

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

## **M E M O R A N D U M**

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

**FROM:** SFWMD Staff Environmental Advisory Team

**DATE:** February 28, 2017

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

### **Summary**

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

Heavy shower activity which developed near an old frontal boundary over coastal Palm Beach and Martin Counties overnight will taper off by late morning. With the front back north of the District, daytime heating should generate some spotty to widely scattered showers Tuesday and Wednesday. A cold front is forecast to move into the District Thursday and then push into the Florida Keys Friday. This front should generate some scattered light to moderate showers and thunderstorms mainly north and east Thursday and then southeast Friday. Drier conditions will then move in for the weekend.

#### **Kissimmee**

On Sunday, stage was 0.8 feet below regulation schedule in East Lake Toho, Lake Toho, and Kissimmee-Cypress-Hatchineha (KCH). Over the past week, discharge at S65, S65A, and S65E averaged 732, 569, and 744 cfs, respectively. Tuesday morning discharges were ~754 cfs, and 558 cfs, and 715 cfs, respectively at S65, S65A, and S65E. Dissolved oxygen data in the Kissimmee River averaged 8.56 mg/L over the past week. Kissimmee River mean floodplain depth on Sunday is 0.07 feet. Recommendation: increase discharge at S65 to establish a stage recession on KCH.

#### **Lake Okeechobee**

As of midnight February 26, 2017, Lake stage was 13.46 feet NGVD and in the Base flow sub-band. The current weekly recession rate of 0.05 feet equates to a monthly recession rate of 0.20 feet which is ideal. The goal should be to maintain the recession rate below 0.50 feet per month. There are currently a total of five snail kite nests on the Lake, one has been successful and four are still active. All five nests are located in Moonshine Bay within the 2015 cattail treatment area. Recent MODIS imagery indicates low bloom potential.

#### **Estuaries**

Total discharge to the St. Lucie estuary averaged 213 cfs over the past week with 0 cfs (0%) coming from Lake Okeechobee as the USACE has stopped flow through the S-80 structure for the foreseeable future. Salinities rose by less than 1 throughout the estuary last week. The seven-day average salinity at the US1 Bridge is in the fair range for adult oysters. Total inflow to the Caloosahatchee estuary averaged 936 cfs over the past week with 504 cfs (54%) coming from the Lake. The 30-day average surface salinity at the Ft. Myers monitoring station is 9.6 and has been below 10 for the past five days. The 30-day average surface salinity at Val I-75 is 3.2. Salinity conditions between Val I-75 and Ft. Myers are improving but tape grass has likely suffered some mortality. The next sampling is planned for March. Salinity conditions are in the good range for adult oysters at the Cape Coral Bridge and Shellpoint, while in the fair range at the Sanibel Causeway. The 30-day moving average salinity at the

I-75 Bridge is forecast to be 4.2 in the next two weeks if no flow comes through the S-79 structure; however, daily salinity is forecast to reach 7.2.

### **Stormwater Treatment Areas**

Over the past week, the STAs/FEBs received approximately 3,200 acre-feet of Lake releases. The total amount of Lake releases sent to the STAs/FEBs in WY2017 (since May 1, 2016) is approximately 184,800 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. This week, if Lake releases are sent to the WCAs and the conditions allow, releases will be sent to STA-2 and STA-3/4.

### **Everglades**

Water levels increased or essentially remained the same with the exception of WCA-2B. While according to the seasonal recession rate criteria an increase in stage is deemed "Poor", current low water depths suggest that instead the minor "reversal" could prolonging wading bird foraging conditions. Weekly stage changes ranged from +0.07 (WCA-1) to -0.05 (WCA-2B) feet last week. The daily average salinity at TR remains at 0.8 psu. The 30-day moving average rose 2.9 psu this week (up 0.1 from last week). The 365-day moving sum of flow from the five creeks decreased about 10,000 acre-feet to end at 269,232 acre-feet (still above the average of 257,628 acre-feet).

## Supporting Information

### KISSIMMEE BASIN

#### Kissimmee Basin Rainfall

The Upper Kissimmee Basin received 0.91 inches of rainfall in the past week and the Lower Basin received 0.59 inches (SFWMD Daily Rainfall Report 02/27/2017).

#### 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: 2/28/2017

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)						
							2/26/17	2/19/17	2/12/17	2/5/17	1/29/17	1/22/17	1/15/17
Lakes Hart and Mary Jane	S62	60	LKMJ	60.8	R	61.0	-0.2	-0.2	0.0	-0.1	0.0	0.0	-0.1
Lakes Myrtle, Preston, and Joel	S57	15	S57	61.0	R	61.0	0.0	0.0	0.0	0.0	-0.1	0.0	0.0
Alligator Chain	S60	0	ALLI	63.3	R	64.0	-0.7	-0.7	-0.7	-0.7	-0.6	-0.6	-0.6
Lake Gentry	S63	0	LKGT	61.3	R	61.5	-0.2	-0.2	-0.2	-0.2	-0.1	-0.1	-0.1
East Lake Toho	S59	183	TOHOE	57.2	R	58.0	-0.8	-0.8	-0.5	-0.3	-0.1	0.0	0.0
Lake Toho	S61	482	TOHOW, S61	54.2	R	55.0	-0.8	-0.8	-0.6	-0.3	-0.1	0.0	0.0
Lakes Kissimmee, Cypress, and Hatchineha	S65	732	LKISSP, KUB011, LKIS5B	50.4	R	51.2	-0.8	-1.1	-1.4	-1.8	-2.0	-2.1	-2.0

\* 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: 2/28/2017

Metric	Location	Sunday's 1-day average	Weekly Average**									
			2/26/17	2/19/17	2/12/17	2/5/17	1/29/17	1/22/17	1/15/17	1/8/17	1/1/17	12/25/16
Discharge (cfs)	S-65	737	732	710	507	482	465	473	475	487	555	759
Discharge (cfs)	S-65A	575	569	550	387	378	368	364	368	461	497	639
Discharge (cfs)	S-65D****	684	688	540	538	730	1274	1292	1268	1293	1411	1607
Discharge (cfs)	S-65E****	723	744	597	523	513	398	386	375	452	626	774
DO concentration (mg/L)***	Phase I river channel	9.06	8.56	8.26	8.96	8.54	8.13	7.97	7.94	7.12	N/A	7.02
Mean depth (feet)*	Phase I floodplain	0.07	0.07	0.06	0.06	0.06	0.06	0.06	0.07	0.07	0.09	0.12

\* 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 PC62 and PC33 .

\*\*\*\* 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>
2/22/2017	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.
2/21/2017	No new recommendations.			SFWMD Water Management /KB Ops
2/14/2017	Increase S65 and S65A discharge by 200 cfs.	Allow stage to decline in KCH.		SFWMD Water Management /KB Ops
2/7/2017	No new recommendations.			
1/25/2017	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).		SFWMD Water Management Section/KB Ops
1/24/2017	No new recommendations.			
1/17/2017	No new recommendations.			
1/10/2017	No new recommendations.			
12/2/2016-1/3/2017	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
12/20/2016	No new recommendations.			
12/13/2016	No new recommendations.			
12/6/2016	No new recommendations.			
11/29/2016	No new recommendations.			
11/22/2016	No new recommendations.			
11/15/2016	No new recommendations.			
11/8/2016	No new recommendations.			
10/25/2016	Allow S65C headwater stage to decline to approximately 33 feet NGVD over the next few days.	To help reduce stage in Pool C to facilitate MacArthur Ditch backfilling	Implemented	USACE/KB Ops
10/24/2016	No new recommendations.			
10/17/2016	Temporarily reduce discharge at S65A to 700 cfs following the discharge rampdown schedule in Figure 8a.	To facilitate MacArthur Ditch backfilling over the next 2-3 weeks.	Implemented	KB Operations
10/10/2016	No new recommendations.			
10/3/2016	No new recommendations.			

# KCOL Hydrographs (through Sunday midnight)

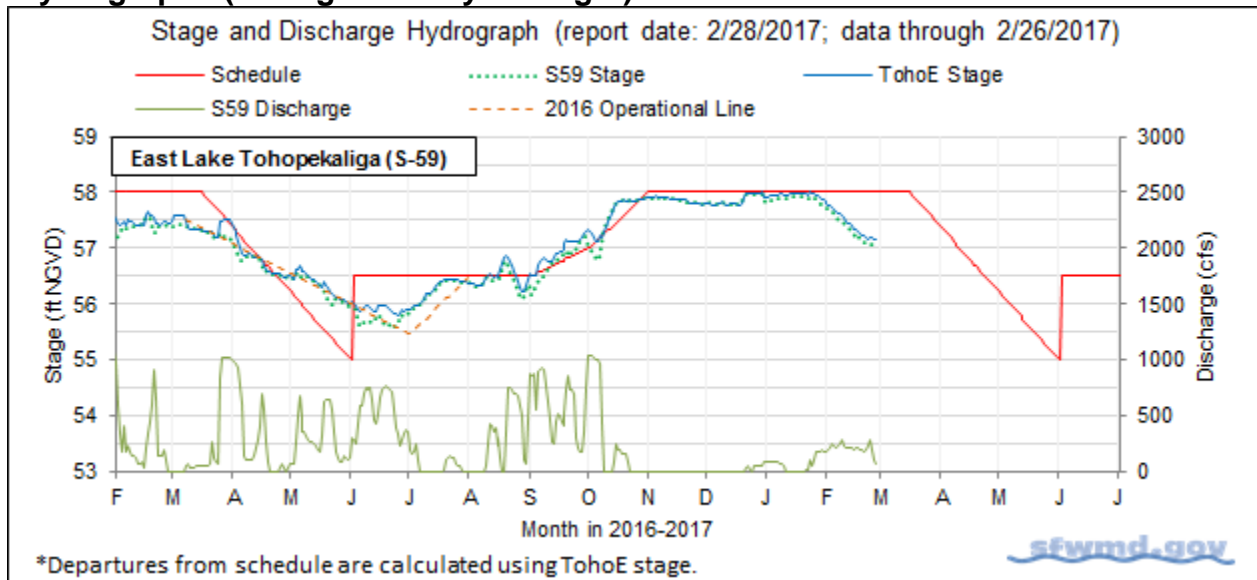


Figure 1.

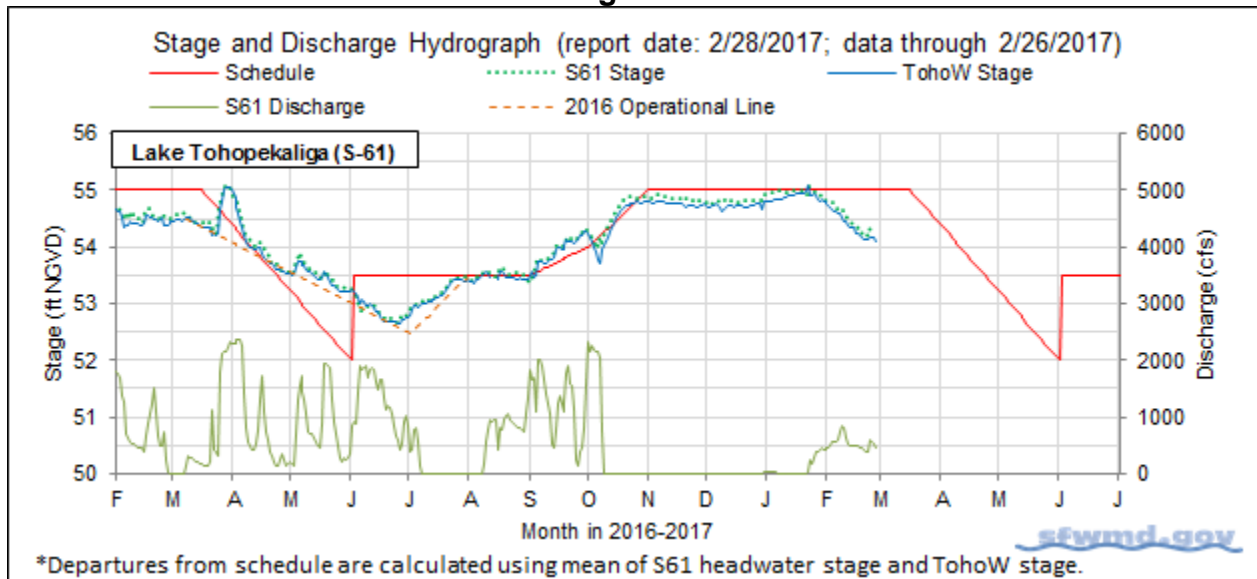


Figure 2.

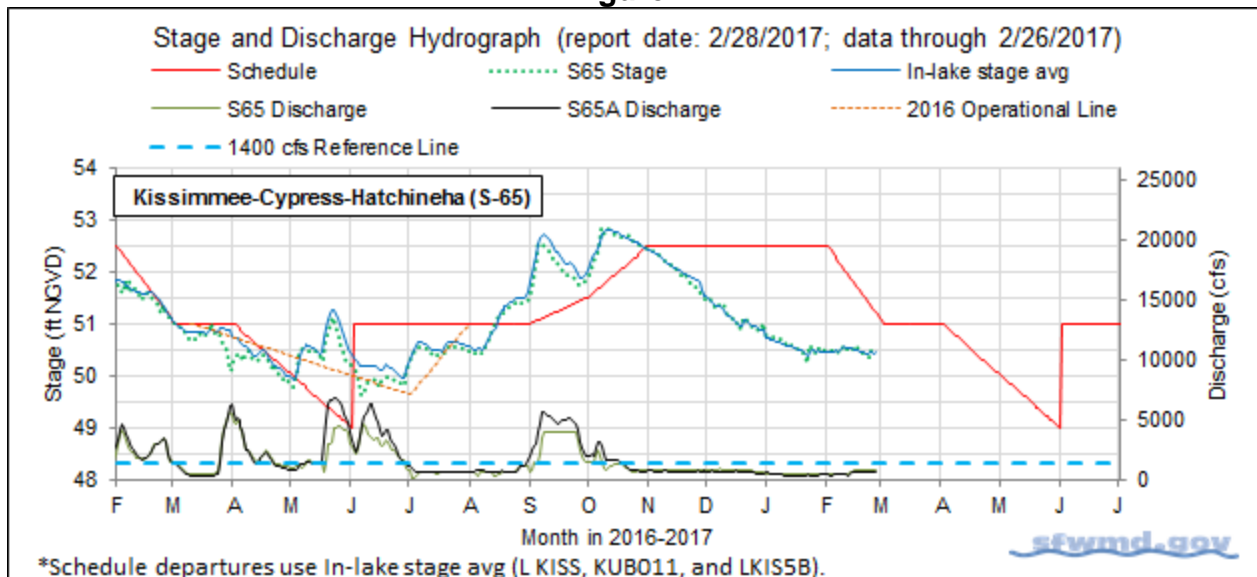


Figure 3.

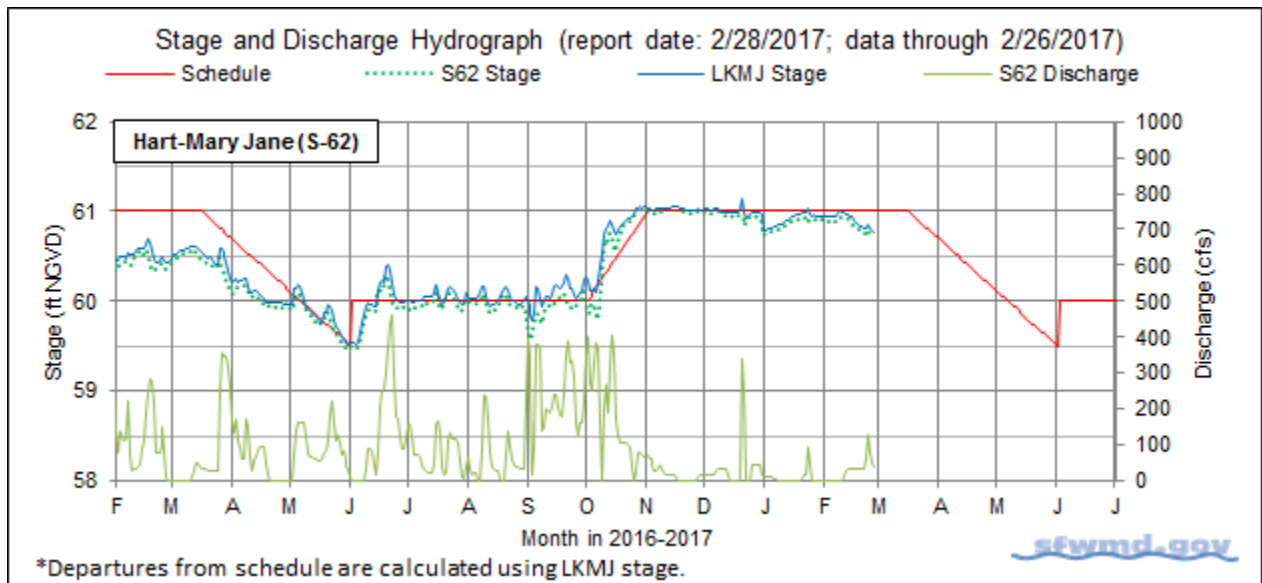


Figure 4.

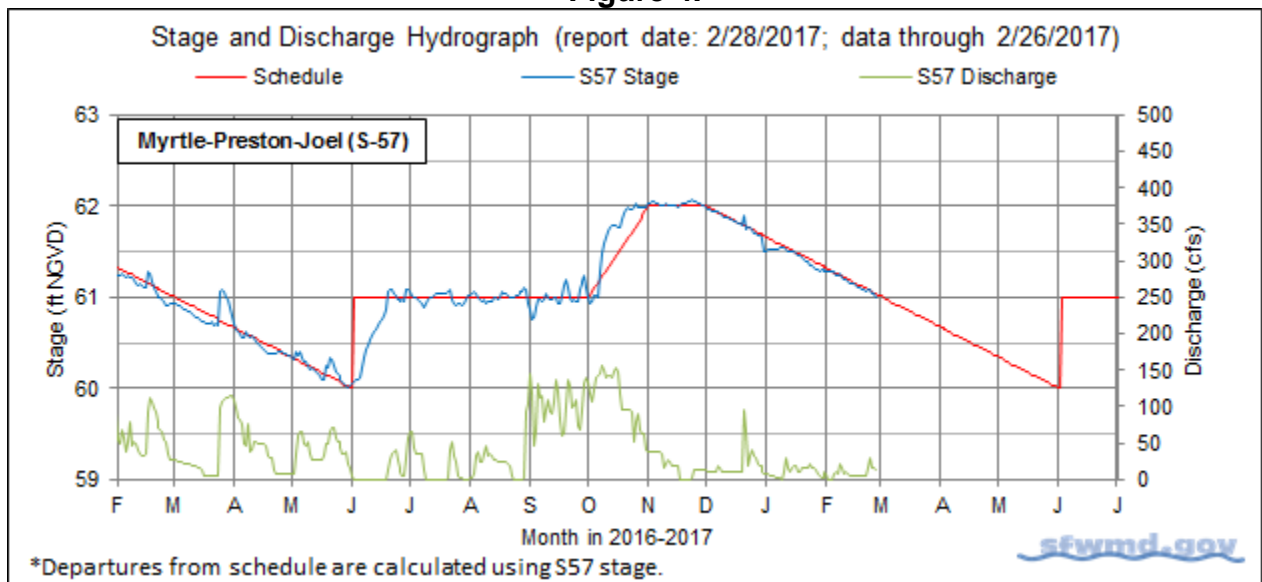


Figure 5.

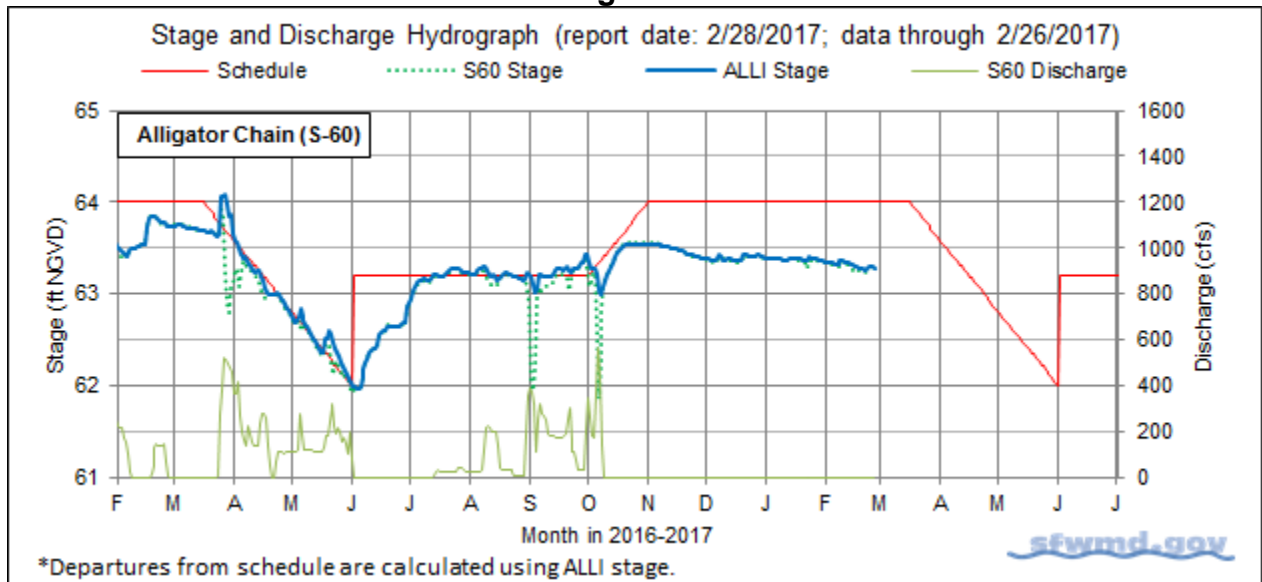


Figure 6.

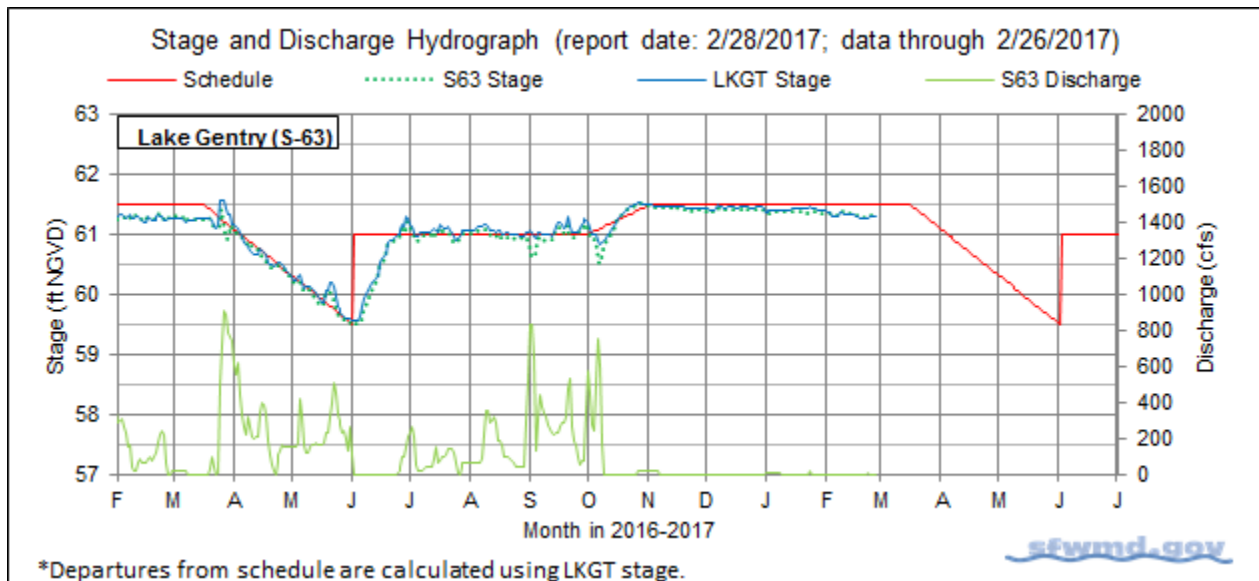


Figure 7.

**SOUTH FLORIDA WATER MANAGEMENT DISTRICT**

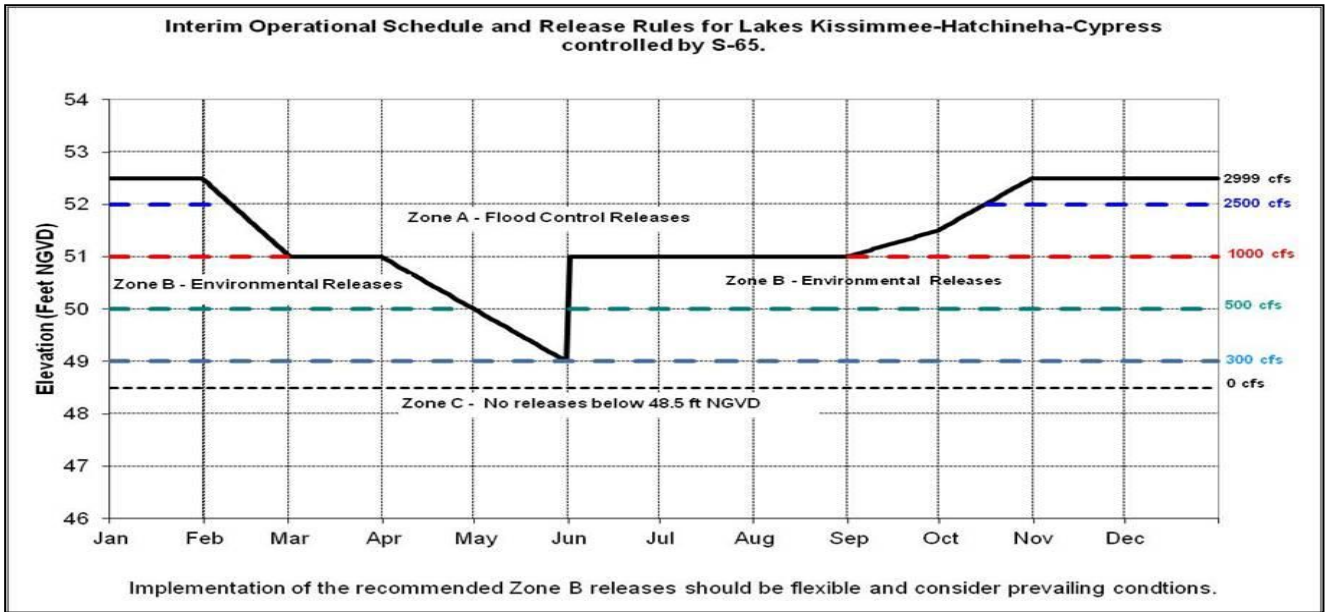
**Limits on Rate of Discharge Change at S65/S65A During Dry Season 2016-2017**

<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

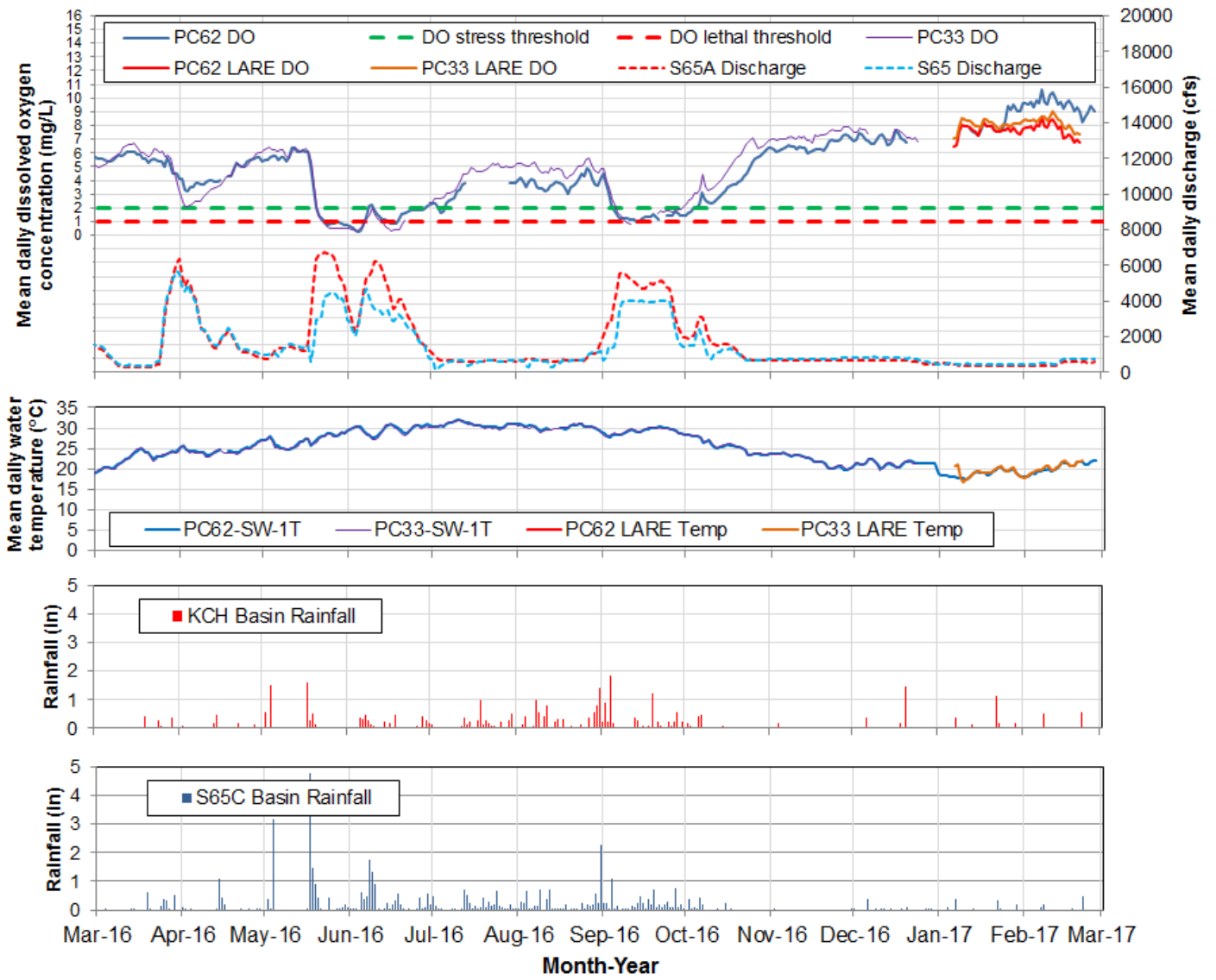
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Figure 8. Limits on rate of discharge change at S65/S65A for the 2016-2017 Dry Season.

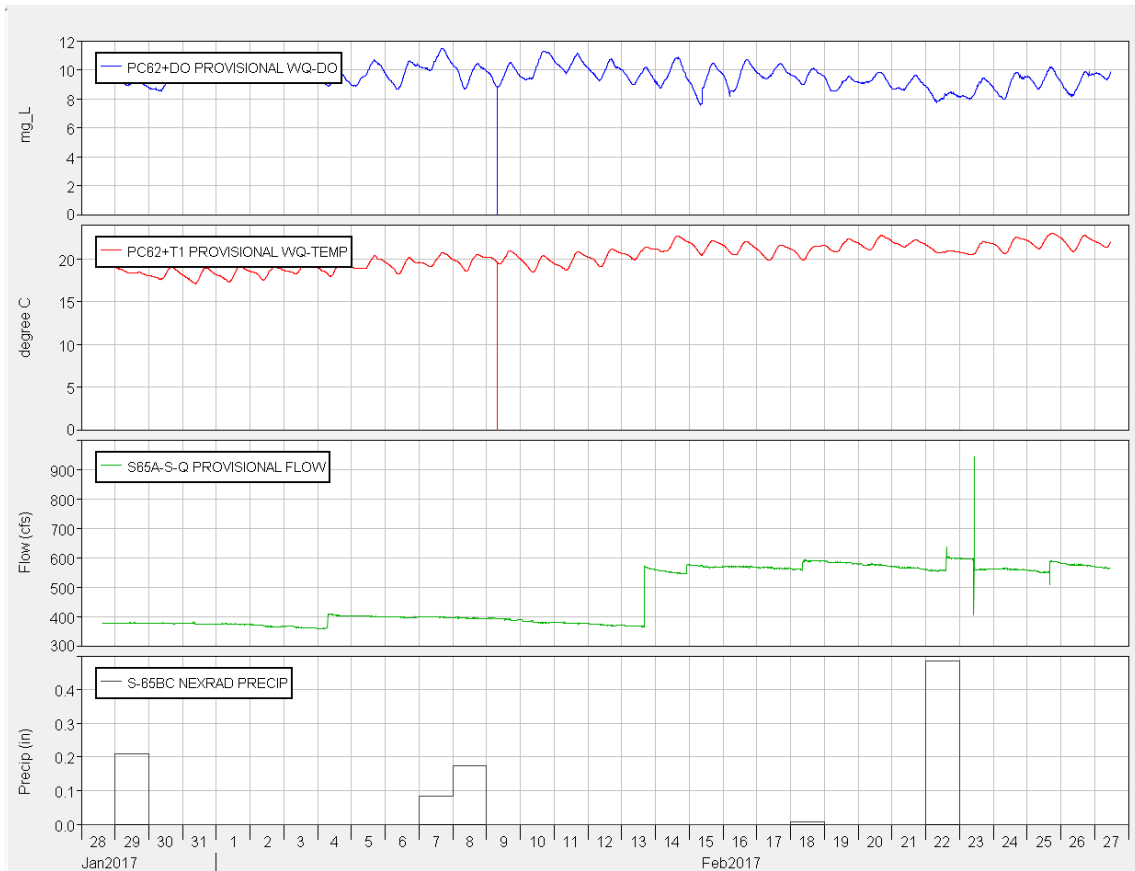




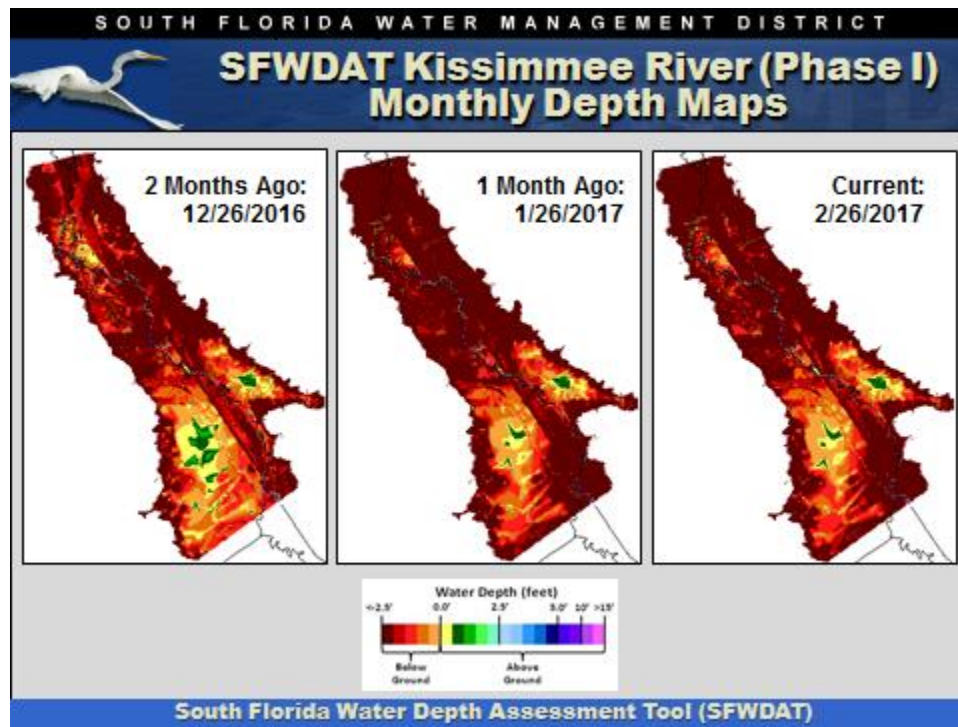
**Figure 9.** Interim operations schedule for S-65. The discharge schedule shown to the right has not been used in recent years or in Wet Season 2015.



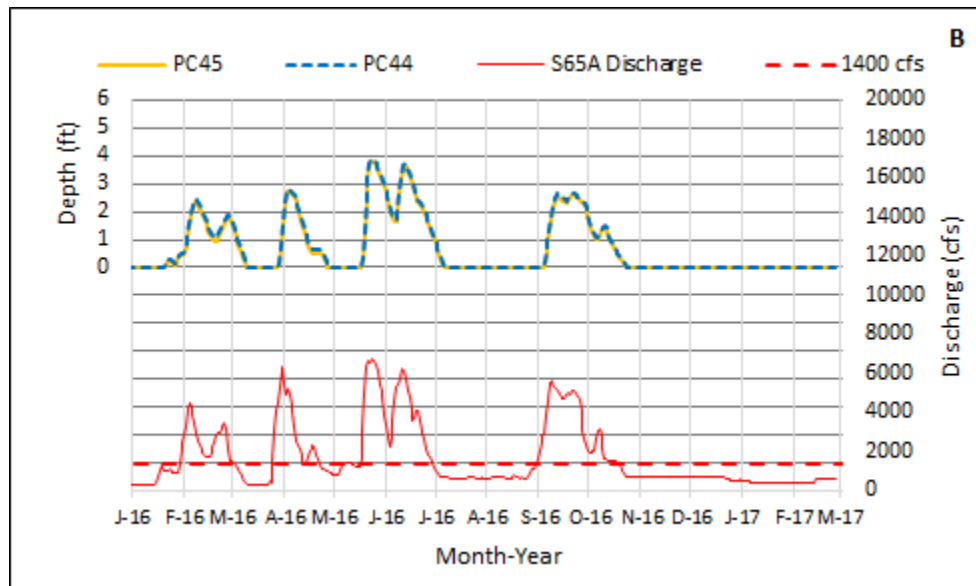
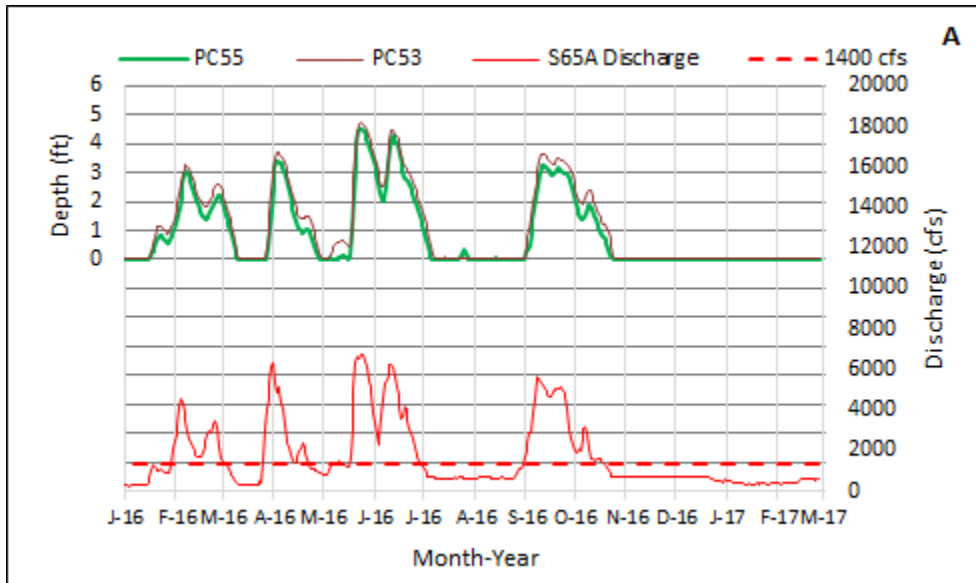
**Figure 10.** Mean daily Dissolved Oxygen, discharge, temperature and rainfall in the Phase I river channel.



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

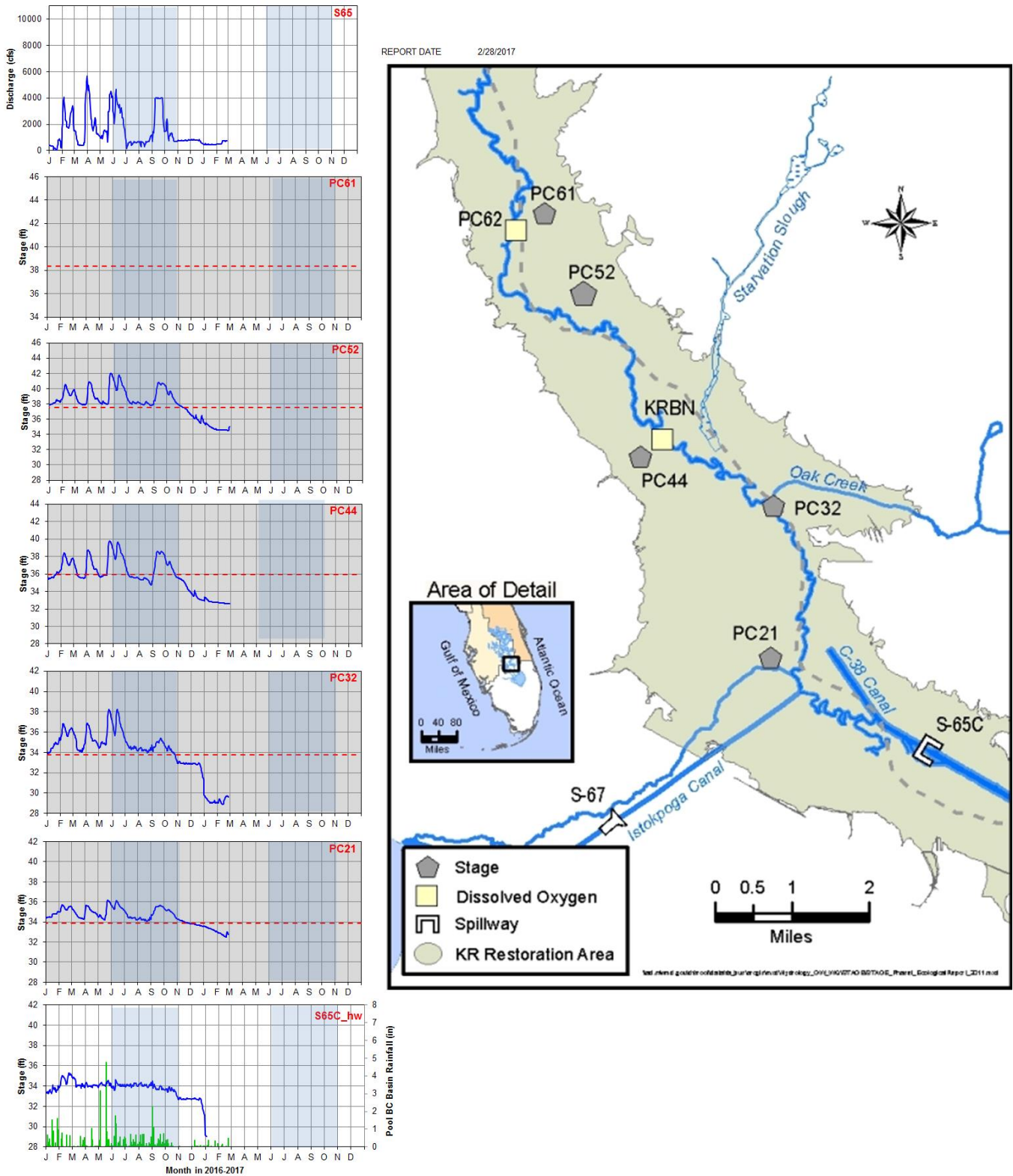


**Figure 12.** Phase I area floodplain water depths for this week, one month ago, and two months ago. Note that the WDAT color-coding has been modified to accommodate greater water depths; these maps are not directly comparable to Kissimmee Basin WDAT maps published prior to Jan. 16, 2012.



**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.



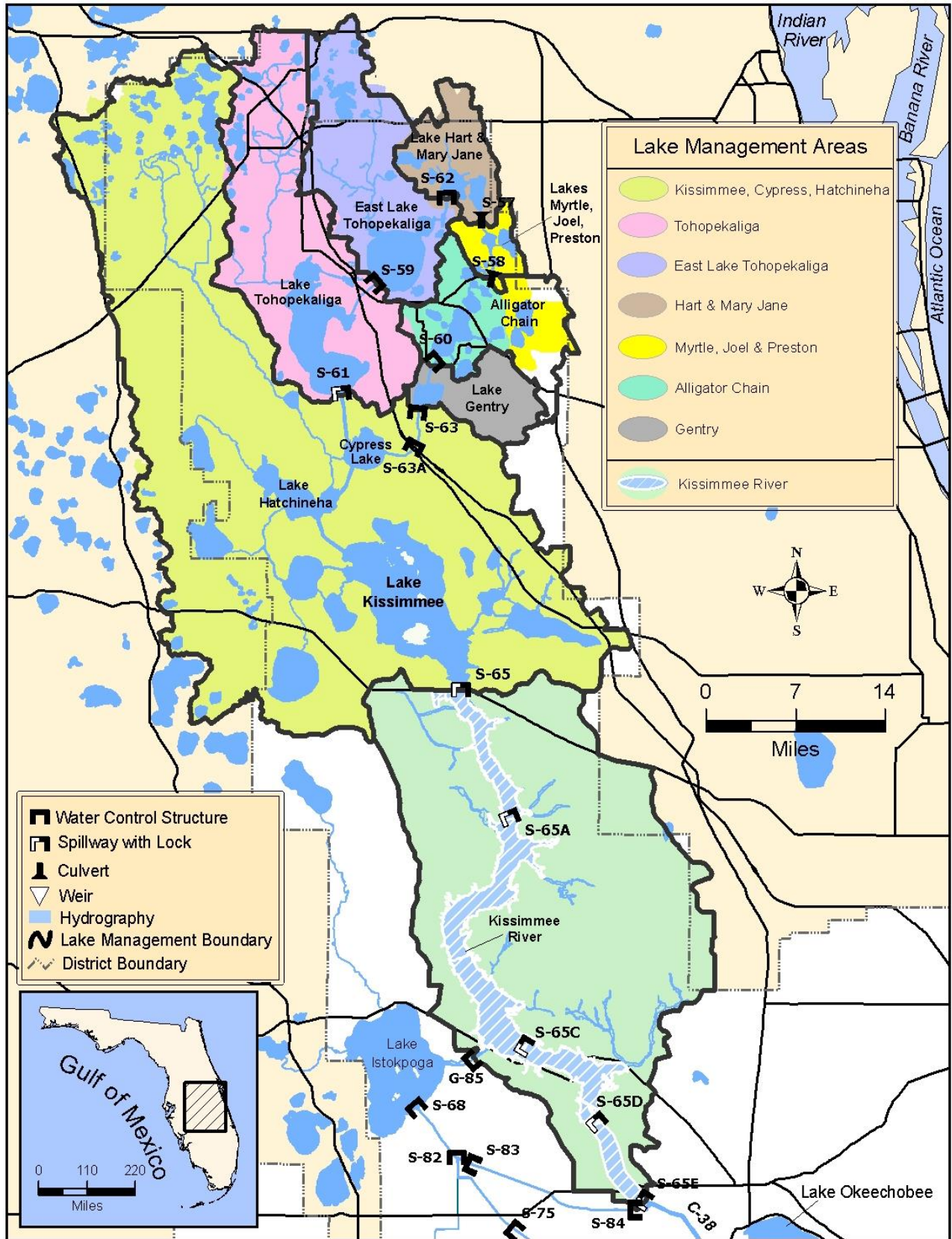


Figure 14. The Kissimmee Basin

## LAKE OKEECHOBEE

According to the USACE web site, Lake Okeechobee stage is at 13.46 feet NGVD for the period ending at midnight on February 26, 2017. This value is based on the use of four interior Lake stations (L001, L005, L006, and LZ40) and four perimeter stations (S352, S4, S308 and S133). Lake stage decreased by 0.05 feet over the past week and is 0.44 feet lower than it was a month ago and 2.56 feet lower than it was a year ago (Figure 1). The Lake is currently in the Base flow sub-band (Figure 2). According to RAINДАР, 0.548 inches of rain fell directly over the Lake during the past seven days (Figure 3). The lower Kissimmee Valley received less rainfall and portions of the upper east coast received greater amounts of rainfall.

Based on USACE reported values, current Lake inflow is approximately 610 cfs as detailed below.

<b>Structure</b>	<b>Flow cfs</b>
S65E	0
S65EX1	723
S154	0
S84 & 84X	0
S71	0
S72	0
C5 (Nicodemus slough dispersed storage)	-114
S191	0
S133 PUMPS	0
S127 PUMPS	0
S129 PUMPS	0
S131 PUMPS	0
S135 PUMPS	0
Fisheating Creek	1
S2 Pumps	0
S3 Pumps	0
S4 Pumps	0

Current Lake outflow is approximately 1,220 cfs with 1,044 cfs exiting at S77 and 162 cfs exiting at the L8 canal through Culvert 10A. Approximately 131 cfs is being directed south through S351, S352 and S354 and 115 cfs is back flowing at S308. Corrected evapotranspiration value based on the L006 weather platform solar radiation data for this past week was 716 cfs.

Change in elevation equivalents and average weekly flows (midnight February 20, 2017 to midnight February 26, 2017) for major structures are presented in Figure 4. Weekly average values for S77 and S308 are based on USGS data for the below structure gauges.

Based on the Lake Okeechobee wading bird habitat suitability index, there are currently approximately 33,167 acres of suitable foraging habitat for long-legged birds and 16,764 acres for long and short-legged birds on the Lake (Figure 5).

The Fish and Wildlife Commission reported two new snail kite nests during their February survey bringing the total to five nests thus far (Figure 6). Of the five nests, one was deemed successful and four are still active. Additionally, there were 332 snail kites observed foraging on the Lake accounting for 38% of the all the snail kites seen in the state.

The most recent available MODIS satellite images (February 17 and 26, 2017) indicate low potential for bloom activity (Figure 7).

### Water Management Recommendations

Lake stage is 13.46 feet NGVD and is in the Base flow sub-band. The current weekly recession rate of 0.05 feet equates to a monthly recession rate of 0.20 feet which is ideal and within the recommended 0.50 feet per month or lower guidelines. A too rapid decrease in Lake levels may jeopardize the upcoming nesting season by drying out foraging locations near the colonies.

The goal should be to maintain the recession rate at no more 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 and fish) communities.

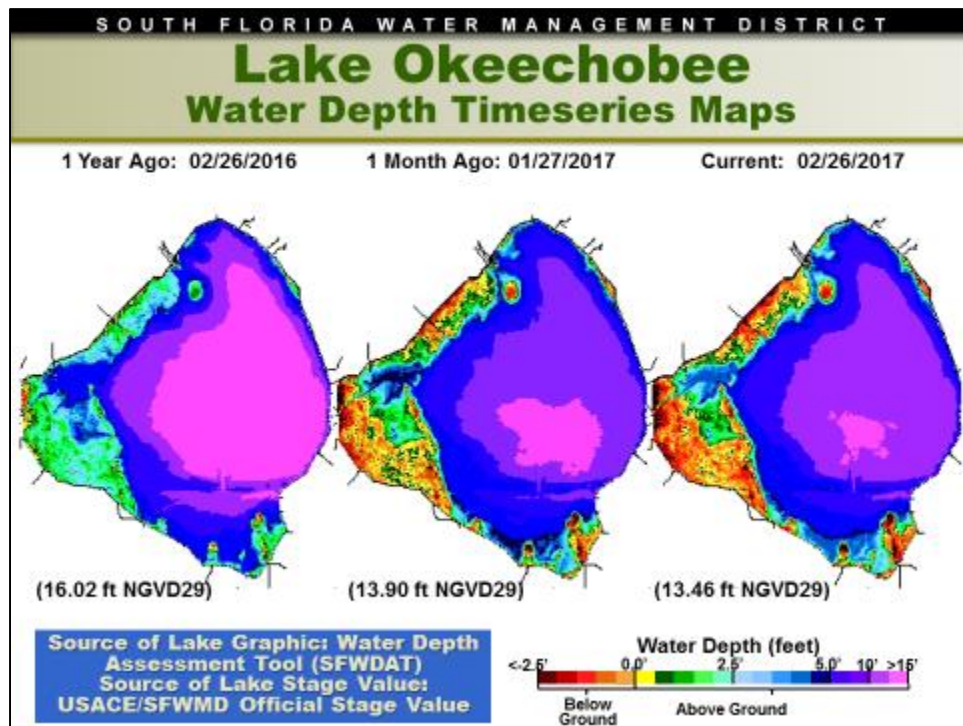


Figure 1



# Weekly Stage Hydrograph

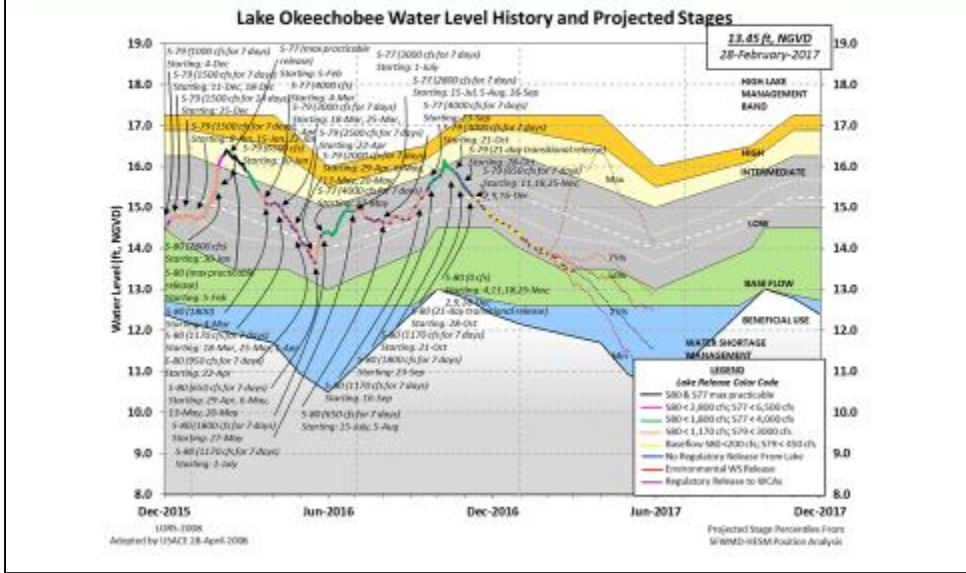
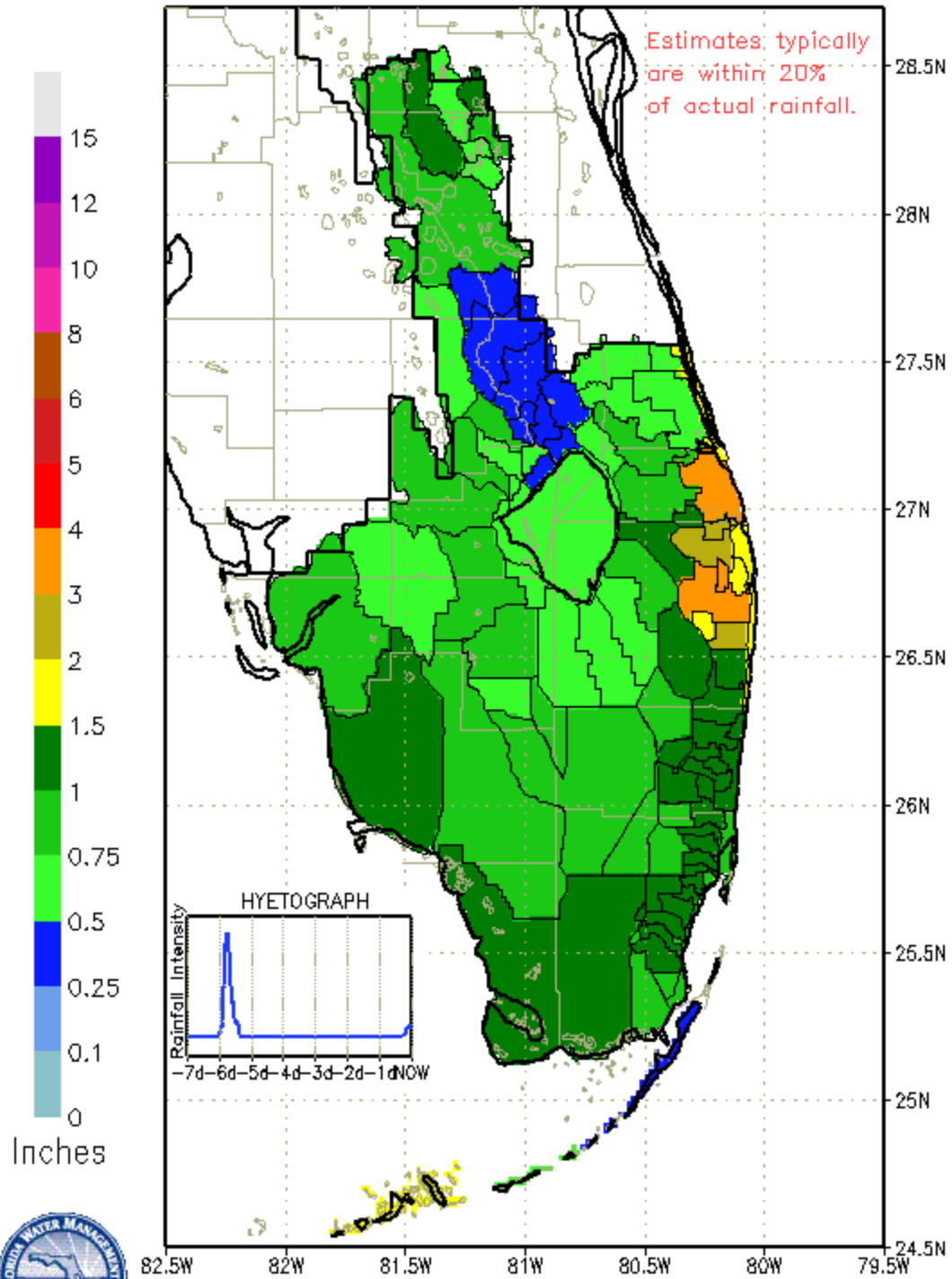


Figure 2

# SFWMD PROVISIONAL RAINFALL 7-DAY BASIN RAINFALL ESTIMATES

FROM: 0615 EST, 02/21/2017 THROUGH: 0615 EST, 02/28/2017



DISTRICT-WIDE RAINFALL ESTIMATE: 0.920"

Figure 3

INFLOWS	Average Daily Flow Past Week cfs	Feet of Change Past Week
S65E & S65EX1	752	0.027
S71 & 72	55	0.002
S84 & 84X	0	0.000
Fisheating Creek	36	0.001
Rainfall	N.A.	0.046
OUTFLOWS	Average Daily Flow Past Week cfs	Feet of Change Past Week
S77	591	0.021
S308	-59	-0.002
S351	182	0.006
S352	212	0.008
S354	261	0.009
L8	165	0.006
ET	716	0.025

Figure 4

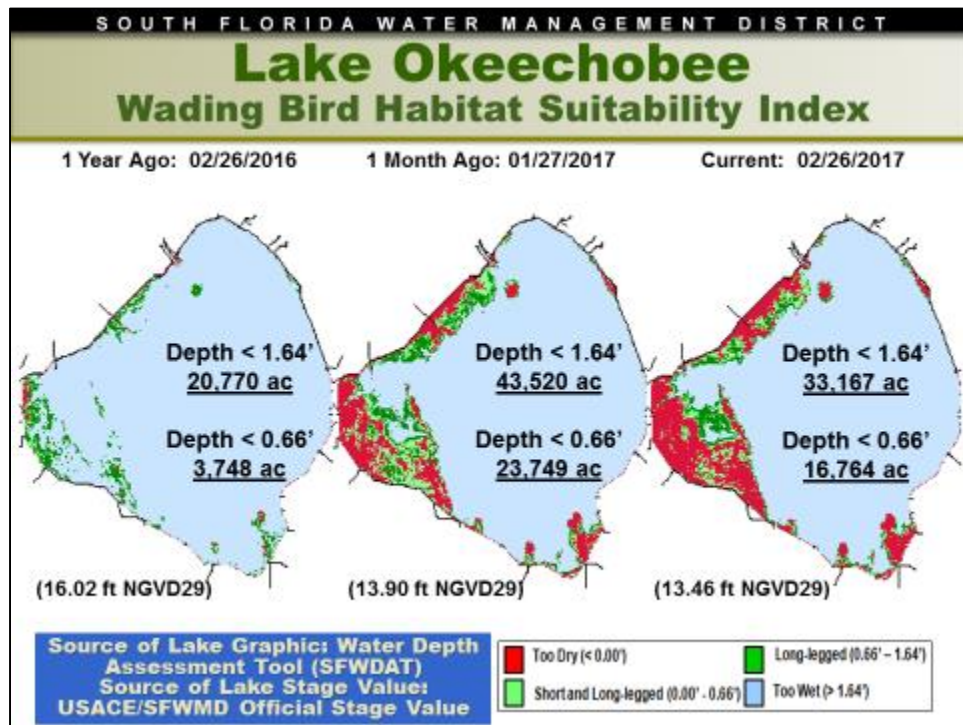


Figure 5



Figure 6

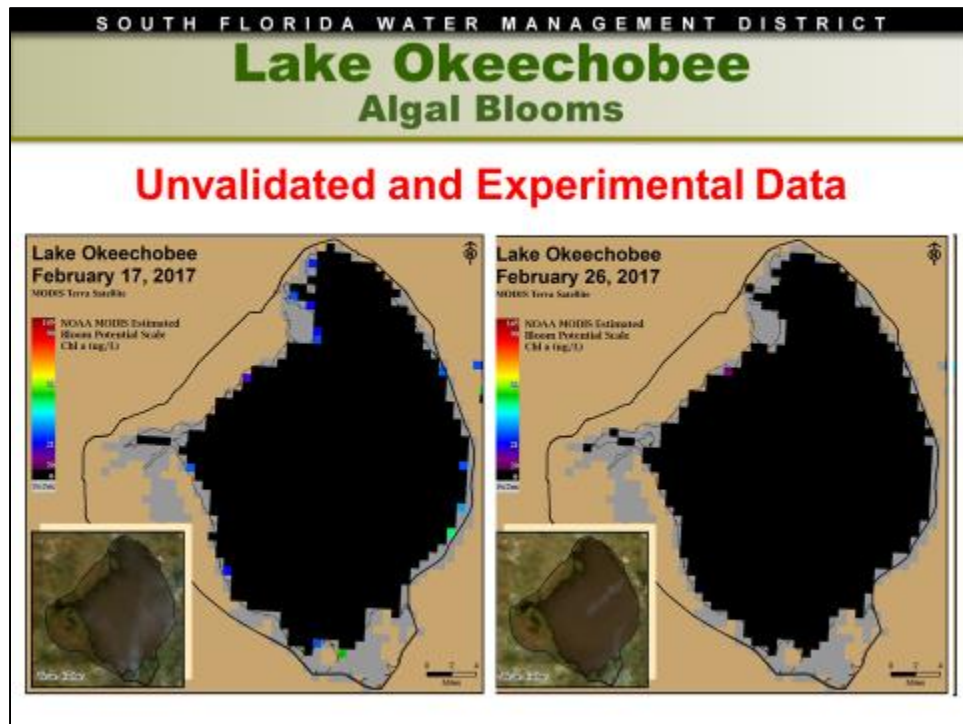


Figure 7

### Lake Istokpoga

The Lake Istokpoga regulation schedule is at winter pool stage of 39.50 feet NGVD. Lake stage is 39.09 feet NGVD and is currently 0.41 feet below regulation stage (Figure 8). Average flows into the Lake from Arbuckle and Josephine creeks were 85 cfs and 15 cfs, respectively, which is a slight increase from last week's total flow. Average discharge from S68 and S68X this past week was 71 cfs,

a decrease from the previous week's flow. According to RAINDAR, 0.587 inches of rain fell in the Lake Istokpoga watershed during the past seven days.

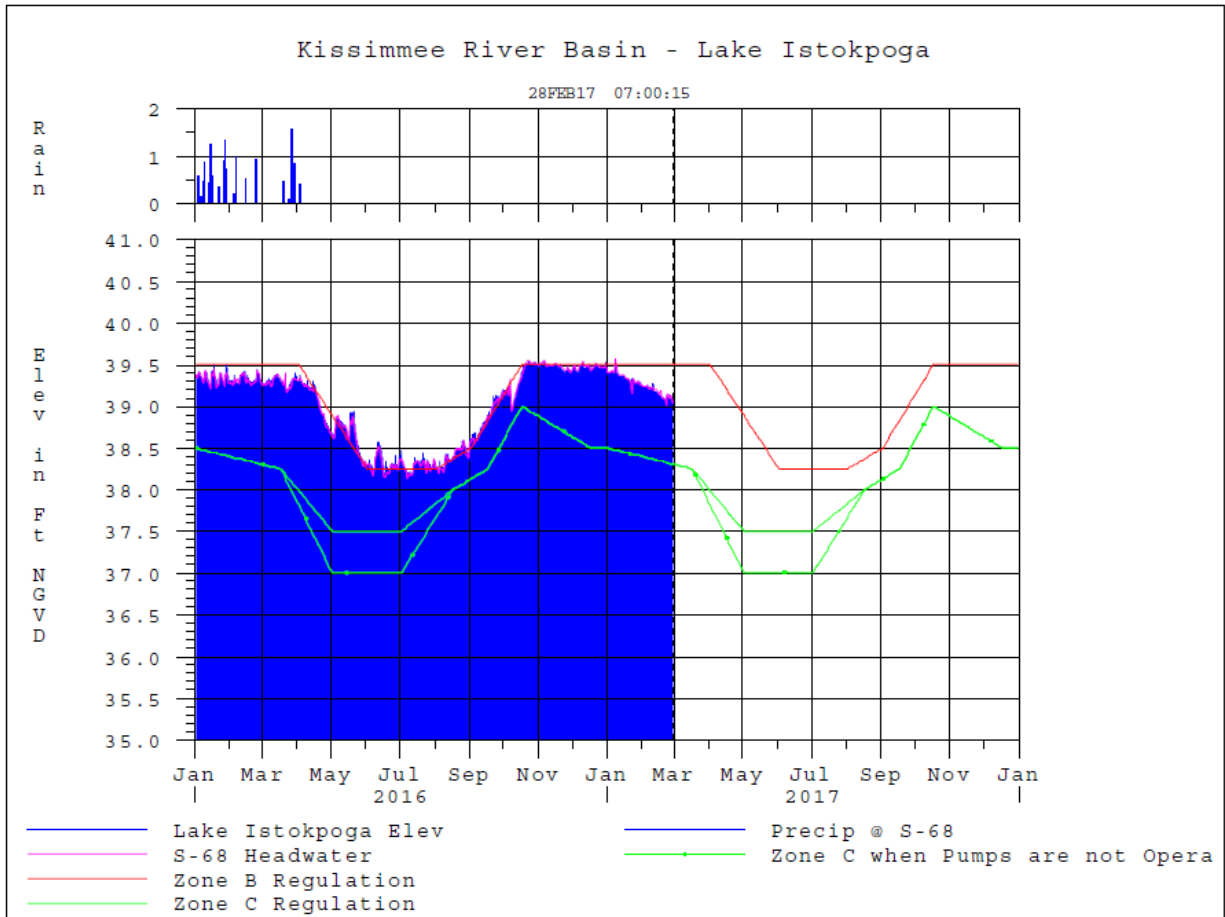


Figure 8

## ESTUARIES

### St. Lucie Estuary

Over the past week, provisional flows averaged about 0 cfs at S-80, 47 cfs downstream of S-308 flowing into Lake Okeechobee, 0 cfs at S-49 on C-24, 0 cfs at S-97 on C-23, and 57 cfs from Ten Mile Creek at the Gordy Road Structure. Average inflow from tidal basin tributaries is estimated to be 156 cfs (Figures 1 and 2). Total inflow averaged about 213 cfs last week and 146 cfs over last month.

Over the past week, salinity increased 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 27.2. 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>25.2</b> (24.2)	<b>26.7</b> (26.0)	NA <sup>1</sup>
US1 Bridge	<b>26.9</b> (26.7)	<b>27.5</b> (27.3)	10.0-26.0
A1A Bridge	<b>32.1</b> (31.8)	<b>32.7</b> (32.7)	NA

<sup>1</sup>Envelope not applicable

## Caloosahatchee Estuary

During the past week, provisional flows averaged approximately 637 cfs downstream of S-77, 555 cfs at S-78, and 790 cfs at S-79. Average inflow from tidal basin tributaries is estimated to be 146 cfs (Figures 5 and 6). Total inflow averaged 936 cfs last week and 808 cfs over last month.

Over the past week in the estuary, salinity increased to Ft. Myers Yacht Basin then decreased downstream (Table 2, Figures 7 and 8). The seven-day average salinity values are within the good range for adult oysters at Cape Coral and at Shell Point and most likely still in the fair range at Sanibel (Figure 9). The 30-day moving average surface salinity is 3.2 at Val I-75 and 9.6 at Ft. Myers. The 30-day moving average salinity at Ft. Myers has been below 10 for five consecutive days. Salinity conditions between Val I-75 and Ft. Myers are improving but tape grass has likely suffered some mortality. Without discharges at S-79, the 30-day moving average salinity at Val I-75 is forecast to be 4.2 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>2.6</b> (1.0)	<b>2.7</b> (1.0)	NA <sup>1</sup>
*Val I75	<b>3.2</b> (2.1)	<b>6.2</b> (3.6)	0.0-5.0 <sup>2</sup>
Ft. Myers Yacht Basin	<b>9.5</b> (9.7)	<b>12.9</b> (11.3)	NA
Cape Coral	<b>17.8</b> (18.2)	<b>19.6</b> (19.8)	10.0-30.0
Shell Point	<b>27.4</b> (28.3)	<b>28.4</b> (29.0)	10.0-30.0
Sanibel	<b>NR</b> (>31)	<b>NR</b> (>31)	10.0-30.0

<sup>1</sup>Envelope not applicable, <sup>2</sup>Envelope is based on a 30-day average, NR=Not Reporting.

\*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. Live Data will be unavailable until website upgrades are complete.

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)	4.21 – 13.98	4.92 – 20.61	1.49 – 9.69 Feb. 21 – 23 only
Dissolved Oxygen (mg/l)	5.47 – 8.42	4.70 – 8.18	No Data

The Florida Fish and Wildlife Research Institute reported on February 24, 2017, that *Karenia brevis*, the Florida red tide organism, persists in Southwest Florida from southern Pinellas to Collier counties. *Karenia brevis* was observed in background to low concentrations in sixteen samples collected from Lee County.

## Water Management Recommendations

Salinity conditions in the upper portion of the Caloosahatchee estuary are improving. While the 30-day average salinity at the I-75 Bridge is forecast to remain below 5 with no inflow at S-79, the daily salinity is forecast to reach 7.2 within two weeks. Cessation of flow at this time would likely result in the 30-



day average forecast exceeding 5 next week. Therefore, it is recommended that runoff from the C-43 basin be supplemented with Lake Okeechobee water as a pulsed release of up to 650 cfs through S-79.

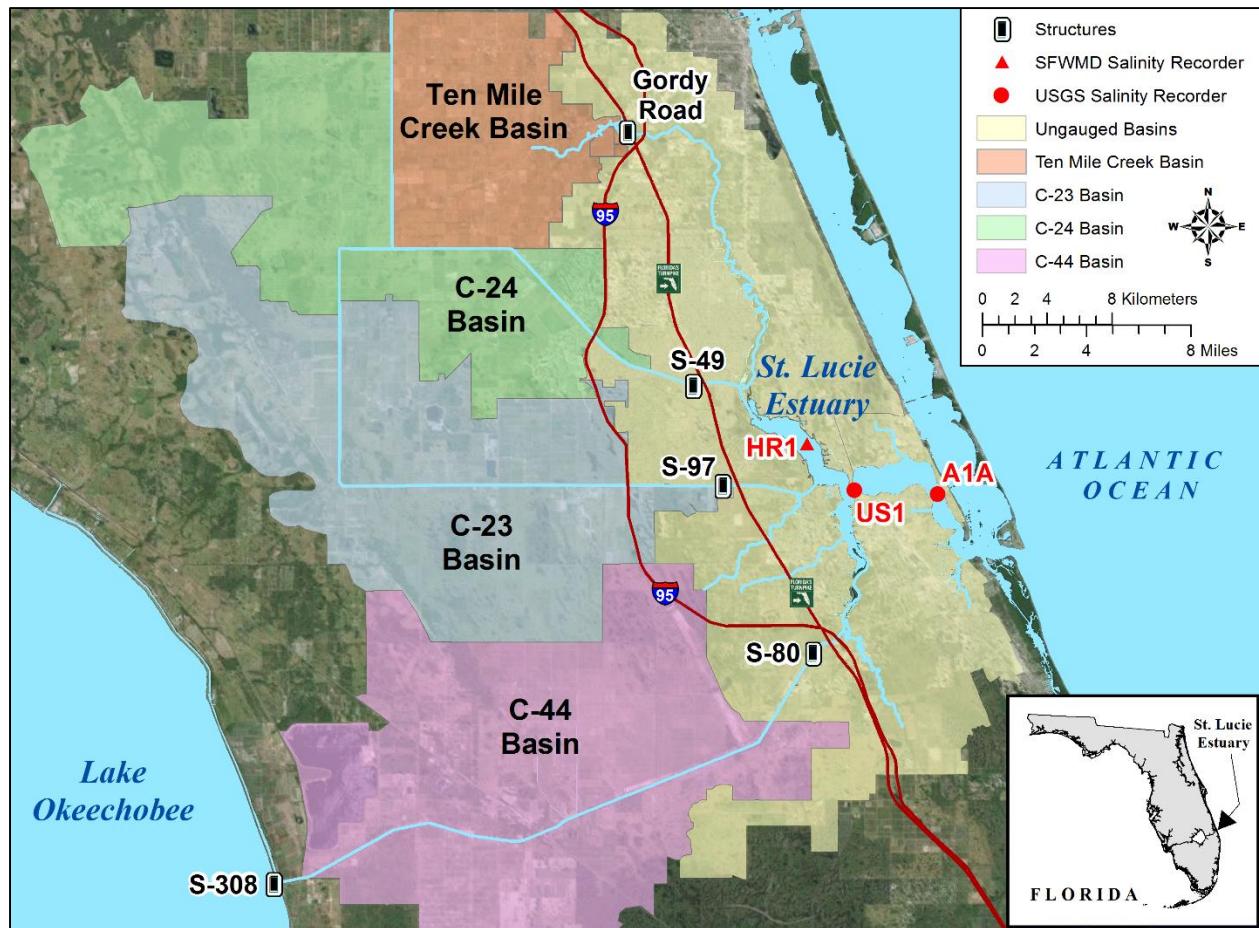


Figure 1. Basins, water control structures, and salinity monitoring for the St. Lucie Estuary.

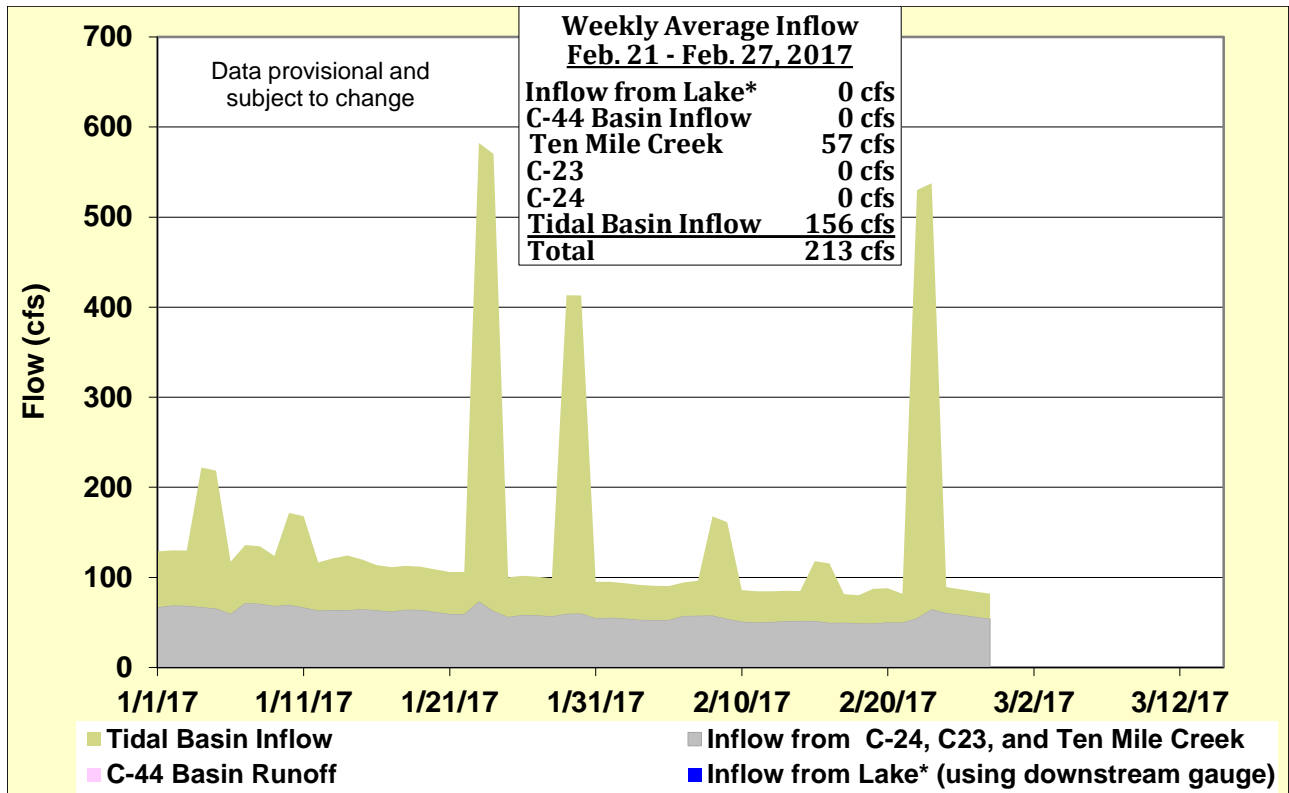


Figure 2. Estimated surface freshwater inflows from Lake Okeechobee and runoff from the C-44, C-23, C-24, Ten Mile Creek, and tidal basins into the St. Lucie Estuary.

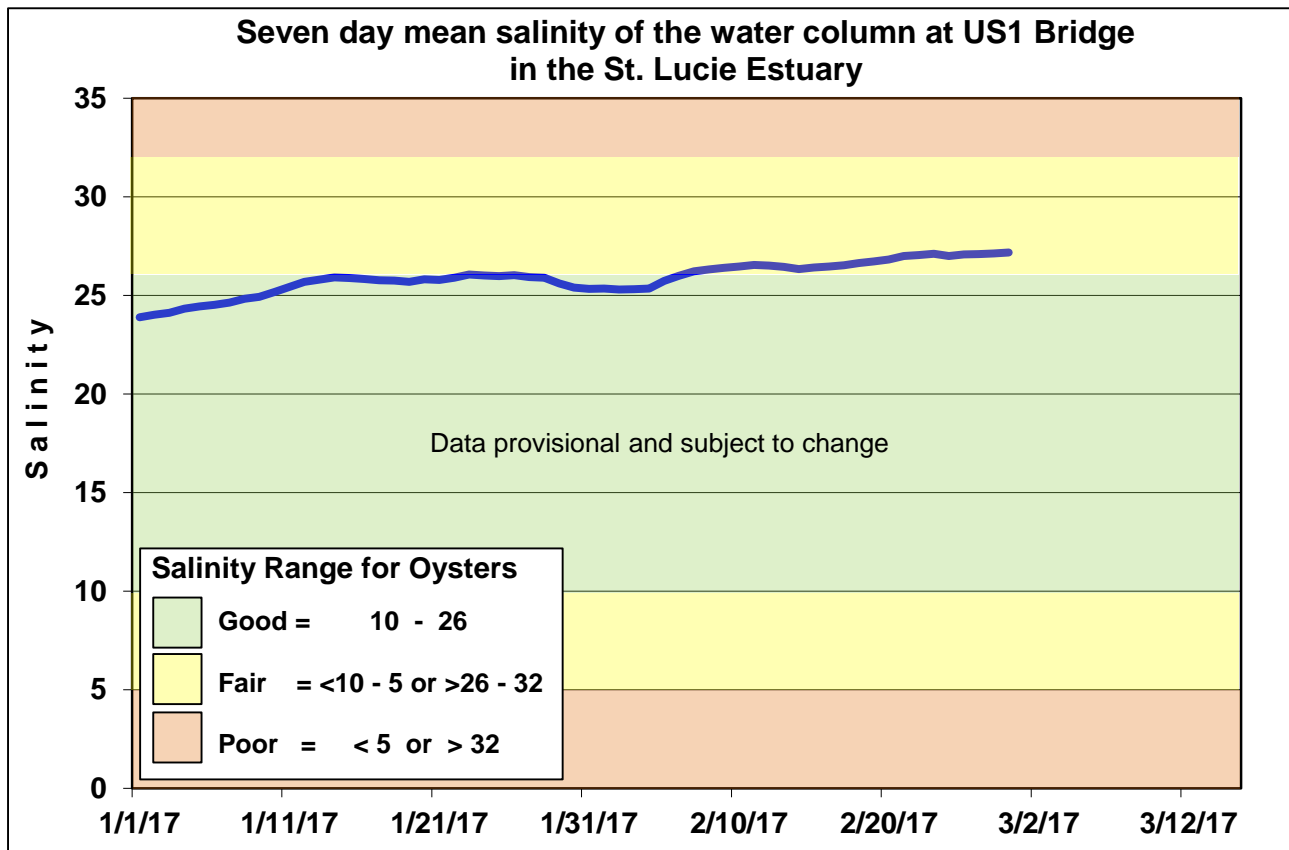


Figure 3. Seven-day mean salinity of the water column at the U.S. Highway 1 Bridge.



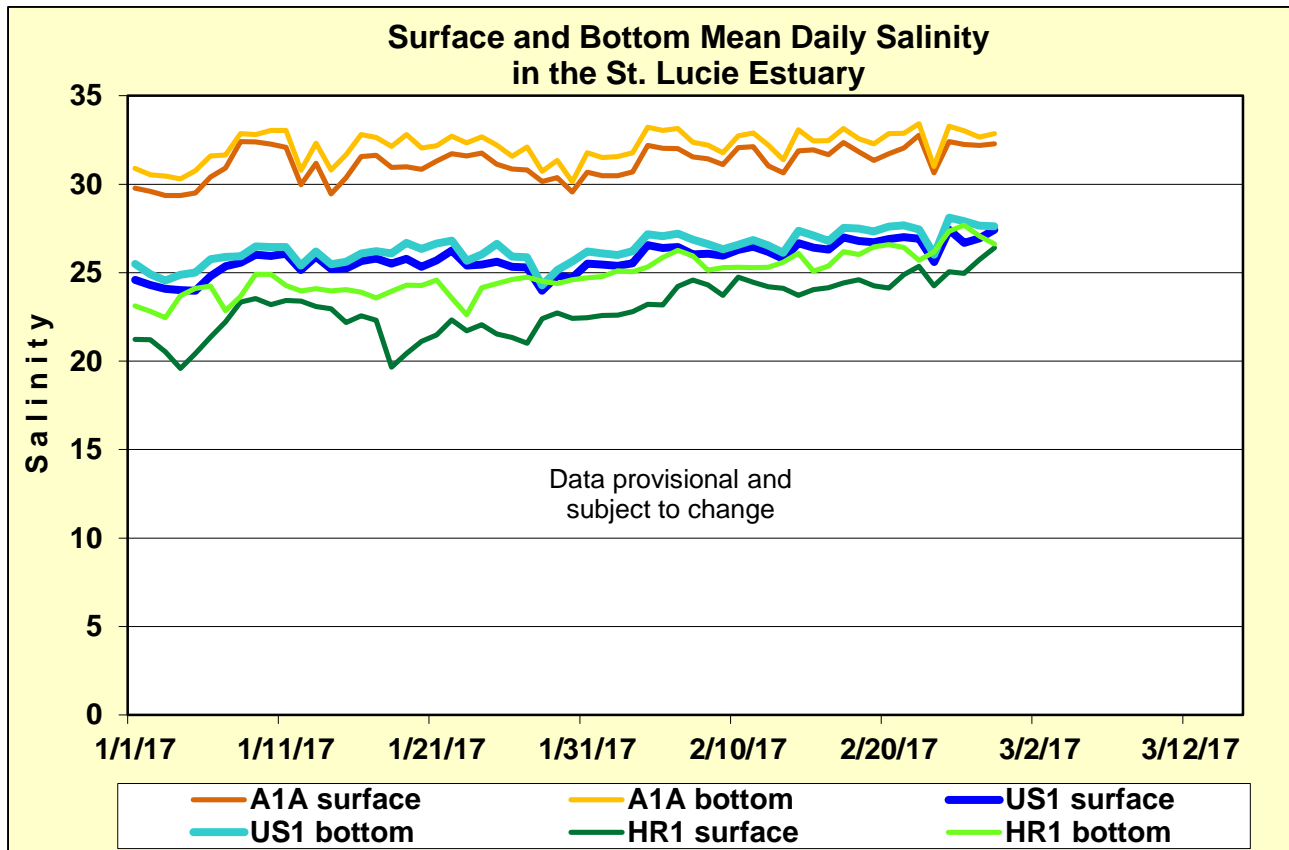


Figure 4. Daily mean salinity at the A1A, US1 and estimated HR1 stations.

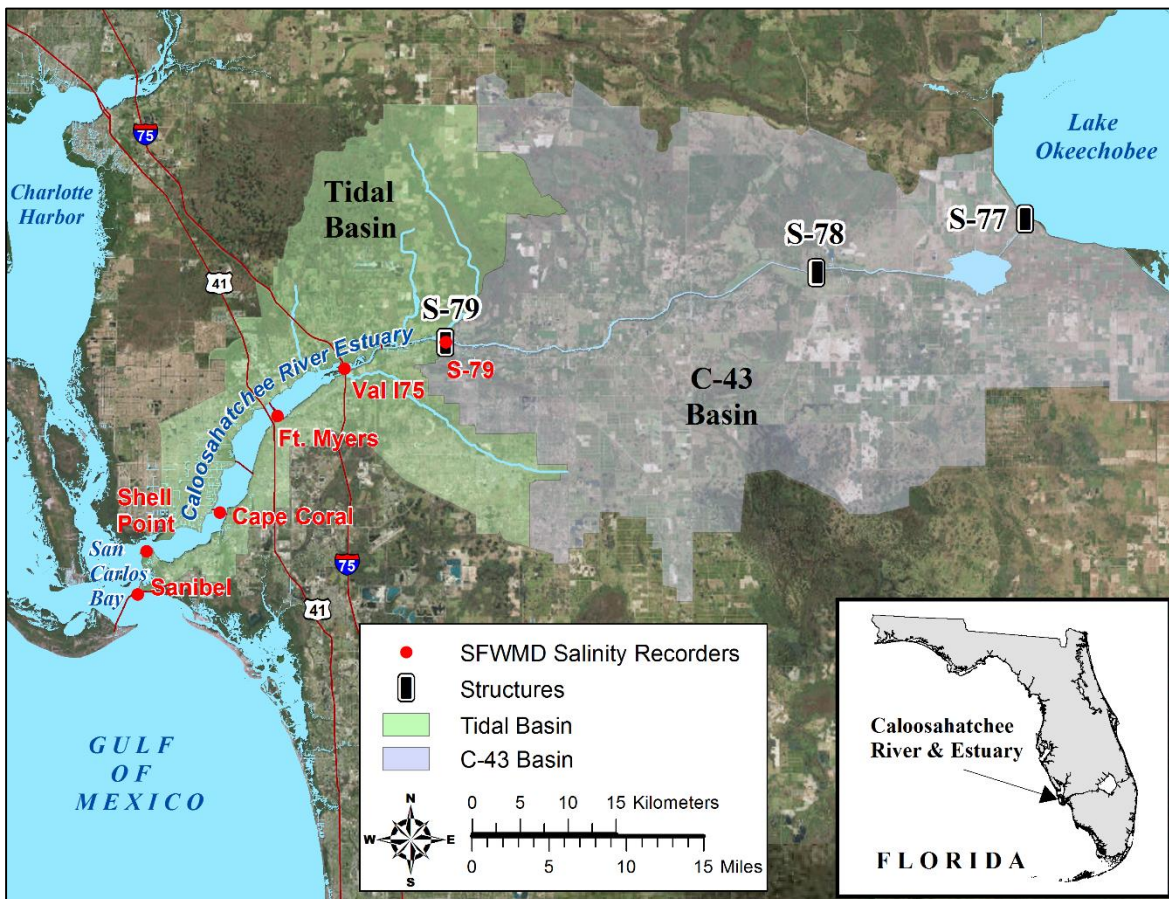


Figure 5. Basins, water control structures, and salinity monitoring for the Caloosahatchee Estuary.

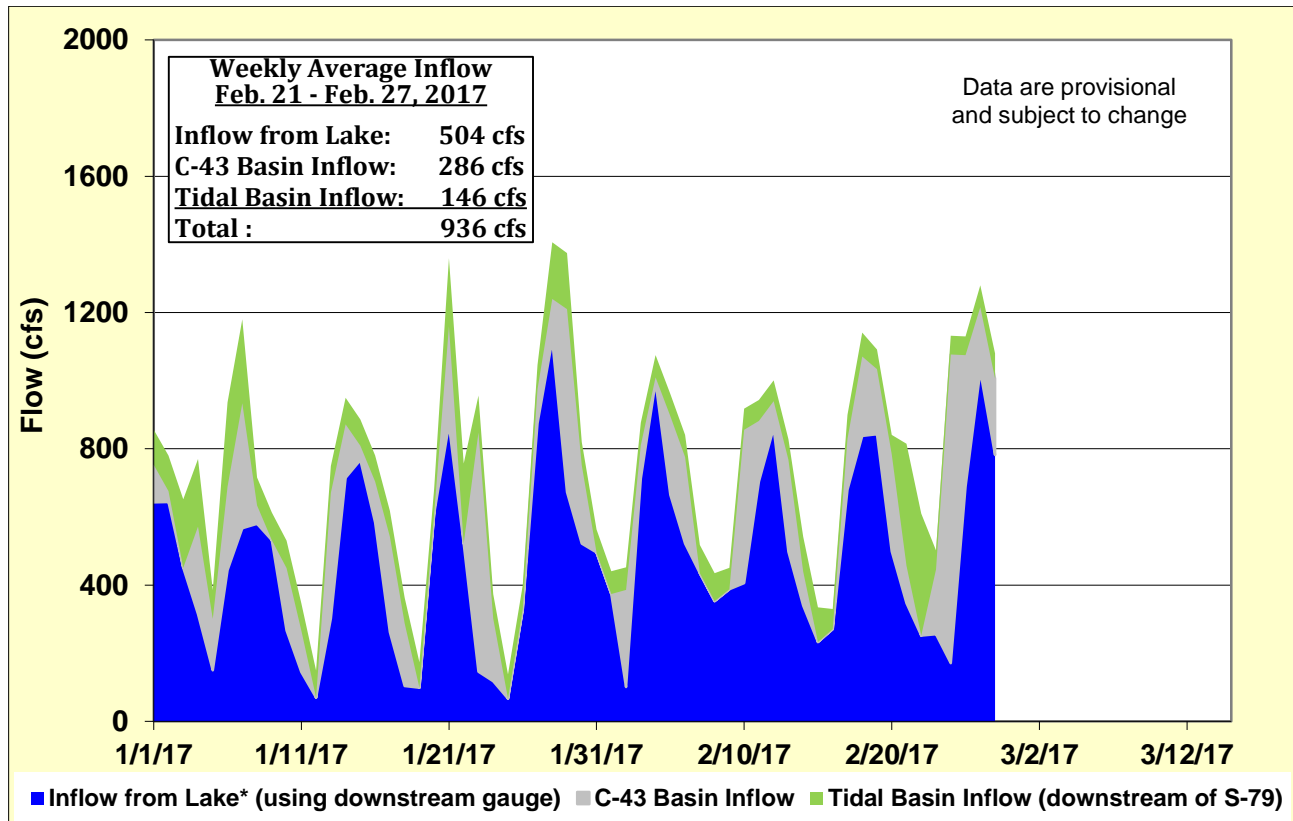
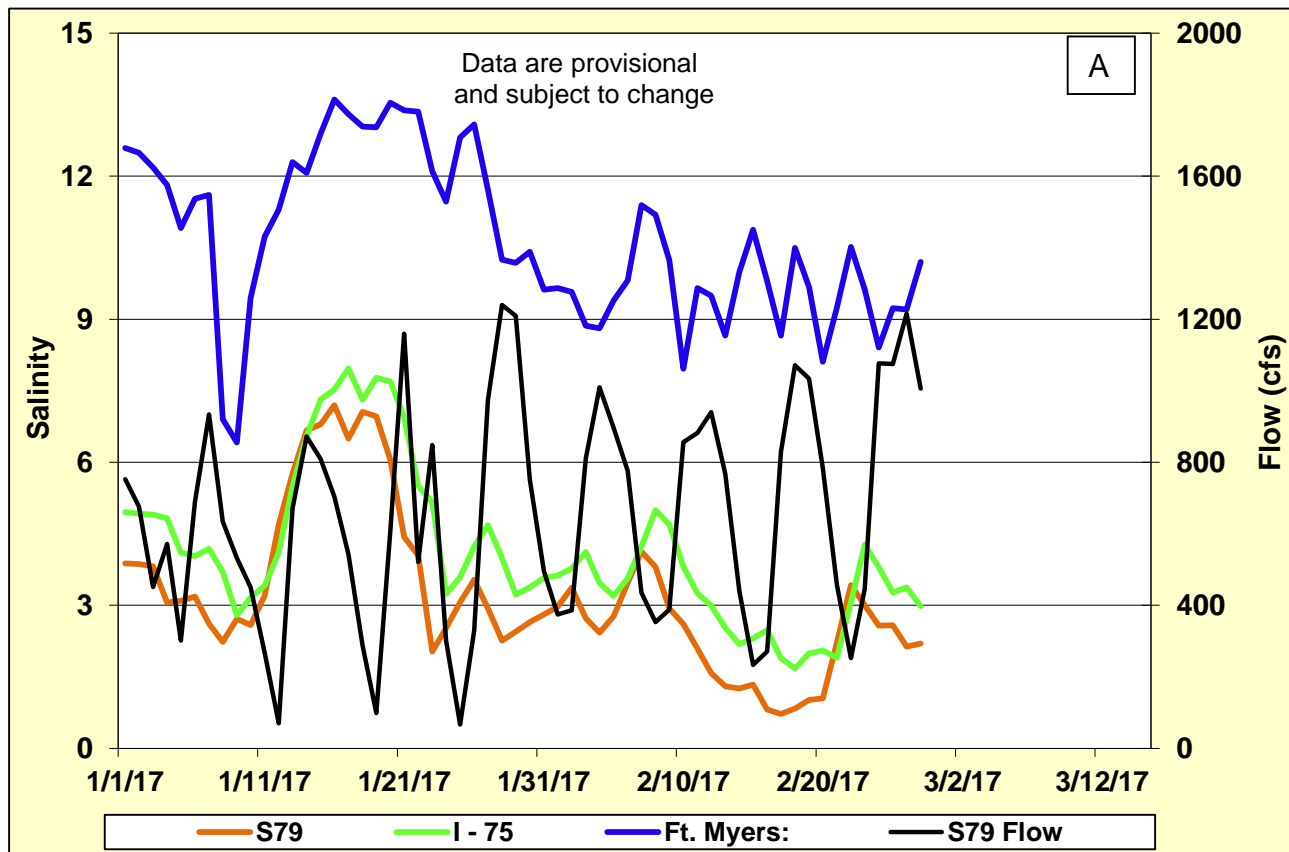


Figure 6. Freshwater inflows from Lake Okeechobee, runoff from the C-43 basin, and tributaries in the tidal basin into the Caloosahatchee River Estuary.



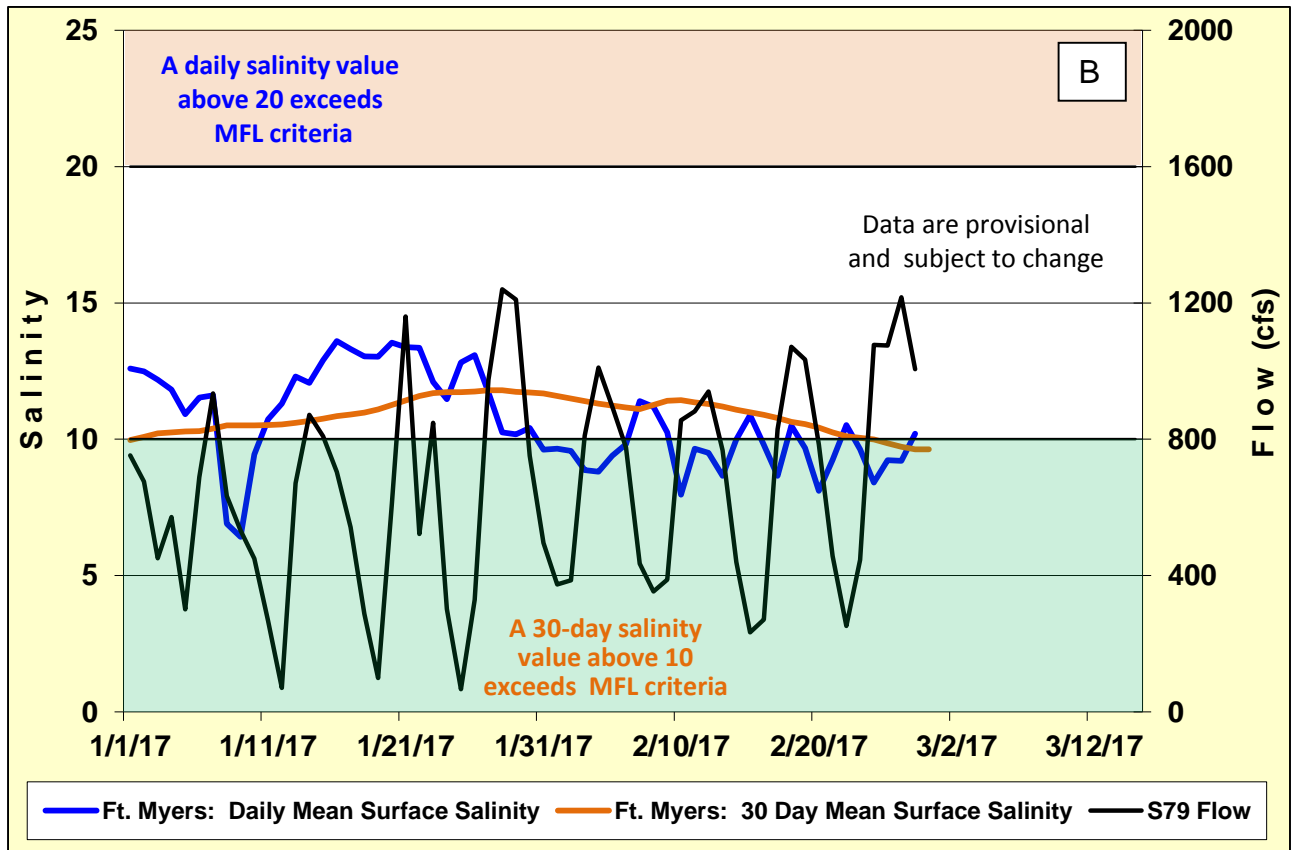


Figure 7. Daily mean flows at S-79 and salinity at upper estuary monitoring stations (A) and 30-day moving average salinity at Ft. Myers (B).

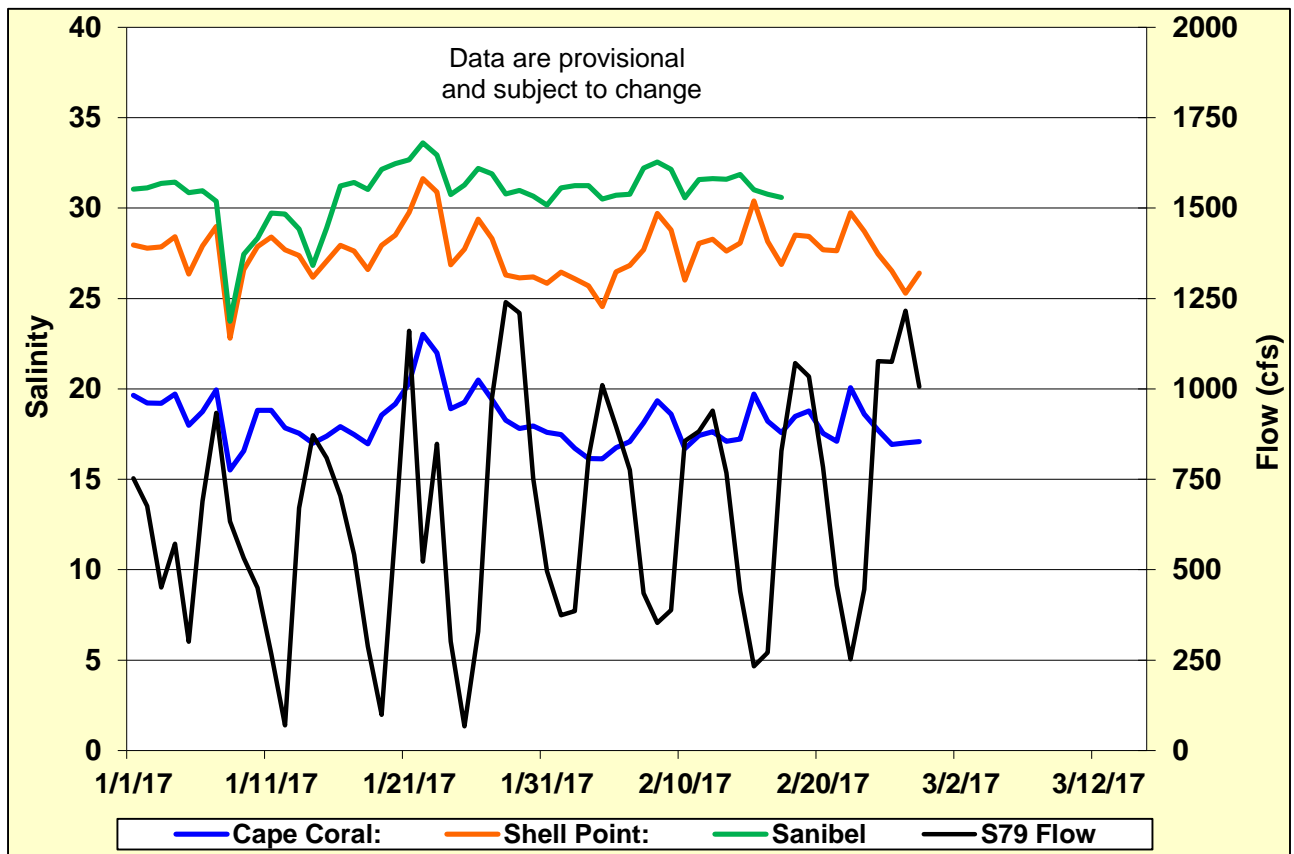


Figure 8. Daily mean flows at S-79 and salinity at lower estuary stations.

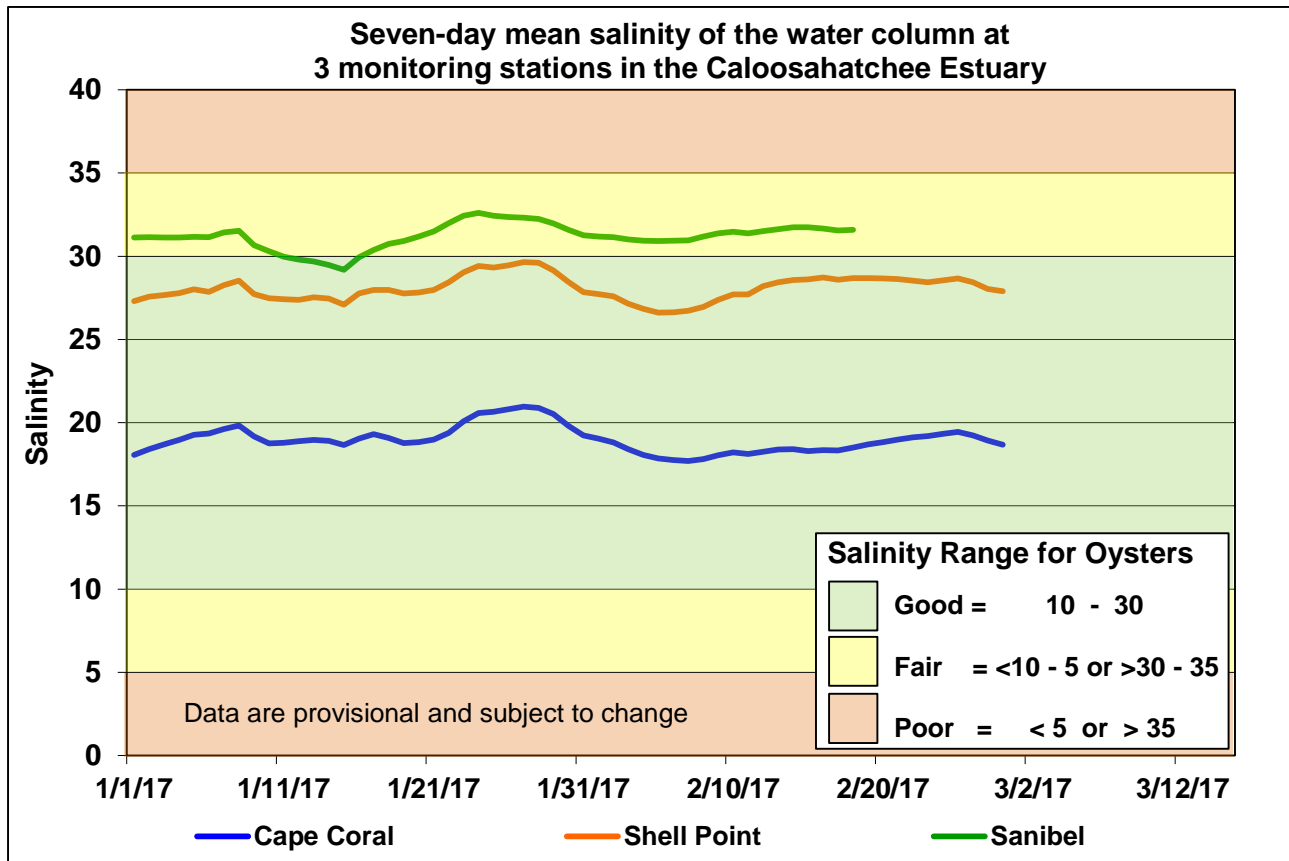


Figure 9. Seven-day mean salinity at Cape Coral Bridge, Shell Point and Sanibel Bridge monitoring stations.

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

**Forecast 1: S-79 = 0 cfs & TBR = 100 cfs**

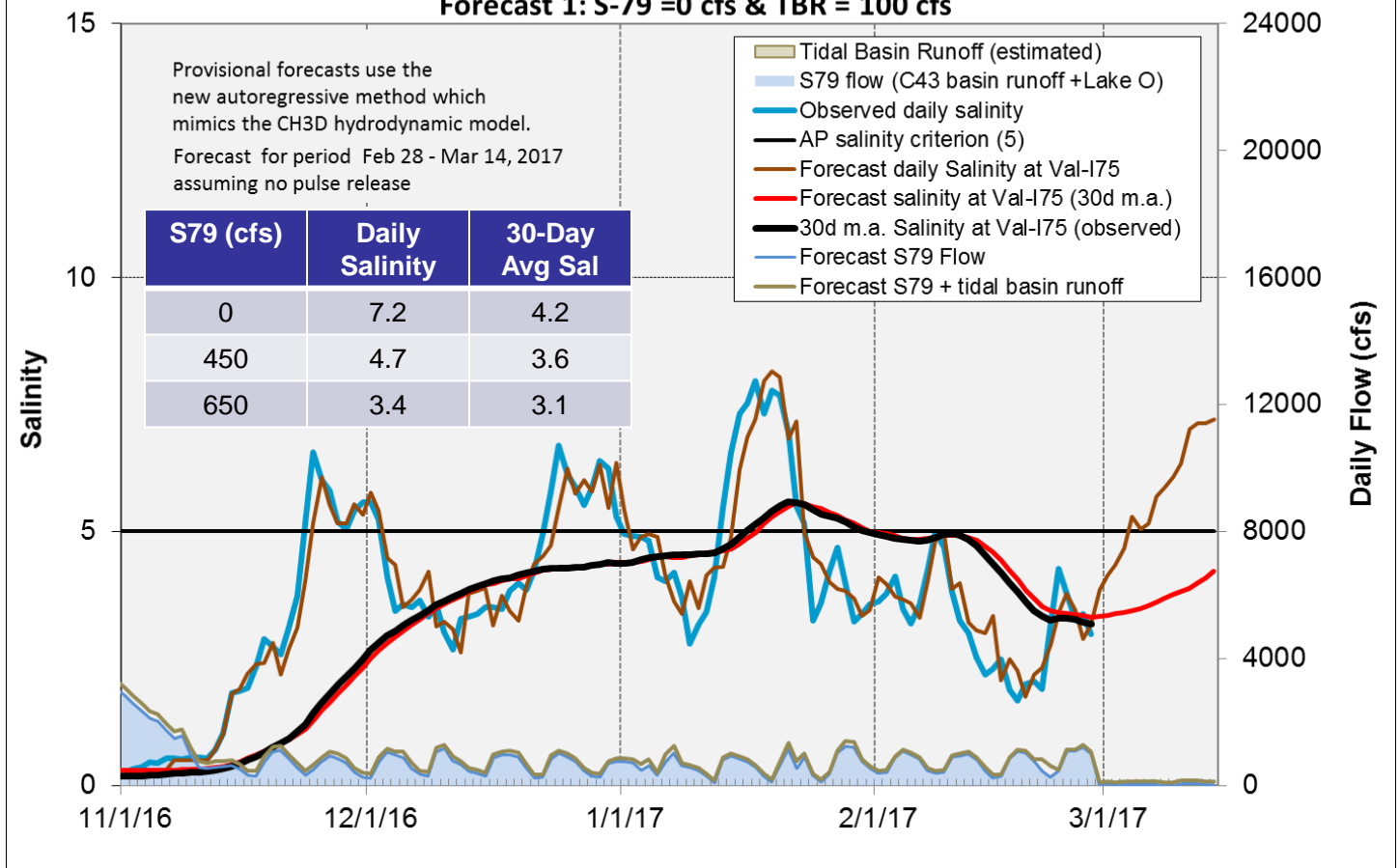


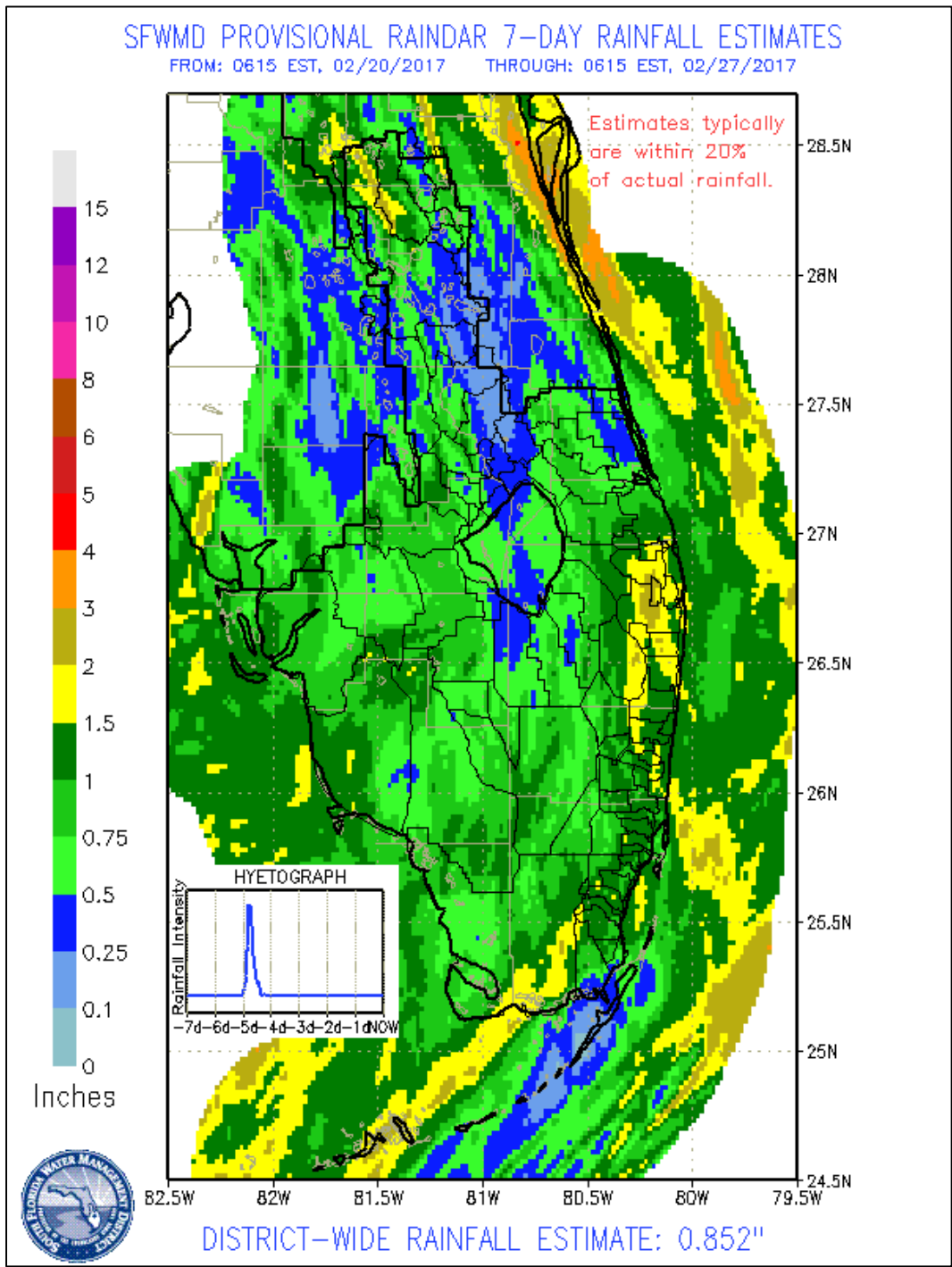
Figure 10. 14-day salinity forecast at Val I-75 assuming no releases at S-79.

### **GREATER EVERGLADES**

District-wide, RAINDAR estimated rainfall for the last week was 0.852 inches with the highest amounts in WCA-1. Water levels increased or essentially remained the same with the exception of WCA-2B.

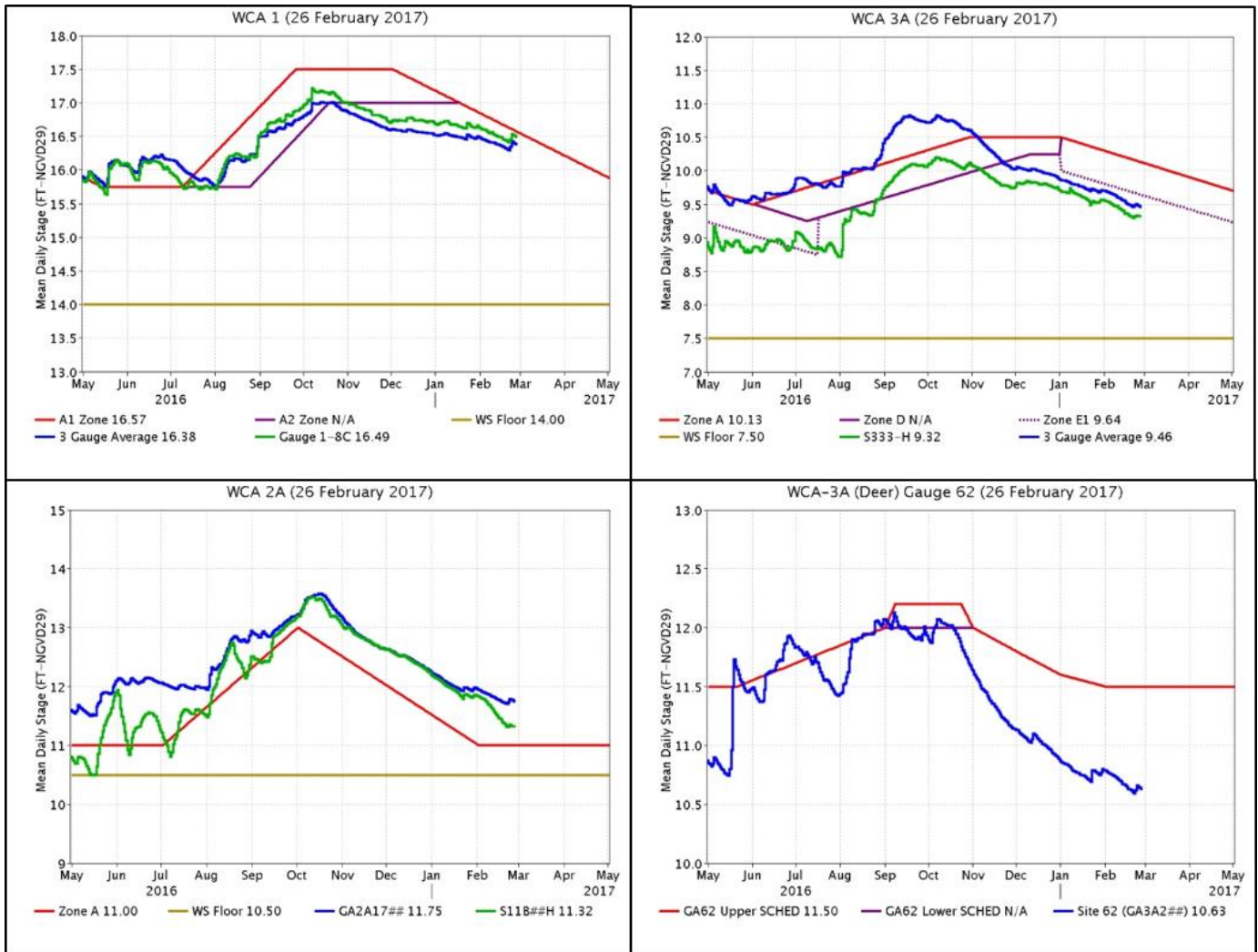
Everglades Region	Rainfall (Inches)	Stage Change (feet)
WCA-1	1.37	0.06
WCA-2A	0.94	0.02
WCA-2B	1.03	-0.05
WCA-3A	0.85	-0.01
WCA-3B	0.80	0.00
ENP	1.02	0.02

	Good
	Fair
	Poor



Regulation Schedules: Stages are below regulation for three of the four areas. The WCA-1 three-gauge average is -0.19 feet below zone A1, the northwestern WCA-3A gauge stage (gauge 62) is -0.87 feet below the upper schedule, and the WCA-3A three-gauge average stage is -0.18 feet below zone E1. The WCA-2A stage remains above regulation by 0.75 feet.

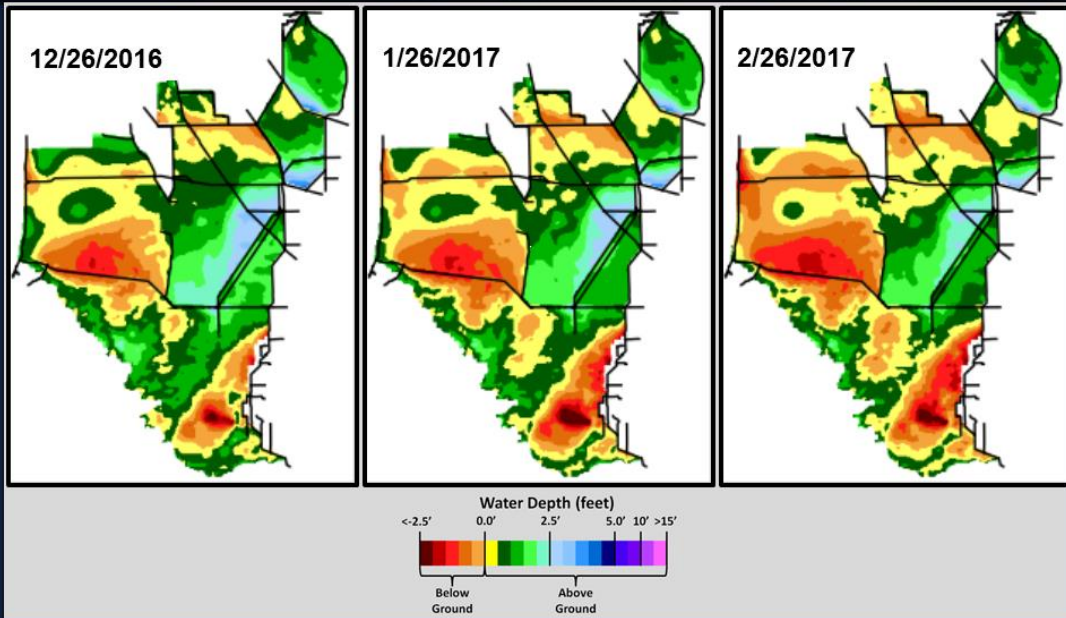




Water Depths and Changes: This week's water depths at monitored gauges other than in WCA-2B range from 0.40 feet (northeast WCA-3A) to 2.00 feet (southern WCA-3A). Individual gauge changes ranged from -0.05 feet to +0.07 feet. Stages are mostly lower than a month ago and lower than a year ago.



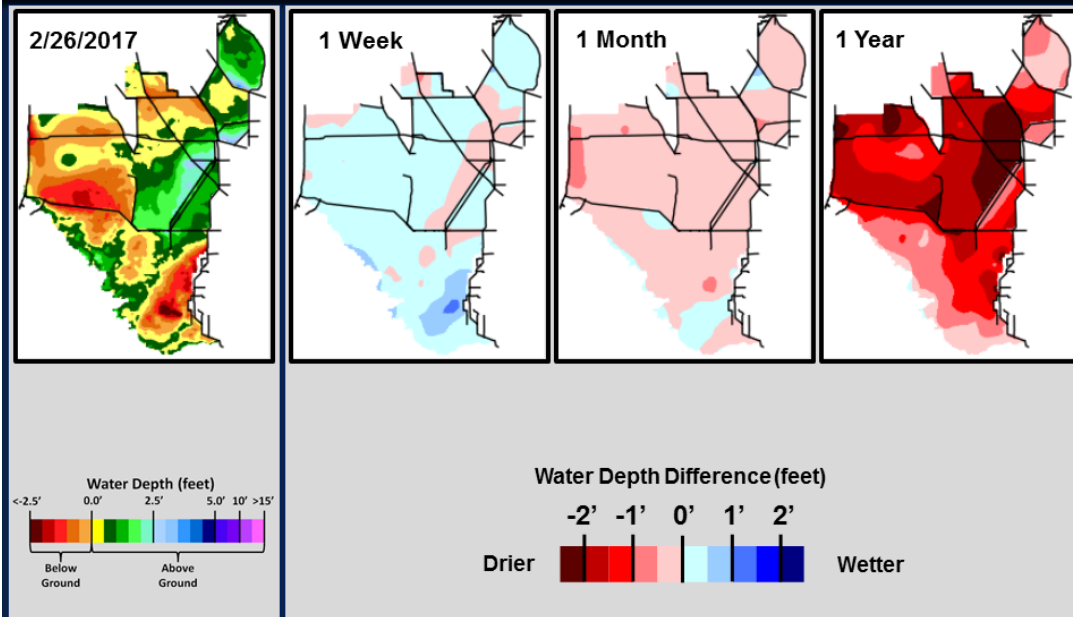
### SFWDAT Water Depth Monthly Snapshots



South Florida Water Depth Assessment Tool (SFWDAT)



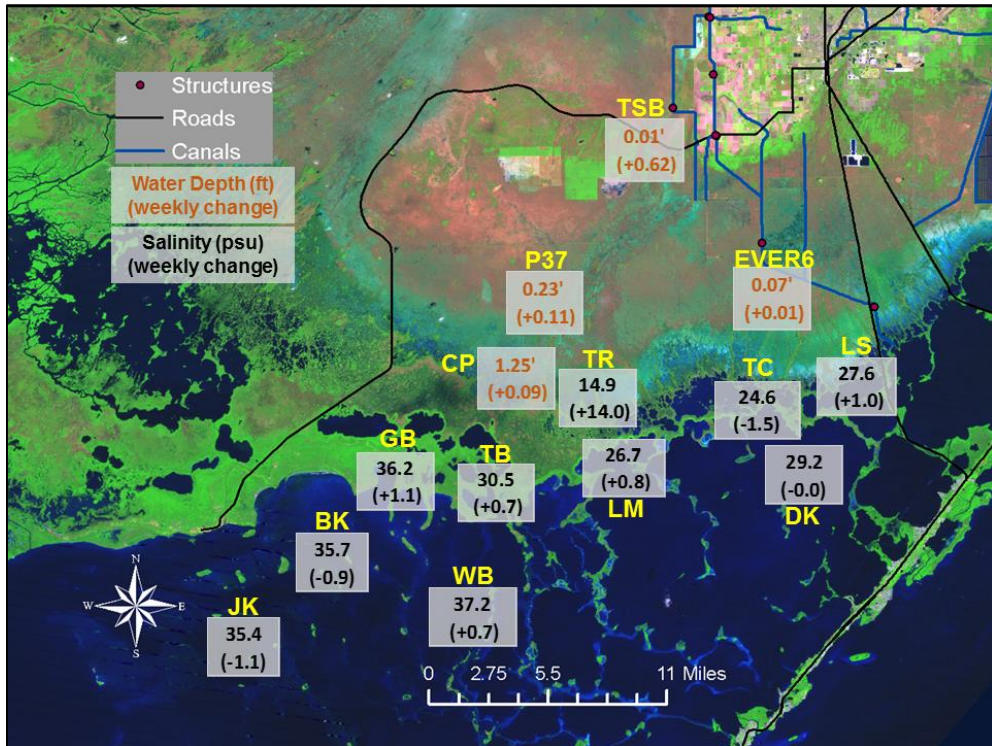
### SFWDAT Everglades Difference Maps (Present - Past)



South Florida Water Depth Assessment Tool (SFWDAT)

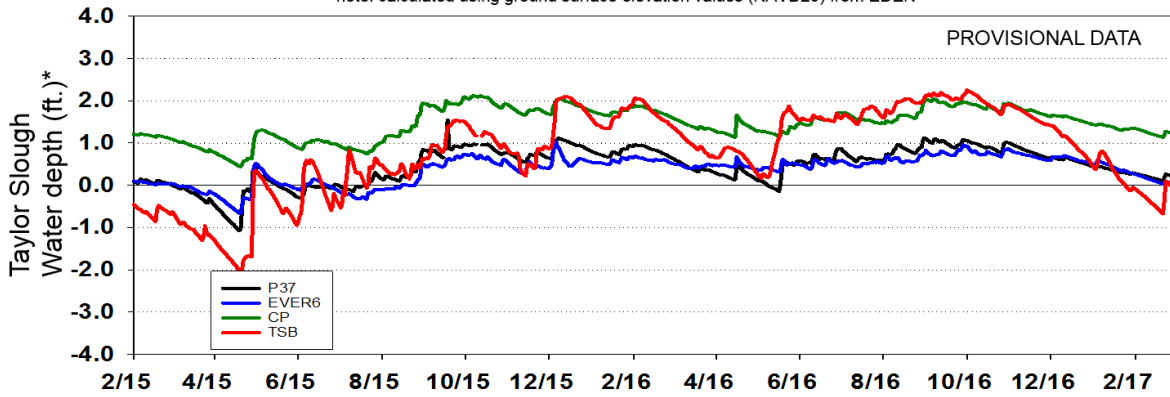
Wading Birds: The District conducted a wading bird survey on February 27, 2017. Birds were found to be foraging in the Refuge and northern WCA3A North. Despite the reversal, 2,500 birds were located (White Ibis and Great Egrets) in northern WCA-1 (i.e. ~1,000 more than previous flight) and 4,000 to 5,000 birds (mixed flocks including storks and spoonbills) in NE WCA-3A North.

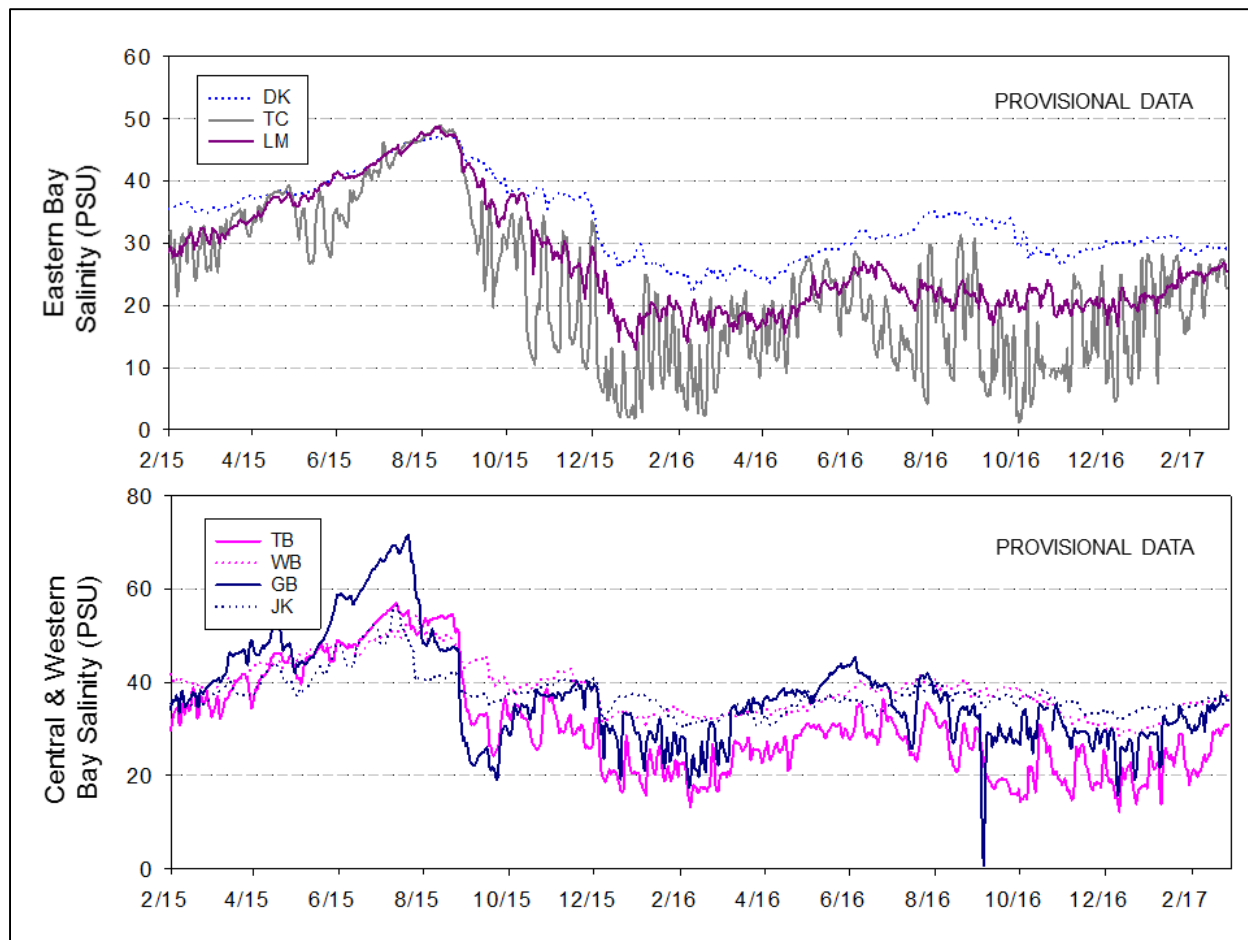




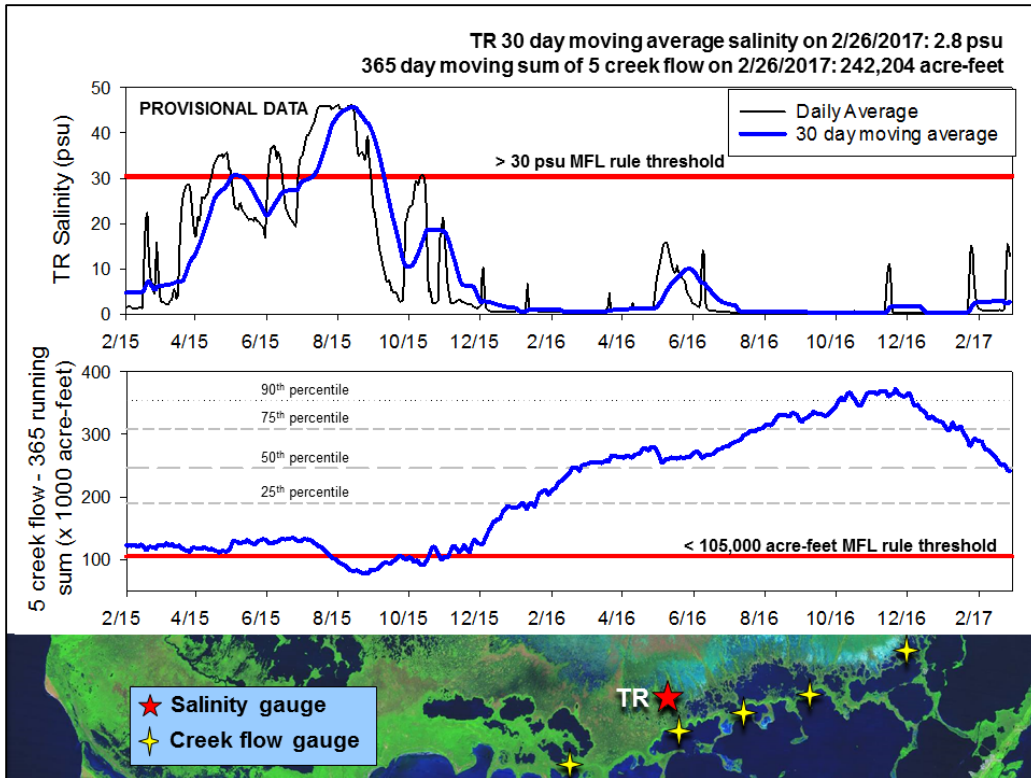
### Taylor Slough Water Depths

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





Florida Bay MFL: The daily average salinity at TR ended the week at 15 psu (up 14 from last week). The 30-day moving average decreased slightly to 2.8 psu this week. The 365-day moving sum of flow from the five creeks identified by stars on the map decreased about 9,000 acre-feet to end at 242,204 acre-feet (below the average of 257,628 acre-feet). The weekly creek flow from the five creeks was negative with around -4,800 acre-feet pushed upstream.



## Water Management Recommendations

- It is recommended to retain water to the extent possible in order to slow recessions in Northeast WCA-3A in order to protect the Alley North wading bird colony from mammalian predators, and maintain foraging conditions in WCA-3A throughout the nesting season. Also recommended is to slow the recession rate within WCA-2A in order to maintain wading bird foraging conditions throughout the nesting season. In the future, to the extent possible, limit inputs to WCA-1 in order to prevent another reversal greater than +0.1 feet would be beneficial for wading bird nesting in that area.
- Water depths in southern WCA-3A should stay below 2.5 feet throughout the dry season to protect tree island forests from further high water conditions like those experienced in 2016.

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

## Everglades Ecological Recommendations, Feb. 28st, 2017 (red is new)

Area	Current Condition	Cause(s)	Recommendation	Reasons
<b>WCA-1</b>	Stages rose 0.05' to 0.07'	Rainfall, ET, management	Operate for dry season conditions and, when possible, restrict recession rates to -0.03' to -0.07' per week. <b>Prevent reversals, when possible.</b>	Retain water for the upcoming dry season while protecting habitat and wildlife and preparing for wading bird breeding season.
<b>WCA-2A</b>	Stages rose 0.02'	Rainfall, ET, management	Maintain slower recession rates. When possible, retain water and restrict recession rates to less than -0.09' per week.	Protect habitat and wildlife and prepare for wading bird breeding season. Retain water to provide foraging habitat later in the breeding season.
<b>WCA-2B</b>	Stages decreased -0.05'	Rainfall, ET, management	When possible, restrict recession rates to -0.05' to -0.09' per week.	Protect habitat and wildlife and support wading bird breeding season.
<b>WCA-3A NE</b>	Stages decreased -0.03'	Rainfall, ET, management	When possible, restrict recession rates to -0.05' to -0.07' per week to prevent the area from drying out too early for wading bird nesting. Continue moving water through S-150 as possible. Water for northwestern 3A (via the G404) is also desired. Prioritization of S-11C over S-11A to get water near the Alley North Colony.	Protect habitat and wildlife and prepare for wading bird breeding season, particularly in Alley North colony. Reduce fire risk as season progresses.
<b>WCA-3A NW</b>	Stages rose 0.01'	Rainfall, ET, management		
<b>Central WCA-3A S</b>	Stages decreased -0.02'	Rainfall, ET, management	When possible, 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).	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 breeding season.
<b>Southern WCA-3A S</b>	Stages decreased -0.01'	Rainfall, ET, management		
<b>WCA-3B</b>	Stages changed from -0.01' to 0.01'	Rainfall, ET, management	When possible, restrict recession rates to -0.05' to -0.09' per week.	Protect habitat and wildlife and prepare for wading bird breeding season.
<b>ENP-SRS</b>	Stages rose 0.02'	ET, rainfall, topography, management	Make discharges to the Park according to the ERTF rainfall plan.	Keep peat wet to promote native habitat and maintain wetland plant and animal communities. Protect habitat and wildlife and prepare for wading bird breeding season.
<b>ENP-CSSS habitats</b>	S-12A, S-12B, S-344, S-343A, S-343B are closed. 100 cfs discharge from S-333	Rainfall, ET, management	Follow rainfall plan for releases and current ERTF guidelines. Follow guidance in C-111 Western Spreader Canal Project operations manual. Care should be taken to avoid overdrying eastern subpopulations C and F.	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 rose +0.01' to +0.62'	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>	+1 to +11 psu above average'	Rain, ET, inflows, wind	Move water southward as possible	Maintain low salinity conditions and prevent early salinity increases.