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MEMORANDUM

TO: John Mitnik, Assistant Executive Director, Executive Office Staff

FROM: SFWMD Staff Environmental Advisory Team

DATE: April 22, 2020

SUBJECT: Weekly Environmental Conditions for Systems Operations

Summary

Weather Conditions and Forecast

Above-average rains this week, particularly Friday-Sunday, then decreasing prospects for rain next week. A weakening cold front is moving through the southern end of the District this morning and scattered light shower activity will move across areas south of the front this morning and early afternoon. Dry air behind the front has moved over central Florida and it should spread across south Florida this evening. Some moisture is forecast to creep back over the southern end of the District Wednesday and yield some isolated light showers south Wednesday afternoon and evening. This moisture should expand northward and yield scattered showers and a couple of thunderstorms focused over central Florida and between Lake Okeechobee and the east coast Thursday afternoon. The next cold front is forecast to move into north Florida Thursday night and then nudge south over the District Friday, wave back north Saturday, and then push completely through the District Sunday night and Monday. This frontal boundary should keep daily doses of showers and thunderstorms over the District Friday, Saturday, and Sunday with the potential for some pockets of heavy rain each day. Drier conditions should spread over the District behind the front Monday and Tuesday. The coming 7-day period ("Week 1") is forecast to produce above-average rainfall. In the extended outlook, a drier pattern is forecast to set up over the District so a change back to below-average rainfall is forecast for the second 7-day period ("Week 2").

Kissimmee

Tuesday morning stages were 52.5 feet NGVD (4.1 feet below schedule) in East Lake Toho, 53.0 feet NGVD (0.6 feet below schedule) in Toho, and 50.2 feet NGVD (0.1 feet below schedule) in Kissimmee-Cypress-Hatchineha; headwater stages were 46.2 feet NGVD at S-65A and 25.9 feet NGVD at S-65D. Tuesday morning discharges were 375 cfs at S-65, 375 cfs at S-65A, 338 cfs at S-65D and 259 cfs at S-65E. Dissolved oxygen concentration in the Kissimmee River averaged 8.3 mg/L for the week through Sunday. Kissimmee River mean floodplain depth on Sunday was 0.06 feet. **Today's recommendations:** Continue the snail kite recession on Lake Tohopekaliga to reach low pool (52 feet) on June 1st. Continue the recession on Lakes Kissimmee-Cypress-Hatchineha to reach 49 feet on June 1st.

Lake Okeechobee

Lake Okeechobee stage was 11.41 feet NGVD on April 21, 2020, down 0.03 feet from the previous week, and down 0.79 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 – 15 feet NGVD +/- 0.5 feet) on October 15, 2019 and are currently 0.90 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 1,115 cfs over the past week with no flow coming from Lake Okeechobee. The seven-day average salinities decreased 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 290 cfs over the past week with 156 cfs coming from the Lake. The seven-day average salinity little changed in the estuary over the past week. Salinities are in the good range for tape grass at Val I-75 but out of the good 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 in the poor range at Sanibel.

Lake stage is in the Beneficial Use sub-band of 2008 LORS. Tributary hydrological conditions are dry. The SFWMD's Lake Okeechobee Adaptive Protocol's Release Guidance suggests no release to the Caloosahatchee Estuary.

Stormwater Treatment Areas

Over the past week, 5,400 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 148,300 ac-feet. The total amount of inflows to the STAs in WY2020 is approximately 987,000 ac-feet. Most STA cells are above or 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 1, STA-2 Flow-way 2, STA-2 Flow-way 3, STA-2 Flow-way 4, STA-3/4 Eastern Flow-way, and STA-3/4 Central 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 Lake Okeechobee releases are sent to the WCAs and the conditions allow, the releases will be sent to STA-3/4 Central Flow-way.

Everglades

Current stages in northeastern WCA-3A remain well below average (Site 62 in the northwest is 0.55 feet below and Site 63 in the northeast is 0.9 feet below) for this time of year. Conserving fresh water in the Everglades, distributing it to where depths are low (WCA-3A NE and WCA-3A NW), then allowing it to flow south has important ecological benefit. Wading bird nesting and foraging numbers are building in WCA-3A South and WCA-1, ecological benefit is gained by slowing recession rates that exceed -0.09 feet per week when possible. The stage reversal in WCA-3A central probably had little negative impact on wading foraging and could maintain water levels above ground longer into the nesting effort, where wading bird nesting is increasing. A wildfire began in ENP on Sunday with the potential for rapid spread with below ground water levels in the area. Sparse rains over Taylor Slough and Florida Bay meant stage fell in Northern Taylor Slough over the last week and remain below average. Salinities increased slightly on average in FB and the 30-day moving average increased again at the Taylor River station. Flows from the 5 creeks associated with the FB MFL were positive last week.

Supporting Information

KISSIMMEE BASIN

Kissimmee Basin Rainfall

The Upper Kissimmee Basin received 0.95 inches of rainfall in the past week and the Lower Basin received 1.25 inches (SFWMD Daily Rainfall Report 4/19/2020).

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: 4/21/2020

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)						
							4/19/20	4/12/20	4/5/20	3/29/20	3/22/20	3/15/20	3/8/20
Lakes Hart and Mary Jane	S-62	0	LKMJ	60.1	R	60.3	-0.2	-0.3	-0.4	-0.4	-0.4	-0.4	-0.3
Lakes Myrtle, Preston, and Joel	S-57	0	S-57	60.5	R	60.5	0.0	-0.1	0.0	0.0	0.0	0.0	0.0
Alligator Chain	S-60	0	ALLI	62.9	R	63.1	-0.2	-0.4	-0.5	-0.6	-0.6	-0.7	-0.6
Lake Gentry	S-63	38	LKGT	60.7	R	60.6	0.1	0.1	0.0	-0.1	-0.1	-0.2	-0.2
East Lake Toho	S-59	0	TOHOE	52.6	R	56.7	-4.1	-4.5	-4.6	-4.8	-5.0	-5.2	-5.1
Lake Toho	S-61	190	TOHOW, S-61	53.0	R	53.7	-0.7	-0.9	-0.9	-1.1	-1.3	-1.3	-1.2
Lakes Kissimmee, Cypress, and Hatchineha	S-65	372	KUB011, LKIS5B	50.1	R	50.4	-0.3	-0.4	-0.5	-0.5	-0.2	0.0	0.2

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 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: 4/21/2020

Metric	Location	1-Day Average		Average for the Preceding 7-Days ¹							
		4/19/2020	4/19/20	4/12/20	4/5/20	3/29/20	3/22/20	3/15/20	3/8/20	3/1/20	2/23/20
Discharge (cfs)	S-65	373	372	365	357	448	690	920	1,013	983	918
Discharge (cfs)	S-65A ²	314	327	323	310	350	592	837	956	956	930
Discharge (cfs)	S-65D ²	341	317	308	302	476	699	940	968	985	960
Headwater Stage (feet NGVD)	S-65D ²	25.91	25.83	25.75	25.78	25.71	25.75	25.85	25.69	25.80	25.86
Discharge (cfs)	S-65E ²	291	282	283	262	433	653	864	891	905	880
Discharge (cfs)	S-67	0	0	0	0	0	0	0	0	0	0
DO (mg/L) ³	Phases I & II/III river channel	8.7	8.3	7.6	7.4	6.9	7.6	8.0	8.3	8.0	7.4
Mean depth (feet) ⁴	Phase I floodplain	0.06	0.06	0.07	0.07	0.08	0.11	0.20	0.24	0.26	0.26

¹Seven-day average of weighted daily means through Sunday midnight.

²S-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.

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

⁴1-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)

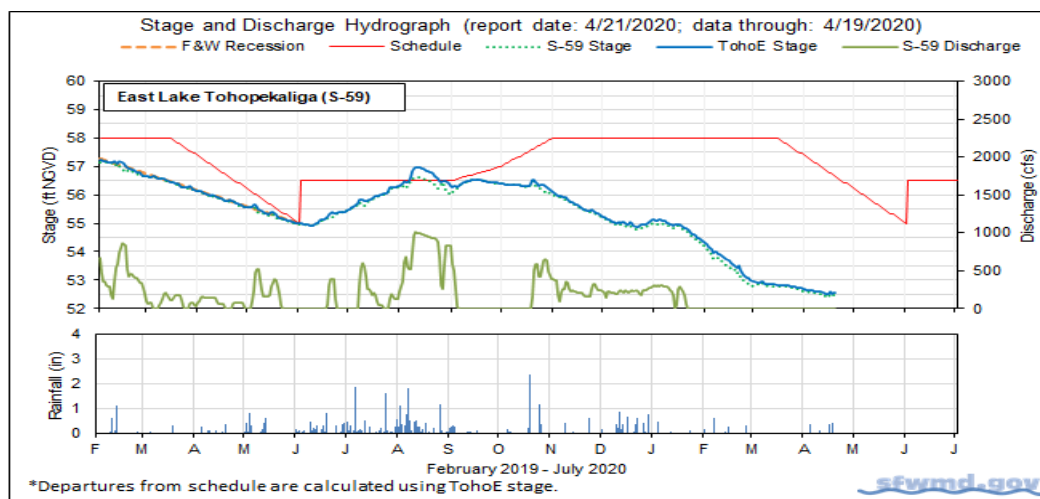


Figure 1.

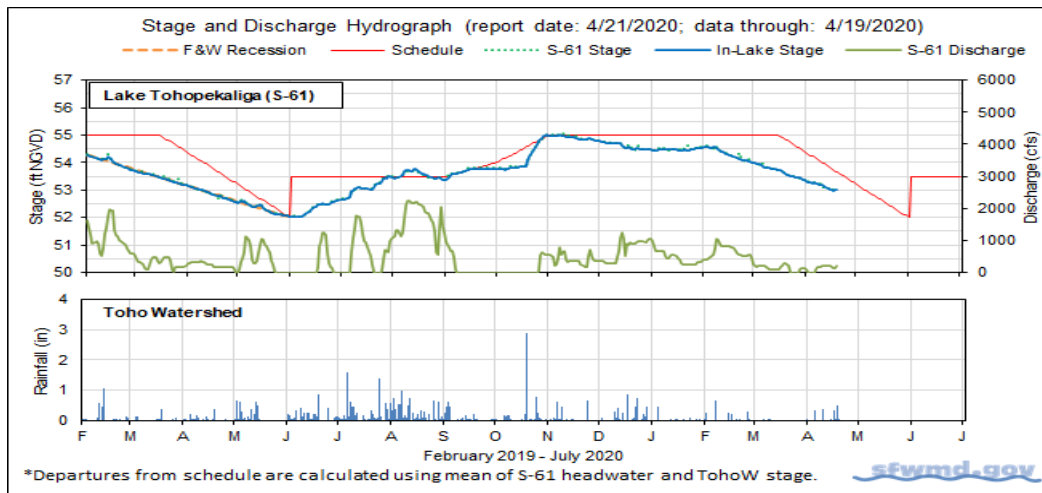


Figure 2.

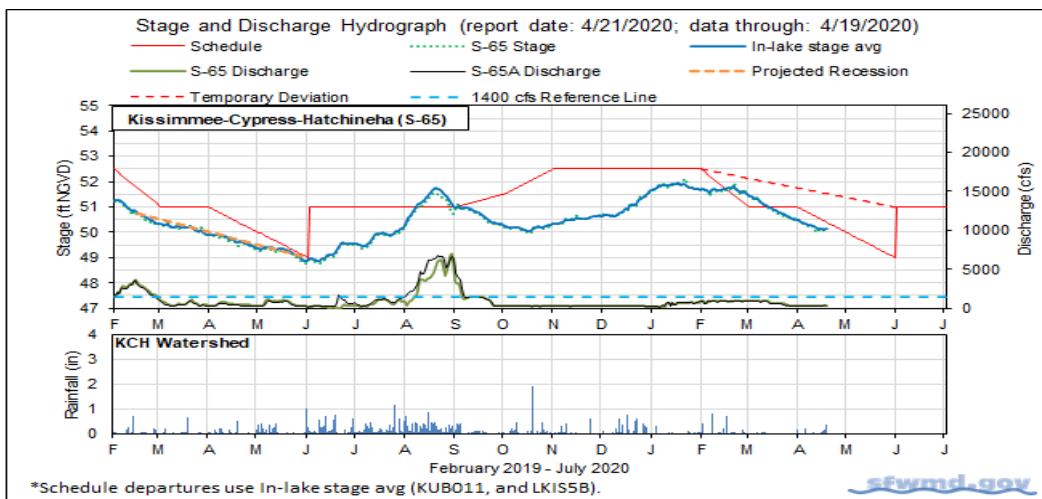


Figure 3.

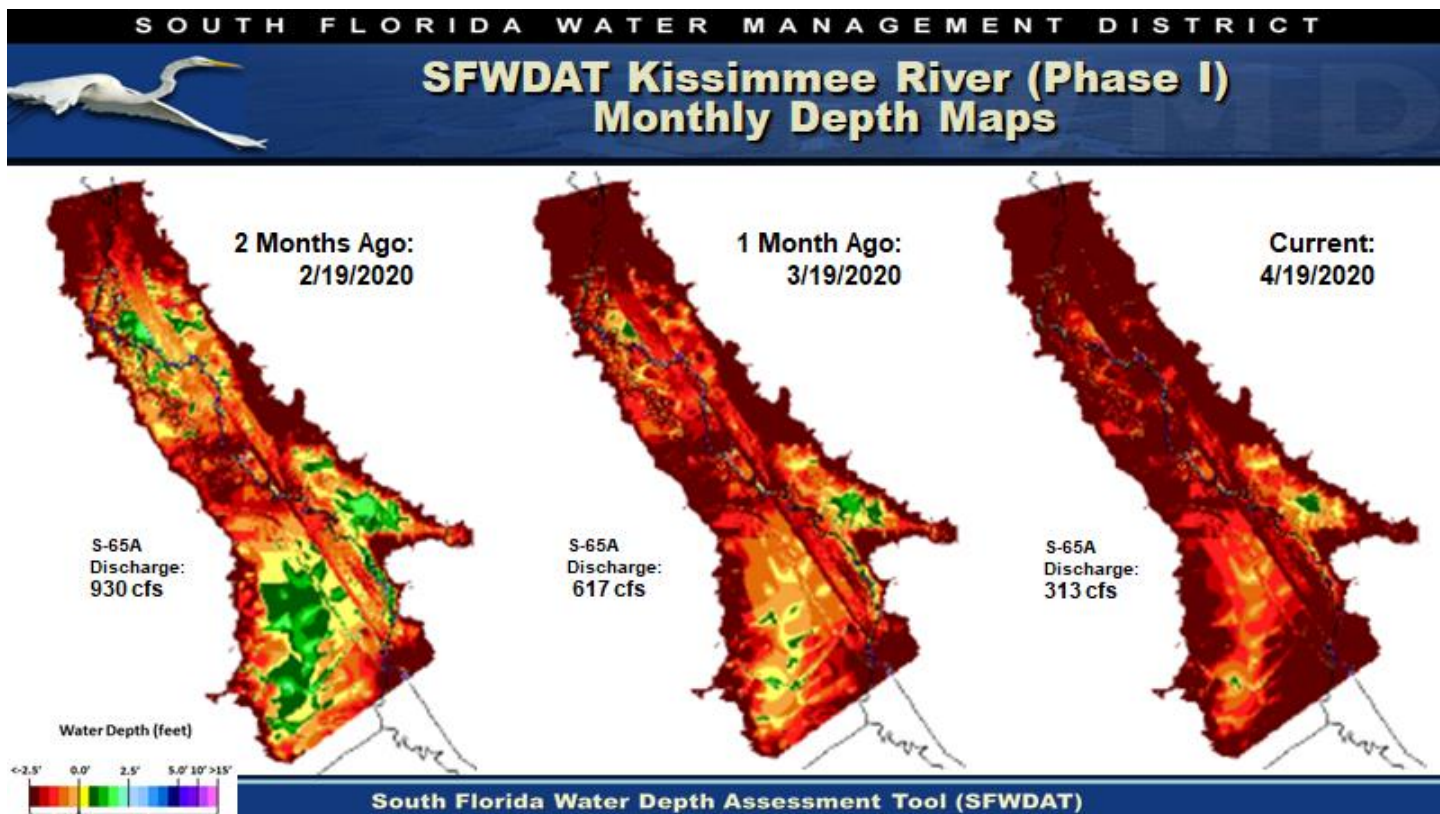
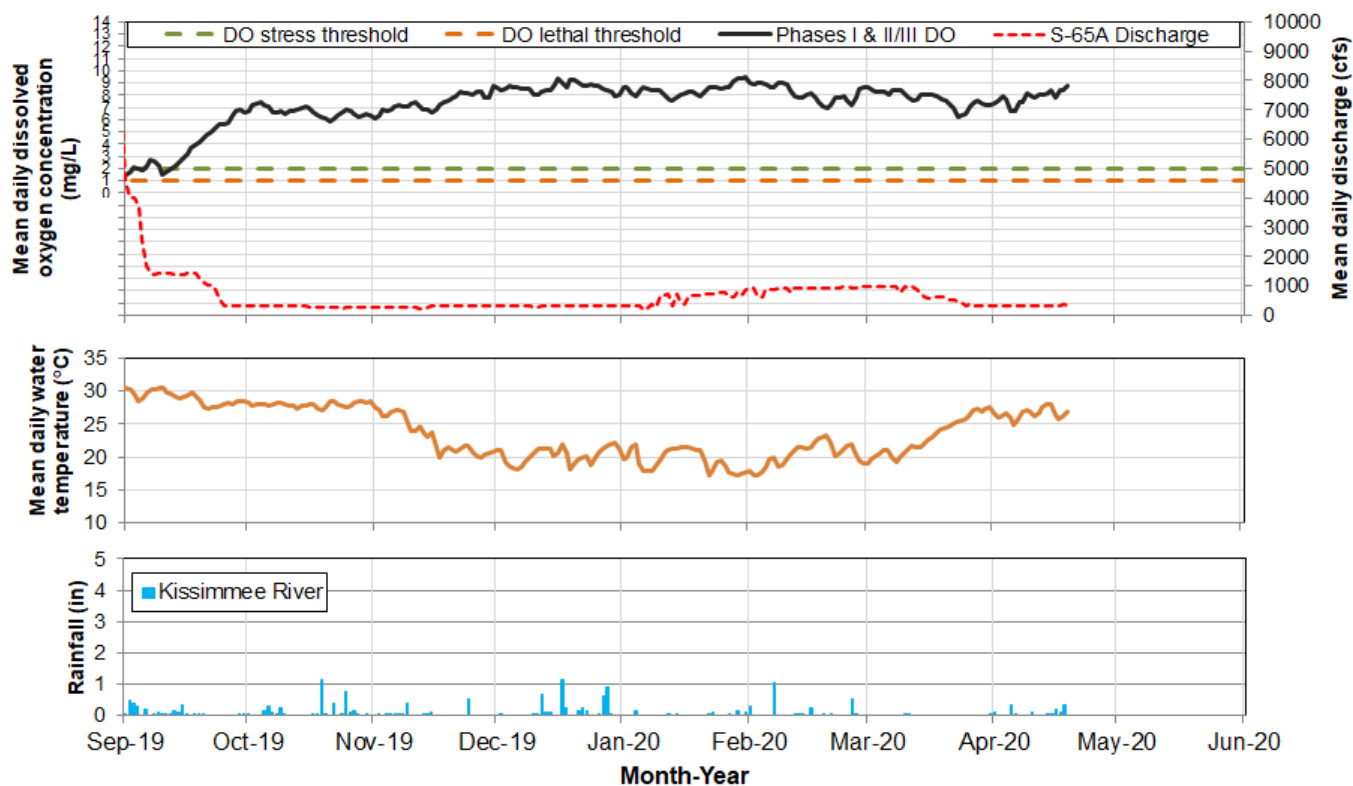


Figure 4. Phase I area floodplain water depths for this week, one month ago, and two months ago. Note that the WDAT color-coding has been modified to accommodate greater water depths; these maps are not directly comparable to Kissimmee Basin WDAT maps published prior to January 16, 2012.



Report Date: 4/21/2020; data are through: 4/19/2020.

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

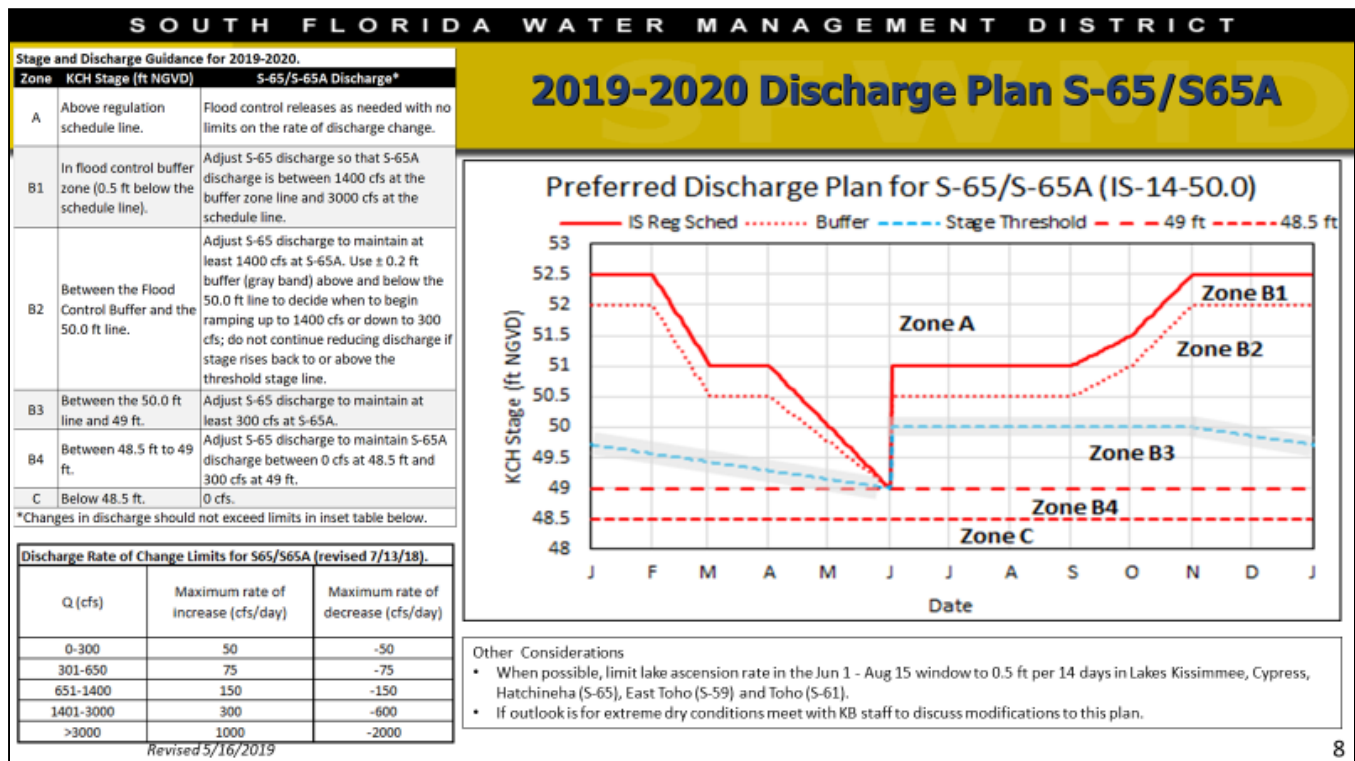


Figure 6. The 2019-2020 Discharge Plan for S-65/S-65A.

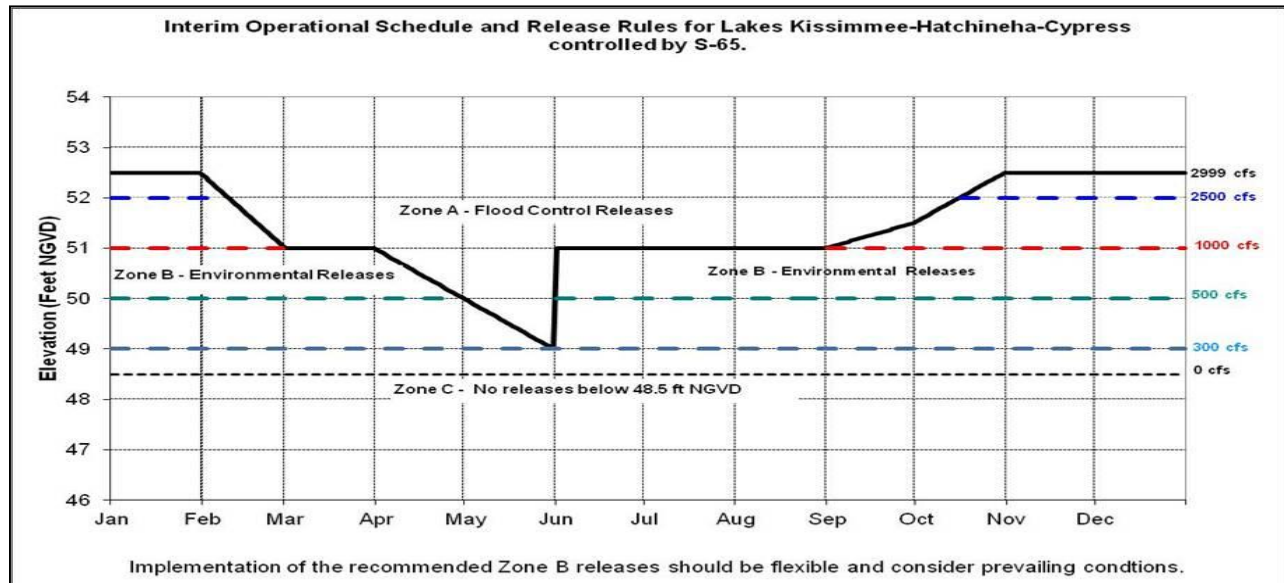


Figure 7. Interim operations schedule for S-65. The discharge schedule shown to the right has not been used in recent years.

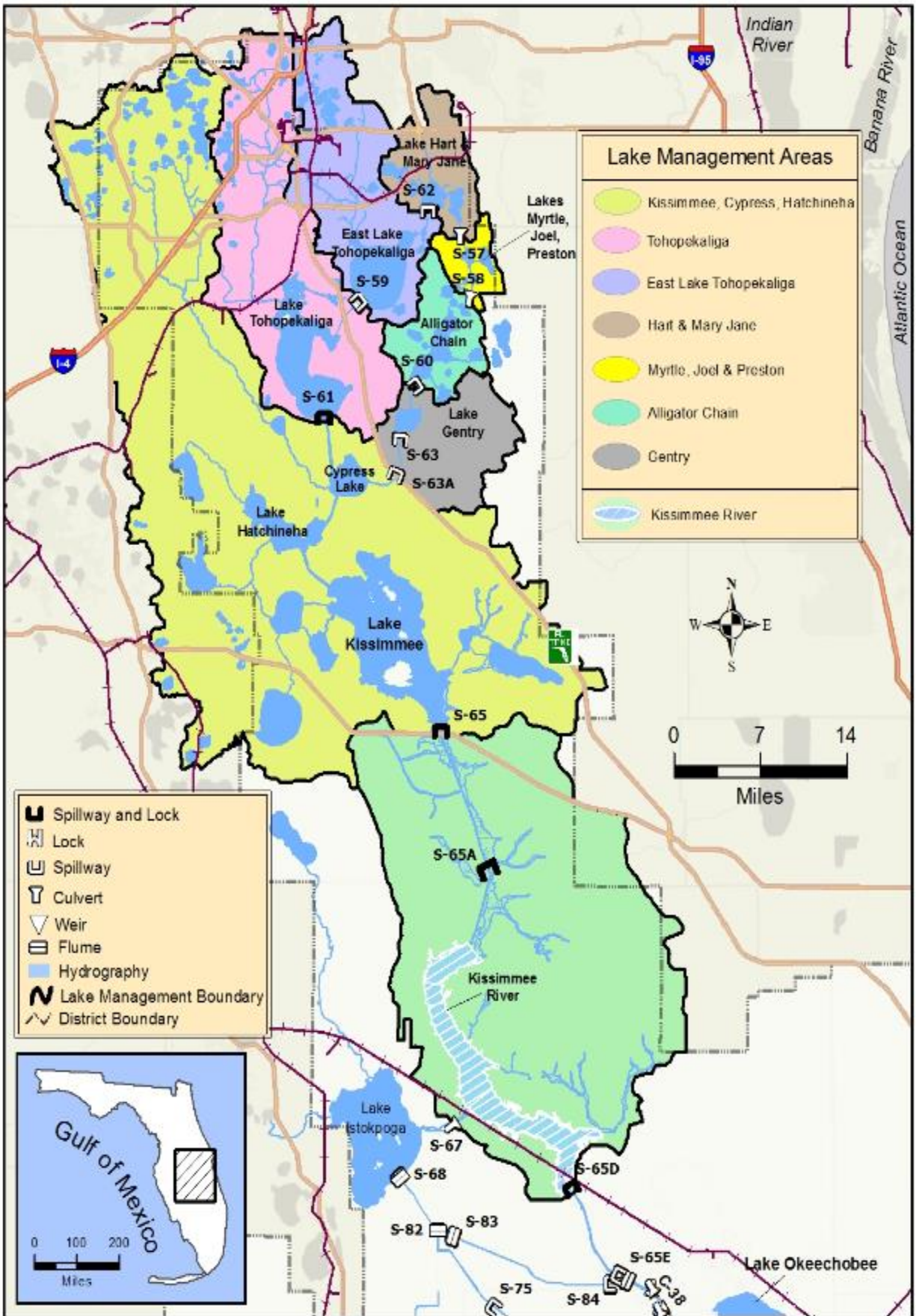


Figure 8. The Kissimmee Basin.

LAKE OKEECHOBEE

Lake Okeechobee stage is 11.41 feet NGVD, 0.79 feet lower than a month ago and 0.11 feet lower than one year ago (Figure 1). The Lake is currently 0.90 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 from December 2019 to mid-February 2020, before declining over 1.5 feet in the past two months. According to RAINДАР, 1.83 inches of rain fell directly over the Lake during the past week (Figure 4). The regions to the northeast of the Lake received between 1 and 4 inches of rain while the southwest region received less than an inch of rain.

The average daily inflows (minus rainfall) increased slightly going from 277 cfs to 303 cfs, and average daily outflows (minus evapotranspiration) decreased by around 500 cfs from the previous week to total 2,189 cfs. Almost all the inflow (256 cfs) came from the Kissimmee River (S-65E & S-65EX1), while most of the outflows were released south through the S-350 structures (1,542 cfs) or west through S-77 (C-43/Caloosahatchee Canal, 578 cfs). An additional 70 cfs were released east through the L8 Canal and the S-308 structure. 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.

A review of water quality samples collected in March over the past 4 years (2017 – 2020) showed similar or slightly lower nearshore values in March 2020 compared to March 2019, and improved conditions compared to March 2018, six months after Hurricane Irma (Figure 6). Conversely, all pelagic values were similar to or increased over the past two years but were still well below the March 2018 post-hurricane levels. The elevated turbidity and associated TP in the pelagic may be indicative of continued sediment disruption from Hurricane Irma in late 2017 or may be related to lower lake stages that can increase the depth at which wave disturbance can reach sediments.

Current satellite imagery (April 14, 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 northwestern shoreline of the Lake, slightly lower than this time last year (Figure 7). Blooms during this time of year tend to be ephemeral in nature with slight changes occurring in intensity and location along the western and northern sides of the lake from week to week.

Water Management Summary

Lake Okeechobee stage was 11.41 feet NGVD on April 21, 2020, down 0.03 feet from the previous week, and down 0.79 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 – 15 feet NGVD +/- 0.5 feet) on October 15, 2019 and are currently 0.90 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	270	256	0.1
S-71 & S-72	0	31	0.0
S-84 & S-84X	0	11	0.0
Fisheating Creek	7	5	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	125	3804	1.8
Total	402	4107	2.0

OUTFLOWS	Previous week Avg Daily CFS	Avg Daily Flow cfs	Equivalent Depth Week Total (in)
S-77	761	578	0.3
S-308	32	32	0.0
S-351	1049	820	0.4
S-352	292	350	0.2
S-354	503	372	0.2
L-8 Outflow	81	38	0.0
ET	3007	2135	1.0
Total	5724	4324	2.1

Provisional Data

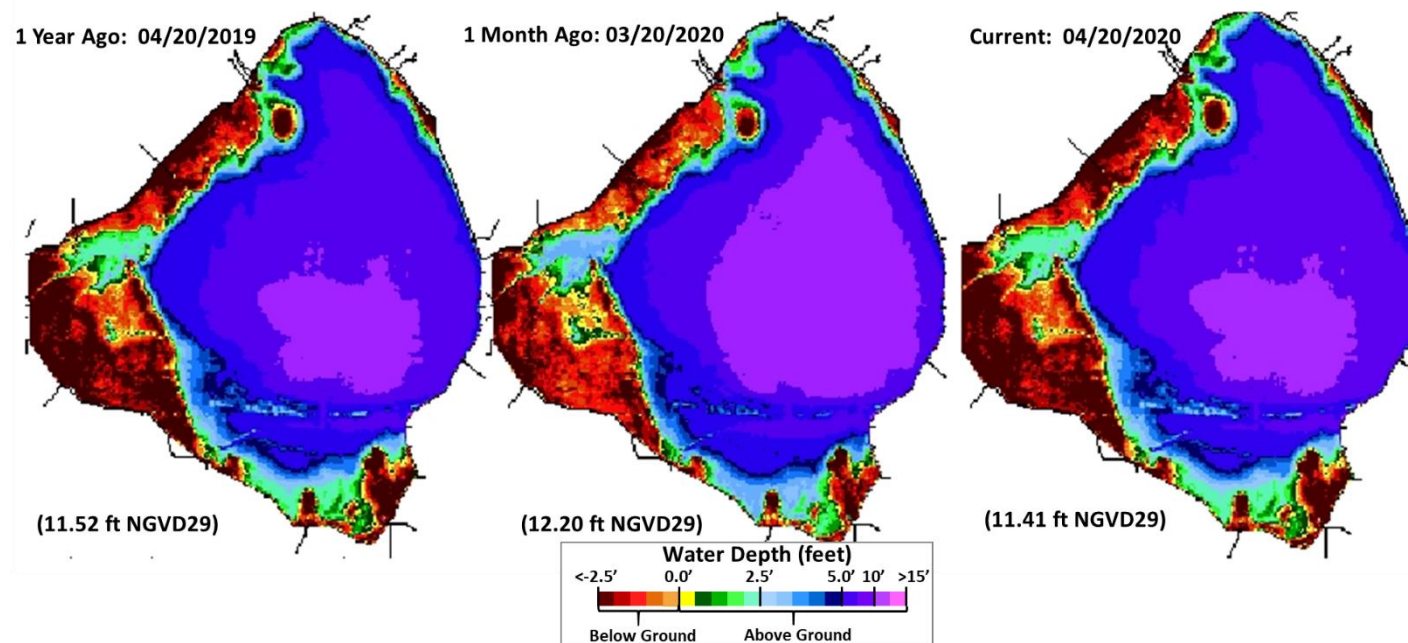


Figure 1. Water depth estimates on Lake Okeechobee based on the South Florida Water Depth Assessment Tool.

Lake Okeechobee Stage vs (Draft) Ecological Envelope

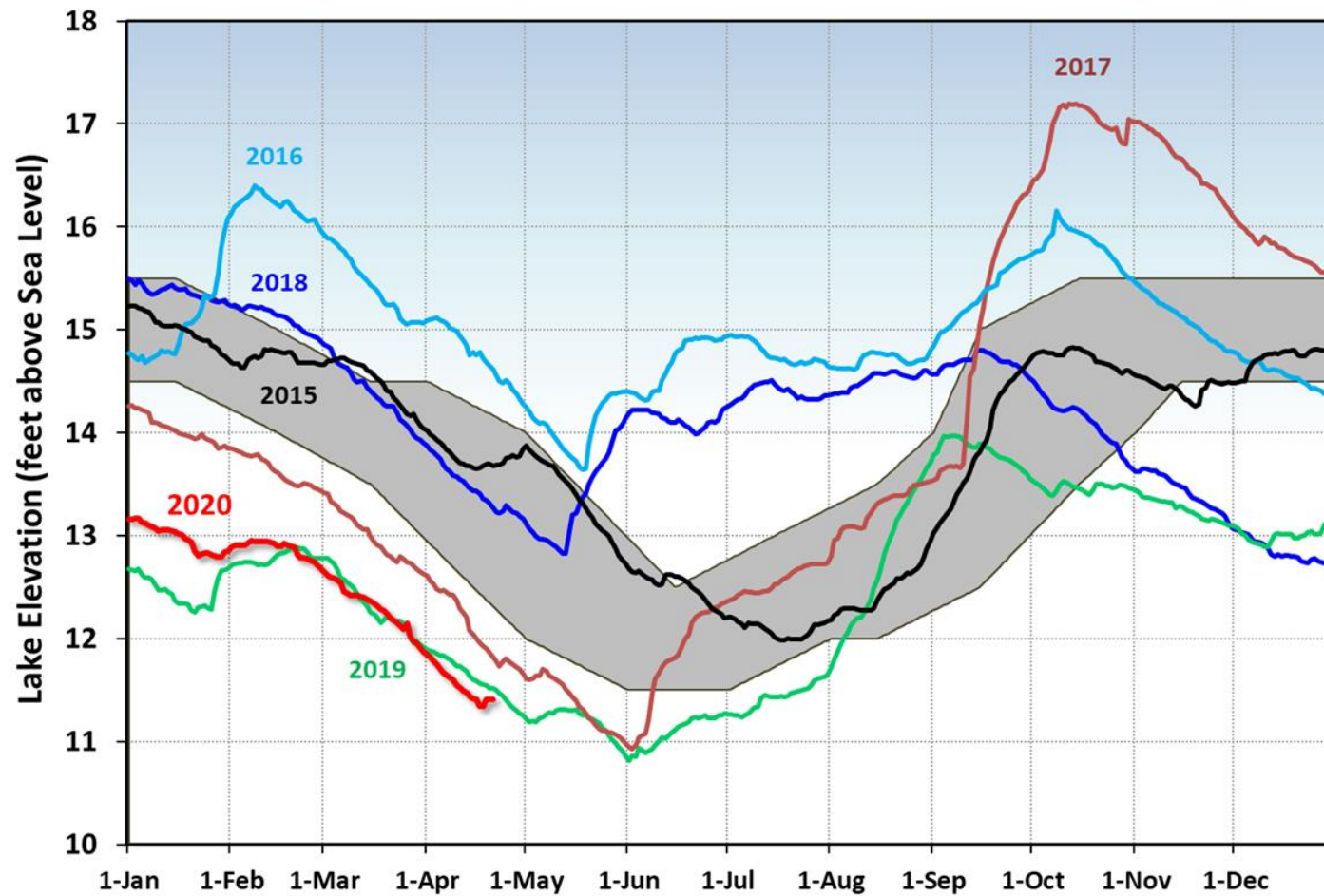


Figure 2. Select annual stage hydrographs for Lake Okeechobee in comparison to the (Draft) updated Ecological Envelope.

Lake Okeechobee Water Level History and Projected Stages

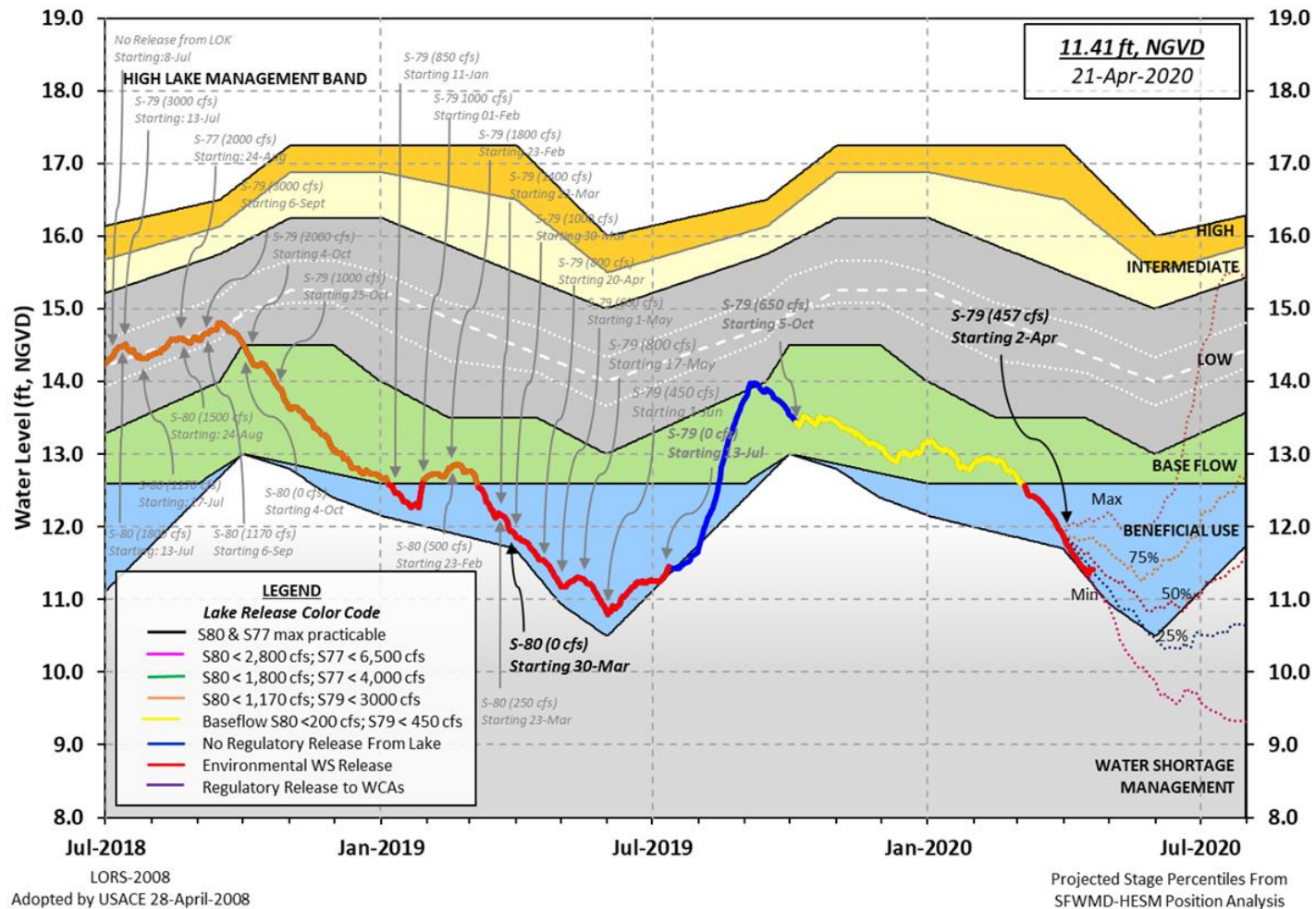


Figure 3. Recent Lake Okeechobee stage and releases, with projected stages based on a dynamic position analysis.

SFWMD PROVISIONAL RAINDAR 7-DAY BASIN RAINFALL ESTIMATES

FROM: 0400 EST, 04/14/2020 THROUGH: 0400 EST, 04/21/2020

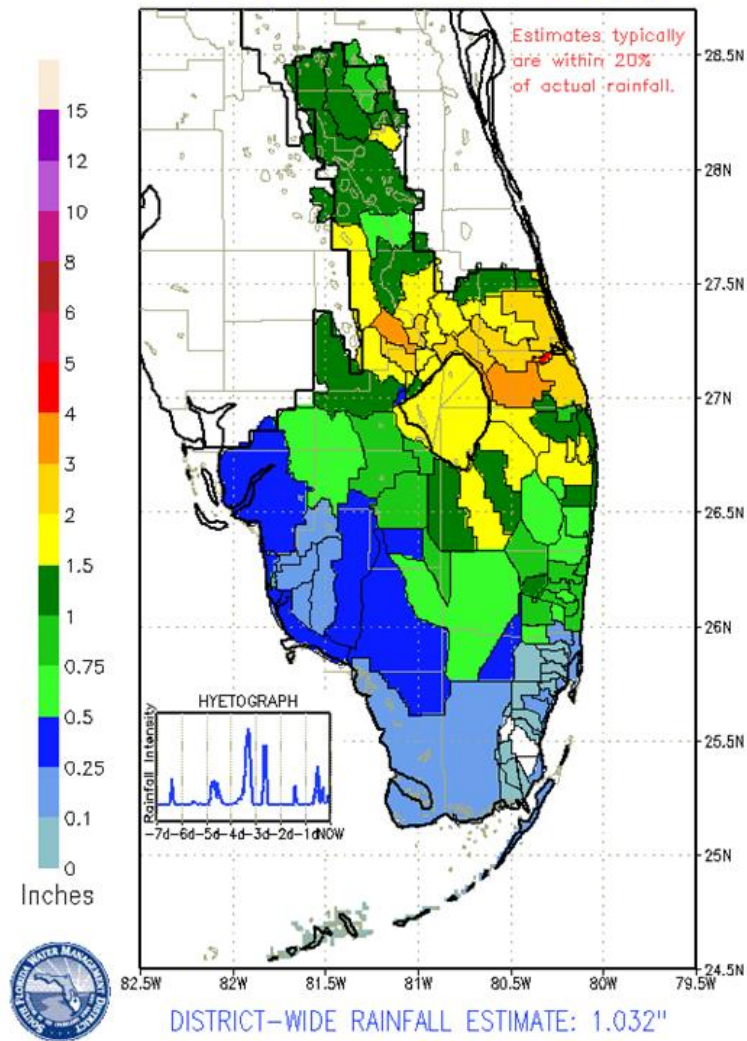


Figure 4. 7-Day rainfall estimates by RAINDAR.

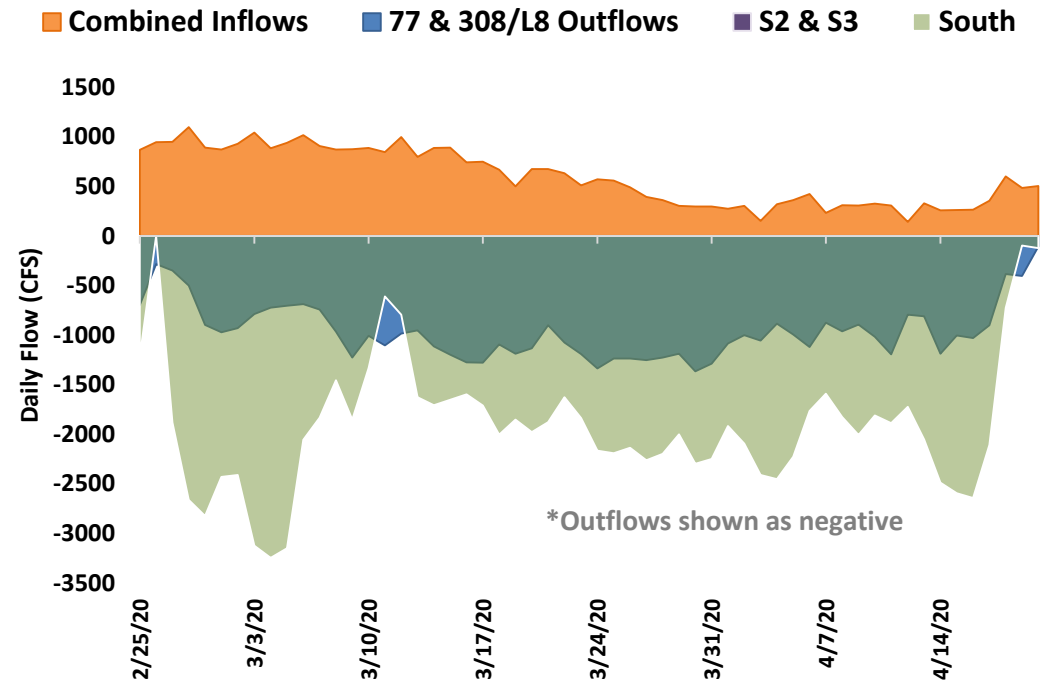
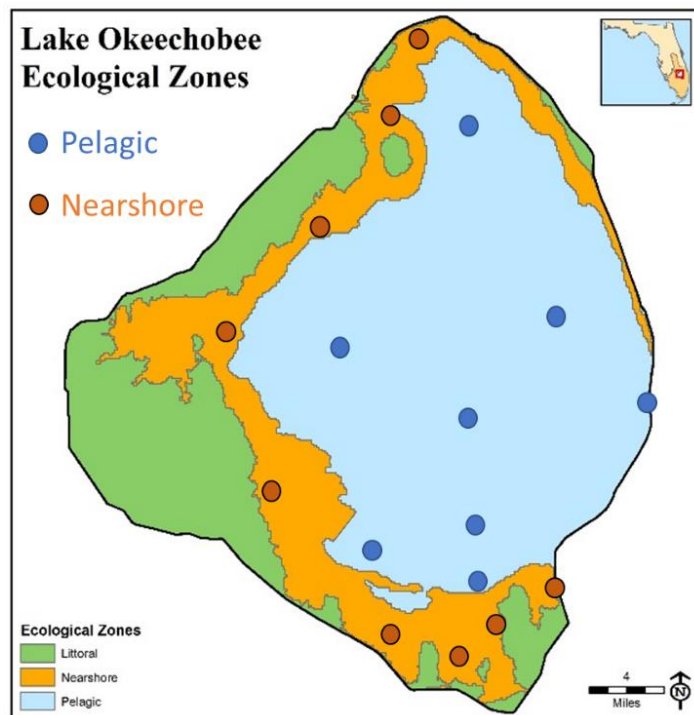


Figure 5. Major inflows (orange) and outflows (blue) of Lake Okeechobee, including the S-350 structures designated as South (green). The L-8 Canal flows through Culvert 10A are included as outflows when positive, and as inflows when backflowing into the Lake. All inflows and outflows are shown as positive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



Average March water quality for years 2017-2020

Location	Year	Chla (ug/L)	DIN (mg/L)	TN (mg/L)	SRP (ug/L)	TP (ug/L)	Turbidity (NTU)
Nearshore	2017	18.6	0.176	1.19	0.027	0.105	19.0
	2018	8.3	0.486	1.69	0.078	0.200	51.7
	2019	17.2	0.198	1.54	0.038	0.139	30.7
	2020	12.5	0.227	1.45	0.033	0.121	27.5
Pelagic	2017	10.4	0.406	1.45	0.060	0.161	49.7
	2018	5.3	0.559	1.81	0.082	0.265	101.4
	2019	8.0	0.315	1.41	0.058	0.160	45.5
	2020	8.7	0.355	1.57	0.057	0.182	60.8

Chlorophyll *a* (Chla), Dissolved Inorganic Nitrogen (DIN), Total Nitrogen (TN), Soluble Reactive Phosphorus (SRP), Total Phosphorus (TP)

Figure 6. Average concentrations of selected water quality parameters at nearshore (n=8) and pelagic (n=9) stations for March 2017 - 2020. Measured parameters are Chlorophyll *a* (Chla), Dissolved Inorganic Nitrogen (NH₄ and NO_x), Total Nitrogen (TN), Soluble Reactive Phosphorus (SRP = OPO₄), Total Phosphorus (TP), and turbidity. Data are provisional.

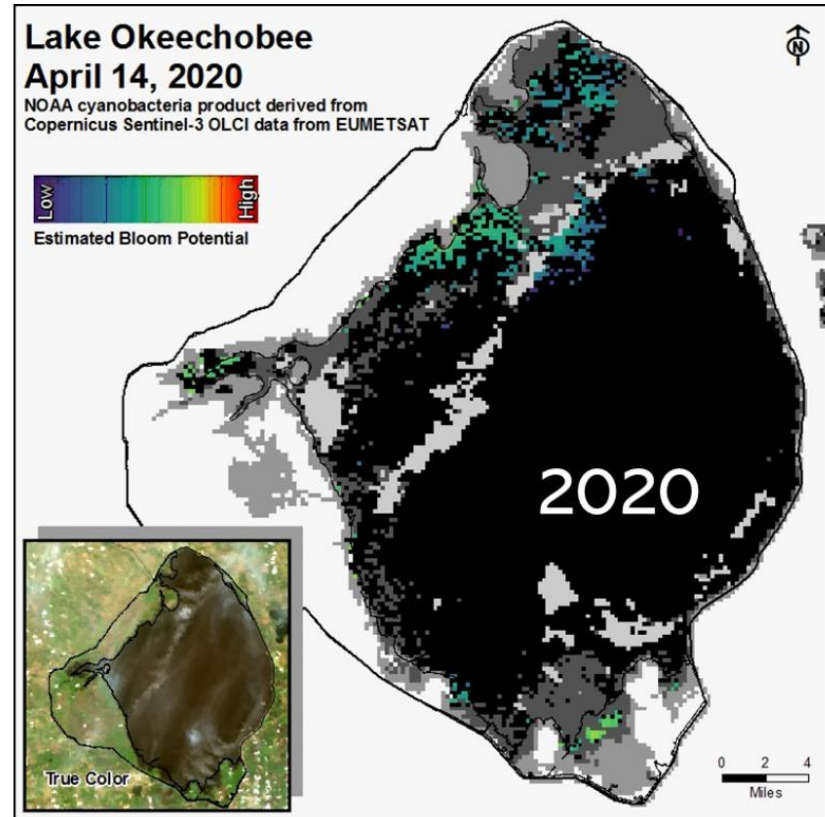
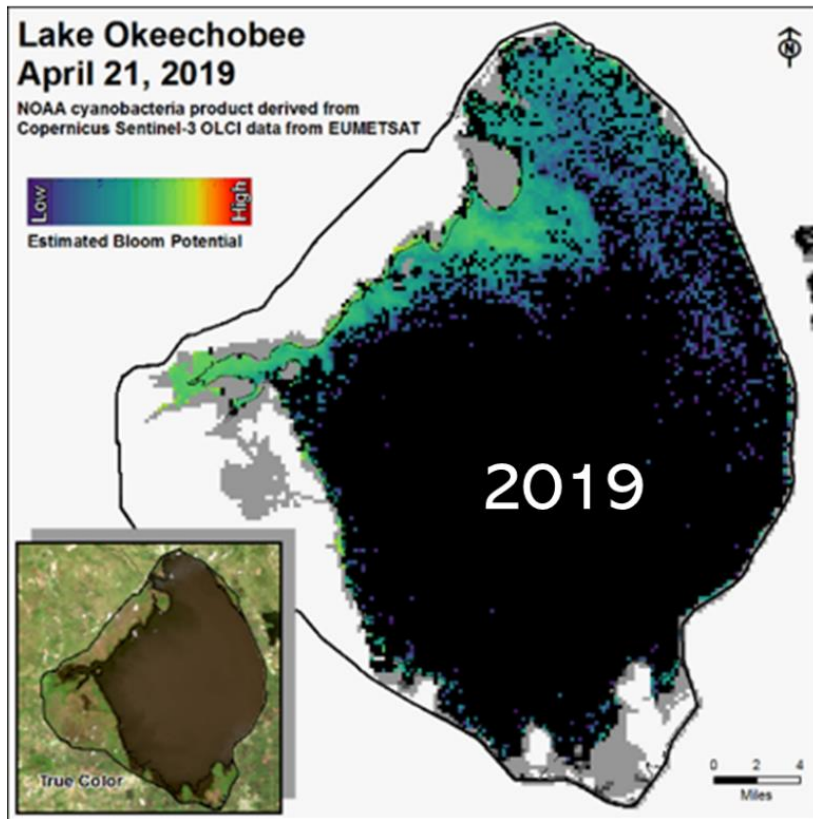


Figure 7. Potential for cyanobacterial blooms on Lake Okeechobee in mid-April 2019 and 2020, based on NOAA's harmful algal bloom monitoring system. Gray color indicates cloud cover.

ESTUARIES

St. Lucie Estuary:

Last week total inflow to the St. Lucie Estuary averaged approximately 1,115 cfs (Figures 1 and 2) and last month inflow averaged about 448 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).

Location	Flow (cfs)
Tidal Basin Inflow	1046
S-80	0
S-308	32
S-49 on C-24	0
S-97 on C-23	0
Gordy Rd. structure on Ten Mile Creek	69

Over the past week, salinity decreased 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 25.6. 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.

Sampling Site	Surface	Bottom	Envelope
HR1 (North Fork)	22.4 (23.3)	23.5 (24.5)	NA ¹
US1 Bridge	25.2 (25.9)	25.5 (26.1)	10.0-26.0
A1A Bridge	30.8 (31.4)	31.4 (32.0)	NA ¹

¹Envelope not applicable

Caloosahatchee Estuary:

Last week total inflow to the Caloosahatchee Estuary averaged approximately 290 cfs (Figures 5 and 6) and last month inflow averaged about 533 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).

Location	Flow (cfs)
S-77	578
S-78	288
S-79	211
Tidal Basin Inflow	79

Over the past week, salinity remained about the same throughout the estuary (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 in the poor range at Sanibel (Figure 9). The seven-day average surface salinities (Table 4) are in the good range for tape grass at Val I-75 but is out of optimum range 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 at Val I-75 is for the protection of tape grass in the upper estuary and the envelope in the lower estuary reflects the preferred salinity range for adult eastern oysters (*Crassostrea virginica*).

Sampling Site	Surface	Bottom	Envelope
S-79 (Franklin Lock)	2.5 (3.0)	3.6 (4.0)	NA ¹
Val I75	5.3 (5.1)	6.1 (6.4)	0.0-5.0 ²
Ft. Myers Yacht Basin	13.7 (13.4)	14.7 (14.5)	NA
Cape Coral	22.6 (22.3)	23.7 (23.9)	10.0-30.0
Shell Point	32.1 (32.2)	32.4 (32.7)	10.0-30.0
Sanibel	34.7 (34.6)	35.4 (35.7)	10.0-30.0

¹Envelope not applicable and ²Envelope is based on a 2-week forecast 30-day average.

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 5.2 to 8.2 at the end of the two week period for pulse release at S-79 ranging from 0 to 800 cfs and estimated Tidal Basin inflows of 65 cfs. The 30-day moving average surface salinity at Val I-75 is forecast to be between 5.1 and 6.0 (Table 5). The current salinity conditions at Val I-75 are outside of 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	65	8.2	6.0
B	300	65	7.8	5.9
C	450	65	7.1	5.6
D	650	65	5.6	5.2
E	800	65	5.2	5.1

Red tide

The Florida Fish and Wildlife Research Institute reported on April 17, 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 South Florida Water Management District's Lake Okeechobee Adaptive Protocol's Release Guidance suggests no release from the lake to the Caloosahatchee Estuary.

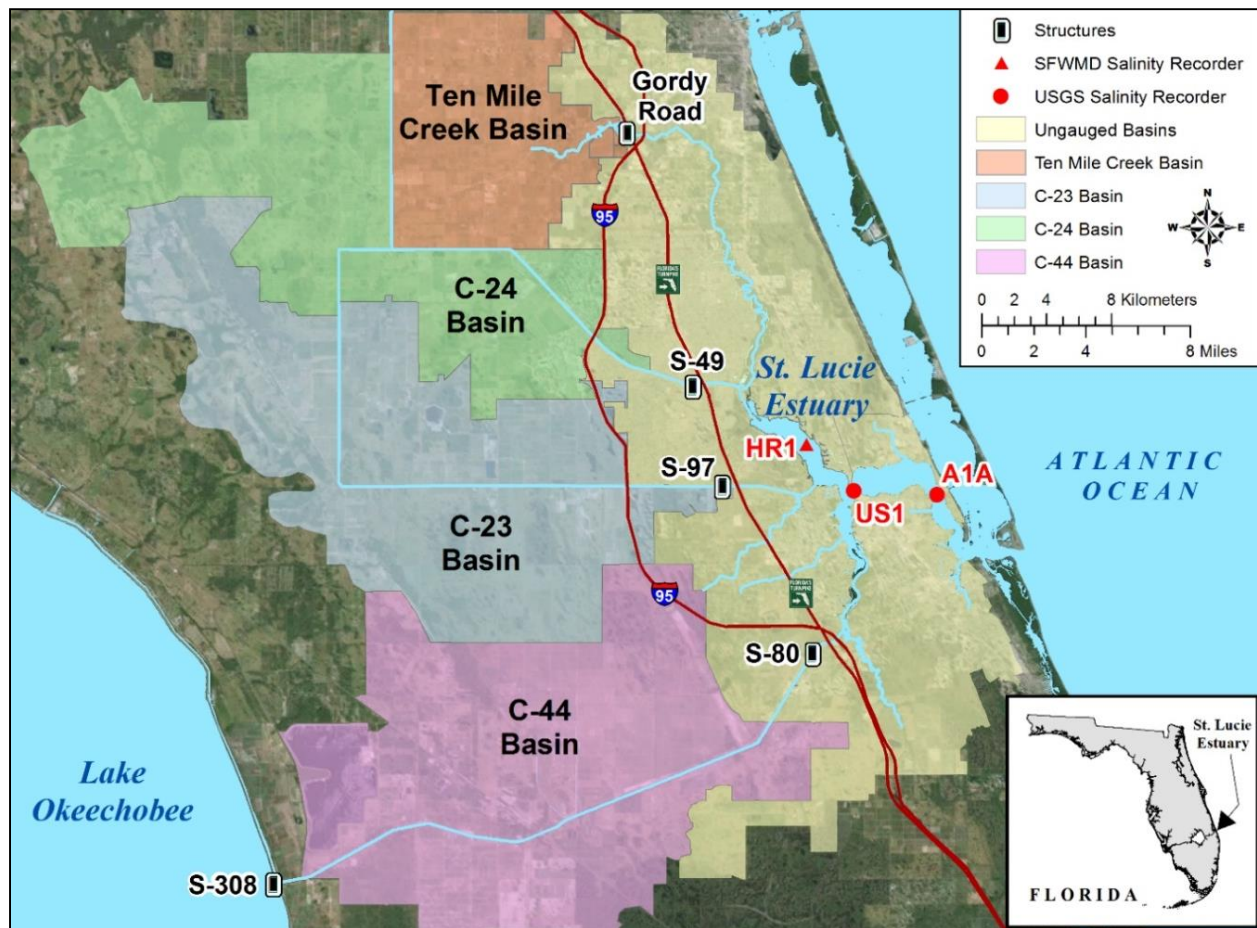


Figure 1. Basins, water control structures, and salinity monitoring for the St. Lucie Estuary.

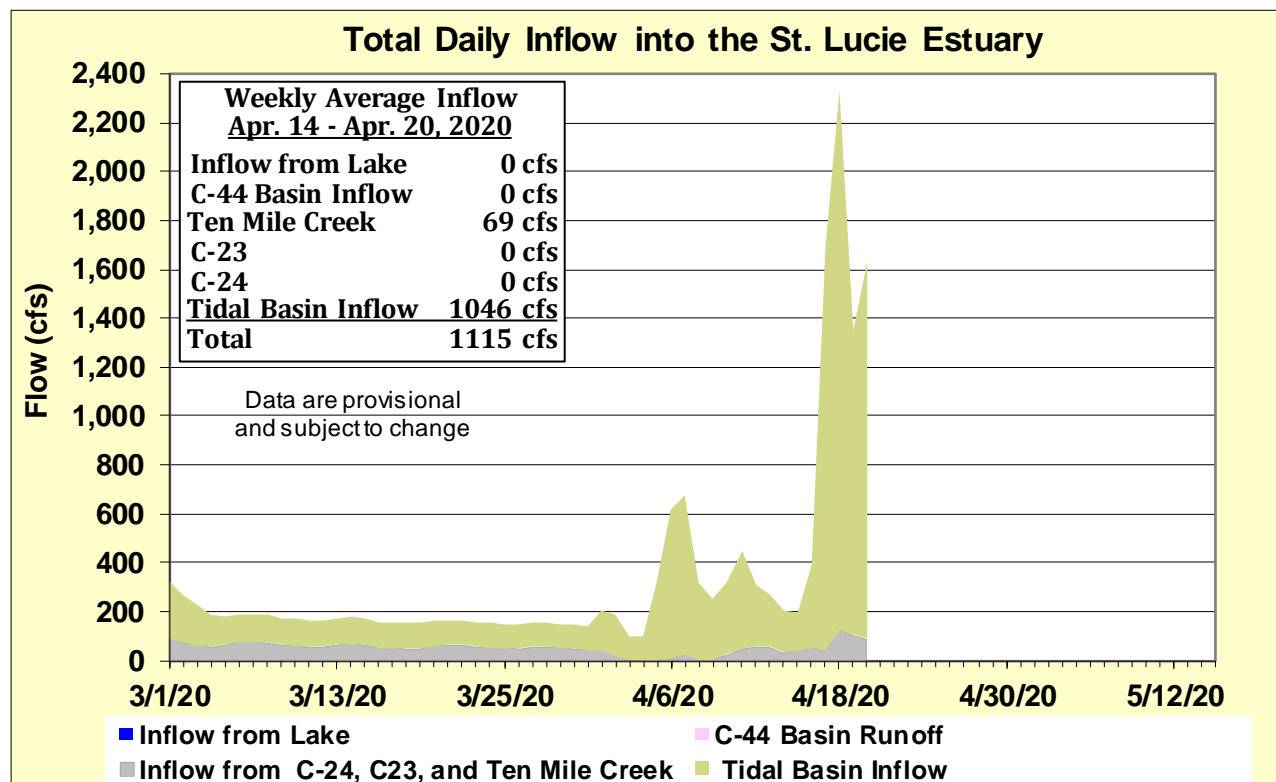


Figure 2. Total daily inflows from Lake Okeechobee and runoff from the C-44, C-23, C-24, Ten Mile Creek, and tidal basin into the St. Lucie Estuary.

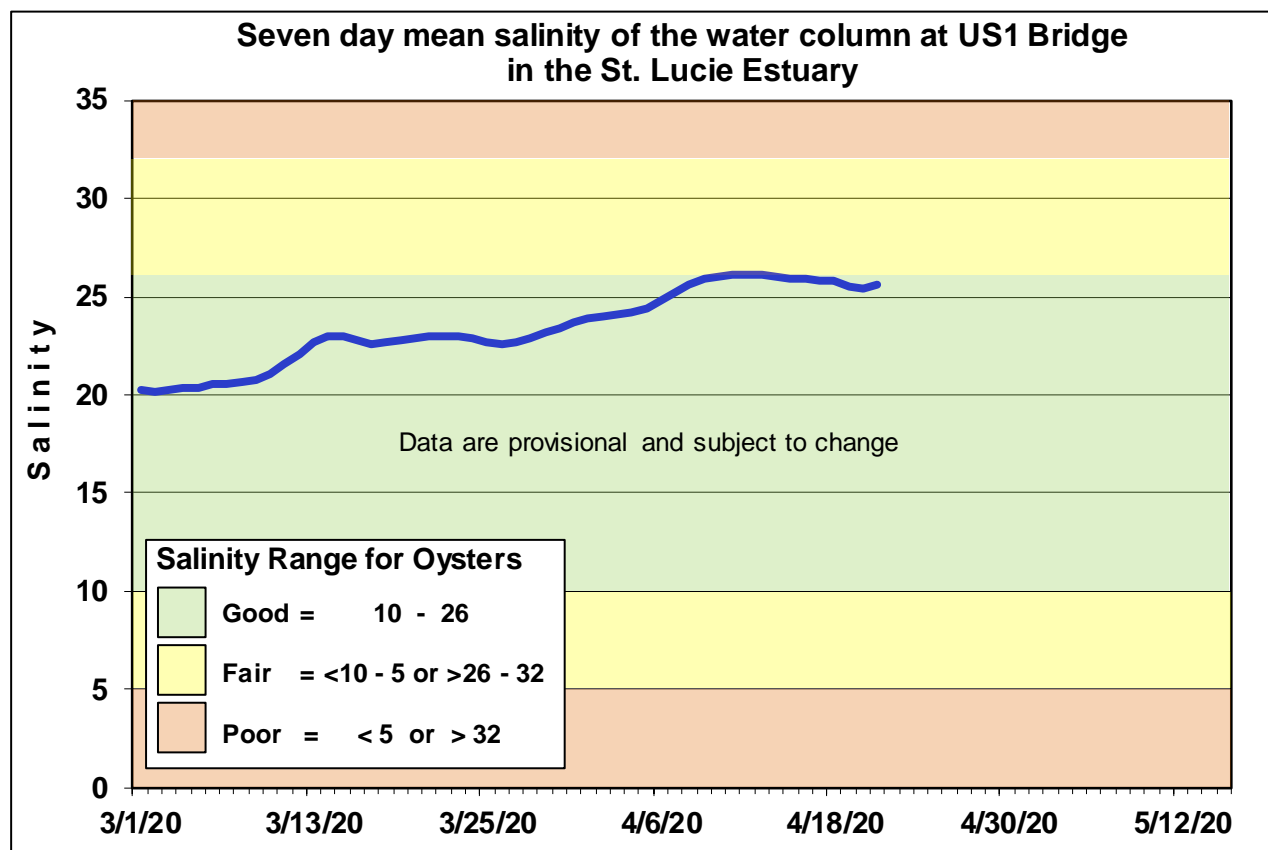


Figure 3. Seven-day mean salinity of the water column at the US1 Bridge.

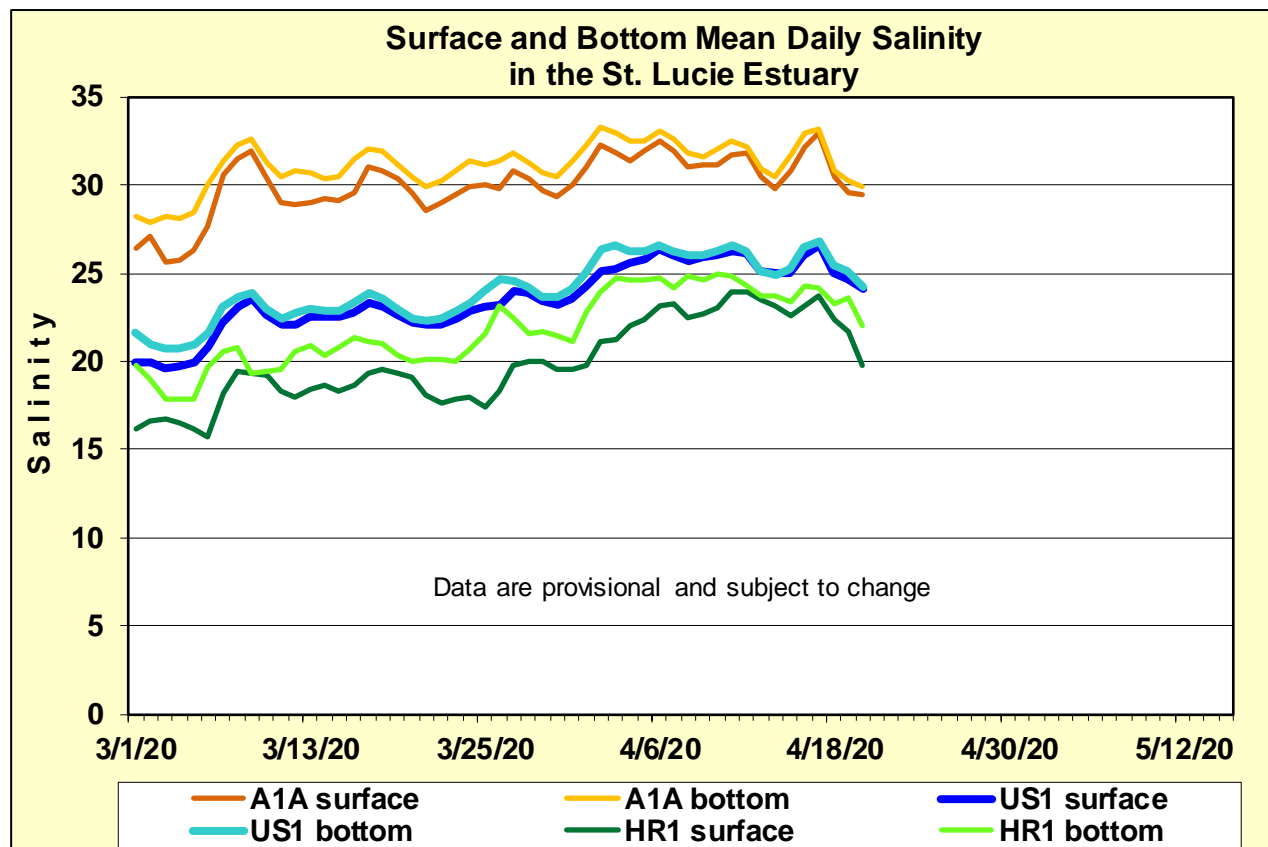


Figure 4. Daily mean salinity at the A1A, US1, and HR1 stations.

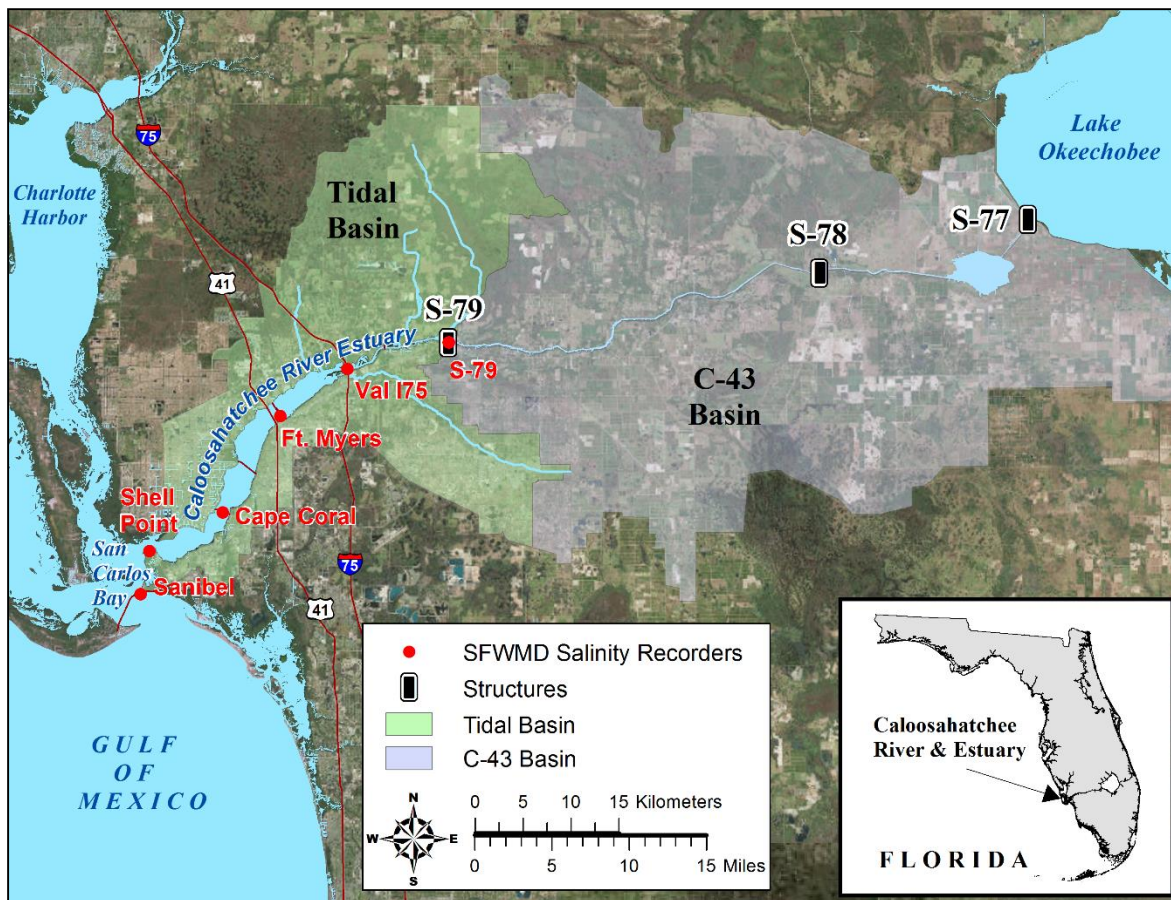


Figure 5. Basins, water control structures, and salinity monitoring for the Caloosahatchee Estuary.

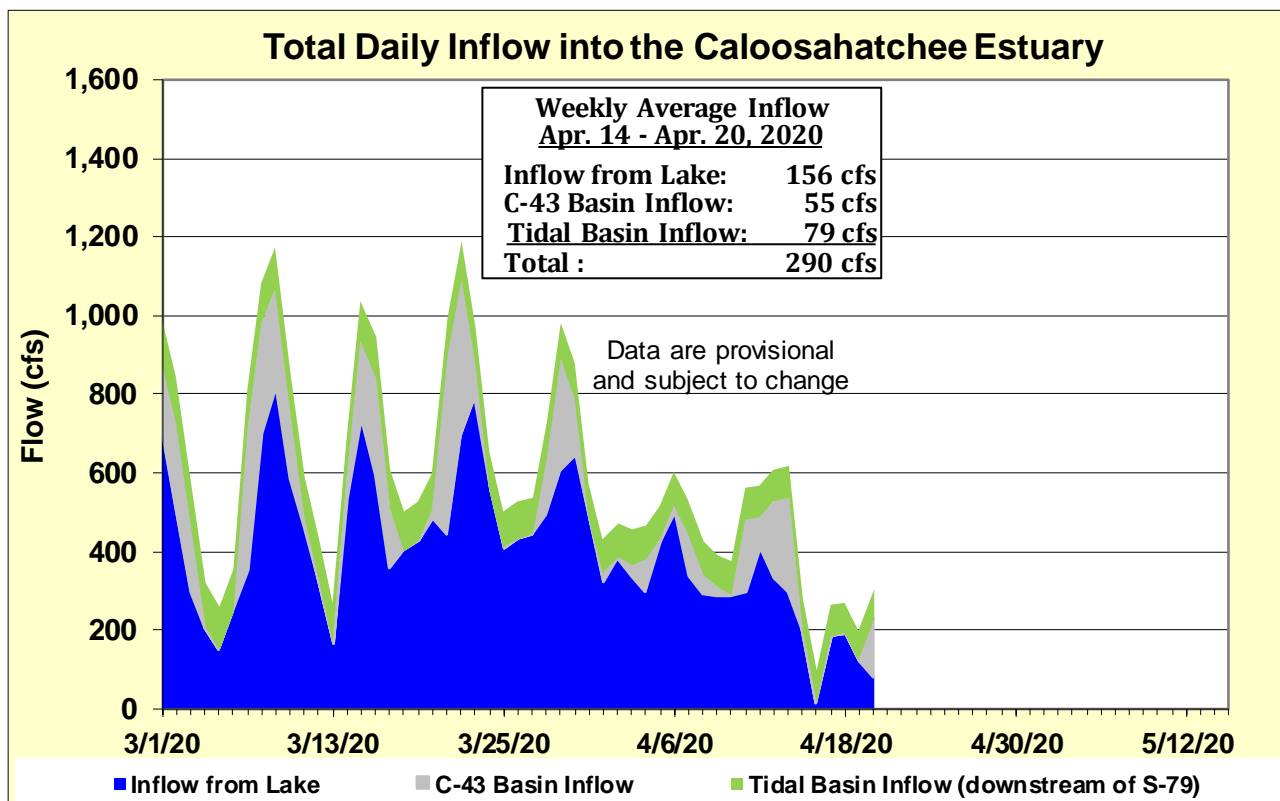


Figure 6. Total daily inflows from Lake Okeechobee, runoff from the C-43 basin

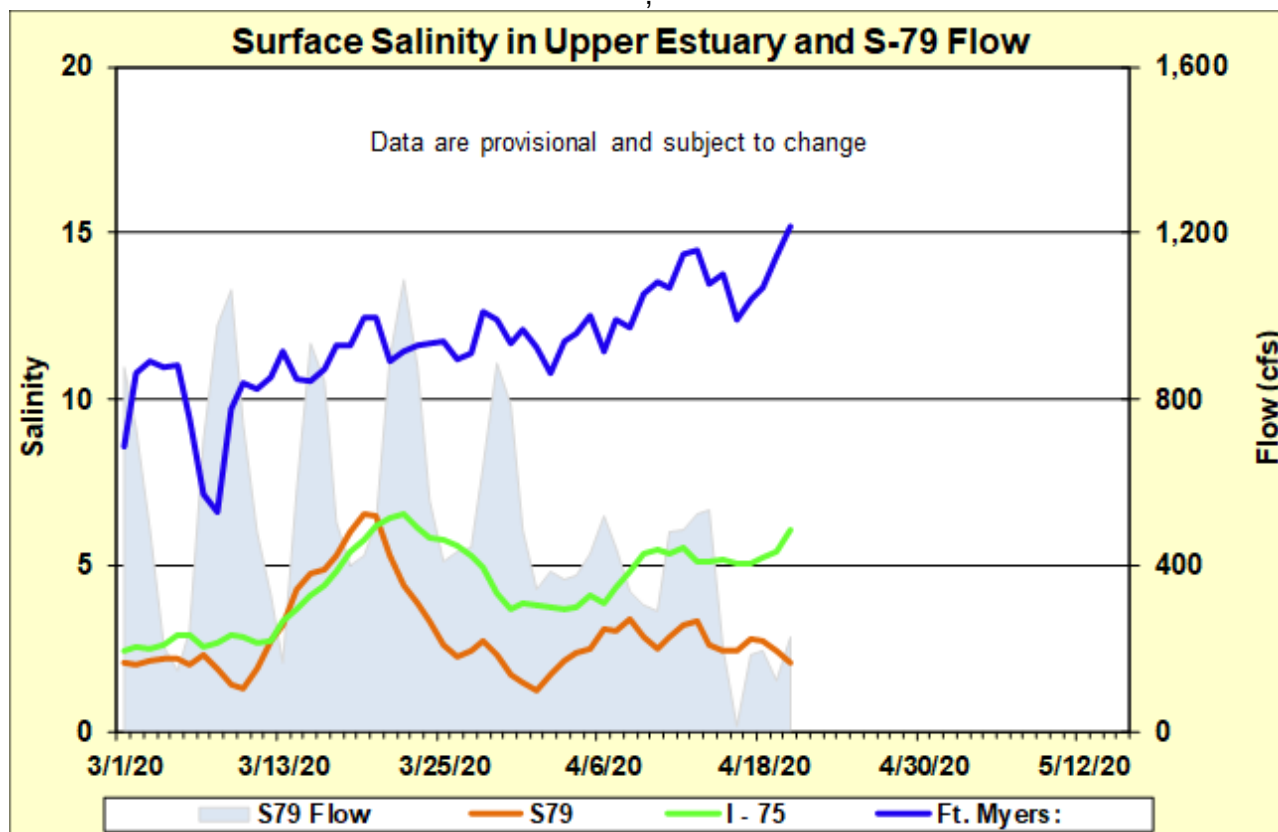


Figure 7. Daily mean flows at S-79 and salinity at upper estuary monitoring stations.

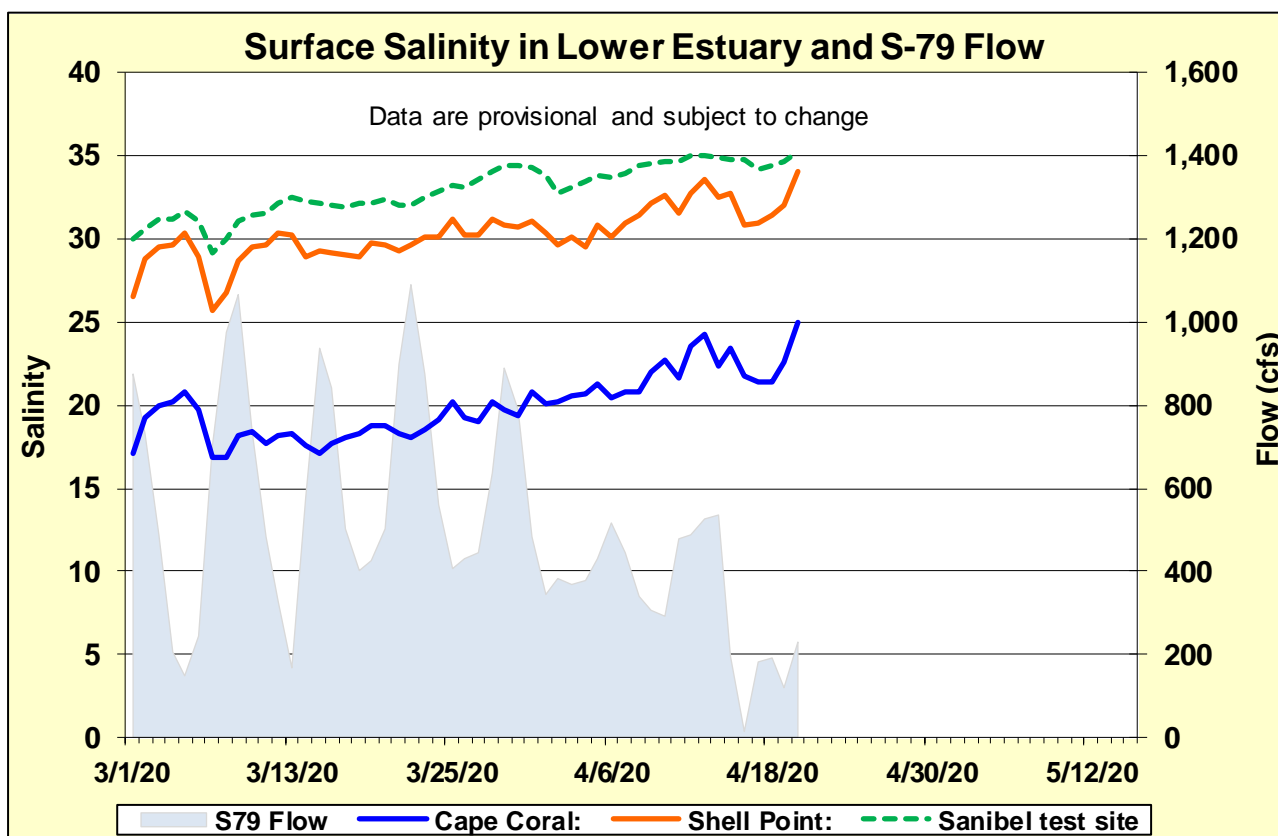


Figure 8. Daily mean flows at S-79 and salinity at lower estuary stations.

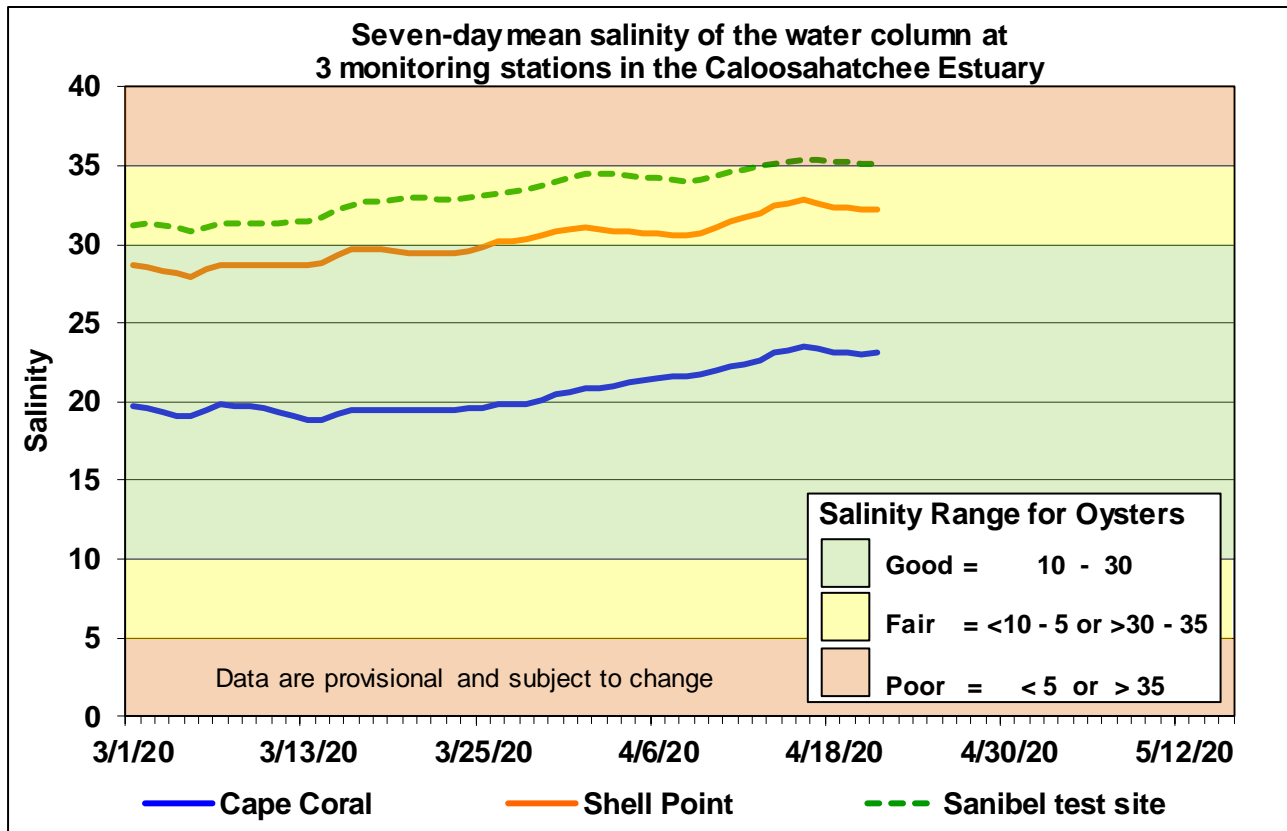


Figure 9. Seven-day mean salinity at Cape Coral, Shell Point, and Sanibel monitoring stations.

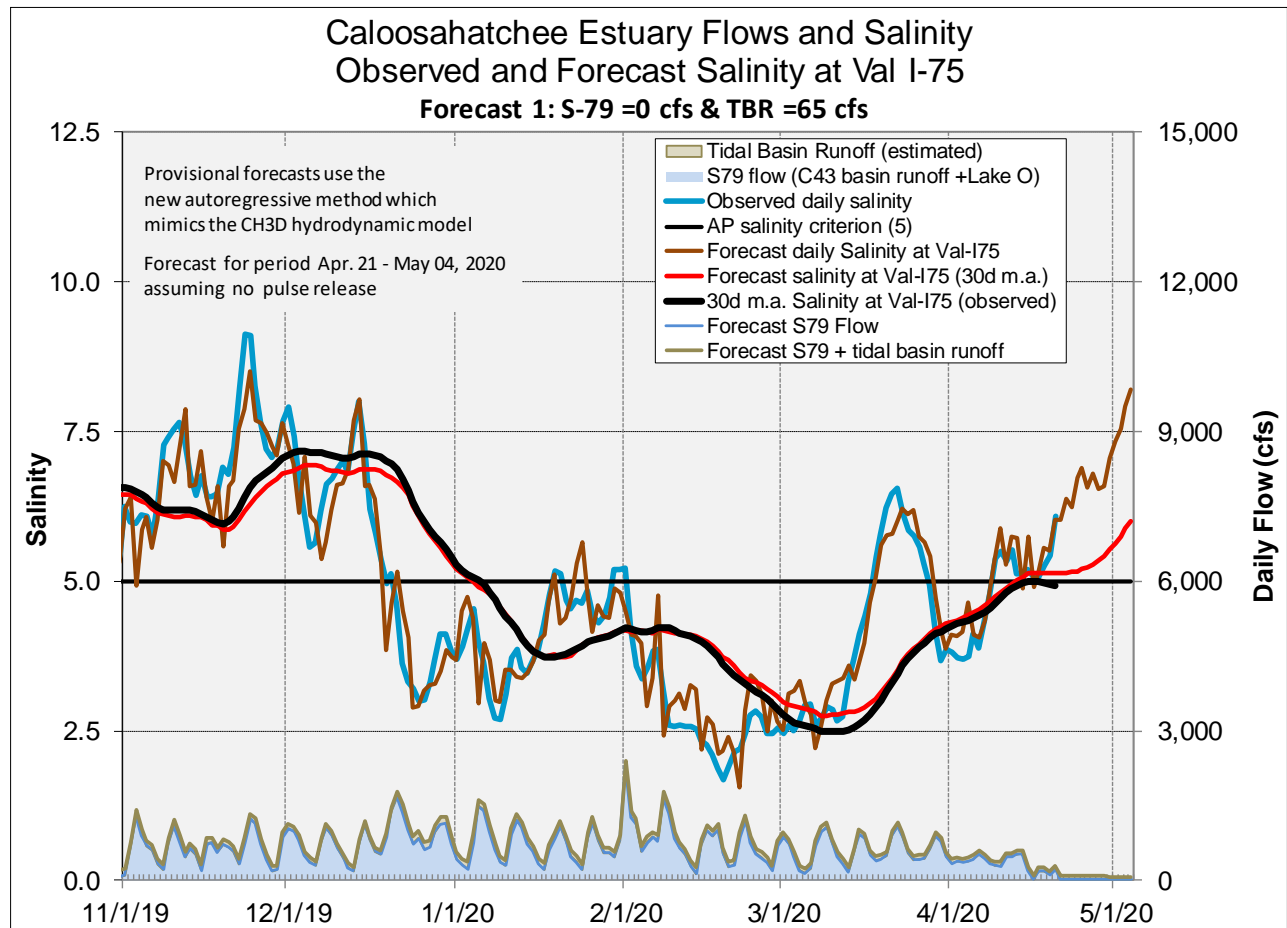



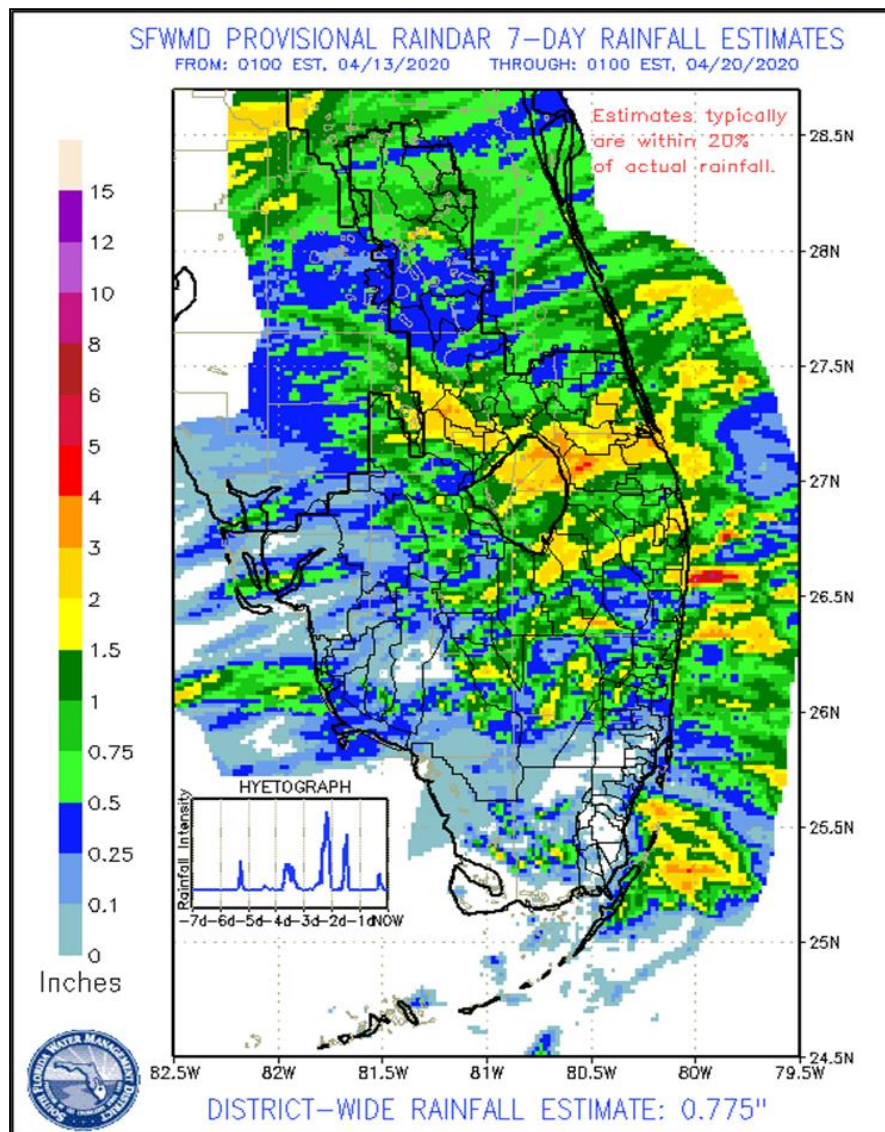


Figure 10. Forecasted Val I-75 surface salinity assuming no pulse release at S-79.

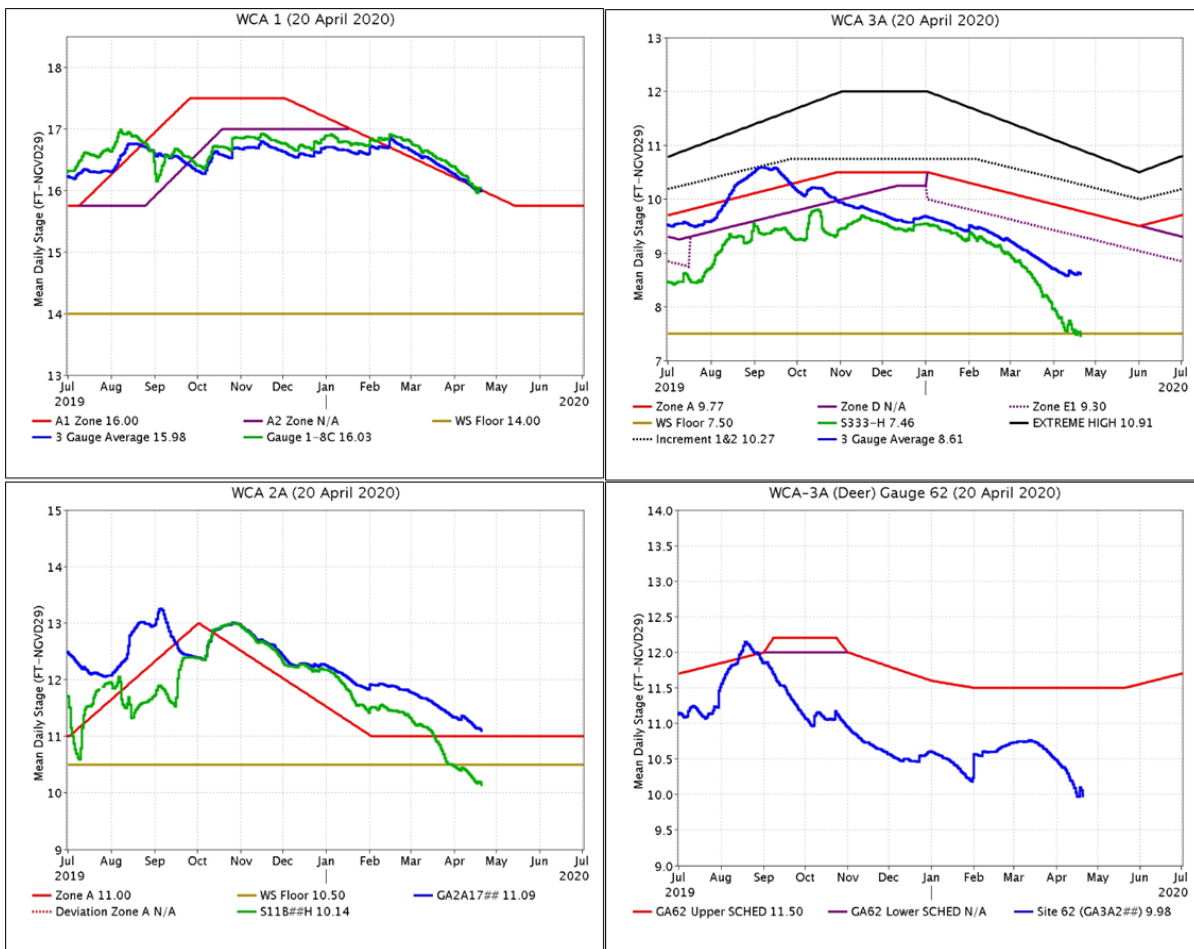
EVERGLADES

Near or above average rainfall was recorded in most of the WCAs last week. Very little rainfall occurred over the ENP and southern WCA-3A. At the gauges monitored for this report stages fell on average 0.11 feet last week and ranged from -0.36 to +0.02. Evaporation was estimated at 1.83 inches last week, an increase over the week prior.

Everglades Region	Rainfall (Inches)	Stage Change (feet)	
WCA-1	0.49	-0.08	 Good  Fair  Poor
WCA-2A	0.88	-0.14	
WCA-2B	0.96	-0.08	
WCA-3A	0.72	-0.07	
WCA-3B	0.28	-0.14	
ENP	0.16	-0.36	



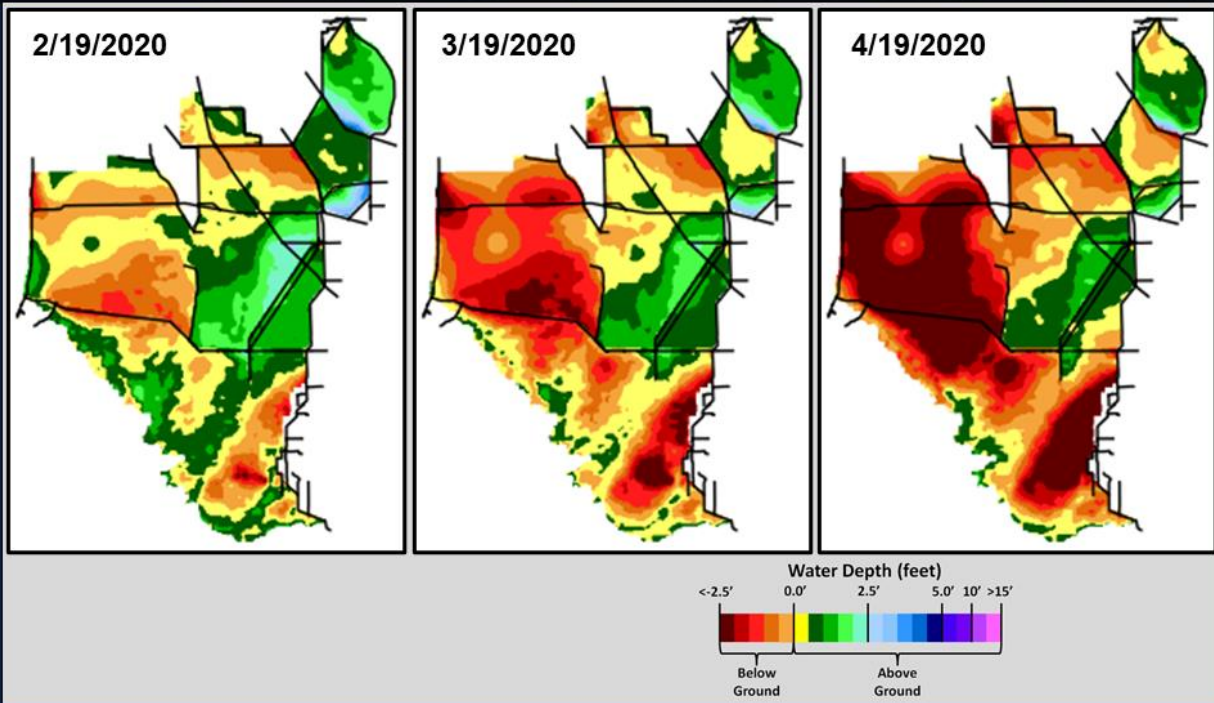
Regulation Schedules: WCA-1: Stage at the 1-8C Gauge trends near parallel to the falling regulation line last week, currently 0.03 feet above the Zone A1 line. WCA-2A: Stage at Gauge S11-B remained below the water supply floor of the regulation schedule last week and trends down, currently 0.36 feet below. WCA-3A: The Three Gauge Average stage remained steady last week, still well below the falling Zone E1 regulation line last week, presently 0.69 feet below. S333-Hw is 0.04' below the water supply floor. WCA-3A at gauge 62 (Northwest corner): Stage continues to trend down and away from the Upper Schedule now 1.52 feet below the stable regulation line.



Water Depths: The WDAT tool for spatial interpolation of depth monthly snapshots indicate depths significantly below ground across WCA-3A North, and more than a foot below in the extreme northeast (for 2 months) and northwest regions with little potential for surface water in that basin. The interior of WCA-2A is drying down to ground surface, with the northern area of cattail expansion along the L39 and south now below ground. WCA-1 depths look stable and drawing down from north to south. All the sloughs in ENP have all dried down to ground surface or near. Comparing WDAT water levels from present, over the last month there was a significant recession in all the WCAs, the most rapid in northwestern corner of WCA-3A North. Looking back one year the stage difference patterns are similar and more dramatic. The entirety of WCA-3A and 2A are significantly lower in stage. WCA-2A is most dramatically lower in stage in the northeastern regions of that basin and WCA-3A in the northwest and in the northern reaches of the L-67 canals. WCA-1 stages are lower than they were a year ago, particularly in the north. The WDAT model indicates a much drier condition in the western basins compared to a month and a year ago.



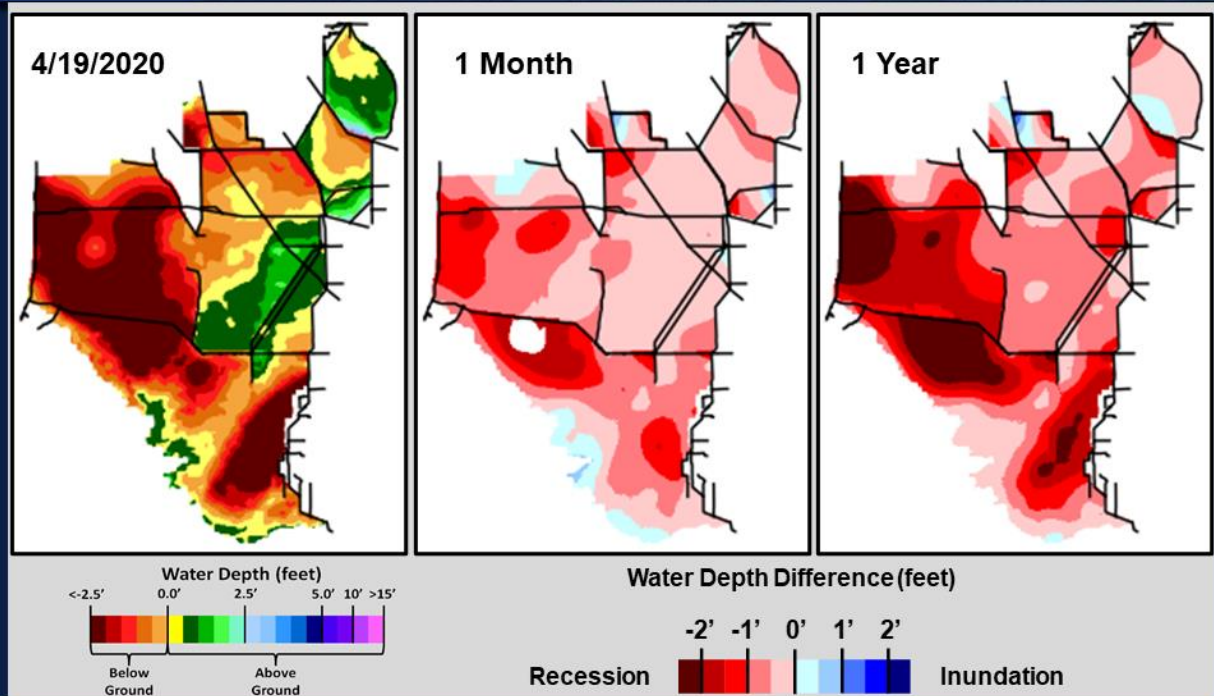
SFWDAT Water Depth Monthly Snapshots



South Florida Water Depth Assessment Tool (SFWDAT)

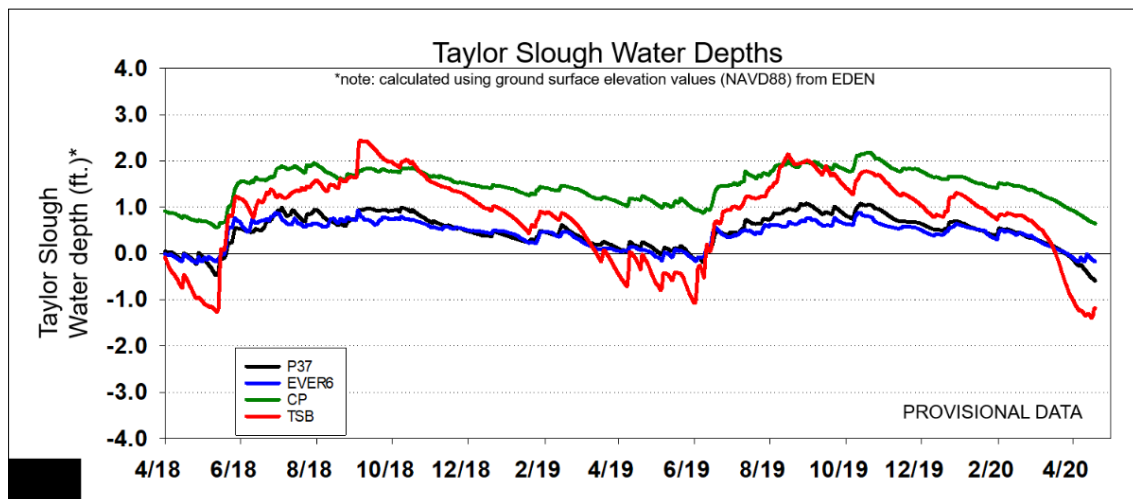
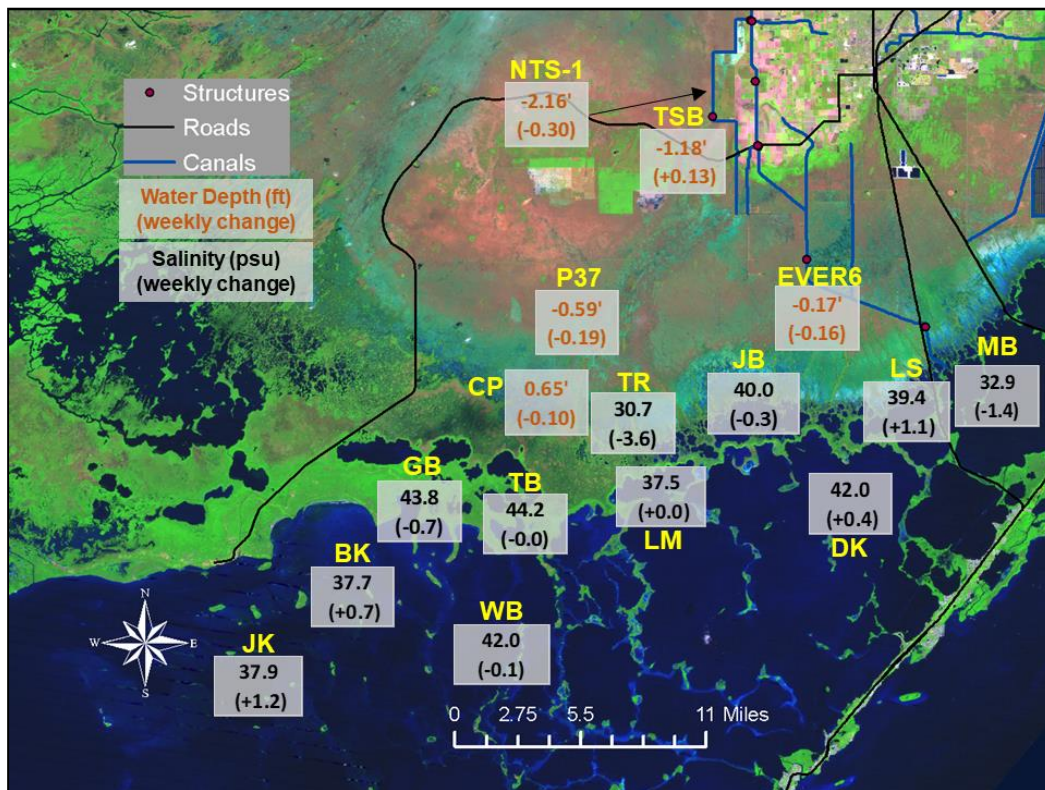


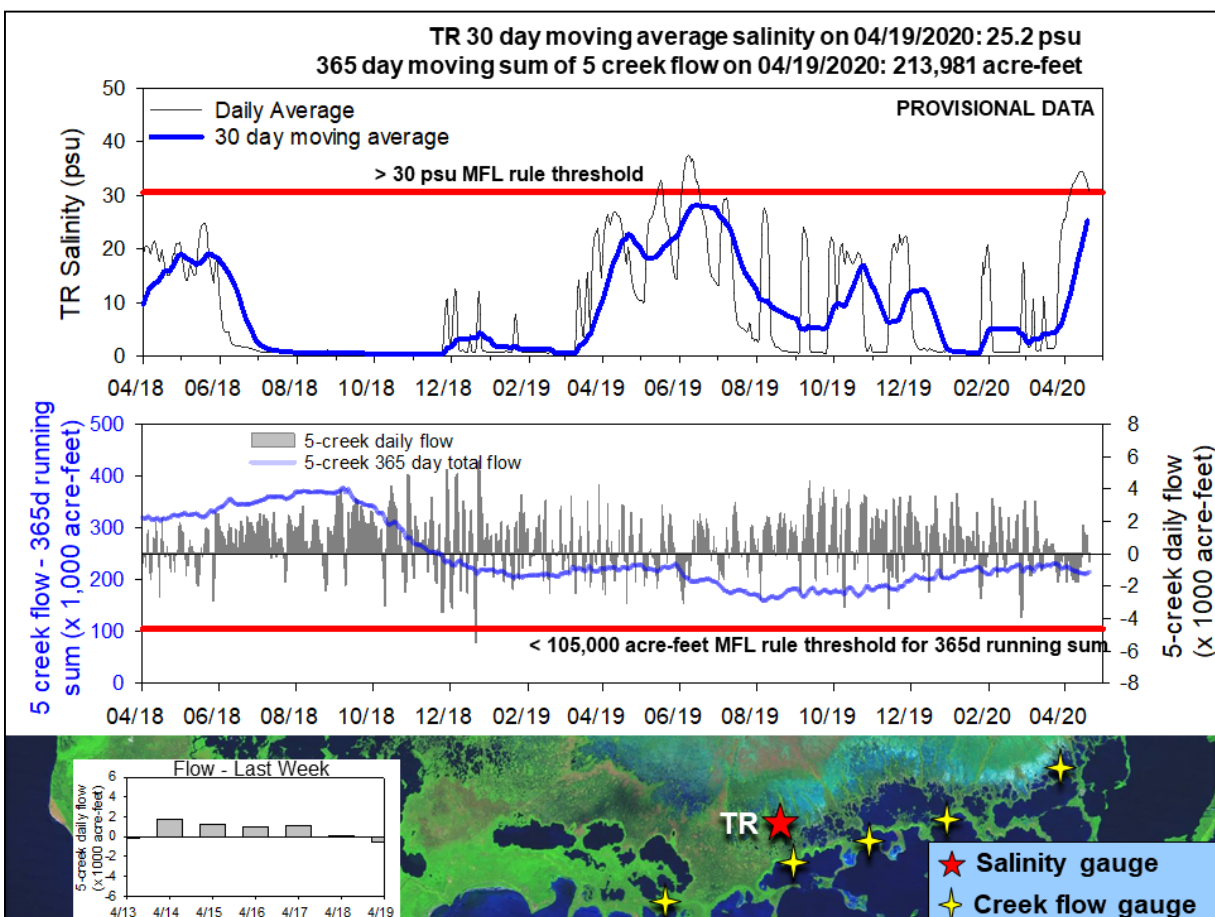
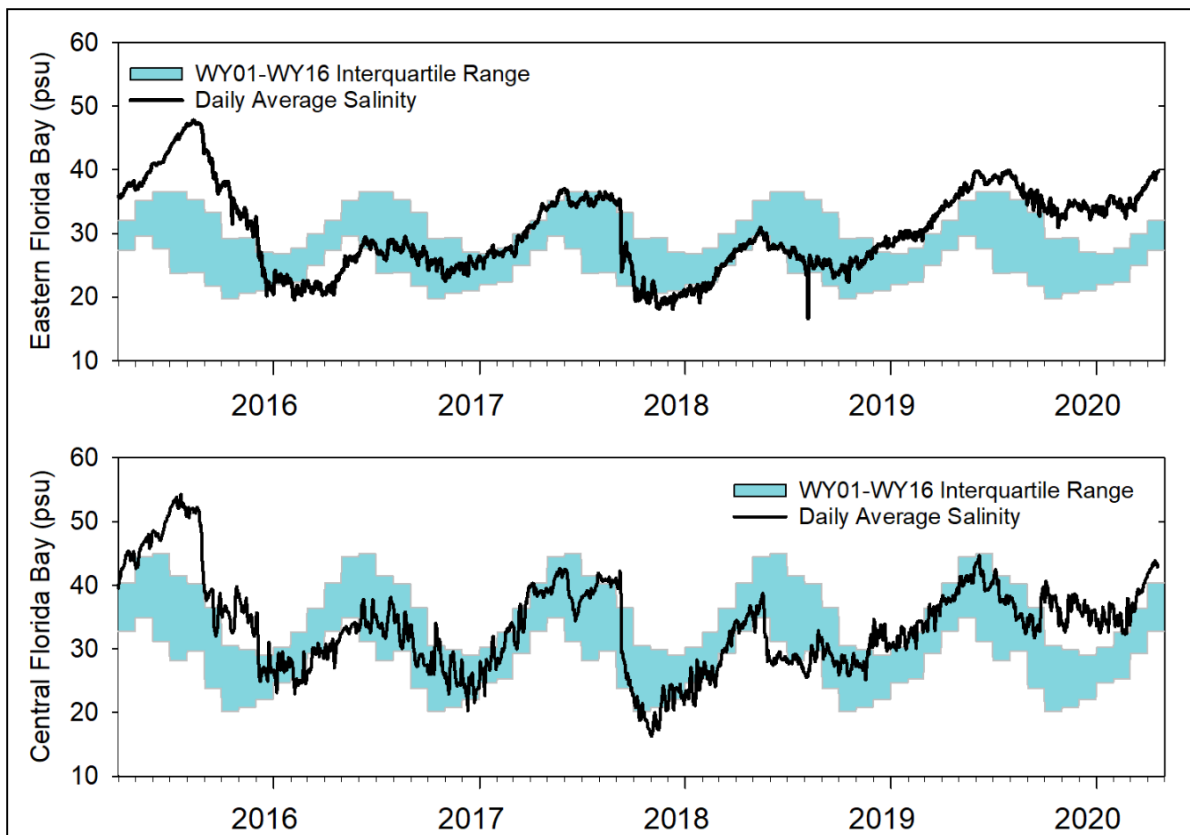
SFWDAT Everglades Difference Maps (Present – Past)



South Florida Water Depth Assessment Tool (SFWDAT)

Taylor Slough Water Levels: An average of 0.10 inches of rain fell over Taylor Slough and Florida Bay this last week, and stage decreased and average of 0.12 feet. Northern Taylor Slough is averaging 9 inches below the historical average (after being the only area that received more than 0.1 inches of rain) while the ENP panhandle region is 2 inches above the historical average this week.





Florida Bay Salinities: Average salinity in Florida Bay increased 0.3 psu this week. Florida Bay average salinity is 6 psu higher than the historical average for this time of year with the nearshore area being 8 psu higher than average. We are at the time of year when salinities can increase rapidly.

Florida Bay MFL: Salinity at the TR station in the mangrove zone (tracked for the Florida Bay MFL) decreased to 31 psu over the last week. The 30-day moving average increased 6.7 psu to end at 25.2 psu. Weekly flow from the 5 creeks identified by yellow stars on the map totaled about 4,400 acre-feet last week with positive flows finally after more than 3 weeks of negative flows. The 365-day moving sum of flow from the five creeks (tracked as part of the Florida Bay MFL criteria) increased 3,000 acre-feet this week to end at 213,981 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

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 especially as depths near the 1.0 foot below ground mark, stages at Gauge 63 northeastern WCA-3A are 0.50 feet below ground. While the moderation of recession rates in any part of WCA-3A North are beneficial, 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. A wildfire in NE corner of ENP with high potential of habitat degradation is currently active. Strong gradient of below surface water levels east of NESRS with a high risk of spread due to wind and dry soils. Flows into the marsh and increasing canal stages in that region would provide ecological benefits. 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, April 21st, 2020 (red is new)

Area	Weekly change	Recommendation	Reasons
WCA-1	Stage decreased by 0.08'	Conserving water in this basin has ecological benefit.	Protect downstream habitat and wildlife. Provide wading bird foraging opportunities as wading bird nesting continues in this basin.
WCA-2A	Stage decreased by 0.14'	Moderating the recession rate and conserving water in this basin has ecological benefit.	Protect upstream/downstream habitat and wildlife. Provide wading bird foraging opportunities as wading bird nesting continues in this basin.
WCA-2B	Stage decreased by 0.08'	Conserving water in this basin has benefit.	Protect upstream/downstream habitat and wildlife.
WCA-3A NE	Stage increased by 0.01'	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 ecological benefit.	Protect and conserve peat soils, prevent muck fires.
WCA-3A NW	Stage decreased by 0.14'	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 increased by 0.02'	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 continues.
Southern WCA-3A S	Stage decreased by 0.15'		
WCA-3B	Stage decreased 0.14'	Conserving water in this basin has benefit.	Protect tree islands, upstream/downstream habitat and wildlife.
ENP-SRS	Stage decreased 0.36'	Make discharges to the Park according to the 2012 WCP rainfall plan or as wildfire risk dictates.	Protect upstream/downstream habitat and wildlife.
Taylor Slough	Stage changes ranged from -0.30' to +0.13'	Move water southward as possible	When available, provide freshwater buffer for downstream conditions.
FB- Salinity	Salinity changes ranged -0.7 to +1.2 psu.	Move water southward as possible	When available, provide freshwater to maintain low salinity buffer and promote water movement.