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, Chief, Operations, Engineering and Construction Bureau
Paul Linton, Chief, Operations Section

FROM: SFWMD Staff Environmental Advisory Team

DATE: October 16, 2018

SUBJECT: Weekly Environmental Conditions for Systems Operations

Summary

Weather Conditions and Forecast

A moderate increase in shower activity Thursday night and Friday. High pressure and drier air over the area will limit shower development today, Wednesday, and Thursday. Some isolated to widely scattered shower activity will pop up each day, but rainfall amounts will remain light. A weakening frontal boundary is forecast to back in from the northeast and increase shower activity a bit on Thursday night and Friday before becoming diffuse over the area. Residual moisture should allow widely scattered to scattered shower activity to pop up mainly during the afternoons Saturday, Sunday, and Monday. In the extended forecast, a second frontal boundary is forecast to push into District and stall early next week and then a more meaningful cold front has the potential to move into the District next weekend.

Kissimmee

Tuesday morning stages were 57.1 feet NGVD (0.4 feet below schedule) in East Lake Toho, 54.4 feet NGVD (0.1 feet below schedule) in Toho, and 50.4 feet NGVD (1.6 feet below schedule) in Kissimmee-Cypress-Hatchineha; headwater stages were 46.3 feet NGVD at S-65A and 27.8 feet NGVD at S-65D. Tuesday morning discharges were: 1,567 cfs at S-65, 1,374 cfs at S-65A, and 1,590 cfs at S-65E. Dissolved oxygen concentration in the Kissimmee River averaged 4.7 mg/L for the week. Kissimmee River mean floodplain depth on Sunday was 0.59 feet. No new recommendations were made this week.

Lake Okeechobee

Lake Okeechobee stage is 14.22 feet NGVD, which is the same as the previous week and 0.58 feet lower than a month ago. Lake stages are the lowest they have been for this time of year since 2011 but are in the preferred ecological envelope, which varies seasonally from 12.5 – 15.5 feet NGVD. Cyanobacterial bloom potential lessened along the north western and north eastern shores over the last week but may have intensified somewhat in the southern region, based on the latest NOAA image (October 15).

Estuaries

Total inflow to the St. Lucie Estuary averaged 310 cfs over the past week with no release from S-80. Salinity increased at HR1, US1 and A1A. The seven-day average salinity at the US1 Bridge now moves into the good range for adult eastern oysters. Total inflow to the Caloosahatchee Estuary averaged 2,157 cfs over the past week with 1,027 cfs coming from the Lake. Salinity increased at Val I-75, Ft. Myers, Cape Coral and Shell Point from the previous week. The 30-day moving average surface salinity is 0.2 at Val I-75 and 0.3 at Ft. Myers. Salinity conditions between Val I-75 and Ft. Myers are good for tape grass. Salinity conditions are now in the good range for adult eastern oysters at Cape Coral and remains in good range at Shell Point. The Florida Fish and Wildlife Research Institute continues to monitor red tide on both the west and east coasts. Lowered concentrations were reported on both the

west and east coast. Given the current estuarine conditions, there are no ecological benefits associated with freshwater releases from Lake Okeechobee.

Stormwater Treatment Areas

Over the past week, the STAs received approximately 30,400 acre-feet of inflows (which includes approximately 21,300 acre-feet of Lake releases). The total amount of inflows to the STAs in WY2019 (since May 1, 2018) is approximately 1,076,000 acre-feet, which includes approximately 241,000 acre-feet of Lake releases. Most STA cells are at or above target depths. Operational restrictions are in place for construction related activities in STA-1W (all flow-ways) and maintenance activities in STA-2 Flow-way 2. STA-5/6 Flow-ways 2 and 3 are offline for initiation of a Restoration Strategies project to grade non-effective treatment areas. This week, if 2008 LORS recommends Lake releases to the WCAs and the conditions allow, releases will be sent to the STA-1E, A-1 FEB/STA-3/4 and STA-2.

Everglades

Over the last week water depths declined on average across the Water Conservation Areas and ENP rose slightly. Conditions within the Everglades are stable but drying as stages drop to very near or below the regulation lines. WCA-3A North and northern WCA-1 continue to dry out as indicated by the WDAT model output. The average water depth at the gauges located in WCA-3A North fell but at a slower rate this week than the last two weeks. Protecting peat soils in this region has ecological benefit. Hurricane Michael's limited impact to Florida Bay was water displacement due to storm surge. Near average precipitation fell on Taylor Slough and Florida Bay, and depths within the slough remain above average for this time of year. Salinities in Florida Bay decreased on average this past week, but conditions at the western stations remain higher than their historic averages for this time of year.

Supporting Information

KISSIMMEE BASIN

Kissimmee Basin Rainfall

The Upper Kissimmee Basin received 0.94 inches of rainfall in the past week and the Lower Basin received 0.73 inches (SFWMD Daily Rainfall Report 10/15/2018).

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: 10/16/2018

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)						
							10/14/18	10/7/18	9/30/18	9/23/18	9/16/18	9/9/18	9/2/18
Lakes Hart and Mary Jane	S-62	0	LKMJ	60.1	R	60.4	-0.3	-0.2	0.0	0.1	0.0	0.1	0.0
Lakes Myrtle, Preston, and Joel	S-57	0	S-57	61.3	R	61.4	-0.1	0.0	0.1	0.0	0.0	0.2	0.1
Alligator Chain	S-60	0	ALLI	63.3	R	63.5	-0.2	-0.1	0.0	0.0	0.1	0.1	0.2
Lake Gentry	S-63	0	LKGT	61.3	R	61.2	0.1	0.1	0.1	0.1	0.0	0.1	0.0
East Lake Toho	S-59	0	TOHOE	57.1	R	57.4	-0.3	-0.1	0.1	0.1	0.0	0.1	0.0
Lake Toho	S-61	0	TOHOW, S-61	54.4	R	54.4	0.0	0.0	0.2	0.1	0.1	0.1	0.1
Lakes Kissimmee, Cypress, and Hatchineha	S-65	1,559	KUB011, LKIS5B	50.5	R	51.9	-1.4	-0.9	-0.4	-0.1	0.1	0.2	0.5

[1] Seven-day average of weighted daily means through midnight.
[2] Names of in-lake monitoring sites and structures used to determine lake stage; if more than one site is listed, an average is reported.
[3] T = temporary schedule, R = USACE flood control schedule, S = temporary snail kite schedule, A = projected ascension line, 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: **10/16/2018**

Metric	Location	1-Day Average	Average for the Preceeding 7-Days[1]									
		10/14/2018	10/14/18	10/7/18	9/30/18	9/23/18	9/16/18	9/9/18	9/2/18	8/26/18	8/19/18	8/12/18
Discharge (cfs)	S-65	1,597	**1,559**	1,542	1,485	1,560	1,544	3,538	3,088	1,806	3,282	4,337
Discharge (cfs)	S-65A[2]	1,402	**1,382**	1,391	1,416	1,532	1,634	3,808	3,315	1,765	3,443	4,674
Discharge (cfs)	S-65D[2]	1,538	**1,521**	1,646	1,982	2,221	3,351	4,313	2,699	3,077	4,254	4,617
Headwater Stage (feet NGVD)	S-65D[2]	27.78	**27.89**	27.81	27.81	27.75	27.67	27.86	27.88	27.70	27.00	26.63
Discharge (cfs)	S-65E[2]	1,591	**1,598**	1,684	2,062	2,296	3,458	4,259	2,902	3,219	3,860	4,848
Discharge (cfs)	S-67	0	**0**	67	310	288	215	176	190	187	169	160
DO (mg/L)[3]	Phase I river channel	4.9	**4.7**	4.2	3.3	2.8	2.5	2.9	2.7	2.5	2.8	3.0
Mean depth (feet)[4]	Phase I floodplain	0.59	**0.60**	0.64	0.75	0.80	1.12	1.79	1.24	1.16	1.76	2.02

[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 PC62 and PC33.
[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)

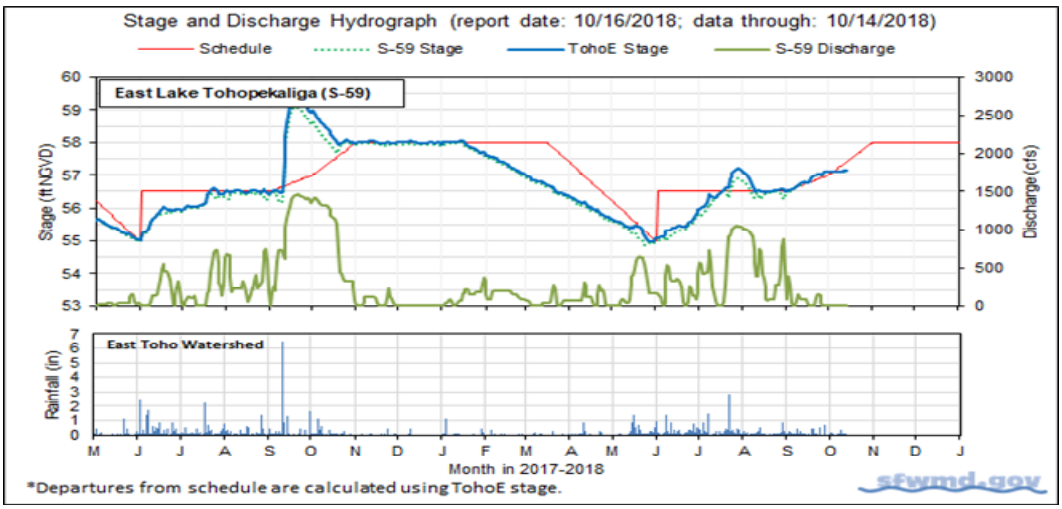


Figure 1.

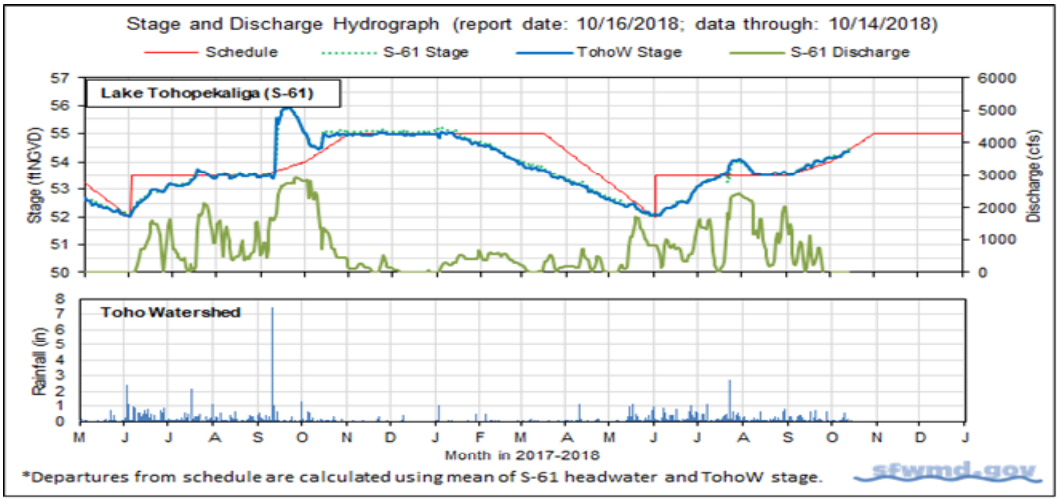


Figure 2.

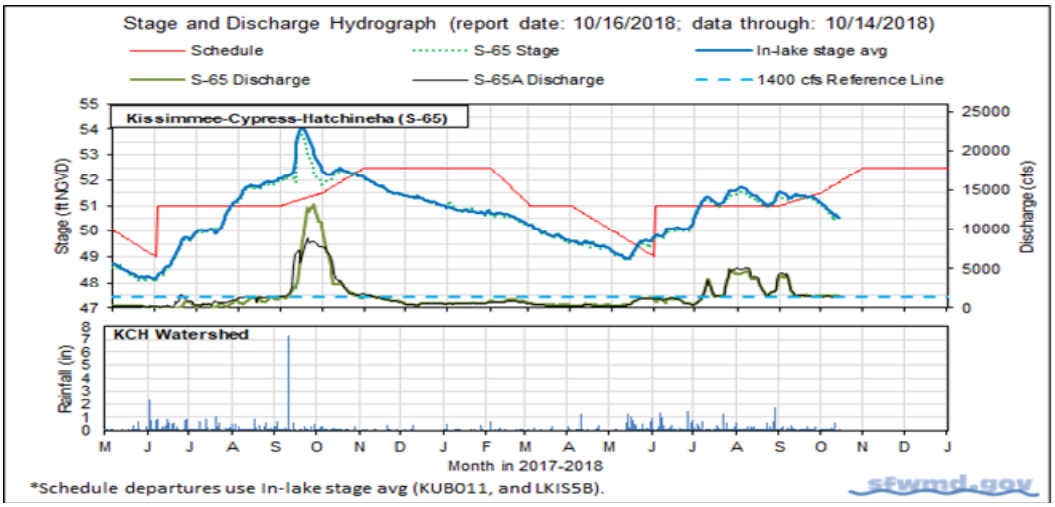


Figure 3.

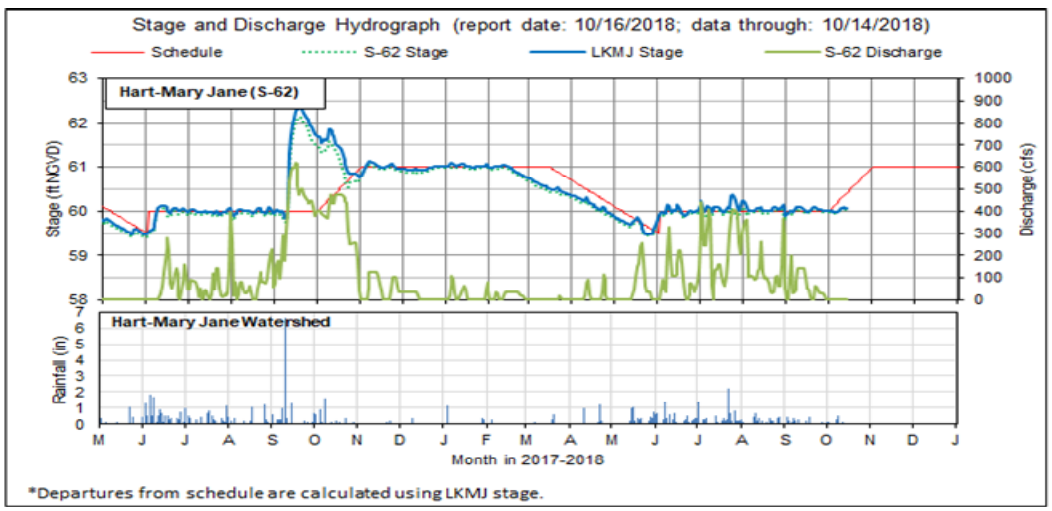


Figure 4.

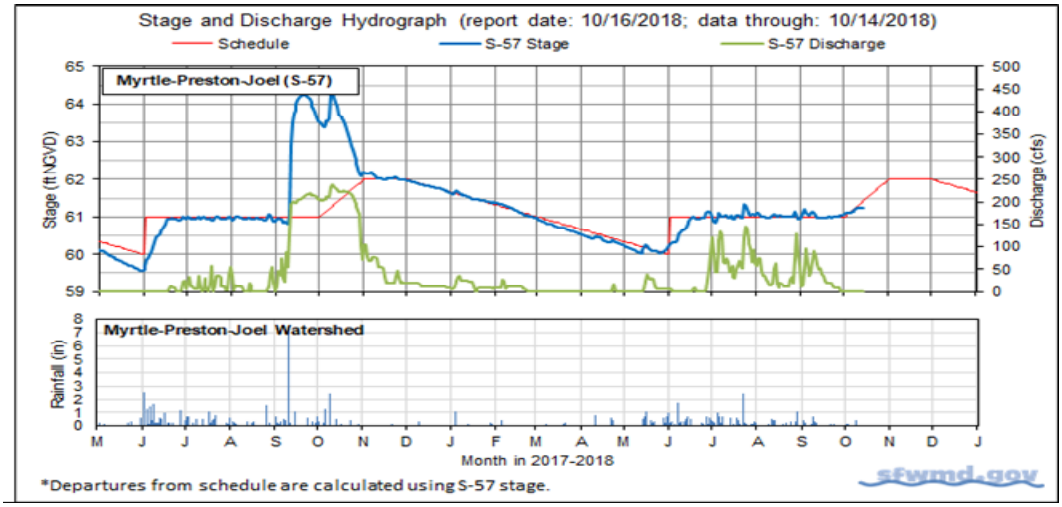


Figure 5.

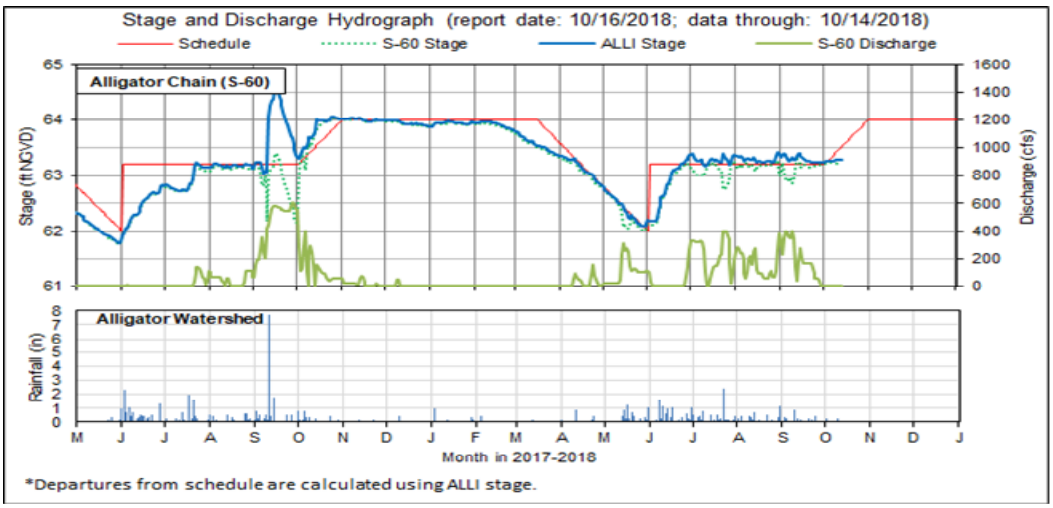


Figure 6.

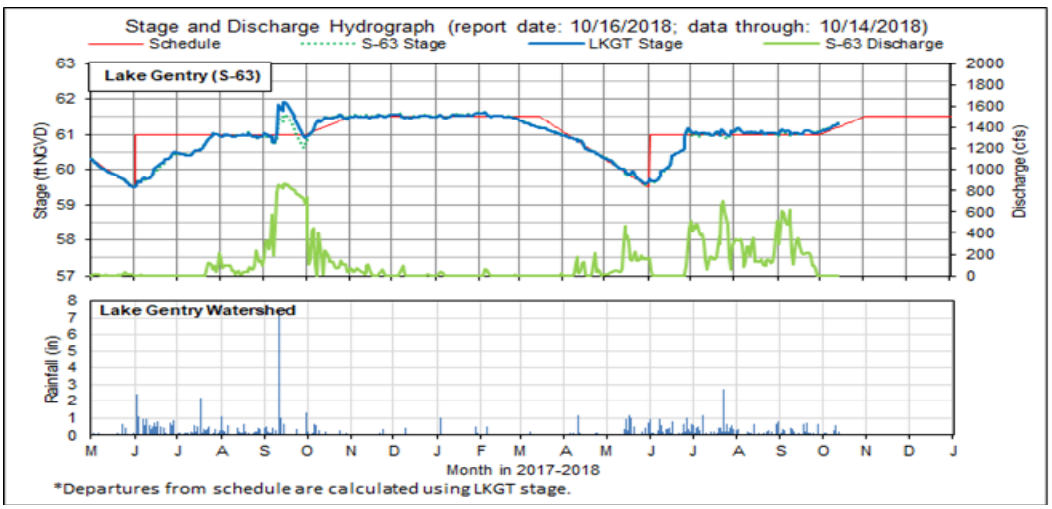


Figure 7.

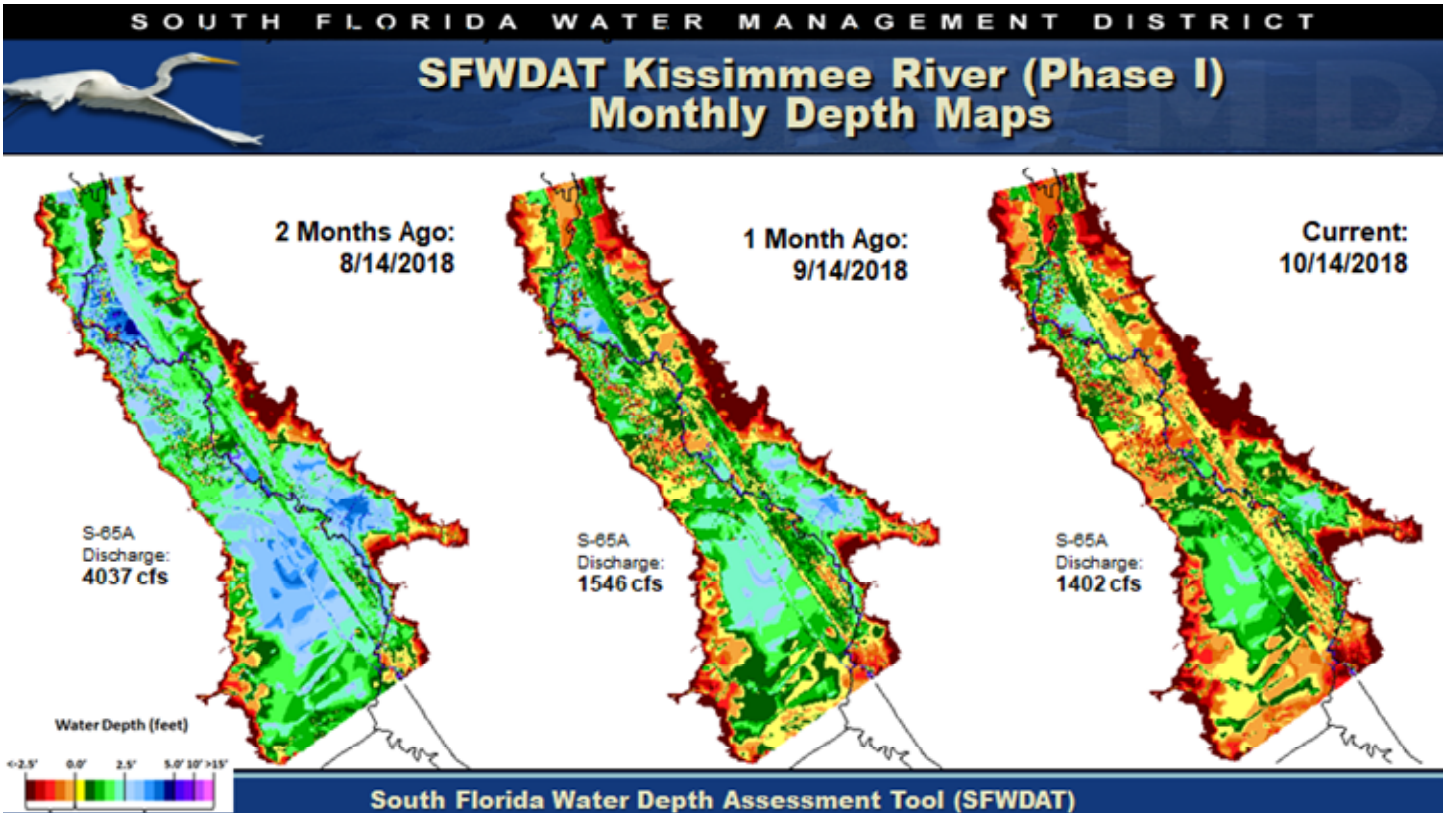


Figure 8. Phase I area floodplain water depths for this week, one month ago, and two months ago. Note that the WDAT color-coding has been modified to accommodate greater water depths; these maps are not directly comparable to Kissimmee Basin WDAT maps published prior to January 16, 2012.

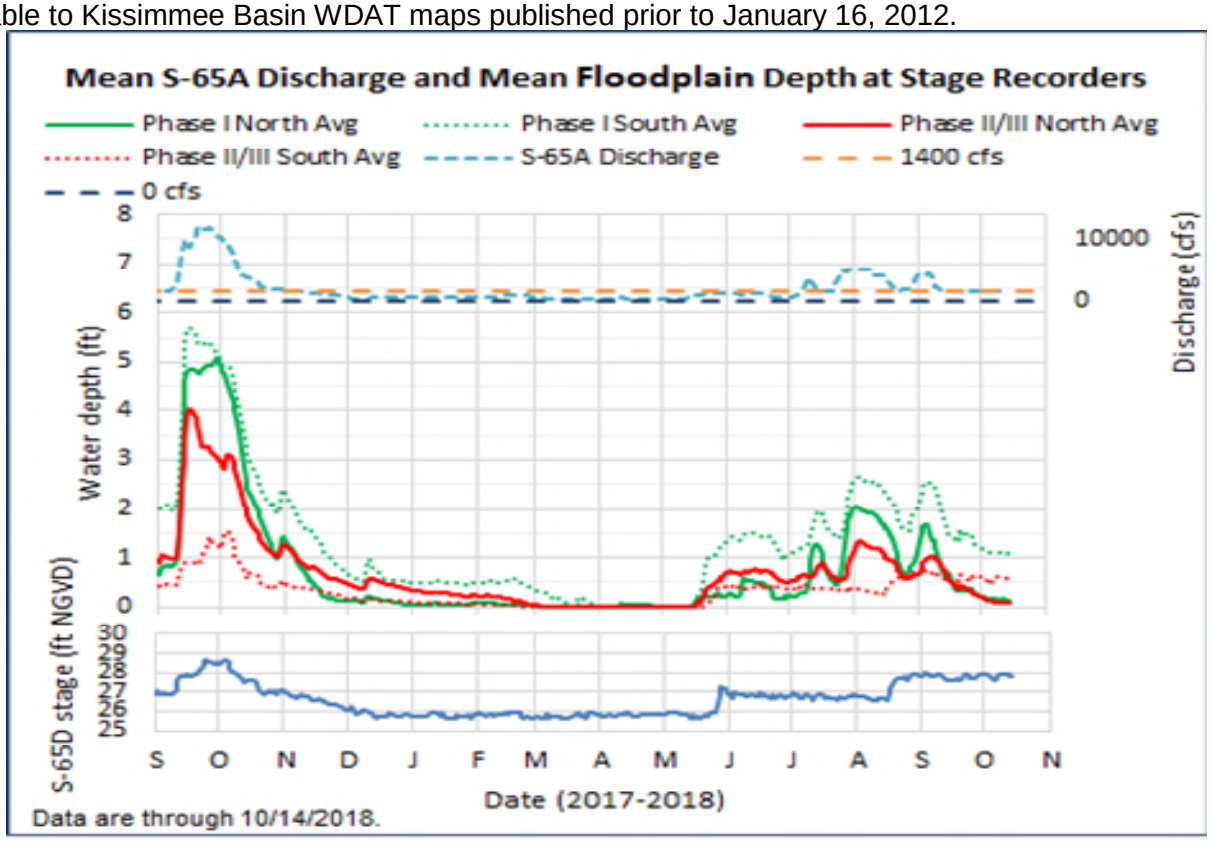


Figure 9. Mean water depth at stage recorders in the northern Phase I, southern Phase I, northern Phase II/III, and southern Phase II/III areas in relation to the S-65A discharge and S-65D headwater stage.

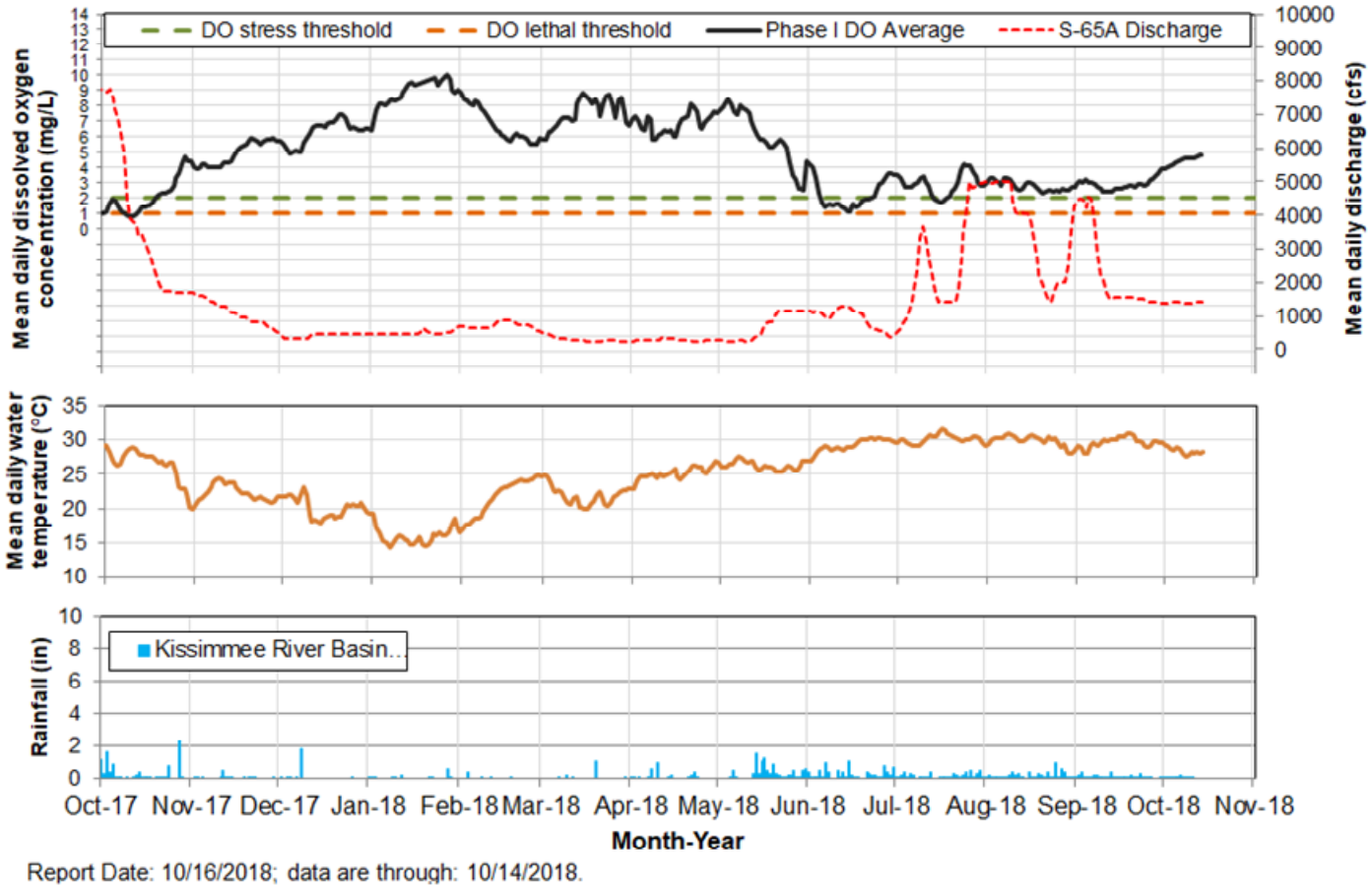


Figure 10. Mean daily dissolved oxygen, discharge, temperature and rainfall in the Phase I river channel.

Water Management Recommendations

Recommendation Date	Recommendation	Purpose	Outcome	Source	Report Date
10/16/2018	No new recommendations.		N/A		10/16/2018
10/9/2018	No new recommendations.		N/A		10/9/2018
10/2/2018	No new recommendations.		N/A		10/2/2018
9/25/2018	No new recommendations.		N/A		9/25/2018
9/18/2018	No new recommendations.		N/A		9/18/2018
9/11/2018	No new recommendations.		N/A		9/11/2018
9/4/2018	No new recommendations.		N/A		9/4/2018
8/28/2018	No new recommendations.		N/A		8/28/2018
8/21/2018	No new recommendations.		N/A		8/21/2018
8/14/2018	No new recommendations.		N/A		8/14/2018
8/7/2018	No new recommendations.		N/A		8/7/2018
7/23/2018-7/24/2018	Increase discharge from 1400 cfs to 3000 cfs, then 3200 cfs and 3500 cfs.	For flood control in Lake Kissimmee.	Implemented	SFWMD Water Mgt/KB Ops	7/31/2018
7/19/2018	Follow Revised (X2) 2018 Wet Season Discharge Plan to the extent possible, including 50 foot stage threshold and 0.5 foot flood control buffer.	To the extent possible, maintain sufficient discharge to keep areas under snail kites nests in Pool D hydrated until nests fledge, while avoiding large increases in discharge that might flood the nests.	N/A	KB Ops	7/24/2018
7/13/2018	Maintain at least 1400 cfs at S-65A while Lake Kissimmee stage is above 50 feet. (See revised 2018 discharge plan).	To the extent possible, maintain sufficient discharge to keep areas under snail nest kites in Pool D hydrated until nests fledge.	N/A	KB Ops	7/17/2018
7/13/2018	Reduce S-65/S-65A discharge by 600 cfs/day until 1400 cfs is reached. (See revised 2018 discharge plan, below).	Reach 1400 cfs faster to help stabilize Lake Kissimmee stage.	Implemented	SFWMD Water Mgt/KB Ops	7/17/2018
7/9/2018	Increase S-65/S-65A discharge by 300 cfs if needed.	Stablize Lake Kissimmee stage.	N/A	SFWMD Water Mgt/KB Ops	7/10/2018
7/8/2018	Increase S-65/S-65A discharge by 900 cfs today in 3 increments of 300 cfs each.	Stablize Lake Kissimmee stage.	Implemented	KB Ops	7/10/2018
7/5/2018	Increase S-65/S-65A discharge by 300 cfs/day (double the prescribed rate of increase) Thursday through Sunday .	Stablize Lake Kissimmee stage.	Implemented	SFWMD Water Mgt	7/10/2018
7/2/2018	Increase S-65/S-65A discharge by 150 cfs/day (double the prescribed rate of increase).	Stablize Lake Kissimmee stage.	Implemented	SFWMD Water Mgt/KB Ops	7/10/2018
6/30/2018	Increase S-65/S-65A discharge as slowly as feasible	Slow stage ascencsion in Kissimmee-Cypress-Hatchineha	Implemented	KB Ops/SFWMD Water Mgt	7/3/2018
6/28/2018	Continue to reduce discharge at S-65/S-65A as slowly as feasible.	Prevent stage decline in Kissimmee-Cypress-Hatchineha.	Implemented	KB Ops/SFWMD Water Mgt	7/3/2018
6/21/2018	Reduce discharge at S-65/S-65A as slowly as feasible.	Prevent stage decline in Kissimmee-Cypress-Hatchineha.	Implemented	KB Ops/SFWMD Water Mgt	6/26/2018
6/15/2018	Reduce S-65A discharge by 150-300 cfs over the weekend.	Slow or stop DO decline in Kissimmee River.	Implemented	KB Ops	6/19/2018
6/12/2018	No new recommendations.		N/A		6/12/2018
6/5/2018	No new recommendations.		N/A		6/5/2018
5/29/2018	Begin implementation of the 2018 Wet Season Discharge Plan for S-65/S-65A on June 1 (see figure).	Provide variable flow from S-65/S-65A to balance Kissimmee River and Headwaters Lakes objectives including Kissimmee River floodplain inundation, moderated rates of change in discharge, and constrained rate of stage rise in the lakes.	Planned	KB Ops/SFWMD Water Mgt/FWC/FWS	5/29/2018
5/22/2018	Hold Kissimmee-Cypress-Hatchineha at current stage of approximately 49.5 ft until June 1.	(a) Reduce impacts of rising water on DO in the Kissimmee River; and (b) limit stage reversal in KCH to <1 foot to protect snail kite nests.	Implemented	KB Ops/SFWMD Water Mgt	5/29/2018
5/18/2018-5/20/2018	Increase discharge gradually in response to rainfall in consultation with KB staff.	(a) Reduce impacts of rising water on DO in the Kissimmee River; and (b) limit stage reversal in KCH to <1 foot to protect snail kite nests.	Implemented	KB Ops	5/22/2018

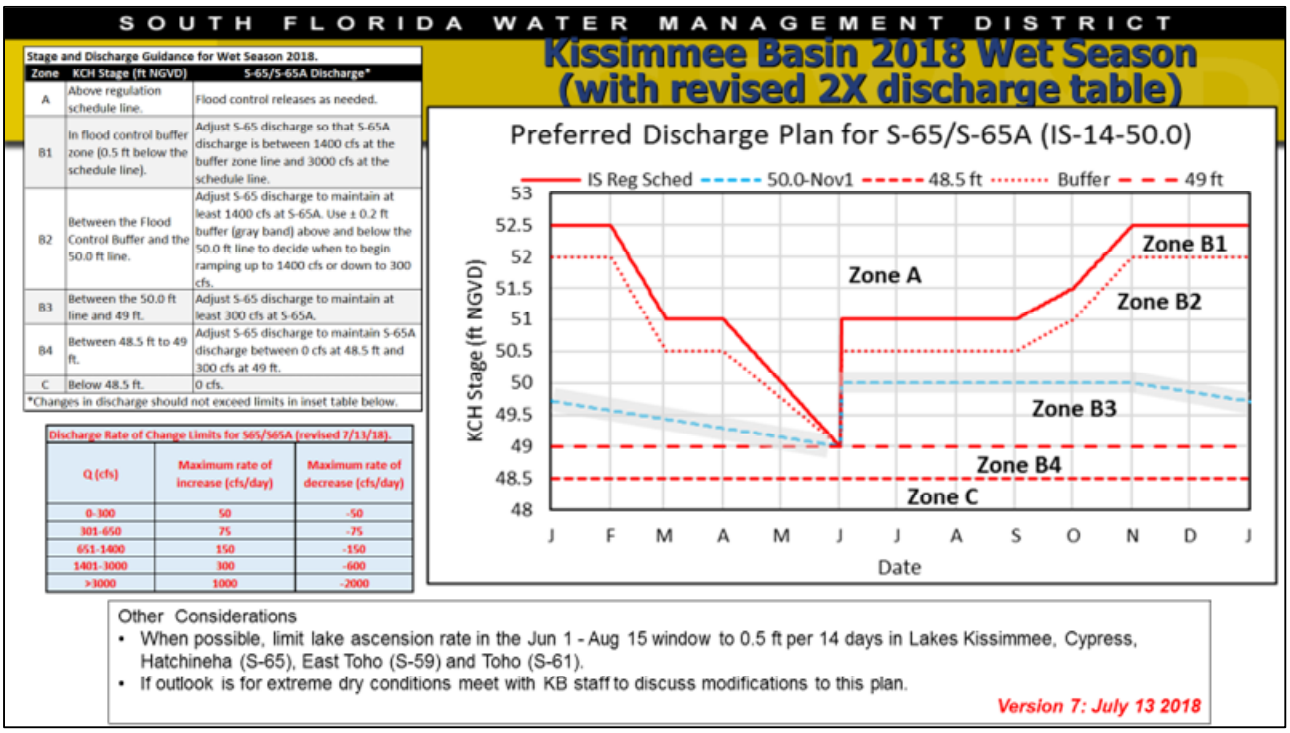


Figure 11. The 2018 Wet Season Discharge Plan for S-65/S-65A.

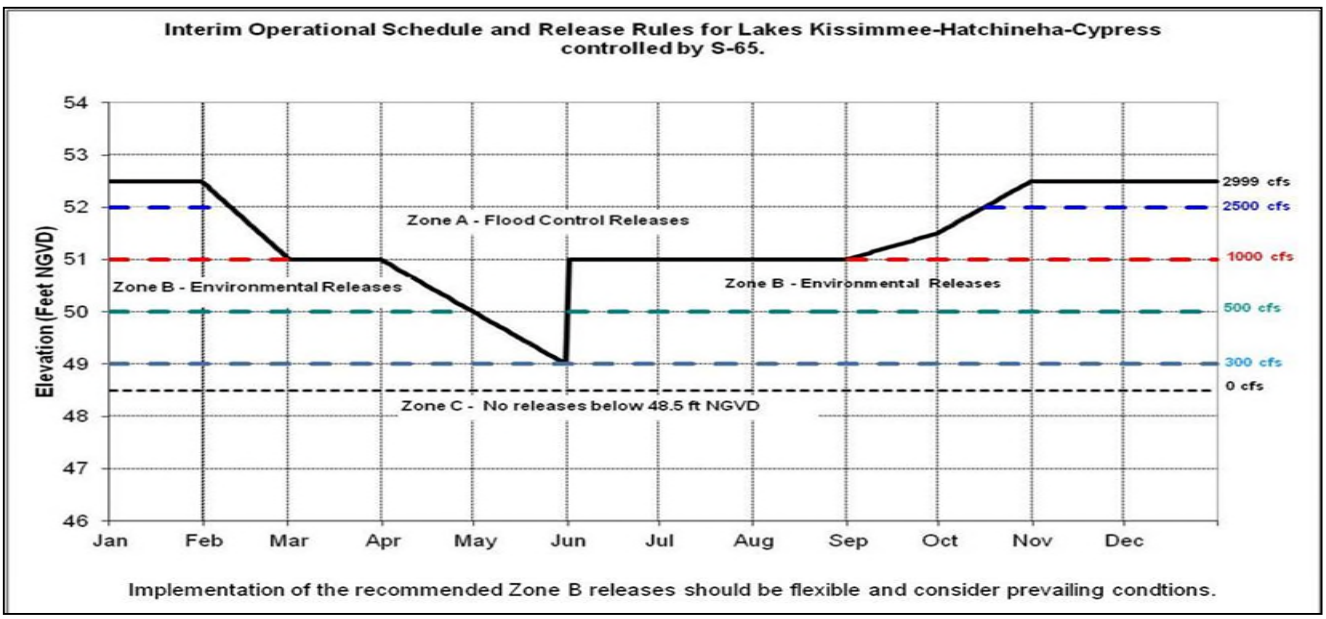


Figure 12. Interim operations schedule for S-65. The discharge schedule shown to the right has not been used in recent years.

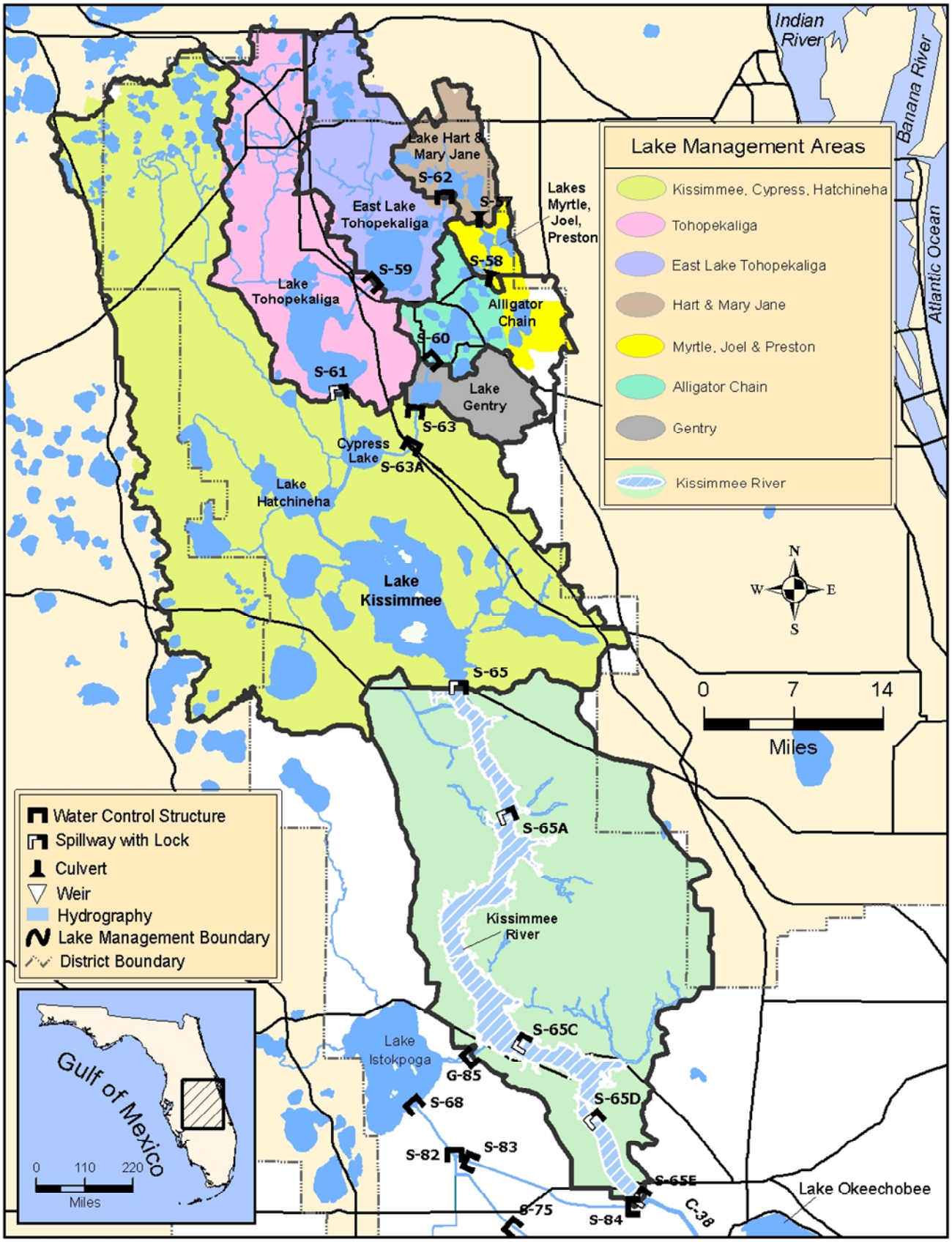


Figure 13. The Kissimmee Basin.

LAKE OKEECHOBEE

According to the USACE web site, Lake Okeechobee stage is at 14.22 feet NGVD for the period ending at midnight on October 15, 2018. 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 0.58 feet lower than it was a month ago and 2.96 feet lower than a year ago (Figure 1). The Lake is now in the Base-Flow sub-band (Figure 2). According to RAINDAR, 1.04 inches of rain fell over the Lake during the week October 9, 2018 – October 15, 2018. Most of the watershed received between 0.5 and 1.5 inches of rain with the exception of the lower Kissimmee basin and the south-central region which received less than 0.5 inches of rainfall (Figure 3).

Average daily inflows to the Lake decreased from the previous week, going from 1,741 cfs to 1,672 cfs. The decrease in inflows was mostly from the Kissimmee River via the S-65E structures, going from 1,665 cfs the previous week to 1,588 cfs this past week (Table 1). Inflows also decreased by 9 cfs from Fisheating Creek but increased by 6 cfs from the northern pumps. There have been no back-pumping operations from the S-2 or S-3 pumps during the wet season thus far.

Total outflows also decreased from the previous week, going from 5,984 average daily cfs the previous week to 3,122 cfs this past week. The decreases in outflows were primarily in discharges west via the S-77 structure and south through the S350 structures. Discharges via the S-77 decreased by 1,229 cfs and outflows south through the S-350 structures decreased by 951 cfs from the previous week. S-308 discharges decreased by 700 cfs from the previous week and all discharges have stopped. Outflow from the L8 at Canal Point increased from 0 cfs last week to 19 cfs this week. The corrected average daily evapotranspiration value for the week based on the L006 weather platform solar radiation was the same as last week at 0.12 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 4 shows the combined average daily cfs for inflows and outflows for the Lake over the past eight weeks. These data are provisional and are subject to change.

The most recent satellite imagery (October 15) using the cyanobacteria monitoring product derived from NOAA's analysis of EUMETSAT's OLCI satellite sensor showed the potential for a bloom on the north end of the Lake lessened this past week while the potential in the south end of the Lake increased (Figure 5).

Water Management Recommendations

Lake Okeechobee stage is 14.22 feet NGVD, remaining the same as last week and 0.58 feet lower than 30 days ago. Lake stages are now the lowest they have been for this time of year since 2011 but are still in the preferred ecological envelope, which varies seasonally from 12.5 – 15.5 feet NGVD. Recovery of vegetation in the nearshore zone from Hurricane Irma impacts and 2016 El Niño-associated rainfall will require lake stages in the lower portion of the ecological envelope for extended periods, so efforts to prepare for such an event will help speed the rebound of this important community.

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 Inflow cfs	Equivalent Depth Week Total (in)
S65E & S65EX1	1655	1588	0.7
S71 & 72	0	0	0.0
S84 & 84X	0	0	0.0
Fisheating Creek	77	68	0.0
S154	0	0	0.0
S191	0	0	0.0
S133 P	9	10	0.0
S127 P	0	0	0.0
S129 P	0	3	0.0
S131 P	0	2	0.0
S135 P	0	0	0.0
S2 P	0	0	0.0
S3 P	0	0	0.0
S4 P	0	0	0.0
L8 Backflow	1	0	0.0
Rainfall	827	2860	1.0
Total	**2568**	**4532**	**1.7**

OUTFLOWS	Previous Week Avg Daily cfs	Avg Daily Outflow cfs	Equivalent Depth Week Total (in)
S77	2332	1103	0.5
S308	700	0	0.0
S351	1113	964	0.4
S352	477	98	0.0
S354	1362	938	0.4
L8 Outflow	0	19	0.0
ET	2949	2315	0.9
Total	**8933**	**5437**	**2.2**

PROVISIONAL DATA

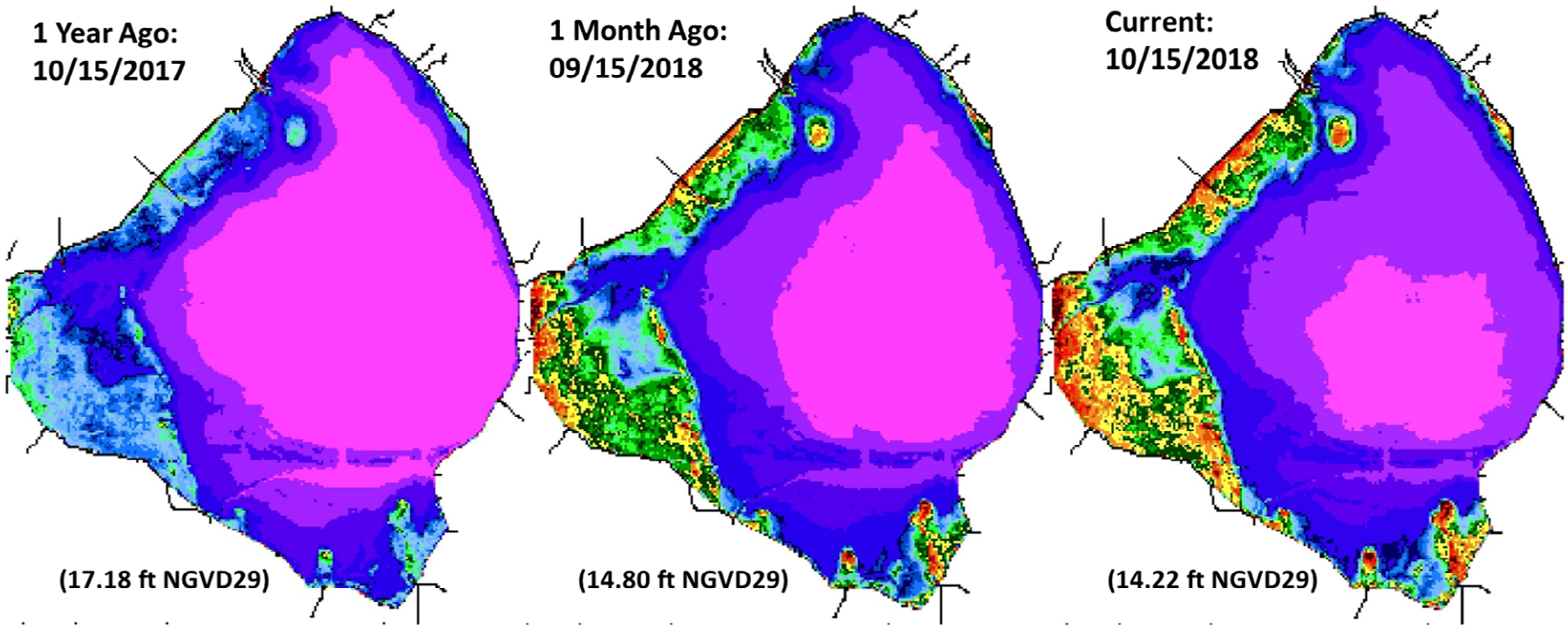


Figure 1. Water depth estimates on Lake Okeechobee based on the South Florida Water Depth Assessment Tool.

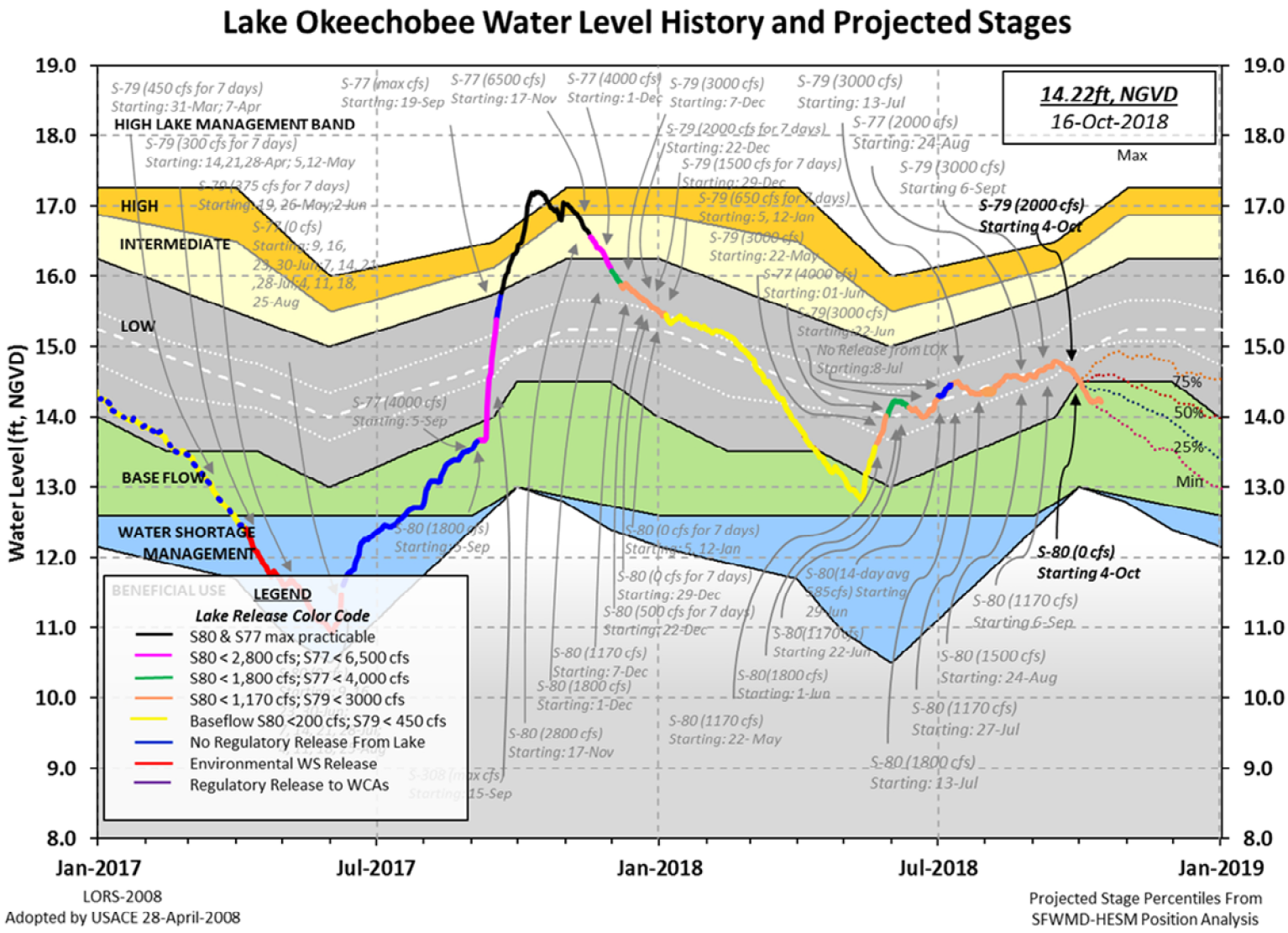


Figure 2. Recent Lake Okeechobee stage and releases, with projected stages based on a dynamic position analysis.

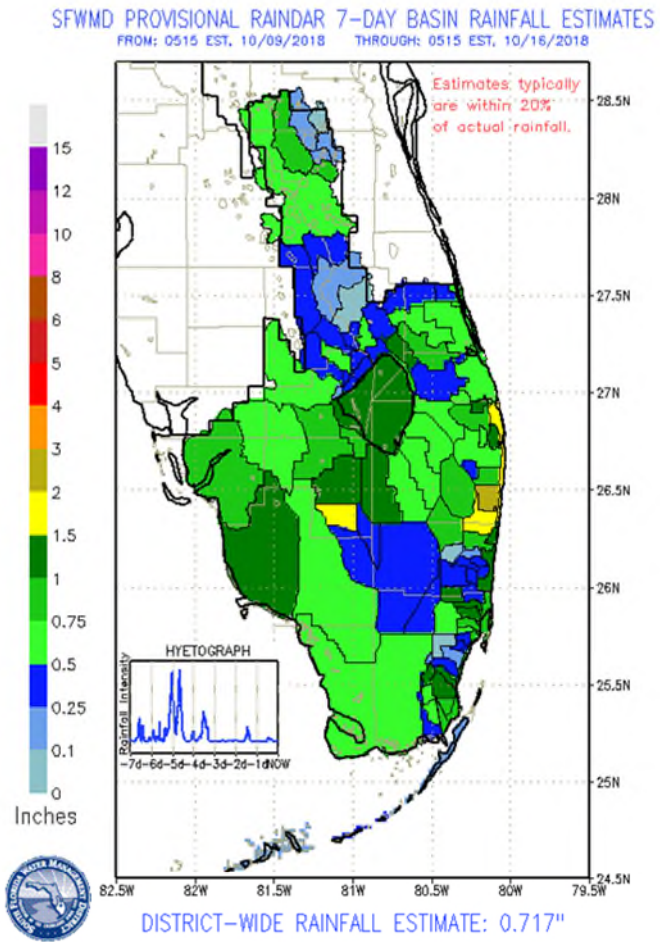


Figure 3. Rainfall estimates by basin.

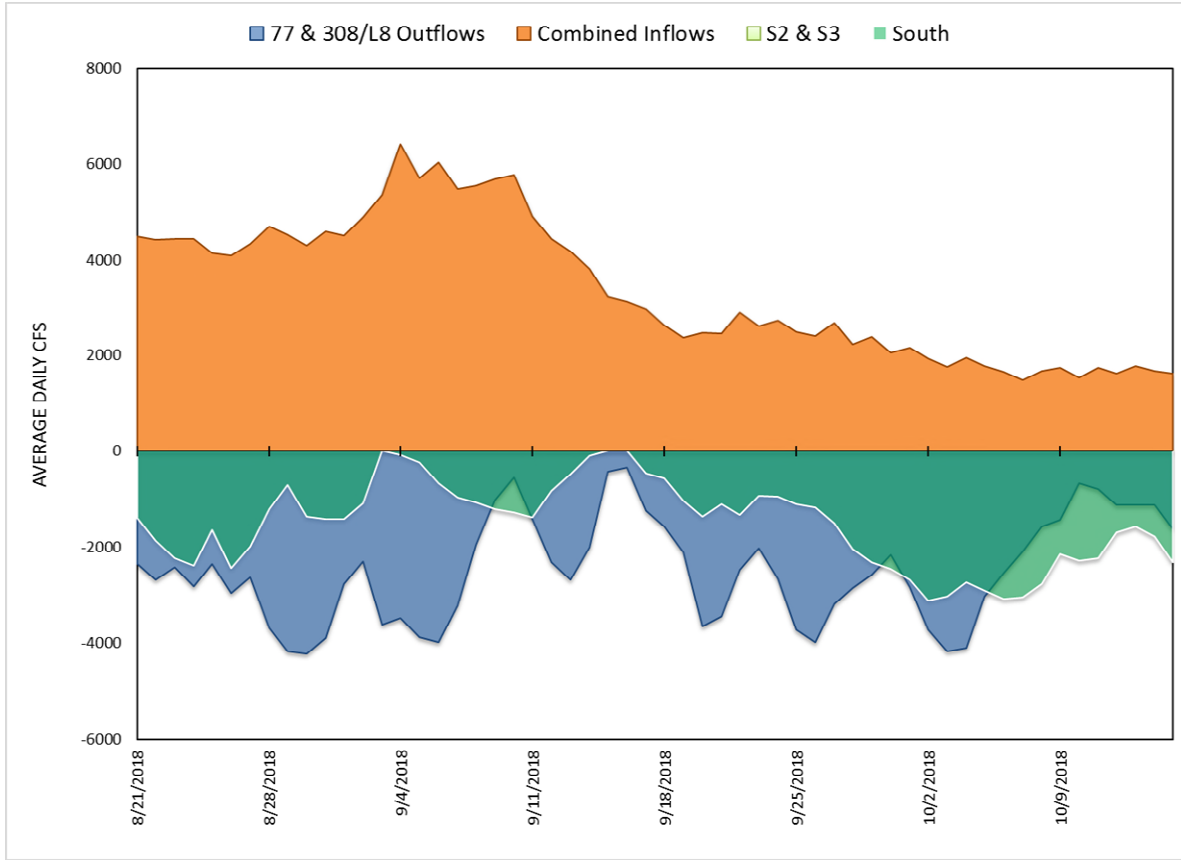


Figure 4. Major inflows and outflows of Lake Okeechobee, including the S-350 structures designated as South. The L-8 canal flows through culvert 10A are included as outflows when positive, and as inflows when backflowing into the lake. Inflows and outflows are shown as positive and negative, respectively, for visual purposes.

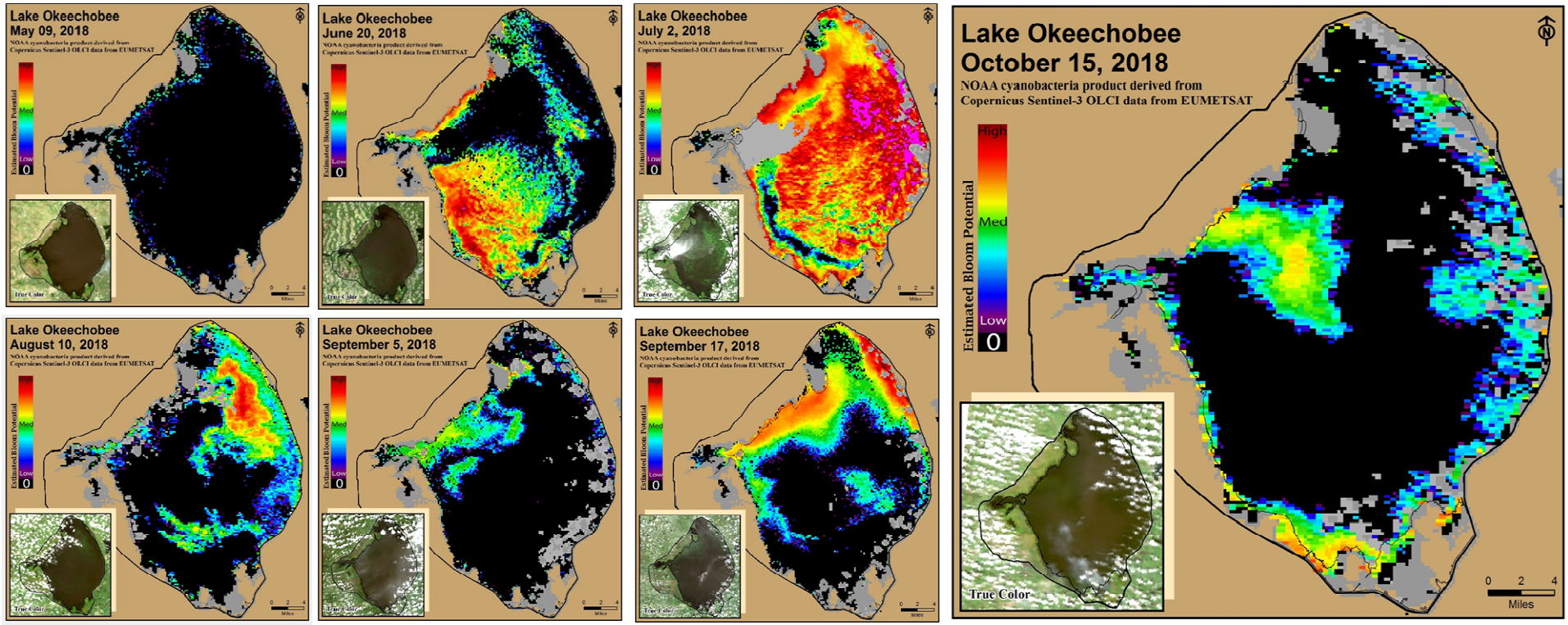


Figure 5. Potential for cyanobacterial blooms on Lake Okeechobee based on NOAA's harmful algal bloom monitoring system derived from Copernicus Sentinel-3 OLCI data from EUMETSAT. Gray indicates cloud cover. All data are experimental and unvalidated at this point in product development.

ESTUARIES

St. Lucie Estuary:

Last week total inflow to the St. Lucie Estuary averaged about 310 cfs (Figures 1 and 2) and last month inflow averaged about 1,096 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	205
S-80	0
S-308	0
S-49 on C-24	0
S-97 on C-23	35
Gordy Rd. structure on Ten Mile Creek	70

Over the past week, salinity increased throughout the estuary (Table 2, Figures 3 and 4). The seven-day moving average salinity of the water column (an average of the surface and bottom salinity) at the US1 Bridge is 12.1. Salinity conditions in the middle estuary are 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
HR1 (North Fork)	**4.7** (3.6)	**9.1** (4.0)
US1 Bridge	**11.7** (6.8)	**12.5** (6.9)
A1A Bridge	**21.3** (18.7)	**26.3** (25.1)

[1]Envelope not applicable and [2]Not Reporting.

Caloosahatchee Estuary:

Last week total inflow to the Caloosahatchee Estuary averaged about 2,157 cfs (Figures 5 and 6) and last month inflow averaged about 3,412 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	1,103
S-78	1,072
S-79	1,793
Tidal Basin Inflow	364

Over the past week, salinity was near 0 down to Val I75 and increased downstream (Table 4, Figures 7 & 8). The seven-day average salinity values are estimated to be within the good range for adult eastern oysters at Cape Coral and at Shell Point (Figure 9). Salinity values were not available at Sanibel. The 30-day moving average surface salinity is 0.3 at Val I-75 and 0.9 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
S-79 (Franklin Lock)	**0.2** (0.2)	**0.2** (0.2)
Val I75	**0.4** (0.2)	**0.9** (0.4)
Ft. Myers Yacht Basin	**2.4 (**1.1)	**4.5** (1.7)
Cape Coral	**9.2** (5.5)	**13.5** (9.1)
Shell Point	**22.2** (18.3)	**NR** (NR)
Sanibel	**NR**[3](NR)	**NR** (NR)

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

Val I-75 Salinity Forecast

Forecast of surface salinity (Table 5, 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 1.4 to 3.4 at the end of the next two weeks for pulse release at S-79 ranging from 0 to 650 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 average
A	0	290	3.4	0.7
B	300	290	1.9	0.4
C	375	290	1.7	0.4
D	450	290	1.6	0.4
E	650	290	1.4	0.4

Red Tide

The Florida Fish and Wildlife Research Institute reported on October 12, 2018, that *Karenia brevis,* the Florida red tide dinoflagellate, was observed at background concentrations in one sample collected from Lee County. Respiratory irritation was reported in Lee County over the past week. *Karenia brevis,* the Florida red tide dinoflagellate, was observed at background to medium concentrations in 20 samples collected from St. Lucie County, background to medium concentrations in 12 samples collected from or offshore of Martin County, very low to medium concentrations in 22 samples collected from or offshore of Palm Beach County, background to low concentrations in 22 samples collected from Broward County, and background to medium concentrations in 12 samples collected from Miami-Dade County. Fish kills were reported for multiple locations in Palm Beach, Broward, and Miami-Dade counties. Respiratory irritation was reported for Palm Beach County.

Water Management Recommendations

Lake stage is in the Baseflow sub-band of 2008 LORS. Tributary hydrological conditions are normal. The 2008 LORS recommends up to 450 cfs at S-79 and up to 200 cfs at S-80. Given the current estuarine conditions, there are no ecological benefits associated with freshwater releases from Lake Okeechobee.

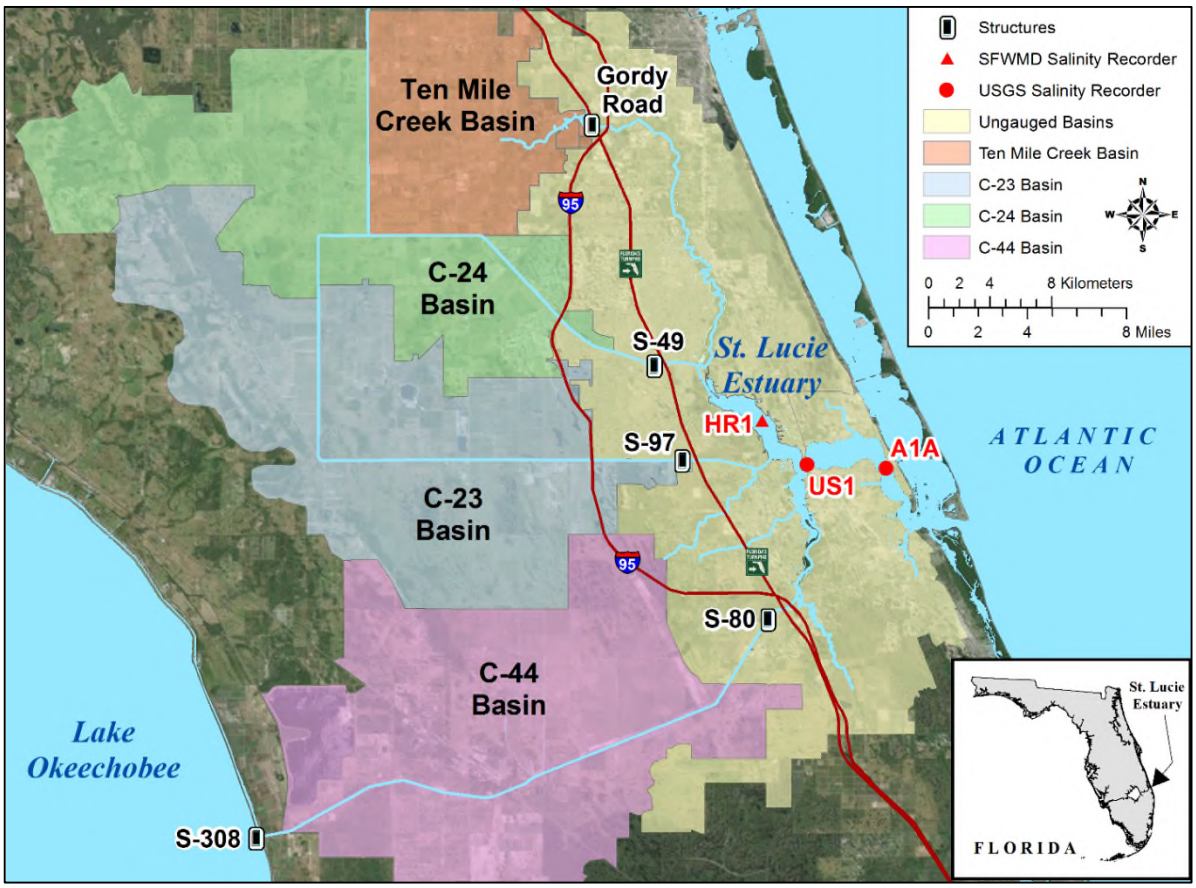


Figure 1. Basins, water control structures, and salinity monitoring for the St. Lucie Estuary.

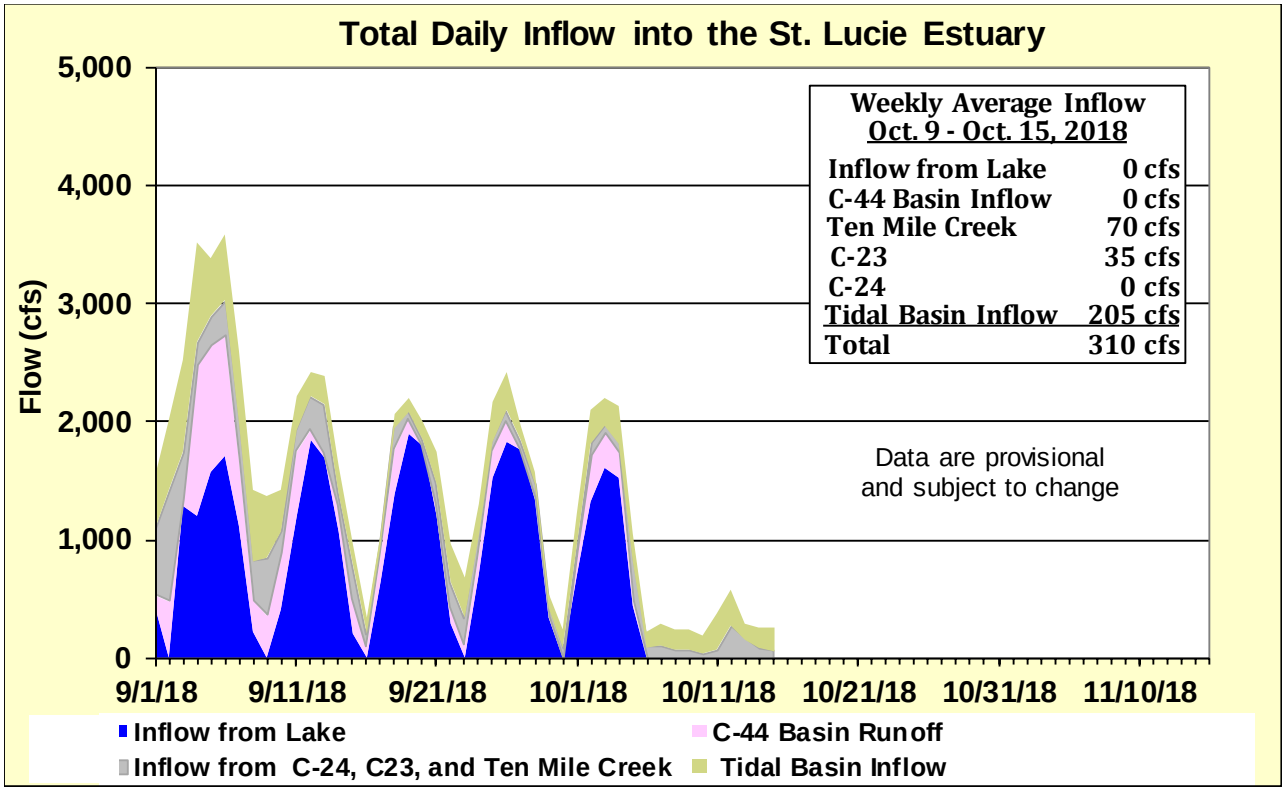


Figure 2. Total daily inflows from Lake Okeechobee and runoff from the C-44, C-23, C-24, Ten Mile Creek, and tidal basins into the St. Lucie Estuary.

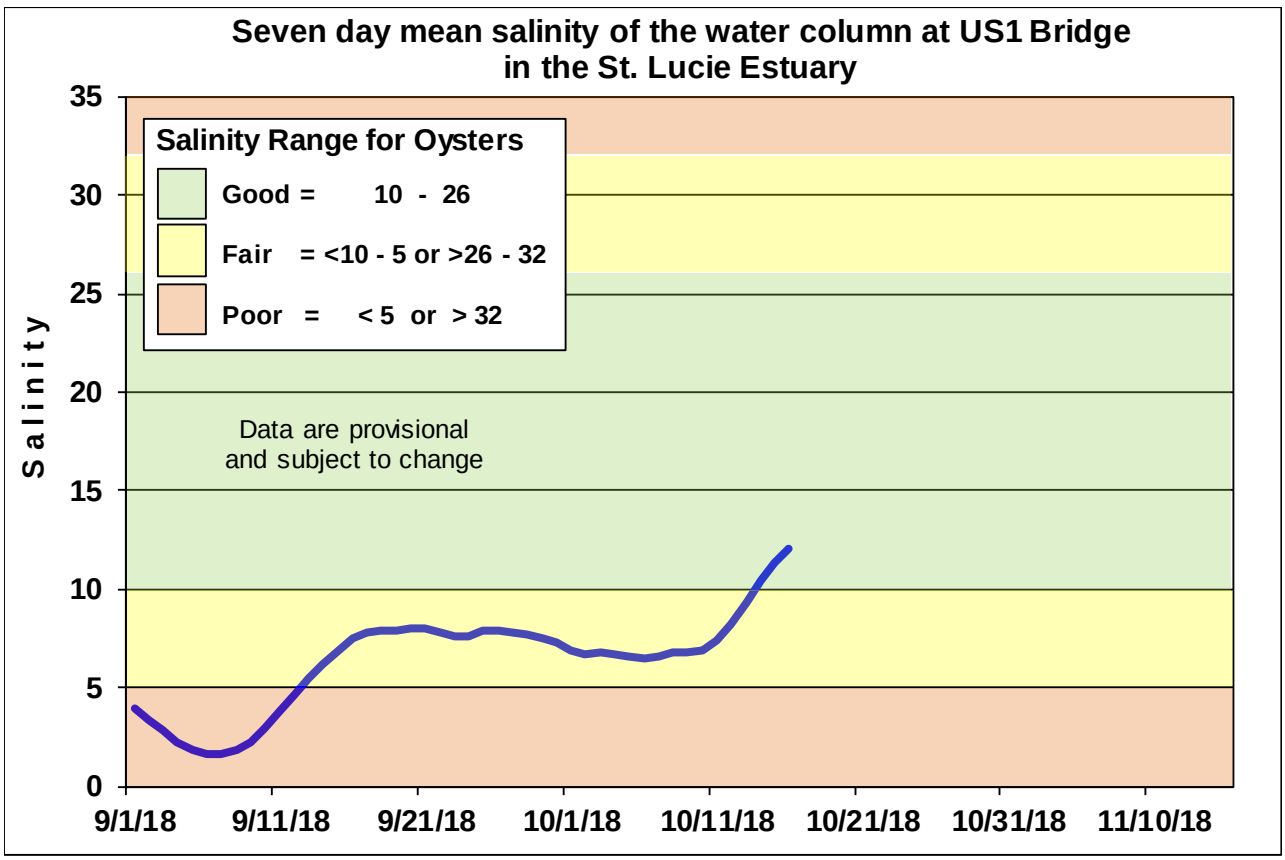


Figure 3. Seven-day mean salinity of the water column at the US1 Bridge.

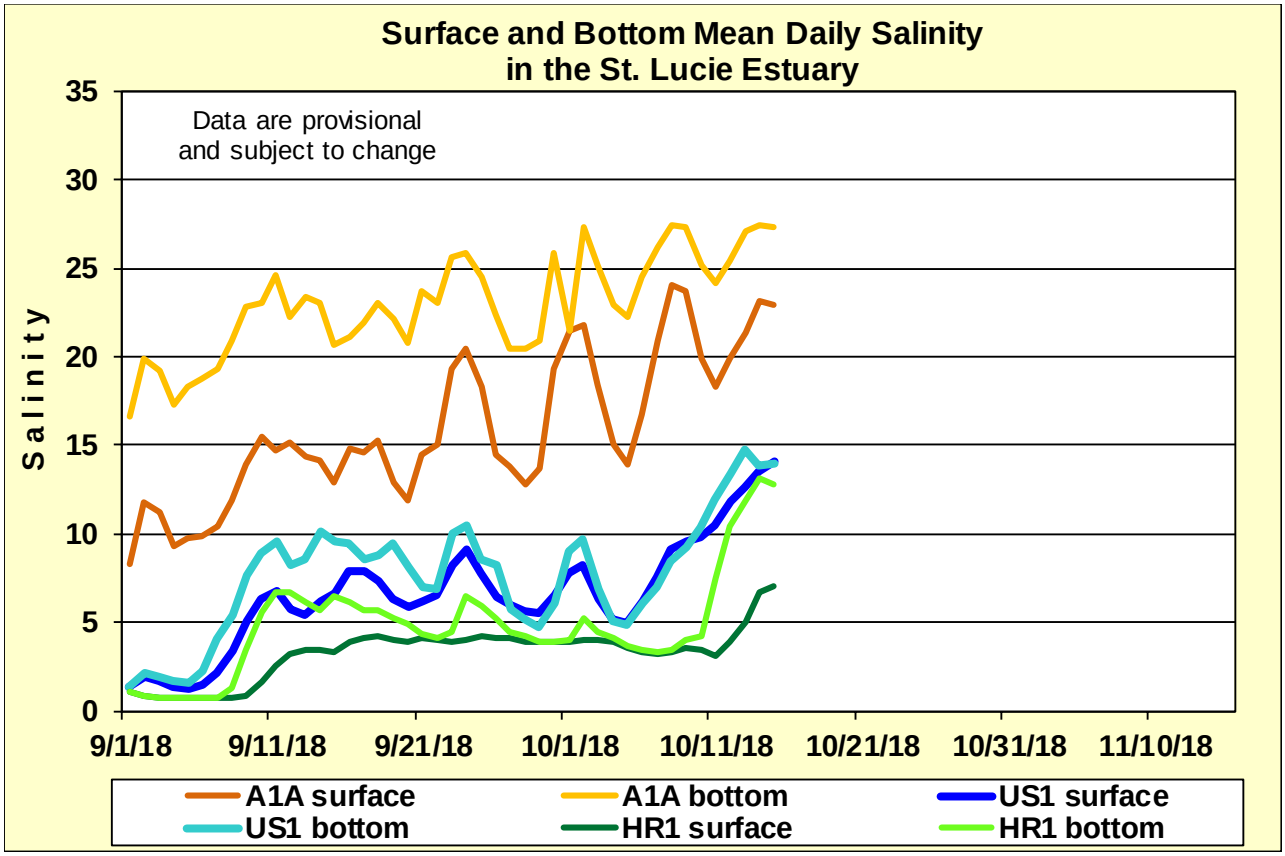


Figure 4. Daily mean salinity at the A1A, US1 and estimated HR1 stations.

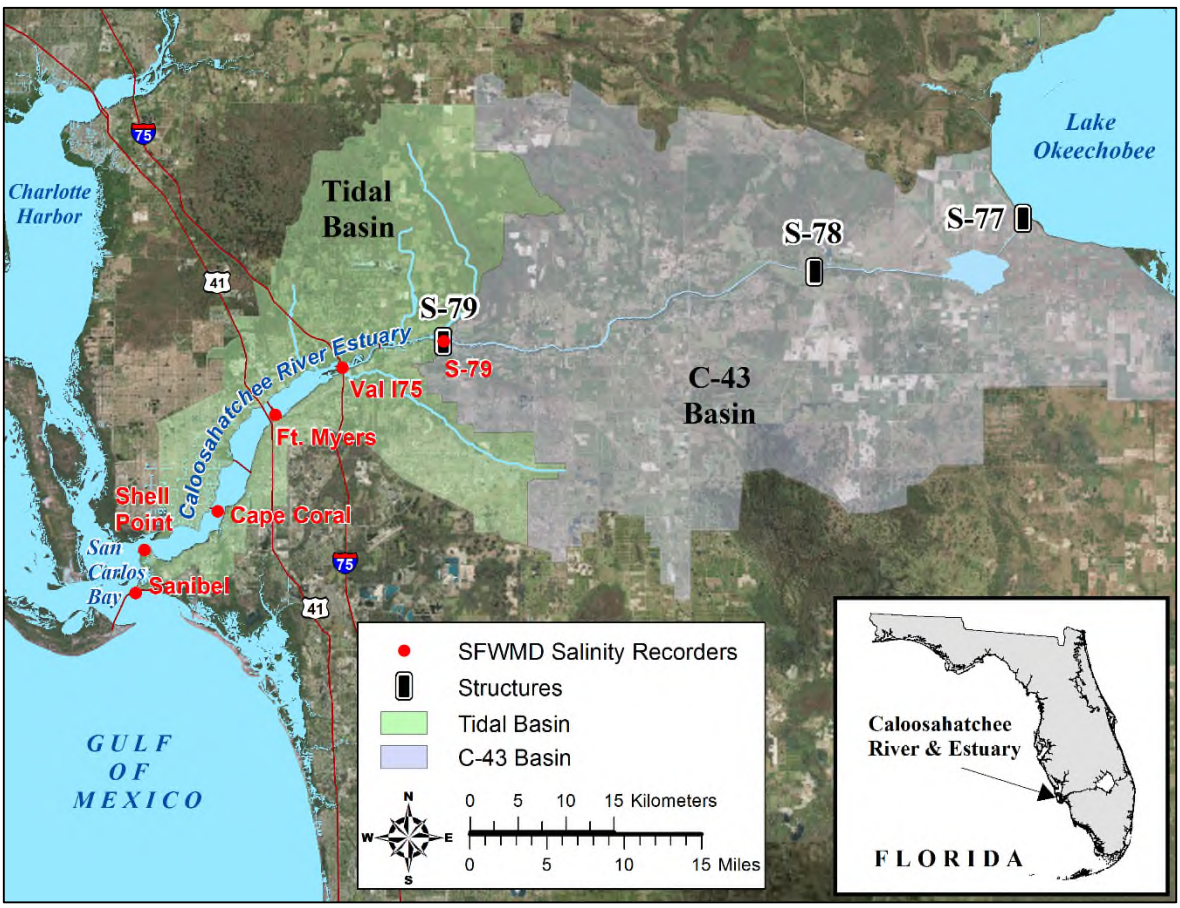


Figure 5. Basins, water control structures, and salinity monitoring for the Caloosahatchee Estuary.

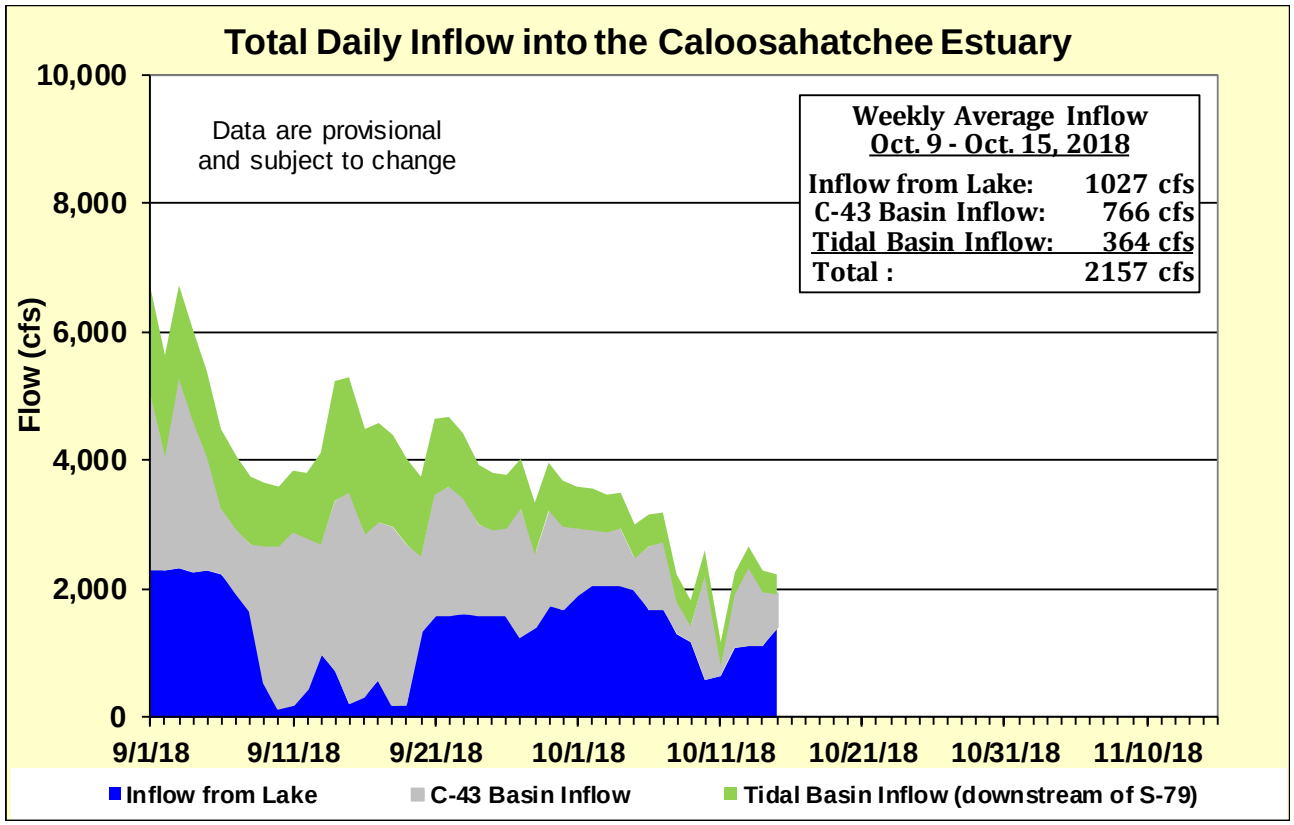


Figure 6. Total daily inflows from Lake Okeechobee, runoff from the C-43 basin, and tributaries in the tidal basin into the Caloosahatchee River Estuary.

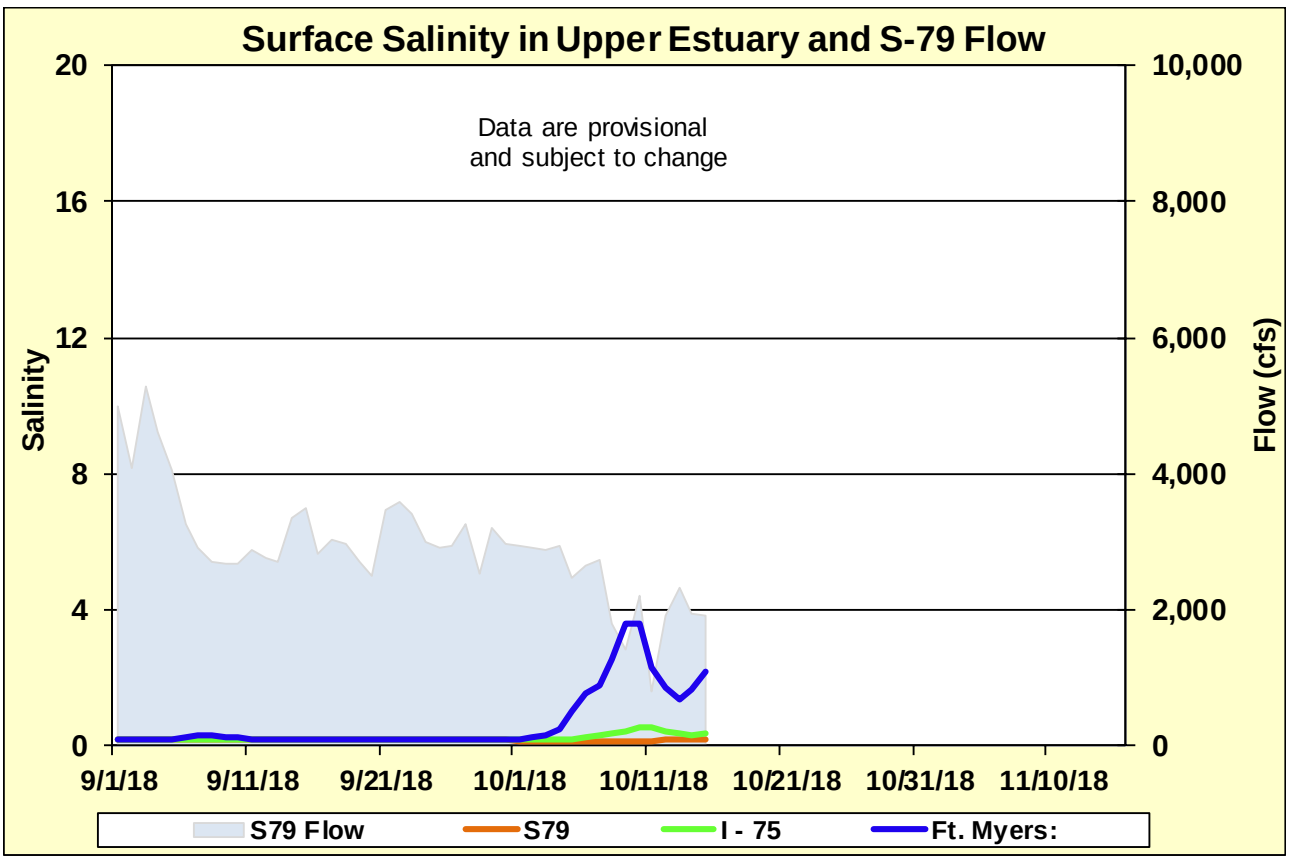


Figure 7. Daily mean flows at S-79 and salinity at upper estuary monitoring stations.

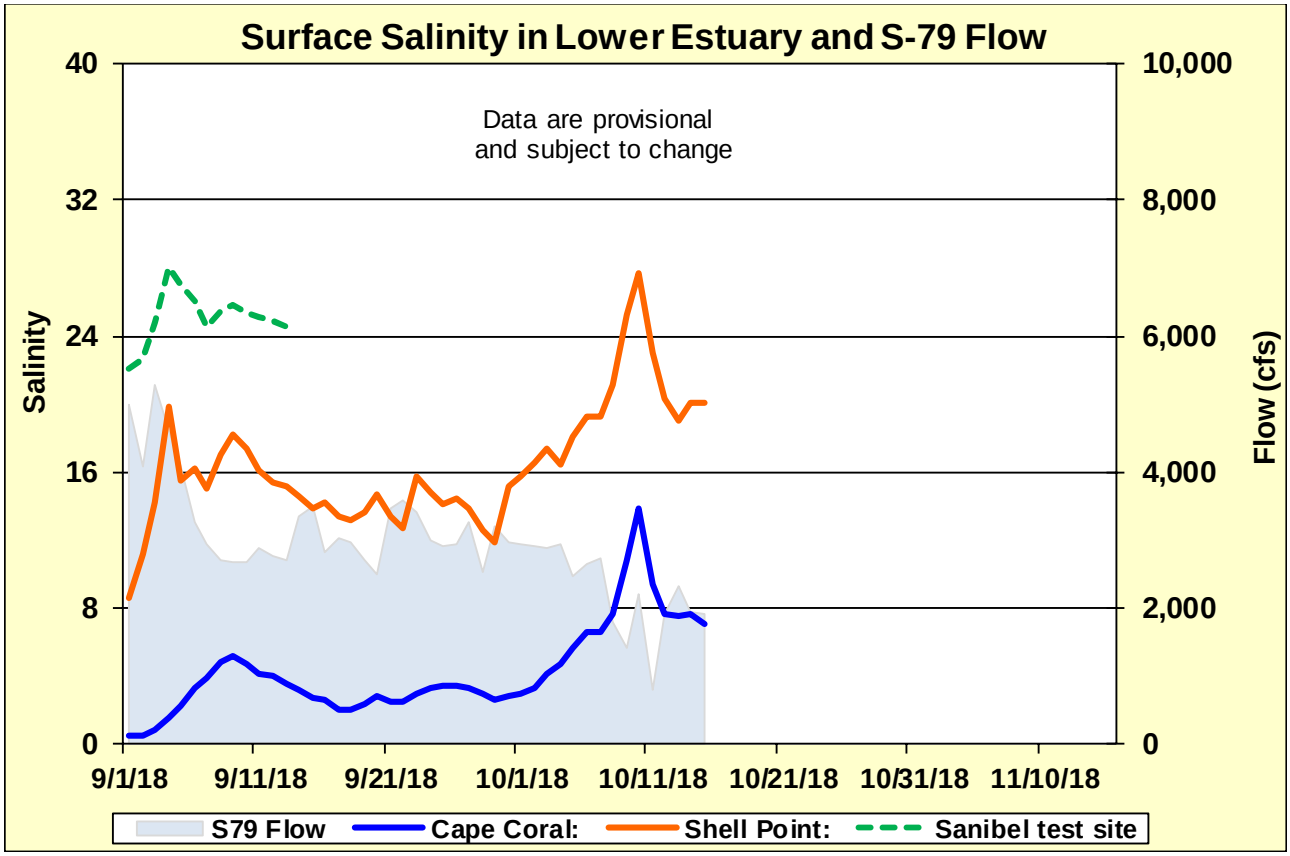


Figure 8. Daily mean flows at S-79 and salinity at lower estuary stations.

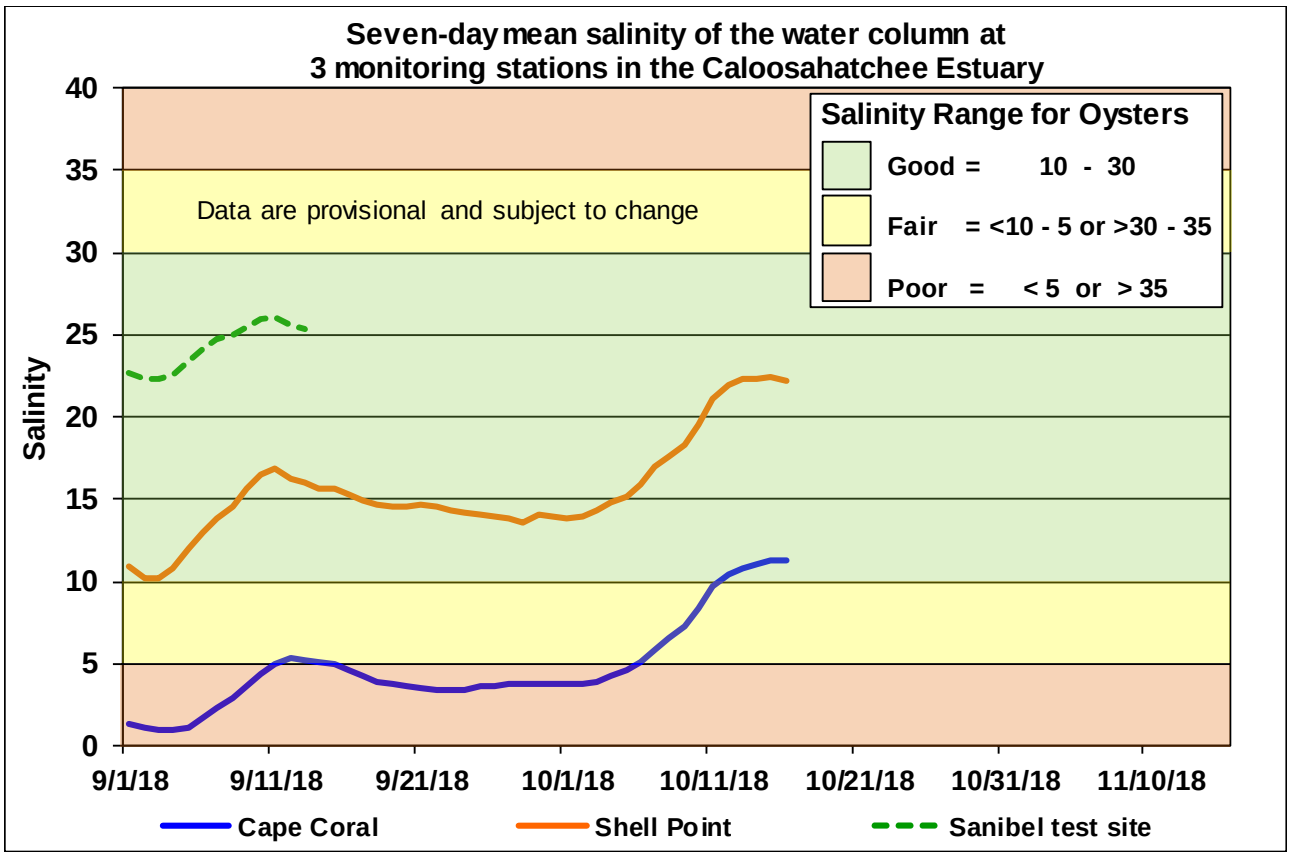


Figure 9. Seven-day mean salinity at Cape Coral, Shell Point, and Sanibel monitoring stations.

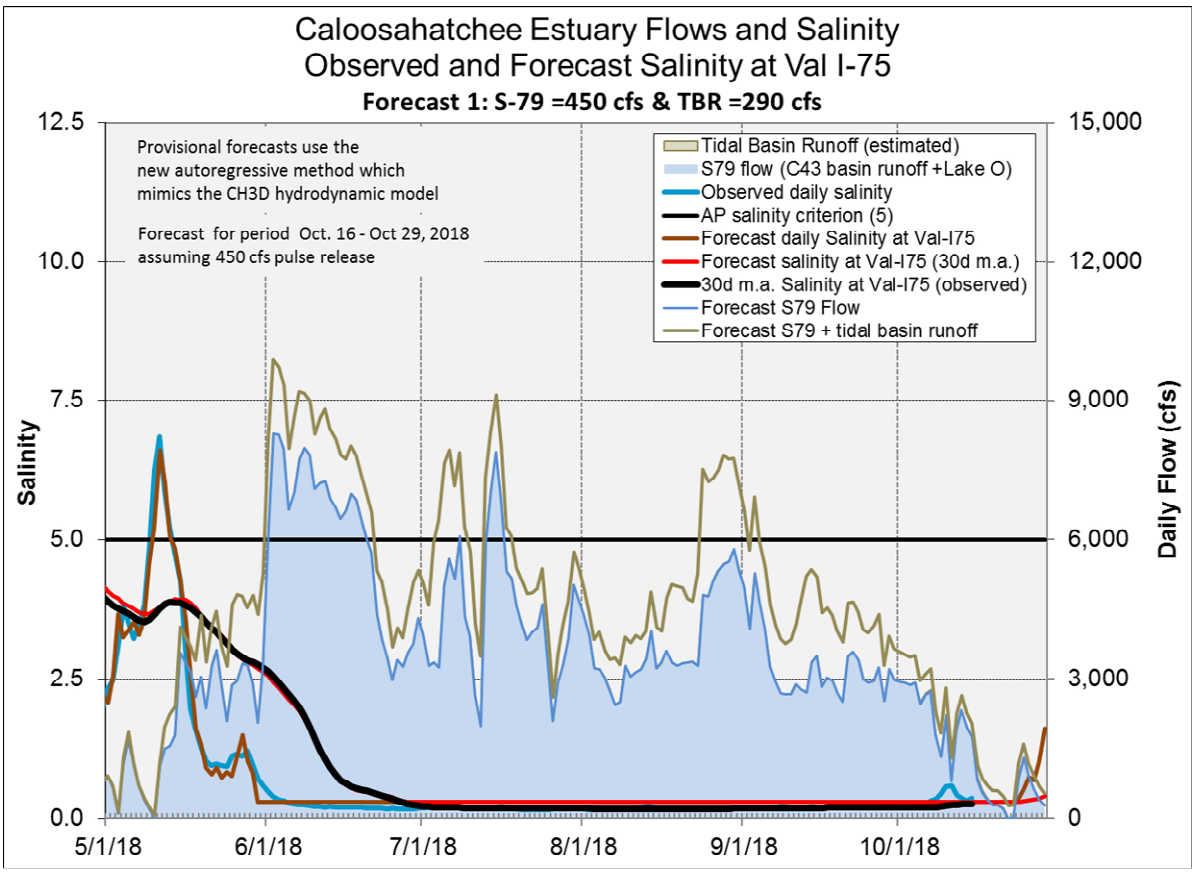
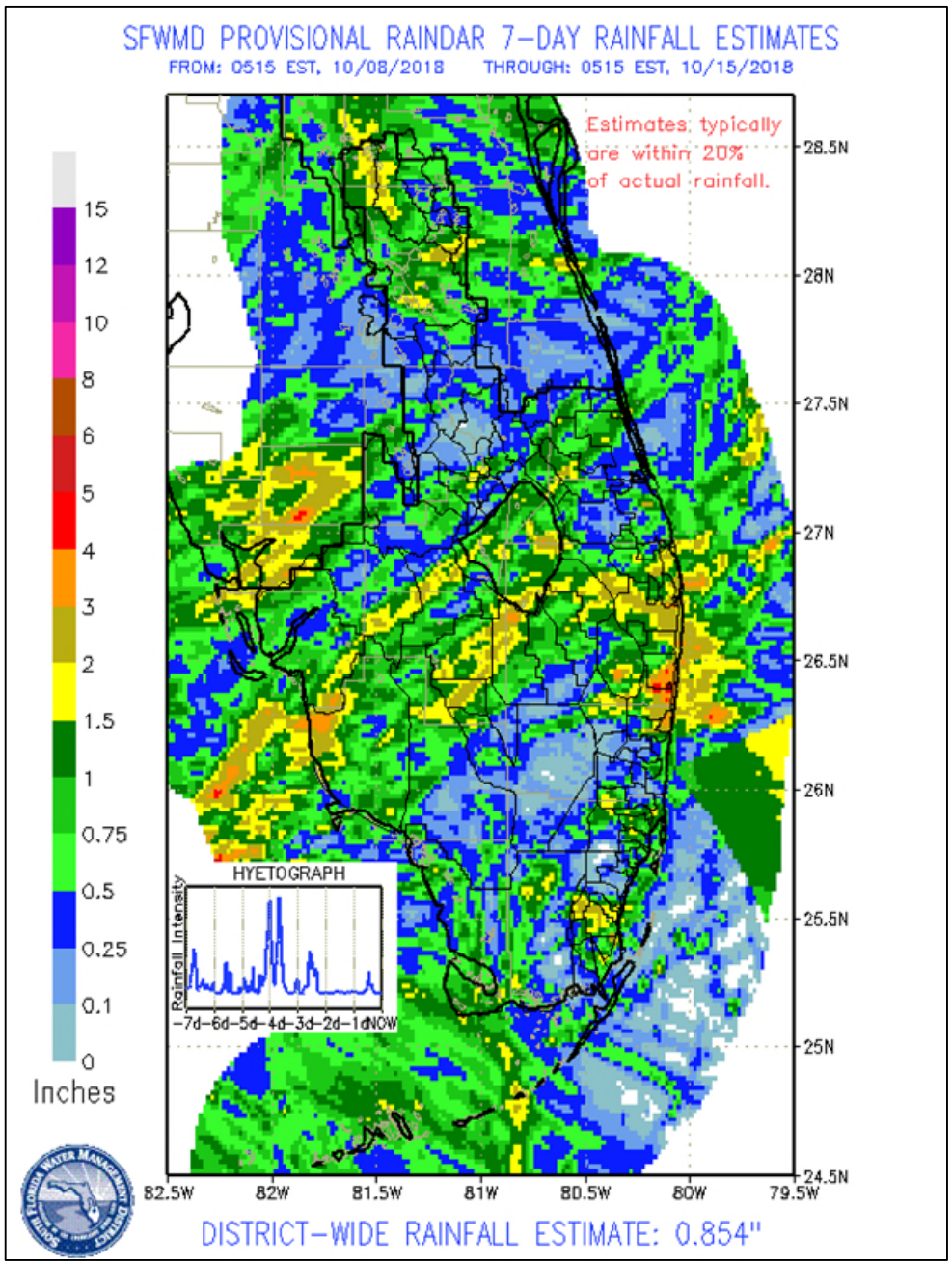


Figure 10. Val I-75 salinity assuming 450 cfs release at S-79

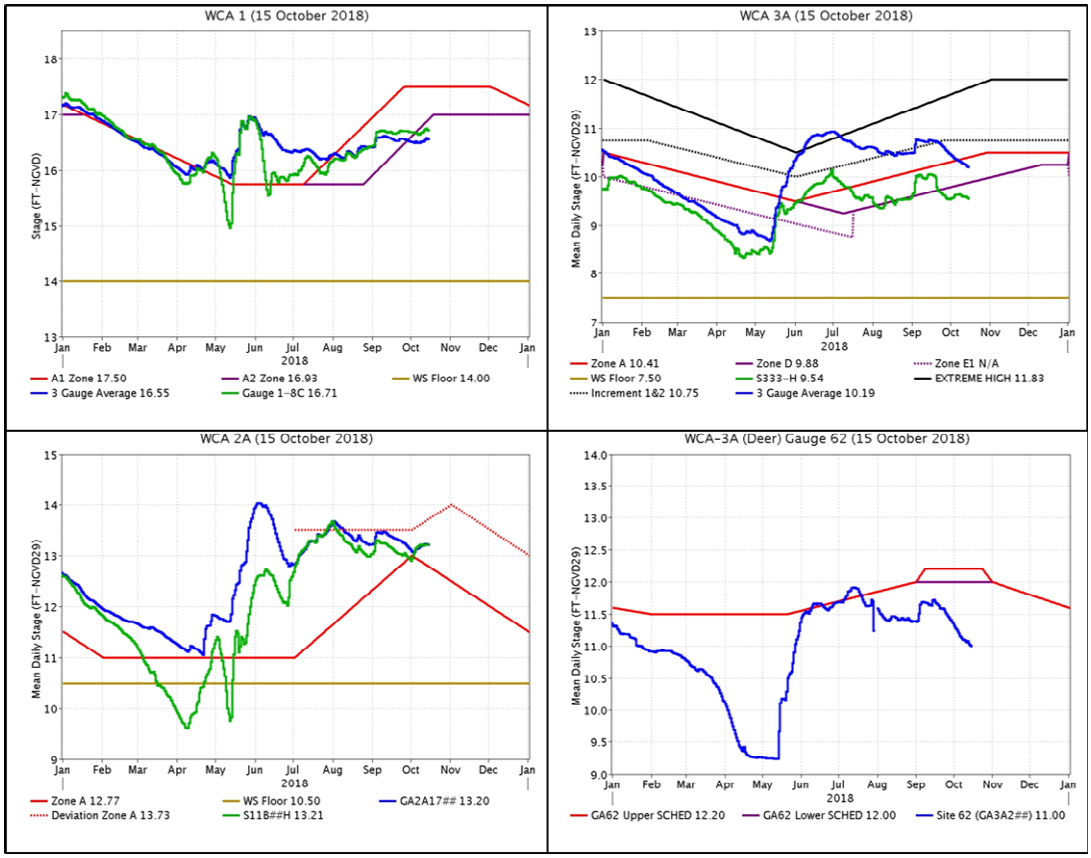
EVERGLADES

At the gauge locations monitored for this report, stages within the Everglades fell 0.02 feet on average over the last week. The most extreme individual gauge changes within the WCAs ranged from +0.11 feet (WCA-1) to -0.18 feet (WCA-3A northeast). Pan evaporation was estimated at 1.47 inches this week.

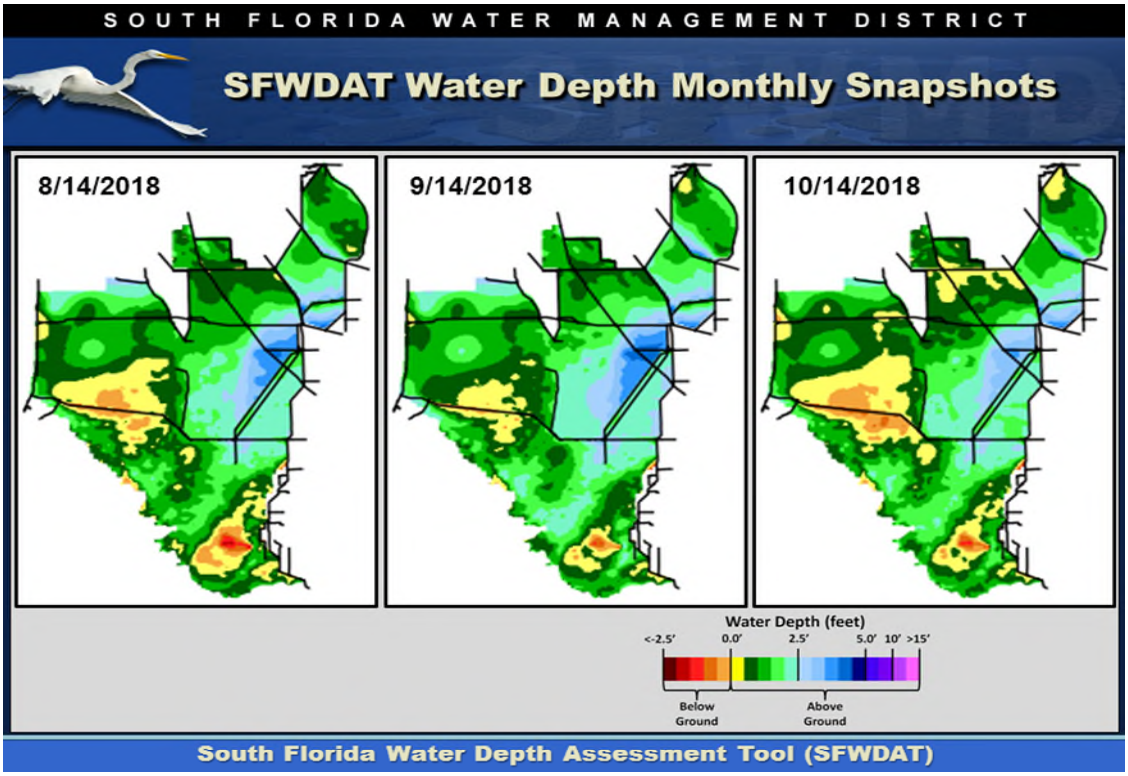
Everglades Region	Rainfall (Inches)	Stage Change (feet)
WCA-1	1.21	+0.08
WCA-2A	0.94	+0.05
WCA-2B	0.16	+0.11
WCA-3A	0.32	−0.12
WCA-3B	0.35	−0.09
ENP	0.77	+0.02

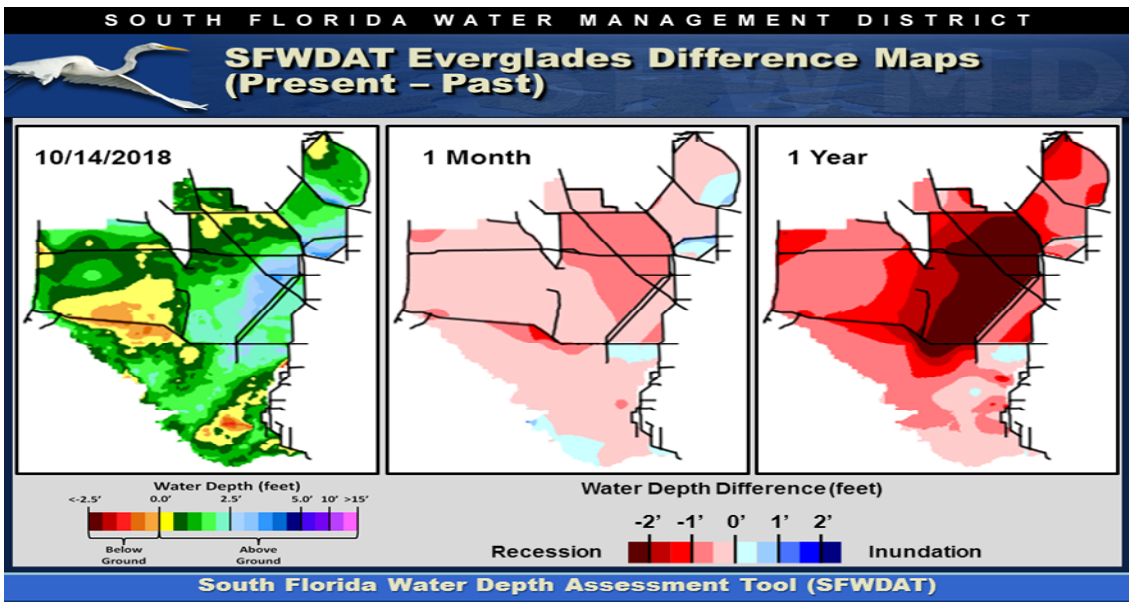


Regulation Schedules: WCA-1 three-gauge average stage is 0.95 feet below Zone A1, and 0.38 feet below the Zone A2 regulation line. WCA-2A marsh stage is 0.53 feet below Dev. Zone A. S-11B Headwater stage is 0.52 feet below the Deviation, and 0.44 above the Zone A regulation line. WCA-3A three-gauge average stage is 0.56 feet below Increment 1&2, and 0.22 feet below the Zone A regulation line. WCA-3A stage at gauge 62 (northwest corner) remains 1.20 feet below the upper schedule and continues to fall away from the regulation line.



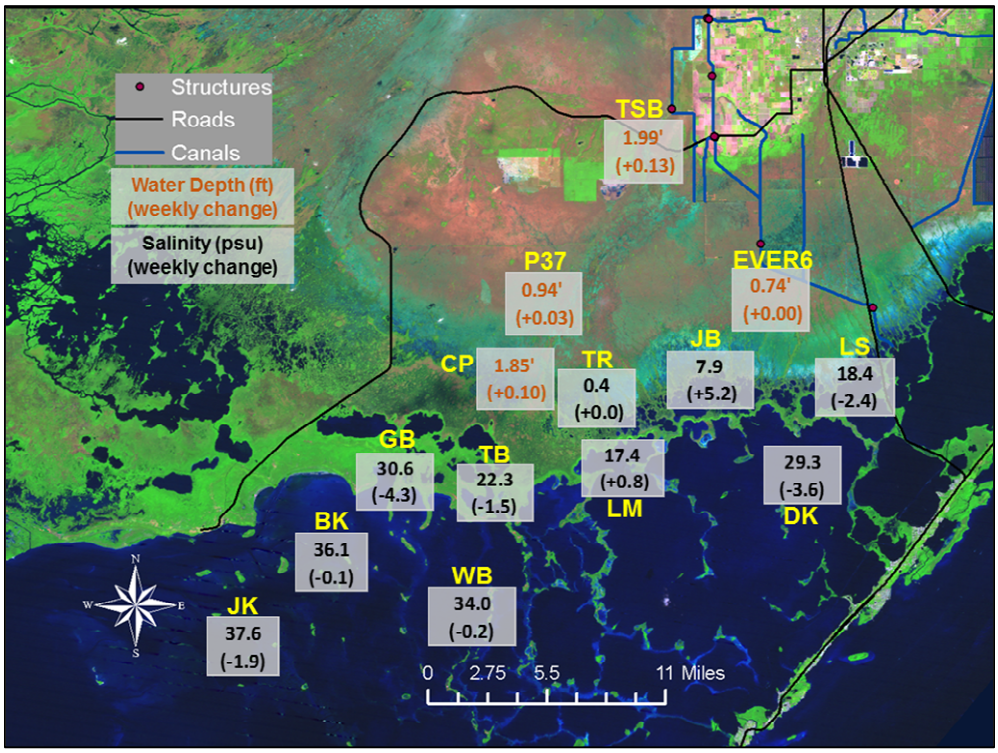
Water Depths and Changes: The WDAT tool for spatial interpolation of depth monthly snapshots indicate drying conditions, the spatial extent of ponded depths along the L-67 and in WCA-3A South has contracted compared with last month and the ponding depth has decreased. Regions with depths down to 0.0 feet expanded greatly over the last month in WCA-3A North, and northern WCA-1. WDAT difference output indicates that water depths changes across most of South Florida are drier but not highly significant. Changes of note are the drier conditions than one month ago across WCA-3A North. In the “1 Year” inset we see the comparison between current depth conditions and post Hurricane Irma’s impact on water depths.

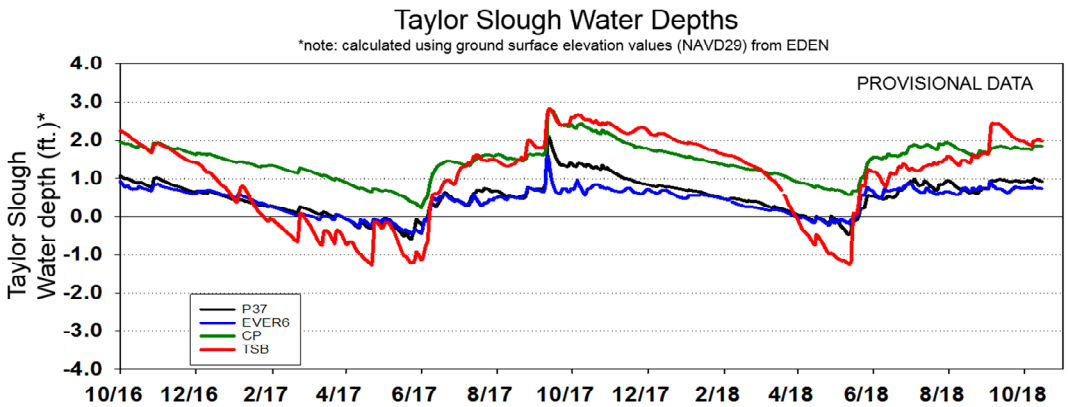


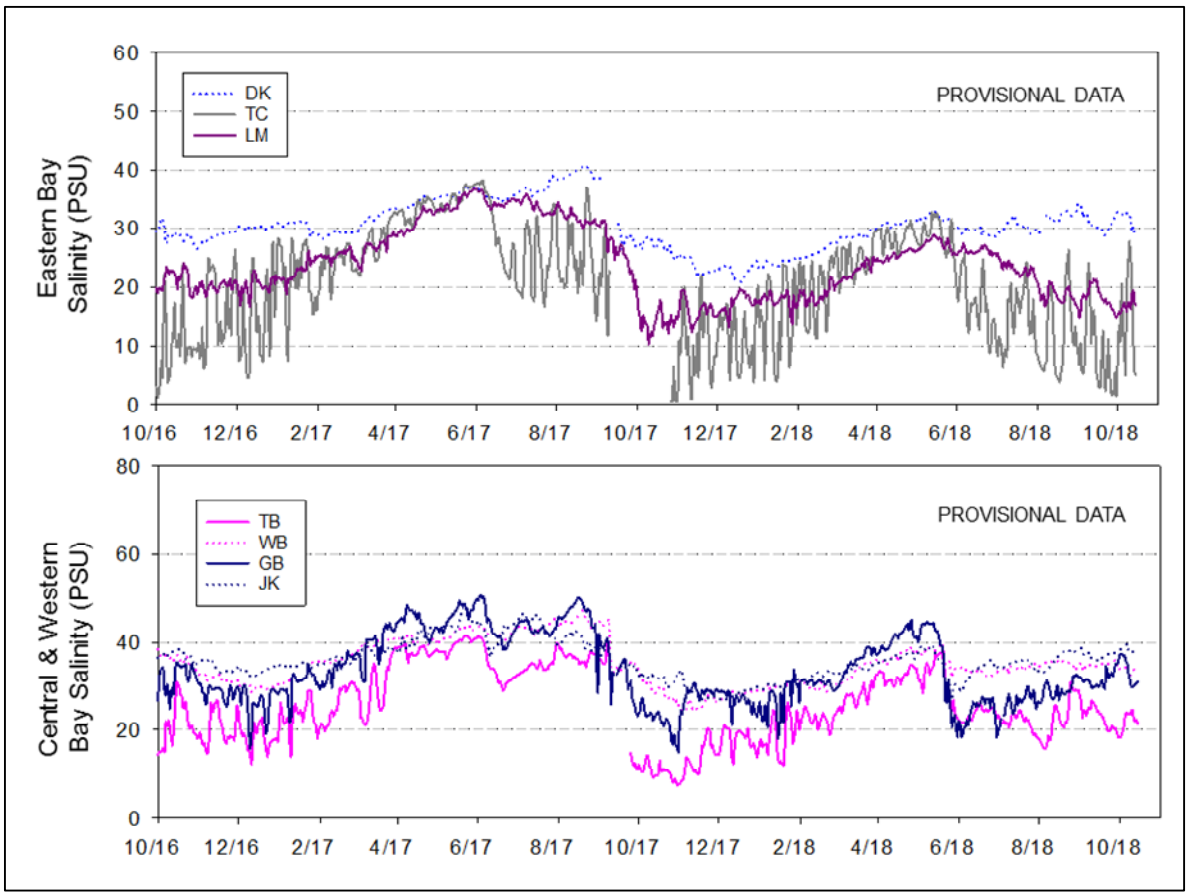


Taylor Slough Water Levels: An average of 1 inch of rain fell on Taylor Slough and Florida Bay this past week. Stages increased an average of 0.05 feet last week. Water depths averaged 1.25 feet across Taylor Slough which is 2 inches higher than the historical averages for this time of year.

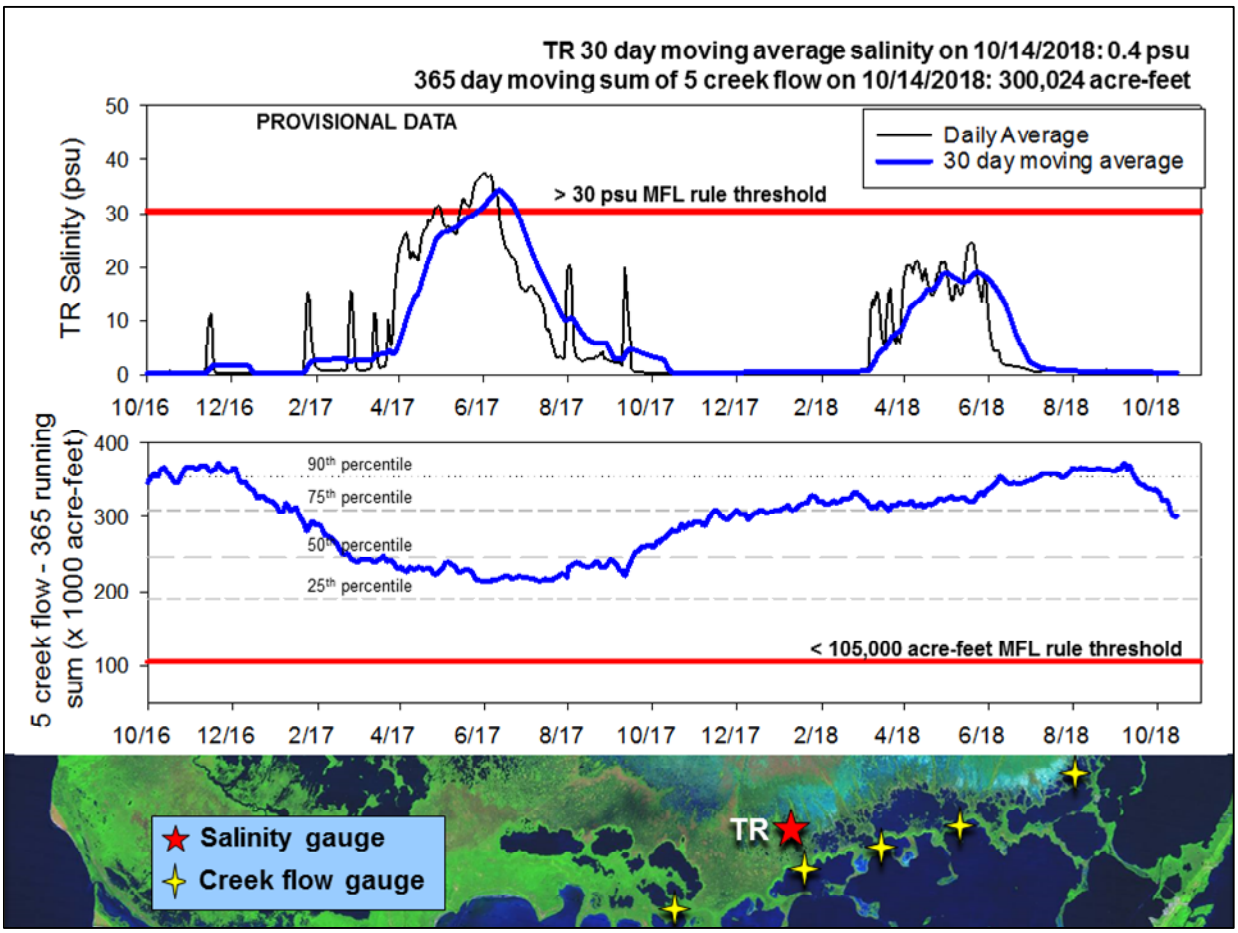
Florida Bay Salinities: Salinities decreased on average 0.9 psu this past week and range from 8 psu in the northeast to 38 psu in the west. Conditions in western Florida Bay are 3 to 6 psu higher than their historical averages for this time of year which is undesirable this late in the wet season. Water movement from Hurricane Michael raised salinities in the nearshore area, but resulted in decreases in the west as water was better mixed.







Florida Bay MFL: Mangrove zone daily average salinity stayed at 0.4 psu this past week, and the 30-day moving average is also 0.4 psu. The weekly cumulative flow from the five creeks denoted by yellow stars on the map totaled about 2,500 acre-feet for the last week which is less than a fifth of the average for this time of year. Negative flows persisted for half of the week due to water movement from the storm. The 365-day moving sum of flow from the five creeks has been dropping rapidly with a decrease of 23,000 acre-feet over the last week to end at 300,024 acre-feet (still greater than the long-term average of 257,628 acre-feet and above the median). Creek flow is provisional data from the USGS and is highly variable.



Water Management Recommendations

Water management that protects peat soils (especially in WCA-3A North) as the dry season approaches has increased ecological benefit over high water concerns at this point. The Deer Gauge (3-62) is now 1.0 feet below the lower schedule and trends unfavorably away from the regulation line. Any water not available to protect the peat soils in WCA-3A North, would be ecologically beneficial to Holeyland WMA as that basin is now in Zone C. According to the WDAT modeling, depths in the northern portion of WCA-1 at and near ground level have expanded significantly over the last month. This historically dry area would benefit from hydration as the 3-gauge average stage is now almost 0.40 feet below the Zone A2 regulation line. Incremental change in the rate of structure flows (i.e., when changing flow rates from 0 cfs to 1,000 cfs, make 500 cfs adjustment per week) to the WCAs is more ecologically sensitive than abrupt rate changes. More specific recommendations appear in the summary table below. The red text represents new or modified information or recommendations.

SFWMD Everglades Ecological Recommendations, October 16th, 2018 (red is new)			
Area	Weekly change	Recommendation	Reasons
WCA-1	Stage increased by 0.08'	Maintain depths at regulation schedule.	Protect upstream/downstream habitat and wildlife.
WCA-2A	Stage increased by 0.05'	Maintain depths at temporary regulation schedule. Manage for a rate of ascension less than +0.25' per week, or less than +0.5 per 2 weeks.	Protect upstream/downstream habitat and wildlife.
WCA-2B	Stage increased by 0.11'	Maintain depths at temporary regulation schedule. Manage for a rate of ascension less than +0.25' per week, or less than +0.5 per 2 weeks.	Protect upstream/downstream habitat and wildlife.
WCA-3A NE	Stage decreased by 0.18'	Maintain depths at regulation schedule.	Protect habitat including peat soil development, tree islands and wildlife.
WCA-3A NW	Stage decreased by 0.11'	Maintain depths at regulation schedule.	
Central WCA-3A S	Stage decreased by 0.15'	Maintain depths at regulation schedule. Manage for a rate of ascension less than +0.25' per week, or less than +0.5 per 2 weeks.	Protect habitat including peat soil development, tree islands and wildlife.
Southern WCA-3A S	Stage decreased by 0.04'		
WCA-3B	Stage decreased by 0.09'	Maintain depths at temporary regulation schedule. Manage for a rate of ascension less than +0.25' per week, or less than +0.5 per 2 weeks.	Protect upstream/downstream habitat and wildlife.
ENP-SRS	Stage increased by 0.02'	Make discharges to the Park according to the 2012 WCP rainfall plan.	Protect upstream/downstream habitat and wildlife.
Taylor Slough	Stage changes ranged from +0.01' to +0.13'	Move water southward as possible	When available, provide freshwater buffer for downstream conditions.
FB- Salinity	Salinity changes ranged −4.3 to +5.2 psu.	Move water southward as possible	When available, provide freshwater to maintain low salinity buffer and promote water movement.