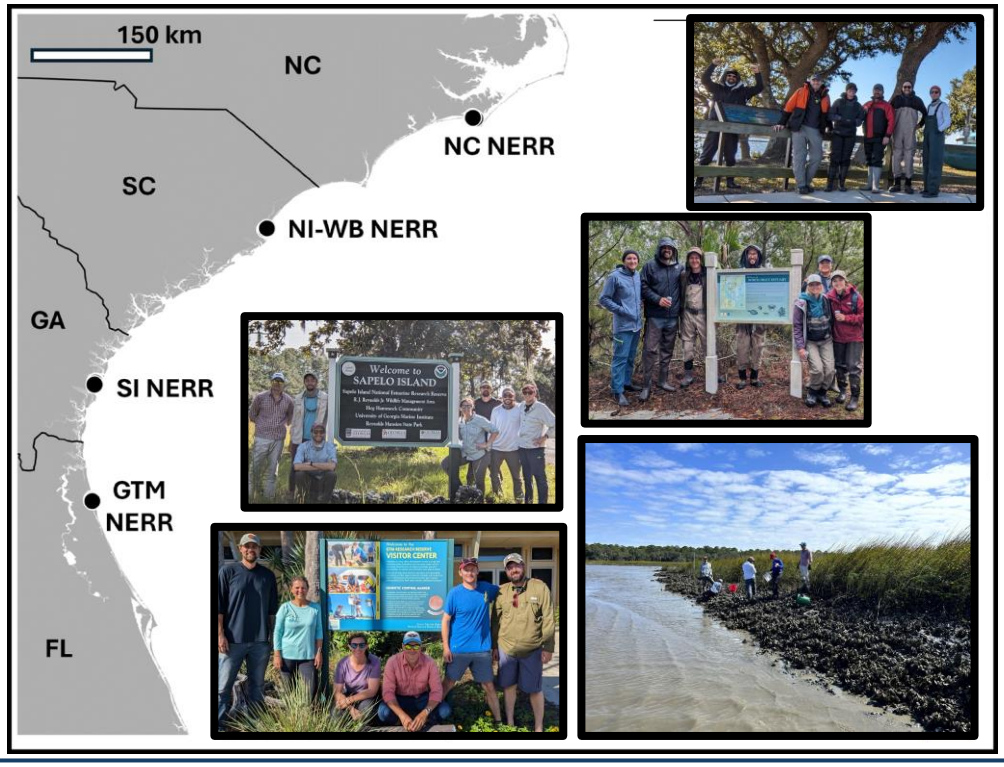
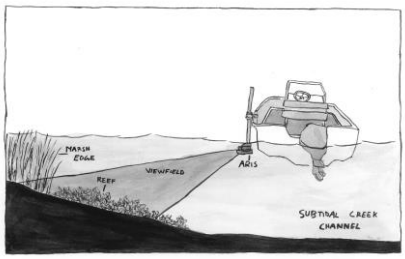
Evaluating oyster reefs as habitat: catalyzing future research for management applications



Southeast NERRs Oyster Catalyst Goals

- Develop a regional collaborative focused on oyster reef ecology and management
- Collect pilot field data testing emerging sampling techniques across the region
- Incorporate end-user feedback and generate a Collaborative proposal

Foundation species such as the eastern oyster (*Crassostrea virginica*) serve numerous ecological functions and provide myriad ecosystem services within coastal environments, including serving as key habitat for a diverse community of organisms within Reserves across the NERR System. Our collaborative team concurrently deployed multiple established and emerging methods to sample intertidal oyster reefs in Reserves in North Carolina (NC), South Carolina (NI-WB), Georgia (SI), and Florida (GTM).



National Estuarine Research Reserve System Science Collaborative

UNIVERSITY OF South Carolina

NC STATE UNIVERSITY

UNIVERSITY OF GEORGIA

GEORGIA SOUTHERN UNIVERSITY

UNIVERSITY OF SOUTH CAROLINA BEAUFORT

Traditional sampling: reef structure and nekton

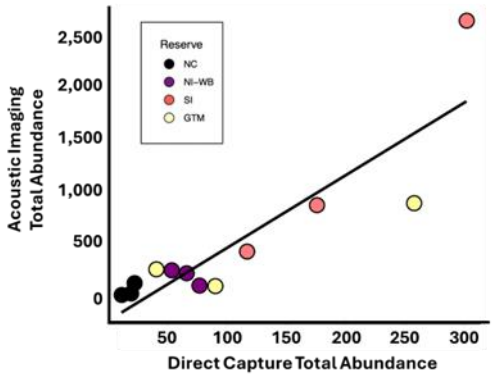






We measured reef structure and caught nekton using nets and traps on 12 reefs across the region.

High-resolution acoustic imaging

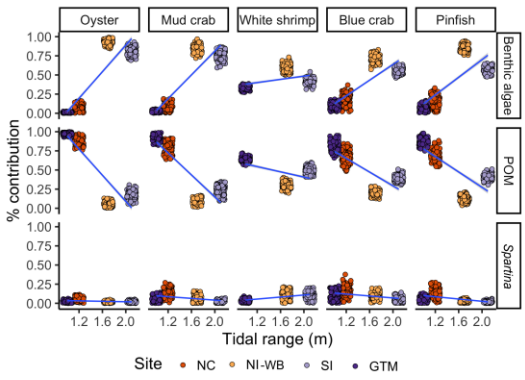



Nekton counts exhibit similar trends between acoustic imaging and direct capture, but sonar more effectively samples larger animals.

eDNA metabarcoding

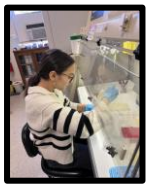

- Targeted 3 gene regions related to different types of organisms.
- Amplified each gene 4 times for each sample.
- Generated 179K to 1.5 million DNA sequences per sample per gene.
- We continue refining bioinformatics workflows.

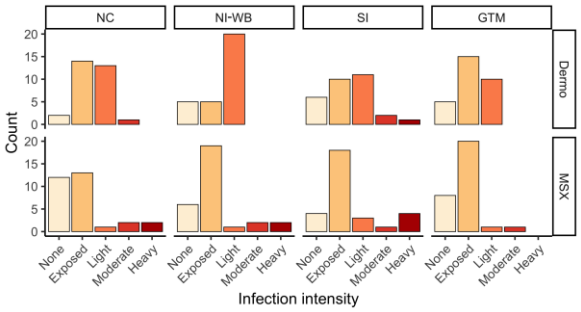
Stable isotope analysis




The primary resource contributing to oyster reef food webs varies across the region, mainly related to tidal height.

Oyster disease assays

Parasite prevalence is high at all sites, but infection intensity is low.

Our results were shared with resource management end-users at a workshop in September 2024. Their feedback was integrated into our Collaborative Science proposal to expand upon this Catalyst project with the goal of understanding the ecosystem function of oyster reefs across management strategies and environmental gradients along the southeastern US Atlantic coast.