

# A Partnership for Biscayne Bay

South Florida Water Management District Governing Board Workshop

December 9<sup>th</sup>, 2020



Lee N. Hefty, Director

Miami-Dade County Division of Environmental  
Resources Management (DERM)



# Miami Dade County Division of Environmental Resources Management (DERM)

Local environmental regulatory agency charged with regulating activities which may cause pollution or contamination of air, water, soil, and property throughout Miami-Dade County, for the protection and preservation of public health, safety and welfare

## Water Resources Protection:

- Environmental Regulation

- Natural Resources Monitoring

- Water Management and Flood Control

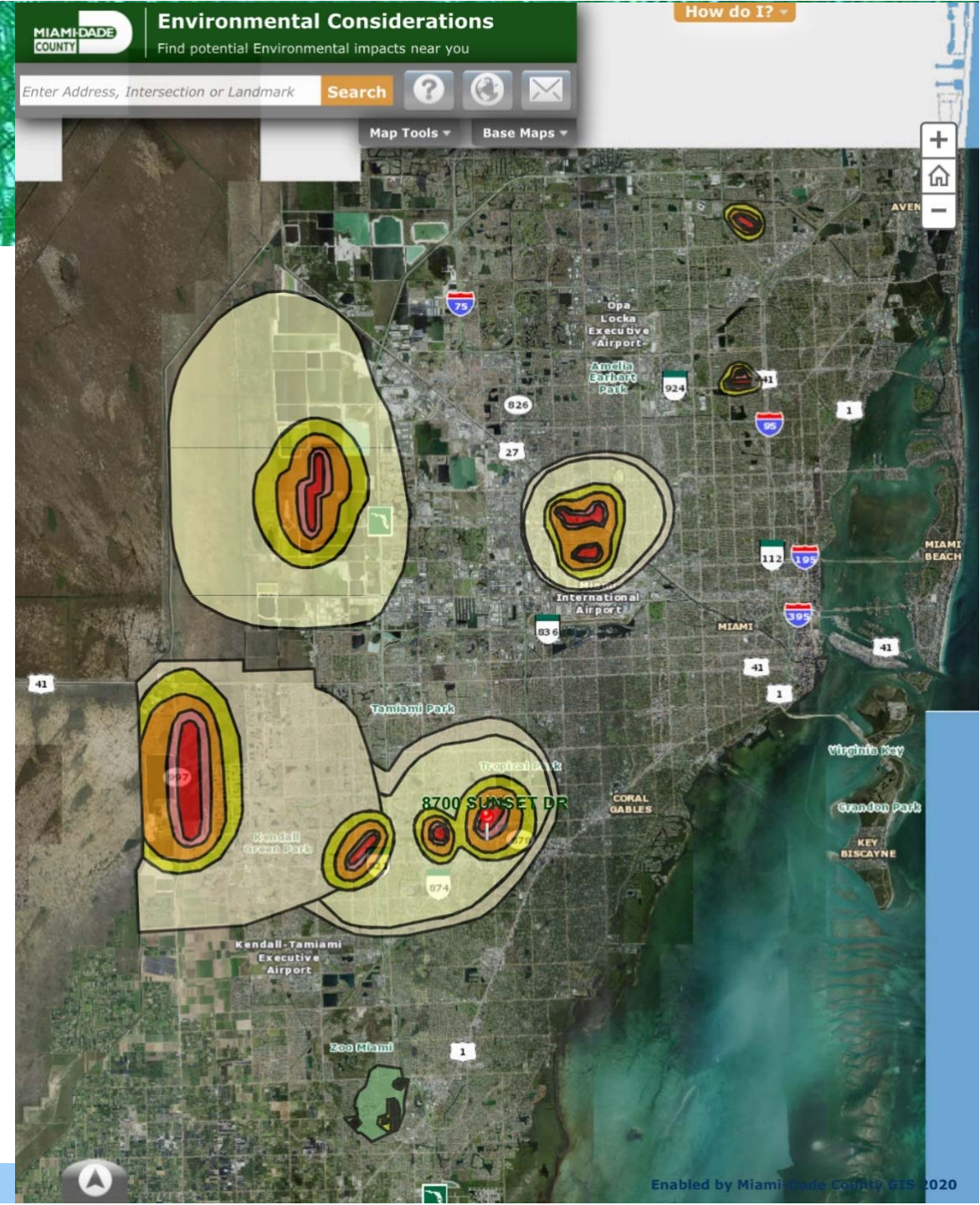
- Conservation and Restoration



# Groundwater Quality Monitoring Program

“we live and work over the water we drink”

- 135 GW monitoring wells in draw-down areas of major wellfields
- 47 ambient GW monitoring wells throughout the County





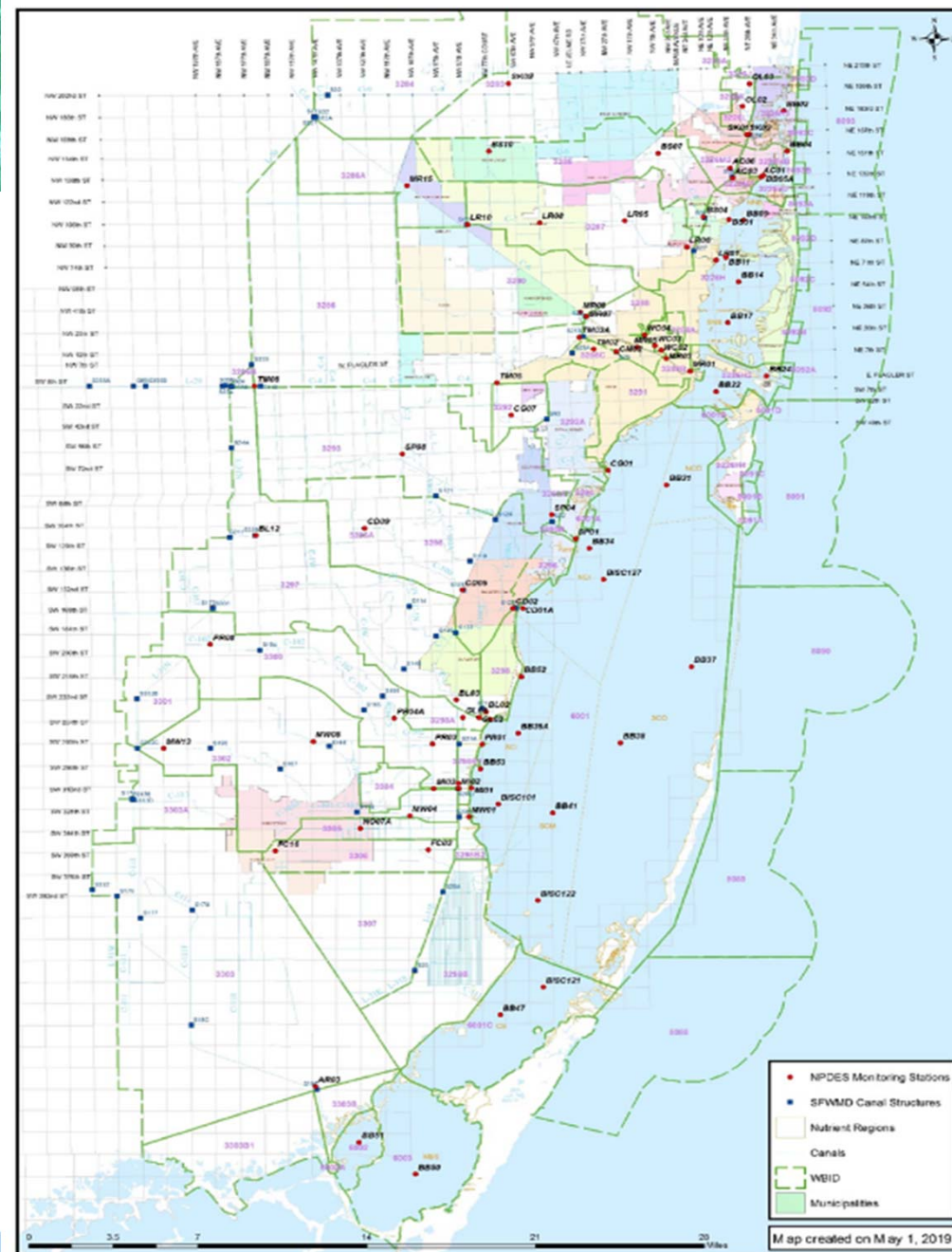
# Surface Water Quality Monitoring Program



Monthly surface water quality samples collected at more than 100 stations throughout the County and in Biscayne Bay for the past 40 years



Miami-Dade County  
Surface Water Quality Monitoring Stations  
and FDEP Established WBIDs



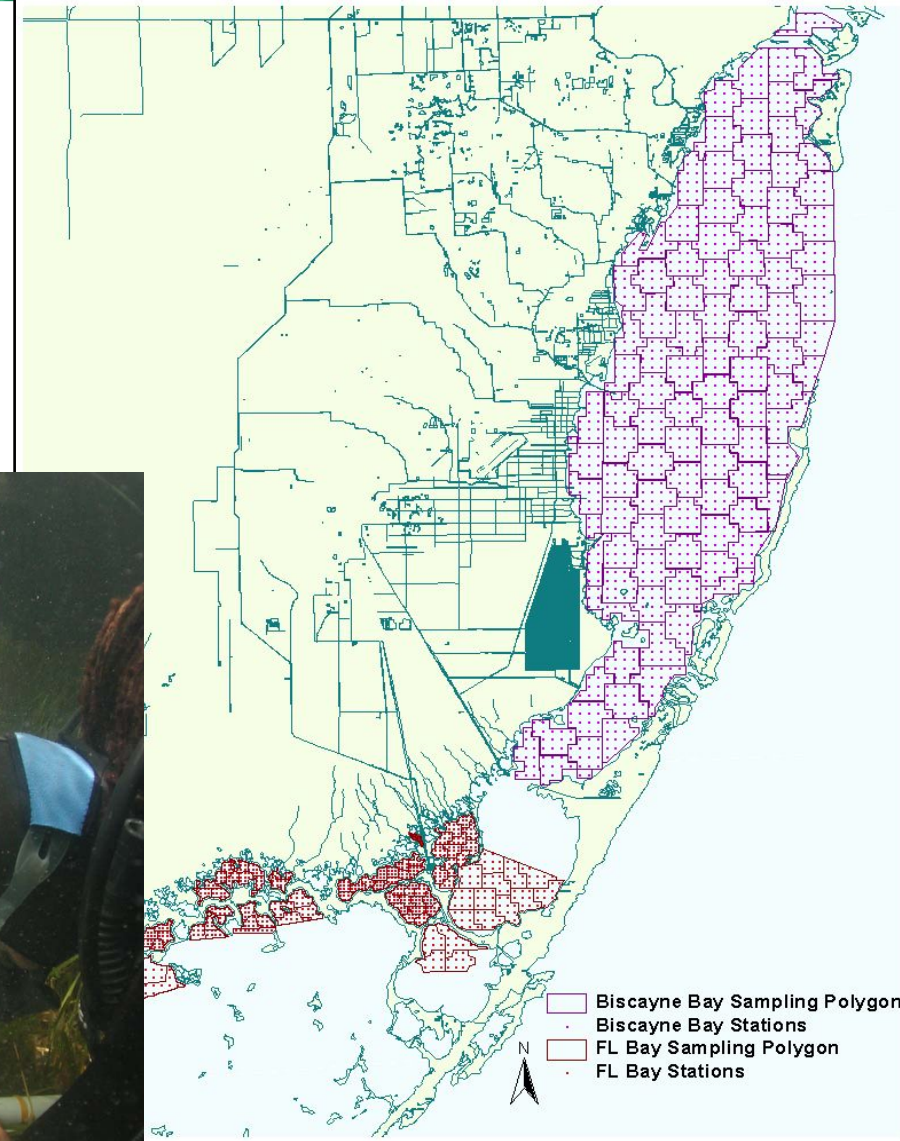
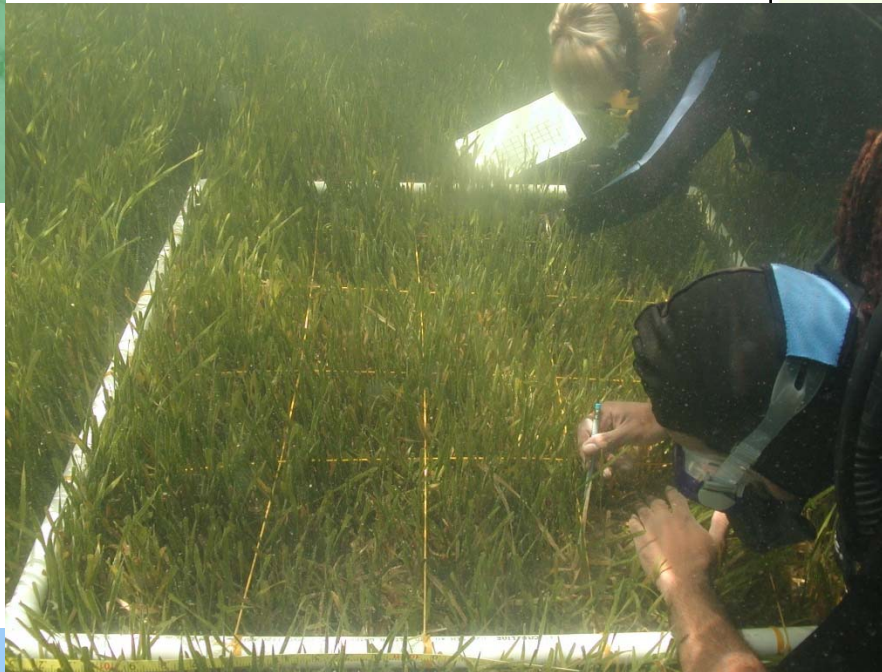


# Submerged Aquatic Vegetation Monitoring



## Annual Bay Bottom Monitoring

- 101 random sites (polygons)
- 11 fixed sites





# Miami-Dade County Managed Stormwater Infrastructure

## Manage and Operate the Secondary Canal System

- **Conveyance**

- approximately 200 miles of canals
- 5 canal control structures
- over 2,200 outfalls

- **Drainage**

- 18 pump stations
- over 300 miles of drainage piping, over 400 pollution control structures
- over 50,000 catch basins

- **Detention**

- 90 lakes
- 3100 miles of swales



Before

After



# Biscayne Bay Restoration and Enhancement Program

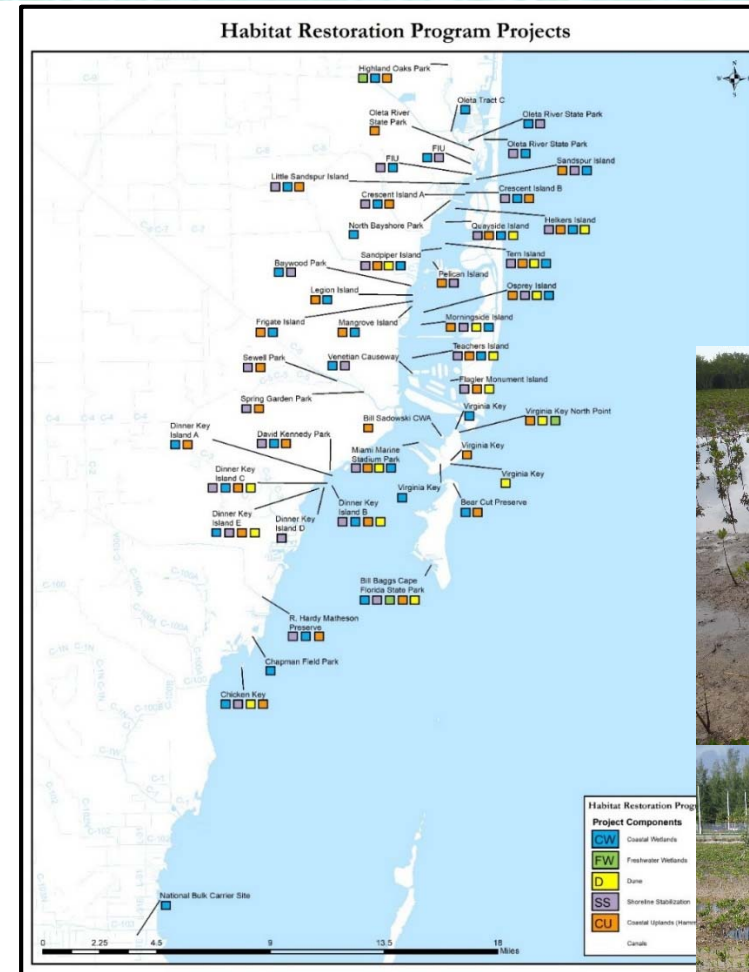


## Habitat Restoration (50 Sites Restored)

- 500 Acres of Wetlands
- 150 Acres of Subtropical Hardwood Hammock, Coastal Strand, and Dune Community
- 23 Island Enhancement Projects
- 2.6 Acres of Seagrass
- 8.5 Miles of Shoreline Stabilization (native vegetation and limestone boulder placements)

Funding: \$36 Million

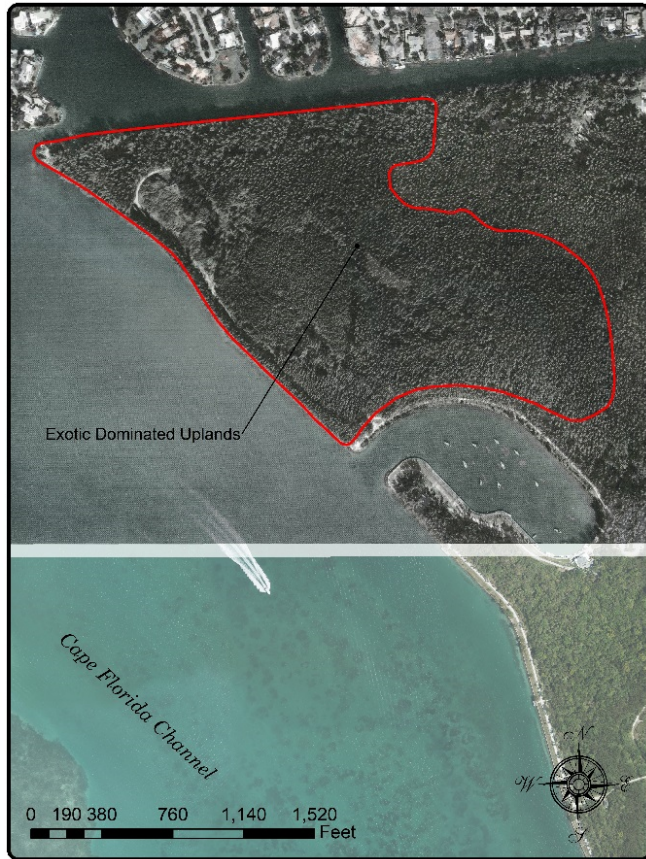
Partners: NOAA, FIND, SFWMD, FDEP, FWCC, USDA, Local Municipalities





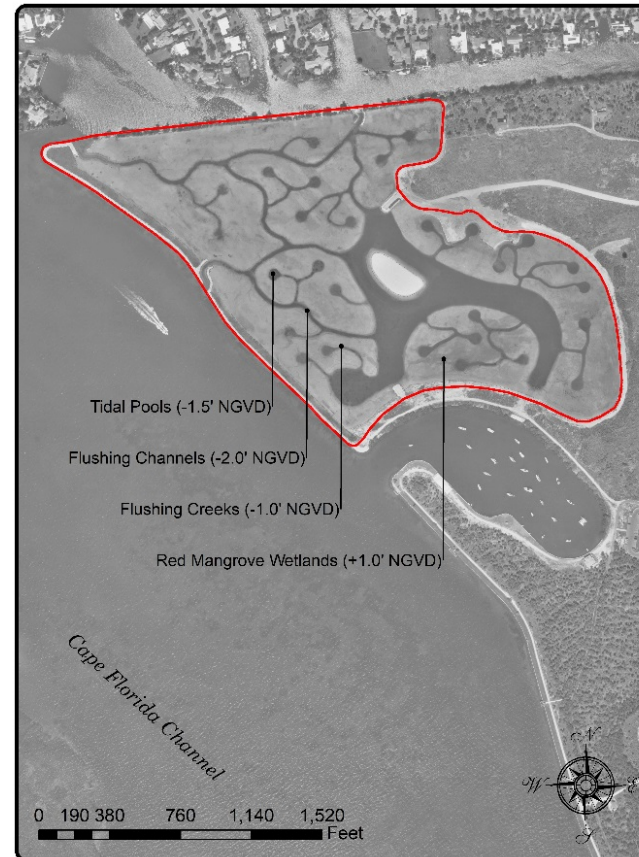
# Bill Baggs Cape Florida State Park Wetlands Restoration

1990

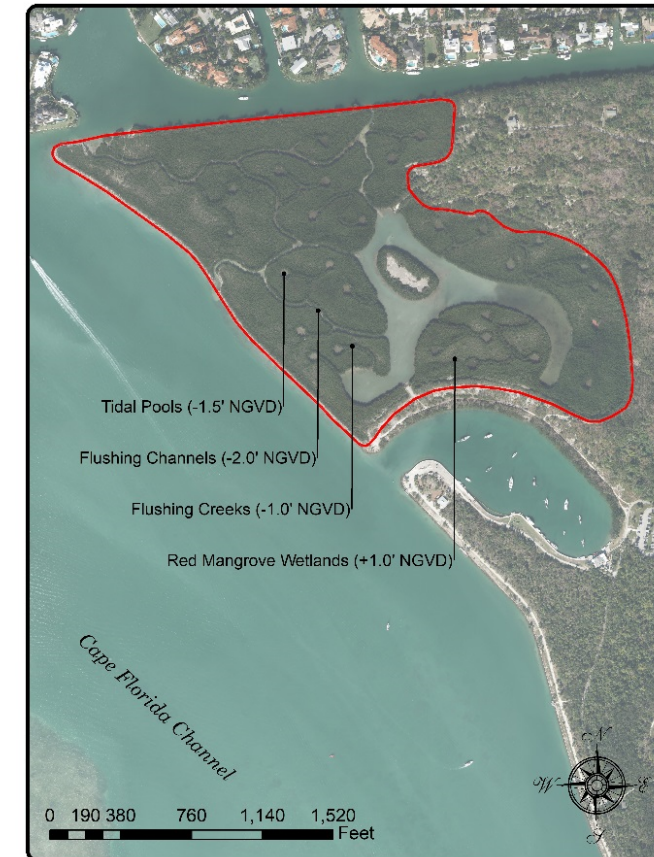


- Cleared exotic vegetation
- Removed 30,000 CY solid waste
- Removed 600,000 CY dredge spoil material
- Created 75 acres of tidally connected mangrove wetlands
- Restored 10 acres of freshwater wetlands

1999

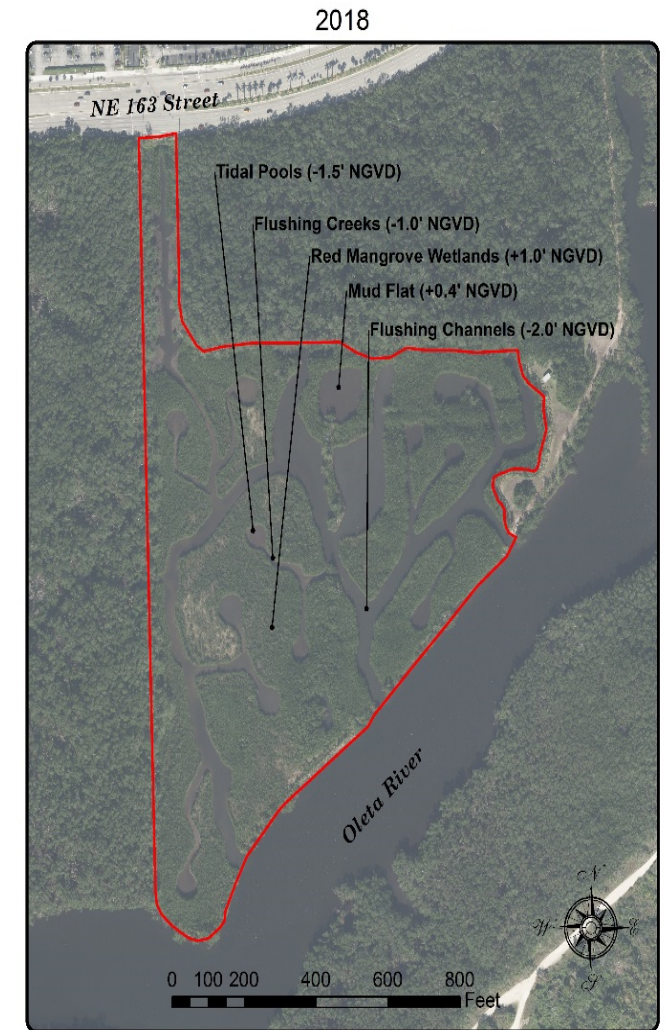
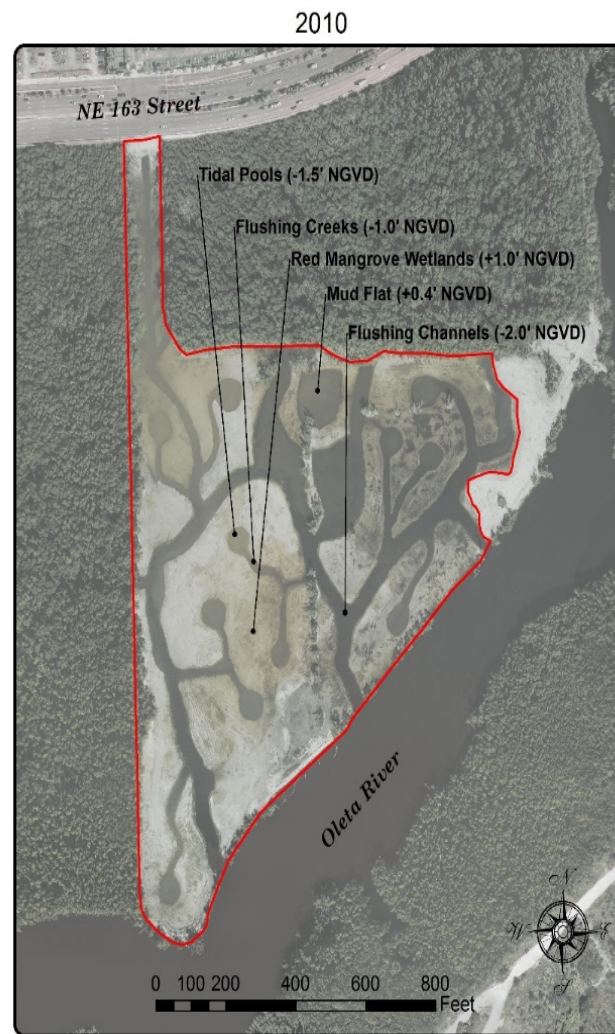


2018



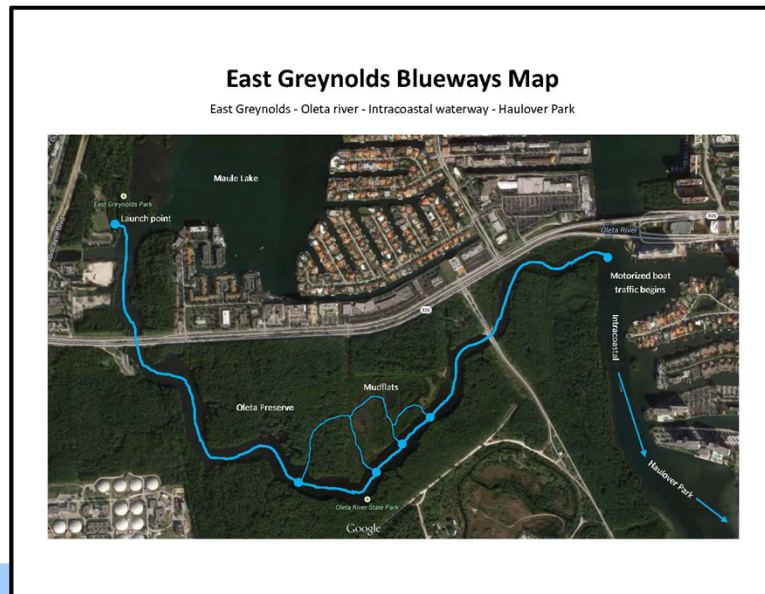


# Oleta River State Park Wetlands Restoration





# Oleta River State Park Wetlands Restoration





# Biscayne Bay Island Restoration and Enhancement Projects

## 23 Bay Spoil Islands Enhanced

- Stabilization of eroding shorelines
- Removal of exotic vegetation and excess fill
- Creation of flushing channels
- Planting of mangroves and salt/drought-tolerant uplands vegetation
- Enhanced recreational opportunities for the boating community

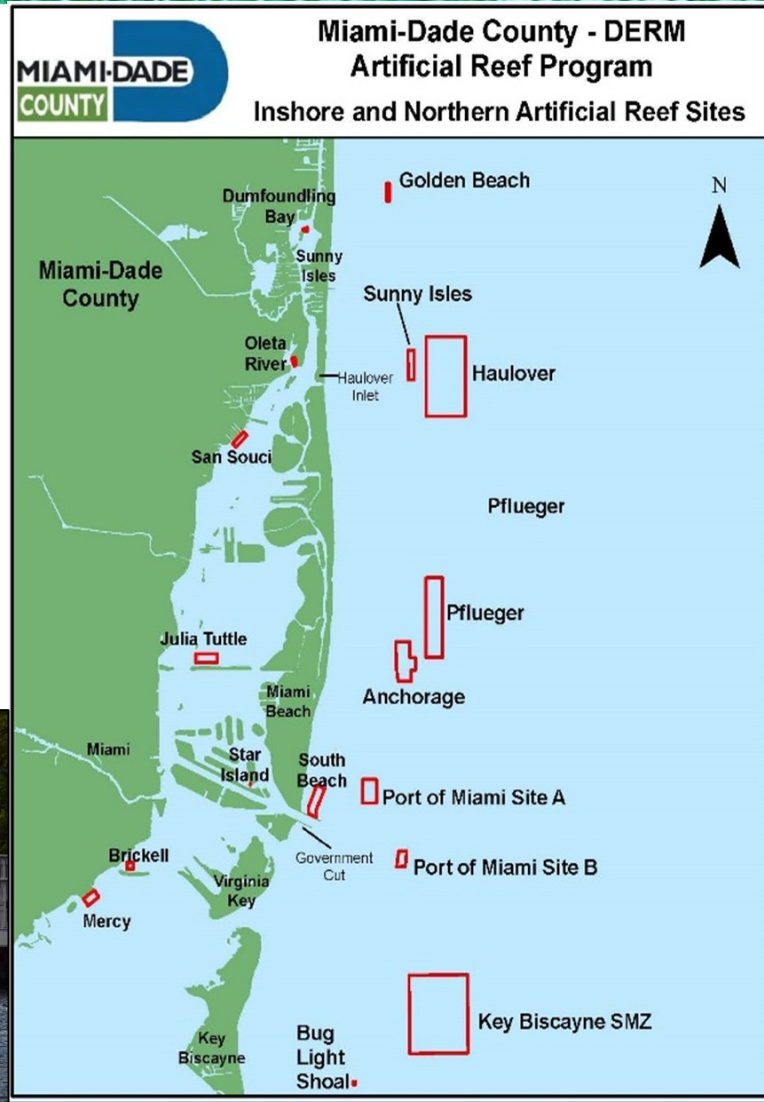




# Miami-Dade County Artificial Reef Program



- Provides habitat structure in Biscayne Bay and offshore areas
- Enhanced fishing and diving opportunities





# Environmentally Endangered Lands Program



## Land, lots of land!

### Acquisition and Management To Date

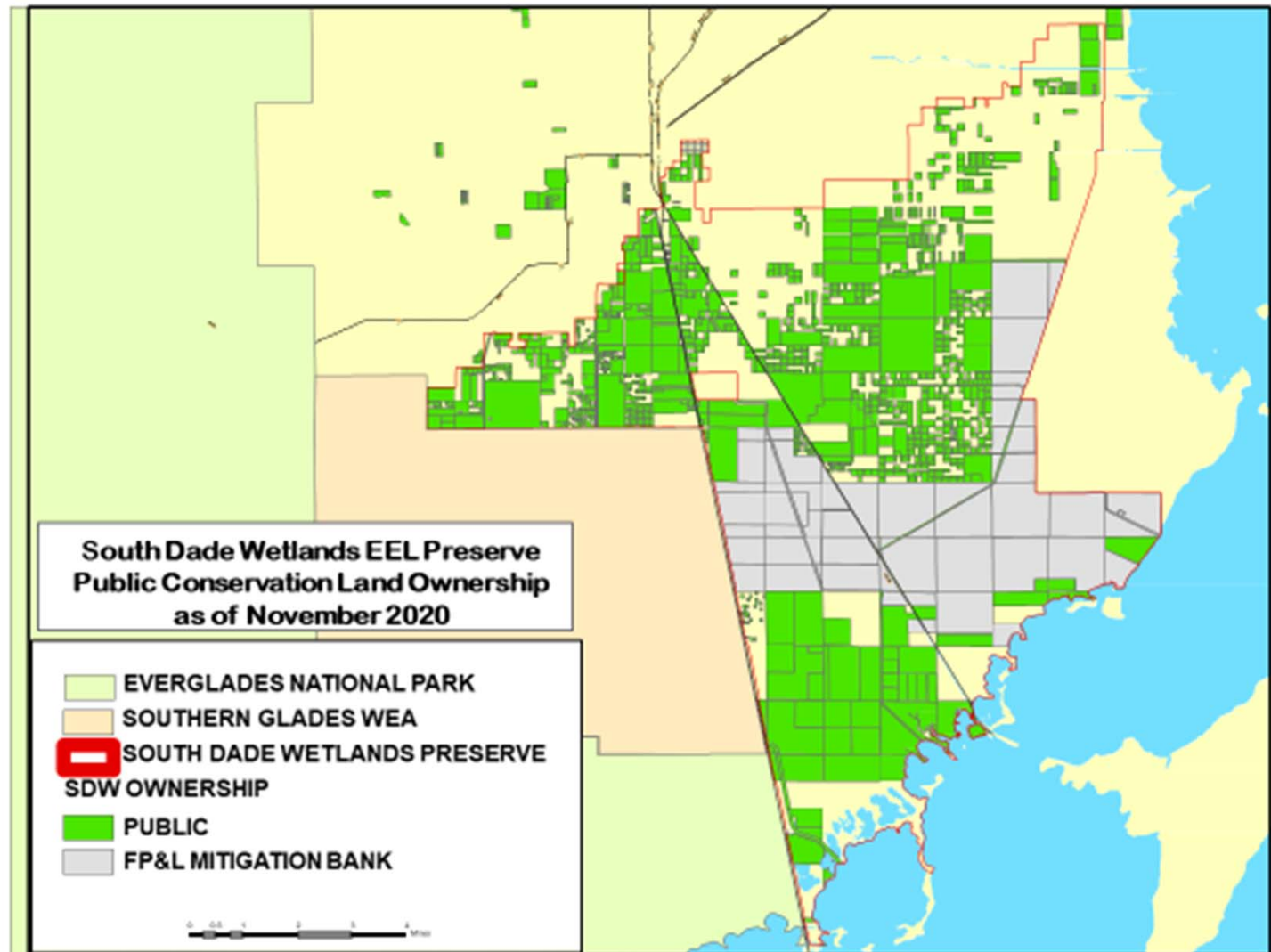


- The EEL Program, in partnership with the South Florida Water Management District, the State of Florida, and other funding partners, has acquired approximately **23,493** acres of land in Miami-Dade County since inception of the EEL Program through November 30, 2020.
- As of November 2020, the EEL Program manages over **27,000** acres
  - 24,719 acres of Coastal & Freshwater Wetlands
  - 1632 acres of Pine Rockland
  - 653 acres of Hardwood Hammock
  - 20 acres of Scrub





# EEL Program South Dade Wetlands Project





# DERM Collaboration with the South Florida Water Management District

- **Water Management and Flood Control**

- County operation of the secondary canal system
- Responding to flooding complaints
- Pre-storm drawdown operations

- **Support CERP Programs**

- Staff CERP Project Delivery Teams
- Certification of lands for CERP
- Funding support for BBCW Cutler Wetlands Flow Way design update
- BBCW pump station at Deering Estate constructed in advance of CERP via the District's Expedite program on lands purchased by the County

- **Conservation Land Management**

- Jointly manage County and District owned wetlands in south Dade via an M.O.U.
- Partnership to allow backfilling a portion of the Card Sound Road canal to restore Everglades wetlands on County and District lands

- **Water Resources Protection**

- Collaboration on water quality monitoring
- Ecosystem restoration projects





# What's wrong with Biscayne Bay?

- Seagrass losses
- Algae blooms
- Evidence of nutrient loading
- Increasing Chlorophyll concentrations
- Recent fish kill in northern Biscayne Bay August 2020



# Little River Julia Tuttle Basin Water Quality Summer 2020

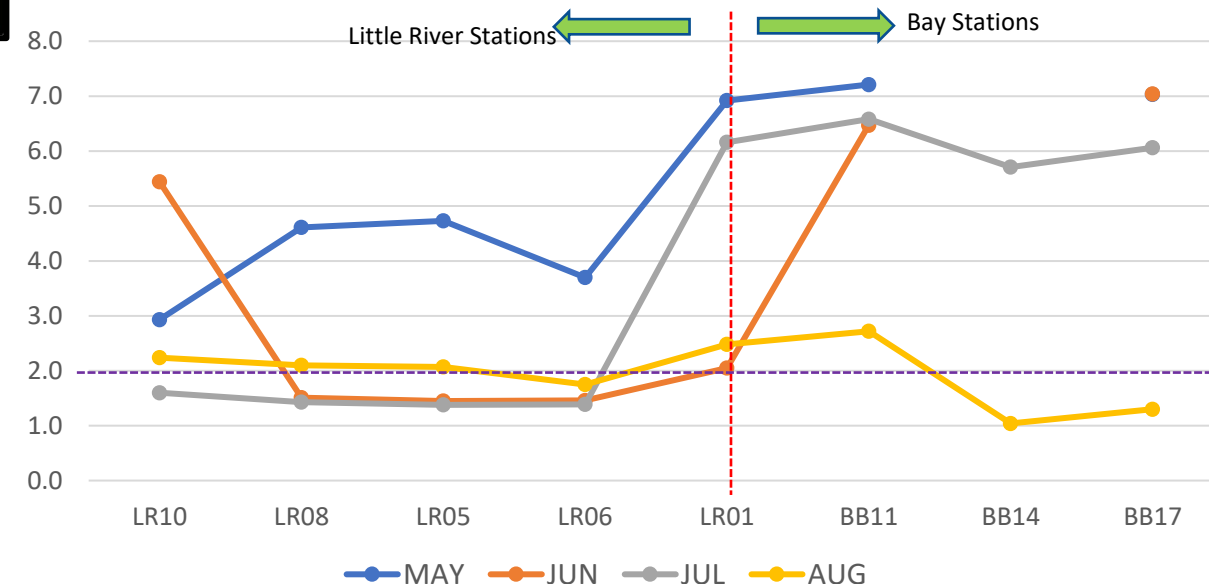


- Water low in dissolved oxygen (DO) conveyed from Little River to the Bay
- 2.0 mg/L DO is considered hypoxic, or devoid of oxygen
- August DO in the Little River and Bay were near, at, or below levels considered hypoxic
- DO at LR01 in July is likely higher as sampling occurred at high tide where river mixes with bay
- Note: May = represents dry season conditions

\* May and June sampling events were reduced due to COVID19

## Dissolved Oxygen

DO (mg/L) Little River & Bay (May-Aug 2020)





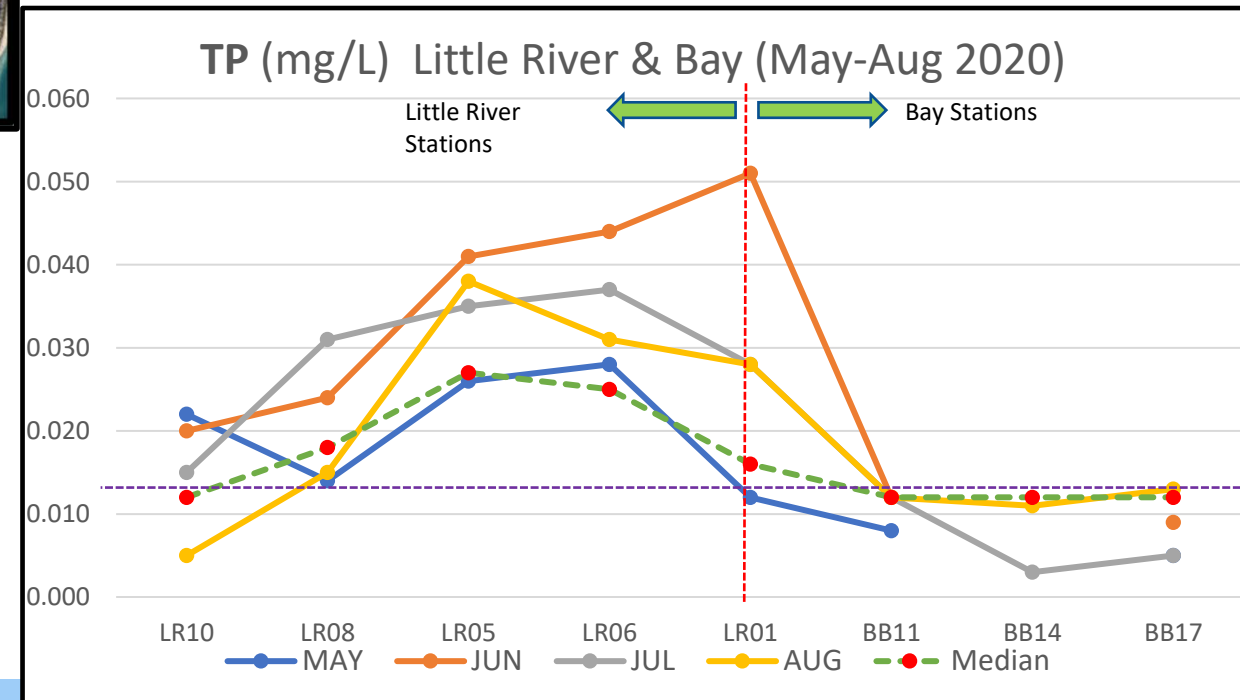
# Little River Julia Tuttle Basin Water Quality Summer 2020



## Total Phosphorus

- Nutrient-laden water conveyed from Little River to the Bay.
- 0.012 mg/L = DEP Numeric Nutrient Criteria for this region
- TP ranges between 2x – 4x criteria at the point Little Rivers reaches the Bay
- Median represents wet season data over last 10 years
- June sampling (6/1/20) immediately followed 1) May rains (5/26-5/28) & opening of structure for wet season capturing highest TP June-August

\* May and June sampling events were reduced due to COVID19





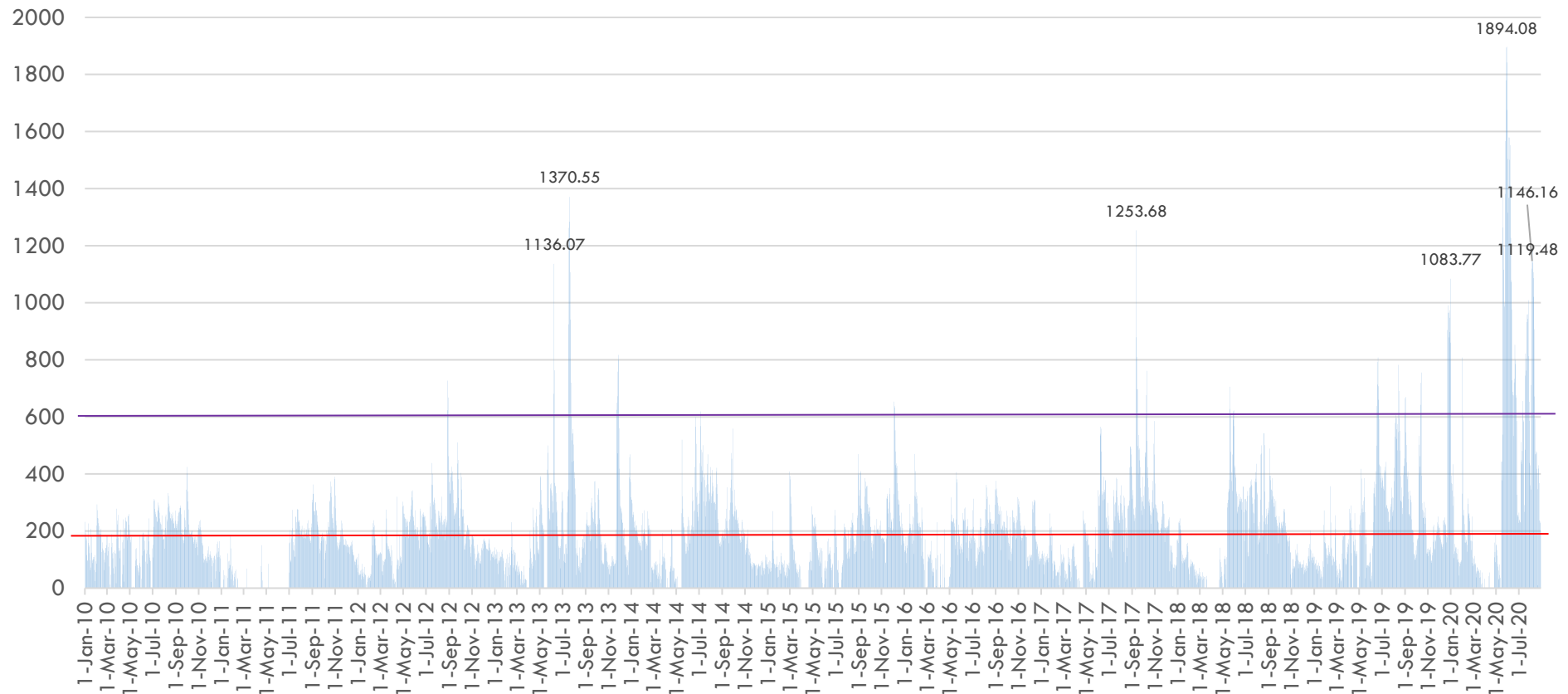
# Little River Flow Data (Structure S-27)

S-27 Avg. Daily Flow (in CFS)

1 Jan 2010 - 28 Aug 2020

Mean flow: 194.88

Note frequency with which Avg. Daily Flow tops 600 CFS (3x the 10 yr Avg Daily Flow) since 2019





# What Led to the August 2020 Fish Kill?

Review of water quality data and canal flow data suggest a convergence of circumstances that likely led to the fish kill event

- Unusually high flows of freshwater from the Little River at S-27 over preceding weeks and months
- Poor water quality in stormwater discharges from a highly urbanized watershed that was low in dissolved oxygen and high in nutrients
- Warm ambient air and water temperatures likely exacerbated the low DO water conditions

Event Date	Days	Flows	Winds	Air Temp	Water Temp	DO surface	Nutrients
19 May -12 Jun	25	2000-2500 cfs	5-10 m/s	<30 °C (25-28)	27-30 °C	2-7 mg/L	Highest
4 -11 Aug (Fish kill)	8	1800-2000 cfs	< 3.5 m/s	>30 °C	29-33 °C	0.2-3 mg/L	High
12-15 Nov	4	>6000 cfs	~ 5 m/s	<30 °C (25-28)	26-27 °C	7-9 mg/L (FIU Buoy)	Unknown





# What is the Bay telling us?

**Despite existing regulations and ongoing restoration efforts, declining water quality trends and recent ecological events indicate that more is needed to protect and preserve Biscayne Bay**





# Biscayne Bay Task Force Recommendations

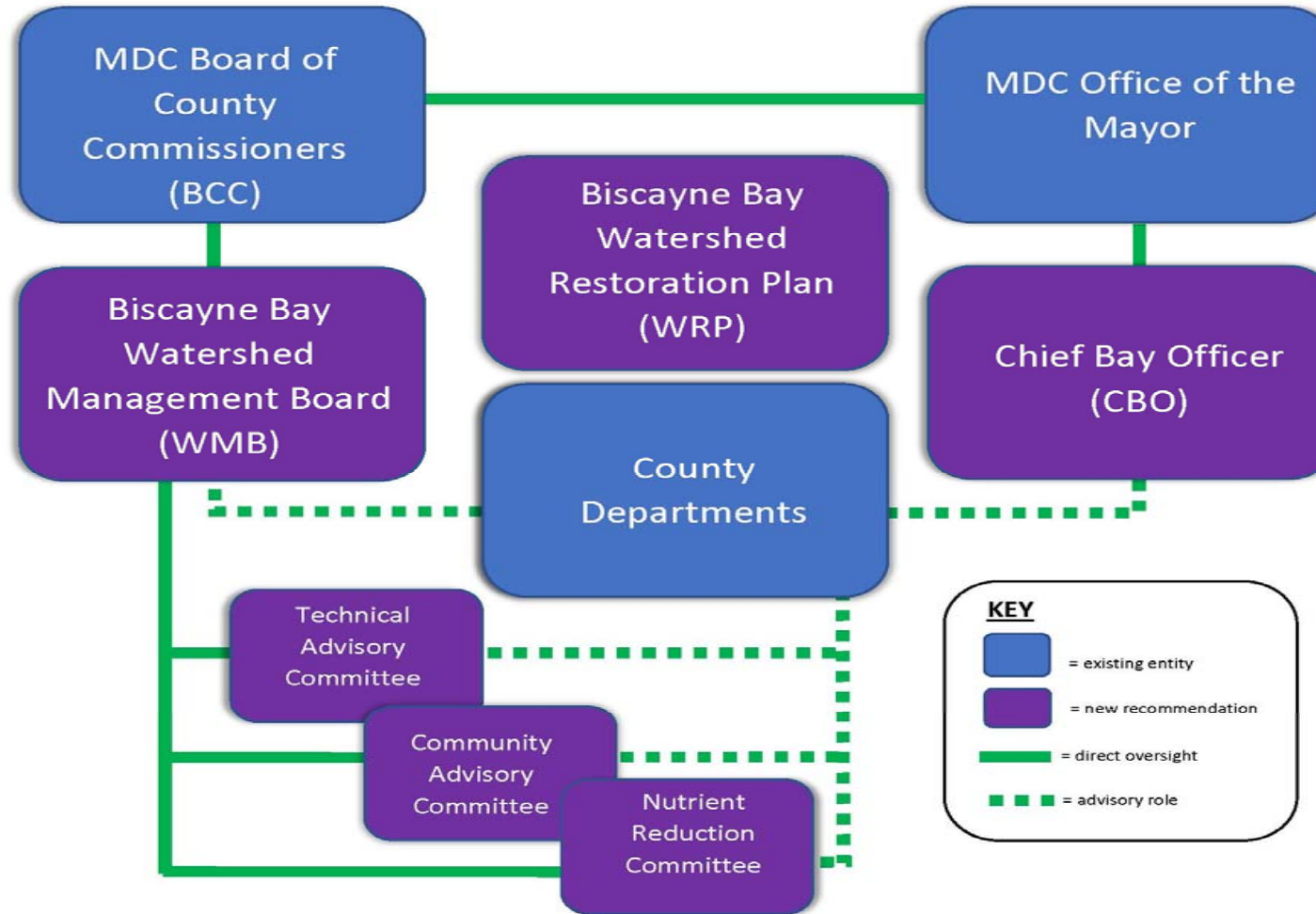
Established by the Miami-Dade Board of County Commissioners in February 2019 by Resolution No. R-165-19.

## Overarching Recommendations

- Establish an intergovernmental body called the Biscayne Bay Watershed Management Board (WMB)
- Establish a Chief Bay Officer (CBO) position in the Office of the Mayor
- Develop a Watershed Restoration Plan and implement recommendations in the Task Force Report



# Biscayne Bay Task Force Recommendations





# Biscayne Bay Task Force Recommendations

## BBTF Recommendation:

**2A. Establish by ordinance or other comparable process that establishes the Biscayne Bay Watershed Management Board (WMB) as a permanent organization.** The Task Force recommends the selection and invitation of participants with diverse backgrounds to the WMB and its committees. It is recommended that the WMB shall be comprised of a total of (11) members as follows:

- (3) members of the Board of County Commissioners (BCC);
- (3) designees of the Miami-Dade County League of Cities;
- South Florida Water Management District Governing Board (member who resides in Miami-Dade County);
- Florida Department of Environmental Protection;
- U.S. Department of Interior;
- Florida Fish and Wildlife Conservation Commission; and
- Florida Inland Navigational District.

Members will have experience with issues related to Biscayne Bay and are expected to leverage the professional and financial resources of their respective organizations to achieve goals of the Watershed Restoration Plan.



# Biscayne Bay Task Force Recommendations

62 specific recommendations under seven broader policy themes.

1. Water Quality
2. Governance
3. Infrastructure
4. Watershed Habitat Restoration and Natural Habitat
5. Marine Debris
6. Education and Outreach
7. Funding



# Biscayne Bay Task Force Recommendations

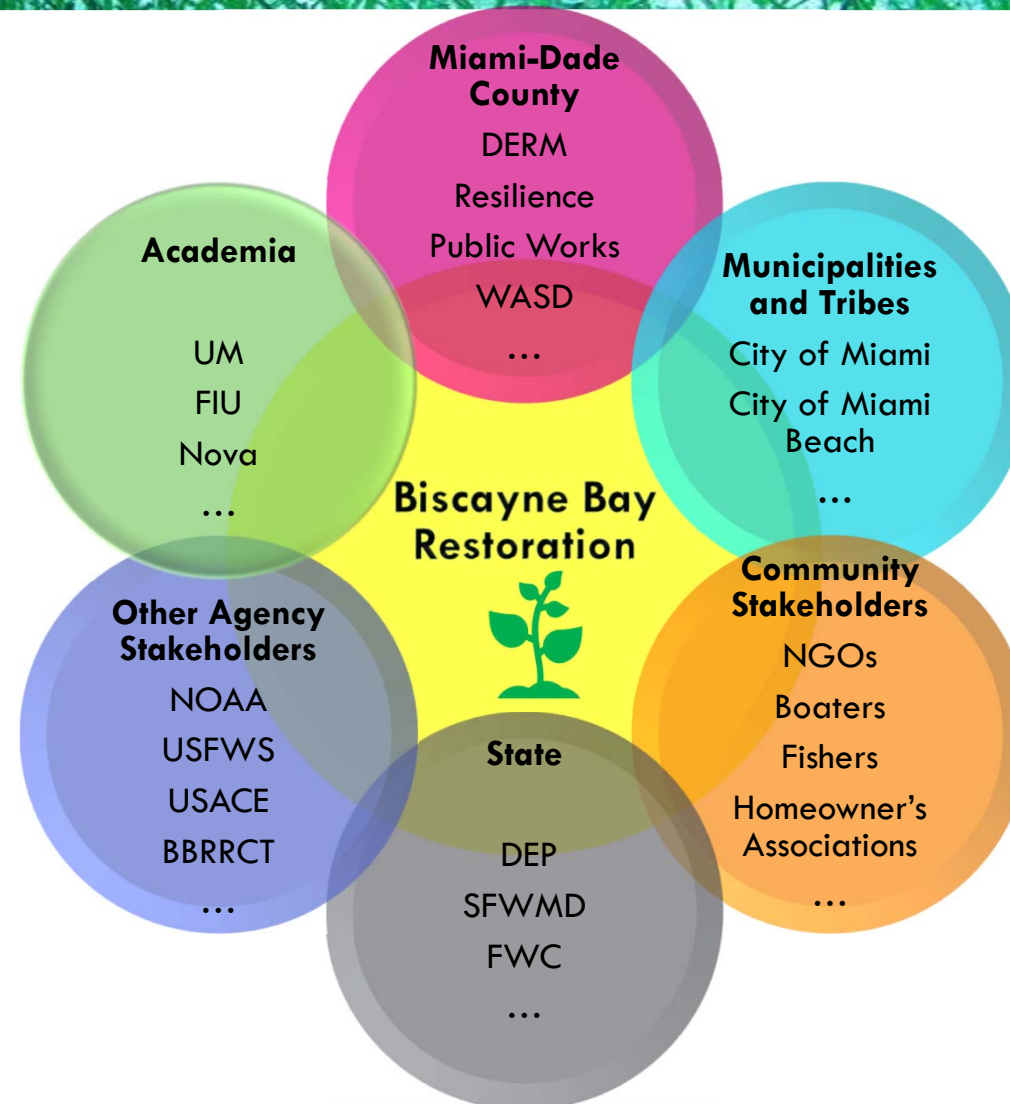
## BBTF Recommendation:

**2D. Develop a formal partnership in the form of a Memorandum of Understanding (MOU) with the SFWMD to create an internal staff working group in addition to their participation on the WMB.** The CBO will lead this effort. The group will work collaboratively to implement the WRP and manage and fund activities to meet pollutant load reduction goals; determine redundancies and data gaps; focus on canals that show high nutrient loads, and trash pollution and study pollutant loads originating outside the watershed, including agricultural sources; develop BMPs and Outstanding Waters standards and regulations, and enhance adaptation efforts to improve the resilience of the regional water management system to manage saltwater intrusion.



# Next Steps...

- Establish restoration goals
- Develop and/or refine science-based water quality targets with restoration goals in mind
- Develop and/or refine policy and regulatory requirements
- Expand stakeholder understanding, buy-in, and involvement
- Public and private partners working collaboratively, taking action, and committed to results







Thank You!