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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: October 15, 2019

SUBJECT: Weekly Environmental Conditions for Systems Operations

Summary

Weather Conditions and Forecast

Dry air has filtered southward over most of the District which should limit shower development to the far southern end of the District this afternoon with activity focused over the interior and southwest. Some spotty very light rain associated with moisture streaming across northern Florida could brush the northern end of the District as well, but any rainfall amounts would be minimal at best over that area. A cold front is forecast to move into north Florida Wednesday and then into central Florida late Wednesday night before stalling and becoming diffuse over the District Thursday night. Some scattered afternoon shower activity should pop up ahead of the front Wednesday afternoon and westerly steering winds should focus activity over the interior and east and then showers and thunderstorms should develop mainly south of the frontal boundary each day Thursday and Friday. Some energy and moisture forecast to move into Central America and Mexico this week is forecast to move through the western Gulf of Mexico and then exit the area across the northern Gulf coast this weekend bringing the potential for a moderate increase in rains Saturday and Sunday. Residual moisture over the area should allow daytime heating to continue producing scattered showers and thunderstorms Monday.

Kissimmee

Tuesday morning stages were 56.3 feet NGVD (1.2 feet below schedule) in East Lake Toho, 53.8 feet NGVD (0.7 feet below schedule) in Lake Toho and 50.1 feet NGVD (1.9 feet below schedule) in lakes Kissimmee-Cypress-Hatchineha; headwater stages were 46.3 feet NGVD at S-65A and 25.8 feet NGVD at S-65D. Tuesday morning discharges were 418 cfs at S-65, 328 cfs at S-65A, 533 cfs at S-65D and 446 cfs S-65E. Dissolved oxygen concentration in the Kissimmee River averaged 7.3 mg/L for the week through Sunday. Kissimmee River mean floodplain depth on Sunday was 0.21 feet. There are no new recommendations this week.

Lake Okeechobee

Lake Okeechobee stage is 13.47 feet NGVD, increasing 0.08 feet from the previous week, but still 0.39 feet lower than this time last month. The Lake stage moved up into the Low sub-band on September 4, 2019 then moved back down into the Base Flow sub-band on September 11, 2019 where it has remained since. The Lake stage moved back into the ecological envelope (which varies seasonally from 12.5 – 15.5 feet NGVD +/- 0.5 feet) at the start of August, after spending about 215 days below the envelope, and is currently at the bottom of the envelope. Low Lake stages continue to benefit recovering SAV communities, but also stress higher elevation marshes; areas with elevations greater than approximately 14 ft NGVD have now been dry for nearly a year. The latest remote sensing of cyanobacteria bloom potential (October 12, 2019) was heavily obscured by cloud cover but shows that bloom potential is low in the Lake, as the season for large-scale blooms has ended.

Estuaries

Total inflow to the St. Lucie Estuary averaged 640 cfs over the past week with no flow coming from Lake Okeechobee. Over the past week, salinity increased slightly in the estuary. Salinity at the US1 Bridge is in the good range for adult eastern oysters.

Total inflow to the Caloosahatchee Estuary averaged 951 cfs over the past week with 165 cfs coming from the Lake. Salinity changed little over the past week. The 30-day moving average surface salinity is 4.4 at Val I-75 and 9.2 at Ft. Myers. Salinity conditions between Val I-75 and Ft. Myers are good for tape grass. Salinities are in the good range for adult eastern at Cape Coral, Shell Point and fair range at Sanibel.

Tributary hydrological conditions are dry. The forecast of 30-day moving average of surface salinity at Val I-75 would exceed 5 over the next two weeks if there are no releases from the Lake. SFWMD's Lake Okeechobee Adaptive Protocol's Release Guidance suggests up to 450 cfs @ S-79 and S-77 baseflow release to supplement as needed.

Stormwater Treatment Areas

Over the past week, approximately 2,000 acre-feet 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 64,000 acre-feet. The total amount of inflows to the STAs in WY2020 is approximately 763,000 acre-feet. All STA cells are at or near target depths. STA-5/6 flow-ways 2 and 3 are offline for the Restoration Strategies project to grade non-effective treatment areas. Operational restrictions are in place in STA-1W Northern Flow-way related to STA-1W Expansion #1 startup activities, in STA-5/6 Flow-way 1 to facilitate the Restoration Strategies grading project in Flow-way 2, and in STA-1E Central Flow-way and STA-2 Flow-way 3 for vegetation management activities. This week, if 2008 LORS recommends Lake releases to the WCAs and the conditions allow, releases will be sent to STA-2 and A-1 FEB / STA-3/4.

Everglades

As the climatological dry season begins, much-needed rain fell across the Everglades and Florida Bay this week. The ecology of both remains concerning however, as current stages in the WCAs are low for this time of year and salinities are high in Florida Bay. Conserving fresh water in the Everglades and distributing it to where depths are low (WCA-3A North) allowing it to flow south has important ecological benefit. Generally, at this time of year an ecologically-based recommendation is that rates of ascension within the WCAs remain below 0.25 feet per week or 0.5 feet per 2 weeks. This is to protect apple snail reproduction; however the window for snail egg-laying is closing and conserving water available within the WCAs is ecologically paramount. Exceeding the recommended rate in WCA-3A, given that basin did not have the rapid rise that WCA-1 and WCA-2A experienced last week and water depths are low in WCA-3A North, would be ecologically appropriate given the unique conditions of this transition period between the wet and dry season. All Taylor Slough and Florida Bay gauge stations received rainfall this past week. Stages responded in Taylor Slough and are now above average, and average salinity fell in Florida Bay but remains above average for this time of year. Salinity conditions also remain positioned much higher than desirable for the start of the dry season.

Supporting Information

KESSIMMEE BASIN

Kissimmee Basin Rainfall

The Upper Kissimmee Basin received 0.85 inches of rainfall in the past week and the Lower Basin received 0.47 inches (SFWMD Daily Rainfall Report 10/14/2019).

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 1-7.

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: 10/15/2019

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)						
							10/13/19	10/6/19	9/29/19	9/22/19	9/15/19	9/8/19	9/1/19
Lakes Hart and Mary Jane	S-62	0	LKMJ	59.9	R	60.4	-0.5	-0.4	-0.1	-0.1	0.0	0.0	-0.2
Lakes Myrtle, Preston, and Joel	S-57	0	S-57	60.9	R	61.4	-0.5	-0.4	-0.1	0.0	0.0	0.0	-0.2
Alligator Chain	S-60	0	ALLI	62.8	R	63.5	-0.7	-0.4	-0.2	-0.1	-0.1	0.0	-0.2
Lake Gentry	S-63	2	LKGT	60.7	R	61.2	-0.5	-0.4	-0.2	-0.1	-0.1	0.0	-0.2
East Lake Toho	S-59	0	TOHOE	56.3	R	57.4	-1.1	-0.8	-0.6	-0.4	-0.2	-0.2	-0.2
Lake Toho	S-61	0	TOHOW, S-61	53.8	R	54.4	-0.6	-0.4	-0.2	-0.1	0.1	0.0	-0.1
Lakes Kissimmee, Cypress, and Hatchineha	S-65	408	KUB011, LKIS5B	50.1	R	51.9	-1.8	-1.5	-1.2	-0.9	-0.4	-0.1	0.0

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: 10/15/2019

Metric	Location	1-Day Average		Average for the Preceding 7-Days ¹							
		10/13/2019	10/13/19	10/6/19	9/29/19	9/22/19	9/15/19	9/8/19	9/1/19	8/25/19	8/18/19
Discharge (cfs)	S-65	418	408	411	507	1,337	1,443	2,135	5,414	5,640	3,852
Discharge (cfs)	S-65A ²	327	327	327	423	1,248	1,412	2,676	5,795	6,547	5,681
Discharge (cfs)	S-65D ²	434	441	483	1,189	1,780	2,976	5,734	6,983	8,207	5,917
Headwater Stage (feet NGVD)	S-65D ²	25.70	25.81	25.84	26.64	26.78	27.00	27.56	27.48	27.42	26.50
Discharge (cfs)	S-65E ²	497	425	453	1,070	1,766	2,988	5,615	6,932	8,155	5,871
Discharge (cfs)	S-67	0	0	0	0	0	28	17	31	24	34
DO (mg/L) ³	Phases I & II/III river channel	7.6	7.3	7.1	6.0	4.2	2.1	2.2	0.9	0.5	0.7
Mean depth (feet) ⁴	Phase I floodplain	0.21	0.24	0.26	0.45	0.74	1.07	2.18	2.82	3.25	2.71

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)

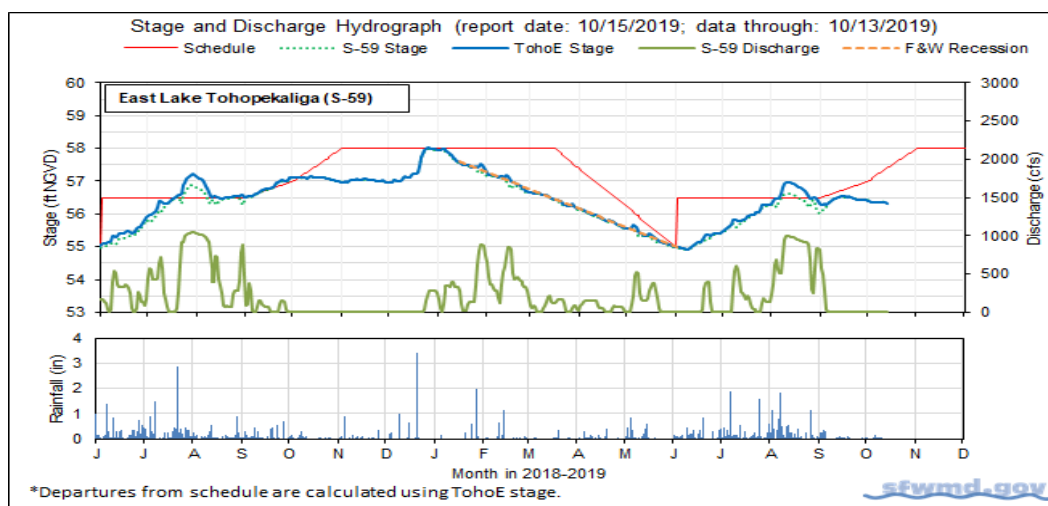


Figure 1.

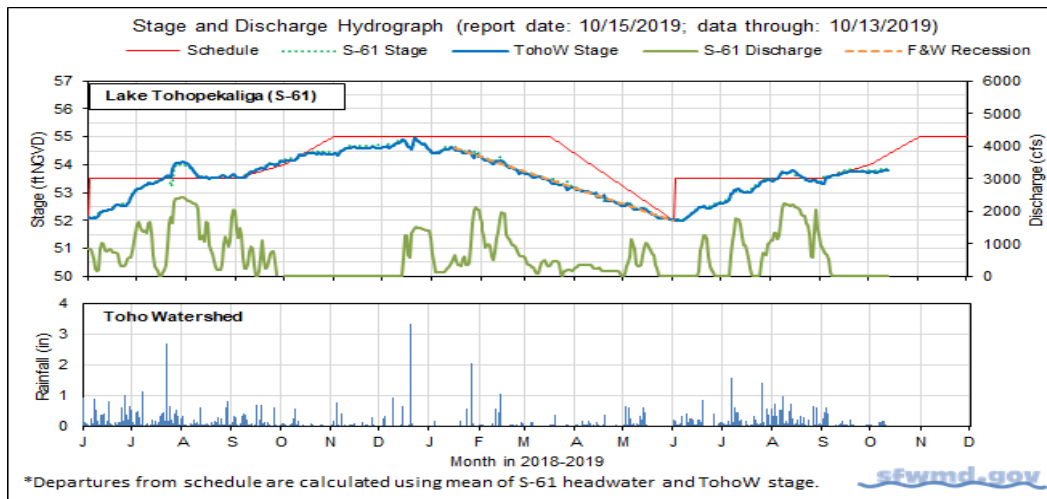


Figure 2.

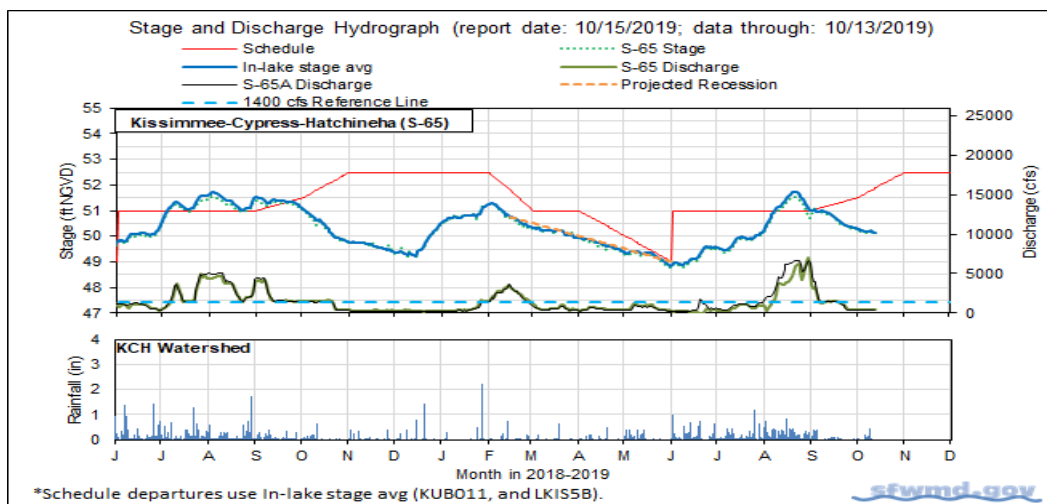


Figure 3.

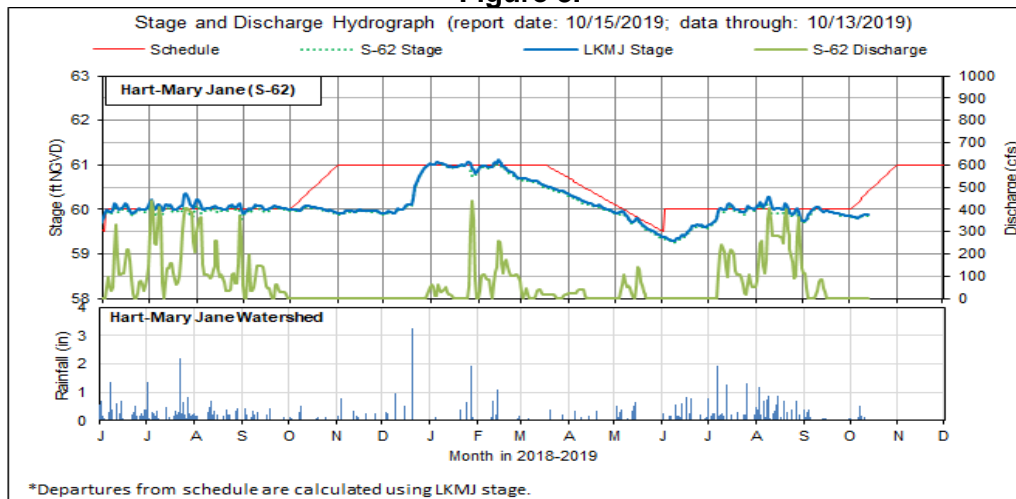


Figure 4.

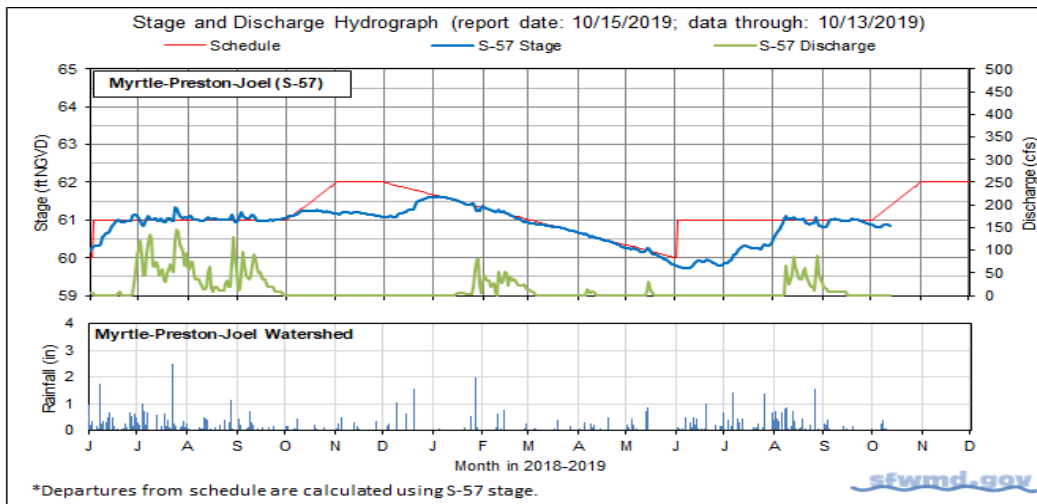


Figure 5.

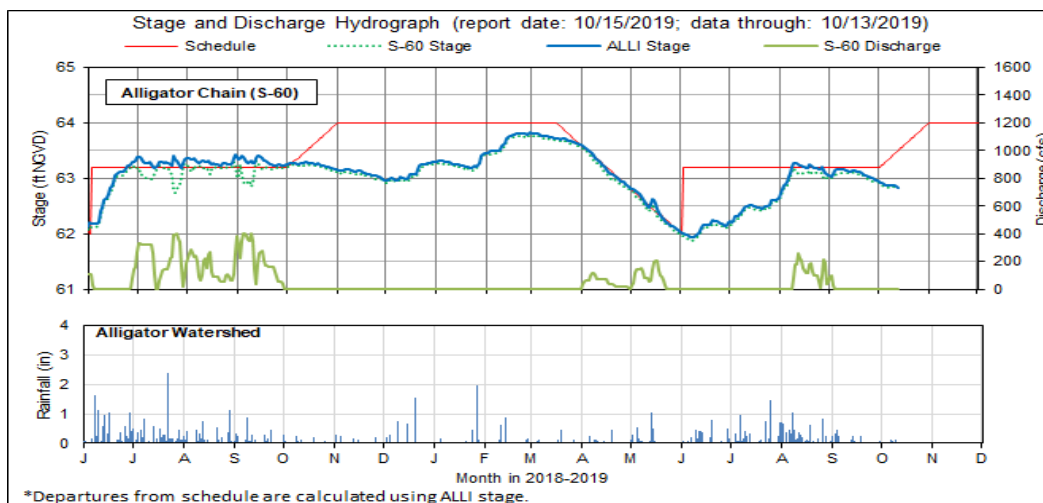


Figure 6.

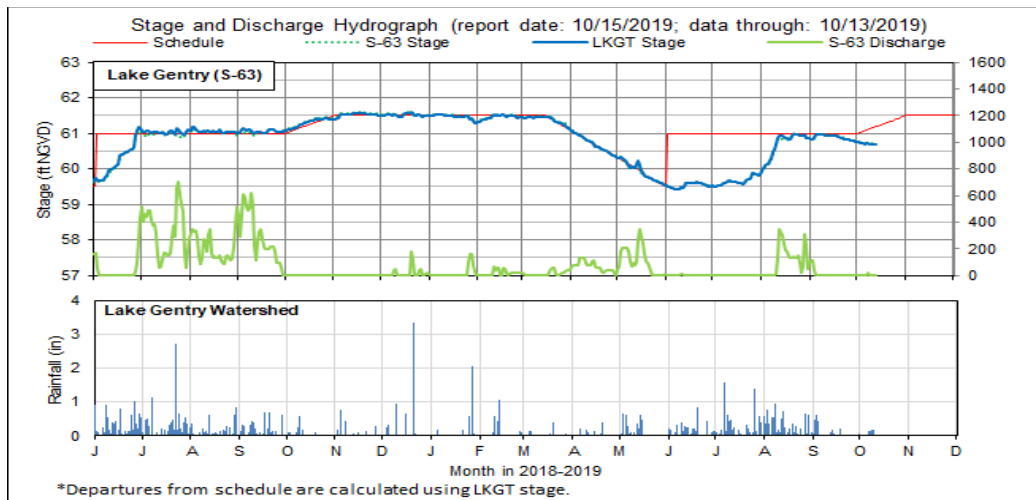


Figure 7.

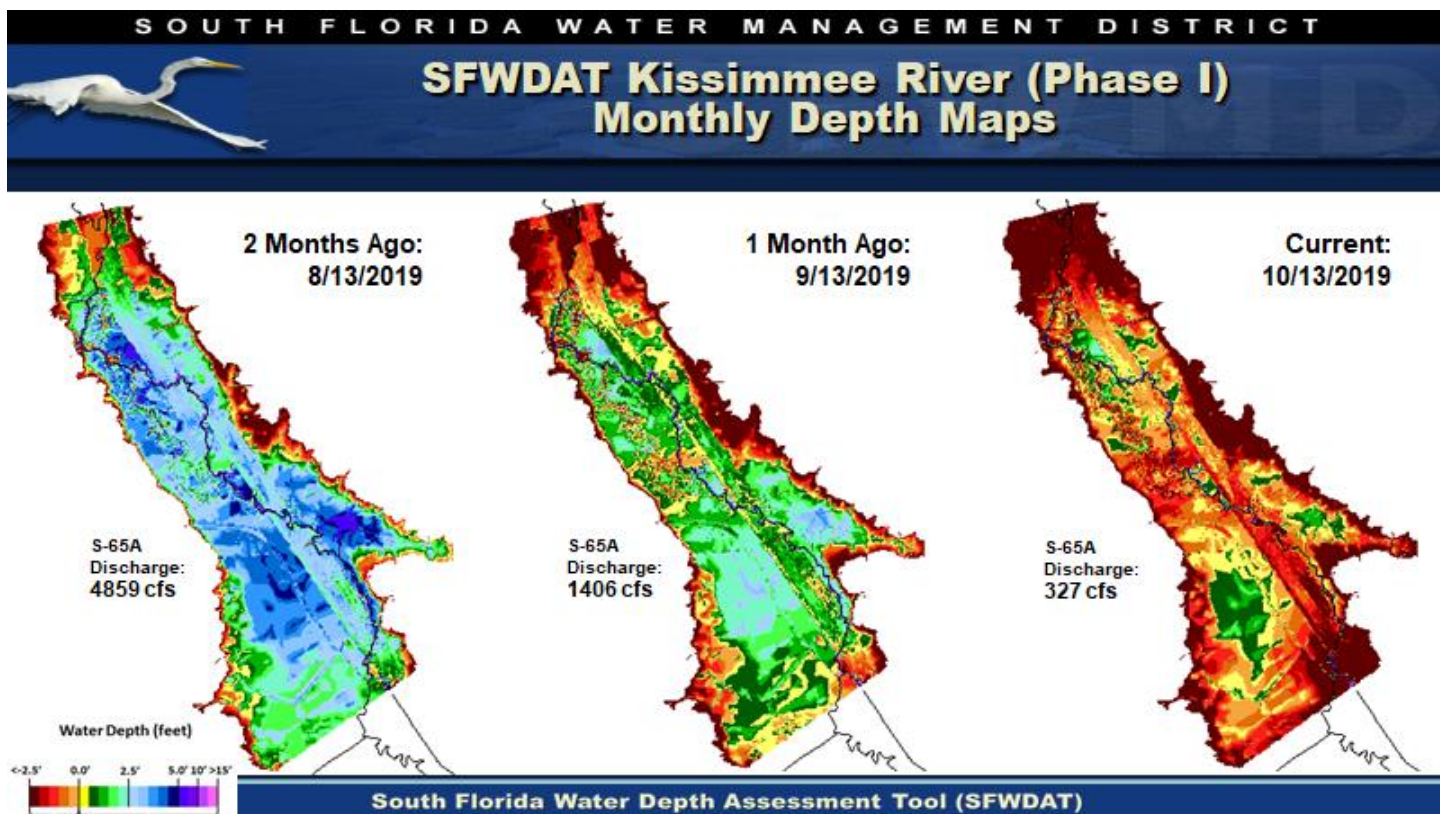


Figure 8. Phase I area floodplain water depths for this week, one month ago, and two months ago. Note that the WDAT color-coding has been modified to accommodate greater water depths; these maps are not directly comparable to Kissimmee Basin WDAT maps published prior to January 16, 2012.

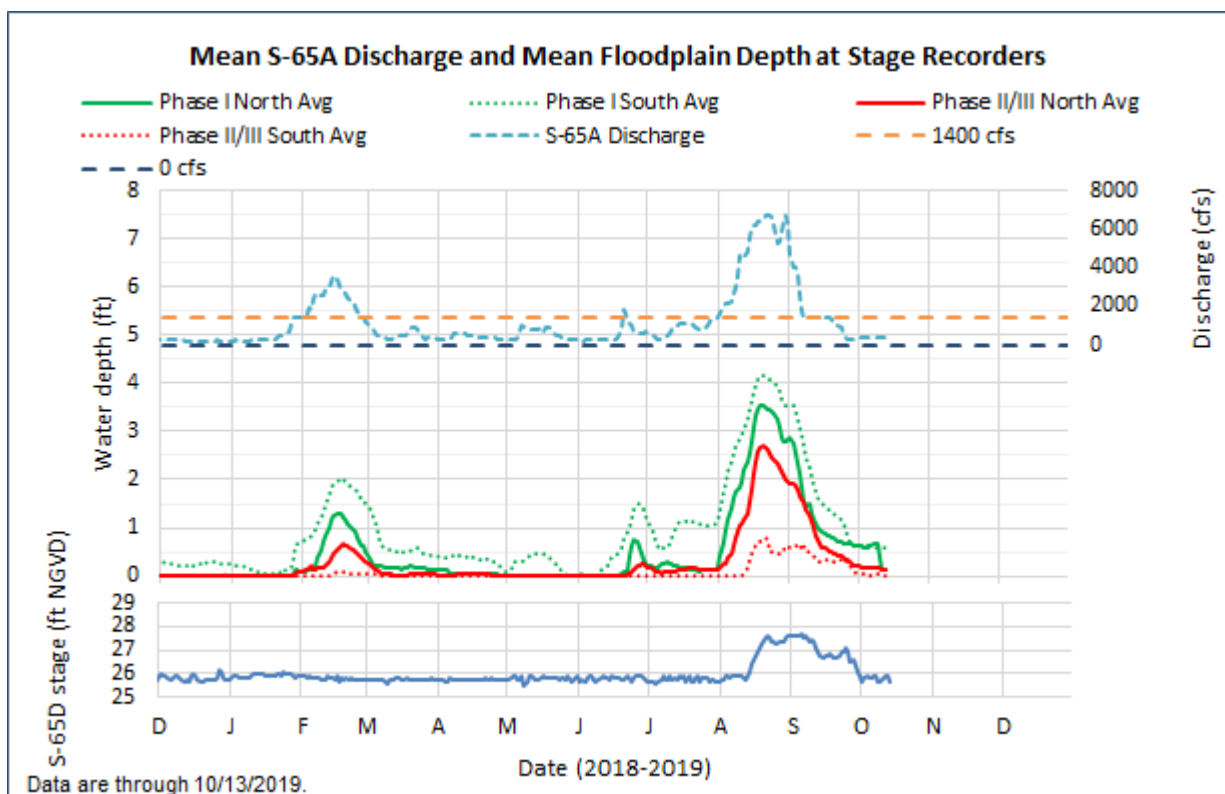
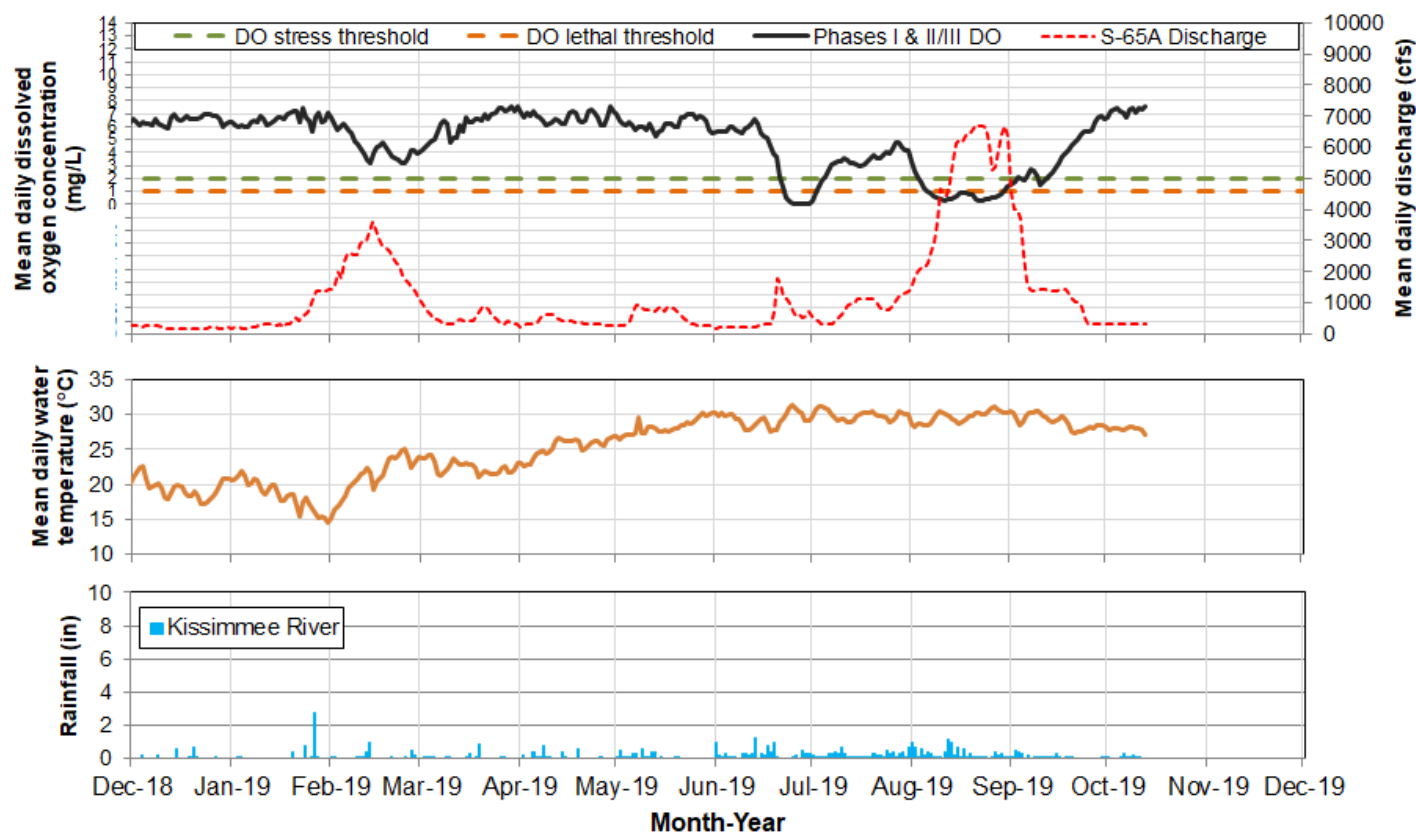


Figure 9. Mean water depth at stage recorders in the northern Phase I, southern Phase I, northern Phase II/III, and southern Phase II/III areas in relation to the S-65A discharge and S-65D headwater stage.



Report Date: 10/15/2019; data are through: 10/13/2019.

Figure 10. Mean daily dissolved oxygen, discharge, temperature and rainfall in the Phases I/II/III river channel.

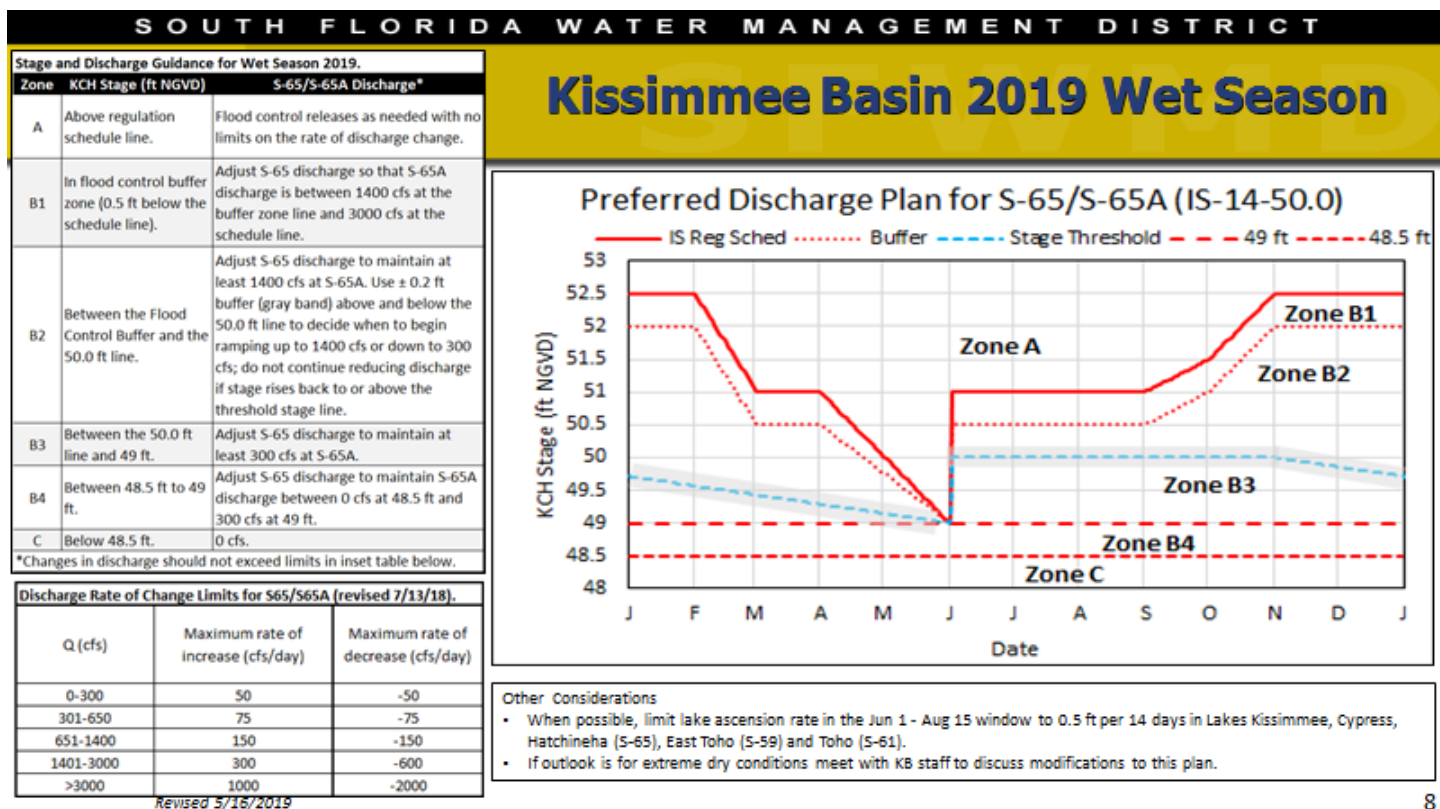


Figure 11. The 2019 Wet Season Discharge Plan for S-65/S-65A.

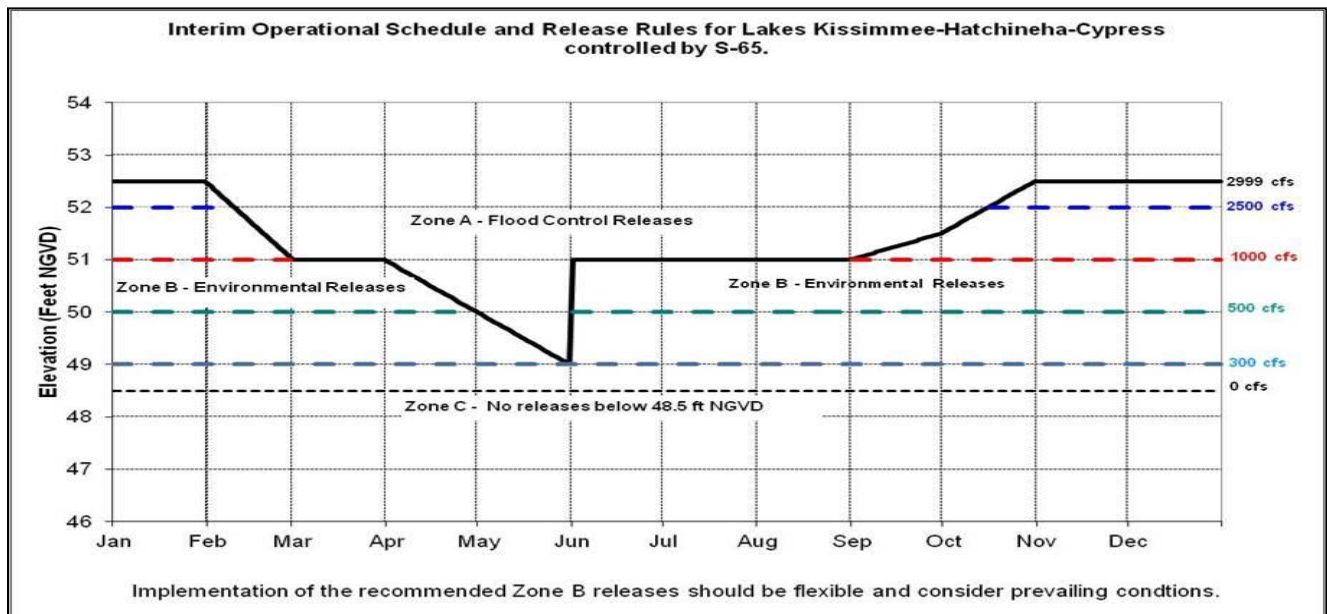


Figure 12. Interim operations schedule for S-65. The discharge schedule shown to the right has not been used in recent years.



Figure 13. The Kissimmee Basin.

LAKE OKEECHOBEE

According to the USACE web site, Lake Okeechobee average daily lake stage is at 13.47 feet NGVD for October 14, 2019 increasing 0.08 feet from the previous week. This value is based on the use of four interior lake stations (L001, L005, L006 and LZ40) and four perimeter stations (S-308, S-352, S-4 and S-133). The Lake is now 0.39 feet lower than a month ago and 0.77 feet lower than a year ago (Figure 1) when stages were in the middle portion of the preferred ecological envelope (Figure 2). The Lake moved up into the Low sub-band on September 4, 2019 then moved back down into the Base Flow sub-band on September 11, 2019 where it has remained since (Figure 3). With the decline over the past month, lake stage remains the lowest it has been for this time of year since 2011 (Figure 4). According to RAINДАР, during the week of October 08 to October 14, 2019, 1.43 inches of rain fell directly over the Lake, compared to just 0.07 inches the previous week. Rainfall across the watershed was highly variable, with most northern and western regions receiving less than 0.5 inches, while many east-coast basins received over 2 inches (Figure 5).

The average daily inflows (minus rainfall) to the Lake decreased for the sixth consecutive week going from 480 cfs to 460 cfs. Over 95% of the inflow was from the Kissimmee River (S-65E & S-65EX1) which decreased from 439 cfs to 416 cfs. No passive backflow from the L8 at Canal Point (via CLV10A) occurred this week (Table 1).

Outflow (minus evapotranspiration) decreased dramatically from 3,138 cfs to just 232 cfs, predominantly because flows going south through the S-350 structures dropped from 2,525 cfs to zero. Flows through the L8 at Canal Point (via CLV10A) dropped from 173 cfs to 67 cfs, and releases west through S-77 decreased from 615 cfs to 165 cfs. The corrected average daily evapotranspiration value for the week based on the L006 and LZ40 weather platform solar radiation were similar to the previous week, going from 0.80 inches to 0.90 inches.

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 6 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 recent satellite imagery has been obscured by cloud cover, however the October 12, 2019 image using NOAA's cyanobacteria monitoring product derived from EUMETSAT's Sentinel 3 OLCI sensor data showed that bloom potential remains low in the lake, as the season for potential wide-spread algal blooms has likely ended (Figure 7).

Water Management Recommendations

Lake Okeechobee stage is 13.47 feet NGVD, increasing 0.08 feet from the previous week, but still 0.39 feet lower than last month. The Lake moved up into the Low sub-band on September 4, 2019 then moved back down into the Base Flow sub-band on September 11, 2019 where it has remained since. The Lake moved back into the ecological envelope (which varies seasonally from 12.5 – 15.5 feet NGVD +/- 0.5 feet) at the start of August, after spending about 215 days below the envelope, and is currently at the bottom of the envelope. Low Lake stages continue to benefit recovering SAV communities, but also stress higher elevation marshes; areas with elevations greater than approximately 14 ft NGVD have now been dry for nearly a year. The latest estimate of cyanobacteria bloom potential (October 12, 2019) is heavily obscured by cloud cover but shows that bloom potential is low in the Lake, as the season for large-scale blooms has ended.

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	439	416	0.2
S-71 & S-72	19	19	0.0
S-84 & S-84X	0	11	0.0
Fisheating Creek	22	14	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	913	3305	1.4
Total	1393	3764	1.6

OUTFLOWS	Previous week Avg Daily CFS	Avg Daily Flow cfs	Equivalent Depth Week Total (in)
S-77	615	165	0.1
S-308	0	0	0.0
S-351	1198	0	0.0
S-352	539	0	0.0
S-354	614	0	0.0
L-8 Outflow	173	67	0.0
ET	1815	2079	0.9
Total	4953	2311	1.0

Provisional Data

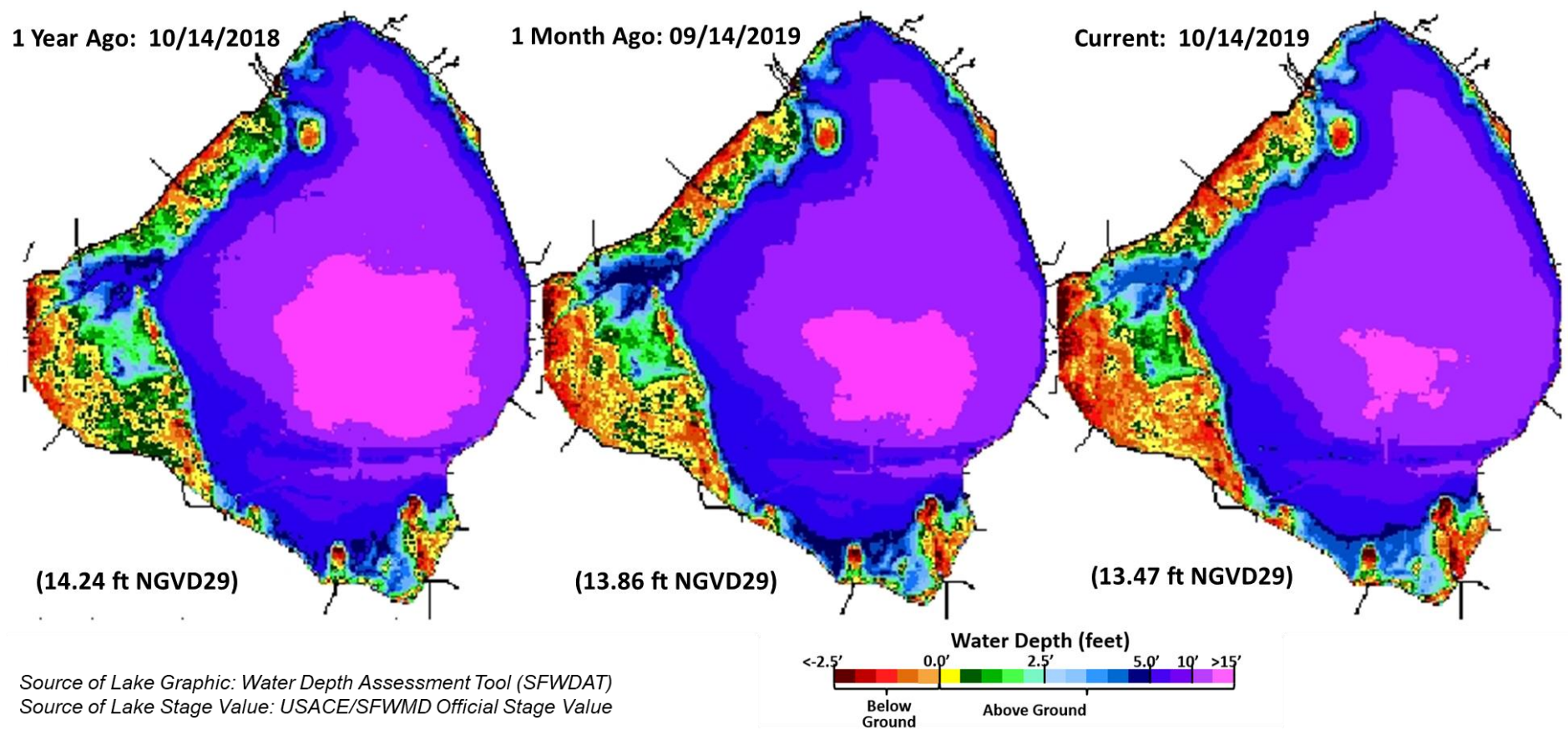


Figure 1. Water depth estimates on Lake Okeechobee based on the South Florida Water Depth Assessment Tool.

Lake Okeechobee Stage vs Ecological Envelope

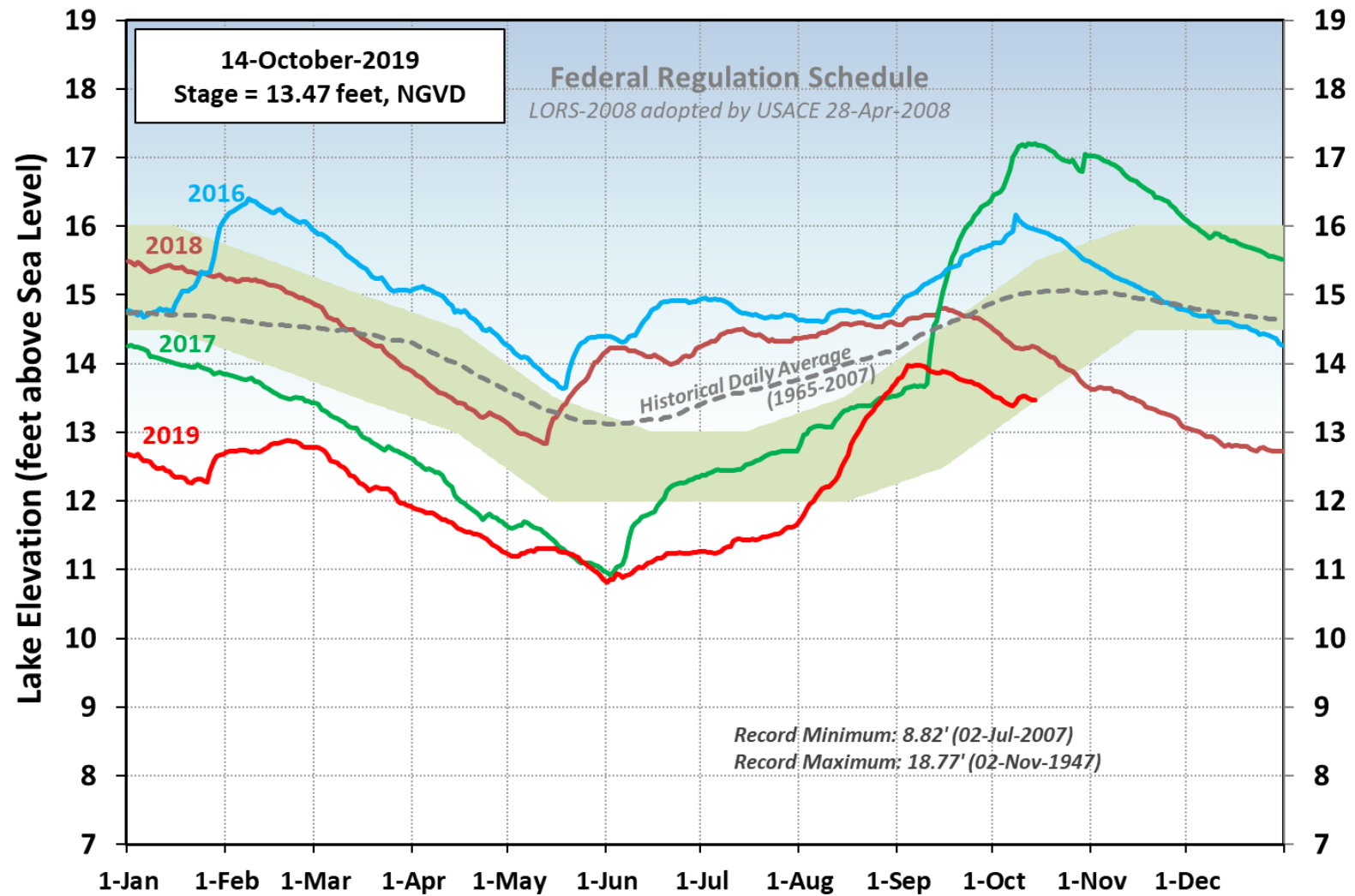
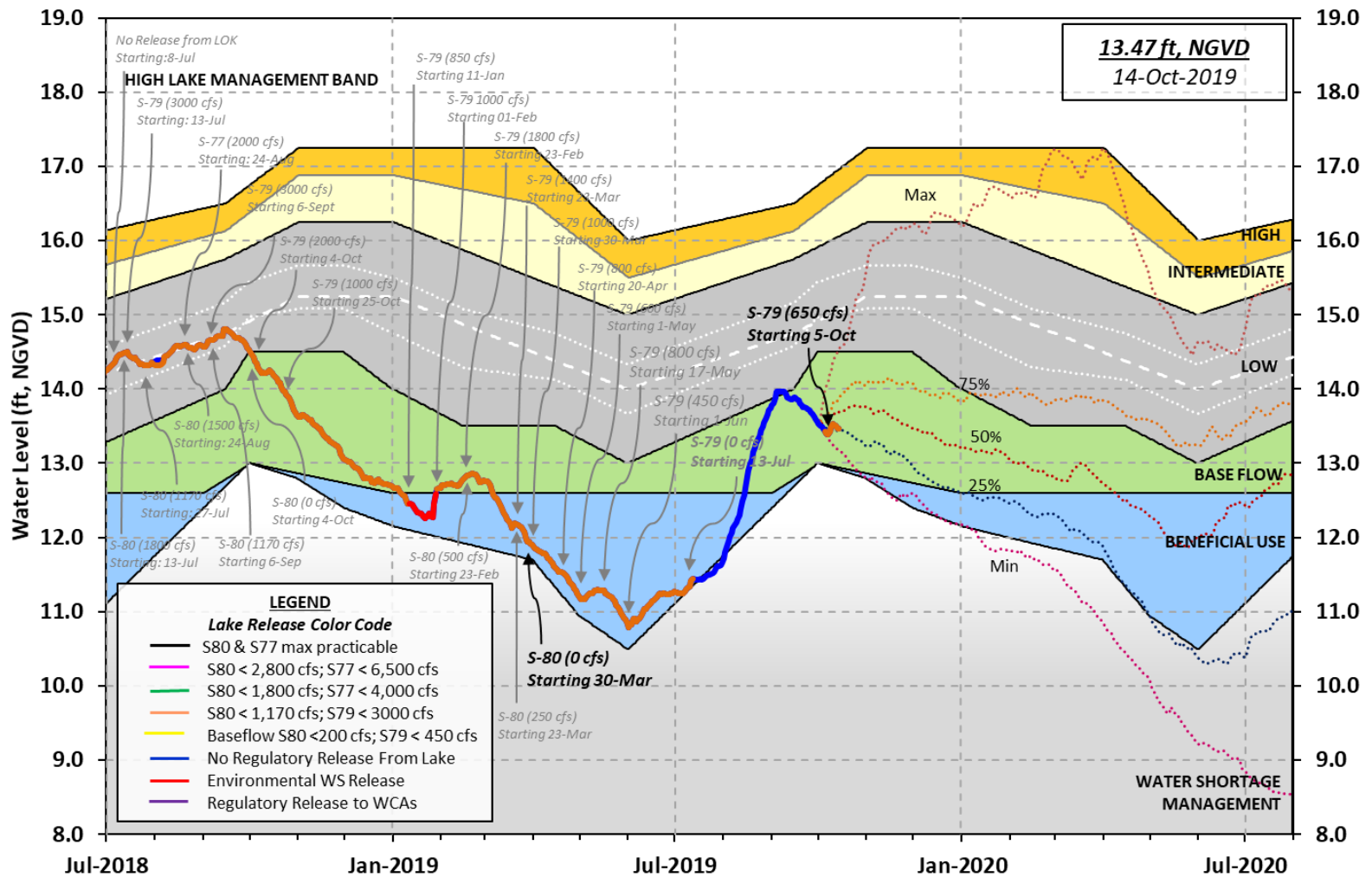


Figure 2. Select annual stage hydrographs for Lake Okeechobee in comparison to the Ecological Envelope.

Lake Okeechobee Water Level History and Projected Stages



LORS-2008
Adopted by USACE 28-April-2008

Projected Stage Percentiles From
SFWM-D-HESM Position Analysis

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

Lake Okeechobee Water Level Comparison

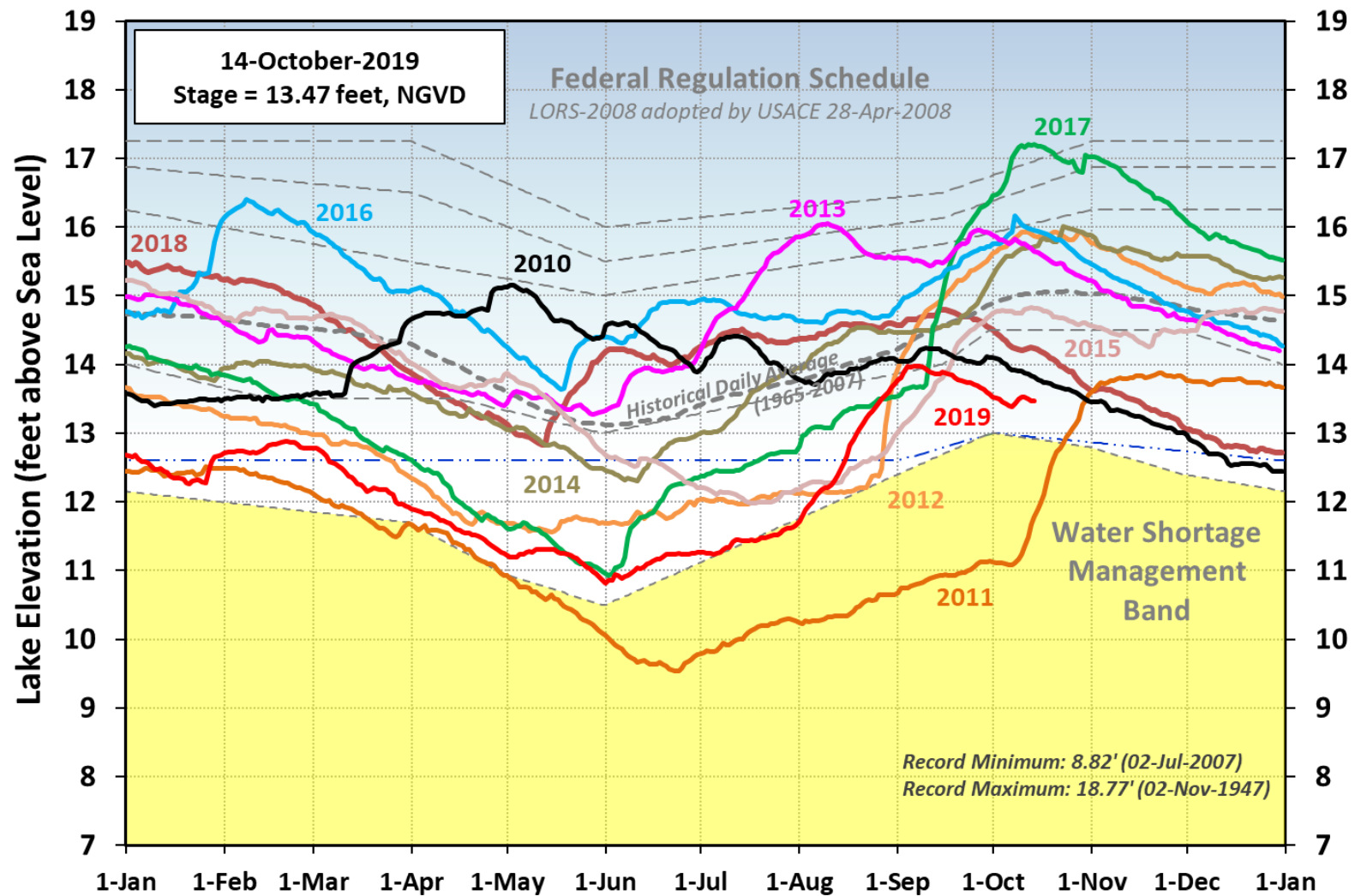


Figure 4. Select annual stage hydrographs for Lake Okeechobee from 2010 – 2019.

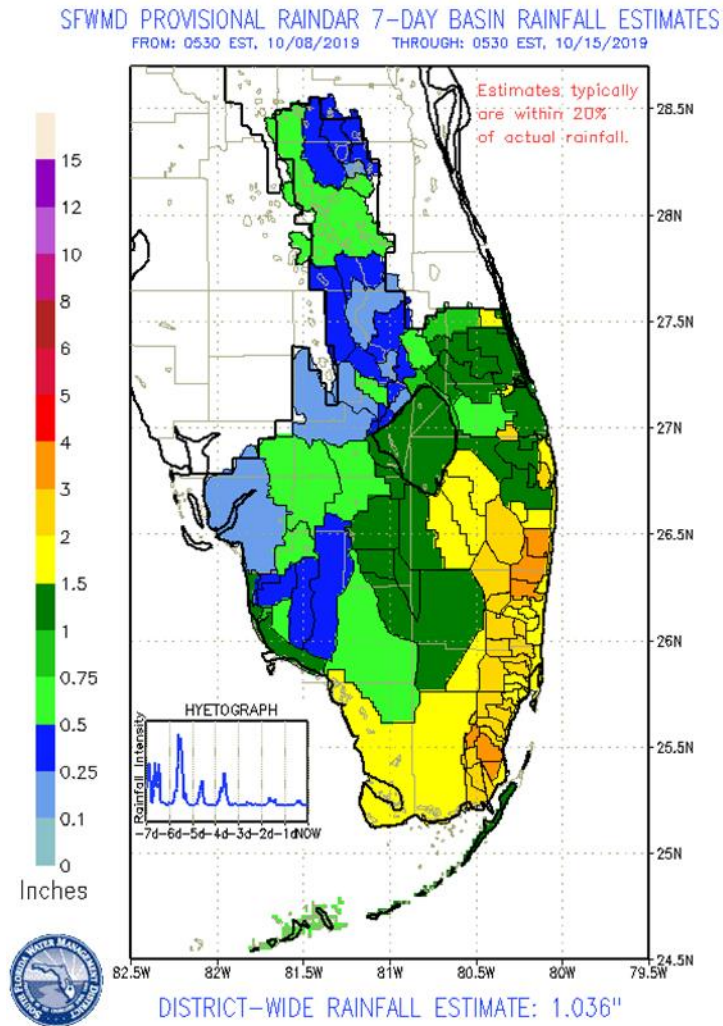


Figure 5. Rainfall estimates by basin.

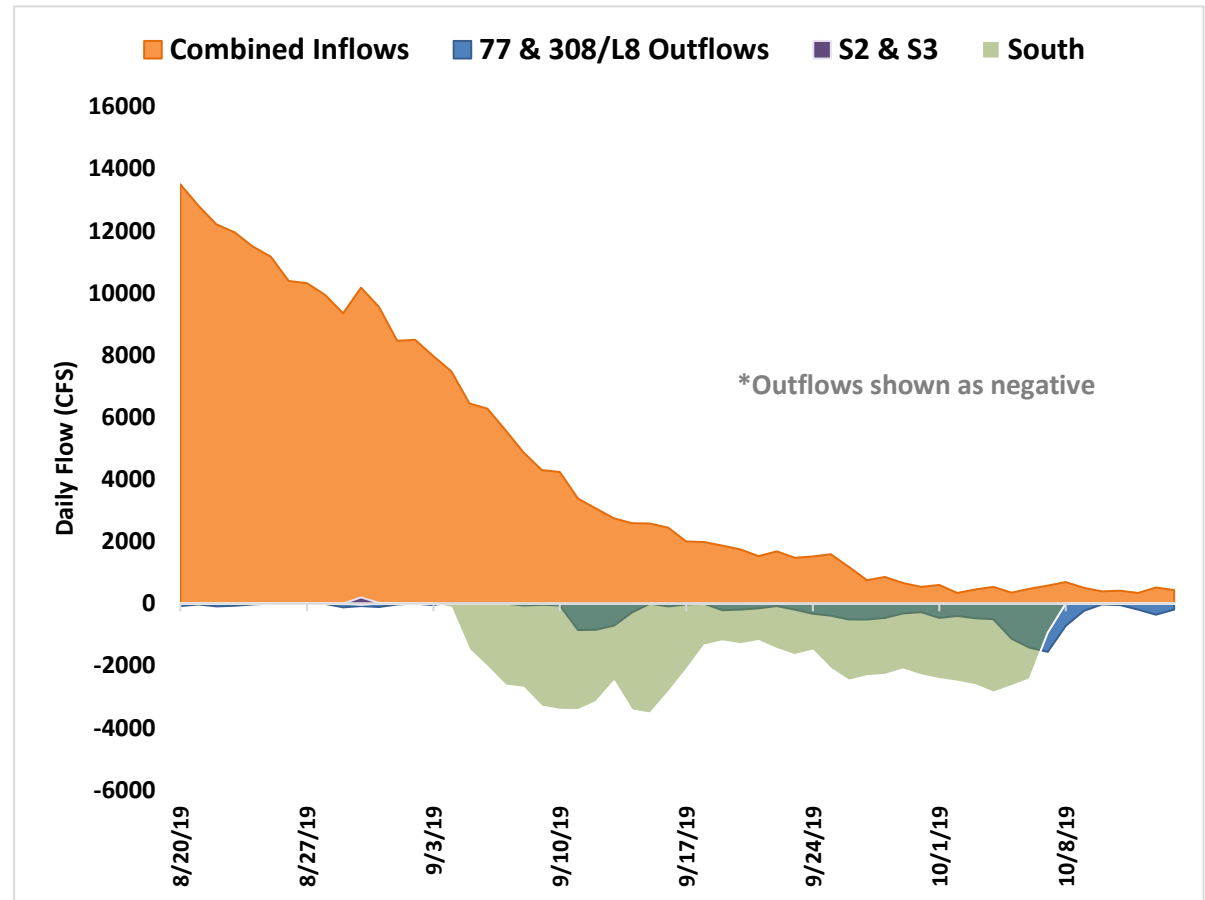


Figure 6. Major inflows (orange) and outflows (blue) of Lake Okeechobee, including the S-350 structures designated as South (green). The L-8 Canal flows through Culvert 10A are included as outflows when positive, and as inflows when backflowing into the lake. All inflows and outflows are shown as positive 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.

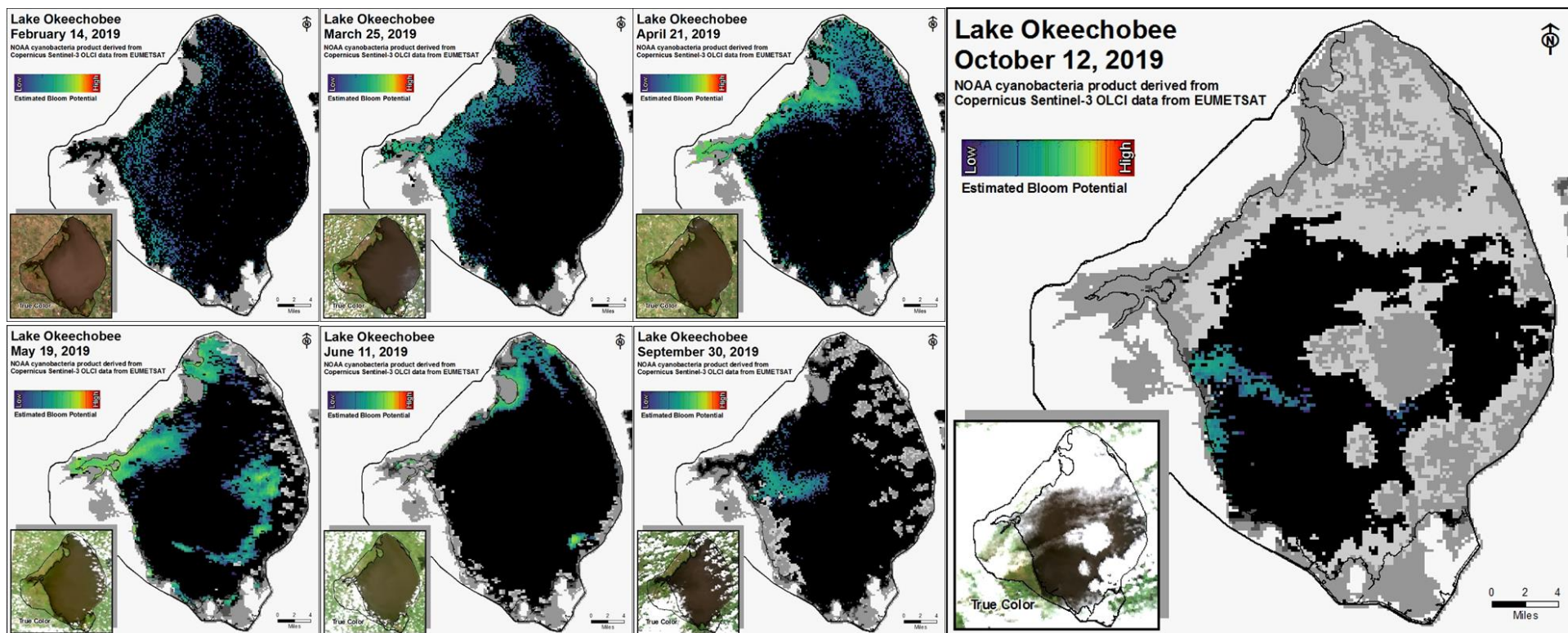


Figure 7. Potential for cyanobacterial blooms on Lake Okeechobee in 2019, based on NOAA's harmful algal bloom monitoring system derived from Copernicus Sentinel-3 OLCI data from EUMETSAT. Gray indicates cloud cover.

ESTUARIES

St. Lucie Estuary:

Last week total inflow to the St. Lucie Estuary averaged approximately 640 cfs (Figures 1 and 2) and last month inflow averaged about 430 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	378
S-80	0
S-308	0
S-49 on C-24	57
S-97 on C-23	38
Gordy Rd. structure on Ten Mile Creek	167

Over the past week in the estuary, surface salinity increased at HR1 and decreased 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 unavailable. 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)	12.8 (12.0)	18.2 (15.6)	NA ¹
US1 Bridge	EM ² (9.7)	19.8 (17.9)	10.0-26.0
A1A Bridge	26.5 (28.2)	EM (EM)	NA ¹

¹Envelope not applicable and ²Equipment Malfunction.

Caloosahatchee Estuary:

Last week total inflow to the Caloosahatchee Estuary averaged approximately 951 cfs (Figures 5 and 6) and last month inflow averaged about 594 cfs. Last week's provisional averaged inflows from the structures are shown in Table 3.

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

Location	Flow (cfs)
S-77	165
S-78	478
S-79	810
Tidal Basin Inflow	141

Over the past week, salinity remained about the same throughout the estuary (Table 4, Figures 7 & 8). The seven-day average salinity values within the good range for adult eastern oysters at Cape Coral, Shell Point and in the fair range at Sanibel (Figure 9). The 30-day moving average surface salinity is 4.4 at Val I-75 and 9.2 at Ft. Myers. Salinity conditions between Val I-75 and Ft. Myers are good for tape grass.

Table 4. Seven-day average salinity at six monitoring stations in the Caloosahatchee Estuary. Current average is in bold face type, previous average in parentheses. The envelope reflects the preferred salinity range for tape grass (*Vallisneria americana*) at Val I-75 and for adult eastern oysters (*Crassostrea virginica*) elsewhere.

Sampling Site	Surface	Bottom	Envelope
S-79 (Franklin Lock)	EM ³ (6.6)	6.4 (7.4)	NA ¹
Val I75	7.7 (7.1)	9.2 (8.8)	0.0-5.0 ²
Ft. Myers Yacht Basin	13.5 (12.9)	14.0 (15.2)	NA
Cape Coral	19.3 (18.3)	21.0 (21.1)	10.0-30.0
Shell Point	28.7 (28.9)	29.1 (29.4)	10.0-30.0
Sanibel	32.3 (32.3)	32.3 (32.3)	10.0-30.0

¹Envelope not applicable, ²Envelope is based on a 30-day average, and ³Equipment Malfunction.

Forecast of surface salinity (Table 5 and Figure 10) at Val I-75 for the next two weeks using the autoregression model (Qiu and Wan, 2013) coupled with a linear reservoir model for the tidal basin predicts daily salinity ranging from 4.5 to 9.1 at the end of the next two weeks for pulse release at S-79 ranging from 0 to 800 cfs and Tidal Basin inflows of 110 cfs.

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	110	9.1	7.4
B	300	110	7.2	6.9
C	450	110	6.2	6.5
D	650	110	4.8	6.1
E	800	110	4.5	6.0

Red tide

The Florida Fish and Wildlife Research Institute reported on October 11, 2019, that *Karenia brevis*, the Florida red tide dinoflagellate, was observed at background to medium concentrations in ten samples collected from and/or offshore of Lee County. *Karenia brevis* was not observed in samples collected from St. Lucie, Martin, or Palm Beach counties (no samples were analyzed this week from Broward or Miami-Dade counties).

Water Management Recommendations

Lake stage is in the Base Flow sub-band. Tributary conditions are dry. The 30-day moving average of surface salinity at Val I-75 is predicted to exceed 5 over the next two weeks. SFWMD's Lake Okeechobee Adaptive Protocol's Release Guidance suggests up to 450 cfs @ S-79 and S-77 baseflow release to supplement as needed.

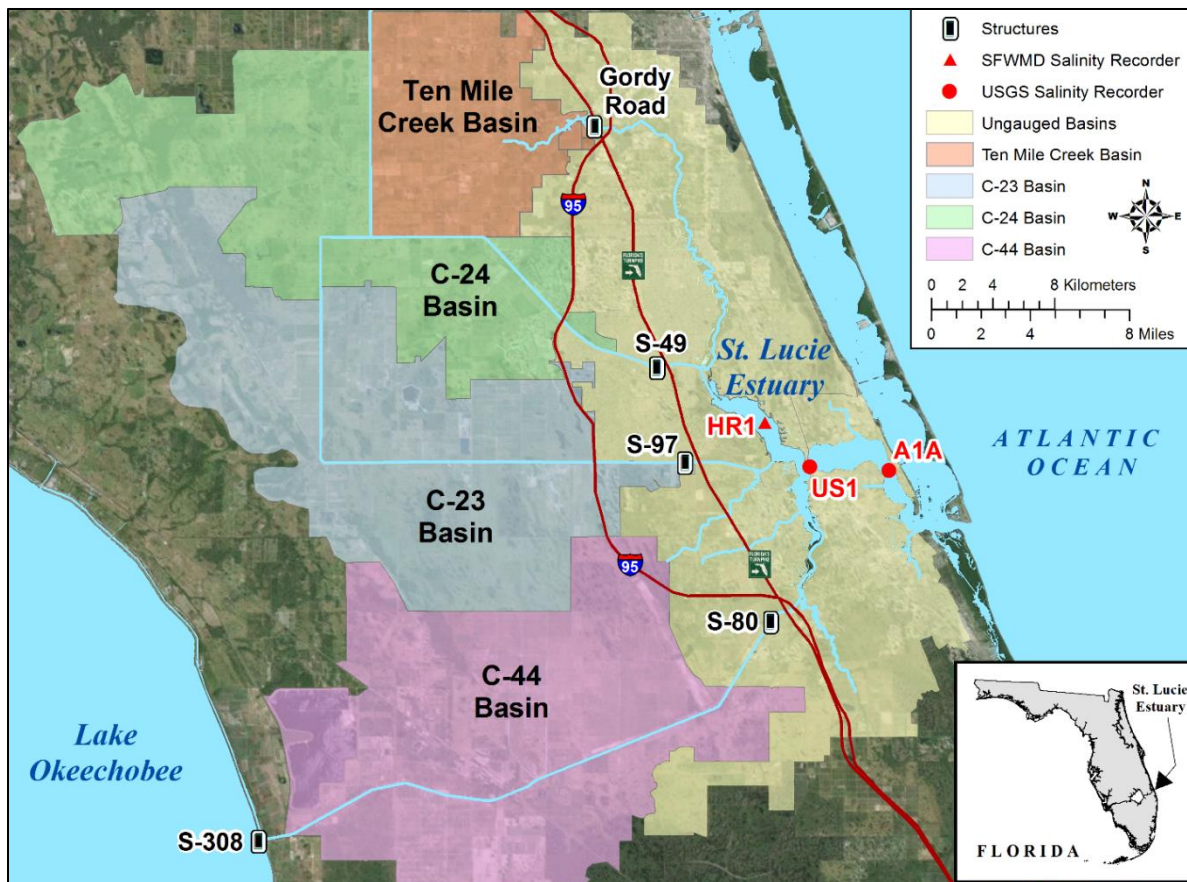


Figure 1. Basins, water control structures, and salinity monitoring for the St. Lucie Estuary.

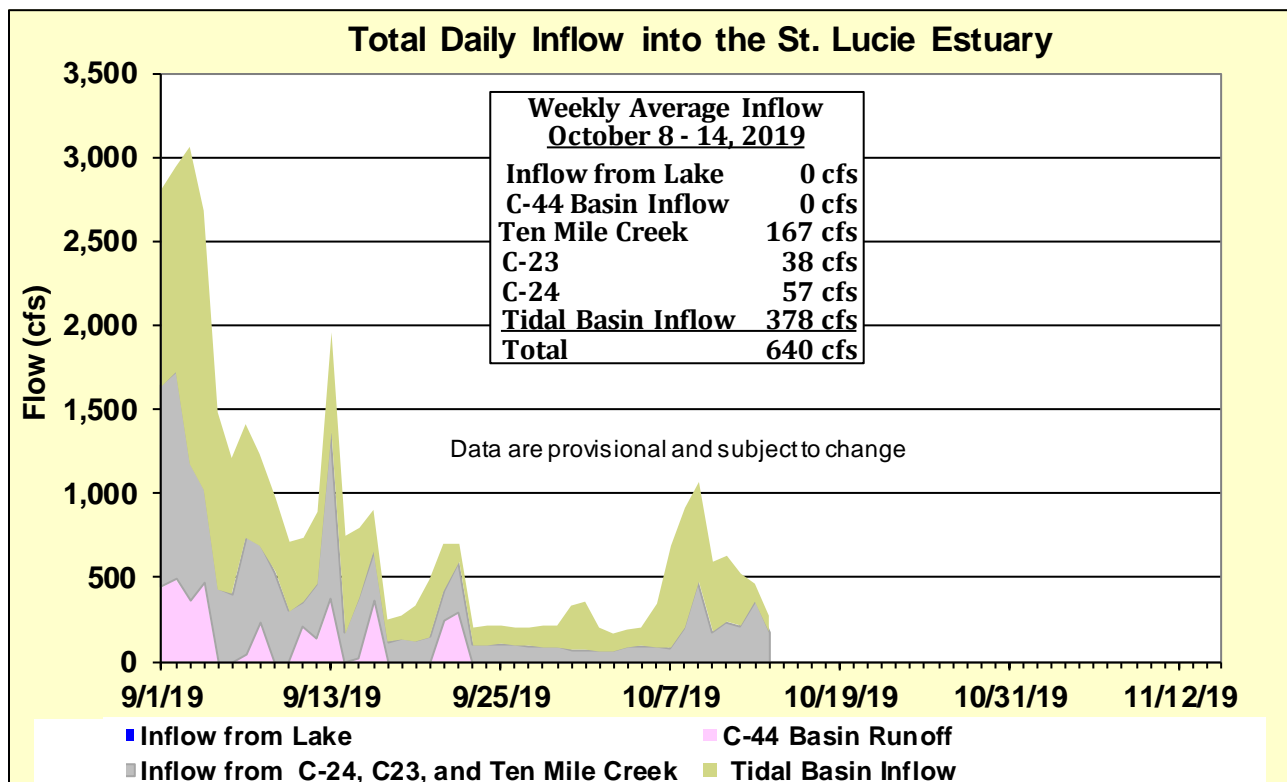


Figure 2. Total daily inflows from Lake Okeechobee and runoff from the C-44, C-23, C-24, Ten Mile Creek, and tidal basins into the St. Lucie Estuary.

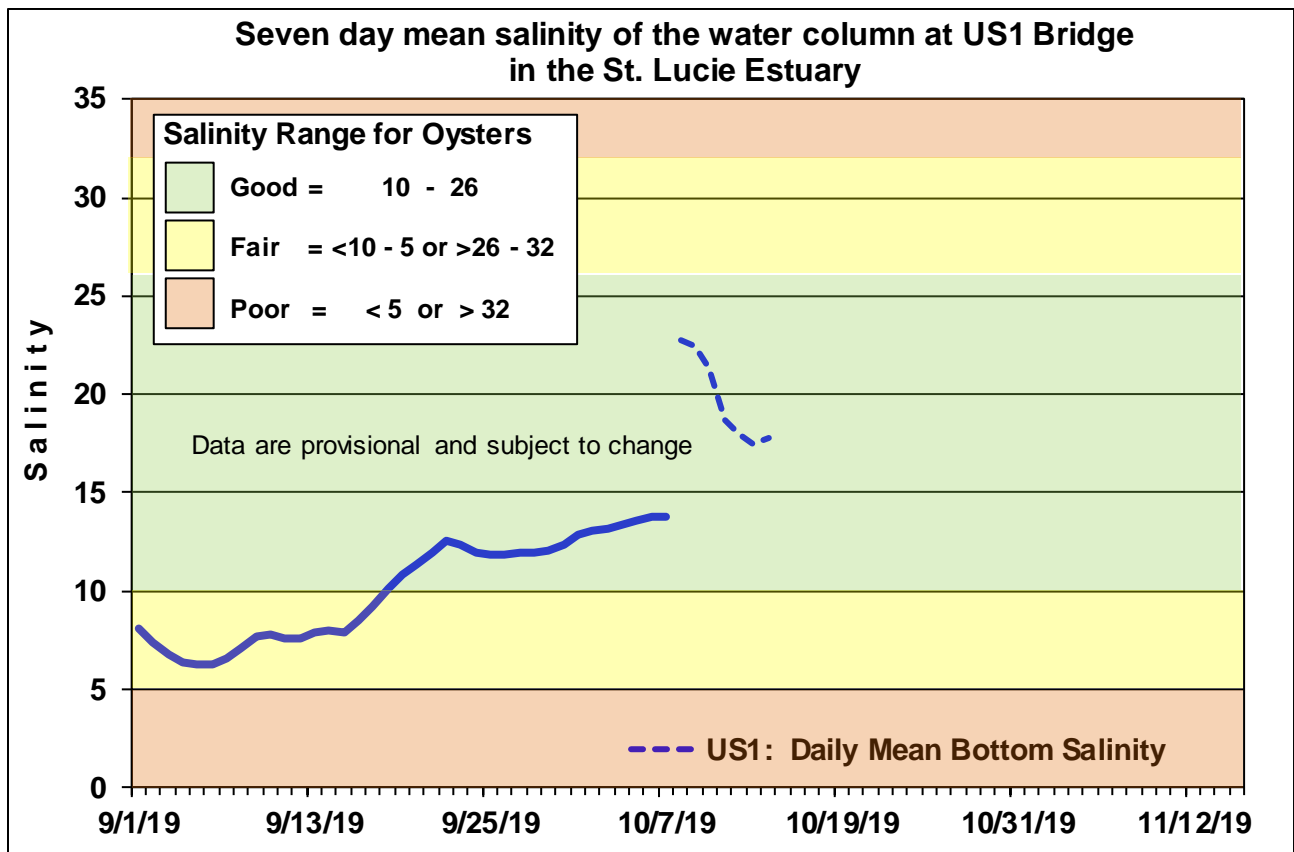


Figure 3. Seven-day mean salinity of the water column at the US1 Bridge.

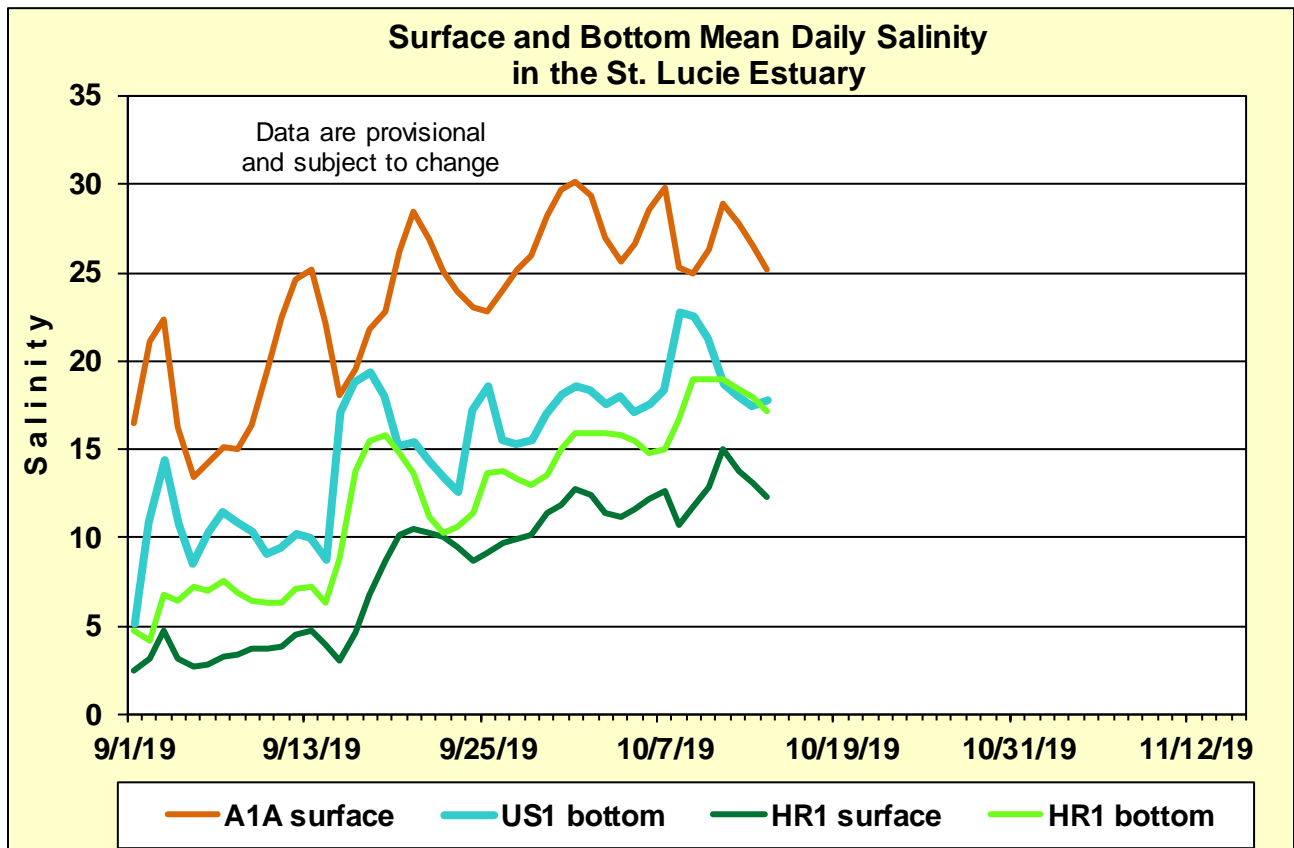


Figure 4. Daily mean salinity at the A1A, US1 and estimated HR1 stations.

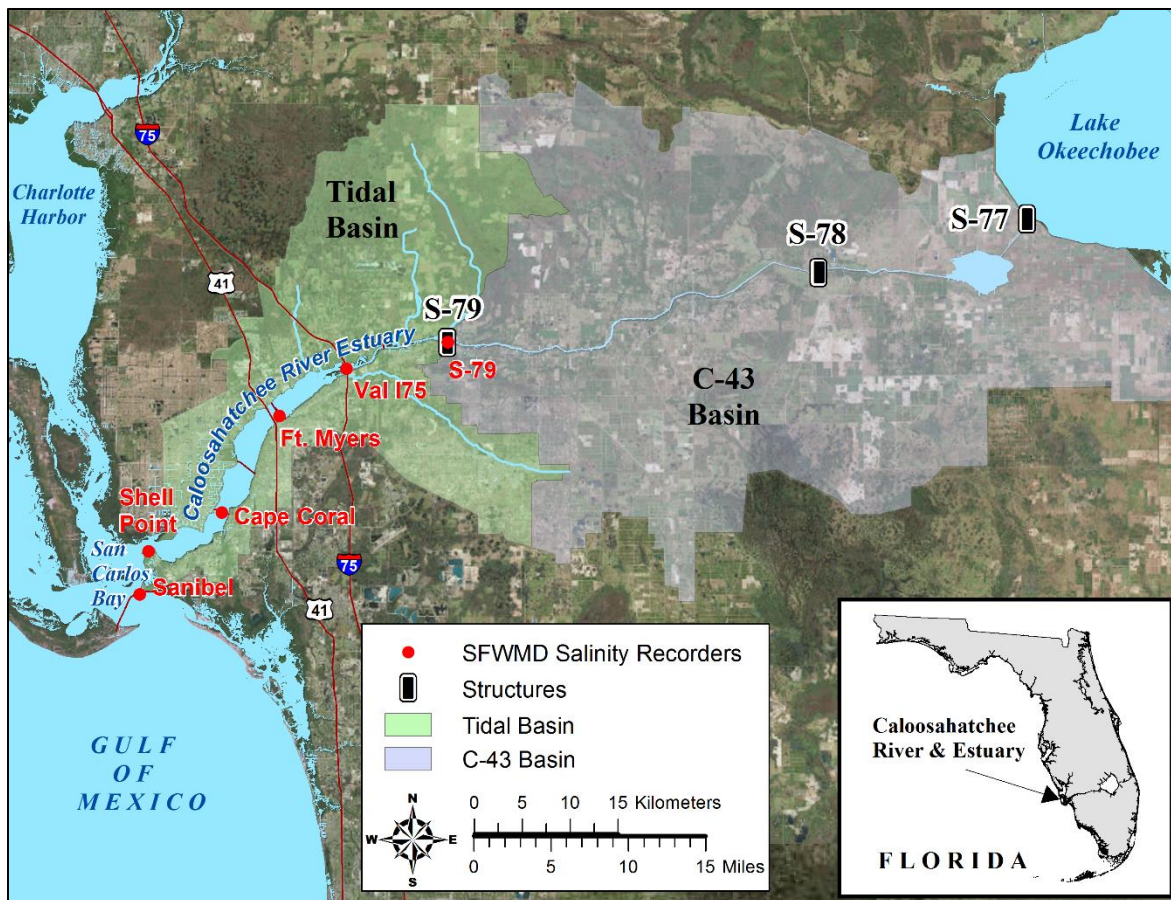


Figure 5. Basins, water control structures, and salinity monitoring for the Caloosahatchee Estuary.

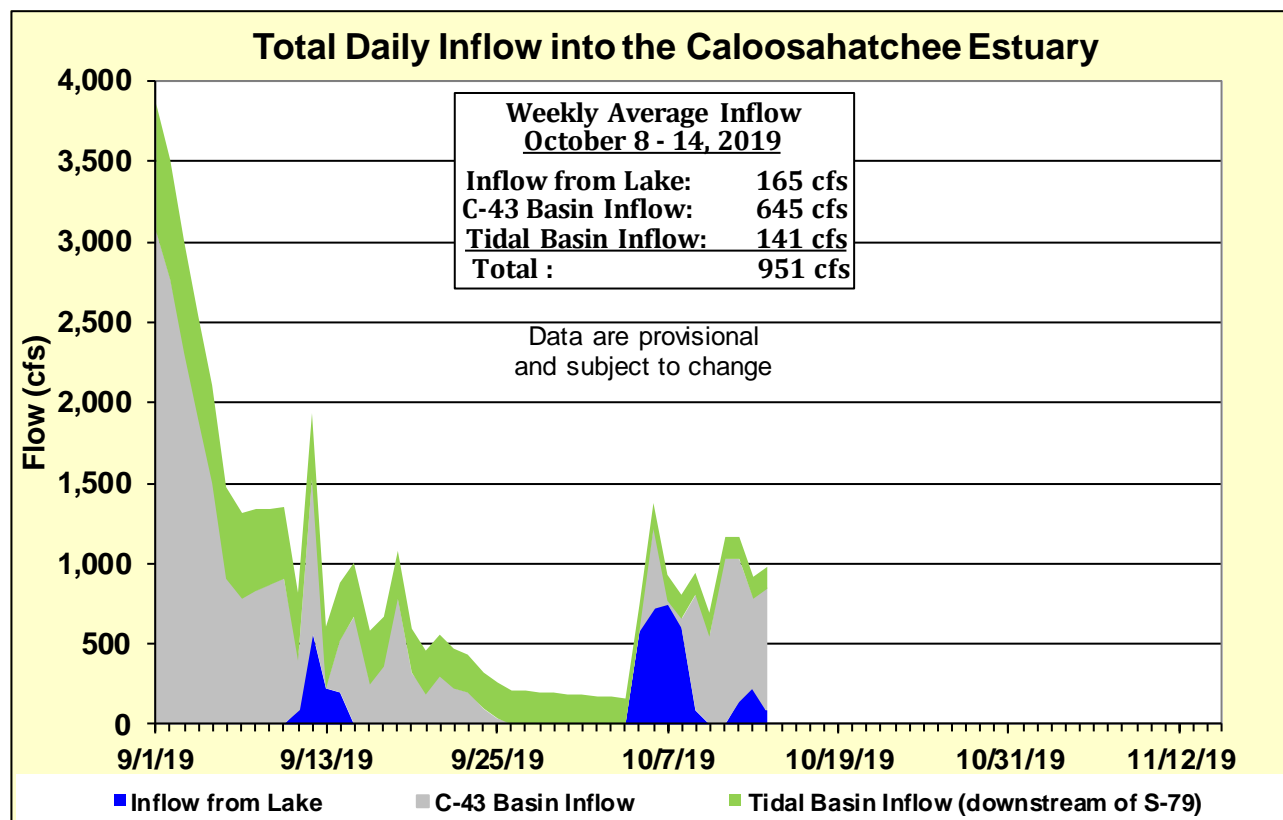


Figure 6. Total daily inflows from Lake Okeechobee, runoff from the C-43 basin, and tributaries in the tidal basin into the Caloosahatchee River Estuary.

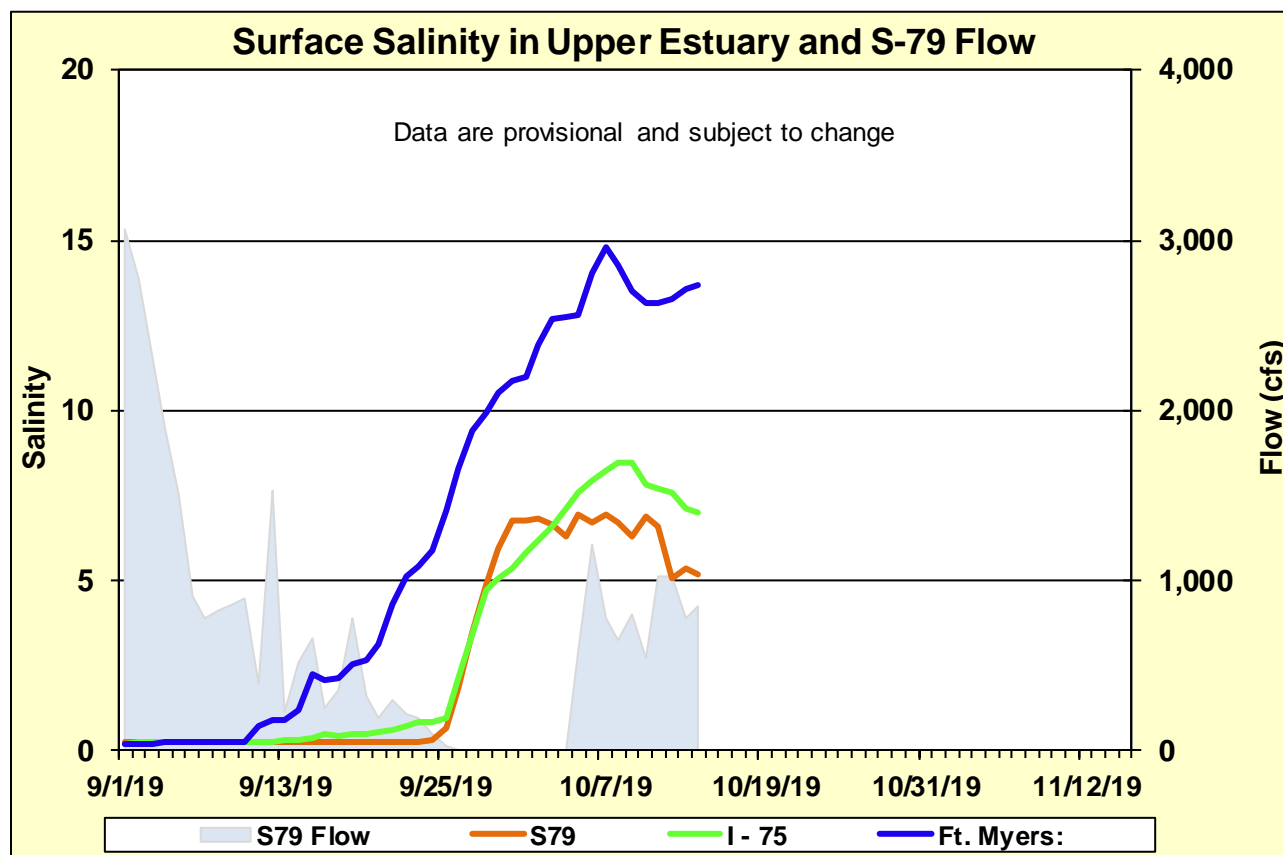


Figure 7. Daily mean flows at S-79 and salinity at upper estuary monitoring stations.

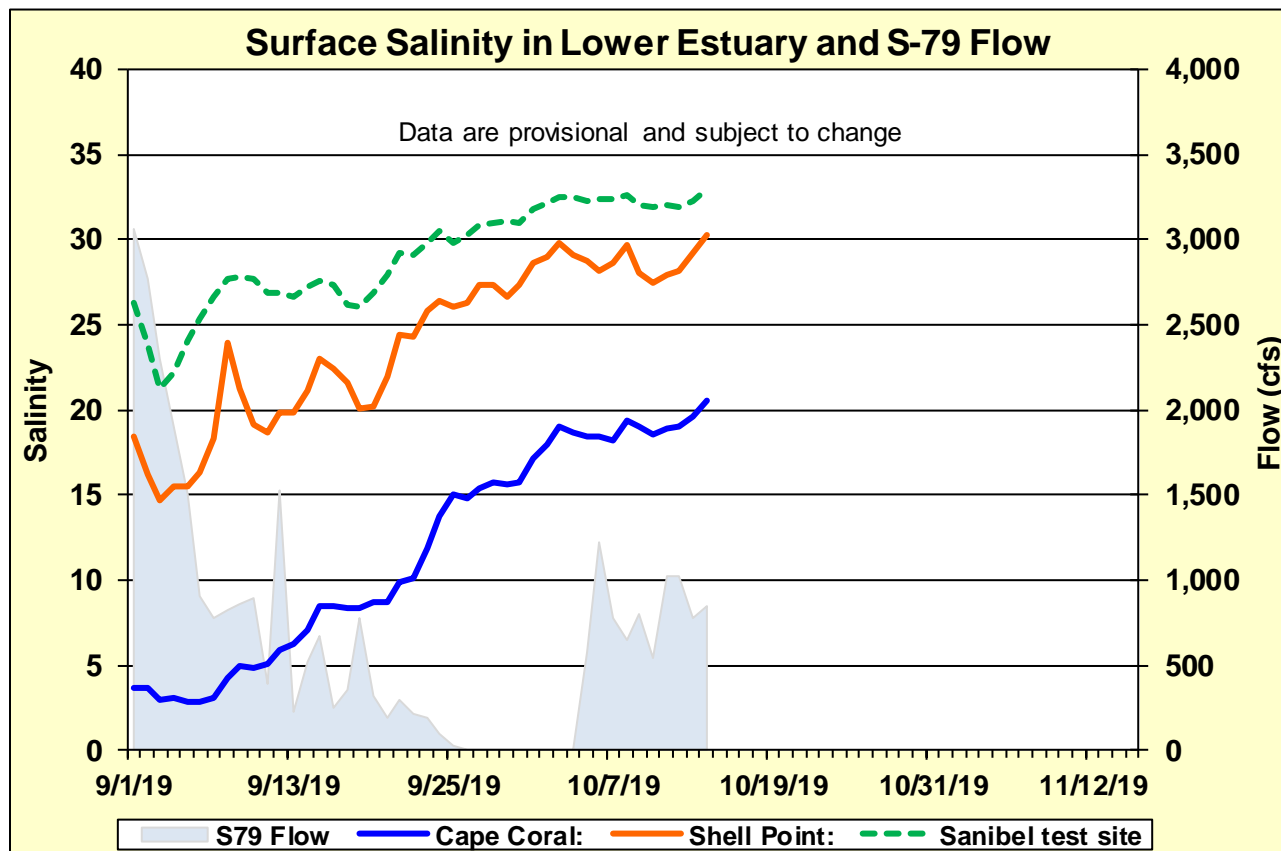


Figure 8. Daily mean flows at S-79 and salinity at lower estuary stations.

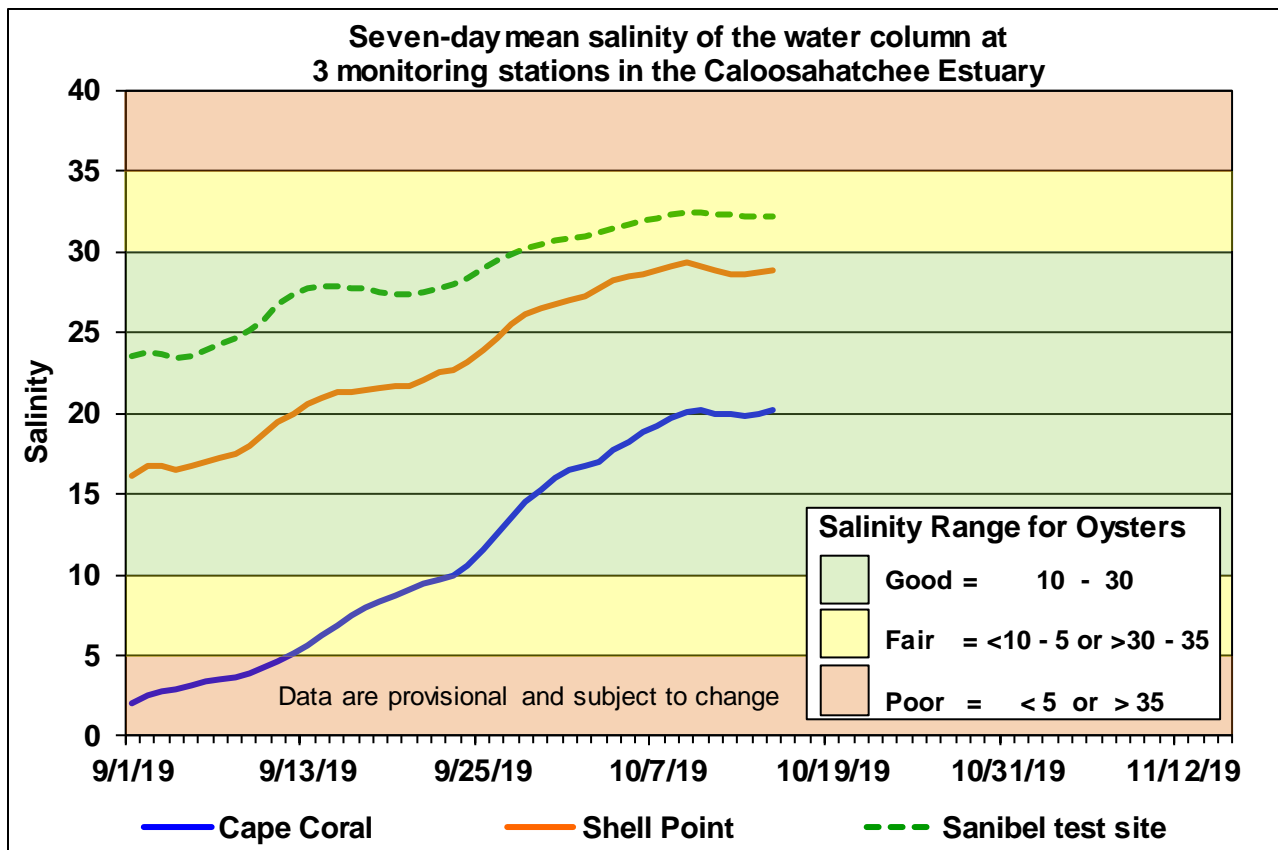


Figure 9. Seven-day mean salinity at Cape Coral, Shell Point, and Sanibel monitoring stations.

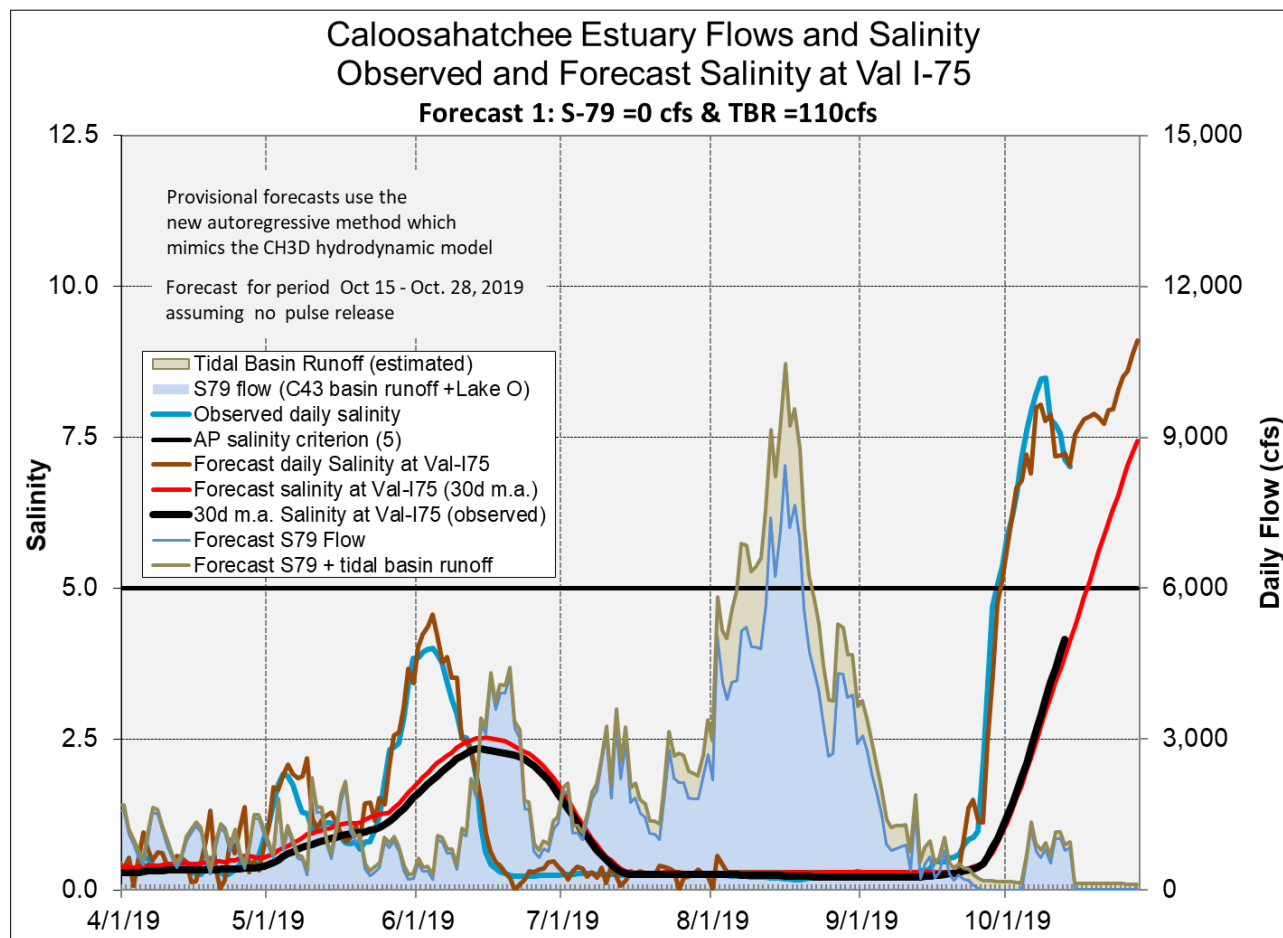
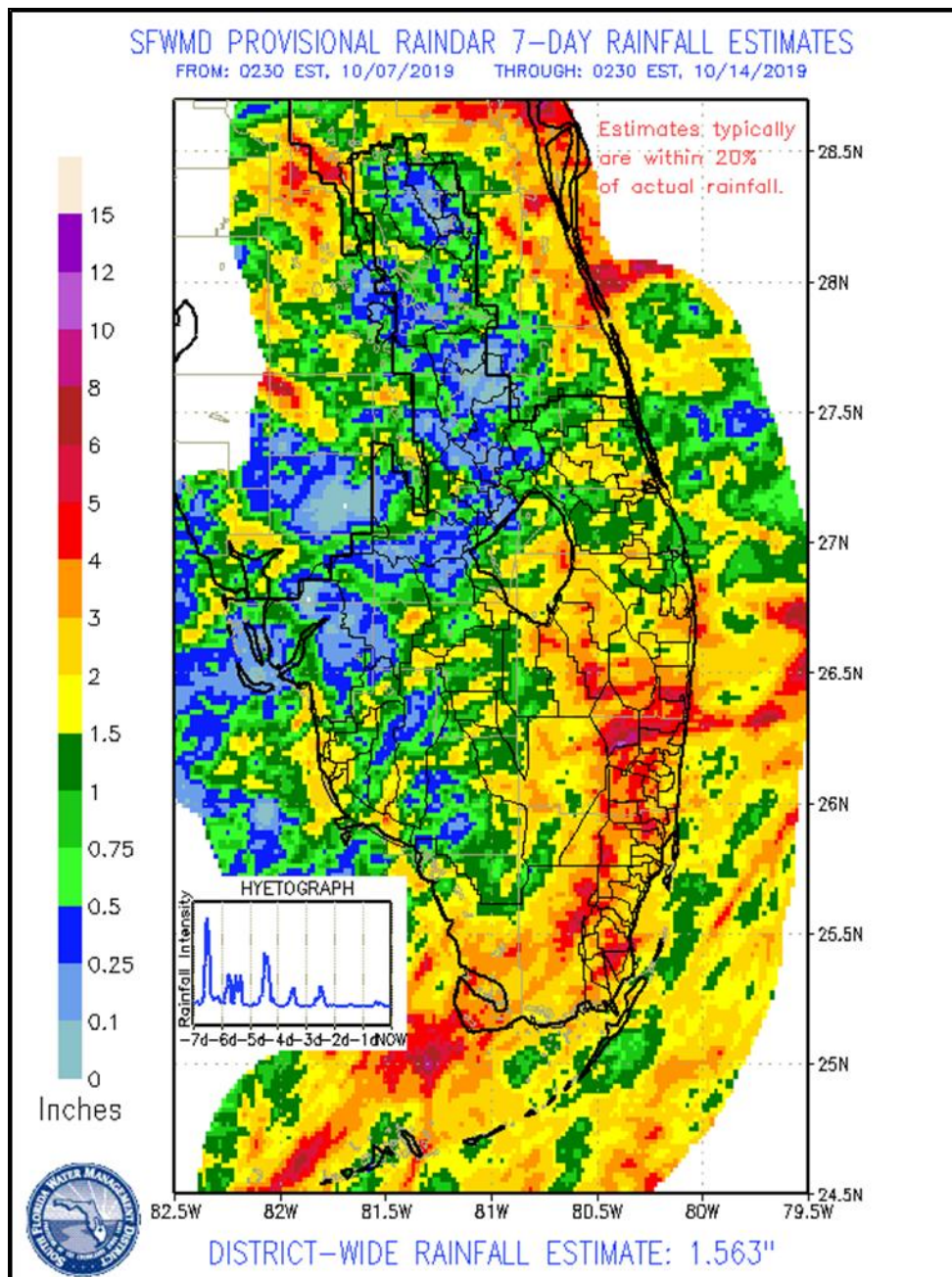


Figure 10. Forecasted Val I-75 surface salinity assuming no pulse release at S-79.

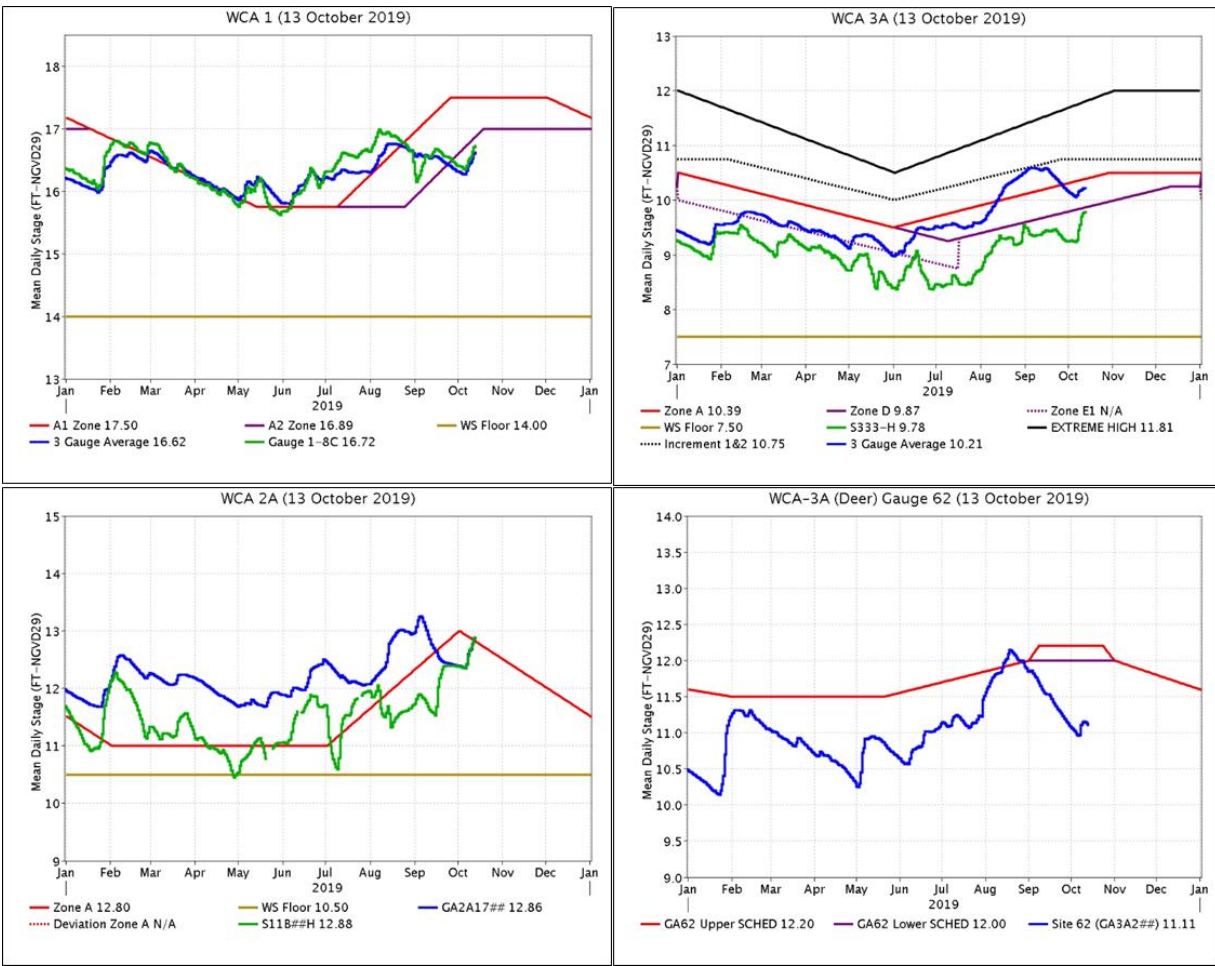
EVERGLADES

WCA-2 received the most rainfall of the WCAs last week, and the highest weekly amount for any basin since May. The average stage change for the gauges monitored in this report increased by 0.26 feet last week. Pan evaporation was estimated at 1.40 inches and the Rainfall Plan calls for a release of 1738 cfs from WCA-3A (a 500 cfs increase from last week).

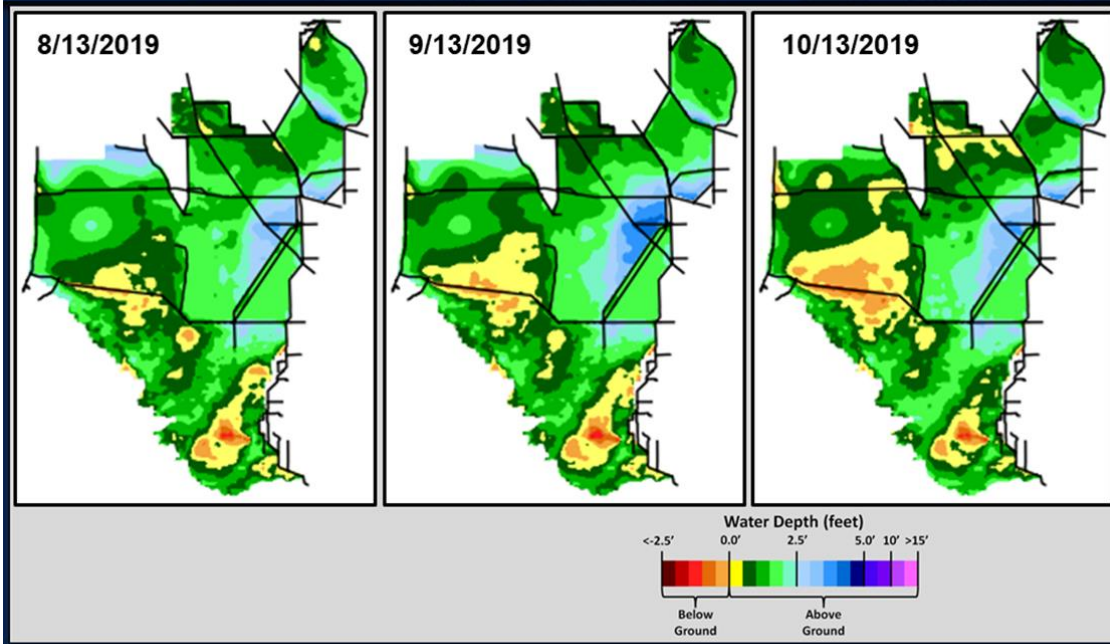
Everglades Region	Rainfall (Inches)	Stage Change (feet)
WCA-1	3.13	+0.38
WCA-2A	4.86	+0.52
WCA-2B	4.51	+0.27
WCA-3A	2.18	+0.17
WCA-3B	2.94	+0.24
ENP	2.77	+0.00



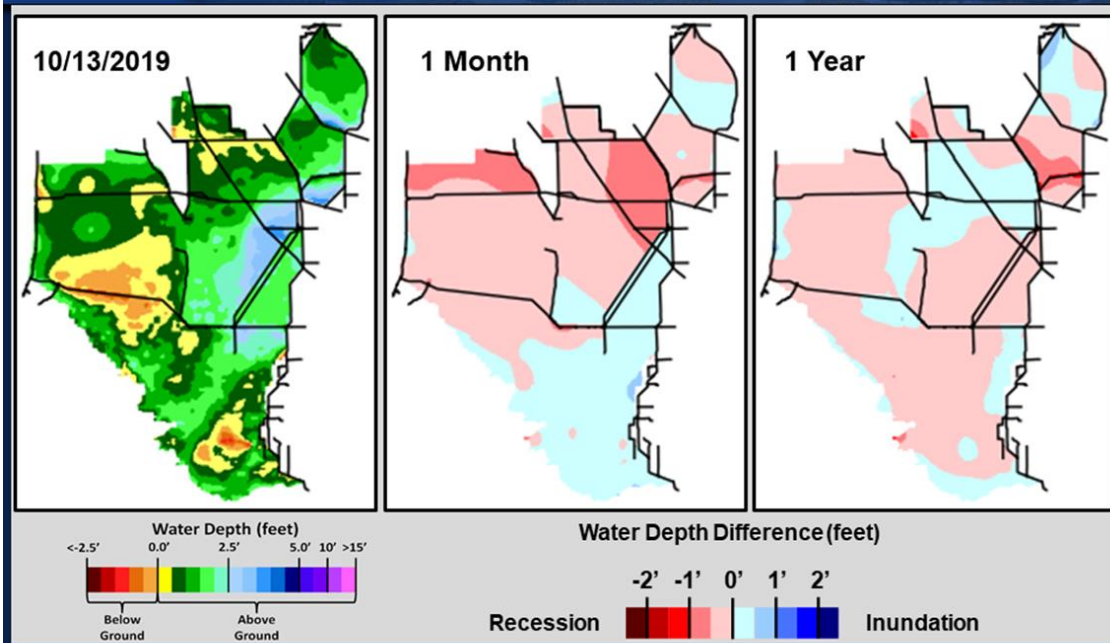
Regulation Schedules: WCA-1: The three-gauge average is below but climbing quickly to the Zone A2 line, currently at 0.27 feet below. WCA-2A: Gauge 2A-17 is 0.06 feet above the Zone A regulation line rising sharply over the last week. WCA-3A: The three-gauge average stage rose towards the climbing Zone A regulation line, currently 0.18 feet below that line. WCA-3A at gauge 62 (northwest corner) made a slight uptick last week but remains well below the lower schedule, currently 1.09 feet below.



Water Depths and Changes: The WDAT tool for spatial interpolation of depth monthly snapshots indicate that despite near average rainfall for the last week potential remains for depths at ground surface along the northern stretches of the Miami and L3-L4 Canal in WCA-3A North; but in the small regions in the extreme north of WCA-1 and 2 have risen to 0.5 to 1.0 foot in depth. The spatial extent of the deepest ponding along the L-67 canal in WCA-3A has diminished. Hydrologic connectivity has diminished, most dramatically in Lostman's but remains through the major sloughs of Everglades National Park. WDAT difference maps indicate that in general conditions are significantly shallower in stage within the north eastern portion of WCA-3A compared to a month ago. Compared to one year ago, stages are up to 1.5 feet higher in extreme northern WCA-1, and up to 1.0 foot lower in southern WCA-2A.

**SFWDAT Water Depth Monthly Snapshots**

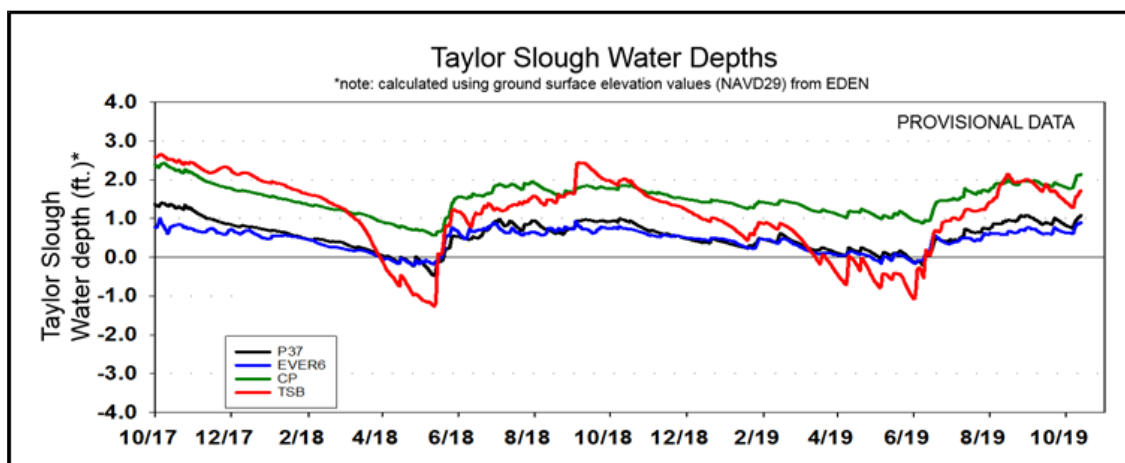
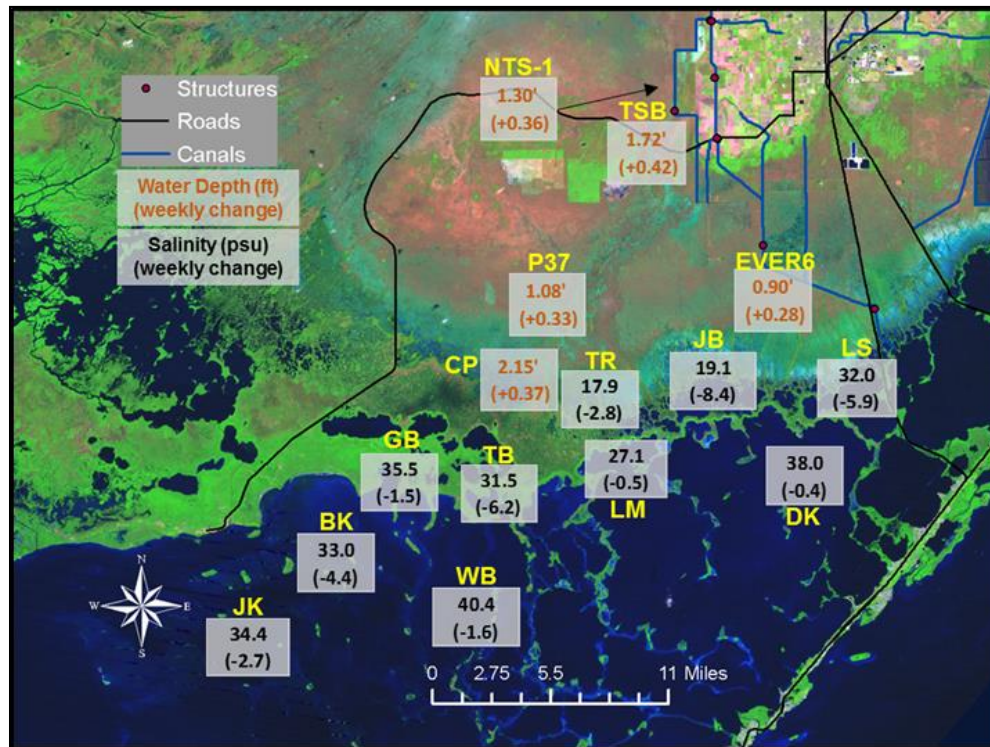
South Florida Water Depth Assessment Tool (SFWDAT)

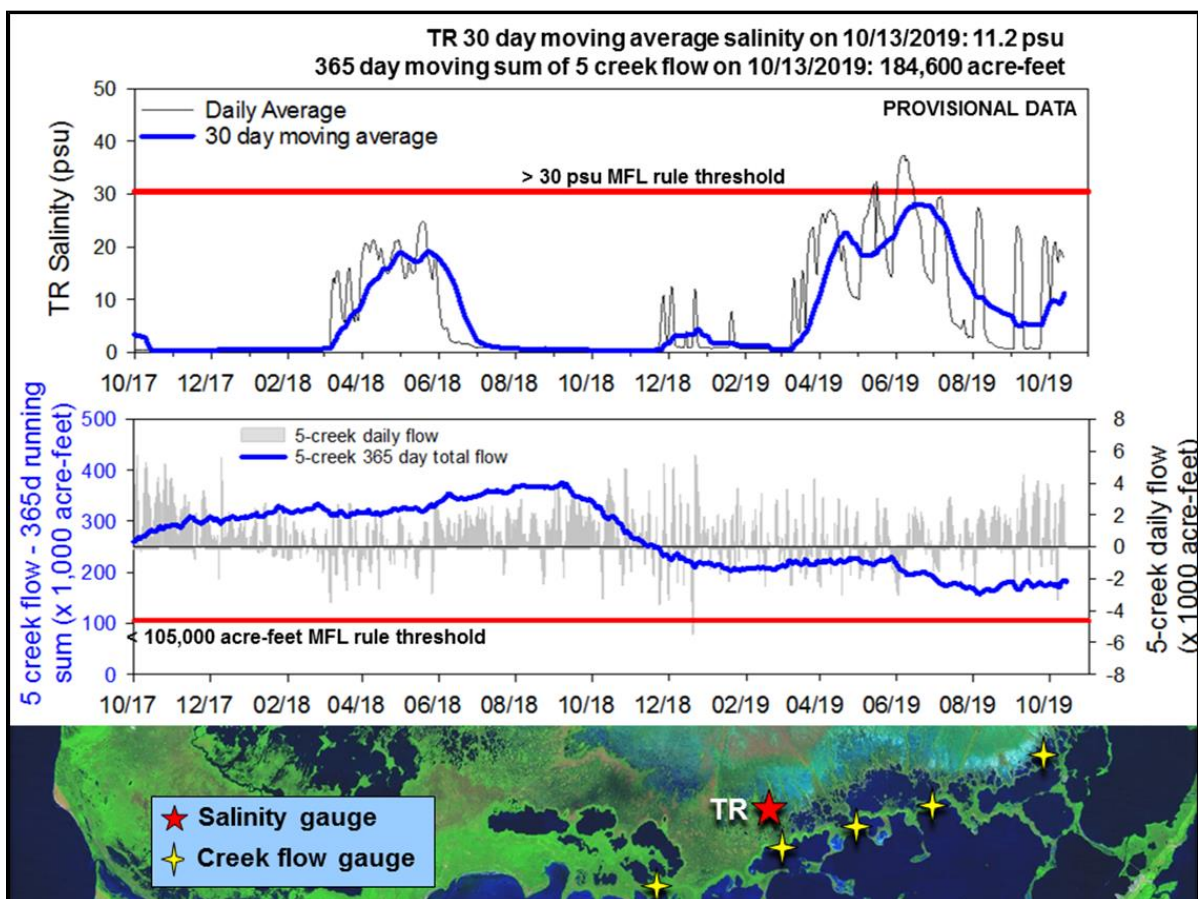
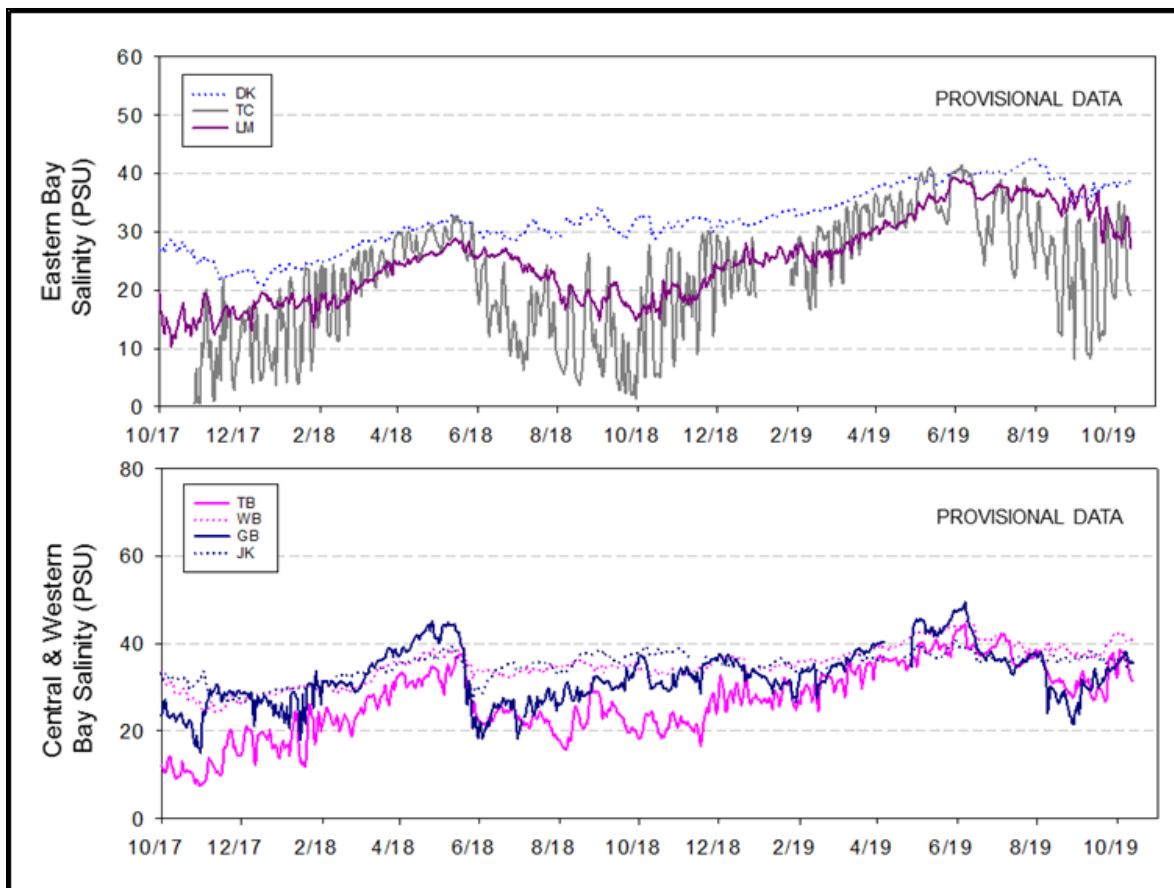
**SFWDAT Everglades Difference Maps
(Present – Past)**

South Florida Water Depth Assessment Tool (SFWDAT)

Taylor Slough Water Levels: An average of 3.36 inches of rain fell over Taylor Slough and Florida Bay this past week causing stages to increase throughout the area. Stage changes ranged +0.28 feet to +0.42 feet. Stages now average 3 inches above the historical averages for this time of year as opposed to the 2 inches below average from last week.

Florida Bay Salinities: Average salinity in Florida Bay was 32 psu, 4 psu lower than last week due to the rainfall. The average for the northern shoreline decreased 3 psu to end at 31 psu. Conditions are 8 psu above average for this time of year. Additional rain will help to improve the salinity condition, but we are still positioned much higher than what is desirable for the start of the dry season.





Florida Bay MFL: Salinity at the TR station in the mangrove zone (tracked for the Florida Bay MFL) remained above 17 psu for the past week and ended Sunday at 18 psu. The 30-day moving average also increased 1.5 psu to end at 11.2 psu. Weekly flow from the 5 creeks identified by yellow stars on the map totaled about 8,600 acre-feet this past week which is about 65% of the historical average for this time of year. The 365-day moving sum of flow from the five creeks (tracked as part of the Florida Bay MFL criteria) increased roughly 11,000 acre-feet to 184,600 acre-feet and continues to hover under the 25th percentile (190,165 acre-feet). Creek flow are provisional USGS data.

Water Management Recommendations

As we begin the climatological dry season the ecology of the Everglades is eliciting concern, as current stages in the WCAs are low for this time of year and salinities are high in Florida Bay. Deeper water during the wet season allows the prey base to build to optimal densities prior to the dry season and wading bird nesting season. Deeper early dry season depths also mean that the seasonal drawdown that concentrates prey for easier foraging can extend throughout the nesting season. WCA-3A North has a high potential for good wading bird foraging this year as a fire in that basin, near the Alley North colony, may have opened the sloughs making it easier for wading birds to forage for prey in that critical region but it is drying down early and rapidly. As WCA-2A is above schedule and WCA-3A North is dry, it may be an appropriate time to route water from 2A to 3A through the s7-s150 route that was utilized in the past. Overall conserving water within the WCAs and moving low nutrient water south has water has many 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. A potential indicator of stress in the Taylor Slough mangrove zone is the minimum that the 30-day moving average salinity reaches during the peak of the wet season; compared to salinities of one and two years ago current conditions are elevated. More specific recommendations appear in the summary table below. The red text represents new or modified information or recommendations.

SFWMD Everglades Ecological Recommendations, October 15th, 2019 (red is new)

Area	Weekly change	Recommendation	Reasons
WCA-1	Stage increased by 0.38'	Conserving water in this basin has ecological benefit as we near the seasonal peak for water depths. Moderating any stage change this week to less than + or - 0.25' this week would have ecological benefit by protecting apple snail reproduction.	Protect tree islands, upstream/downstream habitat and wildlife.
WCA-2A	Stage increased by 0.52'	Conserving water in this basin has ecological benefit as we near the seasonal peak for water depths. Moderating any stage change this week to less than + or - 0.25' this week would have ecological benefit by protecting apple snail reproduction.	Protect tree islands, upstream/downstream habitat and wildlife.
WCA-2B	Stage increased by 0.27'	Conserving water in this basin has ecological benefit as we near the seasonal peak for water depths.	Protect tree islands, upstream/downstream habitat and wildlife.
WCA-3A NE	Stage increased by 0.11'	Conserving water in this basin has ecological benefit as we near the seasonal peak for water depths.	Protect tree islands, upstream/downstream habitat and wildlife.
WCA-3A NW	Stage increased by 0.16'	Conserving water in this basin has ecological benefit as we near the seasonal peak for water depths.	
Central WCA-3A S	Stage increased by 0.09'	Conserving water in this basin has ecological benefit as we near the seasonal peak for water depths.	Protect tree islands, upstream/downstream habitat and wildlife.
Southern WCA-3A S	Stage increased by 0.30'		
WCA-3B	Stage increased by 0.24'	Conserving water in this basin has ecological benefit as we near the seasonal peak for water depths.	Protect tree islands, upstream/downstream habitat and wildlife.
ENP-SRS	Stage remained unchanged	Make discharges to the Park according to the 2012 WCP rainfall plan.	Protect upstream/downstream habitat and wildlife.
Taylor Slough	Stage changes ranged from +0.28 to +0.42'	Move water southward as possible	When available, provide freshwater buffer for downstream conditions.
FB- Salinity	Salinity changes ranged -0.4 to -8.4 psu.	Move water southward as possible	When available, provide freshwater to maintain low salinity buffer and promote water movement.