



# THE APALACHICOLA BAY SYSTEM INITIATIVE (ABSI)



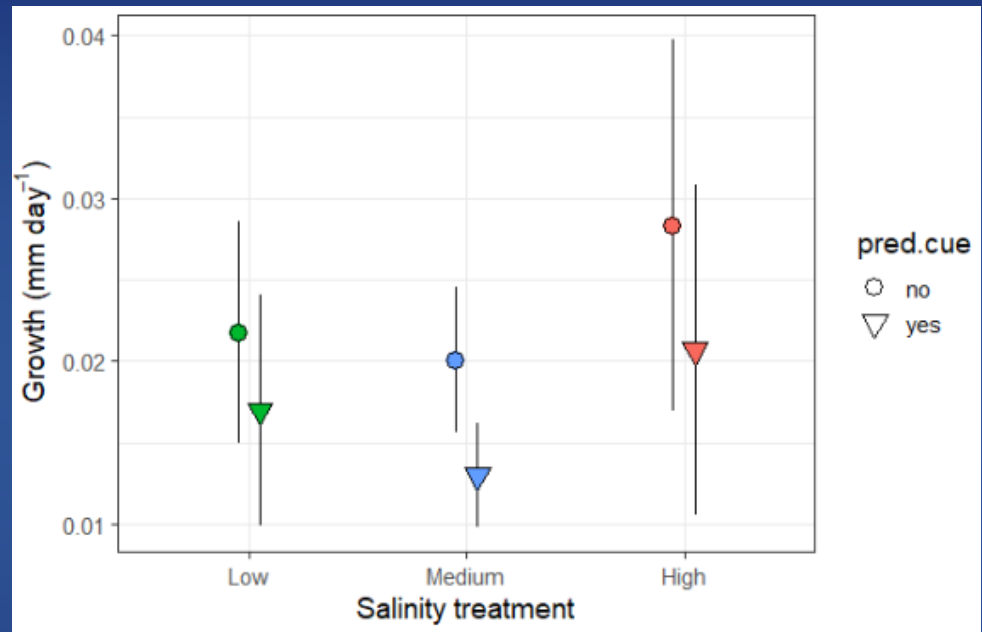
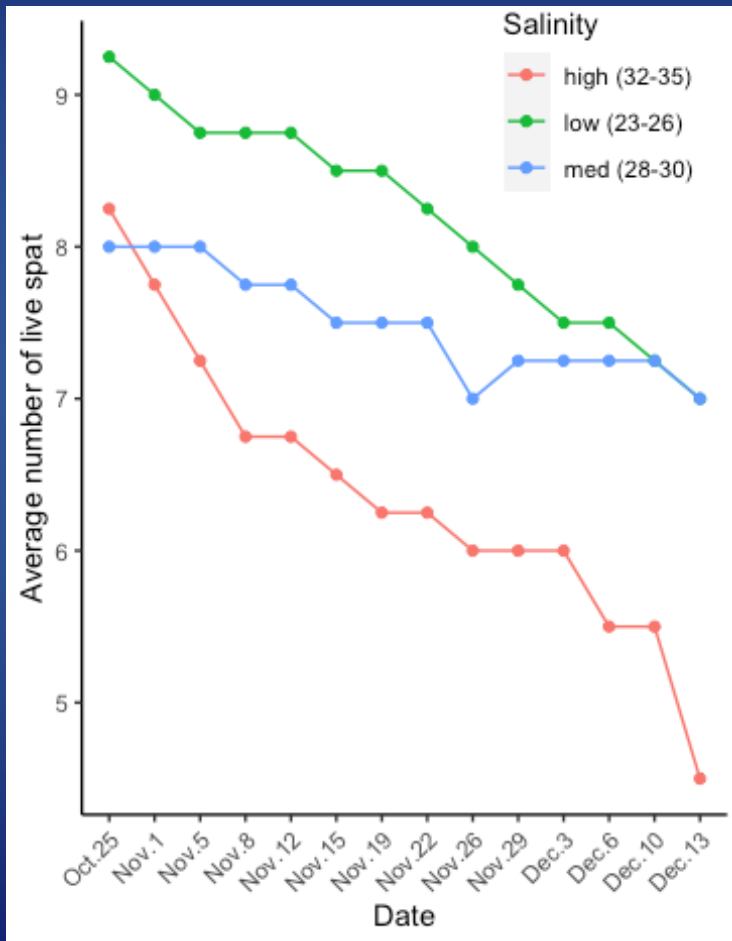
The ABSI seeks to gain insight into the root causes of decline of the Apalachicola Bay ecosystem, and the deterioration of oyster reefs  
Ultimately, the ABSI will help develop a management and restoration plan for oyster reefs and the long-term health of the bay

ABSI funding is provided by Triumph Gulf Coast Inc. and Florida State University

# Oyster biology

## Effect of salinity on juvenile oysters – laboratory experiments

Donaven Baughman FSU graduate student



### Summer

- Field surveys of drill abundance at sites with contrasting salinity regimes.
- Cage studies to assess predation rates, survival of outplant oysters.

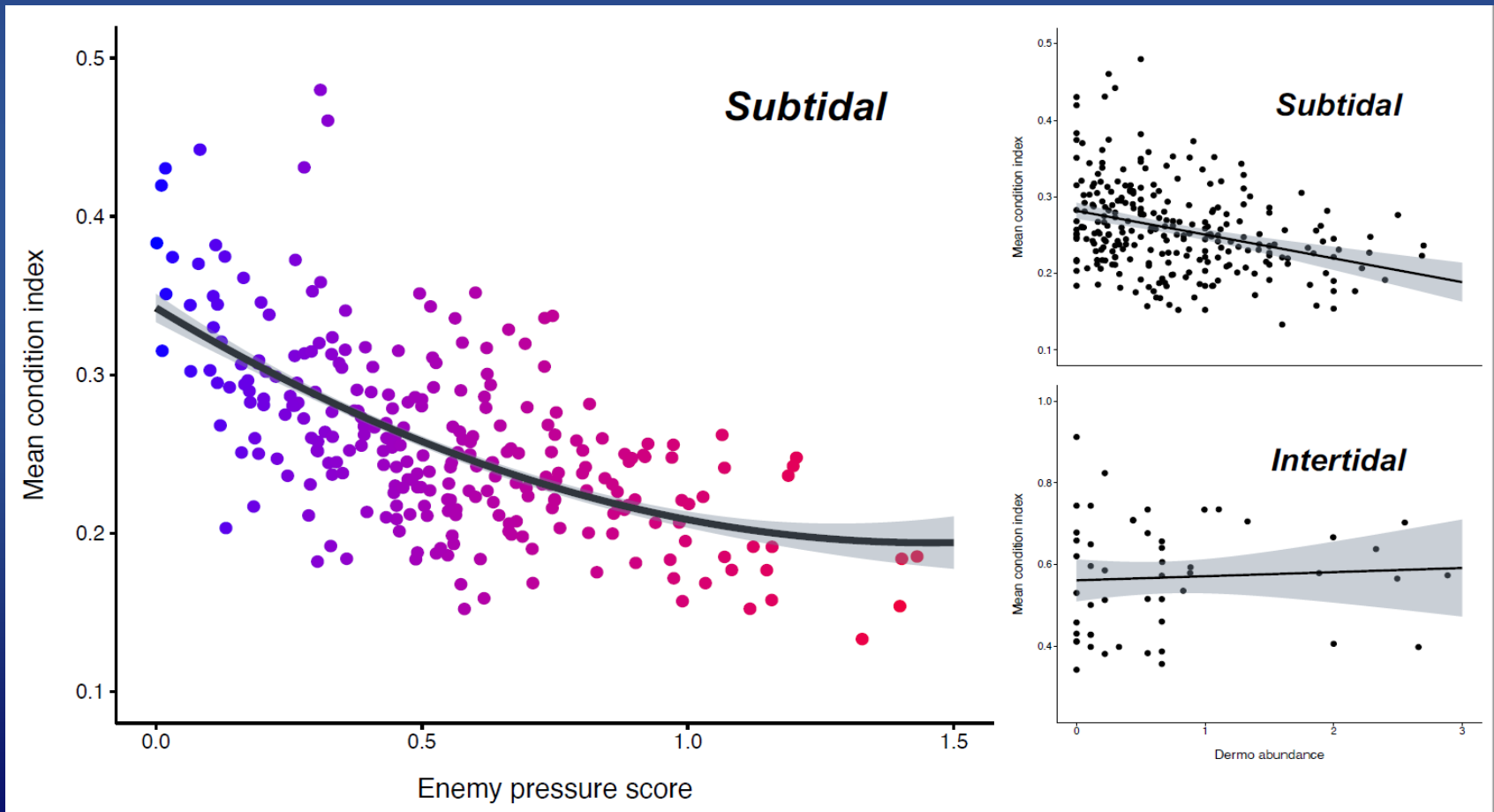
Follow up lab studies on drill consumption rates, survival, habitat use across salinity.

# Oyster biology

## Disease and other stressors Dr. Tara Stewart Merrill

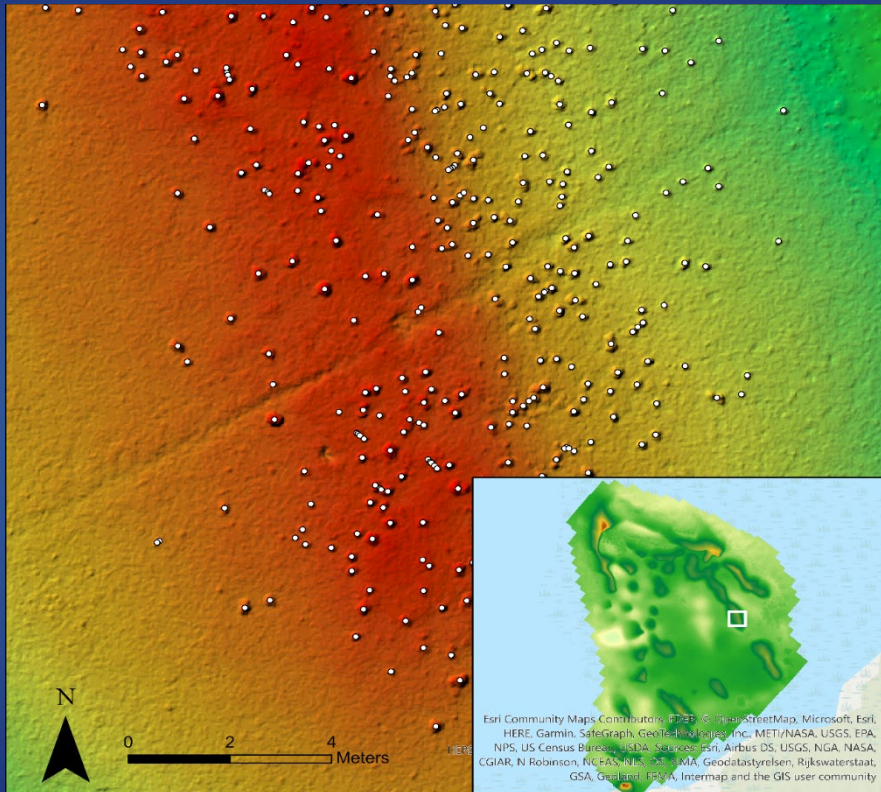
Oyster disease in the Apalachicola Bay:

Infections as indicators of environmental change, ecosystem diversity, and human risk

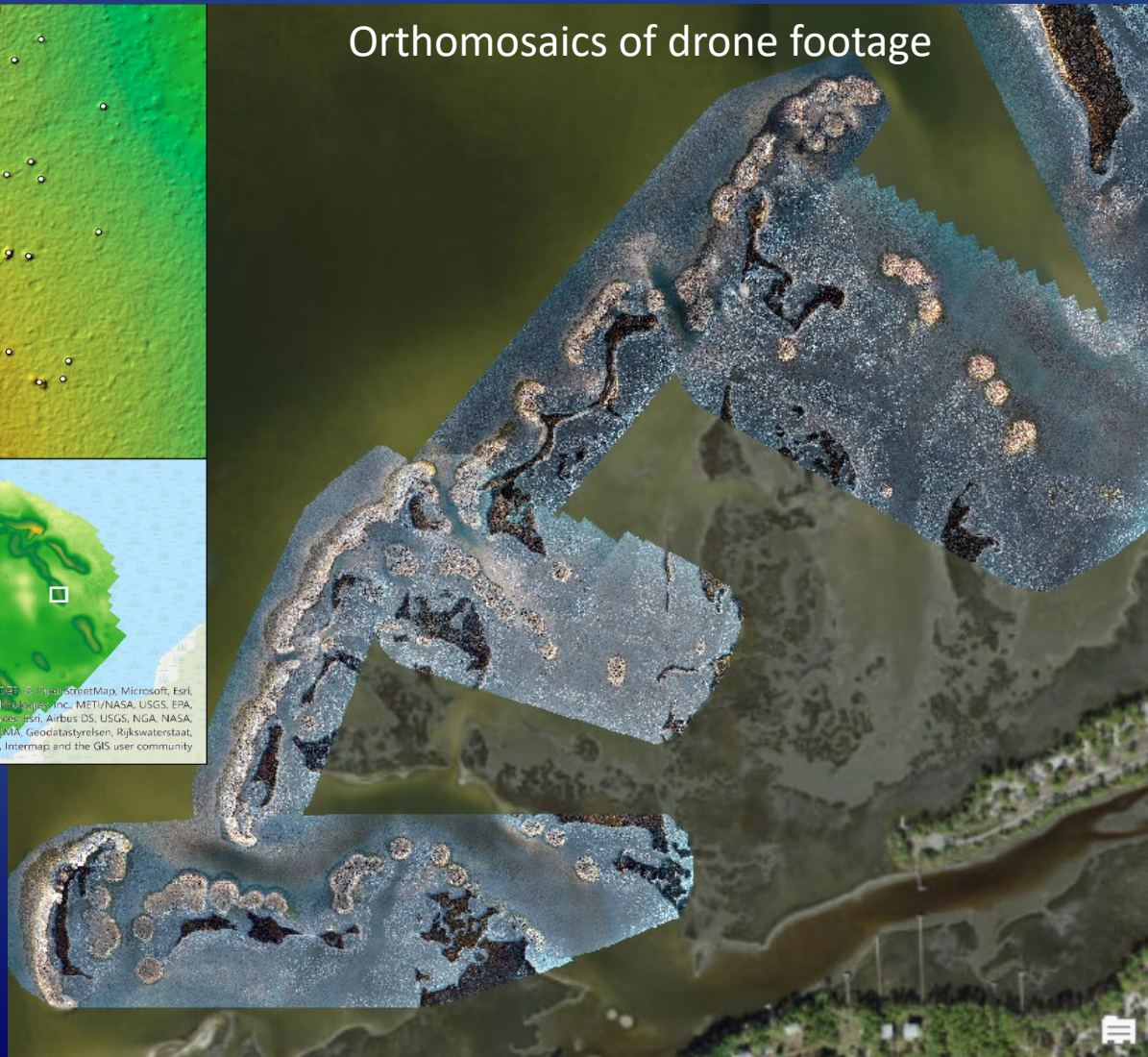


# Oyster ecology

Spatial and temporal patterns of intertidal oyster reefs Jenny Bueno FSU graduate student



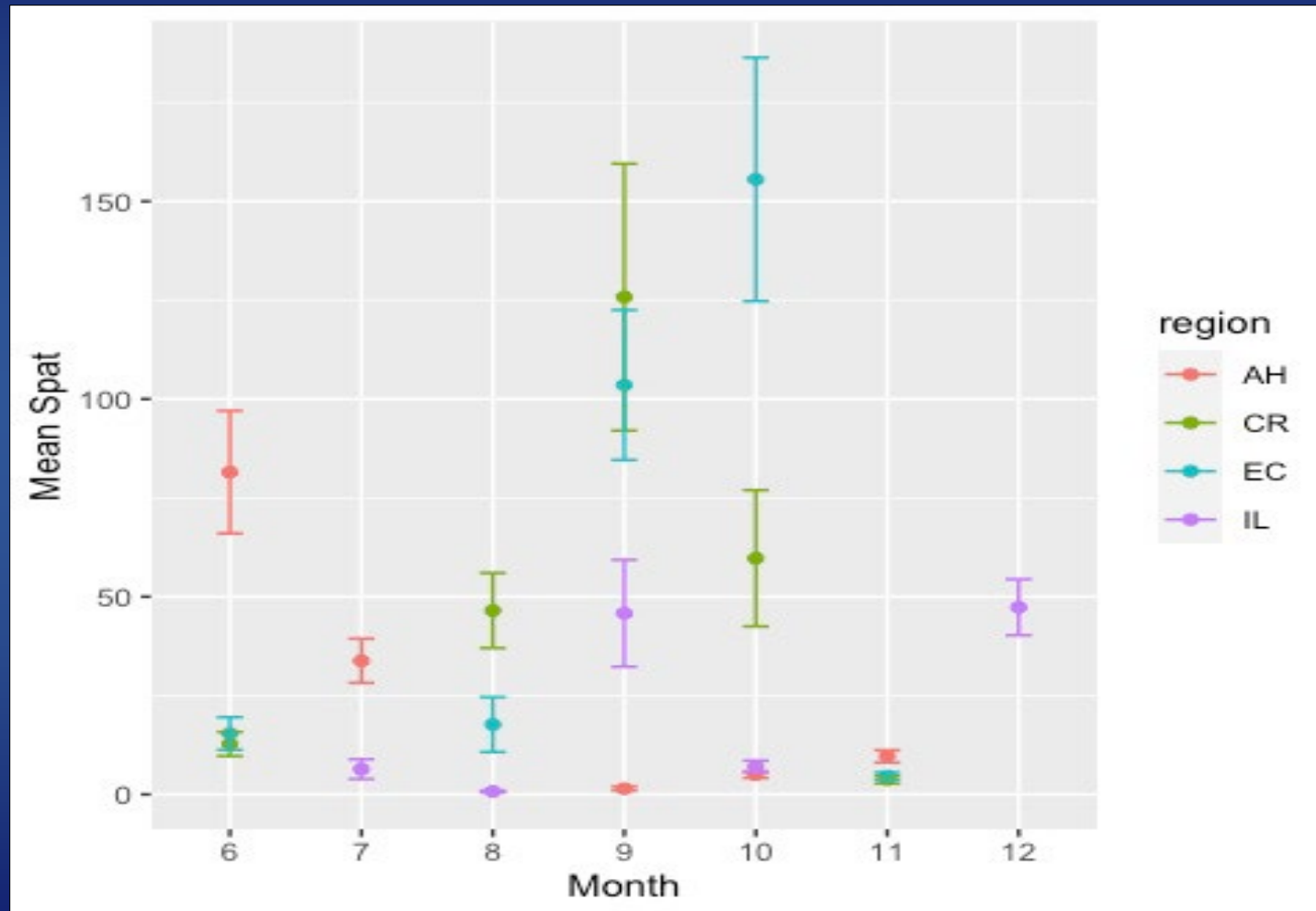
Orthomosaics of drone footage



Oyster clusters extracted from digital elevation models using ArcGIS pro

# Oyster ecology

Intertidal recruitment – mean monthly spat counts from spat traps (3/reef, 5 reefs/site)



AH – Alligator Harbor, CR – Carabelle River, EC – East Cove, IL – Indian Lagoon

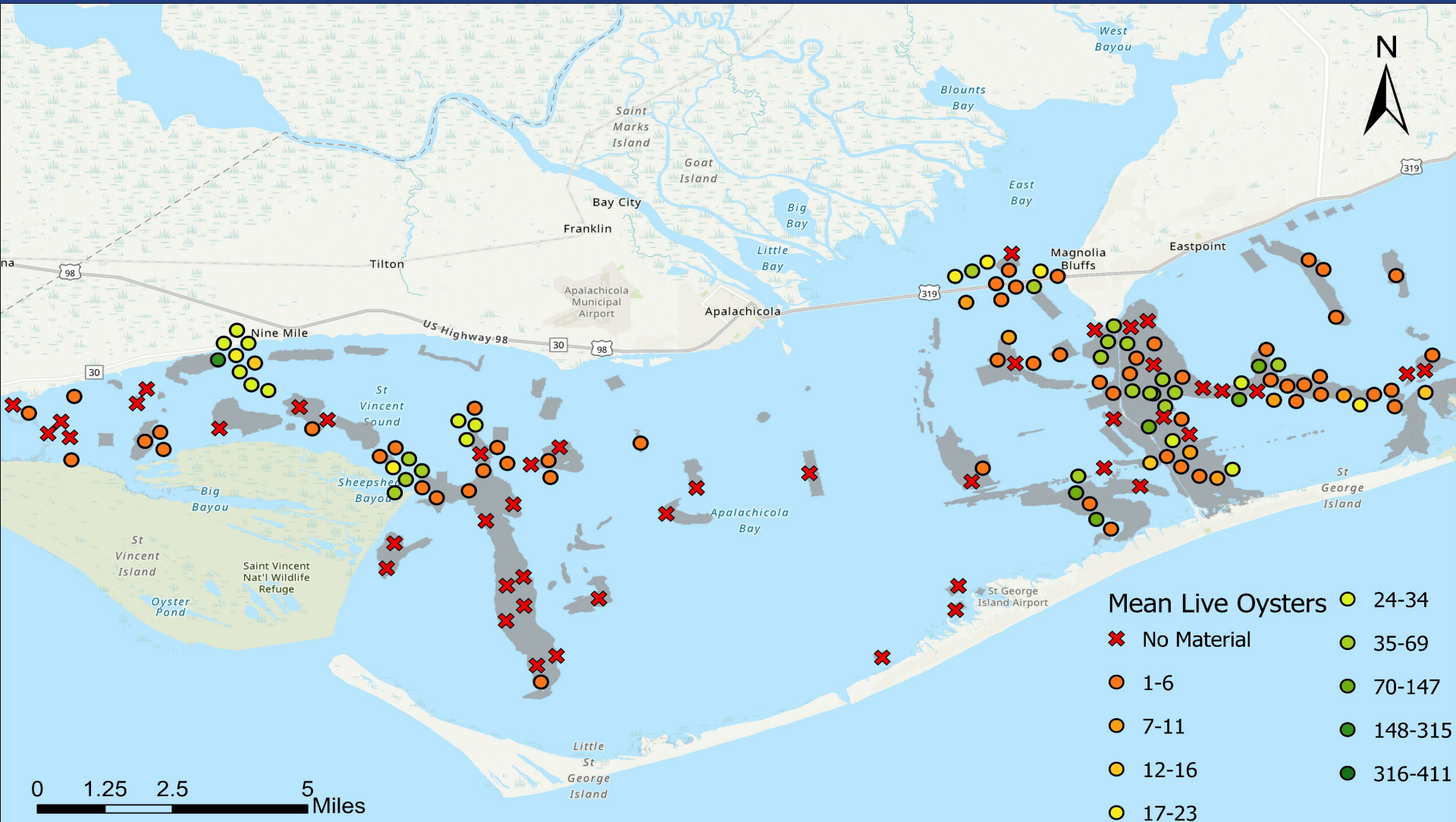
# Sub-tidal Monitoring (2020-2021)

Sampling with hand tongs to cover wide spatial extent

Six replicate samples per site (3 each side of the vessel)

Total volume of material/per tong sample

Mean # live oysters, # boxes, # in each size class (<25, 25-75, > 75 mm)



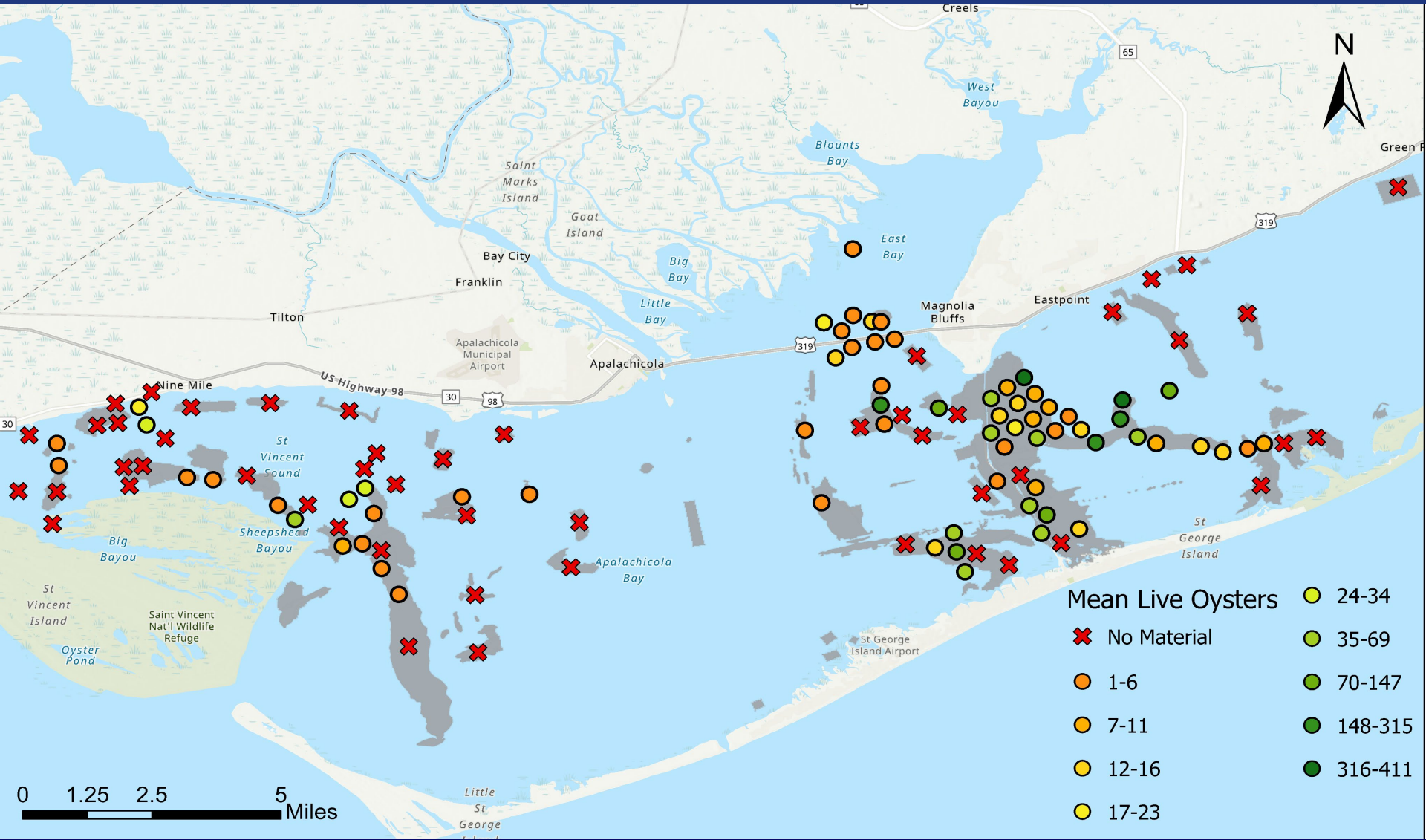
# Sub-tidal Monitoring (2021-2022)

Sampling with hand tongs to cover wide spatial extent

Six replicate samples per site (3 each side of the vessel)

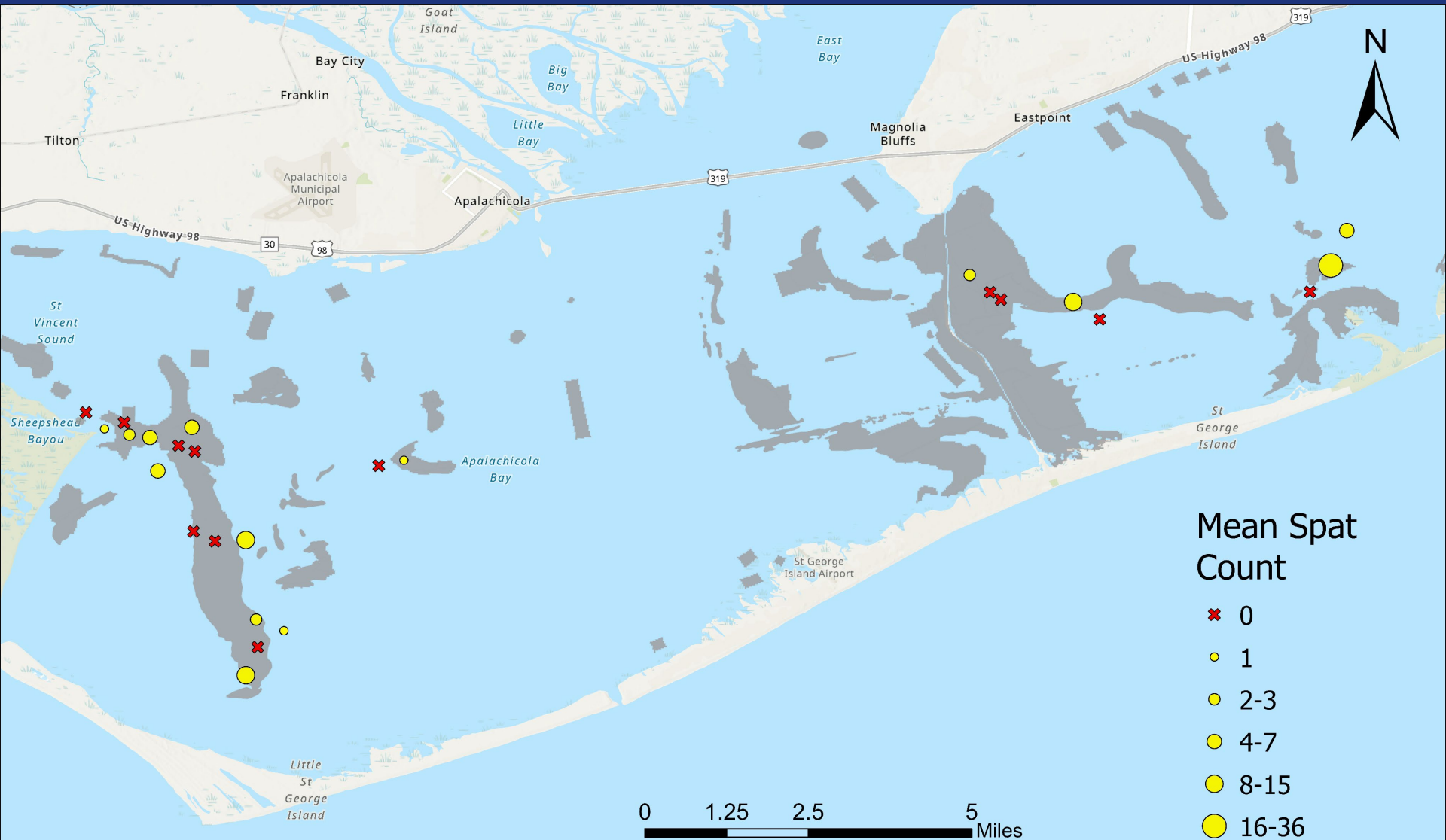
Total volume of material/per tong sample

Mean # live oysters, # boxes, shell height of first 100 individuals



# Oyster ecology

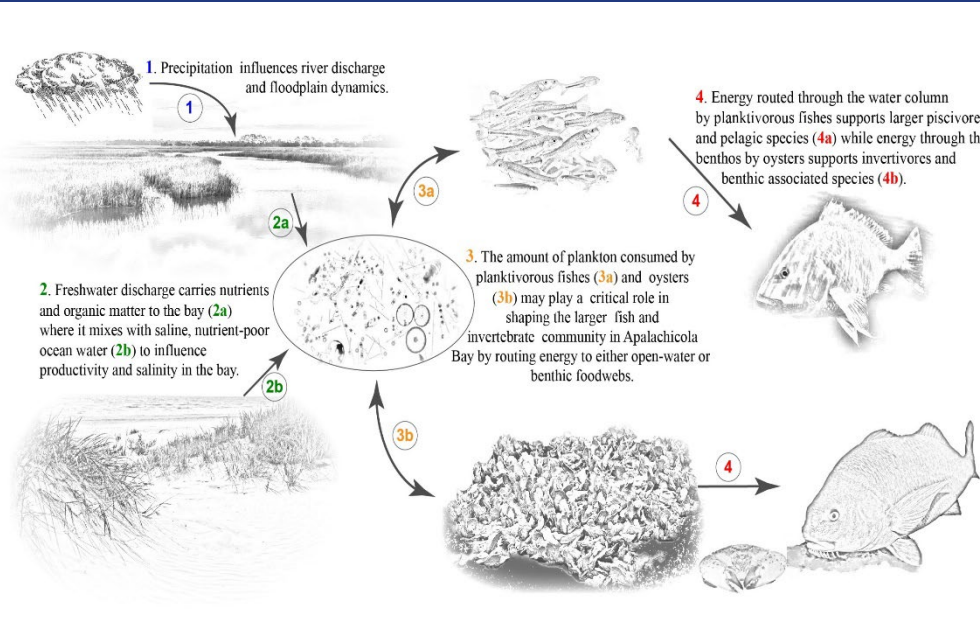
Subtidal recruitment - 26 locations in Apalachicola Bay and St George Sound





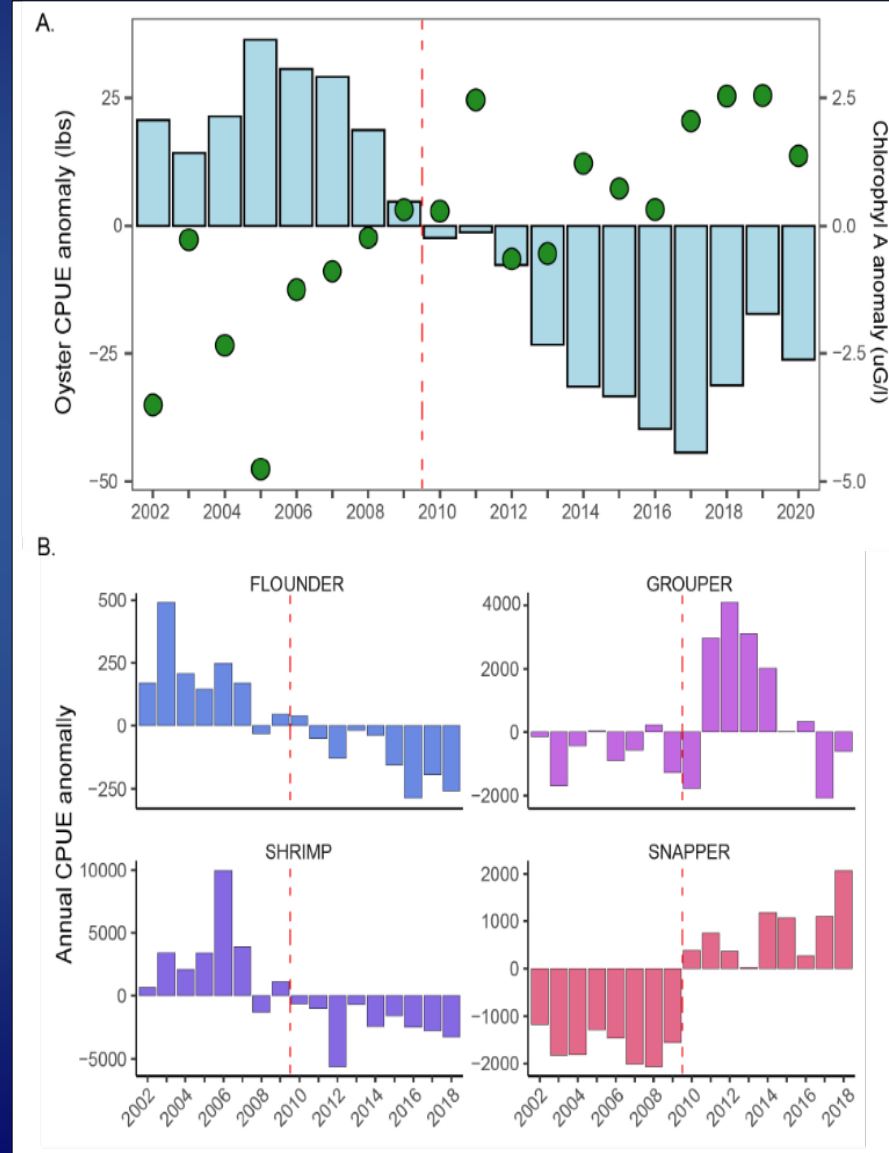
# Oyster ecology

## Impacts of oyster populations on community development Dr. Andrew Shantz



A. Change in annual oyster CPUE and [Chl A] 2002-2020

B. CPUE for other commercial species dependent on benthic (flounder, shrimp) and pelagic (grouper and snapper) food sources



# Oyster ecology

Oyster colonization and community experiments Dr. A Shantz and ABSI core team



## Oyster colonization

10 locations across the Bay

4 units of each type at each location

Current meter and temp, salinity, oxygen data loggers

Recovered and replaced with new unit

Development assessed using photogrammetry

## Community development (invertebrates and fishes)

Trays placed at experimental site

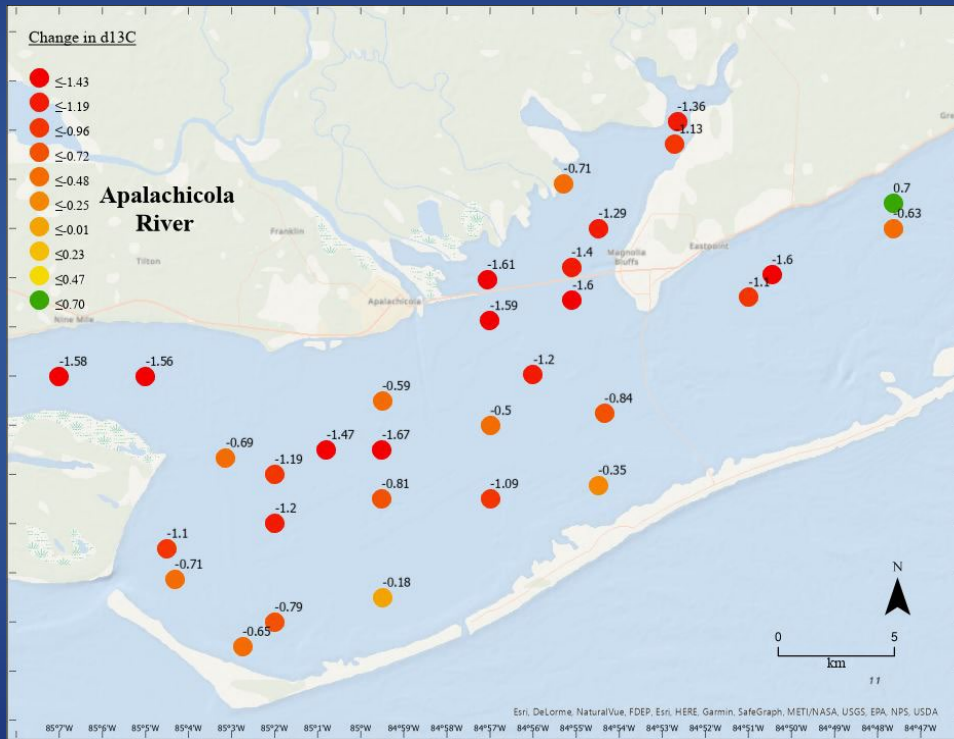
Lined with mesh screen which is closed before recovery



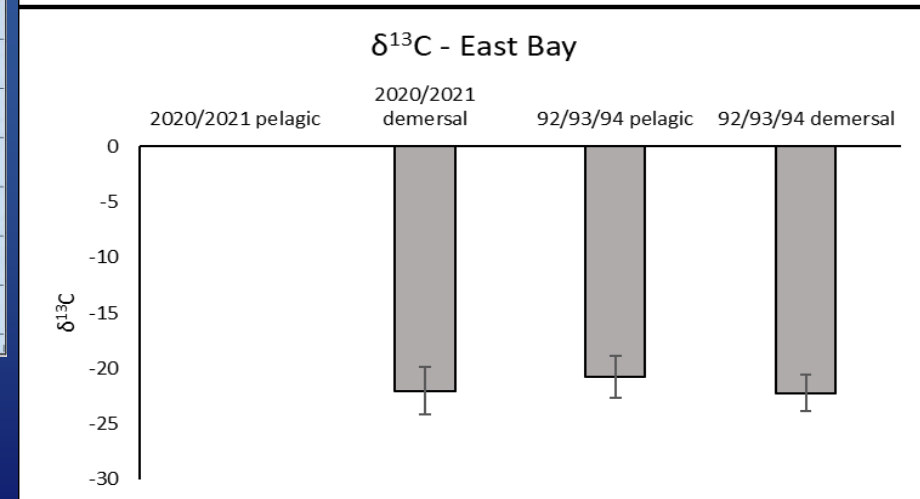
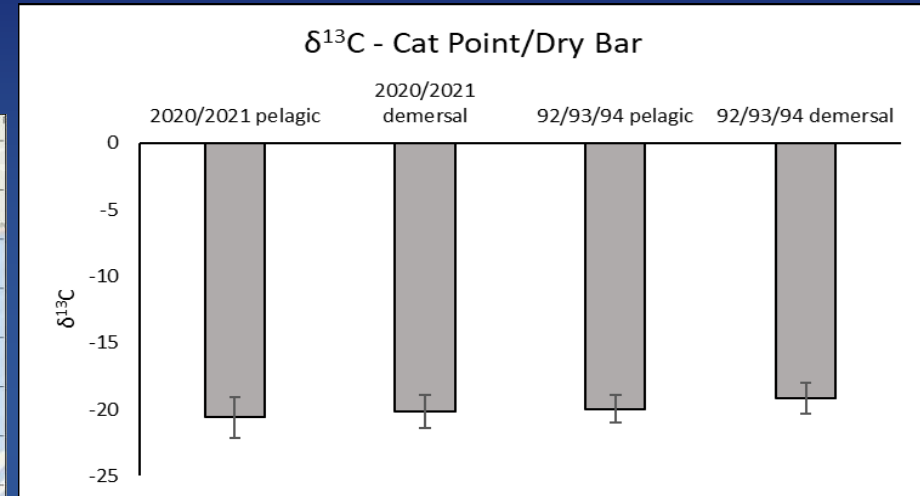
# System Ecology

Apalachicola Bay food web and sediments 1994 vs. 2020 /2021 Dr Jeff Chanton FSU

## Changes in $\delta^{13}\text{C}$



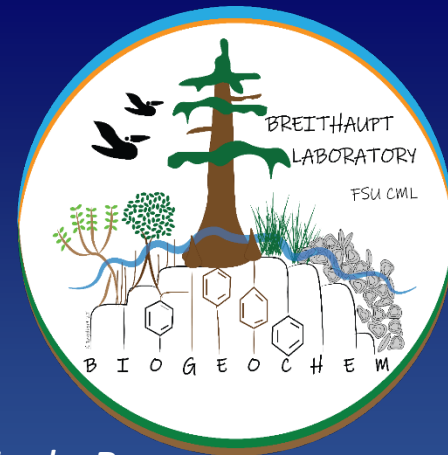
Negative values – more terrestrial input in 2021 vs 1994



NSD between demersal and pelagic fish species from 2021 vs 1994

# System Ecology

## Influence of oysters on function and change in coastal systems Dr. Josh Breithaupt

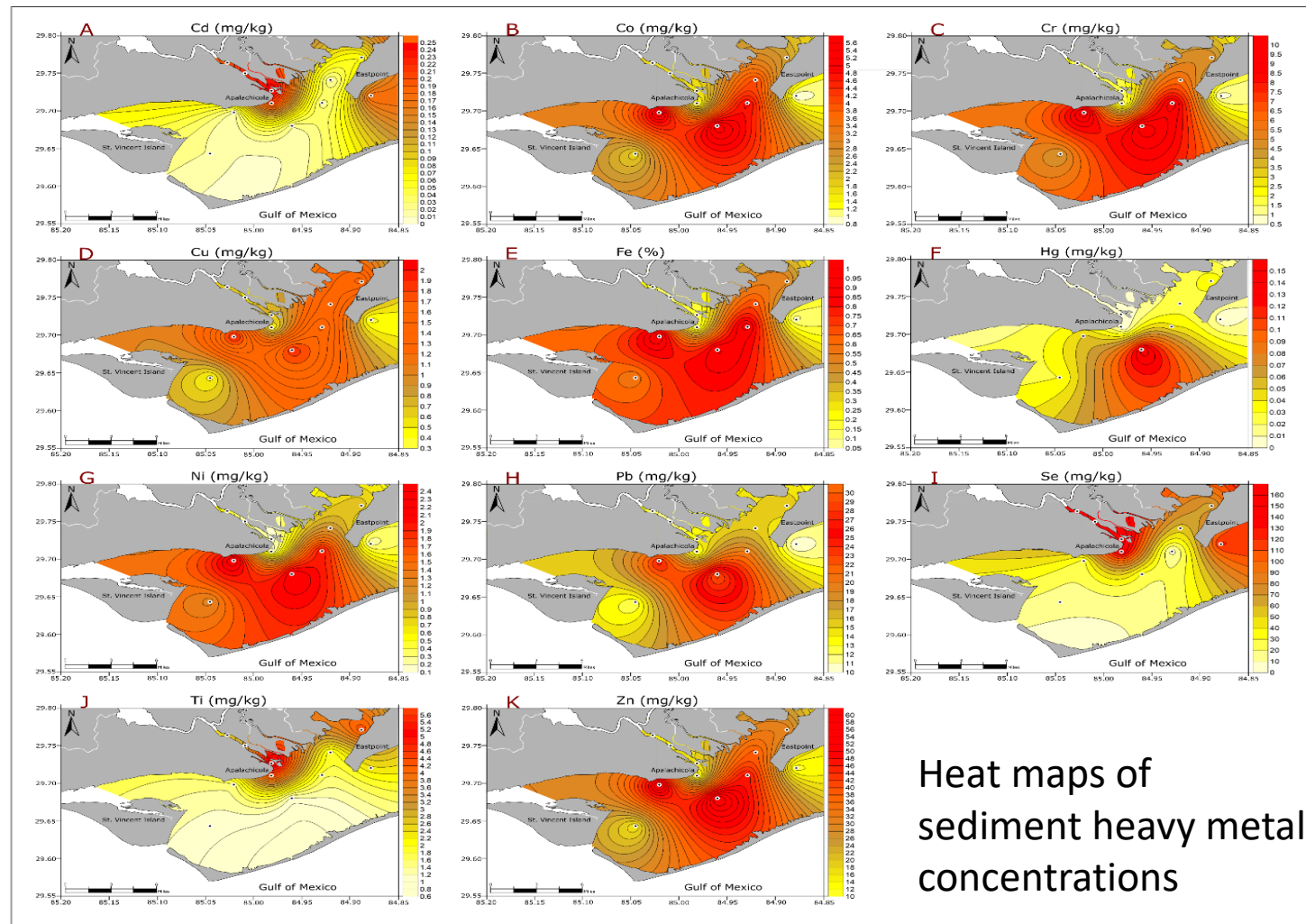


1. *Investigating changing benthic sediment characteristics in Apalachicola Bay*  
*Sediment organic carbon has increased since 1960s*
2. *Oyster Shell Dissolution Dynamics in Apalachicola Bay Region*  
*Oyster shells dissolve faster in mesocosms with mangrove soil and subtidal mud*
3. *Coastal carbon dynamics occurring because of mangrove replacement of regional tidal marshes*  
*Mangroves are not altering soil carbon storage – yet...*
4. *Vulnerability of regional wetlands to sea-level rise and changing sediment delivery from Apalachicola River*  
*Regional wetland surface elevation dynamics vary by geomorphic setting*

# System Ecology

## Apalachicola Bay environmental evolution and pollutant status Dr Martinez Colon FAMU

Assess concentrations of heavy metals and pesticides in sediment cores  
Assess temporal changes in foraminifera (bio-indicators) over time



Heat maps of sediment heavy metal concentrations

## Future priority tasks

- Integrate models to run climate and management scenarios
- Design and deploy a new restoration experiment
- Repeat spat deployment experiment with adjusted methods
- Deploy additional spat on restoration sites
- Develop options for interactive tools

# QUESTIONS?



FOR ADDITIONAL INFORMATION:

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ABSI email: [fsucml-absi@fsu.edu](mailto:fsucml-absi@fsu.edu)