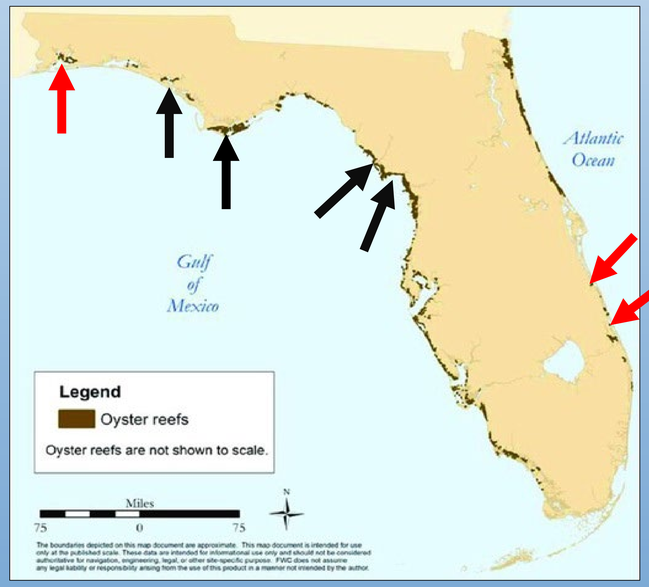
Methods for Mapping Subtidal Oyster Reefs

Ray Grizzle[1], Krystin Ward[1], Tom Waddington[2], Tom Reis[2]

[1]University of New Hampshire, Durham, NH 03824; [2]Substructure, Inc., Portsmouth, NH 03801

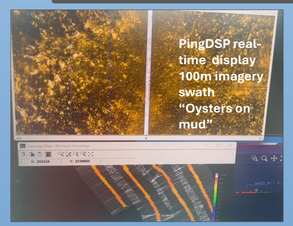
Where in Florida do eastern oysters, *Crassostrea virginica*, occur subtidally (and intertidally in most areas)?

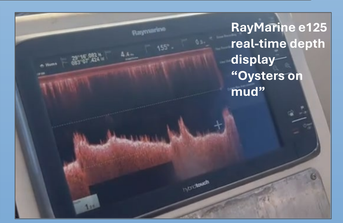


Arrows indicate where subtidal oyster reefs are known to occur. Some mapping has been done in most of the indicated estuaries. Black arrows are where we have worked.

Radabaugh et al. 2019 OIMMP Conclusions chapter: "Subtidal oyster reefs are also mapped infrequently or not at all, because it is so labor-intensive to map the benthos with sonar. Additional subtidal oyster mapping is needed across the panhandle, Big Bend, Tampa Bay, and possibly other locations where the extent of subtidal oysters is unknown."

Methods used for Florida Subtidal Reef Mapping by Substructure and The University of New Hampshire





Broadscale mapping was conducted aboard Substructure's *Diversity*, a 24-ft Privateer outfitted with a variety of sensors during the different projects:

- Ping DSP 3DSS-iDX-450-Pro multibeam echosounder
- Klein 3500 dual-frequency side-scan sonar
- Edgetech 6205 wide-swath bathymetric and side-scan sonar
- Knudsen 3212 dual-frequency single-beam echosounder
- Innomar SES-2000 dual-frequency sub-bottom profiler
- RayMarine e125 with DownVision Chirp transducer at 350 kHz
- SBG Navsight Ekinox vessel position and motion reference unit
- Applanix POSMV 320 vessel position and motion reference unit
- AML Oceanographic MicroX sound velocity sensor (SVS)
- YSI Castaway conductivity-temperature-depth (CTD) profiler
- Hypack/Hysweep, SonarWiz, Qinertia, and Qimera software

The primary goal of the broadscale survey operations was to create detailed mapping of hard substrate (e.g., shell, oysters, rock, coarse sand, etc.) based primarily on the acoustic imagery data. The imagery data typically provided much greater swath coverage than the concurrently-acquired bathymetric data.

In addition to the broadscale mapping, extensive discrete sampling was conducted to help ground-truth the acoustic results and to identify areas for more detailed sampling:

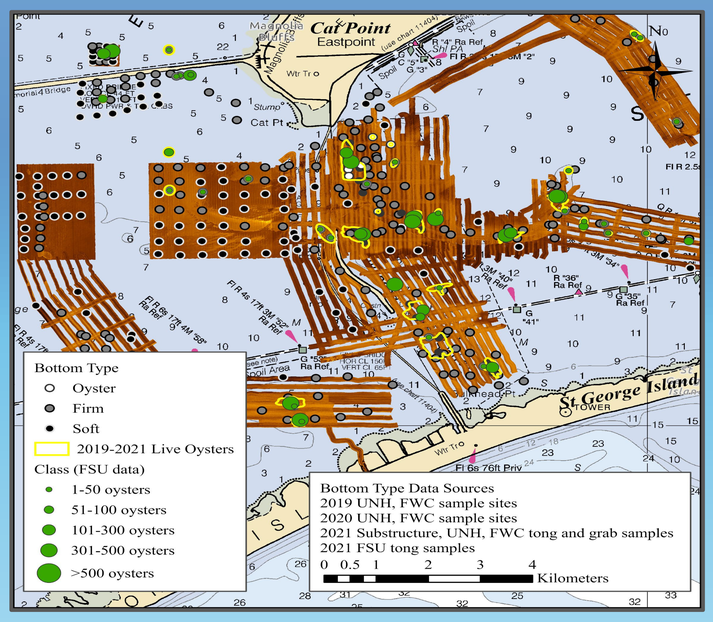
- Probing with measured aluminum pole (during acoustic surveys)
- Grab sampling
- Underwater video
- Hand tongs and small patent tongs
- Diver investigation
- RayMarine e125 "live oyster" acoustic signature

We have conducted acoustic surveys in three Florida estuaries: Apalachicola Bay, St. Andrew Bay, and in the Big Bend, Cedar Key area.

Apalachicola Bay

Subtidal reefs dominant, but also intertidal

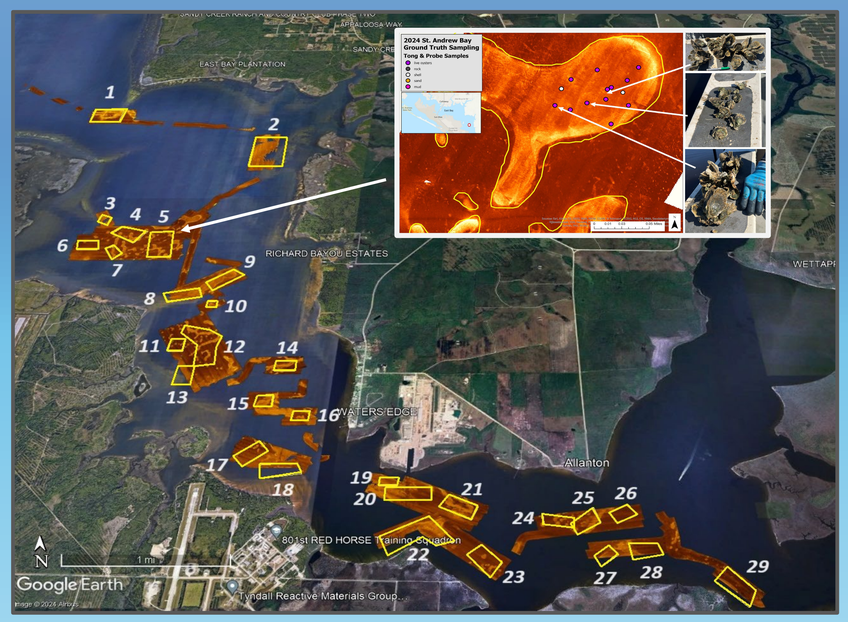
Grizzle, R, K Ward, T. Waddington and T Reis. 2022. FINAL REPORT for Apalachicola Bay Oyster Reef Mapping. Florida Fish and Wildlife Conservation Commission (FWC) Contract #19286.



St. Andrew Bay

Subtidal reefs dominant, but intertidal in a few areas

Grizzle R, Ward K, Waddington T, Reis T. 2025. Final Report—St. Andrew Bay Oyster Reef Mapping, Florida Fish and Wildlife Conservation Commission (FWC) Contract #241565).



Big Bend, Suwannee Sound

Intertidal reefs dominant, but also subtidal

Grizzle R, Ward K, Waddington T, Reis T. 2025. Final Report—Suwannee Sound Oyster Reef Mapping Florida Fish and Wildlife Conservation Commission (FWC) Contract #19286.