The Apalachicola Bay System Initiative (ABSI)

Science update
Community Advisory Board Meeting
February 1, 2023

Funded by Triumph Gulf Coast Inc. in April 2019

ABSI overarching goals are:

- Understand why the Apalachicola Bay oyster populations have not recovered and identify restoration approaches that will inform larger efforts
- Determine whether loss of oyster populations is causing a decline in overall ecosystem health?
- Work with local stakeholders to develop a science-based restoration and management plan for Apalachicola Bay

ABSI Components

Science Advisory Board

Research

Restoration experiments

Management strategies

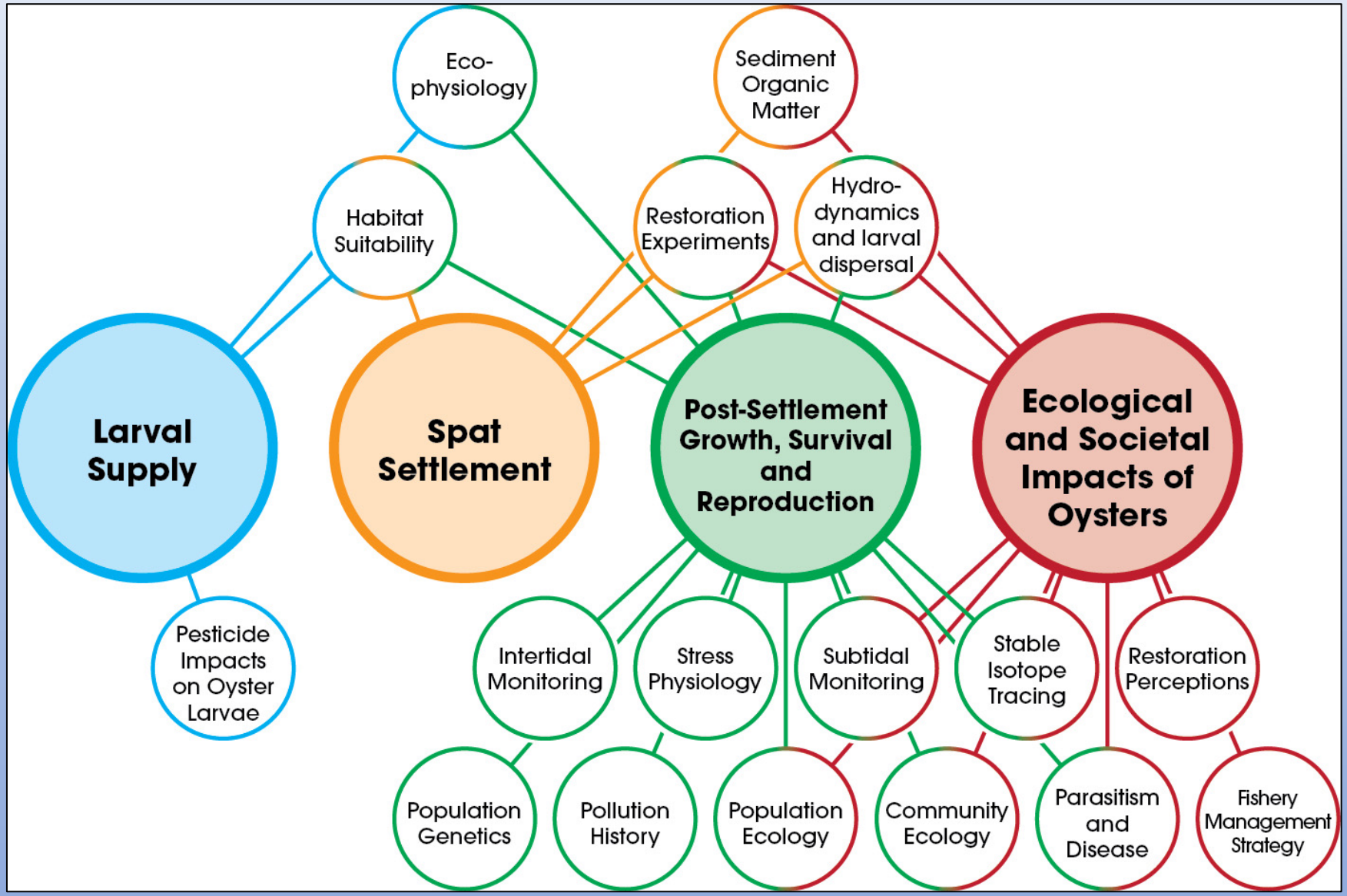
Community Advisory Board

Table of Contents

ABSI Annual Report March 2022

https://marinelab.fsu.edu/absi/about-absi/

Development of a public-facing interactive tool



Habitat suitability

Habitat suitability models

Environmental project

Adam Alfasso*, Sandra Brooke

- Which areas are currently most likely to support oyster recruitment, growth and survival?
- How will these areas change under future climate scenarios?
- What substrate types are most conducive to oyster population development?
- How do seasonal environmental regimes affect habitat suitability patterns?
- How do seasonal variations in larval dispersal impact habitat suitability patterns?
- Is population connectivity an important variable for habitat suitability?
- Which areas within Apalachicola would be optimal for sanctuary (protected) reefs?

Working toward an analytical model

OysterID	SampleEvent	ShellHeight	ShellLength	ShellWidth	TotalWeight	ShellWetWe	DermoMantl	DermoGill	Sex	ReproStage	Parasite	OldSampleN
ABCD1601-0	ABCOLL_201	85.9	81.8	25.5	109.81	79.34	2	2	Z	4	No	AB-S-1
ABCD1601-0	ABCOLL_201	102.8	71.7	28.4	107.9	77.23	1	1	Z		Buceph	AB-S-2
ABCD1601-0	ABCOLL_201	90.8	64.2	45.5	169.41	131.02	2	2	Z	4	No	AB-S-3
ABCD1601-0	ABCOLL_201	51.4	51.3	27.4	34.56	27.84	0	0	M	2	No	AB-S-4
ABCD1601-0	ABCOLL_201	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Z	4	Yes	AB-S-5
ABCD1601-0	ABCOLL_201	60.9	46.5	28.6	36.74	26.02	0.5	0.5	M	2	No	AB-S-6
ABCD1601-0	ABCOLL_201	85.9	54.3	38.1	162.55	129.91	2	1	F	1	No	AB-S-7
ABCD1601-0	ABCOLL_201	87.8	53.3	30.7	105.21	80.4	3	4	Z		Buceph	AB-S-8
ABCD1601-0	ABCOLL_201	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.5	0.5	Z	4	Yes	AB-S-9
ABCD1601-1	ABCOLL_201	85	73.4	34.5	151.25	128.23	0	0.5	F	1	No	AB-S-10
ABCD1601-1	ABCOLL_201	49.9	40.3	23.8	25.75	20.95	0	0	Z	4	No	AB-S-11
ABCD1601-1	ABCOLL_201	60.3	46.8	28.4	33.88	24.08	0	0	M	2	No	AB-S-12
ABCD1601-1	ABCOLL_201	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	AB-S-13
ABCD1601-1	ABCOLL_201	41.7	42.4	15.6	13.38	9.67	0	0	Z	4	No	AB-S-14
ABCD1601-1	ABCOLL_201	[illegible]	[illegible]	15.3	7.76	5.9	0	0	M	3	No	AB-S-15
ABCD1601-1	ABCOLL_201	72.8	64.5	33.8	95.54	77.53	0	0	Z	4	Yes	AB-S-16
ABCD1601-1	ABCOLL_201	27.5	32.6	12.4	4.76	3.68	0	0	F	3	No	AB-S-17
ABCD1601-1	ABCOLL_201	74.5	63.7	29.6	78.75	63.67	0	0	F		Buceph	AB-S-18
ABCD1601-1	ABCOLL_201	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	M		No	AB-S-19
ABCD1601-2	ABCOLL_201	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	F	3	Yes	AB-S-20
ABCD1601-2	ABCOLL_201	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Z		Buceph	AB-S-21
ABCD1601-2	ABCOLL_201	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1	No	AB-S-22
ABCD1601-2	ABCOLL_201	34.5	35.5	13	10.38	8.39	0	0	Z	4	No	AB-S-23
ABCD1601-2	ABCOLL_201	69	53.7	36.6	114.14	94.43	2	2	F	1	Yes	AB-S-24
ABCD1601-2	ABCOLL_201	33.7	30.3	20.4	9.77	8.23	0.5	0	Z	4	No	AB-S-25
ABCD1602-0	ABCOLL_201	61.3	46.6	20.7	43.43	34.95	0	0.5	F	1	No	AB-S-26
ABCD1602-0	ABCOLL_201	53.6	47.2	19.7	31.25	25.04	0	0	F	1	No	AB-S-27
ABCD1602-0	ABCOLL_201	71.5	49	28.8	49.25	34.18	0	0	F	1	No	AB-S-28
ABCD1602-0	ABCOLL_201	50	42.4	21.2	28.06	23.11	0	0	M	1	No	AB-S-29
ABCD1602-0	ABCOLL_201	58.6	46.5	25.3	38.18	28.43	0	0	M	1	No	AB-S-30

- Developing data management plan
- Implementing data QA/QC
- Merging data streams into user-friendly master database(s)
- Master database(s) provide the means to build quantitative models and test hypotheses

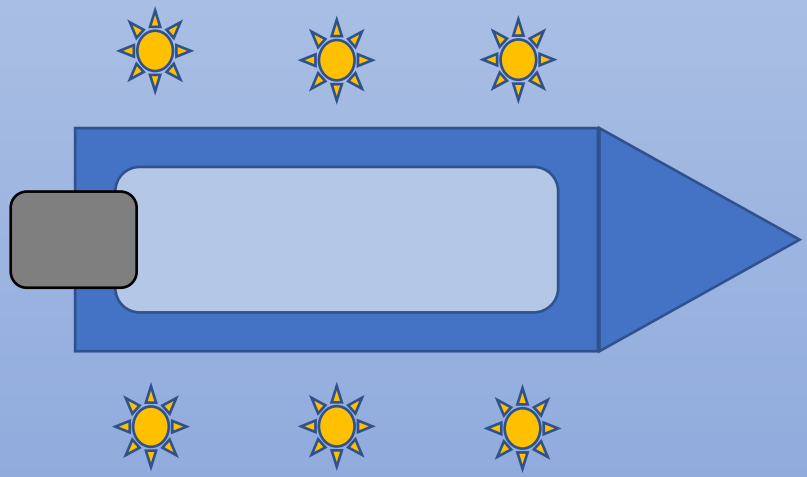
Tonging surveys

Goals of the tonging surveys are:

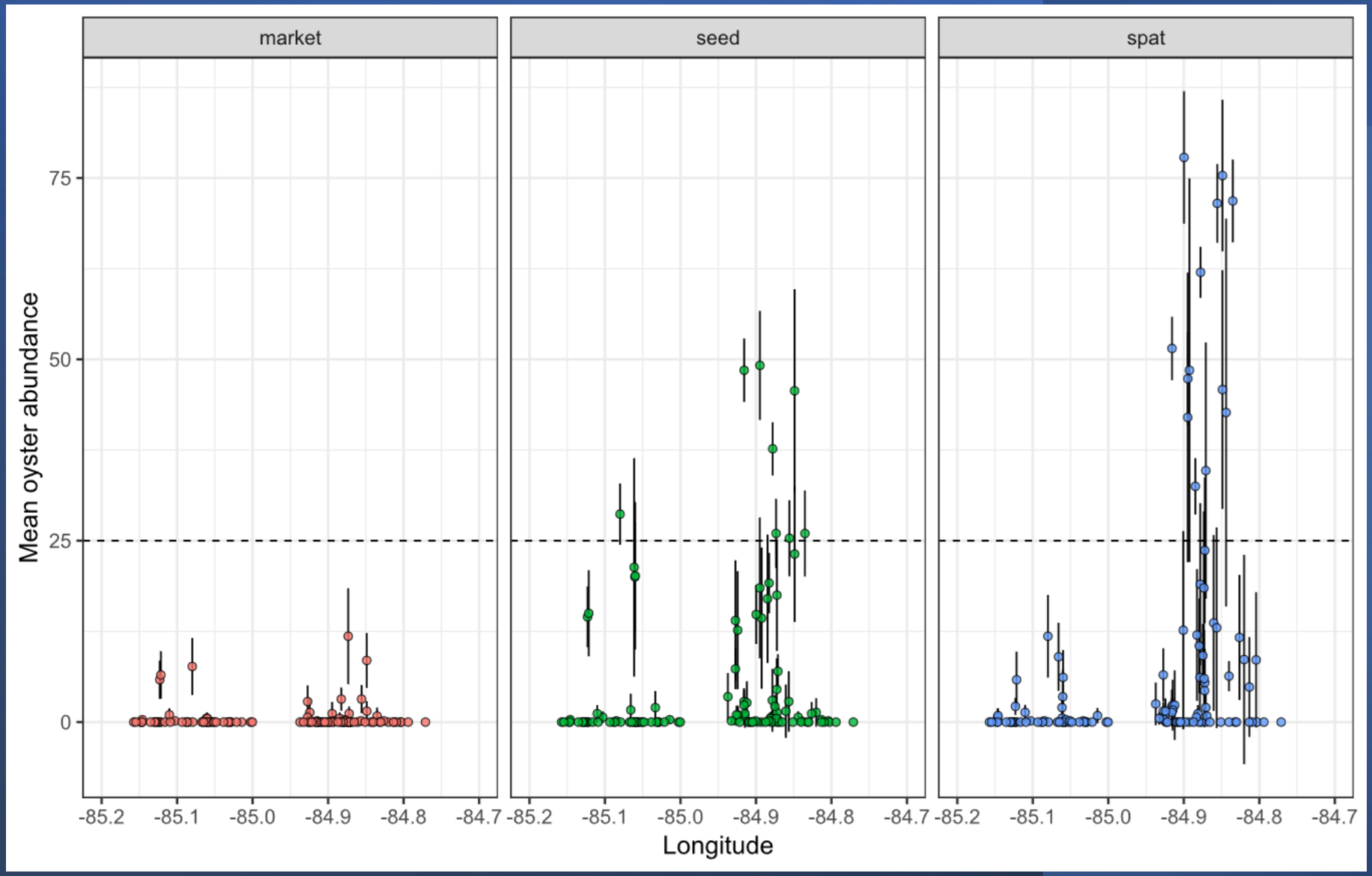
- Understand oyster population status across the bay.
- Identify regions that are doing well/poorly
- Identify substrates that are doing well/poorly

Round 1 (2020/21): 154 sites
Round 2 (2021-22): 121 sites
Round 3 (2023): >200 sites

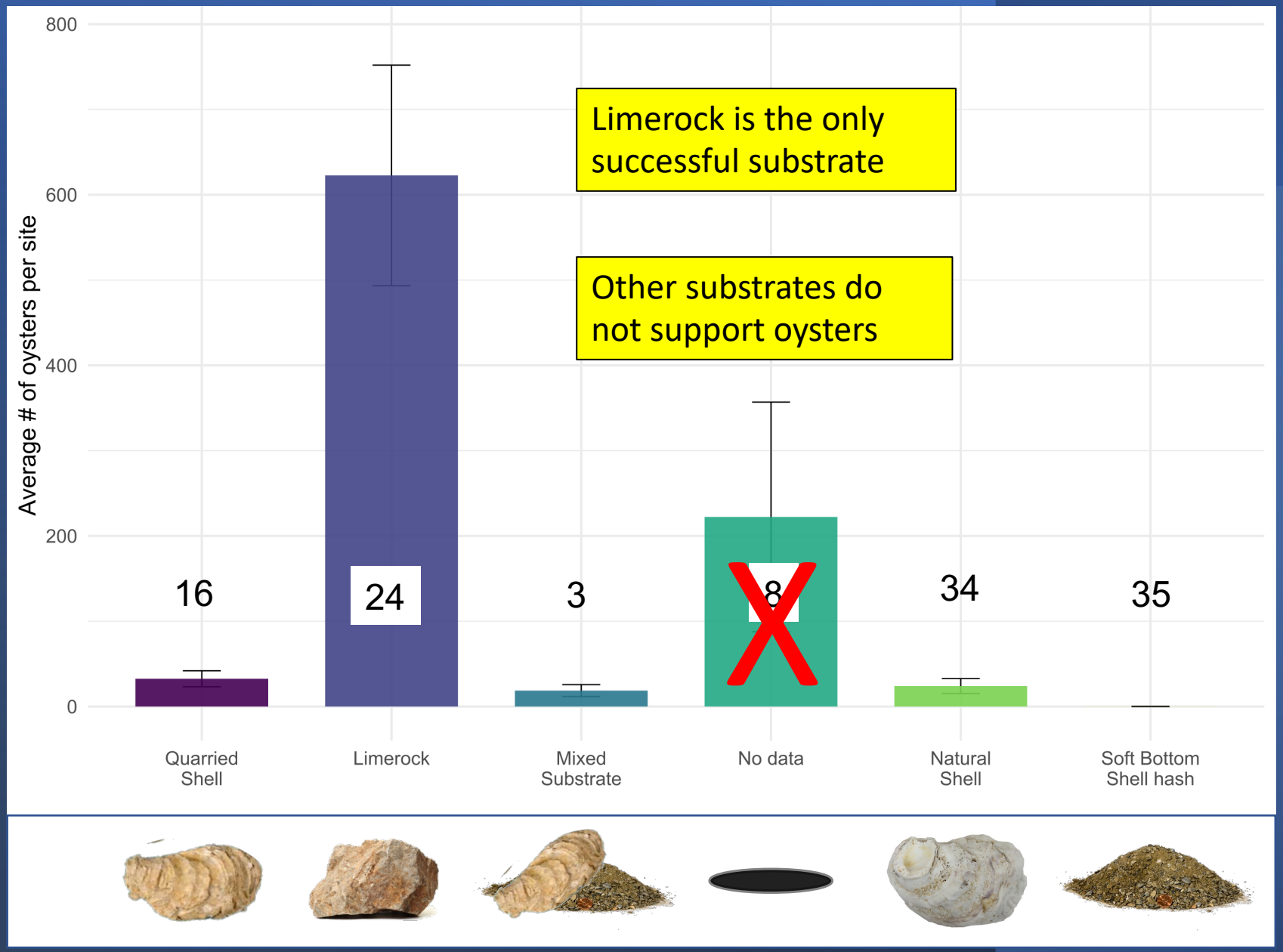
At each survey site:
6 tong samples around boat
Type, volume, weight of substrate recorded
Oysters counted and measured
Boxes counted by size (spat, seed, market)
Predators counted



2021-22 survey by region



2021-22 survey by substrate

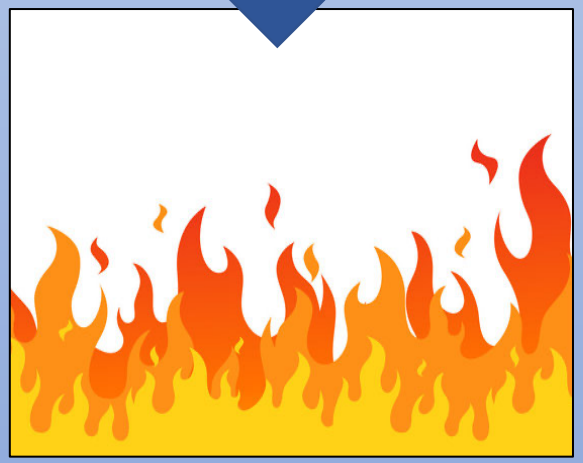


Limerock is not toxic.

Limerock is not the same as quicklime

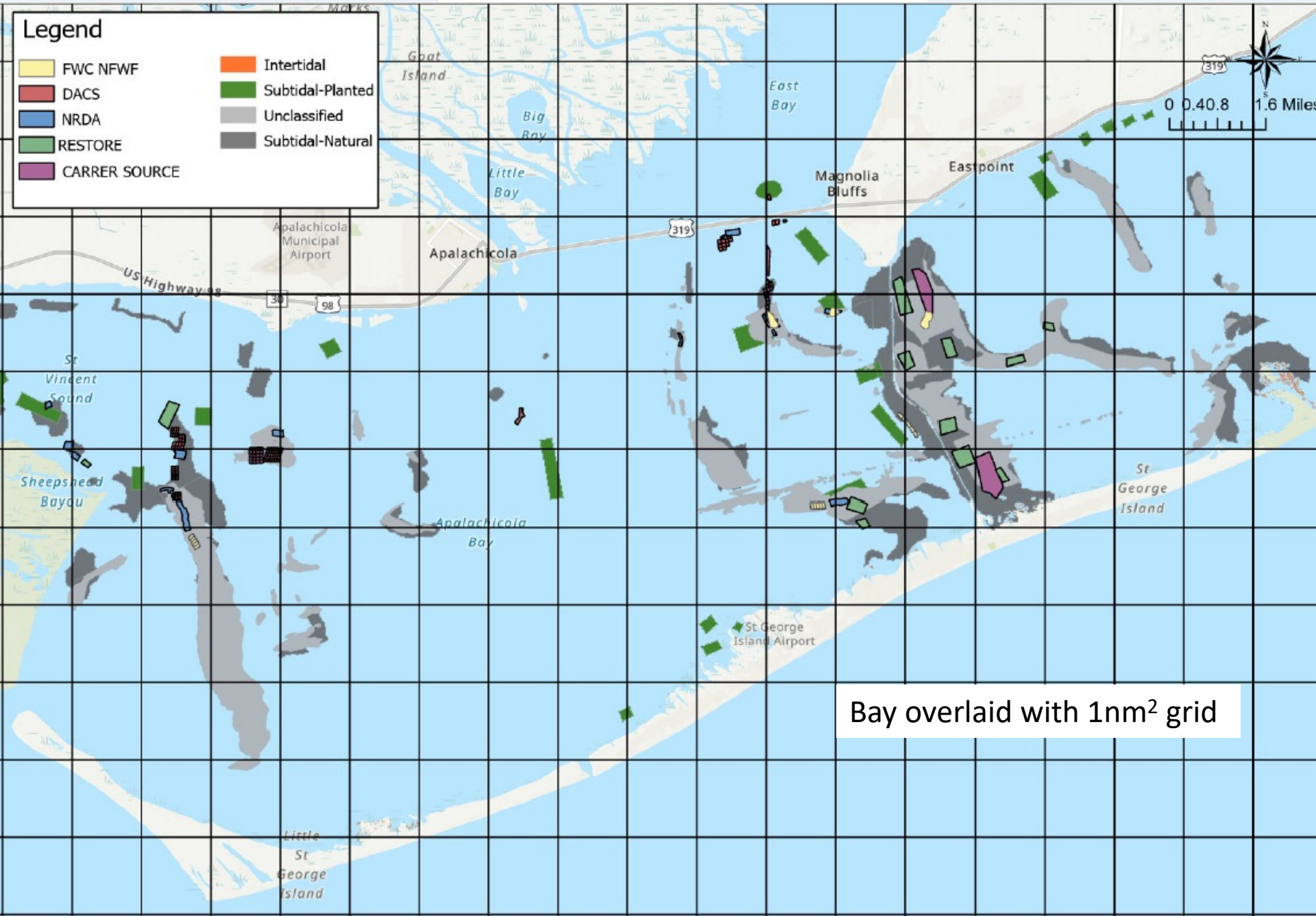
Limerock = Calcium carbonate

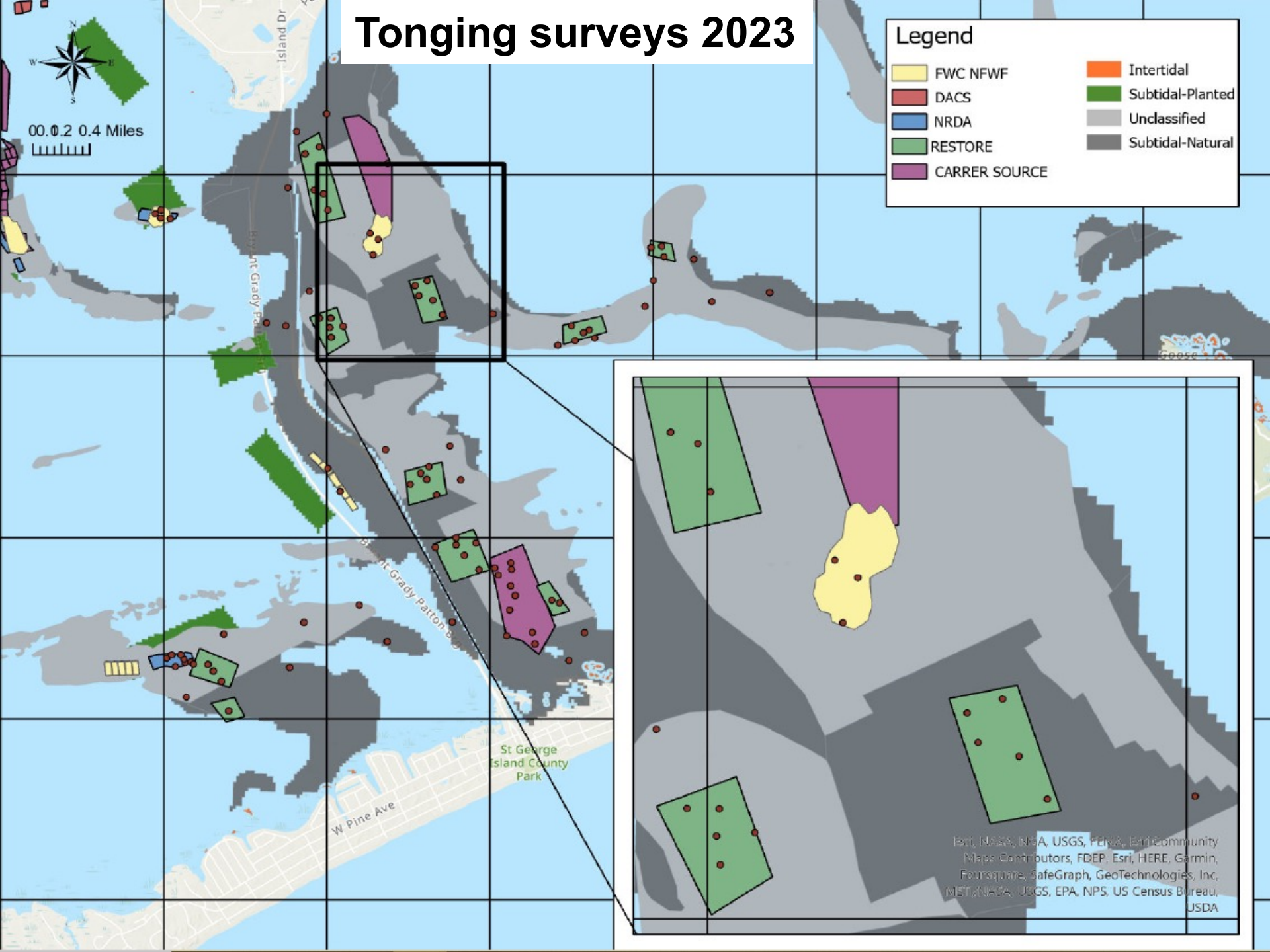
Oyster shell = Calcium carbonate



Quicklime = Calcium oxide

Tonging surveys 2023



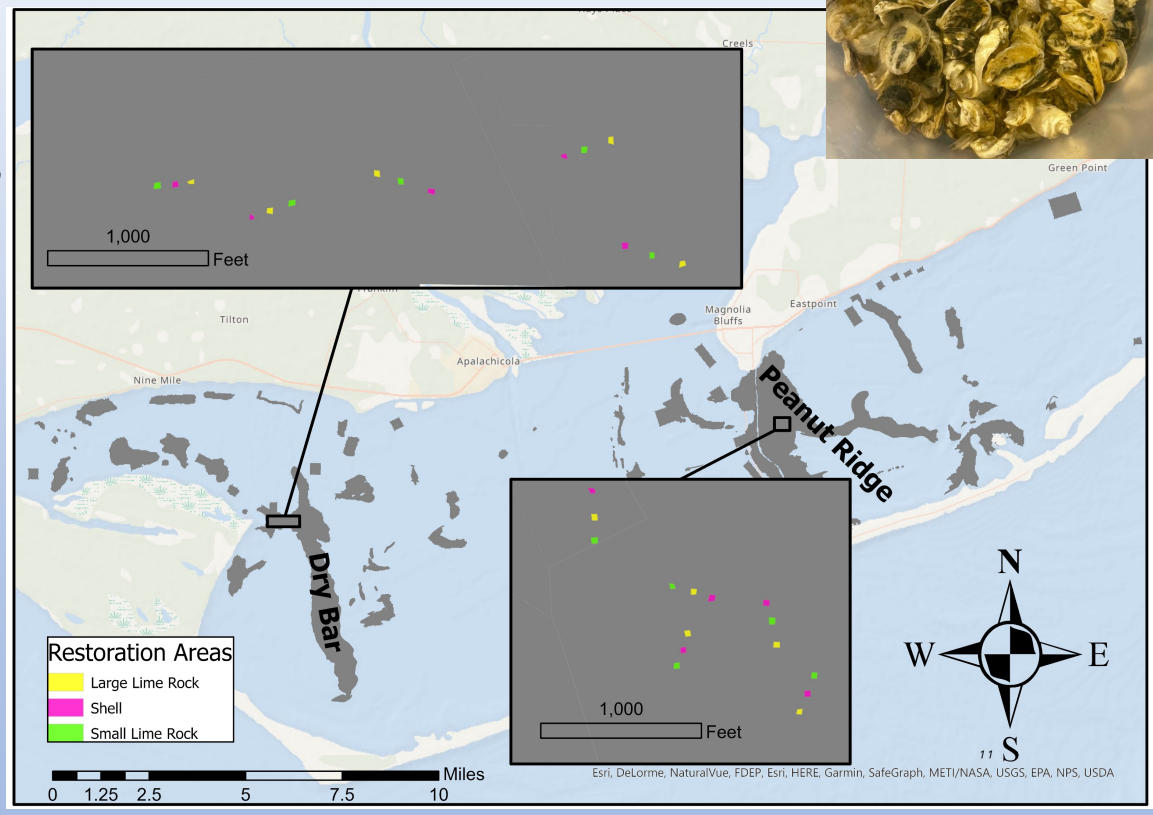

Tonging surveys 2023
Legend
FWC NFWF
DACS
NRDA
RESTORE
CARRER SOURCE
Intertidal
Subtidal-Planted
Unclassified
Subtidal-Natural
0 0.2 0.4 Miles
St George Island County Park
W Pine Ave
Esri, NASA, NGA, USGS, FEMA, Esri Community Maps Contributors, FDEP, Esri, HERE, Garmin, Foursquare, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA

Oyster survival and growth

1. Experimental approach

Cages with seed oysters deployed on ABSI restoration reefs on Jan 27, 2023

- Cages deployed on shell reefs
- 5 cages on Dry Bar
- 5 cages on Peanut Ridge
- 50 seed oysters (~31mm) per cage
- Number of live and dead will be counted and measured monthly
- Survivorship and growth curves compared across sites.



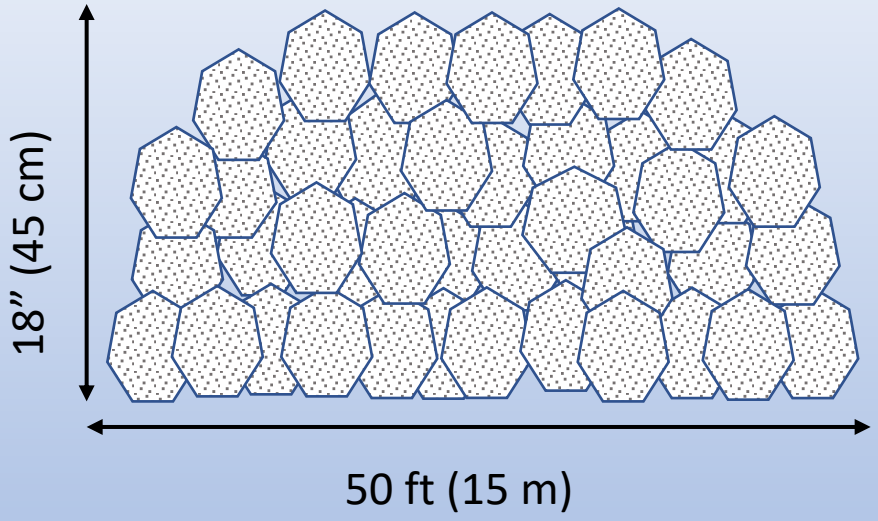
2. Analytical approach

Use existing data from FWC and FDEP to model survival and growth

Initiated in response to suggestions from Science Advisory Board meeting in December 2022

Restoration Experiment Spring 2023

Treatments 1 and 2



Location: Cat Point

Treatments:

1. Limerock ~5-8” (12-18 cm) diameter
2. Concrete ~4-6” (10-15 cm) diameter
3. Limerock ~5-8” (12-18 cm) and shell

Reef height: 18 inches (45 cm)
Reef footprint: 50 x 50 ft (15 x 15 m)
Replicates: 4 per treatment
Total: 12 reefs

Treatment 3