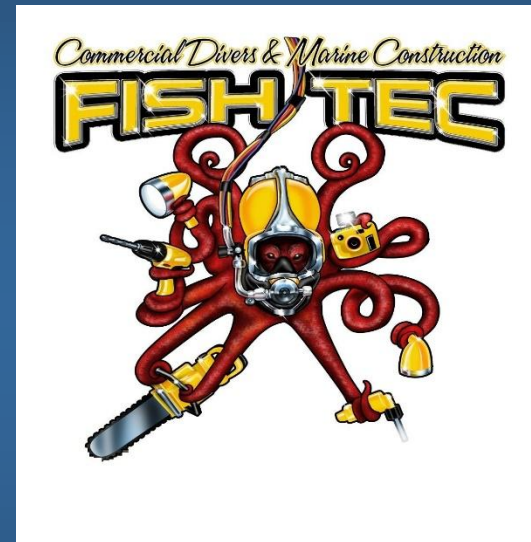


Nature-Based Breakwater Islands - Fort Pierce City Marina



Working with Nature Workshop
Presented by; Michael R Capuano
June 1, 2014

FORT PIERCE CITY MARINA, FLORIDA



2003



2004 Hurricane Season



PHOTO BY
GREG LOVETT/PALE BEACH POST/23MAY
MAY 14, 2004 - Fort Pierce, Florida, USA -
The Fort Pierce City Seal is littered with
debris from the boats that were destroyed
by the hurricane that hit the area.



2004 Hurricane Season





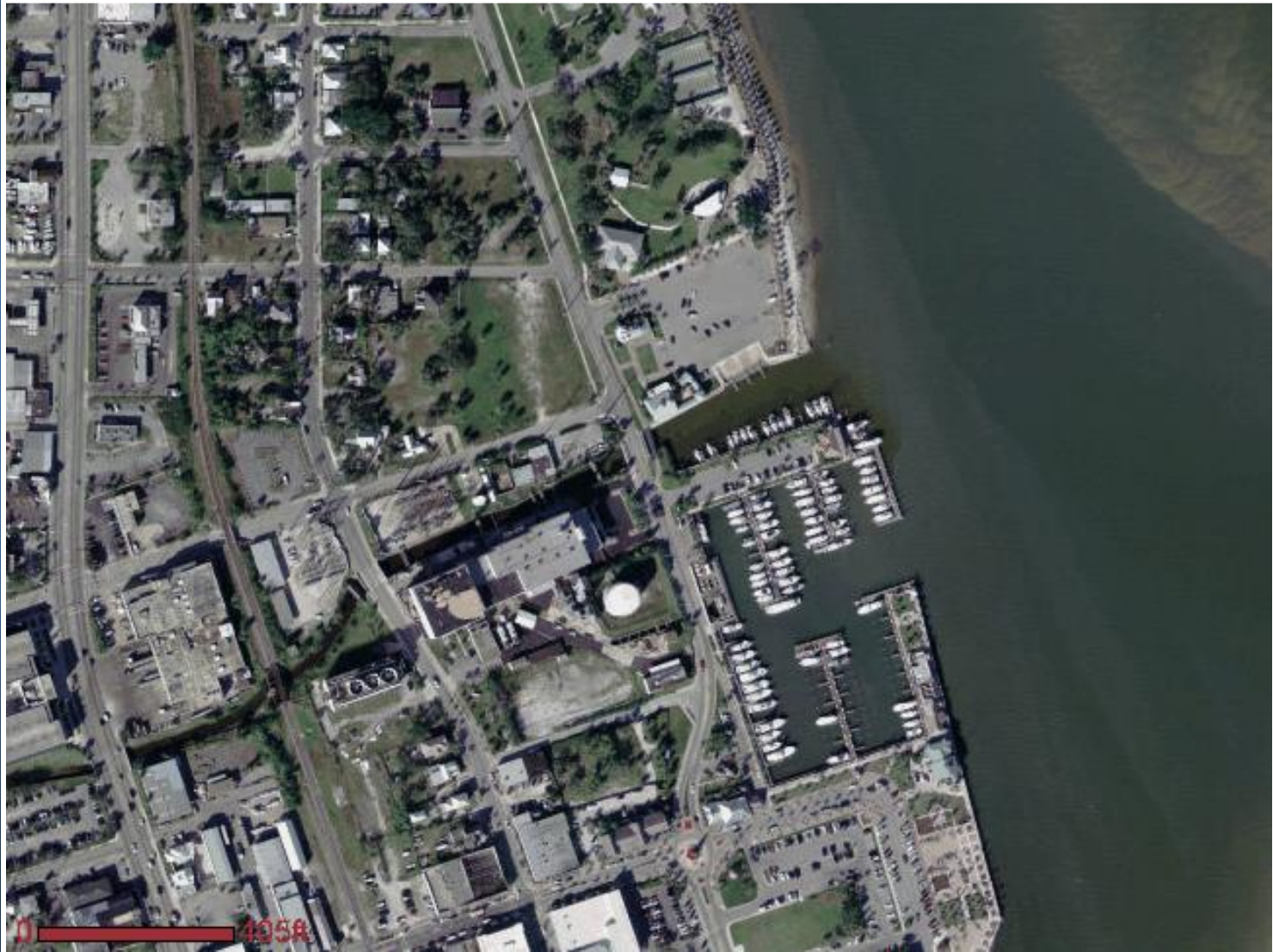
The Restoration Begins....2004

- Clean up started the day after the storm under the State's emergency orders
- Outside marina has not rebuilt because City and FEMA needed added assurances that marina and waterfront will be protected





Post Clean-up Conditions





Economic Impacts

- 150 public slips lost
- 69 lost and 27 damaged vessels (\$26 M loss)
- \$15.5 M in marina damage
- \$15 M in waterfront public infrastructure losses
- \$8.5 M annual revenue loss to St. Lucie County
- \$1.5 M annual gross revenue loss to City



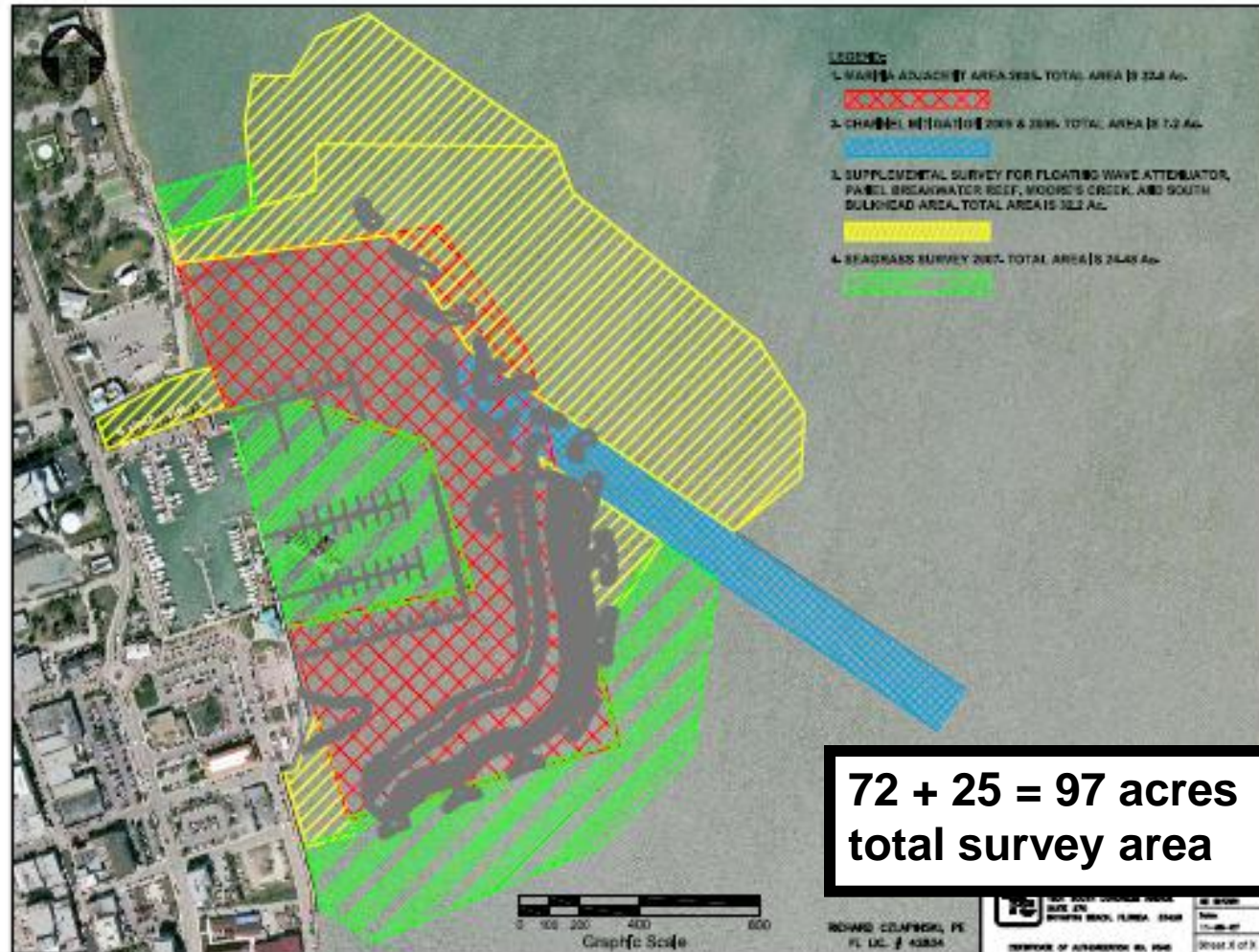
Project Components

- **Outer Basin Marina**
 - Basic restoration of pre-storm configuration
- **Storm Protection System**
 - New item to protect against future damages



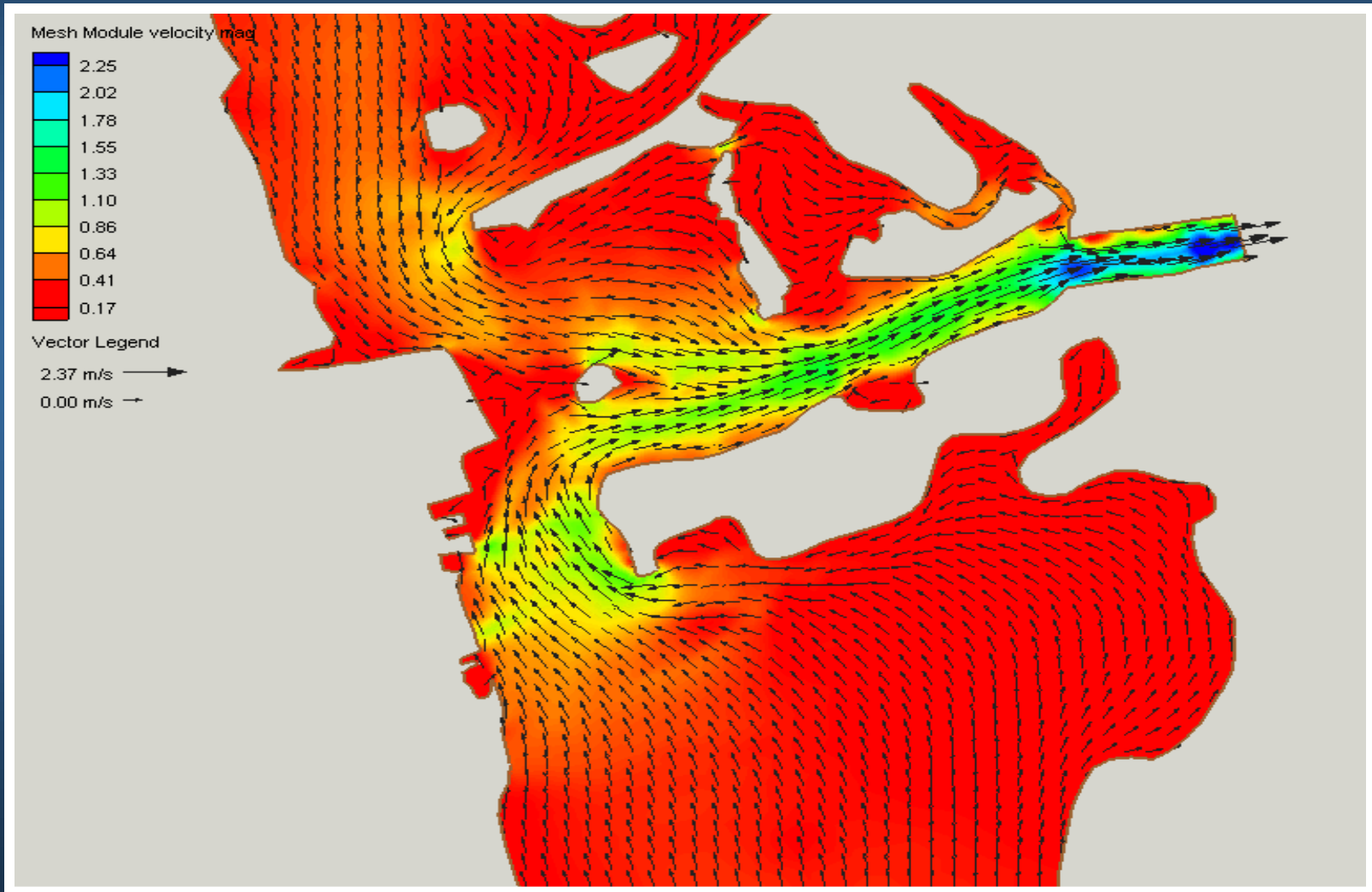


Benthic Survey Areas



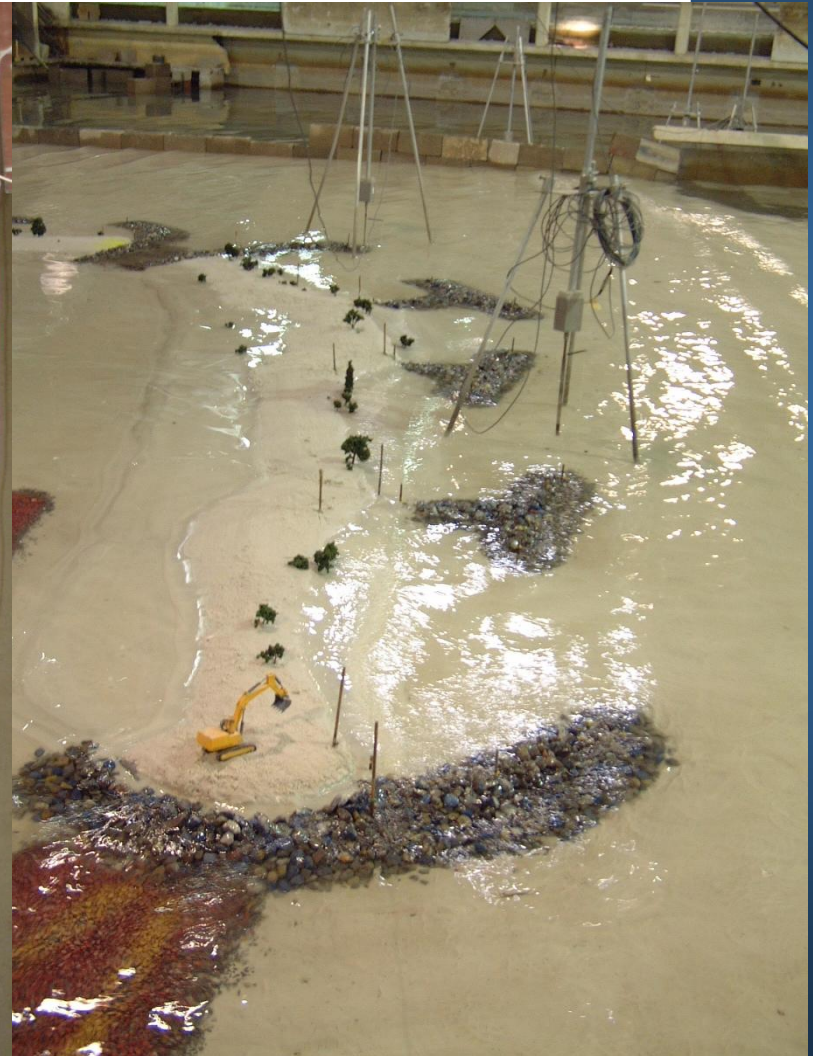
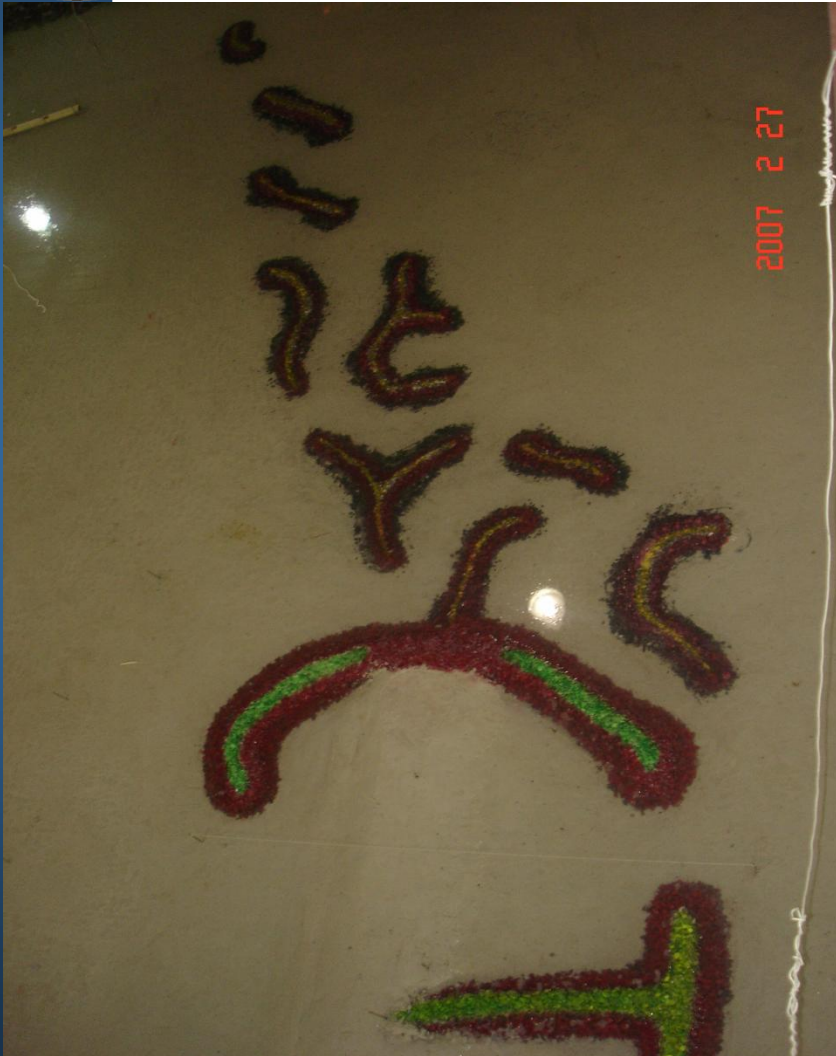


Hydrodynamic Modeling





Physical Modeling





Latest Configuration

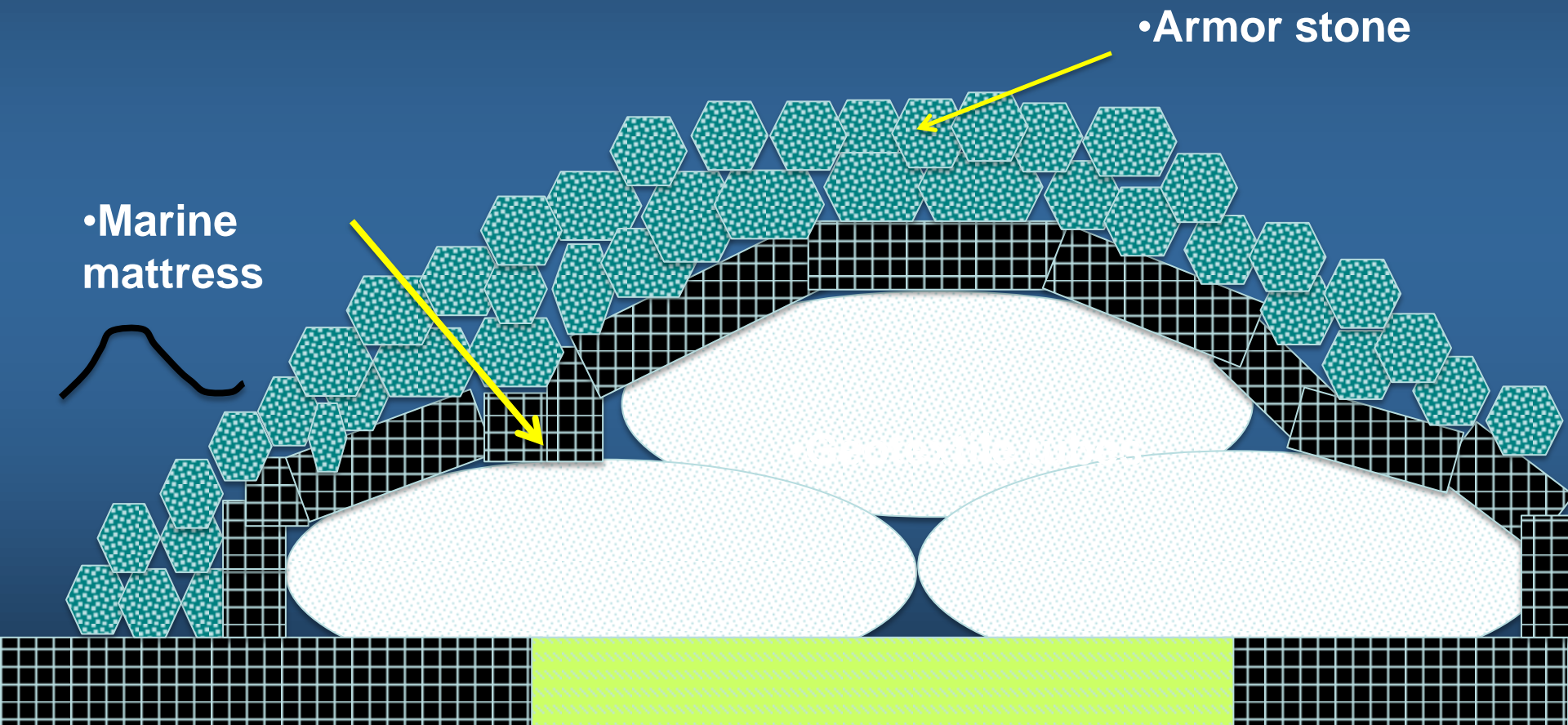








Design – Structure Section





ISLAND CONSTRUCTION MATERIALS

- | | |
|----------------------------------|---------|
| •How many plants are planted? | 80,000 |
| •How many tons of rocks? | 93,518 |
| •How many cubic yards of sand? | 100,000 |
| •How many tons of oyster clutch? | 2,580 |



Mosaic Habitat Creation

Total Island Project = 14.66 acres of fill

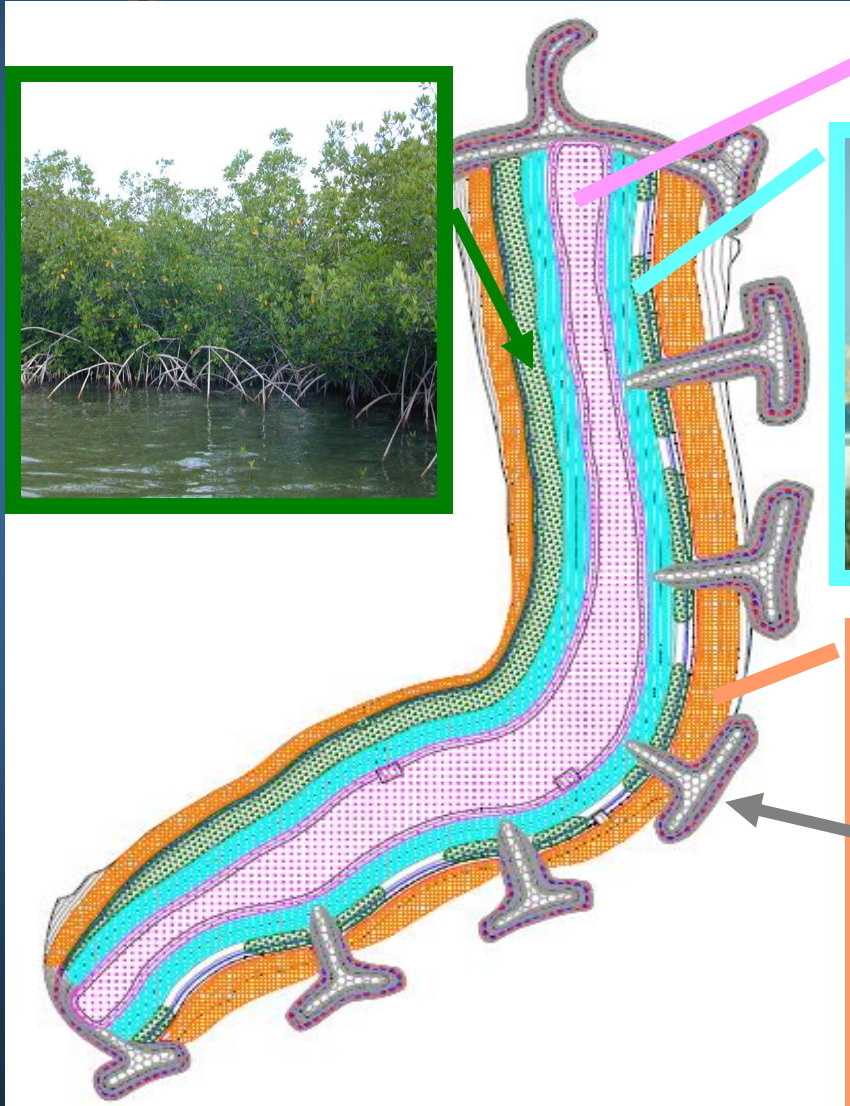
Total Habitat Creation = 21.75 acres

- Oyster Habitat Created = 1.26 acres
- Artificial Reef Created = 6.27 acres
- Mangrove Communities Created = 1.55 acres
- Coastal Dune Habitat Created = 4.55 acres
- Seagrass Recruitment = 8.12 acres





Habitat

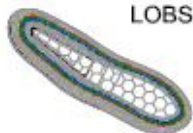




Habitat Islands



SHELL ISLAND



LOBSTER ISLAND



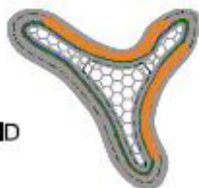
MANGROVE ISLAND



EEL ISLAND



FISH HOOK ISLAND



STARFISH ISLAND



SNOOK ISLAND



MANATEE ISLAND





Benefits of City Marina

- One of the best inlets on the East Coast!
- Water quality
- Known for world-class fishing
- Close proximity to the Bahamas (90 miles)
- Nearby customs check-in office
- Located in the heart of Historic Downtown Fort Pierce
- Nearby shopping, restaurants, public library
- Sunrise Theatre, Community Center, Art Museum
- Endless activities along the waterfront
- Boater and pet friendly
- Two fueling stations
- Free pump out and Wi-Fi
- Small town feel





Businesses located at Fort Pierce City Marina Property

- The Original Tiki Restaurant
- Cobb's Landing - FPRA
- East West Yacht Sales
- Indian River Lagoon Tours
- 8 Charter Boats





Sovereign Submerged Lands Negotiations

- **Provide project mitigation**
 - Propeller scar restoration (seagrass restoration)
 - Installation of navigational aides
 - Dredge hole filling (seagrass restoration)
 - City-owned submerged land donation- 56 Acres
- **Marina use 100% open to public in perpetuity**
- **No public access to islands**



Summary

- The City of Ft. Pierce has designed an innovative project that protects the marina, public resources, and at the same time creates natural habitats to enhance the integrity of the Indian River Lagoon.









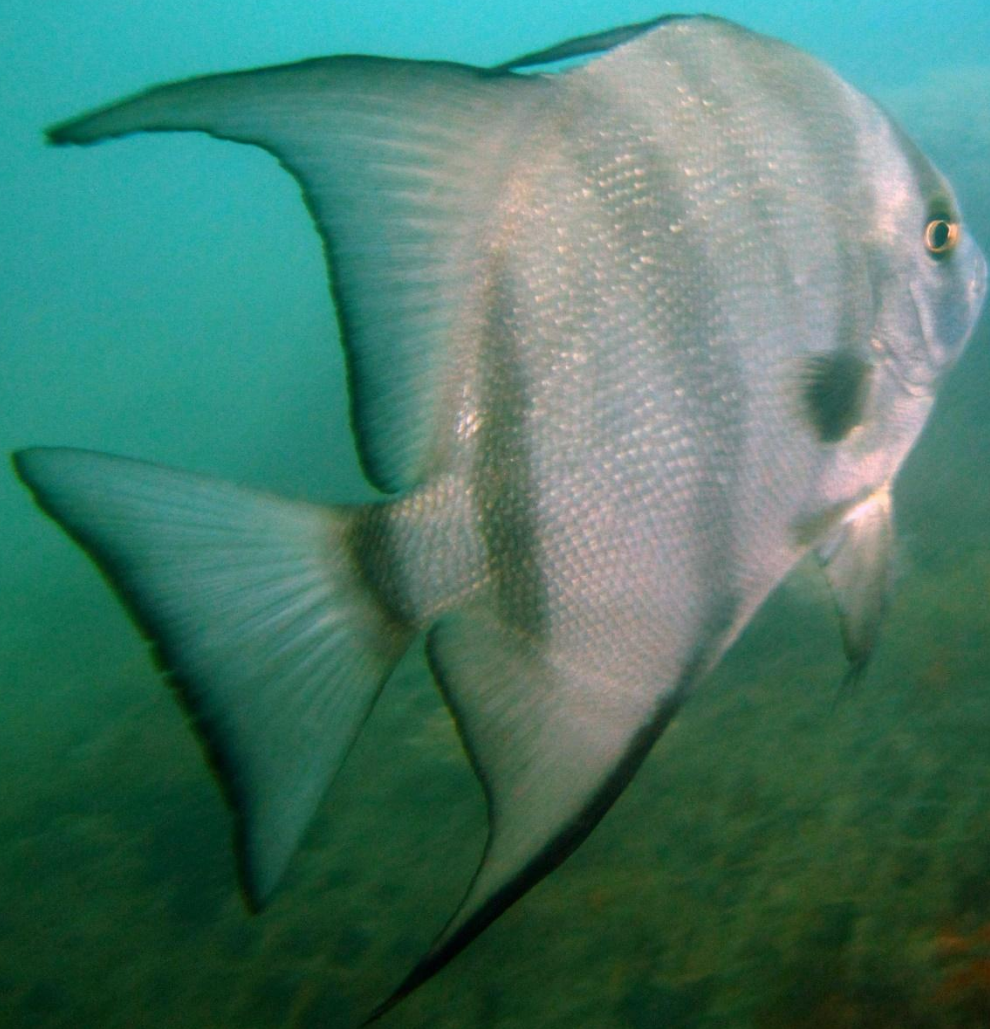




02/19/2014



02/18/2014



02/19/2014



02/19/2014

