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: March 28, 2017

SUBJECT: Weekly Environmental Conditions for Systems Operations

Summary

Weather Conditions and Forecast

Widely scattered light showers east today. A low pressure system located southeast of Bermuda will exit off to the northeast as high pressure builds over the Florida peninsula. Daytime heating will help generate a few light showers east this afternoon and evening then dry conditions are expected Wednesday. Southeasterly winds will bring some widely scattered showers east again on Thursday. A cold front is forecast to push through Florida's panhandle Friday and then into the District early Saturday before stalling across south Florida. The front will have limited shower activity associated with it but daytime heating should generate some scattered shower activity mainly over the interior Friday and then over eastern areas Saturday.

Kissimmee

On Sunday, stage was 1.2 feet below regulation schedule in East Lake Toho and Lake Toho, and 1.4 feet below schedule in Kissimmee-Cypress-Hatchineha (KCH). Over the past week, discharge at S65, S65A, and S65E averaged 626, 461, and 723 cfs, respectively. Tuesday morning discharges were ~433 cfs, and 310 cfs, and 410 cfs, respectively at S65, S65A, and S65E. Dissolved oxygen data in the Kissimmee River averaged 10.1 mg/L over the past week. Kissimmee River mean floodplain depth on Sunday was 0.09 feet. A recommendation was made to reduce S-65 discharge by 75 cfs per day through March 25 for a target discharge of ~500 cfs to reduce rate of stage decline in KCH.

Lake Okeechobee

As of midnight March 26, 2017, Lake stage was 12.68 feet NGVD and in the Base Flow Band but 0.08 feet above the Beneficial Use Band. The current weekly recession rate of 0.17 feet equates to a projected monthly recession rate of 0.68 feet, which is above the recommended 0.50 feet per month or lower guideline. At the current recession rate, Lake stage will be in the Beneficial Use Band later this week. A too rapid decrease in Lake levels may jeopardize the upcoming nesting season by drying out foraging locations near the colonies and lowering water levels under nests allowing for increased risk of predation. The goal should be to slow the current recession rate and maintain it at below 0.50 feet per month. Currently, conditions are good for wading birds and snail kites but a slower recession rate is needed to keep wading bird and snail kite foraging areas hydrated and to help maintain water levels under wading bird and snail kite nests, thereby reducing the risk of predation by raccoons and other animals.

Estuaries

Total discharge to the St. Lucie estuary averaged 156 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 increased slightly throughout the estuary compared to 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 682 cfs over the past week with 532 cfs (78%) coming from the Lake. The 30-day average surface salinity at the Ft. Myers monitoring station is 9.9 and has been below 10 for the past 33 days. The 30-day average surface salinity at Val I-75 is 3.1. Salinity conditions between Val I-75 and Ft. Myers remain in the tolerable range for tape grass. 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 4.4 in the next two weeks if no flow comes through the S-79 structure; however, daily salinity is forecast to reach 7.3.

Stormwater Treatment Areas

Over the past week, the STAs/FEBs received approximately 5,800 acre-feet of Lake releases. The total amount of Lake releases sent to the STAs/FEBs in WY2017 (since May 1, 2016) is approximately 210,100 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. 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

Large numbers of wading birds continue to feed throughout the Everglades. Wading birds continue to forage in northern WCA-3A but in fewer numbers than last week. Salinities in Florida Bay are generally rising due to evaporation and wind-driven water movement upstream. The central and western nearshore areas (largest changes) averaged +1.3 psu increase per week since January 1, 2017. Salinities currently range from +3 to +7 psu above their long-term averages. The 365-day moving sum of flow from the five creeks decreased about −5,000 acre-feet to end at 241,285 acre-feet (below the long-term average of 257,628 acre-feet).

Supporting Information

KISSIMMEE BASIN

Kissimmee Basin Rainfall

The Upper Kissimmee Basin received 0.12 inches of rainfall in the past week and the Lower Basin received 0.09 inches (SFWMD Daily Rainfall Report 03/27/2017).

Upper Kissimmee Basin

Stages and departures in the Kissimmee Chain of Lakes (KCOL) are shown in Table1.

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: **3/28/2017**

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)						
							3/26/17	3/19/17	3/12/17	3/5/17	2/26/17	2/19/17	2/12/17
Lakes Hart and Mary Jane	S62	0	LKMJ	60.4	R	60.8	**-0.4**	-0.4	-0.4	-0.4	-0.2	-0.2	0.0
Lakes Myrtle, Preston, and Joel	S57	0	S57	60.7	R	60.7	**0.0**	0.0	0.0	0.0	0.0	0.0	0.0
Alligator Chain	S60	0	ALLI	62.9	R	63.7	**-0.8**	-0.9	-0.9	-0.8	-0.7	-0.7	-0.7
Lake Gentry	S63	2	LKGT	60.9	R	61.2	**-0.3**	-0.4	-0.4	-0.3	-0.2	-0.2	-0.2
East Lake Toho	S59	86	TOHOE	56.4	R	57.6	**-1.2**	-1.3	-1.2	-1.1	-0.8	-0.8	-0.5
Lake Toho	S61	292	TOHOW, S61	53.4	R	54.6	**-1.2**	-1.3	-1.2	-1.1	-0.8	-0.8	-0.6
Lakes Kissimmee, Cypress, and Hatchineha	S65	626	LKISSP, KUB011, LKIS5B	49.6	R	51.0	**-1.4**	-1.3	-1.0	-0.7	-0.8	-1.1	-1.4

* 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: **3/28/2017**

Metric	Location	Sunday's 1-day average	Weekly Average**								
			3/26/17	3/19/17	3/12/17	3/5/17	2/26/17	2/19/17	2/12/17	2/5/17	1/29/17	1/22/17
Discharge (cfs)	S-65	445	**626**	885	899	877	732	710	507	482	465	473
Discharge (cfs)	S-65A	318	**461**	681	705	682	569	550	387	378	368	364
Discharge (cfs)	S-65D****	567	**679**	791	685	721	688	540	538	730	1274	1292
Discharge (cfs)	S-65E****	609	**723**	855	737	769	744	597	523	513	398	386
DO concentration (mg/L)***	Phase I river channel	9.3	**10.1**	9.8	8.4	8.0	7.7	8.3	9.0	8.5	8.1	8.0
Mean depth (feet)*	Phase I floodplain	0.09	**0.11**	0.17	0.12	0.07	0.07	0.06	0.06	0.06	0.06	0.06

* 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

Date	Recommendation	Purpose	Outcome	Source
3/23/2017	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
3/16/2017	Reduce S-65 and S-65A discharge by 150 cfs.	Reduce rate of stage decline in KCH.	Implemented	SFWMD Water Management/KB Ops
3/14/2017	No new recommendations.		N/A	
3/7/2017	No new recommendations.		N/A	
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.		N/A	
2/14/2017	Increase S65 and S65A discharge by 200 cfs.	Allow stage to decline in KCH.	Implemented	SFWMD Water Management/KB Ops
2/7/2017	No new recommendations.		N/A	
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).	Implemented	SFWMD Water Management Section/KB Ops
1/24/2017	No new recommendations.		N/A	
1/17/2017	No new recommendations.		N/A	
1/10/2017	No new recommendations.		N/A	
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.		N/A	
12/13/2016	No new recommendations.		N/A	
12/6/2016	No new recommendations.		N/A	
11/29/2016	No new recommendations.		N/A	
11/22/2016	No new recommendations.		N/A	
11/15/2016	No new recommendations.		N/A	
11/8/2016	No new recommendations.		N/A	

KCOL Hydrographs (through Sunday midnight)

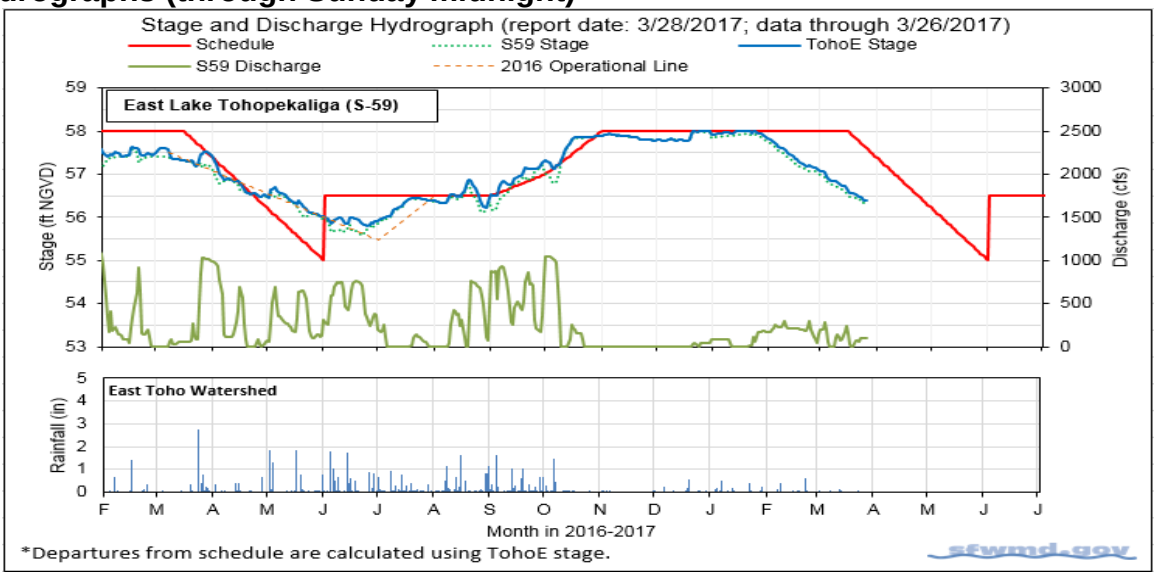


Figure 1.

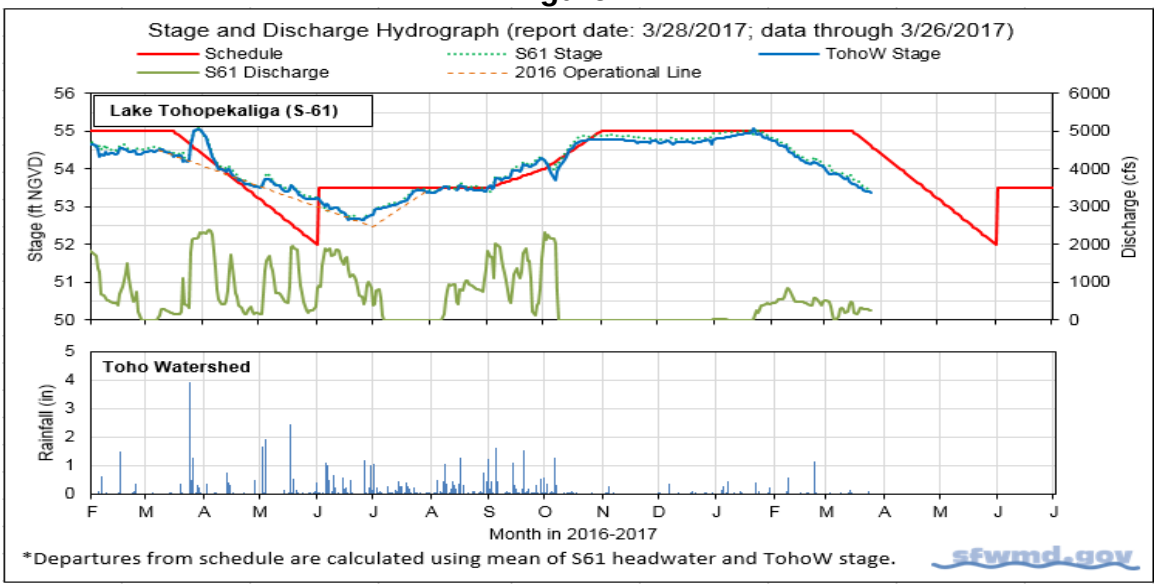


Figure 2.

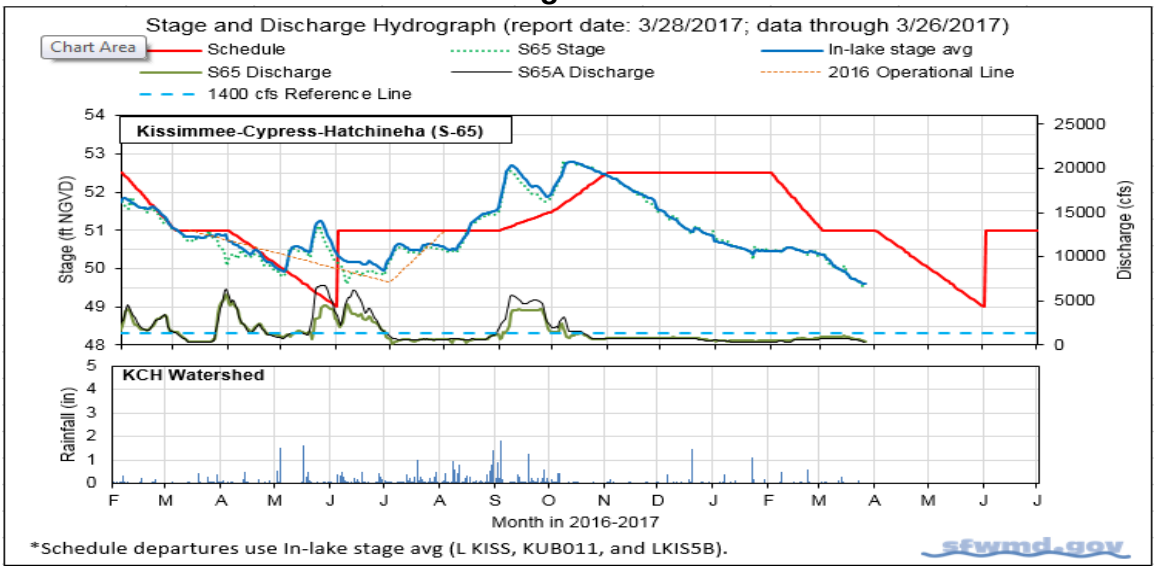


Figure 3.

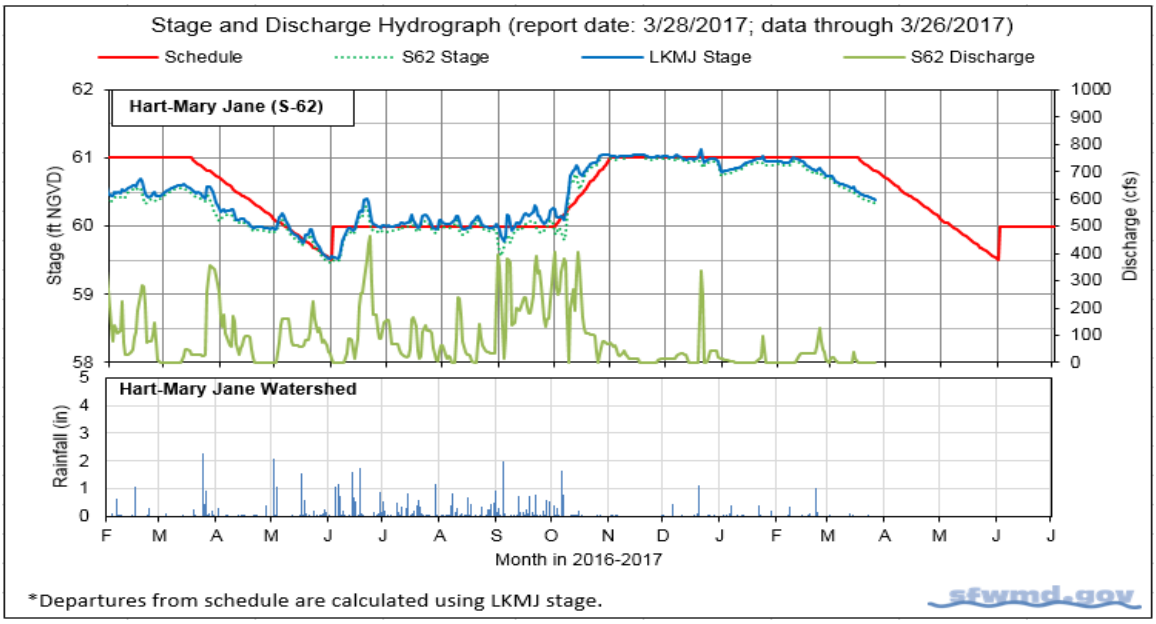


Figure 4.

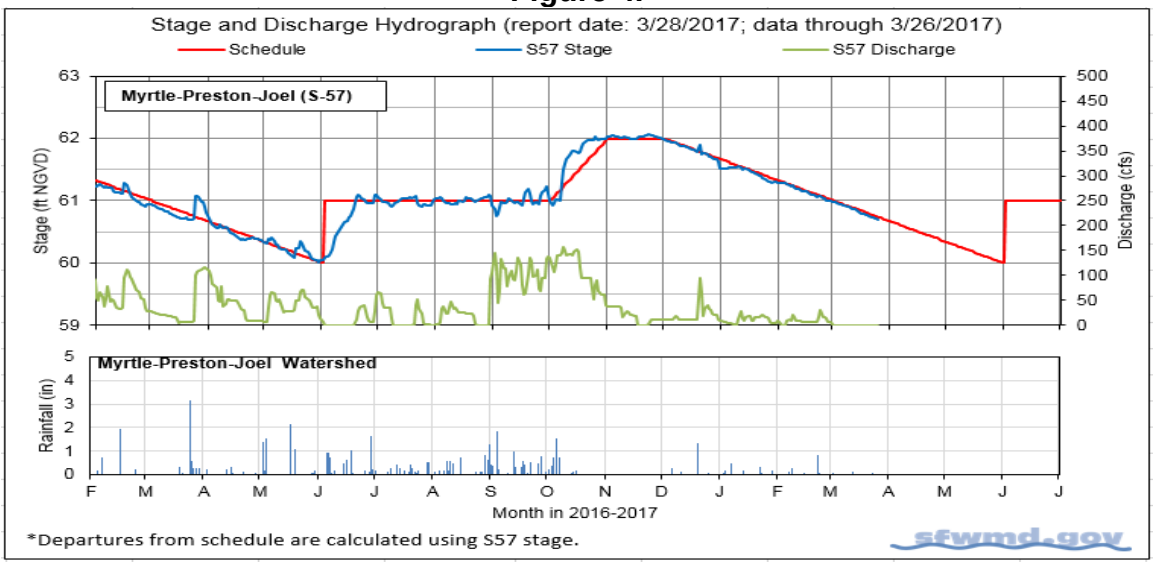


Figure 5.

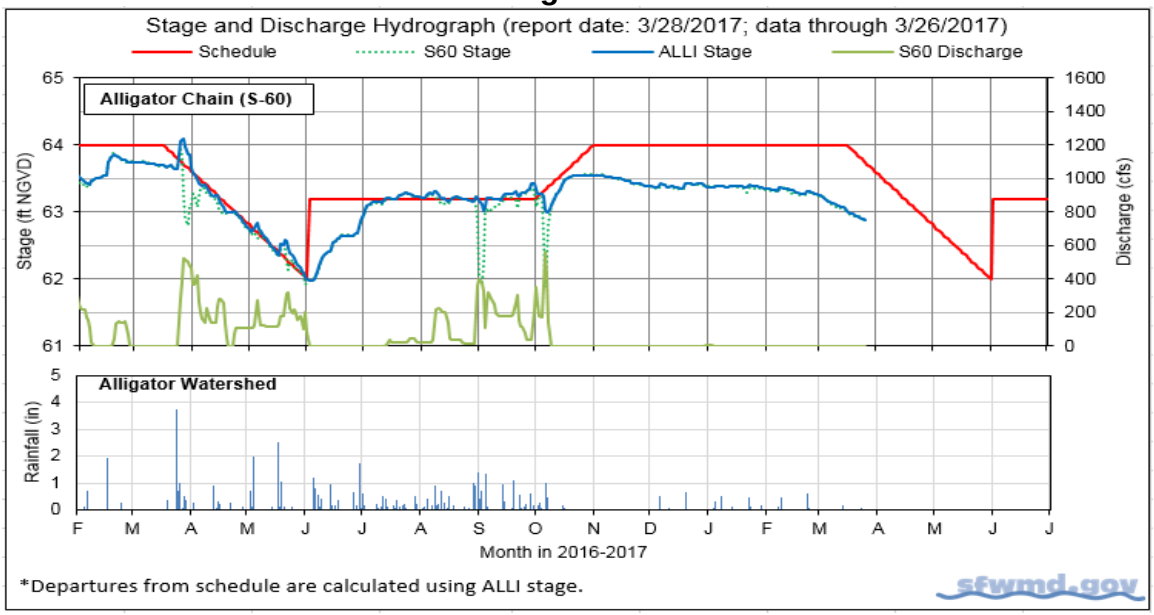


Figure 6.

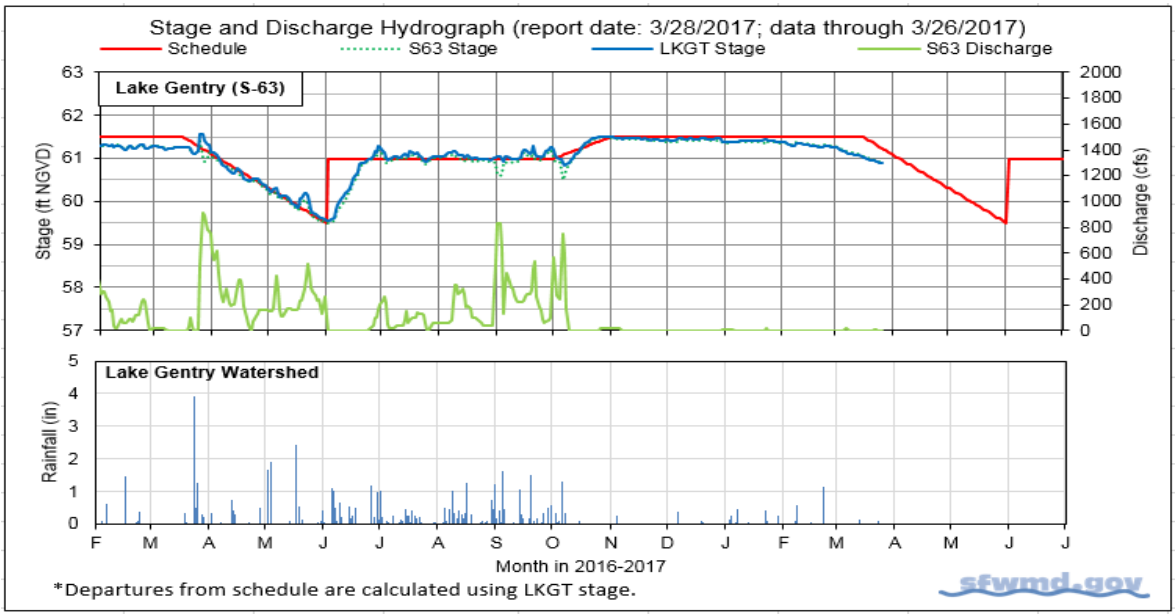


Figure 7.

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

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

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

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

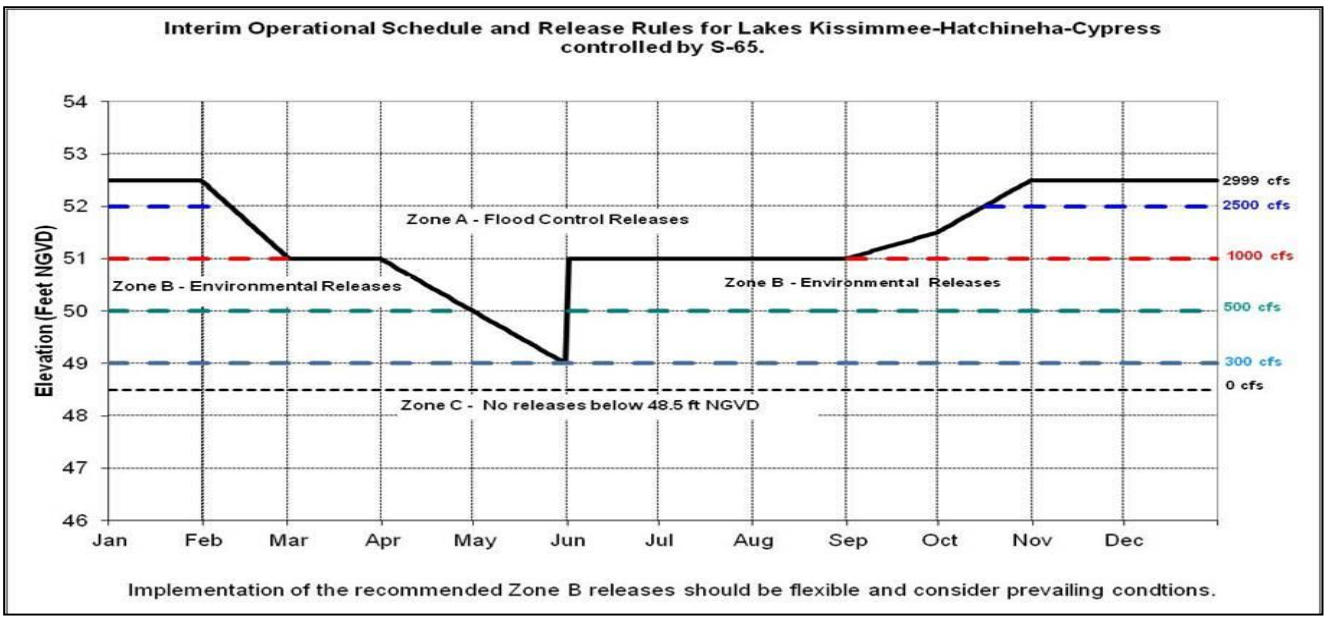


Figure 9. Interim operations schedule for S-65. The discharge schedule shown to the right has not been used in recent years or in Wet Season 2015.

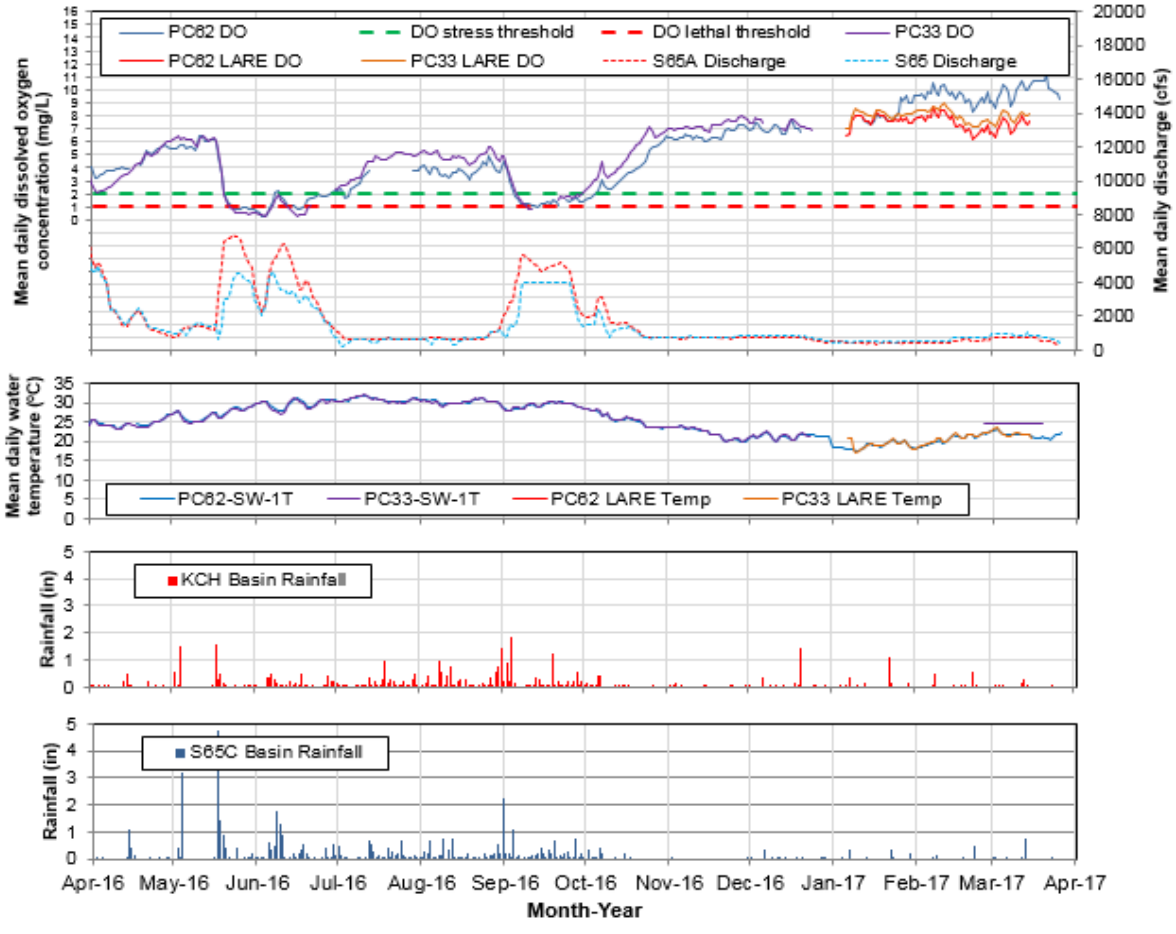


Figure 10. Mean daily Dissolved Oxygen, discharge, temperature and rainfall in the Phase I river channel.

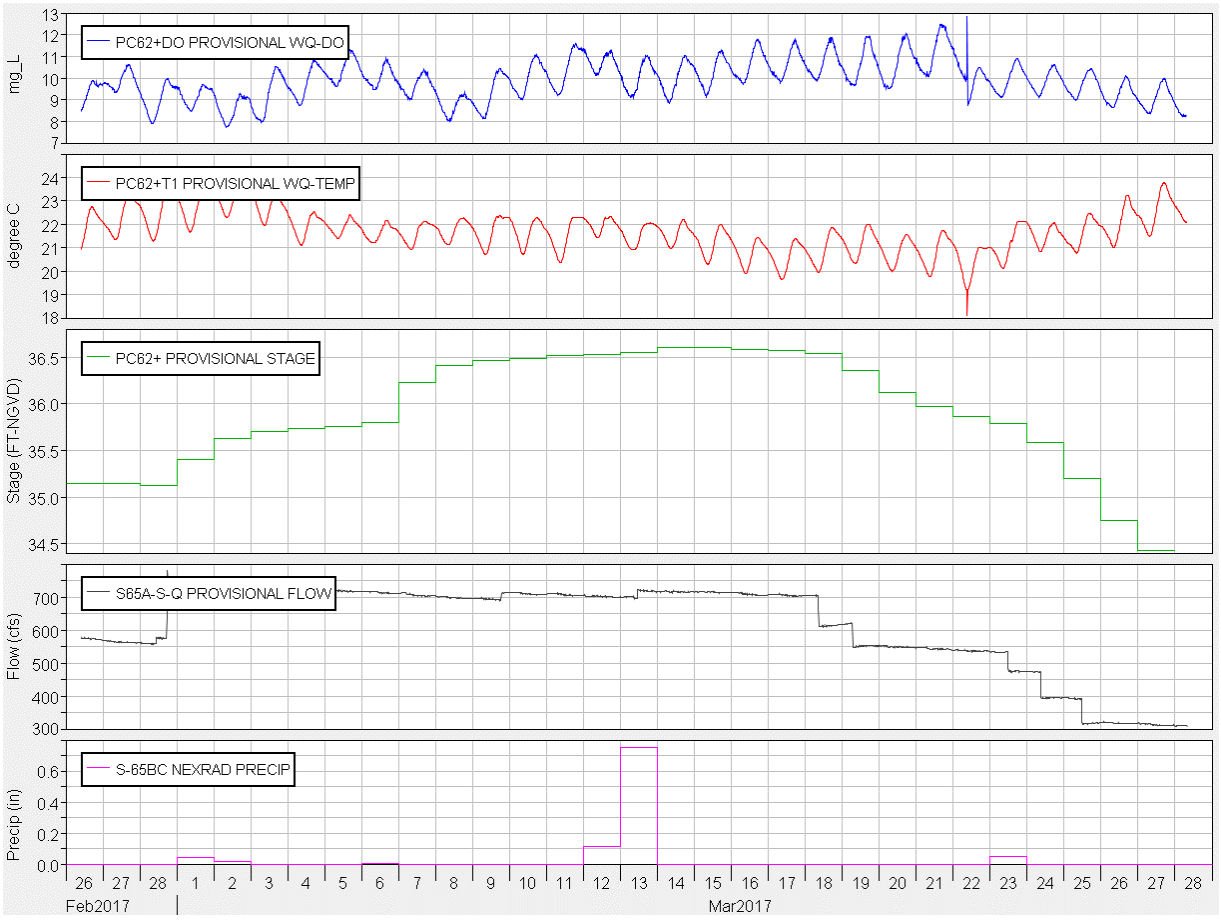


Figure 11. Phase I river channel dissolved oxygen and water temperature (measured at 15 minute intervals) and Pool BC daily rainfall.

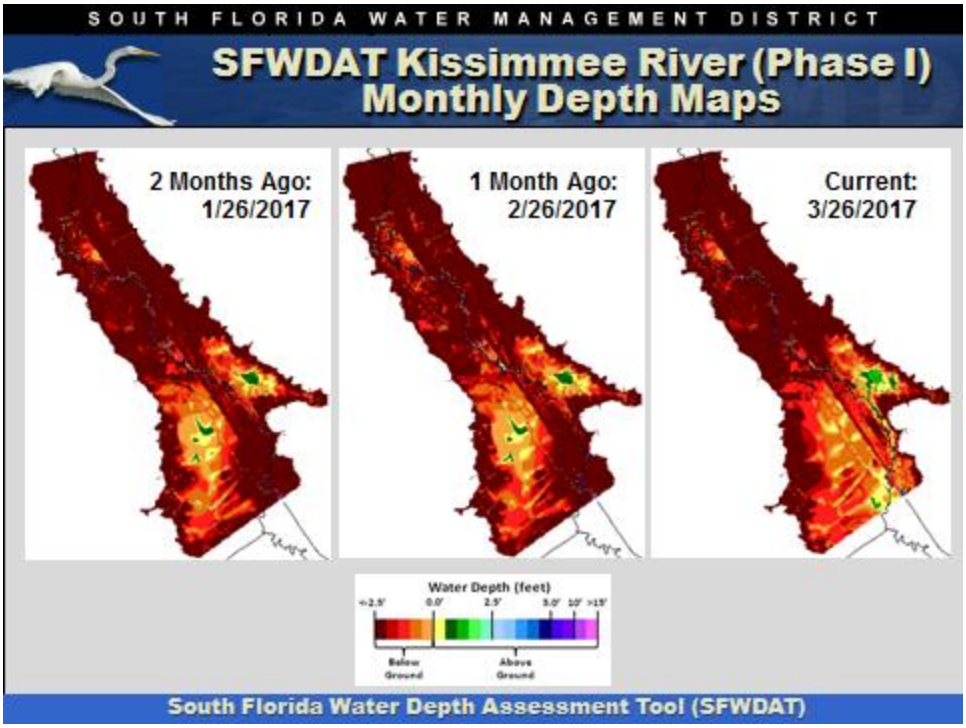
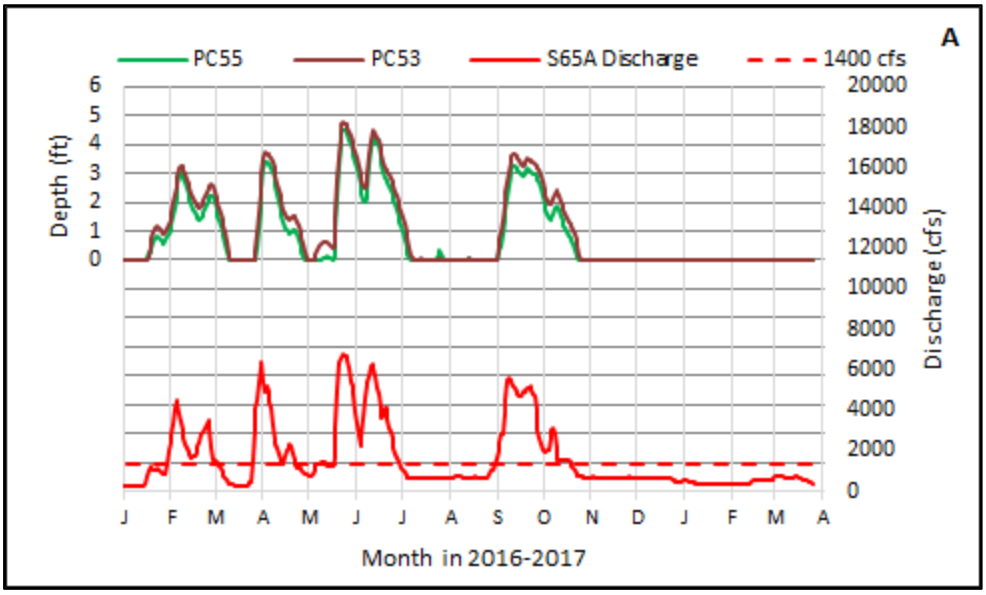
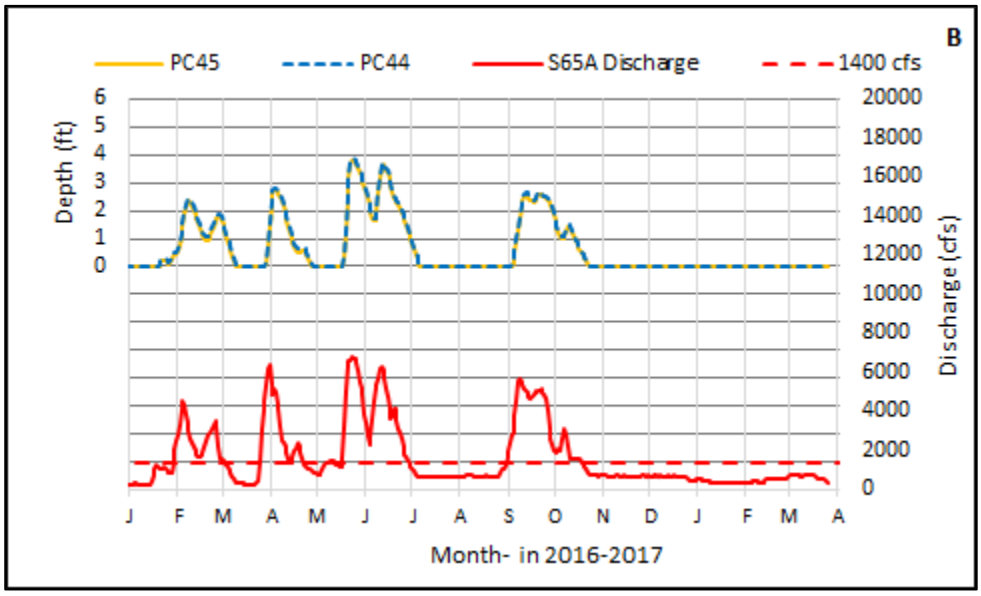


Figure 12. Phase I area floodplain water depths for this week, one month ago, and two months ago. Note that the WDAT color-coding has been modified to accommodate greater water depths; these maps are not directly comparable to Kissimmee Basin WDAT maps published prior to Jan. 16, 2012.





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

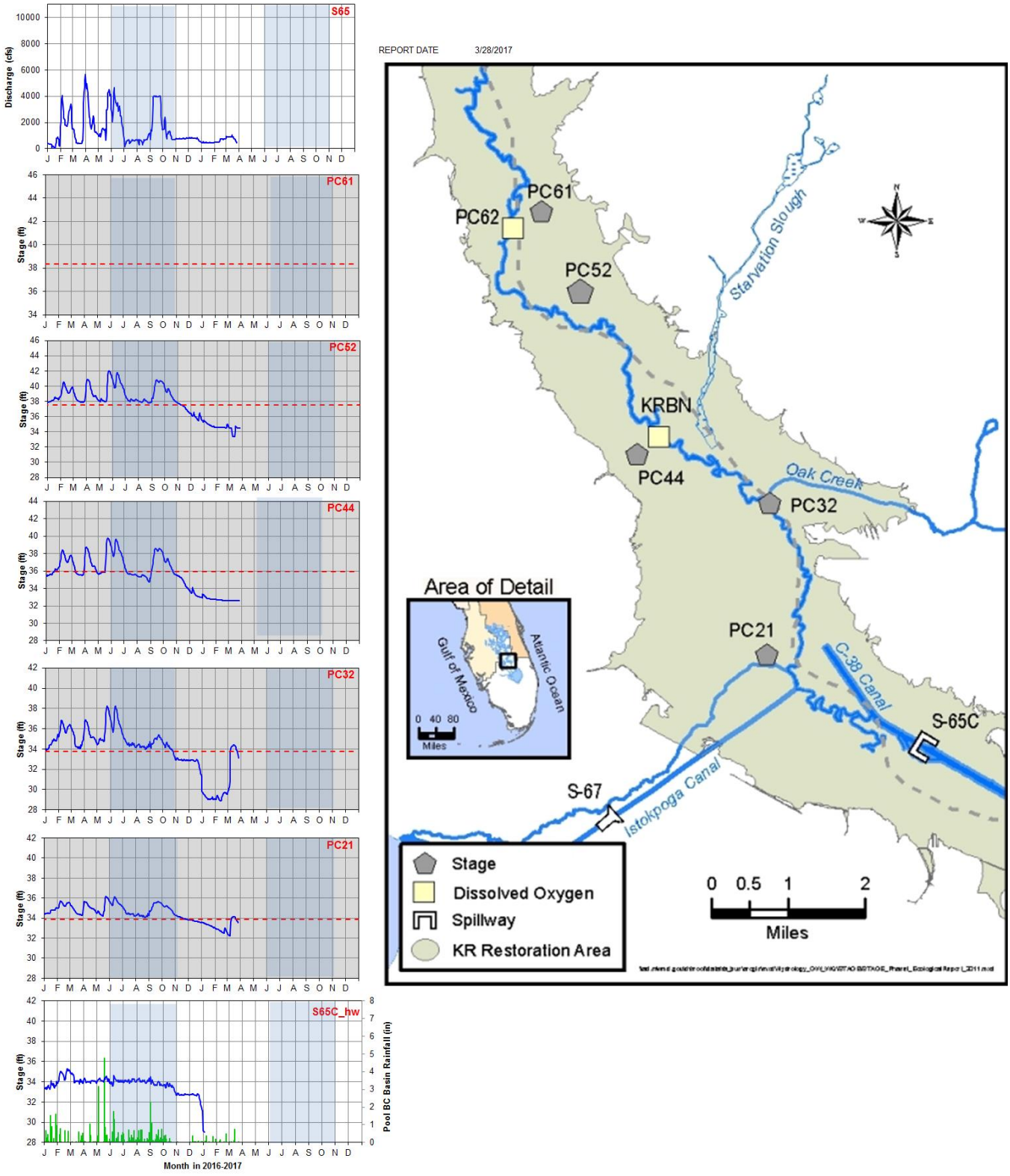


Figure 13. Discharge at S65, stages at five monitoring stations in the Phase I area of the Kissimmee River floodplain, and headwater stage at S65-C since January 1, 2015. The most recent data (~2 weeks) are provisional real-time data from SFWMD DualTrend; previous data are from SFWMD DB-HYDRO (validated).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

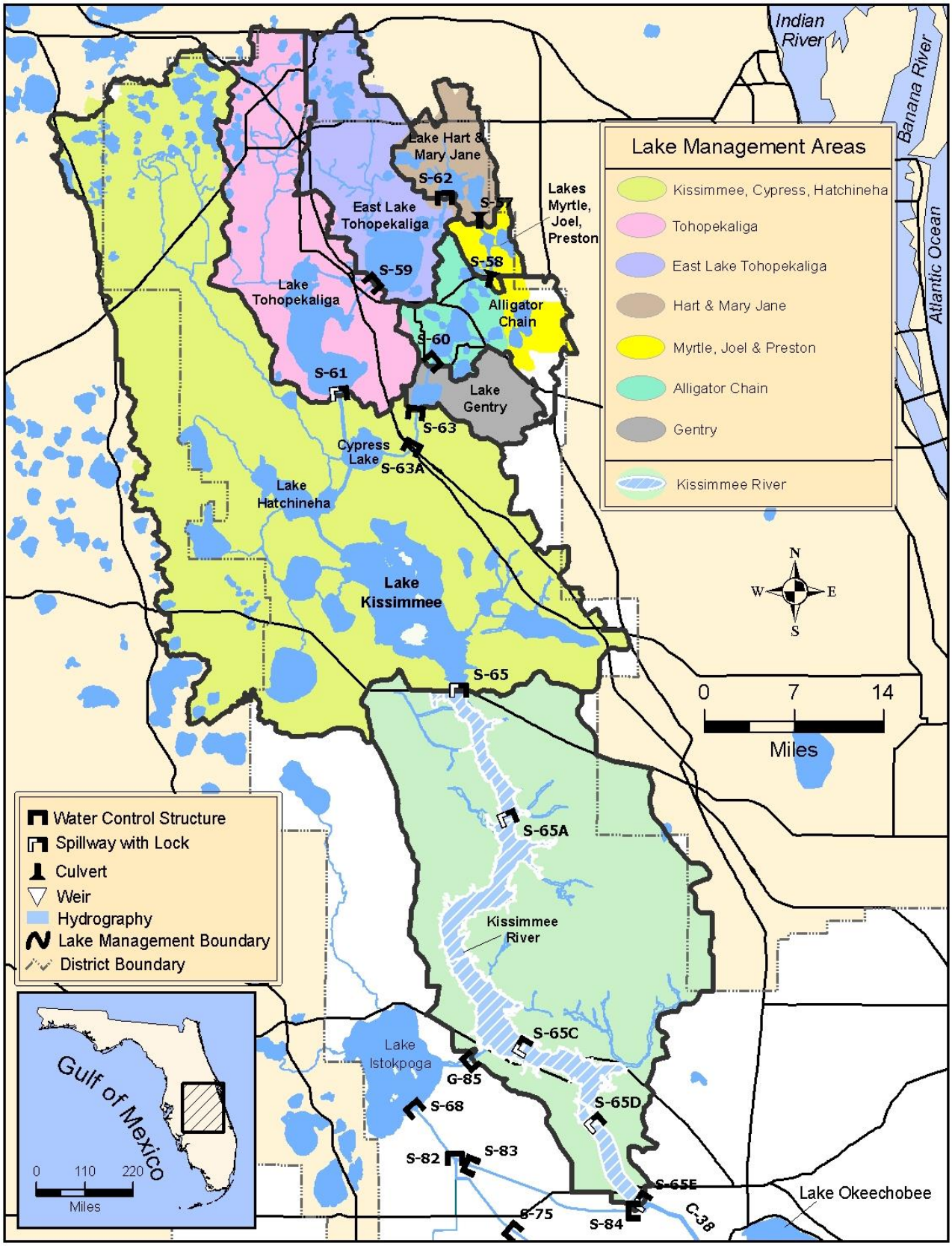


Figure 14. The Kissimmee Basin

LAKE OKEECHOBEE

According to the USACE web site, Lake Okeechobee stage is at 12.68 feet NGVD for the period ending at midnight on March 26, 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 0.82 feet lower than it was a month ago and 2.39 feet lower than it was a year ago (Figure 1). The Lake is currently in the Base Flow Band but only 0.08 feet above the Beneficial Use Band (Figure 2). According to RAINDAR, 0.48 inches of rain fell directly over the Lake during the past seven days (Figure 3). Greater amounts of rain fell along the upper and lower east coast and in the extreme southern region of the watershed.

Based on USACE reported values, current Lake inflow is approximately 595 cfs as detailed below.

Structure	Flow cfs
S65E	0
S65EX1	613
S154	0
S84 & 84X	0
S71	0
S72	0
C5 (Nicodemus slough dispersed storage)	-18
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 4,808 cfs with 1,351 cfs exiting at S77, 881 cfs exiting at S308 and 170 cfs exiting at the L8 canal through Culvert 10A. Approximately 2,407 cfs is being directed south through S351, S352 and S354. Corrected evapotranspiration value based on the L006 weather platform solar radiation data for this past week increased to 2,704 cfs.

Change in elevation equivalents and average weekly flows (midnight March 20, 2017 to midnight March 26, 2017) for major structures are presented in Figure 4.

Based on the Lake Okeechobee wading bird habitat suitability index, there are currently approximately 25,642 acres of suitable foraging habitat for long-legged birds and 11,180 acres for long and short-legged birds on the Lake (Figure 5). Currently, conditions are good for wading birds but a slower recession rate is needed to keep wading bird foraging areas hydrated and to help maintain water levels under wading bird nests in the upcoming nesting season, thereby reducing the risk of predation by raccoons and other animals.

Satellite imagery from a higher resolution sensor (OLCI) aboard the Sentinel 3a satellite is now available. This sensor has increased spatial resolution (300 m compared to 1 km for MODIS) and more

optimal spectral bands for increased detection of the phycocyanin pigments found in cyanobacteria. The most recent imagery from this new OLCI sensor (March 22 and March 23, 2017) indicates moderate bloom potential (Figure 8).

Water Management Recommendations

Lake stage is 12.68 feet NGVD and is in the Base Flow Band but 0.08 feet from the top of the Beneficial Use Band. The current weekly recession rate of 0.17 feet equates to a projected monthly recession rate of 0.68 feet which is above the recommended 0.50 feet or less per month guideline. At the current recession rate, Lake stage will be in the Beneficial Use Band later this week. A too rapid decrease in Lake levels may jeopardize the upcoming nesting season by drying out foraging locations near the colonies and lowering water levels under nests allowing for increased risk of predation.

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 and fish) communities.

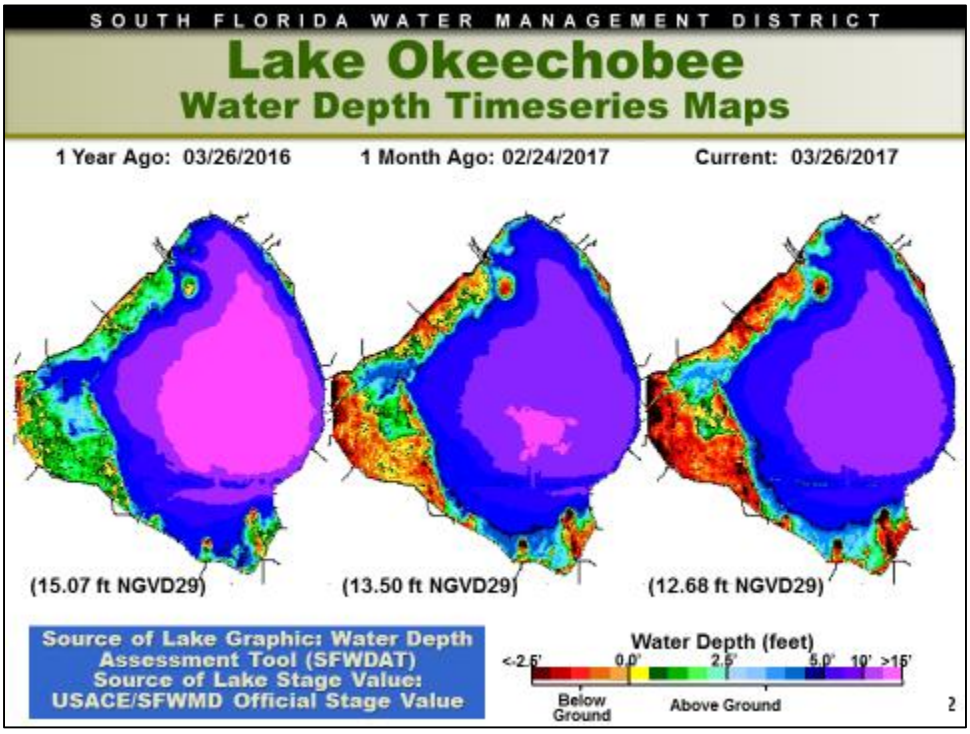


Figure 1

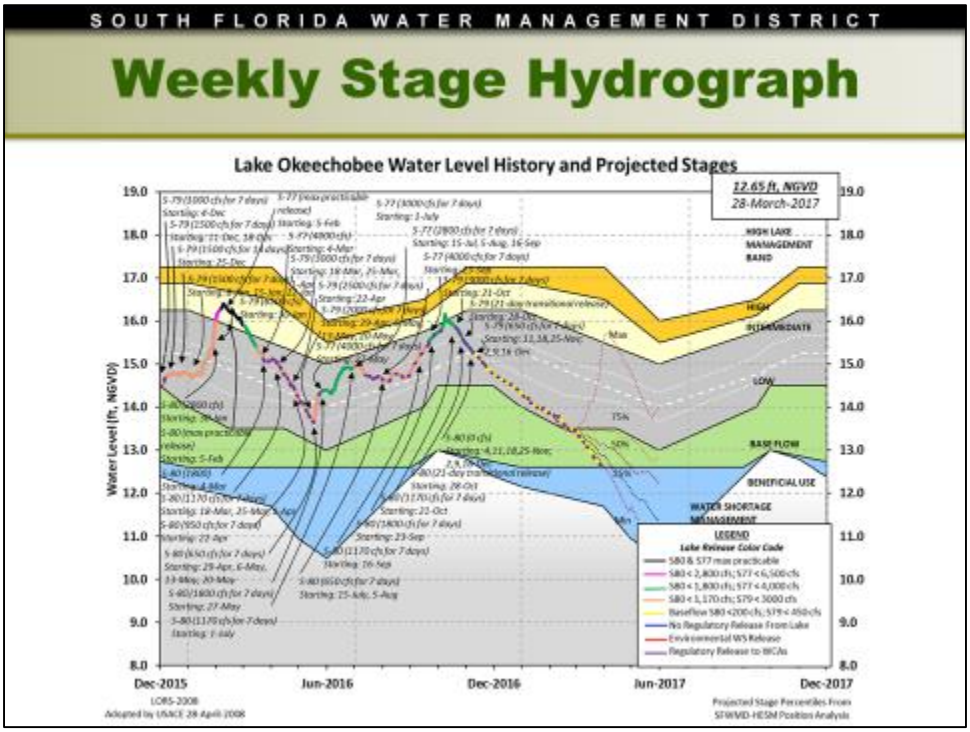

SOUTH FLORIDA WATER MANAGEMENT DISTRICT
Weekly Stage Hydrograph
Lake Okeechobee Water Level History and Projected Stages
12.65 ft, NGVD
28-March-2017
HIGH LAKE MANAGEMENT BAND
HIGH
INTERMEDIATE
LOW
BASE FLOW
BENEFICIAL USE
WATER SHORTAGE MANAGEMENT
LEGEND
Lake Release Color Code
Water Level (ft, NGVD)
Dec-2015
Jun-2016
Dec-2016
Jun-2017
Dec-2017
LORS-2008
Adopted by USACE 28 April 2008
Projected Stage Percentiles From
SFWMD-HESM Position Analysis

Figure 2

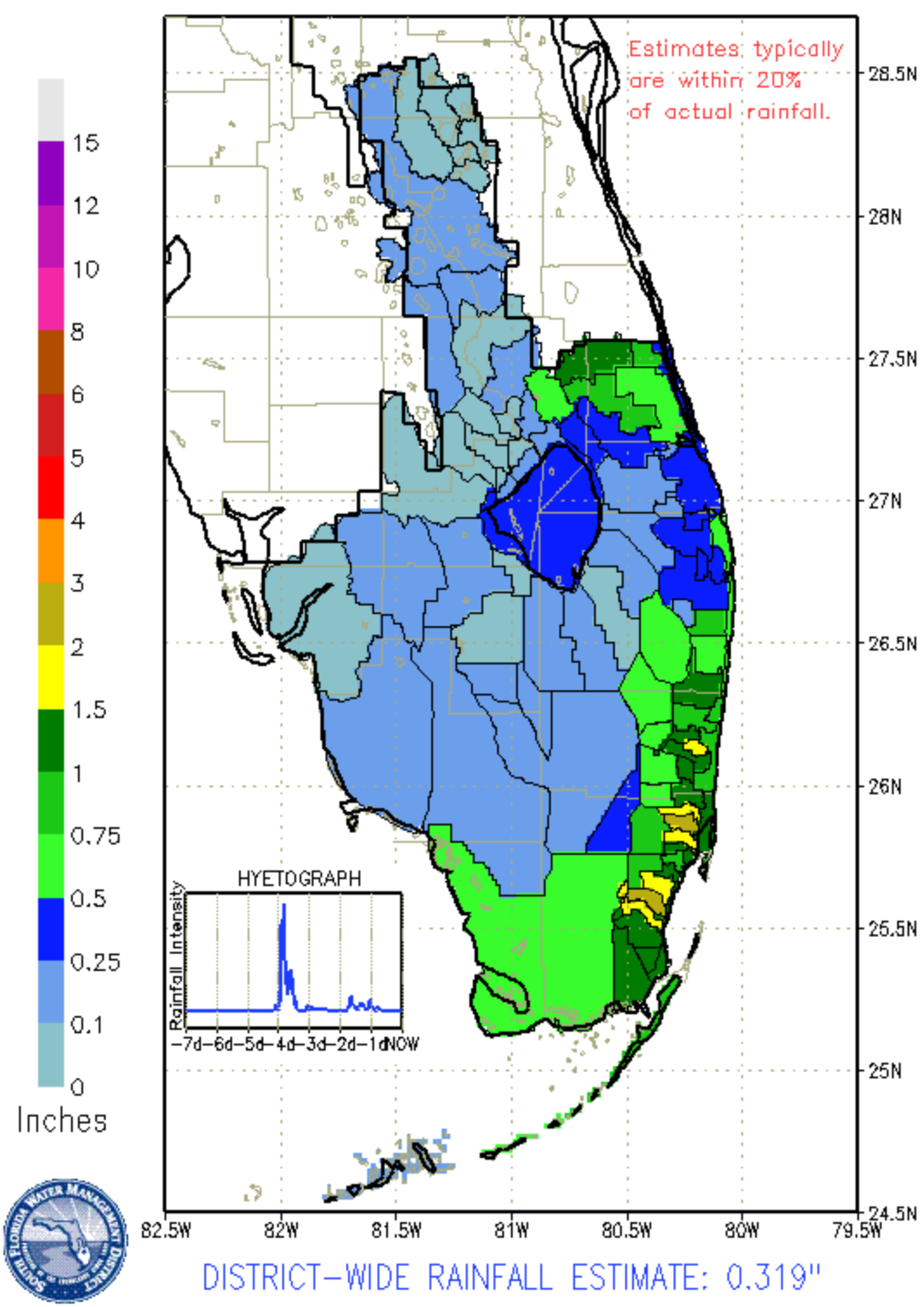

SFWMD PROVISIONAL RAINDAR 7-DAY BASIN RAINFALL ESTIMATES
FROM: 1115 EST, 03/20/2017 THROUGH: 1115 EST, 03/27/2017
Estimates typically are within 20% of actual rainfall.
15
12
10
8
6
5
4
3
2
1.5
1
0.75
0.5
0.25
0.1
0
Inches
HYETOGRAPH
Rainfall Intensity
-7d-6d-5d-4d-3d-2d-1dNOW
28.5N
28N
27.5N
27N
26.5N
26N
25.5N
25N
24.5N
82.5W
82W
81.5W
81W
80.5W
80W
79.5W
DISTRICT-WIDE RAINFALL ESTIMATE: 0.319"

Figure 3

INFLOWS	Average Daily Flow Past Week cfs	Feet of Change Past Week
S65E & S65EX1	739	0.027
S71 & 72	0	0.000
S84 & 84X	0	0.000
Fisheating Creek	45	0.002
Rainfall	N.A.	0.040
OUTFLOWS	**Average Daily Flow Past Week cfs**	**Feet of Change Past Week**
S77	1204	0.045
S308	211	0.008
S351	1193	0.044
S352	679	0.025
S354	862	0.032
L8	103	0.004
ET	2704	0.100

Figure 4

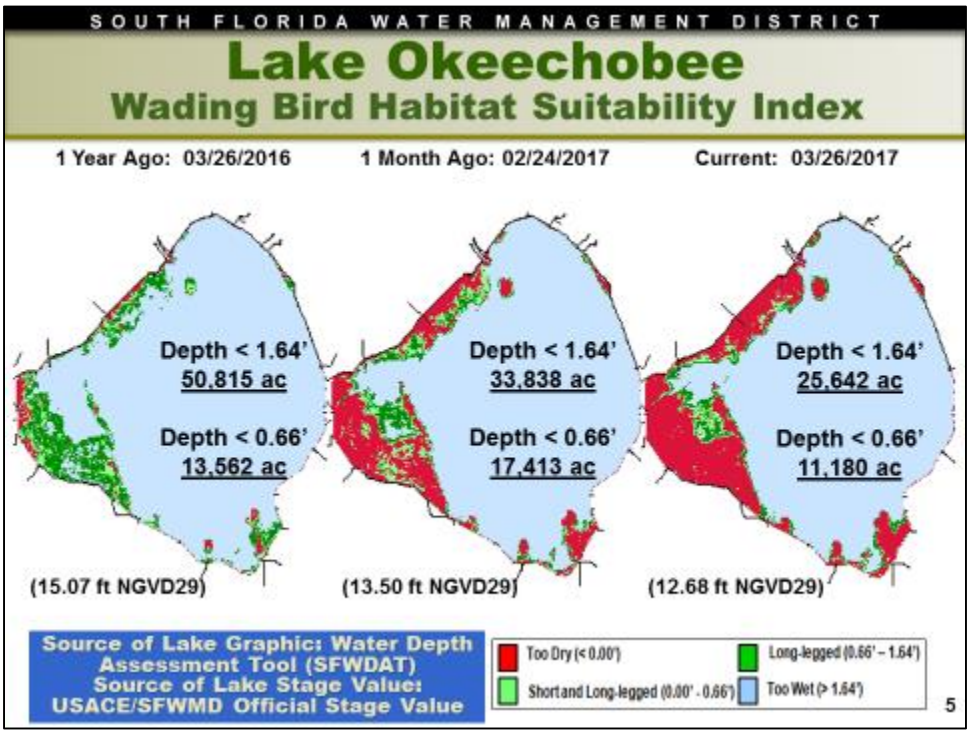


Figure 5

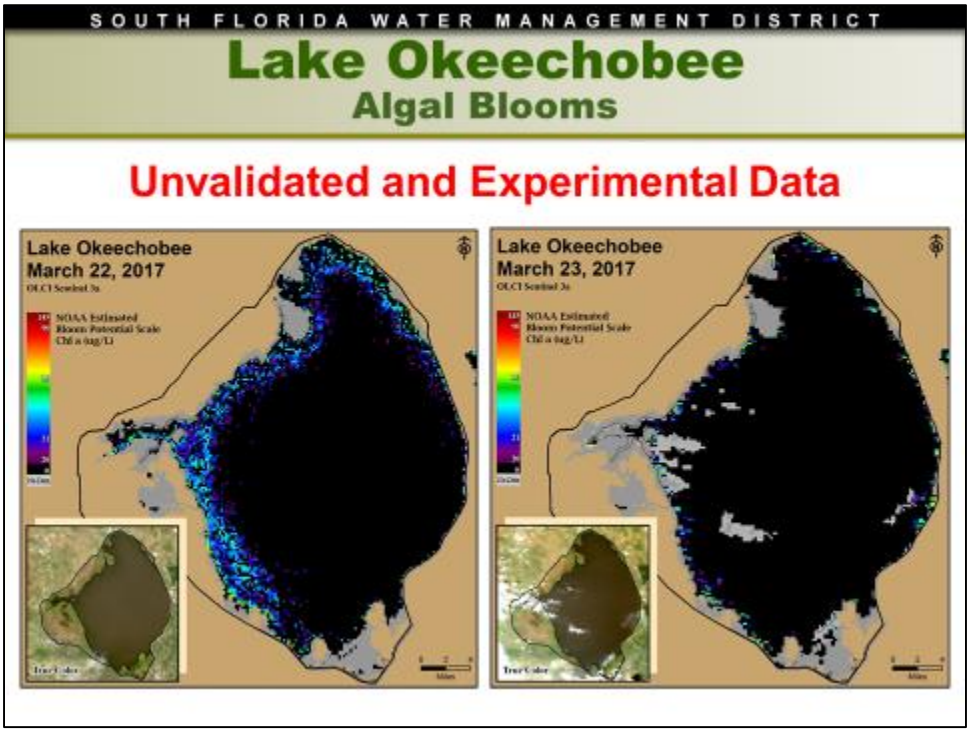


Figure 6

Lake Istokpoga

The Lake Istokpoga regulation schedule is at winter pool stage of 39.50 feet NGVD. Lake stage is 38.64 feet NGVD and is currently 0.86 feet below regulation stage (Figure 7). Average flows into the Lake from Arbuckle and Josephine creeks were 39 cfs and 13 cfs respectively, which is a decrease from last week's total flow. Average discharge from S68 and S68X this past week was 143 cfs, an increase from the previous week's flow. According to RAINDAR, 0.19 inches of rain fell in the Lake Istokpoga watershed during the past seven days.

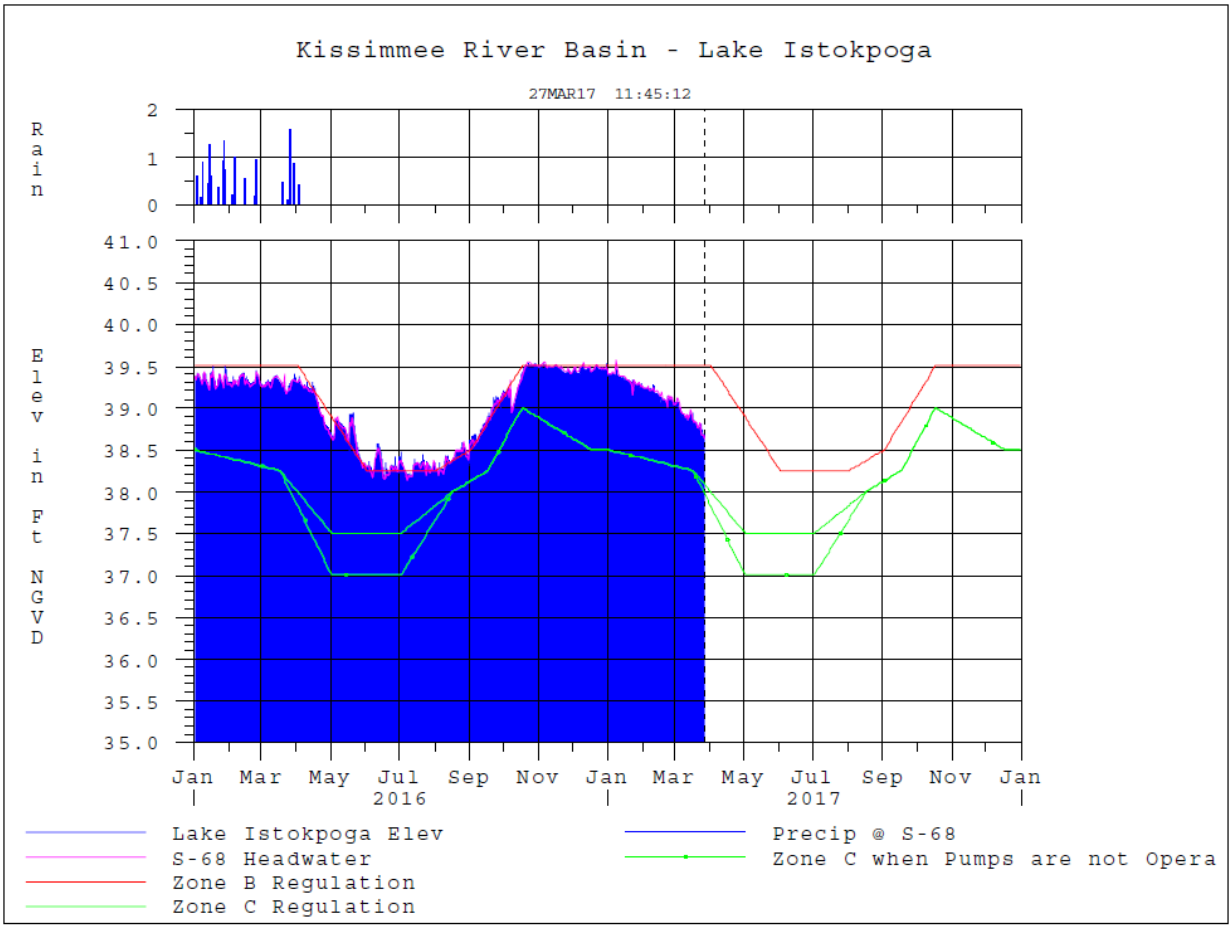


Figure 7

ESTUARIES

St. Lucie Estuary

Over the past week, provisional flows averaged about 0 cfs at S-80, 201 cfs downstream of S-308, 0 cfs at S-49 on C-24, 0 cfs at S-97 on C-23, and 61 cfs from Ten Mile Creek at the Gordy Road Structure. Average inflow from tidal basin tributaries is estimated to be 95 cfs (Figures 1 and 2). Total inflow averaged about 156 cfs last week and 157 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 27.5. 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)	**NR**[2] (NR)	**NR** (NR)	NA[1]
US1 Bridge	**27.2** (27.0)	**27.8** (27.3)	10.0-26.0
A1A Bridge	**32.7** (32.1)	**33.4** (32.9)	NA

[1]Envelope not applicable, [2]Not Reporting

Caloosahatchee Estuary

During the past week, provisional flows averaged approximately 1,091 cfs downstream of S-77, 549 cfs at S-78, and 632 cfs at S-79. Average inflow from tidal basin tributaries is estimated to be 50 cfs (Figures 5 and 6). Total inflow averaged 682 cfs last week and 761 cfs over last month.

Over the past week, salinity increased throughout the estuary (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 in the fair range at Sanibel (Figure 9). The 30-day moving average surface salinity is 3.1 at Val I-75 and 9.9 at Ft. Myers. The 30-day moving average salinity at Ft. Myers has been below 10 for 33 consecutive days. Salinity conditions between Val I-75 and Ft. Myers are improving. Without discharges at S-79, the 30-day moving average salinity at Val I-75 is forecast be 4.4 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)	**2.6** (1.7)	**2.6** (1.7)	NA[1]
*Val I75	**3.3** (2.7)	**6.5** (4.4)	0.0-5.0[2]
Ft. Myers Yacht Basin	**11.0** (8.8)	**13.9** (11.2)	NA
Cape Coral	**18.6** (18.0)	**21.3** (19.1)	10.0-30.0
Shell Point	**28.9** (27.3)	**29.9** (28.1)	10.0-30.0
Sanibel	**33.0** (31.4)	**33.1** (31.6)	10.0-30.0

[1]Envelope not applicable, [2]Envelope is based on a 30-day average.
*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 *a* (µg/l)	4.21 – 8.18	4.37 – 10.71 A spike to 18.67	1.38 – 35.52
Dissolved Oxygen (mg/l)	6.02 – 8.32	6.07 – 7.99	No Data

The Florida Fish and Wildlife Research Institute reported on March 23, 2017, that *Karenia brevis*, the Florida red tide organism, persists in Southwest Florida from Pinellas to Lee counties. *Karenia brevis* was observed in background to low concentrations in seventeen samples collected from Lee County.

Water Management Recommendations

The 30-day average salinity at the I-75 Bridge is forecast to remain below 5 with no inflow at S-79, but the daily salinity is forecast to reach 7.3 within two weeks. It is likely that Lake stage will enter the Beneficial Use Band of 2008 LORS within the next few days. The Adaptive Protocols would recommend no flow from Lake Okeechobee to the Caloosahatchee Estuary. While Lake stage is still in the Base Flow Band, it is recommended that pulse releases at S-79 be reduced from an average rate of 650 cfs to an average rate of 450 cfs to provide a transition.

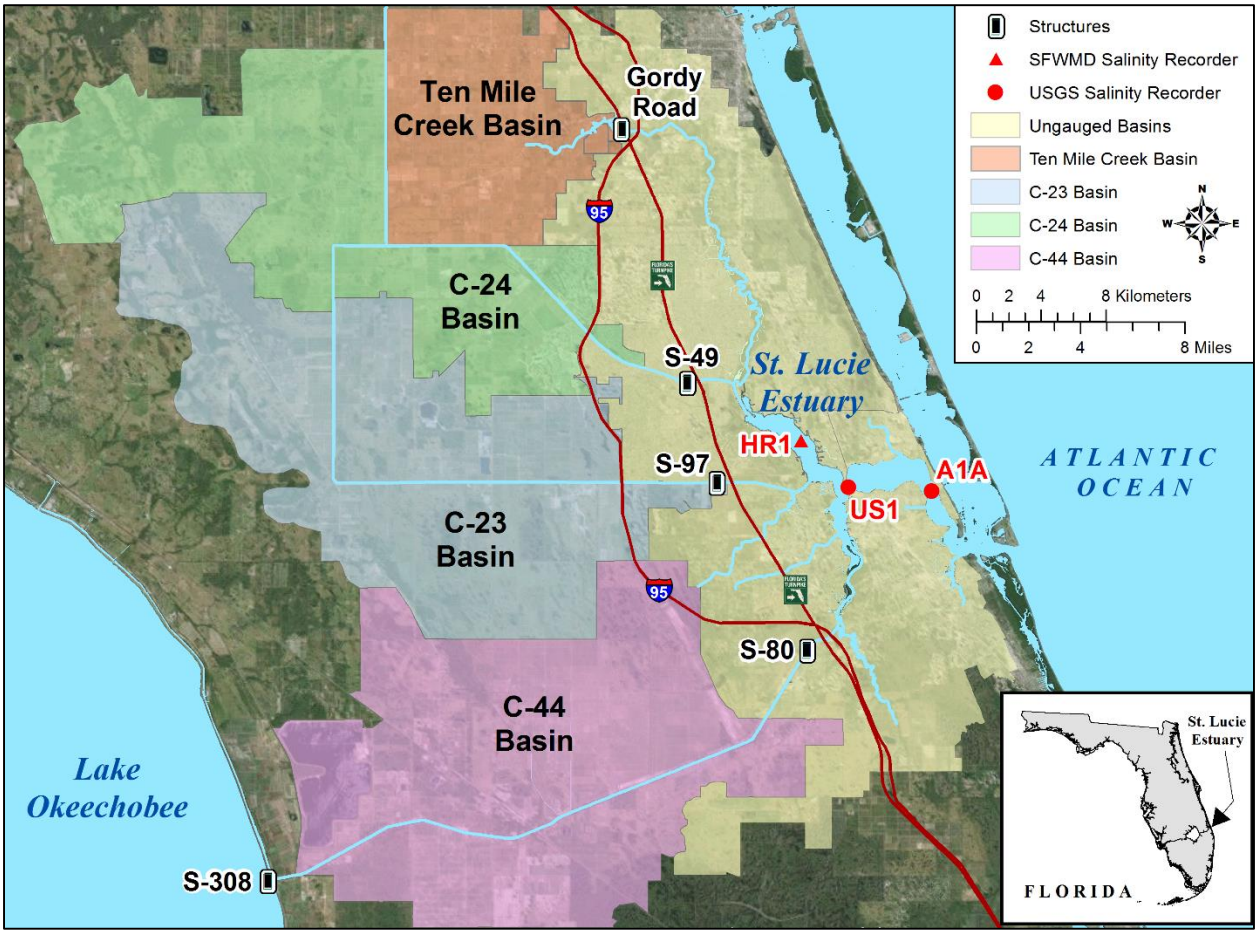


Figure 1. Basins, water control structures, and salinity monitoring for the St. Lucie Estuary.

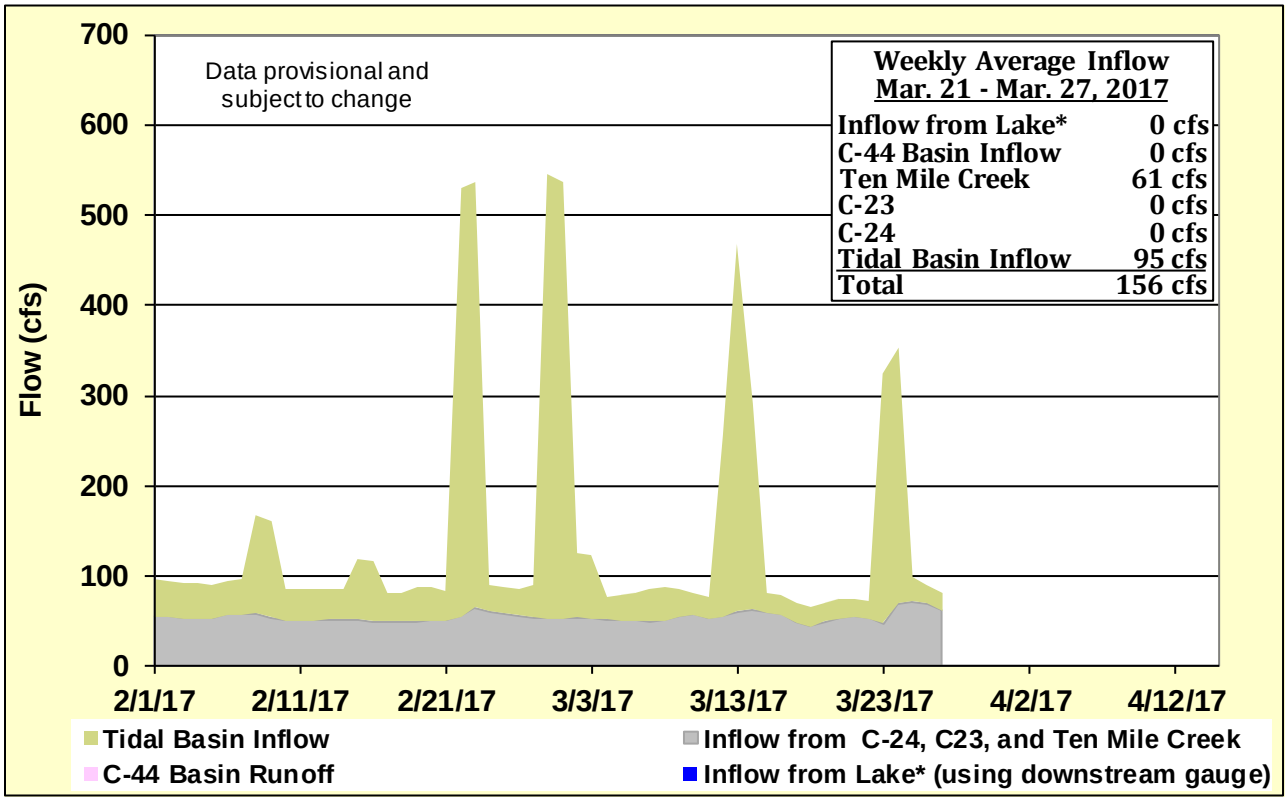


Figure 2. Estimated surface freshwater inflows from Lake Okeechobee and runoff from the C-44, C-23, C-24, Ten Mile Creek, and tidal basins into the St. Lucie Estuary.

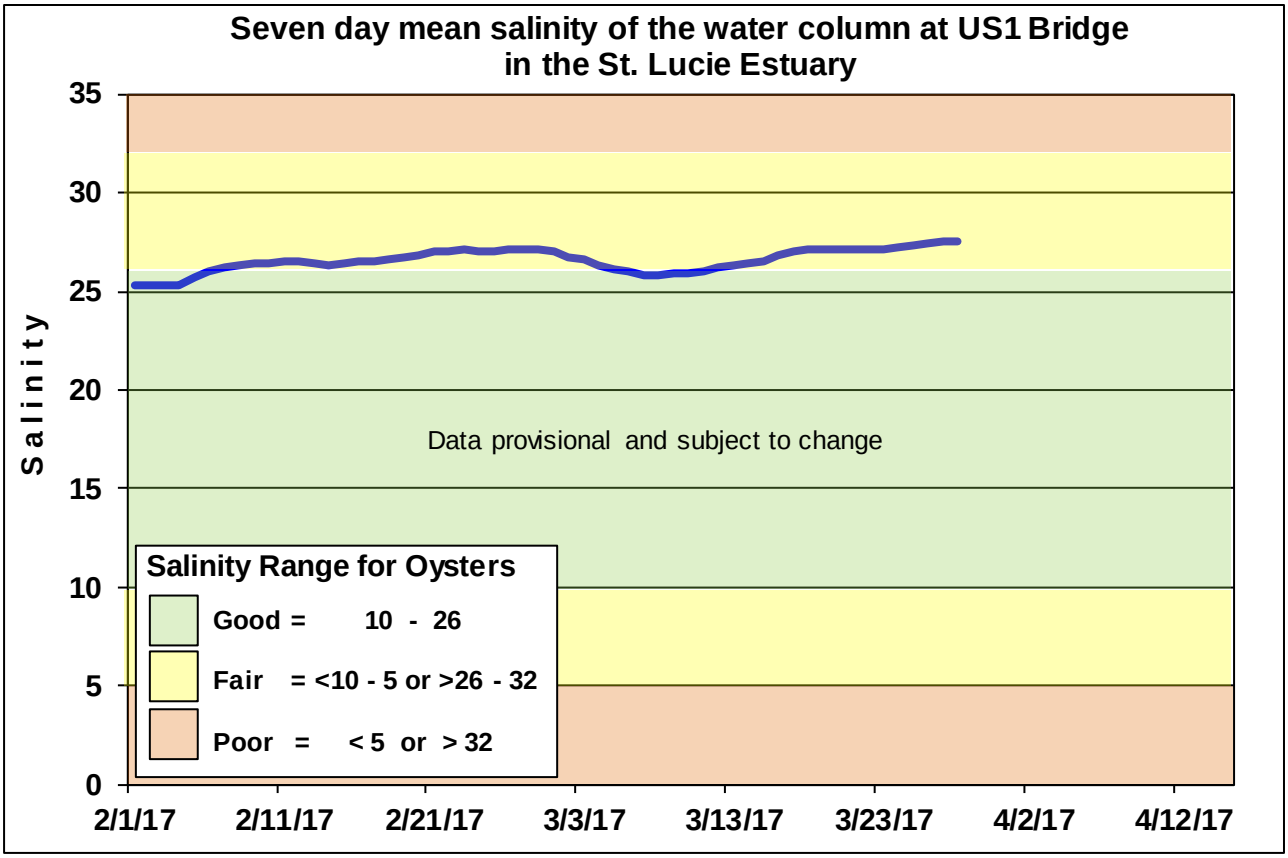


Figure 3. Seven-day mean salinity of the water column at the U.S. Highway 1 Bridge.

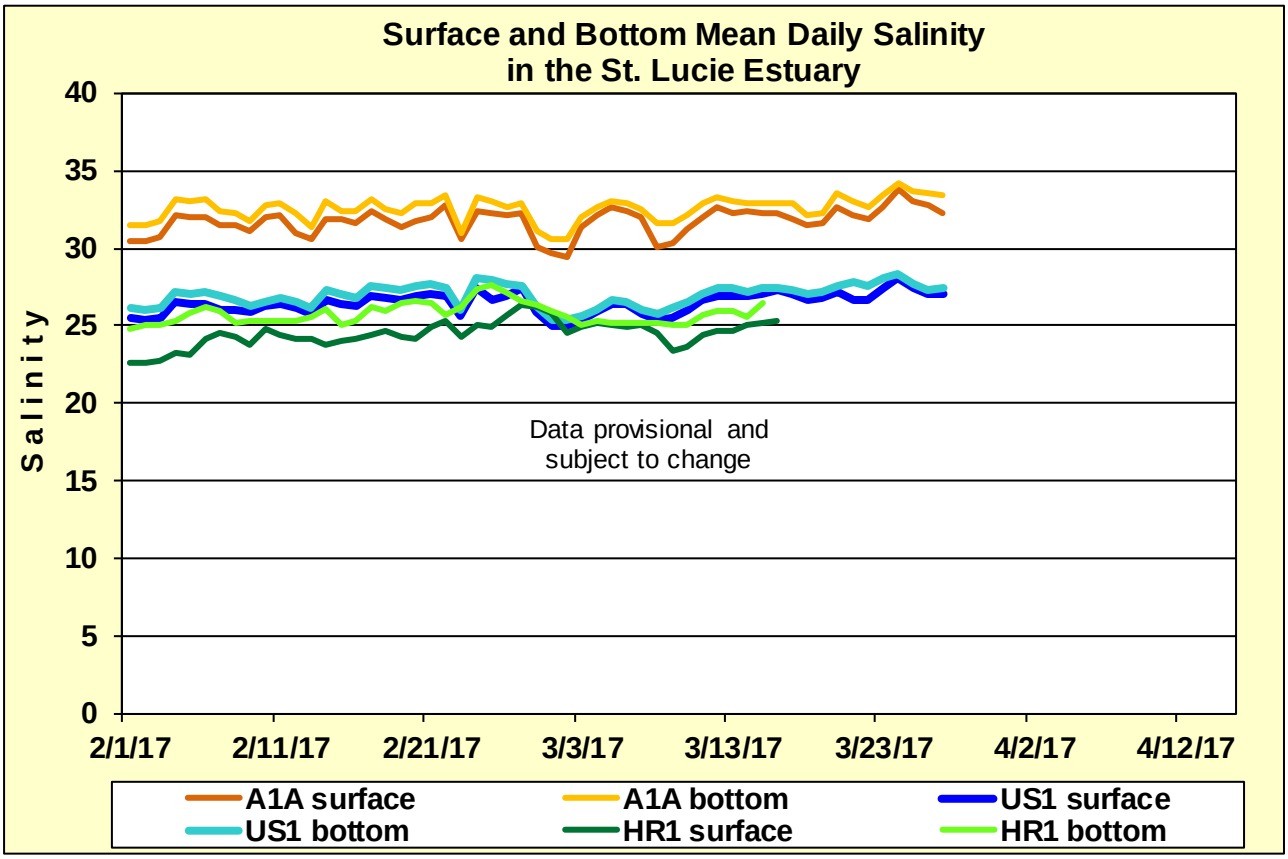


Figure 4. Daily mean salinity at the A1A, US1 and estimated HR1 stations.

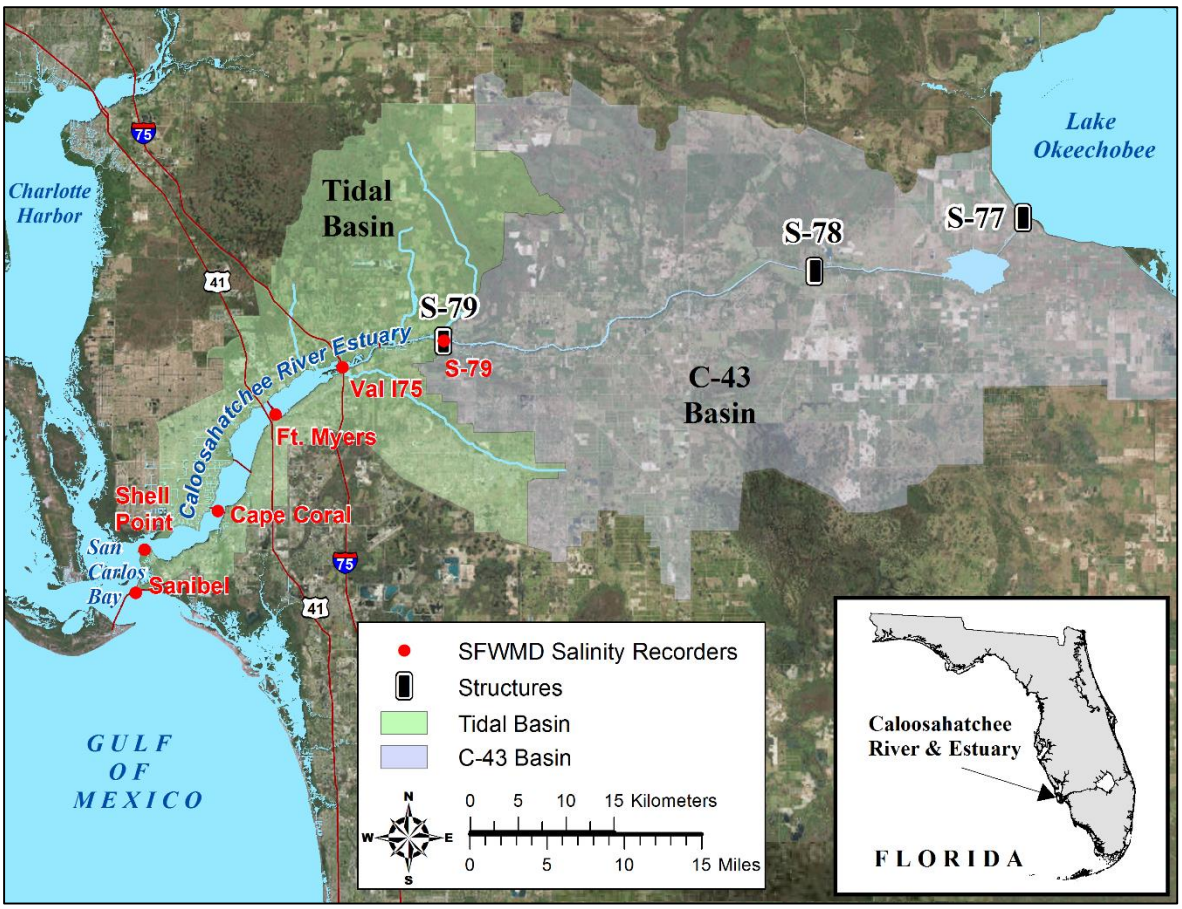


Figure 5. Basins, water control structures, and salinity monitoring for the Caloosahatchee Estuary.

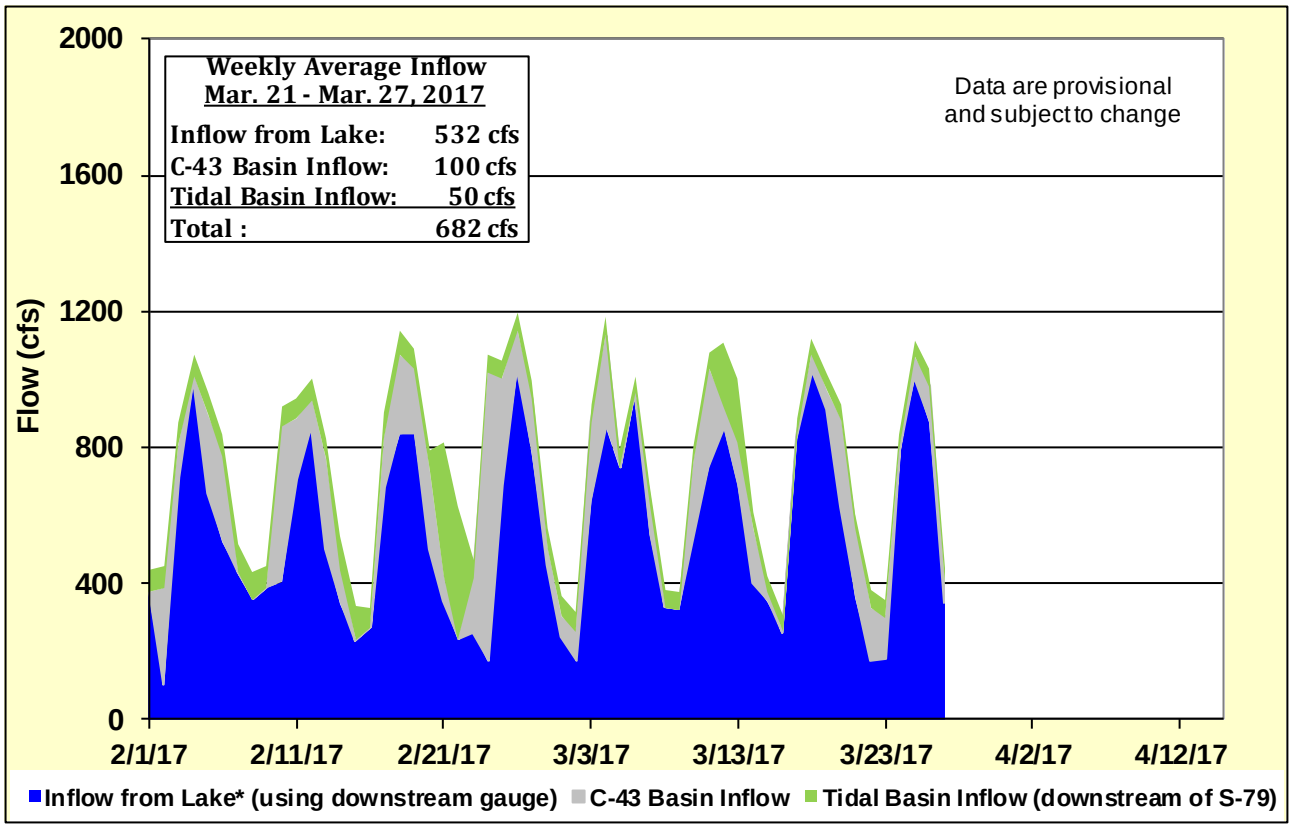
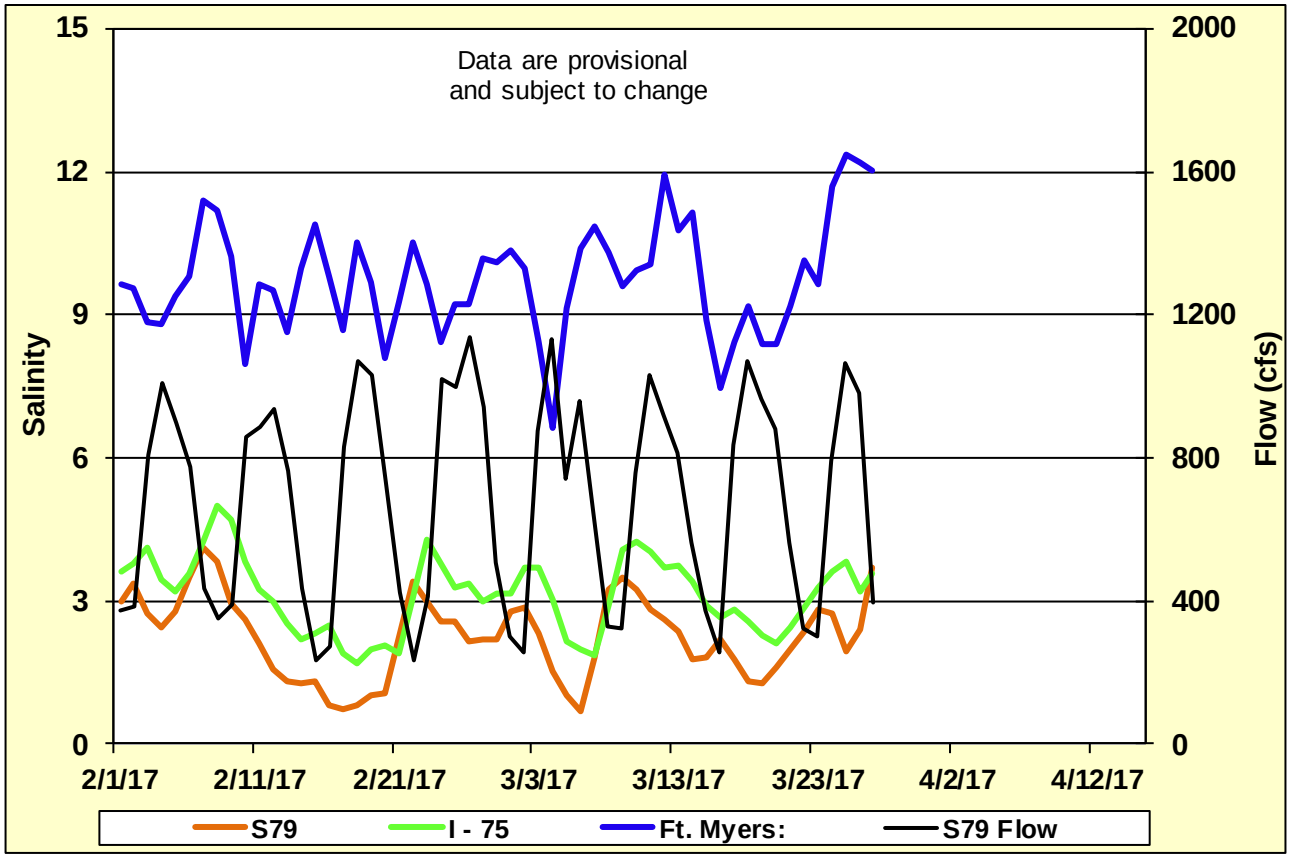


Figure 6. Freshwater inflows from Lake Okeechobee, runoff from the C-43 basin, and tributaries in the tidal basin into the Caloosahatchee River Estuary.



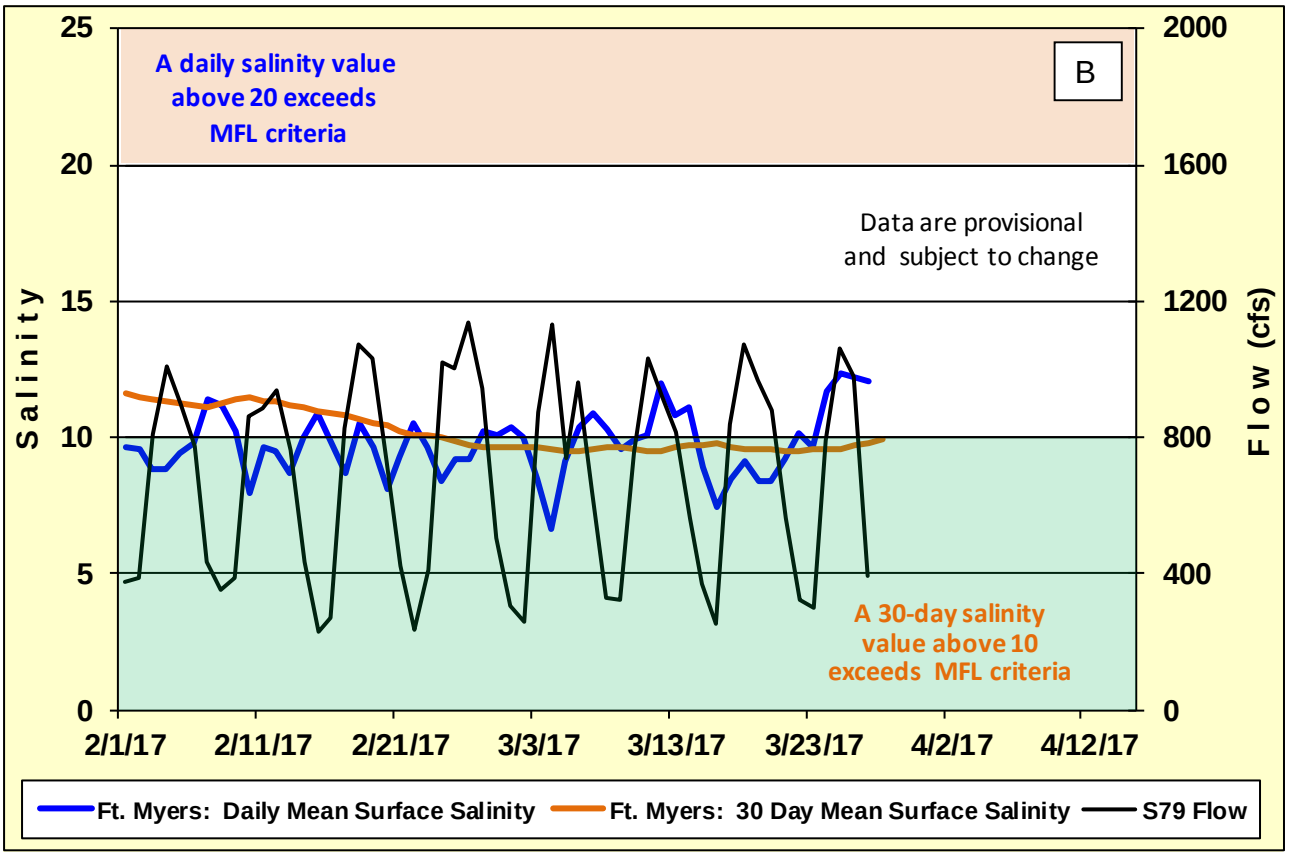


Figure 7. Daily mean flows at S-79 and salinity at upper estuary monitoring stations (A) and 30-day moving average salinity at Ft. Myers (B).

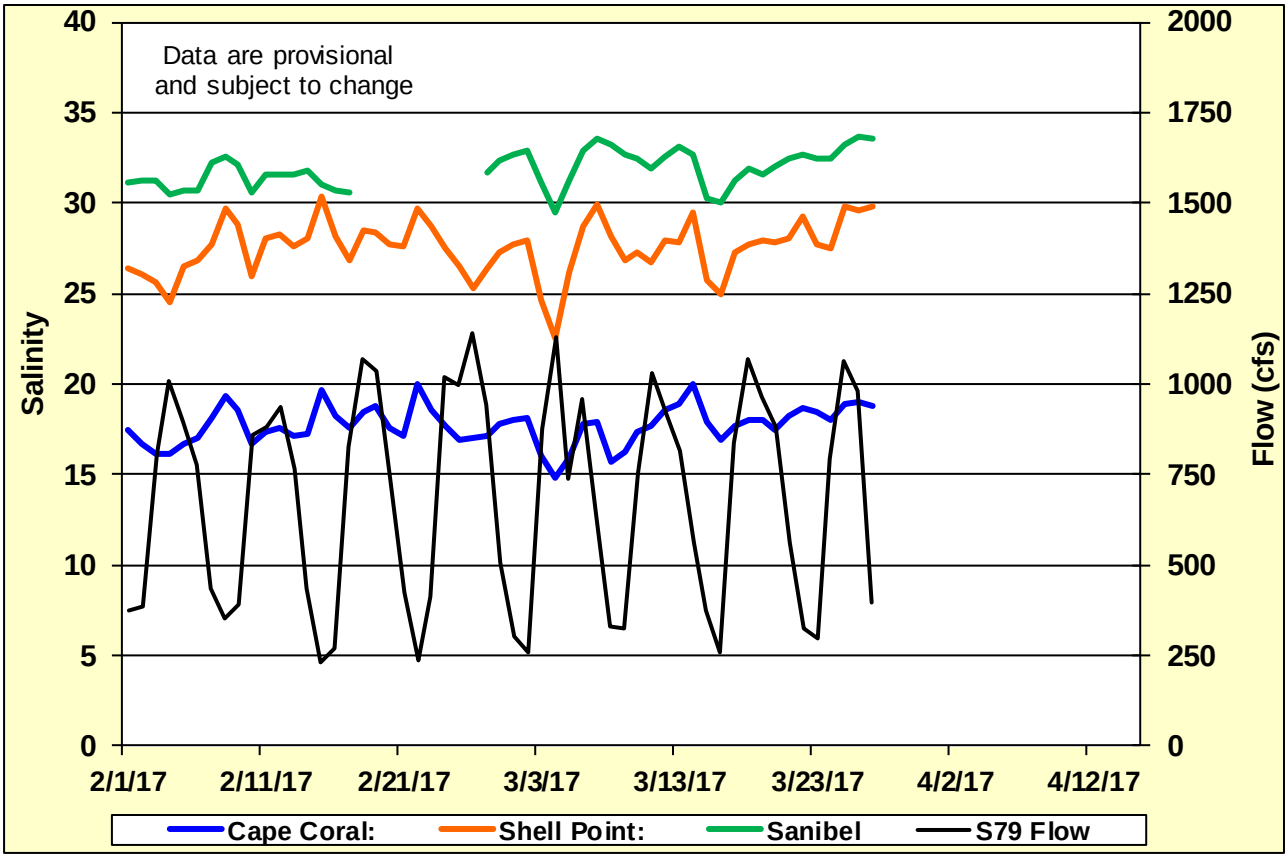


Figure 8. Daily mean flows at S-79 and salinity at lower estuary stations.

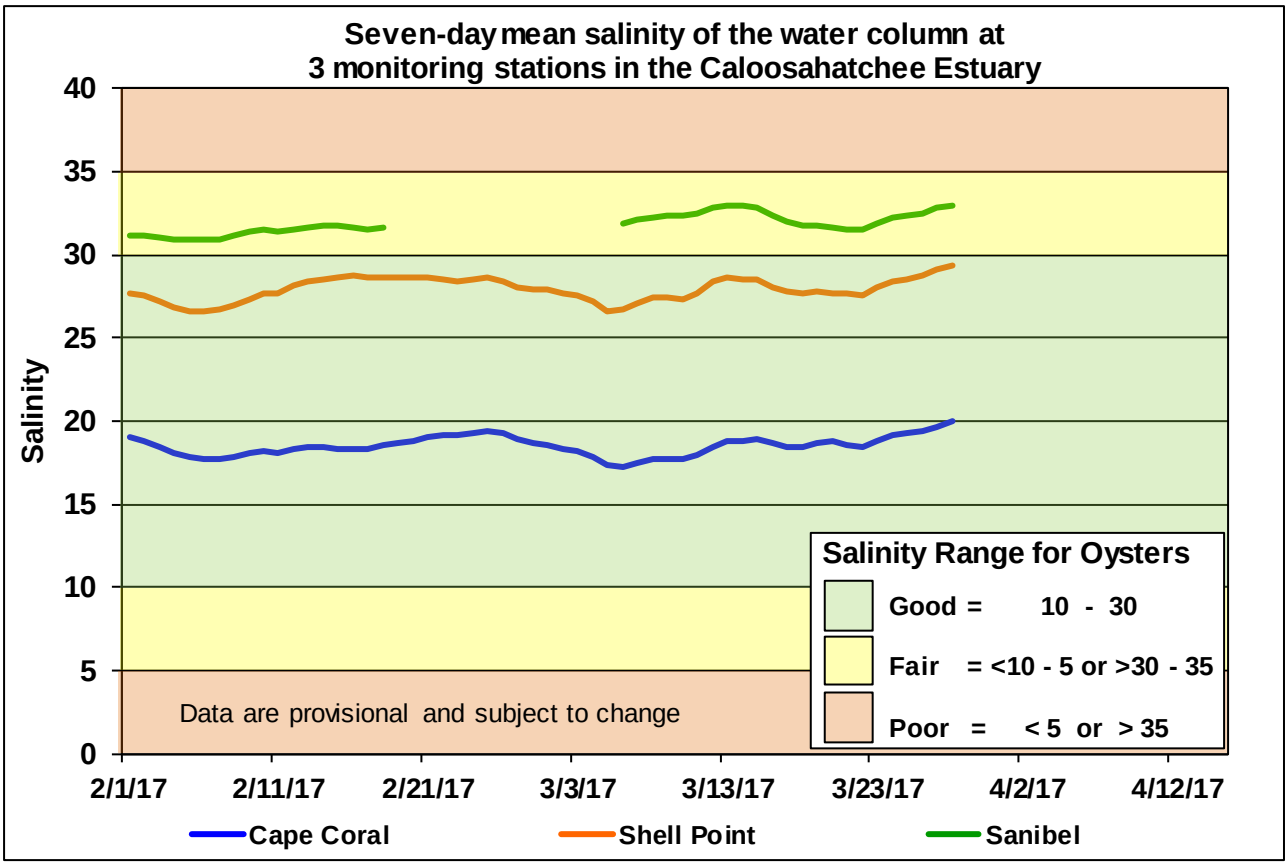


Figure 9. Seven-day mean salinity at Cape Coral Bridge, Shell Point and Sanibel Bridge monitoring stations.

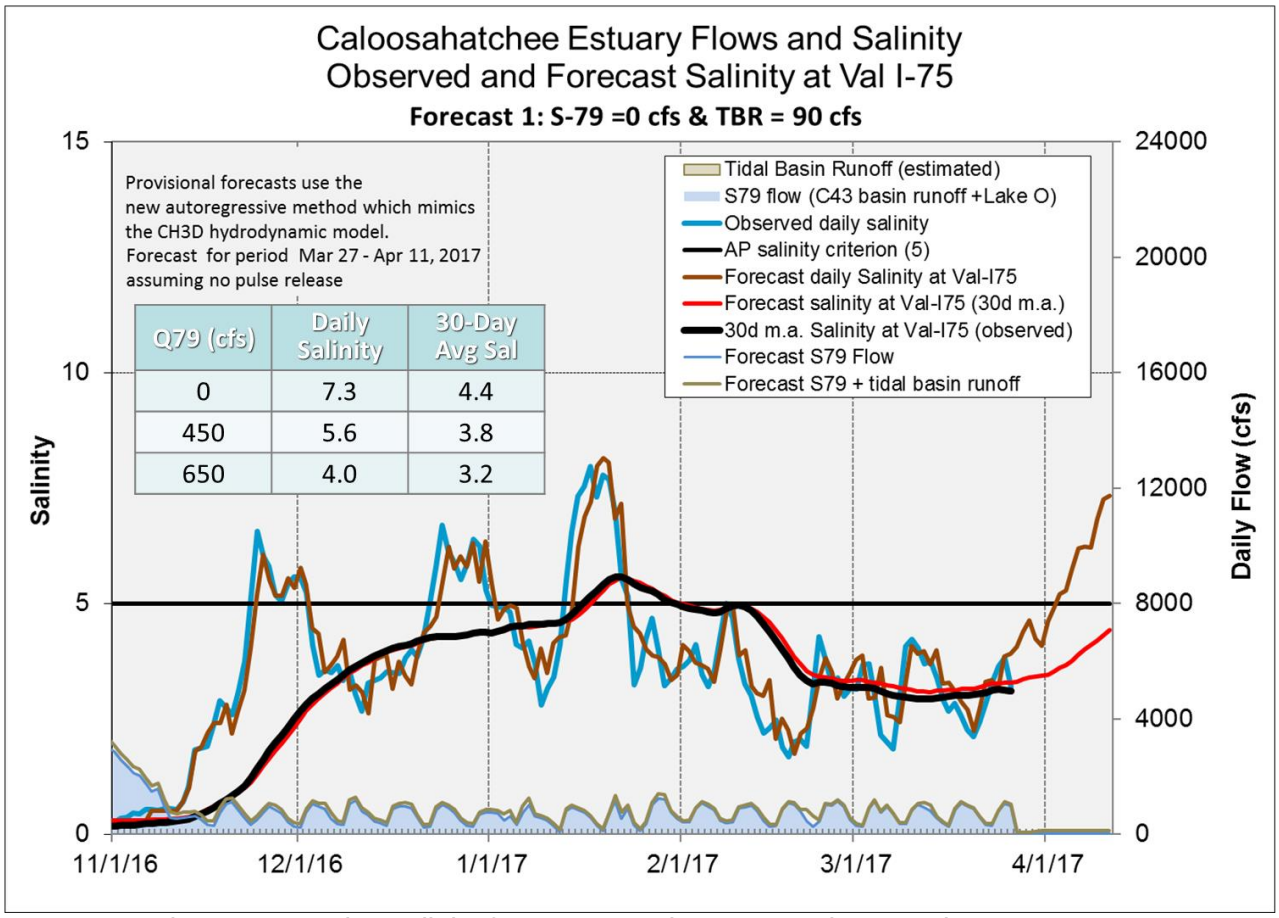


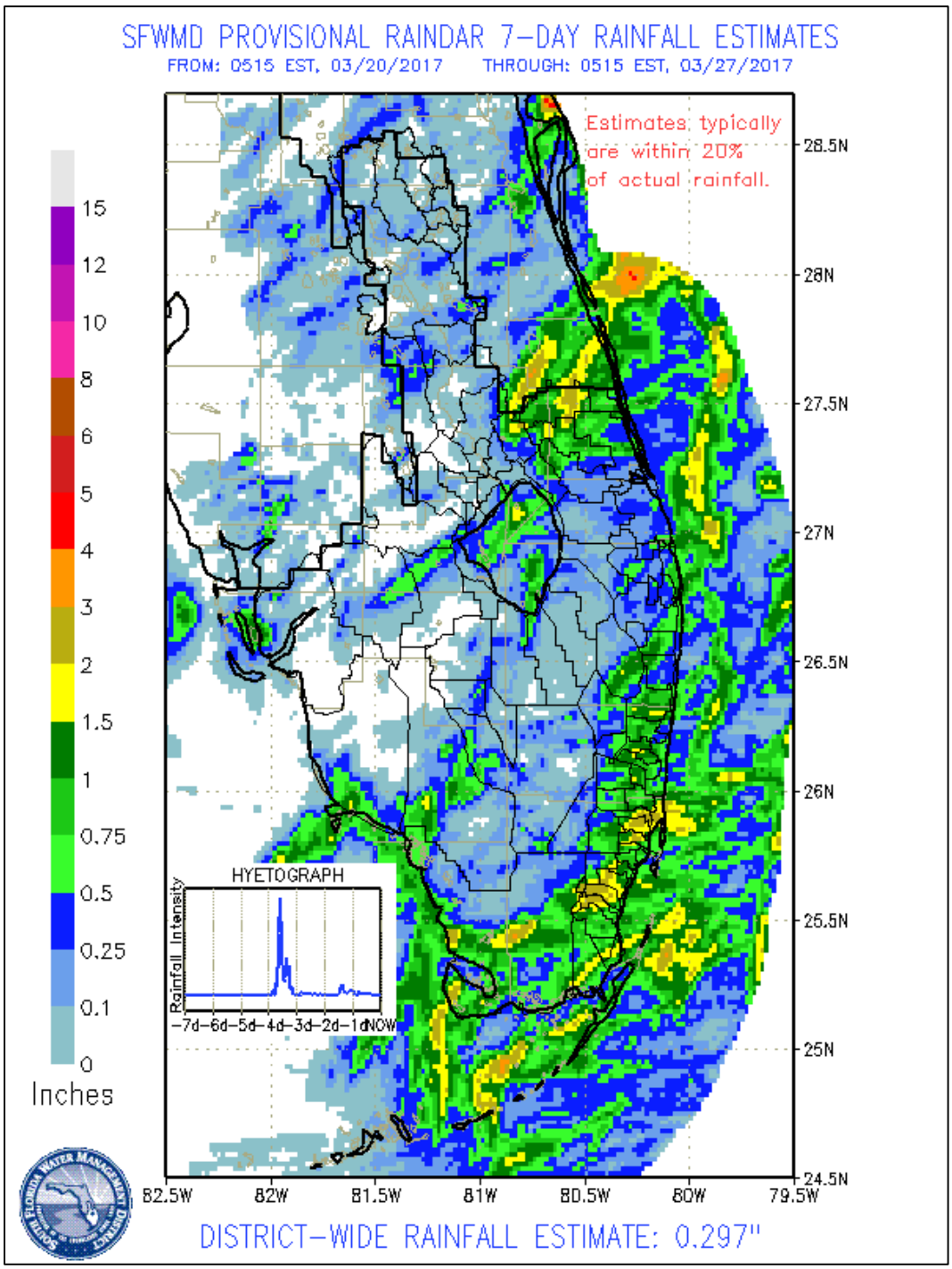
Figure 10. 14-day salinity forecast at Val I-75 assuming no releases at S-79.

GREATER EVERGLADES

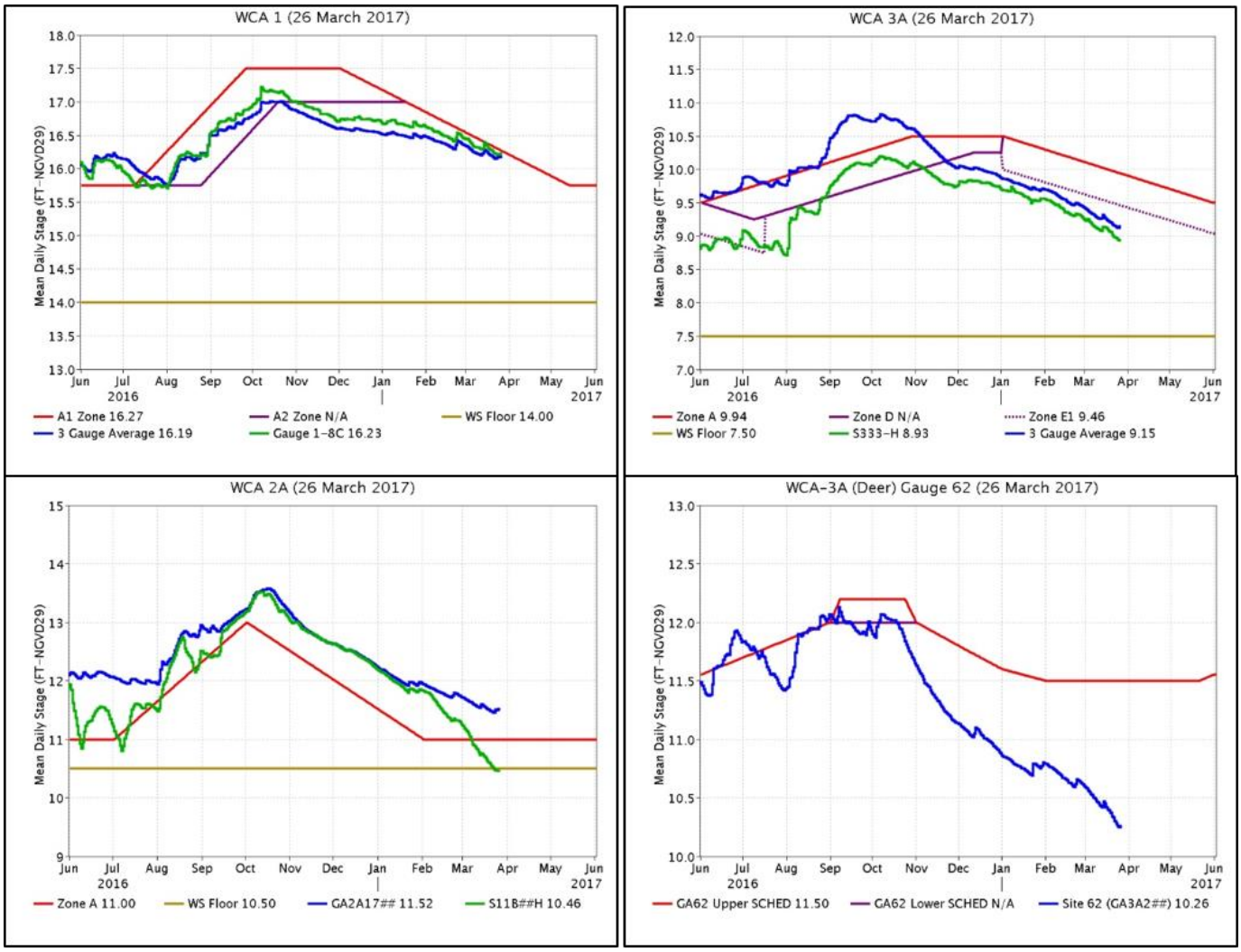
Rainfall over the last week was fairly consistent across the Everglades, averaging 0.4 inches. Recession rates were generally good across the system with the slower recession rates in WCA-1 and WCA-2A being desirable at this time given current water depths. Current stage conditions suggest that faster than – 0.07 feet per week may dry out all areas before the end of the breeding season.

Everglades Region	Rainfall (Inches)	Stage Change (feet)
WCA-1	0.51	-0.01
WCA-2A	0.38	0.01
WCA-2B	0.44	-0.12
WCA-3A	0.18	-0.07
WCA-3B	0.24	-0.05
ENP	0.65	-0.10

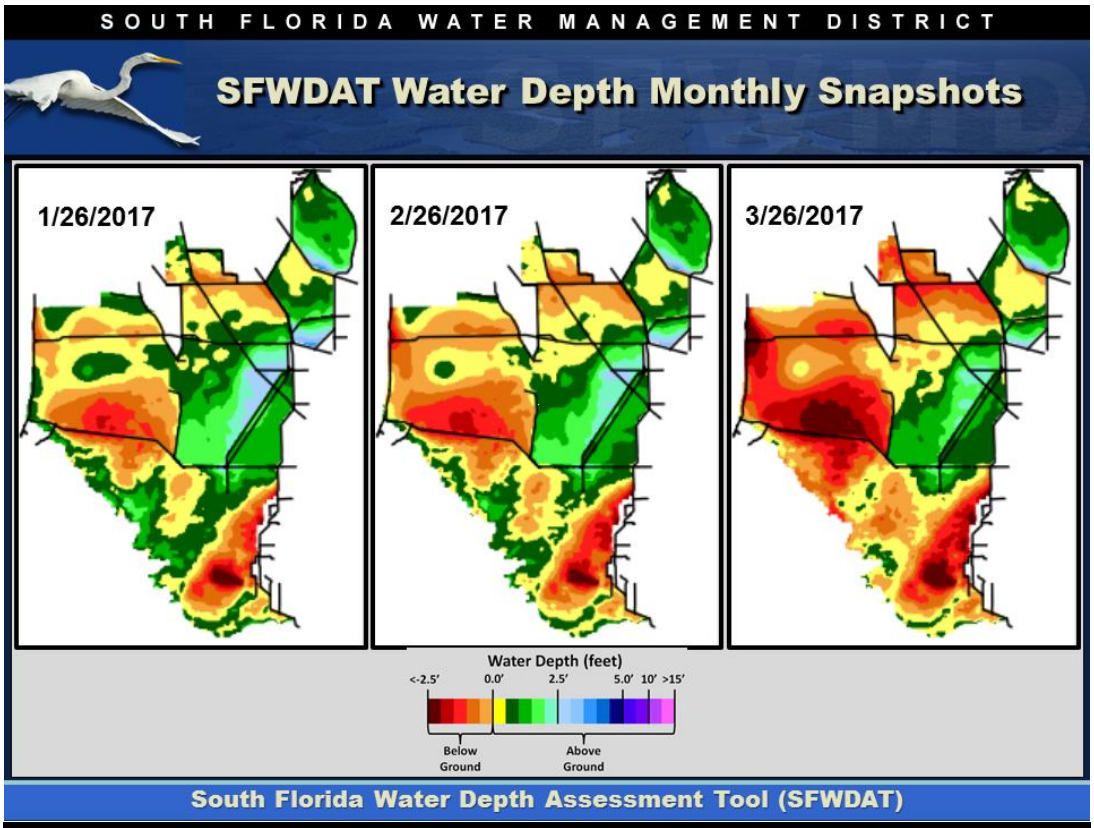
Good
Fair
Poor

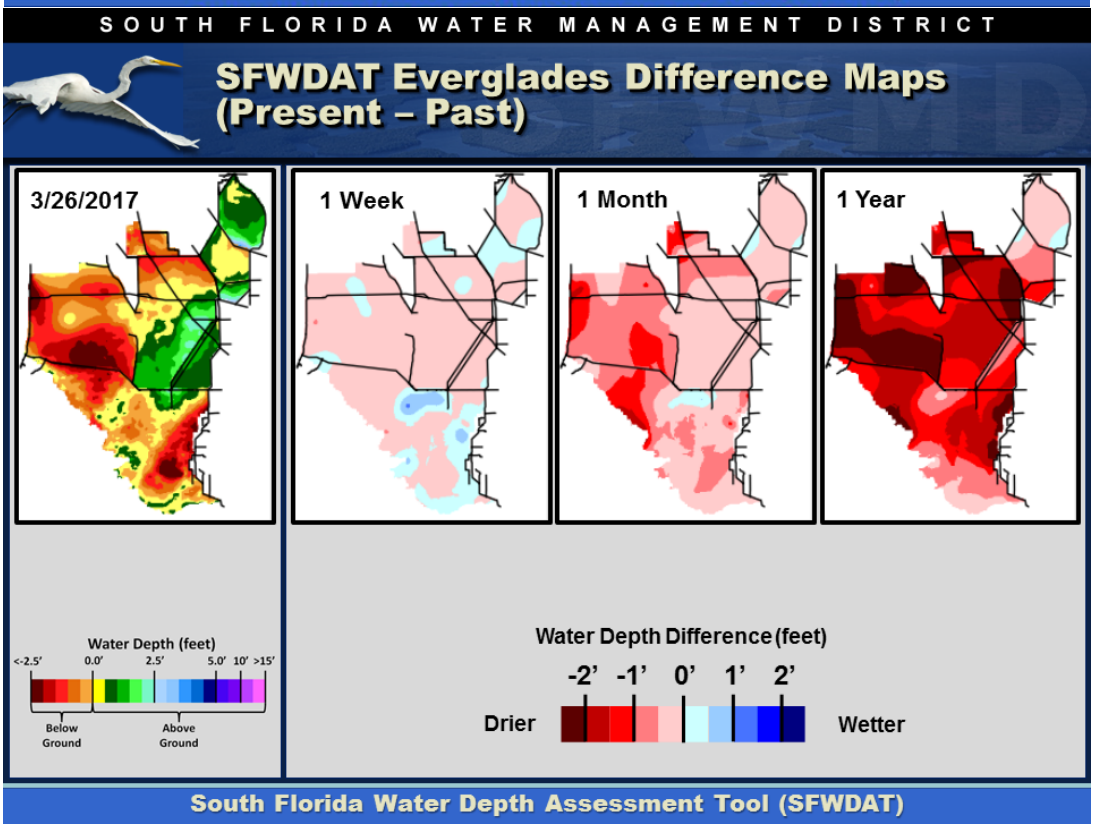


Regulation Schedules: WCA-1 is 0.08 feet below zone A1 and tracking the regulation line. WCA-3A is 0.31 feet below zone E1, and generally tracking. In WCA-2A the canal stage at gauge GA2A17 is 0.52 feet above zone A1 while the marsh stage measured at the headwaters of S11B is 0.54 feet below (.04 feet below the floor). WCA-3A at gauge 62 (Northwest corner) remains greater than 1 foot below schedule.



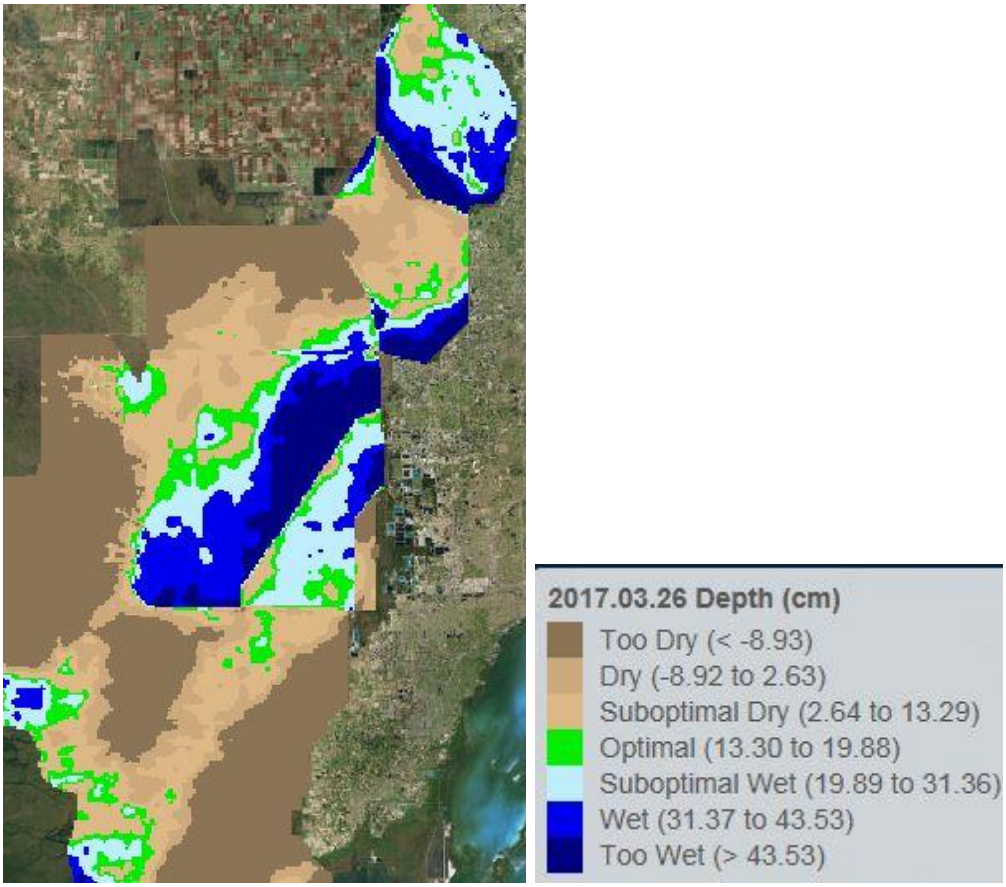
Water Depths and Changes: This week's water depths at monitored gauges other than in WCA-2B range from 0.10 feet (northeast WCA-3A) to 1.67 feet (southern WCA-3A). Over the last week individual gauge changes ranged from 0.0 feet to −0.12 feet. Stages across the Everglades are for the most part lower than they were a week and month ago, and significantly lower than one year ago (of note last year stages were above average).





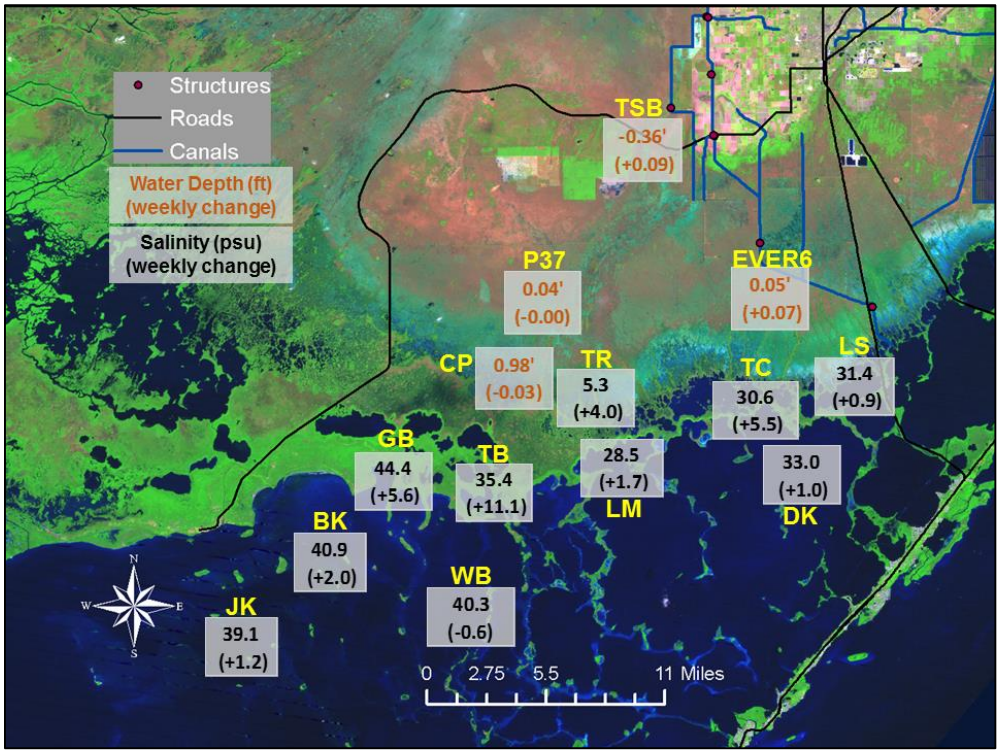
Wading Birds: Wading bird nesting and foraging patterns are similar to last week. Large numbers of wading birds continue to feed throughout the Everglades (WCA-1, WCA2A, WCA3AS, and Everglades National Park {ENP}) in areas where depths are currently optimal for wading bird foraging (see green and pale blue areas on the depth Habitat Suitability Index below). In addition, about 2,000 birds (mixed species) continue to feed in the dryer areas of northeastern WCA-3A North but there are about one-half the birds there than last week.

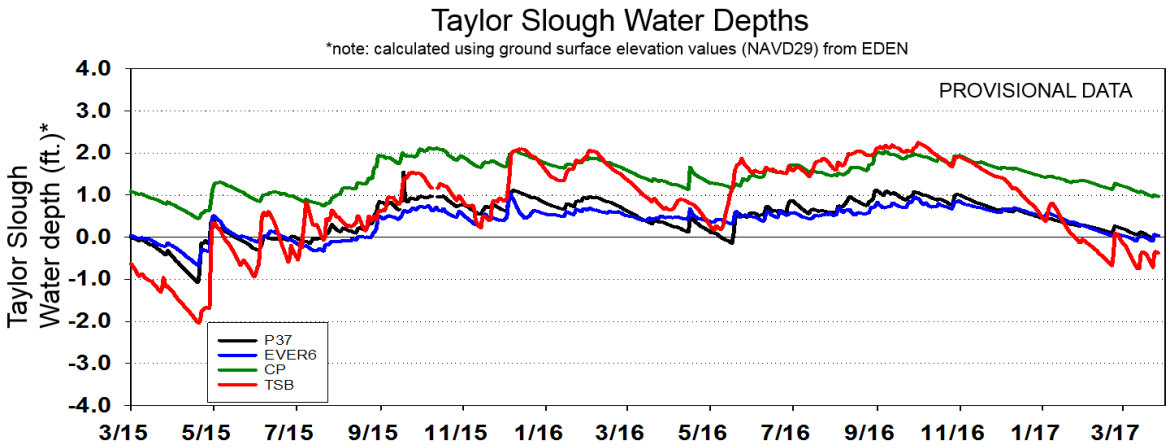
The two Wood Stork colonies on the western border of WCA3A-S continue to grow and now contain about 900 nests and many healthy nestlings (up from 700 nests last week). White Ibis are just starting to nest in the Lox Refuge at colony Lox 99.

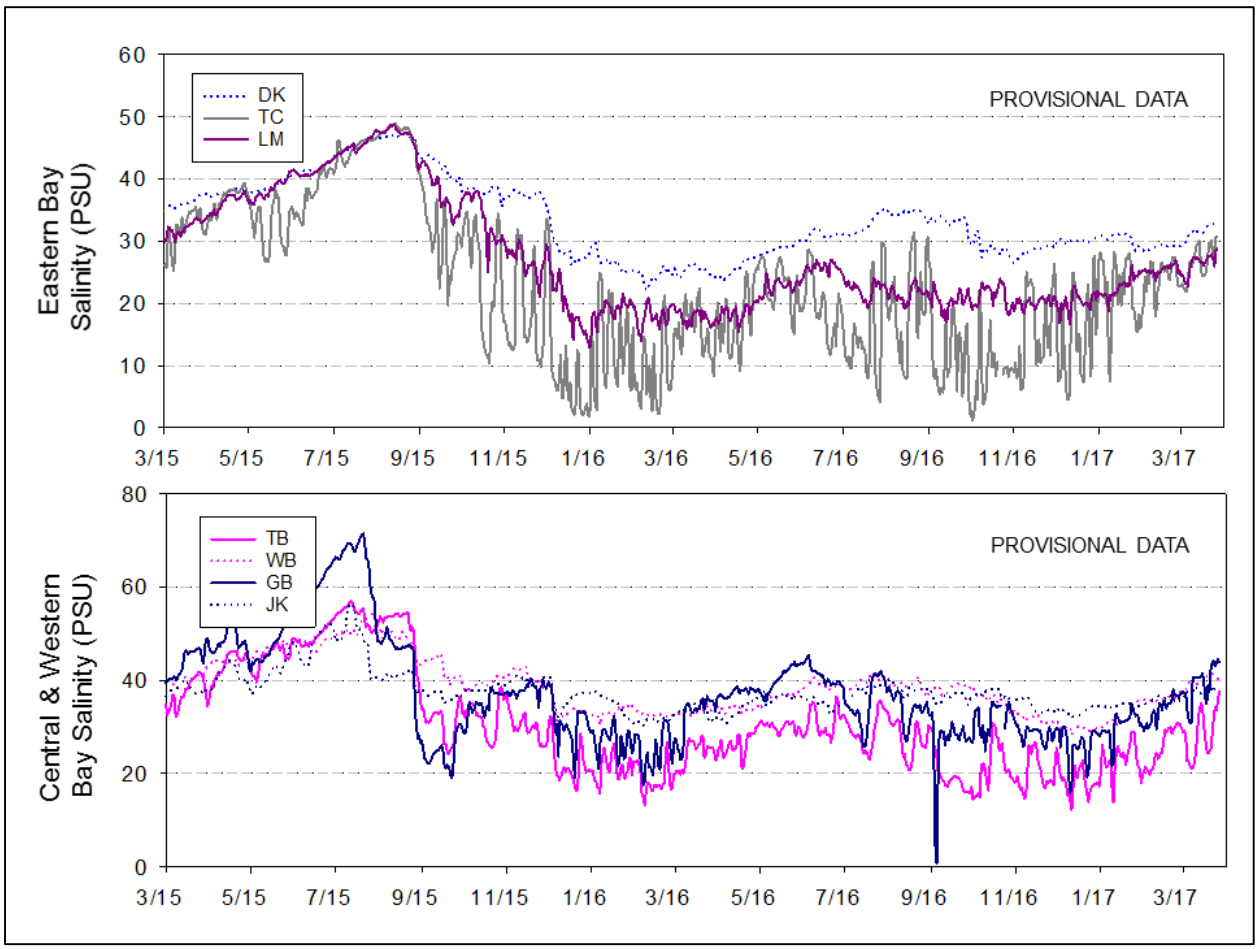


Taylor Slough: Water level changes were mixed last week due to relatively heavy rains for this time of year on Thursday and Friday. Both northern Taylor Slough and the ENP panhandle region increased in stage and were the areas with highest rainfall. Water levels are +1 to +3 inches above average.

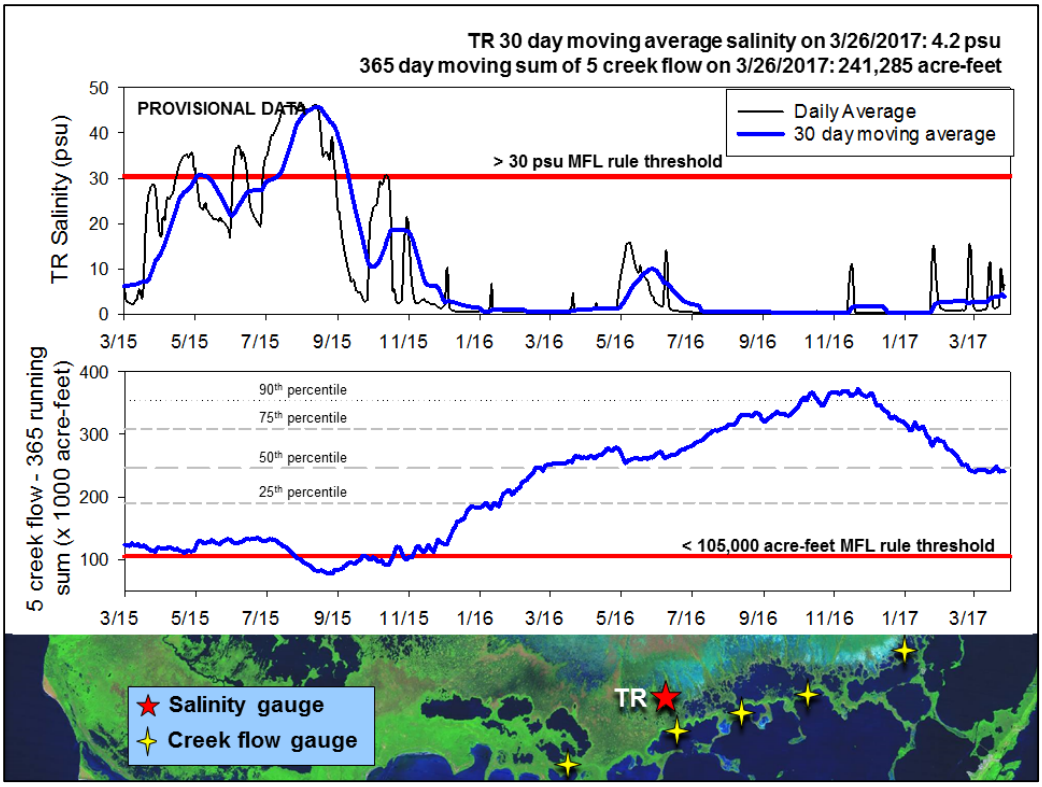
Florida Bay Salinity: Salinities in the Bay are generally rising due to evaporation and wind-driven water movement upstream. In the central and western nearshore areas (largest changes), salinities averaged +1.3 psu increase per week since January 1, 2017. Salinities currently range from 28 psu to 44 psu and are +3 to +7 psu above their long-term averages.


Structures
Roads
Canals
Water Depth (ft)
(weekly change)
Salinity (psu)
(weekly change)
TSB
-0.36'
(+0.09)
P37
0.04'
(-0.00)
EVER6
0.05'
(+0.07)
CP
0.98'
(-0.03)
TR
5.3
(+4.0)
TC
30.6
(+5.5)
LS
31.4
(+0.9)
GB
44.4
(+5.6)
TB
35.4
(+11.1)
28.5
(+1.7)
LM
33.0
(+1.0)
DK
BK
40.9
(+2.0)
WB
40.3
(-0.6)
JK
39.1
(+1.2)
N
W
E
S
0 2.75 5.5 11 Miles


Taylor Slough Water Depths
*note: calculated using ground surface elevation values (NAVD29) from EDEN
PROVISIONAL DATA
Taylor Slough
Water depth (ft.)*
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
P37
EVER6
CP
TSB
3/15
5/15
7/15
9/15
11/15
1/16
3/16
5/16
7/16
9/16
11/16
1/17
3/17



Florida Bay MFL: The daily average salinity at TR again increased to 10 psu by Friday before decreasing back to 5 psu by Sunday. The 30-day moving average increased 0.4 to end the week at 4.2 psu. The weekly creek flow from the five creeks was −963 acre-feet with five of the last seven days experiencing negative flows. The 365-day moving sum of flow from the five creeks identified by stars on the map decreased about −5,000 acre-feet to end at 241,285 acre-feet (below the long-term average of 257,628 acre-feet).



Water Management Recommendations

- Based on current stage conditions and wading bird foraging/nest reconnaissance flights we are continuing to recommend that moderating recession rates in WCA-2A has priority over moderating recession rates in WCA-3A. However, the low water depth conditions in the northern sections of WCA-3A north at gauges 62 (0.17 feet) and 63 (0.10 feet) suggest that available water routed into those areas would serve to protect that habitat.

- Again based on current stage conditions and wading bird foraging/nest reconnaissance flights conducted on March 27 and March 28 we support the water management option that would route water into WCA-2A via the S-7. This option may serve to protect or prolong the optimal foraging conditions currently being seen and modeled in WCA-2A.

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

Everglades Ecological Recommendations, Mar. 28th, 2017 (red is new)

Area	Current Condition	Cause(s)	Recommendation	Reasons
WCA-1	Stages decreased +0.03 to −0.05'	Rainfall, ET, management	Operate for dry season conditions and, when possible, restrict recession rates to -0.03' to -0.07' per week. Moderate reversals, when possible.	Retain water for the upcoming dry season while protecting habitat for apple snail and wading bird breeding season.
WCA-2A	Stages increased 0.01'	Rainfall, ET, management	Maintain slower recession rates. Retain water and restrict recession rates to less than -0.09' per week. Continue to prioritize WCA-2A inflows.	Protect habitat and wildlife. Support apple snails and nesting wading birds. Retain water to provide foraging habitat later in the breeding season.
WCA-2B	Stages decreased −0.12'	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.
WCA-3A NE	Stage remained unchanged	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. Continue moving water through S-150 as possible. Water for northwestern 3A (via the G404) is also desired.	Protect habitat and wildlife. Support apple snails and nesting wading birds. Reduce fire risk as season progresses.
WCA-3A NW	Stages decreased −0.08'	Rainfall, ET, management		
Central WCA-3A S	Stages decreased −0.10'	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).	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.
Southern WCA-3A S	Stages decreased −0.08'	Rainfall, ET, management		
WCA-3B	Stages decreased −0.04' to − 0.07'	Rainfall, ET, management	Restrict recession rates to -0.05' to 0.-09' per week.	Protect habitat and wildlife and prepare for wading bird breeding season. Provide conditions to support apple snails.
ENP-SRS	Stages decreased −0.10'	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, wildlife and wading birds.
ENP-CSSS habitats	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 ERTP 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 forcasted conditions are conducive for a successful sparrow breeding season. Dry conditions are expected for much of the sparrow breeding season.
Taylor Slough	Stages changed by −0.03' to +0.09'	Rain, ET, inflows	Move water southward as possible	Provide freshwater buffer for ecosystems, maintain low salinity conditions downstream, and maintain slow recession rates.
FB- Salinity	+3 psu to +7 psu above average	Rain, ET, inflows, wind	Move water southward as possible	Maintain low salinity conditions and prevent early salinity increases.