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MEMORANDUM

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

FROM: SFWMD Staff Environmental Advisory Team

DATE: February 21, 2017

SUBJECT: Weekly Environmental Conditions for Systems Operations

Summary

Weather Conditions and Forecast

Heavy rains tomorrow likely focused south through east of the Lake. A strong, cut-off upper level low will move across the peninsula tomorrow to likely bring our heaviest rain day since last wet season. Expect the heaviest rains between noon tomorrow and midnight and local maximums to four inches. It will be slow moving, and weaker wrap-around showers will likely persist through Thursday afternoon before dry and mild conditions return Friday through the end of the month.

Kissimmee

On Sunday, stage in East Lake Toho was 0.8 feet below regulation schedule; Lake Toho was 0.8 feet below regulation schedule and Kissimmee-Cypress-Hatchineha was 1.1 feet below schedule respectively. Over the past week, discharge at S65, S65A, and S65E averaged 710, 550, and 597 cfs, respectively. Tuesday morning discharges were: ~727 cfs, and 565 cfs, and 697 cfs respectively at S65, S65A, and S65E. Dissolved oxygen data in the Kissimmee River averaged 9.22 mg/L over the past week. Kissimmee River mean floodplain depth on Sunday is 0.06 feet. No new recommendations.

Lake Okeechobee

As of midnight February 19, 2017, Lake stage is 13.51 feet NGVD and within 0.01 feet of the top of the Base flow sub-band. The current weekly recession rate of 0.20 feet equates to a monthly recession rate of 0.80 feet, which is substantially above the recommended 0.50 feet per month. Current conditions are favorable for foraging wading birds as the most recent foraging survey reported more than 6,000 wading birds in 36 flocks foraging on the Lake. This is an increase of about 2,700 wading birds compared to the previous survey. However, a too rapid decrease in Lake levels may jeopardize the upcoming nesting season by drying out foraging locations around the colonies. The goal should be to slow the recession rate to no more than 0.50 feet per month.

Estuaries

Total discharge to the St. Lucie estuary averaged 82 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 were about the same 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 740 cfs over the past week with 534 cfs (72%) 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 10.2 constituting 51 consecutive days of exceedance of the Caloosahatchee Minimum Flow and Level. The 30-day average surface salinity at Val I-75 is 3.5. Salinity conditions in the upper estuary are improving. However, Tape grass in the upper estuary are likely continuing to deteriorate. 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 3.6 in the next two weeks if no flow comes through the S-79 structure; however, daily salinity is forecast to reach 5.4.

Stormwater Treatment Areas

Over the past week, the STAs/FEBs received approximately 5,600 acre-feet of Lake releases. The total amount of Lake releases sent to the STAs/FEBs in WY2017 (since May 1, 2016) is approximately 181,500 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 a rate that fell within the general seasonal recommended range of – 0.05 and – 0.09 feet per week, but for the second week in a row at a faster rate in Northeast WCA-3A (gauge 62) than current low stage conditions suggest would optimize wading bird foraging and support nesting throughout the nesting season. The WCA-2A stage remains above regulation by 0.73 feet, the recession rate is tracking the regulation schedule but is too rapid for optimal wading bird foraging. Weekly stage changes ranged from –0.06 (WCA-3B) to –0.13 (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 0.08 inches of rainfall in the past week and the Lower Basin received 0.04 inches (SFWMD Daily Rainfall Report 02/20/2017).

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: **2/21/2017**

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)						
							2/19/17	2/12/17	2/5/17	1/29/17	1/22/17	1/15/17	1/8/17
Lakes Hart and Mary Jane	S62	33	LKMJ	60.8	R	61.0	-0.2	0.0	-0.1	0.0	0.0	-0.1	-0.1
Lakes Myrtle, Preston, and Joel	S57	6	S57	61.1	R	61.1	0.0	0.0	0.0	-0.1	0.0	0.0	-0.1
Alligator Chain	S60	0	ALLI	63.3	R	64.0	-0.7	-0.7	-0.7	-0.6	-0.6	-0.6	-0.6
Lake Gentry	S63	0	LKGT	61.3	R	61.5	-0.2	-0.2	-0.2	-0.1	-0.1	-0.1	-0.1
East Lake Toho	S59	206	TOHOE	57.2	R	58.0	-0.8	-0.5	-0.3	-0.1	0.0	0.0	0.0
Lake Toho	S61	476	TOHOW, S61	54.2	R	55.0	-0.8	-0.6	-0.3	-0.1	0.0	0.0	-0.1
Lakes Kissimmee, Cypress, and Hatchineha	S65	710	LKISSP, KUB011, LKIS5B	50.5	R	51.6	-1.1	-1.4	-1.8	-2.0	-2.1	-2.0	-1.9

* 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.

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: 2/21/2017

Metric	Location	Sunday's 1-day average	Weekly Average**									
			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	12/18/16
Discharge (cfs)	S-65	763	710	507	482	465	473	475	487	555	759	809
Discharge (cfs)	S-65A	583	550	387	378	368	364	368	461	497	639	700
Discharge (cfs)	S-65D****	612	531	663	730	1274	1292	1268	1293	1411	1607	1638
Discharge (cfs)	S-65E****	704	597	523	513	398	386	375	452	626	774	779
DO concentration (mg/L)***	Phase I river channel	9.04	14.08	8.96	8.54	8.13	7.97	7.94	7.12	N/A	7.02	7.17
Mean depth (feet)*	Phase I floodplain	0.06	0.06	0.06	0.06	0.06	0.06	0.07	0.07	0.09	0.12	0.13

* 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
2/21/2017	No new recommendations.			
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)

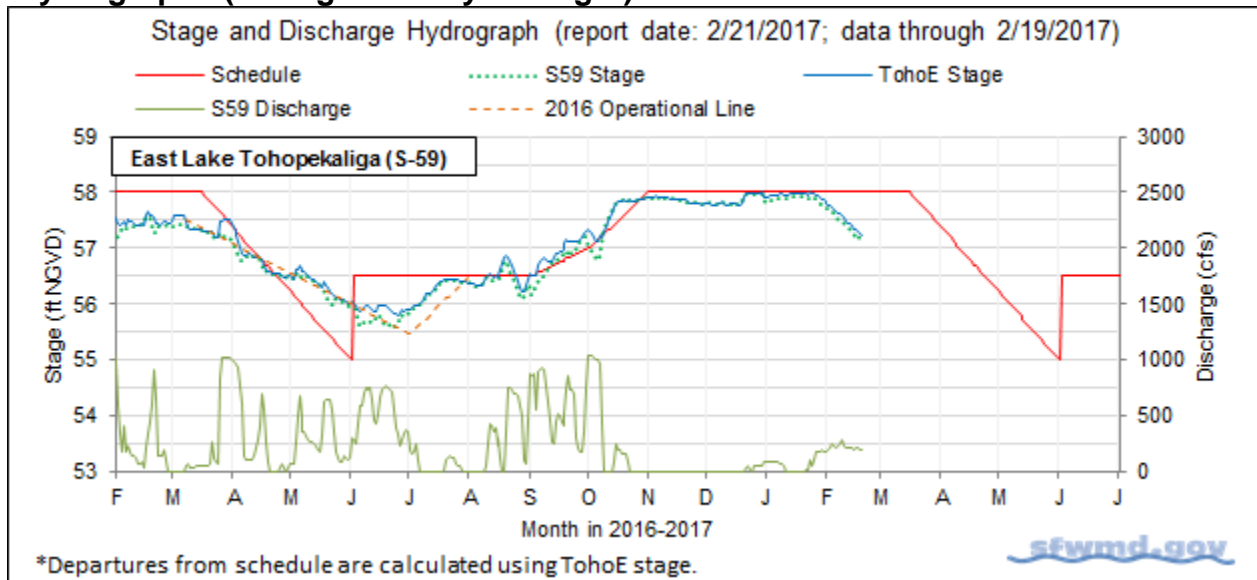


Figure 1.

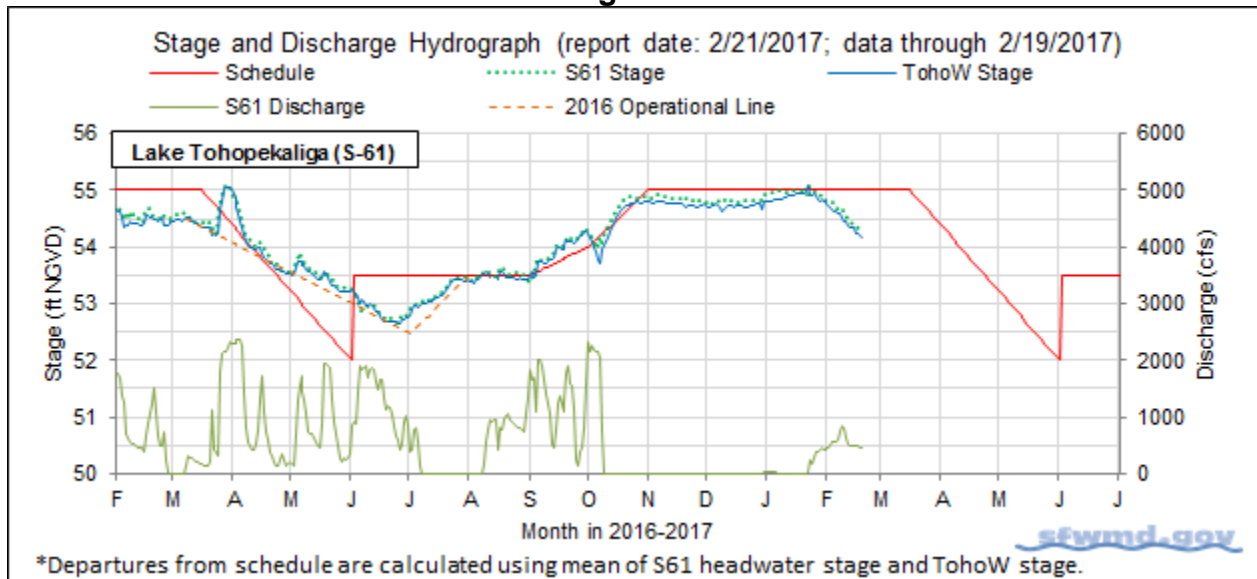


Figure 2.

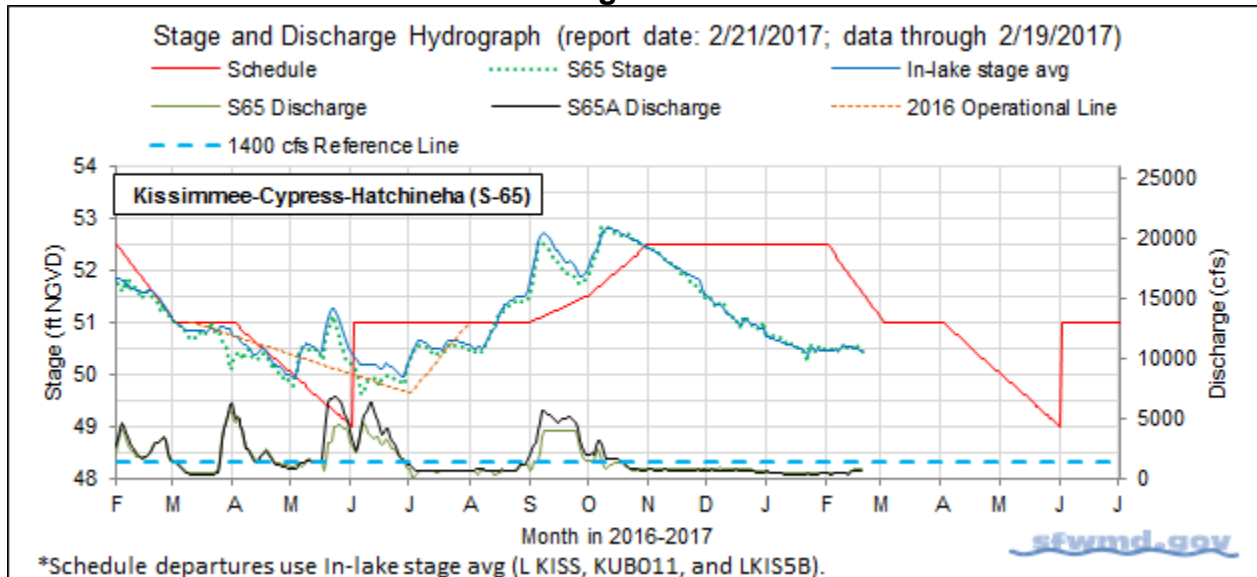


Figure 3.

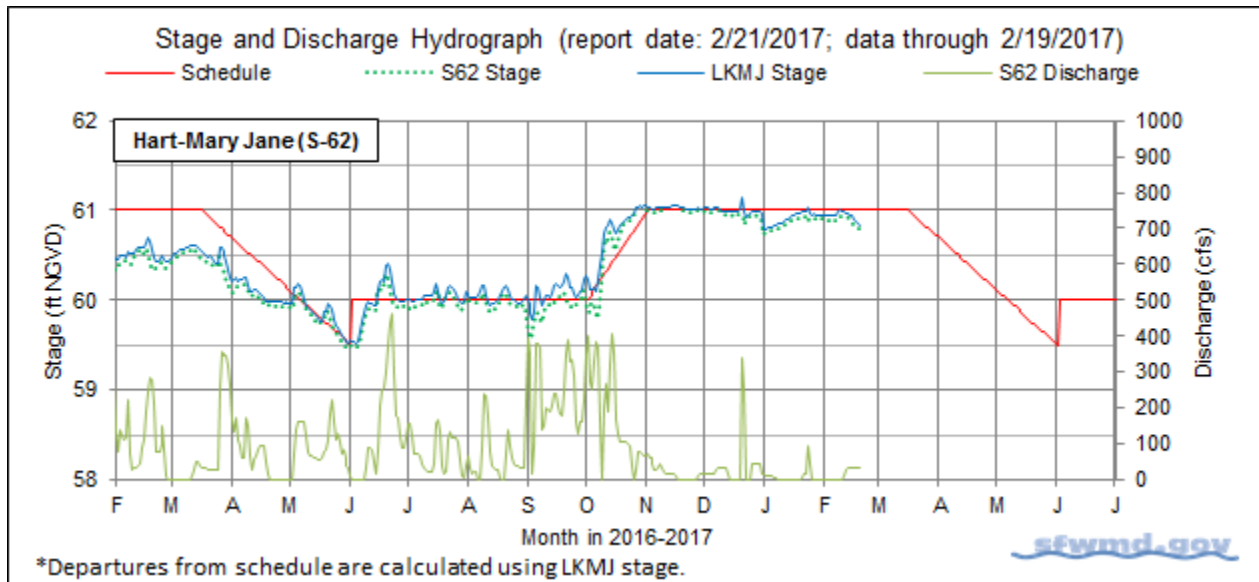


Figure 4.

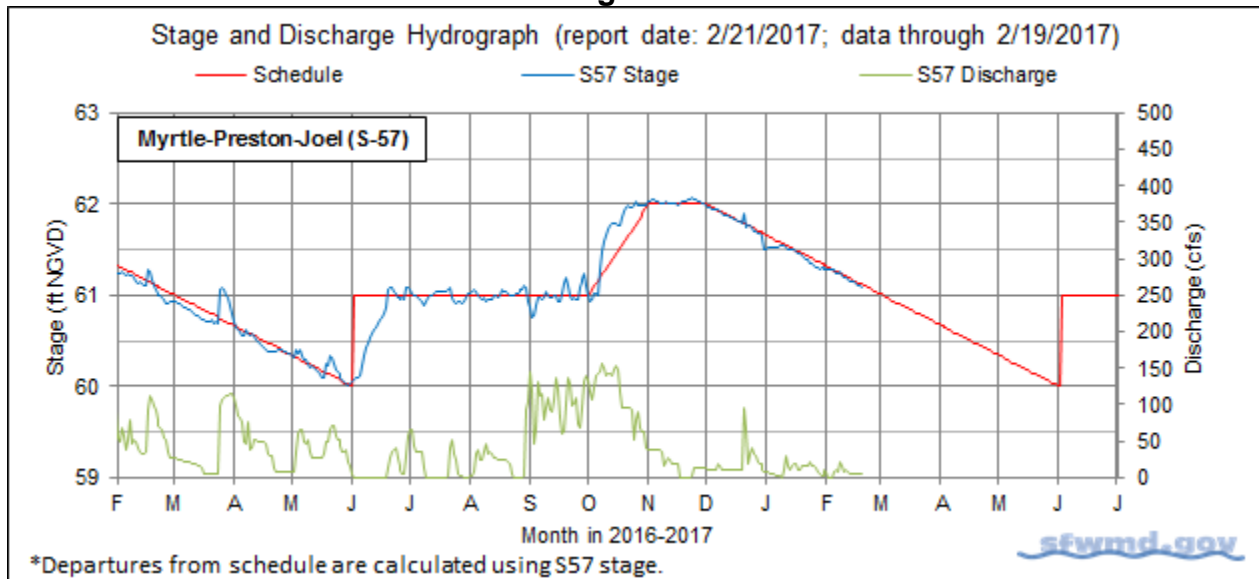


Figure 5.

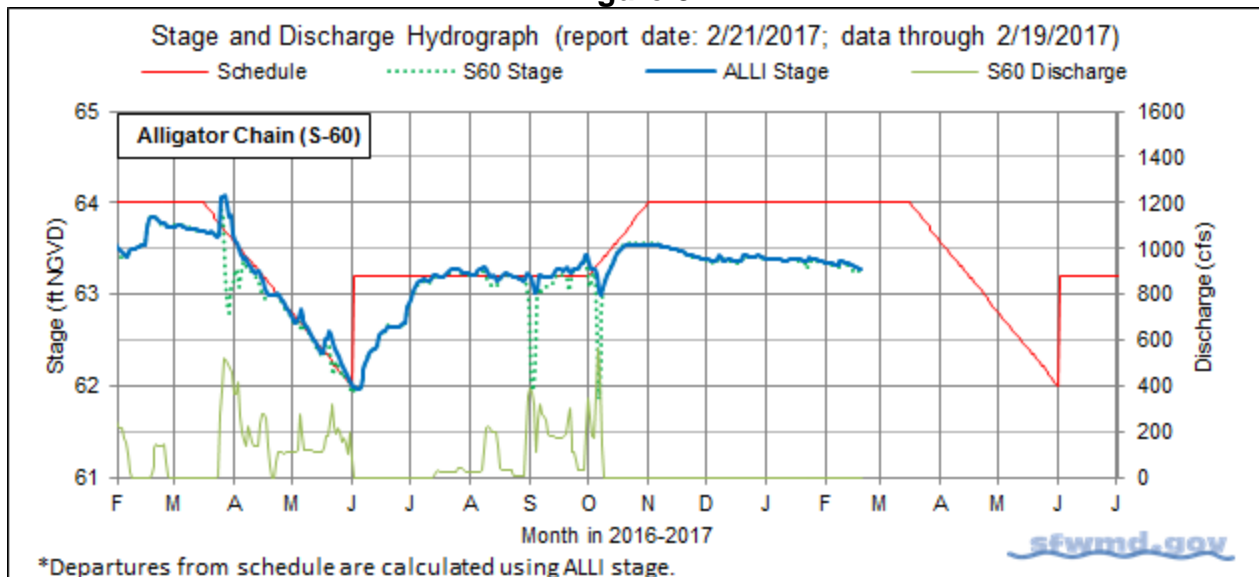


Figure 6.

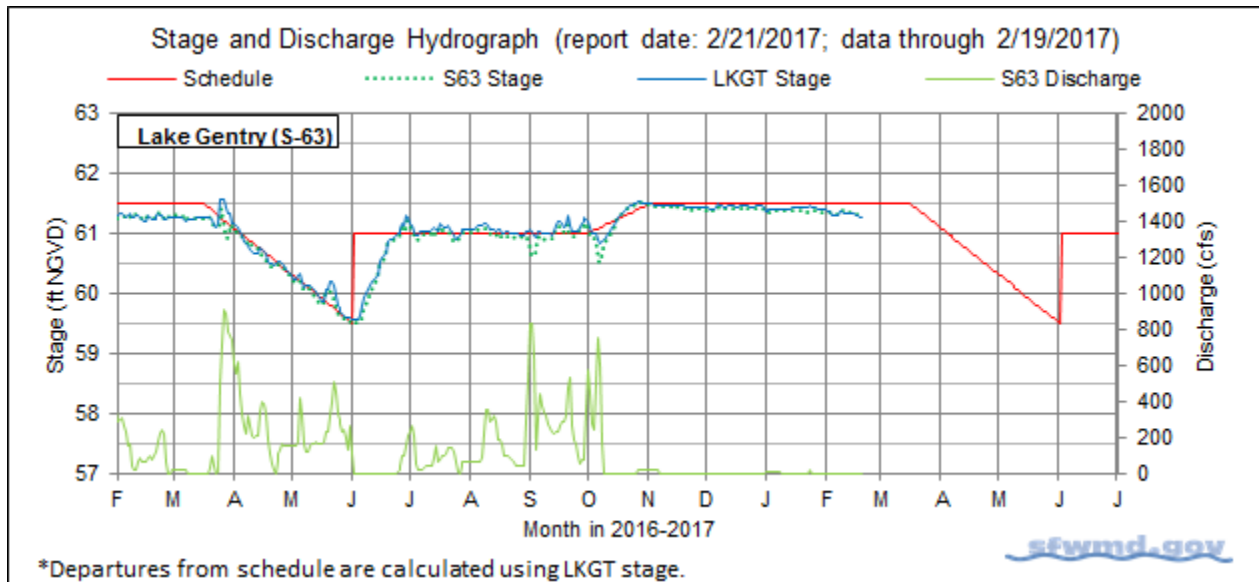


Figure 7.

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.

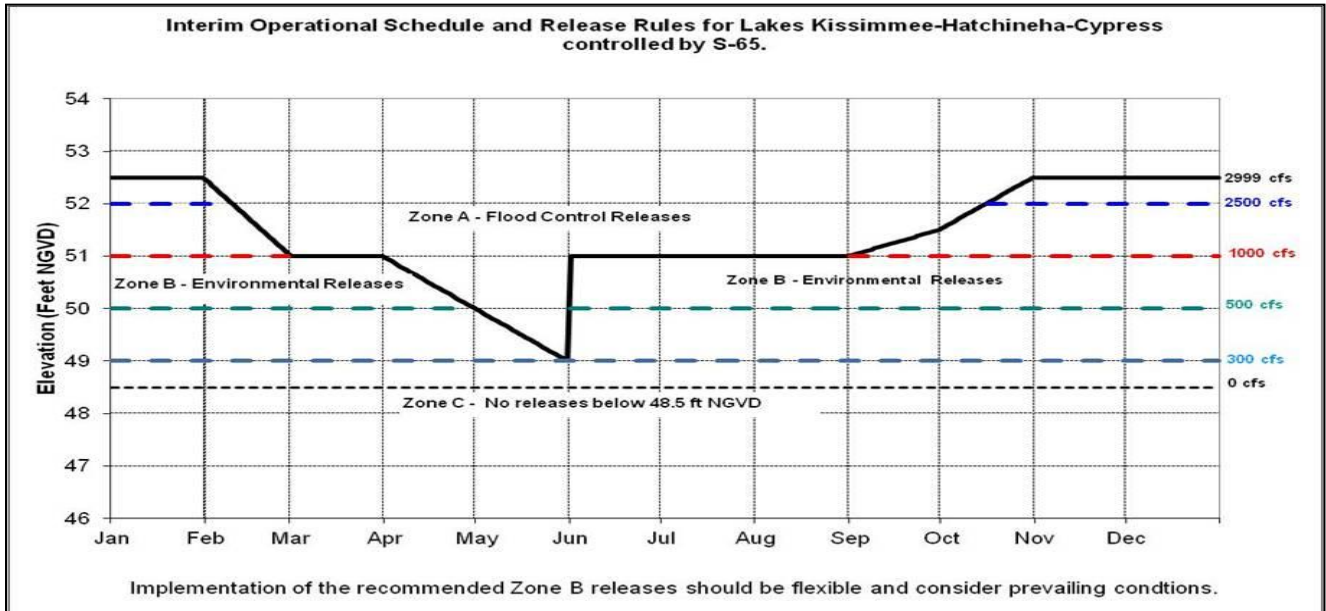


Figure 9. Interim operations schedule for S-65. The discharge schedule shown to the right has not been used in recent years or in Wet Season 2015.

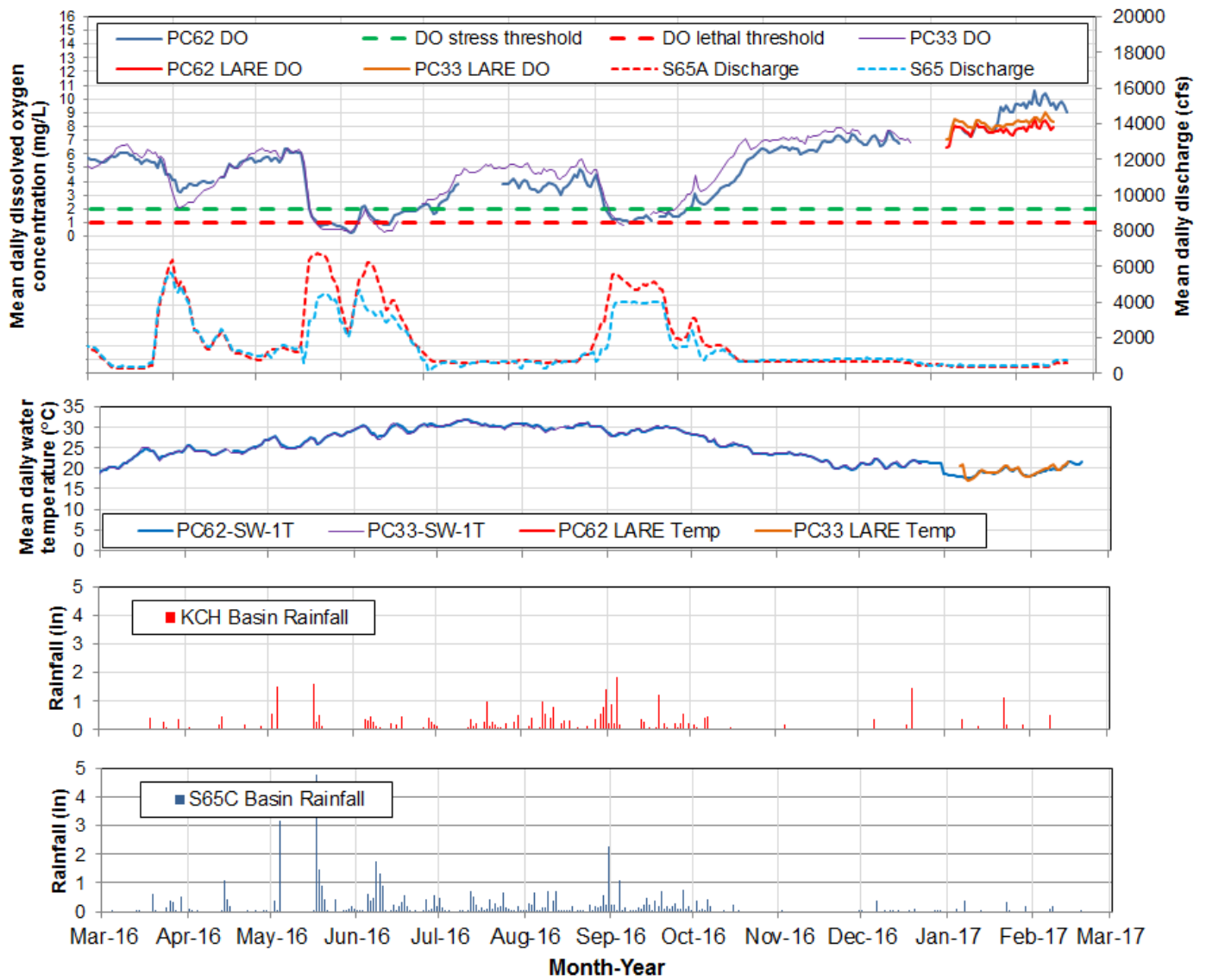


Figure 10. Mean daily dissolved oxygen, discharge, temperature and rainfall in the Phase I river channel.

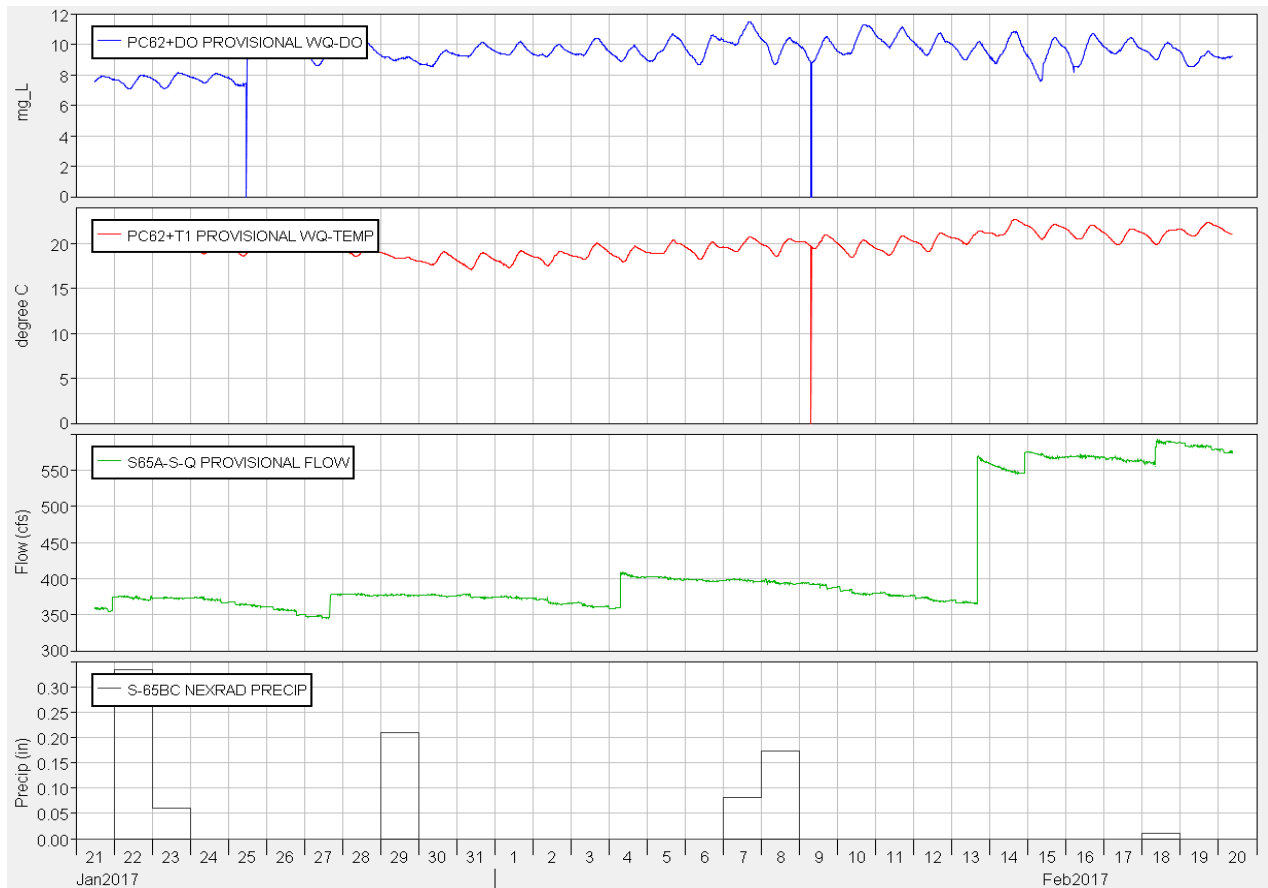


Figure 11. Phase I river channel dissolved oxygen and water temperature (measured at 15 minute intervals) and Pool BC daily rainfall.

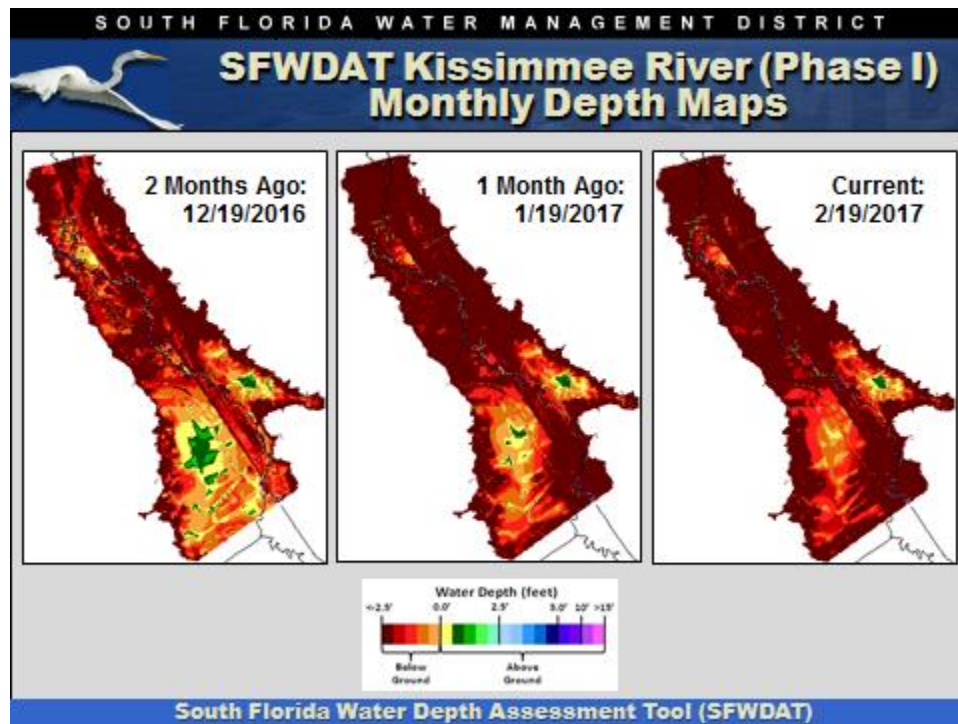
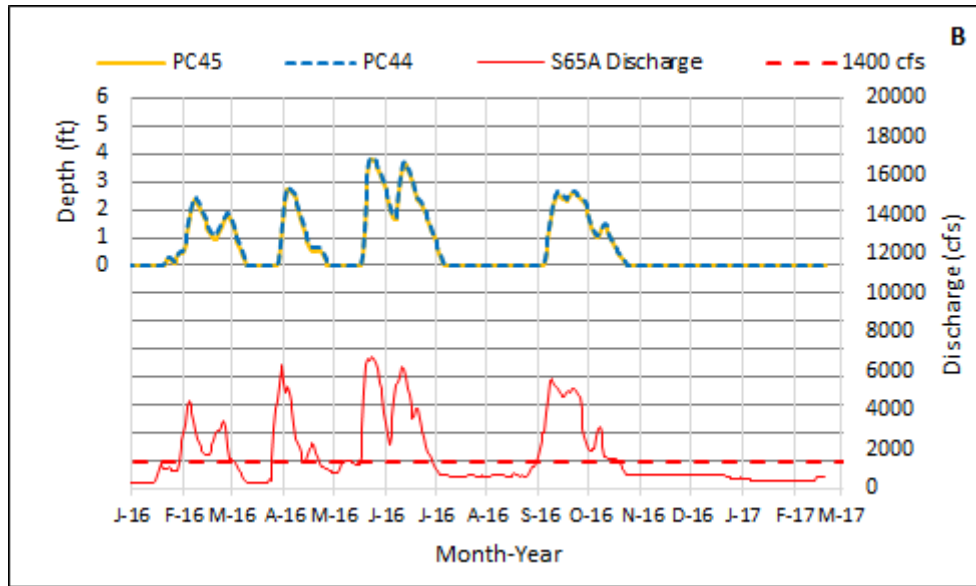
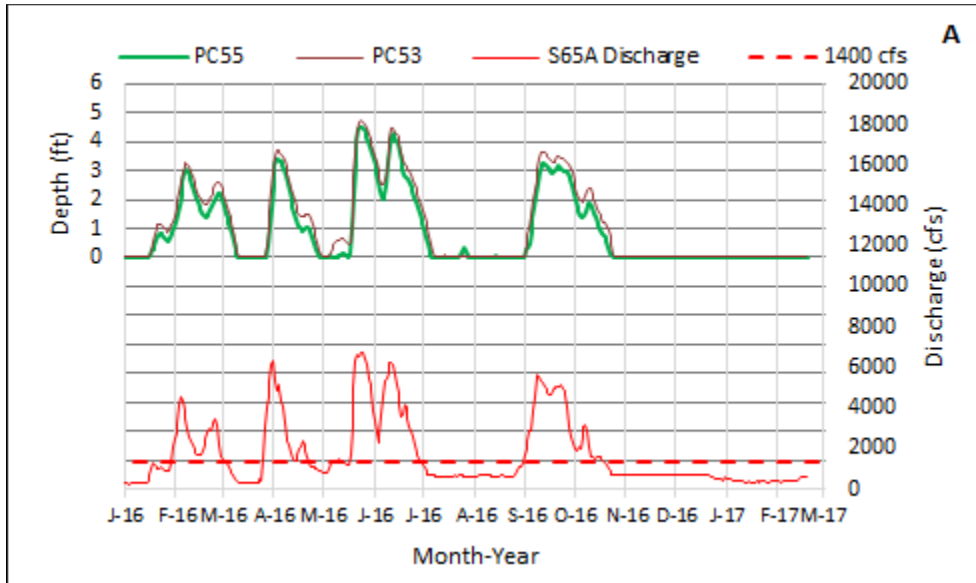


Figure 12. Phase I area floodplain water depths for this week, one month ago, and two months ago. Note that the WDAT color-coding has been modified to accommodate greater water depths; these maps are not directly comparable to Kissimmee Basin WDAT maps published prior to Jan. 16, 2012.



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

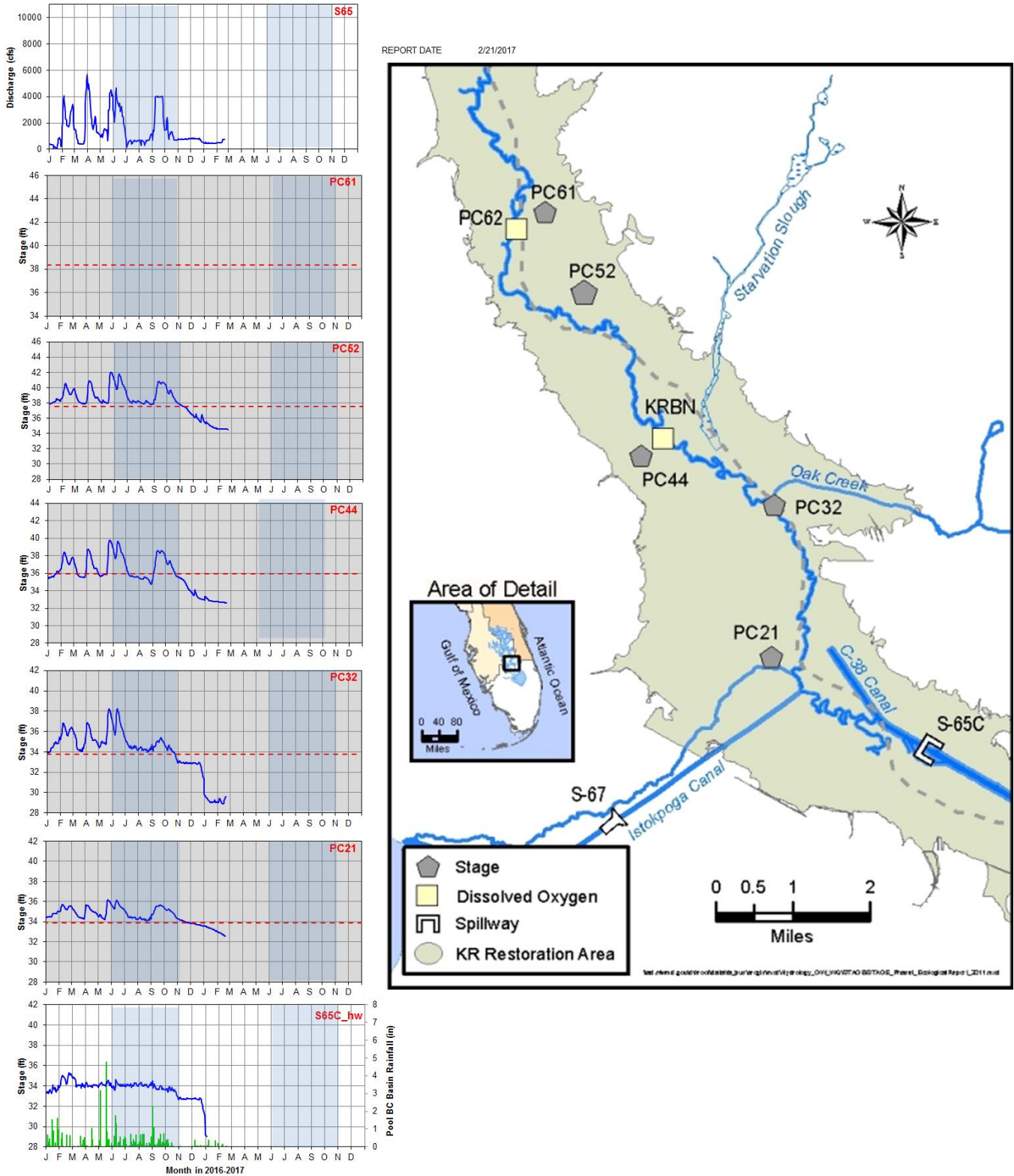


Figure 13. Discharge at S65, stages at five monitoring stations in the Phase I area of the Kissimmee River floodplain, and headwater stage at S65-C since January 1, 2015. The most recent data (~2 weeks) are provisional real-time data from SFWMD DualTrend; previous data are from SFWMD DB-HYDRO (validated).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

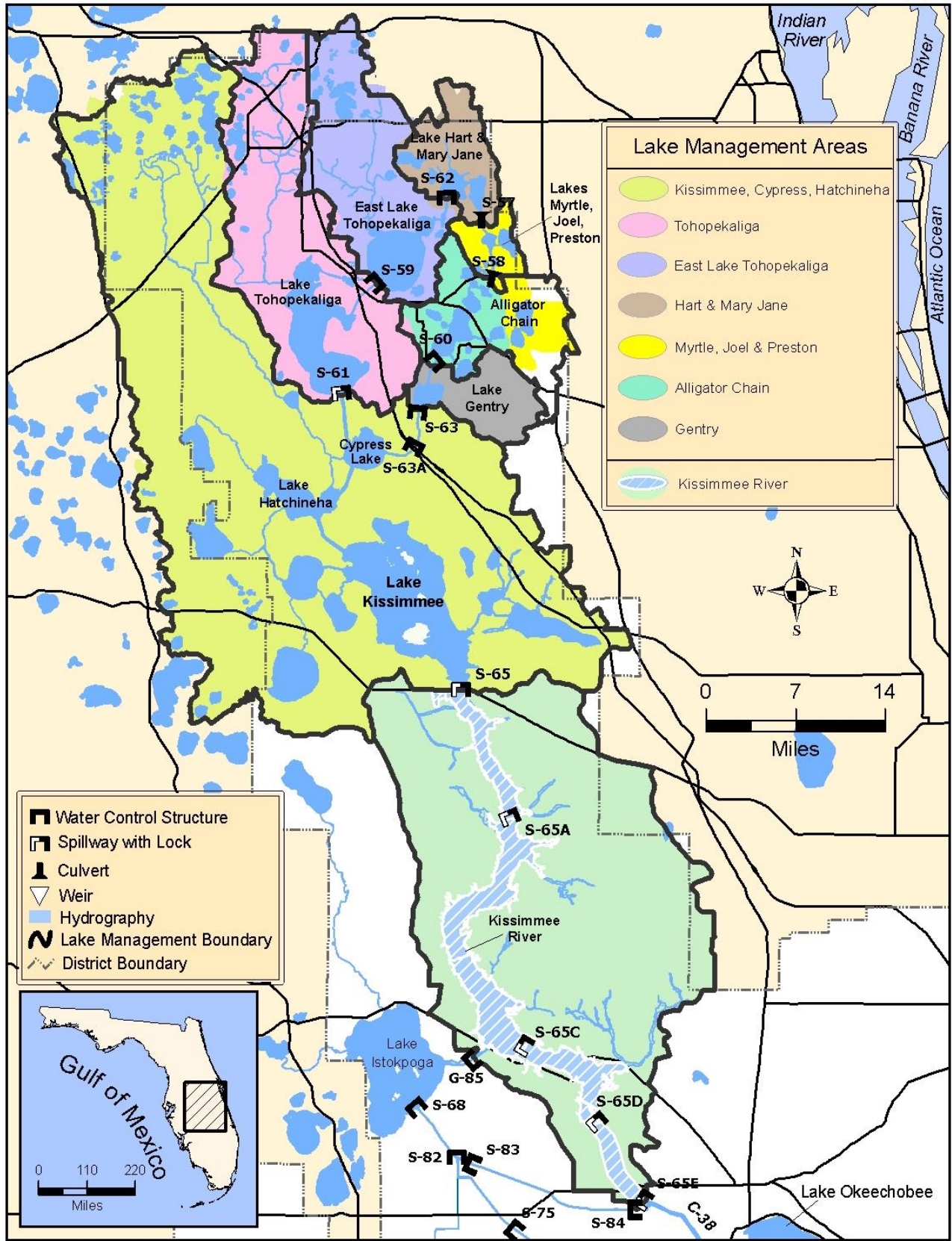


Figure 14. The Kissimmee Basin.

LAKE OKEECHOBEE

According to the United States Army Corps of Engineers (USACE) web site, Lake Okeechobee stage is at 13.51 feet NGVD for the period ending at midnight on February 19, 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 0.20 feet over the past week and is 0.45 feet lower than it was a month ago and 2.65 feet lower than it was a year ago (Figure 1). The Lake is currently in the Low sub-band but 0.01 feet from the top of the Base flow sub-band (Figure 2). According to RAINDAR, 0.057 inches of rain fell directly over the Lake during the past seven days (Figure 3). Less than 0.25 inches of rain fell throughout the entire watershed with the extreme southern region and parts of the lower east coast receiving no rainfall.

Based on USACE reported values, current Lake inflow is approximately -132 cfs as detailed below.

Structure	Flow cfs
S65E	0
S154	0
S84 & 84X	0
S71	0
S72	0
C5 (Nicodemus slough dispersed storage)	-133
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 2,480 cfs with 1,156 cfs exiting at S77, 17 cfs exiting at S308 and 215 cfs exiting at the L8 canal through Culvert 10A. Approximately 1,092 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 was 1,600 cfs.

Change in elevation equivalents and average weekly flows (midnight February 13, 2017 to midnight February 19, 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 34,120 acres of suitable foraging habitat for long-legged birds and 17,585 acres for long and short-legged birds on the Lake (Figure 5). The most recent wading bird foraging survey indicated that there were more than 6,000 wading birds in 36 flocks foraging on the Lake (Figure 6). This is an increase of about 2,700 wading birds compared to the previous survey. Additionally, a large flock of White Ibis were observed perching on willow in the Harney Pond area, an indication that nesting activities may be about to begin. This activity is occurring almost two months earlier than it did last year.

No recent available MODIS satellite images are available.

Water Management Recommendations

Lake stage is 13.51 feet NGVD and is within 0.01 feet of the top of the Base flow sub-band. The current weekly recession rate of 0.20 feet equates to a monthly recession rate of 0.80 feet, which is substantially above the recommended 0.50 feet per month. 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 slow the recession rate to 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.

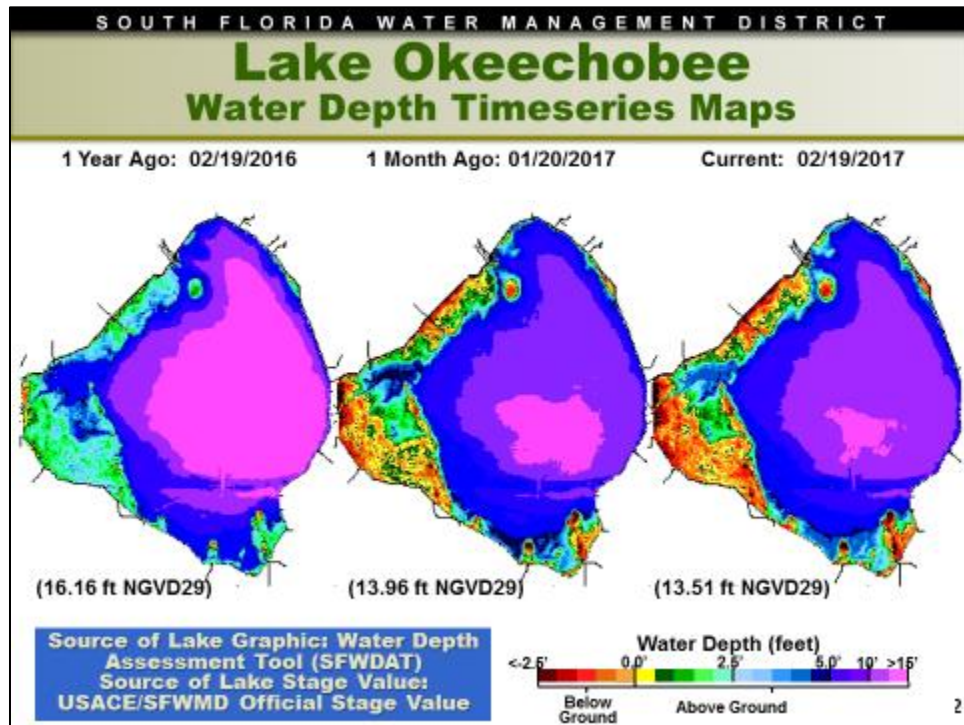


Figure 1

Weekly Stage Hydrograph

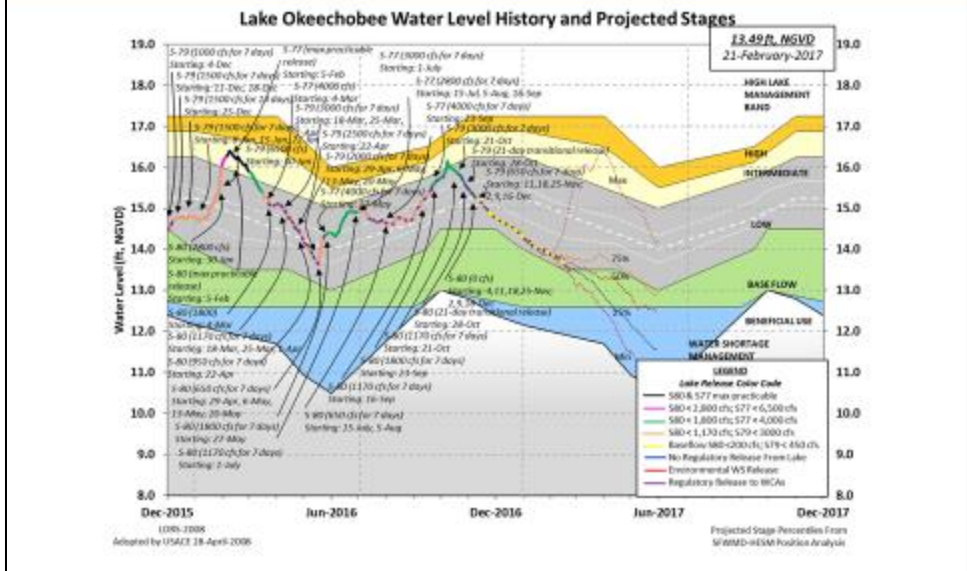
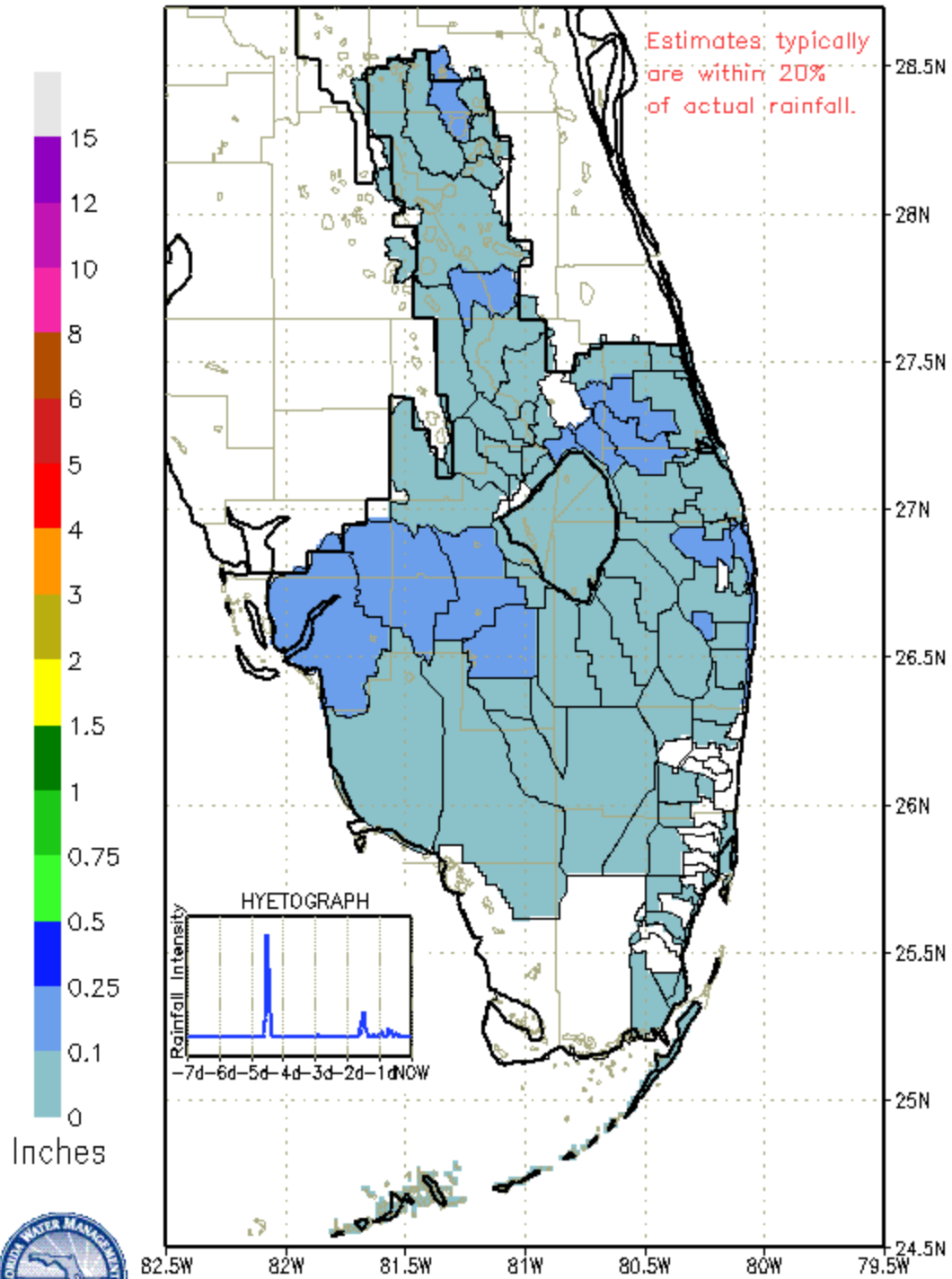


Figure 2

SFWMD PROVISIONAL RAINFAR 7-DAY BASIN RAINFALL ESTIMATES

FROM: 0615 EST, 02/13/2017 THROUGH: 0615 EST, 02/20/2017



DISTRICT-WIDE RAINFALL ESTIMATE: 0.072"

Figure 3

INFLOWS	Average Daily Flow Past Week cfs	Feet of Change Past Week
S65E	601	0.021
S71 & 72	0	0.000
S84 & 84X	0	0.000
Fisheating Creek	22	0.001
Rainfall	N.A.	0.005
OUTFLOWS	Average Daily Flow Past Week cfs	Feet of Change Past Week
S77	1025	0.036
S308	23	0.001
S351	876	0.031
S352	460	0.016
S354	589	0.021
L8	204	0.007
ET	1600	0.057

Figure 4

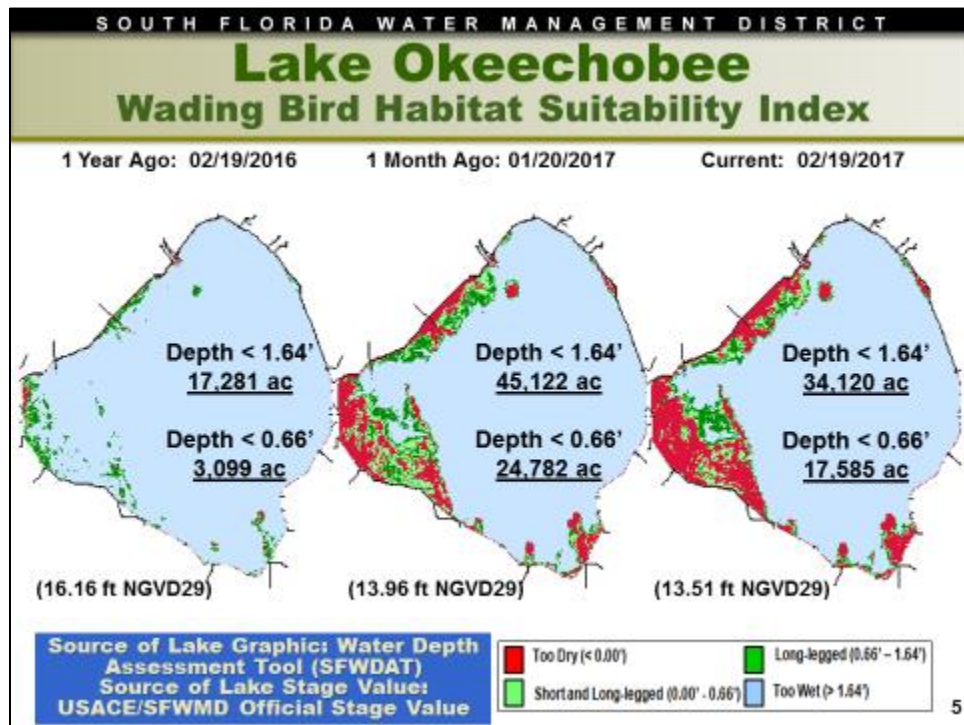


Figure 5

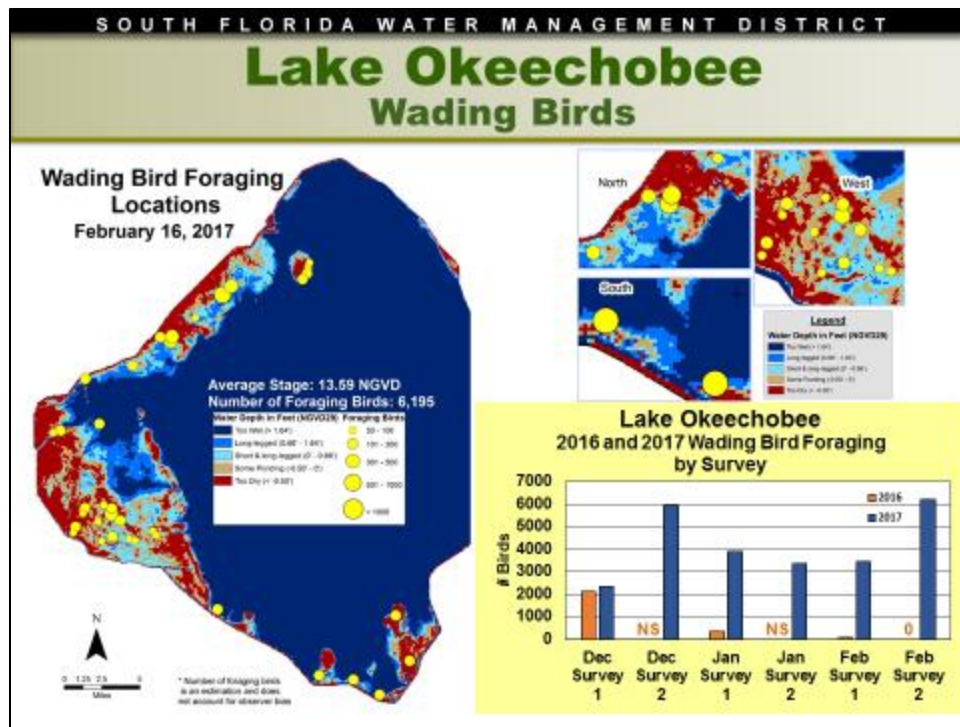


Figure 6

Lake Istokpoga

The Lake Istokpoga regulation schedule is at winter pool stage of 39.50 feet NGVD. Lake stage is 39.08 feet NGVD and is currently 0.42 feet below regulation stage (Figure 7). Average flows into the Lake from Arbuckle and Josephine creeks were 79 cfs and 15 cfs respectively, which is a decrease from last week's total flow. Average discharge from S68 and S68X this past week was 104 cfs, an increase from the previous week's flow. According to RAINДАР, 0.084 inches of rain fell in the Lake Istokpoga watershed during the past seven days.

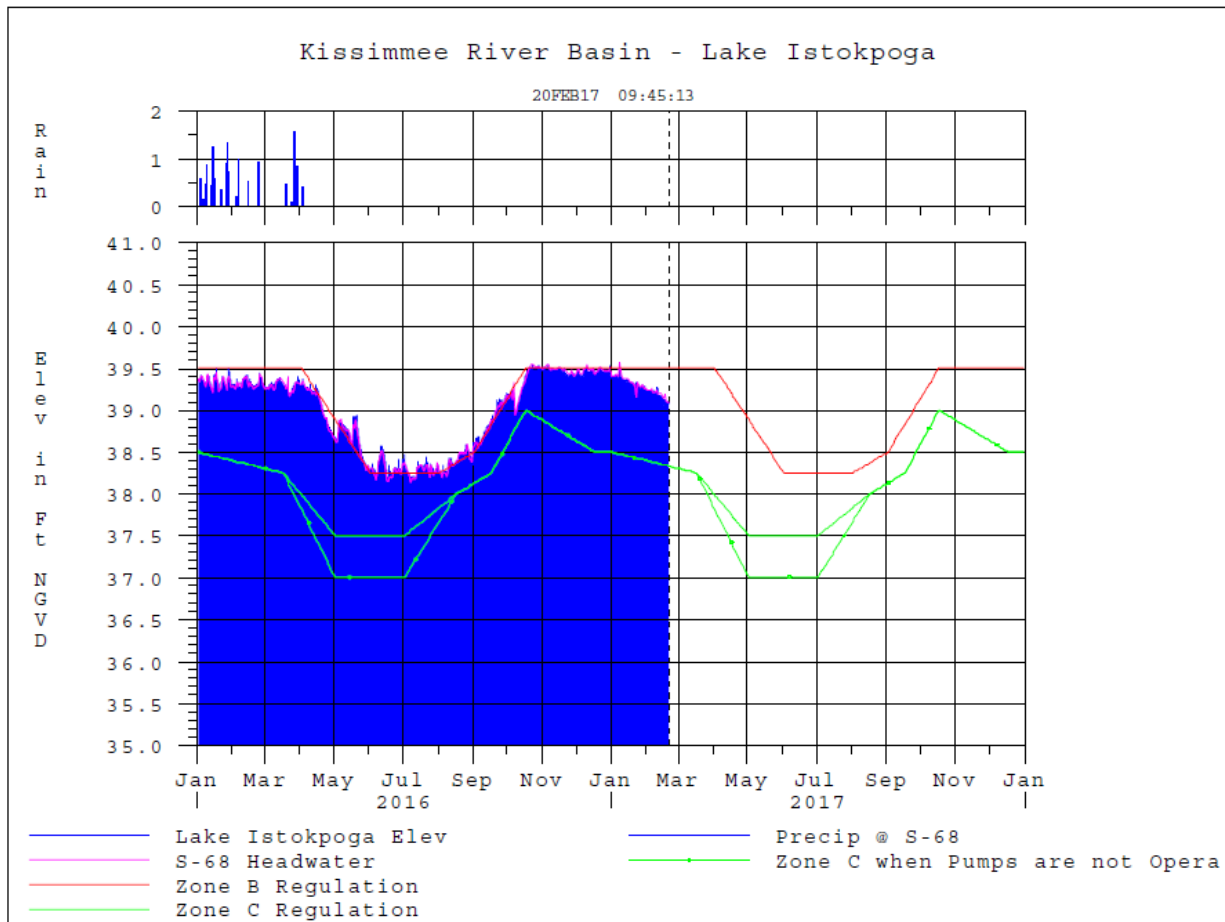


Figure 7

ESTUARIES

St. Lucie Estuary

Over the past week, provisional flows averaged about 0 cfs at S-80, 21 cfs downstream of S-308, 0 cfs at S-49 on C-24, 0 cfs at S-97 on C-23, and 50 cfs from Ten Mile Creek at the Gordy Road Structure. Average inflow from tidal basin tributaries is estimated to be 32 cfs (Figures 1 and 2). Total inflow averaged about 82 cfs last week and 149 cfs over last month.

Over the past week, surface salinity decreased at HR1 and increased throughout the rest of the estuary (Table 1, Figures 3 and 4). The seven-day moving average salinity of the water column at the US1 Bridge is about 27.0. 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)	24.2 (24.3)	26.0 (25.4)	NA ¹
US1 Bridge	26.7 (26.1)	27.3 (26.6)	10.0-26.0
A1A Bridge	31.8 (31.4)	32.7 (32.2)	NA

¹Envelope not applicable

Caloosahatchee Estuary

During the past week, provisional flows averaged approximately 992 cfs at S-77, 553 cfs at S-78, and 675 cfs at S-79. Average inflow from tidal basin tributaries is estimated to be 65 cfs (Figures 5 and 6). Total inflow averaged 740 cfs last week and 779 cfs over last month.

Over the past week in the estuary, surface salinity decreased to Ft. Myers Yacht Basin and remained about the same 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 in the fair range at Sanibel (Figure 9). The 30-day moving average surface salinity is 3.5 at Val I-75 and 10.2 at Ft. Myers. The 30-day moving average salinity at Ft. Myers has been over 10 for 51 consecutive days. Salinity conditions between Val I-75 and Ft. Myers are improving but still likely to result in tape grass deterioration. Without discharges at S-79, the 30-day moving average salinity at Val I-75 is forecast to be 3.6 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)	1.0 (2.6)	1.0 (2.7)	NA ¹
*Val I75	2.1 (3.8)	3.6 (5.0)	0.0-5.0 ²
Ft. Myers Yacht Basin	9.7 (9.8)	11.3 (10.6)	NA
Cape Coral	18.2 (17.8)	19.8 (19.0)	10.0-30.0
Shell Point	28.3 (28.0)	29.0 (29.1)	10.0-30.0
Sanibel	> 31 (>31)	> 31 (31.7)	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)	4.39 – 15.65	4.98 – 15.49	1.28 – 20.24
Dissolved Oxygen (mg/l)	6.45 – 8.78	5.92 – 7.90	No Data

The Florida Fish and Wildlife Research Institute reported on February 17, 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 medium concentrations in thirteen samples collected from Lee County. All nearshore samples ranged from background to low.

Water Management Recommendations

Forecasts of salinity at the VAL I75 station indicate that the estuary does not need supplemental releases of water from Lake Okeechobee. Any managed reduction of discharge at S-79 should occur in a stepwise fashion to avoid sudden changes in salinity.

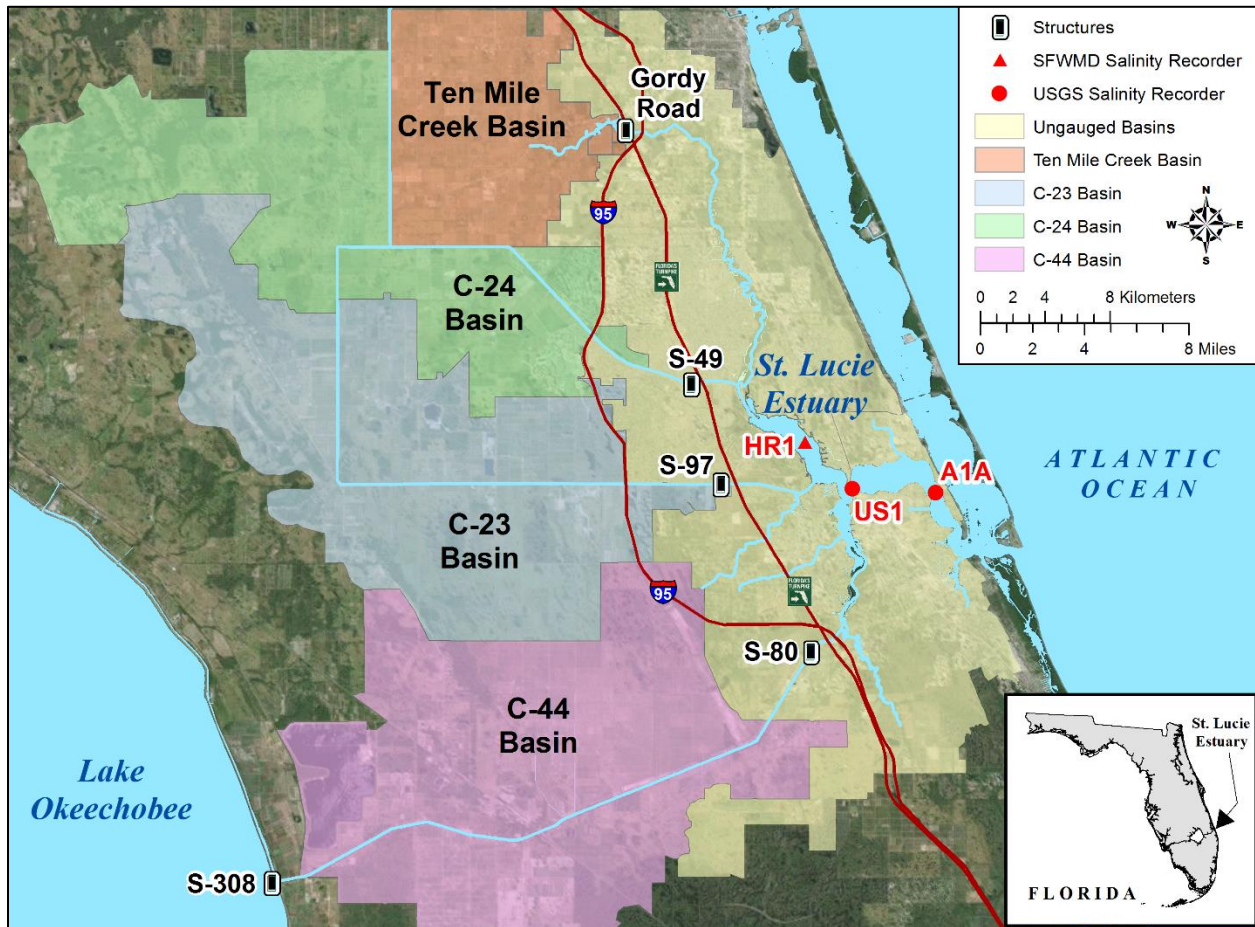


Figure 1. Basins, water control structures, and salinity monitoring for the St. Lucie Estuary.

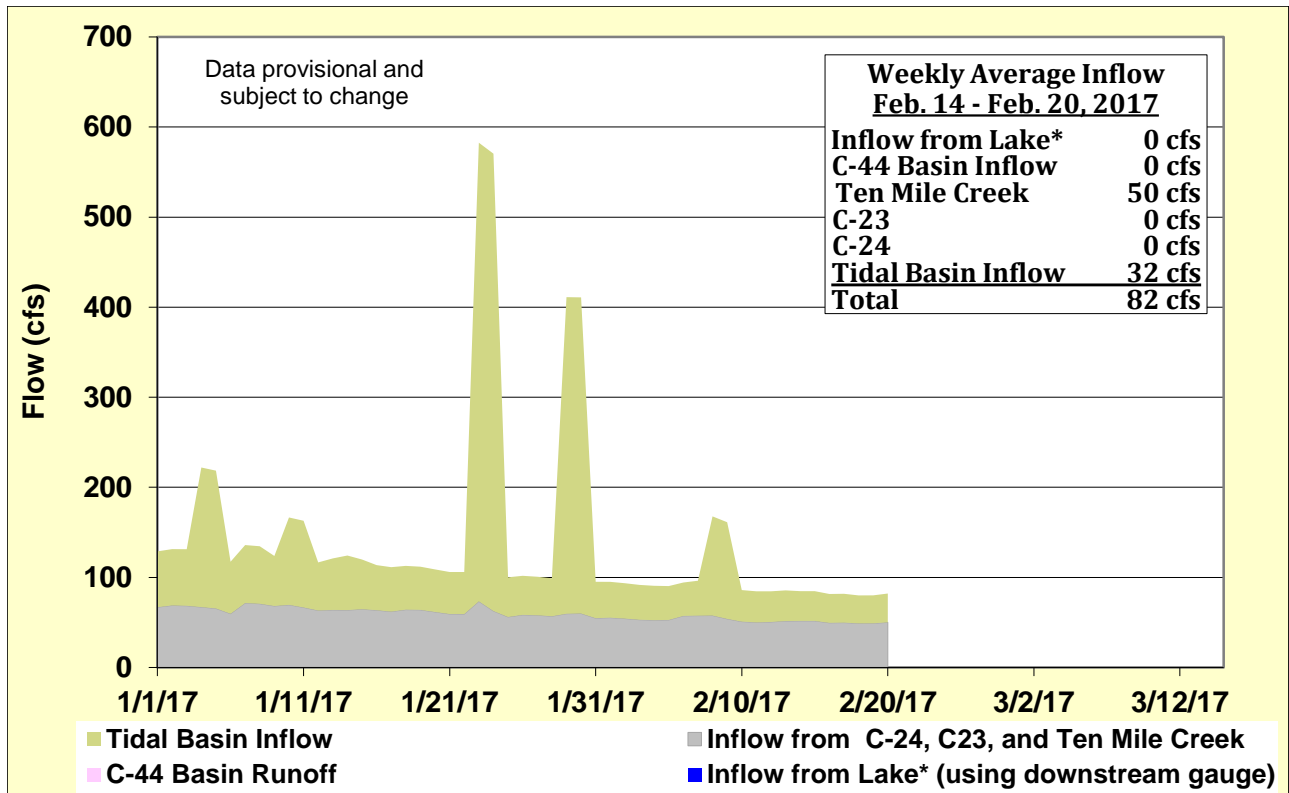


Figure 2. Estimated surface freshwater inflows from Lake Okeechobee and runoff from the C-44, C-23, C-24, Ten Mile Creek, and tidal basins into the St. Lucie Estuary.

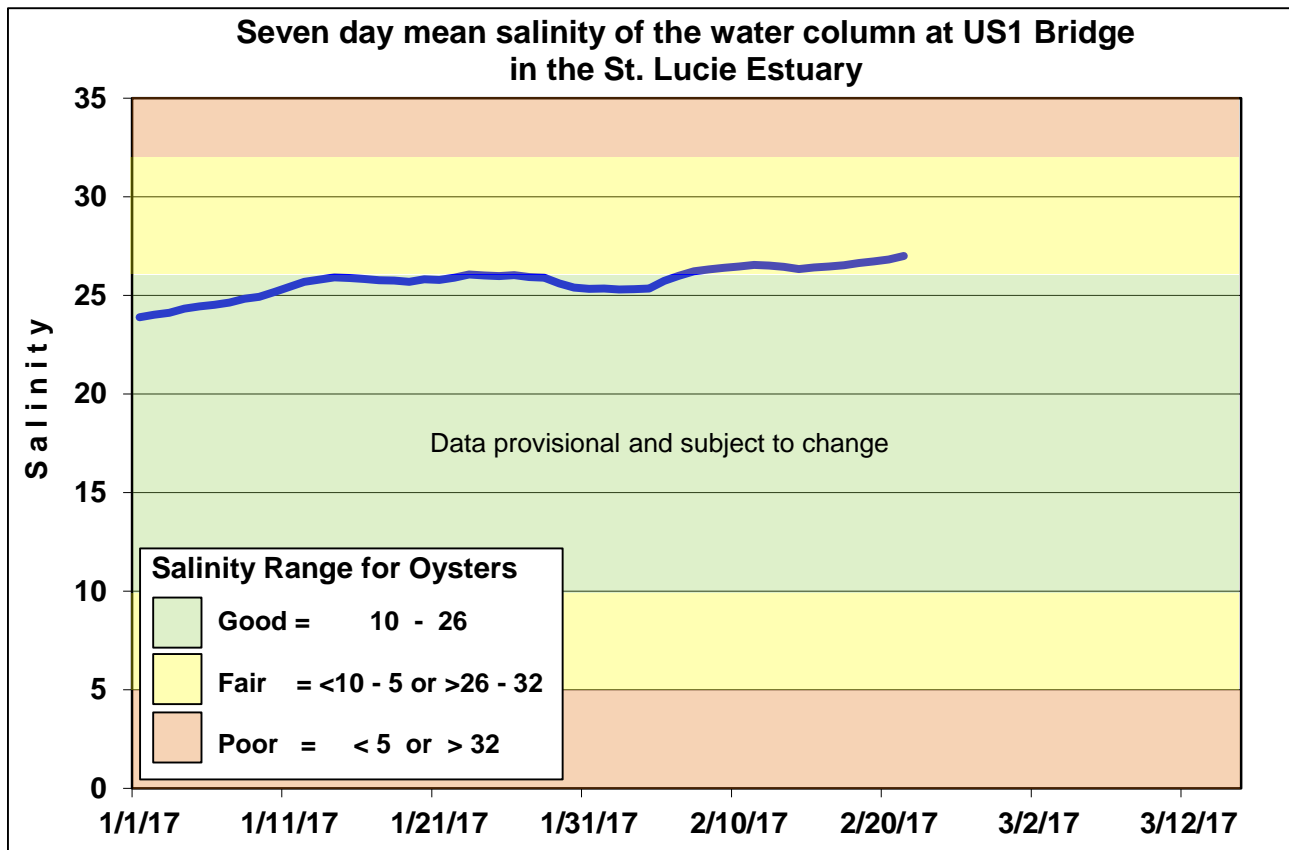


Figure 3. Seven-day mean salinity of the water column at the U.S. Highway 1 Bridge.

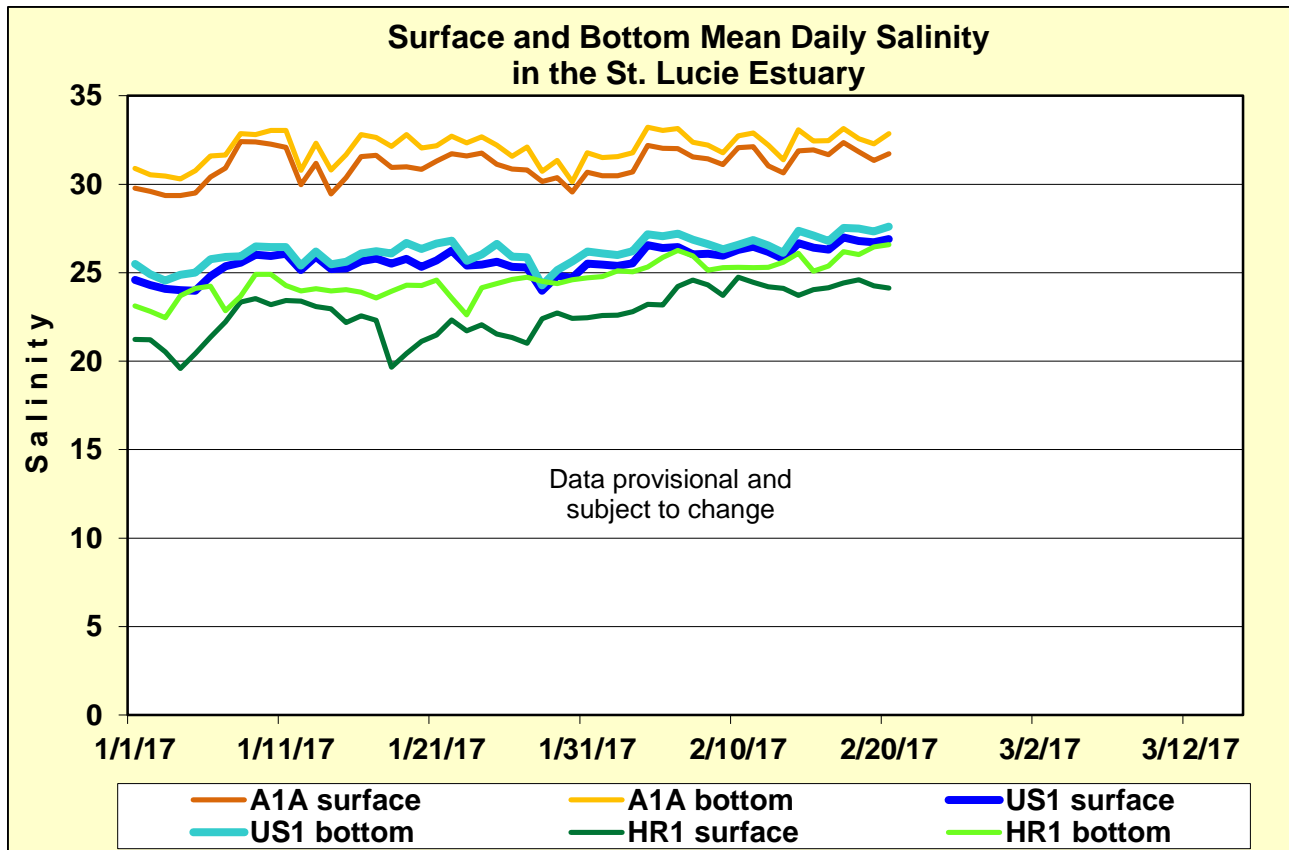


Figure 4. Daily mean salinity at the A1A, US1 and estimated HR1 stations.

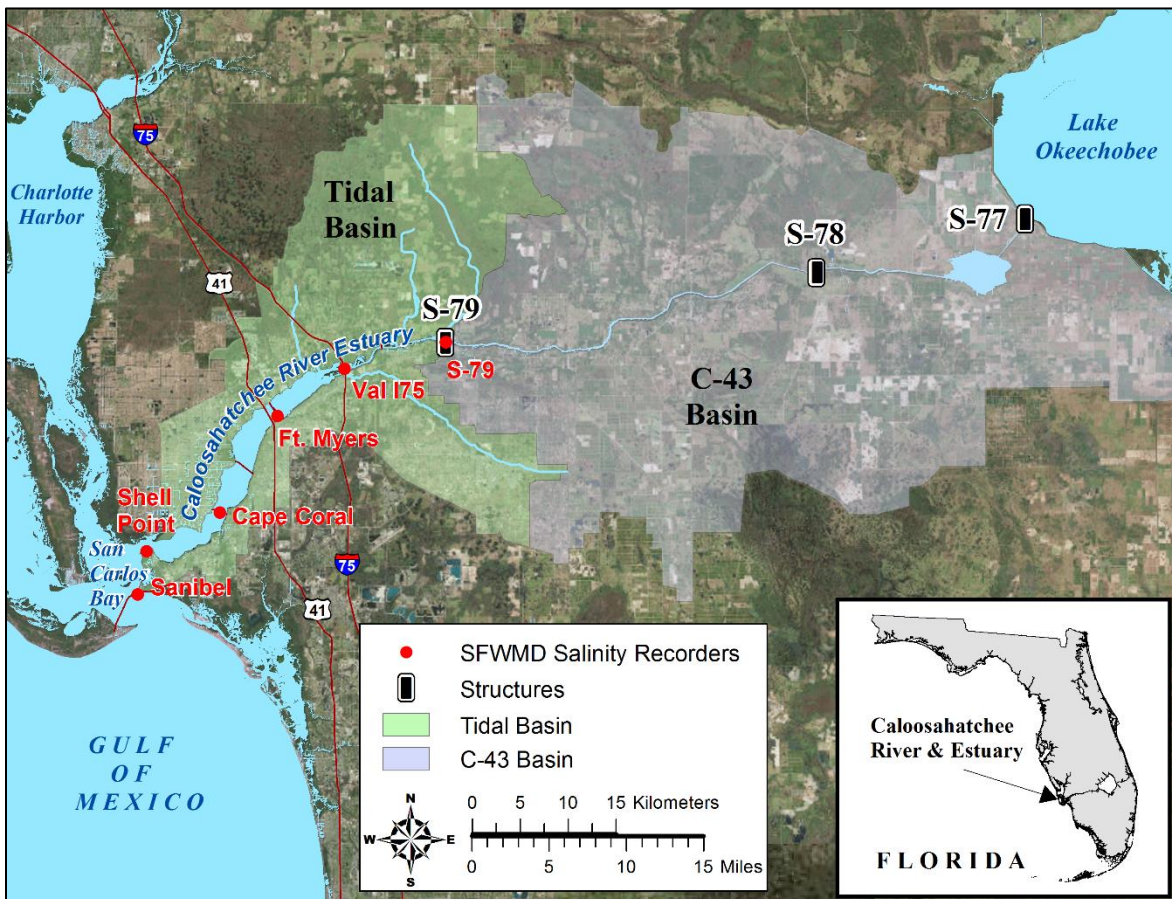


Figure 5. Basins, water control structures, and salinity monitoring for the Caloosahatchee Estuary.

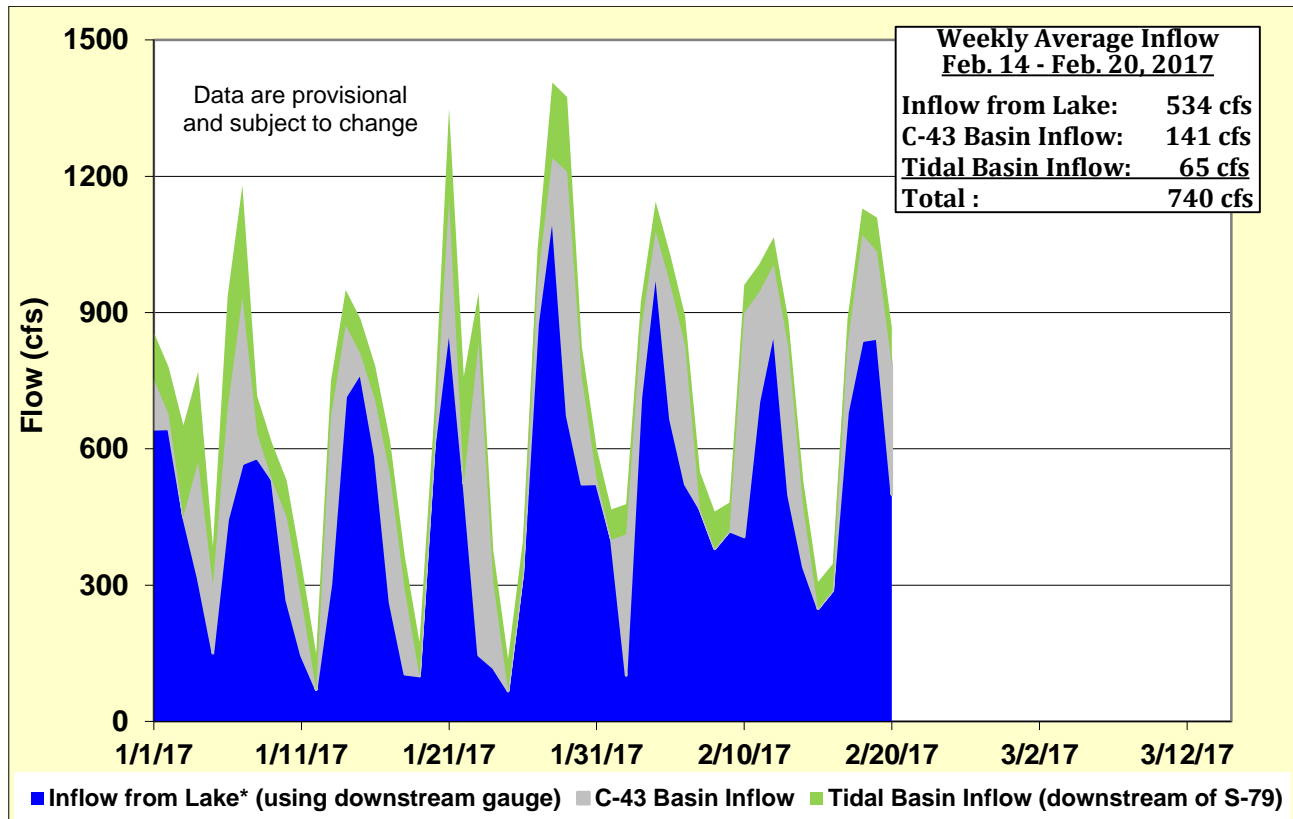
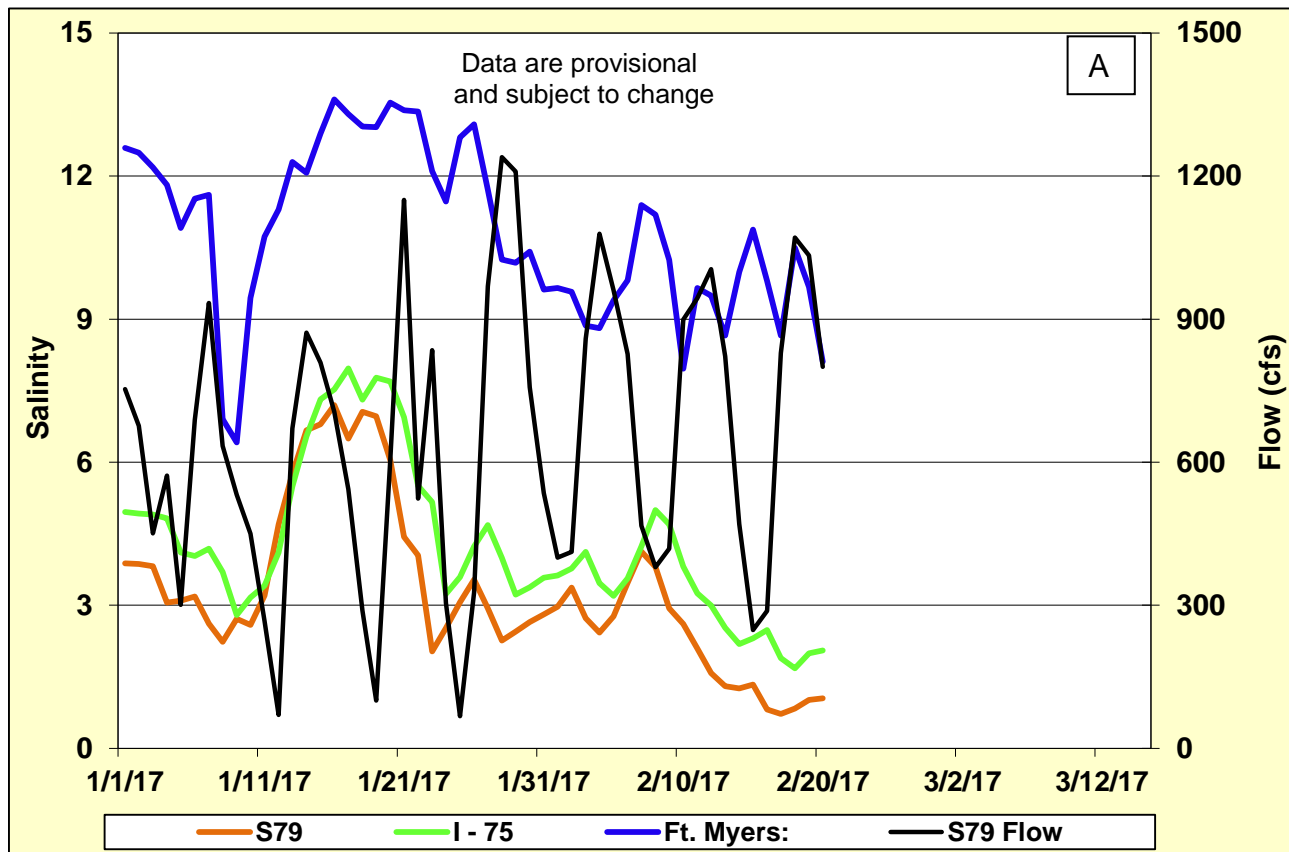


Figure 6. Freshwater inflows from Lake Okeechobee, runoff from the C-43 basin, and tributaries in the tidal basin into the Caloosahatchee River Estuary.



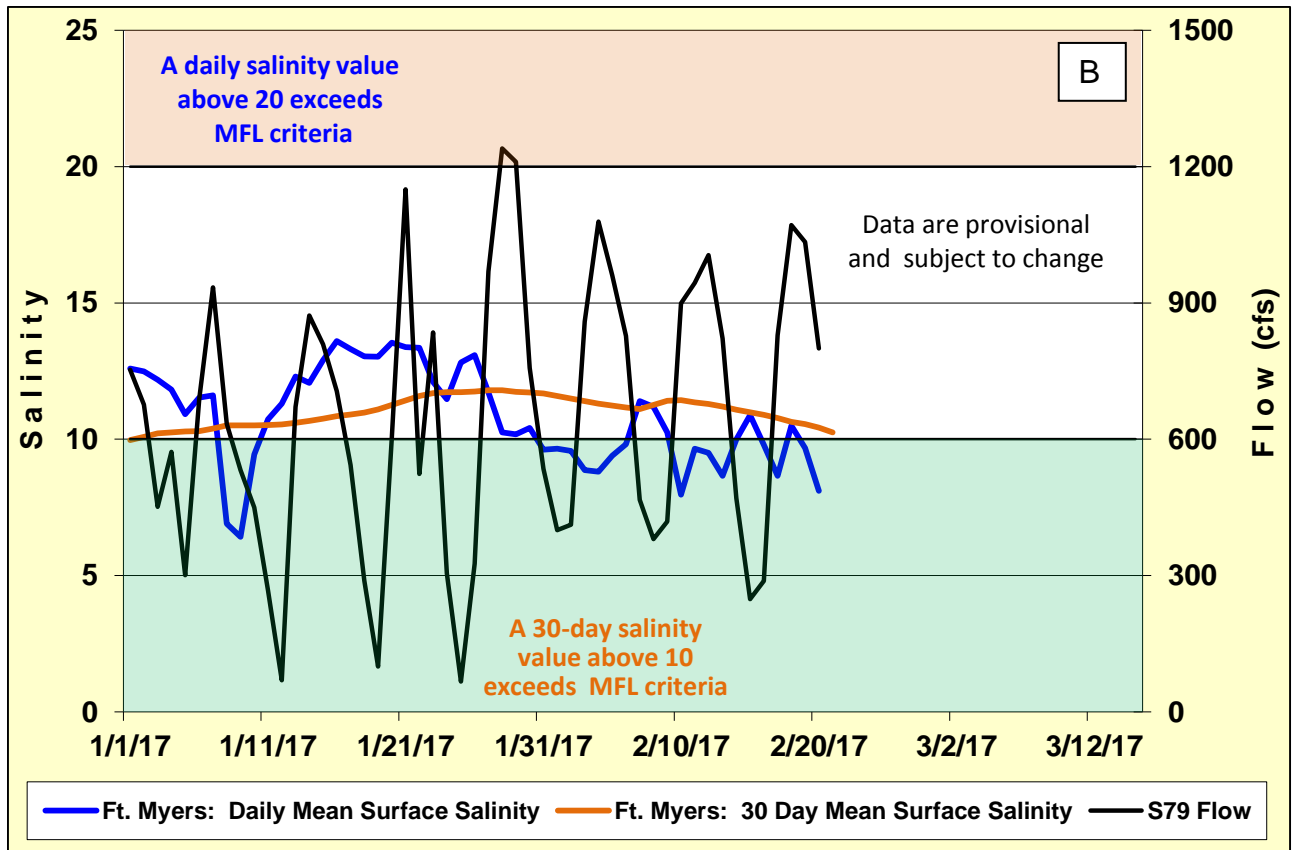


Figure 7. Daily mean flows at S-79 and salinity at upper estuary monitoring stations (A) and 30-day moving average salinity at Ft. Myers (B).

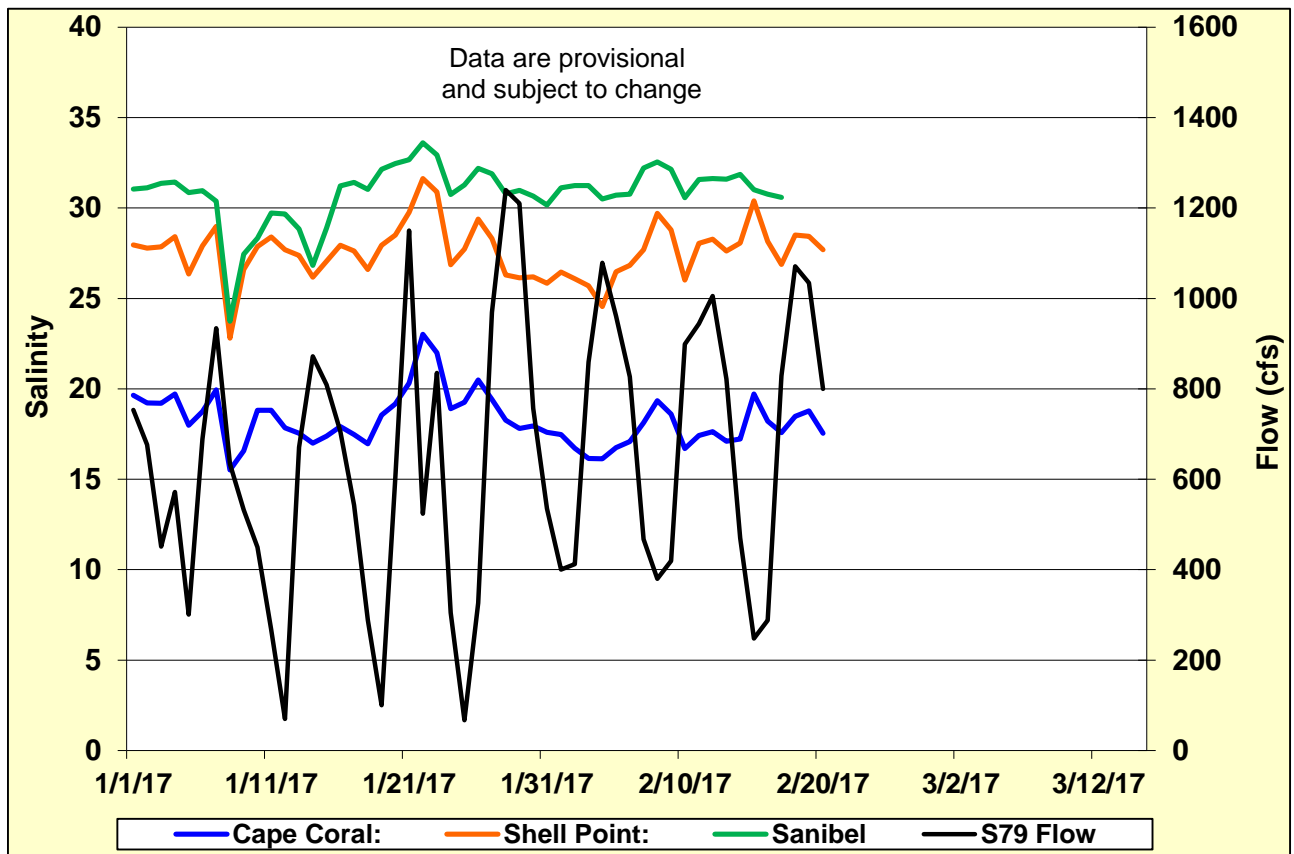


Figure 8. Daily mean flows at S-79 and salinity at lower estuary stations.

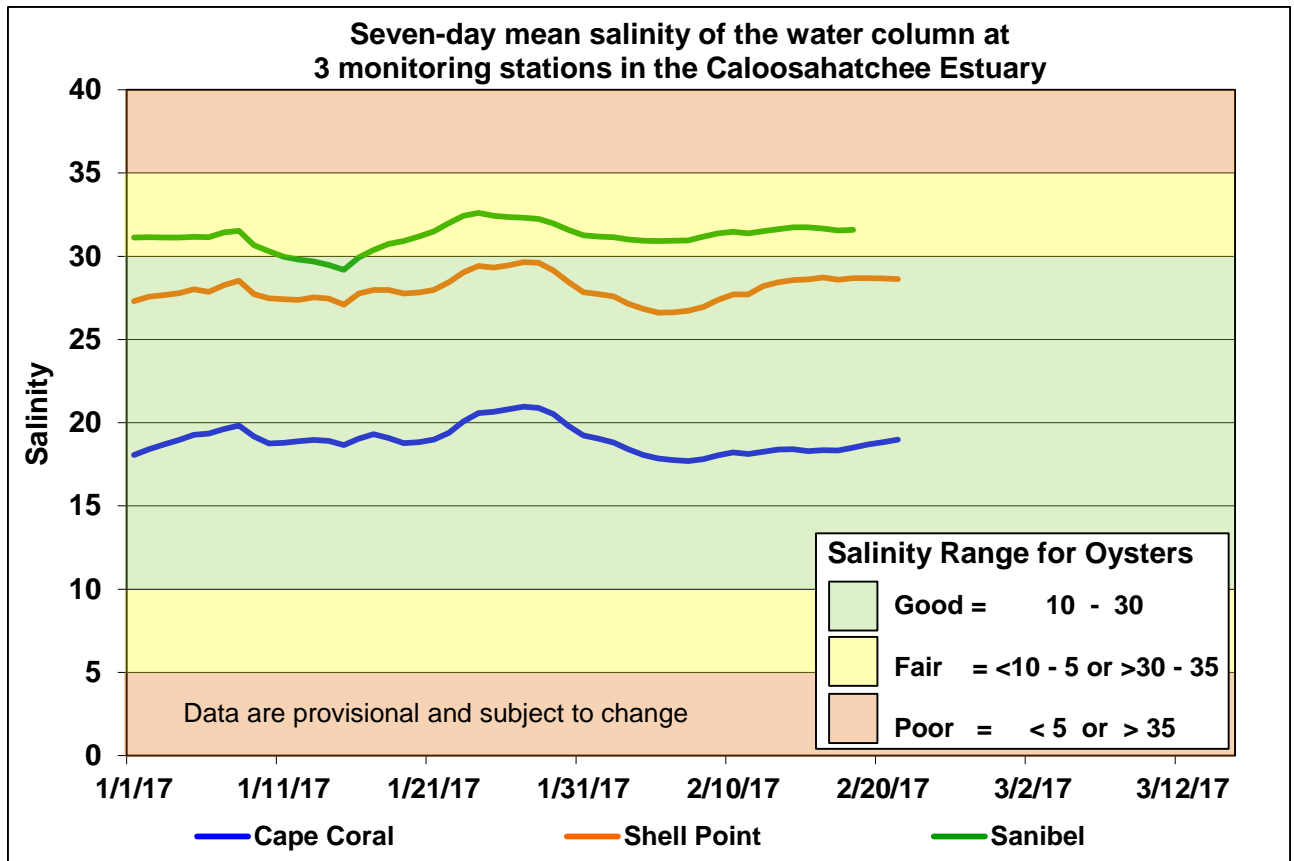


Figure 9. Seven-day mean salinity at Cape Coral Bridge, Shell Point and Sanibel Bridge monitoring stations.

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

Forecast 1: S-79 = 0 cfs & TBR = 130 cfs

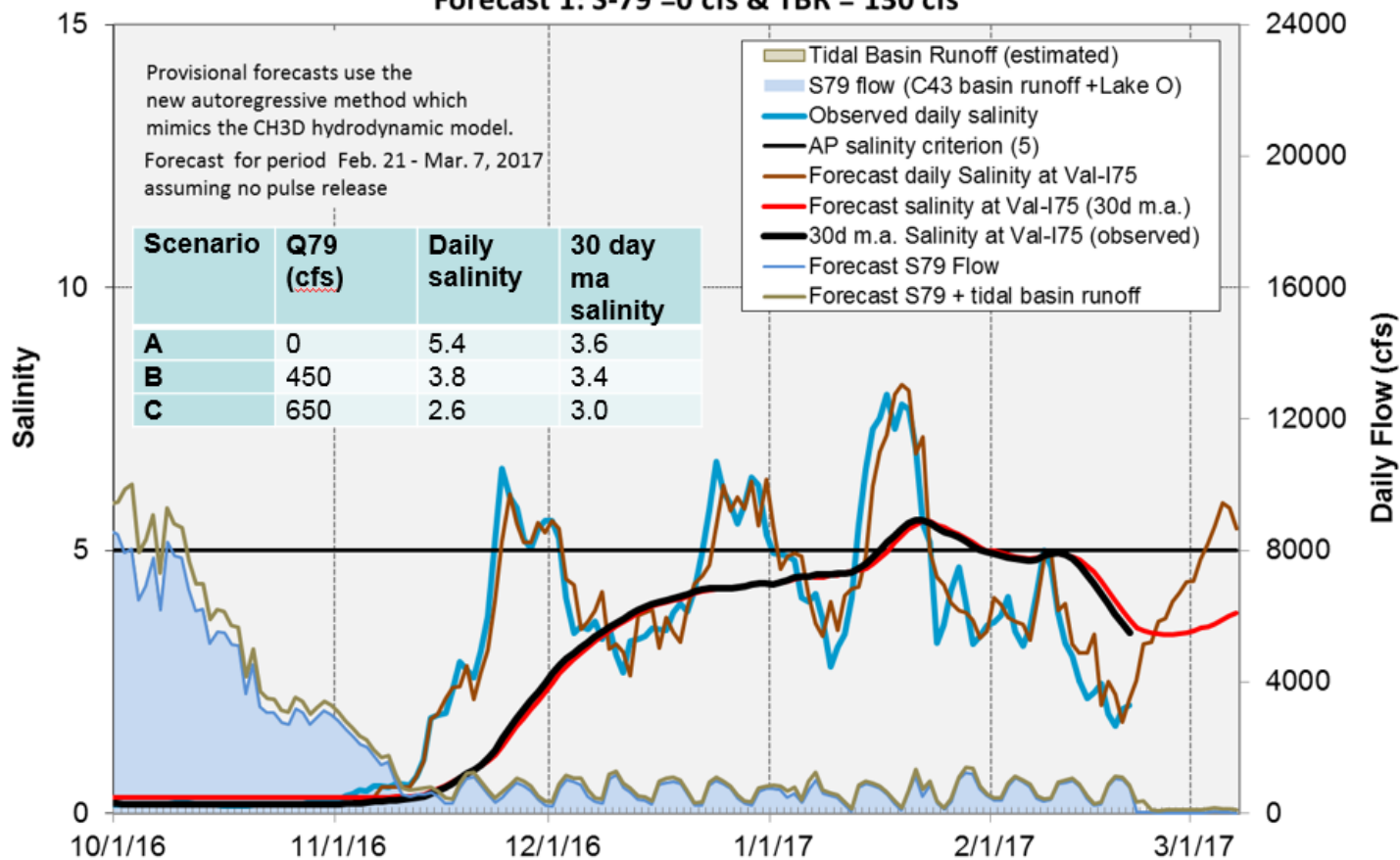


Figure 10. 14-day salinity forecast at Val I-75 assuming no releases at S-79.

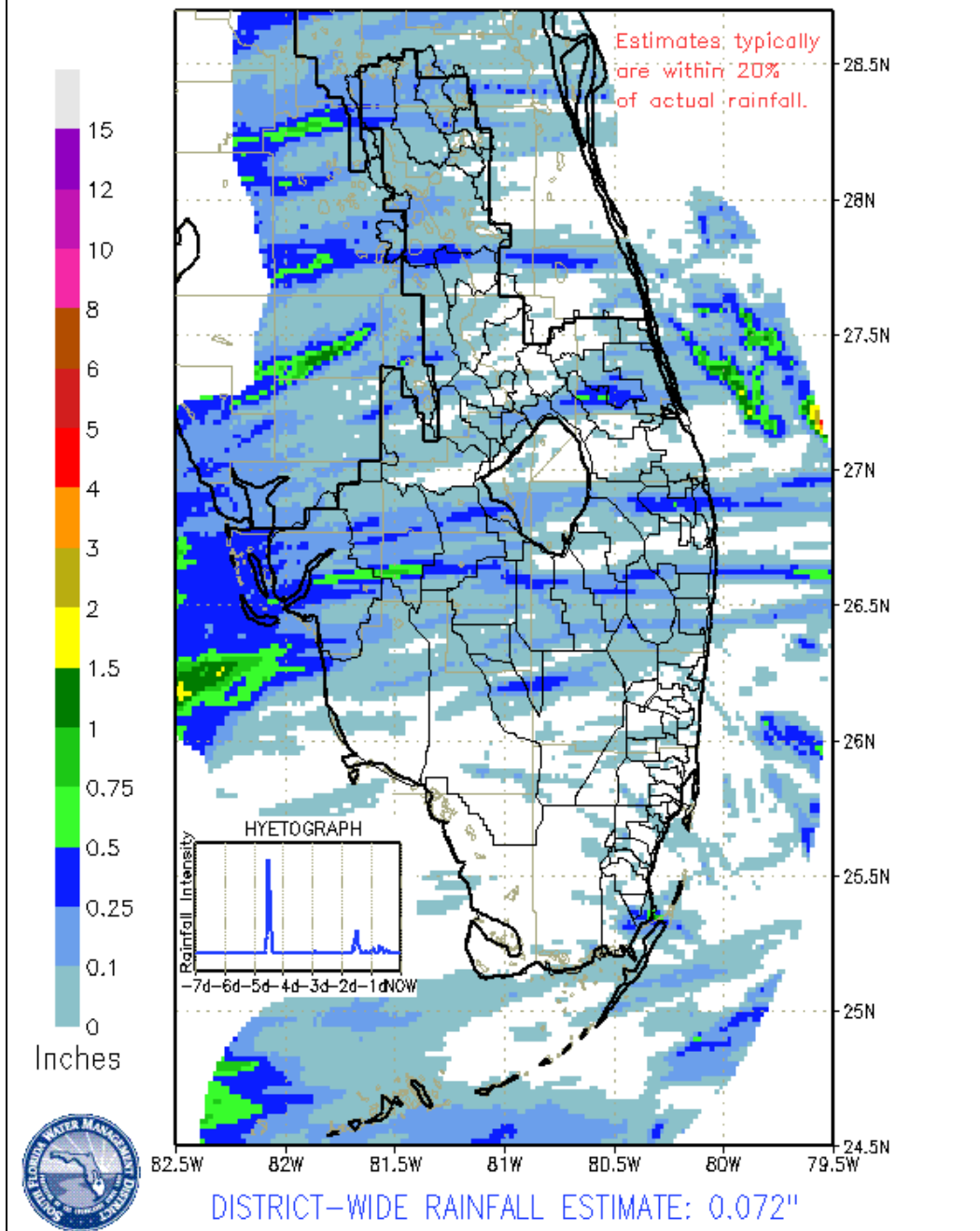
GREATER EVERGLADES

Rainfall was minimal and scattered across the Everglades system. Water levels decreased in all the WCAs and northeastern ENP. With the exception of WCA-2B, the rate of stage change within all the WCAs and the ENP fell with the “good” range.

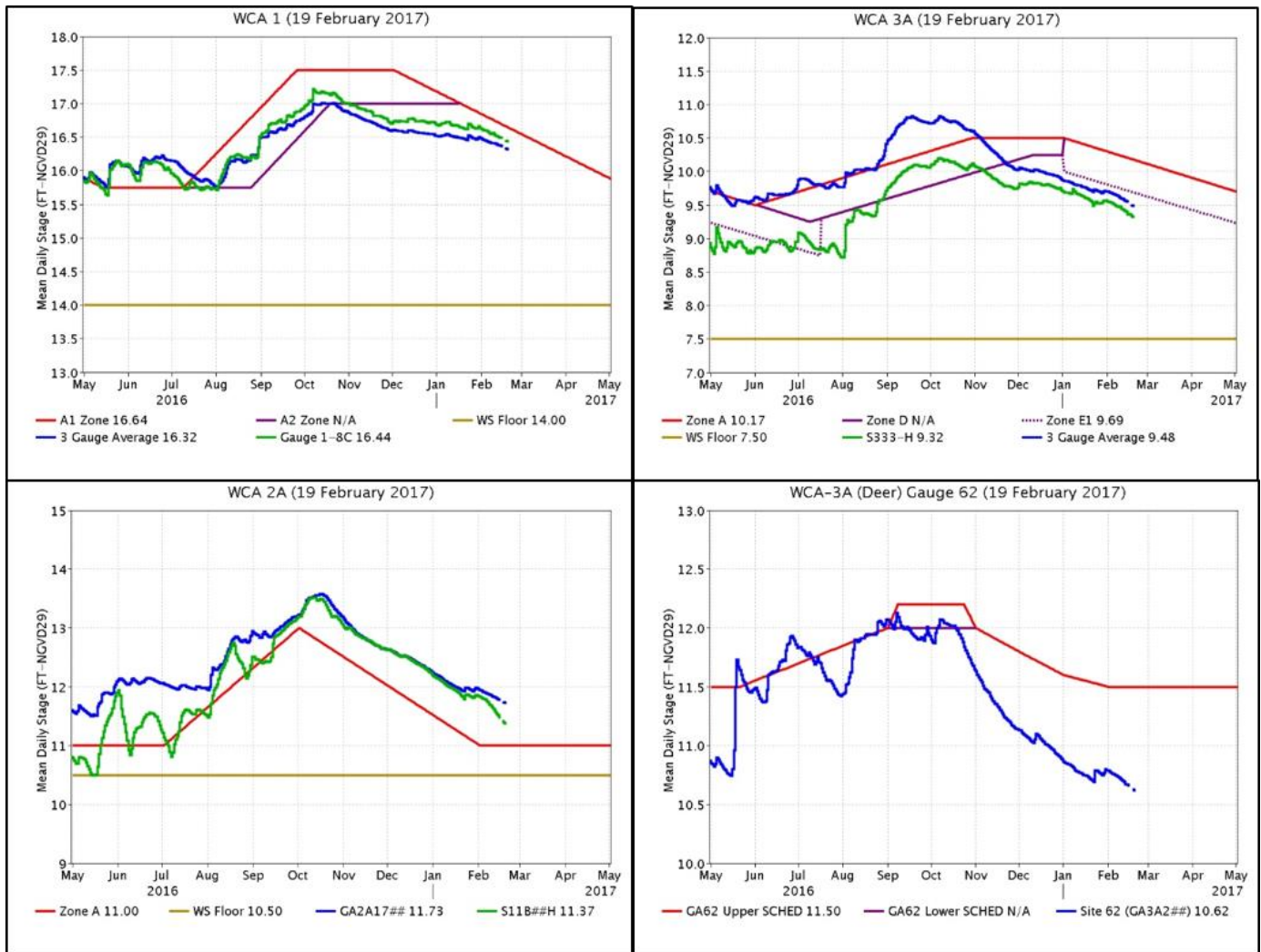
Everglades Region	Rainfall (Inches)	Stage Change (feet)	
WCA-1	0.10	-0.07	Good
WCA-2A	0.06	-0.09	Fair
WCA-2B	<0.01	-0.13	Poor
WCA-3A	0.04	-0.09	Good
WCA-3B	0.01	-0.06	Good
ENP	<0.01	-0.07	Good

SWMD PROVISIONAL RAINDAR 7-DAY RAINFALL ESTIMATES

FROM: 0615 EST, 02/13/2017 THROUGH: 0615 EST, 02/20/2017



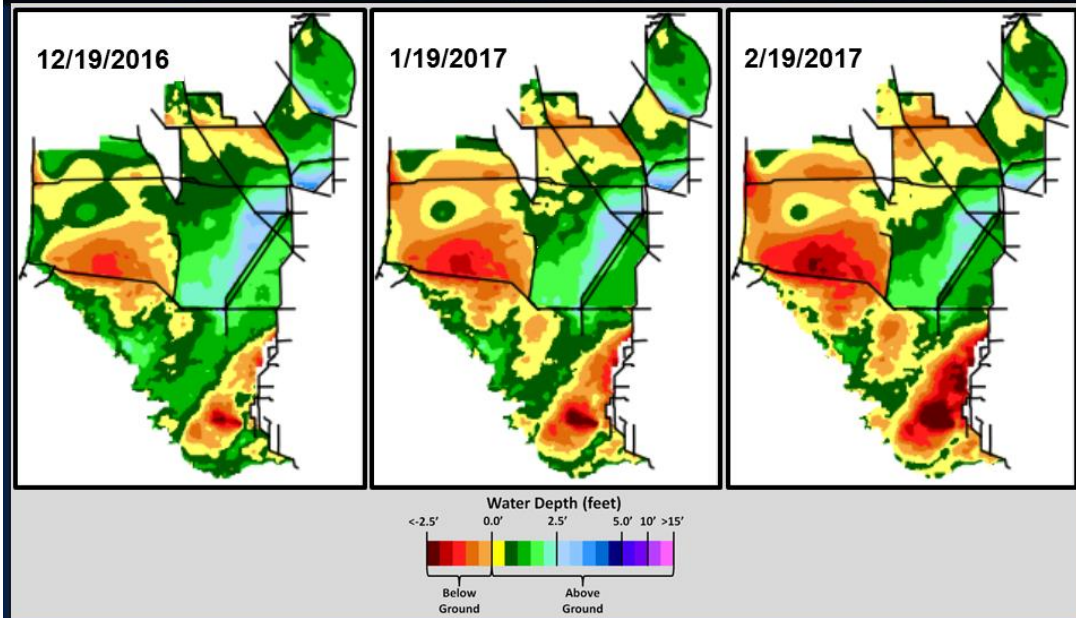
Regulation Schedules: Stages are below regulation for three of the four areas. The WCA-1 three-gauge average is -0.32 feet below zone A1, the northwestern WCA-3A gauge stage (gauge 62) is -0.88 feet below the upper schedule, and the WCA-3A three-gauge average stage is -0.21 feet below zone E1.



Water Depths and Changes: Water levels are generally lower than they were one and two months ago; and significantly lower than one year ago. This week's water depths at monitored gauges other than in WCA-2B range from 0.43 feet (northeast WCA-3A) to 2.01 feet (southern WCA-3A).



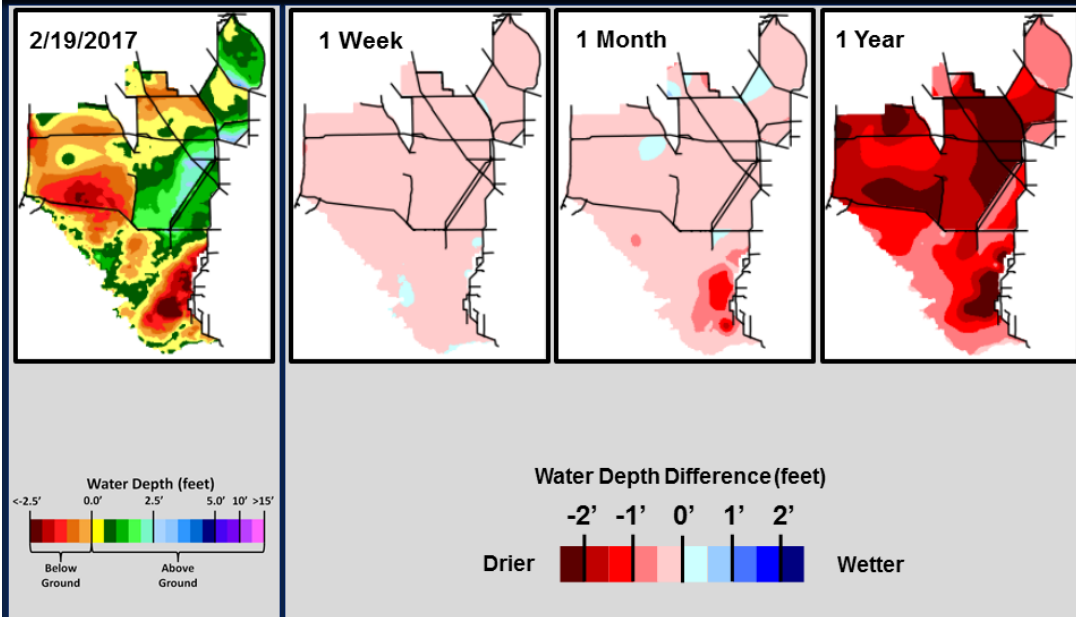
SFWDAT Water Depth Monthly Snapshots



South Florida Water Depth Assessment Tool (SFWDAT)

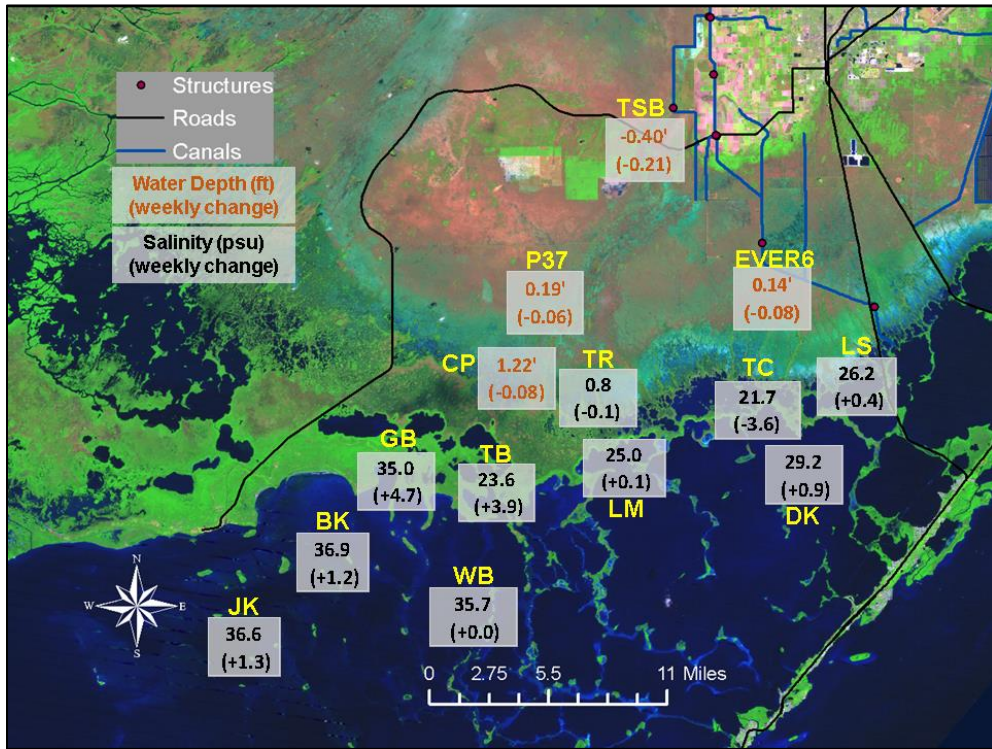


SFWDAT Everglades Difference Maps (Present - Past)



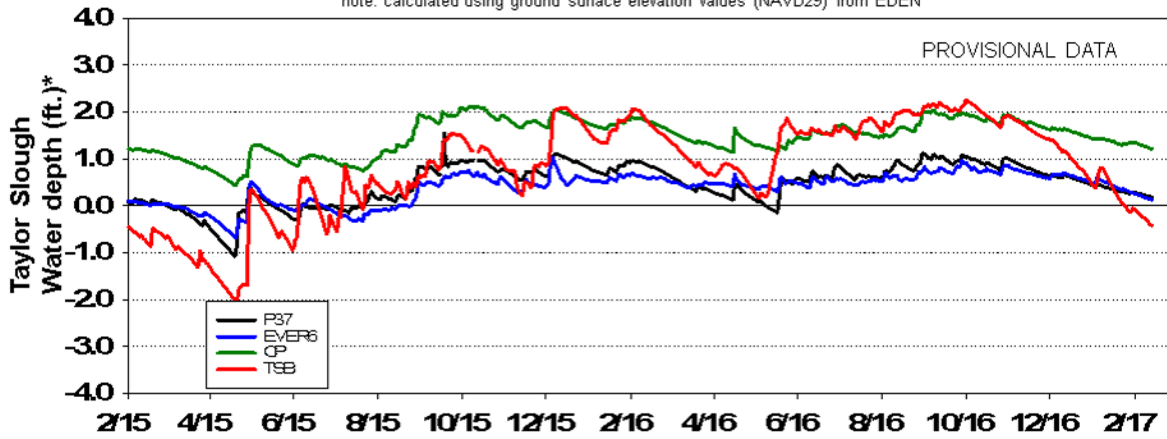
South Florida Water Depth Assessment Tool (SFWDAT)

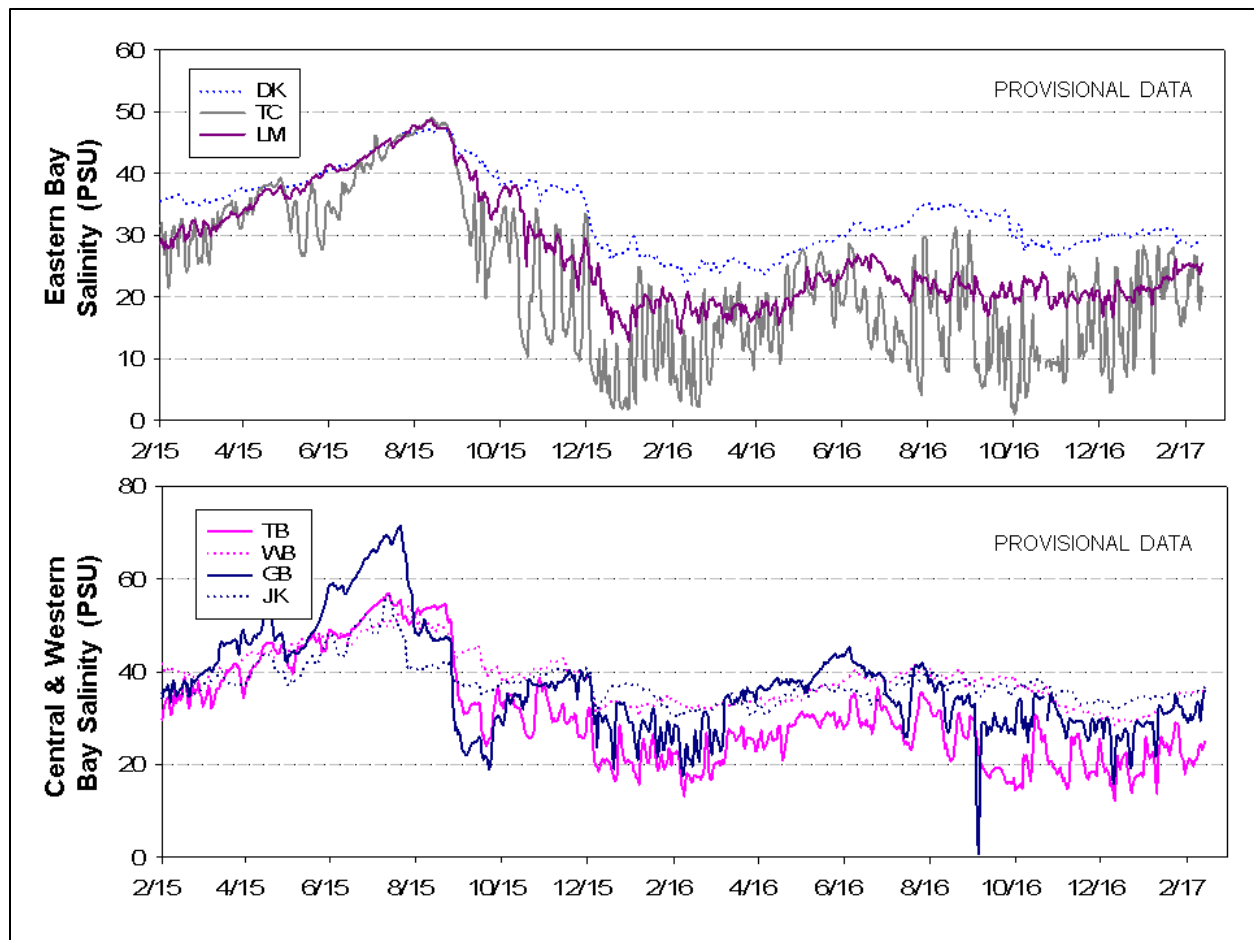
Wading Birds: The wading bird foraging depth HSI for 17 February (<https://irlo.shinyapps.io/EDEN/>) shows that depths remain optimal or suitable for foraging in northern and central WCA-1, central and northwest WCA-2A, southern WCA-3AN, northwest and central WCA-3AS, extreme western edge of WCA-3B, along the outer margins of Shark River and Taylor sloughs, and along large sections of ENP's marsh mangrove ecotone.



Taylor Slough Water Depths

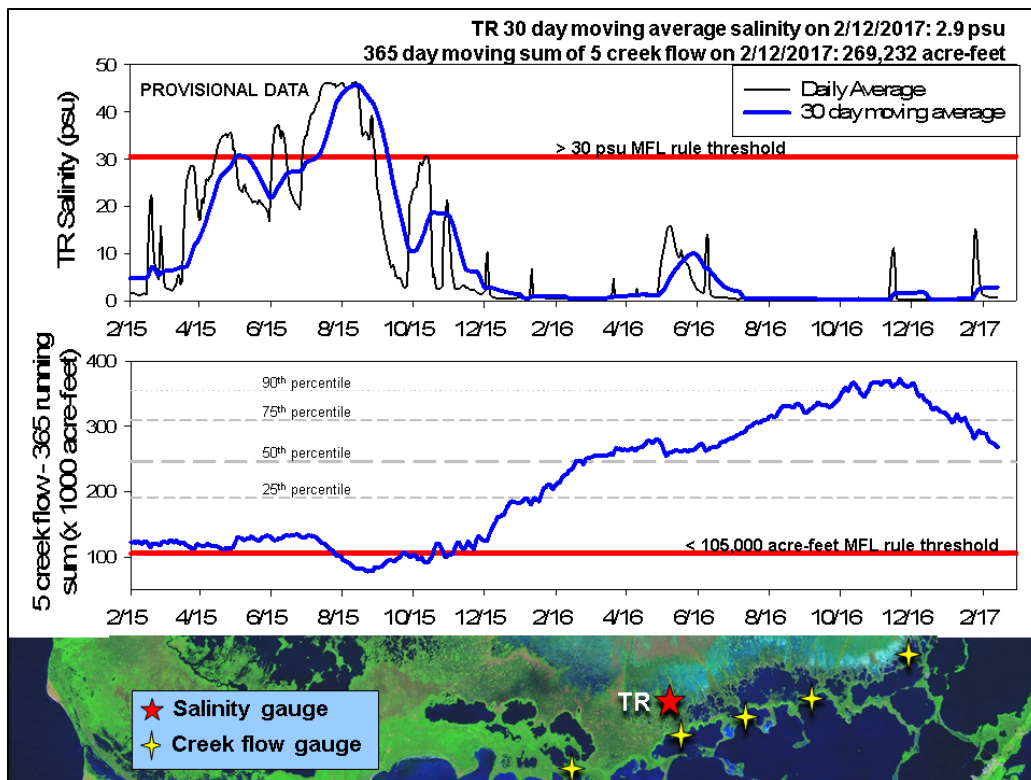
*note: calculated using ground surface elevation values (NAVD29) from EDEN





Florida Bay MFL: The daily average salinity at TR increased to 0.9 psu (up 0.1 from last week). The 30-day moving average stayed at 2.9 psu this week.

The 365-day moving sum of flow from the five creeks identified by stars on the map decreased about 18,000 acre-feet to end at 251,694 acre-feet (now below the average of 257,628 acre feet). The weekly creek flow from the five creeks was negative with around 3,700 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.
- 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. 21st, 2017 (red is new)

Area	Current Condition	Cause(s)	Recommendation	Reasons
WCA-1	Stages decreased -0.06' to -0.08'	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 -0.09'	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 -0.13'	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) remained -.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 -0.10'	Rainfall, ET, management		
WCA-3B	Stages decreased -0.03' 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 -0.07' to -0.22'	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	+1 to +6 psu above average	Rain, ET, inflows, wind	Move water southward as possible	Maintain low salinity conditions and prevent early salinity increases.