

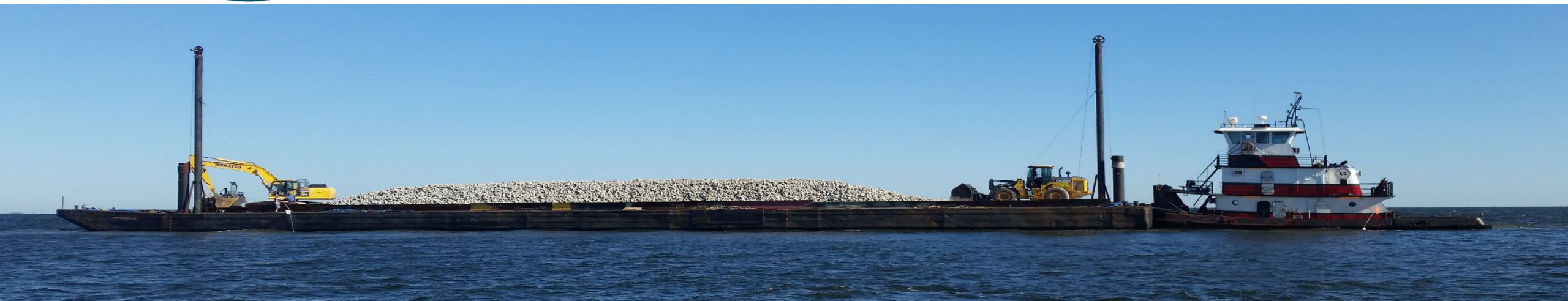


Reef Enhancement Programs Update

DEPARTMENT OF ENVIRONMENTAL QUALITY

Marine Fisheries

N.C. Marine Fisheries Commission | Jason Peters | Aug. 23-25, 2023

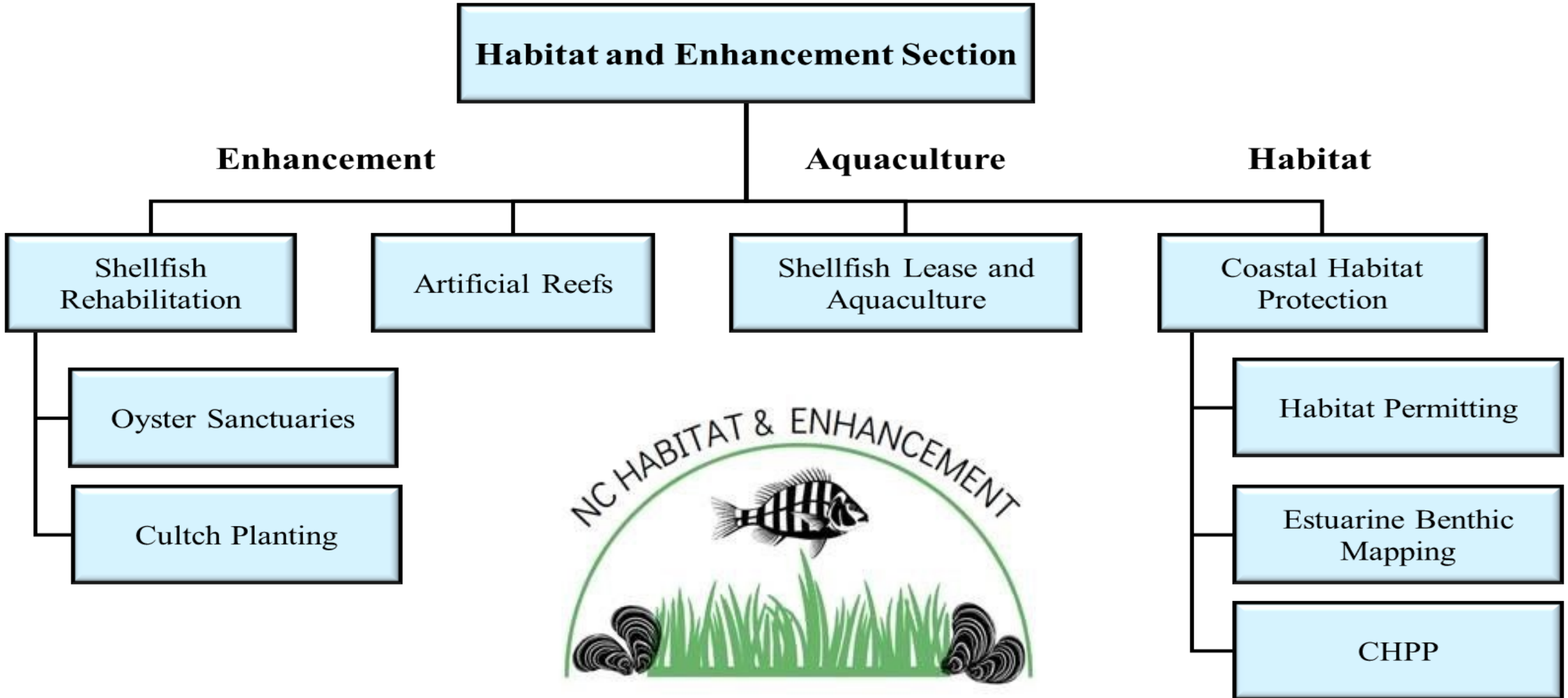


Overview

- Organizational Structure
- Shellfish Rehabilitation Overview
 - Oyster Sanctuaries
 - Cultch Planting
- Artificial Reefs



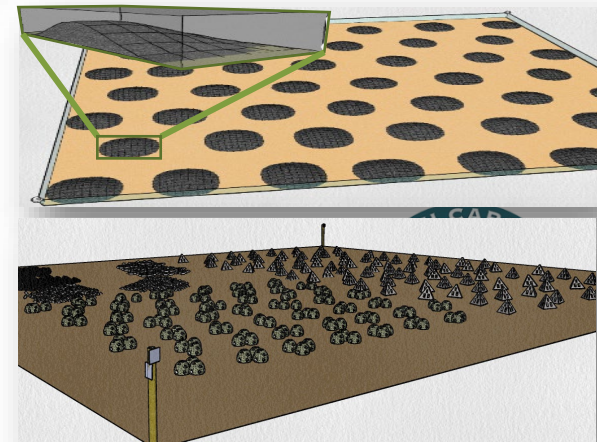
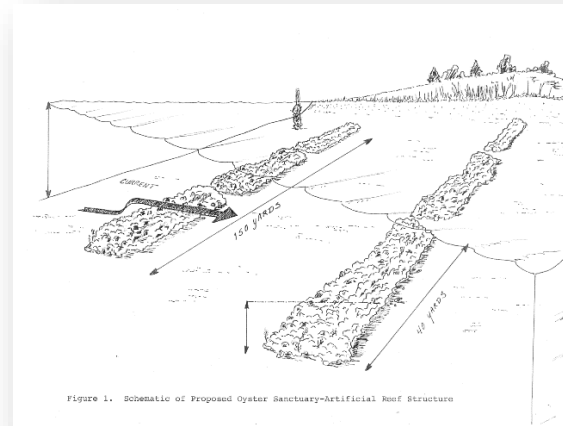
Organizational Structure



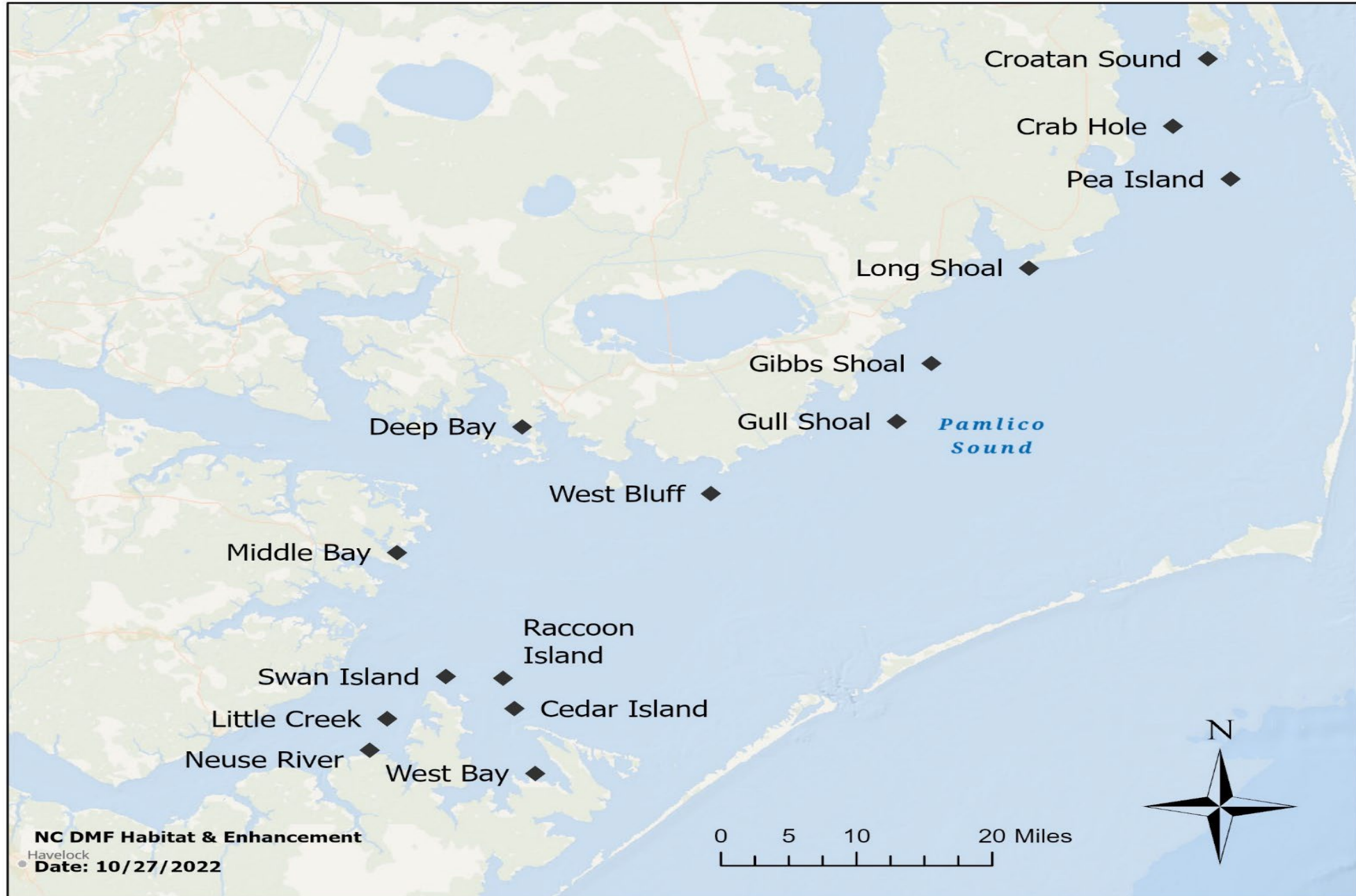
Shellfish Rehabilitation in NC: a two-part approach

Part 1: Oyster Sanctuaries (no harvest)

- **Primary objective: supply viable larvae, system wide**
- Area of focus – Pamlico Sound
- General design:
 - Large areas ~40-80 acres each
 - High relief habitat (2-6')
 - Ridges, mounds, patches
 - Large aggregate rock (5-12") or other materials
- Material types: Limestone marl, crushed concrete, granite, basalt, ERUs (engineered reef units), recycled concrete pipe, precast concrete

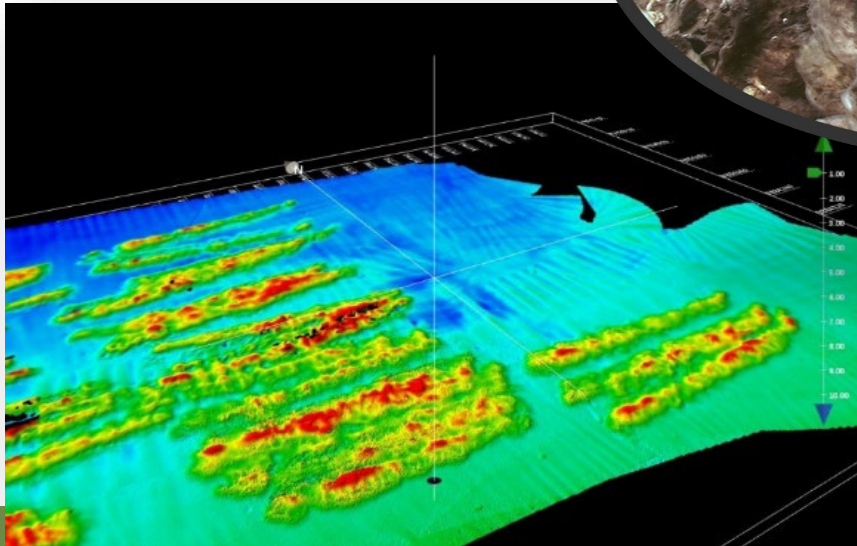


Where are Oyster Sanctuaries located?



Oyster Restoration in NC

Oyster Sanctuaries: How do we do it?

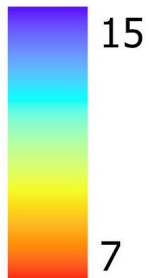


OS-16 Cedar Island

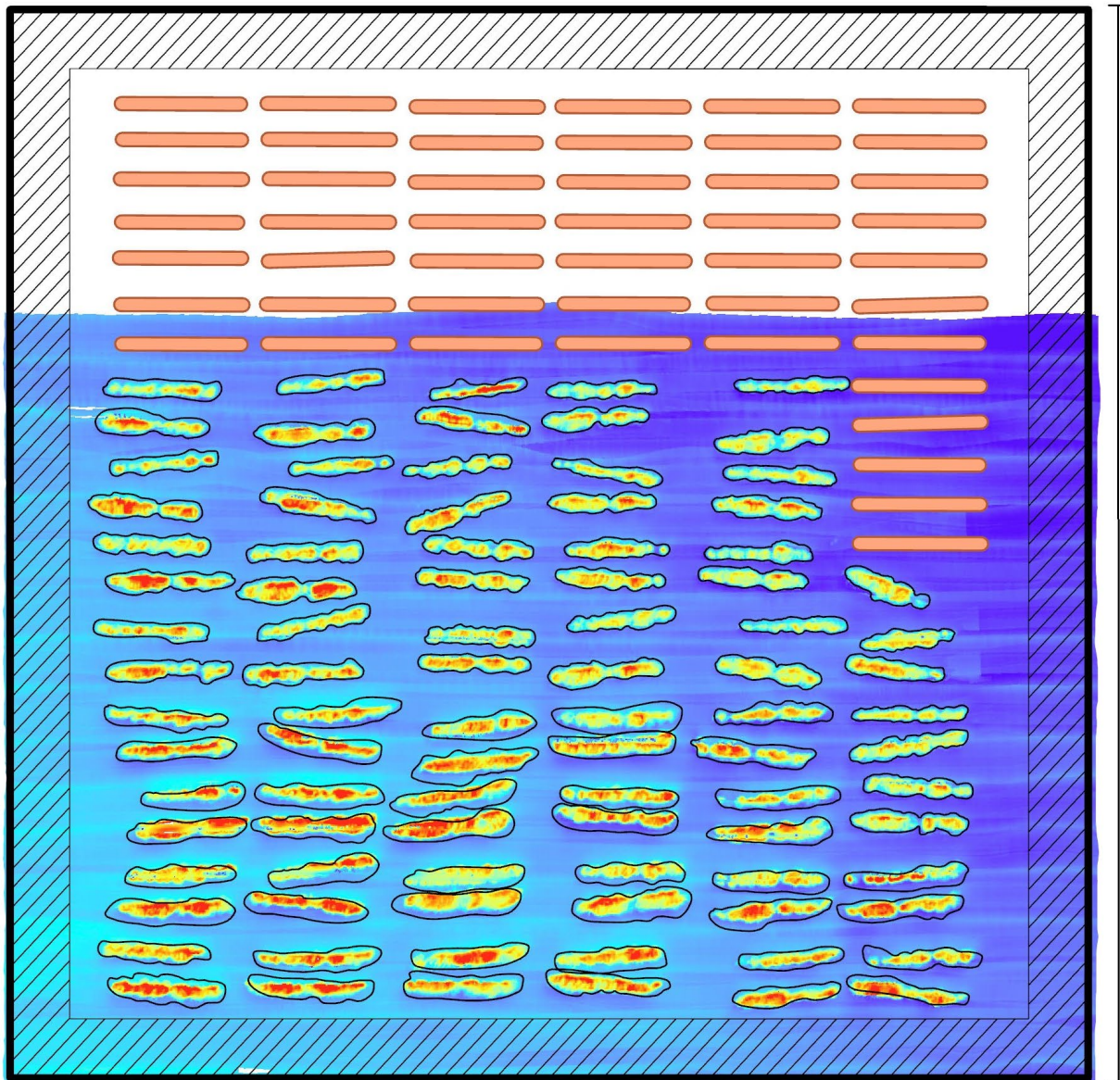


75 acres

Depth (ft)



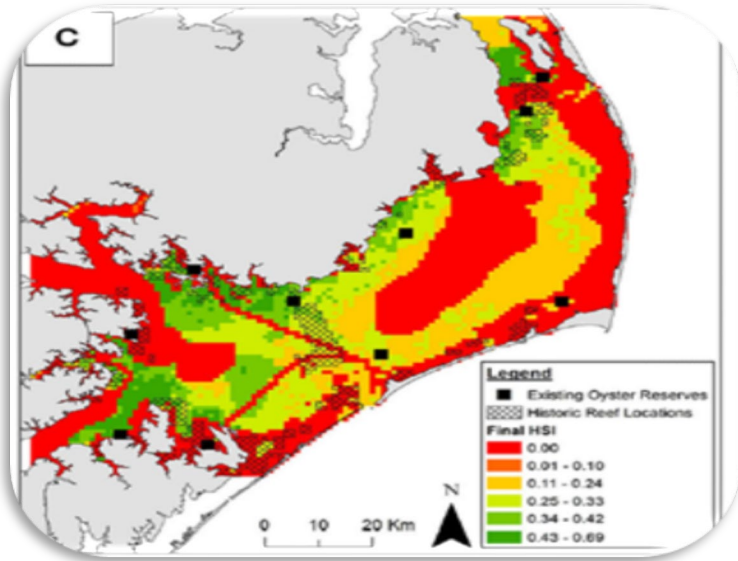
- Permit Boundary
- ▨ Sanctuary Buffer
- 2023 Deployment Lines



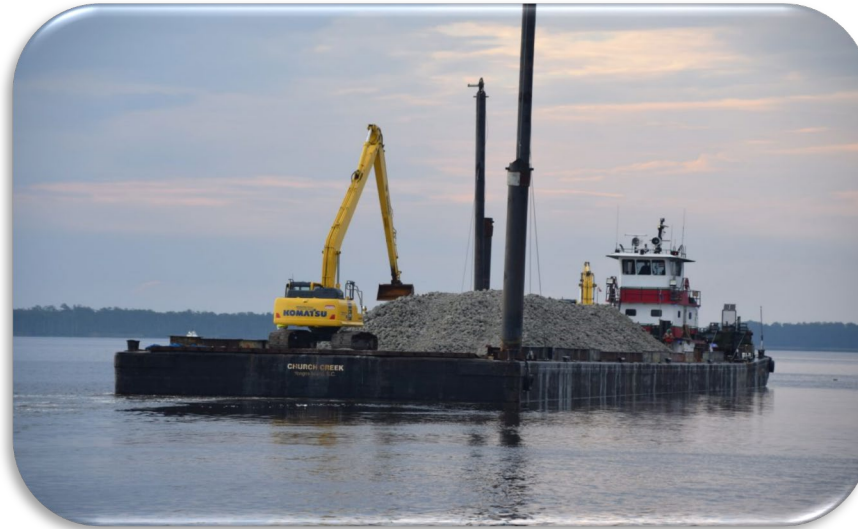
1.25
Empire
State
Buildings



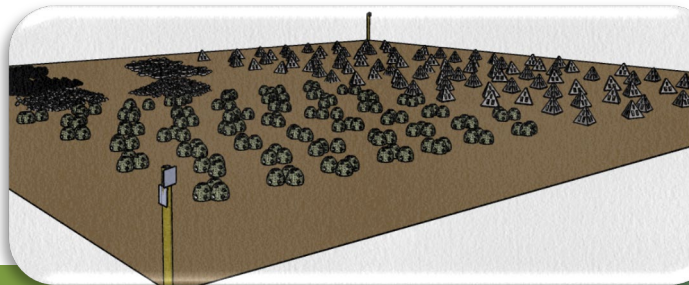
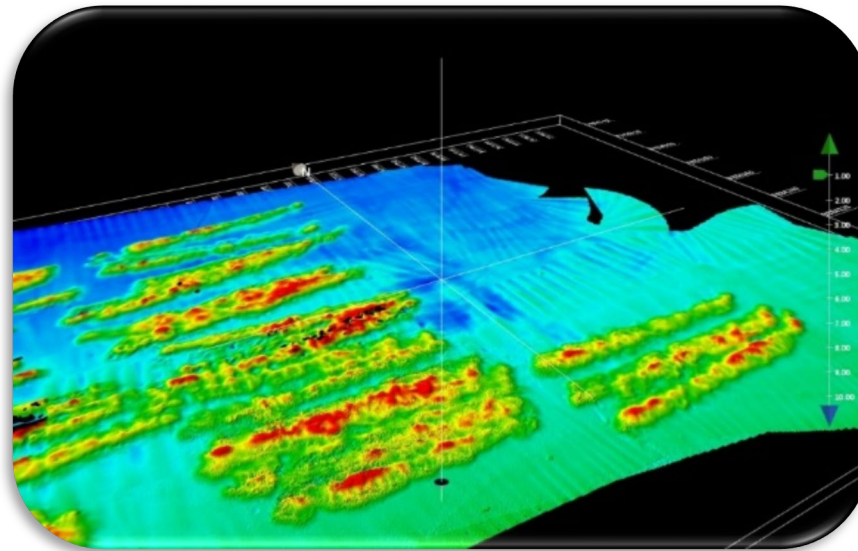
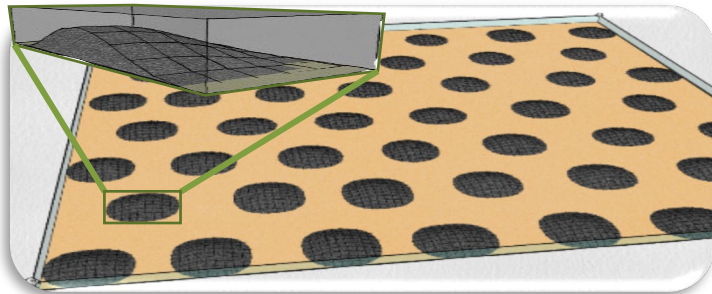
Site Selection



Construction

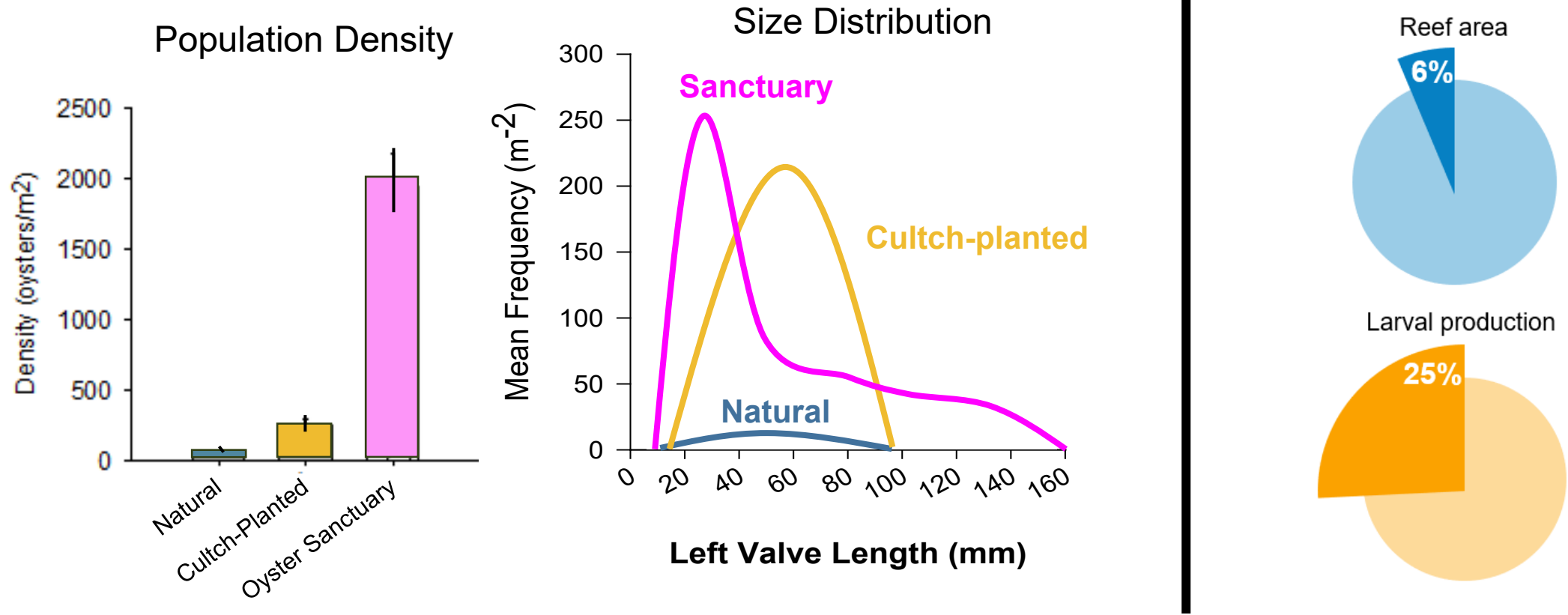


Monitoring



Why are Oyster Sanctuaries important?

Sanctuaries strengthen and support the oyster population



Department of Environmental Quality



Recent Accomplishments: Oyster Sanctuaries

- Cedar Island Oyster Sanctuary
 - 75 acres
 - 46,500 tons of marine limestone marl
 - 5,500 tons of recycled concrete
 - 104 million lbs./ 15,000 F-150s, ~386 staff days, 61 barge loads
- Successful monitoring season
 - ~22,000 oysters measured (136 locations on 14 sanctuaries)
 - Integrate results for improving future site selection
 - Draw comparisons to natural and cultch-planted reefs



Coming up for Oyster Sanctuaries

- 3- year partnership with the North Carolina Coastal Federation
 - \$14.9 million NOAA Habitat Restoration and Resilience
 - ~50,000 tons per year (3x current volume)
 - Meet a statewide target of 500 combined acres of oyster sanctuary area

392 → 500+

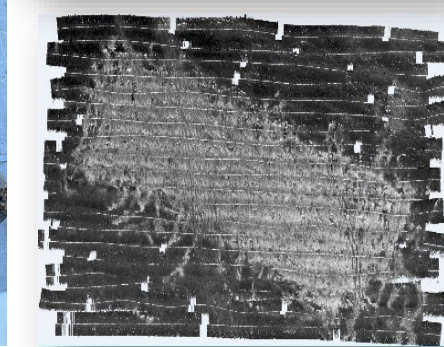
- Developing future goals beyond 500 acres

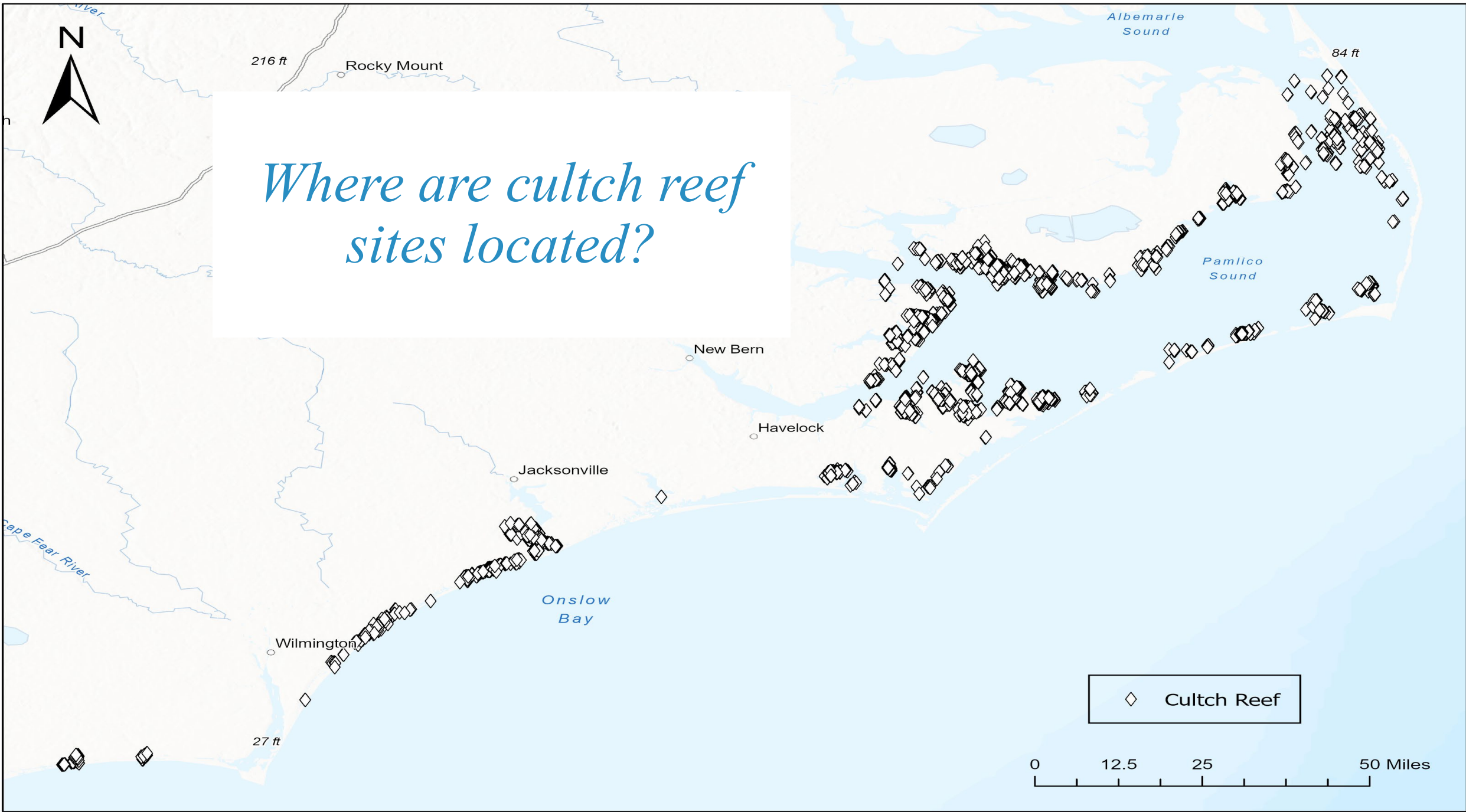


Shellfish Rehabilitation in NC: a two-part approach

Part 2: Cultch Planting (harvest)

- **Primary objective: restore available hard substrate for recruitment**
- Area of focus – Dare to Brunswick
- General design:
 - Small areas ~3 acres each
 - Low relief habitat (12-18")
 - Continuous veneer
 - Small materials (2-4" pieces)
- Material types: Oyster shell, grade ASTM 4 limestone marl



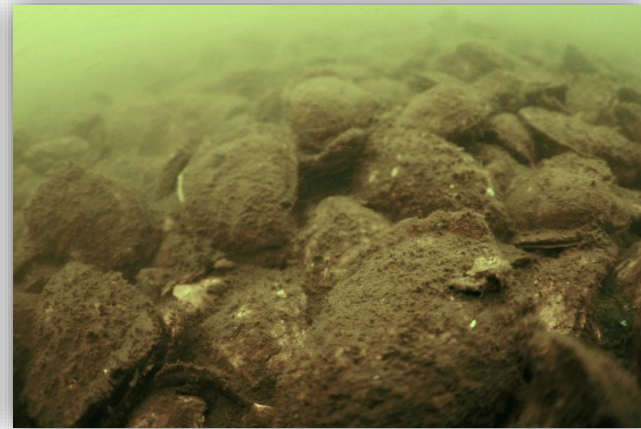


Where are cultch reef sites located?

◇ Cultch Reef

0 12.5 25 50 Miles

Cultch Planting: how do we do it?



Heavy Equipment Fleet



6 vessels
7 wheel-loaders
1 semi tractor & lowboy trailer
3 dump trucks
2 conveyors



Recent Accomplishments: Cultch Planting

- 2021-2023: 127 combined acres built (894,878 bushels, 36 sites)
- Developing plans on alternate fishery management strategies (rotational harvest)
- New sampling program
- Purchased new 120' flagship vessel, *RV Oyster Creek*



Future Goals for Cultch Planting

- Expand effort (Mainland Hyde, eastern Carteret, Outer Banks Dare, south of Pender County)
- Secure stockpile location in Engelhard
- Utilize newly acquired *RV Oyster Creek* for long range enhancements



What are Artificial Reefs?

- Hardbottom habitat built using non-natural materials, placed in featureless areas
- Provide fishing and diving opportunities: sited with public accessibility in mind
- Reef design: stable and durable
 - Ships
 - Demolished bridges
 - Concrete pipe
 - Reef balls



Artificial Reefs: How do we do it?



Recent Accomplishments: Artificial Reefs

- 17 Artificial reefs enhanced 2021-2023:

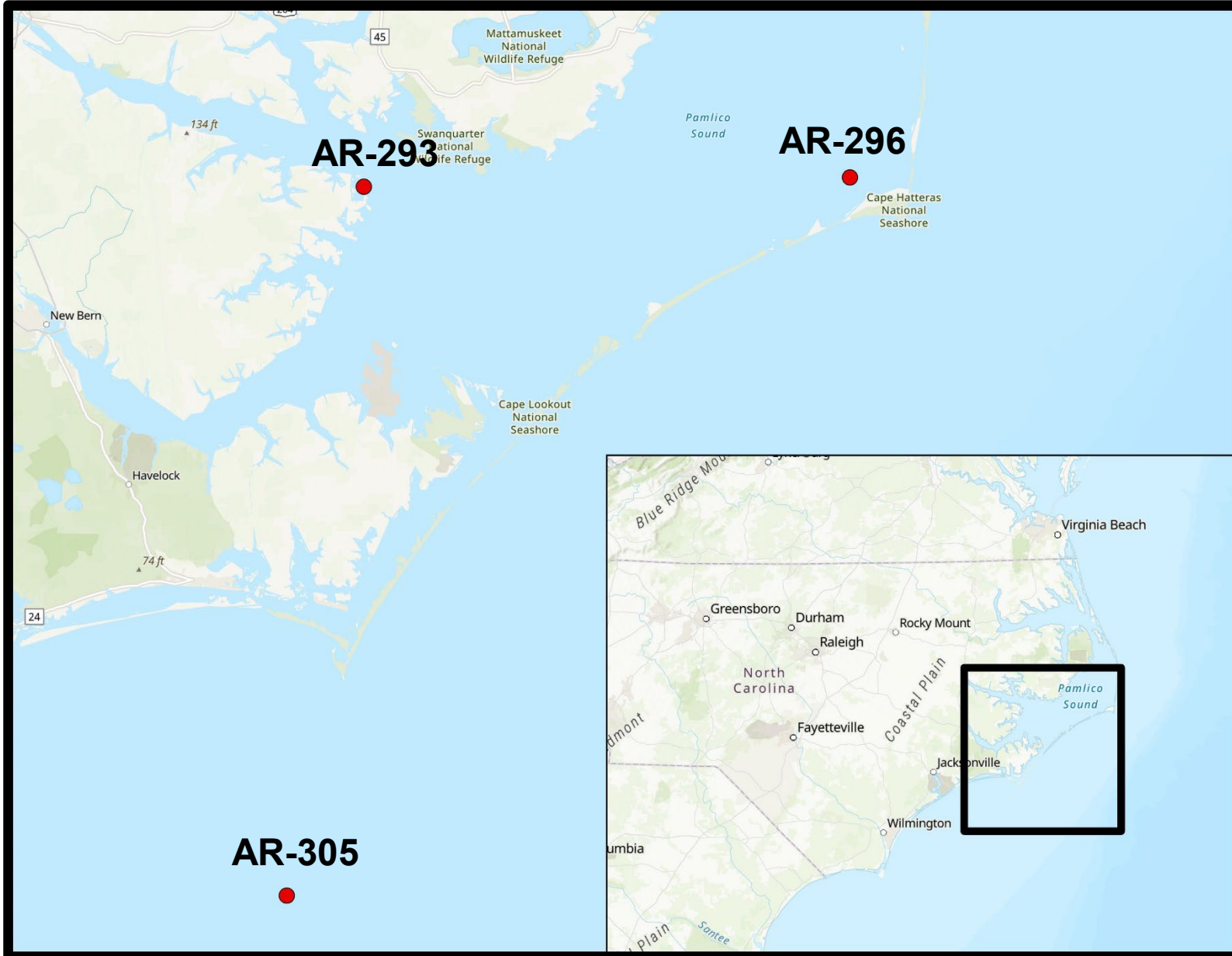
- AR-130 → ~13,200 tons concrete (Bonner Bridge)*
- AR-140 → ~14,400 tons concrete (Bonner Bridge)*
- AR-145 → ~15,600 tons concrete (Bonner Bridge)*
- AR-160 → ~31,200 tons concrete (Bonner Bridge)*
- AR-165 → 532 reef balls, 108' tugboat *Valley Forge*, 75' caisson door
- AR-250 → ~1,200 tons concrete (Bonner Bridge)*
- AR-255 → ~1,200 tons concrete (Bonner Bridge)*
- AR-291 → 100 reef balls
- AR-305 → 1,700 tons concrete pipe
- AR-320 → ~3,600 tons concrete (Bonner Bridge)*
- AR-340 → ~1,200 tons concrete (Bonner Bridge)*
- AR-360 → 31 Eternal Reefs
- AR-368 → 1000 tons pipe, 170 reef balls
- AR-380 → 200 reef balls
- AR-372 → 25 Veteran's Memorial Reefs
- AR-430 → ~2000 tons pipe
- AR-460 → ~2000 tons pipe

*80,000 tons of concrete - the largest reef enhancement in NC history

- Hydrographic surveys of ~ 7,600 acres of reef habitat: Artificial Reef Guide
- Visual diver surveys of ~ 30 ocean Artificial Reefs



Upcoming Artificial Reef Projects



September 2023

AR-293

Inshore, Pamlico Point
Reef balls and NATRX units

Spring 2024

AR-296

Inshore, Buxton/ Clam Shoal
Aggregate rock, concrete

Summer 2024

AR-305

Offshore, Cape Lookout
Vessel TBD



Summary

- Healthy reef habitat is critically important for fisheries
- Investing in reef enhancement is an insurance policy to help sustain fisheries for future generations
- NCDMF is a clear leader:
 - Most robust shellfish rehabilitation efforts among coastal states
 - One of the largest and most active Artificial Reef programs in the nation
- As a state, we should be proud of our accomplishments, but humbly recognize the need for improvement
 - Public engagement!



Questions



Jason Peters

Program Supervisor

Oyster Sanctuaries | Cultch Planting | Artificial Reefs

