

Oyster Reefs for Coastal and Shoreline Defense: Meeting the Challenge of Rising Seas

Niels Lindquist^{1,2} and Marae West¹

¹Sandbar Oyster Company Inc

²UNC Chapel Hill Institute of Marine Sciences



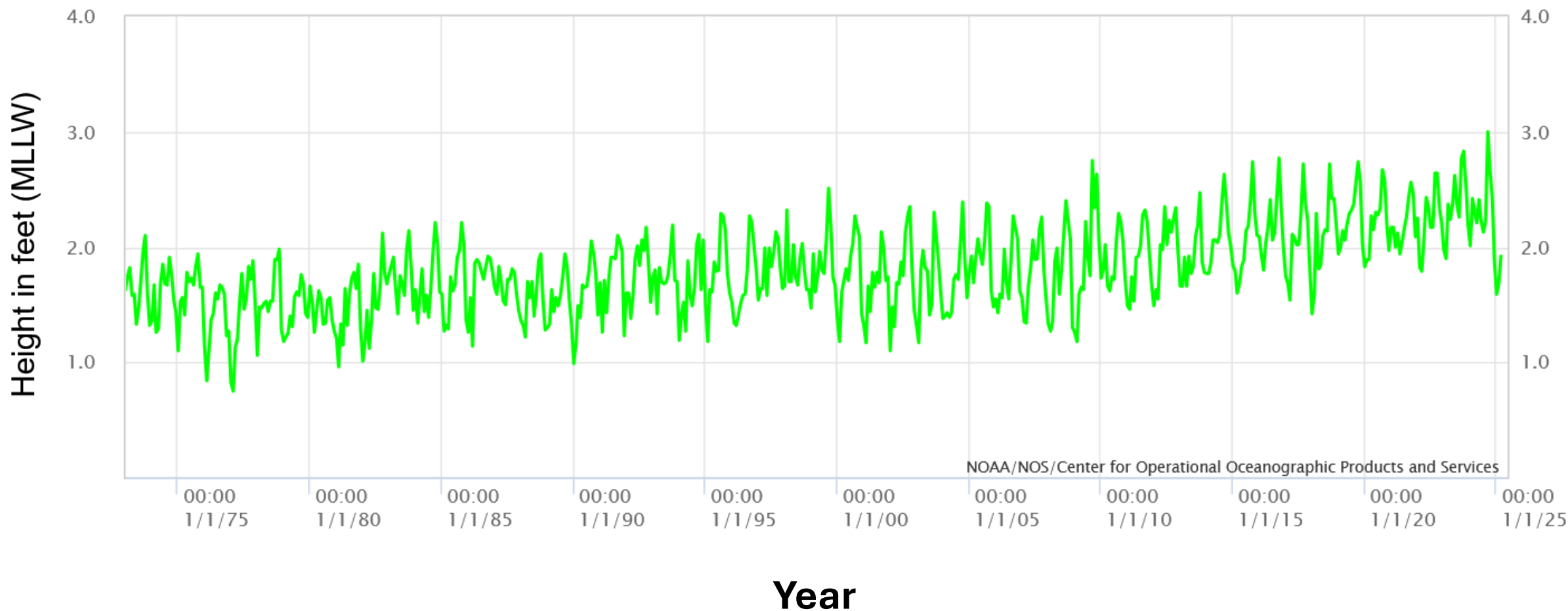
SANDBAR
OYSTER COMPANY | Shellfishly Motivated™



North Carolina
Beach, Inlet and Waterway Association

2025 Local Governments Meeting
The Islander Hotel, Emerald Isle, NC
May 8-9, 2025

Verified Monthly Mean Water Levels at Beaufort, Duke Marine Lab NC



Wachapreague, Virginia

Wachapreague

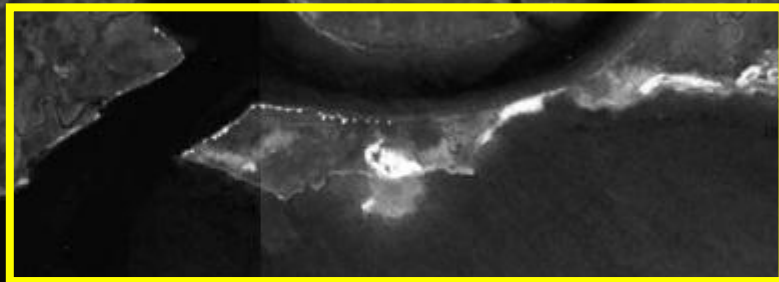
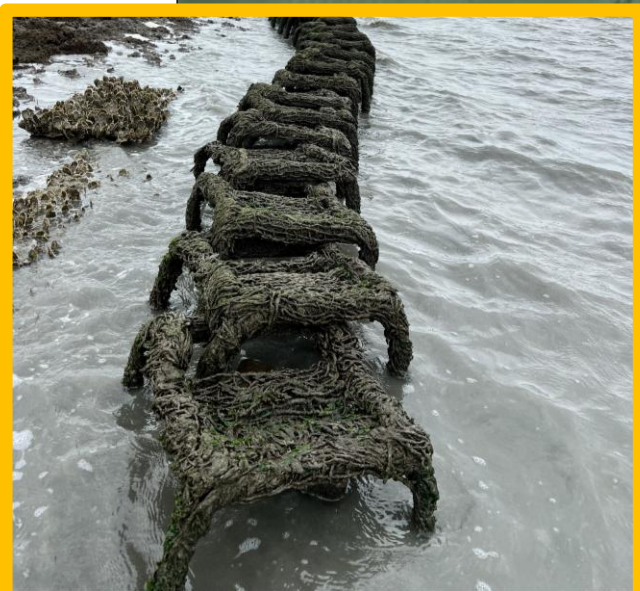


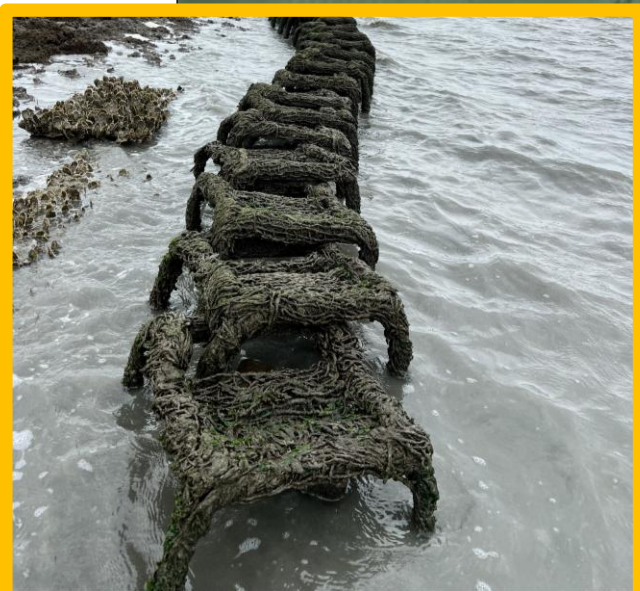
Image U.S. Geological Survey

image year 1994

Google Earth

Imagery Date: 3/19/1994 37°36'44.18" N 75°41'44.68" W elev 6 ft eye alt 11262 ft





June 2024

June 2023



June 2024




SANDBAR
OYSTER COMPANY | Shellfishly Motivated™

Install year
2021 – test section
2022
2023

Project Partners: TNC Virginia Coast Reserve;
University of Virginia, Town of Wachapreague
Funding: NFWF

Pictures courtesy of Bo Lusk, TNC

March 2025



Bo Lusk,
TNC Virginia Coast Reserve

Pictures courtesy of Bo Lusk, TNC

March 2025

nature
climate change

LETTERS

PUBLISHED ONLINE: 28 APRIL 2014 | DOI: 10.1038/NCLIMATE2216

Oyster reefs can outpace sea-level rise

Antonio B. Rodriguez^{1*}, F. Joel Fodrie¹, Justin T. Ridge¹, Niels L. Lindquist¹, Ethan J. Theuerkauf¹, Sara E. Coleman¹, Jonathan H. Grabowski², Michelle C. Brodeur¹, Rachel K. Gittman¹, Danielle A. Keller¹ and Matthew D. Kenworthy¹



Bo Lusk, TNC

Carrot Island, Rachel Carson National Estuarine Research Reserve Beaufort, NC



2016



2025



2022



July 2024

Carrot Island, Rachel Carson National Estuarine Research Reserve, Beaufort, NC



Project Partners: Rachel Carson NERR; Moffatt & Nichol;
Carteret Marine Services; Natrx; Native Shorelines

Funding: NFWF; Carteret County; NC DEQ; NC Land and Water Fund



December 2024

April 2025




SANDBAR
OYSTER COMPANY | Shellfishly Motivated™

Sugarloaf Island, Morehead City, NC



November 2024

Sugarloaf Island, Morehead City, NC



WADs and Oyster Catcher™
reef installed 2024

Project Partners: NC Coastal Federation;
Sea & Shoreline; Quible and Associates;
Town of Morehead City; ECU; Native
Shorelines

Funding: NC General Assembly

Drone image courtesy of
Dr. Hannah Siriani, ECU



Drone image - Fairley Cessa





SANDBAR
OYSTER COMPANY | Shellfishly Motivated™






SANDBAR
OYSTER COMPANY | Shellfishly Motivated™

Project Partners: NC Aquarium; NC Coastal
Federation; Natrx; Native Shorelines; UNC
Chapel Hill; ECU; NOAA

Funding: NC General Assembly, NC Land and Water Fund

Drone image courtesy of
Brandon Puckett, PhD
Research Marine Biologist
Coastal Resilience, Restoration,
and Assessment Branch
NOAA National Ocean Service
Beaufort Laboratory

NC Aquarium, Pine Knoll Shores, NC

Natrx – Exoforms™

April 26, 2025



Natrx
ADAPTIVE INFRASTRUCTURE

April 26, 2025

NC Aquarium, Pine Knoll Shores, NC

Native Shorelines – QuickReef®



April 26, 2025

Oyster Catcher™
Table-Pillow reef

NC Aquarium, Pine Knoll Shores, NC



April 2025

Drone image courtesy of
Brandon Puckett, PhD
Research Marine Biologist
Coastal Resilience, Restoration,
and Assessment Branch
NOAA National Ocean Service
Beaufort Laboratory

April 26, 2025

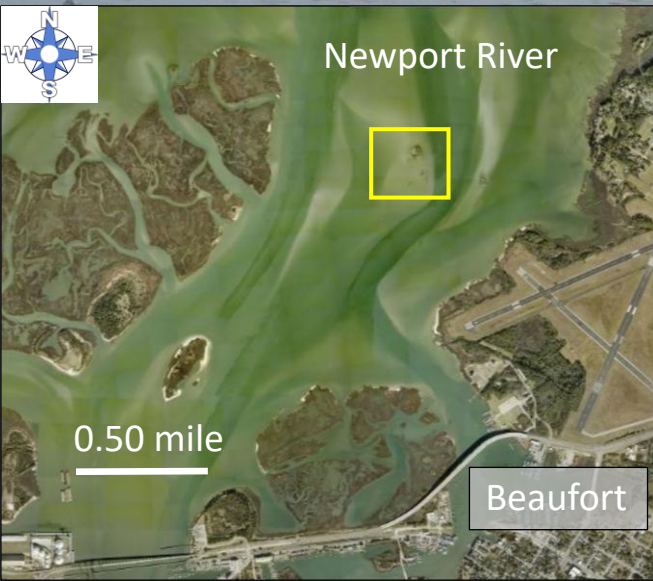


SANDBAR
OYSTER COMPANY | Shellfishly Motivated™

SANDBAR Oyster Company, Newport River Shellfish Leases

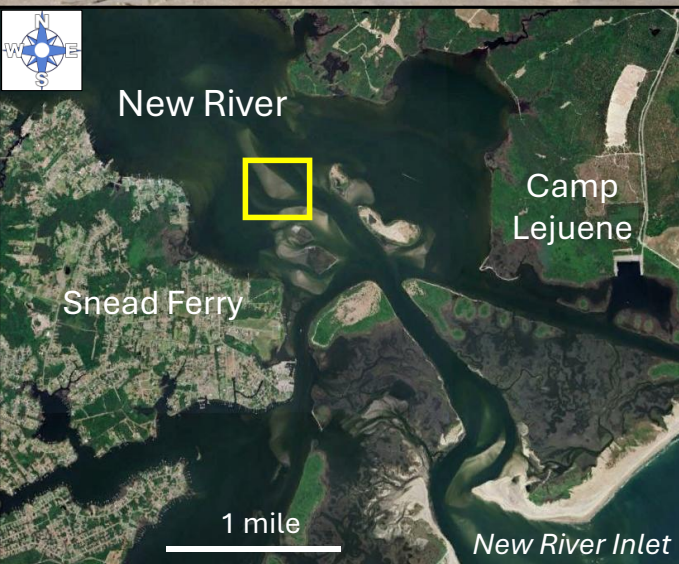
Beaufort, NC

August 2024



March 2025

SANDBAR Oyster Company
New River Shellfish lease
Sneads Ferry, NC

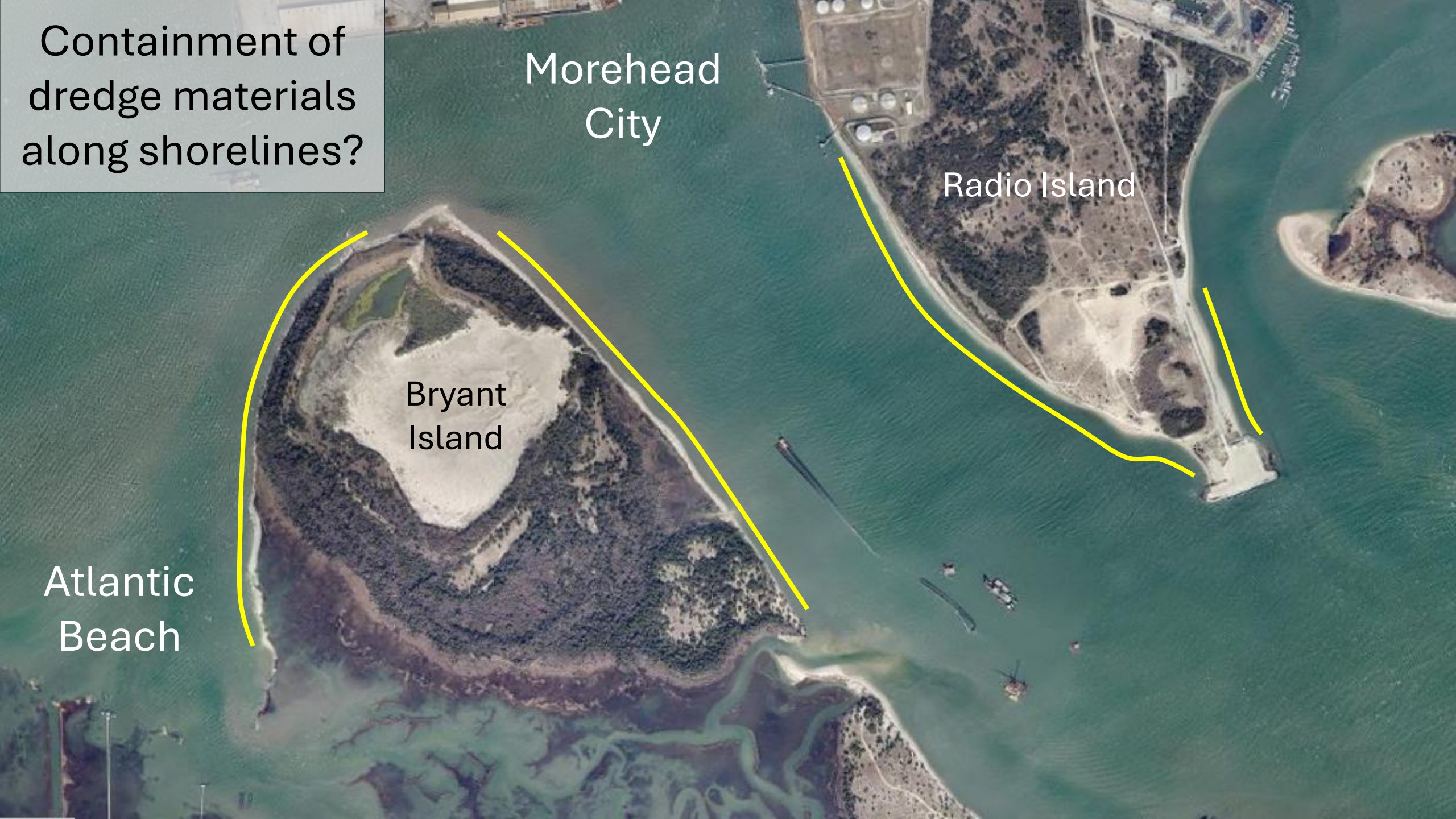


Containment of dredge materials for beneficial use – creation of extensive oyster reef and salt marsh habitat mosaic

Examples of areas for possible dredge material placement and oyster reef/salt marsh creation?



Atlantic
Beach



Containment of
dredge materials
along shorelines?

Morehead
City

Radio Island

Bryant
Island

Atlantic
Beach

Bogue Sound, Morehead City, NC



SANDBAR

OYSTER COMPANY | Shellfishly Motivated™

QUESTIONS?