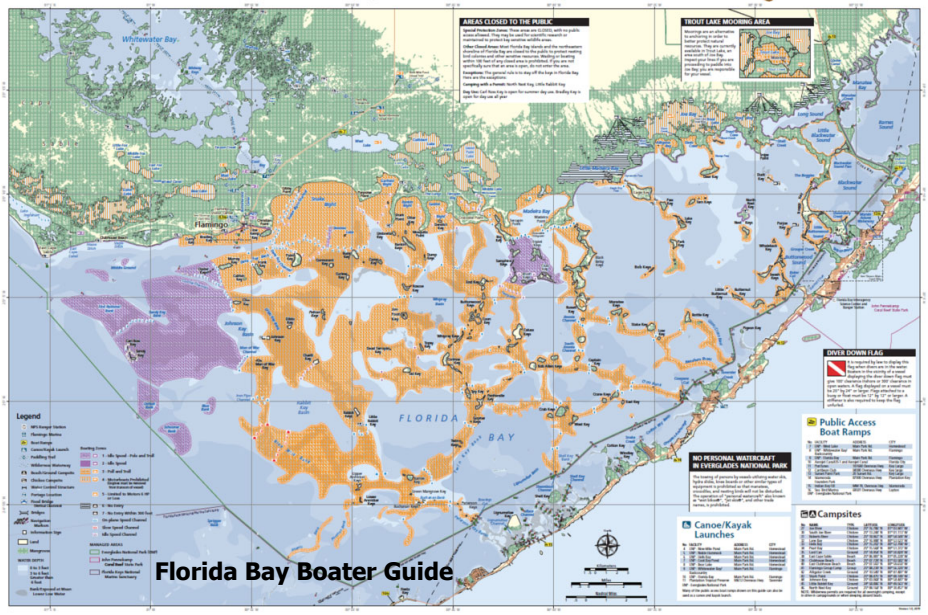
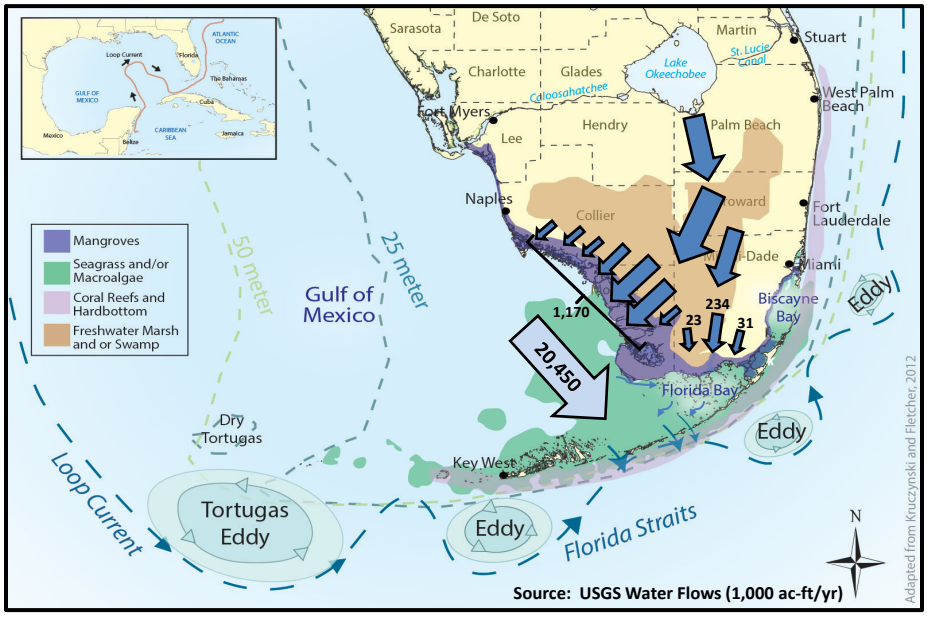
Preserving and Restoring Florida Bay

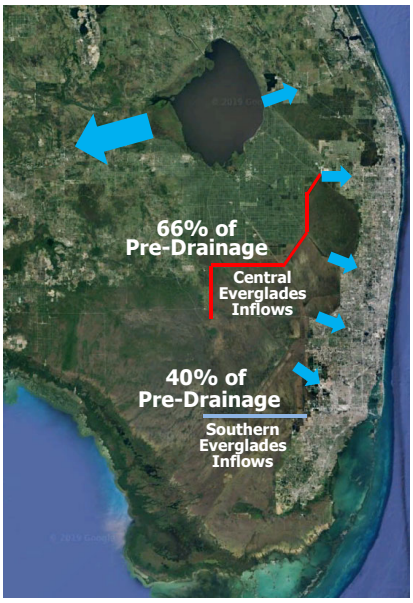
Pedro Ramos and Robert Johnson, July 18, 2019

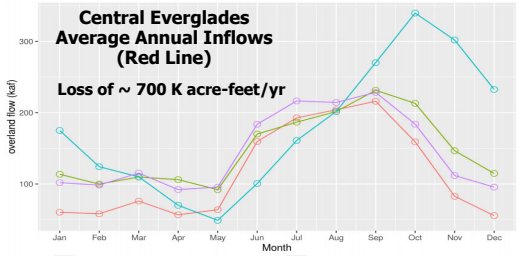


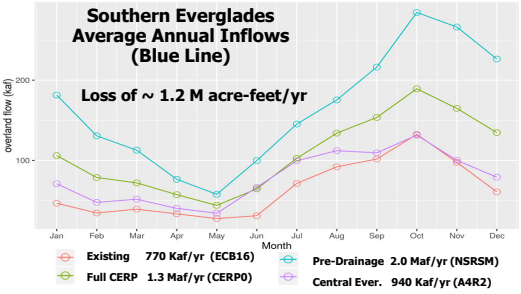
Southern Coastal Ecosystems are Dependent on Upstream Freshwater Flows



Upstream Diversions Reduced Surface Water Flows into the Southern Coastal Ecosystems

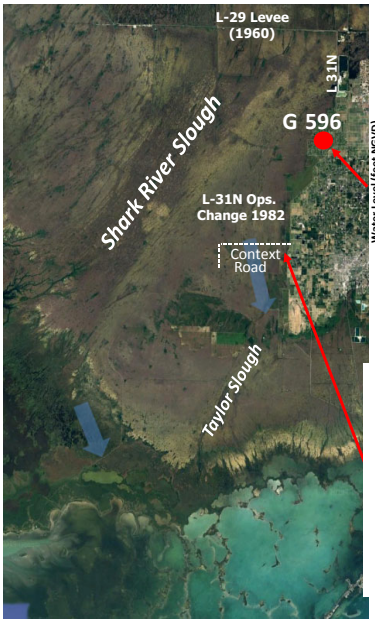


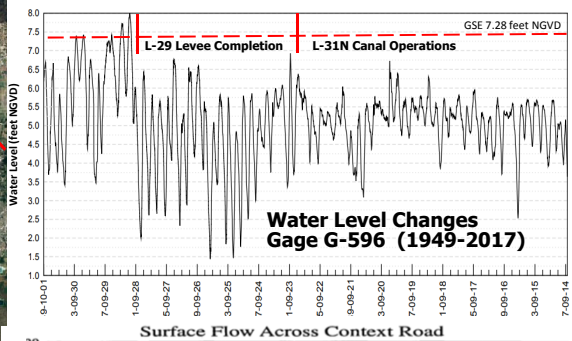


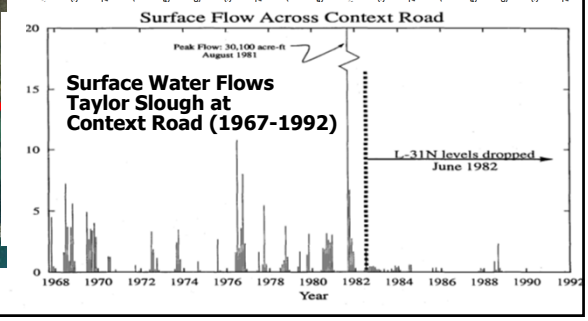


Source: ROG and CEPP Workshops, SFWMD & USACOE, 2010-2011.

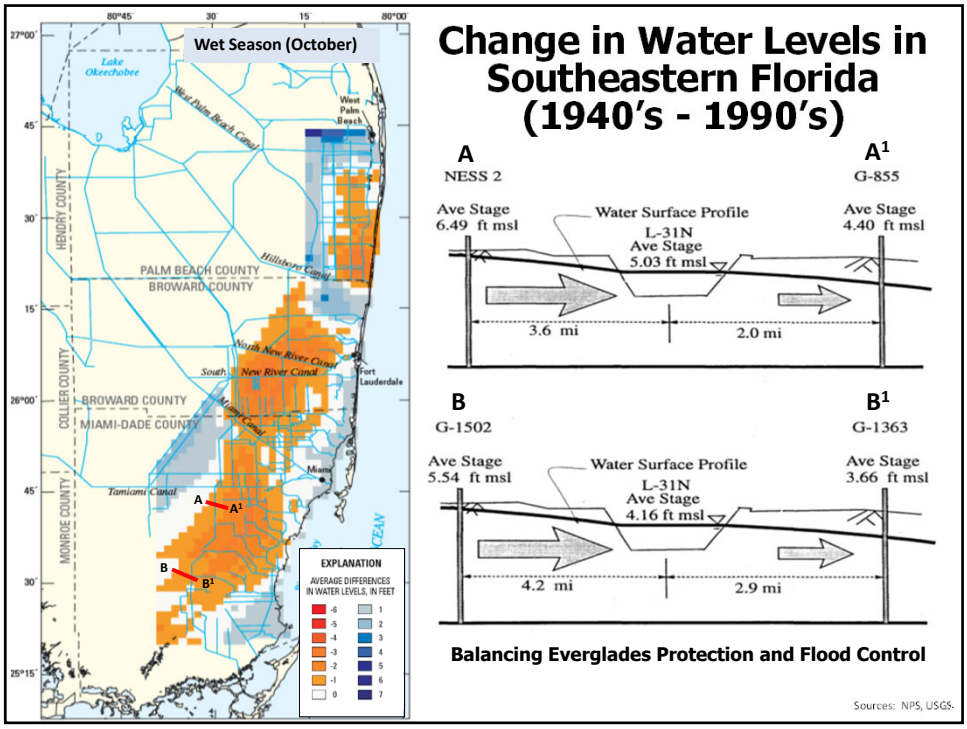
Water Management Changes Reduced Flows to Florida Bay

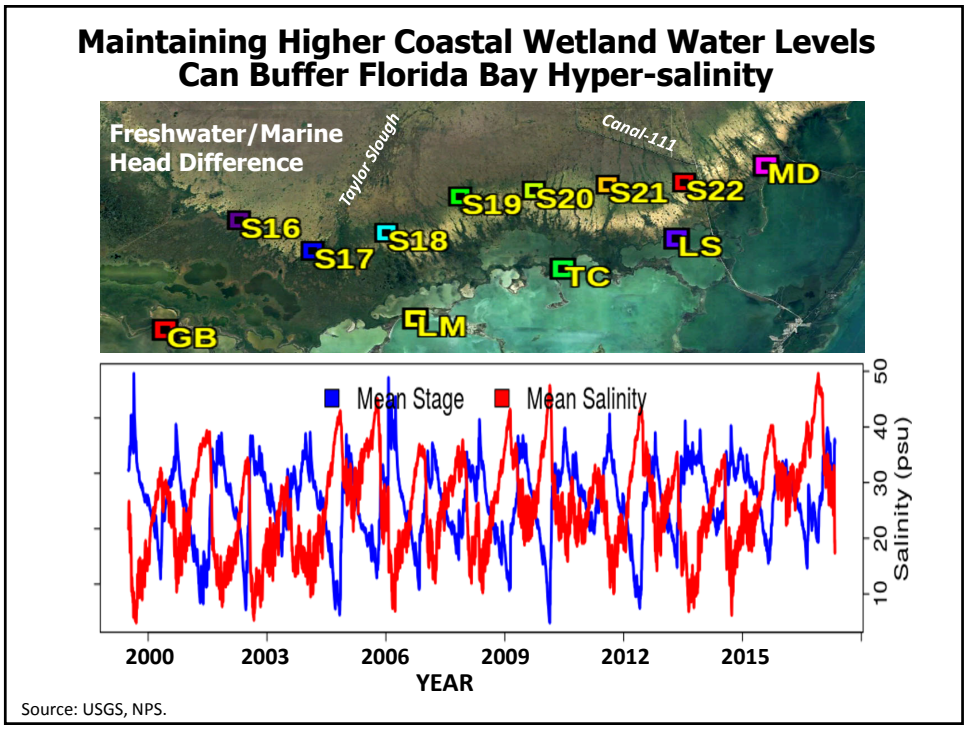




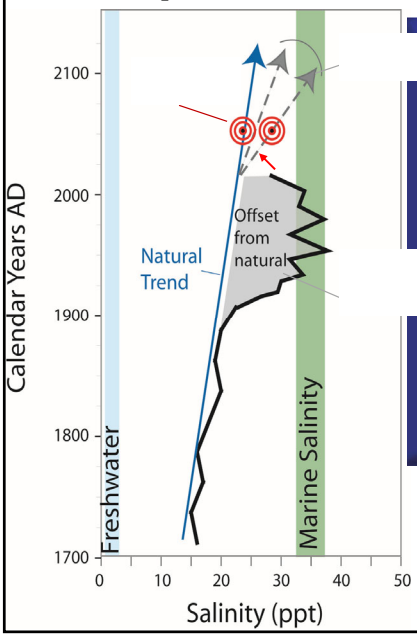


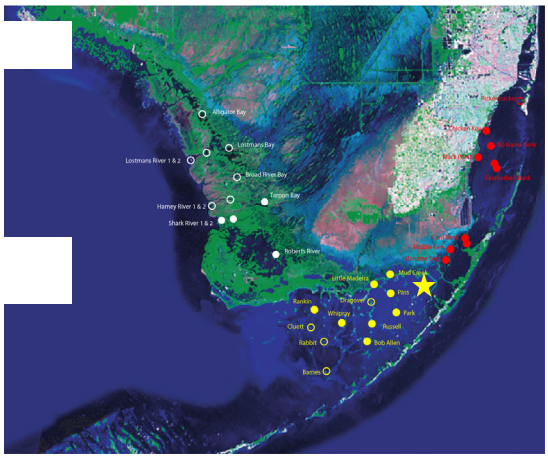
Sources: NPS and USGS.


Wet Season (October)
Lake Okeechobee
West Palm Beach Canal
West Palm Beach
HENDRY COUNTY
PALM BEACH COUNTY
BROWARD COUNTY
Hillsboro Canal
North New River Canal
South New River Canal
Fort Lauderdale
COLLIER COUNTY
BROWARD COUNTY
MIAMI-DADE COUNTY
Miami Canal
Miami
Tamiami Canal
MONROE COUNTY
A
A1
B
B1
EXPLANATION
AVERAGE DIFFERENCES IN WATER LEVELS, IN FEET
Change in Water Levels in Southeastern Florida (1940's - 1990's)
A
NESS 2
A1
G-855
Ave Stage 6.49 ft msl
Water Surface Profile
L-31N Ave Stage 5.03 ft msl
Ave Stage 4.40 ft msl
3.6 mi
2.0 mi
B
G-1502
B1
G-1363
Ave Stage 5.54 ft msl
Water Surface Profile
L-31N Ave Stage 4.16 ft msl
Ave Stage 3.66 ft msl
4.2 mi
2.9 mi
Balancing Everglades Protection and Flood Control
Sources: NPS, USGS.


Maintaining Higher Coastal Wetland Water Levels Can Buffer Florida Bay Hyper-salinity
Freshwater/Marine Head Difference
Taylor Slough
Canal-111
MD
S19
S20
S21
S22
S16
S17
S18
LS
TC
GB
LM
Mean Stage
Mean Salinity
Salinity (psu)
10
20
30
40
50
2000
2003
2006
2009
2012
2015
YEAR
Source: USGS, NPS.

Paleo-Environmental Studies: Describing Salinity Trends and Setting Restoration Targets

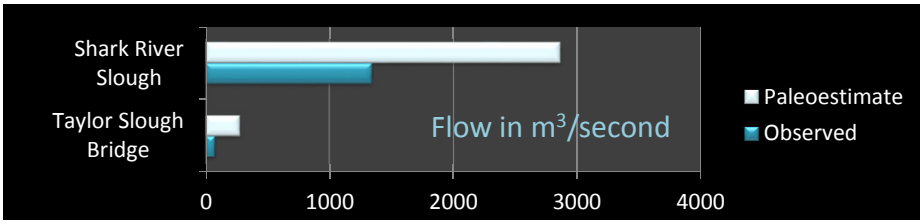




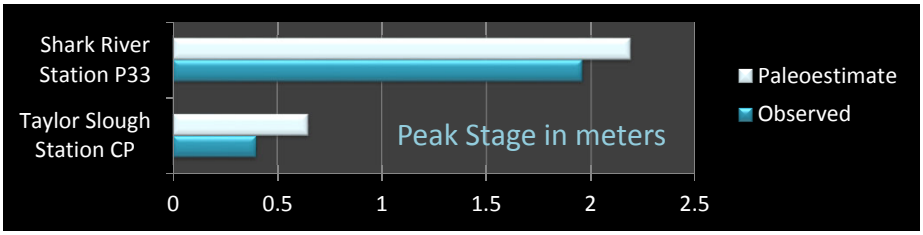
Based on 77 sediment cores collected by the USGS, from 43 locations in the southern estuaries.

Source: USGS, 2014

Observed vs. Pre-Drainage Water Flow and Water Stages

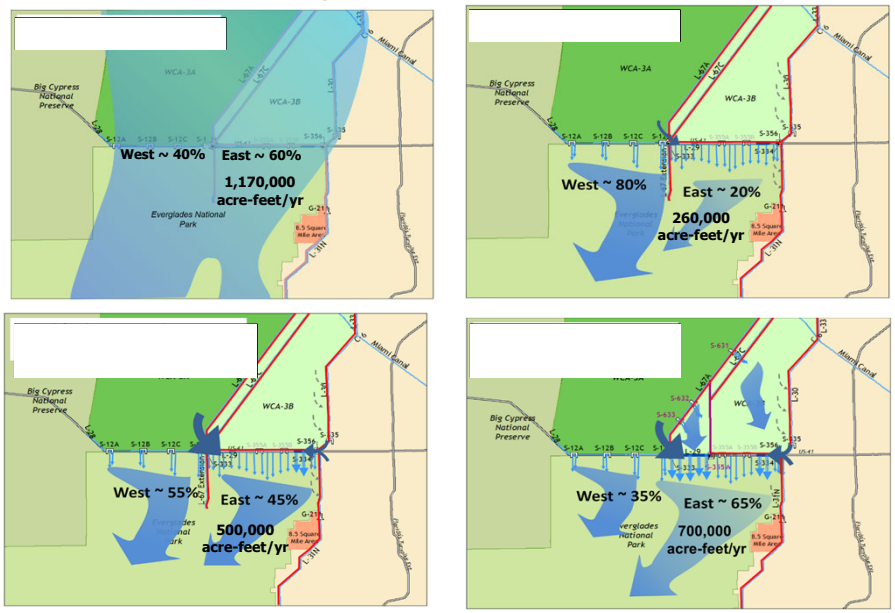


- **Pre-Drainage flows to the Southern Everglades were approximately 1.5 to 2 times greater than current flows.**



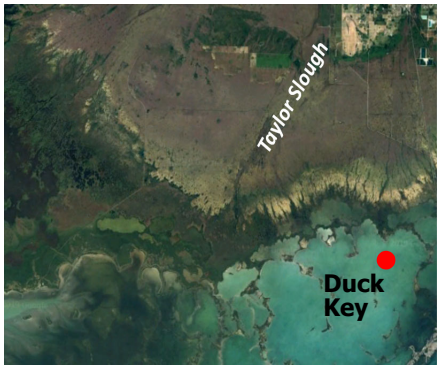
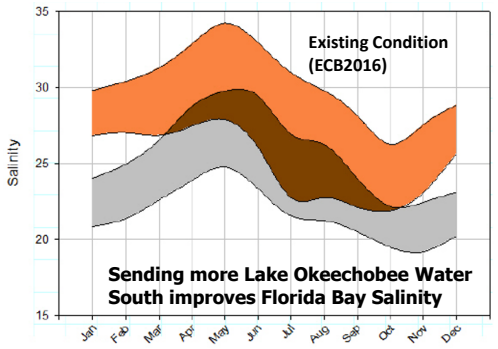
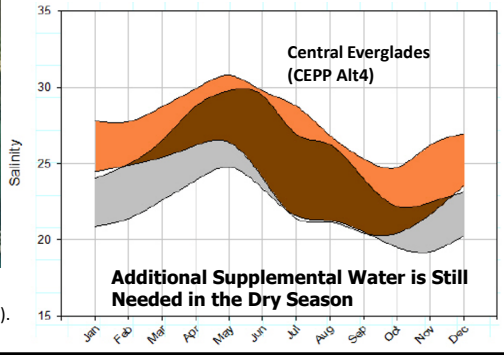
Source: Marshall, Wingard, Pitts 2014, Estuaries & Coasts v. 37.

Incrementally Improving Water Deliveries to Everglades National Park



Salinity Targets and Everglades Restoration Performance in Florida Bay

- Existing Conditions (orange upper) Central Everglades (orange/lower)
- Target – Adjusted Paleo Salinity (grey)



Source: Central Everglades Planning Project, 2014, salinity ribbons represent central 50% (quartiles 25-75%).