

# Palm Beach County Estuarine Habitat Mapping

Coastal Habitat Integrated Mapping and Monitoring Program  
(CHIMMP)

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# Palm Beach County Estuarine Habitat Mapping

- Palm Beach County / Lake Worth Lagoon - Estuarine Habitat
- Overview of PBC mapping efforts
- What PBC and its partners are doing.
- Current status



Munyon Island Restoration Project - Completed 1997



- Loxahatchee River
- Intracoastal Waterway
  - Jupiter to North Palm Beach
- Lake Worth Lagoon
  - North Palm Beach to Ocean Ridge
- Intracoastal Waterway
  - Ocean Ridge to Boca Raton

Sources: Esri, DigitalGlobe, GeoEye, USDA, USGS, AEX, @swapping, AeroGRID, IGN, and the NOAA

## Palm Beach County Estuarine Waters

~ 45 miles of urbanize waterways  
with over 100 miles of shoreline

• By the 1970's the majority of  
mangrove habitat replaced by  
development.

### • Three Regions

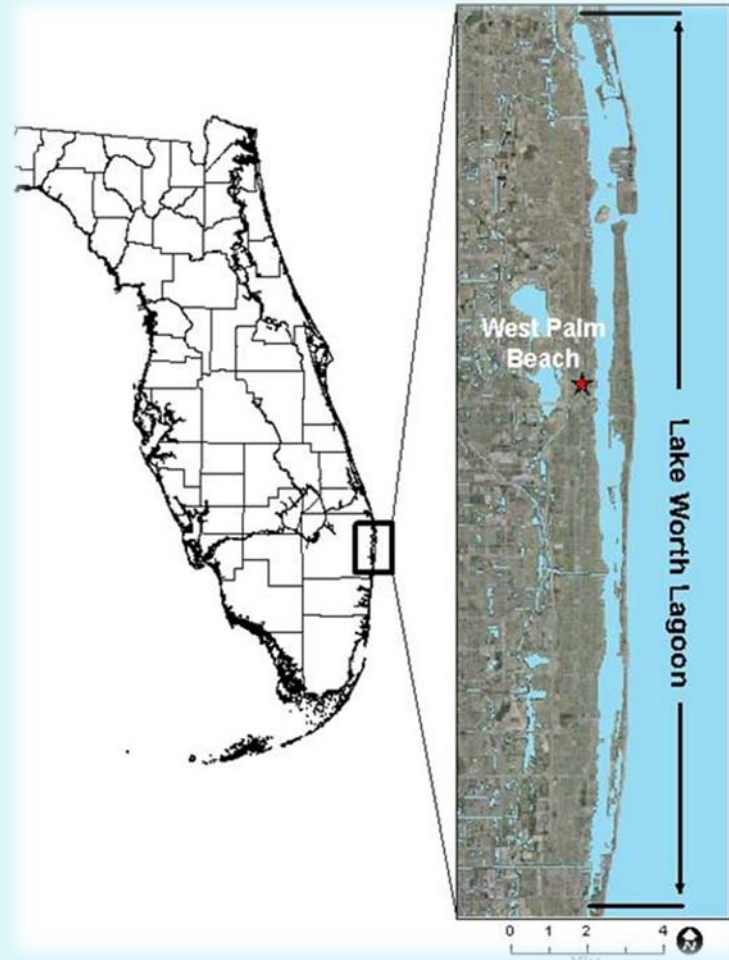
- Loxahatchee River and North ICW
- Lake Worth Lagoon
- South ICW / Lake Wyman

• Four inlets: Jupiter Inlet, Lake  
Worth Inlet, South Lake Worth Inlet,  
Boca Raton Inlet

• Six major Drainage Basin Canals  
& many stormwater outfalls

# Lake Worth Lagoon

- Historically, a lake surrounded by freshwater marshes.
- 1877 first stable inlet.
- Now, the major estuarine waterbody in Palm Beach County.
- ~20 miles long, ½ mile wide
- Separated from Atlantic Ocean by barrier island
- Only a few natural islands

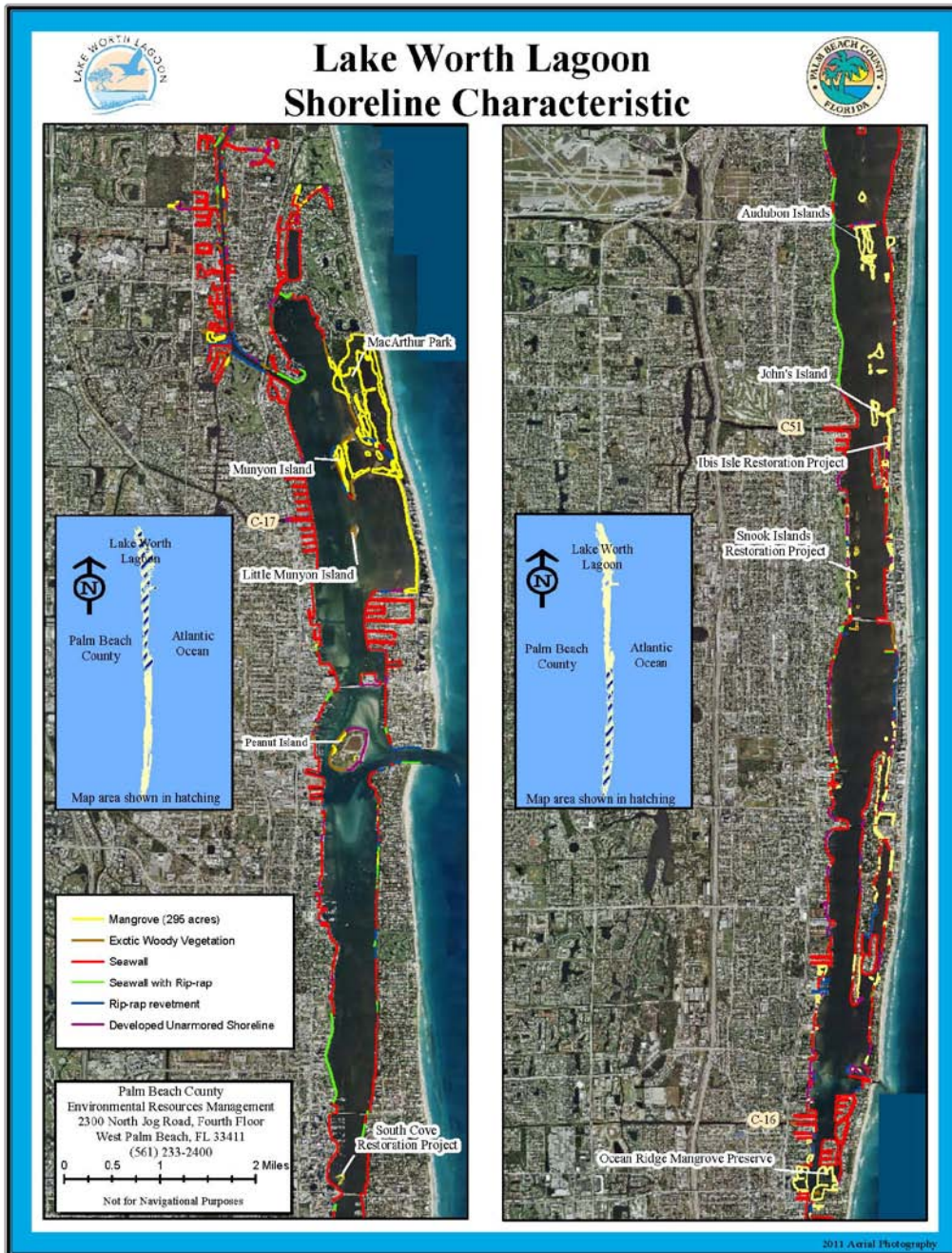


# Palm Beach County 1990 Estuarine Habitat Mapping Overview

- 1990 Lake Worth Lagoon Natural Resources Inventory and Resource Enhancement Study
- 1992 Palm Beach County Estuarine Natural Resource Inventory and Resource Enhancement Study
  - “Between 1940 and 1975, an estimated 87% of the shoreline mangroves were eliminated by shoreline development (Harris, et. Al 1983)”
  - Shoreline inventory documented fringing mangroves:
    - ~30 % of North ICW / Loxahatchee River
    - ~19 % of LWL
    - ~7% of South ICW

# Palm Beach County 1985 - 2001 Estuarine Habitat Mapping Overview

- 2001- Completed first aerial mapping of LWL.
  - High-quality aerial images were acquired.
  - Using GIS and an analytical stereoplotter; seagrasses were mapped.
- 2003 – Using the same 2001 aerials.
  - The seagrasses were mapped Countywide.
  - The 1990's baseline inventories was expanded by mapping the County's estuarine shoreline.
  - Shoreline characteristics mapped mangrove communities as they existed in 1985 and 2001.
    - The survey's identified: Seawalls, rip-rap revetment, exotic non-native vegetation, mangrove swamp, and developed unarmored.



# 1985 -2001 Shoreline Characteristic

- **PBC Shoreline**
- The overall trend showed a conversion from natural shorelines to armoring.
- 1985 – 168 miles armored
- 2001 – 200 miles armored
- ~19% increase of armored shoreline.
- **Mangroves**
- PBC1985 – 657 acres
- PBC 2001 – 669 acres
- LWL 1985 – 273 acres
- LWL 2001 – 278 acres

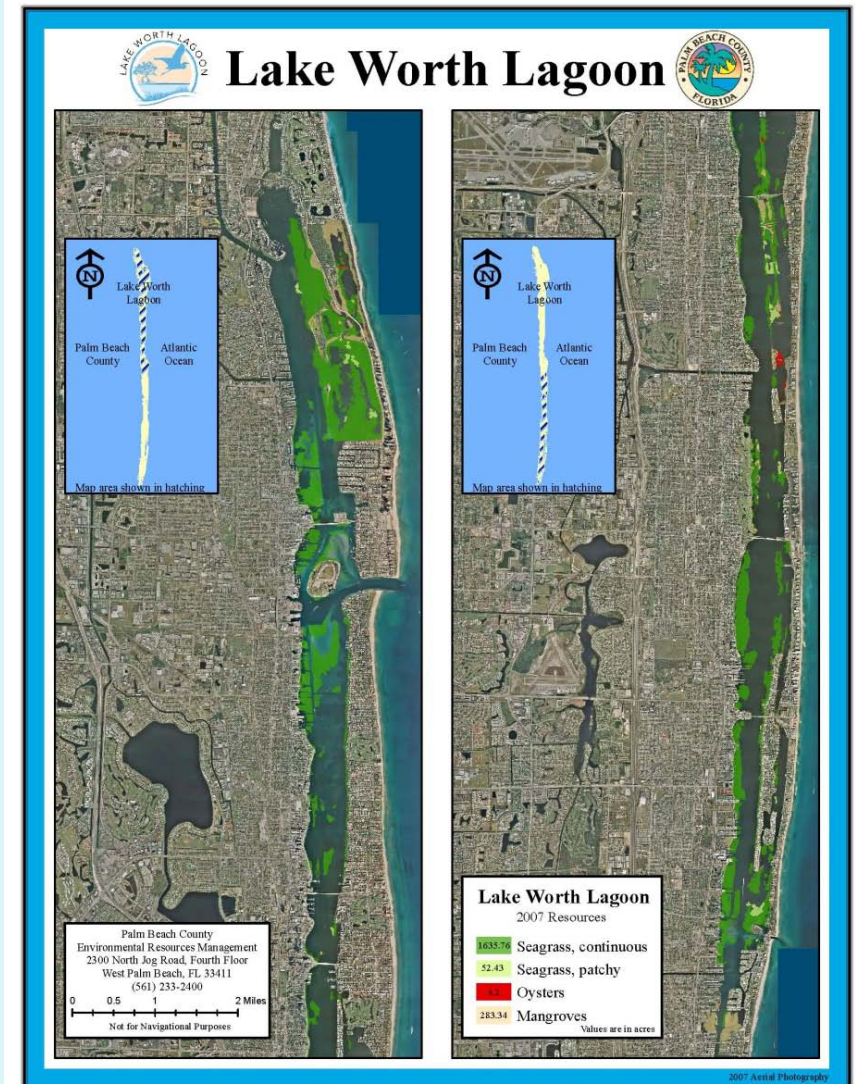
# 1985 -2001 Shoreline Characteristic

- Considerations between the two data sets.
- Limited growthtruthing.
- Aerial Photography had different resolutions
  - 1985 – 1:58,000 (2 acre mapping unit)
  - 2001 – 1:10,000 (0.25 acre mapping unit)
- Results only depict gross changes.
- Slight Increases a result of restoration projects.



# 2007 ShorelineMapping

- Using the same methodology as in 2001, Mangroves was mapped and compared to 1985 and 2001
- 2007 PBC mangroves
  - 710 acres (12.56%)
- 2007 LWL mangroves
  - 283 acres (14%)
- Results attributed to maturity of restoration and mitigation projects and removal of exotic vegetation.
- Also mapped 4.2 acres of oyster and 1.5 acres of spartina.



# 2007 ShorelineMapping - Spartina

- Spartina a major planting component of all restoration projects.
- Only 1.5 acres identified.
- Minimal mapping unit.
- Limited in aerial signature.
- And outcompeted by mangroves.



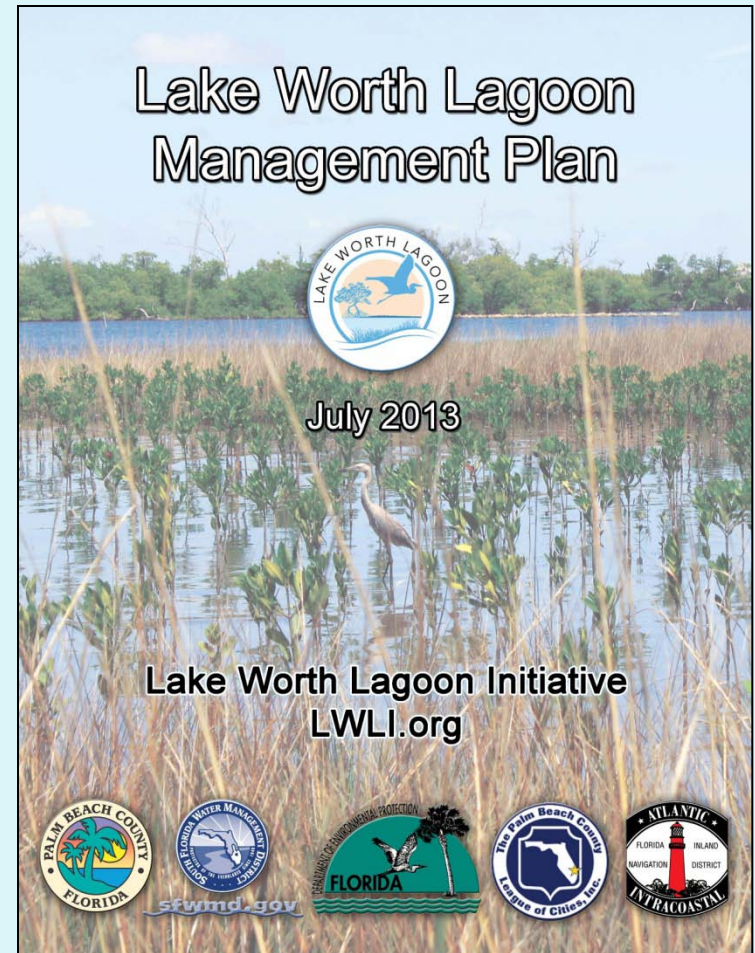
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**Snook Islands 2007**

# What PBC and its partners are doing?

## Habitat Management in the Lagoon

- Development of the LWL Management Plan.
- Since 1998, State Legislature has appropriated \$16.7 million for LWL projects, which has been matched with over \$59.5 million in local and federal funds to construct 44 projects totaling \$76 million.
- Goal to: Restore, Create and Protect Mangrove and Spartina Habitats.
- Conceptual projects have been identify by the plan to restore habitat.



# Habitat Restoration Projects



**Munyon Island- 1997**



**John's Island- 2003**



**Snook Island - 2005**



**Peanut Island - 2005**



**Ocean Ridge – 2006**

# Snook Islands Natural Area

- 100-ac dredge hole filling project completed in 2005 (Phase 1) restored +50 ac seagrass, 11 ac mangroves, 3.8 ac spartina, & 2.2 ac oysters





# Habitat Restoration Projects



**Boynton Beach Breakwaters - 2009**



**South Cove – 2012**



**Ibis Isles- 2010**



**Jupiter Ridge  
Breakwater 2012**

# South Cove Natural Area

- 6-acre dredge hole filling project
  - 2 acres of mangrove/salt marsh
  - 3.5 acres of seagrass
  - 1 acre of oyster/artificial reef
- Completed 2012



Photo Credit: John A. Marshall



January 18, 2013



June 5, 2013

# LWL Restoration Projects Create 12 acres

Four general types of projects:

- Scrape down spoil island
- Fill deep dredge hole
- Cap muck sediments
- Breakwater projection

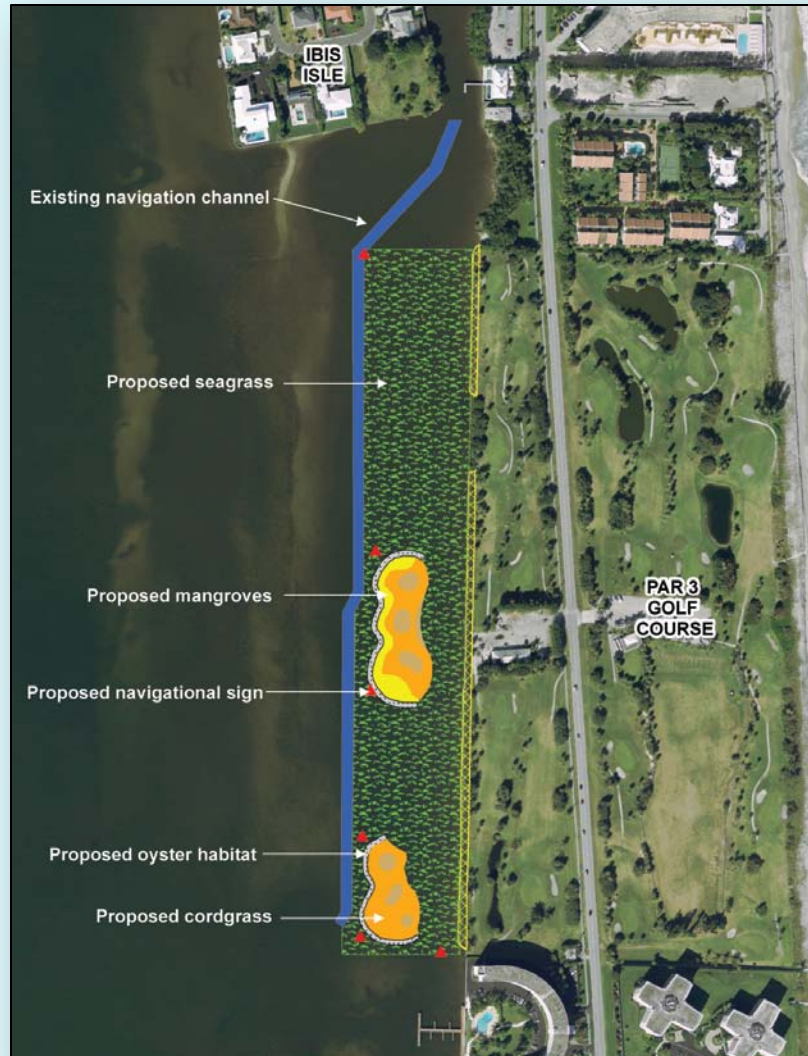
Project	Year Completed	Acres
Little Munyon Island	2009	0.92
Ibis Isles Restoration	2010	6.94
South Cove Natural Area	2012	1.79
Snook Islands Natural Area	2013	2.12
Bryant Park Wetlands	2014	0.44
<b>Total</b>		<b>12.21</b>

# 2014 LWL Mangrove Status

Year	Mangroves (Acres)	Increase (Acres)	% increase from 1985
1985	273	-	-
2001	278	5	1.8%
2007	283	5	3.7%
2014	295	12	8.1%



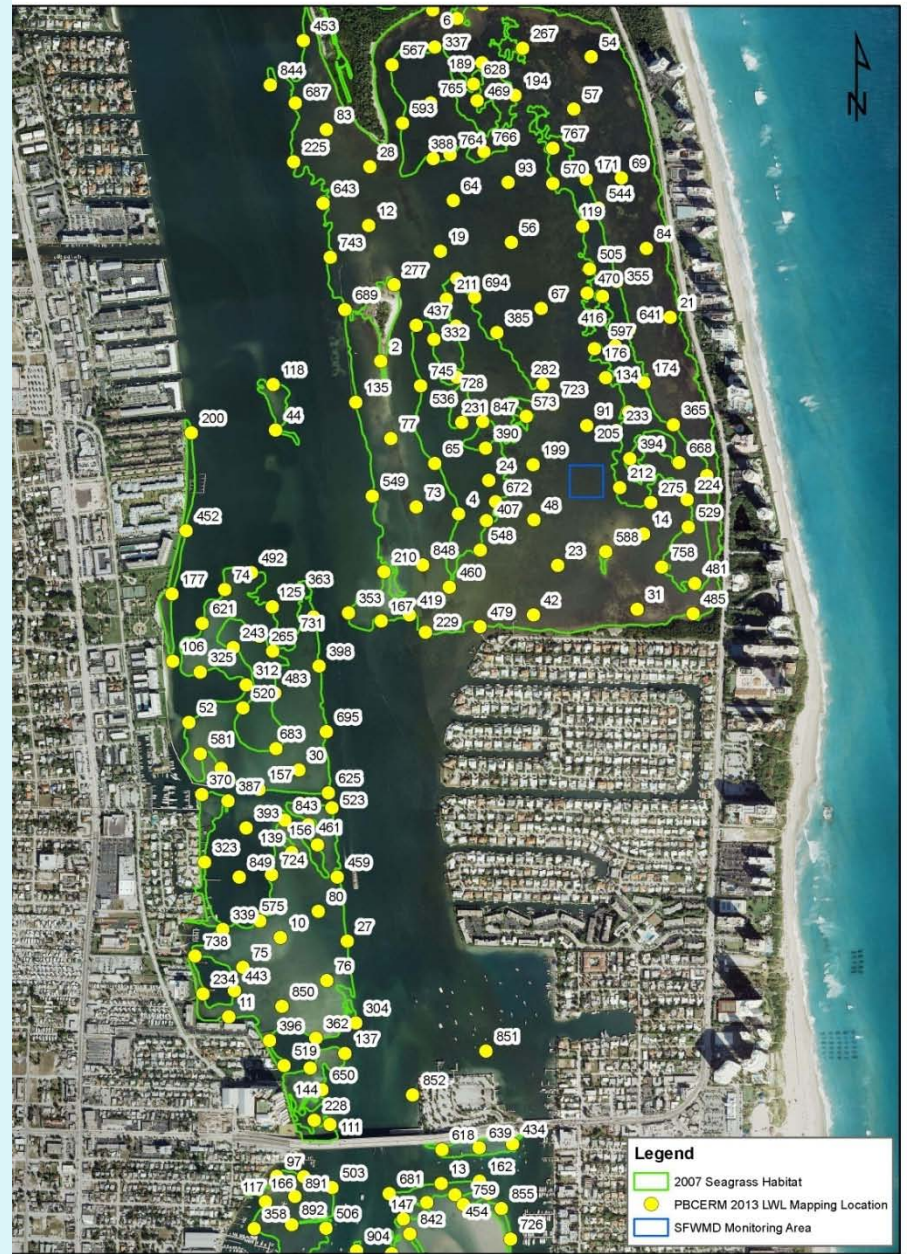
# Grassy Flats Restoration Project



- 13-acre muck capping project:
  - 10 acres seagrass
  - 1.5 acres salt marsh
  - 0.7 acres mangroves
  - 0.6 acre oyster reef
- \$2.6M project
  - 7 government and private partners
  - Awarded federal, state, and local funding
- Construction to begin in 2014

# 2013 PBCERM SAV Field Mapping

- An attempt was to repeat previous aerial methodology; however, poor water clarity has resulted in unfavorable conditions.
- The 2013 methodology is based on ground-truthing verification of the 2007 seagrass map.
- Approximately 20% complete to date.



# Where Do we go from here?

- County is focus on continuing its restoration program.
- Look to expand the living shoreline restoration component, to combat the urban armored shoreline.
- Cost of aerial image, photointerperation to only map mangroves can be expensive.
- No anticipated change in PBC as a result of development and deforestation of mangrove habitats.
- Most anticipated change in PBC is a result of restoration projects.
- Open to future ideas of mapping and monitoring.

# Questions?

- Further information can be obtained at <http://www.co.palm-beach.fl.us/erm>
- Or contact me:
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