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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: November 6, 2019

SUBJECT: Weekly Environmental Conditions for Systems Operations

Summary

Weather Conditions and Forecast

A weakening cold front located just north of the District this morning is forecast to move little today. South of the frontal boundary enhanced low-level moisture and instability should help to trigger widely scattered or scattered showers this morning over the Atlantic waters that are expected to move inland over the eastern half of the District from the middle east coast northward. By this afternoon these favorable environmental factors and surface heating should combine to produce a widely scattered or scattered coverage of showers and thunderstorms in a stripe from the southwestern interior/agricultural areas through the upper east coast... The weak front should remain in place or settle slightly southward on Wednesday as a weak jet stream impulse streaks across the eastern United States. A quick-moving cold front is forecast to plunge southward from the eastern United from Thursday into Friday, with the front sweeping through the northwestern half of the District late on Friday and the remainder of the area by Saturday morning. A burst of fast-moving rains should precede the front and produce an increase of total District rainfall, with the best signal for an increase of rains over the north and then over the east. Breezy conditions and cooler temperatures are expected behind the front on Saturday, with the threat of some post-frontal east coast shower activity through the weekend and early next week. A second, stronger front with little associated rainfall should sweep through the District by Tuesday morning, ushering in the coolest weather this fall season. There is a good signal later in week 2 (11/13-19) of above normal rainfall developing across Florida, but it is too early to have much confidence in predictions of how much rain to expect.

Kissimmee

Tuesday morning stages were 55.9 feet NGVD (2.1 feet below schedule) in East Lake Toho, 55.0 feet NGVD (at schedule) in Toho, and 50.3 feet NGVD (2.2 feet below schedule) in Kissimmee-Cypress-Hatchineha; headwater stages were 46.4 feet NGVD at S-65A and 25.8 feet NGVD at S-65D. Tuesday morning discharges were 344 cfs at S-65, 281 cfs at S-65A, 343 cfs at S-65D and 146 cfs at S-65E. Dissolved oxygen concentration in the Kissimmee River averaged 6.9 mg/L for the week through Sunday. Kissimmee River mean floodplain depth on Sunday was 0.19 feet. Recommendations: 11/5/2019- Continue 250 cfs discharge at S65-A to maintain minimum flow to the Kissimmee River.

Lake Okeechobee

Lake Okeechobee stage was 13.37 feet NGVD on November 04, 2019, down 0.12 feet from the previous week and 0.06 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. After spending about 215 days below the ecological envelope (which varies seasonally from 12.5 – 15.5 feet NGVD +/- 0.5 feet) the lake moved back into it at the start of August. After 70 days within the envelope, the lake has now been below it again for about 3 weeks, currently 0.78 feet below 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 feet NGVD have now been dry for over a year. The latest estimate of cyanobacteria bloom potential (November 4, 2019) shows that bloom potential is low in the western portion of the lake where blooms tend to originate; the rest of the lake was obscured from cloud cover.

Estuaries

Total inflow to the St. Lucie Estuary averaged 688 cfs over the past week with no flow coming from Lake Okeechobee. Salinities are stable (little changed) in the estuary. Salinity at the US1 Bridge is in the good range for adult eastern oysters.

Total inflow to the Caloosahatchee Estuary averaged 620 cfs over the past week with 350 cfs coming from the Lake. Salinity increased in the upper estuary over the past week. Salinities are in the good range at Val I-75 for tape grass and in the fair range at Ft. Myers. Salinities are in the good range for adult eastern oysters at Cape Coral and Shell Point and in the fair range at Sanibel.

Lake stage is in the Base Flow sub-band of 2008 LORS. Tributary hydrological conditions are normal. 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. 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, no 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 65,000 acre-feet. The total amount of inflows to the STAs in WY2020 is approximately 785,000 acre-feet. Most 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, and STA-1E Western Flow-way is offline for West Distribution Cell levee repairs and 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-5/6 Flow-way 1 to facilitate the Restoration Strategies grading project in Flow-way 2, and in STA-1E Central Flow-way, STA-2 Flow-way 3, and STA-2 Flow-way 4 for vegetation management activities. This week, if 2008 LORS recommends Lake releases to the WCAs and the conditions allow, releases will be sent to A-1 FEB/STA-3/4.

Everglades

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, distributing it to where depths are low and allowing it to flow south has important ecological benefit. One example of this currently taking place is the routing of water from WCA-2A into NE WCA-3A via the S7 and S150 structures. Generally, rates of stage change should remain below 0.25 feet per week or 0.5 feet per 2 weeks to protect the ecology of the WCA's. However, given that the window for "wet" season precipitation draws to a close, a rate of ascension that exceeds that recommendation where depths are low (WCA-3A North) would be considered ecologically beneficial. Very little rain fell in Taylor Slough and Florida Bay this past week and stages decreased throughout the area. Average salinities fell in FB and the nearshore over the last week, but both remain above average for this time of year. Salinity conditions are in an unsavory position, much higher than desirable for the start of the dry season.

Supporting Information

KISSIMMEE BASIN

Kissimmee Basin Rainfall

The Upper Kissimmee Basin received 0.03 inches of rainfall in the past week and the Lower Basin received 0.05 inches (SFWMD Daily Rainfall Report 11/4/2019).

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: 11/5/2019

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)						
							11/3/19	10/27/19	10/20/19	10/13/19	10/6/19	9/29/19	9/22/19
Lakes Hart and Mary Jane	S-62	0	LKMJ	60.4	R	61.0	-0.6	-0.5	-0.5	-0.5	-0.4	-0.1	-0.1
Lakes Myrtle, Preston, and Joel	S-57	0	S-57	61.4	R	62.0	-0.6	-0.5	-0.6	-0.5	-0.4	-0.1	0.0
Alligator Chain	S-60	0	ALLI	63.0	R	64.0	-1.0	-0.9	-0.8	-0.7	-0.4	-0.2	-0.1
Lake Gentry	S-63	0	LKGT	60.8	R	61.5	-0.7	-0.6	-0.5	-0.5	-0.4	-0.2	-0.1
East Lake Toho	S-59	442	TOHOE	56.0	R	58.0	-2.0	-1.5	-1.1	-1.1	-0.8	-0.6	-0.4
Lake Toho	S-61	569	TOHOW, S-61	55.0	R	55.0	0.0	0.1	-0.4	-0.6	-0.4	-0.2	-0.1
Lakes Kissimmee, Cypress, and Hatchineha	S-65	332	KUB011, LKISSB	50.4	R	52.5	-2.1	-2.1	-1.9	-1.8	-1.5	-1.2	-0.9

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: 11/5/2019

Metric	Location	1-Day Average		Average for the Preceding 7-Days ¹							
		11/3/2019	11/3/19	10/27/19	10/20/19	10/13/19	10/6/19	9/29/19	9/22/19	9/15/19	9/8/19
Discharge (cfs)	S-65	350	332	318	354	408	411	507	1,337	1,443	2,135
Discharge (cfs)	S-65A ²	281	279	263	286	327	327	423	1,248	1,412	2,676
Discharge (cfs)	S-65D ²	342	382	368	379	441	483	1,189	1,780	2,976	5,734
Headwater Stage (feet NGVD)	S-65D ²	25.68	25.74	25.83	25.78	25.81	25.84	26.64	26.78	27.00	27.56
Discharge (cfs)	S-65E ²	340	365	405	367	425	453	1,070	1,766	2,988	5,615
Discharge (cfs)	S-67	0	0	0	0	0	0	0	0	28	17
DO (mg/L) ³	Phases I & II/III river channel	7.4	6.9	6.7	6.6	6.7	7.1	6.0	4.2	2.1	2.2
Mean depth (feet) ⁴	Phase I floodplain	0.19	0.22	0.25	0.20	0.24	0.26	0.45	0.74	1.07	2.18

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)

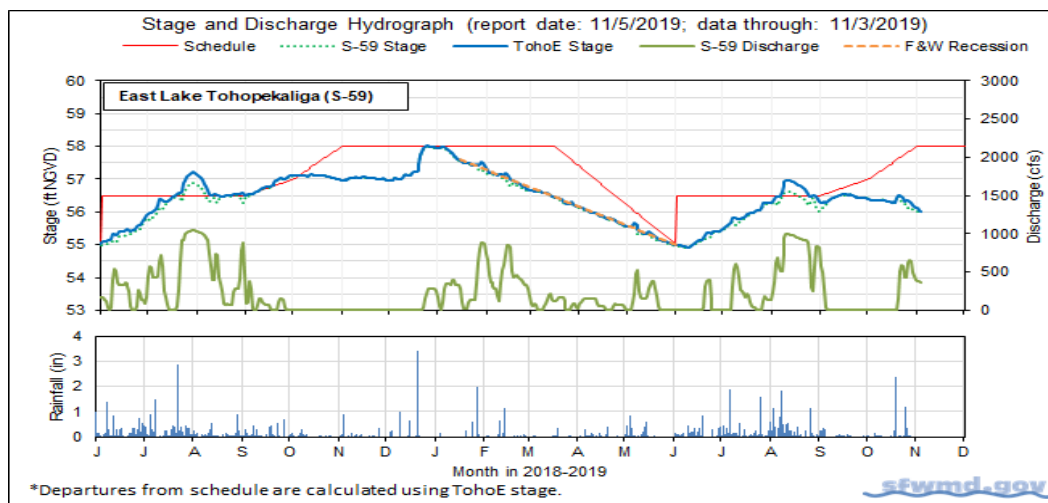


Figure 1.

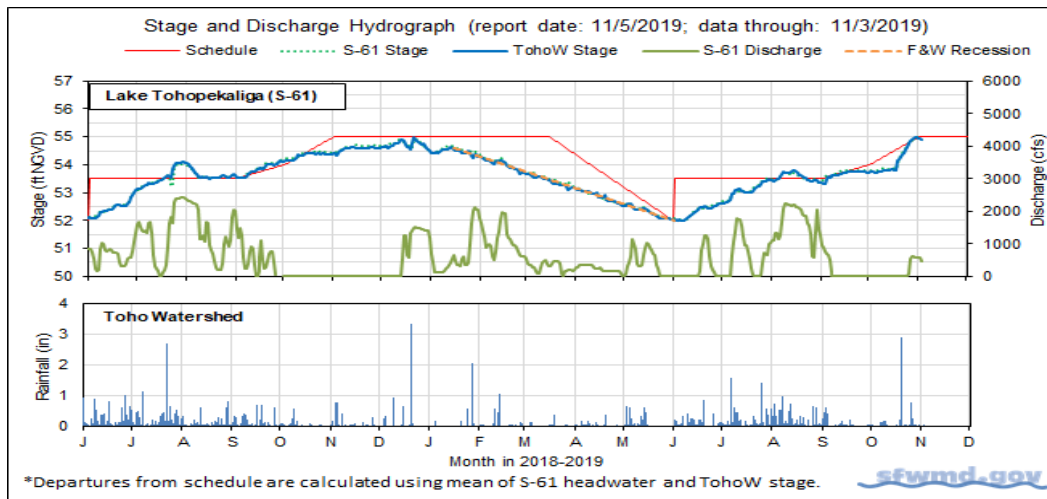


Figure 2.

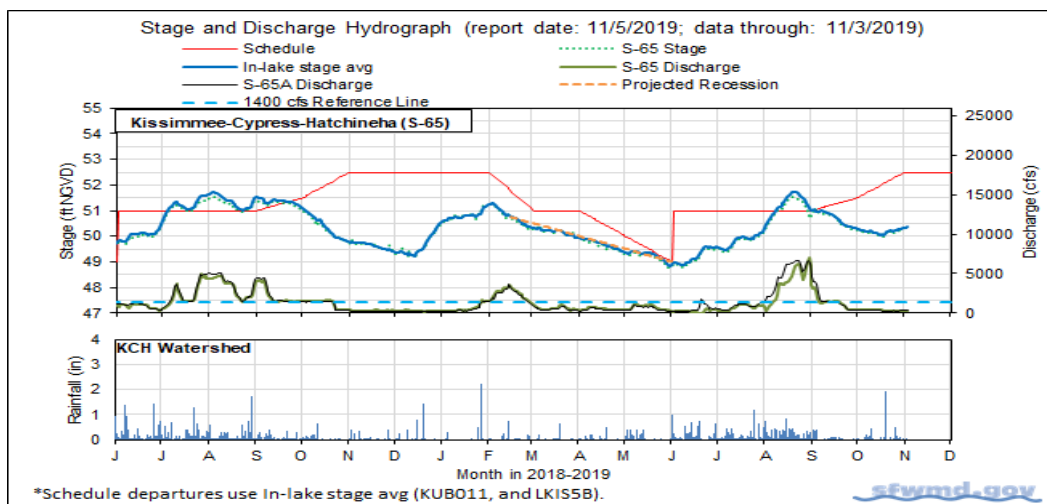


Figure 3.

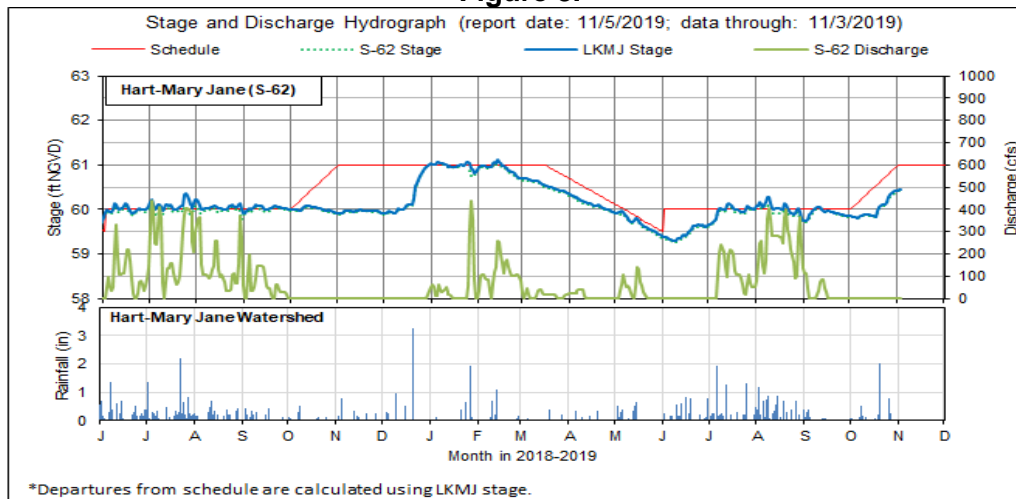


Figure 4.

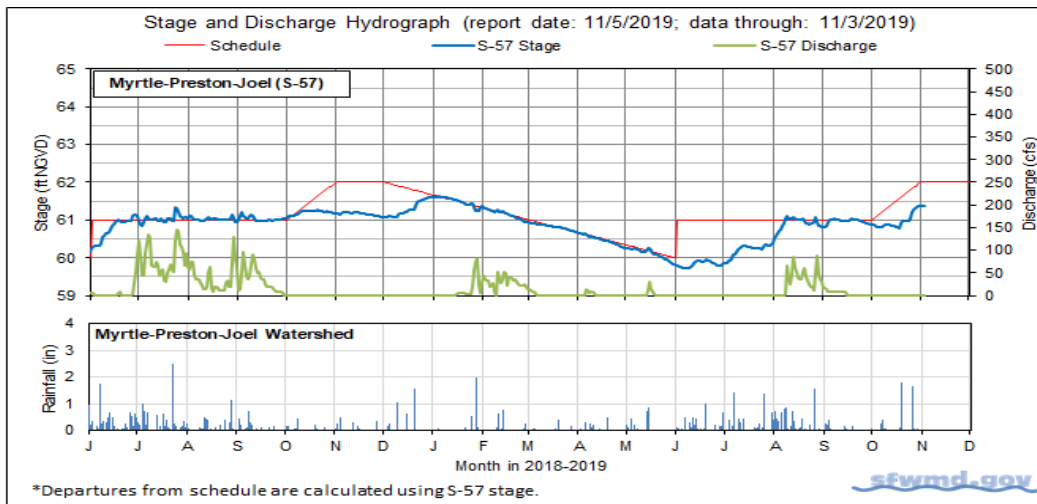


Figure 5.

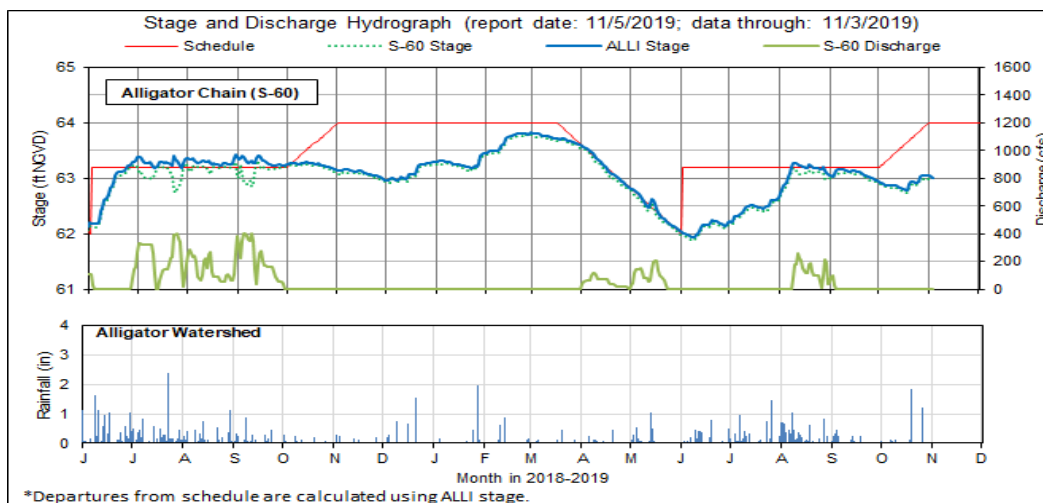


Figure 6.

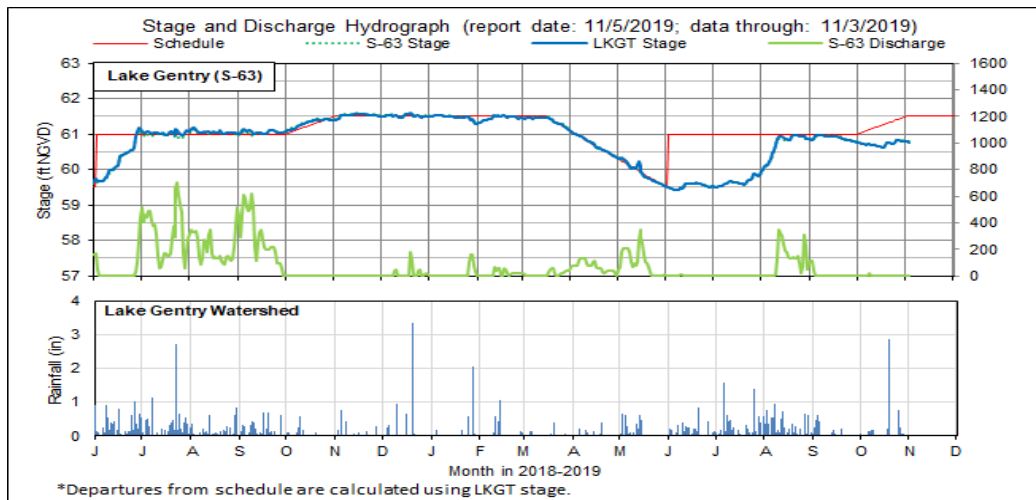


Figure 7.

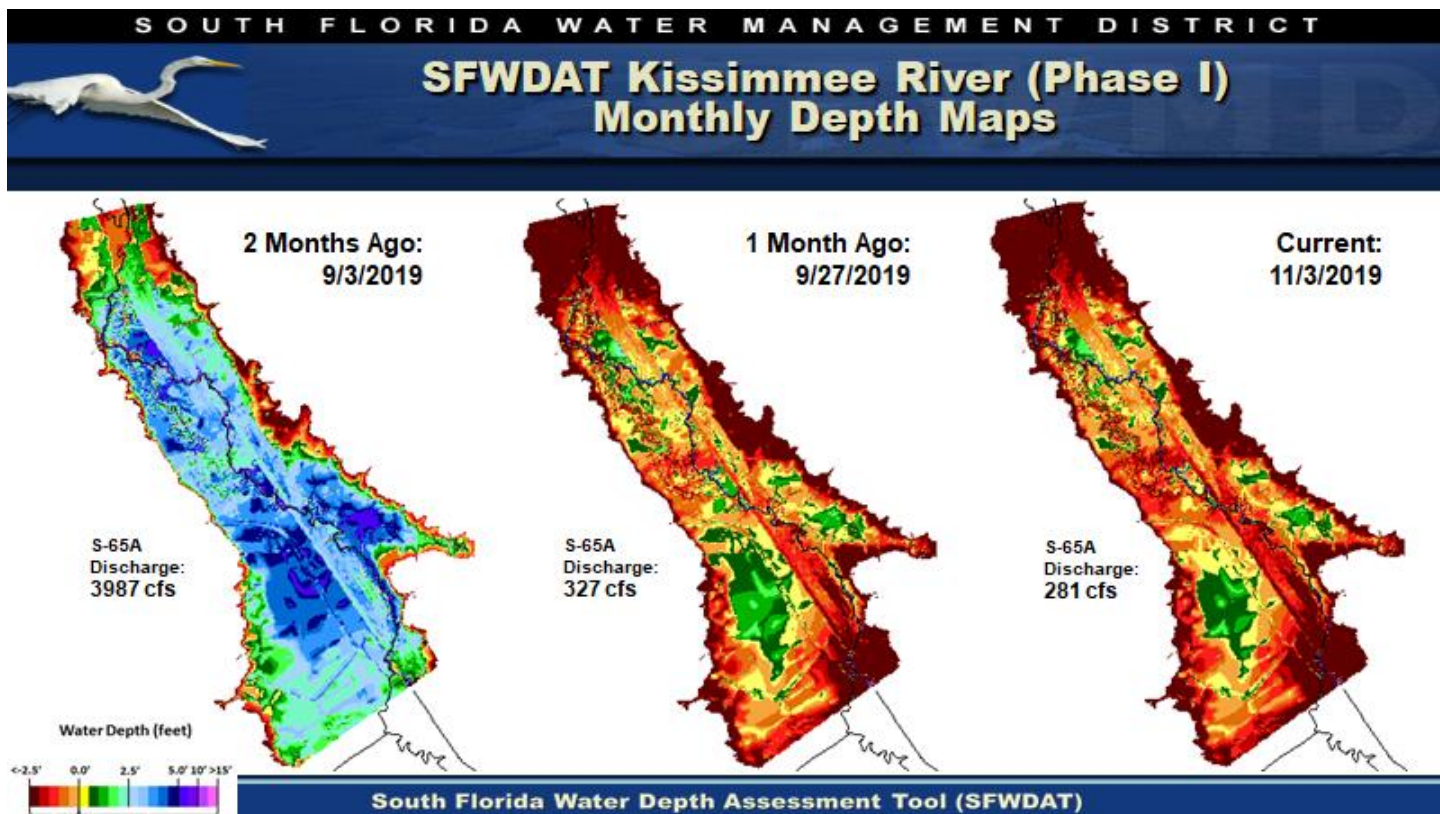


Figure 8. Phase I area floodplain water depths for this week, one month ago, and two months ago. Note that the WDAT color-coding has been modified to accommodate greater water depths; these maps are not directly comparable to Kissimmee Basin WDAT maps published prior to January 16, 2012.

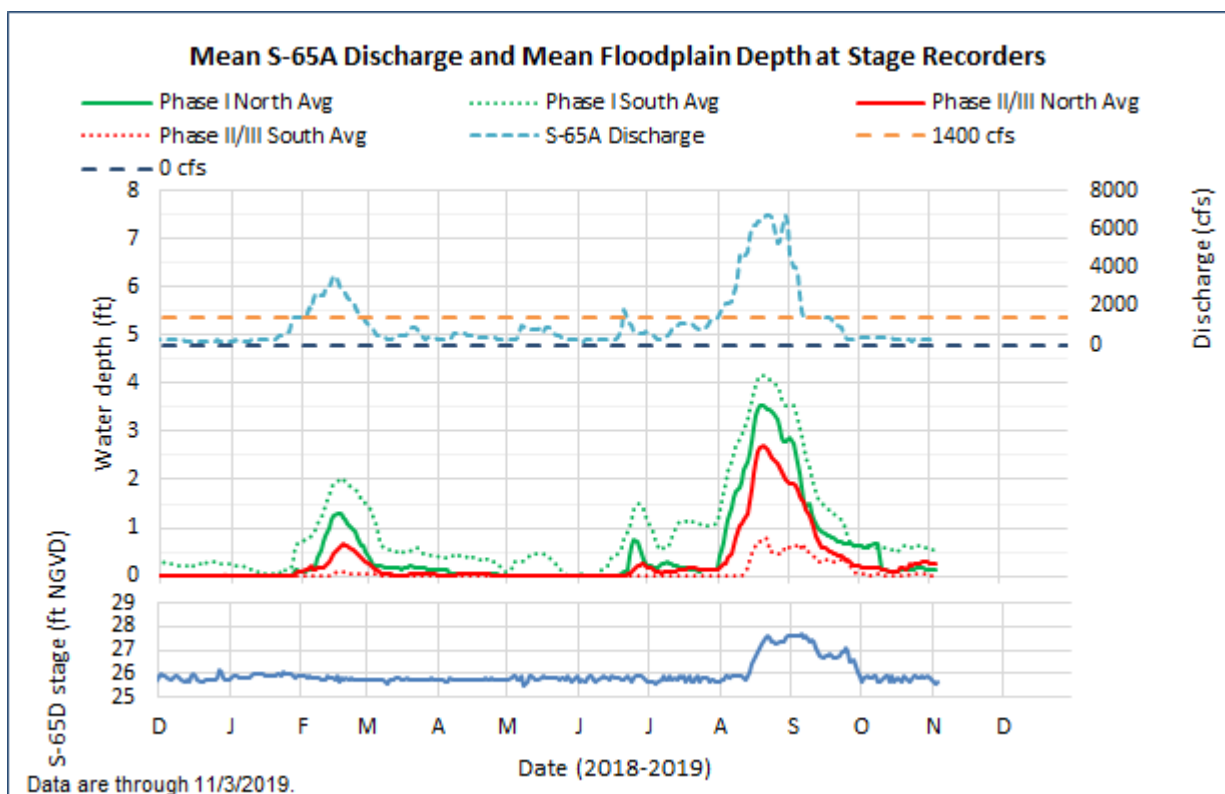
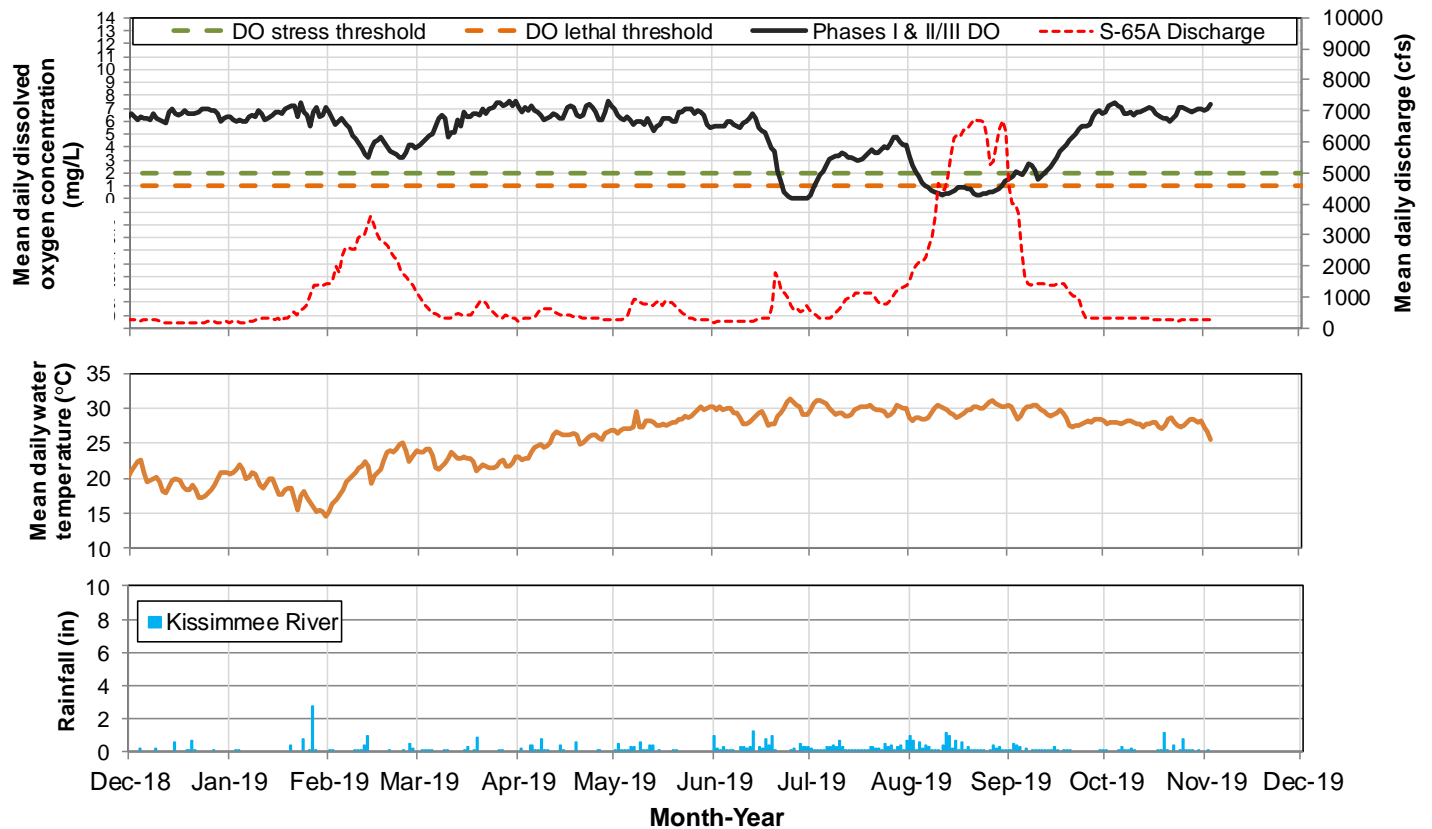


Figure 9. Mean water depth at stage recorders in the northern Phase I, southern Phase I, northern Phase II/III, and southern Phase II/III areas in relation to the S-65A discharge and S-65D headwater stage.



Report Date: 11/5/2019; data are through: 11/3/2019.

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

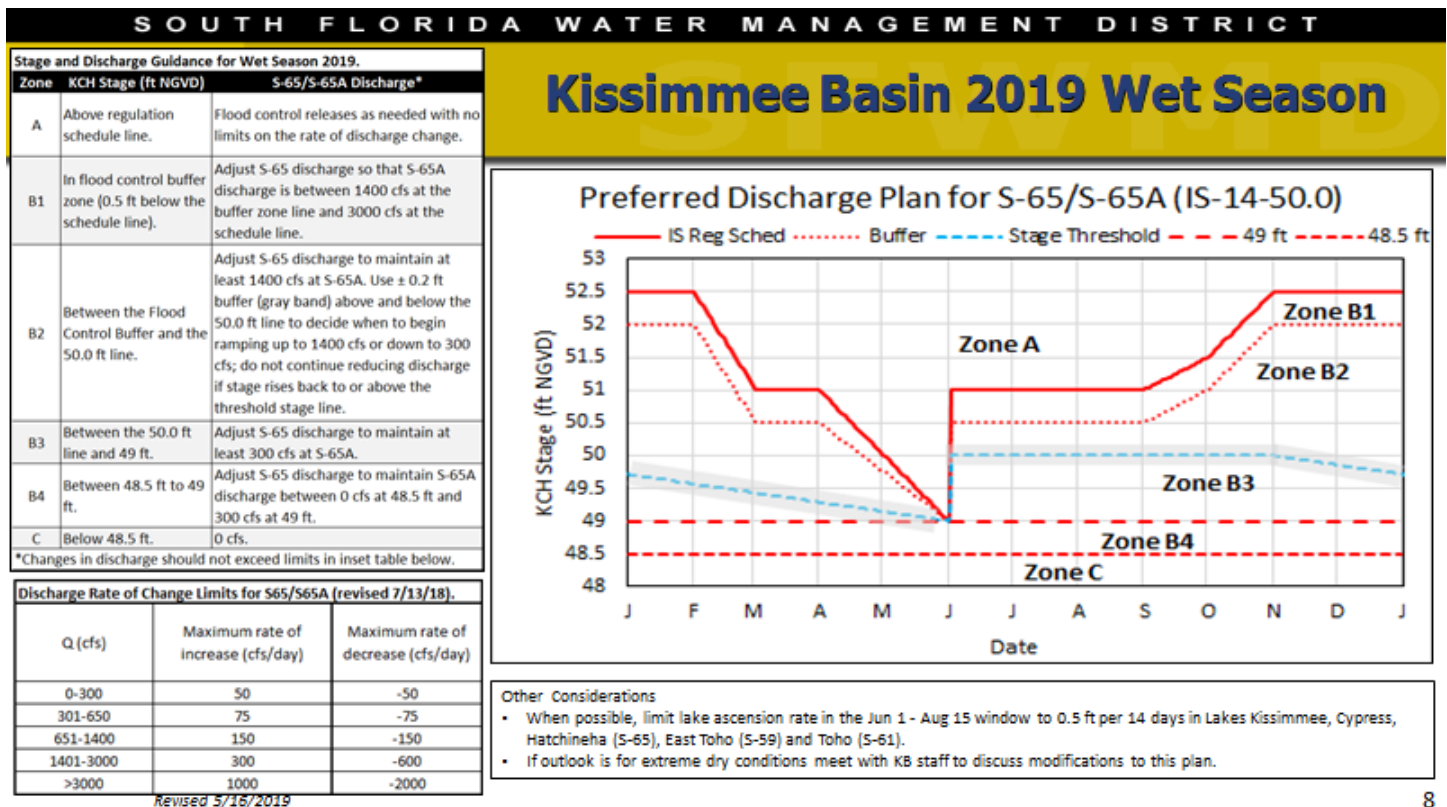


Figure 11. The 2019 Wet Season Discharge Plan for S-65/S-65A.

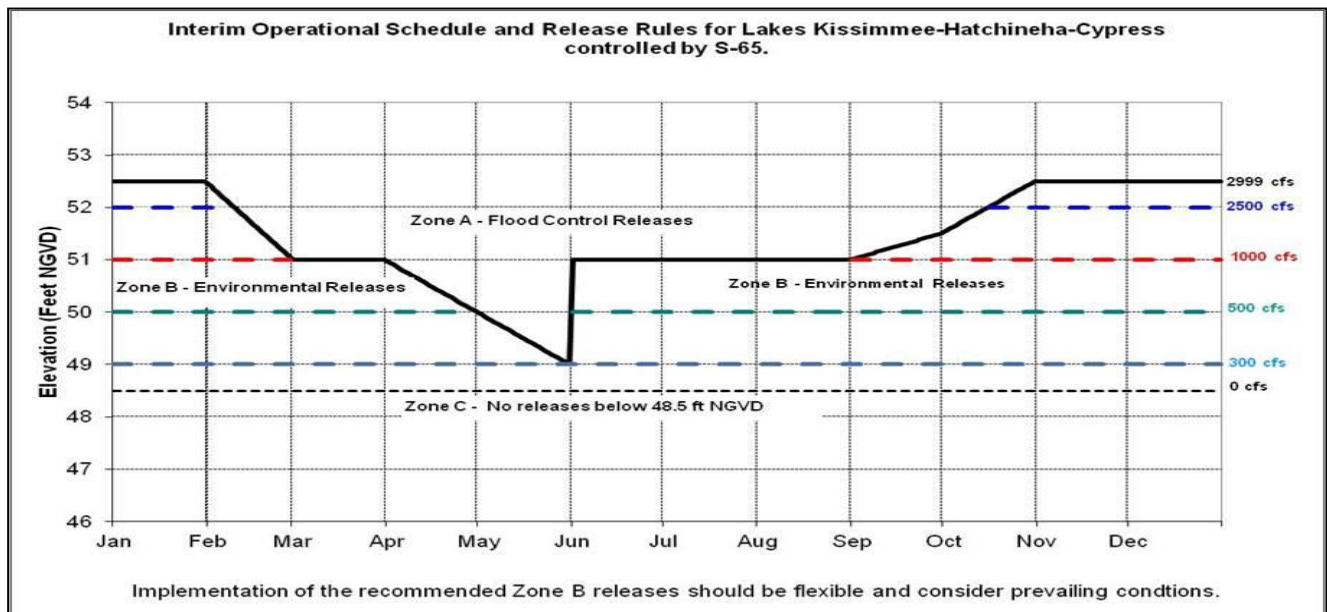


Figure 12. Interim operations schedule for S-65. The discharge schedule shown to the right has not been used in recent years.



Figure 13. The Kissimmee Basin.

LAKE OKEECHOBEE

According to the USACE web site, Lake Okeechobee average daily lake stage was at 13.37 feet NGVD for November 04, 2019 decreasing 0.12 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 0.06 feet lower than a month ago and 0.28 feet lower than a year ago (Figure 1) when stages were below the bottom of the preferred ecological envelope (Figure 2). The Lake is currently 0.78 feet below the preferred ecological envelope. 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). Following a steady decline from the start of September, lake stage has been hovering near 13 ½ feet for the last month (Figure 4). According to RAINDAR, during the week of October 29 to November 04, 2019, 0.11 inches of rain fell directly over the lake, compared to 0.59 inches the previous week. Rainfall across the watershed was similar, with most northern regions receiving less than 0.10 inches (Figure 5).

The average daily inflows (minus rainfall) to the lake decreased slightly, from 512 cfs to 424 cfs. Most of the inflow came from the Kissimmee River (S-65E & S-65EX1) which was nearly the same as the previous week at 377 cfs. No passive backflow from the L-8 Canal at Canal Point (via CLV10A) occurred this week, but S-308 exhibited a net inflow to the lake averaging 44 cfs per day over the week, due to heavy rainfall around the C-44 canal late last week (Table 1).

Outflow (minus evapotranspiration) increased substantially, going from a net inflow of 96 cfs (due to backflow from the S-308 and little other outflows) to a net outflow of 989 cfs. This was primarily due to increases west through the S-77, going from 76 cfs to 732 cfs, while flows south through the S-350 structures went from 0 cfs the previous week to 234 cfs. Flows through the L-8 Canal at Canal Point (via CLV10A) also increased from 18 cfs to 68 cfs. As mentioned above, there was a net inflow to the lake through the S-308 of 44 cfs per day. The corrected average daily evapotranspiration value for the week based on the L006 and LZ40 weather platform solar radiation was lower than the previous week, decreasing from 1.12 inches to 0.81 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 November 4, 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, at least on the western side where cloud cover was minimal (Figure 7).

Water Management Recommendations

Lake Okeechobee stage was 13.37 feet NGVD on November 04, 2019, down 0.12 feet from the previous week and 0.06 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. After spending about 215 days below the ecological envelope (which varies seasonally from 12.5 – 15.5 feet NGVD +/- 0.5 feet) the lake moved back into it at the start of August. After 70 days within the envelope, the lake has now been below it again for about 3 weeks, currently 0.78 ft below 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 over a year. The latest estimate of cyanobacteria bloom potential (November 4, 2019) shows that bloom potential is low in the western portion of the lake where blooms tend to originate; the rest of the lake was obscured from cloud cover.

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	383	377	0.2
S-71 & S-72	30	0	0.0
S-84 & S-84X	39	14	0.0
Fisheating Creek	27	27	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	32	6	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	1357	263	0.1
Total	3094	1884	0.8

OUTFLOWS	Previous week Avg Daily CFS	Avg Daily Flow cfs	Equivalent Depth Week Total (in)
S-77	76	732	0.3
S-308	-190	-44	0.0
S-351	0	128	0.1
S-352	0	25	0.0
S-354	0	81	0.0
L-8 Outflow	18	68	0.0
ET	1671	1877	0.8
Total	1575	2867	1.2

Provisional Data

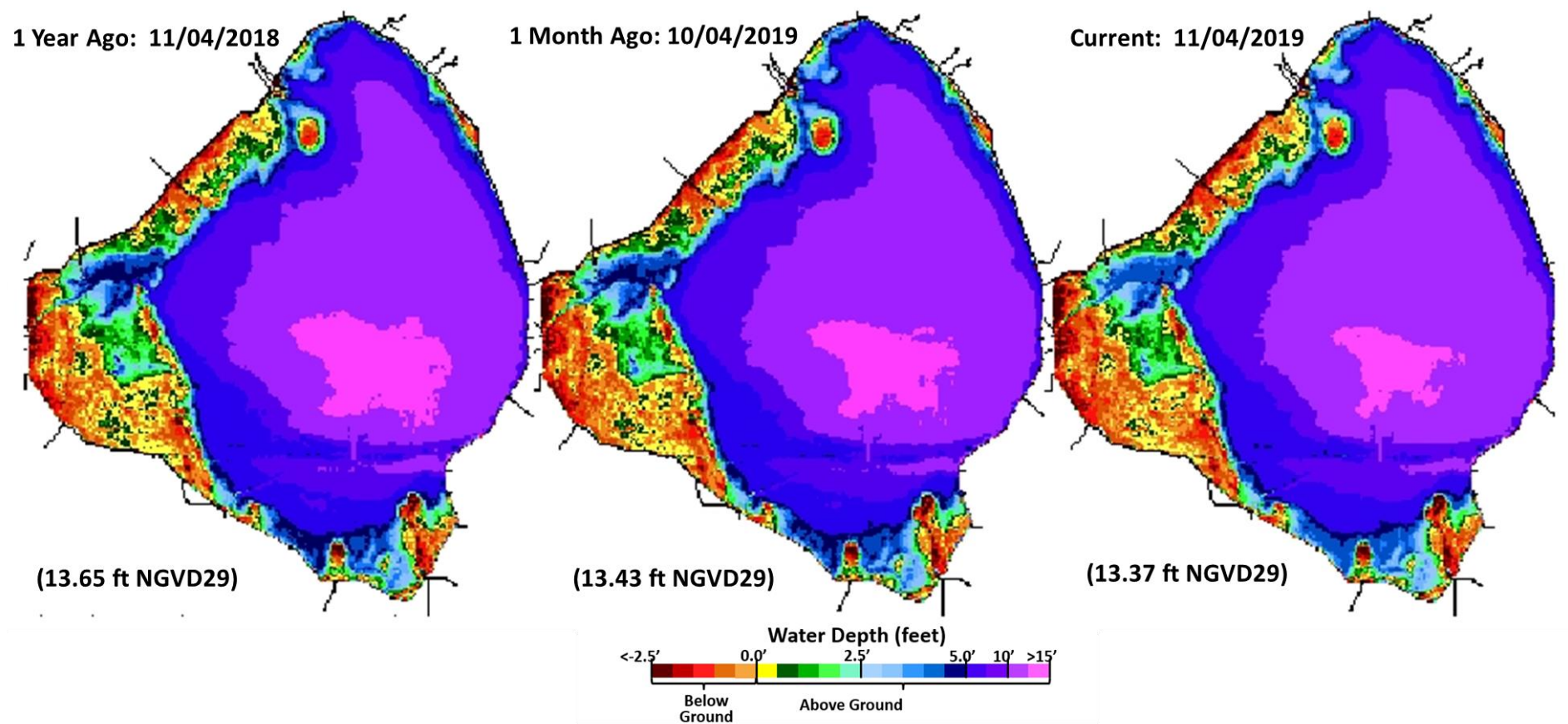


Figure 1. Water depth estimates on Lake Okeechobee based on the South Florida Water Depth Assessment Tool.

Lake Okeechobee Stage vs Ecological Envelope

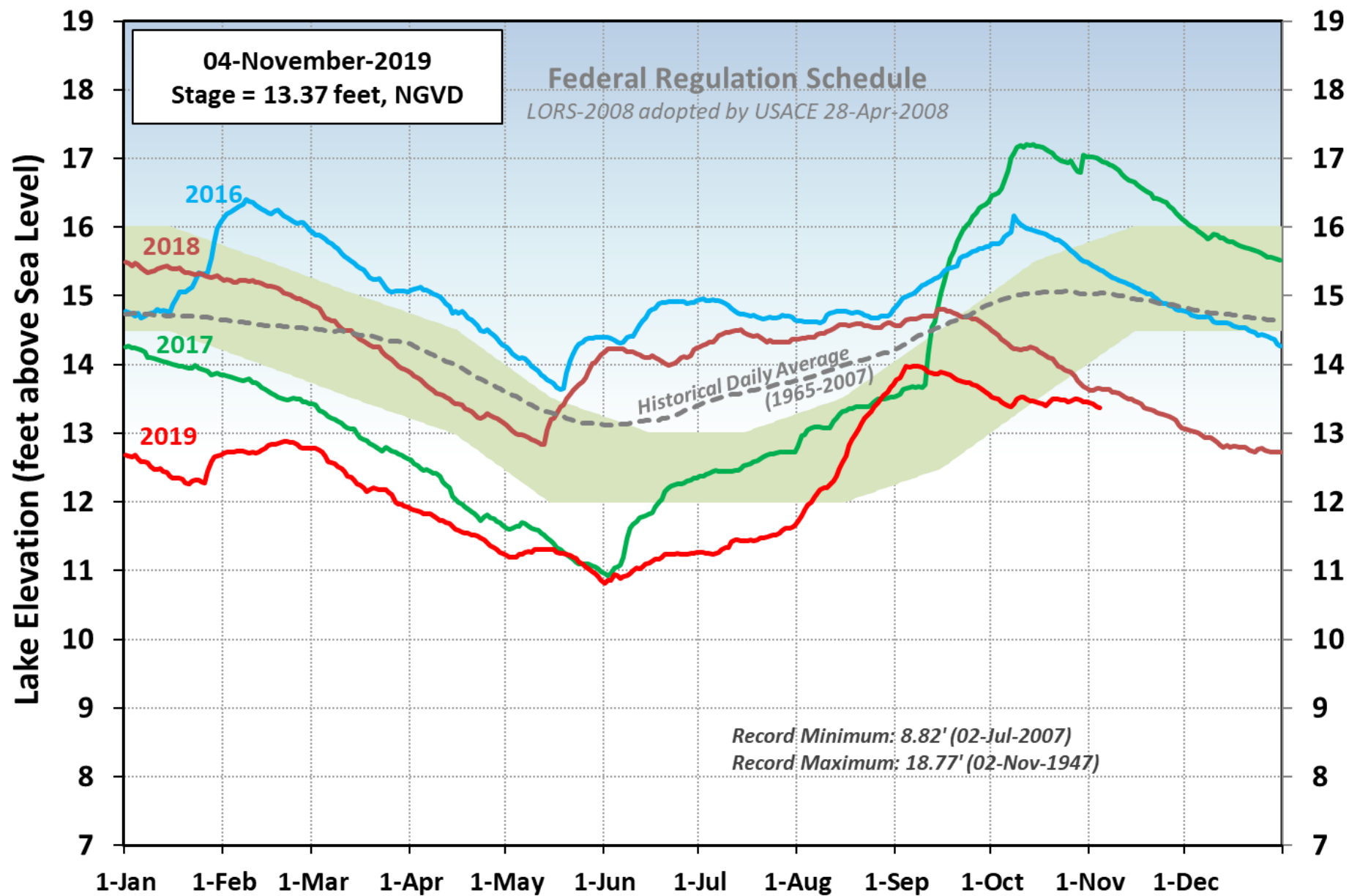
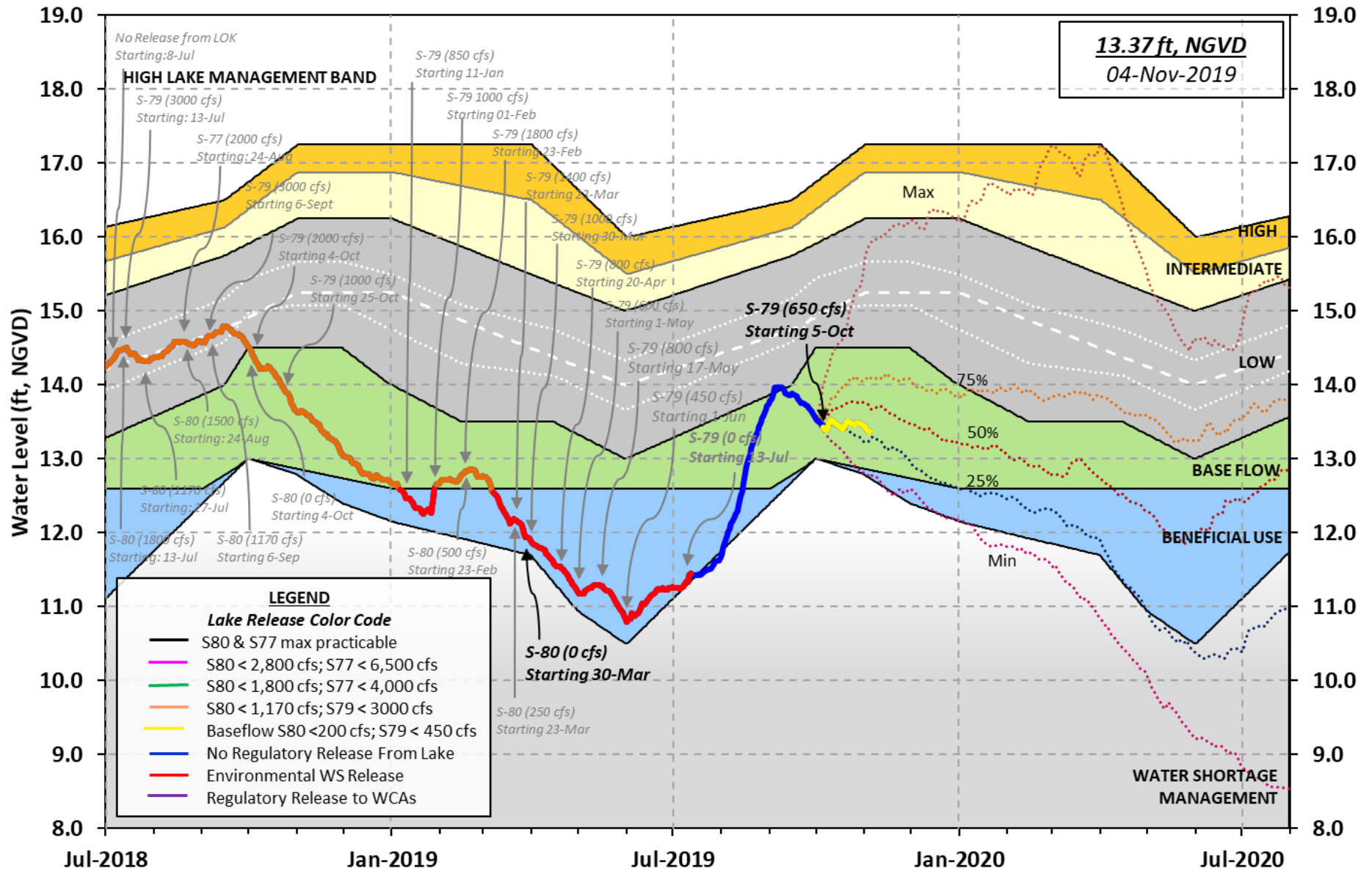


Figure 2. Select annual stage hydrographs for Lake Okeechobee in comparison to the Ecological Envelope.

Lake Okeechobee Water Level History and Projected Stages



LORS-2008
Adopted by USACE 28-April-2008

Projected Stage Percentiles From
SFWMD-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

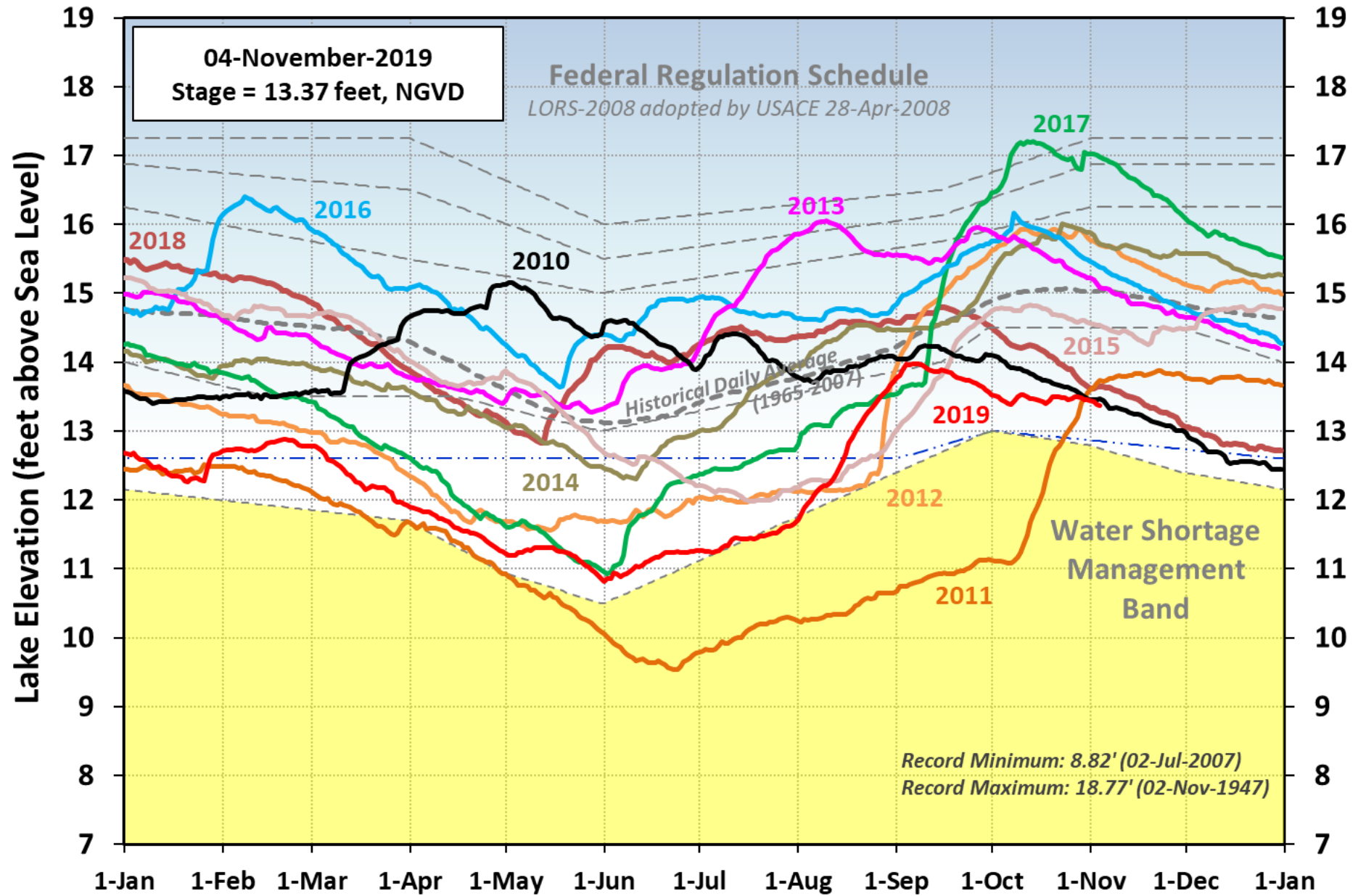


Figure 4. Select annual stage hydrographs for Lake Okeechobee from 2010 – 2019.

SFWM D PROVISIONAL RAINDAR 7-DAY BASIN RAINFALL ESTIMATES

FROM: 0630 EST, 10/29/2019 THROUGH: 0630 EST, 11/05/2019

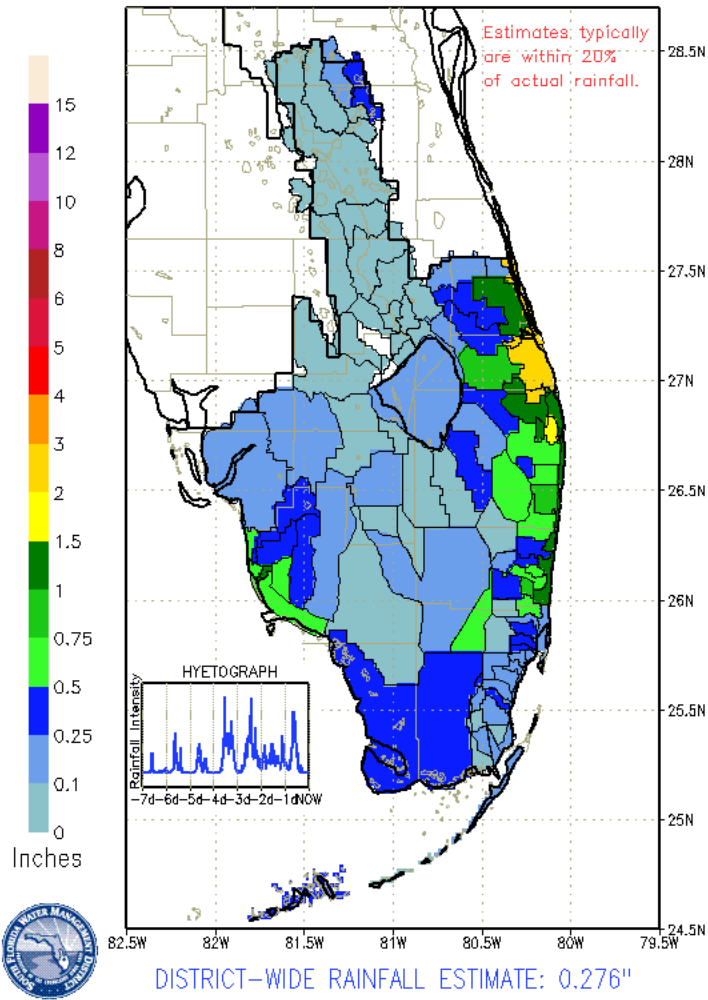


Figure 5. Rainfall estimates by basin.

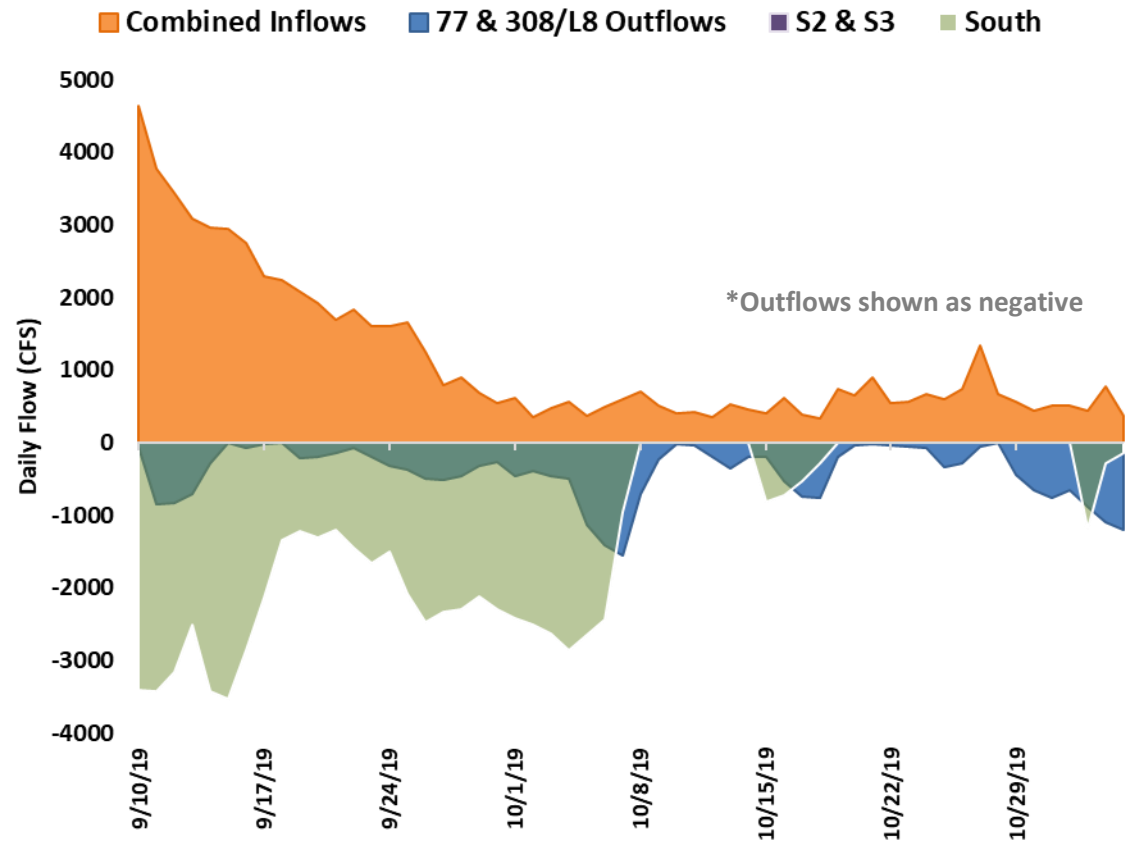


Figure 6. Major inflows (orange) and outflows (blue) of Lake Okeechobee, including the S-350 structures designated as South (green). The L-8 Canal flows through Culvert 10A are included as outflows when positive, and as inflows when backflowing into the lake. All inflows and outflows are shown as positive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

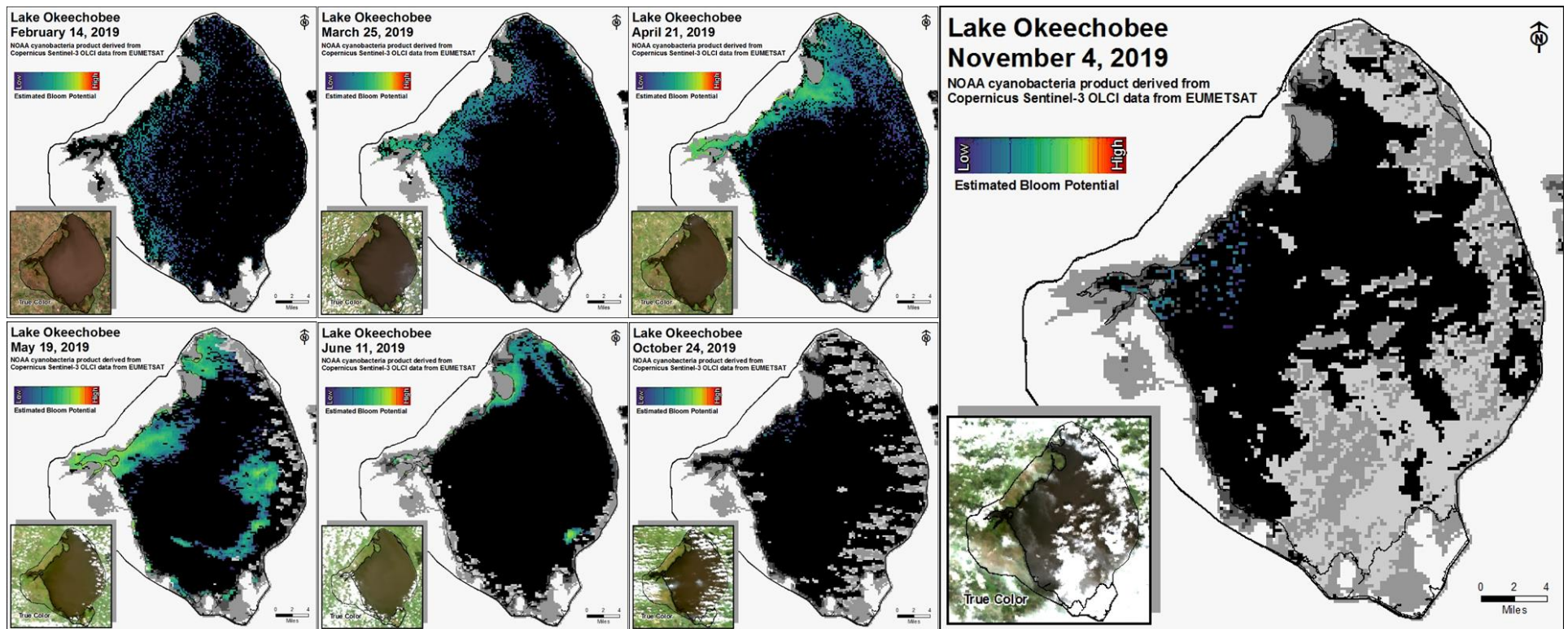


Figure 7. Potential for cyanobacterial blooms on Lake Okeechobee in 2019, based on NOAA's harmful algal bloom monitoring system derived from Copernicus Sentinel-3 OLCI data from EUMETSAT. Gray indicates cloud cover.

ESTUARIES

St. Lucie Estuary:

Last week total inflow to the St. Lucie Estuary averaged approximately 688 cfs (Figures 1 and 2) and last month inflow averaged about 604 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	464
S-80	0
S-308	-44
S-49 on C-24	16
S-97 on C-23	82
Gordy Rd. structure on Ten Mile Creek	126

Over the past week, salinity decreased throughout the estuary (Table 2, Figures 3 and 4). The seven-day moving average of the water column (an average of the surface and bottom salinity) at the US1 Bridge is 16.7. 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)	10.7 (11.7)	15.5 (15.5)	NA ¹
US1 Bridge	16.0 (17.1)	17.4 (18.1)	10.0-26.0
A1A Bridge	25.1 (26.0)	28.3 (28.6)	NA ¹

¹Envelope not applicable

Caloosahatchee Estuary:

Last week total inflow to the Caloosahatchee Estuary averaged approximately 620 cfs (Figures 5 and 6) and last month inflow averaged about 876 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	732
S-78	433
S-79	490
Tidal Basin Inflow	130

Over the past week in the estuary, salinity increased to Ft. Myers Yacht Basin and remained about the same downstream (Table 4, Figures 7 & 8). The seven-day average salinity values are within the good range for adult eastern oysters at Cape Coral and at Shell Point and in the fair range at Sanibel (Figure 9). The seven-day average salinities at Val I-75 and Ft. Myers (Table 4) are within good and fair range for Tape Grass respectively.

Table 4. Seven-day average salinity at six monitoring stations in the Caloosahatchee Estuary. Current average is in bold, previous average in parentheses. The envelope reflects the preferred salinity range for associated sampling sites..

Sampling Site	Surface	Bottom	Envelope
S-79 (Franklin Lock)	4.9 (3.8)	5.2 (3.8)	NA ¹
Val I75	5.7 (4.6)	7.9 (5.7)	0.0-5.0 ²
Ft. Myers Yacht Basin	12.1 (11.5)	14.4 (12.1)	NA
Cape Coral	18.8 (19.2)	21.0 (20.4)	10.0-30.0
Shell Point	29.9 (29.8)	29.3 (29.6)	10.0-30.0
Sanibel	32.3 (32.4)	32.7 (32.7)	10.0-30.0

¹Envelope not applicable and ²Envelope is based on a 2-week forecast 30-day average (see Table 5 below).

Forecast of surface salinity (Table 5 and Figure 10) at Val I-75 for the next two weeks using the autoregression model (Qiu and Wan, 2013) coupled with a linear reservoir model for the tidal basin predicts daily salinity ranging from 4.6 to 9.2 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. The 30-day moving average surface salinity at Val I-75 is forecast to be between 5.0 and 6.7 within two weeks which indicates the estuary would benefit from additional water.

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	9.2	6.7
B	300	110	7.6	6.1
C	450	110	6.4	5.6
D	650	110	4.9	5.1
E	800	110	4.6	5.0

Red tide

The Florida Fish and Wildlife Research Institute reported on November 1, 2019, that *Karenia brevis*, the Florida red tide dinoflagellate, was observed at very low to high concentrations in 29 samples collected from Lee County. *Karenia brevis* was not observed in samples collected from or offshore of Palm Beach or Broward counties (no samples were analyzed this week from St. Lucie, Martin, or Miami-Dade counties). Respiratory irritation and reports of fish kills were received in Lee County.

Water Management Recommendations

Lake stage is in the Base Flow sub-band. Tributary conditions are normal. 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.

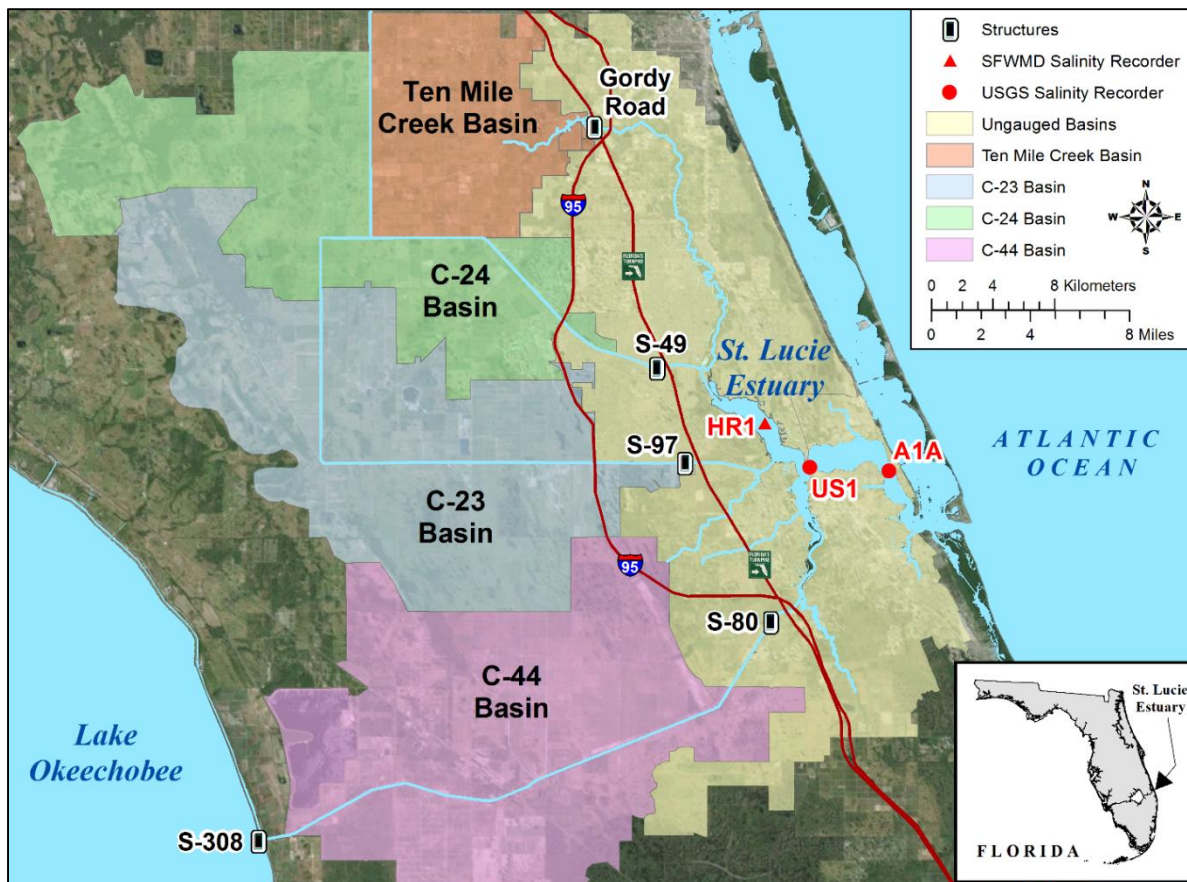


Figure 1. Basins, water control structures, and salinity monitoring for the St. Lucie Estuary.

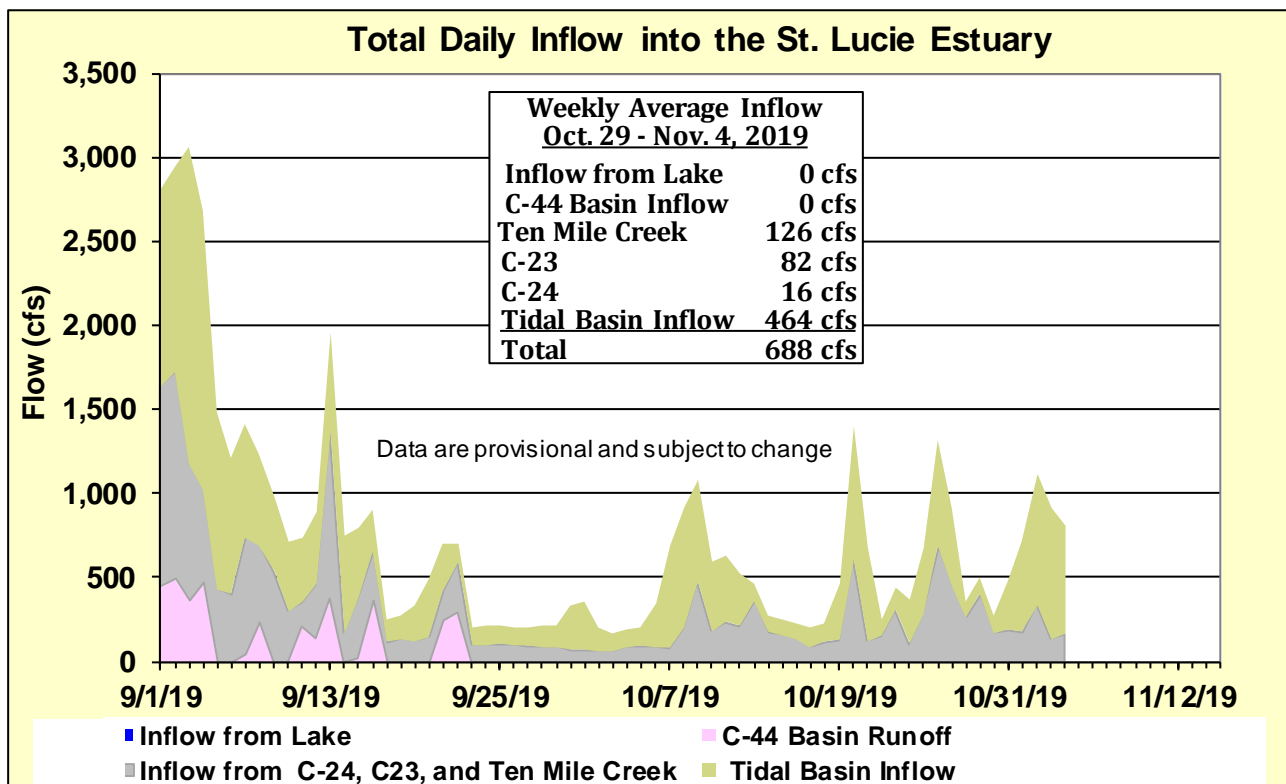


Figure 2. Total daily inflows from Lake Okeechobee and runoff from the C-44, C-23, C-24, Ten Mile Creek, and tidal basins into the St. Lucie Estuary.

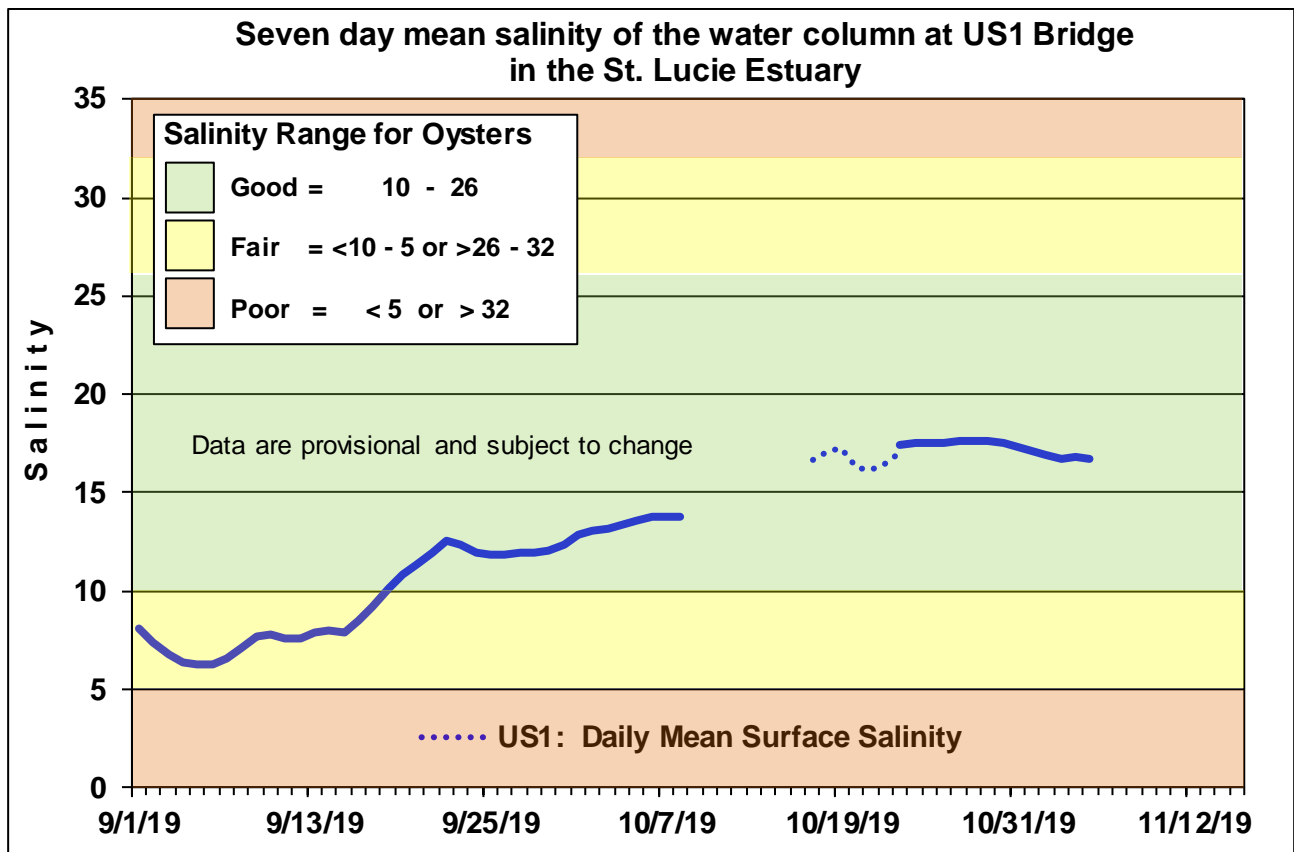


Figure 3. Seven-day mean salinity of the water column at the US1 Bridge.

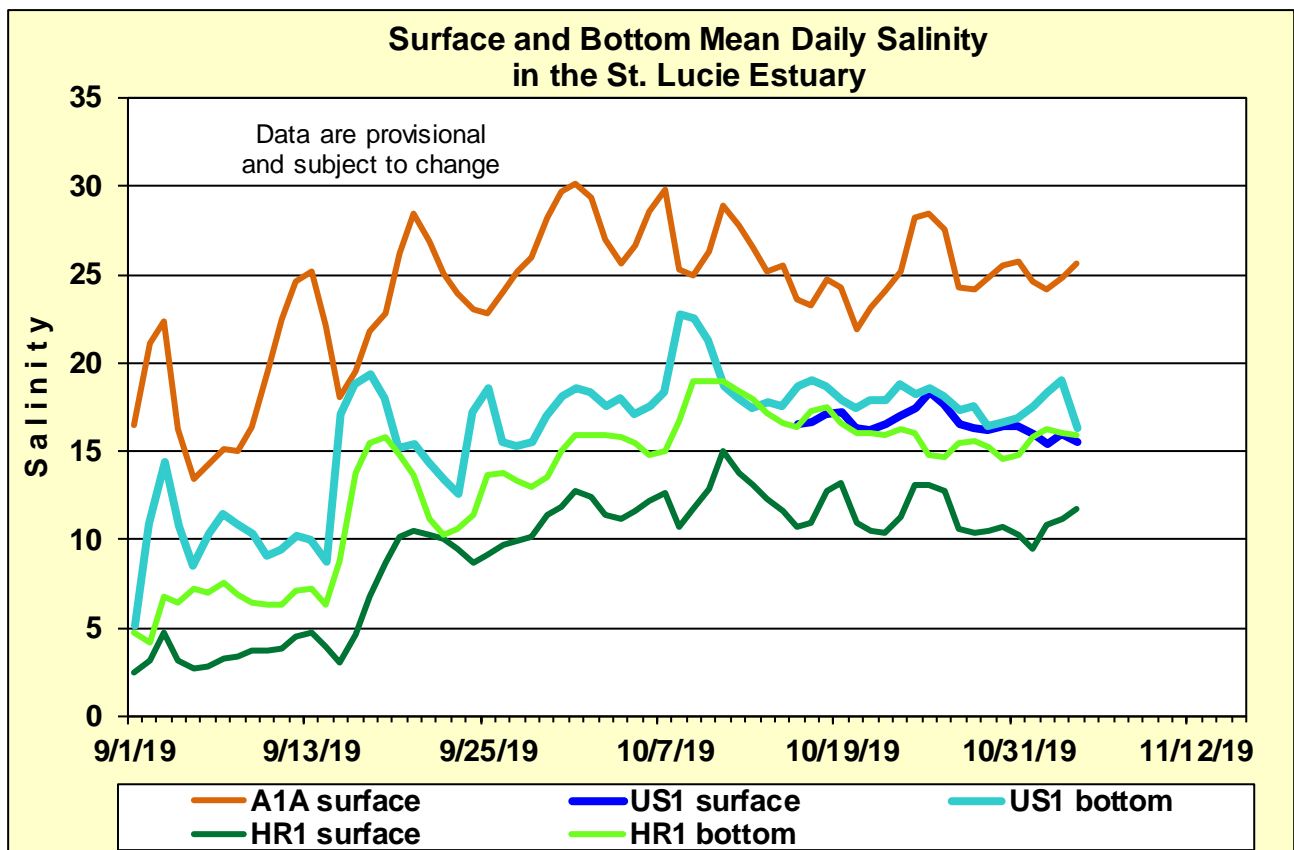


Figure 4. Daily mean salinity at the A1A, US1 and estimated HR1 stations.

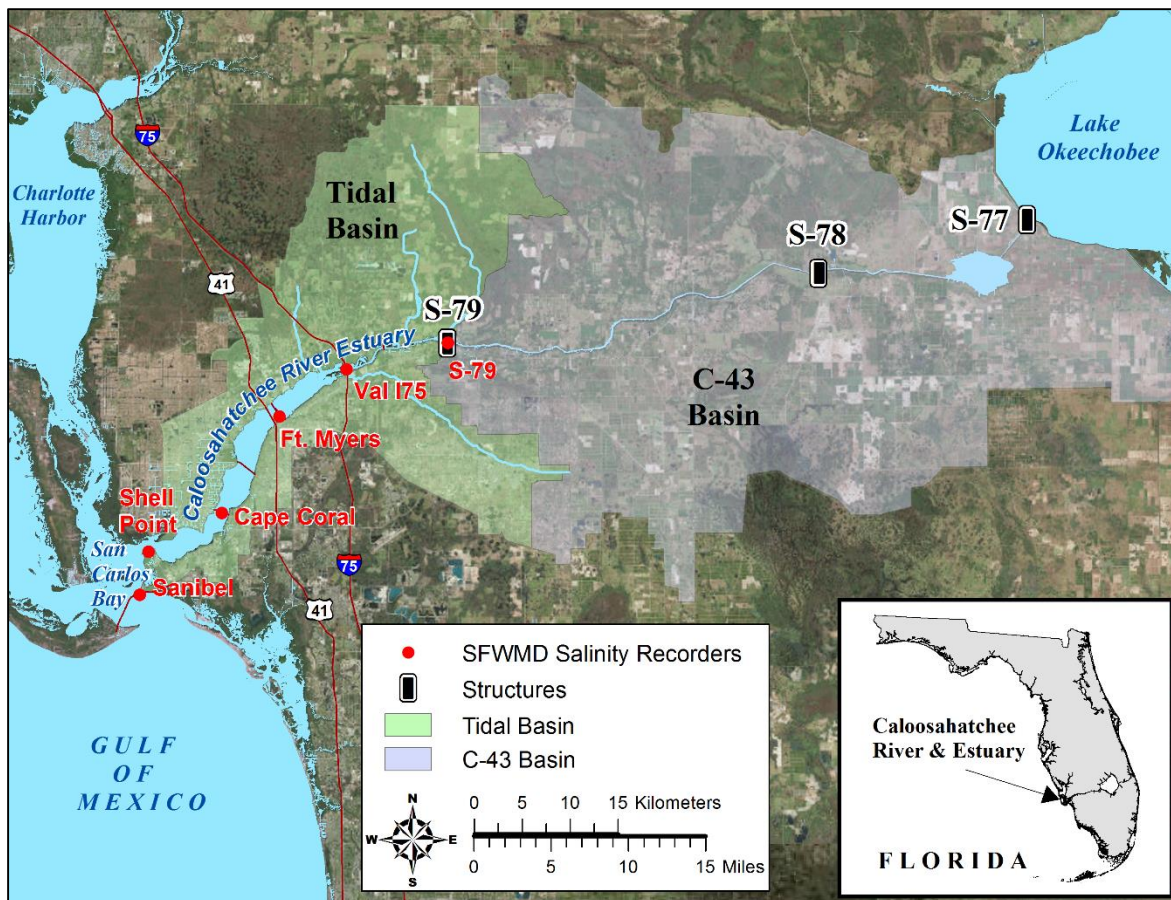


Figure 5. Basins, water control structures, and salinity monitoring for the Caloosahatchee Estuary.

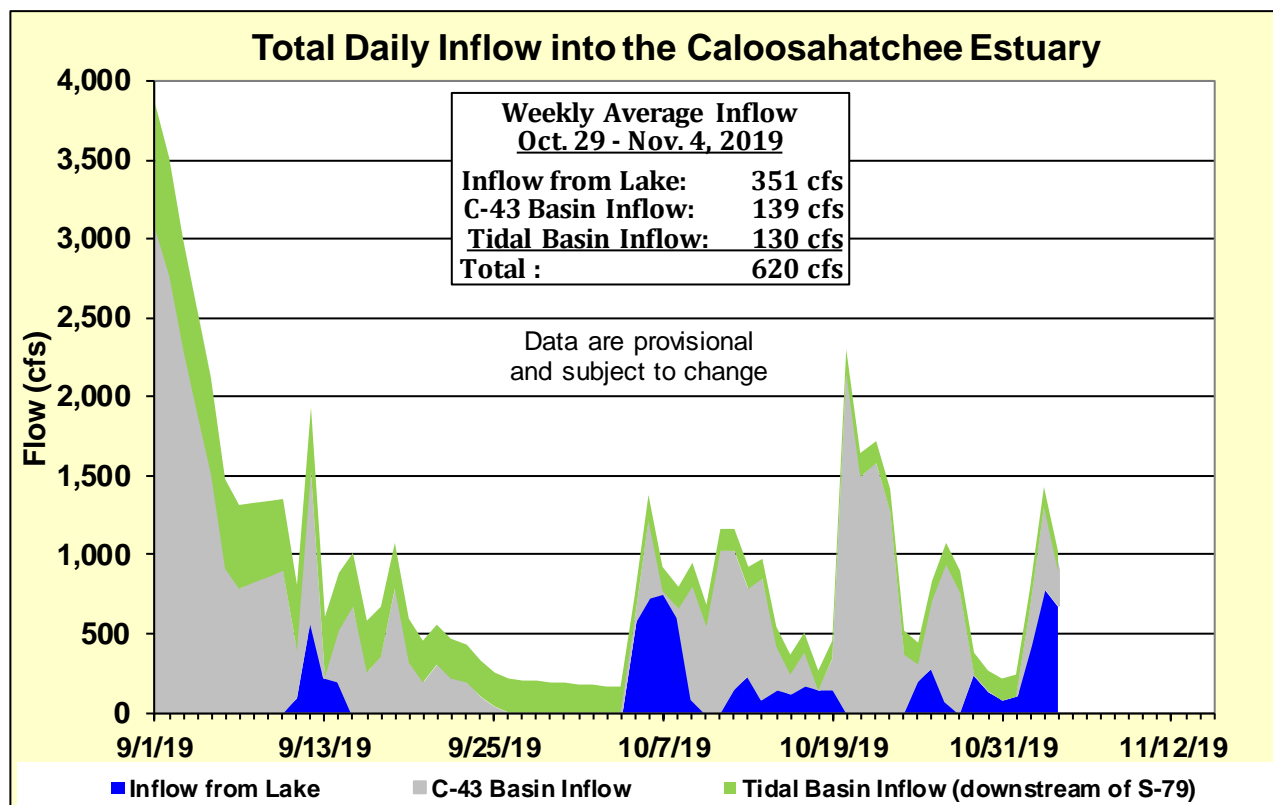


Figure 6. Total daily inflows from Lake Okeechobee, runoff from the C-43 basin, and tributaries in the tidal basin into the Caloosahatchee River Estuary.

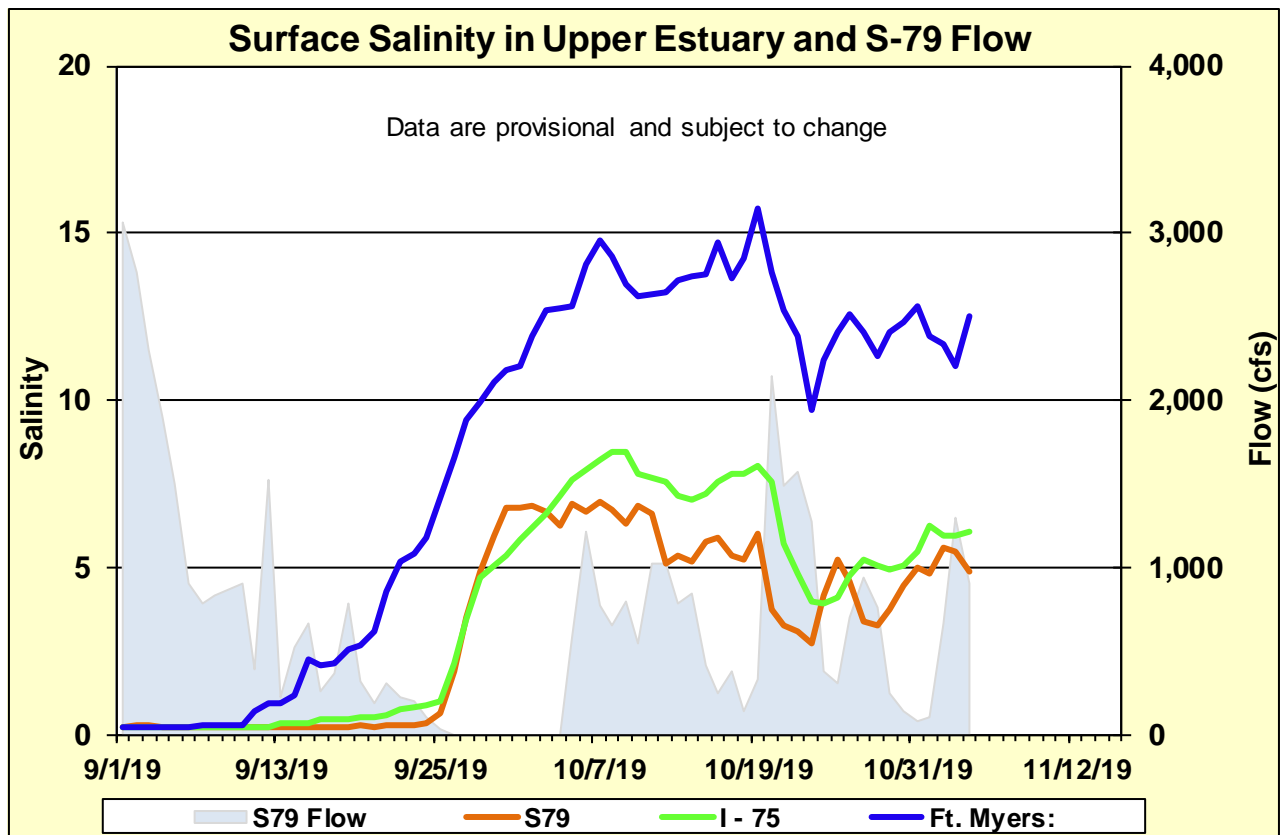


Figure 7. Daily mean flows at S-79 and salinity at upper estuary monitoring stations.

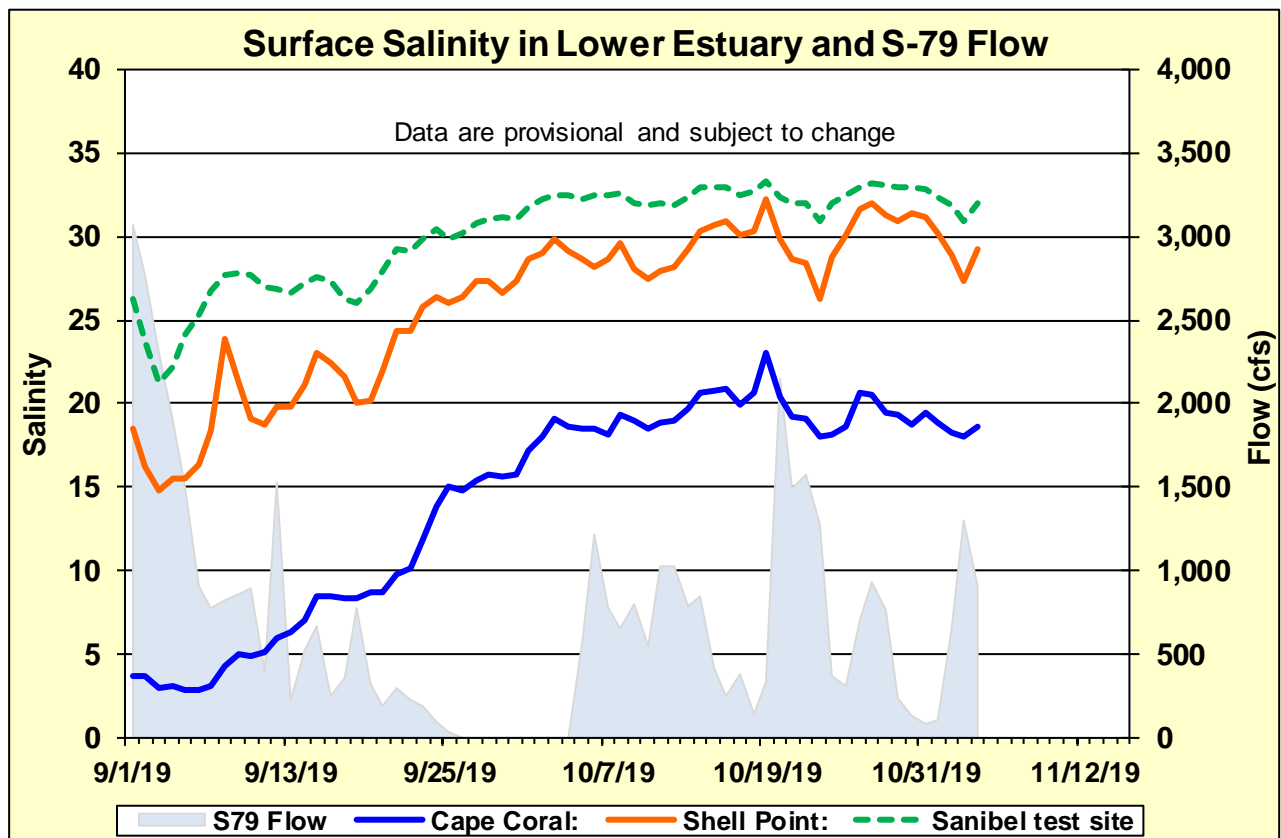


Figure 8. Daily mean flows at S-79 and salinity at lower estuary stations.

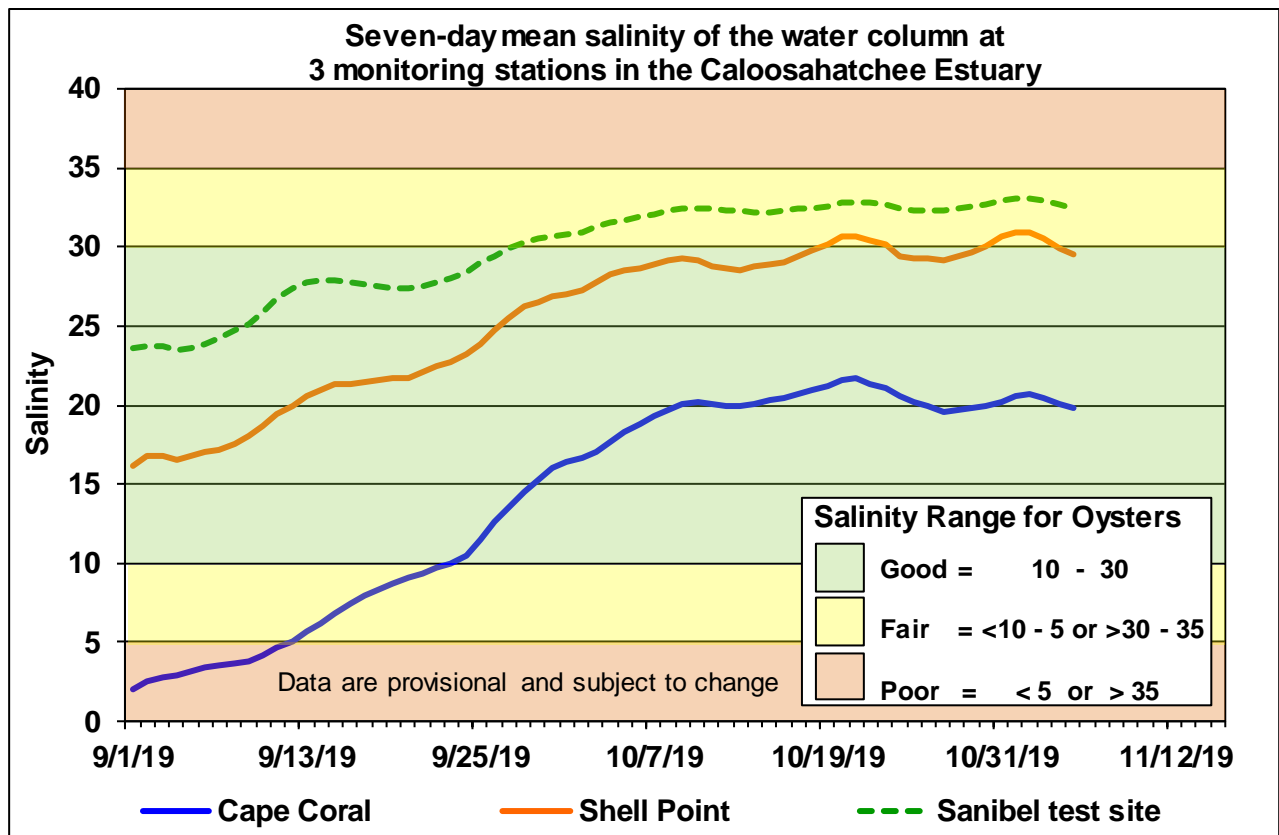


Figure 9. Seven-day mean salinity at Cape Coral, Shell Point, and Sanibel monitoring stations.

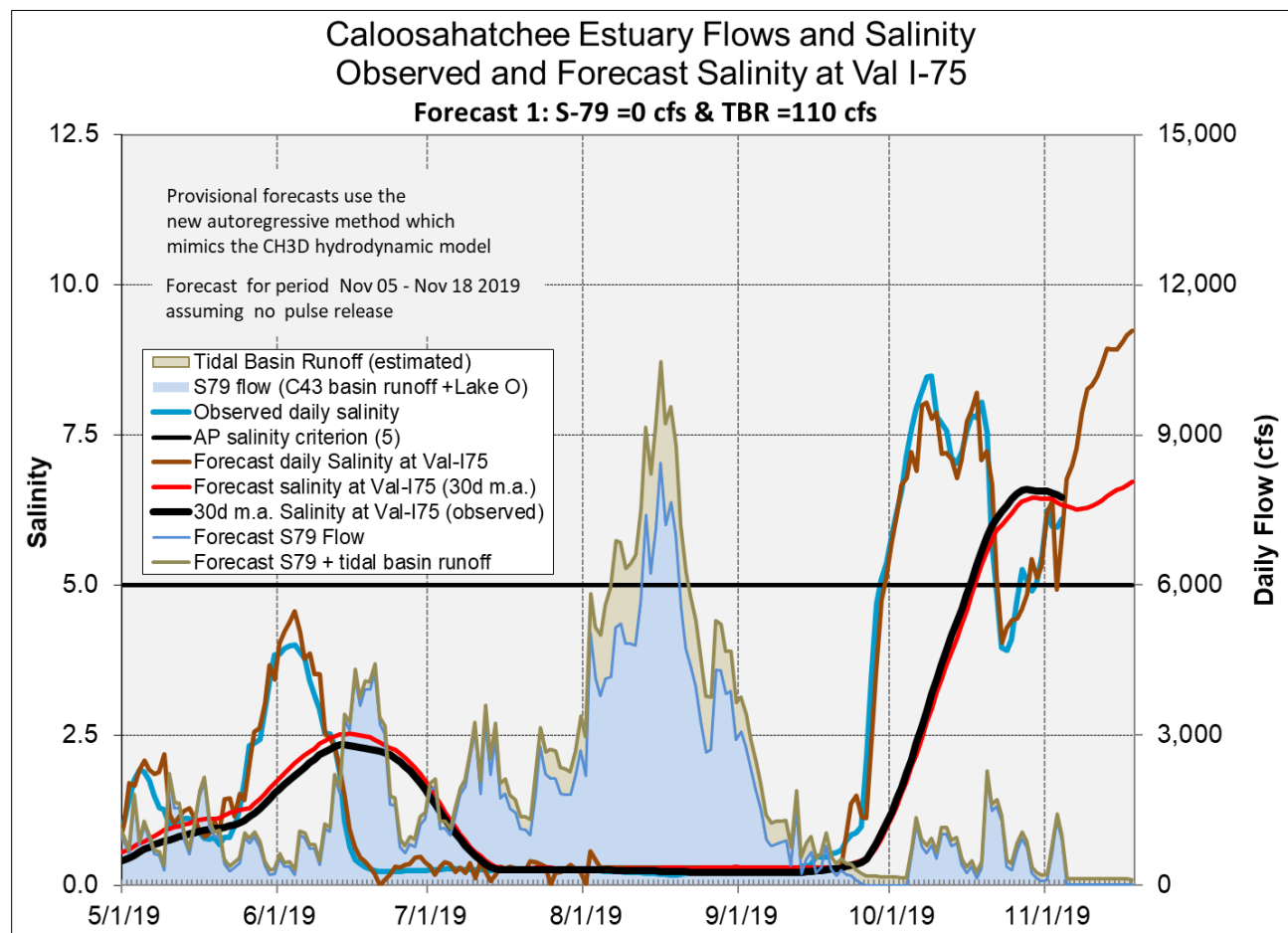
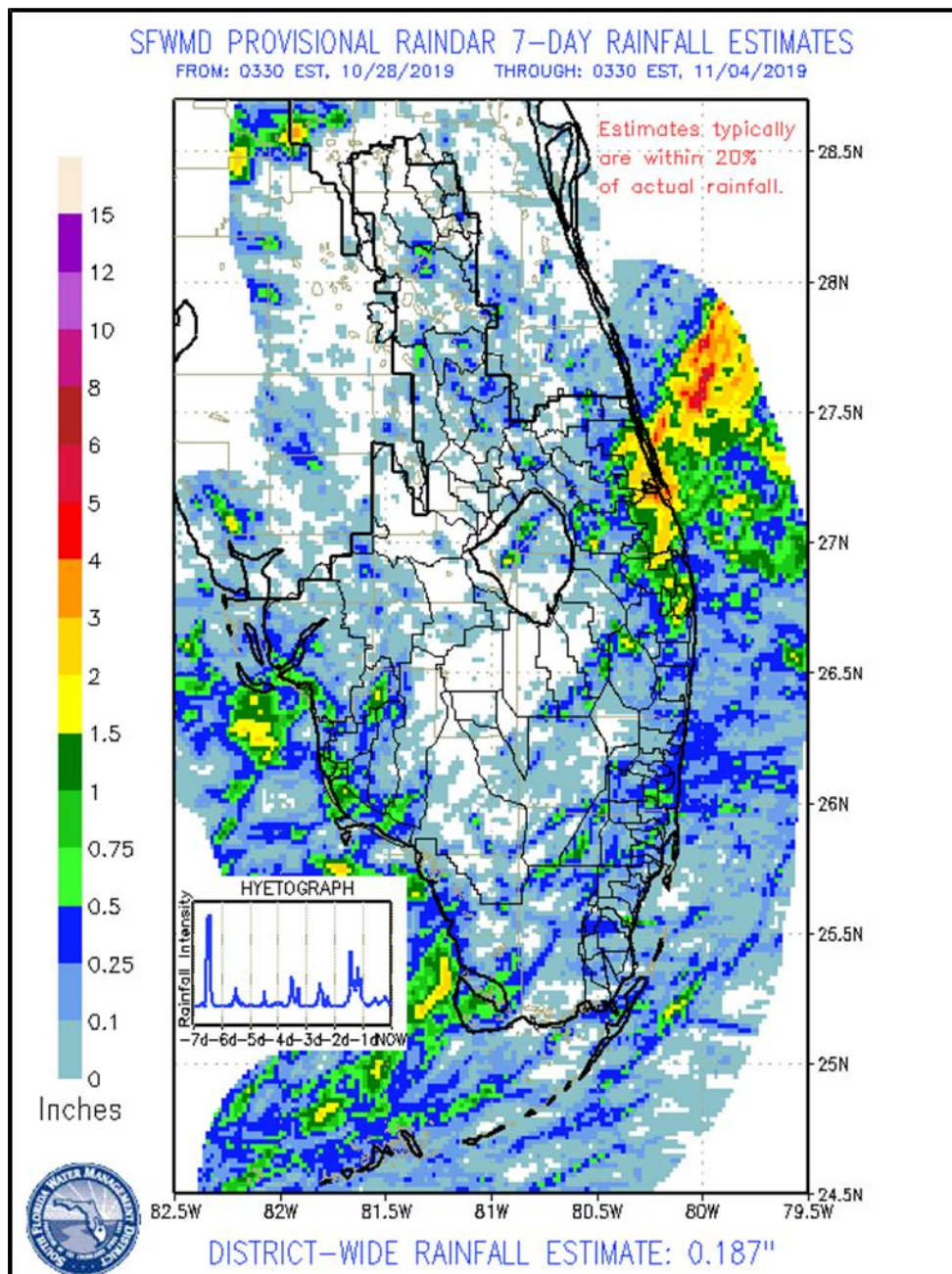


Figure 10. Forecasted Val I-75 surface salinity assuming no pulse release at S-79.

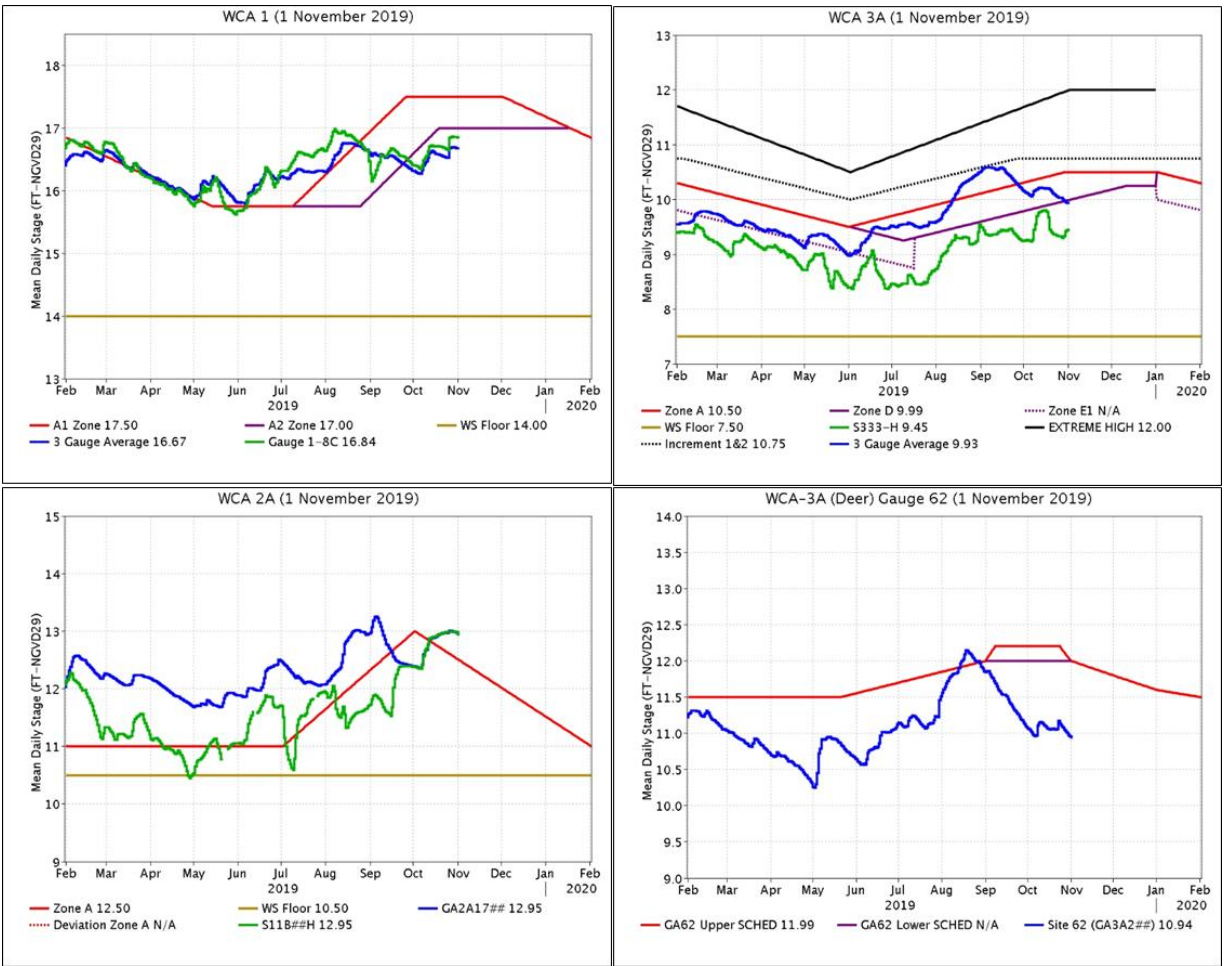
EVERGLADES

Well below average precipitation fell in the WCAs last week. Stages fell slightly in WCA-1 and northern ENP, and more than a tenth in the WCA-2A and 3A basins. Pan evaporation was estimated at 1.27 inches and the Rainfall Plan calls for a release of 41 cfs from WCA-3A (a 500 cfs decrease from last week).

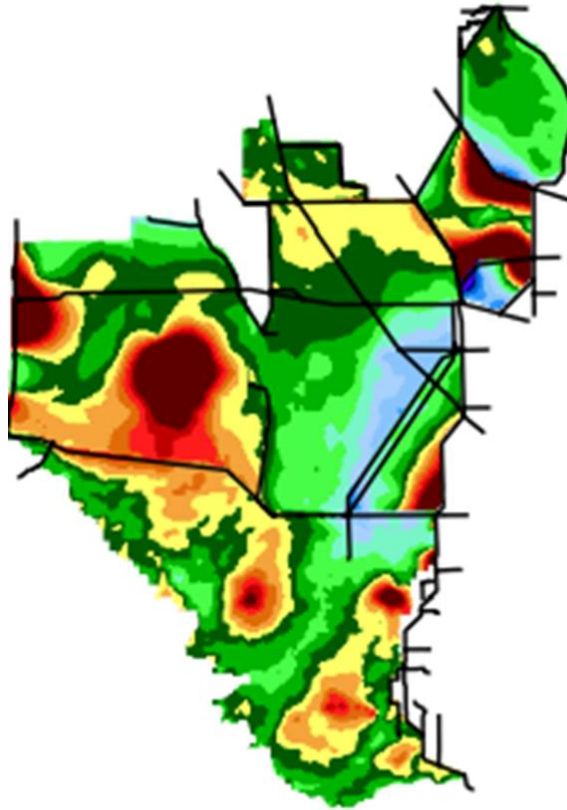
Everglades Region	Rainfall (Inches)	Stage Change (feet)
WCA-1	0.29	-0.01
WCA-2A	0.03	-0.11
WCA-2B	0.14	+0.11
WCA-3A	0.07	-0.12
WCA-3B	0.37	-0.05
ENP	0.20	-0.03



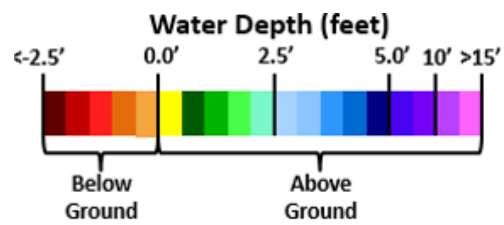
Regulation Schedules: WCA1: The three-gauge average stage remains stable this week, currently at 0.33 feet below the Zone A2 line. WCA-2A: Stages at Gauge 2A-17 stage fell last week now paralleling the Zone A regulation line at 0.45 above the falling line. WCA-3A stage: The three-gauge average stage fell into Zone E last week and trends downward, currently 0.06 feet below that line. WCA-3A at gauge 62 (Northwest corner): dropped 0.15 last week and trends downward away from the lower schedule, currently 1.05 feet below.



Water Depths: The WDAT tool for spatial interpolation of depth monthly snapshots indicates depths are below 0.5 feet along the northern half of WCA-3A North and in the extreme north of WCA-1. The tool shows depths below ground surface along the L-38W in NE WCA-3A and this was confirmed last week in the field. The spatial extent of the deepest ponding along the L-67 canal in WCA-3A has diminished. Hydrologic connectivity has diminished in Lostman's but remains in Shark River and Taylor Slough. WCA-2A model output is suspect.

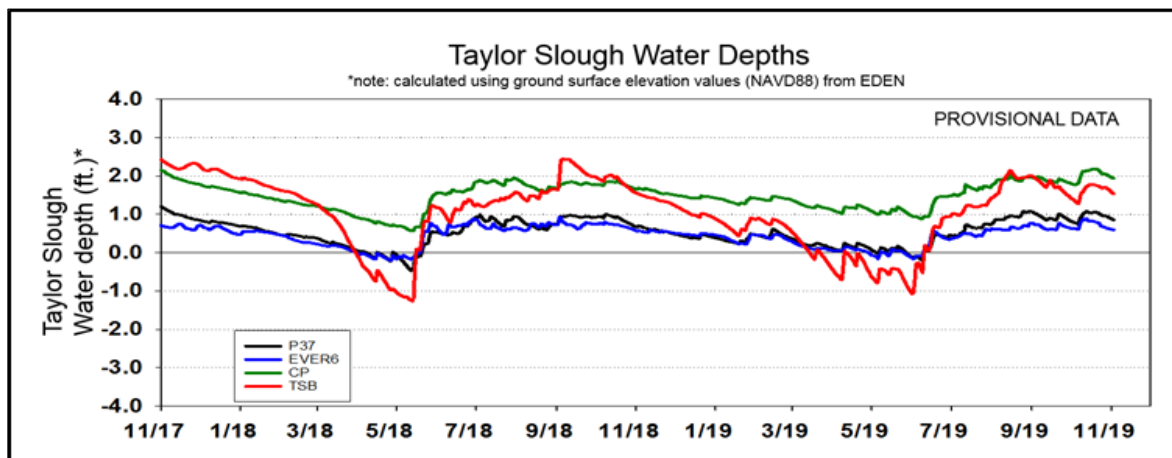
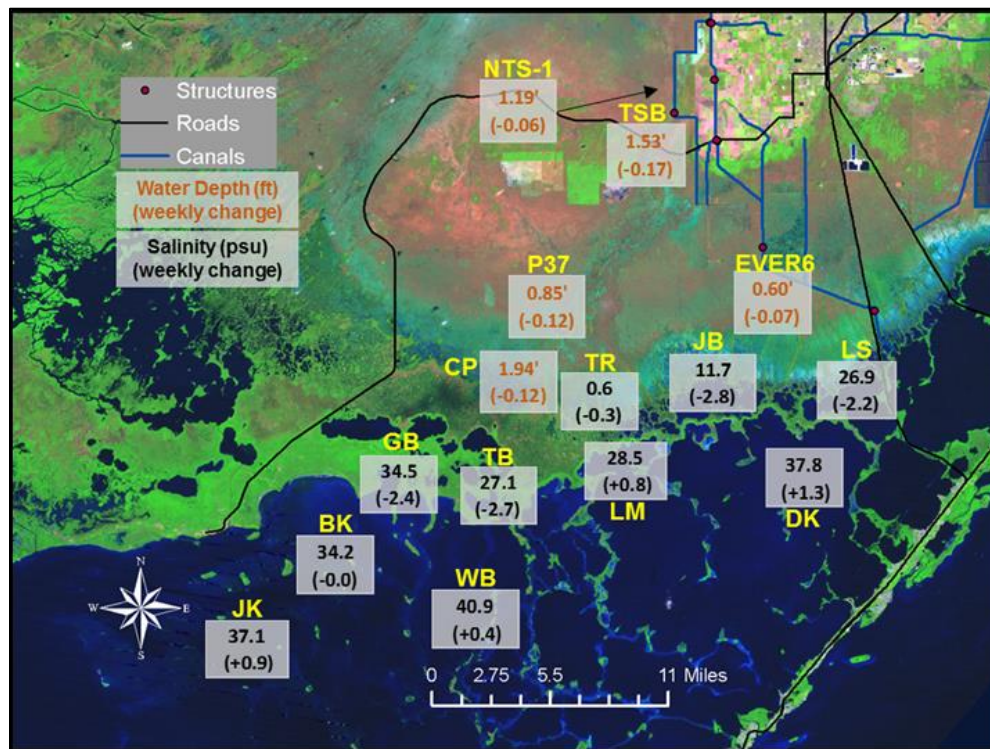


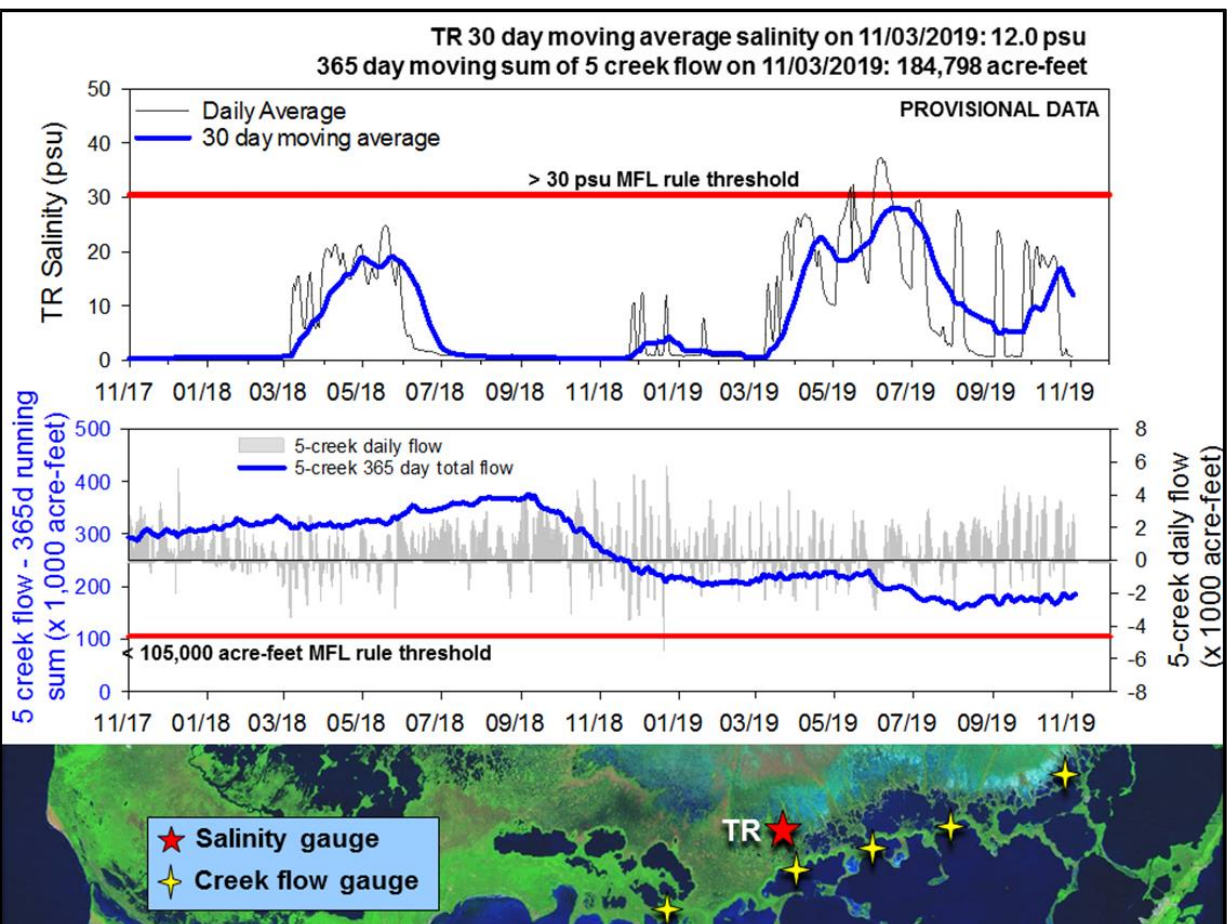
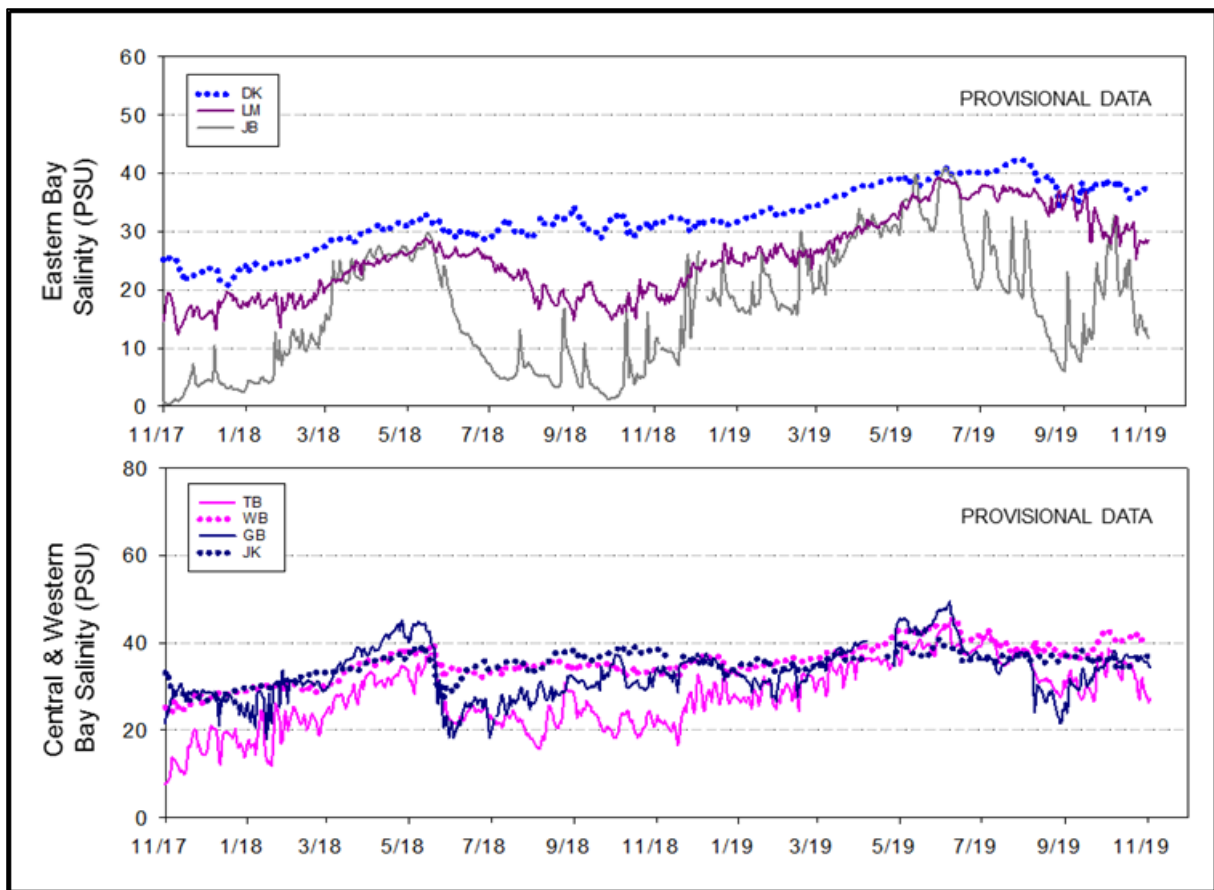
SFWMD WDAT (water depth assessment tool): 11/4/19



Taylor Slough Water Levels: Rainfall over Taylor Slough and Florida Bay this past week averaged 0.52 inches. Stages decreased an average of 0.10 feet throughout the area with individual stations changing -0.06 feet to -0.17 feet over the week. Stages remain 3 inches above the historical averages for this time of year.

Florida Bay Salinities: Average salinity in Florida Bay was 31 psu, 1 psu lower than last week. Largest changes were again at the northern shoreline which brought the average shoreline salinity down to 30 psu which is still 10 psu higher than average. Elsewhere in the bay, conditions are 8 psu above average for this time of year which is unsavory.





Florida Bay MFL: Salinity at the TR station in the mangrove zone (tracked for the Florida Bay MFL) remained under 2 psu last week and ended the week at 0.6 psu. The 30-day moving average ended at 12 psu (3 psu lower than last week). Weekly flow from the 5 creeks identified by yellow stars on the map totaled about 10,000 with this past week showing consistent positive flows for most of the week. The 365-day moving sum of flow from the five creeks (tracked as part of the Florida Bay MFL criteria) decreased roughly 1,200 acre-feet to 184,798 acre-feet and continues to hover under the 25th percentile (190,165 acre-feet). Creek flow are provisional USGS data.

Water Management Recommendations

Current stages in the WCAs are low for this time of year and salinities are high in Florida Bay. Conserving water within the WCAs and moving low nutrient water south has water has many ecological benefits. Maintaining saturated soils in over-drained portions of the Everglades conserves peat and lowers the risk of muck fires. 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.

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

SFWMD Everglades Ecological Recommendations, November 5th, 2019 (red is new)

Area	Weekly change	Recommendation	Reasons
WCA-1	Stage decreased by 0.01'	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-2A	Stage decreased 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-2B	Stage increased by 0.11'	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 + 0.25' this week would have ecological benefit.	Protect within basin habitat and wildlife.
WCA-3A NE	Stage decreased by 0.17'	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 decreased by 0.15'	Conserving water in this basin has ecological benefit as we near the seasonal peak for water depths.	
Central WCA-3A S	Stage decreased by 0.11'	Conserving water in this basin has ecological benefit as we near the seasonal peak for water depths.	Protect <u>tree islands</u> , upstream/downstream habitat and wildlife.
Southern WCA-3A S	Stage decreased by 0.04'		
WCA-3B	Stage decreased by 0.05'	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 decreased by 0.03'	Make discharges to the Park according to the 2012 WCP rainfall plan.	Protect upstream/downstream habitat and wildlife.
Taylor Slough	Stage changes ranged from -0.17 to -0.06'	Move water southward as possible	When available, provide freshwater buffer for downstream conditions.
FB- Salinity	Salinity changes ranged -2.8 to +1.3 psu	Move water southward as possible	When available, provide freshwater to maintain low salinity buffer and promote water movement.