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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 3, 2017

SUBJECT: Weekly Environmental Conditions for Systems Operations

Summary

Weather Conditions and Forecast

An old frontal boundary is becoming diffuse across the peninsula of Florida but an upper level trough over the northern Bahamas is continuing to flare up shower activity in the frontal zone as it backs into the area. Strong east winds are moving shower activity quickly westward but heaviest rainfall amounts should be focused east where redevelopment occurs. Shower activity will decrease this evening and then increase again near the east coast pre-dawn Wednesday and during the day Wednesday as the upper trough moves into the area. A tropical wave passing to our south is forecast to help develop a weak low in the frontal boundary over the Florida Straits Thursday. This low should bring areas of moderate to heavy rain mainly over the southern half of the District Thursday. Daytime heating should then help generate mainly afternoon thunderstorm activity focused north and east Friday and Saturday.

Kissimmee

Tuesday morning stages and departures from schedule were 58.9 feet (1.8 feet above schedule) in East Lake Toho, 54.8 feet (0.7 feet above schedule) in Lake Toho, and 52.3 feet (0.7 feet above schedule) in Kissimmee Cypress Hatchineha; S65A headwater stage was 49.3 feet. Tuesday morning discharges were 8,250 cfs at S65, 7,877 cfs at S65A, and 13,077 cfs at S65E. Dissolved oxygen concentration in the Kissimmee River averaged 1.0 milligrams per liter (mg/L) for the week. Kissimmee River mean floodplain depth on Sunday was 4.68 feet.

Lake Okeechobee

Lake stage is 16.50 feet NGVD having increased by 0.29 feet over the past week and 2.87 feet over the past month, due to Hurricane Irma's extensive rainfall. Lake stages are expected to continue to rise as the watershed drains, and combined with the turbidity from resuspended Lake sediment, the submerged aquatic and emergent vegetation coverage in the nearshore areas of the Lake are expected to decline over the coming months and possibly years. The high inflows and resuspended Lake sediment are also expected to significantly increase water column total phosphorus, which could lead to algal blooms as turbidity begins to decline.

Estuaries

Total discharge to the St. Lucie Estuary averaged 6,250 cfs over the past week with 2,927 cfs coming from Lake Okeechobee. Over the past week, salinity remained about the same at most sites in the St. Lucie Estuary. Bottom salinity at A1A Bridge was slightly higher compared to the week before. Additionally, water was stratified at A1A site, with higher salinity near the bottom and lower salinity near the surface. The seven-day average salinity at the US1 Bridge is in the poor range for adult oysters. Chlorophyll a concentration levels at LOBO stations (maintained by FAU) remain low (on average <7 µg/L). Low oxygen levels (<3 mg/L) were recorded at HR1 monitoring station. Cyanobacteria bloom

potential is low to medium at some locations in the estuary. No other types of algal blooms were reported for the estuary this week.

Total inflow to the Caloosahatchee Estuary averaged 11,908 cfs over the past week with 6,340 cfs coming from the Lake. Salinity conditions are in the poor range for adult oysters at Cape Coral, fair range at Shell Point and in the good range at Sanibel. Chlorophyll a measurements by the Sanibel-Captiva Conservation Foundation did not show high Chlorophyll a concentration levels near Ft. Myers over the last week. No data was available for oxygen due to equipment failure. Cyanobacteria bloom potential status is low-to medium, at limited nearshore locations. *Karenia brevis* (red tide dinoflagellate) was observed at background level in samples collected along the Lee County coast.

Stormwater Treatment Areas

Over the past week, the STAs/FEBs did not receive Lake releases. The total amount of Lake releases sent to the STAs/FEBs in WY2018 (since May 1, 2017) is approximately 21,600 acre-feet. Most STA cells are at or above target depths. Operational restrictions are in place for vegetation rehabilitation in STA-1E and STA-2. Due to recent basin runoff, it is recommended that no Lake releases be sent to the STAs/FEBs this week.

Everglades

Above average rainfall yet fairly stable conditions bring about relief from high water conditions in WCA-2A with another almost 0.25-foot drop in stage. However, deep water conditions persist in WCA-3A with a 0.23-foot rise at gauge 65 in the southern end of that basin. Keeping depths below 2.5 feet at gauge 65 is important to moderate the stress to tree islands caused by flooding when durations last longer than 60-90 days. The depth on Sunday at that location was 4.38 feet, and has exceeded 2.5 feet for 108 days. In all areas of Florida Bay salinities are average to 5 psu below average (central nearshore area) compared to the historic averages for this time of year.

Supporting Information

KISSIMMEE BASIN

Kissimmee Basin Rainfall

The Upper Kissimmee Basin received 1.65 inches of rainfall in the past week and the Lower Basin received 2.15 inches (SFWMD Daily Rainfall Report 10/02/2017).

Upper Kissimmee Basin

Stages and departures in the Kissimmee Chain of Lakes (KCOL) are shown in Table1.

Table 1. Departures from KCOL flood regulation (F) or temporary schedules (T, A, or S) (feet NGVD). Discharge and stage data are provisional real-time data from SFWMD OASyS DualTrend; reported values are averages through midnight of the Sunday prior to the report date unless otherwise specified.

Report Date: 10/3/2017

Water Body	Structure/Site	Discharge (cfs), week's average**	Stage Monitoring Site***	Lake Stage (feet)	Schedule*	Regulation (R) or Target (S or T) Stage (feet)	Daily Departure (feet)						
							10/1/17	9/24/17	9/17/17	9/10/17	9/3/17	8/27/17	8/20/17
Lakes Hart and Mary Jane	S62	419	LKMJ	61.7	R	60.0	1.7	2.1	2.3	0.1	0.0	0.1	0.1
Lakes Myrtle, Preston, and Joel	S57	212	S57	63.5	R	61.0	2.5	3.1	3.2	0.1	-0.1	0.1	0.0
Alligator Chain	S60	575	ALLI	63.3	R	63.2	0.1	0.7	1.3	0.0	0.0	0.0	0.0
Lake Gentry	S63	732	LKGT	61.0	R	61.0	0.0	0.4	0.9	0.0	0.0	-0.1	0.0
East Lake Toho	S59	1398	TOHOE	59.0	R	57.0	2.0	2.4	2.6	0.0	0.0	0.1	0.0
Lake Toho	S61	2867	TOHOW, S61	55.0	R	54.0	1.0	1.8	2.1	0.0	0.0	0.0	0.0
Lakes Kissimmee, Cypress, and Hatchineha	S65	11491	KUB011, LKIS5B	52.4	R	51.5	0.9	1.8	2.7	1.3	1.2	1.0	0.9

* 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.

** Seven-day average of weighted daily means through Sunday midnight.

*** Names of in-lake monitoring sites and structures used to determine lake stage; if more than one site is listed, an average is reported.

DATA ARE PROVISIONAL

Lower Kissimmee Basin

Discharges and stages at Lower Basin structures are shown in Table 2. SFWDAT depth maps for the Phase I restoration area are shown in Figure 12. Kissimmee River floodplain stages at selected stations are shown in Figure 13.

Table 2. Mean weekly discharge at S-65x structures, and mean weekly Phase I area river channel dissolved oxygen and floodplain mean water depth. Discharge and stage data are provisional real-time data from SFWMD OASyS DualTrend; reported values are averages through midnight of the Sunday prior to the report date unless otherwise specified.

Report Date: 10/3/2017

Metric	Location	Sunday's 1-day average	Weekly Average**									
			10/1/17	9/24/17	9/17/17	9/10/17	9/3/17	8/27/17	8/20/17	8/13/17	8/6/17	7/30/17
Discharge (cfs)	S-65	10396	11491	12054	5535	1809	1209	1152	958	1181	665	616
Discharge (cfs)	S-65A	7727	7972	8455	7539	2375	1465	1448	1213	1298	1274	927
Discharge (cfs)	S-65D****	12178	12823	13270	11906	2442	2262	2032	2255	2154	2234	1180
Discharge (cfs)	S-65E****	12801	13342	13748	13216	2584	2279	2085	2276	2195	2319	1293
DO concentration (mg/L)***	Phase I river channel	1.1	1.0	0.8	1.3	2.3	2.3	2.0	2.8	2.0	2.2	2.3
Mean depth (feet)*	Phase I floodplain	4.68	4.70	4.72	4.42	1.35	1.30	1.18	1.08	1.10	1.00	0.63

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

** Seven-day average of weighted daily means through Sunday midnight.

*** DO is the average for manual sondes at PC62 and PC33; telemetry sondes have been taken offline.

**** S-65D discharge combines discharge at S-65D, S-65DX1, and S-65DX2; S65E discharge combines S65E and S65EX1.

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

Water Management Recommendations

Kissimmee Basin Adaptive Recommendations and Operational Actions

Date	Recommendation	Purpose	Outcome	Source
10/3/2017	No new recommendations.		N/A	
9/25/2017	No new recommendations.		N/A	
9/19/2017	No new recommendations.		N/A	
9/5/2017	No new recommendations.		N/A	
8/29/2017	No new recommendations.		N/A	
8/22/2017	No new recommendations.		N/A	
8/15/2017	No new recommendations.		N/A	
8/4/2017	Increase S65A discharge by 150 cfs to about 1400 cfs.	Reduce rate of stage rise in KCH.		SFWMD Water Mgt, KB Ops
8/1/2017	No new recommendations.		N/A	
7/25/2017	Hold current discharge at S65A, adjusting S65 discharge to maintain current flow to the Kissimmee River.	Maintain current S65A discharge.		SFWMD Water Mgt, KB Ops
7/23/2017	Increase S65A discharge slowly using Figure 8a toward the seasonal target of 1400 cfs. Hold at 1400 cfs while stage in KCH remains above 50 feet (+/- 0.2 foot).	Reduce current rapid rate of stage rise in KCH; provide Kissimmee River floodplain inundation if conditions stay wet.	Implemented	KB Ops
7/16/2017	Reduce S65A flow to ~600-650 cfs. As Pool A runoff diminishes keep S65A around 650 +/- 50 cfs by increasing flow from S65.	Maintain moderate discharge to the Kissimmee River from S65A while maintaining S65A headwater within its operating range using flow from S65.	Implemented	SFWMD Water Mgt, KB Ops
7/6/2017	Hold 450 cfs at S65A due to reduced forecast.	Reduced-rainfall forecast led to decision to hold 450 cfs at S65A rather than continuing to ramp up.	Implemented	KB Ops
7/5/2017	Increase S65A flow by 150 cfs today to 450 cfs and by another 150 cfs tomorrow.	Control stage in KCH and Pool A in anticipation of forecast significant rainfall; begin discharge rampup in anticipation of forecast rainfall.	Implemented	KB Ops
6/28/2017	Reduce S65A discharge by a maximum of 150 cfs per day until 300 cfs is reached.	Allow KCH stage to rise before transitioning to 2017 Wet Season discharge plan; facilitate DO recovery in the Kissimmee River by reducing depth in the river channel.	Implemented	KB Ops
6/26/2017	Hold 800 cfs at S65A until further notice.	Maintain reduced discharge to allow stages in KRR project area to decline to facilitate DO recovery.	Implemented	KB Ops
6/22/2017	Reduce discharge by 150 cfs each day on Thursday 6/22, Friday 6/23, Saturday 6/24, and Sunday 6/25. After the Sunday reduction hold at approximately 800 cfs through Monday when new DO data should be available to help guide next steps.	Attempt to allow Kissimmee River dissolved oxygen concentration to rise.	Implemented	KB Ops
6/20/2017	Maintain 1400 cfs at S65A as KCH stage continues to rise. Supplement declining S65A basin runoff by increasing discharge at S65 as needed.	Transition from current operations to 2017 Wet Season discharge plan.	Implemented	KB Ops, SFWMD Water Management
6/15/2017	Attempt to slow the rates of stage rise in Lakes Toho and East Toho by increasing discharge from S59 into Toho and S61 into KCH.	Slow rates of rise in Lakes Toho and East Toho.	Implemented	KB Ops, SFWMD Water Management
6/15/2017	Increase discharge from S65A as necessary using the discharge rates of change table in Figure 8a.	Lower stage in Pool A following rainfall directly over the S65A Basin.	Implemented	SFWMD Water Management, KB Ops
6/13/2017	No new recommendations.			
6/6/2017	No new recommendations.			

KCOL Hydrographs (through Sunday midnight)

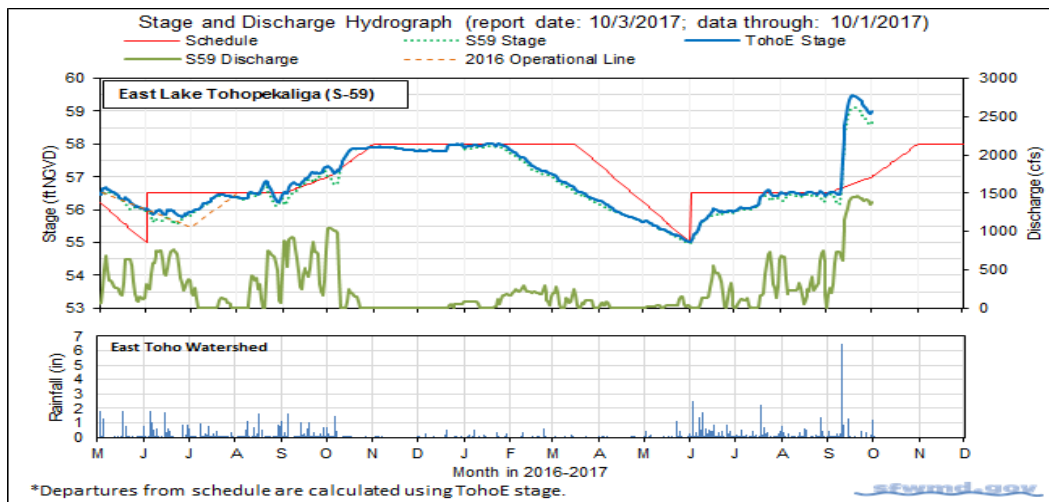


Figure 1.

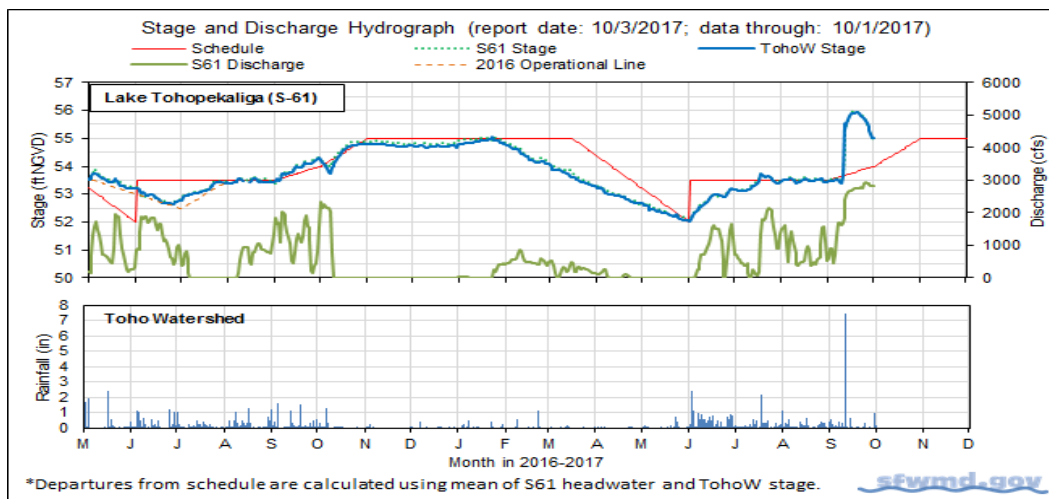


Figure 2.

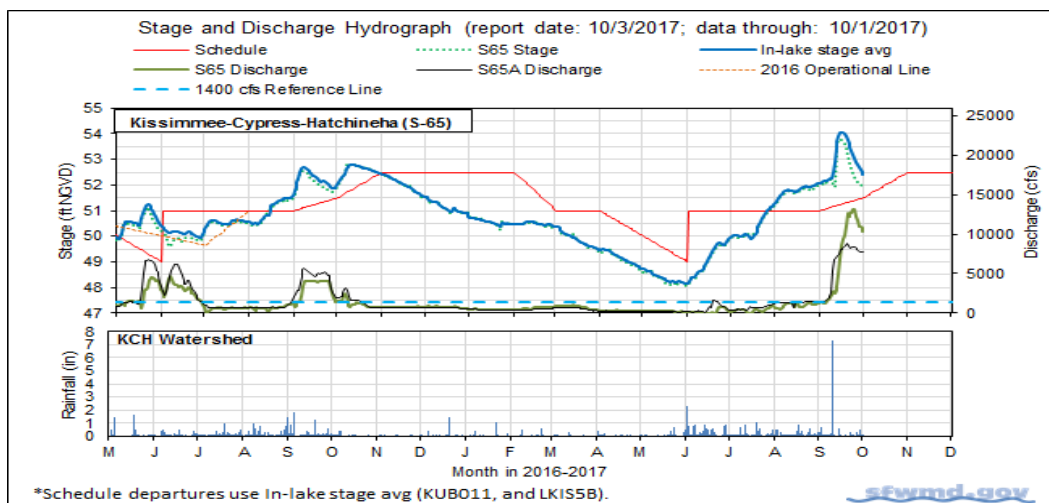


Figure 3.

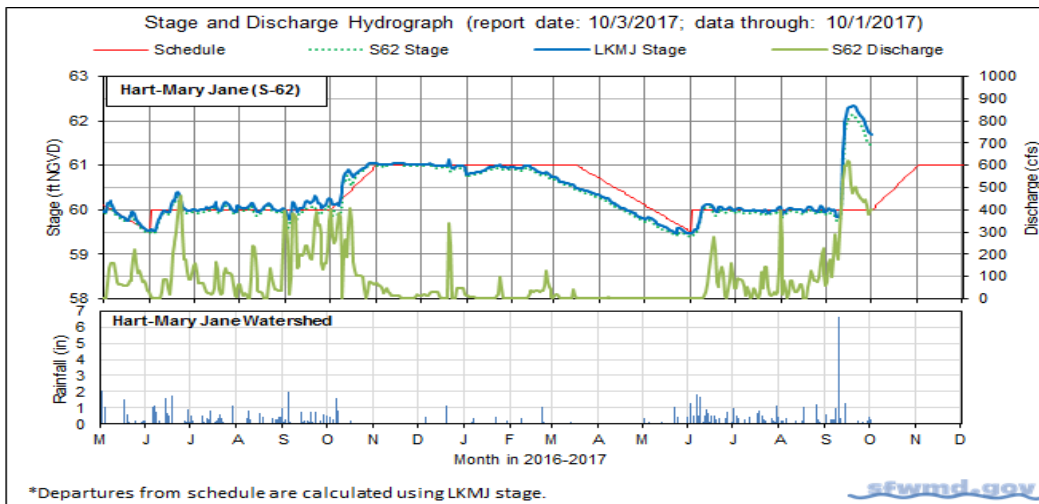


Figure 4.

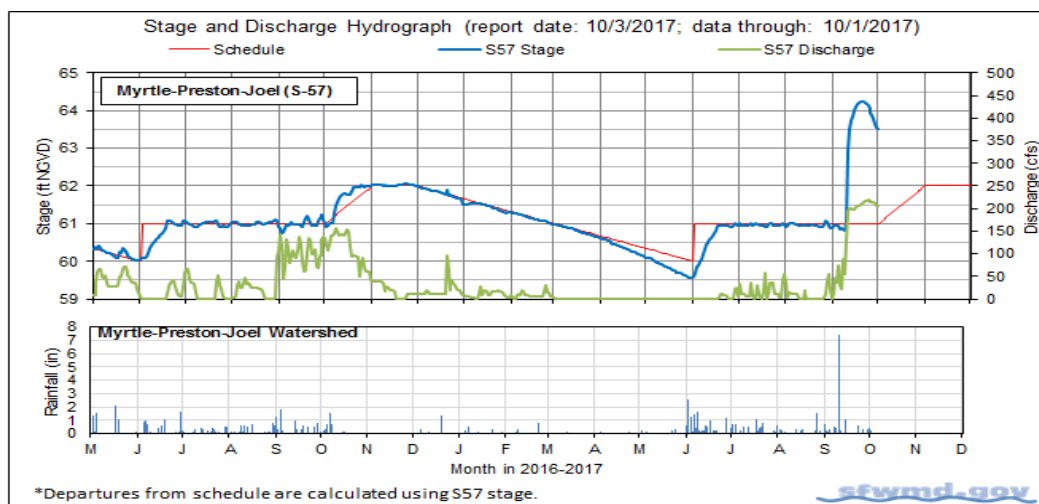


Figure 5.

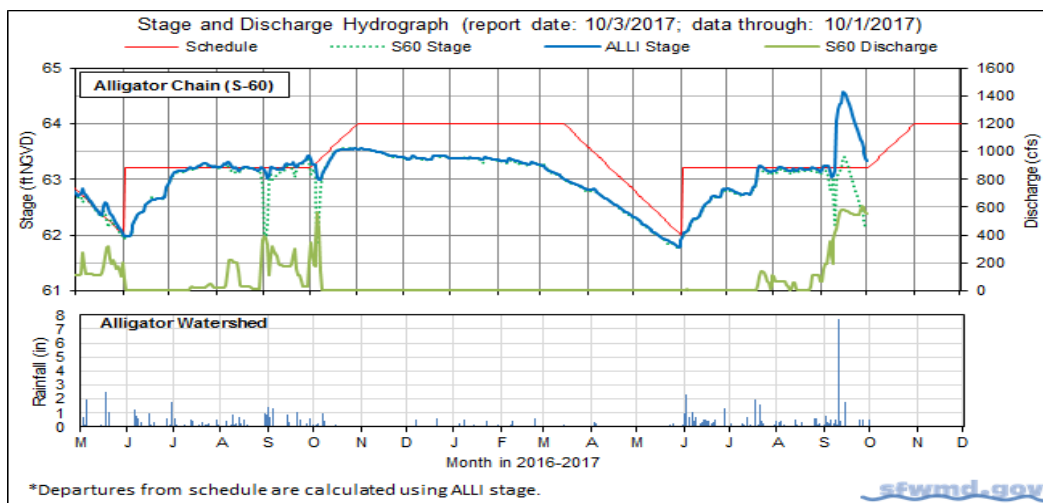


Figure 6.

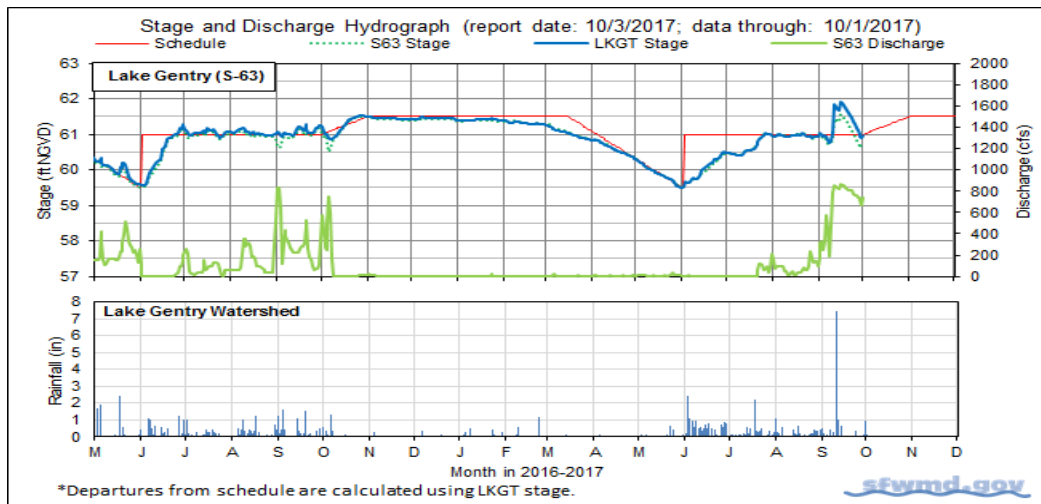


Figure 7.

SOUTH FLORIDA WATER MANAGEMENT DISTRICT	
Limits on Rate of Discharge Change at S65/S65A During Dry Season 2016-2017	
Discharge Rate of Change Limits for S65/S65A (revised 11/16/16).	
Q (cfs)	Maximum rate of increase or decrease (cfs/day)
300-650	75
650-1700	150
1700-3000	300
>3000	1000

Figure 8. Limits on rate of discharge change at S65/S65A for the 2016-2017 Dry Season.

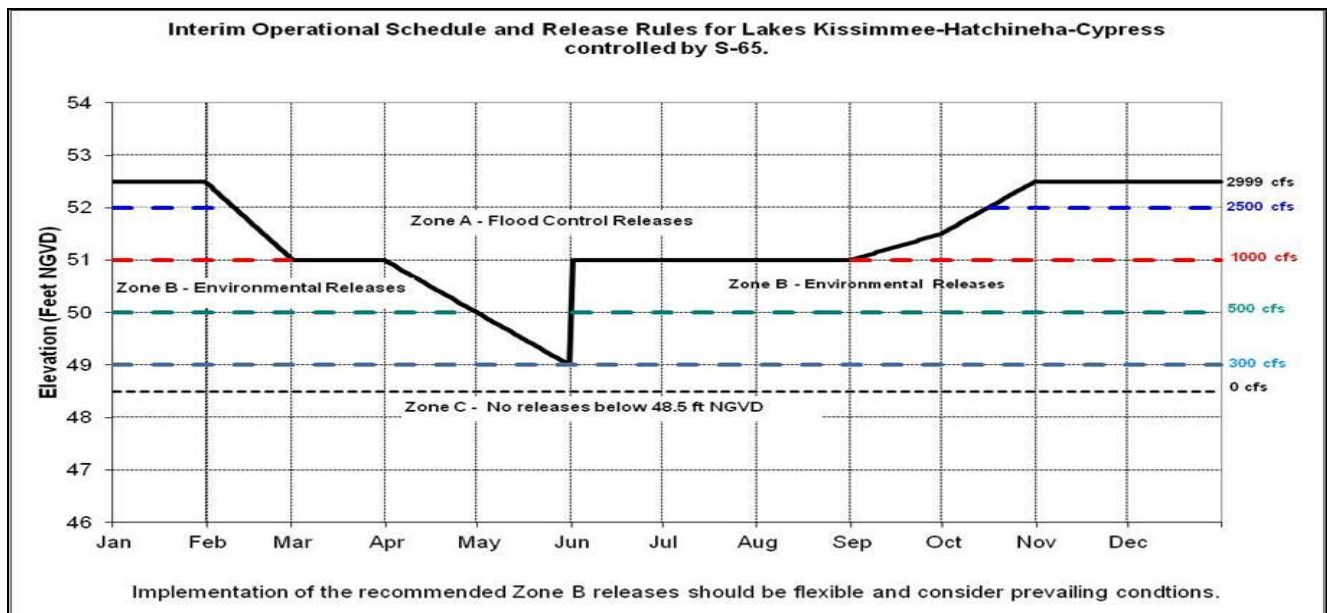
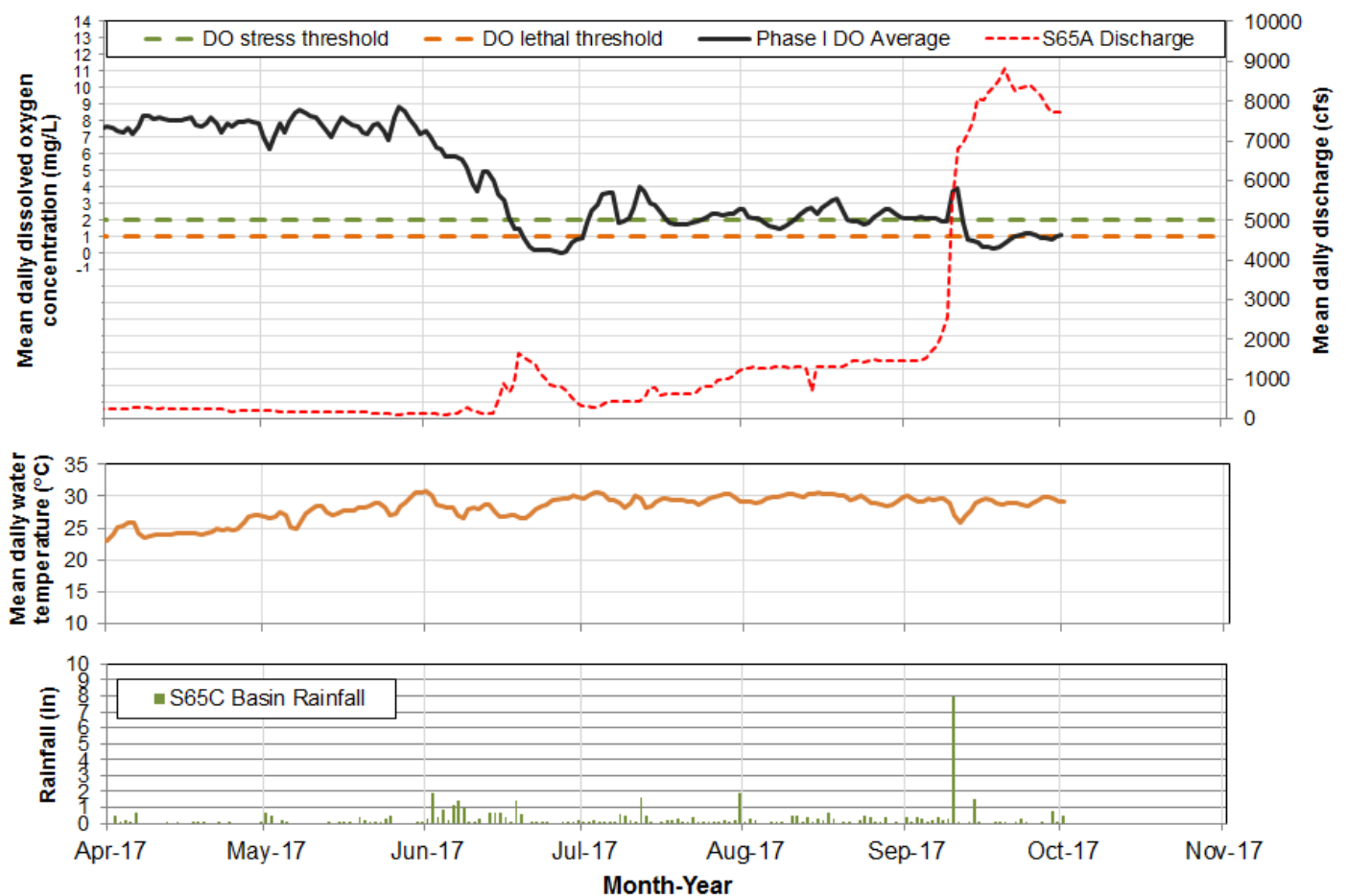


Figure 9. Interim operations schedule for S-65. The discharge schedule shown to the right has not been used in recent years or in Wet Season 2015.



Report Date: 10/3/2017; data are through: 10/1/2017.

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

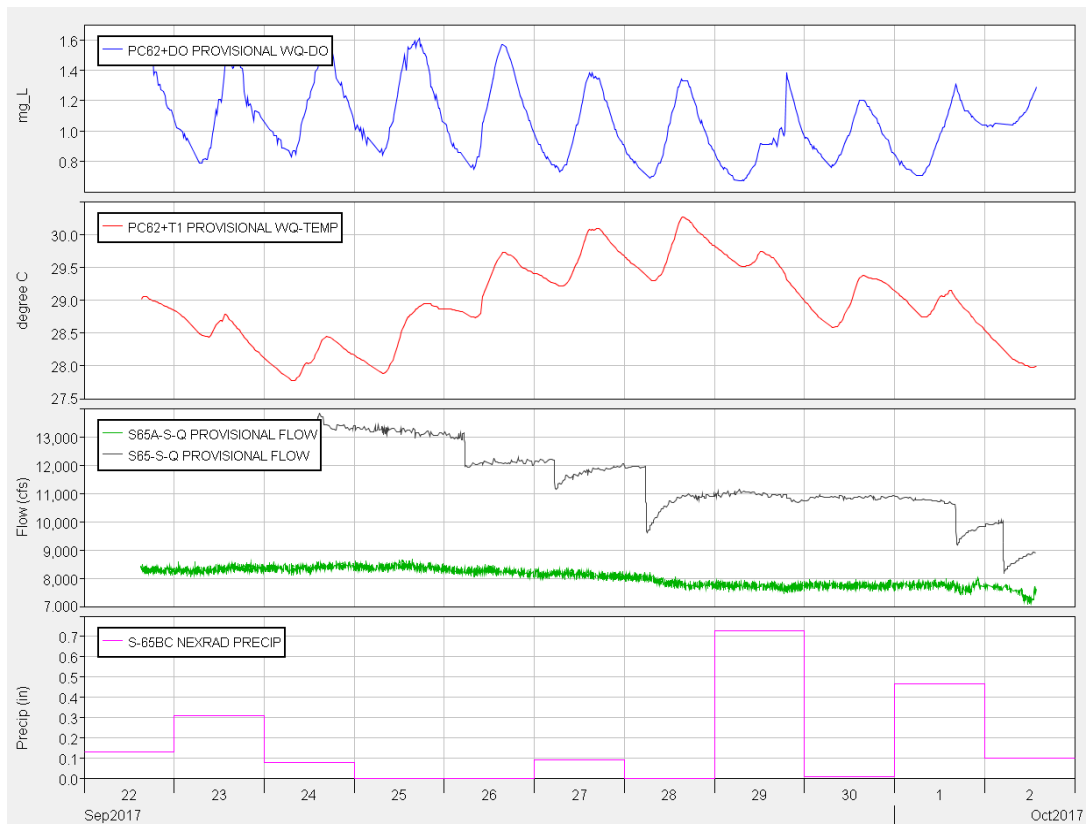


Figure 11. Phase I river channel dissolved oxygen and water temperature (measured at 15 minute intervals) and Pool BC daily rainfall.

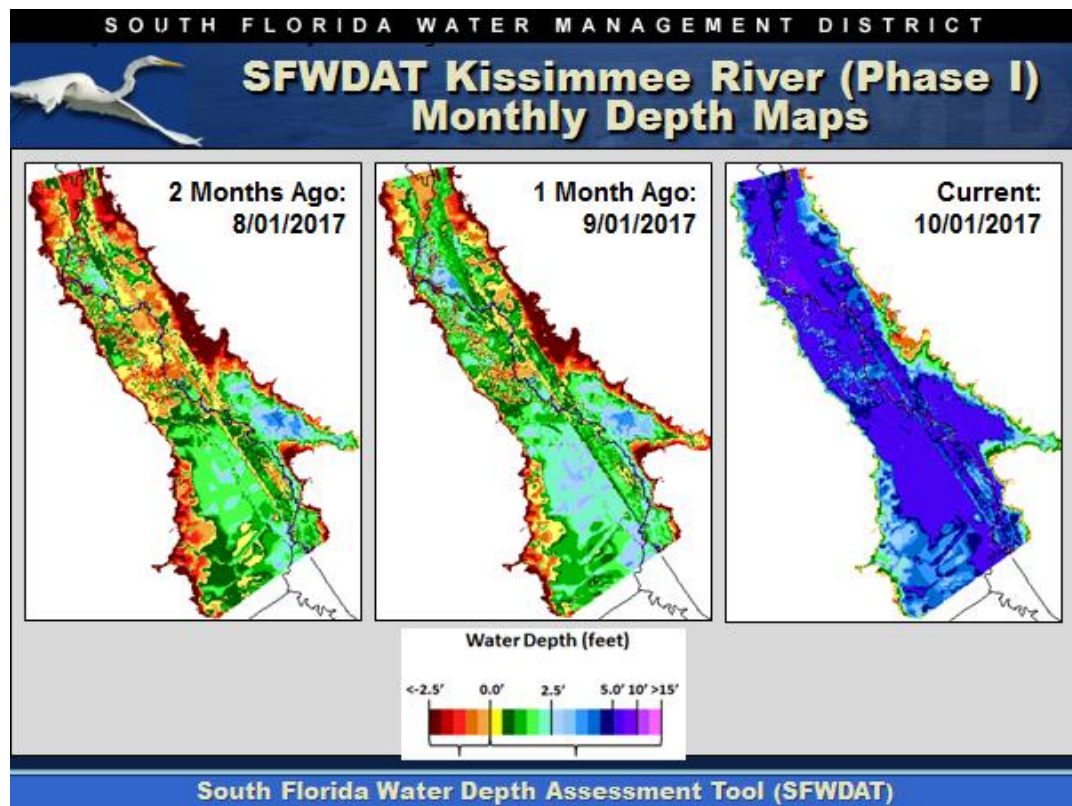
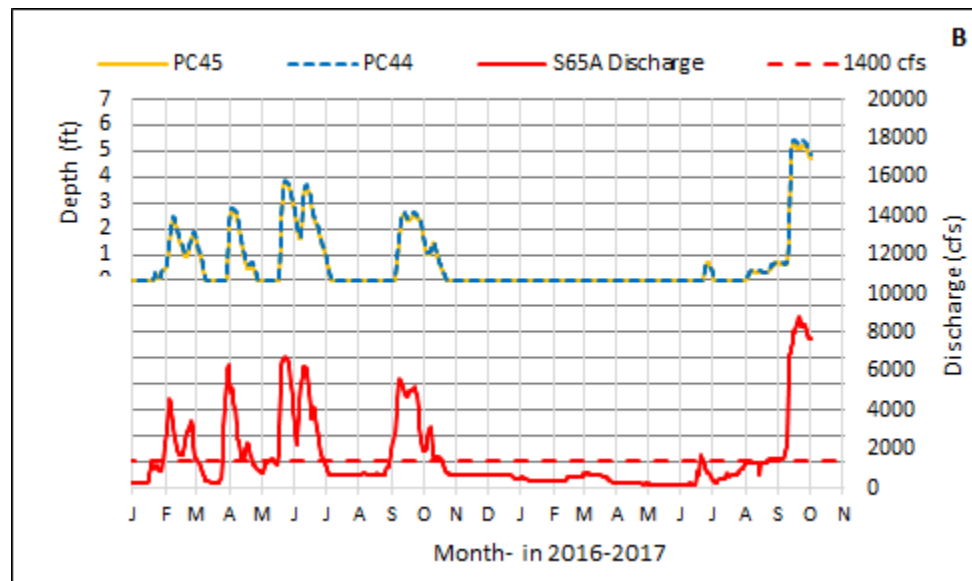
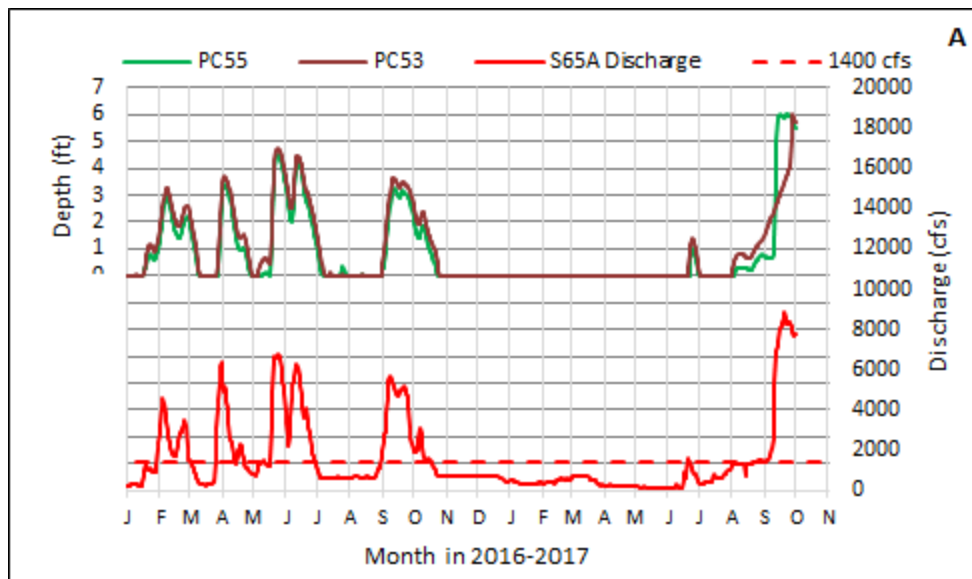


Figure 12. Phase I area floodplain water depths for this week, one month ago, and two months ago. Note that the WDAT color-coding has been modified to accommodate greater water depths; these maps are not directly comparable to Kissimmee Basin WDAT maps published prior to Jan. 16, 2012.



Insert. Water depth at selected northern Kissimmee River floodplain sites on (A) the PC5's transect and (B) the PC4's transect, with S65A discharge.

Kissimmee River Hydrographs

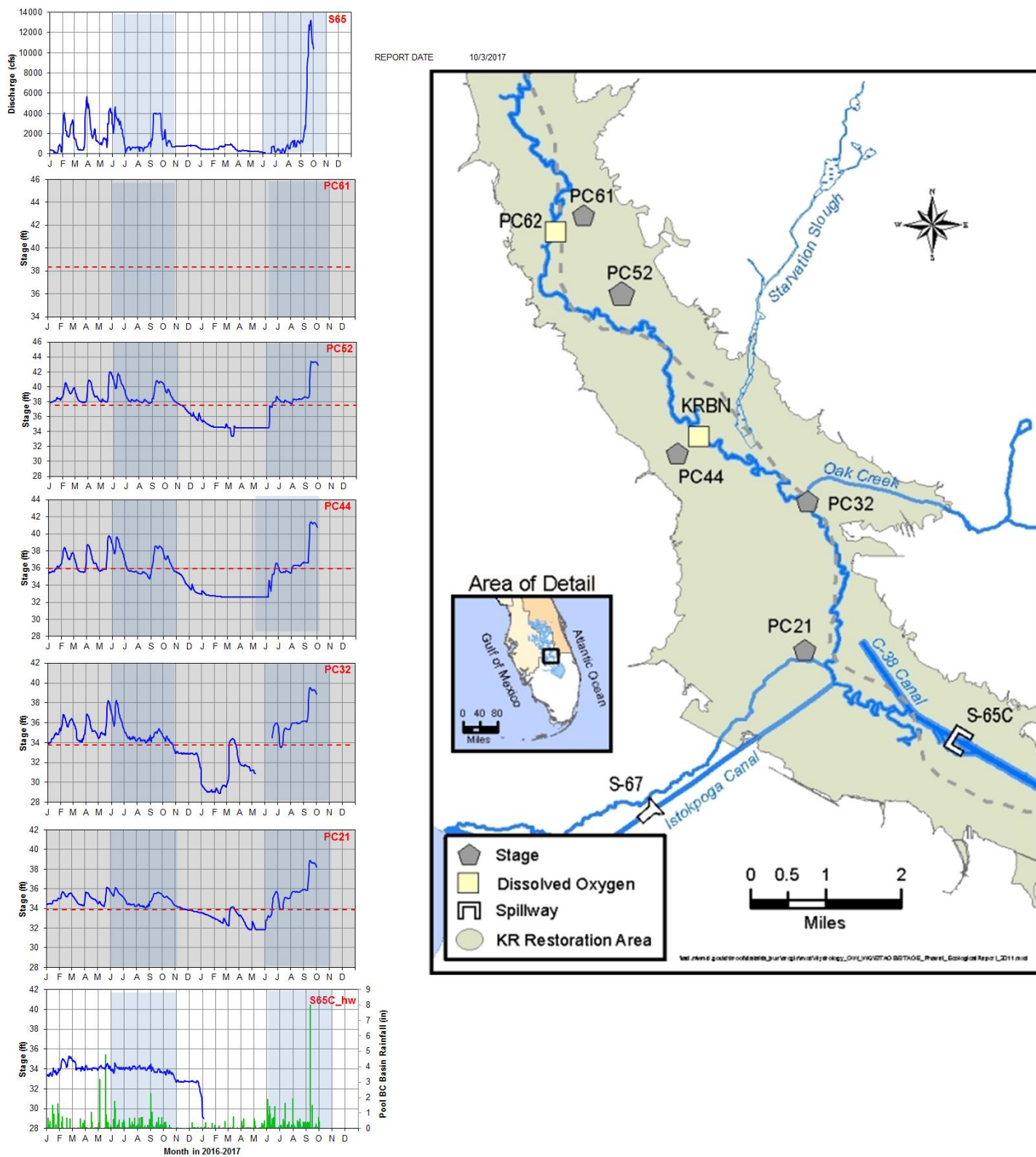


Figure 13. Discharge at S65, stages at five monitoring stations in the Phase I area of the Kissimmee River floodplain, and headwater stage at S65-C since January 1, 2015. The most recent data (~2 weeks) are provisional real-time data from SFWMD DualTrend; previous data are from SFWMD DB-HYDRO (validated). Dashed lines are ground elevations.



Figure 14. The Kissimmee Basin

LAKE OKEECHOBEE

According to the USACE web site, Lake Okeechobee stage is at 16.50 feet NGVD for the period ending at midnight on October 2, 2017. This value is based on the use of four interior Lake stations (L001, L005, L006 and LZ40) and four perimeter stations (S308, S352, S4 and S133). Lake stage increased by 0.29 feet over the past week and is 2.87 feet higher than it was a month ago and 0.75 feet higher than it was a year ago (Figure 1). The Lake is currently in the High sub-band (Figure 2). According to RAINDAR, 1.43 inches of rain fell directly over the Lake during the week September 26 - October 2 (Figure 3). The northern watershed had between 1.5 – 3.0 inches while the eastern watershed received between 4.0 – 6.0 inches, resulting in decreased discharges east through the S308.

Average daily inflows to the Lake over the past two weeks were 18,272 cfs, primarily from the Kissimmee River via the S65 and S84 structures, which averaged 13,223 and 2,417 cfs daily, respectively. This was the third straight week that inflows exceeded 13,000 cfs from the S65 structures.

Average daily outflows for the Lake have increased over the past three weeks as well, going from roughly 627 cfs to 6,993 cfs and then to 10,308 cfs for the past week. Over the last week the flows were primarily through the S77 structure, which averaged 6,340 cfs daily, followed by S308 at 3,183 cfs. Backflows from the L8 canal through Culvert 10A were minimal, averaging only -45 cfs, but on October 2 were up to -215 cfs due to significant rainfall in the basin. There were no discharges south through the S350 structures. The corrected evapotranspiration value based on the L006 weather platform solar radiation data was down slightly to 1.05 inches for the past week.

Total inflows and outflows for the last two weeks are detailed in Table 1, as well as the approximate change in Lake stage from each major structure's total flows over the period (midnight September 26, 2017 to midnight October 2, 2017). Figure 4 shows the combined average daily cfs for inflows and outflows for the Lake over the past eight weeks, as well as backpumping from S2 and S3. These data are provisional, and are subject to change.

Satellite imagery indicates that the bloom potential remains low as it was through much of September, based on NOAA's cyanobacteria monitoring product derived from the OLCI satellite sensor. High winds from Hurricane Irma have further reduced current bloom potential on the Lake by increasing turbidity, but elevated total phosphorous levels from high inflows and resuspended Lake sediment are expected to produce high bloom potentials in the coming months as the turbidity declines in the water column (Figure 5).

Table 1

INFLOWS	Avg Daily Flow cfs	Equivalent Depth Week Total (in)	OUTFLOWS	Avg Daily Flow cfs	Equivalent Depth Week Total (in)
S65E & S65EX1	13223	5.0	S77	6340	2.4
S71 & 72	614	0.2	S308	3183	1.2
S84 & 84X	2417	0.9	S351	0	0.0
Fisheating Creek	688	0.3	S352	0	0.0
S154	163	0.1	S354	0	0.0
S191	879	0.3	L8	-45	0.0
S133 P	115	0.0	ET	2894	1.1
S127 P	39	0.0	Total	12372	4.6
S129 P	0	0.0			
S131 P	28	0.0			
S135 P	106	0.0			
S2 P	0	0.0			
S3 P	0	0.0			
S4 P	0	0.0			
C5	0	0.0			
Rainfall	3941	1.4			
Total	22213	8.3			

PROVISIONAL
DATA

Water Management Recommendations

The Lake is 16.50 feet NGVD having increased 2.87 feet over the past month. Submerged and emergent vegetation communities in the nearshore region have experienced stages >16 feet three times in less than two years. These high water levels, combined with turbid conditions from Hurricane Irma's winds, will likely cause substantial declines in these communities over the coming months and/or years. Lower Lake stages near the end of WY2018 would help to recover these important communities, and long, steady recessions of water levels throughout the dry season may help promote another productive year for wading birds on the Lake as well.

Lake Okeechobee

Water Depth Timeseries Maps

1 Year Ago: 10/02/2016

1 Month Ago: 09/02/2017

Current: 10/02/2017

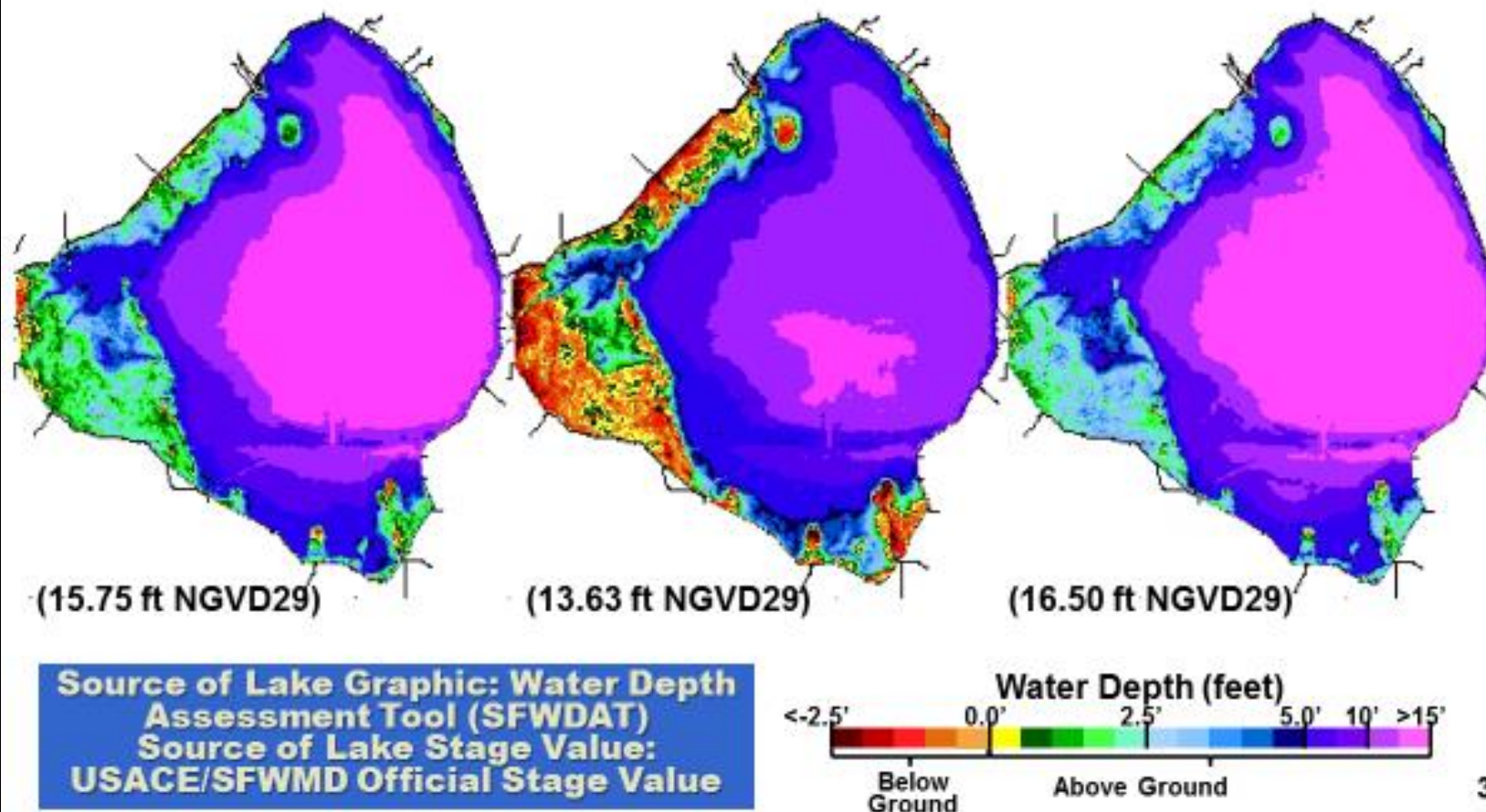


Figure 1

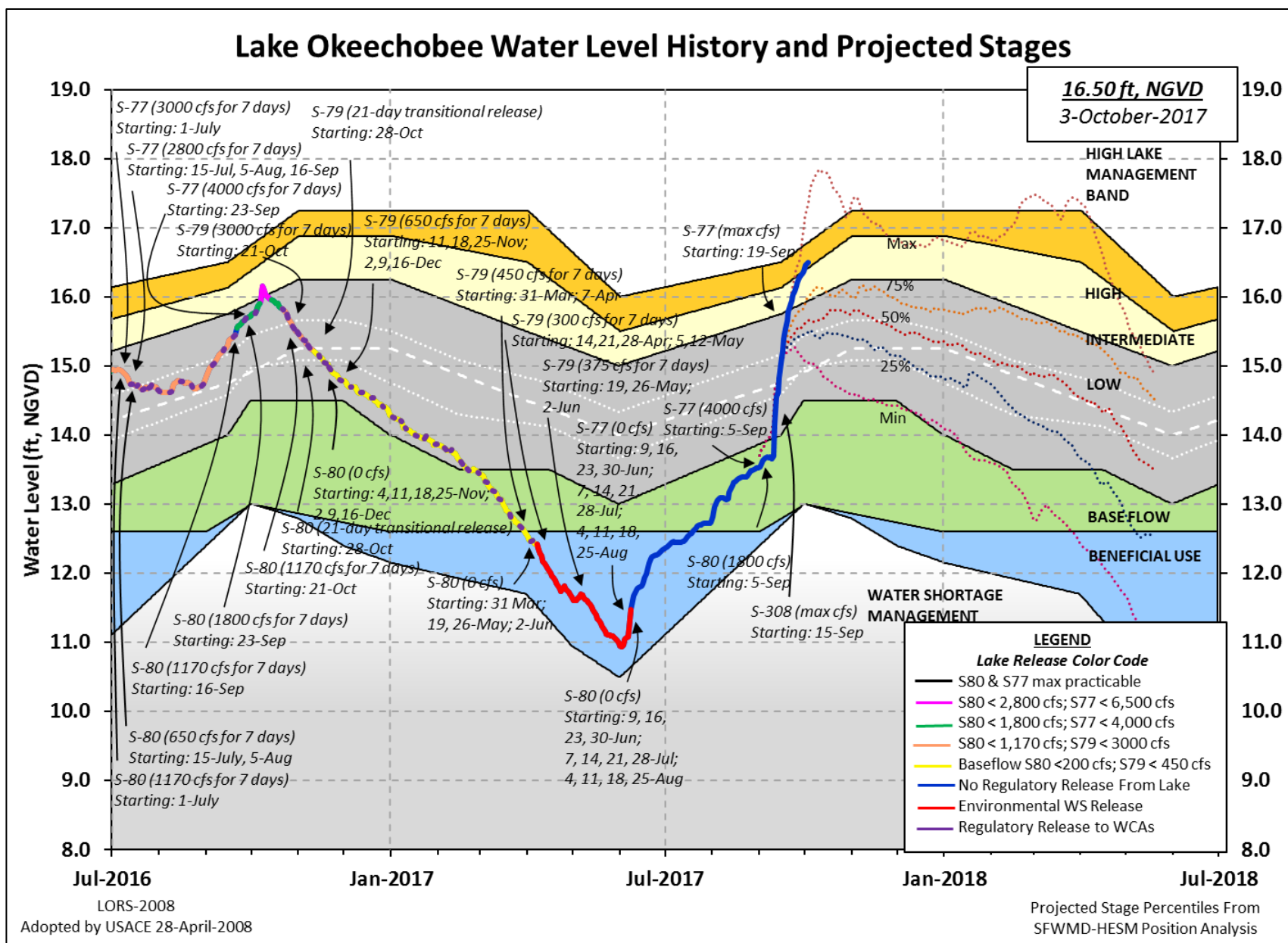


Figure 2

SFWMD PROVISIONAL RAINFALL 7-DAY BASIN RAINFALL ESTIMATES
FROM: 0530 EST, 09/26/2017 THROUGH: 0530 EST, 10/03/2017

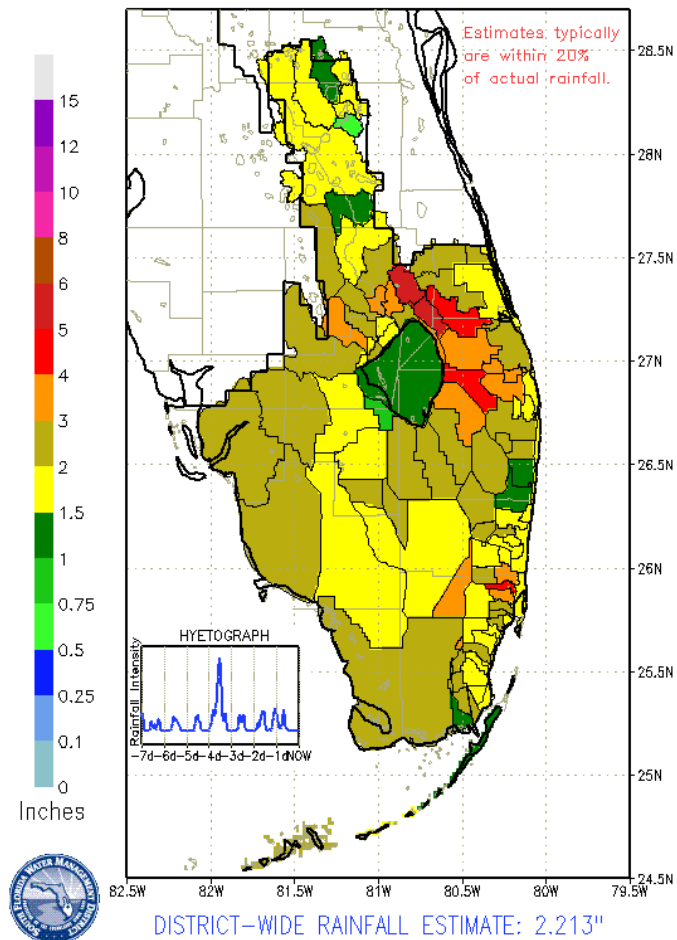


Figure 3

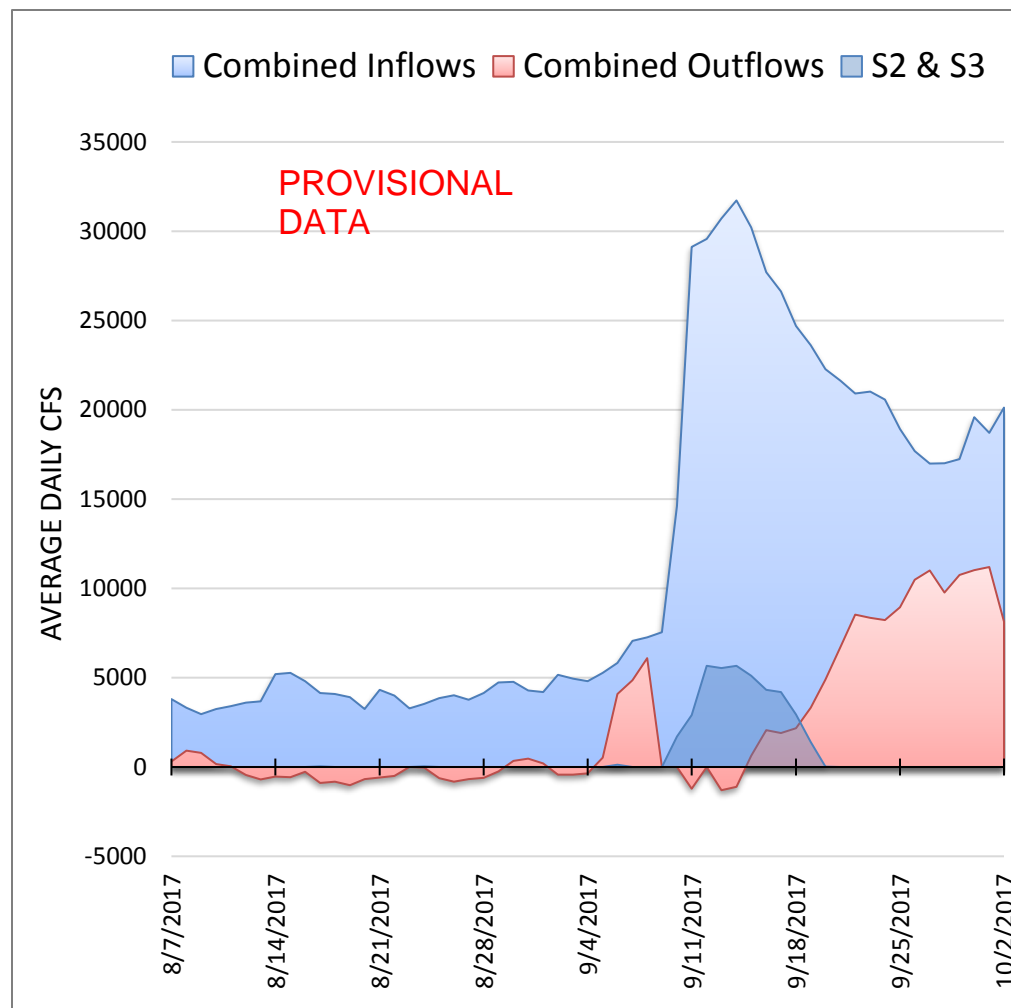


Figure 4

Lake Okeechobee

Algal Bloom Potential

NOAA cyanobacteria product derived from Copernicus Sentinel-3 OLCI data from EUMETSAT

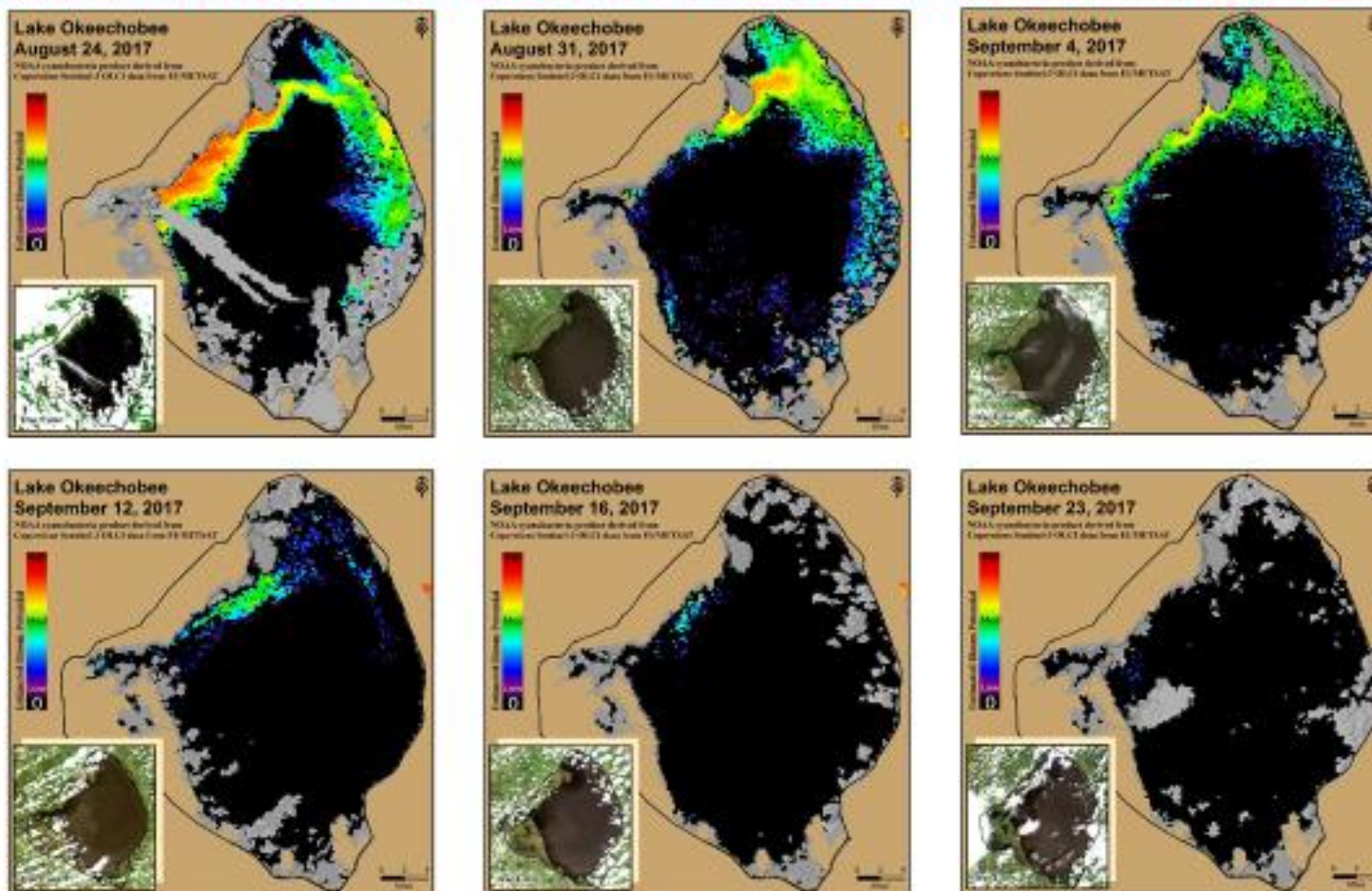


Figure 5

LAKE ISTOKPOGA

Lake Istokpoga stage is 39.21 feet NGVD as of midnight October 2, 2017 and is currently 0.02 feet above its regulation schedule of 39.19 feet NGVD (Figure 6). Average daily flows into the Lake from Josephine Creek for the week September 26 – October 2 declined from the previous week, dropping from 368 cfs to 286 cfs. No data have been reported for Arbuckle Creek since July 4 as the gauge is being recalibrated after construction in the area. Average daily discharge from S68 and S68X over the past week decreased from the previous week, from 4,816 cfs to 2,248 cfs. According to RAINDAR, 2.45 inches of rain fell in the Lake Istokpoga basin from September 26 - October 2.

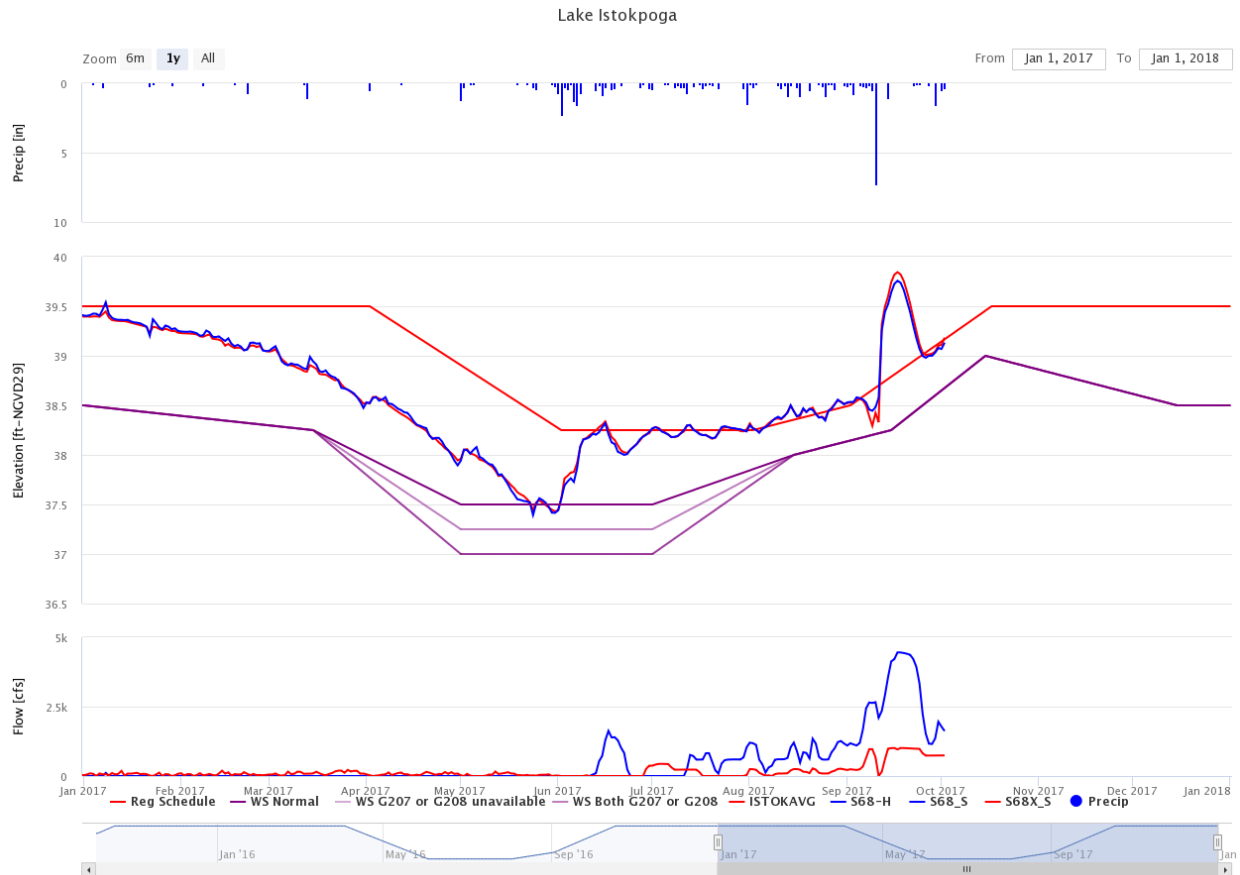


Figure 6

ESTUARIES

St. Lucie Estuary

Over the past week, provisional flows averaged about 3,406 cfs at S-80, 2,980 cfs at S-308, 662 cfs at S-49 on C-24, 1,115 cfs at S-97 on C-23, and 673 cfs from Ten Mile Creek at the Gordy Road Structure. Average inflow from tidal basin tributaries is estimated to be 394 cfs (Figures 1 and 2). Total inflow averaged about 6,250 cfs last week and 6,360 cfs over last month.

Over the past week in the estuary, salinity remained about the same (Table 1, 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 1.0. Salinity conditions in the middle estuary are in the poor range for the adult eastern oysters.

Table 1. Seven-day average salinity at three monitoring stations 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 (N. Fork)	0.3 (0.2)	0.3 (0.2)	NA ¹
US1 Bridge	0.6 (0.4)	1.4 (0.7)	10.0-26.0
A1A Bridge	4.1 (4.8)	17.8 (15.4)	NA ¹

¹Envelope not applicable

Continuous monitoring of water quality is conducted at HR1 in the North Fork. Weekly dissolved oxygen data are summarized in Table 2.

Table 2. Weekly dissolved oxygen conditions at HR1 in the North Fork of the St. Lucie Estuary.

Location	Depth	Average DO (mg/l)	Minimum DO (mg/l)	Maximum DO (mg/l)
HR1	surface	1.65	0.65	5.09
HR1	bottom	1.07	0.01	3.81

Continuous monitoring of water quality is conducted at five Land/Ocean Biogeochemical Observatory (LOBO) stations located in the St. Lucie Estuary and maintained by Florida Atlantic University/Harbor Branch Oceanographic Institute (FAU-HBOI). Data are summarized in Table 3 and station location map is shown in Figure 5.

Table 3. Weekly ranges of Instrument Depth, Chlorophyll *a* (a measure of algal biomass) and dissolved oxygen concentrations at five FAU-HBOI LOBO stations located in the St. Lucie Estuary.

Location	Depth (m)	Chlorophyll <i>a</i> (µg/l)	Average DO (mg/l)	Minimum DO (mg/l)	Maximum DO (mg/l)
SF2	3.17	4.46 - 5.76	5.41	4.09	9.86
SF	1.91	4.9 - 5.79	6.21	3.90	7.01
NF	2.40	5.5 - 7.52	2.76	0.71	5.64
ME ¹	2.14	4.63 - 5.73	4.42	3.53	5.25
IRL-SLE ²	N/A	N/A	N/A	N/A	N/A

¹Recorder stopped working on 9/28/17 at 2 pm and ²Recorder stopped on 9/14/17 at 9 am.

NOAA satellite imagery indicates low potential cyanobacterial presence at some nearshore locations in the St. Lucie estuary (Figure 6).

Caloosahatchee Estuary

During the past week, provisional flows averaged approximately 6,340 cfs at S-77, 6,788 cfs at S-78, and 10,934 cfs at S-79. Average inflow from tidal basin tributaries is estimated to be 974 cfs (Figures 6 & 7). Total inflow averaged 11,908 cfs last week and 13,240 cfs over last month.

Over the past week in the estuary, salinity remained about the same (Table 4, Figures 8 and 9). The seven-day average salinity values are within the poor range for adult oysters at Cape Coral, within the fair range at Shell Point, and within the good range at Sanibel (Figure 10). The 30-day moving average surface salinity is 0.2 at Val I-75 and 0.2 at Ft. Myers. Salinity conditions between Val I-75 and Ft. Myers are good for tape grass.

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

Sampling Site	Surface	Bottom	Envelope
S-79 (Franklin Lock)	0.2 (0.2)	0.2 (0.2)	NA ¹
*Val I75	0.2 (0.2)	0.2 (0.2)	0.0-5.0 ²
Ft. Myers Yacht Basin	0.2 (0.2)	0.2 (0.2)	NA
Cape Coral	0.2 (0.2)	0.2 (0.2)	10.0-30.0
Shell Point	4.6 (4.7)	11.0 (5.9)	10.0-30.0
Sanibel	NR ³ (NR)	NR (NR)	10.0-30.0

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

*Val I75 is temporarily unavailable (salinity values are estimated using models developed for this site).

Monitoring data collected by the River, Estuary and Coastal Observing Network of Sanibel-Captiva Conservation Foundation using continuous sensors are summarized in Table 5 as concentration ranges of chlorophyll *a* and dissolved oxygen at Beautiful Island, Ft. Myers, and Shell Point in the Caloosahatchee Estuary.

Table 5. Weekly ranges of Chlorophyll *a* (a measure of algal biomass) and dissolved oxygen concentrations at three monitoring stations maintained by the Sanibel-Captiva Conservation Foundation.

	RECON Monitoring Stations		
	Beautiful Island	Ft. Myers	Shell Point
Chlorophyll <i>a</i> (µg/l)	Down for maintenance	4.76 - 6.32	2.35 - 7.60
Dissolved Oxygen (mg/l)	Down for maintenance	Not Reporting	No Data

The Florida Fish and Wildlife Research Institute reported on September 29, 2017, that *Karenia brevis*, the Florida red tide dinoflagellate, was observed at the background levels in samples collected from Lee County.

NOAA satellite imagery indicates low to medium potential cyanobacterial presence in the Caloosahatchee estuary, mostly in nearshore areas (Figure 12).

Water Management Recommendations

Lake stage is in the high flow sub-band of 2008 LORS. Tributary hydrological conditions are very wet. The 2008 LORS recommends up to maximum discharge capacity to tidewater.

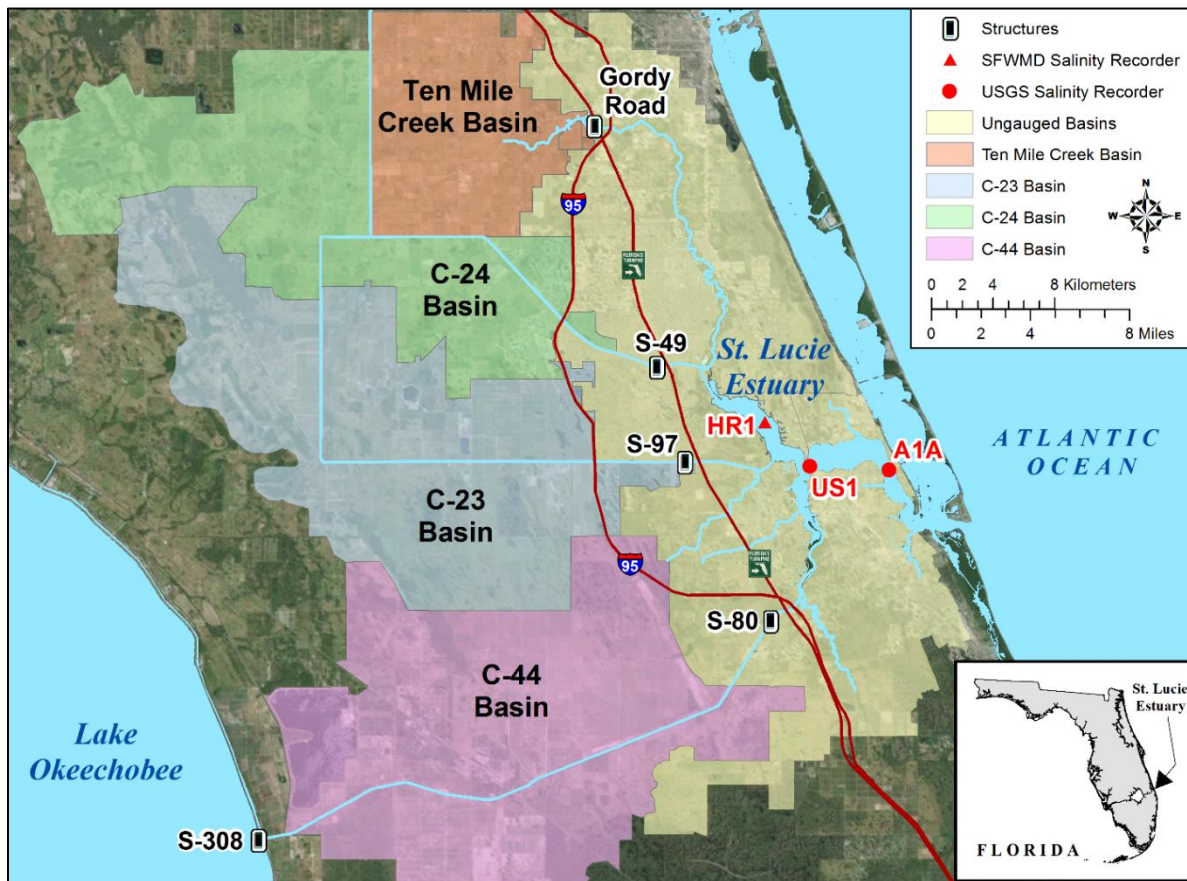


Figure 1. Basins, water control structures, and salinity monitoring for the St. Lucie Estuary.

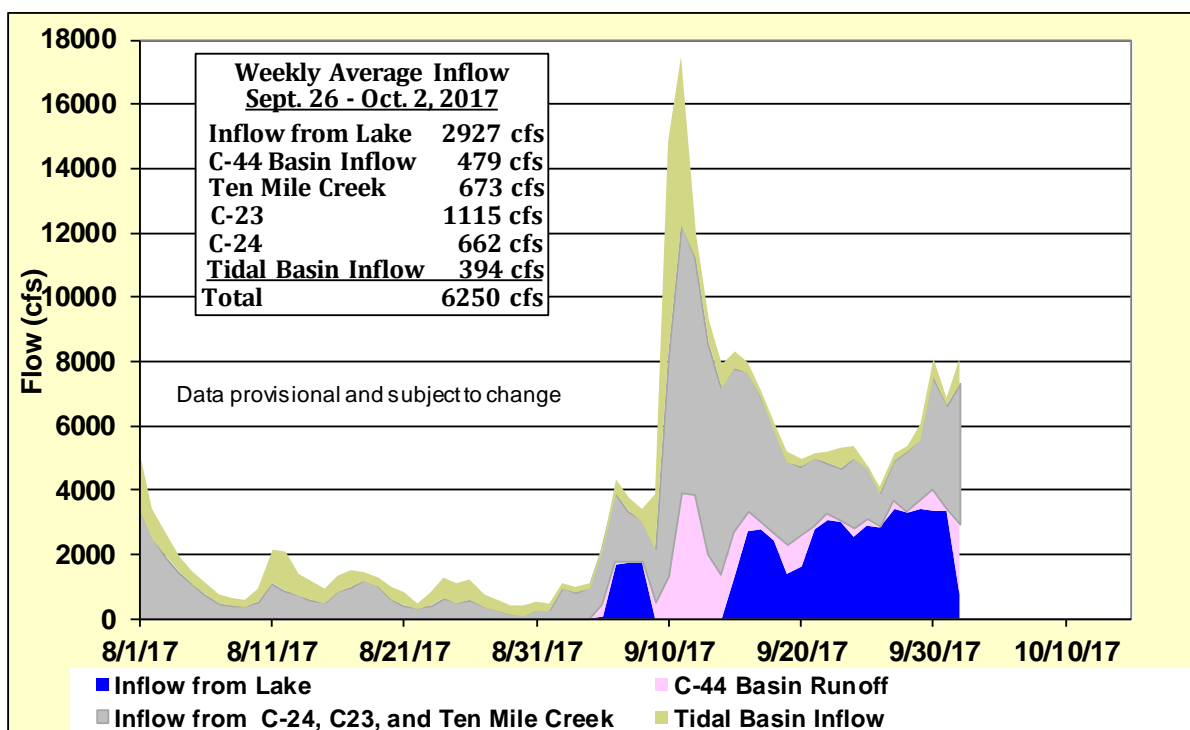


Figure 2. Estimated surface freshwater inflows from Lake Okeechobee and runoff from the C-44, C-23, C-24, Ten Mile Creek, and tidal basins into the St. Lucie Estuary.

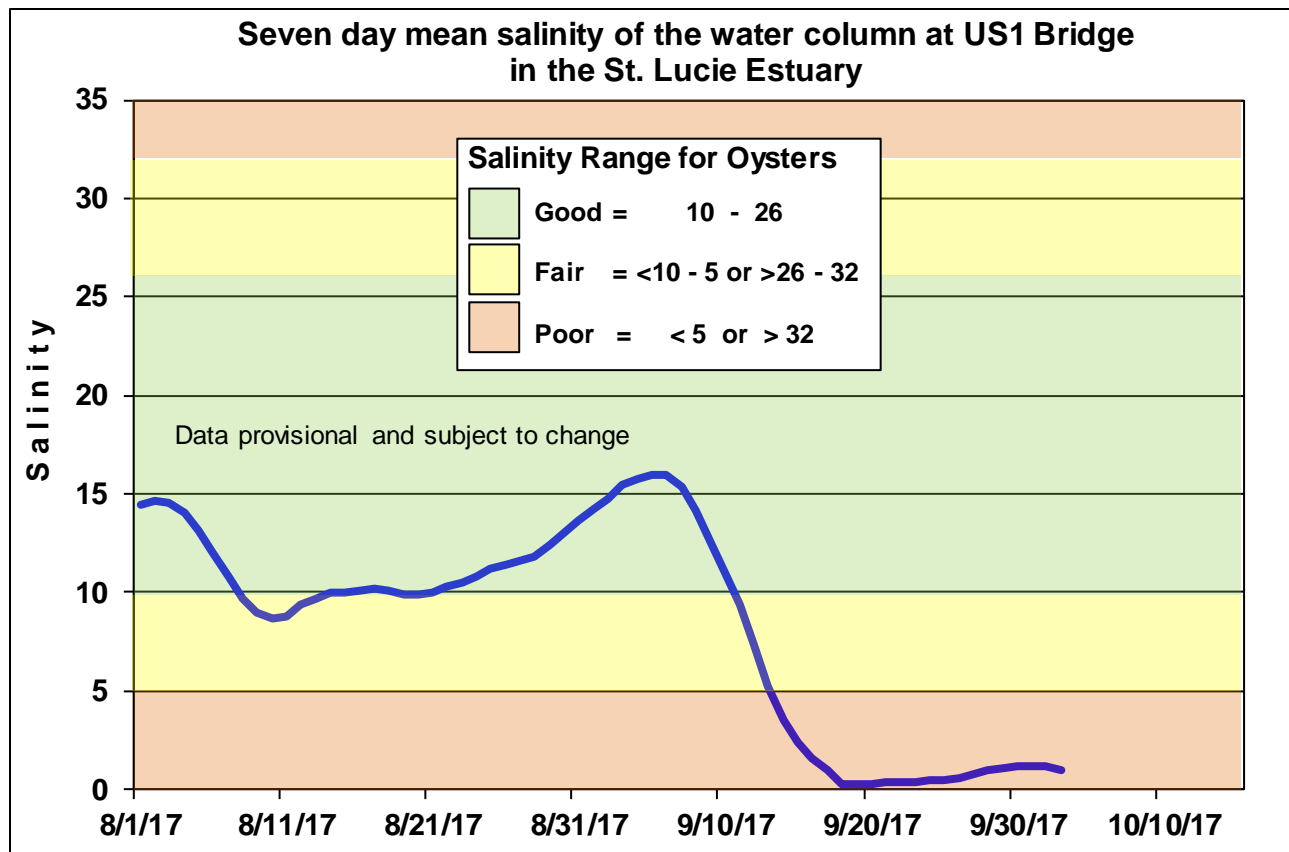


Figure 3. Seven-day mean salinity of the water column at the U.S. Highway 1 Bridge.

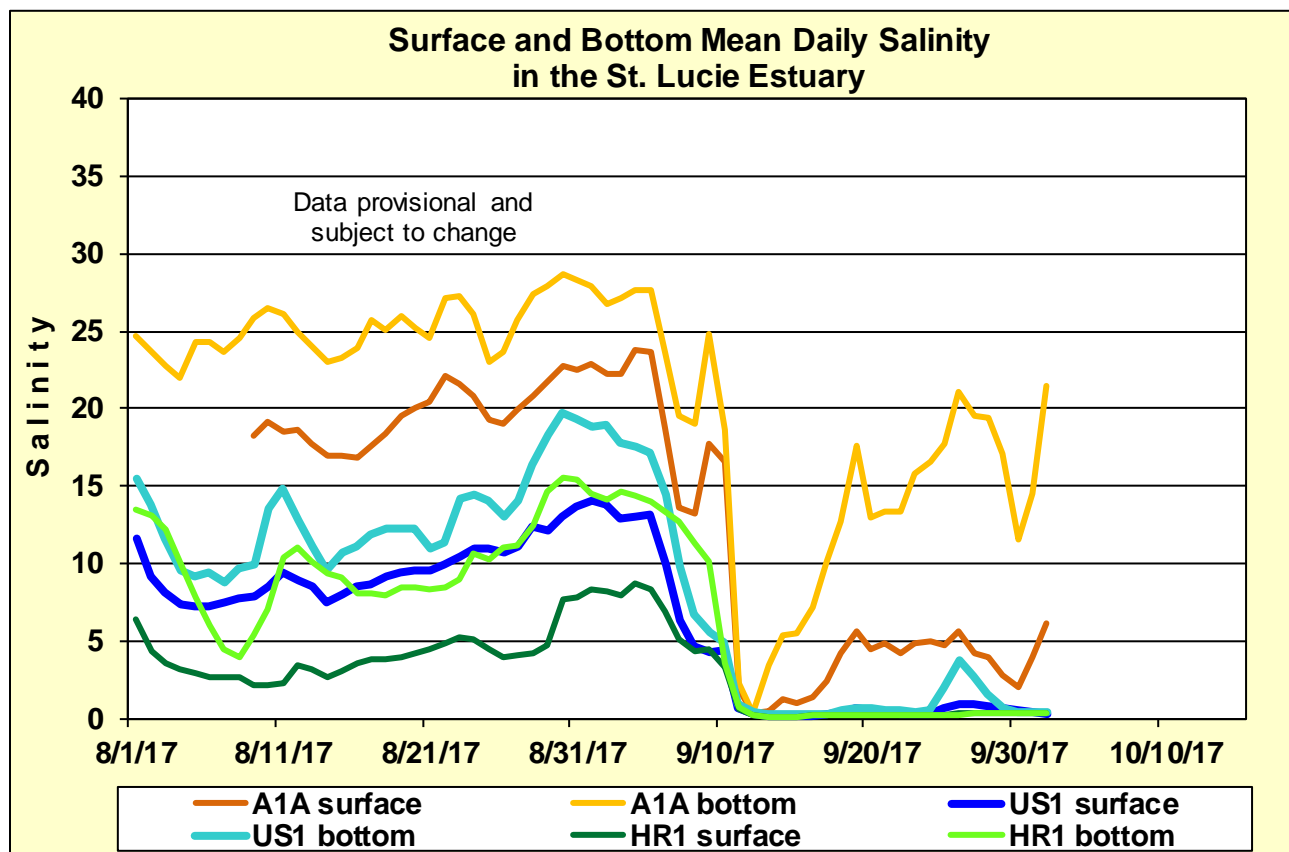


Figure 4. Daily mean salinity at the A1A, US1 and estimated HR1 stations.

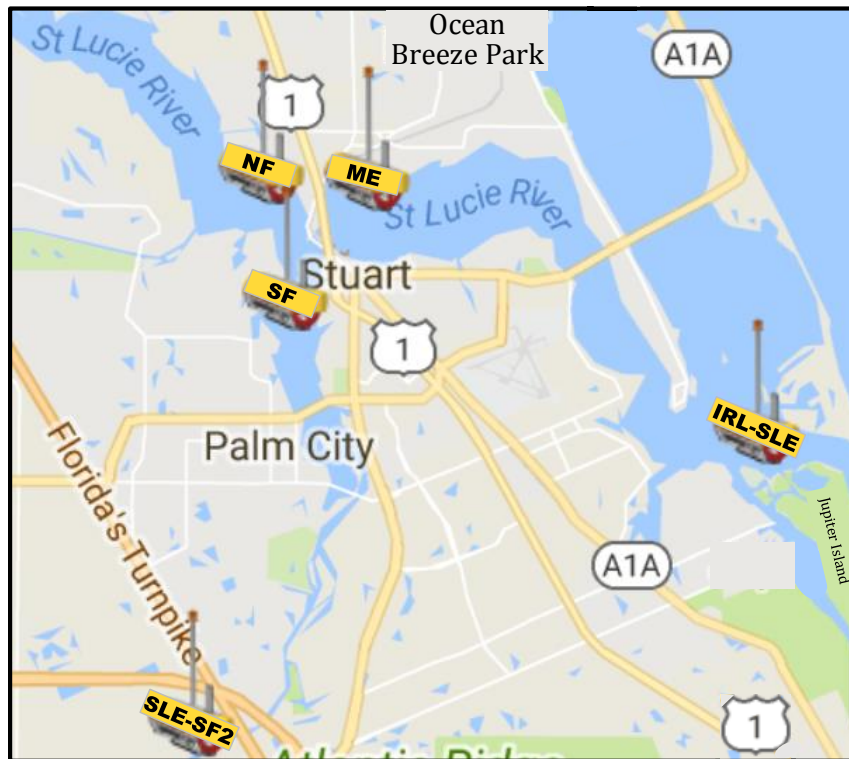


Figure 5. Location of FAU-HBOI LOBO water quality stations in the St. Lucie Estuary.

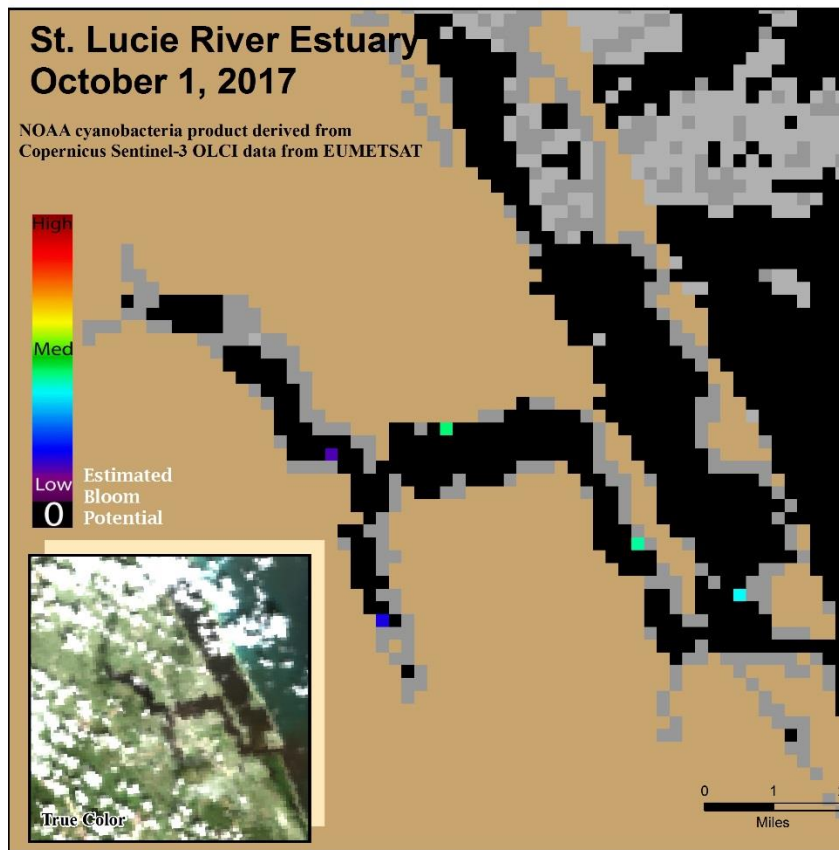


Figure 6. Sentinel 3a Satellite imagery provided by NOAA uses Ocean and Land Color Instrument (OLCI) to estimate cyanobacteria bloom potential in St. Lucie Estuary.

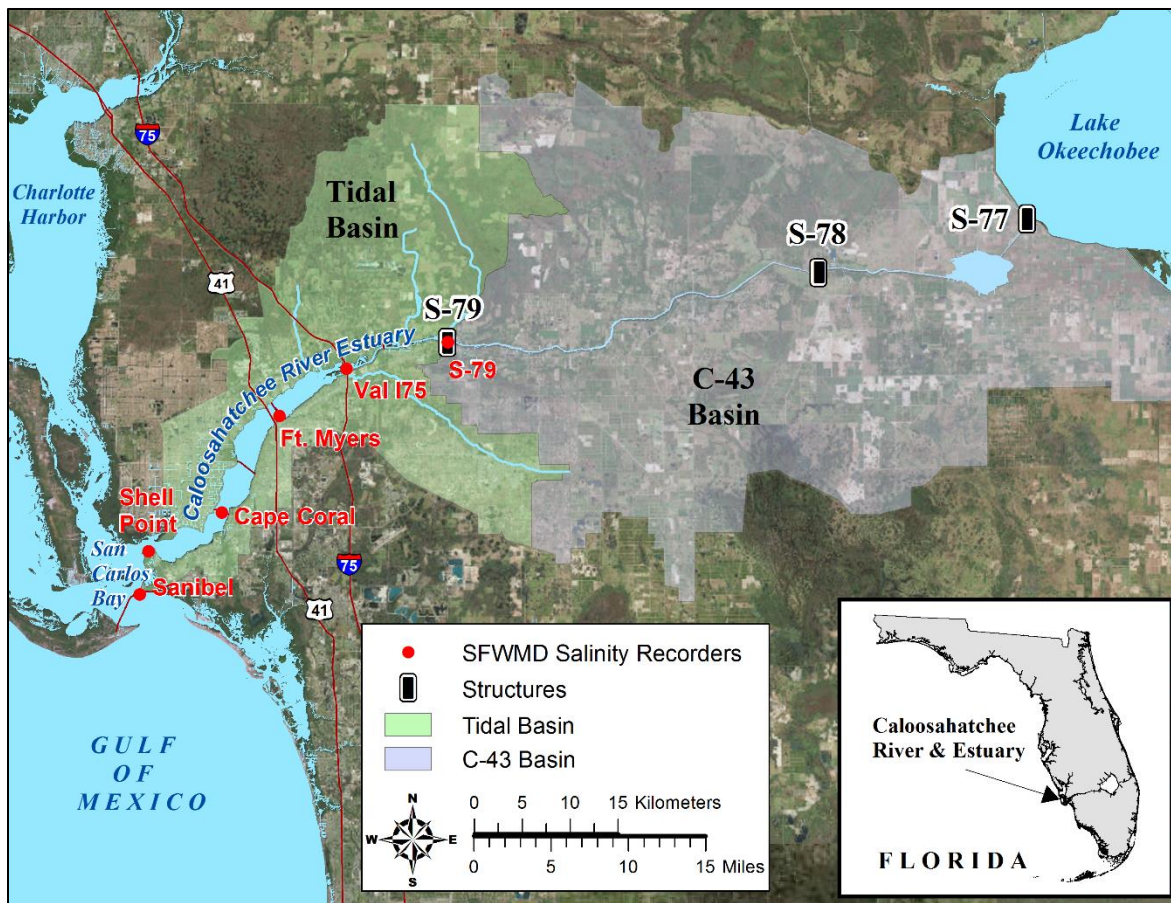


Figure 7. Basins, water control structures, and salinity monitoring for the Caloosahatchee Estuary.

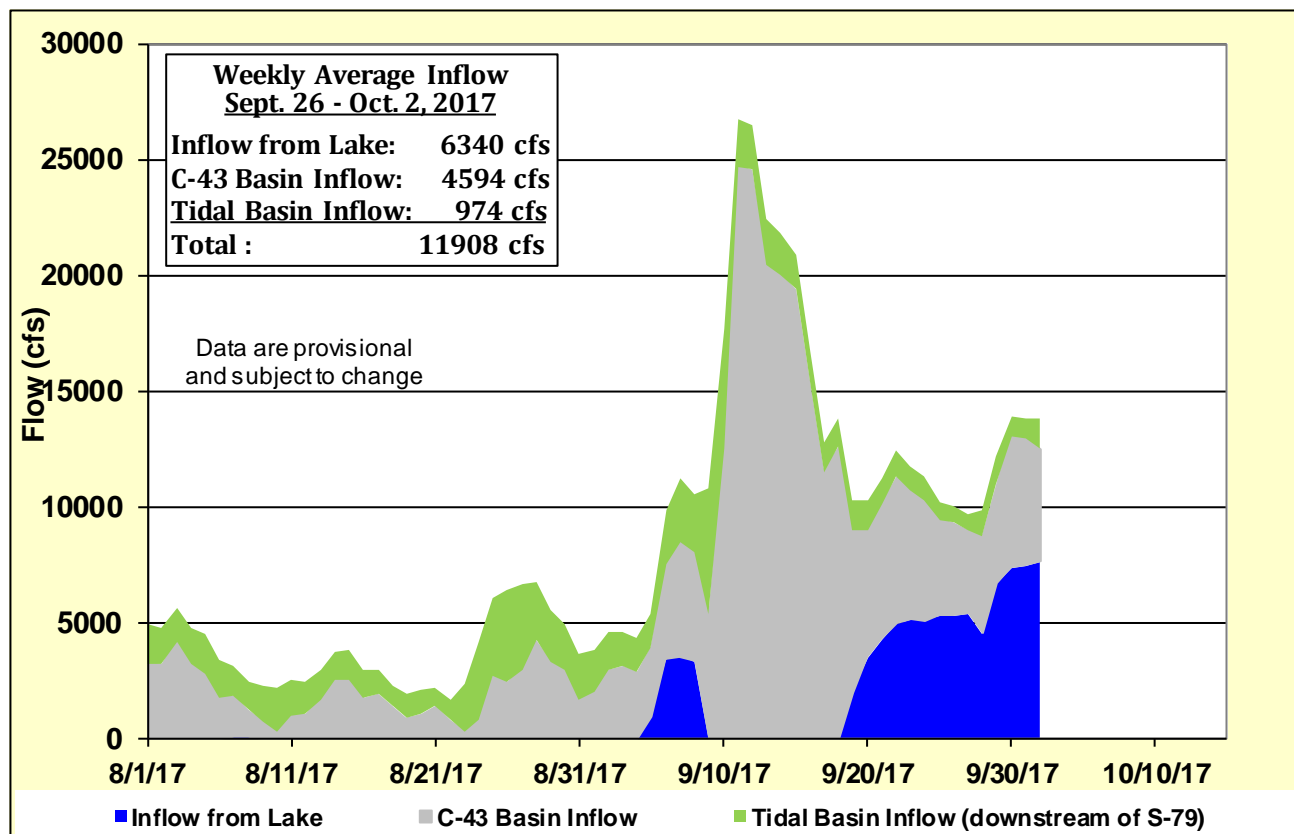


Figure 8. Freshwater inflows from Lake Okeechobee, runoff from the C-43 basin, and tributaries in the tidal basin into the Caloosahatchee River Estuary.

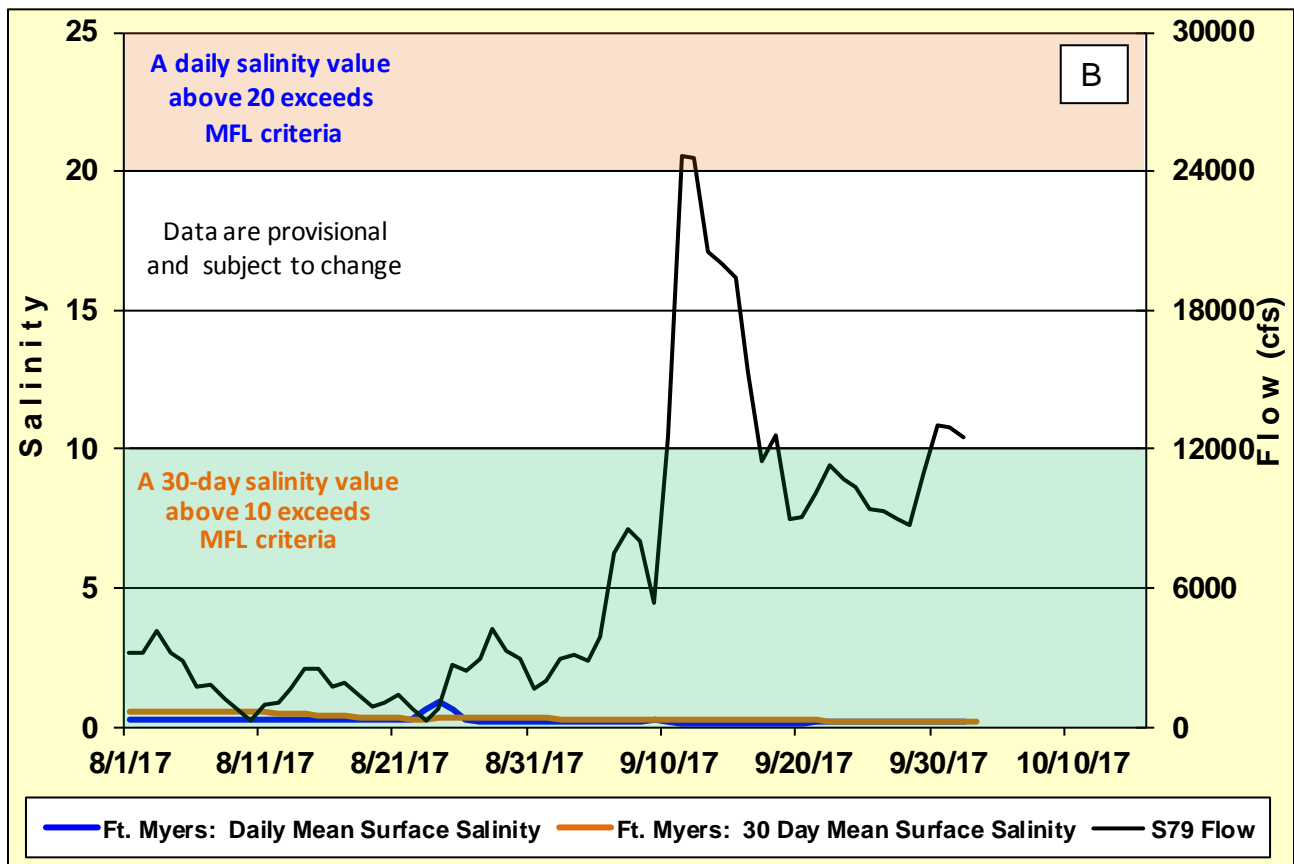
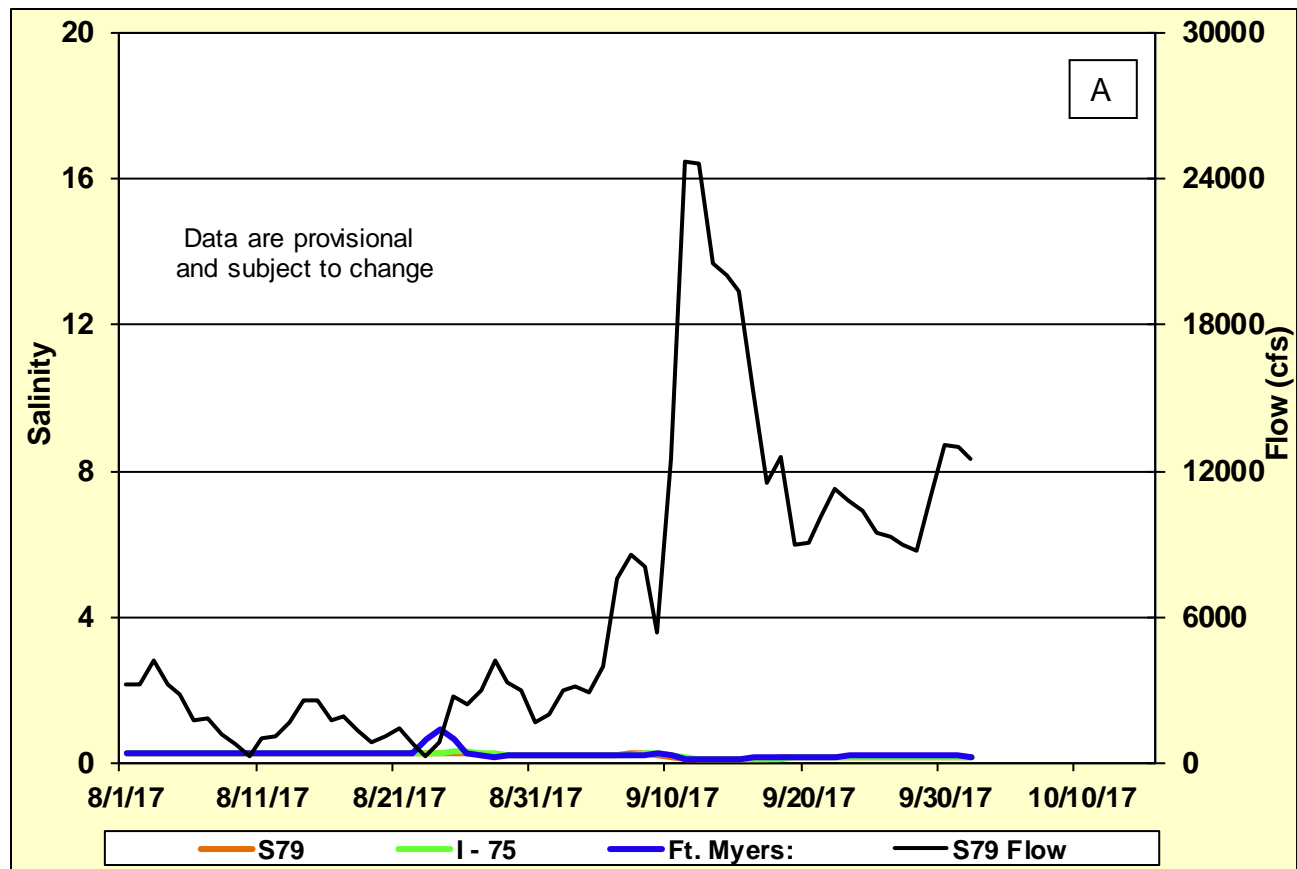


Figure 9. Daily mean flows at S-79 and salinity at upper estuary monitoring stations (A) and 30-day moving average salinity at Ft. Myers (B).

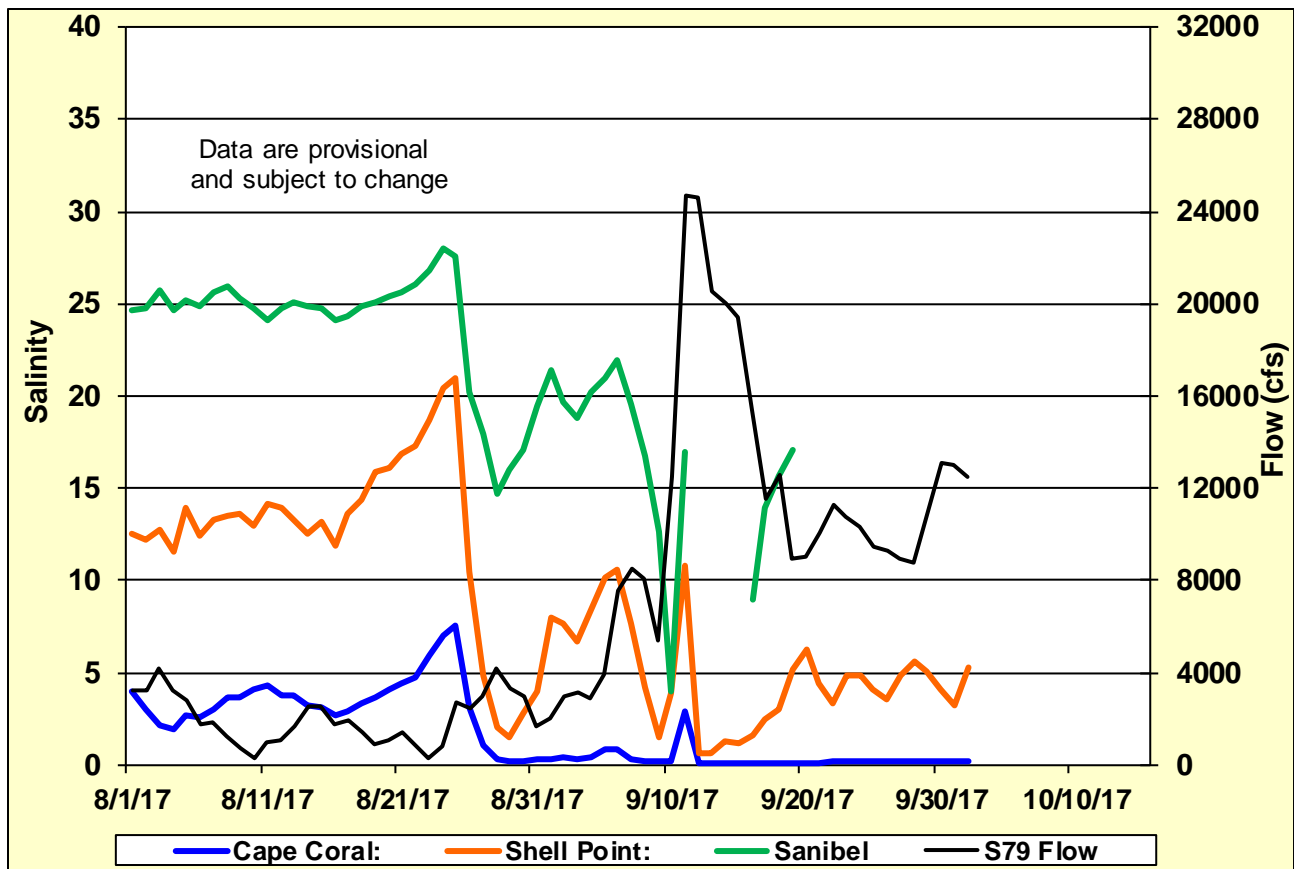


Figure 10. Daily mean flows at S-79 and salinity at lower estuary stations.

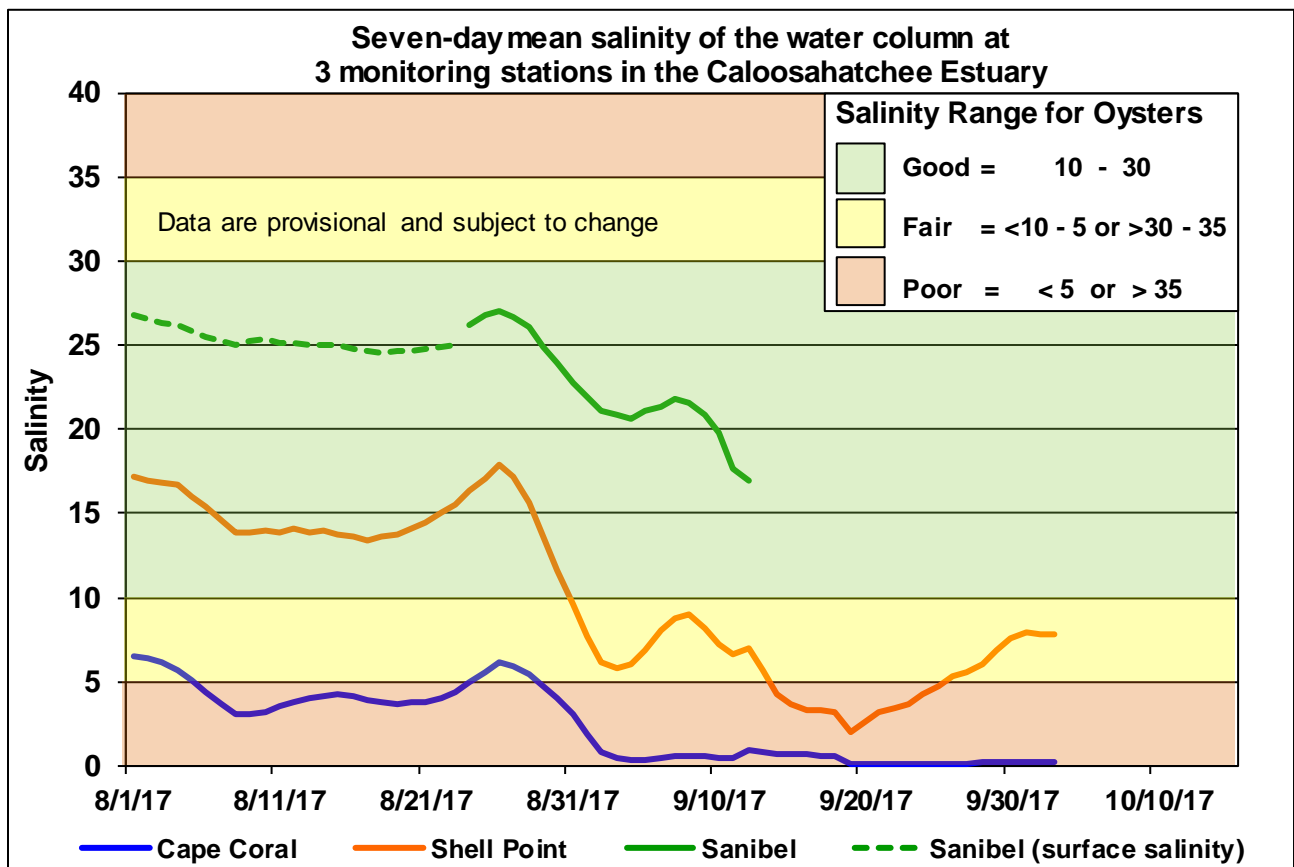


Figure 11. Seven-day mean salinity at Cape Coral Bridge, Shell Point and Sanibel Bridge monitoring stations.

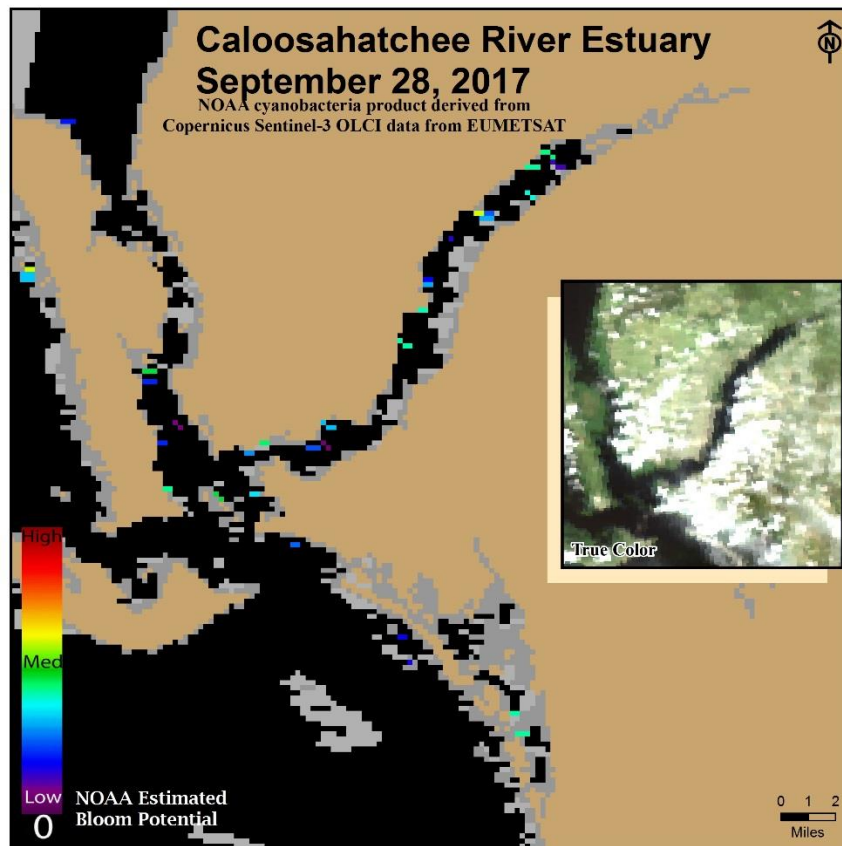
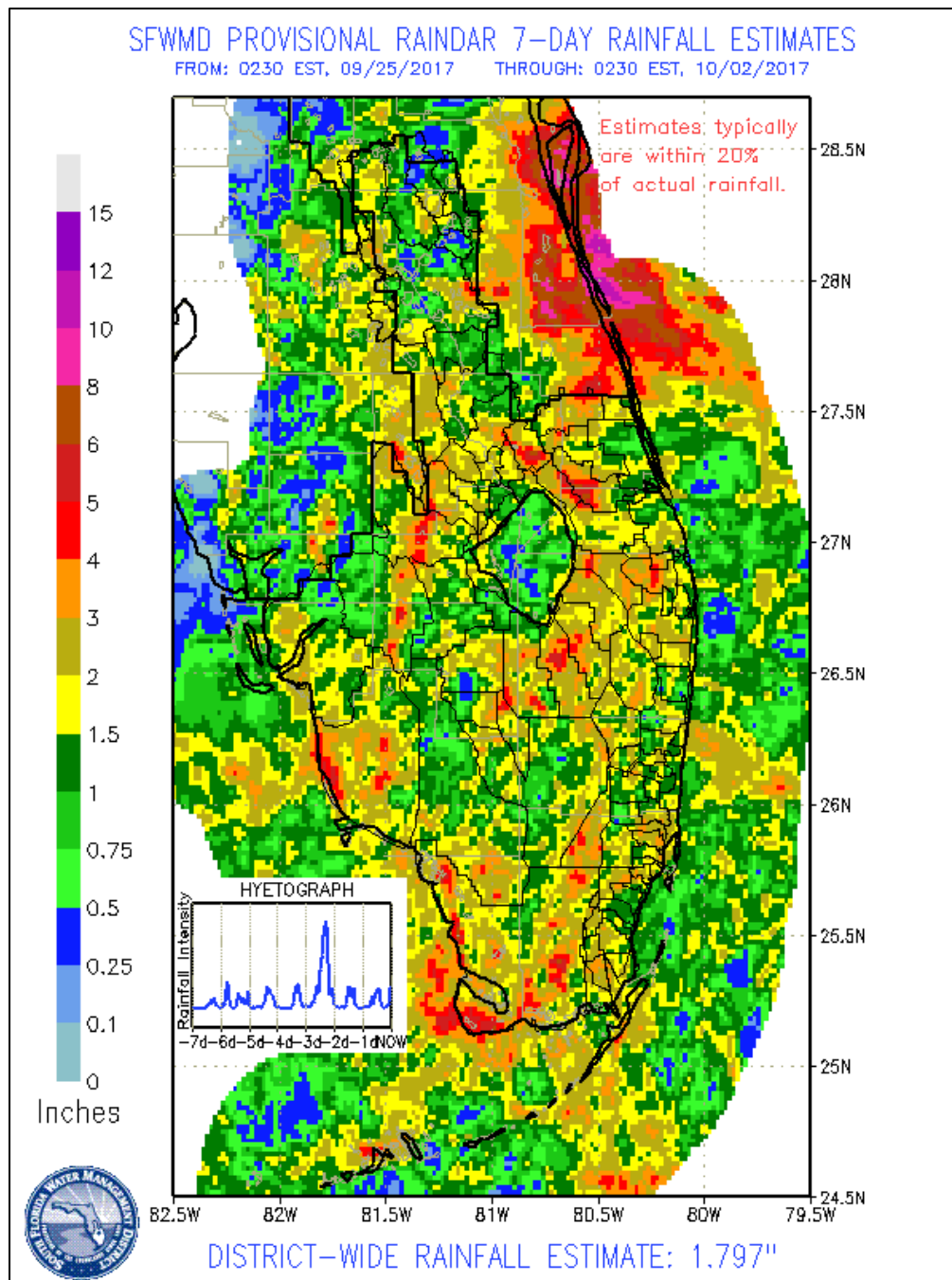


Figure 12. Sentinel 3a Satellite imagery provided by NOAA uses Ocean and Land Color Instrument (OLCI) to estimate cyanobacteria bloom potential in Caloosahatchee Estuary.

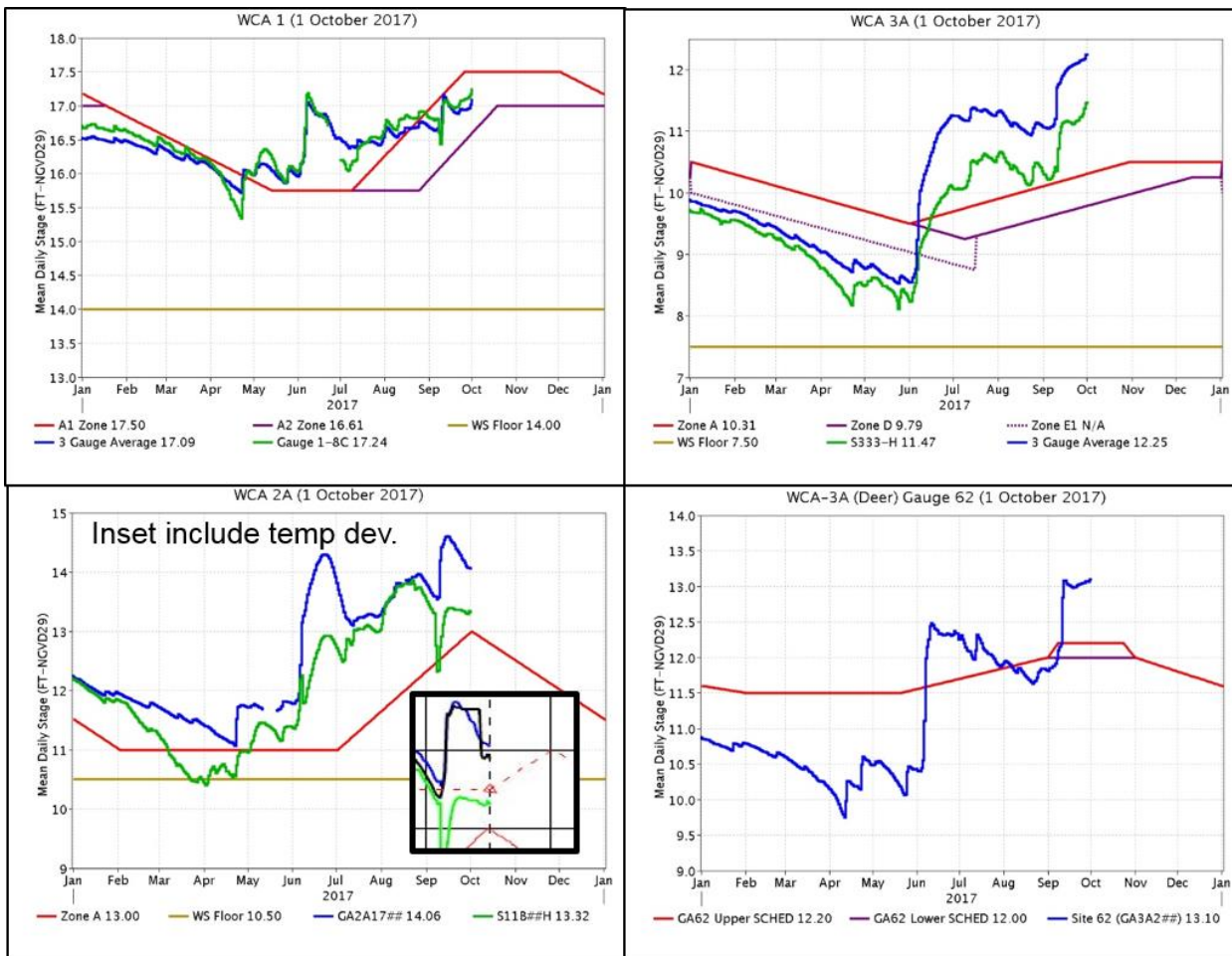
EVERGLADES

The Everglades received above average rainfall last week. WCA-1 is below regulation schedule and is trending towards schedule. WCA-2A and WCA-3A are above regulation schedule; 2A is trending towards schedule, 3A trends away from schedule.

Everglades Region	Rainfall (Inches)	Stage Change (feet)
WCA-1	1.98	+0.16
WCA-2A	1.90	-0.23
WCA-2B	1.77	+0.01
WCA-3A	1.57	+0.12
WCA-3B	2.83	+0.20
ENP	2.53	NA

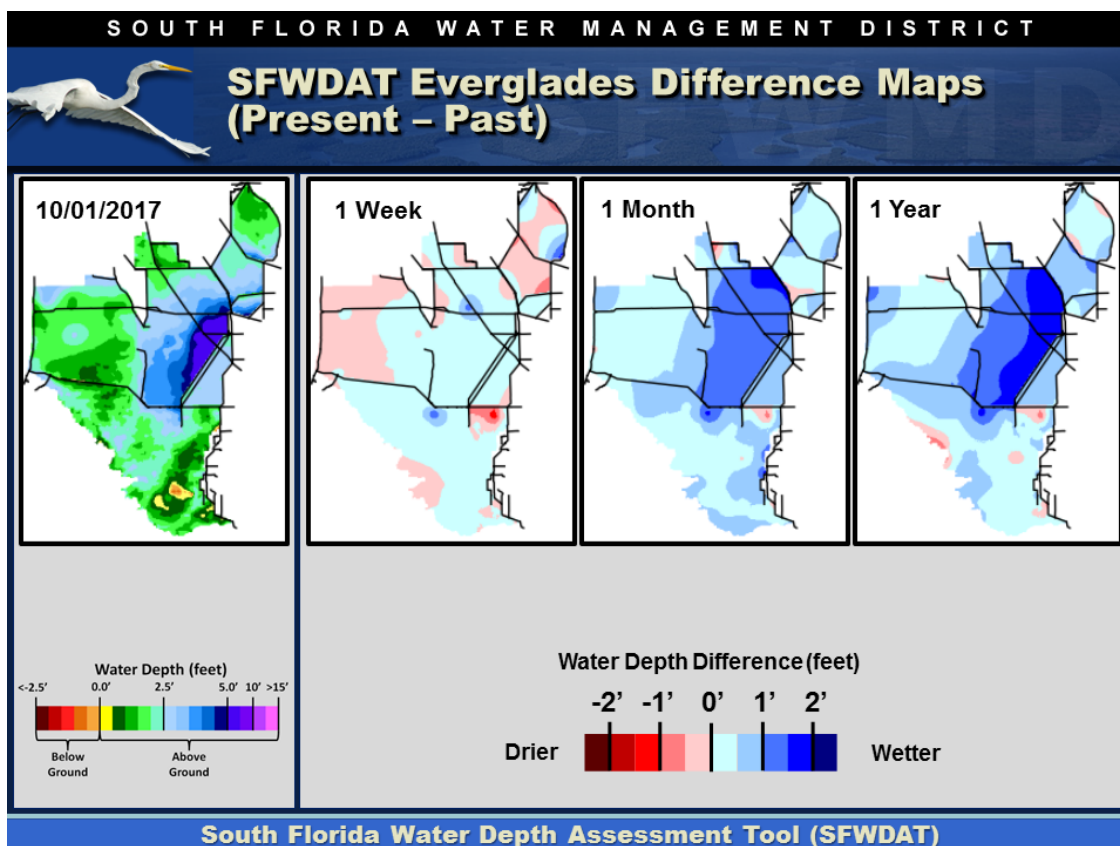
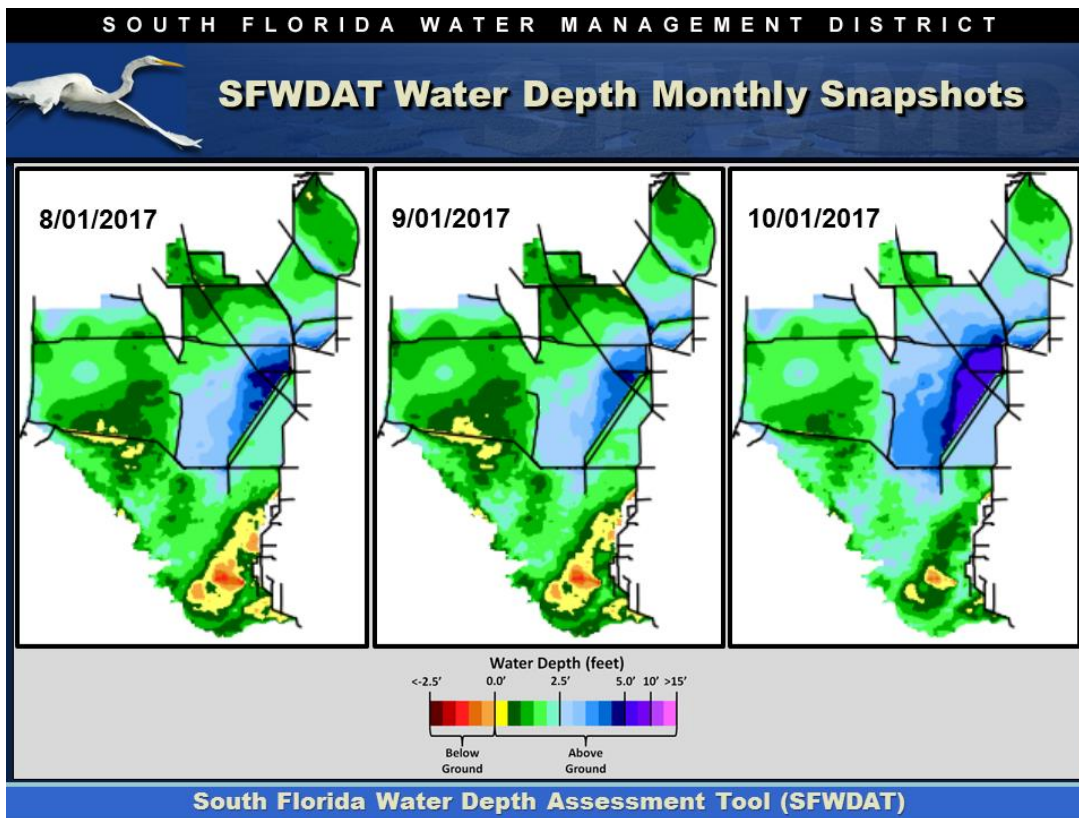


Regulation Schedules: WCA-1 three-gauge average is 0.41 feet below Zone A1, and stage difference between the marsh and the canal is 0.15 feet. WCA-2A marsh stage at gauge GA2A17 is currently 1.06 feet above zone A and around 0.5 feet higher than temporary deviation. Marsh stage is 0.74 feet above canal stage at S11B. WCA-3A three-gauge average stage is 1.94 feet above zone A, and 0.78 feet higher than canal stage. WCA-3A at gauge 62 (Northwest corner) is 0.90 feet above the upper schedule.



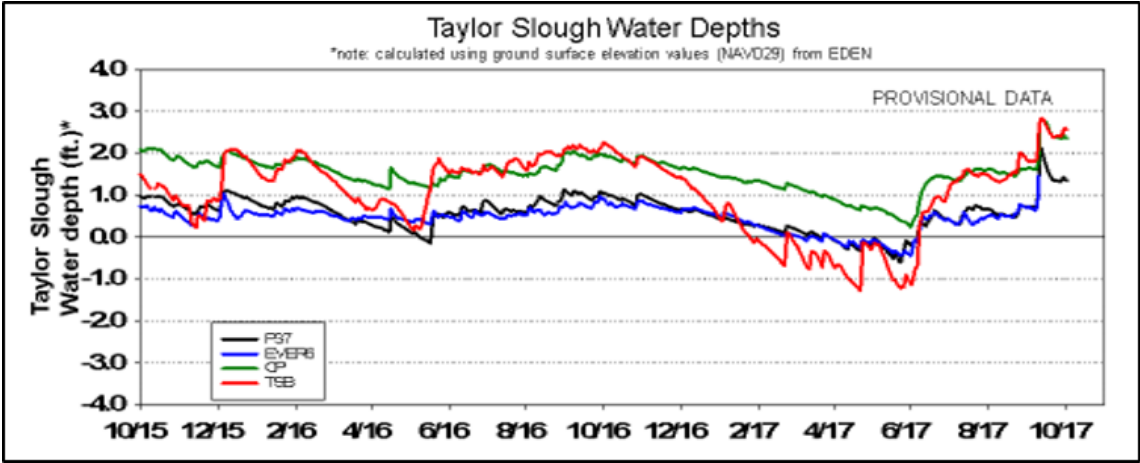
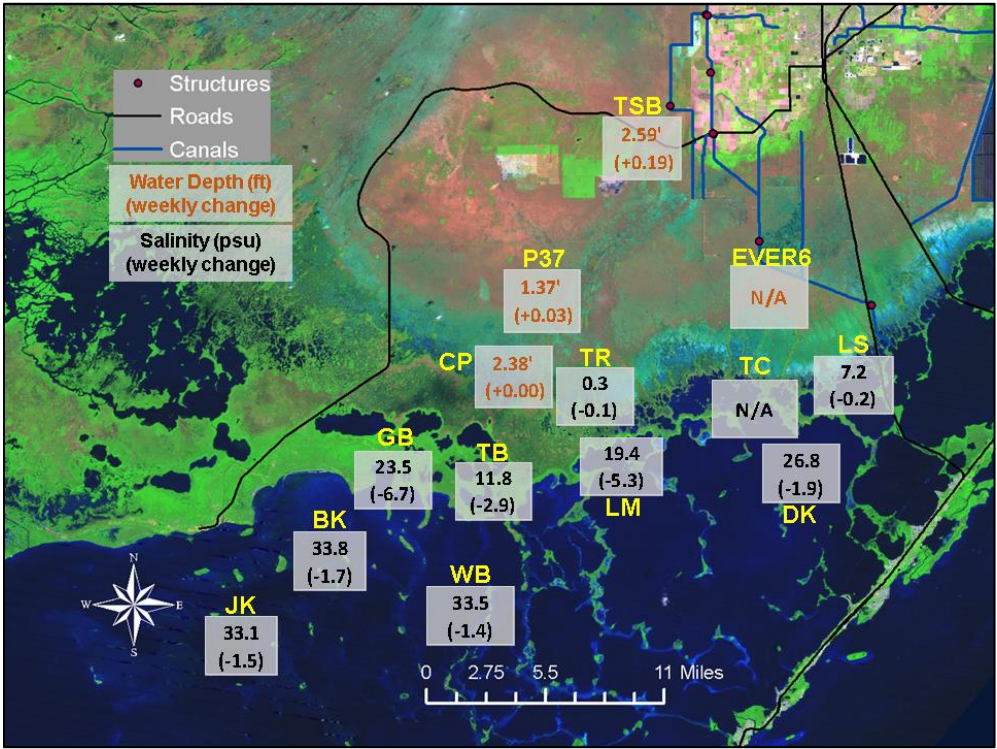
Water Depths and Changes: The WDAT tool for spatial interpolation of depth indicates a range from a low of 1.0 to 1.5 feet in Northern WCA-1 to a high of 5.0+ feet along the L-67A canal and a significant portion of Eastern WCA-3A.

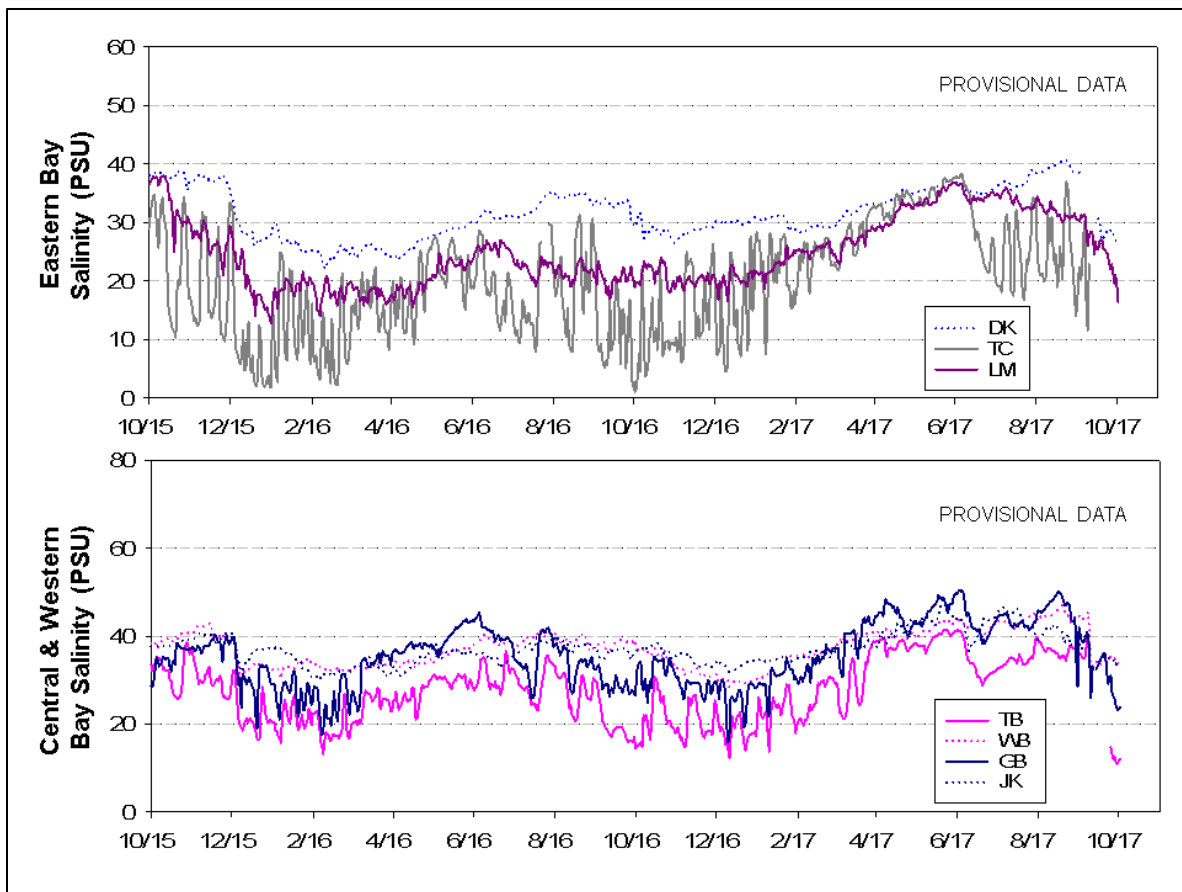
Pan evaporation was estimated at 1.55 inches above the pre-project 1.25 inches.



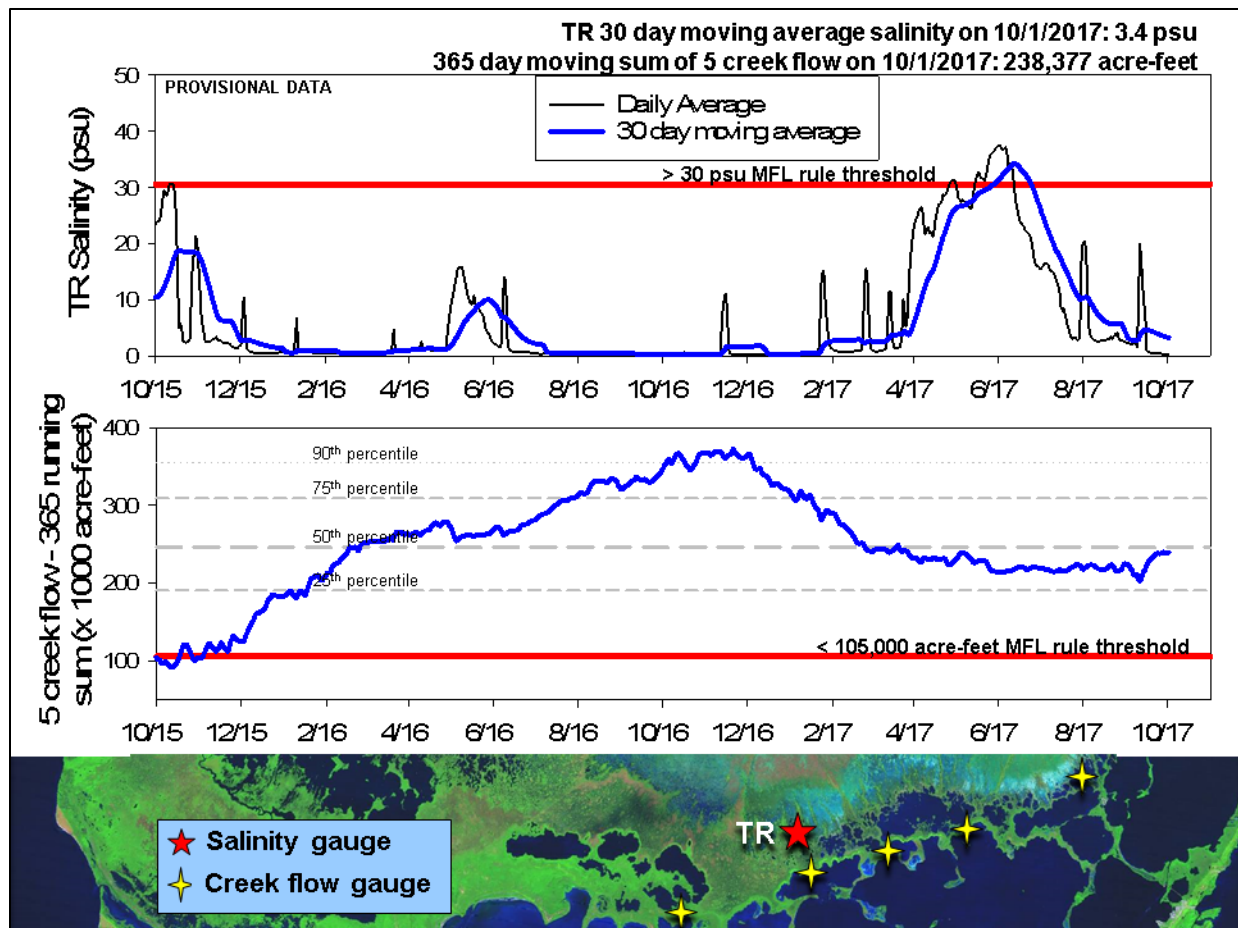
Taylor Slough stages: Water levels in Taylor Slough increased this past week with the largest change of 0.19 feet at Taylor Slough Bridge. Water levels are now 5 to 11 inches above the historic average for this time of year with the highest divergence occurring in northern Taylor Slough.

Florida Bay salinity: Salinities continue to decrease within Florida Bay with decreases ranging from 0.2 to 6.7 psu. Currently, salinities range from 7 in the US Highway 1 corridor to 34 in the western Bay. All areas are average to 5 psu below average (central nearshore area) compared to the historic averages for this time of year.





Florida Bay MFL: Mangrove zone daily average salinity decreased to 0.3 psu. The calculated 30-day moving average is at 3.4 psu. This includes the increased salinity from the hurricane storm surge after the data were recovered. The weekly sum of the five-creek total flow decreased to 13,000 acre-feet after peaking at 34,000 acre-feet after the hurricane. The historic average for this time of year is 15,000 acre-feet. The 365-day moving sum of flow from the five creeks identified by stars on the map increased about 150 acre-feet this past week to end at 238,377 acre-feet (still below the long-term average of 257,628 acre-feet). Creek flow is provisional data from the USGS and is highly variable.



Water Management Recommendations

Deep water conditions persist in WCA-3A and across most of the Everglades. All practicable and novel management options should be explored in order to relieve high water conditions. One measure of stress to the ecology of the Everglades is continuous water depths above 2.5 feet at gauge 65 in Southern WCA-3A beyond 90 days. The water depth at that location on Sunday was 4.38 feet and as of today had exceeded that mark for 108 days.

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

Everglades Ecological Recommendations, October 3rd, 2017 (red is new)

Area	Current Condition	Cause(s)	Recommendation	Reasons
WCA-1	Stages increase from +0.04 to +0.27'	Rainfall, ET, management	Where/when possible achieve high water targets (17.5 ft).	Protect habitat and facilitate invasive plant treatments.
WCA-2A	Stages decreased -0.23'	Rainfall, ET, management	Moderate ascension rates as possible. Manage for relief of high water conditions.	Protect habitat, wildlife and support apple snail reproduction.
WCA-2B	Stages increased +0.02'	Rainfall, ET, management	Moderate ascension rates as possible.	Protect habitat, wildlife and support apple snail reproduction.
WCA-3A NE	Stages increased +0.03'	Rainfall, ET, management	Moderate ascension rates as possible. Manage for relief of high water conditions.	Protect habitat, wildlife and support apple snail reproduction.
WCA-3A NW	Stages increased +0.07'	Rainfall, ET, management		
Central WCA-3A S	Stages increased +0.16'	Rainfall, ET, management	Moderate ascension rates as possible. Manage for relief of high water conditions.	Water depths above 2.5 feet at gauge 65 are indicative that tree islands are flooded and under stress. Depths exceeded that mark on 18 June, meaning the tree islands have been flooded for 108 days.
Southern WCA-3A S	Stages increased +0.23'	Rainfall, ET, management		
WCA-3B	Stages increased +0.20'	Rainfall, ET, management	Moderate ascension rates as possible..	Protect habitat, wildlife and support apple snail reproduction.
ENP-SRS	N/A	ET, rainfall, topography, management	Make discharges to the Park according to the 2012 WCP rainfall plan.	Keep peat wet to promote native habitat and maintain wetland plant and animal communities. Protect habitat and wildlife, including apple snail reproduction.
Taylor Slough	Stage changes ranged from 0 to +0.19'	Rain, ET, inflows	Move water southward as possible	When available provide freshwater buffer for ecosystems and slow recession rates.
FB- Salinity	Salinity changes ranged -0.2 to -6.7 psu.	Rain, ET, inflows, wind	Move water southward as possible	When available, provide freshwater to produce low salinity wet season conditions.