

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, Assistant Executive Director, Executive Office Staff

**FROM:** SFWMD Staff Environmental Advisory Team

**DATE:** April 1, 2020

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

### **Summary**

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

An area of low pressure moving out of the lower Mississippi Valley this morning has caused the dominant mid-level ridge of high pressure over Florida since late last week to weaken and retreat to the southern Gulf of Mexico. While the influence of the high-pressure area is diminishing across the state, strong atmospheric stability and dry mid- to upper-level air are expected to remain in place and inhibit any rainfall across the District through early this evening. Winds veering to the southwest or west-southwest ahead of the low-pressure area when it reaches the southeastern United States later today should result in near-record or record heat over the interior and eastern part of the District. The extreme heat for this time of year, full sunshine and relatively low relative humidity will also support greater-than-normal evapotranspiration rates as has been the case for the last several days. A cold front associated with the developing storm system in the southeast U.S. is expected to push into north Florida by this evening and to the central part of the District by daybreak on Wednesday. Ahead of the front a band of enhanced moisture and instability should generate fast-moving shower activity that should reach the northwestern or western half of the District by early in the night and then overspread the remainder of the area from northwest to southeast during the early morning hours on Wednesday. The overnight showers should represent the first measurable total District rainfall in almost three weeks and offer some limited relief to the exceptionally dry conditions that have prevailed this month. The last of rains should exit the southeast coast of Florida before midday on Wednesday, followed by the first District-wide frontal passage since March 6, 2020 by the afternoon. In the wake of the front, drier and somewhat cooler weather should settle in and last through Friday, except a few late-day showers are possible over the far southwestern interior to the southwest coast each day. A dry weather pattern is seen continuing over the weekend and into early next week, although about 10% of the model solutions show an uptick of rain over the western interior through the Kissimmee Valley on Saturday and Sunday in association with a weak upper-air disturbance crossing Florida from the Gulf of Mexico during that time. For the week ending next Tuesday morning, the deterministic total District quantitative precipitation forecast (QPF) is a little more than 0.1 inches or about 20% of normal, the bulk of which is forecast to occur over a 12-hour period beginning tonight. The model output favors a continuation of much below normal weekly rainfall, and total rainfall is unlikely to exceed 60% of normal. After the all-time lowest observed rainfall in March and likely dry first week of April, there are indications that below normal rainfall would persist into the following week and add to the deficit the District has seen since the first of the year.

#### **Kissimmee**

Tuesday morning stages were 52.7 feet NGVD (4.7 feet below schedule) in East Lake Toho, 53.4 feet NGVD (1.0 feet below schedule) in Toho, and 50.5 feet NGVD (0.5 feet above schedule) in Kissimmee-Cypress-Hatchineha; headwater stages were 46.6 feet NGVD at S-65A and 25.6 feet NGVD at S-65D. Tuesday morning discharges were 366 cfs at S-65, 303 cfs at S-65A, 330 cfs at S-65D and 292 cfs at S-65E. Dissolved oxygen concentration in the Kissimmee River averaged 7.6 mg/L for the week through

Sunday. Kissimmee River mean floodplain depth on Sunday was 0.07 feet. This week's recommendations are to continue the recession on Lake Tohopekaliga to reach low pool (52.0 feet NGVD) on June 1, 2020, and to continue the recession on Lakes Kissimmee-Cypress-Hatchineha to reach low pool (49.0 feet NGVD) on June 1, 2020.

### **Lake Okeechobee**

Lake Okeechobee stage was 11.91 feet NGVD on March 30, 2020, down 0.25 feet from the previous week, and down 0.77 feet from the previous month. The Lake entered the Beneficial Use sub-band on March 4, 2020 and is now 0.21 feet above the Water Shortage sub-band. Water levels moved below the ecological envelope (which varies seasonally from 12.0 – 15.0 feet NGVD +/- 0.5 feet) on October 15, 2019 and are currently 1.11 feet below the bottom of the updated (draft) envelope. Lake stages below the ecological envelope will continue to benefit recovering submerged and emergent marsh vegetation at low elevations but will reduce aquatic habitat for fish and wildlife in the marshes. Wading bird and snail kite nesting efforts are likely to be lower for the second consecutive year on the Lake due to low lake stages during the breeding season.

### **Estuaries**

Total inflow to the St. Lucie Estuary averaged 151 cfs over the past week with no flow coming from Lake Okeechobee. Salinities increased slightly in the estuary over the past week. Salinity at the US1 Bridge is in the good range for adult eastern oysters. Total inflow to the Caloosahatchee Estuary averaged 678 cfs over the past week with 513 cfs coming from the Lake. Salinity decreased in the upper estuary (S79, Vall-75), but increased slightly in the lower estuary (Cape Coral, Shell Point and Sanibel) over the past week. Salinities are in the good range for tape grass at Val I-75 and fair range at Ft. Myers. Salinities are in the good range for adult eastern oysters at Cape Coral and in the fair range at Shell Point and Sanibel. The 2008 LORS release guidance suggests no releases to the estuaries.

### **Stormwater Treatment Areas**

Over the past week, 1,300 ac-ft of Lake Okeechobee water was delivered to the FEBs/STAs. The total amount of Lake releases sent to the FEBs/STAs in WY2020 (since May 1, 2019) is approximately 136,600 ac-feet. The total amount of inflows to the STAs in WY2020 is approximately 960,300 ac-feet. Most STA cells are near target stage, except STA-5/6 cells that continue to dry out. STA-1E Western Flow-way is offline for the Restoration Strategies project to fill and grade Cells 5 and 7. Operational restrictions are in place in STA-1W Northern Flow-way related to STA-1W Expansion #1 startup activities, in STA-3/4 Western Flow-way for energy dissipator installation, in STA-1E Central Flow-way, STA-2 Flow-way 3, STA-2 Flow-way 4, and STA-3/4 Eastern Flow-way for vegetation management activities, and in STA-5/6 Flow-ways 2 and 3 following the Restoration Strategies project to grade non-effective treatment areas. This week, if 2008 LORS recommends Lake releases to the WCAs and the conditions allow, releases will be sent to STA-2 or A-1 FEB/STA-3/4.

### **Everglades**

Current stages in WCA-3A NE remain below average (Site 62 in the northwest is 0.13 feet below and Site 63 in the northeast is 0.81 feet below) for this time of year. Conserving fresh water in the Everglades, distributing it to where depths are low (WCA-3A NE), or maintaining average depths (WCA-3A NW), then allowing it to flow south has important ecological benefit. Wading bird nesting numbers are building in WCA-3A south, however recession rates are exceeding the optimal rate for wading bird foraging success. A reduction in this rate in upcoming weeks may prove important to wading bird nesting as that is the only location in the WCAs currently supporting foraging flocks. Almost no precipitation fell over Taylor Slough and Florida Bay last week and stages fell below average after a long period of well above average. After being a foot or more higher than the historical average stage for the dry season, the Upper Taylor Slough region is now half a foot below average. Average salinities in Florida Bay increased and remain above average.

## Supporting Information

### KISSIMMEE BASIN

#### Kissimmee Basin Rainfall

The Upper Kissimmee Basin received no rainfall in the past week and the Lower Basin received no rainfall in the past week (SFWMD Daily Rainfall Report 3/30/2020).

#### Upper Kissimmee Basin

Stages and departures in the Kissimmee Chain of Lakes (KCOL) are shown in **Table 1**. KCOL stage hydrographs with respective regulation schedules and rainfall are shown in Figures 1-3.

**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: 3/31/2020

Water Body	Structure	7-day Average Discharge (cfs) <sup>1</sup>	Stage Monitoring Site <sup>2</sup>	Lake Stage (feet)	Schedule Type <sup>3</sup>	Schedule Stage (feet)	Daily Departure (feet)						
							3/29/20	3/22/20	3/15/20	3/8/20	3/1/20	2/23/20	2/16/20
Lakes Hart and Mary Jane	S-62	1	LKMJ	60.4	R	60.8	-0.4	-0.4	-0.4	-0.3	-0.2	-0.1	-0.2
Lakes Myrtle, Preston, and Joel	S-57	0	S-57	60.7	R	60.7	0.0	0.0	0.0	0.0	0.0	0.0	-0.1
Alligator Chain	S-60	0	ALLI	63.1	R	63.7	-0.6	-0.6	-0.7	-0.6	-0.6	-0.5	-0.5
Lake Gentry	S-63	0	LKGT	61.1	R	61.2	-0.1	-0.1	-0.2	-0.2	-0.1	-0.1	0.1
East Lake Toho	S-59	0	TOHOE	52.7	R	57.5	-4.8	-5.0	-5.2	-5.1	-58.0	-4.8	-4.4
Lake Toho	S-61	39	TOHOW, S-61	53.4	R	54.5	-1.1	-1.3	-1.3	-1.2	-1.0	-0.9	-0.7
Lakes Kissimmee, Cypress, and Hatchineha	S-65	448	KUB011, LKIS5B	50.5	R	51.0	-0.5	-0.2	0.0	0.2	0.4	0.3	-0.1

<sup>1</sup> Seven-day average of weighted daily means through midnight.

<sup>2</sup> Names of in-lake monitoring sites and structures used to determine lake stage; if more than one site is listed, an average is reported.

<sup>3</sup> A = projected ascension line, R = USACE regulation schedule, S = temporary recession target line, T = temporary schedule, 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: 3/31/2020

Metric	Location	1-Day Average		Average for the Preceding 7-Days <sup>1</sup>							
		3/29/2020	3/29/20	3/22/20	3/15/20	3/8/20	3/1/20	2/23/20	2/16/20	2/9/20	2/2/20
Discharge (cfs)	S-65	367	448	690	920	1,013	983	918	922	853	808
Discharge (cfs)	S-65A <sup>2</sup>	301	384	595	837	956	956	930	895	823	766
Discharge (cfs)	S-65D <sup>2</sup>	327	476	699	940	968	985	960	946	881	785
Headwater Stage (feet NGVD)	S-65D <sup>2</sup>	25.74	25.71	25.75	25.85	25.69	25.80	25.86	25.82	25.79	25.76
Discharge (cfs)	S-65E <sup>2</sup>	263	433	653	864	891	905	880	844	861	759
Discharge (cfs)	S-67	0	0	0	0	0	0	0	0	0	0
DO (mg/L) <sup>3</sup>	Phases I & II/III river channel	7.6	7.6	8.1	8.5	8.8	8.4	7.8	8.2	8.9	9.1
Mean depth (feet) <sup>4</sup>	Phase I floodplain	0.07	0.08	0.11	0.20	0.24	0.26	0.26	0.27	0.24	0.18

<sup>1</sup>Seven-day average of weighted daily means through Sunday midnight.

<sup>2</sup>S-65A discharge combines S-65A with auxiliary structures; S-65D discharge combines discharge at S-65D, S-65DX1, and S-65DX2; S-65D stage averages stage at S-65D and S-65DX1; S-65E discharge combines S-65E and S-65EX1.

<sup>3</sup>DO is the average for sondes at KRBN, PC62, PC33, PD62R, and PD42R.

<sup>4</sup>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)

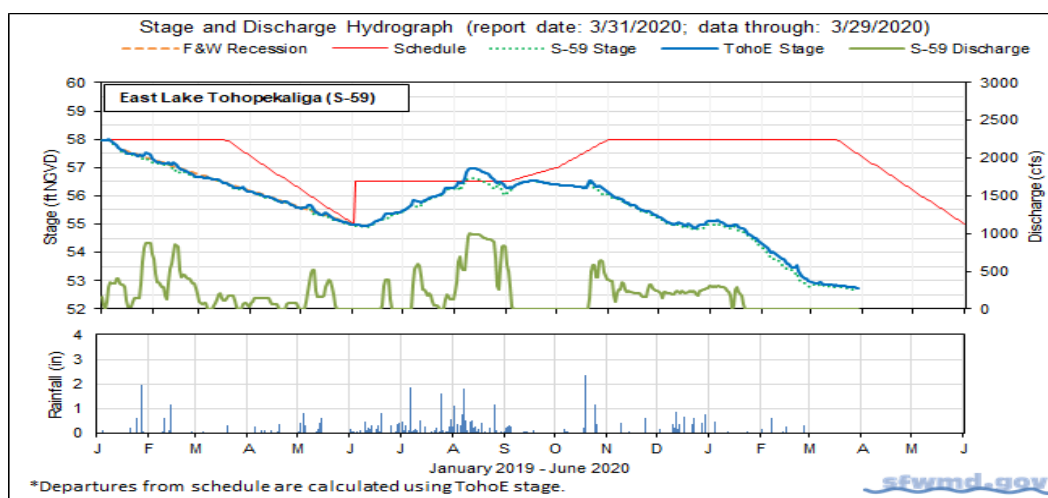


Figure 1.

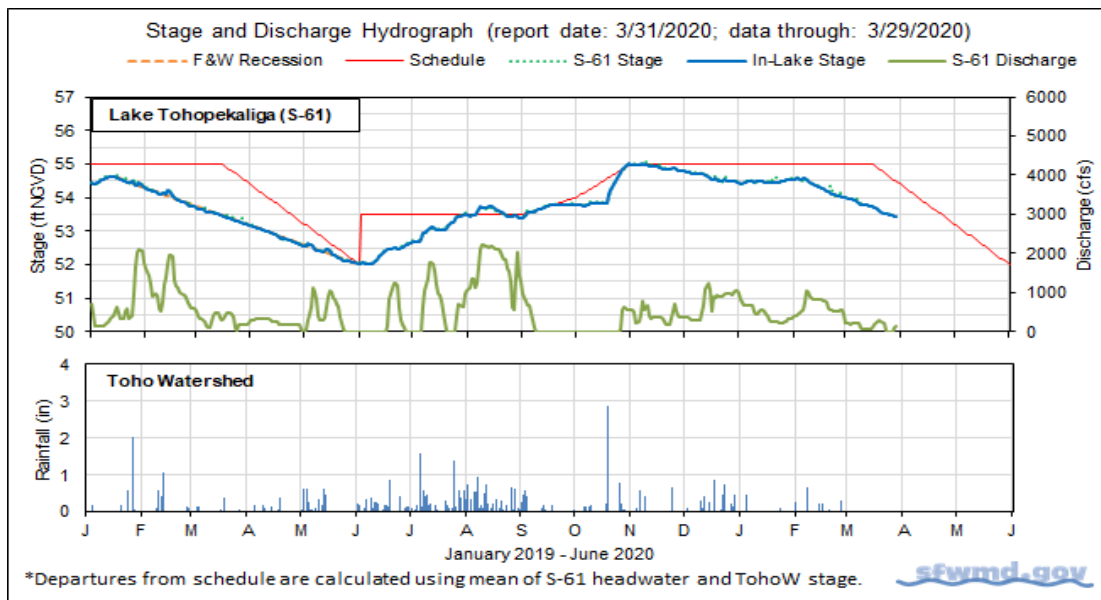


Figure 2.

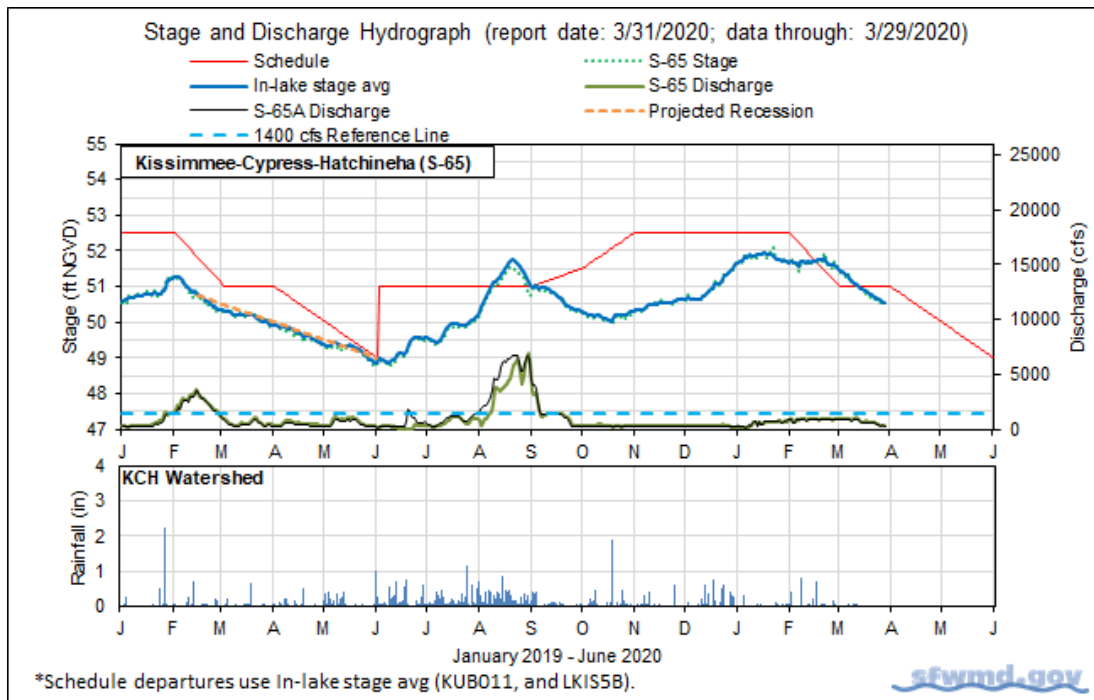
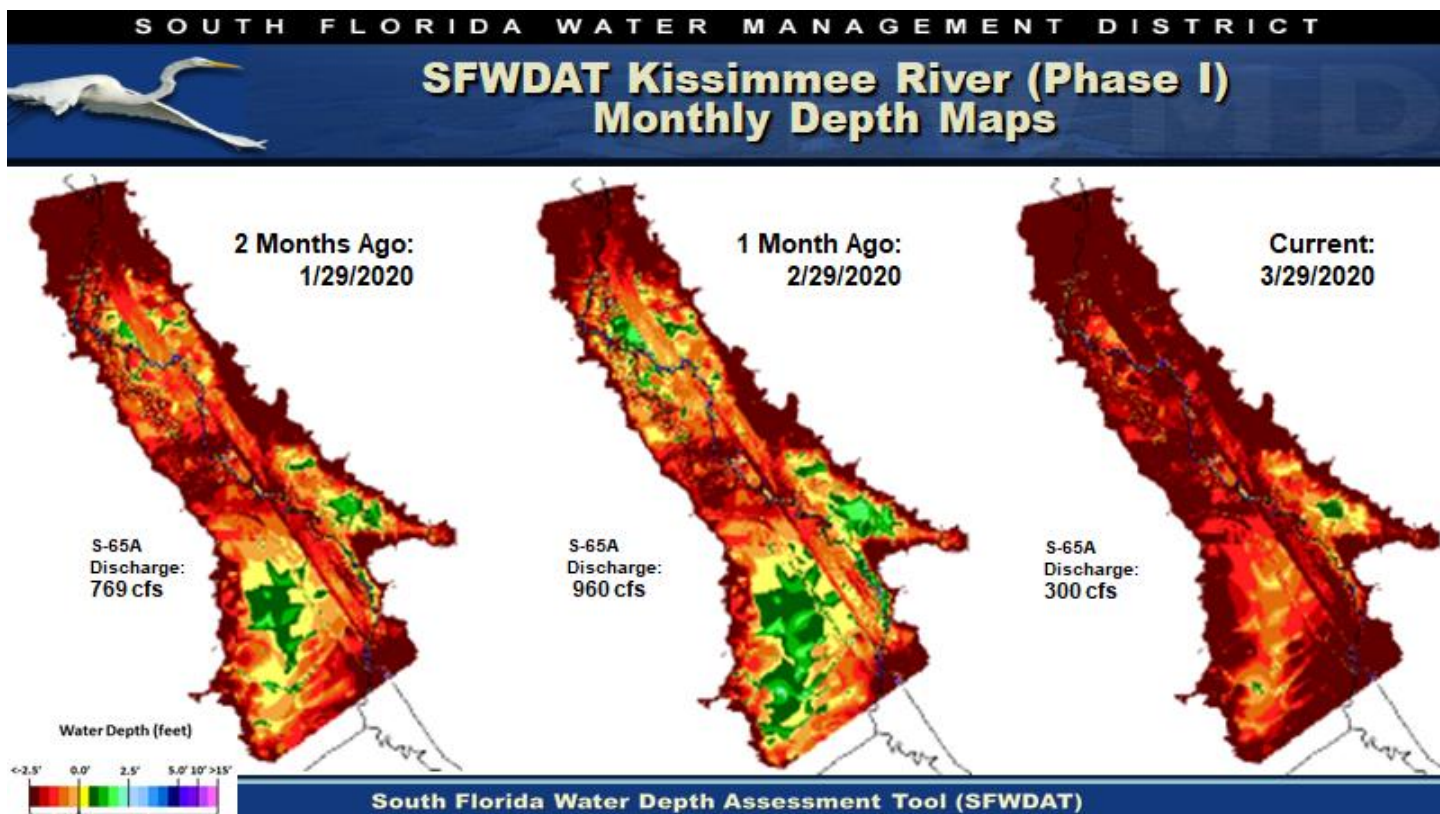
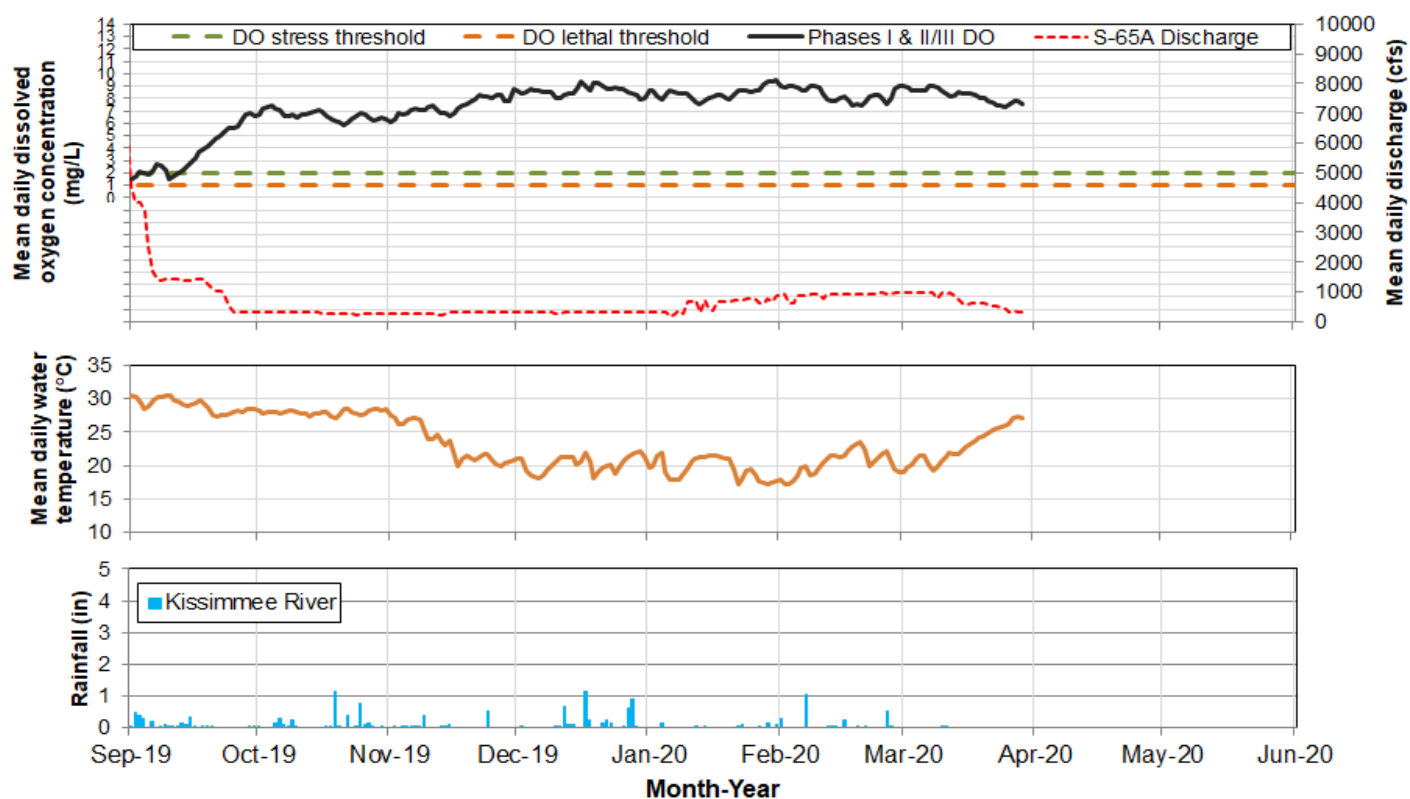


Figure 3.



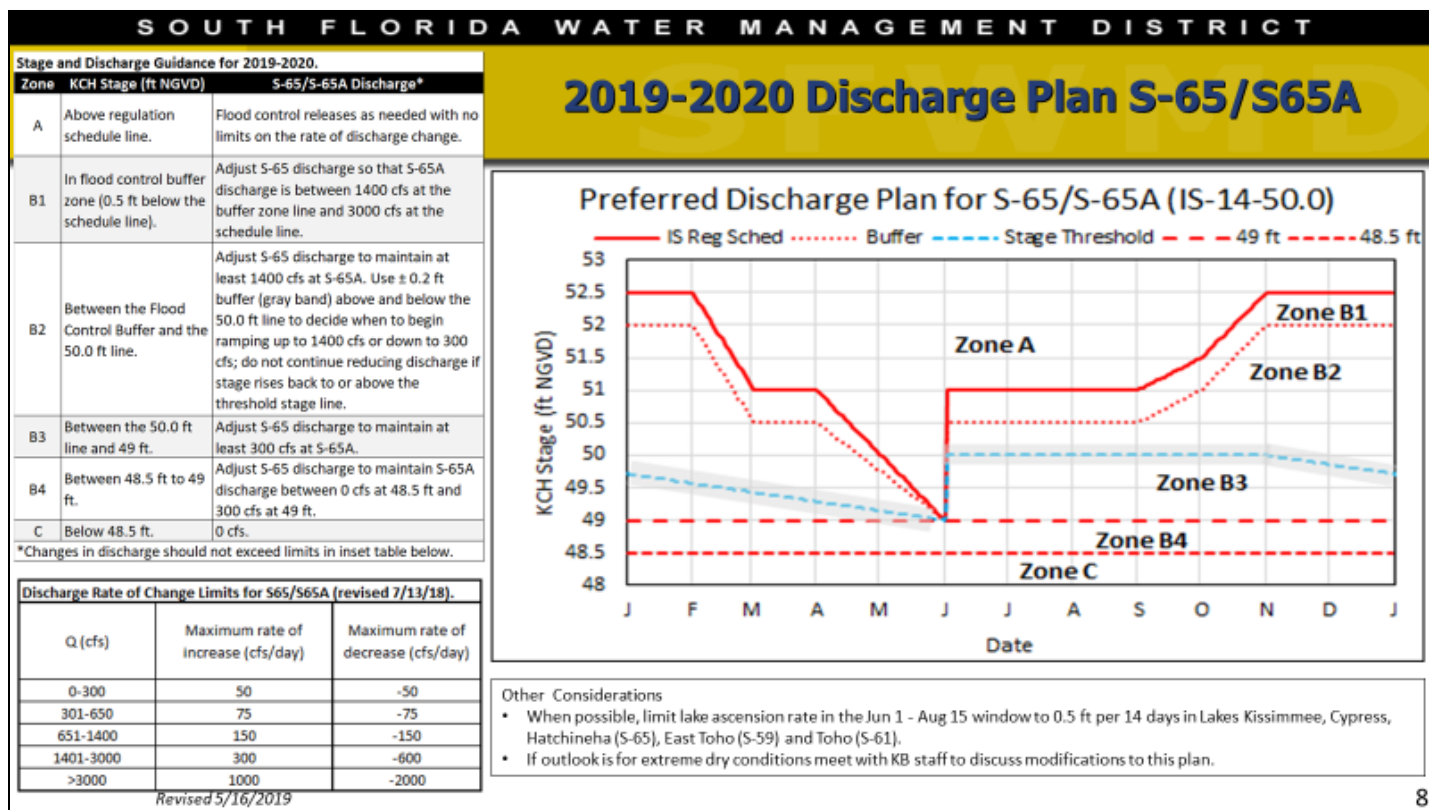
**Figure 4.** Phase I area floodplain water depths for this week, one month ago, and two months ago. Note that the WDAT color-coding has been modified to accommodate greater water depths; these maps are not directly comparable to Kissimmee Basin WDAT maps published prior to January 16, 2012.



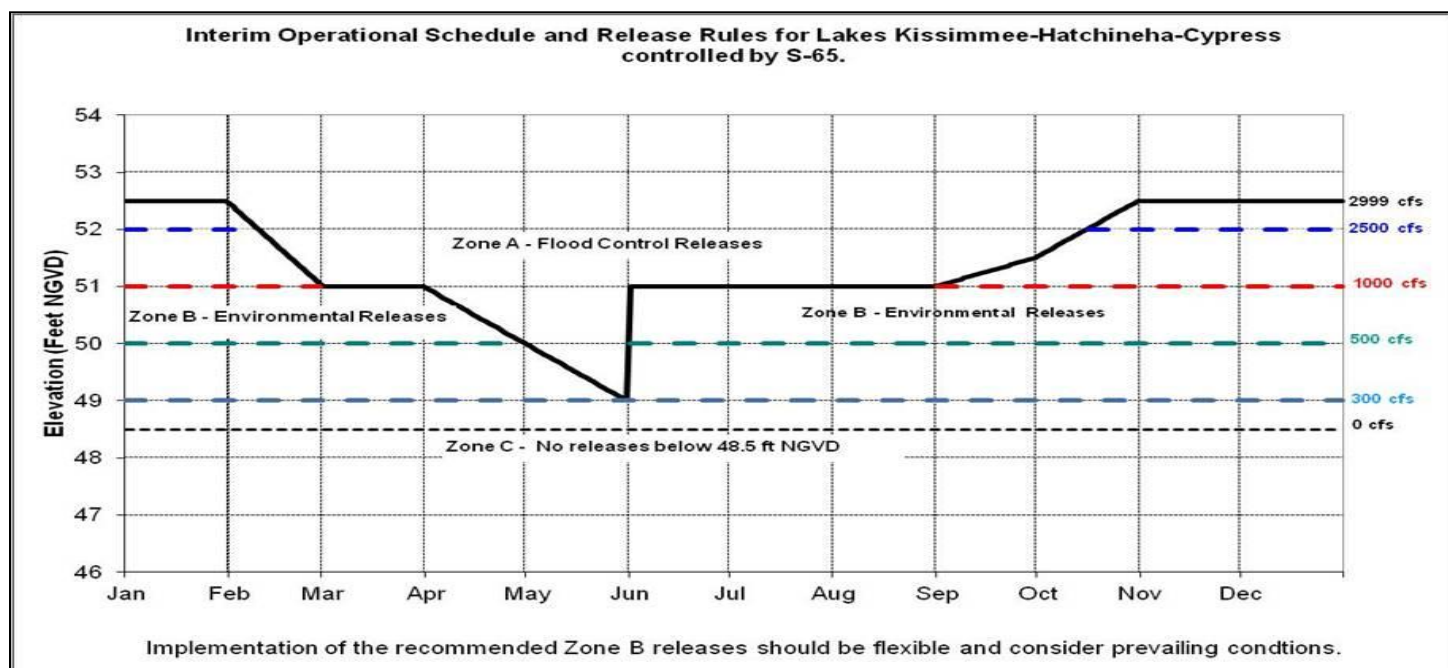
Report Date: 3/31/2020; data are through: 3/29/2020.

**Figure 5.** Mean daily dissolved oxygen, discharge, temperature and rainfall in the Phases I/II/III river channel.





**Figure 6.** The 2019-2020 Discharge Plan for S-65/S-65A.



**Figure 7.** Interim operations schedule for S-65. The discharge schedule shown to the right has not been used in recent years.

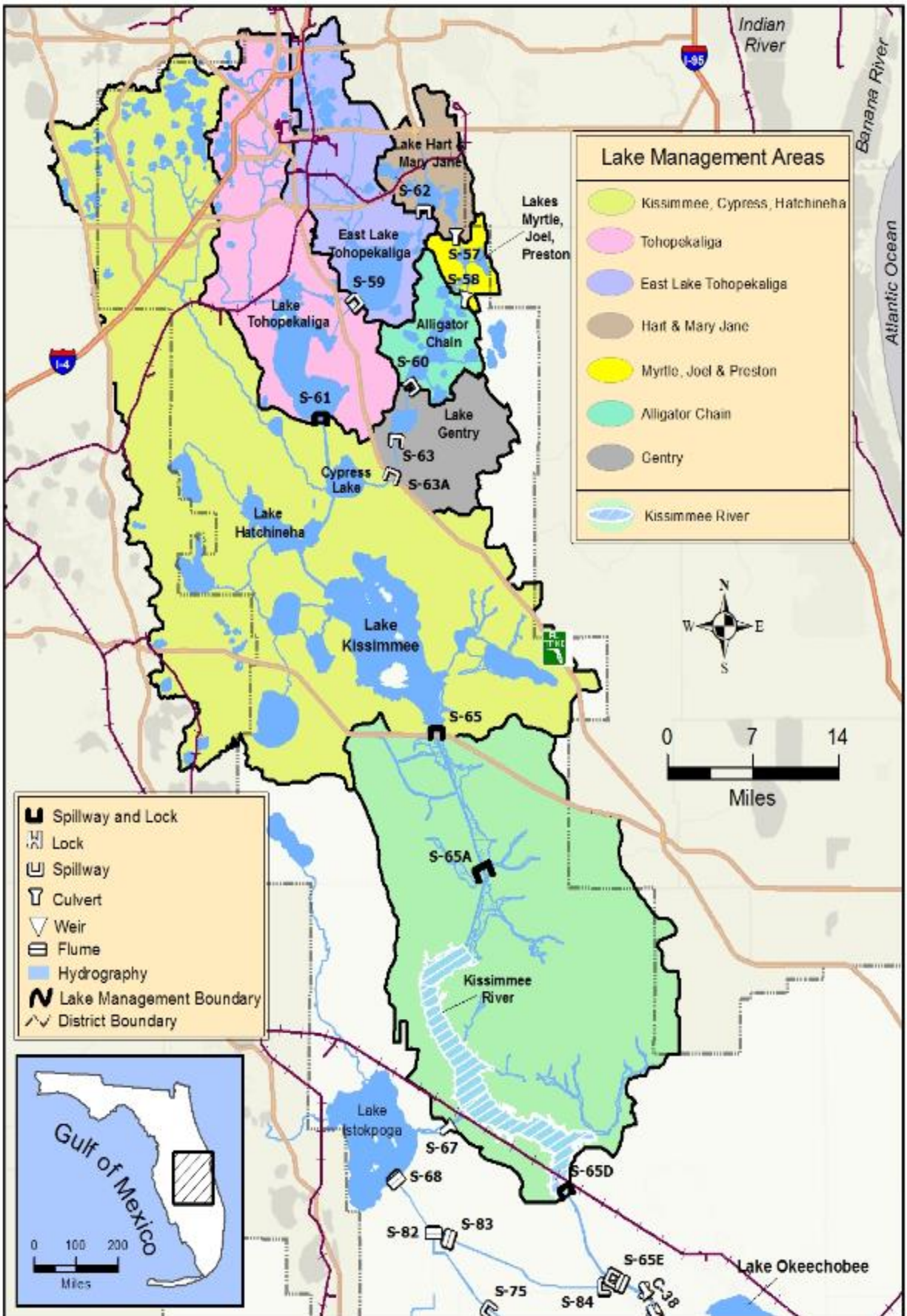


Figure 8. The Kissimmee Basin.



## **LAKE OKEECHOBEE**

Lake Okeechobee stage is 11.91 feet NGVD, 0.77 feet lower than a month ago and the same level as one year ago (Figure 1). The Lake is currently 1.11 feet below the preferred (draft) ecological envelope (Figure 2). Lake stages moved into the Base Flow sub-band on September 11, 2019 and entered the Beneficial Use sub-band on March 4, 2020 (Figure 3). Lake stage had been hovering near 13.0 feet NGVD from December 2019 to mid-February 2020, before declining over 0.77 feet in the past month. According to RAINDAR, no rain fell directly over the Lake or over the watershed during the past week (Figure 4).

The average daily inflows (minus rainfall) decreased again from 625 cfs to just 414 cfs, and average daily outflows (minus evapotranspiration) increased by around 450 cfs from the previous week to total 3,525 cfs. Almost all the inflow came from the Kissimmee River (S-65E & S-65EX1), while most of the outflows were released south through the S-350 structures (2,183 cfs) or west through S-77 (C-43/Caloosahatchee Canal, 1,172 cfs). Total lake inflows and outflows for the past 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 5 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.

The most recent snail kite survey of the Lake was conducted on March 8, 2020, and no nests were found (Figure 6). Last year was the first year since 2010 that no snail kite nesting was observed on the Lake by March surveys, and the same trend continues this year. Low water levels are likely contributing to the lack of snail kite nesting on the Lake, though there were also about 100 fewer individuals (65 vs 179) observed than at the same time last year; the lowest since 2010 (13 observed).

Current satellite imagery (March 28, 2020) using NOAA's cyanobacteria monitoring product derived from EUMETSAT's Sentinel 3 OLCI sensor data suggested low/moderate potential for cyanobacterial blooms along the northwest shoreline of the Lake, slightly lower than this time last year (Figure 7). However, conditions have been similar to last year throughout the spring, with slight changes occurring in intensity and location along the western side of the lake from week to week.

## **Water Management Summary**

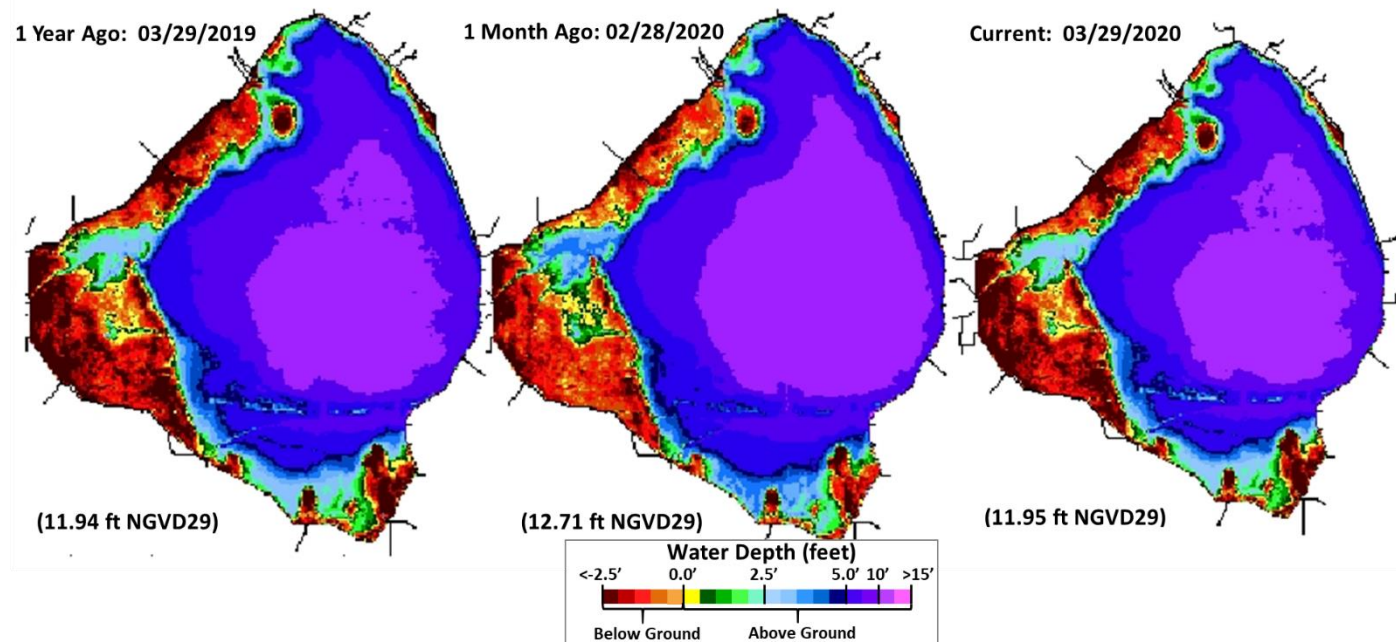
Lake Okeechobee stage was 11.91 feet NGVD on March 30, 2020, down 0.25 feet from the previous week, and down 0.77 feet from the previous month. The Lake entered the Beneficial Use sub-band on March 4, 2020 and is now 0.21 feet above the Water Shortage sub-band. Water levels moved below the ecological envelope (which varies seasonally from 12.0 – 15.0 feet NGVD +/- 0.5 feet) on October 15, 2019 and are currently 1.11 feet below the bottom of the updated (draft) envelope. Lake stages below the ecological envelope will continue to benefit recovering submerged and emergent marsh vegetation at low elevations but will reduce aquatic habitat for fish and wildlife in the marshes. Wading bird and snail kite nesting efforts are likely to be lower for the second consecutive year on the Lake due to low lake stages during the breeding season.

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

INFLOWS	Previous week Avg Daily CFS	Avg Daily Flow cfs	Equivalent Depth Week Total (in)
S-65E & S-65EX1	617	407	0.2
S-71 & S-72	0	0	0.0
S-84 & S-84X	0	0	0.0
Fisheating Creek	9	7	0.0
S-154	0	0	0.0
S-191	0	0	0.0
S-133 P	0	0	0.0
S-127 P	0	0	0.0
S-129 P	0	0	0.0
S-131 P	0	0	0.0
S-135 P	0	0	0.0
S-2 P	0	0	0.0
S-3 P	0	0	0.0
S-4 P	0	0	0.0
L-8 Backflow			
Rainfall	0	0	0.0
<b>Total</b>	<b>625</b>	<b>414</b>	<b>0.2</b>

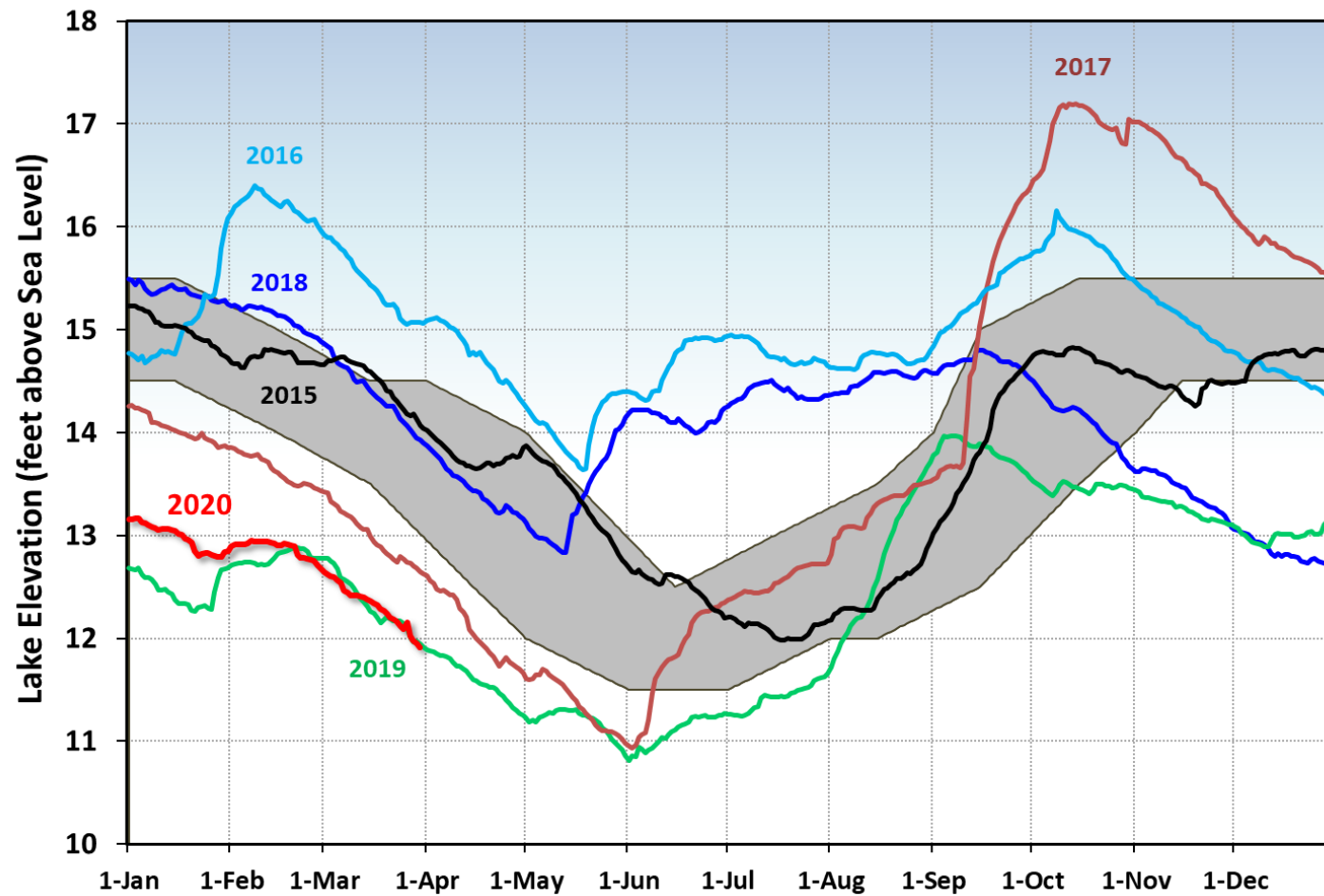
OUTFLOWS	Previous week Avg Daily CFS	Avg Daily Flow cfs	Equivalent Depth Week Total (in)
S-77	960	1172	0.6
S-308	136	52	0.0
S-351	964	1184	0.6
S-352	275	372	0.2
S-354	604	627	0.3
L-8 Outflow	141	118	0.1
ET	2337	2429	1.1
<b>Total</b>	<b>5418</b>	<b>5954</b>	<b>2.8</b>

Provisional Data



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

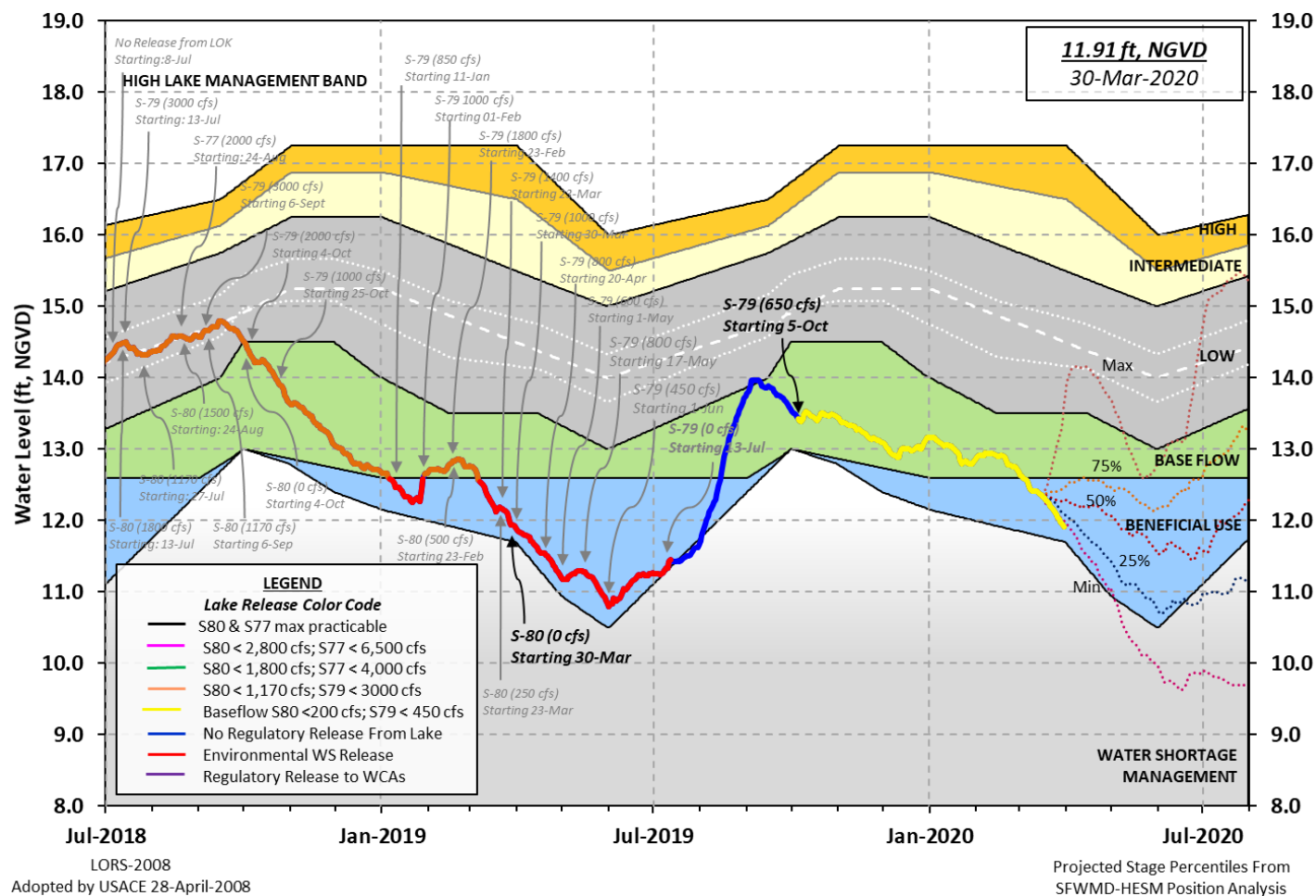
## Lake Okeechobee Stage vs (Draft) Ecological Envelope



**Figure 2.** Select annual stage hydrographs for Lake Okeechobee in comparison to the (Draft) updated Ecological Envelope.



## Lake Okeechobee Water Level History and Projected Stages



**Figure 3.** Recent Lake Okeechobee stage and releases, with projected stages based on a dynamic position analysis.

SFWMD PROVISIONAL RAINDAR 7-DAY RAINFALL ESTIMATES  
FROM: 0345 EST, 03/24/2020 THROUGH: 0345 EST, 03/31/2020

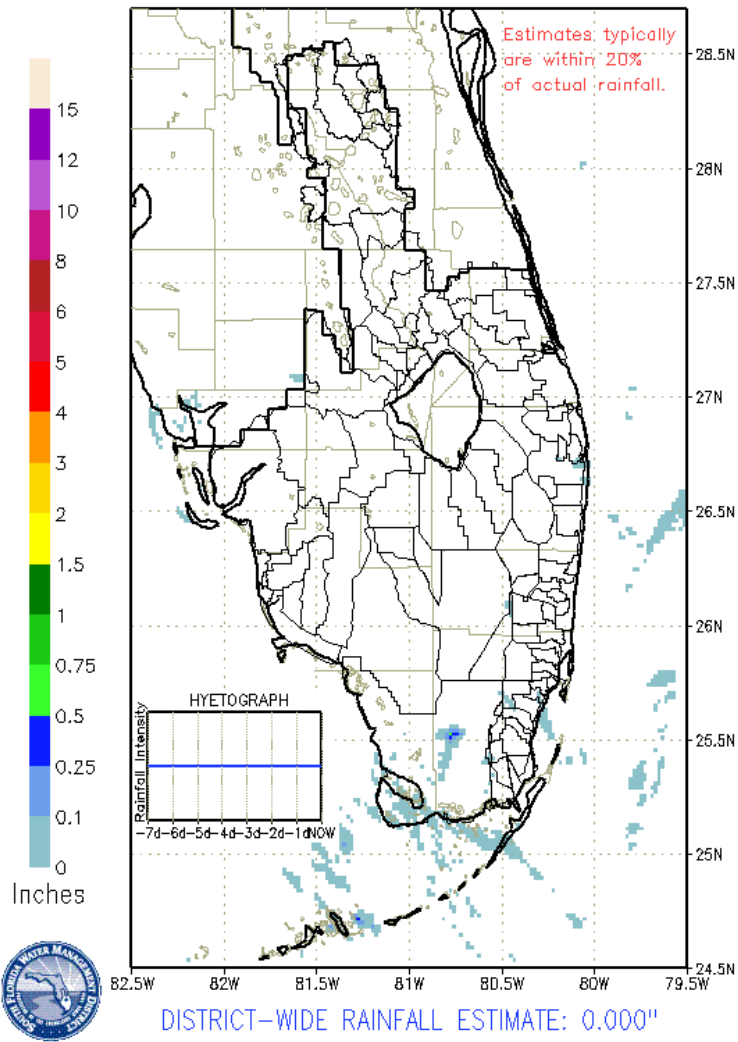


Figure 4. 7-Day rainfall estimates by RAINDAR.

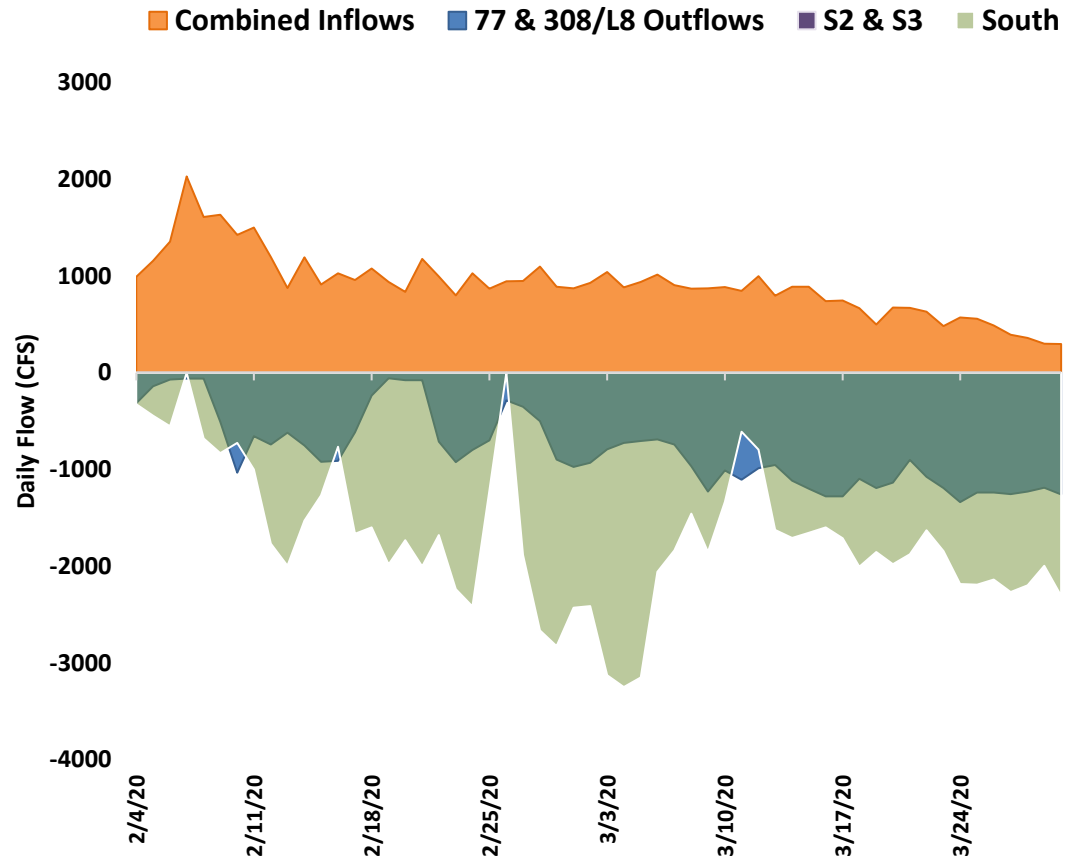
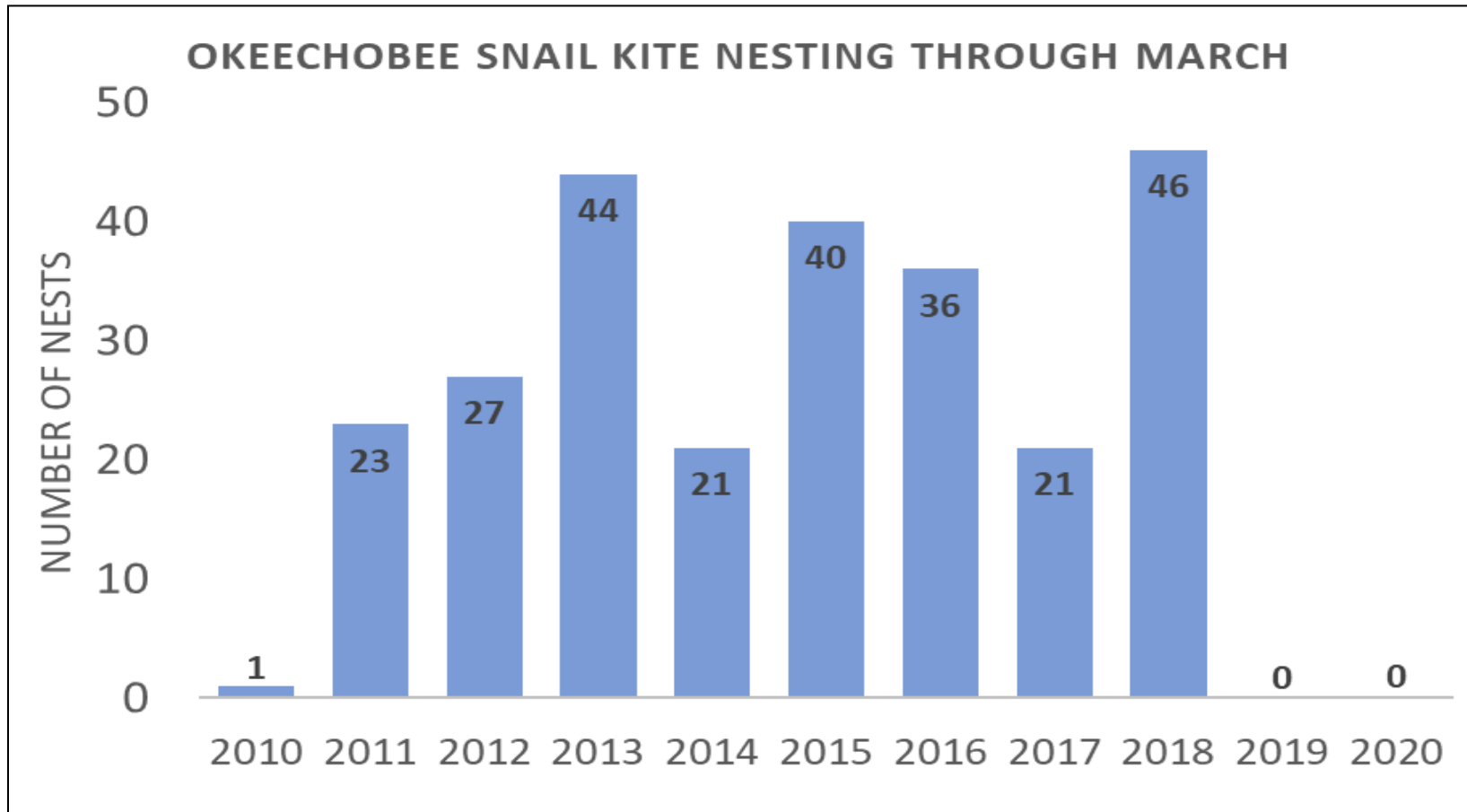
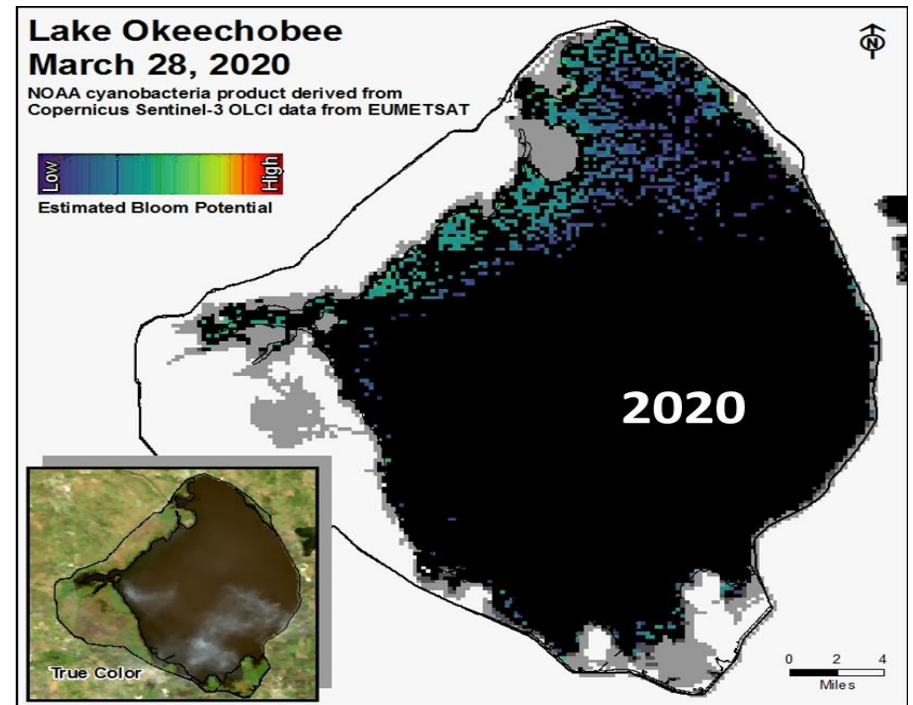
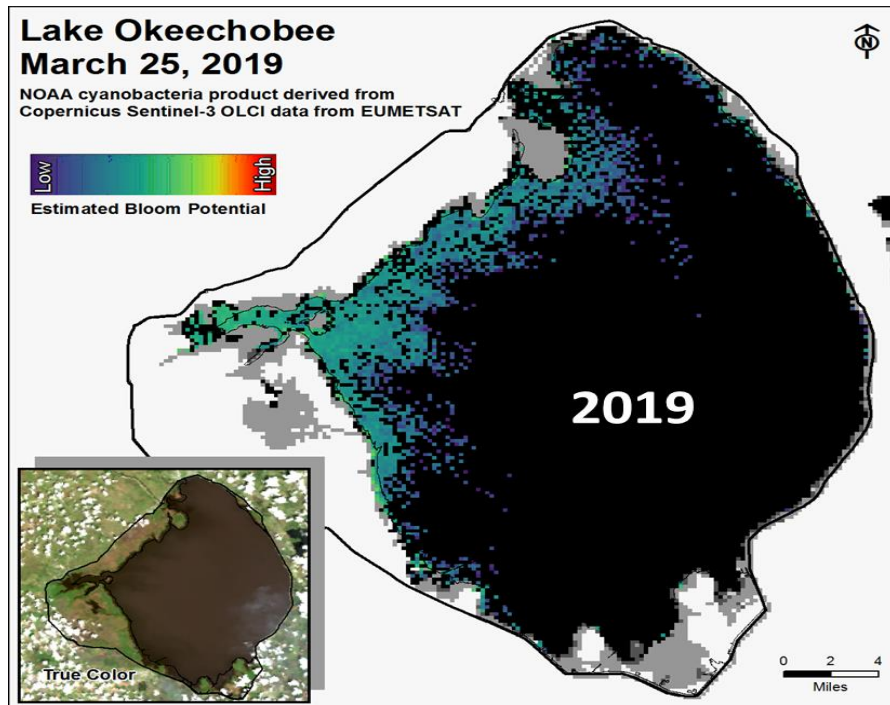


Figure 5. Major inflows (orange) and outflows (blue) of Lake Okeechobee, including the S-350 structures designated as South (green). The L-8 Canal flows through Culvert 10A are included as outflows when positive, and as inflows when backflowing into the Lake. All inflows and outflows are shown as positive and negative, respectively, for visual purposes. Outflows through the S-77 and S-308 structures are shown based on their downstream gauges to account for lock openings for navigation.



**Figure 6.** Results of snail kite nest surveys through March, from 2010 - 2020.



**Figure 7.** Potential for cyanobacterial blooms on Lake Okeechobee in 2019 and 2020, based on NOAA's harmful algal bloom monitoring system.



## **ESTUARIES**

### **St. Lucie Estuary:**

Last week total inflow to the St. Lucie Estuary averaged approximately 151 cfs (Figures 1 and 2) and last month inflow averaged about 176 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 are provisional).

<b>Location</b>	<b>Flow (cfs)</b>
Tidal Basin Inflow	99
S-80	0
S-308	52
S-49 on C-24	0
S-97 on C-23	0
Gordy Rd. structure on Ten Mile Creek	52

Over the past week, salinity increased throughout the estuary (Table 2, Figures 3 and 4). The seven-day moving average of the water column (an average of the surface and bottom salinity) at the US1 Bridge is 23.7. Salinity conditions in the middle estuary are estimated to be within 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.

<b>Sampling Site</b>	<b>Surface</b>	<b>Bottom</b>	<b>Envelope</b>
HR1 (North Fork)	<b>19.0</b> (18.7)	<b>21.8</b> (20.4)	NA <sup>1</sup>
US1 Bridge	<b>23.4</b> (22.6)	<b>24.0</b> (22.9)	10.0-26.0
A1A Bridge	<b>30.0</b> (29.9)	<b>31.2</b> (31.0)	NA <sup>1</sup>

<sup>1</sup>Envelope not applicable

### **Caloosahatchee Estuary:**

Last week total inflow to the Caloosahatchee Estuary averaged approximately 687 cfs (Figures 5 and 6) and last month inflow averaged about 715 cfs. Last week's provisional averaged inflows from the structures and the tidal basin are shown in Table 3.

**Table 3.** Weekly average inflows (data is provisional).

<b>Location</b>	<b>Flow (cfs)</b>
S-77	1172
S-78	585
S-79	594
Tidal Basin Inflow	93

Over the past week in the estuary, salinity decreased to Ft. Myers Yacht Basin and increased downstream (Table 4, Figures 7 & 8). The seven-day average salinity values are within the good range for adult eastern oysters at Cape Coral and in the fair range at Shell Point and at Sanibel (Figure 9). The seven-day average surface salinities (Table 4) are in the fair range for tape grass at Val I-75 and at Ft. Myers.

**Table 4.** Seven-day average salinity at six monitoring stations in the Caloosahatchee Estuary. Current average is in bold, previous average in parentheses. The envelope reflects the preferred salinity range for associated sampling sites.

Sampling Site	Surface	Bottom	Envelope
S-79 (Franklin Lock)	<b>2.5</b> (5.4)	<b>2.9</b> (5.7)	NA <sup>1</sup>
Val I75	<b>5.0</b> (5.9)	<b>5.8</b> (7.6)	0.0-5.0 <sup>2</sup>
Ft. Myers Yacht Basin	<b>11.8</b> (11.8)	<b>12.7</b> (13.6)	NA
Cape Coral	<b>19.6</b> (18.4)	<b>21.7</b> (20.7)	10.0-30.0
Shell Point	<b>EM</b> <sup>3</sup> (29.5)	<b>31.2</b> (29.7)	10.0-30.0
Sanibel	<b>33.7</b> (32.2)	<b>34.9</b> (33.7)	10.0-30.0

<sup>1</sup>Envelope not applicable, <sup>2</sup>Envelope is based on a 2-week forecast 30-day average, and <sup>3</sup>Equipment Malfunction (see Table 5 below).

Forecast of surface salinity (Table 5 and Figure 10) at Val I-75 for the next two weeks using the autoregression model (Qiu and Wan, 2013) coupled with a linear reservoir model for the tidal basin predicts daily salinity ranging from 3.3 to 7.3 at the end of the two week period for pulse release at S-79 ranging from 0 to 1,000 cfs and Tidal Basin inflows of 80 cfs. The 30-day moving average surface salinity at Val I-75 is forecast to be between 4.2 and 5.6 (Table 5). The current salinity conditions at Val I-75 are outside the envelope of salinity 0.0-5.0 for this site (Table 4).

**Table 5.** Predicted salinity at Val I-75 at the end of forecast period

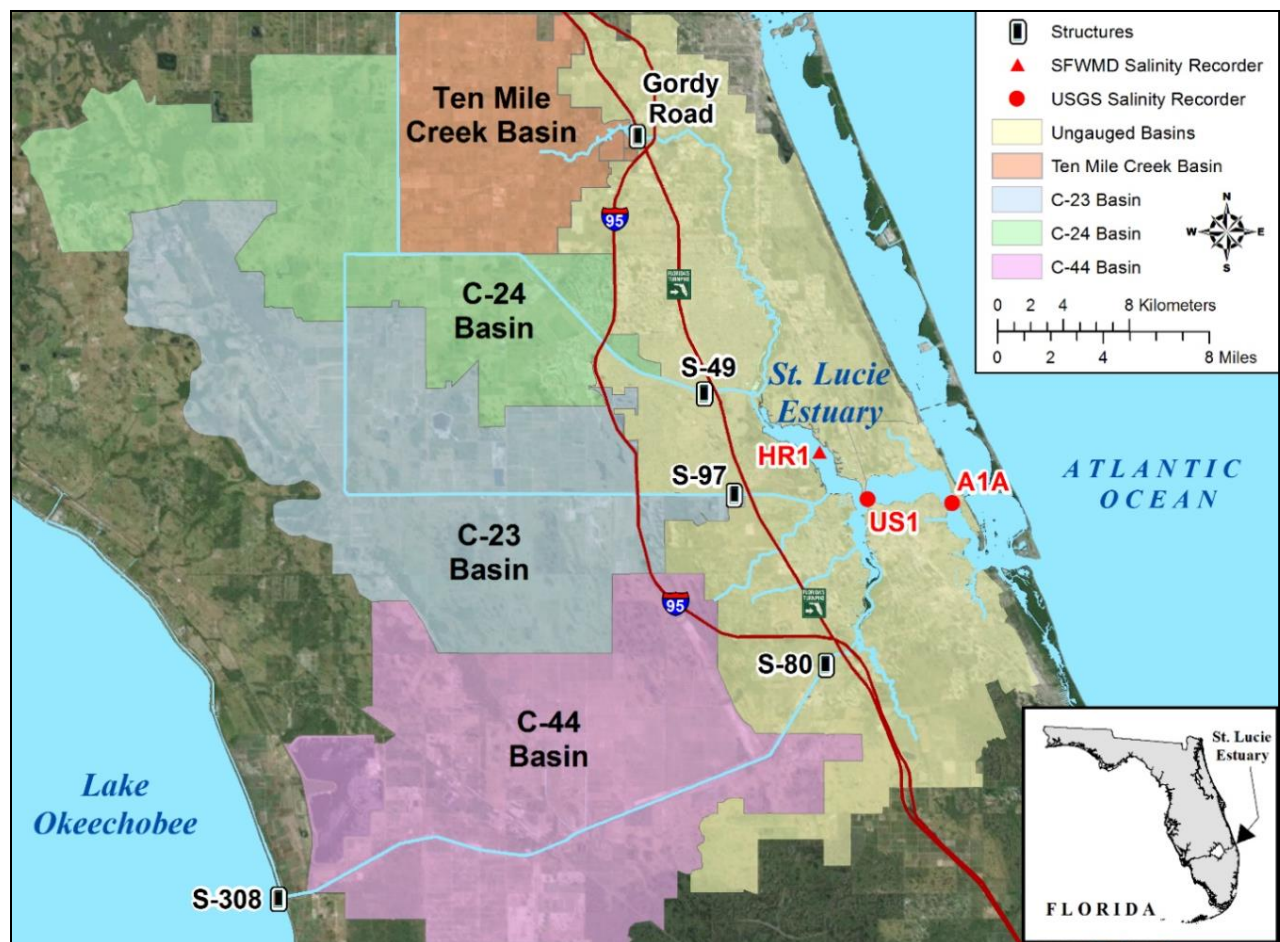
Scenario	Q79 (cfs)	TB runoff (cfs)	Daily salinity	30 day Mean
A	0	80	7.3	5.6
B	450	80	6.0	5.0
C	650	80	4.2	4.5
D	800	80	3.9	4.4
E	1000	80	3.3	4.2

### Red tide

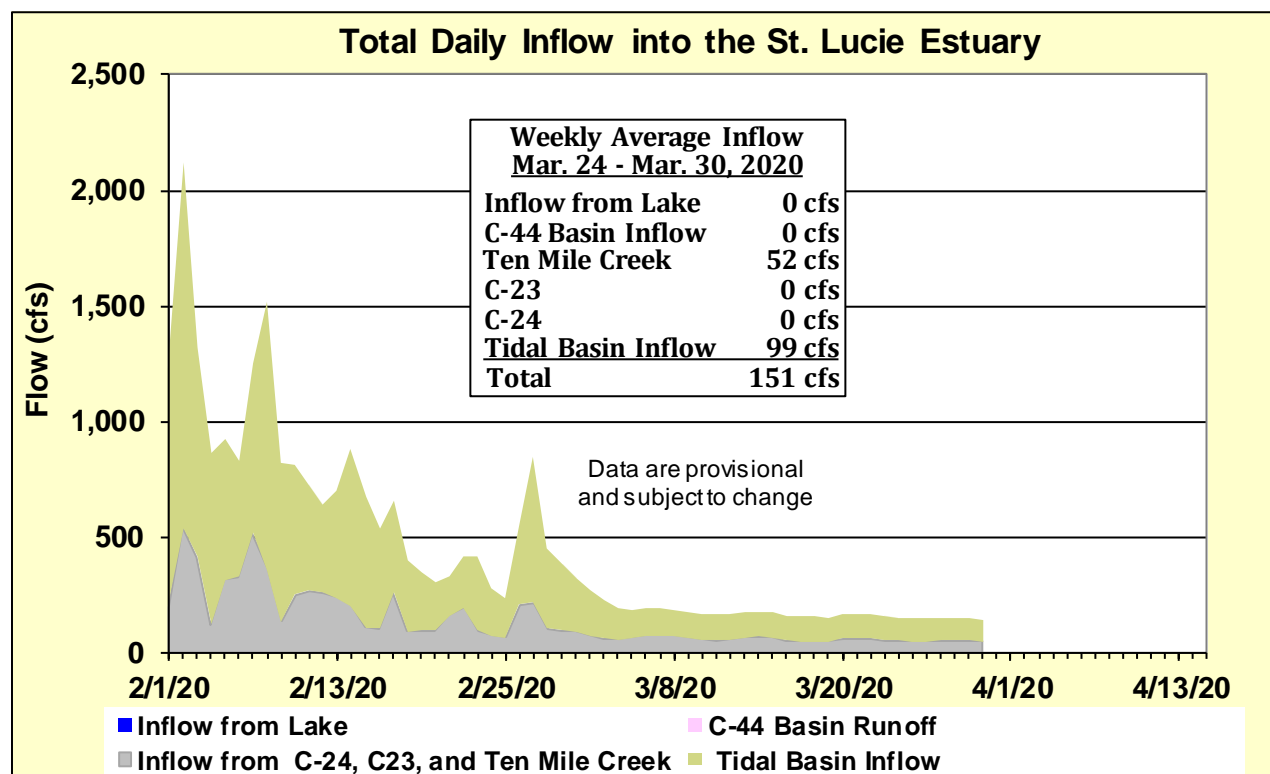
The Florida Fish and Wildlife Research Institute reported on March 27, 2020, that *Karenia brevis*, the Florida red tide dinoflagellate, was not observed in samples collected from or offshore of Lee or Palm Beach counties (no samples were analyzed this week from St. Lucie, Martin, Broward, or Miami-Dade counties).

### Water Management Recommendations

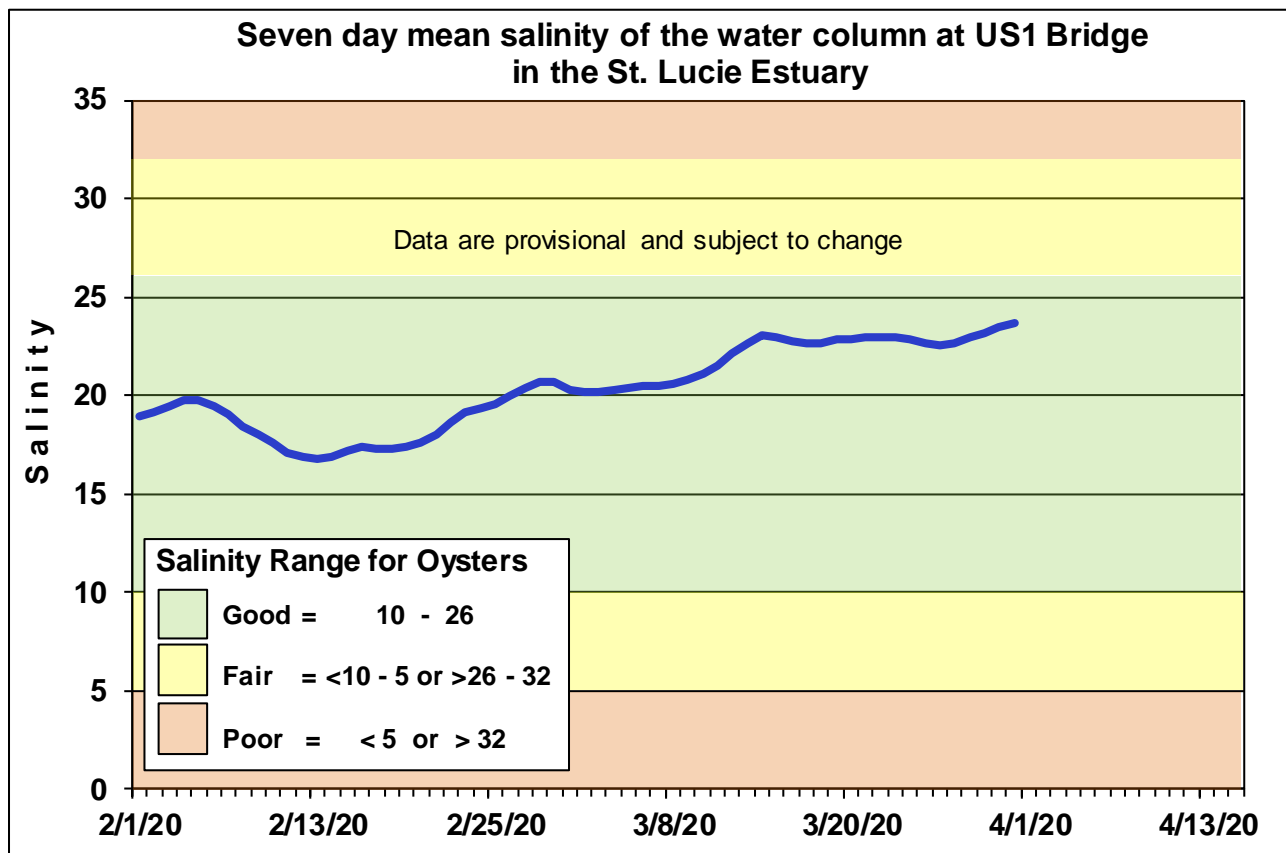
Lake stage is in the Beneficial Use Flow sub-band. Tributary conditions are dry. The 2008 LORS suggests no release to the estuaries from the lake unless the Governing Board recommends otherwise.



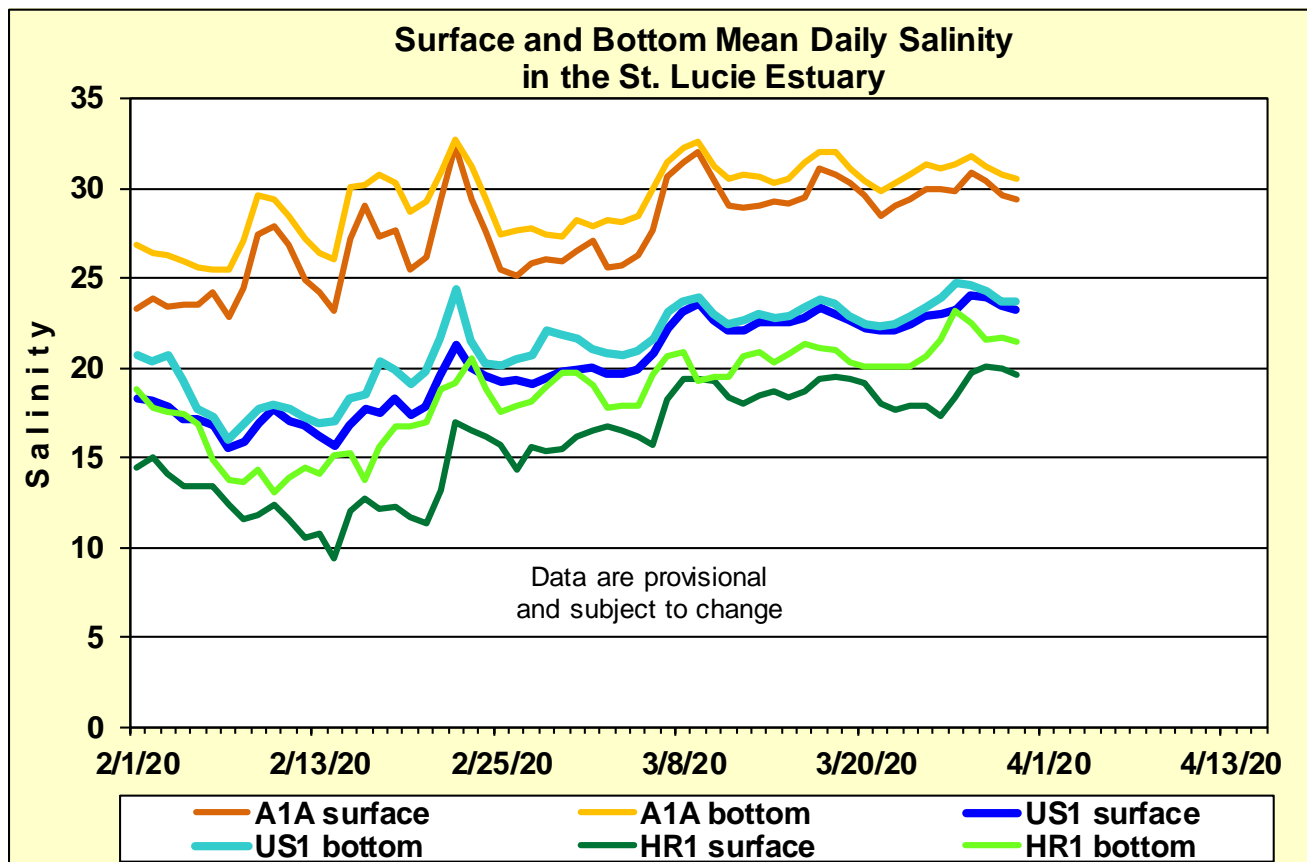
**Figure 1.** Basins, water control structures, and salinity monitoring for the St. Lucie Estuary.



**Figure 2.** Total daily inflows from Lake Okeechobee and runoff from the C-44, C-23, C-24, Ten Mile Creek, and tidal basin into the St. Lucie Estuary.

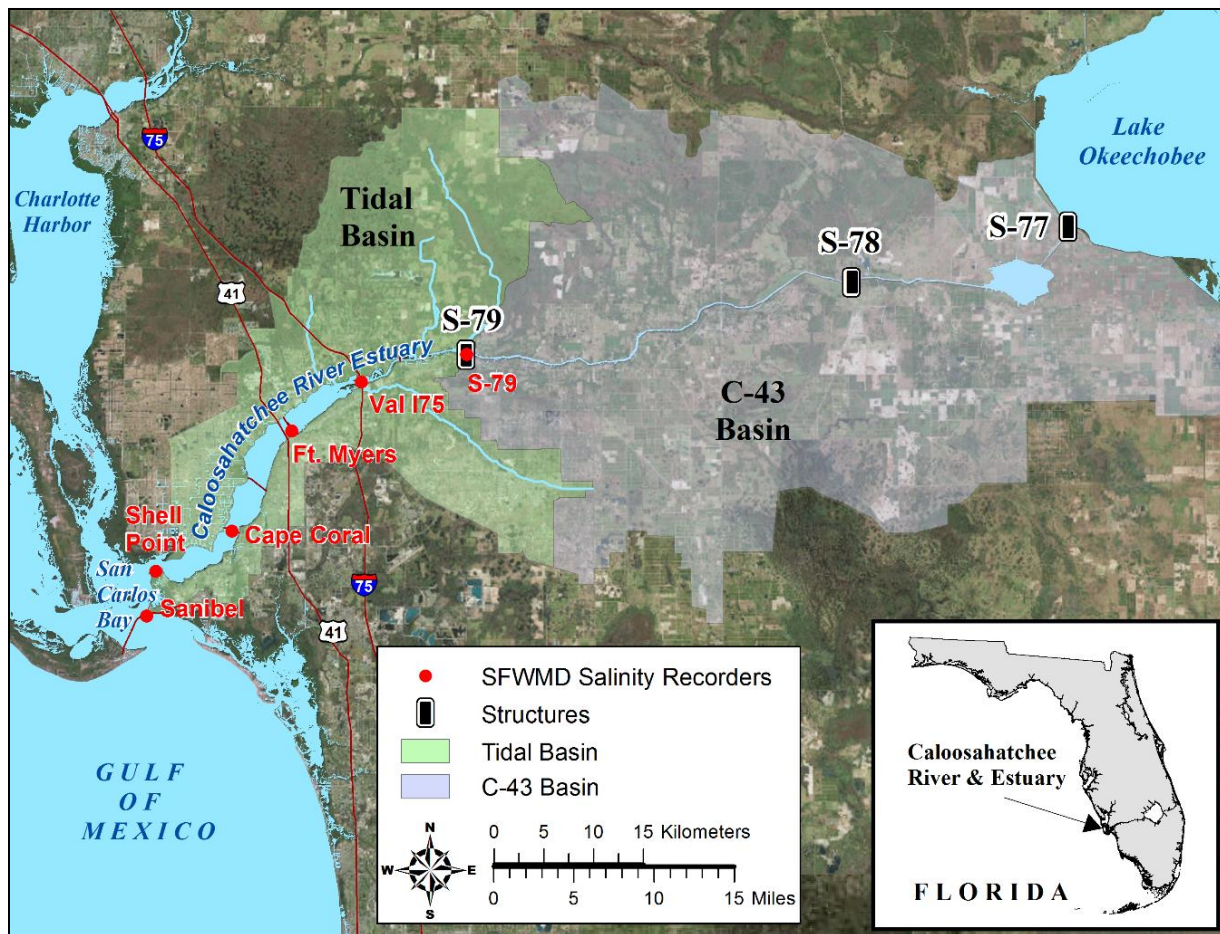


**Figure 3.** Seven-day mean salinity of the water column at the US1 Bridge.

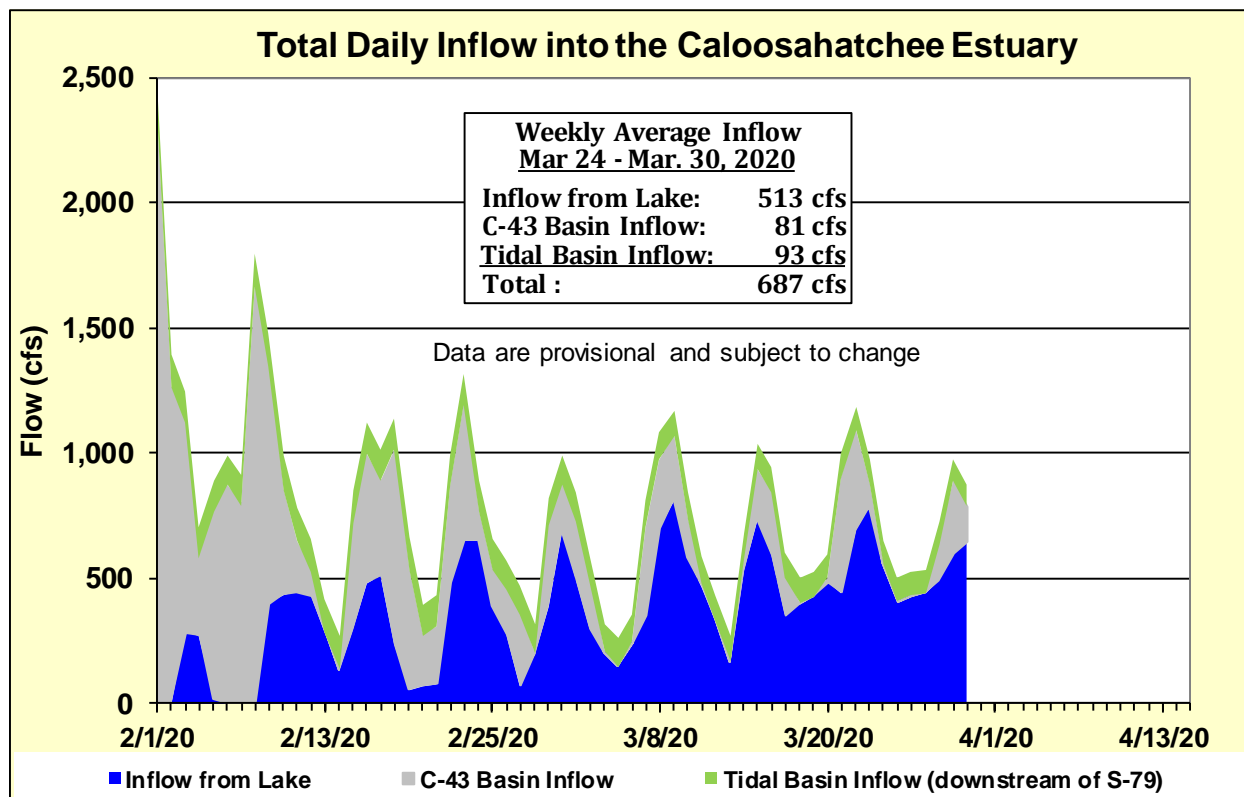


**Figure 4.** Daily mean salinity at the A1A, US1, and HR1 stations.

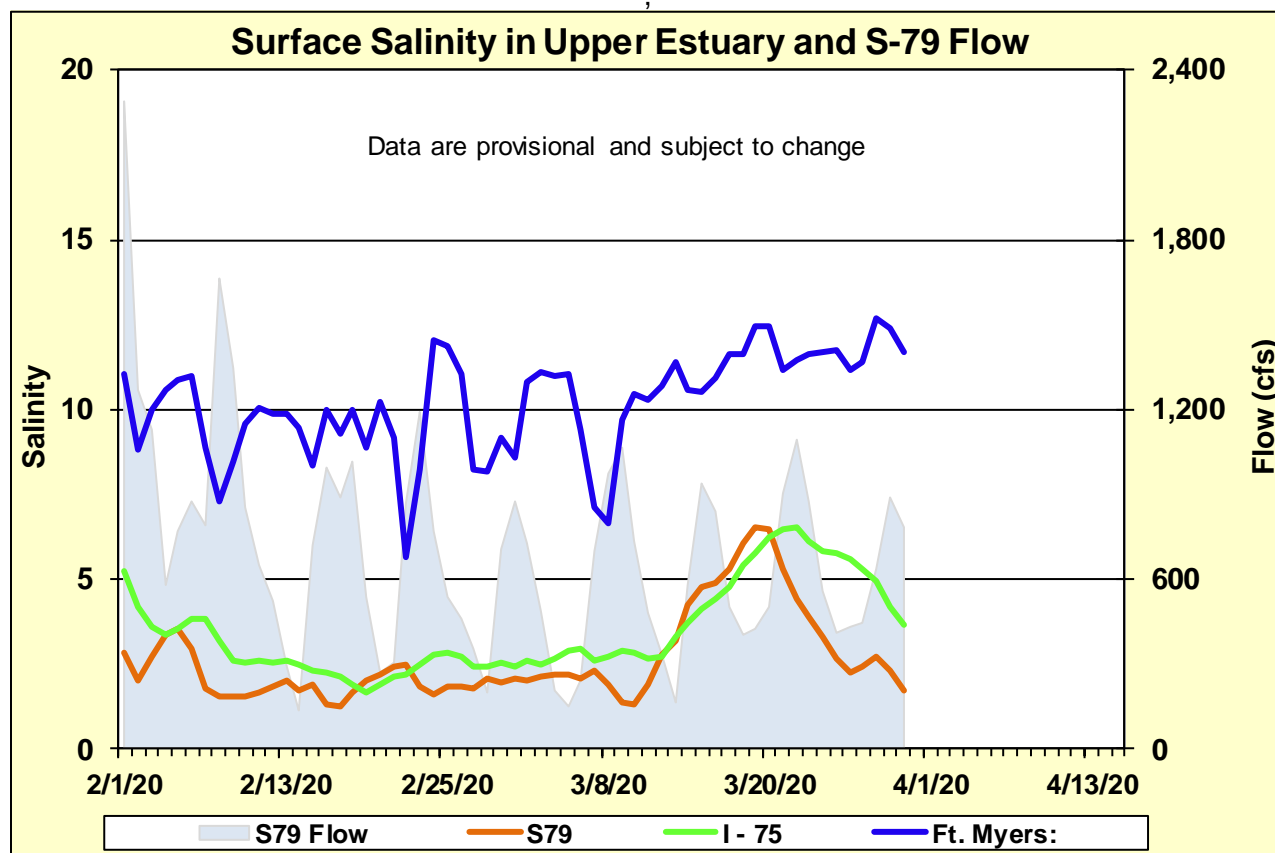




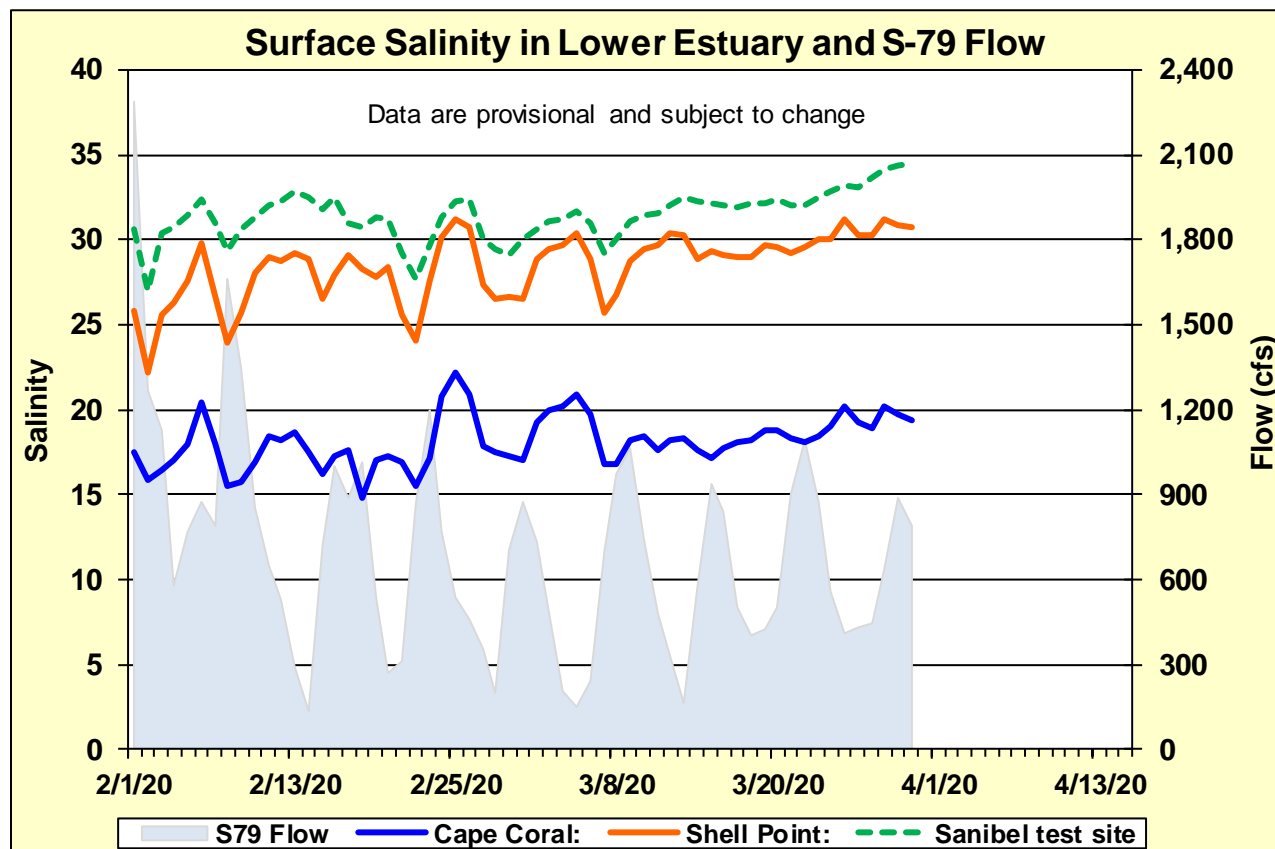
**Figure 5.** Basins, water control structures, and salinity monitoring for the Caloosahatchee Estuary.



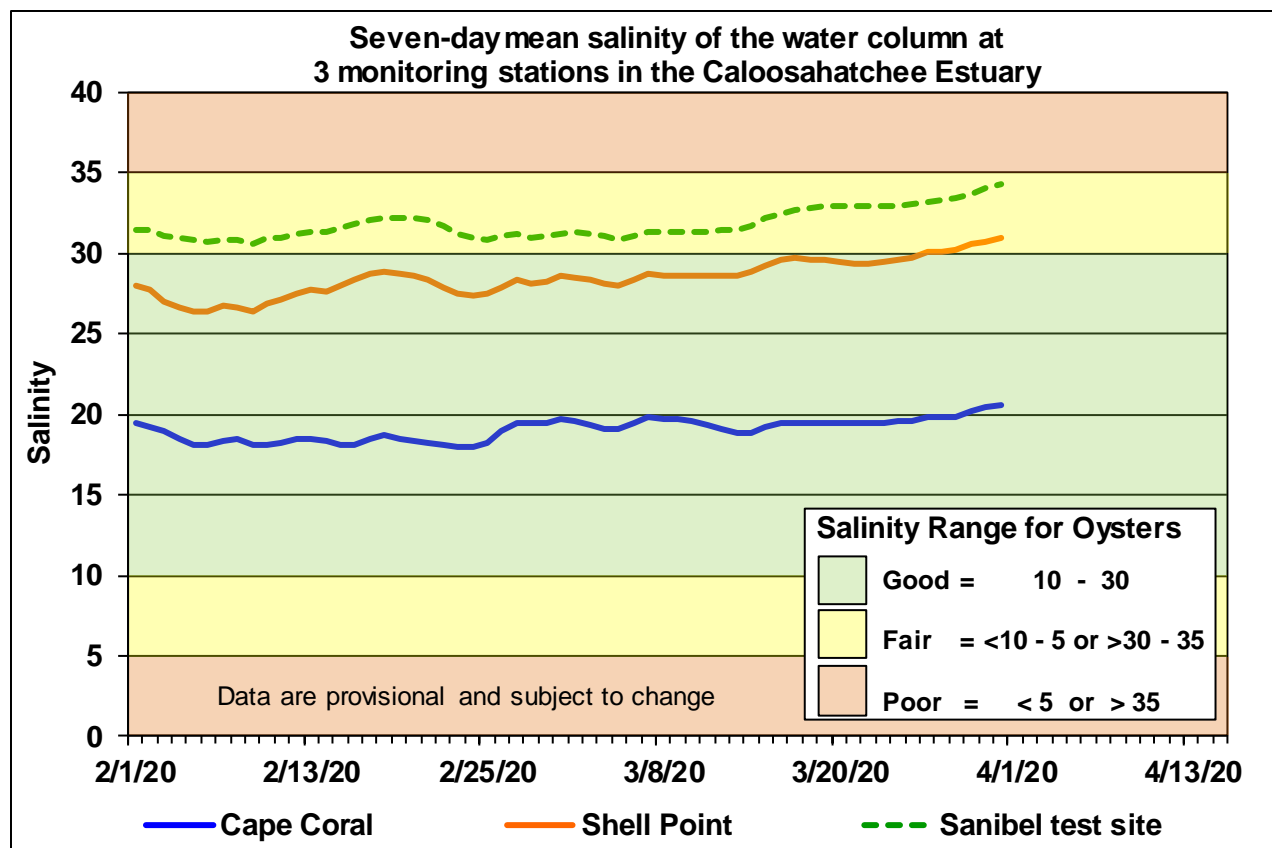
**Figure 6.** Total daily inflows from Lake Okeechobee, runoff from the C-43 basin



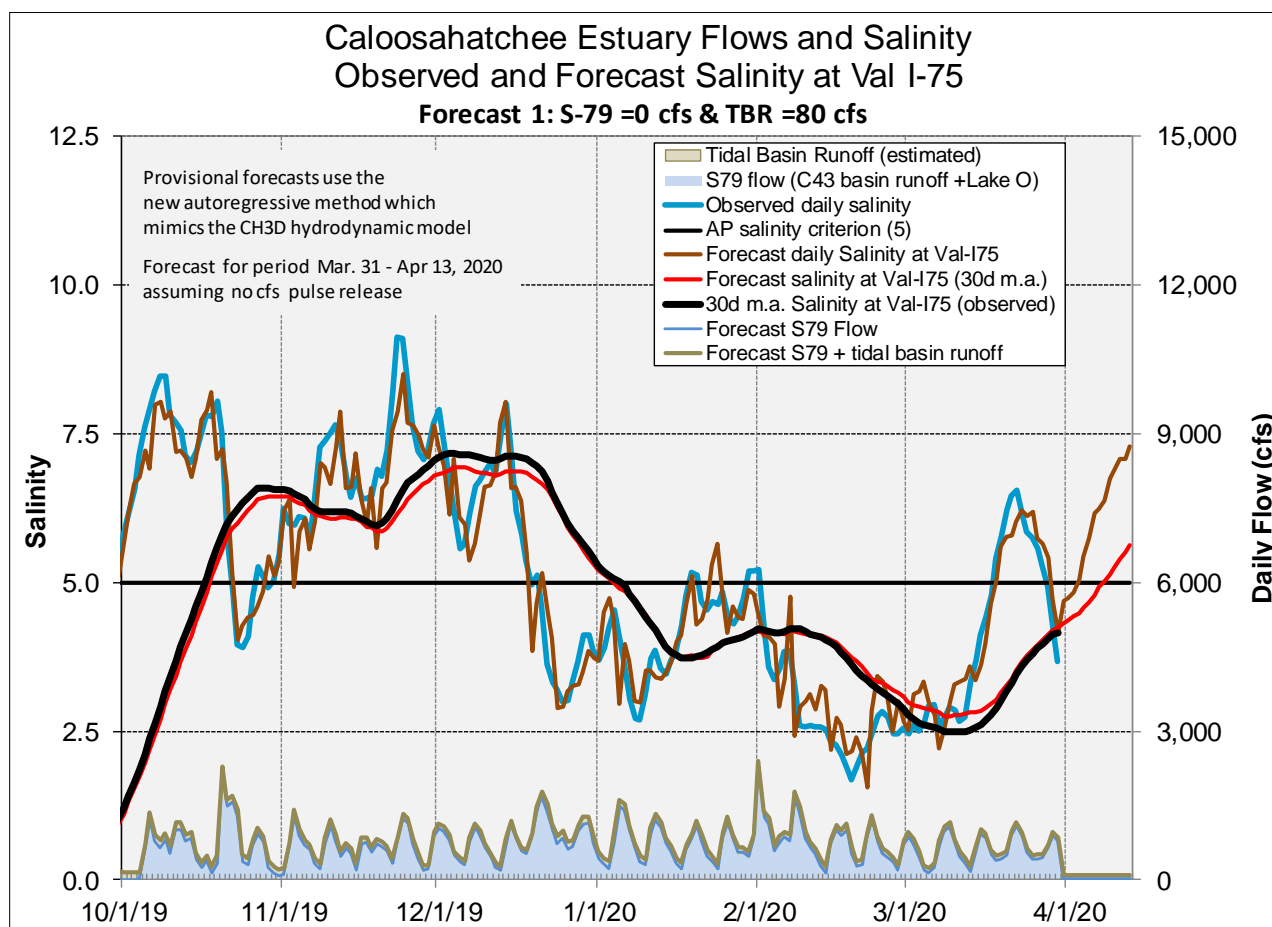
**Figure 7.** Daily mean flows at S-79 and salinity at upper estuary monitoring stations.



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






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



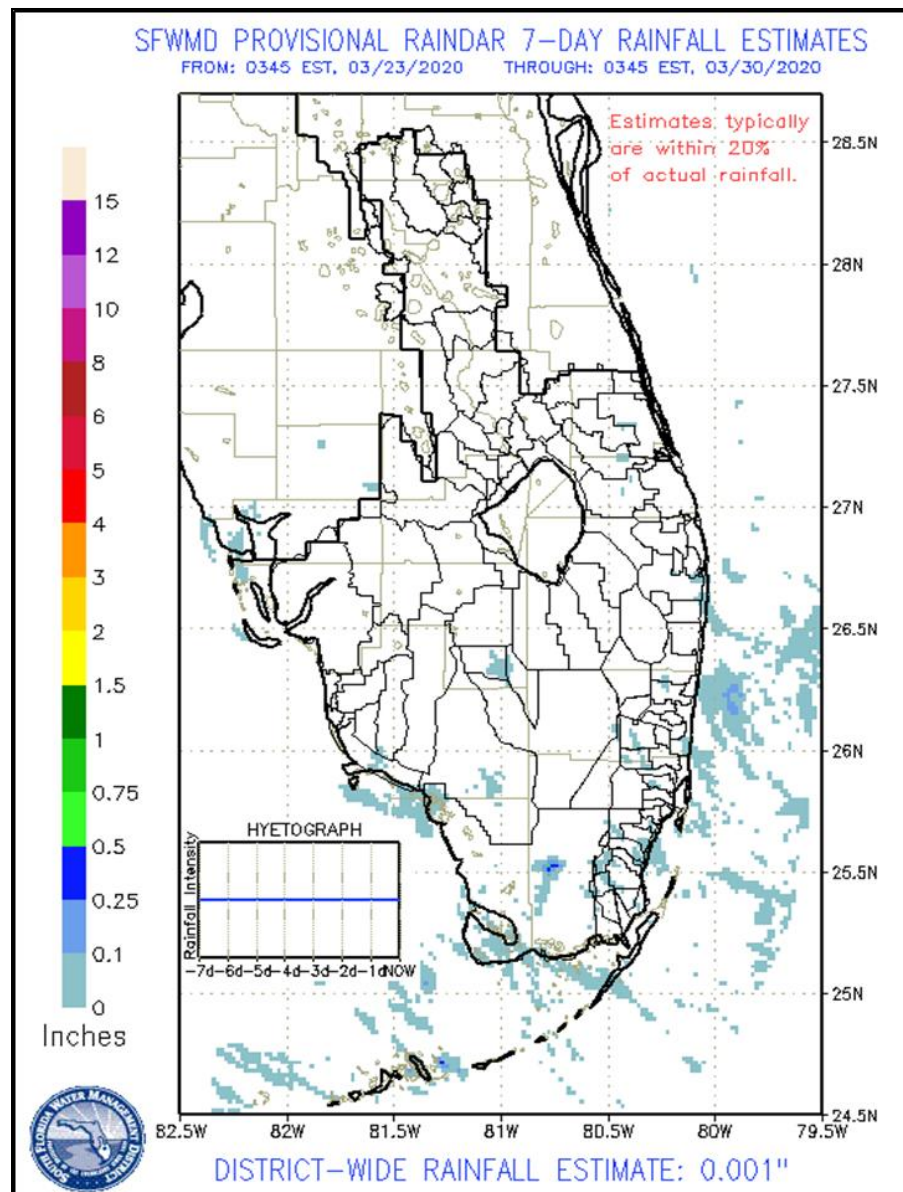
**Figure 10.** Forecasted Val I-75 surface salinity assuming no pulse release at S-79.

## **EVERGLADES**

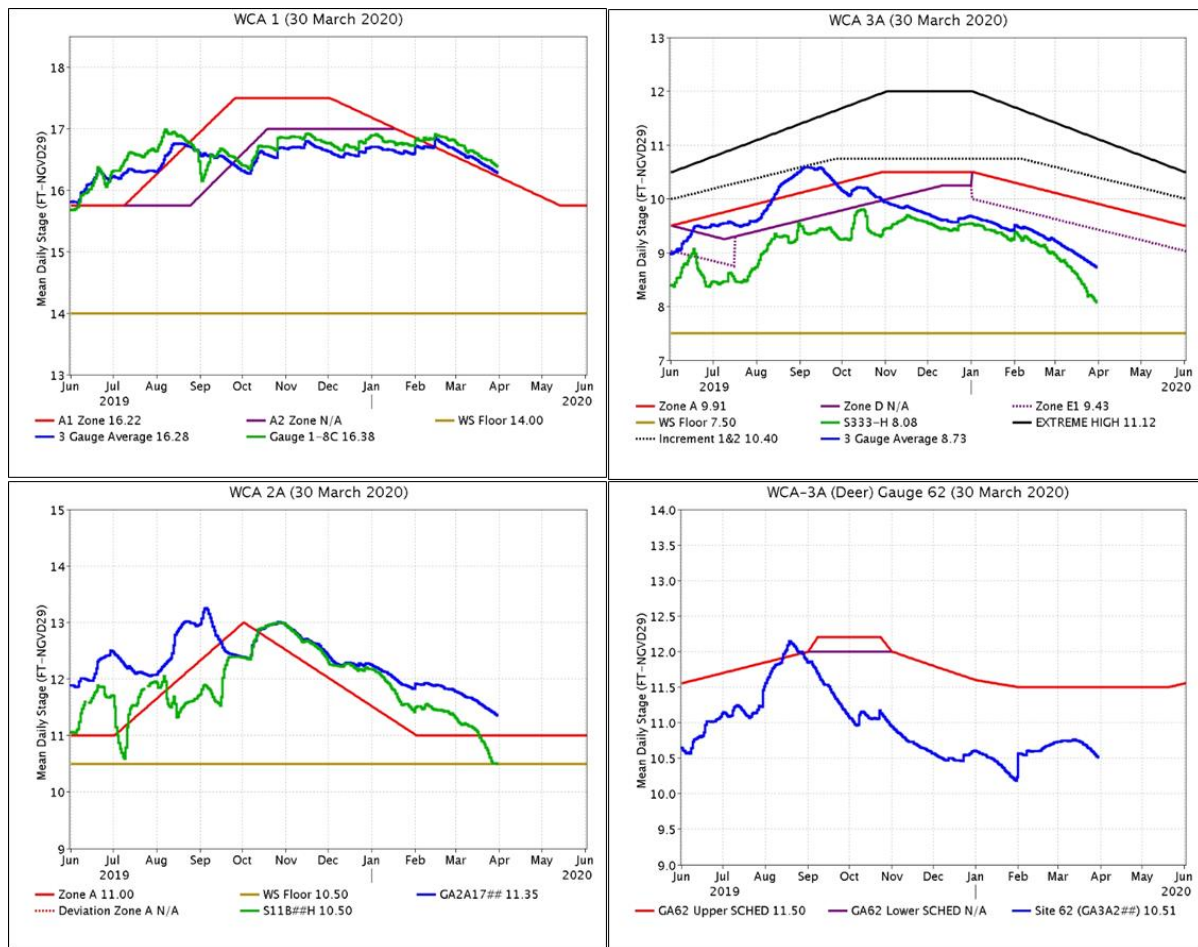
Essentially zero precipitation fell within the Everglades last week, and stages responded with all major basins recording a faster than optimal recession rate this past week. At the gauges monitored for this report, stages fell on average 0.13 feet last week, the same as the week prior. Evaporation was estimated at 1.67 inches last week.

Everglades Region	Rainfall (Inches)	Stage Change (feet)	
WCA-1	0.00	-0.10	 Good  Fair  Poor
WCA-2A	0.00	-0.12	
WCA-2B	0.00	-0.19	
WCA-3A	0.00	-0.13	
WCA-3B	<0.01	-0.11	
ENP	<0.01	-0.20	





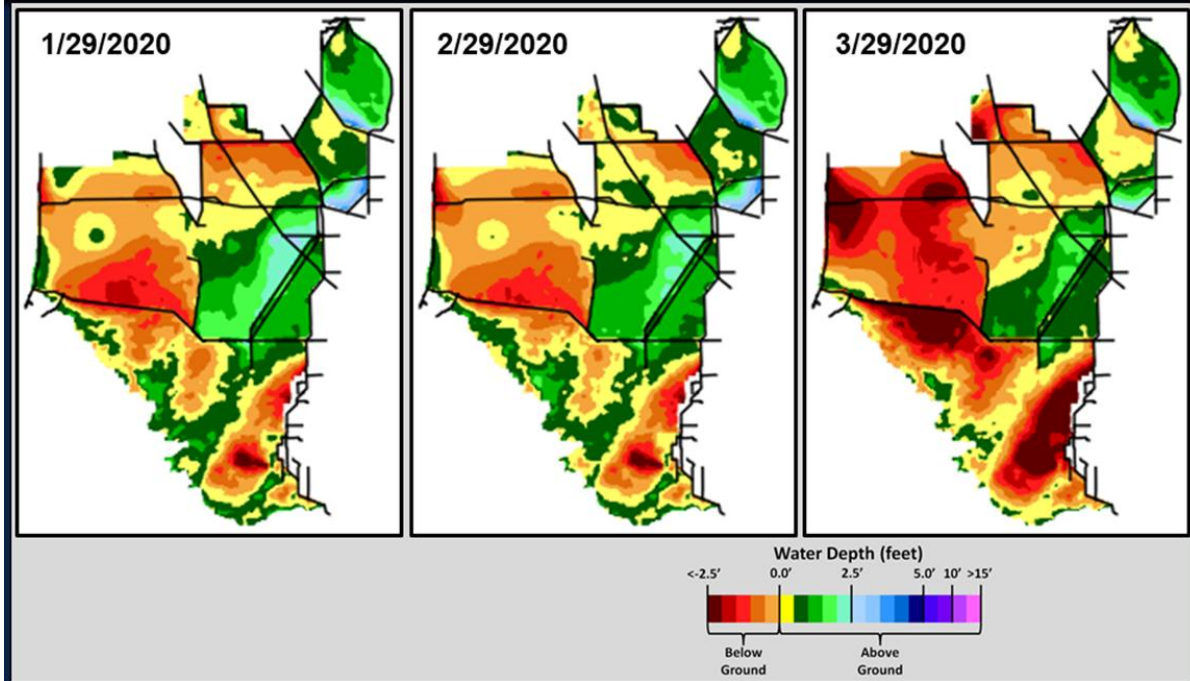
Regulation Schedules: WCA-1: Stage at the 1-8C Gauge remained parallel to the falling regulation line last week, currently 0.16 feet above the Zone A1 line. WCA-2A: Stage at Gauge S11-B continued the sharp downward trend to the floor of the regulation schedule; stage is currently at the floor elevation of 10.5 ft NGVD. WCA-3A: The three-gauge average stage continued to trend down and away from the falling Zone E1 regulation line last week, presently 0.70 feet below. WCA-3A stage at gauge 62 (northwest corner) returned to trending down and away from the stable upper schedule, now 0.86 feet below the regulation line.



Water Depths: The WDAT tool for spatial interpolation of depth monthly snapshots indicate depths more than 1.0 foot below ground in extreme northeast WCA-3A North, and the rest of that basin's stage is potentially at ground surface. The interior of WCA-2A is drying down to near ground surface, with the northern sections along the L-39 now below ground. Hydrologic connectivity has greatly diminished over the last month but remains in Shark River Slough. Comparing WDAT water depths from present, over the last month there were significant decreases in depth in the northeastern region of WCA-2A and most of WCA-3A South. Looking back one year, the depth differences are more significant. The entirety of WCA-3A and 2A are significantly lower in depth. WCA-2A is most dramatically lower in depth in the northeastern regions of that basin becoming less so moving southwest. WCA-1 depths are similar to a year ago. The WDAT model indicates a much drier condition in the western basins compared to a month and a year ago.



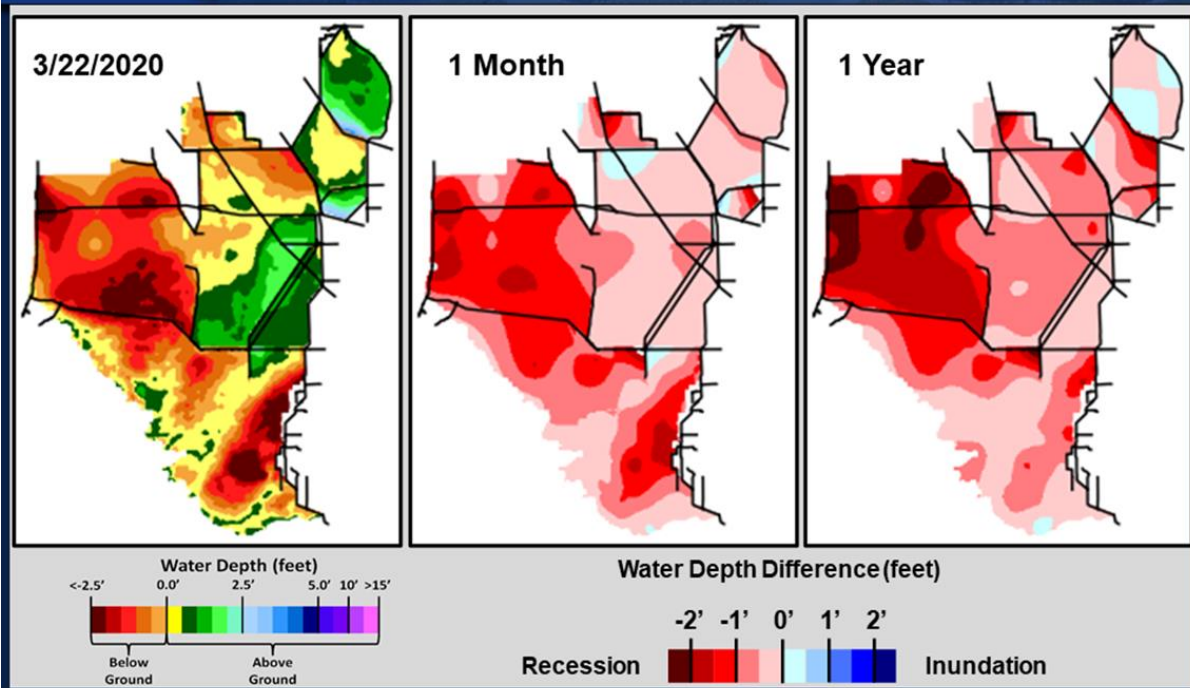
## SFWDAT Water Depth Monthly Snapshots



South Florida Water Depth Assessment Tool (SFWDAT)



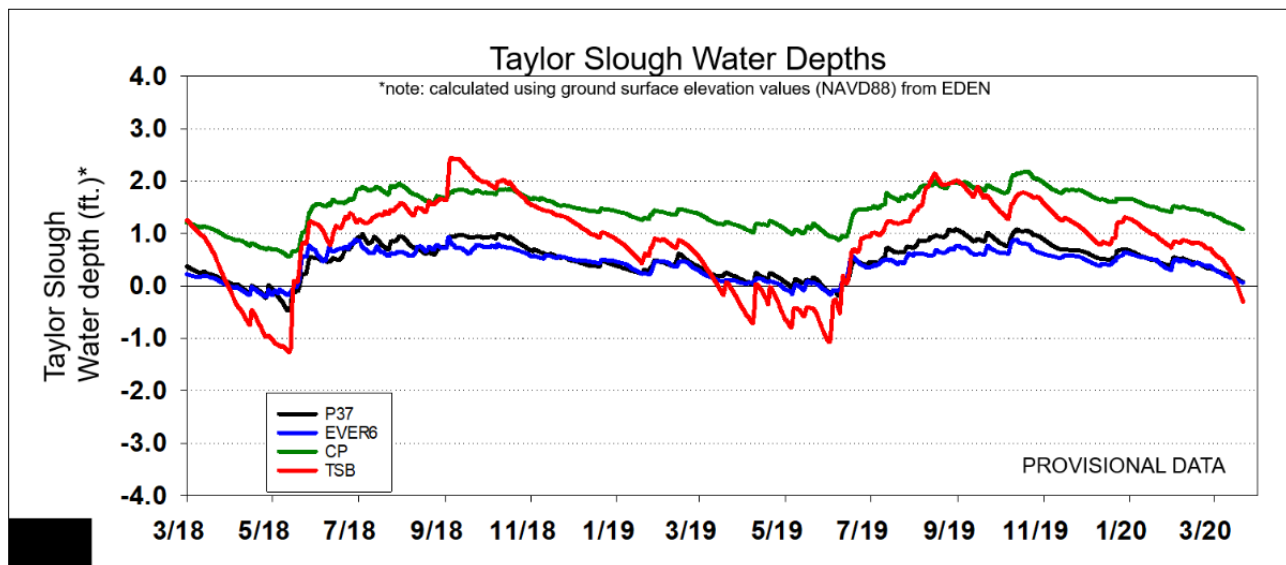
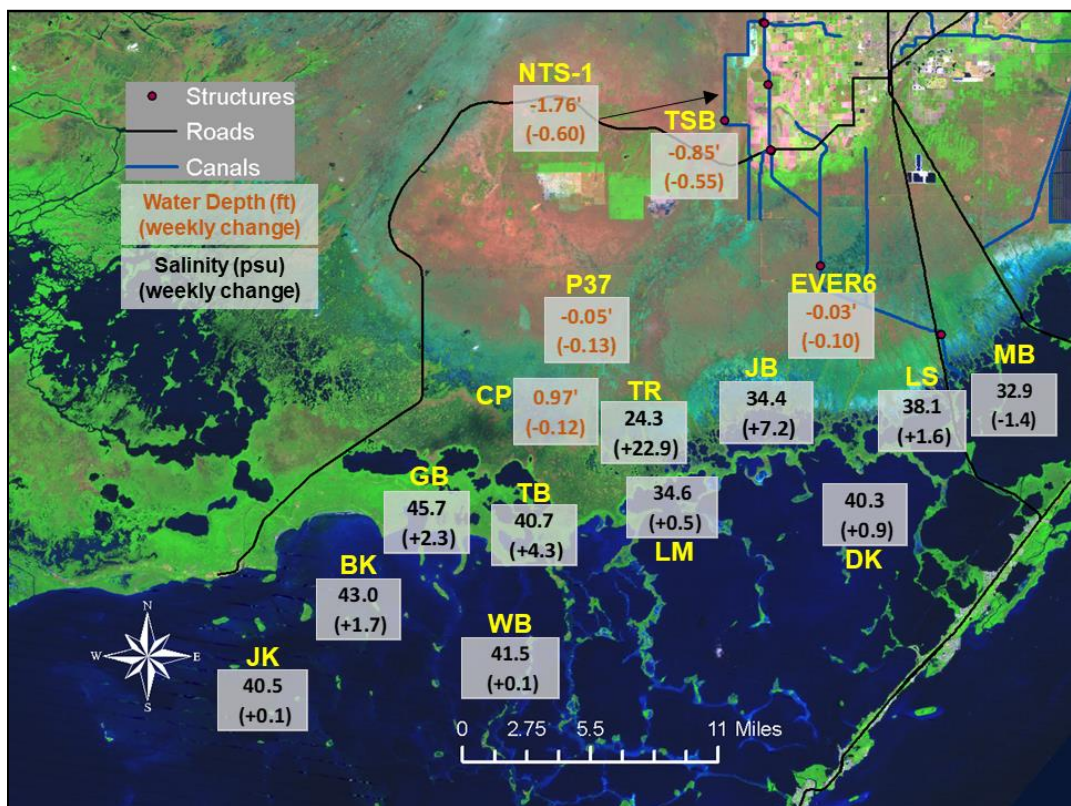
## SFWDAT Everglades Difference Maps (Present – Past)

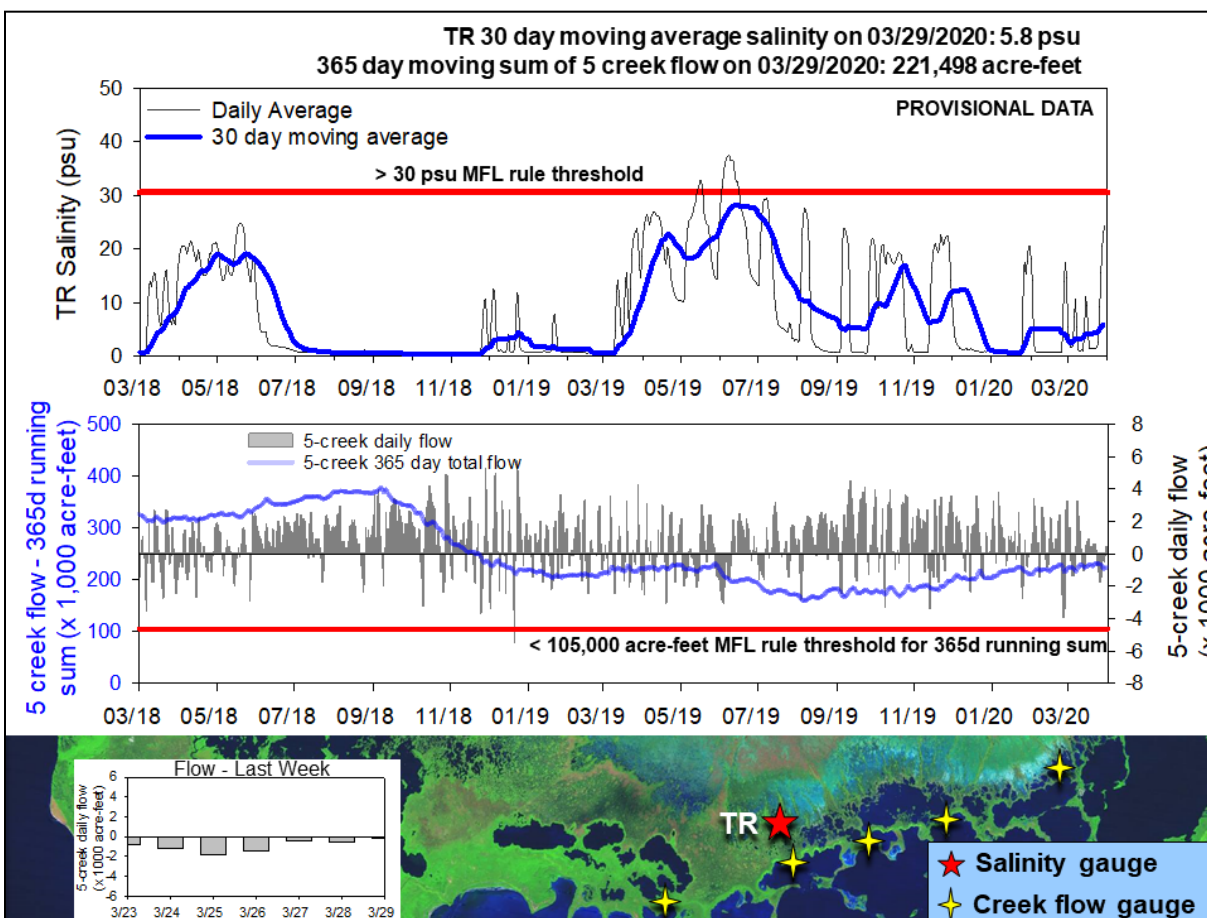
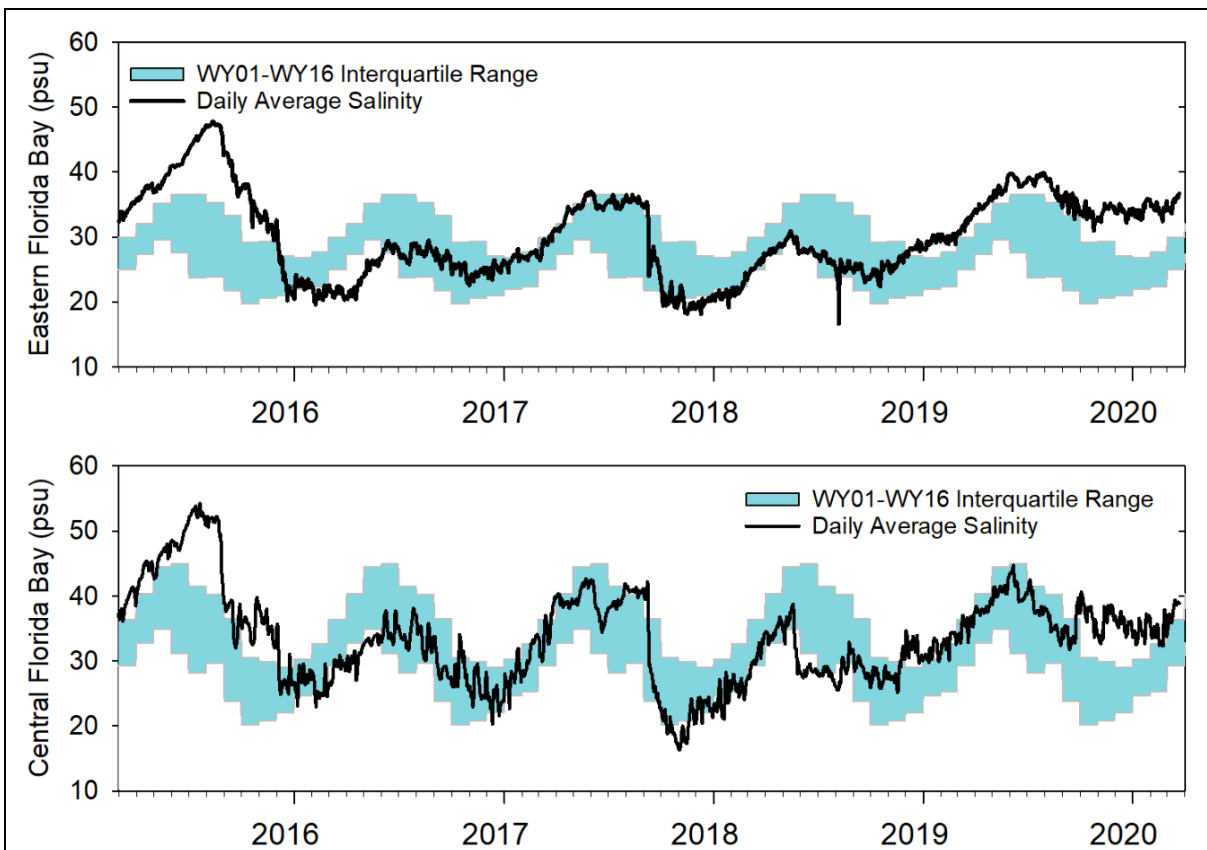


South Florida Water Depth Assessment Tool (SFWDAT)



Taylor Slough Water Levels: Next to no rain fell over Taylor Slough and Florida Bay again this last week and stages decreased an average of 0.30 feet. Upper Taylor Slough (UTS; west of S-332D impoundment) decreased the most rapidly as westward water movements have stopped and temperatures are rising. After being a foot or more higher than the historical average for the dry season up until now, the UTS region is now half a foot below average.





Florida Bay Salinities: Average salinity in Florida Bay increased 2 psu this week. Florida Bay average salinity is 8.5 psu higher than the historical average for this time of year. During this time of year, salinities will increase more rapidly due to evaporation and lack of rain and freshwater flow until wet season rains start.

Florida Bay MFL: Salinity at the TR station in the mangrove zone (tracked for the Florida Bay MFL) increased rapidly to 24 psu over the last week. The 30-day moving average increased 1.5 psu to 5.8 psu. Weekly flow from the 5 creeks identified by yellow stars on the map totaled about -6,400 acre-feet last week with negative flows all last week. The 365-day moving sum of flow from the five creeks (tracked as part of the Florida Bay MFL criteria) decreased 10,000 acre-feet this week to end at 221,498 acre-feet, between the 25th percentile (192,885 acre-feet) and the median (249,091 acre-feet). Creek flow are provisional USGS data.

### **Water Management Recommendations**

Current stages in northeastern WCA-3A (WCA-3A NE) are low for this time of year and salinities are high in Florida Bay. Conserving water within WCA-3A and moving water south has many ecological benefits which are unrealized when flows are lost to tide. Discharges into historically over drained WCA-3A NE have the potential to maintain saturated soils and protect these over-drained portions of the Everglades. The ecological benefits include conserving peat and lowering the risk of muck fires. Any available water sent through the S-150 into WCA-3A NE would have greater ecological value than the same amount of water discharged in Northwestern WCA-3A. Flows toward Taylor Slough and Florida Bay freshen salinity conditions within the nearshore areas of Florida Bay and decrease the currently stressful conditions for seagrasses and fauna as nearshore salinities remain elevated, decreasing the estuarine gradient within the bay. More specific recommendations appear in the summary table below. The red text represents new or modified information or recommendations.



## SFWMD Everglades Ecological Recommendations, March 31st, 2020 (red is new)

Area	Weekly change	Recommendation	Reasons
WCA-1	Stage decreased by 0.10'	Conserving water in this basin has ecological benefit.	Protect downstream habitat and wildlife. Provide wading bird foraging opportunities later in the dry season.
WCA-2A	Stage decreased by 0.12'	Moderating the recession rate and conserving water in this basin has ecological benefit as downstream basins are below seasonal average.	Protect upstream/downstream habitat and wildlife. Provide wading bird foraging opportunities later in the dry season.
WCA-2B	Stage decreased by 0.19'	Conserving water in this basin has benefit.	Protect upstream/downstream habitat and wildlife.
WCA-3A NE	Stage decreased by 0.12'	Conserving water and slowing the recession in this basin has ecological benefit as current water depths are well below seasonal averages. Inflows to this region have great ecological benefit.	Protect and conserve peat soils.
WCA-3A NW	Stage decreased by 0.13'	Conserving water and slowing the recession in this basin has ecological benefit as current water depths. Inflows to this region have ecological benefit.	
Central WCA-3A S	Stage decreased by 0.13'	Conserving water and slowing the recession in this region has ecological benefit as current water depths are below seasonal averages. Inflows to this region have great ecological benefit.	Protect upstream/downstream habitat and wildlife. Protect wading bird foraging as nesting begins.
Southern WCA-3A S	Stage decreased by 0.12'		
WCA-3B	Stage decreased by 0.11'	Conserving water in this basin has benefit.	Protect tree islands, upstream/downstream habitat and wildlife.
ENP-SRS	Stage decreased by 0.20'	Make discharges to the Park according to the 2012 WCP rainfall plan.	Protect upstream/downstream habitat and wildlife.
Taylor Slough	Stage changes ranged from -0.10' to -0.60'	Move water southward as possible	When available, provide freshwater buffer for downstream conditions.
FB- Salinity	Salinity changes ranged +0.1 to +7.2 psu	Move water southward as possible	When available, provide freshwater to maintain low salinity buffer and promote water movement.