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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: September 9, 2020

SUBJECT: Weekly Environmental Conditions for Systems Operations

Summary

Weather Conditions and Forecast

A tropical wave extending from the Yucatan Channel through west-central Florida is slowly moving northwestward. Southerly steering winds behind the tropical wave should slow the inland progression of east and west coast sea breezes. Over the next few days, the influence of the upper-level trough over the Gulf of Mexico is expected to diminish. The above-normal moisture will continue to fuel enhanced rains and widespread coverage of rainfall each day, with easterly to southeasterly steering winds forecast through late in the week generally favoring greater rains over the interior and the west. Another tropical wave is forecast to pass from the Bahamas on Saturday, across the District by later Sunday, and should extend the current period of enhanced rains through at least that time. The prolonged period of enhanced rains that began on Sunday is also likely to result in significant rainfall accumulations over a large part of the District with areal average rainfall above or much above normal. Some reduction in rainfall is possible by early next week when the large circulation of what could be Hurricane Paulette enters the western Atlantic waters and drags drier continental air southward. While the degree to which a drying occurs is uncertain, total rainfall at least around the daily climatological average is seen continuing through at least Sunday.

Kissimmee

Tuesday morning stages were 56.4 feet NGVD (0.2 feet below schedule) in East Lake Toho, 53.8 feet NGVD (0.2 feet above schedule) in Toho, and 51.4 feet NGVD (0.3 feet above schedule) in Kissimmee-Cypress-Hatchineha; headwater stages were 46.6 feet NGVD at S-65A and 27.6 feet NGVD at S-65D. Tuesday morning discharges were 1,910 cfs at S-65, 2,430 cfs at S-65A, 3,740 cfs at S-65D and 3,810 cfs at S-65E. Dissolved oxygen concentration in the Kissimmee River averaged 0.9 mg/L for the week through Sunday, below the critical threshold of 1 mg/L. Kissimmee River mean floodplain depth on Sunday was 2.22 feet. Today's recommendations are to continue to use the IS-14-50 discharge plan through the 2,020 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); and manage S-59 discharge to allow stage in East Lake Toho to rise to the regulation schedule by September 15 as rainfall allows.

Lake Okeechobee

Lake Okeechobee stage was 14.61 feet NGVD on September 7, 2020, 0.27 feet higher than the previous week and 0.99 feet higher than the previous month. The Lake is in the Low sub-band. Lake stage moved into the ecological envelope (which varies seasonally from 12.0– 15.0 feet NGVD +/- 0.5 feet) on June 2, 2020, after being up to 1.5 feet below since October 15, 2019, and is now just 0.18 feet above the top of envelope. Ascension rates have exceeded the recommended rate (<0.5 foot per 2 weeks) several times since the onset of the wet season but have remained close to one ft per month on average; potentially allowing submerged plant communities to keep up with rising stages. The cyanobacteria bloom risk potential remains moderate in the central/northern region of the Lake.

Estuaries

Total inflow to the St. Lucie Estuary averaged 764 cfs over the past week with no flow coming from Lake Okeechobee. The seven-day average salinities increased throughout 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 2,728 cfs over the past week with no flow coming from the Lake. There was little change in seven-day average salinity in the estuary over the past week. Salinities are in the good range (0-10) for tape grass at Val I-75 and Ft. Myers. Salinities are in the good range for adult eastern oysters at Shell Point (10-30) and Sanibel, and in the fair range at Cape Coral (5-10). Lake stage is in the Low sub-band of 2008 LORS. Tributary hydrological conditions are 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 694,000 ac-feet. Most STA cells are near or 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 remain above schedule but generally trending along with regulation. WCA-1 stages continued to rise within the preferred ecological range. Stages in WCA-2A central ascended rapidly and the WCA-3A three-gauge average fell last week, but stages came up at Gauge 65 located in the south of that basin. Stages at the “Deer Gauge” in northwestern WCA-3A remains below the Upper Schedule and the two-gauge average in WCA-3A North also remains below the Florida Fish and Wildlife Conservation (FFWC) closure stage but public closure remains in effect. Depths in WCA-3A north that benefit the Alley North colony have the potential to be reached according to the Gauge 63 dynamic position analysis, but the probability is low. Daily but moderate rain fell over Florida Bay and Taylor Slough and the stages decreased slightly but stages in the north remain above average. Salinities bay wide increased on average and in the central and western bay areas moved higher than the 75th percentile of historical data. Florida Fish and Wildlife Commission surveys in WCA-3B have not detected wildlife stress due to deeper than normal water conditions in that basin.

Supporting Information

KESSIMMEE BASIN

The Upper Kissimmee Basin received 1.09 inches of rainfall in the past week and the Lower Basin received 1.11 inches (SFWMD Daily Rainfall Report 09/07/2020).

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: 9/8/2020

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)						
							9/6/20	8/30/20	8/23/20	8/16/20	8/9/20	8/2/20	7/26/20
Lakes Hart and Mary Jane	S-62	154	LKMJ	60.0	R	60.0	0.0	0.0	0.0	0.2	0.1	-0.2	0.0
Lakes Myrtle, Preston, and Joel	S-57	19	S-57	61.0	R	61.0	0.0	0.0	0.0	0.0	-0.1	-0.2	0.0
Alligator Chain	S-60	110	ALLI	63.3	R	63.2	0.1	0.0	0.1	0.1	0.0	-0.1	0.0
Lake Gentry	S-63	187	LKGT	61.1	R	61.0	0.1	0.1	0.1	0.0	-0.1	-0.2	0.1
East Lake Toho	S-59	51	TOHOE	56.3	R	56.6	-0.3	-0.7	-0.5	-0.4	-0.5	-0.7	-0.8
Lake Toho	S-61	293	TOHOW, S-61	53.7	R	53.6	0.1	-0.1	0.0	0.1	0.0	-0.2	0.0
Lakes Kissimmee, Cypress, and Hatchineha	S-65	2,631	KUB011, LKISSB	51.4	R	51.1	0.3	0.5	0.7	0.3	0.2	0.1	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**. **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.

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: 9/8/2020

Metric	Location	1-Day Average		Average for the Preceding 7-Days ¹							
		9/6/2020	9/6/20	8/30/20	8/23/20	8/16/20	8/9/20	8/2/20	7/26/20	7/19/20	7/12/20
Discharge (cfs)	S-65	2,014	2,631	3,273	2,506	1,611	1,760	4,215	4,623	2,396	1,779
Discharge (cfs)	S-65A ²	2,236	3,176	4,247	3,173	1,990	2,554	4,851	5,111	3,202	2,174
Discharge (cfs)	S-65D ²	3,921	4,262	3,420	3,067	4,360	5,466	5,538	3,846	2,383	1,602
Headwater Stage (feet NGVD)	S-65D ²	27.54	27.74	27.75	27.59	27.57	27.70	27.75	26.99	26.02	25.81
Discharge (cfs)	S-65E ²	4,018	4,317	3,444	3,079	4,484	5,703	5,462	3,671	2,229	1,574
Discharge (cfs)	S-67	0	0	0	0	0	0	0	0	0	0
DO (mg/L) ³	Phases I & II/III river channel	0.7	0.9	1.2	1.0	0.4	0.5	0.4	0.2	0.2	1.4
Mean depth (feet) ⁴	Phase I floodplain	2.22	2.42	2.27	1.76	2.06	2.60	3.02	2.64	1.63	1.13

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.

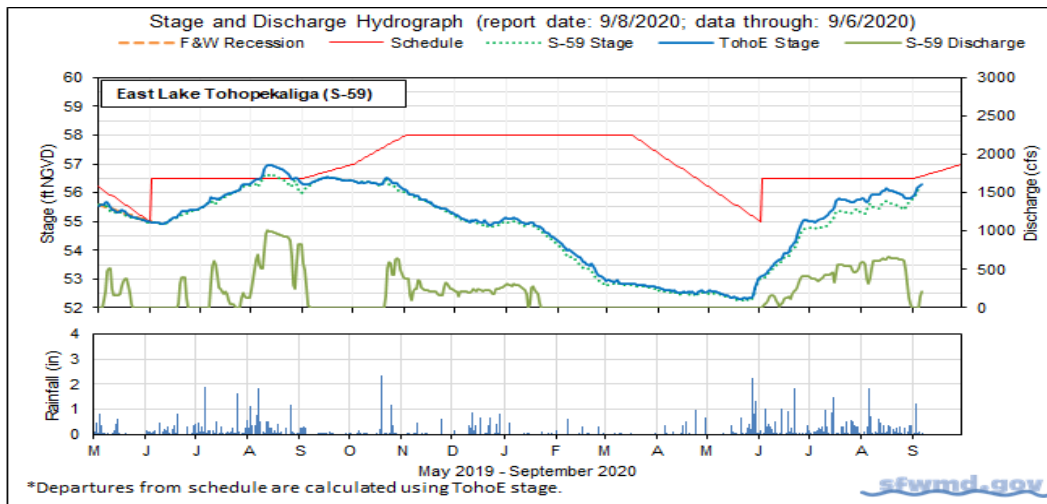


Figure 1. East Lake Toho regulation schedule, stage, discharge and rainfall.

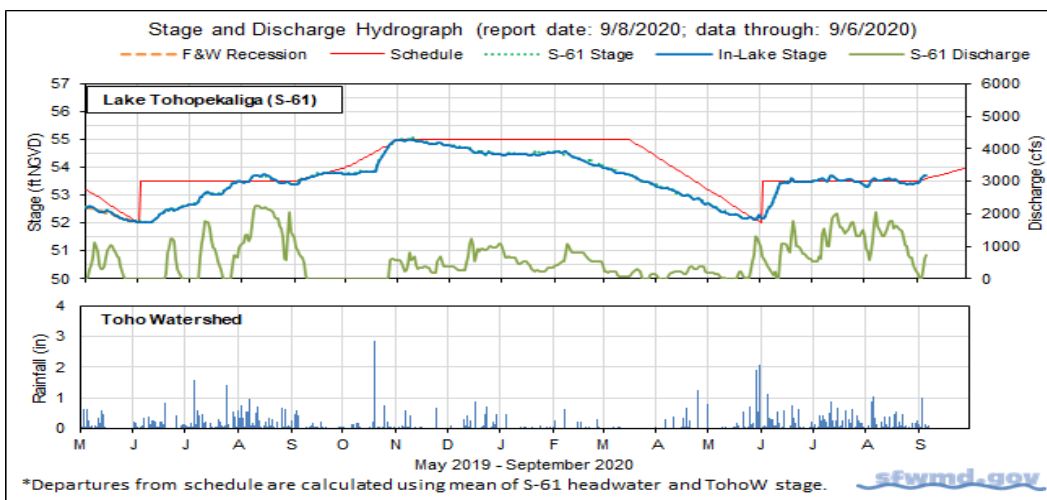


Figure 2. Lake Toho regulation schedule, stage, discharge and rainfall.

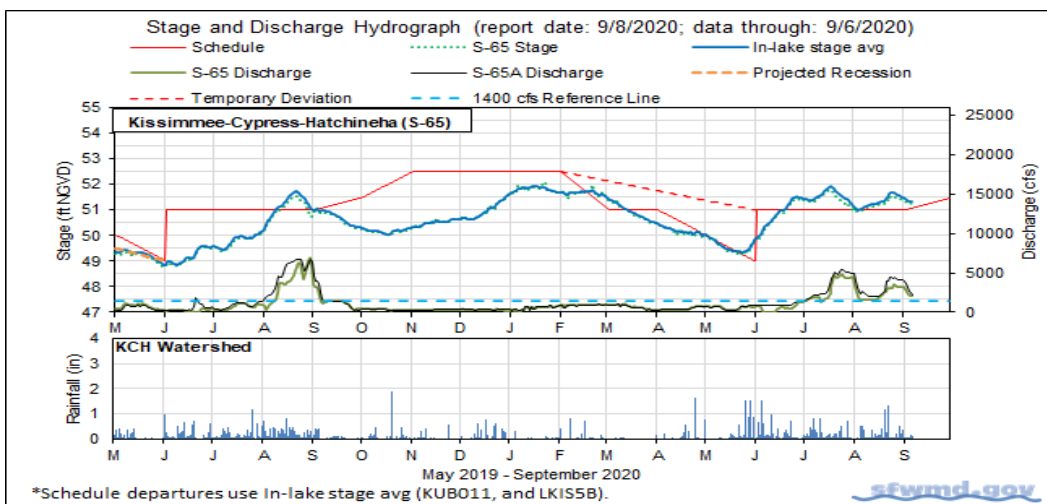


Figure 3. Lakes Kissimmee, Cypress and Hatchineha regulation schedule, stage, discharge and rainfall.

Kissimmee River Phase I Restoration Area Water Depth Maps

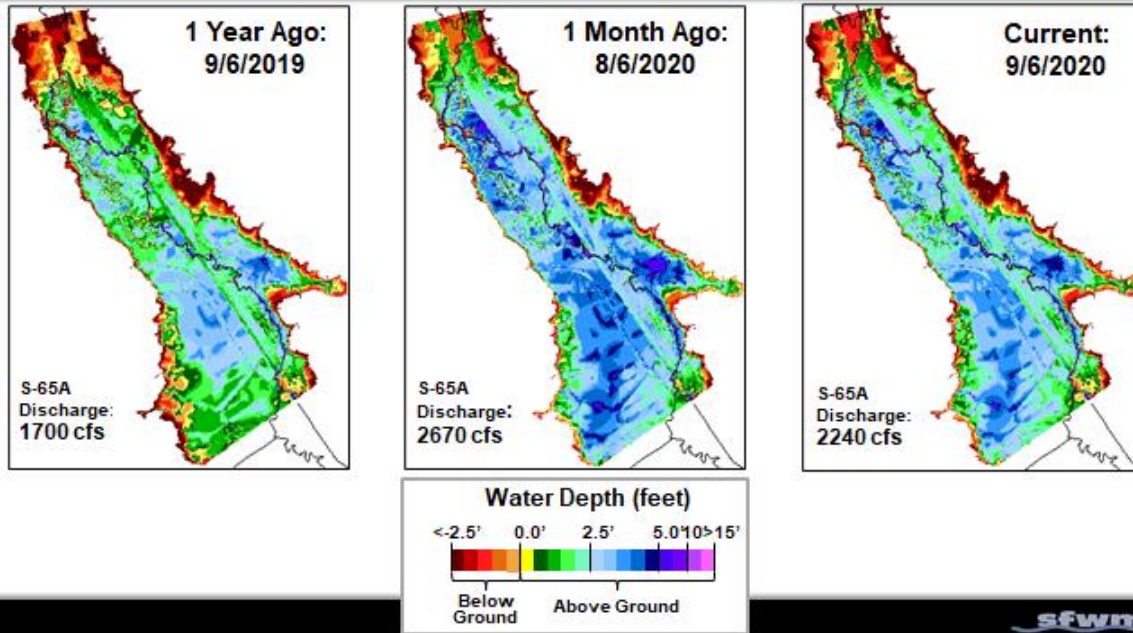
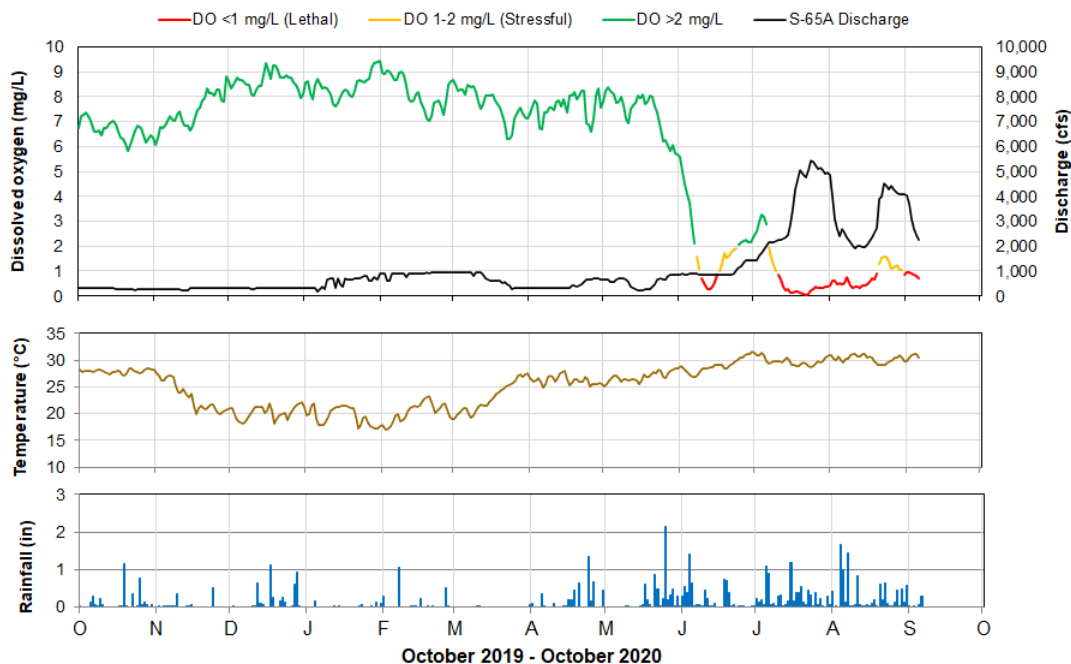


Figure 4. Phase I area floodplain water depths (from left to right) one year ago, one month ago and current. Color-coding has been modified to accommodate greater water depths; these maps are not directly comparable to Kissimmee Basin WDAT maps published prior to January 16, 2012.



Dissolved oxygen (DO) and temperature are mean daily values averaged for PC62, KRBN, PC33, PD62R and PD42R with an average of 3 stations reporting this week. Rainfall values are daily totals for Kissimmee River (Pool BCD) AHED watershed.

Report Date: 9/8/2020; data are through: 9/6/2020

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

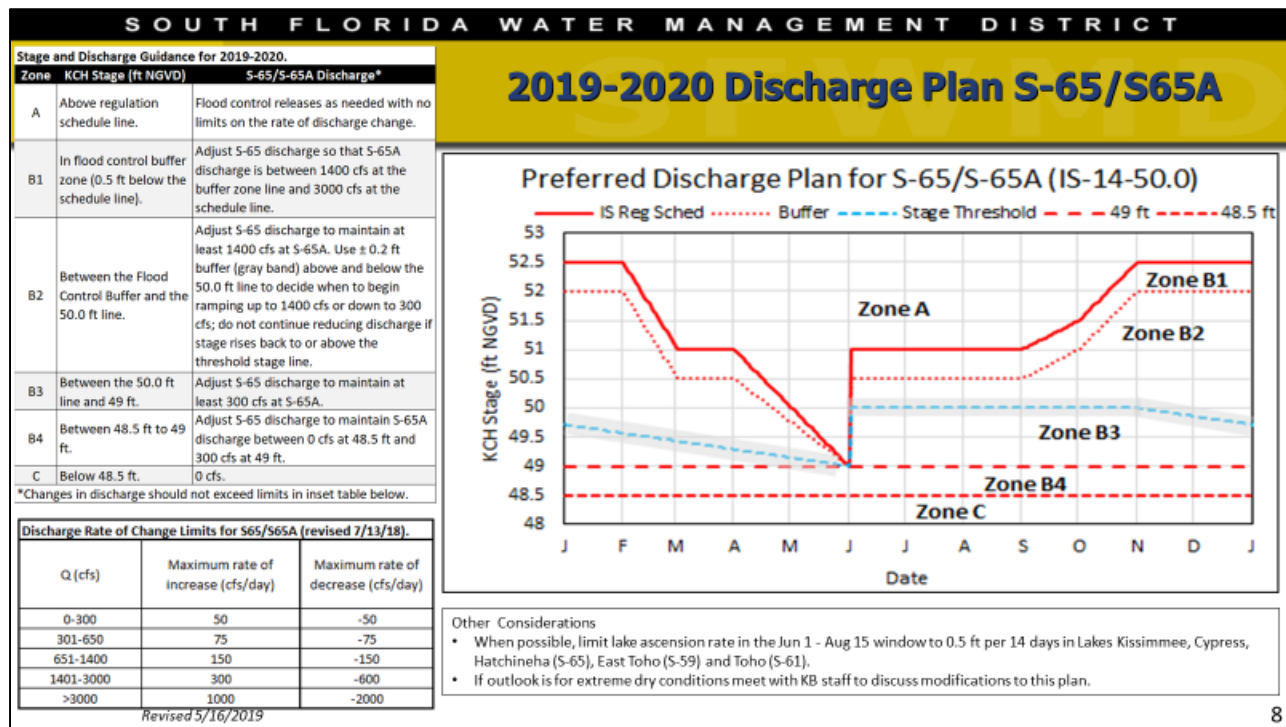


Figure 6. The 2019-2020 Discharge Plan for S-65/S-65A.

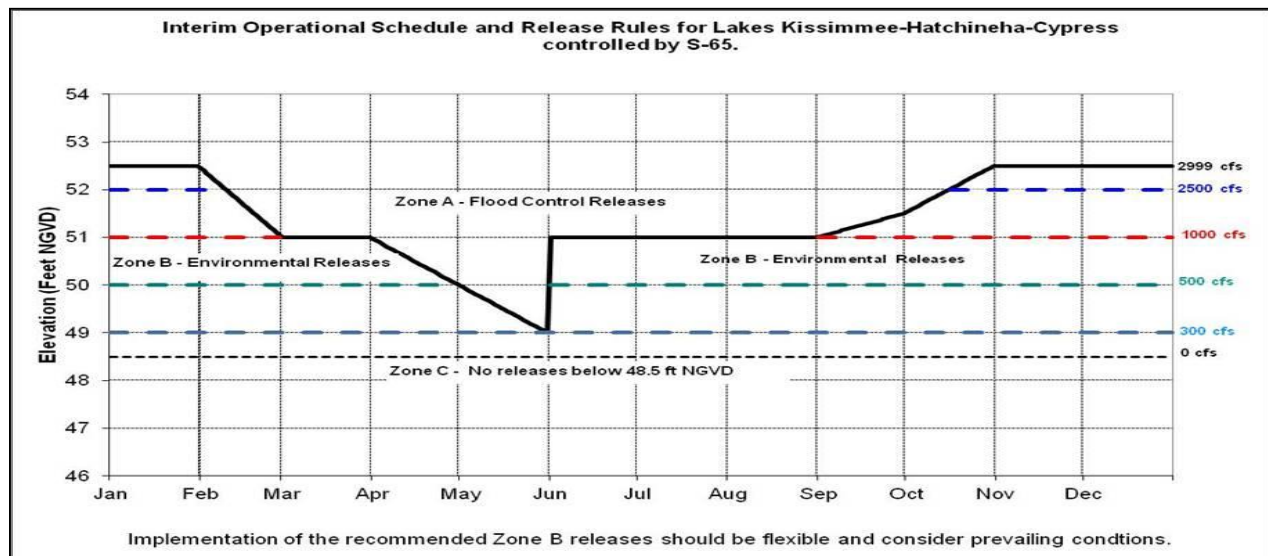


Figure 7. Interim operations schedule for S-65 (solid black line). The discharge schedule shown to the right has not been used in recent years.



Figure 8. The Kissimmee Basin.

LAKE OKEECHOBEE

Lake Okeechobee stage is 14.61 feet NGVD, 0.99 feet higher than a month ago and 0.64 feet higher than one year ago (Figure 1). Lake stages rose into the lower portion of the preferred ecological envelope on June 2, 2020 (Figure 2) but has been above the envelope since the end of July. 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 feet NGVD on May 17 and has been rising at close to one foot per month since. According to RAINДАР, 2.30 inches of rain fell directly over the Lake through the past week, while much of the watershed received between 0.75 and 1.5 inches (Figure 4).

The average daily inflows (minus rainfall) increased from the previous week, from 5,825 cfs to 6,396 cfs, and the outflows (minus evapotranspiration) decreased from 305 cfs to just 63 cfs. Most of the inflows came from the Kissimmee River (4,206 cfs through S-65E & S-65EX1), while 892 cfs came from the C-41A canal (through S-84 & S-84X), 250 cfs from Fisheating Creek, and 218 cfs came from S-71 and S-72. An additional 168 cfs came from passive inflow from the east through the L-8 Canal via Culvert 10A. Outflows totaled just 63 cfs, all going south through the S-352 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.

The most recent satellite image (September 3, 2020) from NOAA's cyanobacteria monitoring product derived from EUMETSAT's Sentinel 3 OLCI sensor data suggested a moderate cyanobacteria bloom risk persisting in the central/northern region of the Lake (Figure 6).

Water Management Summary

Lake Okeechobee stage was 14.61 feet NGVD on September 7, 2020, 0.27 feet higher than the previous week and 0.99 feet higher than the previous month. The Lake is 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, and is now just 0.18 feet above the top of envelope. Ascension rates have exceeded the recommended rate (<0.5 foot per 2 weeks) several times since the onset of the wet season but have remained close to one ft per month on average; potentially allowing submerged plant communities to keep up with rising stages. The cyanobacteria bloom risk potential remains moderate in the central/northern region 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	3701	4206	1.8
S-71 & S-72	217	218	0.1
S-84 & S-84X	970	892	0.4
Fisheating Creek	286	250	0.1
S-154	61	59	0.0
S-191	72	122	0.1
S-133 P	43	126	0.1
S-127 P	18	46	0.0
S-129 P	48	37	0.0
S-131 P	33	25	0.0
S-135 P	49	175	0.1
S-2 P	0	0	0.0
S-3 P	0	0	0.0
S-4 P	150	70	0.0
L-8 Backflow	177	168	0.1
Rainfall	3539	5508	2.3
Total	9365	11904	5.0

OUTFLOWS	Previous week Avg Daily CFS	Avg Daily Flow cfs	Equivalent Depth Week Total (in)
S-77	198	0	0.0
S-308	0	0	0.0
S-351	0	0	0.0
S-352	15	63	0.0
S-354	92	0	0.0
L-8 Outflow			
ET	2301	2055	0.9
Total	2606	2118	0.9

Provisional Data

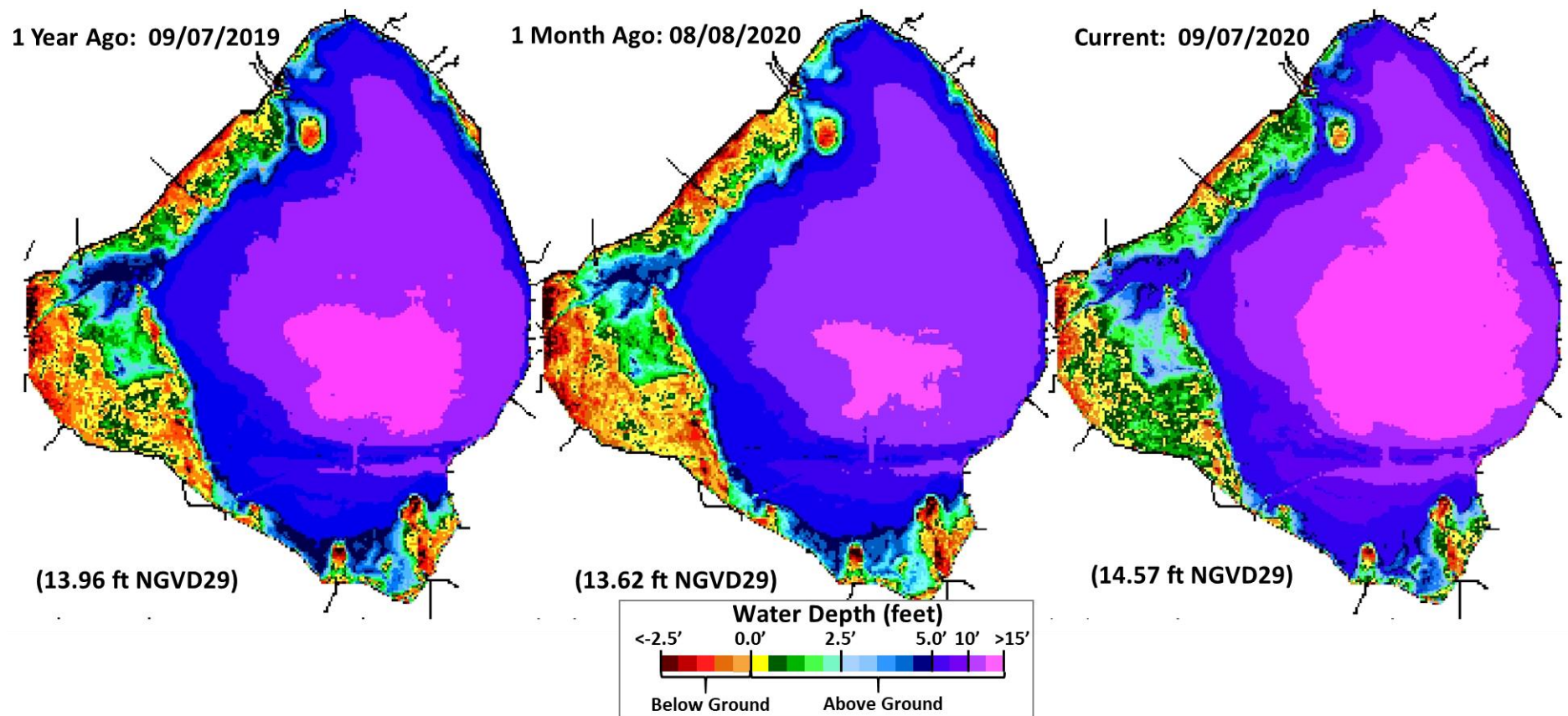


Figure 1. Water depth estimates on Lake Okeechobee based on the South Florida Water Depth Assessment Tool.

Lake Okeechobee Stage vs Updated Ecological Envelope

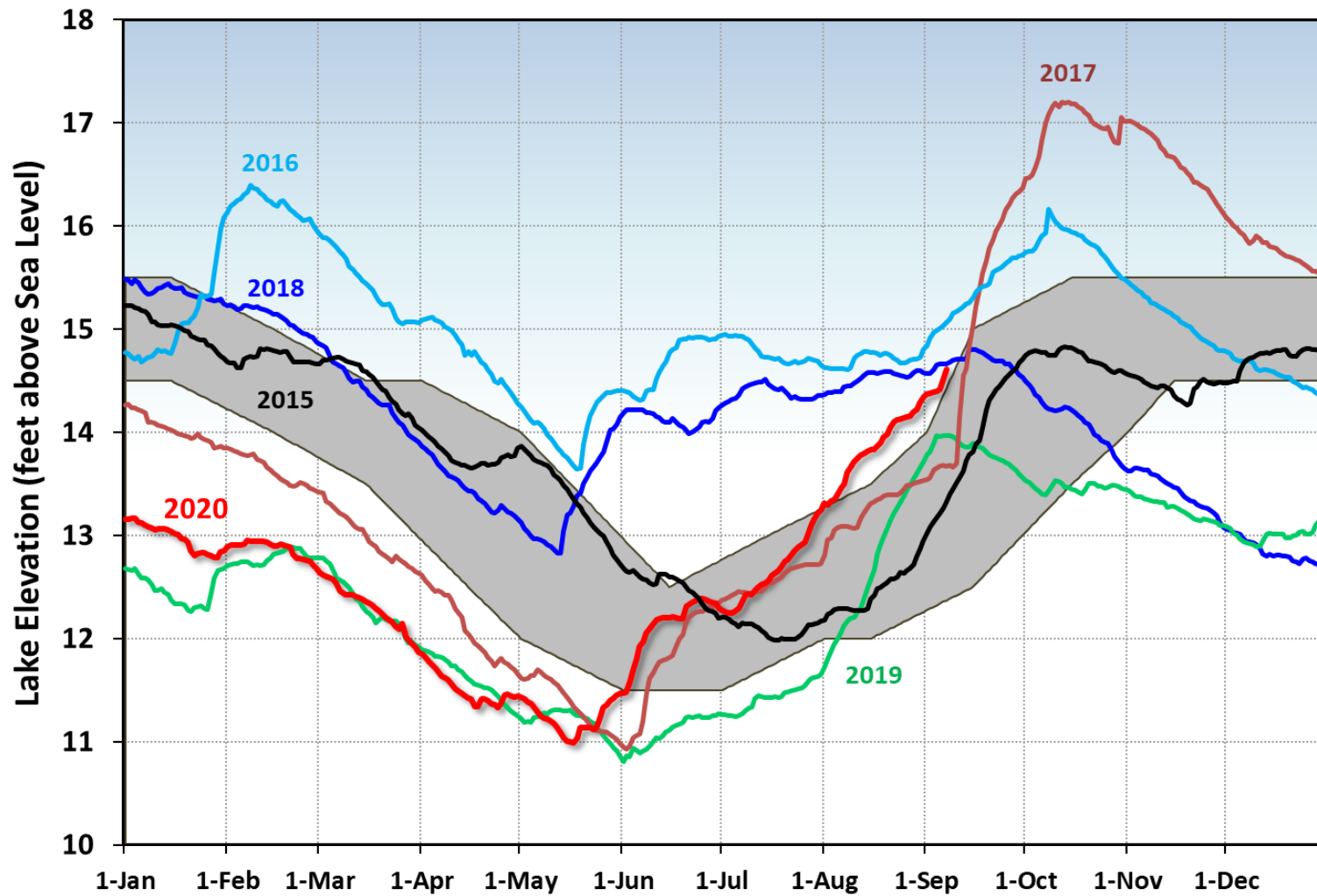


Figure 2. Select annual stage hydrographs for Lake Okeechobee in comparison to the updated Ecological Envelope.

Lake Okeechobee Water Level History and Projected Stages

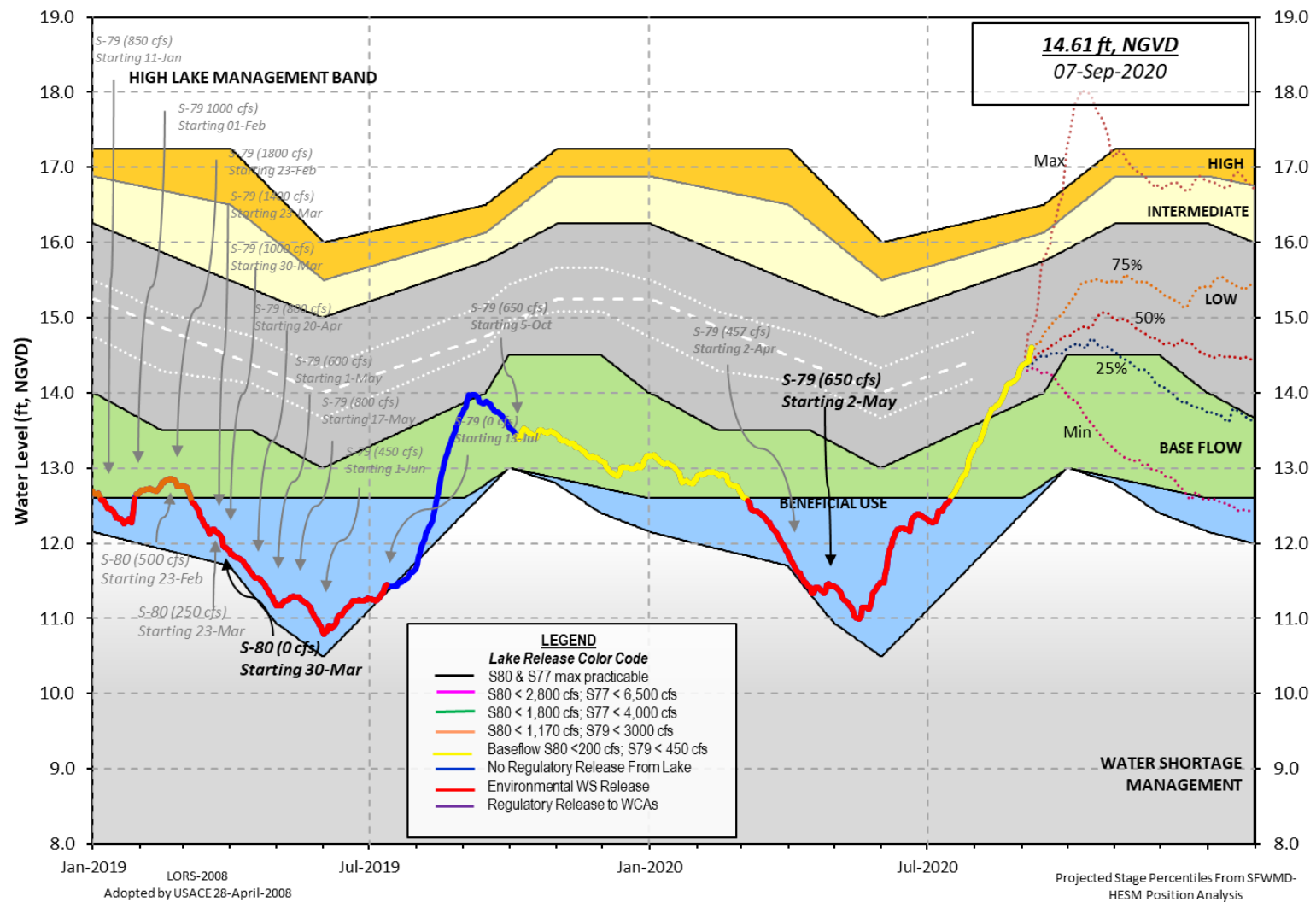


Figure 3. Recent Lake Okeechobee stage and releases, with projected stages based on a dynamic position analysis.

SFWMD PROVISIONAL RAINDAR 7-DAY RAINFALL ESTIMATES

FROM: 0400 EST, 09/01/2020 THROUGH: 0400 EST, 09/08/2020

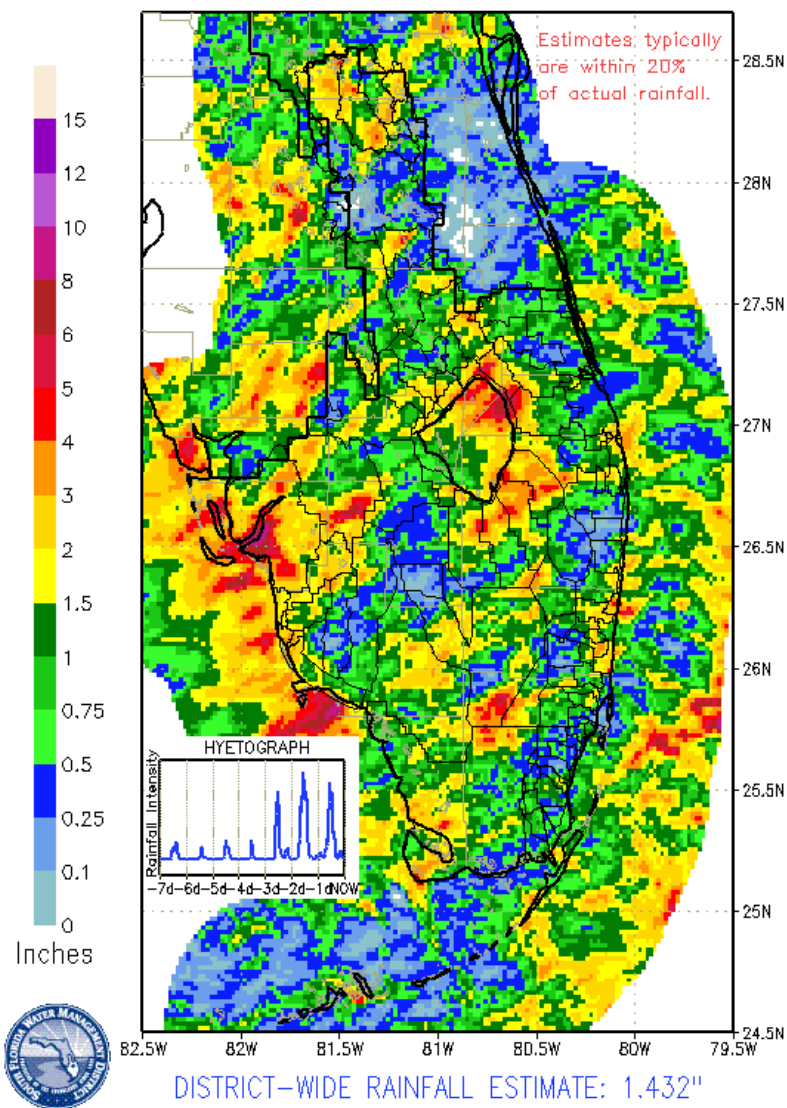


Figure 4. 7-Day rainfall estimates by RAINDAR.

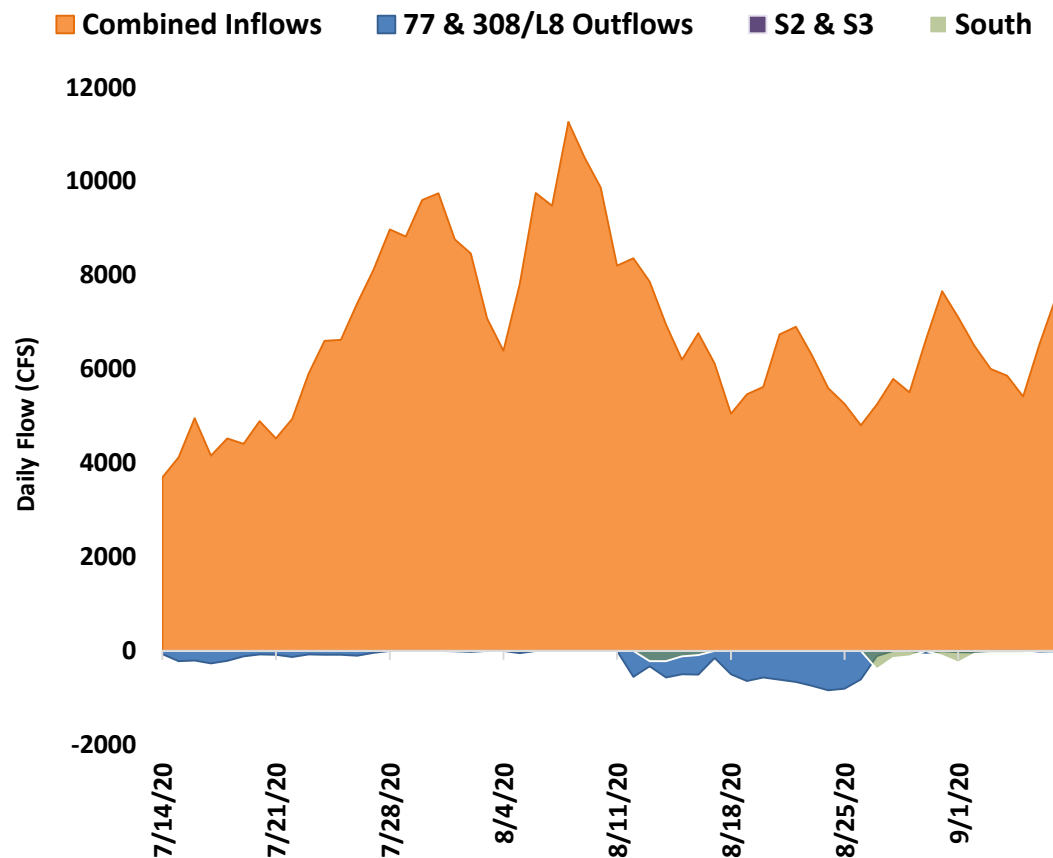


Figure 5. Major inflows (orange) and outflows (blue) of Lake Okeechobee, including the S-350 structures designated as South (green). The L-8 Canal flows through Culvert 10A are included as outflows when positive, and as inflows when backflowing into the Lake. All inflows and outflows are shown as positive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

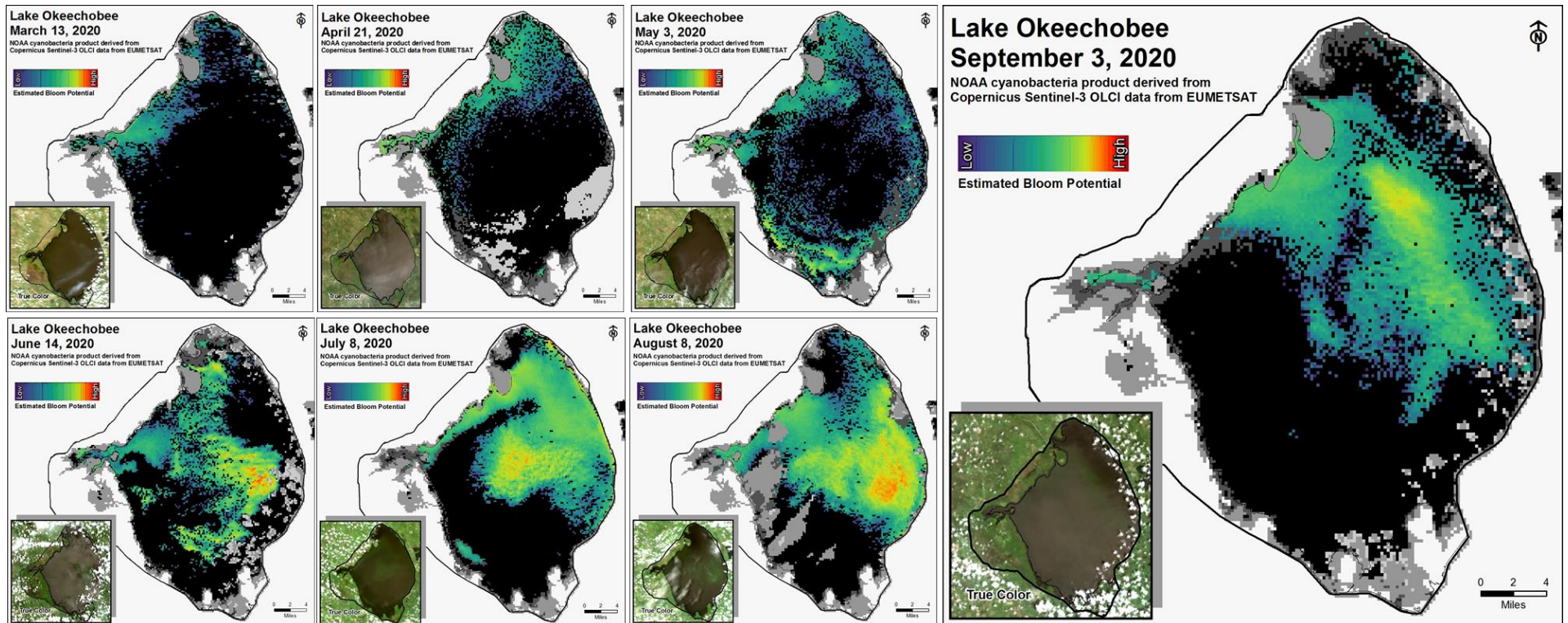


Figure 6. Potential for cyanobacterial blooms on Lake Okeechobee during 2020, based on NOAA's harmful algal bloom monitoring system. Gray color indicates cloud cover.

ESTUARIES

St. Lucie Estuary:

Last week total inflow to the St. Lucie Estuary averaged approximately 764 cfs (Figures 1 and 2) and last month inflow averaged about 1,222 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	470
S-80	10
S-308	0
S-49 on C-24	108
S-97 on C-23	57
Gordy Rd. structure on Ten Mile Creek	119

Over the past week, salinity increased throughout the estuary (Table 2, Figures 3 and 4). The seven-day moving average of the water column (an average of the surface and bottom salinity) at the US1 Bridge is 11.6. Salinity conditions in the middle estuary are estimated to be just 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)	3.9 (2.8)	7.4 (3.8)	NA ¹
US1 Bridge	10.5 (6.6)	13.4 (8.5)	10.0-26.0
A1A Bridge	20.6 (15.7)	26.1 (23.1)	NA ¹

¹Envelope not applicable and ²Not Reporting

Caloosahatchee Estuary:

Last week total inflow to the Caloosahatchee Estuary averaged approximately 2,728 cfs (Figures 5 and 6) and last month inflow averaged about 3,140 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	328
S-79	1,927
Tidal Basin Inflow	801

Over the past week in the estuary, salinity remained about the same (Table 4, Figures 7 & 8). The seven-day average salinity values are within the good range for adult eastern oysters at Shell Point and at Sanibel and in the fair range at Cape Coral (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)	0.2 (0.2)	0.2 (0.2)	NA ¹
Val I75	0.2 (0.2)	0.2 (0.2)	0.0-5.0 ²
Ft. Myers Yacht Basin	0.4 (0.4)	0.6 (0.5)	NA
Cape Coral	5.9 (5.6)	7.8 (8.2)	10.0-30.0
Shell Point	19.7 (20.8)	21.3 (23.0)	10.0-30.0
Sanibel	28.9 (29.4)	29.8 (30.6)	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 is 0.3 at the end of the two week period for all five scenarios of pulse release at S-79 ranging from 0 to 800 cfs and estimated Tidal Basin inflows of 1700 cfs. The 30-day moving average surface salinity at Val I-75 is forecast to be .3 for these scenarios (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	1700	0.3	0.3
B	300	1700	0.3	0.3
C	450	1700	0.3	0.3
D	650	1700	0.3	0.3
E	800	1700	0.3	0.3

Red tide

The Florida Fish and Wildlife Research Institute reported on September 4, 2020, that *Karenia brevis*, the Florida red tide dinoflagellate, was not observed in samples collected from Lee, St. Lucie, or Palm Beach counties (no samples were analyzed this week from Martin, Broward, or Miami-Dade counties).

Water Management Recommendations

Lake stage is in the Low sub-band. Tributary conditions are 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.

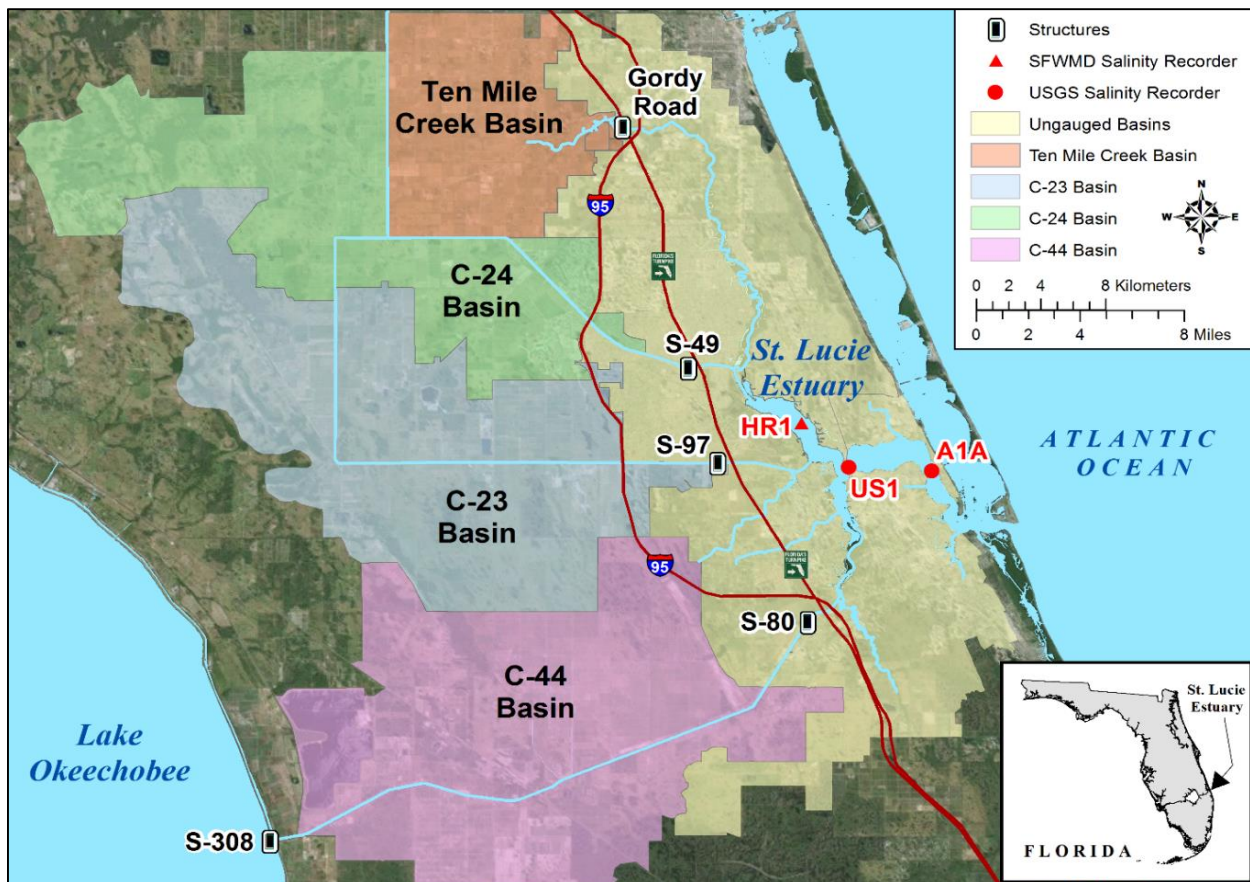


Figure 1. Basins, water control structures, and salinity monitoring for the St. Lucie Estuary.

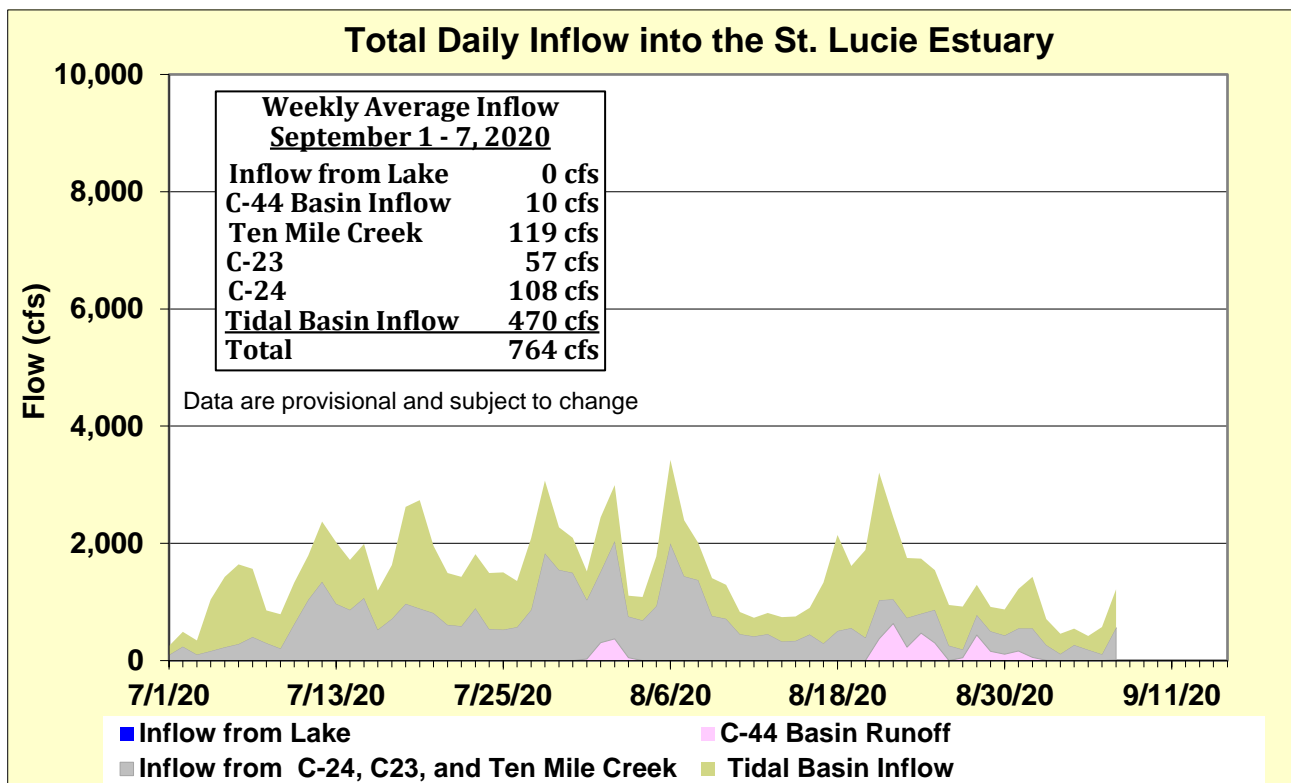


Figure 2. Total daily inflows from Lake Okeechobee and runoff from the C-44, C-23, C-24, Ten Mile Creek, and tidal basin into the St. Lucie Estuary.

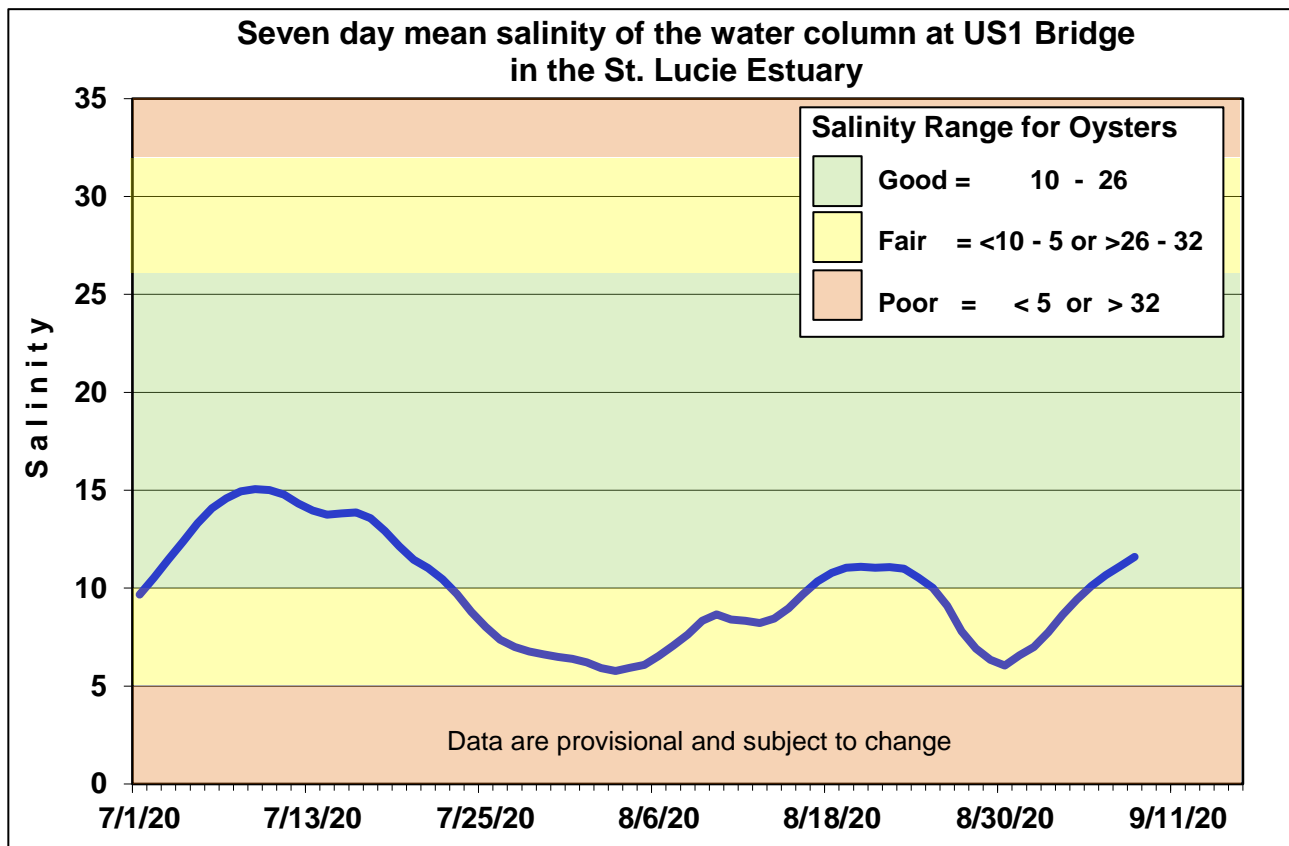


Figure 3. Seven-day mean salinity of the water column at the US1 Bridge.

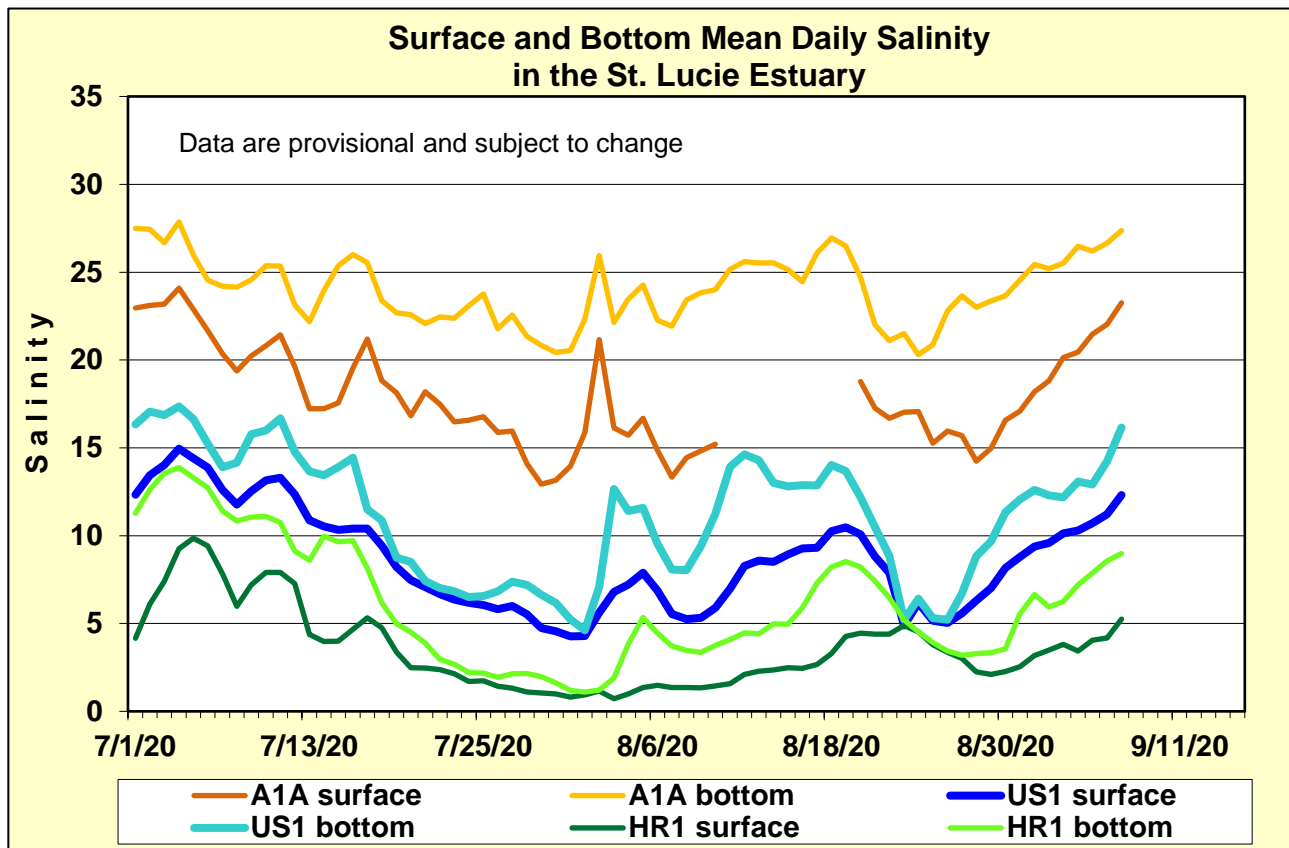


Figure 4. Daily mean salinity at the A1A, US1, and HR1 stations.

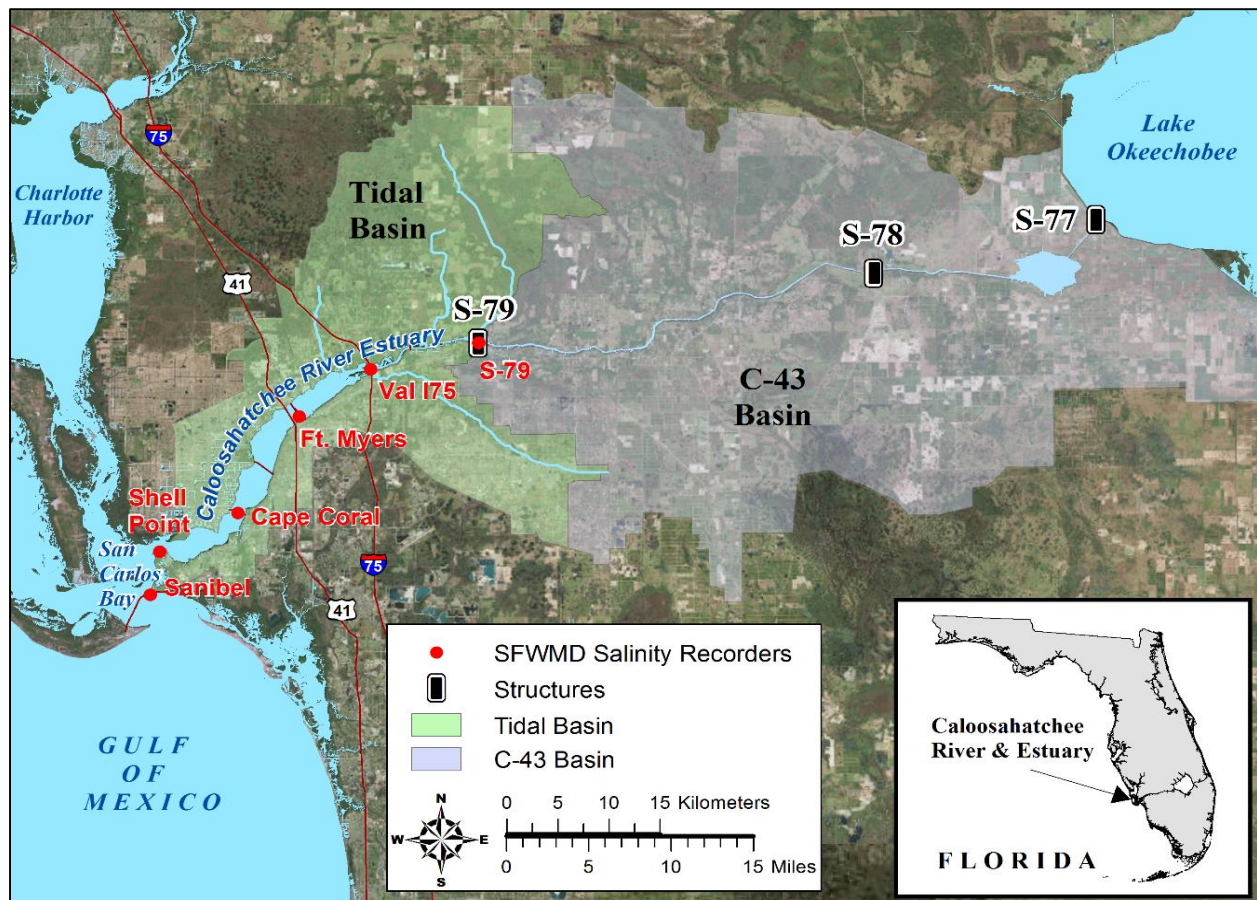


Figure 5. Basins, water control structures, and salinity monitoring for the Caloosahatchee Estuary.

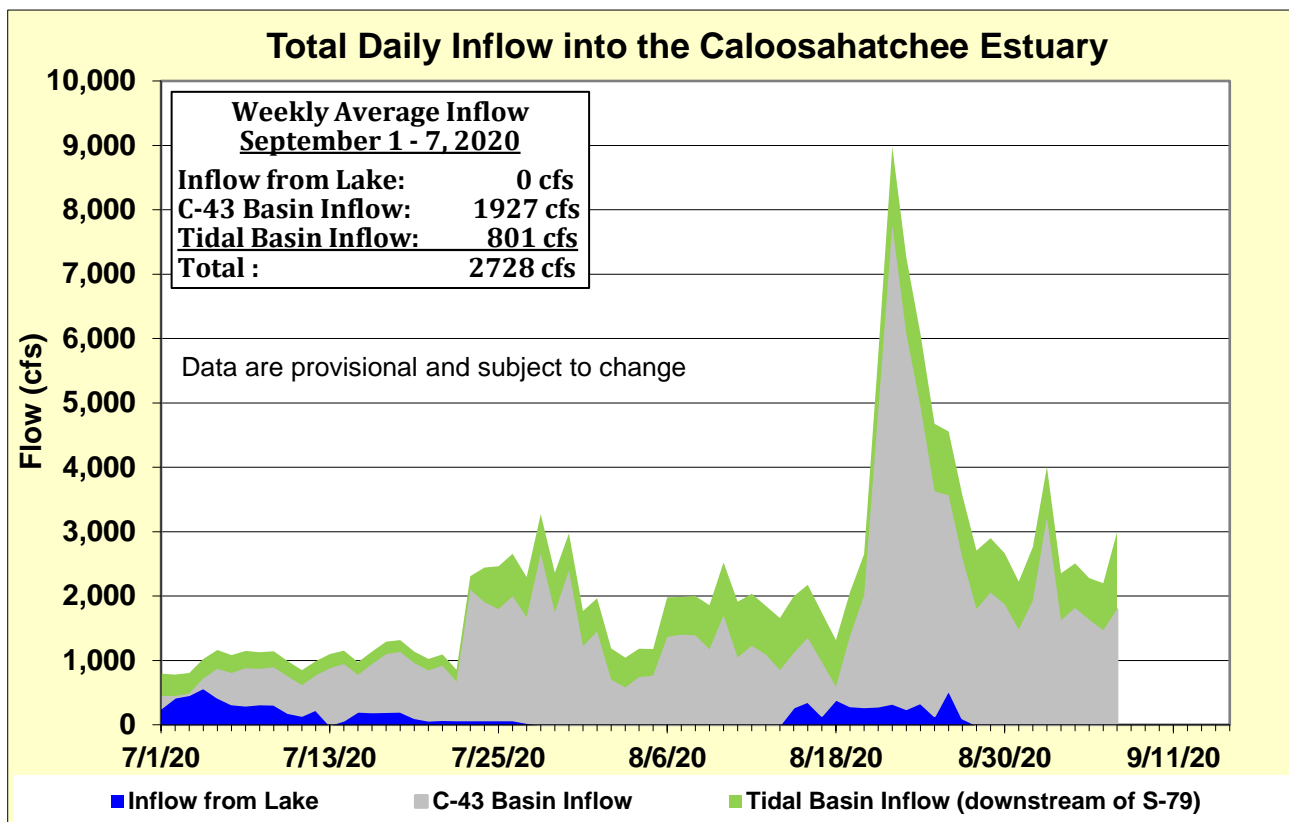


Figure 6. Total daily inflows from Lake Okeechobee, runoff from the C-43 basin

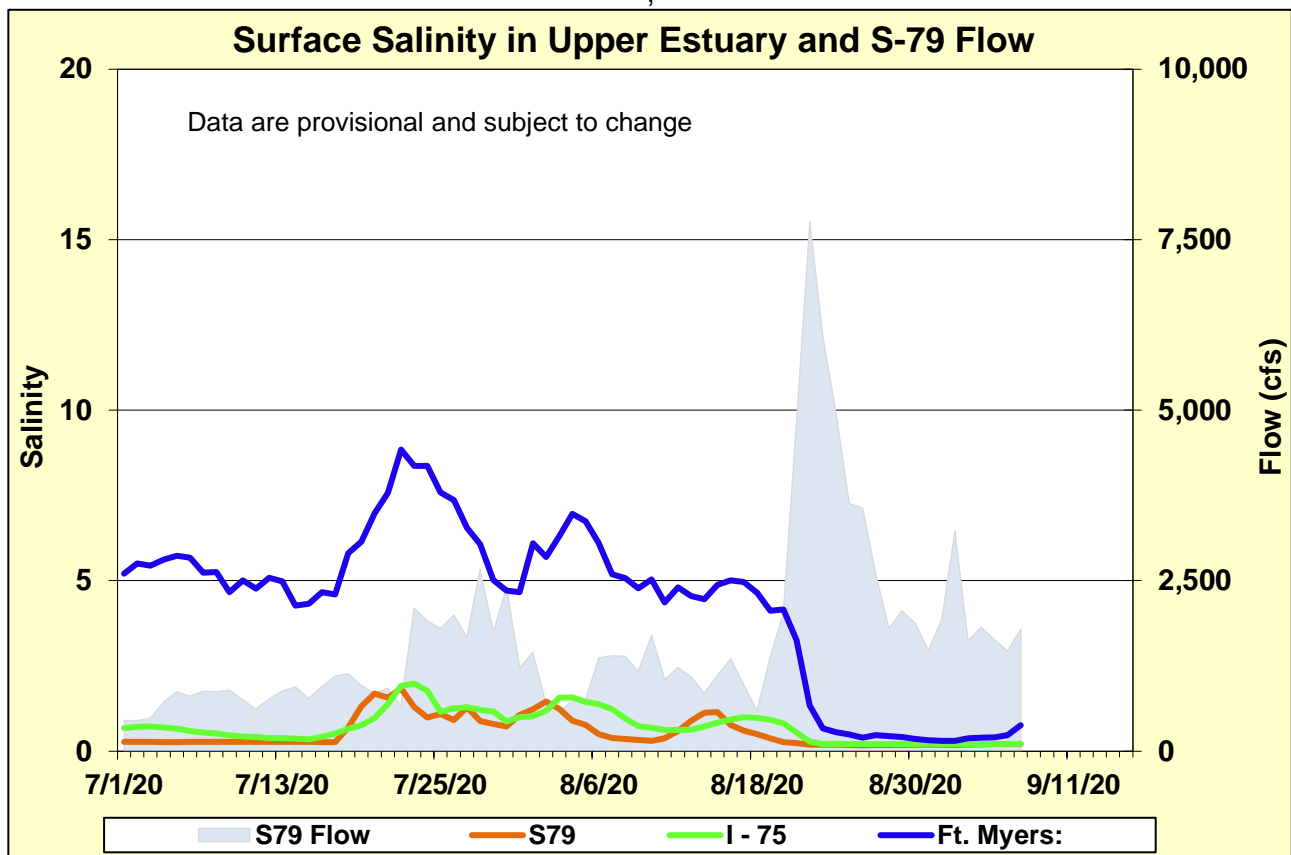


Figure 7. Daily mean flows at S-79 and salinity at upper estuary monitoring stations.

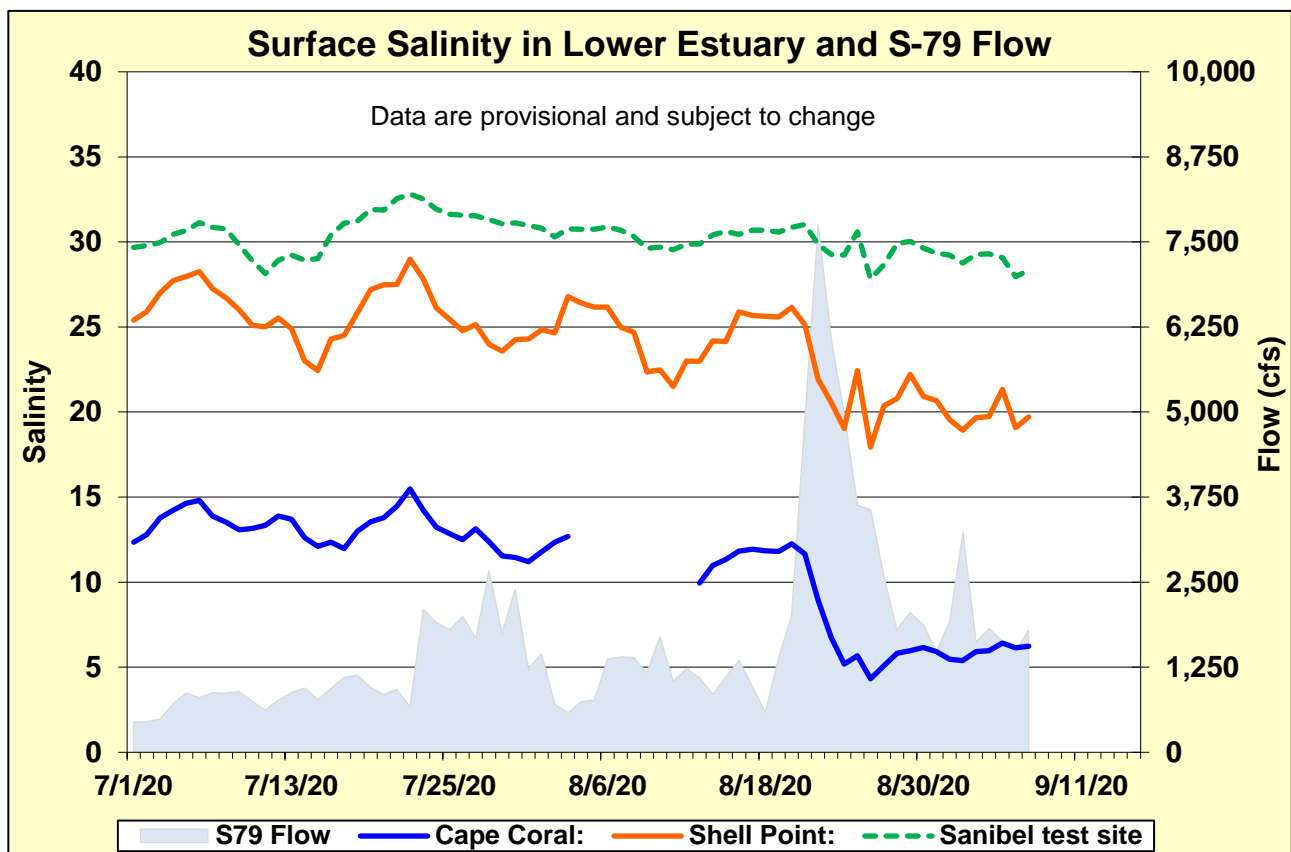


Figure 8. Daily mean flows at S-79 and salinity at lower estuary stations.

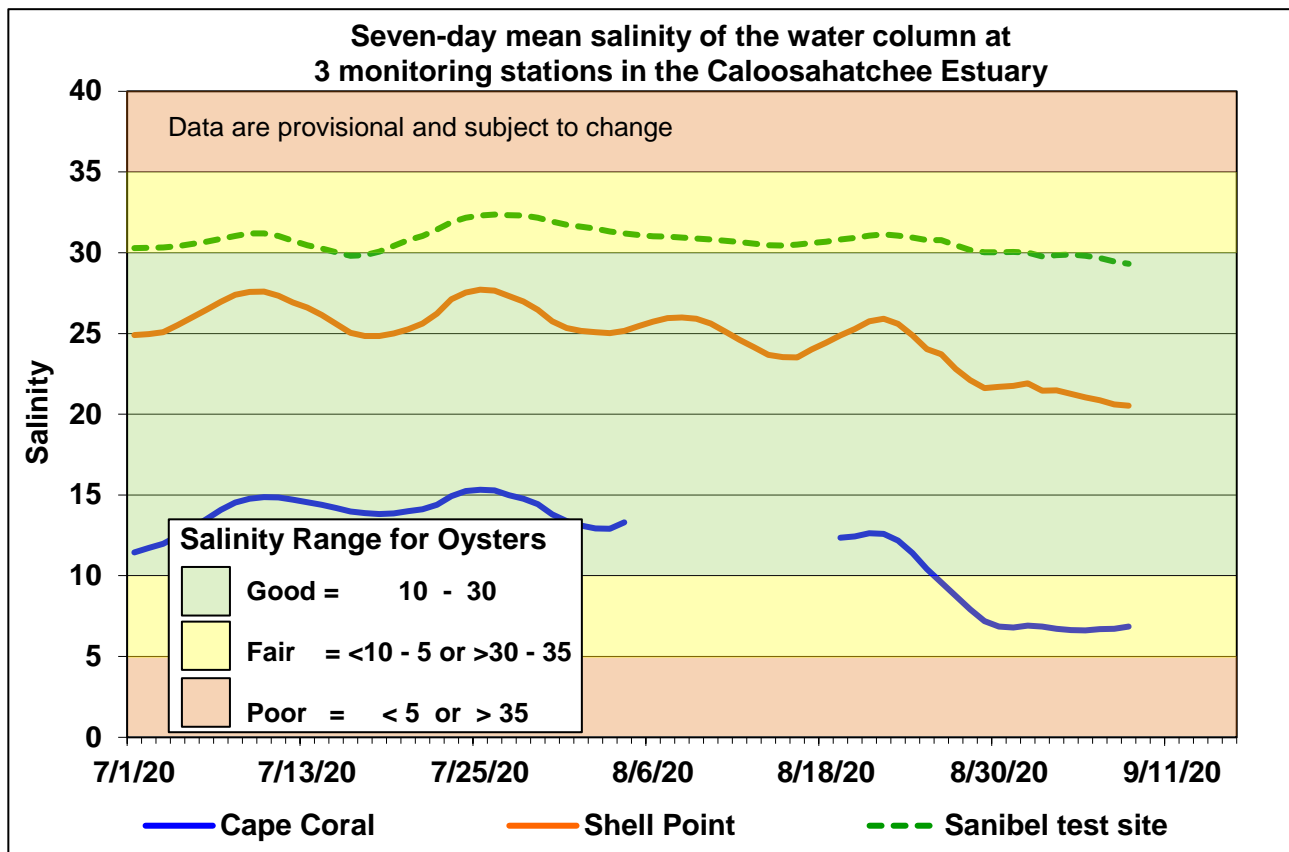


Figure 9. Seven-day mean salinity at Cape Coral, Shell Point, and Sanibel monitoring stations.

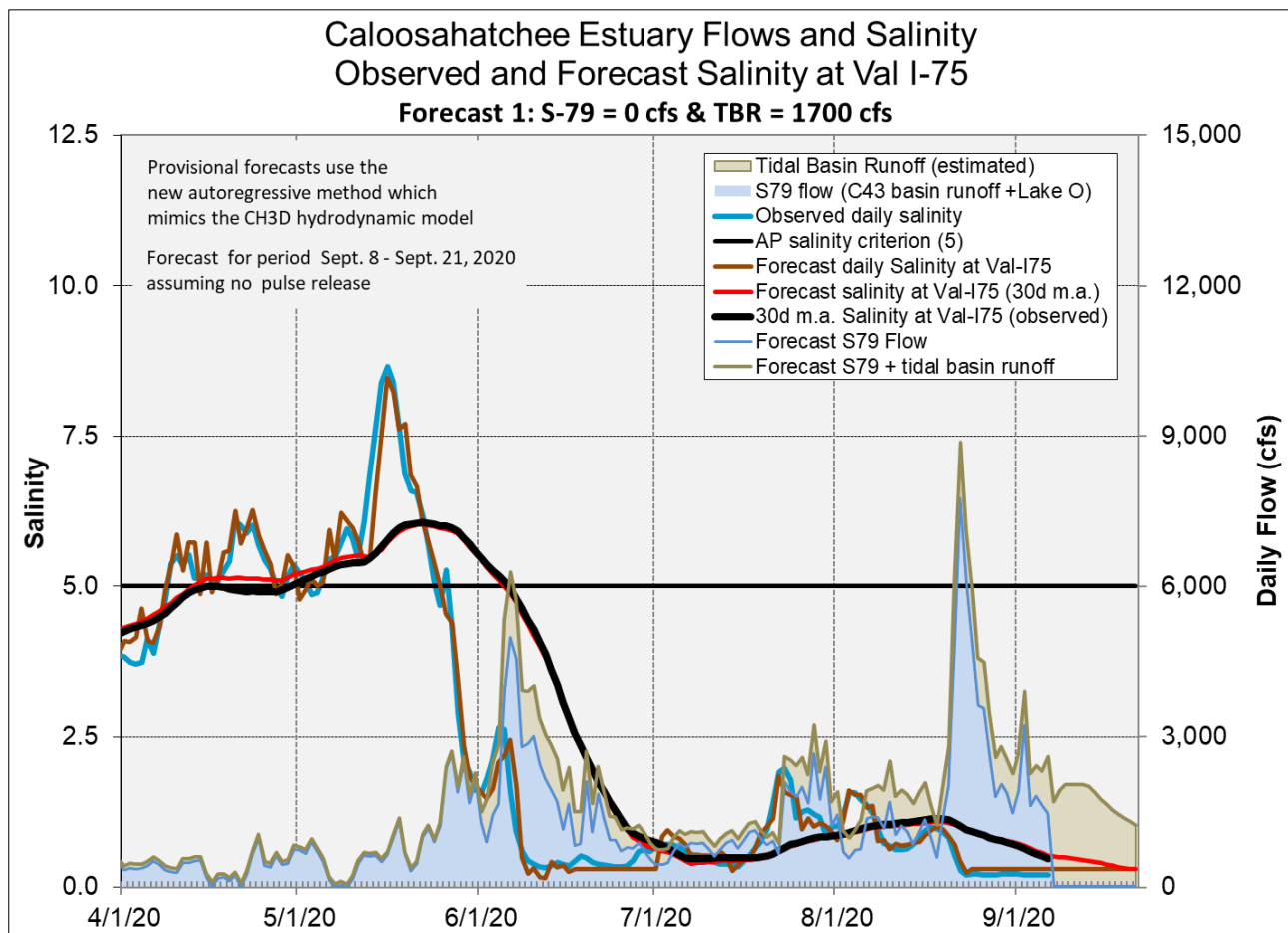
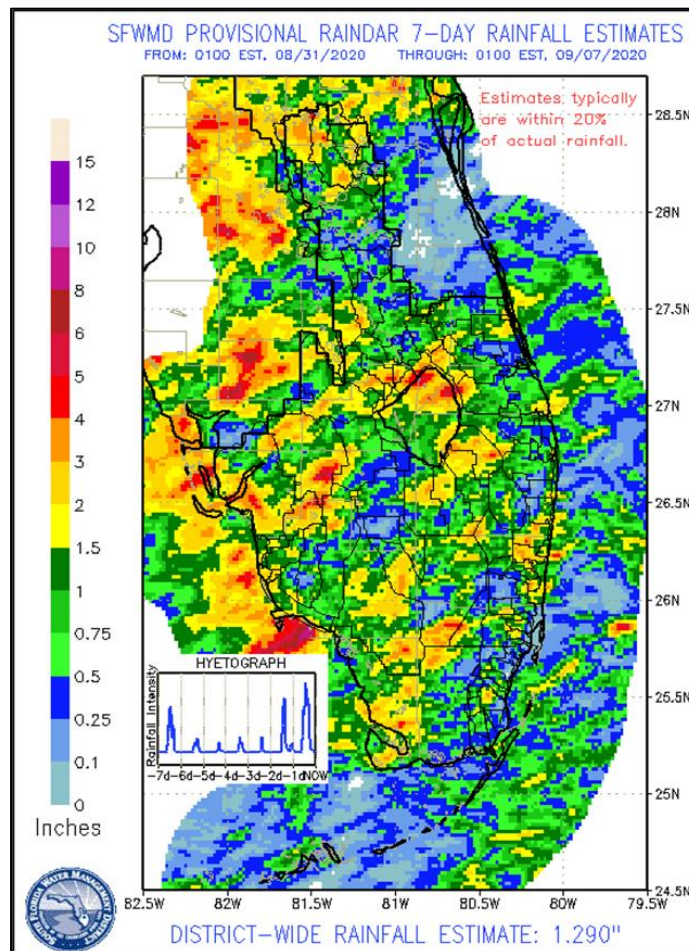


Figure 10. Forecasted Val I-75 surface salinity assuming no pulse release at S79.

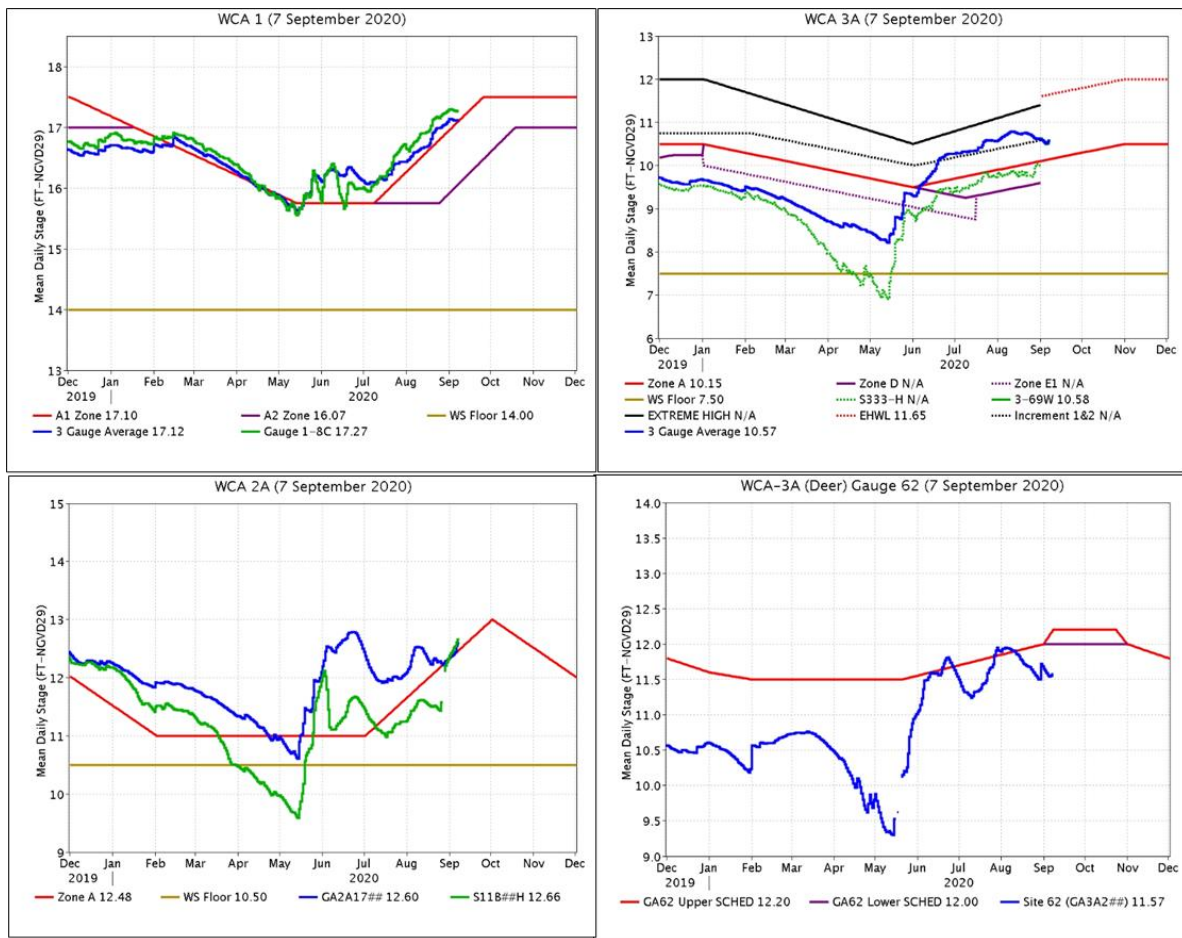
EVERGLADES

Near average rainfall was recorded across the Everglades last week, the highest amount in southern WCA-3A. At the gauges monitored for this report stages increased 0.01 feet on average, with central WCA-2A experiencing the most extreme change with an increase of 0.28 feet. Evaporation was estimated at 1.19 inches last week.

Everglades Region	Rainfall (Inches)	Stage Change (feet)
WCA-1	0.93	+0.05
WCA-2A	1.29	+0.28
WCA-2B	0.84	+0.00
WCA-3A	1.32	-0.08
WCA-3B	1.15	+0.00
ENP	1.23	-0.02



Regulation Schedules: WCA-1: Stage at the 1-8C Gauge trends towards the rising Zone A1 regulation line last week, currently 0.17 feet above and the 3-Gauge average moved to 0.02 feet above. WCA-2A: Stage at Gauge 2-17 stages trends along to the rising regulation schedule now 0.12 feet above. WCA-3A: The Three Gauge Average continues this to week to trend slightly downward and towards the rising Zone A regulation line, currently 0.42 feet above. WCA-3A: Stage at gauge 62 (Northwest corner) is currently 0.43 feet below the stable Lower Schedule.

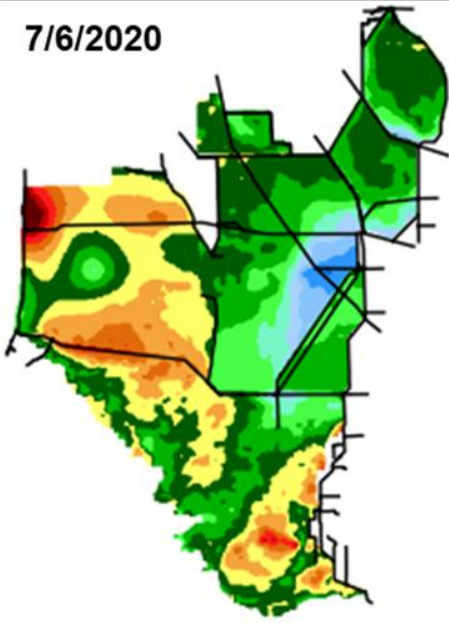


Water Depths: The WDAT tool for spatial interpolation of depth monthly snapshots over the last two months indicate ponding depths in WCA-3A South are diminishing around the upper reaches of the L-67 canal and in the northwestern region of WCA-3A North along the Miami Canal. Depths are consistent in WCA-1 and there is no longer the potential for exposed ground surface in the north of that basin. Hydrologic connectivity is well established within the major sloughs in Everglades National Park (ENP). Comparing WDAT water levels from present, over the last month stages stayed relatively stable across the Everglades. Only WCA-1 (deeper in the south) and WCA-2A (shallower in the far north) experienced significant changes. Looking back one year the stage difference patterns are similar yet more significant than one month ago. Compared to one year ago there are shallower depths in northeastern WCA-2A and WCA-3A and conditions in WCA-1 are generally wetter.

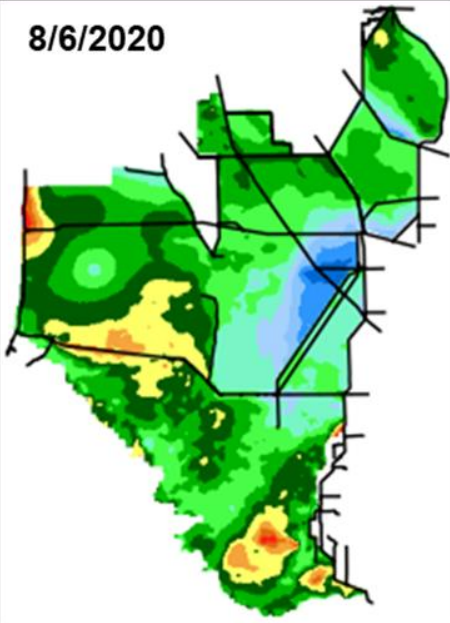


SFWDAT Water Depth Monthly Snapshots

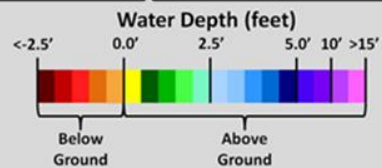
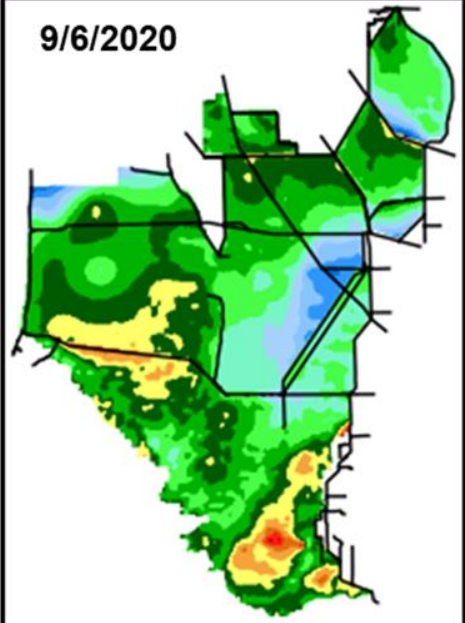
7/6/2020



8/6/2020



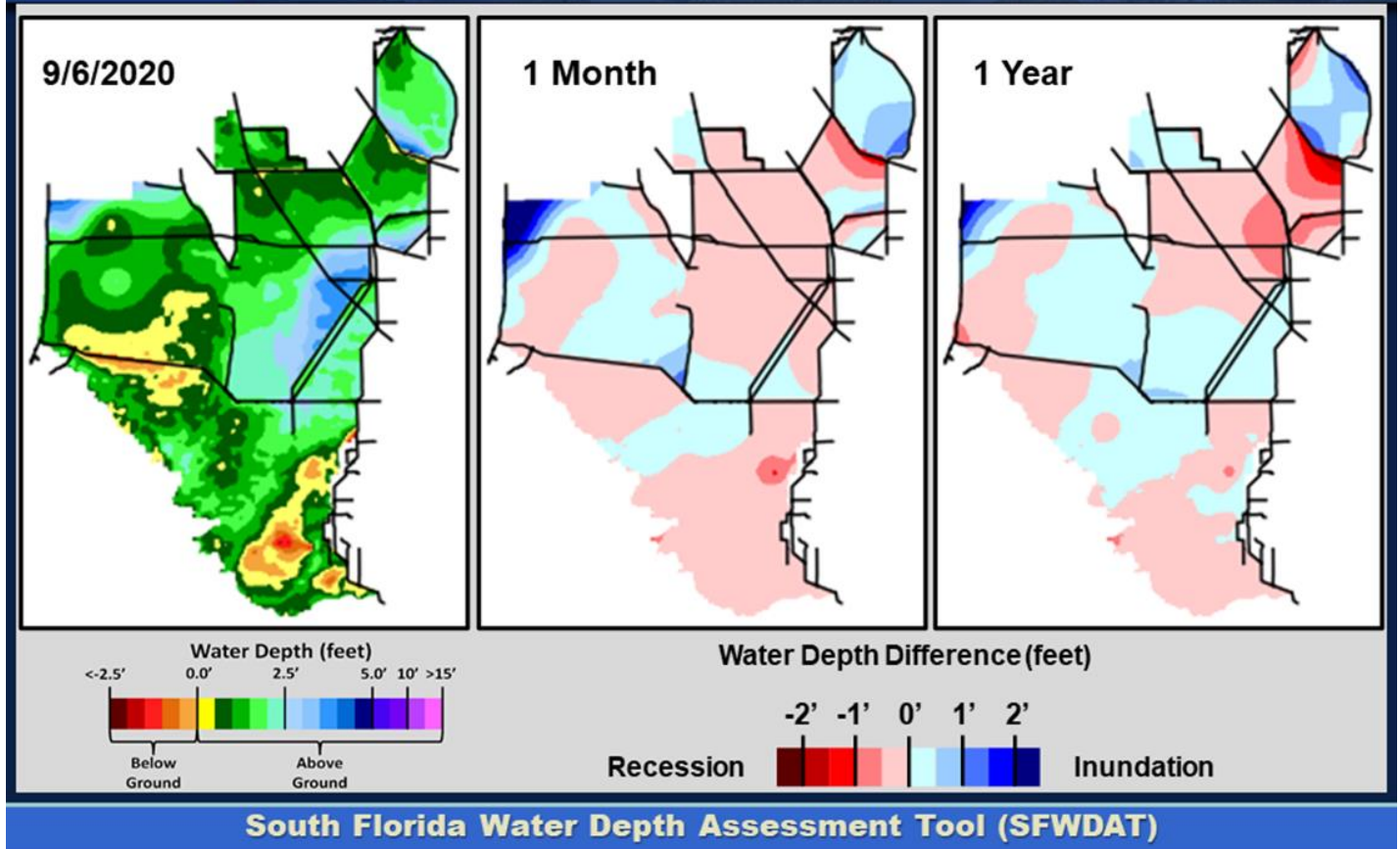
9/6/2020



South Florida Water Depth Assessment Tool (SFWDAT)

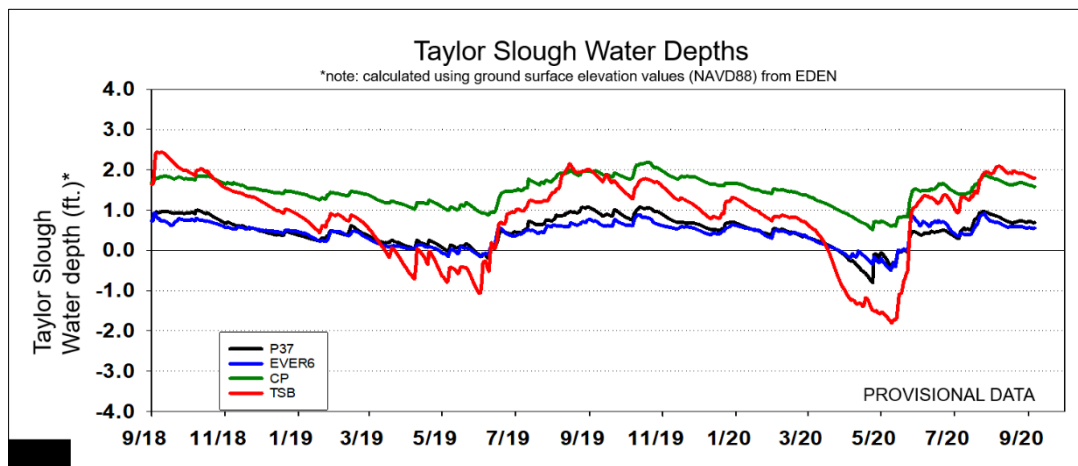
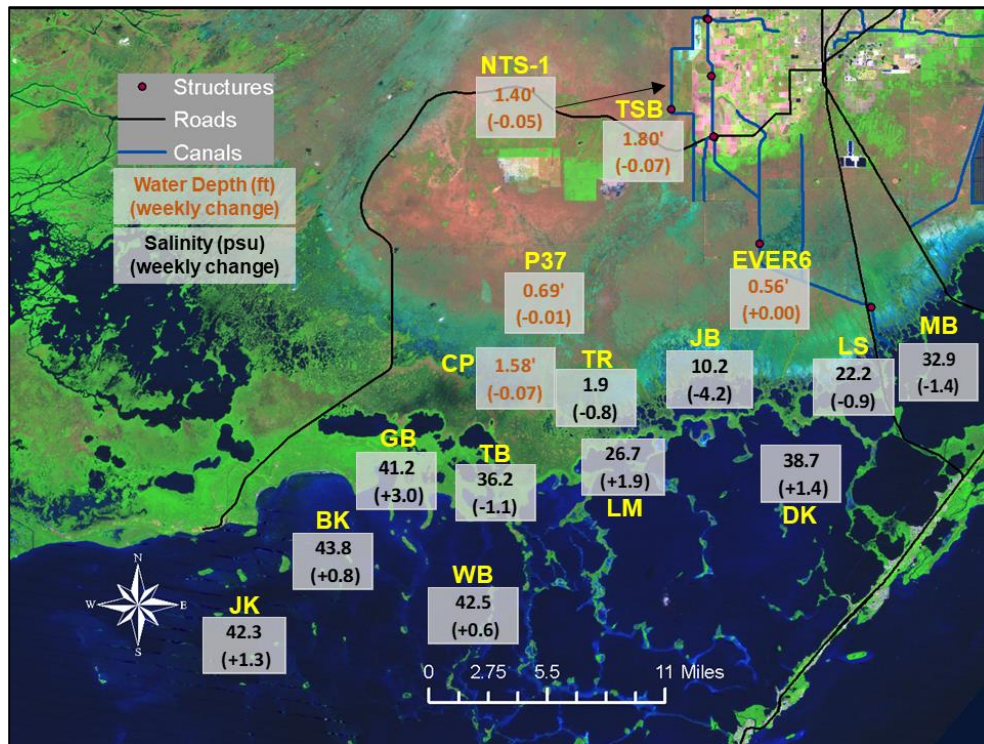


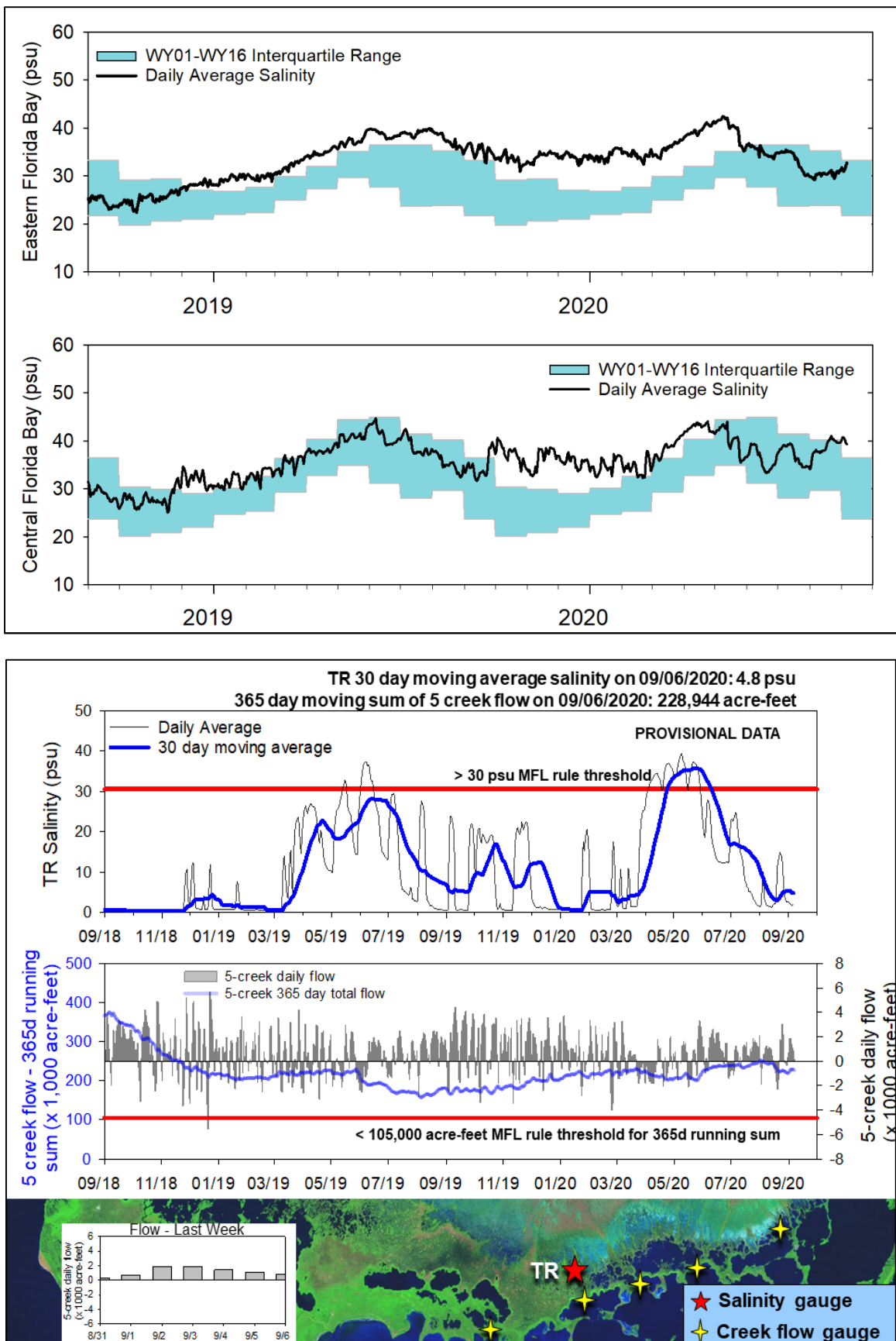
SFWDAT Everglades Difference Maps (Present – Past)



Tree island inundation in WCA-3A and ENP: 371 Tree Islands of known elevation within WCA-3A, -3B, and Everglades National Park's Shark Slough. Current rough estimates using WDAT (9/06/20), 39% or 145 of the tree islands are currently inundated, down from 41% the week prior. Initial islands were inundated beginning 5/24/20, longest duration of continuous inundation is 99 days.

Taylor Slough Water Levels: Daily rains fell over Taylor Slough and Florida Bay this past week averaging 0.65 inches, and stages decreased 0.04 feet on average. The Everglades National Park panhandle area was the only area that did not decrease this past week. Northern Taylor Slough is 3.4 inches deeper than the historical average (pre-Florida Bay Initiative) indicating that restoration actions are showing some success for this area. Almost daily rains fell over Taylor Slough and Florida Bay this past week averaging just over half an inch (0.59 inches), and stages decreased 0.03 feet on average. All stations decreased between 0.02 and 0.06 feet for the week. Northern Taylor Slough is 3.9 inches deeper than the historical average (pre-Florida Bay Initiative).





Florida Bay Salinities: Salinities in Florida Bay increased 0.3 psu on average with individual station changes ranging from -4.2 to +3.0 psu which is a narrower band than the previous few weeks. The central and western Bay areas (western graph not shown) are once again higher than the 75th percentile of historical data, and the east is quickly approaching it.

Florida Bay MFL: Salinity at the TR station in the mangrove zone (tracked for the Florida Bay MFL) decreased from 3 psu to 2 psu over the last week. The 30-day moving average decreased 0.5 psu to end at 4.8 psu. We still have not reached the less than 1 psu condition that is common for this area when freshwater is flowing. Weekly flow from the 5 creeks identified by yellow stars on the map totaled just over +8,000 acre-feet with positive flows for the entire week. The 365-day moving sum of flow from the five creeks (tracked as part of the Florida Bay MFL criteria) increased 8,000 acre-feet this week to end at 228,944 acre-feet which is between the historical median (249,091 acre-feet) and the 25th percentile (192,885 acre-feet). Creek flows are provisional USGS data. Salinity at the TR station in the mangrove zone (tracked for the Florida Bay MFL) decreased from 15 psu to 3 psu starting on Wednesday (8/26). The 30-day moving average increased 1.3 psu to end at 5.3 psu as a result of the recent pulse of increased salinity. Weekly flow from the 5 creeks identified by yellow stars on the map totaled just over +5,400 acre-feet driven by flows during the first half of the week. Negative flows resumed over the weekend. The 365-day moving sum of flow from the five creeks (tracked as part of the Florida Bay MFL criteria) decreased 4,000 acre-feet this week to end at 220,572 acre-feet which is decreasing away from the historical median (249,091 acre-feet) but still above the 25th percentile (192,885 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 provide surface water that can protect it from terrestrial predators during the nesting season. The WDAT currently predicts the potential for exposed ground surface in the extreme northwest of WCA-3A North along the Miami Canal. Inflows or the conservation of water within this area has ecological benefit for peat soil conservation and wading bird foraging.

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 90 days. Moderating inflows/outflows within that region that decreases ponding in both spatial extent and the amount of time the region is inundated has benefit to the ecology of tree islands.

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 require more freshwater to continue to decrease salinities in all areas of the 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, September 1st, 2020 (red is new)			
Area	Weekly change	Recommendation	Reasons
WCA-1	Stage increased by 0.08'	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 0.04'	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 0.08'	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 decreased by 0.22'	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 increased by 0.09'	Moderating the ascension rate to less than 0.25 feet per week or 0.50 feet per two weeks.	
Central WCA-3A S	Stage decreased by 0.07'	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 diminished by flooding
Southern WCA-3A S	Stage increased by 0.01'		
WCA-3B	Stage decreased by 0.05'	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 0.18'	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 -0.02' to -0.06'	Move water southward as possible	When available, provide freshwater buffer for downstream conditions.
FB- Salinity	Salinity changes ranged -8.2 to +6.7 psu	Move water southward as possible	When available, provide freshwater to maintain low salinity buffer and promote water movement.