PRESERVING OUR NATURAL RESOURCE RESILIENCE

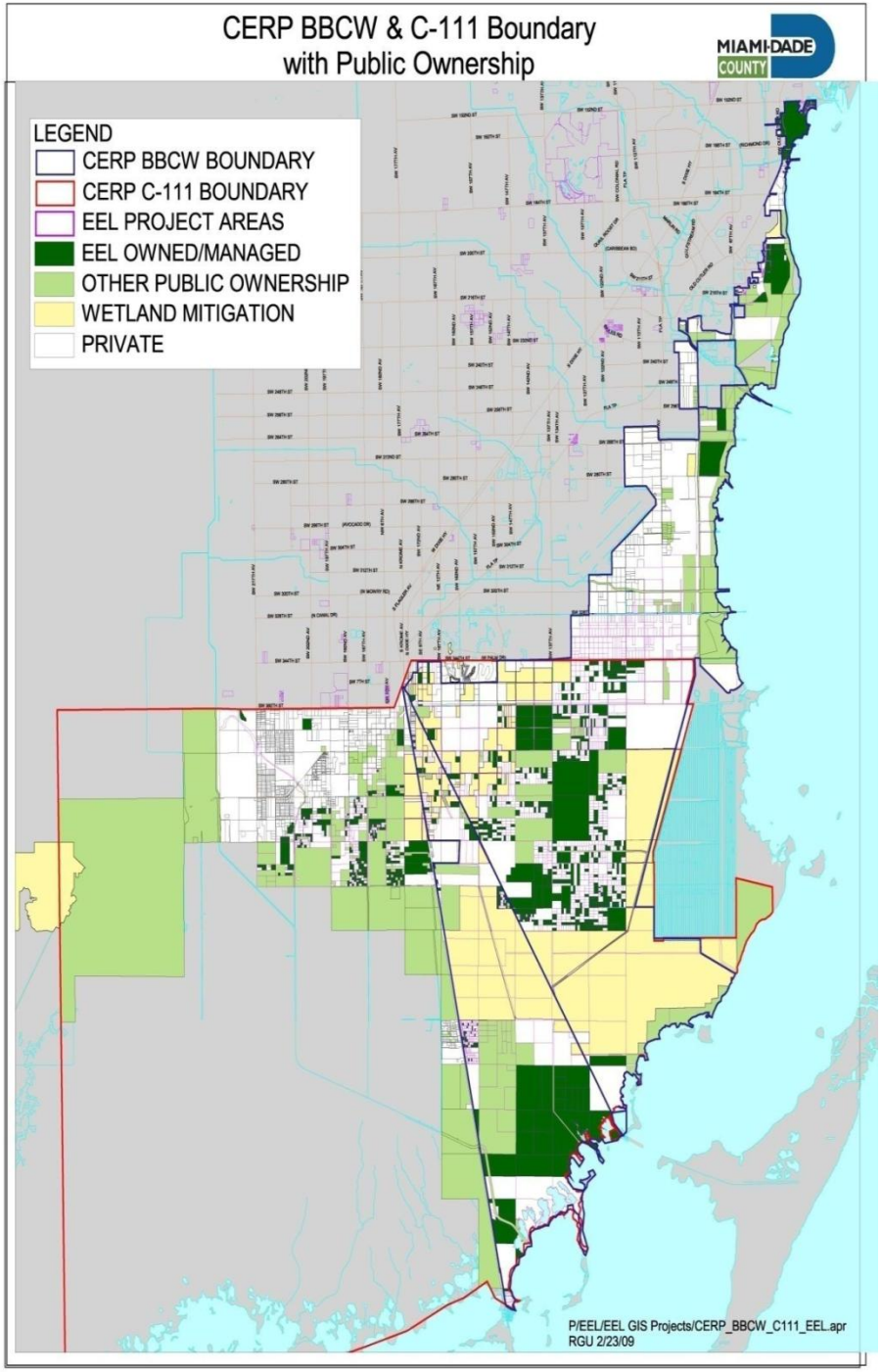
SEA LEVEL RISE TASK FORCE MEETING
MARCH 7, 2014

Miami-Dade County
Department of Regulatory and Economic Resources,
Division of Environmental Resources Management
(RER-DERM)

DERM preserves natural resource resilience through:

- The Environmentally Endangered Lands Program's acquisition of conservation lands
- Monitoring the salt intrusion boundary
- The Erosion Control / Beach Renourishment Program
- Natural resource restoration projects
- Regulatory programs that protect natural resources

- Miami-Dade County’s natural mangrove shorelines dissipate storm energy/surges and retain floodwaters while protecting inland areas.
- These protective natural barriers are usually high-value lands for conservation of habitat and ecosystems.
- Placing these lands in preservation reduces development in areas that would be more vulnerable to storm impact.



ENVIRONMENTALLY ENDANGERED LANDS PROGRAM

The EEL Program was approved & created by voters in 1990 to acquire, preserve, enhance, restore, conserve, and maintain environmentally endangered lands for this and future generations.

The FY91 & FY92 property tax increase was approved by referendum and generated $90M in revenue originally collected to fund the EEL Program.

From 1992 to 2013, the EEL Program received an additional $106M in revenue from grants, County bonds (GOB), interest and other sources.

Through 2013, over $149M was expended to acquire and manage more than 23,000 acres of targeted conservation lands in Miami-Dade County.

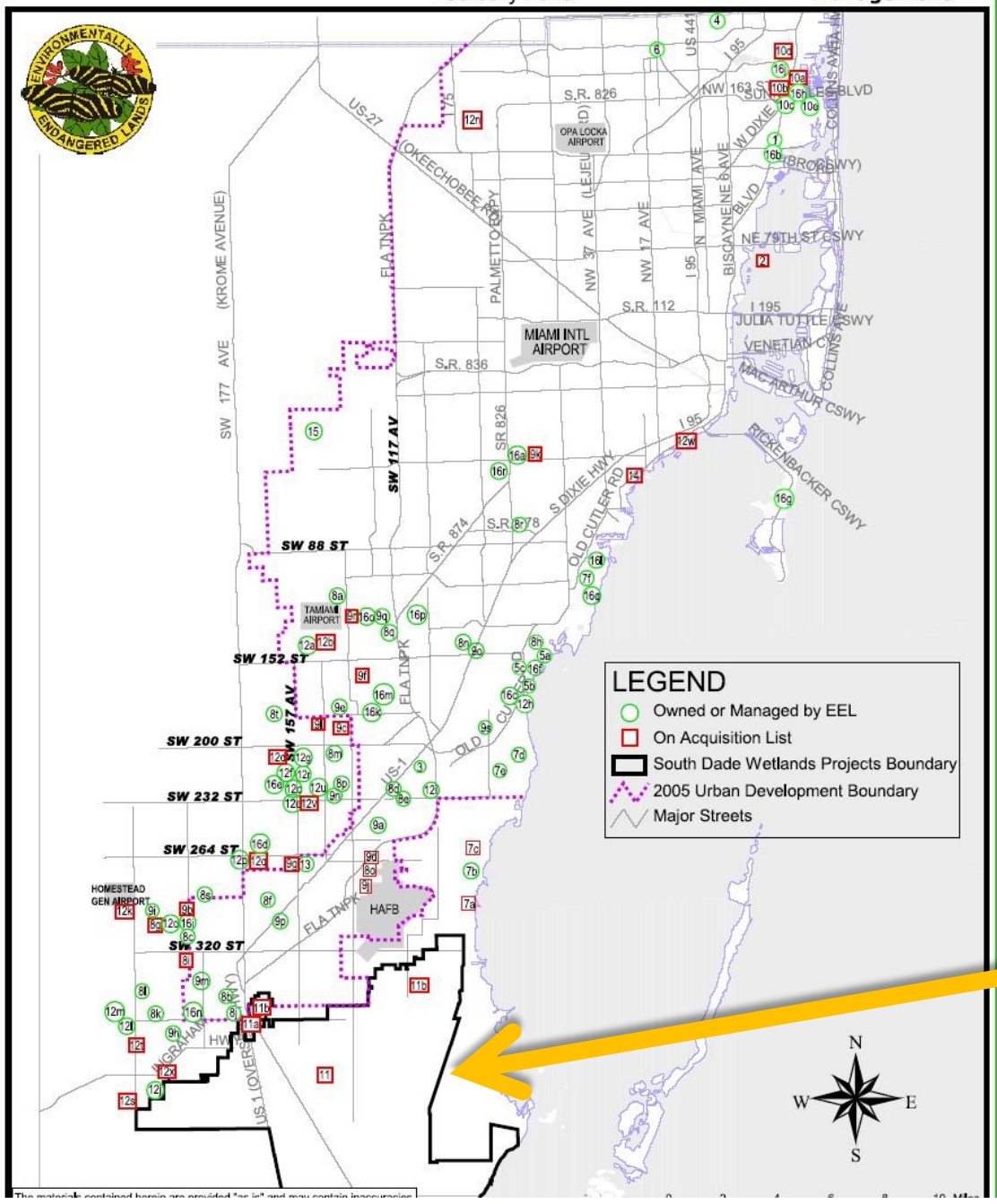
MIAMI-DADE COUNTY

MIAMI-DADE COUNTY

ACQUISITION PROJECTS

Environmentally Endangered Lands Program
February 2010

Department of Environmental Resources Management



Of the more than 23,000 acres acquired under the EEL Program in Miami-Dade County, many are in low-lying coastal areas.

EEL Program acquisition in the South Dade Wetlands Project places land in preservation thereby reducing development in an area vulnerable to storm impact.

Lands in public ownership are crucial to restoring hydrology and surface water levels, which can help reduce the potential for salt water intrusion. But funds are needed to complete the targeted acquisitions.

MONITORING SALTWATER INTRUSION

Rising sea level adds to the threat of saltwater intrusion into the Biscayne Aquifer, the sole source of drinking water in Miami-Dade County.

The salt intrusion boundary must be monitored for proximity to public wellfields and other sensitive receptors.

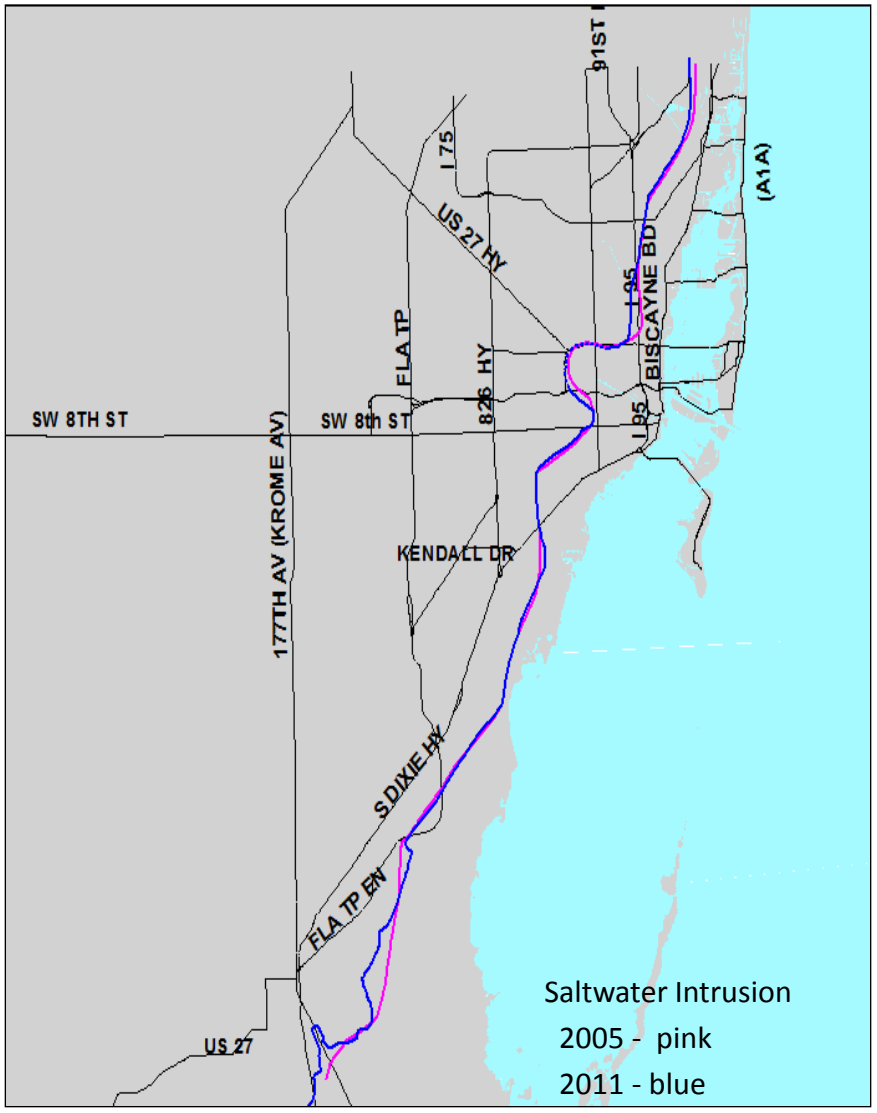
DERM and WASD fund the USGS's operation and maintenance of 90 water level recording stations and 74 saltwater monitoring stations.

Chloride sampling is done monthly, quarterly or annually depending on location. Induction logs are collected annually for select wells.

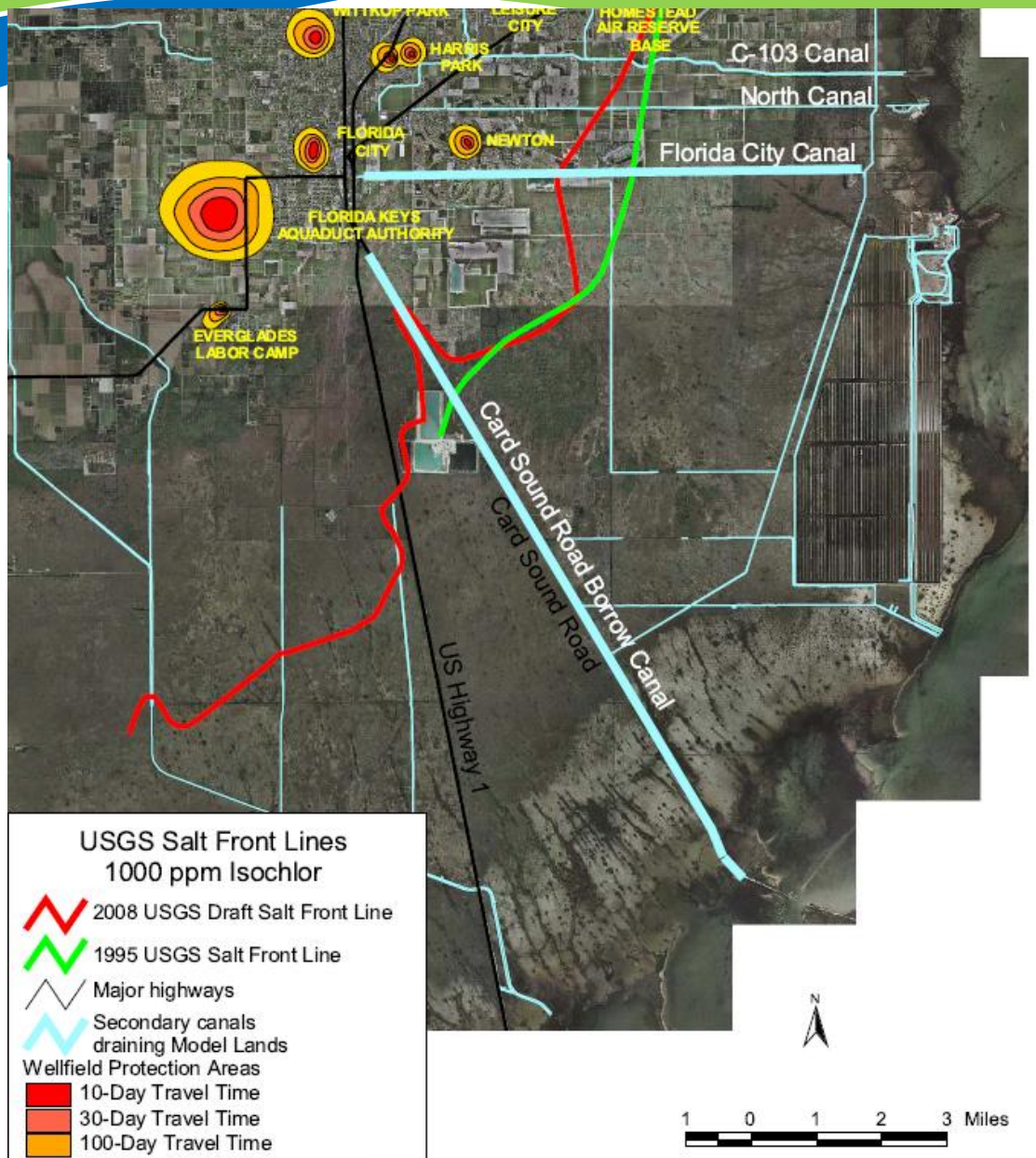
MONITORING SALTWATER INTRUSION

All 10 wells east of the salt front from the Broward County line to the C-2 Canal show an increasing trend in chloride concentration, which indicates regional movement of the salt line inland.

This diagram shows the inland migration of the boundary between 2005 (in pink) and 2011 (in blue).



Salt Water Intrusion



Saltwater intrusion boundary
1995 vs 2008

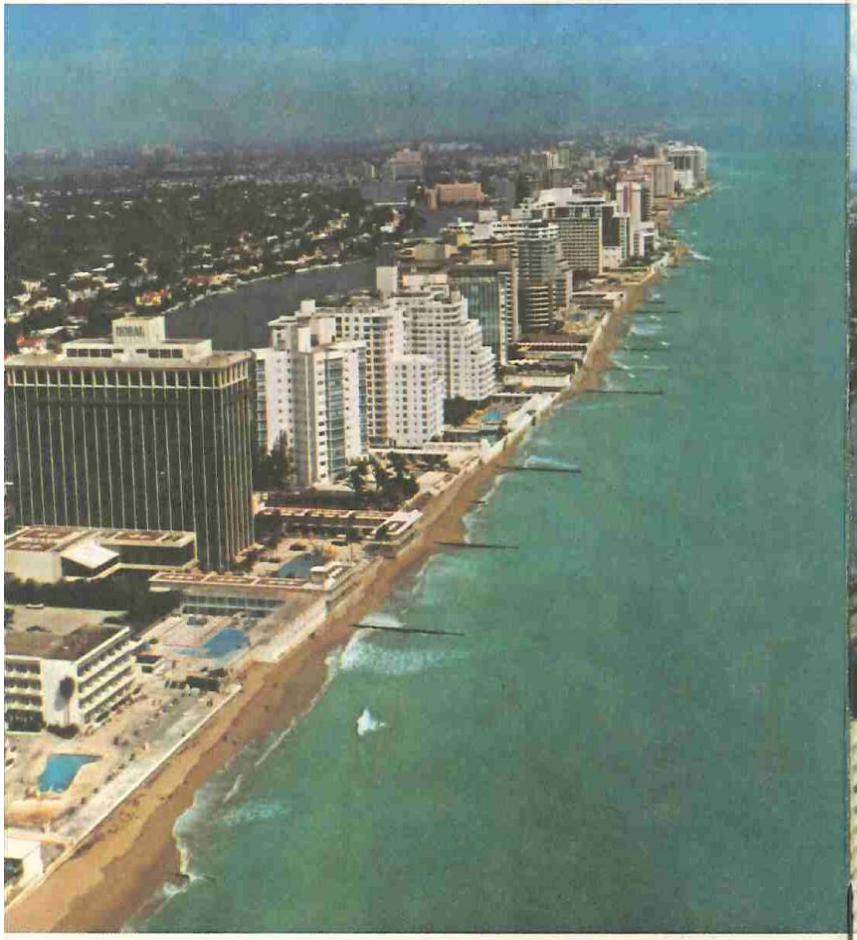
Significant westward movement along the Florida City and Card Sound Canals.

Both of these canals have salt control structures being constructed.

MIAMI-DADE COUNTY EROSION CONTROL / BEACH RENOURISHMENT PROGRAM

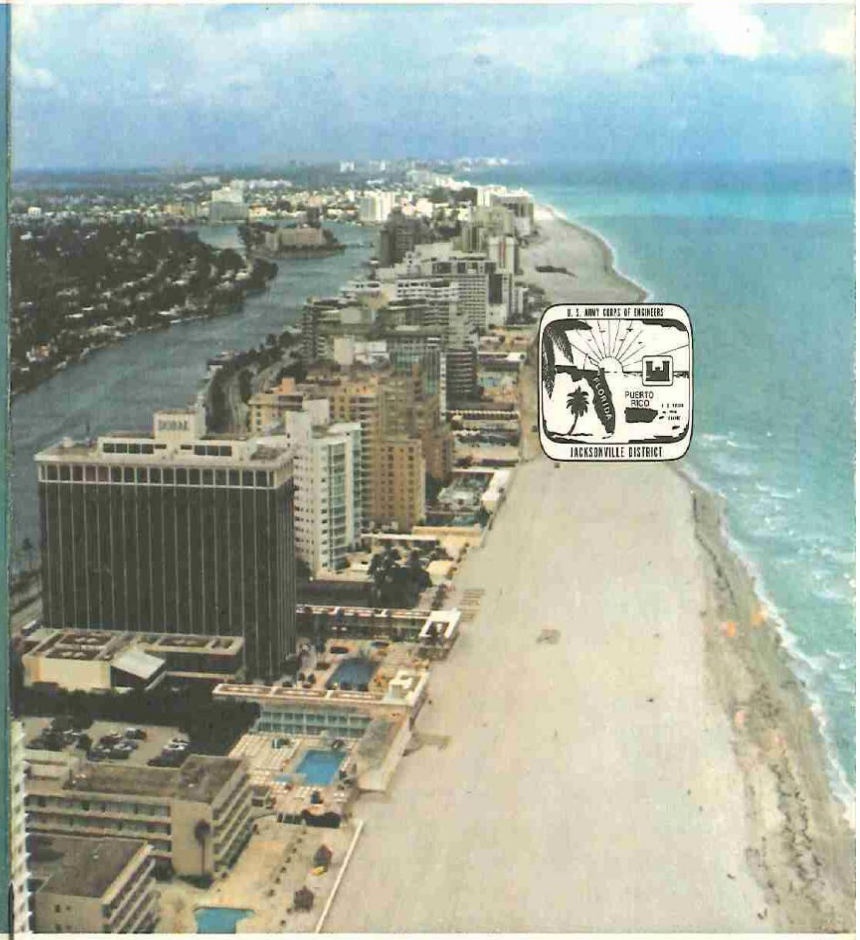
The Miami-Dade County Erosion Control / Beach Renourishment Program maintai beaches and dune systems which provide protection from storm damage, while preserving the economic benefits of wider beaches

OUR OLD BEACH



Looking north from approximately 48th Street in Miami Beach

OUR NEW BEACH
How It Works



DADE COUNTY BEACH EROSION CONTROL AND HURRICANE PROTECTION PROJECT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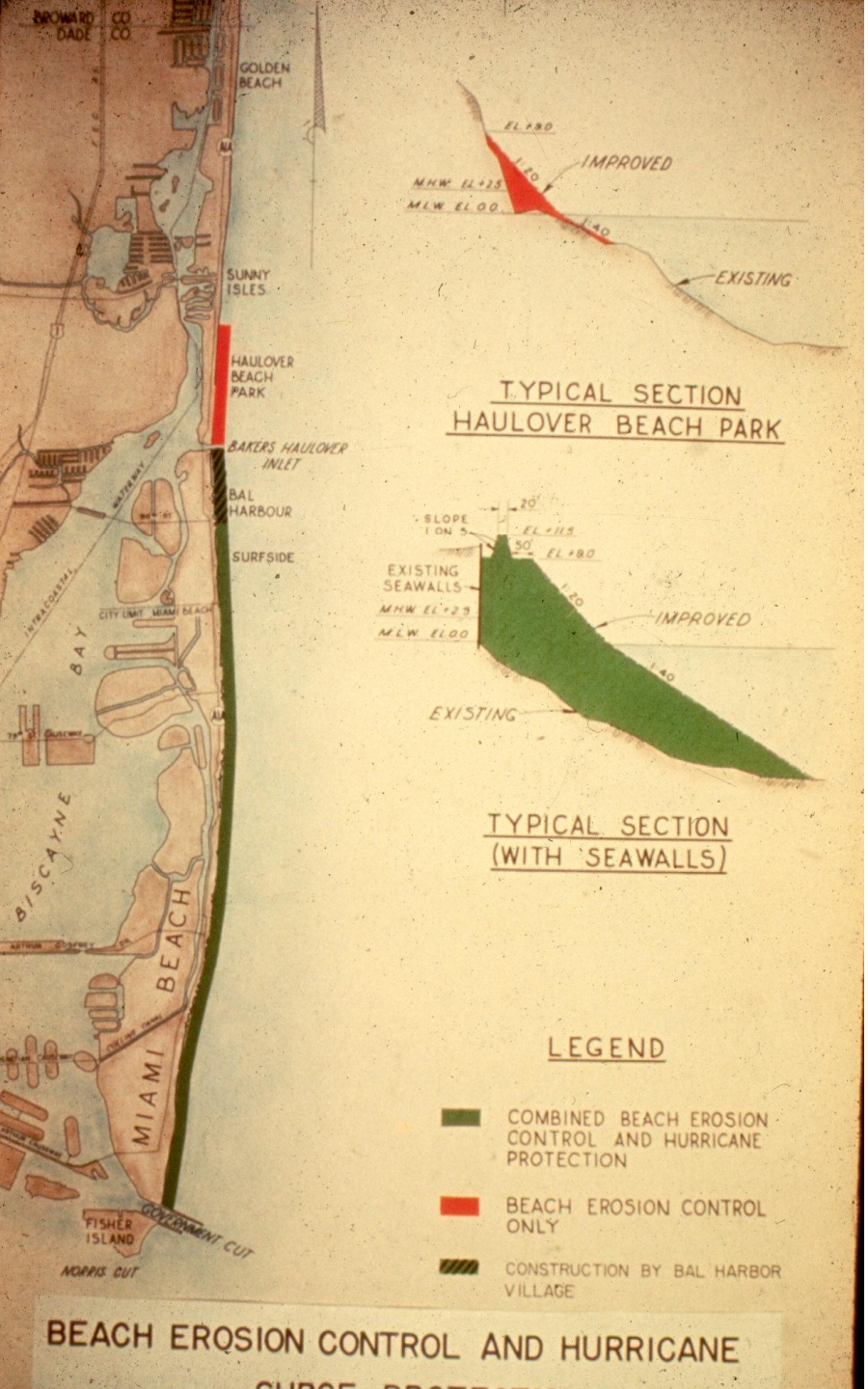


Dade County Beach Erosion Control and Hurricane Surge Protection Project

Initially 10.5 miles-Extended to 13 miles in 1988

Three Different Design Berms 225’ to 280’ from ECL

Initial Restoration: 17.8 million c.y.

$52 million

BISCAYNE

MIAMI-DADE DUNE REVEGETATION PROJECT

Objectives:

Restore design elevation of hurricane berms

Restore a functional dune system for sand trapping/stabilization

Channel pedestrian and vehicular traffic

Aesthetic enhancement of beach area

8 miles total length - $4.2 million


10 30 '86

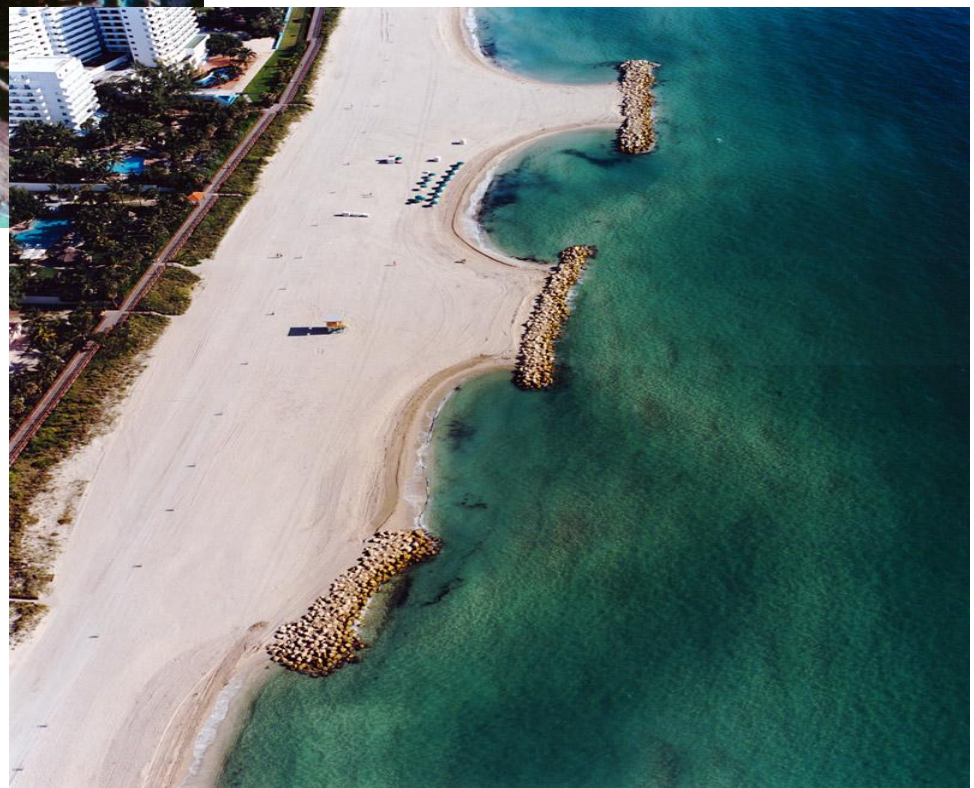

9 15 '86

MIAMI-DADE COUNTY

Change in shoreline orientation

Highest rate of littoral transport on entire project

Study recommends strategic use of structures to anchor and transition the beach fill into the stable beaches to the south



CHALLENGES FOR FUTURE BEACH EROSION CONTROL IN MIAMI-DADE COUNTY

Sand Management

Optimizing Sand Distribution along the Project

Identifying Sources of Future Nourishment Materials

Funding

NATURAL AREAS RESTORATION PROGRAMS

Attempting to restore the natural areas resilience through:

- **The Miami-Dade County Biscayne Bay Restoration and Enhancement Program**
- **Various demonstration projects and pilot projects**
- **EEL Volunteer Days**

Miami-Dade Biscayne Bay Restoration and Enhancement Program
Ongoing Restoration Efforts

Summary of the restoration of natural areas by the Biscayne Bay Restoration and Enhancement Program from 1987 to present:

- 53 sites restored
- 500 acres of wetlands restored
- 155 acres subtropical hardwood hammock, coastal strand, and dune community restored
- 2.3 acres of seagrass restored
- 9.5 miles shoreline stabilization (native vegetation and limestone revetments)
- Many hours of labor donated by community volunteers

Miami-Dade Biscayne Bay Restoration and Enhancement Program
Ongoing Restoration Efforts (3/2013)

Coastal Wetlands Restoration

- Virginia Key ACOE Section 1135 Ecosystem Restoration
- Florida International University BBC/Oleta River State Park
- City of North Miami (NE 135th Street)
- Crandon Preserve
- Matheson Hammock Park

Shoreline Stabilization

- R. Hardy Matheson Preserve Shoreline Enhancement
- Dinner Key Islands Phase III Enhancement
- Miami Marine Stadium Park Shoreline Stabilization

Seagrass Restoration

- Oleta River State Park Dredged Areas
- North Virginia Key Prop Scar and Boat Groundings

Freshwater Wetlands Restoration

- Highland Oaks Park (Headwaters of the Oleta River)
- Oleta River State Park

Dune/Coastal Strand Restoration

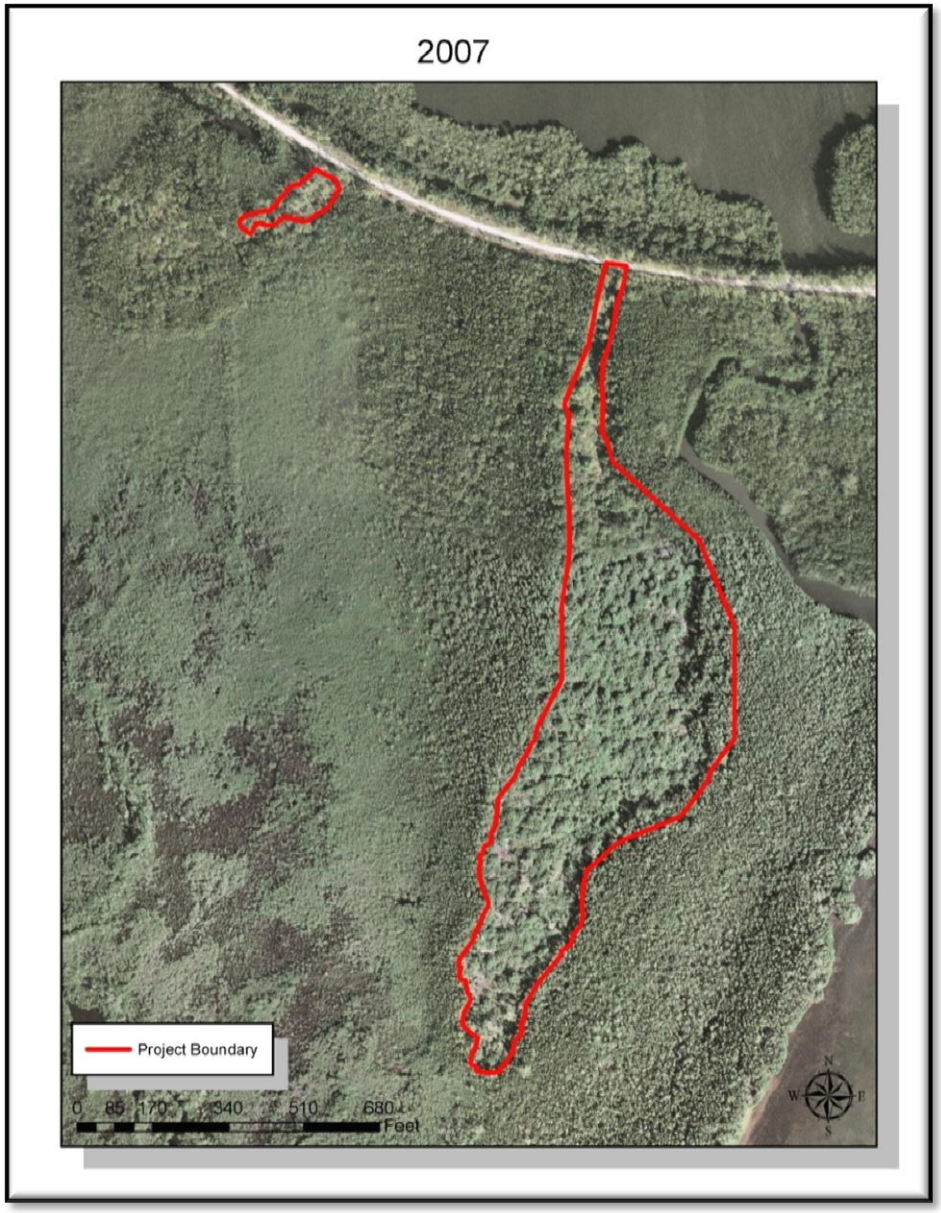
- North Virginia Key (North Point)
- Historic Virginia Key Beach Park (South)
- Oleta River State Park

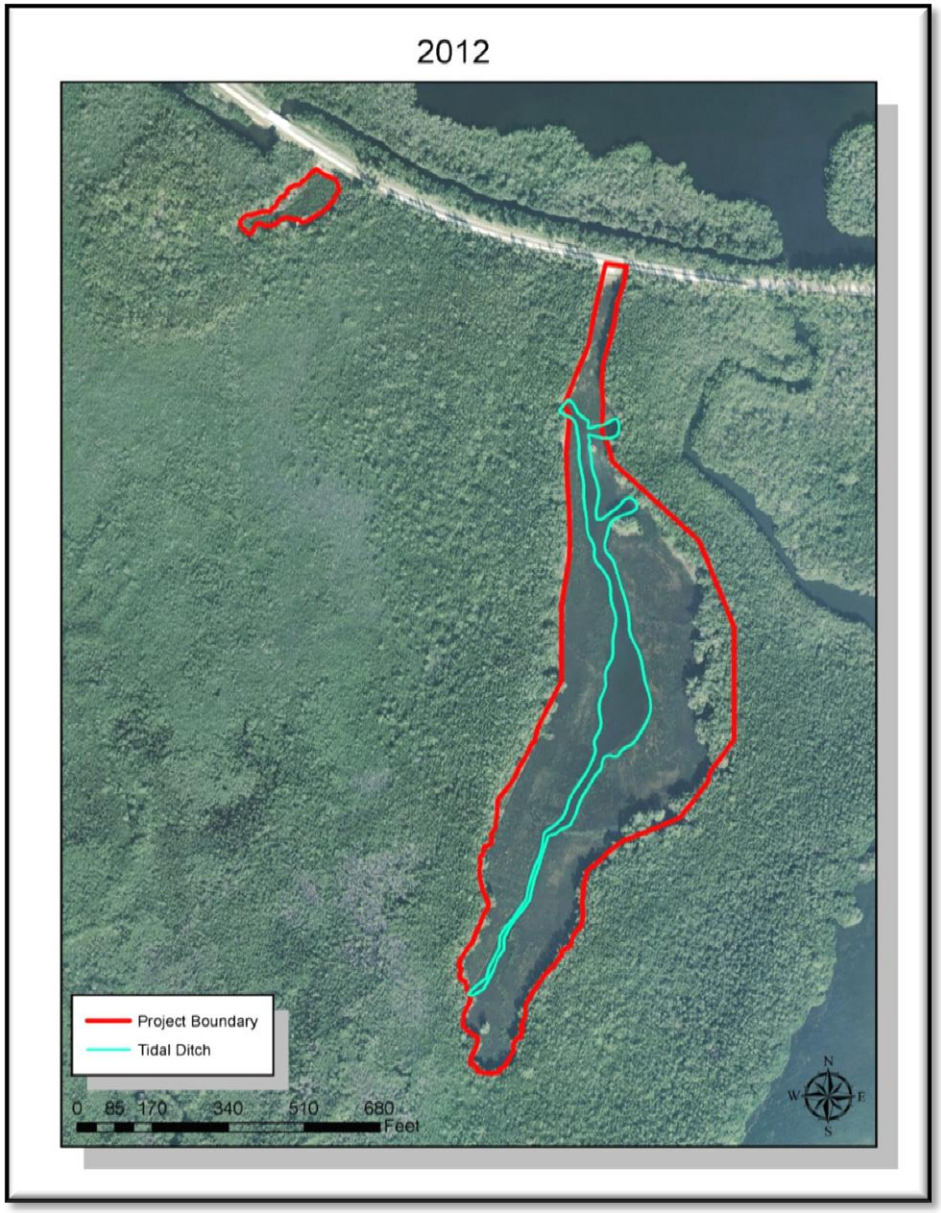
Tropical Hardwood Hammock Restoration

- Holiday Hammock
- Oleta River State Park
- Virginia Key (North Point)

Coastal Wetlands Restoration

Chapman Field Park Wetlands Restoration



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June 2010


December 2010


December 2011


December 2012

September 2009

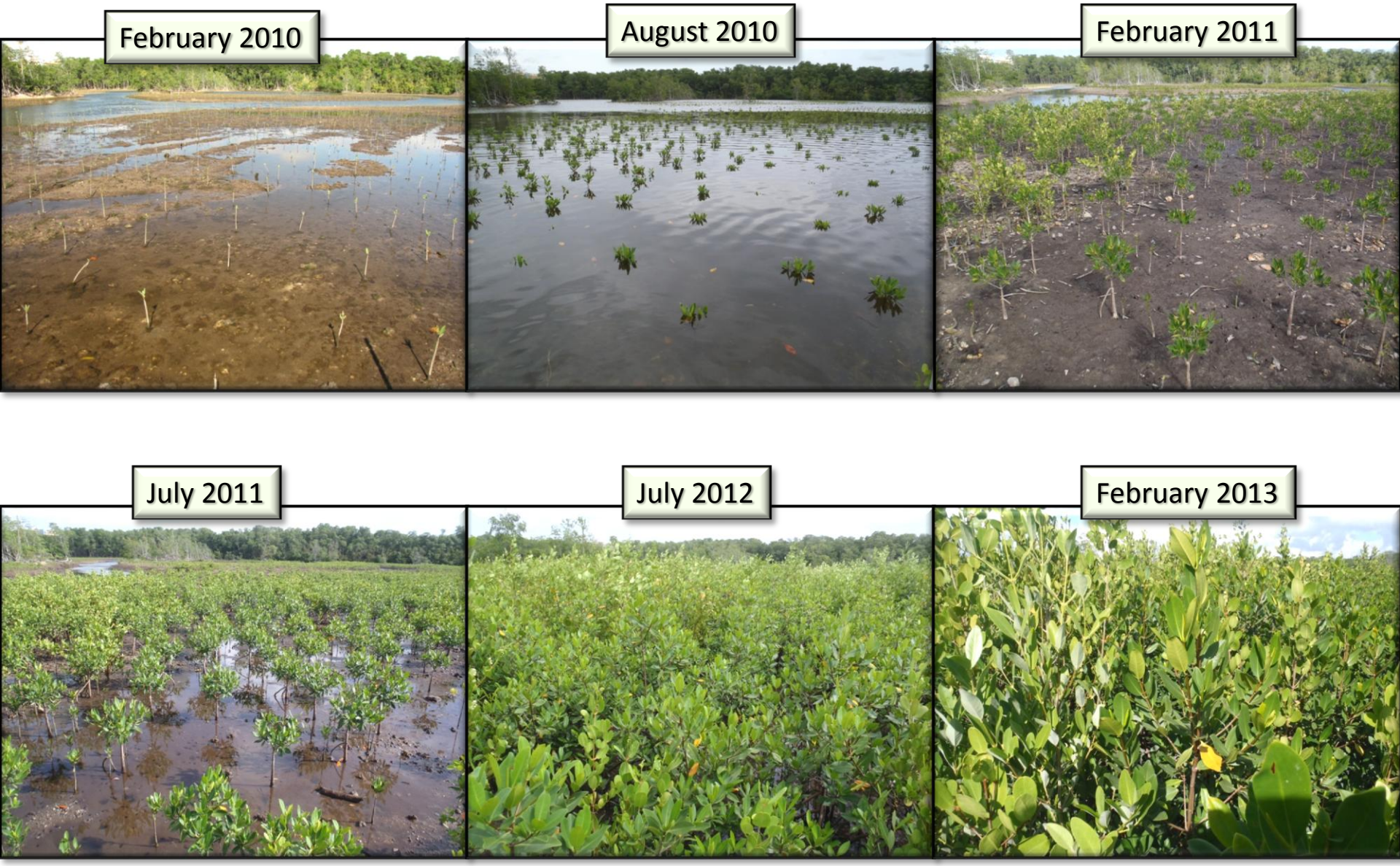
February 2013

Oleta River State Park Wetlands Restoration

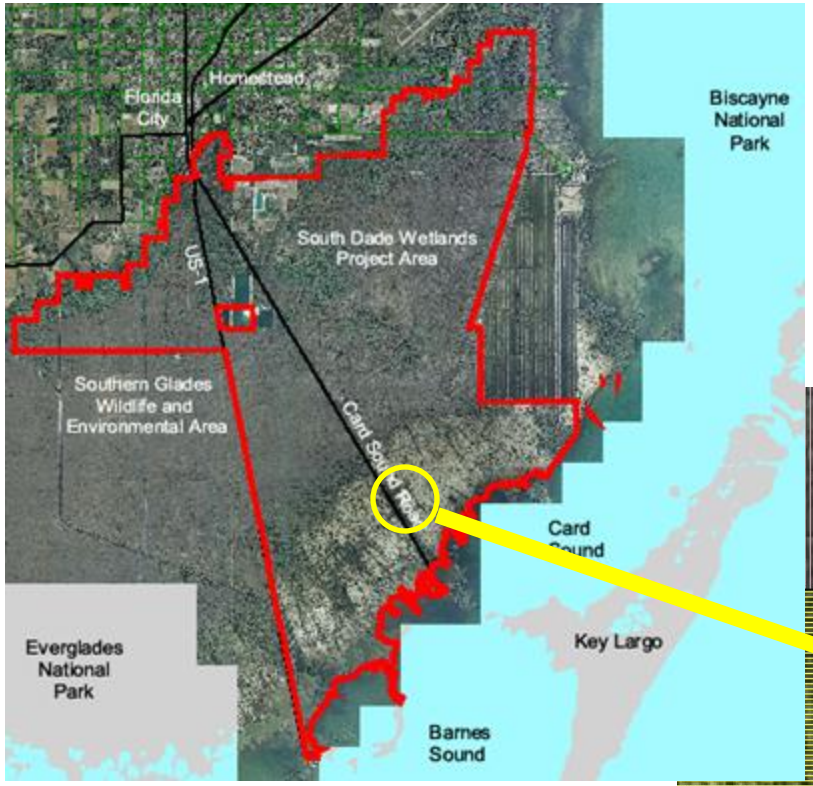

02/11/2013

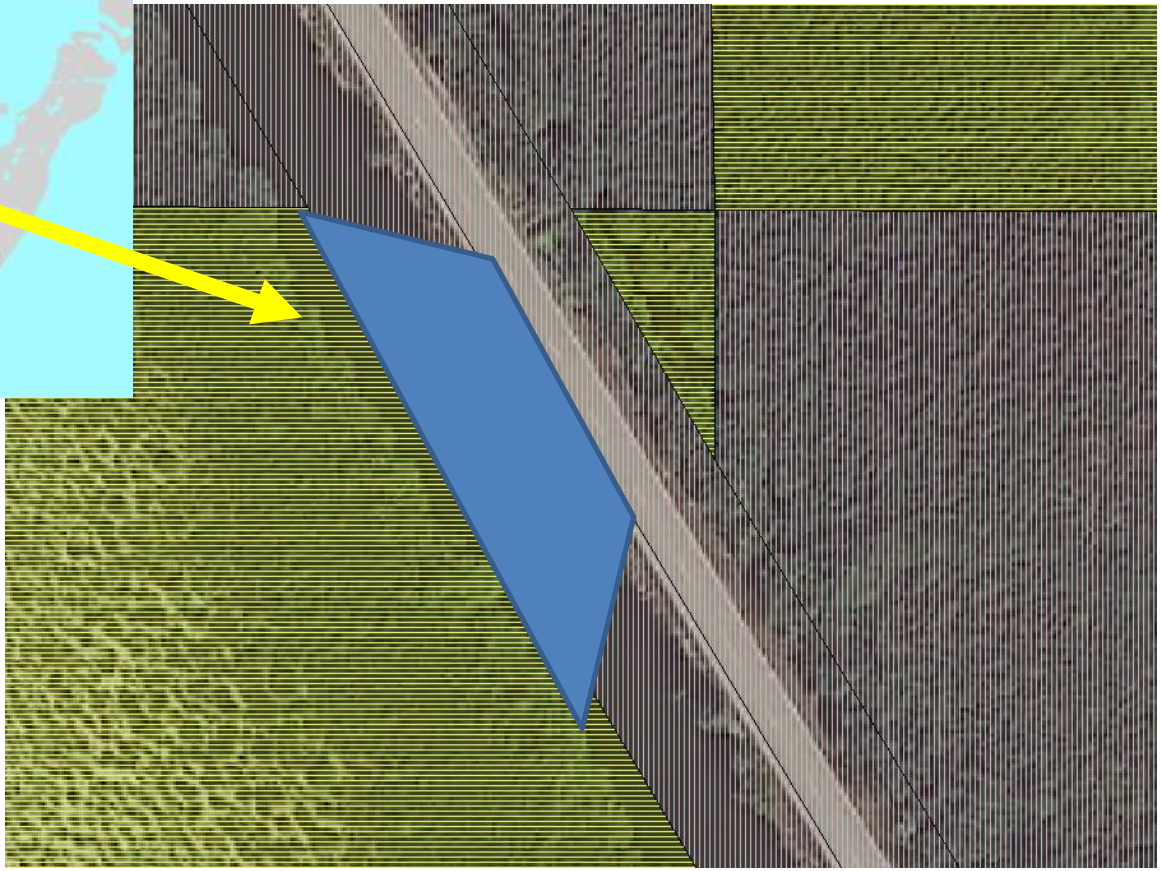

02/11/2013

Monitoring for Success



CARD SOUND BORROW
CANAL PLUG
PILOT PROJECT





CONSTRUCTED PILOT PROJECT
CARD SOUND ROAD BORROW CANAL PLUG

MANGROVES PLANTED WITHIN THE PLUG'S RESTORED WETLANDS

MIAMI-DADE COUNTY'S REGULATORY PROGRAMS THAT PROTECT COASTAL RESOURCES

Under Sec. 24-48.1 of the Code, Class I coastal construction permits are required to alter mangrove trees or for any work to take place in, on, over or upon any tidal waters or in salt wetlands anywhere in Miami-Dade County.

Sec 24-48.3(2) of the Code protects coastal wetlands through the dredge & fill criteria that will allow permitting only for minimal and necessary impacts to coastal wetlands.

Sec. 24-48.16 prohibits of top pruning of mangrove trees in a coastal band community, except for specified trimming activities exempt from permitting requirements pursuant to Section 403.9326, Florida Statutes. No Class I permit shall be issued for the top pruning of coastal band mangrove trees except when necessary for the protection of overhead power lines.

From the FL Dept of Environmental Protection website:
"… Mangrove forests protect uplands from storm winds, waves, and floods. A very narrow fringe of mangroves offers limited protection, while a wide fringe can considerably reduce wave and flood damage to landward areas by enabling overflowing water to be absorbed into the expanse of forest. Florida's estimated 469,000 acres of mangrove forests contribute to the overall health of the state's southern coastal zone. "

403.9323, Florida Statutes, Legislative intent.
(1) It is the intent of the Legislature to protect and preserve mangrove resources valuable to our environment and economy from unregulated removal, defoliation, and destruction.
(2) It is the intent of the Legislature that no trimming or alteration of mangroves may be permitted on uninhabited islands which are publicly owned or on lands set aside for conservation and preservation, or mitigation, except where necessary to protect the public health, safety, and welfare, or to enhance public use of, or access to, conservation areas in accordance with approved management plans.