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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 14, 2017

SUBJECT: Weekly Environmental Conditions for Systems Operations

Summary

Weather Conditions and Forecast

Some showers north and east. A cold front has stalled across the mid-section of the District and it should return northward this afternoon and evening helping to generate some scattered light showers east and north. A low forecast to develop along the front will then push it back south through the District bringing some moderate showers and thunderstorms Wednesday and Wednesday night. Dry conditions will move in behind the front Thursday and Friday. An impulse is then forecast to move eastward across the area Saturday bringing areas of moderate to locally heavy showers and thunderstorms.

Kissimmee

On Sunday, stage was 0.5 feet below regulation schedule in East Lake Toho, 0.6 feet below schedule in Lake Toho, and 1.4 feet below schedule in Kissimmee-Cypress-Hatchineha (KCH). Over the past week, discharge at S65, S65A, and S65E averaged 507, 387, and 523 cfs, respectively. Tuesday morning discharges were ~687 cfs, 554 cfs, and 520 cfs, respectively at S65, S65A, and S65E. Dissolved oxygen data in the Kissimmee River averaged 9.71 mg/L over the past week. Kissimmee River mean floodplain depth on Sunday is not available. New recommendation: increase discharge at S65 and S65A by 200 cfs to allow stage to decline in KCH.

Lake Okeechobee

Lake stage is 13.71 feet NGVD and continues to fall. The current weekly recession rate of 0.08 feet equates to a monthly recession rate of 0.32 feet, which is within the preferred range. The February submerged aquatic vegetation (SAV) sampling indicated the northern and western sites maintained the SAV beds that were present during the previous two quarters (August and October) but the sites along the southern and southwestern nearshore zones still have not recovered from the high Lake stages experienced during last year's growing season. The goal should be to continue to lower Lake levels but at a rate of no more than 0.50 feet per month.

Estuaries

Total discharge to the St. Lucie estuary averaged 91 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 throughout the estuary. The seven-day average salinity at the US1 Bridge is in the fair range for adult oysters. Total inflow to the Caloosahatchee estuary averaged 769 cfs over the past week with 534 cfs (69%) coming from the Lake. The 30-day average surface salinity at the Ft. Myers monitoring station reached 10 on January 2, 2017 and is now at 11.1 constituting 44 consecutive days of exceedance of the Caloosahatchee Minimum Flow and Level. The 30-day average surface salinity at Val I-75 is 4.7. Tape grass in the upper estuary are likely deteriorating due to salinity conditions. Salinity conditions are good 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 4.6 in the next two weeks if no flow comes through the S-79 structure; however, daily salinity is forecast to reach 6.5.

Stormwater Treatment Areas

Over the past week, the STAs/FEBs received approximately 4,500 acre-feet of Lake releases. The total amount of Lake releases sent to the STAs/FEBs in WY2017 (since May 1, 2016) is approximately 175,900 acre-feet. Most STA cells are at or near target depths, except STA-5/6 emergent aquatic vegetation cells which are below target and many are drying out. Operational restrictions are in place for structure repairs and vegetation rehabilitation in STA-1E, as well as a Restoration Strategies Science Plan Study in STA-2 and STA-3/4. 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

Over the last week depths decreased across the Everglades at rate that fell within the general seasonal recommended range of – 0.05 and – 0.09 feet per week, but at a faster rate in WCA-3A than current low stage conditions suggest would optimize wading bird foraging and support nesting throughout the nesting season. Weekly stage changes ranged from –0.05 (WCA-1) to –0.15 (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 0.52 inches of rainfall in the past week and the Lower Basin received 0.21 inches (SFWMD Daily Rainfall Report 02/13/2017).

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: 2/14/2017

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)	Sunday Departure (feet)						
							2/12/17	2/5/17	1/29/17	1/22/17	1/15/17	1/8/17	1/1/17
Lakes Hart and Mary Jane	S62	5	LKMJ	61.0	R	61.0	0.0	-0.1	0.0	0.0	-0.1	-0.1	-0.2
Lakes Myrtle, Preston, and Joel	S57	12	S57	61.2	R	61.2	0.0	0.0	-0.1	0.0	0.0	-0.1	-0.2
Alligator Chain	S60	0	ALLI	63.3	R	64.0	-0.7	-0.7	-0.6	-0.6	-0.6	-0.6	-0.6
Lake Gentry	S63	0	LKGT	61.3	R	61.5	-0.2	-0.2	-0.1	-0.1	-0.1	-0.1	-0.1
East Lake Toho	S59	238	TOHOE	57.5	R	58.0	-0.5	-0.3	-0.1	0.0	0.0	0.0	-0.1
Lake Toho	S61	679	TOHOW, S61	54.4	R	55.0	-0.6	-0.3	-0.1	0.0	0.0	-0.1	-0.1
Lakes Kissimmee, Cypress, and Hatchineha	S65	507	LKISSP, KUB011, LKISSB	50.5	R	51.9	-1.4	-1.8	-2.0	-2.1	-2.0	-1.9	-1.8

* 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: 2/14/2017

Metric	Location	Sunday's 1-day average	Weekly Average**									
			2/12/17	2/5/17	1/29/17	1/22/17	1/15/17	1/8/17	1/1/17	12/25/16	12/18/16	12/11/16
Discharge (cfs)	S-65	477	507	482	465	473	475	487	555	759	809	821
Discharge (cfs)	S-65A	371	387	378	368	364	368	461	497	639	700	699
Discharge (cfs)	S-65C	N/A	N/A	N/A	N/A	N/A	N/A	548	703	892	887	909
Headwater stage (feet NGVD)		N/A	N/A	N/A	N/A	N/A	N/A	29.1	30.8	32.5	32.7	32.8
Discharge (cfs)	S-65D****	867	663	730	1274	1292	1268	1293	1411	1607	1638	1700
Discharge (cfs)	S-65E	436	523	513	398	386	375	452	626	774	779	773
DO concentration (mg/L)***	Phase I river channel	9.98	9.71	8.54	8.13	7.97	7.94	7.12	N/A	7.02	7.17	7.06
Mean depth (feet)*	Phase I floodplain	N/A	N/A	N/A	N/A	0.06	0.07	0.07	0.09	0.12	0.13	0.15

* 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.

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
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.			
9/27/2016	<ul style="list-style-type: none"> • Begin reducing discharge when Ops and management feel the time is right (could be now) <ul style="list-style-type: none"> • Use the discharge table below to ramp down to 1400 cfs; however, if stage should stop declining or start to rise during the rampdown, hold the current discharge unless stage begins to decline again • If KCH stage reaches ~50.5 ft, hold ~1400 cfs while KCH stage is at or above ~50.5 ft, then: <ul style="list-style-type: none"> • If KCH stage declines below ~50.5 ft, continue reducing discharge, potentially to minimum discharge. However, if stage stops declining or starts to rise during the rampdown, hold or increase current discharge until stage begins to decline again or until it rises to ~50.5 ft • If KCH stage rises or stays above ~50.5 ft, hold ~1400 cfs unless stage approaches ~0.25 ft below the regulation line. If stage continues to rise into this buffer zone, use the discharge table to ramp up in anticipation of flood control releases 	To the extent possible, avoid repeated wet/dry cycles in the Kissimmee River floodplain and extend the period of continuous floodplain inundation without decreasing lake stage too much. The recommendation is similar to the discharge plan used last wet season that balanced the river, the KCOL, and downstream waterbodies.	TBD	KB Operations

KCOL Hydrographs (through Sunday midnight)

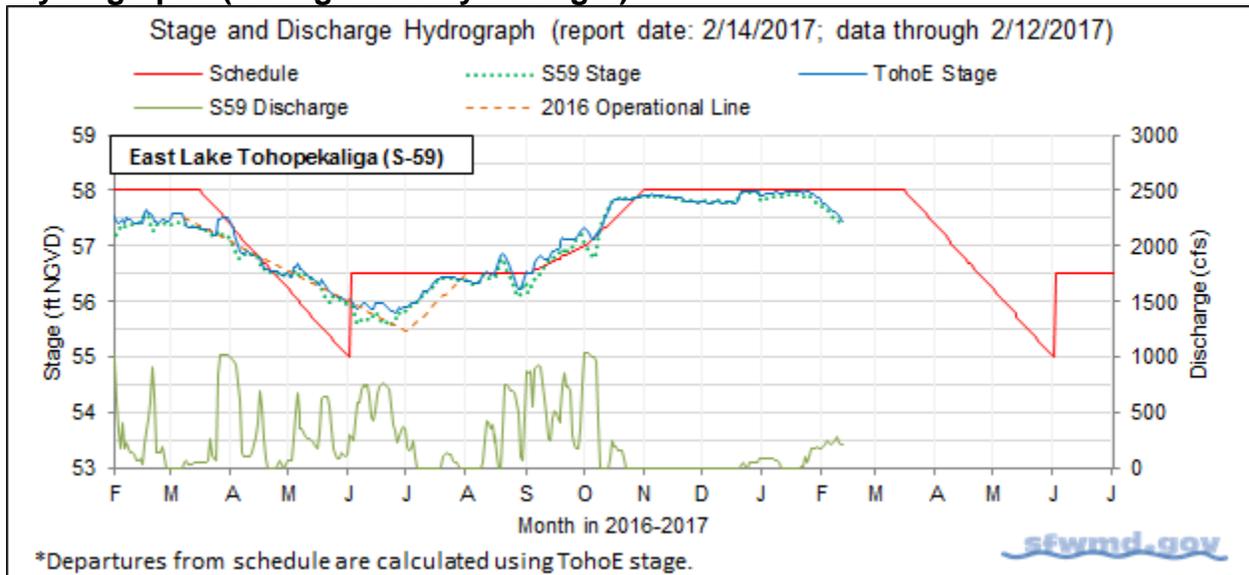


Figure 1.

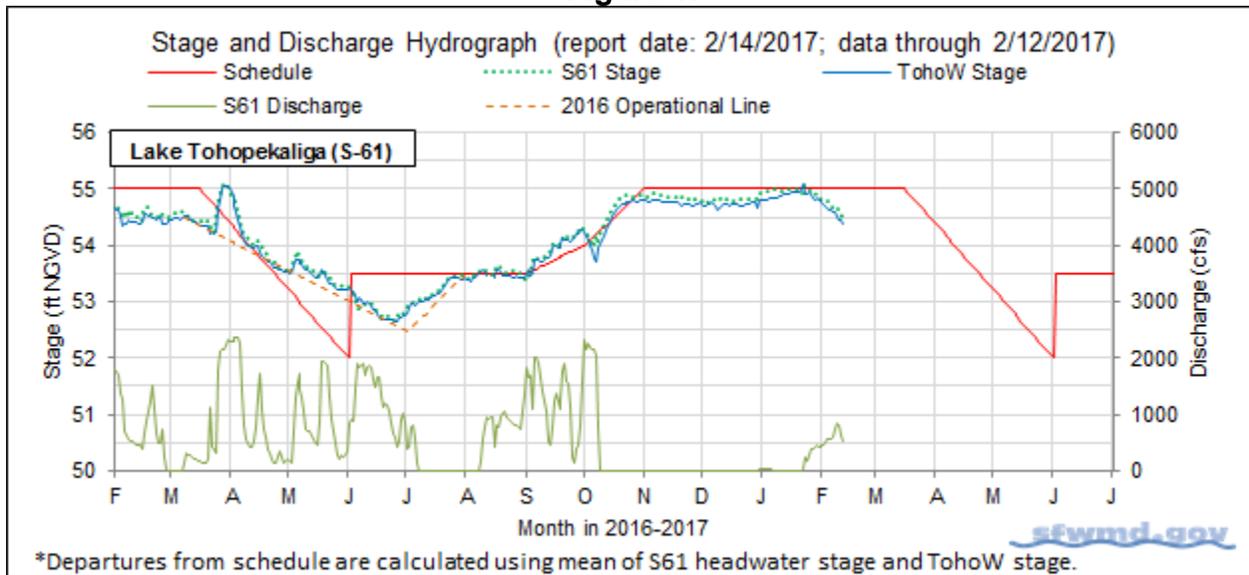


Figure 2.

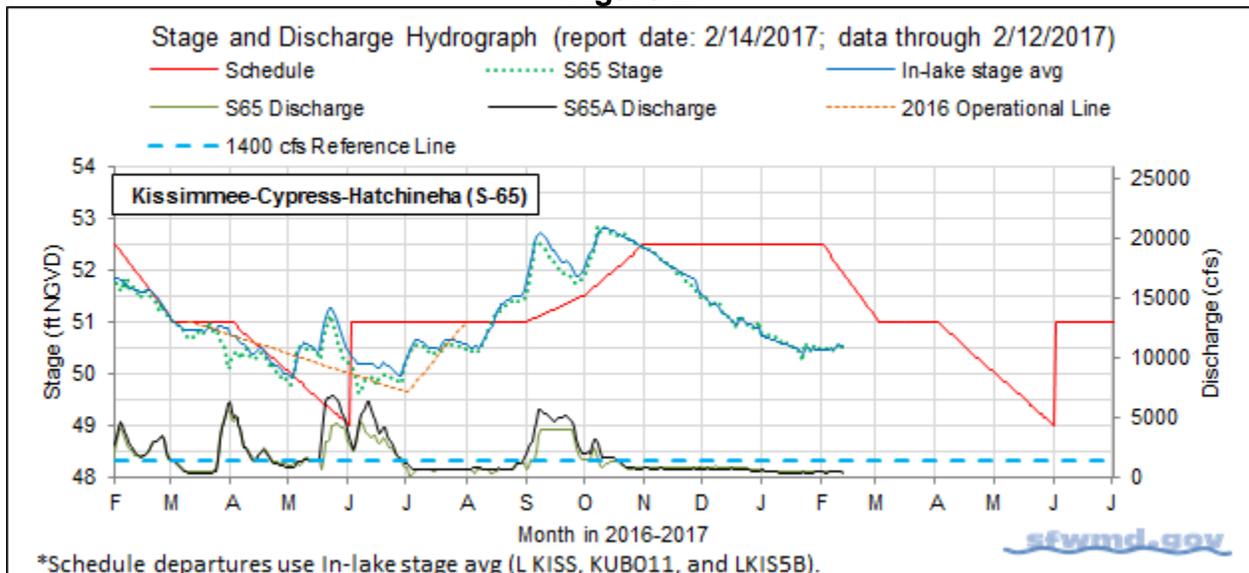


Figure 3.

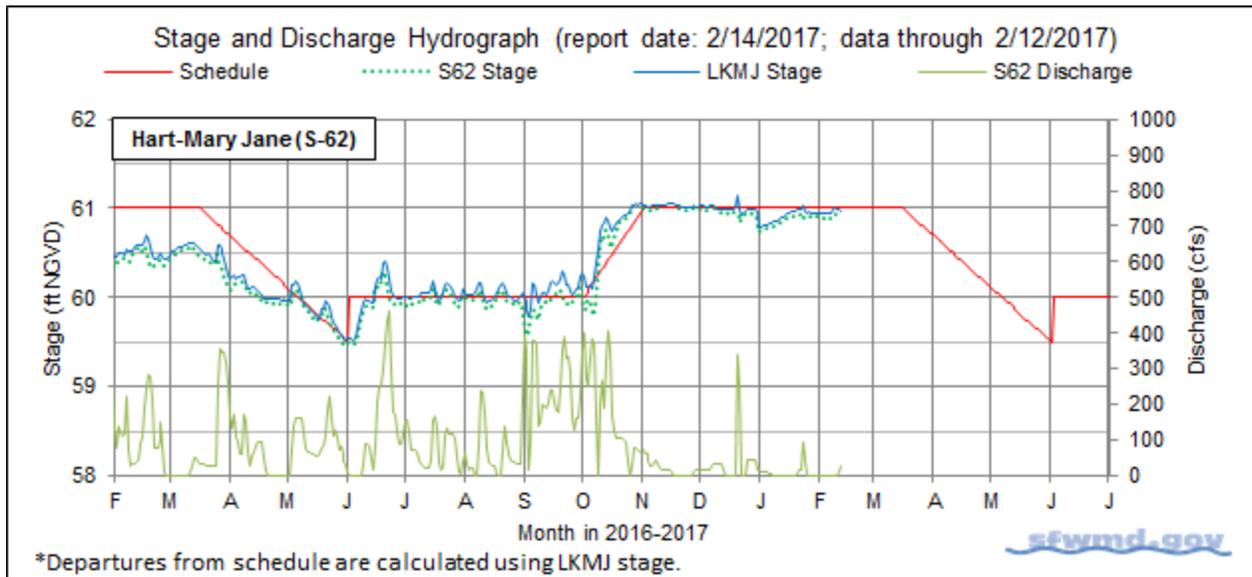


Figure 4.

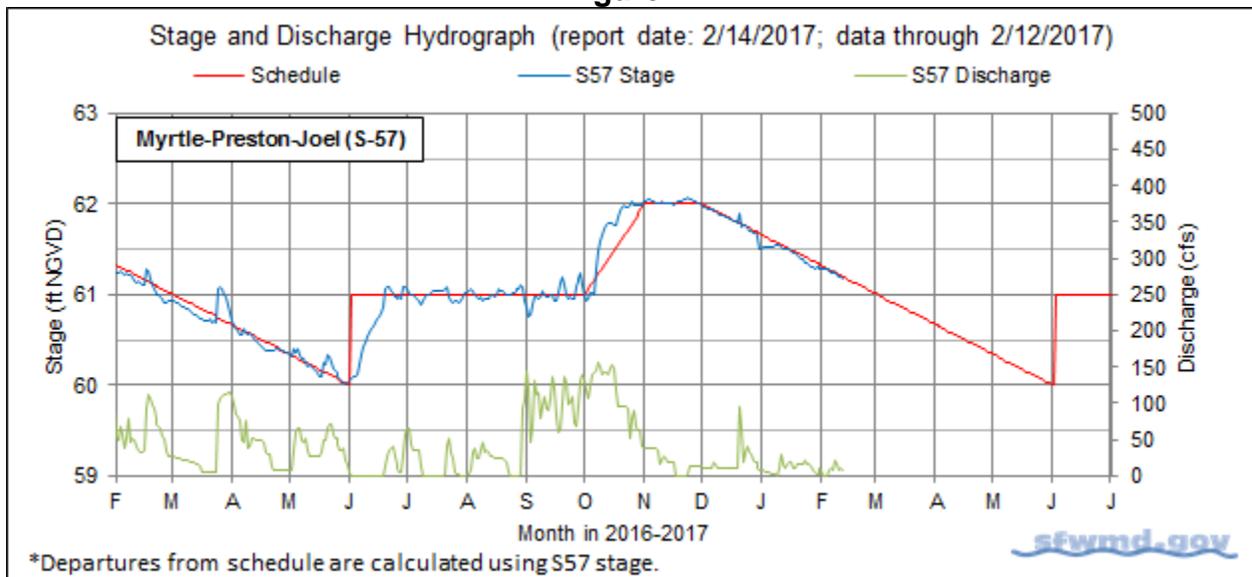


Figure 5.

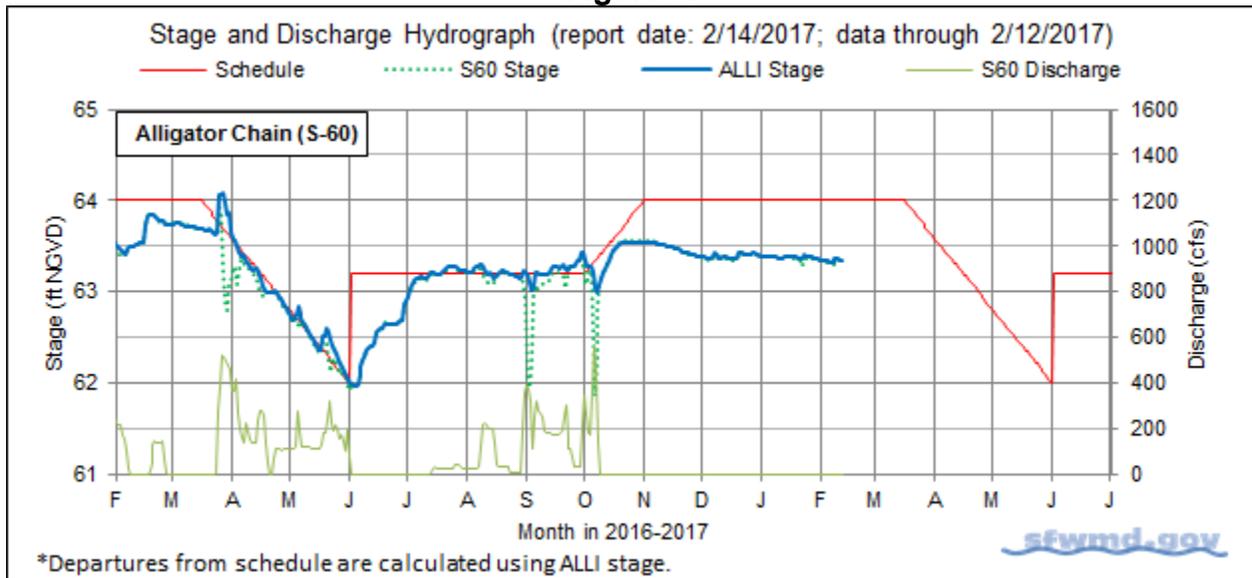


Figure 6.

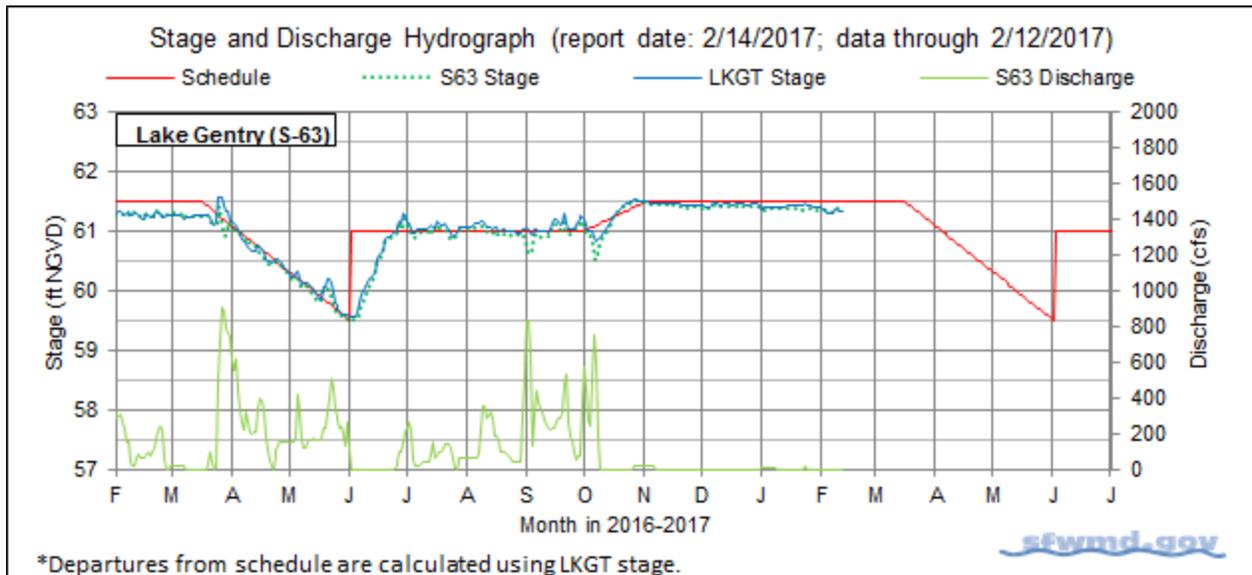


Figure 7.

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

15

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

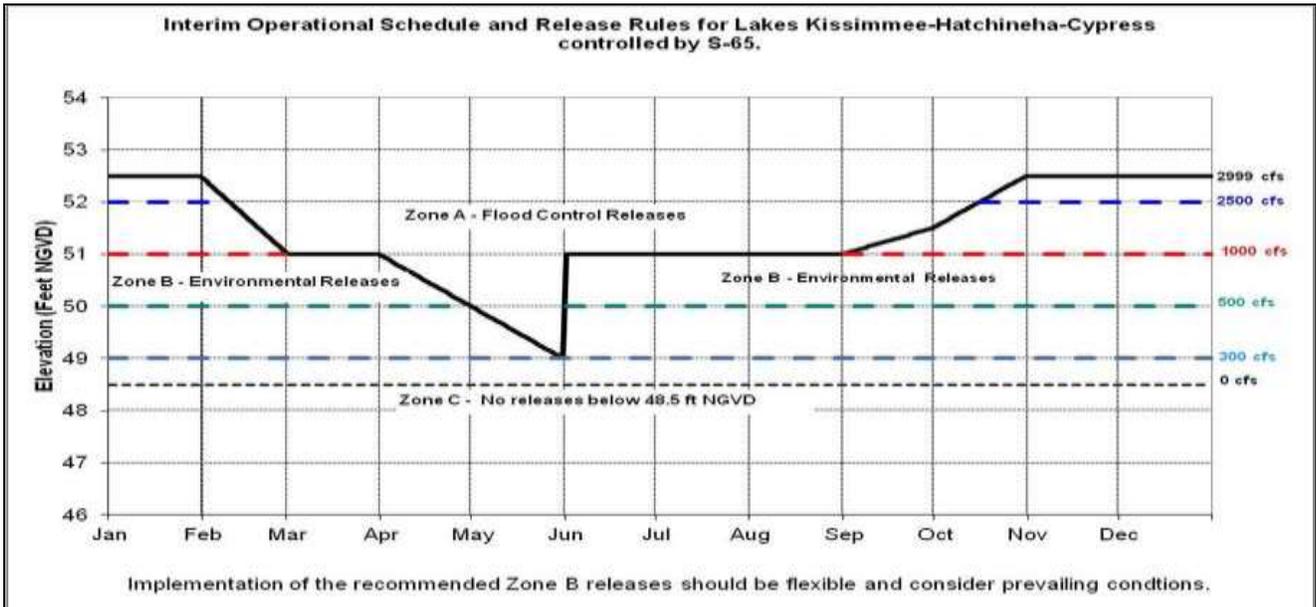


Figure 9. Interim operations schedule for S-65. The discharge schedule shown to the right has not been used in recent years or in Wet Season 2015.

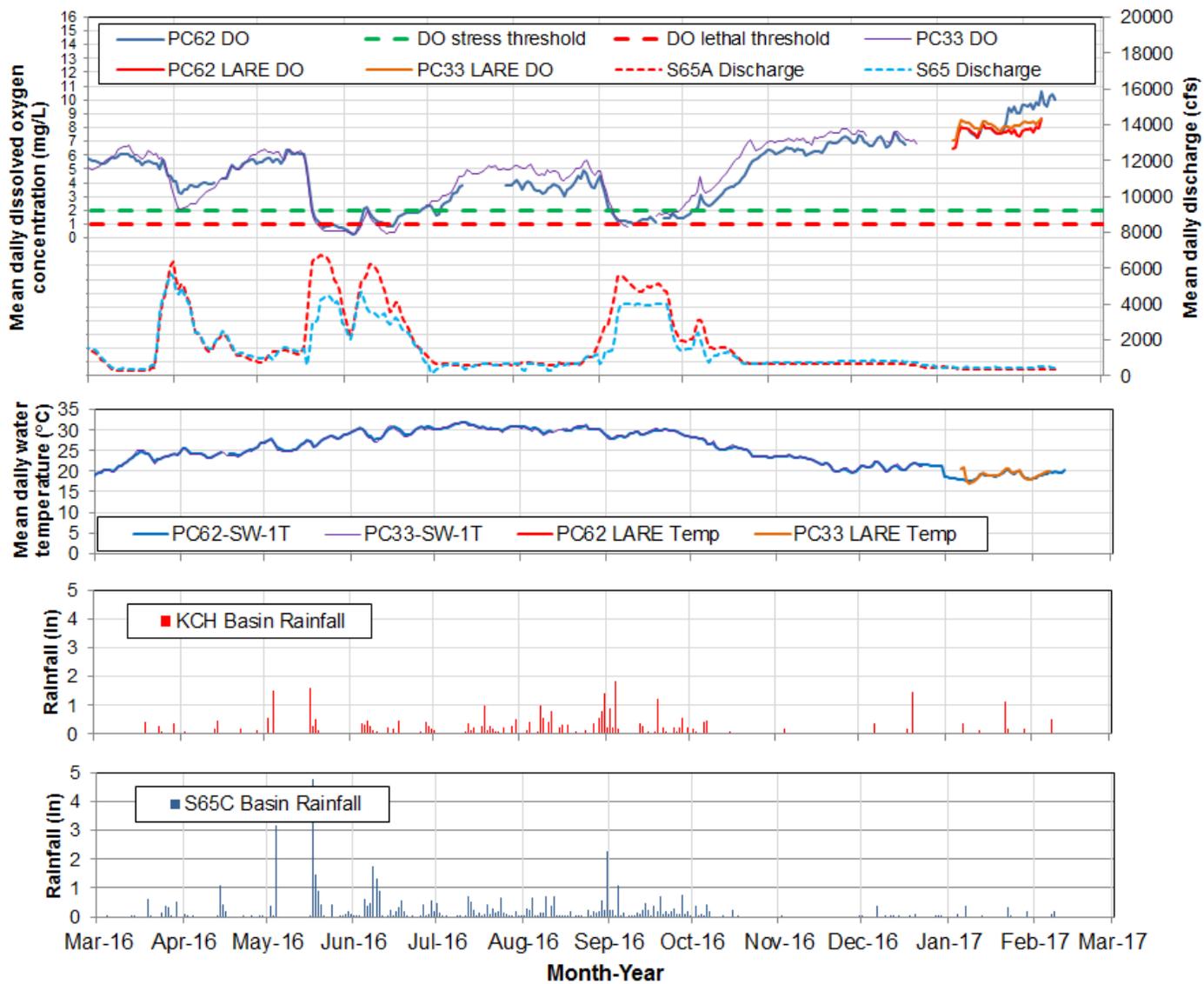


Figure 10. Mean daily Dissolved Oxygen, discharge, temperature and rainfall in the Phase I river channel.

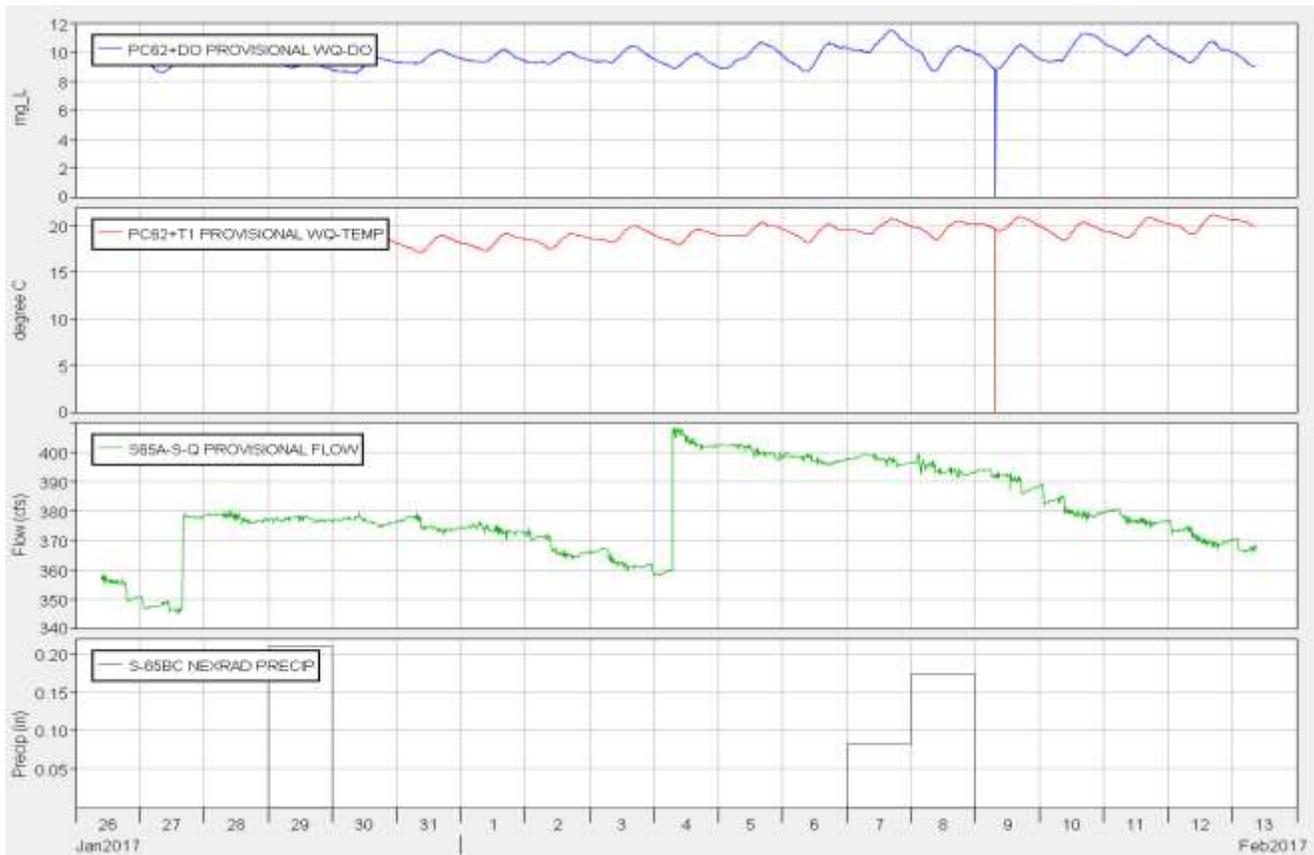


Figure 11. Phase I river channel dissolved oxygen and water temperature (measured at 15 minute intervals) and Pool BC daily rainfall.

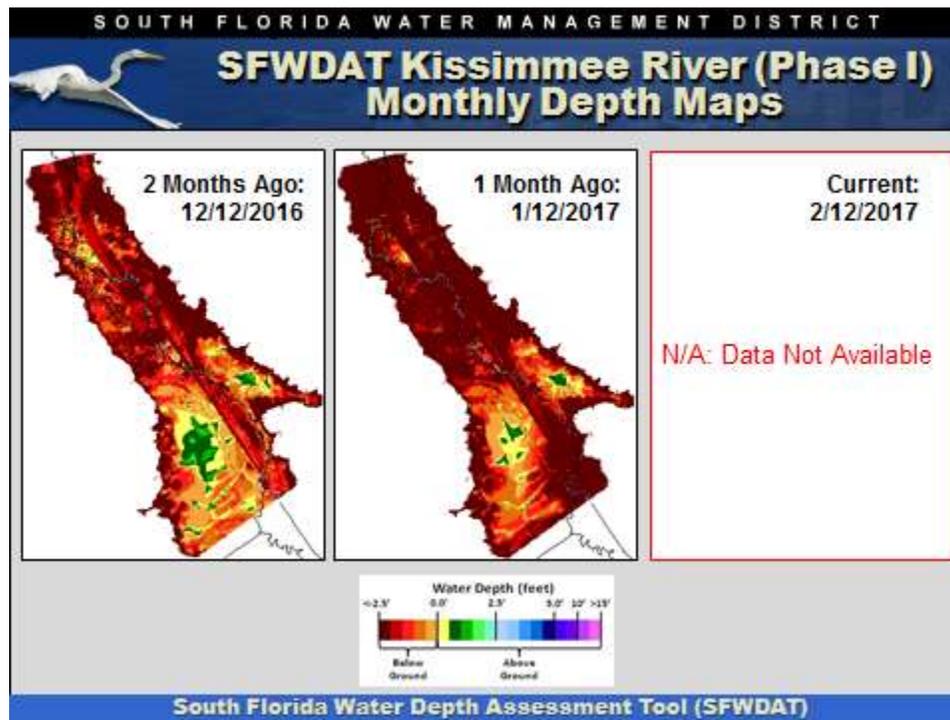
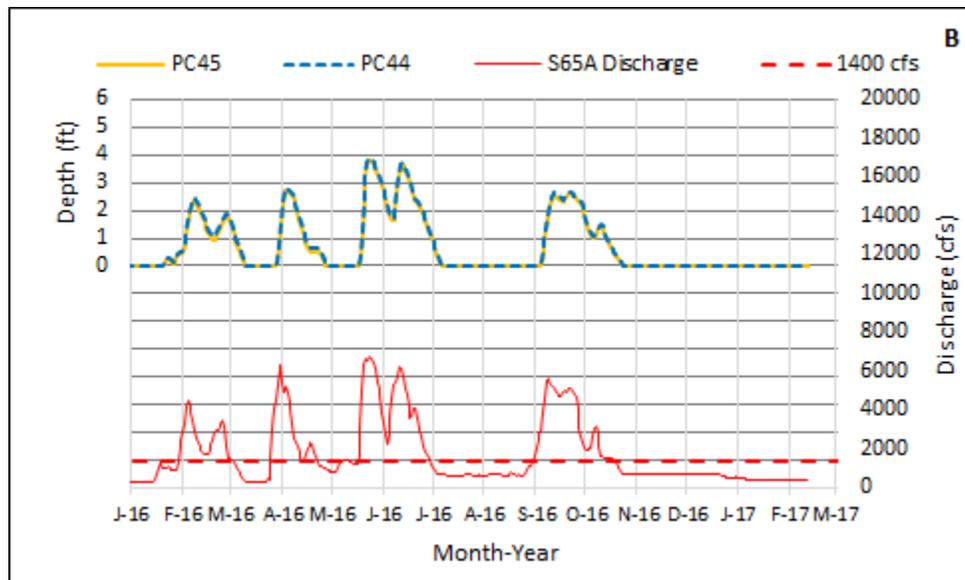
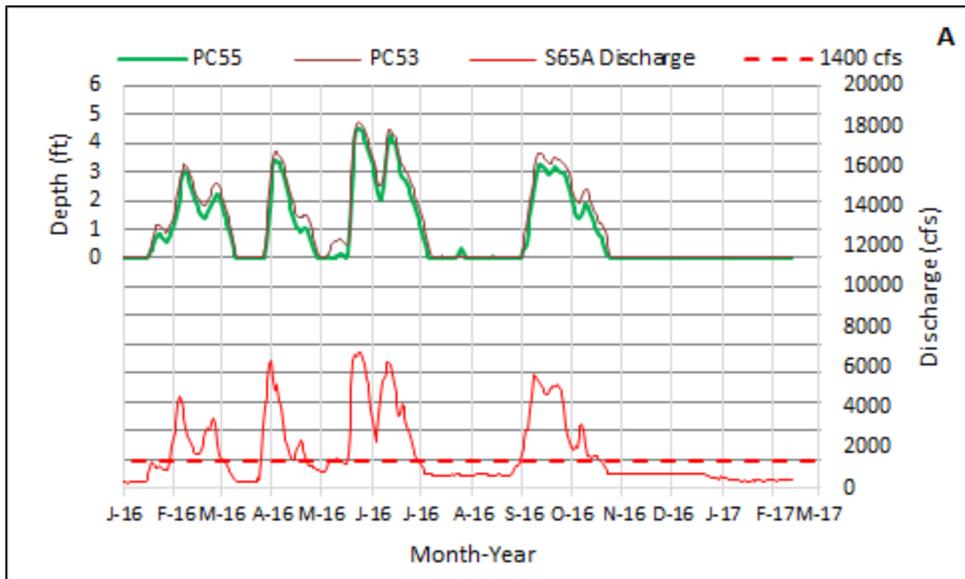


Figure 12. Phase I area floodplain water depths for this week, one month ago, and two months ago. Note that the WDAT color-coding has been modified to accommodate greater water depths; these maps are not directly comparable to Kissimmee Basin WDAT maps published prior to Jan. 16, 2012.



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

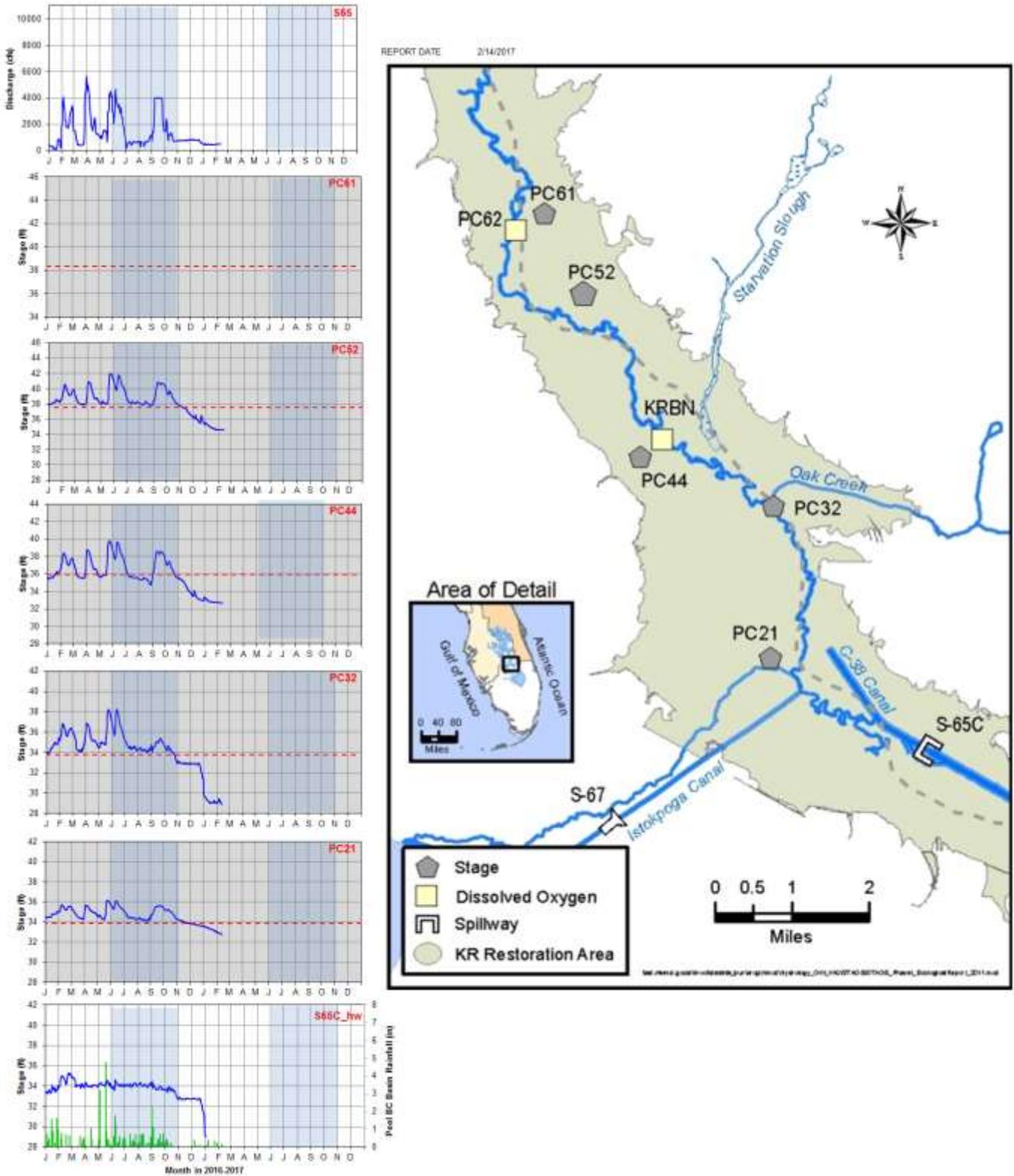


Figure 13. Discharge at S65, stages at five monitoring stations in the Phase I area of the Kissimmee River floodplain, and headwater stage at S65-C since January 1, 2015. The most recent data (~2 weeks) are provisional real-time data from SFWMD DualTrend; previous data are from SFWMD DB-HYDRO (validated).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

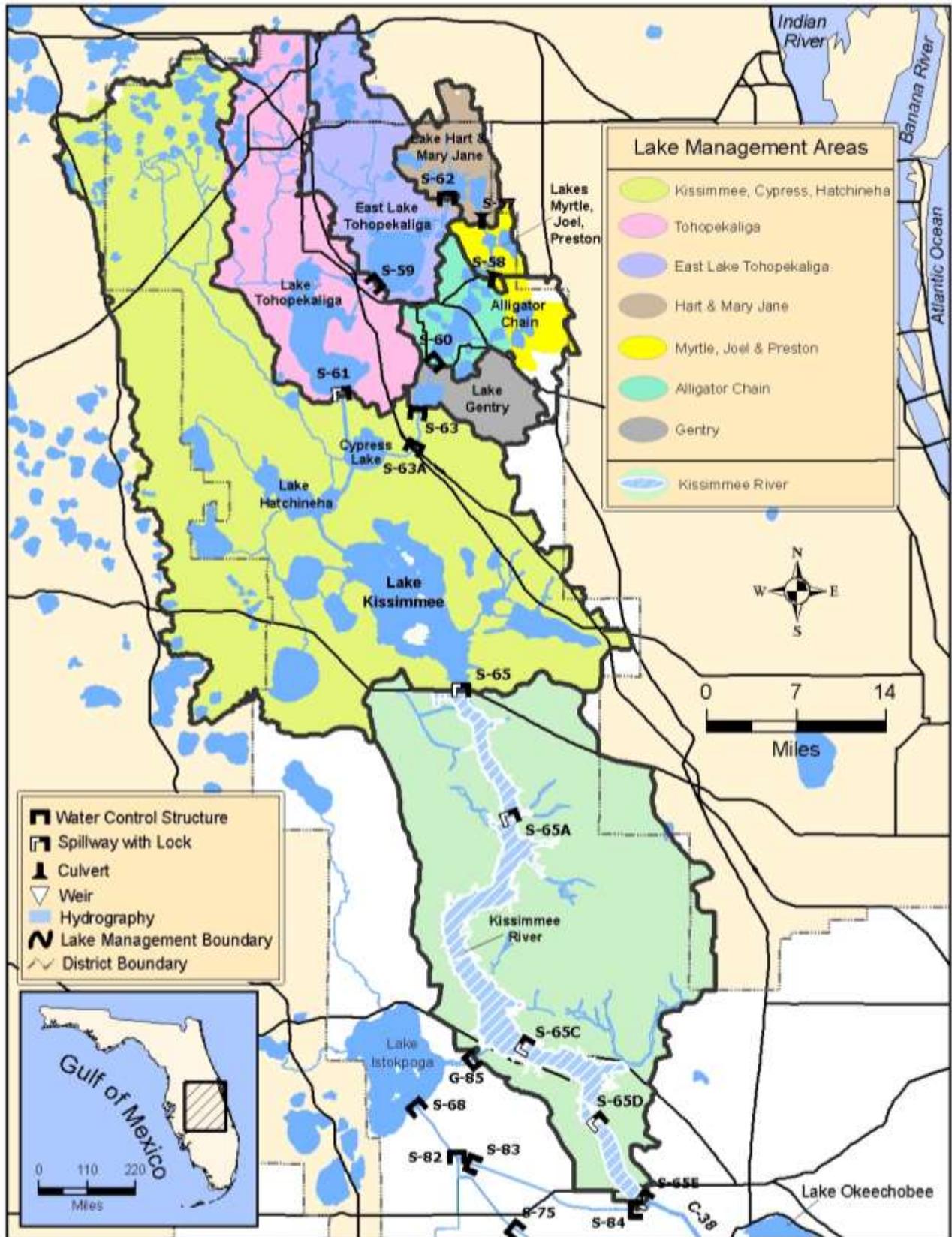


Figure 14. The Kissimmee Basin

LAKE OKEECHOBEE

According to the USACE web site, Lake Okeechobee stage is at 13.71 feet NGVD for the period ending at midnight on February 12, 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 0.08 feet over the past week and is 0.34 feet lower than it was a month ago and 2.55 feet lower than it was a year ago (Figure 1). The Lake is currently in the Low sub-band but 0.18 feet from the top of the Baseflow sub-band (Figure 2). According to RAINDAR, 0.030 inches of rain fell directly over the Lake during the past seven days (Figure 3). The upper Kissimmee valley received higher rainfall amounts while the extreme southern region of the watershed did not receive any rainfall.

Based on USACE reported values, current Lake inflow is approximately 331 cfs as detailed below.

Structure	Flow cfs
S65E	436
S154	0
S84 & 84X	0
S71	0
S72	0
C5 (Nicodemus slough dispersed storage)	-106
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 3,039 cfs with 1,386 cfs exiting at S77 and 196 cfs exiting at the L8 canal through Culvert 10A. Approximately 1,480 cfs is being directed south through S351, S352 and S354 and an additional 23 cfs is back flowing through S308. Corrected evapotranspiration value based on the L006 weather platform solar radiation data for this past week was 1,361 cfs.

Change in elevation equivalents and average weekly flows (midnight February 6, 2017 to midnight February 12, 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 38,895 acres of suitable foraging habitat for long-legged birds and 21,000 acres for long and short-legged birds on the Lake (Figure 5). Current conditions are similar to the 2014 wading bird season which was considered a good year in terms of wading bird utilization of the Lake.

The quarterly submerged aquatic vegetation (SAV) sampling was conducted last week and 14 of the 44 sites had plants (Figure 6, far right panel). The northern and western sites maintained the SAV beds that were present during the previous two quarters (August and October) but the sites along the

southern and southwestern nearshore zones still have not recovered from the high Lake stages experienced during last year's growing season.

The most recent available MODIS satellite images (February 10 and 12, 2017) indicate low bloom potential (Figure 7).

Water Management Recommendations

Lake stage is 13.71 feet NGVD and continues to fall at a steady rate. The current weekly recession rate of 0.08 feet equates to a monthly recession rate of 0.32 feet, which is within the preferred range. A too rapid decrease in Lake levels may jeopardize the upcoming wading bird season by drying out foraging locations too early in the winter.

From an ecological perspective, high Lake levels over the past spring and summer resulted in a loss of SAV and increased cyanobacterial blooms and associated toxins. Near optimal Lake stages will be necessary this coming spring and summer to provide conditions conducive to the reestablishment of the SAV acreage lost this year due to high Lake stages.

The goal should be to continue to lower Lake levels but at a rate of no more than 0.50 feet per month. Actions which contribute to a continued steady but slow recession and avoid reversals are essential to protect critical components of the Lake's floral (bulrush and SAV) and faunal (wading birds, snail kites and fish) communities.

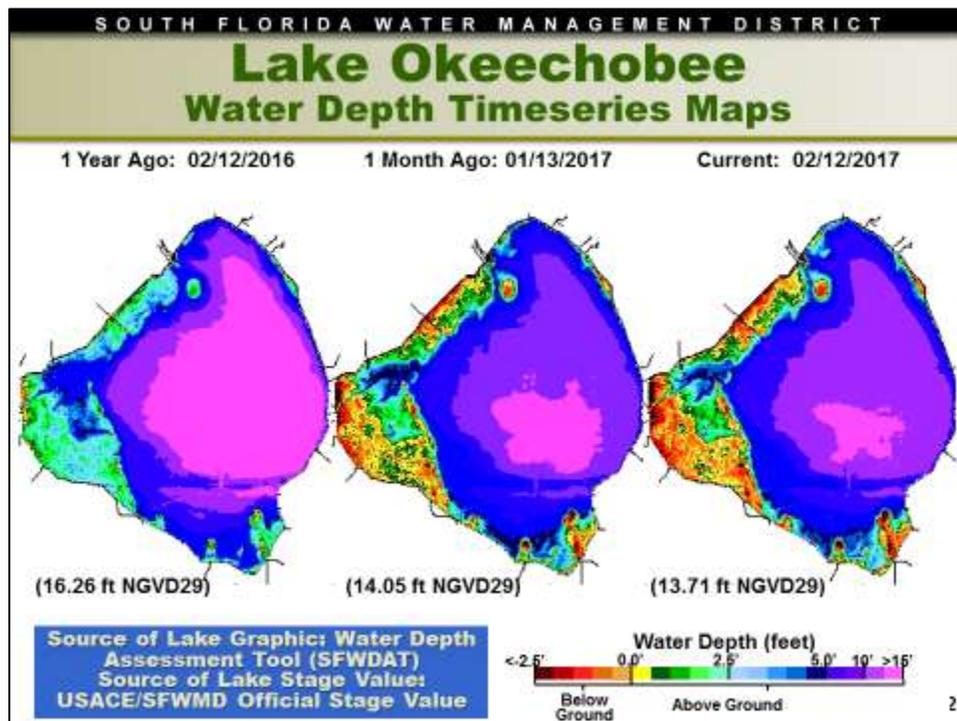


Figure 1

Weekly Stage Hydrograph

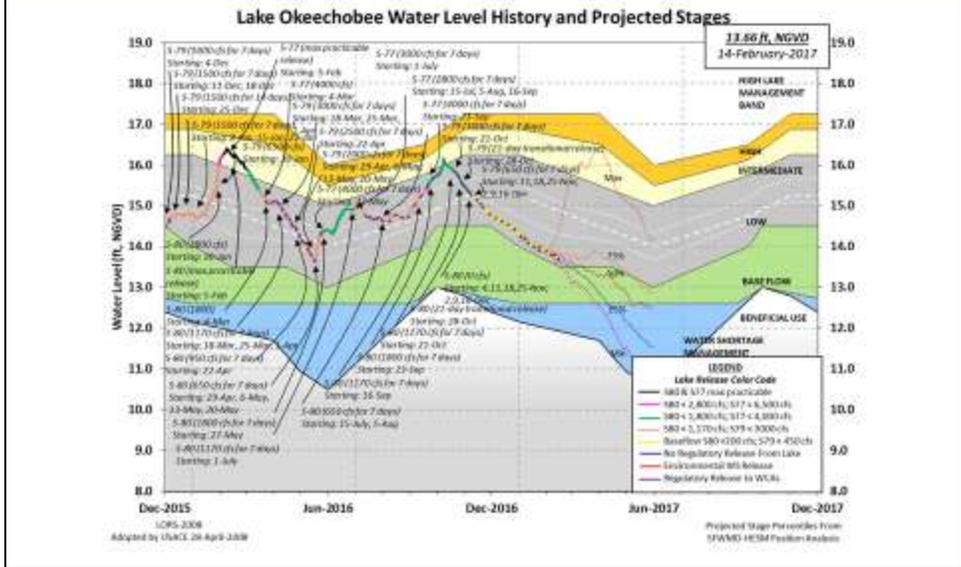
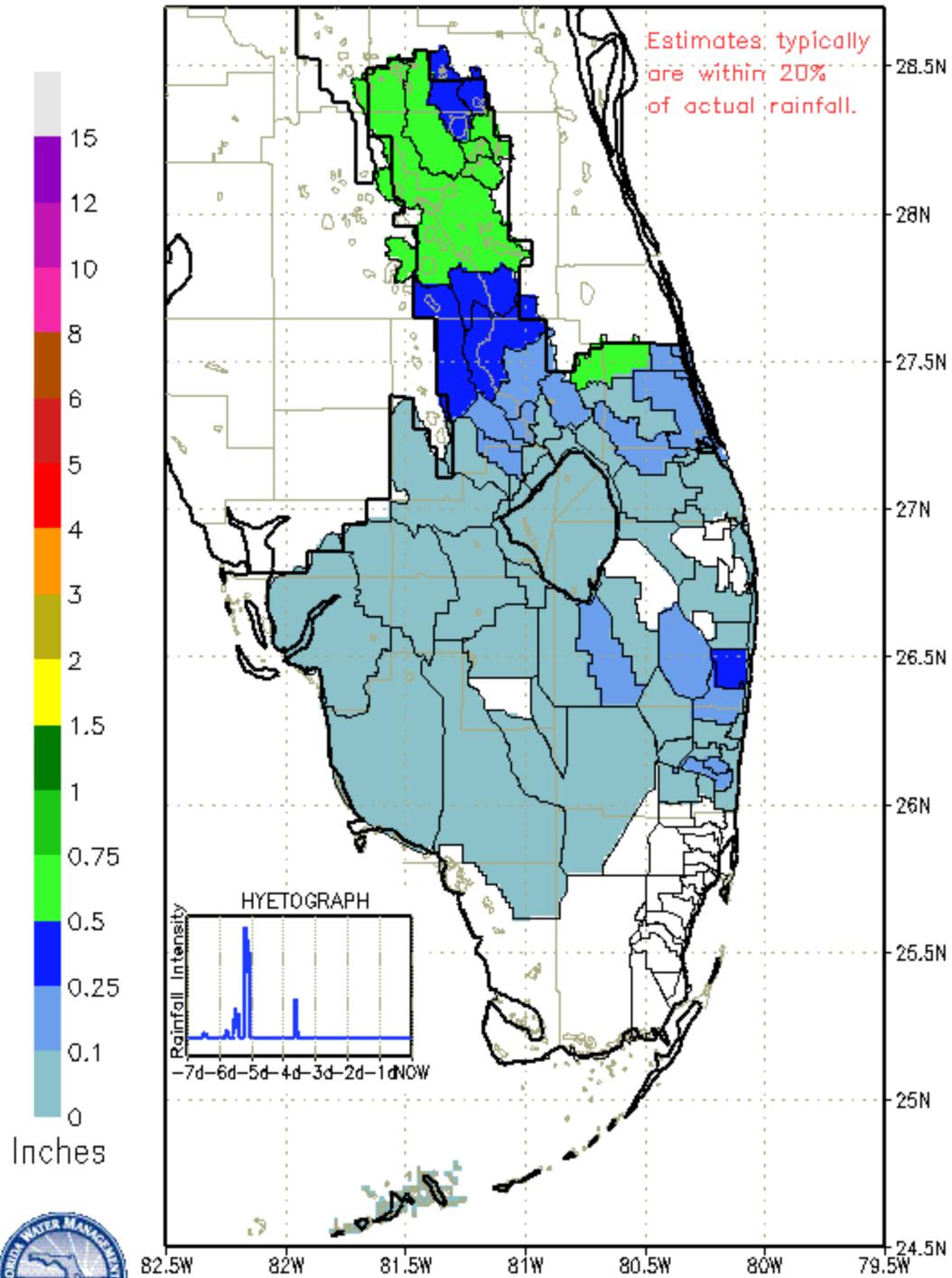


Figure 2

SFWMD PROVISIONAL RAINFAR 7-DAY BASIN RAINFALL ESTIMATES

FROM: 0615 EST, 02/06/2017 THROUGH: 0615 EST, 02/13/2017



DISTRICT-WIDE RAINFALL ESTIMATE: 0.123"



Figure 3

INFLOWS	Average Daily Flow Past Week cfs	Feet of Change Past Week
S65E	540	0.019
S71 & 72	0	0.000
S84 & 84X	0	0.000
Fisheating Creek	17	0.001
Rainfall	N.A.	0.003
OUTFLOWS	Average Daily Flow Past Week cfs	Feet of Change Past Week
S77	1039	0.036
S308	0	0.000
S351	586	0.021
S352	113	0.004
S354	610	0.021
L8	194	0.007
ET	1361	0.048

Figure 4

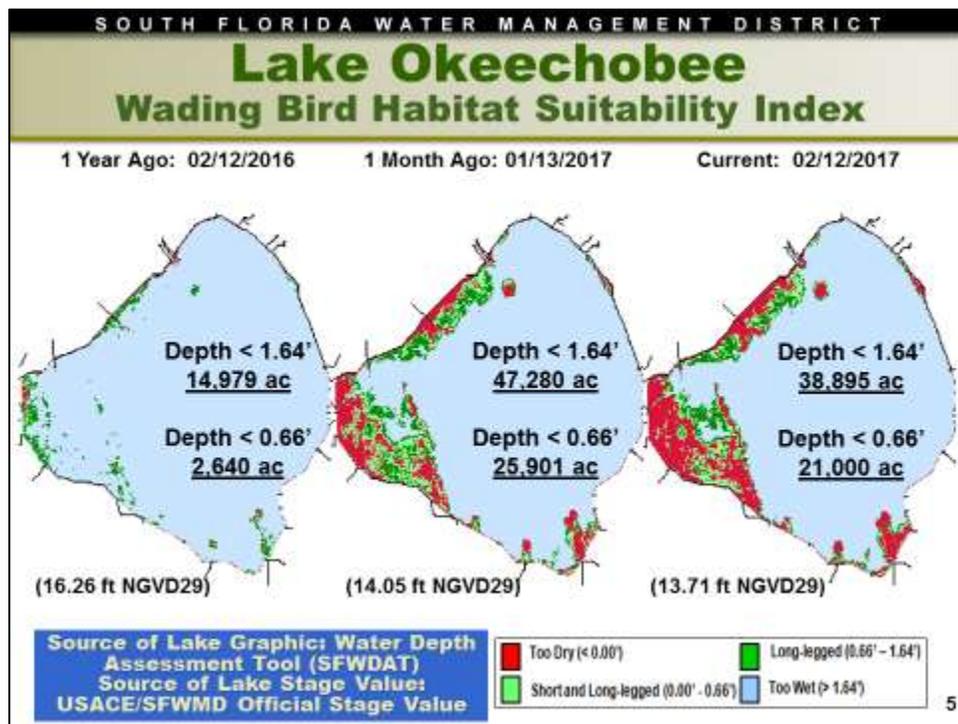


Figure 5

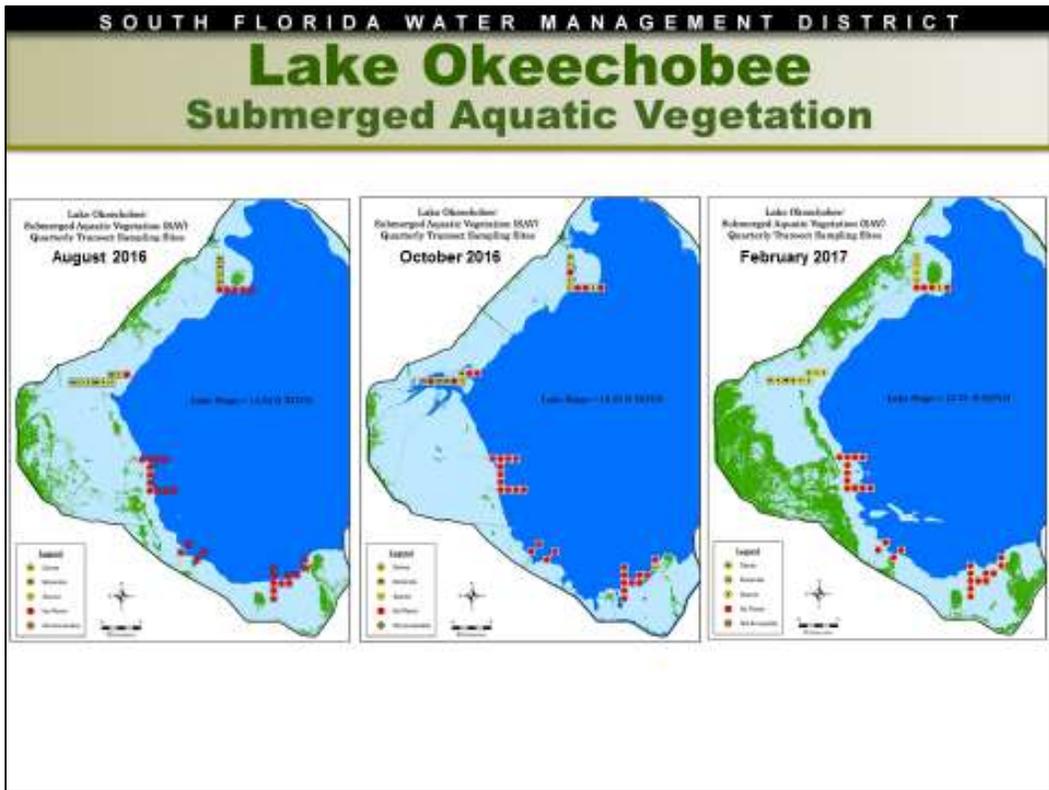


Figure 6

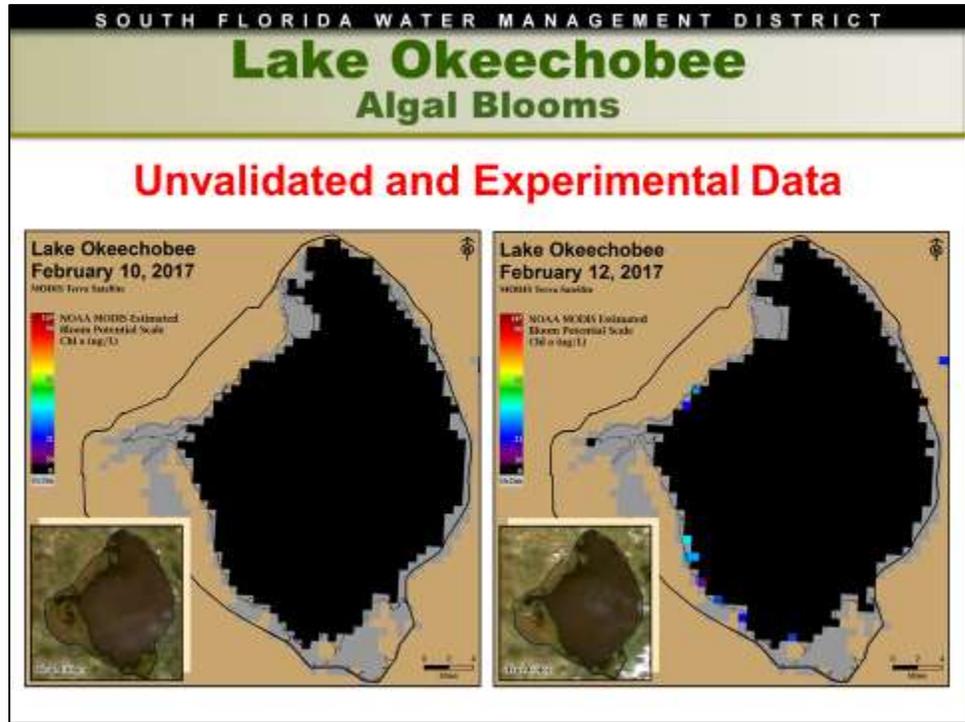


Figure 7

Lake Istokpoga

The Lake Istokpoga regulation schedule is at winter pool stage of 39.50 feet NGVD. Lake stage is 39.17 feet NGVD and is currently 0.33 feet below regulation stage (Figure 8). Average flows into the Lake from Arbuckle and Josephine creeks were 94 cfs and 17 cfs respectively, which is a decrease from last week's total flow. Average discharge from S68 and S68X this past week was 50 cfs, also a decrease from the previous week's flow. According to RAINDAR, 0.275 inches of rain fell in the Lake Istokpoga watershed during the past seven days.

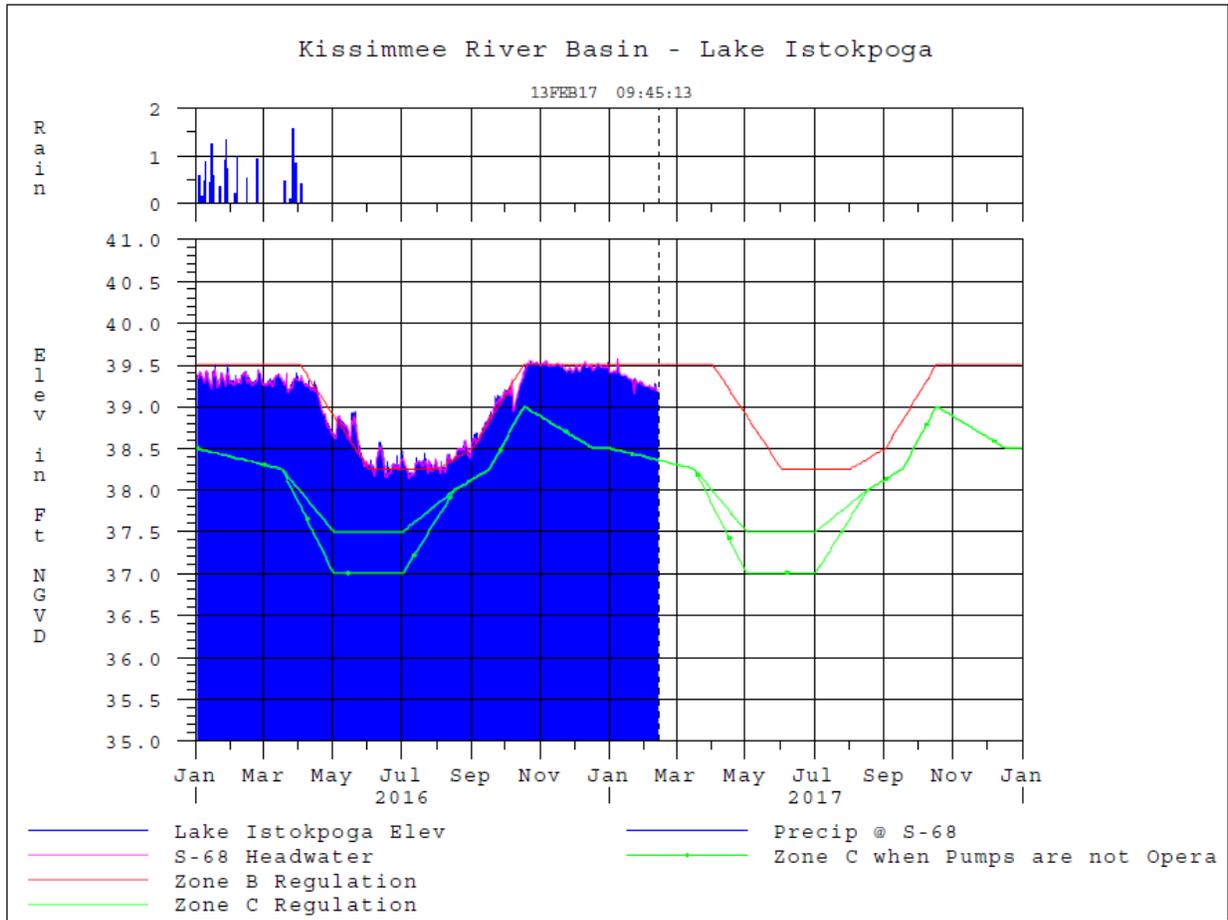


Figure 8

ESTUARIES

St. Lucie Estuary

Over the past week, provisional flows averaged about 0 cfs at S-80, 11 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 53 cfs from Ten Mile Creek at the Gordy Road Structure. Average inflow from tidal basin tributaries is estimated to be 38 cfs (Figures 1 and 2). Total inflow averaged about 91 cfs last week and 152 cfs over last month.

Over the past week, surface 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 26.3. 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)	24.3 (23.0)	25.4 (25.3)	NA ¹
US1 Bridge	26.1 (25.9)	26.6 (26.6)	10.0-26.0
A1A Bridge	31.4 (31.2)	32.2 (32.3)	NA

¹Envelope not applicable

Caloosahatchee Estuary

During the past week, provisional flows averaged approximately 1,042 cfs at S-77, 571 cfs at S-78, and 705 cfs at S-79. Average inflow from tidal basin tributaries is estimated to be 64 cfs (Figures 5 and 6). Total inflow averaged 769 cfs last week and 768 cfs over last month.

Over the past week in the estuary, surface salinity increased downstream of S-79 (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 4.7 at Val I-75 and 11.1 at Ft. Myers. The 30-day moving average salinity at Ft. Myers has been over 10 for 44 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 be 4.6 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 (2.9)	2.7 (2.9)	NA ¹
*Val I75	3.8 (3.6)	5.0 (6.0)	0.0-5.0 ²
Ft. Myers Yacht Basin	9.8 (9.4)	10.6 (12.6)	NA
Cape Coral	17.8 (16.8)	19.0 (18.5)	10.0-30.0
Shell Point	28.0 (26.0)	29.1 (27.5)	10.0-30.0
Sanibel	>31 (>30)	31.7 (31.1)	10.0-30.0

¹Envelope not applicable, ²Envelope 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 <i>a</i> (µg/l)	0.24 – 18.80	5.92 – 13.72	1.64 – 20.19 spike to 33.68
Dissolved Oxygen (mg/l)	6.57 – 9.04	5.66 – 8.25	No Data

The Florida Fish and Wildlife Research Institute reported on February 10, 2017, that *Karenia brevis*, the Florida red tide organism, persists in Southwest Florida from southern Pinellas to Lee counties. *Karenia brevis* was observed in background to high concentrations in twelve samples collected from Lee County. The highest near-shore sampling was a medium concentration near Boca Grande Pass. Fish kills were reported at Bonita Beach in Lee County over the past week.

Water Management Recommendations

While salinity conditions in the upper portion of the Caloosahatchee estuary are improving, the salinity conditions at Ft. Myers remain above the minimum flows and levels exceedance level. Therefore, it is recommended that runoff from the C-43 basin be supplemented with Lake Okeechobee water as a pulsed release of 650 cfs through S-79.

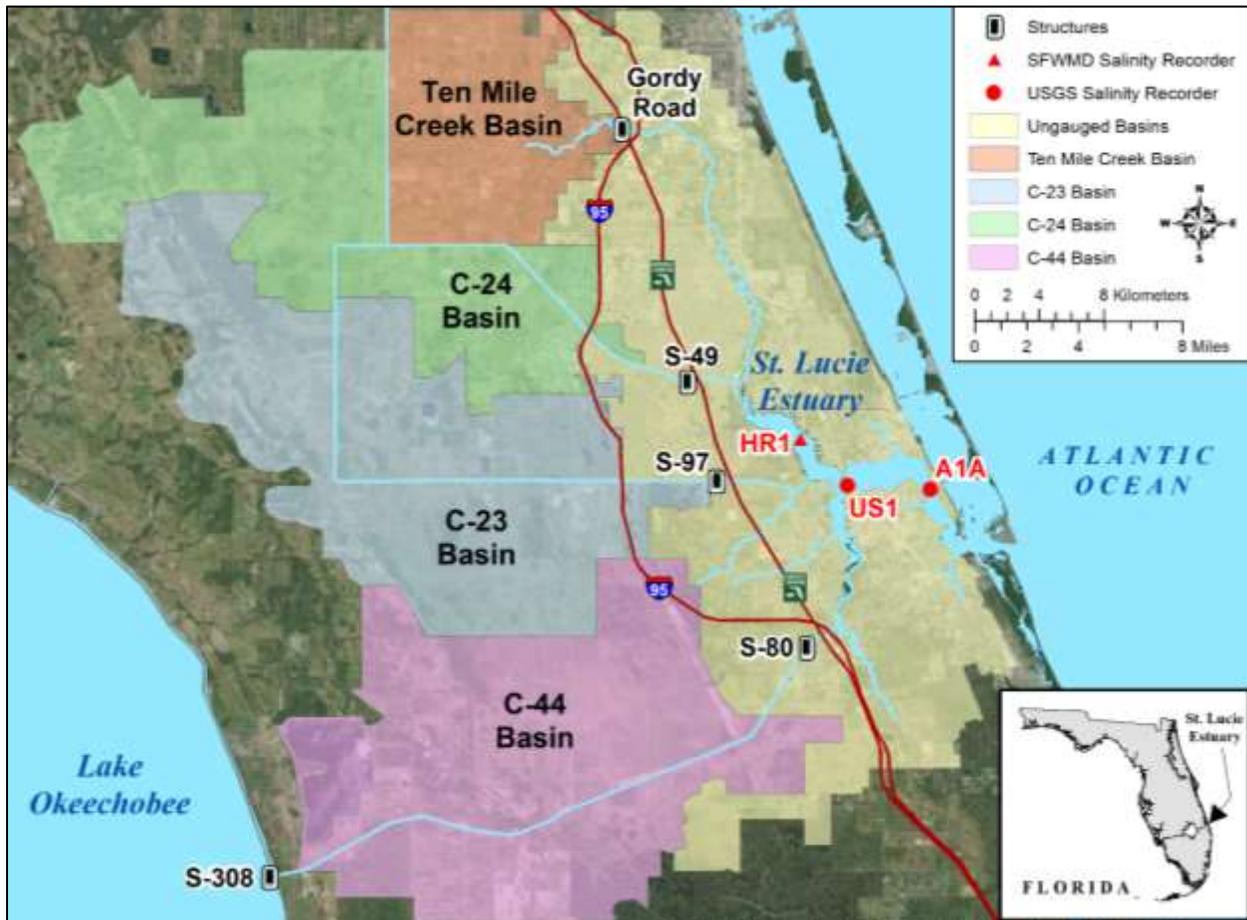


Figure 1. Basins, water control structures, and salinity monitoring for the St. Lucie Estuary.

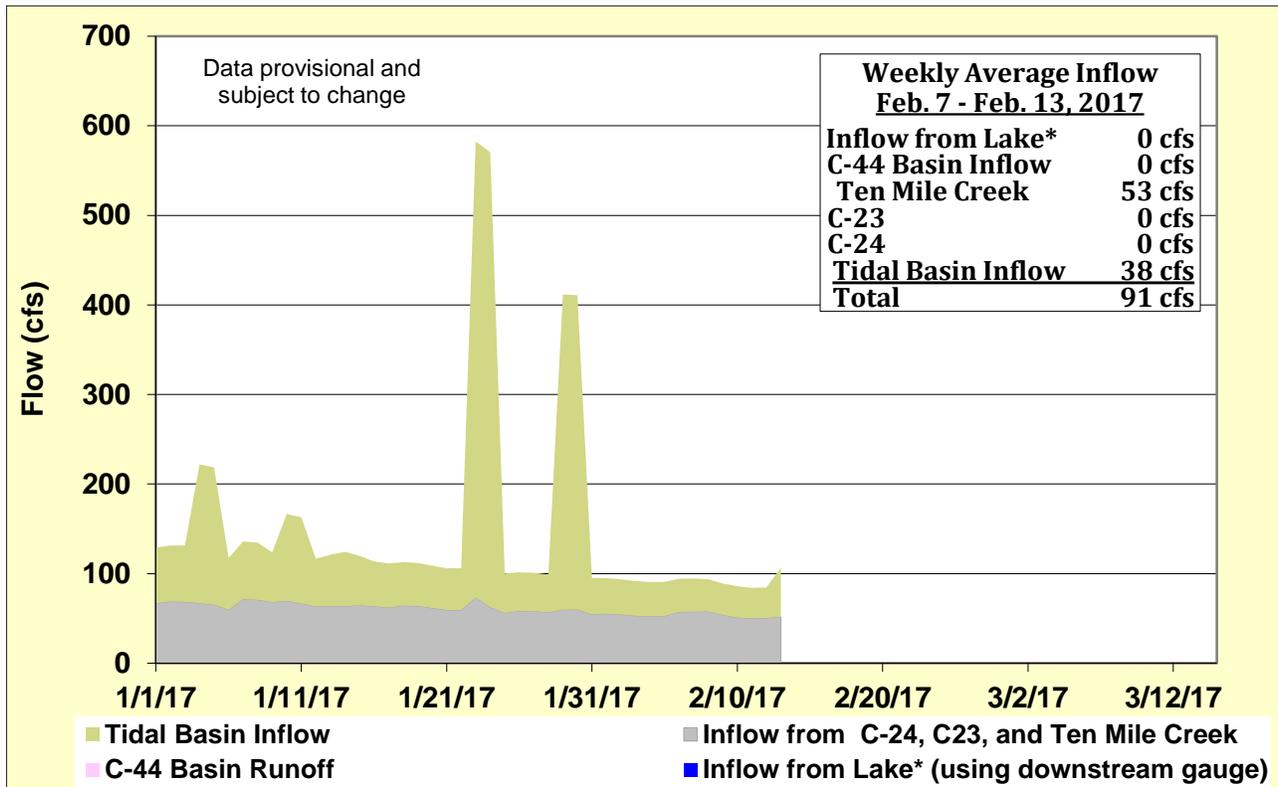


Figure 2. Estimated surface freshwater inflows from Lake Okeechobee and runoff from the C-44, C-23, C-24, Ten Mile Creek, and tidal basins into the St. Lucie Estuary.

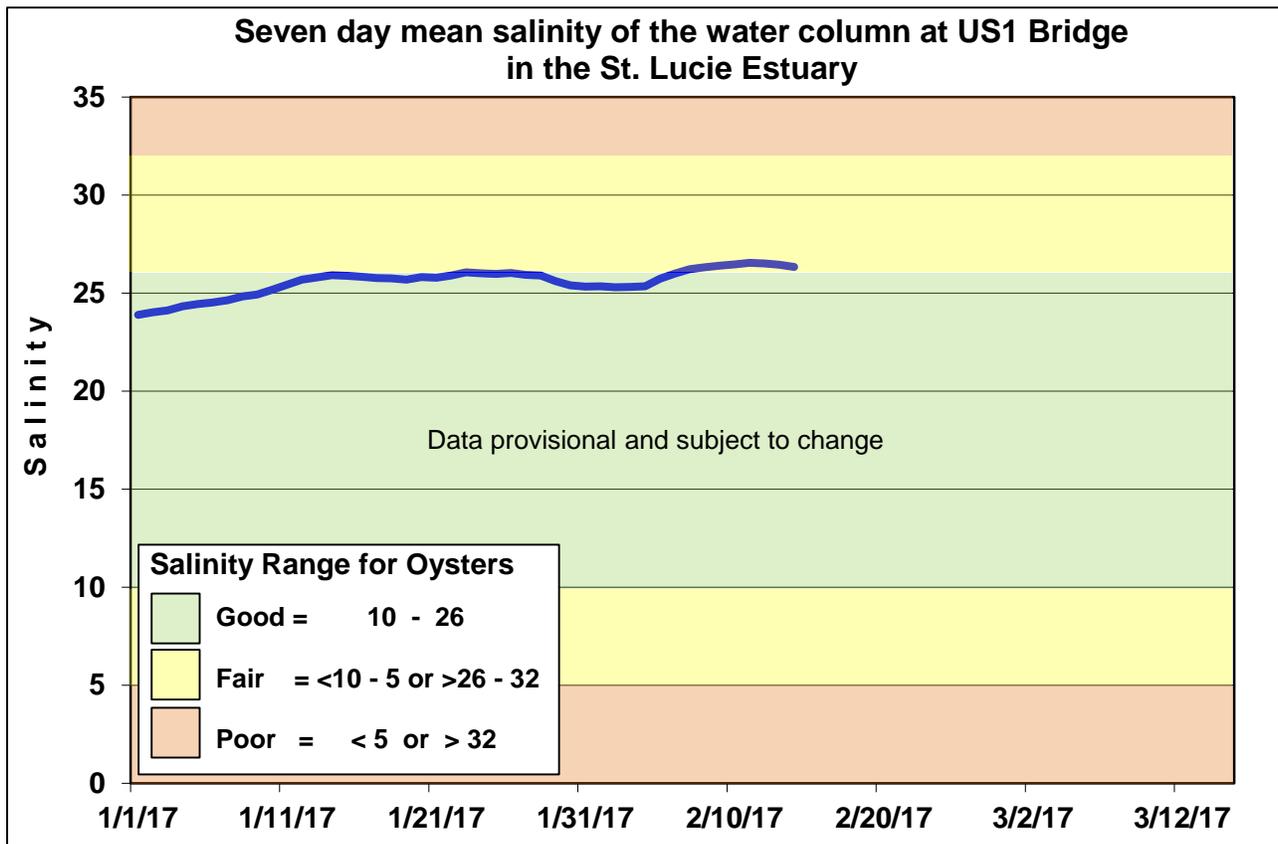


Figure 3. Seven-day mean salinity of the water column at the U.S. Highway 1 Bridge.

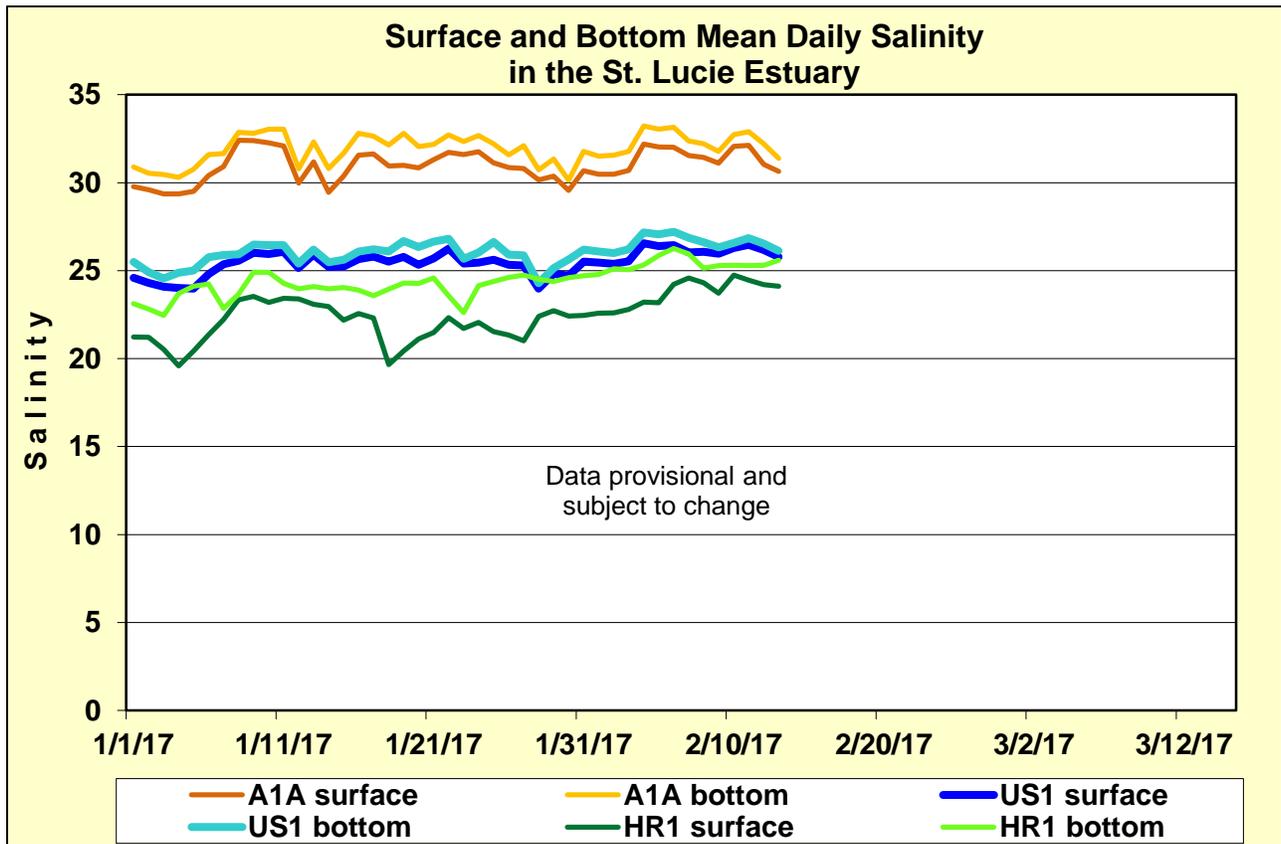


Figure 4. Daily mean salinity at the A1A, US1 and estimated HR1 stations.

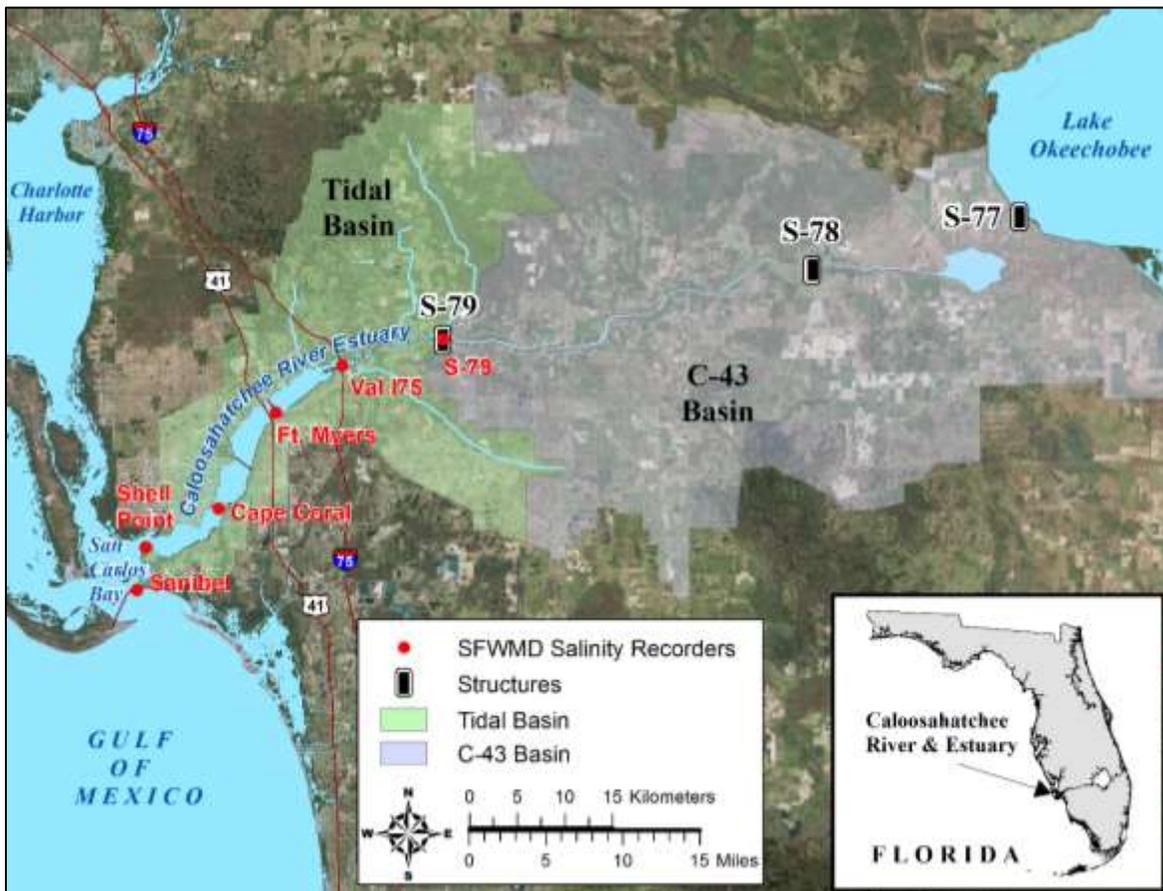


Figure 5. Basins, water control structures, and salinity monitoring for the Caloosahatchee Estuary.

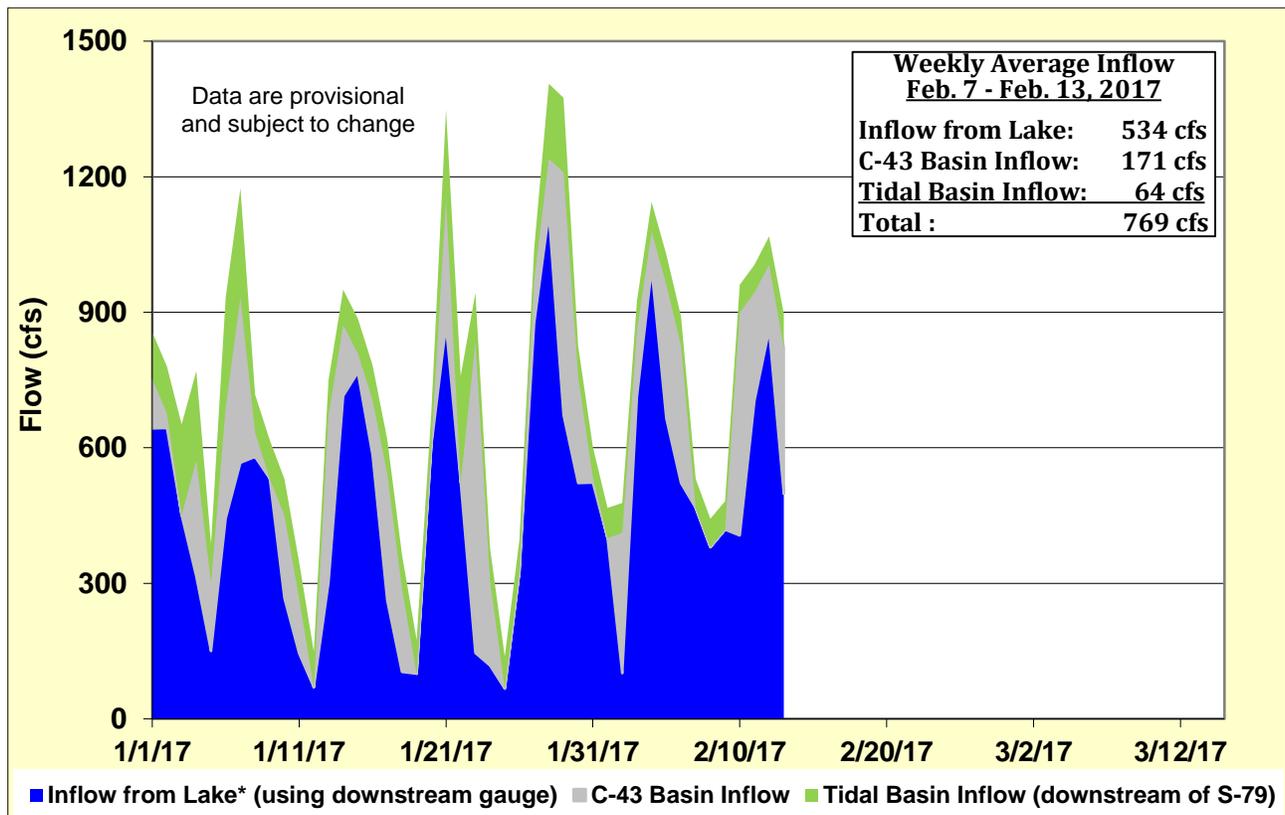
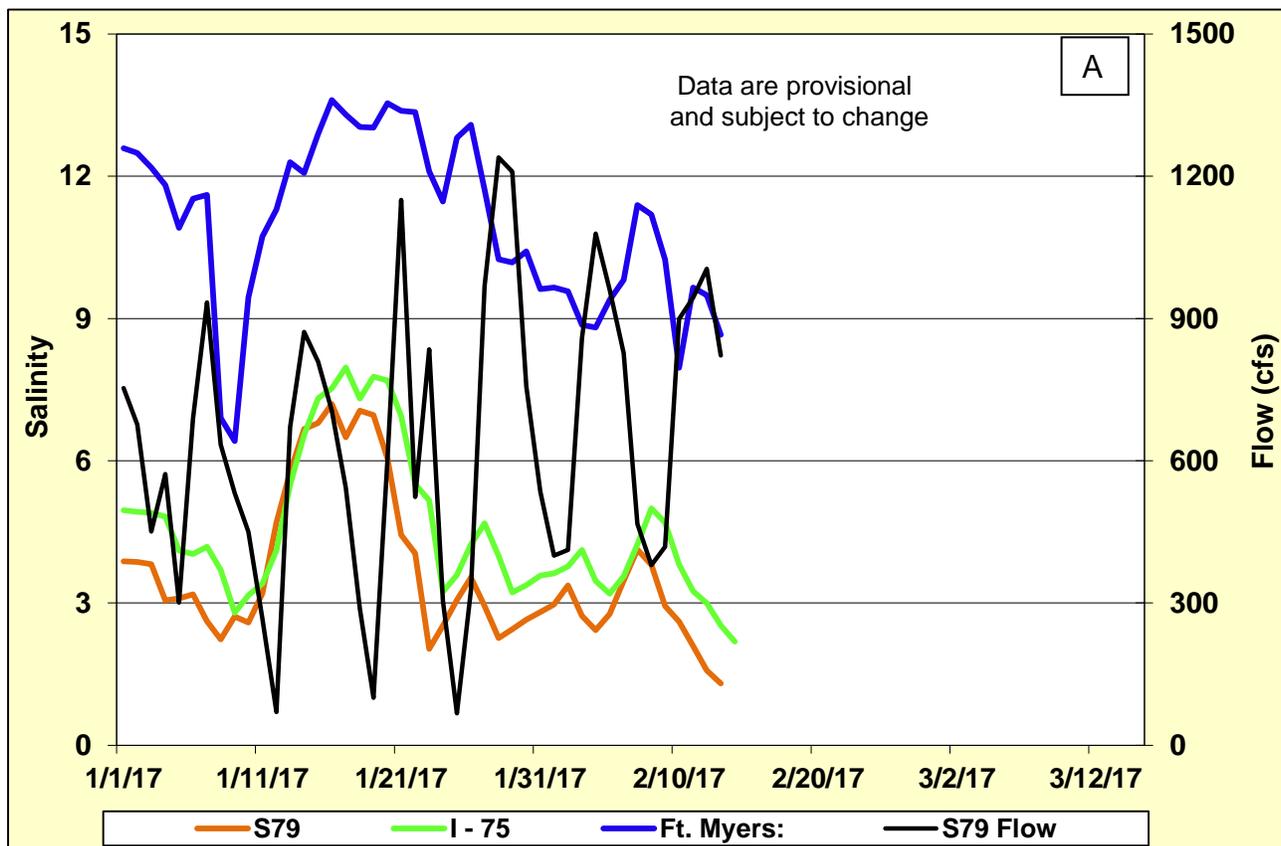


Figure 6. Freshwater inflows from Lake Okeechobee, runoff from the C-43 basin, and tributaries in the tidal basin into the Caloosahatchee River Estuary.



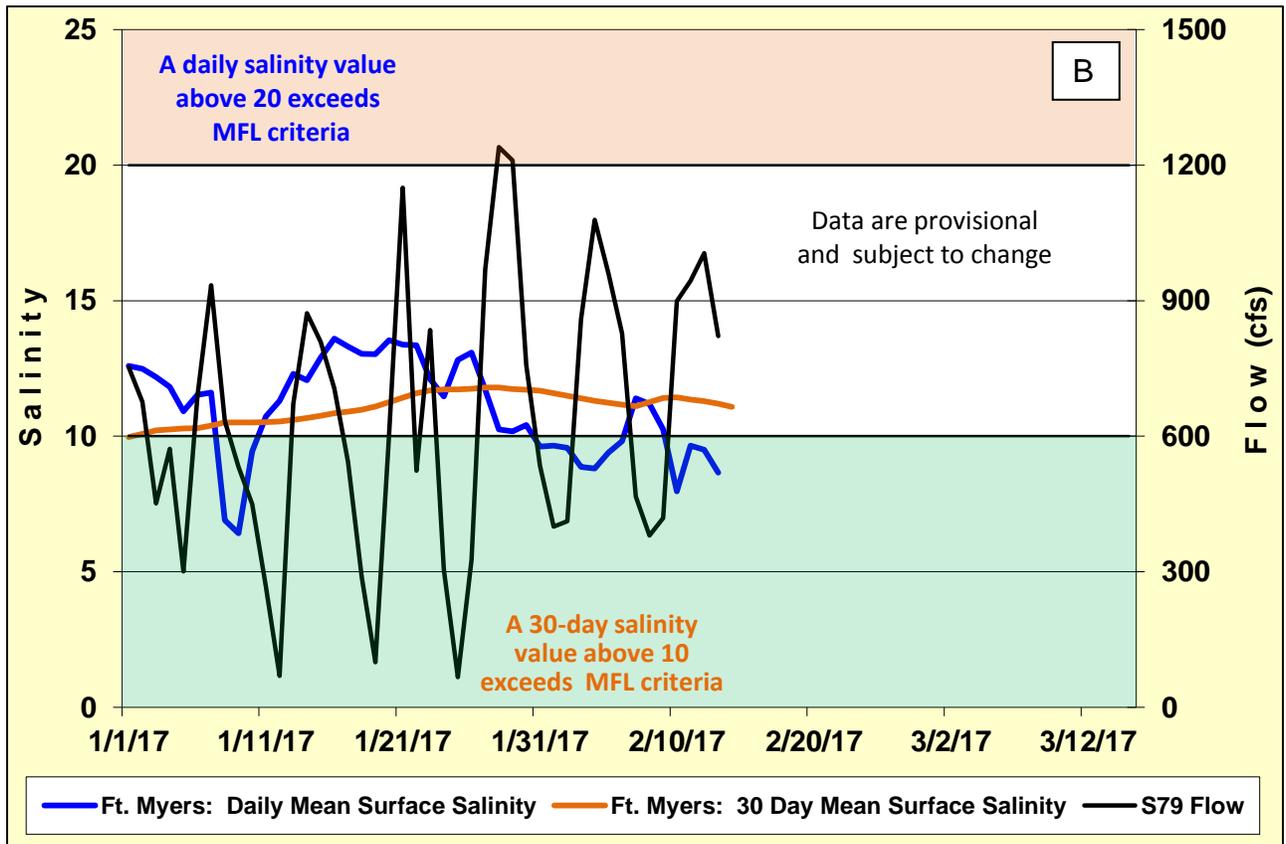


Figure 7. Daily mean flows at S-79 and salinity at upper estuary monitoring stations (A) and 30-day moving average salinity at Ft. Myers (B).

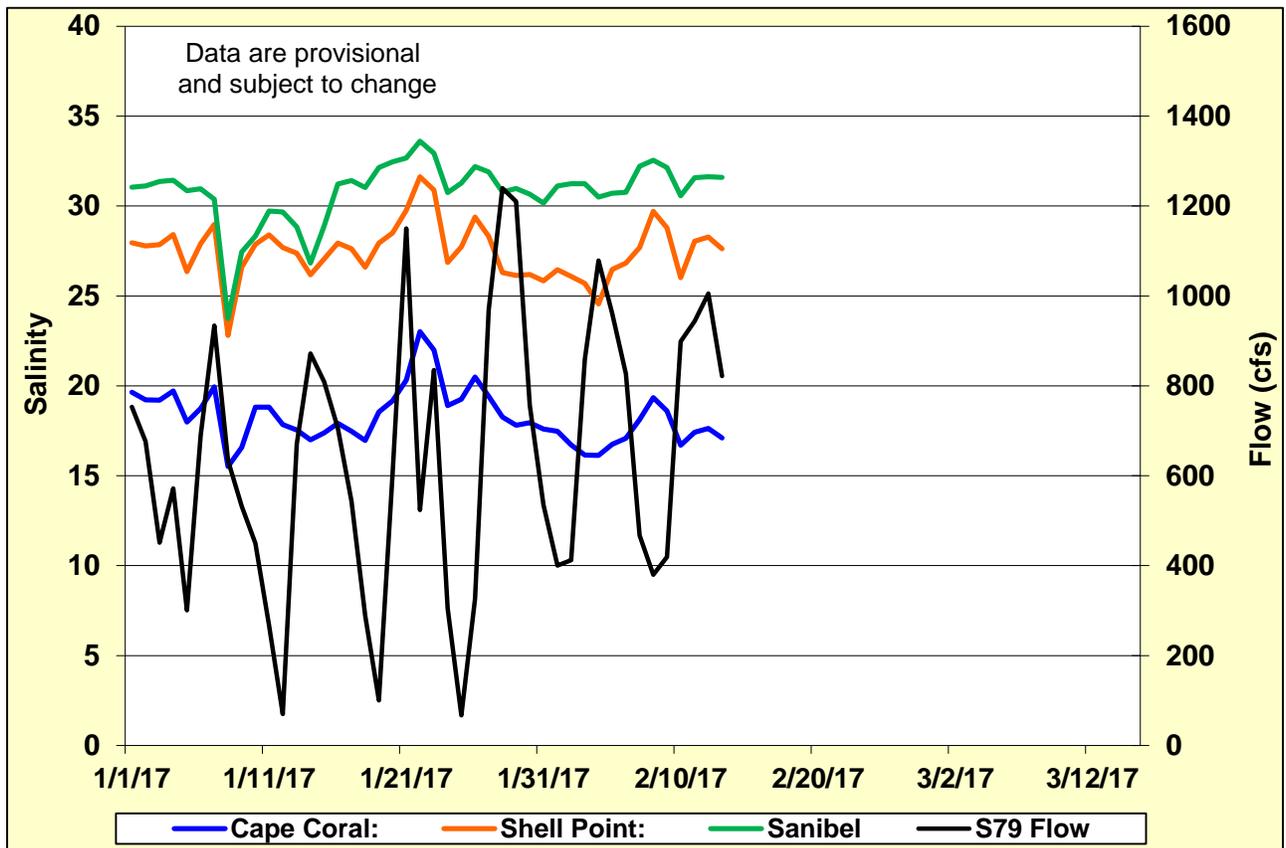


Figure 8. Daily mean flows at S-79 and salinity at lower estuary stations.

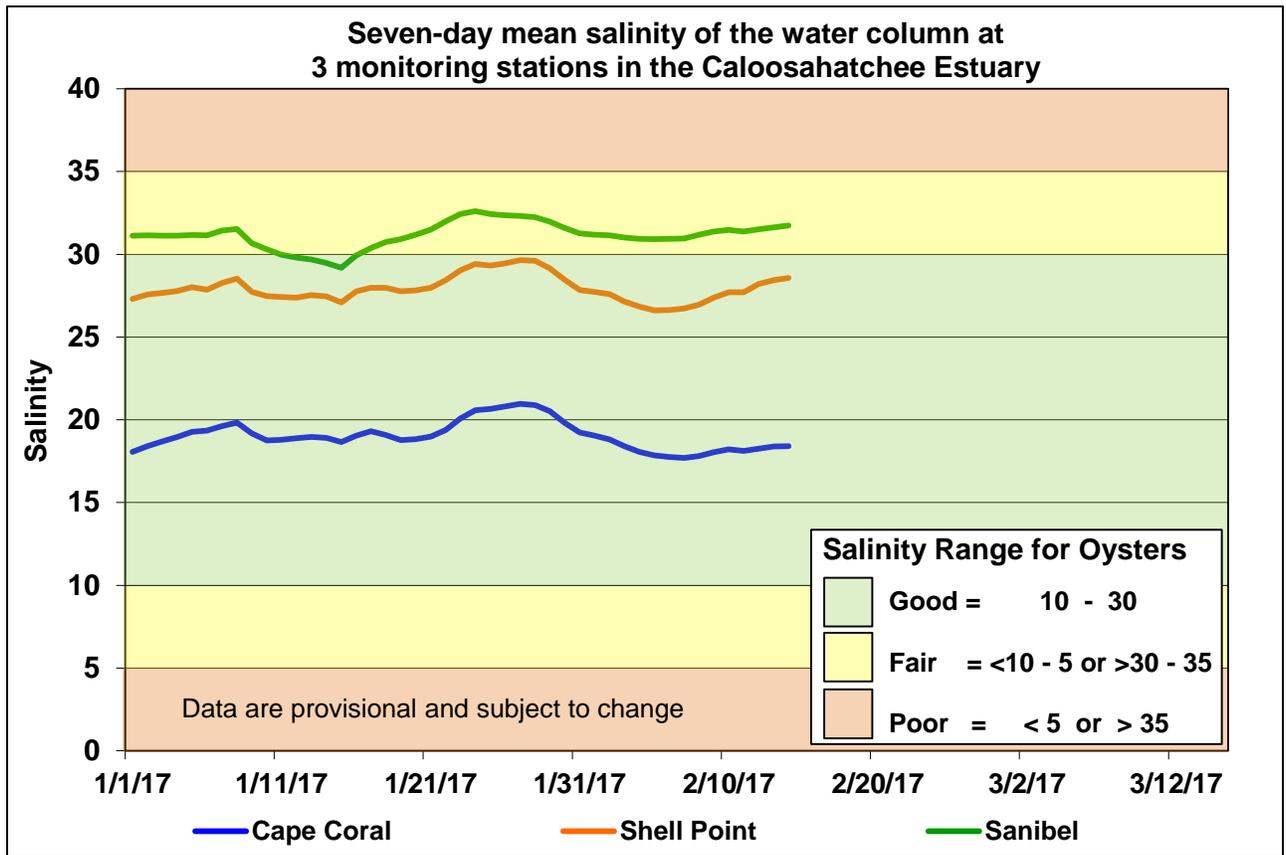


Figure 9. Seven-day mean salinity at Cape Coral Bridge, Shell Point and Sanibel Bridge monitoring stations.

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

Forecast 1: S-79 = 0 cfs & TBR = 110 cfs

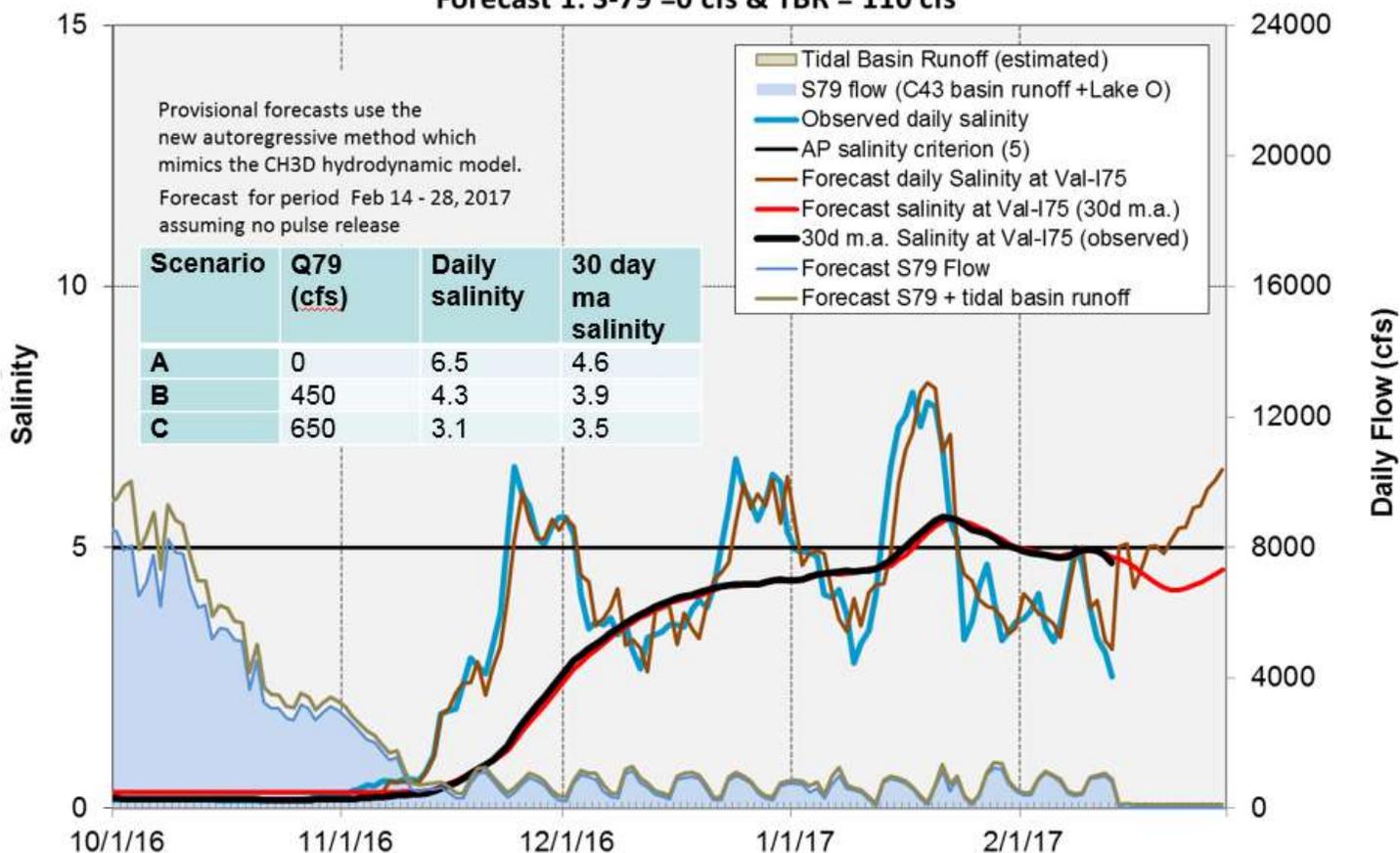


Figure 10. 14-day salinity forecast at Val I-75 assuming no releases at S-79.

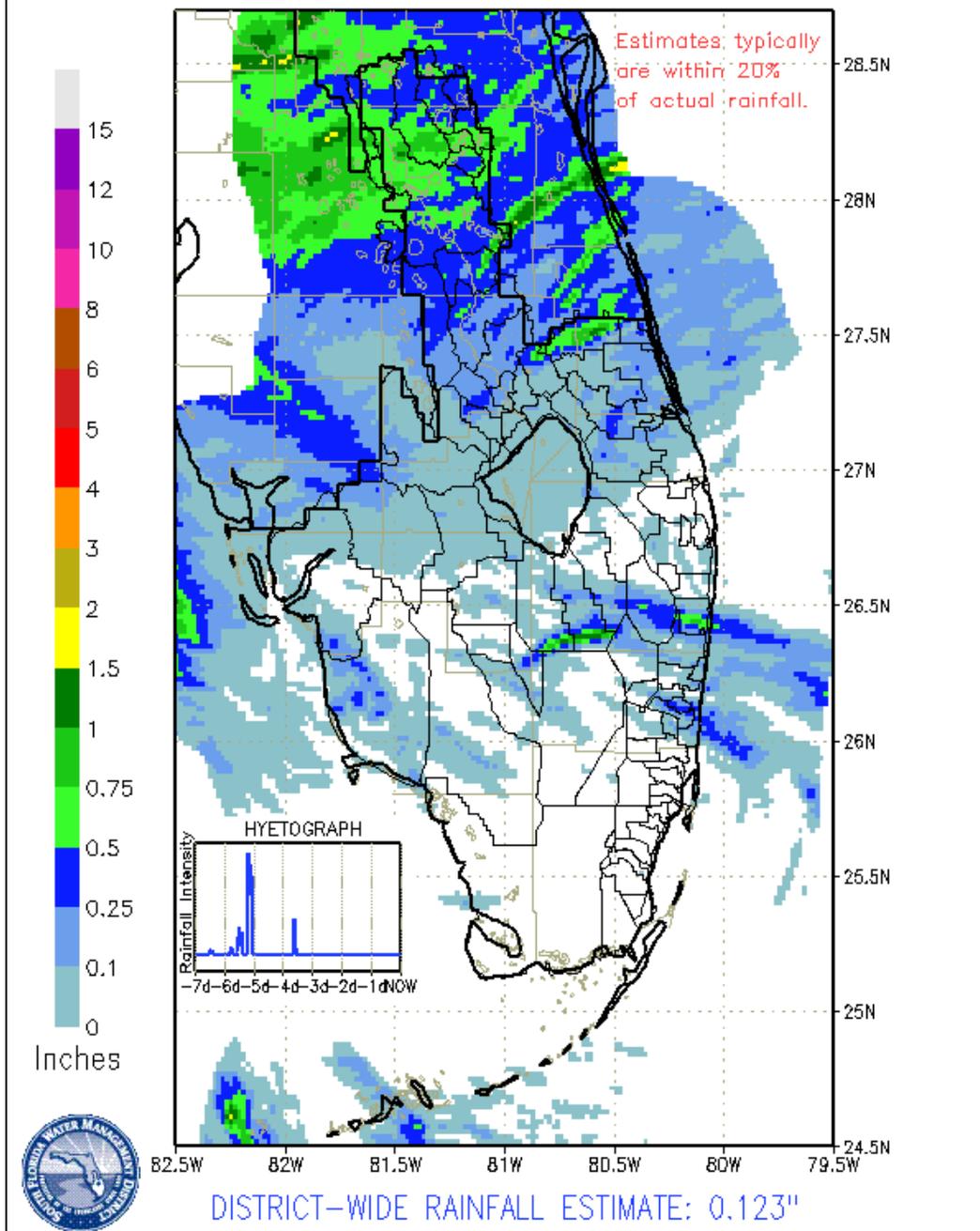
GREATER EVERGLADES

Rainfall was minimal across the northern WCAs decreasing to near zero at the southern end of the Everglades system. Water levels decreased in all the WCAs and northeastern Everglades National Park (ENP). With the exception of WCA-2B, the rate of stage change within all the WCAs and the ENP fell with the “good” range.

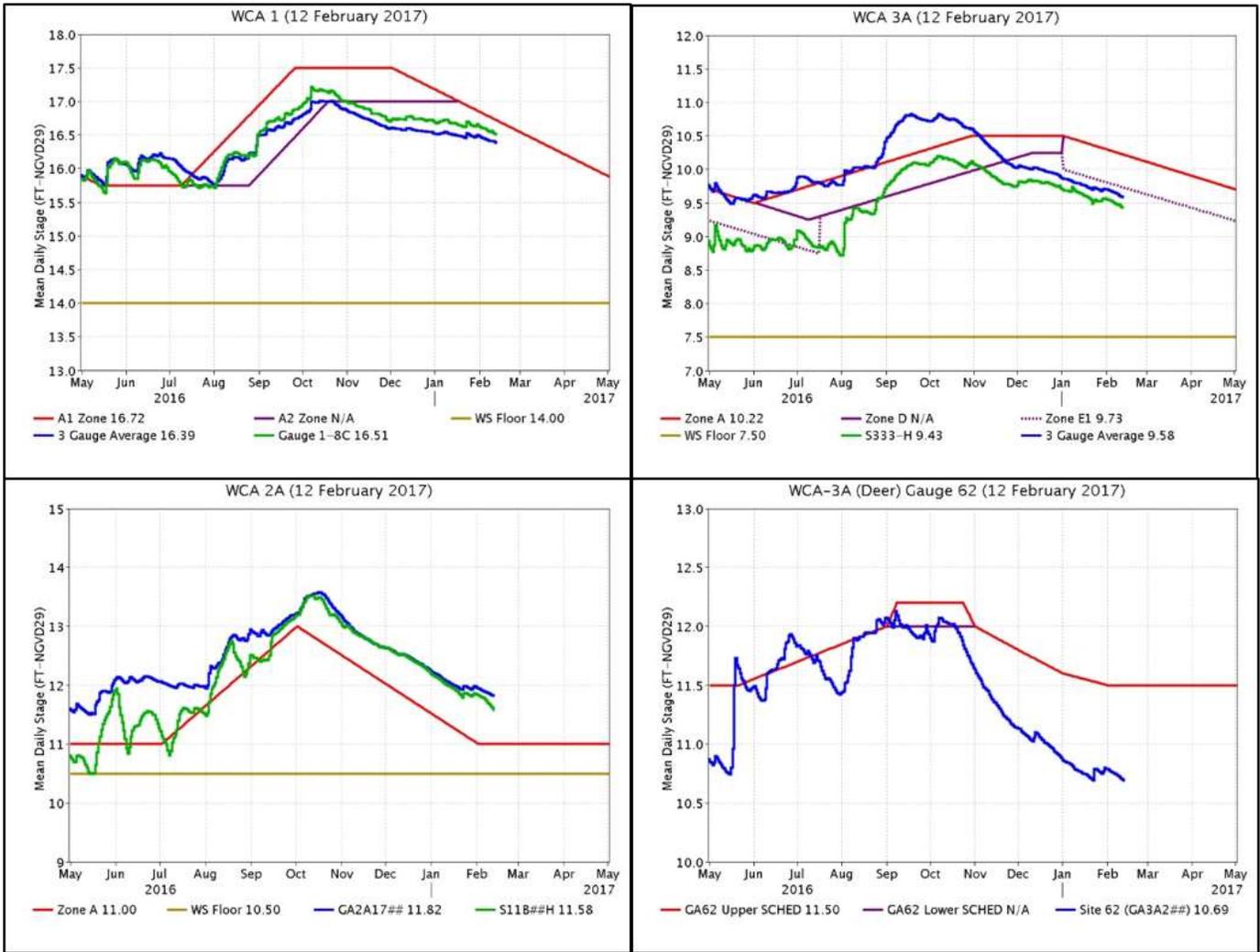
Everglades Region	Rainfall (Inches)	Stage Change (feet)	
WCA-1	0.15	-0.05	<div style="display: flex; flex-direction: column; align-items: center;"> <div style="width: 20px; height: 20px; background-color: #90EE90; margin-bottom: 5px;"></div> Good <div style="width: 20px; height: 20px; background-color: #FFFF00; margin-bottom: 5px;"></div> Fair <div style="width: 20px; height: 20px; background-color: #FFB6C1; margin-bottom: 5px;"></div> Poor </div>
WCA-2A	0.08	-0.08	
WCA-2B	0.02	-0.15	
WCA-3A	0.02	-0.09	
WCA-3B	<0.01	-0.06	
ENP	<0.01	-0.07	

SFWMD PROVISIONAL RAINDAR 7-DAY RAINFALL ESTIMATES

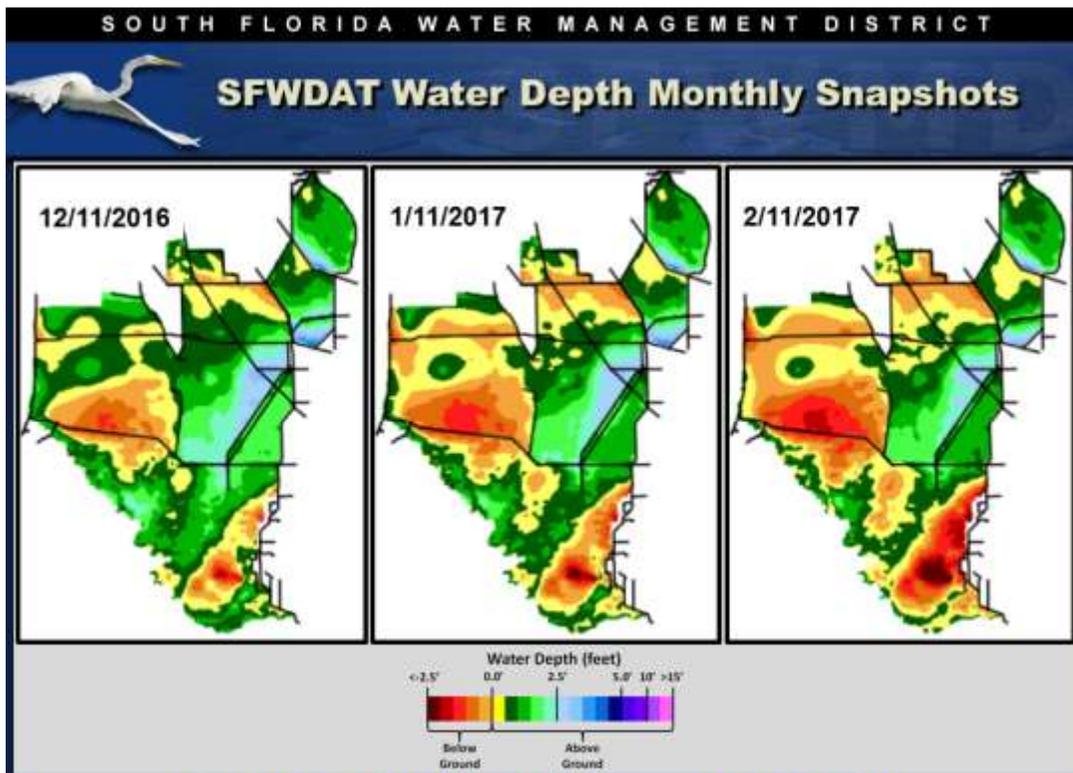
FROM: 0615 EST, 02/06/2017 THROUGH: 0615 EST, 02/13/2017



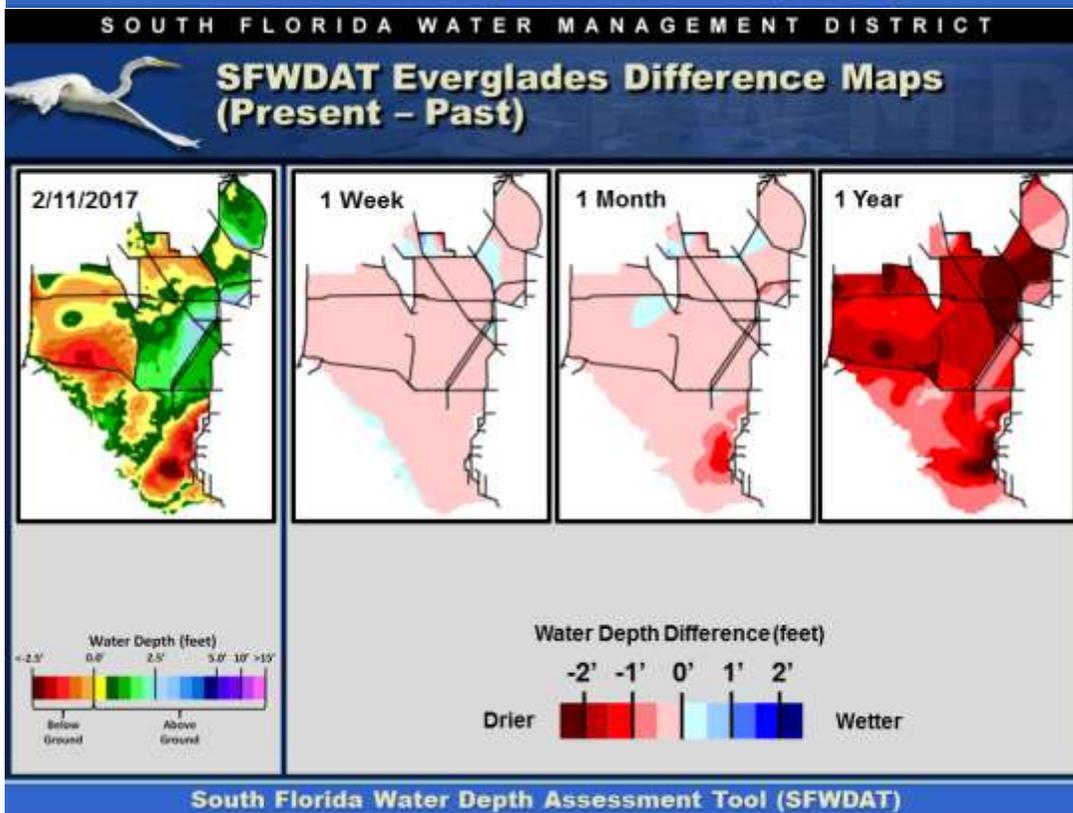
Regulation Schedules: Stages are below regulation for three of the four areas. The WCA-1 three-gauge average is -0.33 feet below zone A1, the northwestern WCA-3A gauge stage (gauge 62) is -0.81 feet below the upper schedule, and the WCA-3A three-gauge average stage is -0.15 feet below zone E1. The WCA-2A stage remains above regulation by 0.82 feet. The rate of change is tracking the regulation schedule but is too rapid for optimal wading bird foraging.



Water Depths and Changes: Water levels decreased this week. Water levels generally remain lower than they were one week, one month and one year ago. This week's water depths at monitored gauges other than in WCA-2B range from 0.53 feet (northeast WCA-3A) to 2.11 feet (southern WCA-3A).



South Florida Water Depth Assessment Tool (SFWDAT)



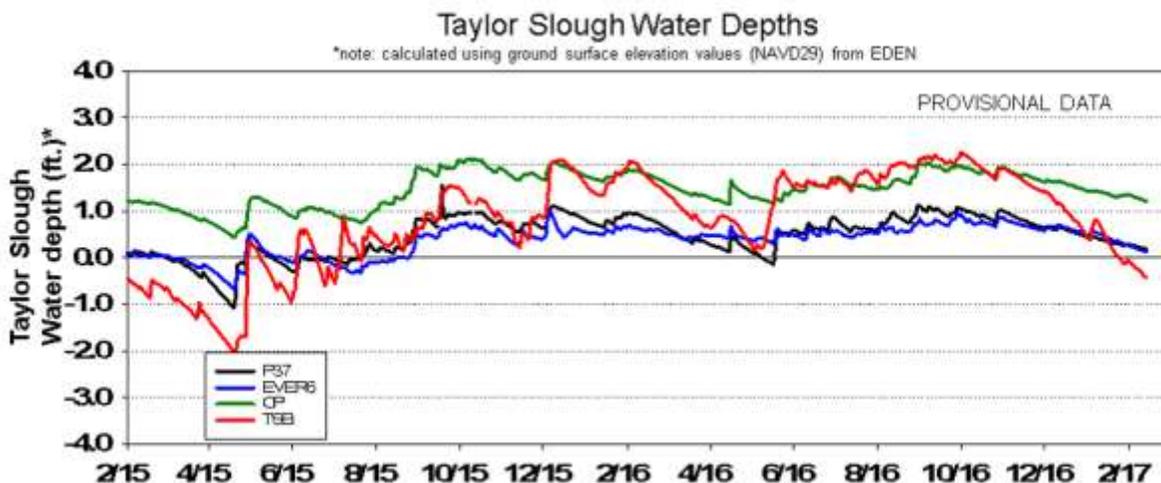
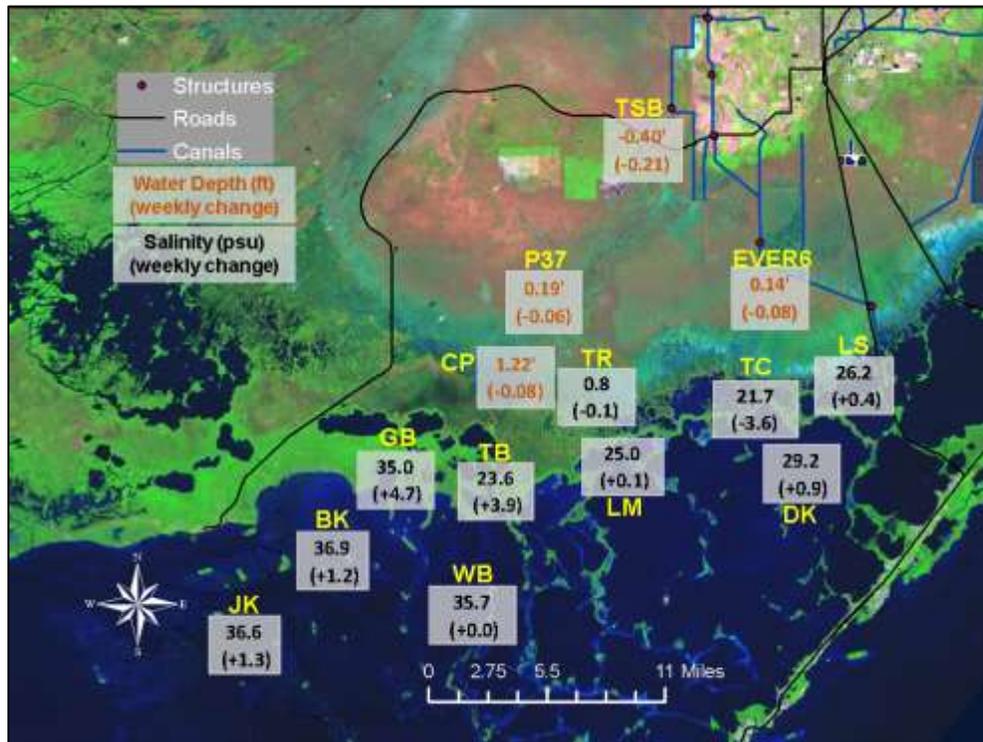
South Florida Water Depth Assessment Tool (SFWDAT)

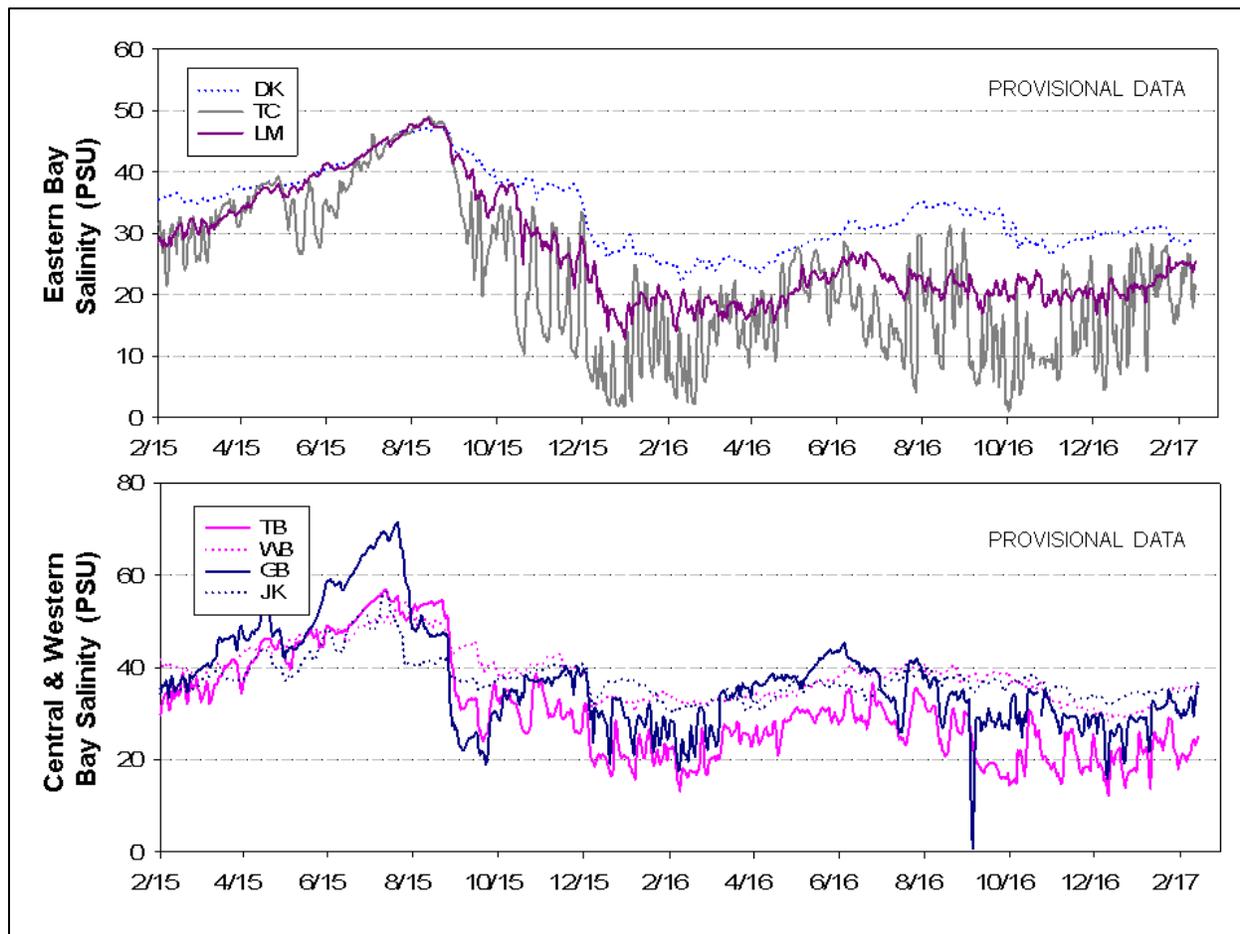
Wading Birds: The District conducted a wading bird foraging survey of the northern Everglades on Feb 13, 2017. An estimated 2,622 foraging birds (mainly White Ibis and smaller numbers of Great Egret) were counted in northern and central WCA-1 (up from 1,700 birds last week) in 57 flocks. Flocks continue to feed in central WCA-2A and large flocks of White Ibis, Great Egrets and Wood Storks are foraging in northern WCA-3A South. The District surveyed Alley North (about 1,000 nests), and 6th

Bridge colonies on February 13 and both colonies appear to have more nesting birds (Great Egrets and Roseate Spoonbills) than they did during the February 2 flight.

Water level fell this past week from -0.06 feet in central Taylor Slough to -0.21 feet in northern Taylor Slough. Water levels range from -6 inches below average for this time of year at TSB to $+1$ inch above average in southern Taylor Slough.

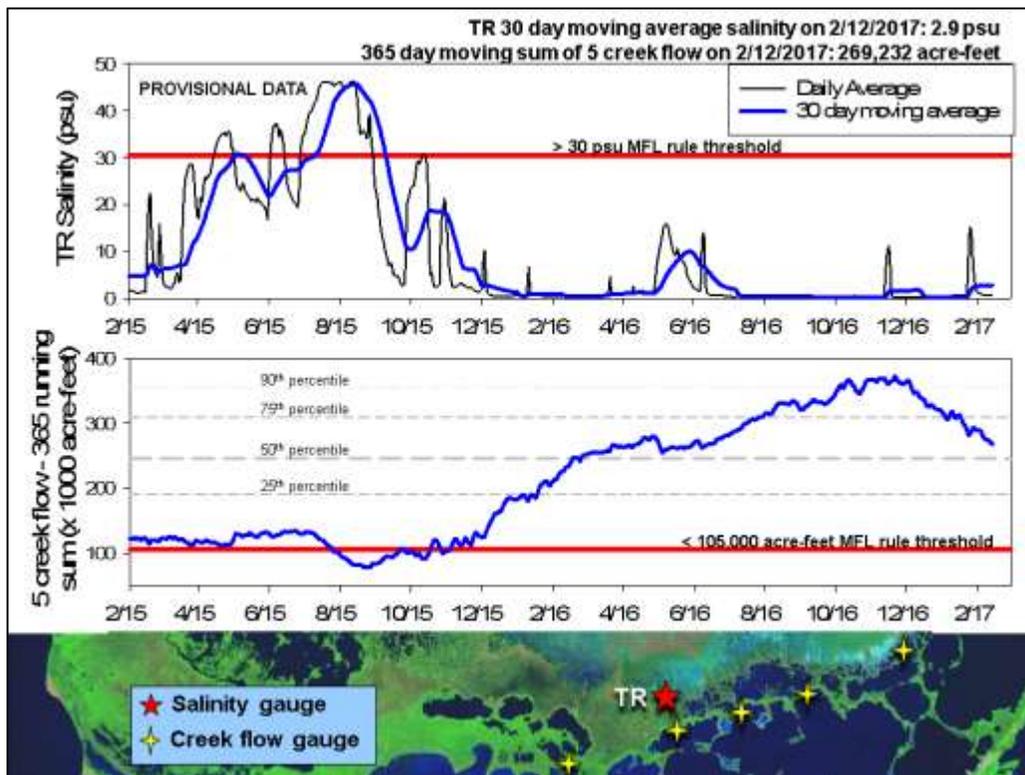
Salinities mostly increased by less than 5 psu this past week with the largest increases at the central and western nearshore stations. Salinities are average (central nearshore station, TB) to 6 psu above average (western nearshore station, GB). The central and western bay areas are 3-4 psu above average.





Florida Bay MFL: 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 identified by stars on the map decreased about 10,000 acre-feet to end at 269,232 acre-feet (still above the average of 257,628 acre-feet). The weekly creek flow from the five creeks was around 800 acre-feet with only the eastern most creek maintaining positive flow for six of the last seven days. The other creeks experienced at least three days of negative flows.



Water Management Recommendations

- Over the last week depths decreased across the Everglades at rate that falls within the general seasonal recommended range of – 0.05 and – 0.09 feet per week, but at a faster rate in WCA-3A (-0.09 feet over the last week) than current low stage conditions suggest would optimize wading bird foraging and support nesting (especially at the important Alley North colony) throughout the nesting season. Any available water should be directed to slow recession rates in northern WCA-3A to maintain a depth condition at Alley North that protects nesting from mammalian predators and slows the recession rate within WCA-2A to support wading bird foraging.
- The seasonal Multispecies Management Team (interagency group related to ERTTP schedule) remains concerned that water levels in WCA-1 and WCA-3 are too low going into the breeding season, which could result in deteriorating foraging conditions later in the nesting season. It is important to keep water moving into the WCAs and ENP and to hold water and improve hydrologic conditions.
- 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. 14th, 2017 (red is new)

Area	Current Condition	Cause(s)	Recommendation	Reasons
WCA-1	Stages decreased -0.04' 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.	Retain water for the upcoming dry season while protecting habitat and wildlife and preparing for wading bird breeding season.
WCA-2A	Stages decreased -0.08'	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.
WCA-2B	Stages decreased -0.15'	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.
WCA-3A NE	Stages decreased -0.10'	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. Multispecies group requests 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. Recession rate at gauge 63 (location closest to Alley North wading bird colony) increases from -0.07 to -0.10 feet/week
WCA-3A NW	Stages decreased -0.07'	Rainfall, ET, management		
Central WCA-3A S	Stages decreased -0.09'	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 wading bird breeding season.
Southern WCA-3A S	Stages decreased -0.09'	Rainfall, ET, management		
WCA-3B	Stages decreased -0.01' to -0.09'	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.
ENP-SRS	Stages decreased -0.07'	ET, rainfall, topography, management	Make discharges to the Park according to the ERTTP 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.
ENP-CSSS habitats	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 ERTTP 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.
Taylor Slough	Stages fell -0.06' to -0.21'	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	Average to +6 psu above average	Rain, ET, inflows, wind	Move water southward as possible	Maintain low salinity conditions and prevent early salinity increases.