

# Biscayne Bay Update

## Biscayne Bay Coastal Wetlands Phase 1 Project Observed Benefits



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# Biscayne Bay Coastal Wetlands Phase 1 Project

## Objectives:

- ❑ Improve freshwater & estuarine habitats
  - ❑ Improve salinity distribution & reestablish productive nursery habitat along the shoreline
  - ❑ Restore the quantity, quality, timing & distribution of freshwater to Biscayne Bay and Biscayne National Park
  - ❑ Preserve & restore the spatial extent of natural coastal glades habitat
- Monitoring used to track project performance against restoration targets

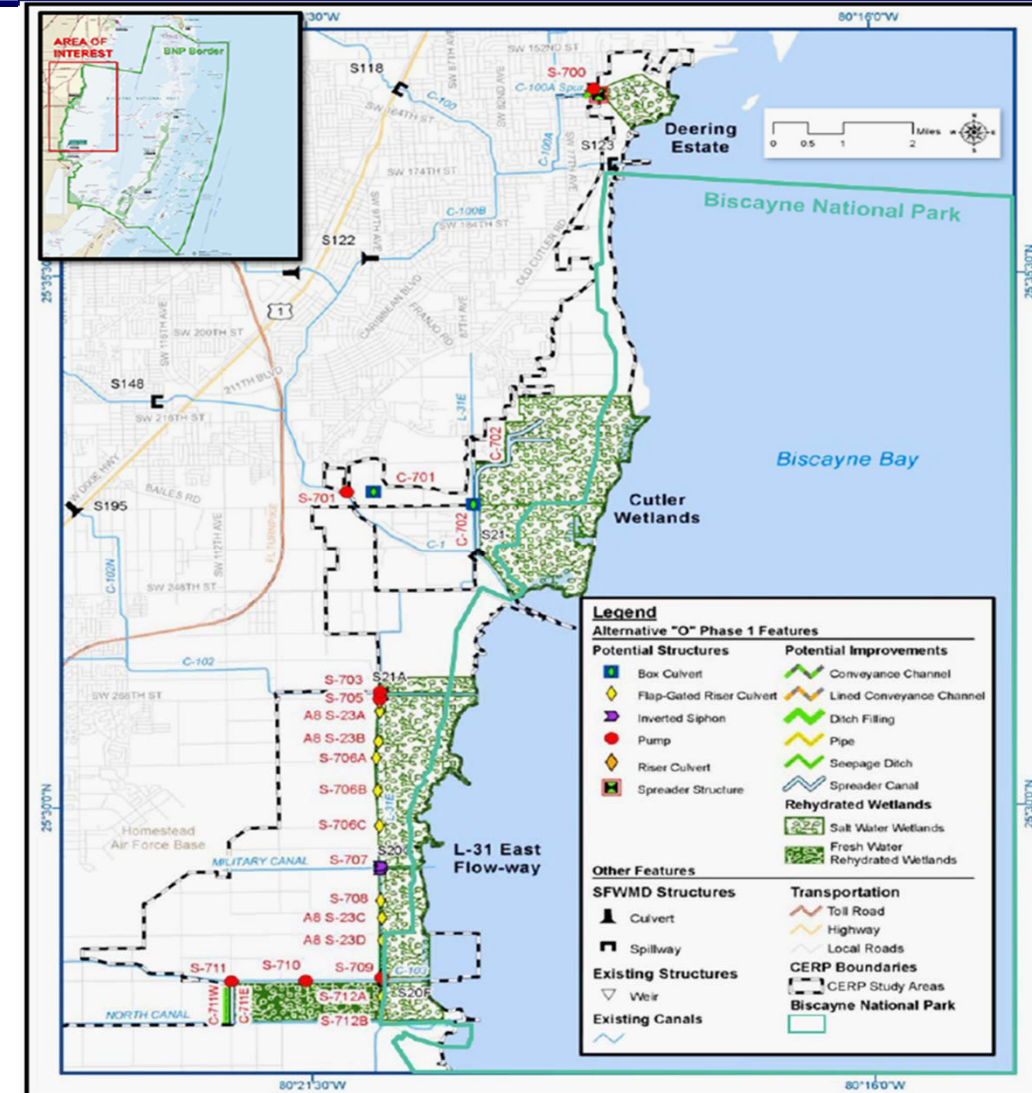


BBCW Phase I project components

# Biscayne Bay Coastal Wetlands Phase 1 Project

## Project Milestones:

- ☐ Project Implementation Report & Environmental Impact Statement (2012)
- ☐ Congressional authorization in Water Resources Development Act (2014)
- ☐ USACE Partnership Agreement (2016)



BBCW Phase 1 features

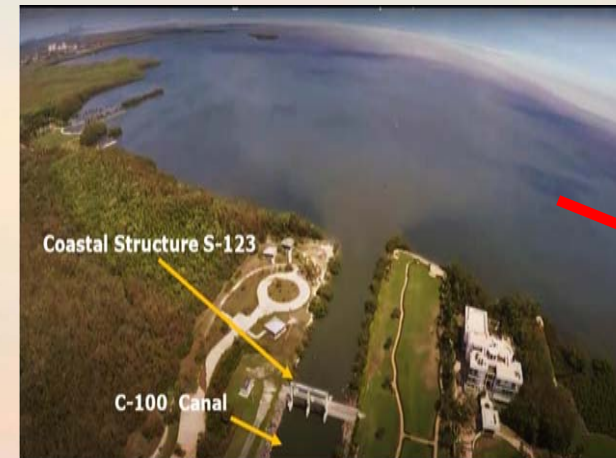


# Biscayne Bay Coastal Wetlands Phase 1 Project Deering Estate

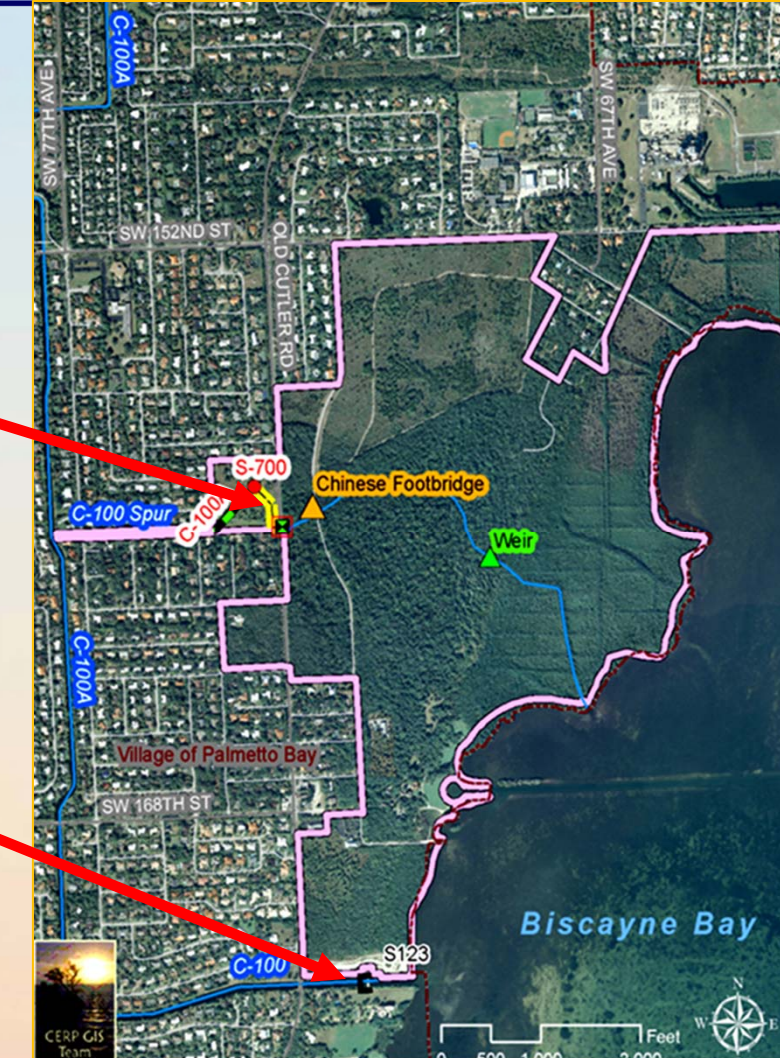
- The Deering Estate Flow way Construction completed April 2012
- Goals:
  - ❑ Redirect up to 100cfs freshwater to the coastal wetlands and Biscayne Bay
  - ❑ Re-hydrate the historical sloughs of Deering Estate and restore a more natural freshwater flow regime
  - ❑ Establish an educational wetland



Deering Estate Pump Station (S-700)



Coastal Structure S-123 on C-100 canal



Deering Estate component features

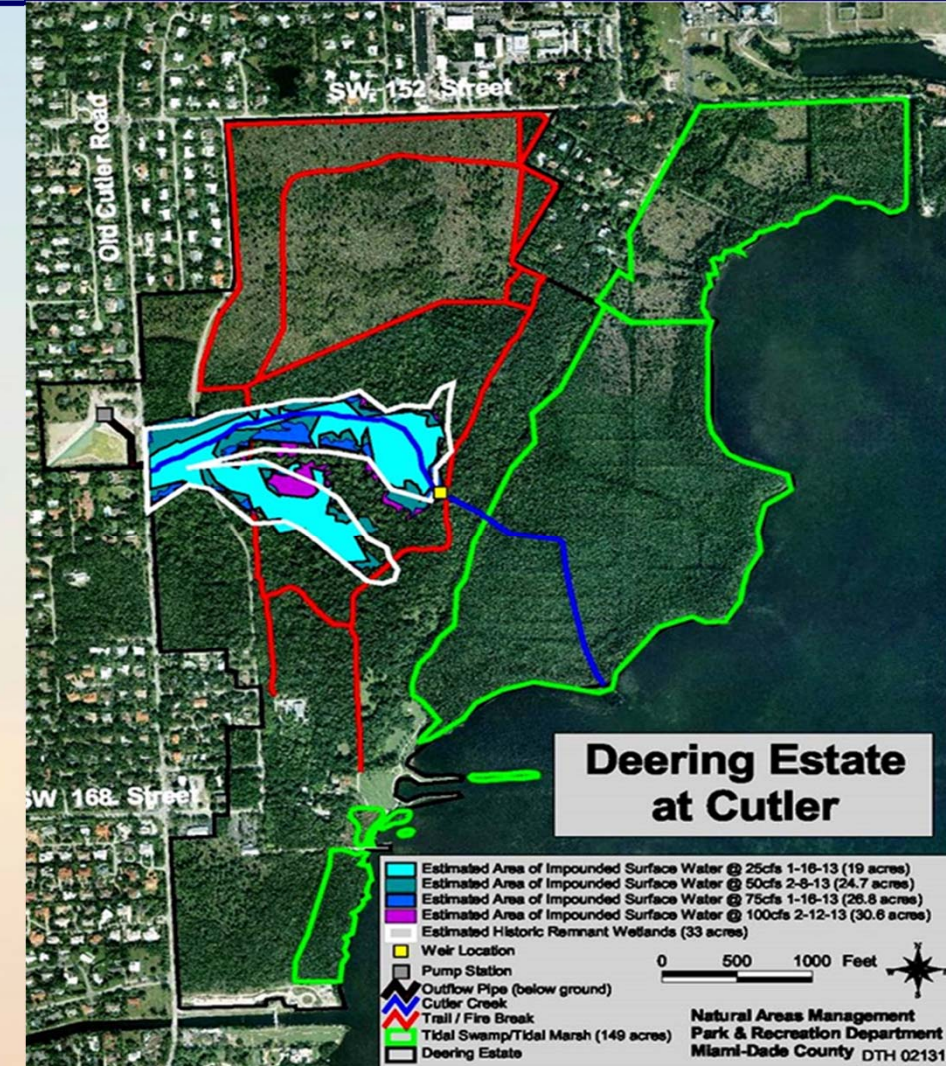


# Biscayne Bay Coastal Wetlands Phase 1 Project

## Deering Estate - Operations

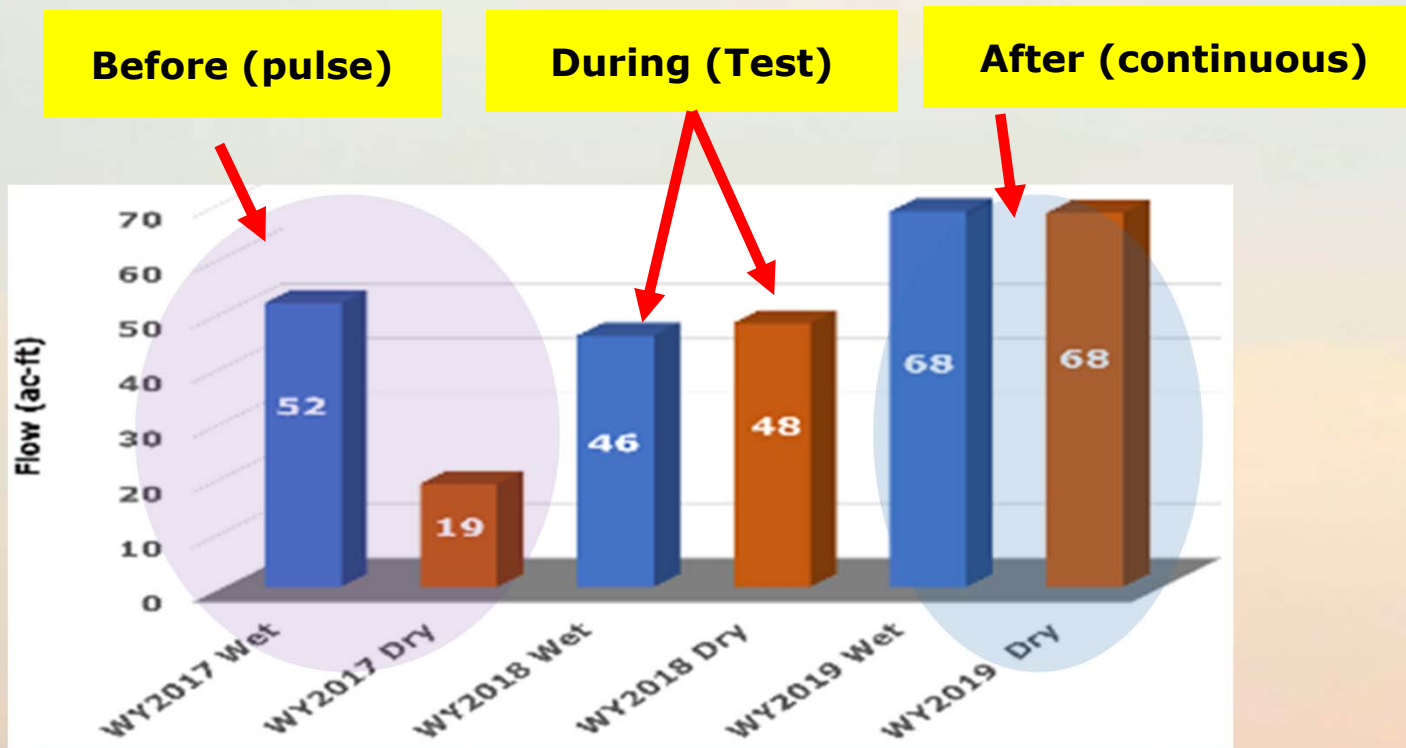
- ✓ **Determined extent of inundation under various pumping rates**
- ✓ **Estimated acreage of impounded surface water within Deering Estate under different pumping/flow rates**

Pumping Rate(cfs)	Duration of Testing (hours)	Estimated Acres of Impounded Surface Water	Percentage of Inundate Historic Remnant Wetlands within Cutler Creek
0	5	0	0%
25	5	19	58%
50	5	25	76%
75	5	27	82%
100	5	31	94%



# Biscayne Bay Coastal Wetlands Phase 1 Project Deering Estate - Operations

- Redistributes freshwater to hydrate coastal wetlands & moderate nearshore salinities
- WY2017: Pump test compared pulse releases versus continuous pumping at rates of 25-100cfs

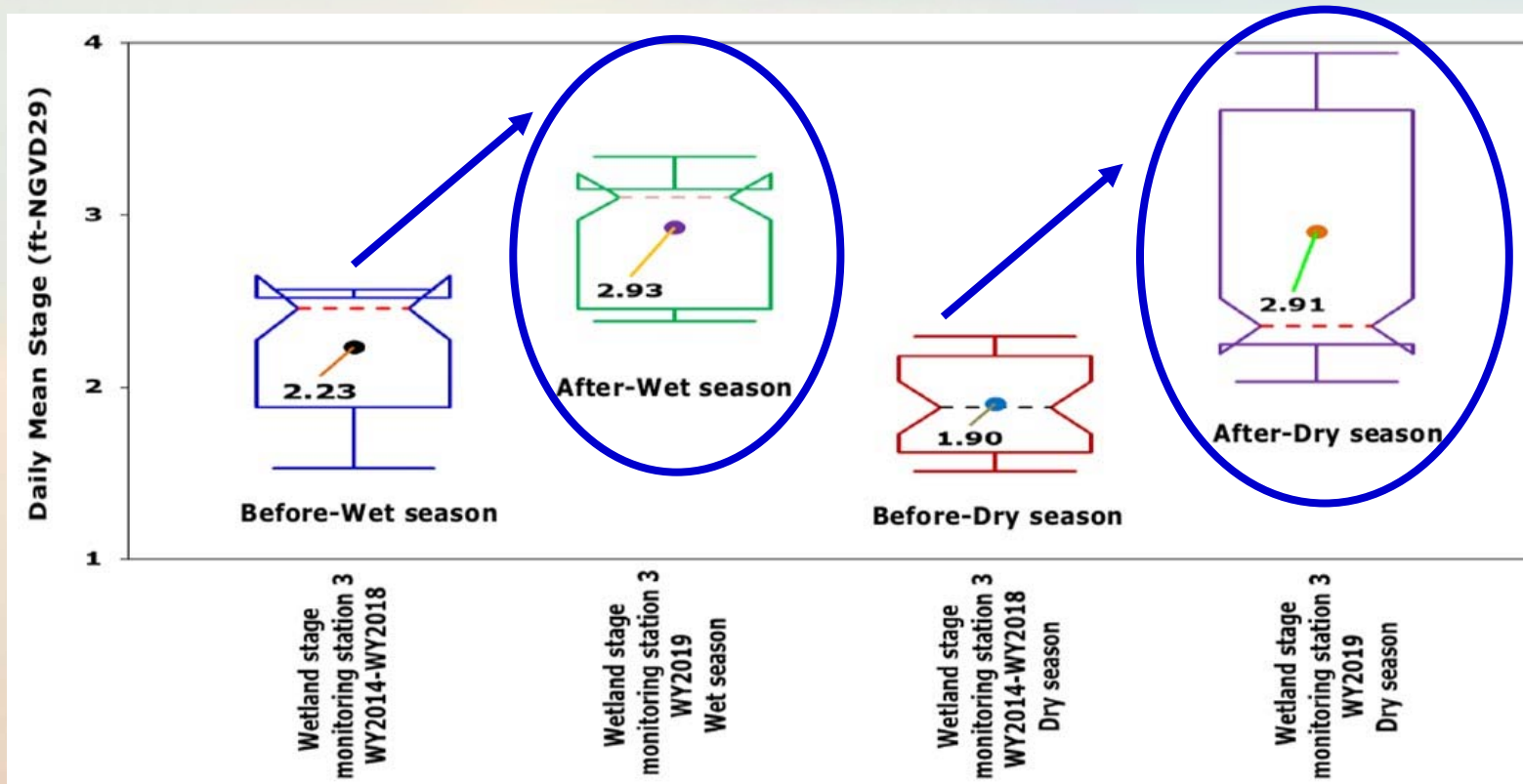




# Biscayne Bay Coastal Wetlands Phase 1 Project

## Deering Estate - Stage

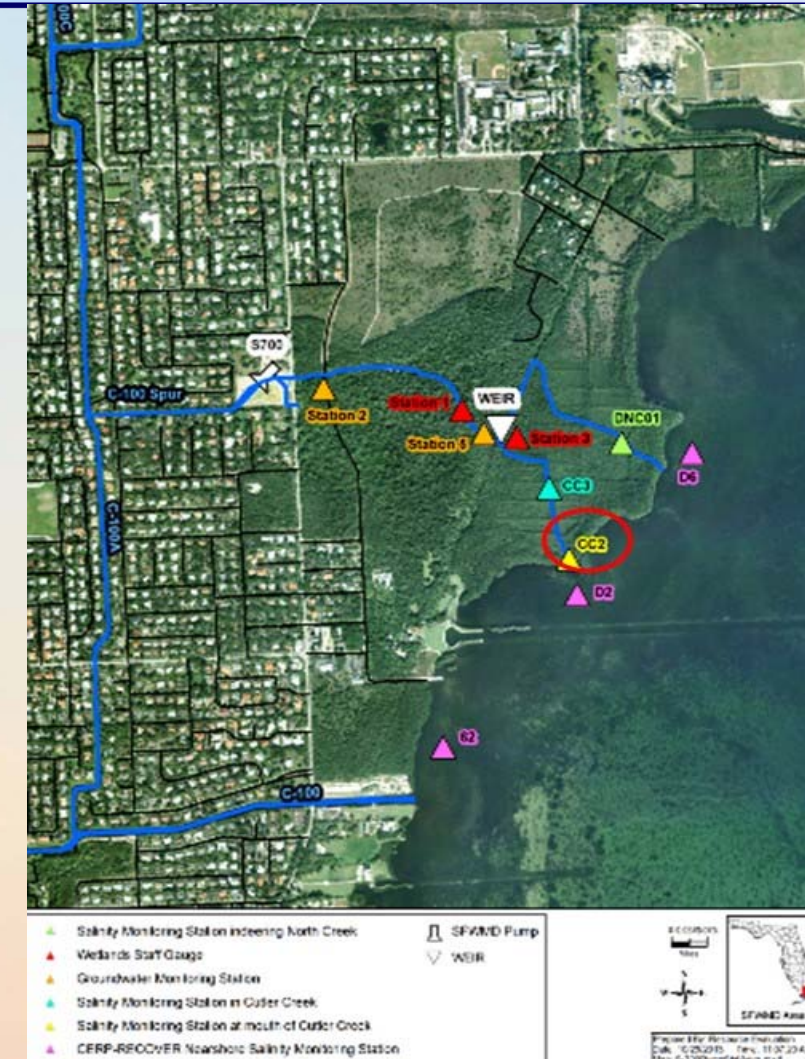
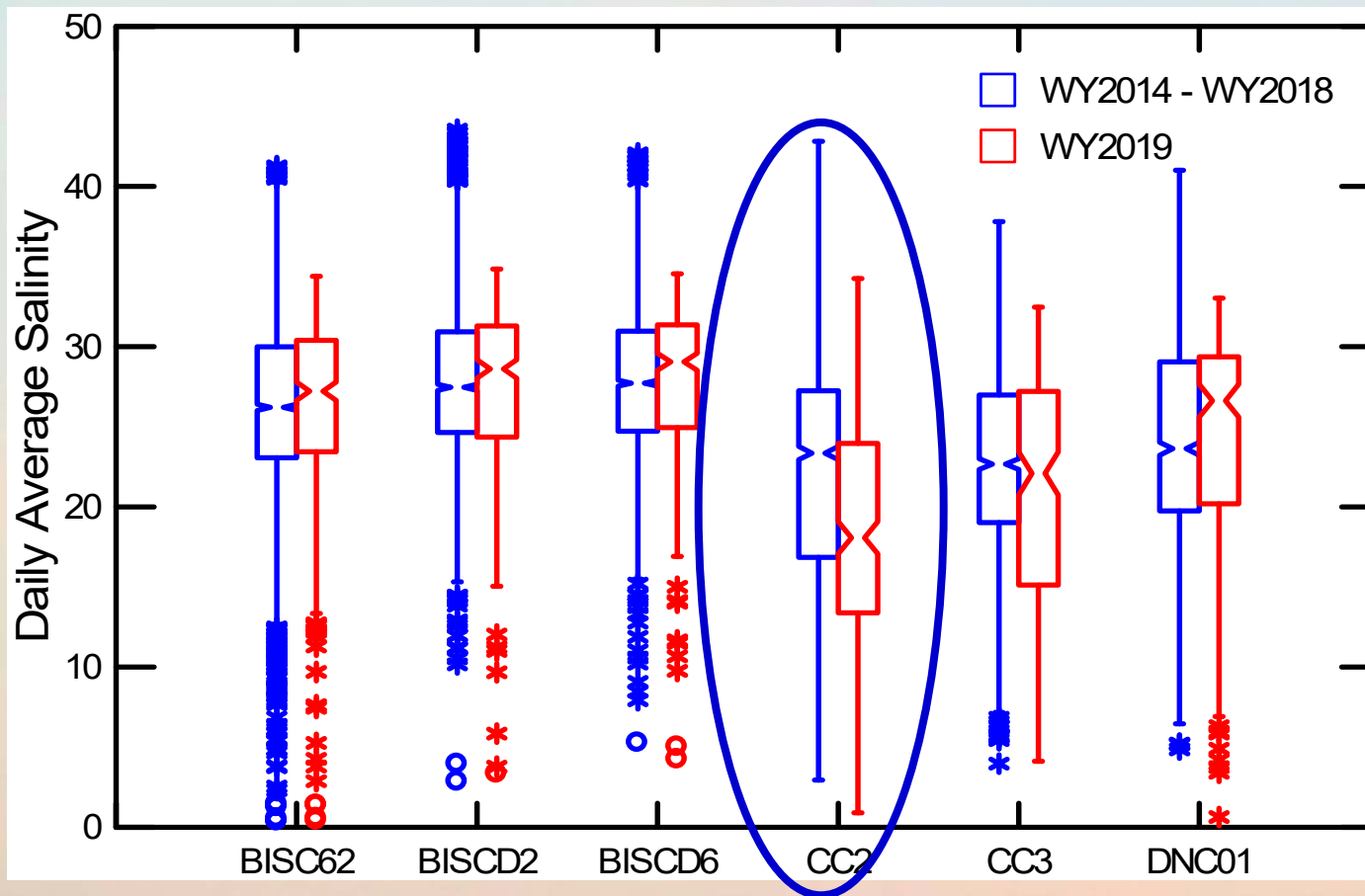
- WY2019: S-700 pump station modified from pulse releases to daily continuous pumping at  $\geq 25\text{cfs}$ 
  - ✓ Result: Increase of 0.7 ft in Wet season and 1.0 ft in Dry season



# Biscayne Bay Coastal Wetlands Phase 1 Project

## Deering Estate - Salinity

- ✓ **Result: Decrease in salinity at nearshore station CC2 from 24.3 (WY2014–WY2018) to 18.1 (WY2019)**

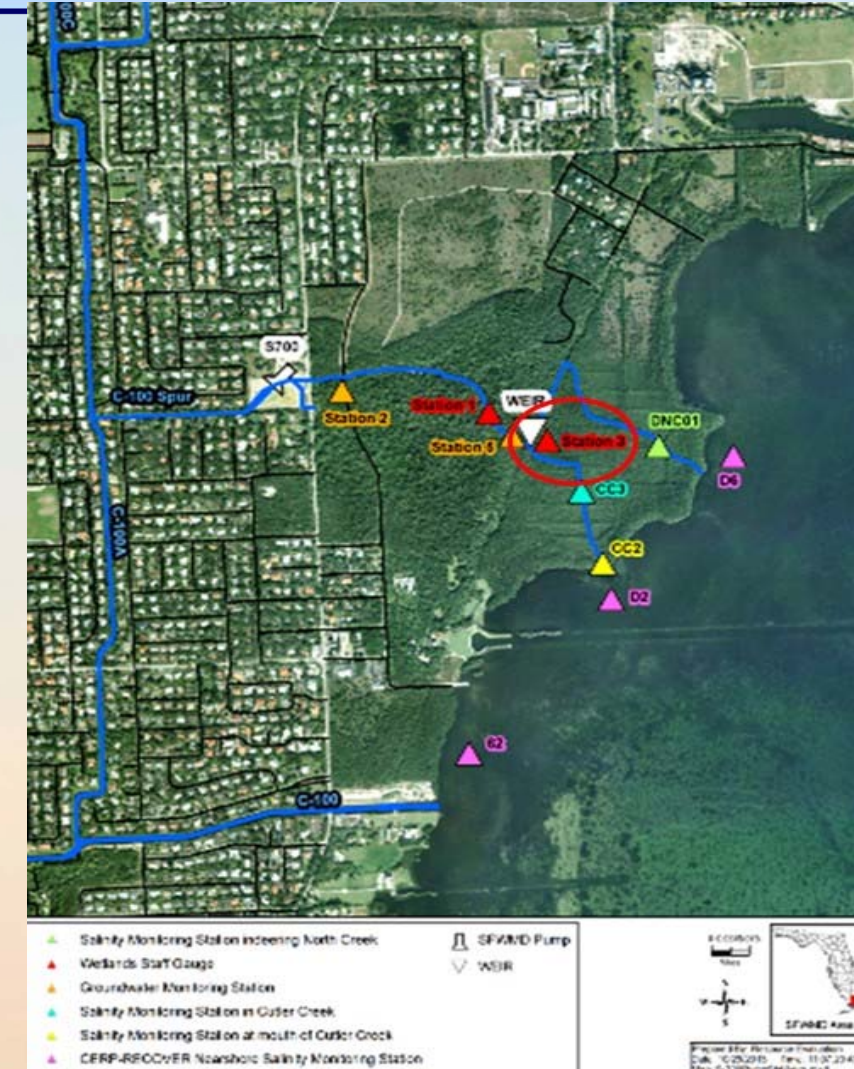
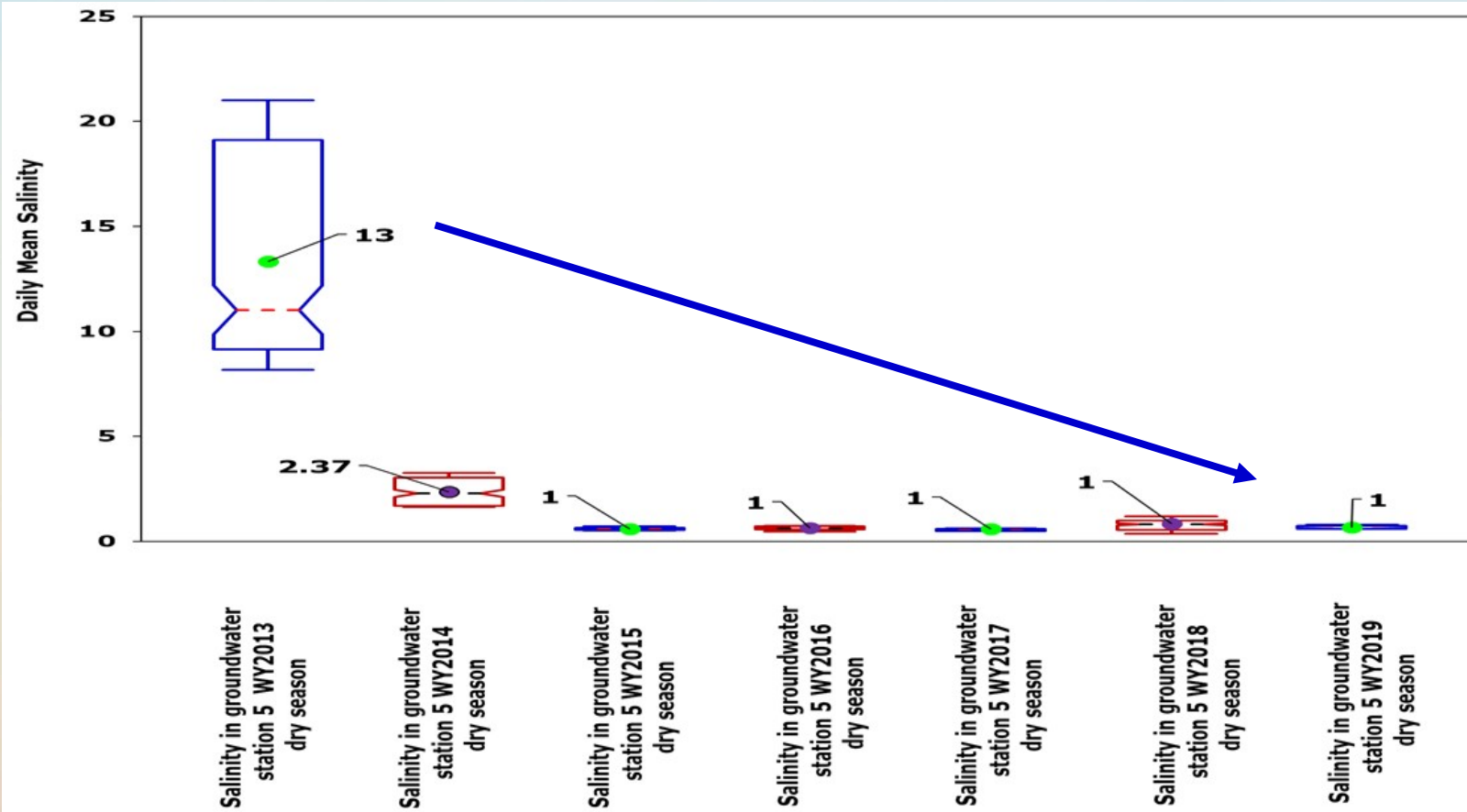




# Biscayne Bay Coastal Wetlands Phase 1 Project

## Deering Estate - Groundwater

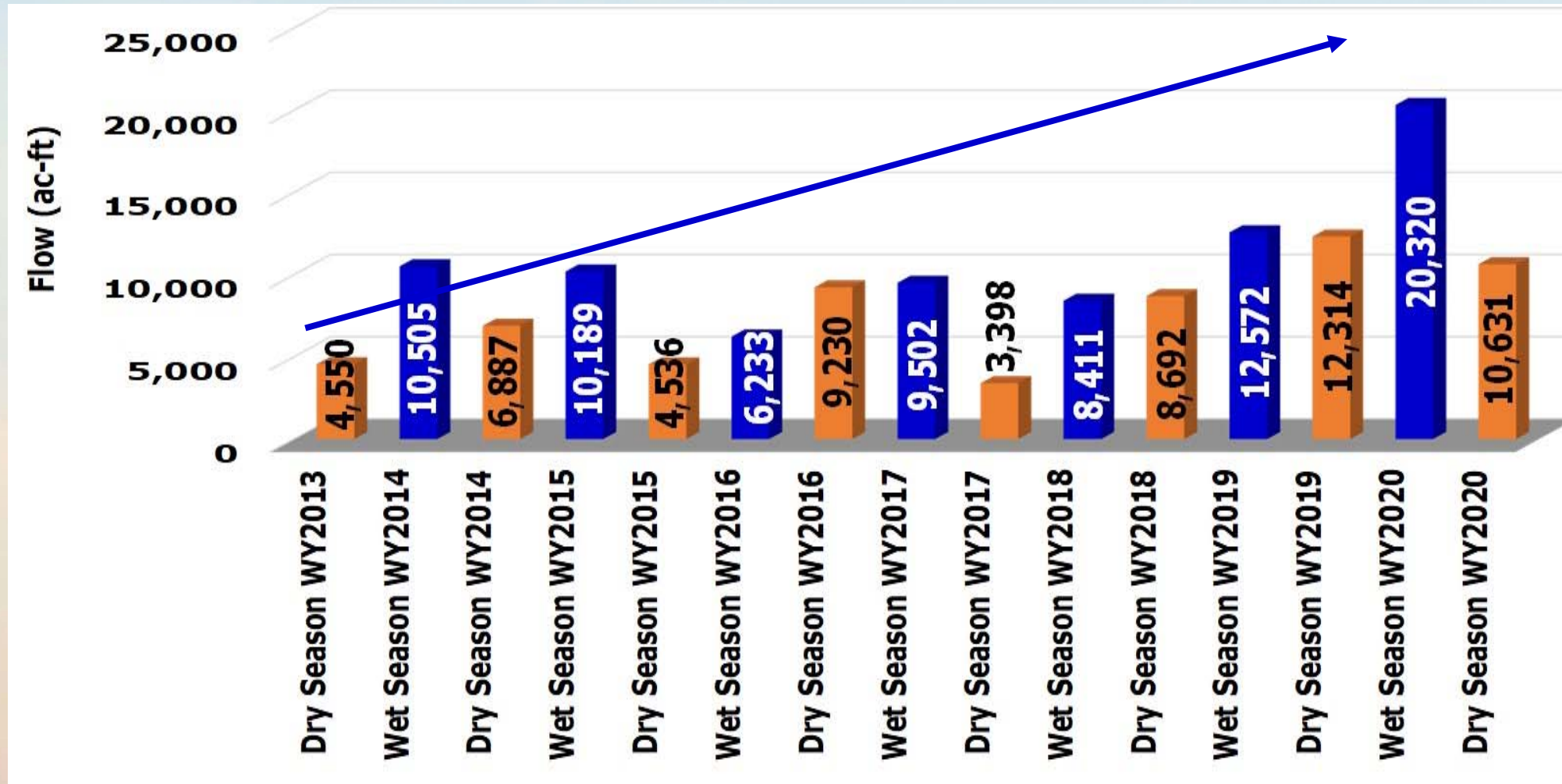
✓ Result: Groundwater salinity also decreased



# Biscayne Bay Coastal Wetlands Phase 1 Project

## Deering Estate - Flow

- ~138,000 ac-ft. redirected to coastal wetlands & Biscayne Bay since December 2012

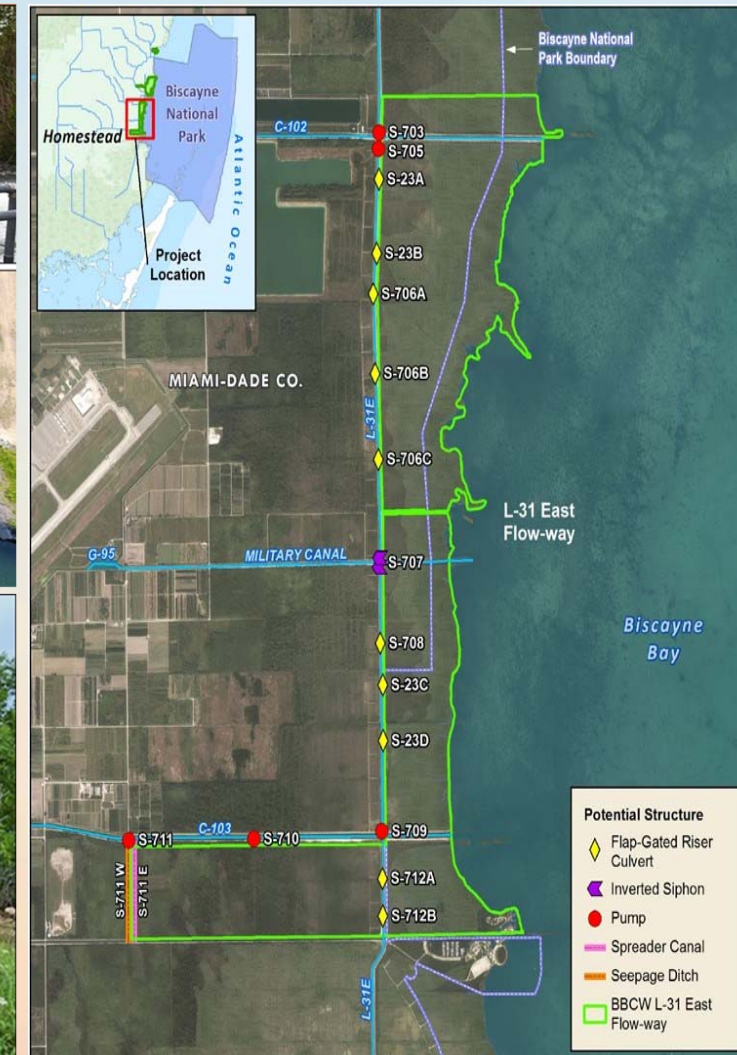




# Biscayne Bay Coastal Wetlands Phase 1 Project

## L-31E Flow way

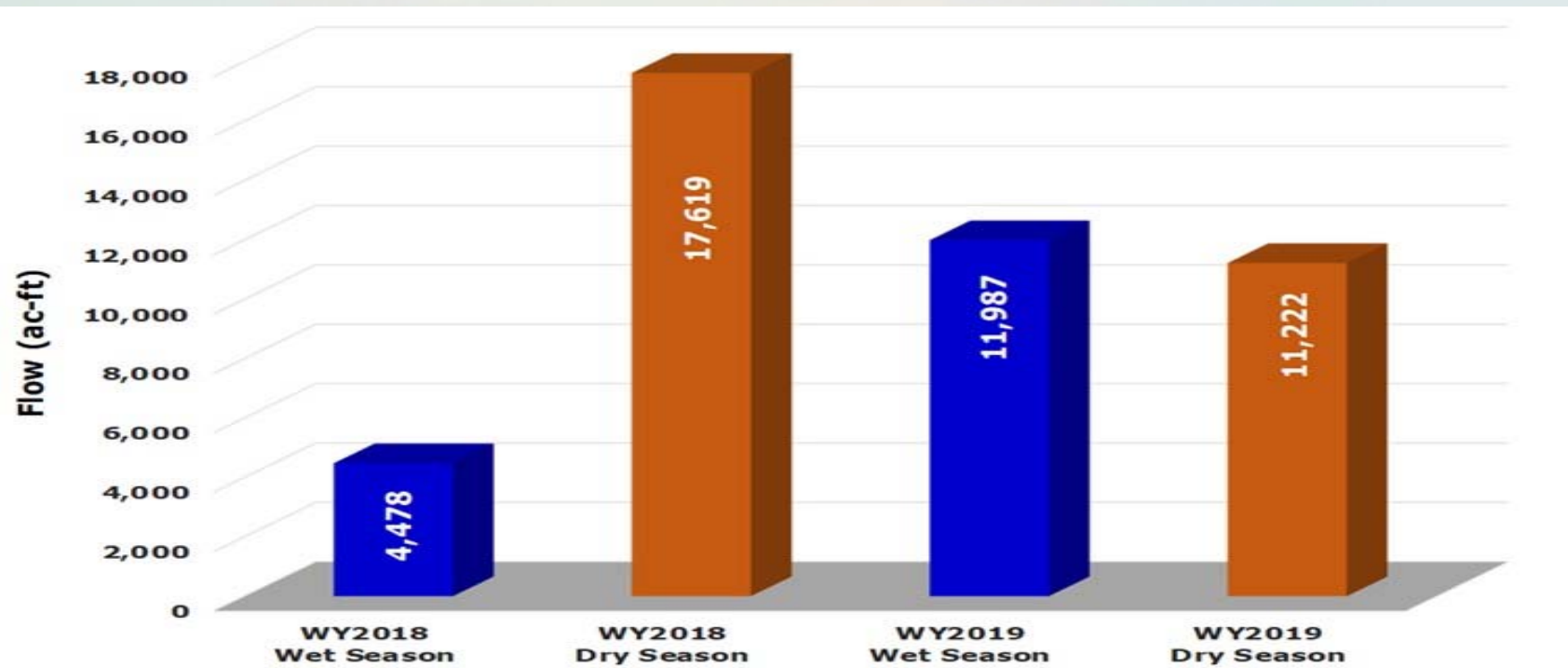
- **June 2010:** Completed construction of four L-31E culverts & initiated monitoring
  - **March 2017:** Completed construction of interim pump (S-709) & operated from August 2017–March 2019
  - **WY2019:** Completed construction of remaining L-31E culverts & initiated monitoring
- ✓ **Result:** Enhanced sheet flow to the coastal wetlands & Biscayne Bay
- ✓ **Result:** Pumping maintained at optimal levels for sheet flow ~2.20 ft-NGVD29





# Biscayne Bay Coastal Wetlands Phase 1 Project L-31E Flow way Interim Pump Operations

- Interim electric pump diverted ~45,000 ac-ft of freshwater to the coastal wetlands & Biscayne Bay



A comparison of total flow through interim electric pump S-709 in WY2018 and WY2019.

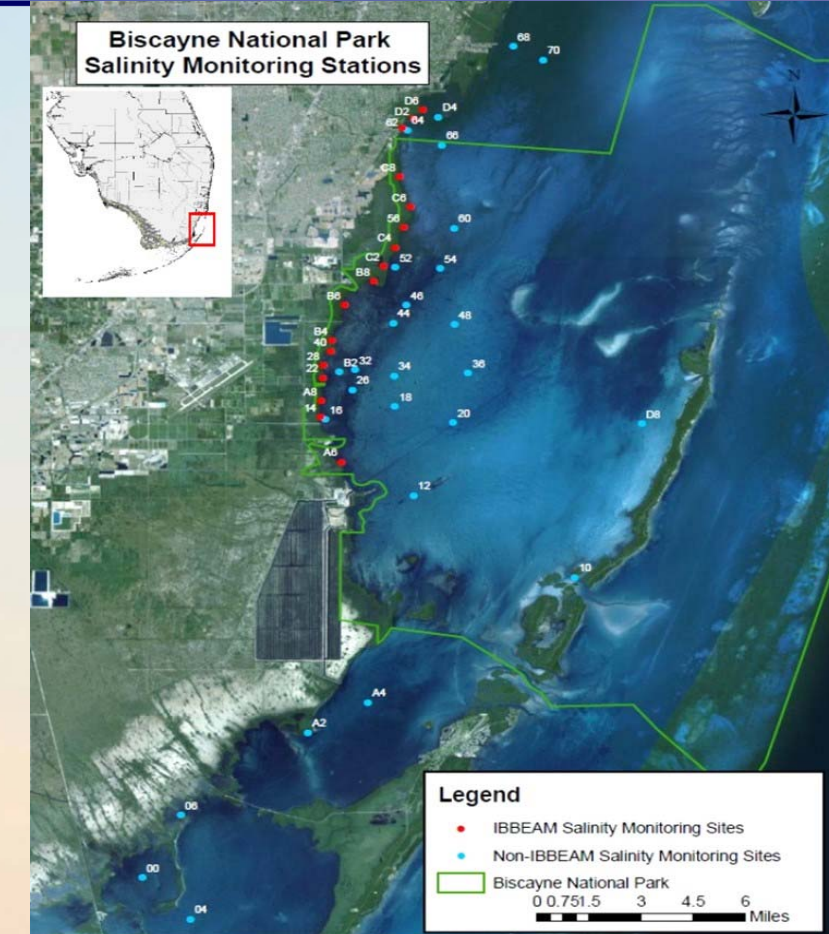
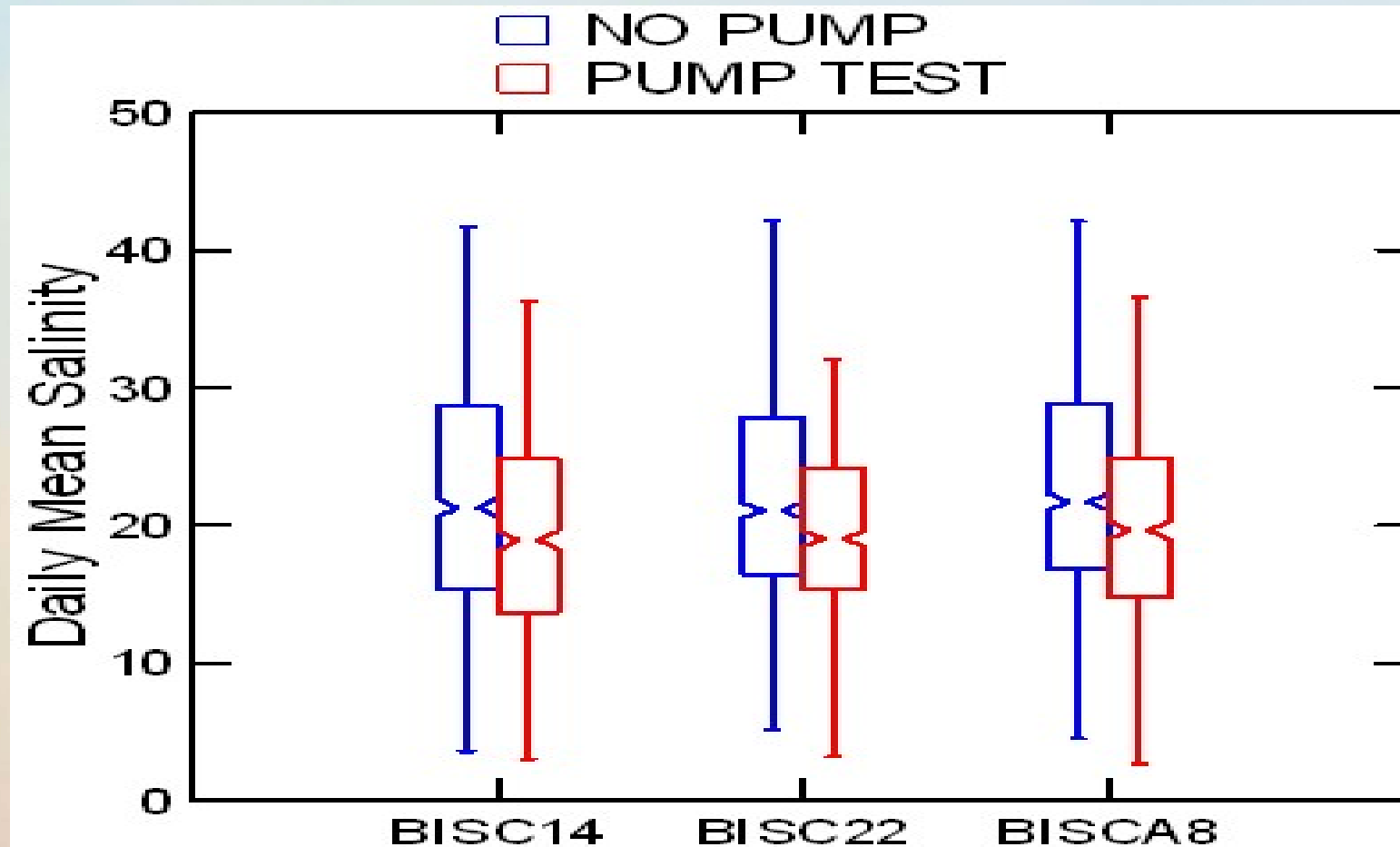




# Biscayne Bay Coastal Wetlands Phase 1 Project

## L-31E Flow-way Interim Pump Test Salinity

✓ Result: Nearshore salinity decreased



L-31E culverts nearshore salinity monitoring stations. These stations are BISC14B (14), BISC22B (22), BISC28B (28), BISC40B (40), and BISC8 (A8). Also shown are the CERP RECOVER Integrated Biscayne Bay Ecological Assessment and Monitoring Project (IBBEAM) monitoring stations.



# Biscayne Bay Coastal Wetlands Phase 1 Project

## L-31E Flow-way – Vegetation Response

- ✓ **Result: Sawgrass acreage increased > 9 acres since 2013**
- ✓ **Result: Reduced percent cover of exotic plants**



WY2020 sawgrass recruitment east of the L-31E levee.





# Biscayne Bay Coastal Wetlands Phase 1 Project

## Deering Estate – Vegetation Response

### ✓ Results:

- Sawgrass began to establish naturally in the slough
- Total canopy cover returned to pre-Hurricane Irma levels
- Herb & shrub cover decreased, while canopy cover increased in all slough plots
- State-endangered ferns increased in abundance in both hammock plots
- Native species richness largely increased in upland hammock sites



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**U.S. Army, Corps of Engineers**

**Florida Department of Environmental Protection**

**Deering Estate Park**

Thank you