

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, Interim Assistant Executive Director, Executive Office Staff

**FROM:** SFWMD Staff Environmental Advisory Team

**DATE:** March 25, 2020

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

### **Summary**

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

A very dry week ahead; increasing potential for Week 2 to receive near-average rainfall. Mid-level high pressure building over the area is expected to only allow spotty showers over eastern areas today. A mostly dry frontal boundary is forecast to move into north-central Florida on Wednesday and then slowly back in over central Florida Thursday but only widely scattered light showers are expected to accompany this boundary. No rain is forecast over the District Friday or Saturday as high pressure and rebuilds over the area. Another cold front is then forecast to push through Florida's panhandle and into north-central Florida Sunday and Sunday night bringing some widely scattered light showers north and east. This frontal boundary is then forecast to move over central Florida and bring some scattered showers activity Monday. While it is forecast to temporarily lift north of the District, the front is then forecast to move back southeastward through the District next Wednesday bringing the potential for the first significant dose of showers and thunderstorms to the District since late February. Near-average rainfall is forecast for Week 2 due to the combination of the rains associated with this frontal boundary next Wednesday and the potential for a second frontal system by the end of next weekend.

#### **Kissimmee**

Tuesday morning stages were 52.8 feet NGVD (4.9 feet below schedule) in East Lake Toho, 53.5 feet NGVD (1.2 feet below schedule) in Toho, and 50.7 feet NGVD (0.3 feet above schedule) in Kissimmee-Cypress-Hatchineha; headwater stages were 46.5 feet NGVD at S-65A and 25.7 feet NGVD at S-65D. Tuesday morning discharges were 632 cfs at S-65, 545 cfs at S-65A, 571 cfs at S-65D and 445 cfs at S-65E. Dissolved oxygen concentration in the Kissimmee River averaged 8.1 mg/L for the week through Sunday. Kissimmee River mean floodplain depth on Sunday was 0.09 feet. Today's recommendations: Continue the recession on Lake Tohopekaliga to reach low pool (52 feet) on June 1<sup>st</sup>. Continue the recession on Lakes Kissimmee-Cypress-Hatchineha to reach low pool (49 feet) on June 1<sup>st</sup>.

#### **Lake Okeechobee**

Lake Okeechobee stage was 12.16 feet NGVD on March 23, 2020, down 0.18 feet from the previous week, and down 0.62 feet from the previous month. The Lake entered the Beneficial Use sub-band on March 4, 2020 and is now 0.42 feet above the Water Shortage sub-band. Water levels moved below the ecological envelope (which varies seasonally from 12 – 15 feet NGVD +/- 0.5 feet) on October 15, 2019 and is currently 1.08 feet below the bottom of the 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 if stages continue below the ecological envelope throughout the breeding season.

## **Estuaries**

Total inflow to the St. Lucie Estuary averaged 159 cfs over the past week with no flow coming from Lake Okeechobee. Salinities little changed 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 771 cfs over the past week with 514 cfs coming from the Lake. Salinity increased in the upper estuary (S79, Vall-75, Ft. Myers) but little changed in the lower estuary 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 Shell Point and in the fair range at Sanibel. Lake stage is in the Beneficial Use sub-band of 2008 LORS. Tributary hydrological conditions are dry. The 2008 LORS release guidance suggests no releases to the estuaries.

## **Stormwater Treatment Areas**

Over the past week, 800 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 135,300 ac-feet. The total amount of inflows to the STAs in WY2020 is approximately 953,400 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 Central Flow-way for energy dissipator installation, in STA-1E Eastern and Central Flow-way for East Distribution Cell levee repairs, 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 northeastern WCA-3A remain below average (Site 62 in the northwest is 0.04 feet below and Site 63 in the northeast is 0.94 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. As wading bird nesting begins in the Everglades, ecological recommendations move towards moderating recession rates where and when possible. Recession rates in WCA-3A South 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 in that basin. Almost no precipitation fell over Taylor Slough and Florida Bay this last week and stages fell below average after a long period of well above average as westward water management slows. Average salinities in Florida Bay increased and remain above average. We are at the time of year when evaporation will increase salinities more rapidly until wet season rains start.

## Supporting Information

### KESSIMMEE BASIN

#### Kissimmee Basin Rainfall

The Upper Kissimmee Basin received 0.00 inches of rainfall in the past week and the Lower Basin received 0.00 inches (SFWMD Daily Rainfall Report 3/23/2020).

#### 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: 3/24/2020**

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)						
							3/22/20	3/15/20	3/8/20	3/1/20	2/23/20	2/16/20	2/9/20
Lakes Hart and Mary Jane	S-62	20	LKMJ	60.5	R	60.9	-0.4	-0.4	-0.3	-0.2	-0.1	-0.2	0.0
Lakes Myrtle, Preston, and Joel	S-57	0	S-57	60.8	R	60.8	0.0	0.0	0.0	0.0	0.0	-0.1	0.0
Alligator Chain	S-60	0	ALLI	63.2	R	63.8	-0.6	-0.7	-0.6	-0.6	-0.5	-0.5	-0.5
Lake Gentry	S-63	3	LKGT	61.2	R	61.3	-0.1	-0.2	-0.2	-0.1	-0.1	0.1	0.0
East Lake Toho	S-59	0	TOHOE	52.8	R	57.8	-5.0	-5.2	-5.1	-58.0	-4.8	-4.4	-4.1
Lake Toho	S-61	222	TOHOW, S-61	53.5	R	54.8	-1.3	-1.3	-1.2	-1.0	-0.9	-0.7	-0.5
Lakes Kissimmee, Cypress, and Hatchineha	S-65	690	KUB011, LKIS5B	50.8	R	51.0	-0.2	0.0	0.2	0.4	0.3	-0.1	-0.4

<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: 3/24/2020**

Metric	Location	1-Day Average		Average for the Preceding 7-Days <sup>1</sup>							
		3/22/2020	3/22/20	3/15/20	3/8/20	3/1/20	2/23/20	2/16/20	2/9/20	2/2/20	1/26/20
Discharge (cfs)	S-65	634	690	920	1,013	983	918	922	853	808	719
Discharge (cfs)	S-65A <sup>2</sup>	541	595	837	956	956	930	895	823	766	736
Discharge (cfs)	S-65D <sup>2</sup>	707	699	940	968	985	960	946	881	785	777
Headwater Stage (feet NGVD)	S-65D <sup>2</sup>	25.83	25.75	25.85	25.69	25.80	25.86	25.82	25.79	25.76	25.77
Discharge (cfs)	S-65E <sup>2</sup>	625	653	864	891	905	880	844	861	759	713
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	7.7	8.1	8.5	8.8	8.4	7.8	8.2	8.9	9.1	8.5
Mean depth (feet) <sup>4</sup>	Phase I floodplain	0.09	0.11	0.20	0.24	0.26	0.26	0.27	0.24	0.18	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)

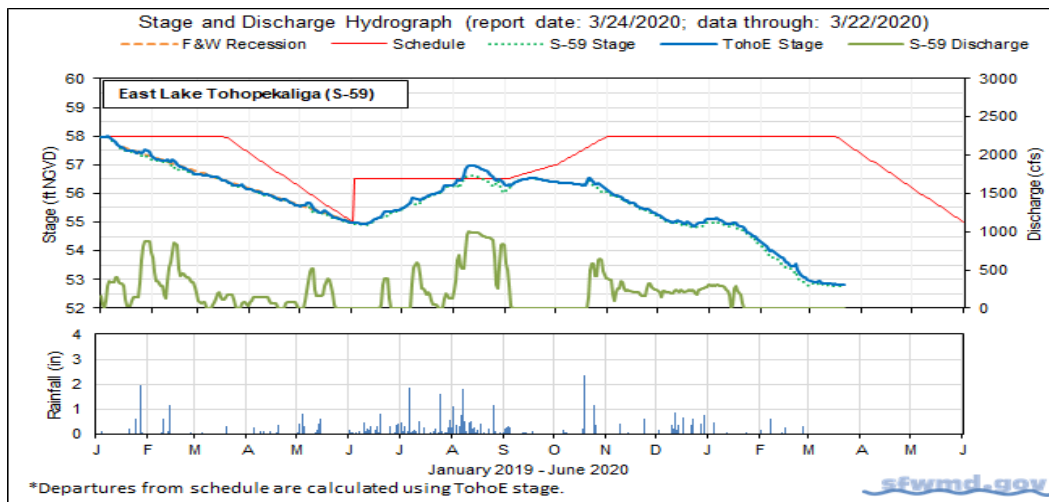


Figure 1.

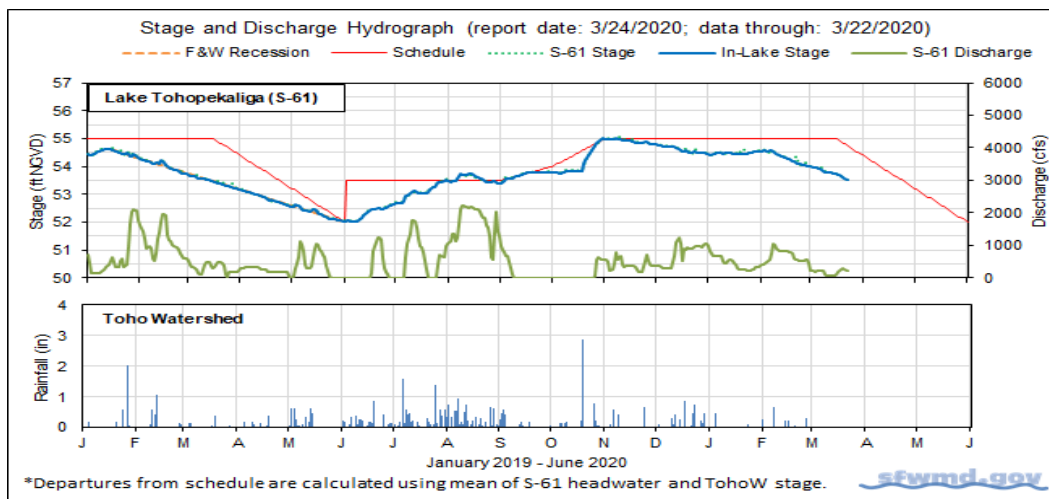


Figure 2.

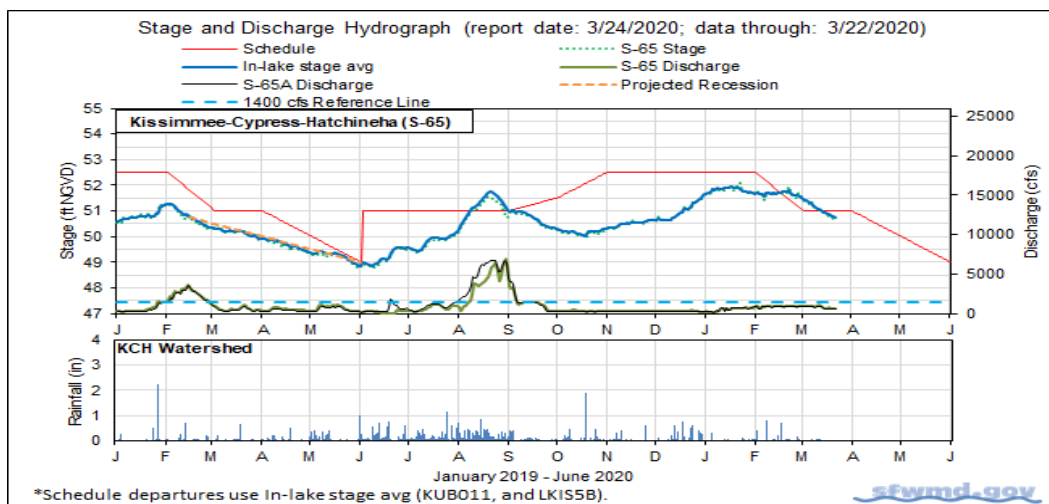
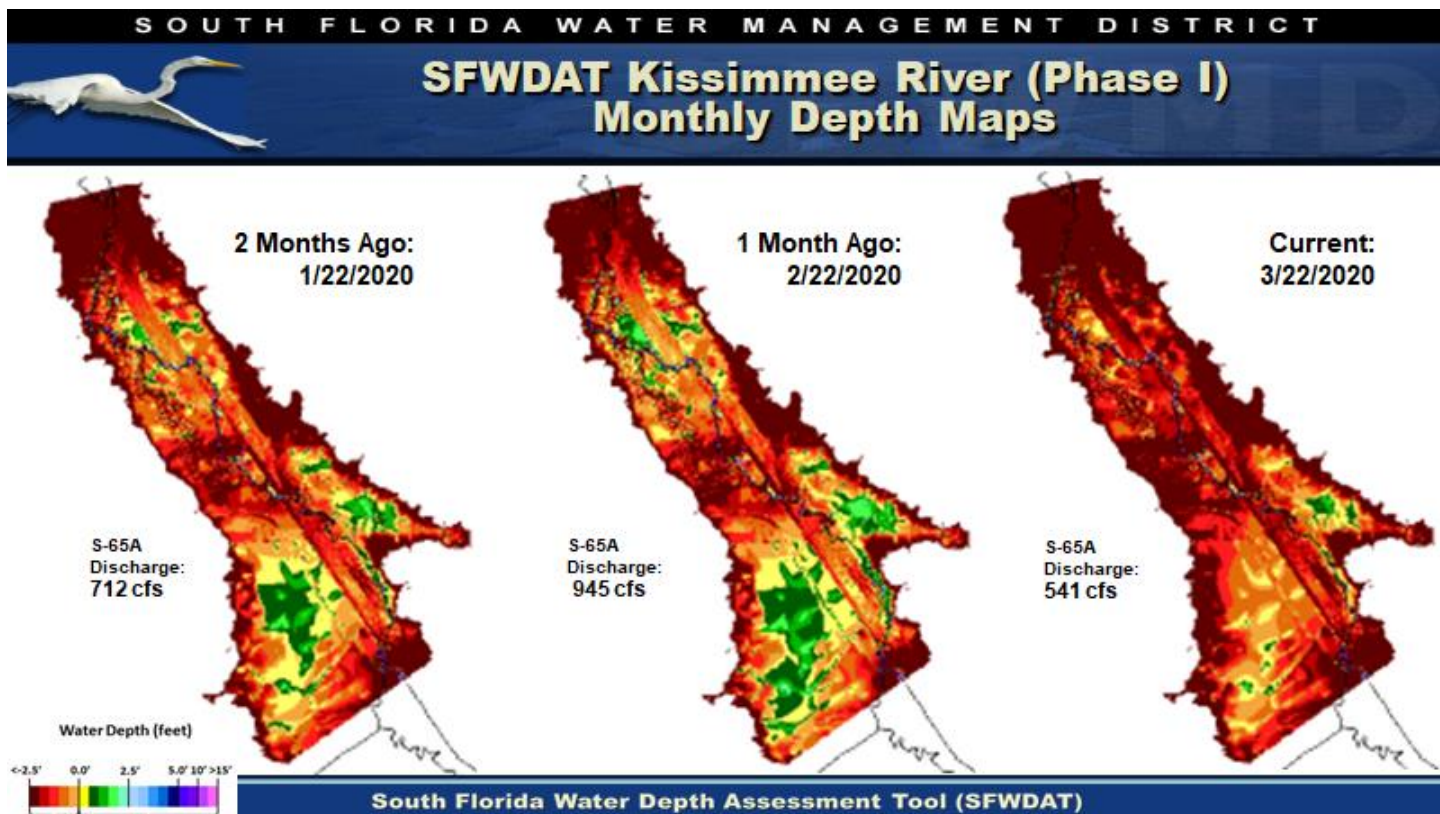
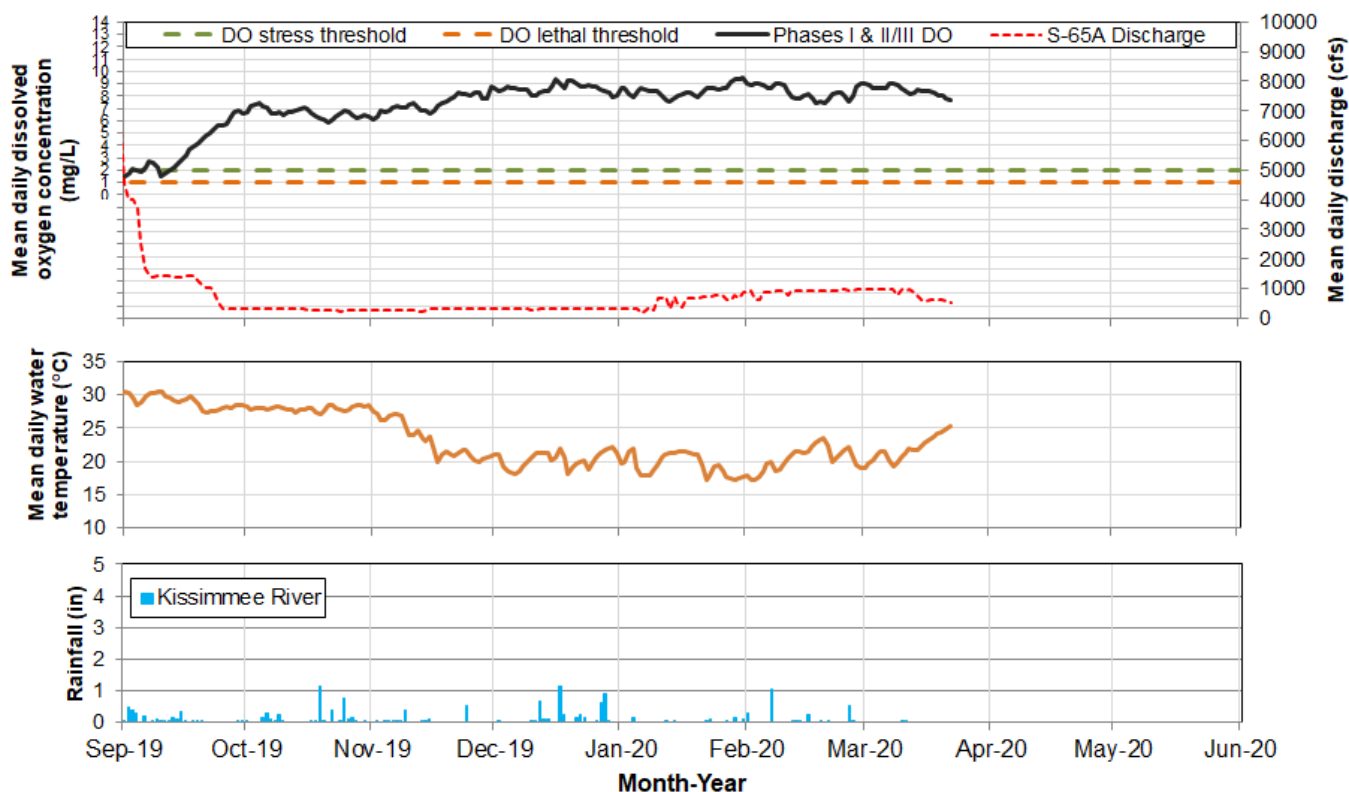


Figure 3.



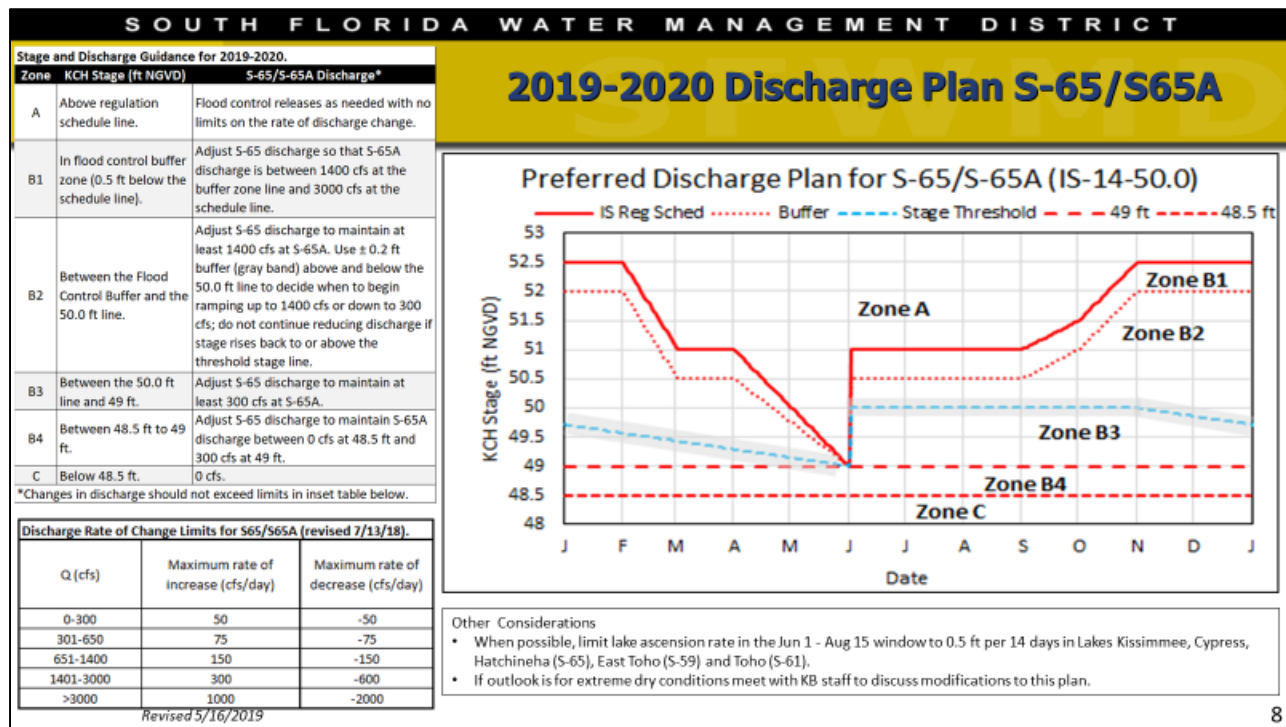
**Figure 4.** Phase I area floodplain water depths for this week, one month ago, and two months ago. Note that the WDAT color-coding has been modified to accommodate greater water depths; these maps are not directly comparable to Kissimmee Basin WDAT maps published prior to January 16, 2012.



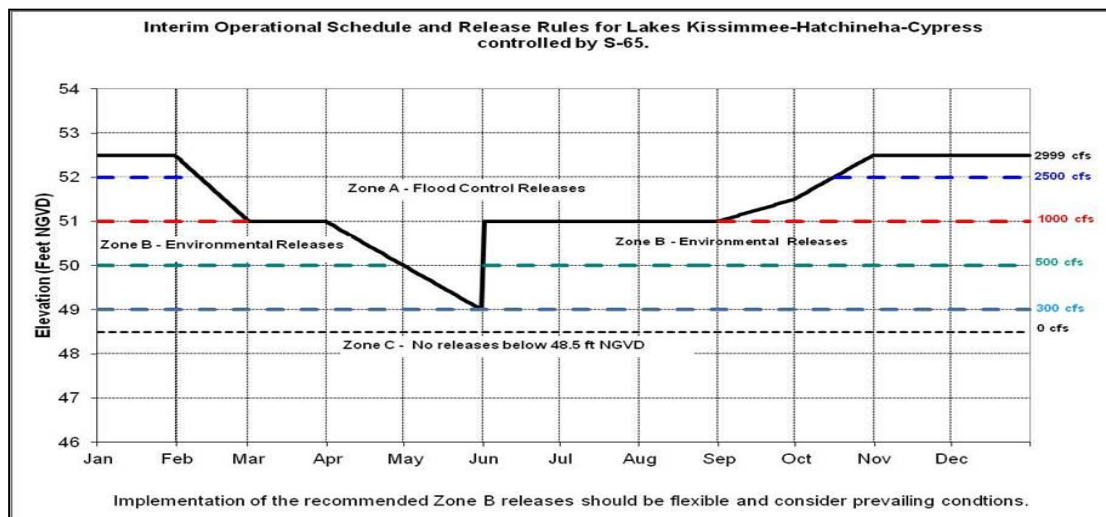
Report Date: 3/24/2020; data are through: 3/22/2020.

**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 12.16 feet NGVD, 0.62 feet lower than a month ago and the same level as one year ago (Figure 1). The Lake is currently 1.08 feet below the preferred 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 from December 2019 to mid-February 2020, before declining over 0.6 feet in the past month. According to RAINДАР, 0.00 inches of rain fell directly over the Lake during the past week, with most of the watershed receiving no rainfall as well (Figure 4).

The average daily inflows (minus rainfall) decreased from 864 cfs to 625 cfs, and average daily outflows (minus evapotranspiration) increased by around 400 cfs from the previous week. 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 (1,844 cfs) or west through S-77 (C-43/Caloosahatchee Canal, 960 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 wading bird flight of 2020 was conducted on March 12 (Figure 6). There were approximately 9,405 wading birds seen foraging around Lake Okeechobee, an increase of over 3,500 from the February 27 survey. Wading bird nesting is currently low, with 246 nests counted during the most recent survey. Water levels have been below 14 feet since October 2018 leaving many areas of the marsh continuously dry for two wading bird seasons now, so current conditions on the lake are not favorable for nesting.

Current satellite imagery (March 21, 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 and near Fisheating Bay, slightly higher than this time last year (Figure 7).

## **Water Management Summary**

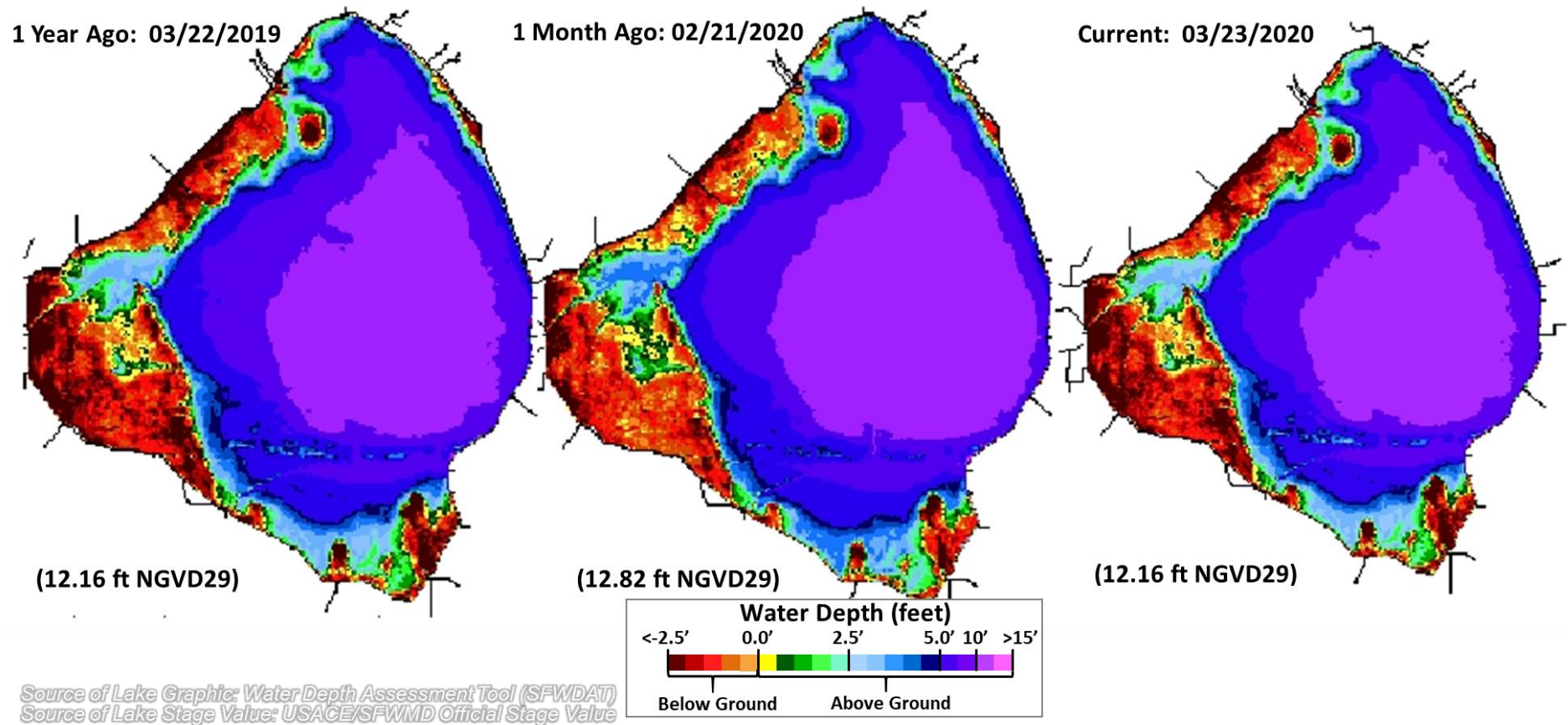
Lake Okeechobee stage was 12.16 feet NGVD on March 23, 2020, down 0.18 feet from the previous week, and down 0.62 feet from the previous month. The Lake entered the Beneficial Use sub-band on March 4, 2020 and is now 0.42 ft above the Water Shortage sub-band. Water levels moved below the ecological envelope (which varies seasonally from 12 – 15 feet NGVD +/- 0.5 feet) on October 15, 2019 and is currently 1.08 feet below the bottom of the 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 if stages continue below the ecological envelope throughout the breeding season.



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

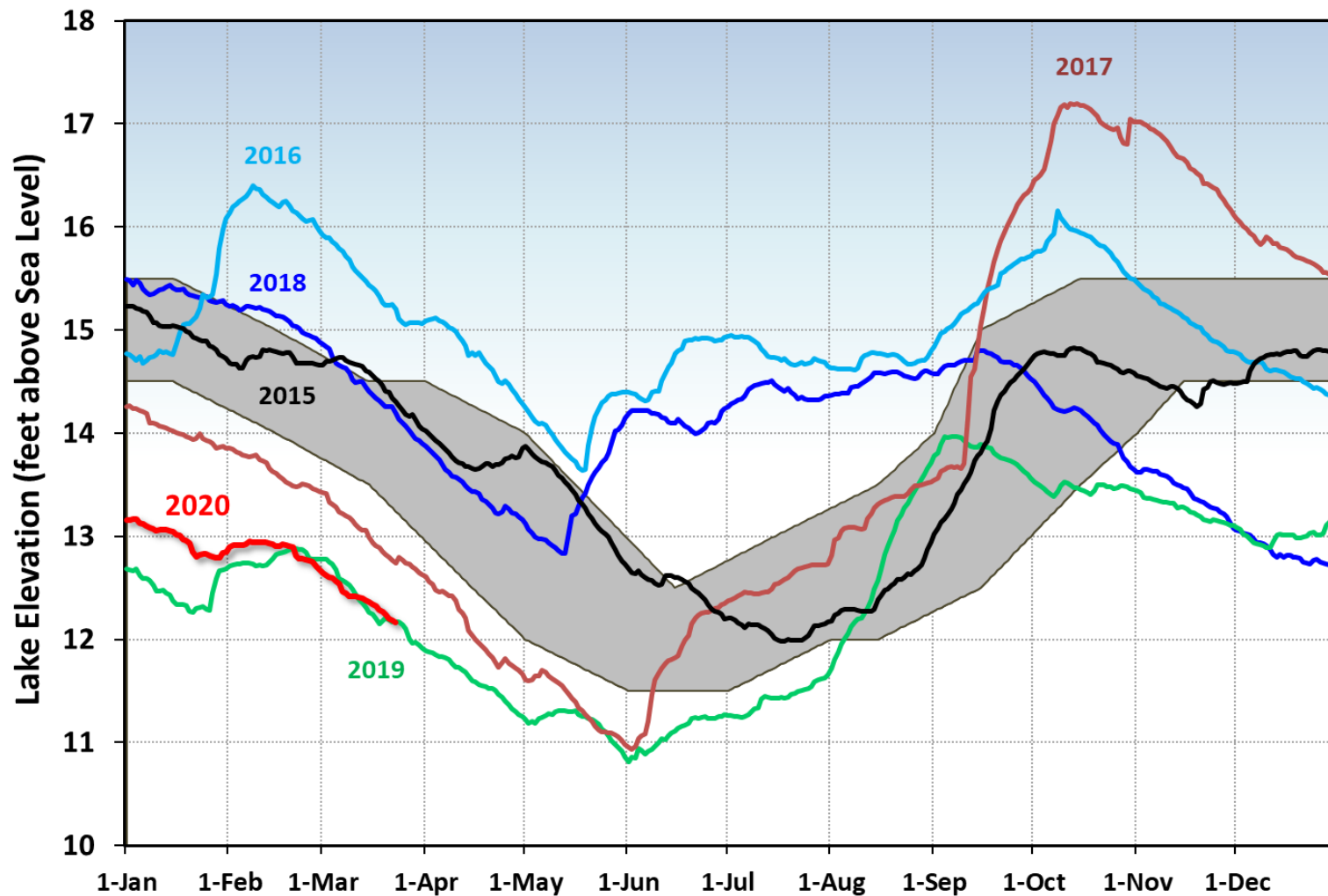
INFLOWS	Previous week Avg Daily CFS	Avg Daily Flow cfs	Equivalent Depth Week Total (in)	OUTFLOWS	Previous week Avg Daily CFS	Avg Daily Flow cfs	Equivalent Depth Week Total (in)
S-65E & S-65EX1	845	616	0.3	S-77	878	960	0.4
S-71 & S-72	0	0	0.0	S-308	329	136	0.1
S-84 & S-84X	0	0	0.0	S-351	673	965	0.5
Fisheating Creek	18	9	0.0	S-352	208	276	0.1
S-154	0	0	0.0	S-354	452	604	0.3
S-191	0	0	0.0	L-8 Outflow	145	141	0.1
S-133 P	0	0	0.0	ET	2304	2343	1.1
S-127 P	0	0	0.0	<b>Total</b>	<b>4989</b>	<b>5425</b>	<b>2.5</b>
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	43	0	0.0				
<b>Total</b>	<b>907</b>	<b>625</b>	<b>0.3</b>				

Provisional Data



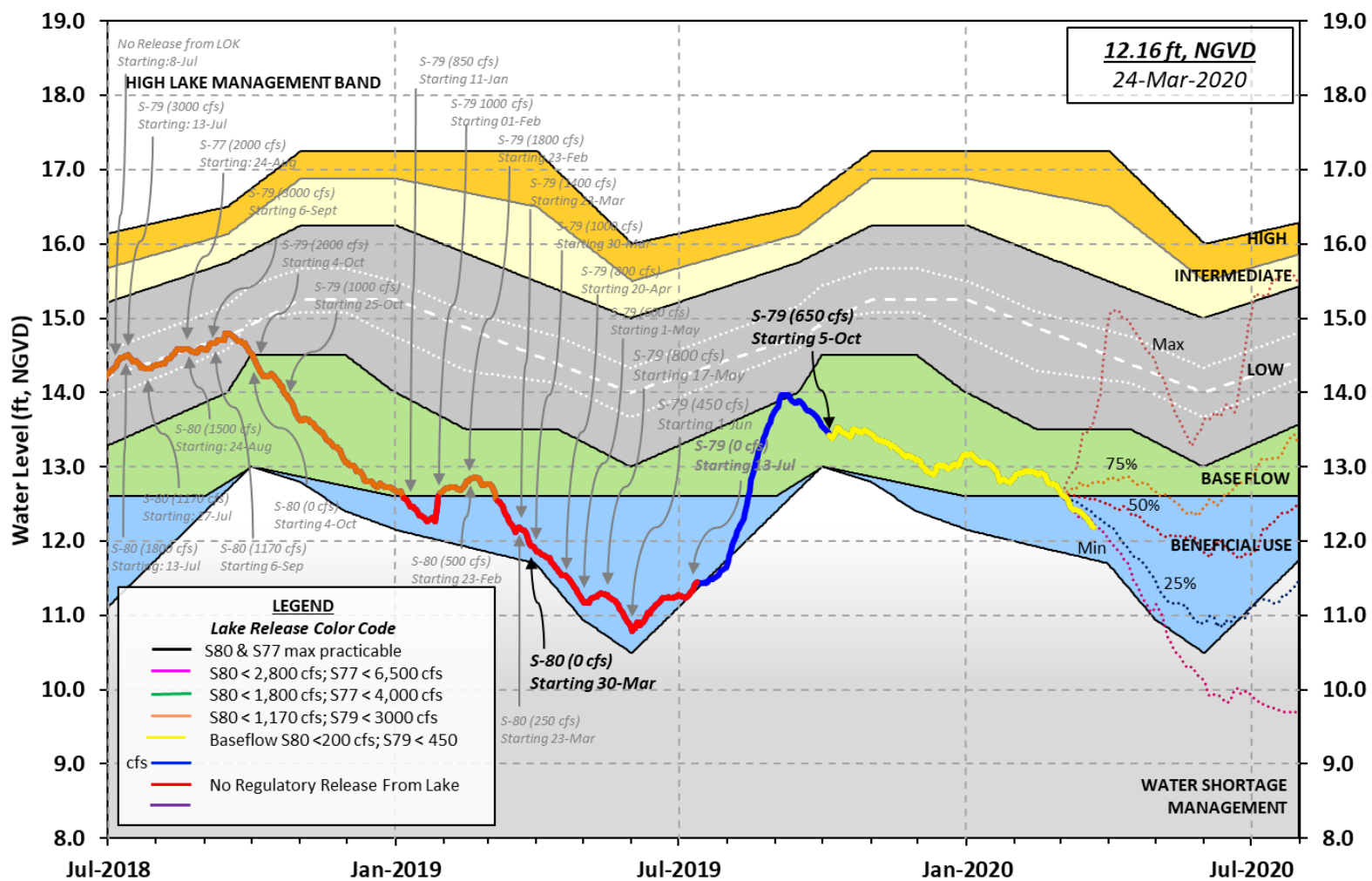
**Figure 1.** Water depth estimates on Lake Okeechobee based on the South Florida Water Depth Assessment Tool.

## 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

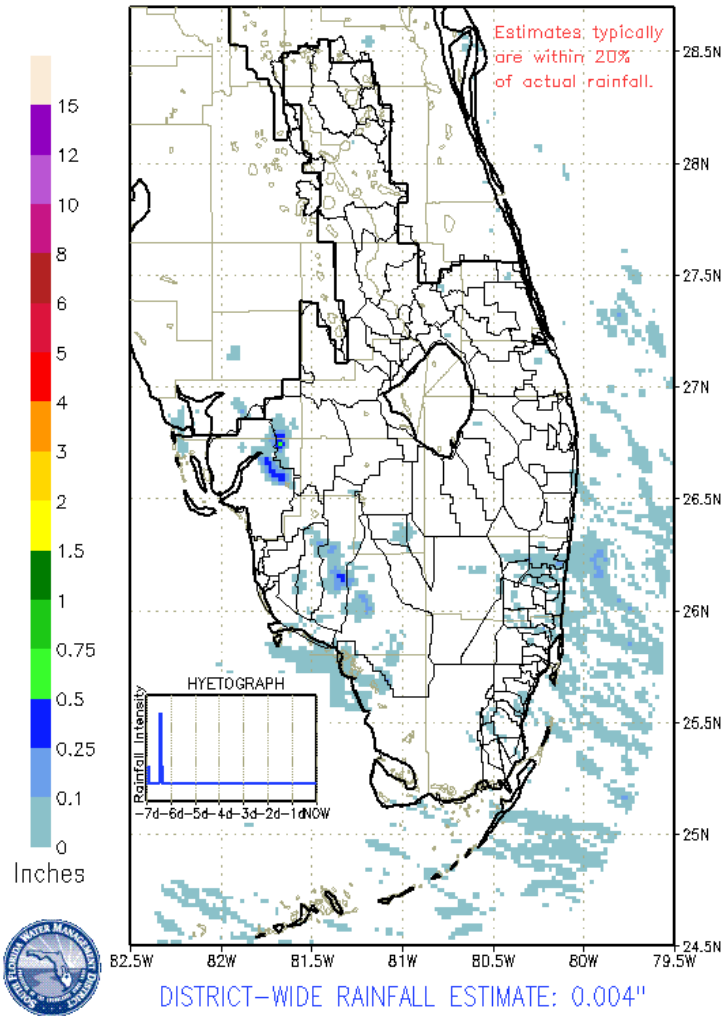


LORS-2008  
Adopted by USACE 28-April-2008

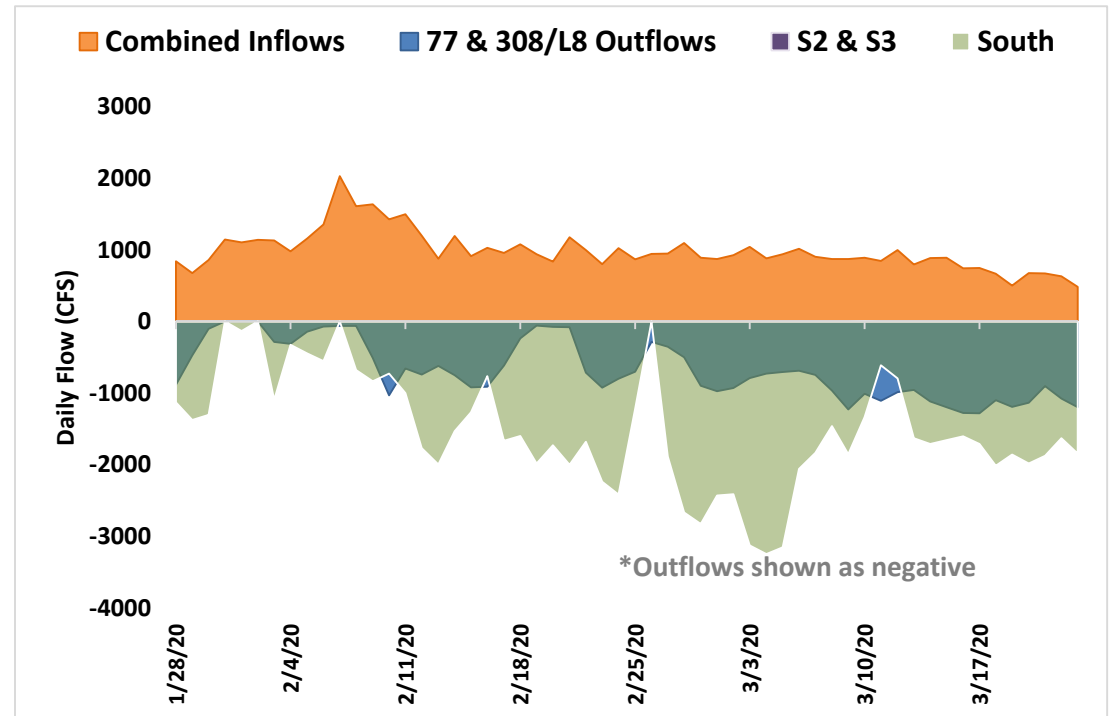
Projected Stage Percentiles From  
SFWMD-HESM Position Analysis

**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: 0400 EST, 03/17/2020 THROUGH: 0400 EST, 03/24/2020



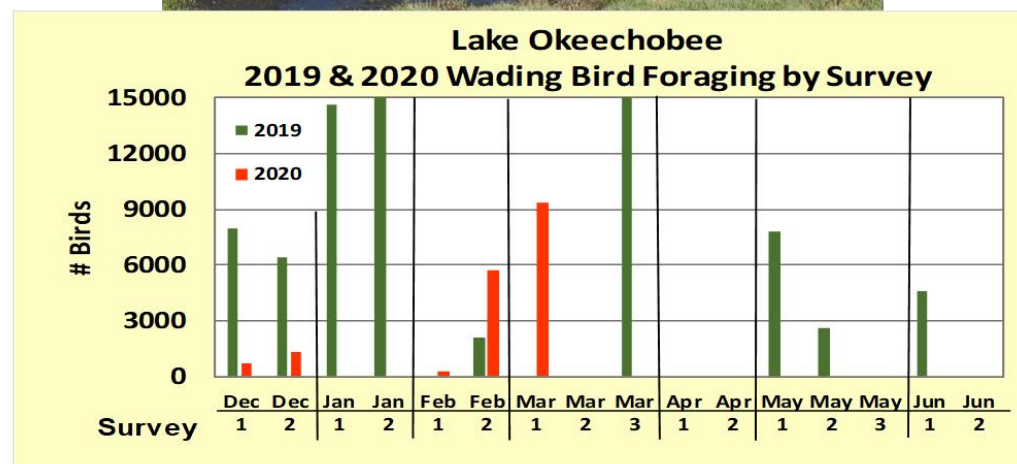
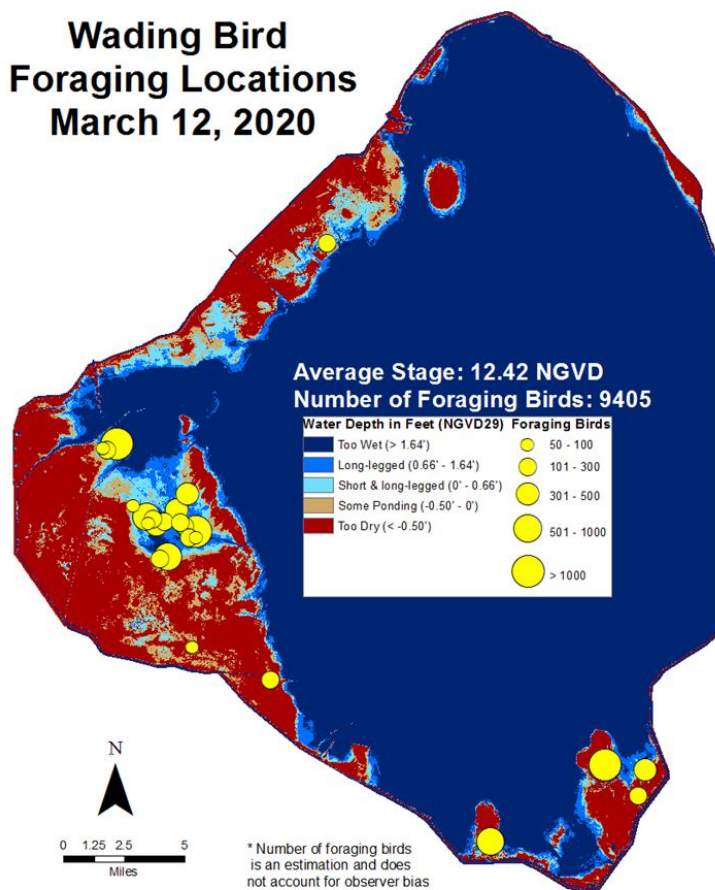
**Figure 4.** 7-Day rainfall estimates by RAINDAR.



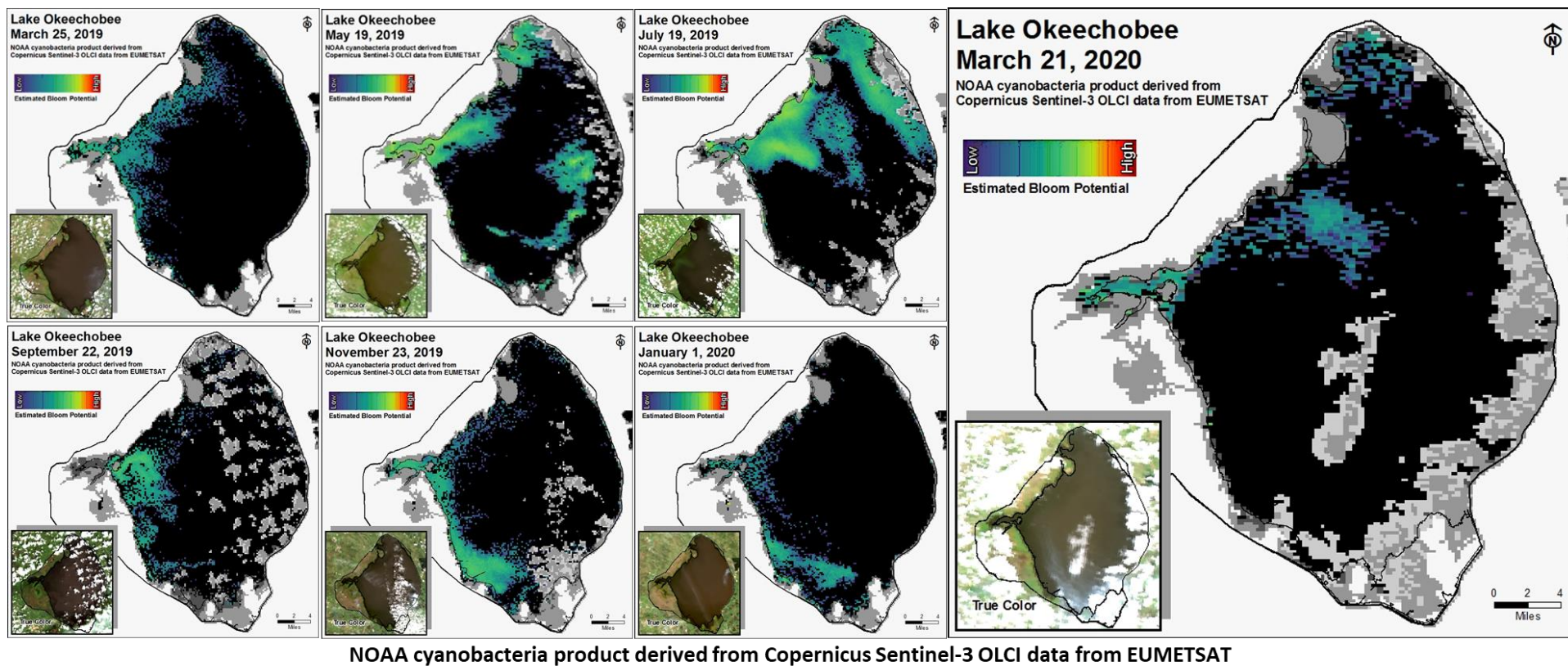
**Figure 5.** Major inflows (orange) and outflows (blue) of Lake Okeechobee, including the S-350 structures designated as South (green). The L-8 Canal flows through Culvert 10A are included as outflows when positive, and as inflows when backflowing into the Lake. All inflows and outflows are shown as 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.



# Wading Bird Foraging Locations March 12, 2020



**Figure 6.** Results of wading bird survey flight from March 12, 2020, and comparison to previous surveys.



NOAA cyanobacteria product derived from Copernicus Sentinel-3 OLCI data from EUMETSAT

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

## **ESTUARIES**

Last week total inflow to the St. Lucie Estuary averaged approximately 159 cfs (Figures 1 and 2) and last month inflow averaged about 246 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	103
S-80	0
S-308	2
S-49 on C-24	0
S-97 on C-23	0
Gordy Rd. structure on Ten Mile Creek	56

Over the past week, salinity remained about the same 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 22.9. 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>18.7</b> (18.5)	<b>20.4</b> (20.4)	NA <sup>1</sup>
US1 Bridge	<b>22.6</b> (22.5)	<b>22.9</b> (22.9)	10.0-26.0
A1A Bridge	<b>29.9</b> (29.3)	<b>31.0</b> (30.8)	NA <sup>1</sup>

<sup>1</sup>Envelope not applicable

### **Caloosahatchee Estuary:**

Last week total inflow to the Caloosahatchee Estuary averaged approximately 771 cfs (Figures 5 and 6) and last month inflow averaged about 723 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	960
S-78	552
S-79	672
Tidal Basin Inflow	99

Over the past week in the estuary, surface salinity increased to Cape Coral and remained about the same 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 at Shell Point and in the fair range 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>5.4</b> (3.3)	<b>5.7</b> (3.5)	NA <sup>1</sup>
Val I75	<b>5.9</b> (3.4)	<b>7.6</b> (6.0)	0.0-5.0 <sup>2</sup>
Ft. Myers Yacht Basin	<b>11.8</b> (10.7)	<b>13.6</b> (14.0)	NA
Cape Coral	<b>18.4</b> (17.9)	<b>20.7</b> (21.1)	10.0-30.0
Shell Point	<b>29.5</b> (29.6)	<b>29.7</b> (29.8)	10.0-30.0
Sanibel	<b>32.2</b> (32.0)	<b>33.7</b> (33.3)	10.0-30.0

<sup>1</sup>Envelope not applicable and <sup>2</sup>Envelope is based on a 2-week forecast 30-day average (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 4.0 to 9.2 at the end of the two-week period for pulse release at S-79 ranging from 0 to 1000 cfs and Tidal Basin inflows of 80 cfs. The 30-day moving average surface salinity at Val I-75 is forecast to be between 4.1 and 5.9 (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	9.2	5.9
B	450	80	6.8	5.0
C	650	80	4.9	4.4
D	800	80	4.4	4.3
E	1000	80	4.0	4.1

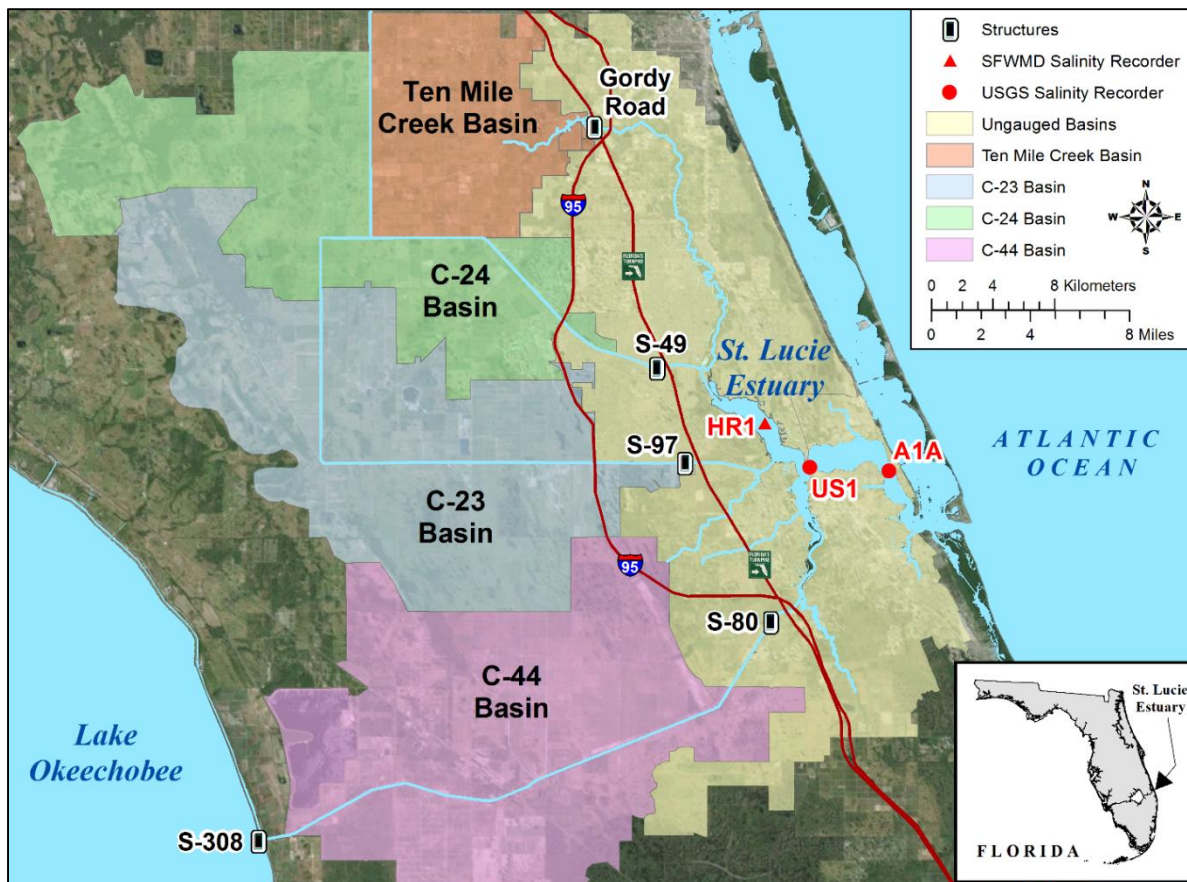
### Red tide

The Florida Fish and Wildlife Research Institute reported on March 20, 2020, that *Karenia brevis*, the Florida red tide dinoflagellate, was observed at background concentrations in one sample collected from Lee County, at very low concentrations in one sample collected from Palm Beach County, and was not observed in samples collected in Miami-Dade County (no samples were analyzed this week from St. Lucie, Martin, or Broward counties).

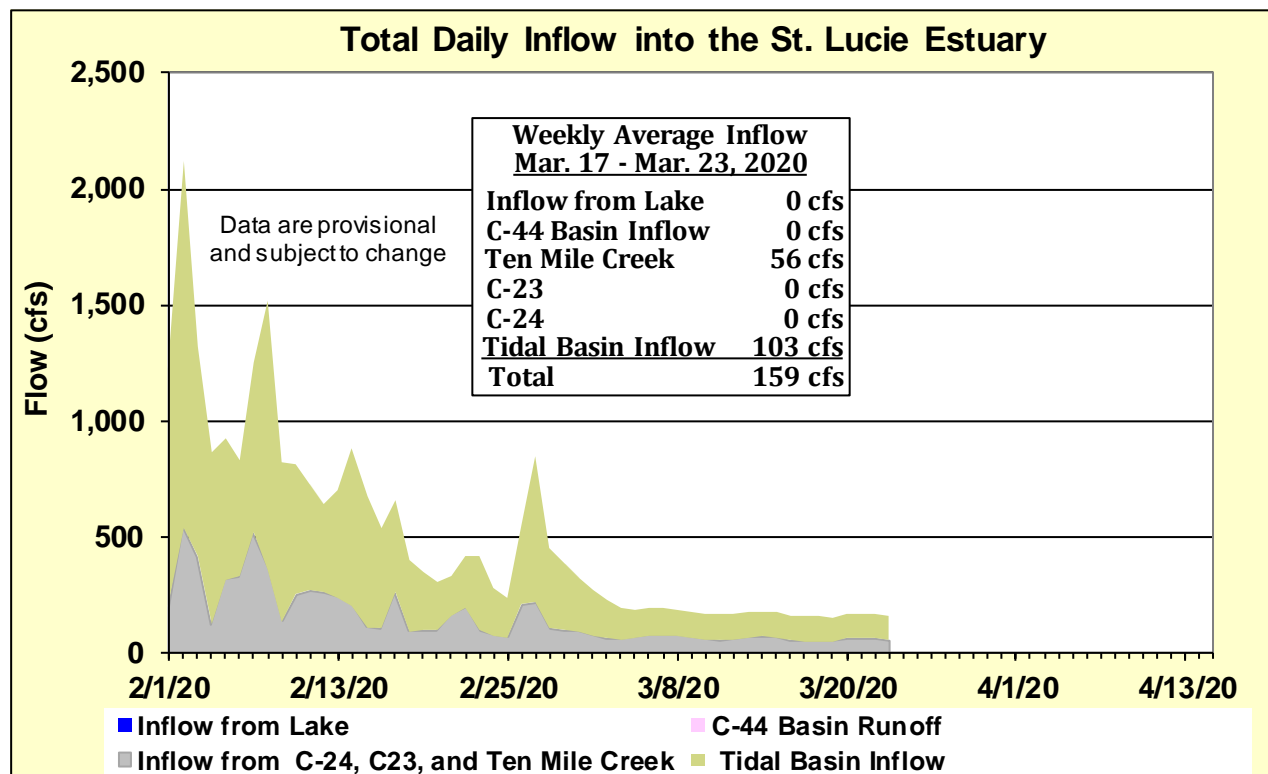
### Water Management Recommendations

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.



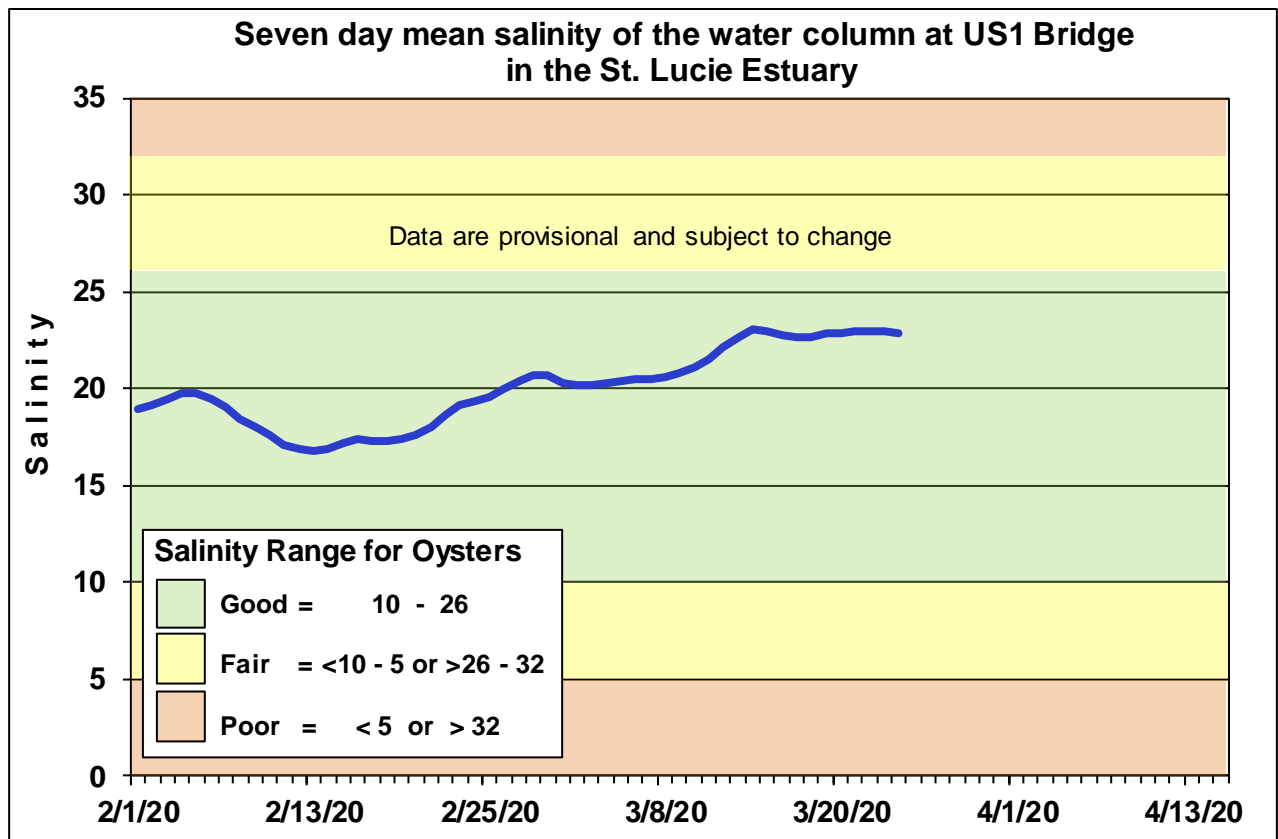


Figure 3. Seven-day mean salinity of the water column at the US1 Bridge.

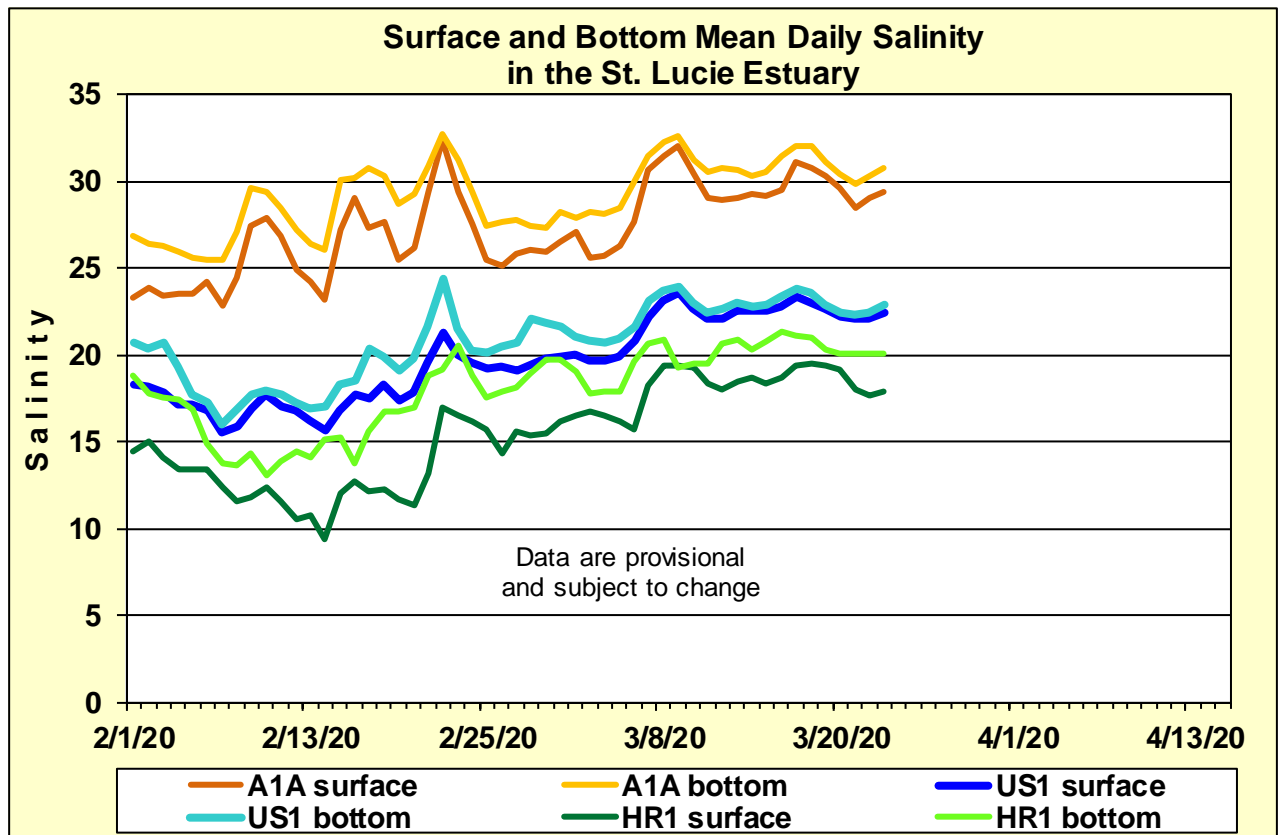


Figure 4. Daily mean salinity at the A1A, US1, and HR1 stations.

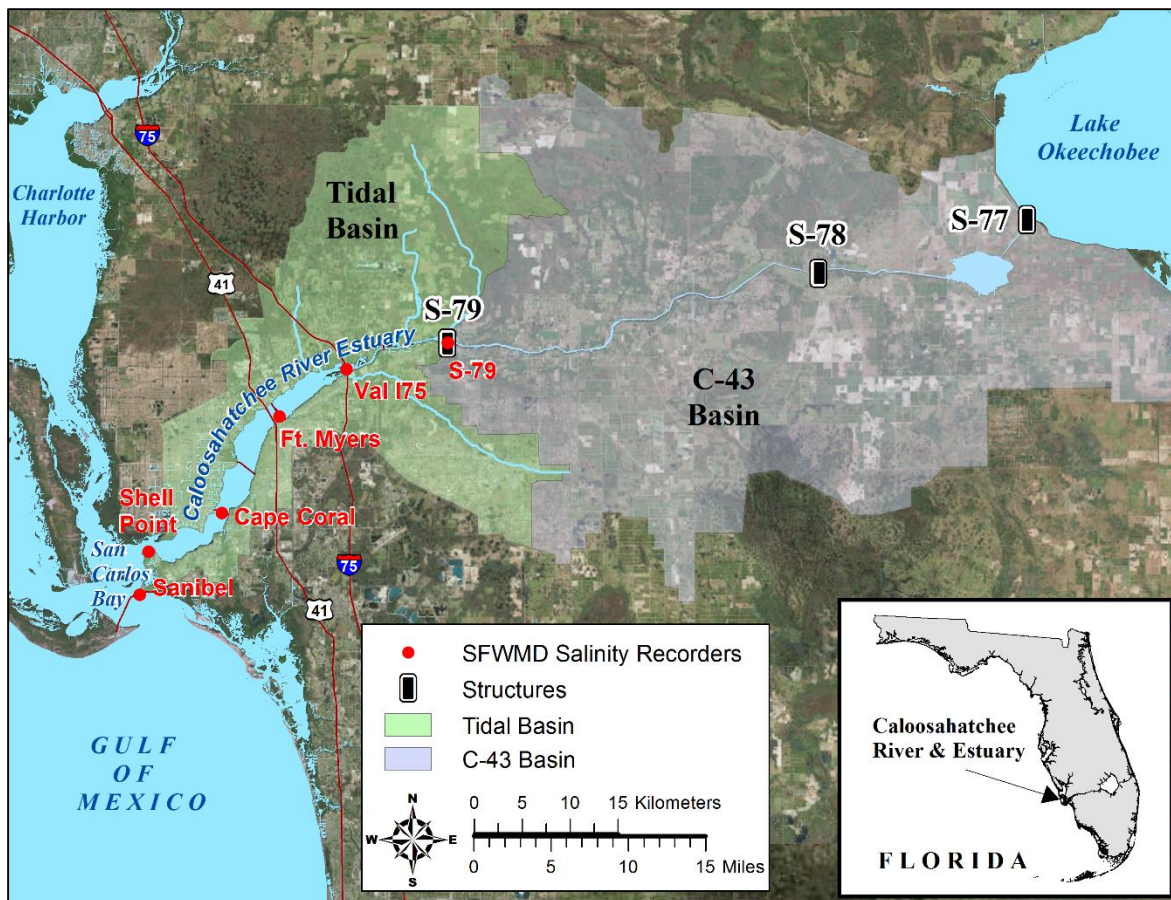


Figure 5. Basins, water control structures, and salinity monitoring for the Caloosahatchee Estuary.

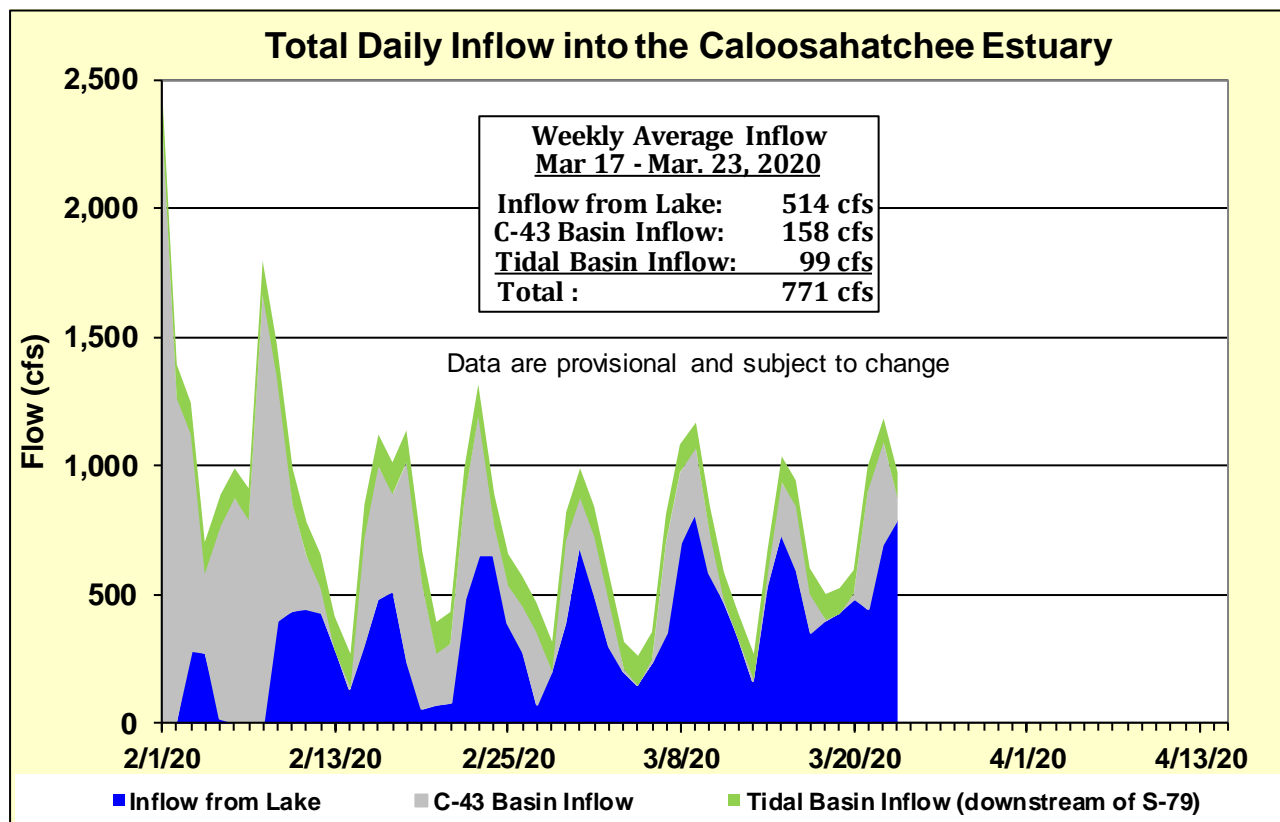
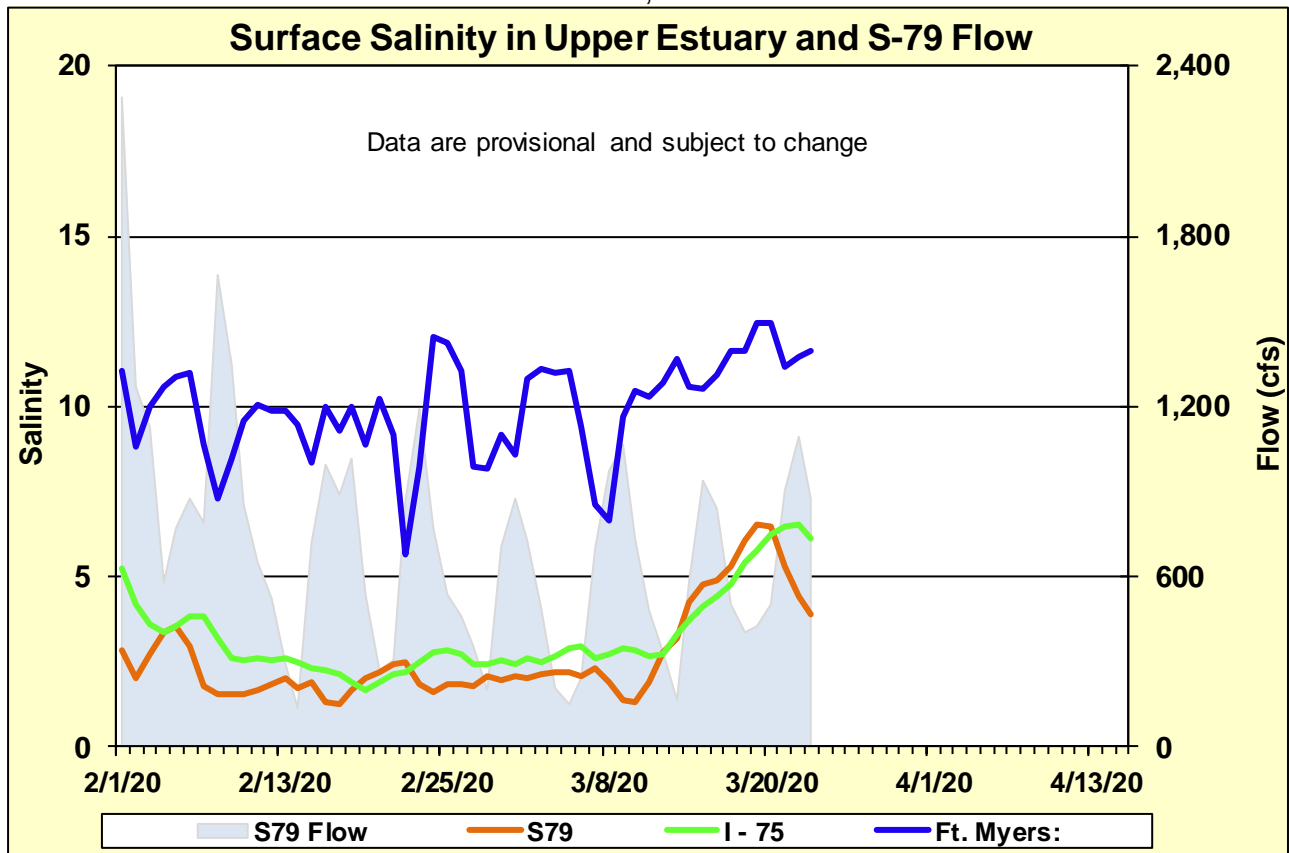
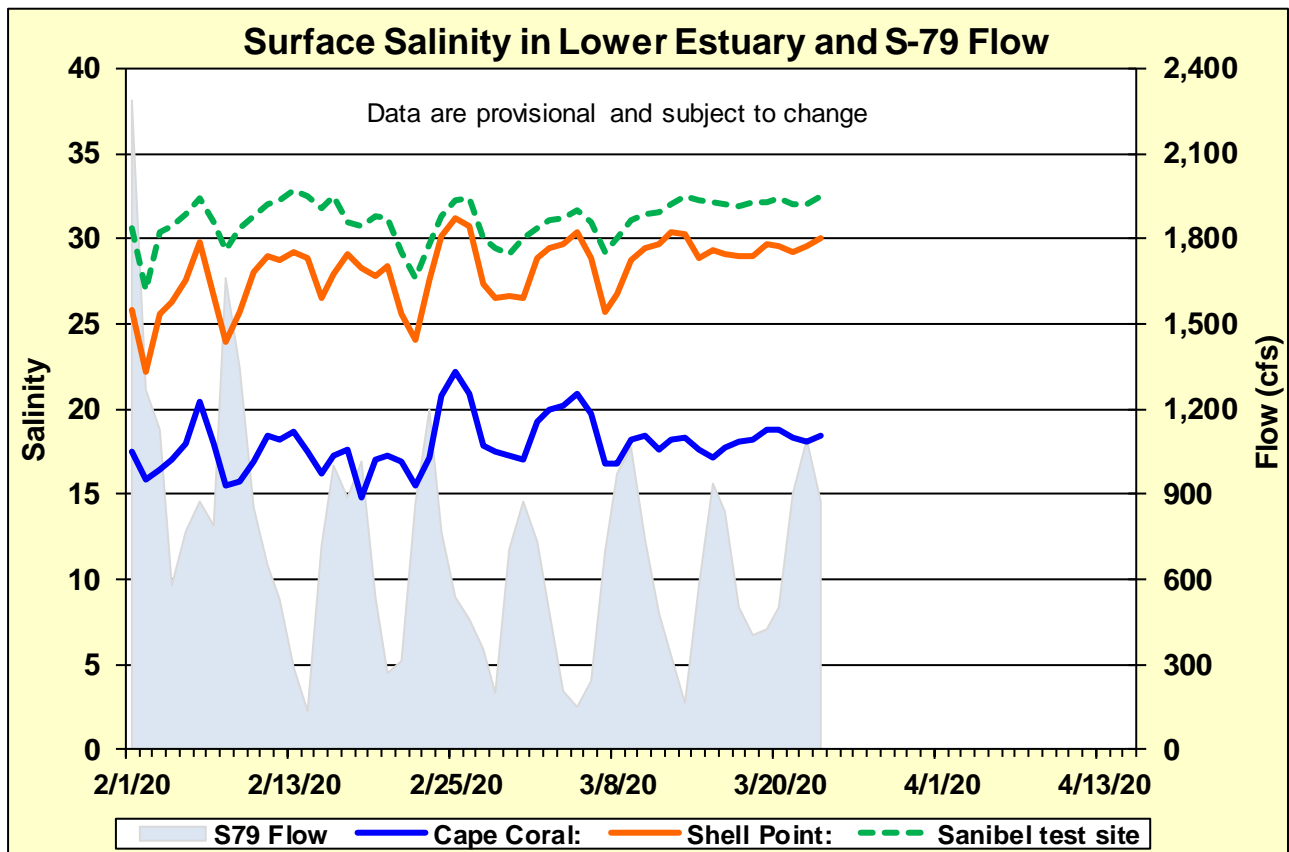


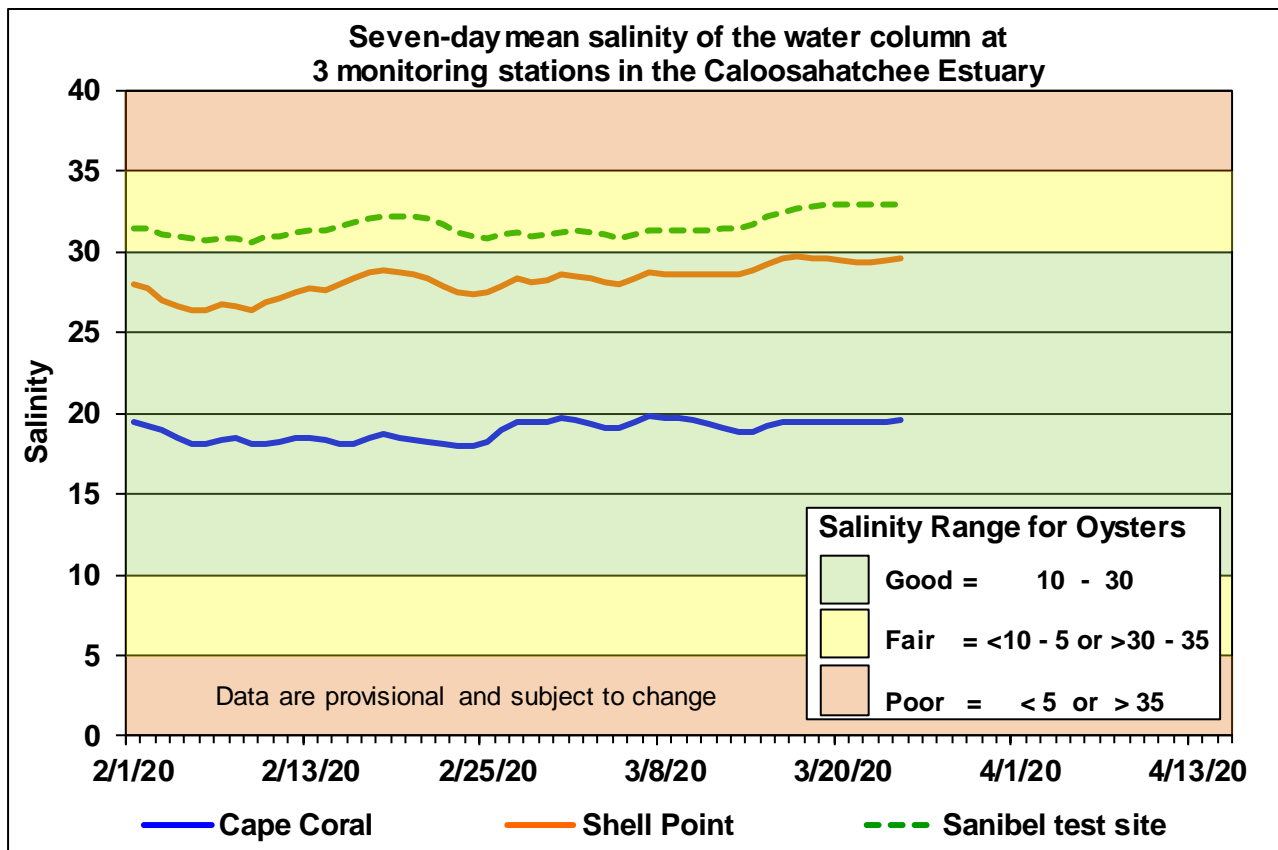
Figure 6. Total daily inflows from Lake Okeechobee, runoff from the C-43 basin



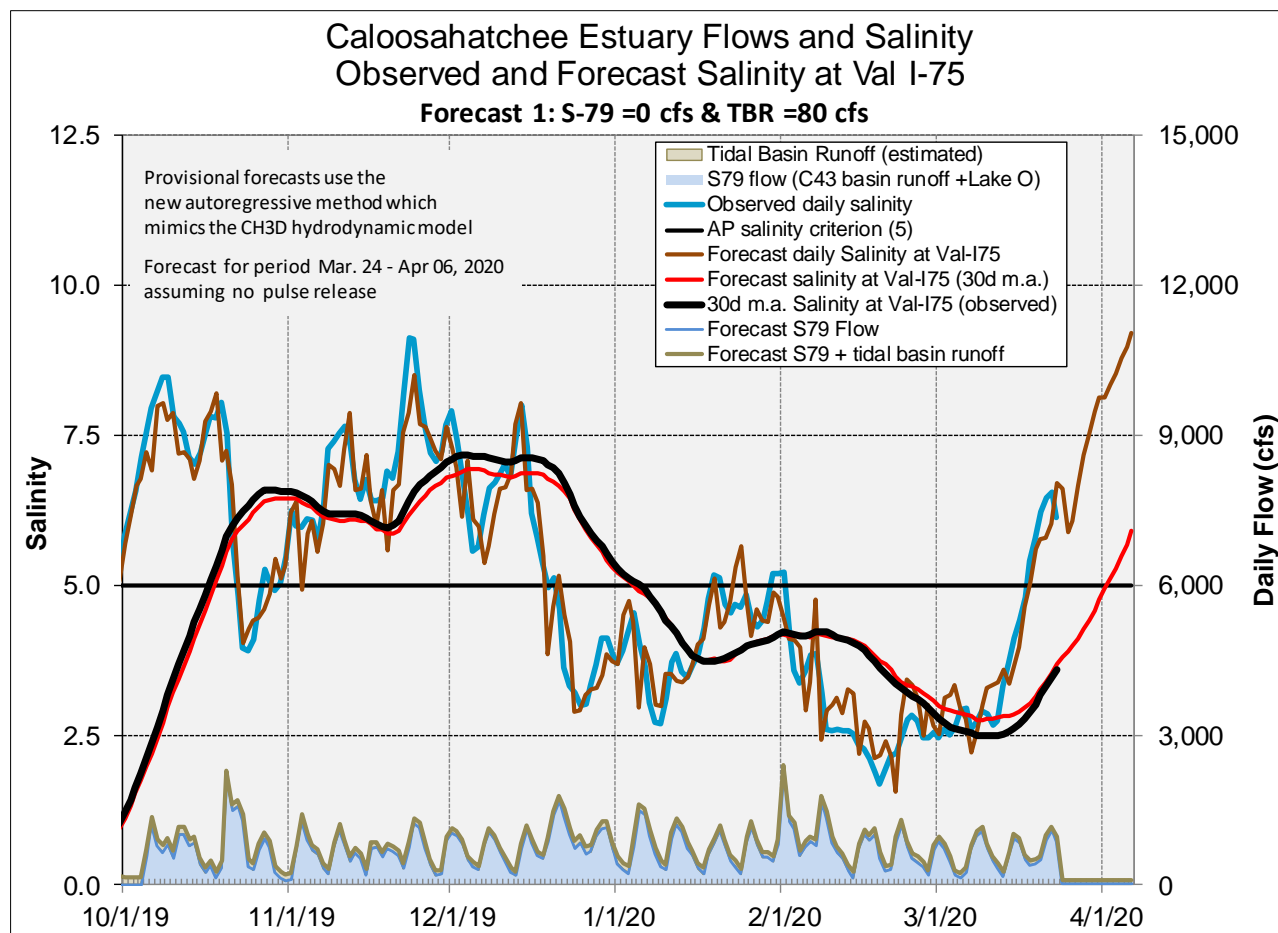
**Figure 7.** Daily mean flows at S-79 and salinity at upper estuary monitoring stations.



**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.



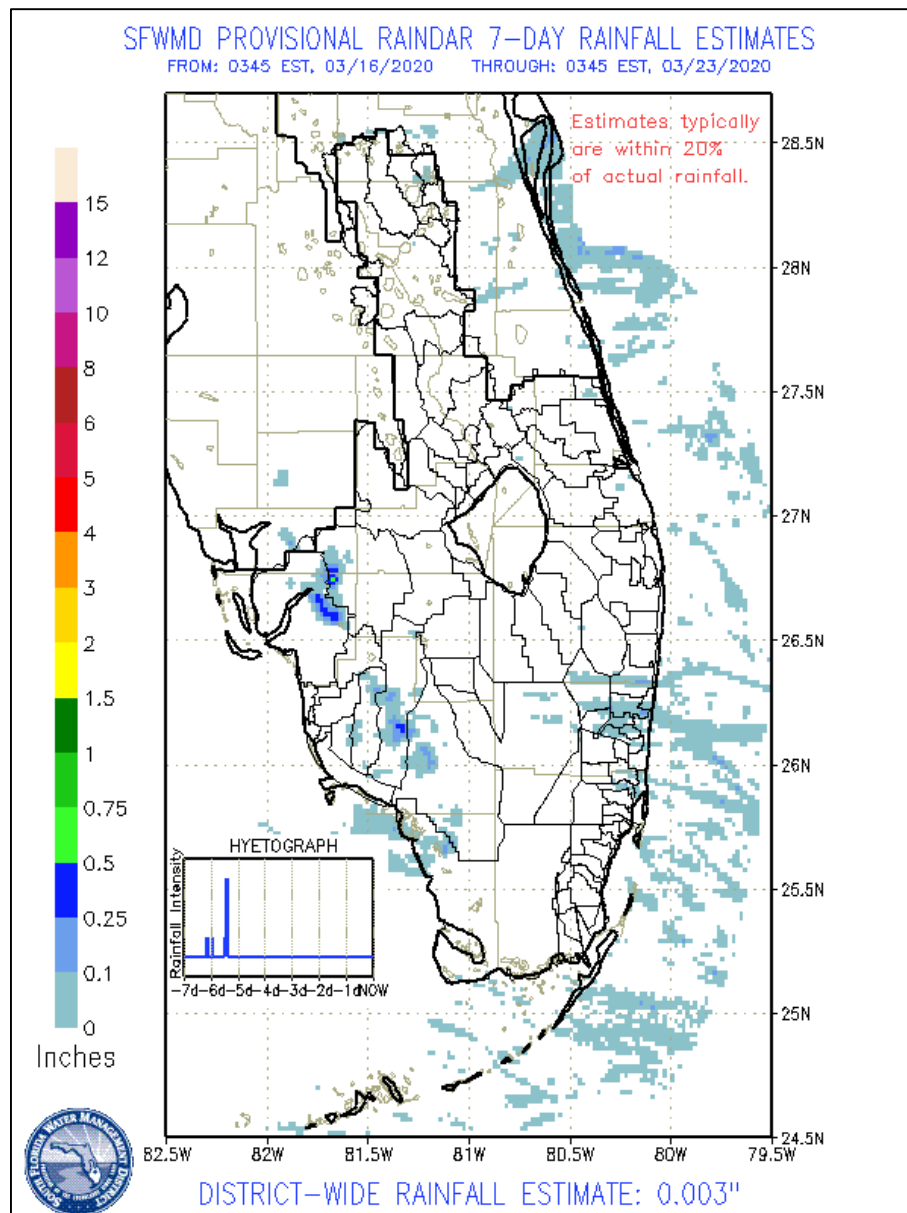
**Figure 10.** Forecasted Val I-75 surface salinity assuming no pulse release at S79.

## **EVERGLADES**

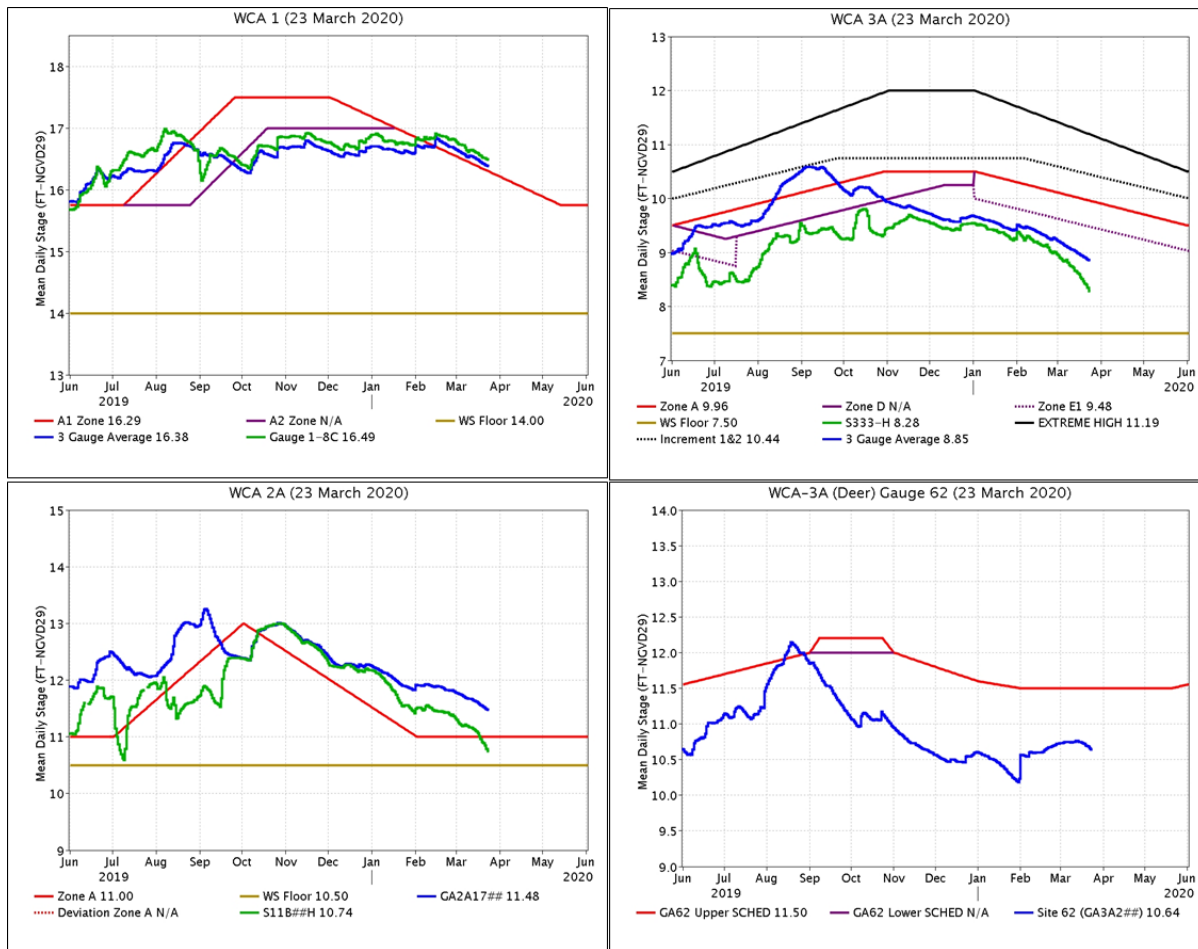
Essentially zero precipitation fell within the Everglades last week, and stages responded with all major basins recording a faster than optimal recession rate this week. At the gauges monitored for this report stages fell on average 0.12 feet last week, significantly faster than the week prior. Evaporation was estimated at 1.6 inches last week.

Everglades Region	Rainfall (Inches)	Stage Change (feet)	<div><div></div> Good</div> <div><div></div> Fair</div> <div><div></div> Poor</div>
WCA-1	0.00	-0.11	
WCA-2A	0.00	-0.12	
WCA-2B	0.00	-0.18	
WCA-3A	0.00	-0.11	
WCA-3B	0.00	-0.09	
ENP	0.00	-0.16	





Regulation Schedules: WCA-1: Stage at the 1-8C Gauge fell in parallel to the regulation line last week, currently 0.09 feet above the falling Zone A1 line. WCA-2A: Stage at Gauge S11-B trended sharply downwards and fell to 0.26 feet below the stable Zone A regulation line last week. WCA-3A: The Three Gauge Average stage trends down and away from parallel to the falling Zone E1 regulation line last week, currently 0.63 feet below. WCA-3A at gauge 62 (Northwest corner): Last week stage began to trend down and away from the stable Upper Schedule now 0.86 feet below the regulation line.

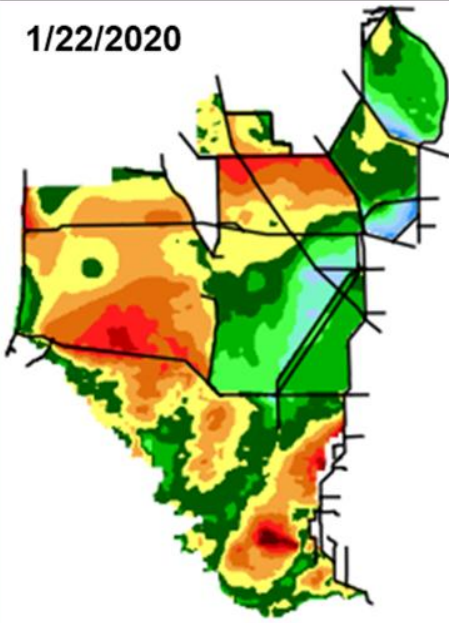


Water Depths: The WDAT tool for spatial interpolation of depth monthly snapshots indicate depths more than 1.0 foot below ground in extreme northeast WCA-3A North, and the rest of that basin's stage is potentially at ground surface. The interior of WCA-2A is drying down to near ground surface. Hydrologic connectivity has greatly diminished over the last month but remains in Shark River Slough. WCA-1 Depths look stable. Comparing WDAT water levels from present, there were significant recessions in depth in the northern regions of both WCA-1 and 2A and in the northern reaches of the L67 and L28 canals over the last month. Looking back one year the stage differences are more significant. The northeast corner of WCA-3A is significantly lower in stage, as is most of WCA-3. WCA-2A is most significantly drier in the northeastern regions of that basin becoming less so moving southwest. The WDAT model indicates a much drier condition in the western basins compared to a month and a year ago.

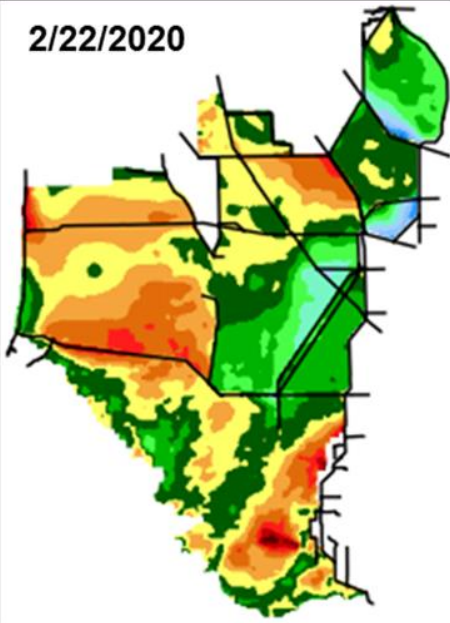


## SFWDAT Water Depth Monthly Snapshots

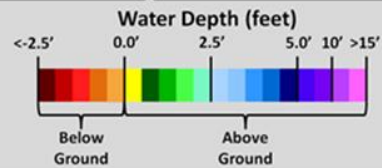
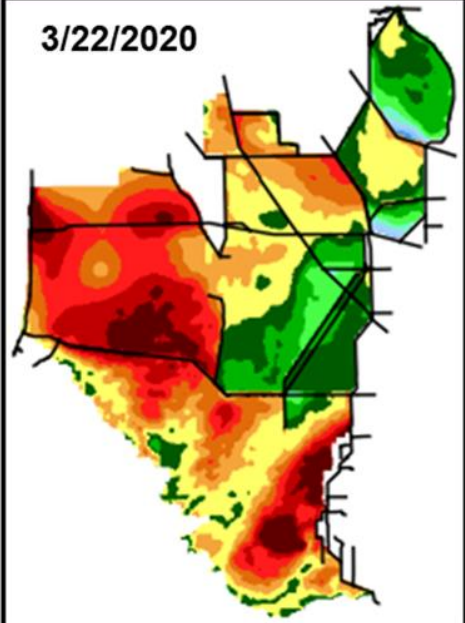
1/22/2020



2/22/2020



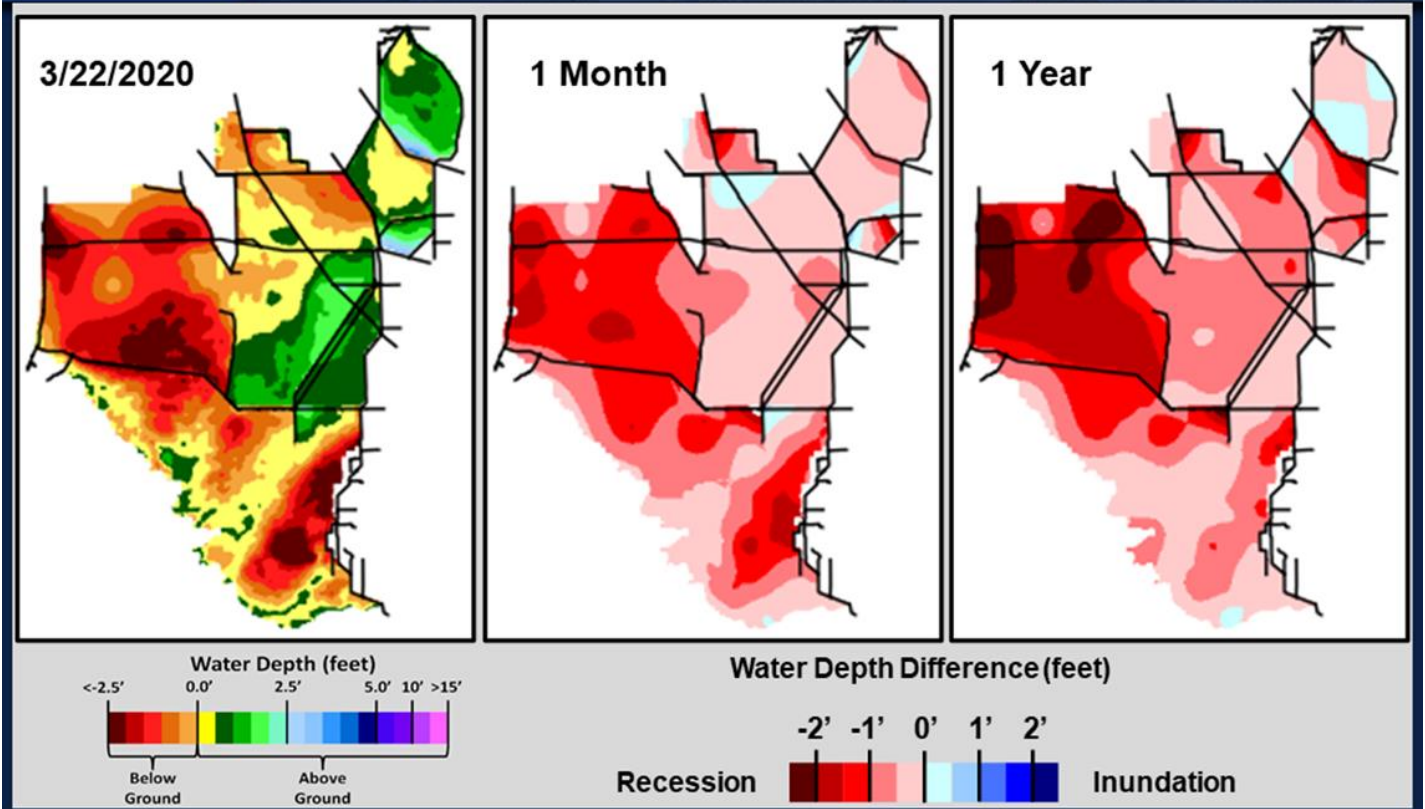
3/22/2020



South Florida Water Depth Assessment Tool (SFWDAT)



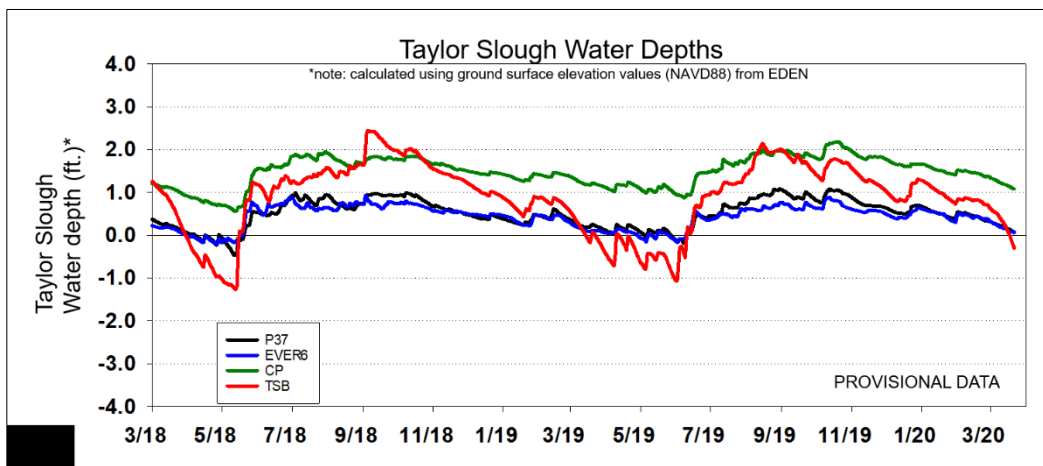
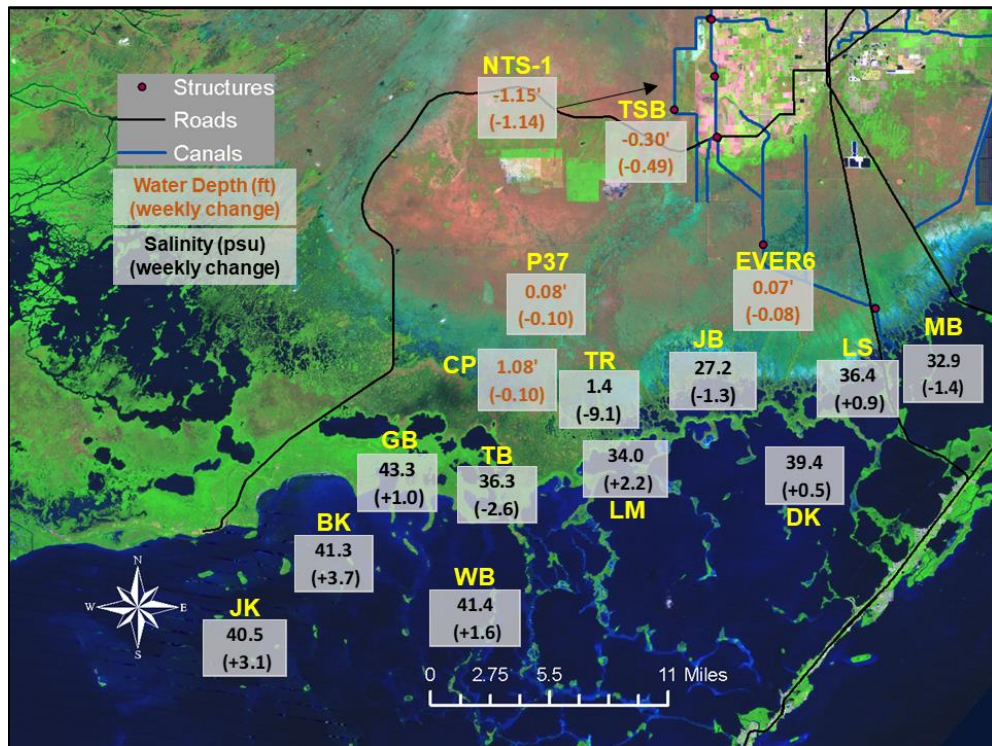
## SFWDAT Everglades Difference Maps (Present – Past)



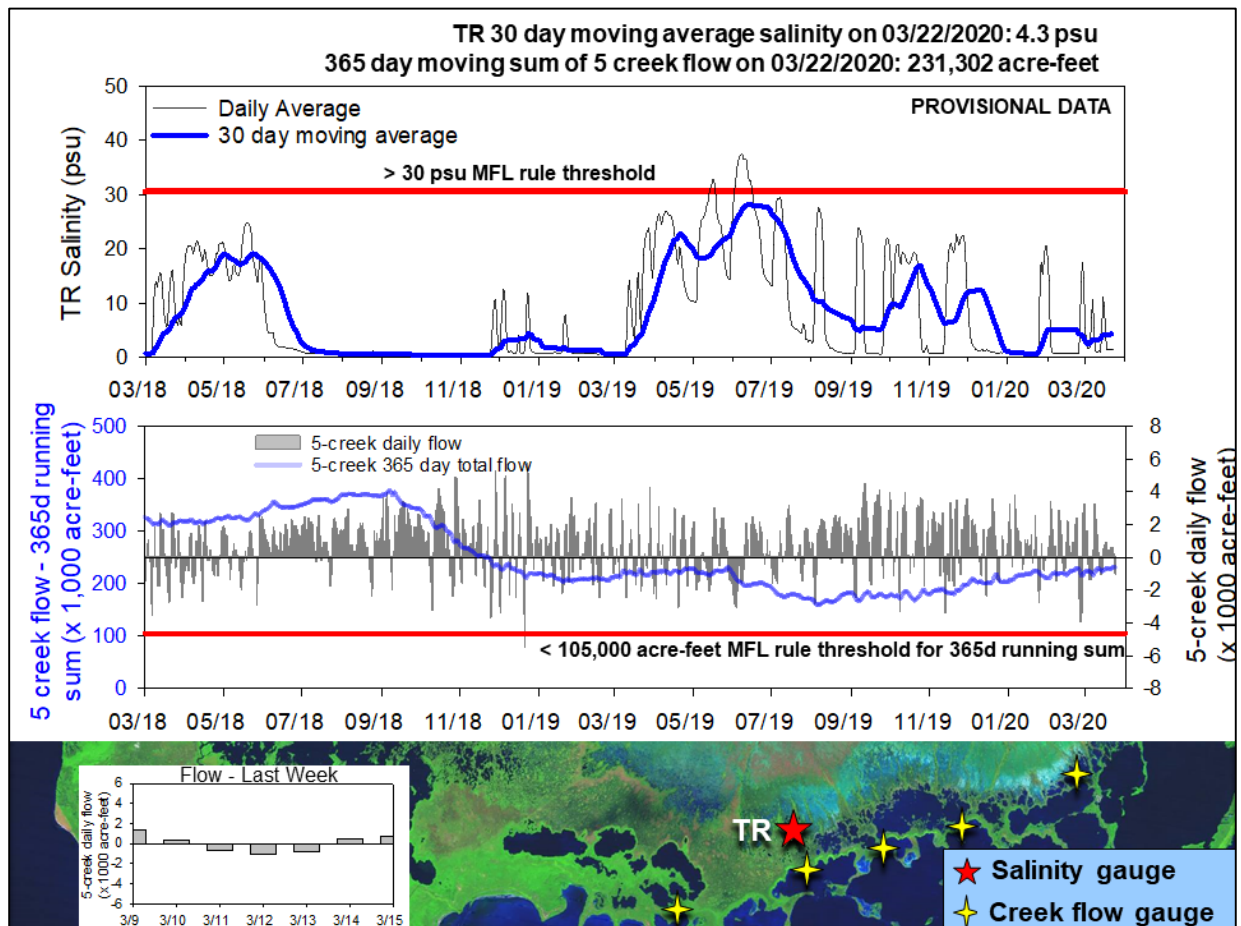
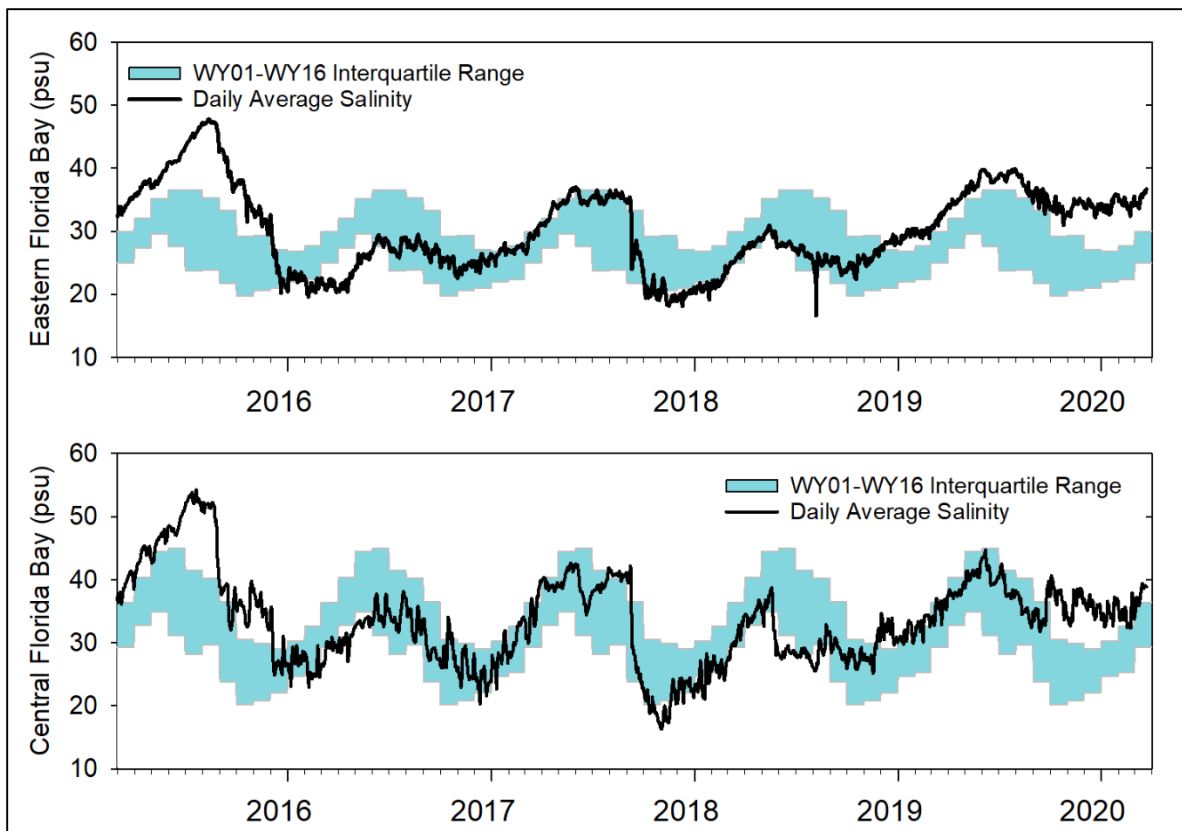
**South Florida Water Depth Assessment Tool (SFWDAT)**

Taylor Slough Water Levels: Next to no rain fell over Taylor Slough and Florida Bay this last week and stages decreased an average of -0.38 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 higher than the historical average for the dry season up until now, the UTS region is now an inch below average as it decreased a foot over the last week.









Florida Bay Salinities: Average salinity in Florida Bay increased 1 psu this week. Florida Bay average salinity is 7.5 psu higher than the historical average for this time of year. We are at the time of year when evaporation will increase salinities more rapidly until wet season rains start.

Florida Bay MFL: Salinity at the TR station in the mangrove zone (tracked for the Florida Bay MFL) decreased over the week to end at 1.4 psu. The 30-day moving average increased 0.2 psu to 4.3 psu. Weekly flow from the 5 creeks identified by yellow stars on the map totaled almost 3,100 acre-feet last week with small positive flows all week until this Monday. The 365-day moving sum of flow from the five creeks (tracked as part of the Florida Bay MFL criteria) increased 5,500 acre-feet this week to end at 231,302 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 are low for this time of year and salinities are high in Florida Bay. Conserving water within the WCA-3A and moving low nutrient water south has water has many ecological benefits, these benefits are unrealized when flows are lost to tide. Discharges into historically over drained northeastern WCA-3A 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 Northeastern WCA-3A would have greater ecological value than the same amount of water discharged in Northwestern 3A. Flows towards 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 24th, 2020 (red is new)

Area	Weekly change	Recommendation	Reasons
WCA-1	Stage decreased by 0.11'	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 0.18'	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 0.09'	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 0.12'	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 0.09'	Conserving water in this basin has benefit.	Protect tree islands, upstream/downstream habitat and wildlife.
ENP-SRS	Stage decreased by 0.16'	Make discharges to the Park according to the 2012 WCP rainfall plan.	Protect upstream/downstream habitat and wildlife.
Taylor Slough	Stage changes ranged from -0.08' to -1.14'	Move water southward as possible	When available, provide freshwater buffer for downstream conditions.
FB- Salinity	Salinity changes ranged -2.6 to +3.7 psu.	Move water southward as possible	When available, provide freshwater to maintain low salinity buffer and promote water movement.