

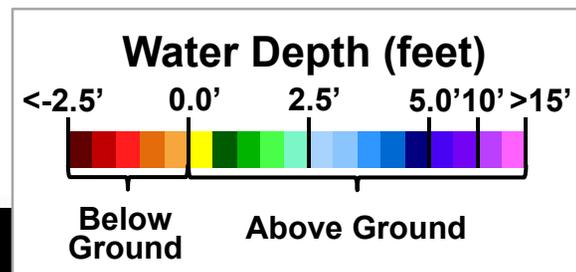
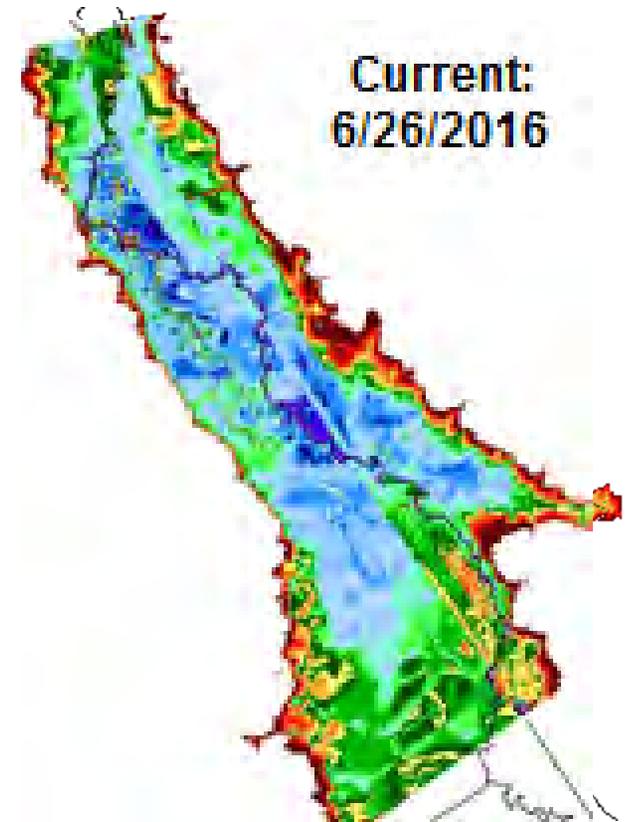
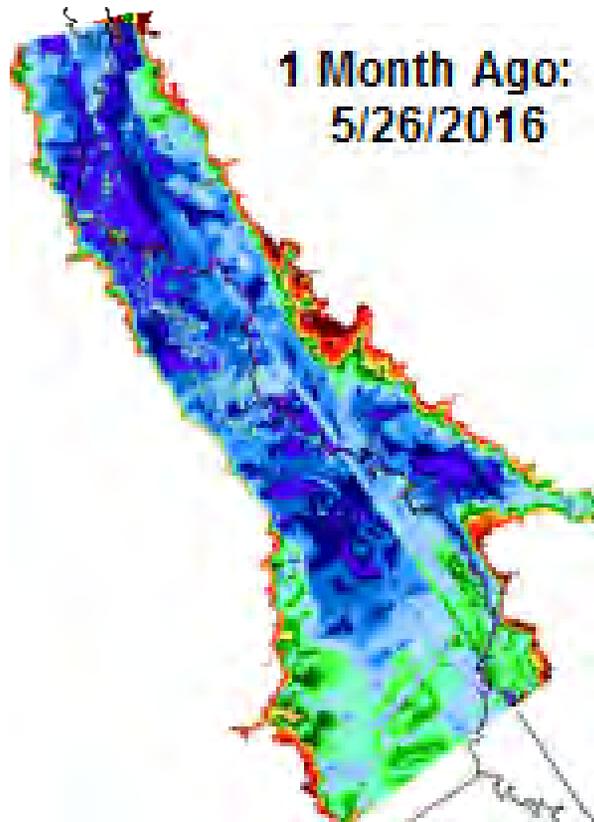
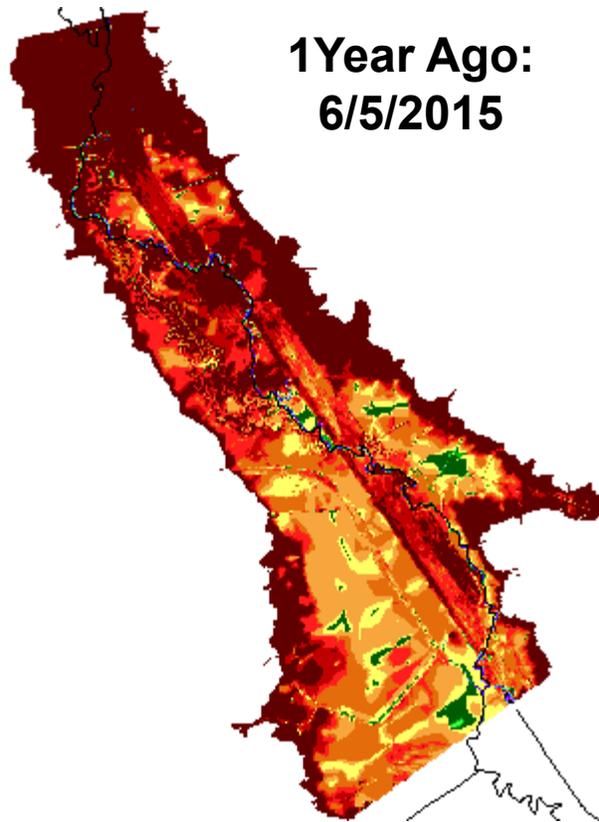
South Florida Ecosystem
Restoration Task Force
June 29, 2016

Environmental Conditions Update

Terrie Bates

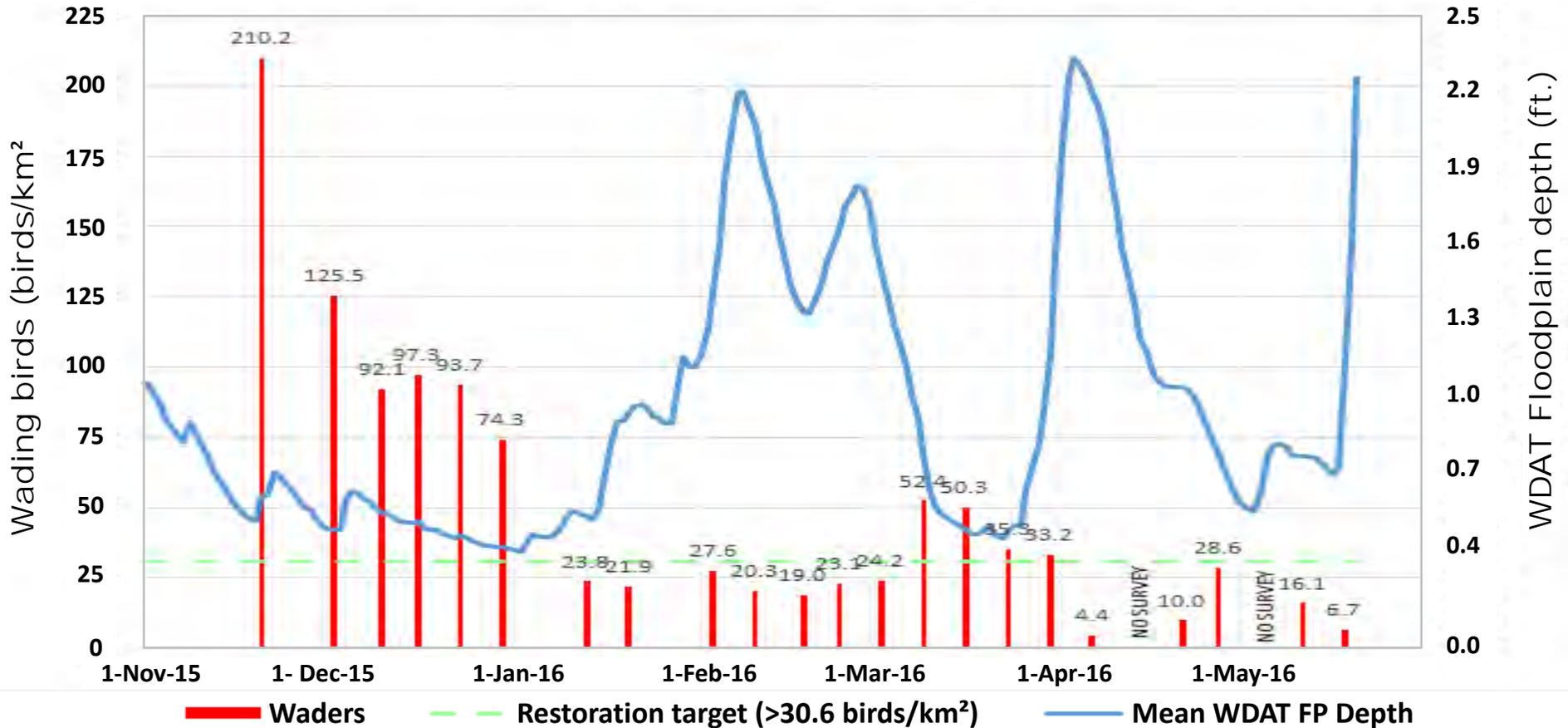
Water Resources Division Director
South Florida Water Management District

Kissimmee River Phase I Restoration Area Water Depth Maps



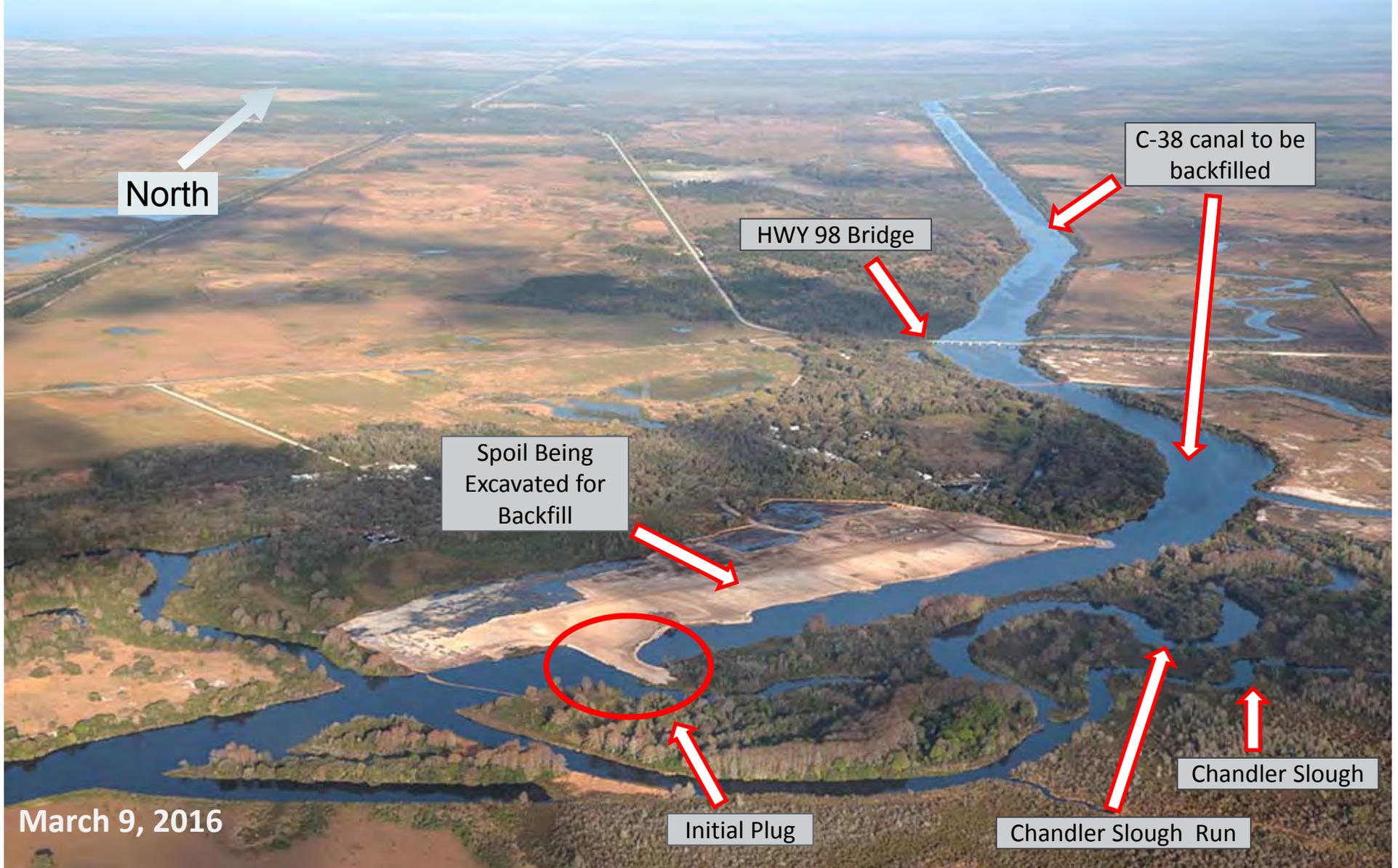
Kissimmee River Dry Season Wading Bird Abundance

Wading Bird Abundance vs. Mean Floodplain Depth Phases I, IVA, and IVB



- Stage reversals (increases in water depth) on the Kissimmee River floodplain are caused by increases in flow at S65/S65A following rainfall
- Increases in floodplain water depth affect the ability of wading birds to use floodplain habitats because they cannot forage in water that is too deep

Kissimmee River Phase/Reach 3 Restoration Area



March 9, 2016

Kissimmee River Phase/Reach 3 restoration area looking northwest. Contractors have successfully completed the initial plug of C-38 reach 3 backfill. They will now continue their way northwest backfilling the canal. Phase/Reach 3 continues upstream to HW98 bridge. Phase/Reach 2 will continue further upstream to connect with Phase/Reach 1 backfill completed in 2001



Kissimmee River Reach 3 restoration area

SOUTH FLORIDA WATER MANAGEMENT DISTRICT



North

May 18, 2016

Kissimmee River Reach 3 restoration area looking north up the C-38 where a plug is being placed at the north end of reach 3 just south of the HW98 bridge

Phase II/III Floodplain First Flood Event in 45 Years and Fish Kill



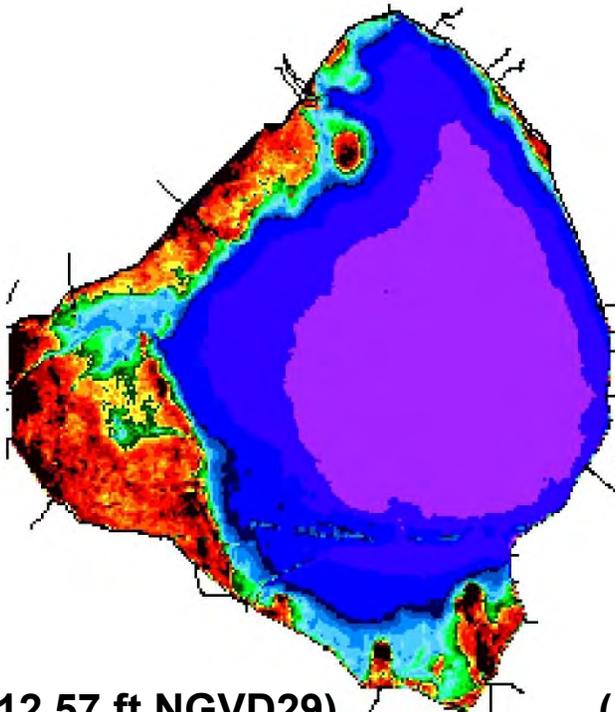
Looking across the Phase II/III floodplain on 5/25/2016

Lake Okeechobee Water Depth Maps

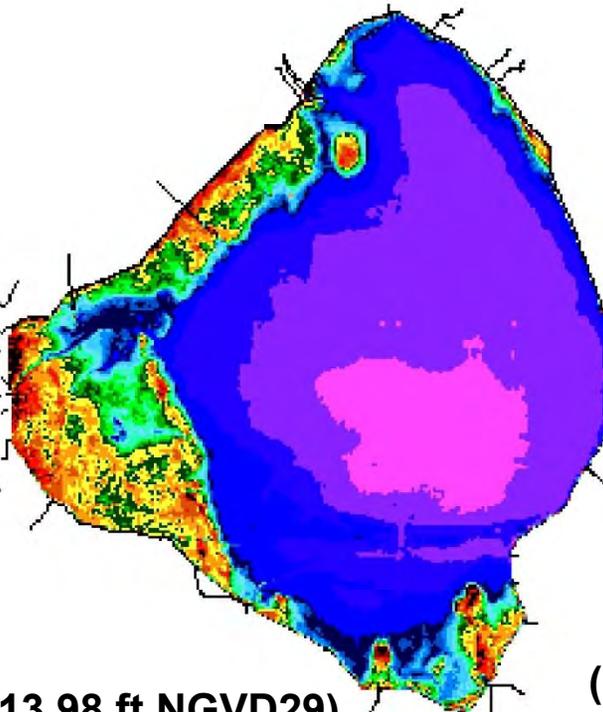
1 Year Ago: 06/06/2015

1 Month Ago: 05/07/2016

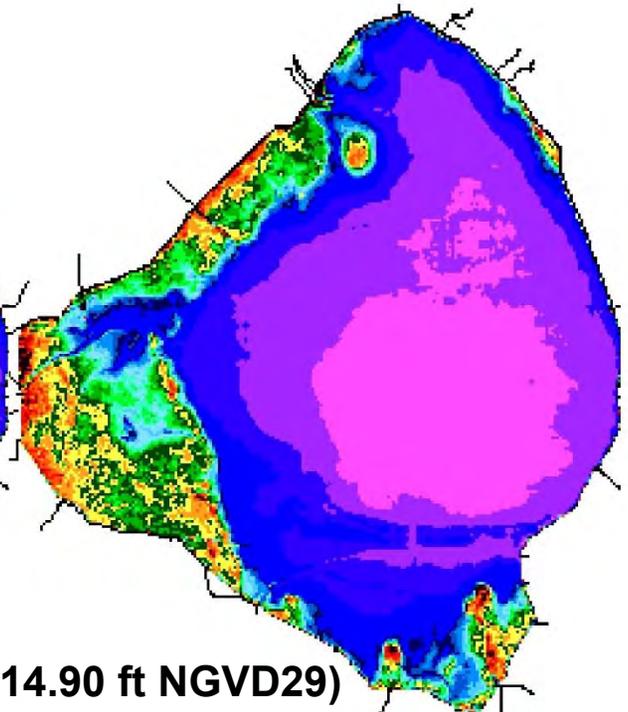
Depth Map: 06/06/2016



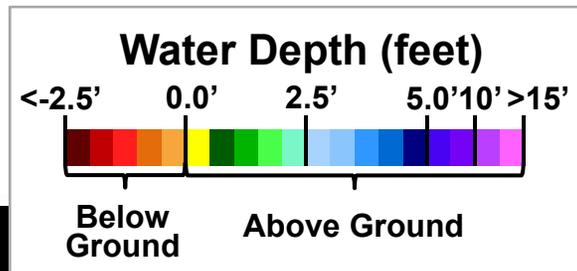
(12.57 ft NGVD29)



(13.98 ft NGVD29)

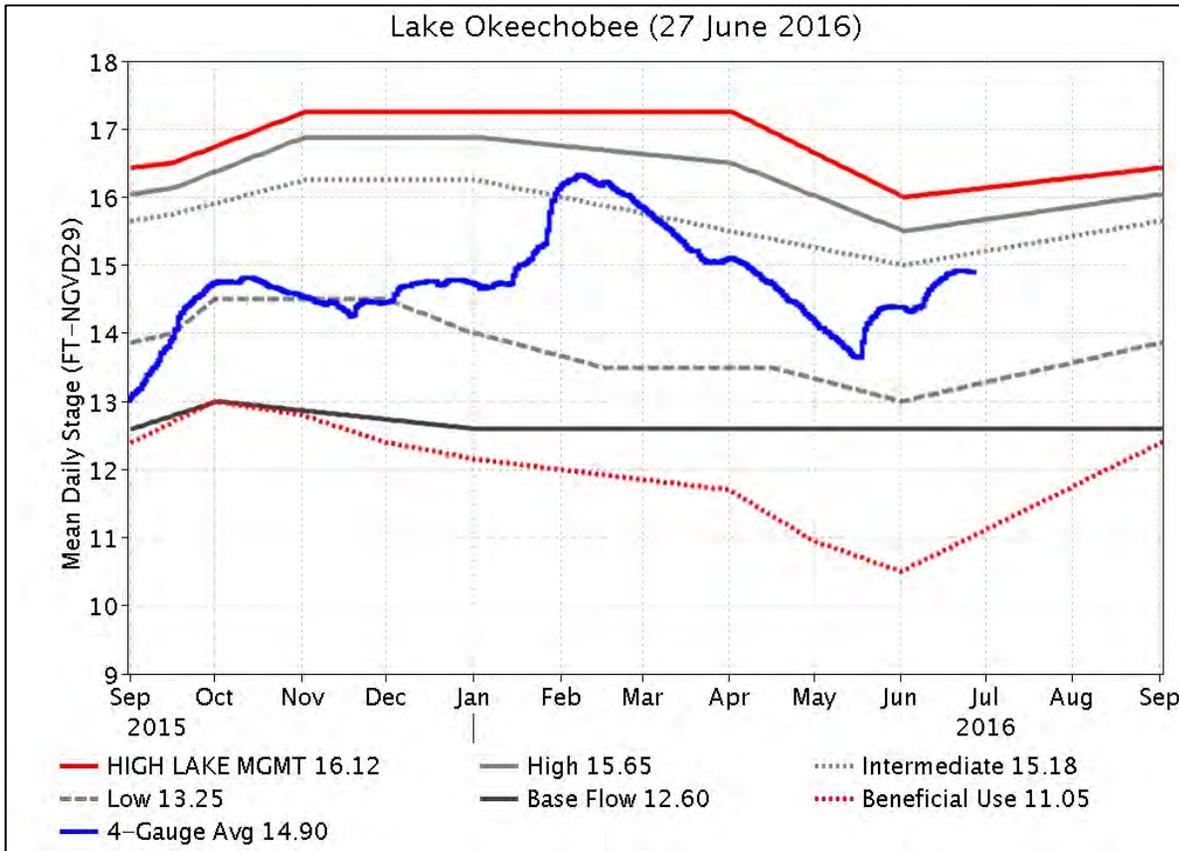


(14.90 ft NGVD29)
Current Lake Stage

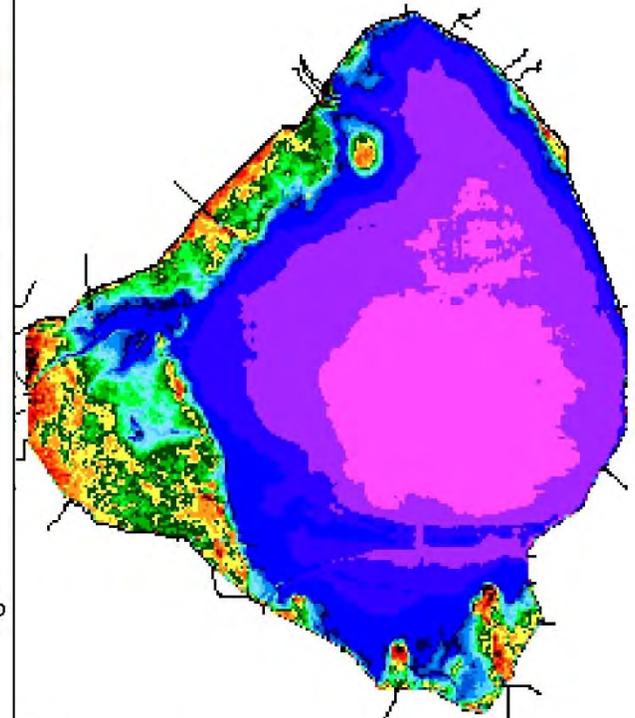


Lake Okeechobee Water Depth Maps

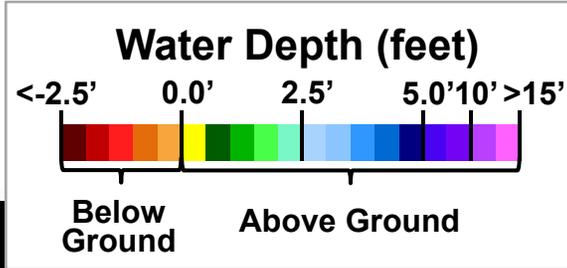
Lake Okeechobee (27 June 2016)



Depth Map: 06/06/2016



(14.90 ft NGVD29)
Current Lake Stage



Lake Okeechobee Algal Blooms

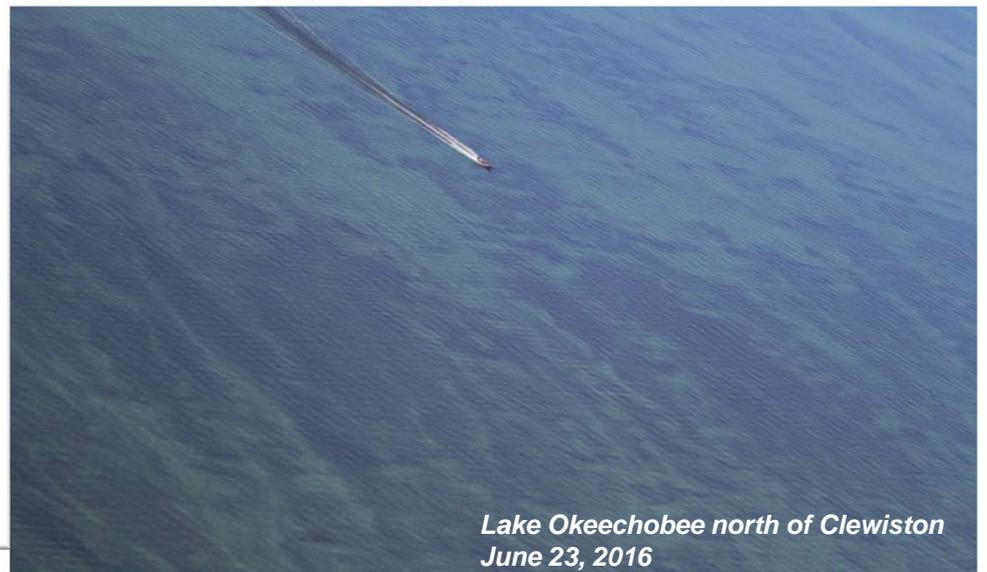
Lake Okeechobee
Algal Bloom Observed
May 9, 2016



- Large blue green algal bloom reported on May 9th
- Bloom conditions persist across the lake
- Lake Okeechobee algal blooms strongly associated with higher lake stages
- Elevated nutrient levels are principal cause of blooms, but other factors include warm temperatures & stagnant conditions



Lake Okeechobee looking south to Clewiston
May, 2016



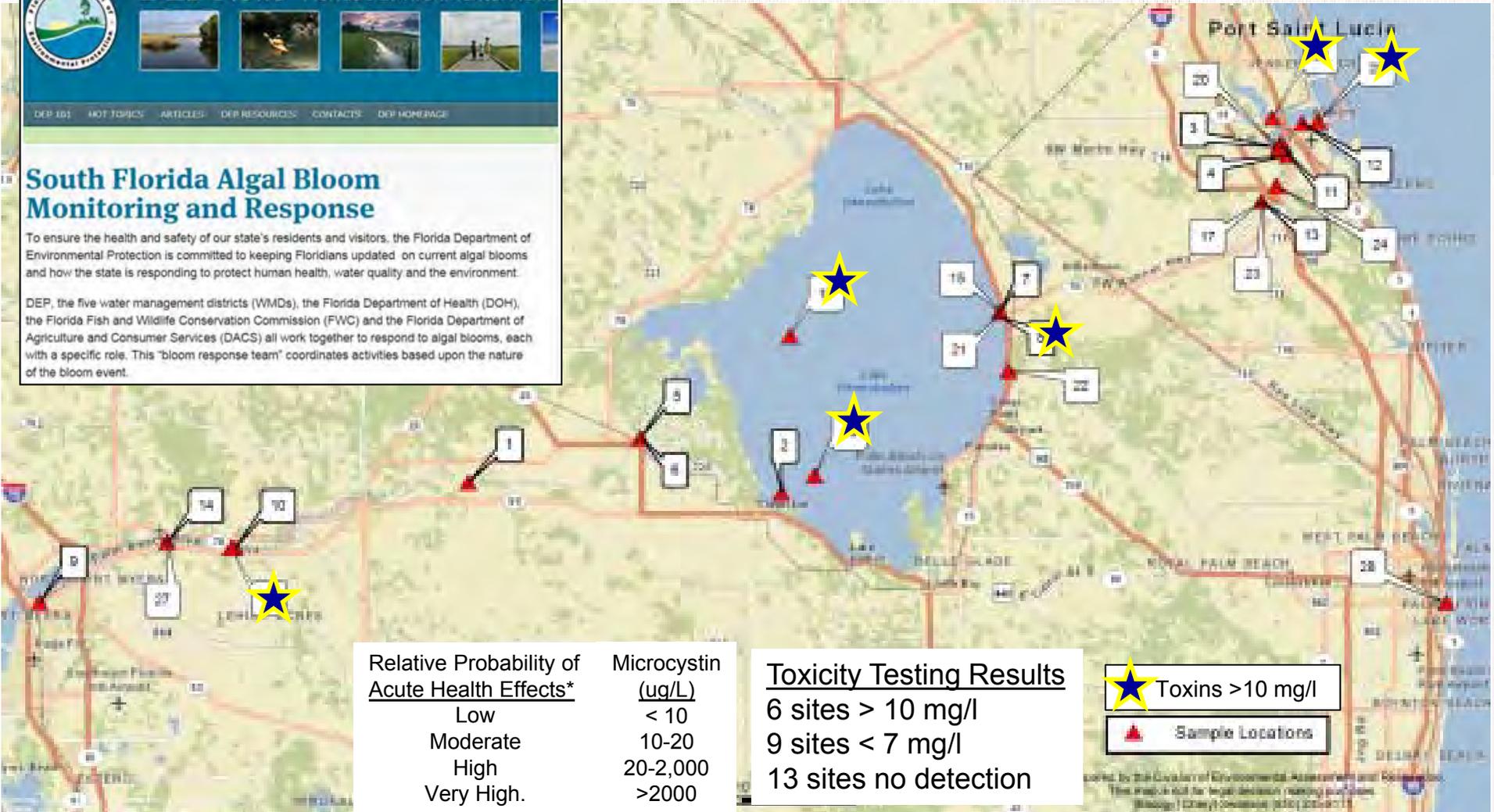
Lake Okeechobee north of Clewiston
June 23, 2016

FDEP Leading WQ Testing & Reporting

South Florida Algal Bloom Monitoring and Response

To ensure the health and safety of our state's residents and visitors, the Florida Department of Environmental Protection is committed to keeping Floridians updated on current algal blooms and how the state is responding to protect human health, water quality and the environment.

DEP, the five water management districts (WMDs), the Florida Department of Health (DOH), the Florida Fish and Wildlife Conservation Commission (FWC) and the Florida Department of Agriculture and Consumer Services (DACS) all work together to respond to algal blooms, each with a specific role. This "bloom response team" coordinates activities based upon the nature of the bloom event.



Relative Probability of Acute Health Effects*	Microcystin (ug/L)
Low	< 10
Moderate	10-20
High	20-2,000
Very High.	>2000

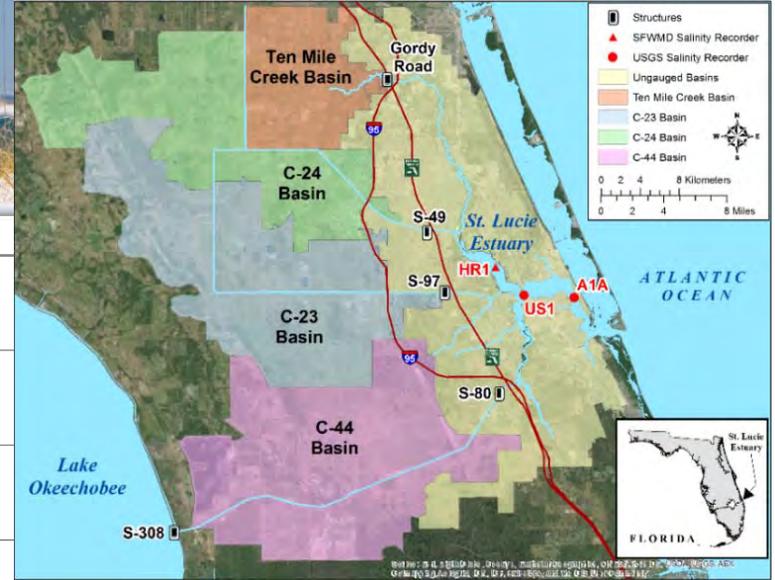
Toxicity Testing Results
 6 sites > 10 mg/l
 9 sites < 7 mg/l
 13 sites no detection

Toxins >10 mg/l

Sample Locations

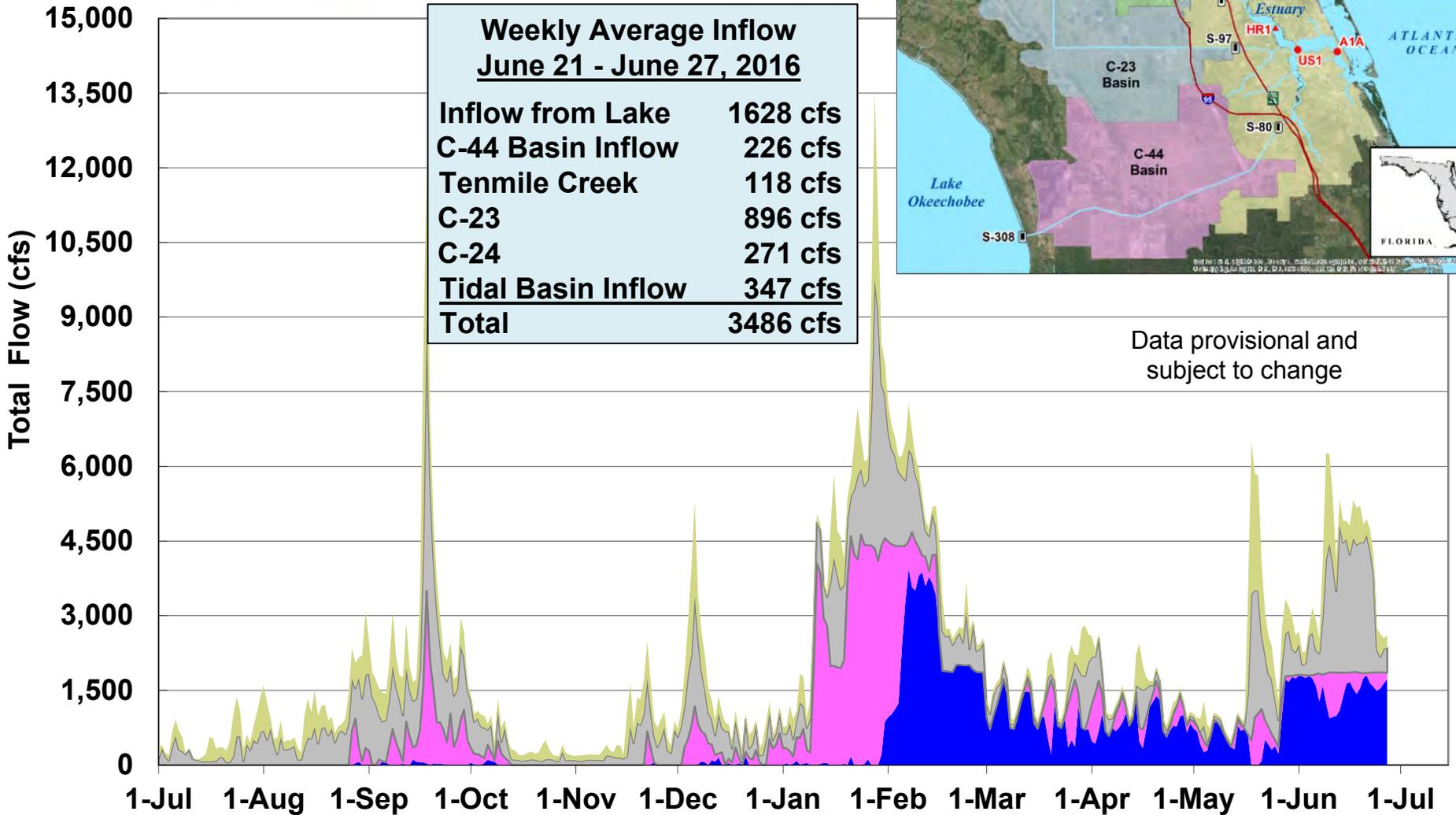
*World Health Org

St. Lucie Estuary



**Weekly Average Inflow
June 21 - June 27, 2016**

Inflow from Lake	1628 cfs
C-44 Basin Inflow	226 cfs
Tenmile Creek	118 cfs
C-23	896 cfs
C-24	271 cfs
Tidal Basin Inflow	347 cfs
Total	3486 cfs



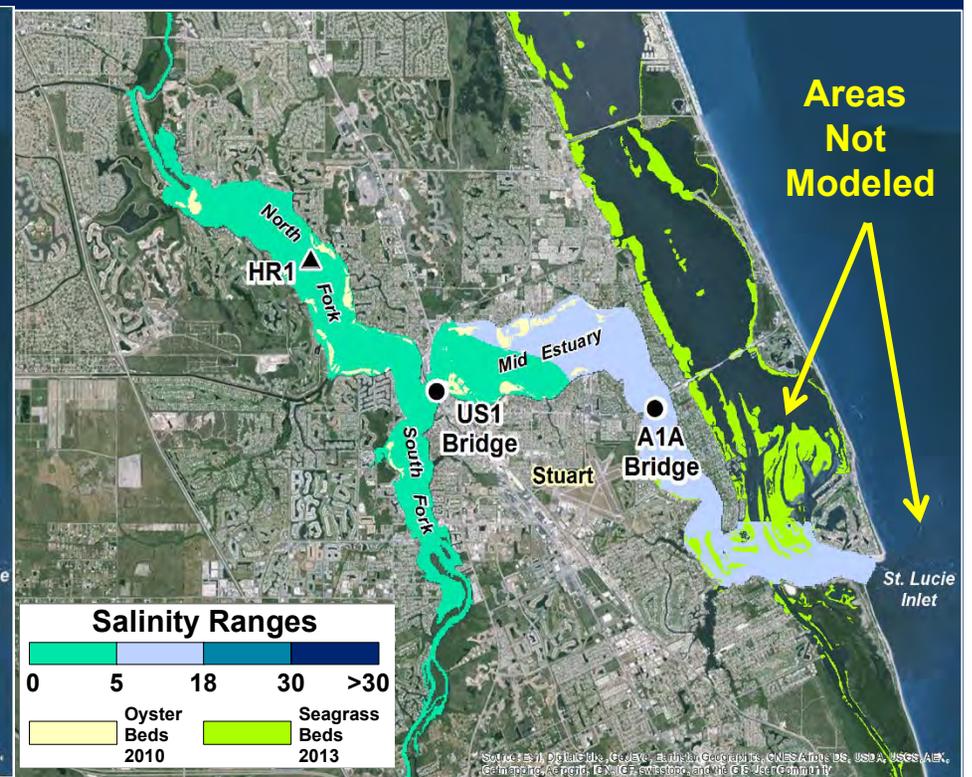
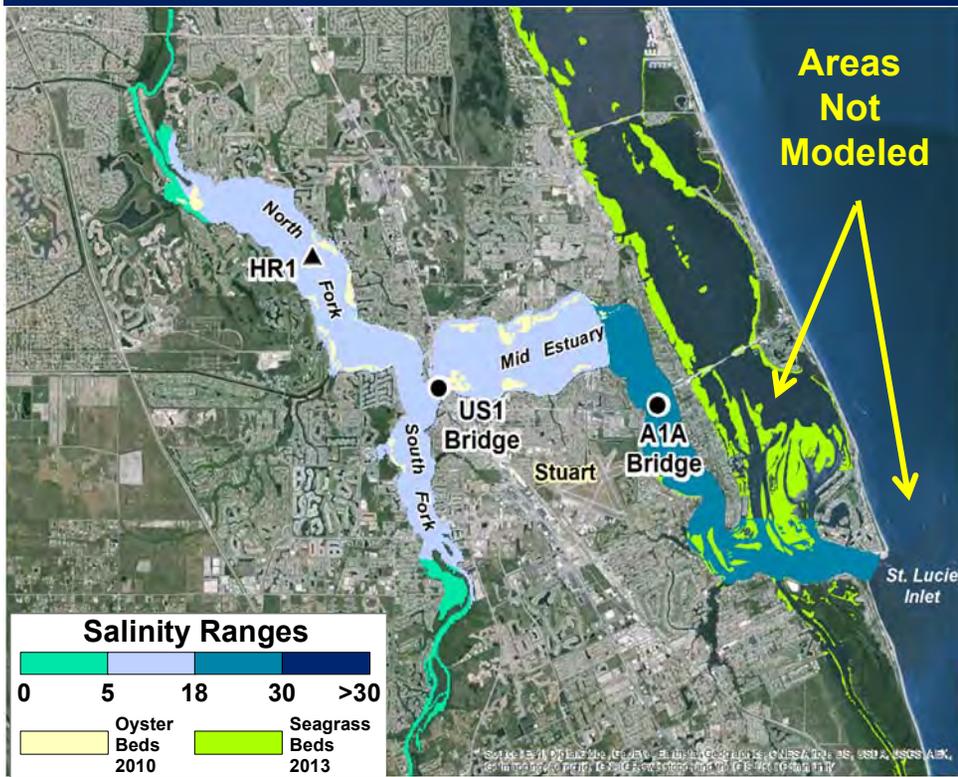
■ Inflow from Lake* (using downstream gauge)
 ■ C-44 Basin Runoff
 ■ Inflow from C-24, C-23, and Tenmile Creek
 ■ Tidal Basin Inflow

St. Lucie Estuary

Salinity Conditions

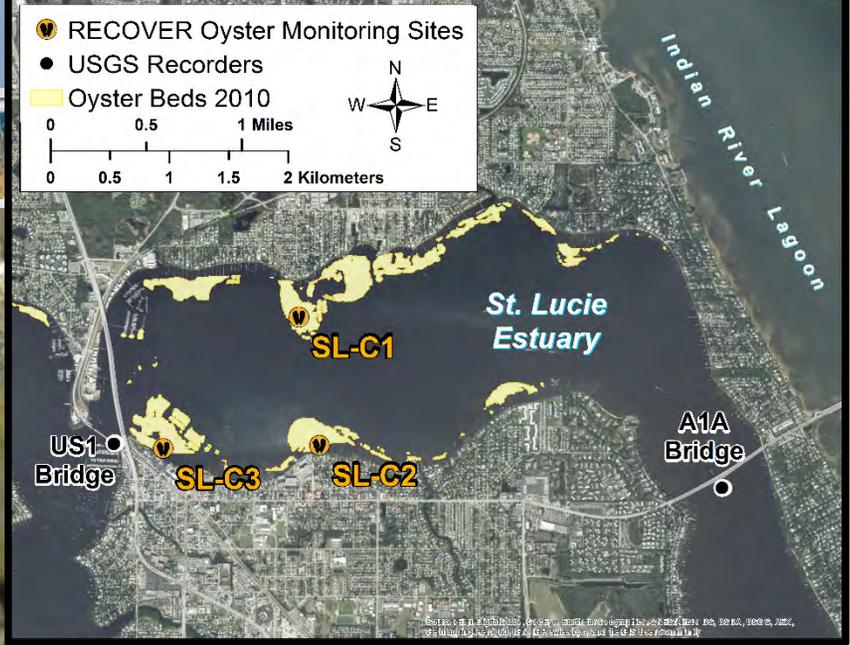
May 9, 2016

June 27, 2016

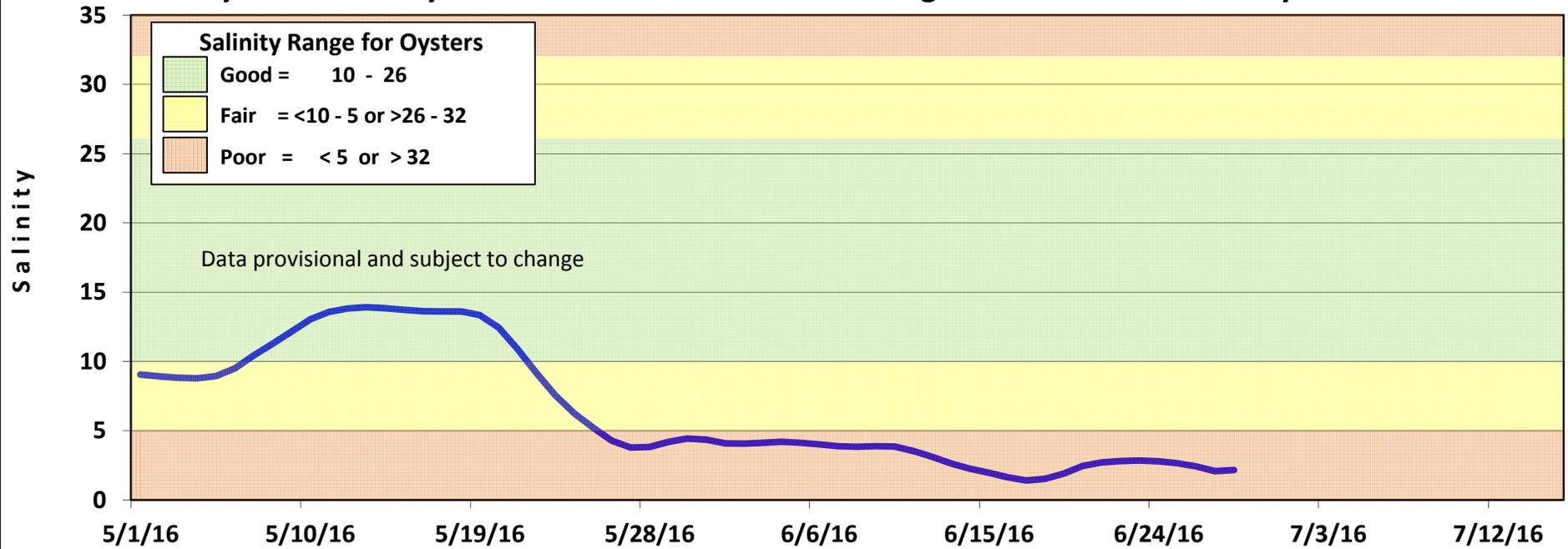


St. Lucie Estuary Salinity

Live Oysters



Seven day mean salinity of the water column at US1 Bridge in the St. Lucie Estuary



Widespread Algal Blooms in the St. Lucie Estuary



S-80 Structure
6/21/16
Source: WPTV



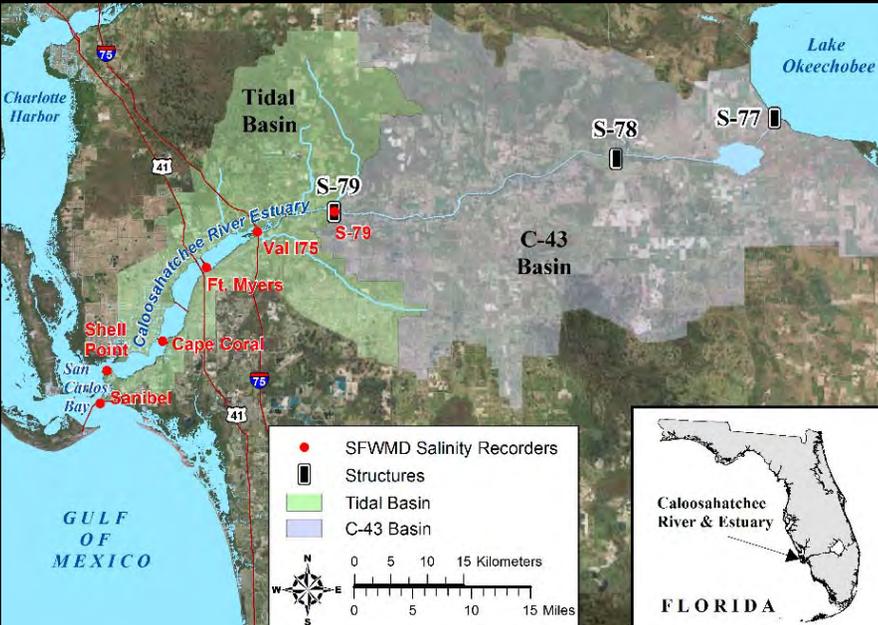
St. Lucie Estuary 6/24/16
Eric Hasert –Treasure Coast Newspapers



St. Lucie Estuary 6/24/16
Eric Hasert –Treasure Coast Newspapers

Shepherd's Park 6/1/2016
Jacqui Thurlow-Lippisch

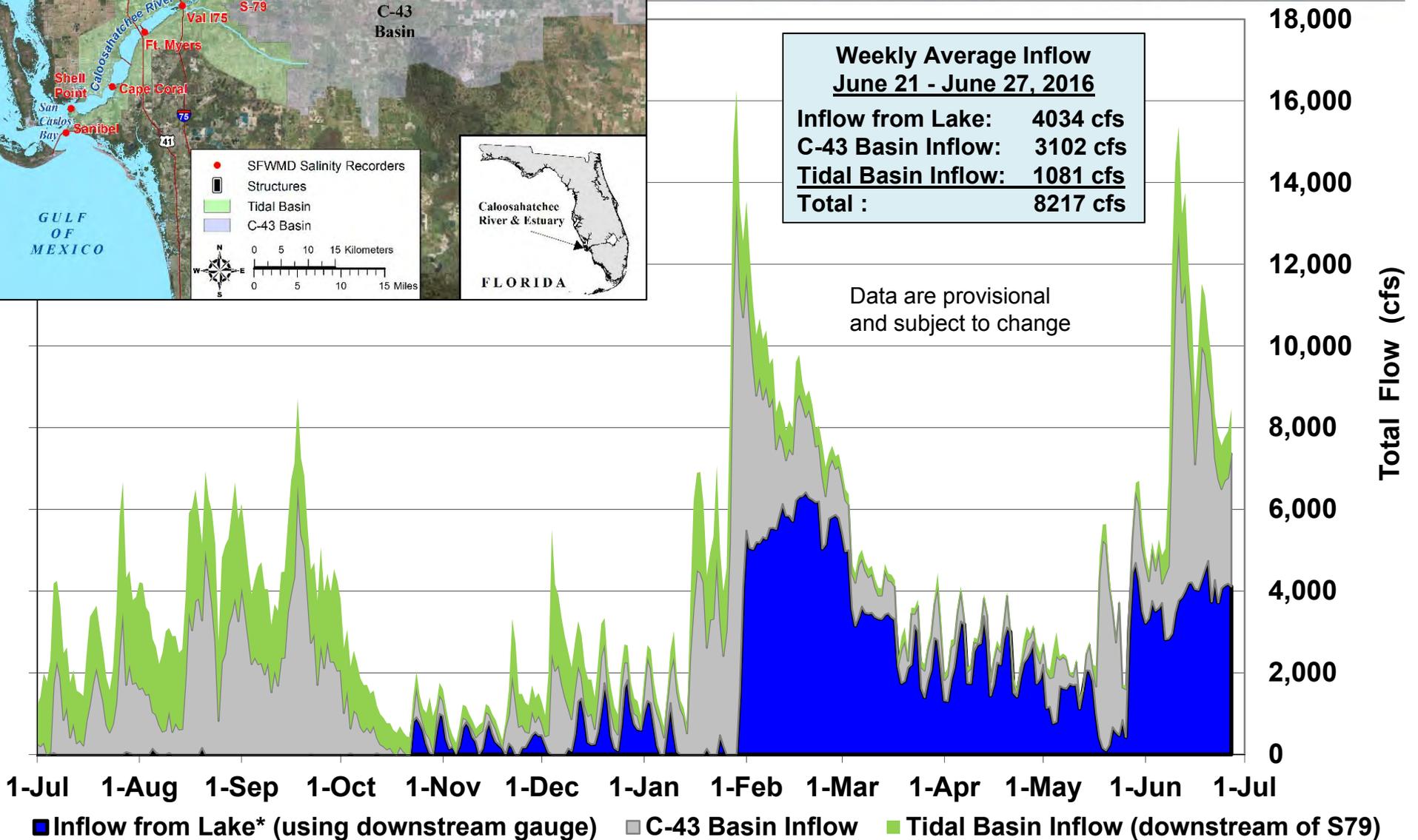
SOUTH FLORIDA WATER MANAGEMENT DISTRICT



Caloosahatchee Estuary

Weekly Average Inflow June 21 - June 27, 2016	
Inflow from Lake:	4034 cfs
C-43 Basin Inflow:	3102 cfs
Tidal Basin Inflow:	1081 cfs
Total :	8217 cfs

Data are provisional and subject to change

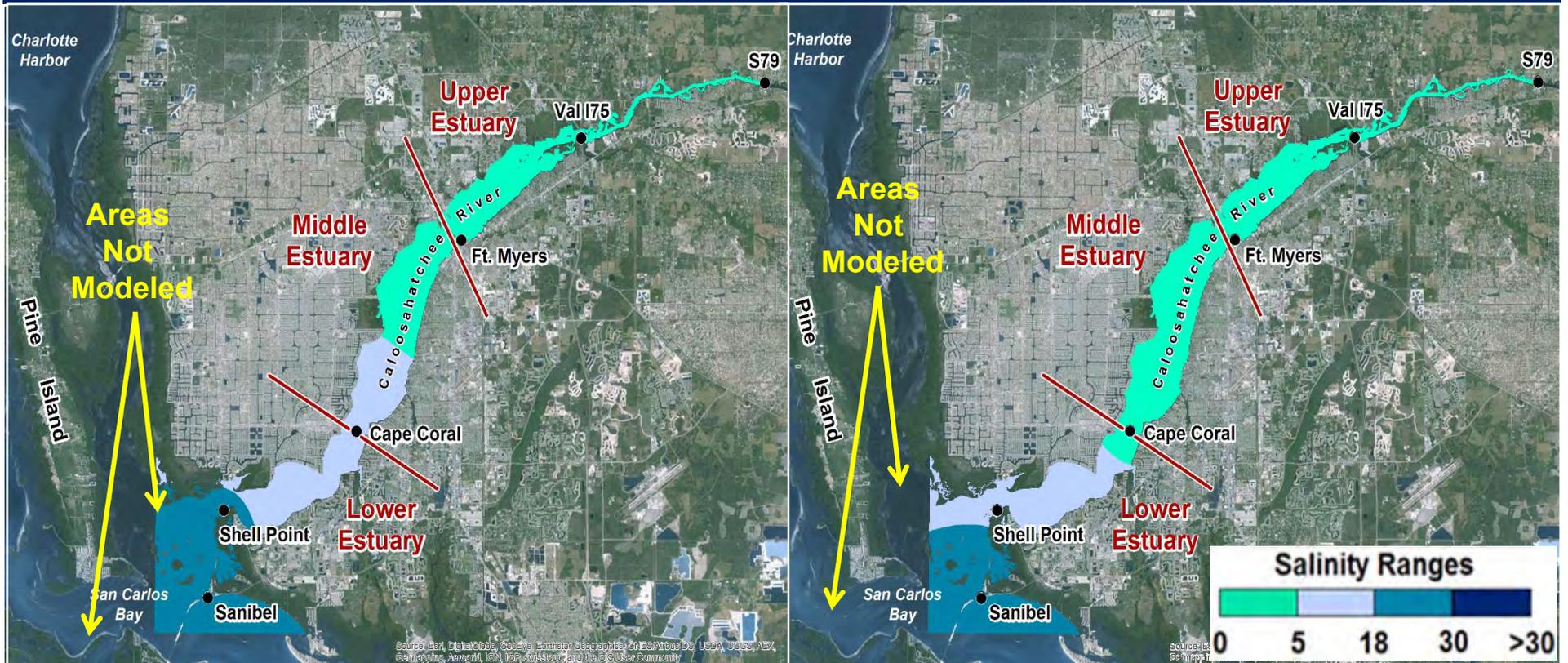


Caloosahatchee Estuary

Salinity Conditions

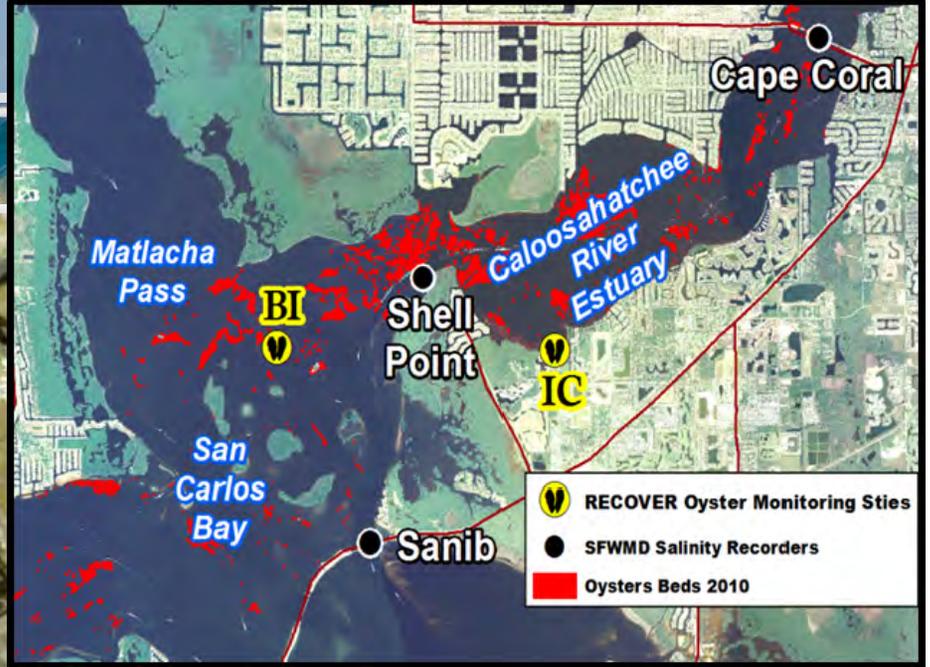
May 9, 2016

June 27, 2016

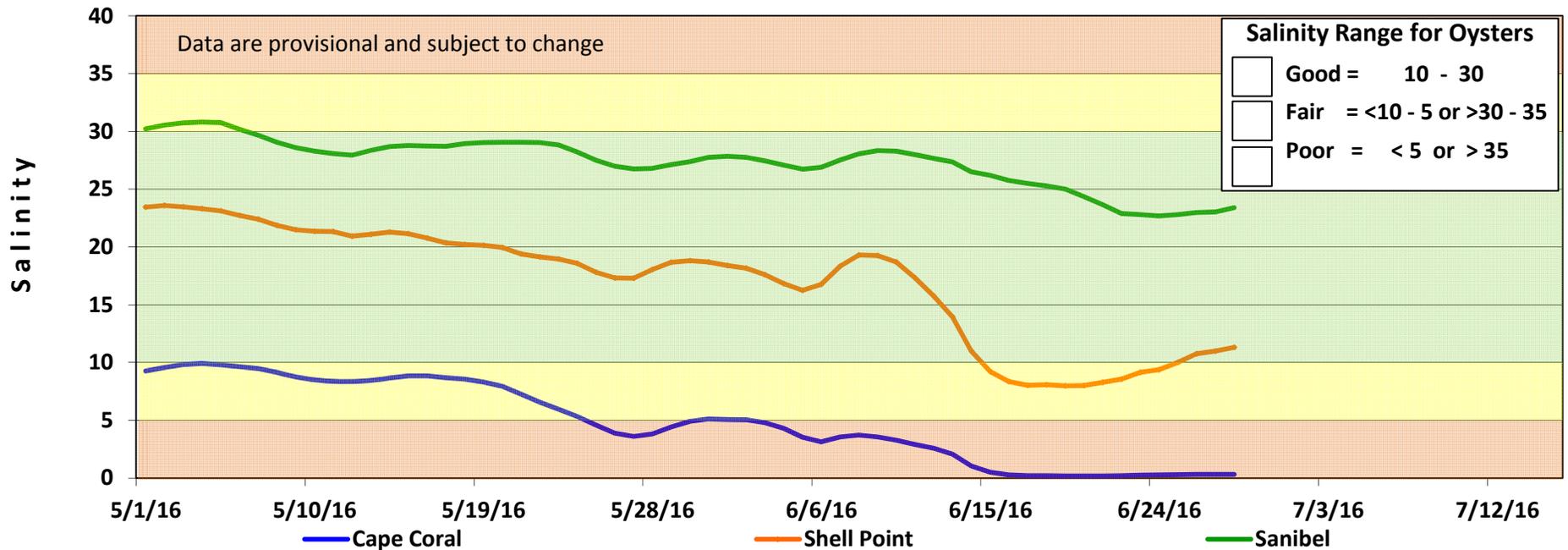


Caloosahatchee Salinity

Live Oysters



Seven day mean salinity of the water column at 3 monitoring stations in the Caloosahatchee Estuary



Stormwater Treatment Areas (STAs) Water Year 2016 Performance

Water Year 2016

5/1/15 - 4/30/16

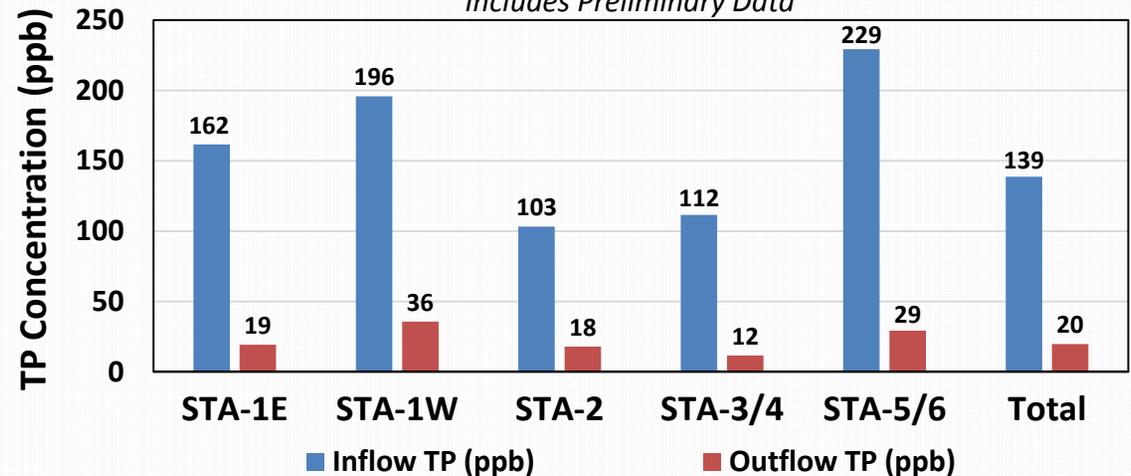
In Water Year 2016, the STAs achieved a total combined Total Phosphorus (TP) outflow of 20 ppb - despite high inflows during the dry season

	STA-1E	STA-1W	STA-2	STA-3/4	STA-5/6	Total
Inflow TP (ppb)	162	196	103	112	229	139
Outflow TP (ppb)	19	36	18	12	29	20
Inflow Vol. (ac-ft)	207,057	155,089	424,209	434,362	145,128	1,365,845

Includes preliminary data

STA Performance Summary WY2016

Includes Preliminary Data



Stormwater Treatment Areas (STAs) Flow Equalization Basin Operations

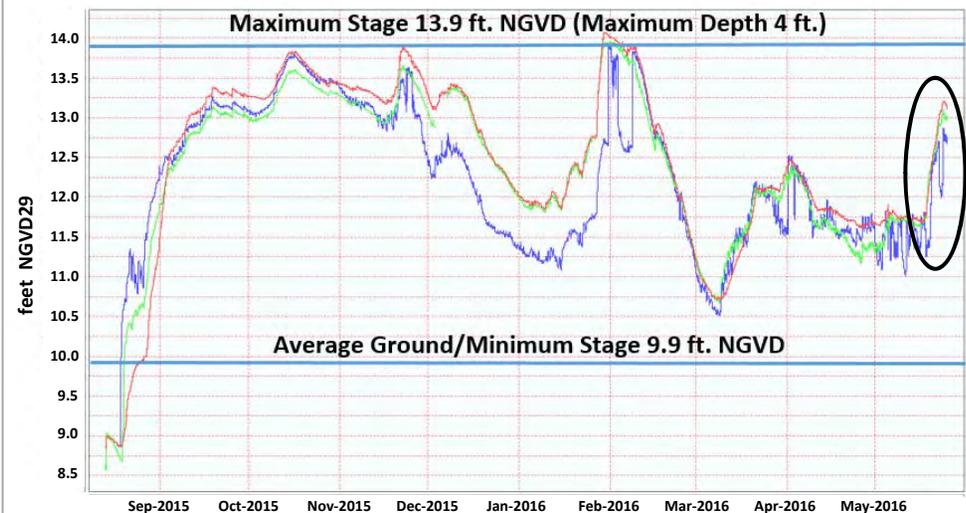
STAs received high inflow volumes in May-June

- Most cell depths are at or above target
- A-1 Flow-Equalization Basin (FEB) receiving runoff then discharging to the STAs for treatment and delivery south to the Water Conservation Areas
- A-1 FEB has been reducing TP concentrations by ~60% & TP loads to the STAs by ~80%

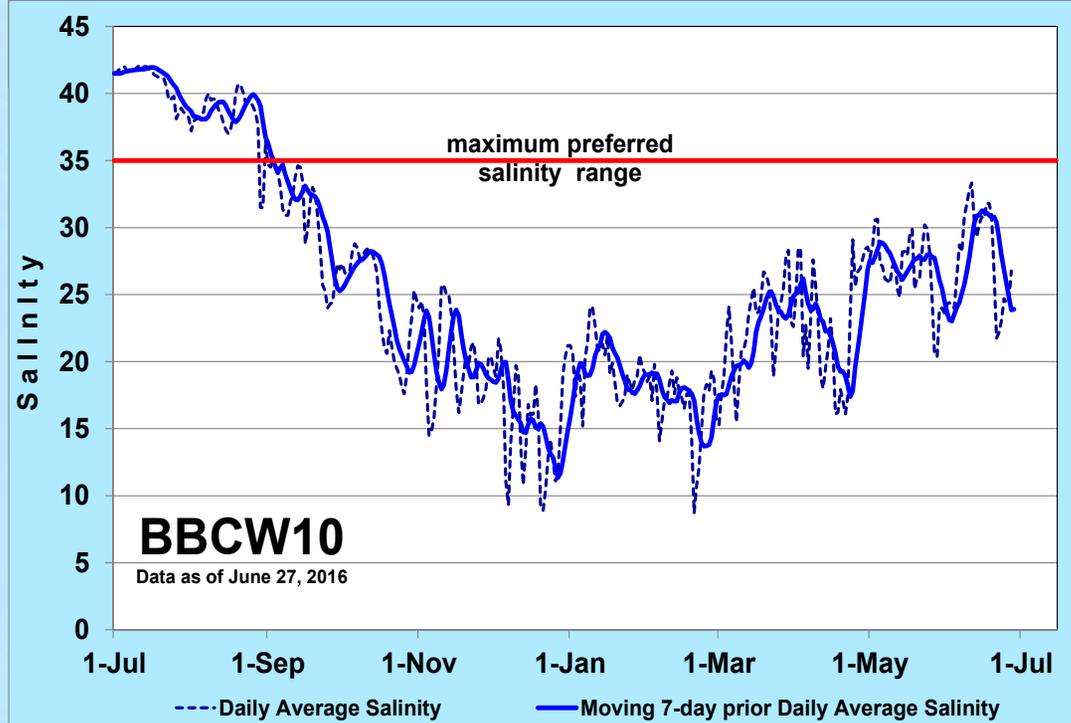
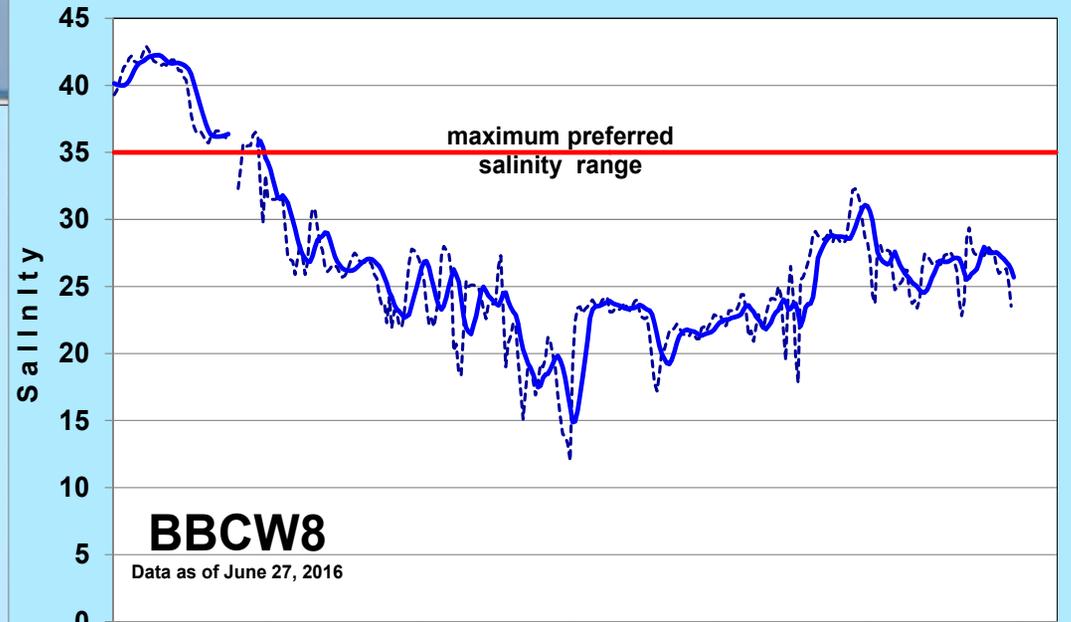
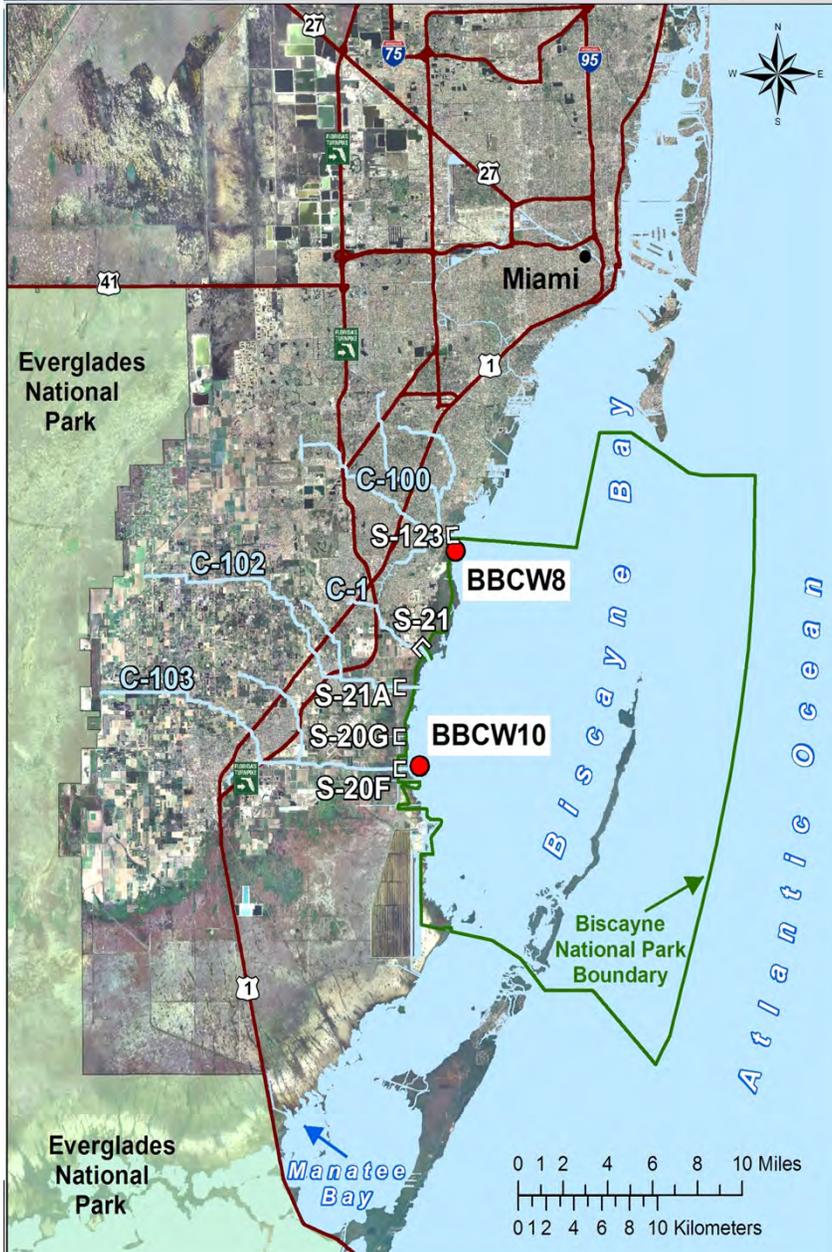
A-1 FEB Inflow Structure G-720



A-1 FEB Stage

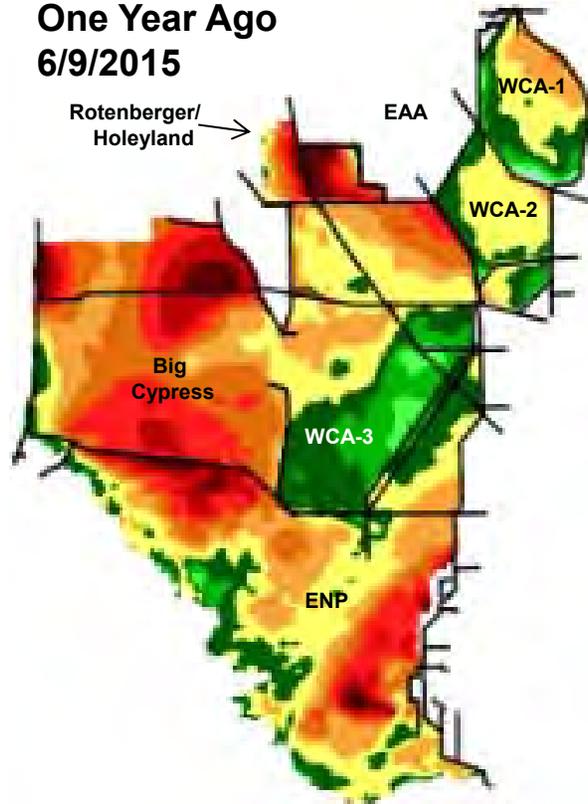


Biscayne Bay Salinity

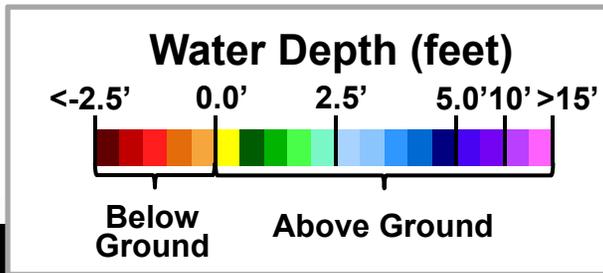
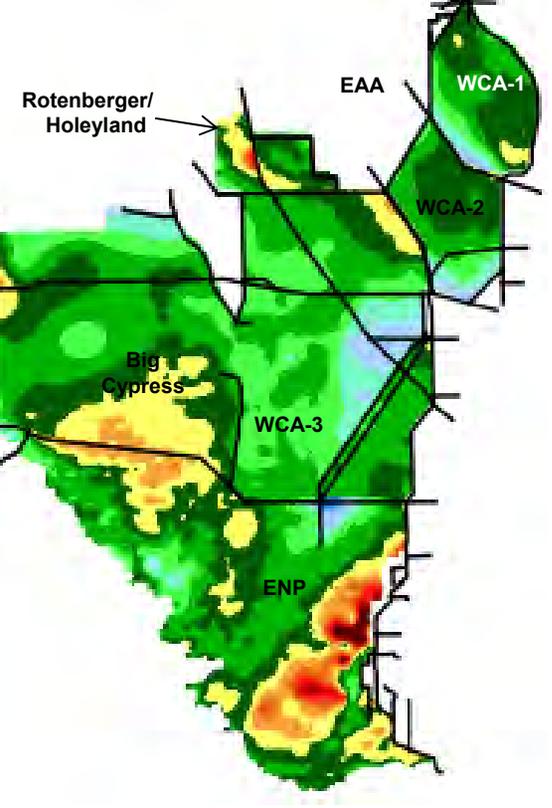
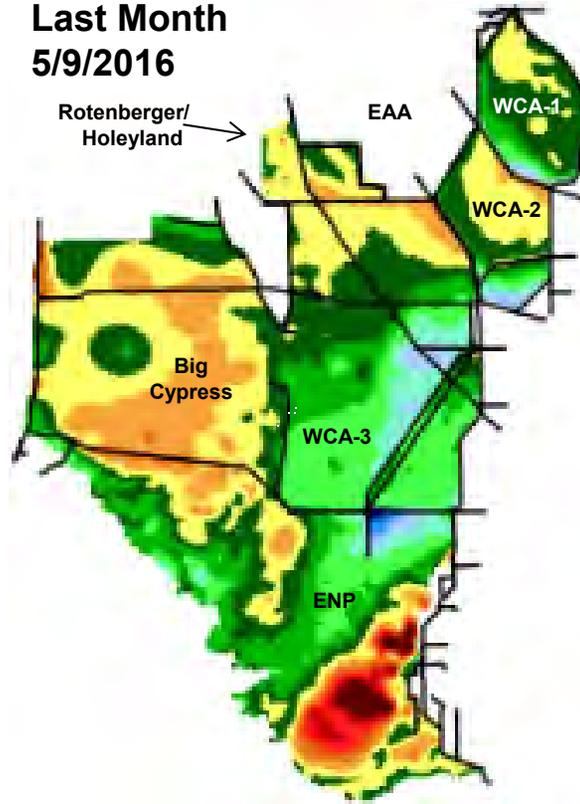


Everglades Water Depths

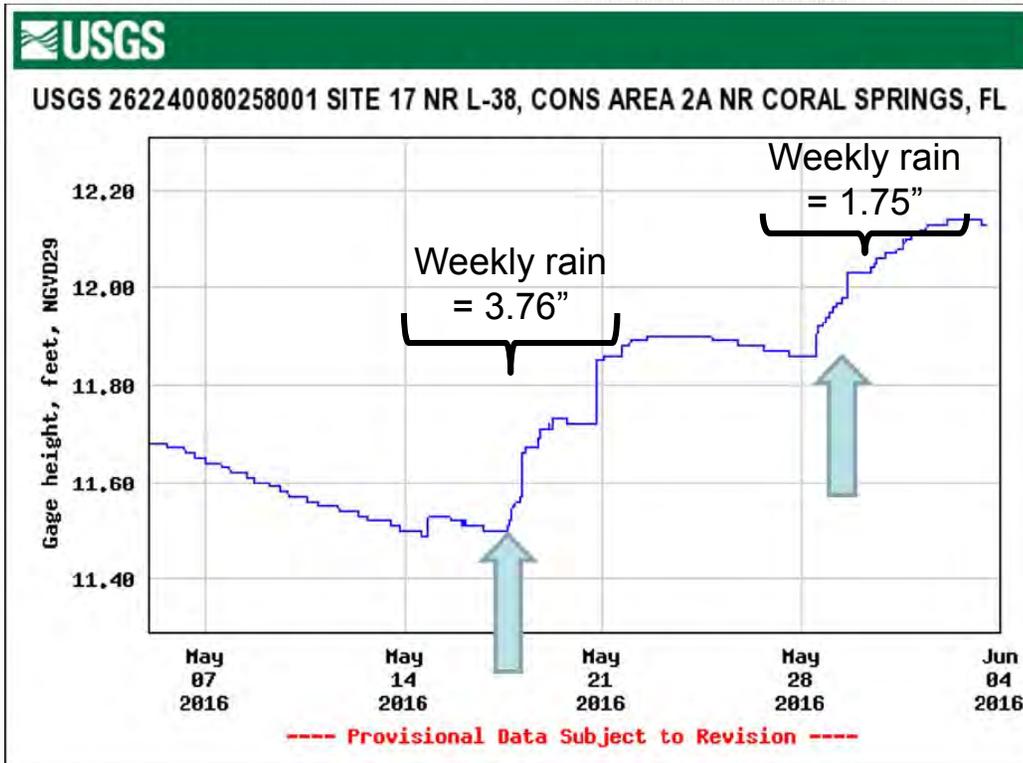
One Year Ago
6/9/2015



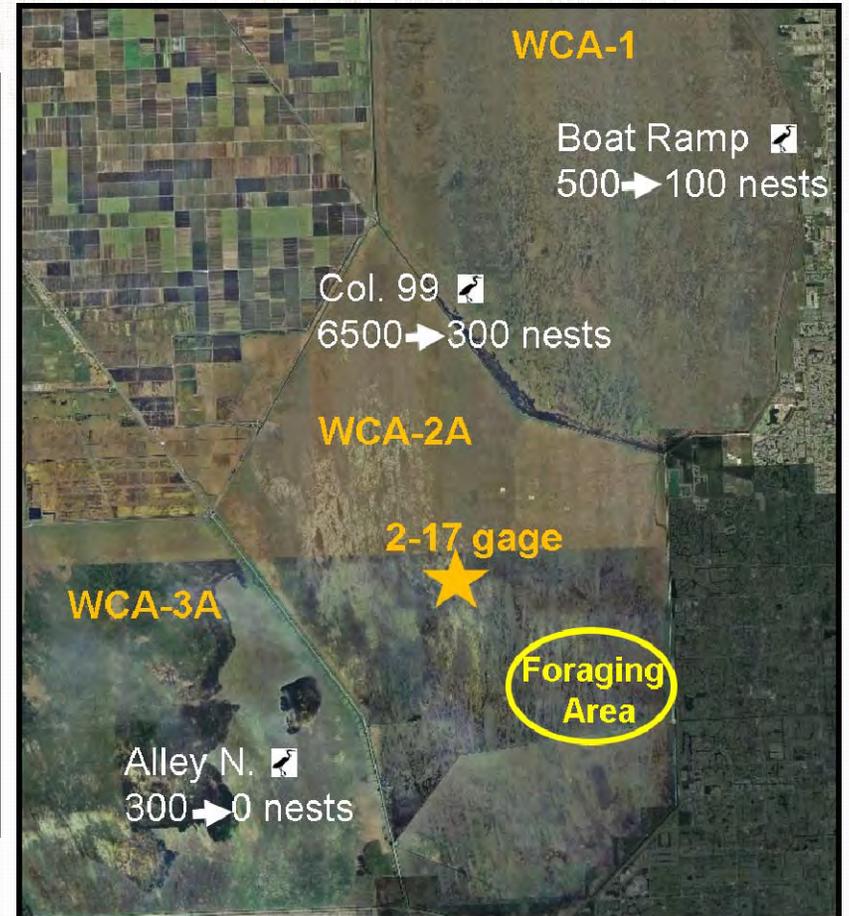
Last Month
5/9/2016



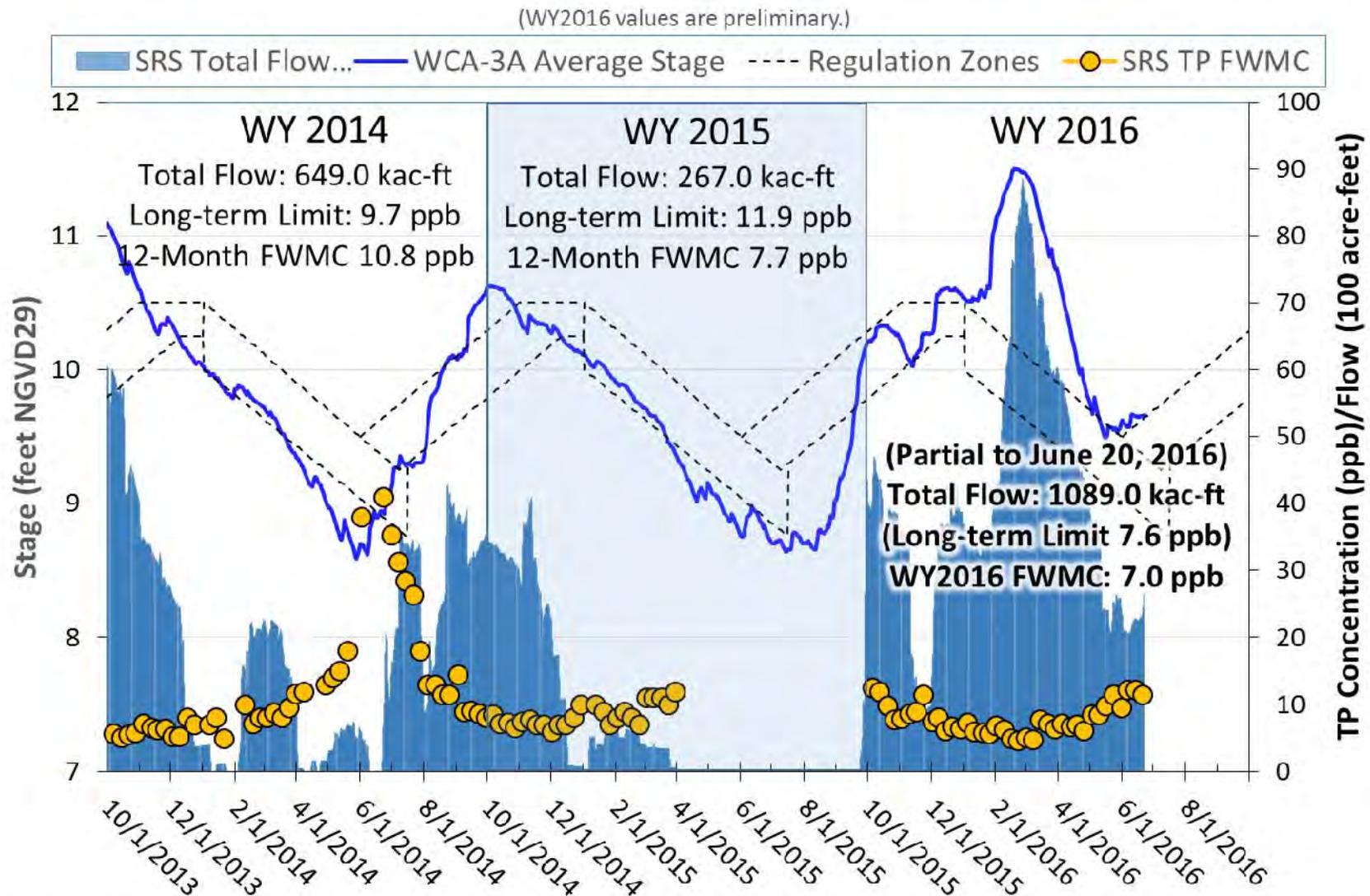
White Ibis Nest Failure



4-8000 foraging birds 0 foraging birds



Water Level, Flow & Total Phosphorus Trends Shark River Slough Water Years 2014 – 2016



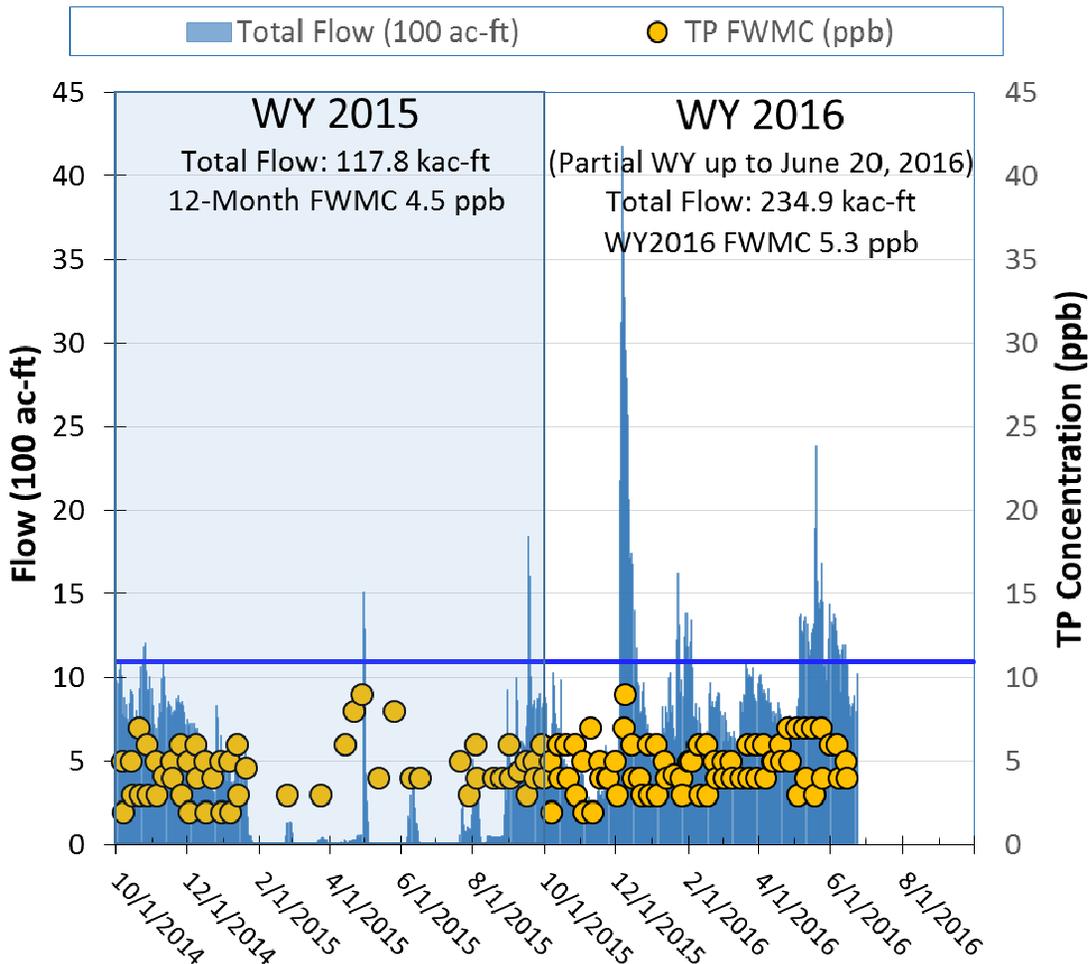
Kac-ft = Acre-feet x 1000

WY2016 Provisional data included – Subject to change

Taylor Slough/Coastal Basins

Flow and TP Trends WY2015 – WY2016

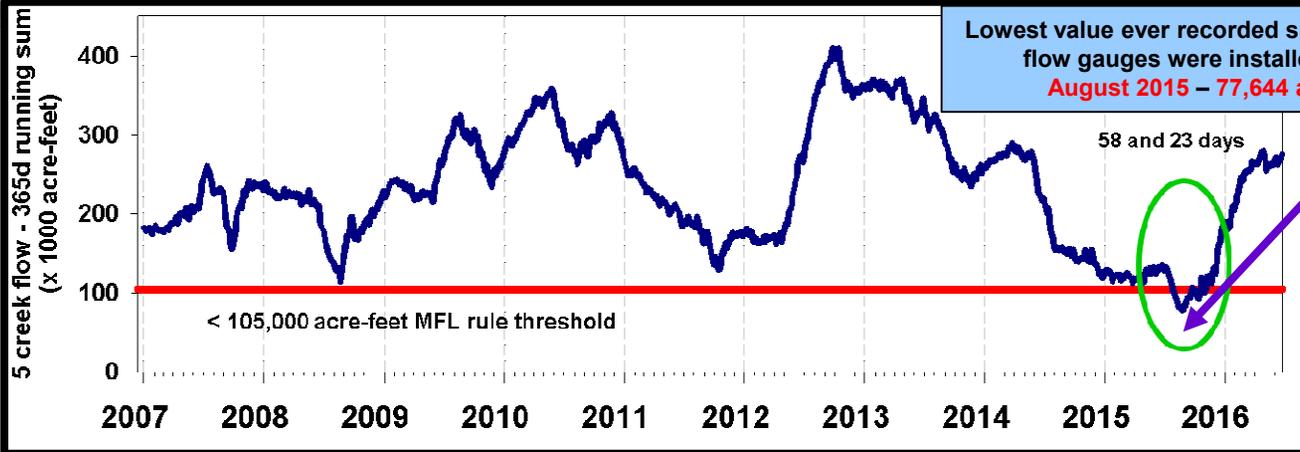
Flow and TP Flow-weighted Mean Concentration to Taylor Slough and Coastal Basins



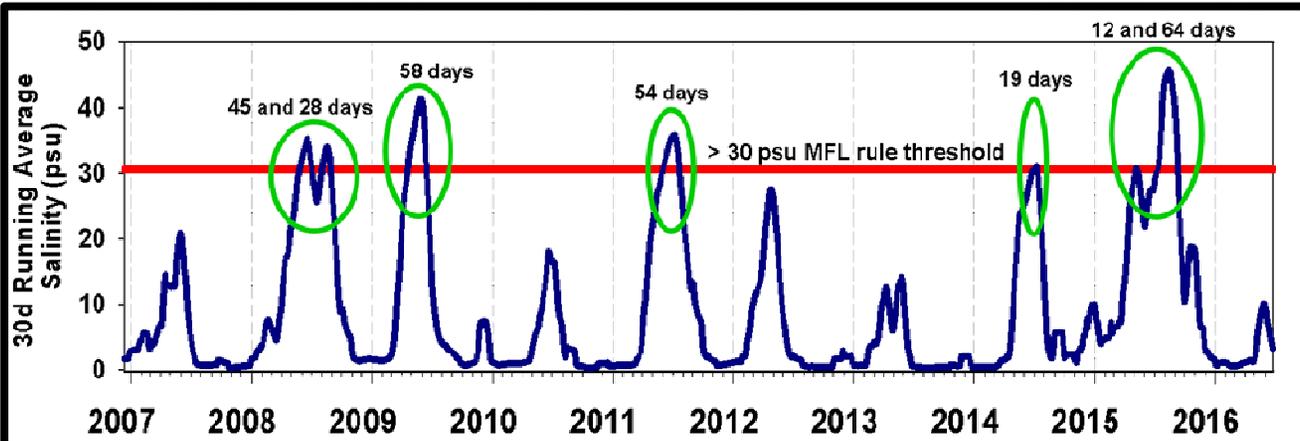
- Consent Decree compliance for Taylor Slough and Coastal Basins based on annual flow-weighted mean Total Phosphorus concentration
- TP limit fixed at 11 ppb
- TP concentrations appear to be on trajectory for 5 - 6 ppb
- Federal WY2016 ends September 30, 2016 (three months remain in compliance period)

WY2016 Provisional data included – Subject to change
 1 ppb = 1 µg/L = 0.001 mg/L
 ac-ft = acre-feet, 1 kac-ft = 1,000 ac-ft

Minimum Flow & Level Thresholds for Florida Bay

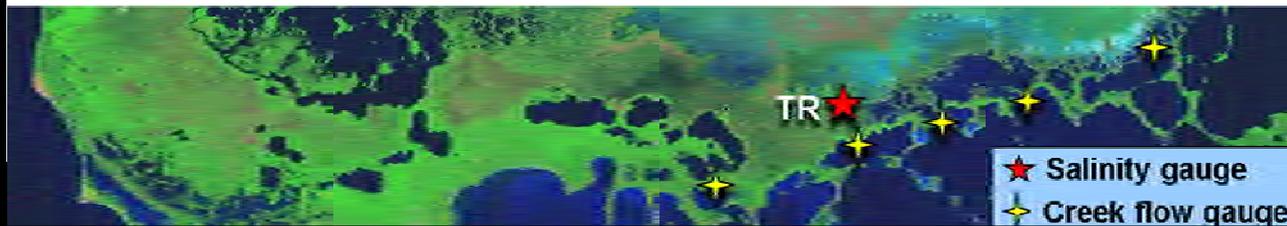


Minimum Flow
105,000 ac-ft
365 day running
sum of 5 creeks

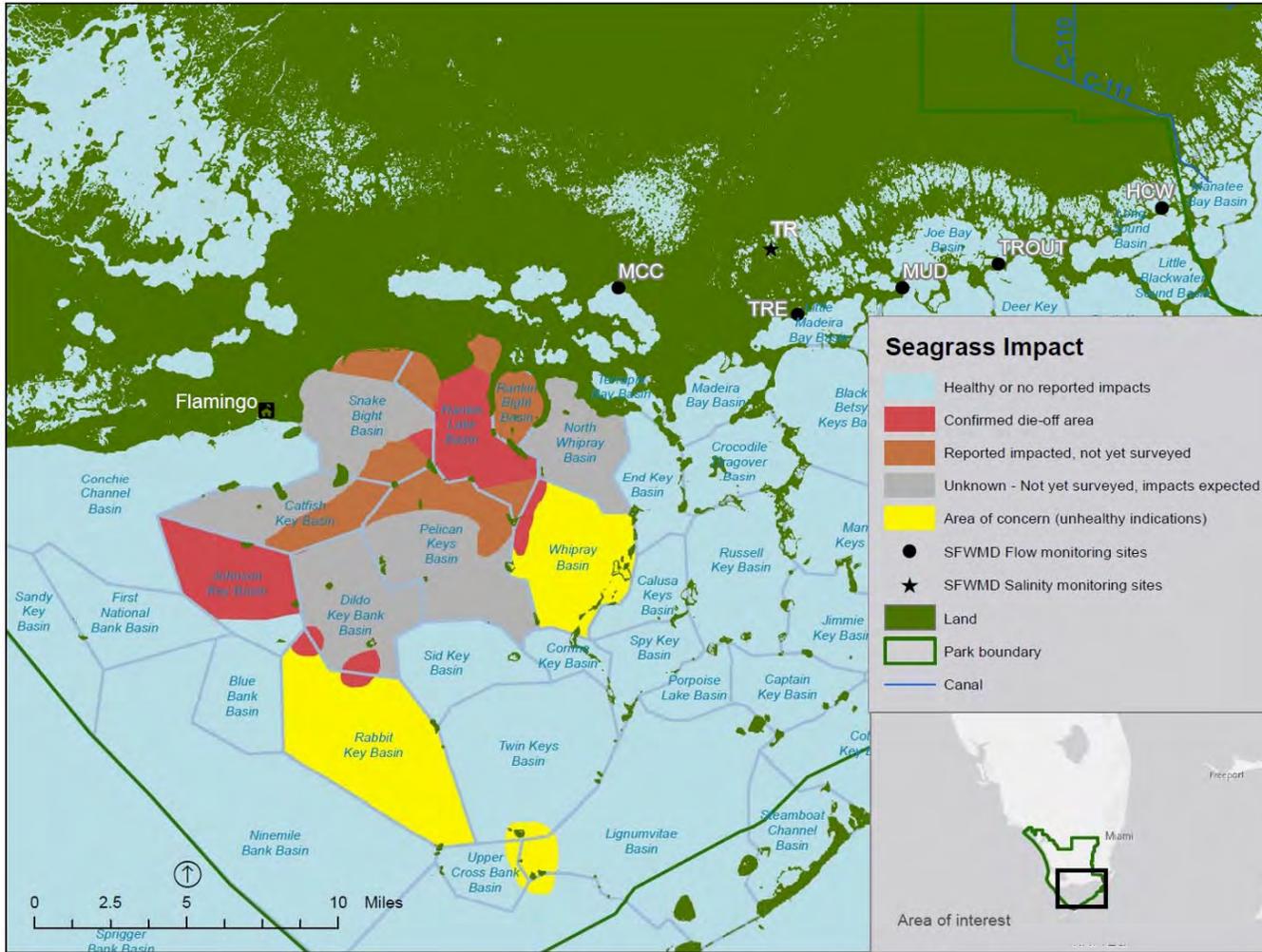


MFL “exceedance”
when 30-day
running average
salinity is > 30 psu

“Violation” occurs with
exceedances during
each of two consecutive
years, more often than
once in a ten-year
period



Florida Bay Seagrass Die-off



- Localized drought conditions May 2014 through August 2015
- Reduced rainfall & freshwater inflows, extremes in salinity and temperature
- Die-off of seagrass within estimated 40,000 acres are in central Florida Bay

Questions?

