

Overview

- Background
- Reef Construction
- Purpose
- Hypothesis
- Sampling Methods
- Observations and Results
- Conclusions

Background

- Part of final monetary compensation for 1993 oil spill used to restore lost recreational resources
 - Pinellas County received portion of these funds for oyster reef construction
 - Additional funds from NOAA
- Construction began June 2005
- Goals for reef construction
 - 1. Revitalize local oyster population and develop a new, viable oyster reef
 - 2. Protect local seagrass population from wave action and promote further growth
 - 3. Reduce shoreline erosion along nearby seawall
 - 4. Improve local water conditions

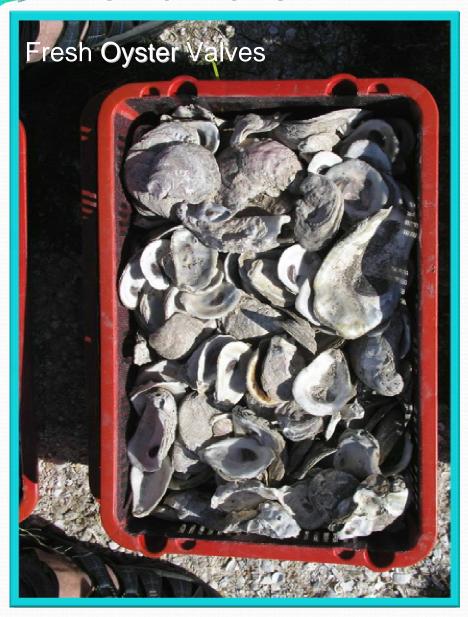
Reef Construction

- Construction completed October 2005
- Built off the coast of War Veteran's Memorial Park, in Boca Ciega Bay, in St. Petersburg, FL
- 600ft x 20ft
- Approximately 90m from shore, parallel to the seawall
- Reef veneer: half mined fossilized shell material and half fresh oyster valves

Aerial View of Reef Construction – September 2005

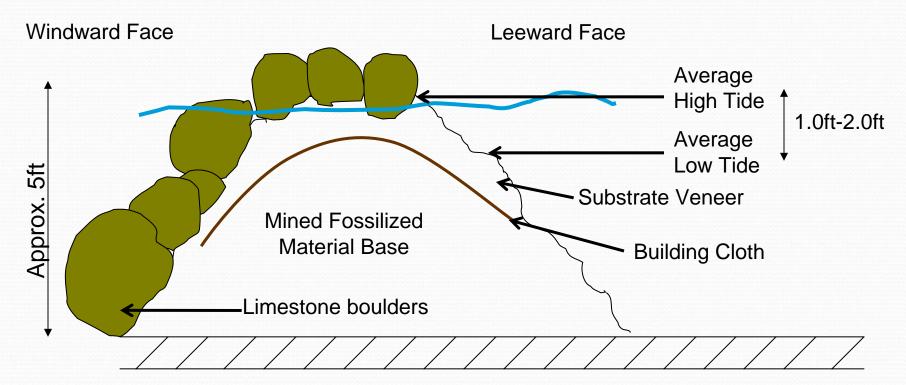


Materials





Reef Cross-section



Purpose

• To determine how different substrates (fresh oyster valves and mined fossilized shell material) will influence the establishment of an artificial oyster reef and the development of the associated macrofaunal assemblage.

Hypothesis

- The fresh oyster shell will be the favored reef substrate, stimulating increased levels of larval settlement.
- Due to higher levels of oyster recruitment and growth, a more diverse macrofaunal community will be established on the fresh oyster valves.

Sampling

- Monthly
 - 6 randomly placed 0.25m²
 PVC quadrats
 - Difference in oyster density and biodiversity due to different substrates
 - Surface observations only



- Quarterly
 - 48 tray placed along leeward base of reef
 - Substrate effect on oyster usage and developing macrofaunal assemblage
 - Effect of preset oyster spat on natural spat settlement and growth and developing macrofaunal assemblage

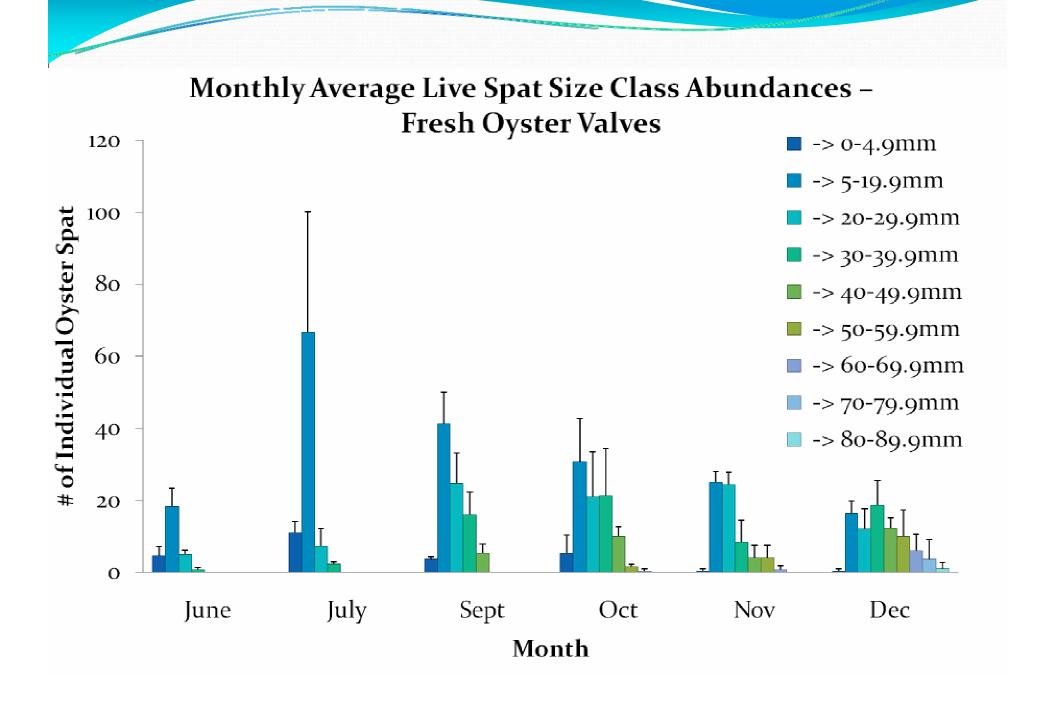


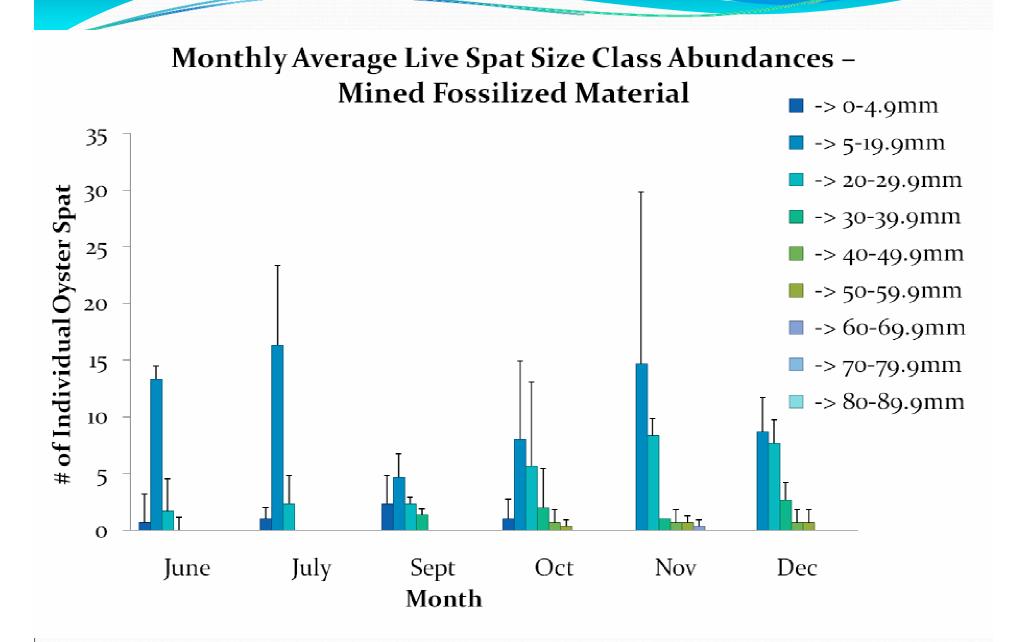
Results – Monthly Observations

- Experimental trays deployed December 14th, 2005
 - These are a preliminary analyses of a one year study
- January 2006 May 2006
 - January start of monthly quadrat surveys
 - Increasing presence of macroalgae and sediment
 - April first appearance of spat within quadrat
 - Few settled species observed
- June 2006 September 2006
 - Period of rapid increase in spat settlement and species diversity on fresh oyster valves
 - Appearance of spat > 30mm
 - Began measuring spat sizes

Results - Contd.

- June September 2006 contd.
 - No data collected in August due to poor water conditions
 - Greater spat density and growth on fresh oyster valves
- October –December 2006
 - Decreased spat density
 - Continued spat growth
 - Oysters > 70.0mm observed on fresh oyster valves
 - Decreased species diversity
- Other Observations
 - Fossilized material unstable
 - Resulting in small rubble "broken and disintegrating shells"
 →lower spat densities



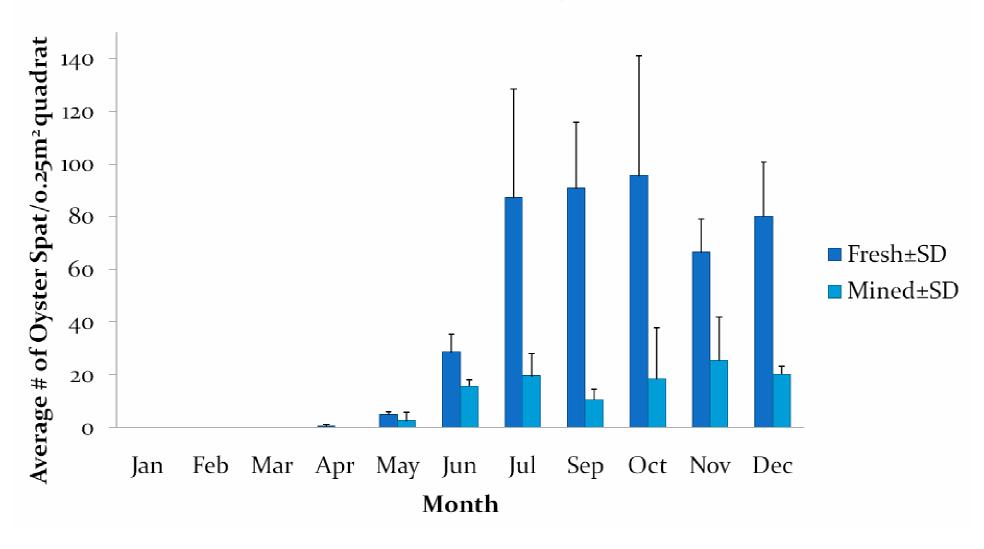


Oyster Growth

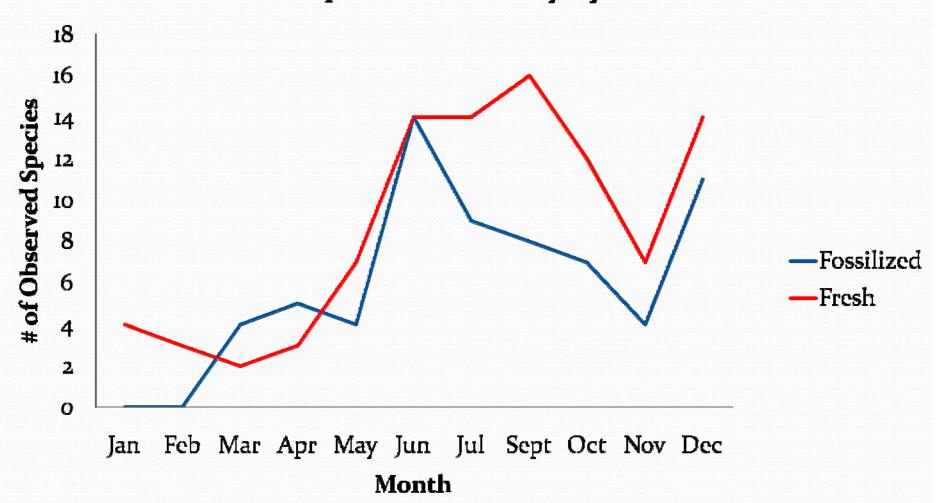




Average Live Oyster Spat Densities per Substrate Type



Pooled Species Diversity by Month



Other Reef Goals

- Local seagrass population density
 - Variable, but possibly normal seasonal variation
- Shoreline accretion/erosion
 - No accretion observed and minimal erosion observed
 - Sediment building up off shore along reef base?
- Water Conditions
 - Seasonal variations in water temperature
 - Little variation in salinity
 - Constant poor water clarity(> 150 NTU's) due to suspended sediment

Conclusions – success or failure?

- Develop a viable oyster reef and associated macrofaunal community- Yes
 - Fresh oyster valves are a more stable and "attractive" substrate for oyster settlement and species colonization
- Enhance adjacent seagrass bed Undetermined
 - Possible that variations in seagrass density and sediment loading are due to seasonal variations not detected within the scope of this study.
- Increase shoreline accretion/erosion No
- Improve local water conditions Undetermined
- This is just a 1-year glimpse at the beginning of this reef's life. More long-term observation is necessary.

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Sampling Deployments



