



Turkey Point Monitoring Plan

**South Dade Water Issues Meeting
October 4, 2010**

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History

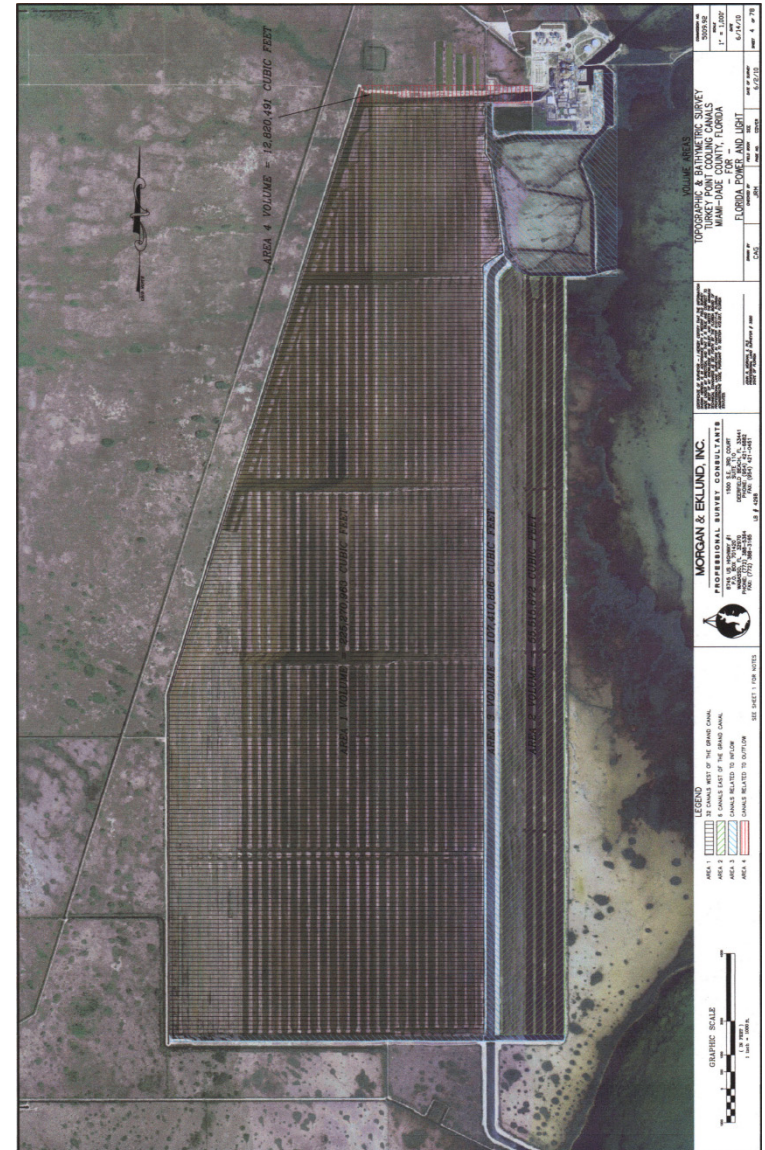
- In the early 70's, the cooling canal system (CCS) was constructed as a result of an agreement between multiple agencies and a Final Order was issued by a federal court
- In 2009, the Monitoring Plan was developed by FPL and a multi-agency team to determine the vertical and horizontal effects and extent of the CCS
- In 2009, the 5th Supplemental Agreement replaced the 1983 4th Supplemental Agreement between FPL and the South Florida Water Management District (SFWMD)
 - Interceptor ditch operation
 - Monitoring Plan

Status of the Monitoring Plan

- **Bathymetric Survey / Volumetric Calculation**
- **Groundwater monitoring wells stations**
- **Surface water stations**
- **Porewater sampling**
- **Quarterly sampling**
- **Ecological monitoring**
- **Water Budget**
 - Meteorological station and rain collectors

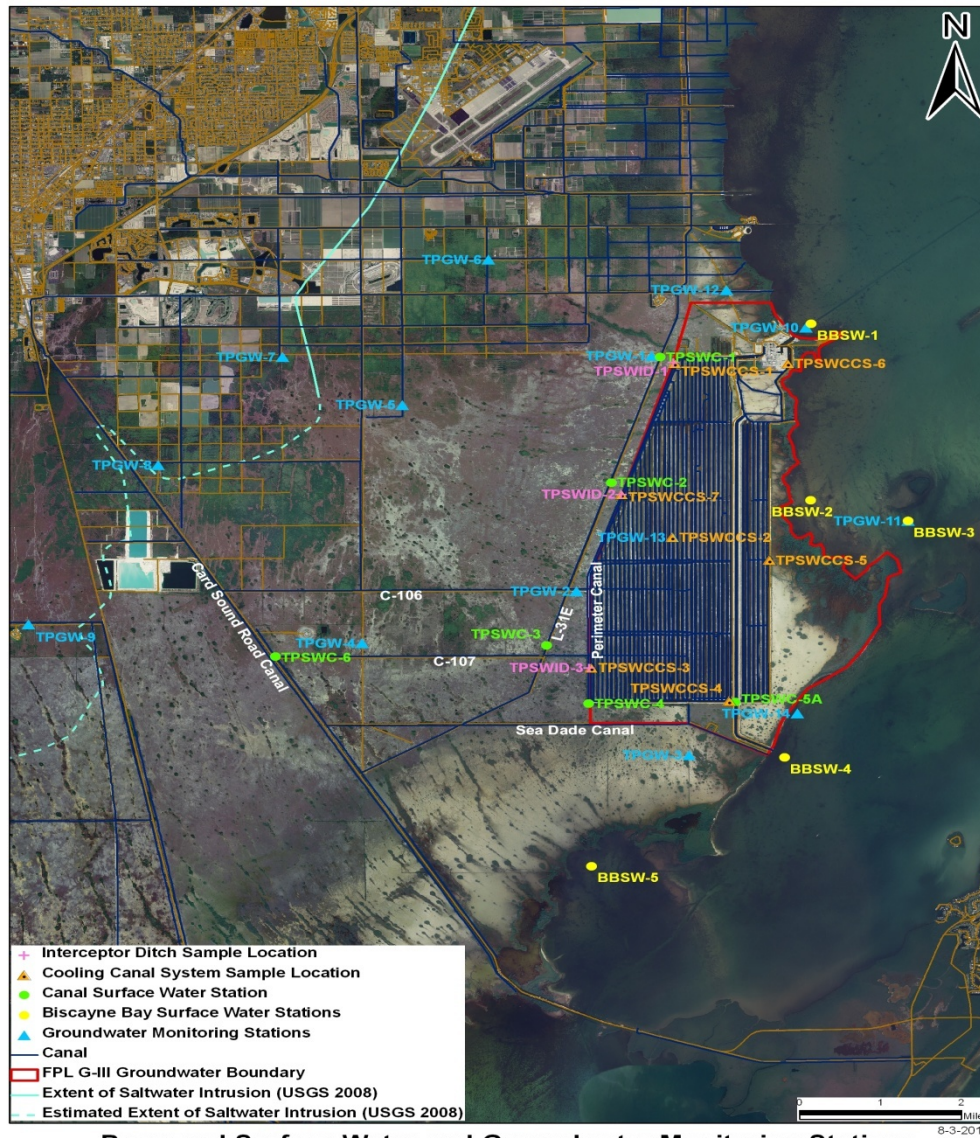
Bathymetric Survey

- **Began January 2010 – Completed June 2010**
 - A bathymetric/volumetric survey of the CCS (over 168 miles of canals) and each segment of the interceptor ditch (ID) (total ID length of approximately 5.5 miles)
 - 38 north-south longitudinal canals and the Grand Canal
 - The positioning (x, y, and z) used Real-Time Kinematic GPS survey grade equipment
 - Transects at a minimum of every 1000 ft
- **Calculate Volume**



Real – Time and Water Quality Sample Stations

- **Total of 75 sample locations**
 - 42 Total - 14 Well Clusters (3 per cluster) – TPGW
 - 10 Total - 7 Cooling Canal System (CCS) stations – TPSWCCS
 - 12 Total - 6 Surface Water stations – TPSWC
 - 5 Biscayne Bay stations – BBSW
 - 6 Total - 3 Interceptor Ditch stations – TPSWID
 - > 12,000 data points collected daily
- **Continuous Monitoring Equipment**
 - Temperature
 - Specific Conductance
 - Stage



Proposed Surface Water and Groundwater Monitoring Stations

Monitoring Plan Sample Locations

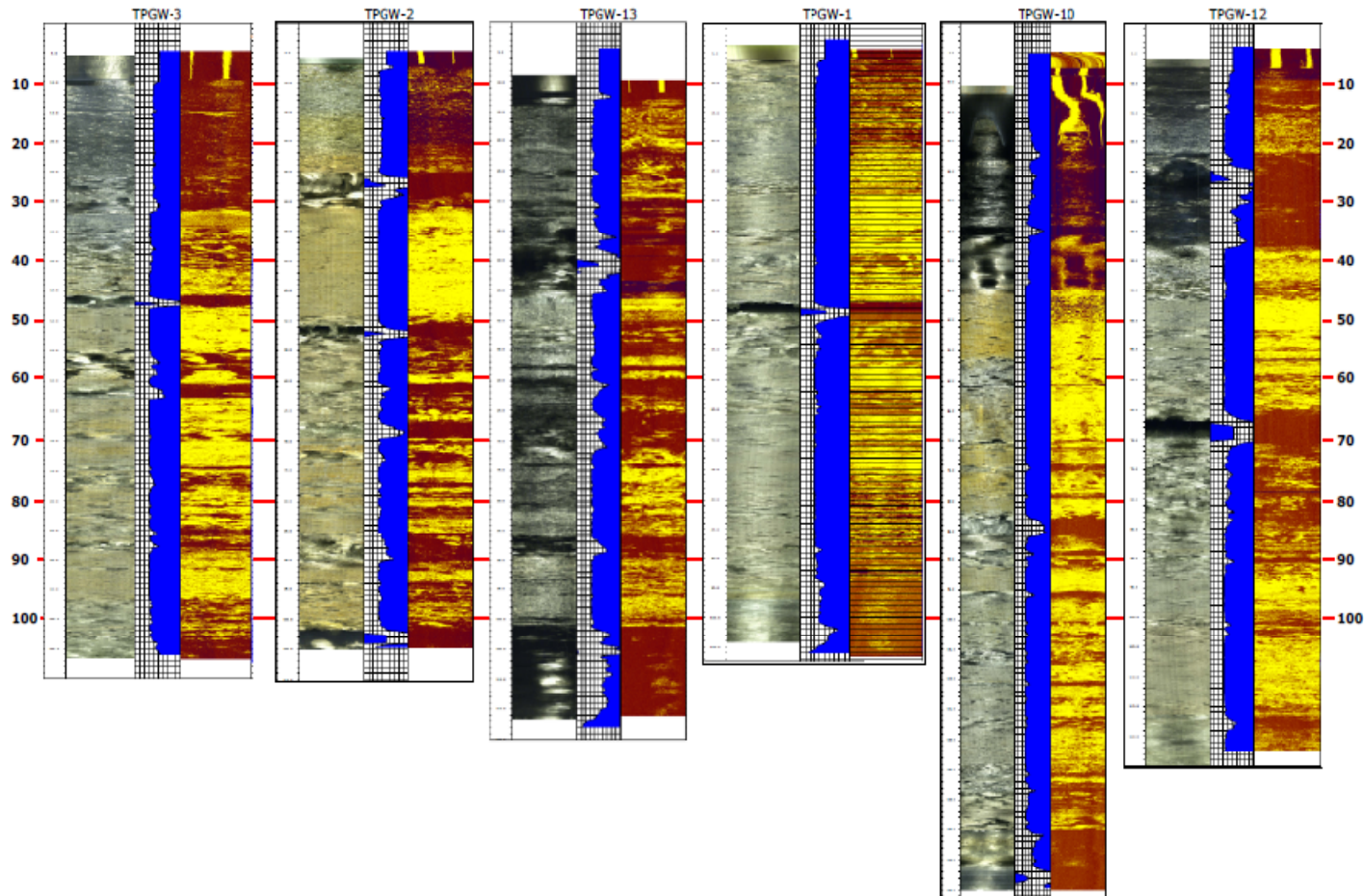
Well Installation

- Began Permitting process in January 2010
- Began installation on February 2, 2010
- Completed installation on July 2, 2010



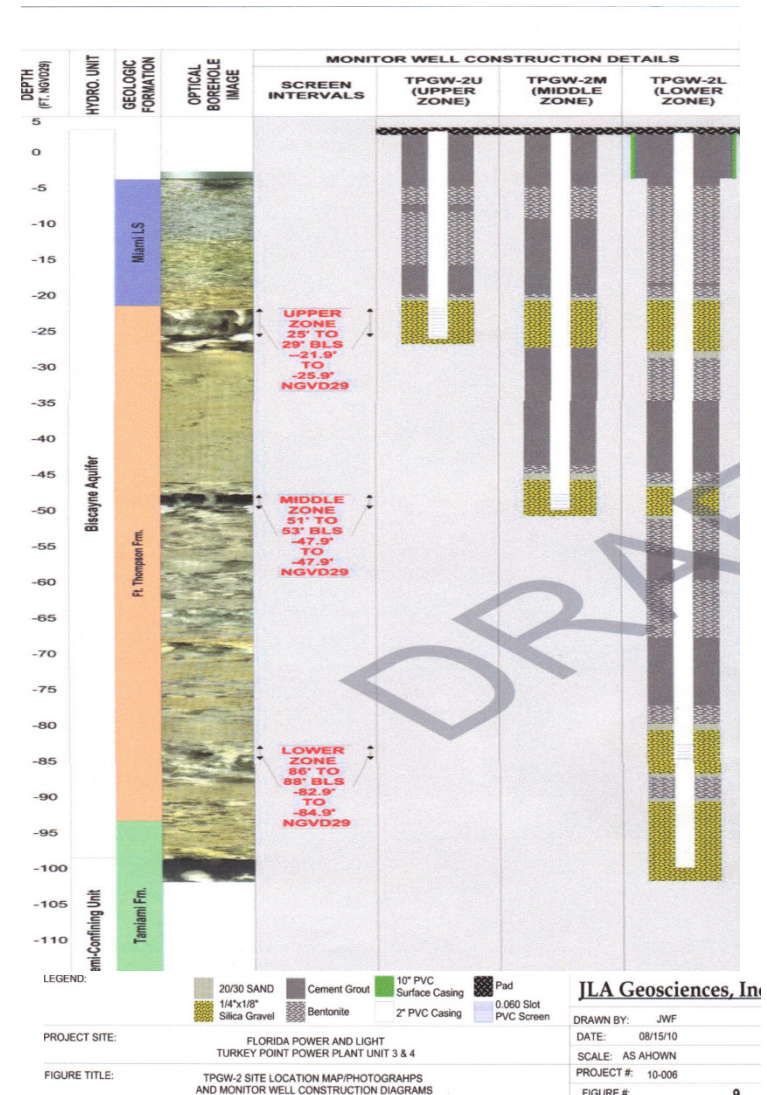
Well Construction

- Geophysical logging to identify flow zones
 - Optical Borehole Image, Caliper, Gamma Ray, etc.



Well Construction

- Screened wells at discrete intervals to capture flow zones
- Use of various material during installation as to not restrict flow
 - Silica gravel
 - Sand
 - Cement
 - Bentonite
 - Pellets or chips



Surface Water Stations

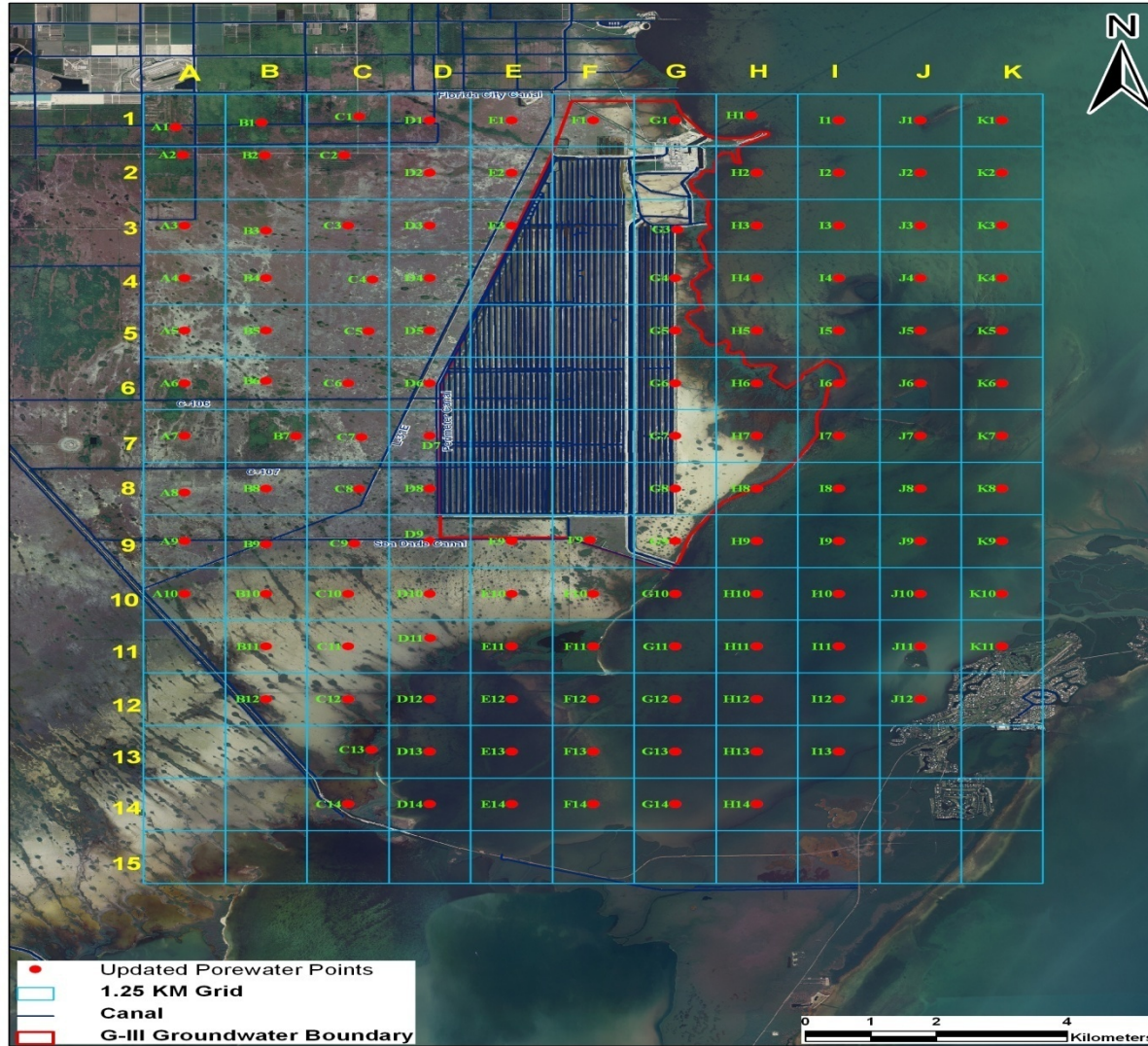
- **Began infrastructure installation in late May 2010**
- **Complete infrastructure installation in September 2010**



Porewater Sampling

- **Initial broad scale sampling March 18 – April 12**
 - Biscayne Bay, mangrove fringe and freshwater wetlands
 - 200 locations sampled for temperature, specific conductance and salinity
- **Second sampling event in Biscayne Bay August 17 – 25**
 - 100 locations sampled for temperature, specific conductance and salinity
 - Agencies requested FPL sample areas that had refusal
 - FPL agreed and sampling was conducted on August 26
 - An additional 4 areas of interest were identified and also sampled
- **Subset of 30 locations in Biscayne Bay sampled for the suite of parameters September 22 – 27**

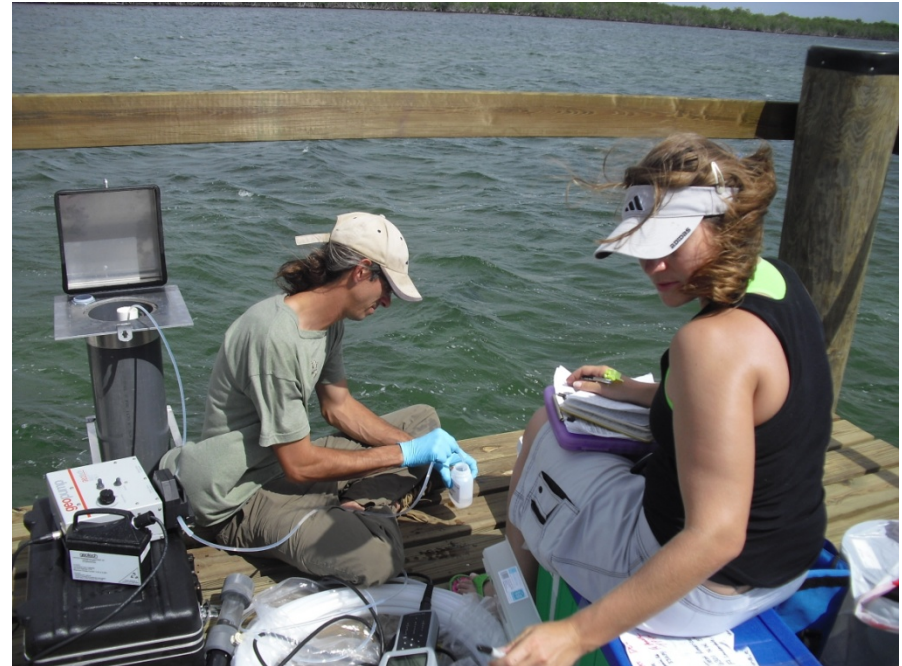
Porewater Map Location



Porewater Grids and Sample Locations
No Ownership Information On Circled Points

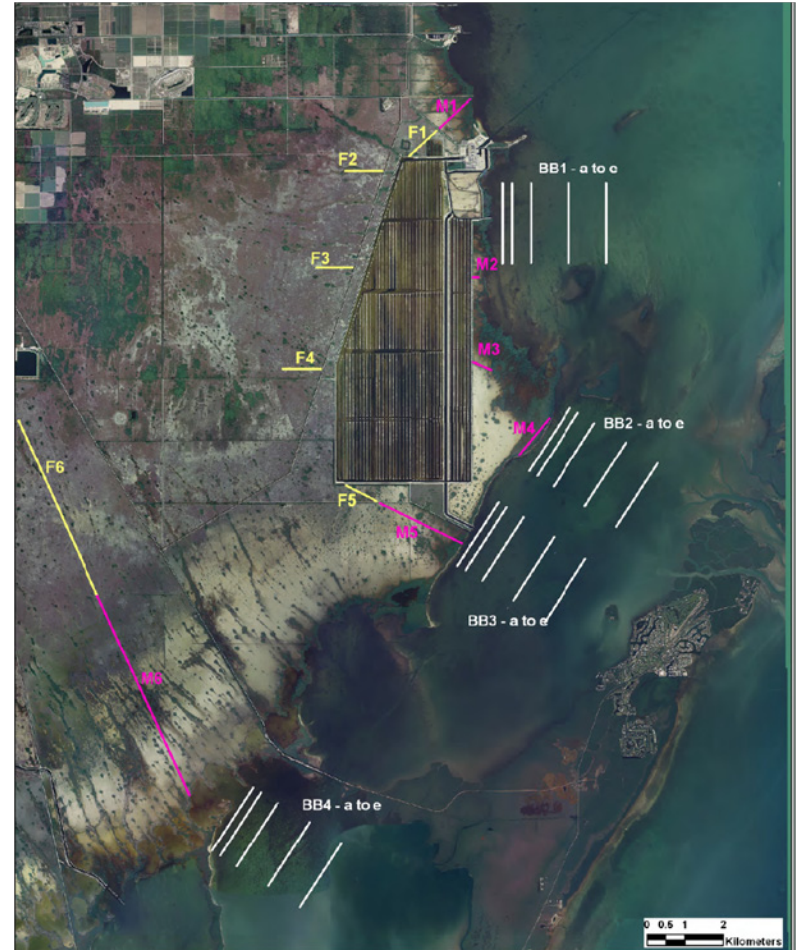
Lab Water Quality Quarterly Sampling

- **First quarter sampling event – June and July**
- **Second quarter sampling event – September**
- **Future sampling events**
 - December, March, June, September (minimum of 16)
- **Parameters include:**
 - Field Parameters
 - Laboratory Parameters (ions, nutrients, trace elements etc.)



Ecological Monitoring

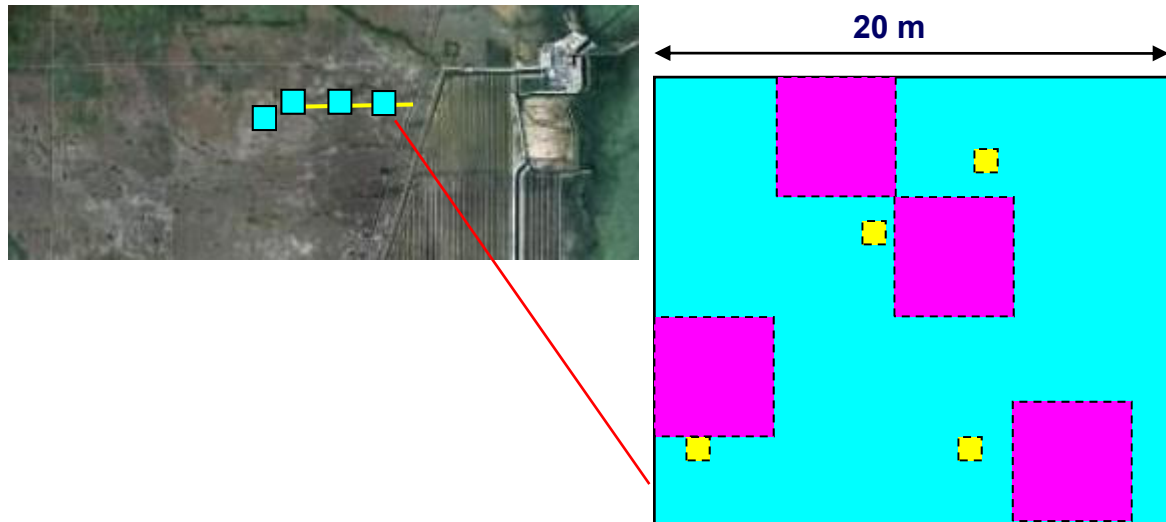
- **Transect location/design agreed to on September 21**
- **Initial transect set up to begin October 4**
- **Biscayne Bay transects**
 - SAV – 8 locations per transect (160) and
 - Seagrass – 1 to 2 composite location per transect (20)
 - Faunal – 4 locations per transect (80)
 - Specific conductance and temperature – 8 locations per transect (160)
 - Tracer suite – 1 location per transect (20)
 - Porewater nutrient and tracer suite 1 to 2 composite location per transect (20)



Ecological Monitoring

- **Marsh and Mangrove transects**

- Overall design: 20 m x 20 m plots with nested 5 m x 5 m woody plant and 1 m x 1 m herbaceous subplots.
- Marsh--16 plots, 128 subplots
- Tree islands--4 plots, 32 subplots
- Mangrove--12 plots, 96 subplots
- Parameters measured:
 - Community composition, cover and structure, productivity
 - Leaf nutrients
 - Porewater specific conductance, temperature, nutrients, tracer suite
- Number of tagged plants tracked: ~1000



Water Budget

Meteorological Station and Rain Collectors

- **Met station monitors**
 - Relative humidity
 - Rainfall
 - Wind speed/direction
 - Solar Radiation
- **Rain Collectors**
 - Total 7 locations
- **Rain Gauges**
 - Total 5 locations



Questions?

