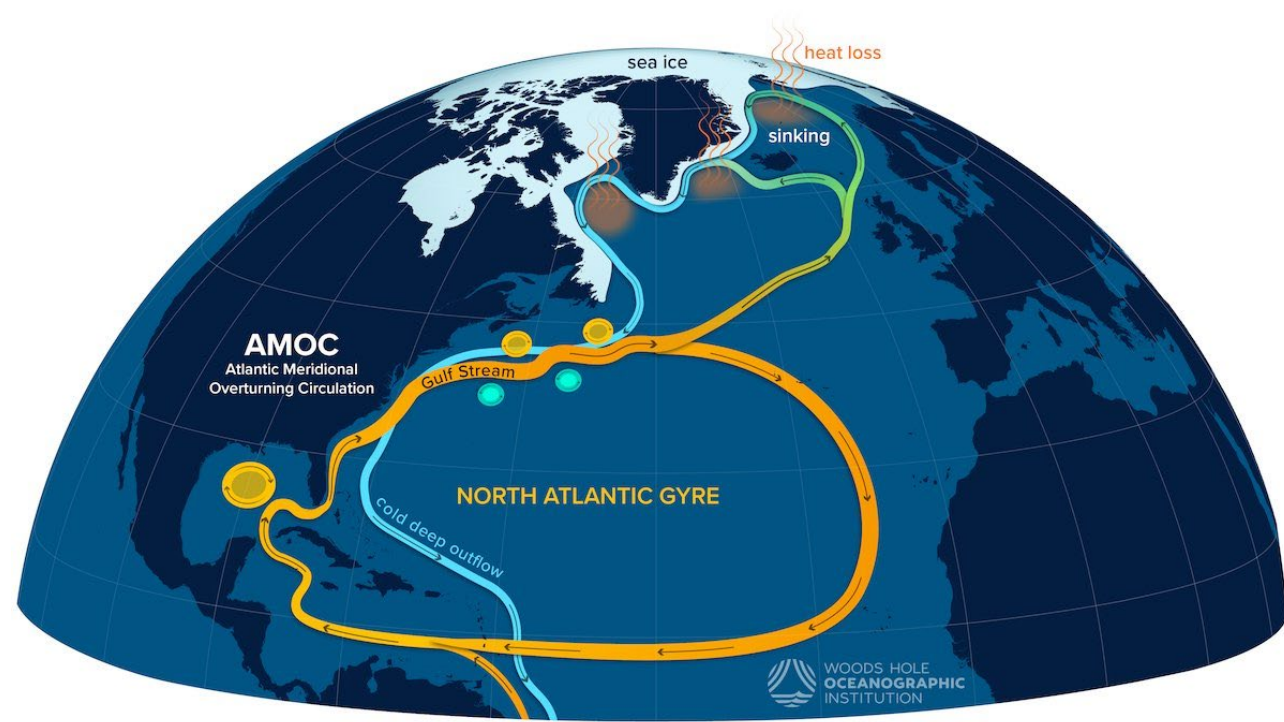
- **Ohnemus Lab**

- Marine particles and trace elements
- Trace metal clean CTD, clean lab



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# Physical Oceanography

- **Edwards Lab**
  - Coastal physical oceanography, marine robotics/autonomous sampling
- **Foukal Lab**
  - Physical oceanography, Atlantic Meridional Overturning Circulation (AMOC)



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# Geological Oceanography

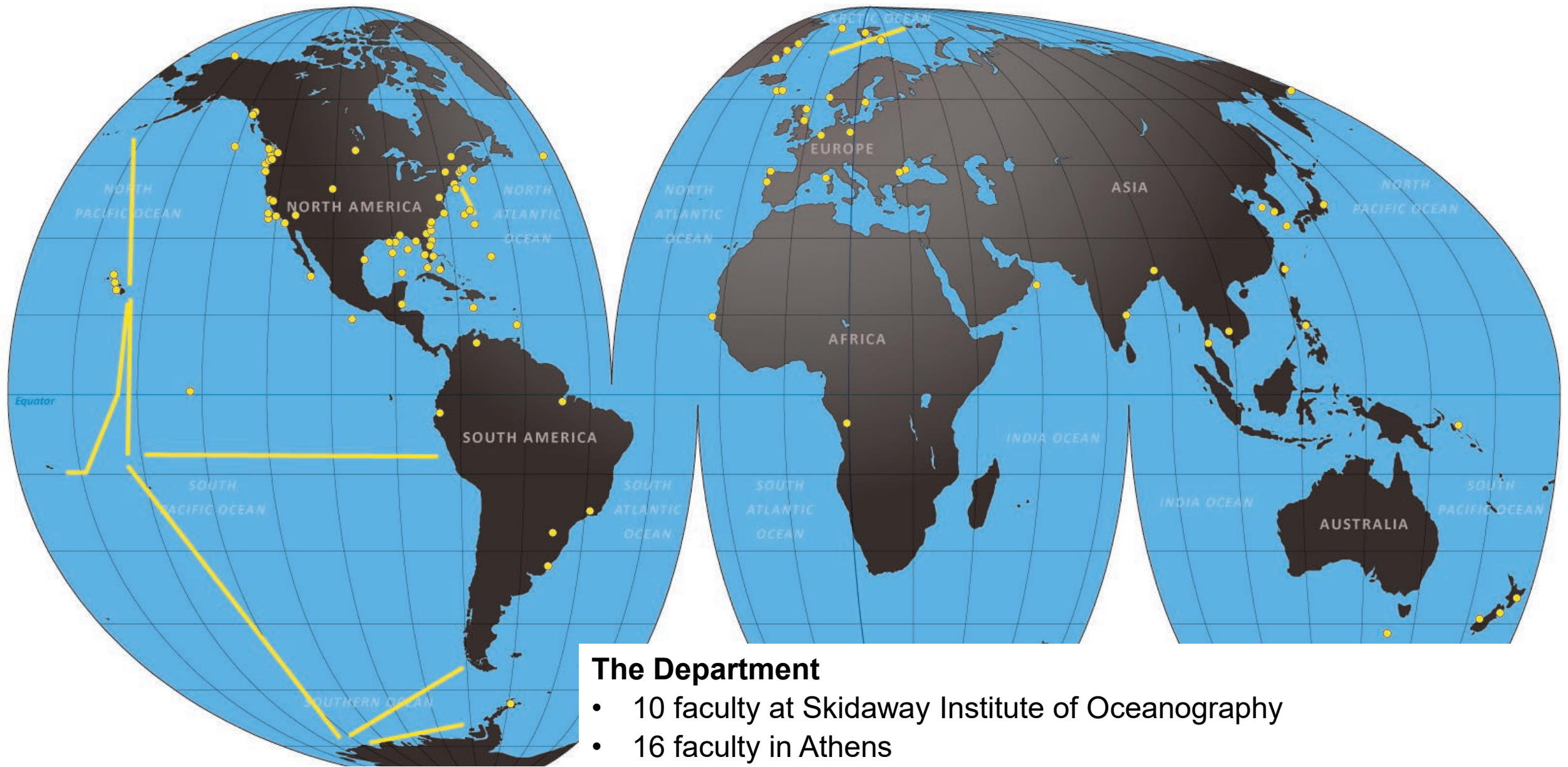
- **Alexander Lab**

- sediment processes and coastal change
- coastal and marsh resilience
- marine remote sensing and mapping
- sand resource assessment



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### The Department

- 10 faculty at Skidaway Institute of Oceanography
- 16 faculty in Athens
- 53 Graduate students (PhD and MSc)
- collaborations across campus with faculty in FCAS, COE, CED, Warnell, and Odum.



**Department of Marine Sciences**

*Franklin College of Arts and Sciences*

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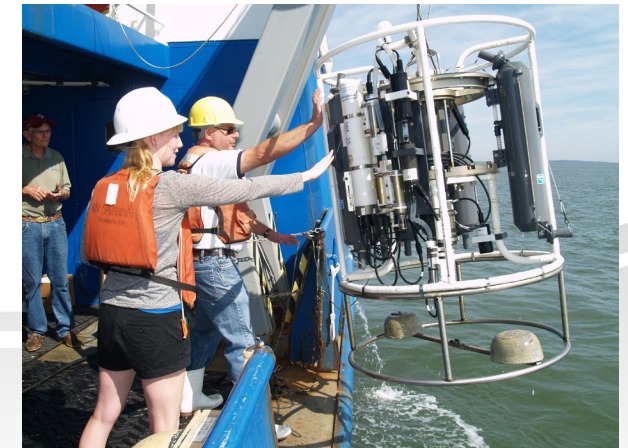
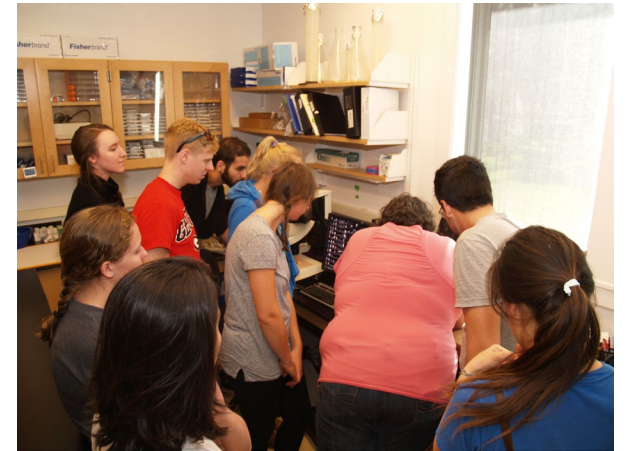
# Educational programs

## Graduate

- Athens and Skidaway-based course delivery
- Faculty support/advisement for MS and PhD students, Post-docs
- Certificate in Coastal and Oceanographic Engineering
- New course for incoming students “Oceanography Boot Camp”
- RV Savannah educational ship days and cruises - 6 days annually

## Undergraduate

- Eight-week paid summer internship program
- UGA undergraduate major in Ocean Science
- Semester at Skidaway (5 new courses; Fall)



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# Campus Partners

UGA Marine Extension Service/GA Sea Grant  
UGA Shellfish Research Laboratory



NOAA's Gray's Reef  
National Marine Sanctuary

Georgia DNR  
LE Division



US Fish and  
Wildlife Service



Savannah State  
University REU  
program



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The Georgia  
Aquarium





# University of Georgia Marine Institute



Dr. Merryl Alber  
Professor, Dept. of Marine Sciences &  
Director, UGA Marine Institute



# UGAMI is the birthplace of salt marsh research

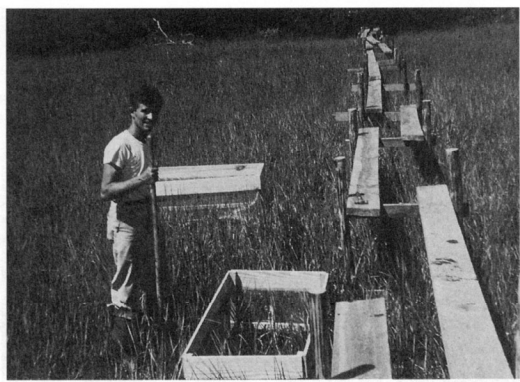


Figure 7-3. John M. Teal preparing experimental enclosures in the South End Marsh, 1955. The boardwalk that Glasco Bailey and he constructed provided regular access without trampling the marsh.

1958: First international  
salt marsh conference



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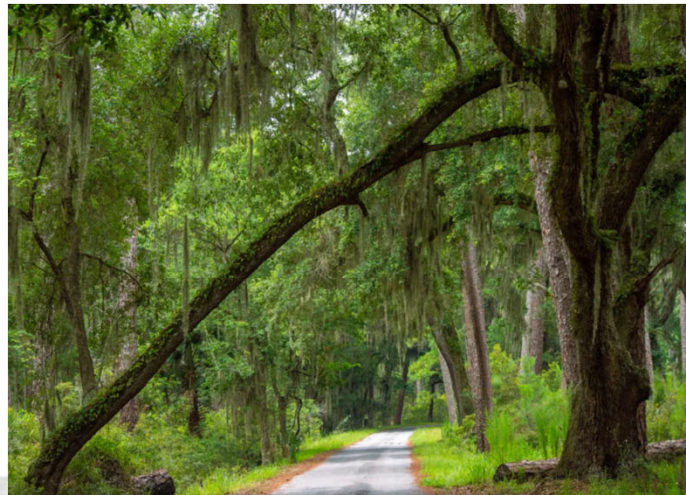
## Salt marshes provide important ecosystem services:

- Habitat
- Nutrient cycling
- Water quality
- Shoreline protection
- Carbon storage
- Aesthetic value



## Mission statement:

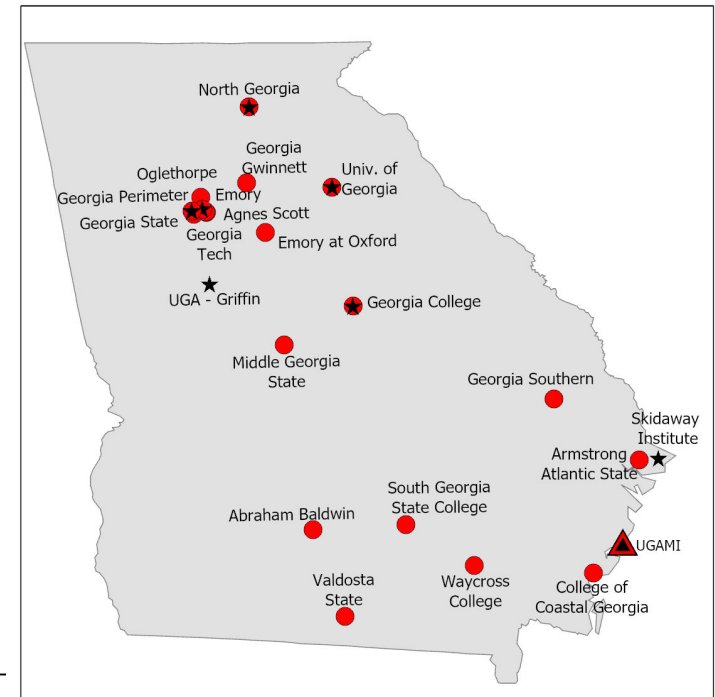
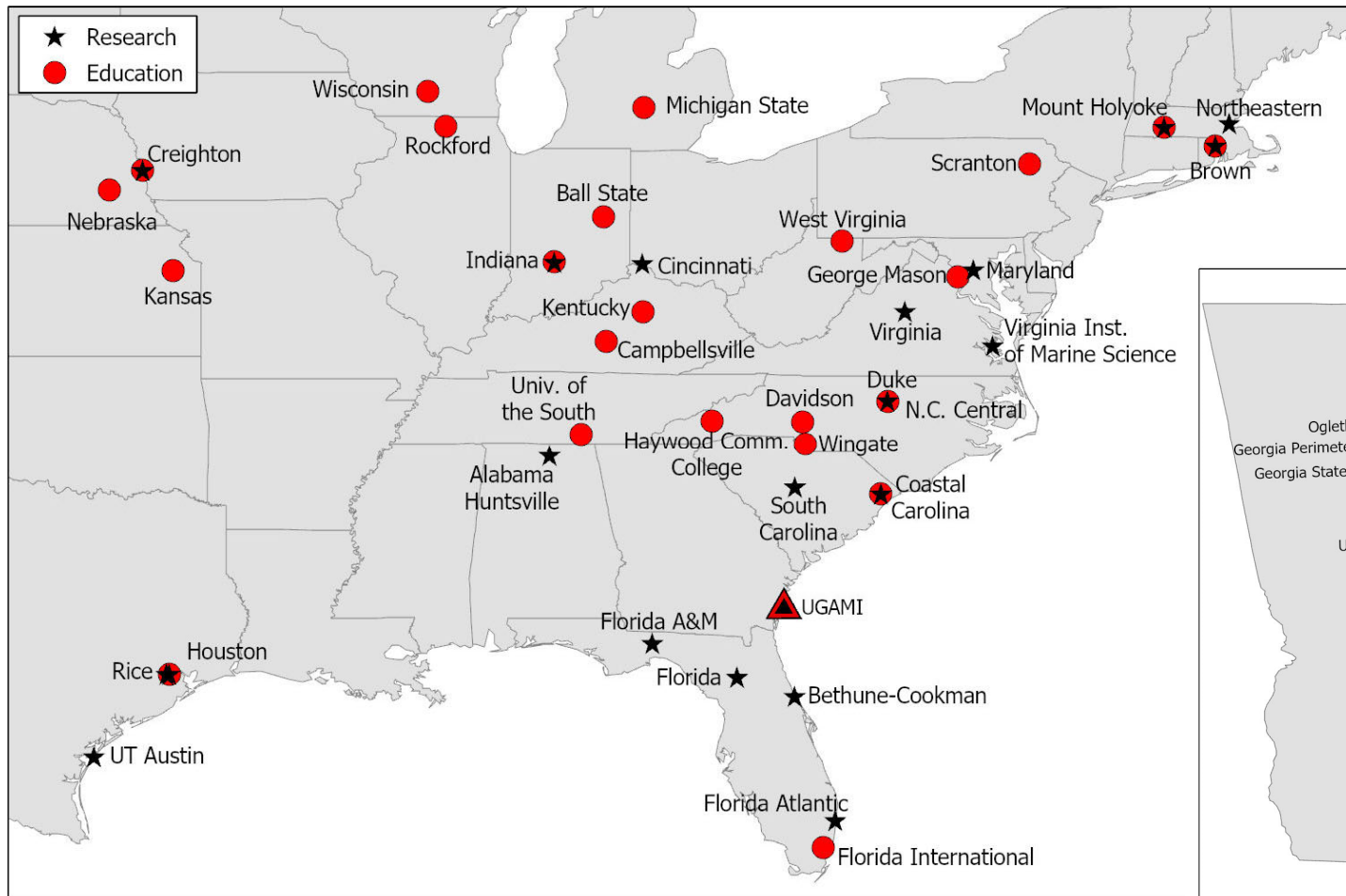
The UGA Marine Institute provides exceptional opportunities for world-class research and education in coastal ecosystems.



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## UGAMI is a resource for groups from across the U.S.





## Education at UGAMI

- Residential courses
- Visiting classes
- Internships

*"This has been the best semester I have had"*

*"I have made so many connections through this program that will help me in my career."*

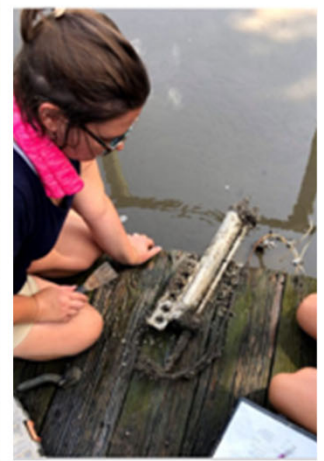


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## Events at UGAMI

- Teacher workshops
- Scientific retreats
- Work weekends
- Sapelo symposium

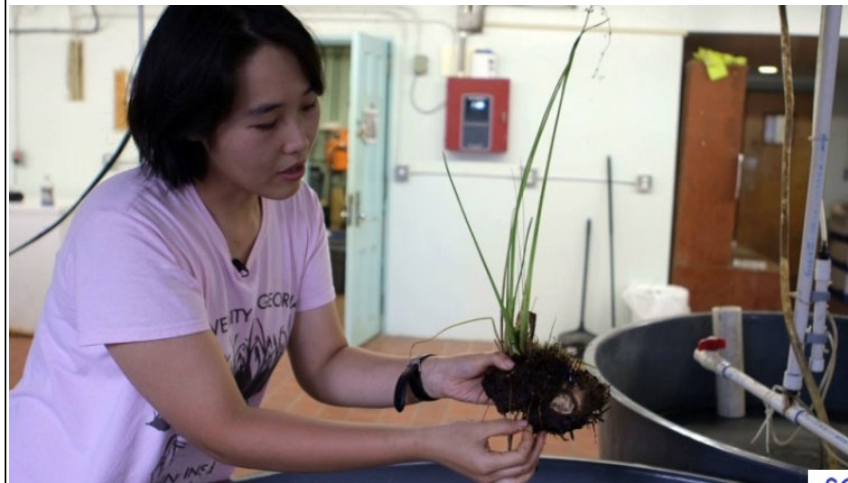


*"This experience changed  
my view of doing science  
and what science is."*



## Research at UGAMI

- Scientists
- Graduate students
- Interns
- 40 papers/year
- Press coverage



*"I can honestly say that without UGAMI I wouldn't be where I am today."*

AT THE WATER'S EDGE:  
SOUTH FLORIDA PBS The Salt Marsh



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## Federally funded projects



NSF: Georgia Coastal Ecosystems  
Long Term Ecological Research Project (GCE-LTER)

- NSF: Characterizing Rhizosphere Decomposition with Novel Techniques in Contrasting Salt Marshes
- NSF: Assessing the effects of organismal and environmental traits on ecosystem engineering function



NASA: High-resolution blue carbon products for fragmented and species diverse tidal marshes



NOAA: Oyster Reef Restoration on Sapelo Island for Coastal Hazard Protection and Multiple Benefits



FEMA: UGA Marine Institute Campus Resiliency Project



NFWF: Coastal Habitat Restoration on Sapelo Island for Flood Risk Reduction



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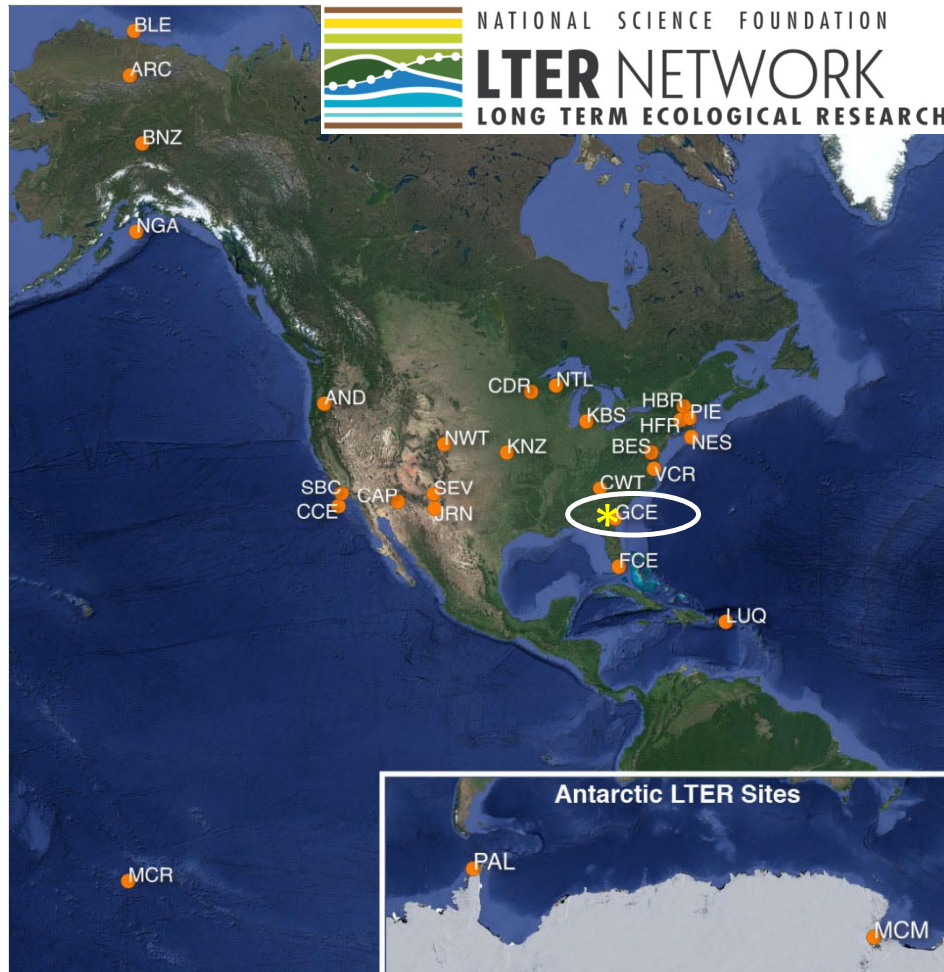




# Long-term Ecological Research Sites

Established in 1980 to provide the

- Scientific expertise,
- Research platforms, &
- Long-term data sets to document & understand environmental change



## Georgia Coastal Ecosystems (GCE)



Studying long-term change in estuaries and marshes

2000-present

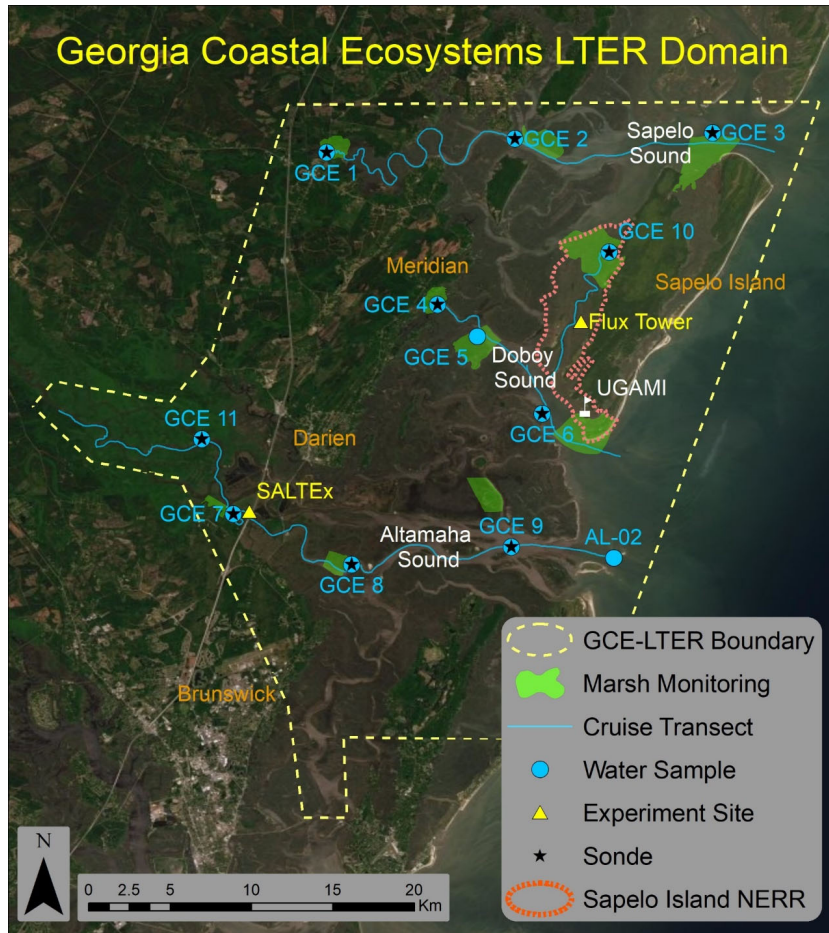
22 Scientists  
10 Institutions



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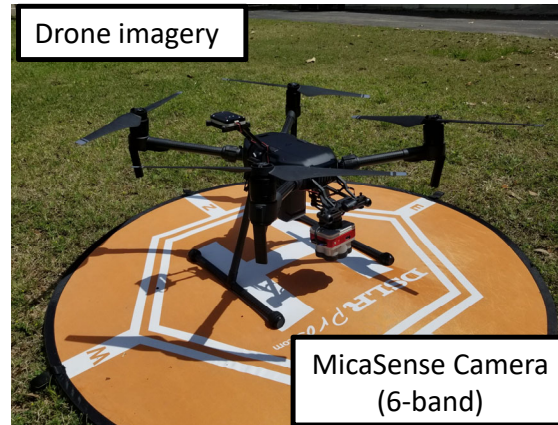
# GCE conducts place-based research with broad relevance



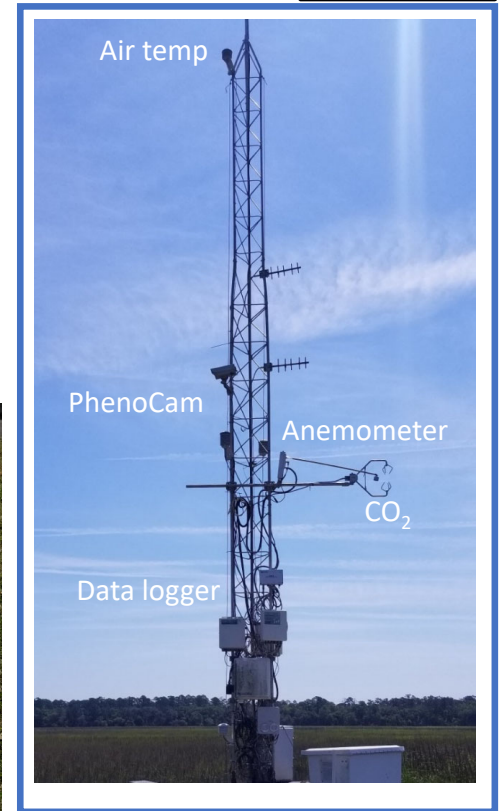
Sediment elevation



Drone imagery



Carbon flux





# Using the Belowground Ecosystem Resilience Model (BERM) to predict marsh vulnerability

1. There is ~ 4 times more material belowground (“roots”) than aboveground (“shoots”)



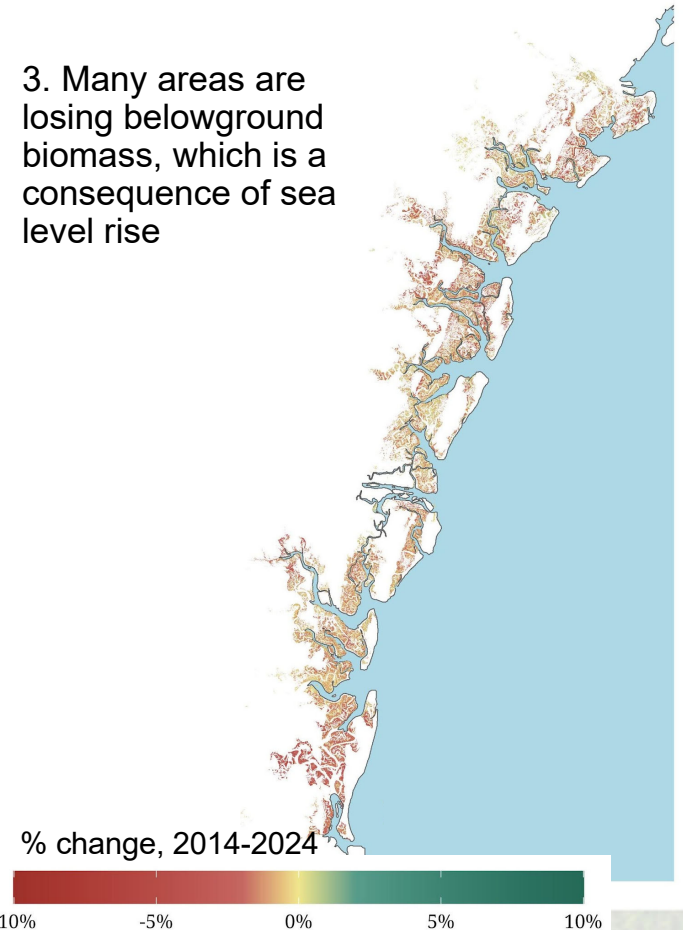
Above ground  
Belowground

2. BERM estimates belowground biomass from satellite and basic data (e.g., weather, elevation)



O'Connell et al. 2021

3. Many areas are losing belowground biomass, which is a consequence of sea level rise



Runion et al., in press



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# Marshes are valuable

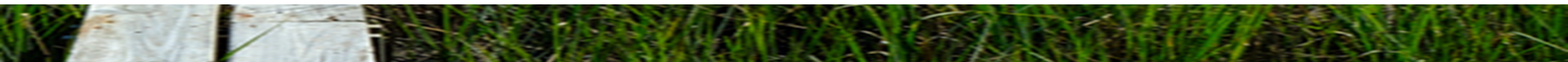


## **Salt marshes provide important ecosystem services:**

- Habitat
- Nutrient cycling
- Water quality
- Shoreline protection
- Carbon storage
- Aesthetic value



*"Oh, like to the greatness of God is the greatness within...  
...the length and the breadth and the sweep  
of the marshes of Glynn"*  
– Sidney Lanier





UGAMI provides exceptional opportunities for research and education in coastal ecosystems





# Dr. Mona Behl

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Associate Director of Georgia Sea Grant



Marine Extension and  
Georgia Sea Grant  
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# MISSION

To improve the environmental, social and economic health of the Georgia coast through **research, education and extension.**





# OUR LOCATIONS



## ATHENS

- Headquarters' office
- Research coordination and fiscal management
- Coastal resilience



## UGA MARINE EDUCATION CENTER AND AQUARIUM

- K-12 education
- Summer Marine Science Camps
- Marine Education Fellowships



## SHELLFISH RESEARCH LAB

- Aquaculture research and extension
- Oyster hatchery
- Shellfish restoration research



## BRUNSWICK

- Sustainable land use and fisheries extension
- Coastal ecology research
- Marine debris outreach



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# NOAA Sea Grant Network









# Applied Research Funding

- Invest more than \$600,000 annually toward researching issues identified by coastal stakeholders
  - Public resource policy
  - Economic and fisheries decisions
  - Anticipating vulnerabilities
  - Educating citizens on environmental stewardship
- Includes stakeholder review and technical review
- All institutions of higher ed are eligible for research funding
- Student programs included





# FOCUS AREAS



Environmental literacy  
and workforce development



Resilient coastal communities  
and economies



Healthy coastal ecosystems



Sustainable fisheries  
and aquaculture



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# Oyster Aquaculture

- Operate the only shellfish hatchery in Georgia
- Growing and distributing single oysters to shellfish farmers
- Single oysters have a higher market value than clusters
- Seed production:
  - 2017: 250,000
  - 2023: 2.75 million
    - **GA = 2 farms**
    - SC = 4 farms
    - FL = 3 farms
- 6 new farms in Georgia and 2 new leases available in Glynn Co. in 2025





# STUDENT OPPORTUNITIES

AT UGA MARINE EXTENSION AND GEORGIA SEA GRANT

## NATIONAL FELLOWSHIPS



Application window: *November - February*

### Knauss Marine Policy Fellowship

12 month paid position in the legislative or executive branch of the federal government in Washington, DC. Great for those interested in policy and management.



Application window: *October - January*

### NOAA Coastal Management and Digital Coast Fellowship

Two-year fellowship in coastal resource management and policy for post-graduate students.



Application window: *November - January*

### NOAA National Marine Fisheries / Sea Grant Joint Fellowship

For PhD students interested in population dynamics and marine resource economics.

## STATE FELLOWSHIPS

### Marine Education Fellowship

**Application window:** *February - March*

Designed for recent college graduates who would like experience in marine science education, coastal ecology research and aquarium husbandry.

### State Fellowship

**Application window:** *April - July*

Matches graduate students with local, state, and federal agencies to better understand the policy management of coastal and marine resources.

### Legal Fellowship

**Application window:** *Year-round*

Offers students currently enrolled in a law program the chance to work with lawyers and policymakers in coastal communities.

### Research Traineeship

**Application window:** *February - March*

For undergraduate or graduate students seeking support and mentorship through their research endeavors.

## INTERNSHIPS

### Focus areas:

Communications

Aquarium Science

Shellfish Research

Stormwater Research

Summer Camp

Coastal Resilience

Sustainable Landscapes

Microplastics and Marine Debris

Water Quality Research

Pre-k - 4 Education

Boat Operations

Public Programs

Phytoplankton Monitoring

**and more!**





# Marine Education Center and Aquarium

- Full-service education facility
- 24,000+ visitors annually
- Year-round education programming
- Pre-K-12 school groups
- Educator workshops
- Public programs for families and lifelong learners





# Questions?

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