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

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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

https://reefinnovations.com/services/ecosystem-restoration/oyster-reefs

Standard ‘removal’ method

Oyster clump and shell removal

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

5 – 10 cm
In-situ method testing: sites
In-situ method testing: results

![Graph showing the results of in-situ method testing for different locations: Clam Bayou, Pinellas Point, Weedon Island, Fort DeSoto, and Frog Creek. The graph compares 'in-situ' and 'Removal' methods, with vertical bars representing the number of oysters per square meter.]
**In-situ** method testing: results

Oyster density between methods is proportional. *In-situ* density can be used as a relative measurement between sites.

![Graph showing the relationship between removal and in-situ totals with an R² value of 0.9408.](image-url)
**In-situ method testing: results**

No significant difference for oyster shell height between methods.

*In-situ* shell height can be used as an ‘absolute’ measurement between sites.
Project Overview

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

- 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

From: Drexler 2011
**In-situ method**

Stratified-random sampling of reef edge/interior structures

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

0.25 m² area

28 cm

165°
MacDill Oyster Domes

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

MacDill Oyster Bags
Oyster density decreases over time for both bags and domes.

No significant shell-height differences over time for bags nor domes.
Fantasy Island Moderate-age Restoration

MacDill Oyster Restoration

Old: >9 years
Moderate: 2-8 years
Young: <2 years
Oyster bags sustain higher densities of oysters than domes.

No significant shell-height differences between bags and domes.

Old: >9 years
Moderate: 2-8 years
Young: <2 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
Age of construction: no difference in shell heights; density decreases
Ongoing Work
# Acknowledgments

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Questions?