Disclaimer: Information contained in the report addresses environmental conditions only and is not the official South Florida Water Management District operations recommendation or decision.

M E M O R A N D U M

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

FROM: SFWMD Staff Environmental Advisory Team

DATE: December 4, 2019

SUBJECT: Weekly Environmental Conditions for Systems Operations

Summary

Weather Conditions and Forecast

Mostly dry until Saturday. Very dry air has spread over the District and a dry, reinforcing front will punch through the area Wednesday so no rain is forecast through Thursday except for some spotty light showers near the west coast. As winds switch around to the northeast and then east Thursday night and Friday ahead of the next frontal boundary, some moisture will work is way back over portions of the District yielding some limited light showers. The next frontal boundary is then expected to sag into central Florida late Friday night and stall over the District Saturday. Upper level energy streaming across the area is forecast to flare up some moderate to locally heavy shower activity near the boundary mainly near the east coast Saturday and Sunday. The front will then lift north of the District so only a few scattered showers are forecast mainly over the interior Monday. A couple of frontal systems are forecast to affect the District the following week bringing the potential for the Week 2 total rainfall to be near average and even above average in some areas.

Kissimmee

Tuesday morning stages were 55.2 feet NGVD (2.8 feet below schedule) in East Lake Toho, 54.8 feet NGVD (0.2 feet below schedule) in Toho, and 50.7 feet NGVD (1.8 feet below schedule) in Kissimmee-Cypress-Hatchineha; headwater stages were 46.4 feet NGVD at S-65A and 25.9 feet NGVD at S-65D. Tuesday morning discharges were 351 cfs at S-65, 321 cfs at S-65A, 343 cfs at S-65D and 0 cfs at S-65E. Dissolved oxygen concentration in the Kissimmee River averaged 8.2 mg/L for the week through Sunday. Kissimmee River mean floodplain depth on Sunday was 0.12 feet. Recommendations: 12/3/2019- Continue S65-A discharge of at least 250 cfs. The purpose is to maintain minimum flow to the Kissimmee River.

Lake Okeechobee

Lake Okeechobee stage was 13.07 feet NGVD on December 2, 2019, down 0.08 feet from the previous week and 0.35 feet from the previous 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. Water levels moved below the ecological envelope (which varies seasonally from 12.5 – 15.5 feet NGVD +/- 0.5 feet) on October 15, 2019 and are currently 1.43 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 since late October of last year. The latest estimate of cyanobacteria bloom potential (December 1, 2019) shows that estimated bloom potential is medium around Fisheating bay and the southwest portion of the lake where blooms tend to originate; the rest of the lake is estimated as no- to low-risk.

Estuaries

Total inflow to the St. Lucie Estuary averaged 188 cfs over the past week with no flow coming from Lake Okeechobee. Salinities 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 738 cfs over the past week with 448 cfs coming from the Lake. Salinity decreased slightly in upper estuary, but little changed in the lower 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 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 is no release. 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 796,000 acre-feet. Most STA cells are at or near target depths except STA-5/6 cells which are below target. 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 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 STA-2 or A-1 FEB/STA-3/4.

Everglades

Current stages in the WCAs, particularly in WCA-3A North, 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. As wading bird foraging begins in the Everglades, ecological recommendations move towards moderating recession rates where and when possible. Generally, this time of year rates from -0.05 to -0.09 feet per week are desirable to optimize conditions for prey concentration and capture. However, given the uniquely low stages at the start of this season it remains ecologically desirable to conserve as much water as possible. No rain fell on Taylor Slough or Florida Bay this past week and stages fell in Taylor Slough where the recession rate continues to increase. Average salinities fell slightly in Florida Bay, however both the Bay and nearshore remain well above average for this time of year. These elevated salinities are disadvantageous as we move into the dry season.

Supporting Information

KISSIMMEE BASIN

Kissimmee Basin Rainfall

The Upper Kissimmee Basin received 0.00 inches of rainfall in the past week and the Lower Basin received 0.03 inches (SFWMD Daily Rainfall Report 12/1/2019).

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: 12/3/2019

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)						
							12/1/19	11/24/19	11/17/19	11/10/19	11/3/19	10/27/19	10/20/19
Lakes Hart and Mary Jane	S-62	0	LKMJ	60.6	R	61.0	**-0.4**	-0.4	-0.5	-0.5	-0.6	-0.5	-0.5
Lakes Myrtle, Preston, and Joel	S-57	0	S-57	61.5	R	62.0	**-0.5**	-0.5	-0.6	-0.5	-0.6	-0.5	-0.6
Alligator Chain	S-60	0	ALLI	62.9	R	64.0	**-1.1**	-1.0	-1.0	-1.0	-1.0	-0.9	-0.8
Lake Gentry	S-63	0	LKGT	60.8	R	61.5	**-0.7**	-0.7	-0.6	-0.6	-0.7	-0.6	-0.5
East Lake Toho	S-59	268	TOHOE	55.2	R	58.0	**-2.8**	-2.5	-2.4	-2.2	-2.0	-1.5	-1.1
Lake Toho	S-61	445	TOHOW, S-61	54.8	R	55.0	**-0.2**	-0.1	-0.1	0.0	0.0	0.1	-0.4
Lakes Kissimmee, Cypress, and Hatchineha	S-65	358	KUB011, LKIS5B	50.6	R	52.5	**-1.9**	-1.9	-1.9	-2.0	-2.1	-2.1	-1.9

[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: **12/3/2019**

Metric	Location	1-Day Average	Average for the Preceeding 7-Days[1]								
		12/1/2019	12/1/19	11/24/19	11/17/19	11/10/19	11/3/19	10/27/19	10/20/19	10/13/19	10/6/19
Discharge (cfs)	S-65	383	**358**	356	323	335	332	318	354	408	411
Discharge (cfs)	S-65A[2]	315	**315**	319	276	281	279	263	286	327	327
Discharge (cfs)	S-65D[2]	345	**347**	330	290	338	382	368	379	441	483
Headwater Stage (feet NGVD)	S-65D[2]	25.88	**25.90**	25.84	25.76	25.77	25.74	25.83	25.78	25.81	25.84
Discharge (cfs)	S-65E[2]	389	**330**	345	244	208	365	405	367	425	453
Discharge (cfs)	S-67	0	**0**	0	0	0	0	0	0	0	0
DO (mg/L)[3]	Phases I & II/III river channel	9.2	**8.2**	8.0	7.3	7.3	6.4	6.4	6.6	6.7	7.1
Mean depth (feet)[4]	Phase I floodplain	0.12	**0.14**	0.13	0.15	0.17	0.22	0.24	0.20	0.24	0.26

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

[2]S-65A discharge combines S-65A with auxillary strucutures; S-65D discharge combines discharge at S-65D, S-65DX1, and S-65DX2; S-65D stage averages stage at S-65D and S-65DX1; S-65E discharge combines S-65E and S-65EX1.

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

[4]1-day spatial average from South Florida Water Depth Assessment Tool (SFWDAT).

DATA ARE PROVISIONAL; N/A indicates that data were not available.

KCOL Hydrographs (through Sunday midnight)

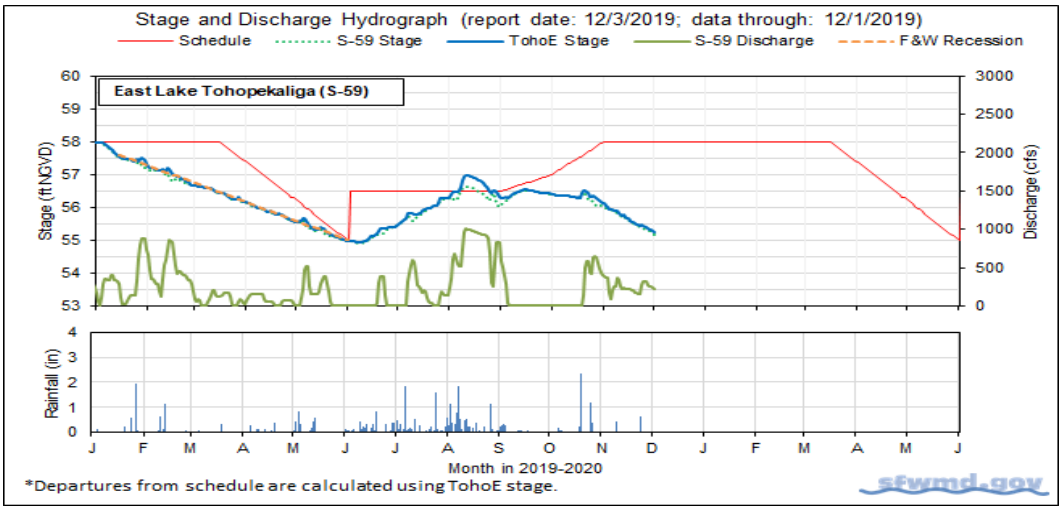


Figure 1.

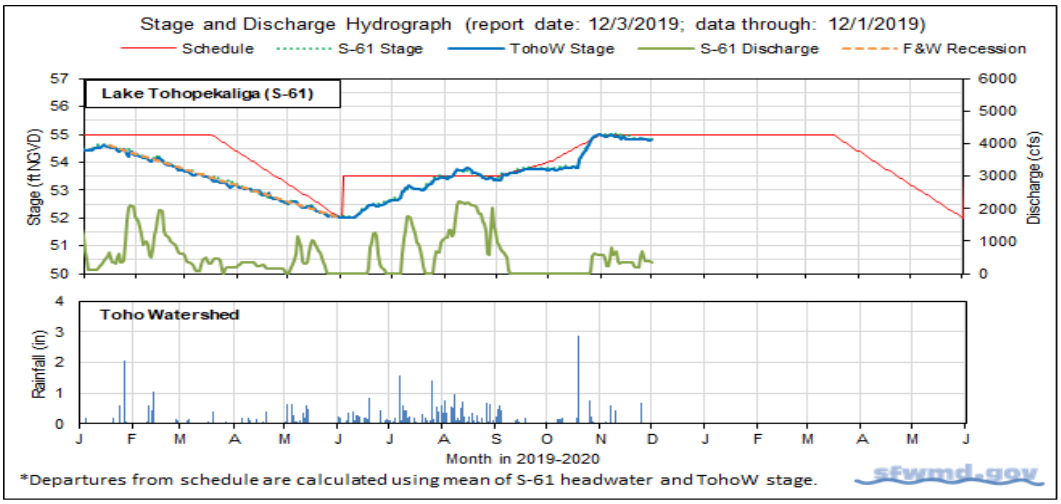


Figure 2.

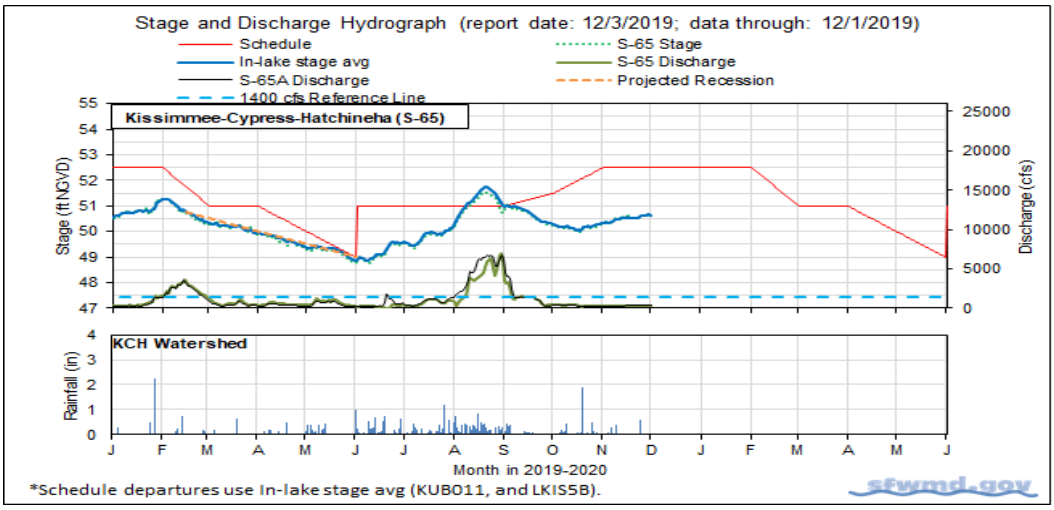


Figure 3.

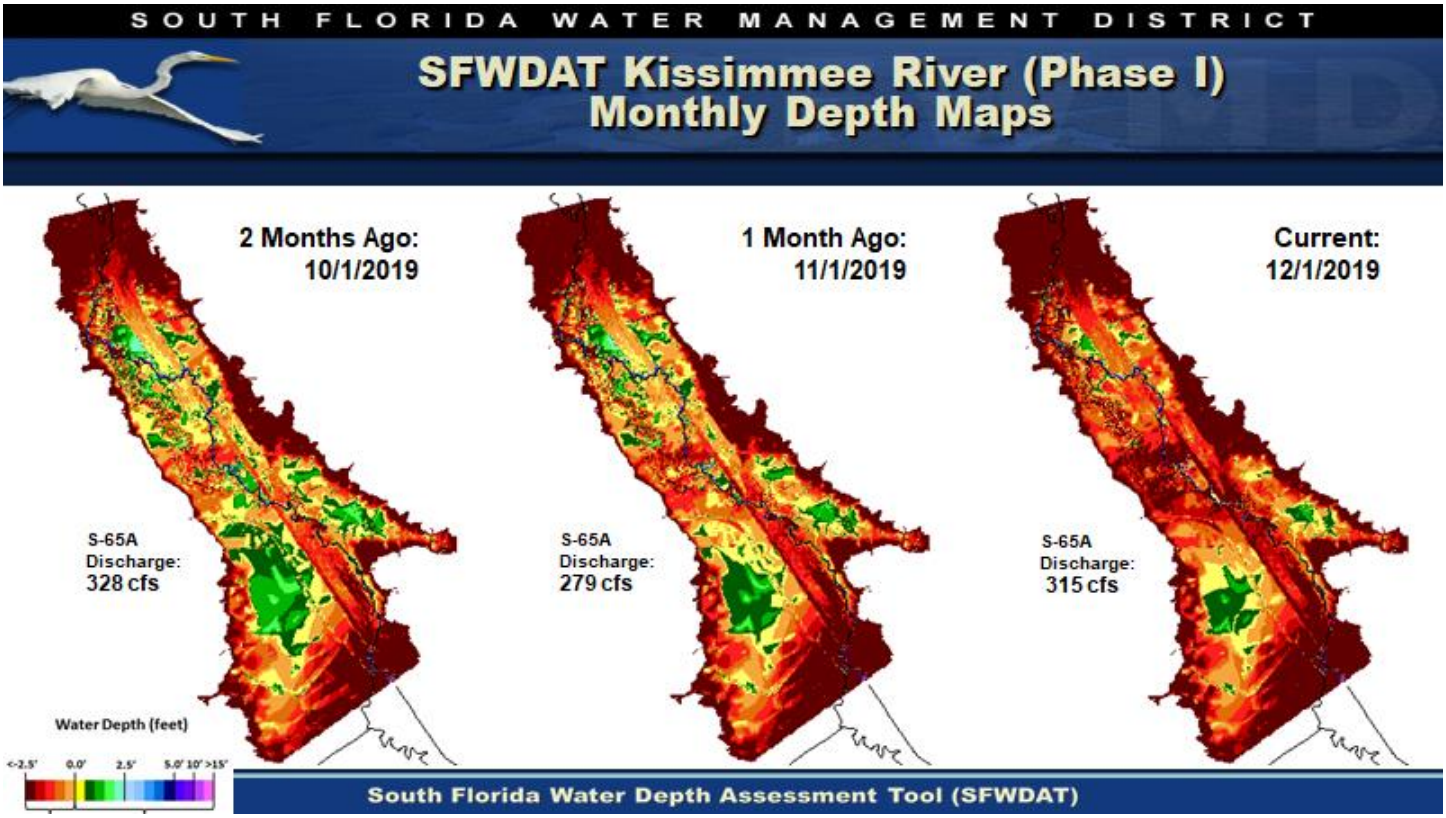


Figure 4. Phase I area floodplain water depths for this week, one month ago, and two months ago. Note that the WDAT color-coding has been modified to accommodate greater water depths; these maps are not directly comparable to Kissimmee Basin WDAT maps published prior to January 16, 2012.

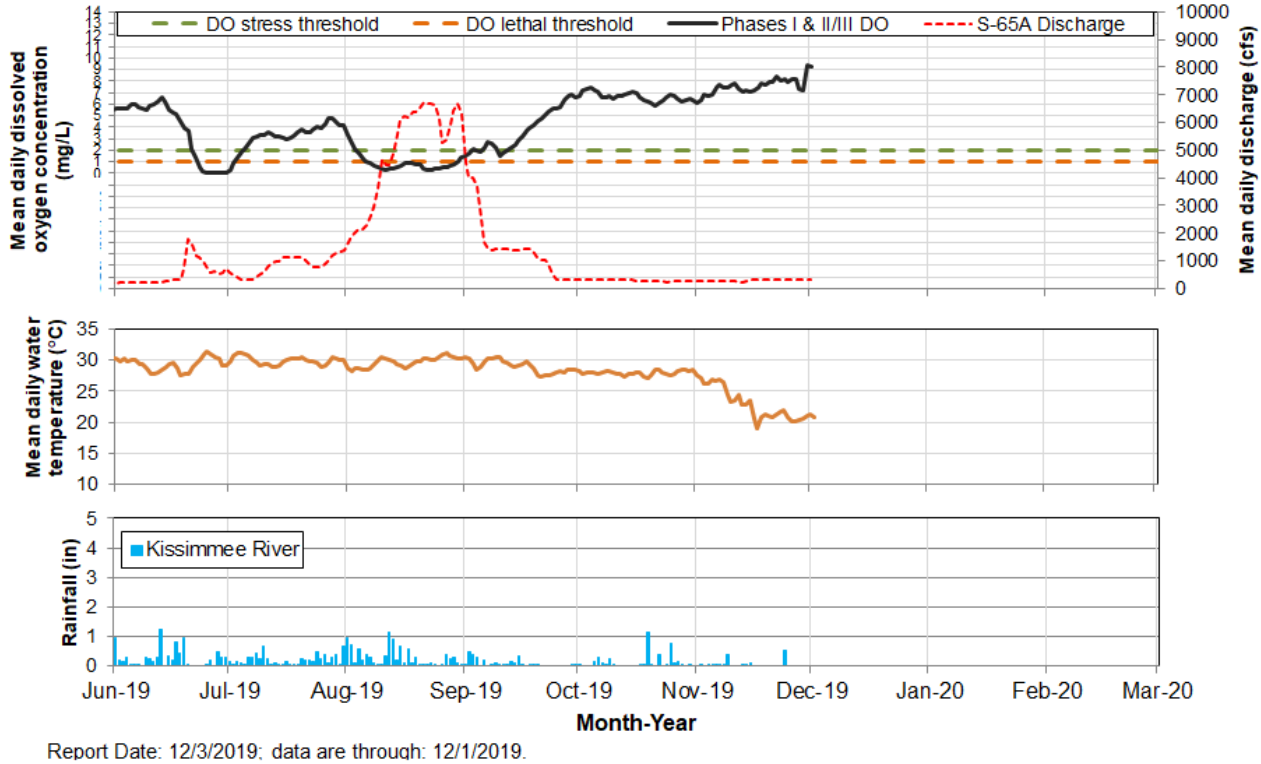


Figure 5. Mean daily dissolved oxygen, discharge, temperature and rainfall in the Phases I/II/III river channel.

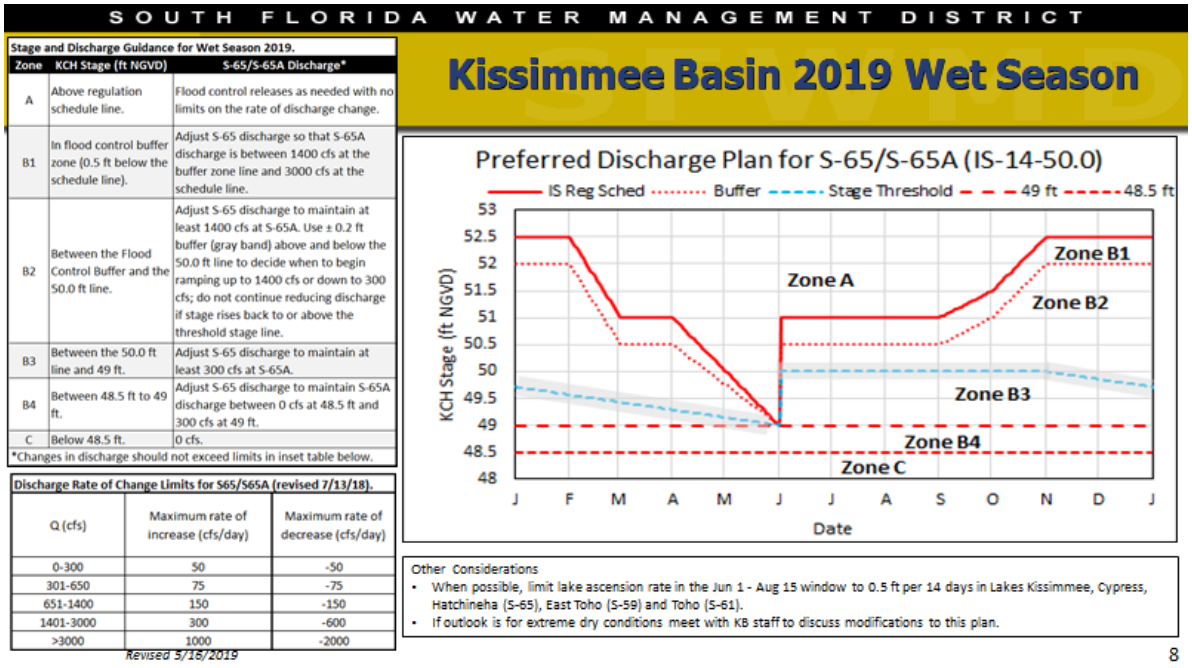


Figure 6. The 2019 Wet Season Discharge Plan for S-65/S-65A.

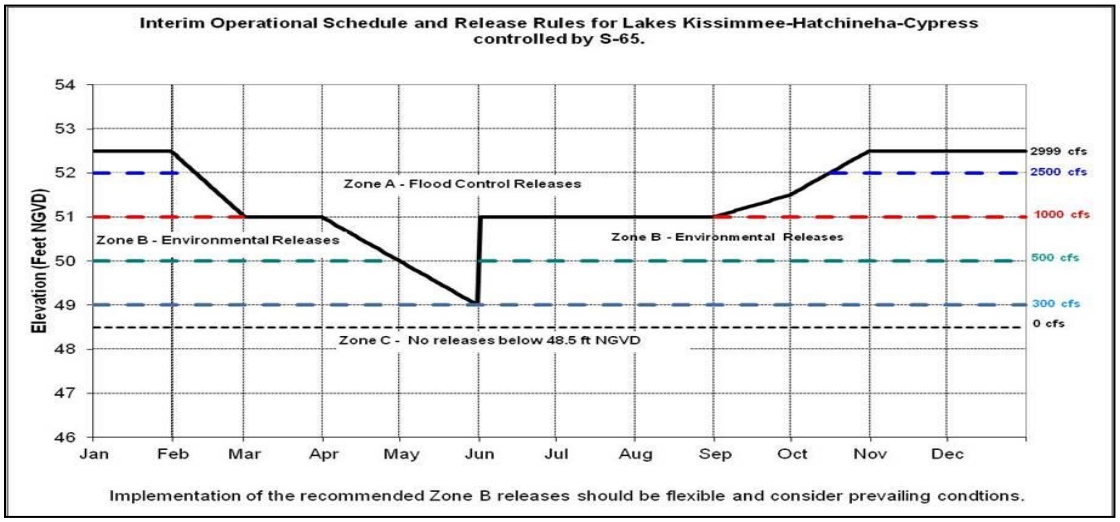


Figure 7. Interim operations schedule for S-65. The discharge schedule shown to the right has not been used in recent years.

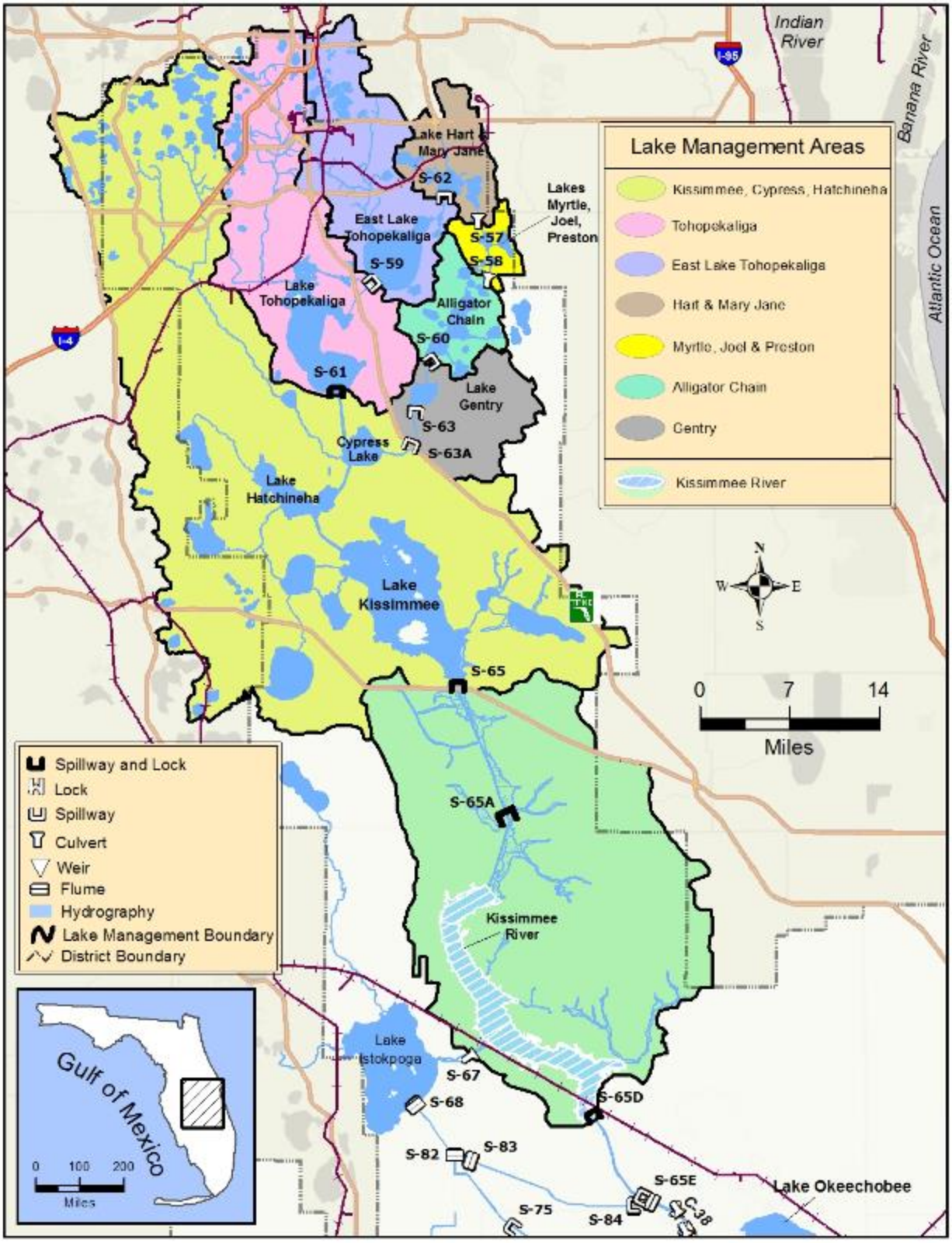


Figure 8. The Kissimmee Basin.

LAKE OKEECHOBEE

According to the USACE web site, Lake Okeechobee average daily lake stage was at 13.07 feet NGVD for December 2, 2019 decreasing 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 0.35 feet lower than a month ago and 0.04 feet higher than a year ago (Figure 1). The Lake is currently 1.43 feet below the preferred ecological envelope (Figure 2). Lake stages 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). Lake stage has exhibited a gradual, steady decline since early September (Figure 4). According to RAINDAR, during the week of November 26 to December 2, 2019, just 0.01 inches of rain fell directly over the Lake, compared to 0.48 inches the previous week. Rainfall across the watershed was similar, with nearly all basins receiving less than 0.1 inches (Figure 5).

The average daily inflows (minus rainfall) to the Lake were similar to the previous week, at 353 cfs. Most of the inflow came from the Kissimmee River (S-65E & S-65EX1) which was also similar to the previous week at 324 cfs. Fisheating Creek averaged 24 cfs, nearly the same as the prior week (Table 1).

Outflow (minus evapotranspiration) was lower than the previous week, going from 1,831 cfs to 1,293 cfs. Flows west through the S-77 decreased from 723 cfs to 521 cfs, while flows south through the S-350 structures fell from 840 cfs the previous week to 590 cfs this past week. There was a decrease of flows east through the S-308, going from 128 cfs per day the previous week to 38 cfs this past week. The corrected average daily evapotranspiration value for the week based on the L006 and LZ40 weather platform solar radiation was the same as the previous week at 0.55 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.

Water quality samples collected on November 5th – 6th, 2019 found elevated values of Chlorophyll a (Chla) in the western portion of the Lake at L008 (27 μg/L), L005 (35 μg/L) and Palmout (28 μg/L) stations, and in the north at KISSR0.0 (31 μg/L) and LZ2 (26 μg/L) stations (Figure 7). Microcystin was not found (detection limit of 0.20 μg/L) at any station and no stations had Chla values >40 μg/L, a threshold which the District considers representative of bloom conditions.

The most recent available satellite imagery (December 1, 2019) using NOAA's cyanobacteria monitoring product derived from EUMETSAT's Sentinel 3 OLCI sensor data showed that bloom potential remains low across most of the Lake, with a medium risk around Fisheating Bay and the southwestern edge of the Lake (Figure 8). The southwest portion appears to have increased in potential from prior weeks.

Water Management Recommendations

Lake Okeechobee stage was 13.07 feet NGVD on December 2, 2019, down 0.08 feet from the previous week and 0.35 feet from the previous 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. Water levels moved below the ecological envelope (which varies seasonally from 12.5 – 15.5 feet NGVD +/- 0.5 feet) on October 15, 2019 and are currently 1.43 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 since late October of last year. The latest estimate of cyanobacteria bloom potential (December 1,

2019) shows that estimated bloom potential is medium around Fisheating bay and the southwest portion of the Lake where blooms tend to originate; the rest of the Lake is estimated as no- to low-risk.

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	337	324	0.1
S-71 & S-72	0	0	0.0
S-84 & S-84X	0	0	0.0
Fisheating Creek	22	24	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	4	5	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	1081	22	0.0
Total	**1444**	**376**	**0.2**

OUTFLOWS	Previous week Avg Daily CFS	Avg Daily Flow cfs	Equivalent Depth Week Total (in)
S-77	723	521	0.2
S-308	128	38	0.0
S-351	366	325	0.1
S-352	233	97	0.0
S-354	241	168	0.1
L-8 Outflow	140	144	0.1
ET	1244	1231	0.5
Total	**3075**	**2524**	**1.1**

Provisional Data

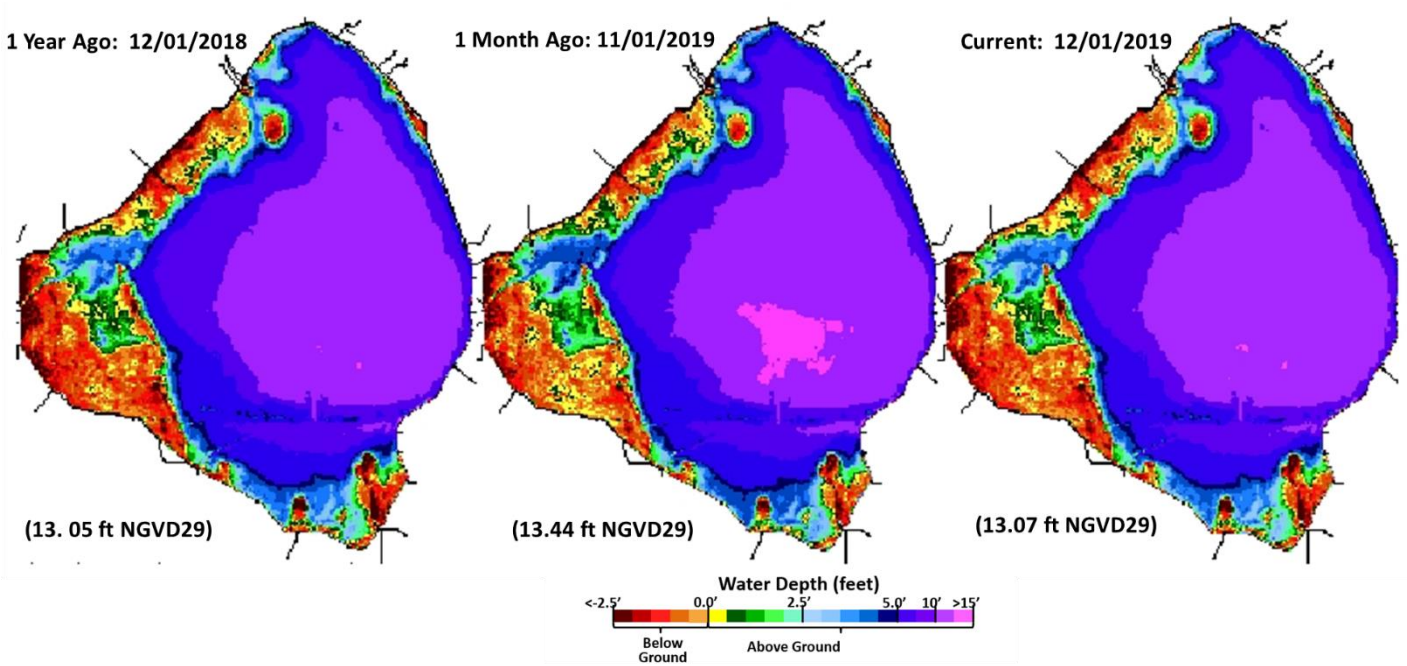


Figure 1. Water depth estimates on Lake Okeechobee based on the South Florida Water Depth Assessment Tool.

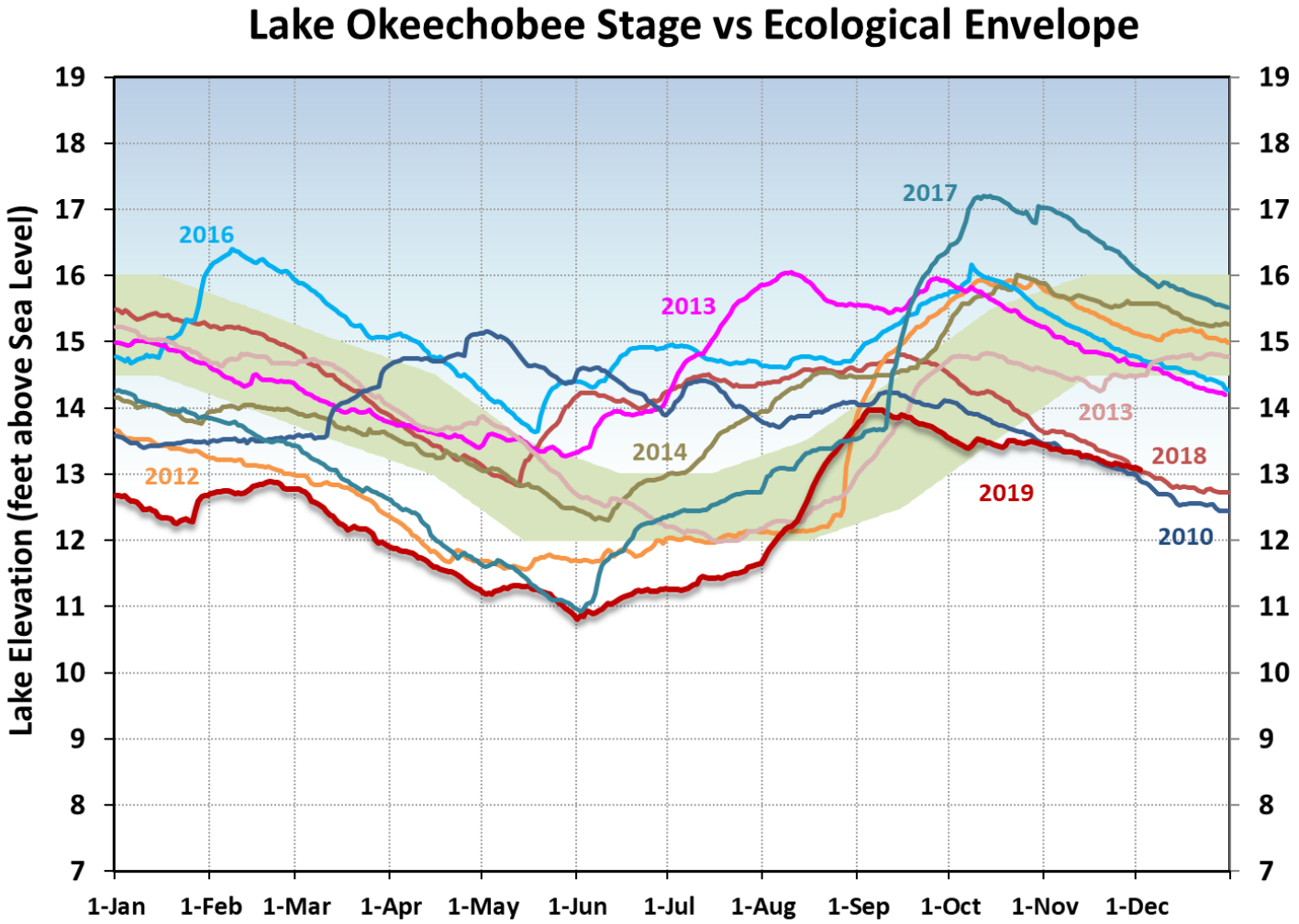


Figure 2. Select annual stage hydrographs for Lake Okeechobee in comparison to the Ecological Envelope.

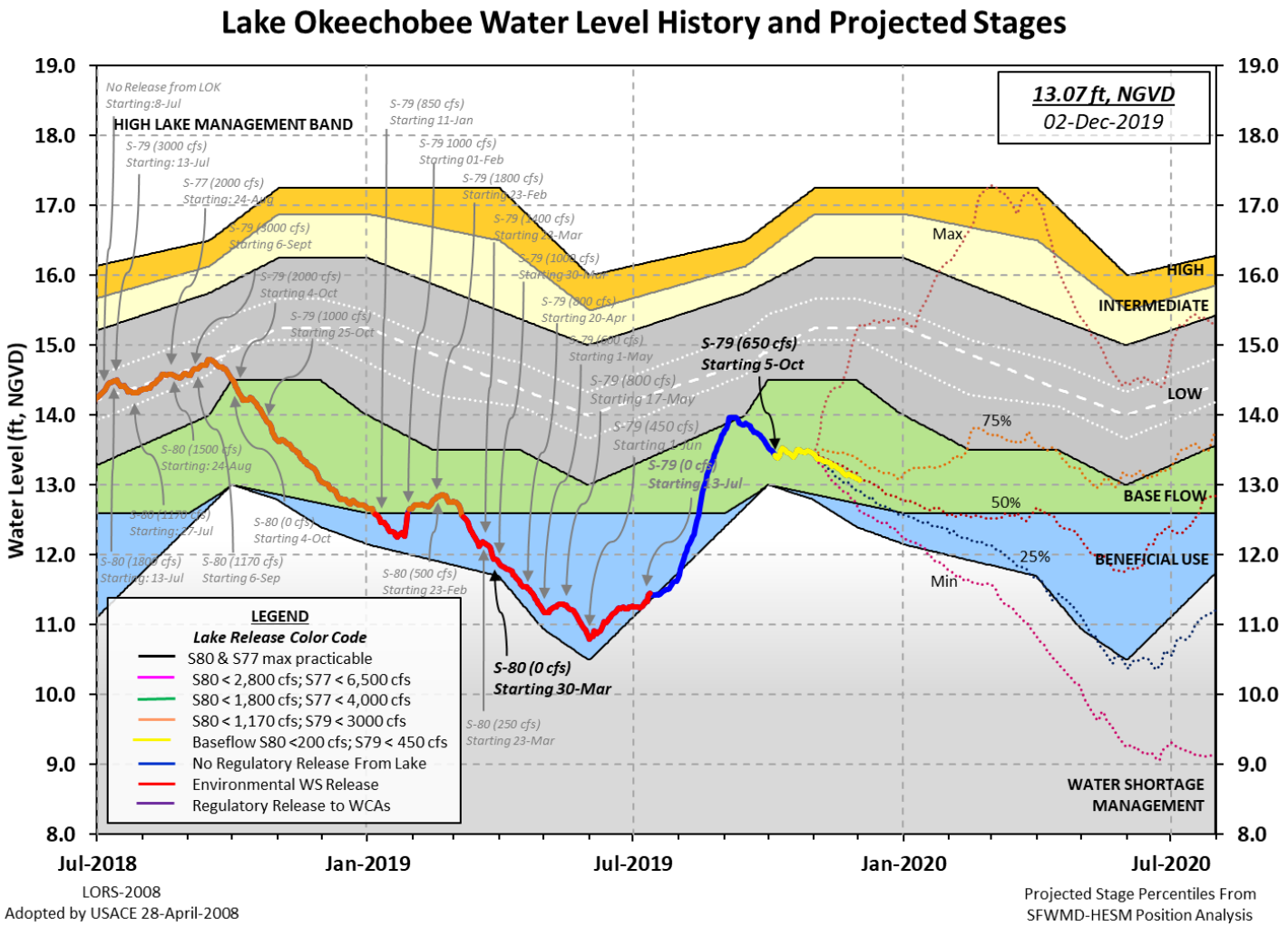


Figure 3. Recent Lake Okeechobee stage and releases, with projected stages based on a dynamic position analysis.

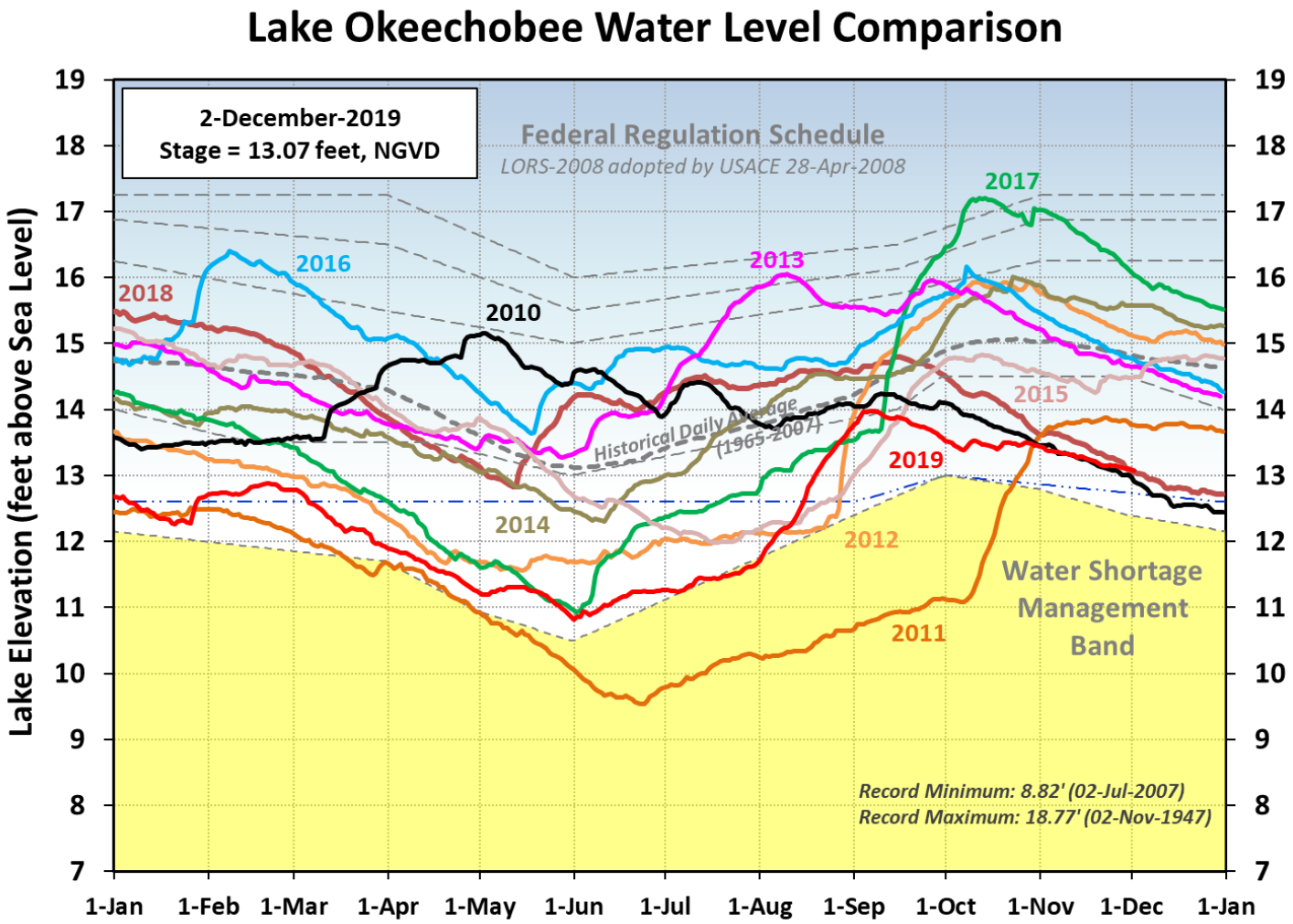


Figure 4. Select annual stage hydrographs for Lake Okeechobee from 2010 – 2019.

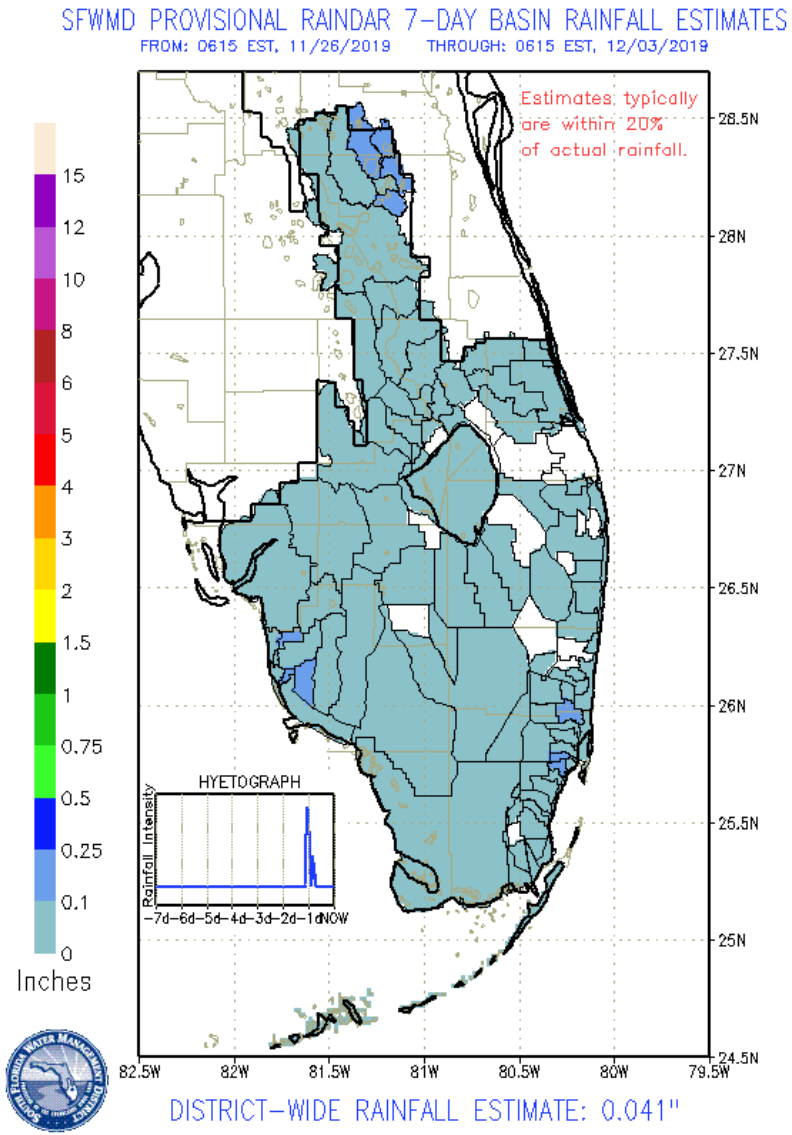


Figure 5. Rainfall estimates by basin.

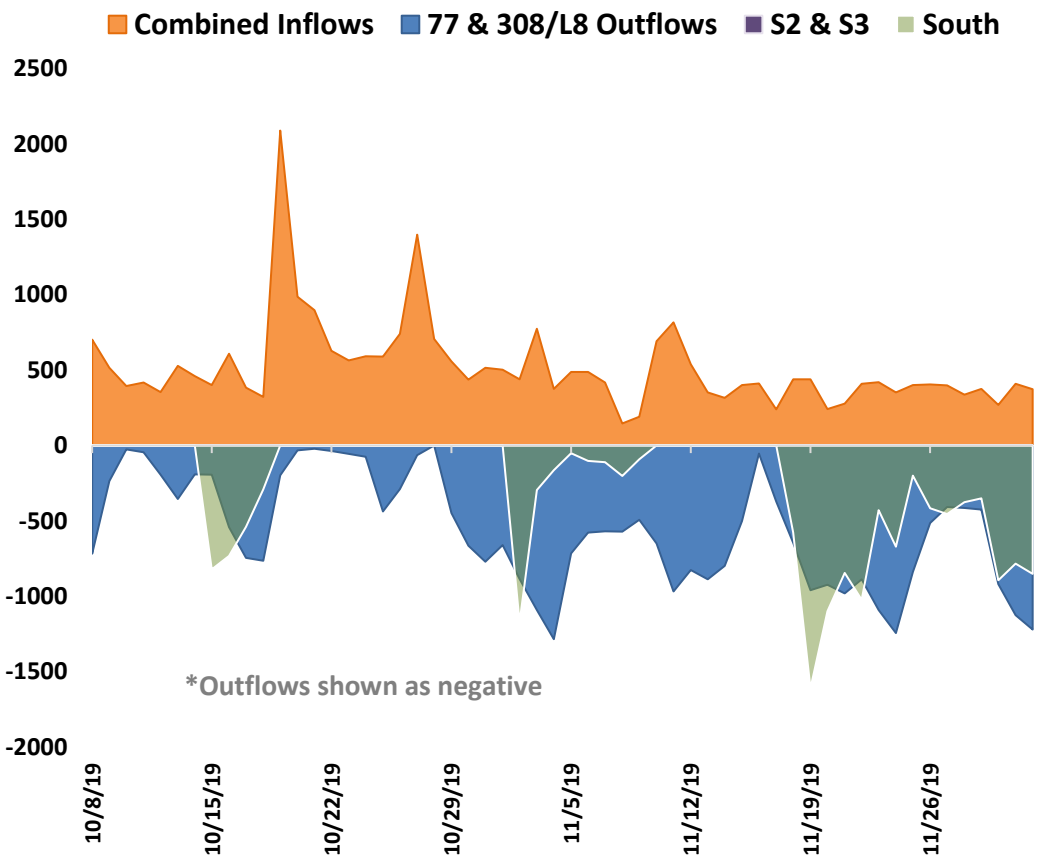
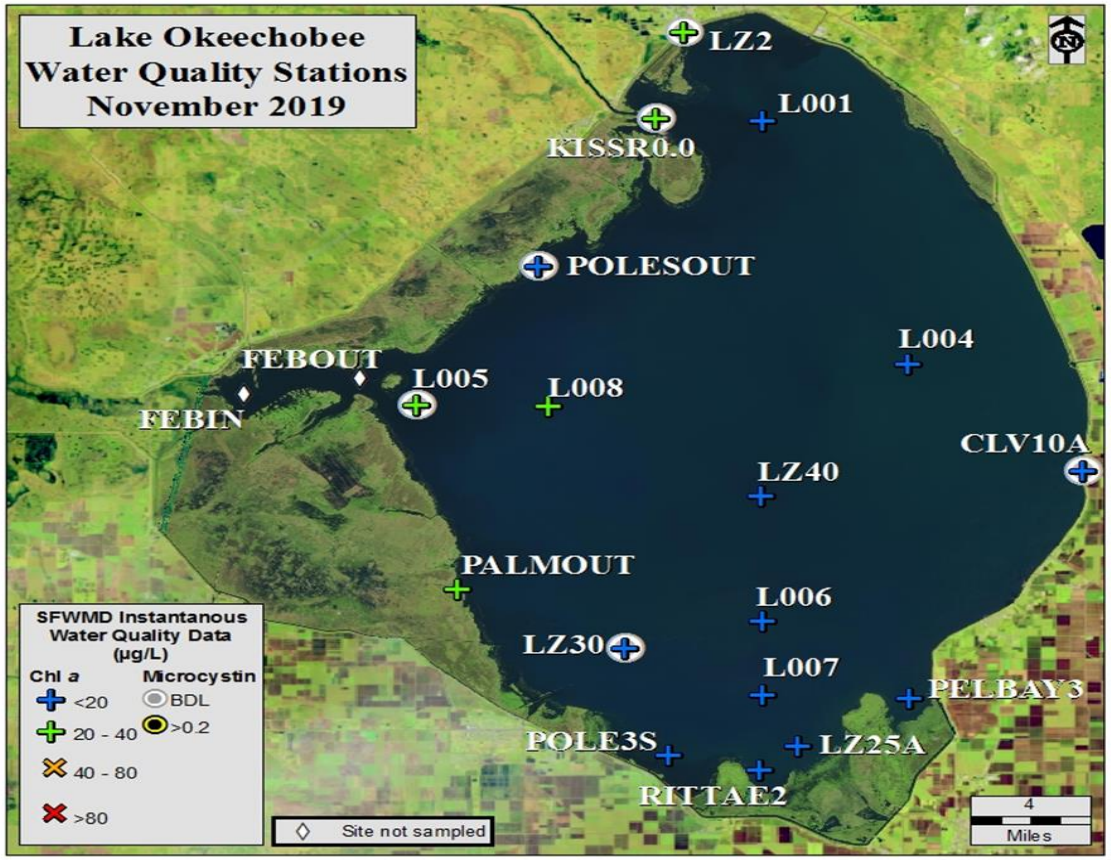


Figure 6. Major inflows (orange) and outflows (blue) of Lake Okeechobee, including the S-350 structures designated as South (green). The L-8 Canal flows through Culvert 10A are included as outflows when positive, and as inflows when backflowing into the lake. All inflows and outflows are shown as positive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



November 5-6, 2019

Site	Chlorophyll *a* (µg/L)	Microcystin (µg/L)
Nearshore Stations		
KISSR0.0	**30.5**	BDL
L005	**35.4**	BDL
LZ2	**26.0**	BDL
LZ25A	8.5	
PALMOUT	**28.2**	
PELBAY3	6.4	
POLE3S	12.6	
POLESOUT	19.5	BDL
RITTAE2	11.5	
Pelagic Stations		
CLV10A	10.0	BDL
L001	11.1	
L004	10.6	
L006	7.4	
L007	6.9	
L008	**27.0**	
LZ30	7.4	
LZ40	7.4	

Figure 7. Chlorophyll *a* (µg/L) and microcystin (µg/L) values for nearshore and pelagic stations for November 5th and 6th, 2019. SFWMD classifies an algal bloom as having Chla values >40 µg/L. Microcystin values <0.20 µg/L are below the detection limit (BDL).

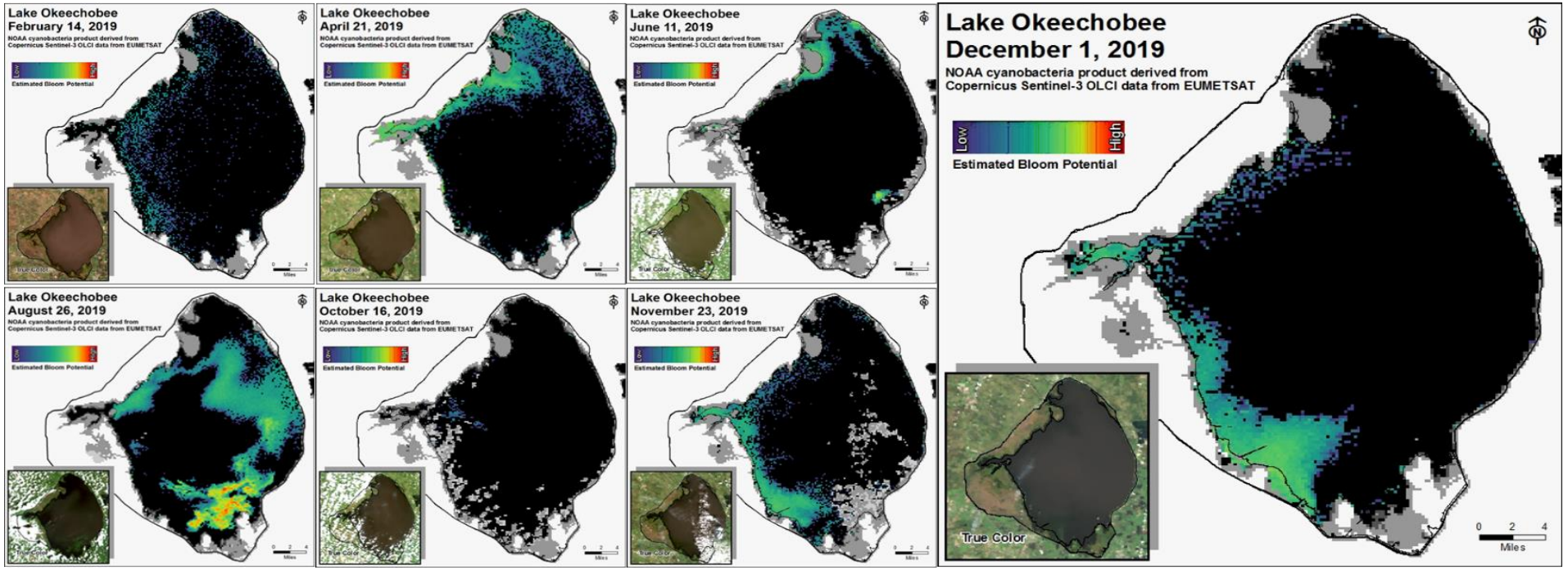


Figure 8. Potential for cyanobacterial blooms on Lake Okeechobee in 2019, based on NOAA's harmful algal bloom monitoring system derived from Copernicus Sentinel-3 OLCI data from EUMETSAT. Gray indicates cloud cover.

ESTUARIES

St. Lucie Estuary:

Last week total inflow to the St. Lucie Estuary averaged approximately 188 cfs (Figures 1 and 2) and last month inflow averaged about 405 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	107
S-80	0
S-308	38
S-49 on C-24	0
S-97 on C-23	0
Gordy Rd. structure on Ten Mile Creek	81

Over the past week, salinity remained about the same 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 20.8. 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)	**17.3** (17.1)	**20.0** (20.6)	NA[1]
US1 Bridge	**20.2** (20.4)	**21.4** (21.3)	10.0-26.0
A1A Bridge	**27.1** (26.6)	**28.9** (28.5)	NA[1]

[1]Envelope not applicable

Caloosahatchee Estuary:

Last week total inflow to the Caloosahatchee Estuary averaged approximately 738 cfs (Figures 5 and 6) and last month inflow averaged about 793 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	521
S-78	462
S-79	637
Tidal Basin Inflow	101

Over the past week in the estuary, salinity decreased to Val I75 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 surface salinities (Table 4) are in the good range for Tape Grass at Val I-75 and in the fair range at Ft. Myers.

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

Sampling Site	Surface	Bottom	Envelope
S-79 (Franklin Lock)	**5.9** (7.0)	**6.1** (7.2)	NA[1]
Val I75	**7.4** (7.9)	**9.3** (10.7)	0.0-5.0[2]
Ft. Myers Yacht Basin	**13.5** (13.0)	**14.9** (16.2)	NA
Cape Coral	**19.6** (20.0)	**21.3** (21.8)	10.0-30.0
Shell Point	**29.2** (28.3)	**29.5** (29.4)	10.0-30.0
Sanibel	**31.7** (31.8)	**31.6** (31.8)	10.0-30.0

[1]Envelope not applicable and [2]Envelope 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 5.3 to 11.0 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 90 cfs. The 30-day moving average surface salinity at Val I-75 is forecast to be between 6.2 and 8.2 within two weeks (Table 5). This and the current salinity conditions at Val I-75 outside the envelope of salinity 0.0-5.0 for this site (Table 4) indicate that 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	90	11.0	8.2
B	300	90	8.6	7.4
C	450	90	7.1	6.8
D	650	90	5.5	6.3
E	800	90	5.3	6.2

Red tide

The Florida Fish and Wildlife Research Institute reported on November 27, 2019, that *Karenia brevis,* the Florida red tide dinoflagellate, was observed at very low to high concentrations in 30 samples collected from and/or offshore of Lee County. *Karenia brevis* was not observed in samples collected from Palm Beach County (no samples were analyzed this week from St. Lucie, Martin, Broward 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 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.

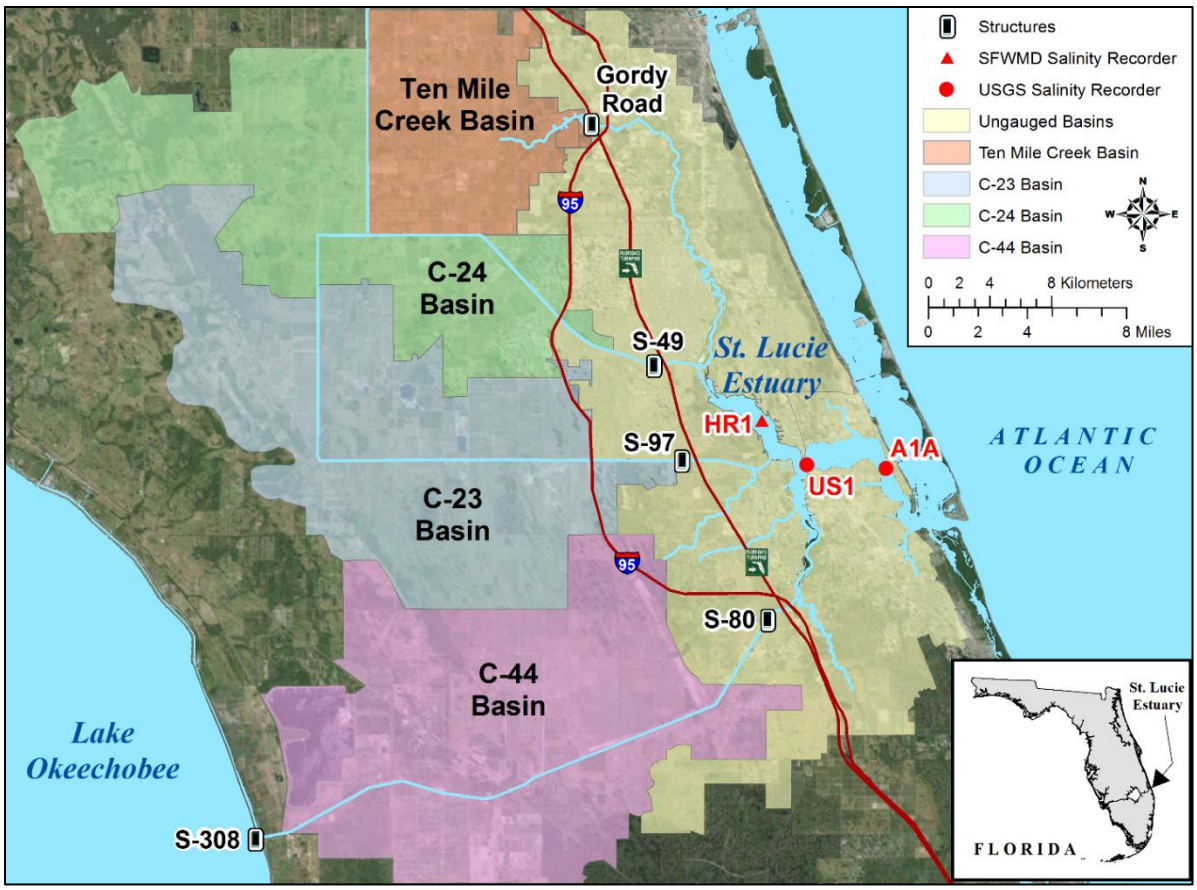


Figure 1. Basins, water control structures, and salinity monitoring for the St. Lucie Estuary.

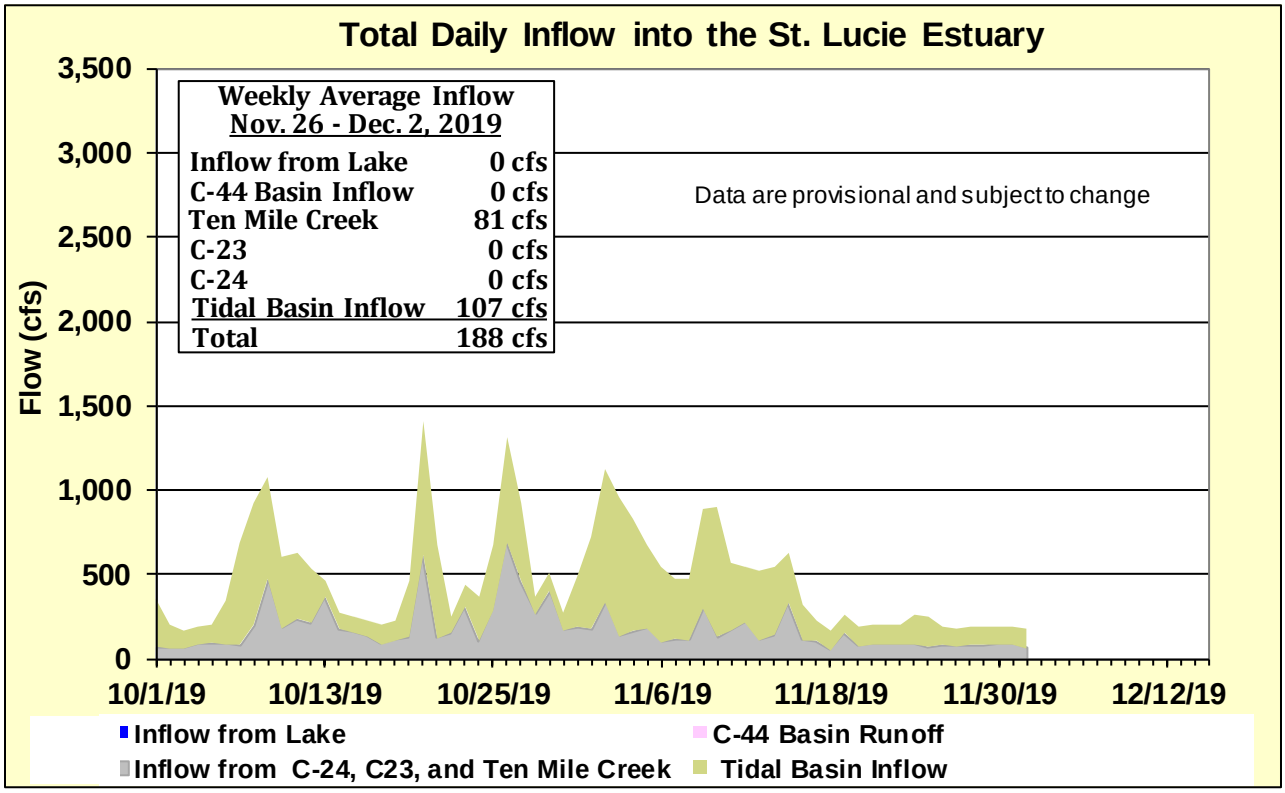


Figure 2. Total daily inflows from Lake Okeechobee and runoff from the C-44, C-23, C-24, Ten Mile Creek, and tidal basin into the St. Lucie Estuary.

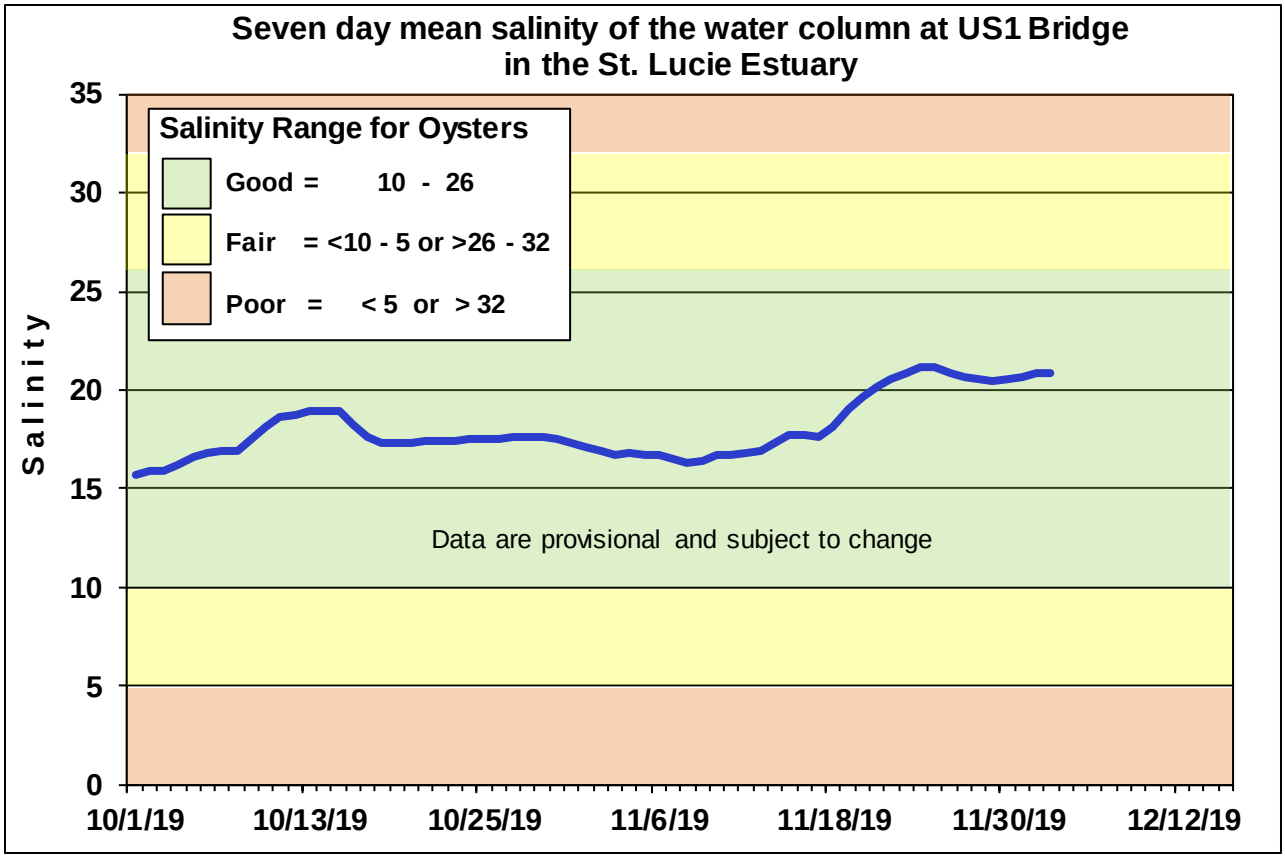


Figure 3. Seven-day mean salinity of the water column at the US1 Bridge.

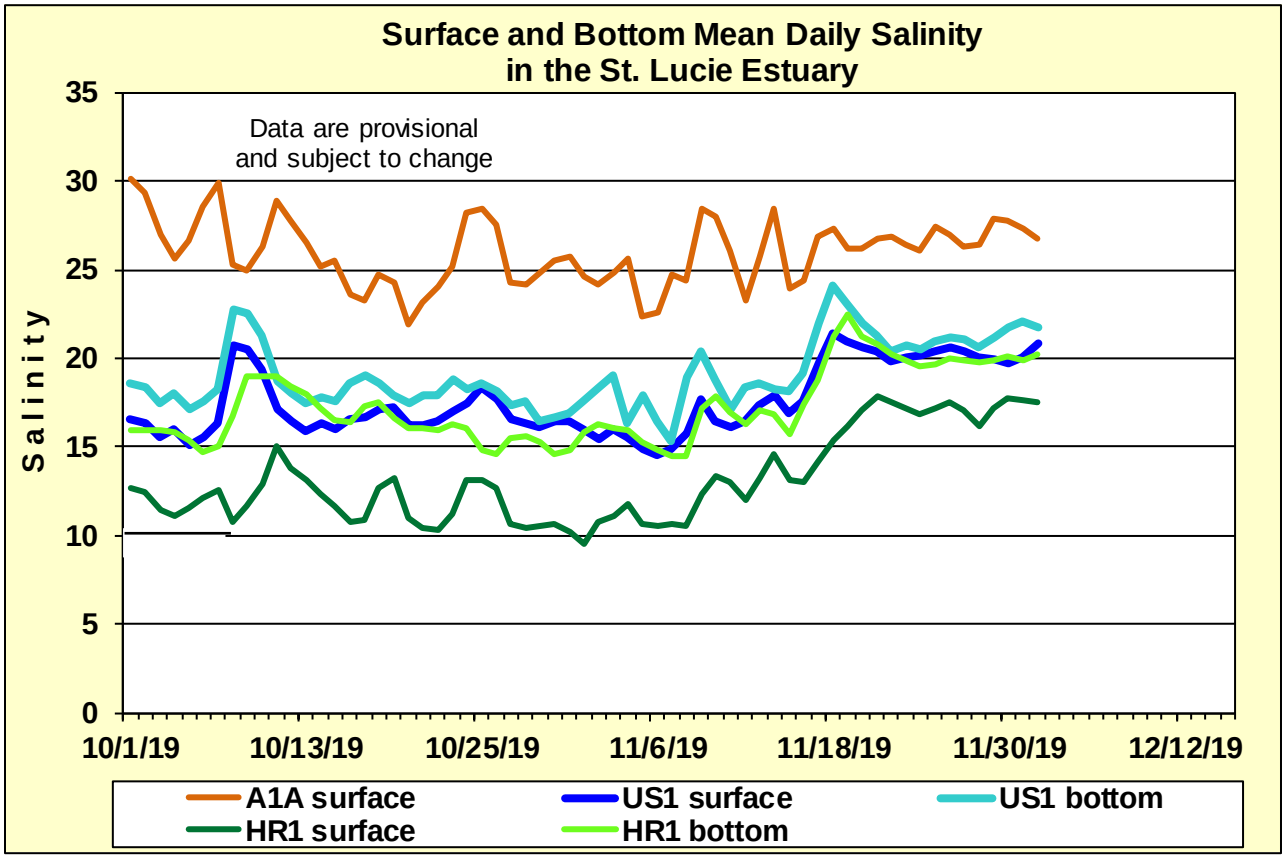


Figure 4. Daily mean salinity at the A1A, US1, and HR1 stations.

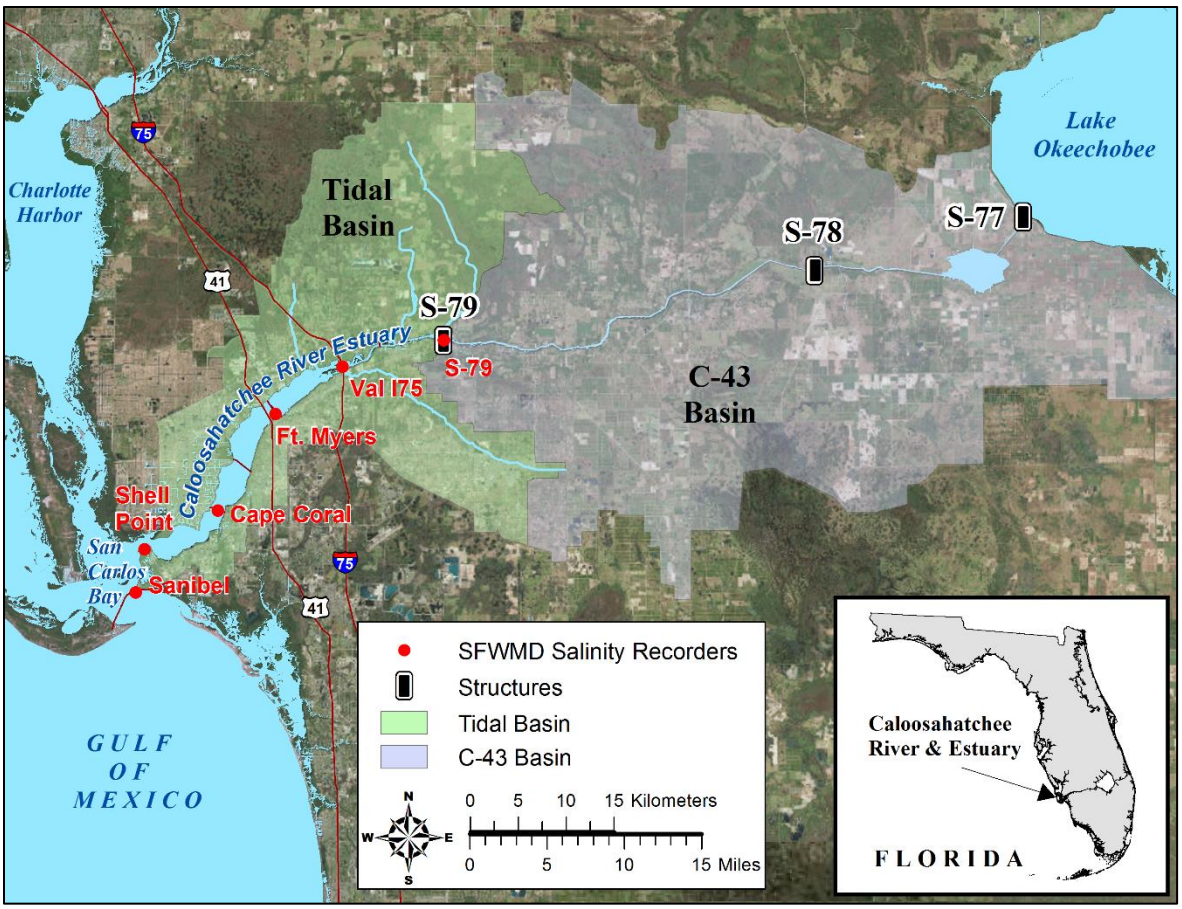


Figure 5. Basins, water control structures, and salinity monitoring for the Caloosahatchee Estuary.

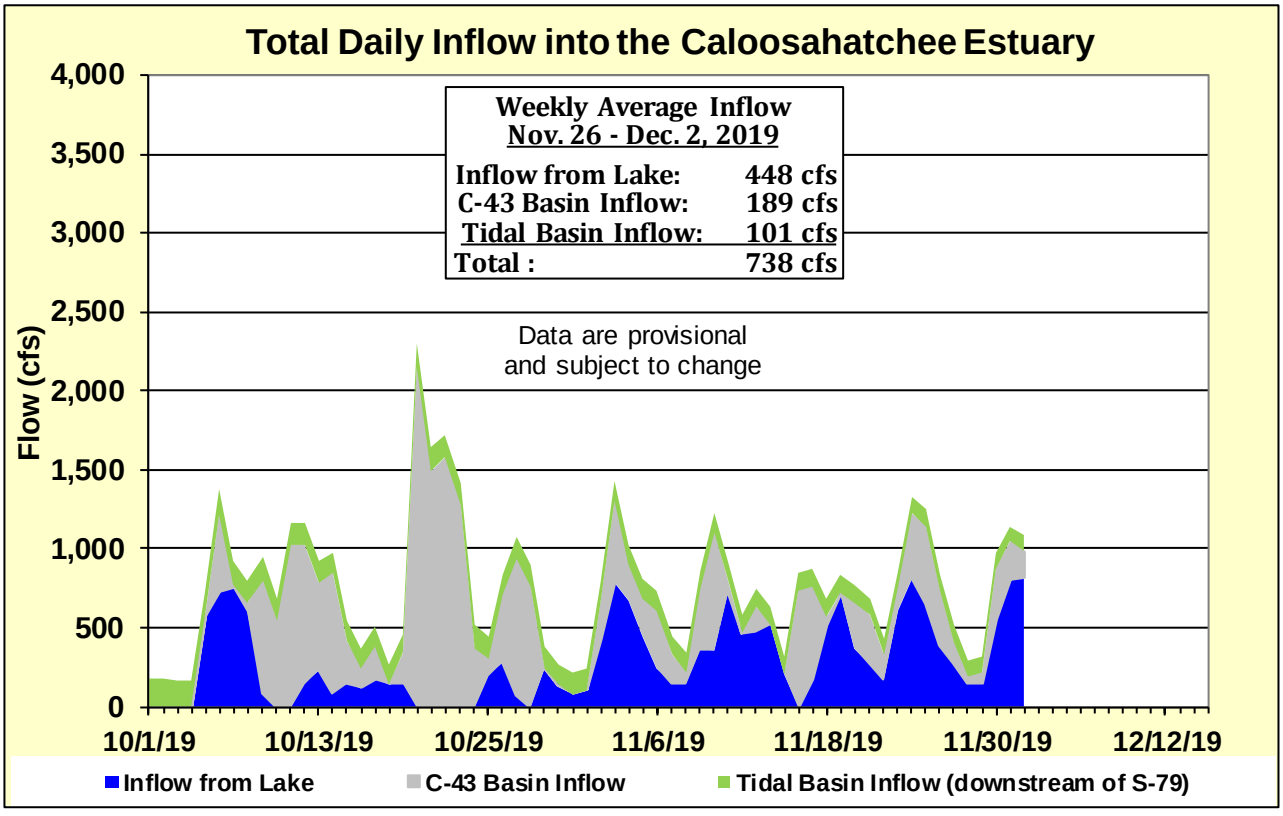


Figure 6. Total daily inflows from Lake Okeechobee, runoff from the C-43 basin, and tributaries in the tidal basin into the Caloosahatchee River Estuary.

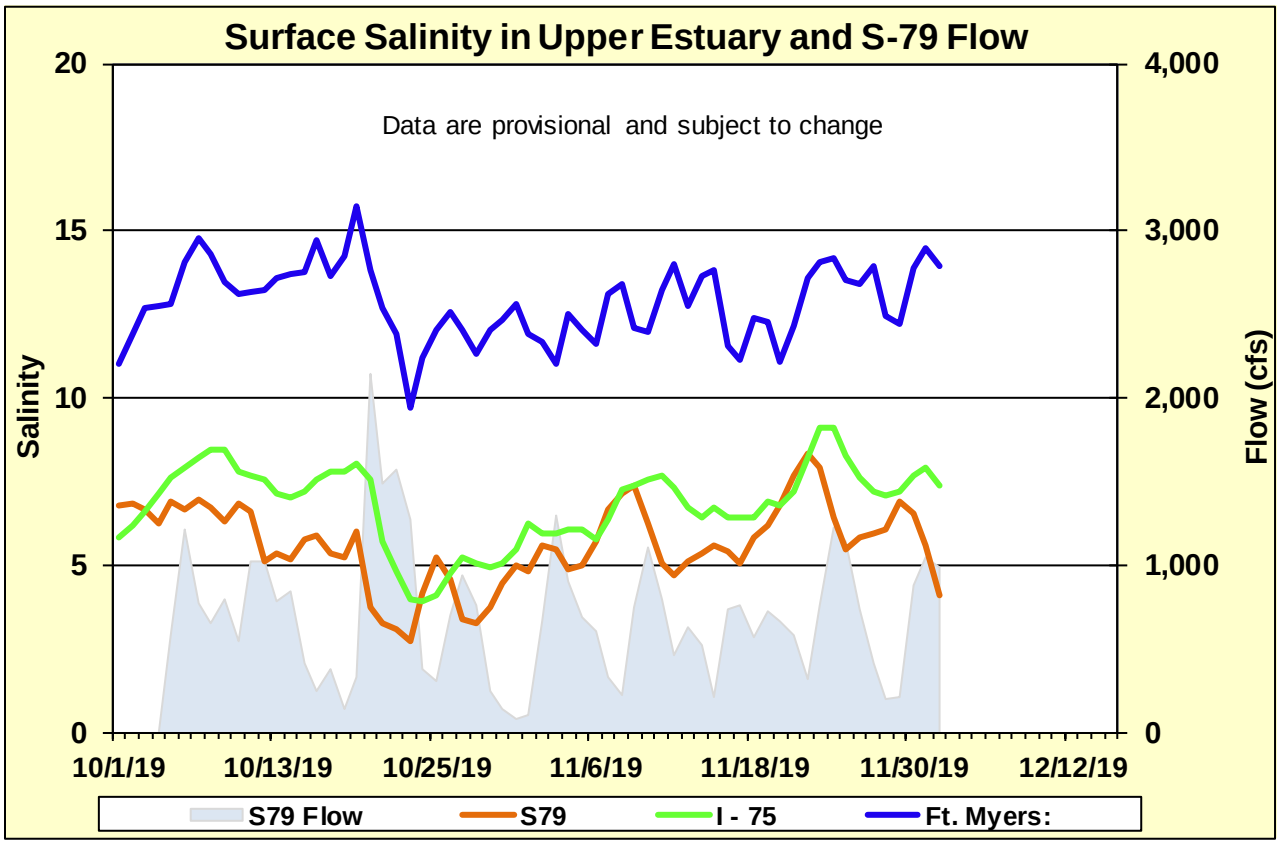


Figure 7. Daily mean flows at S-79 and salinity at upper estuary monitoring stations.

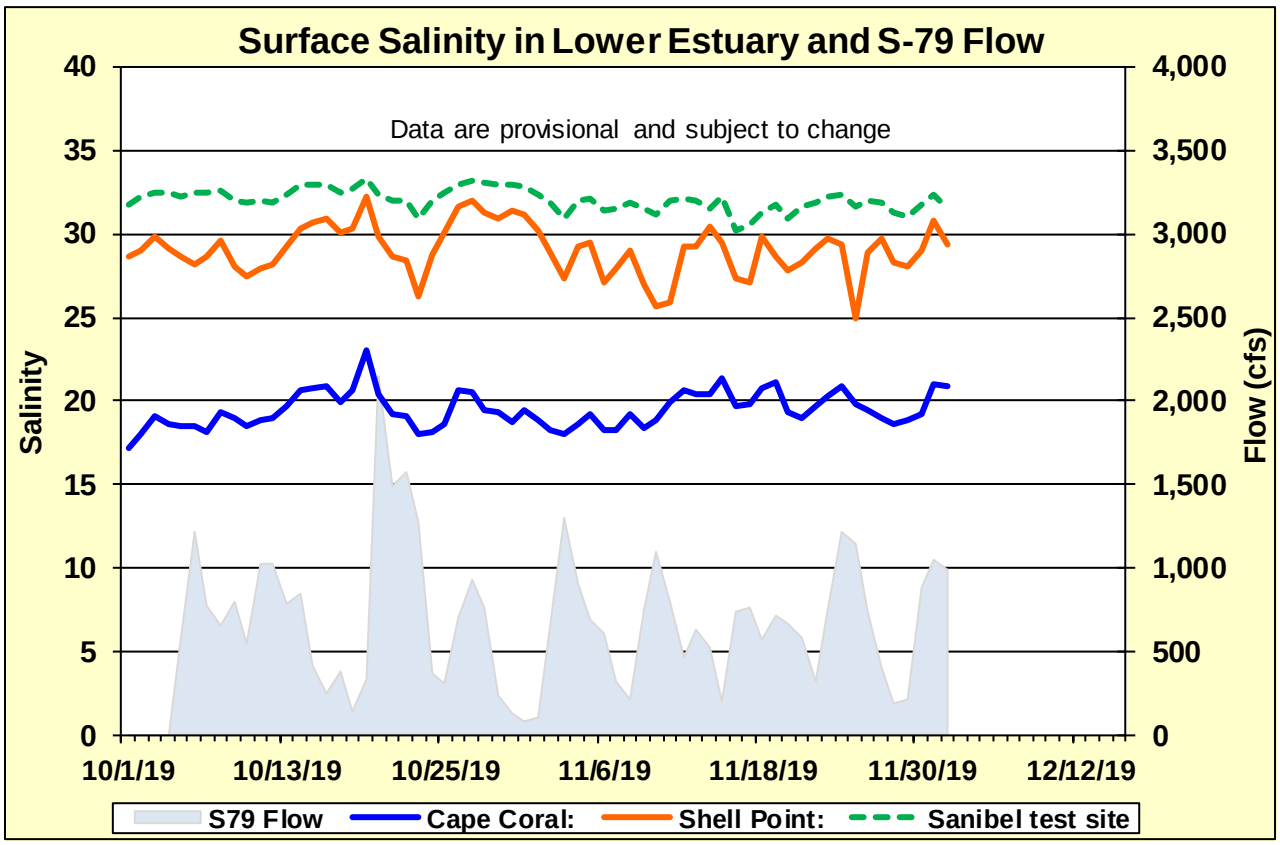


Figure 8. Daily mean flows at S-79 and salinity at lower estuary stations.

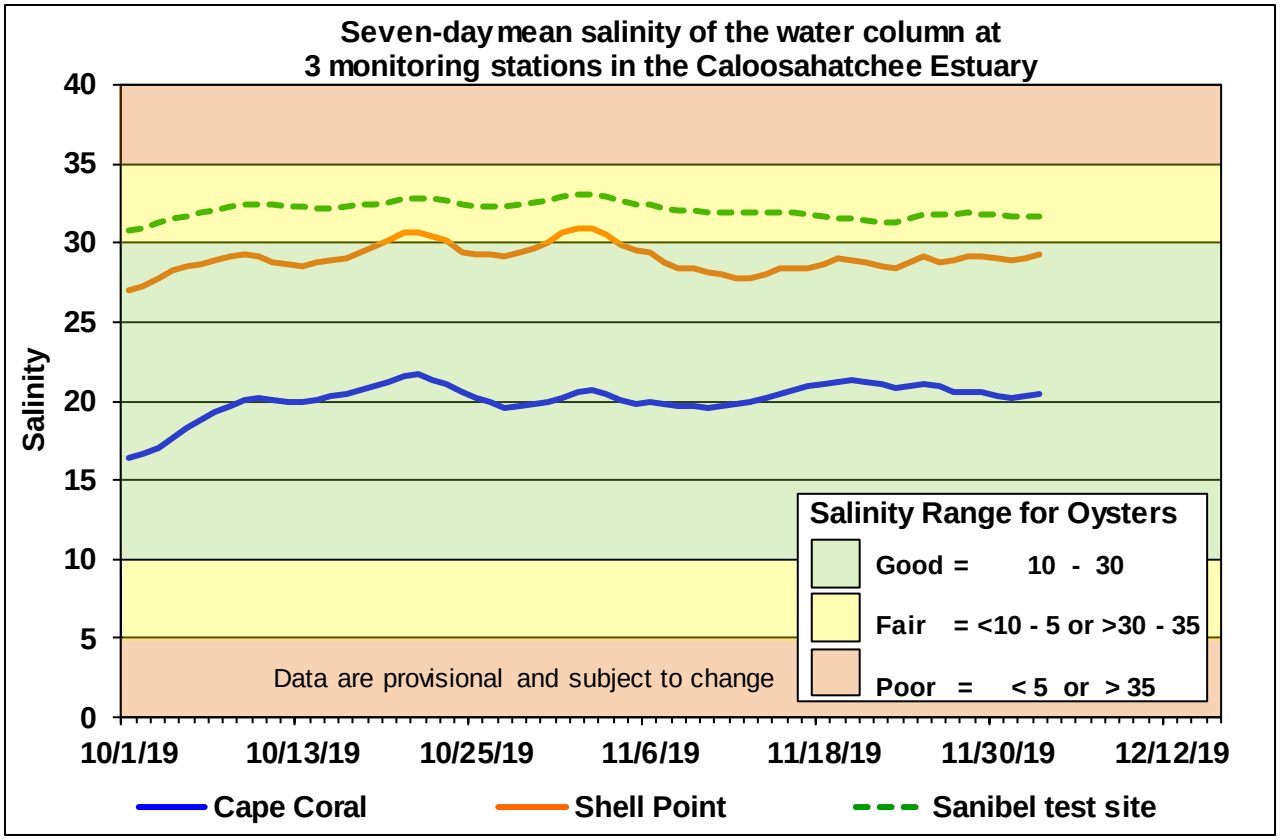


Figure 9. Seven-day mean salinity at Cape Coral, Shell Point, and Sanibel monitoring stations.

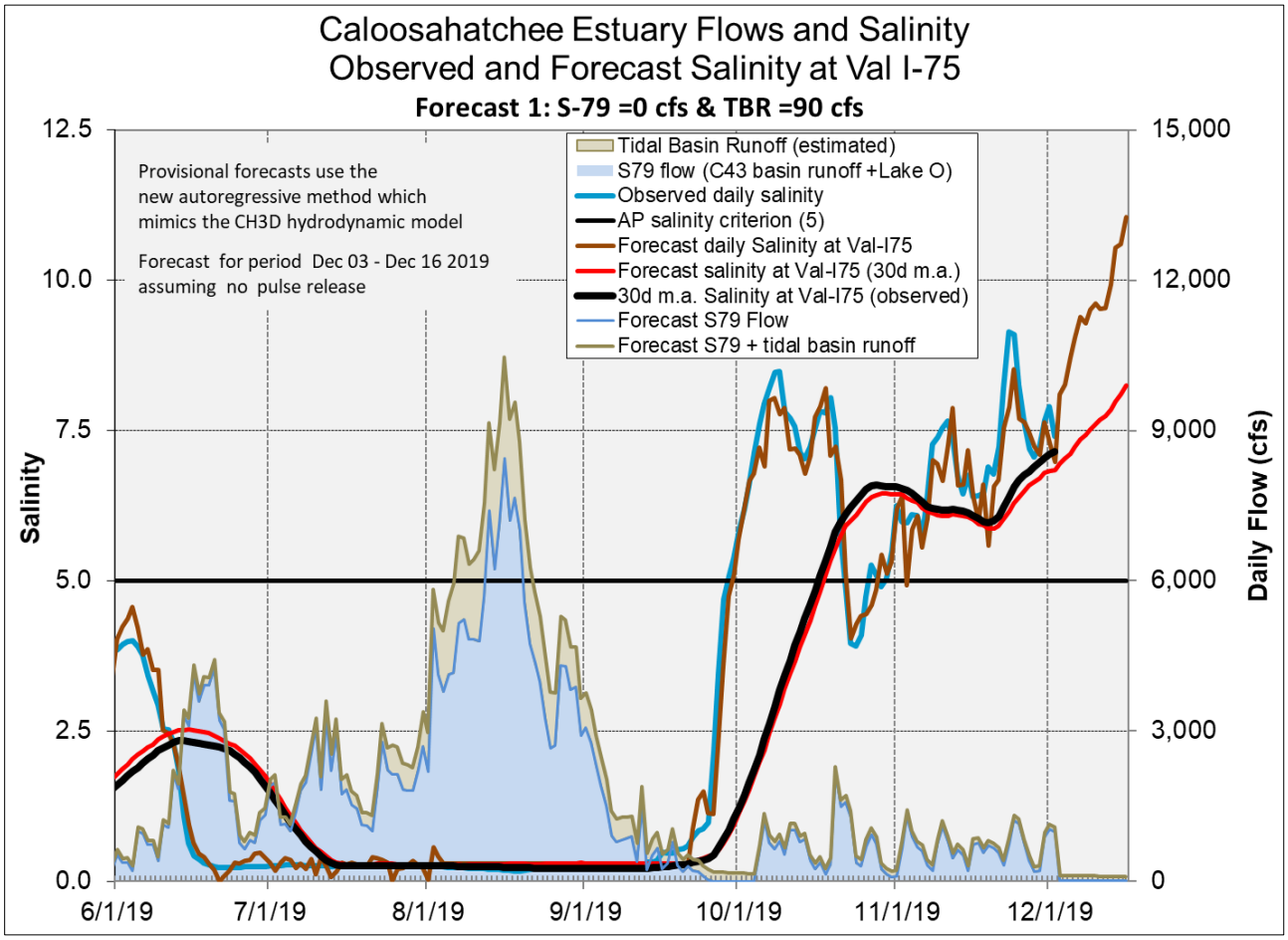


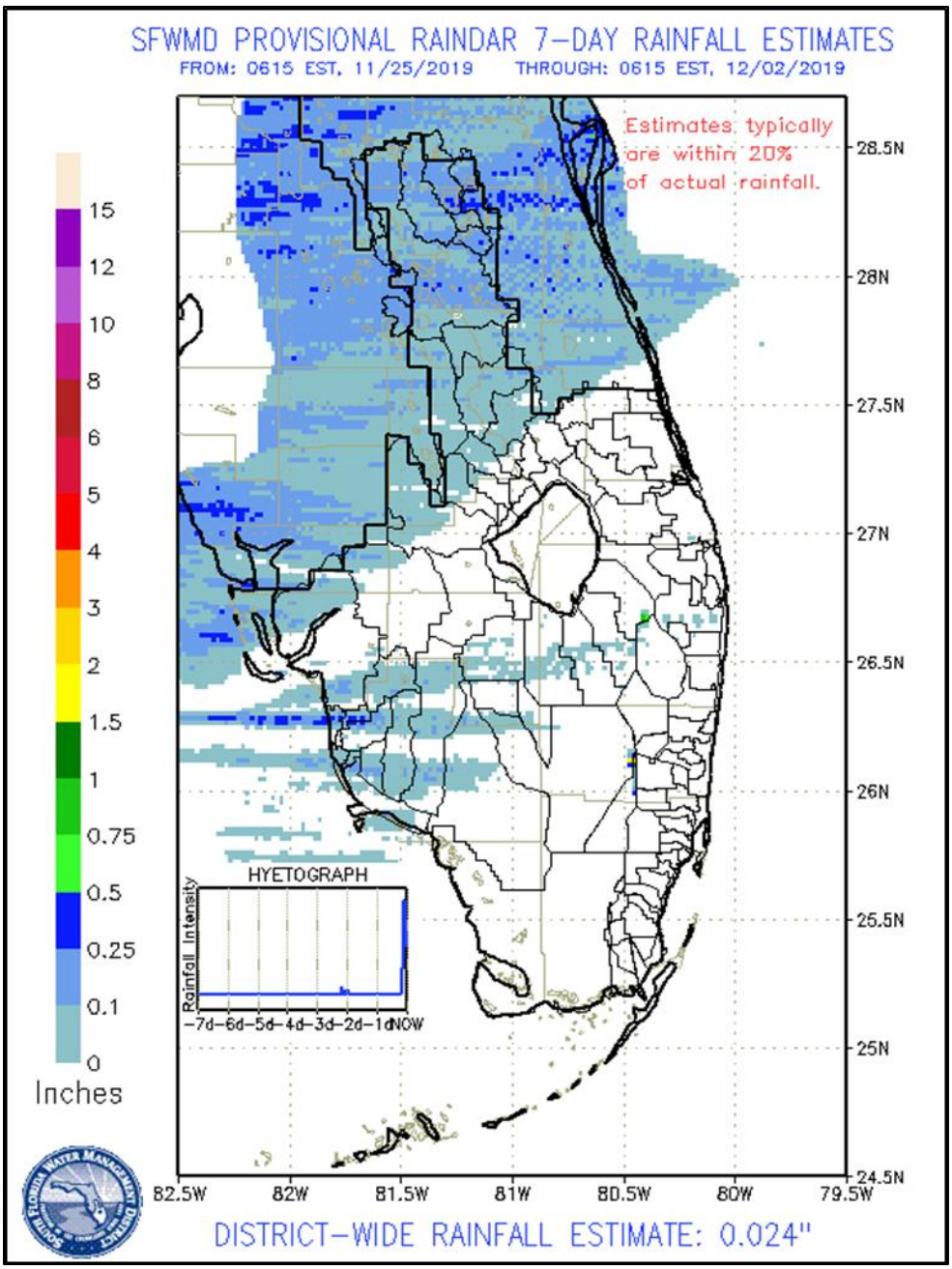
Figure 10. Forecasted Val I-75 surface salinity assuming no pulse release at S-79.

EVERGLADES

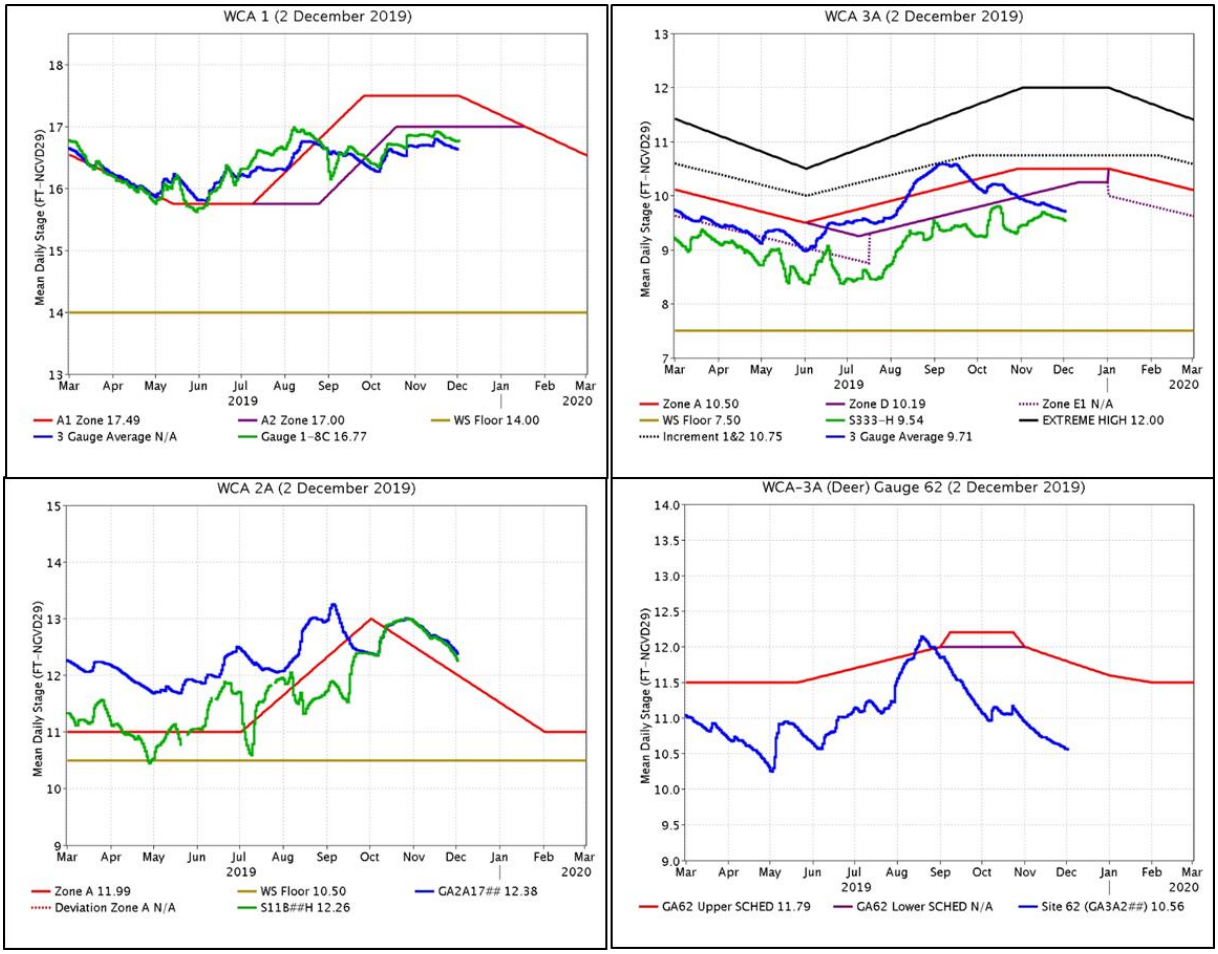
Almost no rainfall occurred within the Everglades last week, however most regions receded at an optimal rate for wading bird foraging. Pan evaporation was estimated at 0.90 inches.

Everglades Region	Rainfall (Inches)	Stage Change (feet)
WCA-1	0.01	−0.07
WCA-2A	0.00	−0.21
WCA-2B	0.00	−0.05
WCA-3A	<0.01	−0.07
WCA-3B	0.04	−0.08
ENP	0.00	−0.18

Good
Fair
Poor



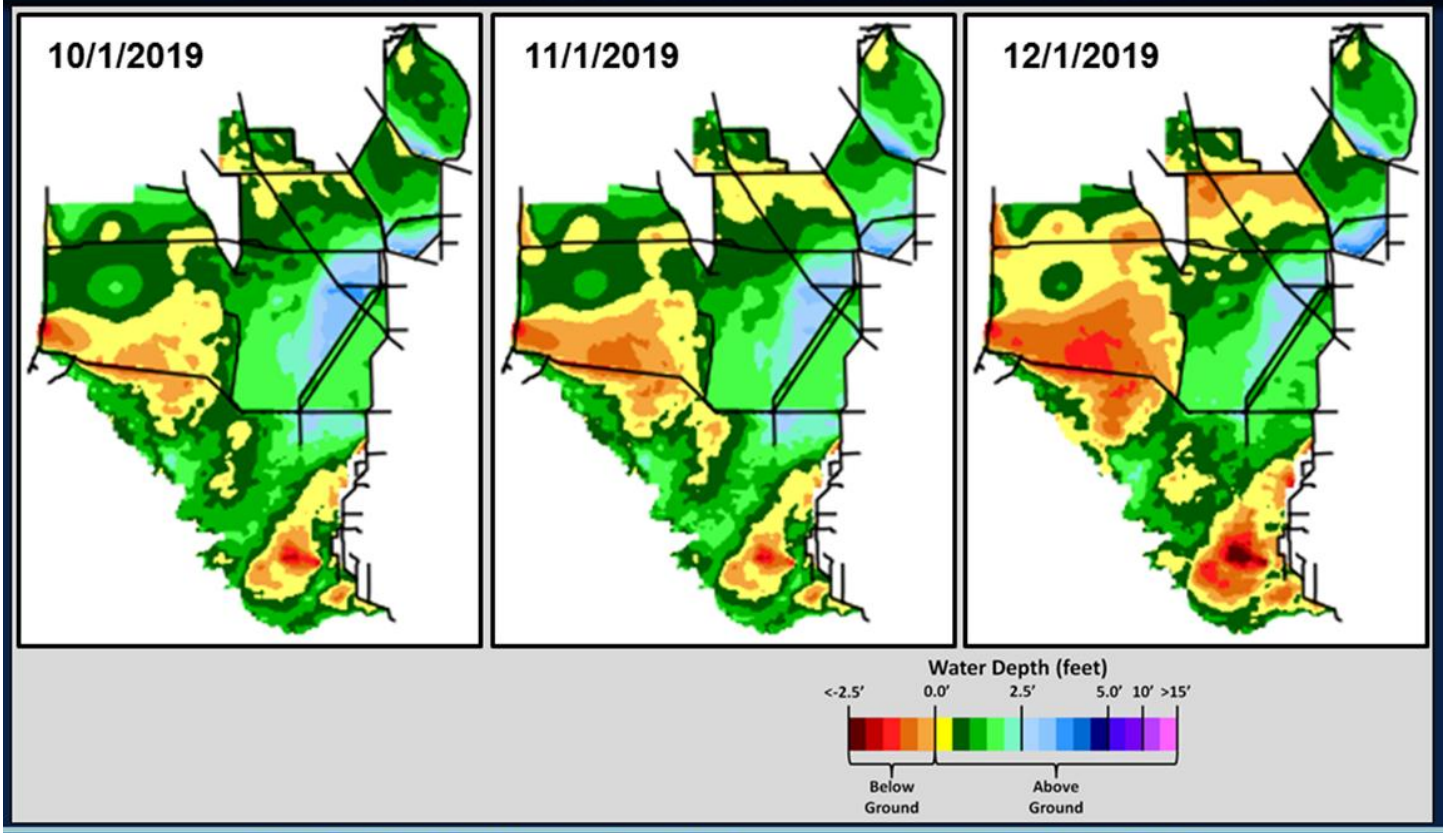
Regulation Schedules: WCA-1: The three-gauge average continues following below the Zone A2 regulation line, currently 0.38 feet below and trending slightly downward. WCA-2A: The marsh stage at gauge GA2A17 remains above the Zone A regulation line, currently 0.39 feet above and moving closer to the falling line this week. WCA-3A: The three-gauge average stage trends downward away from schedule over last week, currently 0.48 feet below the rising Zone D regulation line. WCA-3A: At gauge 62 (northwest corner) continues to trend away from the falling upper schedule at 1.23 feet below.



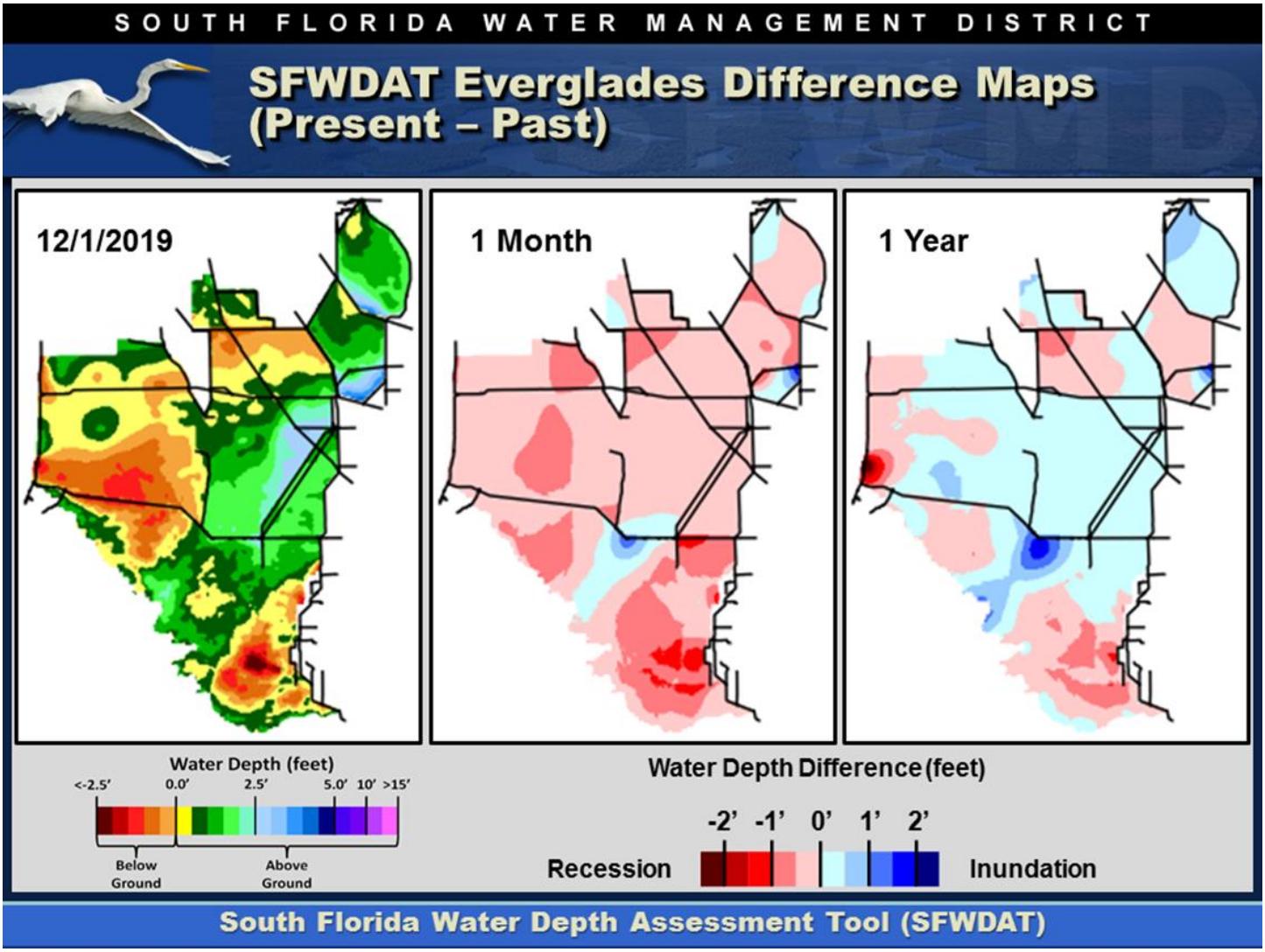
Water Depths: The WDAT tool for spatial interpolation of depth monthly snapshots indicate depths at or below ground across most of WCA-3A North, and new this week in that basin depths have reached more than 0.5' below ground along the Miami canal. Depths exceed 4 feet across parts of WCA-2B. Comparing WDAT water levels from present, water depths over the last month are lower across most of the Everglades and western basins, with the exception being 2B which is significantly wetter. Substantial recessions nearing -1.0 feet occurred in northwest WCA-3A and northern WCA-2A. Looking back one year the stage differences are mixed in WCA-3A with the northwest corner significantly drier and the rest of the basin slightly wetter. WCA-1 is significantly wetter especially in the northern region and WCA-2A is slightly drier. December of 2018 was a relatively dry time with below average stages and rainfall. ** model output in Everglades National Park is suspect due to datum issues.

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

SFWDAT Water Depth Monthly Snapshots

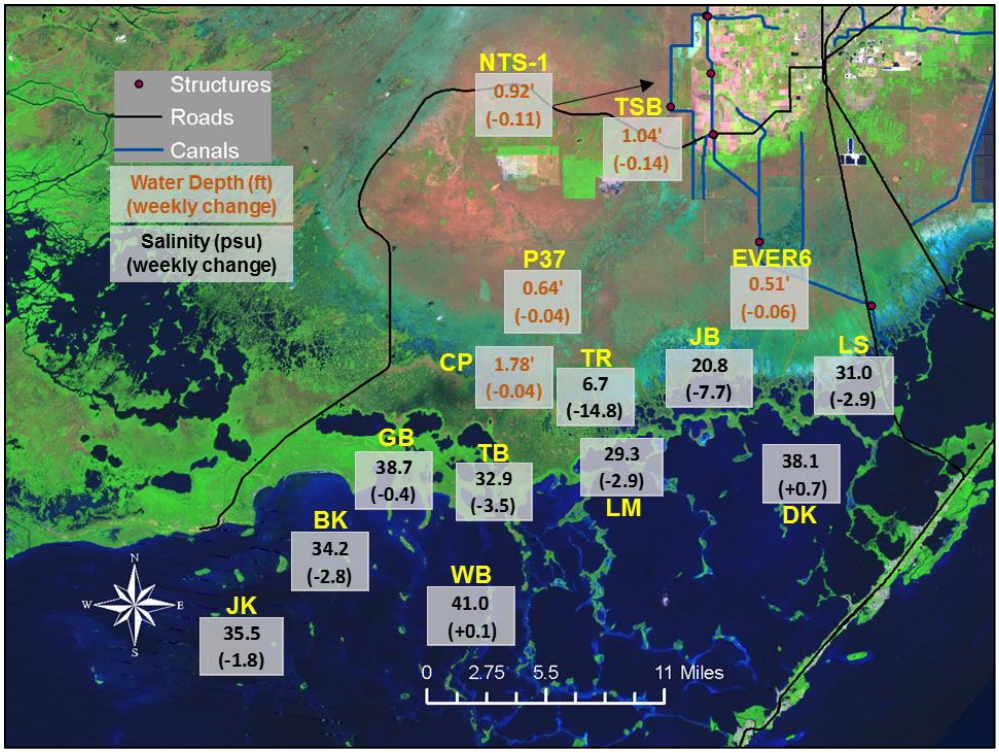


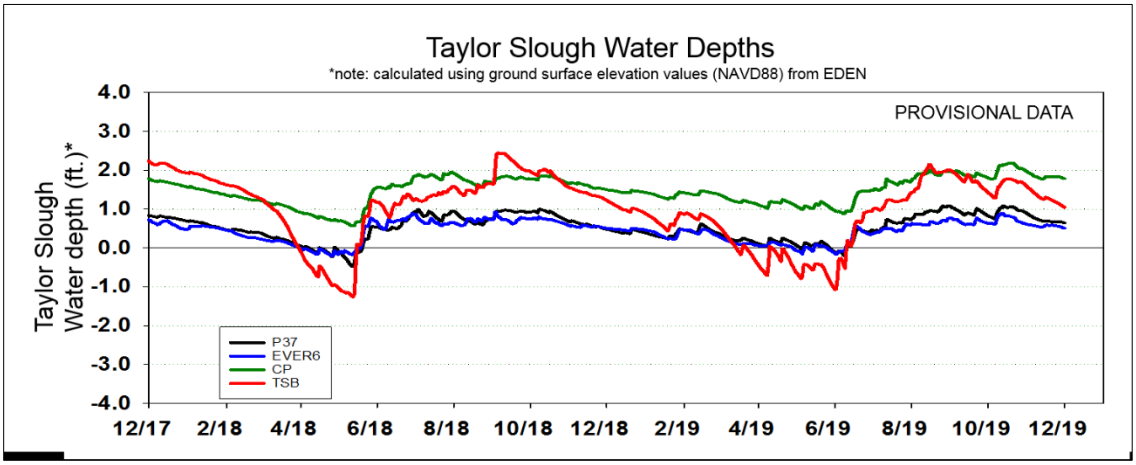
South Florida Water Depth Assessment Tool (SFWDAT)

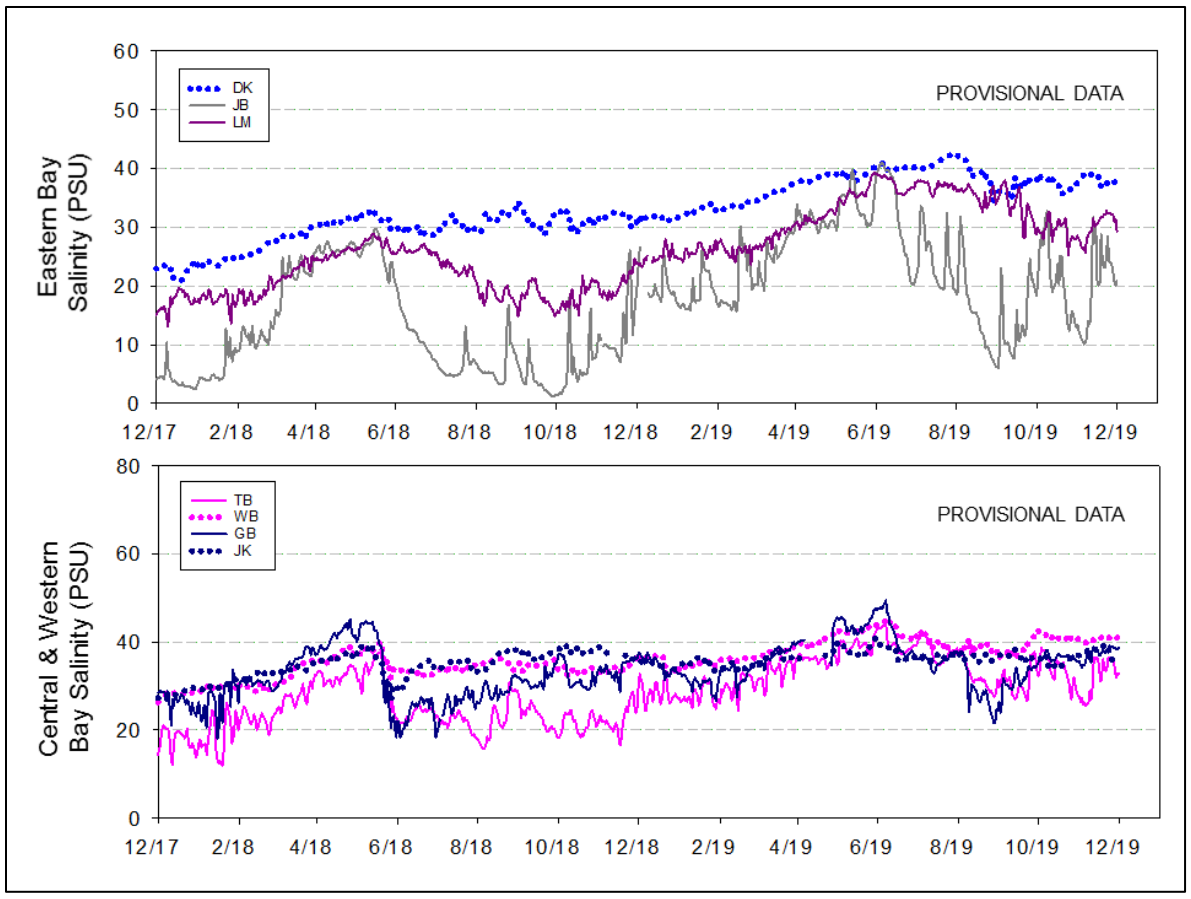


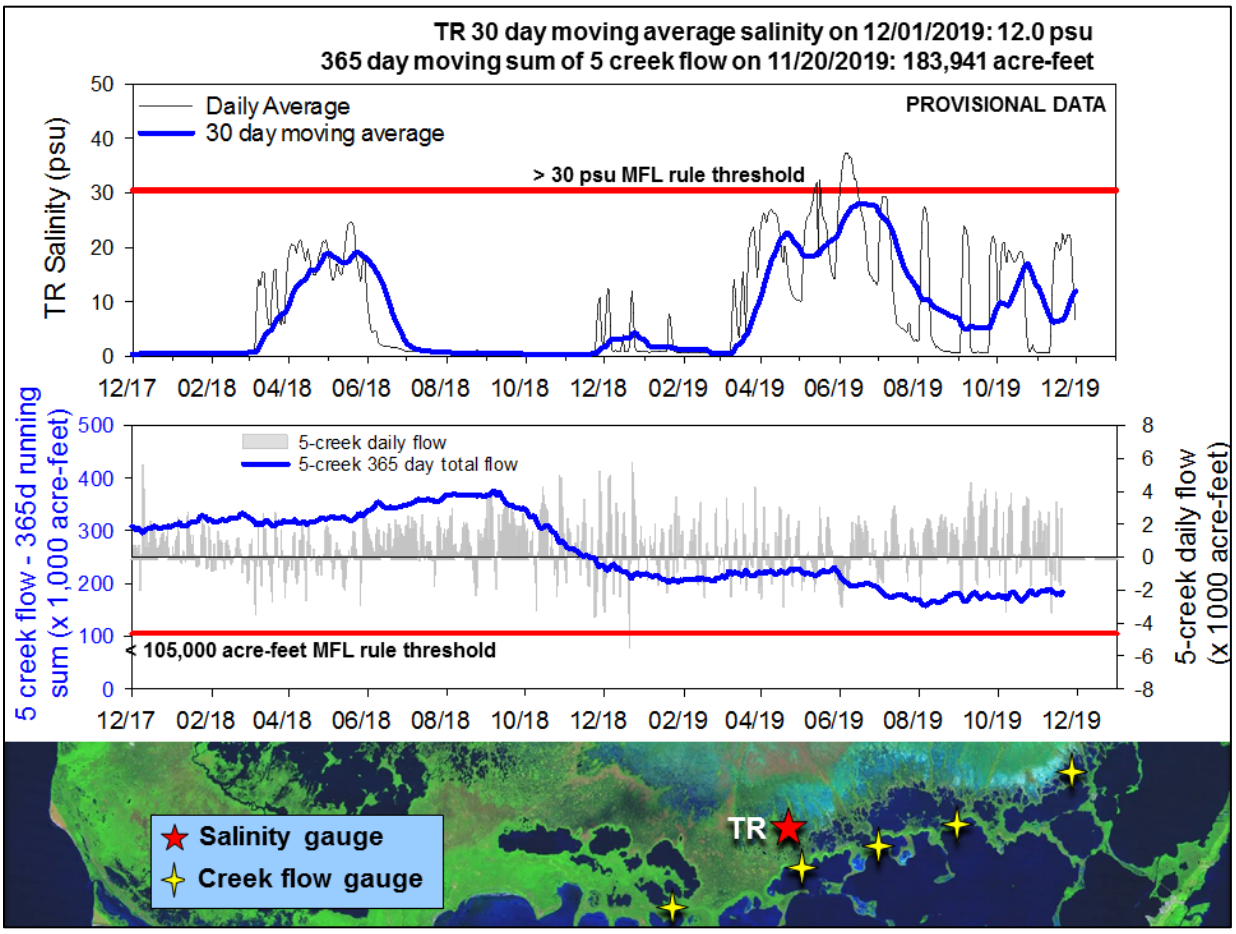
Taylor Slough Water Levels: No rain fell over Taylor Slough and Florida Bay this last week. Stages in Taylor Slough averaged a decrease of 0.08 feet this past week with individual stations changing −0.04 feet to −0.14 feet. Fastest recession was in the northern areas of the slough, averaging a decrease of 0.13 feet/week for the last month. If this continues, the northern area of the slough would dry out a month earlier than the historical average.

Florida Bay Salinities: Average salinity in Florida Bay was 34 psu, 2 psu lower than last week. The average shoreline salinity (34 psu) continues to be 12 psu higher than average. Elsewhere in the bay, conditions are 9 psu above average for this time of year which is disadvantageous.


Structures
Roads
Canals
Water Depth (ft)
(weekly change)
Salinity (psu)
(weekly change)
NTS-1
0.92'
(-0.11)
TSB
1.04'
(-0.14)
P37
0.64'
(-0.04)
EVER6
0.51'
(-0.06)
CP
1.78'
(-0.04)
TR
6.7
(-14.8)
JB
20.8
(-7.7)
LS
31.0
(-2.9)
GB
38.7
(-0.4)
TB
32.9
(-3.5)
29.3
(-2.9)
LM
38.1
(+0.7)
DK
BK
34.2
(-2.8)
WB
41.0
(+0.1)
JK
35.5
(-1.8)
N
W
E
S
0 2.75 5.5 11 Miles


Taylor Slough Water Depths
*note: calculated using ground surface elevation values (NAVD88) from EDEN
PROVISIONAL DATA
Taylor Slough Water depth (ft.)*
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
P37
EVER6
CP
TSB
12/17
2/18
4/18
6/18
8/18
10/18
12/18
2/19
4/19
6/19
8/19
10/19
12/19


Eastern Bay Salinity (PSU)
DK
JB
LM
PROVISIONAL DATA
60
50
40
30
20
10
0
12/17
2/18
4/18
6/18
8/18
10/18
12/18
2/19
4/19
6/19
8/19
10/19
12/19
Central & Western Bay Salinity (PSU)
TB
WB
GB
JK
PROVISIONAL DATA
80
60
40
20
0


TR 30 day moving average salinity on 12/01/2019: 12.0 psu
365 day moving sum of 5 creek flow on 11/20/2019: 183,941 acre-feet
TR Salinity (psu)
Daily Average
30 day moving average
PROVISIONAL DATA
> 30 psu MFL rule threshold
50
40
30
20
10
0
12/17
02/18
04/18
06/18
08/18
10/18
12/18
02/19
04/19
06/19
08/19
10/19
12/19
5 creek flow - 365d running sum (x 1,000 acre-feet)
5-creek daily flow
5-creek 365 day total flow
< 105,000 acre-feet MFL rule threshold
500
400
300
200
100
0
8
6
4
2
0
-2
-4
-6
-8
5-creek daily flow (x 1000 acre-feet)
Salinity gauge
Creek flow gauge
TR

Florida Bay MFL: Salinity at the TR station in the mangrove zone (tracked for the Florida Bay MFL) decreased from 22 psu to 7 psu over the past week. The 30-day moving average ended at 12.0 psu (1.7 psu higher than last week). The high variability in the salinity at this station this year is a result of the higher than average salinities within Florida Bay from saline water being pushed upstream by winds. The eastern-most creek of the 5 creeks feeding Florida Bay (the yellow stars on the map) stopped reporting on 11/20 so a weekly total flow is not available for this week. The 365-day moving sum of flow from the five creeks (tracked as part of the Florida Bay MFL criteria) was 183,941 acre-feet on 11/20 and continued 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, December 3rd, 2019 (red is new)

Area	Weekly change	Recommendation	Reasons
WCA-1	Stage decreased by 0.07'	Conserving water in this basin has ecological benefit as current water depths are below seasonal averages.	Protect tree islands, upstream/downstream habitat and wildlife.
WCA-2A	Stage decreased by 0.21'	Conserving water in this basin has ecological benefit as current water depths are below seasonal averages.	Protect tree islands, upstream/downstream habitat and wildlife.
WCA-2B	Stage increased by 0.05'	Conserving water in this basin has benefit as current water depths are below seasonal averages.	Protect within basin habitat and wildlife.
WCA-3A NE	Stage decreased by 0.07'	Conserving water in this basin has ecological benefit as current water depths are below seasonal averages.	Protect stage conditions conducive to wading bird foraging and peat soil conservation.
WCA-3A NW	Stage decreased by 0.07'	Conserving water in this basin has ecological benefit as current water depths are below seasonal averages.	
Central WCA-3A S	Stage decreased by 0.07'	Conserving water in this basin has ecological benefit as current water depths are below seasonal averages.	Protect upstream/downstream habitat and wildlife.
Southern WCA-3A S	Stage decreased by 0.05'		
WCA-3B	Stage decreased by 0.08'	Conserving water in this basin has benefit as current water depths are below seasonal averages.	Protect tree islands, upstream/downstream habitat and wildlife.
ENP-SRS	Stage decreased by 0.21'	Make discharges to the Park according to the 2012 WCP rainfall plan.	Protect upstream/downstream habitat and wildlife.
Taylor Slough	Stage changes ranged from −0.04 to −0.14'	Move water southward as possible	When available, provide freshwater buffer for downstream conditions.
FB- Salinity	Salinity changes ranged −7.7 to +0.7 psu	Move water southward as possible	When available, provide freshwater to maintain low salinity buffer and promote water movement.