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 1, 2017

SUBJECT: Weekly Environmental Conditions for Systems Operations

Summary

Weather Conditions and Forecast

Showers/storms focused south today before decreasing some and shifting focus north tomorrow. Remnant moisture and convergence associated with Tropical Depression Emily extends back westward over south Florida. Look for moderate to locally heavy showers/storms to focus south of the Lake and near both coasts through early evening. High pressure begins to build in from the south as Emily vacates the area overnight and tomorrow. Showers/storms will also shift northward on Wednesday within the resulting southwest steering winds. Below average rains are then expected on Thursday as high pressure shifts further northward to temporarily dry and warm the atmosphere before a strong tropical wave moves into the area on Friday with increased rains.

Kissimmee

On Sunday, stage was 0.1 feet below regulation schedule in East Lake Toho and Lake Toho, and 0.2 feet above schedule in Kissimmee-Cypress-Hatchineha (KCH). Over the past week, discharge averaged 616 cubic feet per second (cfs) at S65, 927 cfs at S65A, and 1,293 cfs at S65E. Tuesday morning stages and departures from schedule were 56.5 feet (at schedule) in East Lake Toho, 53.5 feet (at schedule) in Lake Toho, and 51.3 feet (0.3 feet above schedule) in KCH; S65A headwater stage was 46.4 feet. Tuesday morning discharges were 714 cfs at S65, 1,293 cfs at S65A, and 1,618 cfs at S65E. Dissolved oxygen concentration in the Kissimmee River averaged 2.3 milligrams per liter (mg/L) for the week. Kissimmee River mean floodplain depth on Sunday was 0.62 feet. No new recommendations.

Lake Okeechobee

Lake stage is 12.72 feet NGVD having increased by 0.02 feet over the past week and 0.35 feet over the past month. Ascension rates have continued to moderate over the past month after the rapid rise in early June, slowing to 0.09 feet/week on average. Conditions continue to be favorable for algal blooms in the central, western, and northern portions of the Lake based on satellite imagery from mid- to late-July. The first blooms and microcystin detections were reported in late June's water quality samples, and the mid-July sample recorded more blooms and one station with microcystin above detection limits.

Estuaries

Total discharge to the St. Lucie estuary averaged 946 cfs over the past week with no Lake Okeechobee releases. Salinities increased 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 3,221 cfs over the past week with 48 cfs (1.5%) released from the Lake. The 30-day average surface salinity at the Ft. Myers monitoring station is 0.6 and 0.3 at Val I-75. 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 tapegrass. Salinity conditions are in the fair 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 16,400 acre-feet. Most STA cells are at or above target depths. Operational restrictions are in place for vegetation rehabilitation in STA-1E. The nest of an Endangered Species Act protected species has been observed in STA-5/6. Due to recent basin runoff, it is recommended that no Lake releases be sent to the STAs/FEBs this week.

Everglades

Some parts of the Everglades received some relief from high water conditions as this week depths dropped in Water Conservation Area – 3A (in both the northern and southern part of that basin) and in WCA-2A. 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 3.36 feet, and has exceeded 2.5 feet for 44 days. In Florida Bay salinity changes ranged from −2.3 psu in western Florida Bay to +17.5 psu in the northeastern nearshore area. Current salinities are 3 to 16 psu above average with the northeastern nearshore furthest from average.

Supporting Information

KISSIMMEE BASIN

Kissimmee Basin Rainfall

The Upper Kissimmee Basin received 1.05 inches of rainfall in the past week and the Lower Basin received 1.18 inches (SFWMD Daily Rainfall Report 7/31/2017).

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: **8/1/2017**

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)						
							7/30/17	7/23/17	7/16/17	7/9/17	7/2/17	6/25/17	6/18/17
Lakes Hart and Mary Jane	S62	40	LKMJ	60.1	R	60.0	**0.1**	-0.1	0.0	0.0	0.1	0.0	-0.1
Lakes Myrtle, Preston, and Joel	S57	16	S57	61.0	R	61.0	**0.0**	0.0	0.0	0.0	0.0	-0.1	0.0
Alligator Chain	S60	77	ALLI	63.1	R	63.2	**-0.1**	0.0	-0.5	-0.5	-0.4	-0.5	-0.6
Lake Gentry	S63	81	LKGT	61.0	R	61.0	**0.0**	-0.1	-0.4	-0.6	-0.5	-0.7	-0.9
East Lake Toho	S59	430	TOHOE	56.4	R	56.5	**-0.1**	0.1	-0.4	-0.5	-0.5	-0.6	-0.5
Lake Toho	S61	1529	TOHOW, S61	53.4	R	53.5	**-0.1**	0.1	-0.1	-0.3	-0.3	-0.6	-0.5
Lakes Kissimmee, Cypress, and Hatchineha	S65	616	KUB011, LKIS5B	51.2	R	51.0	**0.2**	-0.3	-1.1	-1.0	-1.0	-1.3	-1.6

* 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: **8/1/2017**

Metric	Location	Sunday's 1-day average	Weekly Average**									
			7/30/17	7/23/17	7/16/17	7/9/17	7/2/17	6/25/17	6/18/17	6/11/17	6/4/17	5/28/17
Discharge (cfs)	S-65	894	**616**	342	160	392	407	455	20	37	145	190
Discharge (cfs)	S-65A	1067	**927**	638	575	393	564	1291	477	175	126	121
Discharge (cfs)	S-65D****	1158	**1180**	1236	838	875	1715	1426	584	307	174	157
Discharge (cfs)	S-65E****	1251	**1293**	1321	886	915	1698	1462	643	350	161	159
DO concentration (mg/L)***	Phase I river channel	2.4	**2.3**	1.8	3.3	3.3	0.7	0.5	3.5	5.2	7.2	7.9
Mean depth (feet)*	Phase I floodplain	0.62	**0.62**	0.67	0.45	0.36	1.00	0.90	0.27	0.13	0.05	0.05

* 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
8/1/2017	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.		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.			
5/22/2017	No new recommendations.			
5/15/2017	Reduce discharge at S65/S65A by 40-50 cfs	Reduce rate of stage decline in KCH while maintaining discharge to the Kissimmee River.	Implemented	KB Ops
5/9/2017	No new recommendations.			
5/3/2017	Reduce discharge at S65/S65A by 50 cfs	Reduce rate of stage decline in KCH		SFWMD Water Management/KB Ops
4/25/2017	Reduce discharge at S65/S65A by 50 cfs	Reduce rate of stage decline in KCH	Implemented	SFWMD Water Management/KB Ops
4/17/2017	No new recommendations.			
4/11/2017	No new recommendations.			

KCOL Hydrographs (through Sunday midnight)

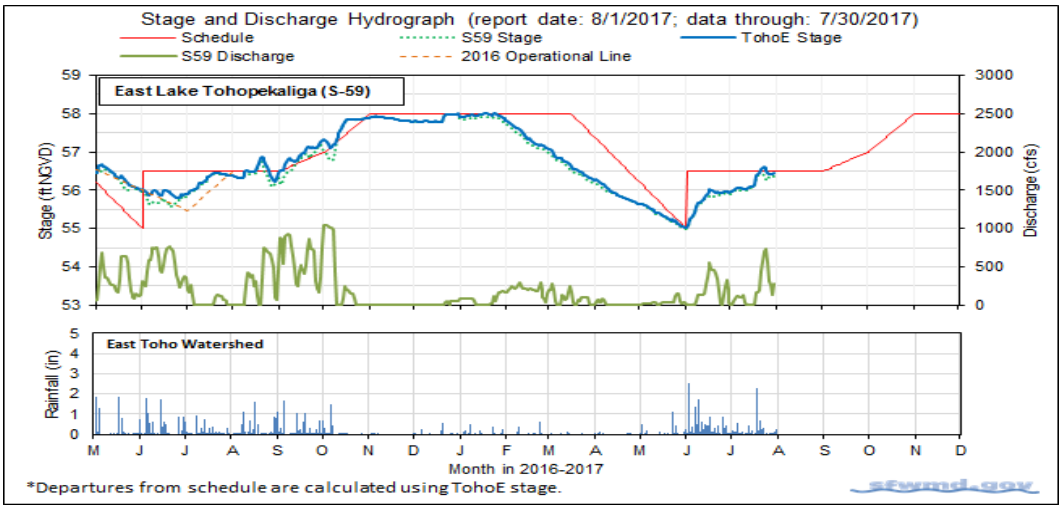


Figure 1.

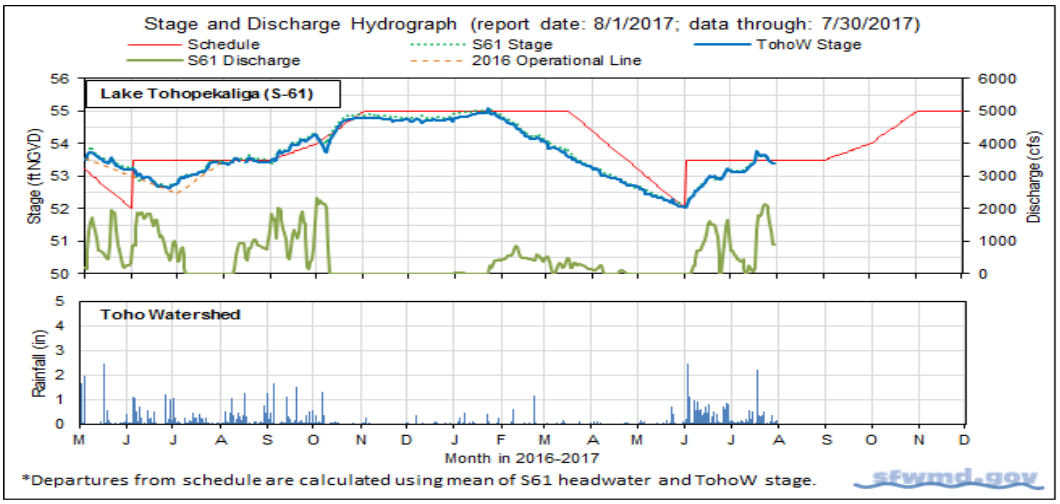


Figure 2.

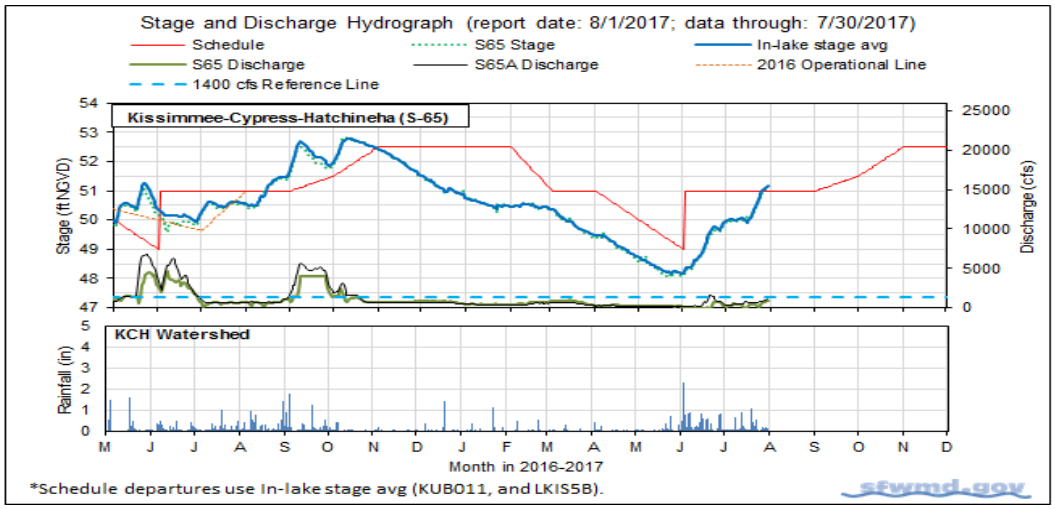


Figure 3.

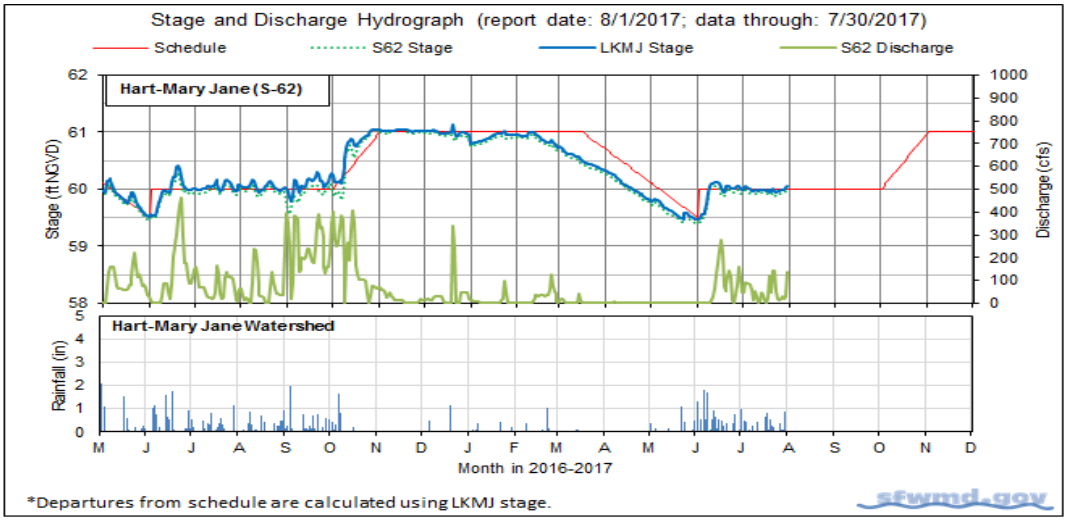


Figure 4.

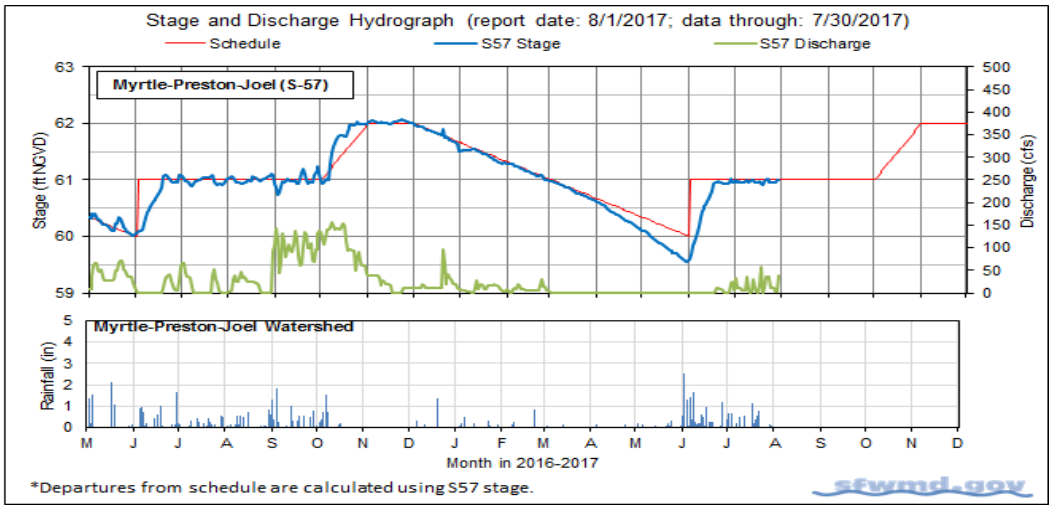


Figure 5.

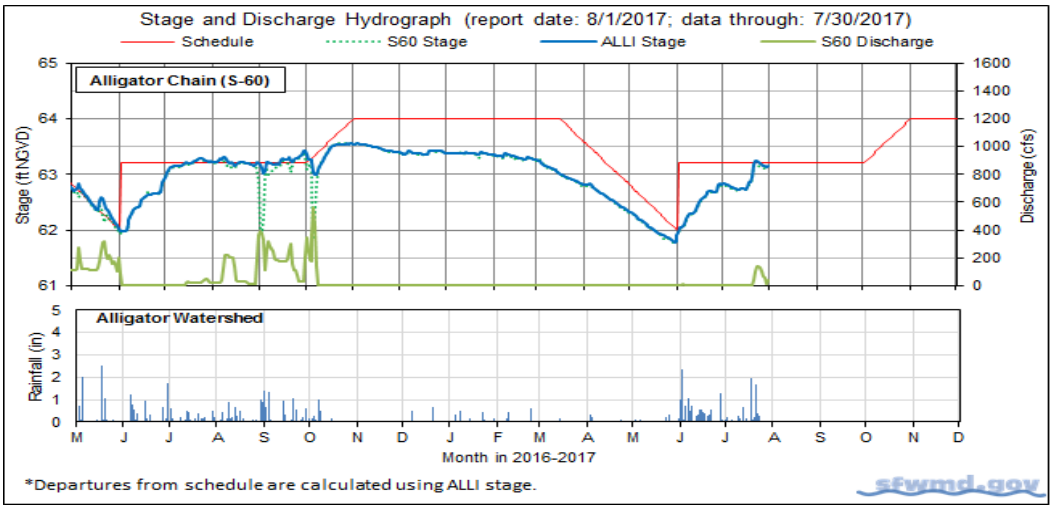


Figure 6.

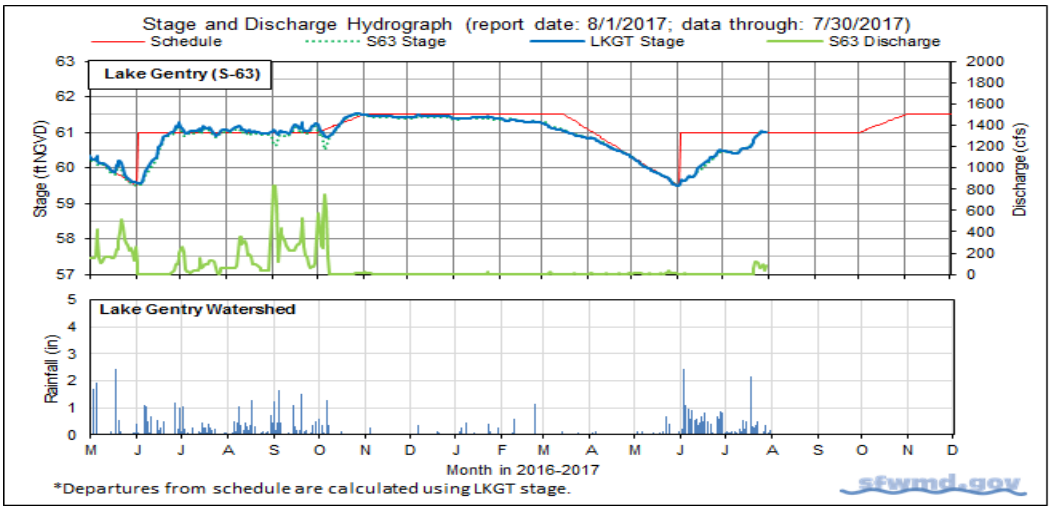


Figure 7.

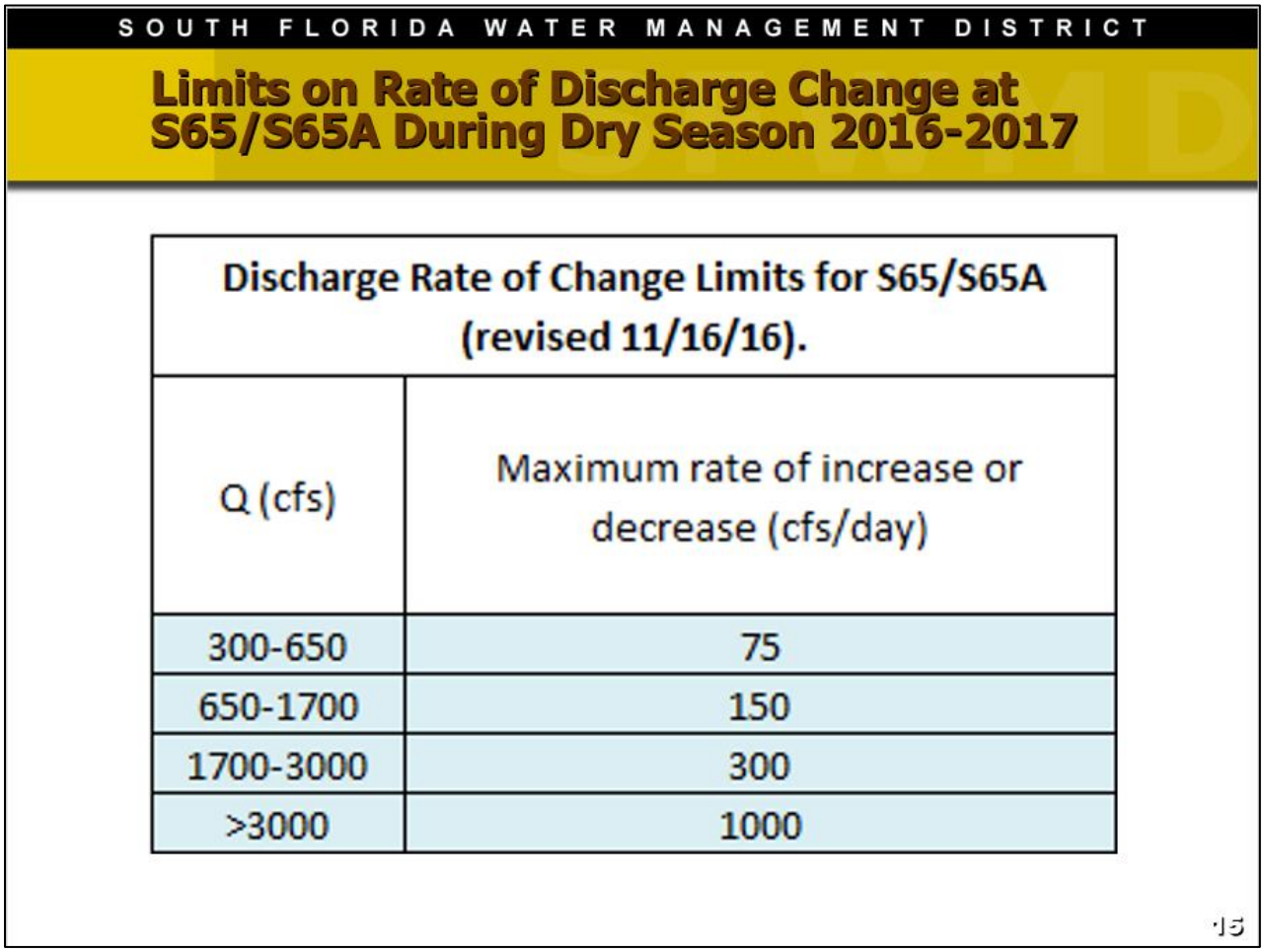


Figure 8. Limits on rate of discharge change at S65/S65A for the 2016-2017 Dry Season.

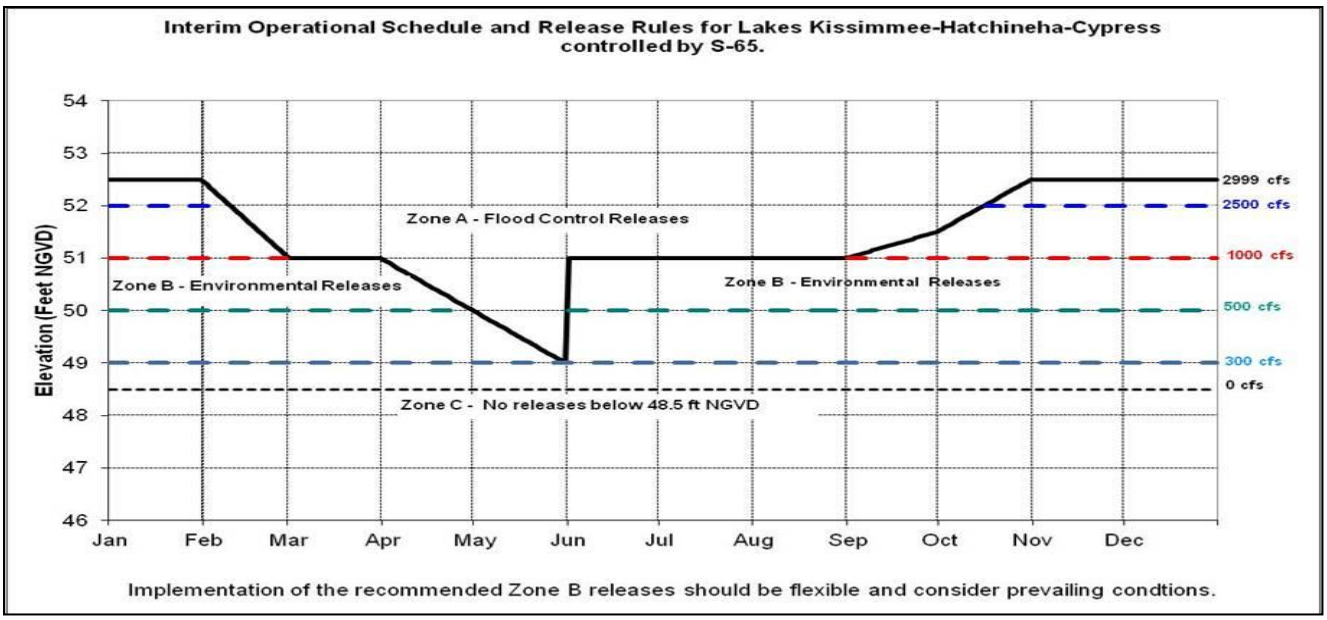


Figure 9. Interim operations schedule for S-65. The discharge schedule shown to the right has not been used in recent years or in Wet Season 2015.

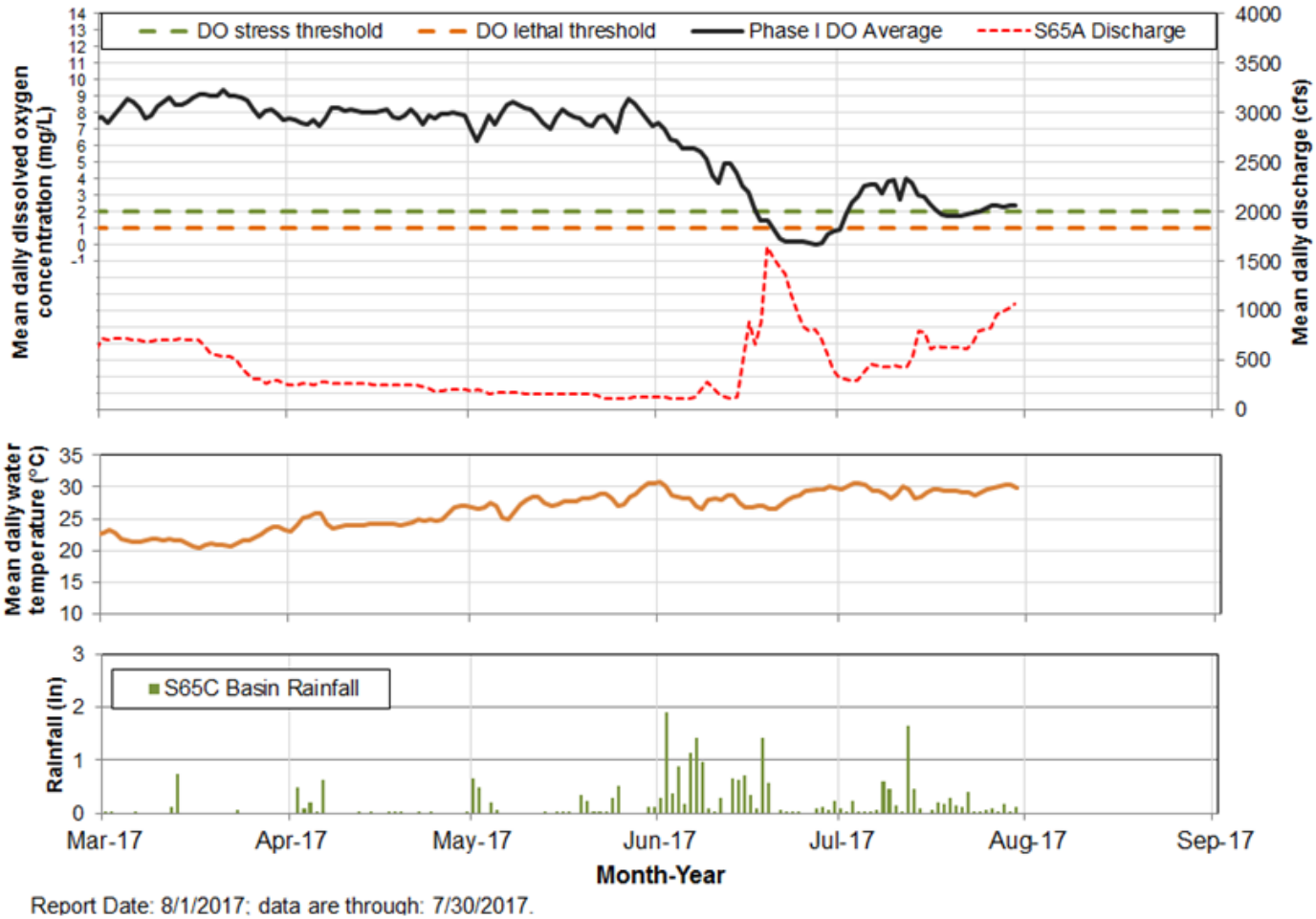


Figure 10. Mean daily Dissolved Oxygen, discharge, temperature and rainfall in the Phase I river channel.

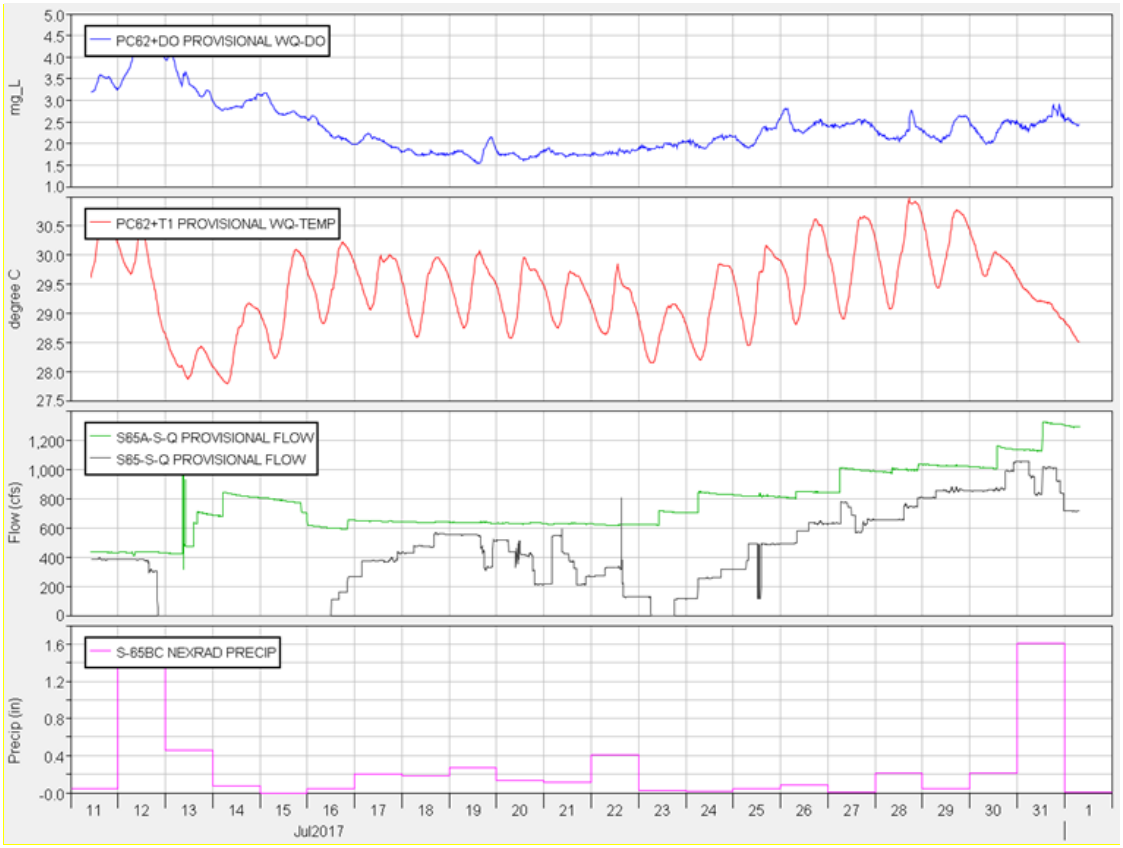


Figure 11. Phase I river channel dissolved oxygen and water temperature (measured at 15 minute intervals) and Pool BC daily rainfall.

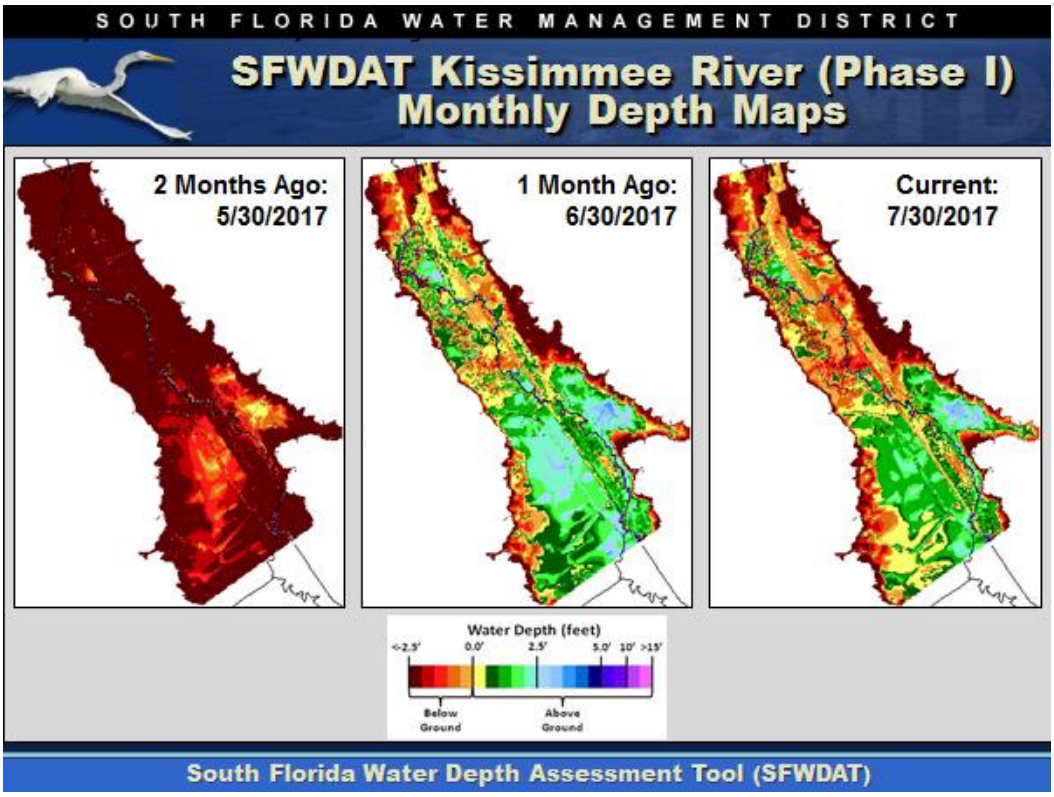
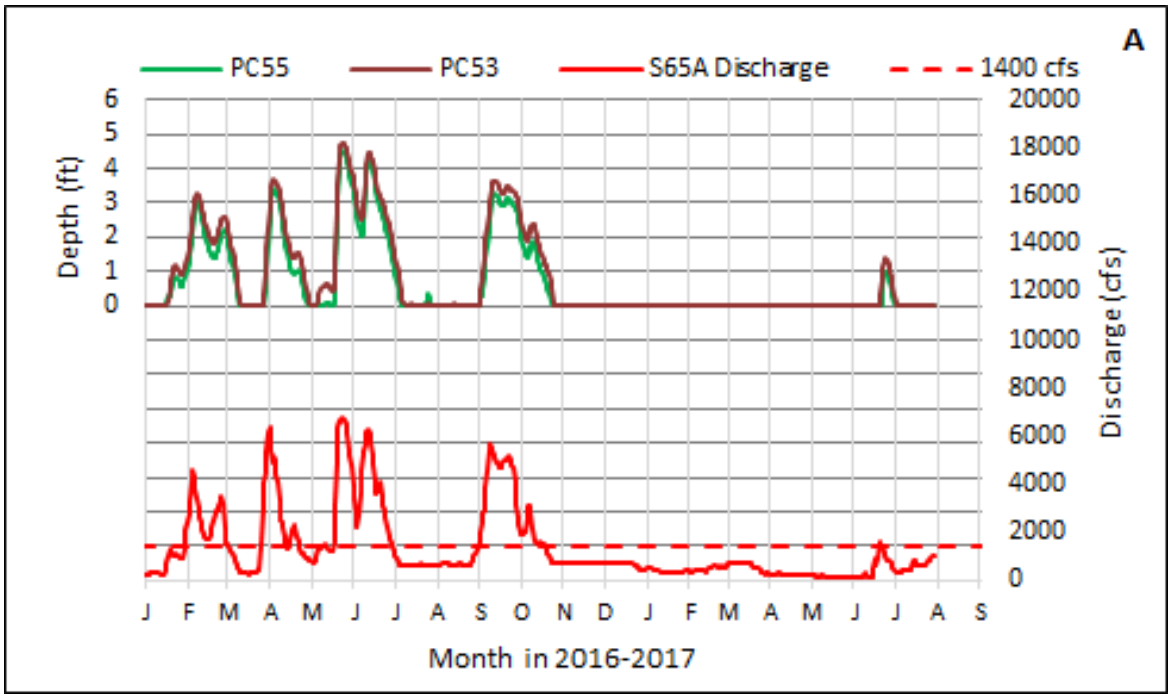
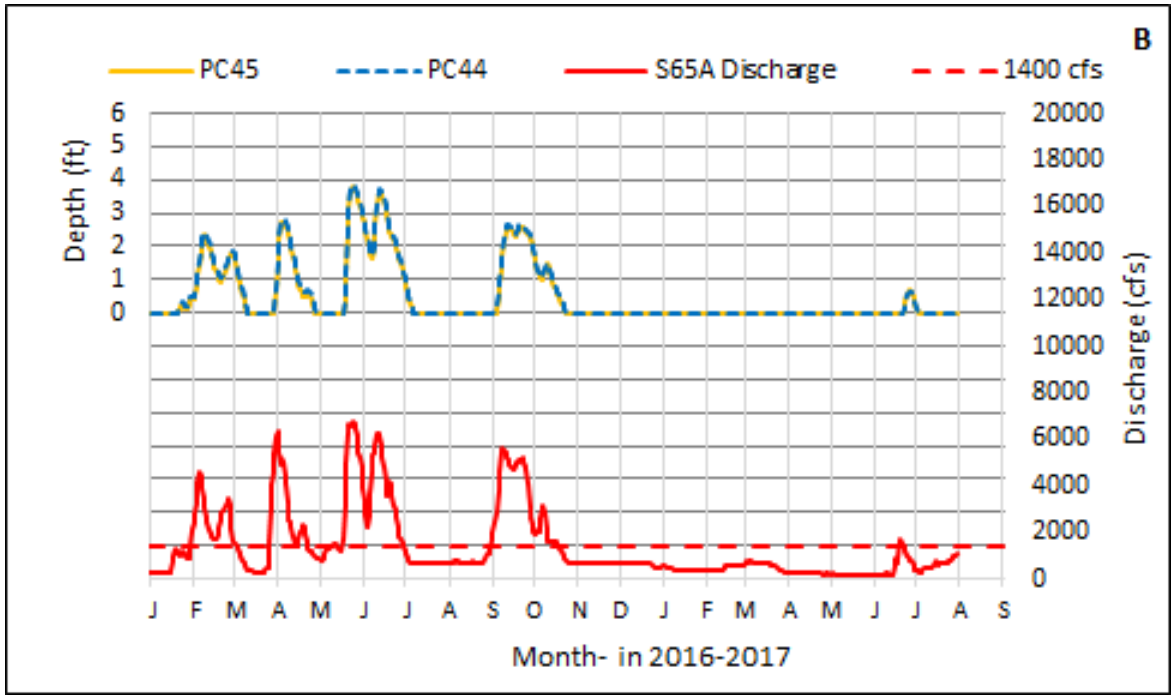


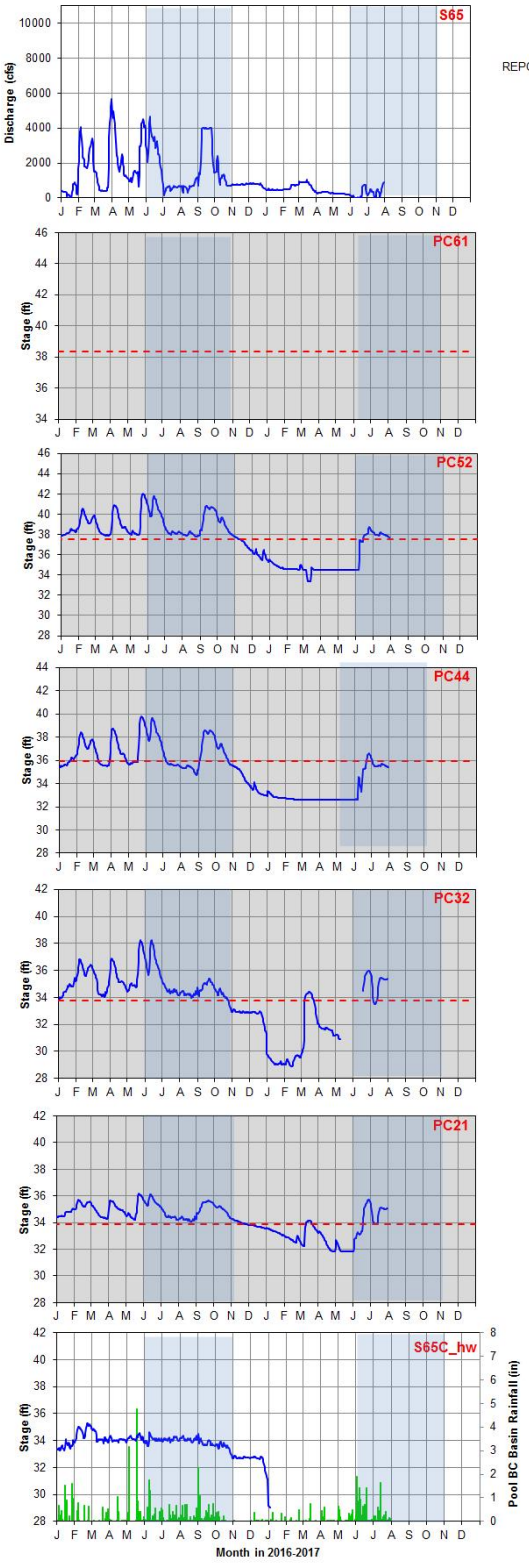
Figure 12. Phase I area floodplain water depths for this week, one month ago, and two months ago. Note that the WDAT color-coding has been modified to accommodate greater water depths; these maps are not directly comparable to Kissimmee Basin WDAT maps published prior to Jan. 16, 2012.





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



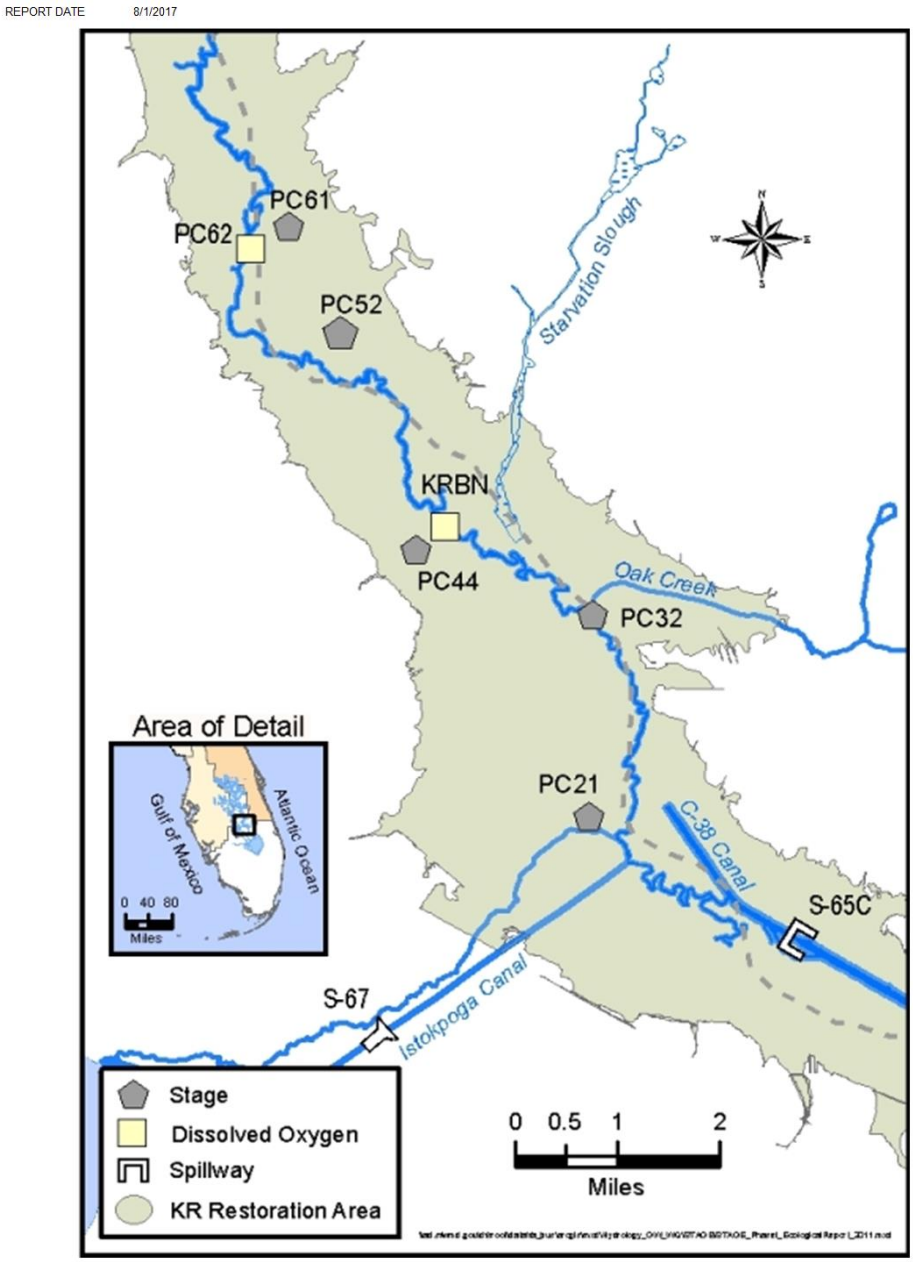


Figure 13. Discharge at S65, stages at five monitoring stations in the Phase I area of the Kissimmee River floodplain, and headwater stage at S65-C since January 1, 2015. The most recent data (~2 weeks) are provisional real-time data from SFWMD DualTrend; previous data are from SFWMD DB-HYDRO (validated).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

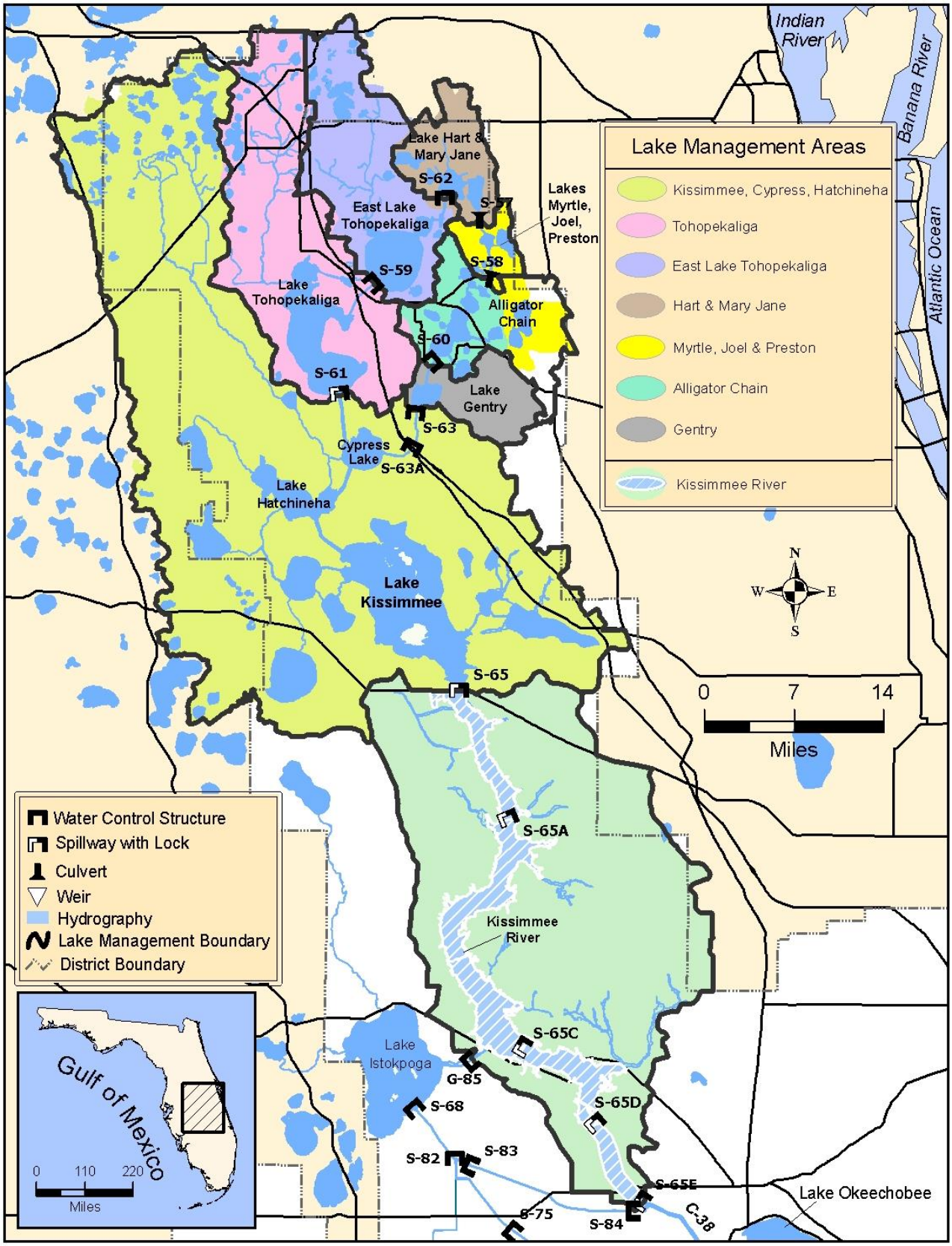


Figure 14. The Kissimmee Basin

LAKE OKEECHOBEE

According to the USACE web site, Lake Okeechobee stage is at 12.72 feet NGVD for the period ending at midnight on July 30, 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 0.02 feet over the past week and is 0.35 feet higher than it was a month ago and 1.93 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, 1.4 inches of rain fell directly over the Lake during the week July 24-30 (Figure 3). Much of the surrounding watershed had similar amounts of rainfall, but portions of the northern and western watersheds, however, were much wetter, with up to twice as much rainfall than fell directly on the Lake.

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

INFLOWS	Avg Daily Flow cfs	Equivalent Depth Week Total (in)
S65E & S65EX1	1293	0.6
S71 & 72	138	0.1
S84 & 84X	551	0.2
Fisheating Creek	444	0.2
S154	5	0.0
S191	141	0.1
S133 P	0	0.0
S127 P	0	0.0
S129 P	21	0.0
S131 P	12	0.0
S135 P	0	0.0
S2 P	7	0.0
S3 P	6	0.0
S4 P	9	0.0
C5	0	0.0
Rainfall	3858	1.4
Total	**6485**	**2.6**

OUTFLOWS	Avg Daily Flow cfs	Equivalent Depth Week Total (in)
S77	46	0.0
S308 (DS)	-194	-0.1
S351	0	0.0
S352	0	0.0
S354	0	0.0
L8	-81	0.0
ET	3362	1.5
Total	**3133**	**1.4**

Average daily outflows for the Lake have been negative since the beginning of June, and continued that trend this past week, albeit to a lesser extent; a total of -229 average daily cfs flowed back into the Lake through S308 (-194 cfs) and the L8 canal through Culvert 10A (-81 cfs). Average daily flows of 46 cfs went through S77, and no flows were directed south through the S350s. The corrected evapotranspiration value based on the L006 weather platform solar radiation data was the same as the previous week at 1.22 inches for the week.

The approximate change in Lake stage from each structure's total weekly flows (midnight July 24, 2017 to midnight July 30, 2017) for major structures are also presented in the above table.

July satellite imagery indicates that the bloom potential remains high in the western and northern portions of the Lake in general, but may be lessening somewhat (Figure 4). The western region near Fisheating Bay and Indian Prairie continue to show high potential for bloom, as well as the northern shore.

Snail Kites

Two more snail kite nests were initiated in the management areas where most kite nests have been on the Lake this year and last (Figure 5). Water levels continue to rise in the area and nesting activity may increase as well, despite it being late in the season. The nest brings the unofficial total to 41 for the 2017 nesting season thus far. Nesting has resumed in other areas of the state as well, with several other areas having more activity than Okeechobee in July.

Water Management Recommendations

The Lake is 12.72 feet NGVD having increased by 0.02 feet over the past week due to rainfall and increased inflows from the Kissimmee River basin. Ascension rates have continued to moderate over the past month after the rapid rise in early June, slowing to 0.09 feet/week on average.

The submerged and emergent vegetation communities in the nearshore region have likely benefited from low water levels this dry season, helping to offset impacts from high water levels in February and October of 2016. Slow-to-moderate ascension rates will enable this new growth to keep up with rising water levels.

Activities that maintain a moderate ascension rate (<0.5 feet per month) in Lake Okeechobee would be ecologically beneficial at this time and would be protective of the Lake's emergent wetland and submerged aquatic flora and its associated fauna.

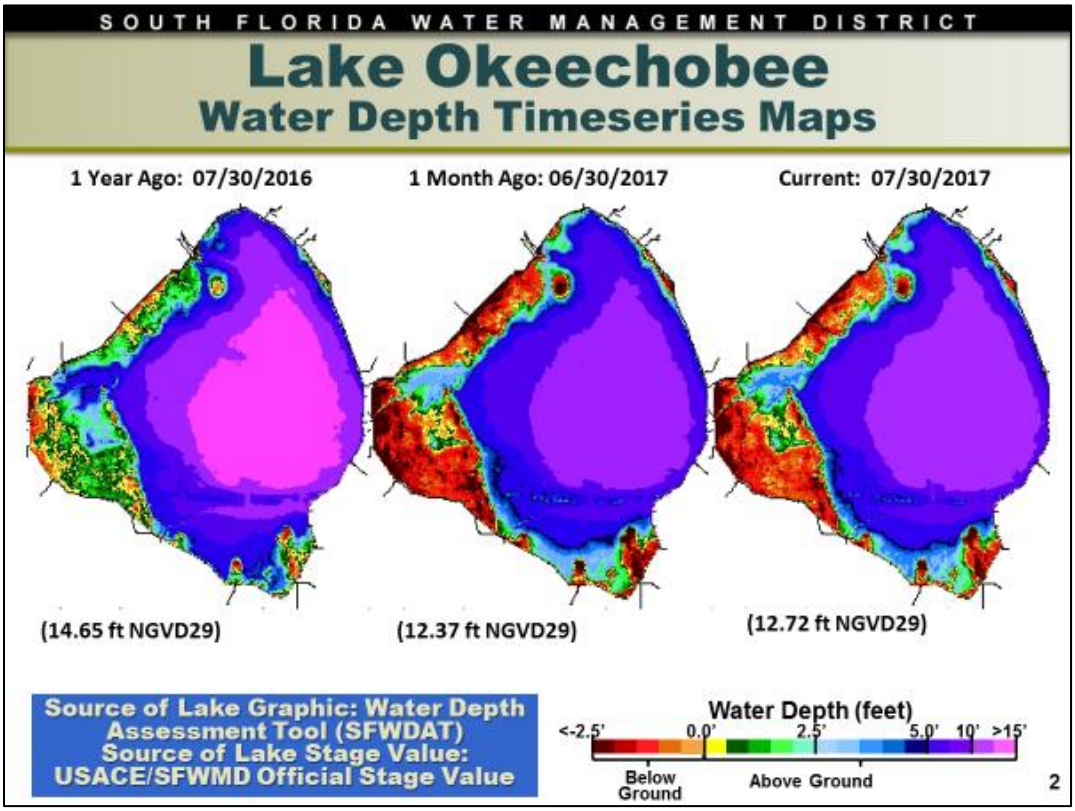


Figure 1

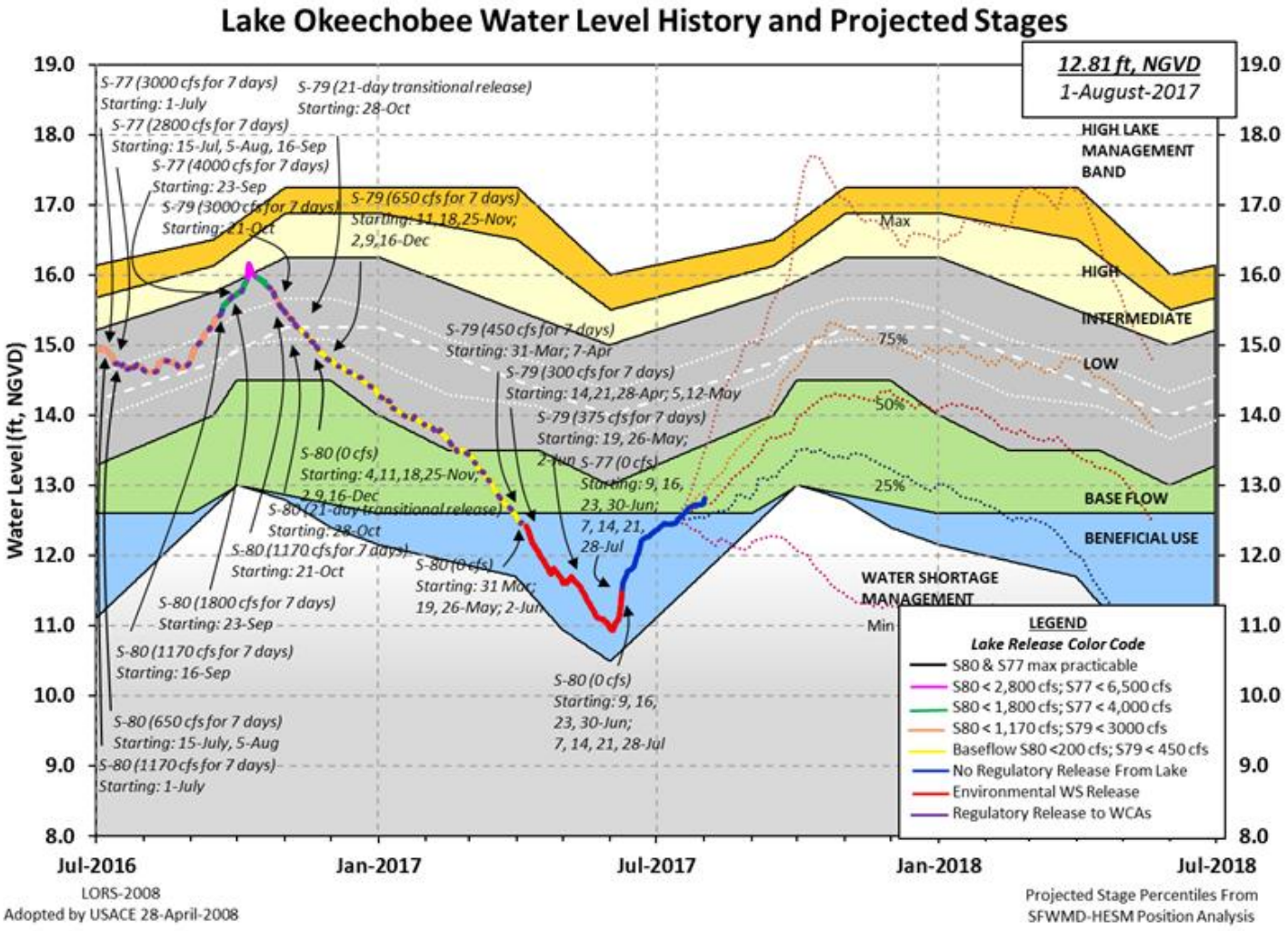

Lake Okeechobee Water Level History and Projected Stages
12.81 ft, NGVD
1-August-2017
Water Level (ft, NGVD)
HIGH LAKE MANAGEMENT BAND
Max
HIGH
INTERMEDIATE
75%
LOW
50%
25%
BASE FLOW
BENEFICIAL USE
WATER SHORTAGE MANAGEMENT
Min
S-77 (3000 cfs for 7 days) Starting: 1-July
S-77 (2800 cfs for 7 days) Starting: 15-Jul, 5-Aug, 16-Sep
S-77 (4000 cfs for 7 days) Starting: 23-Sep
S-79 (3000 cfs for 7 days) Starting: 21-Oct
S-79 (21-day transitional release) Starting: 28-Oct
S-79 (650 cfs for 7 days) Starting: 11,18,25-Nov; 2,9,16-Dec
S-79 (450 cfs for 7 days) Starting: 31-Mar; 7-Apr
S-79 (300 cfs for 7 days) Starting: 14,21,28-Apr; 5,12-May
S-79 (375 cfs for 7 days) Starting: 19, 26-May; 2-Jun
S-77 (0 cfs) Starting: 9, 16, 23, 30-Jun; 7, 14, 21, 28-Jul
S-80 (0 cfs) Starting: 4,11,18,25-Nov; 2,9,16-Dec
S-80 (21-day transitional release) Starting: 28-Oct
S-80 (1170 cfs for 7 days) Starting: 21-Oct
S-80 (0 cfs) Starting: 31 Mar; 19, 26-May; 2-Jun
S-80 (1800 cfs for 7 days) Starting: 23-Sep
S-80 (1170 cfs for 7 days) Starting: 16-Sep
S-80 (650 cfs for 7 days) Starting: 15-July, 5-Aug
S-80 (1170 cfs for 7 days) Starting: 1-July
S-80 (0 cfs) Starting: 9, 16, 23, 30-Jun; 7, 14, 21, 28-Jul
LEGEND
Lake Release Color Code
S80 & S77 max practicable
S80 < 2,800 cfs; S77 < 6,500 cfs
S80 < 1,800 cfs; S77 < 4,000 cfs
S80 < 1,170 cfs; S79 < 3000 cfs
Baseflow S80 <200 cfs; S79 < 450 cfs
No Regulatory Release From Lake
Environmental WS Release
Regulatory Release to WCAs
19.0
18.0
17.0
16.0
15.0
14.0
13.0
12.0
11.0
10.0
9.0
8.0
Jul-2016
Jan-2017
Jul-2017
Jan-2018
Jul-2018
LORS-2008
Adopted by USACE 28-April-2008
Projected Stage Percentiles From SFWMD-HESM Position Analysis

Figure 2

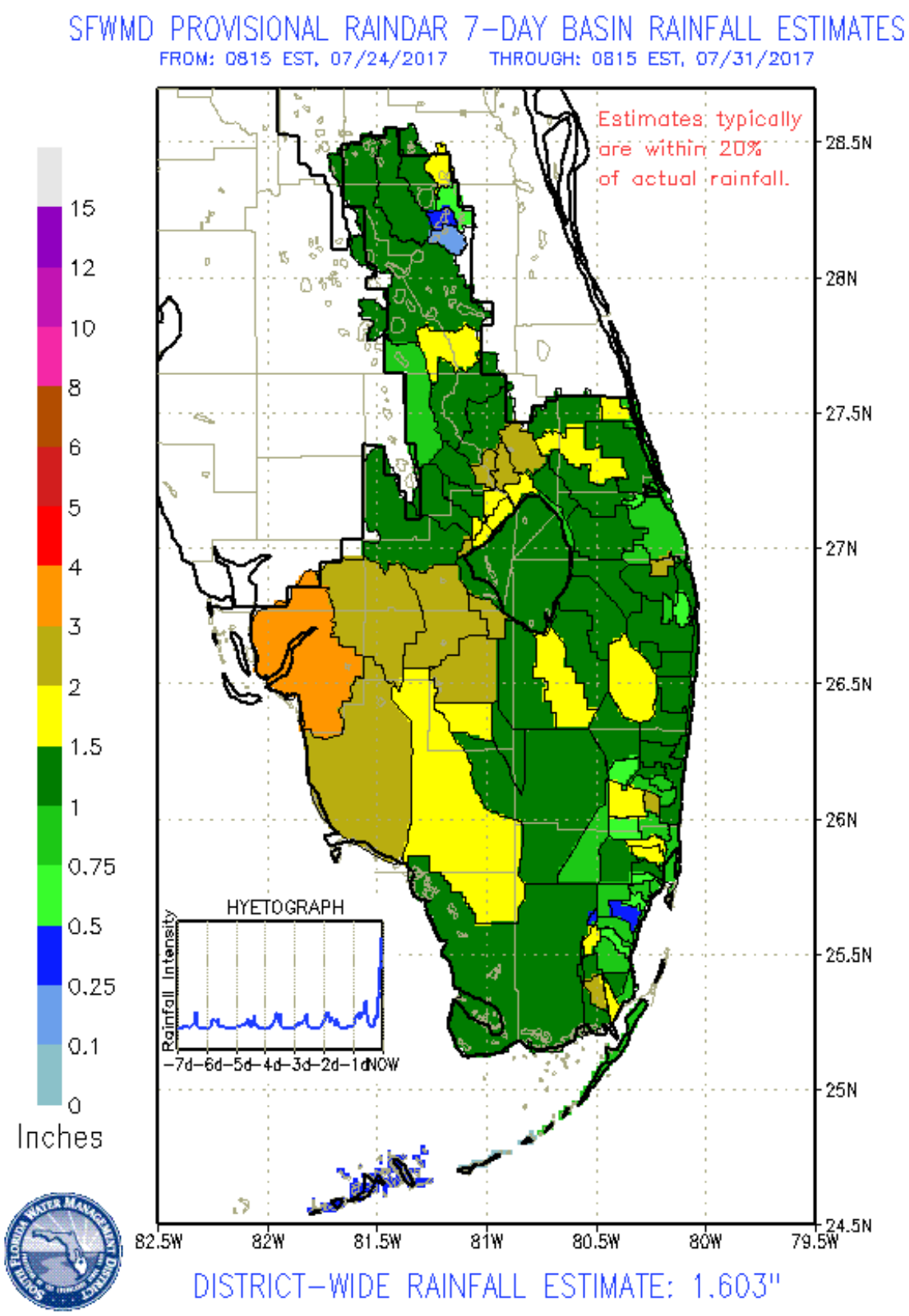

SFWMD PROVISIONAL RAINDAR 7-DAY BASIN RAINFALL ESTIMATES
FROM: 0815 EST, 07/24/2017 THROUGH: 0815 EST, 07/31/2017
Estimates typically are within 20% of actual rainfall.
15
12
10
8
6
5
4
3
2
1.5
1
0.75
0.5
0.25
0.1
0
Inches
HYETOGRAPH
Rainfall Intensity
-7d-6d-5d-4d-3d-2d-1dNOW
28.5N
28N
27.5N
27N
26.5N
26N
25.5N
25N
24.5N
82.5W
82W
81.5W
81W
80.5W
80W
79.5W
DISTRICT-WIDE RAINFALL ESTIMATE: 1.603"

Figure 3

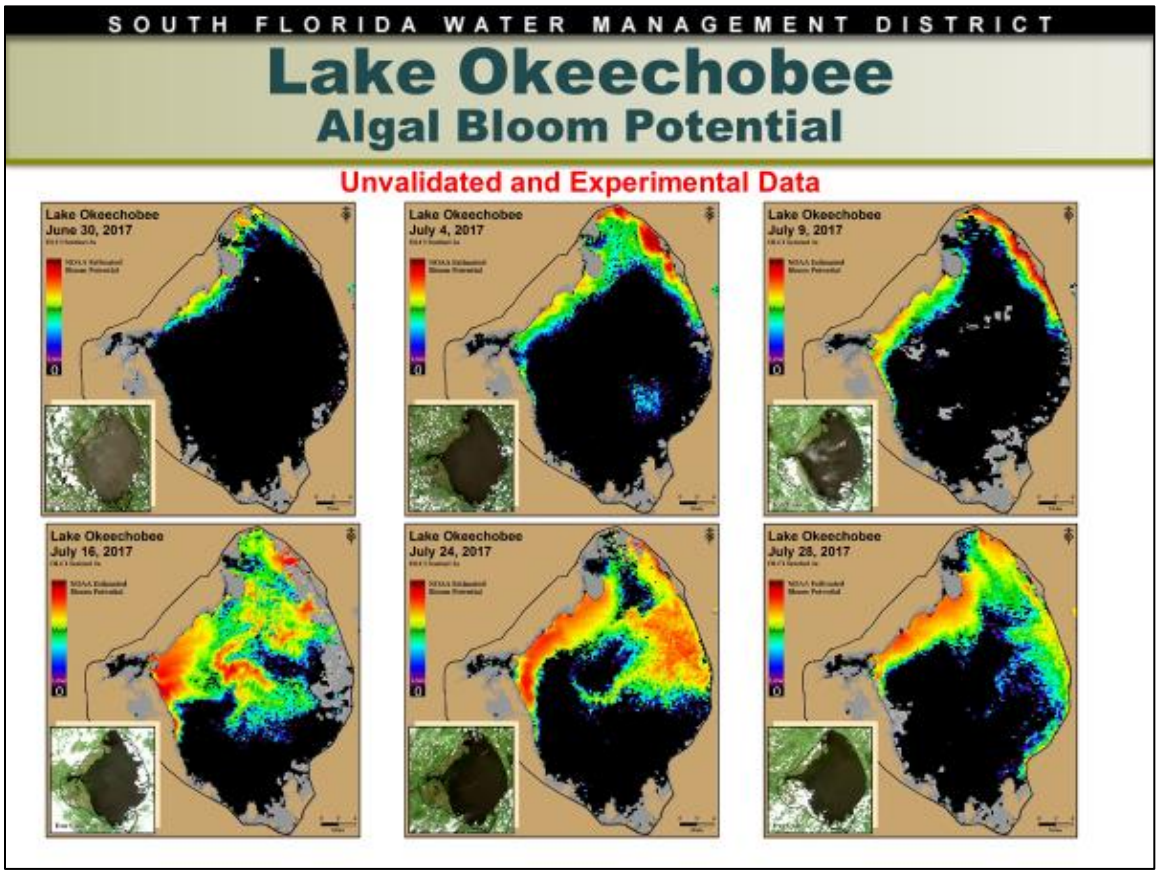


Figure 4

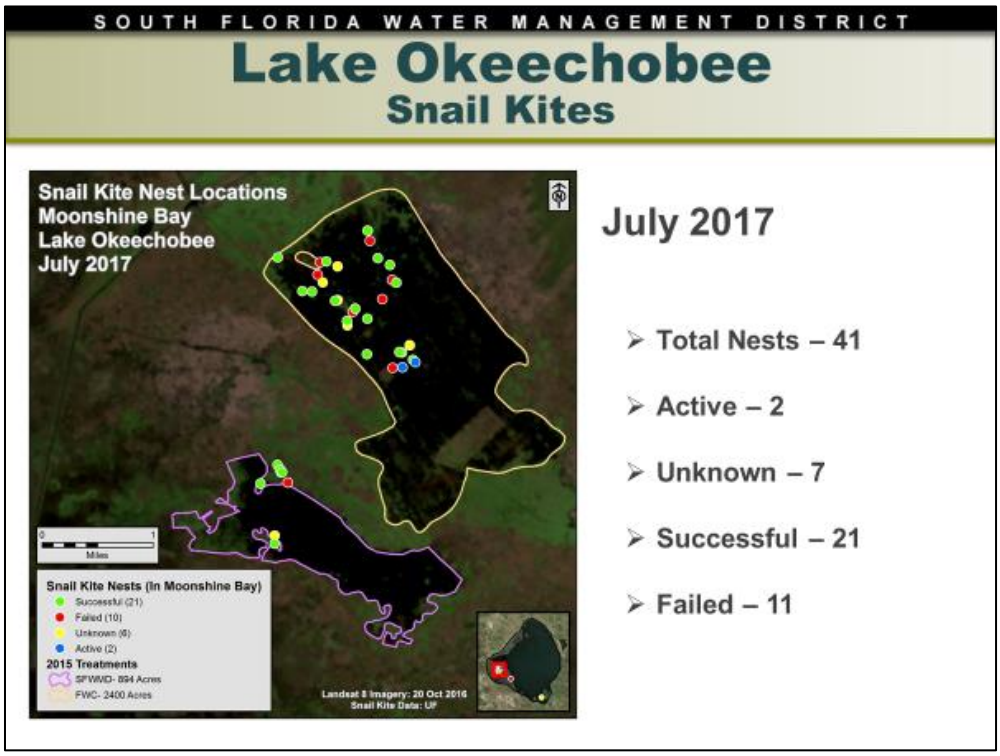


Figure 5

LAKE ISTOKPOGA

Lake Istokpoga stage is 38.23 feet NGVD as of midnight July 30, 2017 and is currently 0.02 feet below its low pool regulation schedule of 38.25 feet NGVD (Figure 6). Average daily flows into the Lake from

Josephine Creek over the past week were 51 cfs again, but no data have reported for Arbuckle Creek since July 4. Average daily discharge from S68 and S68X this past week was up to 604 cfs, a slight increase from the previous week's flow of 501 cfs. According to RAINDAR, only 0.84 inches of rain fell in the Lake Istokpoga basin from July 24 – July 30.

Snail Kites

One more snail kite nest was initiated on Istokpoga in July, similar to a small-scale resumption of breeding activity seen throughout the state as water levels rebound (Figure 7). The nest brings the unofficial total to 15 for the 2017 nesting season thus far.

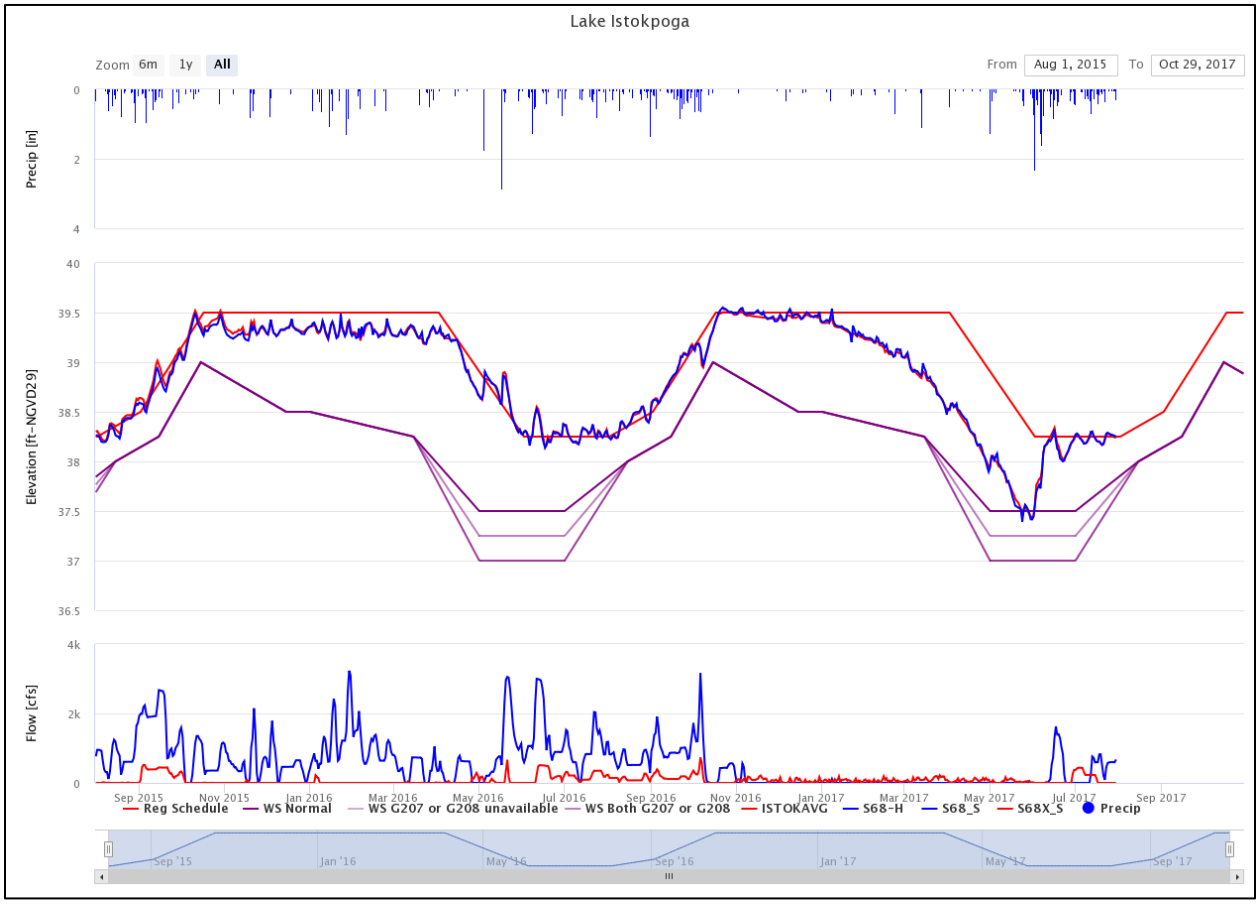


Figure 6

Figure 7

ESTUARIES

St. Lucie Estuary

Over the past week, provisional flows averaged about 0 cfs at S-80, 271 cfs downstream of S-308 flowing into Lake Okeechobee, 108 cfs at S-49 on C-24, 146 cfs at S-97 on C-23, and 145 cfs from Ten Mile Creek at the Gordy Road Structure. Average inflow from tidal basin tributaries is estimated to be 547 cfs (Figures 1 and 2). Total inflow averaged about 946 cfs last week and 1,032 cfs over last month.

Over the past week, salinity increased throughout the estuary (Table 1, Figures 3 and 4). The seven-day moving average salinity of the water column at the US1 Bridge is about 14.4. 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)	**5.9** (3.7)	**11.5** (9.0)	NA[1]
US1 Bridge	**11.9** (9.6)	**17.0** (12.6)	10.0-26.0
A1A Bridge	**EM**[2] (EM)	**26.8** (25.7)	NA[1]

[1]Envelope not applicable and [2]Equipment Malfunction.

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.

Sampling Location	Average DO (mg/l)	Minimum DO (mg/l)	Maximum DO (mg/l)
HR1-Surface	5.47	0.91	9.52
HR1-Bottom	1.61	0.00	5.02

Caloosahatchee Estuary

During the past week, provisional flows averaged approximately 50 cfs at S-77, 386 cfs at S-78, and 1,480 cfs at S-79. Average inflow from tidal basin tributaries is estimated to be 1,741 cfs (Figures 5 & 6). Total inflow averaged 3,221 cfs last week and 3,062 cfs over last month.

Over the past week salinity decreased throughout the estuary, except at Cape Coral Bridge which remained about the same salinity (Table 3, Figures 7 and 8). The seven-day average salinity values are within the fair range for adult oysters at Cape Coral, and within the good range at Shell Point and at Sanibel (Figure 9). The 30-day moving average surface salinity is 0.3 at Val I-75 and 0.6 at Ft. Myers. Salinity at Val I-75 is forecast to be 0.3 in two weeks with no flow through S-79 (Figure 10). Salinity conditions between Val I-75 and Ft. Myers are good for tapegrass. NOAA satellite imagery indicates potential cyanobacterial algae presence in the upper-estuary (Figure 11).

Table 3. 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)	**0.3** (0.3)	**0.3** (0.3)	NA[1]
*Val I75	**0.3** (0.3)	**0.3** (0.4)	0.0-5.0[2]
Ft. Myers Yacht Basin	**0.4** (0.6)	**0.4** (0.7)	NA
Cape Coral	**5.9** (5.7)	**7.2** (6.8)	10.0-30.0
Shell Point	**17.0** (17.2)	**17.5** (18.0)	10.0-30.0
Sanibel	**26.9** (27.1)	**EM**[3] (EM)	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 offline due to site construction,
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 4 as concentration ranges of Chlorophyll *a* and dissolved oxygen at Beautiful Island, Ft. Myers, and Shell Point in the Caloosahatchee Estuary.

Table 4. 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	2.24 – 11.81	1.72 – 15.13
Dissolved Oxygen (mg/l)	Down for maintenance	2.19 – 4.24	No Data

The Florida Fish and Wildlife Research Institute reported on July 28, 2017, that *Karenia brevis*, the Florida red tide organism, was not present 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.

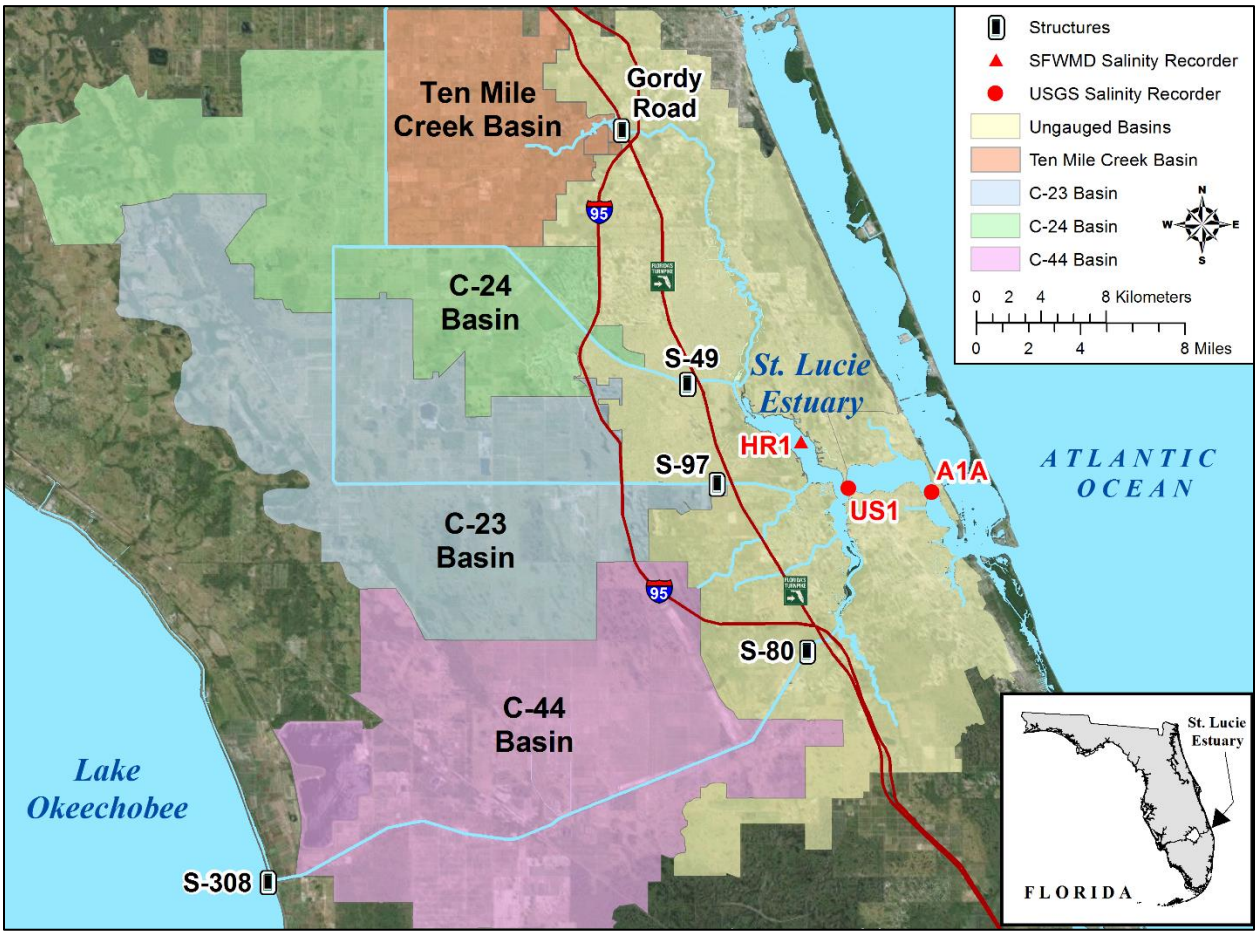


Figure 1. Basins, water control structures, and salinity monitoring for the St. Lucie Estuary.

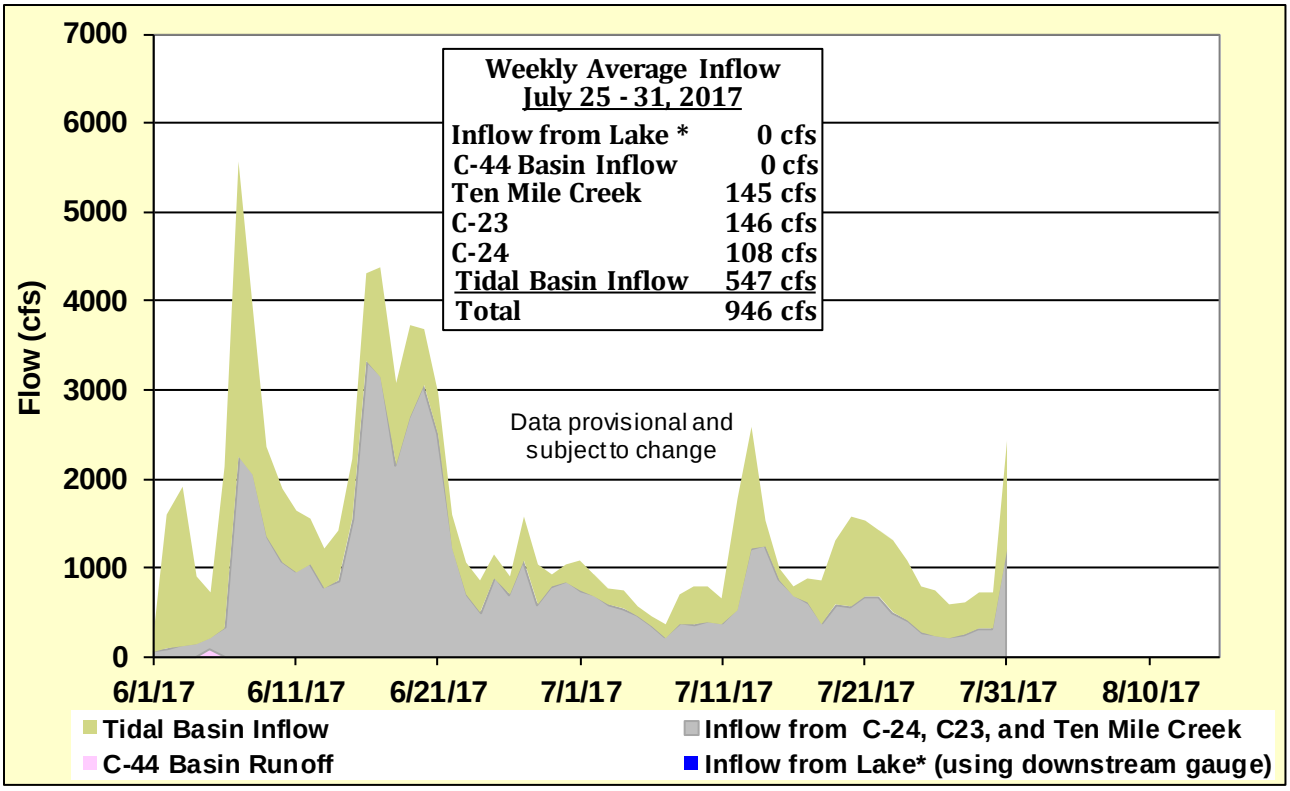


Figure 2. Estimated surface freshwater inflows from Lake Okeechobee and runoff from the C-44, C-23, C-24, Ten Mile Creek, and tidal basins into the St. Lucie Estuary.

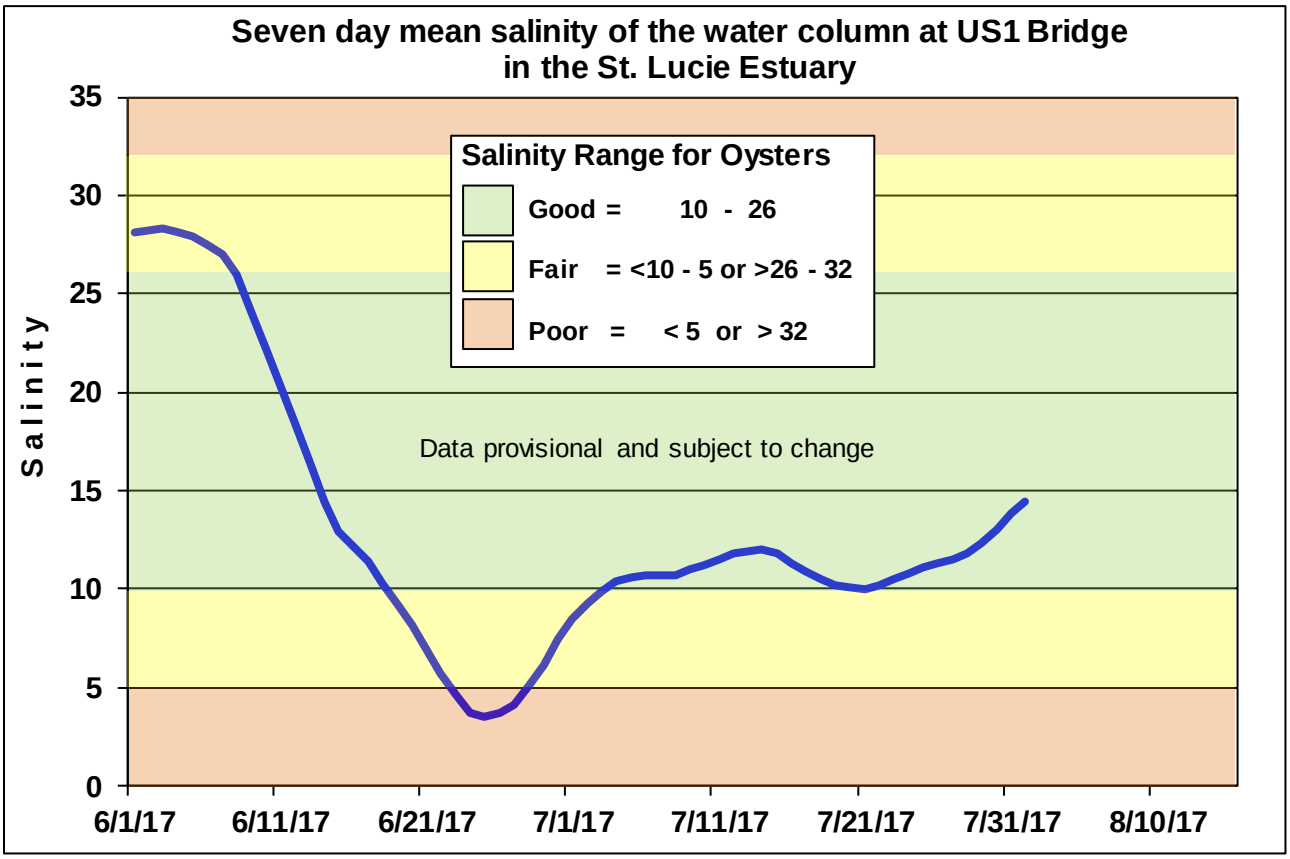


Figure 3. Seven-day mean salinity of the water column at the U.S. Highway 1 Bridge.

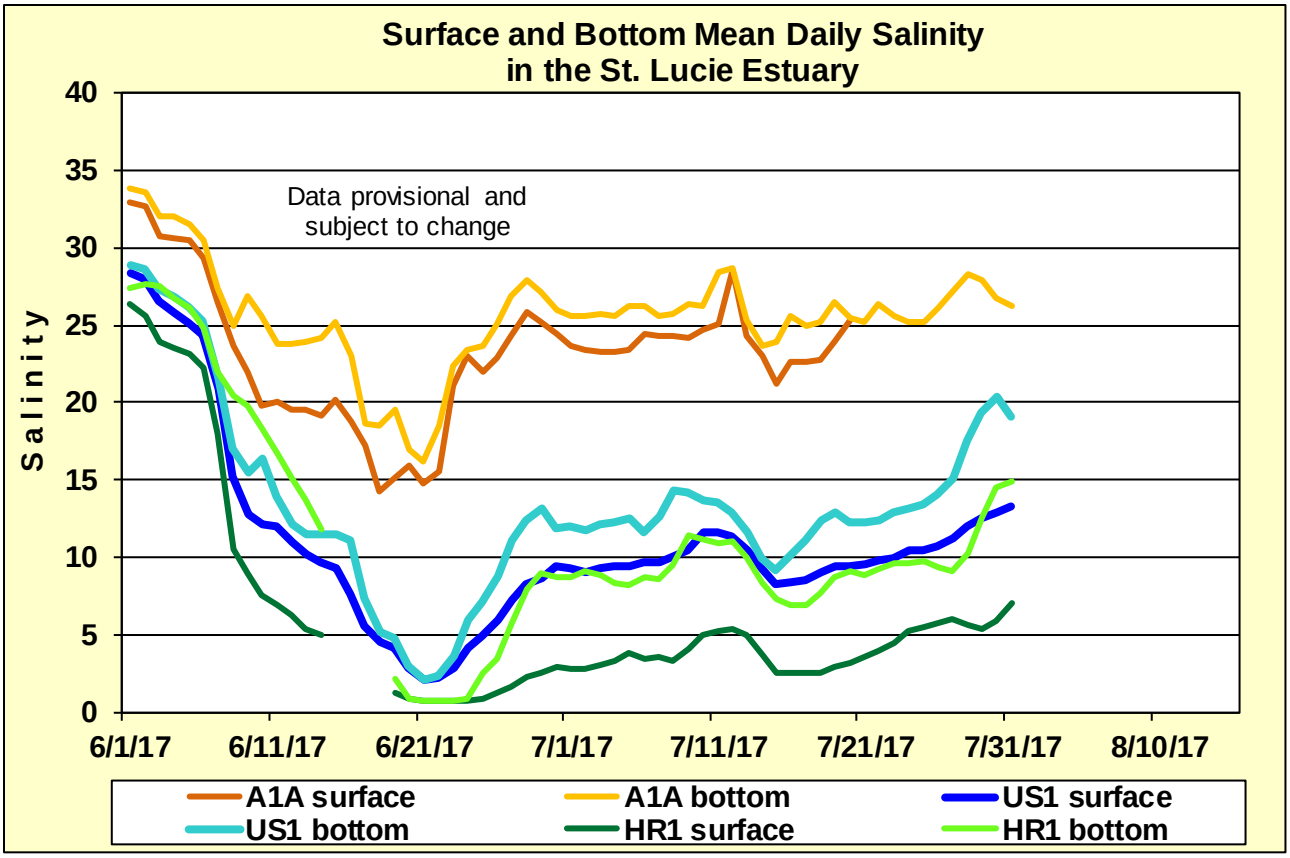


Figure 4. Daily mean salinity at the A1A, US1 and estimated HR1 stations.

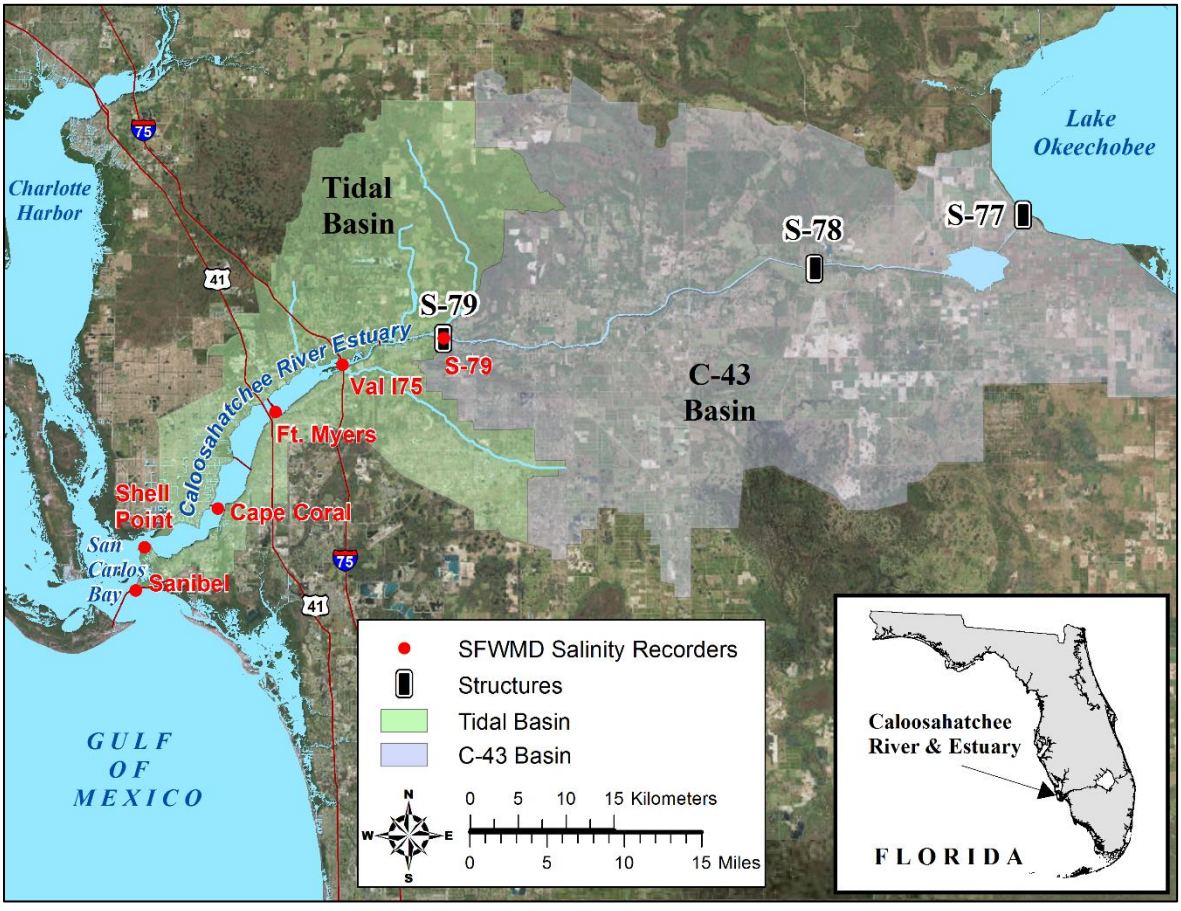


Figure 5. Basins, water control structures, and salinity monitoring for the Caloosahatchee Estuary.

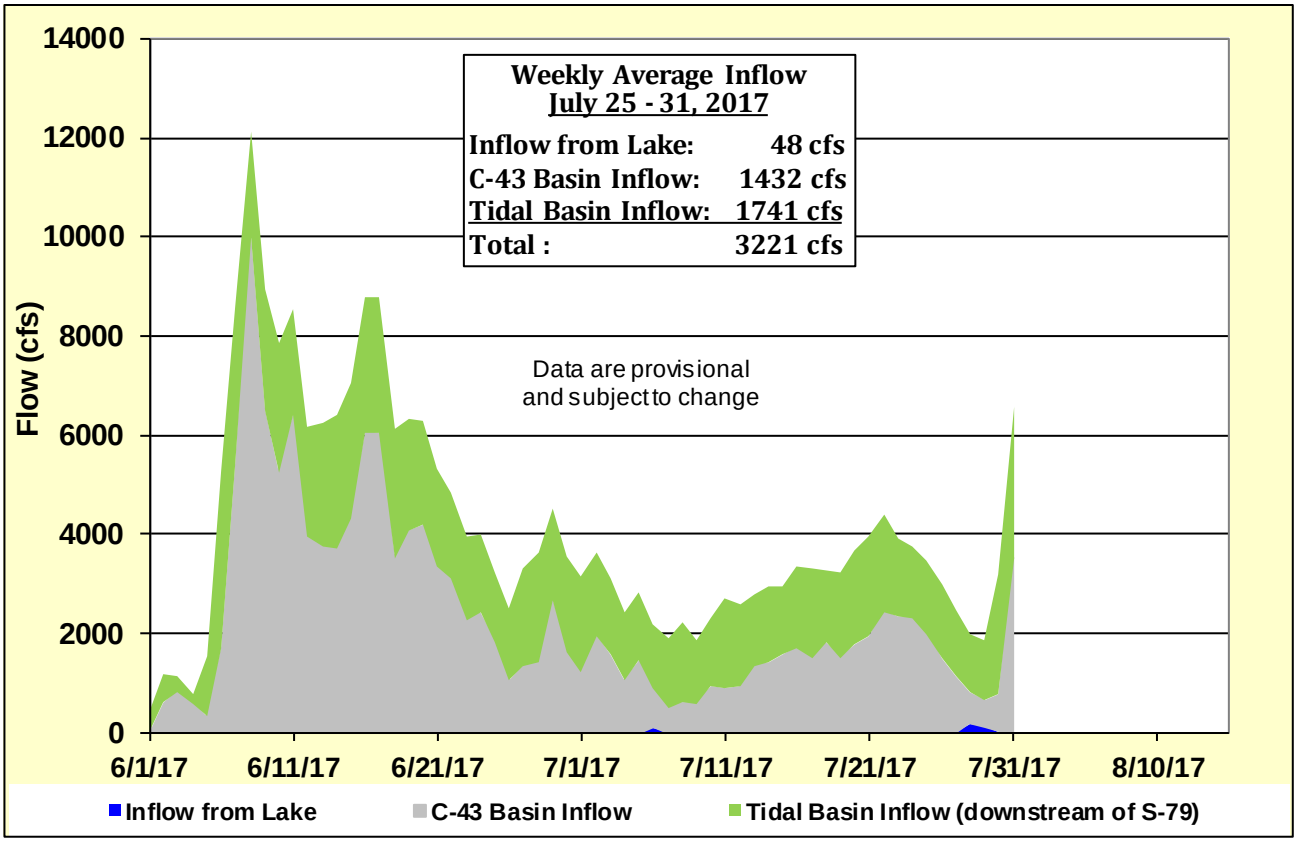
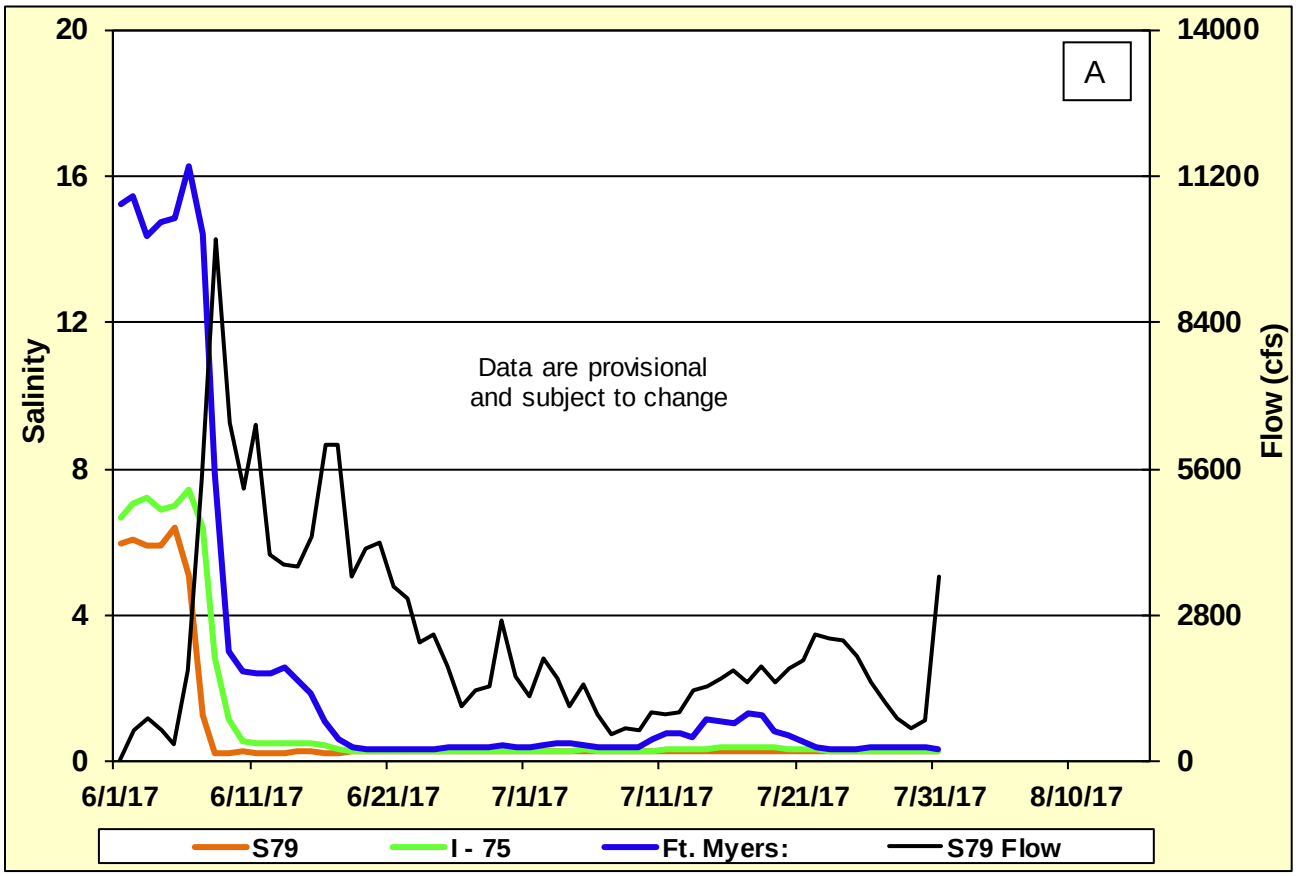


Figure 6. Freshwater inflows from Lake Okeechobee, runoff from the C-43 basin, and tributaries in the tidal basin into the Caloosahatchee River Estuary.



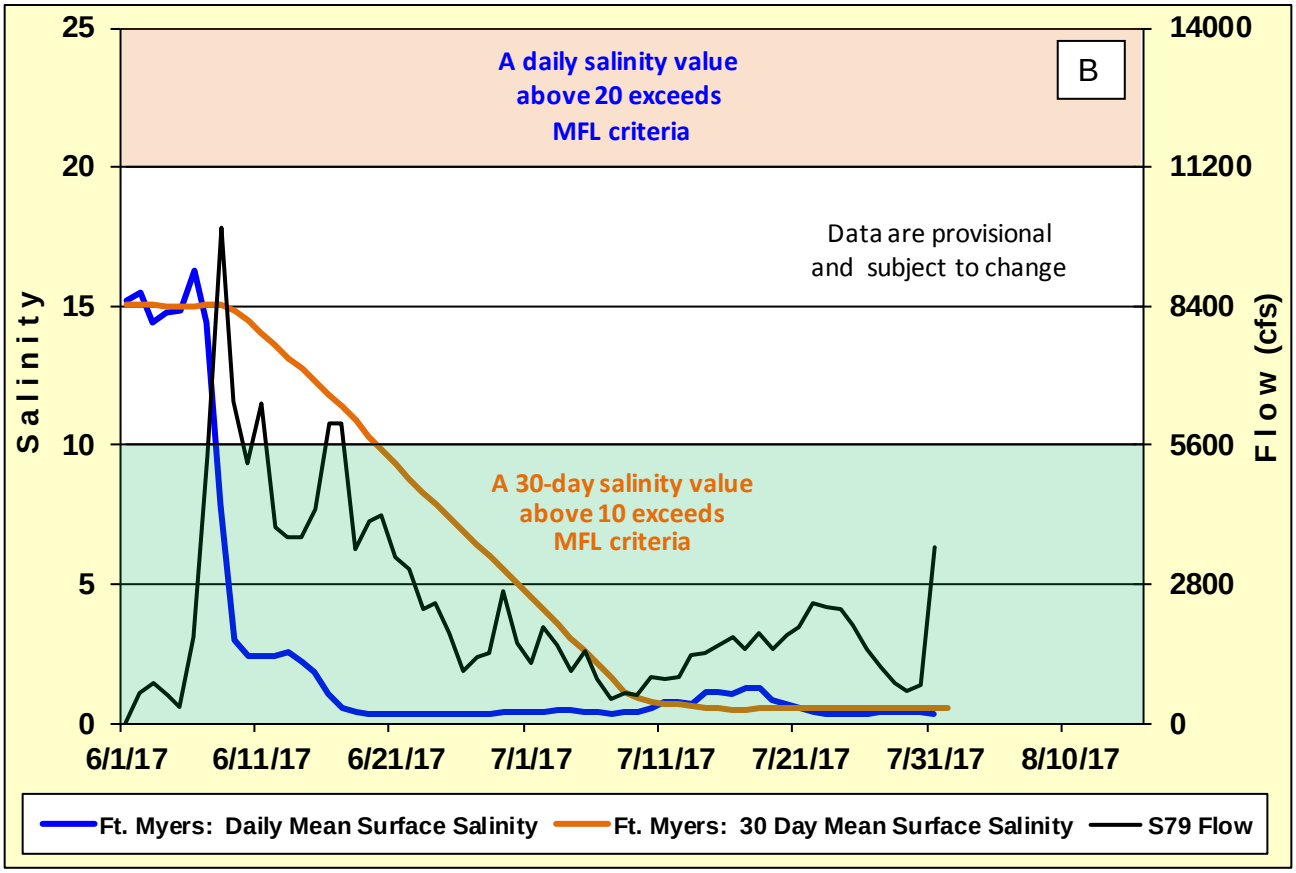


Figure 7. Daily mean flows at S-79 and salinity at upper estuary monitoring stations (A) and 30-day moving average salinity at Ft. Myers (B).

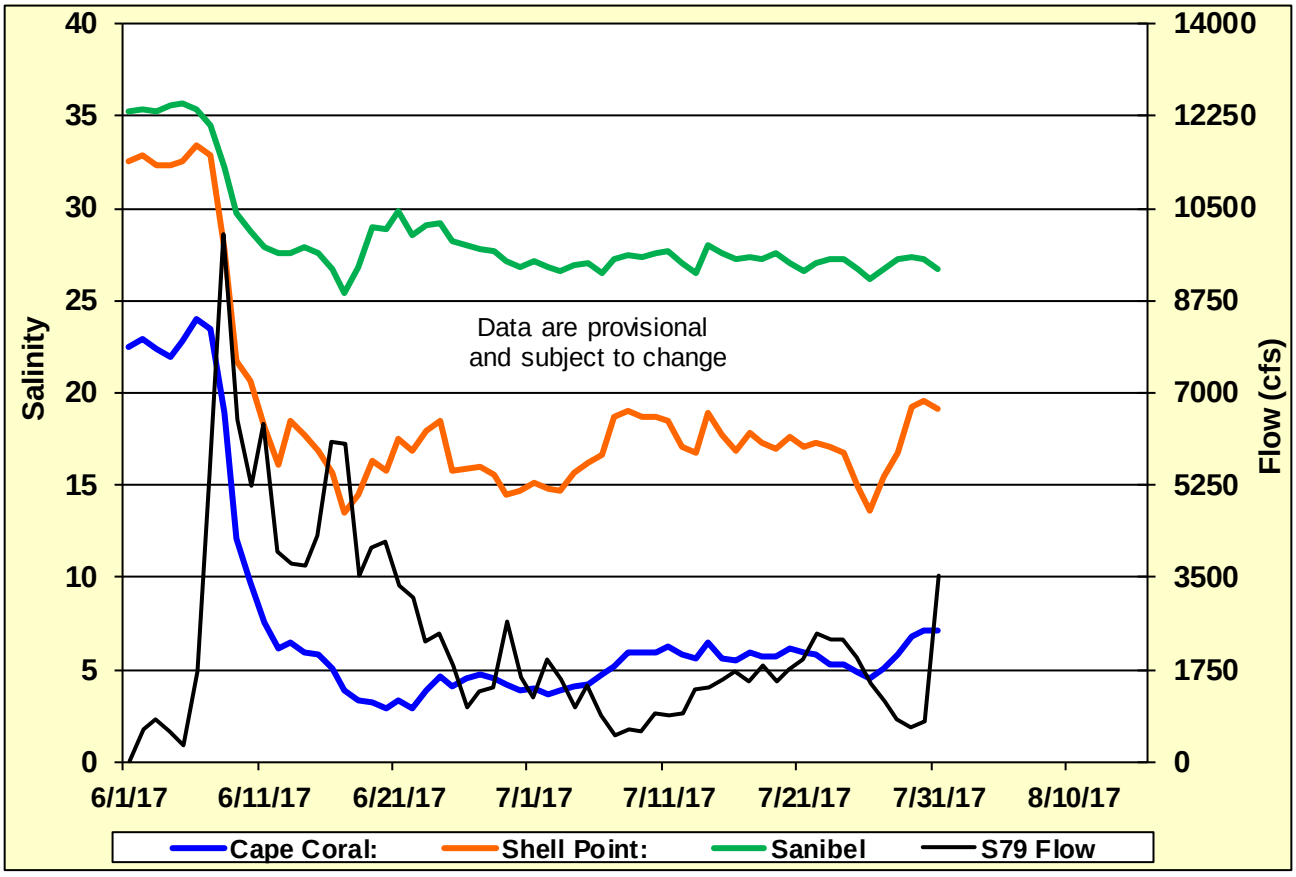


Figure 8. Daily mean flows at S-79 and salinity at lower estuary stations.

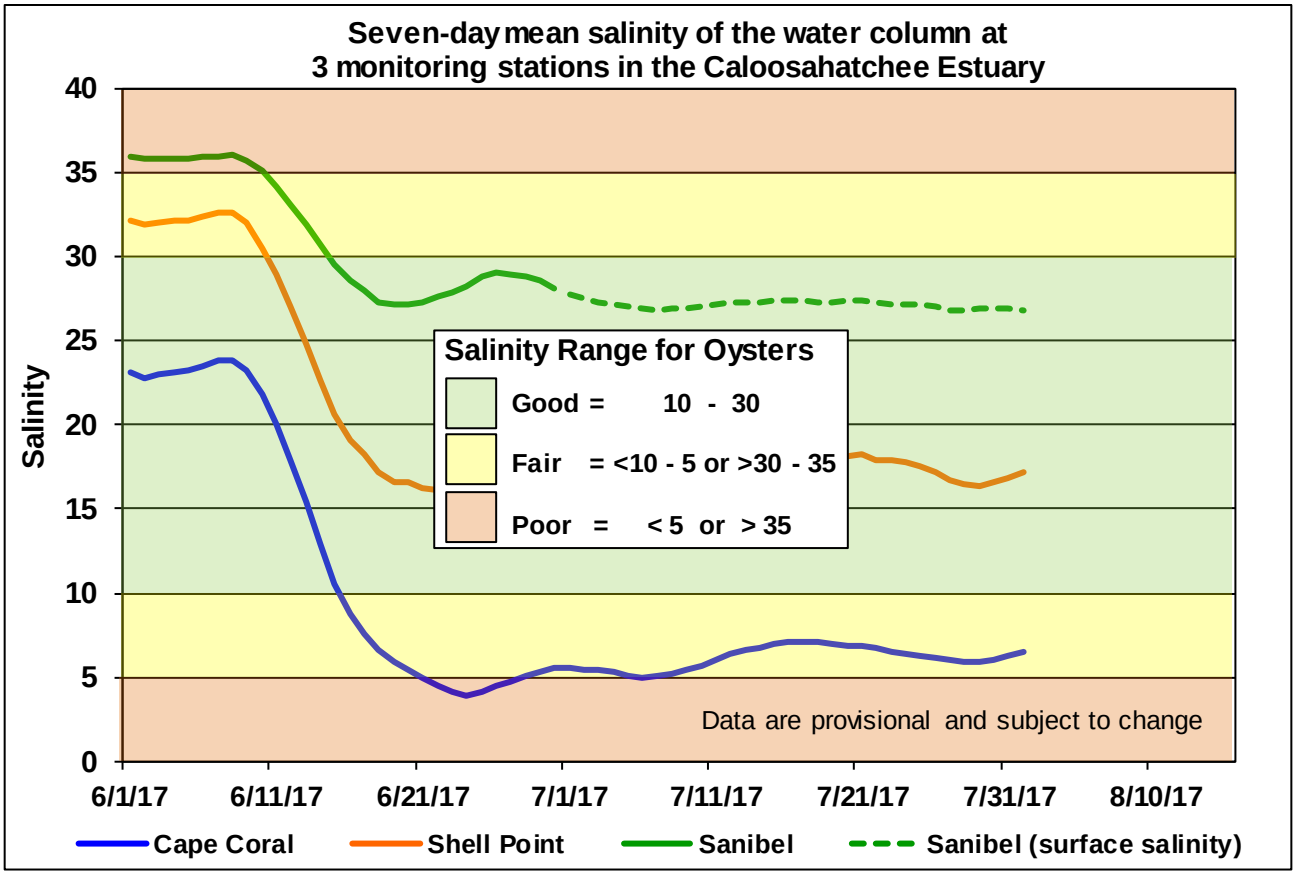


Figure 9. Seven-day mean salinity at Cape Coral Bridge, Shell Point and Sanibel Bridge monitoring stations.

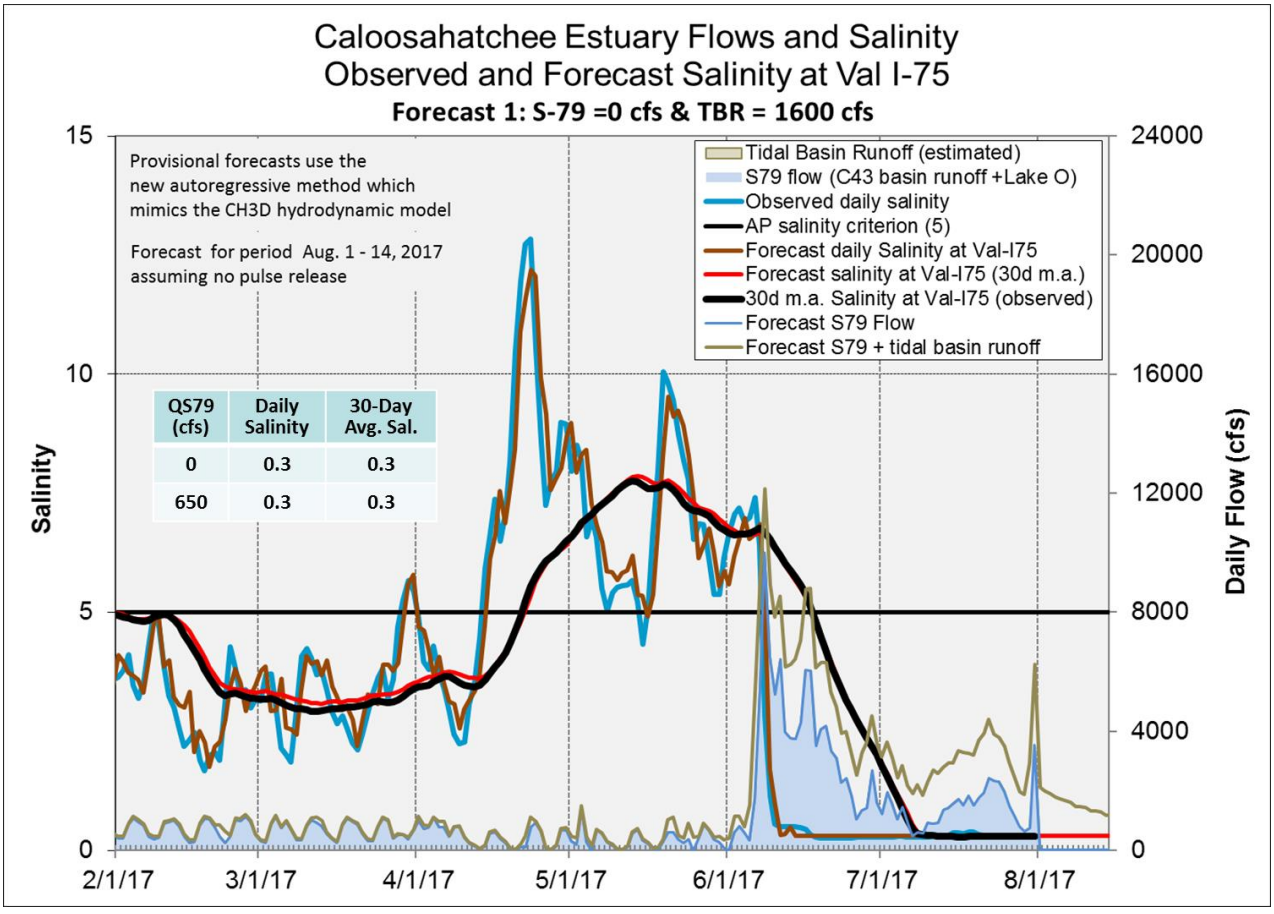


Figure 10. 14-day salinity forecast at Val I-75 assuming no releases at S-79.

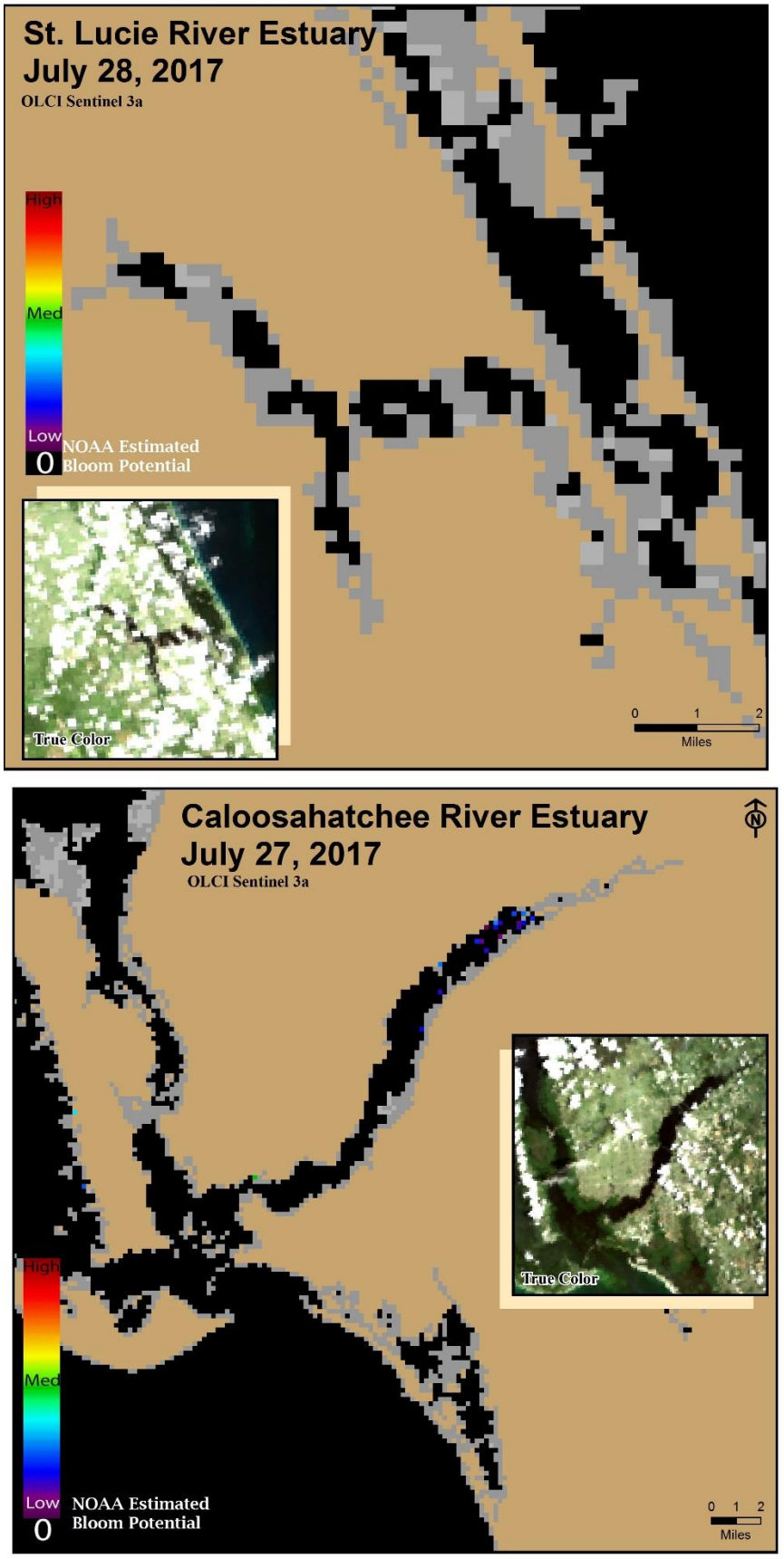
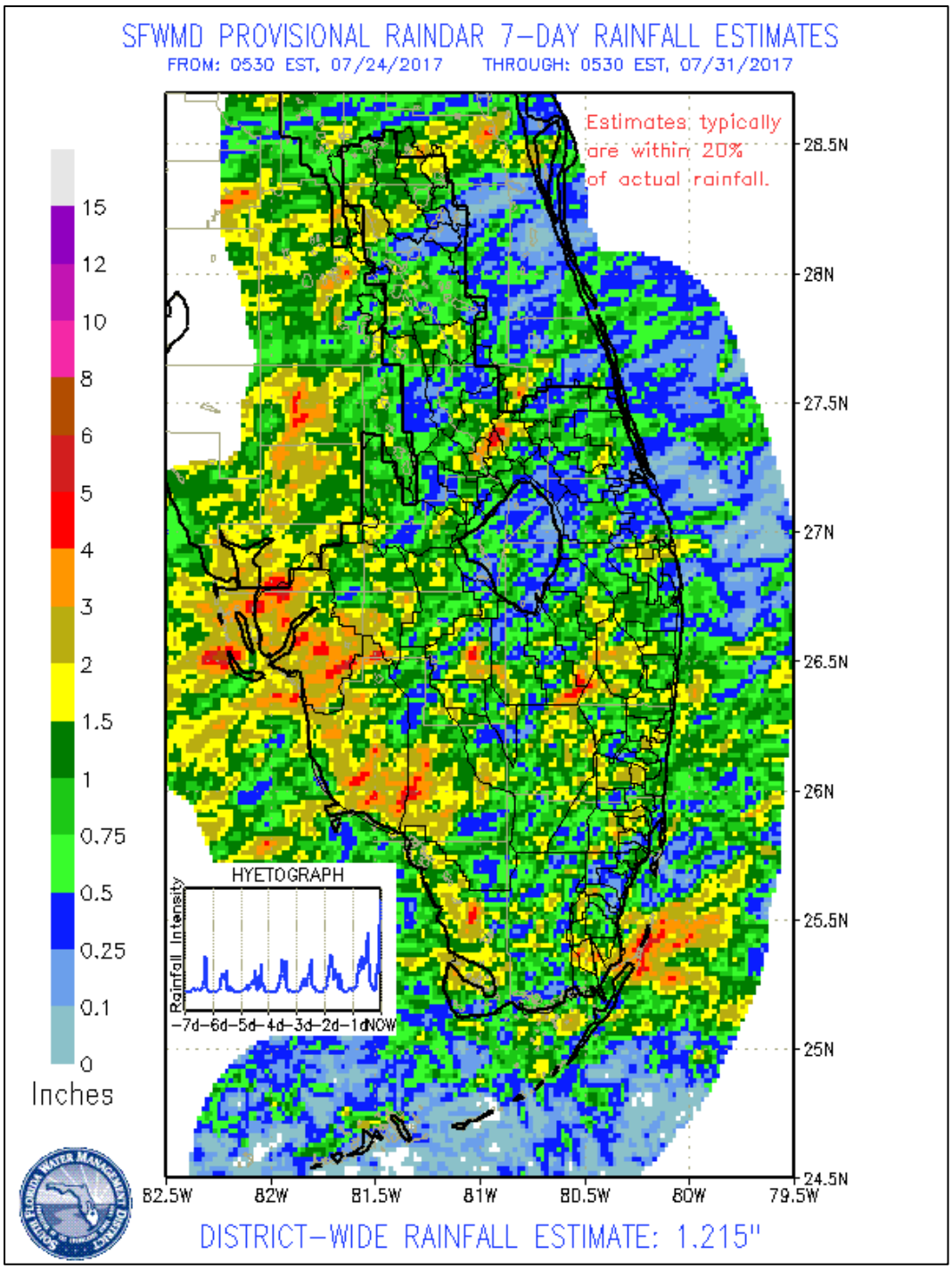


Figure 11. Sentinel 3a Satellite imagery provided by NOAA uses Ocean and Land Color Instrument (OLCI) to estimate cyanobacteria bloom potential in Caloosahatchee Estuary.

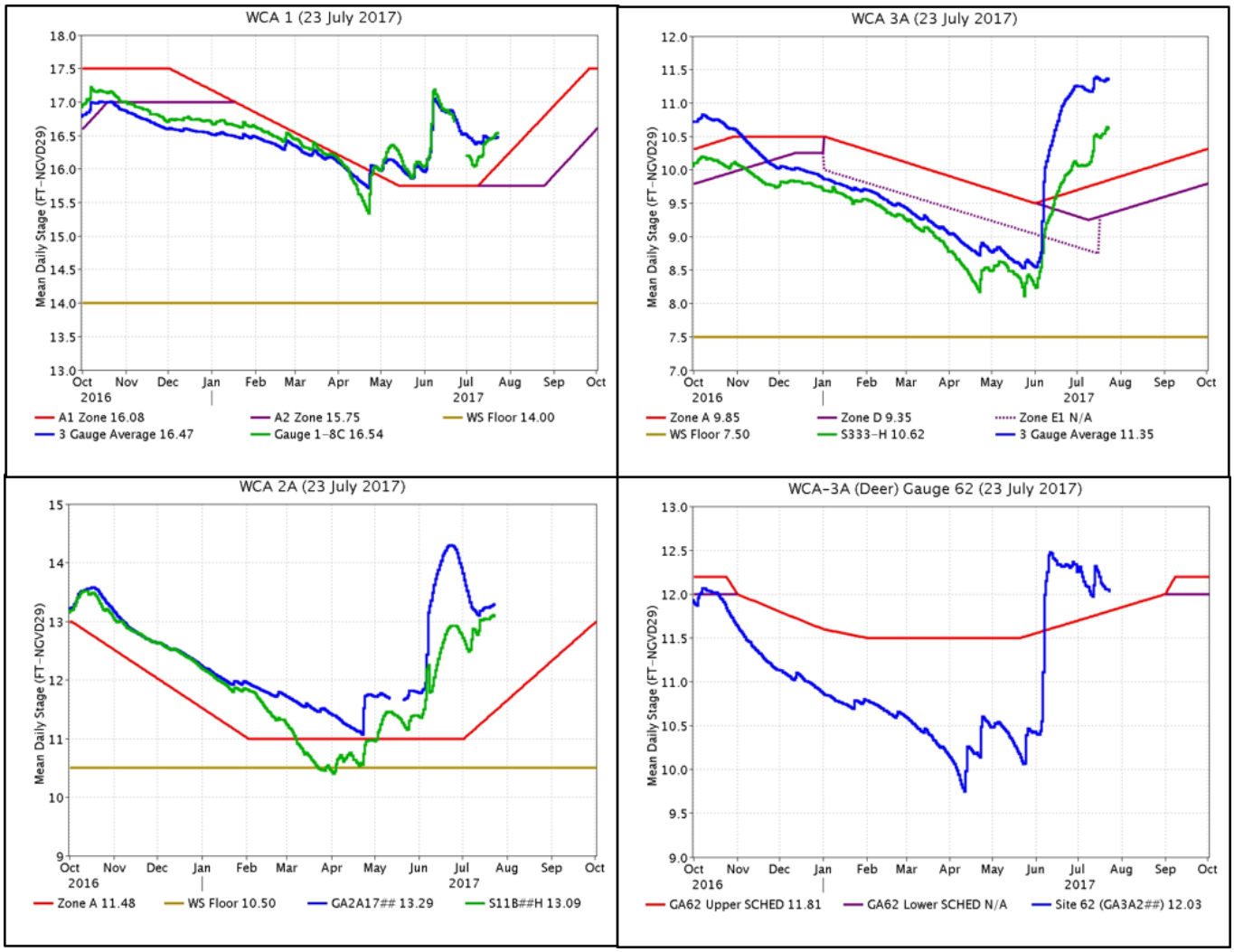
EVERGLADES

Near average rainfall resulted in a moderate increase in stage across the Everglades except for WCA-3A & 2A. Stages decreased all four gauge locations in WCA-3A. WCA-1, 2A and 3A all moved closer but remain above their regulation schedules.

Everglades Region	Rainfall (Inches)	Stage Change (feet)
WCA-1	1.71	+0.05
WCA-2A	1.33	−0.03
WCA-2B	0.73	+0.04
WCA-3A	1.21	−0.09
WCA-3B	0.92	+0.14
ENP	1.19	+0.25

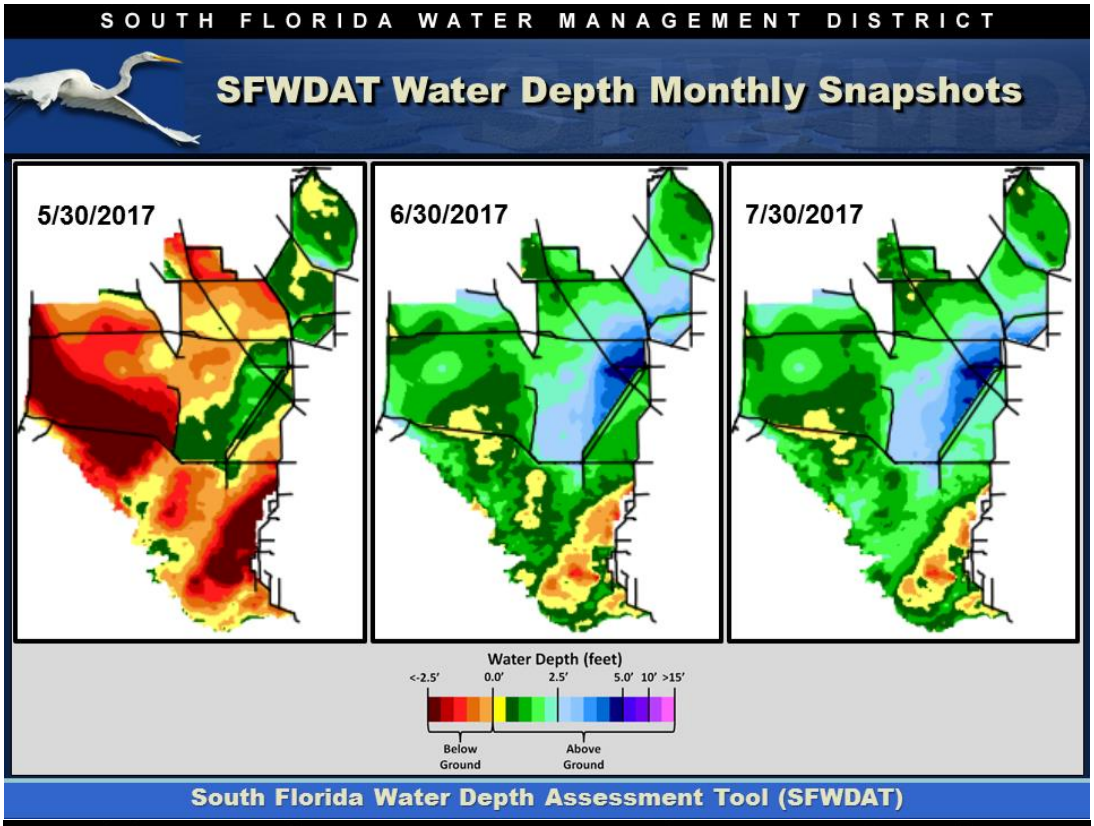


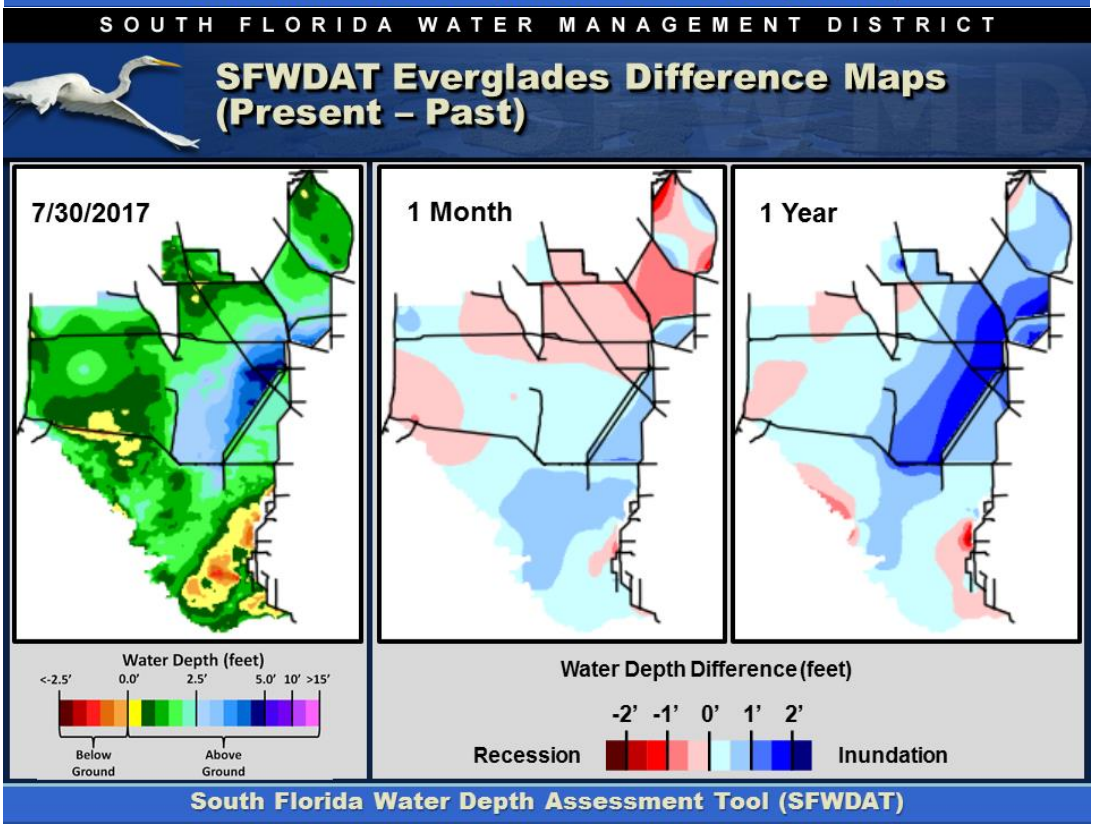
Regulation Schedules: WCA-1 stage is 0.23 feet above Zone A, and stage difference between the marsh and the canal is minimal at about 0.1 feet. WCA-2A marsh stage at gauge GA2A17 is currently 1.63 feet above zone A. Marsh stage is .26 feet higher than canal stage at S11B. WCA-3A three-gauge average is 1.36 feet above zone A, and .76 feet higher than canal stage. WCA-3A at gauge 62 (Northwest corner) is 0.03 feet above schedule.



Blue – wetlands
Green – canals

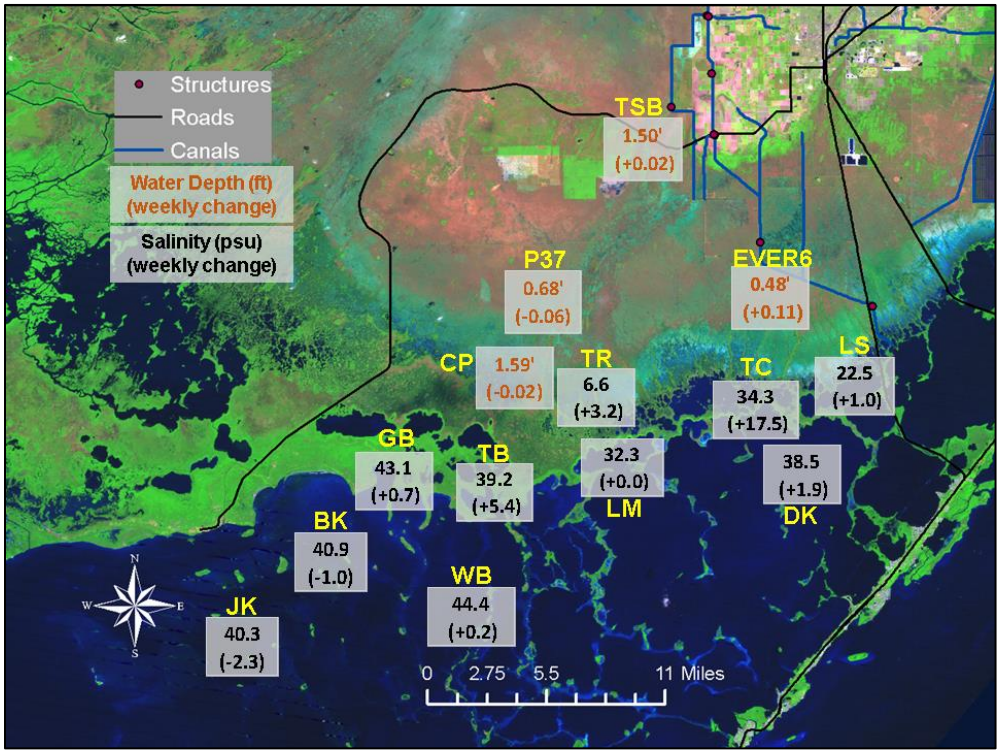
Water Depths and Changes: This week's range of water depths at monitored gauges other than in WCA-2B ranged from 1.24 feet (WCA-1) to 3.36 feet (WCA-3A gauge 65). Over the last week individual gauge changes ranged from -0.15 feet (WCA-3A Northwest) to +0.06 feet (WCA-1). Pan evaporation was estimated to be 2.0 inches which is higher than the pre-project estimate of 1.42 inches.

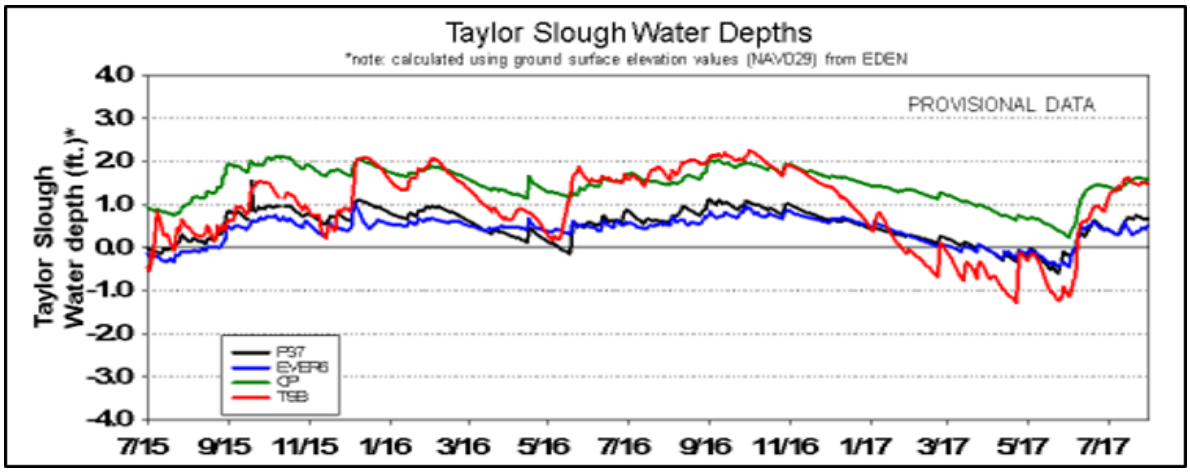


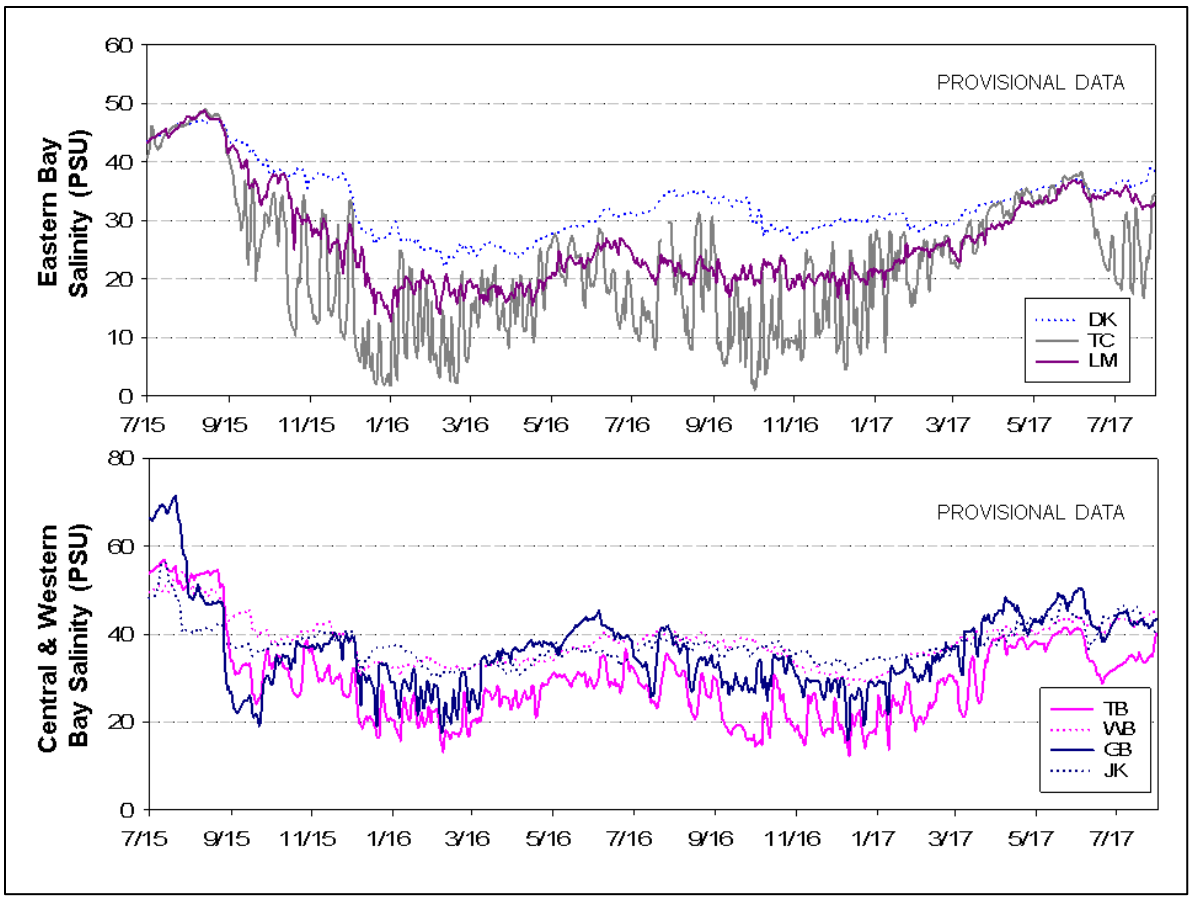


Taylor Slough stages: Water levels changed −0.06 to +0.11feet this past week in Taylor Slough and the Everglades National Park (ENP) panhandle. The largest change was in the ENP panhandle region which would be influenced by overbank flow from the C-111 canal. All areas are two to three inches above the historic average for this time of year.

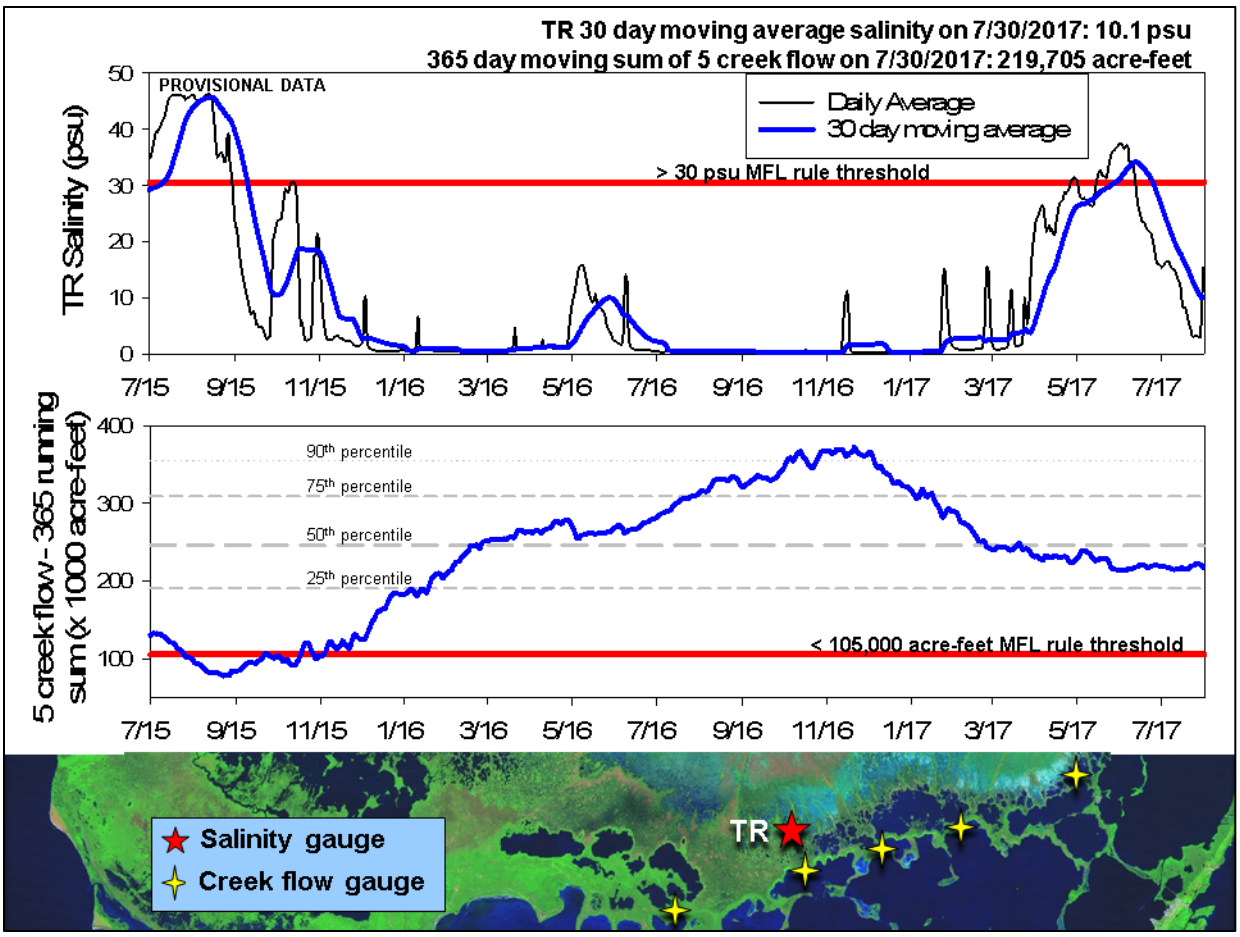
Florida Bay salinity: Salinity changes ranged from −2.3 psu in western Florida Bay to +17.5 psu in the northeastern nearshore area. Salinities currently range from 22 psu in the US Highway 1 corridor in the east to 44 psu in the central bay. Compared to historic averages, current salinities are 3 to 16 psu above average with the northeastern nearshore furthest from average.







Florida Bay MFL: Mangrove zone daily average remained at 3 psu for most of the week before rising to 7 psu this weekend with upstream water movement. The 30-day moving average changed −3.3 to end the week at 10.1 psu. The cumulative weekly flow from the five creeks identified by the stars on the map was approximately −2,200 acre-feet after sustained negative flows starting on Friday. The 365-day moving sum of flow from the five creeks identified by stars on the map increased by about 400 acre-feet to 219,705 acre-feet (still below the long-term average of 257,628 acre-feet). Creek flow is provisional data from the US Geological Survey and is highly variable.



Water Management Recommendations

The rate of stage flux 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/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 the tree islands have been flooded for 44 days.

At this time there is no recommendation relating to the closure of the S-11 structures as part of the temporary deviation to WCA-2A regulation schedule. Next week an evaluation will be made of the hydrologic needs of Northern WCA-3A as a result of this closure.

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

Everglades Ecological Recommendations, August 1st, 2017 (red is new)

Area	Current Condition	Cause(s)	Recommendation	Reasons
WCA-1	Stages increased from +0.02' to +0.06'	Rainfall, ET, management	Moderate ascension rates as possible. Releasing inflows through S-10s to moderate ascension is recommended. 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 decreased −0.03'	Rainfall, ET, management	Moderate ascension rates as possible.	Protect habitat, wildlife and support apple snail reproduction.
WCA-2B	Stages increased +0.04'	Rainfall, ET, management	Moderate ascension rates as possible.	Protect habitat, wildlife and support apple snail reproduction.
WCA-3A NE	Stages decreased −0.10'	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 −0.07'	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 44 days.
Southern WCA-3A S	Stages decreased −0.07'	Rainfall, ET, management		
WCA-3B	Stages decreased from −0.06' to −0.12'	Rainfall, ET, management	Moderate ascension rates as possible..	Protect habitat, wildlife and support apple snail reproduction.
ENP-SRS	Stages decreased −0.05'	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 +0.11'	Rain, ET, inflows	Move water southward as possible	When available provide freshwater buffer for ecosystems and slow recession rates.
FB- Salinity	Salinity changes ranged −2.3 to +17.5 psu	Rain, ET, inflows, wind	Move water southward as possible	When available provide freshwwater to buffer hypersalinity conditions.