

# Comparison of oyster growth on artificial reef substrates in Tampa Bay using *in-situ* methods

**Scott Adams**, Kara Radabaugh, Serra Herndon, Gary Raulerson, Ryan Moyer







# Project Overview

Systematic monitoring for  
oyster restoration sites and  
natural reefs in Tampa Bay



Improve understanding of  
restored reefs through:

Type of substrate  
Site selection  
Age of construction



## Loose Shell



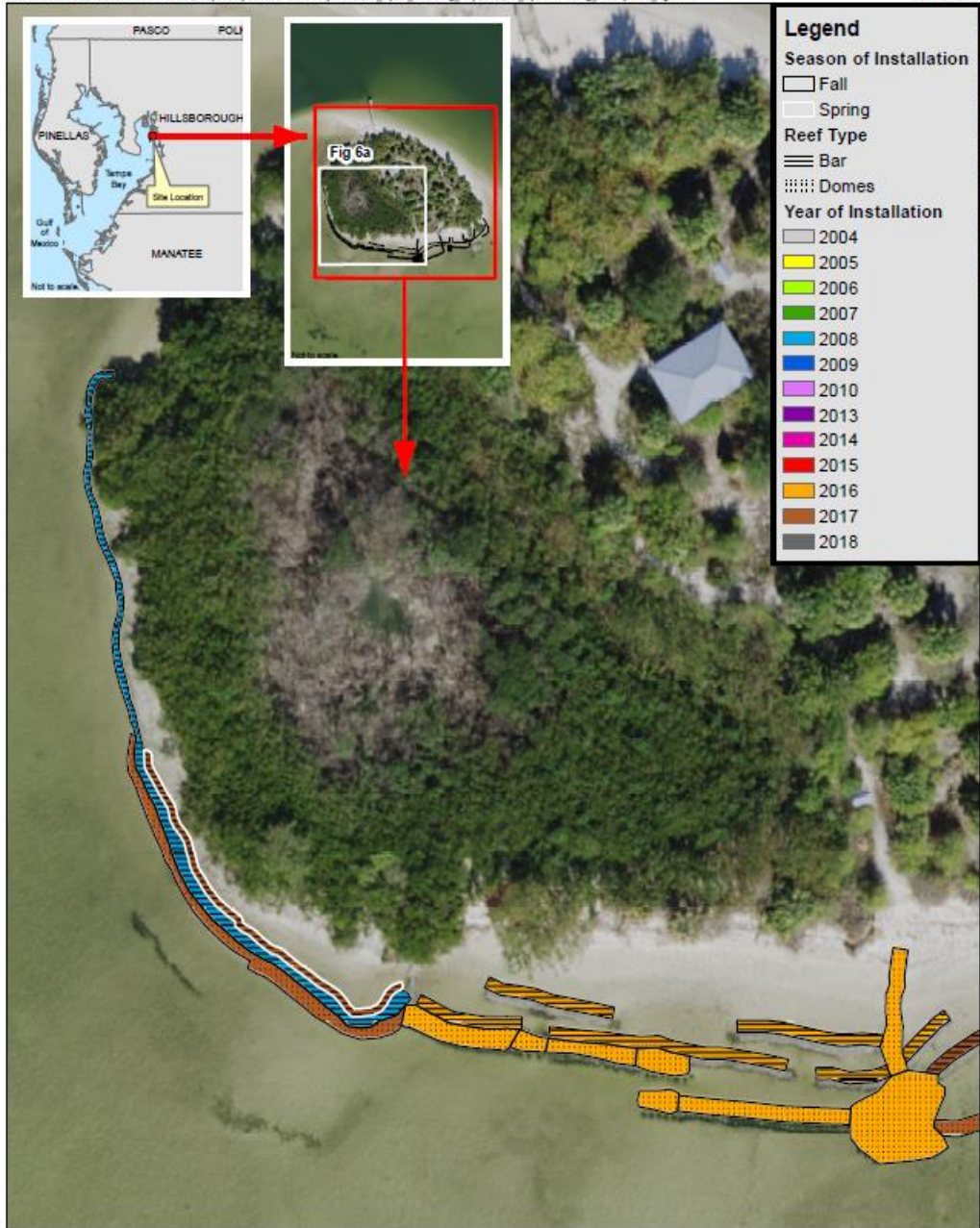
## Domes



## Mesh bags







**FIGURE 6a. FANTASY ISLAND - LARGE-SCALE OVERVIEW**  
**TBERF OYSTER MONITORING PROJECT**  
**HILLSBOROUGH COUNTY, FL**

Sources: Aerial Imagery, LABINS.org; Image Acquisition and Rectification by Surdex Corporation, 12/2016 - 03/2017.



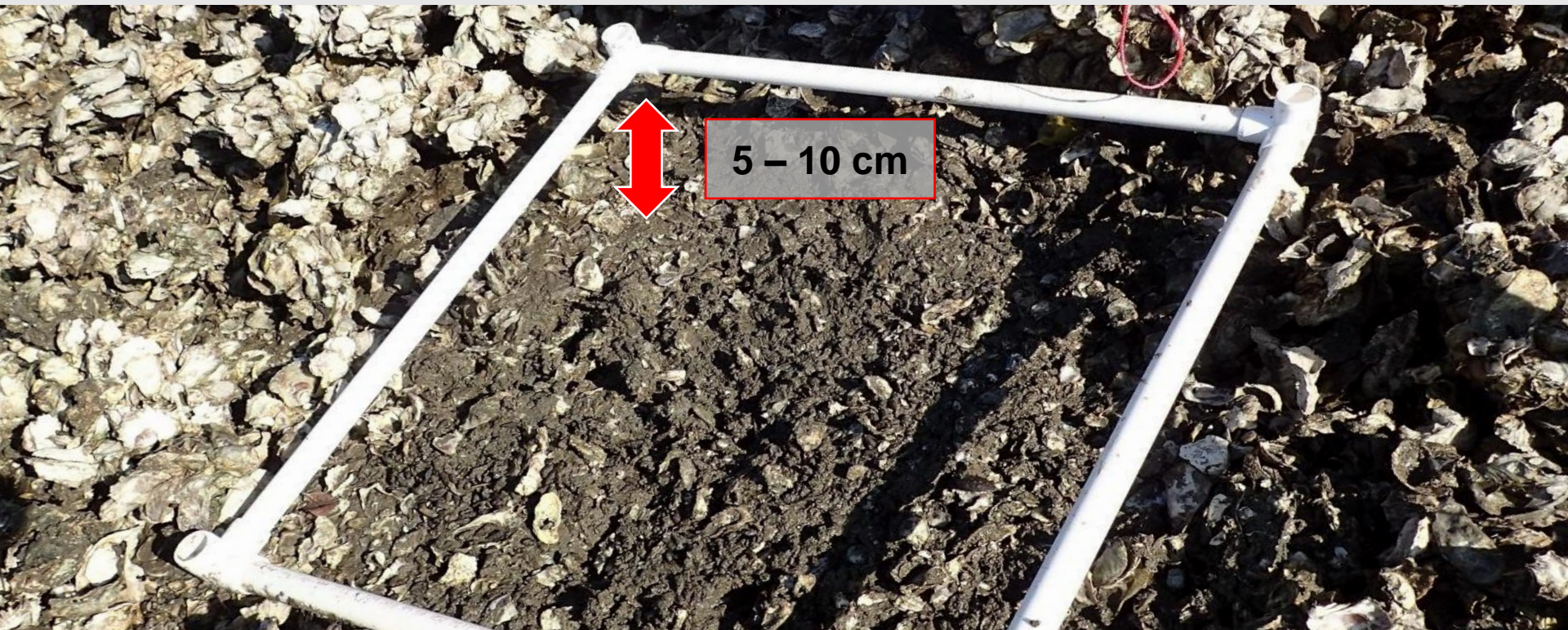




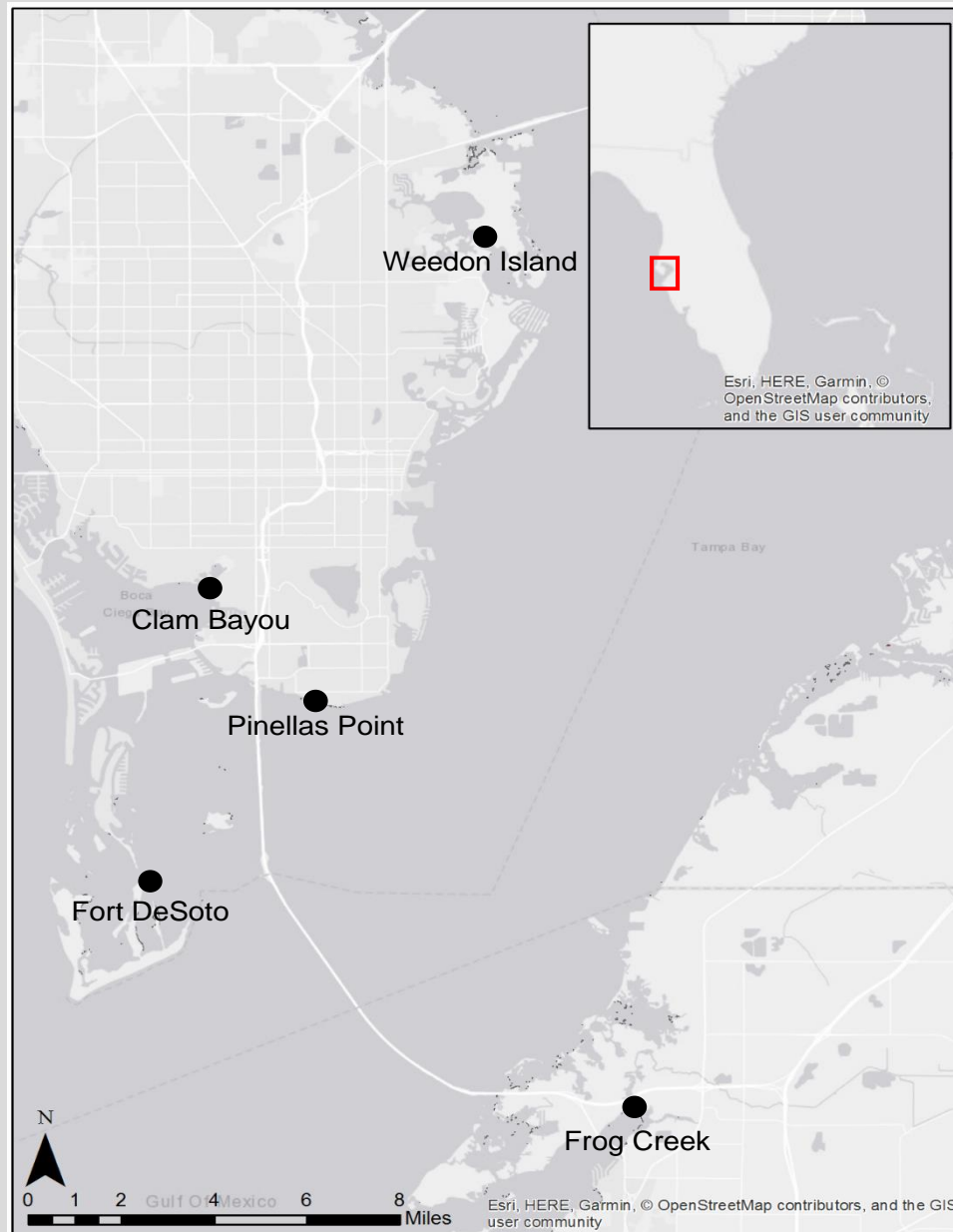
# Standard 'removal' method

## Oyster clump and shell removal

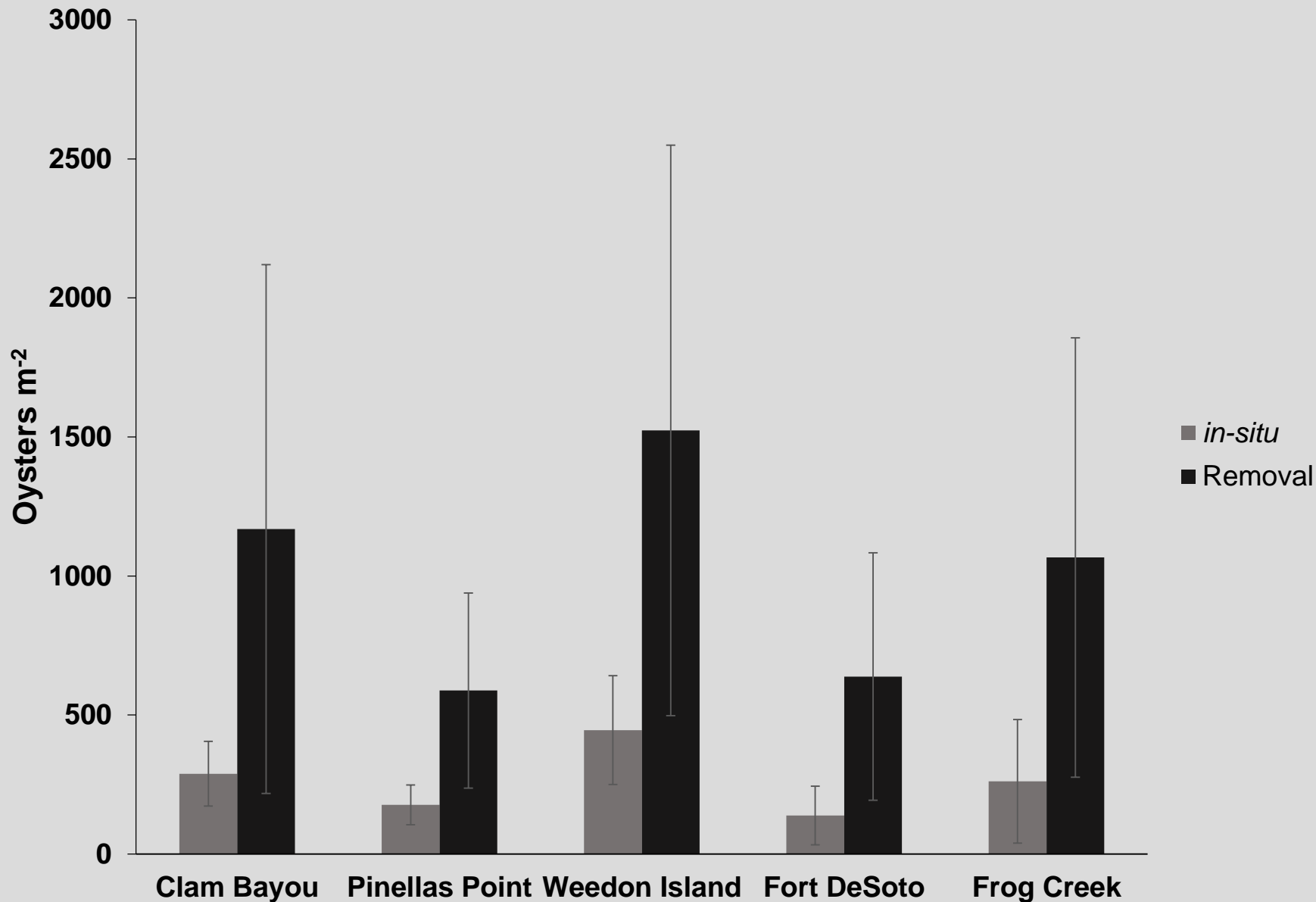
Total live count, 50 shell heights (mm), associated fauna



# *In-situ* method testing: **sites**

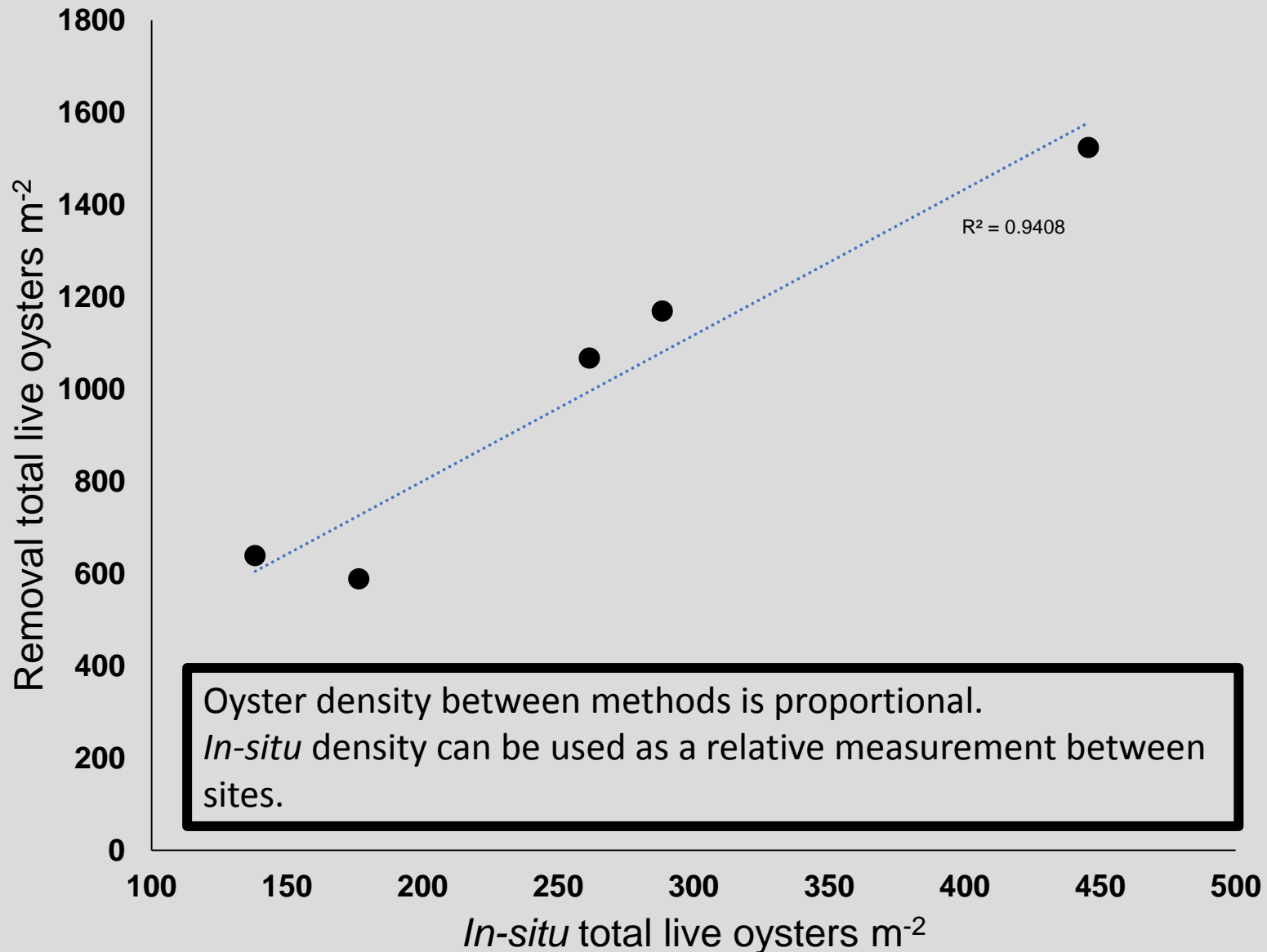


# *In-situ* method testing: results



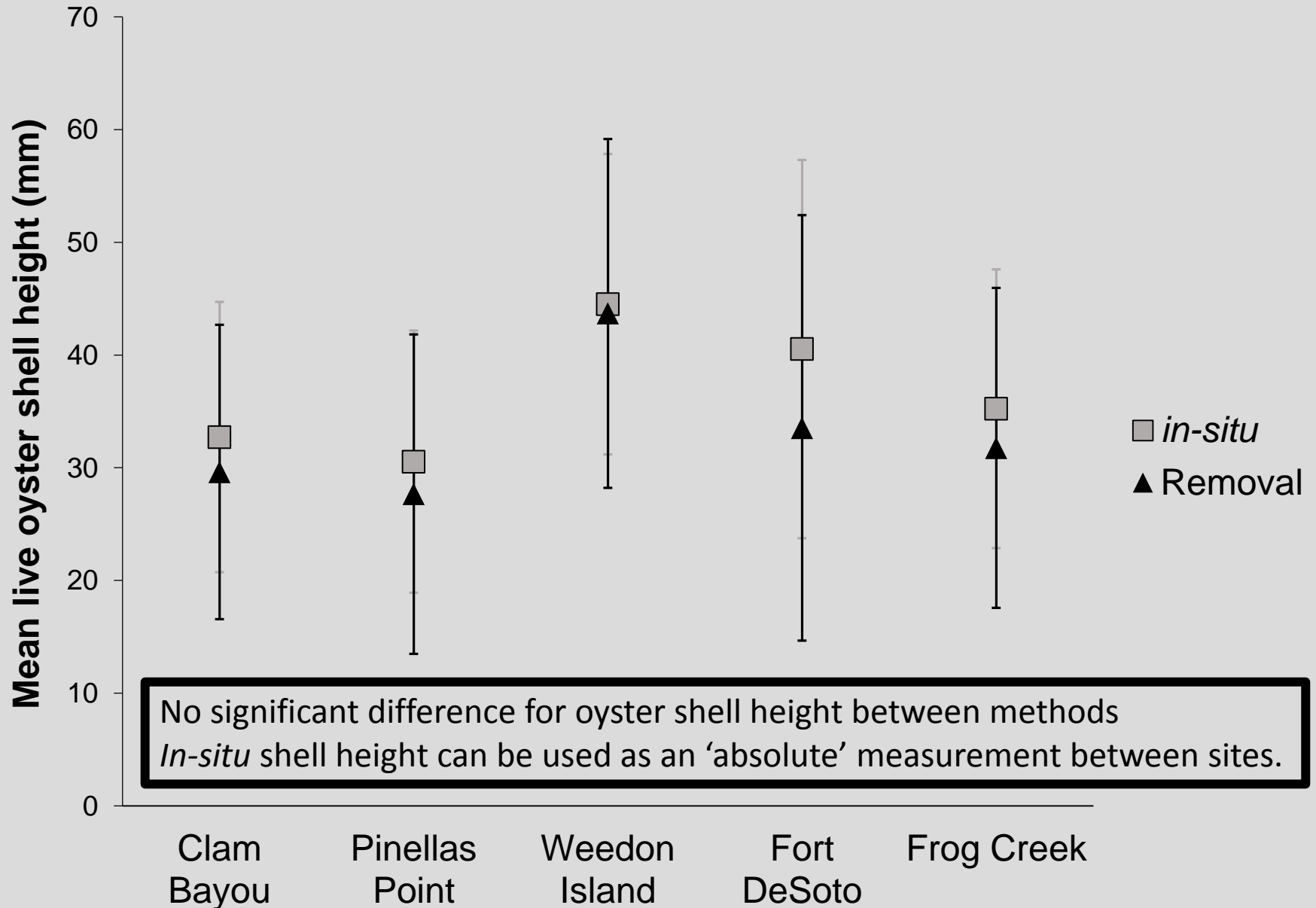


# *In-situ* method testing: results





# *In-situ* method testing: results







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Total live/box oyster counts  
Shell heights (mm)  
Associated fauna  
RTK GPS elevation profile  
Water quality  
Rugosity



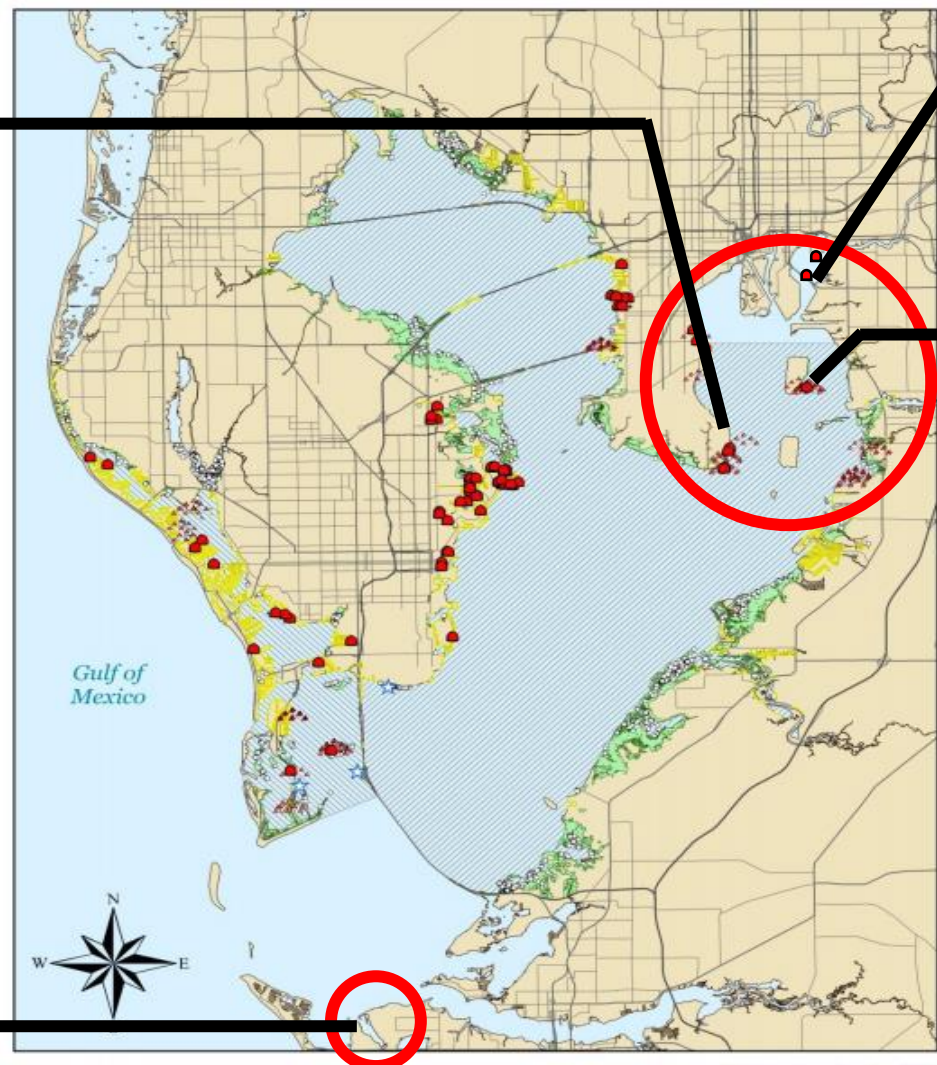
# TBERF monitoring sites

MacDill AFB  
North  
Interior  
Exterior

McKay Bay

2D Island  
Fantasy Island

Perico Bay

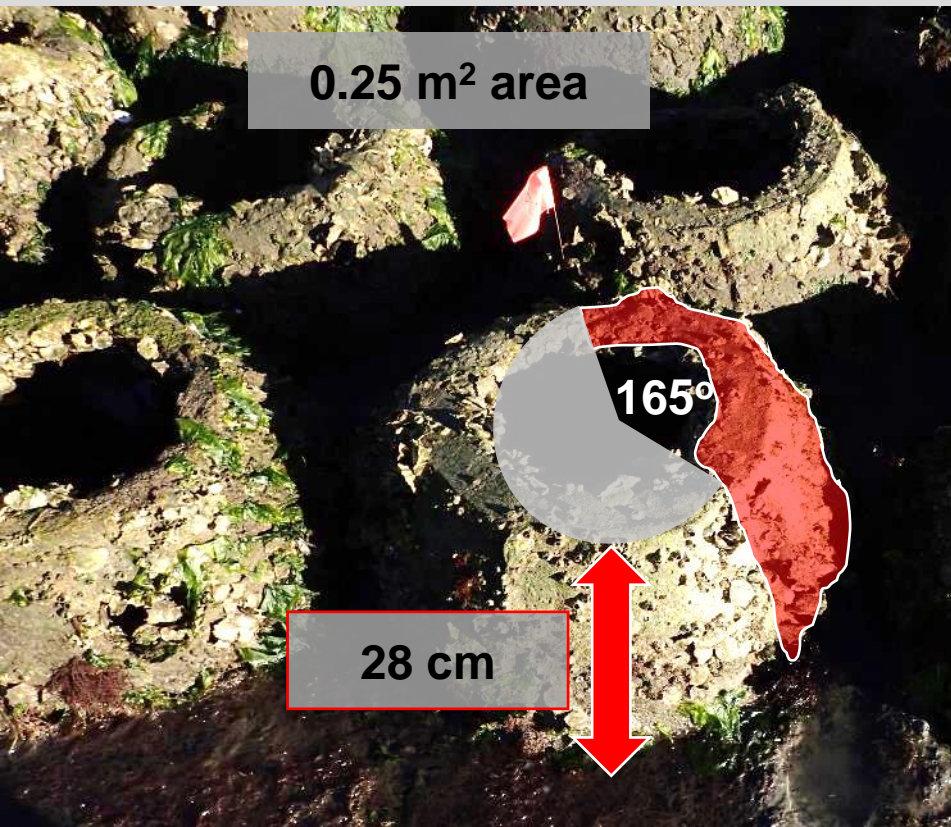




# *In-situ* method

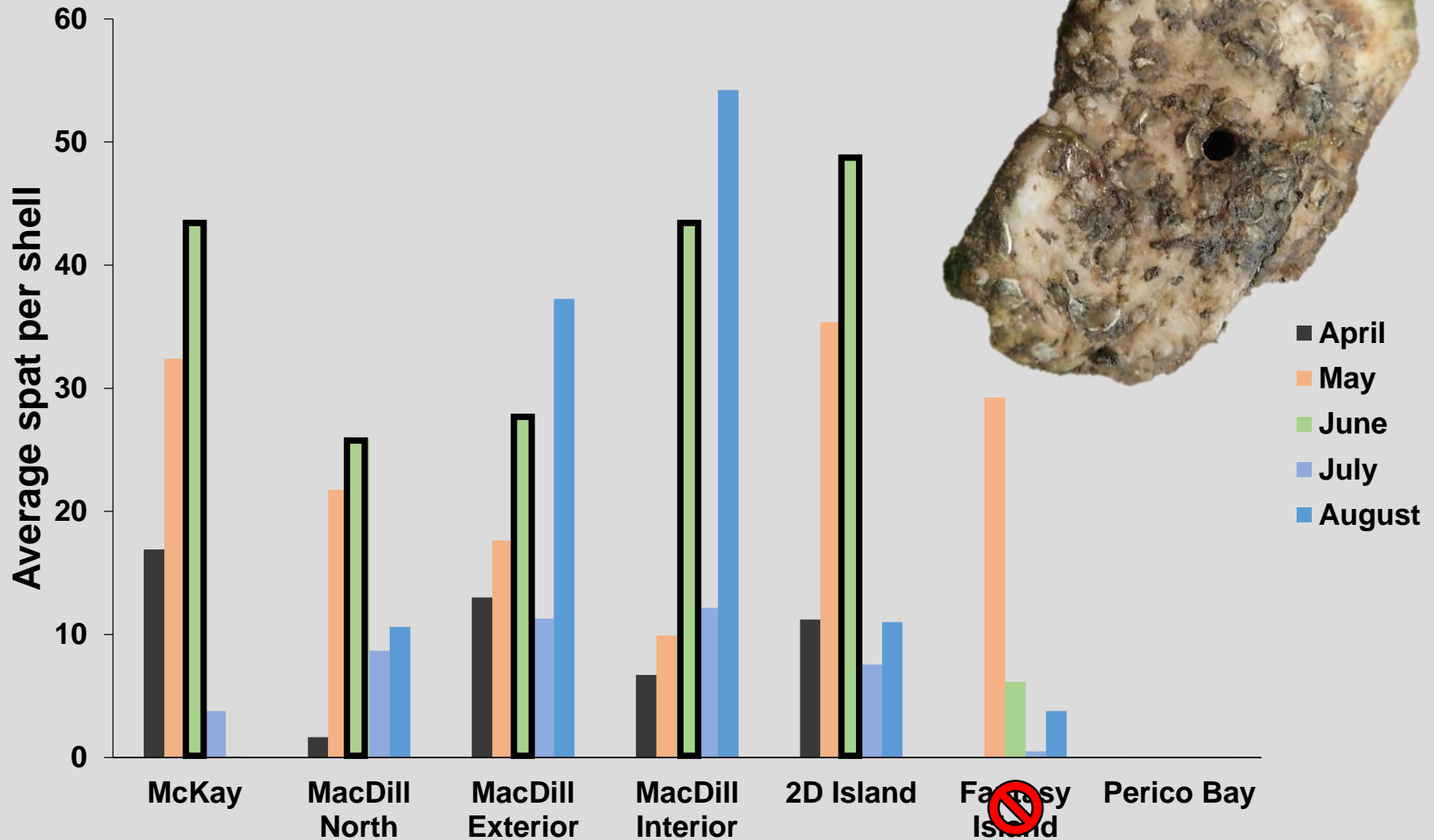
## Stratified-random sampling of reef edge/interior structures

Height of exposed dome (cm)	Dome burial depth (cm)	Angle of pie slice (degrees)	Clock equivalent
38	0	111	12:00 to 3:40
33	5	134	12:00 to 4:28
28	10	165	12:00 to 5:30
23	15	208	12:00 to 6:55



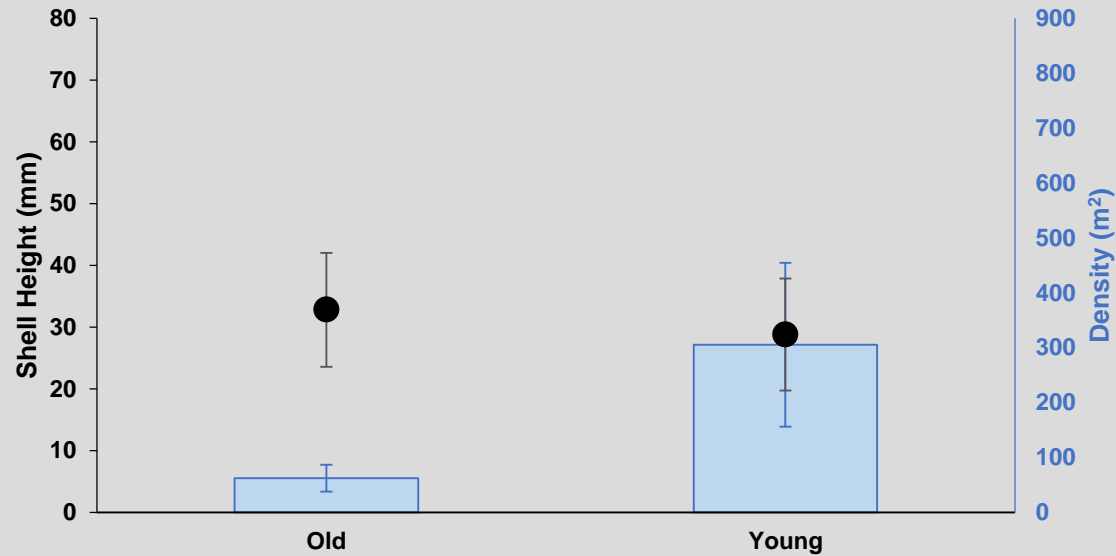


# Oyster spat availability



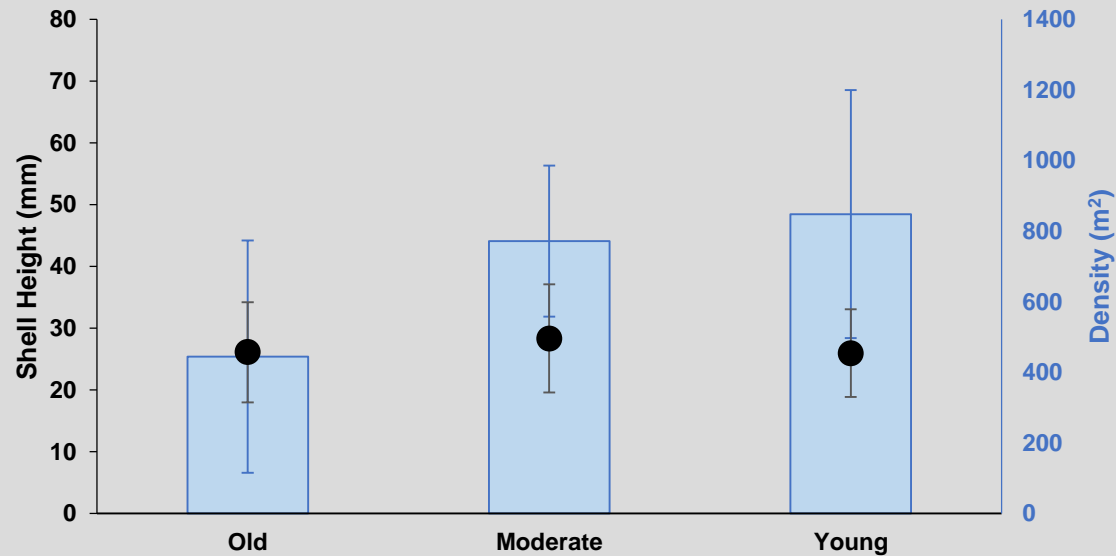


## MacDill Oyster Domes



Old: >9 years  
Moderate: 2-8 years  
Young: <2 years

## MacDill Oyster Bags





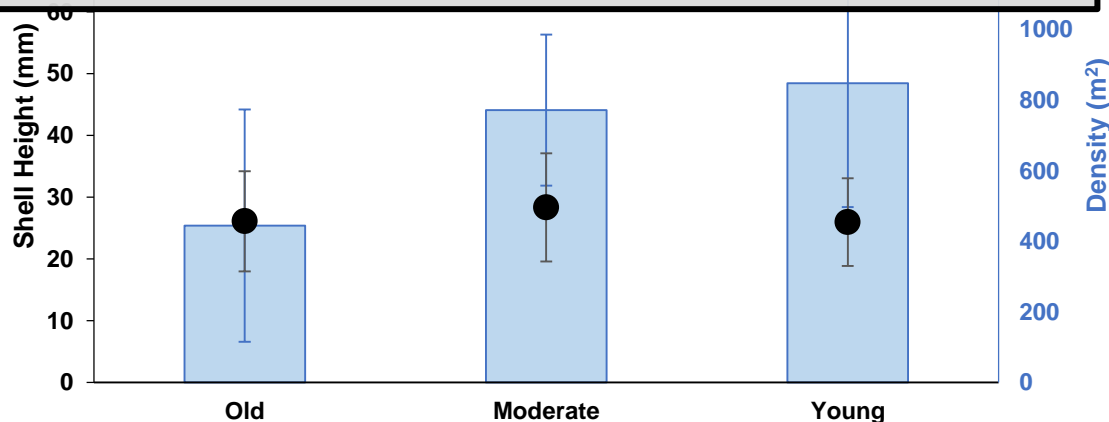
## MacDill Oyster Domes



Oyster density decreases over time for both bags and domes.

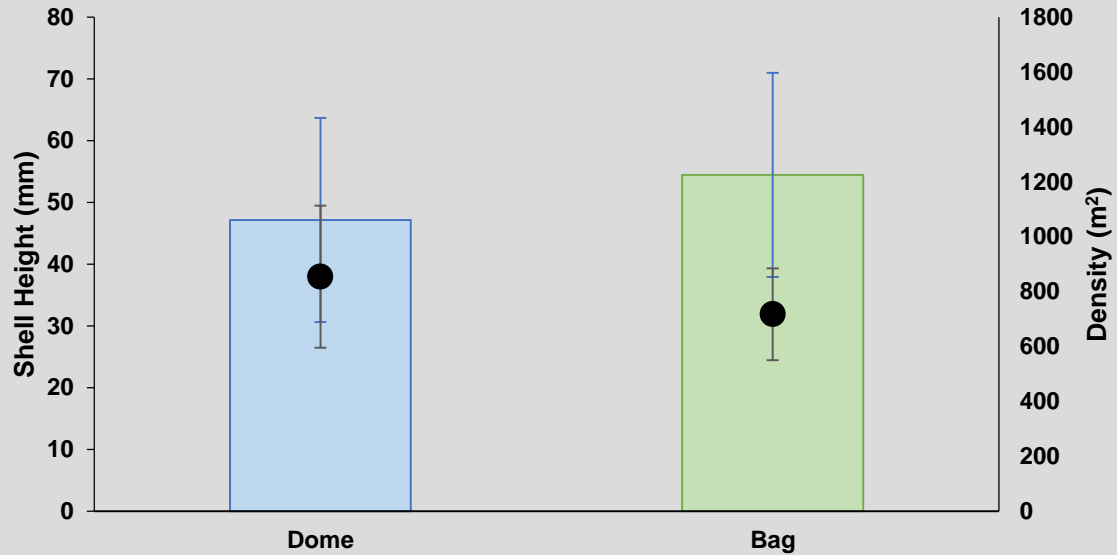
No significant shell-height differences over time for bags nor domes.

Old:	>9 years
Moderate:	2-8 years
Young:	<2 years



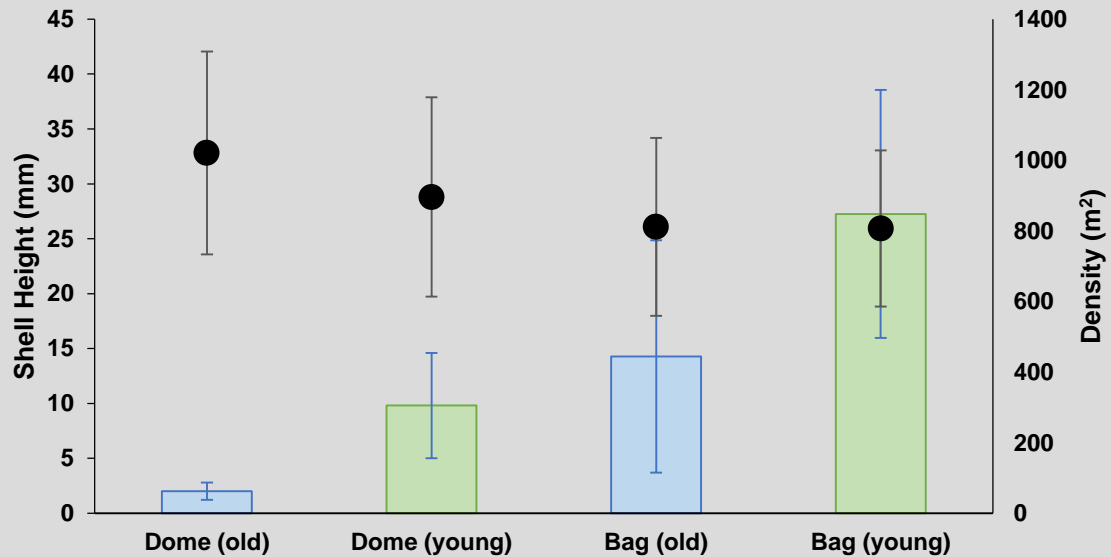


## Fantasy Island Moderate-age Restoration

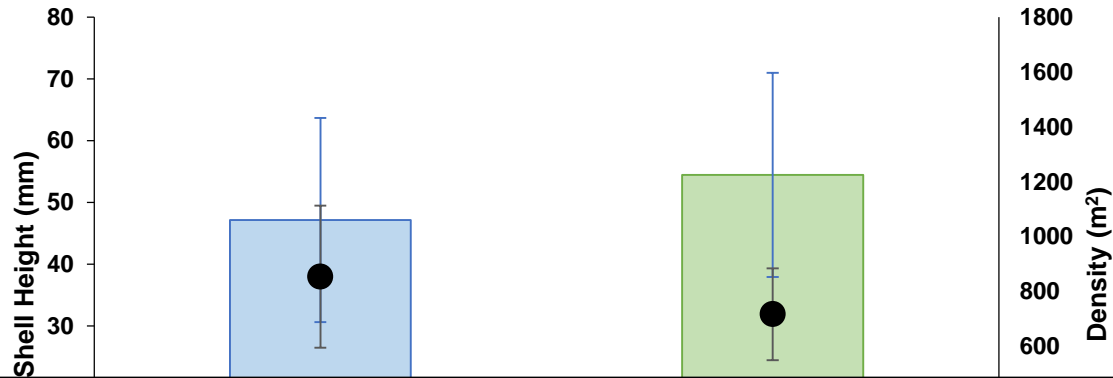


Old:	>9	years
Moderate:	2-8	years
Young:	<2	years

## MacDill Oyster Restoration



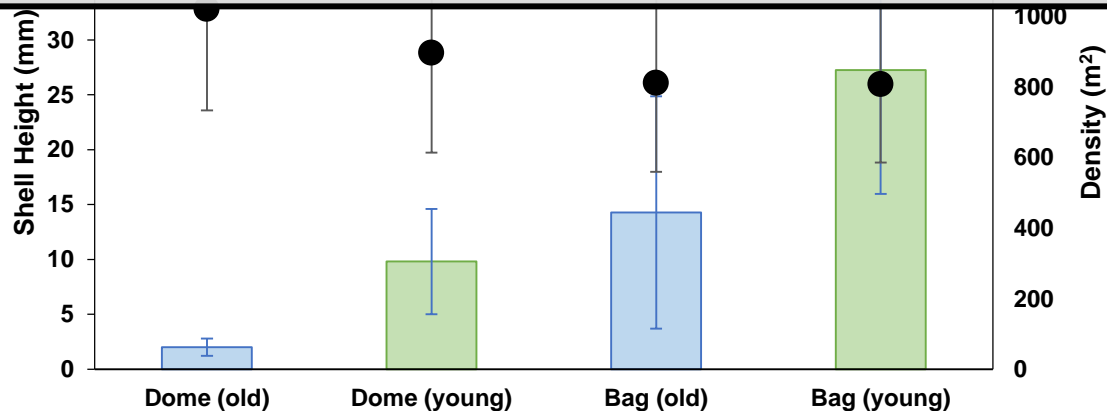
## Fantasy Island Moderate-age Restoration



Oyster bags sustain higher densities of oysters than domes.

No significant shell-height differences between bags and domes

Old:	>9	years
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# Preliminary conclusions

**Type of substrate:** bagged shell hosts higher oyster densities





# Preliminary conclusions

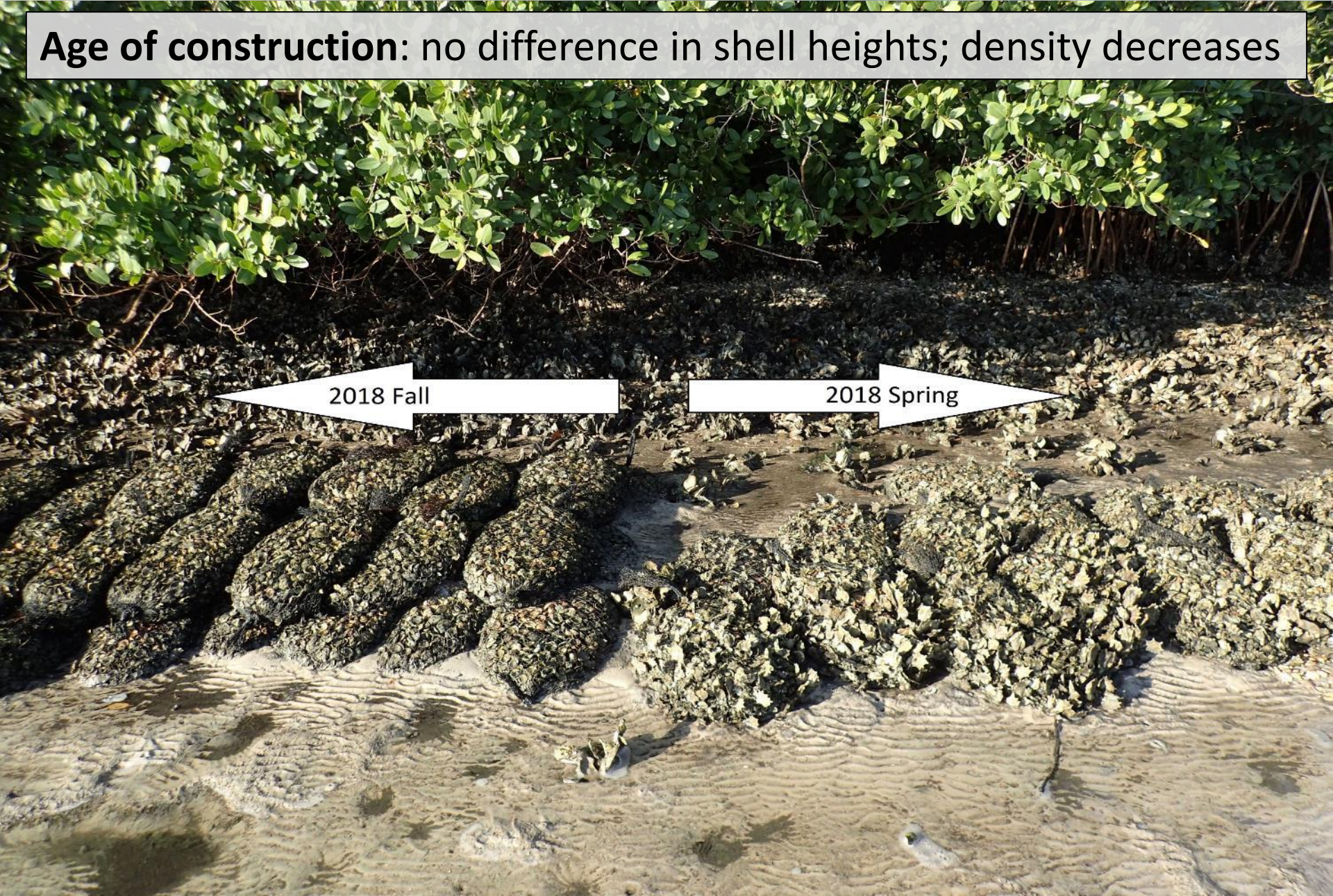
**Site selection:** elevation within water column is crucial to reef success





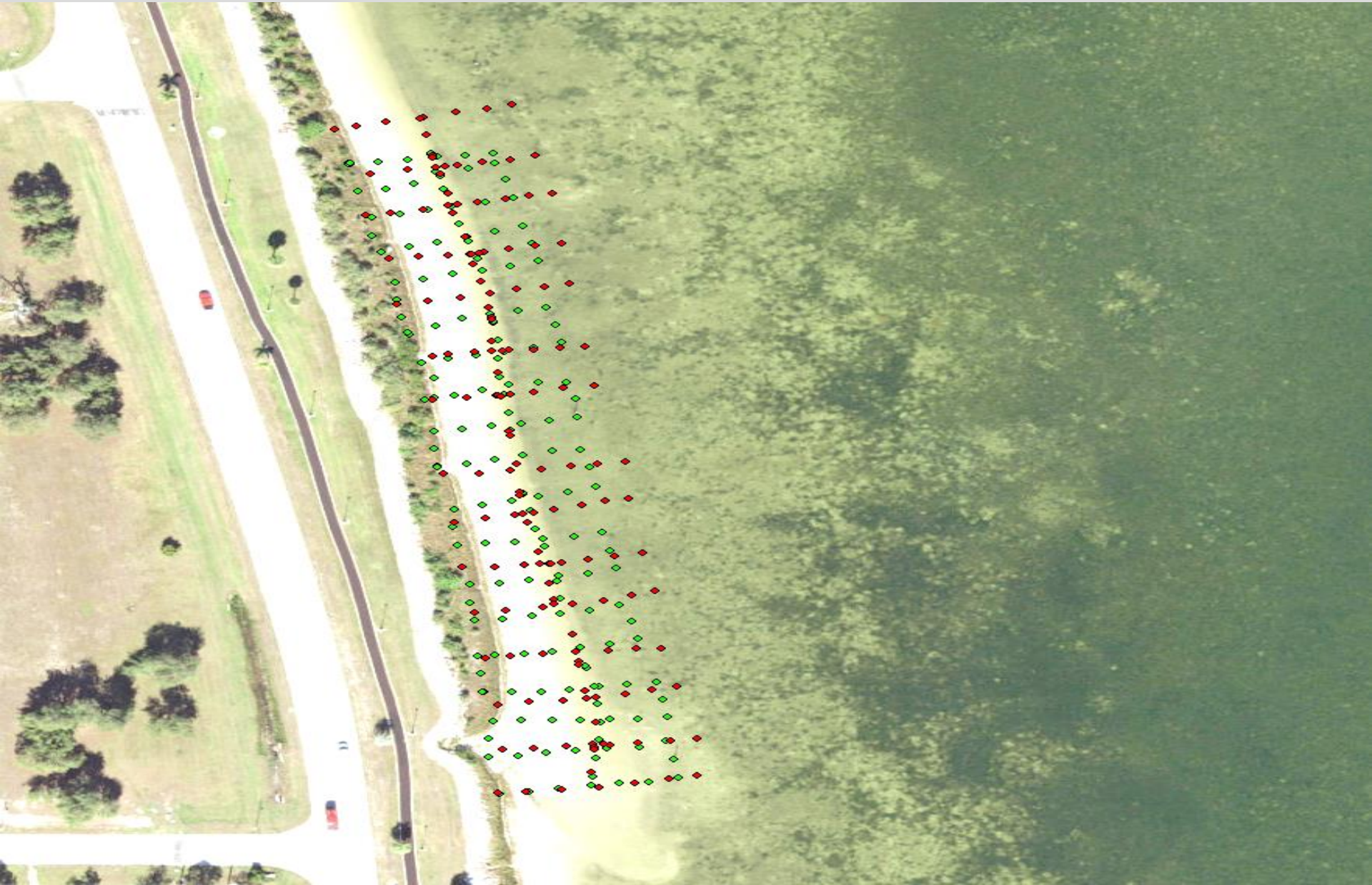
# Preliminary conclusions

**Age of construction:** no difference in shell heights; density decreases

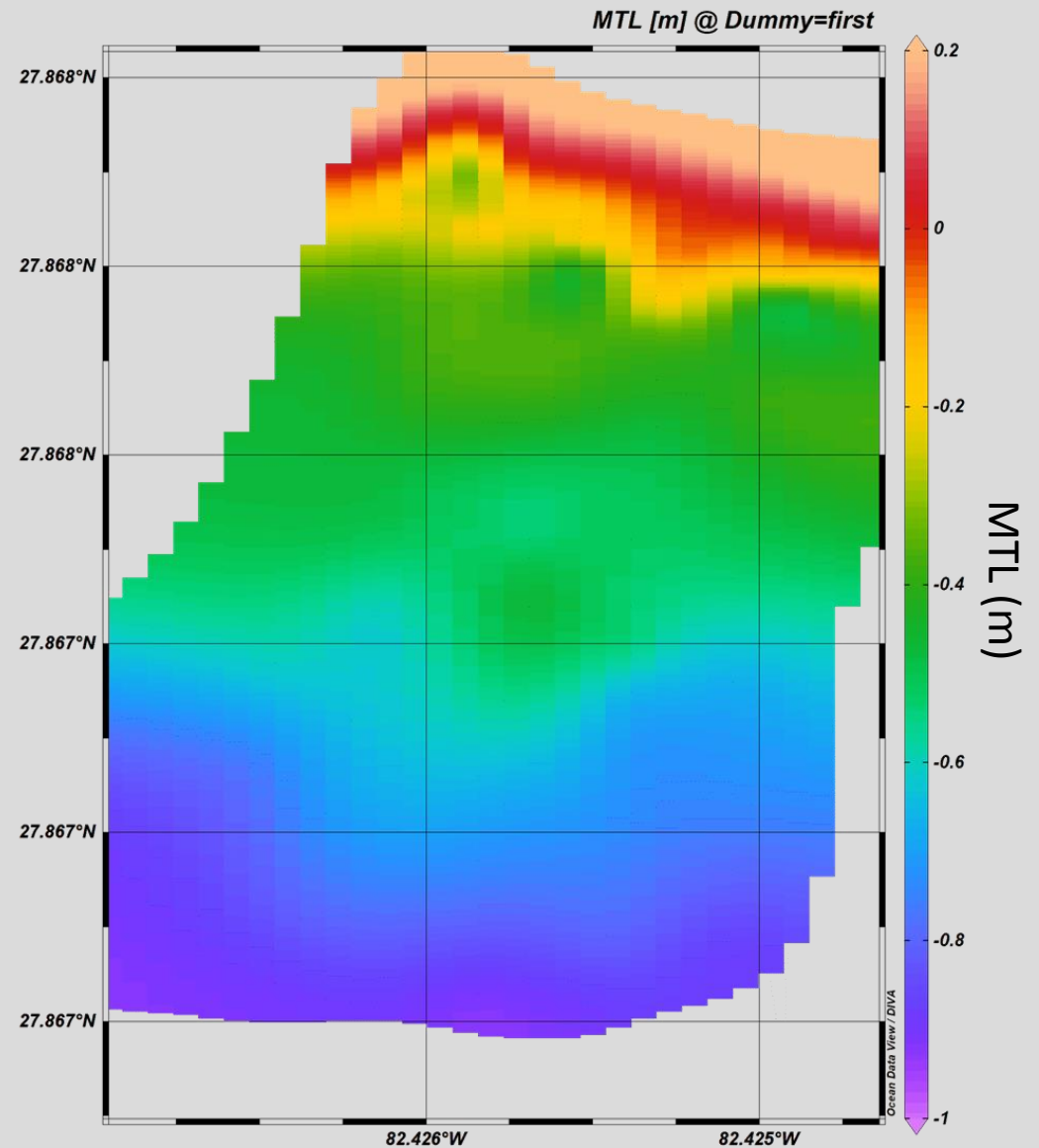
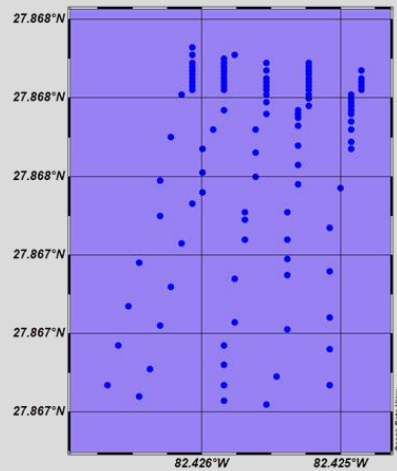




# Ongoing Work



# Ongoing Work





# Acknowledgments



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# Questions?

