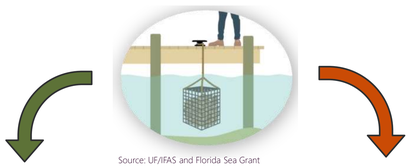
Evaluating Alternative Oyster Garden Structures and Materials in Residential Canals

Adrian Sakr[1], Logan Mazor[1], Christine Angelini[1], Eric Milbrandt[2], & Andrew Altieri[1]
[1]University of Florida ESSIE; [2]Sanibel Captiva Conservation Foundation I **adriansakr@ufl.edu**

Introduction

What is Oyster Gardening?

Modular, suspended oyster reefs often deployed in residential waterways



Source: UF/IFAS and Florida Sea Grant

Benefits:

- Habitat restoration
- Water quality improvement
- Community science development

Challenges:

- Artificial material usage
- Lack of consistent design guidelines

Study Overview

Tested five oyster garden structure/material types in residential canals of Sanibel Island, FL, during a study period which included Hurricane Ian (Cat. 5)

Methodology

Deployed 2 of each garden at each of 4 houses in June 2022

Final data collection Oct. 2023; Hurricane Ian occurred late Sept. 2022

Performance metrics:

1. Oyster recruitment & growth
2. Community development & diversity
3. Filtration rates

Structures/Materials Tested

Jute-Reinforced (JR) Calcium Sulfoaluminate Cement Cylinder

Size: 3' x 6" x 6"

***GROW Oyster Reefs, LLC.* Concrete Discs**

Size (per disc): 3.5" x 3.5" x 3.5"

Drilled Oyster Shell on Steel Wire

Size: 2' x 3" x 3"

***BESE* Biodegradable Plastic Matrix Panel**

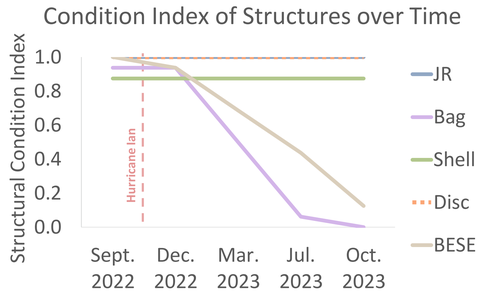
Size: 3' x 1.5' x 3"

***BESE* Biodegradable Plastic Mesh Bag + Oyster Culch**

Size: 1.5' x 1.5' x 1.5'

Oyster Garden Survivorship

Structural integrity was rated on a three-point scale based on remaining garden mass and averaged to create a 0-1 condition index, with 1 indicating all structures fully intact

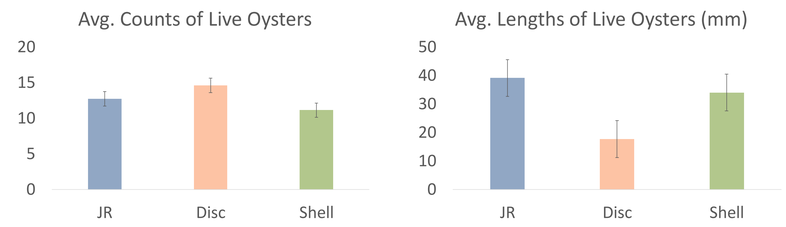


All JR and Disc structures survived the 15-month monitoring period; all but one Drilled Shell (Shell) structure survived

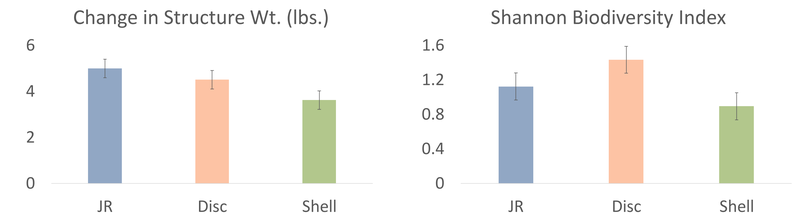
The following graphs are for the remaining structures following monitoring

Performance Metrics for Remaining Structures after 15 Months

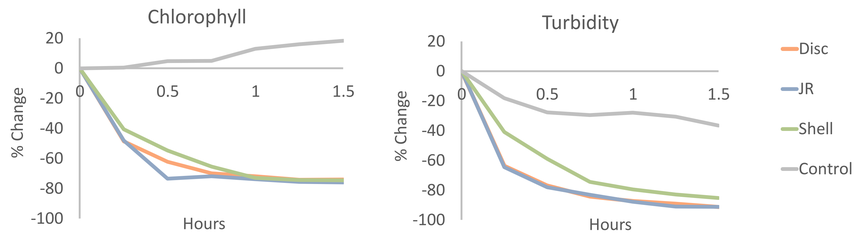
Oyster Recruitment & Growth



Community Development & Diversity



Filtration Rates



Conclusions

- All structures withstood Hurricane Ian, but both plastic structures almost entirely degraded in the following 12 months
- **JR structures** performed best for oyster recruitment/growth; JR and Disc had similar community development/diversity
- All structures tested had similar filtration rates

Acknowledgements

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