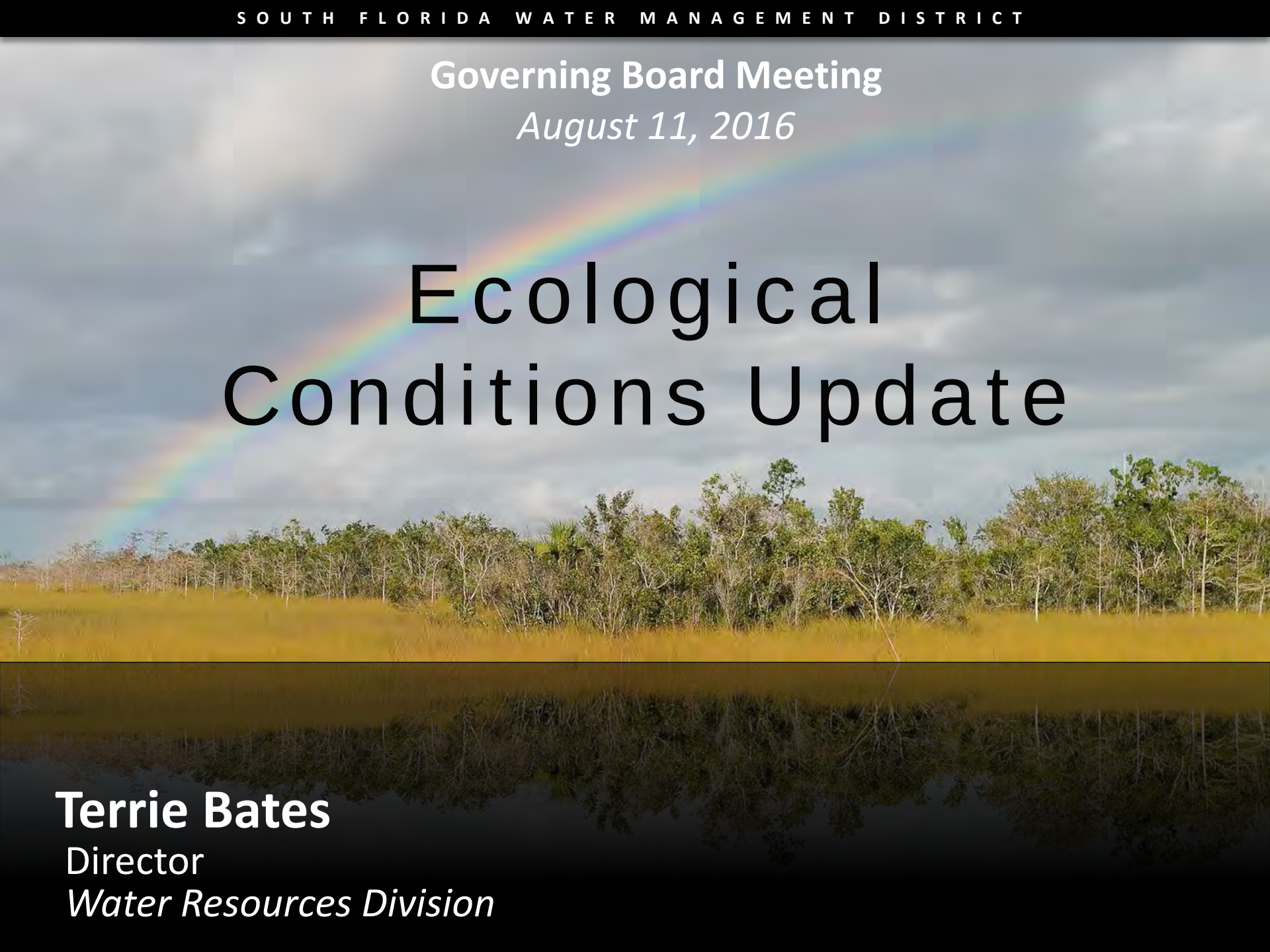
Governing Board Meeting

August 11, 2016

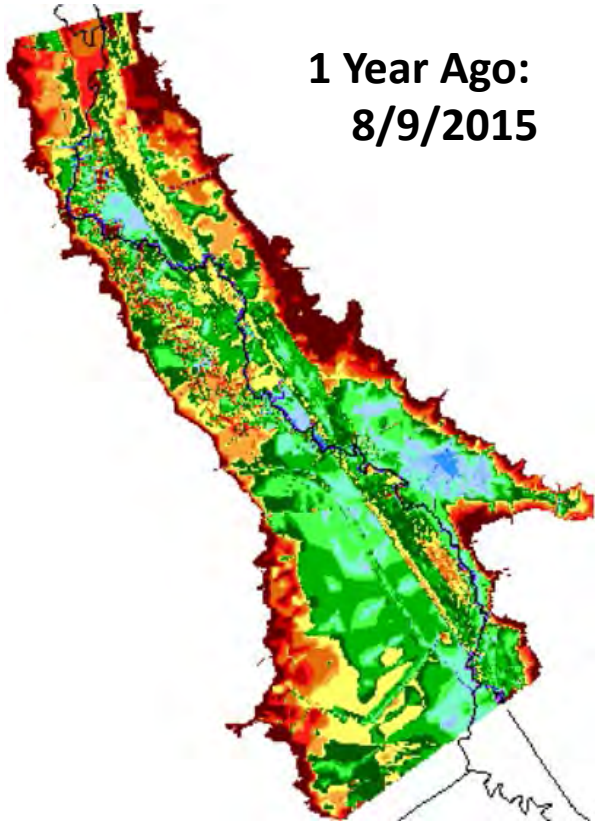
Ecological Conditions Update



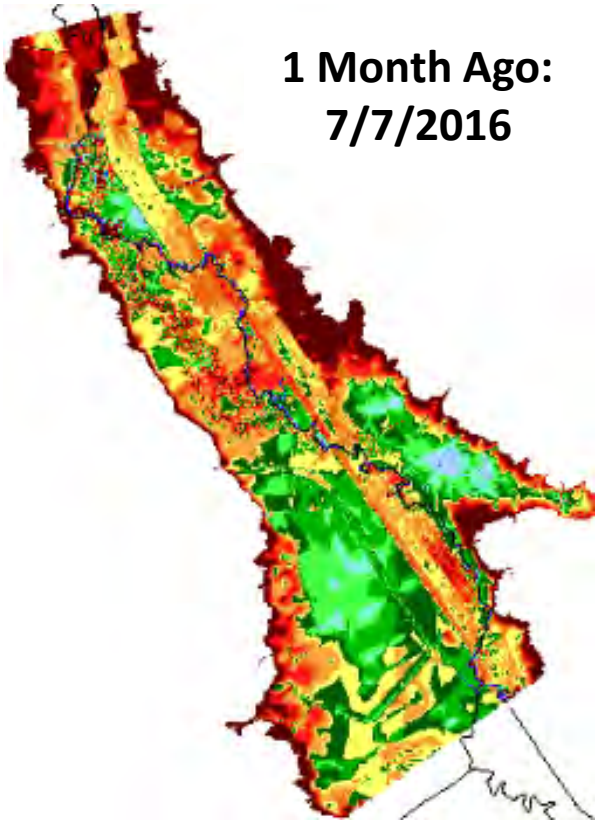
Terrie Bates
Director
Water Resources Division

Kissimmee River Phase I Restoration Area Water Depth Maps

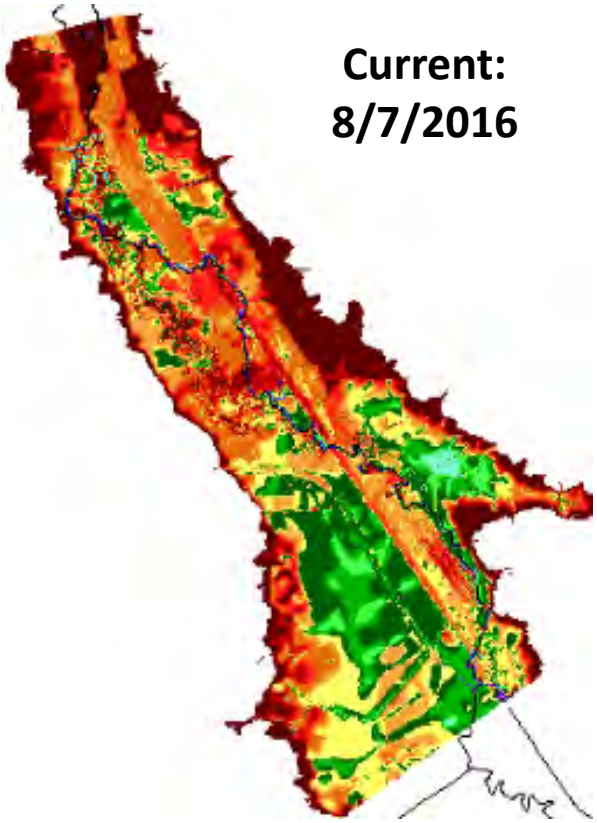
1 Year Ago: 8/9/2015

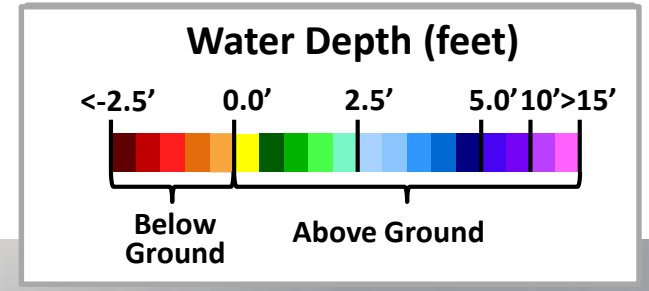


1 Month Ago: 7/7/2016



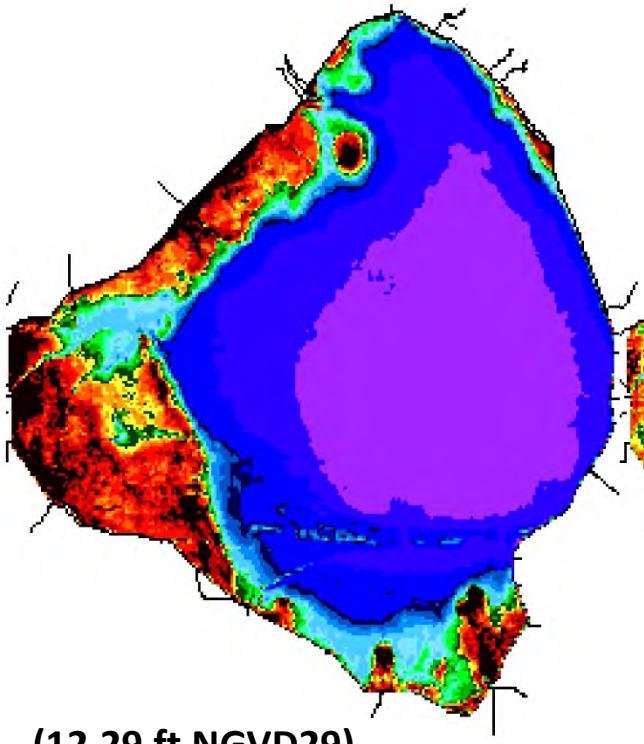
Current: 8/7/2016





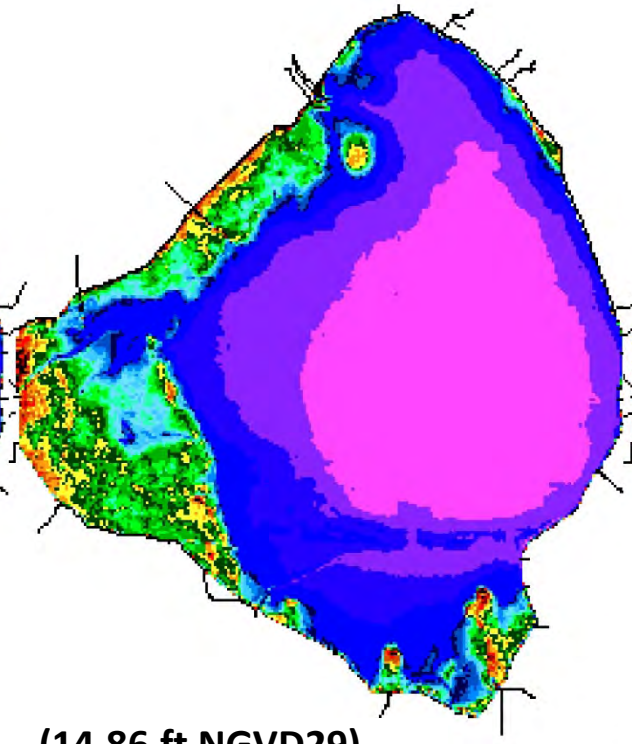
Lake Okeechobee
Water Depth Maps

1 Year Ago: 08/08/2015



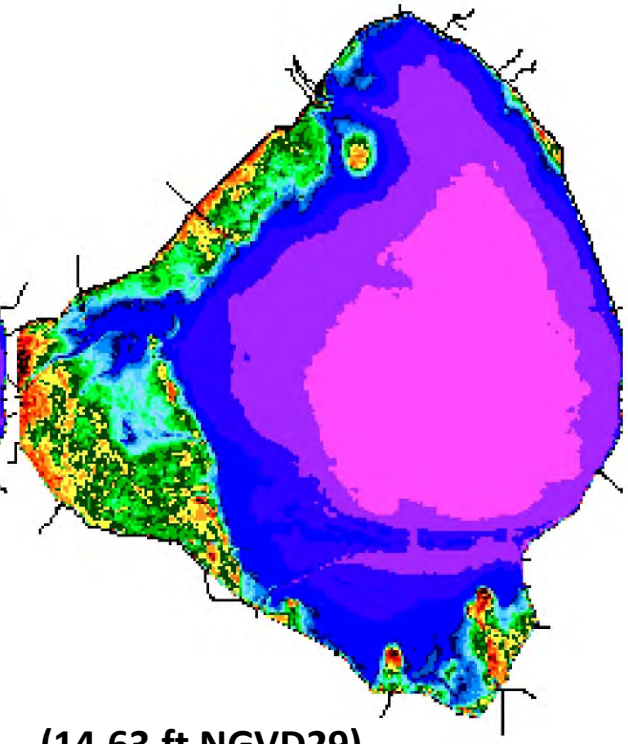
(12.29 ft NGVD29)

1 Month Ago: 07/09/2016

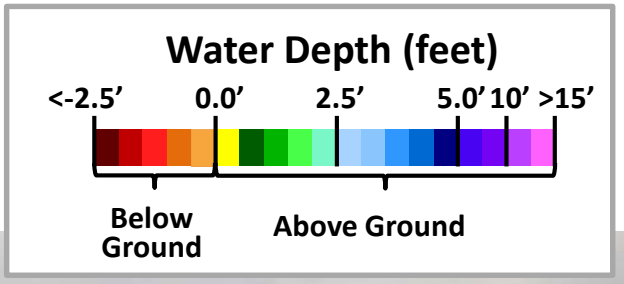


(14.86 ft NGVD29)

Current: 08/08/2016



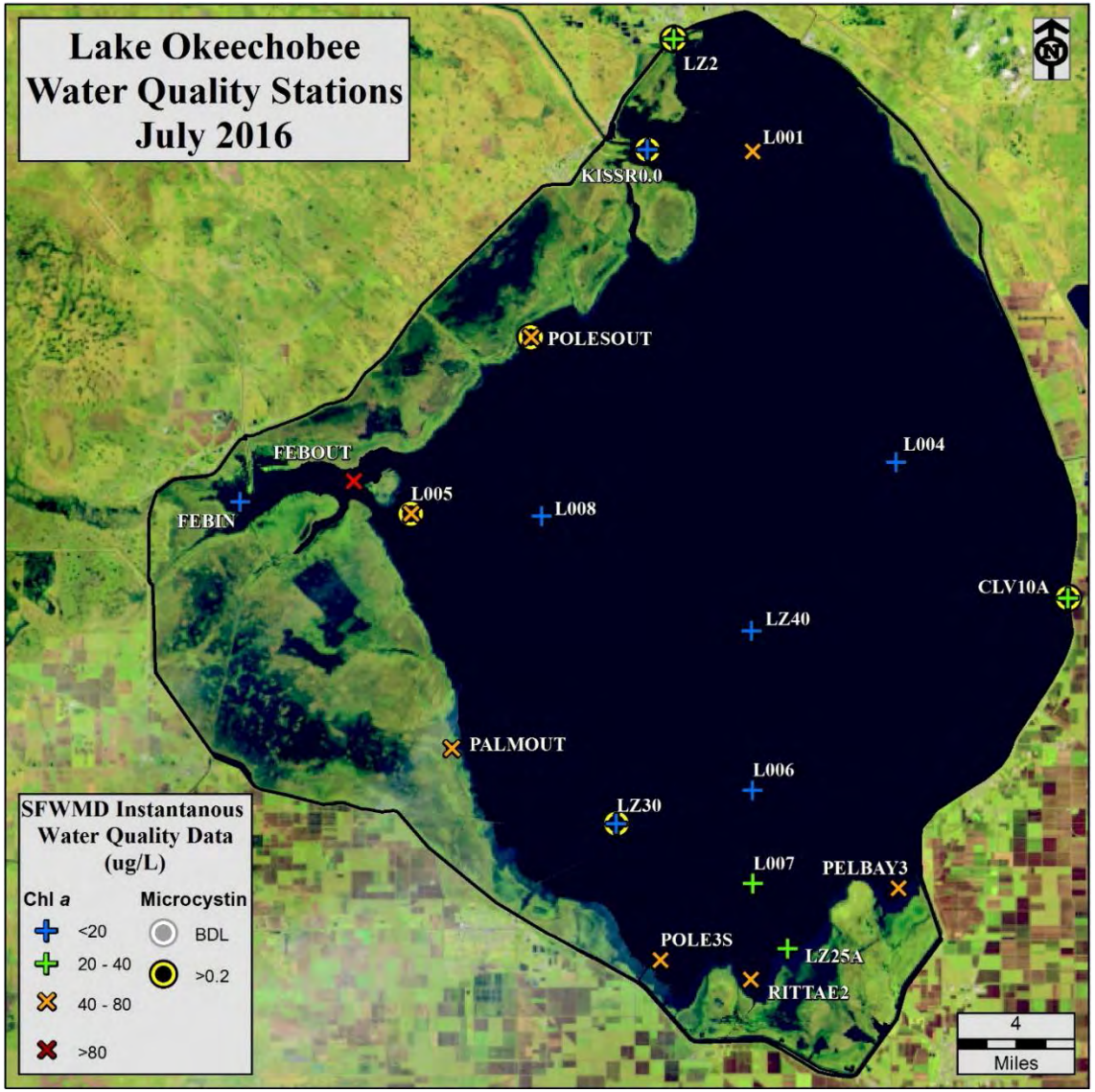
(14.63 ft NGVD29)



Lake has been above elevation 14' NGVD almost continuously for 10 months

Lake Okeechobee Water Quality

July 5, 2016 & July 11-12, 2016		
Site	**Chlorophyll *a* (ug/L)**	**Microcystin (ug/L)**
Nearshore Stations		
FEBIN	13.5	
FEBOUT	87.2	
KISSR0.0	16.6	0.40
LZ2	39.0	0.81
LZ25A	24.4	
PALMOUT	70.0	
PELBAY3	41.4	
POLE3S	52.2	
POLESOUT	67.6	0.45
RITTAE2	41.9	
Pelagic Stations		
L001	46.1	
L004	14.7	
L005	62.3	0.38
L006	4.7	
L007	29.2	
L008	14.0	
LZ30	17.4	1.10
LZ40	8.2	
CLV10A	21.6	6.60

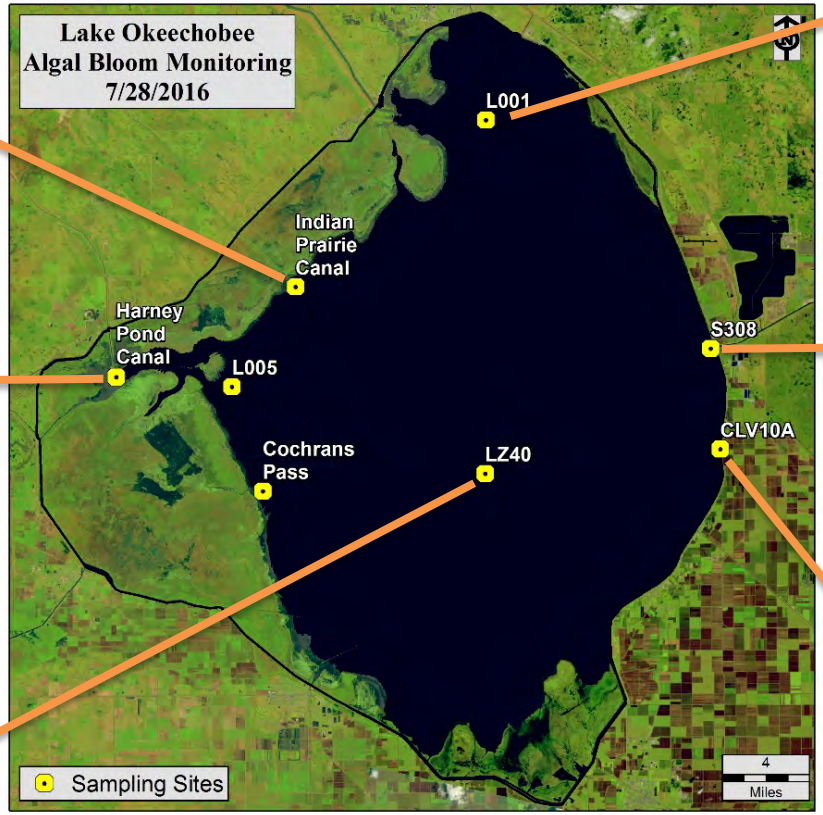


Lake Okeechobee Algal Blooms

Indian Prairie
Chl *a*: 54.2 µg/L

Harney Pond
Chl a: 37.7 mg/L

LZ40
Chl a: 25.3 mg/L



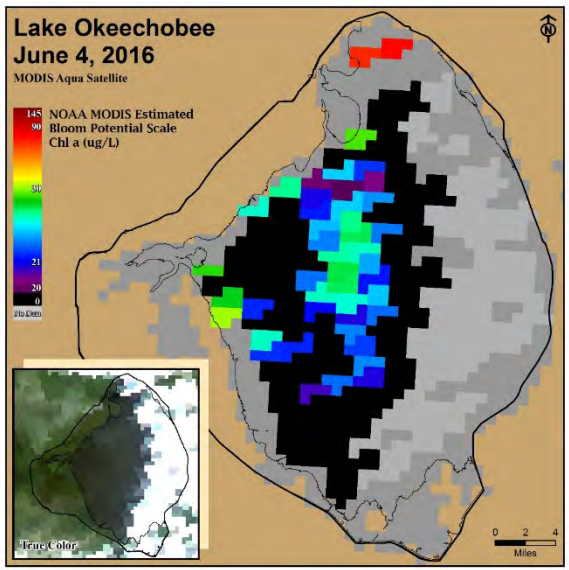
L001
Chl a: 14.7 mg/L

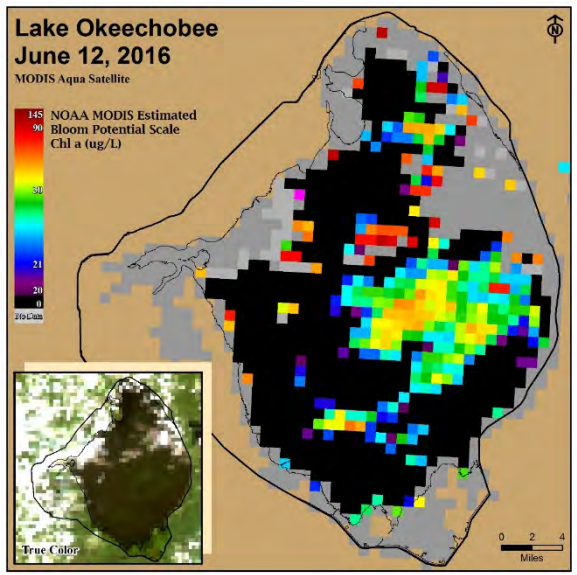
S308
Chl a: 60.5 mg/L

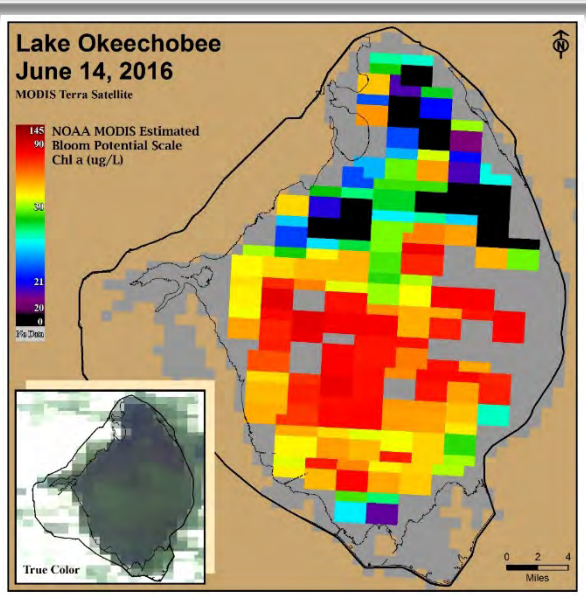
CLV10A
Chl a: 27.1 mg/L

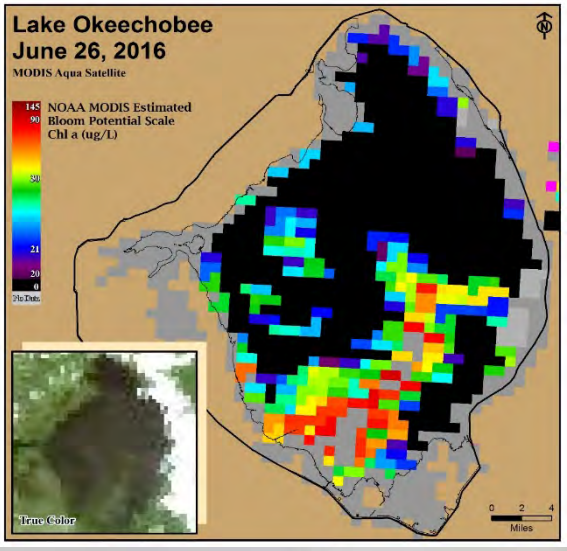
MODIS Satellite Bloom Monitoring

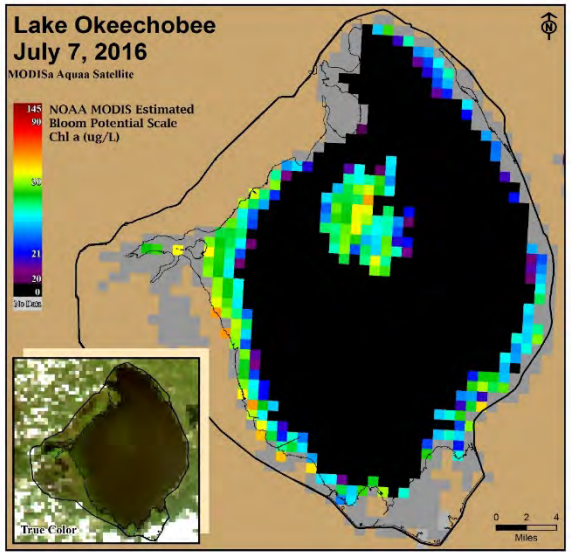
NOAA – Experimental Data, Ongoing Validation

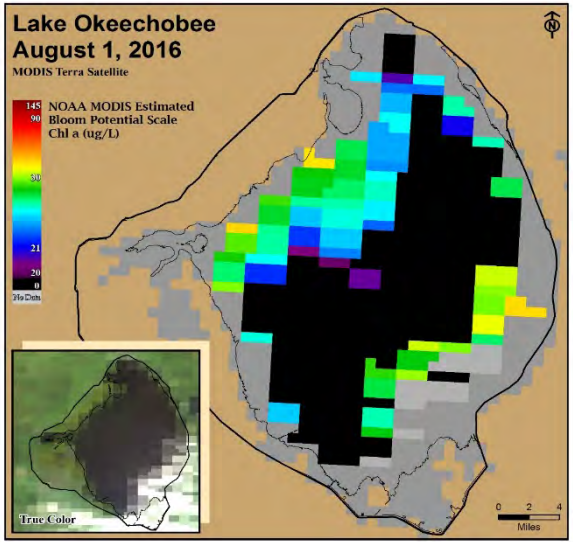




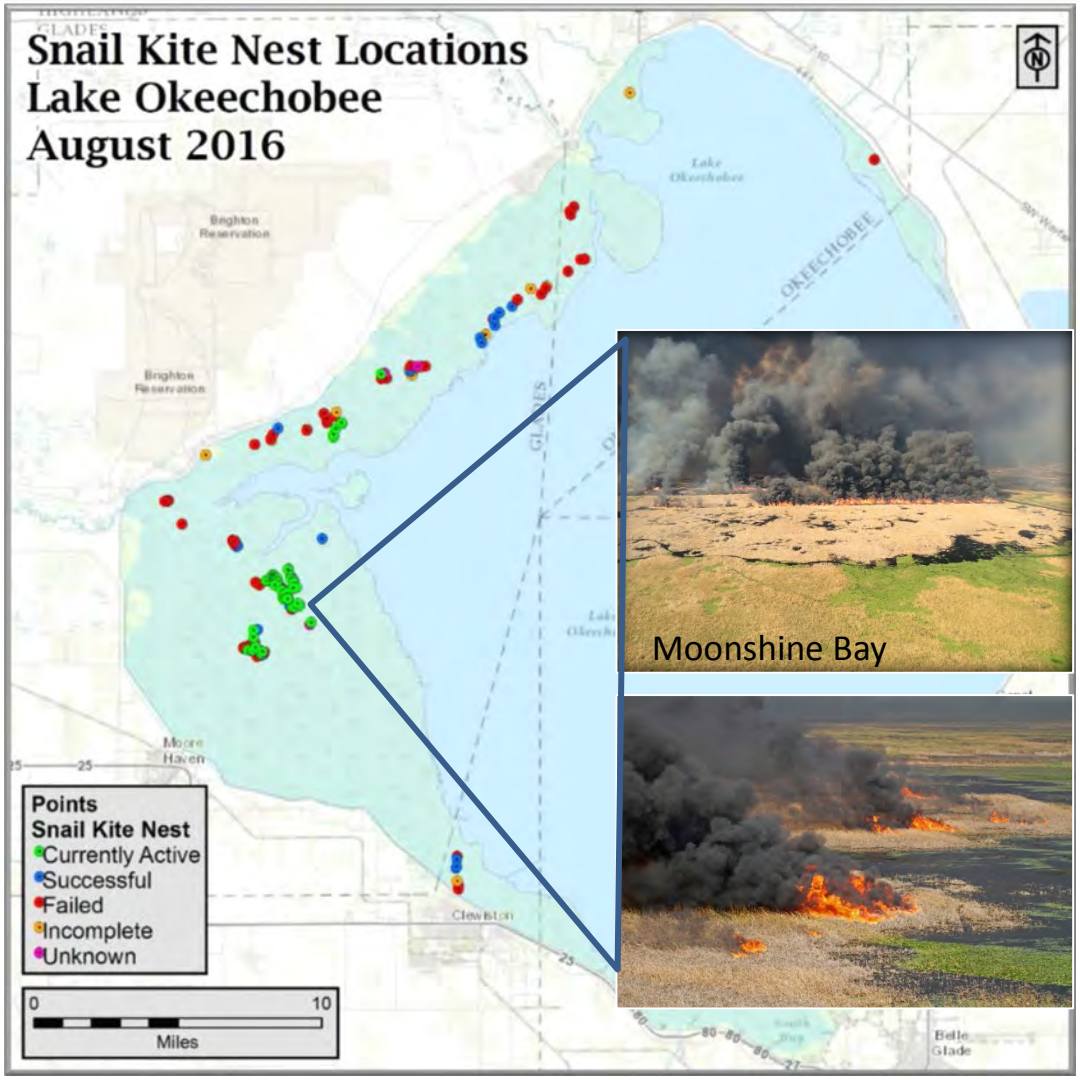








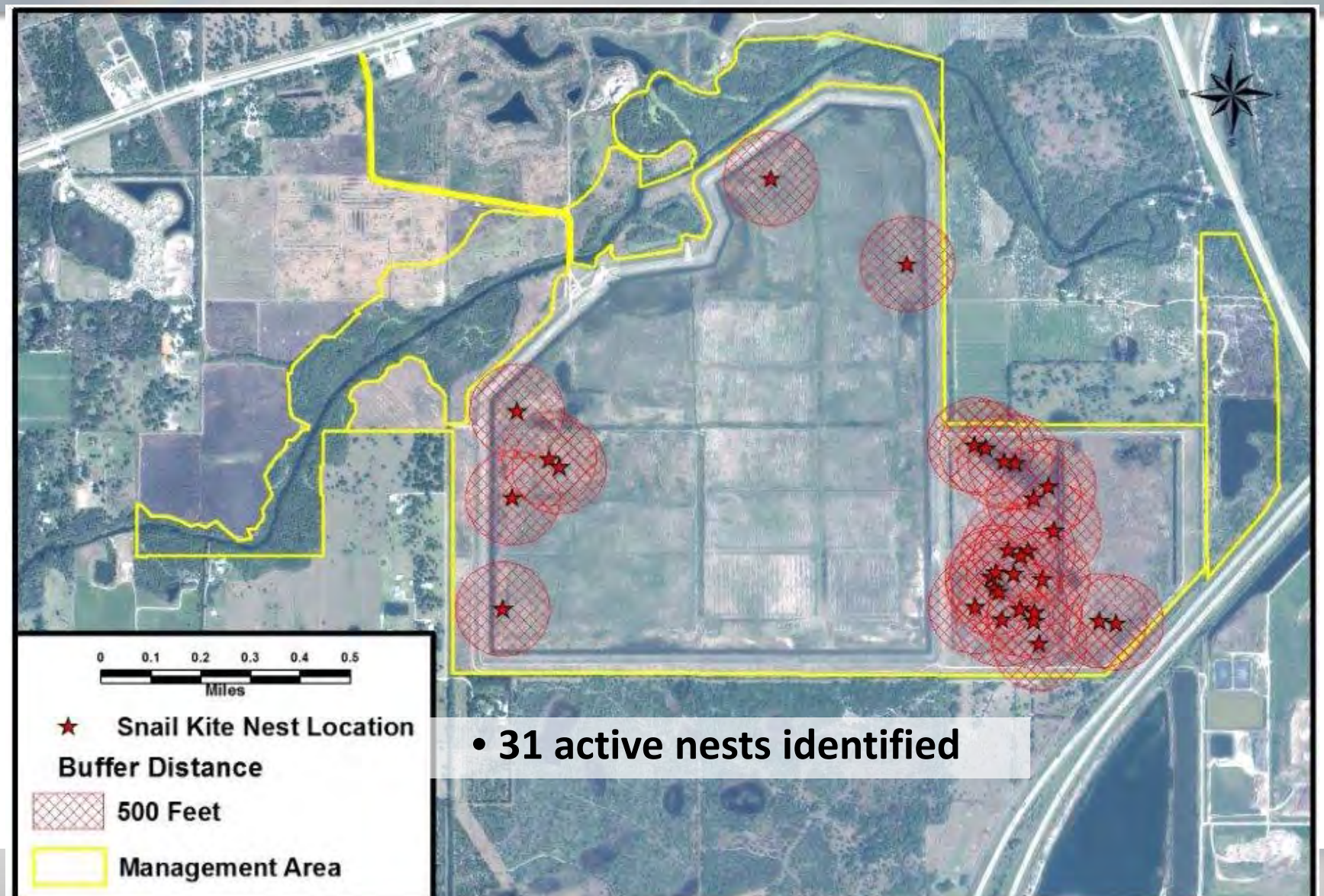
Lake Okeechobee Snail Kite Nests



- 170 nests in 2016 compared to 76 nests in 2015
- Includes 52 new late season nests (mostly in Moonshine Bay Treatment Area)
- 26 successful nests so far

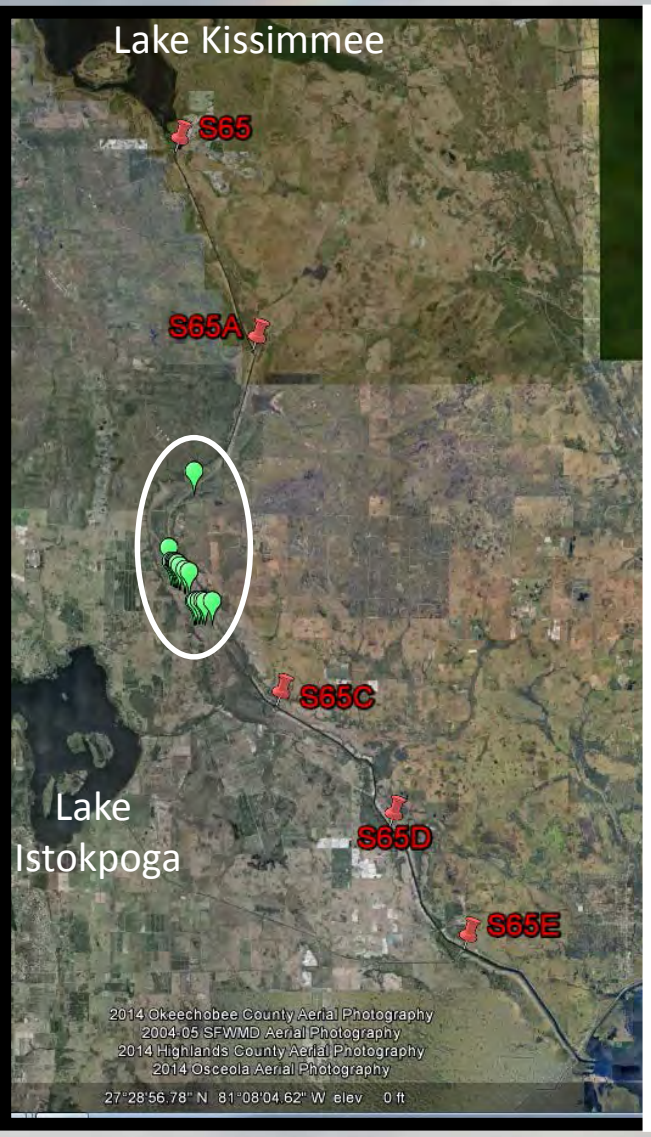
Ten Mile Creek – Snail Kite Nests

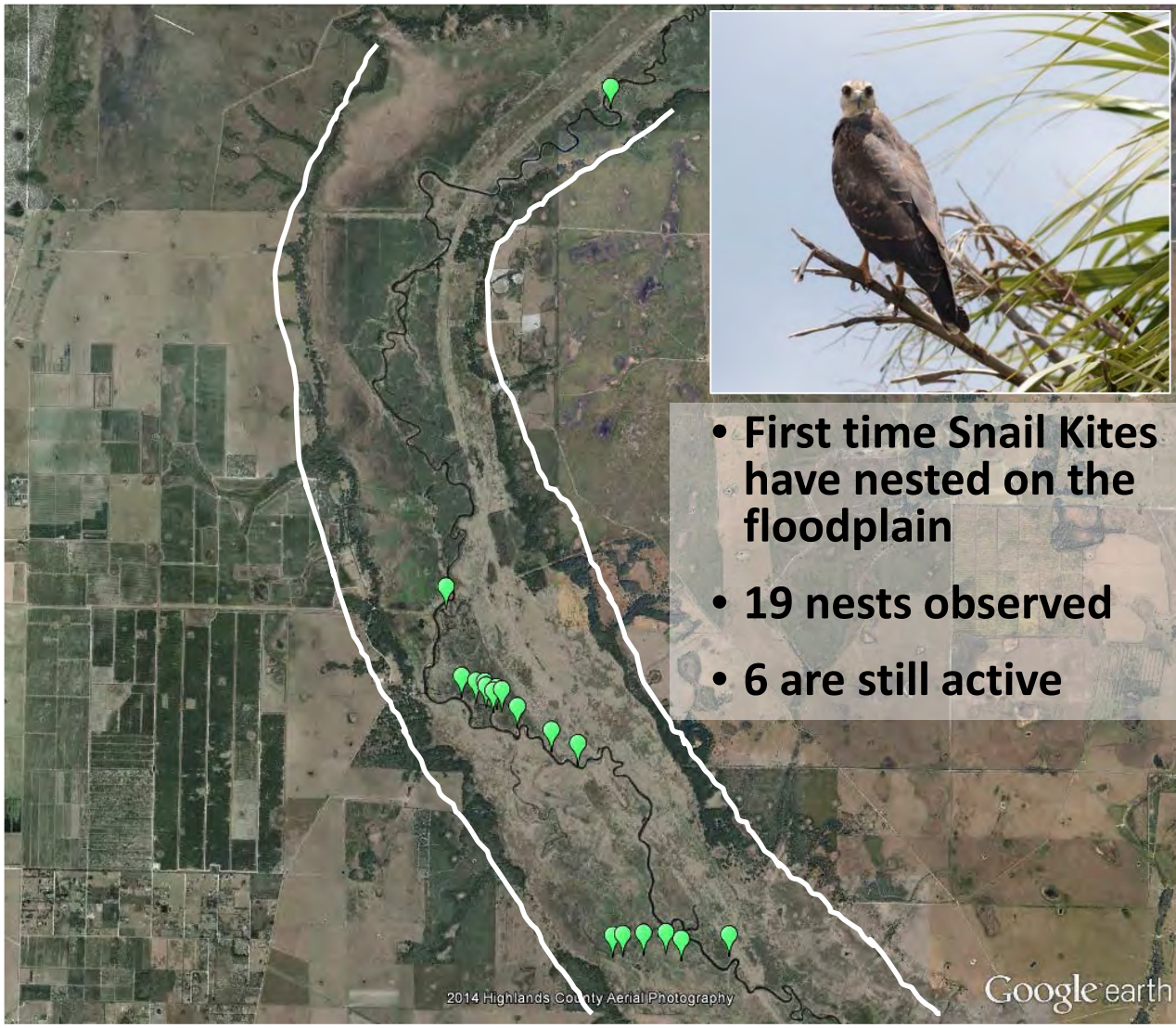
July 27, 2016



- **31 active nests identified**

Kissimmee River Phase I Restoration Area Snail Kite Nests

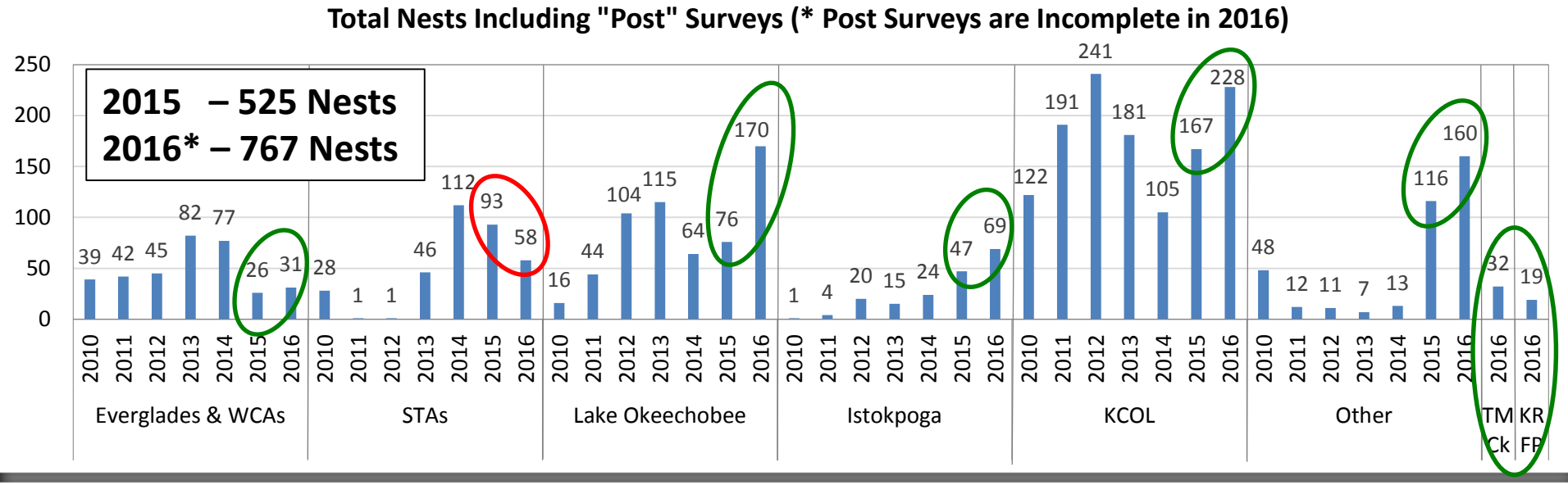


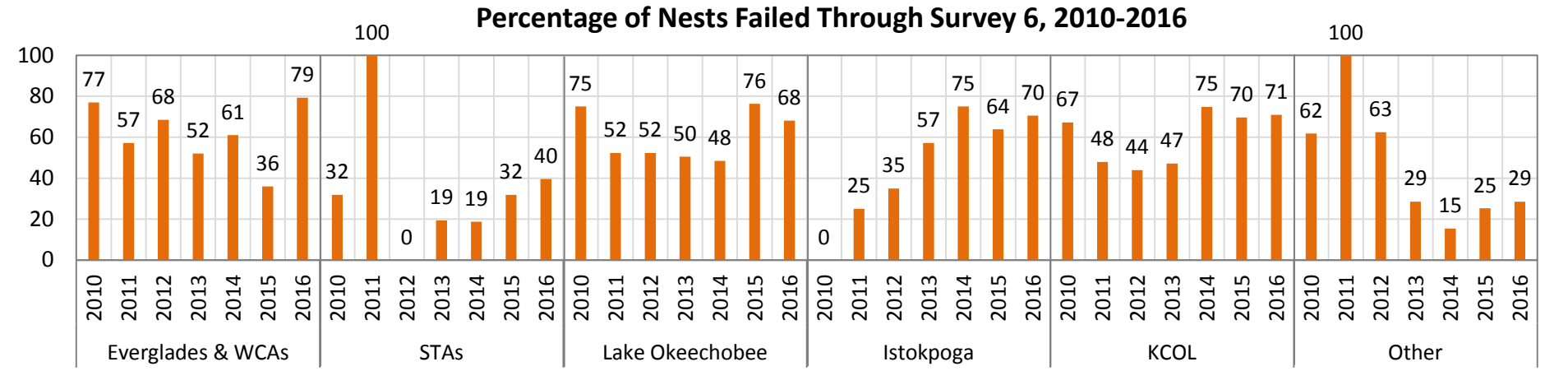


- First time Snail Kites have nested on the floodplain
- 19 nests observed
- 6 are still active

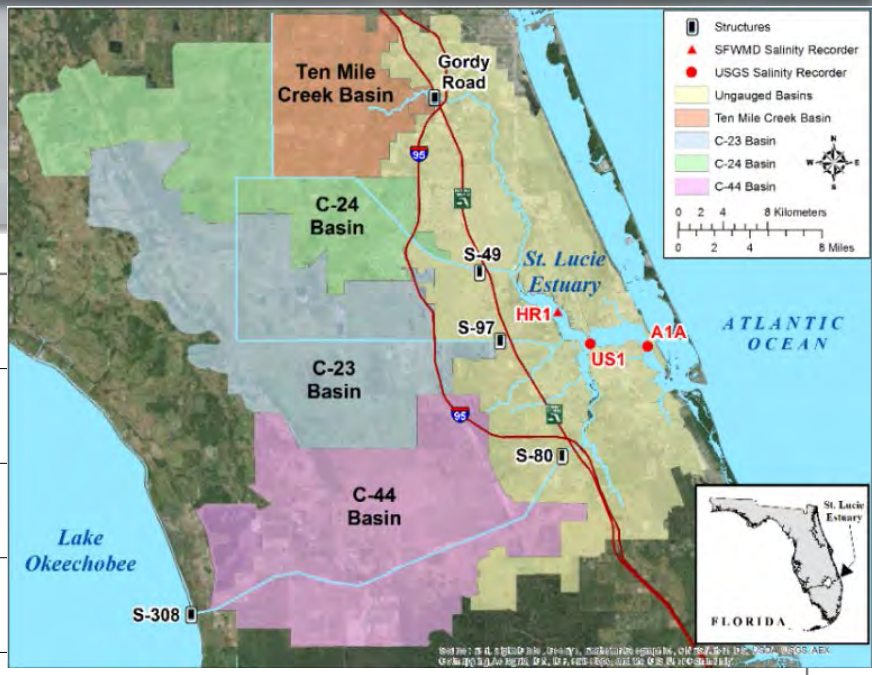
Regional Snail Kite Nesting

Total Nests to Date and Percentage Failed Through Survey 6, 2010-2016





St. Lucie Estuary



Weekly Average Inflow August 2 - Aug 8, 2016	
Inflow from Lake	623 cfs
C-44 Basin Inflow	38 cfs
Ten Mile Creek	93 cfs
C-23	109 cfs
C-24	15 cfs
Tidal Basin Inflow	493 cfs
Total	1371 cfs

Data provisional and subject to change

Total Flow (cfs)

15,000
13,500
12,000
10,500
9,000
7,500
6,000
4,500
3,000
1,500
0

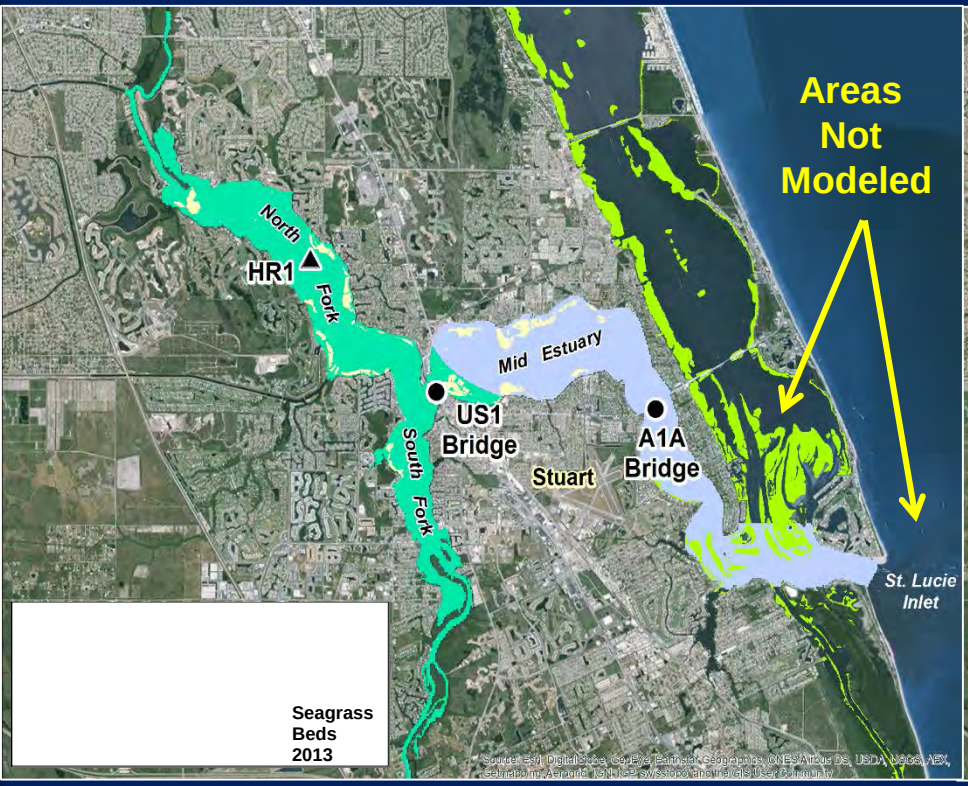
1-Aug 1-Sep 1-Oct 1-Nov 1-Dec 1-Jan 1-Feb 1-Mar 1-Apr 1-May 1-Jun 1-Jul 1-Aug

Inflow from Lake* (using downstream gauge)
C-44 Basin Runoff
Inflow from C-24, C23, and Ten Mile Creek
Tidal Basin Inflow

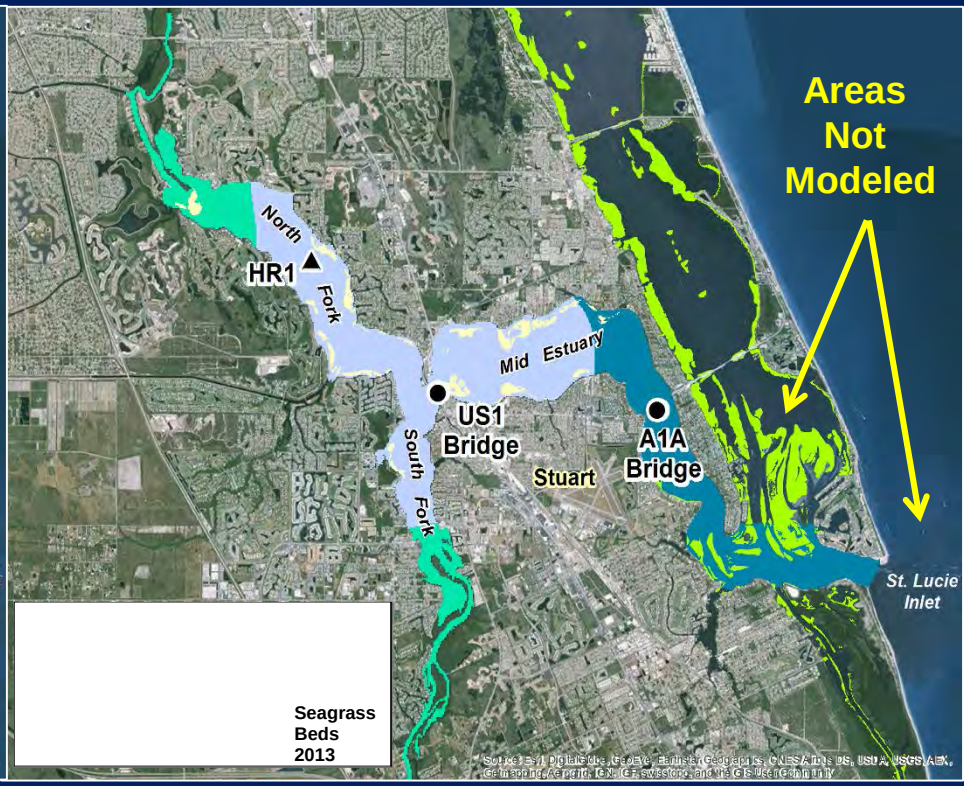
St. Lucie Estuary

Salinity Conditions

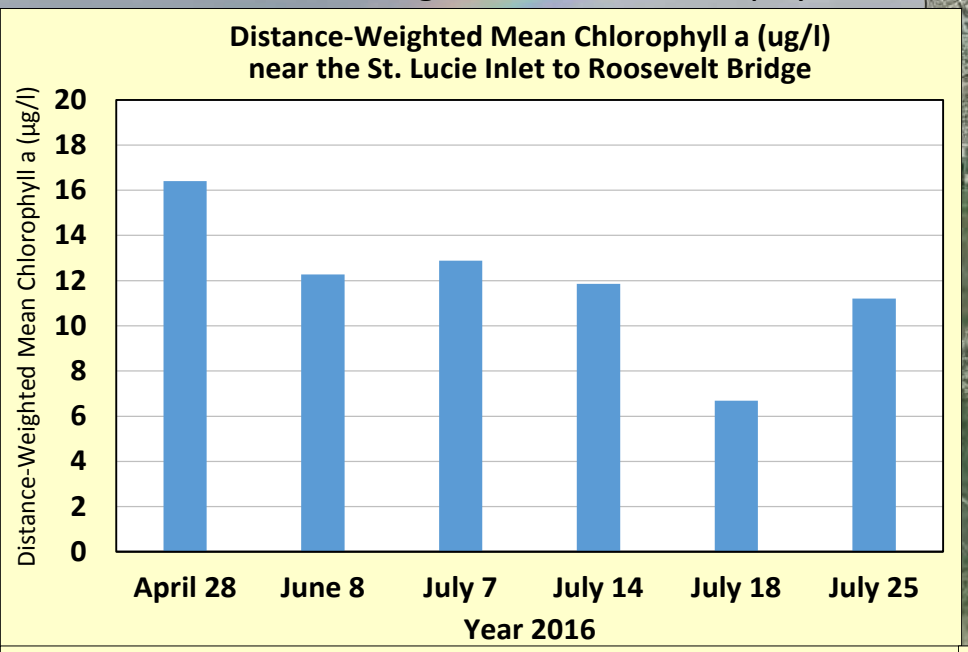
July 11, 2016

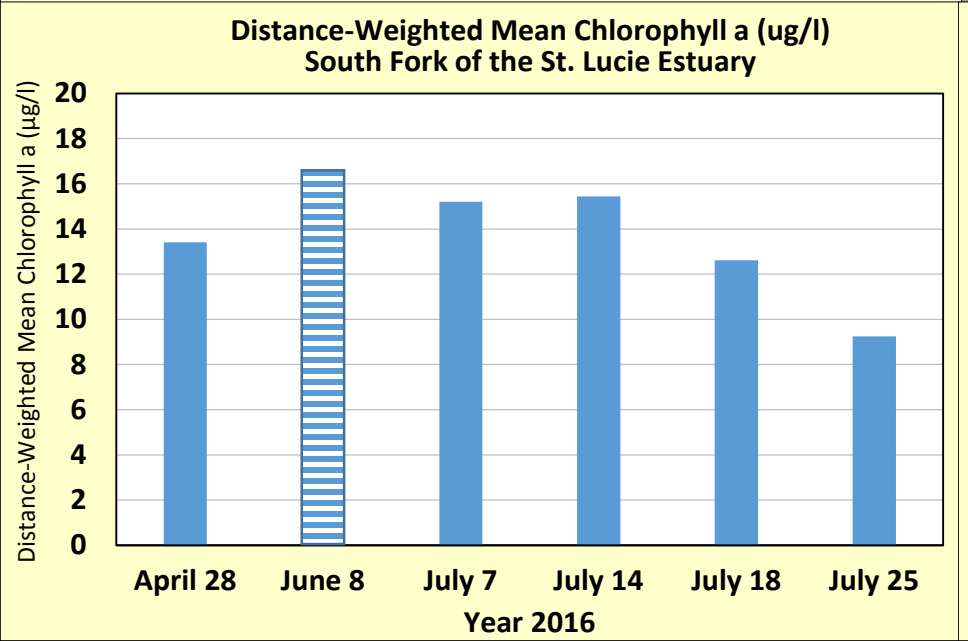


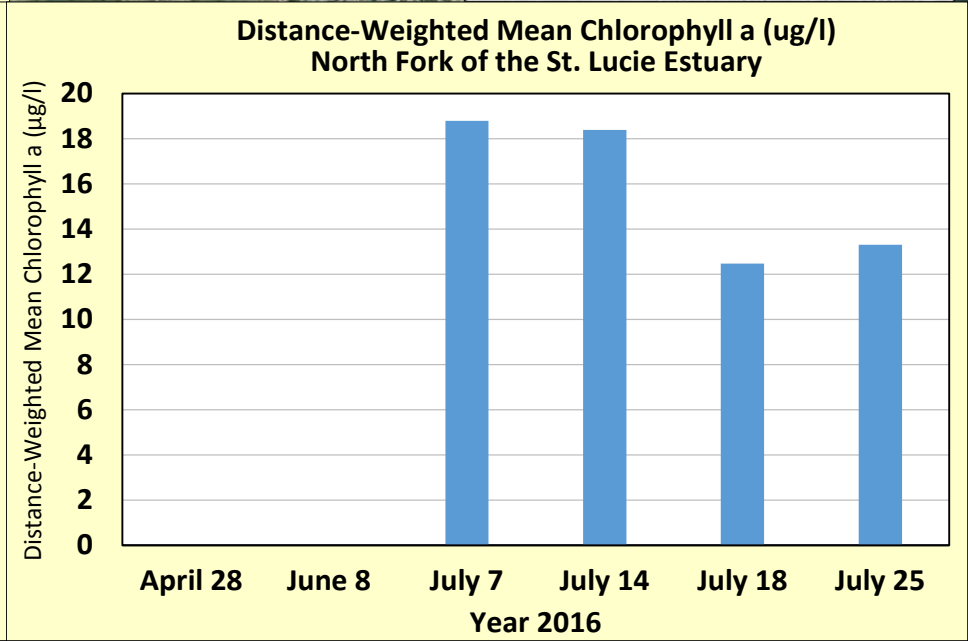
August 8, 2016



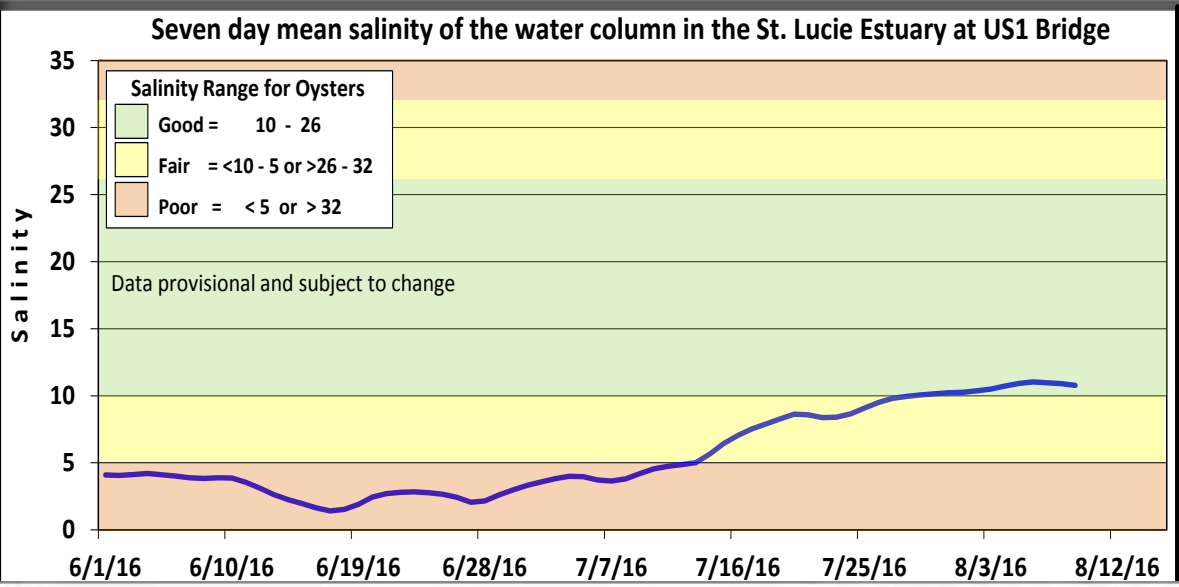
St. Lucie Estuary
2016 Distance-Weighted Mean Chlorophyll a

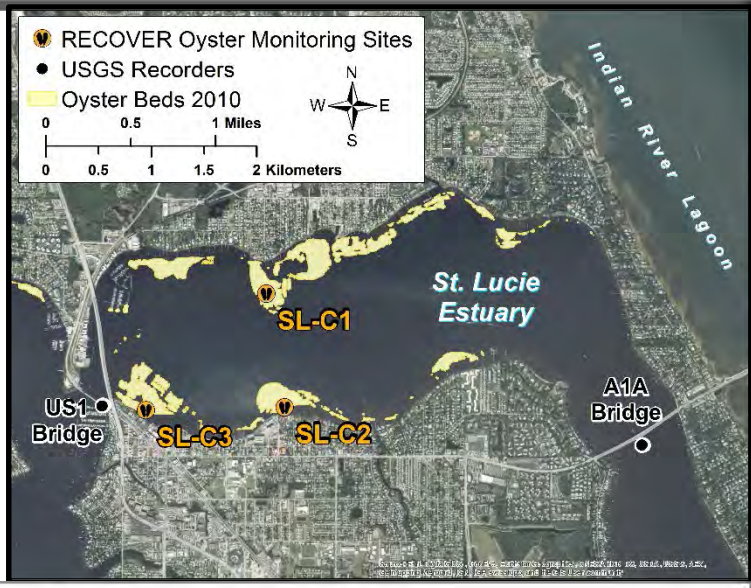


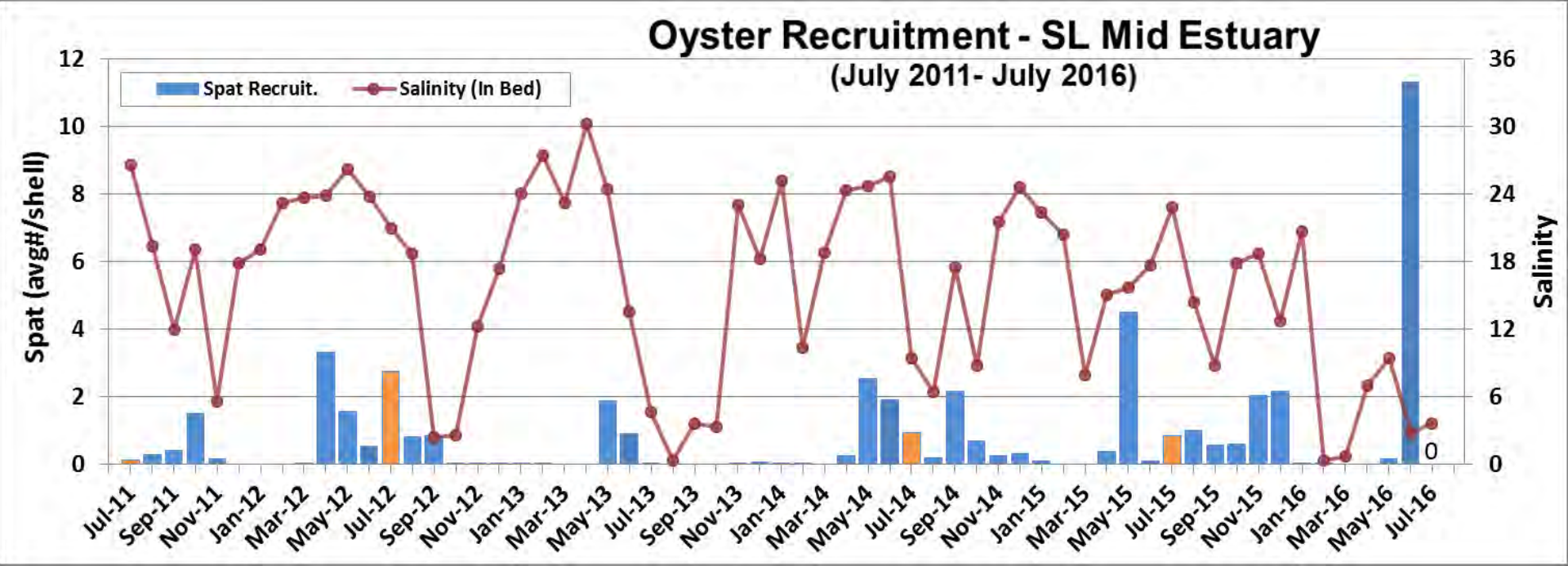




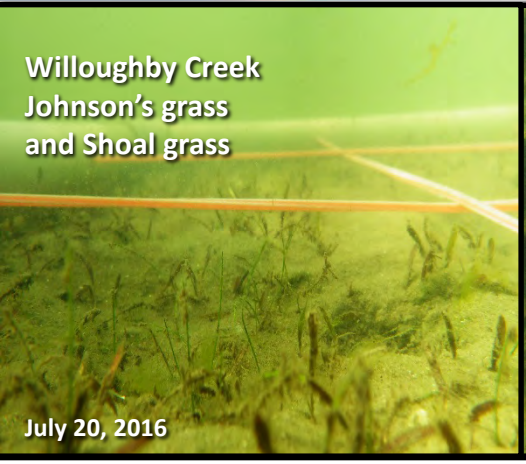
St. Lucie Estuary - Oyster Spat Recruitment



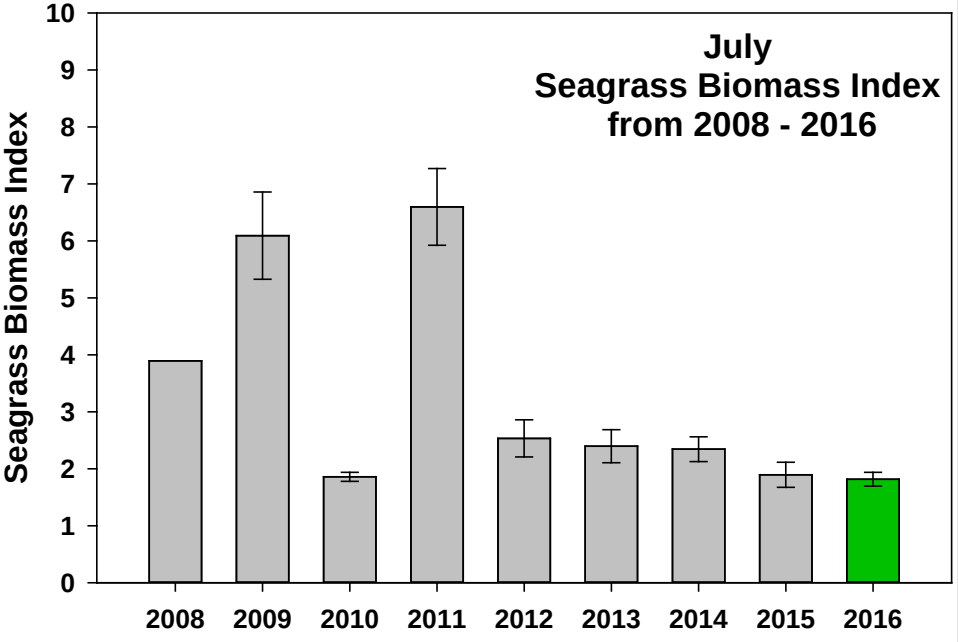




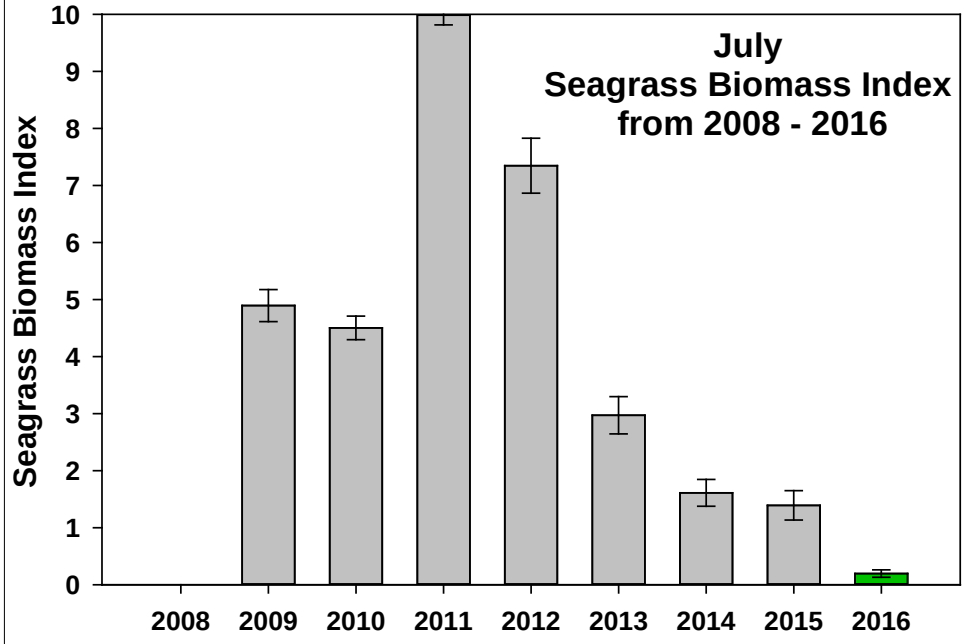
St. Lucie Estuary – Seagrass



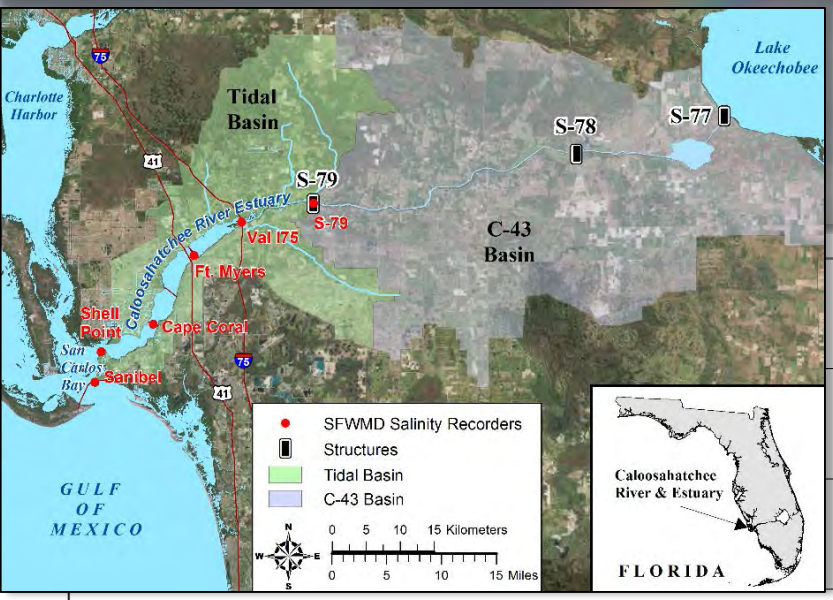
Willoughby Creek



Boy Scout Island



Caloosahatchee Estuary



Weekly Average Inflow
August 2 - August 8, 2016

Inflow from Lake:	748 cfs
C-43 Basin Inflow:	2317 cfs
Tidal Basin Inflow:	1291 cfs
Total :	4356 cfs

Data are provisional and subject to change

Total Flow (cfs)

18,000
16,000
14,000
12,000
10,000
8,000
6,000
4,000
2,000
0

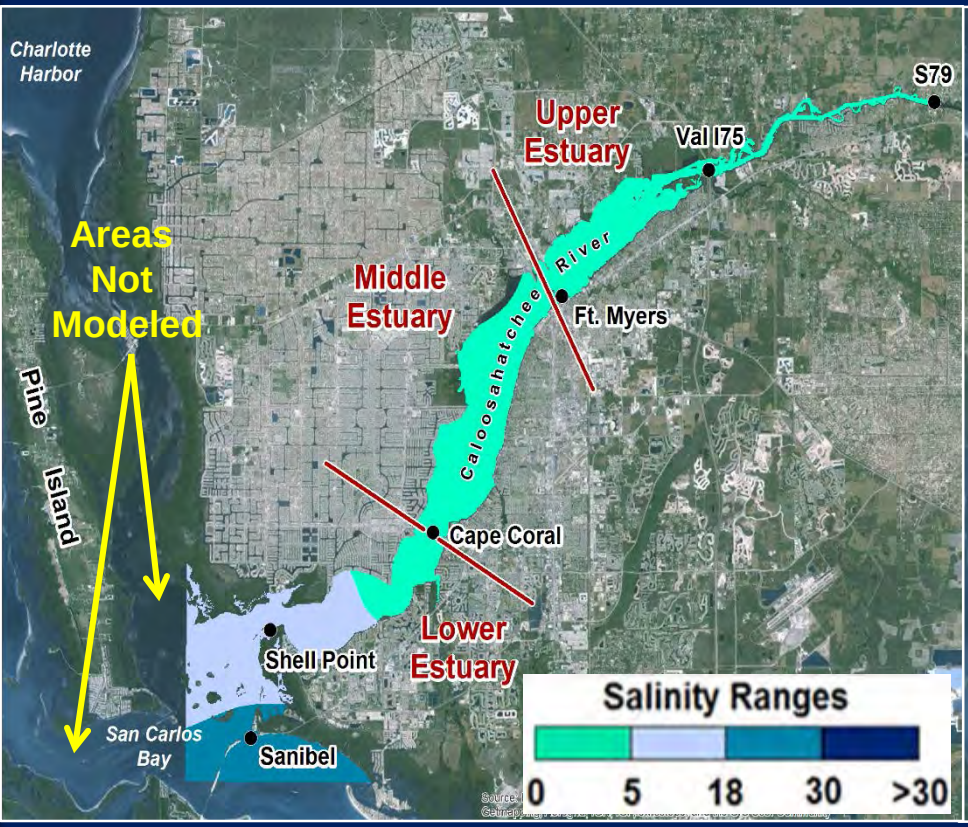
1-Aug 1-Sep 1-Oct 1-Nov 1-Dec 1-Jan 1-Feb 1-Mar 1-Apr 1-May 1-Jun 1-Jul 1-Aug

Inflow from Lake* (using downstream gauge) C-43 Basin Inflow Tidal Basin Inflow (downstream of S79)

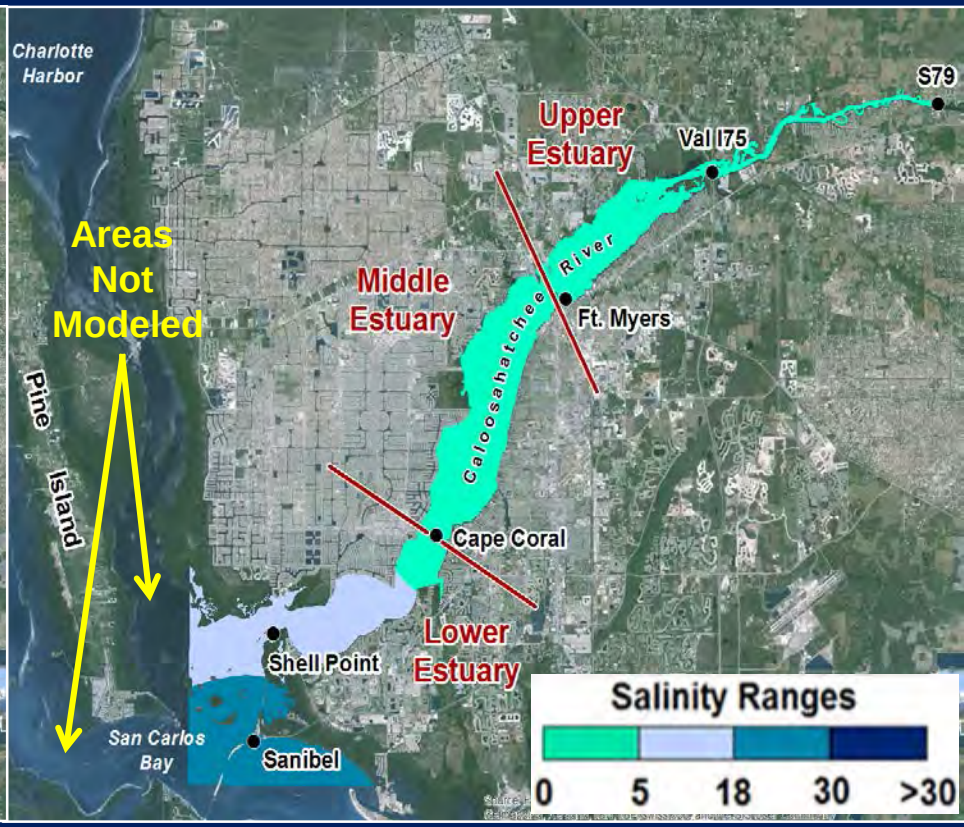
Caloosahatchee Estuary

Salinity Conditions

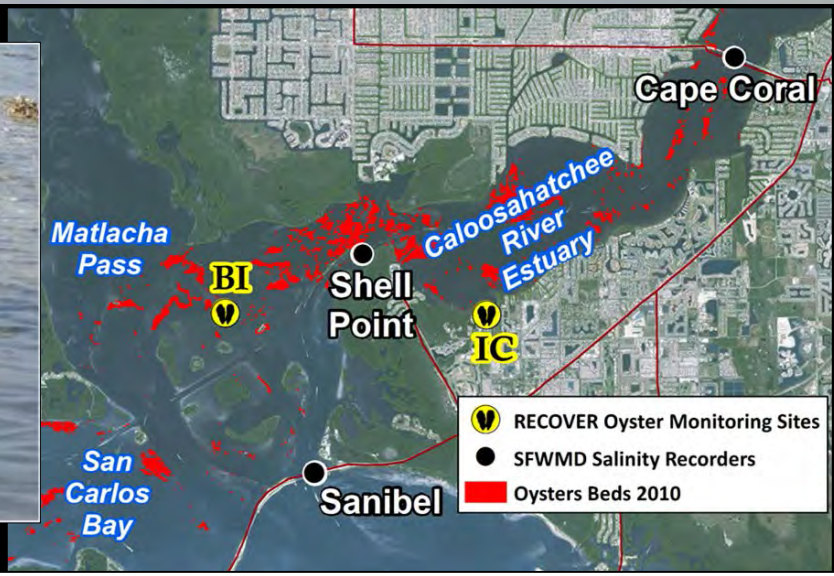
July 11, 2016



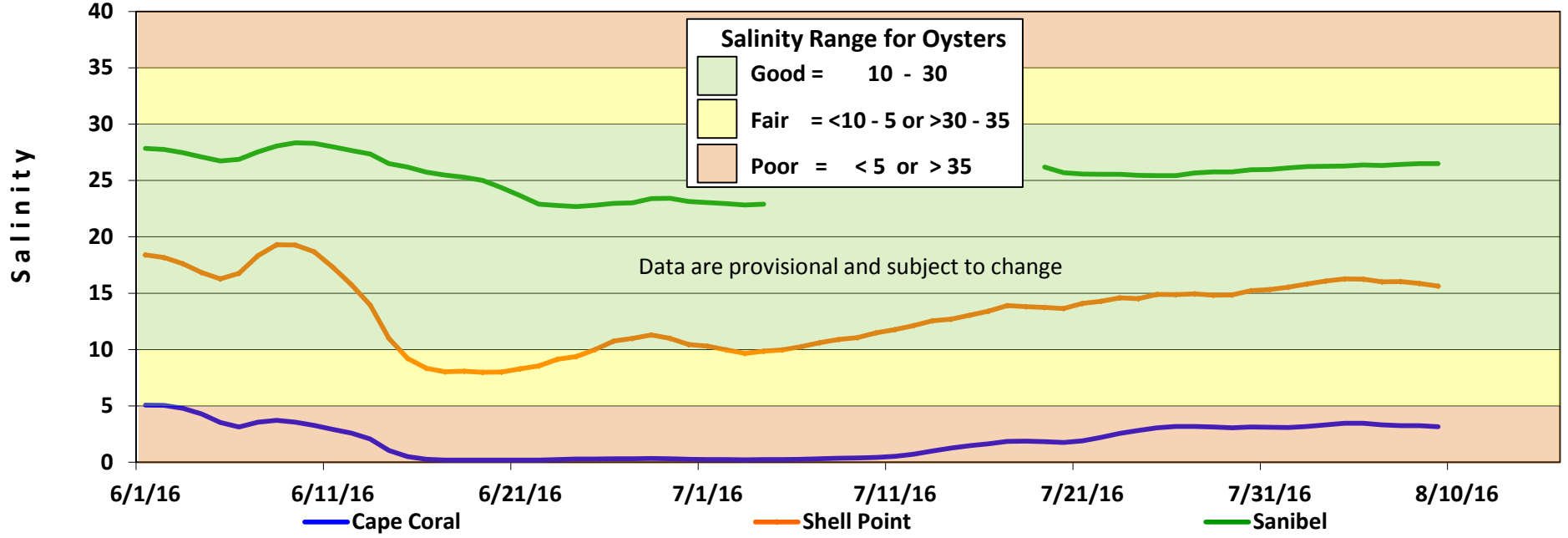
August 8, 2016



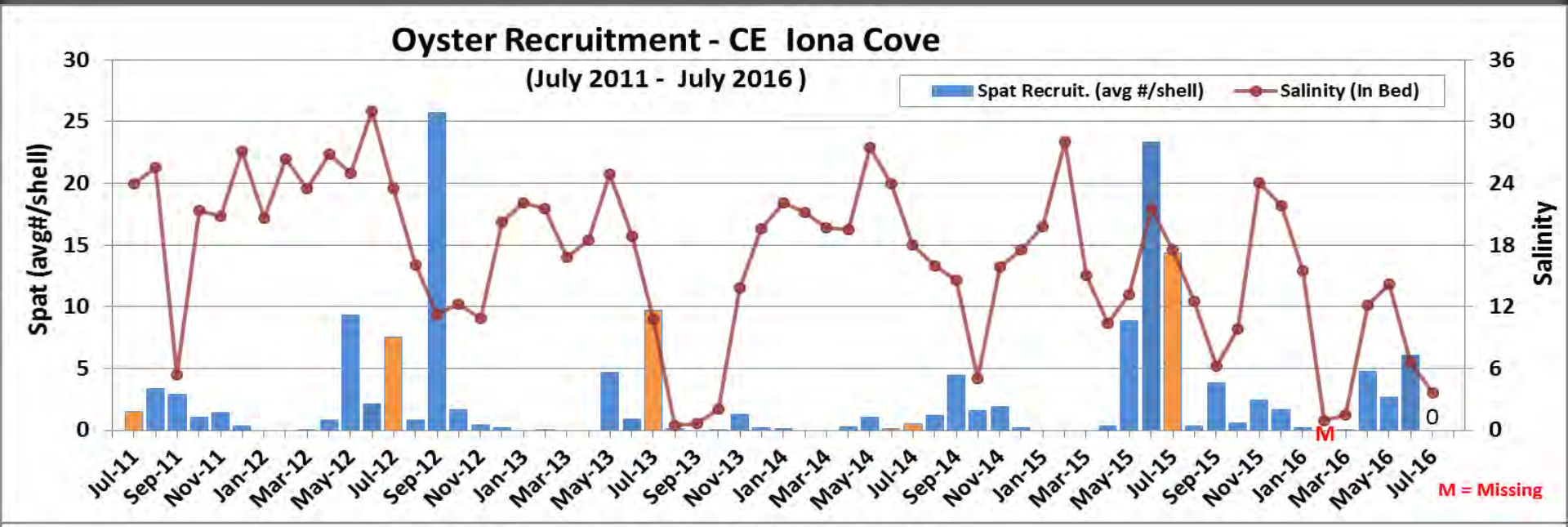
Caloosahatchee Estuary - Oysters

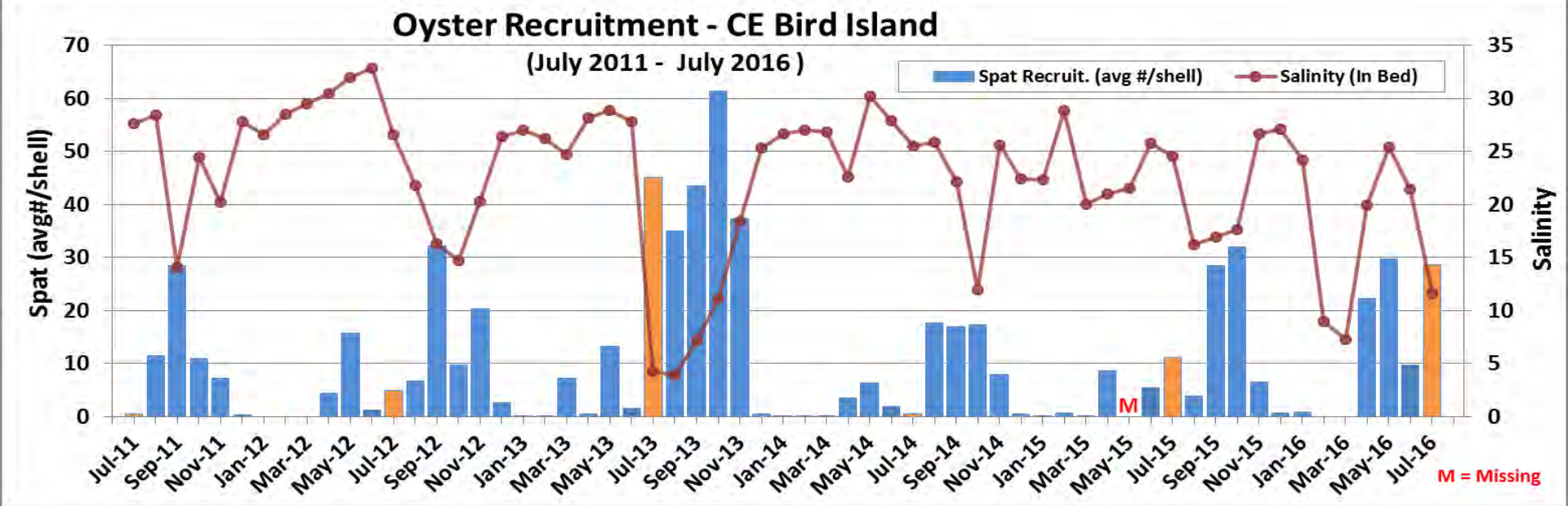


Seven day mean salinity of the water column at 3 monitoring stations in the Caloosahatchee Estuary

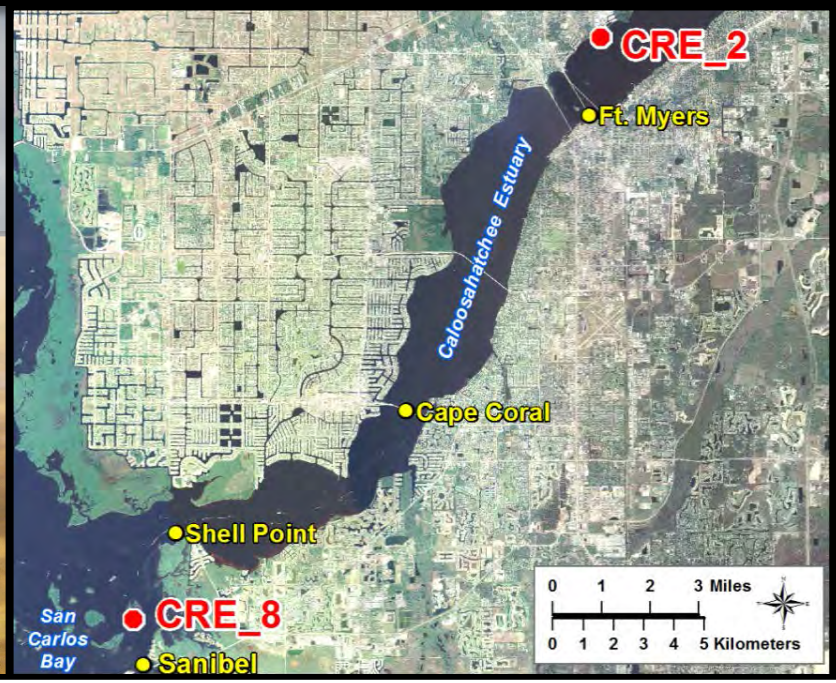


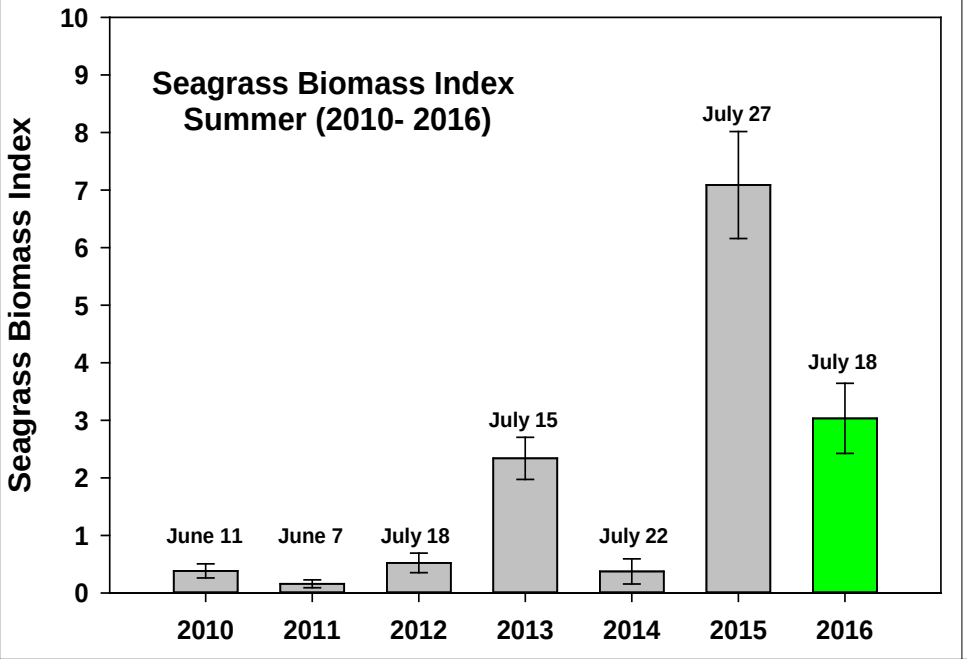
Caloosahatchee Estuary Oyster Spat Recruitment

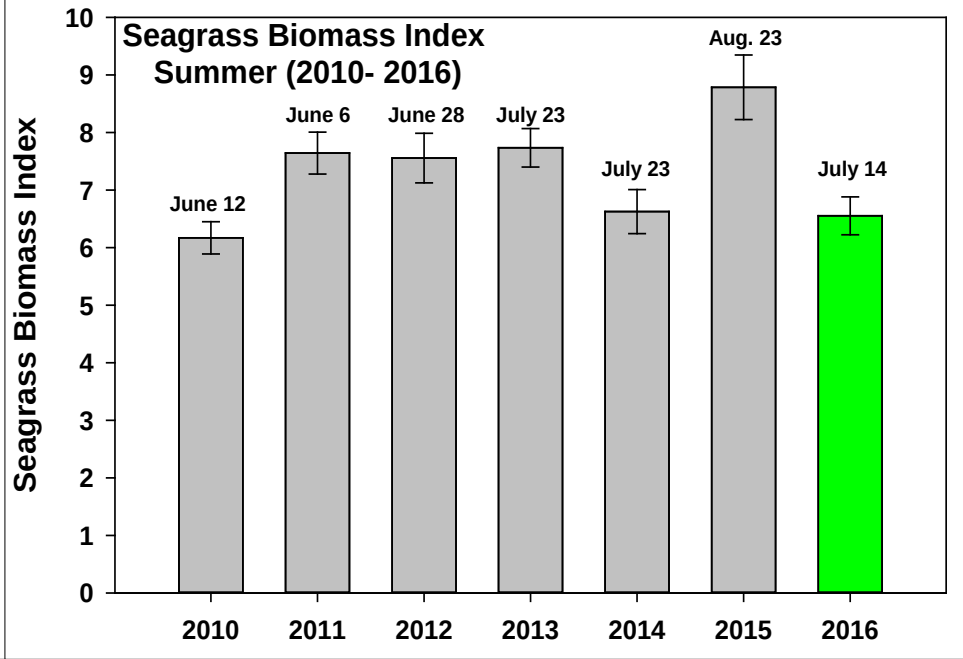




Caloosahatchee Estuary –
Submerged Aquatic Vegetation





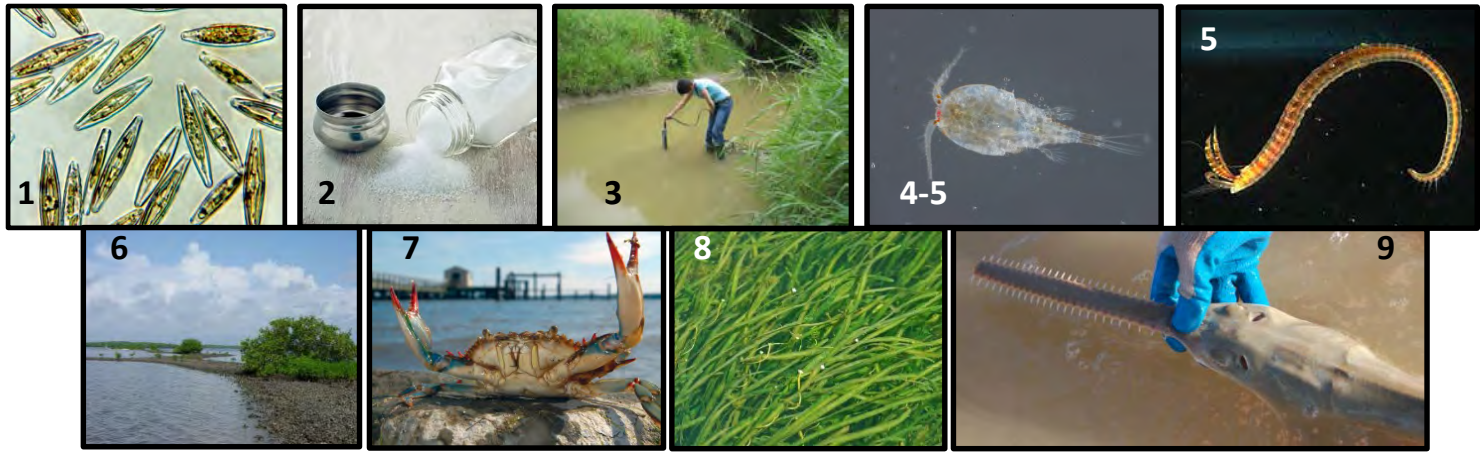


Caloosahatchee Science Symposium
September 14 -15, 2016

- District scientist have completed a comprehensive assessment of the science for the Caloosahatchee River Estuary
- The science includes a robust evaluation of 11 different indicator components
- 2-Day Public Science Symposium
  - Lower West Coast Service Center
- Goal is to communicate science information to interested parties in a public forum
  - Request input and feedback from other scientists
  - Incorporate additional science where appropriate

Science Components

	Component	Method
1	Hydrodynamics	Influence of alterations on hydrodynamics
2	Inflow vs. Salinity	Monthly freshwater-salinity relationships
3	Water Quality	Relationships between inflow, salinity, and water quality
4	Zooplankton	Inflow, zooplankton and habitat compression
5	Ichthyoplankton	Relationships between ichthyoplankton and inflow
6	Benthic Fauna	Macrofauna-salinity patterns relative to inflow
7	*Vallisneria* data	Empirical relationships between tape grass, S, and inflow
8	*Vallisneria* model	Model exploration of tape grass, S, light, and inflow
9	Oyster Habitat	Salinity patterns for oyster habitat in lower CRE
10	Blue Crabs	Relationships between blue crab landings, rainfall, and inflow
11	Sawfish	Dry season inflow, hydrodynamics, and habitat extent



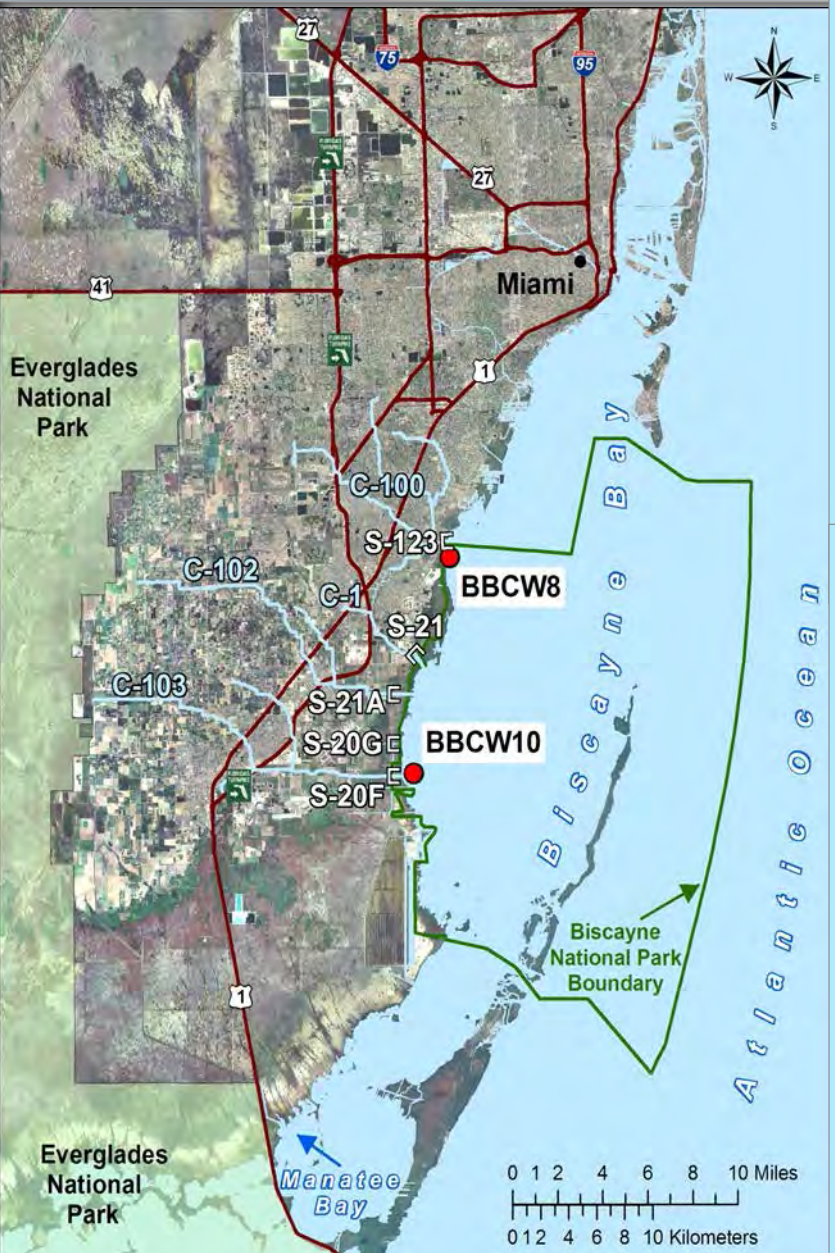
Stormwater Treatment Areas (STAs) Current Conditions

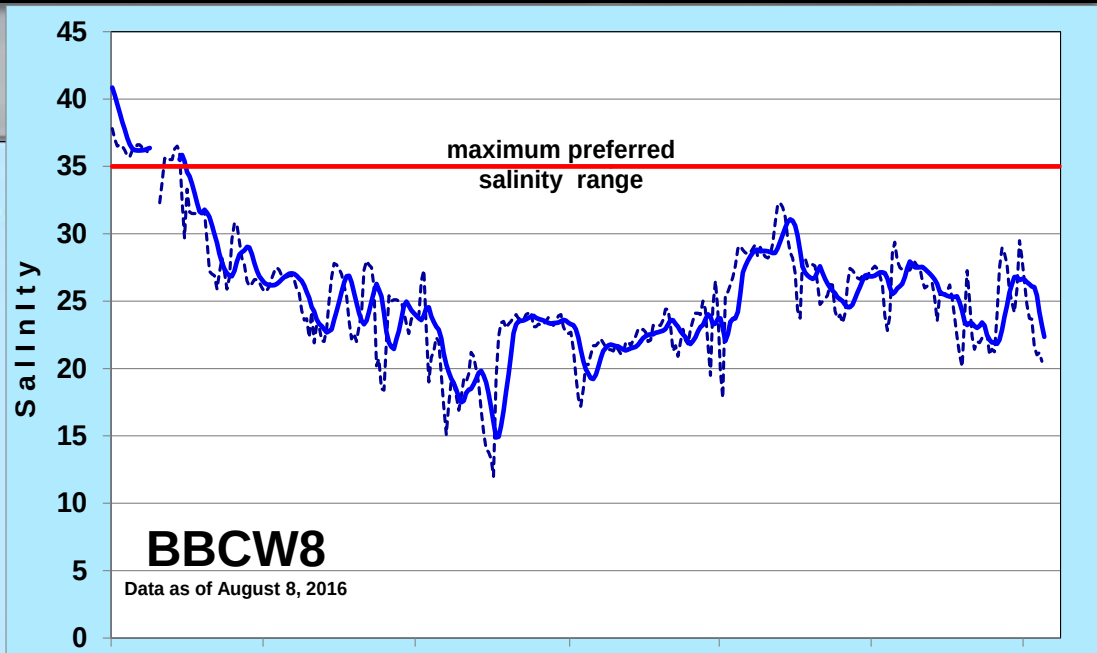
- Continued to send Lake releases south through A-1 FEB and STAs in July
  - Total Lake regulatory releases to FEBs/STAs in WY2017 (since May 1) ~56,000 ac-ft
- All treatment cells are at or above target depths
- Operation of existing STA-1W continues during STA-1W Expansion construction

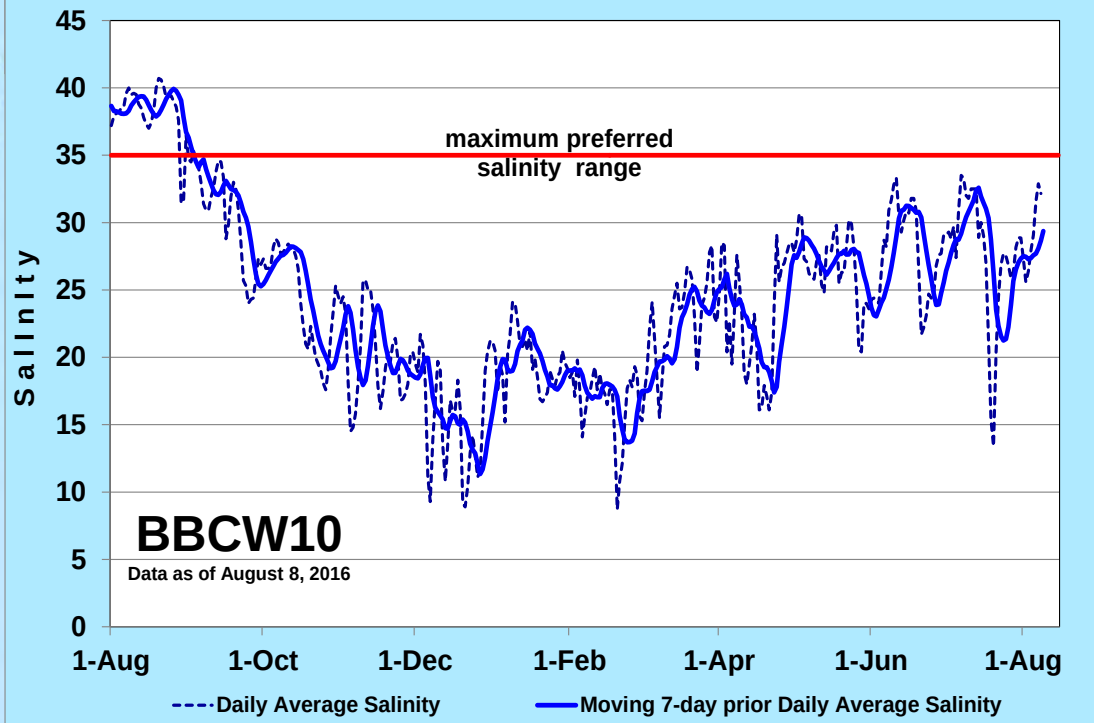
Water Year 2017 (5/1/16 to 7/31/16)						
	STA-1E	**STA-1W**	**STA-2**	**STA-3/4**	**STA-5/6**	**Total**
Inflow TP (ppb)	155	171	95	28	148	89
Outflow TP (ppb)	24	28	19	13	25	19
Inflow Vol. (ac-ft)	49,133	22,385	88,053	121,586	29,034	310,191

Includes Preliminary Data

Biscayne Bay Salinity

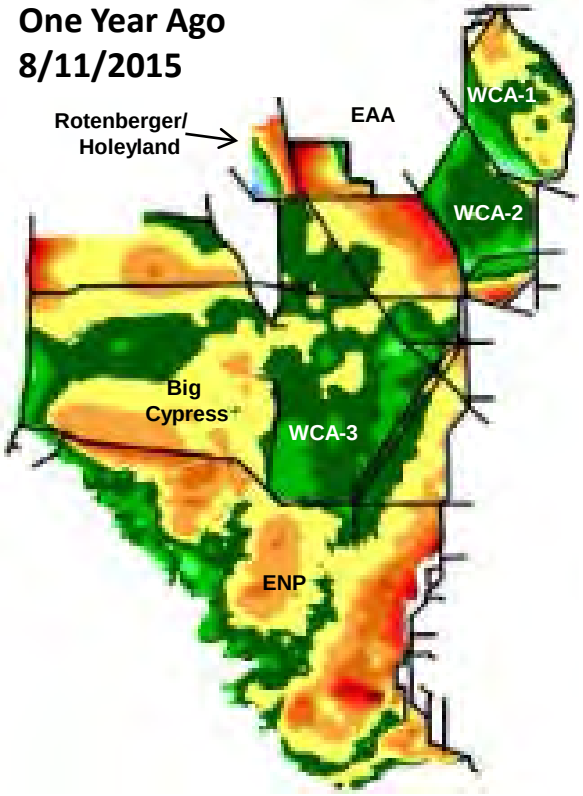




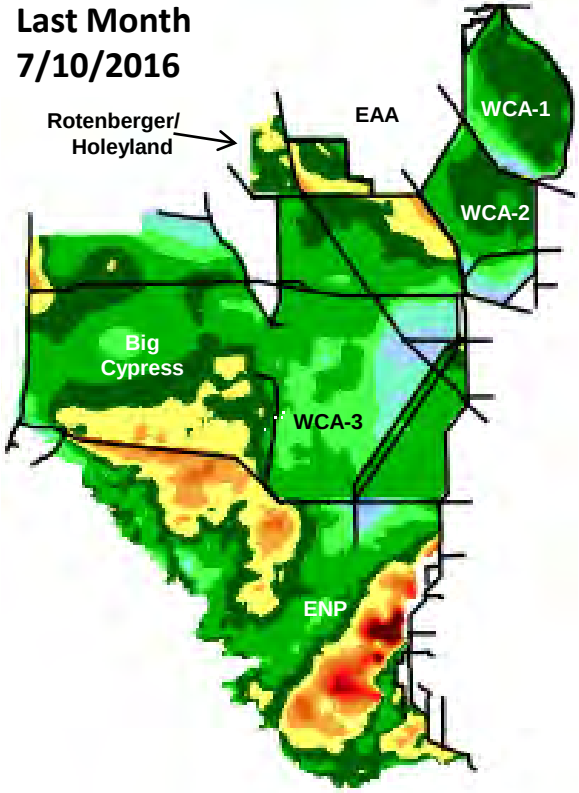


Everglades
Water Depth Maps

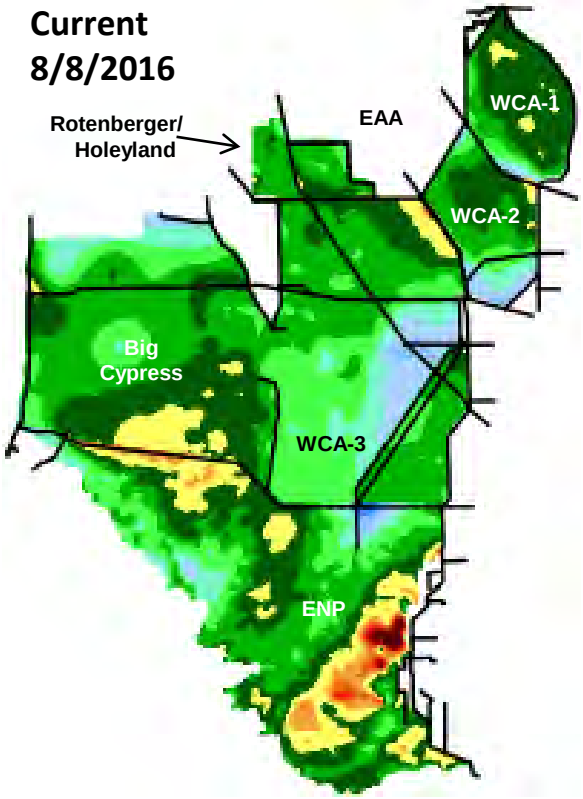
One Year Ago
8/11/2015

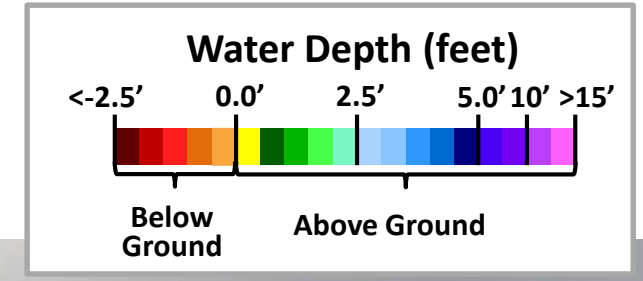


Last Month
7/10/2016

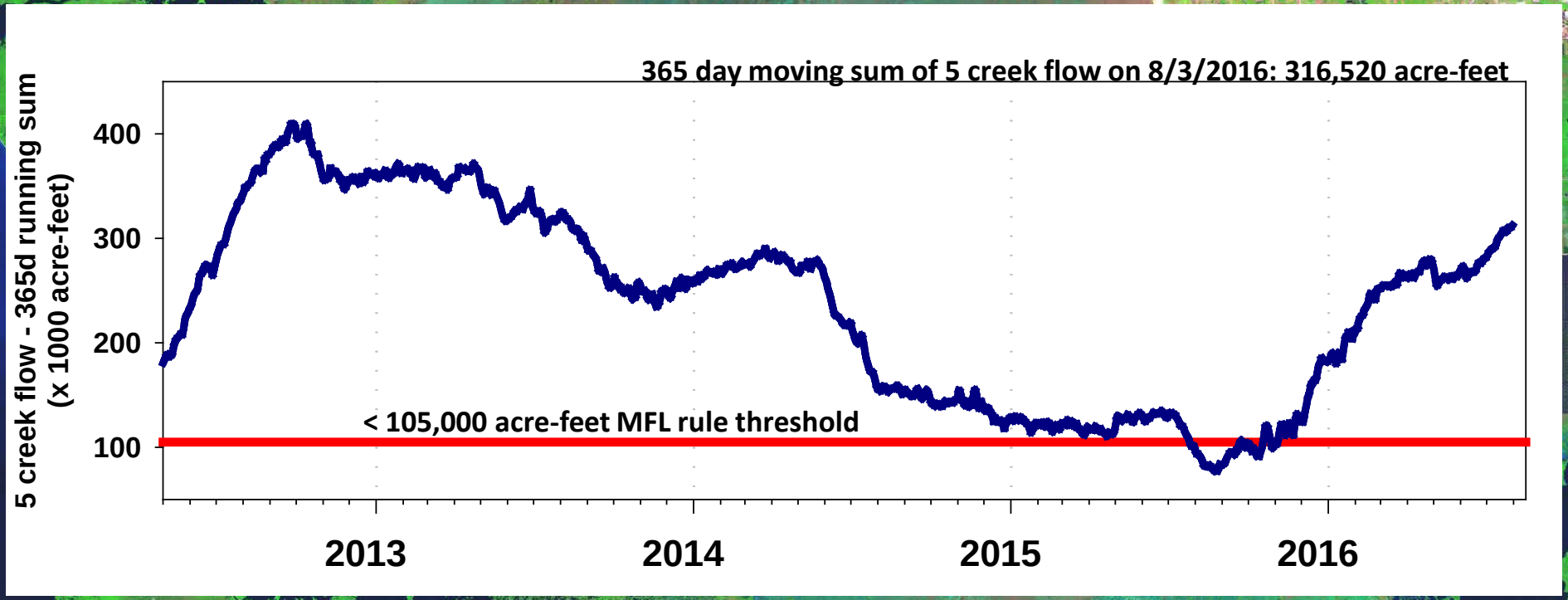


Current
8/8/2016

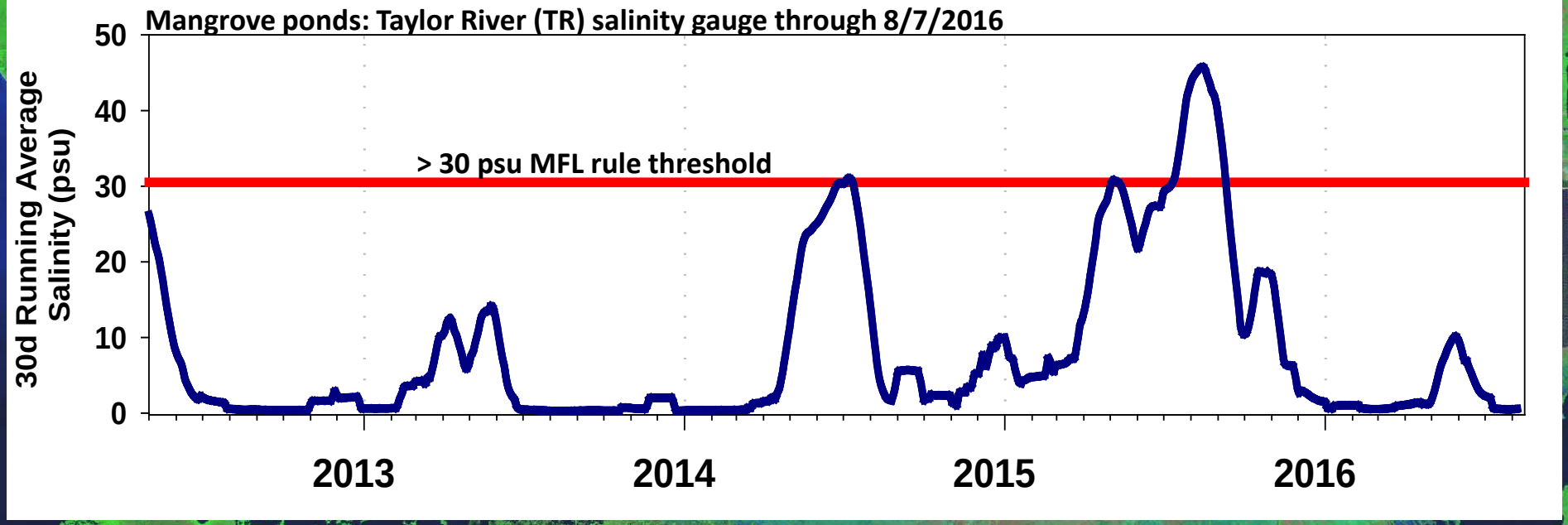




Florida Bay Flow Update

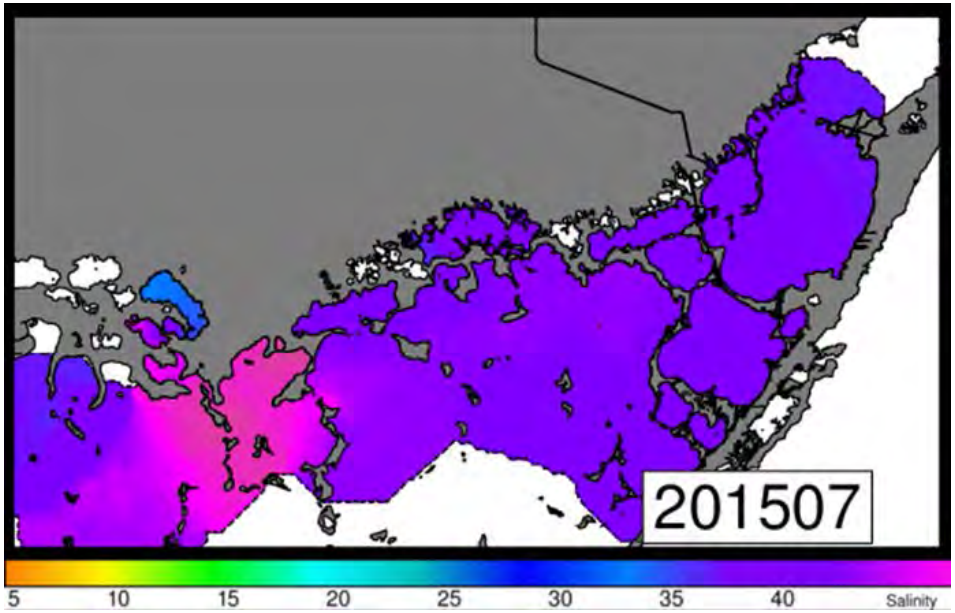


Florida Bay Salinity Update

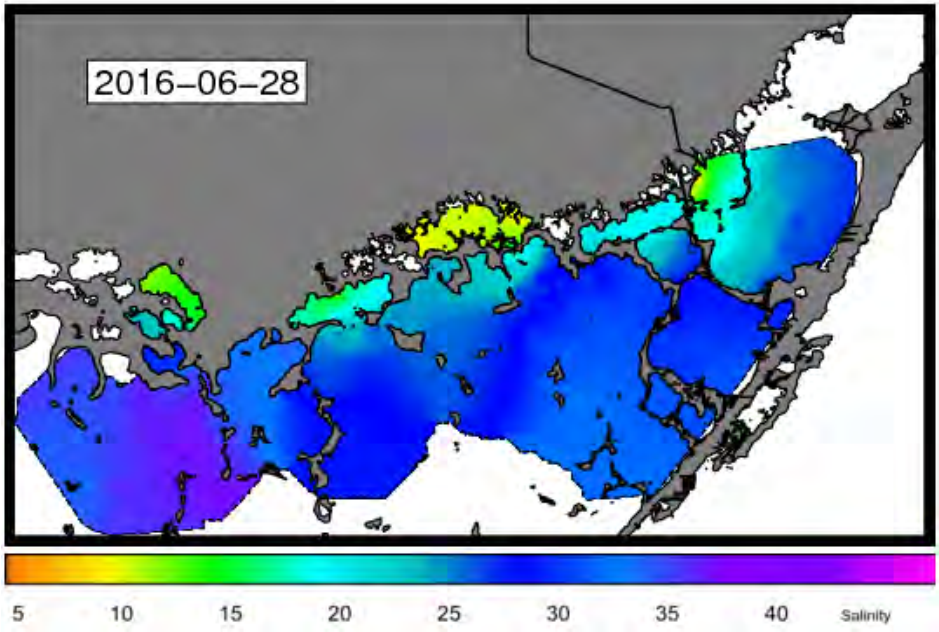


Northeast Florida Bay Salinity Map

July, 2015



June, 2016



- In 2015 salinities were extremely high
- Caused a widespread seagrass die-off
- In 2016, higher rainfall lowered salinities to seasonally normal levels


THANK YOU