

Disclaimer: Information contained in the report addresses environmental conditions only and is not the official South Florida Water Management District operations recommendation or decision.

## MEMORANDUM

**TO:** John Mitnik, Chief, Engineering and Construction Bureau  
Paul Linton, Administrator, Water Control Operations Section

**FROM:** SFWMD Staff Environmental Advisory Team

**DATE:** May 2, 2017

**SUBJECT:** Weekly Environmental Conditions for Systems Operations

### Summary

#### **Weather Conditions and Forecast**

Scattered to numerous heavy showers/storms are expected this afternoon through mid-evening with local three inch rains likely. Morning balloon data from across the peninsula reflects the presence of a weak frontal boundary across central Florida. Steering winds are northerly which will help guide initial storm development over central Florida southward through the afternoon where it will collide with the seabreeze to possibly generate some strong thunderstorms late afternoon. Much quieter day is expected tomorrow with drier air arriving, but this will leave the threat for a few storms near the residual frontal boundary. Another cold front pushes into the region Thursday night/Friday morning with anticipated widespread light to locally moderate rainfall.

#### **Kissimmee**

On Sunday, stage was 0.7 feet below regulation schedule in East Lake Toho, 0.6 feet below regulation schedule in Lake Toho, and 1.3 feet below schedule in Kissimmee-Cypress-Hatchineha (KCH). Over the past week, discharge at S65, S65A, and S65E averaged 283, 205, and 225 cfs, respectively. Tuesday morning discharges were ~274 cfs, 195 cfs, and 327 cfs, respectively at S65, S65A, and S65E. Dissolved oxygen data in the Kissimmee River averaged 7.9 mg/L for the week (manual sondes at PC33 and PC62). Kissimmee River mean floodplain depth on Sunday was 0.05 feet. This week's recommendation is to reduce discharge at S65/S65A by 50 cfs tomorrow (May 3, 2017) to reduce the rate of stage decline in KCH.

#### **Lake Okeechobee**

As of midnight April 30, 2017, Lake stage was 11.61 feet NGVD and in the Beneficial Use sub-band. The current weekly recession rate of 0.17 feet equates to a projected monthly recession rate of 0.68 feet which is well above the recommended 0.50 feet per month or lower guideline. Based on the most recent Lake Okeechobee survey, approximately 14,190 wading birds were reported foraging on the Lake, which is the highest number encountered on the Lake since June of 2011. Half of the birds recorded during the recent survey were found in the hydrated pockets in the cattail treatment areas in Moonshine Bay. For the remainder of the dry season, efforts should be made to limit the amount of water discharged from the Lake in an attempt to keep wading bird and snail kite foraging and nesting locations hydrated. The goal should be to slow the current recession rate and maintain it at below 0.50 feet per month.

#### **Estuaries**

Total discharge to the St. Lucie estuary averaged 67 cfs over the past week with no flow from Lake Okeechobee. Salinities declined slightly compared to last week. The seven-day average salinity at the US1 Bridge remains in the fair range for adult oysters. Total inflow to the Caloosahatchee estuary

averaged 441 cfs over the past week with 266 cfs (60%) coming from the Lake. The 30-day average surface salinity at the Ft. Myers monitoring station is 13.8 PSU and has been above 10 PSU for 35 consecutive days. The 30-day average surface salinity at Val I-75 is 6.6 PSU. Salinity conditions between Val I-75 and Ft. Myers are deteriorating for tape grass. Salinity conditions are in the good range for adult oysters at the Cape Coral Bridge, in the fair range at Shellpoint, and likely in the fair range at the Sanibel Causeway. The 30-day moving average salinity at the I-75 Bridge is forecast to be 9.1 PSU in the next two weeks if no flow comes through the S-79 structure, and the daily salinity is forecast to reach 10.3 PSU. The 2008 LORS/Adaptive Protocols recommend up to 300 cfs at S-79 with flow from Lake Okeechobee supplementing as needed. However, a release greater than 650 cfs is forecast to be required to achieve a 30-day average salinity below 5 at the I-75 Bridge.

### **Stormwater Treatment Areas**

Over the past week, the STAs/FEBs received approximately 4,600 acre-feet of Lake releases. The total amount of Lake releases sent to the STAs/FEBs in WY2017 (since May 1, 2016) is approximately 245,100 acre-feet. Most STA cells are at or near target depths, except STA-5/6 emergent aquatic vegetation cells which are drying out. Operational restrictions are in place for structure repairs and vegetation rehabilitation in STA-1E. In addition, nests of MBTA-protected species have been observed in STA-1E, STA-2, and STA-5/6. If Lake releases are sent to the WCAs and the conditions allow, releases will be sent to STA-2 and STA-3/4.

### **Everglades**

The previous week's water level reversals due to heavy rainfall may have negatively affected White Ibis nesting in WCA-1 and -2A even though recession has resumed. Central and southern WCA-3A are still supporting large numbers of foraging storks, spoonbills, and egrets. In Florida Bay, mangrove zone salinities continue to rise. The 30-day moving average salinity at TR increased by 4.1 PSU to end the week at 26.0 PSU while the daily average salinity has reached 31 PSU. It is recommended to continue to maintain recession rates within the range of  $-0.05$  to  $-0.09$  feet per week to benefit wading bird foraging as much as possible at the end of the wading bird breeding season. More detailed recommendations are included in the table at the end of this report.

## Supporting Information

### KISSIMMEE BASIN

#### Kissimmee Basin Rainfall

The Upper and Lower Kissimmee Basins received 0.00 inches of rainfall in the past week (SFWMD Daily Rainfall Report 05/01/2017).

#### Upper Kissimmee Basin

Stages and departures in the Kissimmee Chain of Lakes (KCOL) are shown in Table 1.

**Table 1.** Departures from KCOL flood regulation (F) or temporary schedules (T, A, or S) (feet NGVD). Discharge and stage data are provisional real-time data from SFWMD OASyS DualTrend; reported values are averages through midnight of the Sunday prior to the report date unless otherwise specified.

Report Date: 5/2/2017

Water Body	Structure/Site	Discharge (cfs), week's average**	Stage Monitoring Site***	Lake Stage (feet)	Schedule*	Regulation (R) or Target (S or T) Stage (feet)	Daily Departure (feet)						
							4/30/17	4/23/17	4/16/17	4/9/17	4/2/17	3/26/17	3/19/17
Lakes Hart and Mary Jane	S62	0	LKMJ	59.8	R	60.1	-0.3	-0.4	-0.4	-0.3	-0.4	-0.4	-0.4
Lakes Myrtle, Preston, and Joel	S57	0	S57	60.1	R	60.4	-0.3	-0.1	-0.1	-0.1	-0.1	0.0	0.0
Alligator Chain	S60	0	ALLI	62.3	R	62.8	-0.5	-0.5	-0.6	-0.7	-0.8	-0.8	-0.9
Lake Gentry	S63	5	LKGT	60.3	R	60.3	0.0	0.0	-0.1	-0.2	-0.3	-0.3	-0.4
East Lake Toho	S59	0	TOHOE	55.6	R	56.3	-0.7	-0.7	-0.9	-1.0	-1.0	-1.2	-1.3
Lake Toho	S61	1	TOHOW, S61	52.7	R	53.3	-0.6	-0.7	-0.8	-1.0	-1.1	-1.2	-1.3
Lakes Kissimmee, Cypress, and Hatchineha	S65	283	LKISSP, KUB011, LKIS5B	48.8	R	50.1	-1.3	-1.3	-1.3	-1.3	-1.5	-1.4	-1.3

\* T = temporary schedule, R = USACE flood control schedule, S = temporary snail kite schedule, A = projected ascension line, N/A= not applicable or data not available.

\*\* Seven-day average of weighted daily means through Sunday midnight.

\*\*\* Names of in-lake monitoring sites and structures used to determine lake stage; if more than one site is listed, an average is reported.

DATA ARE PROVISIONAL

#### Lower Kissimmee Basin

Discharges and stages at Lower Basin structures are shown in Table 2. SFWDAT depth maps for the Phase I restoration area are shown in Figure 12. Kissimmee River floodplain stages at selected stations are shown in Figure 13.

**Table 2.** Mean weekly discharge at S-65x structures, and mean weekly Phase I area river channel dissolved oxygen and floodplain mean water depth. Discharge and stage data are provisional real-time data from SFWMD OASyS DualTrend; reported values are averages through midnight of the Sunday prior to the report date unless otherwise specified.

Report Date: 5/2/2017

Metric	Location	Sunday's 1-day average	Weekly Average**									
			4/30/17	4/23/17	4/16/17	4/9/17	4/2/17	3/26/17	3/19/17	3/12/17	3/5/17	2/26/17
Discharge (cfs)	S-65	276	283	330	344	292	361	626	885	899	877	732
Discharge (cfs)	S-65A	201	205	248	262	270	277	461	681	705	682	569
Discharge (cfs)	S-65D****	243	253	286	297	288	359	679	791	685	721	688
Discharge (cfs)	S-65E****	214	225	267	282	297	372	723	855	737	769	744
DO concentration (mg/L)***	Phase I river channel	7.9	7.9	7.8	8.1	7.7	7.8	8.9	8.8	8.4	8.0	7.7
Mean depth (feet)*	Phase I floodplain	0.05	0.05	0.06	0.06	0.06	0.07	0.11	0.17	0.12	0.07	0.07

\* 1-day spatial average from South Florida Water Depth Assessment Tool (SFWDAT).

\*\* Seven-day average of weighted daily means through Sunday midnight.

\*\*\* DO is the average for manual sondes at PC62 and PC33; telemetry sondes have been taken offline.

\*\*\*\* S-65D discharge combines discharge at S-65D, S-65DX1, and S-65DX2; S65E discharge combines S65E and S65EX1.

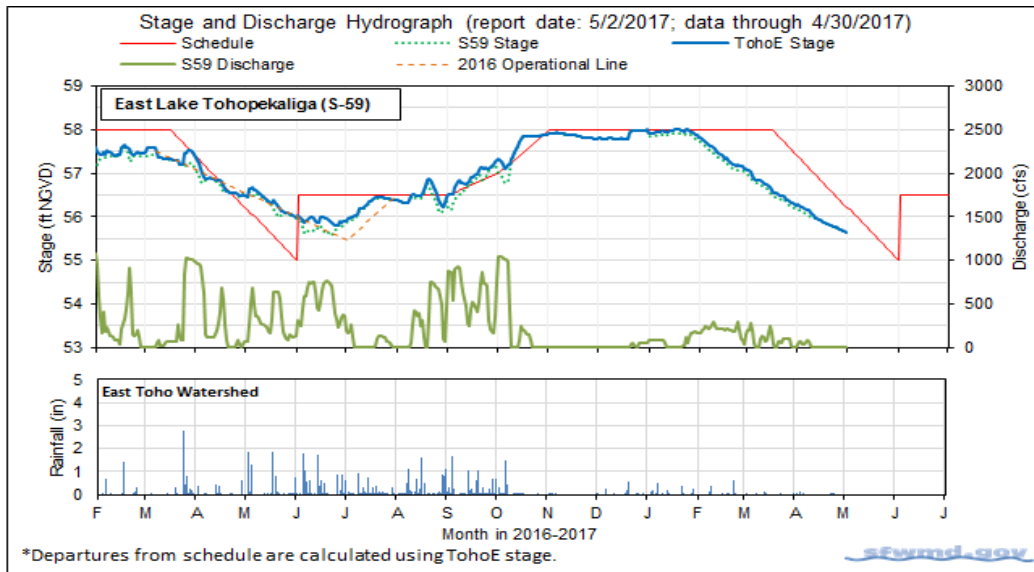
DATA ARE PROVISIONAL; N/A indicates that data were not available.

## Water Management Recommendations

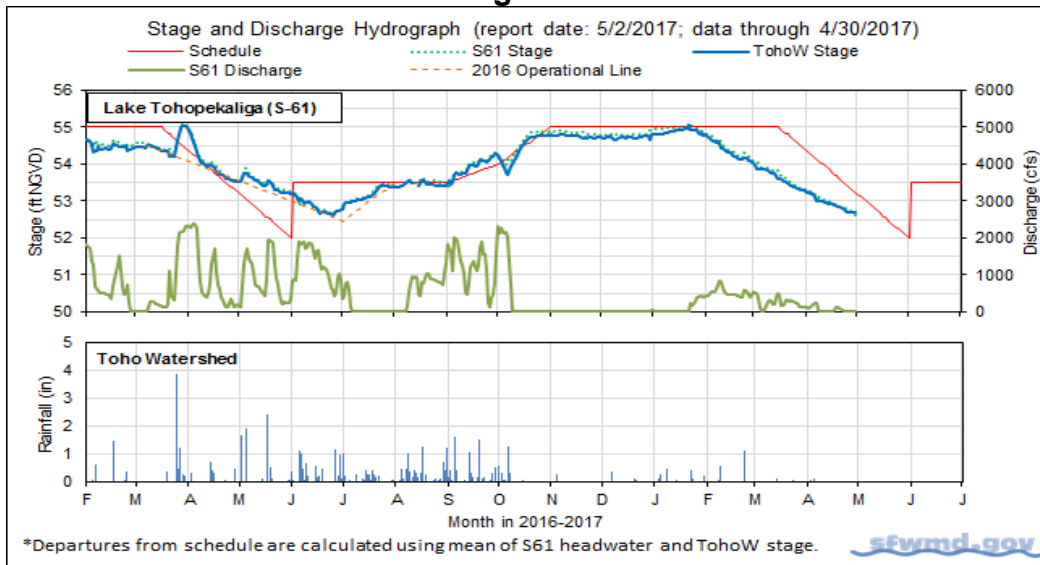
### **Kissimmee Basin Adaptive Recommendations and Operational Actions**

<b>Date</b>	<b>Recommendation</b>	<b>Purpose</b>	<b>Outcome</b>	<b>Source</b>
<b>5/3/2017</b>	Reduce discharge at S65/S65A by 50 cfs	Reduce rate of stage decline in KCH		SFWMD Water Management/KB Ops
<b>4/25/2017</b>	Reduce discharge at S65/S65A by 50 cfs	Reduce rate of stage decline in KCH	Implemented	SFWMD Water Management/KB Ops
<b>4/17/2017</b>	No new recommendations.			
<b>4/11/2017</b>	No new recommendations.			
<b>3/30/2017</b>	Reduce discharge at S-59 and S-61 so that stage in these lakes declines to respective low pools on May 31; reduce discharge at S-65 to 300 cfs.	Reduce rate of stage decline in East Toho, Toho, and KCH.	Implemented	SFWMD Water Management/KB Ops
<b>3/23/2017</b>	Reduce S-65 discharge by 75 cfs per day through 3/25 for a target discharge of ~500 cfs.	Reduce rate of stage decline in KCH.	Implemented	SFWMD Water Management/KB Ops
<b>3/16/2017</b>	Reduce S-65 and S-65A discharge by 150 cfs.	Reduce rate of stage decline in KCH.	Implemented	SFWMD Water Management/KB Ops
<b>3/14/2017</b>	No new recommendations.		N/A	
<b>3/7/2017</b>	No new recommendations.		N/A	
<b>2/22/2017</b>	Increase discharge at S65 to establish and maintain a stage recession on KCH to reach low pool (49 ft) by May 1, as possible subject to rainfall and construction needs. Maintain 49 ft or lower for the month of May as possible.	Wet season storage, aquatic plant management.		KB Operations
<b>2/21/2017</b>	No new recommendations.		N/A	
<b>2/14/2017</b>	Increase S65 and S65A discharge by 200 cfs.	Allow stage to decline in KCH.	Implemented	SFWMD Water Management/KB Ops
<b>2/7/2017</b>	No new recommendations.		N/A	
<b>1/25/2017</b>	Make releases from East Lake Tohopekaliga and Lake Tohopekaliga to achieve a recession rate of 0.2 feet per week. Releases will not be made to compensate for direct rain on the lakes, but adjustments may be made for changes in inflow to maintain the 0.2 feet per week recession rate to the extent available capacity in Lake Kissimmee allows.	To prepare for the 2017 wet season, facilitate the ongoing Kissimmee River Restoration Construction (backfilling of the C-38), and provide more desirable recession rates for East Lake Tohopekaliga and Lake Tohopekaliga, the SFWMD will follow the below guiding criteria to the extent it does not conflict with other water related needs (e.g. Kissimmee River Flows, Kissimmee River Restoration Construction, and flood control).	Implemented	SFWMD Water Management Section/KB Ops
<b>1/24/2017</b>	No new recommendations.		N/A	
<b>1/17/2017</b>	No new recommendations.		N/A	
<b>1/10/2017</b>	No new recommendations.		N/A	
<b>12/2/2016-1/3/2017</b>	Reduce discharge at S65 to minimum (300 cfs +/- 50 cfs) using the table in Figure 8a. Continue reducing headwater stage at S65C at a rate of ~1 ft/week through mid-January per request from USACE.	To facilitate KRRP construction in Pool BC.	Implemented	USACE/WCO/KB Ops
<b>12/20/2016</b>	No new recommendations.		N/A	
<b>12/13/2016</b>	No new recommendations.		N/A	
<b>12/6/2016</b>	No new recommendations.		N/A	
<b>11/29/2016</b>	No new recommendations.		N/A	
<b>11/22/2016</b>	No new recommendations.		N/A	
<b>11/15/2016</b>	No new recommendations.		N/A	

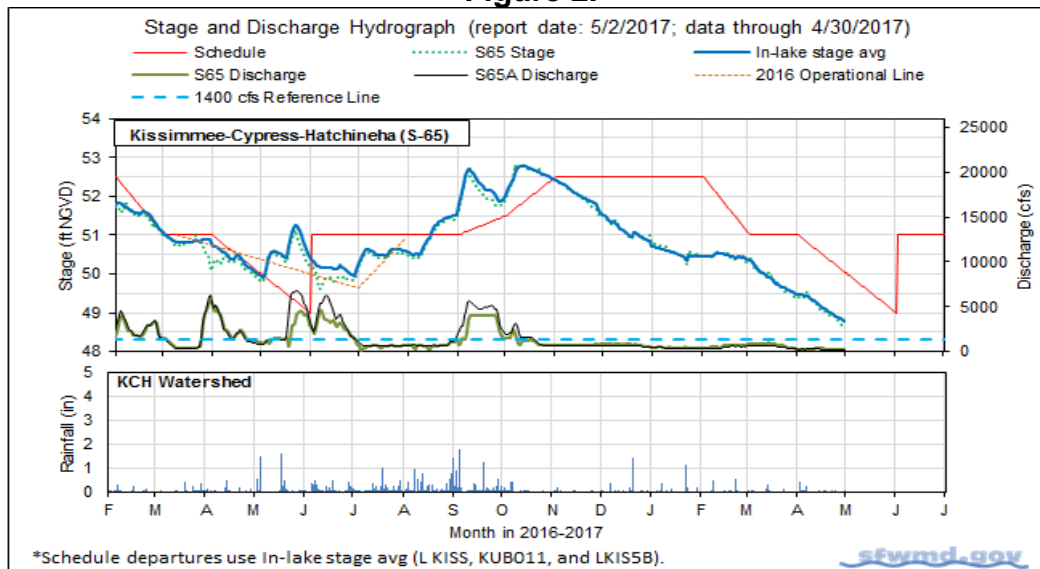
# KCOL Hydrographs (through Sunday midnight)



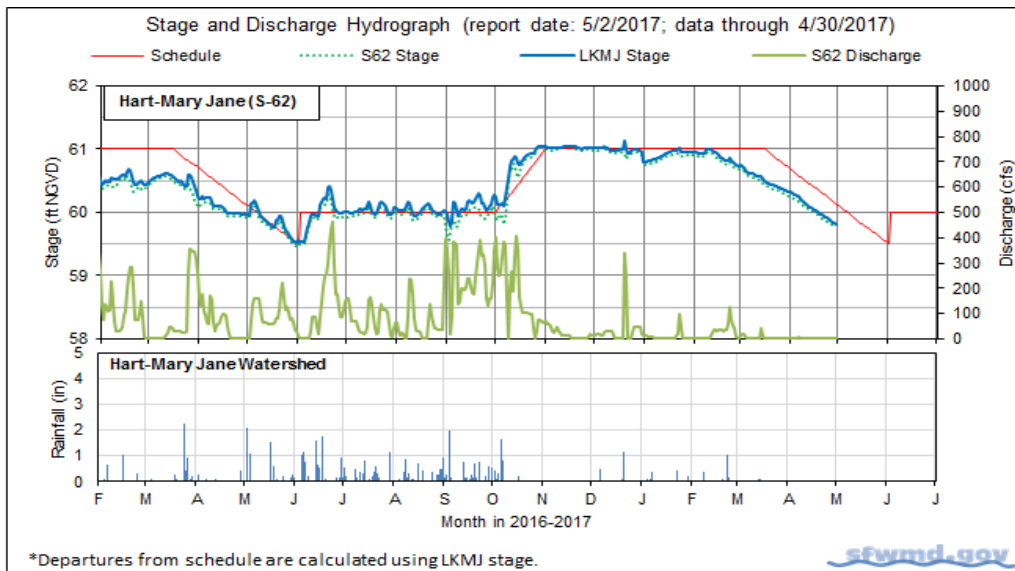
**Figure 1.**



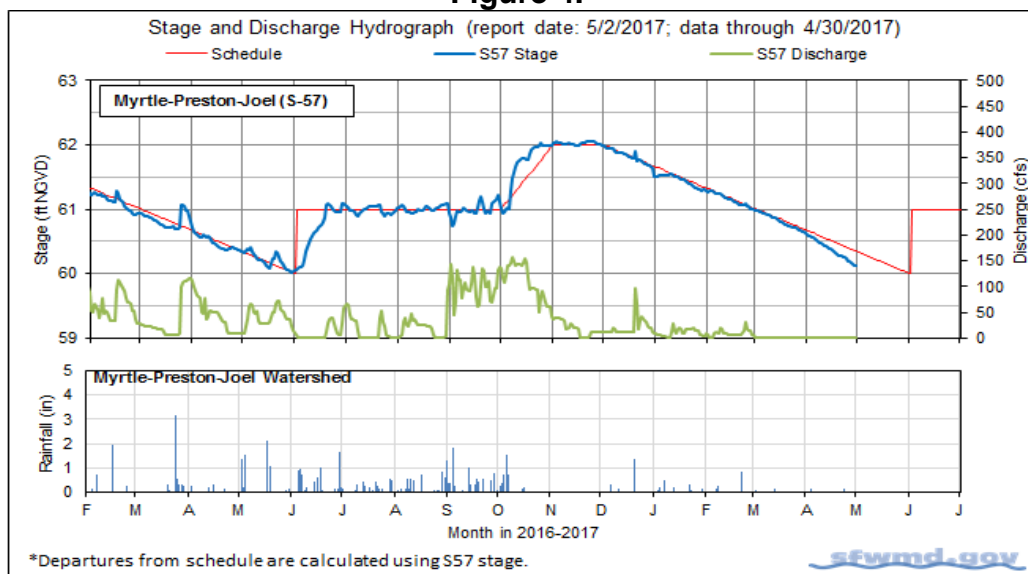
**Figure 2.**



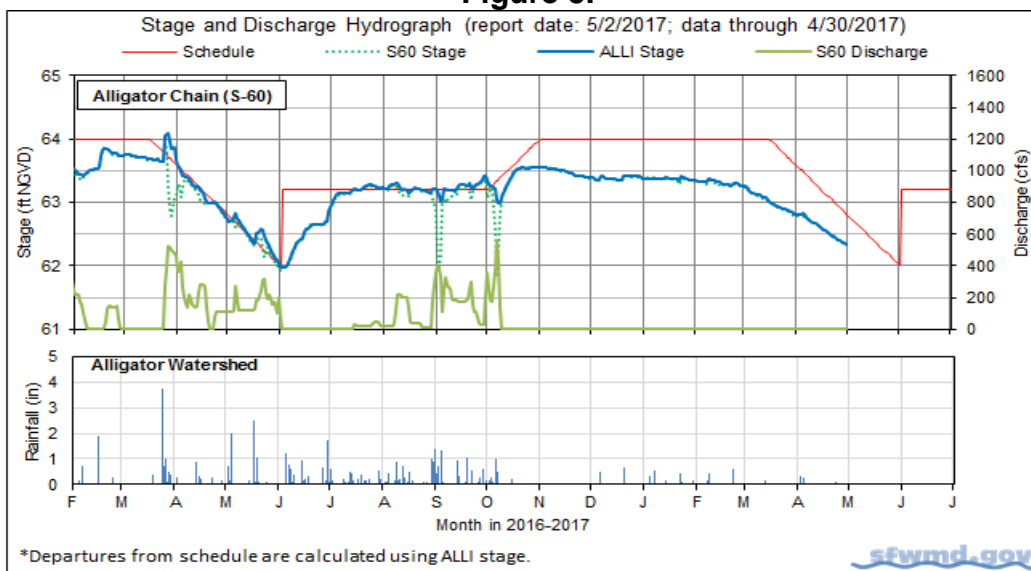
**Figure 3.**



**Figure 4.**



**Figure 5.**



**Figure 6.**



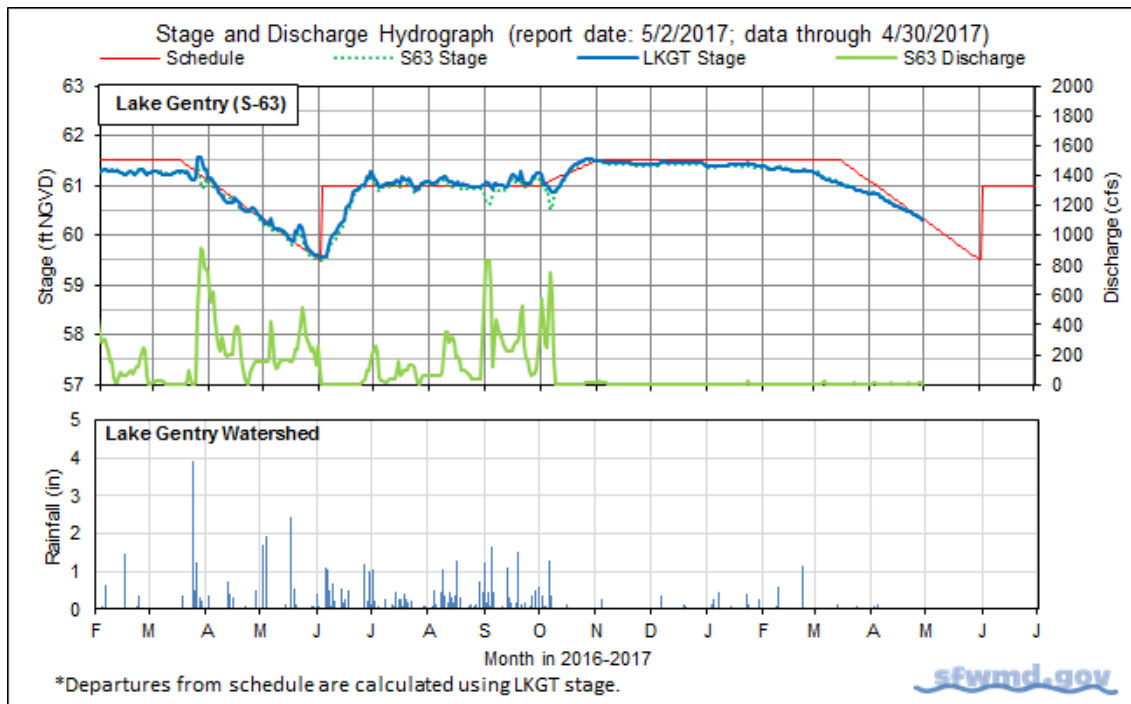


Figure 7.

**SOUTH FLORIDA WATER MANAGEMENT DISTRICT**

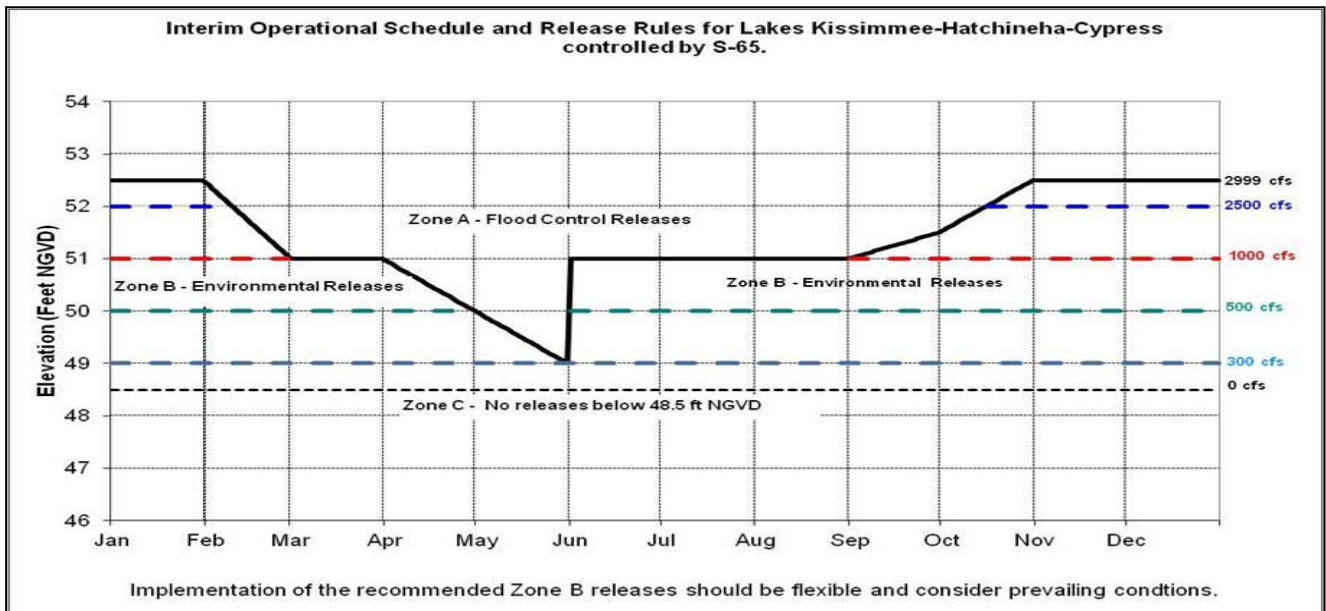
**Limits on Rate of Discharge Change at S65/S65A During Dry Season 2016-2017**

<b>Discharge Rate of Change Limits for S65/S65A (revised 11/16/16).</b>	
Q (cfs)	Maximum rate of increase or decrease (cfs/day)
300-650	75
650-1700	150
1700-3000	300
>3000	1000

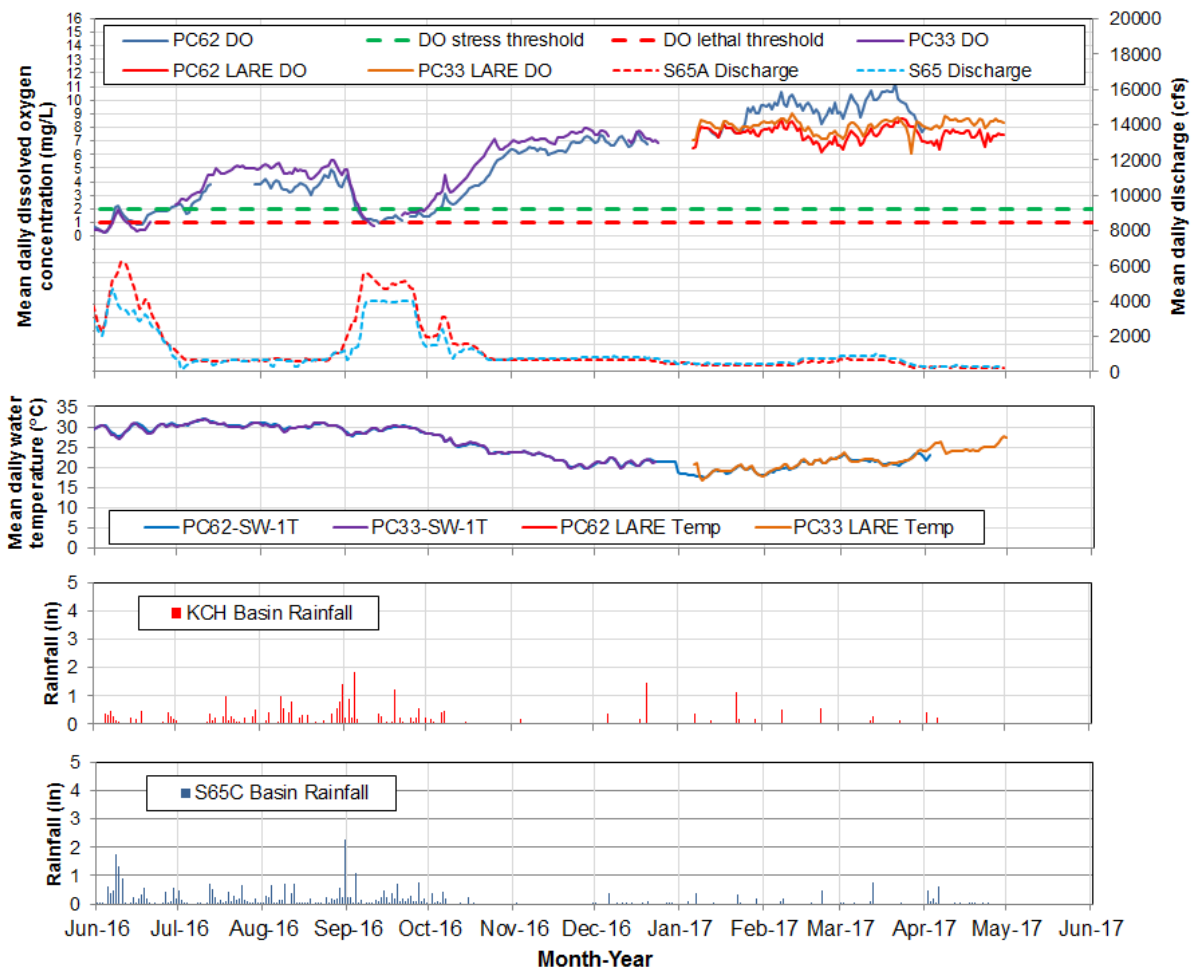
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Figure 8. Limits on rate of discharge change at S65/S65A for the 2016-2017 Dry Season.

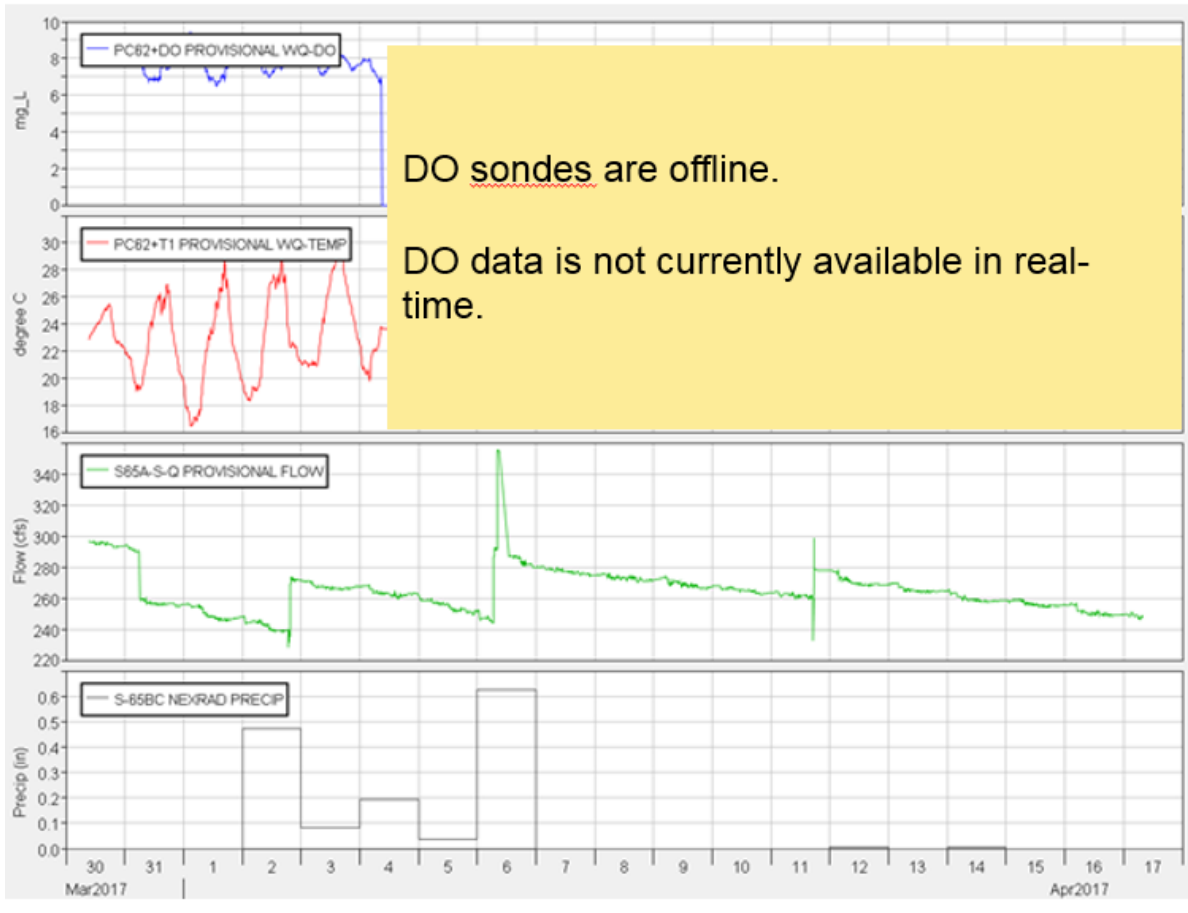




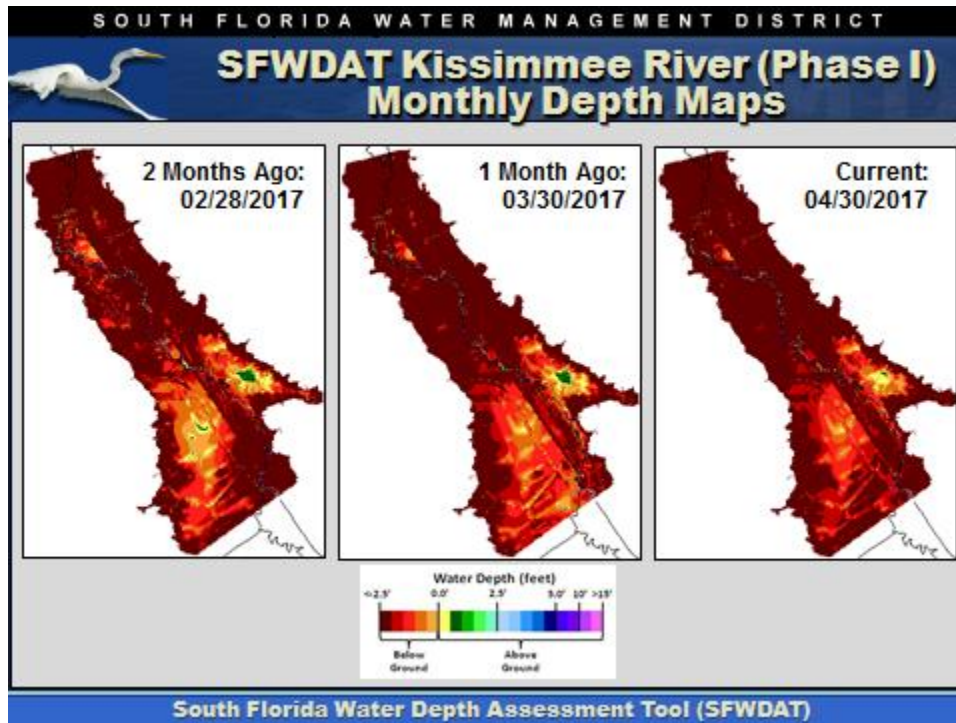
**Figure 9.** Interim operations schedule for S-65. The discharge schedule shown to the right has not been used in recent years or in Wet Season 2015.



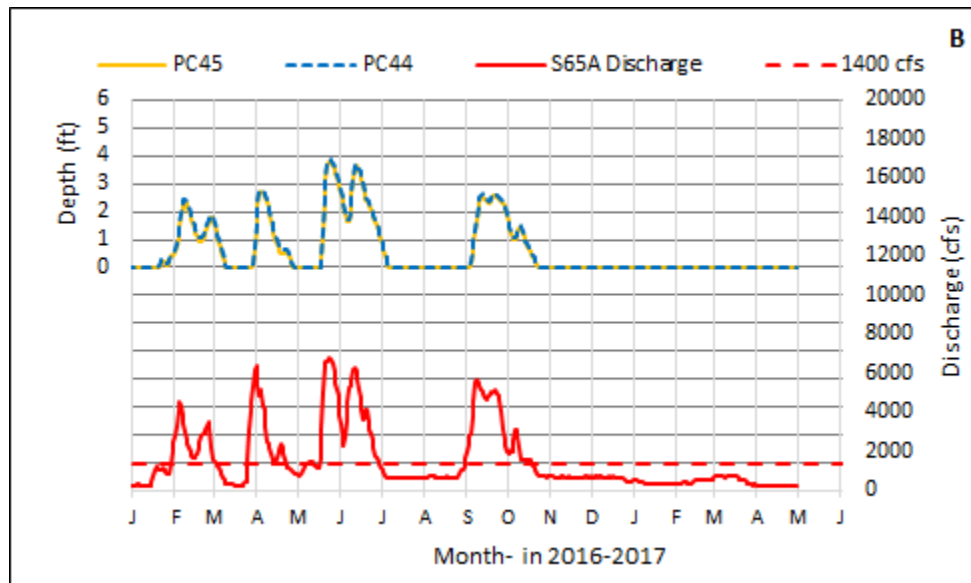
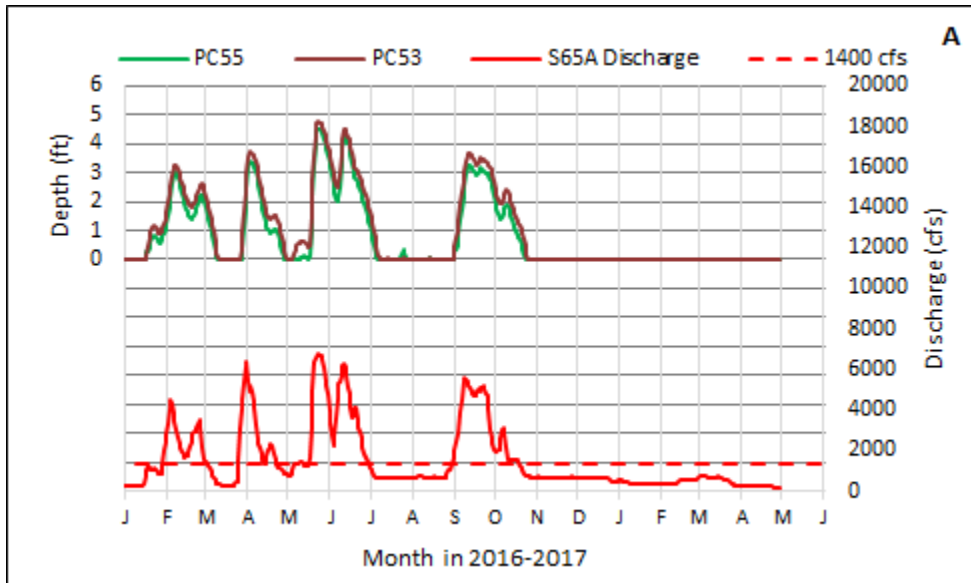
**Figure 10.** Mean daily Dissolved Oxygen, discharge, temperature and rainfall in the Phase I river channel.



**Figure 11.** Phase I river channel dissolved oxygen and water temperature (measured at 15 minute intervals) and Pool BC daily rainfall.

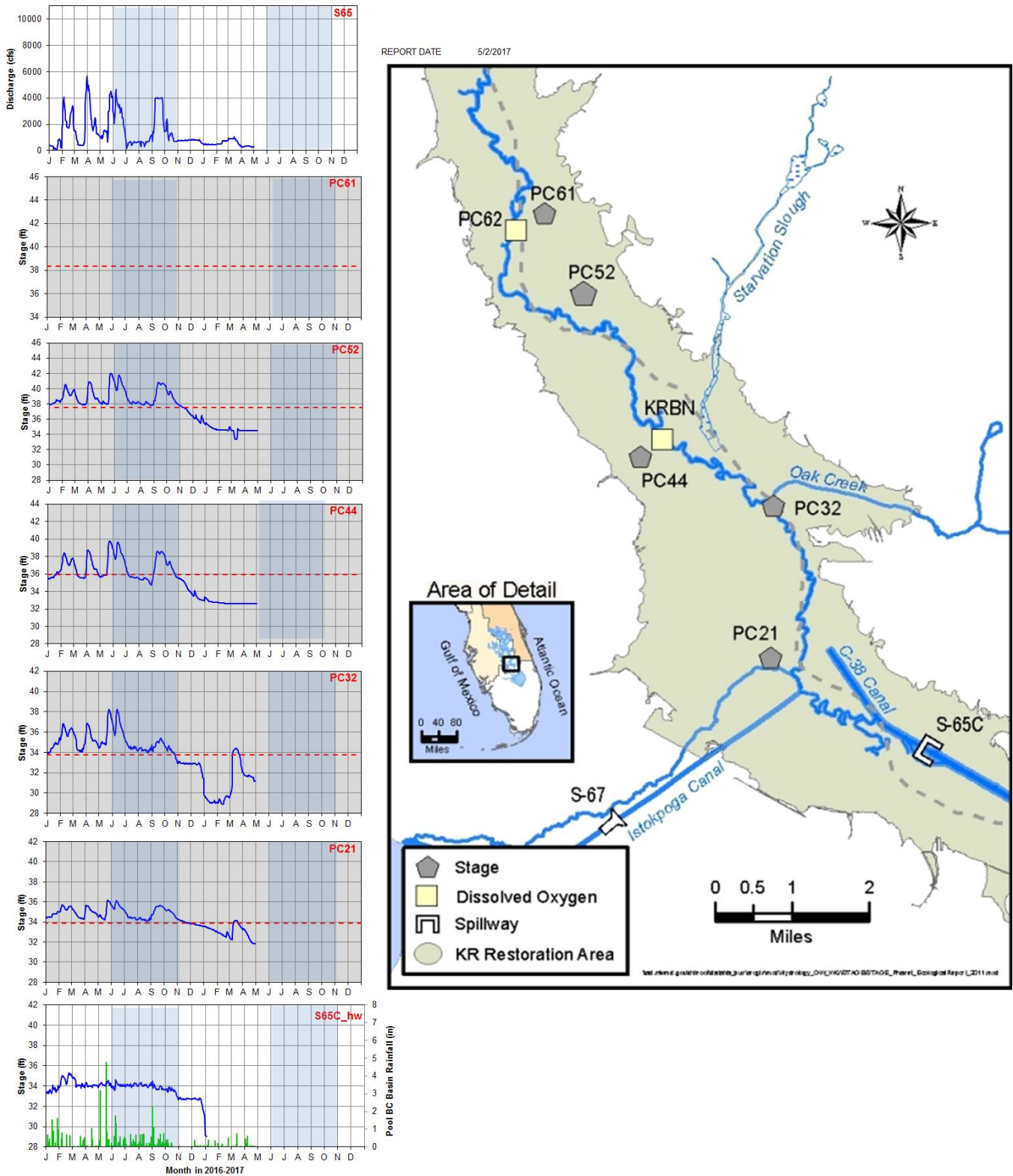


**Figure 12.** Phase I area floodplain water depths for this week, one month ago, and two months ago. Note that the WDAT color-coding has been modified to accommodate greater water depths; these maps are not directly comparable to Kissimmee Basin WDAT maps published prior to Jan. 16, 2012.



**Insert.** Water depth at selected northern Kissimmee River floodplain sites on (A) the PC5's transect and (B) the PC4's transect, with S65A discharge.

# Kissimmee River Hydrographs



**Figure 13.** Discharge at S65, stages at five monitoring stations in the Phase I area of the Kissimmee River floodplain, and headwater stage at S65-C since January 1, 2015. The most recent data (~2 weeks) are provisional real-time data from SFWMD DualTrend; previous data are from SFWMD DB-HYDRO (validated). Dashed lines are ground elevations.



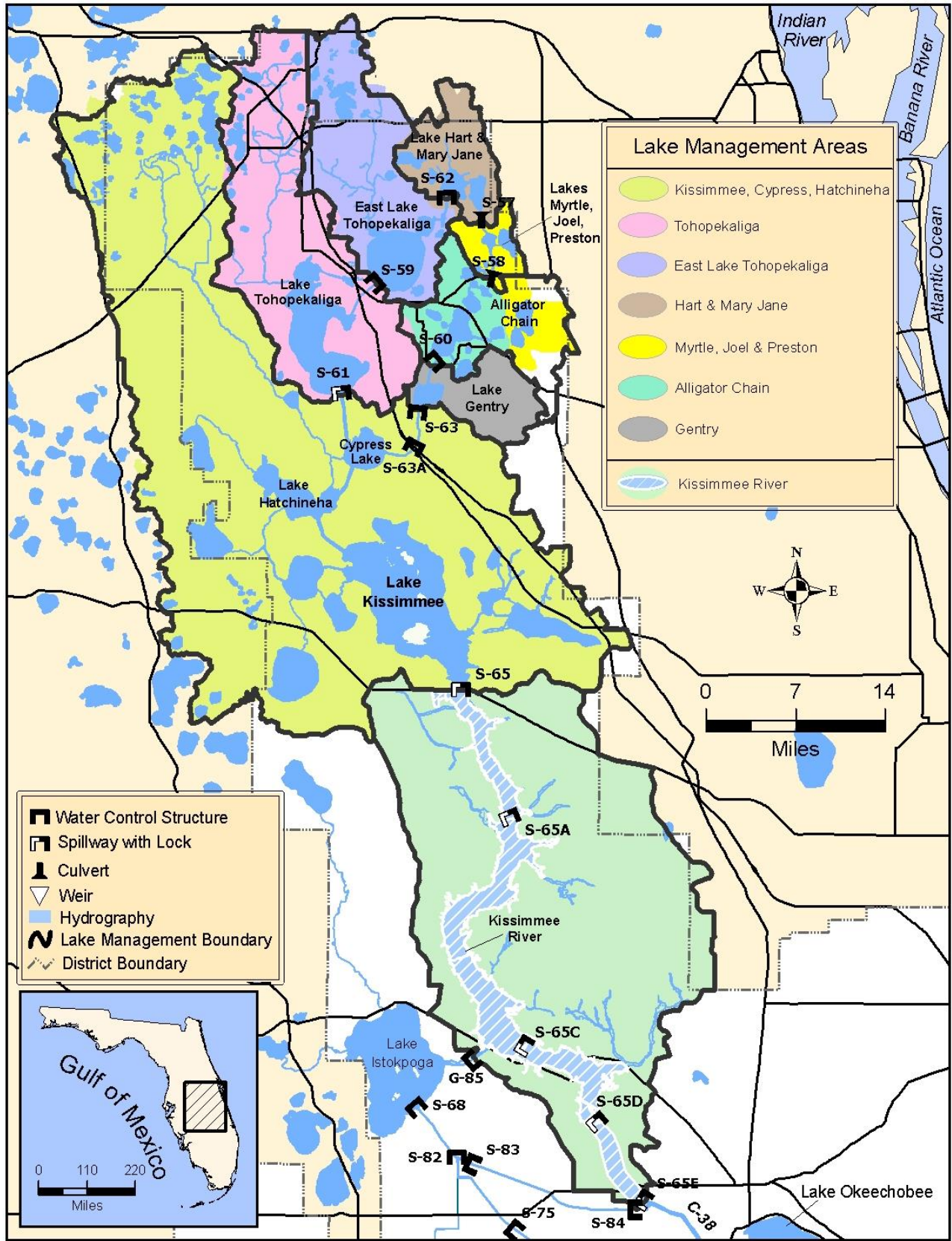


Figure 14. The Kissimmee Basin.

## LAKE OKEECHOBEE

According to the USACE web site, Lake Okeechobee stage is at 11.61 feet NGVD for the period ending at midnight on April 30, 2017. This value is based on the use of four interior Lake stations (L001, L005, L006, and LZ40) and four perimeter stations (S308, S352, S4 and S133). Lake stage decreased by 0.17 feet over the past week and is 0.92 feet lower than it was a month ago and 2.60 feet lower than it was a year ago (Figure 1). The Lake is currently in the Beneficial Use sub-band (Figure 2) and closely tracking the 2012 water levels (Figure 3). According to RAINDAR, 0.03 inches of rain fell directly over the Lake during the past seven days (Figure 4). Similar or less rain fell throughout the remaining watershed.

Based on USACE reported values, current Lake inflow is approximately 214 cfs as detailed below.

<b>Structure</b>	<b>Flow cfs</b>
S65E	0
S65EX1	214
S154	0
S84 & 84X	0
S71	0
S72	0
C5 (Nicodemus slough dispersed storage)	0
S191	0
S133 PUMPS	0
S127 PUMPS	0
S129 PUMPS	0
S131 PUMPS	0
S135 PUMPS	0
Fisheating Creek	0
S2 Pumps	0
S3 Pumps	0
S4 Pumps	0

Current Lake outflow is approximately 2,890 cfs with 1,146 cfs exiting at S77, 315 cfs exiting at S308 and 1,553 cfs being directed south through S351, S352 and S354. Approximately 123 cfs is entering the Lake from the L8 canal through Culvert 10A. Corrected evapotranspiration value based on the L006 weather platform solar radiation data for this past week increased from 3,472 cfs last week to 3,858 cfs.

Change in elevation equivalents and average weekly flows (midnight April 24, 2017 to midnight April 30, 2017) for major structures are presented in Figure 5.

Based on the Lake Okeechobee wading bird habitat suitability index, there are currently approximately 23,072 acres of suitable foraging habitat for long-legged birds and 9,435 acres for long and short-legged birds on the Lake (Figure 6). Most of the marsh is now dry but pockets of hydrated areas remain in the Moonshine Bay cattail treatment areas. During the most recent Lake Okeechobee wading bird foraging survey (April 27, 2017), approximately 14,190 birds were reported foraging on the Lake (Figure 7). This is the greatest number of foraging birds encountered on the Lake since June of 2011 when 14,695 birds were recorded. Additionally, half of the birds recorded during the recent survey were found in the hydrated pockets in the cattail treatment areas in Moonshine Bay.

The most recent imagery from the OLCI sensor are too obscured from cloud cover to evaluate.

### Water Management Recommendations

Lake stage is 11.61 feet NGVD and is in the Beneficial Use sub-band. The current weekly recession rate of 0.17 feet equates to a projected monthly recession rate of 0.68 feet which is well above the recommended 0.50 feet or less per month guideline. Even accounting for the recent two-day reversal of 0.08 feet, the recession rate still remains too high and has been suboptimal for the past two months. For the remainder of the dry season, efforts should be made to limit the amount of water discharged from the Lake in an attempt to keep wading bird and snail kite foraging and nesting locations hydrated.

The goal should be to slow the monthly recession rate to less than 0.50 feet per month. Actions which contribute to a slower recession are essential to protect critical components of the Lake's floral (bulrush and submerged aquatic vegetation) and faunal (wading birds, snail kites, apple snails and fish) communities.

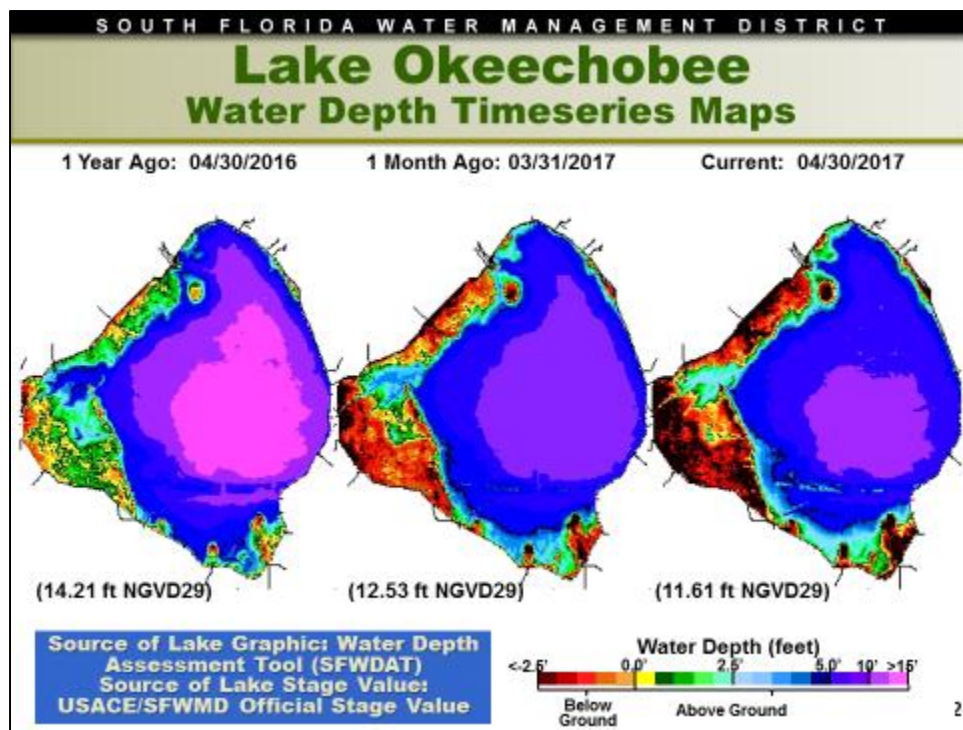


Figure 1



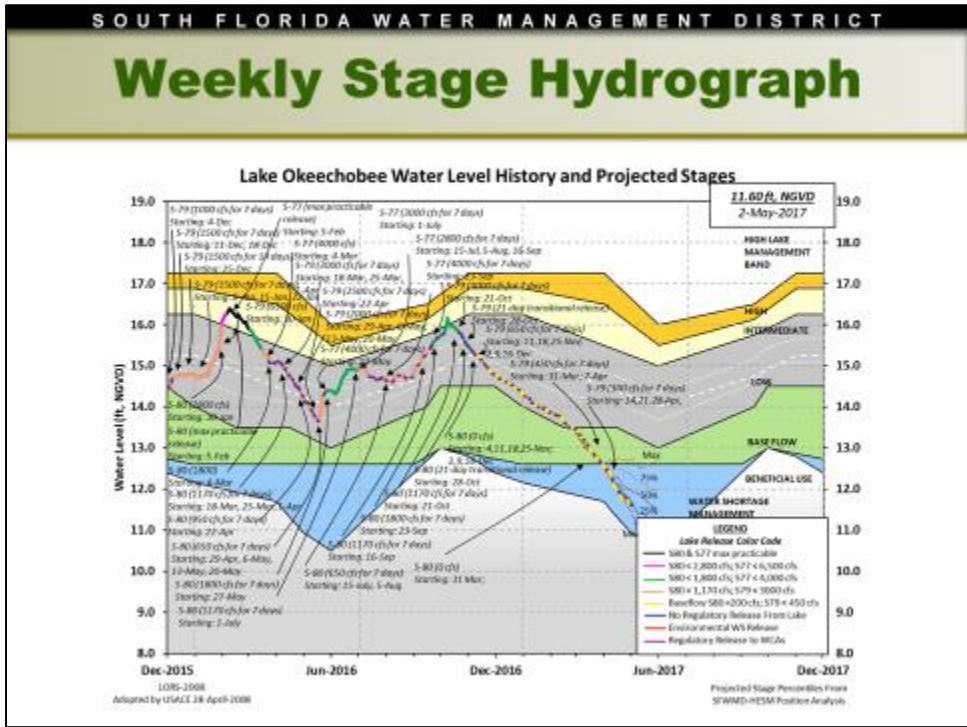


Figure 2

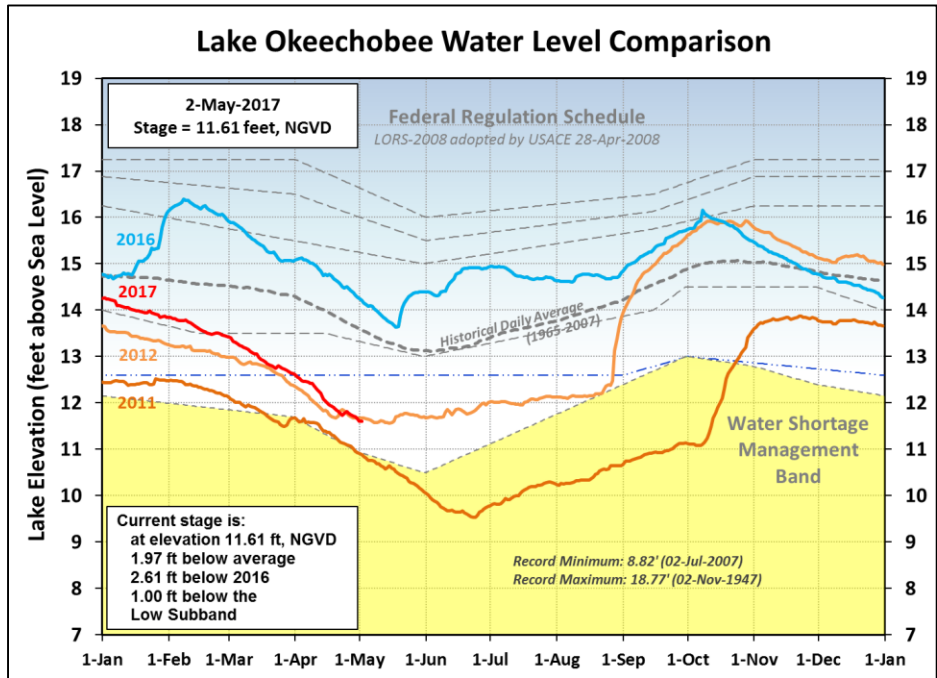
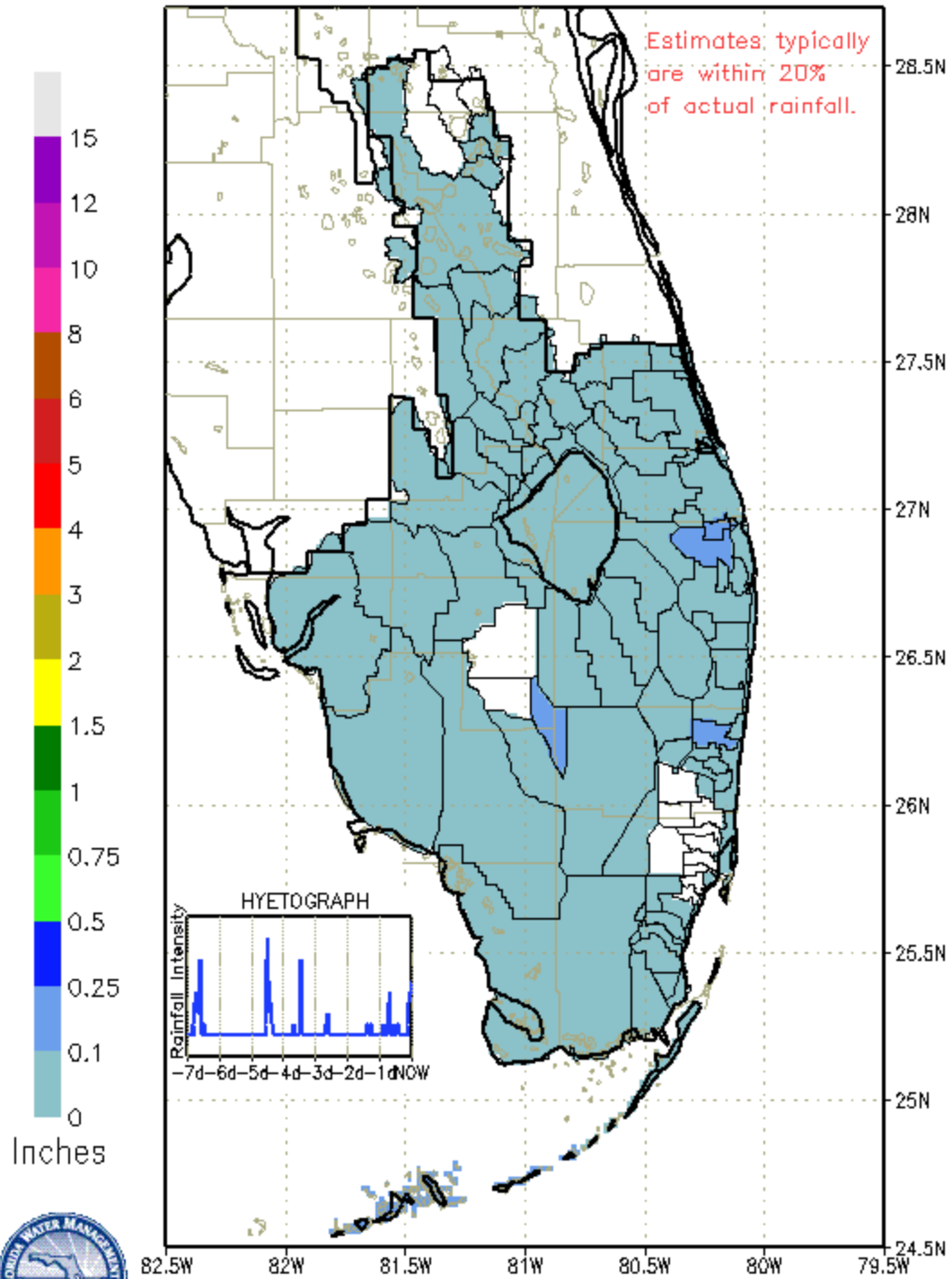


Figure 3

# SFWMD PROVISIONAL RAINFALL 7-DAY BASIN RAINFALL ESTIMATES

FROM: 0530 EST, 04/24/2017 THROUGH: 0530 EST, 05/01/2017



DISTRICT-WIDE RAINFALL ESTIMATE: 0.031"

Figure 4

INFLOWS	Average Daily Flow Past Week cfs	Feet of Change Past Week
S65E & S65EX1	230	0.009
S71 & 72	0	0.000
S84 & 84X	0	0.000
Fisheating Creek	8	0.000
Rainfall	N.A.	0.003
OUTFLOWS	Average Daily Flow Past Week cfs	Feet of Change Past Week
S77	733	0.029
S308	158	0.006
S351	362	0.014
S352	96	0.004
S354	715	0.028
L8	70	0.003
ET	3858	0.153

Figure 5

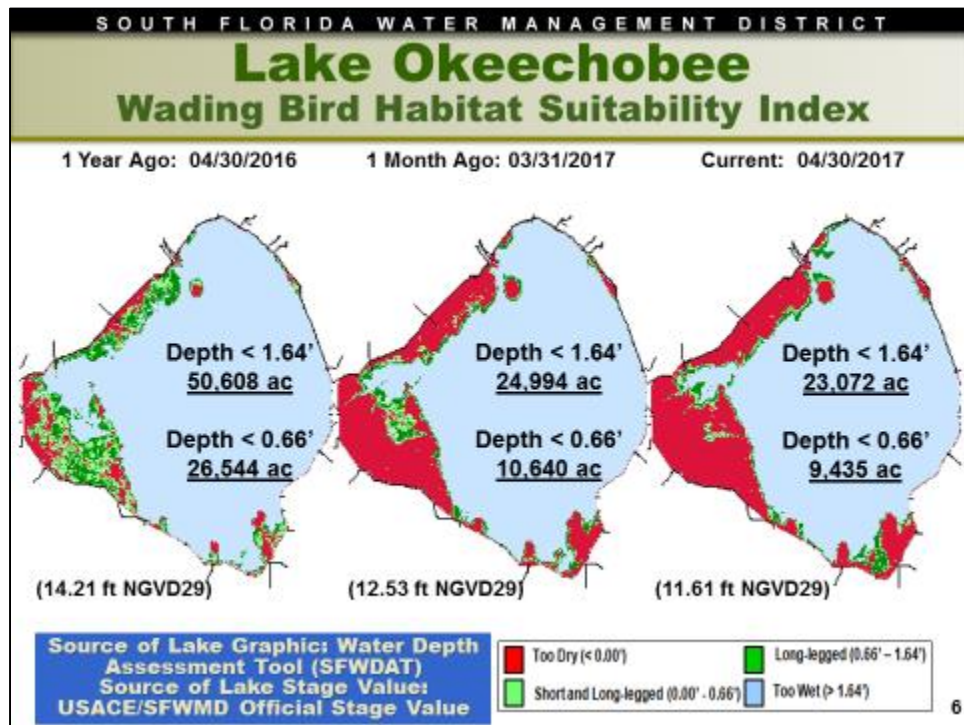


Figure 6

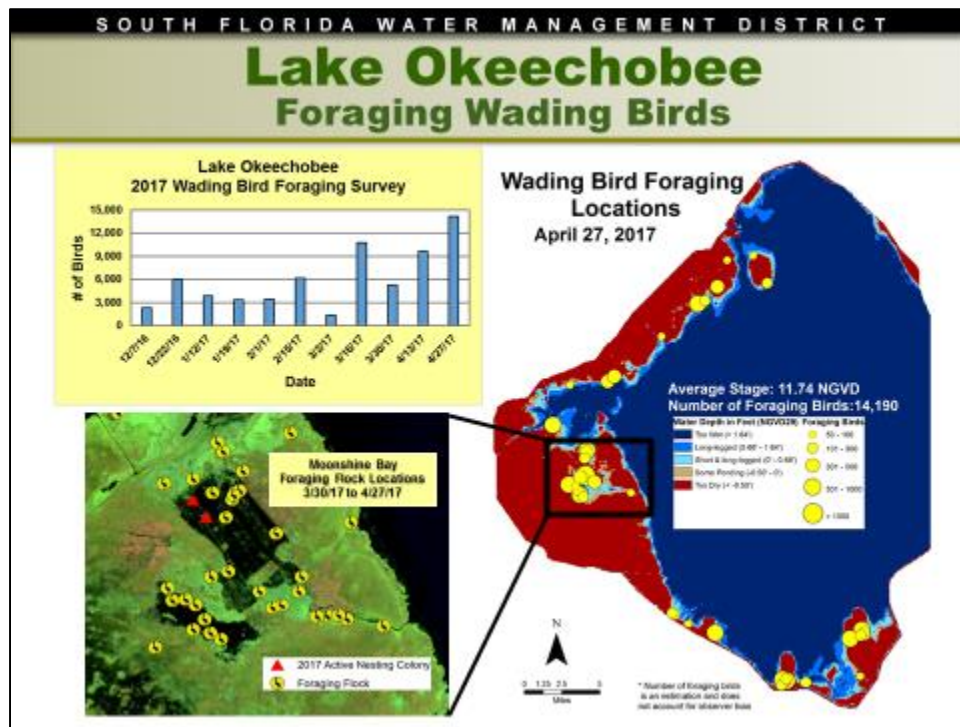


Figure 7

## Lake Istokpoga

The annual recession from high pool to low pool stage on Lake Istokpoga continues. Stage is 37.93 feet NGVD as of April 30, 2017 and is currently 0.98 feet below its regulation schedule of 38.91 feet NGVD (Figure 8). Average flows into the Lake from Arbuckle and Josephine creeks were -14 cfs and 5 cfs respectively, a decrease from last week's total flow. Average discharge from S68 and S68X this past week was 96 cfs, an increase from the previous week's flow of 87 cfs. According to RAINДАР, 0.01 inches of rain fell in the Lake Istokpoga watershed during the past seven days.

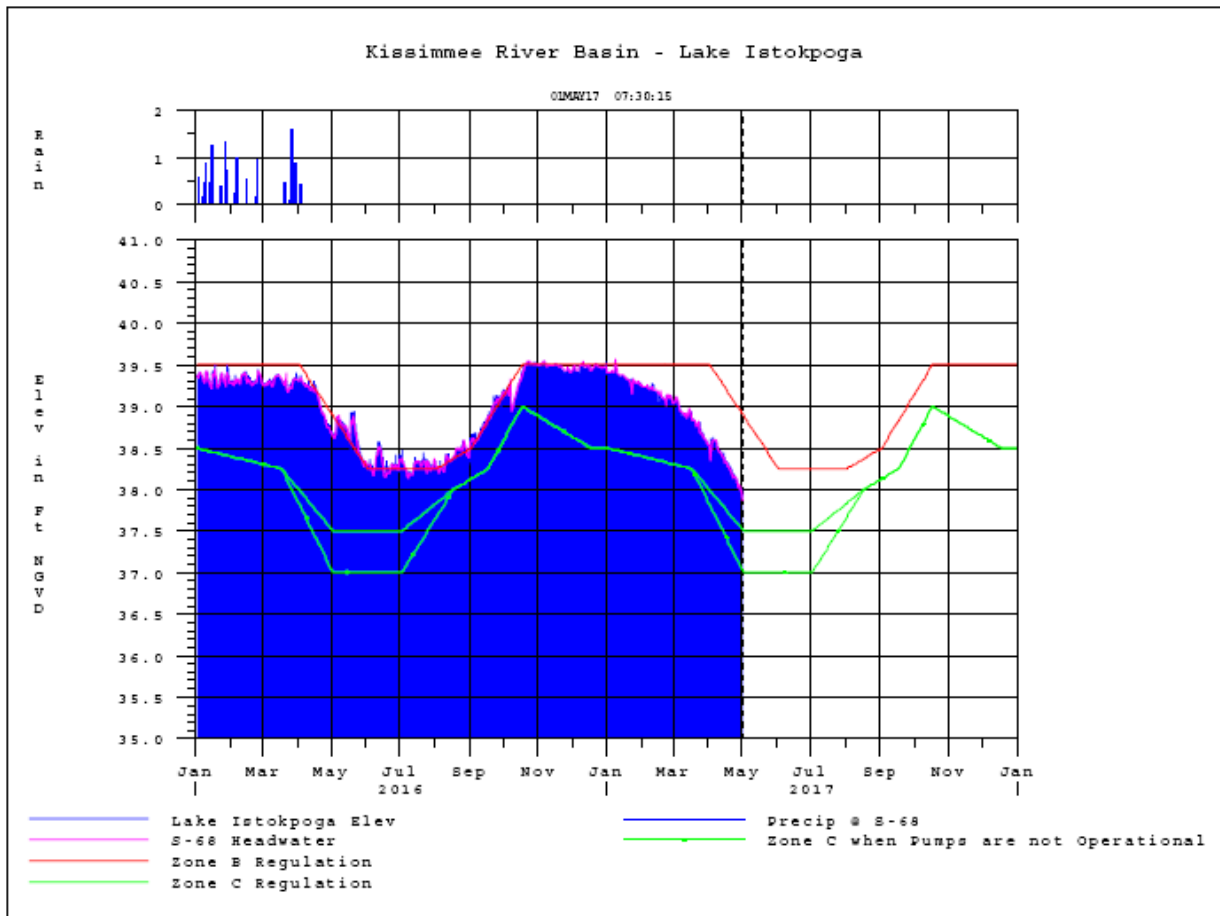


Figure 8

## ESTUARIES

### St. Lucie Estuary

Over the past week, provisional flows averaged about 0 cfs at S-80, 211 cfs downstream of S-308 (gates closed, lock open during the day and closed at night), 0 cfs at S-49 on C-24, 0 cfs at S-97 on C-23, and 39 cfs from Ten Mile Creek at the Gordy Road Structure. Average inflow from tidal basin tributaries is estimated to be 42 cfs (Figures 1 and 2). Total inflow averaged about 67 cfs last week and 180 cfs over last month.

Over the past week, salinity decreased throughout the estuary (Table 1, Figures 3 and 4). The seven-day moving average salinity of the water column at the US1 Bridge is about 27.4. Salinity conditions in the middle estuary are in the fair range for the adult eastern oyster.

Table 1. Seven-day average salinity at three monitoring stations in the St. Lucie Estuary. Current average is in bold face type, previous average in parentheses. The envelope reflects the preferred salinity range for adult eastern oysters (*Crassostrea virginica*) in the middle estuary.

Sampling Site	Surface	Bottom	Envelope
HR1 (N. Fork)	<b>25.9</b> (26.6)	<b>26.6</b> (27.7)	NA <sup>1</sup>
US1 Bridge	<b>27.2</b> (28.7)	<b>27.5</b> (29.1)	10.0-26.0
A1A Bridge	<b>32.0</b> (34.0)	<b>32.5</b> (34.4)	NA

<sup>1</sup>Envelope not applicable

## Caloosahatchee Estuary

During the past week, provisional flows averaged approximately 623 cfs at S-77, 297 cfs at S-78, and 357 cfs at S-79. Average inflow from tidal basin tributaries is estimated to be 84 cfs (Figures 5 and 6). Total inflow averaged 441 cfs last week and 535 cfs over last month.

Over the past week in the estuary, salinity decreased to Ft. Myers Yacht Basin and at Sanibel, but increased downstream of Ft. Myers to Shell Point (Table 2, Figures 7 and 8). The seven-day average salinity values are within the good range for adult oysters at Cape Coral, within the fair range at Shell Point, and likely within the fair range at Sanibel (Figure 9). The 30-day moving average surface salinity is 6.6 at Val I-75 and 13.8 at Ft. Myers. The 30-day moving average salinity at Ft. Myers has been above 10 for 35 consecutive days. Salinity conditions between Val I-75 and Ft. Myers are likely to result in tape grass deterioration. Without discharges at S-79, the 30-day moving average salinity at Val I-75 is forecast to be 9.1 within two weeks (Figure 10).

Table 2. Seven-day average salinity at six monitoring stations in the Caloosahatchee Estuary. Current average is in bold face type, previous average in parentheses. The envelope reflects the preferred salinity range for tape grass (*Vallisneria americana*) at Val I-75 and for adult eastern oysters (*Crassostrea virginica*) elsewhere.

Sampling Site	Surface	Bottom	Envelope
S-79 (Franklin Lock)	<b>7.0</b> (10.1)	<b>7.5</b> (10.6)	NA <sup>1</sup>
*Val I75	<b>8.2</b> (10.6)	<b>10.9</b> (13.3)	0.0-5.0 <sup>2</sup>
Ft. Myers Yacht Basin	<b>16.8</b> (16.0)	<b>16.5</b> (18.4)	NA
Cape Coral	<b>23.0</b> (21.3)	<b>23.3</b> (24.3)	10.0-30.0
Shell Point	<b>32.7</b> (31.4)	<b>32.0</b> (31.9)	10.0-30.0
Sanibel	<b>34.8</b> (34.9)	<b>EM</b> <sup>3</sup> (EM)	10.0-30.0

<sup>1</sup>Envelope not applicable, <sup>2</sup>Envelope is based on a 30-day average, <sup>3</sup>Equipment Malfunction.

\*Val I75 is temporarily offline due to site construction,  
Salinity values are estimated using models developed for this site.

Monitoring data collected by the River, Estuary and Coastal Observing Network of Sanibel-Captiva Conservation Foundation using continuous sensors are summarized in Table 3 as concentration ranges of Chlorophyll *a* and dissolved oxygen at Beautiful Island, Ft. Myers, and Shell Point in the Caloosahatchee Estuary.

Table 3. Weekly ranges of Chlorophyll *a* (a measure of algal biomass) and dissolved oxygen concentrations at three monitoring stations maintained by the Sanibel-Captiva Conservation Foundation.

	RECON Monitoring Stations		
	Beautiful Island	Ft. Myers	Shell Point
Chlorophyll <i>a</i> (µg/l)	4.25 – 8.99	4.35 – 8.82	1.28 – 10.30 4 spikes up to 76.1 (4/26)
Dissolved Oxygen (mg/l)	3.84 – 6.70	4.67 – 6.78	No Data

The Florida Fish and Wildlife Research Institute reported on April 28, 2017, that *Karenia brevis*, the Florida red tide organism, was observed in background concentrations in two samples collected from Lee County.



## Water Management Recommendations

The 30-day average salinity at the I-75 Bridge is forecast to exceed 5 with no inflow at S-79, and the daily salinity is forecast to reach 10.3 within two weeks. Lake stage is in the Beneficial Use sub-band of 2008 LORS. The 2008 LORS/Adaptive Protocols recommend up to 300 cfs at S-79 with flow from Lake Okeechobee supplementing as needed. However, a release greater than 650 cfs is forecast to be required to achieve a 30-day average salinity below 5 at the I-75 Bridge.

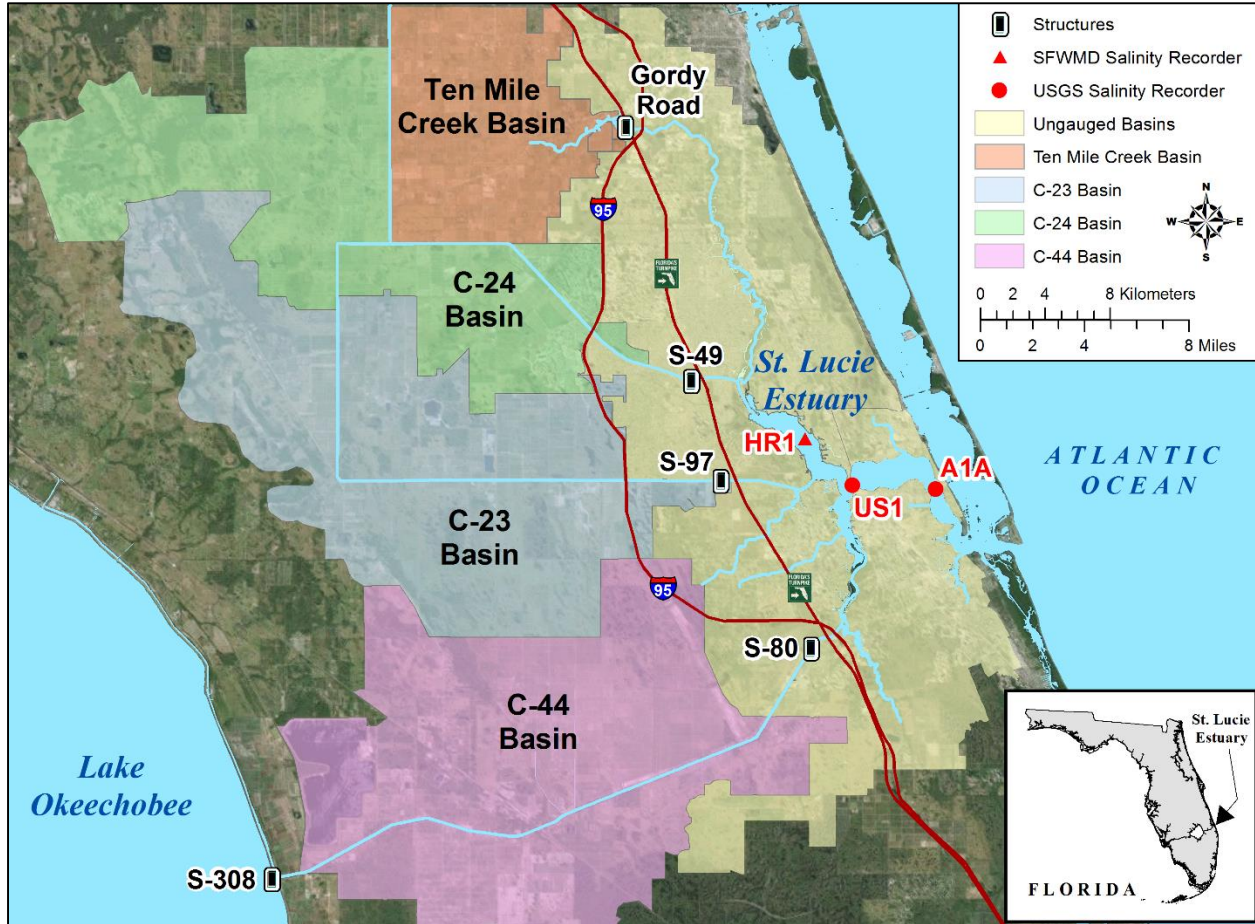


Figure 1. Basins, water control structures, and salinity monitoring for the St. Lucie Estuary.



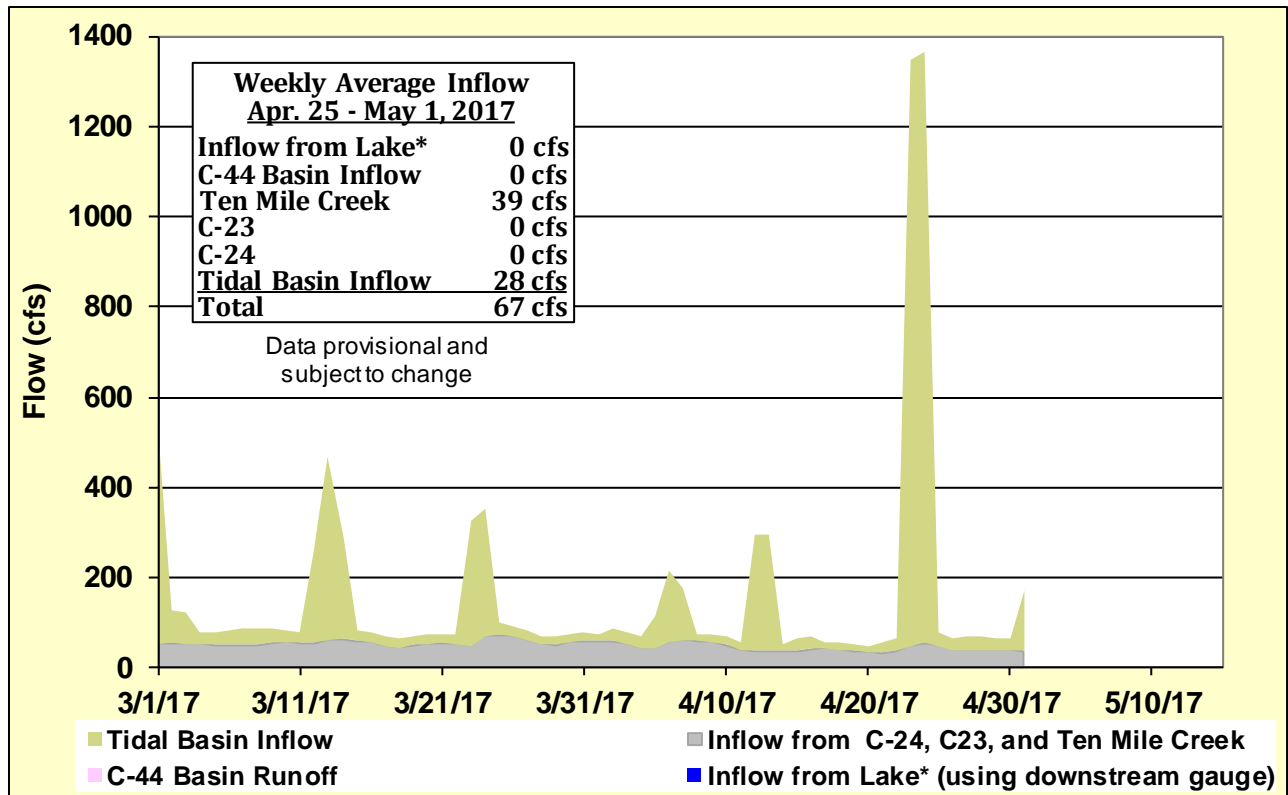


Figure 2. Estimated surface freshwater inflows from Lake Okeechobee and runoff from the C-44, C-23, C-24, Ten Mile Creek, and tidal basins into the St. Lucie Estuary.

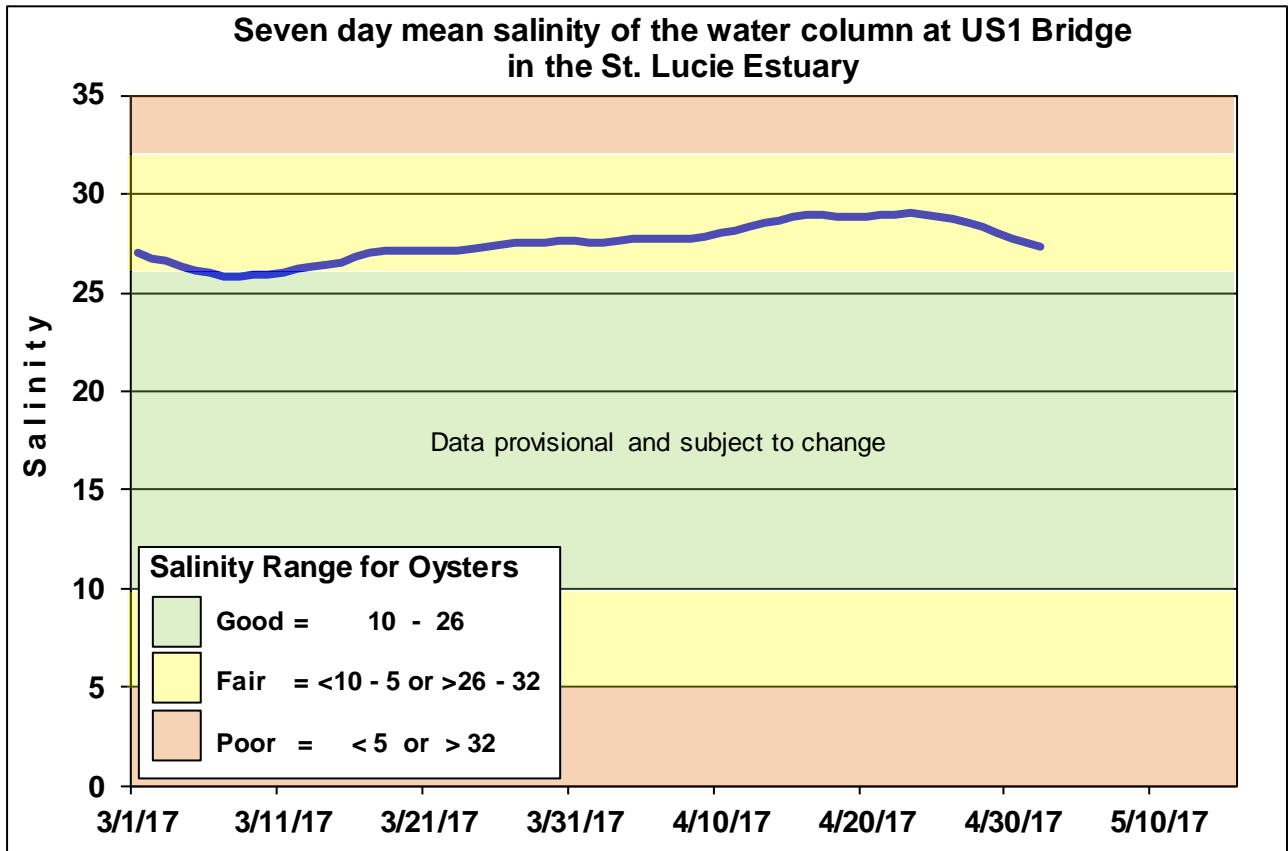


Figure 3. Seven-day mean salinity of the water column at the U.S. Highway 1 Bridge.

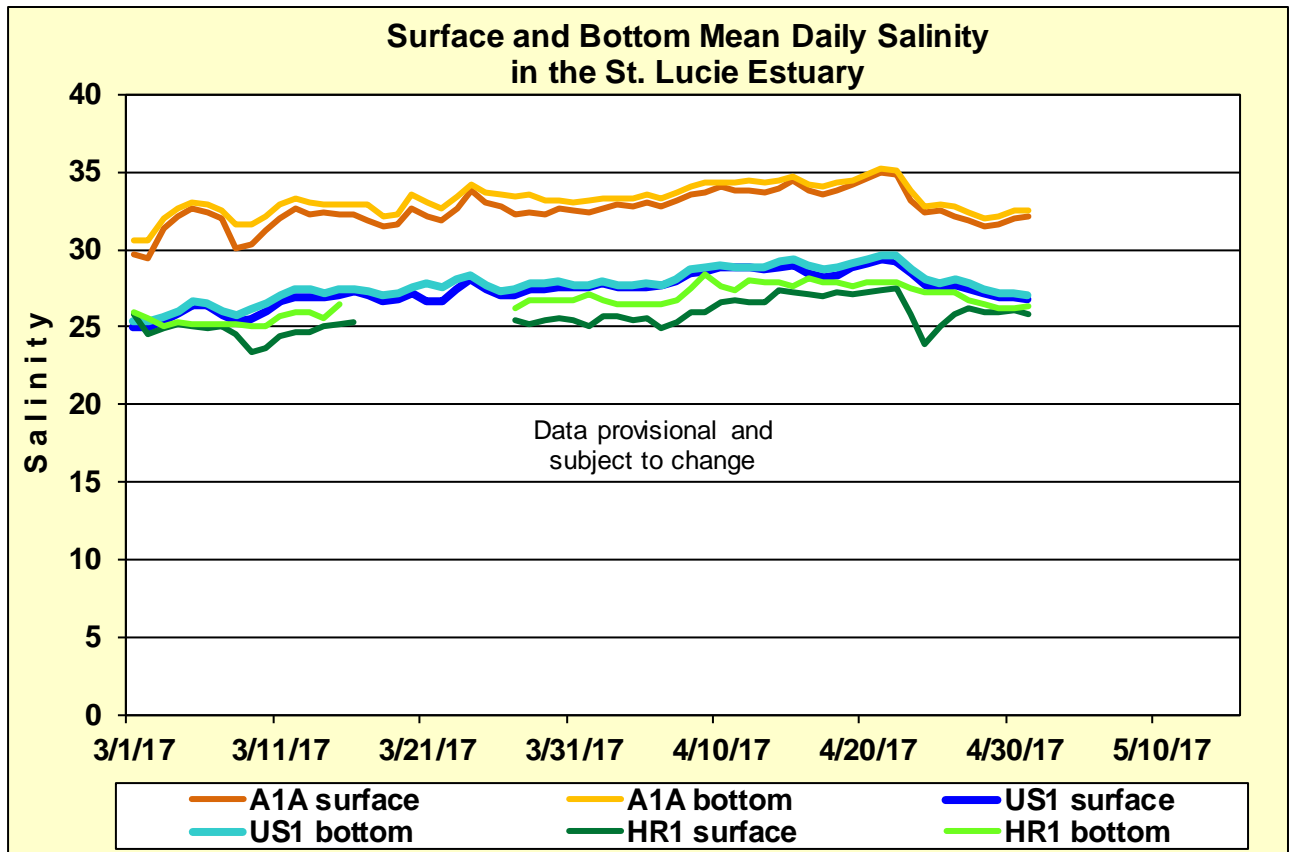


Figure 4. Daily mean salinity at the A1A, US1 and estimated HR1 stations.

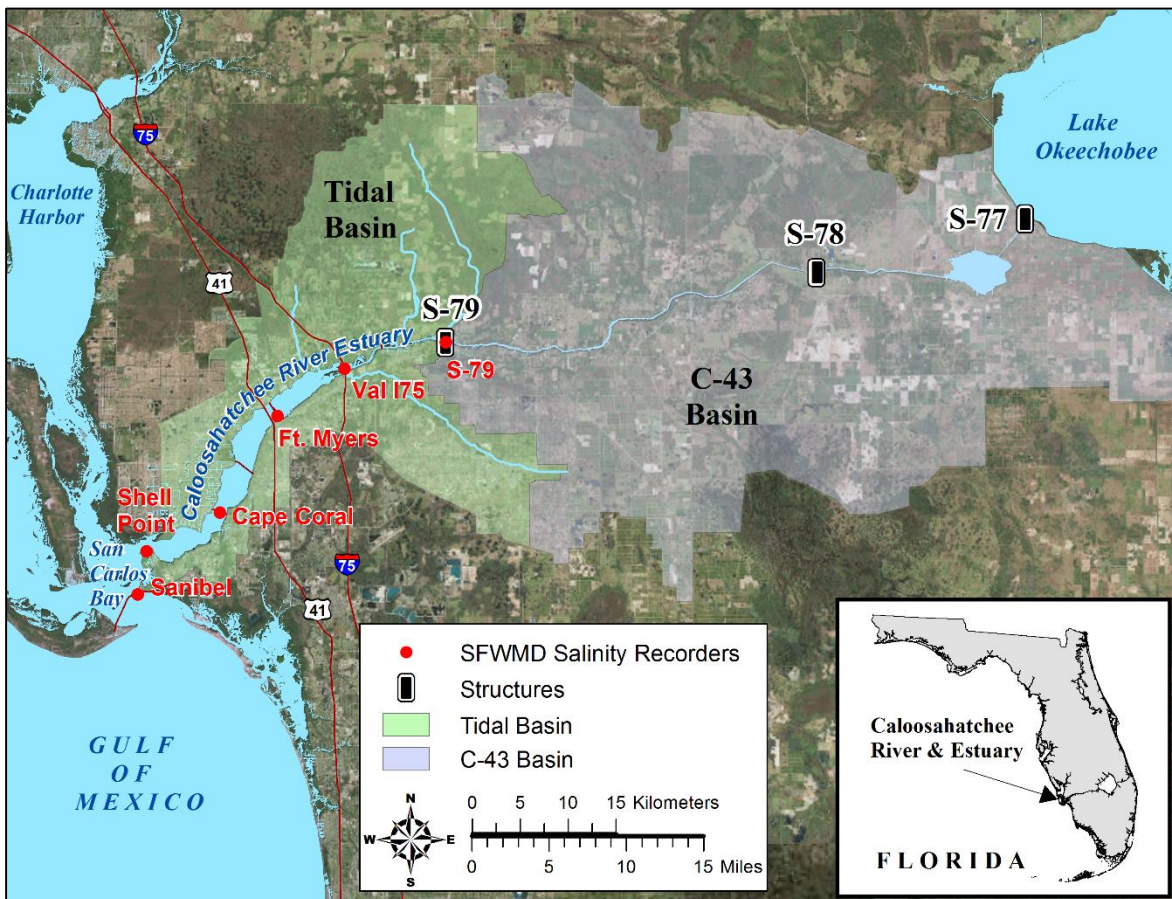


Figure 5. Basins, water control structures, and salinity monitoring for the Caloosahatchee Estuary.

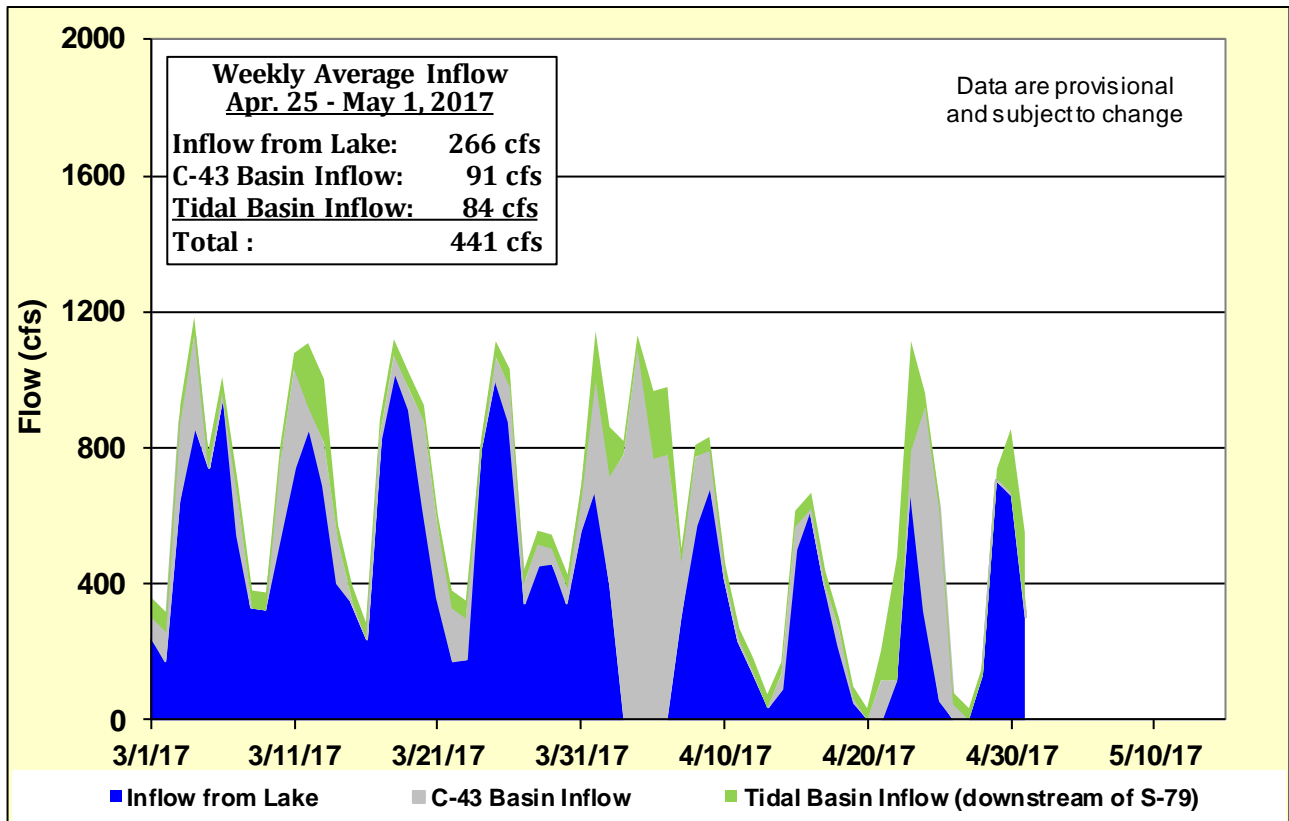
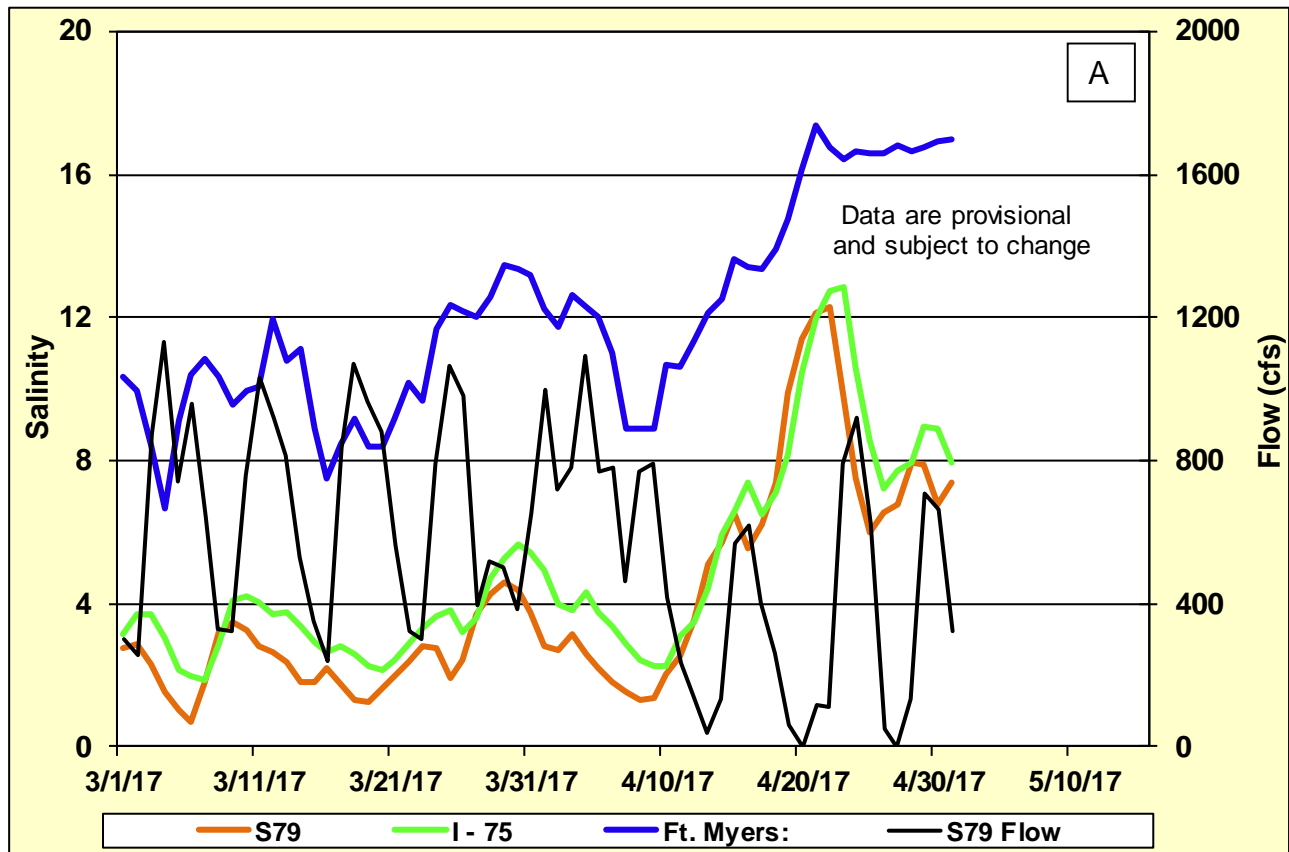


Figure 6. Freshwater inflows from Lake Okeechobee, runoff from the C-43 basin, and tributaries in the tidal basin into the Caloosahatchee River Estuary.



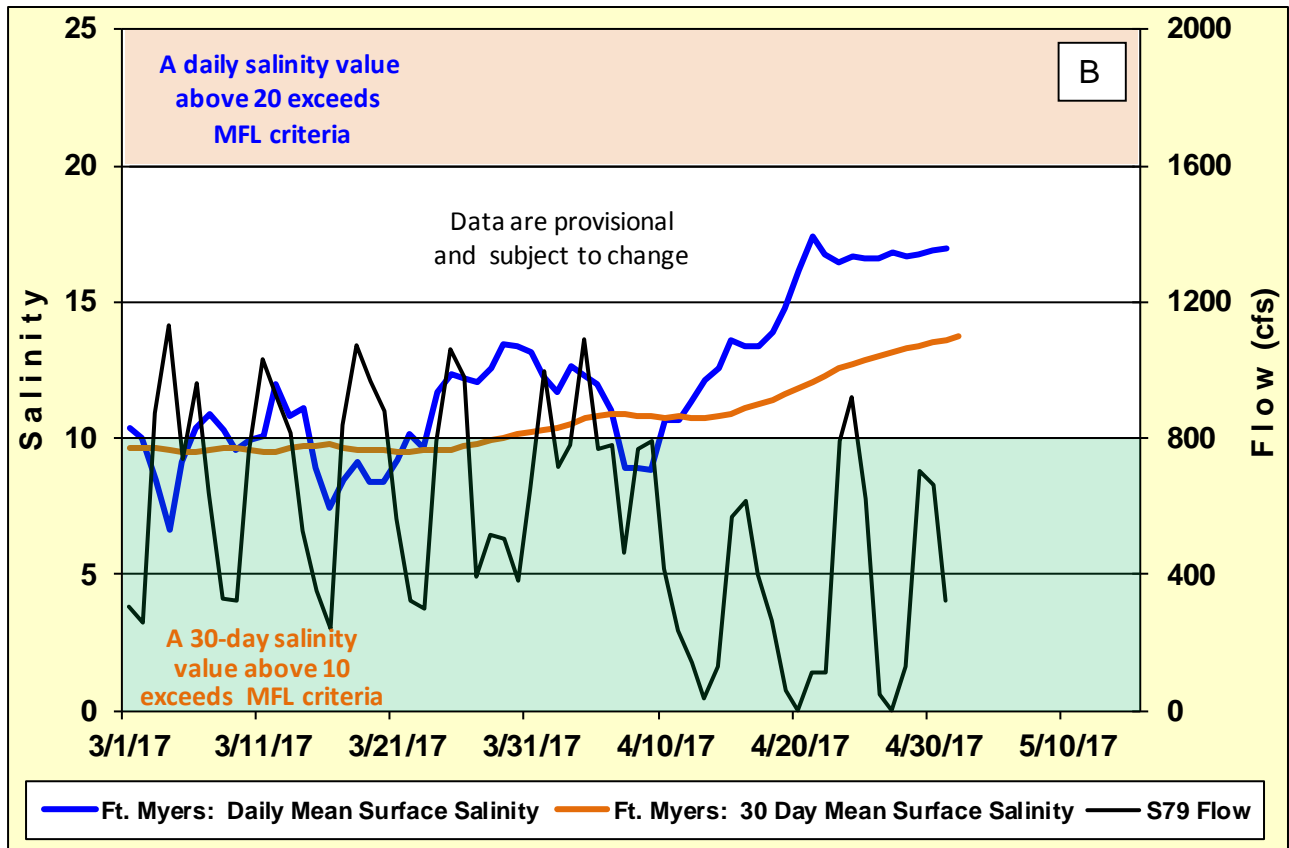


Figure 7. Daily mean flows at S-79 and salinity at upper estuary monitoring stations (A) and 30-day moving average salinity at Ft. Myers (B).

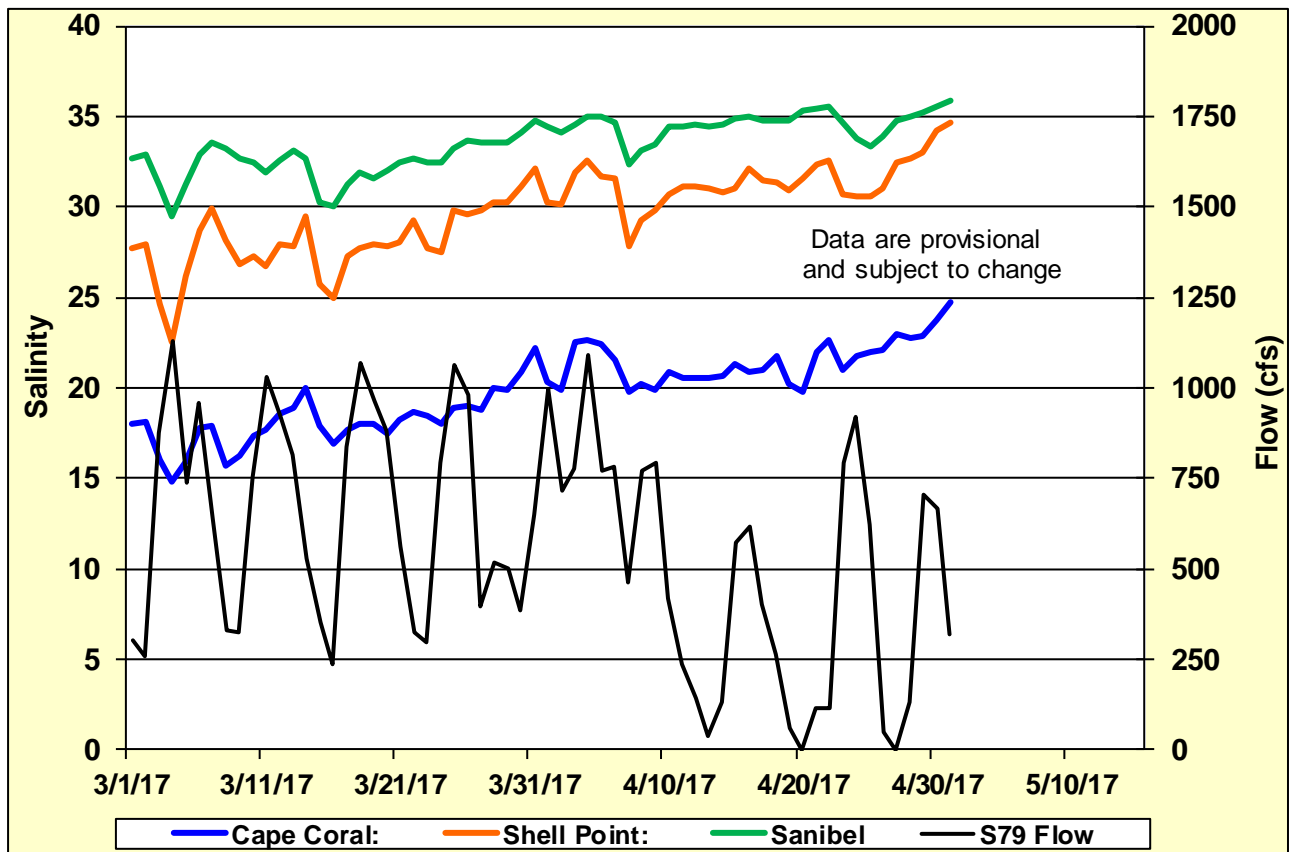


Figure 8. Daily mean flows at S-79 and salinity at lower estuary stations.

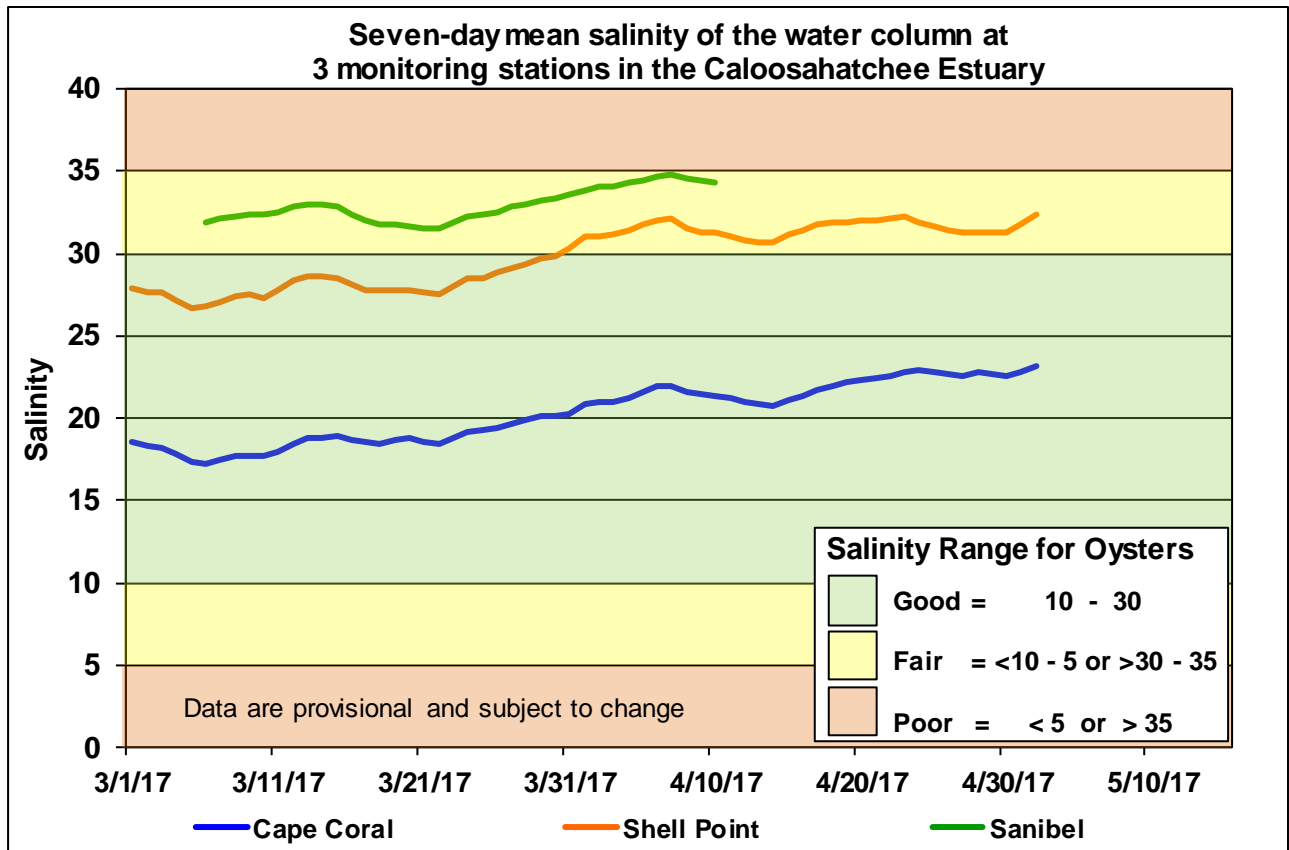


Figure 9. Seven-day mean salinity at Cape Coral Bridge, Shell Point and Sanibel Bridge monitoring stations.

# Caloosahatchee Estuary Flows and Salinity Observed and Forecast Salinity at Val I-75

**Forecast 1: S-79 = 0 cfs & TBR = 120 cfs**

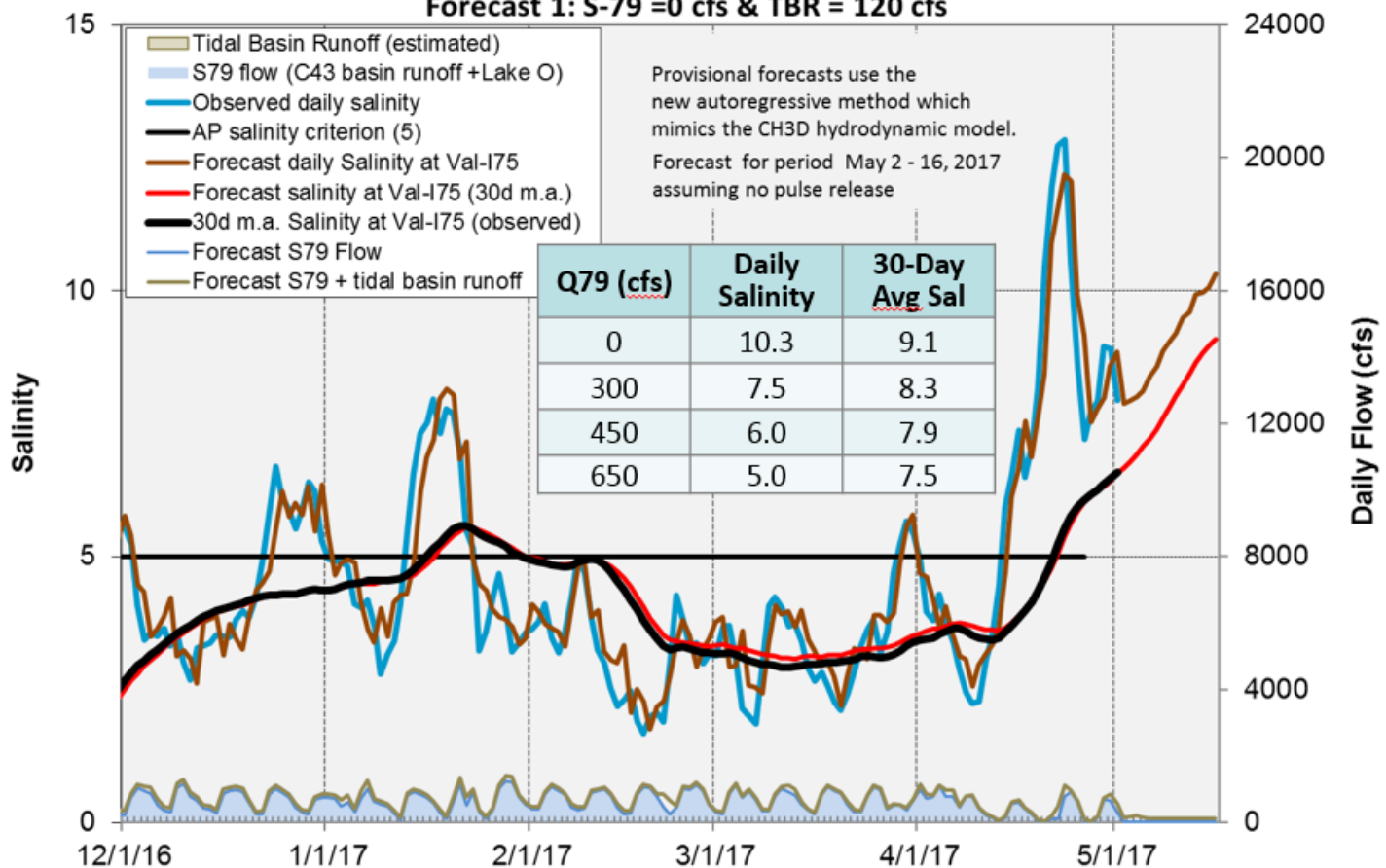


Figure 10. 14-day salinity forecast at Val I-75 assuming no releases at S-79.



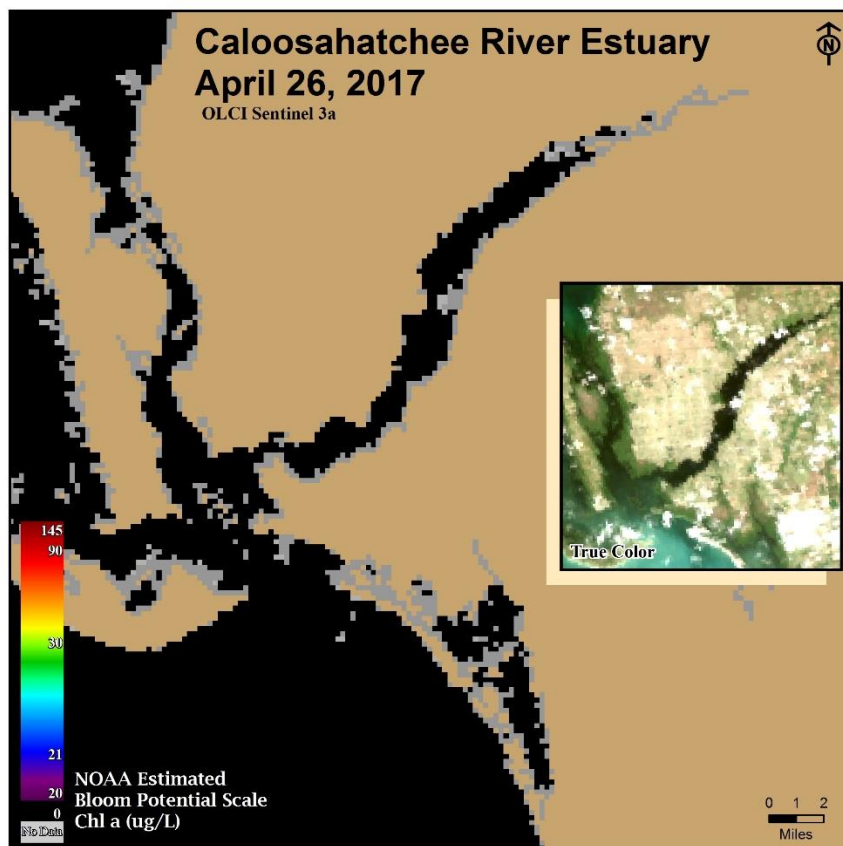
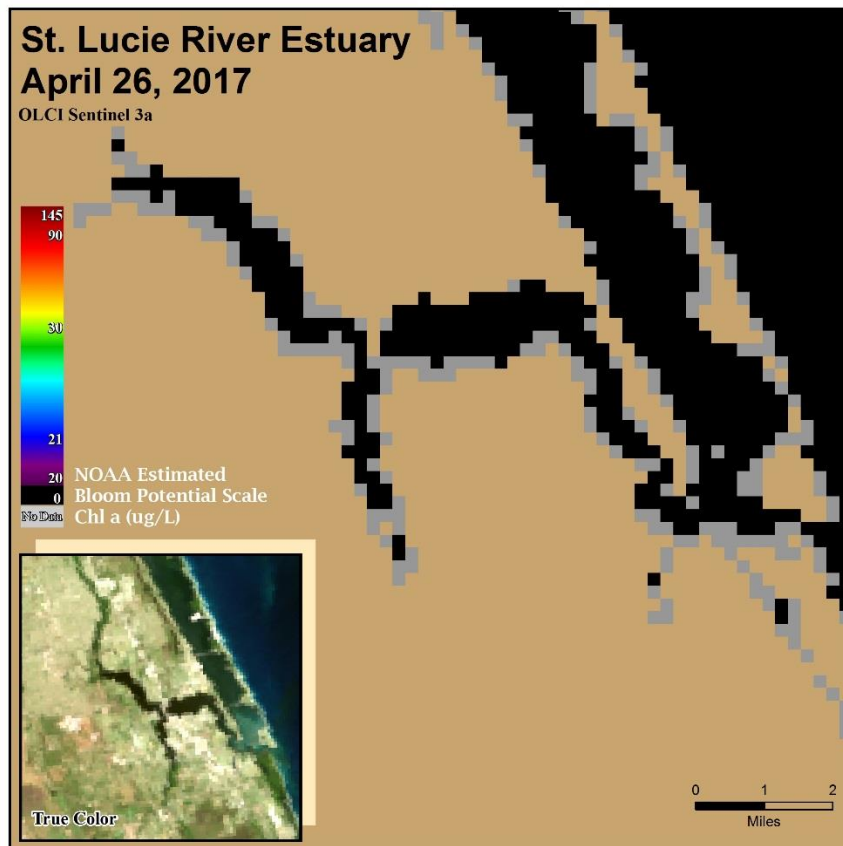



Figure 11. Sentinel 3a Satellite imagery provided by NOAA uses Ocean and Land Color Instrument (OLCI) to estimate cyanobacteria bloom potential in Caloosahatchee Estuary.



## EVERGLADES

District wide rainfall averaged 0.31 inches over the last week, so water levels receded in all areas. Only WCA-1 had recession rates within the recommended range.

Everglades Region	Rainfall (Inches)	Stage Change (feet)
WCA-1	0.07	-0.08
WCA-2A	0.03	-0.01
WCA-2B	<0.01	-0.17
WCA-3A	0.10	-0.15
WCA-3B	0.02	-0.16
ENP	0.02	-0.11

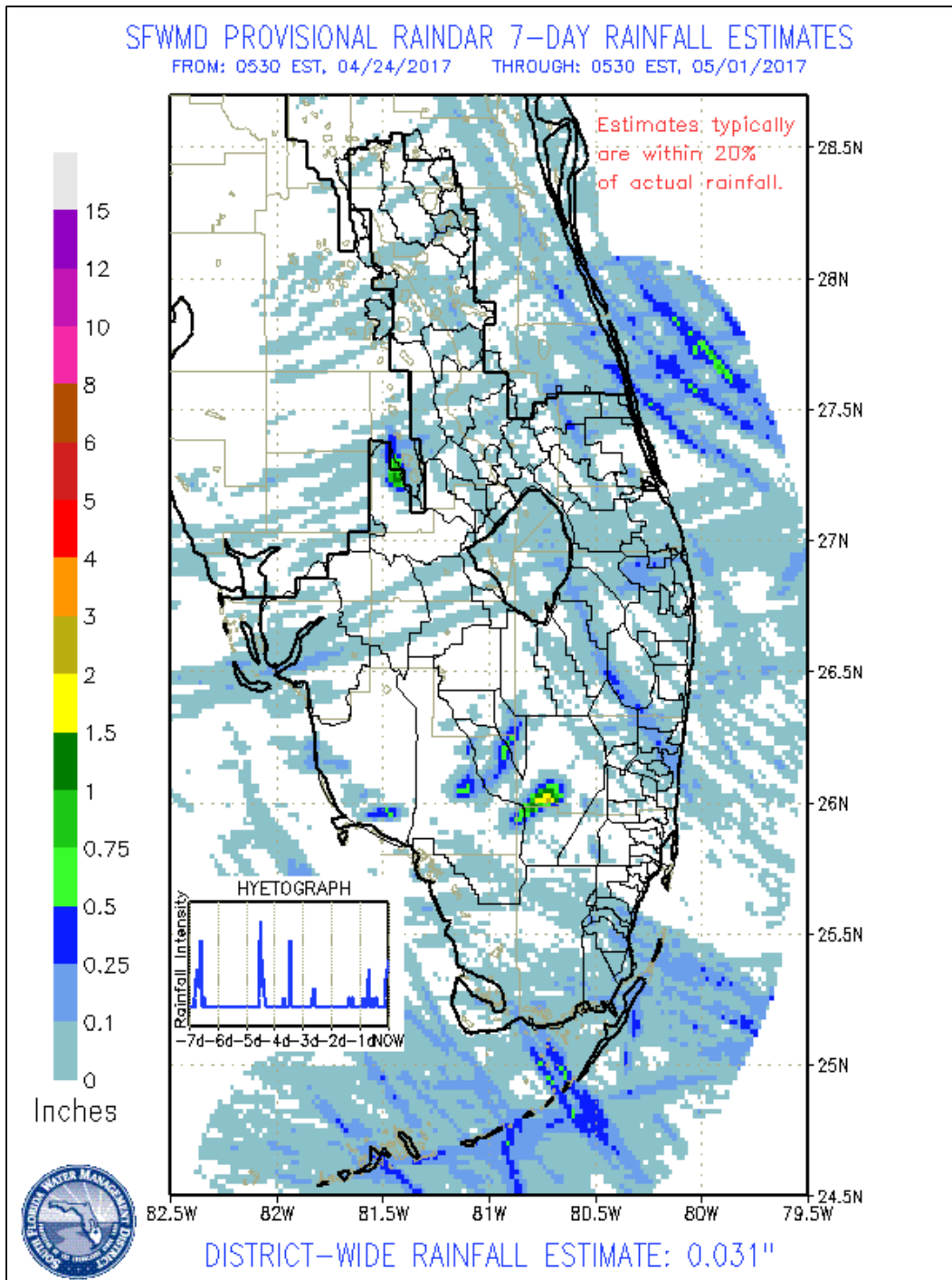


Legend for Stage Change:

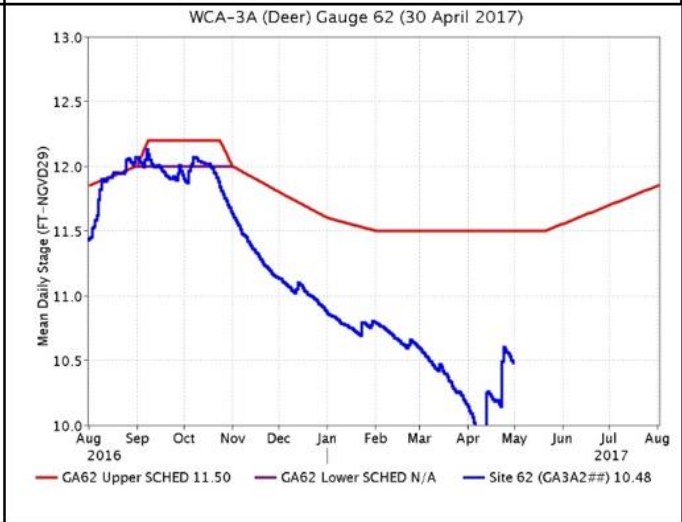
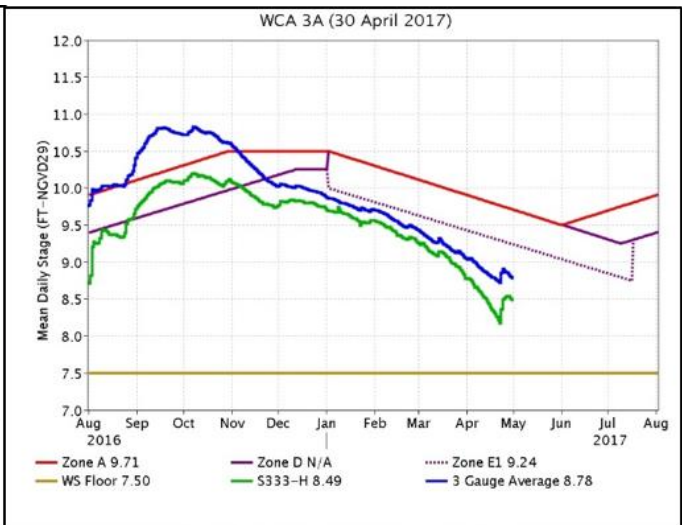
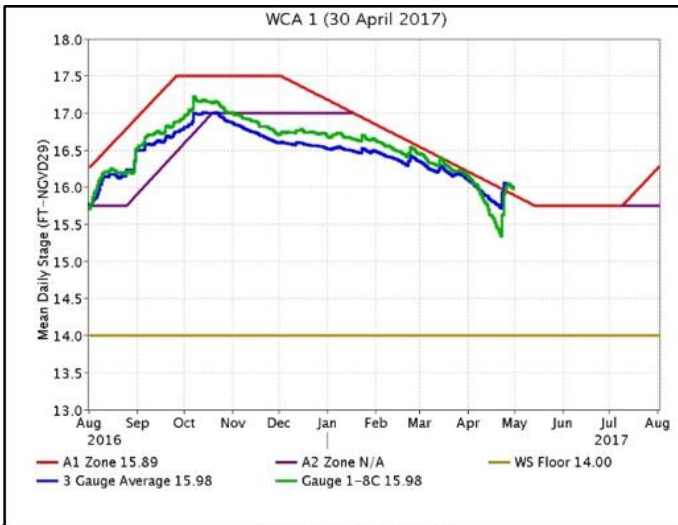
- Good (Green)
- Fair (Yellow)
- Poor (Red)

# SWMD PROVISIONAL RAINDAR 7-DAY RAINFALL ESTIMATES

FROM: 0530 EST, 04/24/2017 THROUGH: 0530 EST, 05/01/2017



Regulation Schedules: WCA-1 is now 0.09 feet above zone A1. In WCA-2A the marsh stage at gauge GA2A17 increased to 0.72 feet above zone A while the canal stage measured at the headwaters of S11B rose to 0.46 feet above the floor. WCA-3A three-gauge average is 0.46 feet below zone E1. WCA-3A at gauge 62 (Northwest corner) is 1.2 feet below schedule.

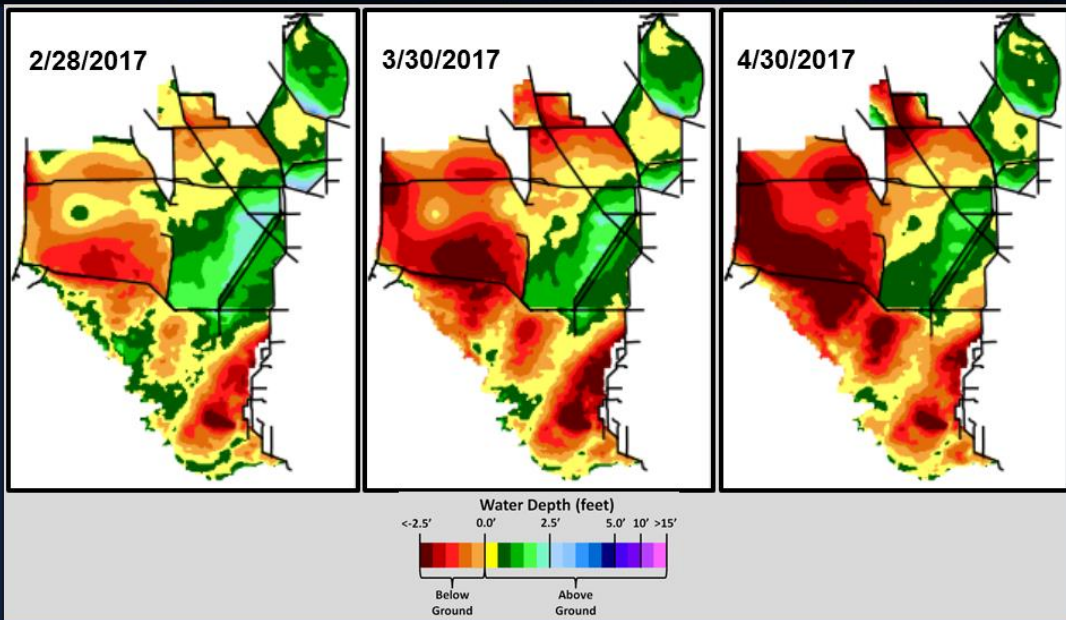


**Blue – wetlands**  
**Green – canals**

Water Depths and Changes: This week's water depths at monitored gauges other than in WCA-2B range from -0.22 feet (northeast Everglades National Park {ENP}) to 1.28 feet (WCA-1). Over the last week individual gauge changes ranged from -0.22 feet (WCA-3B) to +0.02 feet (WCA1). Note: The gauge in Northeast ENP is at its minimum operating range and has been going lower than its range this past week.



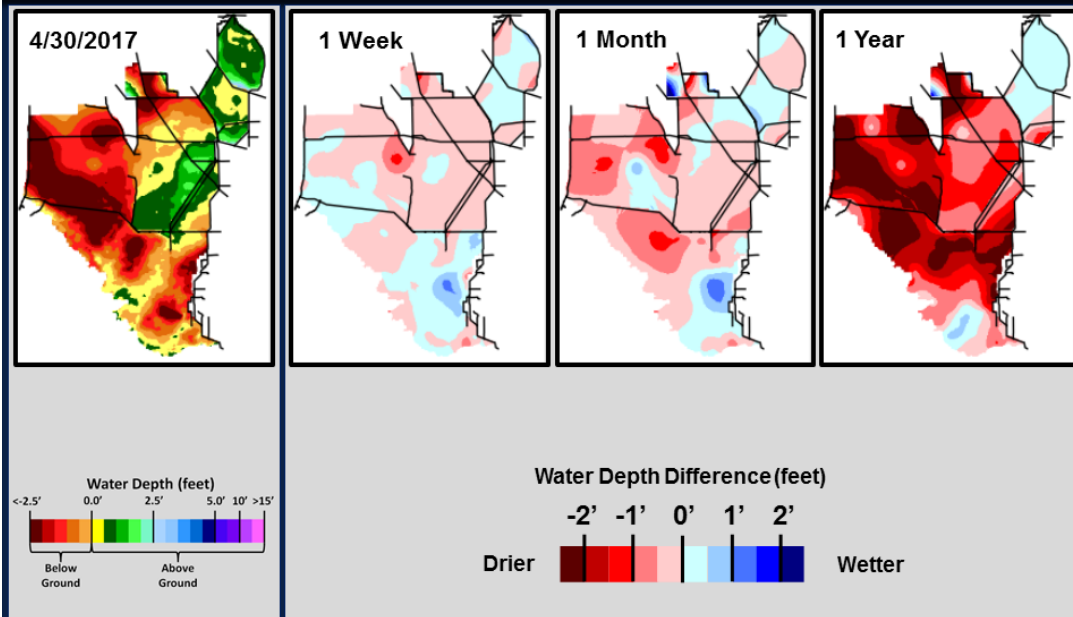
### SFWDAT Water Depth Monthly Snapshots



South Florida Water Depth Assessment Tool (SFWDAT)



### SFWDAT Everglades Difference Maps (Present - Past)



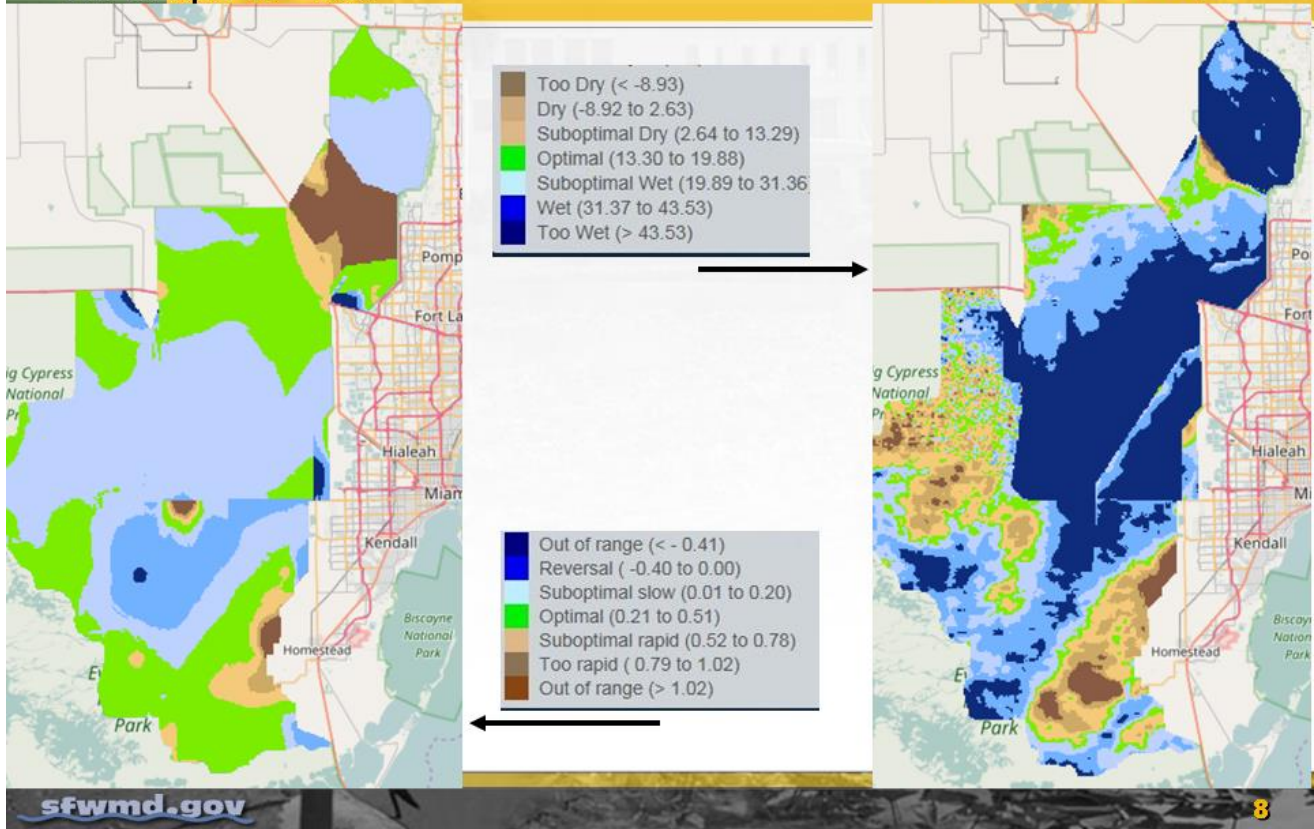
South Florida Water Depth Assessment Tool (SFWDAT)

Wading Birds: The next wading bird survey flight is scheduled for May 3. After the reversals of the previous week, White Ibis nesting bird numbers appear to be greatly reduced and neither WCA-1 nor -2A have had foraging flocks. Central and southern WCA-3A is still supporting lots of foraging storks, spoonbills, and egrets.



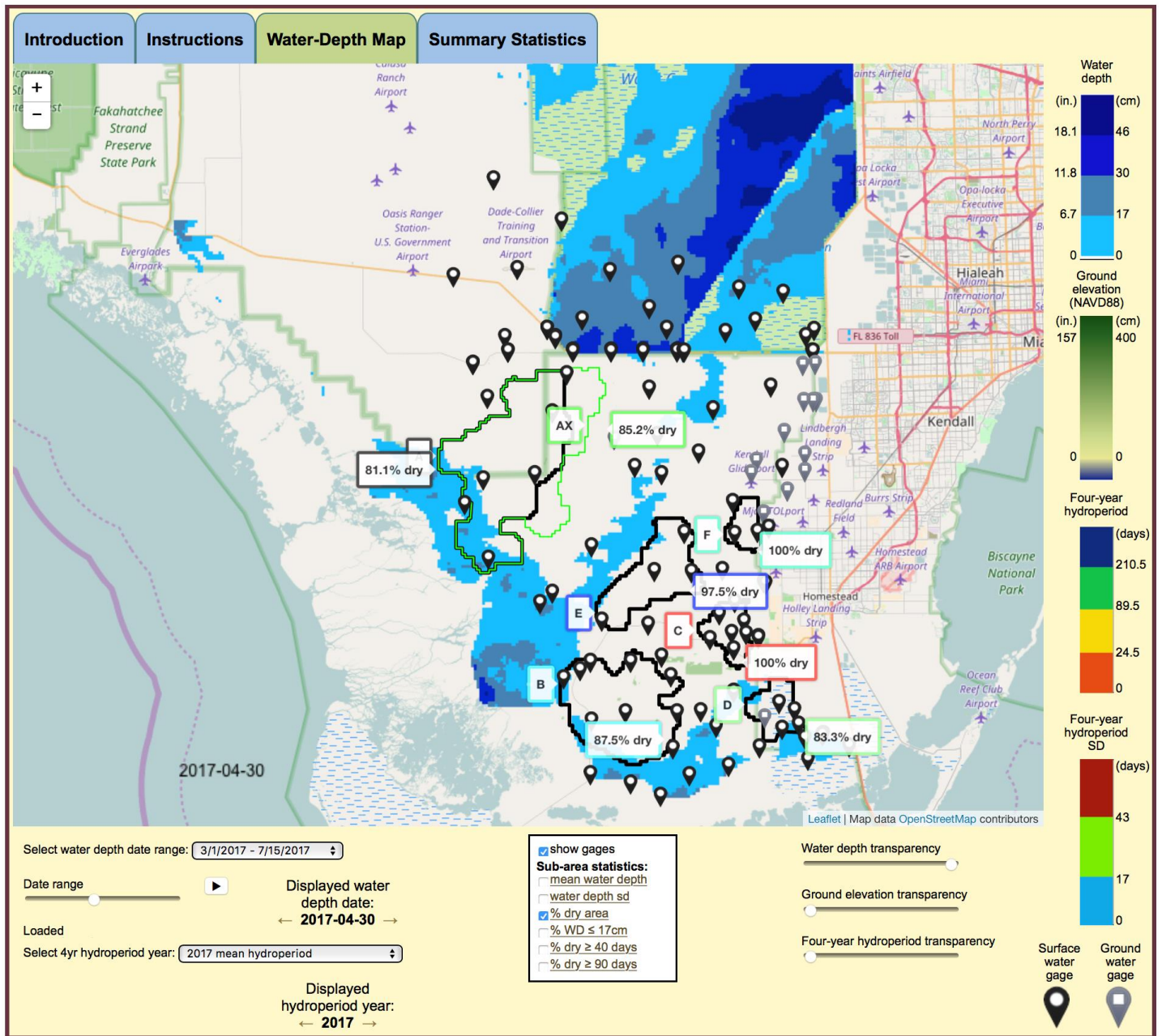
The Wading Bird Foraging HSI for April 30 – Rate

The Wading Bird Foraging HSI for April 30 – Depth



Cape Sable Seaside Sparrow: Conditions remain good for Cape Sable Seaside Sparrow nesting. The reversals within the subpopulations from the previous week's rain were mostly below ground so did not affect the birds nesting. The eastern areas (subpops C and F) may be getting too dry (100% of these subpopulation areas have been dry for more than 40 days) and could benefit from some water input.

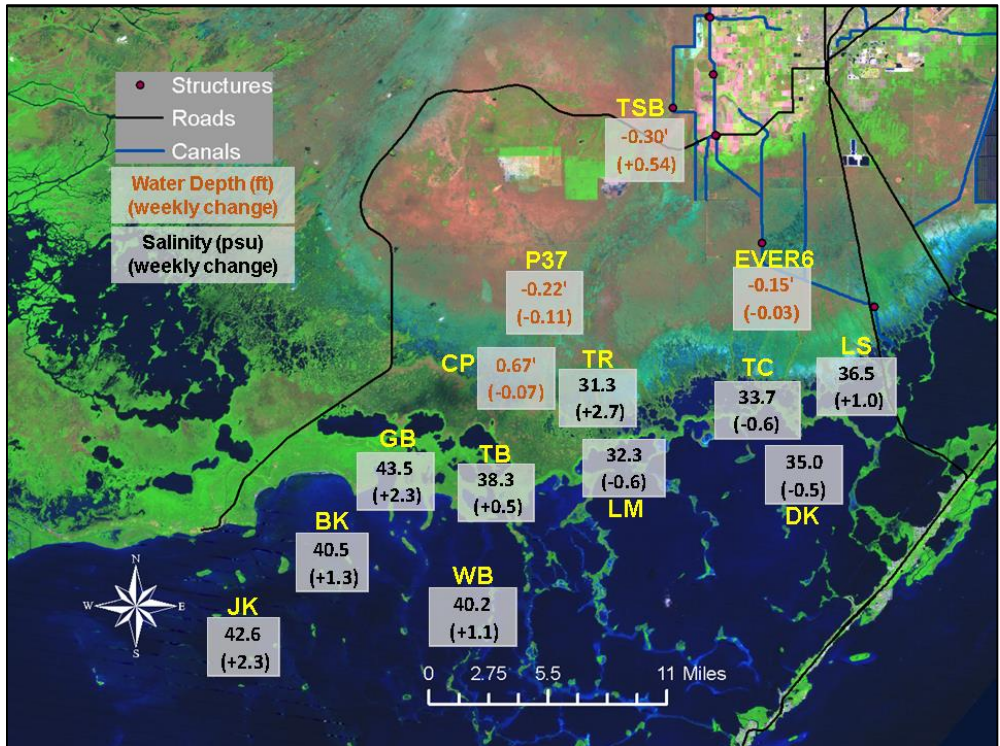
Cape Sable Seaside Sparrow (CSSS) Viewer



Taylor Slough: Water levels continued to decrease last week with the exception of northern Taylor Slough which increased. Northern Taylor Slough is also the only area that is higher than a month ago. Compared to historic averages, water levels are mostly one to three inches above average.

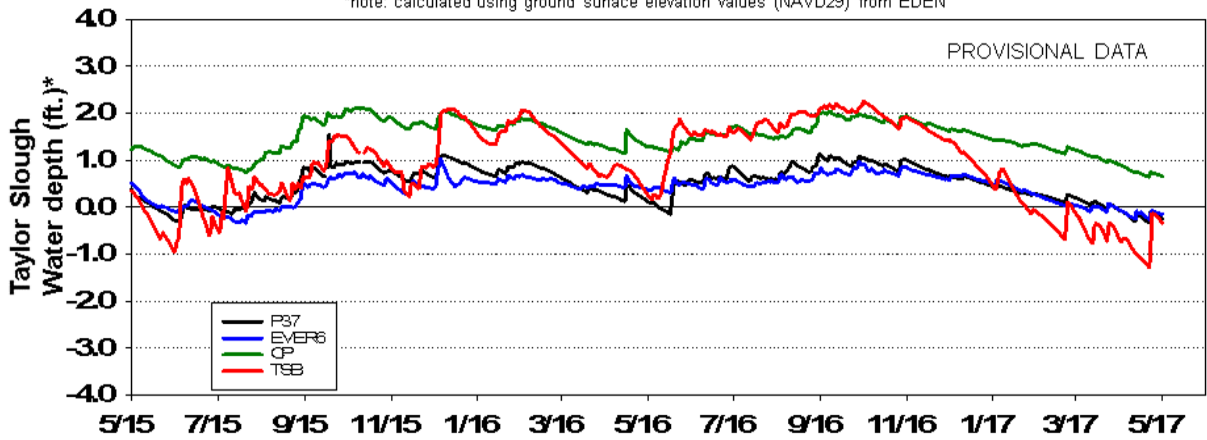
Florida Bay Salinity: Salinities in the Bay are currently average in the western nearshore areas to +5 psu above average in the eastern bay. Salinities currently range from 32 psu in the eastern nearshore to 44 psu in the western nearshore area. Weekly changes ranged from -0.6 psu to +2.3 psu.



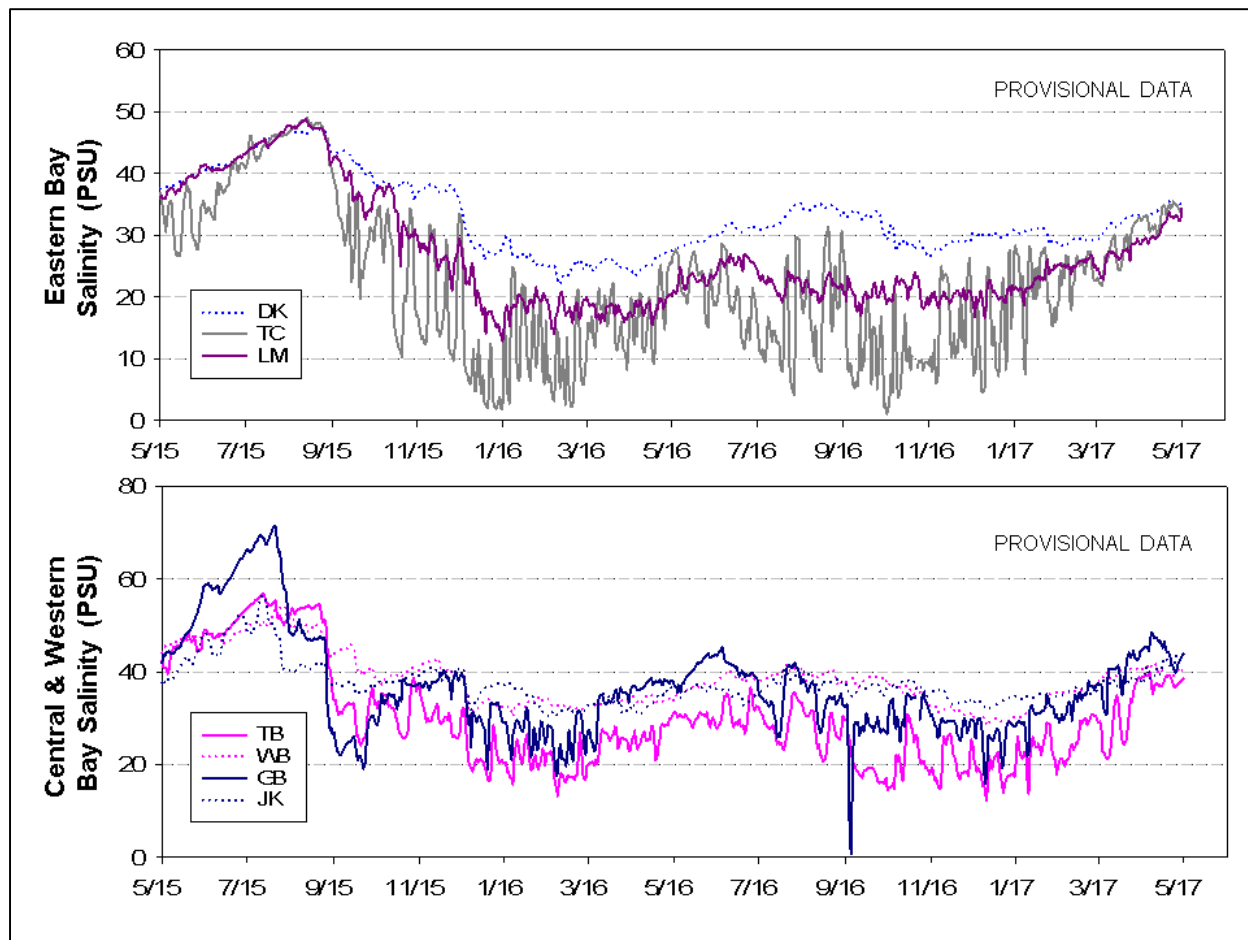


### Taylor Slough Water Depths

\*note: calculated using ground surface elevation values (NAVD29) from EDEN

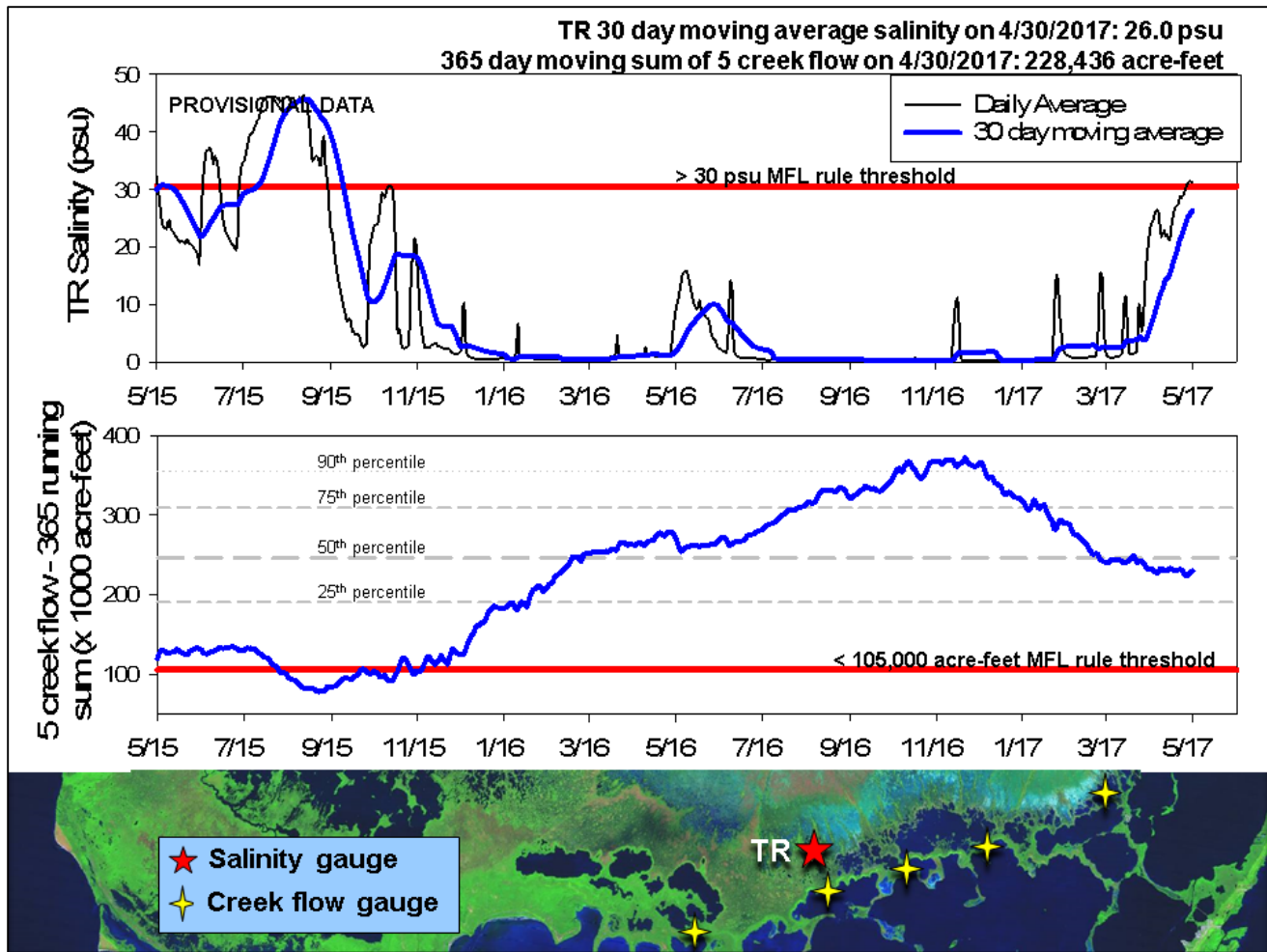






Florida Bay MFL: Mangrove zone salinities continue to rise. The daily average salinity at TR ended the week at 31 psu which is +3 psu higher than last week. The 30-day moving average increased by 4.1 PSU to end the week at 26.0 PSU.

The weekly creek flow from the five creeks was just under -5,000 acre-feet but the daily flows were positive starting on Friday. The 365-day moving sum of flow from the five creeks identified by stars on the map decreased about -3,000 acre-feet to end at 228,436 acre-feet (below the long-term average of 257,628 acre-feet). Creek flow is provisional data from the USGS and is highly variable.



### Water Management Recommendations

- Maintain recession rates within the range of  $-0.05$  to  $-0.09$  feet per week to benefit wading bird foraging as much as possible at the end of the wading bird breeding season.

More specific recommendations appear in the summary table below. The red text represents new or modified information or recommendations.

## Everglades Ecological Recommendations, May 2nd, 2017 (red is new)

Area	Current Condition	Cause(s)	Recommendation	Reasons
<b>WCA-1</b>	Stages changed -0.15' to +0.02'	Rainfall, ET, management	Operate for dry season conditions and, when possible, restrict recession rates to -0.03' to -0.07' per week. <b>Allow natural recession to resume.</b>	Retain water for the upcoming dry season while protecting habitat for apple snail, snail kite and wading bird breeding season.
<b>WCA-2A</b>	Stages decreased -0.01'	Rainfall, ET, management	Maintain slower recession rates. Retain water and restrict recession rates to less than -0.09' per week. <b>Allow to return to natural recession rates.</b>	Protect habitat and wildlife. Support apple snails and nesting wading birds. Retain water to provide foraging habitat later in the breeding season.
<b>WCA-2B</b>	Stages decreased -0.13' to -0.20'	Rainfall, ET, management	Restrict recession rates to -0.05' to -0.09' per week.	Protect habitat and wildlife. Support apple snails and nesting wading birds.
<b>WCA-3A NE</b>	Stages decreased -0.18'	Rainfall, ET, management	Restrict recession rates to -0.05' to -0.07' per week to prevent the area from drying out too early for wading bird nesting. Water for northwestern 3A (via the G404) is also desired. <b>NW area priority for STA inflows.</b>	Protect habitat and wildlife. Support apple snails and nesting wading birds and snail kites. Reduce fire risk as water depths are now below ground.
<b>WCA-3A NW</b>	Stages -0.13'	Rainfall, ET, management		
<b>Central WCA-3A S</b>	Stages decreased -0.15'	Rainfall, ET, management	Restrict recession rates to -0.05' to -0.09' per week. When flows are changed a gradual reduction is recommended (stepping down over several days). <b>Allow to return to natural recession rates.</b>	Keeping depths below 2.5' at gauge 65 is important to allow tree island vegetation to recover from stress of the recent extended inundation duration. Protect habitat, wildlife and support wading bird and snail kite breeding.
<b>Southern WCA-3A S</b>	Stages decreased -0.14'	Rainfall, ET, management		
<b>WCA-3B</b>	Stages decreased -0.13' to -0.22'	Rainfall, ET, management	Restrict recession rates to -0.05' to -0.09' per week.	Protect habitat and wildlife and prepare for wading bird and snail kite breeding season. Provide conditions to support apple snails.
<b>ENP-SRS</b>	Stages at or below minimum for gauge	ET, rainfall, topography, management	Make discharges to the Park according to the 2012 WCP rainfall plan.	Keep peat wet to promote native habitat and maintain wetland plant and animal communities. Protect habitat and wildlife, including wading birds and snail kites.
<b>ENP-CSSS habitats</b>	S-12A, S-12B, S-344, S-343A, S-343B are closed. S-333 closed	Rainfall, ET, management	Follow rainfall plan for releases and current ERTTP guidelines. Follow guidance in C-111 Western Spreader Canal Project operations manual. <b>Avoid overdrying eastern subpopulations C and F. Some inflows into the eastern area could be beneficial.</b>	Future operations need to continue to provide appropriate hydrological and habitat conditions for CSSS. Current and forecasted conditions are conducive for a successful sparrow breeding season. Dry conditions are expected for much of the sparrow breeding season.
<b>Taylor Slough</b>	Stages changed by -0.11' to +0.54'	Rain, ET, inflows	Move water southward as possible	Provide freshwater buffer for ecosystems, maintain low salinity conditions downstream, and maintain slow recession rates.
<b>FB- Salinity</b>	Average to +5 psu above average	Rain, ET, inflows, wind	Move water southward as possible	Maintain low salinity conditions and prevent early salinity increases.