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: June 20, 2017

SUBJECT: Weekly Environmental Conditions for Systems Operations

Summary

Weather Conditions and Forecast

A drier pattern is setting up through the weekend. A developing low pressure system in the southcentral Gulf of Mexico is focusing moisture and rain west of the District. Expect daily thunderstorm activity to focus along a band near the west coast this afternoon and along a second band through the Kissimmee Valley. As the low moves off to the northwest and high pressure builds in from the east, expect daily shower activity to decrease and focus over the interior west through the weekend. A trough is forecast to push into north Florida early next week and increase daily thunderstorm activity Monday and Tuesday.

Kissimmee

On Sunday, stage was 0.5 feet below regulation schedule in East Lake Toho and Lake Toho, and 1.6 feet below schedule in Kissimmee-Cypress-Hatchineha (KCH). Over the past week, discharge at S65, S65A, and S65E averaged 020 cfs, 477 cfs, and 643 cfs, respectively. Tuesday morning discharges were ~000 cfs, 1,581 cfs, and 1,328 cfs, respectively at S65, S65A, and S65E. Dissolved oxygen data in the Kissimmee River averaged 3.5 mg/L for the week (manual sondes at PC33 and PC62). Kissimmee River mean floodplain depth on Sunday was 0.40 feet.

Recommendations: Maintain 1,400 cfs at S65A as KCH stage continues to rise. Supplement declining S65A basin runoff by increasing discharge at S65 as needed. 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. Increase 65A discharge as necessary using the discharge rates of change table in Figure 8a to lower Pool A stage following rainfall over the S65A Basin.

Lake Okeechobee

Lake stage is 12.04 feet NGVD having increased by 0.27 over the past week and 0.80 feet over the past month. Chlorophyll *a* values from May 23, 2017, and corresponding satellite imagery, indicated bloom conditions occurred at two sites and moderate bloom potential occurred at three additional sites from the northern region along the northwestern shoreline and west to the mouth of Fisheating Bay. However, no elevated toxin levels were detected. Both pelagic Total Phosphorus (TP) and Total Suspended Solids (TSS) concentrations increased in May compared to April while nearshore values declined. The District and the Florida Fish and Wildlife Conservation Commission (FWC) continue to conduct aerial herbicide treatments to control nuisance emergent vegetation in the Indian Prairie, Moonshine Bay, and Moore Haven marshes. The current weekly ascension rate of 0.27 feet equates to a projected ascension rate of 1.08 feet per month which is double the optimal 0.5 feet per month. The short-term impacts of the recent rapid rise in Lake stage are anticipated to be primarily negative, including loss of submerged aquatic vegetation and the drowning of both native and exotic apple snail egg clutches.

Estuaries

Total discharge to the St. Lucie estuary averaged 3,218 cfs over the past week with 0 cfs (0%) coming from Lake Okeechobee. Salinities were substantially lower compared to last week. The seven-day average salinity at the US1 Bridge is now in the fair range for adult oysters. Total inflow to the Caloosahatchee estuary averaged 7,109 cfs over the past week with 0 cfs (0%) coming from the Lake. The 30-day average surface salinity at the Ft. Myers monitoring station is 9.8 and is below the MFL salinity exceedance threshold of 10. The 30-day average surface salinity at Val I-75 is 4.5. Salinity conditions between Val I-75 and Ft. Myers are improving for tape grass. 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. The 30-day moving average salinity at the I-75 Bridge is forecast to be 1.0 in the next two weeks if no flow comes through the S-79 structure, and the daily salinity is forecast to be 0.3.

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 15,400 acre-feet. Most STA cells are above target depths. Operational restrictions are in place for vegetation rehabilitation in STA-1E. Operational restrictions are in place for the STA-1W Expansion project construction in STA-1W. The nest of a Migratory Bird Treaty Act (MBTA) protected species has been observed in STA-1E and the nest of an Endangered Species Act (ESA) protected species has also been observed in STA-1E. Due to recent basin runoff, it is recommended that no Lake Releases be sent to the STAs/FEBs this week.

Everglades

Near record rainfall continues this week as most of the Everglades experienced an increase in stage. At the gauge 65 location within southern WCA-3A the water depth equals 2.6 feet; depths above 2.5 feet are considered stressful for tree island forests. Florida Bay Mangrove zone salinities have now exceeded the MFL threshold for three weeks; however, conditions are improving as the 30-day moving average dropped 1 psu this week. Maintaining natural rehydration rates and distribution is now the eco-hydrology focus as wading bird nesting season nears completion.

Supporting Information

KISSIMMEE BASIN

Kissimmee Basin Rainfall

The Upper Kissimmee Basin received 2.75 inches of rainfall in the past week and the Lower Basin received 3.47 inches (SFWMD Daily Rainfall Report 6/19/2017).

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: **6/20/2017**

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)						
							6/18/17	6/11/17	6/4/17	5/28/17	5/21/17	5/14/17	5/7/17
Lakes Hart and Mary Jane	S62	167	LKMJ	59.9	R	60.0	**-0.1**	0.1	-0.4	-0.1	-0.2	-0.3	-0.3
Lakes Myrtle, Preston, and Joel	S57	1	S57	61.0	R	61.0	**0.0**	-0.5	-1.1	-0.4	-0.4	-0.3	-0.3
Alligator Chain	S60	0	ALLI	62.6	R	63.2	**-0.6**	-0.9	-1.1	-0.3	-0.4	-0.4	-0.5
Lake Gentry	S63	0	LKGT	60.1	R	61.0	**-0.9**	-1.2	-1.3	0.0	0.0	-0.1	-0.1
East Lake Toho	S59	346	TOHOE	56.0	R	56.5	**-0.5**	-0.8	-1.2	-0.1	-0.2	-0.3	-0.5
Lake Toho	S61	1253	TOHOW, S61	53.0	R	53.5	**-0.5**	-0.8	-1.1	-0.1	-0.2	-0.3	-0.5
Lakes Kissimmee, Cypress, and Hatchineha	S65	20	LKISSP, KUB011, LKIS5B	49.4	R	51.0	**-1.6**	-2.3	-2.6	-0.9	-1.2	-1.2	-1.2

* 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: **6/20/2017**

Metric	Location	Sunday's 1-day average	Weekly Average**									
			6/18/17	6/11/17	6/4/17	5/28/17	5/21/17	5/14/17	5/7/17	4/30/17	4/23/17	4/16/17
Discharge (cfs)	S-65	77	**20**	37	145	190	237	234	258	283	330	344
Discharge (cfs)	S-65A	896	**477**	175	126	121	160	167	184	205	248	262
Discharge (cfs)	S-65D****	1087	**584**	307	174	157	182	198	252	253	286	297
Discharge (cfs)	S-65E****	1253	**643**	350	161	159	182	173	260	225	267	282
DO concentration (mg/L)***	Phase I river channel	1.5	**3.5**	5.2	7.2	7.9	7.7	8.0	7.4	7.9	7.8	8.1
Mean depth (feet)*	Phase I floodplain	0.40	**0.27**	0.13	0.05	0.05	0.05	0.05	0.05	0.05	0.06	0.06

* 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
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.			
3/30/2017	Reduce discharge at S-59 and S-61 so that stage in these lakes declines to respective low pools on May 31; reduce discharge at S-65 to 300 cfs.	Reduce rate of stage decline in East Toho, Toho, and KCH.	Implemented	SFWMD Water Management/KB Ops
3/23/2017	Reduce S-65 discharge by 75 cfs per day through 3/25 for a target discharge of ~500 cfs.	Reduce rate of stage decline in KCH.	Implemented	SFWMD Water Management/KB Ops
3/16/2017	Reduce S-65 and S-65A discharge by 150 cfs.	Reduce rate of stage decline in KCH.	Implemented	SFWMD Water Management/KB Ops
3/14/2017	No new recommendations.		N/A	
3/7/2017	No new recommendations.		N/A	
2/22/2017	Increase discharge at S65 to establish and maintain a stage recession on KCH to reach low pool (49 ft) by May 1, as possible subject to rainfall and construction needs. Maintain 49 ft or lower for the month of May as possible.	Wet season storage, aquatic plant management.		KB Operations
2/21/2017	No new recommendations.		N/A	

KCOL Hydrographs (through Sunday midnight)

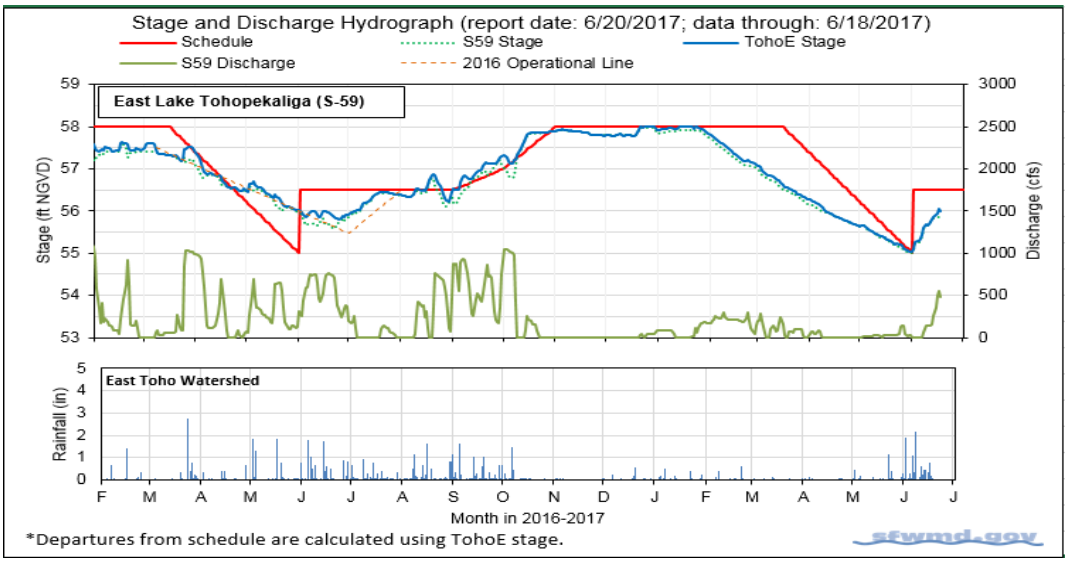


Figure 1.

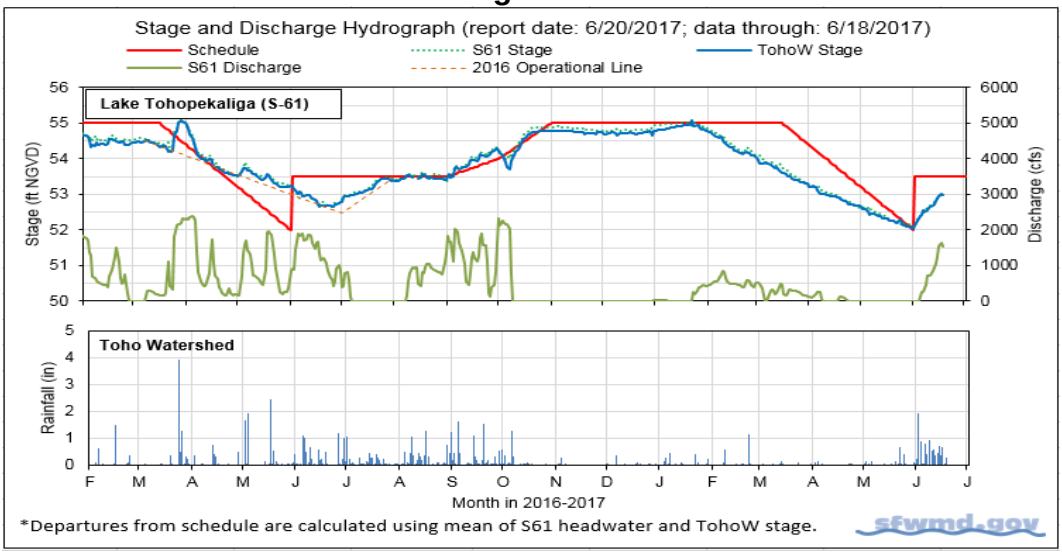


Figure 2.

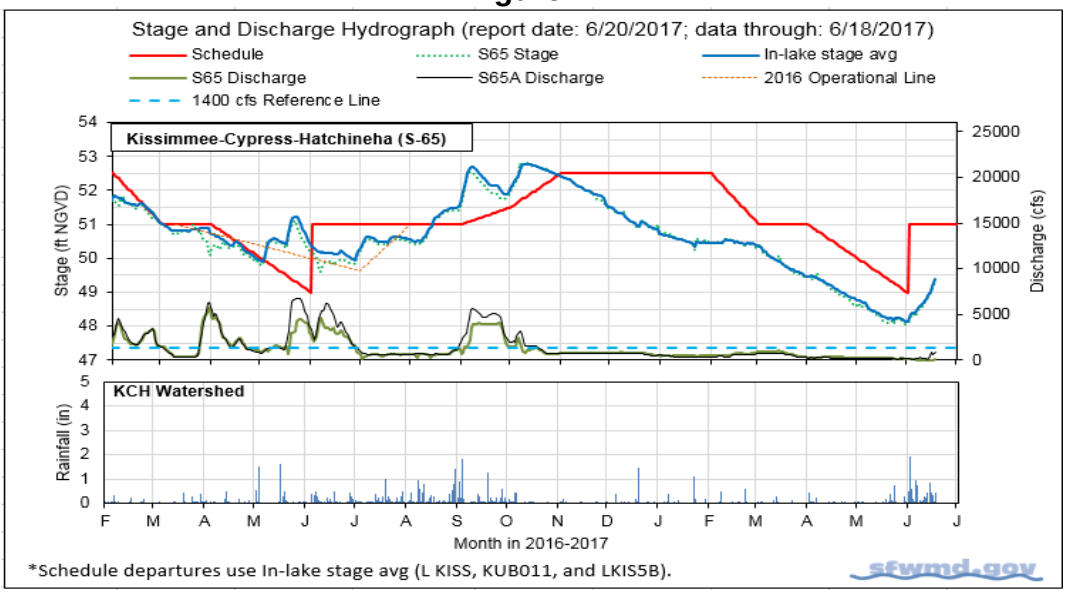


Figure 3.

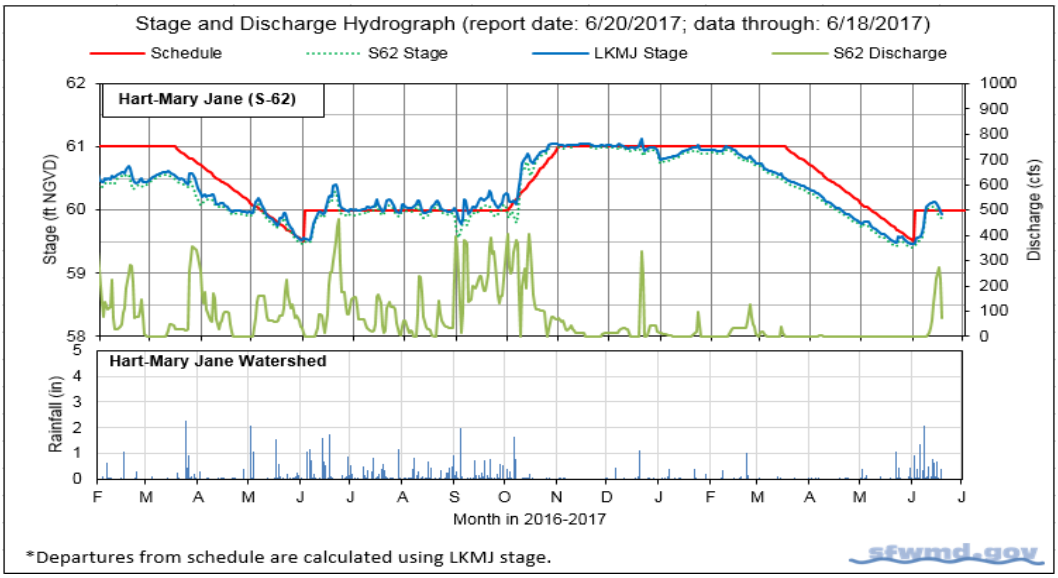


Figure 4.

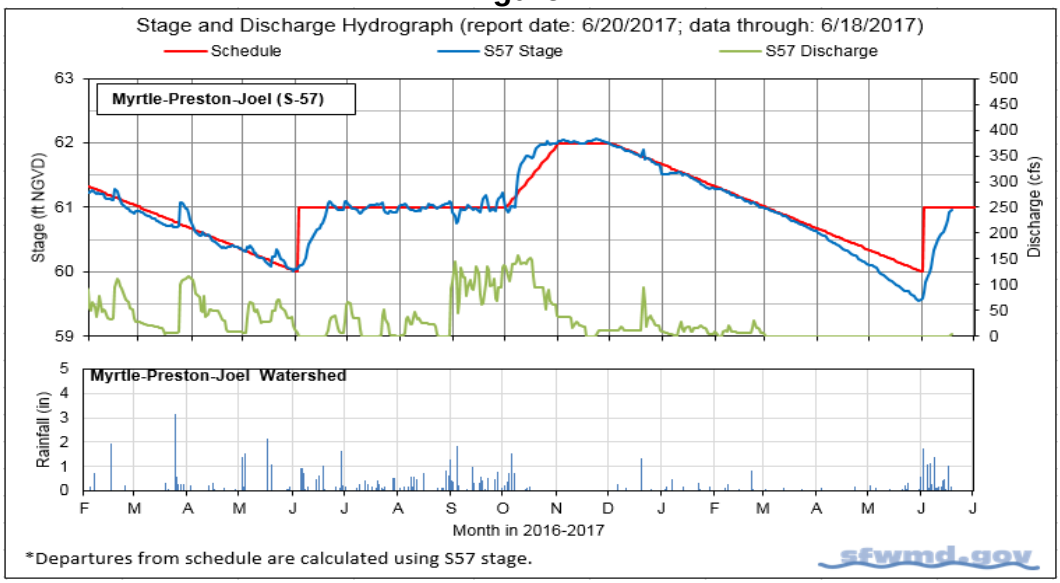


Figure 5.

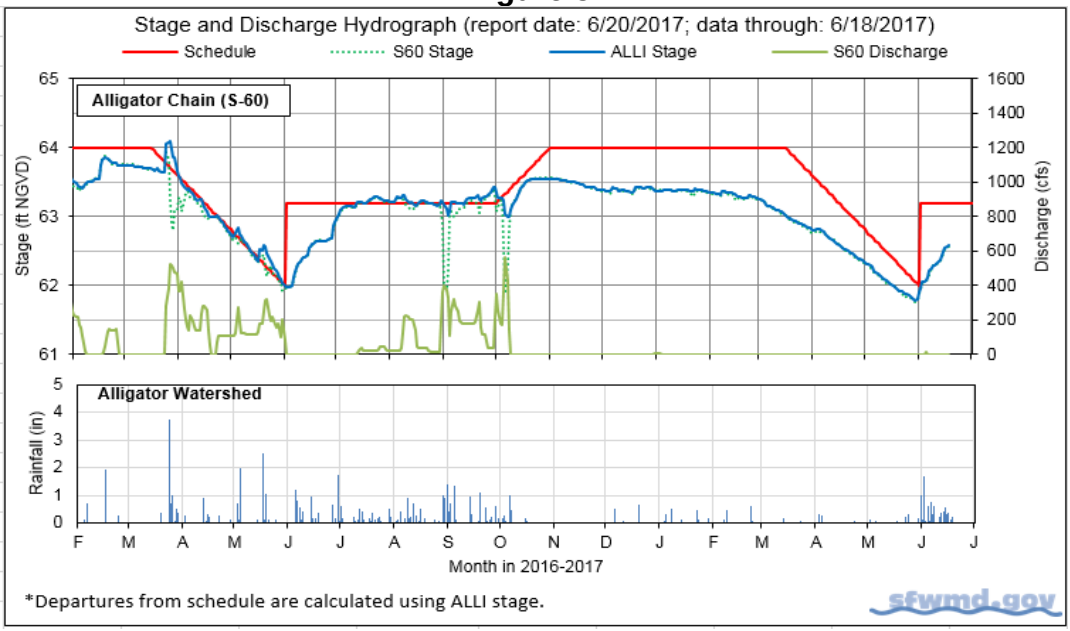


Figure 6.

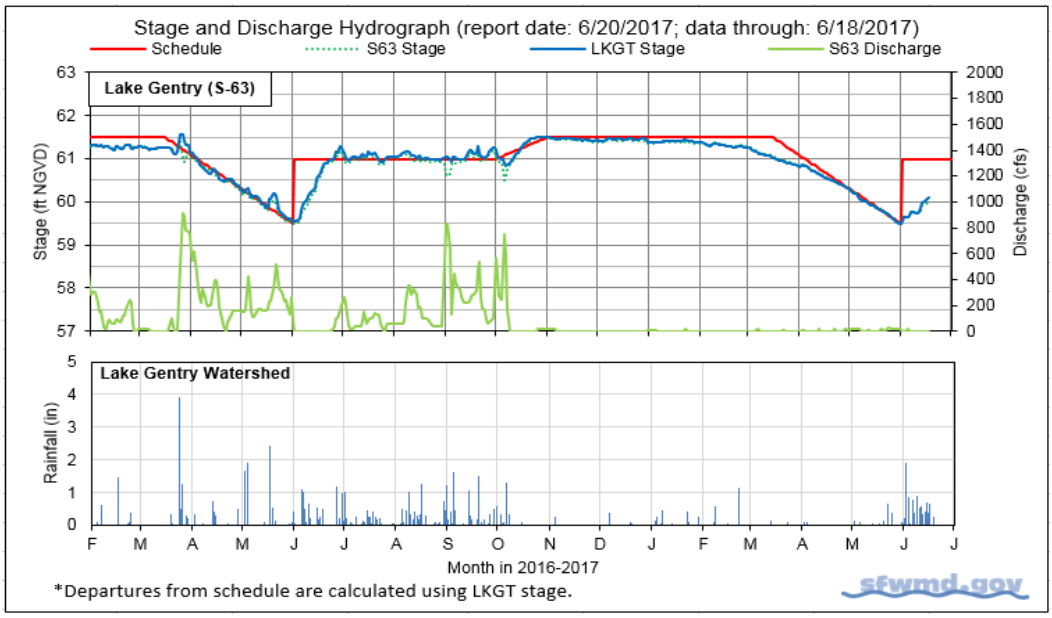


Figure 7.

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Limits on Rate of Discharge Change at S65/S65A During Dry Season 2016-2017

Discharge Rate of Change Limits for S65/S65A (revised 11/16/16).	
Q (cfs)	Maximum rate of increase or decrease (cfs/day)
300-650	75
650-1700	150
1700-3000	300
>3000	1000

15

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

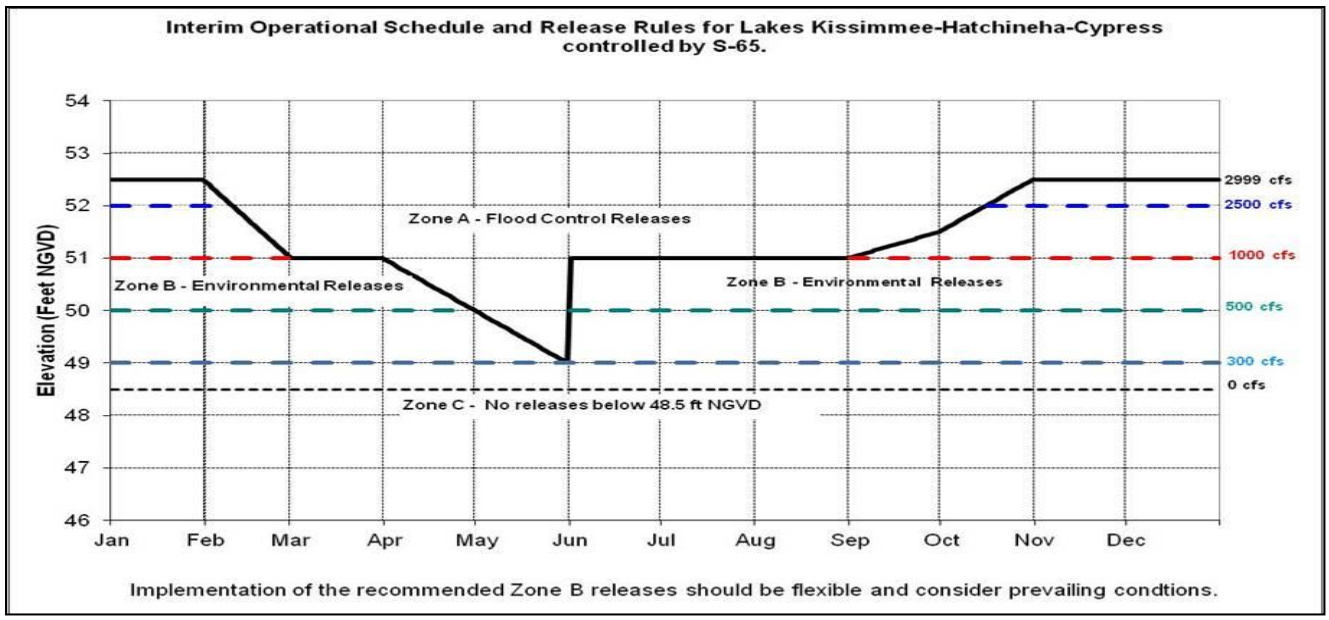


Figure 9. Interim operations schedule for S-65. The discharge schedule shown to the right has not been used in recent years or in Wet Season 2015.

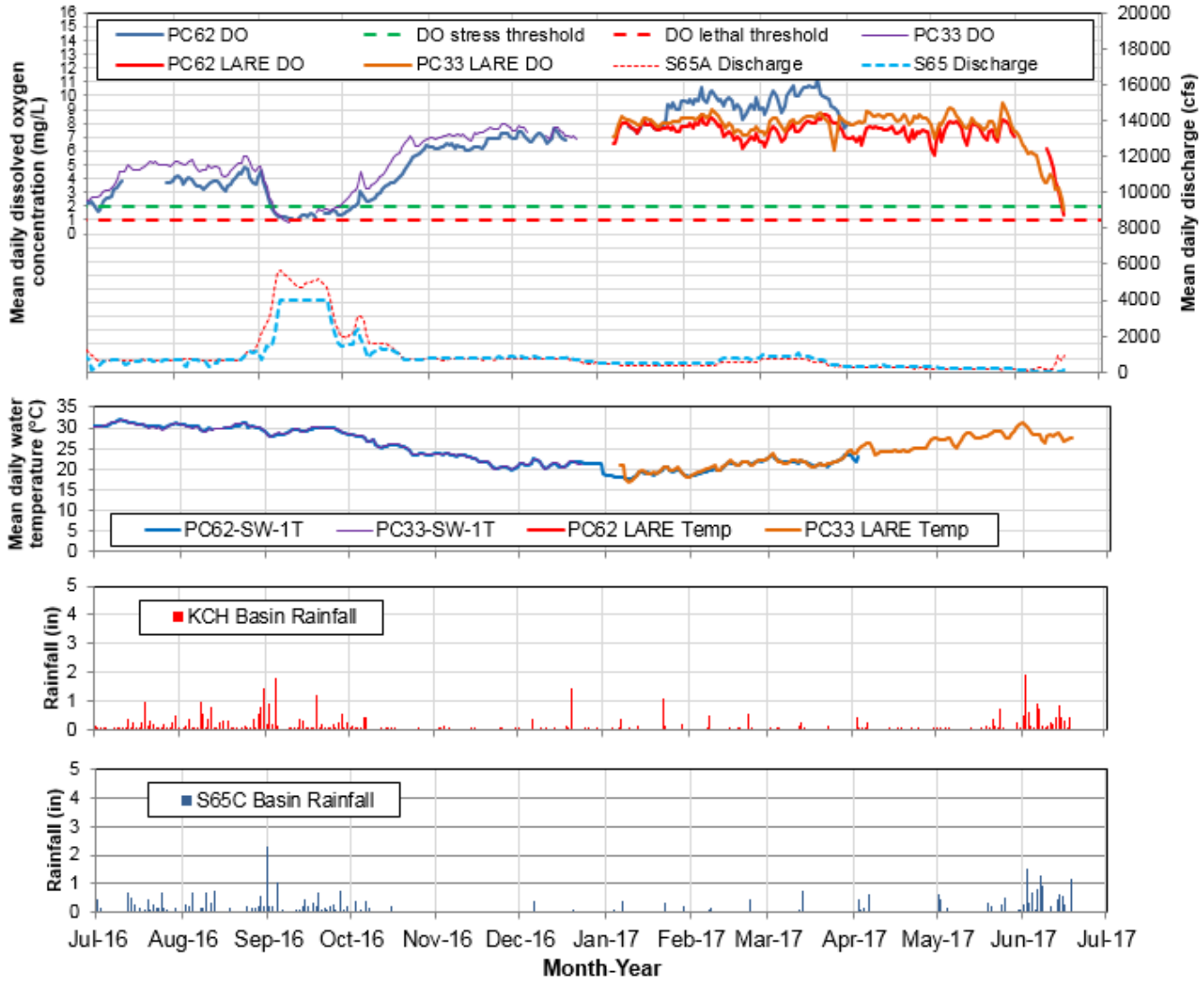


Figure 10. Mean daily Dissolved Oxygen, discharge, temperature and rainfall in the Phase I river channel.

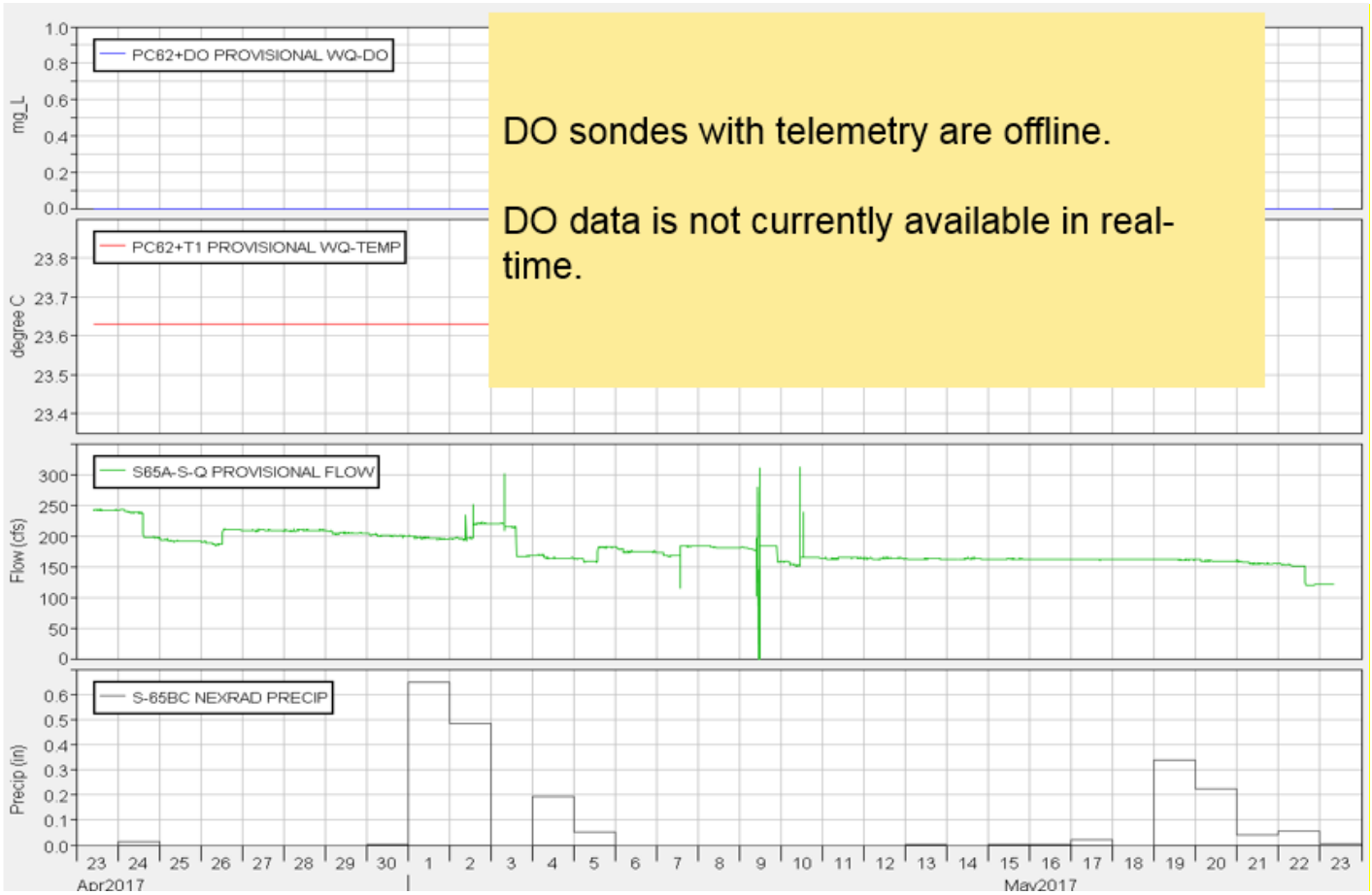


Figure 11. Phase I river channel dissolved oxygen and water temperature (measured at 15 minute intervals) and Pool BC daily rainfall.

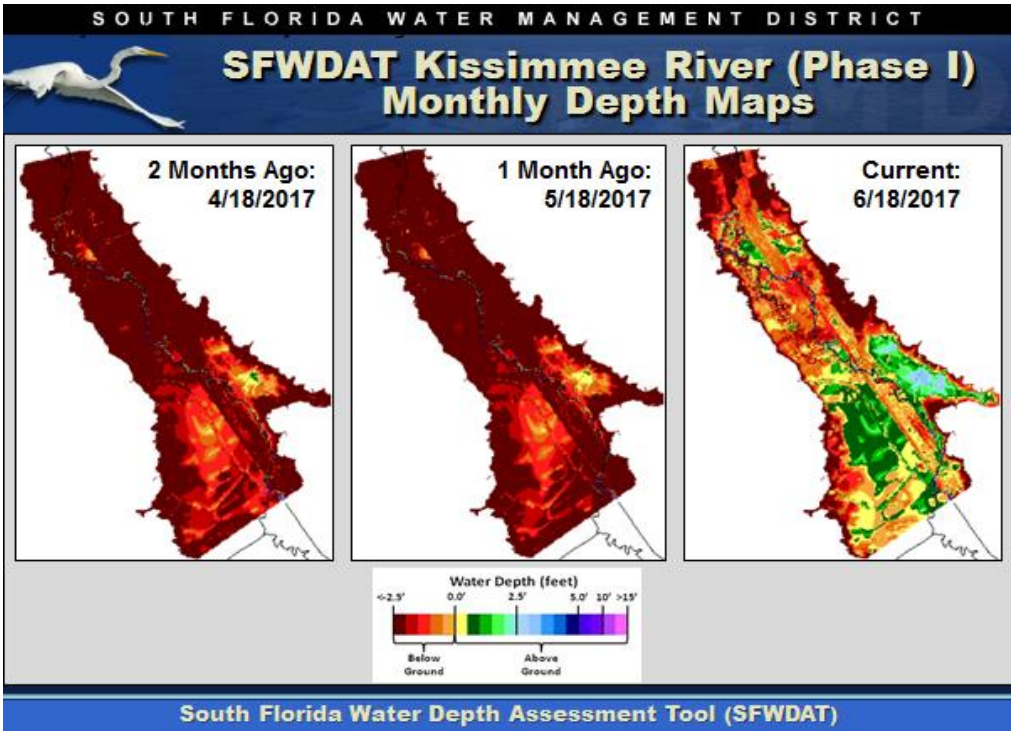
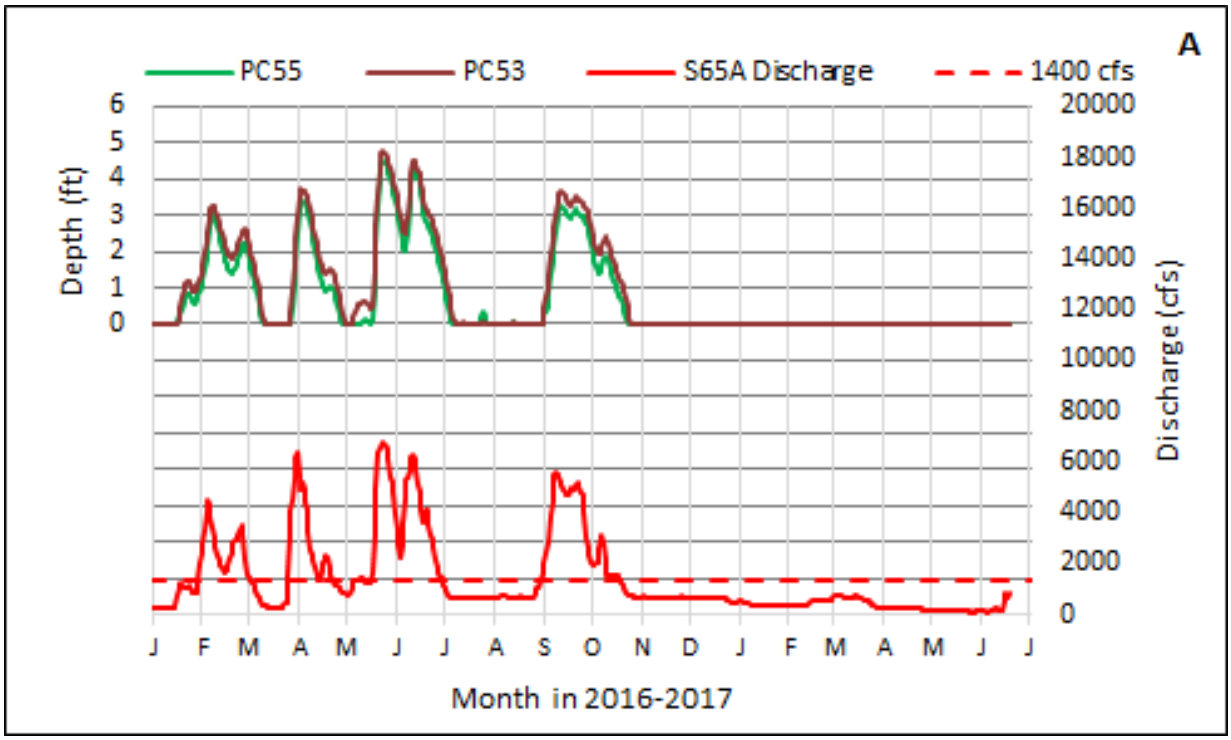
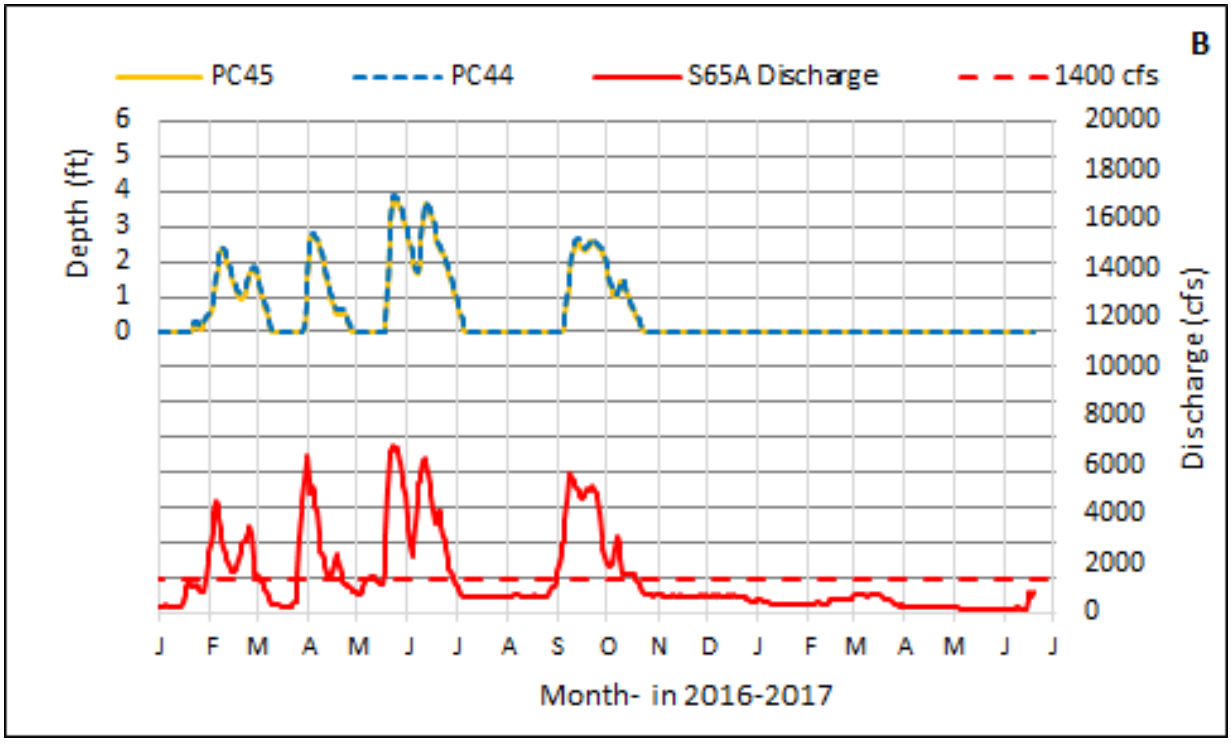


Figure 12. Phase I area floodplain water depths for this week, one month ago, and two months ago. Note that the WDAT color-coding has been modified to accommodate greater water depths; these maps are not directly comparable to Kissimmee Basin WDAT maps published prior to Jan. 16, 2012.





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

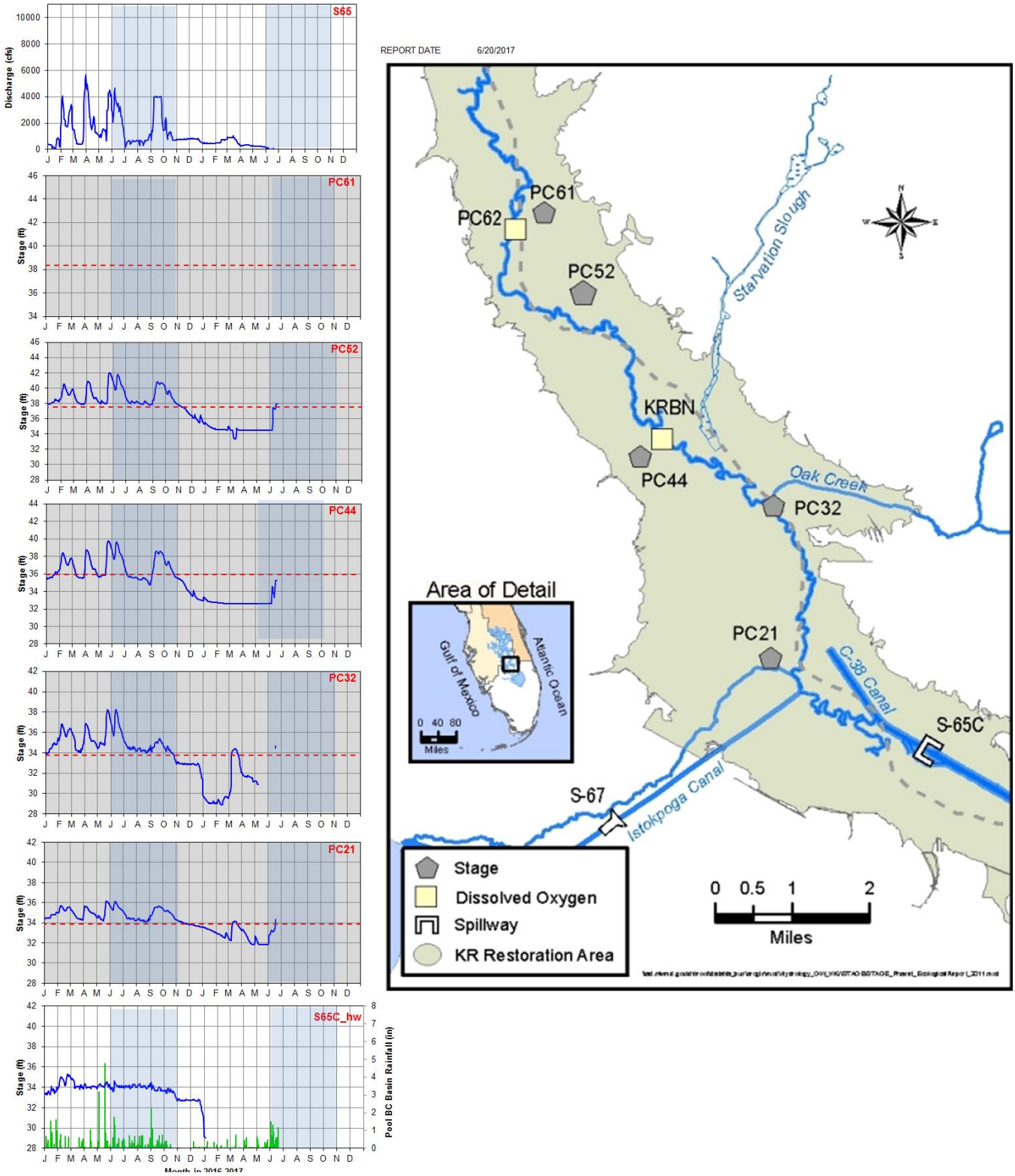


Figure 13. Discharge at S65, stages at five monitoring stations in the Phase I area of the Kissimmee River floodplain, and headwater stage at S65-C since January 1, 2015. The most recent data (~2 weeks) are provisional real-time data from SFWMD DualTrend; previous data are from SFWMD DB-HYDRO (validated).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

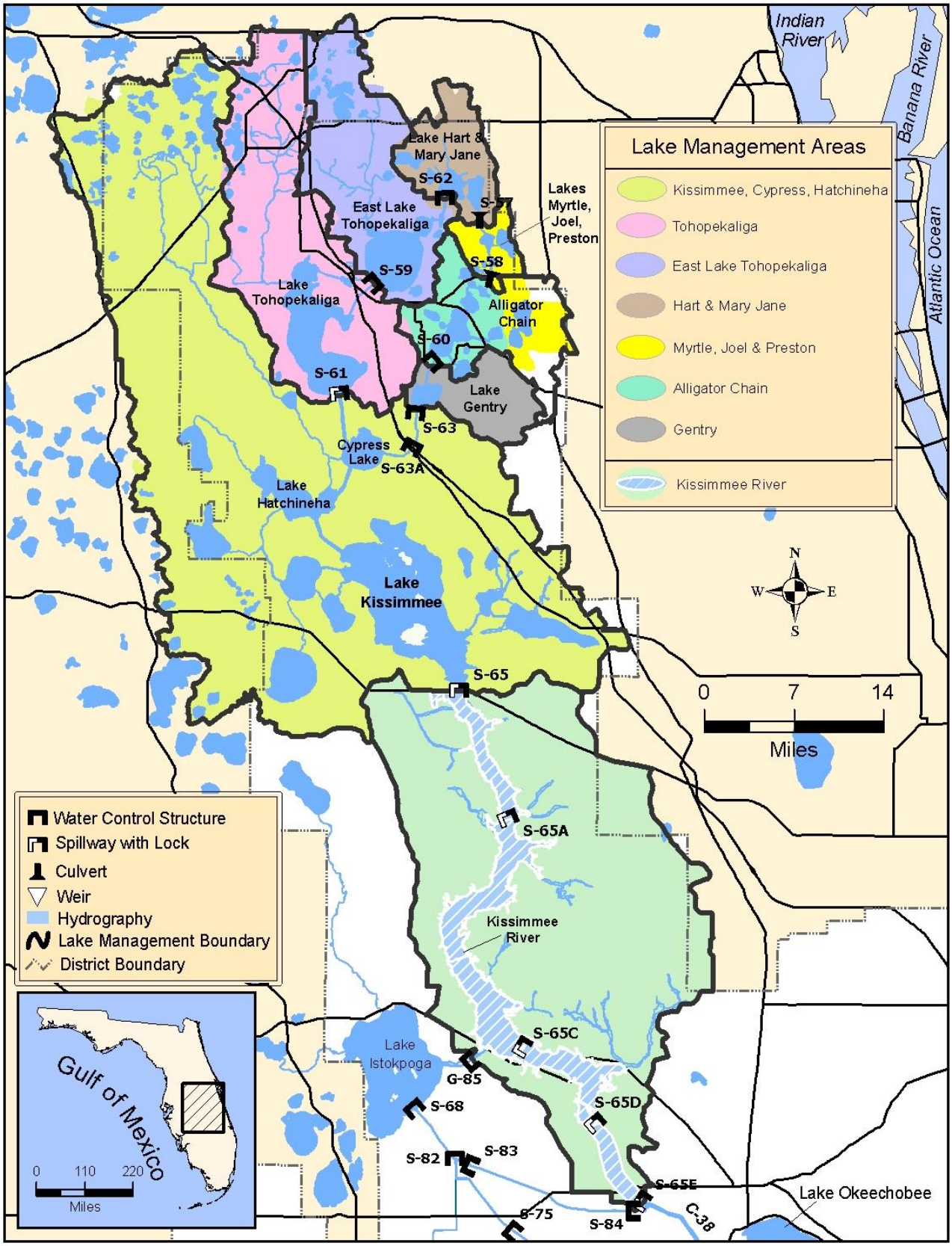


Figure 14. The Kissimmee Basin

LAKE OKEECHOBEE

According to the USACE web site, Lake Okeechobee stage is at 12.04 feet NGVD for the period ending at midnight on June 18, 2017. This value is based on the use of three interior Lake stations (L001, L005, and LZ40) and four perimeter stations (S308, S352, S4 and S133). Stage data for L006 is not available. Lake stage increased by 0.27 feet over the past week and is 0.80 feet higher than it was a month ago and 2.86 feet lower than it was a year ago (Figure 1). The Lake is currently in the Beneficial Use sub-band (Figure 2). According to RAINDAR, 2.77 inches of rain fell directly over the Lake during the past seven days (Figure 3). Similar or greater amounts of rain fell in most of the watershed except for the lower east coast and scattered pockets which received less amounts of rainfall.

Based on USACE reported values, current Lake inflow is approximately 3,926 cfs as detailed below.

Structure	Flow cfs
S65E	0
S65EX1	1250
S154	0
S84 & 84X	1359
S71	111
S72	58
C5 (Nicodemus slough dispersed storage)	0
S191	214
S133 PUMPS	0
S127 PUMPS	0
S129 PUMPS	68
S131 PUMPS	0
S135 PUMPS	195
Fisheating Creek	672
S2 Pumps	0
S3 Pumps	0
S4 Pumps	0

Current Lake outflow is approximately -1,530 cfs with approximately 1,158 cfs entering the Lake through S308 and 395 cfs entering from the L8 canal through Culvert 10A. Approximately 19 cfs is exiting through S131 Culverts and 2 cfs is exiting through both S77 and the S127 Culverts. Corrected evapotranspiration value based on the L006 weather platform solar radiation data for this past week increased from 2,122 cfs last week to 2,508 cfs.

Change in elevation equivalents and average weekly flows (midnight June 12, 2017 to midnight June 18, 2017) for major structures are presented in Figure 4.

Based on the Lake Okeechobee wading bird habitat suitability index, there are currently approximately 23,875 acres of suitable foraging habitat for long-legged birds and 10,130 acres for long and short-legged birds on the Lake (Figure 5). However, the 2017 wading bird season is winding down so minimal impacts to wading birds are expected from the recent rise in Lake levels.

Taking advantage of the dry marsh conditions in Lake Okeechobee, the District and the Florida Fish and Wildlife Conservation Commission (FWC) have collaborated to conduct aerial herbicide treatments to control nuisance emergent vegetation. The FWC has treated 1,500 acres of torpedograss in the Indian Prairie marsh and is in the process of treating 1,600 acres of cattail in Moonshine Bay. The

District began treating an additional 1,900 acres of torpedograss in the Moore Haven marsh this week (Figure 6).

Water quality data collected on May 23, 2017 are now available. Pelagic Total Phosphorus (TP) and Total Suspended Solids (TSS) concentrations have both increased over the past three months while nearshore values have declined since April (Figure 7). Lakewide TP concentrations also declined since April but TSS values remained the same.

May chlorophyll *a* data (collected May 23, 2017) indicated bloom conditions (>40 ug/L) at two nearshore sites, LZ2 in the north and POLESOUT along the northwestern shoreline (Figure 8). Three additional sites in the north and western regions had elevated values in the 20-40 ug/L range confirming the moderate bloom potential seen in those areas from the satellite imagery of May 27, 2017. None of the six routine microcystin sampling sites had values above the 0.20 analytical limit of detection.

The most recent satellite imagery (June 15 and June 16) indicates that the northern and western regions continue to have potentially elevated chlorophyll values. However, cloud cover obscured most of the Lake in the June 15 image (Figure 9).

Water Management Recommendations

The Lake is 12.04 feet NGVD having increased by 0.27 feet over the past week. This ascension rate equates to a projected ascension rate of 1.08 feet per month which is double the optimal 0.5 feet per month.

With the onset of the wet season, ecological concerns shift from the effects of desiccation of the marsh to the potential damage to submerged and emergent vegetation, wading bird foraging and nesting, and native apple snail egg production which can result from a too rapid (greater than 0.5 feet per month) rise in Lake stage.

Any activities that result in the slowing of the rate of rise of Lake Okeechobee would be ecologically beneficial now and would be protective of the Lake's emergent wetland and submerged aquatic flora and its associated fauna.

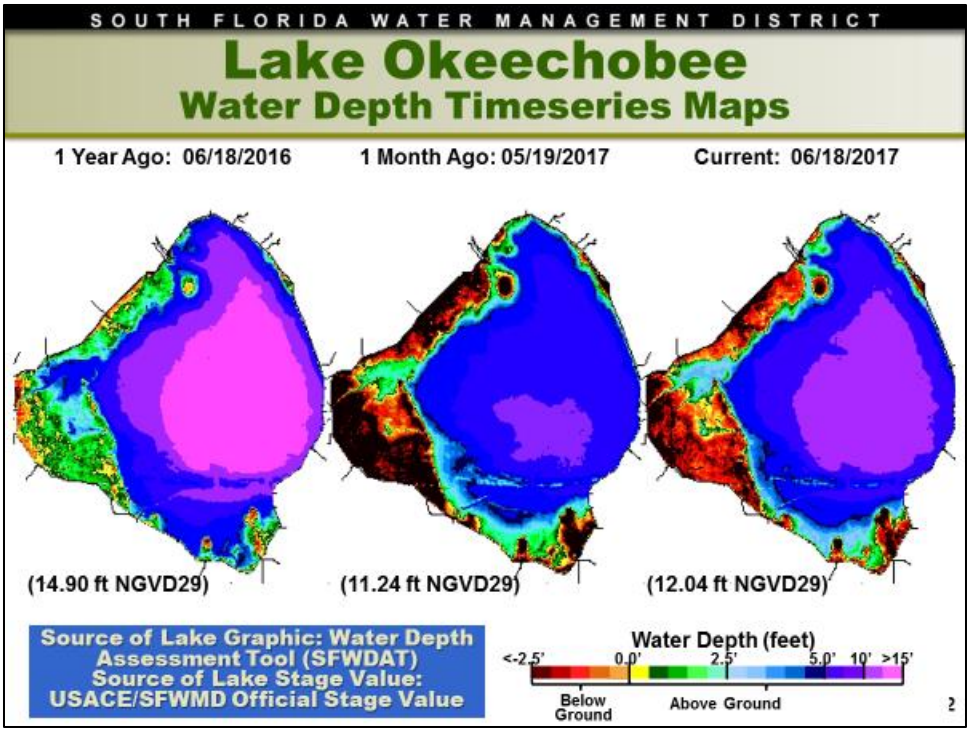


Figure 1

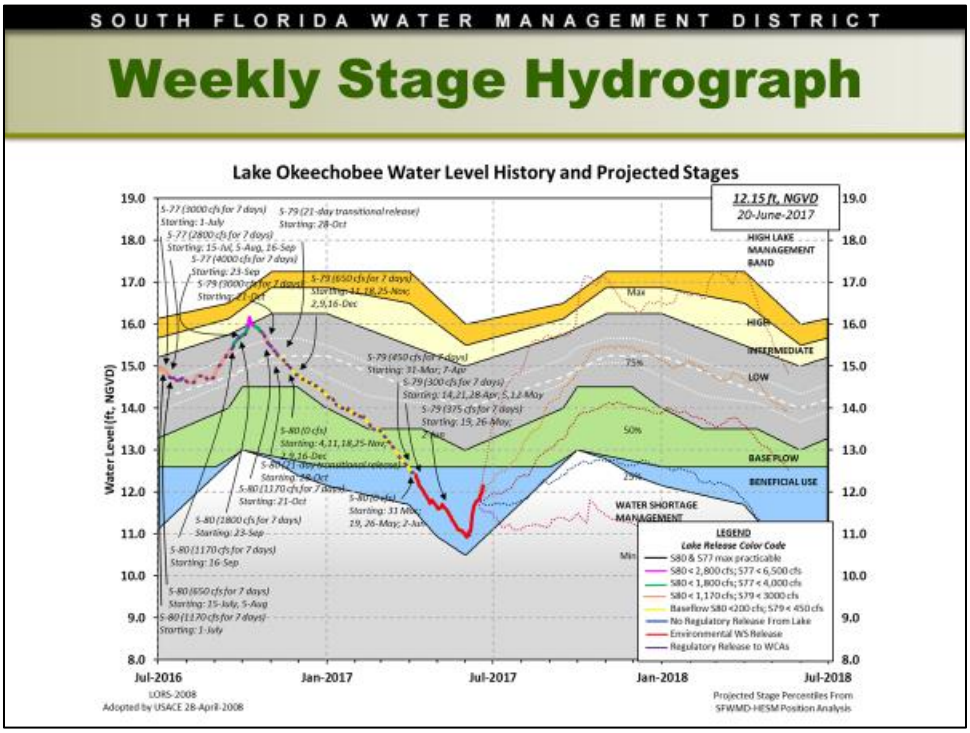


Figure 2

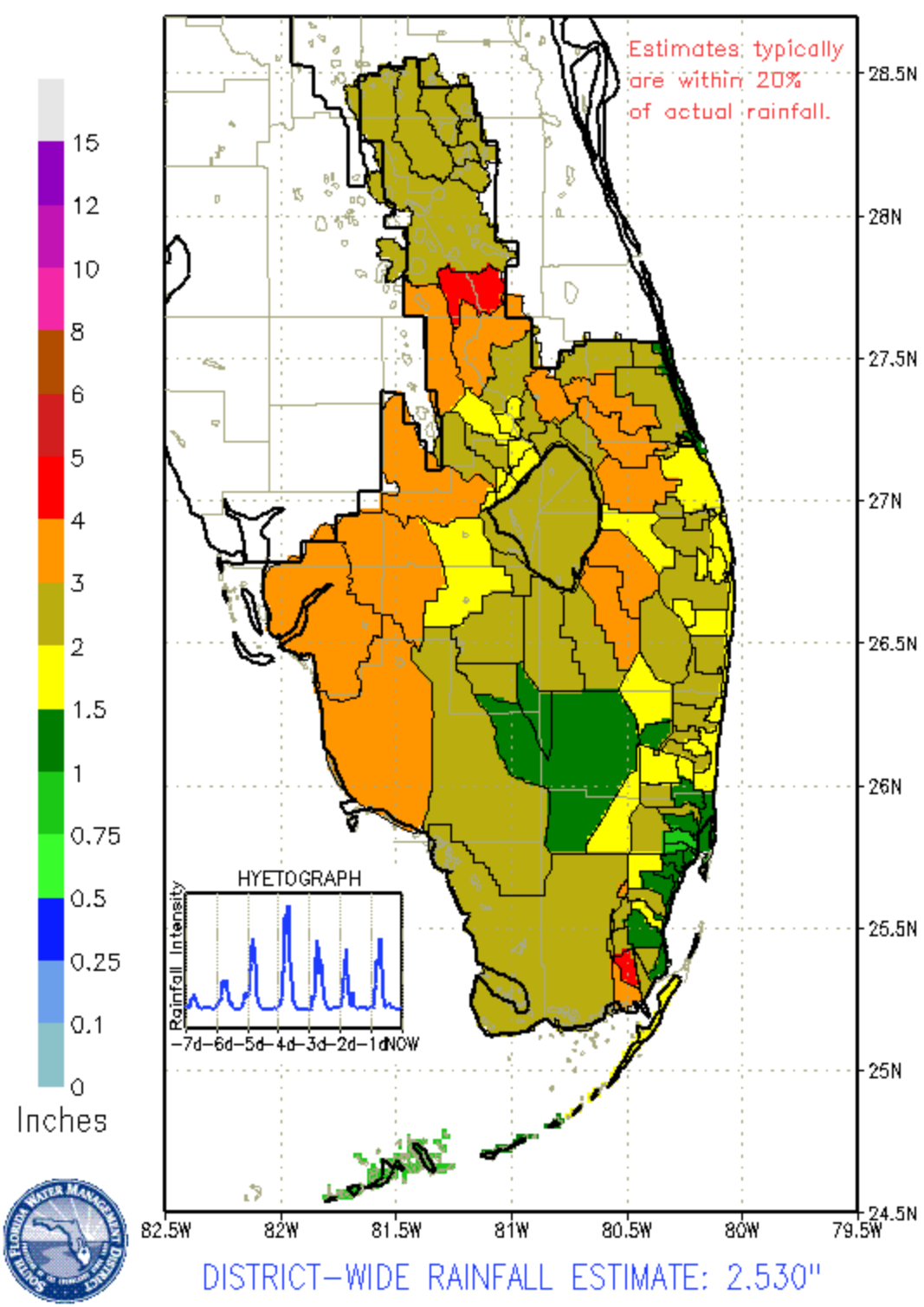

SFWMD PROVISIONAL RAINDAR 7-DAY BASIN RAINFALL ESTIMATES
FROM: 0830 EST, 06/12/2017 THROUGH: 0830 EST, 06/19/2017
Estimates typically are within 20% of actual rainfall.
15
12
10
8
6
5
4
3
2
1.5
1
0.75
0.5
0.25
0.1
0
Inches
HYETOGRAPH
Rainfall Intensity
-7d-6d-5d-4d-3d-2d-1dNOW
28.5N
28N
27.5N
27N
26.5N
26N
25.5N
25N
24.5N
82.5W
82W
81.5W
81W
80.5W
80W
79.5W
DISTRICT-WIDE RAINFALL ESTIMATE: 2.530"

Figure 3

INFLOWS	Average Daily Flow Past Week cfs	Feet of Change Past Week
S65E & S65EX1	587	0.023
S71 & 72	398	0.015
S84 & 84X	807	0.031
Fisheating Creek	94	0.004
Rainfall	N.A.	0.231
OUTFLOWS	**Average Daily Flow Past Week cfs**	**Feet of Change Past Week**
S77	11	0.000
S308	13	0.001
S351	-8	0.000
S352	0	0.000
S354	-45	-0.002
L8	-343	-0.013
ET	2508	0.097

Figure 4

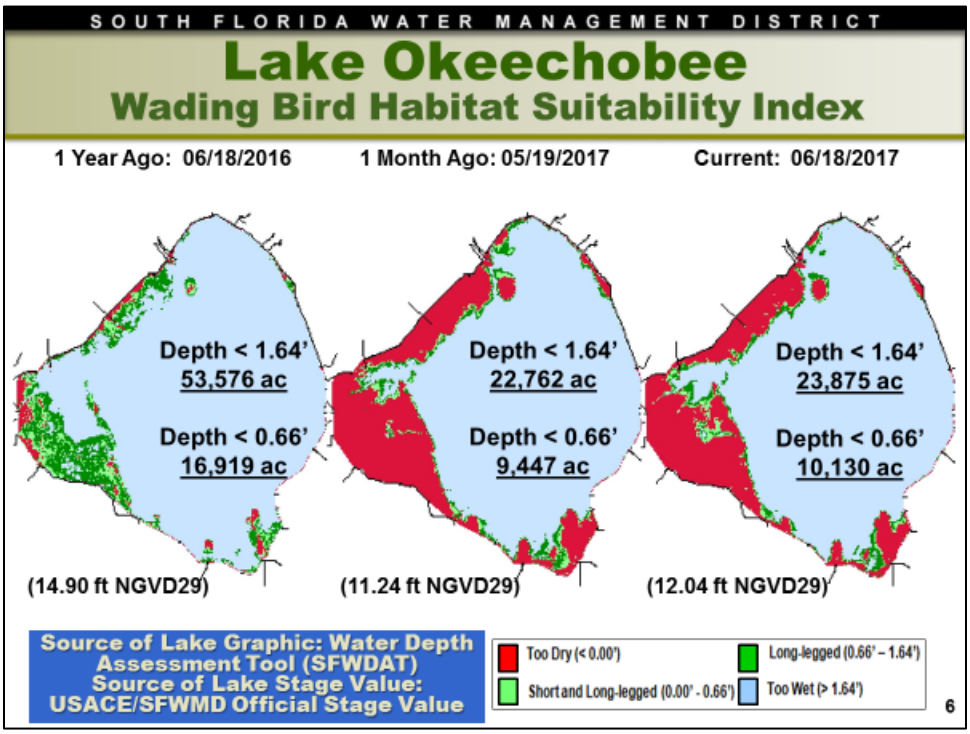
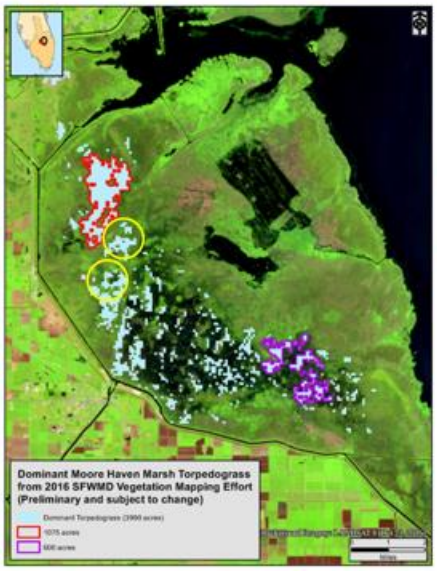


Figure 5

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Lake Okeechobee
Habitat Enhancement



- **Proposed by District**
- **1,900 acres Torpedograss**
  - conducted recon flight
  - began treatments 6/19
  - additional 300 acres

Figure 6

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Lake Okeechobee
Water Quality

Parameter		Mar 2017	Apr 2017	May 2017
TP (ppb)	Nearshore	109	133	83
	Pelagic	151	164	183
	Lakewide	131	150	136
TSS (ppm)	Nearshore	16	26	17
	Pelagic	29	36	45
	Lakewide	23	31	31

TP = Total Phosphorus
TSS = Total Suspended Solids

NOTE: Fisheating Bay sites (FEBIN and FEBOUT) were not sampled in March, April and May

Figure 7

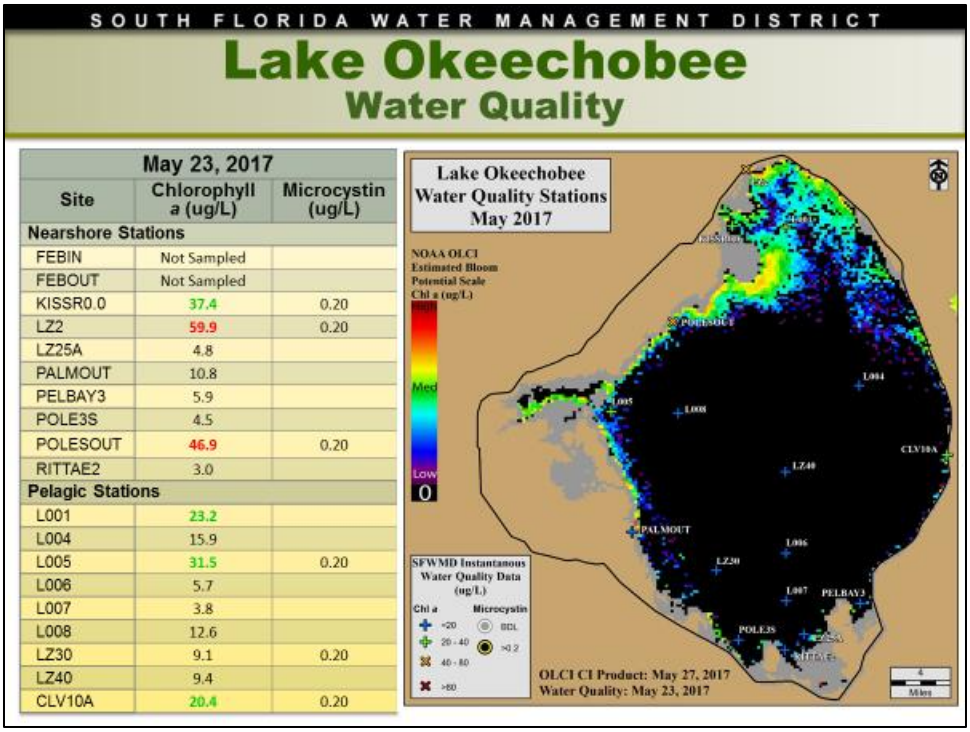


Figure 8

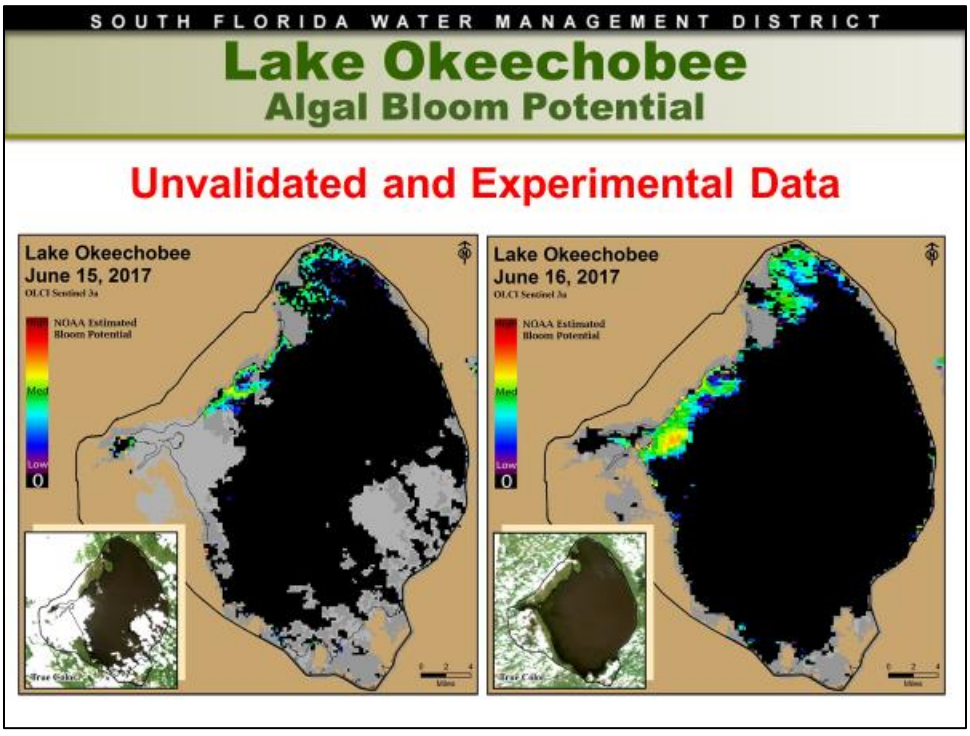


Figure 9

Lake Istokpoga

Lake Istokpoga stage is 38.17 feet NGVD as of midnight June 18, 2017 and is currently 0.08 feet below its low pool regulation schedule of 38.25 feet NGVD (Figure 10). Average flows into the Lake from Arbuckle and Josephine creeks over the past week increased to 298 cfs and 77 cfs, respectively. Average discharge from S68 and S68X this past week was 777 cfs, an increase from the previous

week's flow of 5 cfs. According to RAINDAR, 3.40 inches of rain fell in the Lake Istokpoga watershed during the past seven days.

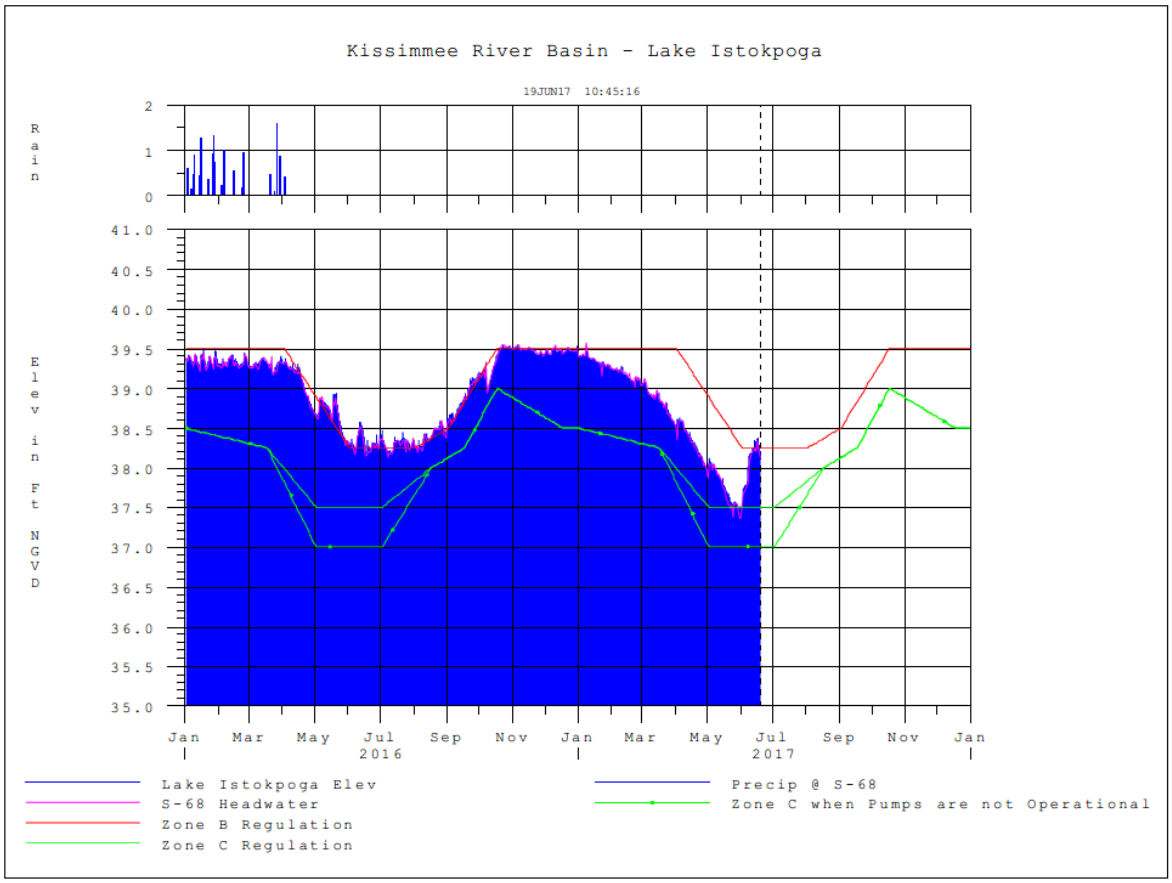


Figure 10

ESTUARIES

St. Lucie Estuary

Over the past week, provisional flows averaged about 0 cfs at S-80, 792 cfs downstream of S-308 flowing into Lake Okeechobee, 693 cfs at S-49 on C-24, 861 cfs at S-97 on C-23, and 885 cfs from Ten Mile Creek at the Gordy Road Structure. Average inflow from tidal basin tributaries is estimated to be 779 cfs (Figures 1 and 2). Total inflow averaged about 3,218 cfs last week and 1,634 cfs over last month.

Over the past week, salinity decreased 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 8.1. Salinity conditions in the middle estuary are in the fair 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)	**NR**[2](11.5)	**NR** (19.6)	NA[1]
US1 Bridge	**7.3** (15.5)	**9.0** (17.4)	10.0-26.0
A1A Bridge	**17.8** (23.0)	**21.9** (26.2)	NA

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

Caloosahatchee Estuary

During the past week, provisional flows averaged approximately 0 cfs at S-77, 1,577 cfs at S-78, and 4,496 cfs at S-79. Average inflow from tidal basin tributaries is estimated to be 2,613 cfs (Figures 5 & 6). Total inflow averaged 7,109 cfs last week and 3,969 cfs over last month.

Over the past week in the estuary, salinity decreased throughout the estuary (Table 2, 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 Sanibel (Figure 9). The 30-day moving average surface salinity is 4.5 at Val I-75 and 9.8 at Ft. Myers. Salinity conditions between Val I-75 and Ft. Myers are improving for tape grass. Without discharges at S-79, the 30-day moving average salinity at Val I-75 is forecast be 1.0 within two weeks (Figure 10).

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** (1.1)	**0.2** (1.1)	NA[1]
*Val I75	**0.4** (2.8)	**0.8** (4.9)	0.0-5.0[2]
Ft. Myers Yacht Basin	**1.3** (7.0)	**2.1** (10.5)	NA
Cape Coral	**4.8** (14.6)	**6.1** (16.4)	10.0-30.0
Shell Point	**16.1** (24.4)	**17.0** (25.1)	10.0-30.0
Sanibel	**27.3** (30.9)	**27.1** (33.0)	10.0-30.0

[1]Envelope not applicable and [2]Envelope is based on a 30-day average.
*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 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)	5.07 – 6.62	5.86 – 66.04 (spike)	1.56 – 24.04
Dissolved Oxygen (mg/l)	2.47 – 3.91	1.29 – 4.17	No Data

The Florida Fish and Wildlife Research Institute reported on June 16, 2017, that *Karenia brevis*, the Florida red tide organism, was not present in samples collected from Lee County.

Water Management Recommendations

The 30-day average salinity at the I-75 Bridge is 4.5 and is forecast to be 1 in two weeks with no inflow at S-79. Lake stage is in the Beneficial Use sub-band of 2008 LORS. The 2008 LORS/Adaptive Protocols recommend no S-77 releases unless the Governing Board recommends otherwise. Given the current estuarine conditions, there are no ecological benefits associated with additional releases from Lake Okeechobee.

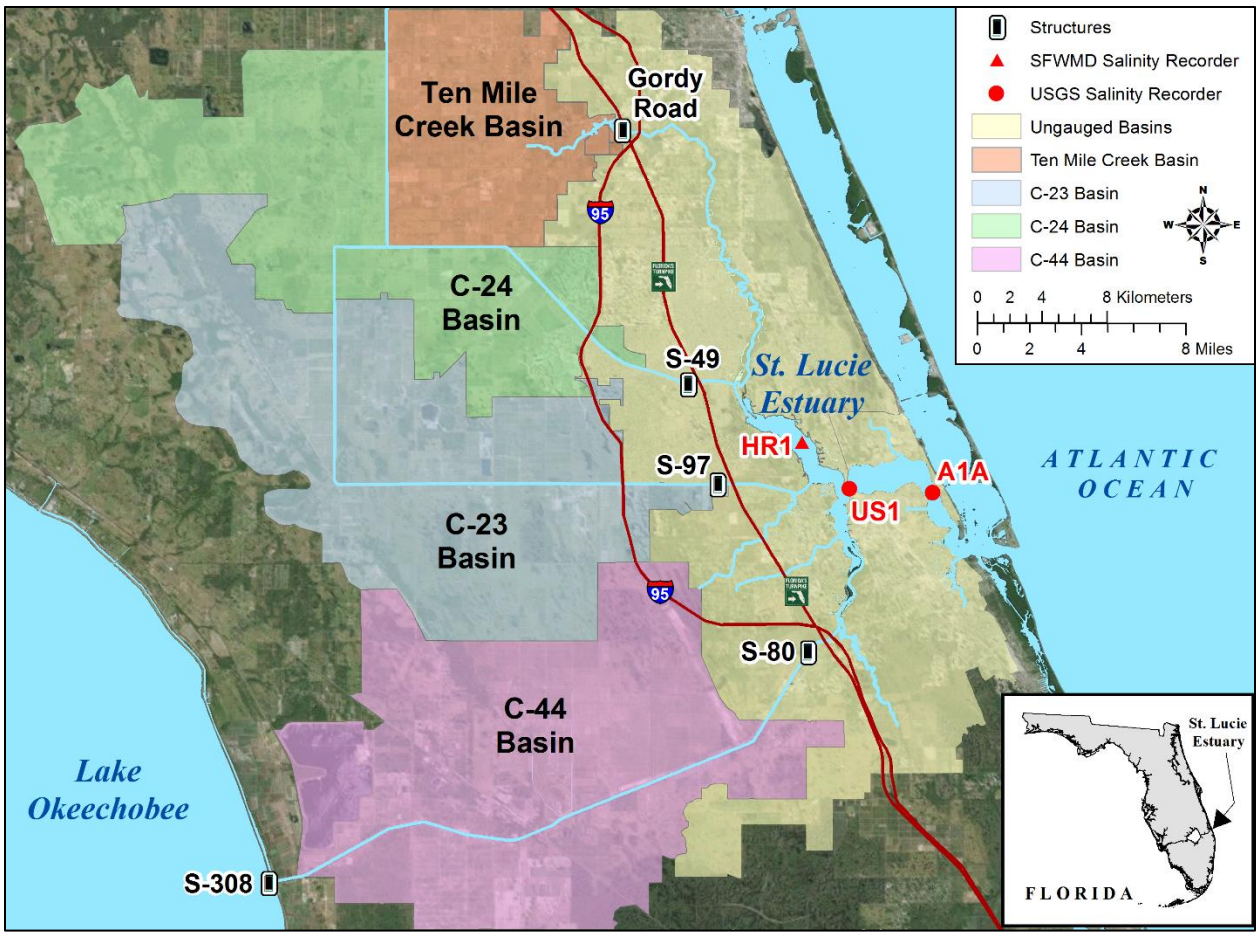


Figure 1. Basins, water control structures, and salinity monitoring for the St. Lucie Estuary.

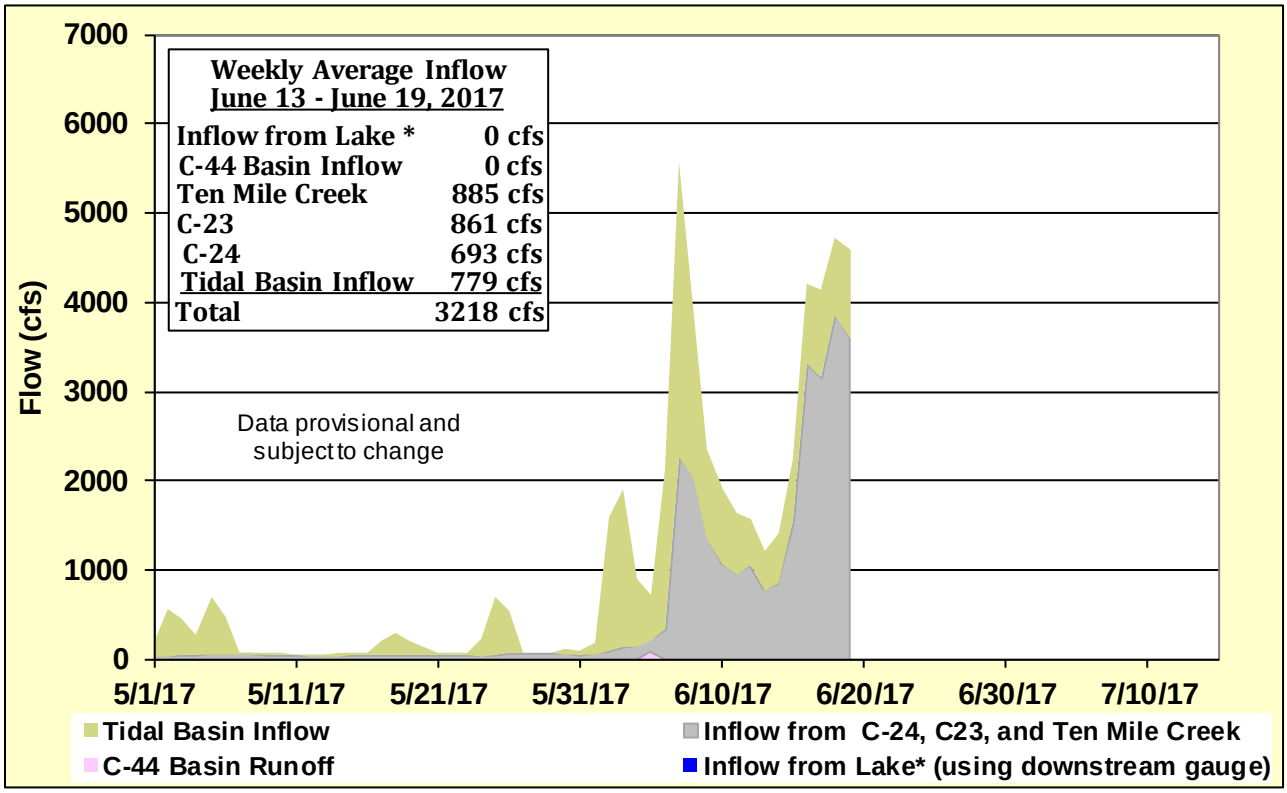


Figure 2. Estimated surface freshwater inflows from Lake Okeechobee and runoff from the C-44, C-23, C-24, Ten Mile Creek, and tidal basins into the St. Lucie Estuary.

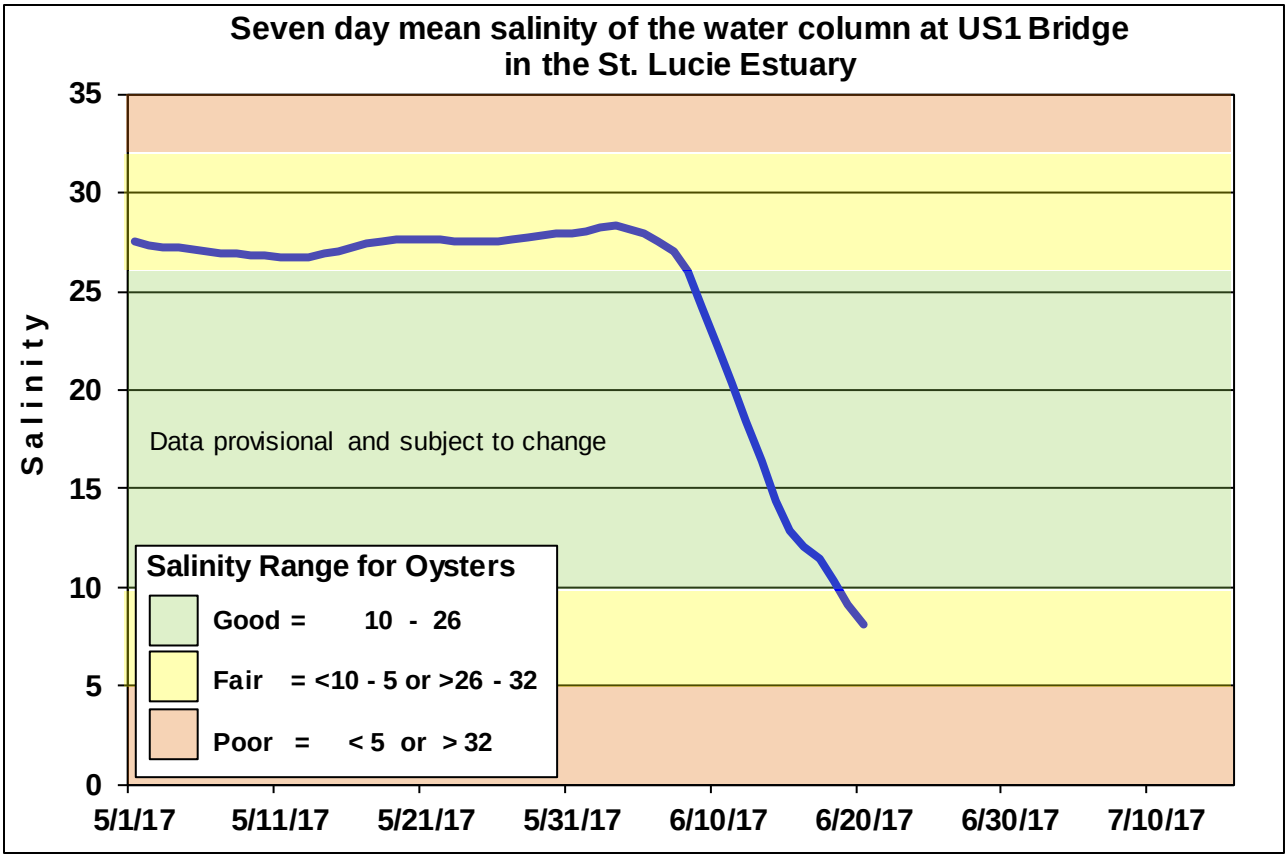


Figure 3. Seven-day mean salinity of the water column at the U.S. Highway 1 Bridge.

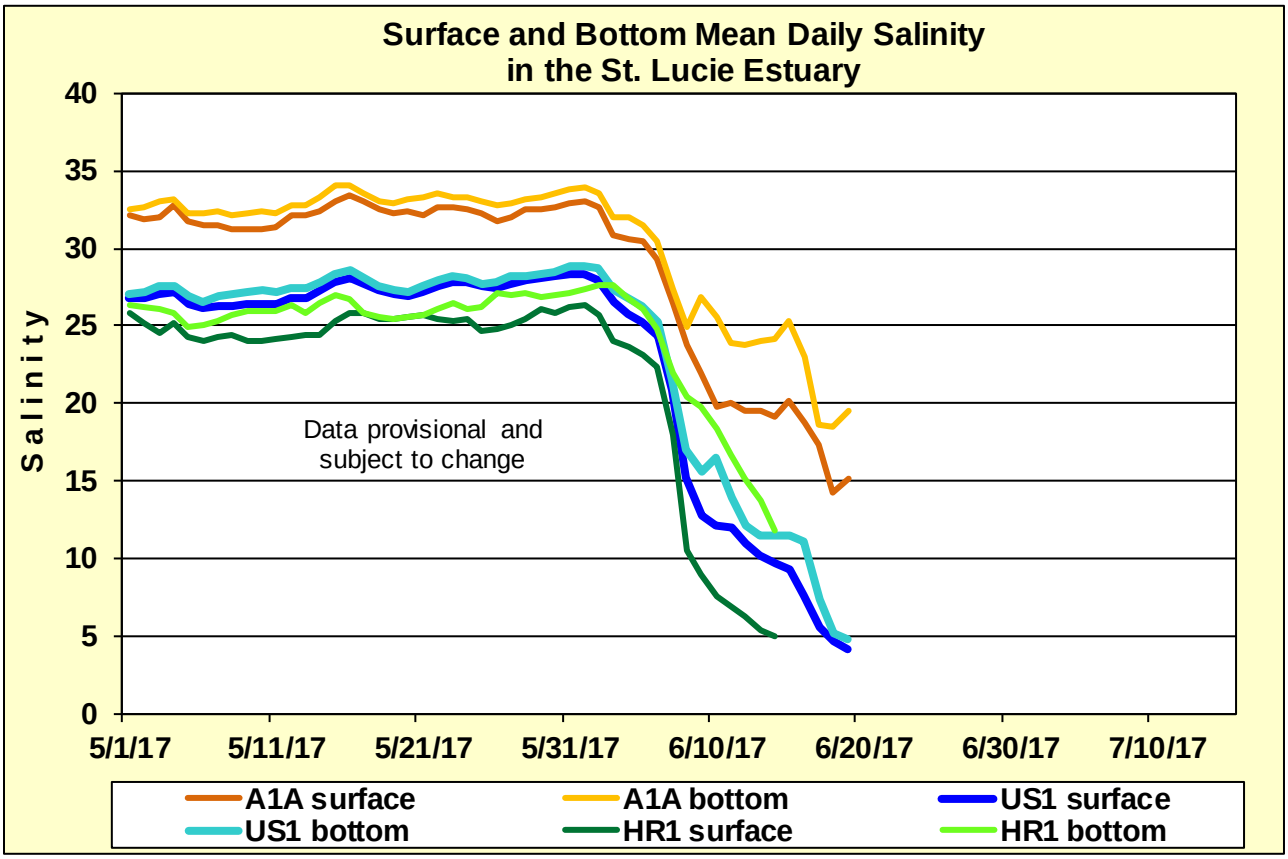


Figure 4. Daily mean salinity at the A1A, US1 and estimated HR1 stations.

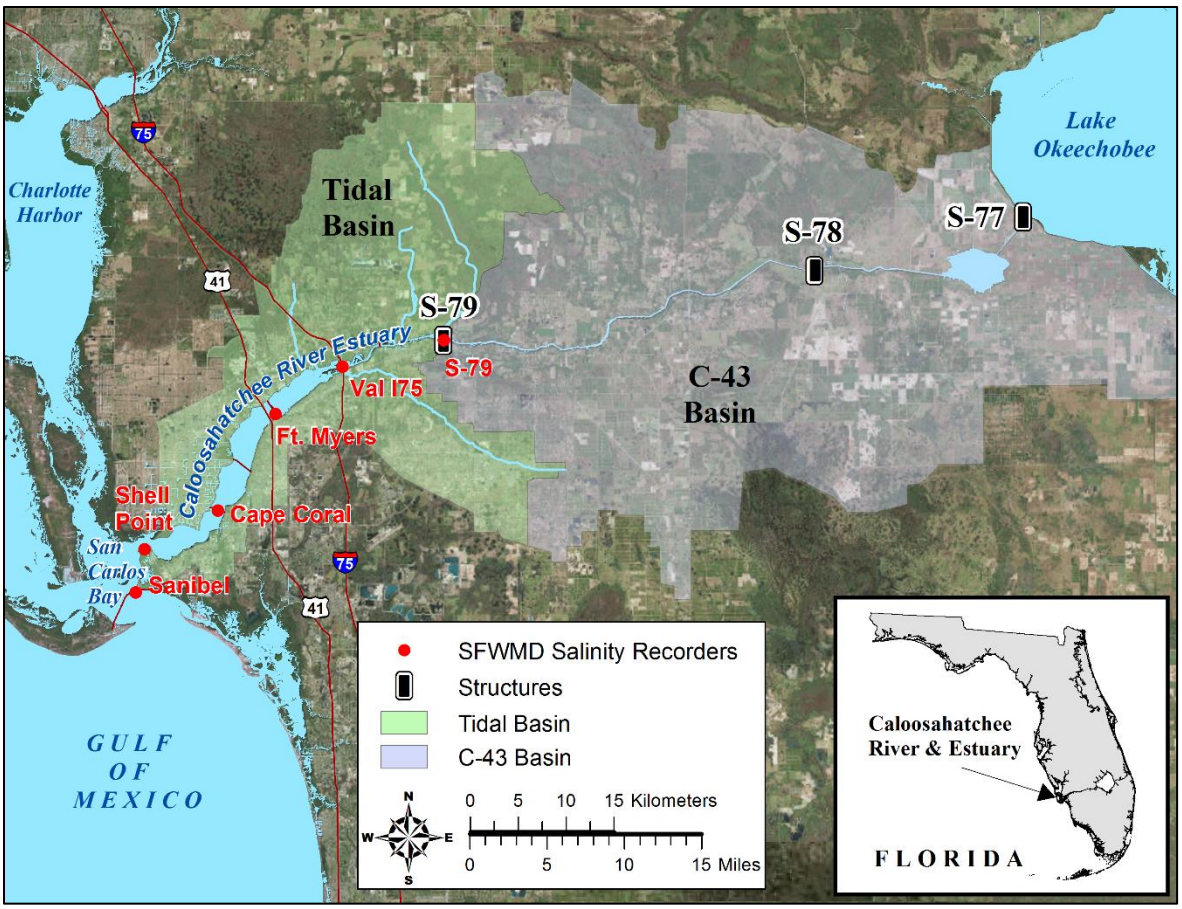


Figure 5. Basins, water control structures, and salinity monitoring for the Caloosahatchee Estuary.

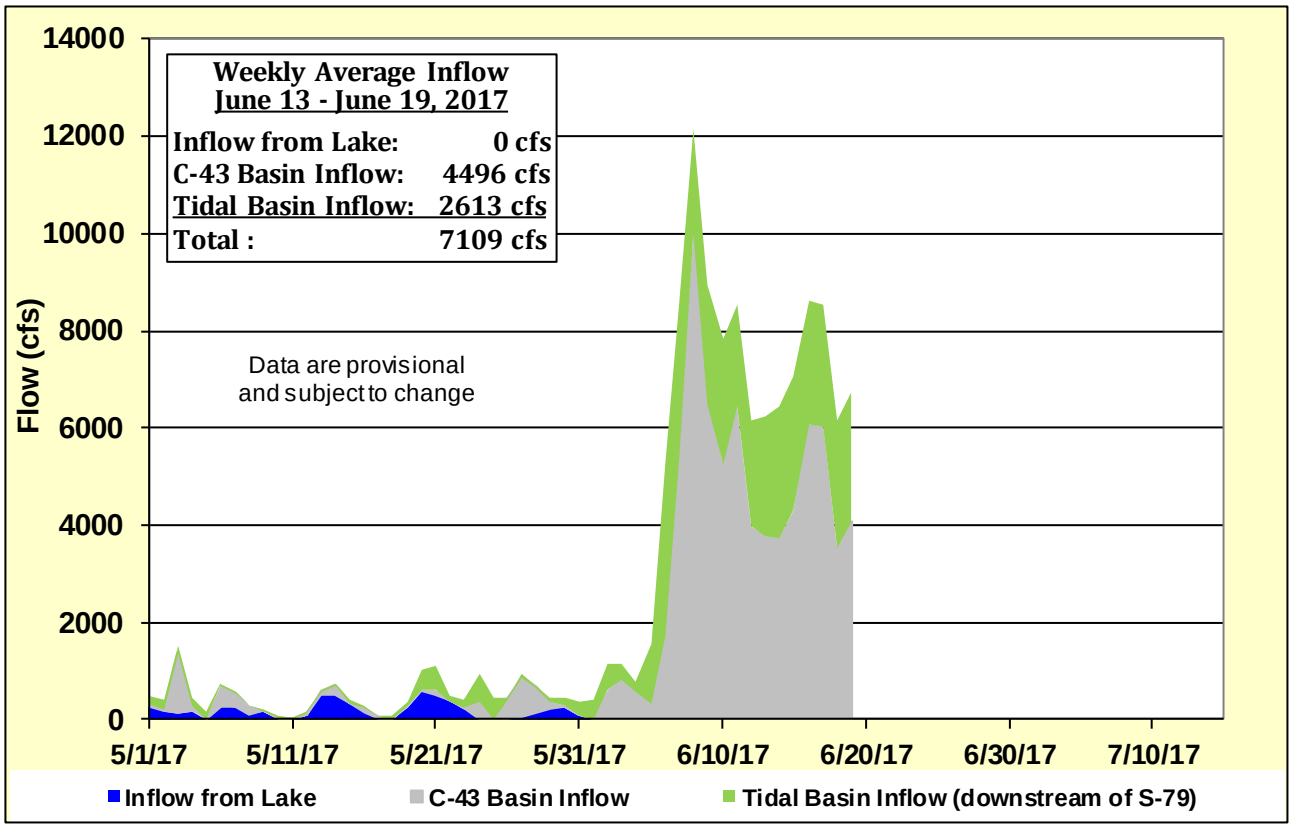
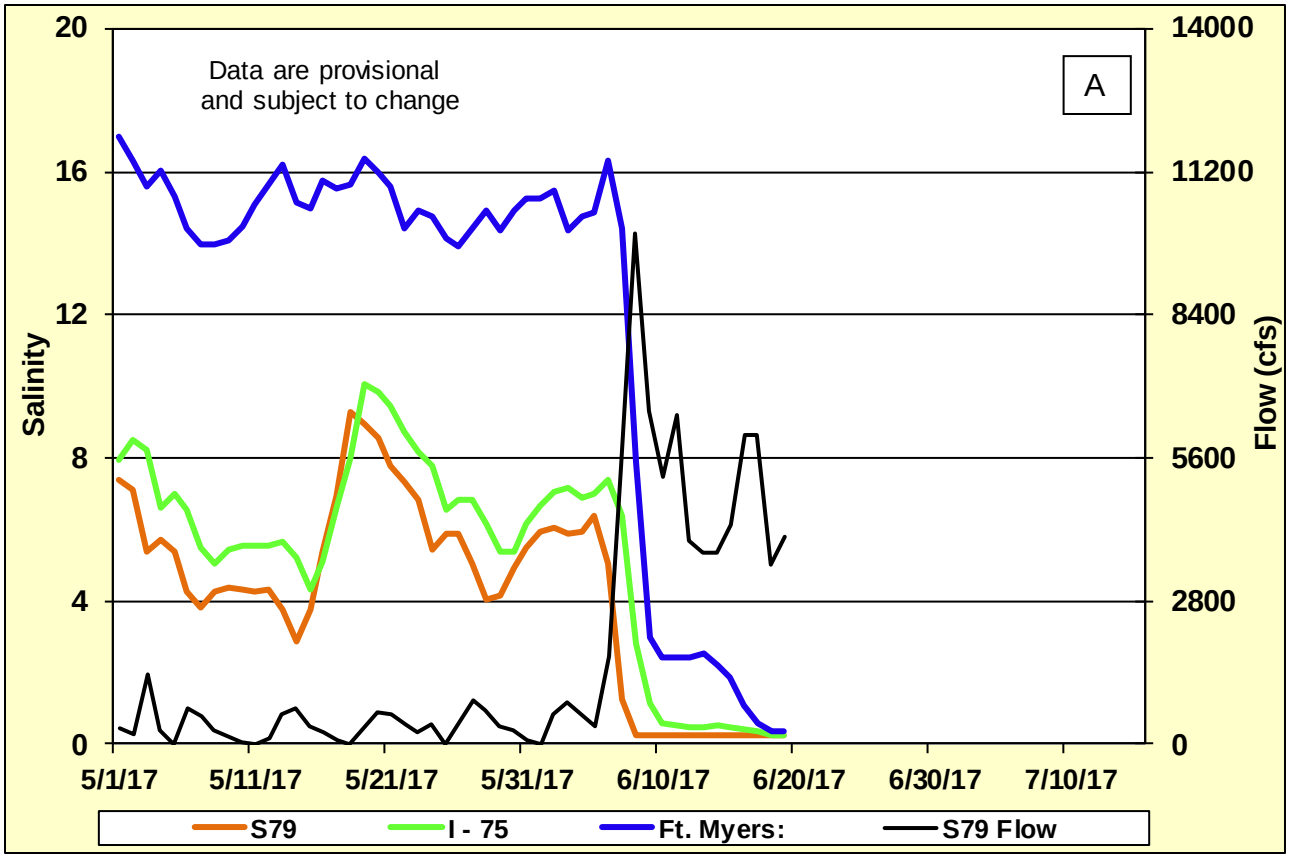


Figure 6. Freshwater inflows from Lake Okeechobee, runoff from the C-43 basin, and tributaries in the tidal basin into the Caloosahatchee River Estuary.



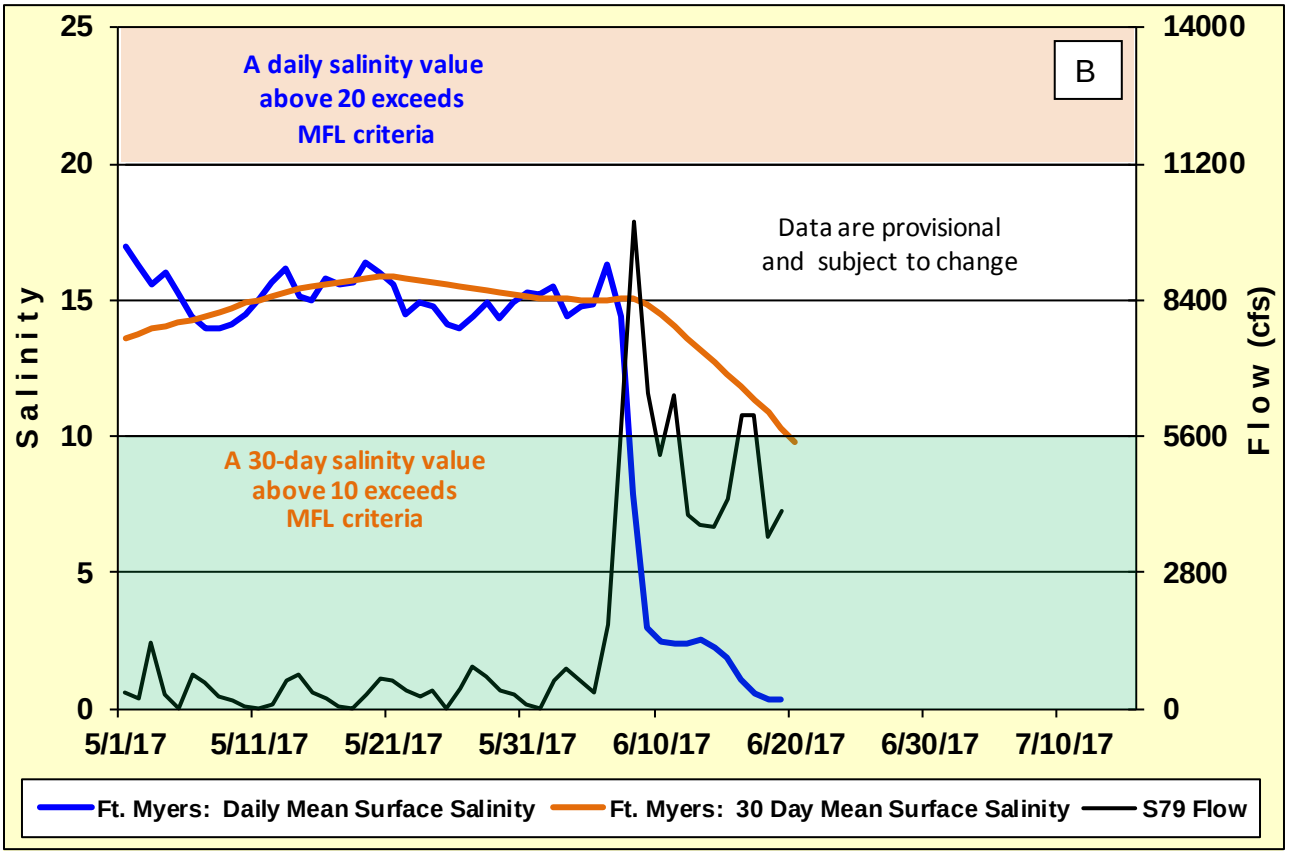


Figure 7. Daily mean flows at S-79 and salinity at upper estuary monitoring stations (A) and 30-day moving average salinity at Ft. Myers (B).

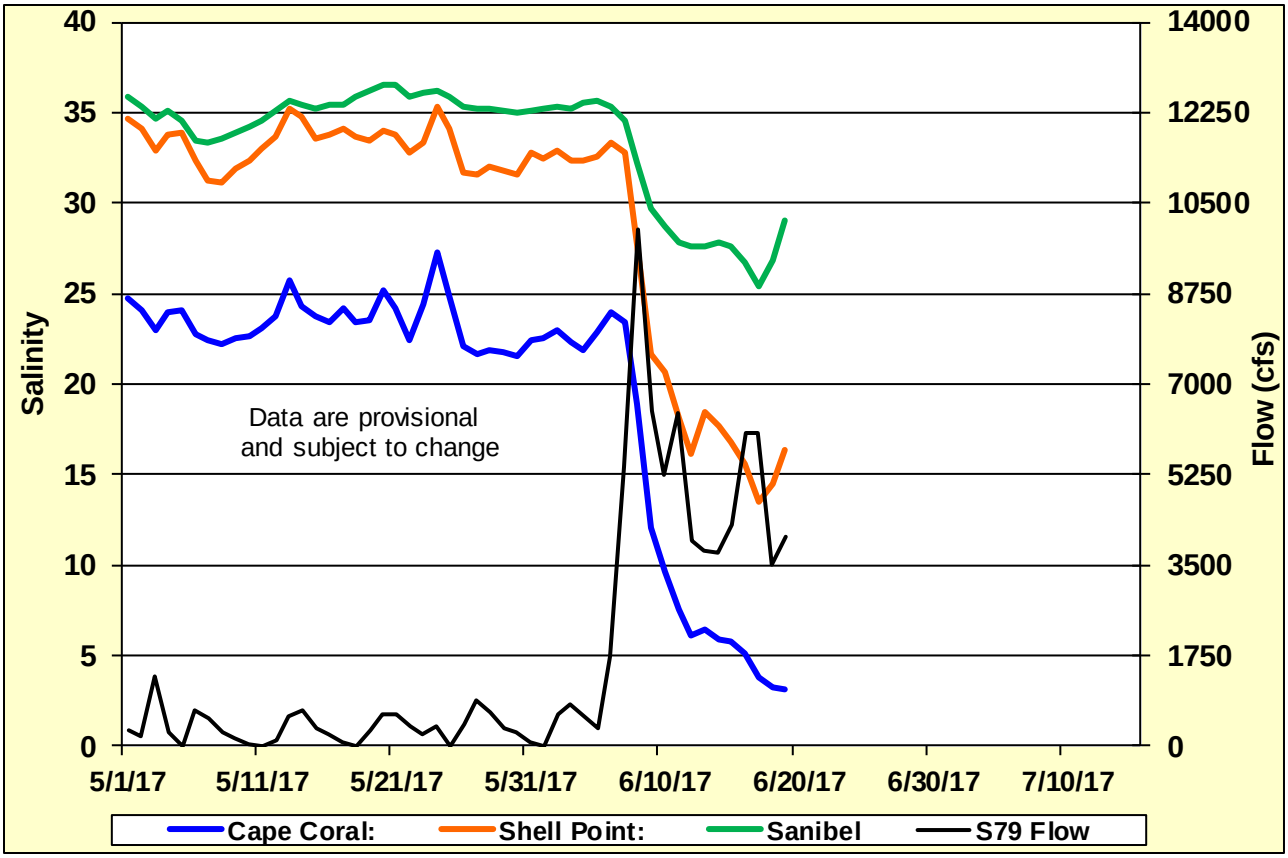


Figure 8. Daily mean flows at S-79 and salinity at lower estuary stations.

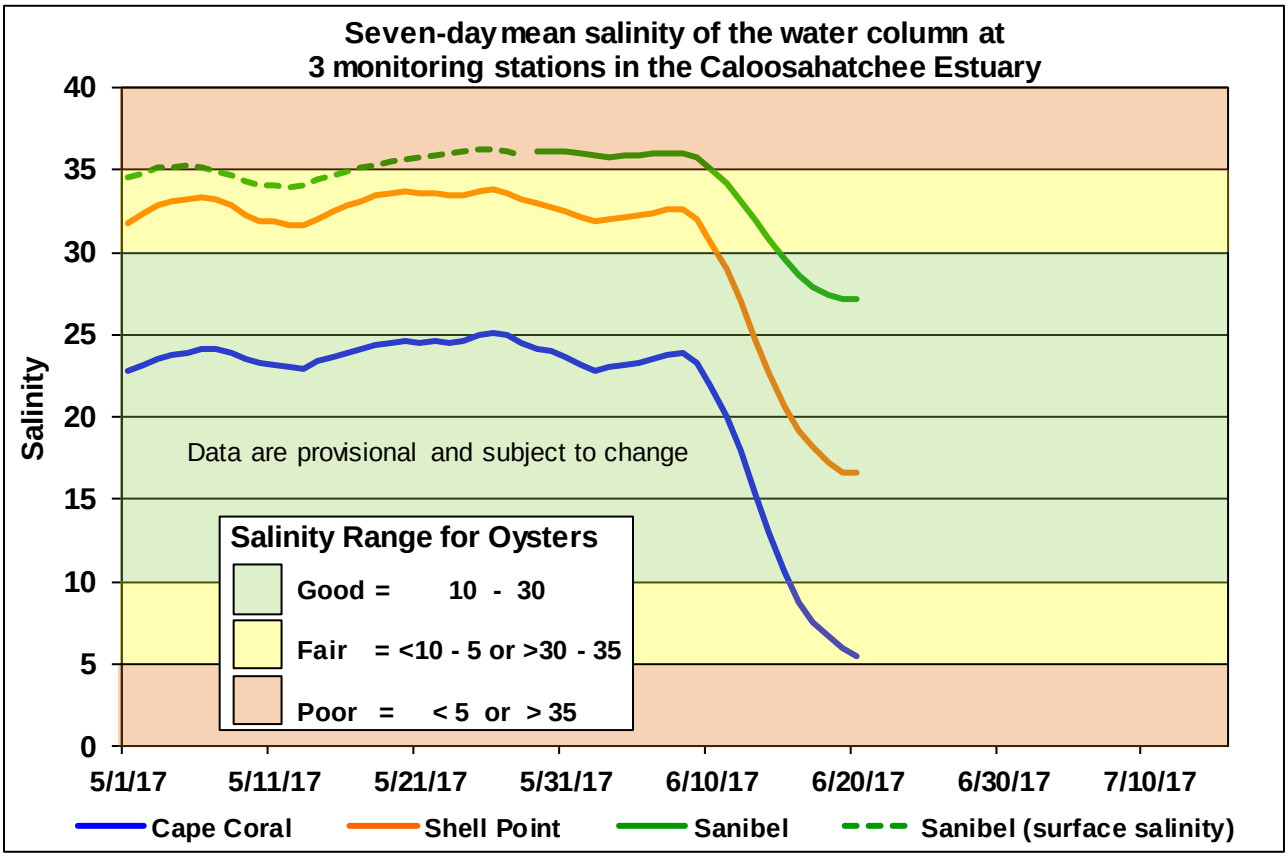


Figure 9. Seven-day mean salinity at Cape Coral Bridge, Shell Point and Sanibel Bridge monitoring stations.

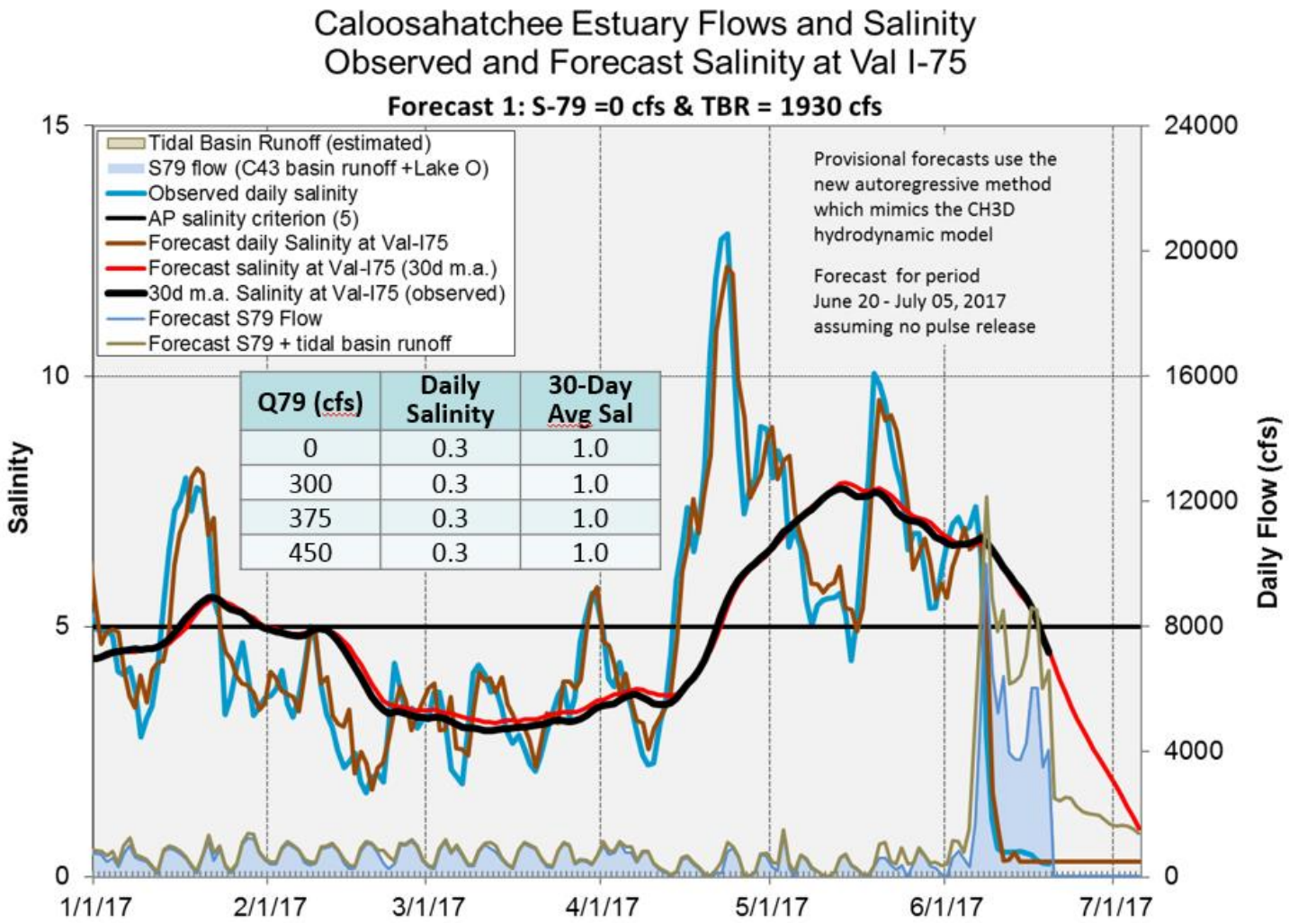
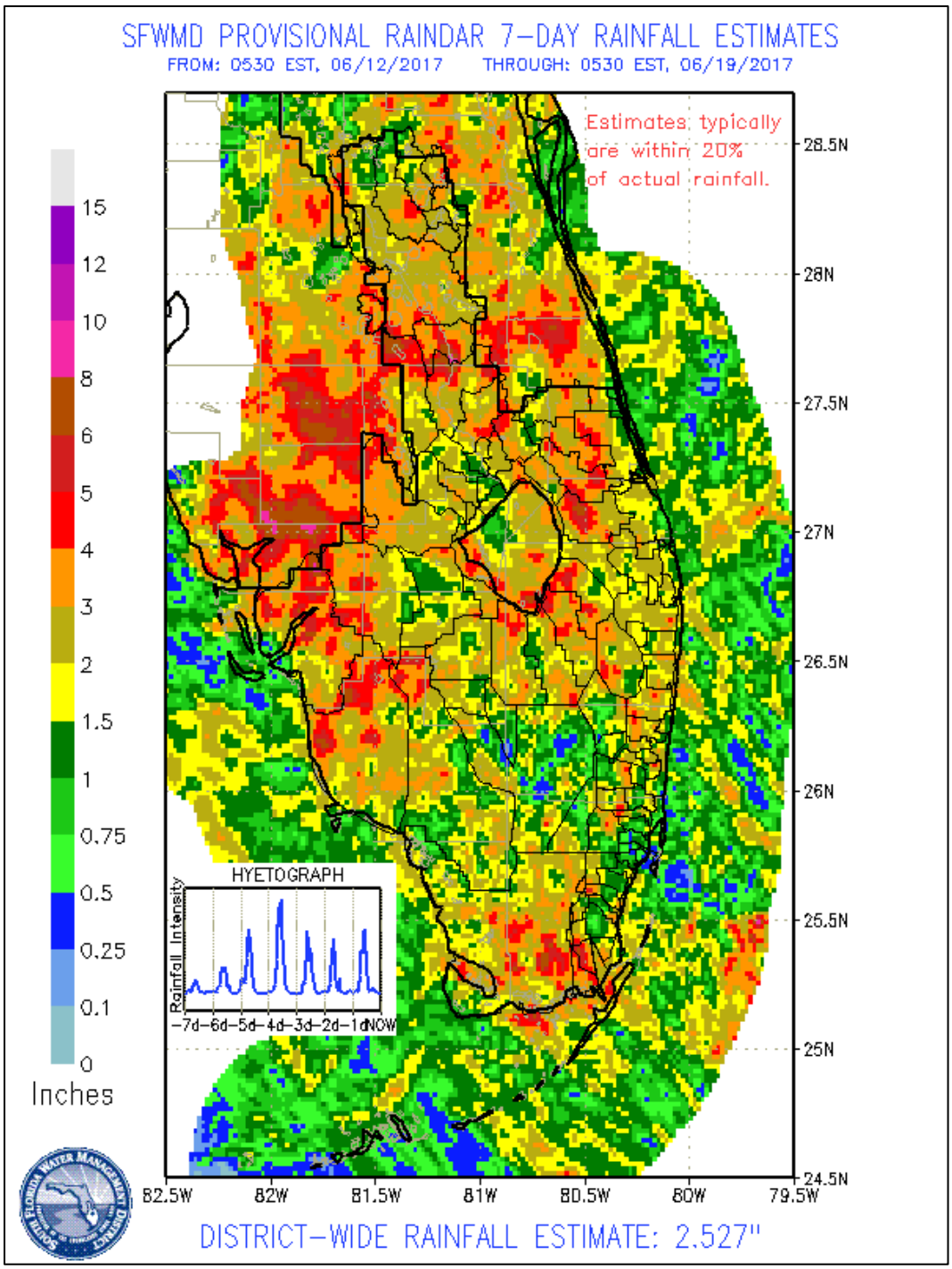


Figure 10. 14-day salinity forecast at Val I-75 assuming no releases at S-79.

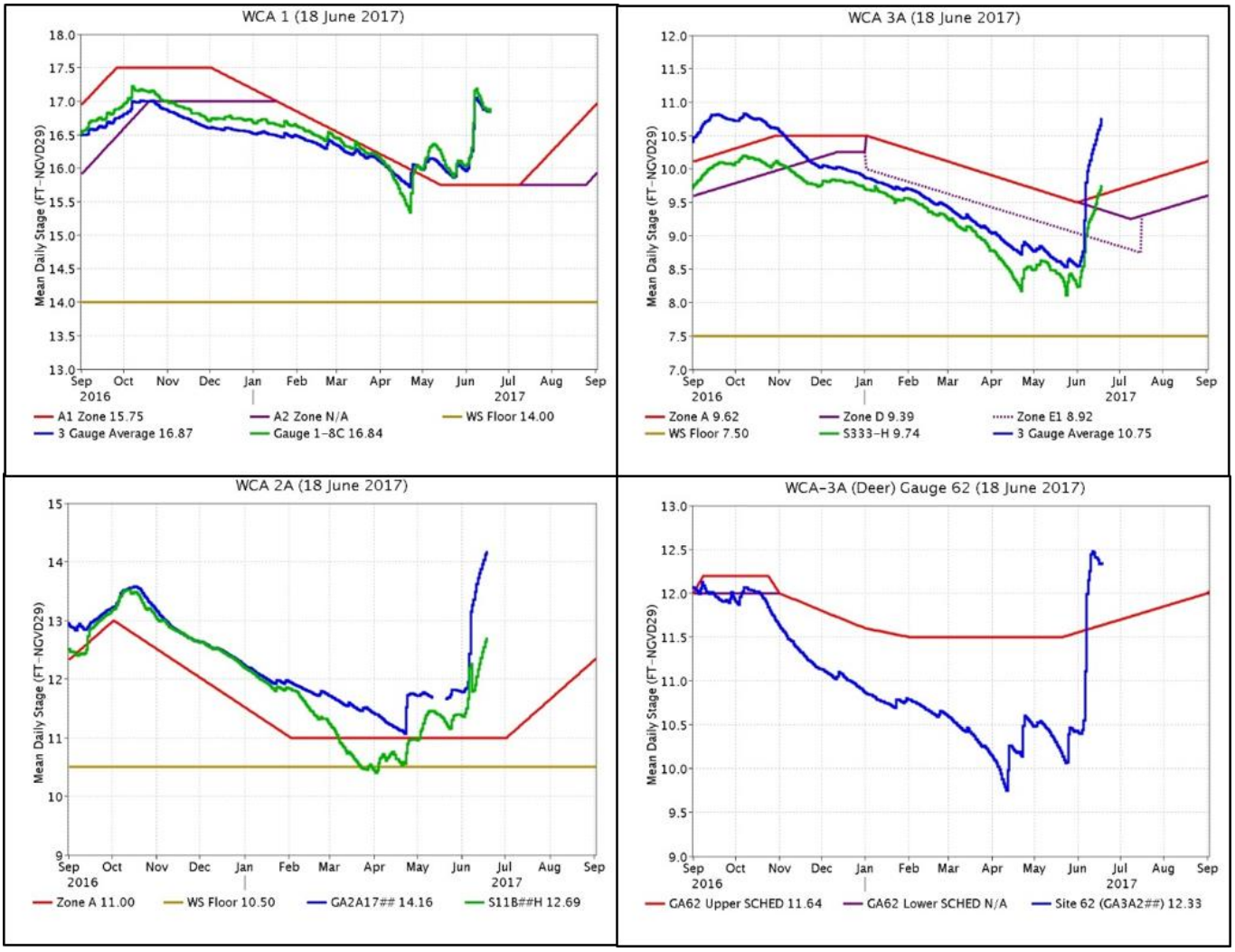
EVERGLADES

Widespread rain and run-off from the recent week's rain continued the stage increases across most of the Everglades. *WCA-2B information is estimated due to instrumentation issue.

Everglades Region	Rainfall (Inches)	Stage Change (feet)
WCA-1	2.61	-0.07
WCA-2A	1.66	0.50
WCA-2B*	1.35	~0.20
WCA-3A	1.46	0.34
WCA-3B	1.46	0.14
ENP	2.53	0.25

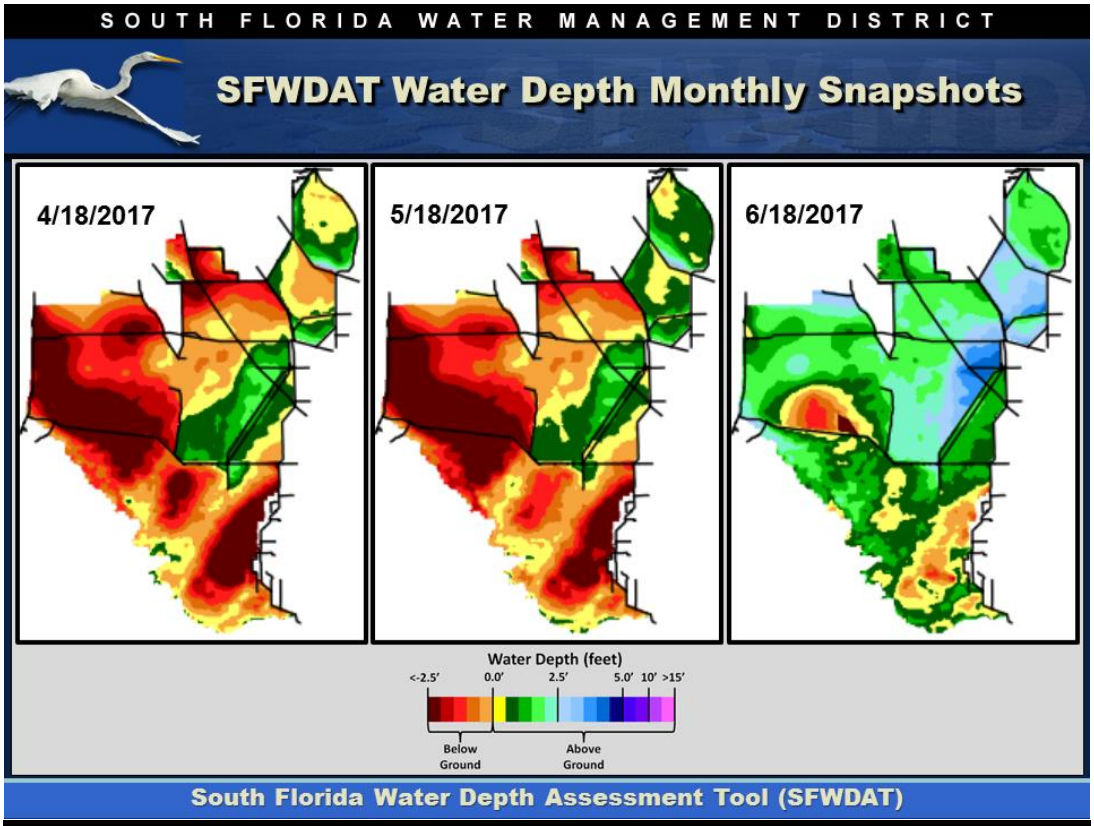


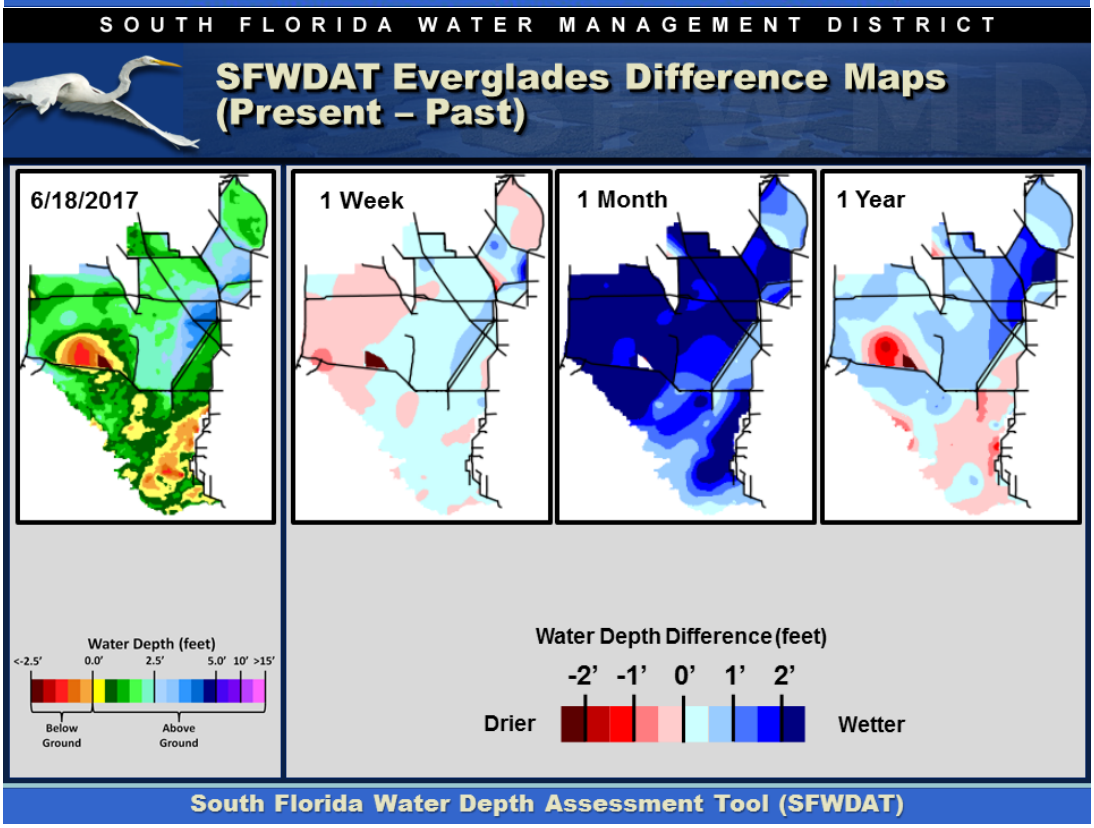
Regulation Schedules: WCA-1 stage is 1.12 feet above Zone A. In WCA-2A the marsh stage at gauge GA2A17 is currently 3.16 feet above zone A and canal stage at S11B is 1.69 feet above Zone A. WCA-3A three-gauge average is 1.13 feet above Zone A1. WCA-3A at gauge 62 (Northwest corner) is .70 feet above schedule.



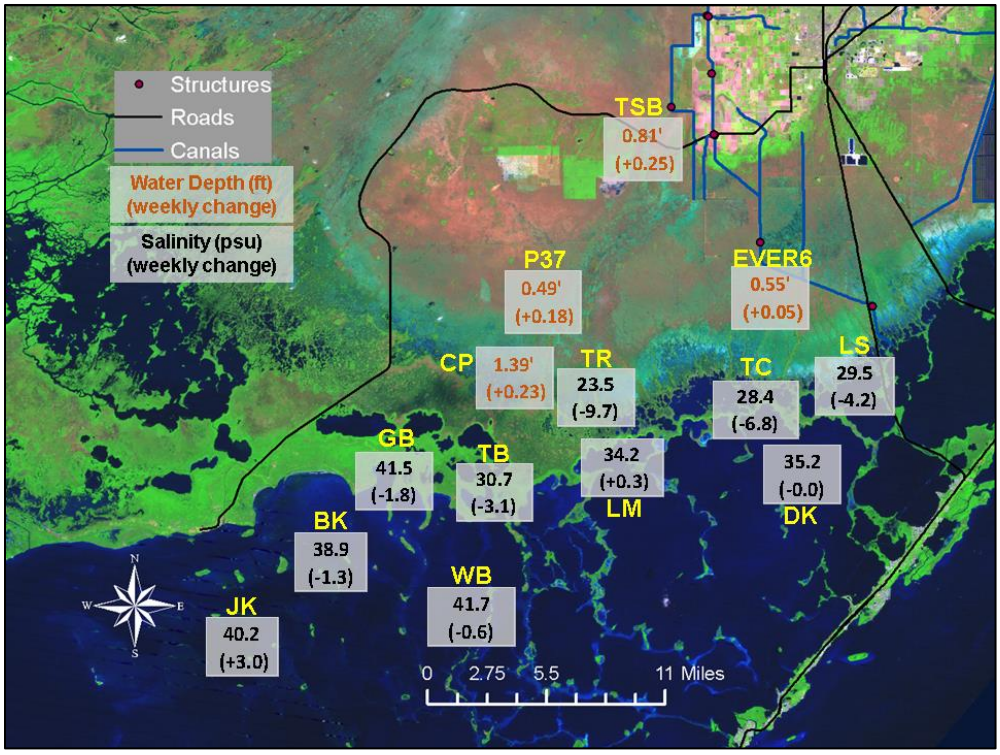
Blue – wetlands
Green – canals

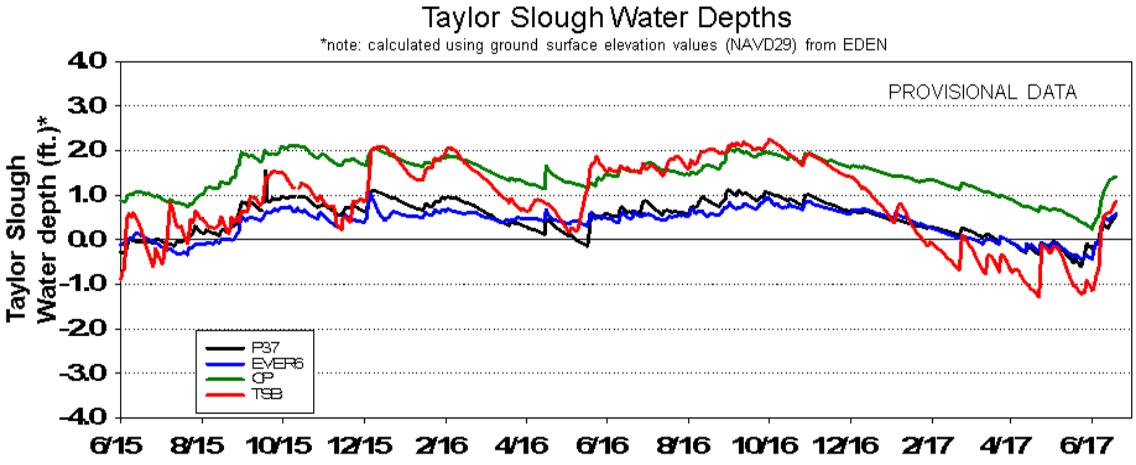
Water Depths and Changes: This week's range of water depths at monitored gauges other than in WCA-3B range from 1.19 feet (SRS1) to 3.07 feet (WCA-2A). Over the last week individual gauge changes ranged from +0.54 feet (Northwest WCA-3A) to -0.17 feet (Central WCA-3A).

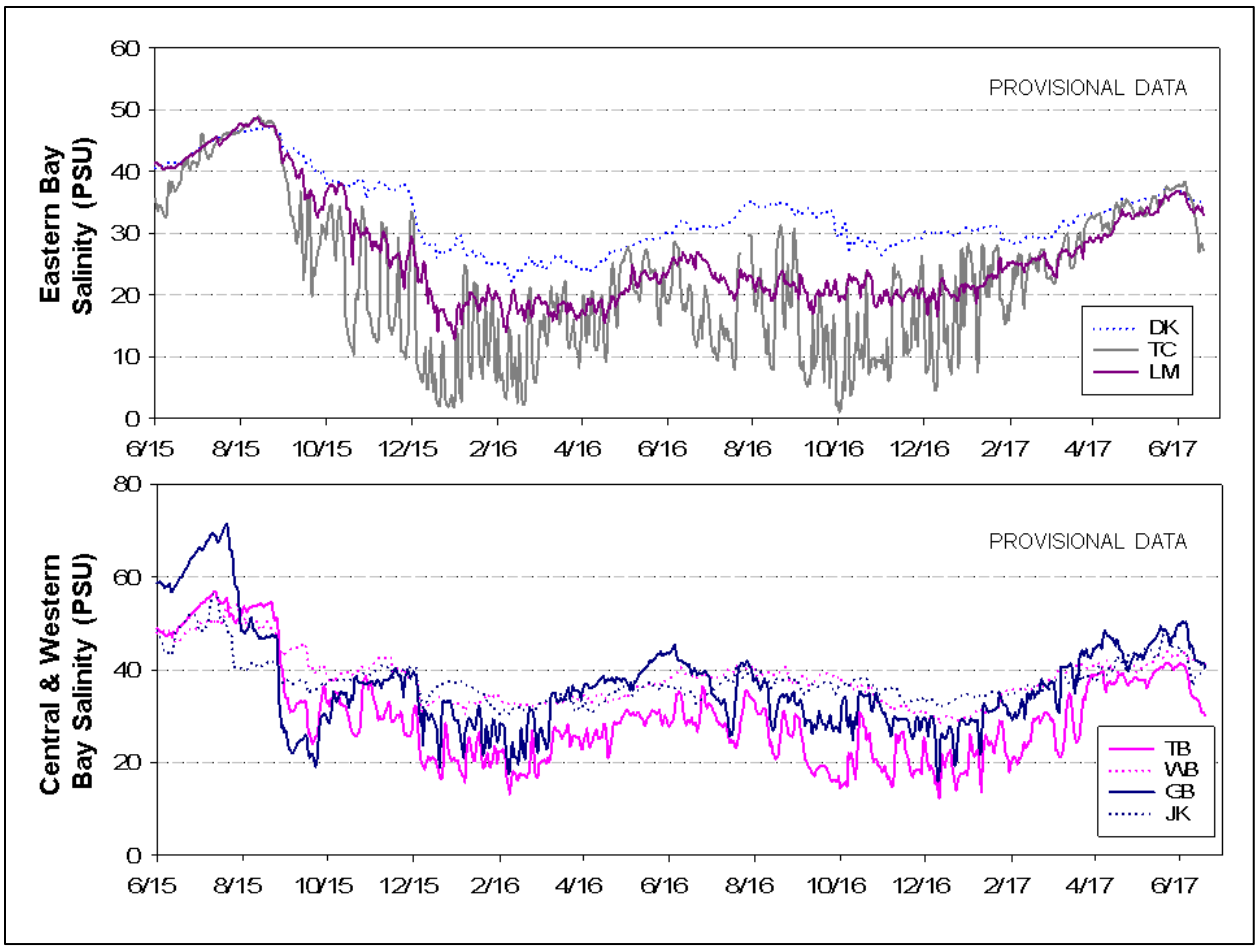




Wildlife update: Cape Sable Seaside Sparrow (CSSS) - Current conditions: While only 5% of CSSS-A is dry, 43% has water levels at or below about six inches. Last week, natural recession rates returned to Everglades National Park (ENP) unless scattered afternoon rains occurred. However, no reversals were recorded. The eastern subpopulations are still a mix of dry areas and water levels at or below six inches.


Structures
Roads
Canals
Water Depth (ft)
(weekly change)
Salinity (psu)
(weekly change)
TSB
0.81'
(+0.25)
P37
0.49'
(+0.18)
EVER6
0.55'
(+0.05)
CP
1.39'
(+0.23)
TR
23.5
(-9.7)
TC
28.4
(-6.8)
LS
29.5
(-4.2)
GB
41.5
(-1.8)
TB
30.7
(-3.1)
34.2
(+0.3)
LM
35.2
(-0.0)
DK
BK
38.9
(-1.3)
WB
41.7
(-0.6)
JK
40.2
(+3.0)
N
W
E
S
0
2.75
5.5
11 Miles


Taylor Slough Water Depths
*note: calculated using ground surface elevation values (NAVD29) from EDEN
PROVISIONAL DATA
Taylor Slough
Water depth (ft.)*
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
P37
EVER6
CP
TSB
6/15
8/15
10/15
12/15
2/16
4/16
6/16
8/16
10/16
12/16
2/17
4/17
6/17

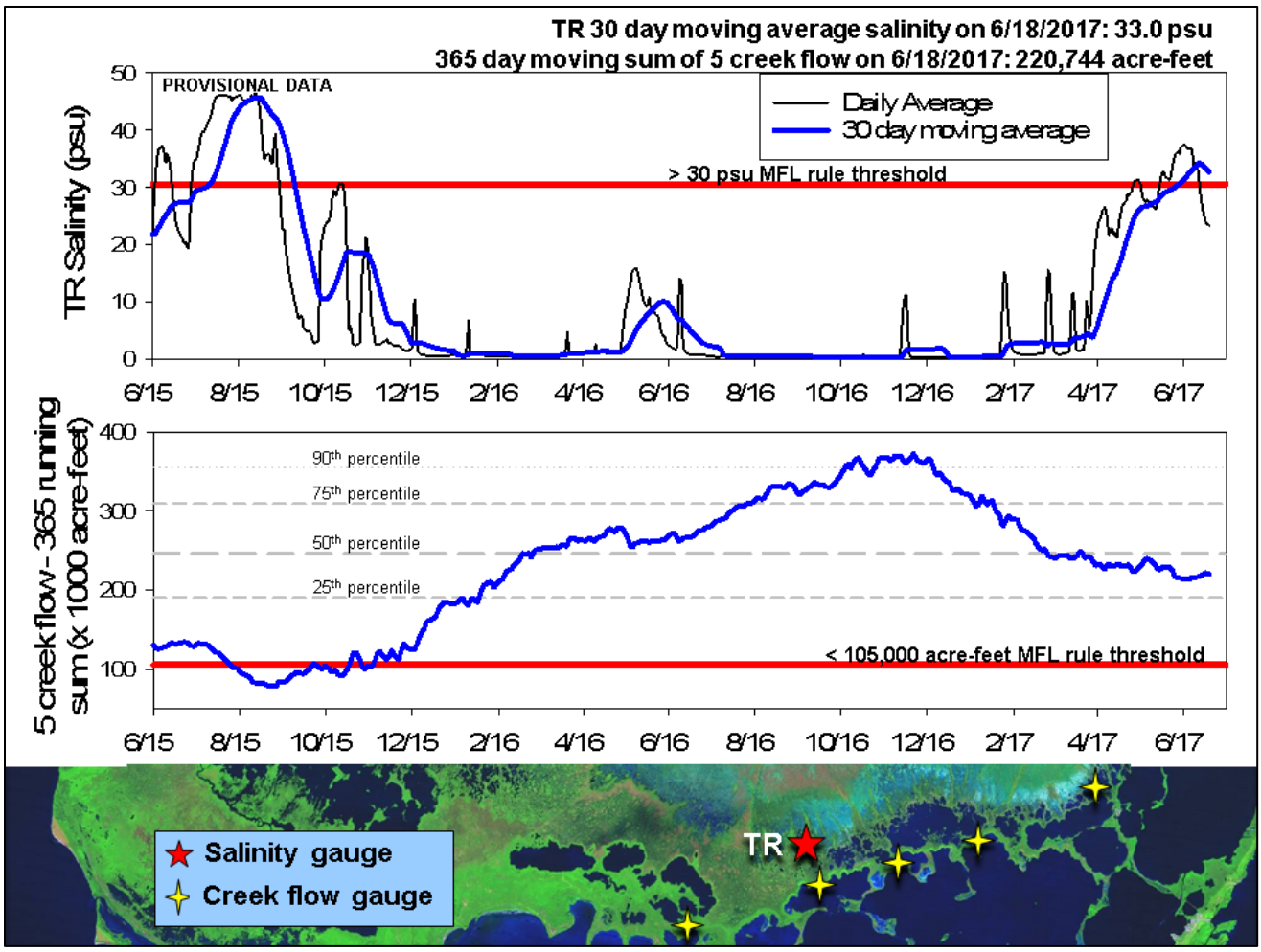


Taylor Slough stages: Water levels are rising with the largest increase of +0.25 feet in northern Taylor Slough. All gauges measured at least 0.4 feet of water depth. Compared to historic averages, water levels are +2 to +5 inches above average.

Florida Bay salinity: Salinities changes in the Bay ranged from −10 psu in the eastern nearshore to +3 psu in the western Bay, and currently range from 28 psu in the eastern nearshore to 42 psu in the central Bay. This is within 5 psu of the historic averages for the region.

Florida Bay MFL: Mangrove zone daily average decreased −10 psu over the last week to reach 23 psu. The 30-day moving average decreased −1.0 to end the week at 33.0 psu.

The cumulative weekly flow from the five creeks identified by the stars on the map was just over 10,300 acre-feet which is double 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 ~4,000 acre-feet to 220,744 acre-feet (still below the long-term average of 257,628 acre- feet). Creek flow is provisional data from the USGS and is highly variable.



Water Management Recommendations

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. Returning to a natural recession rate and limiting ascensions to .25 feet/week will help to avoid drowning of apple snail egg clusters.

The USFWS has made a request to hold water in WCA-1 during the transition from dry to wet season in order to facilitate invasive species management. At this late point in the wading bird nesting season, as long as operational reversals are avoided this request makes ecological sense.

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

Everglades Ecological Recommendations, June 20th, 2017 (red is new)

Area	Current Condition	Cause(s)	Recommendation	Reasons
WCA-1	Stages changed from -0.16' to 0.03'	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. Moderating flow rates through structures to 500 cfs steps is recommended.	Achieve high water targets (17.5 ft) to protect habitat and facilitate invasive plant treatments.
WCA-2A	Stages increased 0.50'	Rainfall, ET, management	Moderate ascension rates as possible. Moderating flow rates through structures to 500 cfs steps is recommended.	Protect habitat, wildlife and support apple snail reproduction.
WCA-2B	Stages increased 0.08 to 0.20	Rainfall, ET, management	Moderate ascension rates as possible. Moderating flow rates through structures to 500 cfs steps is recommended.	Protect habitat, wildlife and support apple snail reproduction.
WCA-3A NE	Stages increased 0.50'	Rainfall, ET, management	Moderate ascension rates as possible. Moderating flow rates through structures to 500 cfs steps is recommended.	Protect habitat, wildlife and support apple snail reproduction.
WCA-3A NW	Stages decreased -0.17'	Rainfall, ET, management		
Central WCA-3A S	Stages increased 0.54'	Rainfall, ET, management	Moderate ascension rates as possible. Moderating flow rates through structures to 500 cfs steps is recommended.	Protect habitat, wildlife and support apple snail reproduction.
Southern WCA-3A S	Stages increased 0.50'	Rainfall, ET, management		
WCA-3B	Stages increased 0.13'	Rainfall, ET, management	Moderate ascension rates as possible. Moderating flow rates through structures to 500 cfs steps is recommended.	Protect habitat, wildlife and support apple snail reproduction.
ENP-SRS	Stages increased 0.45'	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.
ENP-CSSS habitats	6 of the 7 sub-population habitats are outside of preferred range mean water depth for CSSS breeding season	Rainfall, ET, management	Follow rainfall plan for releases and current ERTP guidelines. Follow guidance in C-111 Western Spreader Canal Project operations manual. Care should be taken to avoid overdrying eastern subpopulations C and F.	Future operations need to continue to provide appropriate hydrological and habitat conditions for CSSS. Current and near term forcasted conditions are conducive for continuation of a successful sparrow breeding season.
Taylor Slough	Stage increases ranged +0.05' to +0.25'	Rain, ET, inflows	Move water southward as possible	When available provide freshwater buffer for ecosystems and slow recession rates.
FB- Salinity	Salinity changes ranged −10 to +3 psu.	Rain, ET, inflows, wind	Move water southward as possible	When available provide freshwwater to buffer hypersalinity conditions.