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, Engineering and Construction Bureau
Paul Linton, Administrator, Water Control Operations Section

FROM: SFWMD Staff Environmental Advisory Team

DATE: August 9, 2016

SUBJECT: Weekly Environmental Conditions for Systems Operations

Summary

Kissimmee
On Sunday, stage in East Lake Toho, Lake Toho, and Kissimmee-Cypress-Hatchineha were below schedule by 0.2, 0, and 0.5 feet, respectively. Over the past week, discharge at S65, S65A, and S65E averaged 579, 684, and 986 cfs, respectively. Tuesday morning discharges were: ~715 cfs, ~710 cfs, ~1147 cfs, and ~1188 cfs, respectively at S65, S65A, S65C, and S65E. Dissolved oxygen in the Kissimmee River averaged 4.58 mg/L over the past week and 4.68 mg/L on Sunday. Kissimmee River mean floodplain depth on Sunday was 0.39 feet. There are no new recommendations for this week.

Lake Okeechobee
Lake Okeechobee is at 14.63 feet NGVD having remained static over the past week. The Lake remains in the low flow sub-band. Lake levels are approximately 0.75 feet too high for this time of year and there is a potential for negative impacts to Submerged Aquatic Vegetation (SAV). Various data sources indicate the presence of large dense cyanobacterial blooms on the Lake.

Estuaries
Total discharge to the St. Lucie estuary average 1371 over the past week with 631 cfs (46%) coming from Lake Okeechobee. Salinity at the US1 Bridge is in the good range for oysters. Total inflow to the Caloosahatchee estuary average 4356 cfs over the past week with 774 cfs (18%) coming from the Lake. Salinity conditions are good for tape grass in the upper estuary. Salinity conditions are good for oysters at the Sanibel Causeway and Shellpoint, but in the poor range at the Cape Coral Bridge.

Stormwater Treatment Areas
Over the past week, the STAs/FEBs received approximately 5,400 acre-feet of Lake regulatory releases. The total amount of Lake regulatory releases sent to the STAs/FEBs in WY2017 (since May 1, 2016) is approximately 58,300 acre-feet. All STA cells are at or above target depths. Operational restrictions are in place for vegetation rehabilitation in STA-1E and STA-5/6 and structure repairs are underway in STA-1E. In addition, nests of Endangered Species Act (ESA) protected species have been observed in STA-1E and STA-5/6. This week, as conditions allow, lake releases will be sent to STA-1E and STA-1W.

Everglades
Rainfall was high last week, so stages rose from 0.14 feet to 0.57 feet. Water levels remain shallow in northeastern WCA-3A and in WCA-1, where the northern half has been closed to airboat access. Additional water is requested for WCA-1 and northeastern WCA-3A. The 30-day moving average

salinity at the Florida Bay MFL site is 0.6 psu and the cumulative 365-day inflow from the five creeks into Florida Bay increased to 316,520 acre-feet.

Weather Conditions and Forecast

Heavy showers/storms focused north through east of the Lake this afternoon through early evening. Today should be the last day of above average rains. A weak low over the Florida panhandle will combine with an upper low just off the east central FL coast and well above average moisture to generate numerous showers/storms, but with a lower coverage than yesterday. High pressure to our east will begin to ridge over south Florida overnight as the upper low weakens and moves across the peninsula. The associated decrease in moisture and less favorable upper level winds should yield a more typical rain day tomorrow and then a below average rain day on Thursday.

KISSIMMEE BASIN

Kissimmee Basin Rainfall

The Upper Kissimmee Basin received 1.03 inches of rainfall in the past week and the Lower Basin received 1.70 inches (SFWMD Daily Rainfall Report 08/08/2016).

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: 8/9/2016

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)	Sunday Departure (feet)						
							8/7/16	7/31/16	7/24/16	7/17/16	7/10/16	7/3/16	6/26/16
Lakes Hart and Mary Jane	S62	22	LKMJ	60.1	R	60.0	**0.1**	0.1	0.1	0.0	0.1	0.0	0.0
Lakes Myrtle, Preston, and Joel	S57	19	S57	61.0	R	61.0	**0.0**	0.0	-0.1	0.1	0.0	0.0	0.0
Alligator Chain	S60	24	ALLI	63.3	R	63.2	**0.1**	0.0	0.1	0.0	0.0	-0.1	-0.5
Lake Gentry	S63	61	LKGT	61.1	R	61.0	**0.1**	0.1	-0.1	0.2	0.0	0.0	0.1
East Lake Toho	S59	0	TOHOE	56.3	R	56.5	**-0.2**	-0.1	-0.1	-0.1	-0.3	-0.5	-0.7
Lake Toho	S61	0	TOHOW, S61	53.5	R	53.5	**0.0**	-0.1	-0.1	-0.3	-0.4	-0.5	-0.8
Lakes Kissimmee, Cypress, and Hatchineha	S65	579	LKISSP, KUB011, LKIS5B	50.5	R	51.0	**-0.5**	-0.4	-0.4	-0.5	-0.4	-0.5	-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: **8/9/2016**

Metric	Location	Sunday's 1-day average	Weekly Average**									
			8/7/16	7/31/16	7/24/16	7/17/16	7/10/16	7/3/16	6/26/16	6/19/16	6/12/16	6/5/16
Discharge (cfs)	S-65	661	**579**	643	642	545	552	857	2431	3194	3940	2899
Discharge (cfs)	S-65A	725	**694**	638	660	633	660	1211	2890	4455	5649	3348
Discharge (cfs)	S-65C	1129	**1000**	1219	1091	1119	1489	2741	4168	6224	5091	4792
Headwater stage (feet NGVD)		34.3	**34.3**	34.1	34.0	34.1	34.2	34.0	34.1	34.1	34.1	33.9
Discharge (cfs)	S-65D****	1078	**1037**	1284	1263	1272	1835	3108	4552	7361	5471	5186
Discharge (cfs)	S-65E	1142	**986**	1158	1181	1147	1755	2991	4458	7216	5255	5005
DO concentration (mg/L)***	Phase I river channel	4.68	**4.58**	5.01	4.91	4.40	2.74	2.21	1.66	0.77	1.44	0.48
Mean depth (feet)*	Phase I floodplain	0.39	N/A	0.36	0.44	0.63	0.62	1.18	1.93	2.33	3.12	1.75

* 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 PC62 and PC33 starting June 2.PC33 omitted for week of Aug16. DO for week of Sept 15-22 is for PC33 only.

**** S-65D discharge combines discharge at S-65D, S-65DX1, and S-65DX2

***** 1-day spatial average from field measurements in Pools A and BC

N/A Not applicable or data not available.

DATA ARE PROVISIONAL

Water Management Recommendations

Kissimmee Basin Adaptive Recommendations and Operational Actions

Date	Recommendation	Purpose	Outcome	Source
8/9/2016	No new recommendations.			
8/2/2016	No new recommendations.			
7/26/2016	No new recommendations.			
7/19/2016	No new recommendations.			
7/12/2016	No new recommendations.			
6/30/2016	Ramp down S65/S65A discharge by 150 cfs per day to 650 cfs and hold at 650 cfs until lake stage rises to Zone A of the schedule. When stage enters Zone A, ramp up S65 discharge to 1,400 cfs as stage rises from 0.0 to 0.6 feet above the regulation line unless there is a large rainfall event. This ramp up schedule will be reevaluated when the regulation schedule reaches 52.0 feet NGVD.	The ramp down in S65/S65A discharge is intended to lessen the impact of Lake Okeechobee releases on naturally occurring algal blooms. Holding discharge at 650 cfs reflects consideration for the Snail Kites nesting in the Kissimmee River floodplain.	Implemented	SFWMD Operations Control
6/28/2016	No new recommendations.			
6/21/2016	No new recommendations.			
6/14/2016	No new recommendations.			
6/7/2016	No new recommendations.			
5/31/2016	No new recommendations.			
5/24/2016	No new recommendations.			
5/17/2016	No new recommendations.			
5/10/2016	No new recommendations.			
5/3/2016	No new recommendations.			
4/26/2016	No new recommendations.			
4/19/2016	No new recommendations.			
4/12/2016	No new recommendations.			
4/5/2016	No new recommendations.			
3/29/2016	No new recommendations.			
3/22/2016	No new recommendations.			
3/15/2016	No new recommendations.			
3/8/2016	No new recommendations.			
3/1/2016	No new recommendations.			
2/23/2016	No new recommendations.			
2/16/2016	No new recommendations.			
2/9/2016	No new recommendations.			
2/1/2016	Begin F&W recessions in East Toho, Toho, and KCH per the requested recession lines shown in the 2015-16 Dry Season Standing Recommendation (SR). Use Table 2 for guidance on rates of change in discharge to control departures from the line in KCH, and the reversal guidelines shown in the SR for Toho and East.	Initiate and manage lake stage recessions in East Toho, Toho, and KCH for the benefit of fish and wildlife, while avoiding harm to the Kissimmee River	TBD	KB Tech Team
1/20/2016	Continue to adjust discharge at S65 to follow the 2015-16 Dry Season SR guidelines for rampdown at S65A. Balance discharge at the two structures to maintain at least minimum discharge to the river. As stage rises above 51 ft in KCH, temporarily bypass the Fig 1 discharge plan in the SR and manage discharge to let KCH stage rise to 51.5 ft (the Feb 1 recession starting stage) if conditions allow while following rampdown guidelines. If KCH stage rises further than 51.5 ft, we will reevaluate. As changes in discharge become necessary, continue to follow the Table 1 guidelines in the SR. Switch to Table 2 rampup/rampdown guidelines on Feb 1 or when the recession line is intercepted for management of the recession in KCH.	If conditions allow, let stage increase to 51.5 ft to intersect the Feb 1 starting stage for KCH F&W recession line.	Implemented	KB Tech Team

KCOL Hydrographs (through Sunday midnight)

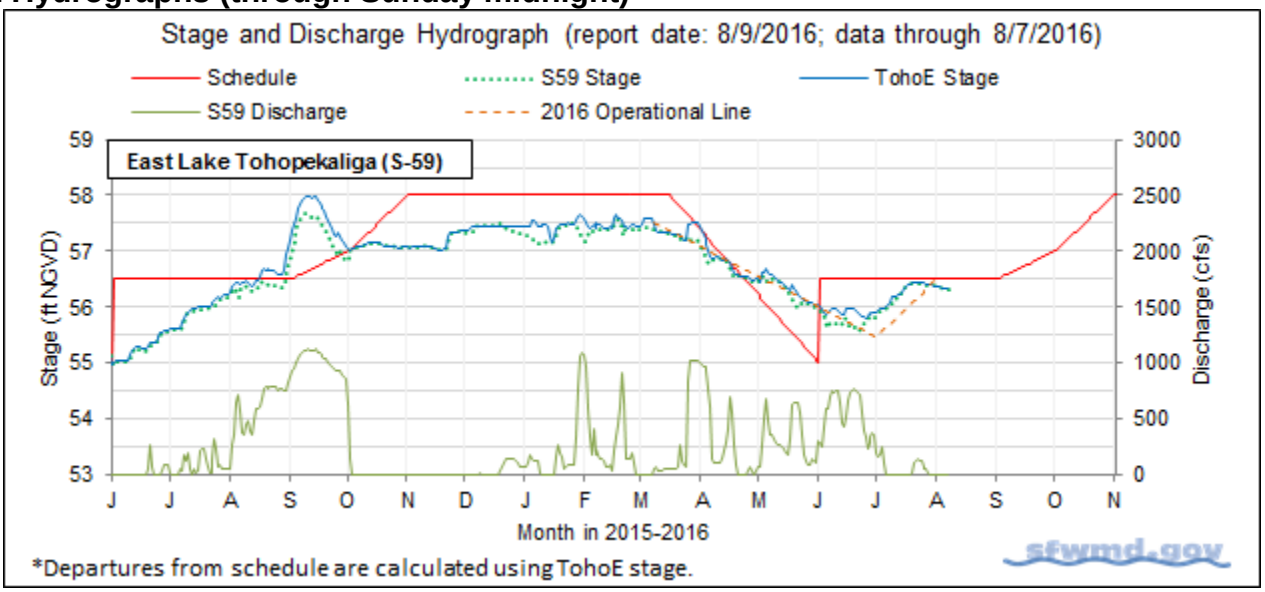


Figure 1.

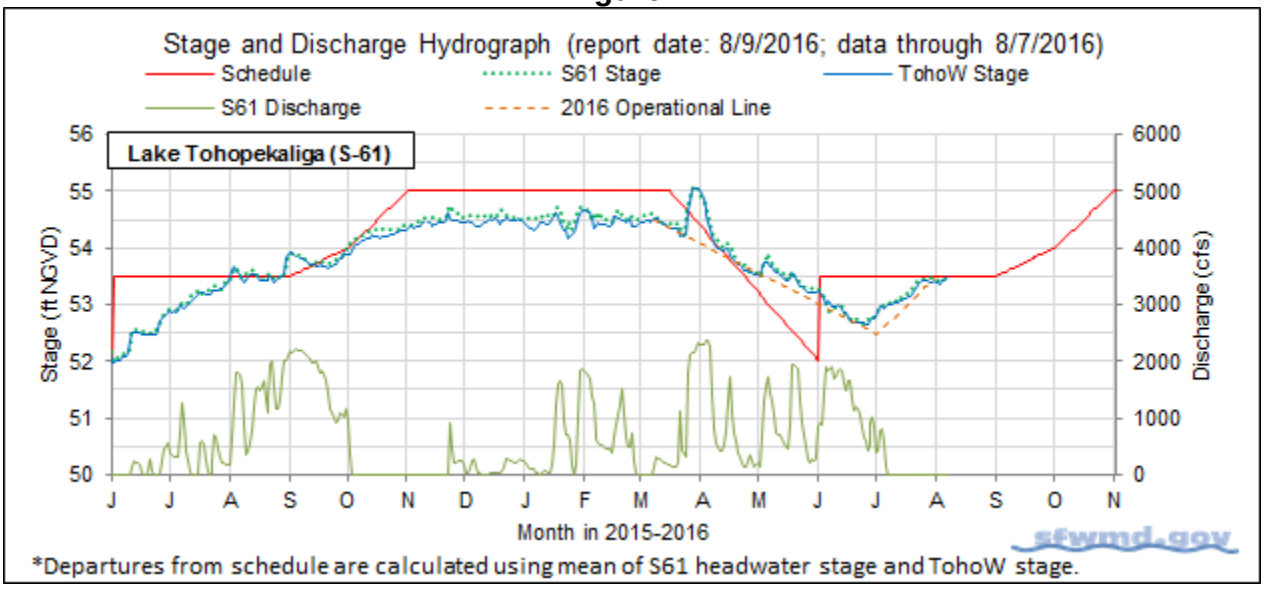


Figure 2.

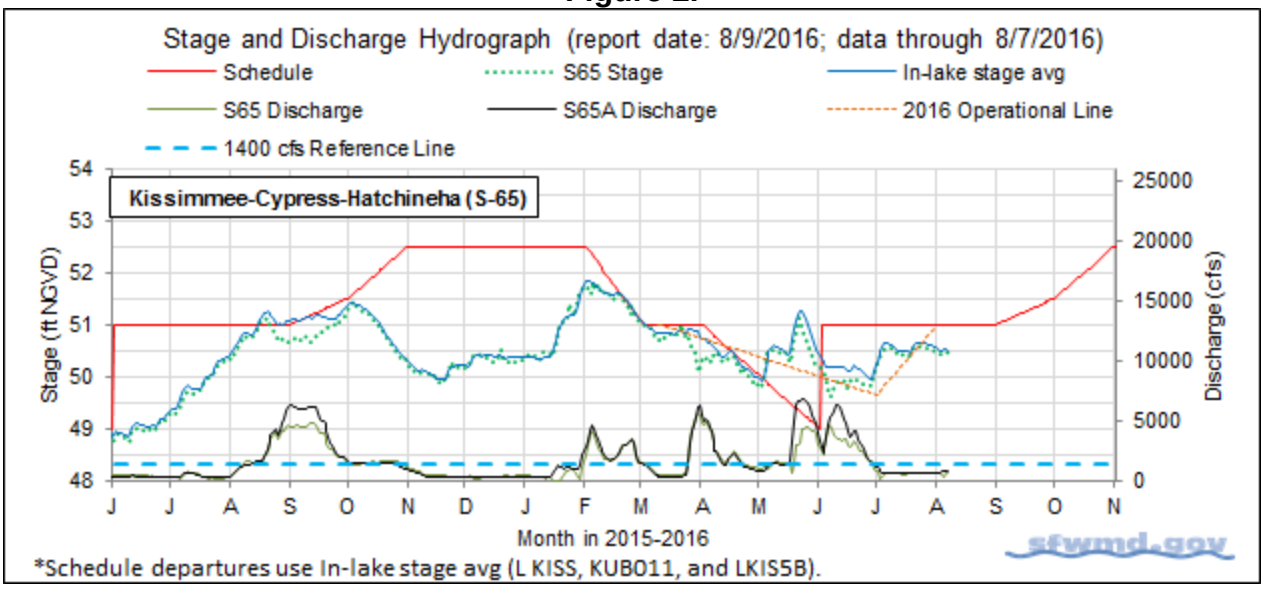


Figure 3.

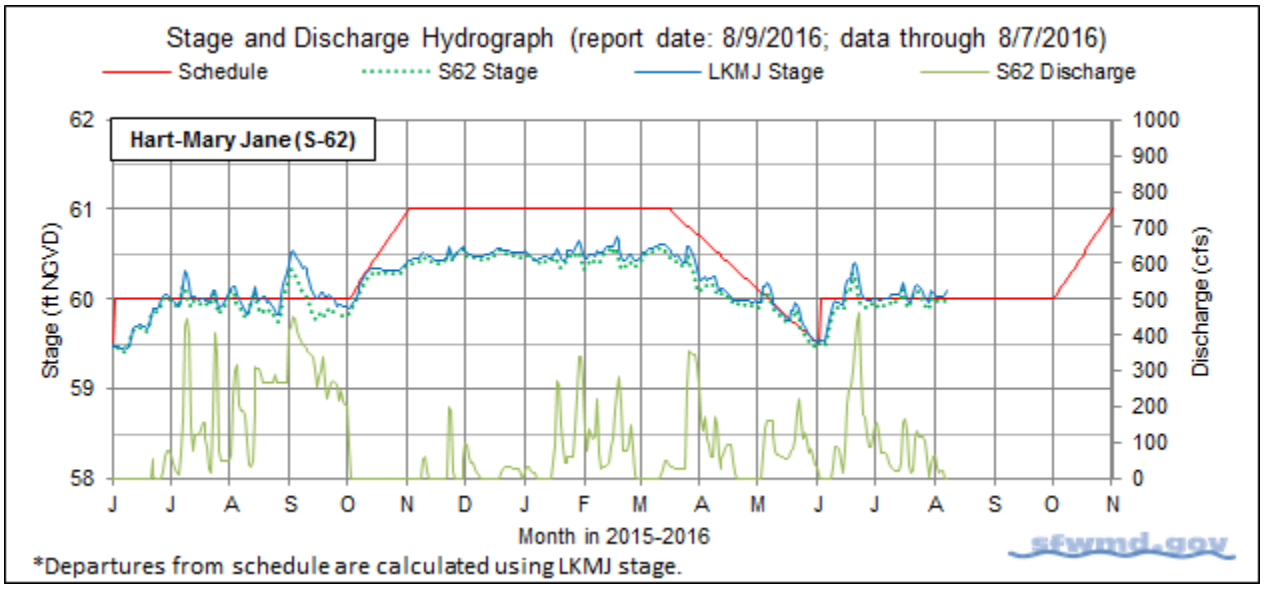


Figure 4.

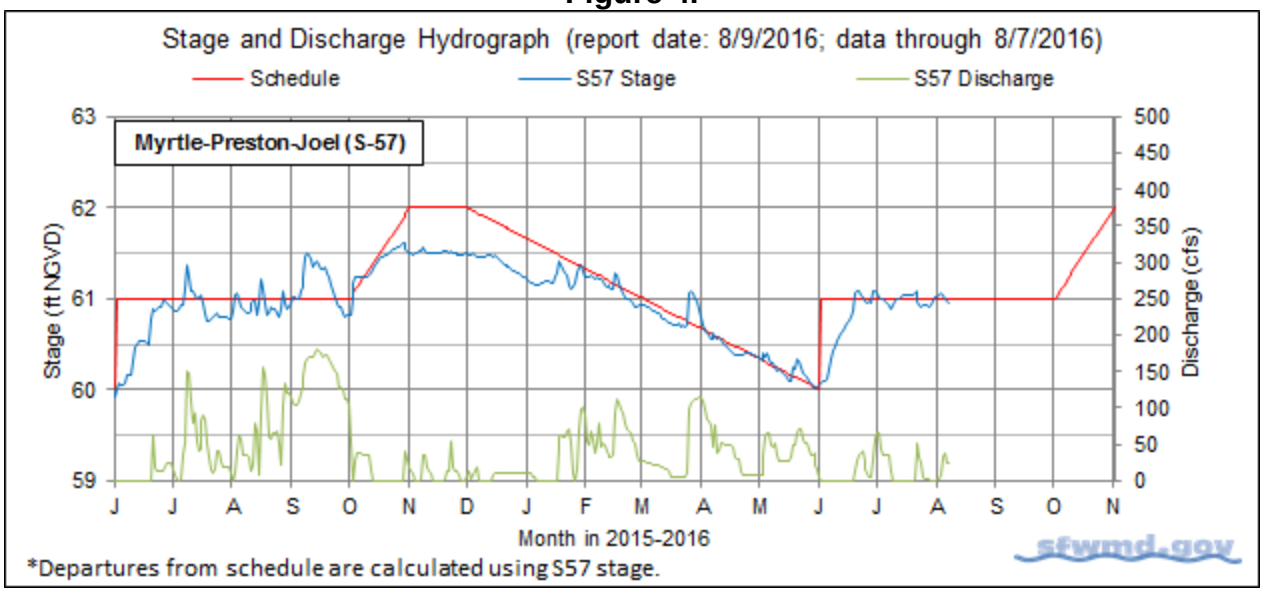


Figure 5.

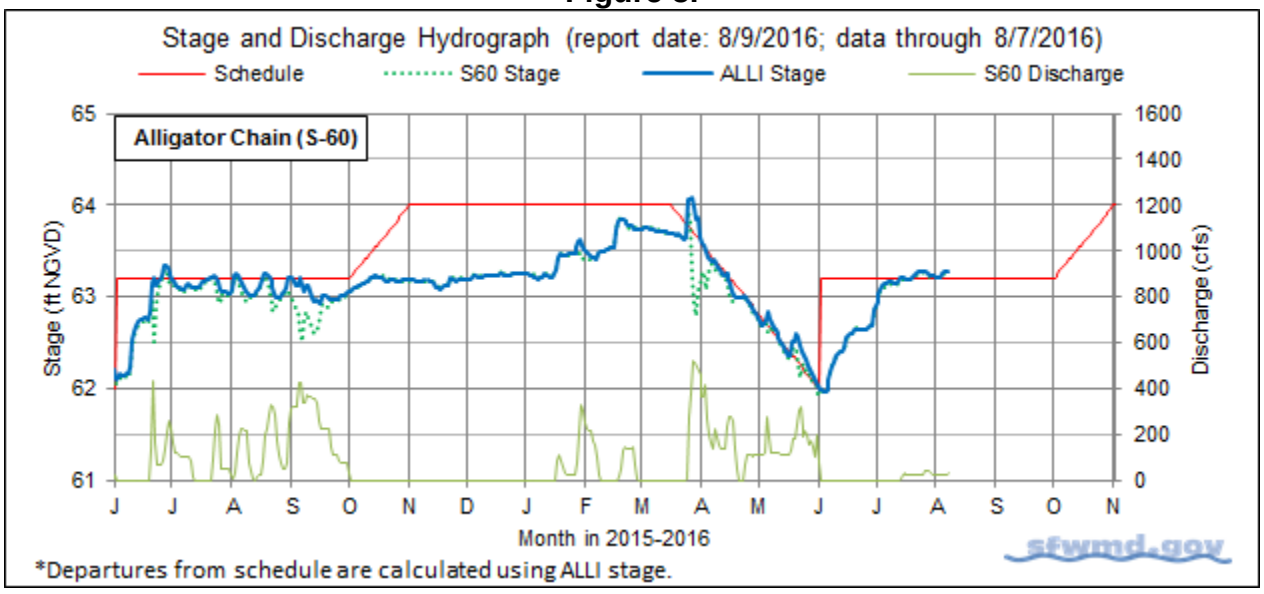


Figure 6.

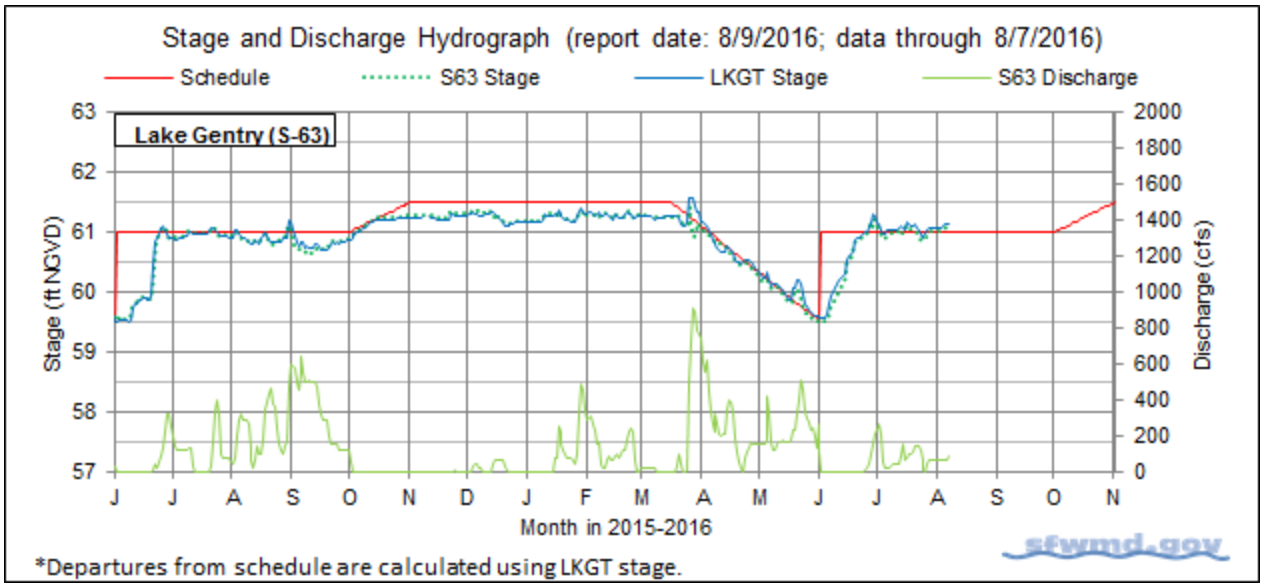


Figure 7.

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Limits on Rate of Discharge Change at S65/S65A During Wet Season 2016

Discharge Rate of Change Limits for S65/S65A (revised 6/30/16). **Rate limits apply only in Zone B**			
	Q (cfs)	Maximum rate of increase (cfs/day)	Maximum rate of decrease (cfs/day)
Zone B	650-1450	150	-150
	1450-1700	250	-250
	1700-2600	300	-300
	2600-3000	400	-400
	>3000	1000	-1000
Zone A	No limits		

Figure 8a. Limits on rate of discharge change at S65/S65A for the 2016 Wet Season.

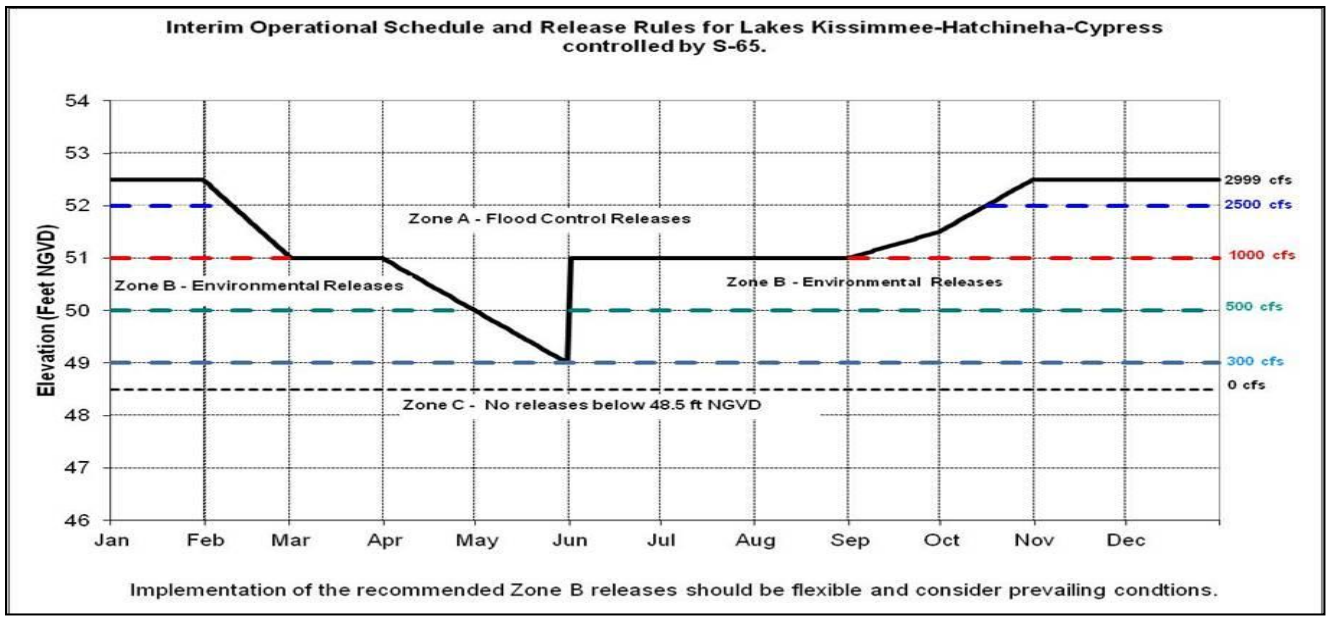


Figure 8b. Interim operations schedule for S-65. The discharge schedule shown to the right has not been used in recent years or in Wet Season 2015.

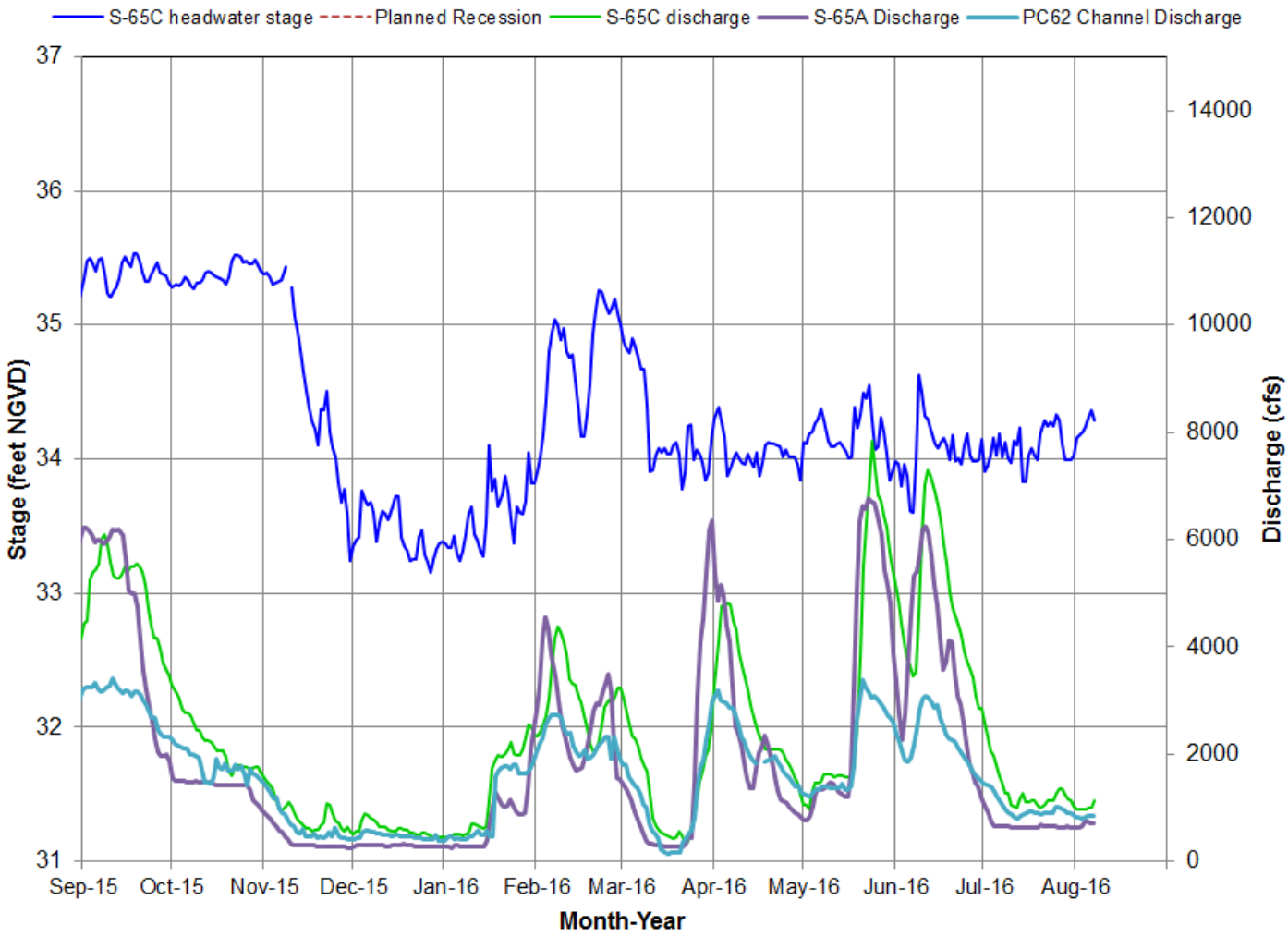


Figure 9. S-65C headwater stage in relation to discharge at S-65C, S-65A, and PC62.

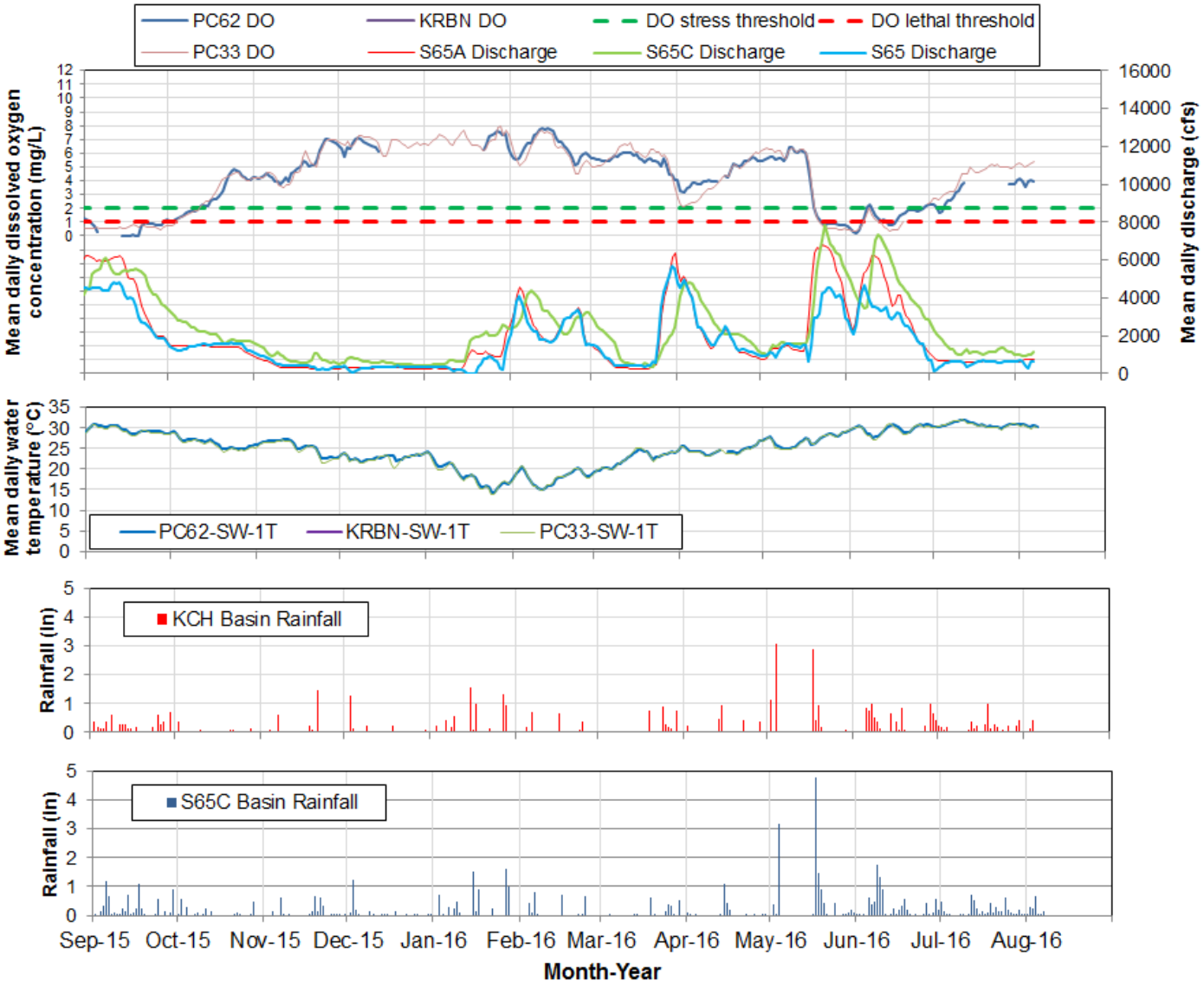


Figure 10. Mean daily Dissolved Oxygen, discharge, temperature and rainfall in the Phase I river channel.

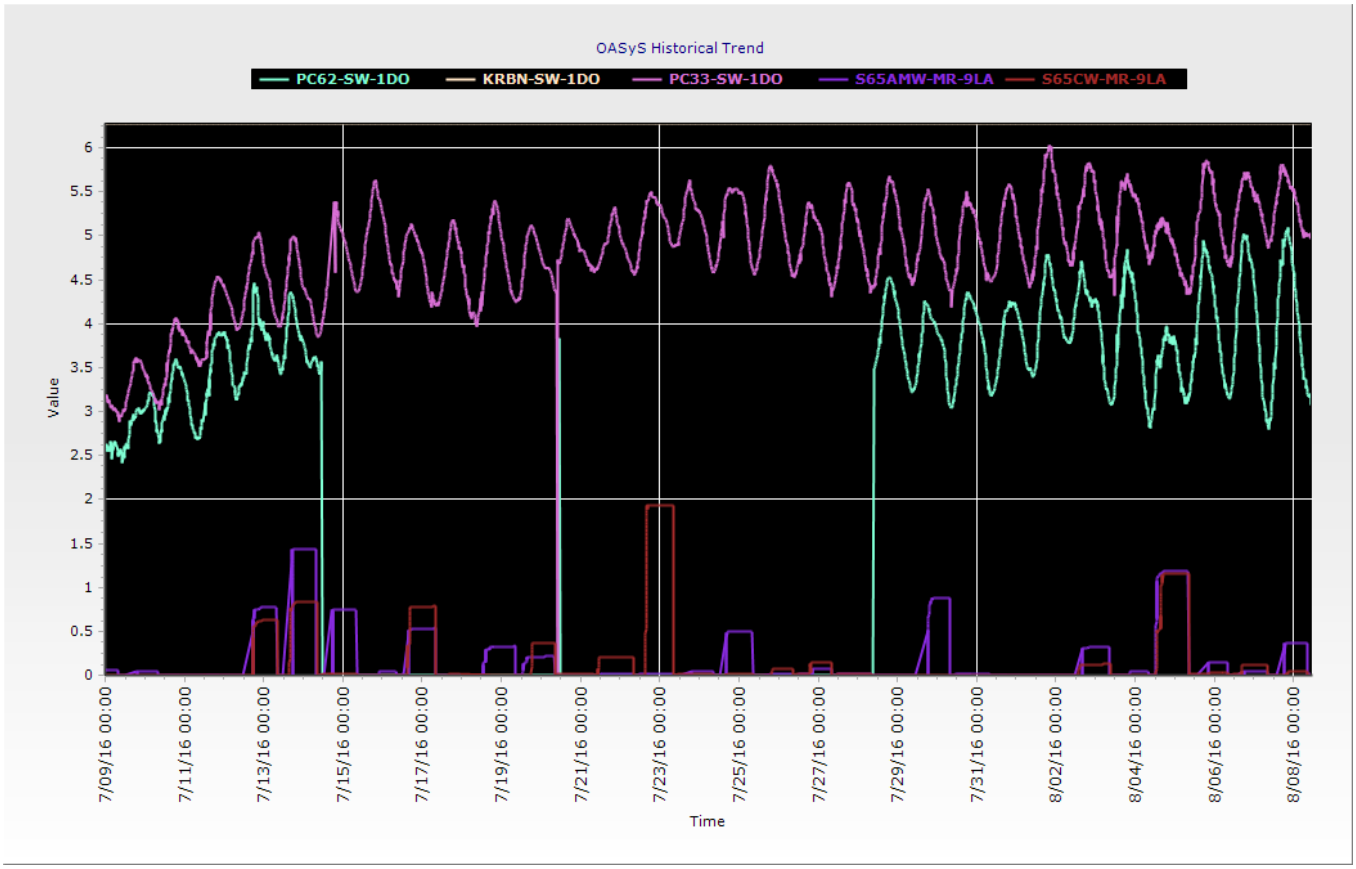


Figure 11. Phase I river channel dissolved oxygen (measured at 15 minute intervals) and rainfall at S65A and S65C.

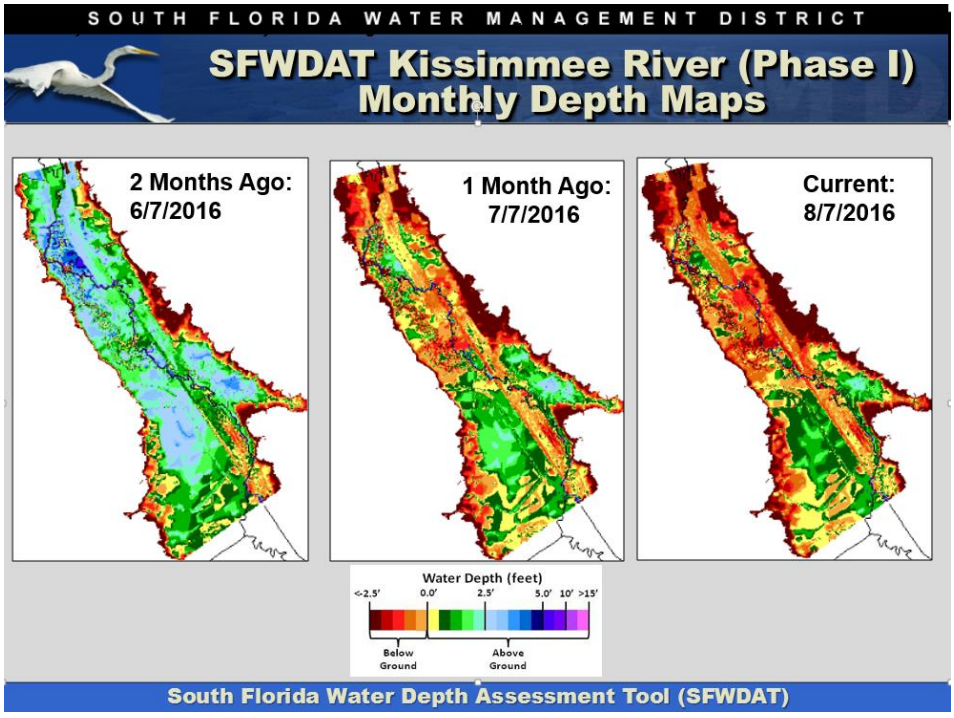
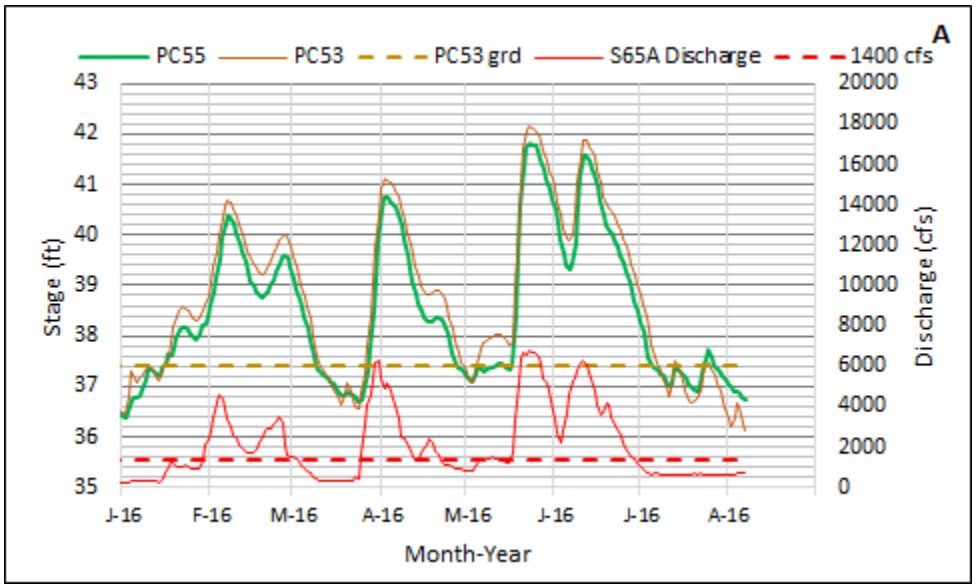
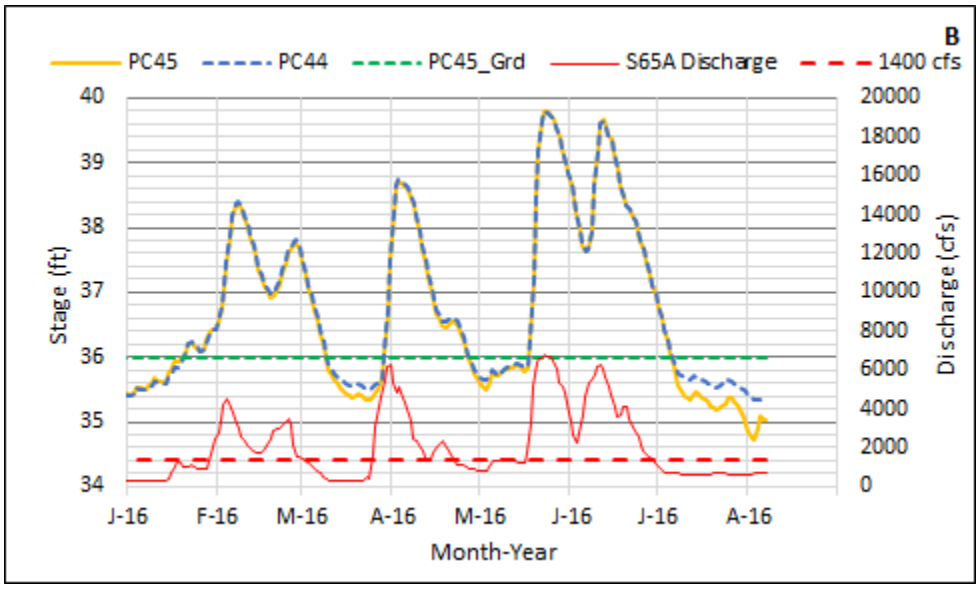


Figure 12. Phase I area floodplain water depths for this week, one month ago, and two months ago. Note that the WDAT color-coding has been modified to accommodate greater water depths; these maps are not directly comparable to Kissimmee Basin WDAT maps published prior to Jan. 16, 2012.





Insert. Stage and ground elevations 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

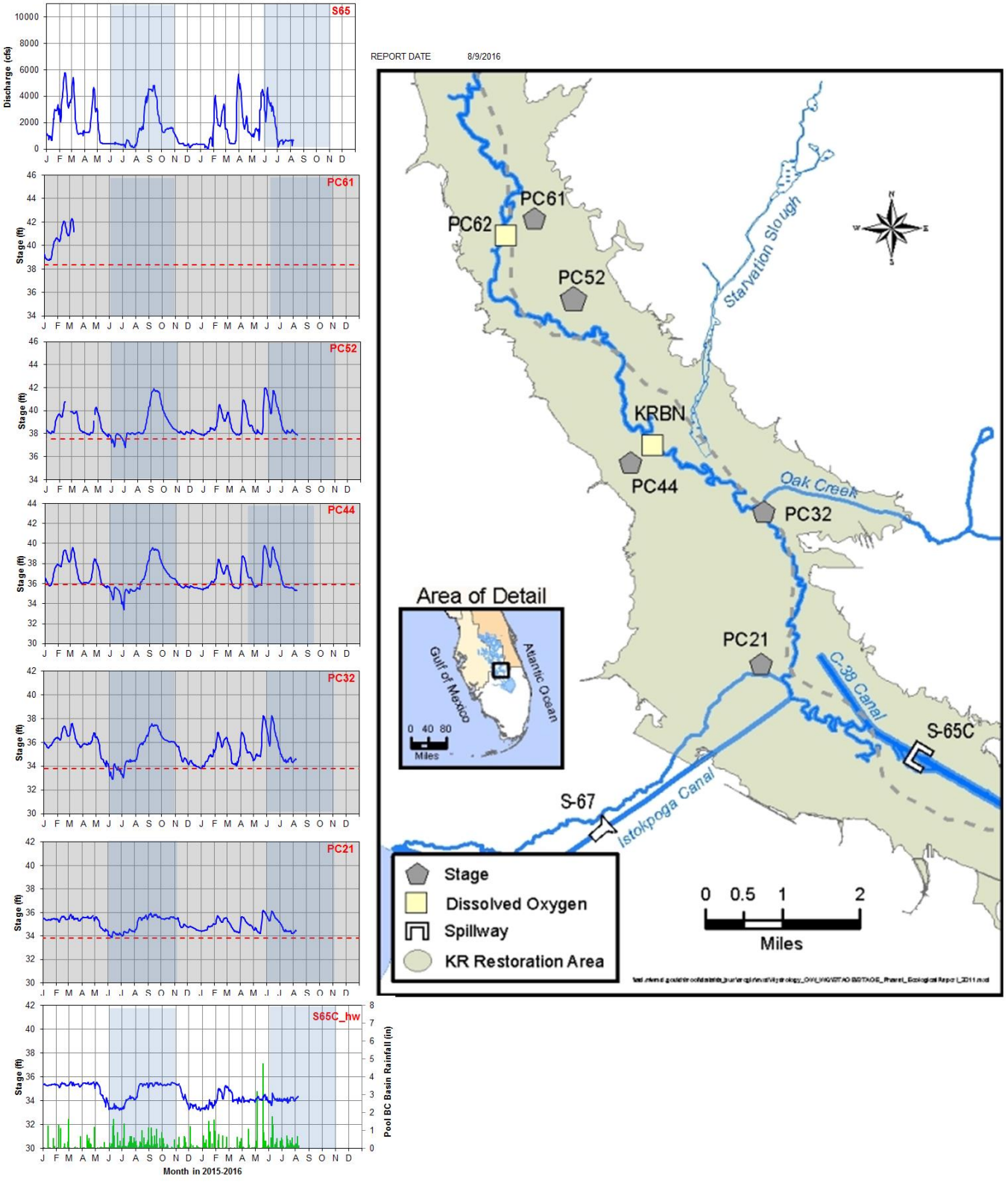


Figure 13. Discharge at S65, stages at five monitoring stations in the Phase I area of the Kissimmee River floodplain, and headwater stage at S65-C since January 1, 2015. The most recent data (~2 weeks) are provisional real-time data from SFWMD DualTrend; previous data are from SFWMD DB-HYDRO (validated).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

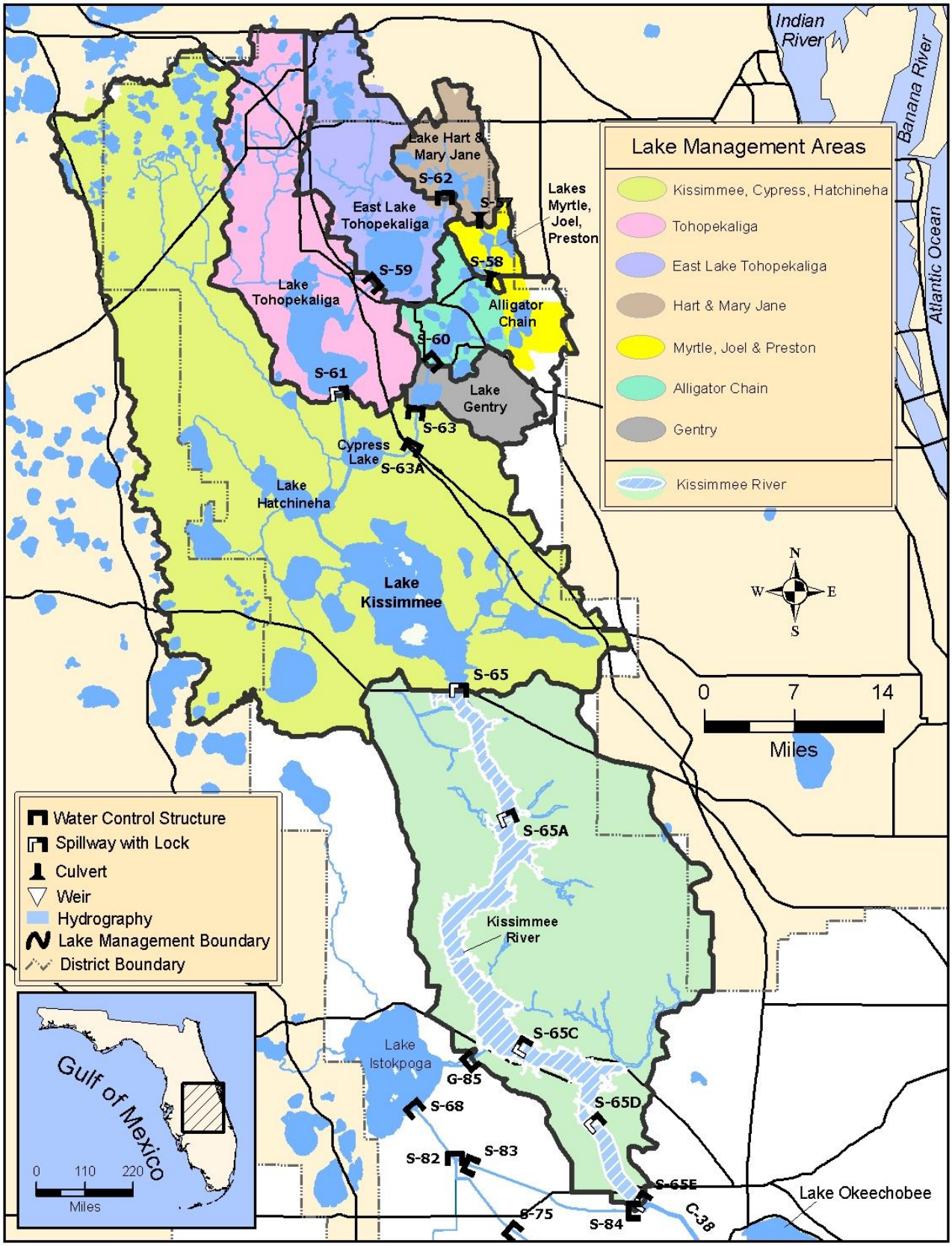


Figure 14. The Kissimmee Basin.

LAKE OKEECHOBEE

According the United States Army Corps of Engineers (USACE) web site Lake Okeechobee stage is at 14.63 feet NGVD for the period ending at midnight on August 08, 2016. This value is based on the use of four interior Lake Stations (L001, L005, L006, and LZ40) and four perimeter stations (S352, S308, S4 and S133). Lake stage showed no net change over the past week and is 0.23 feet lower than it was a month ago and 2.34 feet higher than it was a year ago (Figure 1). The Lake is in the low flow sub-band (Figure 2). According to RAINDAR, 1.94 inches of rain fell directly over the Lake during the past seven days. The surrounding watershed, experienced similar rainfall amounts to the north but higher amounts to the east, west and south (Figure 3).

Based on USACE reported values, current Lake inflow is approximately 2,677 cfs as detailed below.

Structure	Flow cfs
S65E	1133
S154	0
S84 & 84X	508
S71	195
S72	156
C5(Nicodemus slough dispersed storage)	-103
S191	0
S133 PUMPS	120
S127 PUMPS	53
S129 PUMPS	0
S131 PUMPS	0
S135 PUMPS	108
Fisheating Creek	507
S2 Pumps	0
S3 Pumps	0
S4 Pumps	0

Current Lake outflow is approximately 2,410 cfs exiting at S77 (1313 cfs), S308 (710 cfs) and to the L8 canal through Culvert 10A (378 cfs). Water supply demands decreased in the EAA, compared to the previous week, with a total of 9 cfs exiting through S351, S352, and S354. Corrected ET value based on the L006 weather platform solar radiation data for this past week was 2373 cfs, down from last week's value of 3,500 cfs.

Change in elevation equivalents and average weekly flows for major structures are presented in Figure 4. Weekly average values for S77 and S308 are based on USGS data for the below structure gauges.

The FWC snail kite coordinator reported that during the August Lake Okeechobee survey 52 new nests were identified; most of them in the moonshine bay area (Figure 5). There are currently 82 active nest on the Lake. Twenty-six successful kite nests have been recorded for Lake Okeechobee this season out of a total of 127 nesting attempts (19%).

Water Management Recommendations

Lake stage has been decreasing slowly over the past month but showed no net change over the past week. The current Lake stage is about 0.75 feet too high for this time of year, which may result in an increased loss of Submerged Aquatic Vegetation (SAV). There also appears to be an increase in the occurrence of cyanobacterial blooms and the potential for elevated toxin levels.

Future short-term recommendations are highly dependent on near-term rainfall patterns and amounts. The goal should be to limit the rate of Lake stage increase or continue the current unseasonable recession in Lake stage to avoid exceeding the top of the preferred stage envelope (15.5 feet NGVD) during the wet season.

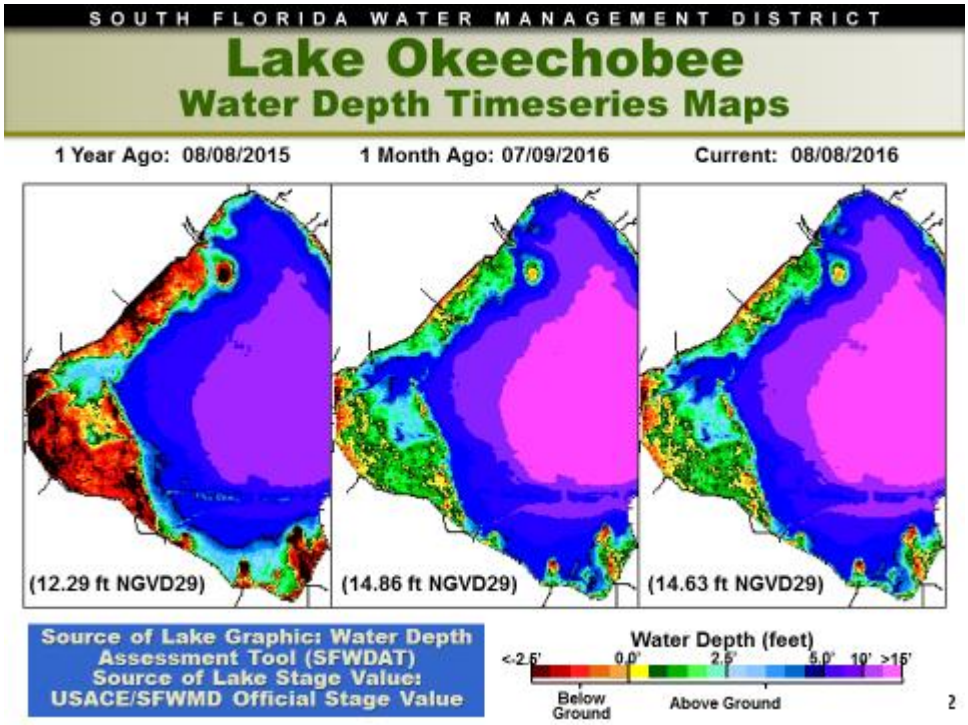


Figure 1

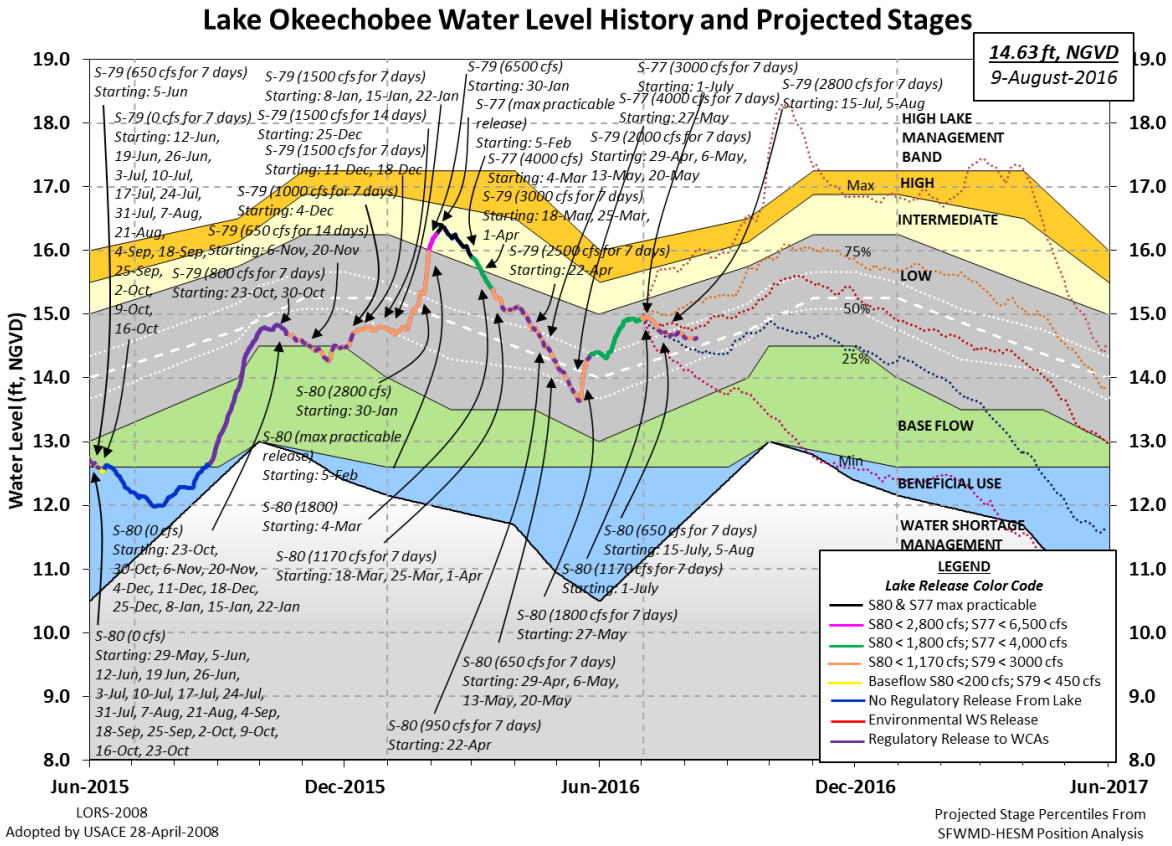

Lake Okeechobee Water Level History and Projected Stages
14.63 ft, NGVD
9-August-2016
Water Level (ft, NGVD)
19.0
18.0
17.0
16.0
15.0
14.0
13.0
12.0
11.0
10.0
9.0
8.0
Jun-2015
Dec-2015
Jun-2016
Dec-2016
Jun-2017
HIGH LAKE MANAGEMENT BAND
HIGH
INTERMEDIATE
LOW
BASE FLOW
BENEFICIAL USE
WATER SHORTAGE MANAGEMENT
Max
75%
50%
25%
Min
S-79 (650 cfs for 7 days) Starting: 5-Jun
S-79 (0 cfs for 7 days) Starting: 12-Jun, 19-Jun, 26-Jun, 3-Jul, 10-Jul, 17-Jul, 24-Jul, 31-Jul, 7-Aug, 21-Aug, 4-Sep, 18-Sep, 25-Sep, 2-Oct, 9-Oct, 16-Oct
S-79 (1500 cfs for 7 days) Starting: 8-Jan, 15-Jan, 22-Jan
S-79 (1500 cfs for 14 days) Starting: 25-Dec
S-79 (1500 cfs for 7 days) Starting: 11-Dec, 18-Dec
S-79 (1000 cfs for 7 days) Starting: 4-Dec
S-79 (650 cfs for 14 days) Starting: 6-Nov, 20-Nov
S-79 (800 cfs for 7 days) Starting: 23-Oct, 30-Oct
S-79 (6500 cfs) Starting: 30-Jan
S-77 (max practicable release) Starting: 5-Feb
S-77 (4000 cfs) Starting: 4-Mar
S-79 (3000 cfs for 7 days) Starting: 18-Mar, 25-Mar, 1-Apr
S-79 (2500 cfs for 7 days) Starting: 22-Apr
S-77 (3000 cfs for 7 days) Starting: 1-July
S-77 (4000 cfs for 7 days) Starting: 27-May
S-79 (2000 cfs for 7 days) Starting: 29-Apr, 6-May, 13-May, 20-May
S-79 (2800 cfs for 7 days) Starting: 15-Jul, 5-Aug
S-80 (2800 cfs) Starting: 30-Jan
S-80 (max practicable release) Starting: 5-Feb
S-80 (1800) Starting: 4-Mar
S-80 (0 cfs) Starting: 23-Oct, 30-Oct, 6-Nov, 20-Nov, 4-Dec, 11-Dec, 18-Dec, 25-Dec, 8-Jan, 15-Jan, 22-Jan
S-80 (1170 cfs for 7 days) Starting: 18-Mar, 25-Mar, 1-Apr
S-80 (0 cfs) Starting: 29-May, 5-Jun, 12-Jun, 19 Jun, 26-Jun, 3-Jul, 10-Jul, 17-Jul, 24-Jul, 31-Jul, 7-Aug, 21-Aug, 4-Sep, 18-Sep, 25-Sep, 2-Oct, 9-Oct, 16-Oct, 23-Oct
S-80 (950 cfs for 7 days) Starting: 22-Apr
S-80 (650 cfs for 7 days) Starting: 29-Apr, 6-May, 13-May, 20-May
S-80 (1800 cfs for 7 days) Starting: 27-May
S-80 (1170 cfs for 7 days) Starting: 1-July
S-80 (650 cfs for 7 days) Starting: 15-July, 5-Aug
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
LORS-2008
Adopted by USACE 28-April-2008
Projected Stage Percentiles From SFWMD-HESM Position Analysis

Figure 2

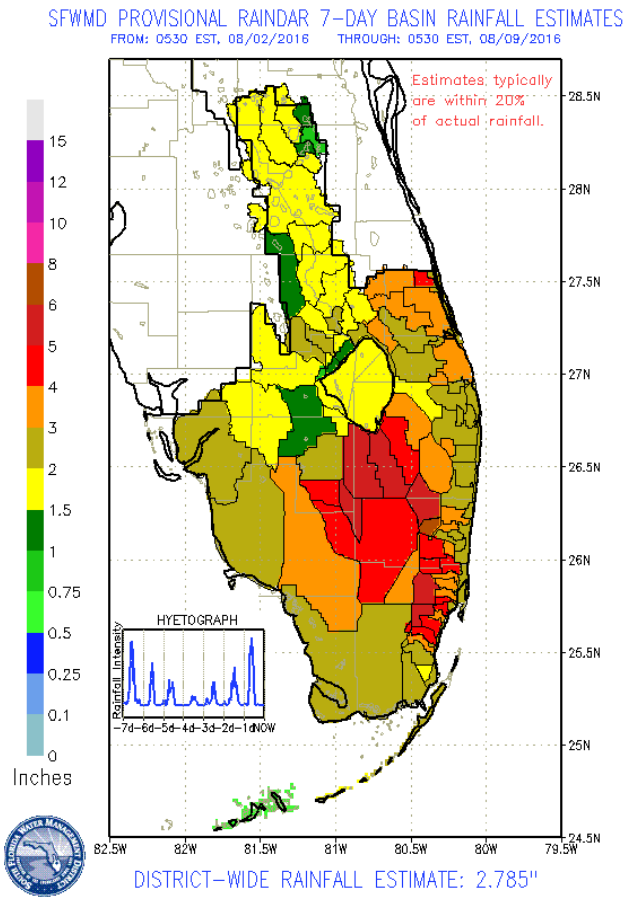

SFWMD PROVISIONAL RAINDAR 7-DAY BASIN RAINFALL ESTIMATES
FROM: 0530 EST, 08/02/2016 THROUGH: 0530 EST, 08/09/2016
Estimates typically are within 20% of actual rainfall.
15
12
10
8
6
5
4
3
2
1.5
1
0.75
0.5
0.25
0.1
0
Inches
HYETOGRAPH
Rainfall Intensity
-7d-6d-5d-4d-3d-2d-1dNOW
28.5N
28N
27.5N
27N
26.5N
26N
25.5N
25N
24.5N
82.5W
82W
81.5W
81W
80.5W
80W
79.5W
DISTRICT-WIDE RAINFALL ESTIMATE: 2.785"

Figure 3

INFLOWS	Average Daily Flow Past Week cfs	Feet of Change Past Week
S65E	1109	0.037
S71 & 72	133	0.004
S84 & 84X	701	0.023
Fisheating Creek	430	0.014
Rainfall	N.A.	0.162
OUTFLOWS	**Average Daily Flow Past Week cfs**	**Feet of Change Past Week**
S77	774	0.026
S308	631	0.021
S351	1	0.000
S352	177	0.006
S354	119	0.004
L8	378	0.013
ET	2373	0.079

Figure 4

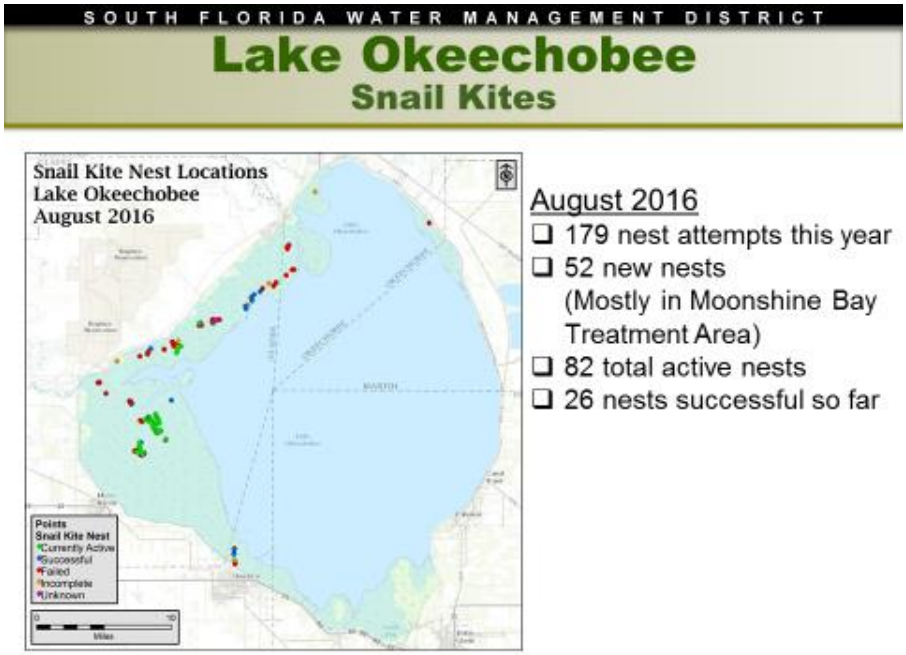


Figure 5

Lake Istokpoga:

The Lake Istokpoga regulation schedule began its ascension towards winter pool stage of 39.50 feet NGVD on August 2, 2016. Lake stage is 38.25 feet NGVD and is currently 0.06 feet below its regulation stage of 38.31 feet NGVD. (Figure 6). Average flows into the Lake from Arbuckle and Josephine creeks were not available. Average discharge from S68 and S68X this past week was 869 cfs, a decrease from the preceding week. According to RAINDAR, 1.42 inches of rain fell in the Lake Istokpoga watershed during the past seven days.

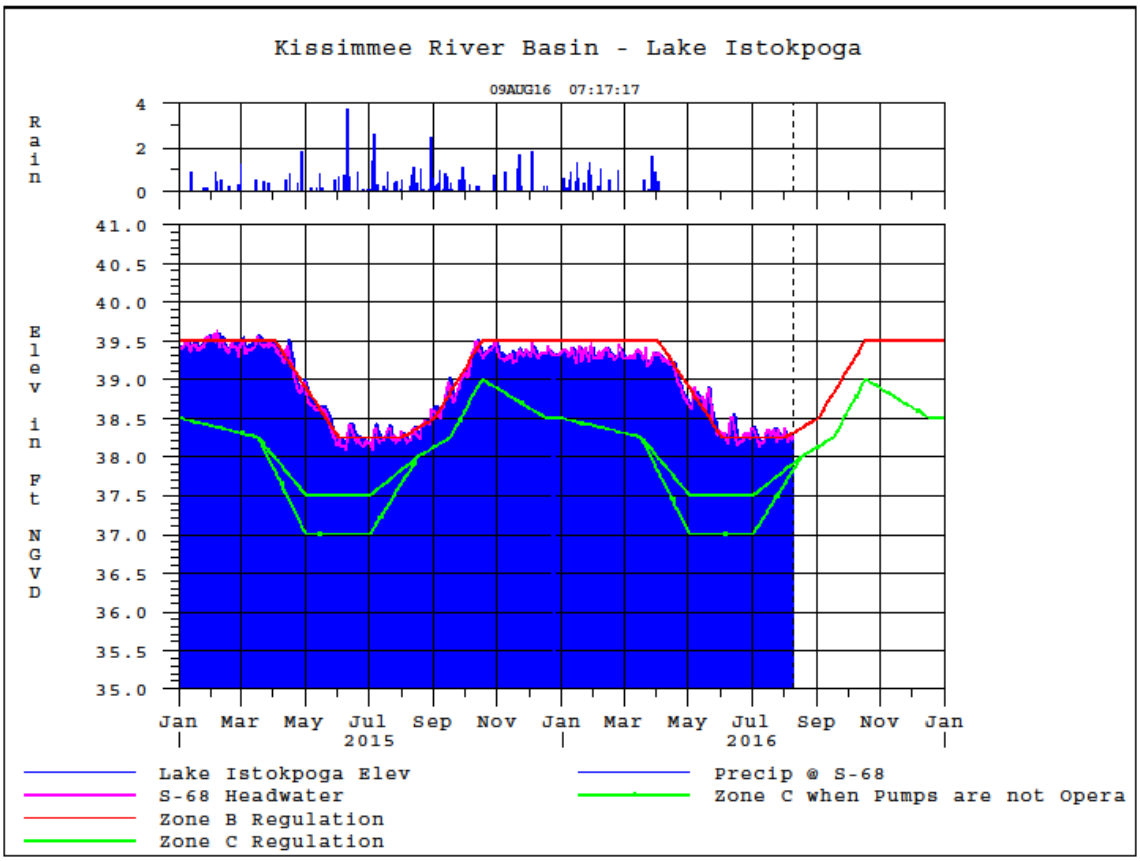


Figure 6

ESTUARIES

St. Lucie Estuary:
Over the past week, provisional flows averaged about 661 cfs at S-80, 631 cfs downstream of S-308, 15 cfs at S-49 on C-24, 109 cfs at S-97 on C-23, and 93 cfs from Ten Mile Creek at the Gordy Road Structure. Average inflow from tidal basin tributaries is estimated to be 493 cfs (Figures 1 and 2). Total inflow averaged about 1,371 cfs last week and 1169 cfs over last month.

Over the past week, salinity remained about the same 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 10.8. Salinity conditions in the middle estuary are just within the good range for the adult eastern oyster.

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** (5.5)	**8.5** (7.7)	NA[1]
US1 Bridge	**9.5** (9.1)	**12.1** (11.6)	10.0-26.0
A1A Bridge	**22.8** (23.1)	**24.1** (24.8)	NA

[1]Envelope not applicable

Caloosahatchee Estuary:
During the past week, provisional flows averaged approximately 774 cfs downstream of S-77, 912 cfs at S-78, and 3,065 cfs at S-79. Average inflow from tidal basin tributaries is estimated to be 1,291 cfs (Figures 5 and 6). Total inflow averaged 4,356 cfs last week and 4,722 cfs over last month.

Over the past week in the estuary, fresh water extended to the Cape Coral Bridge. Downstream. Salinity remained the same as last week (Table 2, Figures 7 and 8). The seven-day average salinity values are within the good range for adult oysters at Shell Point and at Sanibel and has been in the poor range at Cape Coral for 77 consecutive days (Figure 9). The 30-day moving average surface salinity is 0.2 at Val I-75 and 0.2 at Ft. Myers. Salinity conditions at Val I-75 are in the good range for tape grass.

Table 2. 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	**2.6** (2.4)	**3.8** (4.0)	10.0-30.0
Shell Point	**14.0** (13.9)	**17.3** (17.8)	10.0-30.0
Sanibel	**25.6** (25.4)	**27.4** (27.1)	10.0-30.0

[1]Envelope not applicable, [2]Envelope is based on a 30-day average.
*Val I75 is temporarily offline due to bridge 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 3 as concentration ranges of Chlorophyll *a* and dissolved oxygen at Beautiful Island, Ft. Myers, and Shell Point in the Caloosahatchee Estuary.

Table 3. 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)	5.15 – 5.6	5.3 – 6.6	2.0 – 9.8
Dissolved Oxygen (mg/l)	3.7 – 5.0	5.6 – 6.9	4.1 – 6.6

The Florida Fish and Wildlife Research Institute reported on August 5, 2016, that *Karenia brevis, the* Florida red tide organism*,* was not detected in samples collected from Lee County.

<u>Water Management Recommendations</u>
Given the current estuarine conditions, there are no ecological benefits associated with additional releases from Lake Okeechobee.

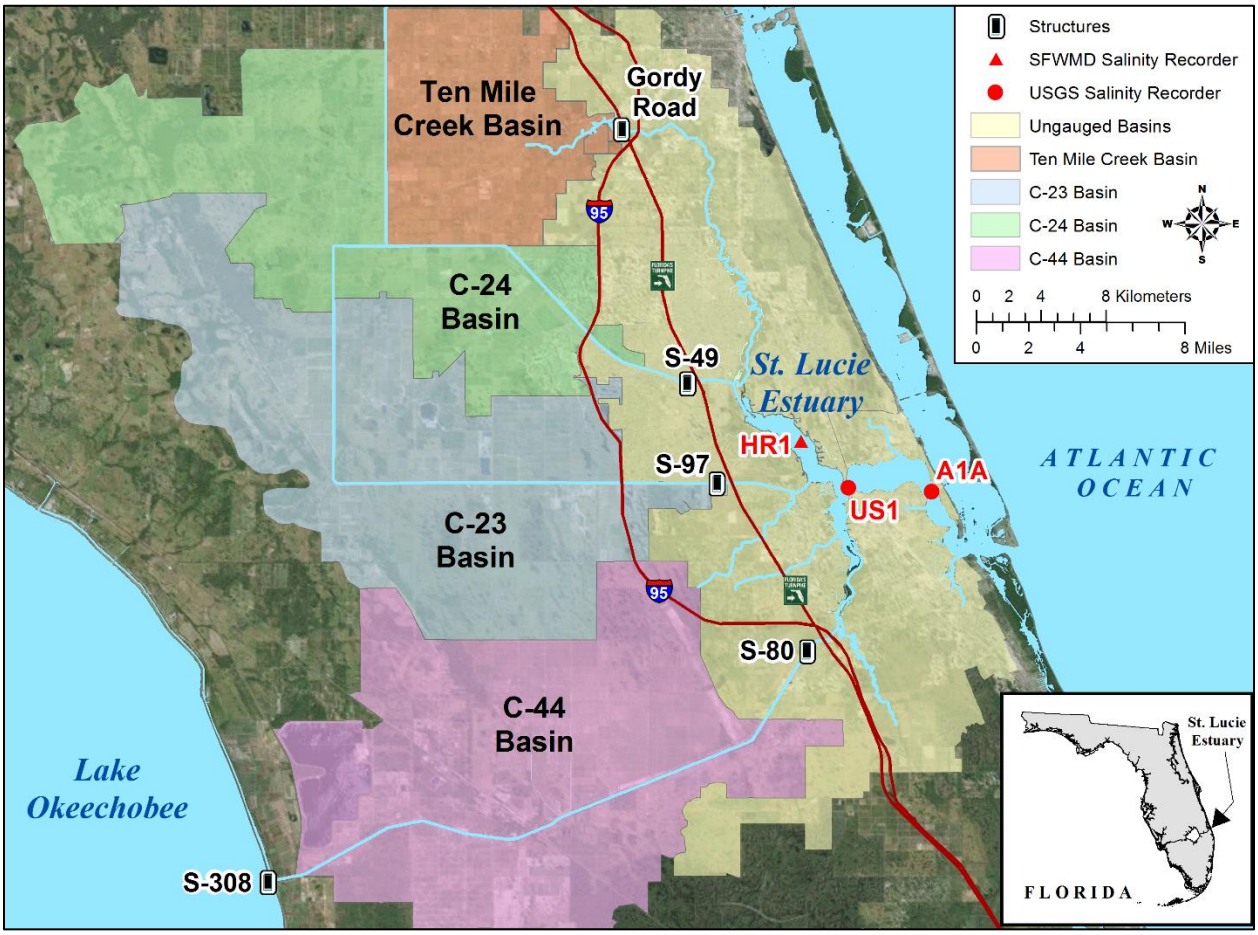


Figure 1. Basins, water control structures, and salinity monitoring for the St. Lucie Estuary.

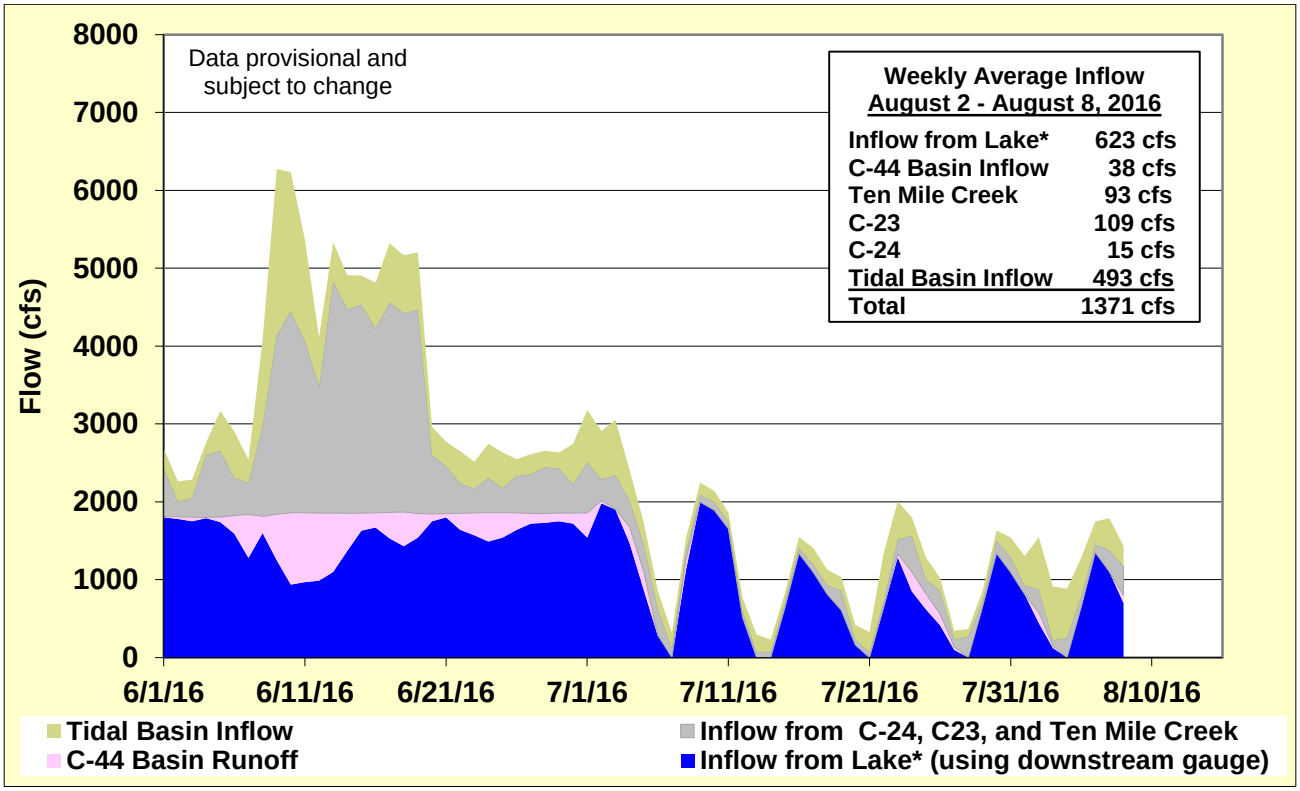


Figure 2. Estimated surface freshwater inflows from Lake Okeechobee and runoff from the C-44, C-23, C-24, Ten Mile Creek, and tidal basins into the St. Lucie Estuary.

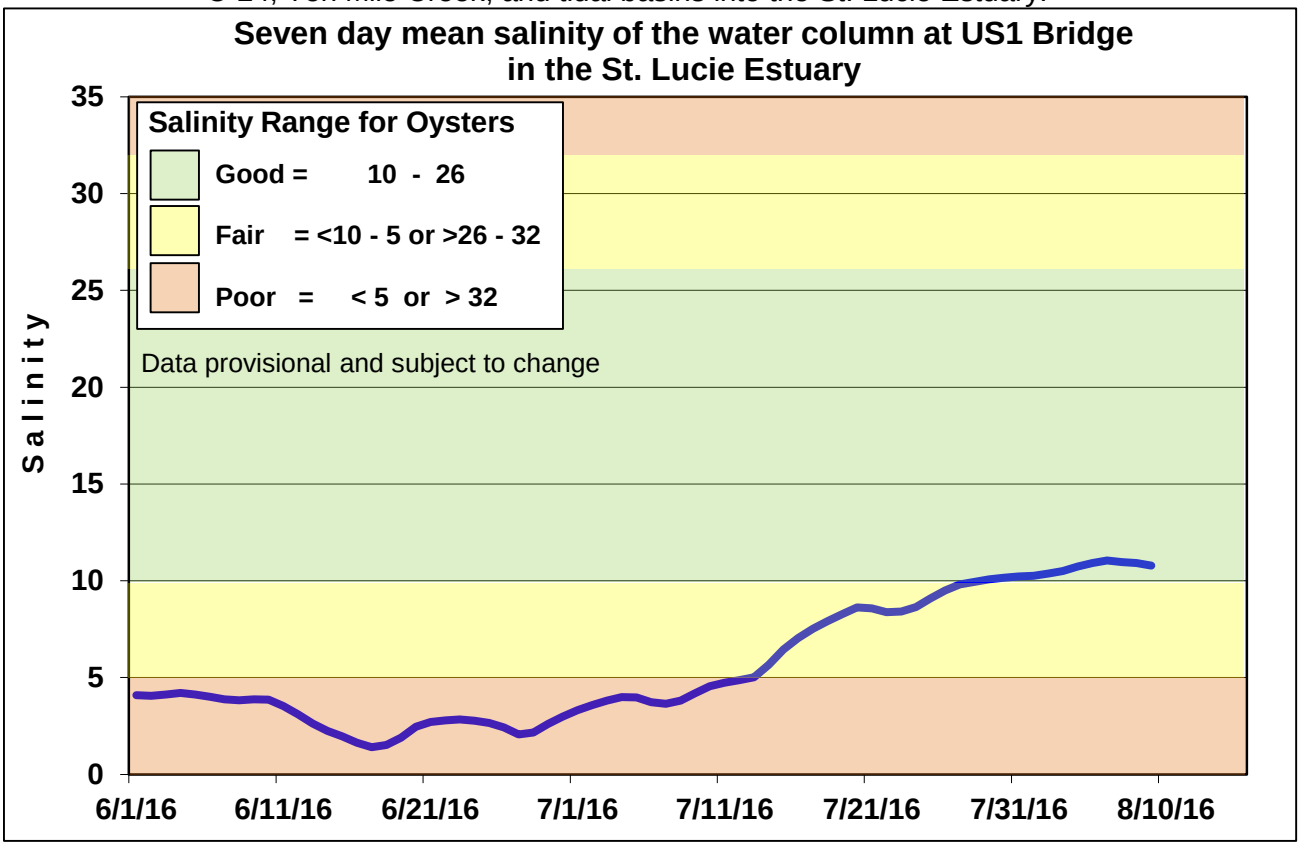


Figure 3. Seven-day mean salinity of the water column at the U.S. Highway 1 Bridge.

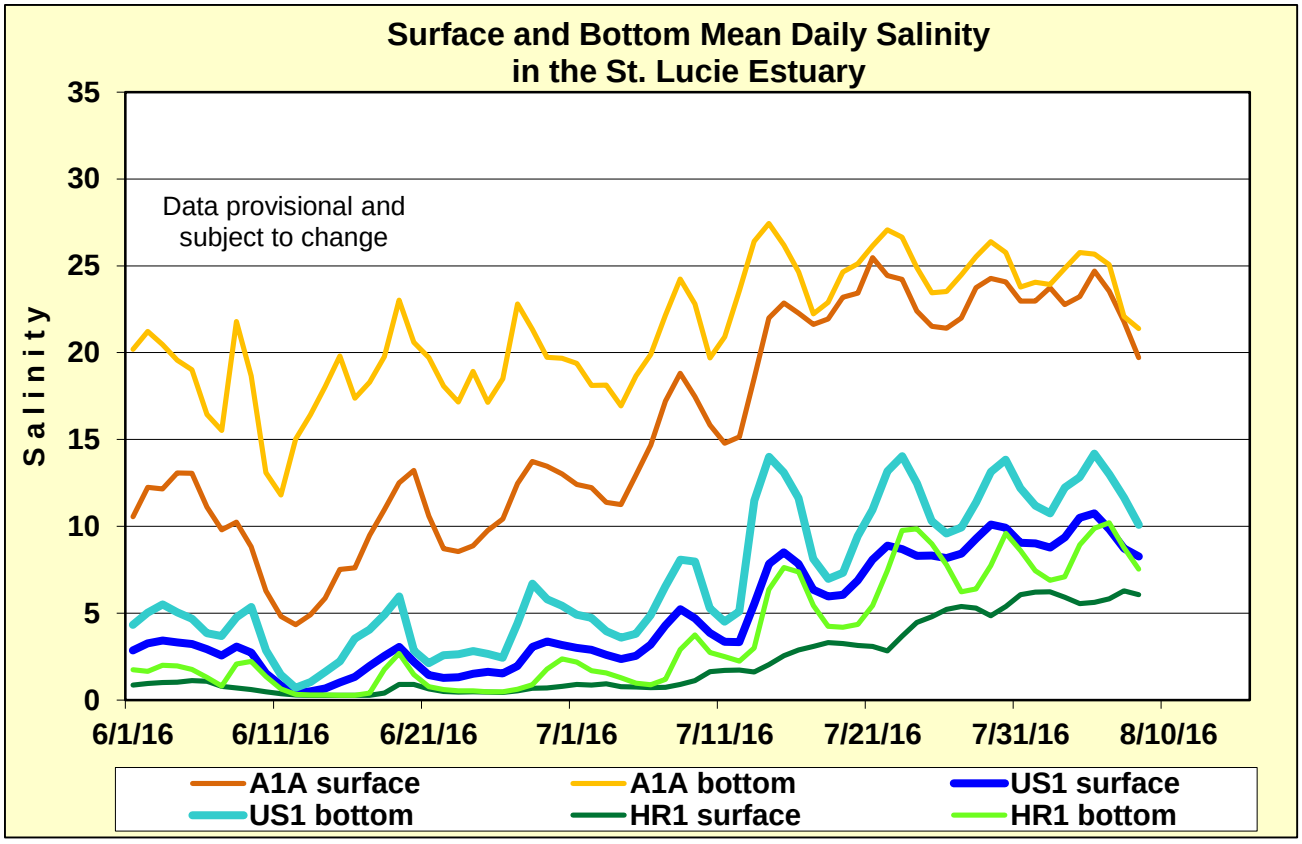


Figure 4. Daily mean salinity at the A1A, US1 and estimated HR1 stations.

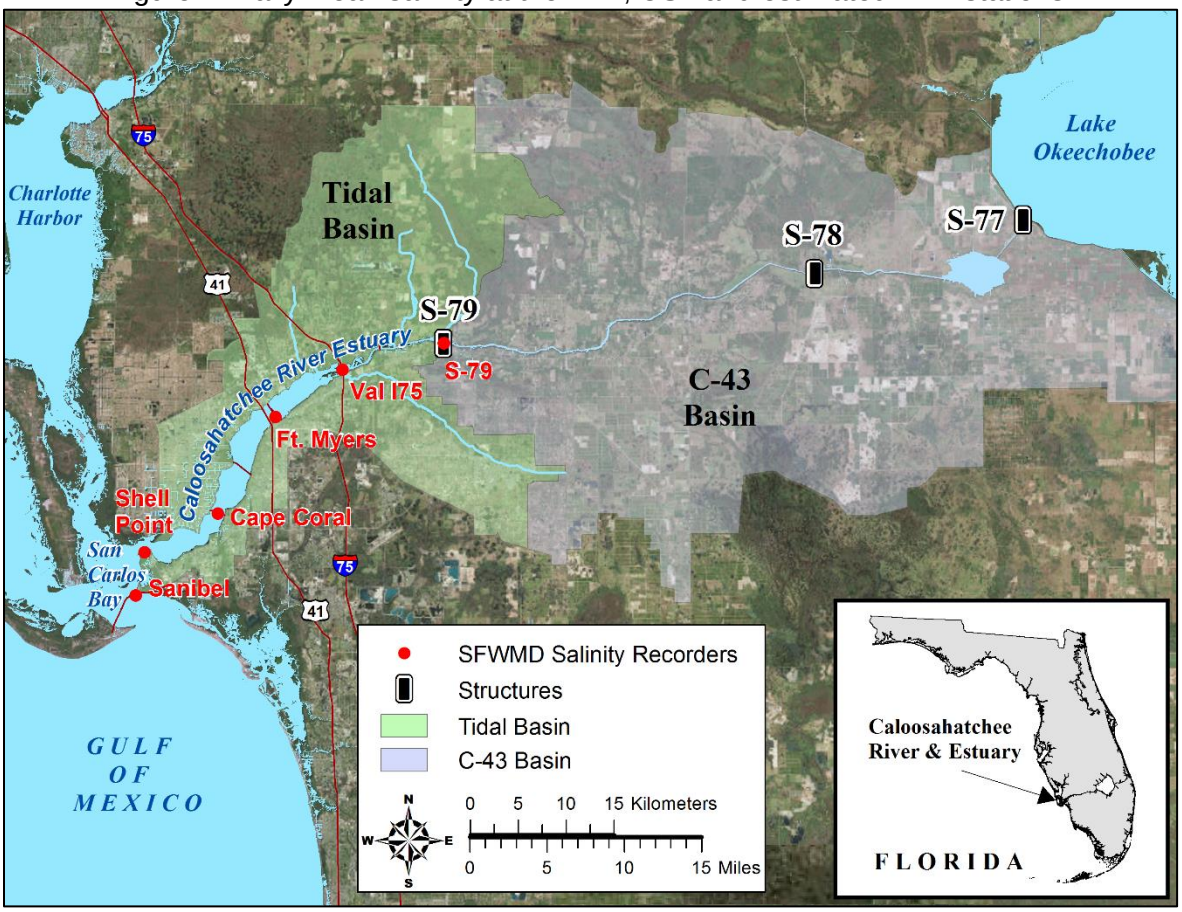


Figure 5. Basins, water control structures, and salinity monitoring for the Caloosahatchee Estuary.

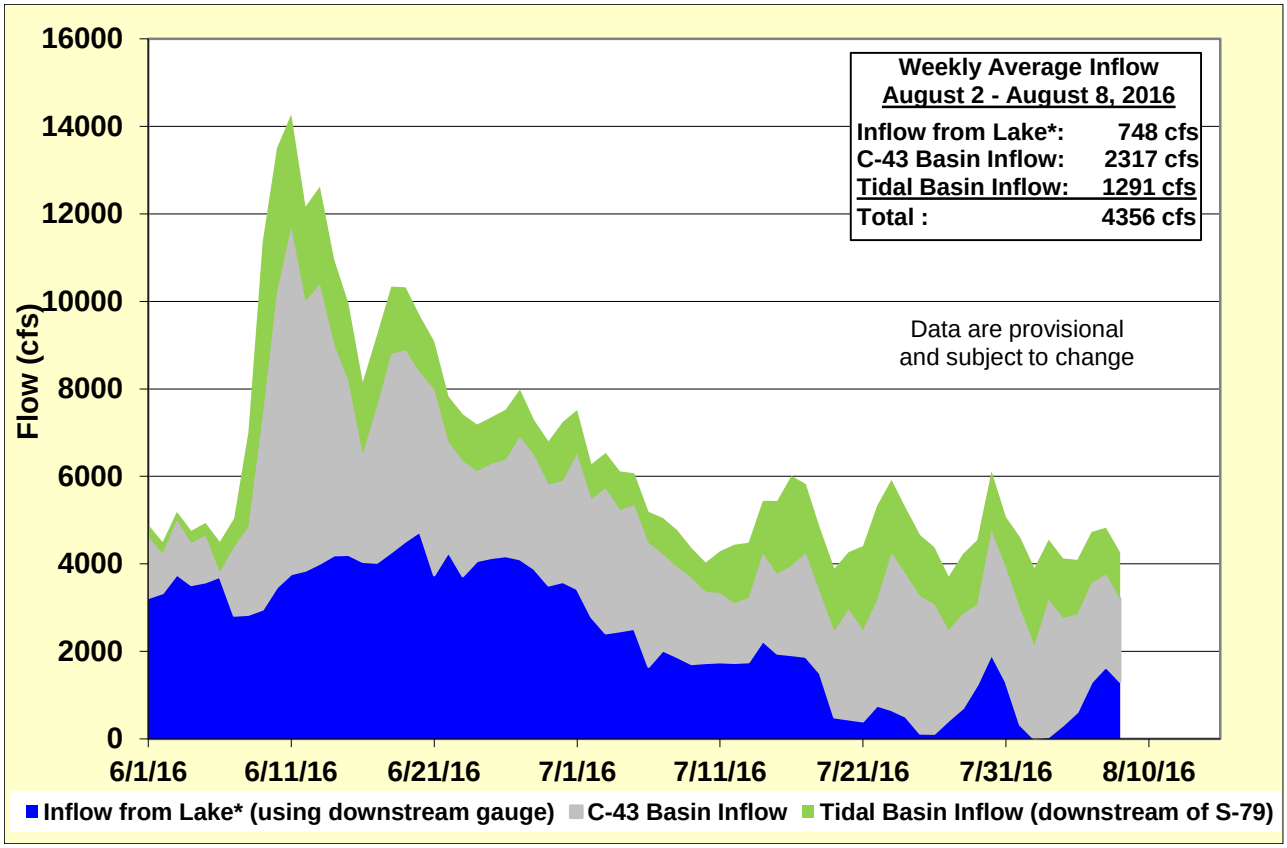
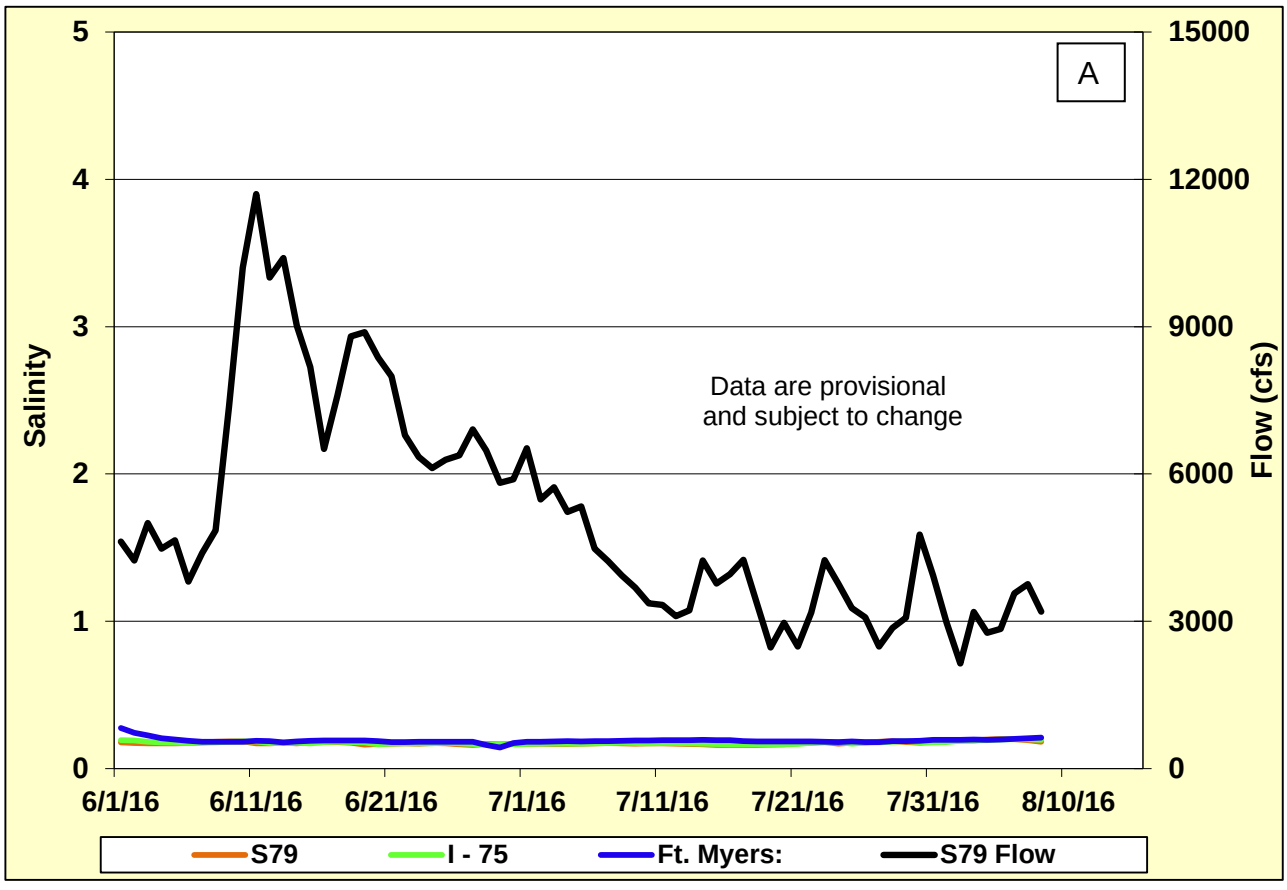


Figure 6. Freshwater inflows from Lake Okeechobee, runoff from the C-43 basin, and tributaries in the tidal basin into the Caloosahatchee River Estuary.



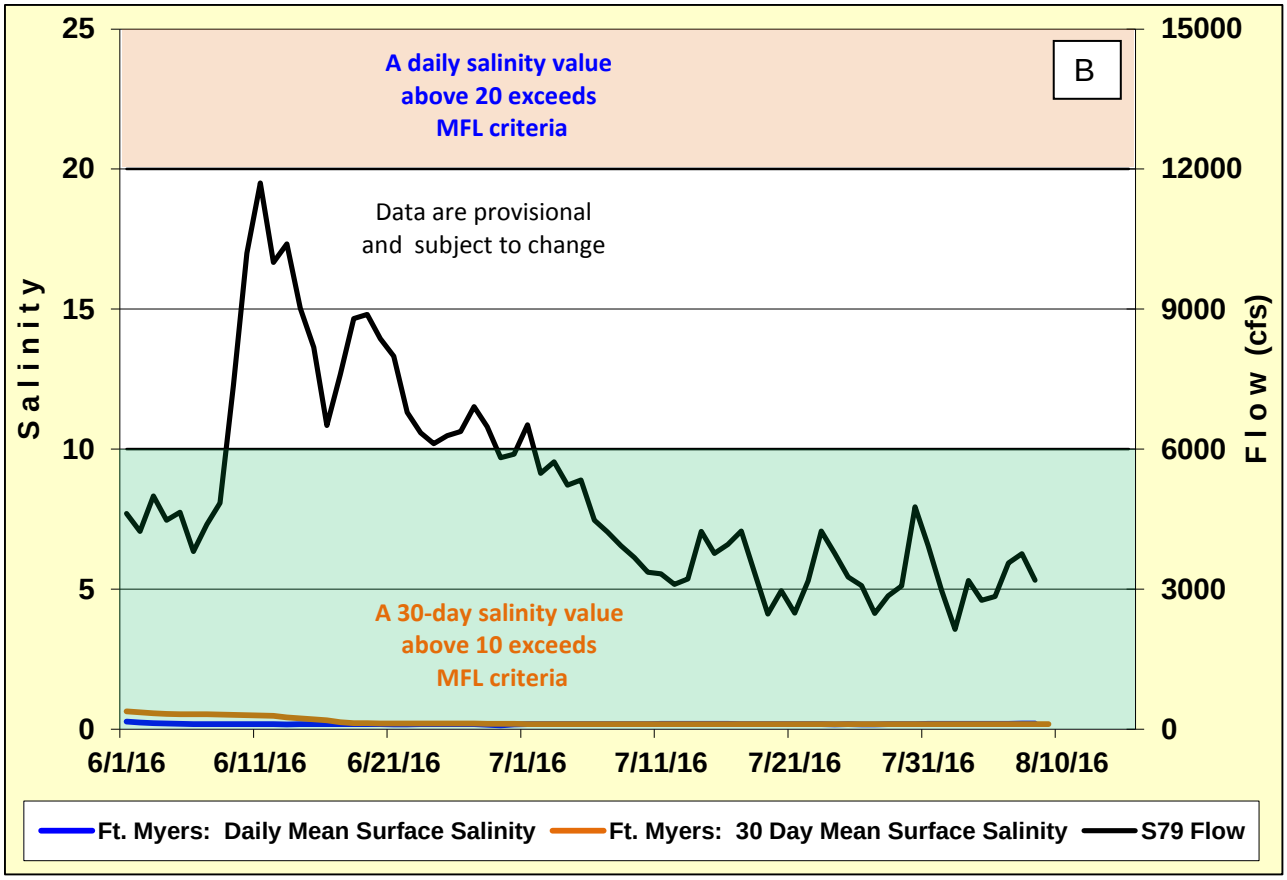


Figure 7. Daily mean flows at S-79 and salinity at upper estuary monitoring stations (A) and 30-day moving average salinity at Ft. Myers (B).

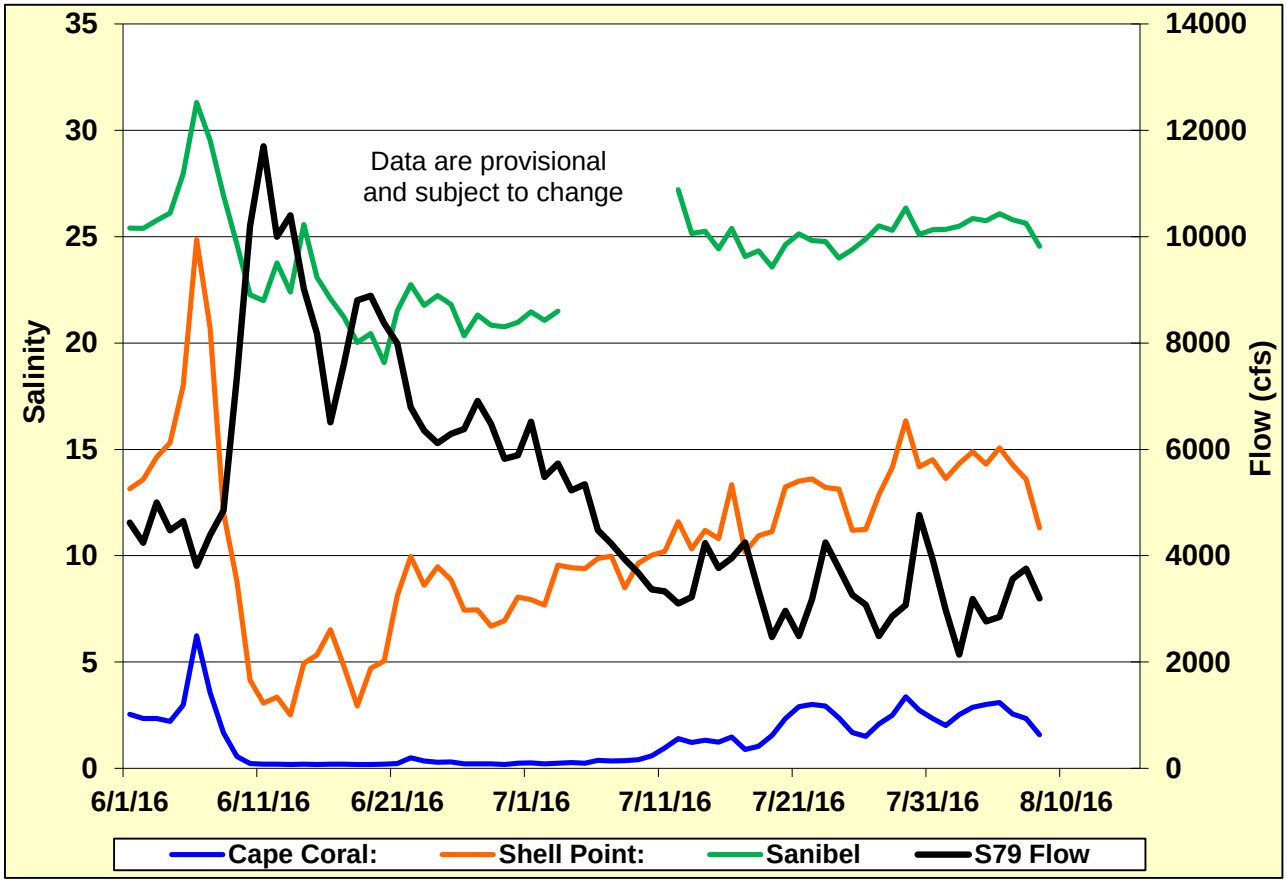


Figure 8. Daily mean flows at S-79 and salinity at lower estuary stations.

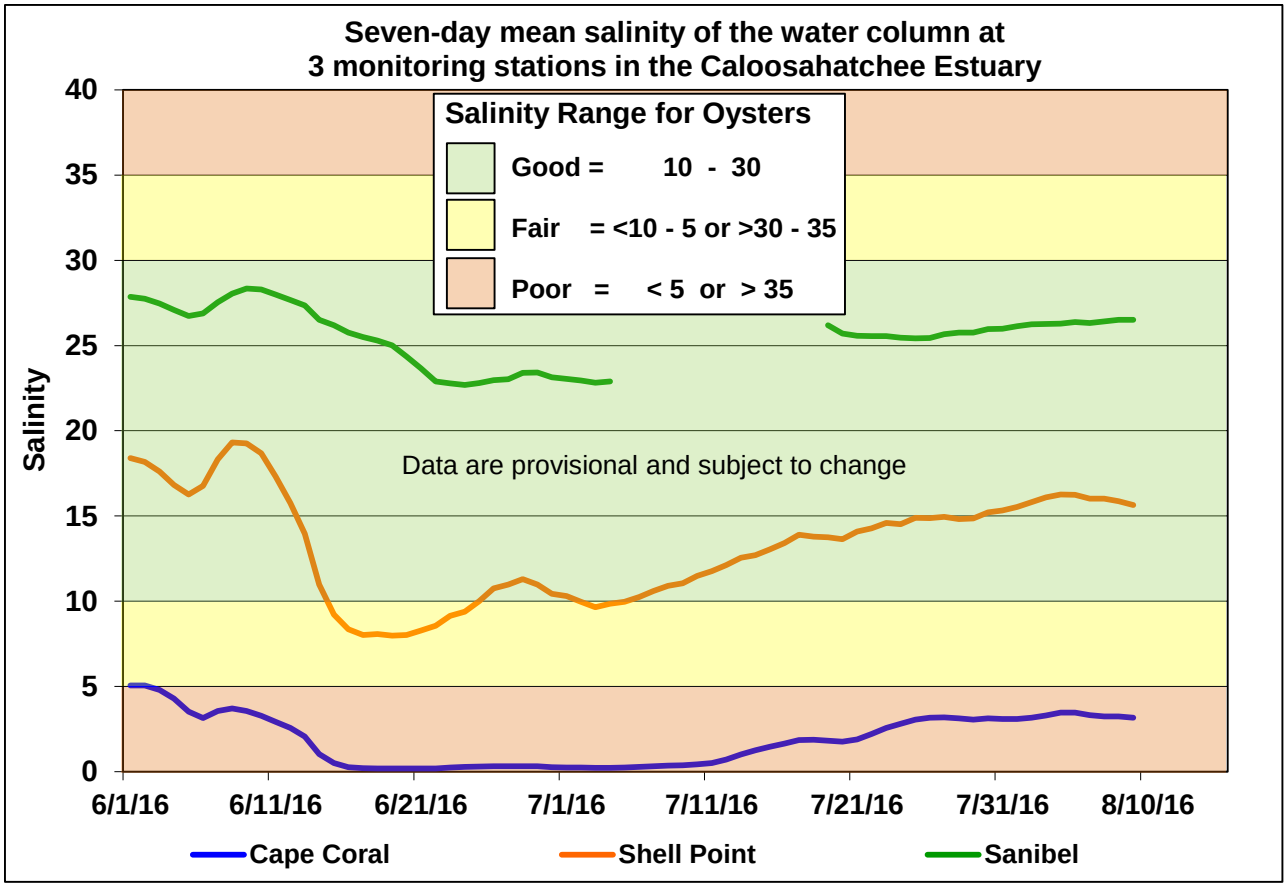
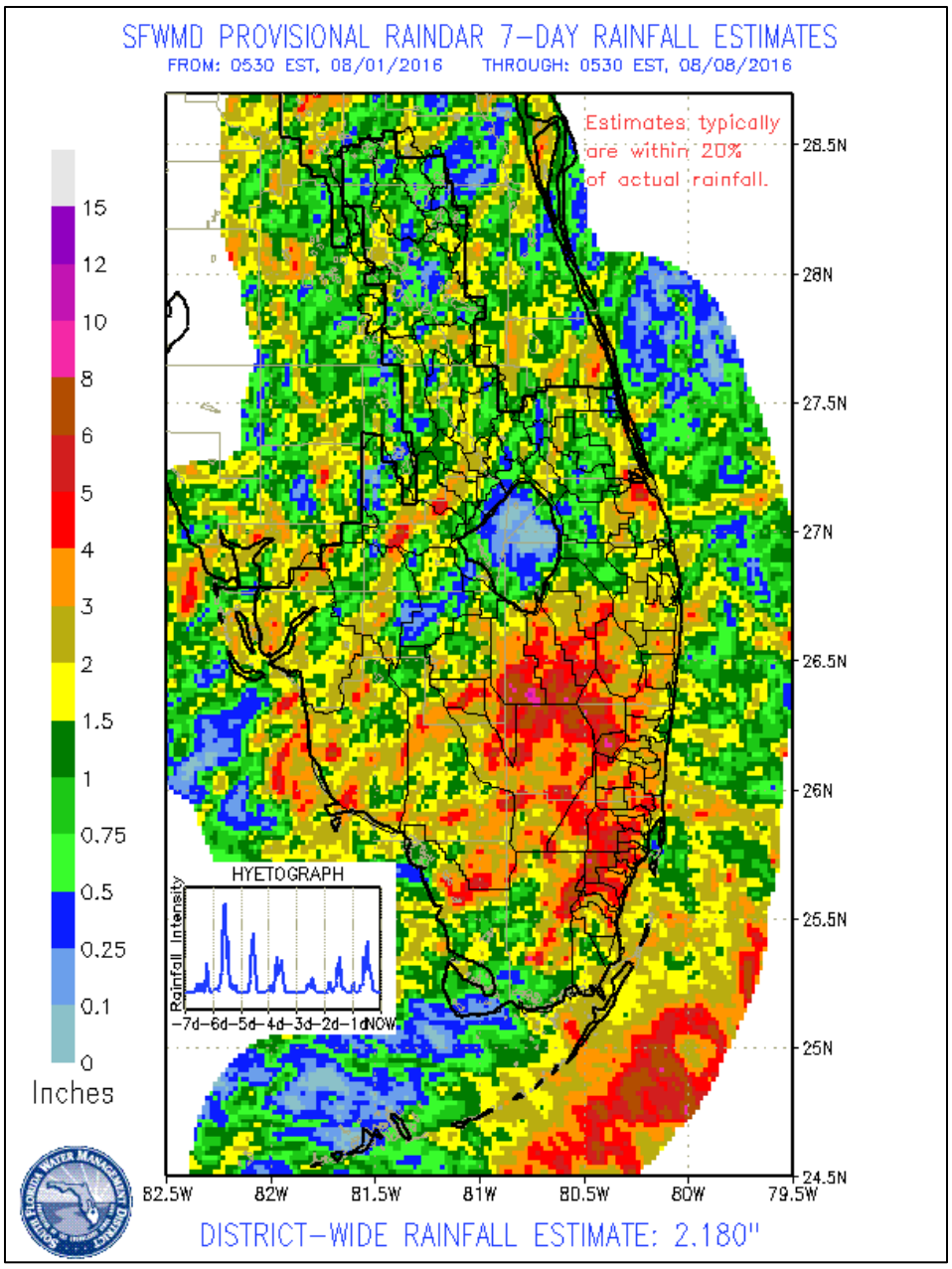


Figure 9. Seven-day mean salinity at Cape Coral Bridge, Shell Point and Sanibel Bridge monitoring stations.

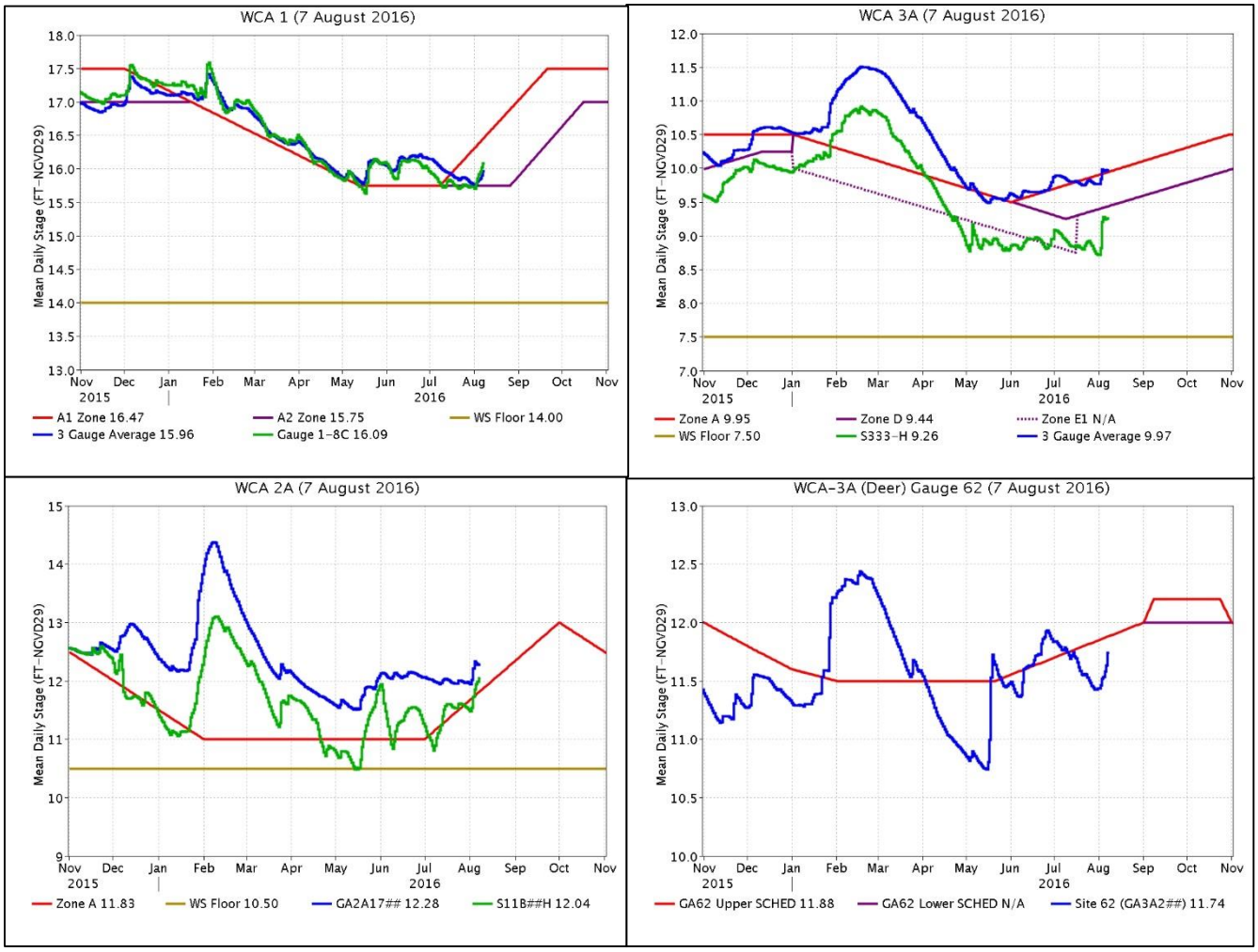
GREATER EVERGLADES

Rainfall was high last week, with basin-wide averages ranging from 1.88 inches to 6.36 inches. The highest local rainfall of 8.19 inches occurred in WCA-2A. Water levels rose rapidly in basins with the high rainfall. Pan evaporation was 1.39 inches, close to the pre-project average of 1.42 inches

Everglades Region	Rainfall (Inches)	Stage Change (feet)
WCA-1	3.44	0.25
WCA-2A	4.90	0.34
WCA-2B	6.36	0.57
WCA-3A	3.87	0.23
WCA-3B	3.77	0.16
ENP	1.88	0.14

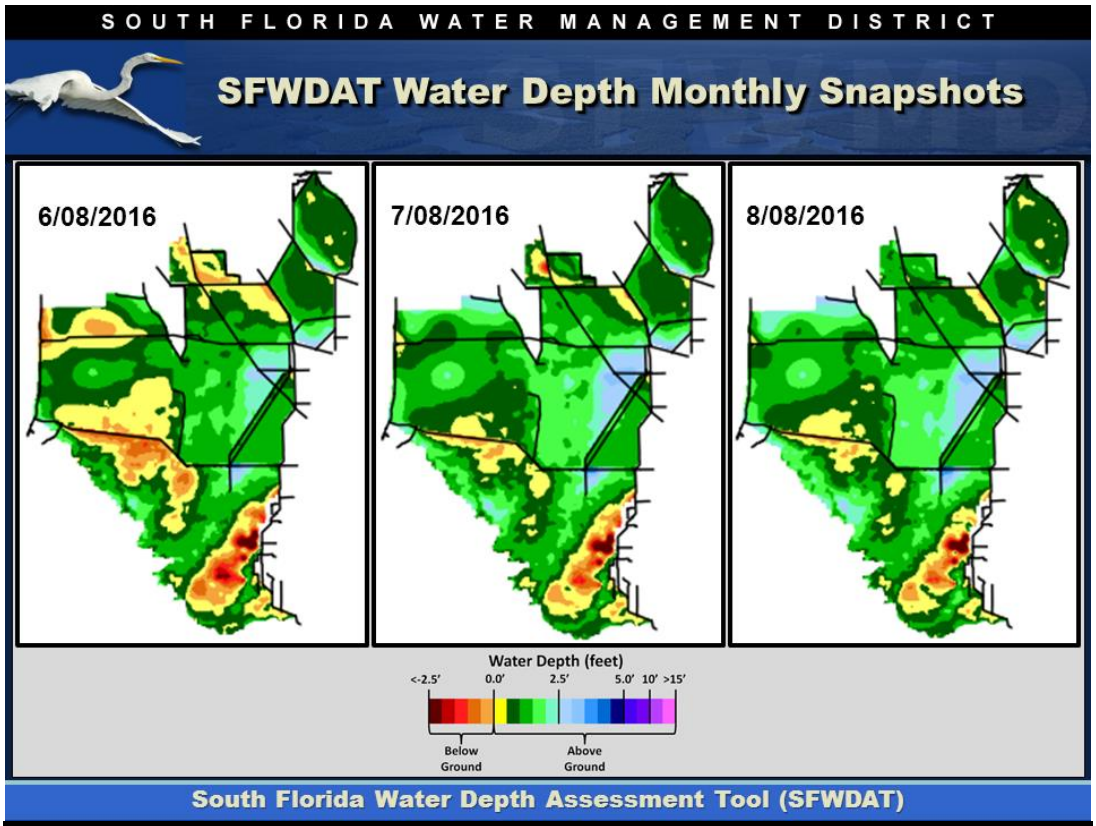


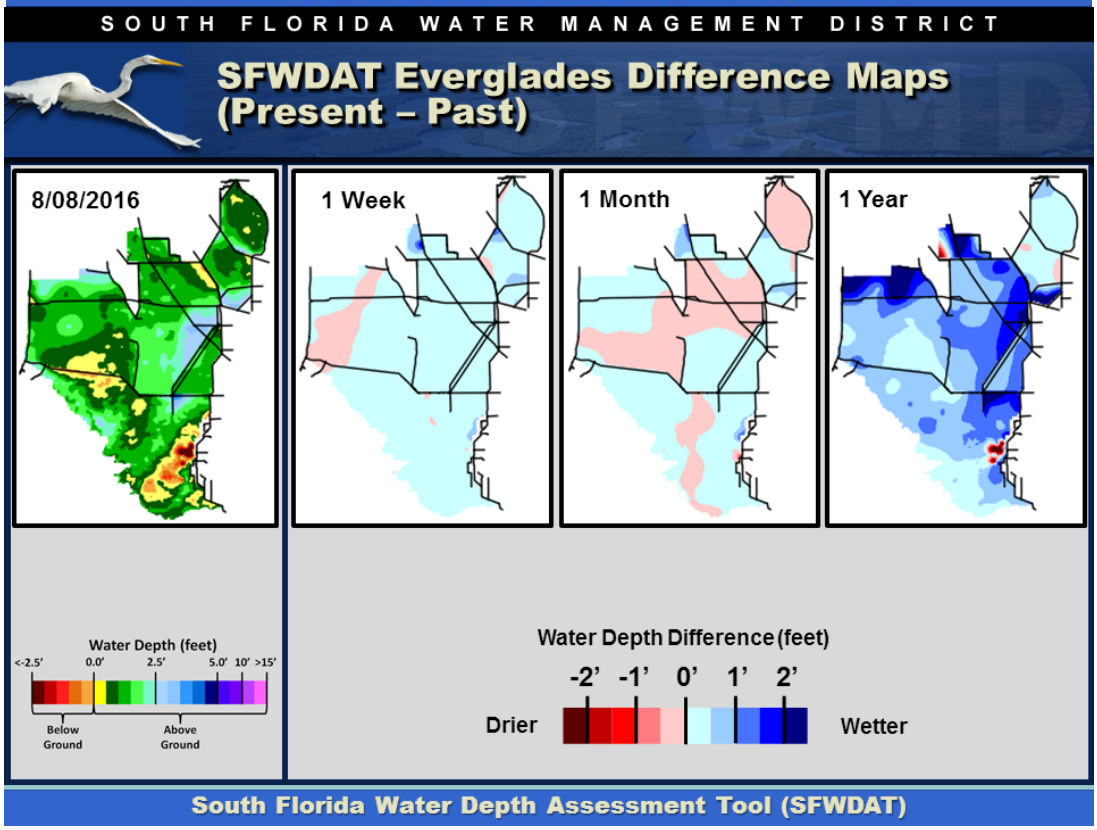
Regulation Schedules: Water levels have increased and two of the four areas are below regulation. The WCA-1 three-gauge average is 0.51 feet below regulation. The WCA-2A stage is 0.45 feet above regulation. The WCA-3A three-gauge average stage is 0.02 feet above regulation and the northwestern WCA-3A gauge stage (gauge 62) is 0.14 feet below regulation.



Water Depths and Changes: Water levels are similar to those a month ago and higher than stages two months ago. Water depths at monitored gauges other than in WCA-2B range from 0.85 inches to 2.15 inches.

Stages are higher than last week with gauge increases ranging from 0.14 feet to 0.58 feet. Compared to a month ago, stages are mixed but generally higher. Relative to a year ago, stages are generally higher to much higher.



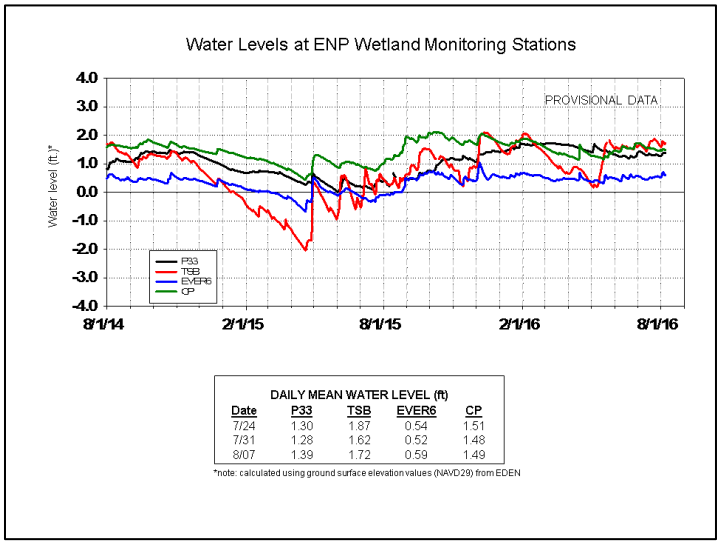


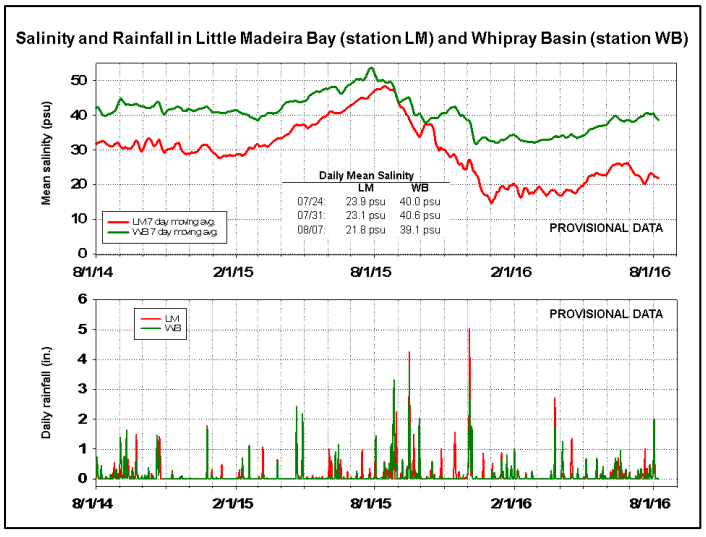
Cape Sable Seaside Sparrows: Ground surveys of subpopulations A and B will continue through August 15 accompanied by weekly reports. The CSSS breeding season appears to be ending as indicated by absence of new nests, behavioral changes, and the onset of adult molt.

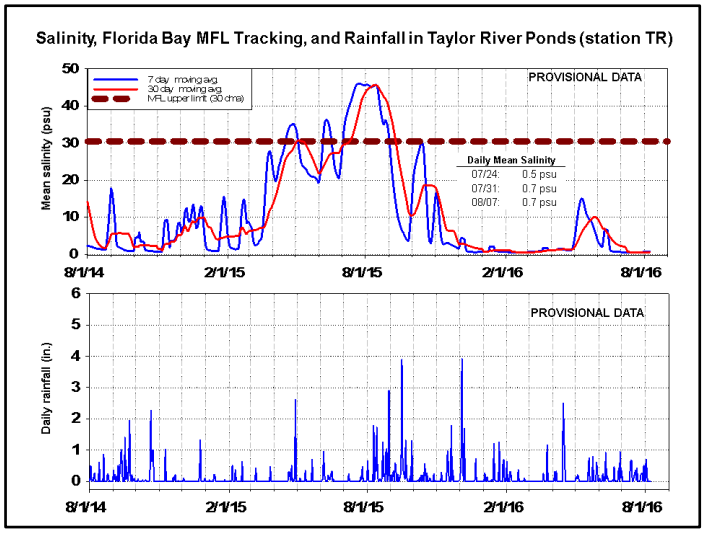
Subpopulation surveys in early August:

A: Few males are singing. Eight territories were observed. Two nests were depredated (one with chicks, one with eggs). Eight to ten fledglings have been observed in the area. Water coverage is 100 percent at 2.5 to 8.0 cm deep.
B: Little singing was heard. Five to six territories were observed. One active nest was seen with one pair feeding fledglings. Juveniles and molting adults were observed. Water coverage is 100 percent at 3.4-6.8 cm deep.

Everglades National Park (ENP) and Florida Bay: Water levels increased last week because of rainfall. Only southwestern Taylor Slough's stage is lower than it was 30 days ago and is at its long-term average. Other areas are three to six inches above average.
Salinities across Florida Bay range from average to nine psu above average. Daily average salinities range from 18 to 39 psu with the highest salinity in central Florida Bay. Weekly changes of salinity were less than three psu at all stations with the western areas changing less than 0.5 psu.
The MFL sentinel site TR in the mangrove zone remains near fresh at a daily average of 0.7 psu, and the 30-day moving average salinity at TR is also at a seasonal 0.6 psu.

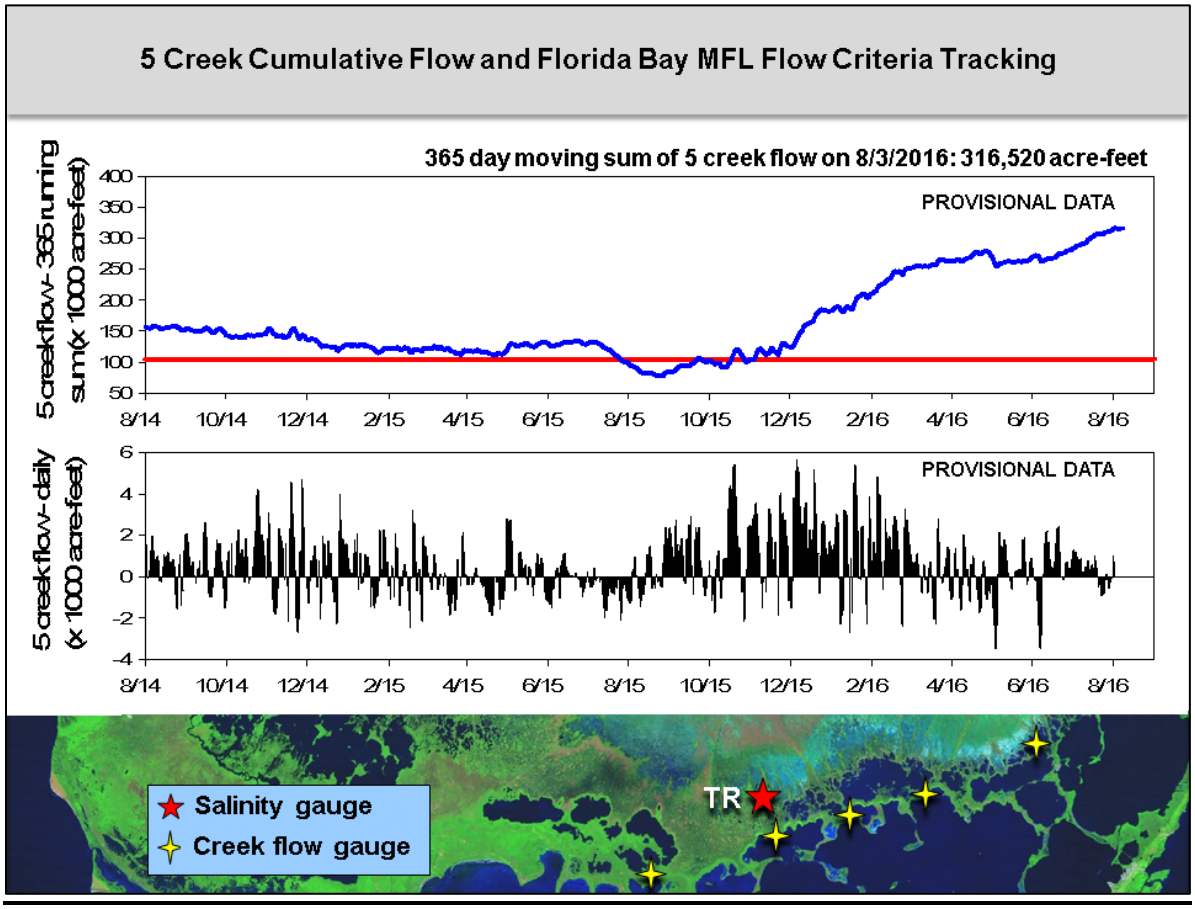






The 365-day running sum of the cumulative flow from the five creeks feeding Florida Bay has risen to 316,520 acre-feet (above the average of 257,628 acre-feet) on August 3, the last day that data were

available. USGS has reported that the eastern-most creek is experiencing an equipment malfunction. Creek flow is provisional data from the USGS and is highly variable.



Water Management Recommendations

- Water levels need to increase in WCA-1 and northeastern WCA-3A. The northern half of WCA-1 has been closed to airboats because of low water and FWS indicates that water levels need to be higher than their current stage to re-open.

- We recommend keeping water depths in southern WCA-3A below 2.5 feet throughout the wet season to protect tree island forests. The depth at gauge 65 is 2.15 feet.

- Ascension rates need to remain under 0.25 feet per week to protect habitat and wildlife, including apple snails, prey of the endangered snail kite.

- The Cape Sable Seaside Sparrows continue late breeding in subpopulations A and B but are almost finished for this year. Gates S-12A and S-12B should remain closed through August 15.

- Rain has provided the Active Marsh Improvement Project (AMI) in WCA-2A with water for a planned burn. Stages need to remain at current depths for several weeks.

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

Everglades Ecological Recommendations, Aug. 9, 2016 (red is new)

Area	Current Condition	Cause(s)	Recommendation	Reasons
WCA-1	Stages rose 0'.21 to 0.31'	Rainfall, ET, management	Provide additional water to WCA-1. Limit ascension rates to extent possible with a maximum of 0.25 ft/week.	Higher water levels are needed to reopen the Refuge to airboats. Ascension rates of <0.25'/week will protect habitat and wildlife including reproducing apple snails.
WCA-2A	Stage rose 0.34'	Rainfall, ET, management	Maintain ascension rates <0.25 ft/week. Raise water levels to at least 6" depth at experimental sites and maintain depths of 6"-12" for a controlled burn.	A burn at an experimental site is necessary as part of an ongoing effort to determine how best to achieve restoration goals. Ascension rates of <0.25'/week will protect habitat and wildlife including reproducing apple snails, prey for endangered snail kites.
WCA-2B	Stages rose 0.56' to 0.58'	Rainfall, ET, management	Follow normal seasonal practices. Limit ascension rates to extent possible with a maximum of 0.25 ft/week.	Ascension rates of <0.25'/week will protect habitat and wildlife including reproducing apple snails.
WCA-3A NE	Stage rose 0.22'	Rainfall, ET, management	Increase inflow into northeastern WCA-3A. Increase ascension rates to extent possible with a maximum of 0.25 ft/week.	Water levels are too low in northeastern WCA-3A. Ascension rates not exceeding 0.25'/week will protect habitat and wildlife including reproducing apple snails.
WCA-3A NW	Stage rose 0.32'	Rainfall, ET, management		
Central WCA-3A S	Stage rose 0.15'	Rainfall, ET, management	Limit ascension rates to extent possible with a maximum of 0.25 ft/week. Water depths at gauge 65 should remain below 2.5 feet over this upcoming wet season. When flows are changed a gradual reduction is recommended (stepping down over several days).	Keeping depths below 2.5' at gauge 65 is important to allow tree island vegetation to recover from stress of the recent extended inundation duration. Ascension rates of <0.25'/week will protect habitat and wildlife including reproducing apple snails.
Southern WCA-3A S	Stage rose 0.21'	Rainfall, ET, management		
WCA-3B	Stages rose 0.14' to 0.17'	Rainfall, ET, management	Follow normal seasonal practices. Limit ascension rates to extent possible with a maximum of 0.25 ft/week.	Ascension rates of <0.25'/week will protect habitat and wildlife including reproducing apple snails.
ENP-SRS	Stage rose 0.14'	ET, rainfall, topography, management	Make discharges to the Park according to the ERTP rainfall plan.	Keep peat wet to promote native habitat and maintain wetland plant and animal communities.
ENP-CSSS habitats	S-12A and S-12B remain closed to enhance dry-down.	Rainfall, ET, management	Follow rainfall plan for releases. Extend ERTP closures for S12-A and B through mid-August. Gradual reduction in flows through S333, S12C and D, as possible, is recommended (stepping down over several days). Follow guidance in C-111 western spreader canal project operations manual.	Sparrows continue to breed into August, so it is important to provide appropriate hydrological and habitat conditions for breeding in subpopulation A.
Taylor Slough	Average to 6 inches above average	Rain, ET, inflows	Move water southward as needed	Provide freshwater buffer for ecosystems and maintain low salinity conditions downstream
FB- Salinity	Average to 9 psu above average	Rain, ET, inflows, wind	Move water southward as needed	Maintain lower salinity levels.