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: August 22, 2017

SUBJECT: Weekly Environmental Conditions for Systems Operations

Summary

Weather Conditions and Forecast

A wet week. An upper level low located just east of central Florida is interacting with a surface trough over the northwest Bahamas. Dry air remains over central Florida but moisture has spread from the Bahamas across the southern half of the District. Expect an increase in thunderstorm activity over the District today and Wednesday with heaviest activity over the southern half of the District. A trough and its associated cold front are forecast to dig into north Florida Thursday and northcentral Florida Friday. Energy associated with the trough should help a weak low spin up near the southeast coast of the District on Thursday. This low should work its way northward and then merge with the frontal boundary by this weekend. The low will tap moisture over the District and generate above-average thunderstorm activity over the District Thursday, Friday, and Saturday with heaviest activity over eastern areas.

Kissimmee

Tuesday morning stages and departures from schedule were 56.5 feet (at schedule) in East Lake Toho, 53.5 feet (at schedule) in Toho, and 51.9 feet (0.9 feet above schedule) in Kissimmee Cypress Hatchineha; S65A headwater stage was 46.3 feet. Tuesday morning discharges were 961 cfs at S65, 1,446 cfs at S65A, and 2,027 cfs at S65E. Dissolved oxygen concentration in the Kissimmee River averaged 2.8 milligrams per liter (mg/L) for the week. Kissimmee River mean floodplain depth on Sunday was 1.08 feet.

Lake Okeechobee

Lake stage is 13.39 feet NGVD having increased by 0.08 feet over the past week and 0.70 feet over the past month. Conditions appear favorable for algal blooms again in the western, northeastern, and eastern portions of the Lake, showing high potential for blooms based on the OLCI sensor satellite data.

Estuaries

Total discharge to the St. Lucie estuary averaged 1,044 cfs over the past week with no Lake Okeechobee releases. Salinities were about the same throughout the estuary compared to last week. The seven-day average salinity at the US1 Bridge is in the good range for adult oysters. Total inflow to the Caloosahatchee estuary averaged 2,771 cfs over the past week with no flow coming from the Lake. The 30-day average surface salinity is 0.3 at Val I-75 and Ft.

Myers. The 30-day average salinity at ValI-75 is forecast to be 0.3 in two weeks with no flow coming through S-79. Salinity conditions between Val I-75 and Ft. Myers are good for tape grass. Salinity conditions are in the poor range for adult oysters at the Cape Coral Bridge and in the good range at Shellpoint and the Sanibel Causeway.

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 19,600 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. The nest of an Endangered Species Act protected species has been observed in STA-5/6. Due to basin runoff, it is recommended that no Lake releases be sent to the STAs/FEBs this week.

Everglades

For the fourth week in a row the stages dropped across Water Conservation Area – 3A, WCA-2A rose 0.06 feet over the week and WCA-1 rose 0.09 feet. Only WCA1 is at regulation, 2A is some 2 feet above and 3A is about 1.25 feet above regulation. 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 3.24 feet, and has exceeded 2.5 feet for 64 days. Western Florida Bay received significant rainfall which helped to reduce salinities within that region. Salinity changes ranged from −7.6 psu in the eastern bay area to +1.3 psu in the central bay. Salinities currently range from 23 psu in eastern nearshore region to 48 psu in the western nearshore area.

Supporting Information

KISSIMMEE BASIN

Kissimmee Basin Rainfall

The Upper Kissimmee Basin received 1.71 inches of rainfall in the past week and the Lower Basin received 1.61 inches (SFWMD Daily Rainfall Report 8/21/2017).

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: **8/22/2017**

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)						
							8/20/17	8/13/17	8/6/17	7/30/17	7/23/17	7/16/17	7/9/17
Lakes Hart and Mary Jane	S62	33	LKMJ	60.1	R	60.0	0.1	0.0	0.0	0.1	-0.1	0.0	0.0
Lakes Myrtle, Preston, and Joel	S57	2	S57	61.0	R	61.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Alligator Chain	S60	10	ALLI	63.2	R	63.2	0.0	0.0	0.0	-0.1	0.0	-0.5	-0.5
Lake Gentry	S63	34	LKGT	61.0	R	61.0	0.0	0.0	0.0	0.0	-0.1	-0.4	-0.6
East Lake Toho	S59	175	TOHOE	56.5	R	56.5	0.0	0.0	0.0	-0.1	0.1	-0.4	-0.5
Lake Toho	S61	649	TOHOW, S61	53.5	R	53.5	0.0	0.0	0.1	-0.1	0.1	-0.1	-0.3
Lakes Kissimmee, Cypress, and Hatchineha	S65	958	KUB011, LKIS5B	51.9	R	51.0	0.9	0.8	0.7	0.2	-0.3	-1.1	-1.0

* 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: **8/22/2017**

Metric	Location	Sunday's 1-day average	Weekly Average**									
			8/20/17	8/13/17	8/6/17	7/30/17	7/23/17	7/16/17	7/9/17	7/2/17	6/25/17	6/18/17
Discharge (cfs)	S-65	696	**958**	1181	665	616	342	160	392	407	455	20
Discharge (cfs)	S-65A	1298	**1213**	1298	1274	927	638	575	393	564	1291	477
Discharge (cfs)	S-65D****	2041	**2257**	2154	2234	1180	1236	838	875	1715	1426	584
Discharge (cfs)	S-65E****	2022	**2277**	2195	2319	1293	1321	886	915	1698	1462	643
DO concentration (mg/L)***	Phase I river channel	2.6	**2.8**	2.0	2.2	2.3	1.8	3.0	2.9	0.7	0.5	3.5
Mean depth (feet)*	Phase I floodplain	1.08	**1.09**	1.10	1.01	0.63	0.68	0.46	0.37	1.00	0.90	0.27

* 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
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.			
5/30/2017	No new recommendations.			

KCOL Hydrographs (through Sunday midnight)

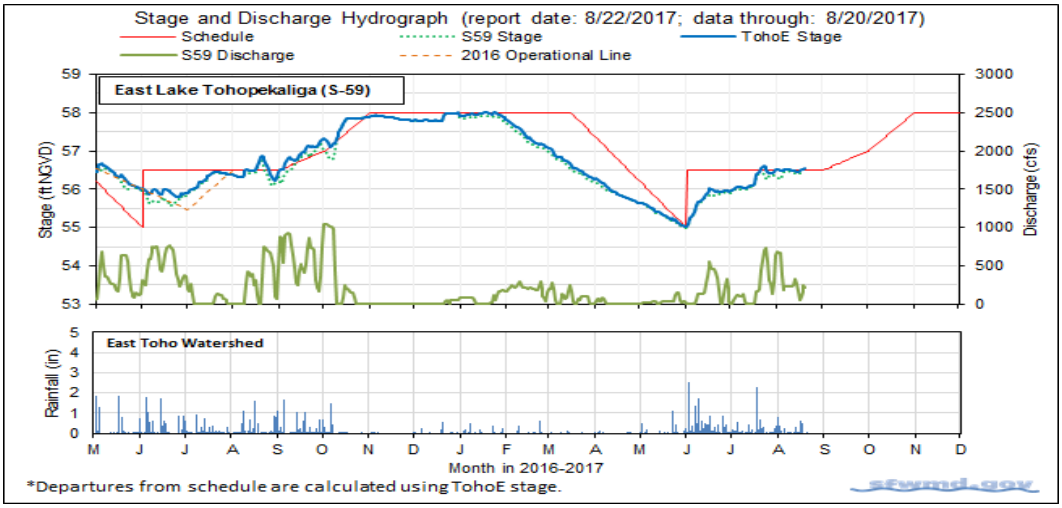


Figure 1.

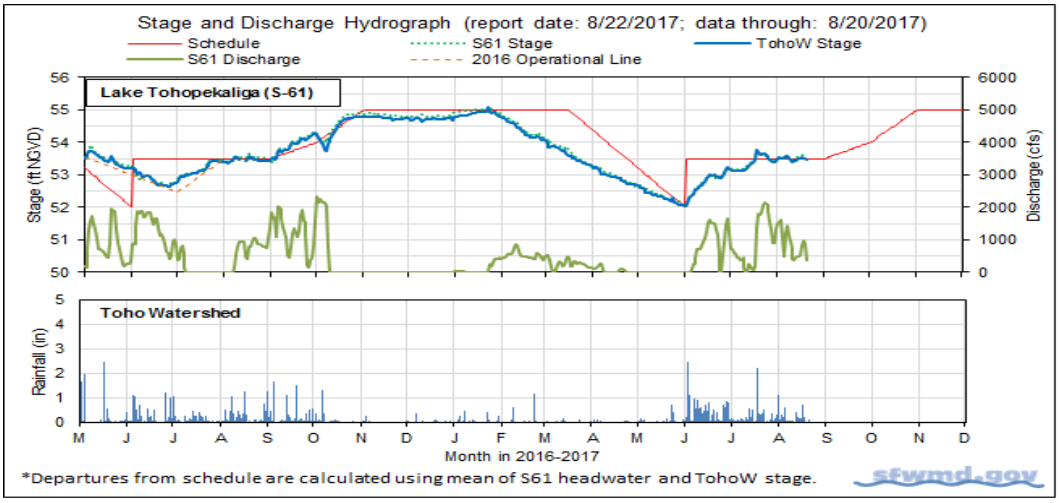


Figure 2.

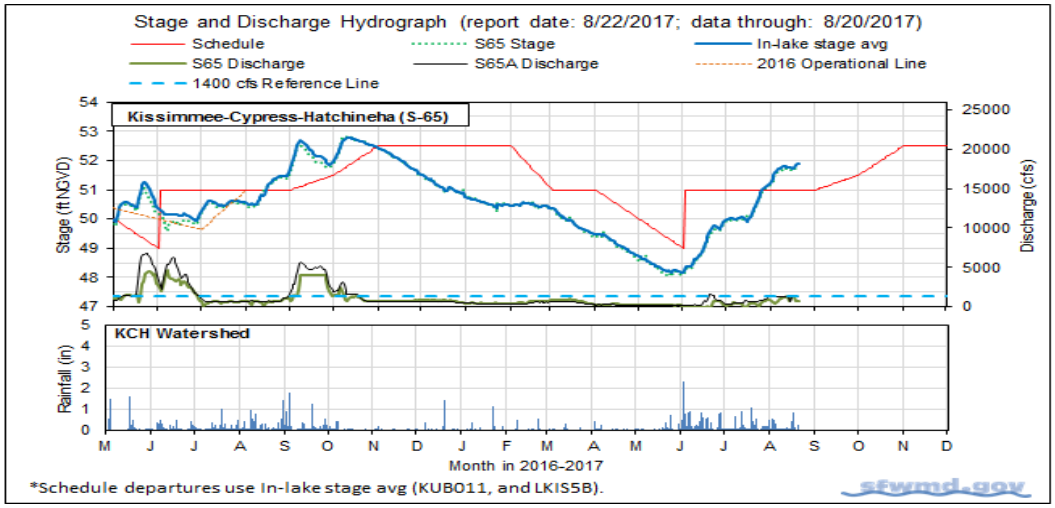
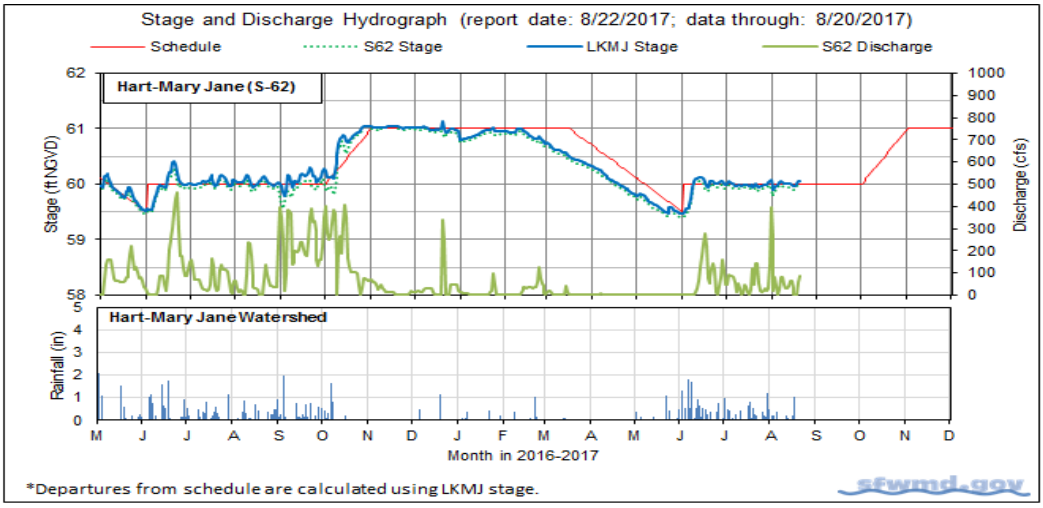


Figure 3.



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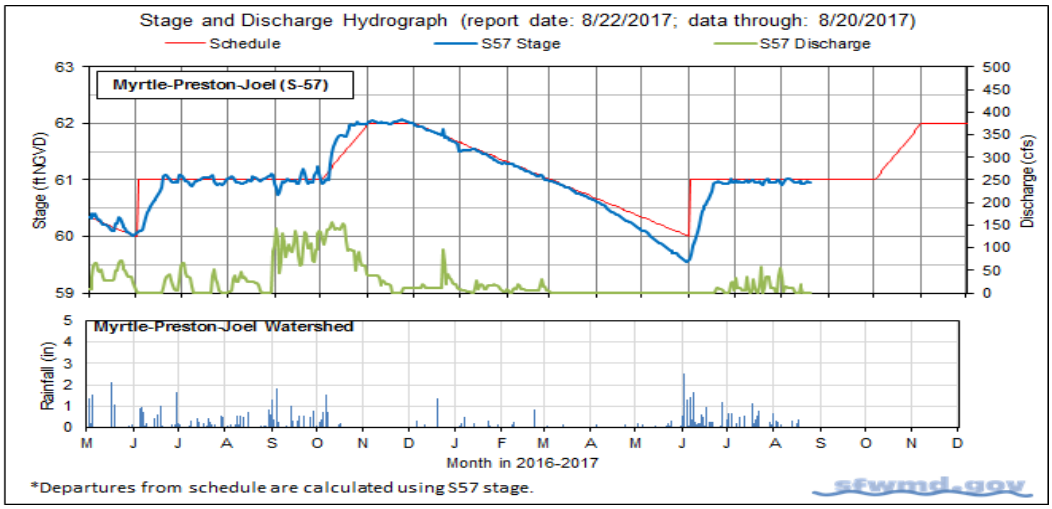


Figure 5.

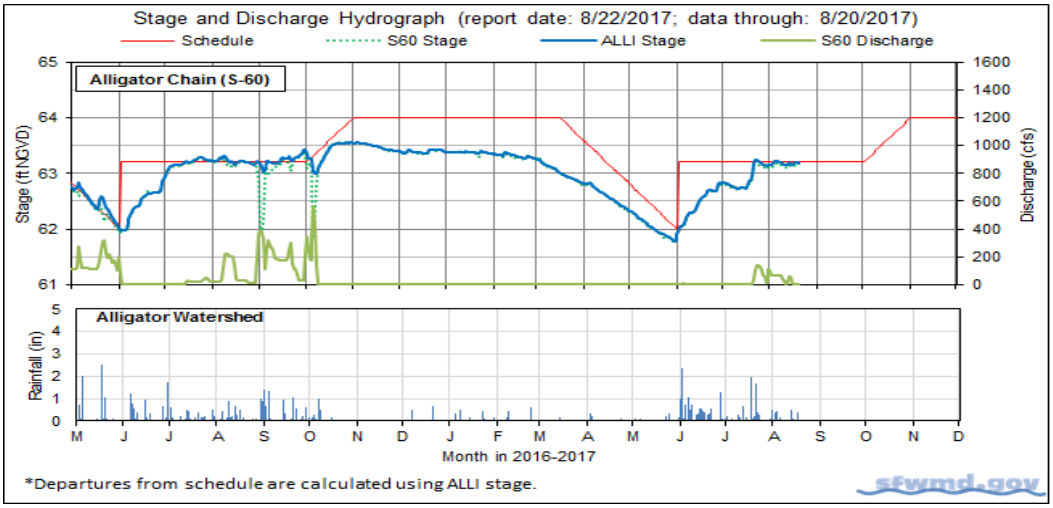


Figure 6.

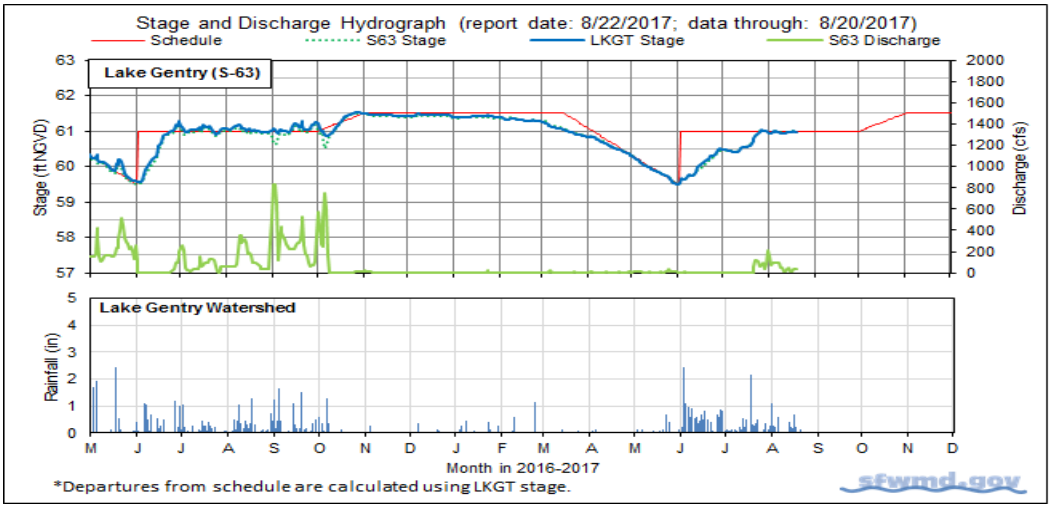


Figure 7.

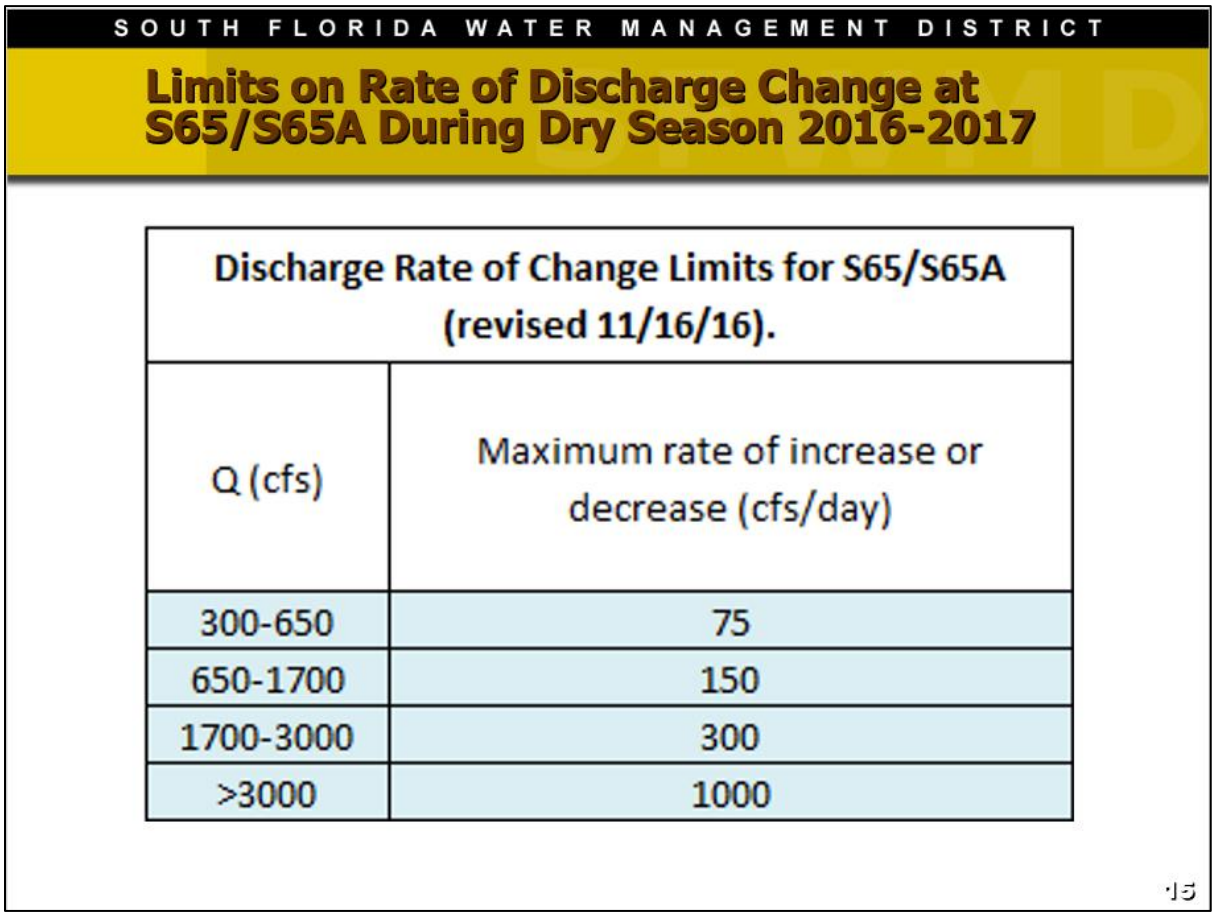


Figure 8. Limits on rate of discharge change at S65/S65A for the 2016-2017 Dry Season.

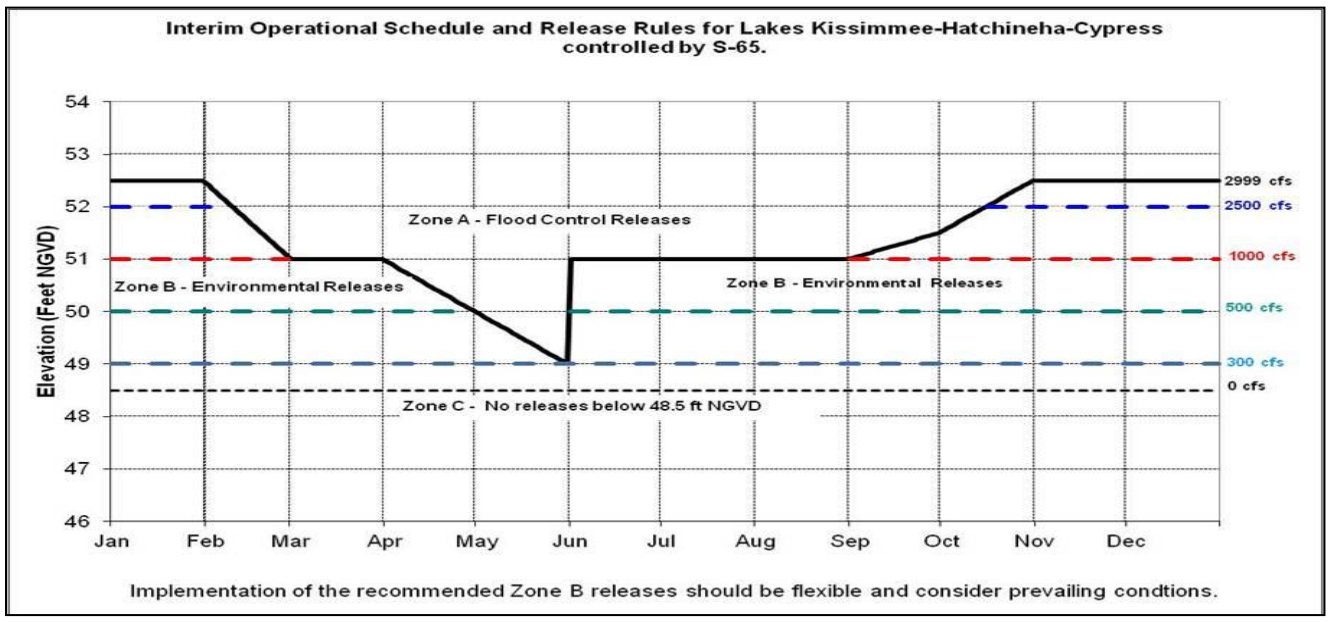


Figure 9. Interim operations schedule for S-65. The discharge schedule shown to the right has not been used in recent years or in Wet Season 2015.

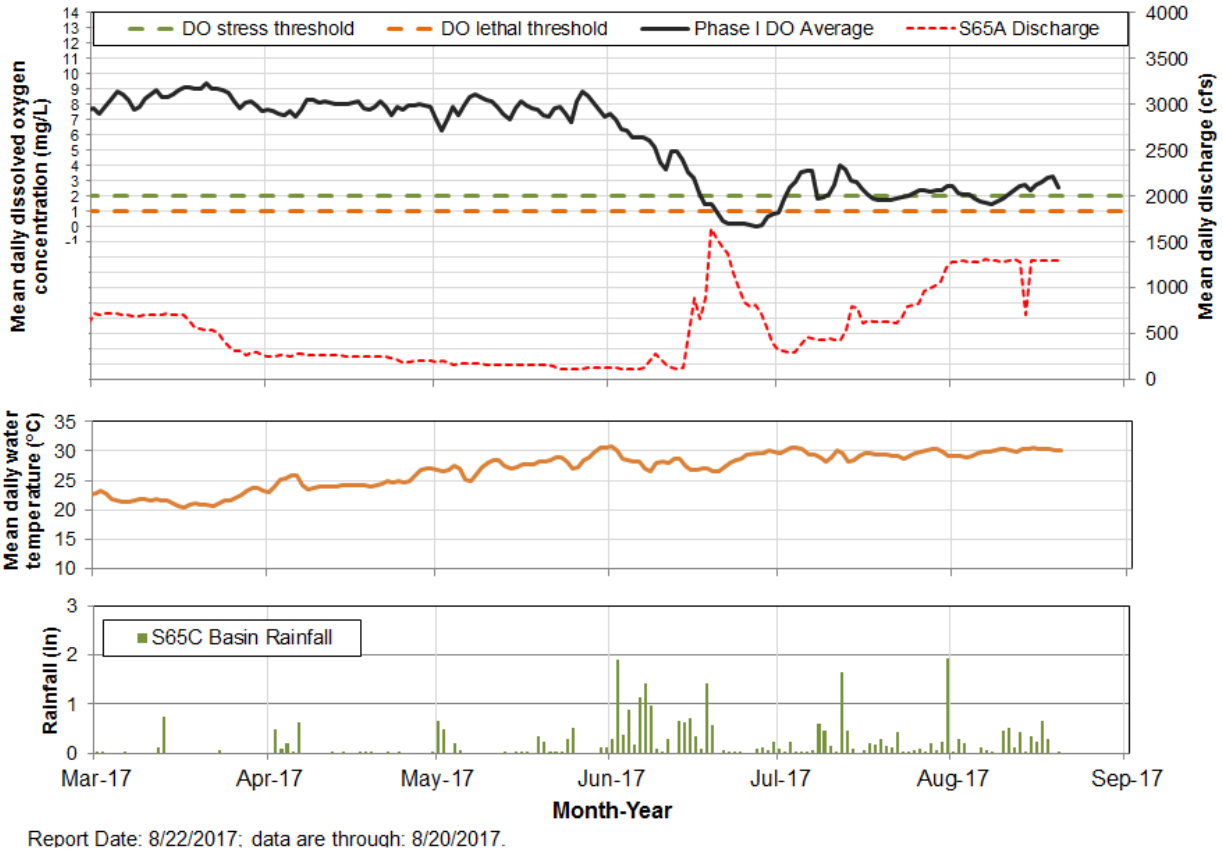


Figure 10. Mean daily Dissolved Oxygen, discharge, temperature and rainfall in the Phase I river channel.

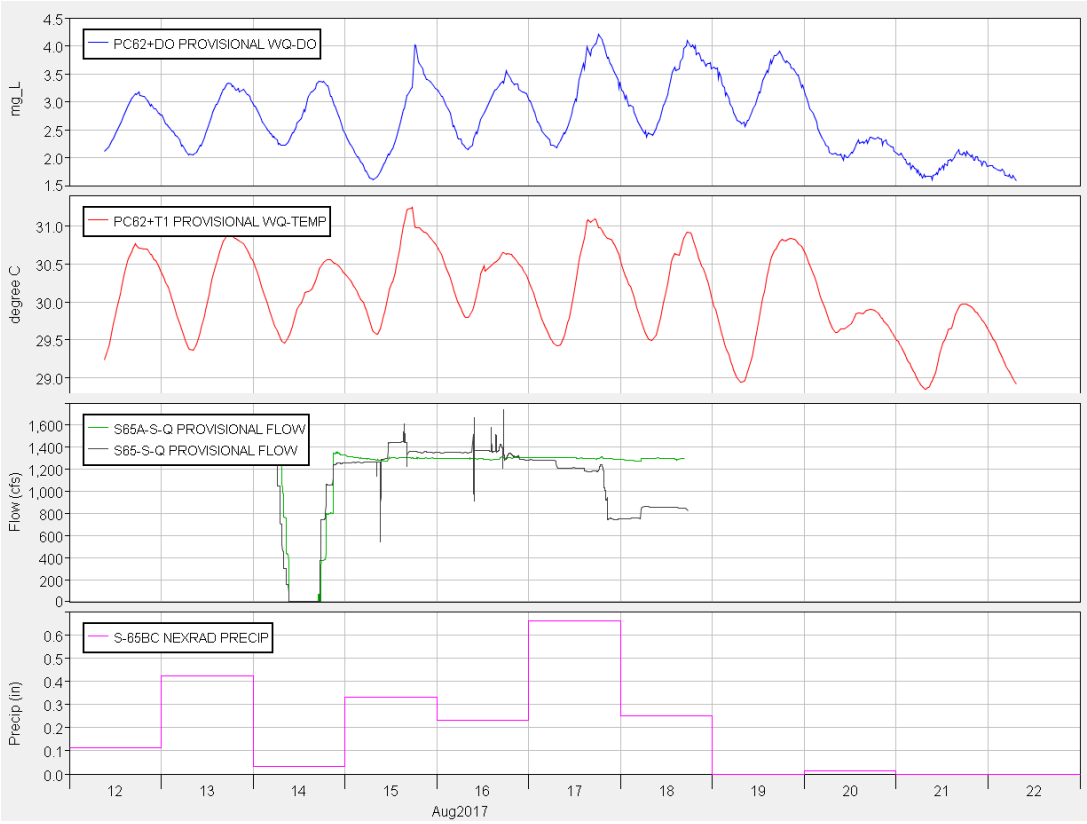


Figure 11. Phase I river channel dissolved oxygen and water temperature (measured at 15 minute intervals) and Pool BC daily rainfall.

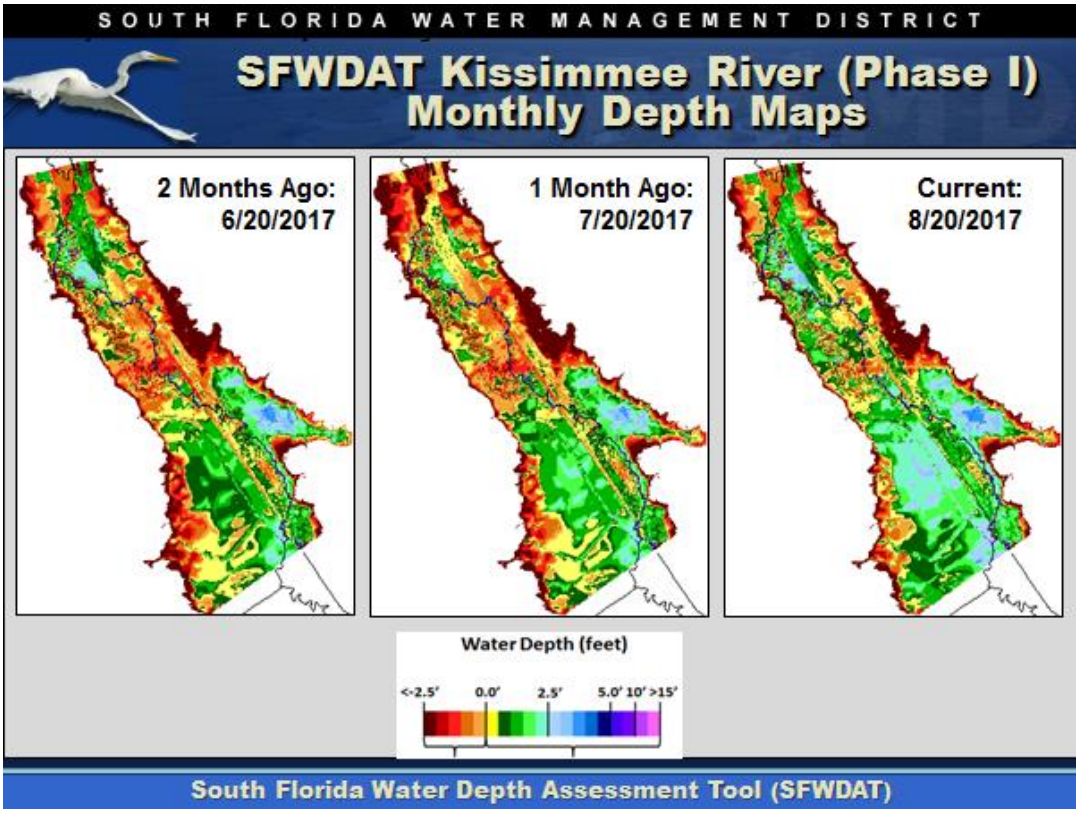
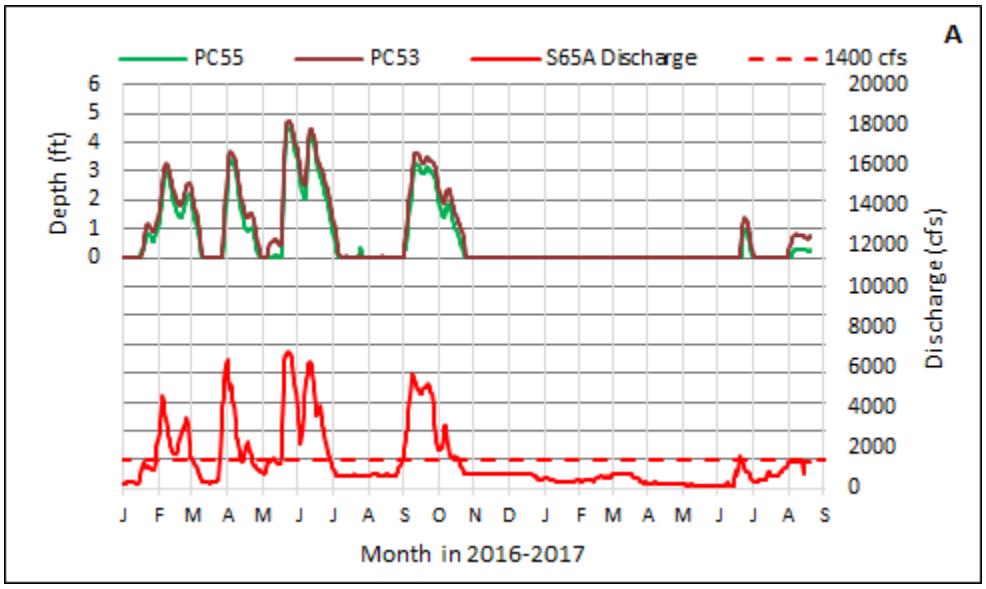
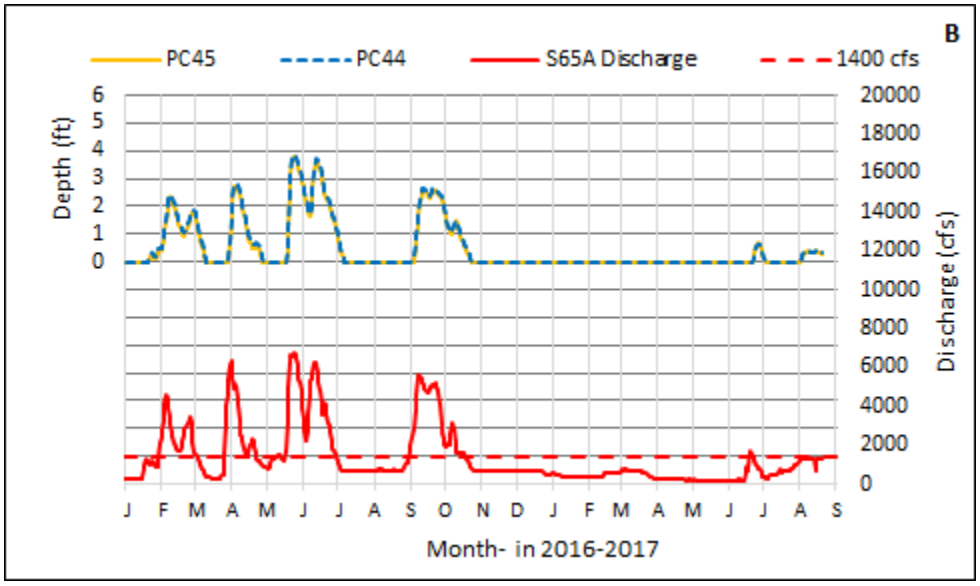


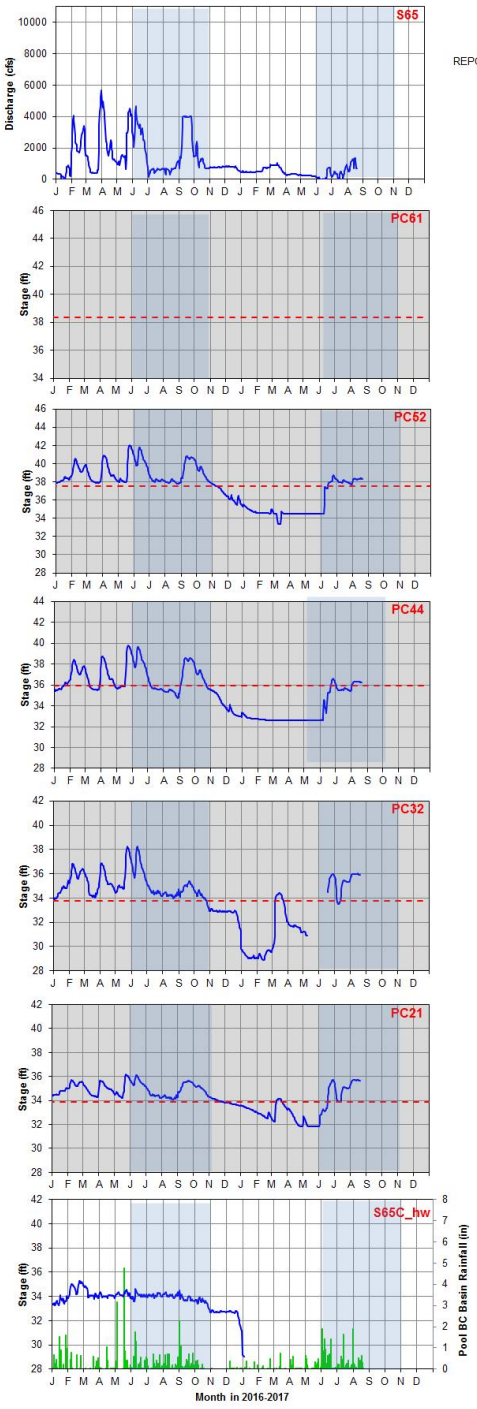
Figure 12. Phase I area floodplain water depths for this week, one month ago, and two months ago. Note that the WDAT color-coding has been modified to accommodate greater water depths; these maps are not directly comparable to Kissimmee Basin WDAT maps published prior to Jan. 16, 2012.





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



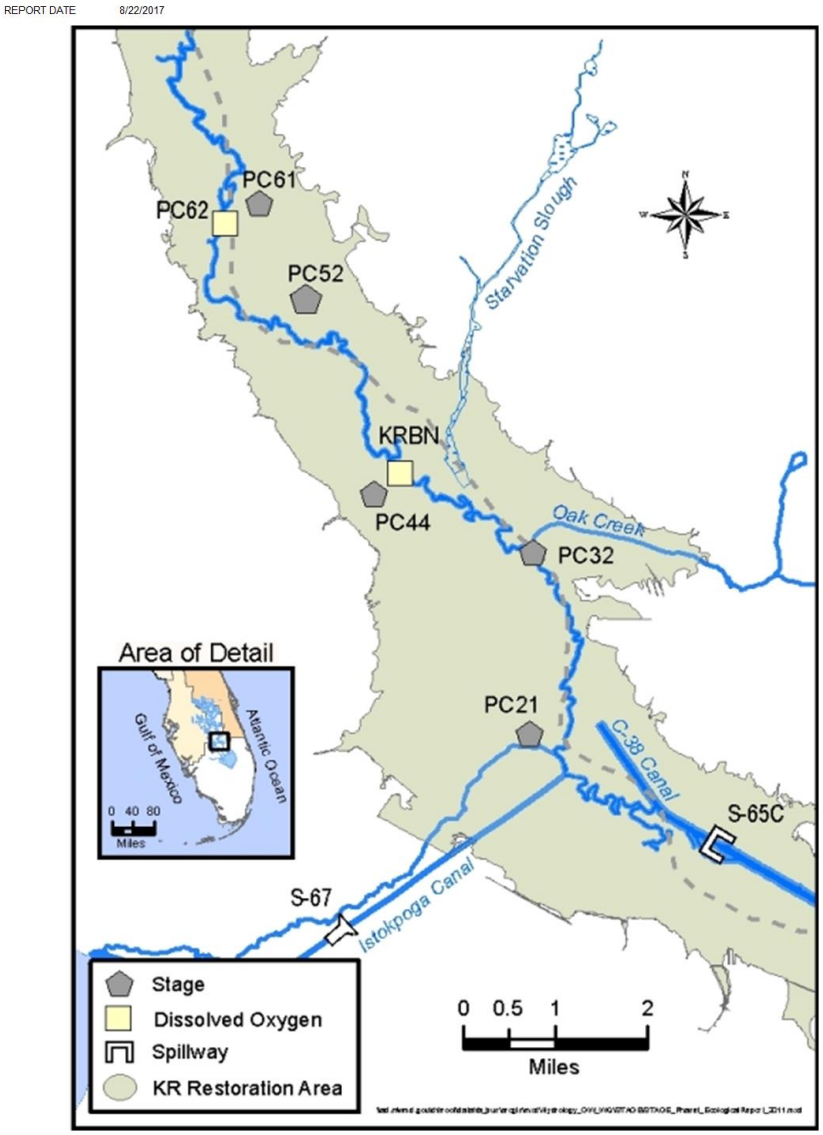


Figure 13. Discharge at S65, stages at five monitoring stations in the Phase I area of the Kissimmee River floodplain, and headwater stage at S65-C since January 1, 2015. The most recent data (~2 weeks) are provisional real-time data from SFWMD DualTrend; previous data are from SFWMD DB-HYDRO (validated).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

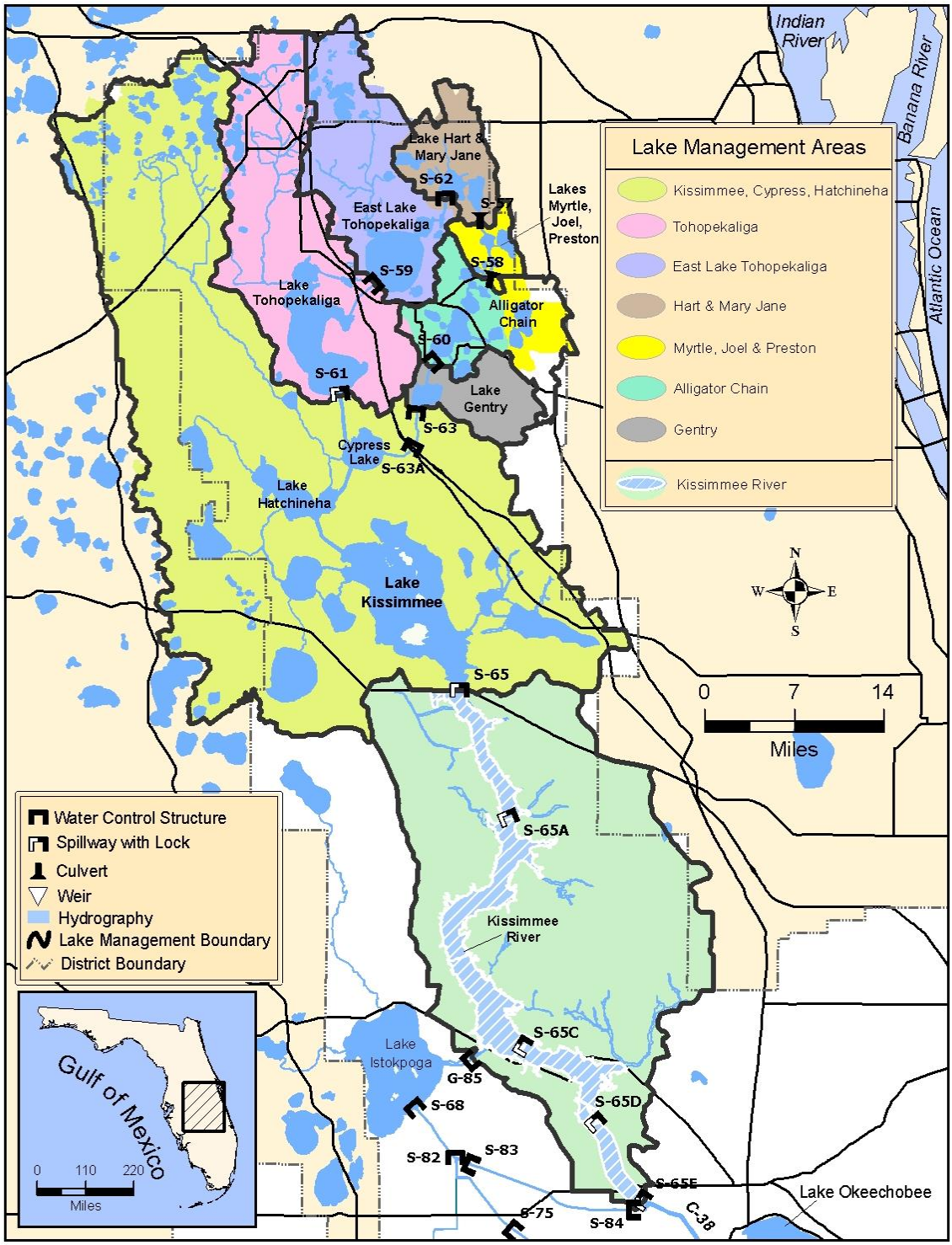


Figure 14. The Kissimmee Basin

LAKE OKEECHOBEE

According to the USACE web site, Lake Okeechobee stage is at 13.39 feet NGVD for the period ending at midnight on August 21, 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 0.08 feet over the past week and is 0.70 feet higher than it was a month ago and 1.33 feet lower than it was a year ago (Figure 1). The Lake is currently in the Base Flow sub-band (Figure 2). According to RAINDAR, only 0.5 inches of rain fell directly over the Lake during the week Aug 15 - Aug 21 (Figure 3). Much of the surrounding watershed had similar amounts of rainfall, but northern portions of the Kissimmee River watershed were wetter, with Pool A receiving 2.6 inches.

Average daily inflows and outflows for the last week are detailed below.

INFLOWS	Avg Daily Flow cfs	Equivalent Depth Week Total (in)
S65E & S65EX1	2074	0.9
S71 & 72	267	0.1
S84 & 84X	1033	0.4
Fisheating Creek	485	0.2
S154	32	0.0
S191	151	0.1
S133 P	0	0.0
S127 P	17	0.0
S129 P	15	0.0
S131 P	3	0.0
S135 P	20	0.0
S2 P	6	0.0
S3 P	0	0.0
S4 P	0	0.0
C5	0	0.0
Rainfall	1408	0.5
Total	**5512**	**2.3**

OUTFLOWS	Avg Daily Flow cfs	Equivalent Depth Week Total (in)
S77	0	0.0
S308	-352	-0.2
S351	0	0.0
S352	0	0.0
S354	0	0.0
L8	-97	0.0
ET	3197	1.4
Total	**2748**	**1.2**

The approximate change in Lake stage from each structure's total weekly flows (midnight August 15, 2017 to midnight August 21, 2017) for major structures are also presented in the above table.

Average daily outflows for the Lake have been negative since the beginning of June with the exception of last week, but continued the negative trend this week; a total of -448 average daily cfs flowed back into the Lake through outflow structures, with -352 cfs through S308 and -97 cfs from the L8 canal through Culvert 10A. There were no discharges through S77 or the S350 structures. The corrected evapotranspiration value based on the L006 weather platform solar radiation data was 1.16 inches for the week.

Mid-August satellite imagery indicates that the bloom potential continues to be high, similar to conditions seen in late July. A visible bloom was apparent in truecolor satellite imagery in the western and eastern portions of the Lake for the second week, and the western, northeastern,

and eastern shorelines showed high bloom potential via the OLCI satellite sensor for cyanobacterial blooms, indicated by red and orange colors (Figure 4).

Water Management Recommendations

The Lake is 13.39 feet NGVD having increased 0.08 feet over the past week due to rainfall and inflows mainly from the Kissimmee River basin. The submerged and emergent vegetation communities recovering in the nearshore region after high water levels in February and October of 2016 are still vulnerable to rapid ascension rates that may limit new growth.

Activities that maintain a moderate ascension rate in Lake Okeechobee will remain ecologically beneficial at this time and would be protective of the Lake's emergent wetland and submerged aquatic flora and its associated fauna.

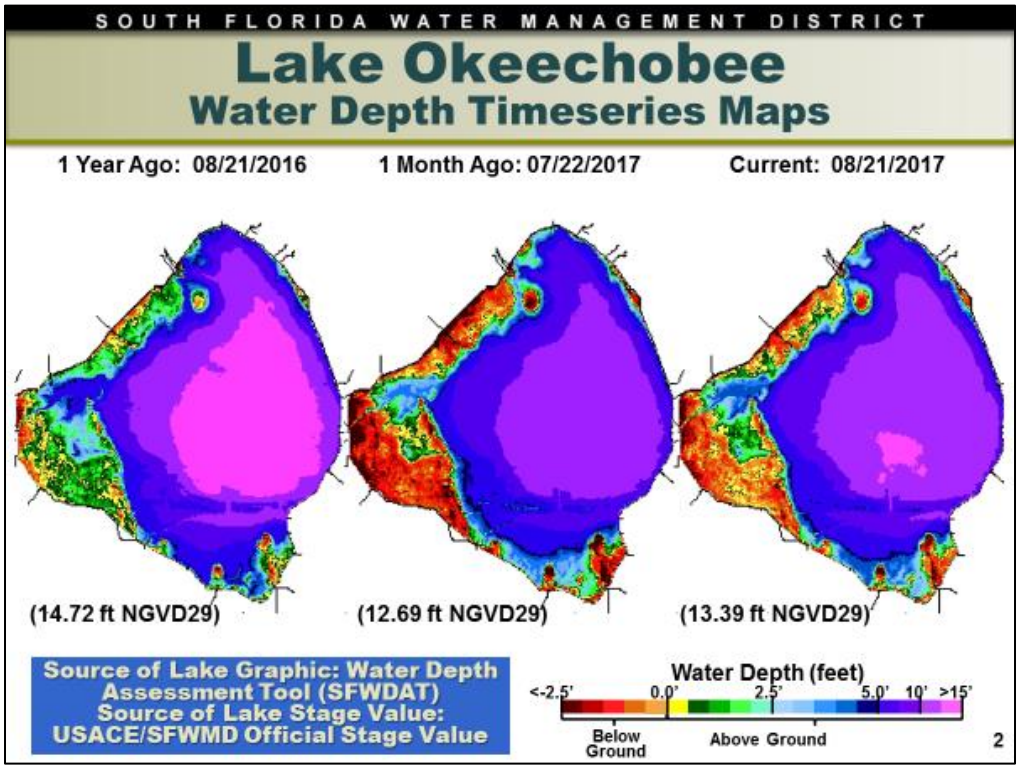


Figure 1

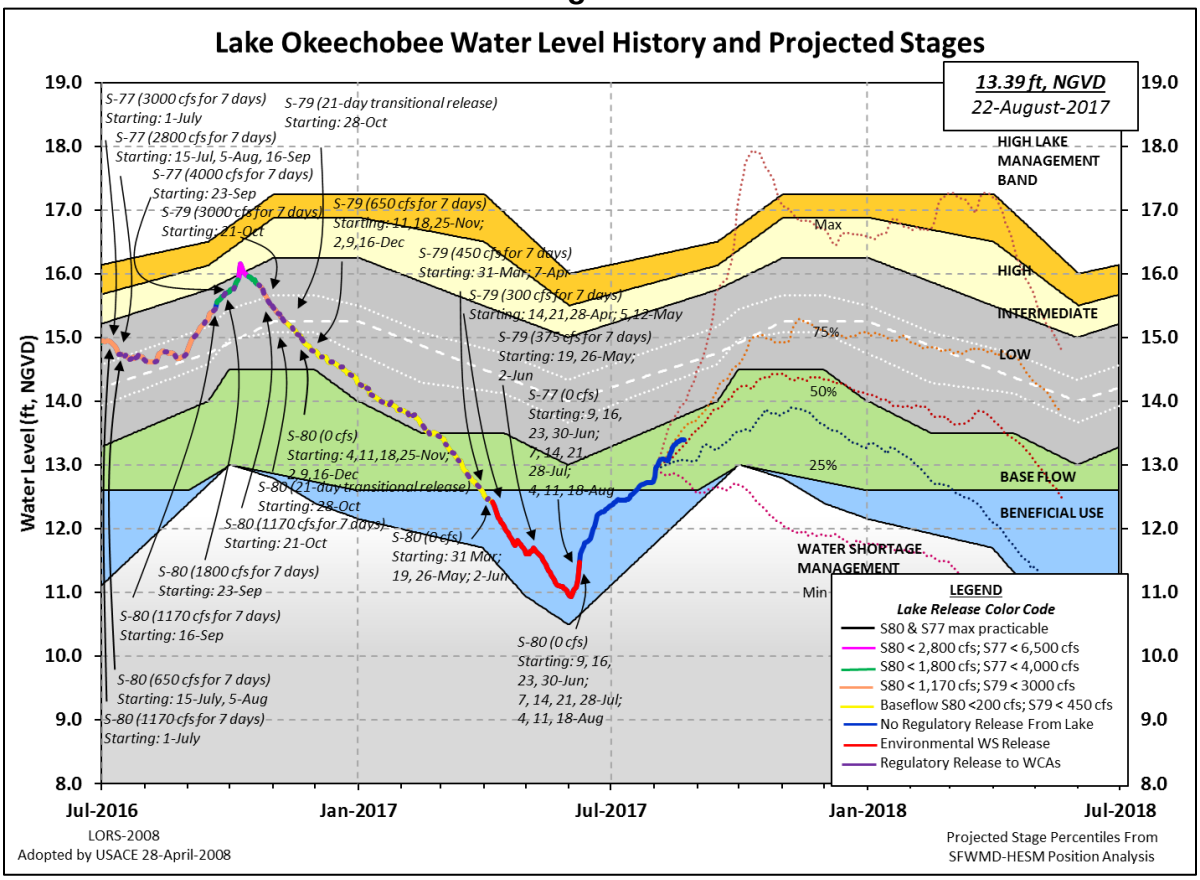


Figure 2

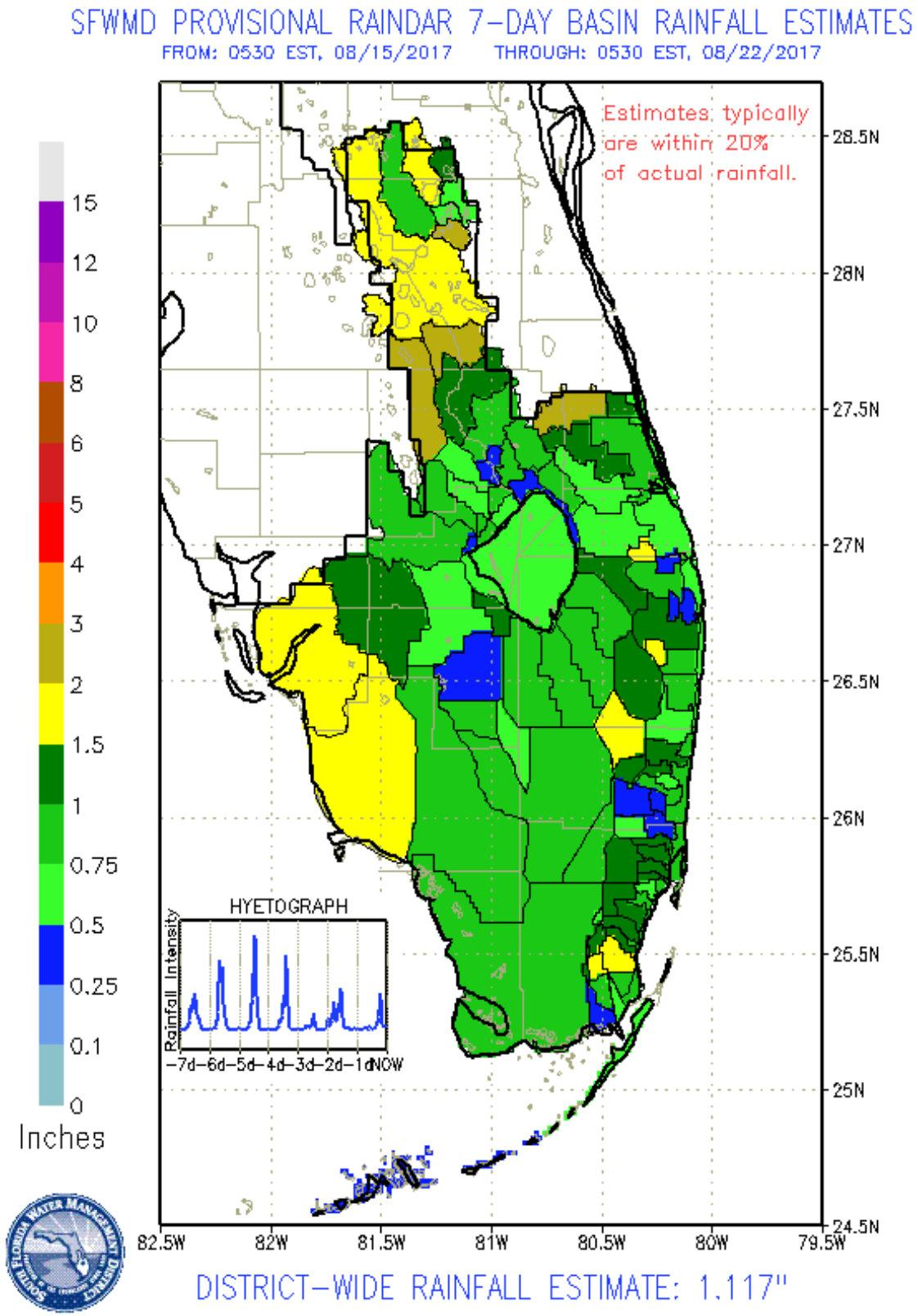

SFWMD PROVISIONAL RAINDAR 7-DAY BASIN RAINFALL ESTIMATES
FROM: 0530 EST, 08/15/2017 THROUGH: 0530 EST, 08/22/2017
Estimates typically are within 20% of actual rainfall.
15
12
10
8
6
5
4
3
2
1.5
1
0.75
0.5
0.25
0.1
0
Inches
HYETOGRAPH
Rainfall Intensity
-7d-6d-5d-4d-3d-2d-1dNOW
28.5N
28N
27.5N
27N
26.5N
26N
25.5N
25N
24.5N
82.5W
82W
81.5W
81W
80.5W
80W
79.5W
DISTRICT-WIDE RAINFALL ESTIMATE: 1.117"

Figure 3

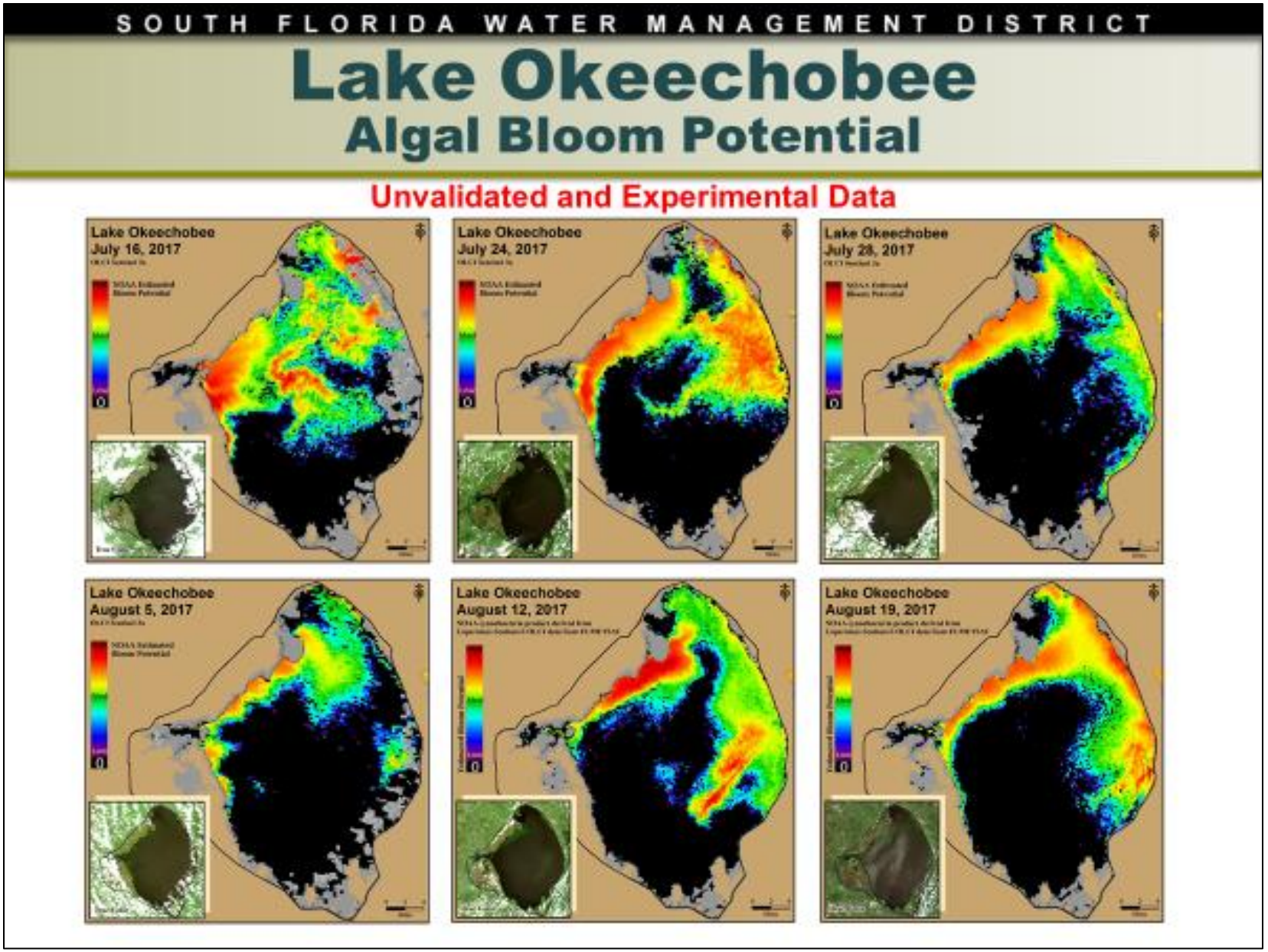

SOUTH FLORIDA WATER MANAGEMENT DISTRICT
Lake Okeechobee
Algal Bloom Potential
Unvalidated and Experimental Data
Lake Okeechobee
July 16, 2017
Lake Okeechobee
July 24, 2017
Lake Okeechobee
July 28, 2017
Lake Okeechobee
August 5, 2017
Lake Okeechobee
August 12, 2017
Lake Okeechobee
August 19, 2017

Figure 4

LAKE ISTOKPOGA

Lake Istokpoga stage is 38.44 feet NGVD as of midnight August 21, 2017 and is currently 0.03 feet above its regulation schedule of 38.41 feet NGVD (Figure 5). Average daily flows into the Lake from Josephine Creek over the past week nearly doubled to 151 cfs from 78 cfs, but no data have been reported for Arbuckle Creek since July 4. Average daily discharge from S68 and S68X this past week also increased to 1,030 cfs, from the previous week's flow of 601 cfs. According to RAINDAR, 2.2 inches of rain fell in the Lake Istokpoga basin from August 15 - August 21.

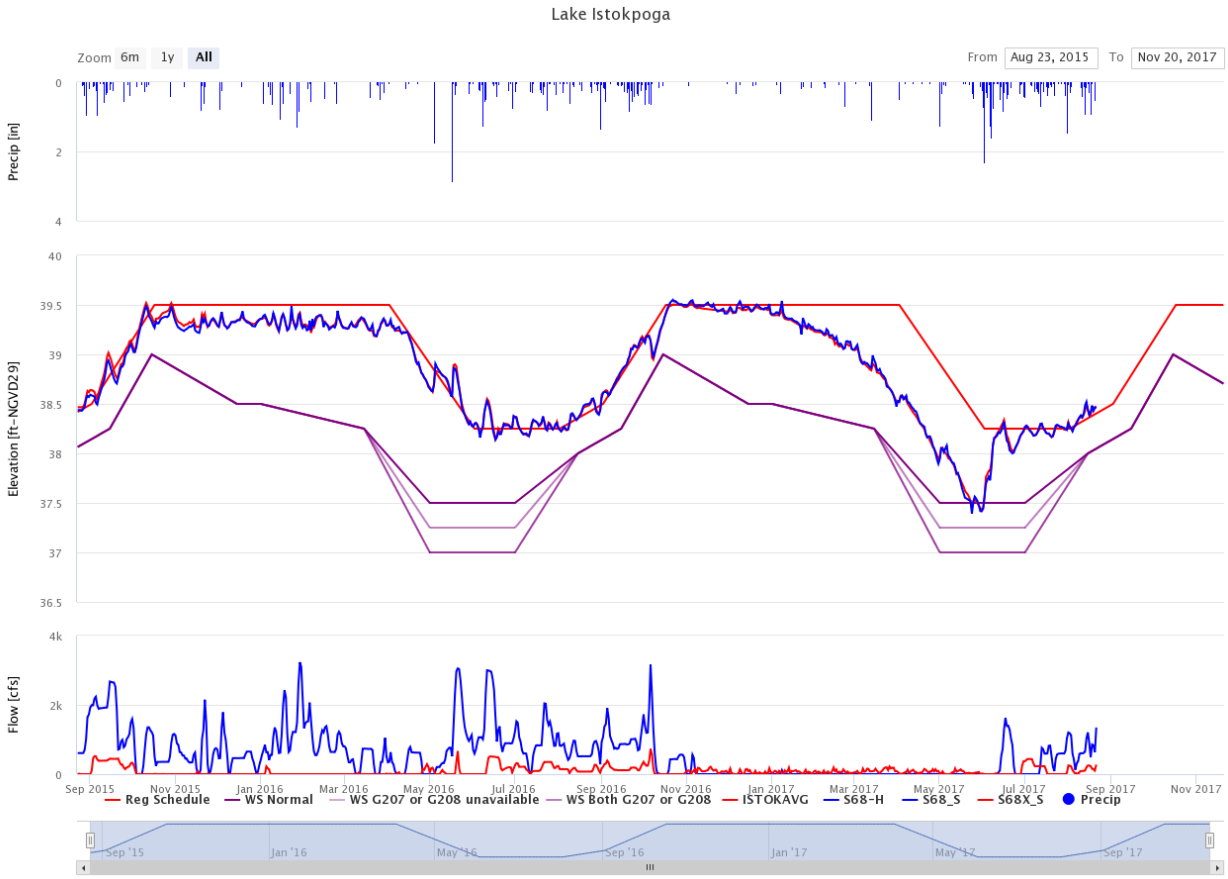


Figure 5

ESTUARIES

St. Lucie Estuary

Over the past week, provisional flows averaged about 0 cfs at S-80, 375 cfs downstream of S-308 flowing into Lake Okeechobee, 340 cfs at S-49 on C-24, 148 cfs at S-97 on C-23, and ~ 148 cfs from Ten Mile Creek at the Gordy Road Structure. Average inflow from tidal basin tributaries is estimated to be 408 cfs (Figures 1 and 2). Total inflow averaged about 1,044 cfs last week and 1,398 cfs over last month.

Over the past week, surface salinity increased throughout the estuary (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 10.3. Salinity conditions in the middle estuary are in the good 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)	**3.9** (2.6)	**8.3** (8.2)	NA[1]
US1 Bridge	**9.0** (8.4)	**11.6** (11.6)	10.0-26.0
A1A Bridge	**18.5** (18.2)	**24.9** (25.0)	NA[1]

[1]Envelope 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	4.11	1.15	8.52
HR1	bottom	1.69	0.98	3.82

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 *a* (µg/l)	Average DO (mg/l)	Minimum DO (mg/l)	Maximum DO (mg/l)
SF2	2.53	5.21 - 8.22	4.31	2.56	7.58
SF	1.51	5.11 - 9.49	4.75	3.42	7.54
NF	2.00	4.6 - 7.99	4.52	1.60	7.71
ME	1.77	3.88 - 10.97	4.98	3.77	7.35
IRL-SLE*	3.47	0.16 - 2.5	6.07	5.07	6.69

*No data after 2 pm on August 19, 2017.

NOAA satellite imagery indicates no potential cyanobacterial presence in the St. Lucie estuary (Figure 6).

Caloosahatchee Estuary

During the past week, provisional flows averaged approximately 0 cfs at S-77, 464 cfs at S-78, and 1,658 cfs at S-79. Average inflow from tidal basin tributaries is estimated to be 1,113 cfs (Figures 7 & 8). Total inflow averaged 2,771 cfs last week and 3,320 cfs over last month.

Over the past week, salinity remained about the same throughout the estuary except for an increase in salinity at Shell Point (Table 4, Figures 9 and 10). The seven-day average salinity values are within the poor range for adult oysters at Cape Coral, and within the good range at Shell Point and Sanibel (Figure 11). The 30-day moving average surface salinity is 0.3 at Val I-75 and 0.3 at Ft. Myers. Salinity

at Val I-75 is forecast to be 0.3 in two weeks with no flow through S-79 (Figure 12). 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** (0.3)	**0.2** (0.3)	NA[1]
*Val I75	**0.2** (0.3)	**0.3** (0.3)	0.0-5.0[2]
Ft. Myers Yacht Basin	**0.3** (0.3)	**0.3** (0.3)	NA
Cape Coral	**3.5** (3.8)	**4.6** (4.6)	10.0-30.0
Shell Point	**14.6** (13.4)	**15.5** (14.0)	10.0-30.0
Sanibel	**24.9** (25.0)	**25.9** (EM[3])	10.0-30.0

[1]Envelope not applicable, [2]Envelope is based on a 30-day average, and [3]Equipment Malfunction. *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 *a* (µg/l)	Down for maintenance	5.80 – 8.22	1.75 – 7.42 A spike to 30.29 on 8/21/17
Dissolved Oxygen (mg/l)	Down for maintenance	2.10 – 4.03	No Data

NOAA satellite imagery indicates no potential cyanobacterial presence in the Caloosahatchee estuary (Figure 13).

The Florida Fish and Wildlife Research Institute reported on August 18, 2017, that *Karenia brevis*, the Florida red tide dinoflagellate, was not observed in samples collected from Lee County.

Water Management Recommendations

Lake stage is in the Base Flow sub-band of 2008 LORS. The 2008 LORS recommends up to 450 cfs at S-79 and 200 cfs at S-80 and no releases from the Lake at S-77. Given the current estuarine conditions, there are no ecological benefits associated with freshwater releases from Lake Okeechobee.

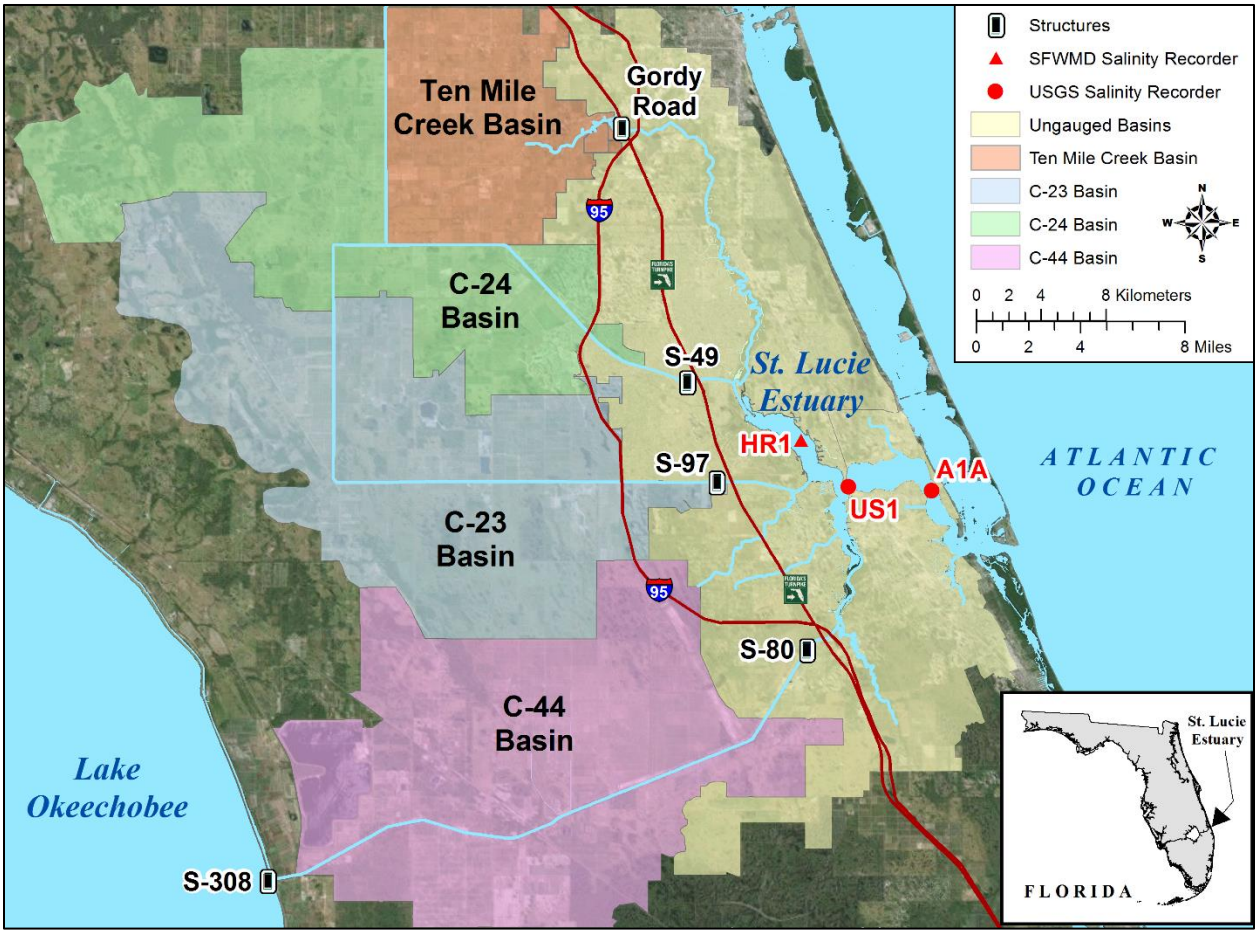


Figure 1. Basins, water control structures, and salinity monitoring for the St. Lucie Estuary.

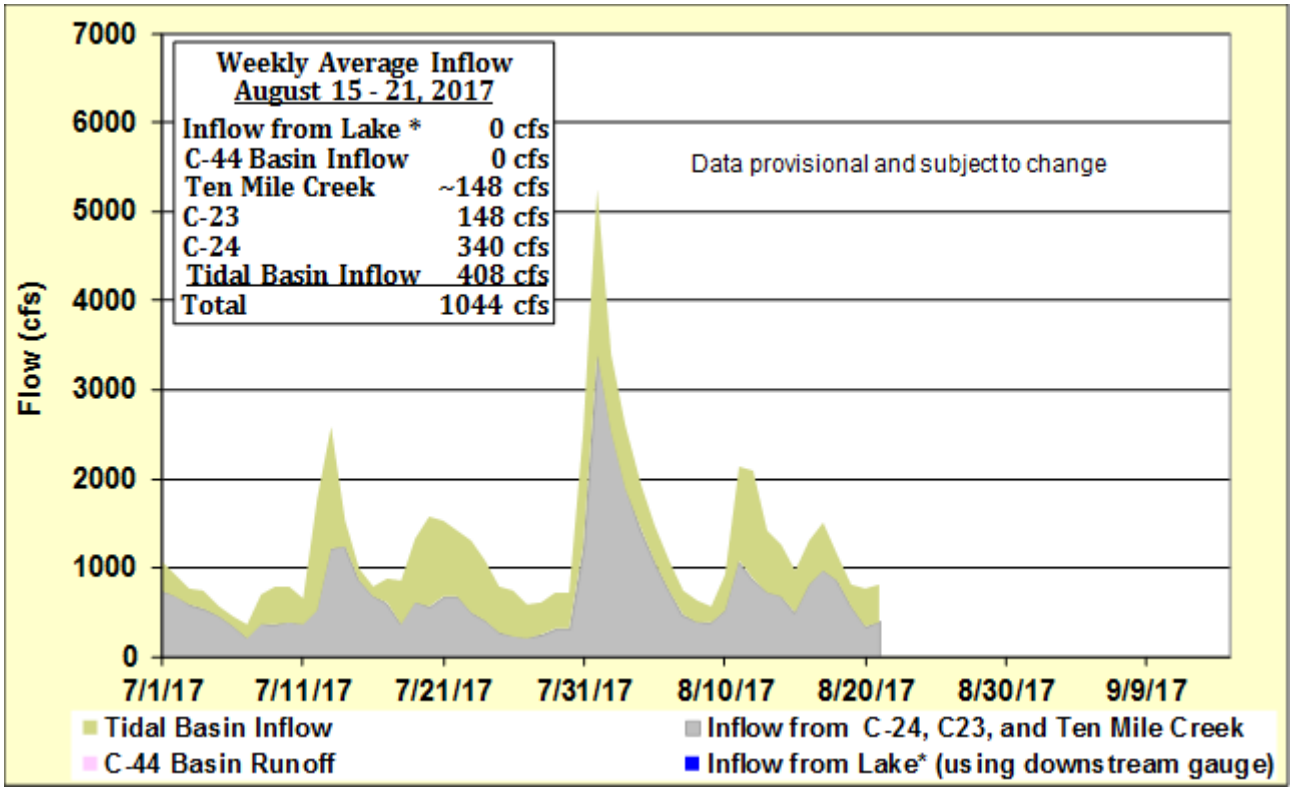


Figure 2. Estimated surface freshwater inflows from Lake Okeechobee and runoff from the C-44, C-23, C-24, Ten Mile Creek, and tidal basins into the St. Lucie Estuary.

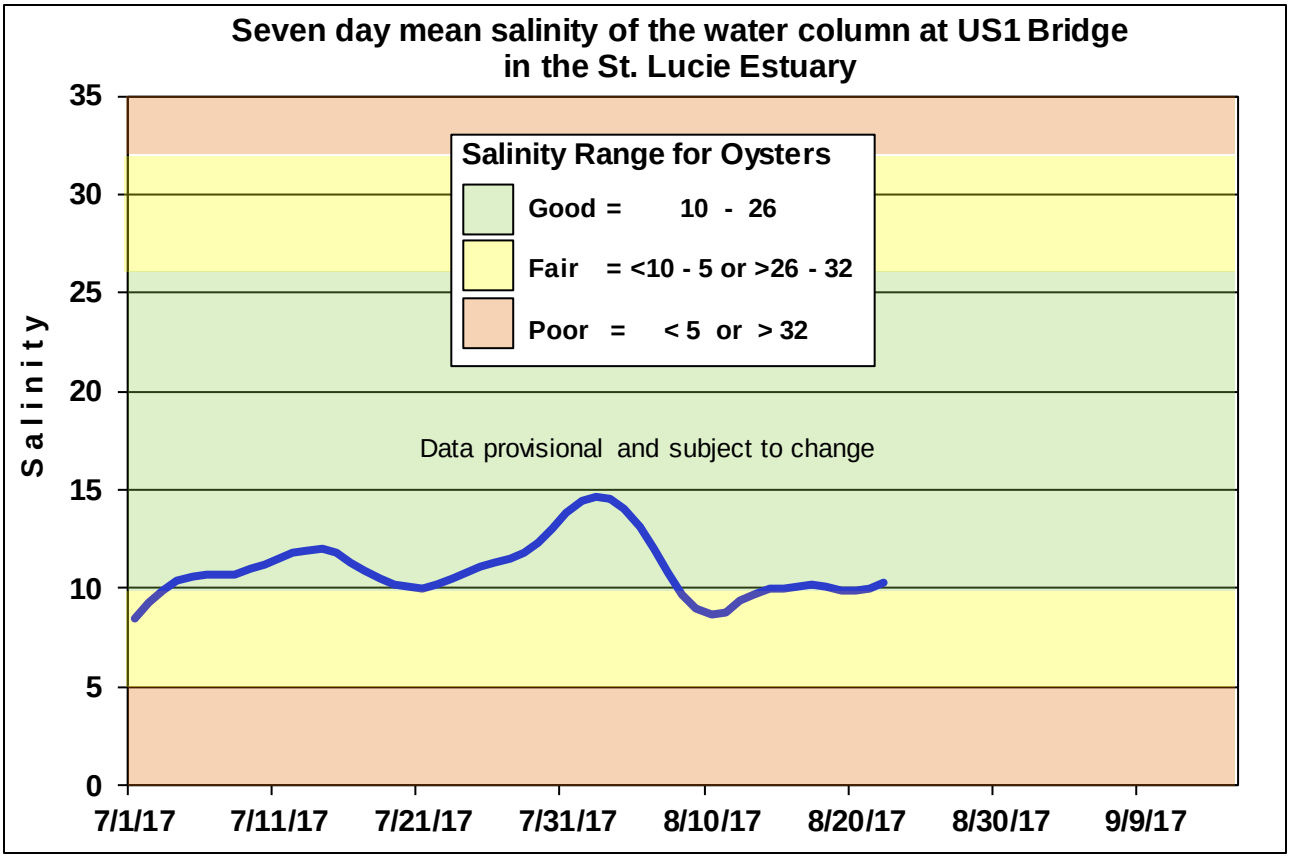


Figure 3. Seven-day mean salinity of the water column at the U.S. Highway 1 Bridge.

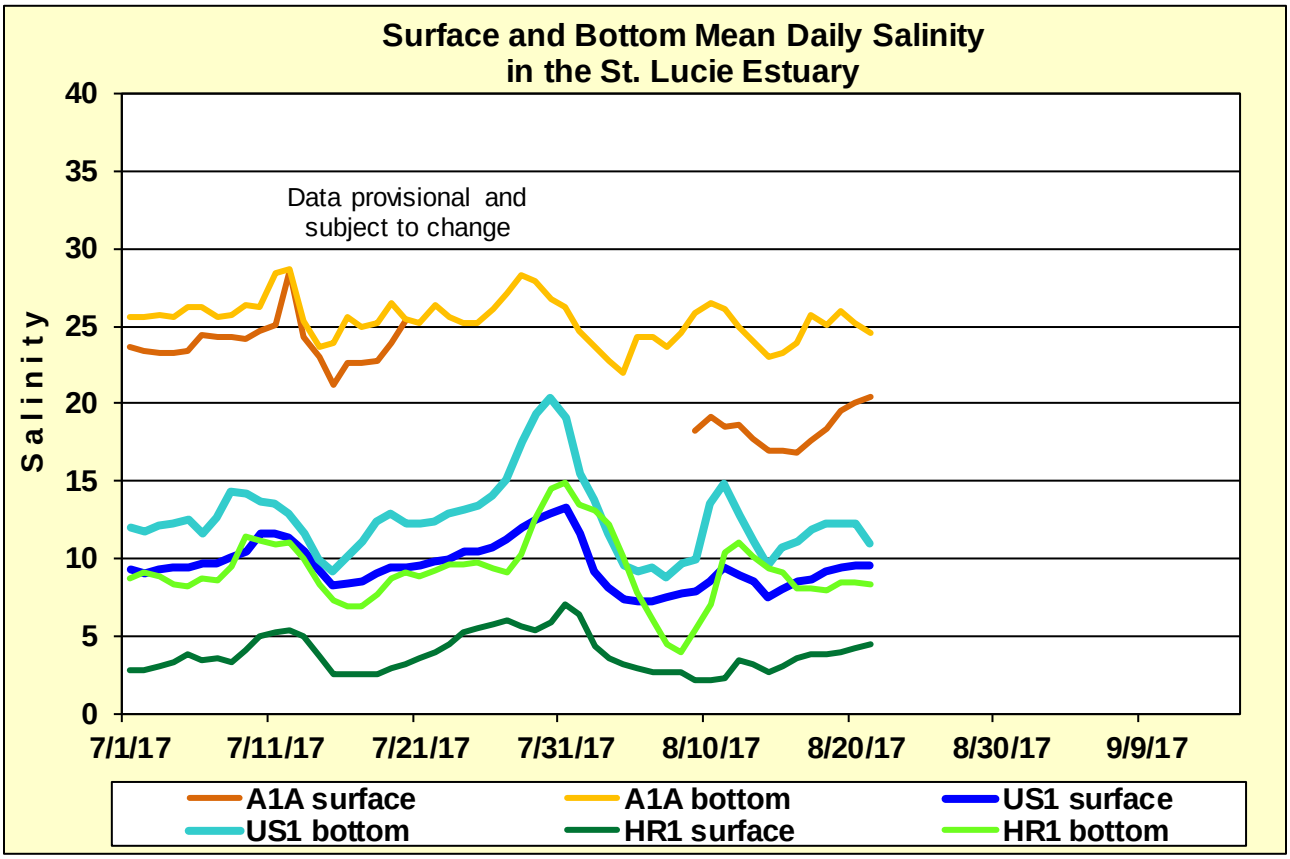


Figure 4. Daily mean salinity at the A1A, US1 and estimated HR1 stations.

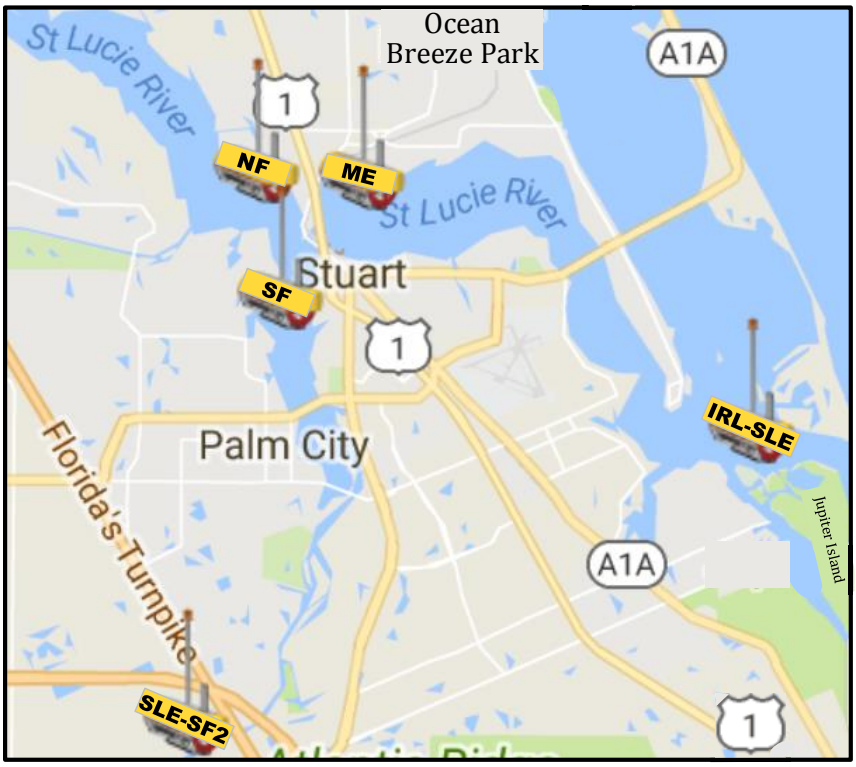


Figure 5. Location of FAU-HBOI LOBO water quality stations in the St. Lucie Estuary.

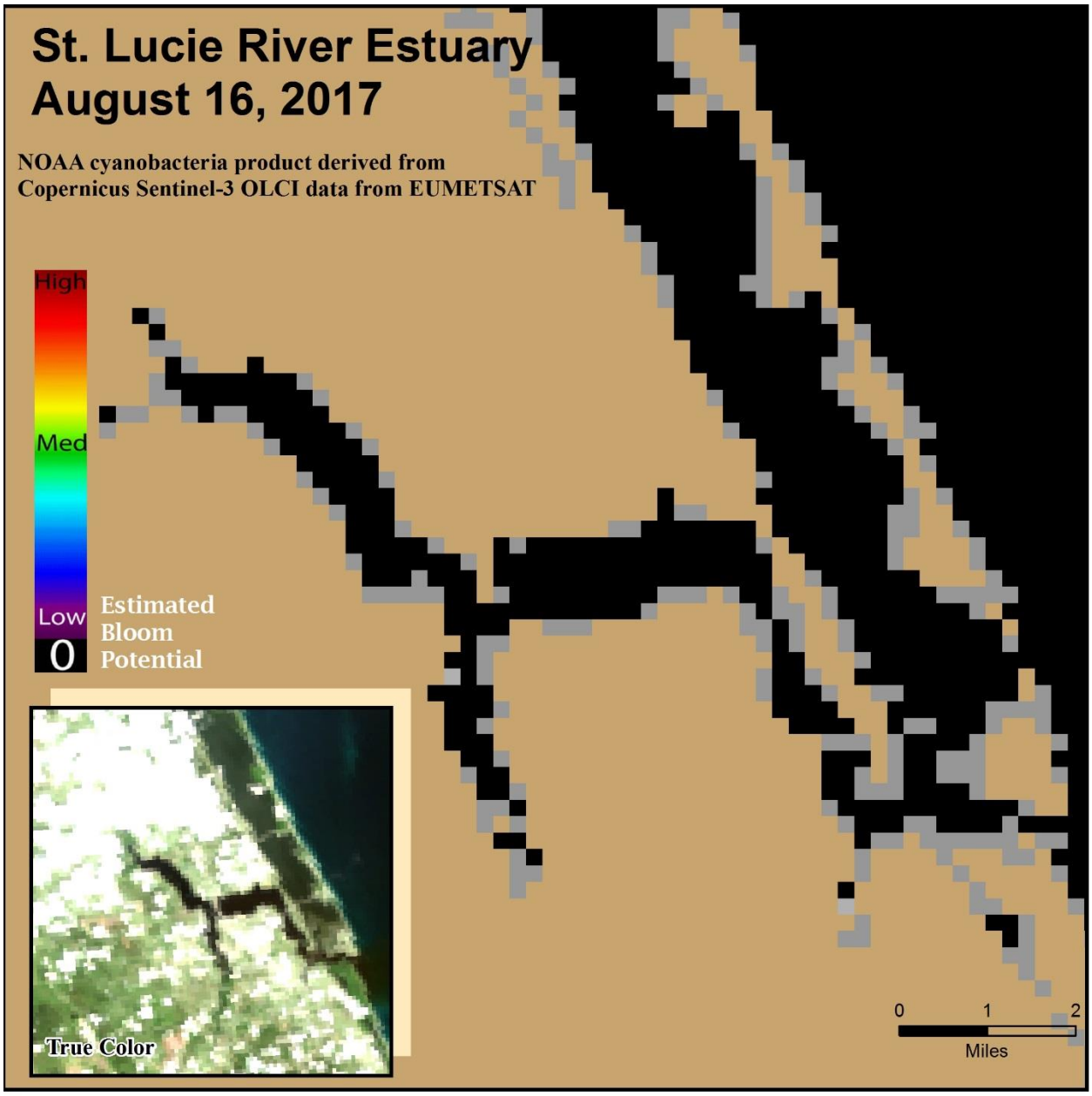


Figure 6. Sentinel 3a Satellite imagery provided by NOAA uses Ocean and Land Color Instrument (OLCI) to estimate cyanobacteria bloom potential in St. Lucie Estuary.

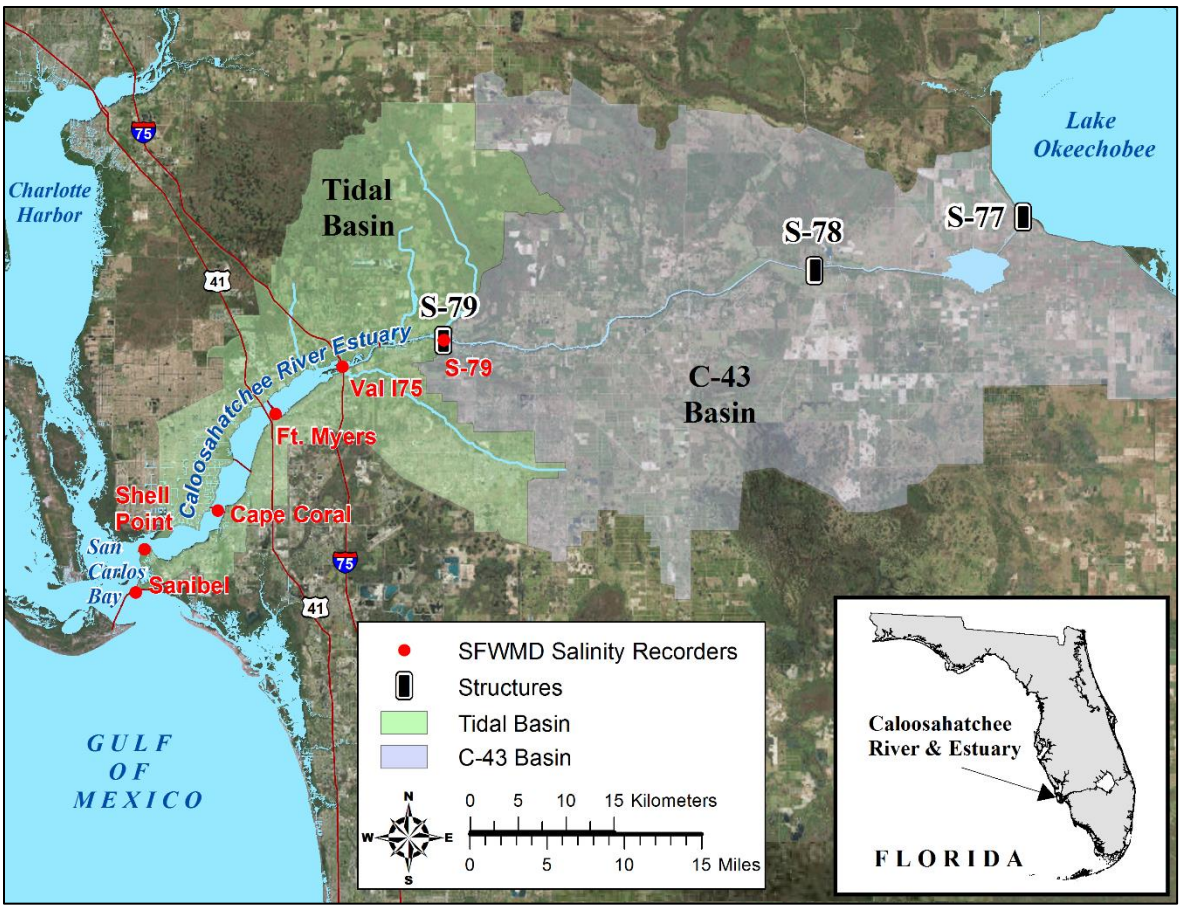


Figure 7. Basins, water control structures, and salinity monitoring for the Caloosahatchee Estuary.

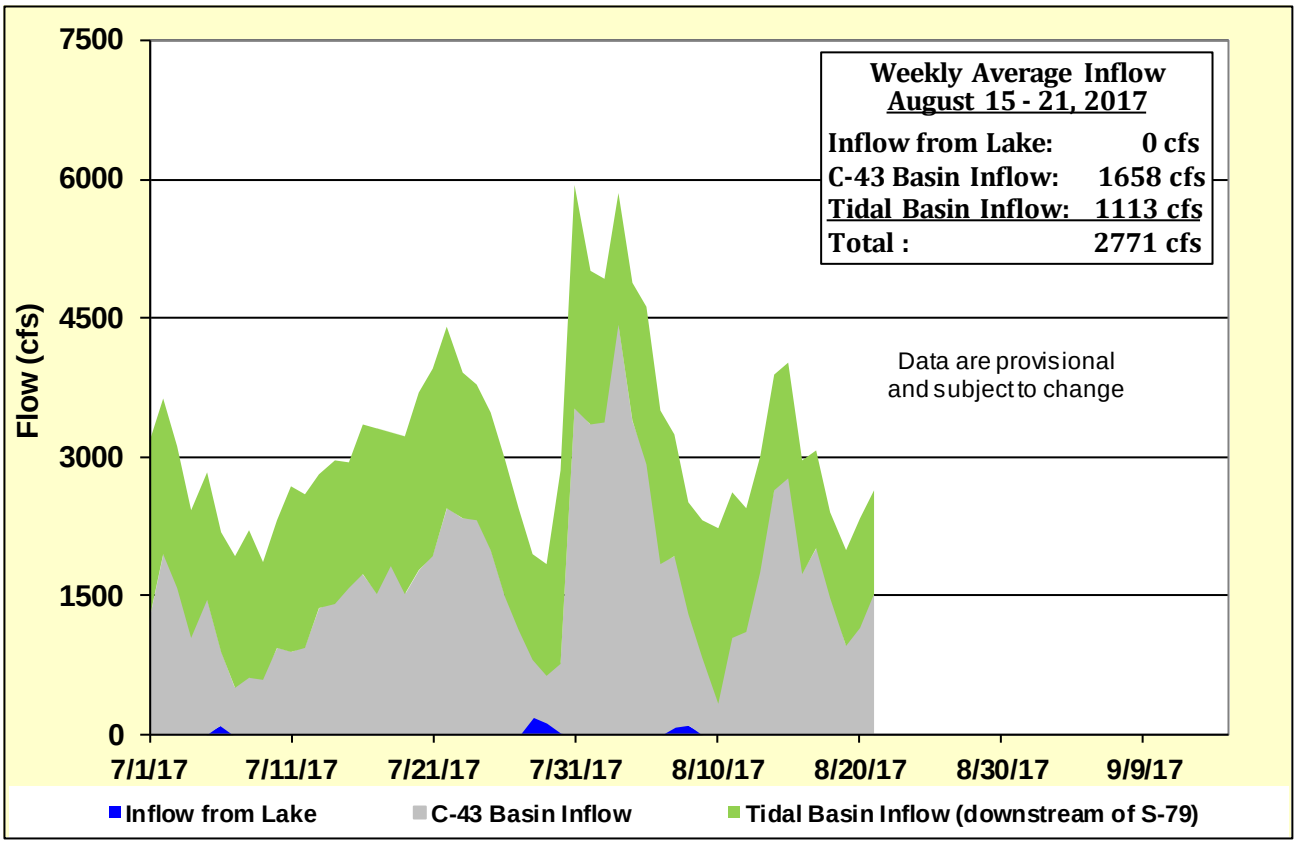
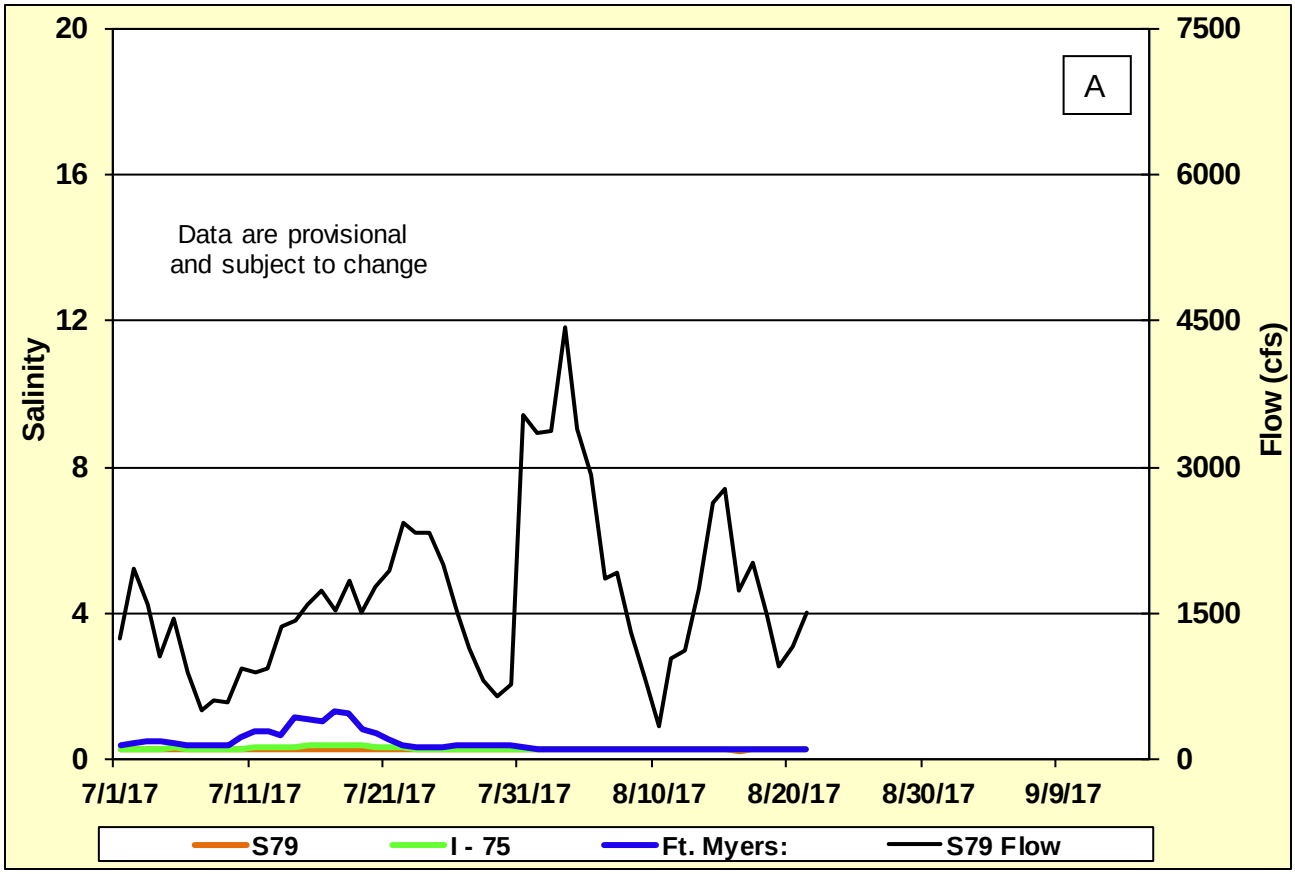


Figure 8. Freshwater inflows from Lake Okeechobee, runoff from the C-43 basin, and tributaries in the tidal basin into the Caloosahatchee River Estuary.



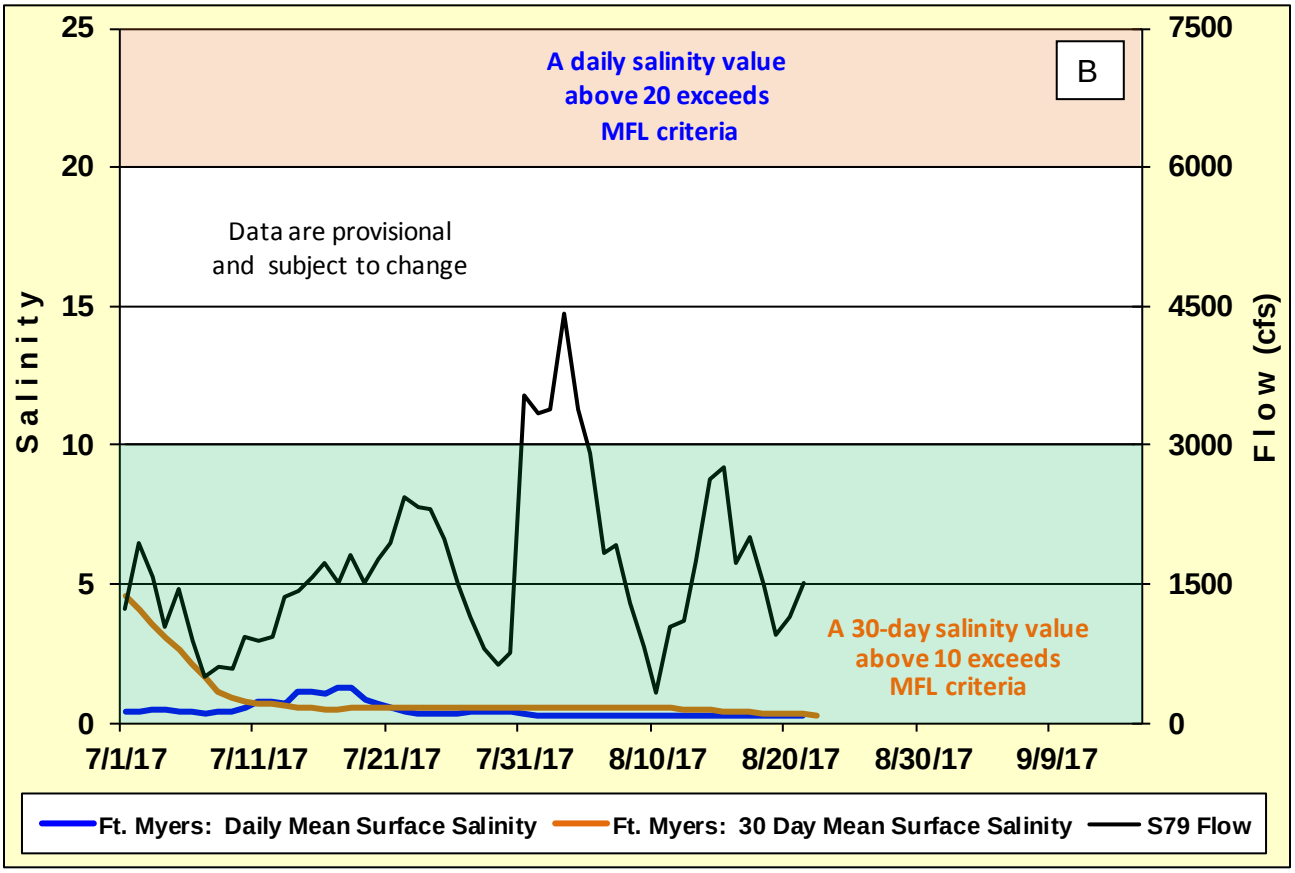


Figure 9. Daily mean flows at S-79 and salinity at upper estuary monitoring stations (A) and 30-day moving average salinity at Ft. Myers (B).

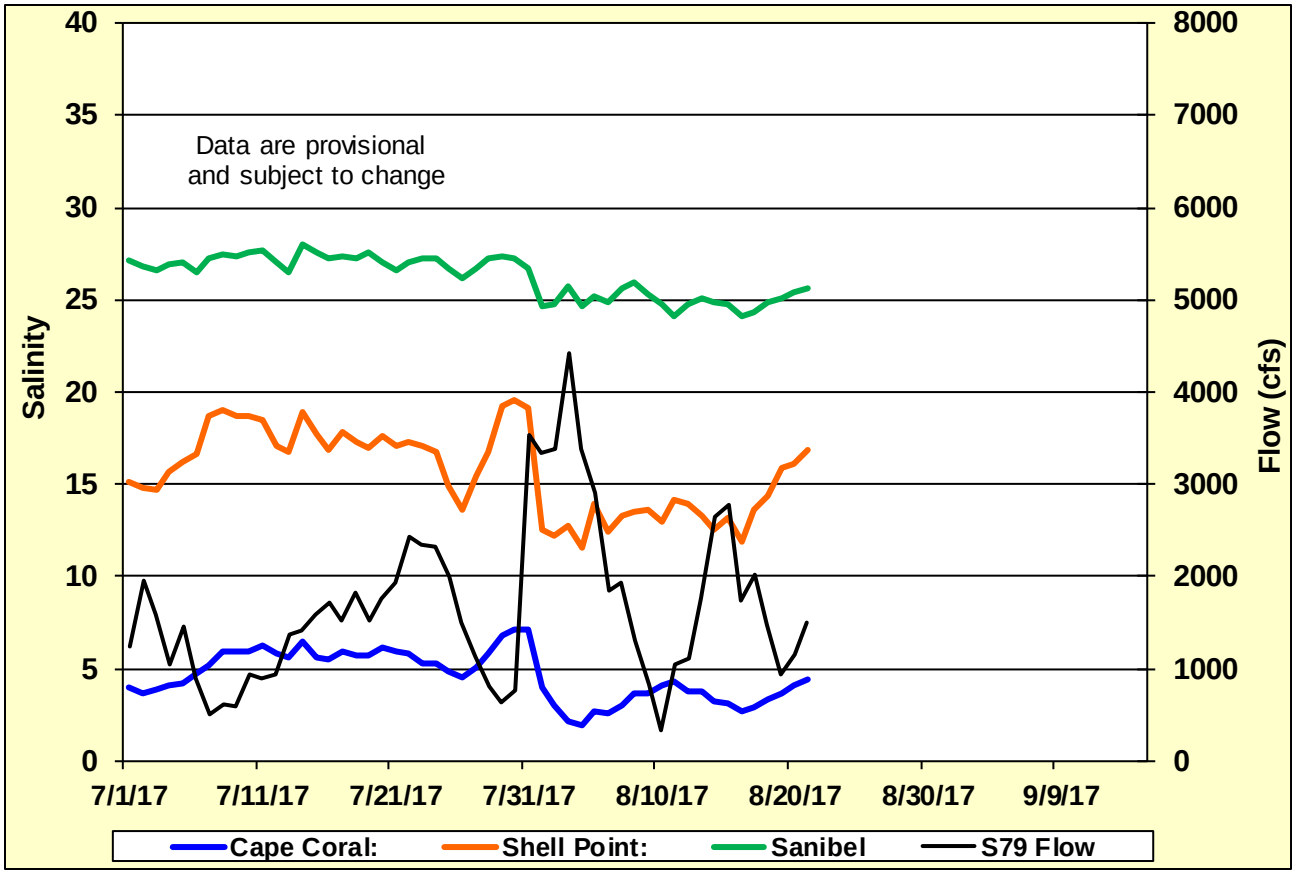


Figure 10. Daily mean flows at S-79 and salinity at lower estuary stations.

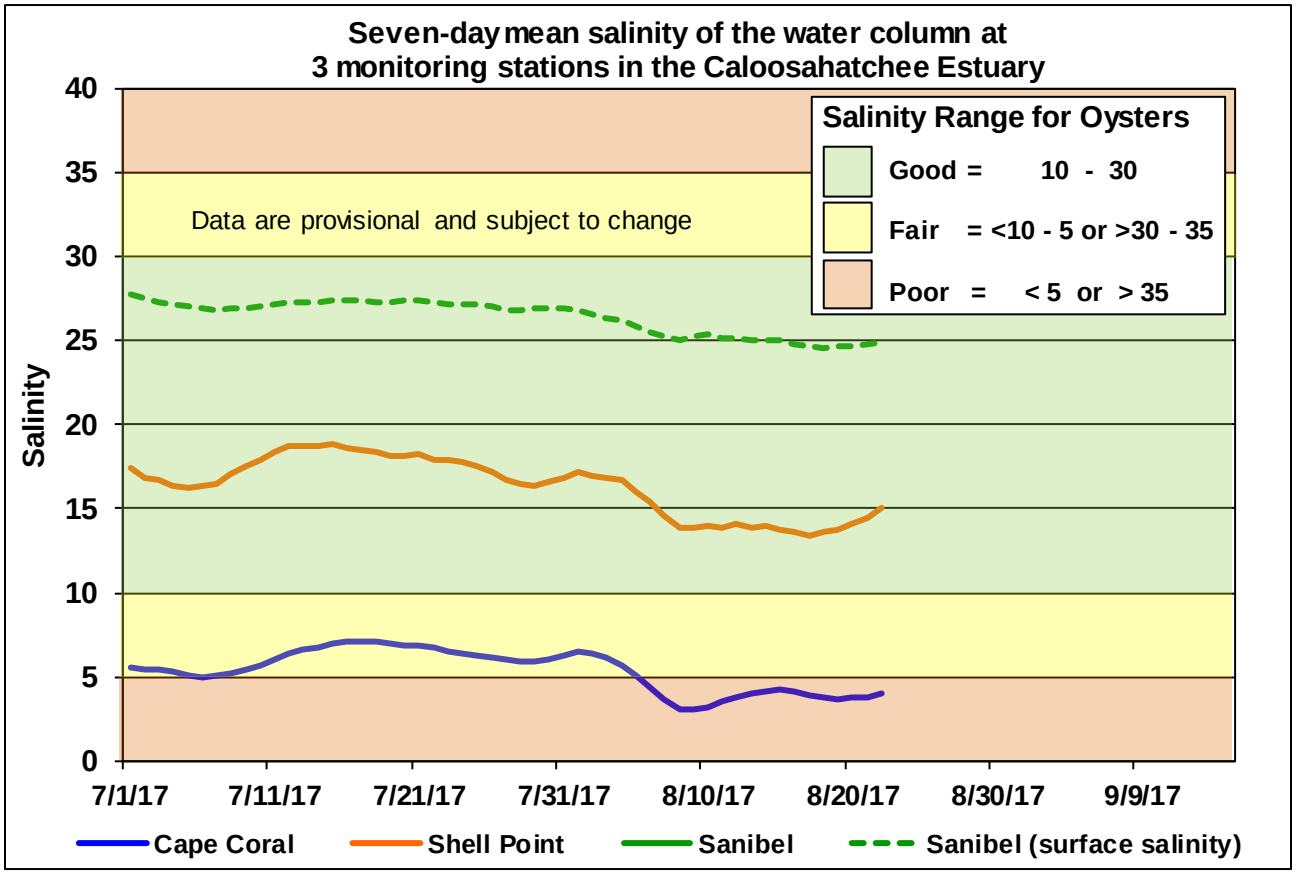


Figure 11. Seven-day mean salinity at Cape Coral Bridge, Shell Point and Sanibel Bridge monitoring stations.

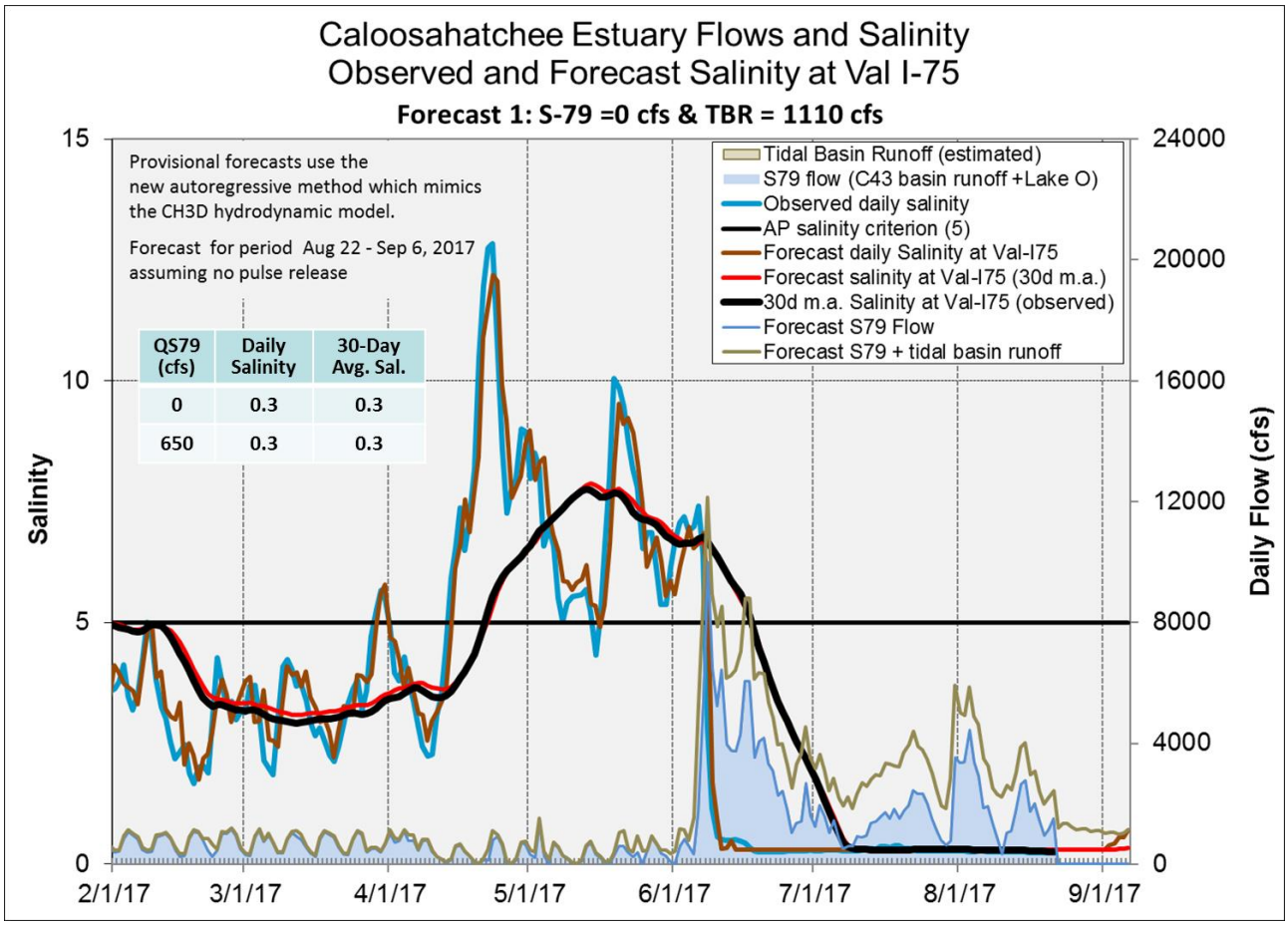


Figure 12. 14-day salinity forecast at Val I-75 assuming no releases at S-79.

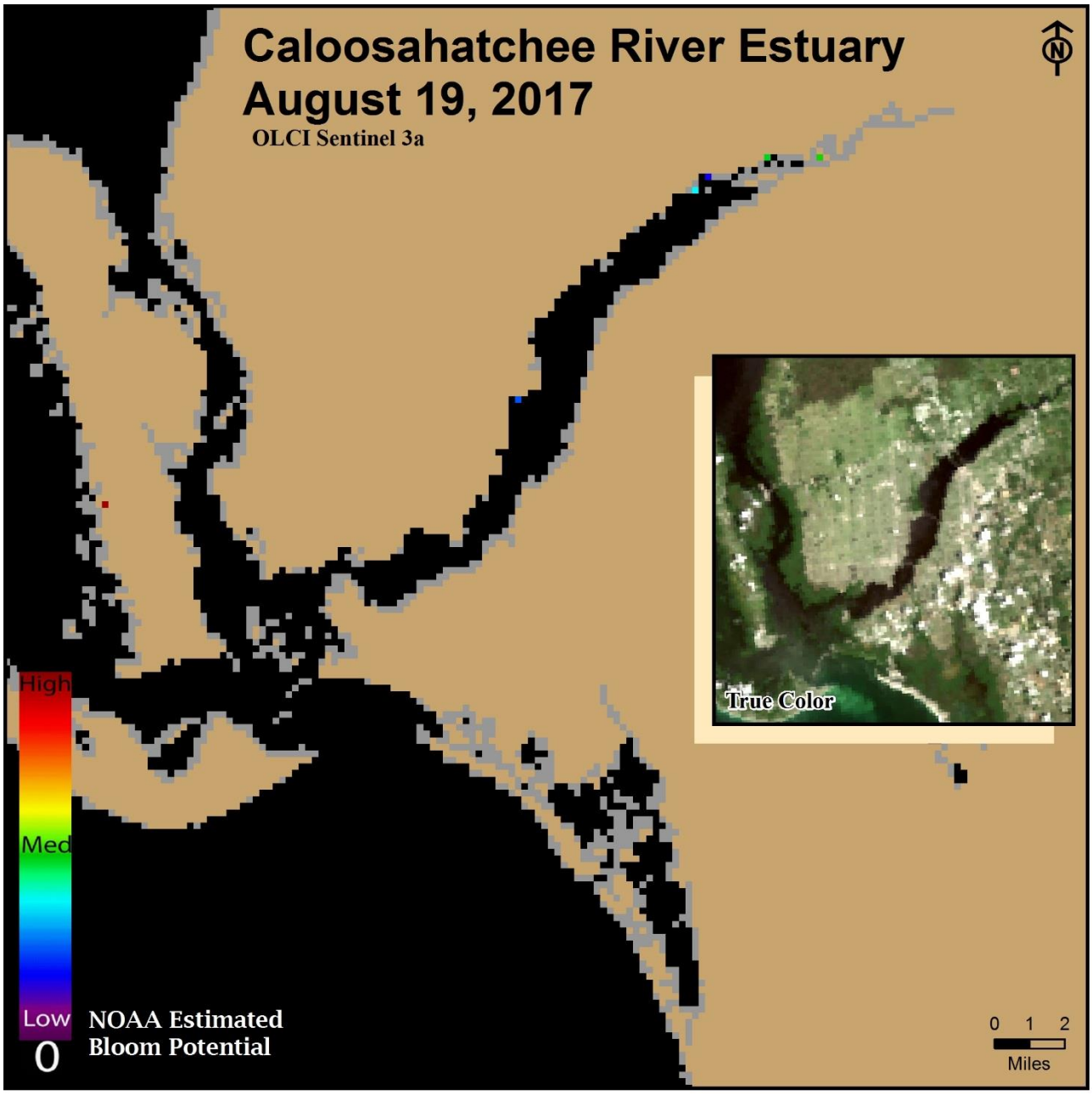
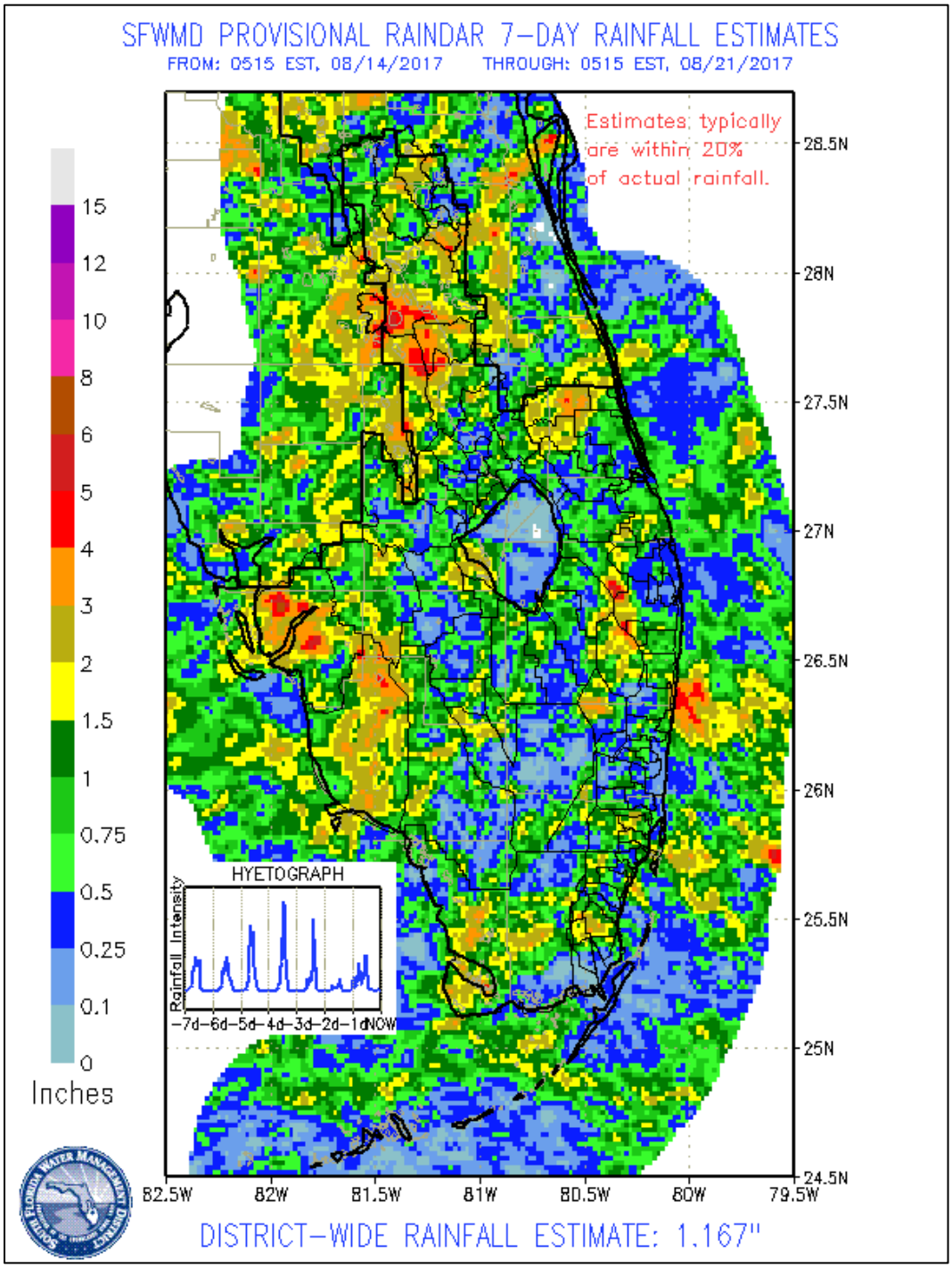


Figure 13. Sentinel 3a Satellite imagery provided by NOAA uses Ocean and Land Color Instrument (OLCI) to estimate cyanobacteria bloom potential in Caloosahatchee Estuary.

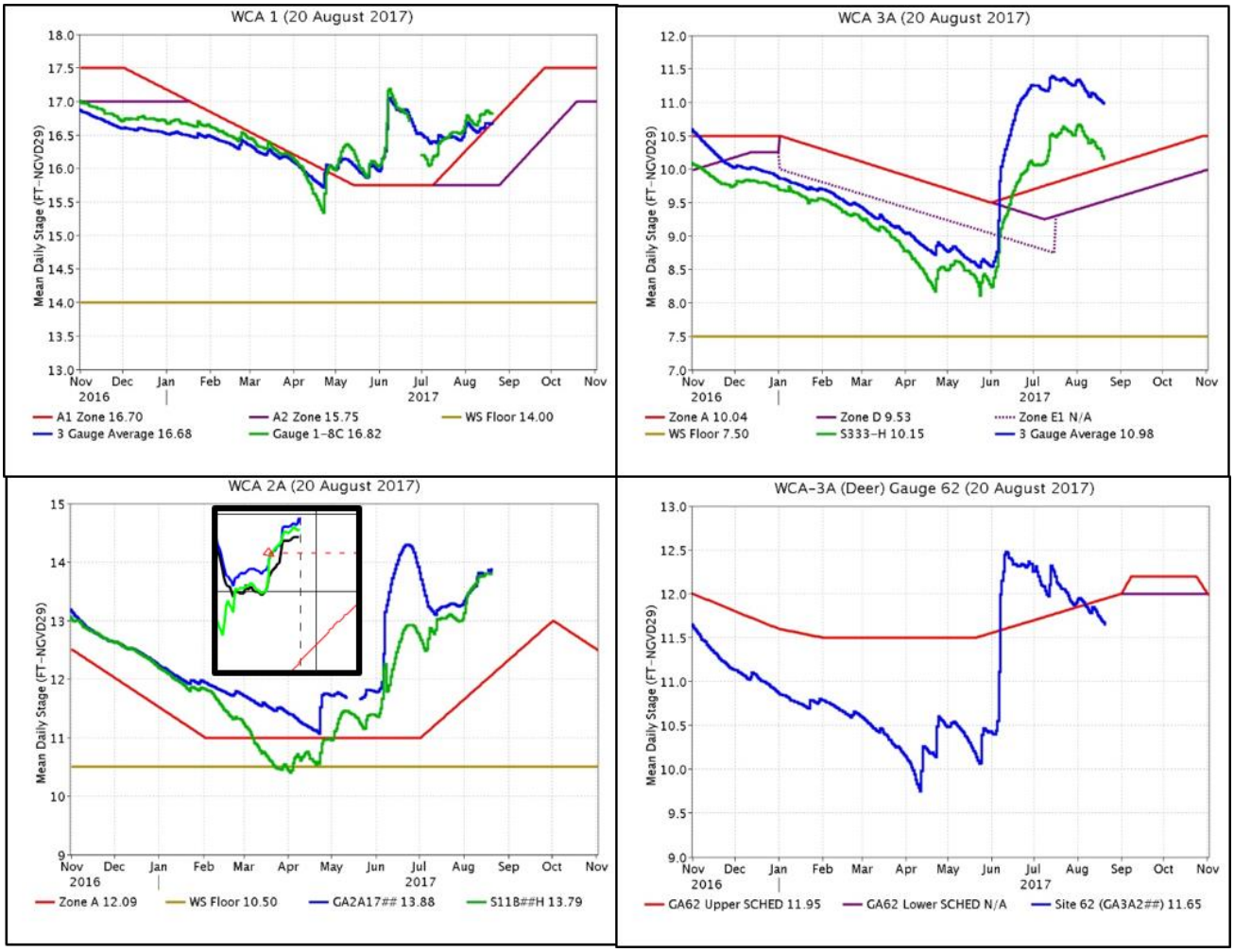
EVERGLADES

There was below average rainfall across the Everglades and well below average in WCA-3A last week. All of the WCAs are at or above regulation schedule with WCA-3A the farthest from schedule. Each of the last four weeks' stages at the gauge stations in WCA-3A have moved closer to the regulation schedule.

Everglades Region	Rainfall (Inches)	Stage Change (feet)
WCA-1	1.57	+0.09
WCA-2A	1.47	+0.06
WCA-2B	0.43	−0.14
WCA-3A	0.61	−0.15
WCA-3B	0.80	−0.11
ENP	1.08	−0.09



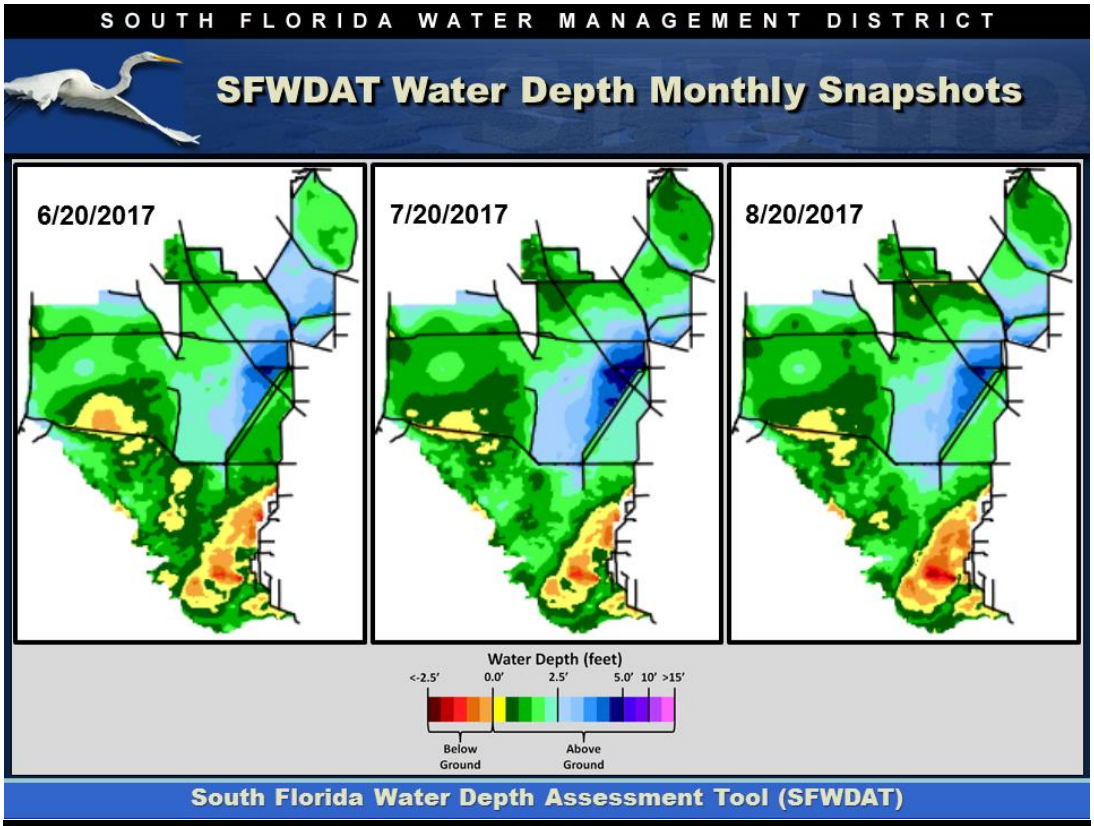
Regulation Schedules: WCA-1 stage is 0.02 feet below Zone A, and stage difference between the marsh and the canal is 0.08 feet. WCA-2A marsh stage at gauge GA2A17 is currently 1.79 feet above zone A. Marsh stage is .09 feet above canal stage at S11B. WCA-3A three-gauge average is 0.94 feet above zone A, and .83 feet higher than canal stage (both 0.10 feet lower than last week). WCA-3A at gauge 62 (Northwest corner) is 0.30 feet below schedule.

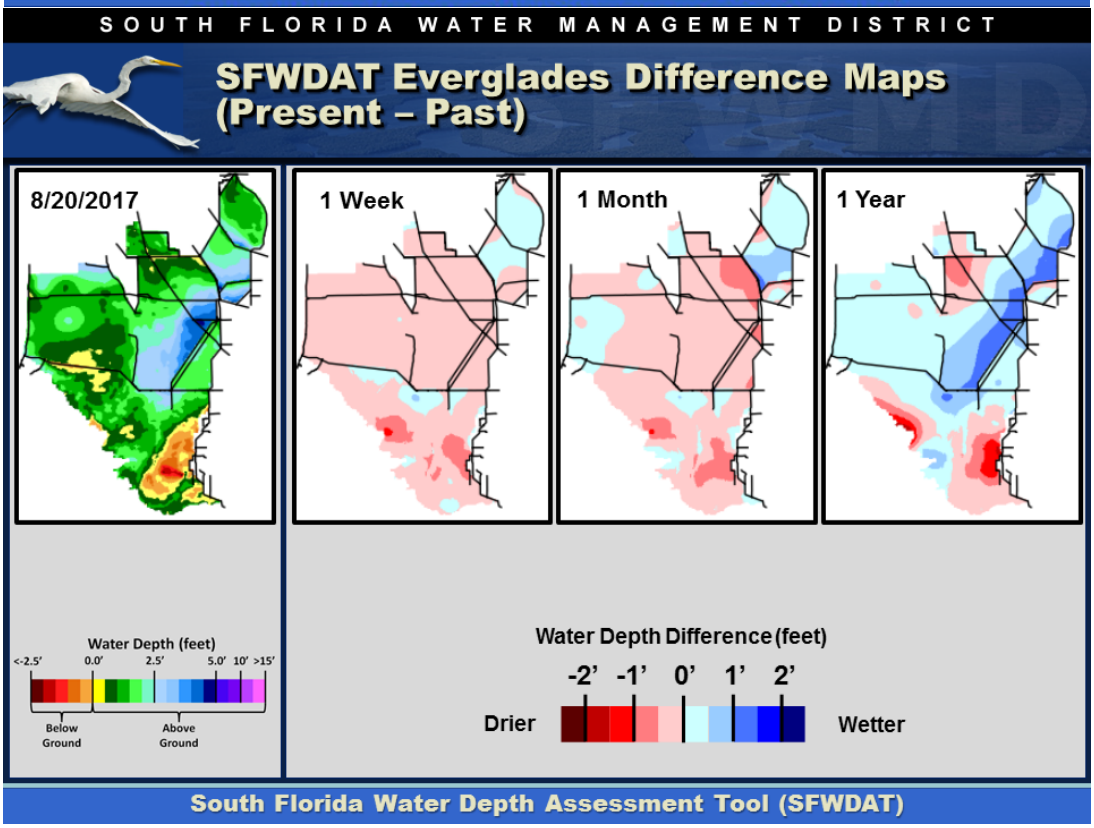


Blue – wetlands
Green – canals

Water Depths and Changes: This week's range of water depths at monitored gauges other than in WCA-2B ranged from a low of 1.32 feet (WCA-1) to 3.09 feet (WCA-3A gauge 65). The Water Depth Assessment Tool (WDAT) for spatial interpolation of depth indicates a range from a low of 0.5 feet along the L-4 canal in Northern 3A to a high of 4.5 feet along the L-67A canal in Eastern WCA-3A.

Over the last week individual gauge changes ranged from -0.16 feet (WCA-3A Northeast) to +0.14 feet (WCA-1). Pan evaporation was estimated to be 1.74 inches which is higher than the pre-project estimate of 1.39 inches.

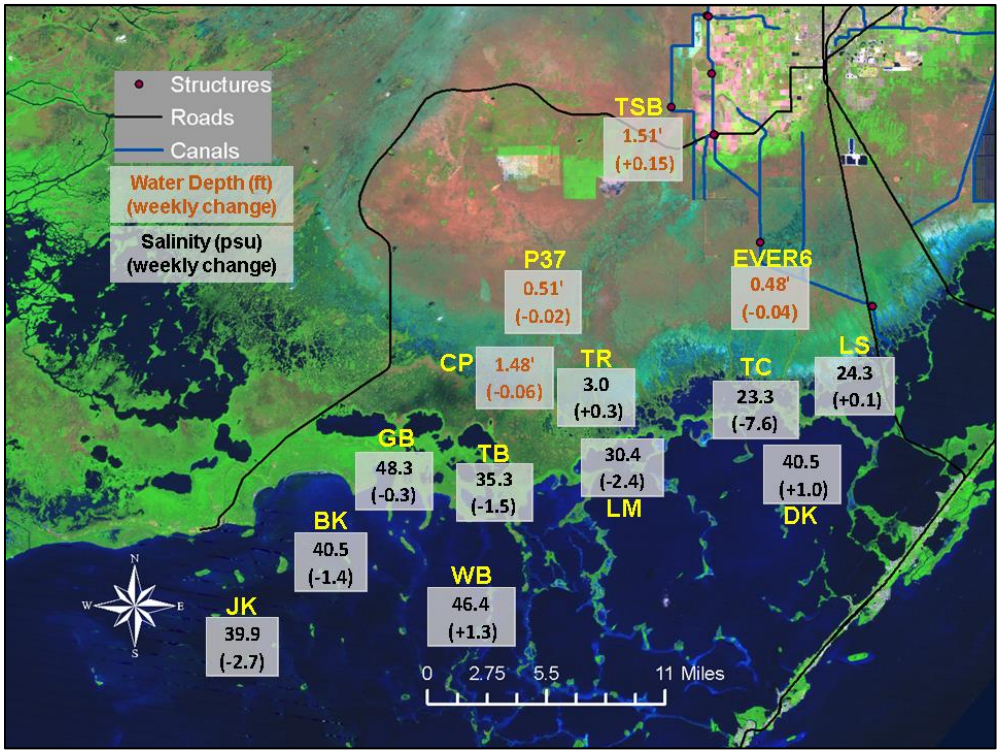


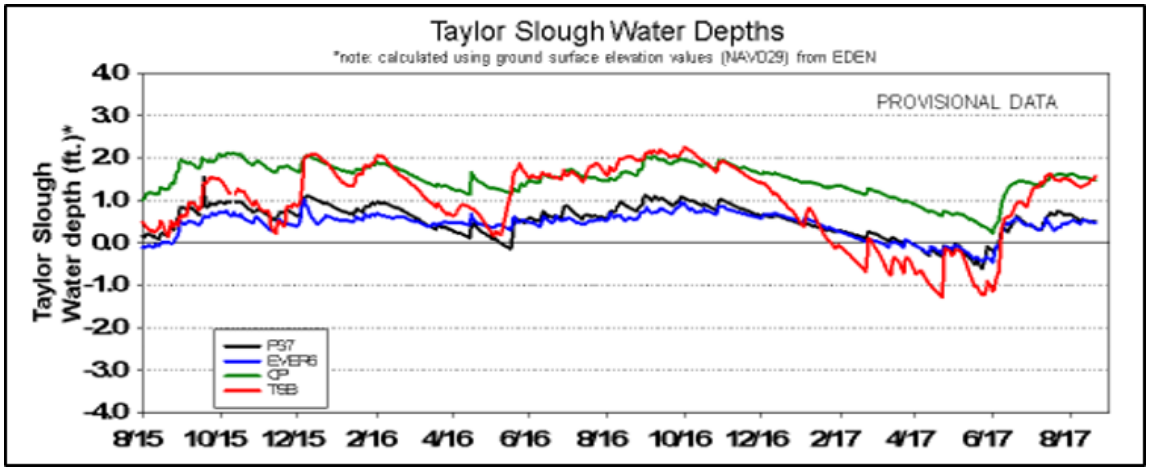


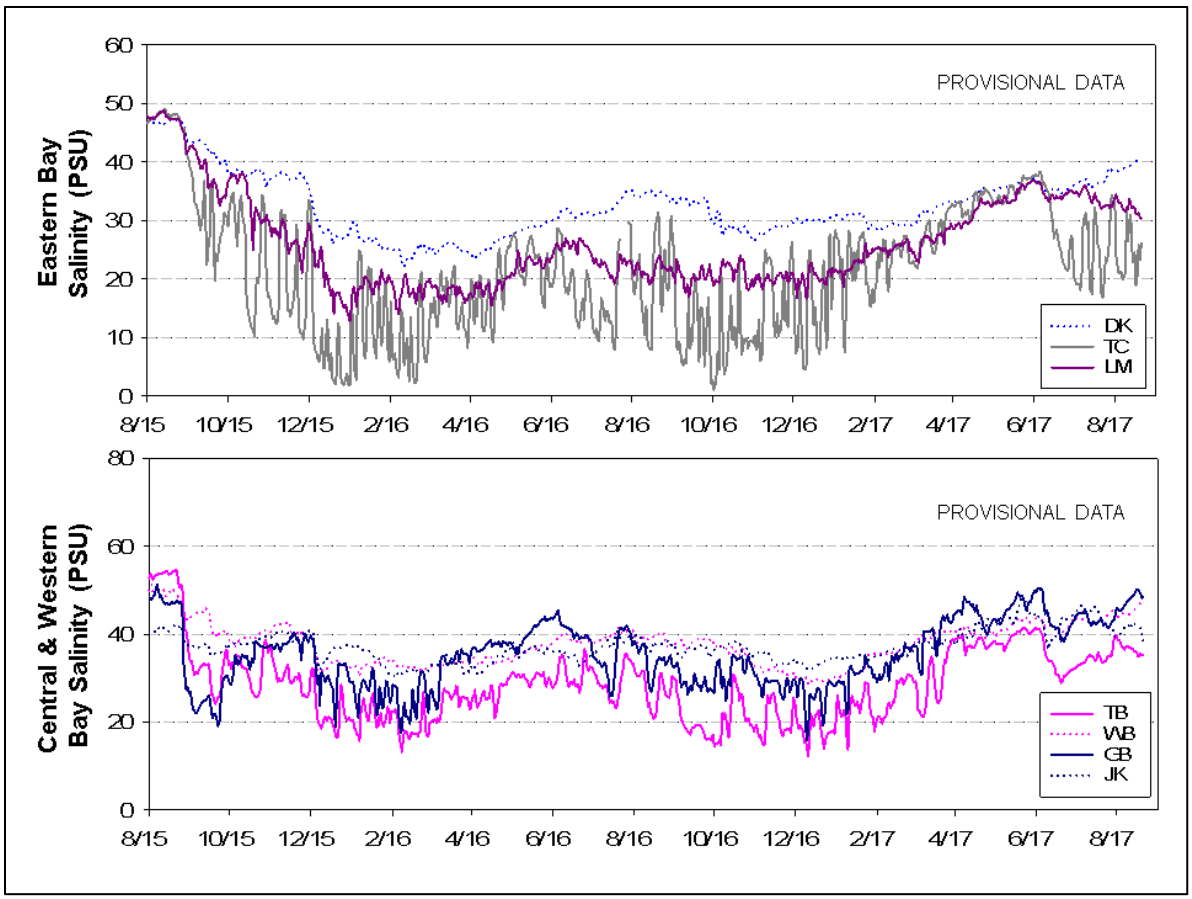
Taylor Slough stages: Water levels changed −0.06 to +0.15 feet this past week. All areas are − one inch below to two inches above the historic average for this time of year.

Florida Bay salinity: The rain gauge with the greatest amount of rain for the past week (2.5 inches) was in western Florida Bay which helped to reduce salinities within that region. Salinity changes ranged from −7.6 psu in the eastern bay area to +1.3 psu in the central bay. Salinities currently range from 23

psu in eastern nearshore region to 48 psu in the western nearshore area. Compared to historic averages, current salinities remain 3 to 18 psu above average with the western nearshore furthest from average.

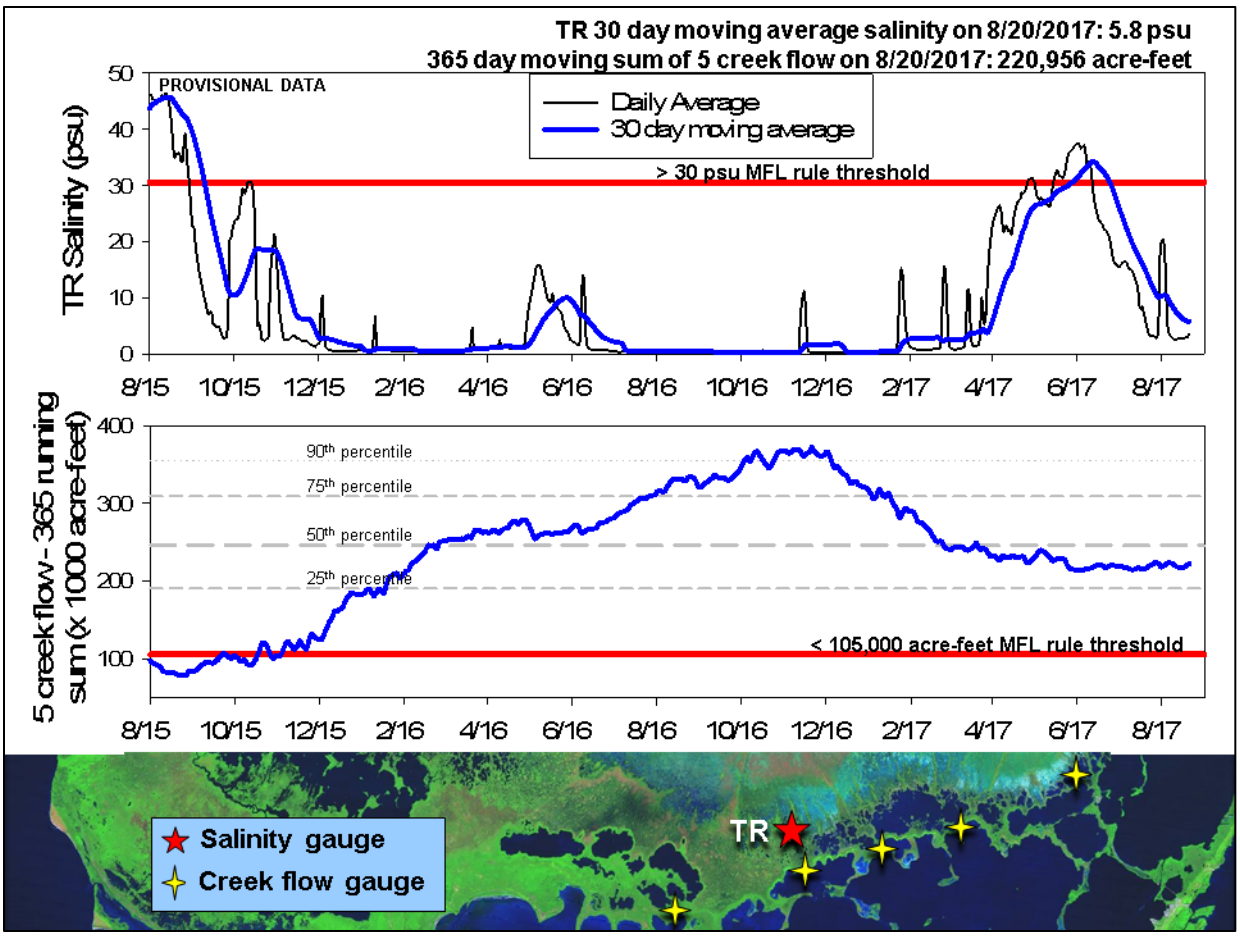






Florida Bay MFL: Mangrove zone daily average salinity stayed at 3 psu this past week. The 30-day moving average changed −1.2 to end the week at 5.8 psu.

The cumulative weekly flow from the five creeks identified by the stars on the map was approximately 5,950 acre-feet which is 1,100 acre-feet less than the historic average for this time of year. The 365-day moving sum of flow from the five creeks identified by stars on the map increased about 3,000 acre-feet to 220,956 acre-feet (still below the long-term average of 257,628 acre-feet). Creek flow is provisional data from the U.S. Geologic Survey and is highly variable.



Water Management Recommendations

The rate of stage change should be moderated as possible in all the WCAs, as apple snail production can be negatively affected by rapid changes in water depth. Limiting ascensions to 0.25 feet per week will help to avoid drowning of apple snail egg clusters.

Water depths above 2.5 feet at gauge 65 are indicative that tree islands are flooded and under stress. Depths exceeded that mark on June 18, meaning as of Sunday the tree islands have been flooded for 64 days.

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

Everglades Ecological Recommendations, August 22nd, 2017 (red is new)

Area	Current Condition	Cause(s)	Recommendation	Reasons
WCA-1	Stages increased from +0.04' to +0.14'	Rainfall, ET, management	Moderate ascension rates as possible. Maintaining water levels a minimum of 0.1 ft above WRS until early July is also recommended.	Achieve high water targets (17.5 ft) to protect habitat and facilitate invasive plant treatments.
WCA-2A	Stages increased from +0.06'	Rainfall, ET, management	Moderate ascension rates as possible. Limit to +.25 feet per week.	Protect habitat, wildlife and support apple snail reproduction.
WCA-2B	Stages decreased -0.14'	Rainfall, ET, management	Moderate ascension rates as possible.	Protect habitat, wildlife and support apple snail reproduction.
WCA-3A NE	Stages decreased −0.16'	Rainfall, ET, management	Moderate ascension rates as possible.	Protect habitat, wildlife and support apple snail reproduction.
WCA-3A NW	Stages decreased −0.15'	Rainfall, ET, management		
Central WCA-3A S	Stages decreased −0.13'	Rainfall, ET, management	Moderate ascension rates as possible.	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 64 days.
Southern WCA-3A S	Stages decreased −0.15'	Rainfall, ET, management		
WCA-3B	Stages decreased from −0.07' to −0.14'	Rainfall, ET, management	Moderate ascension rates as possible..	Protect habitat, wildlife and support apple snail reproduction.
ENP-SRS	Stages decreased −0.09'	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 −0.06' to +0.15'	Rain, ET, inflows	Move water southward as possible	When available provide freshwater buffer for ecosystems and slow recession rates.
FB- Salinity	Salinity changes ranged −7.6 to +1.3 psu.	Rain, ET, inflows, wind	Move water southward as possible	When available, provide freshwater to produce low salinity wet season conditions.