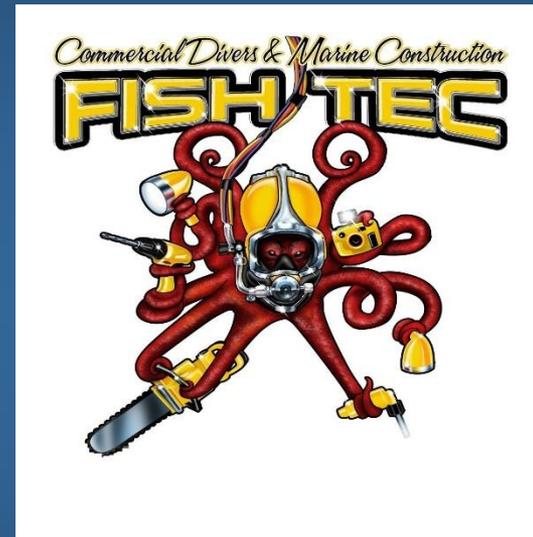


# Nature-Based Breakwater Islands - Fort Pierce City Marina



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

# FORT PIERCE CITY MARINA, FLORIDA

An aerial photograph of the Fort Pierce City Marina in Florida. The marina is filled with hundreds of sailboats docked at various piers. A long bridge spans across the water in the background. In the foreground, there are several buildings with orange-tiled roofs, parking lots, and palm trees. The overall scene is a busy waterfront area.

**2003**



# 2004 Hurricane Season



Stack up the pieces  
Sept. 14, 2004 - Fort Pierce, Florida, USA -  
The Fort Pierce City Marina is littered with  
debris from the 2004 hurricane season.  
Franklin County covers the area.  
Photo by  
Greg Lovett/Water Escape Press/DMAK



# 2004 Hurricane Season





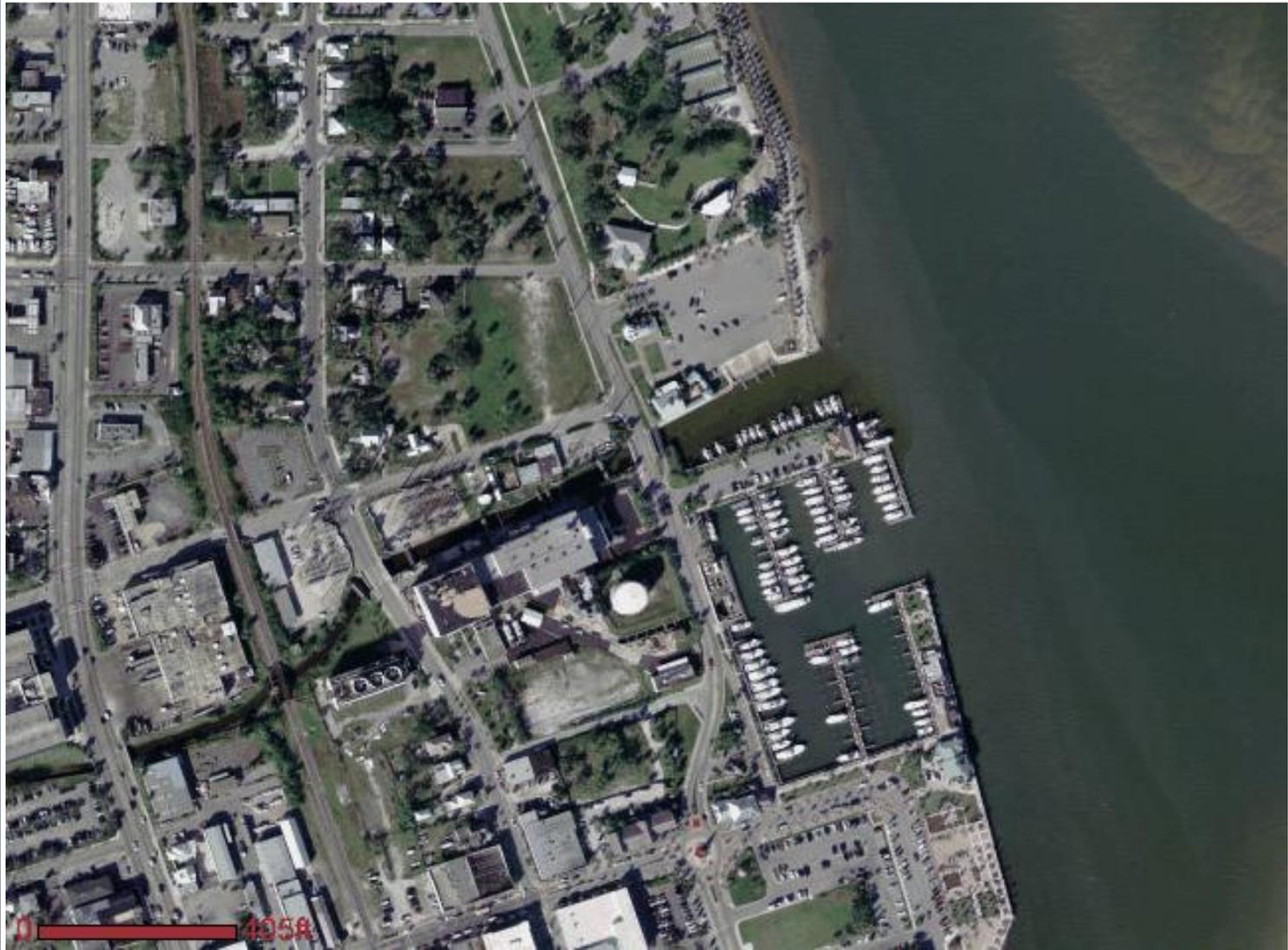
# The Restoration Begins....2004

- 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



0 1058





# 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



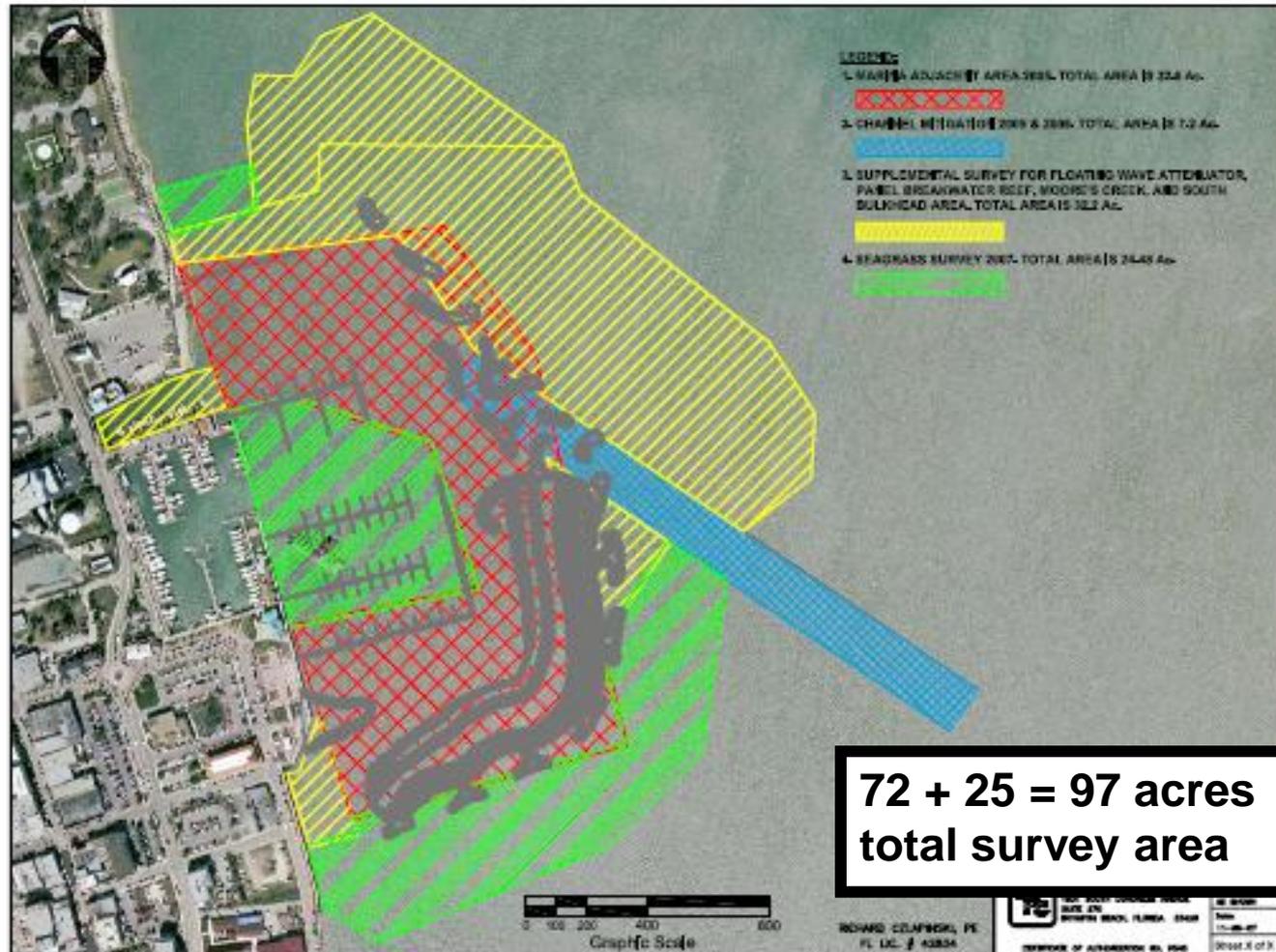
# Project Components

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



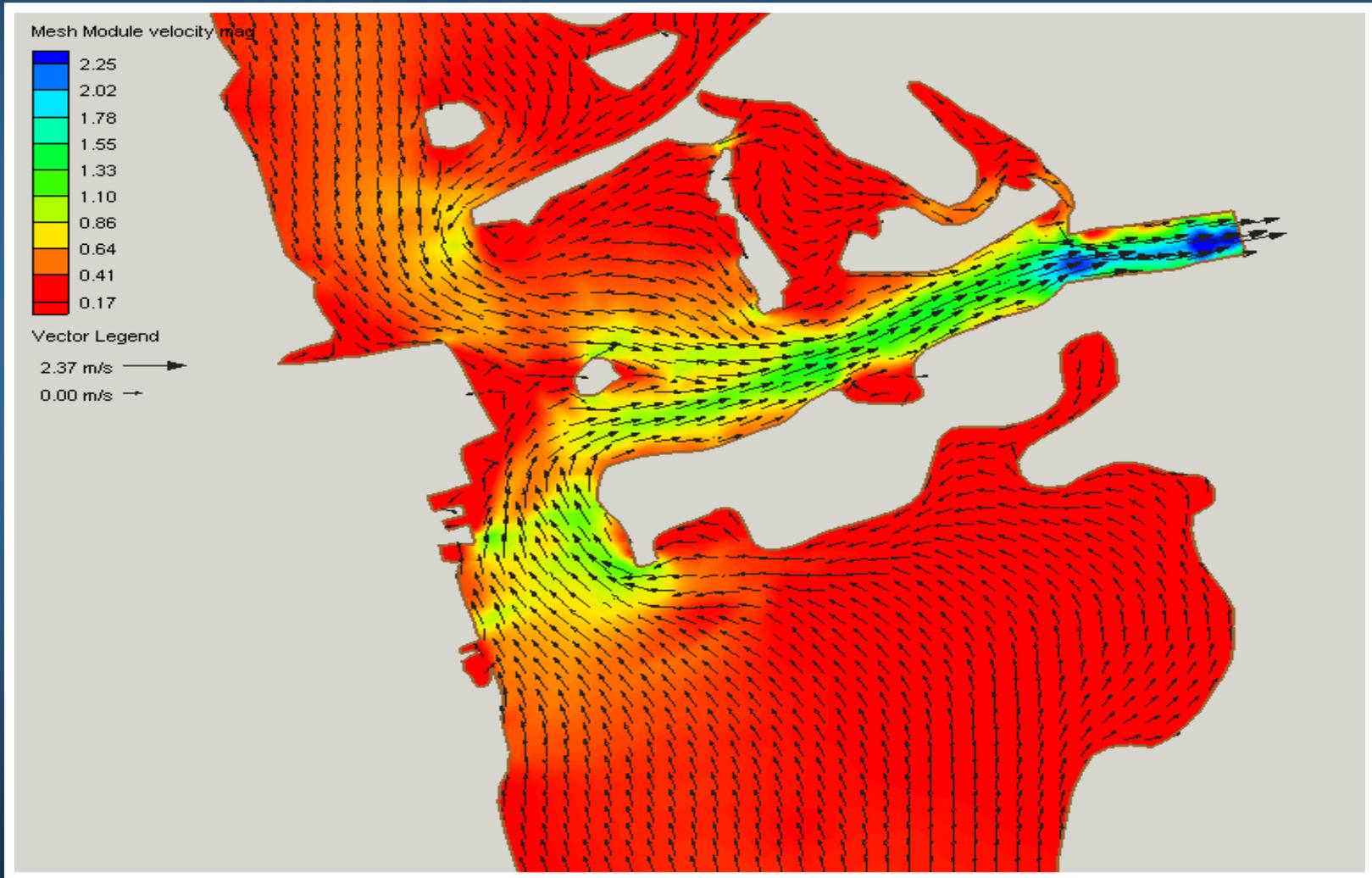


# Benthic Survey Areas



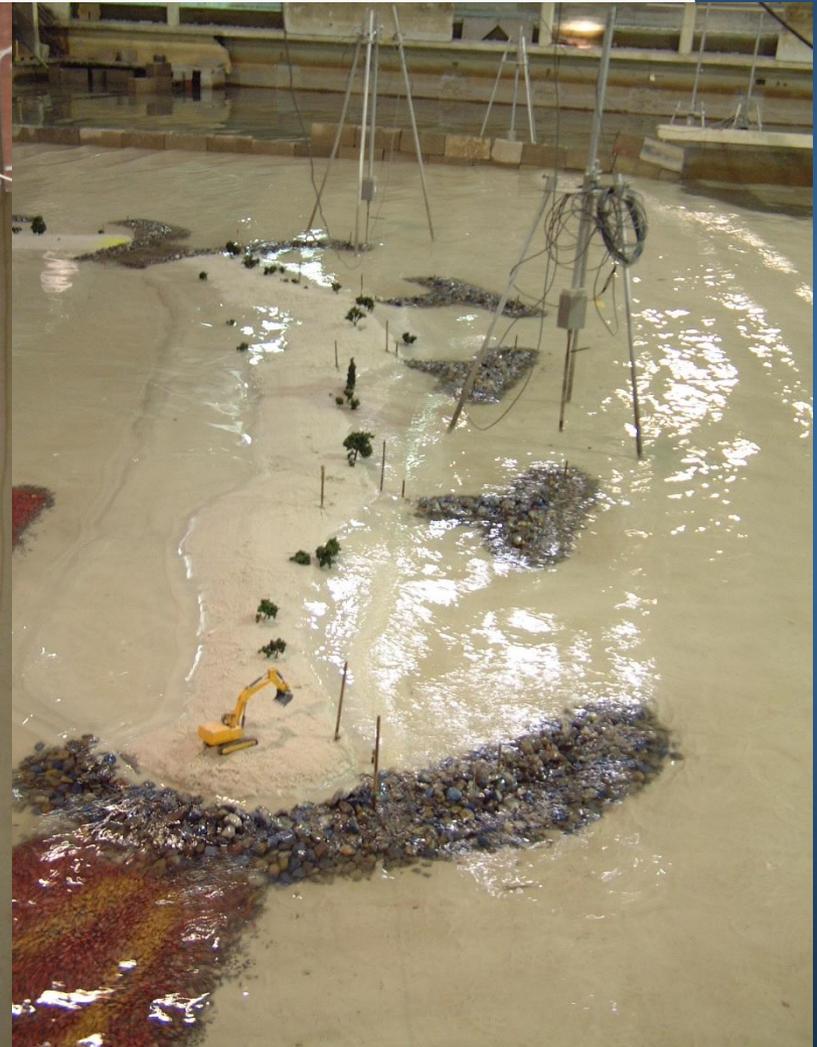


# Hydrodynamic Modeling





# Physical Modeling





# Latest Configuration

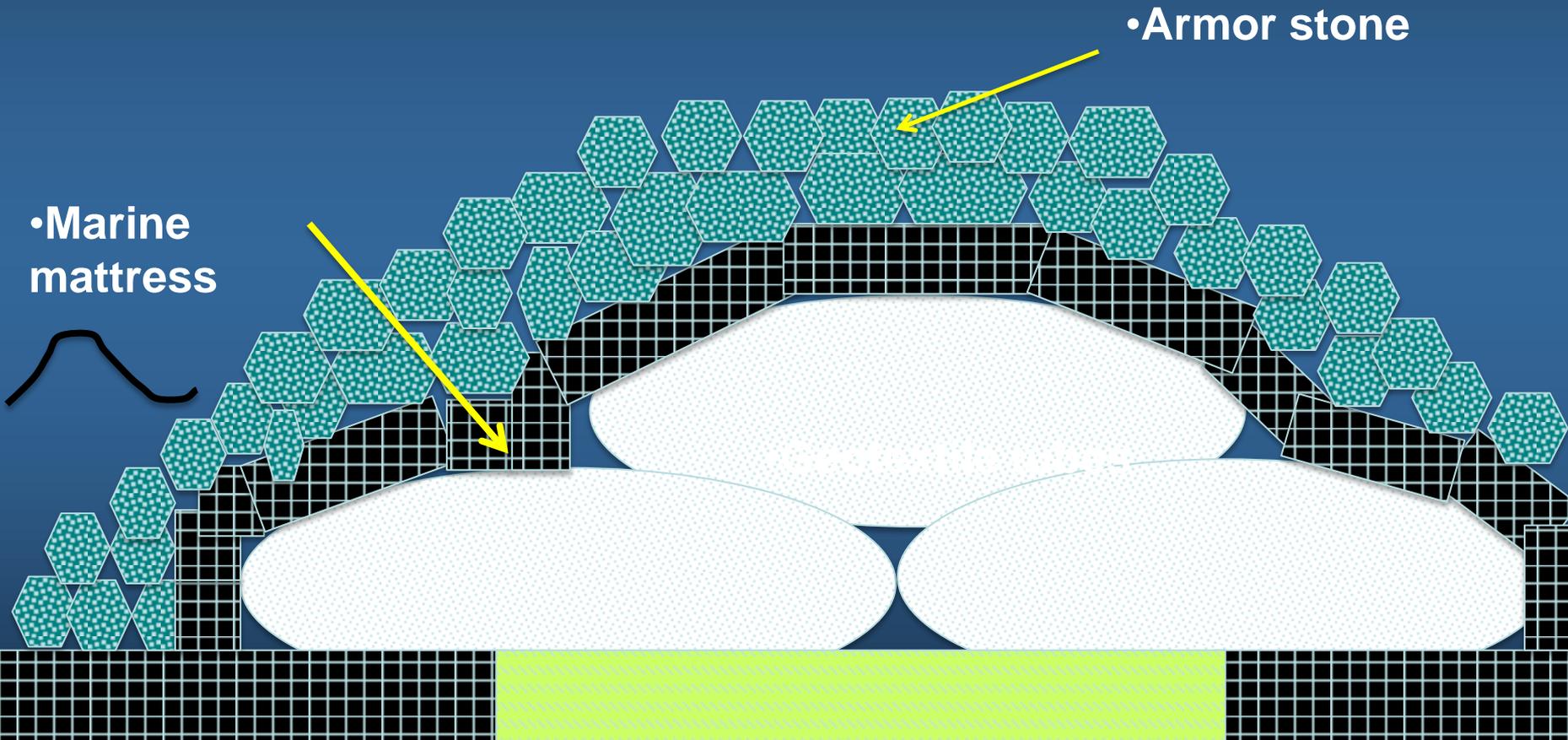








# Design – Structure Section





# 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

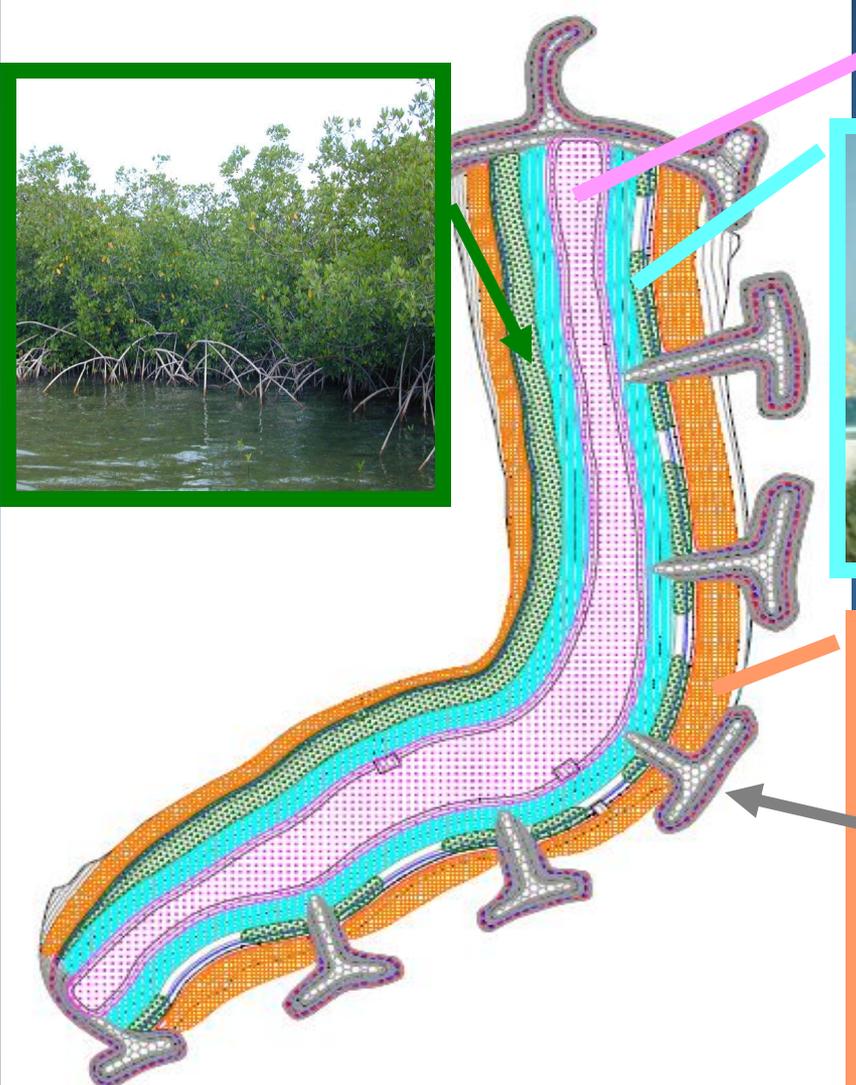
Total Habitat Creation = 21.75 acres

- 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

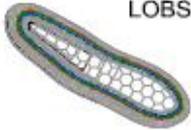




# Habitat Islands



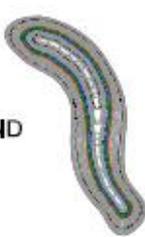
SHELL ISLAND



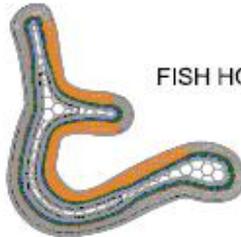
LOBSTER ISLAND



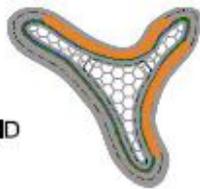
MANGROVE ISLAND



EEL ISLAND



FISH HOOK ISLAND



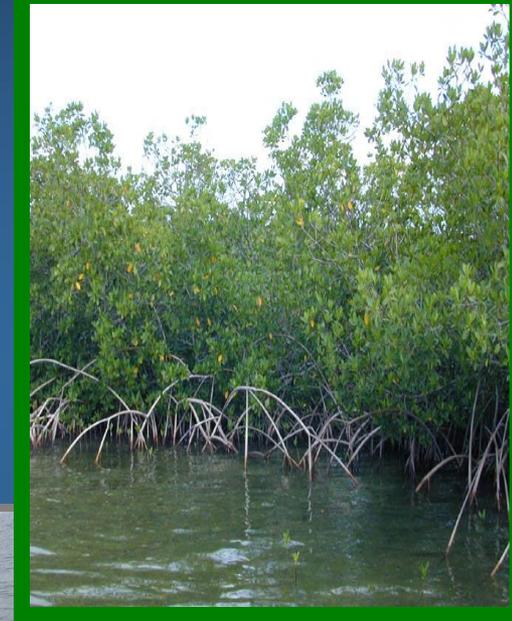
STARFISH ISLAND



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.**









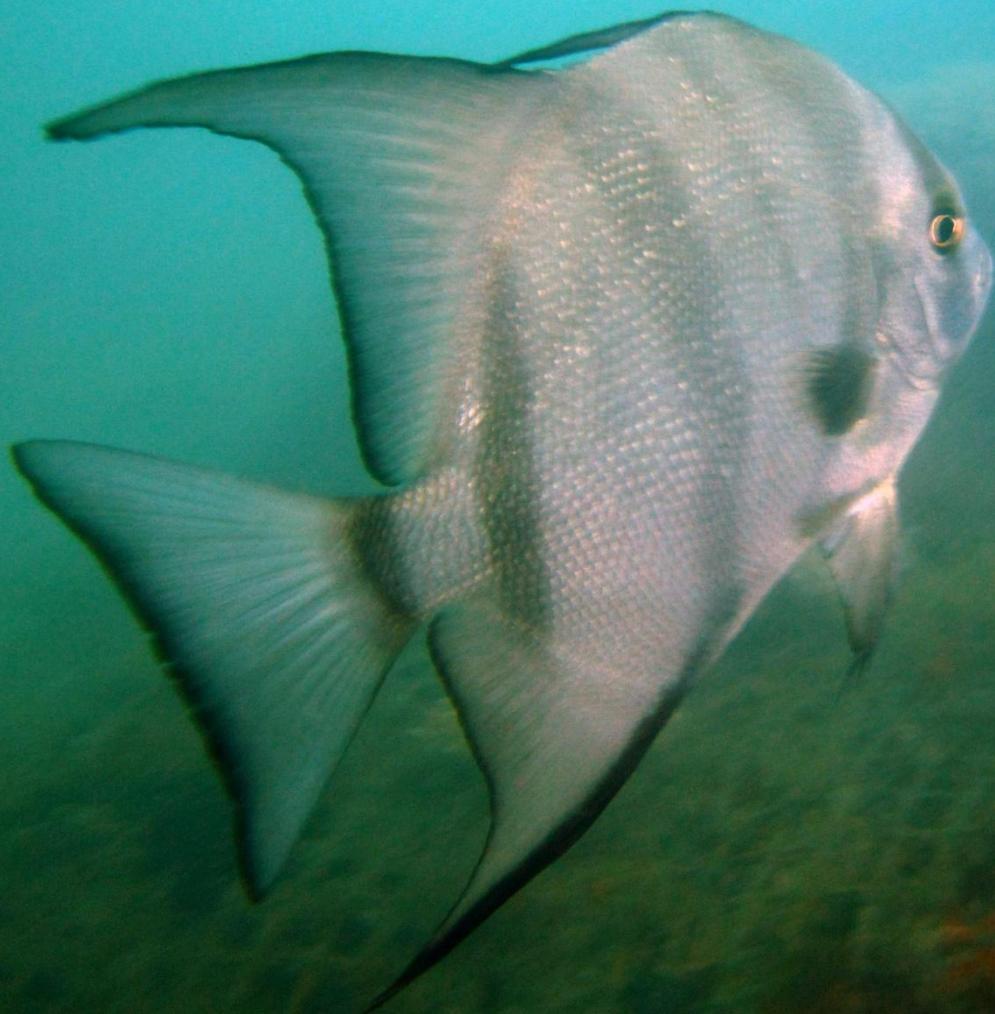




02/19/2014



02/18/2014



02/19/2014



02/19/2014



FORT PIERCE CITY MARINA  
LAST GREAT FISHING FRONTIER

