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: August 12, 2020

SUBJECT: Weekly Environmental Conditions for Systems Operations

Summary

Weather Conditions and Forecast

A low- to mid-level ridge of high pressure extending from the central Atlantic Ocean to Florida should remain in place during the next few days. A cyclonic feature near the southeast U.S. coast is forecast to induce southwesterly or westerly steering winds north of Lake Okeechobee on Wednesday. The favorable wind profile north of Lake Okeechobee and plentiful moisture are forecast to enhance rains over a broad area from the southwestern interior through the upper east coast, while areas in the southeast remain dry. Through Friday, southeasterly to southerly steering winds across all but the northern part of the District should reinforce the pattern of relatively dry conditions in the east/southeast and concentrated afternoon rains over the western or northwestern half of the area. By the weekend, the weather pattern is predicted to change as a mid- to upper-level trough digs into the southeastern United States and induces a southwesterly to westerly steering regime across the entire District. This means that afternoon rains will be inland from the west coast over interior and the east, with the east probably seeing its greatest rainfall in over a week from Saturday through Monday. However, daily rainfall is forecast to be under the daily climatological average through Sunday, after which greater rainfall is possible. For the week ending next Tuesday morning, the weekly total District rainfall is predicted to be below or well below average. The greatest departures from normal are most likely to occur in the east, despite some relief from the dry conditions this coming weekend. Areas over the interior and the west are most likely to see total rainfall closer to but under the long-term mean, with the best chance of above normal rains over the western interior through the Kissimmee Valley. Indications are that the trough in the southeast U.S. would be reinforced to some extent the following week, which would make it more likely to increase total rainfall. The week 2 probabilities are for near normal rainfall.

Kissimmee

Tuesday morning stages were 55.9 feet NGVD (0.6 feet below schedule) in East Lake Toho, 53.5 feet NGVD (at schedule) in Toho, and 51.2 feet NGVD (0.2 feet above schedule) in Kissimmee-Cypress-Hatchineha; headwater stages were 46.1 feet NGVD at S-65A and 27.6 feet NGVD at S-65D. Tuesday morning discharges were 1,590 cfs at S-65, 2,000 cfs at S-65A, 5,130 cfs at S-65D and 5,260 cfs at S-65E. Dissolved oxygen concentration in the Kissimmee River averaged 0.7 mg/L for the week through Sunday, [below the critical threshold of 1 mg/L]. Kissimmee River mean floodplain depth on Sunday was 2.4 feet. Today's recommendation is continued to manage S65/S65A discharge per the seasonal recommendations for 2020 Wet Season. The wet season recommendation is to continue to use the IS-14-50 discharge plan through the 2020 wet season. The discharge rate of change limits for S-65 / S-65A may be adjusted for individual events after consultation with Kissimmee River Restoration Evaluation Program staff. To the extent possible, attempt to control the ascension rate in East Lake Toho to be less than 1 feet per 30 days from June 1- August 15. To the extent possible, attempt to control the ascension rate in lakes Toho, Kissimmee, Cypress and Hatchineha to less than 0.5 feet per 14 days during the same June 1 – August 15 timeframe

Lake Okeechobee

Lake Okeechobee stage was 13.70 feet NGVD on August 10, 2020, 0.37 feet higher than the previous week and 1.23 feet higher than the previous month. The Lake is now in the Low sub-band. Lake stage moved into the ecological envelope (which varies seasonally from 12 – 15 feet NGVD +/- 0.5 feet) on June 2, 2020, after being up to 1.5 feet below since October 15, 2019, but it is now 0.28 ft above the top of envelope. Ascension rates were high in early June, but briefly slowed and stabilized through the beginning of July, potentially providing submerged plant communities an opportunity to catch up with rising stages. However, lake stage has been rising higher than the recommended rate (<0.5 ft per 2 weeks) over the past few weeks. The cyanobacteria bloom risk potential increased from last week, especially in the central and eastern areas of the Lake.

Estuaries

Total inflow to the St. Lucie Estuary averaged 1,897 cfs over the past week with no flow coming from Lake Okeechobee. The seven-day average salinities increased in the estuary over the past week, except for A1A surface salinity. Salinity at the US1 Bridge is in the fair range for adult eastern oysters. Total inflow to the Caloosahatchee Estuary averaged 1,816 cfs over the past week with no flow coming from the Lake. Salinities remained generally unchanged relative to the previous week's averages in the estuary. Salinities are in the good range (<10) for tape grass at Val I-75 and Ft. Myers. Salinities are estimated to be in the good range (10-30) for adult eastern oysters at Shell Point and Cape Coral, and in the fair range at Sanibel. Lake stage is in the Low sub-band of 2008 LORS. Tributary hydrological conditions are very wet. The LORS2008 Release Guidance suggests up to 450 cfs release at S-79 to the Caloosahatchee Estuary and up to 200 cfs release at S-80 to the St. Lucie Estuary.

Stormwater Treatment Areas

Over the past week, no Lake Okeechobee water was delivered to the FEBs/STAs. The total amount of Lake releases sent to the FEBs/STAs in WY2021 (since May 1, 2020) is approximately 11,100 ac-feet. The total amount of inflows to the STAs in WY2021 is approximately 561,000 ac-feet. Most STA cells are near or above target stage, while the EAV cells of STA-1W and STA-3/4 are considerably above target stage. 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-1E Central Flow-way, STA-2 Flow-way 3, STA-2 Flow-way 4, STA-3/4 Eastern, Central, and Western Flow-ways 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, there is no capacity for Lake releases in the STAs.

Everglades

All the WCAs are above regulation but depths increased at an ecologically favorable rate across most of the Everglades last week and have been doing so in regions important for apples snails like central and southern WCA-3A. Stages at the "Deer Gauge" in northwestern WCA-3A are at the Upper Schedule and the two-gauge average in WCA-3A north is at the Florida Fish and Wildlife Conservation (FFWC) closure stage (most likely coming soon). Florida Bay and Taylor Slough received low rainfall again this week, but stages remain unchanged on average in the slough due to water movement. In Florida Bay average salinity increased at the nearshore sites and remained essentially unchanged in the bay. Daily average salinity in the mangrove zone increased last week and flows from the creeks were about a quarter of the volume from the week prior. Ascension rates impact apple snail reproduction and the current ecologically preferred rate in the Everglades is 0.05–0.15 feet per week, with a maximum of 0.25 feet per week or 0.5 feet per two weeks.

Supporting Information

KISSIMMEE BASIN

The Upper Kissimmee Basin received 2.13 inches of rainfall in the past week and the Lower Basin received 3.65 inches (SFWMD Daily Rainfall Report 08/10/2020).

Upper Kissimmee

Table 1 lists stage and discharge for several KCL water bodies using data from lake outfall structures. KCL stage hydrographs with respective regulation schedules and rainfall are shown in **Figures 1-3**.

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

Report Date: 8/11/2020

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)						
							8/9/20	8/2/20	7/26/20	7/19/20	7/12/20	7/5/20	6/28/20
Lakes Hart and Mary Jane	S-62	50	LKMJ	60.1	R	60.0	**0.1**	-0.2	0.0	0.0	0.2	0.2	0.0
Lakes Myrtle, Preston, and Joel	S-57	0	S-57	60.9	R	61.0	**-0.1**	-0.2	0.0	0.0	0.1	-0.2	-0.1
Alligator Chain	S-60	3	ALLI	63.2	R	63.2	**0.0**	-0.1	0.0	0.0	-0.2	-0.6	-0.5
Lake Gentry	S-63	40	LKGT	60.9	R	61.0	**-0.1**	-0.2	0.1	0.1	0.1	-0.2	-0.2
East Lake Toho	S-59	485	TOHOE	56.0	R	56.5	**-0.5**	-0.7	-0.8	-0.7	-1.2	-1.5	-1.4
Lake Toho	S-61	1,269	TOHOW, S-61	53.5	R	53.5	**0.0**	-0.2	0.0	0.0	0.2	0.1	0.0
Lakes Kissimmee, Cypress, and Hatchineha	S-65	1,760	KUB011, LKIS5B	51.2	R	51.0	**0.2**	0.1	0.5	0.9	0.7	0.4	0.5

[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

Discharges at lower basin structures are shown in **Table 2**. SFWDAT depth maps for the Phase I restoration area are shown in Figure 4. Mean daily dissolved oxygen concentrations, discharge, temperature, and rainfall are shown in Figure 5. The 2019-2020 Discharge Plan for S-65/S-65A, the interim regulation schedule for S-65, and a map of the Kissimmee Basin are shown respectively in Figures 6-8.

Table 2. One- and seven-day average discharge at lower basin structures, dissolved oxygen concentration in phases I and II/III area river channel, and depth in the Phase I area floodplain using provisional, real-time data from SFWMD.

Report Date: 8/11/2020

Metric	Location	1-Day Average	Average for the Preceeding 7-Days[1]							
		8/9/2020	8/9/20	8/2/20	7/26/20	7/19/20	7/12/20	7/5/20	6/28/20	6/21/20	6/14/20
Discharge (cfs)	S-65	1,587	**1,760**	4,215	4,623	2,396	1,779	1,527	873	581	80
Discharge (cfs)	S-65A[2]	2,158	**2,554**	4,851	5,111	3,202	2,174	1,559	1,127	864	854
Discharge (cfs)	S-65D[2]	5,641	**5,466**	5,538	3,846	2,383	1,602	1,314	1,453	1,641	1,988
Headwater Stage (feet NGVD)	S-65D[2]	27.85	**27.70**	27.75	26.99	26.02	25.81	25.76	25.72	25.74	25.72
Discharge (cfs)	S-65E[2]	6,015	**5,703**	5,462	3,671	2,229	1,574	1,240	1,402	1,549	1,868
Discharge (cfs)	S-67	0	**0**	0	0	0	0	0	0	0	0
DO (mg/L)[3]	Phases I & II/III river channel	0.6	**0.7**	0.4	0.2	0.2	1.4	2.7	2.0	1.2	0.7
Mean depth (feet)[4]	Phase I floodplain	2.41	**2.60**	3.02	2.64	1.63	1.13	0.73	0.71	0.78	0.90

[1]Seven-day average of weighted daily means through Sunday midnight.
[2]S-65A discharge combines S-65A with auxillary strucutures; 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.
[3]DO is the average for sondes at KRBN, PC62, PC33, PD62R, and PD42R.
[4]1-day spatial average from South Florida Water Depth Assessment Tool (SFWDAT).
DATA ARE PROVISIONAL; N/A indicates that data were not available.

Figure 4 compares floodplain inundation depths from one year and one month ago with current inundation depths in the Phase I restored area of the Kissimmee River. **Figure 5** shows dissolved oxygen concentration along with S-65A discharge, water temperature and rainfall. **Figures 6-8** are included for reference: **Figure 6** is the current guide for operation of S-65 and S-65A, called the "Preferred Discharge Plan IS-14-50.0". This is developed collaboratively each year between ecologists and SFWMD water managers based on prevailing ecological and hydrologic conditions. A preferred discharge plan and the interim regulation schedule (**Figure 7**) will be used until the Headwaters Lakes Revitalization regulation schedule is implemented. **Figure 8** is a map of the Kissimmee Basin showing Central and Southern Florida (C&SF) flood control project structures and color-coded watersheds.

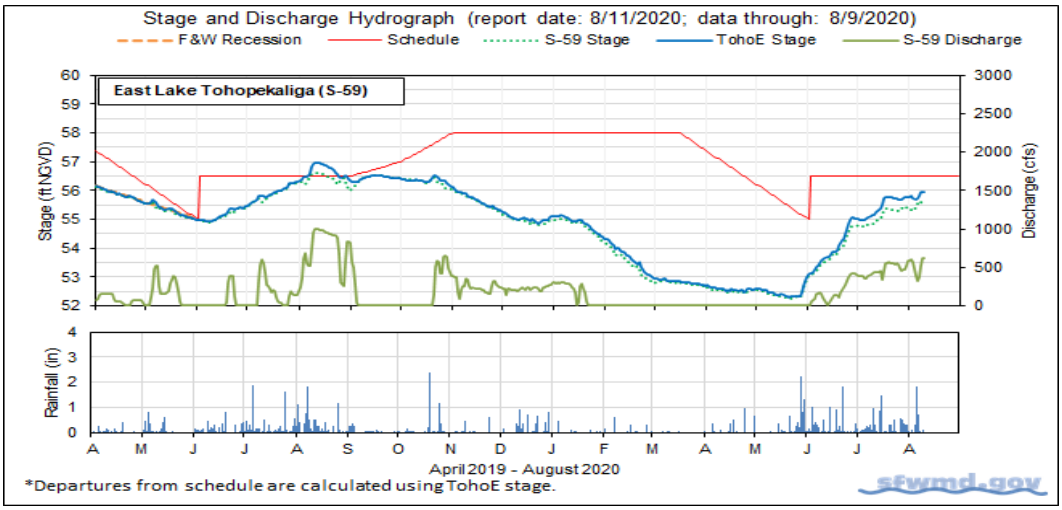


Figure 1. East Lake Toho regulation schedule, stage, discharge and rainfall.

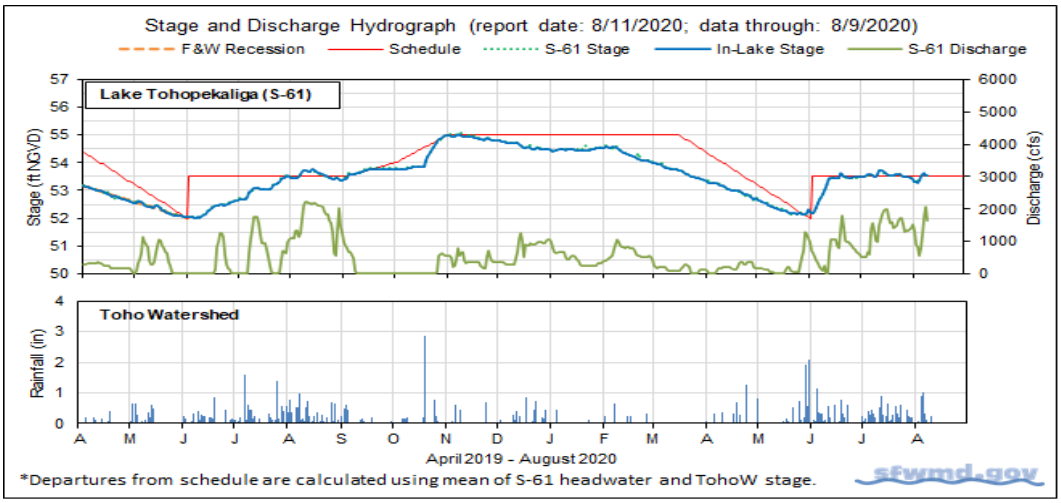


Figure 2. Lake Toho regulation schedule, stage, discharge and rainfall.

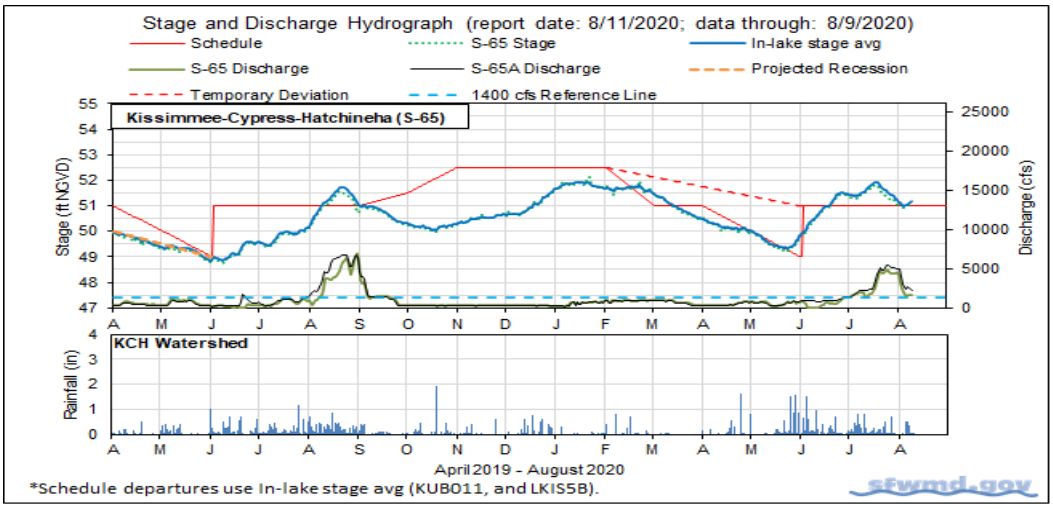


Figure 3. Lakes Kissimmee, Cypress and Hatchineha regulation schedule, stage, discharge and rainfall.

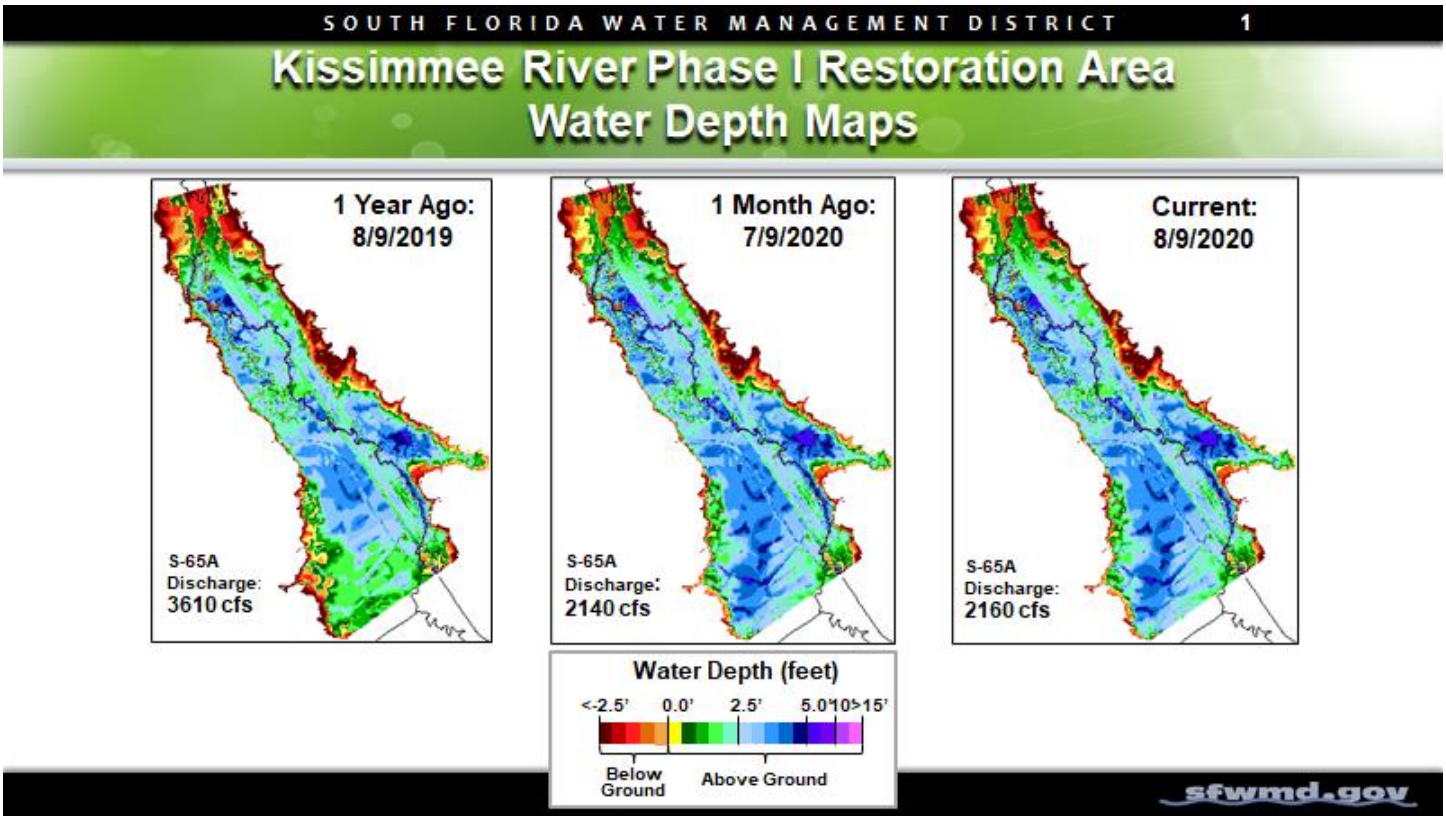


Figure 4. Phase I area floodplain water depths (from left to right) one year ago, one month ago and current. Color-coding has been modified to accommodate greater water depths; these maps are not directly comparable to Kissimmee Basin WDAT maps published prior to January 16, 2012.

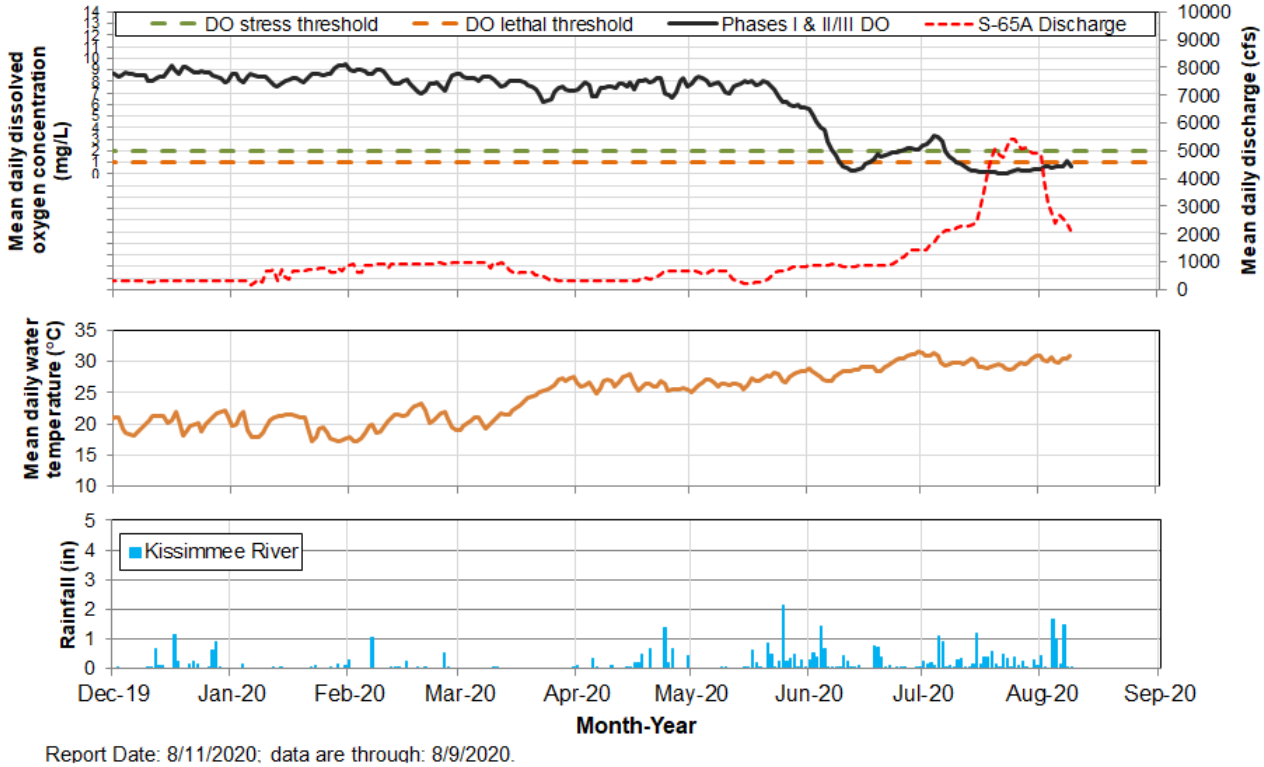


Figure 5. Restored Kissimmee river channel mean daily dissolved oxygen concentration (mg/L), S-65A discharge (cfs), temperature (°C) and rainfall (inches)

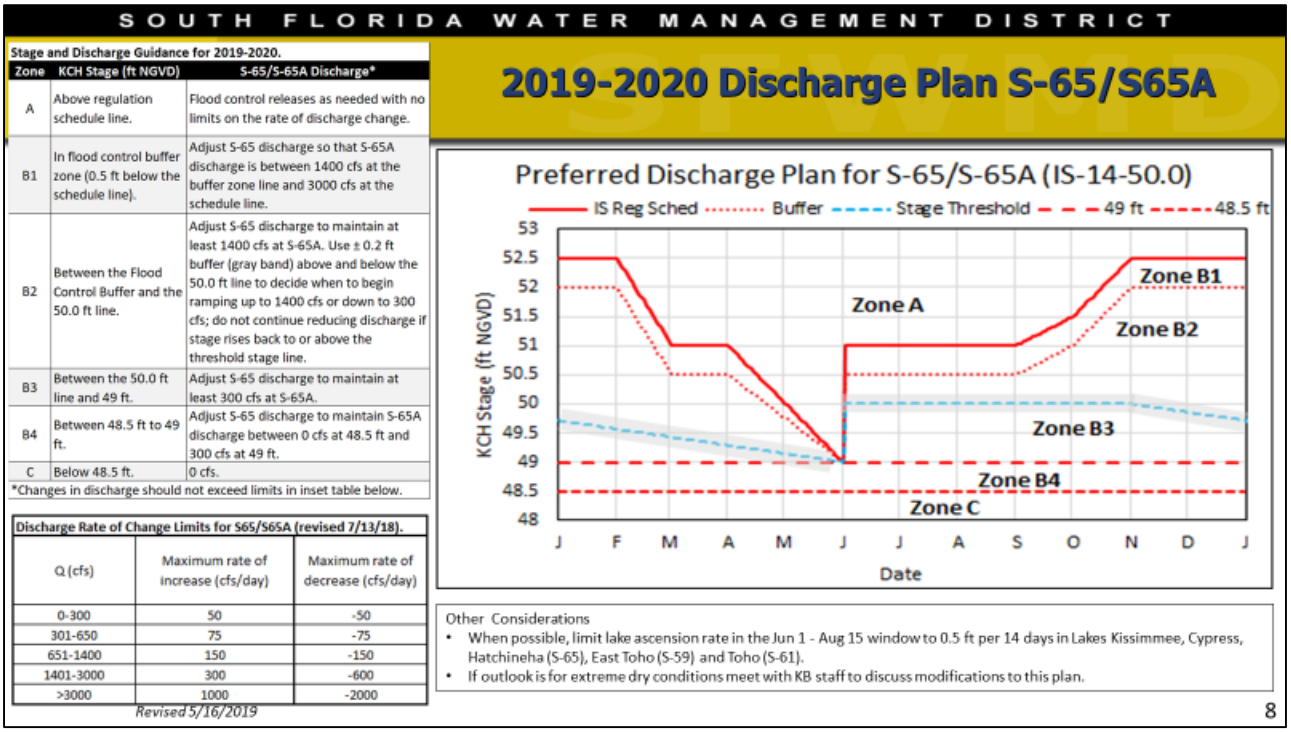


Figure 6. The 2019-2020 Discharge Plan for S-65/S-65A.

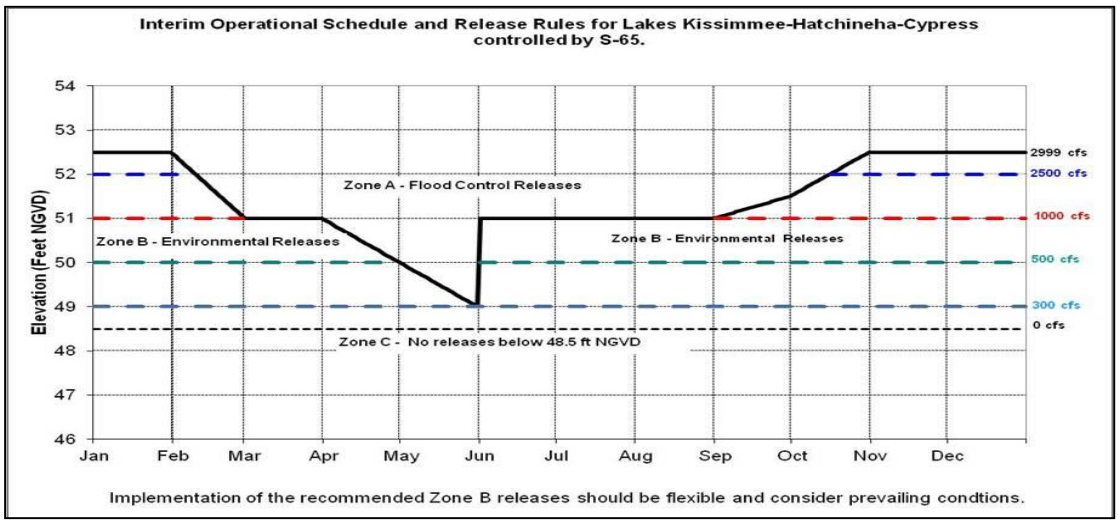


Figure 7. Interim operations schedule for S-65 (solid black line). The discharge schedule shown to the right has not been used in recent years.

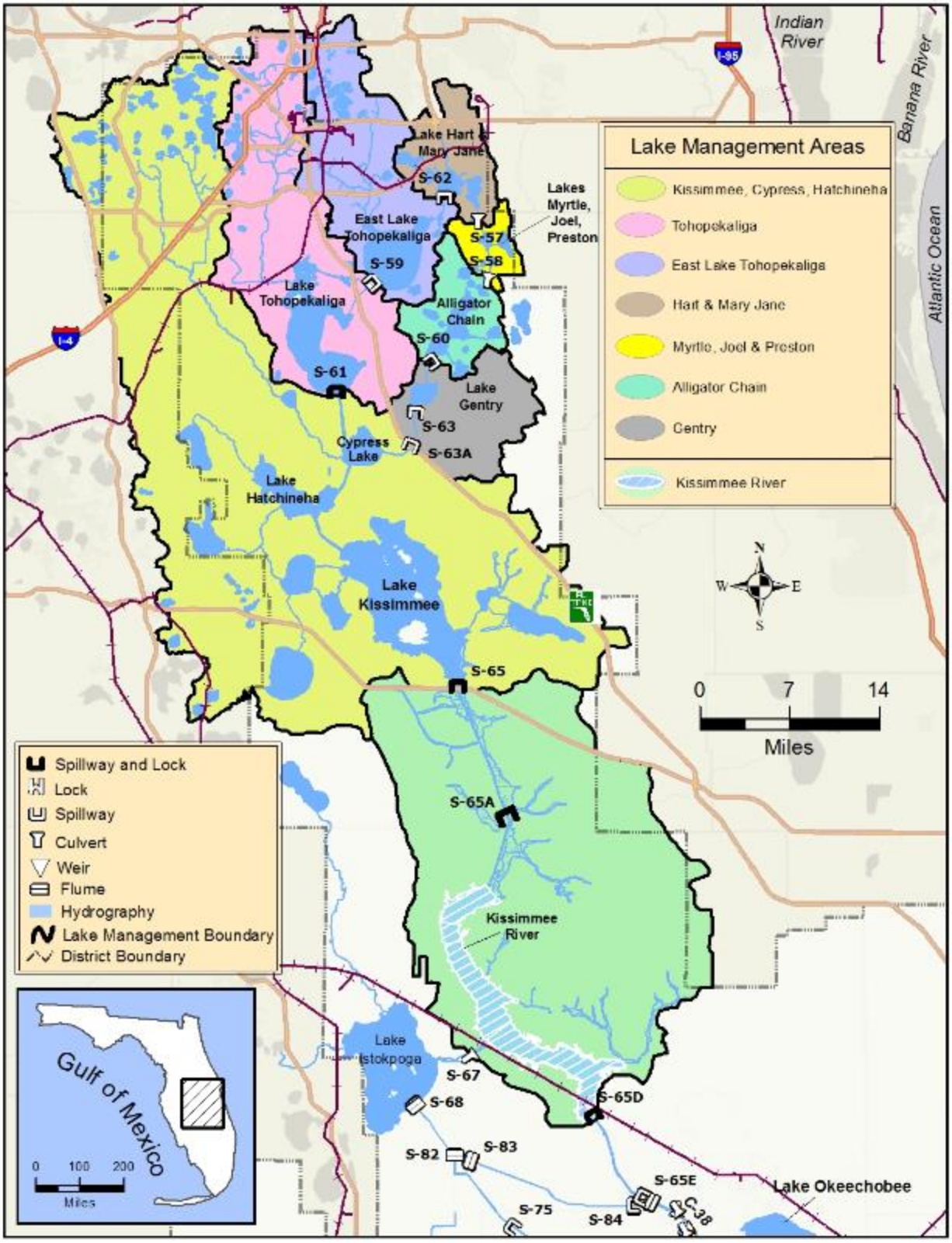


Figure 8. The Kissimmee Basin.

LAKE OKEECHOBEE

Lake Okeechobee stage is 13.70 feet NGVD, 1.23 feet higher than a month ago and 1.46 feet higher than one year ago (Figure 1). The Lake had been back within the preferred ecological envelope since June 2, 2020 (Figure 2) but rose to 0.28 feet above the top of the envelope this week. Lake stage moved into the Beneficial Use sub-band on March 4, 2020, into the Base Flow sub-band in mid-July, and is now in the Low sub-band (Figure 3). Lake stage reached a low of 10.99 on May 17, rose rapidly for a month, levelled out for the remainder of June, but has been rising at a rate greater than the recommended 0.25 feet per week since early July. According to RAINDAR, 1.67 inches of rain fell directly over the Lake during the past week (Figure 4). The district-wide average was approximately 2 inches, although many eastern basins received less than 1 inch of rain, while some lower Kissimmee and western basins experienced 3-5 inches of rainfall.

The average daily inflows (minus rainfall) increased from 8,783 cfs to 9,288 cfs, while the outflows (minus evapotranspiration) remained at 0 cfs. Most of the inflows came from the Kissimmee River (5,784 cfs through S-65E & S-65EX1), while 1,458 cfs came from the C-41A canal (through S-84 & S-84X), 253 cfs from Fisheating Creek, and around 393 cfs came from S-71 and S-72. An additional 331 cfs and 404 cfs also came from passive inflow from the east through S-308 and the L-8 Canal via Culvert 10A, respectively. There were no outflows again this week. 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.

Water quality sampling occurs twice-monthly at approximately 30 stations from May – October as part of expanded monitoring efforts to track and study Harmful Algal Blooms on the Lake. The first August sampling occurred on the 4th and 5th and the chlorophyll *a* values are still pending. Cyano-toxin values were relatively low at most of the sites, with 17 sites exhibiting detectable levels of toxin, however 10 of these sites were less than 1 μg/L, and all but 2 sites had microcystin levels below the EPA recreational waters recommendation of 8 μg/L. L004 and LZ40 had toxin levels of 28 μg/L and 25 μg/L, respectively.

The most recent satellite image (August 8, 2020) from NOAA's cyanobacteria monitoring product derived from EUMETSAT's Sentinel 3 OLCI sensor data suggested a slight increase in cyanobacteria bloom risk potential, particularly in the central and eastern regions of the Lake (Figure 7).

Water Management Summary

Lake Okeechobee stage was 13.70 feet NGVD on August 10, 2020, 0.37 feet higher than the previous week and 1.23 feet higher than the previous month. The Lake is now in the Low sub-band. Lake stage moved into the ecological envelope (which varies seasonally from 12 – 15 feet NGVD +/- 0.5 feet) on June 2, 2020, after being up to 1.5 feet below since October 15, 2019, but it is now 0.28 feet above the top of envelope. Ascension rates were high in early June, but briefly slowed and stabilized through the beginning of July, potentially providing submerged plant communities an opportunity to catch up with rising stages. However, lake stage has been rising higher than the recommended rate (<0.5 feet per 2 weeks) over the past few weeks. The cyanobacteria bloom risk potential increased from last week, especially in the central and eastern areas of the Lake.

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	5440	5784	2.4
S-71 & S-72	443	393	0.2
S-84 & S-84X	1707	1458	0.6
Fisheating Creek	268	253	0.1
S-154	31	23	0.0
S-191	115	376	0.2
S-133 P	11	91	0.0
S-127 P	5	17	0.0
S-129 P	16	7	0.0
S-131 P	13	22	0.0
S-135 P	118	129	0.1
S-2 P	0	0	0.0
S-3 P	0	0	0.0
S-4 P	0	0	0.0
L-8 Backflow	433	404	0.2
Rainfall	1256	3966	1.7
Total	**9855**	**12923**	**5.5**

OUTFLOWS	Previous week Avg Daily CFS	Avg Daily Flow cfs	Equivalent Depth Week Total (in)
S-77	0	0	0.0
S-308	-183	-331	-0.1
S-351	0	0	0.0
S-352	0	0	0.0
S-354	0	0	0.0
L-8 Outflow			
ET	2554	2112	0.9
Total	**2371**	**1781**	**0.8**

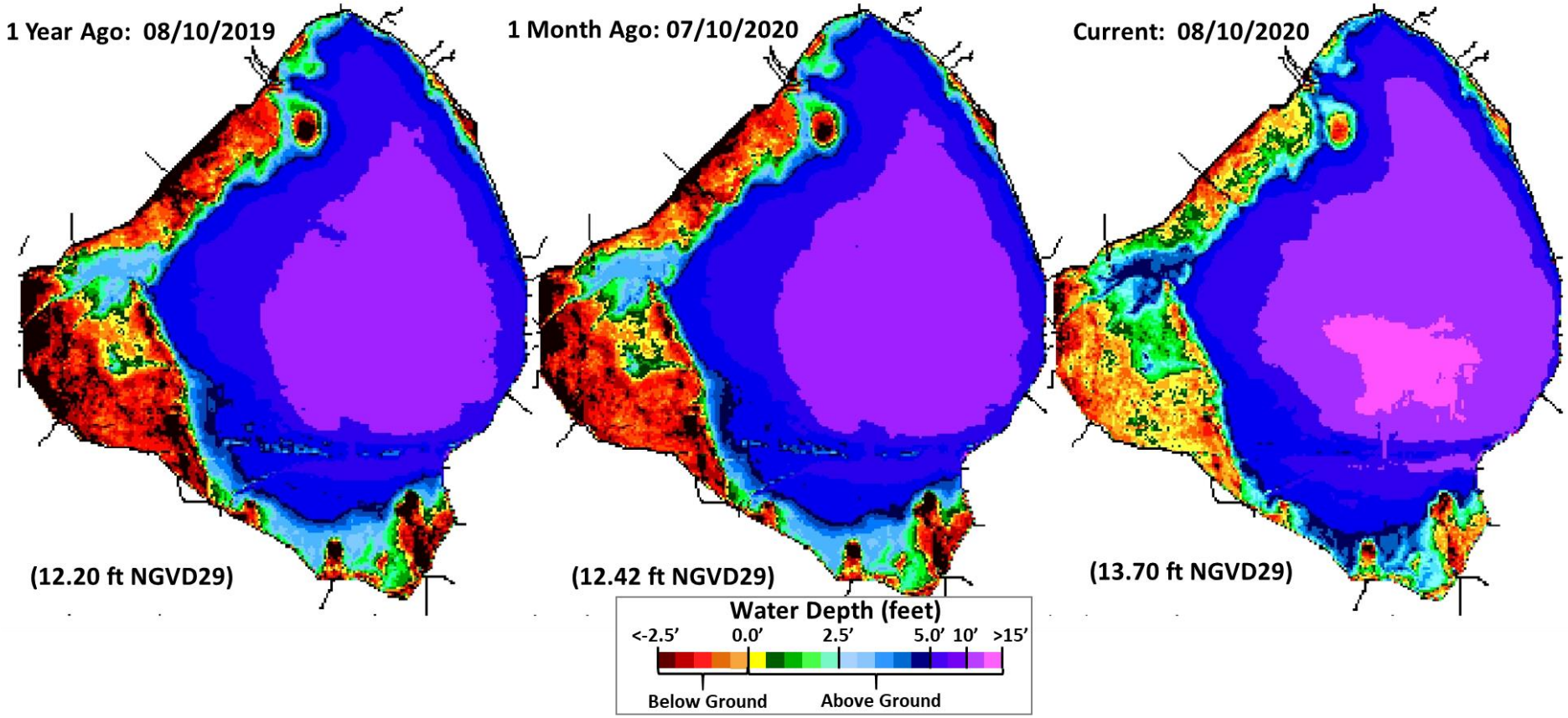


Figure 1. Water depth estimates on Lake Okeechobee based on the South Florida Water Depth Assessment Tool.

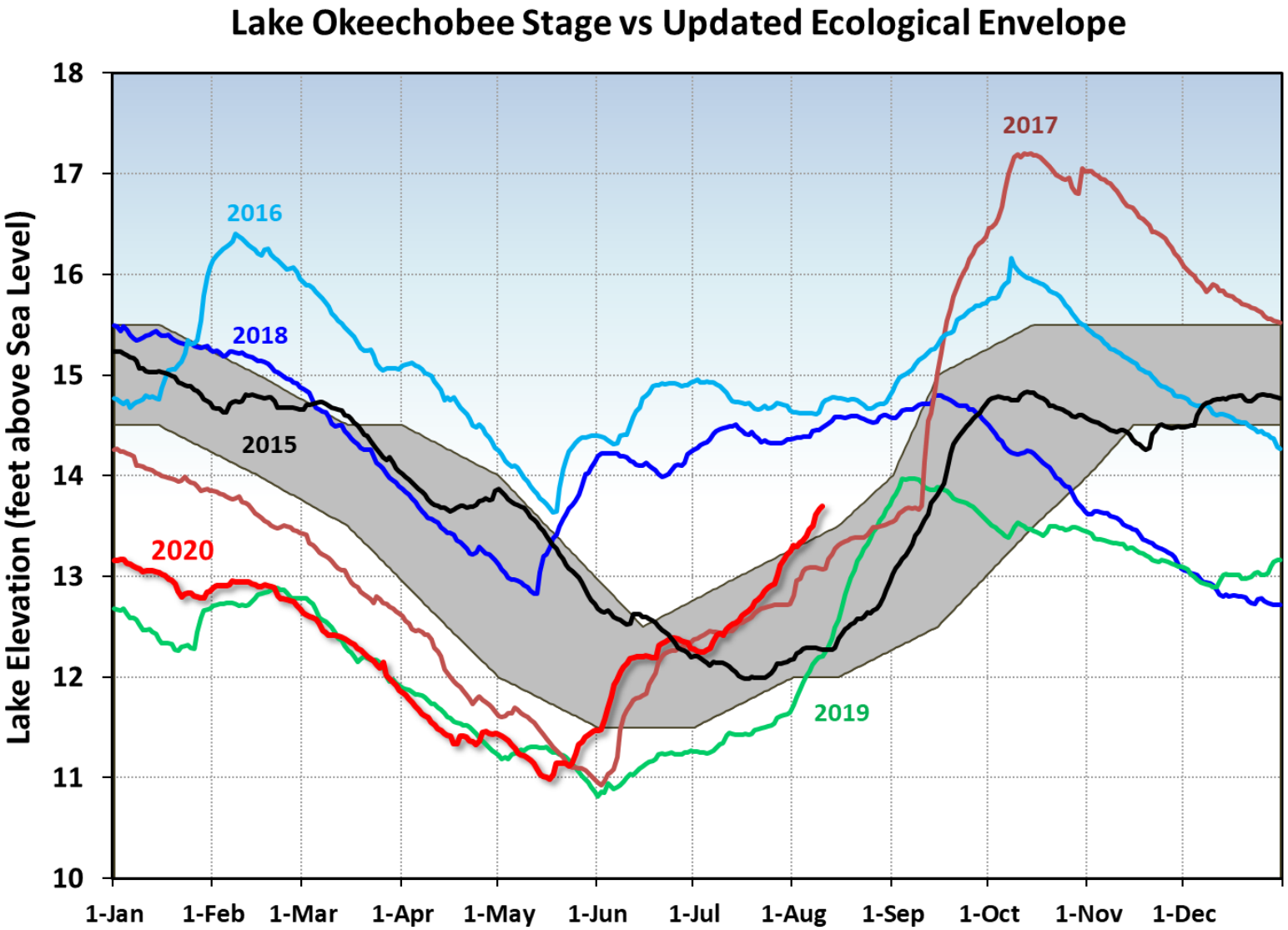


Figure 2. Select annual stage hydrographs for Lake Okeechobee in comparison to the updated Ecological Envelope.

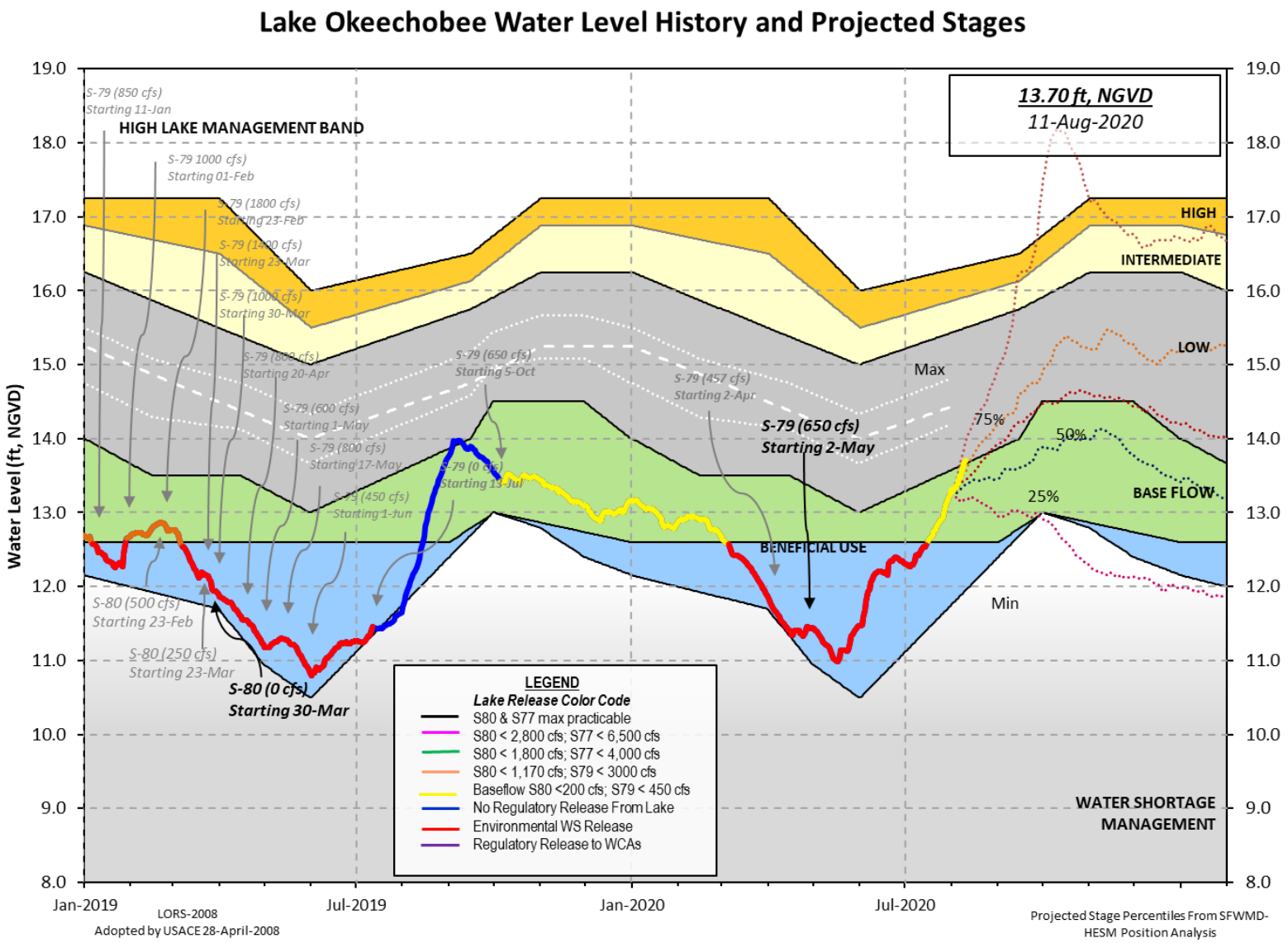


Figure 3. Recent Lake Okeechobee stage and releases, with projected stages based on a dynamic position analysis.

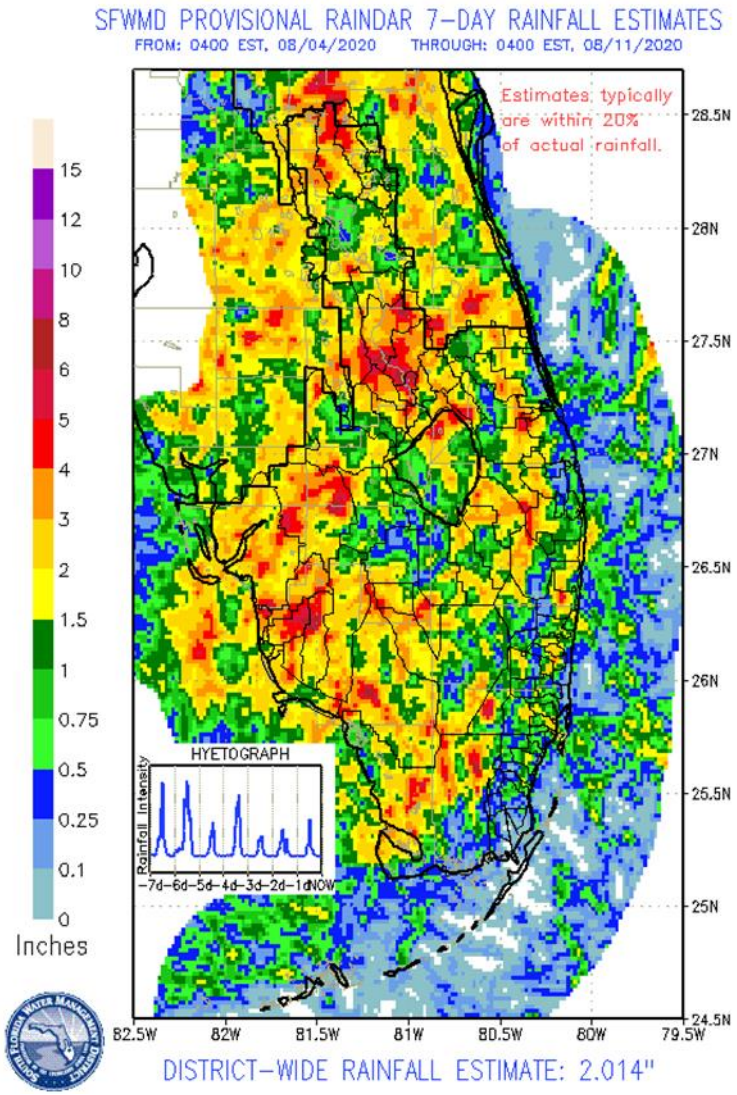


Figure 4. 7-Day rainfall estimates by RAINDAR.

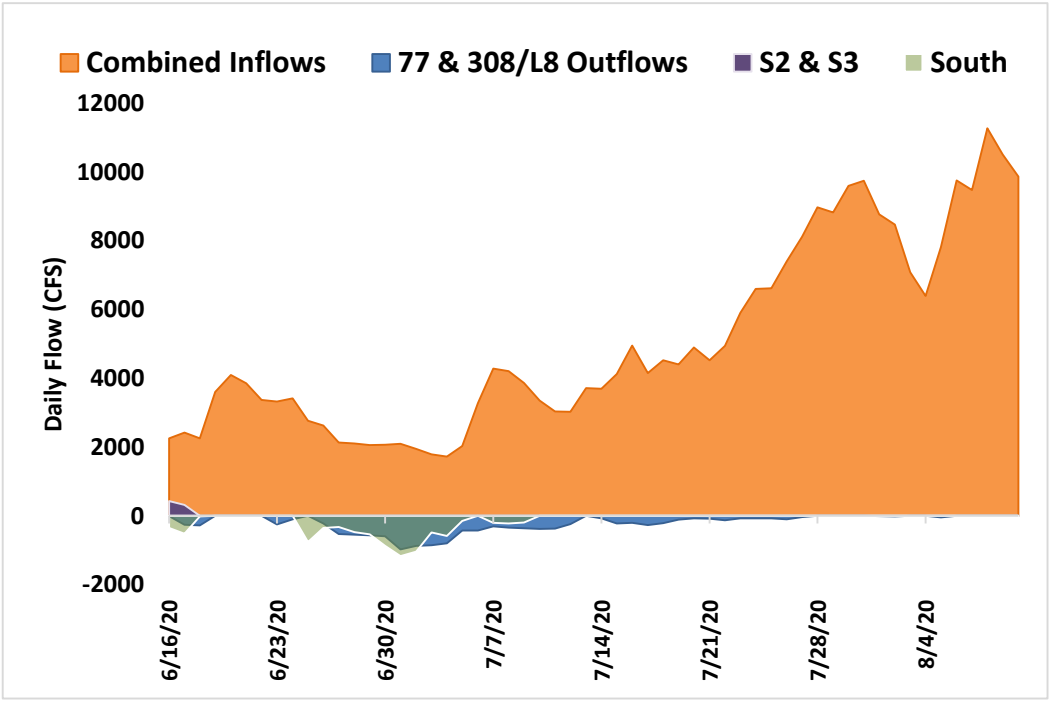


Figure 5. Major inflows (orange) and outflows (blue) of Lake Okeechobee, including the S-350 structures designated as South (green). The L-8 Canal flows through Culvert 10A are included as outflows when positive, and as inflows when backflowing into the Lake. All inflows and outflows are shown as positive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

Collection Date: August 4-5, 2020

Station	CHL*a* (ug/L)	TOXIN (ug/L)	TAXA
FEBIN			NS
FEBOUT			NS
KISSR0.0	P	BDL	mixed
L005	P	BDL	*Cylindro*
LZ2	P	BDL	mixed
KBARSE	P	**1.0**	*Micro/Cylin*
RITTAE2	P	**0.4**	*Microcys*
PELBAY3	P	**0.3**	mixed
POLE3S	P	BDL	mixed
LZ25A	P	BDL	mixed
PALMOUT	P	BDL	mixed
PALMOUT1	P	**3.2**	*Microcys*
PALMOUT2	P	**2.2**	*Microcys*
PALMOUT3	P	**2.0**	*Microcys*
POLESOUT	P	**0.3**	*Cylindro*
POLESOUT1	P	**0.3**	*Cylindro*
POLESOUT2	P	**0.3**	*Micro/Cylin*
POLESOUT3	P	**0.5**	*Micro/Cylin*
EASTSHORE	P	**0.5**	*Microcys*
NES135	P	BDL	NS
NES191	P	**0.3**	mixed

Station	CHL*a* (ug/L)	TOXIN (ug/L)	TAXA
L001	P	BDL	mixed
L004	P	**28.0**	*Microcys*
L006	P	BDL	mixed
L007	P	BDL	mixed
L008	P	**0.7**	*Microcys*
LZ30	P	BDL	*Microcys*
LZ40	P	**25.0**	*Microcys*
CLV10A	P	**0.3**	*Microcys*
NCENTER	P	**1.8**	*Microcys*

Samples collected July 27

S308C	6.9	BDL	mixed
S77	6.3	BDL	*Microcys*

- SFWMD considers >40 µg/L Chlorophyll *a* (Chl*a*) an algal bloom
- BDL – Below Detectable Limit of **0.25** µg/L
- ND – No Dominant taxa
- P – Pending
- NS – Not Sampled
- Bold – crew observed possible BGA
- Chlorophyll *a* analyzed by SFWMD
- Toxin and Taxa analyzed by FDEP

Cylindro = Cylindrospermopsis
Planktol = Planktolyngbya
Dolicho = Dolichospermum

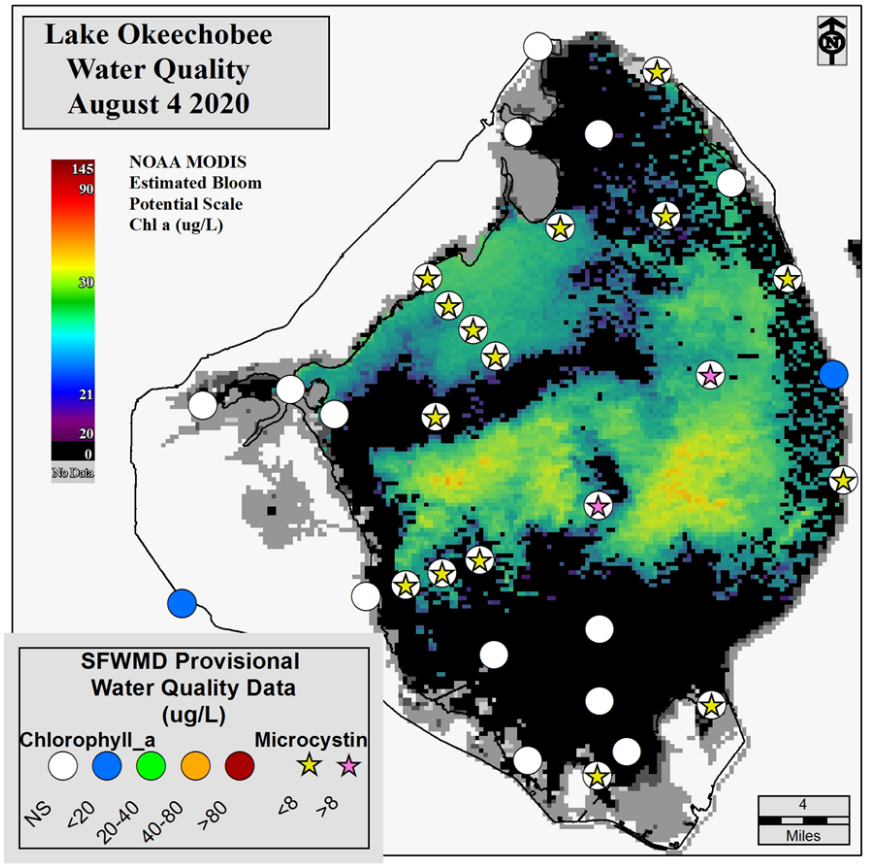


Figure 6. Provisional results from the expanded monitoring sampling trips on August 4-5, 2020.

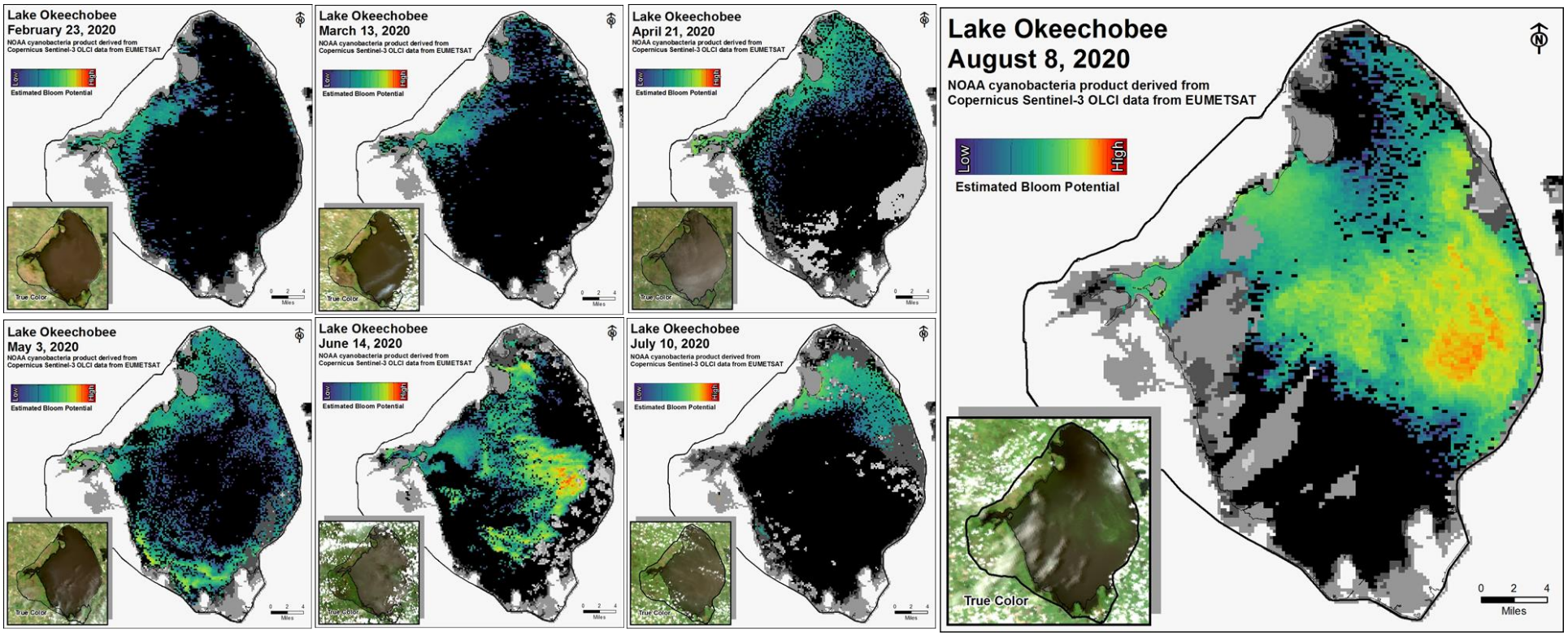


Figure 7. Potential for cyanobacterial blooms on Lake Okeechobee during 2020, based on NOAA's harmful algal bloom monitoring system. Gray color indicates cloud cover.

ESTUARIES

St. Lucie Estuary:

Last week total inflow to the St. Lucie Estuary averaged approximately 1,897 cfs (Figures 1 and 2) and last month inflow averaged about 1,941 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	768
S-80	0
S-308	-331
S-49 on C-24	535
S-97 on C-23	313
Gordy Rd. structure on Ten Mile Creek	281

Over the past week, salinity increased throughout the estuary except for the surface salinity at A1A Bridge (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 8.4. Salinity conditions in the middle estuary are estimated to be within the fair 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)	**1.3** (1.0)	**4.0** (1.6)	NA[1]
US1 Bridge	**6.3** (5.1)	**9.9** (7.1)	10.0-26.0
A1A Bridge	**15.0** (15.3)	**23.3** (21.9)	NA[1]

[1]Envelope not applicable

Caloosahatchee Estuary:

Last week total inflow to the Caloosahatchee Estuary averaged approximately 1,816 cfs (Figures 5 and 6) and last month inflow averaged about 1,717 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	0
S-78	161
S-79	1220
Tidal Basin Inflow	596

Over the past week, salinities 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 Shell Point and most likely at Cape Coral and in the fair range at Sanibel (Figure 9). The seven-day average surface salinities (Table 4) are in the good range (0-10) 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 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)	**0.5** (1.0)	**0.5** (1.0)	NA[1]
Val I75	**1.1** (1.1)	**1.5** (1.7)	0.0-5.0[2]
Ft. Myers Yacht Basin	**5.7** (5.5)	**7.0** (7.3)	NA
Cape Coral	**NR**[3] (11.9)	**NR**[3] (14.7)	10.0-30.0
Shell Point	**24.8** (24.6)	**25.5** (25.7)	10.0-30.0
Sanibel	**30.4** (30.9)	**31.1** (31.5)	10.0-30.0

[1]Envelope not applicable, [2]Envelope is based on a 2-week forecast 30-day average, [3]Not Reporting

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 0.9 to 3.2 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 675 cfs. The 30-day moving average surface salinity at Val I-75 is forecast to be between 1.1 and 1.9 (Table 5). The current salinity conditions at Val I-75 are within 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	675	3.2	1.9
B	300	675	2.1	1.5
C	450	675	1.6	1.3
D	650	675	1.1	1.2
E	800	675	0.9	1.1

Red tide

The Florida Fish and Wildlife Research Institute reported on August 7, 2020, that *Karenia brevis,* the Florida red tide dinoflagellate, was not observed in samples collected from Lee, St. Lucie, or Martin counties (no samples were analyzed this week from Palm Beach, Broward, or Miami-Dade counties).

Water Management Recommendations

Lake stage is in the Low sub-band. Tributary conditions are very wet. The LORS2008 release guidance suggest up to 450 cfs release at S-79 to the Caloosahatchee Estuary and up to 200 cfs release at S-80 to the St. Lucie Estuary.

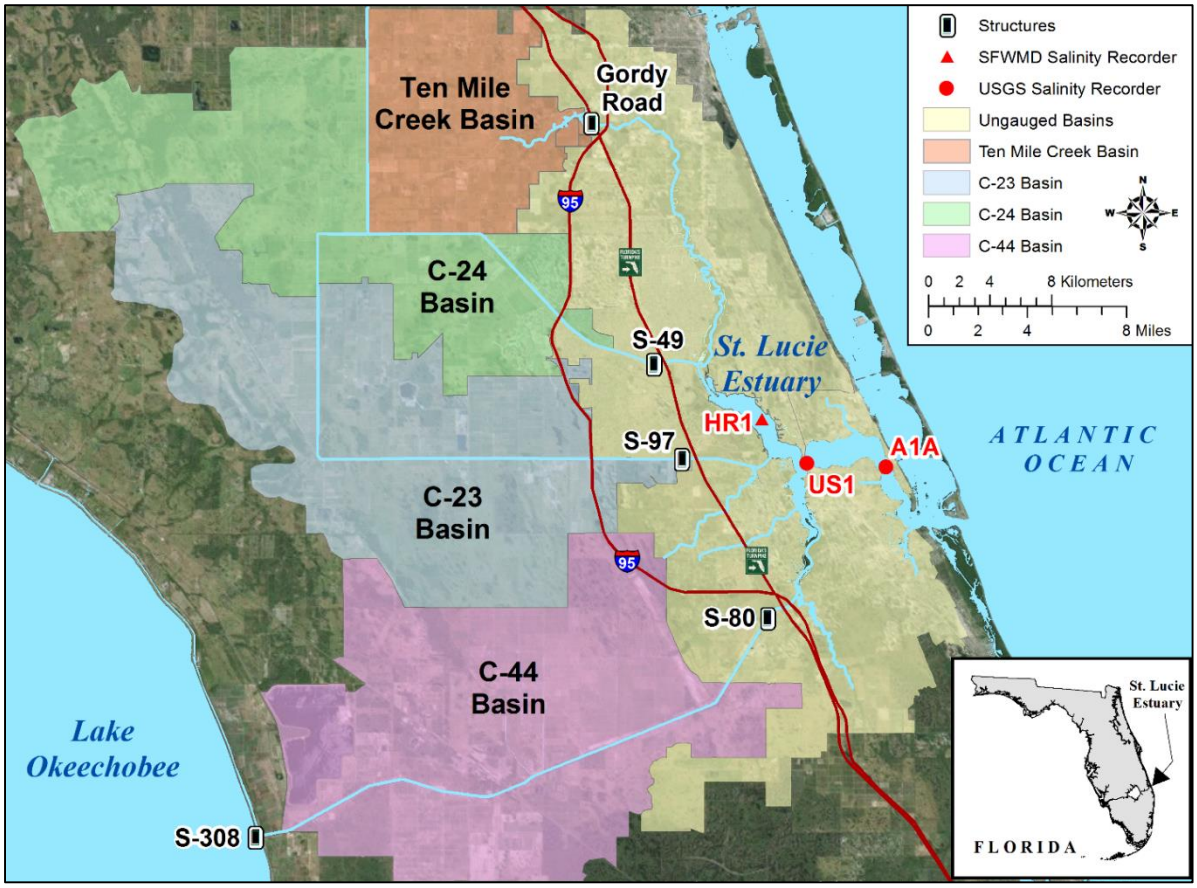


Figure 1. Basins, water control structures, and salinity monitoring for the St. Lucie Estuary.

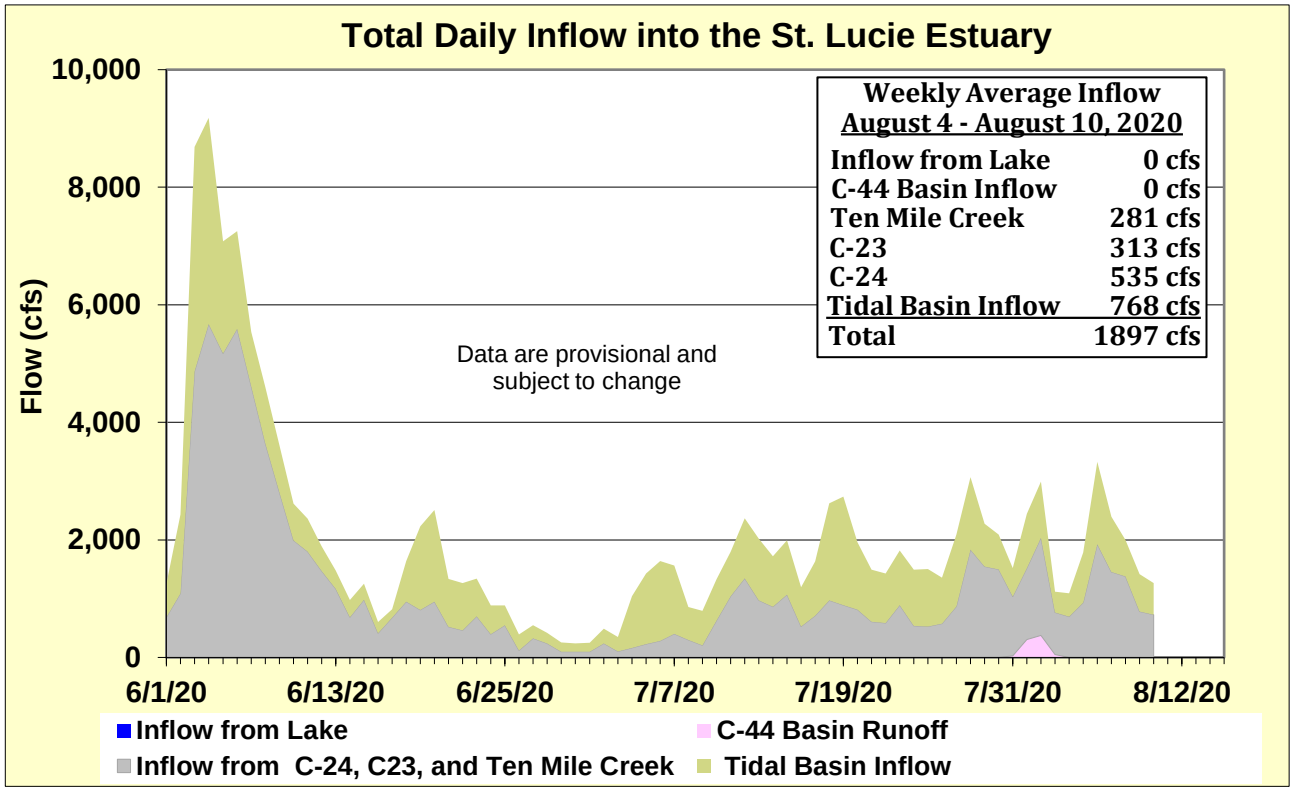


Figure 2. Total daily inflows from Lake Okeechobee and runoff from the C-44, C-23, C-24, Ten Mile Creek, and tidal basin into the St. Lucie Estuary.

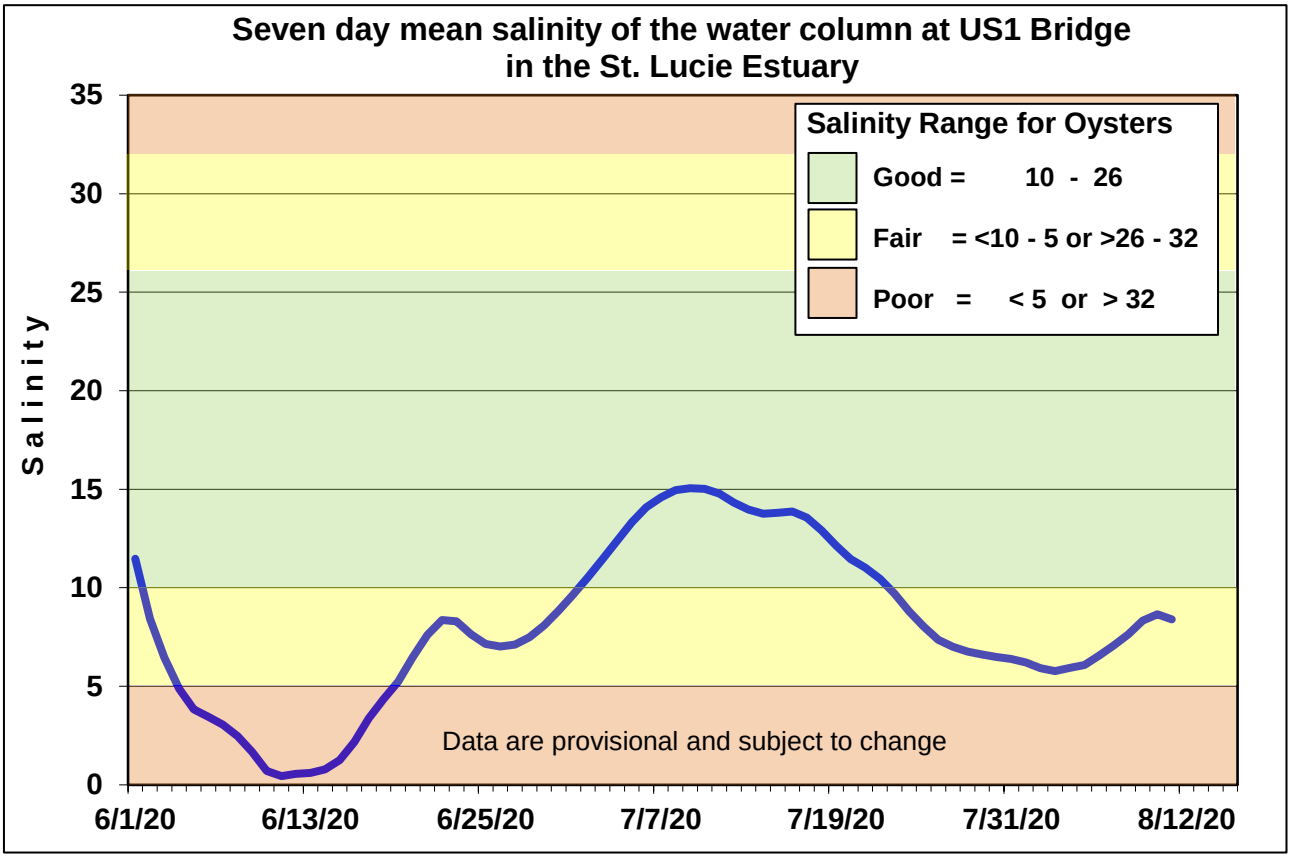


Figure 3. Seven-day mean salinity of the water column at the US1 Bridge.

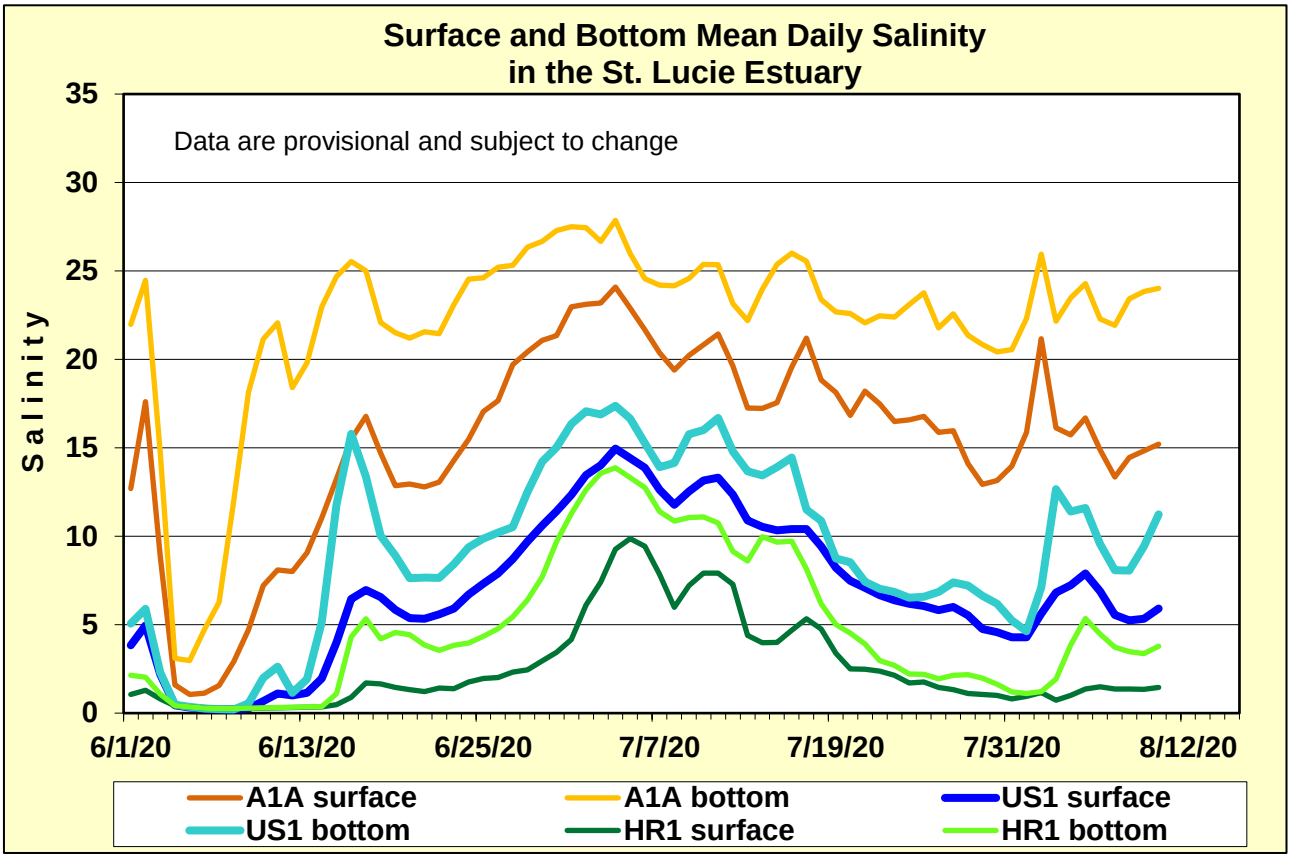


Figure 4. Daily mean salinity at the A1A, US1, and HR1 stations.

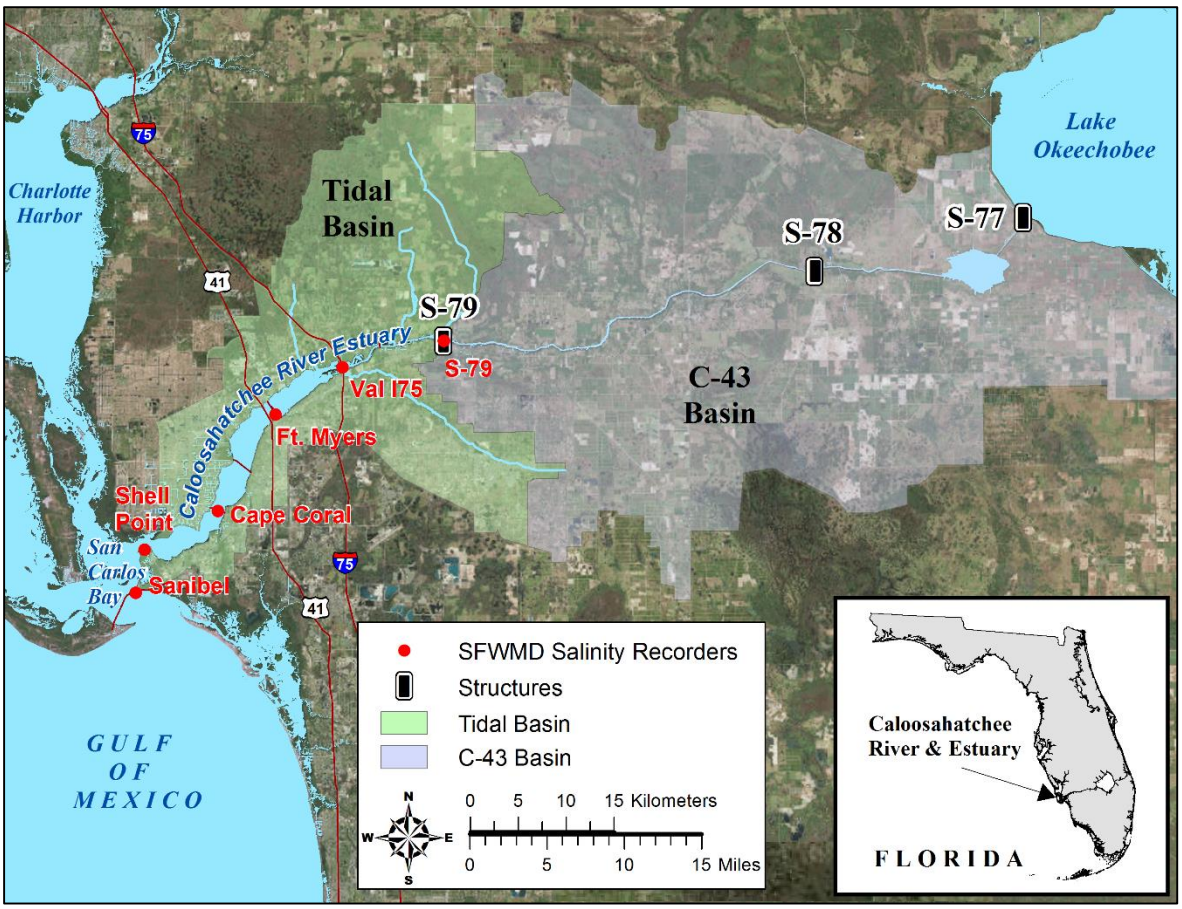


Figure 5. Basins, water control structures, and salinity monitoring for the Caloosahatchee Estuary.

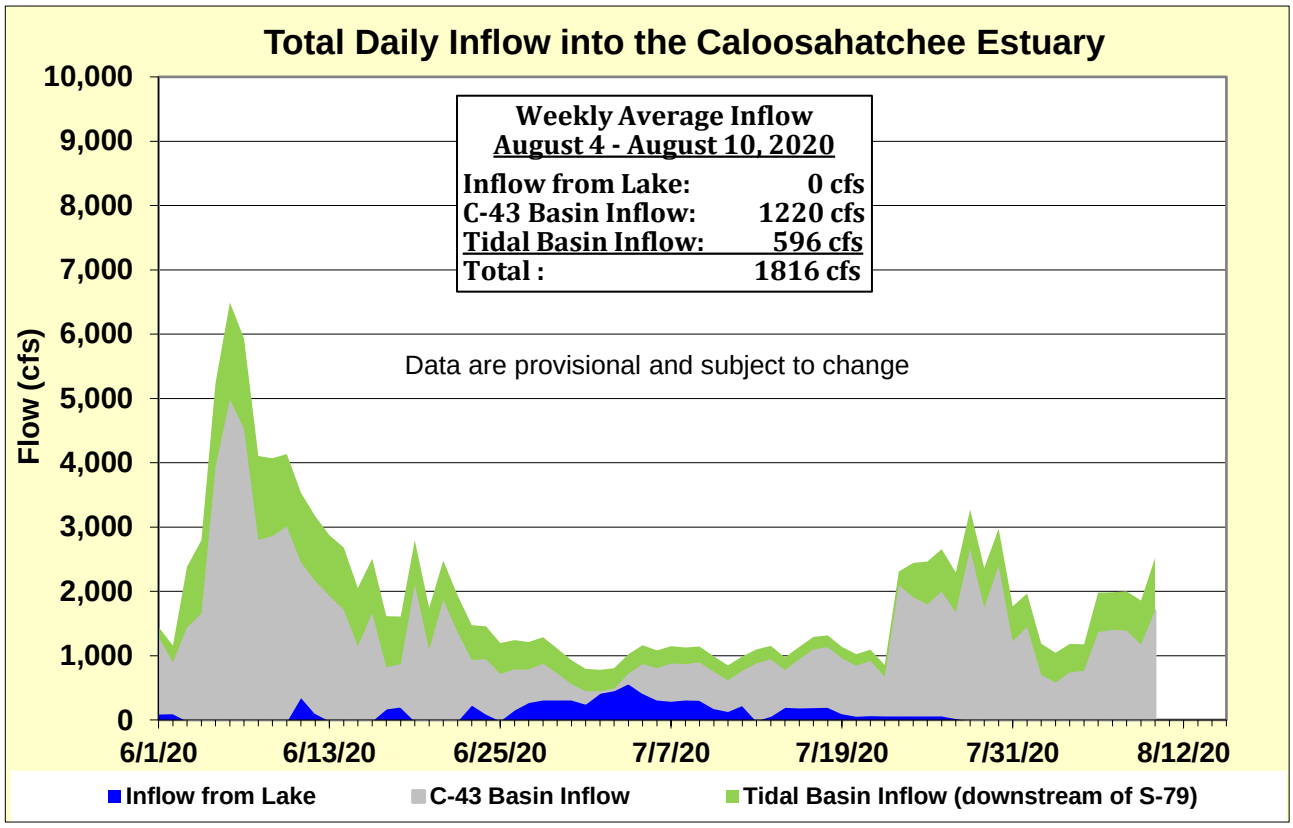


Figure 6. Total daily inflows from Lake Okeechobee, runoff from the C-43 basin

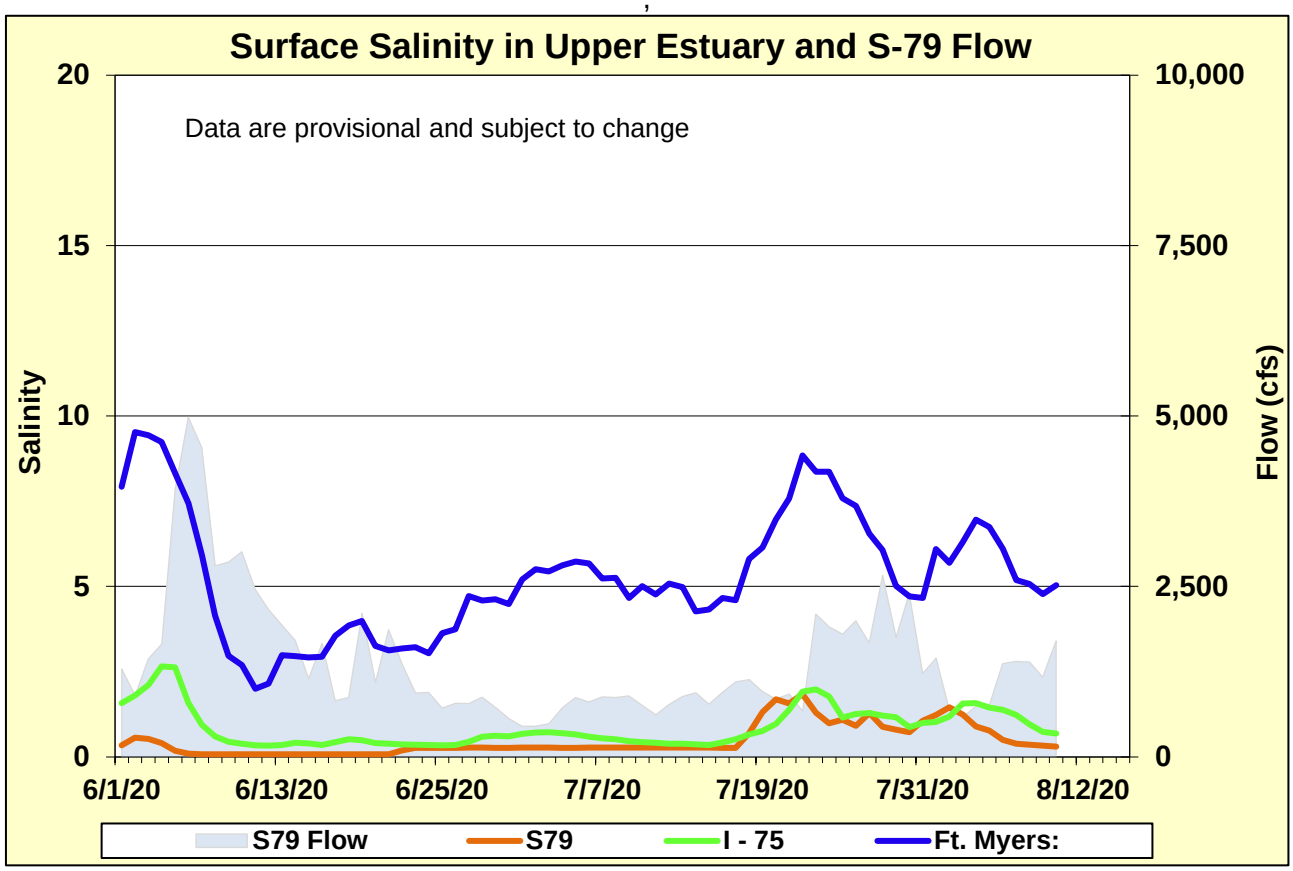


Figure 7. Daily mean flows at S-79 and salinity at upper estuary monitoring stations.

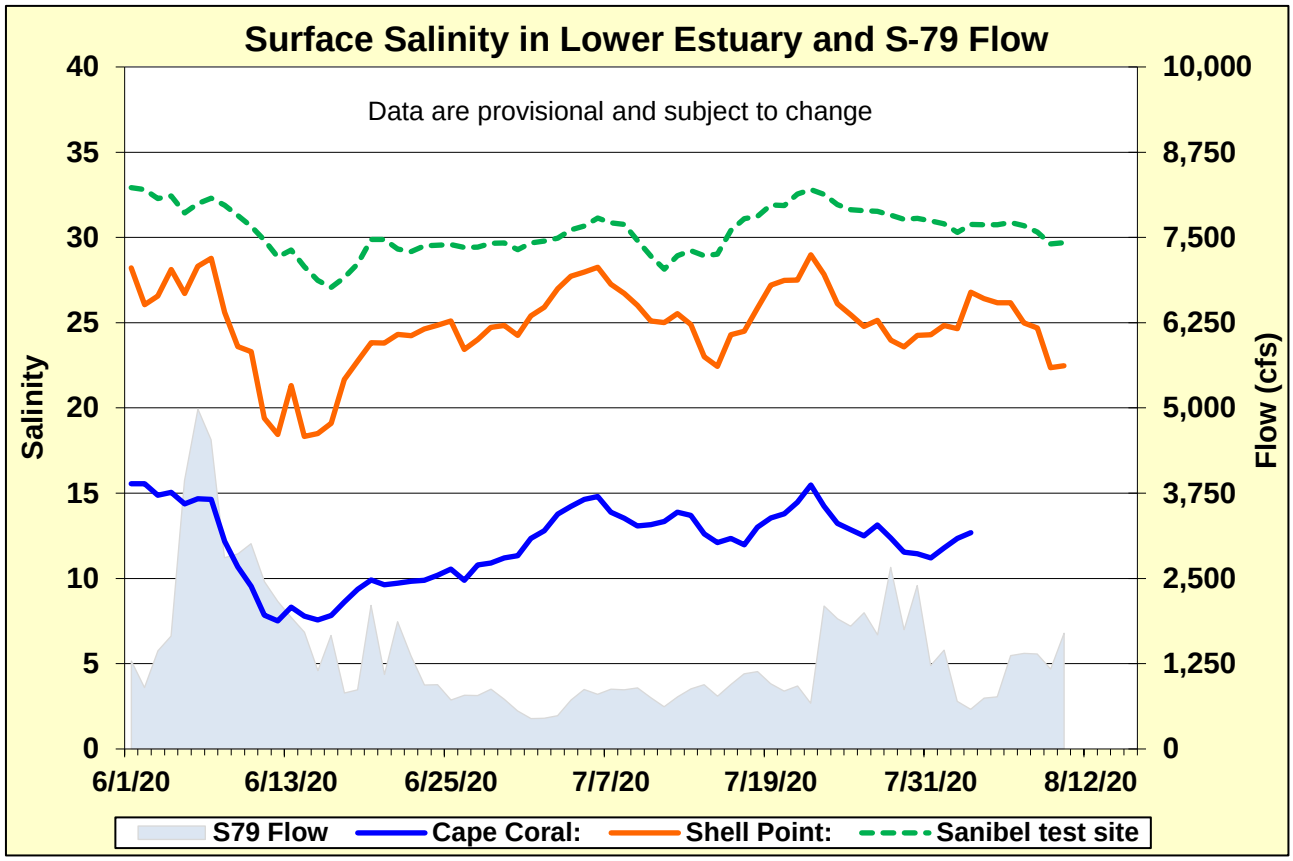


Figure 8. Daily mean flows at S-79 and salinity at lower estuary stations.

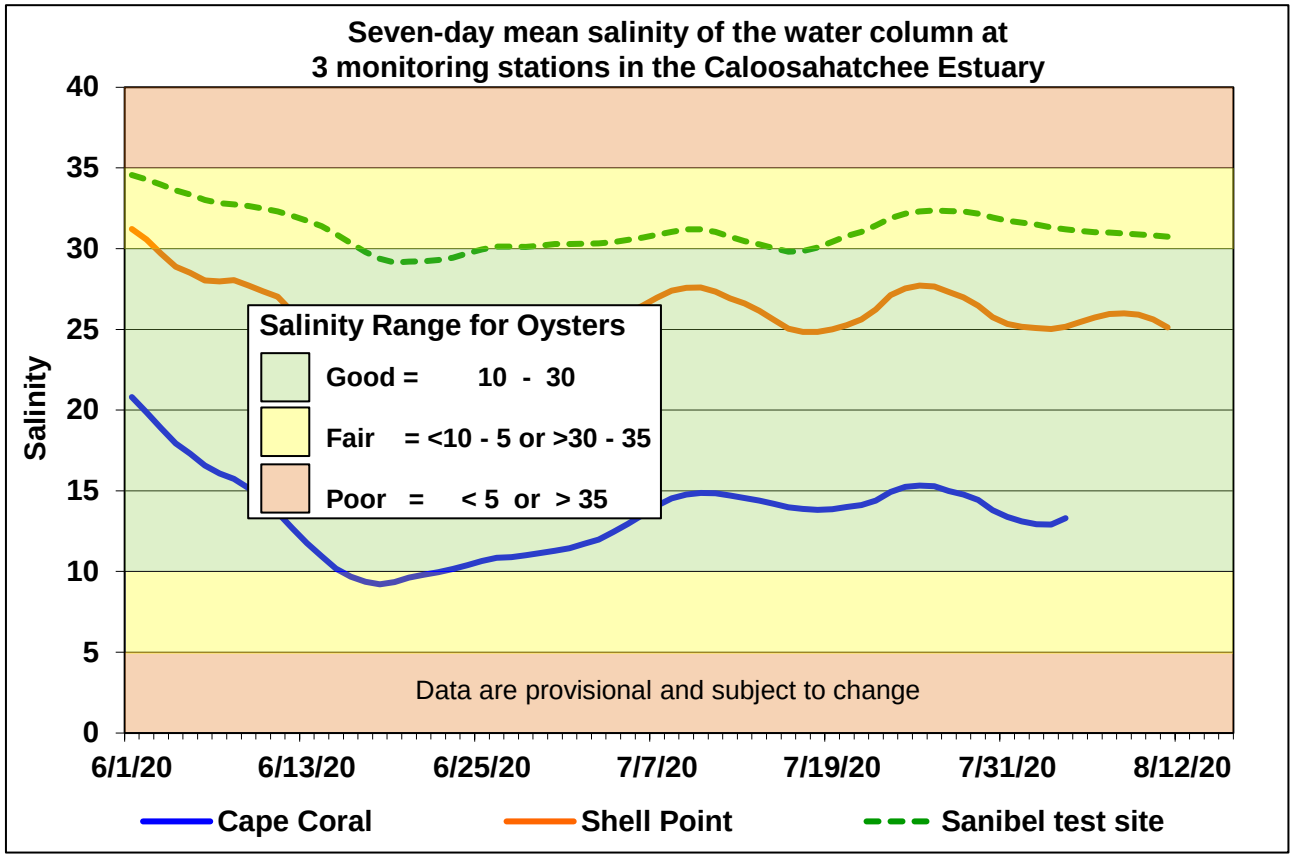


Figure 9. Seven-day mean salinity at Cape Coral, Shell Point, and Sanibel monitoring stations.

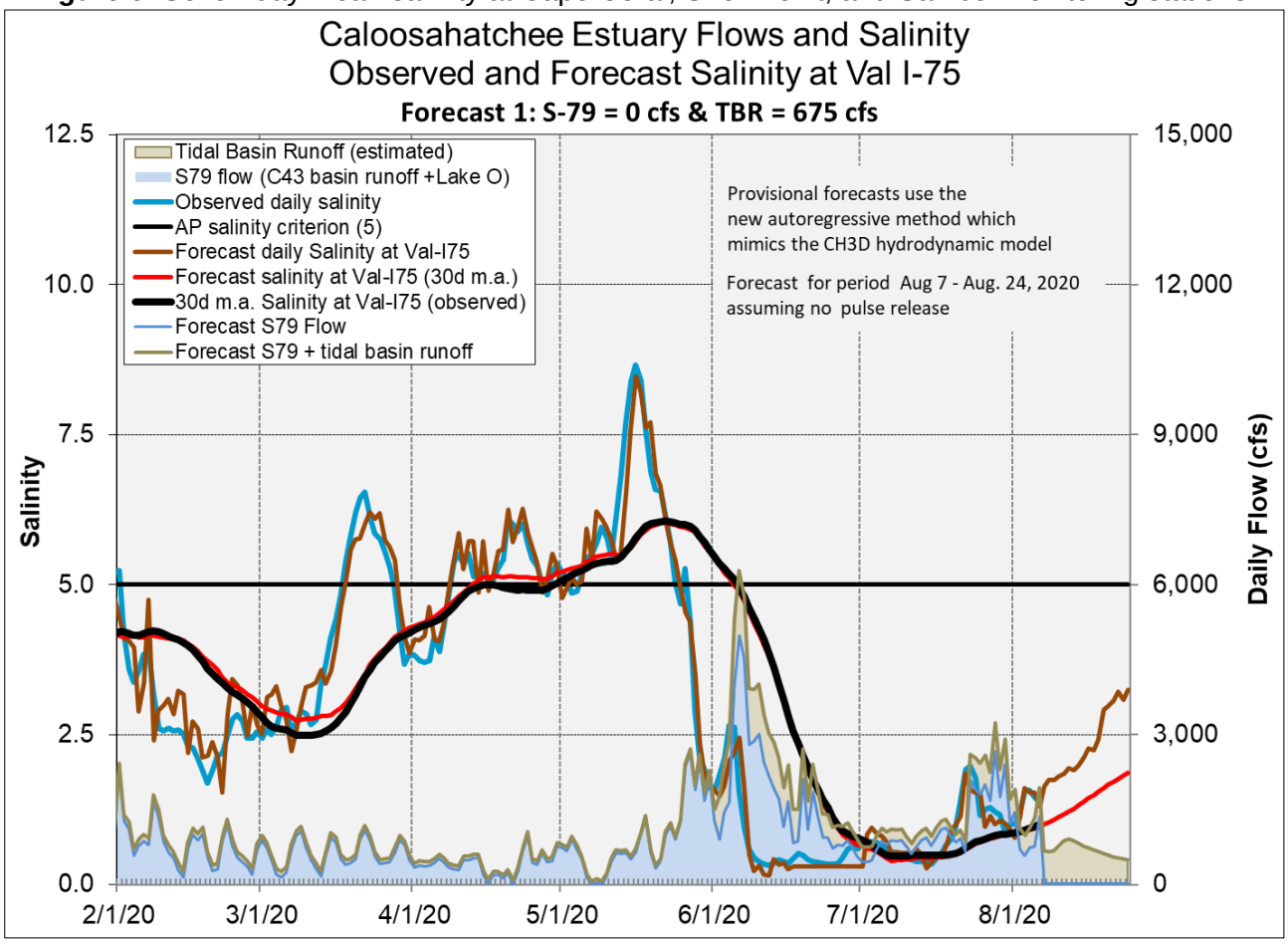
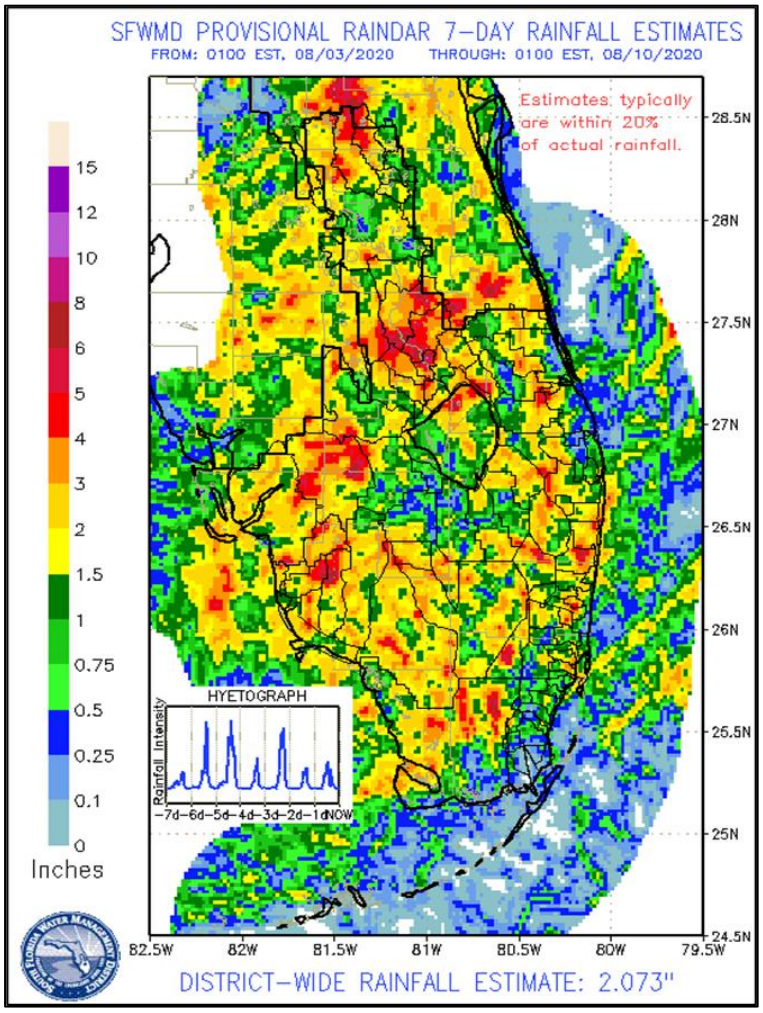


Figure 10. Forecasted Val I-75 surface salinity assuming no pulse release at S79.

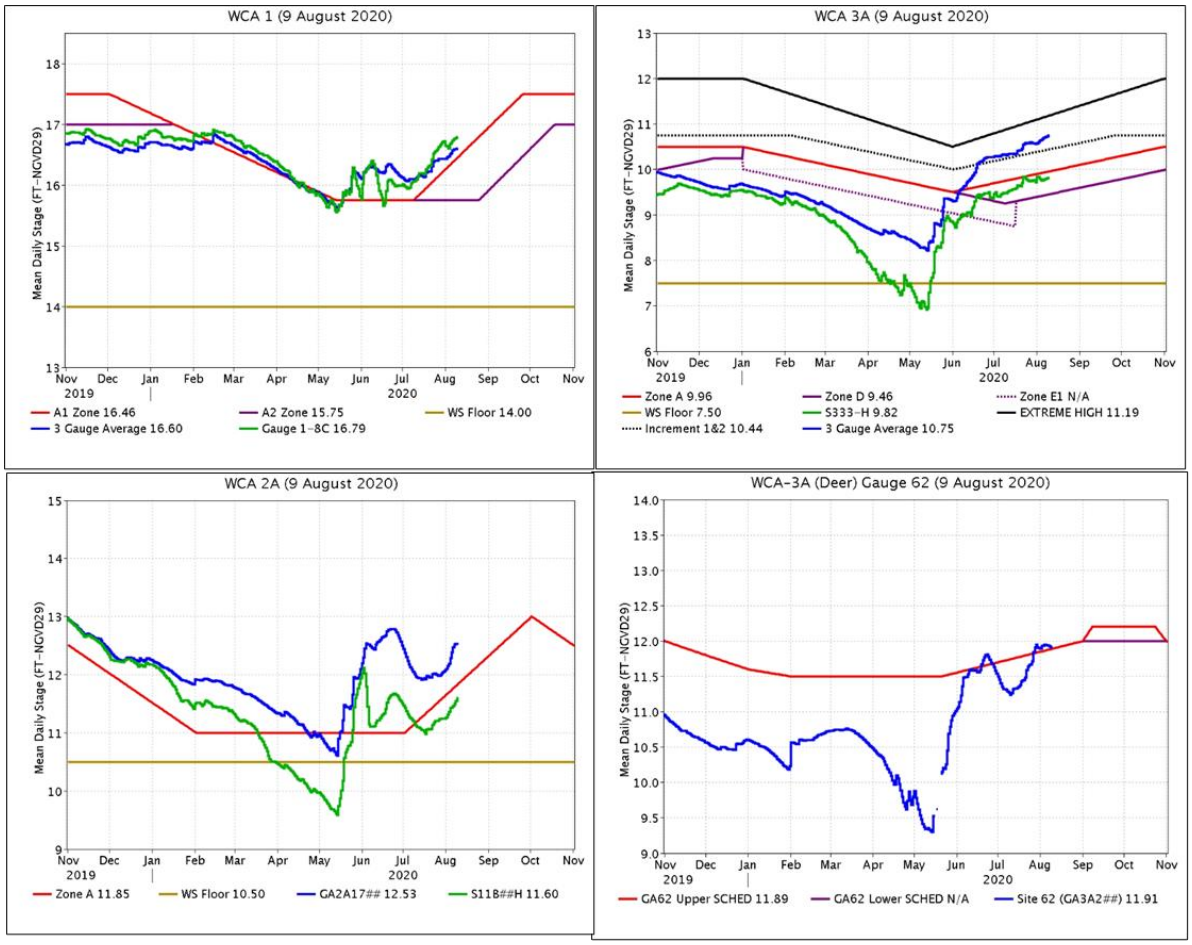
EVERGLADES

Widespread above average rainfall was recorded across the WCAs last week, WCA-2A received the most. At the gauges monitored for this report stages increased 0.14 feet on average and for the second week in a row central WCA-2 had the maximum increase last week of 0.38 feet. Evaporation was estimated at 1.78 inches last week, higher than the week prior.

Everglades Region	Rainfall (Inches)	Stage Change (feet)
WCA-1	2.15	+0.15
WCA-2A	2.39	+0.38
WCA-2B	1.59	+0.06
WCA-3A	1.94	+0.11
WCA-3B	2.43	+0.13
ENP	1.83	+0.13



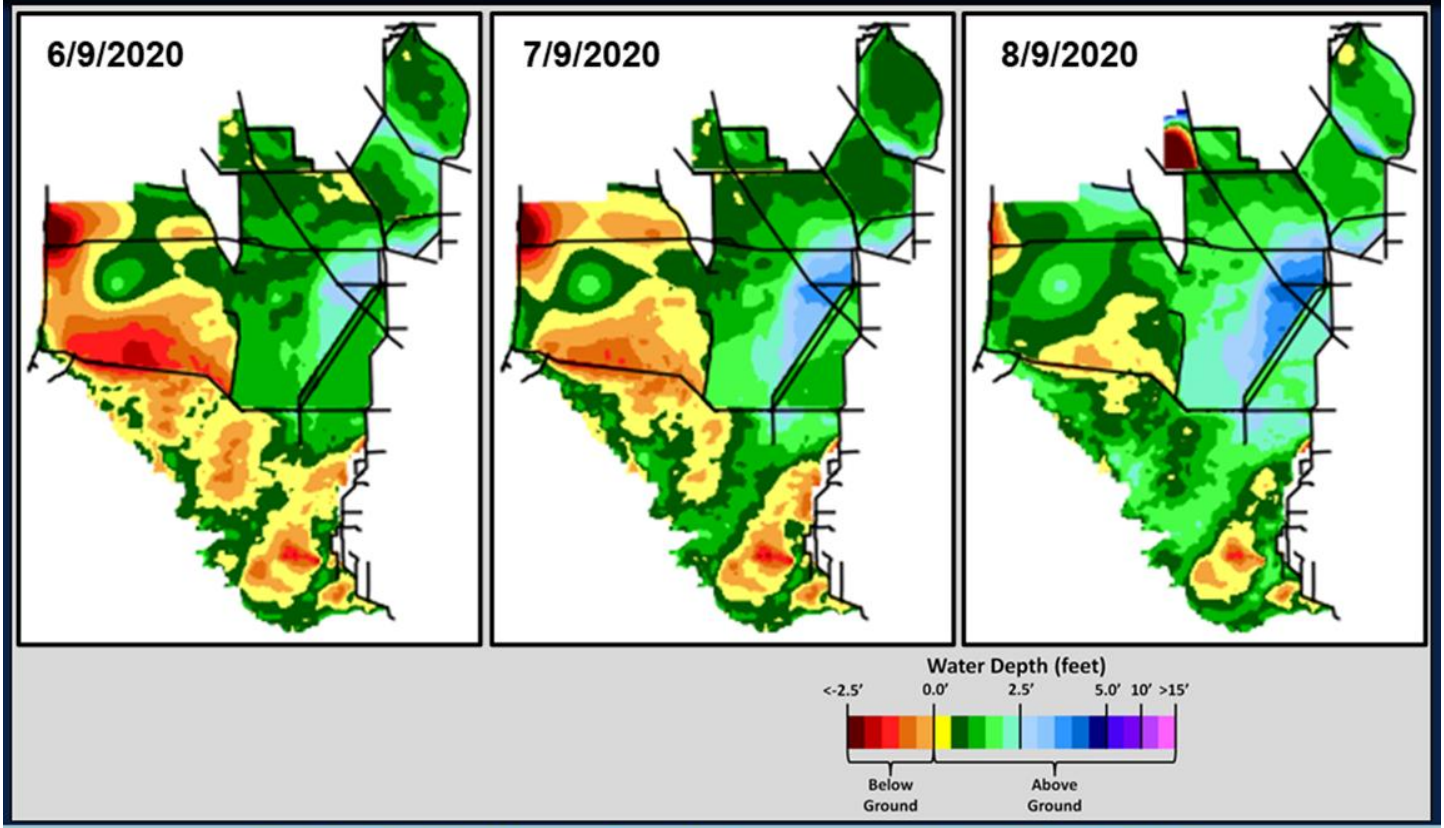
Regulation Schedules: WCA-1: Stage at the 1-8C Gauge followed along the rising Zone A1 regulation line last week, currently 0.33 feet above and the 3-Gauge average remained 0.14 feet above. WCA-2A: Stage at Gauge 2-17 continues to trend upward but generally along the rising Zone A regulation line last week now 0.68 feet above. WCA-3A: The Three Gauge Average trends slightly upward and away from the rising Increment 1.2-line, currently 0.31 feet above, and 0.79 feet above the Zone A regulation line. WCA-3A: Stage at gauge 62 (Northwest corner) followed along the rising Upper Schedule last week, now 0.02 feet above.



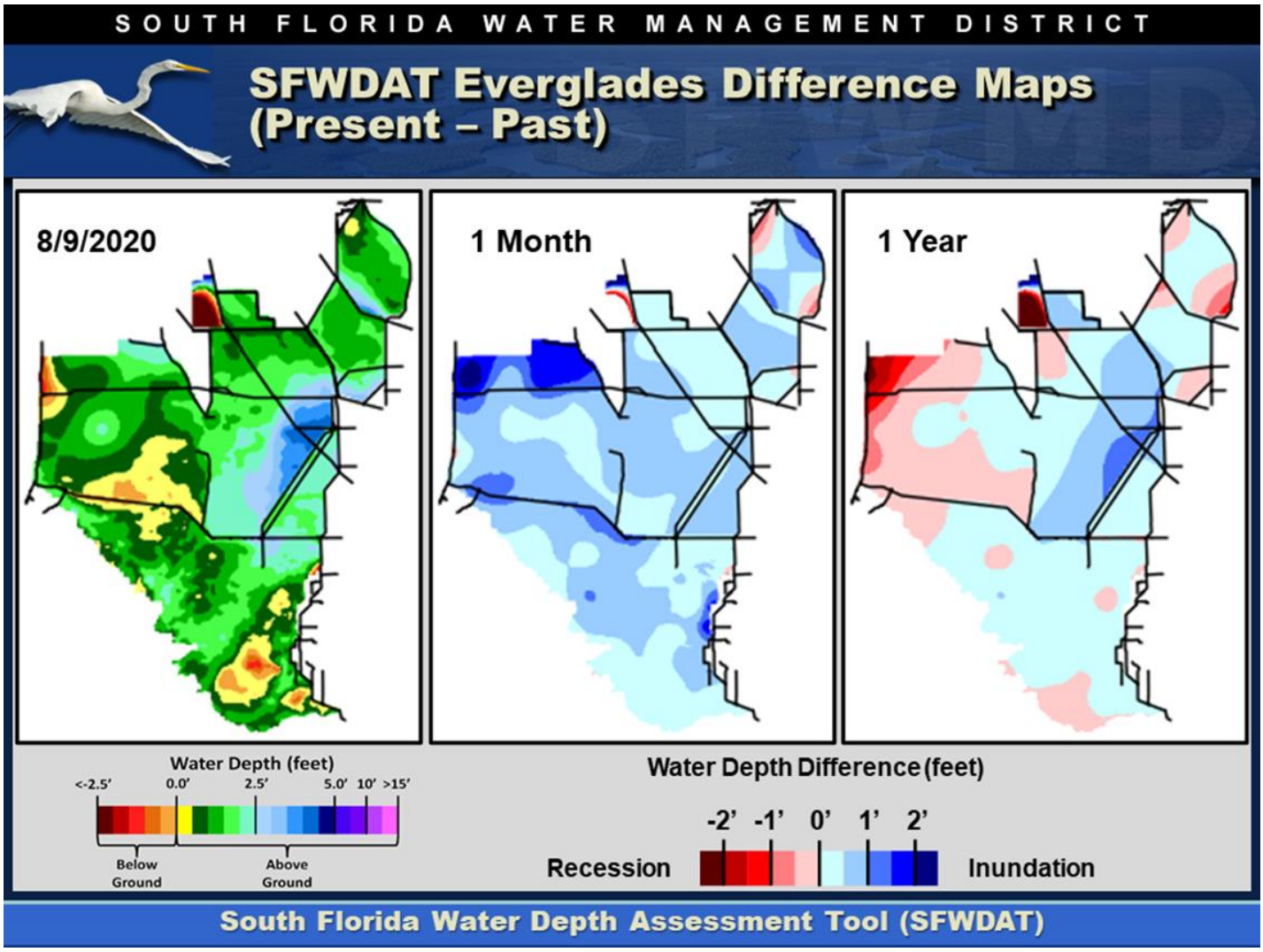
Water Depths: The WDAT tool for spatial interpolation of depth monthly snapshots indicate ponding depths in WCA-3A South are building, in excess of 3.5 feet along the upper reaches of the L-67 canal and the spatial extent is expanding west along the southern boundary to the L-28S. WCA-2A depths are consistent across the basin. Stages in WCA-1 remain deepest along the southwestern perimeter with the potential for shallow depths in the far north. Hydrologic connectivity is strengthening within the major sloughs in Everglades National Park (ENP). Comparing WDAT water levels from present, over the last month stages rose across most of the Everglades. Differences in WCA-1 are mixed, deeper in the northeast and southwest, shallower along the northwest and southeastern boundaries. Looking back one year the stage difference patterns are more significant in WCA-3A with greater depths along the L-67 A downstream of the S-11s. WCA-1 changes are similar to a month ago, and WCA-2A is drier in the far northern extreme. The WDAT model indicates wetter conditions in the western basins and ENP compared to a month ago but less so a year ago.

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

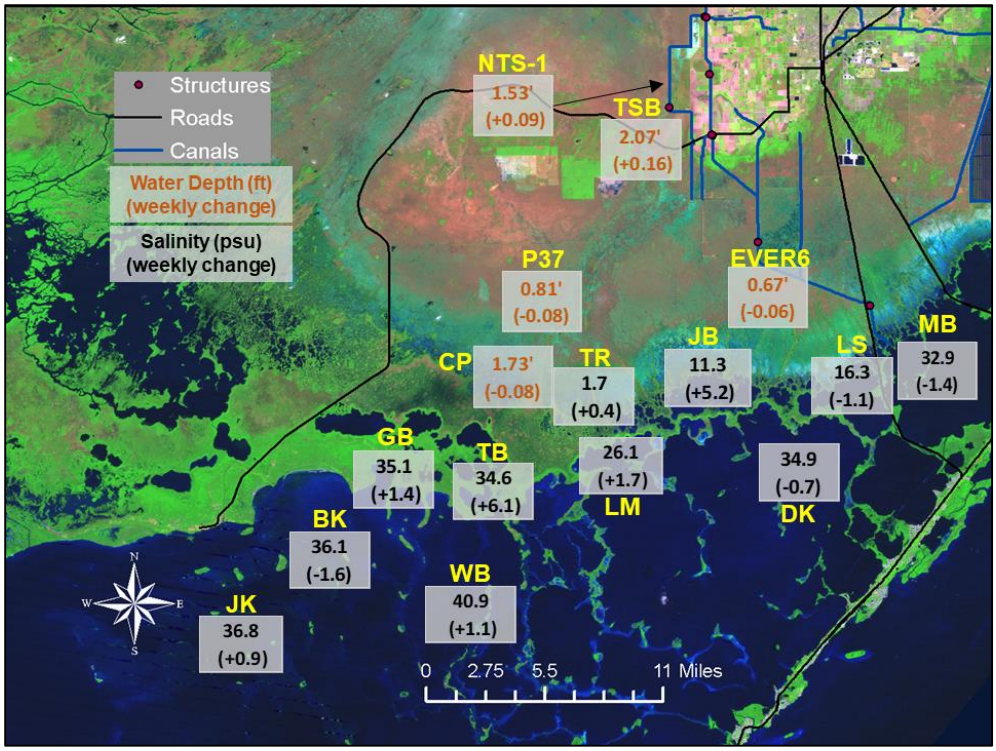
SFWDAT Water Depth Monthly Snapshots

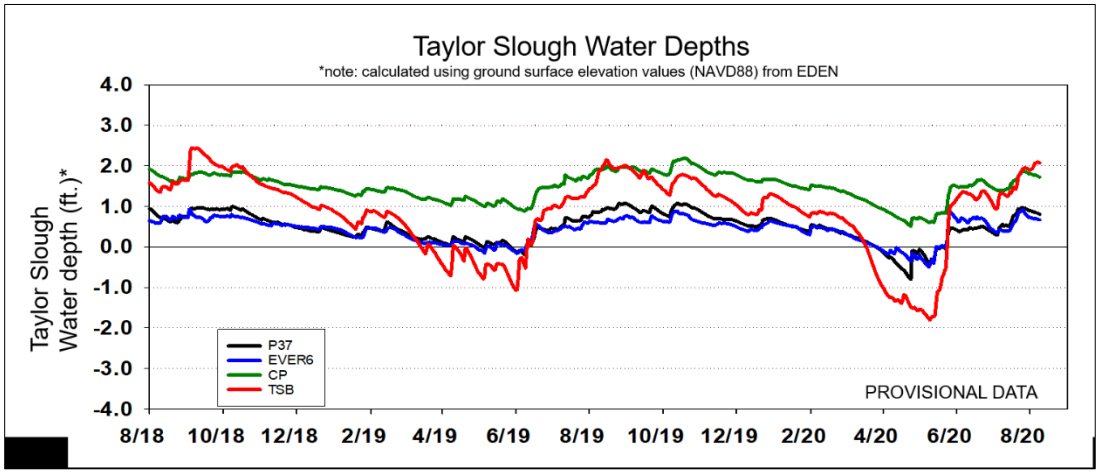


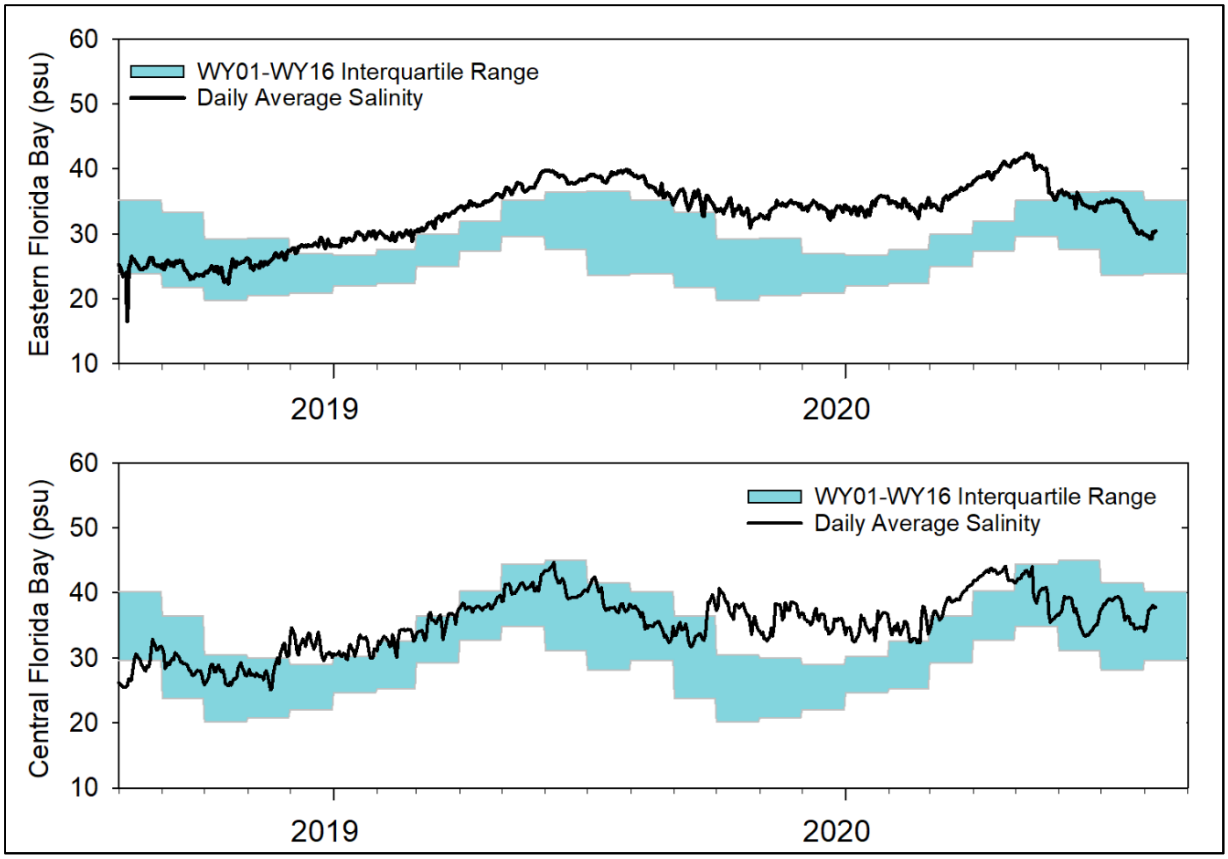
South Florida Water Depth Assessment Tool (SFWDAT)

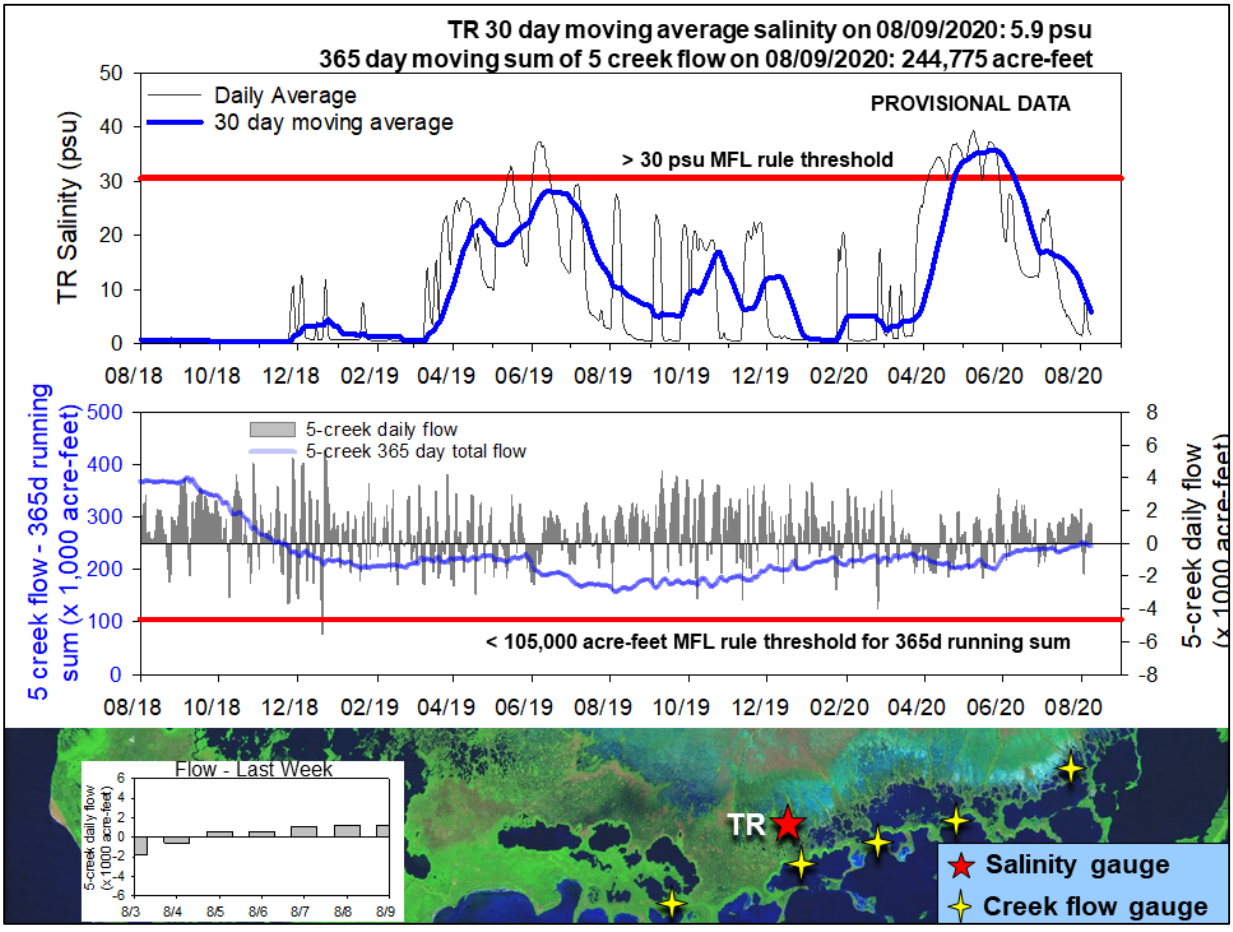


Taylor Slough Water Levels: Rainfall over Taylor Slough and Florida Bay this past week averaged even less than last week at 0.4 inches, but stages increased 0.01 feet on average because of the increases in the north due to water movement. Northern Taylor Slough increased 0.14 feet while the central and southern parts decreased an average of 0.07 feet. Northern Taylor Slough is 8.8 inches deeper than historical average (before the Florida Bay Initiative).


Structures
Roads
Canals
Water Depth (ft)
(weekly change)
Salinity (psu)
(weekly change)
NTS-1
1.53'
(+0.09)
TSB
2.07'
(+0.16)
P37
0.81'
(-0.08)
EVER6
0.67'
(-0.06)
CP
1.73'
(-0.08)
TR
1.7
(+0.4)
JB
11.3
(+5.2)
LS
16.3
(-1.1)
MB
32.9
(-1.4)
GB
35.1
(+1.4)
TB
34.6
(+6.1)
26.1
(+1.7)
LM
34.9
(-0.7)
DK
BK
36.1
(-1.6)
WB
40.9
(+1.1)
JK
36.8
(+0.9)
N
W
E
S
0
2.75
5.5
11 Miles


Taylor Slough Water Depths
*note: calculated using ground surface elevation values (NAVD88) from EDEN
Taylor Slough
Water depth (ft.)*
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
8/18
10/18
12/18
2/19
4/19
6/19
8/19
10/19
12/19
2/20
4/20
6/20
8/20
P37
EVER6
CP
TSB
PROVISIONAL DATA


Eastern Florida Bay (psu)
WY01-WY16 Interquartile Range
Daily Average Salinity
60
50
40
30
20
10
2019
2020
Central Florida Bay (psu)
WY01-WY16 Interquartile Range
Daily Average Salinity
60
50
40
30
20
10
2019
2020


TR 30 day moving average salinity on 08/09/2020: 5.9 psu
365 day moving sum of 5 creek flow on 08/09/2020: 244,775 acre-feet
TR Salinity (psu)
Daily Average
30 day moving average
PROVISIONAL DATA
> 30 psu MFL rule threshold
50
40
30
20
10
0
08/18
10/18
12/18
02/19
04/19
06/19
08/19
10/19
12/19
02/20
04/20
06/20
08/20
5 creek flow - 365d running sum (x 1,000 acre-feet)
5-creek daily flow
5-creek 365 day total flow
< 105,000 acre-feet MFL rule threshold for 365d running sum
500
400
300
200
100
0
8
6
4
2
0
-2
-4
-6
-8
5-creek daily flow (x 1000 acre-feet)
08/18
10/18
12/18
02/19
04/19
06/19
08/19
10/19
12/19
02/20
04/20
06/20
08/20
Flow - Last Week
5-creek daily flow (x 1000 acre-feet)
6
4
2
0
-2
-4
-6
8/3
8/4
8/5
8/6
8/7
8/8
8/9
TR
Salinity gauge
Creek flow gauge

Florida Bay Salinities: Average salinity in Florida Bay increased an average of 1.4 psu this past week. Nearshore salinities averaged a weekly increase of 3 psu while bay sites averaged a decrease of 0.1 psu. All stations are average to 7 psu above the historical average for this time of year.

Florida Bay MFL: Salinity at the TR station in the mangrove zone (tracked for the Florida Bay MFL) increased from 1 psu to 10 psu and decreased again to end the week at 2 psu. The 30-day moving average decreased 4.2 psu to end at 5.9 psu. Weekly flow from the 5 creeks identified by yellow stars on the map totaled just over 2,300 acre-feet which is about a quarter of last week's flows. The 365-day moving sum of flow from the five creeks (tracked as part of the Florida Bay MFL criteria) decreased 8,000 acre-feet this week to end at 244,775 acre-feet which is staying near the historical median (249,091 acre-feet) and mean (250,857 acre-feet). Creek flows are provisional USGS data.

Water Management Recommendations

When water is discharged to tide its potential to benefit the ecology of the Everglades is lost. Conserving water in the WCAs and sending it southward has ecological benefit.

Peak stages in the fall in northern WCA-3A provide improved conditions to support next season's wading bird nesting success at the Alley North colony by providing conditions for an increase in prey base as well as providing surface water that can protect nests from terrestrial predators during the nesting season.

Ponding along the L-67 canal/levee system has increased and inundation of the tree islands in that region has now persisted for more than 67 days. Moderating inflows into that region decreases ponding in both spatial extent and limits the amount of time the region is inundated, this has benefit to the ecology of tree islands in that region.

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 the nearshore/off shore gradient returns but more freshwater is needed to continue to decrease salinities in both the nearshore and the eastern bay towards a more ecologically preferred condition.

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

SFWMD Everglades Ecological Recommendations, August 11th, 2020 (red is new)			
Area	Weekly change	Recommendation	Reasons
WCA-1	Stage increased by 0.15'	Moderating the ascension rate to less than 0.25 feet per week or 0.50 feet per two weeks and conserving water in this basin has ecological benefit.	Protect upstream/downstream habitat and wildlife. Apple snail reproduction is hindered by rapidly increasing stage.
WCA-2A	Stage increased by 0.38'	Moderating the ascension rate to less than 0.25 feet per week or 0.50 feet per two weeks and conserving water in this basin has ecological benefit.	Protect upstream/downstream habitat and wildlife. Apple snail reproduction is hindered by rapidly increasing stage.
WCA-2B	Stage increased by 0.06'	Moderating the ascension rate to less than 0.25 feet per week or 0.50 feet per two weeks.	Protect upstream/downstream habitat and wildlife. Apple snail reproduction is hindered by rapidly increasing stage.
WCA-3A NE	Stage increased by 0.19	Moderating the ascension rate to less than 0.25 feet per week or 0.50 feet per two weeks. Conserving water in this region has ecological benefit.	Protect upstream/downstream habitat and wildlife. Apple snail reproduction is hindered by rapidly increasing stage.
WCA-3A NW	Stage remained unchanged	Moderating the ascension rate to less than 0.25 feet per week or 0.50 feet per two weeks.	
Central WCA-3A S	Stage increased by 0.17'	Moderating the ascension rate to less than 0.25 feet per week or 0.50 feet per two weeks.	Protect upstream/downstream habitat and wildlife. Apple snail reproduction is hindered by rapidly increasing stage, and and tree island ecology is dimineshed by flooding
Southern WCA-3A S	Stage decreased by 0.07'		
WCA-3B	Stage decreased by 0.13'	Moderating the ascension rate to less than 0.25 feet per week or 0.50 feet per two weeks.	Protect upstream/downstream habitat and wildlife. Apple snail reproduction is hindered by rapidly increasing stage.
ENP-SRS	Stage decreased by 0.13'	Make discharges to the Park according to the 2012 WCP rainfall plan	Protect upstream/downstream habitat and wildlife. Apple snail reproduction is hindered by rapidly increasing stage.
Taylor Slough	Stage changes ranged from −0.08' to +0.16'	Move water southward as possible	When available, provide freshwater buffer for downstream conditions.
FB- Salinity	Salinity changes ranged −1.6 to +6.1 psu	Move water southward as possible	When available, provide freshwater to maintain low salinity buffer and promote water movement.