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, Operations, Engineering and Construction Bureau
Paul Linton, Chief, Operations Section

FROM: SFWMD Staff Environmental Advisory Team

DATE: February 27, 2018

SUBJECT: Weekly Environmental Conditions for Systems Operations

Summary

Weather Conditions and Forecast

Forecast includes some showers east again today, then through early next week. A frontal boundary that extends across the Kissimmee Valley will help trigger some showers over eastern areas of the District as it stalls this evening. This front will then return northward tomorrow as deep layered high pressure dominates again through Thursday. Another stronger but mainly dry front pushes through Friday morning with some cooler air settling over the District through the weekend. The next chance for appreciable, widespread rainfall is about 10 days away.

Kissimmee

Tuesday morning stages were 57.1 feet NGVD (0.9 feet below schedule) in East Lake Toho, 54.0 feet NGVD (1.0 feet below schedule) in Toho, and 50.3 feet NGVD (0.9 feet below schedule) in Kissimmee-Cypress-Hatchineha; headwater stages were 46.5 feet NGVD at S65A and 25.7 feet NGVD at S65D. Mean recession rates for the last week in East Lake Toho, Toho, and Kissimmee-Cypress-Hatchineha were 0.18, 0.17, and 0.20 feet per week, respectively (preferred maximum rate is 0.2 feet per week). Tuesday morning discharges were: 728 cfs at S65, 521 cfs at S65A, and 1,067 cfs at S65E. Dissolved oxygen concentration in the Kissimmee River averaged 6.0 milligrams per liter (mg/L) for the week.

Lake Okeechobee

Lake Okeechobee stage is 14.92 feet NGVD having decreased 0.12 feet over the past week and 0.35 feet over the last month. Following Hurricane Irma, stages exceeded 16.0 feet NGVD for 72 days, the longest period since late 2004, which was 73 days. Stages also exceeded 15.5 feet NGVD for 105 days, the longest period since late 2004, and exceeded 15.0 feet NGVD for 161 days, the longest period since the winter of 2005/2006. The high water and associated turbidity have had substantial impacts on the submerged aquatic and emergent vegetation coverage in the nearshore areas of the Lake; these areas would benefit from lower stages near the end of the 2018 dry season. Higher lake stages in the summer and total phosphorus which remained at elevated levels in January due to continued resuspension of sediments that were disturbed during Hurricane Irma, will likely be favorable for algal blooms this spring and summer as turbidity declines and water temperatures rise.

Estuaries

Total inflow to the St. Lucie Estuary averaged 165 cfs over the past week with no flow coming from Lake Okeechobee. Salinity slightly increased throughout the estuary. The seven-day average salinity at the US1 Bridge is in the good range for adult oysters. Average weekly dissolved oxygen levels at HR1 station in the North Fork were 5.64 mg/L near the surface and 4.10 mg/L near the bottom. The highest weekly ranges of chlorophyll *a* were between 5.29 – 17.2 µg/L in the Middle Estuary.

Total inflow to the Caloosahatchee Estuary averaged 709 cfs over the past week with 421 cfs coming from Lake Okeechobee. Salinity slightly increased throughout the estuary. The 30-day moving average surface salinity is 3.8 at Val I-75 and 10.1 at Ft. Myers. The 30-day moving average salinity at Val I-75 is forecast to be 5.5 in two weeks with no flow through S-79. Salinity conditions between Val I-75 and Ft. Myers are good for tape grass. Salinity conditions are in the good range for adult oysters at Shell Point and at Cape Coral. Chlorophyll *a* concentrations were low to medium near Beautiful Island (11.2 – 34.7 µg/L), Ft. Myers (5.47 – 11.6 µg/L) and Shell Point (1.23 – 3.43 µg/L) over the last week. Dissolved oxygen levels at Beautiful Island were 7.45 – 11.1 mg/L, at Ft. Myers were 5.26 – 7.80 mg/L and at Shell Point were 5.40 – 9.62 mg/L. Given the current estuarine conditions, there are no ecological benefits associated with freshwater releases from Lake Okeechobee.

Stormwater Treatment Areas

Over the past week, the STAs/FEBs received approximately 6,200 acre-feet of Lake Okeechobee releases. The total amount of Lake releases sent to the STAs/FEBs in WY2018 (since May 1, 2017) is approximately 72,700 acre-feet. Most STA cells are at or above target depths, except many of the STA-5/6 cells which are below target. Operational restrictions are in place for vegetation rehabilitation in STA-1E and STA-2, and for construction related activities in STA-1W. This week, if 2008 LORS recommends Lake Okeechobee releases to the WCAs and the conditions allow, releases will be sent to STA-1E Eastern Flow-way, STA-2 Flow-way 1, and the A-1 FEB.

Everglades

Over the last week basin-wide recession rates across most of the Everglades are within the range that results in good foraging conditions for wading birds. At this point in the season, there is little need for any artificial manipulation of recession rate or depths, with the exception of northeastern WCA-3A which can use additional flows to slow down recession rates. Maintaining open water conditions around the Alley North wading bird nesting colony is important to protect nests from terrestrial predators (based on field observations, the current depths there are about 6 to 7 inches). In Taylor slough, water levels are still 1 to 16 inches above the historical average for this time of year with the largest divergence occurring in northern Taylor Slough, where stages would typically be below ground by this time of year. Salinity changes for the last week were small with the largest change being an increase of 3.3 psu in the central nearshore region. The changes in salinity this week are mostly opposite from last week. Recommendations for individual areas are presented at the end of this report.

Supporting Information

KISSIMMEE BASIN

Kissimmee Basin Rainfall

The Upper Kissimmee Basin received 0.02 inches of rainfall in the past week and the Lower Basin received 0.01 inches (SFWMD Daily Rainfall Report 2/26/2018).

Upper Kissimmee Basin

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

Table 1. Average discharge (cfs) for the preceding seven days, one-day stage (feet NGVD), and departures from KCOL flood regulation (R) or temporary schedules (T, A, or S). Provisional, real-time data are from SFWMD.

Report Date: 2/27/2018

Water Body	Structure	7-day Average Discharge (cfs)[1]	Stage Monitoring Site[2]	Lake Stage (feet)	Schedule Type[3]	Schedule Stage (feet)	Daily Departure (feet)						
							2/25/18	2/18/18	2/11/18	2/4/18	1/28/18	1/21/18	1/14/18
Lakes Hart and Mary Jane	S62	30	LKMJ	60.8	R	61.0	-0.2	-0.1	0.1	0.0	0.0	0.0	0.1
Lakes Myrtle, Preston, and Joel	S57	5	S57	61.0	R	61.1	-0.1	0.0	0.0	0.1	0.0	0.1	0.0
Alligator Chain	S60	0	ALLI	63.8	R	64.0	-0.2	-0.1	0.0	-0.1	-0.1	-0.1	0.0
Lake Gentry	S63	0	LKGT	61.5	R	61.5	0.0	0.0	0.0	0.1	0.1	0.0	0.1
East Lake Toho	S59	149	TOHOE	57.1	R	58.0	-0.9	-0.7	-0.6	-0.4	-0.3	-0.1	0.1
Lake Toho	S61	406	TOHOW, S61	54.0	R	55.0	-1.0	-0.8	-0.6	-0.4	-0.3	-0.2	0.0
Lakes Kissimmee, Cypress, and Hatchineha	S65	968	KUB011, LKIS5B	50.4	R	51.3	-0.9	-1.0	-1.3	-1.7	-1.8	-1.8	-1.7

[1] Seven-day average of weighted daily means through midnight.
[2] Names of in-lake monitoring sites and structures used to determine lake stage; if more than one site is listed, an average is reported.
[3] T = temporary schedule, R = USACE flood control schedule, S = temporary snail kite schedule, A = projected ascension line, N/A= not applicable or data not available.
DATA ARE PROVISIONAL

Lower Kissimmee Basin

Discharges at Lower Basin structures are shown in Table 2. SFWDAT depth maps for the Phase I restoration area are shown in Figure 8. Kissimmee River floodplain stages at selected stations are shown in Figure 9.

Table 2. One-day and seven-day averages of discharge at S-65x structures, of dissolved oxygen concentration in the Phase I area river channel, and water depth in the Phase I area floodplain. Data are provisional real-time data from SFWMD.

Report Date: **2/27/2018**

Metric	Location	1-Day Average	Average for the Preceeding 7-Days[1]									
		2/25/2018	2/25/18	2/18/18	2/11/18	2/4/18	1/28/18	1/21/18	1/14/18	1/7/18	12/31/17	12/24/17
Discharge (cfs)	S-65	906	968	1,000	810	785	583	572	567	540	517	553
Discharge (cfs)	S-65A	703	764	796	647	625	468	506	446	452	443	446
Discharge (cfs)	S-65D[2]	703	1,047	1,018	940	857	656	692	764	696	718	770
Stage (feet NGVD)	S-65D[2]	25.68	25.79	25.87	25.80	25.82	25.76	25.72	25.85	25.74	25.77	25.82
Discharge (cfs)	S-65E[2]	703	1,088	1,059	978	899	712	730	837	751	777	857
Discharge (cfs)	S-67	0	133	389	350	346	241	97	404	396	399	322
DO (mg/L)[3]	Phase I river channel	5.6	6.0	6.2	7.8	8.7	9.7	9.5	8.8	7.7	6.5	7.1
Mean depth (feet)[4]	Phase I floodplain	N/A	0.26	0.27	0.27	0.26	0.19	0.21	0.24	0.22	0.23	0.27

[1] Seven-day average of weighted daily means through Sunday midnight.
[2] S-65D discharge combines discharge at S-65D, S-65DX1, and S-65DX2; S-65D stage averages stage at S65D and S65DX1; S65E discharge combines S65E and S65EX1.
[3] DO is the average for sondes at PC62 and PC33.
[4] 1-day spatial average from South Florida Water Depth Assessment Tool (SFWDAT).
DATA ARE PROVISIONAL; N/A indicates that data were not available.

KCOL Hydrographs (through Sunday midnight)

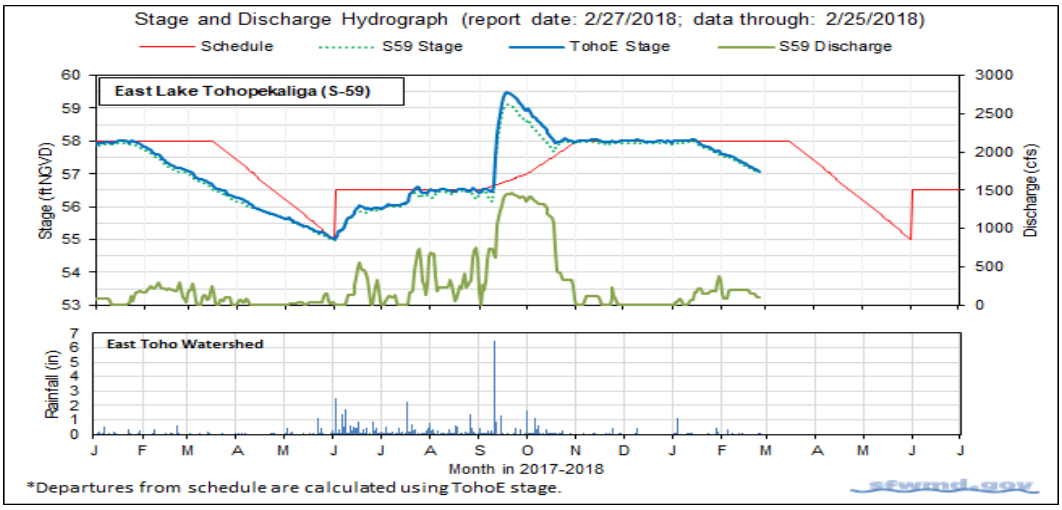


Figure 1.

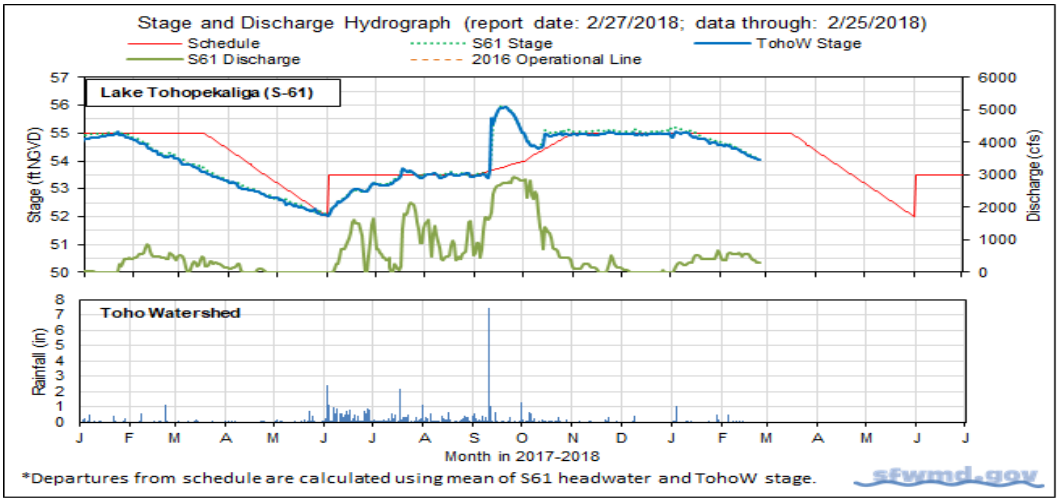


Figure 2.

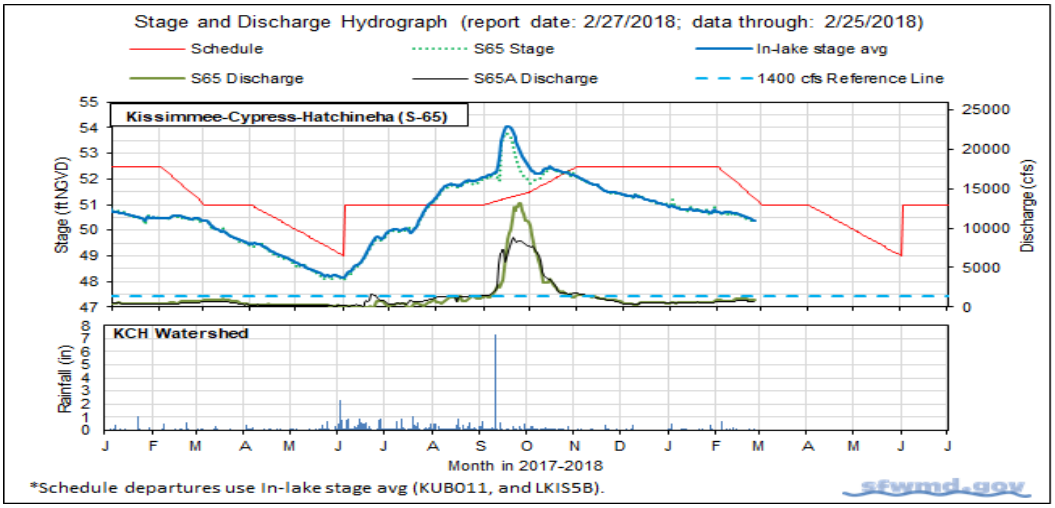


Figure 3.

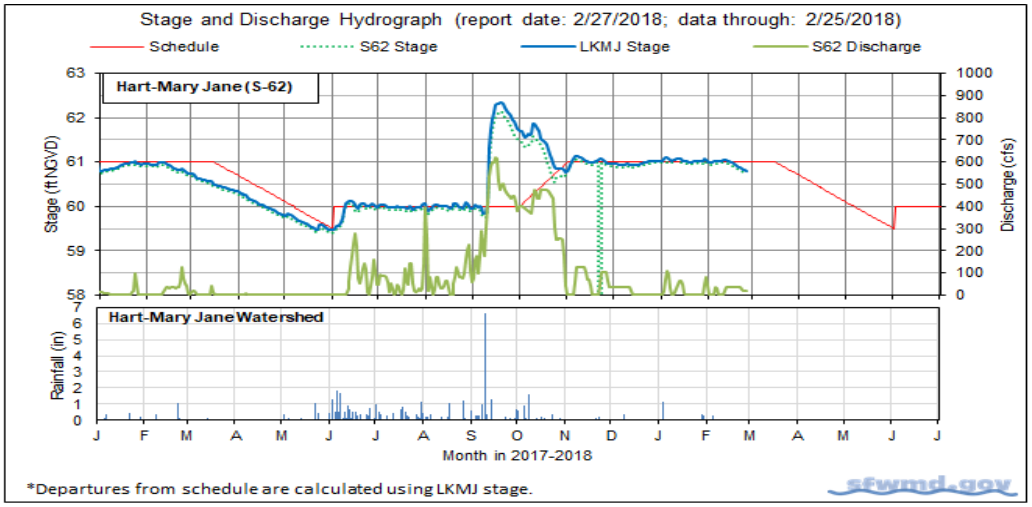


Figure 4.

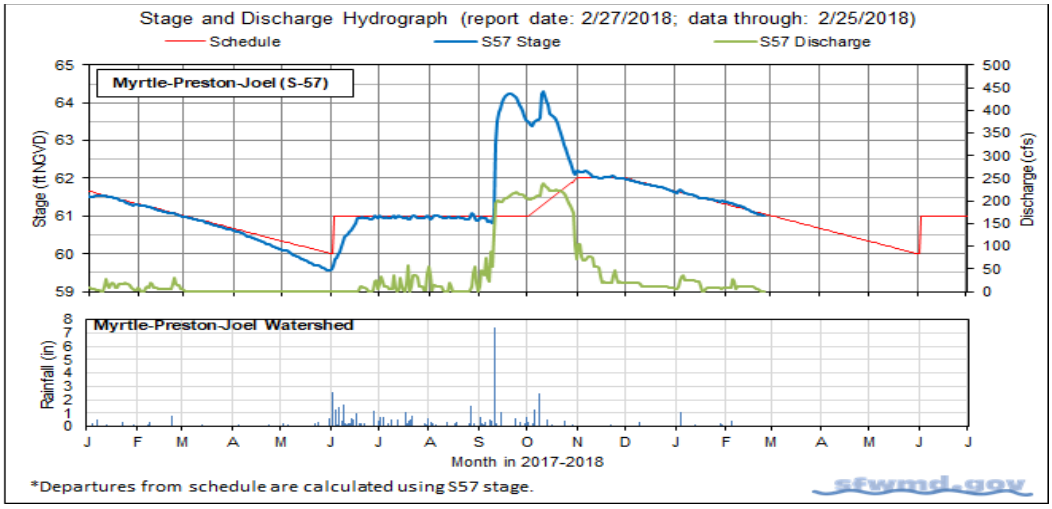


Figure 5.

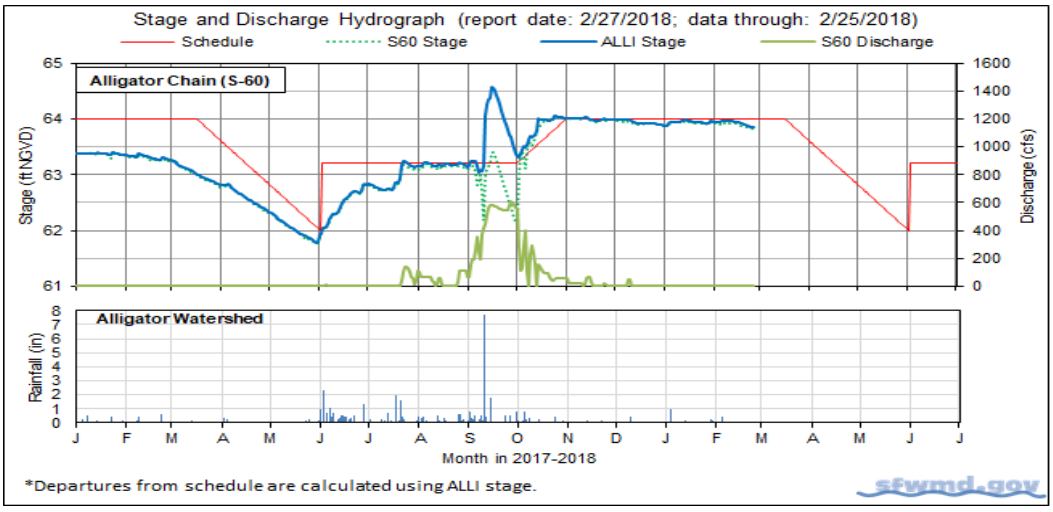


Figure 6.

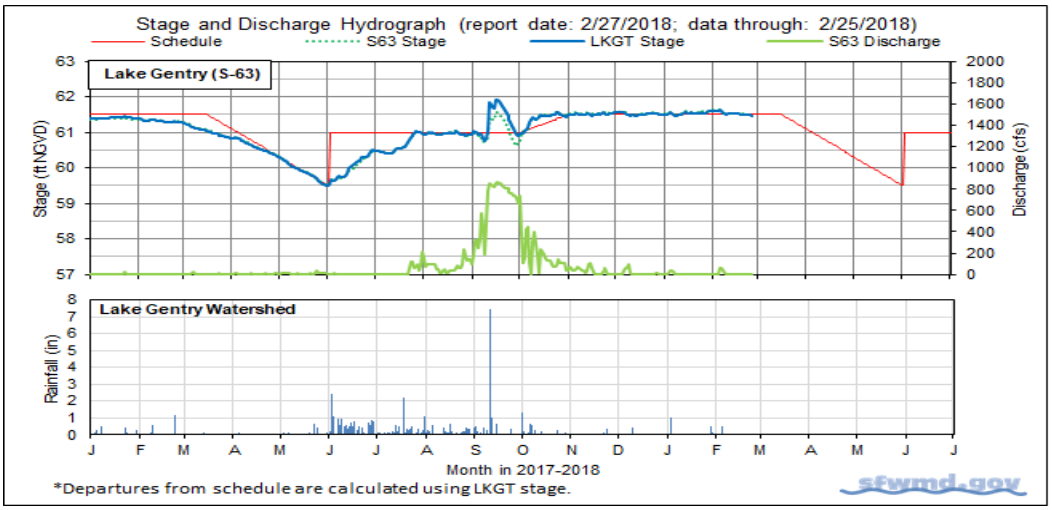


Figure 7.

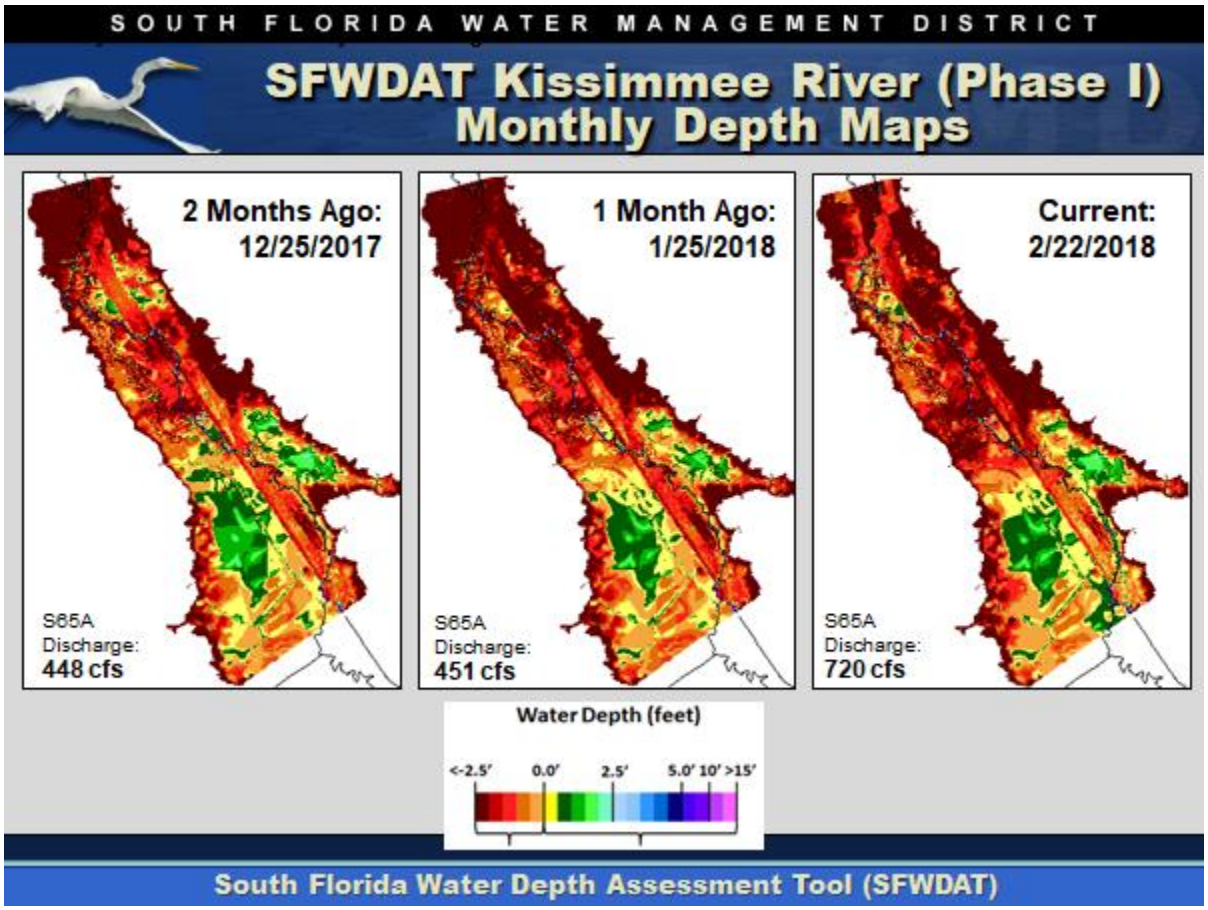


Figure 8. Phase I area floodplain water depths for this week, one month ago, and two months ago. Note that the WDAT color-coding has been modified to accommodate greater water depths; these maps are not directly comparable to Kissimmee Basin WDAT maps published prior to January 16, 2012.

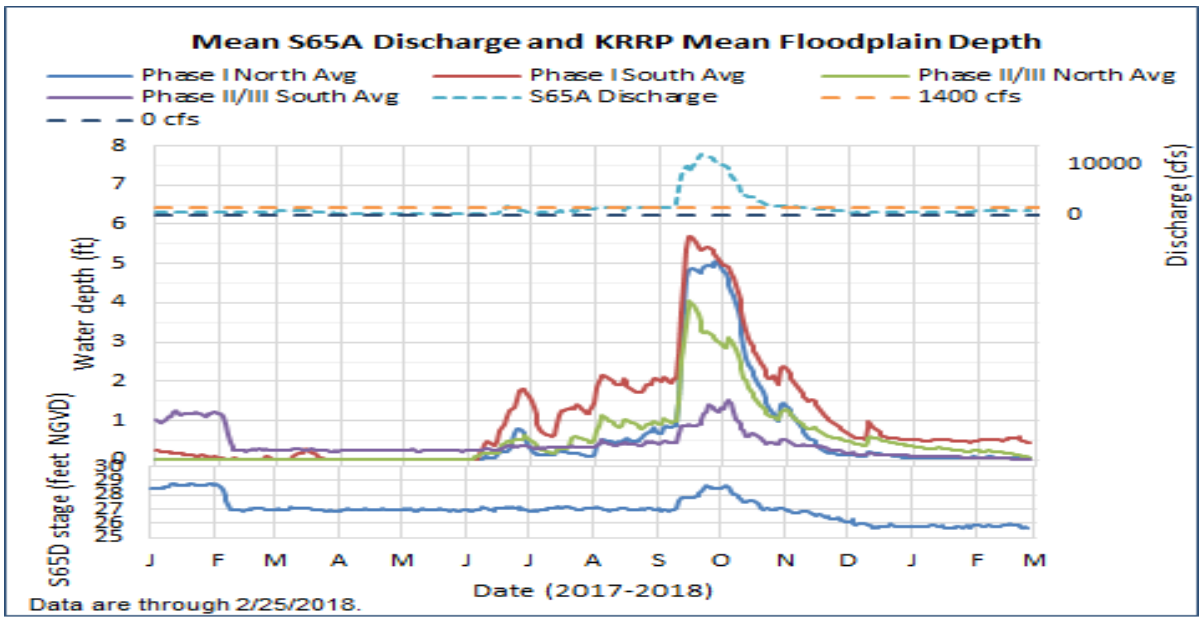


Figure 9. Mean water depth in the northern Phase I, southern Phase I, northern Phase II/III, and southern Phase II/III areas in relation to the S65A discharge and S65D headwater stage.

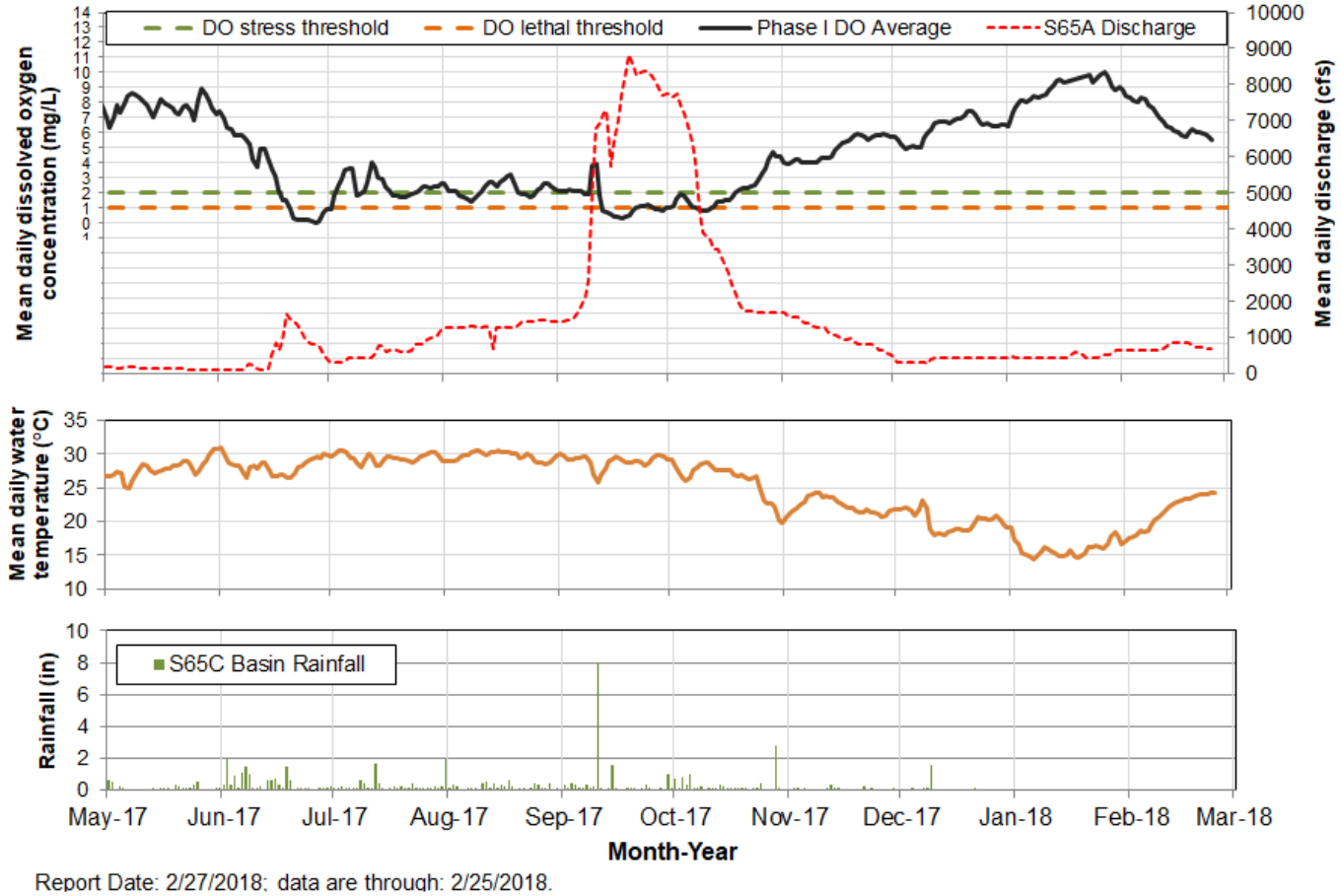


Figure 10. Mean daily dissolved oxygen, discharge, temperature and rainfall in the Phase I river channel.

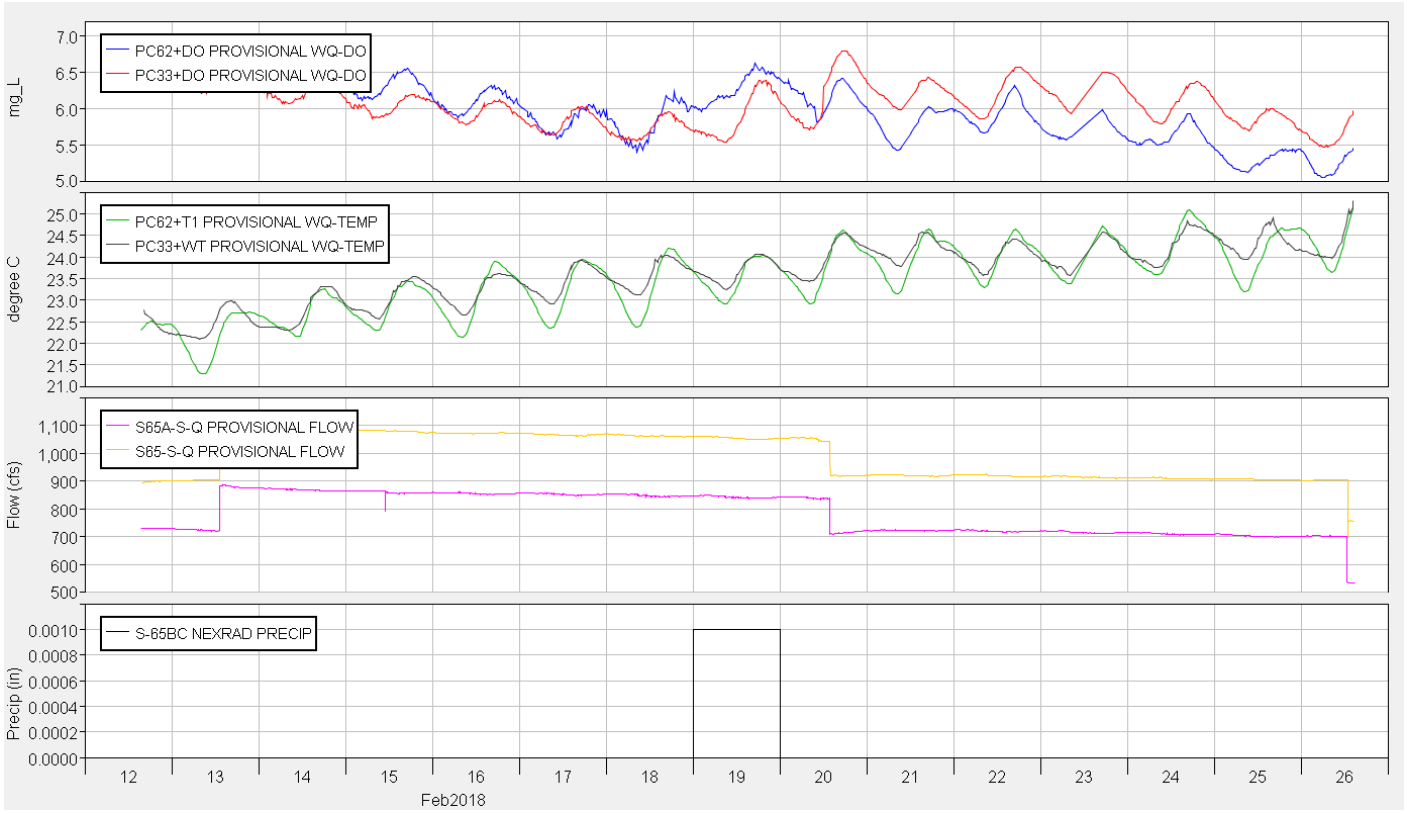


Figure 11. Phase I river channel dissolved oxygen and water temperature (measured at 15-minute intervals) and Pool BC daily rainfall.

Water Management Recommendations

Kissimmee Basin Adaptive Recommendations and Operational Actions

Date	Recommendation	Purpose	Outcome	Source
2/27/2018	No new recommendations.		N/A	
2/20/2018	No new recommendations.		N/A	
2/13/2018	No new recommendations.		N/A	
2/6/2018	No new recommendations.		N/A	
1/30/2018	No new recommendations.		N/A	
1/23/2018	No new recommendations.		N/A	
1/16/2018	No new recommendations.		N/A	
1/9/2018	No new recommendations.		N/A	
12/19/2017	Begin discharge of 400 cfs from S67 into Istokpoga Canal.	Increase navigability by scouring channel and reducing sandbar at canal mouth.	Implemented	KB Ops/SFWMD Water Mgt
12/19/2017	Begin a stage recession on January 1 in Lakes Kissimmee-Cypress-Hatchineha starting at stage on January 1 to reach low pool on May 31. Recession rate not to exceed 0.2 ft/week as possible. Subject to SFWMD planned operations hierarchy.	Achieve fish and wildlife benefits by slowing lake stage recession rates relative to the regulation schedule recession rates.	-	KB Ops/SFWMD Water Mgt
12/19/2017	Begin stage recessions on January 15 in Lakes East Toho and Toho starting at stage on January 15, to reach low pools on May 31. Recession rate not to exceed 0.2 ft/week if possible. Subject to SFWMD planned operations hierarchy.	Achieve fish and wildlife benefits by slowing lake stage recession rates relative to the regulation schedule recession rates.	-	KB Ops/SFWMD Water Mgt
12/12/2017	No new recommendations.		N/A	
12/5/2017	No new recommendations.		N/A	
11/28/2017	No new recommendations.		N/A	
11/21/2017	No new recommendations.		N/A	
11/13/2017	No new recommendations.		N/A	
11/1/2017	No new recommendations.		N/A	
10/24/2017	No new recommendations.		N/A	
10/17/2017	No new recommendations.		N/A	
10/10/2017	No new recommendations.		N/A	
10/3/2017	No new recommendations.		N/A	
9/25/2017	No new recommendations.		N/A	
9/19/2017	No new recommendations.		N/A	
9/5/2017	No new recommendations.		N/A	
8/29/2017	No new recommendations.		N/A	
8/22/2017	No new recommendations.		N/A	
8/15/2017	No new recommendations.		N/A	
8/4/2017	Increase S65A discharge by 150 cfs to about 1400 cfs.	Reduce rate of stage rise in KCH.		SFWMD Water Mgt, KB Ops

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

S65/S65A Limits on Rate of Change in Discharge

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 12. Limits on rate of discharge change at S65/S65A starting with the 2016-2017 Dry Season.

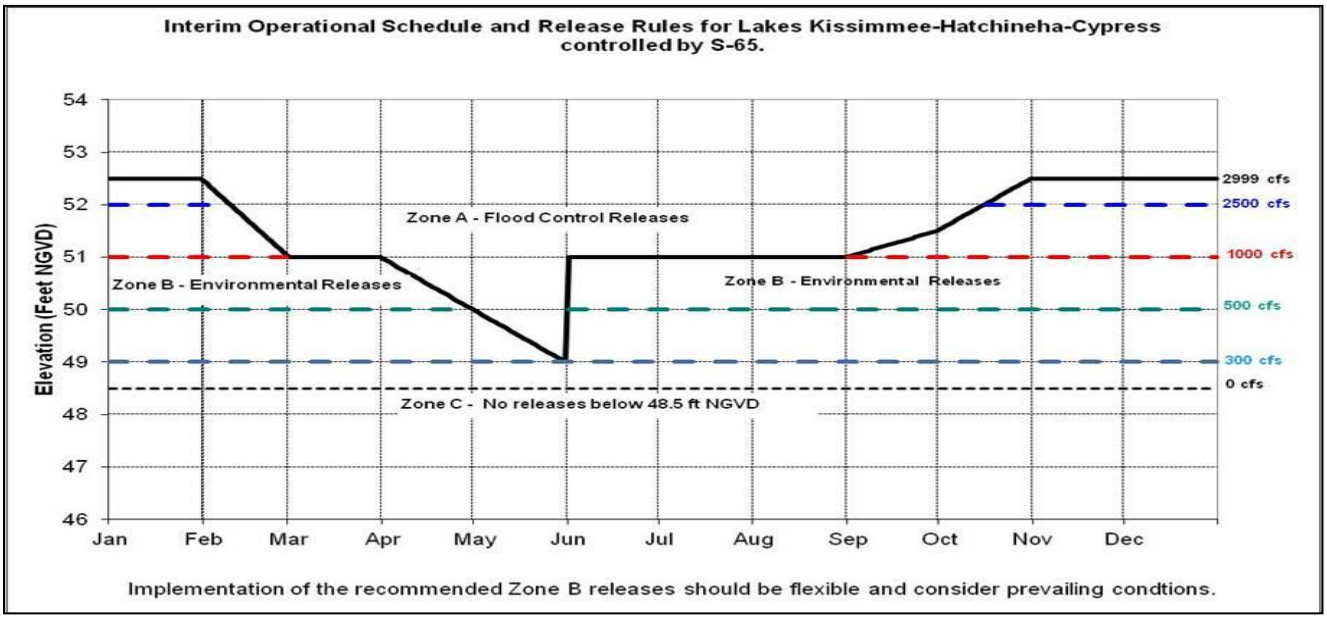


Figure 13. Interim operations schedule for S-65. The discharge schedule shown to the right has not been used in recent years.

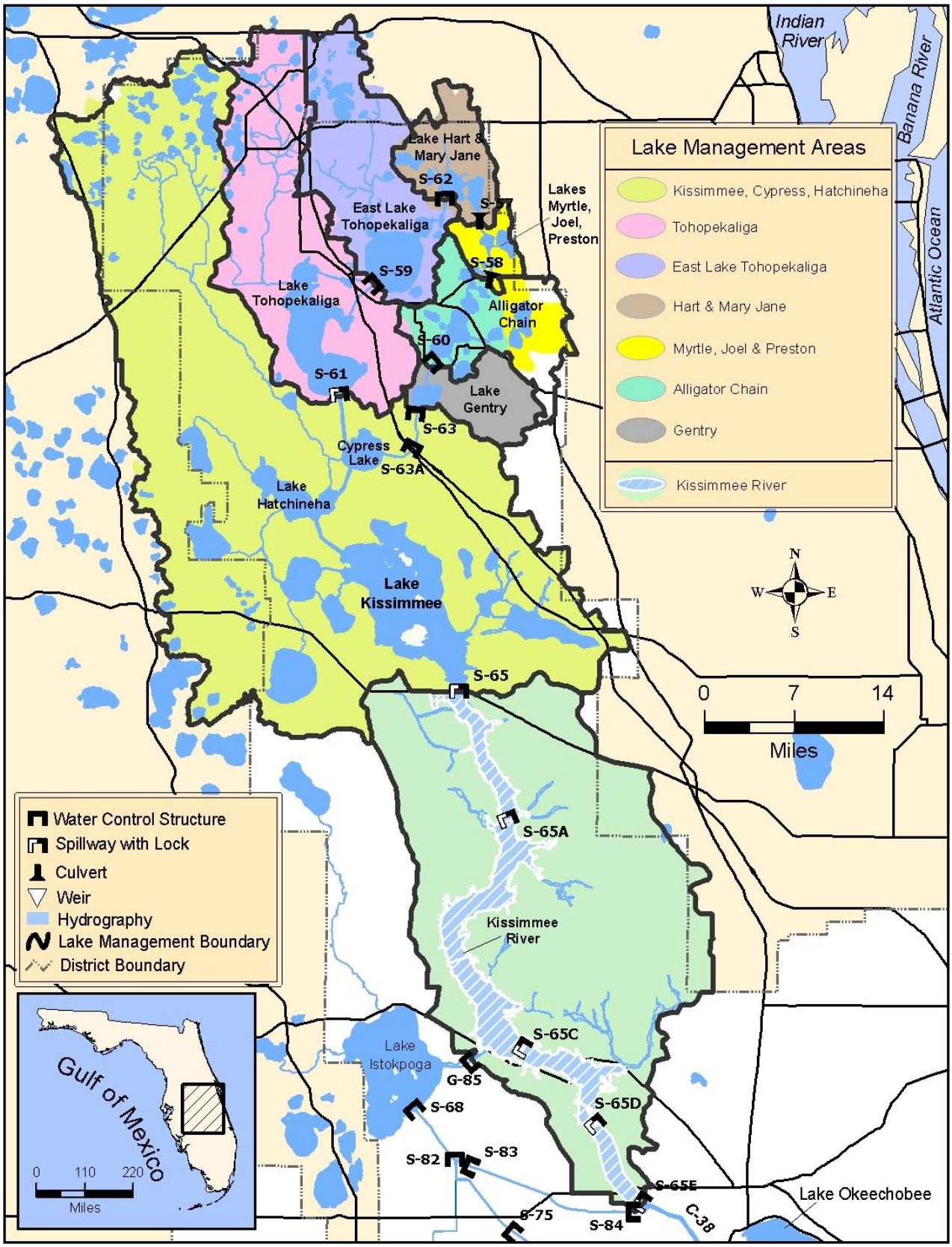


Figure 14. The Kissimmee Basin.

LAKE OKEECHOBEE

According to the USACE web site, Lake Okeechobee stage is at 14.92 feet NGVD for the period ending at midnight on February 26, 2018. 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). The Lake is now 0.35 feet lower than it was a month ago, 2.28 feet lower than its peak in mid-October, but still 1.46 feet higher than a year ago (Figure 1). The Lake is now in the Low sub-band (Figure 2). According to RAINDAR, 0.04 inches of rain fell over the Lake during the week February 20, 2018 – February 26, 2018 with most of the watershed receiving similar amounts (Figure 3).

Average daily inflows to the Lake decreased from 1,218 cfs last week to 1,105 cfs this week. 1,035 average daily cfs came from the Kissimmee River via the S65E structures, while the S71 and S72 structures and Fisheating Creek contributed a combined 69 average daily cfs as well.

Average daily outflows for the Lake also decreased from the previous week, going from 3,345 cfs to 3,088 cfs. S77 discharges decreased from 837 cfs the previous week to 785 cfs this past week, while the S308 structure went from no flow the previous week to 145 average daily cfs this past week. Discharges south through the S350 structures decreased from an average of 2,242 cfs the previous week to 1,925 cfs this past week, and discharges to the L8 canal via Culvert 10A this week averaged 234 daily cfs compared to 267 daily cfs the previous week. The corrected evapotranspiration value for the week based on the L006 weather platform solar radiation data was 0.13 inches.

Total Lake inflows and outflows for the last week are detailed in Table 1, as well as the approximate change in Lake stage from each major structure's total flows over the period. Figure 4 shows the combined average daily cfs for inflows and outflows for the Lake over the past eight weeks. These data are provisional, and are subject to change.

Based on the Lake Okeechobee wading bird habitat suitability index, there are approximately 53,271 acres of suitable foraging habitat for long-legged birds and 16,437 acres for long and short-legged birds on the Lake (Figure 5).

The most recent satellite imagery using the cyanobacteria monitoring product derived from NOAA's OLCI satellite sensor had substantial cloud cover, but did not suggest increases in bloom potential. Potential for elevated cyanobacterial levels were last observed in the northern portion of the Lake in early September 2017 (Figure 6).

Table 1. Average daily inflows and outflows and the approximate depth equivalents on Lake Okeechobee for various structures.

INFLOWS	Avg Daily Flow cfs	Equivalent Depth Week Total (in)
S65E & S65EX1	1035	0.4
S71 & 72	35	0.0
S84 & 84X	0	0.0
Fisheating Creek	34	0.0
S154	0	0.0
S191	0	0.0
S133 P	0	0.0
S127 P	0	0.0
S129 P	0	0.0
S131 P	0	0.0
S135 P	0	0.0
S2 P	0	0.0
S3 P	0	0.0
S4 P	0	0.0
C5	0	0.0
Rainfall	105	0.0
Total	**1209**	**0.5**

OUTFLOWS	Avg Daily Flow cfs	Equivalent Depth Week Total (in)
S77	785	0.3
S308	145	0.1
S351	971	0.4
S352	690	0.3
S354	264	0.1
L8	234	0.1
ET	2508	1.0
Total	**5596**	**2.2**

PROVISIONAL DATA

Water Management Recommendations

The Lake stage is 14.92 feet NGVD having decreased 0.12 feet from the week prior and 0.35 feet over the past month. Lake stages have been >16.0 feet NGVD three times in 2016 and 2017, have exceeded 15.5 feet NGVD for 105 consecutive days this water year, and were >15.0 feet NGVD for 161 consecutive days prior to last week. The high water and associated turbidity have had substantial impacts on the submerged aquatic and emergent vegetation coverage in the nearshore areas of the Lake, which would benefit from lower stages near the end of the 2018 dry season. Higher Lake stages in the summer are also correlated with algal blooms on the Lake, and total phosphorus values remained elevated in January due to continued resuspension of sediments that were disturbed during Hurricane Irma. Lower Lake stages near the end of WY2018 would help to mitigate impacts to nearshore vegetation communities and potentially reduce algal bloom severity and duration. Additionally, long, steady recessions of water levels throughout the dry season may help promote another productive year for wading birds on the Lake as well.

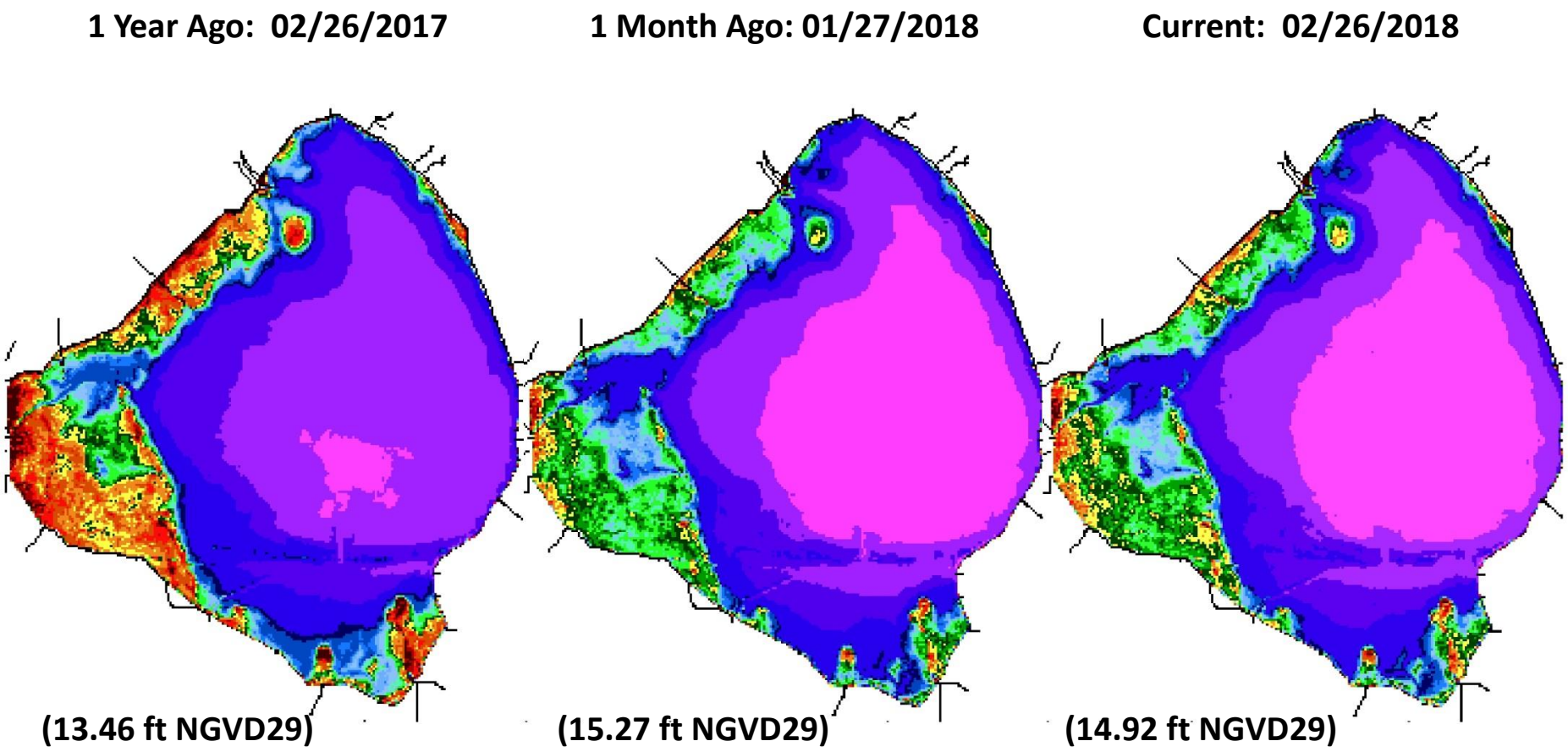


Figure 1. Water depth estimates on Lake Okeechobee based on the South Florida Water Depth Assessment Tool.

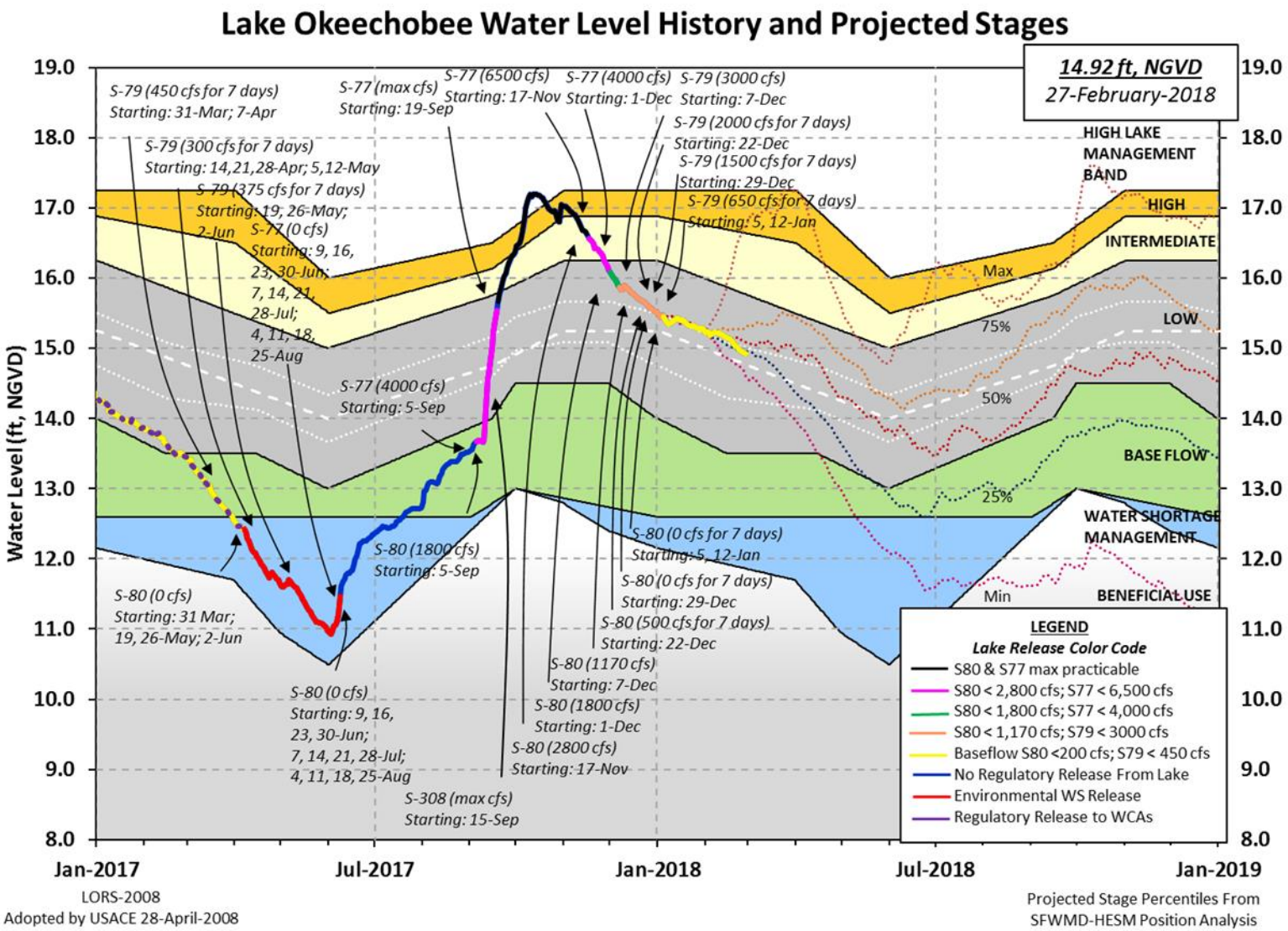


Figure 2. Recent Lake Okeechobee stage and releases, with projected stages based on a dynamic position analysis.

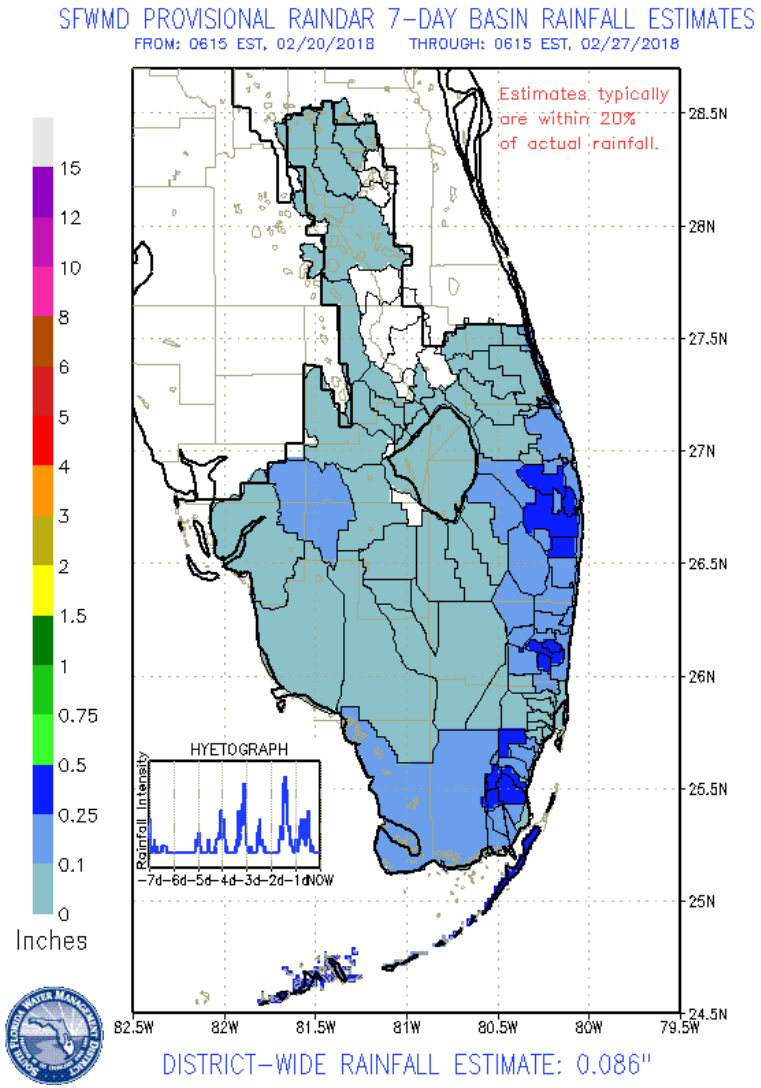


Figure 3. Rainfall estimates by basin.

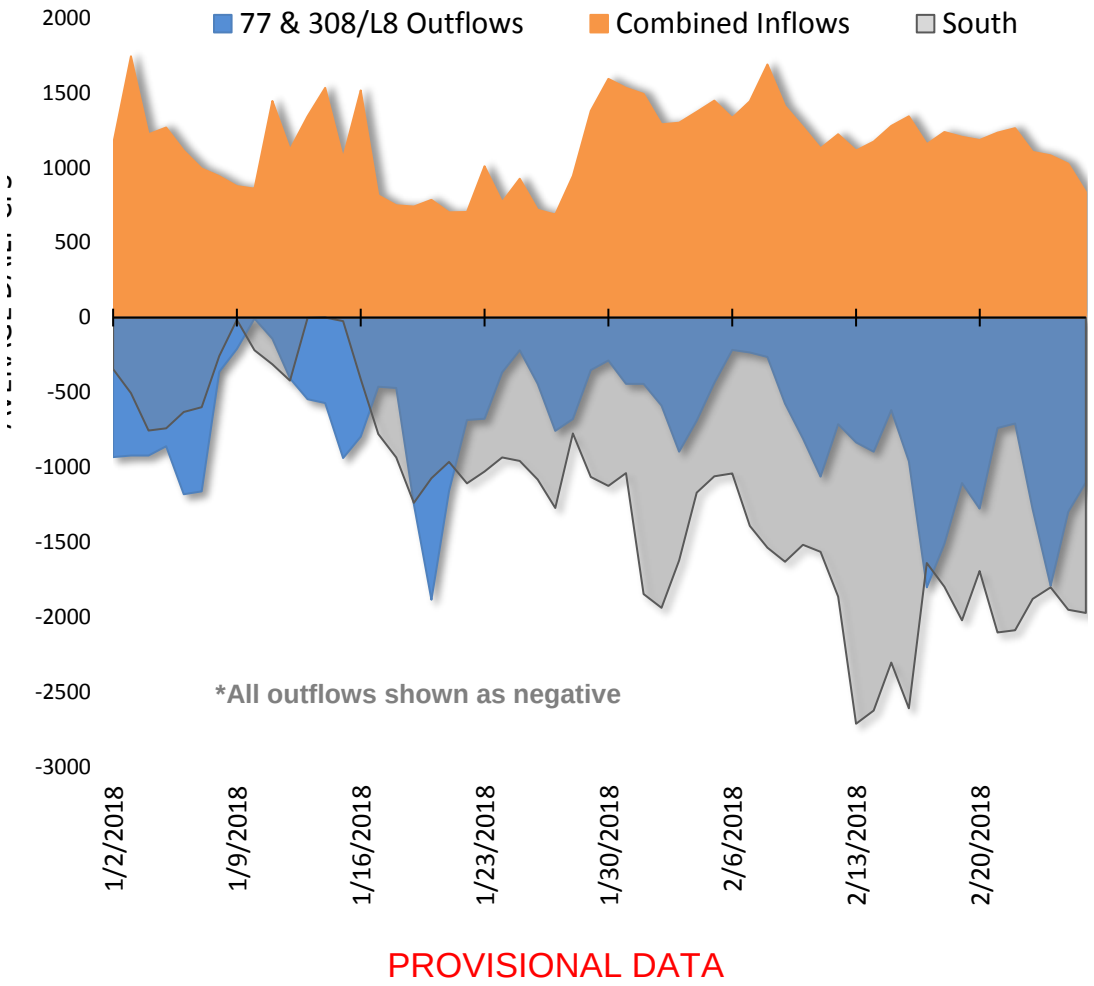


Figure 4. Major inflows and outflows of Lake Okeechobee, including the S350 structures designated as South. Inflows and outflows are shown as positive and negative, respectively, for visual purposes.

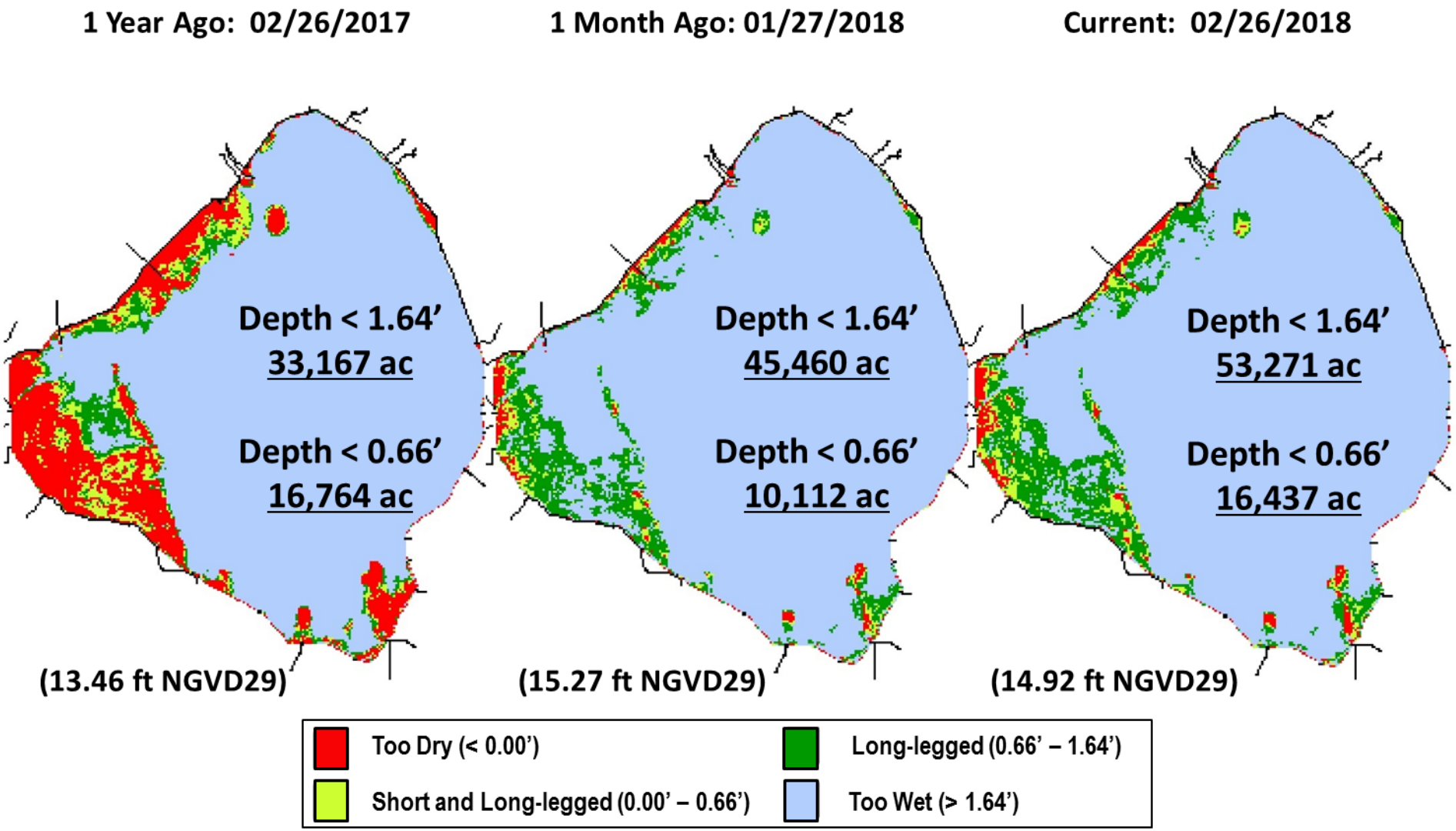


Figure 5. Wading bird habitat suitability index for Lake Okeechobee based on the South Florida Water Depth Assessment Tool.

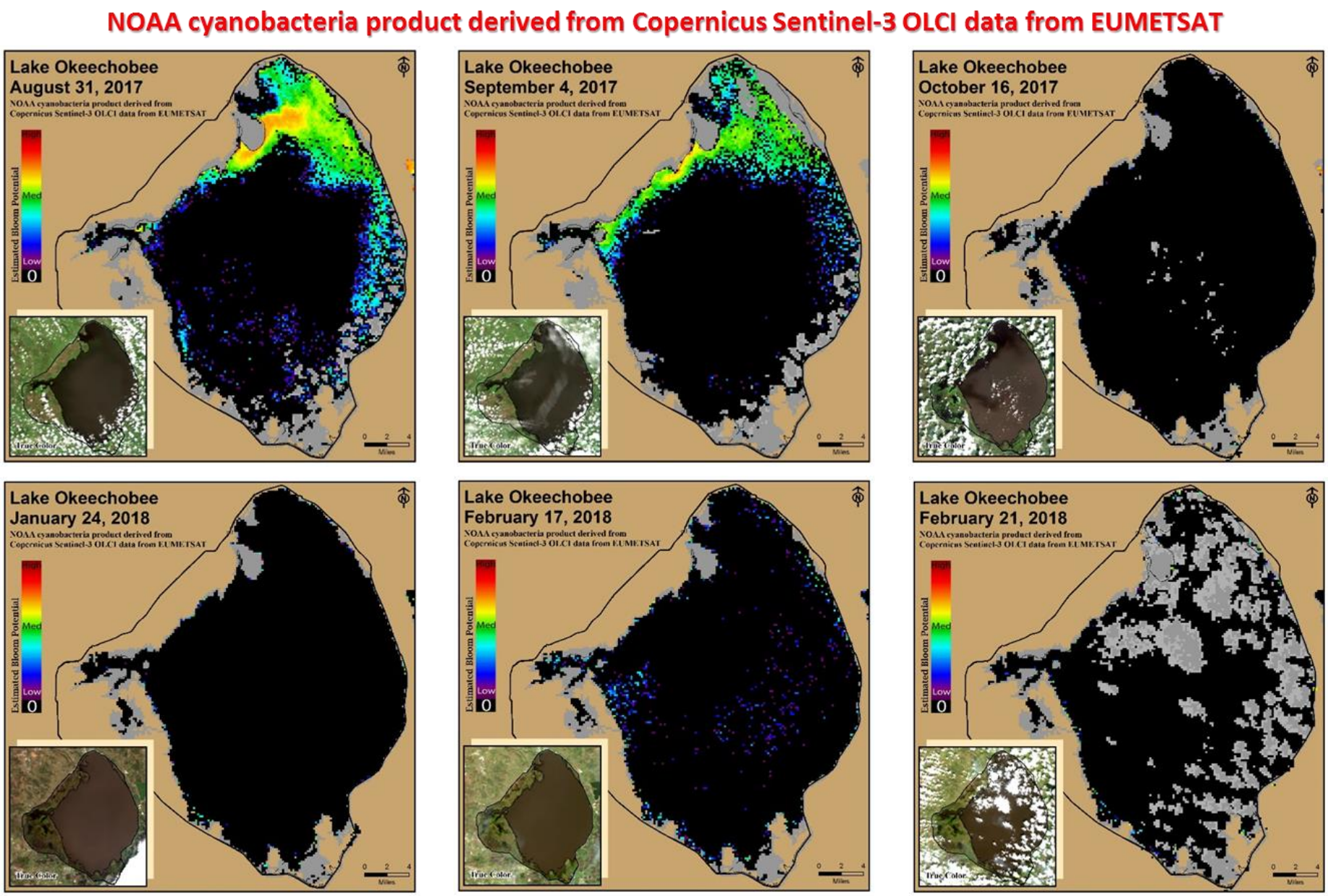


Figure 6. Potential for cyanobacterial blooms on Lake Okeechobee based on NOAA's harmful algal bloom monitoring system derived from Copernicus Sentinel-3 OLCI data from EUMETSAT.

LAKE ISTOKPOGA

Lake Istokpoga stage is 39.25 feet NGVD as of midnight February 26, 2018 and is currently 0.25 feet below its regulation schedule to accommodate construction on downstream structures (Figure 7). Average daily inflows to the lake from Josephine Creek for the week February 20, 2018 – February 26 were slightly lower than the previous week, going from 65 cfs to 44 cfs. No data have been reported for Arbuckle Creek since July 4, 2017 as the gauge is being recalibrated after construction in the area. There were no discharges via the S68 and S68X structures, decreasing from 112 average daily cfs the previous week. According to RAINDAR, 0.03 inches of rain fell in the Lake Istokpoga basin over the past week.

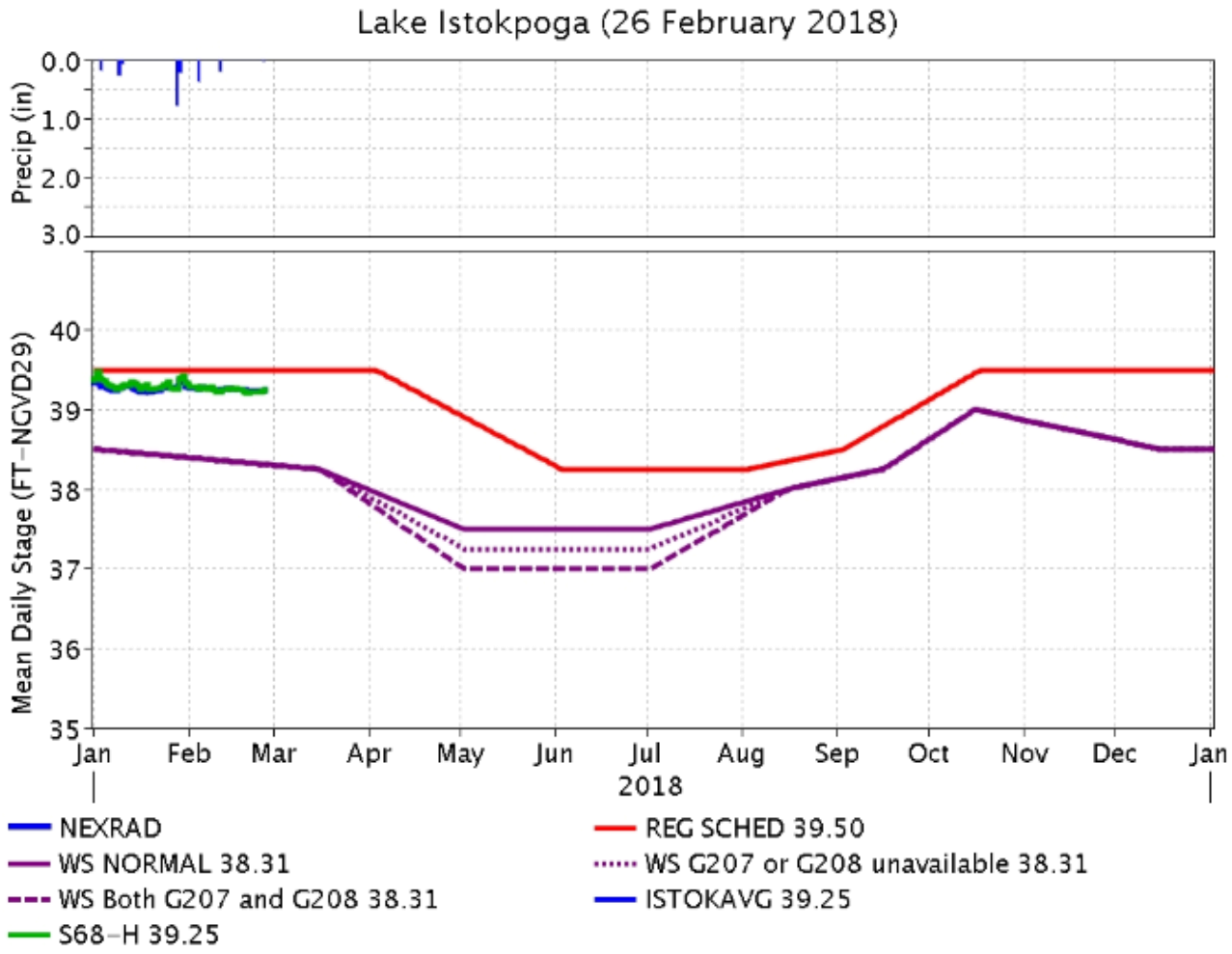


Figure 7. Recent stages on Lake Istokpoga.

ESTUARIES

St. Lucie Estuary:

Last week total inflow into the St. Lucie Estuary averaged about 165 cfs (Figures 1 and 2) and last month inflow averaged about 214 cfs. Last week's provisional averaged inflows from the tidal basin and the structures are shown in Table 1.

Table 1. Weekly average inflows (data is provisional).

Location	Flow (cfs)
Tidal Basin Inflow	93
S-80	0
S-308	144
S-49 on C-24	0
S-97 on C-23	0
Gordy Rd. structure on Ten Mile Creek	72

Over the past week, salinity increased throughout the estuary except for bottom salinity at HR1 (Table 2, Figures 3 and 4). The seven-day moving average salinity of the water column (an average of the surface and bottom salinity) at the US1 Bridge is 20.4. Salinity conditions in the middle estuary are in the good range for adult eastern oysters (Figure 3).

Table 2. Seven-day average salinity at three monitoring sites 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 (North Fork)	**15.2** (13.9)	**17.2** (17.8)	NA[1]
US1 Bridge	**20.0** (19.0)	**20.8** (20.5)	10.0-26.0
A1A Bridge	**28.5** (27.0)	**30.3** (29.5)	NA[1]

[1]Envelope not applicable.

Continuous monitoring of water quality is conducted at HR1 in the North Fork. Weekly dissolved oxygen data are summarized in Table 3.

Table 3. Weekly dissolved oxygen conditions at HR1 in the North Fork of the St. Lucie Estuary.

Location	Depth	Average DO (mg/l)	Minimum DO (mg/l)	Maximum DO (mg/l)
HR1	surface	5.64	1.75	7.75
HR1	bottom	4.10	1.56	6.92

Continuous monitoring of water quality is conducted at five Land/Ocean Biogeochemical Observatory (LOBO) stations located in the St. Lucie Estuary and maintained by Florida Atlantic University/Harbor Branch Oceanographic Institute (FAU-HBOI). Data are summarized in Table 4 and station location map is shown in Figure 5.

Table 4. Weekly ranges of instrument depth, chlorophyll *a* (a measure of algal biomass) and dissolved oxygen concentrations at five FAU-HBOI LOBO stations located in the St. Lucie Estuary.

Location	Depth (m)	Chlorophyll *a* (µg/l)	Average DO (mg/l)	Minimum DO (mg/l)	Maximum DO (mg/l)
SF2	2.61	5.29 - 17.19	1.45	0.56	2.95
SF	1.48	4.58 - 14.84	7.28	6.10	8.92
NF	2.02	4.04 - 9.10	4.44	3.22	5.48
ME	1.78	4.02 - 7.09	6.98	6.11	7.90
IRL-SLE	3.42	0.32 - 2.61	6.65	6.21	7.10

NOAA satellite imagery indicates no visible cyanobacteria bloom potential in the St. Lucie Estuary this week.

Caloosahatchee Estuary:
Last week total inflow into the Caloosahatchee Estuary averaged about 709 cfs (Figures 6 and 7) and last month inflow averaged about 779 cfs. Last week's provisional averaged inflows from the structures are shown in Table 5.

Table 5. Weekly average inflows (data is provisional).

Location	Flow (cfs)
S-77	785
S-78	452
S-79	631

Over the past week, salinity increased throughout the estuary (Table 6, Figures 8 & 9). The seven-day average salinity values are within the good range for adult eastern oysters at Cape Coral and at Shell Point (Figure 10). Salinity data were not available at Sanibel. The 30-day moving average surface salinity is 3.8 at Val I-75 and 10.1 at Ft. Myers. With no flow through S-79, daily salinity at Val I-75 is forecast in two weeks to be 8.2, and the 30-day moving average is forecast to be 5.5 (Figure 11). Salinity conditions between Val I-75 and Ft. Myers are good for tape grass.

Table 6. 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)	**4.1** (3.3)	**4.3** (3.5)	NA[1]
*Val I75	**4.8** (4.2)	**7.6** (5.8)	0.0-5.0[2]
Ft. Myers Yacht Basin	**11.9** (10.0)	**13.6** (11.6)	NA
Cape Coral	**18.5** (17.2)	**21.0** (18.9)	10.0-30.0
Shell Point	**30.1** (28.1)	**29.5** (27.4)	10.0-30.0
Sanibel	**NR**[3](NR)	**NR** (NR)	10.0-30.0

[1]Envelope not applicable, [2]Envelope is based on a 30-day average, and [3]Not Reporting.
*Val I75 is temporarily unavailable (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 7 as concentration ranges of chlorophyll *a* and dissolved oxygen at Beautiful Island, Ft. Myers, and Shell Point in the Caloosahatchee Estuary.

Table 7. 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.

Parameter Name	RECON Monitoring Stations		
	Beautiful Island	Ft. Myers	Shell Point
Chlorophyll *a* (µg/l)	11.21 – 34.74	5.47 – 11.58	1.23 – 3.43
Dissolved Oxygen (mg/l)	7.45 – 11.08	5.26 – 7.60	5.40 – 9.62

The Florida Fish and Wildlife Research Institute reported on February 23, 2018, that *Karenia brevis, the Florida red tide dinoflagellate,* was observed at very low to medium concentrations in five samples collected from or offshore of Lee County. Fish kills were reported in Lee County at Bunche Beach and in Pine Island Sound (2/22/18).

NOAA satellite imagery indicates no visible cyanobacteria bloom potential in the Caloosahatchee Estuary this week.

Water Management Recommendations

Lake stage is in the Low sub-band of 2008 LORS. Tributary hydrological conditions are normal. The 2008 LORS recommends up to 450 cfs at S-79 and up to 200 cfs at S-80. Given the current estuarine conditions, there are no ecological benefits associated with freshwater releases from Lake Okeechobee.

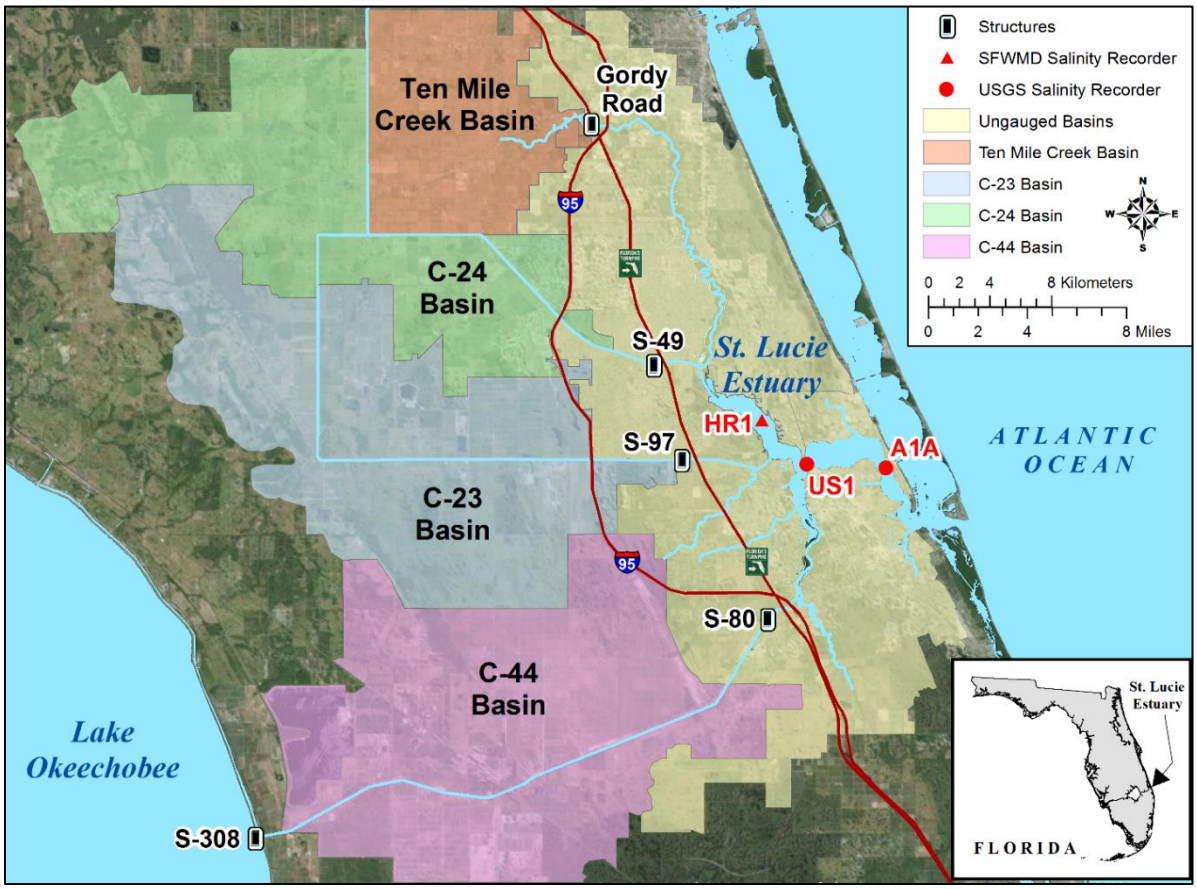


Figure 1. Basins, water control structures, and salinity monitoring for the St. Lucie Estuary.

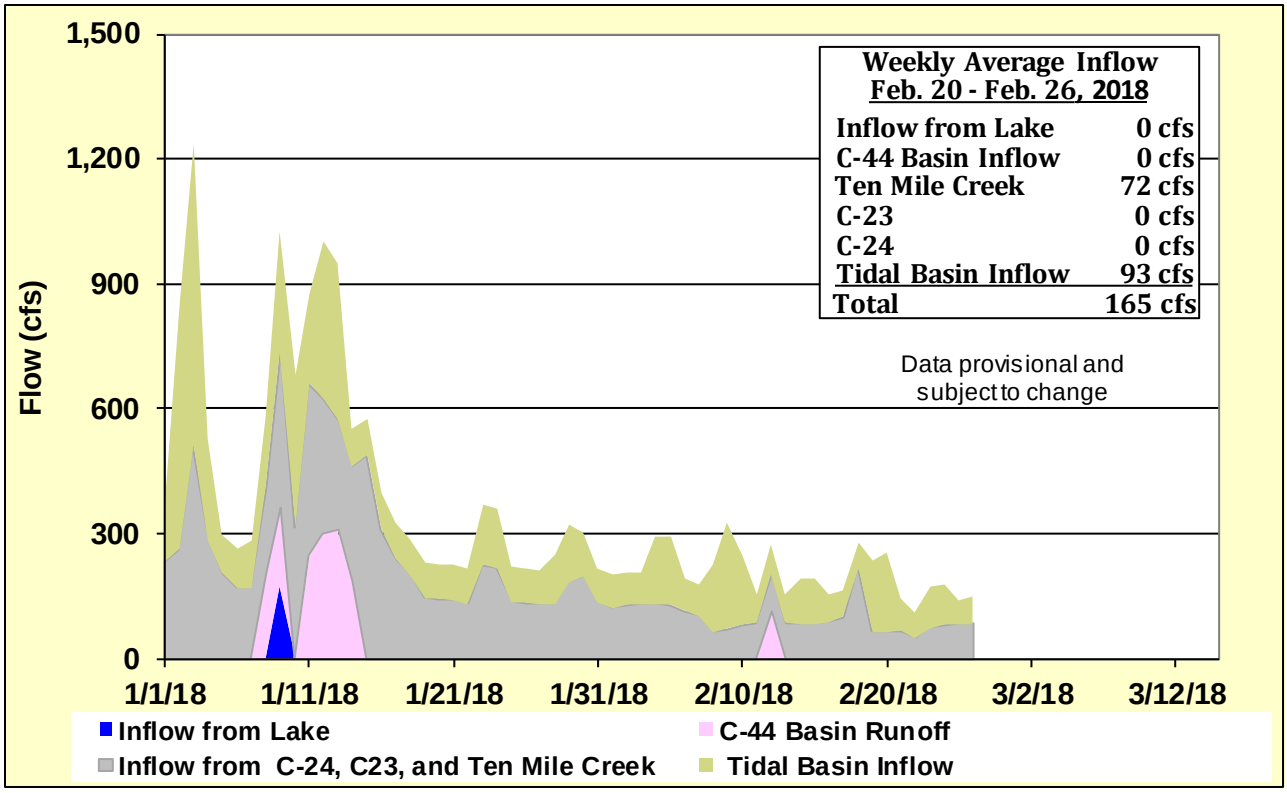


Figure 2. Estimated surface freshwater inflows from Lake Okeechobee and runoff from the C-44, C-23, C-24, Ten Mile Creek, and tidal basins into the St. Lucie Estuary.

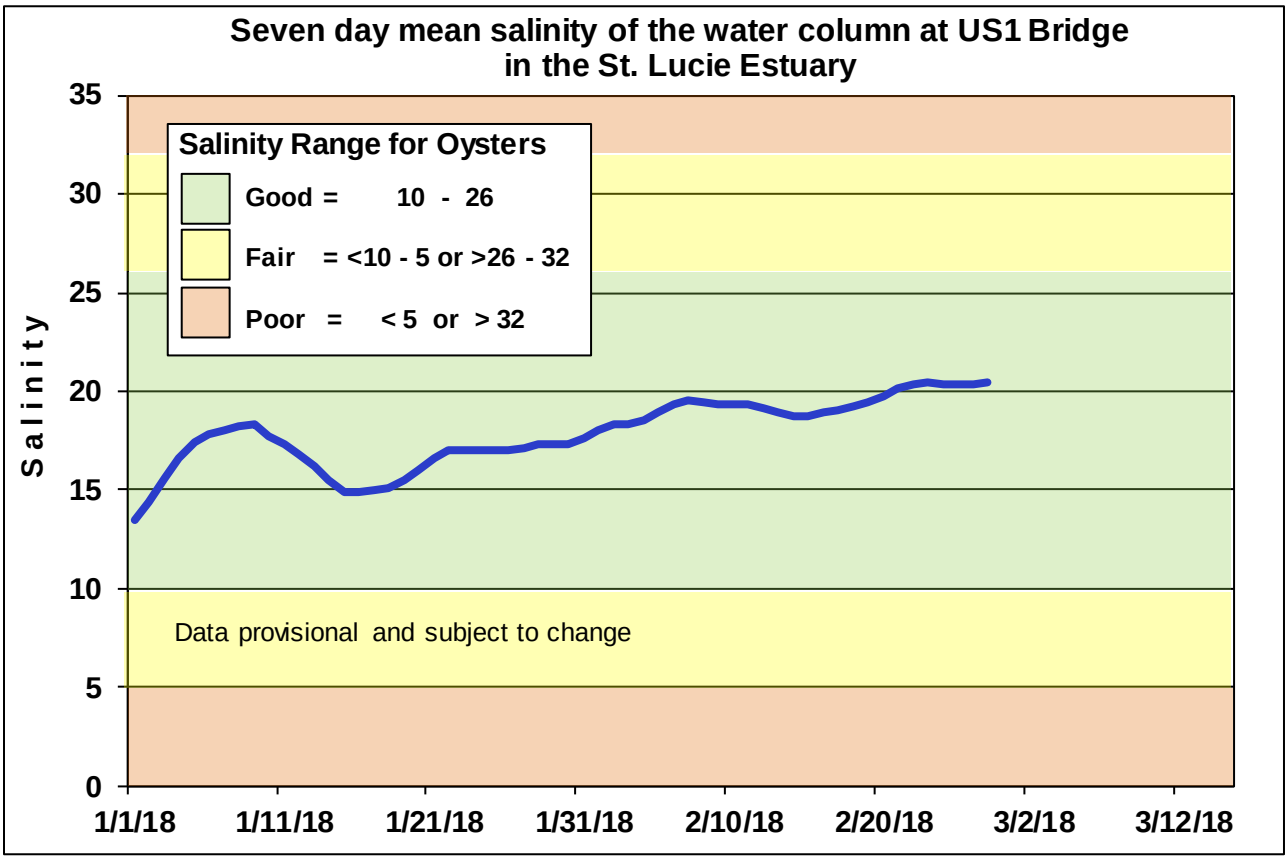


Figure 3. Seven-day mean salinity of the water column at the US1 Bridge.

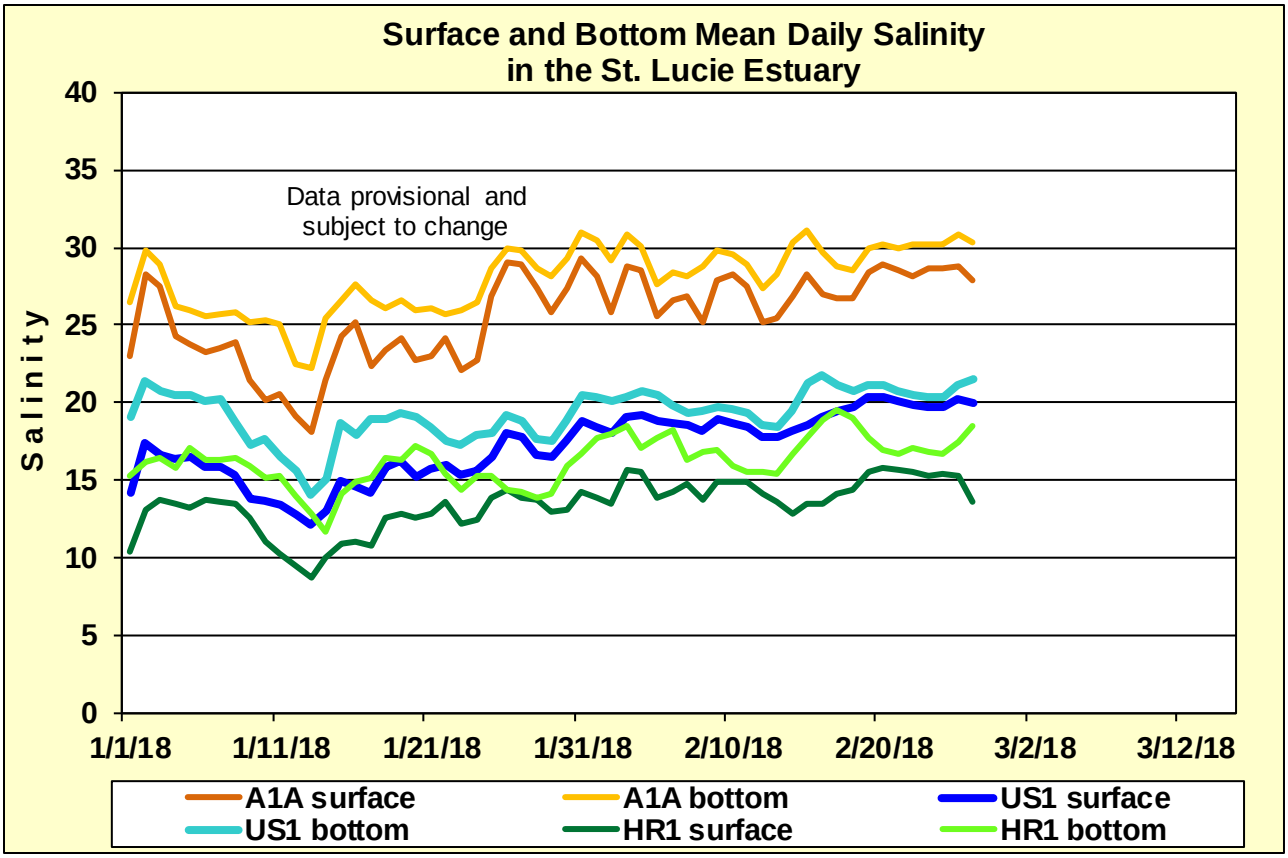


Figure 4. Daily mean salinity at the A1A, US1 and estimated HR1 stations.

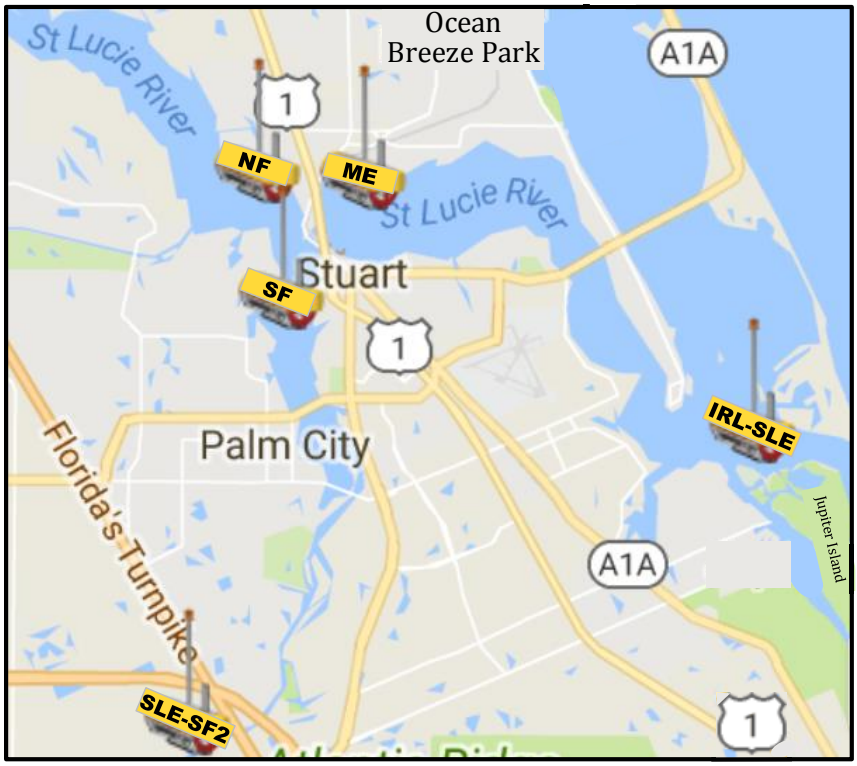


Figure 5. Location of FAU-HBOI LOBO water quality stations in the St. Lucie Estuary.

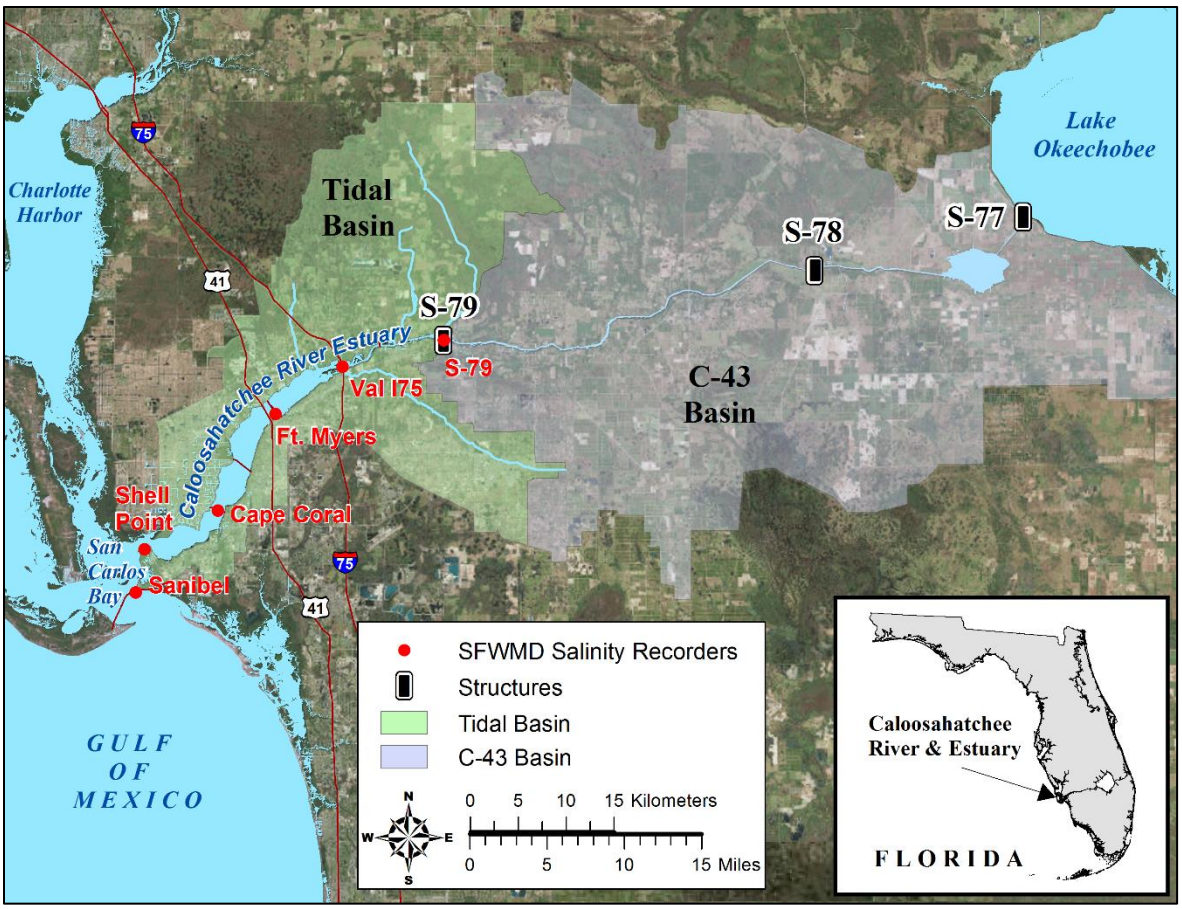


Figure 6. Basins, water control structures, and salinity monitoring for the Caloosahatchee Estuary.

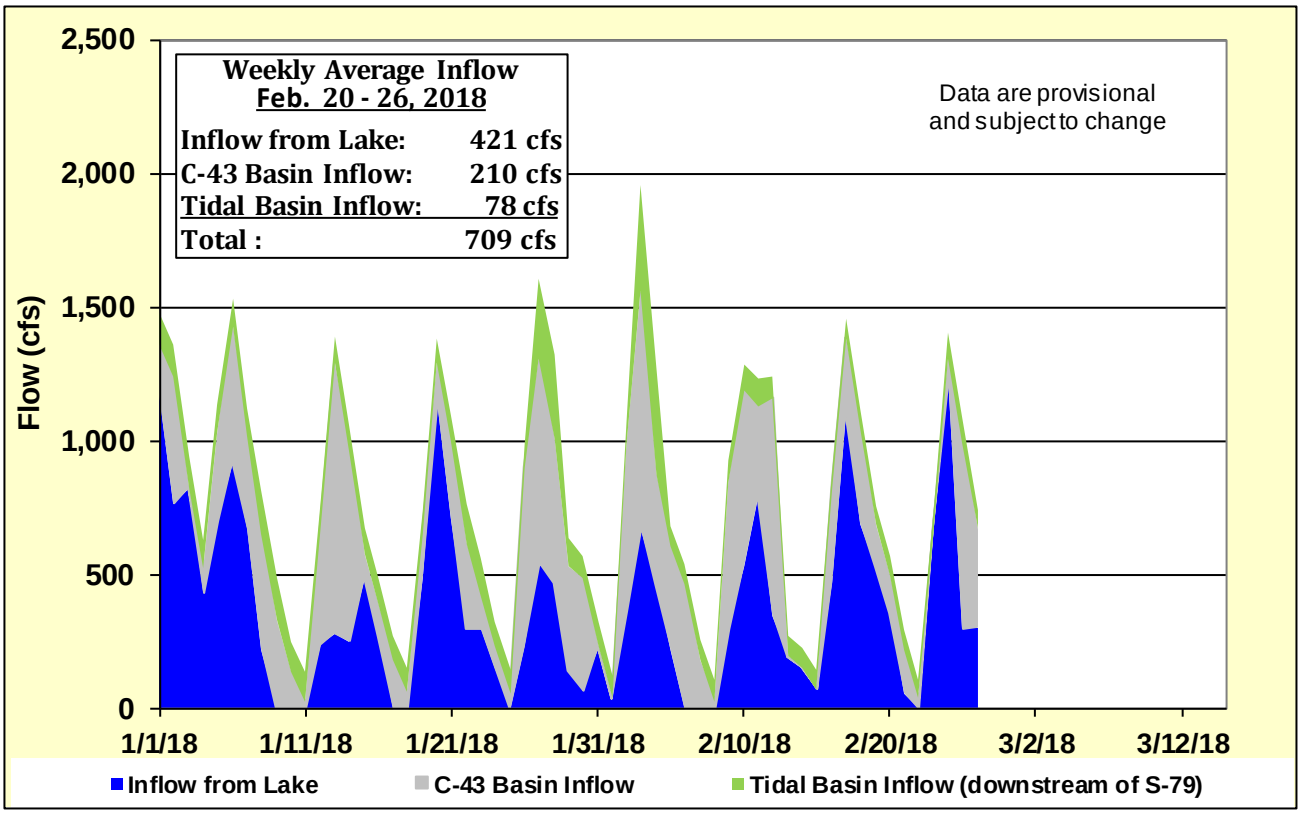


Figure 7. Freshwater inflows from Lake Okeechobee, runoff from the C-43 basin, and tributaries in the tidal basin into the Caloosahatchee River Estuary.

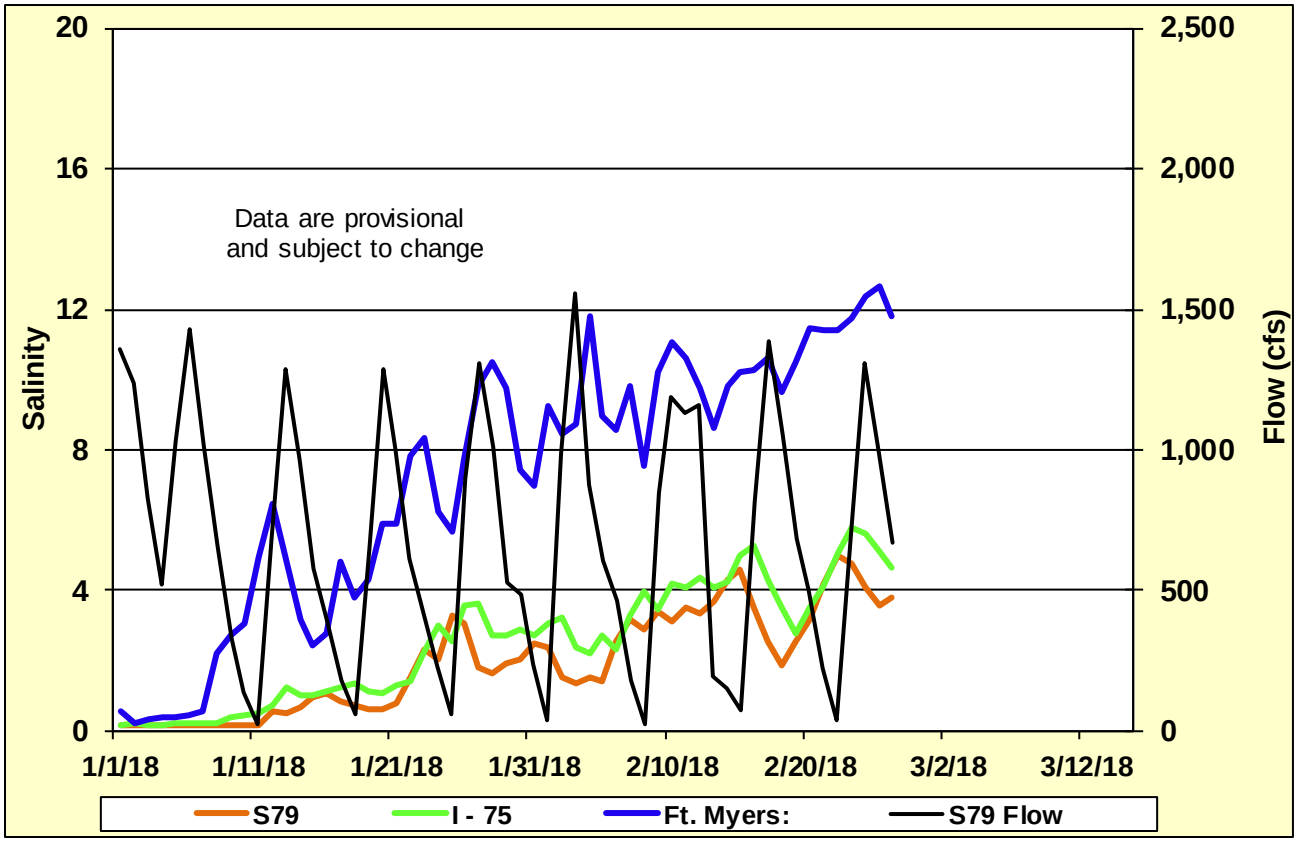


Figure 8. Daily mean flows at S-79 and salinity at upper estuary monitoring stations.

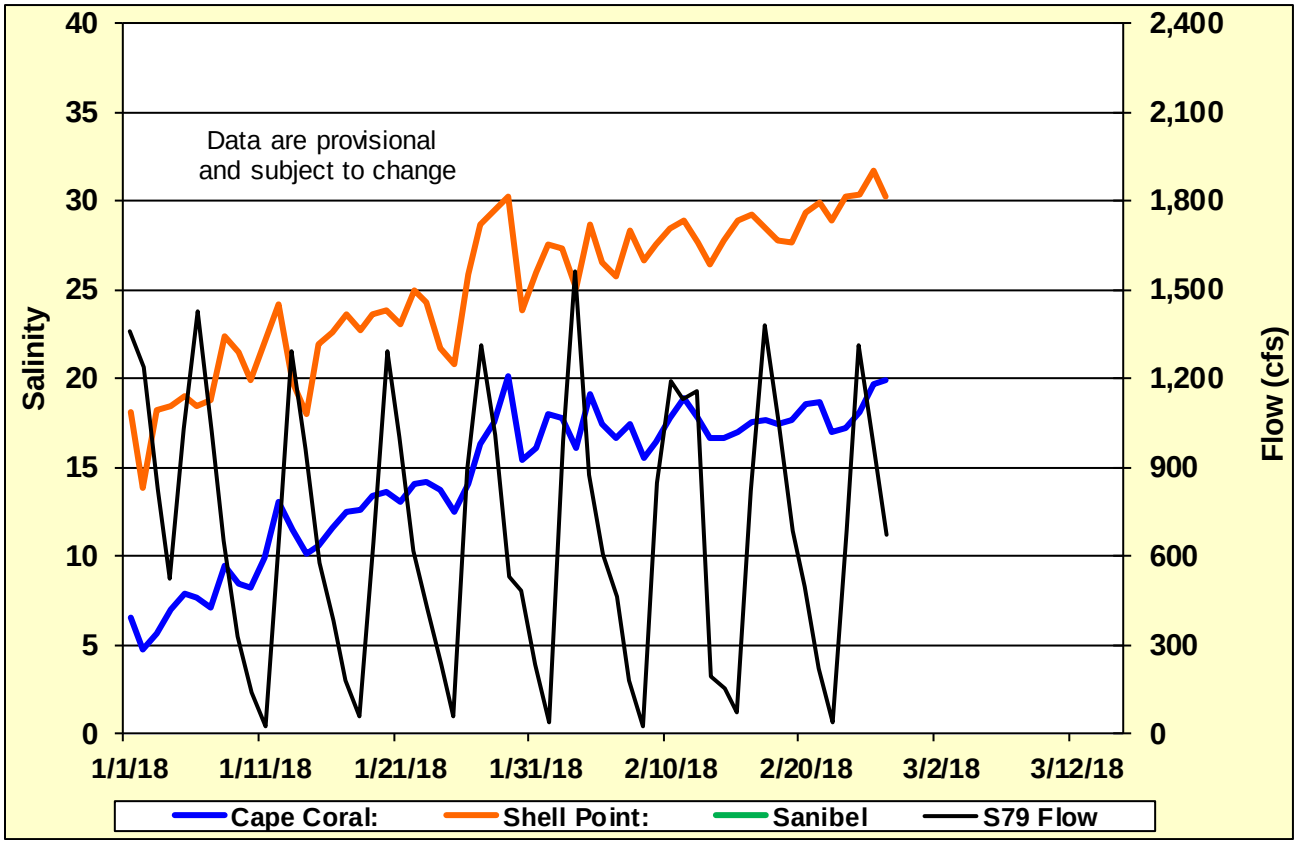


Figure 9. Daily mean flows at S-79 and salinity at lower estuary stations.

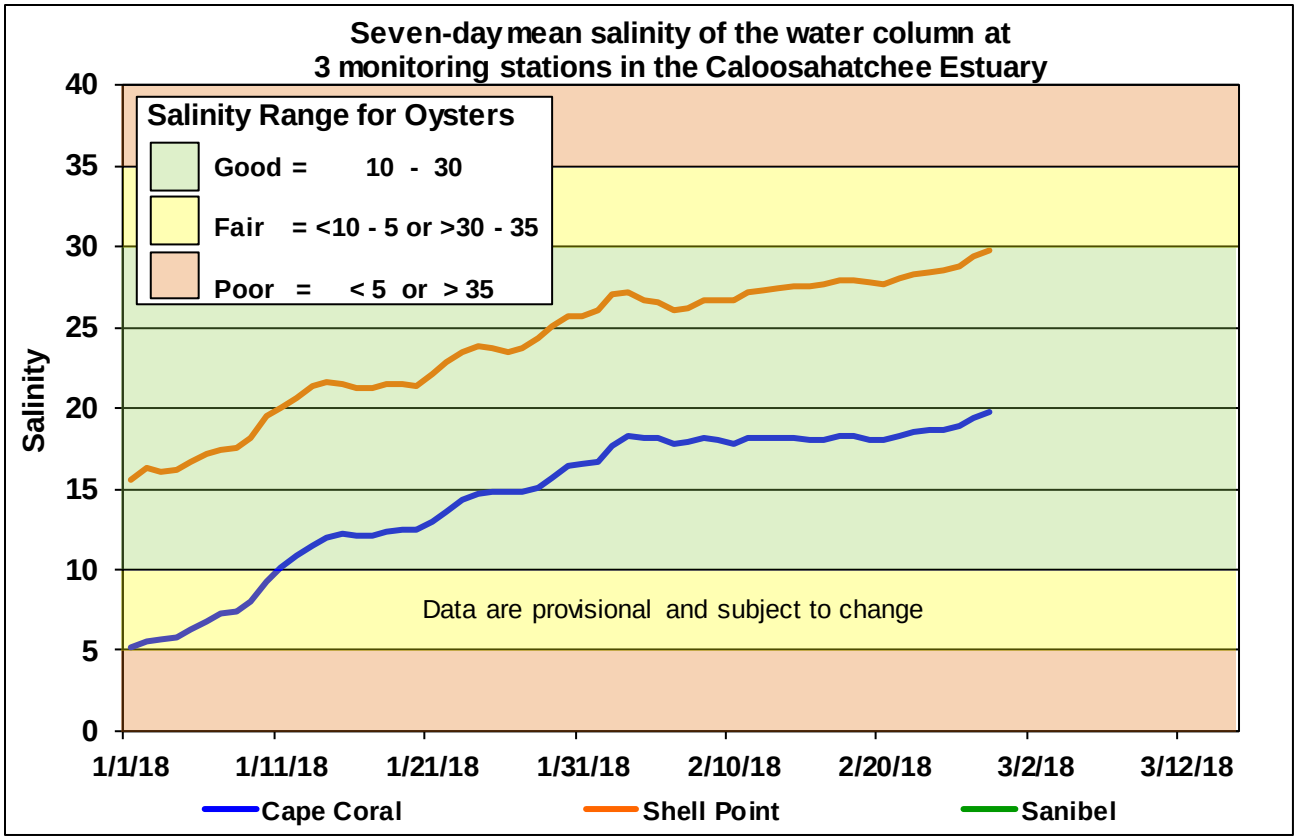


Figure 10. Seven-day mean salinity at Cape Coral Bridge, Shell Point, and Sanibel Bridge monitoring stations.

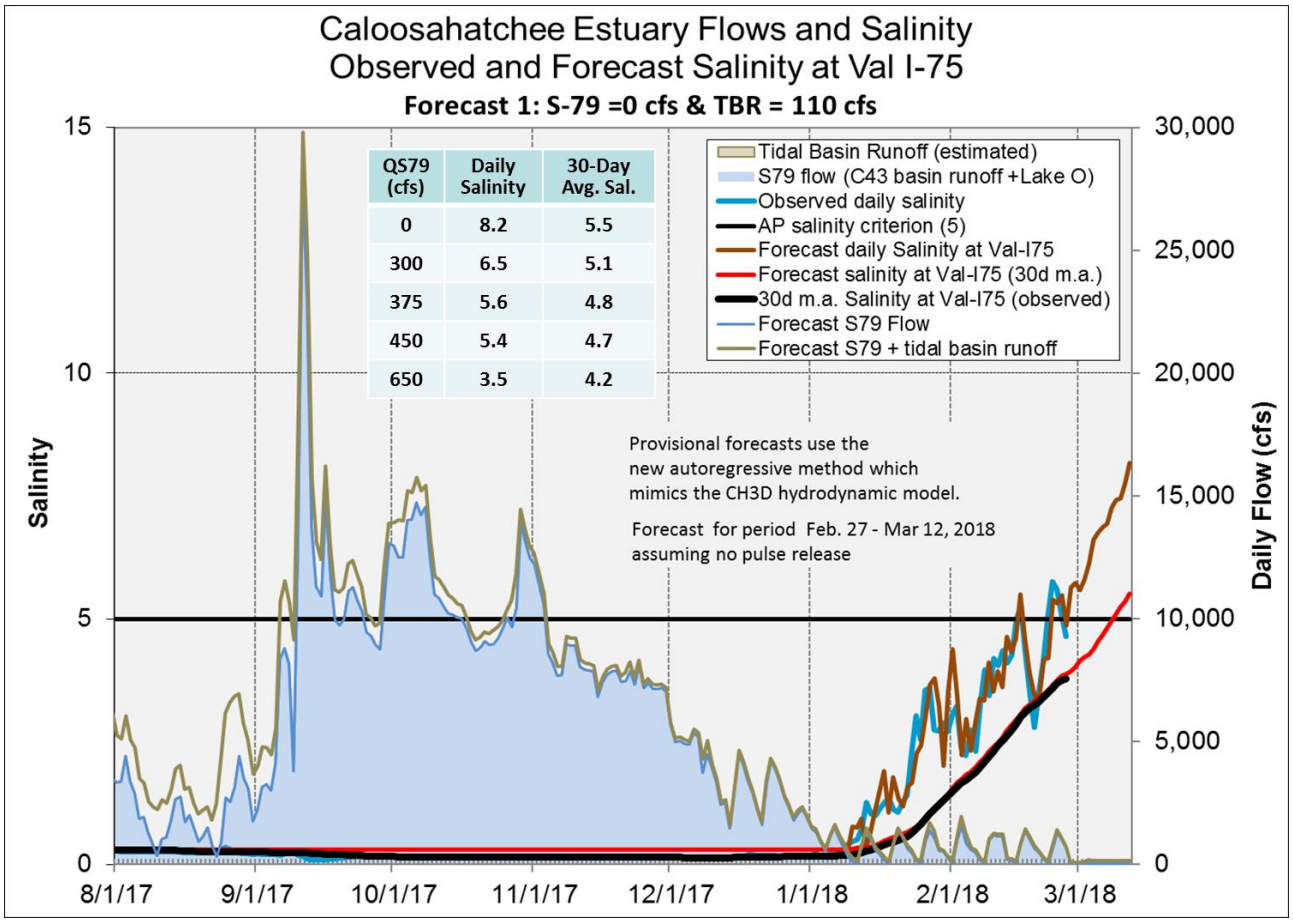
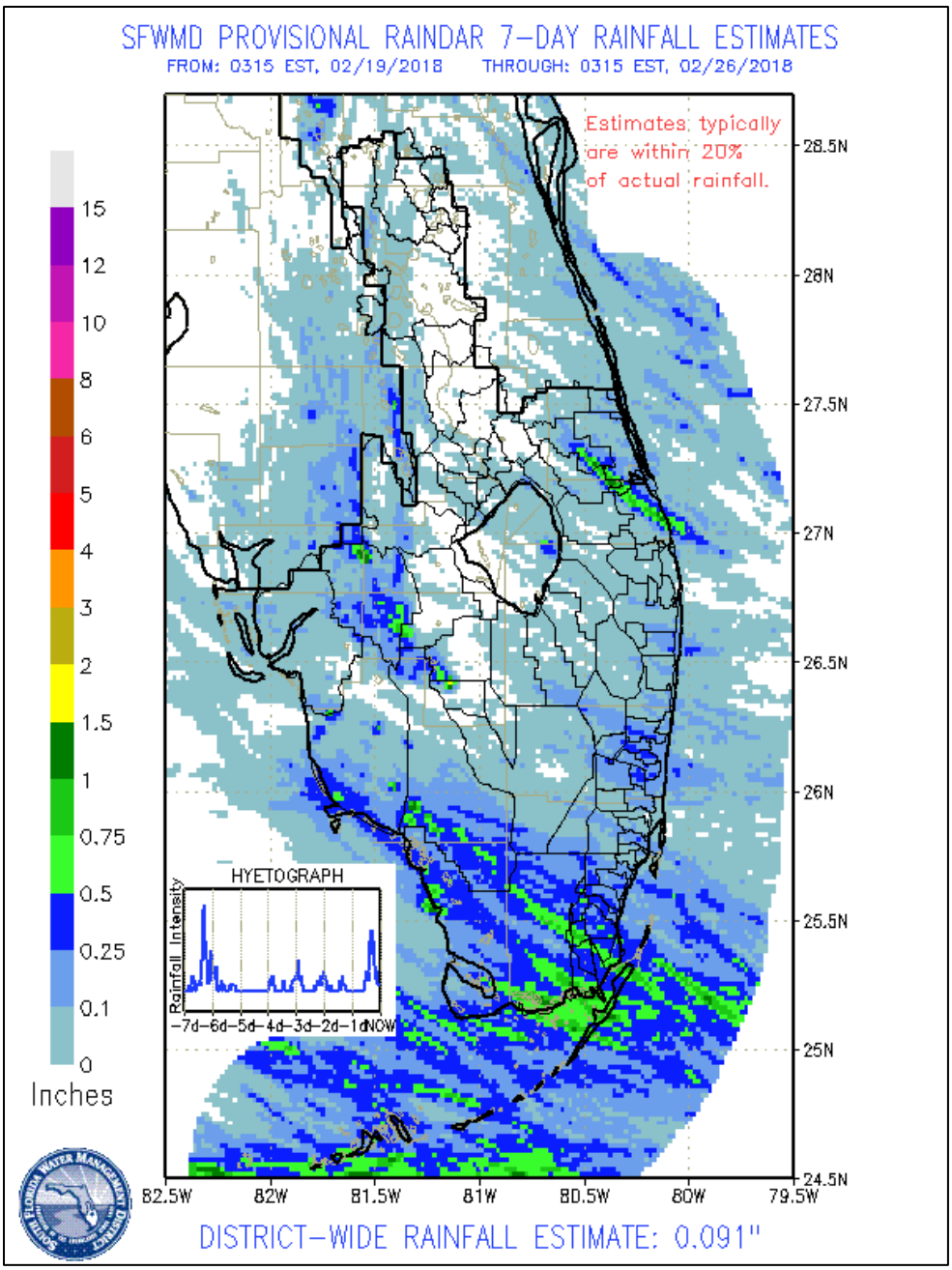


Figure 11. 14-day salinity forecast at Val I-75 assuming no releases at S-79.

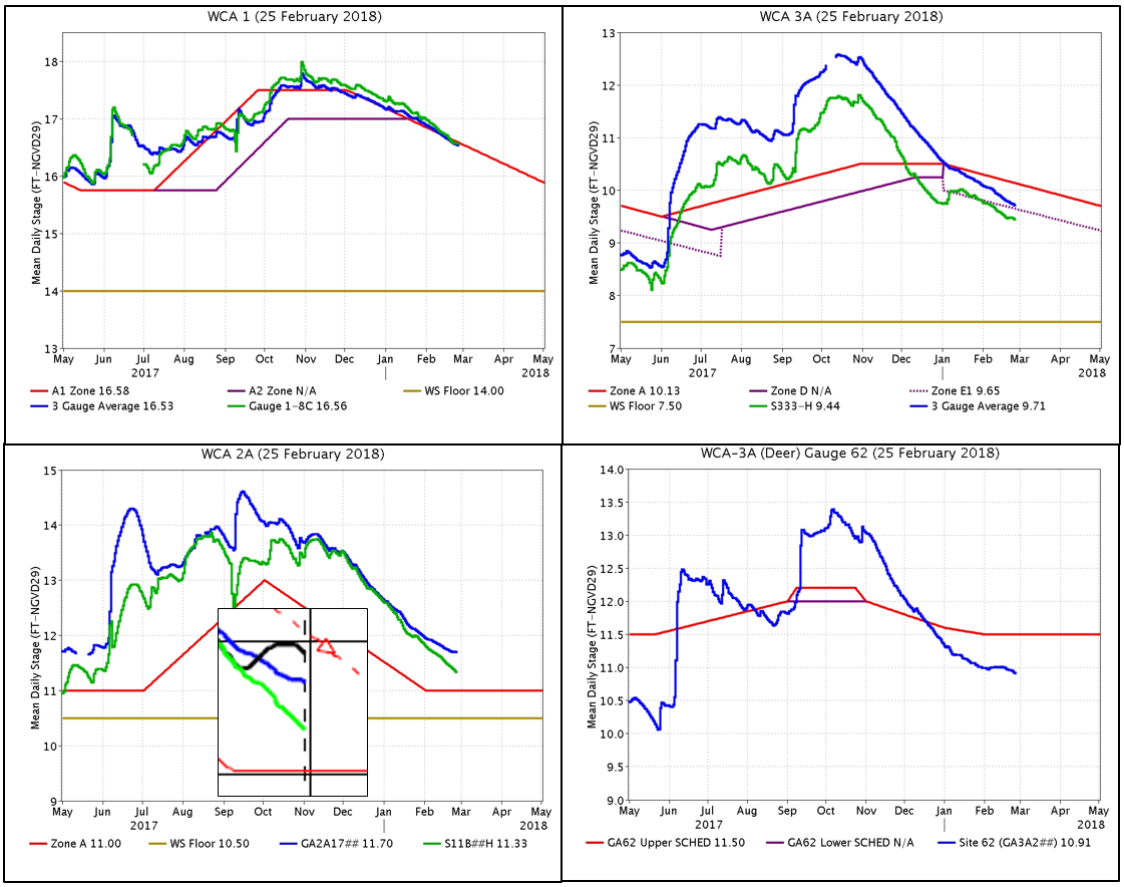
EVERGLADES

At the gauges monitored for this report, the water depth across the Everglades fell an average of 0.08 feet last week, a slight decrease from the week prior. Individual gauge changes in the WCAs ranged from 0.0 feet (WCA-1) to −0.13 feet (WCA-2B). Pan evaporation increased again and was estimated at 1.87 inches last week.

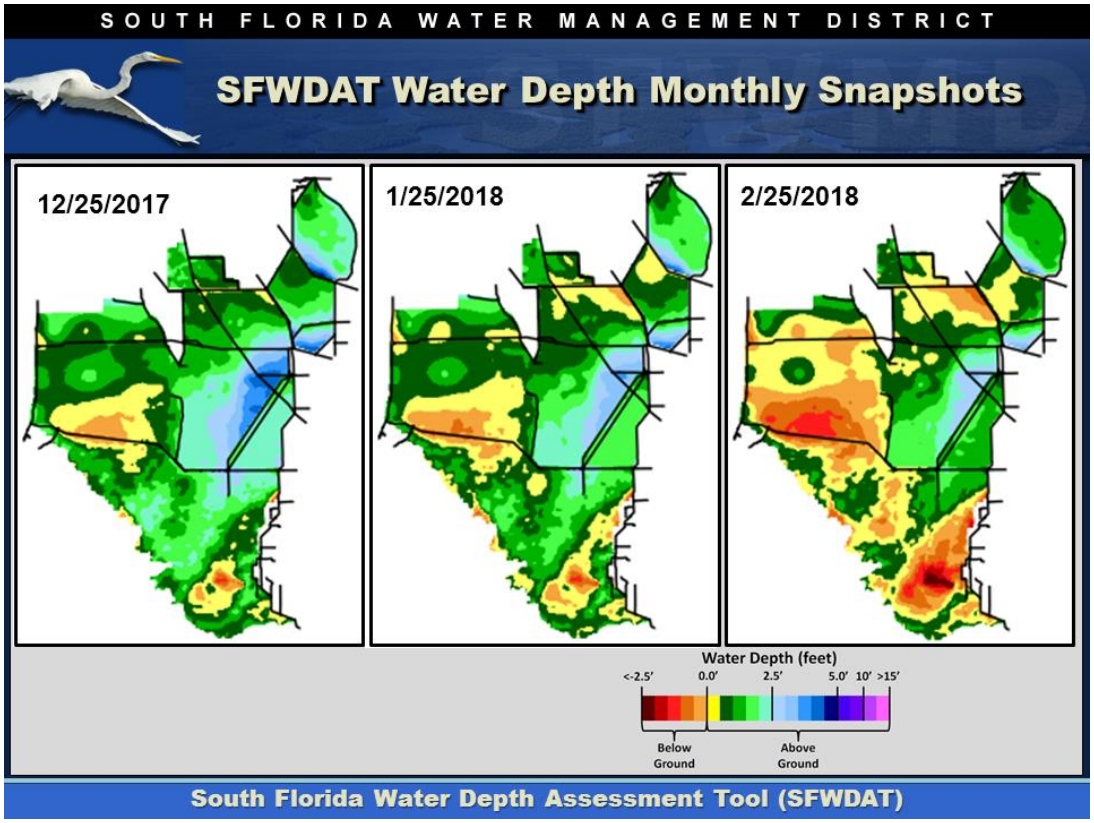
Everglades Region	Rainfall (Inches)	Stage Change (feet)
WCA-1	0.05	−0.07
WCA-2A	0.12	−0.04
WCA-2B	0.14	−0.12
WCA-3A	0.06	−0.09
WCA-3B	0.10	−0.07
ENP	0.34	−0.07

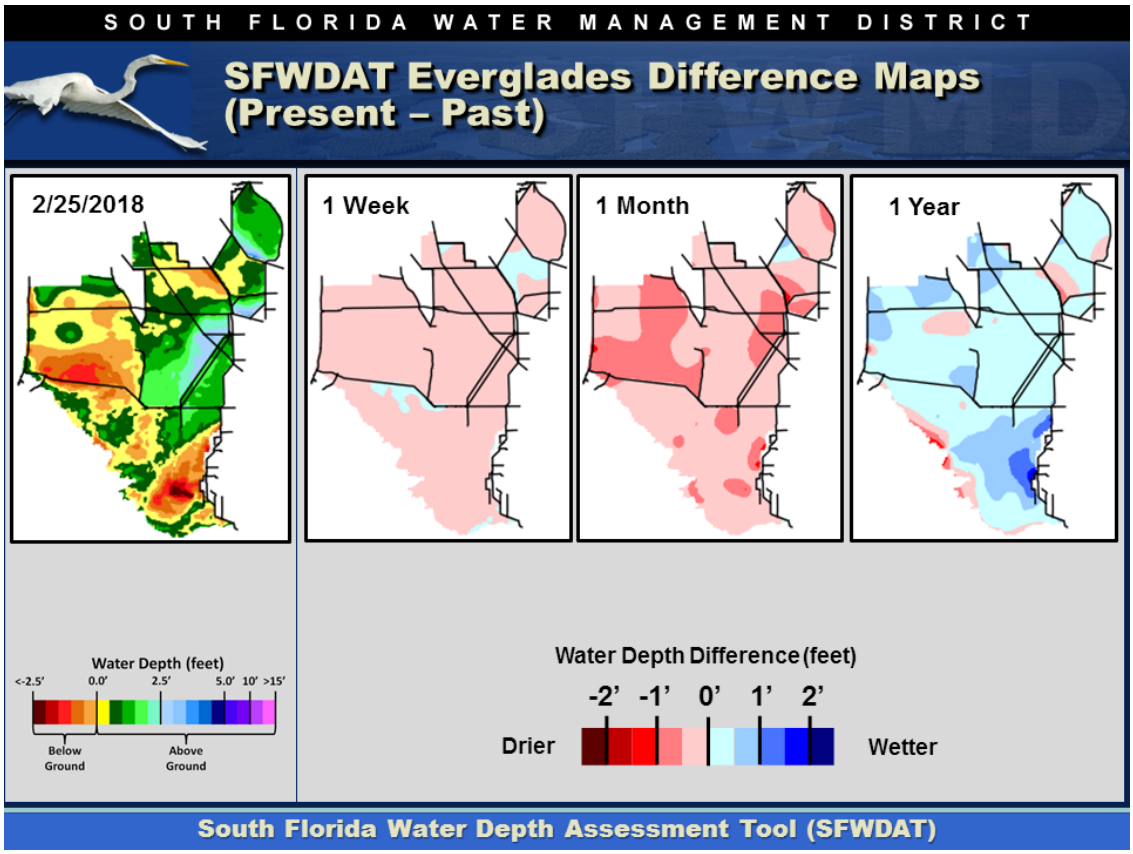


Regulation Schedules: WCA-1 three-gauge average continues trending along the top of the Zone A1 schedule, at 0.05 feet above. WCA-2A (subject to a temporary deviation – see inset) marsh stage at gauge GA2A17 is 0.70 feet above Zone A1, below the temporary schedule, and falling away from the temporary schedule. WCA-3A three-gauge average stage is 0.42 feet below Zone A and falling away from the regulation line. WCA-3A at gauge 62 (northwest corner) stage is 0.59 feet below the upper schedule and has leveled off.



Water Depths and Changes: The WDAT tool for spatial interpolation of depth monthly snapshots indicate a drying front in WCA-3A moving north to south, drying conditions prevailing in central WCA-2A, and deeper water conditions in WCA-1. The northeast corner of WCA-3A continues to elicit concern as the model shows depths are 0.5 to 1.0 feet below ground (however field observations in that region indicate about 6 to 7 inches of water). Comparing WDAT water levels from present, water depths over the last week fell across most of the Everglades. Portions of northern WCA-2A rose slightly over the past week. Of note, the northwestern portion of WCA-2A is significantly wetter than it was a month ago, with the southwestern corner being significantly drier.


SOUTH FLORIDA WATER MANAGEMENT DISTRICT
SFWDAT Water Depth Monthly Snapshots
12/25/2017
1/25/2018
2/25/2018
Water Depth (feet)
<-2.5'
0.0'
2.5'
5.0'
10'
>15'
Below Ground
Above Ground
South Florida Water Depth Assessment Tool (SFWDAT)

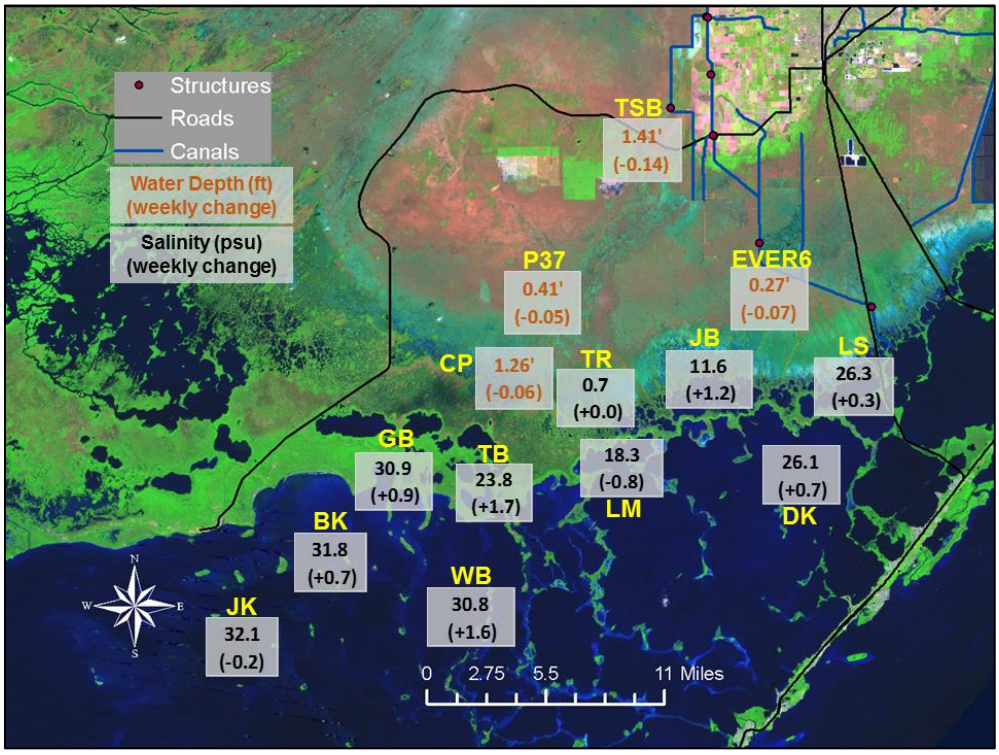

SOUTH FLORIDA WATER MANAGEMENT DISTRICT
SFWDAT Everglades Difference Maps
(Present – Past)
2/25/2018
1 Week
1 Month
1 Year
Water Depth (feet)
<-2.5'
0.0'
2.5'
5.0'
10'
>15'
Below Ground
Above Ground
Water Depth Difference (feet)
-2'
-1'
0'
1'
2'
Drier
Wetter
South Florida Water Depth Assessment Tool (SFWDAT)

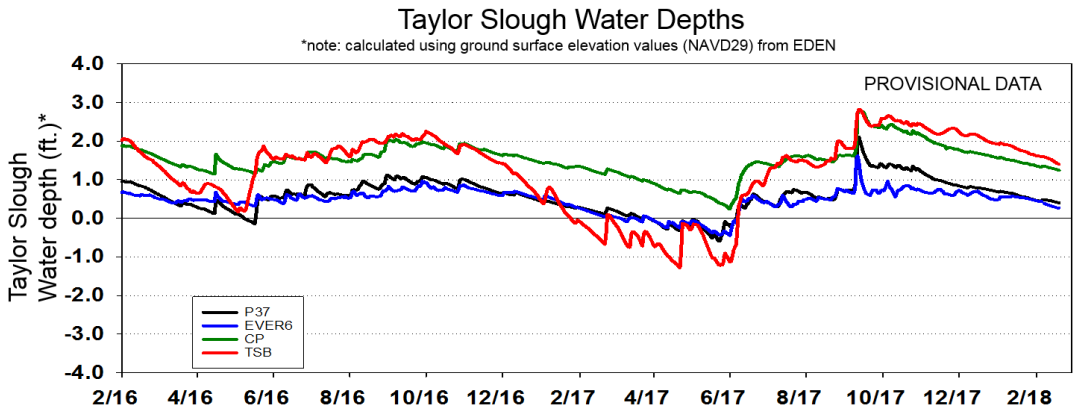
SFWMD northern WCAs wading bird foraging flight (February 26, 2018)

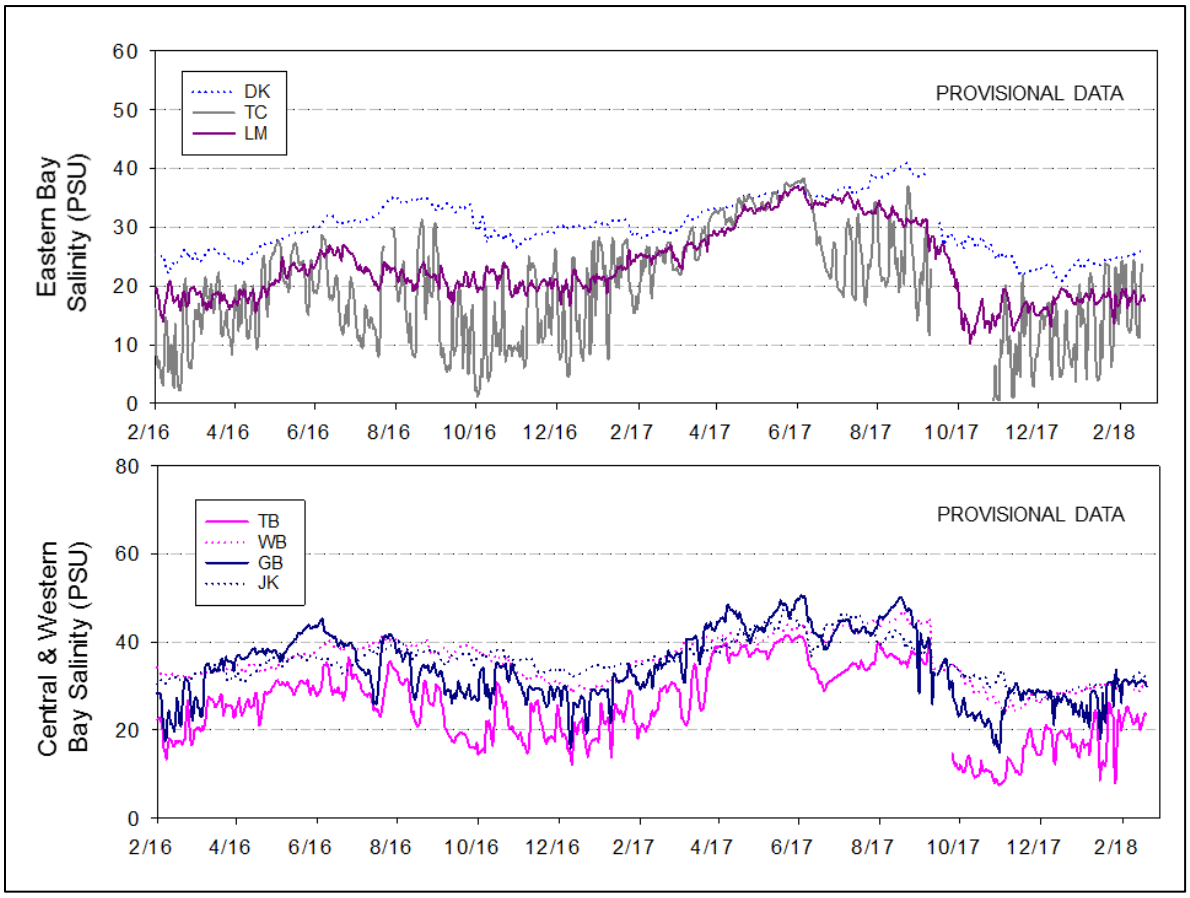
- 8,000 wading birds foraging along burned areas in northern WCA-3A along Miami Canal.
- Low numbers of wading birds in WCA-1, and increasing numbers in WCA-2A.
- 30,000 white ibis initiating nesting in Alley North colony. Field observations indicate about 6 to 7 inches of standing water around the colony island.

Taylor Slough Stages: Water levels continue to decrease in Taylor Slough despite the half inch of rain that fell this past week. Weekly changes ranged from −0.002 feet to −0.10 feet. Water levels are still 1 to 16 inches above the historical average for this time of year with the largest divergence occurring in northern Taylor Slough, where stages would typically be below ground by this time of year.

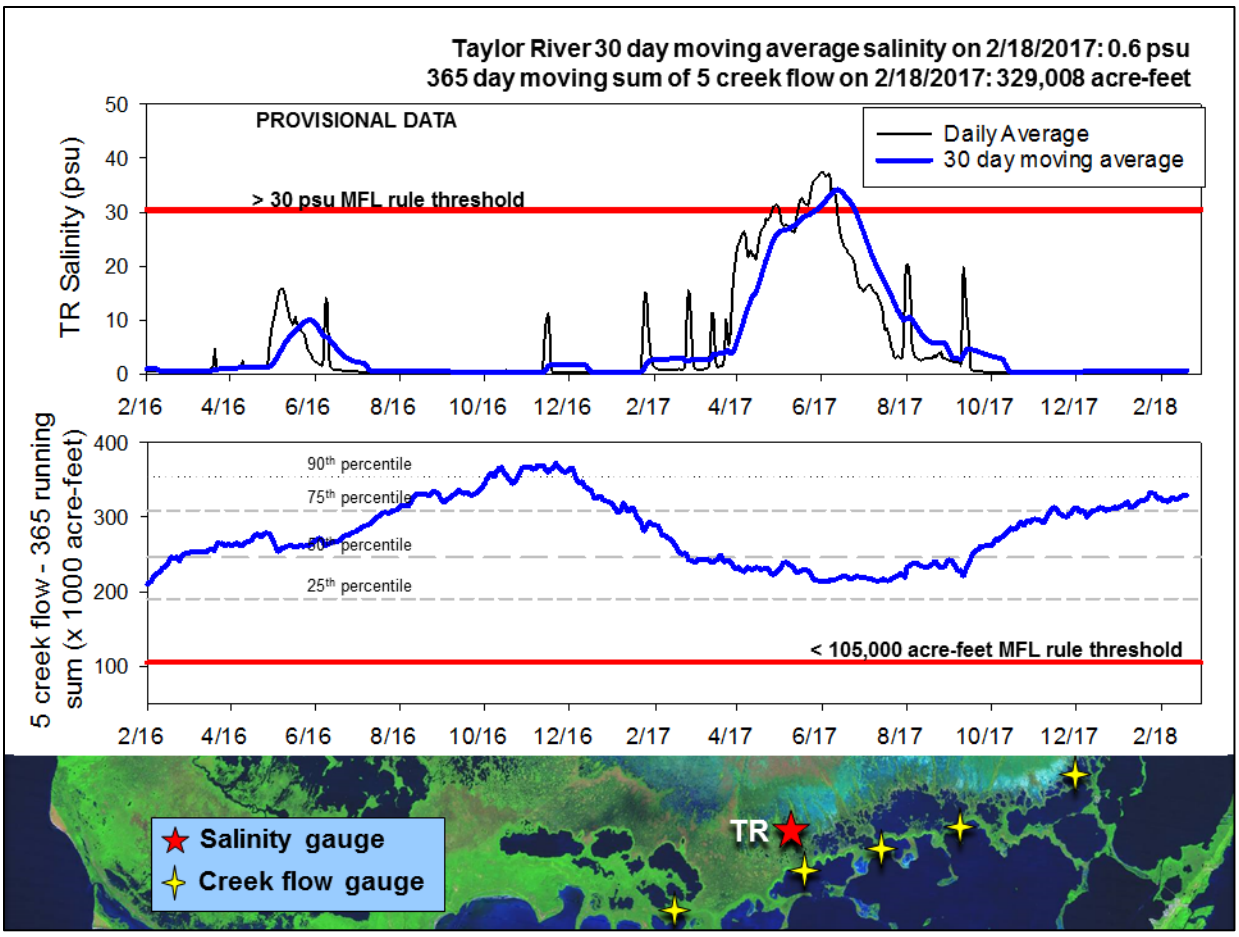
Florida Bay Salinities: Salinity changes for the last week were small with the largest change, in either direction, being an increase of 3.3 psu in the northeastern nearshore. The changes this week are mostly opposite from last week. Current salinities range from 11 psu in the northeastern embayments to 32 psu in the western bay. Compared to historical averages, salinities range from 4 psu below to 2 psu above average.







Florida Bay MFL: Mangrove zone daily average salinity remains near fresh at 0.8 psu and is slowly rising. The 30-day moving average is 0.7 psu. The weekly cumulative flow from the five creeks denoted by yellow stars on the map increased by 500 acre-feet over the last week to end at 2,400 acre-feet. The 365-day moving sum of flow from the five creeks increased about 9,000 acre-feet over the last week to end at 337,948 acre-feet (still greater than the long-term average of 257,628 acre-feet). Creek flow is provisional data from the USGS and is highly variable.



Water Management Recommendations

At this point in the season, there is little ecological need for manipulation of recession rate or depths, with the exception being northeastern WCA-3A. Current recession rates across the system are conducive for the development of optimal foraging conditions for wading birds, and the birds are responding by nesting earlier than in recent years (a restoration goal) and in notable numbers. WDAT modeling shows northeastern WCA-3A as the driest of the WCAs, with stages at 0.5 to 1.0 feet below ground surface (however field observations report about 6 to 7 inches of standing water). Protecting that area from late season over-drying and maintaining open water conditions around the important Alley North wading bird nesting colony in northeast WCA-3A has great ecological benefit, and any inflows into that region serve that purpose.

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

SFWMD Everglades Ecological Recommendations, February 27th, 2018 (red is new)				
Area	**Current Condition**	**Cause(s)**	**Recommendation**	**Reasons**
WCA-1	Stages decreased by 0.07'	Rainfall, ET, management	Maintain 0.07 to 0.10 feet per week recession rates.	Protect habitat and facilitate invasive plant treatments.
WCA-2A	Stages decreased by 0.04'	Rainfall, ET, management	Maintain current recession rates.	Foster conditions for wildlife and optimal wading bird foraging.
WCA-2B	Stages decreased by 0.12'	Rainfall, ET, management	Maintain depths at regulation schedule or slightly above.	Protect upstream/downstream habitat and wildlife. Foster conditions for wading bird foraging.
WCA-3A NE	Stages decreased by 0.11'	Rainfall, ET, management	Slower recession rates with additional inflows would be beneficial.	Protect habitat and wildlife, foster conditions for wading bird foraging and protect nesting habitat. Northeast WCA-3A, −0.12' per week average over the last month.
WCA-3A NW	Stages decreased by 0.07'	Rainfall, ET, management	Maintain current recession rates.	
Central WCA-3A S	Stages decreased by 0.09'	Rainfall, ET, management	Maintain current recession rates.	Protect habitat and wildlife, foster conditions for wading bird foraging.
Southern WCA-3A S	Stages decreased by 0.08'	Rainfall, ET, management		
WCA-3B	Stages decreased by 0.07'	Rainfall, ET, management	Maintain depths at regulation schedule.	Protect habitat and wildlife from high water stress.
ENP-SRS	Stages decreased by 0.07'	ET, rainfall, topography, management	Make discharges to the Park according to the 2012 WCP rainfall plan.	Keep peat wet to promote native habitat and maintain wetland plant and animal communities. Protect habitat and wildlife, including apple snail reproduction.
Taylor Slough	Stage changes ranged from −0.002' to −0.10'	Rain, ET, inflows	Move water southward as possible	When available, provide freshwater buffer for downstream conditions.
FB- Salinity	Salinity changes ranged −2.1 to +3.3 psu	Rain, ET, inflows, wind	Move water southward as possible	When available, provide freshwater to maintain low salinity buffer and promote water movement.