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

Mean Spat Count
- 0
- 1
- 2-3
- 4-7
- 8-15
- 16-36
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 $\delta^{13}C$

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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