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MEMORANDUM

TO: John Mitnik, Chief, Operations, Engineering and Construction Bureau
Paul Linton, Chief, Operations Section

FROM: SFWMD Staff Environmental Advisory Team

DATE: June 6, 2017

SUBJECT: Weekly Environmental Conditions for Systems Operations

Summary

Weather Conditions and Forecast

Wet. Disorganized remnant energy from what was eastern Pacific Tropical Storm Beatriz continues to stream across the District and generate waves of heavy showers and thunderstorms. As this energy leaves the area tonight, an upper level trough over the central Gulf of Mexico will shift eastward bringing very favorable conditions for thunderstorms over the District Wednesday and Thursday. The trough will also bring a weakening frontal boundary into the northern portion of the District, which will keep above average afternoon thunderstorm activity over the District Friday. Daily seabreeze thunderstorms should then continue with near-average coverage over the weekend.

Kissimmee

On Sunday, stage was 1.2 feet below regulation schedule in East Lake Toho, 1.1 feet below regulation schedule in Lake Toho, and 2.6 feet below schedule in Kissimmee-Cypress-Hatchineha. Over the past week, discharge at S65, S65A, and S65E averaged 145, 126, and 161 cfs, respectively. Tuesday morning discharges were ~121 cfs, 111 cfs, and 150 cfs, respectively at S65, S65A, and S65E. Dissolved oxygen data in the Kissimmee River averaged 7.7 mg/L for the week (manual sondes at PC33 and PC62). Kissimmee River mean floodplain depth on Sunday was 0.05 feet. No new recommendations.

Lake Okeechobee

A slight reversal occurred over the past week with Lake stage having increased by 0.01 feet. As of midnight June 4, 2017, Lake stage was 11.06 feet NGVD, in the Beneficial Use sub-band and 0.50 feet above the Water Shortage Management sub-band. Results from the quarterly submerged aquatic vegetation (SAV) survey indicate that SAV distribution has remained relatively stable with the northern and western sites maintaining the SAV beds that were present during the previous three quarters. However, the *Chara* beds that typically dominate the southern and southwestern nearshore zones have not yet started their spring/summer expansion. The most recent imagery from the OLCI sensor suggests a moderate potential for bloom conditions in the north and western regions of the Lake but chlorophyll a concentrations from the monthly Lake Okeechobee water quality sampling are not available for validation.

Estuaries

Total discharge to the St. Lucie estuary averaged 730 cfs over the past week with 0 cfs (0%) coming from Lake Okeechobee. Salinities were slightly lower compared to last week. The seven-day average salinity at the US1 Bridge remains in the fair range for adult oysters. Total inflow to the Caloosahatchee estuary averaged 801 cfs over the past week with 53 cfs (6%) coming from the Lake. The 30-day average surface salinity at the Ft. Myers monitoring station is 15.0 and has been above 10 for 70

consecutive days. The 30-day average surface salinity at Val I-75 is 6.7. Salinity conditions between Val I-75 and Ft. Myers are deteriorating for tape grass. Salinity conditions are in the good range for adult oysters at the Cape Coral Bridge, in the fair range at Shellpoint, and in the poor range at the Sanibel Causeway. The 30-day moving average salinity at the I-75 Bridge is forecast to be 5.9 in the next two weeks if no flow comes through the S-79 structure, and the daily salinity is forecast to be 4.2.

Stormwater Treatment Areas

Over the past week, the STAs/FEBs received approximately 5,100 acre-feet of Lake releases. The total amount of Lake releases sent to the STAs/FEBs in WY2018 (since May 1, 2017) is approximately 15,000 acre-feet. Most STA cells are at target depths, except STA-5/6 emergent aquatic vegetation cells which are drying out. 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. In addition, nests of MBTA-protected species have been observed in STA-1E, STA-1W, STA-2 and STA-5/6, and the nest of an Endangered Species Act protected species has 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

Widespread and heavy rain resulted in increases in stage across the Everglades suggesting the initiation of the wet season. A few white ibis remain nesting at this time in WCA-1. There are no active wildfires in the Everglades system. In Florida Bay, mangrove zone 30-day moving average increased +1.8 to end the week at 32.2 psu. An exceedance of the Florida Bay MFL is denoted as >30 psu. The U.S. Fish and Wildlife Service 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.

Supporting Information

KISSIMMEE BASIN

Kissimmee Basin Rainfall

The Upper Kissimmee Basin received 4.09 inches of rainfall in the past week and the Lower Basin received 3.74 inches (SFWMD Daily Rainfall Report 6/6/2017).

Upper Kissimmee Basin

Stages and departures in the Kissimmee Chain of Lakes (KCOL) are shown in Table 1.

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: 6/6/2017

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)						
							6/4/17	5/28/17	5/21/17	5/14/17	5/7/17	4/30/17	4/23/17
Lakes Hart and Mary Jane	S62	0	LKMJ	59.6	R	60.0	-0.4	-0.1	-0.2	-0.3	-0.3	-0.3	-0.4
Lakes Myrtle, Preston, and Joel	S57	0	S57	59.9	R	61.0	-1.1	-0.4	-0.4	-0.3	-0.3	-0.3	-0.1
Alligator Chain	S60	0	ALLI	62.1	R	63.2	-1.1	-0.3	-0.4	-0.4	-0.5	-0.5	-0.5
Lake Gentry	S63	7	LKGT	59.7	R	61.0	-1.3	0.0	0.0	-0.1	-0.1	0.0	0.0
East Lake Toho	S59	12	TOHOE	55.3	R	56.5	-1.2	-0.1	-0.2	-0.3	-0.5	-0.7	-0.7
Lake Toho	S61	0	TOHOW, S61	52.4	R	53.5	-1.1	-0.1	-0.2	-0.3	-0.5	-0.6	-0.7
Lakes Kissimmee, Cypress, and Hatchineha	S65	145	LKISSP, KUB011, LKIS5B	48.4	R	51.0	-2.6	-0.9	-1.2	-1.2	-1.2	-1.3	-1.3

* 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: 6/6/2017

Metric	Location	Sunday's 1-day average	Weekly Average**									
			6/4/17	5/28/17	5/21/17	5/14/17	5/7/17	4/30/17	4/23/17	4/16/17	4/9/17	4/2/17
Discharge (cfs)	S-65	99	145	190	237	234	258	283	330	344	292	361
Discharge (cfs)	S-65A	114	126	121	160	167	184	205	248	262	270	277
Discharge (cfs)	S-65D****	177	174	157	182	198	252	253	286	297	288	359
Discharge (cfs)	S-65E****	187	161	159	182	173	260	225	267	282	297	372
DO concentration (mg/L)***	Phase I river channel	N/A	7.7	7.9	7.7	8.0	7.4	7.9	7.8	8.1	7.7	7.8
Mean depth (feet)*	Phase I floodplain	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.06	0.06	0.06	0.07

* 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
6/6/2017	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	
2/14/2017	Increase S65 and S65A discharge by 200 cfs.	Allow stage to decline in KCH.	Implemented	SFWMD Water Management/KB Ops
2/7/2017	No new recommendations.		N/A	
1/25/2017	Make releases from East Lake Tohopekaliga and Lake Tohopekaliga to achieve a recession rate of 0.2 feet per week. Releases will not be made to compensate for direct rain on the lakes, but adjustments may be made for changes in inflow to maintain the 0.2 feet per week recession rate to the extent available capacity in Lake Kissimmee allows.	To prepare for the 2017 wet season, facilitate the ongoing Kissimmee River Restoration Construction (backfilling of the C-38), and provide more desirable recession rates for East Lake Tohopekaliga and Lake Tohopekaliga, the SFWMD will follow the below guiding criteria to the extent it does not conflict with other water related needs (e.g. Kissimmee River Flows, Kissimmee River Restoration Construction, and flood control).	Implemented	SFWMD Water Management Section/KB Ops
1/24/2017	No new recommendations.		N/A	
1/17/2017	No new recommendations.		N/A	
1/10/2017	No new recommendations.		N/A	

KCOL Hydrographs (through Sunday midnight)

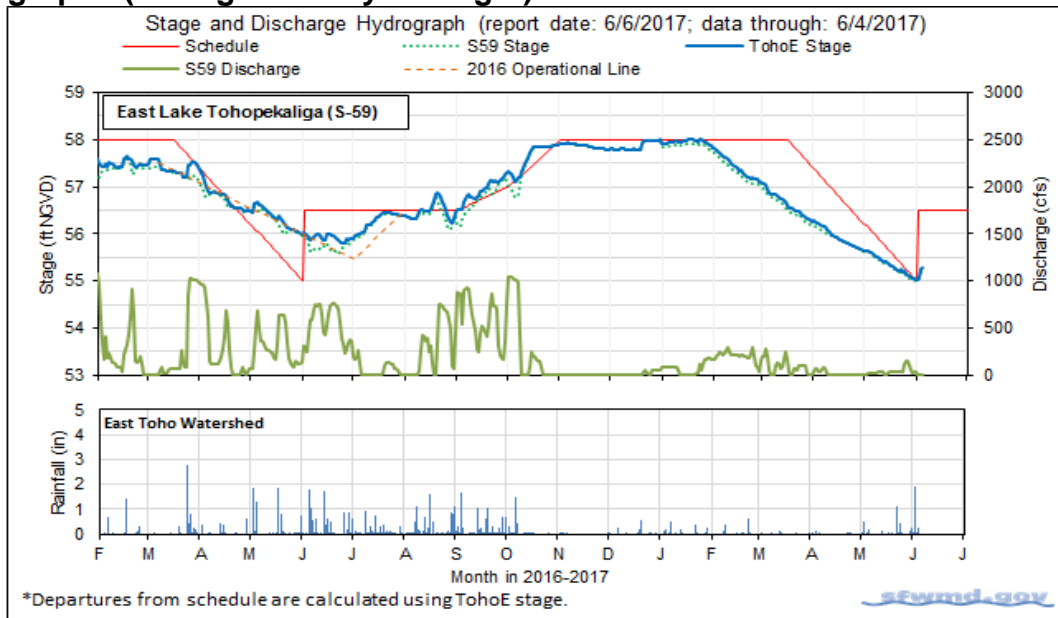


Figure 1.

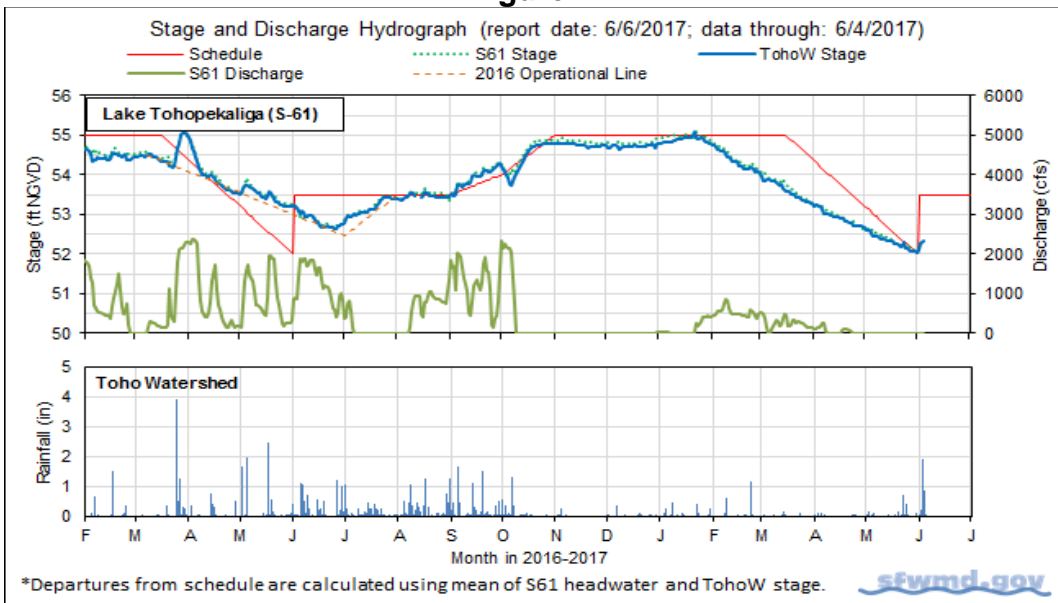


Figure 2.

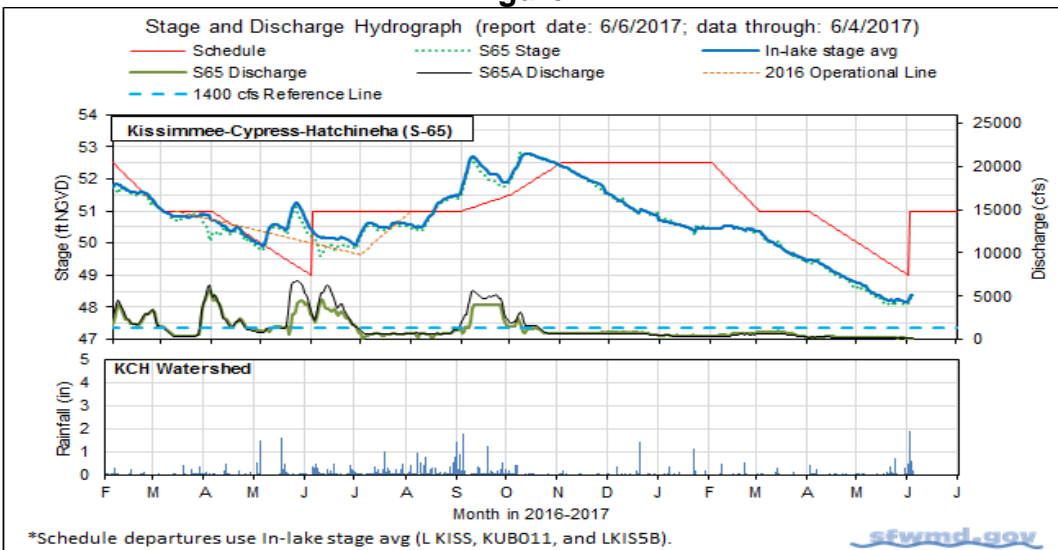


Figure 3.

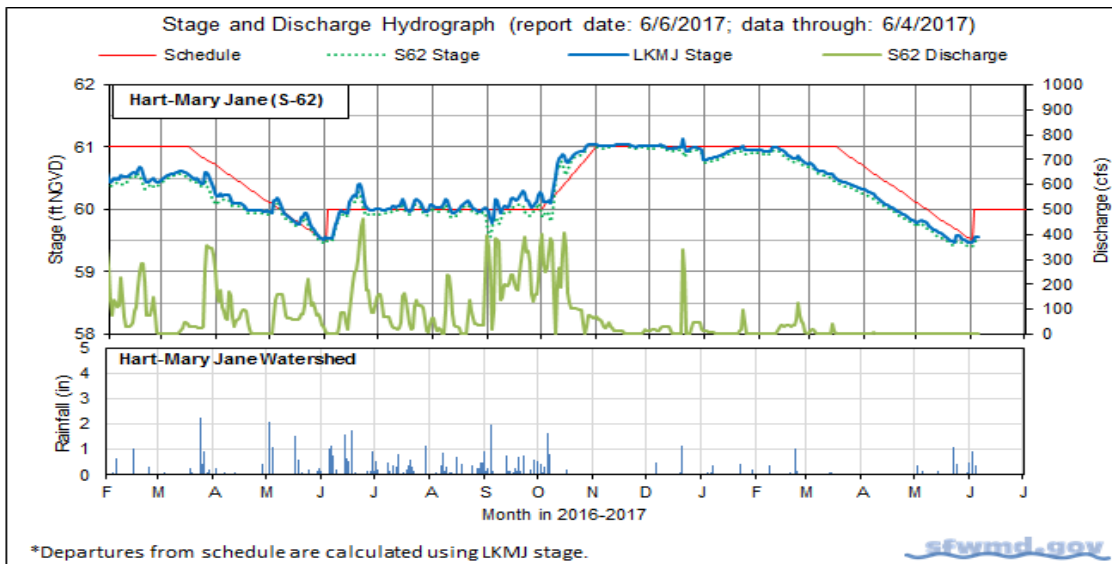


Figure 4.

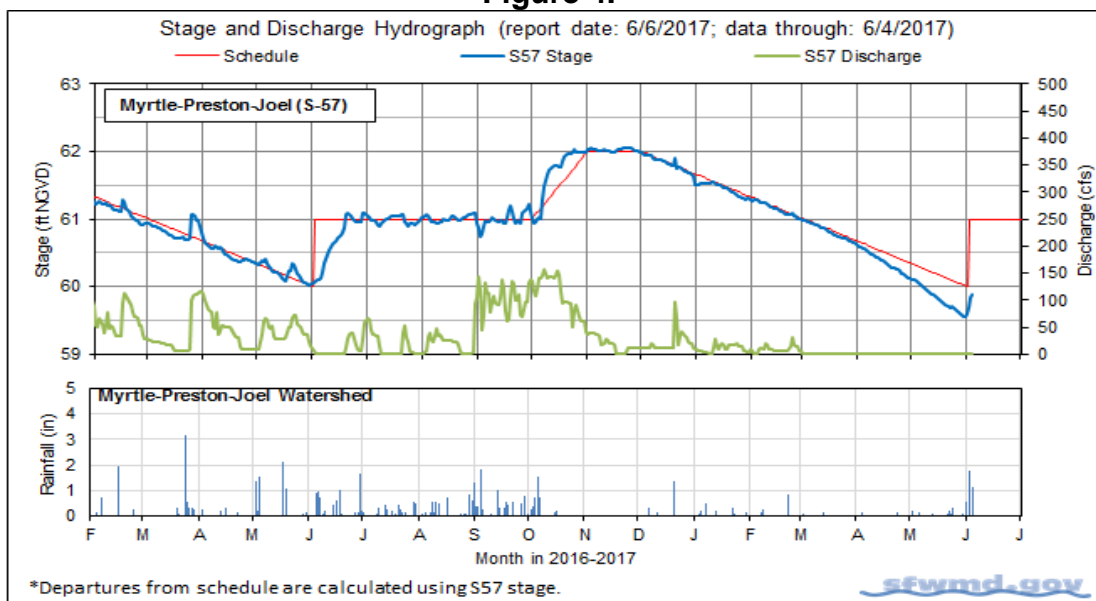


Figure 5.

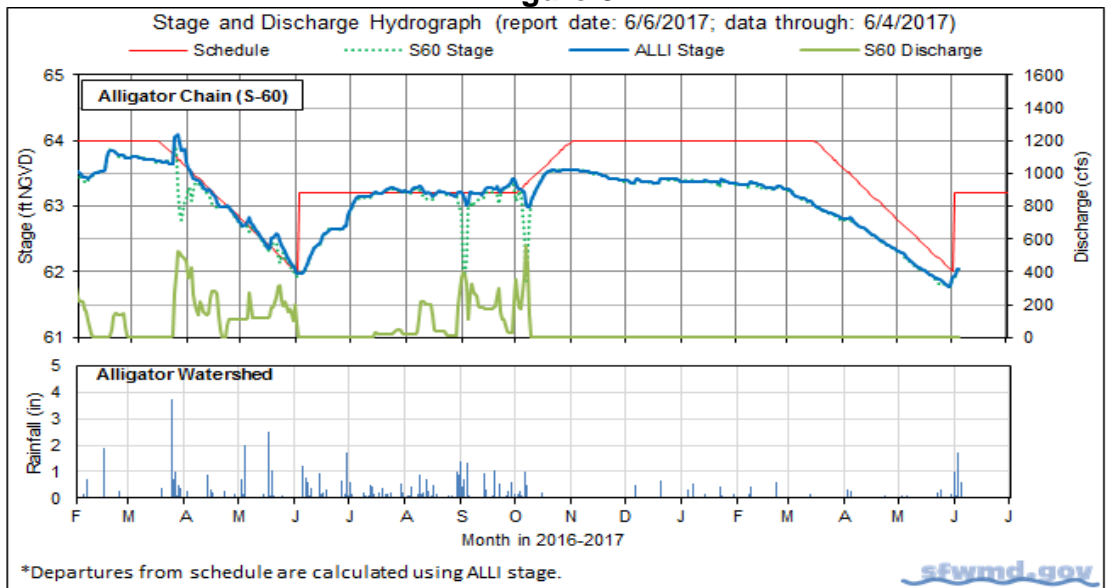


Figure 6.

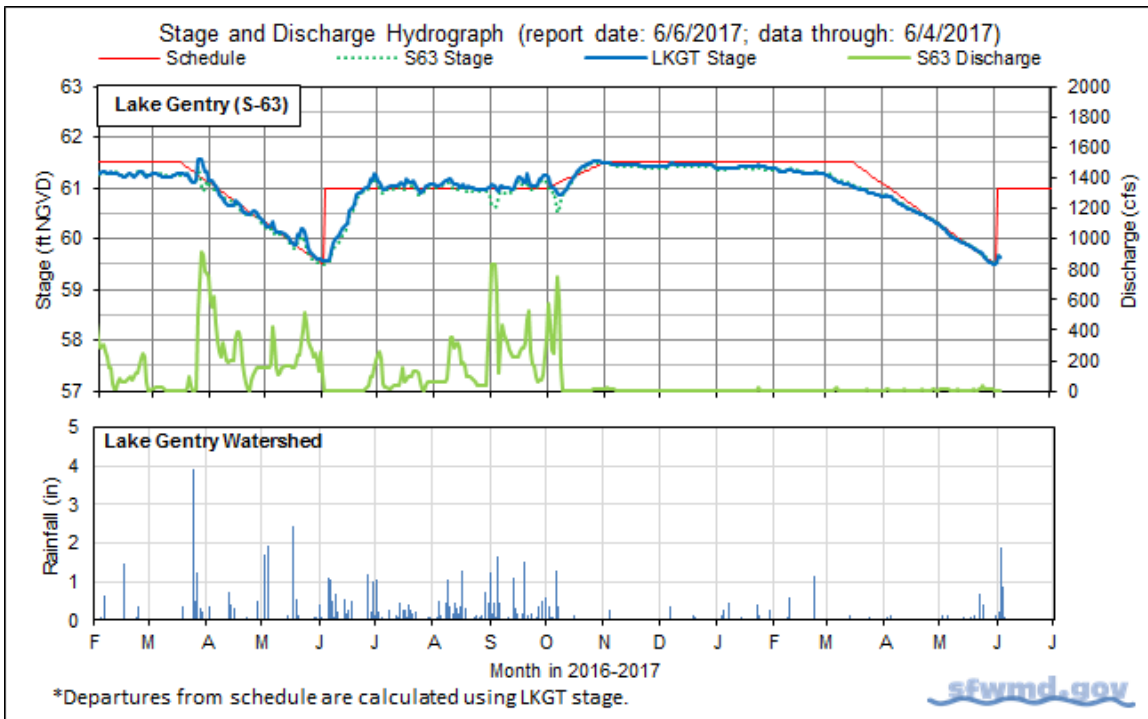


Figure 7.

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

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

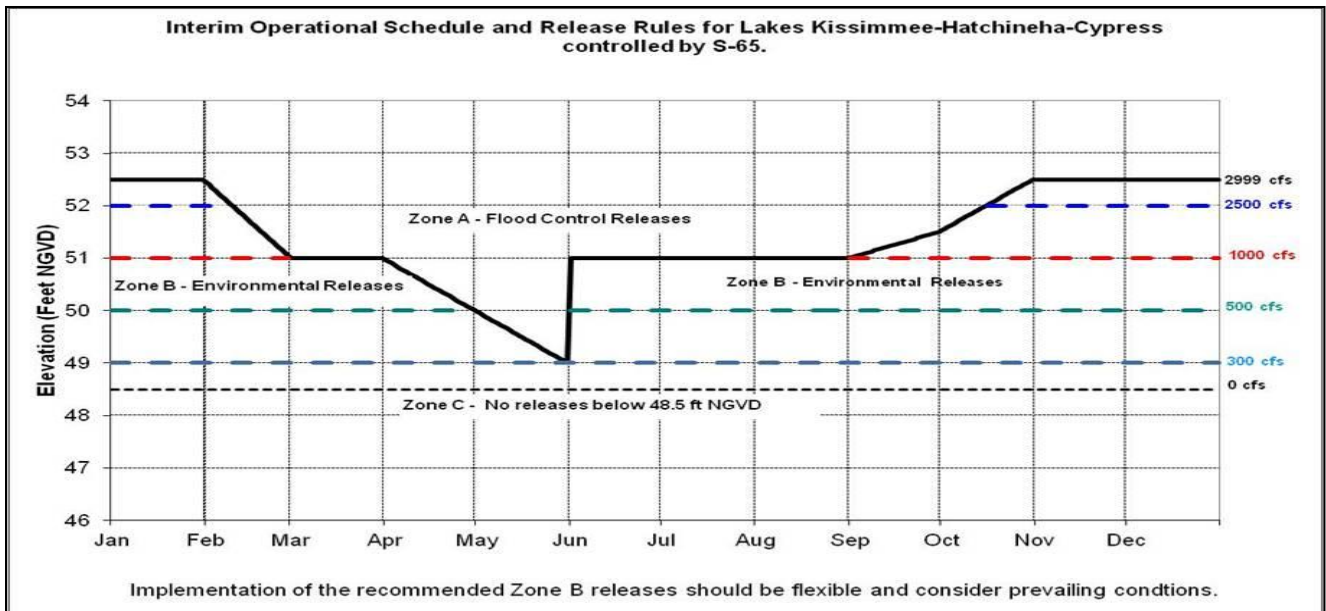
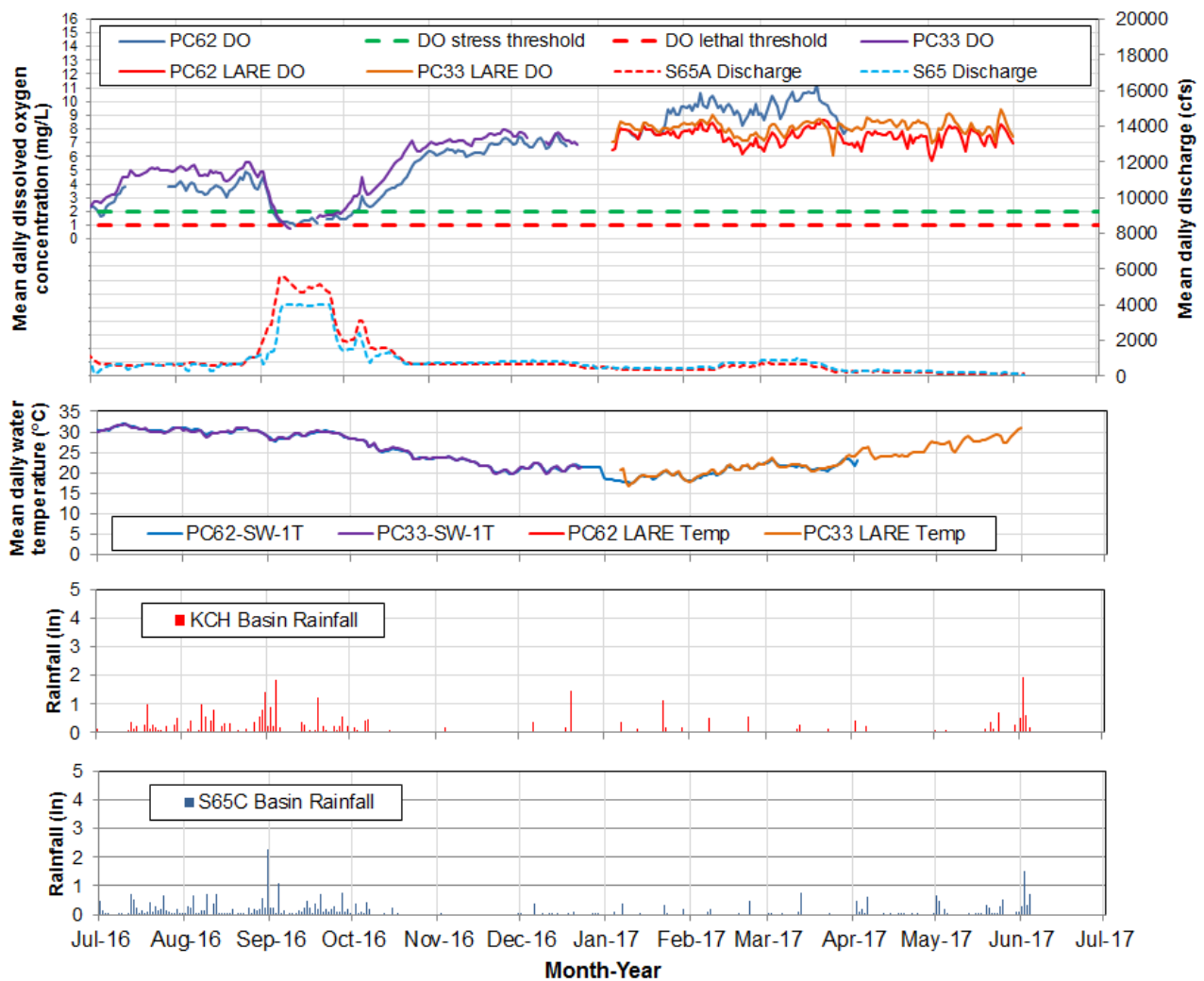


Figure 9. Interim operations schedule for S-65. The discharge schedule shown to the right has not been used in recent years or in Wet Season 2015.



Report Date: 6/6/2017; data are through: 6/4/2017.

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

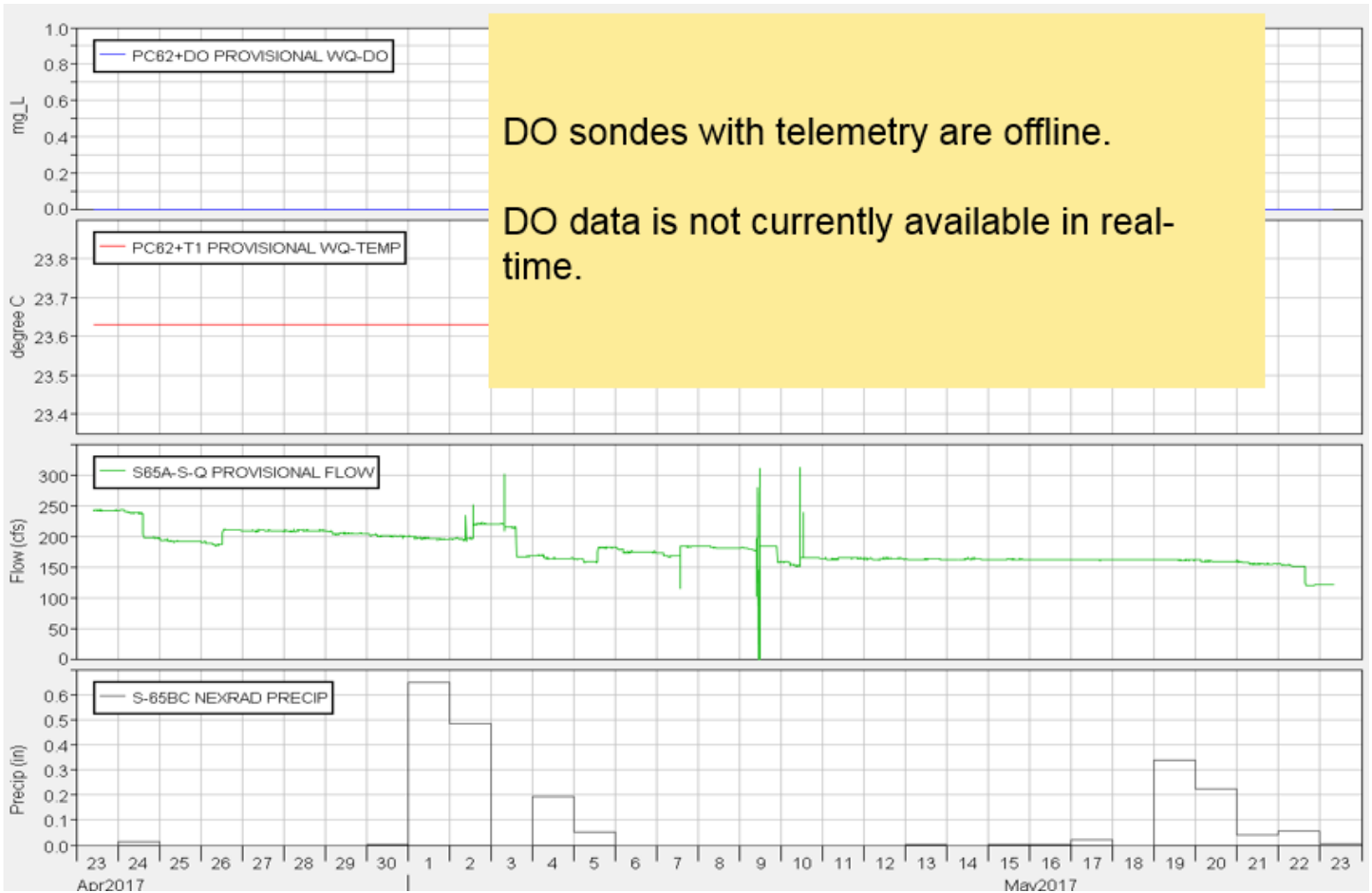


Figure 11. Phase I river channel dissolved oxygen and water temperature (measured at 15 minute intervals) and Pool BC daily rainfall.

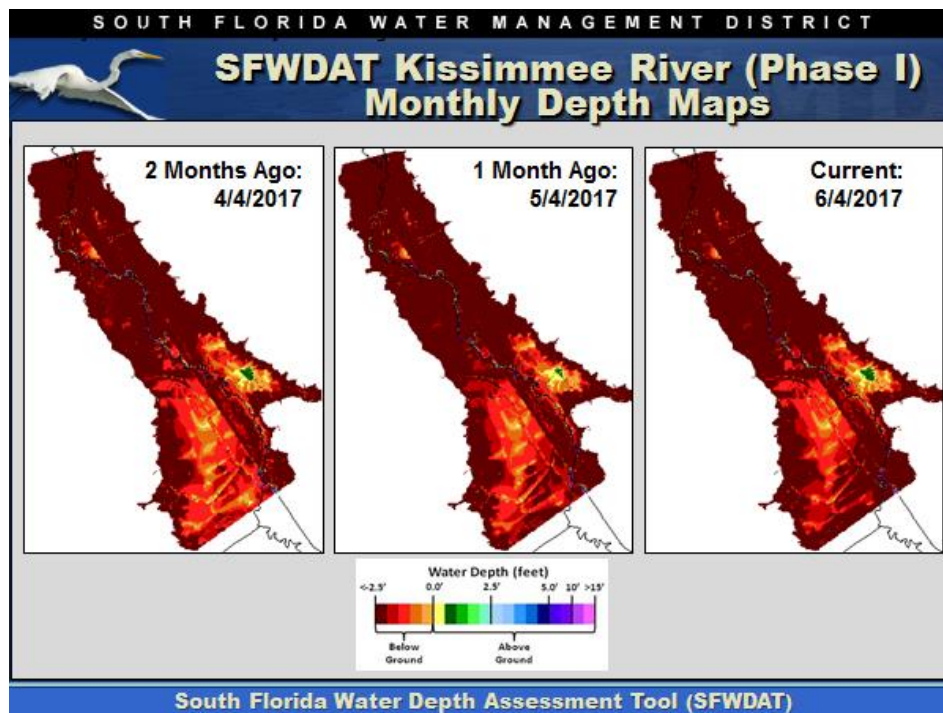
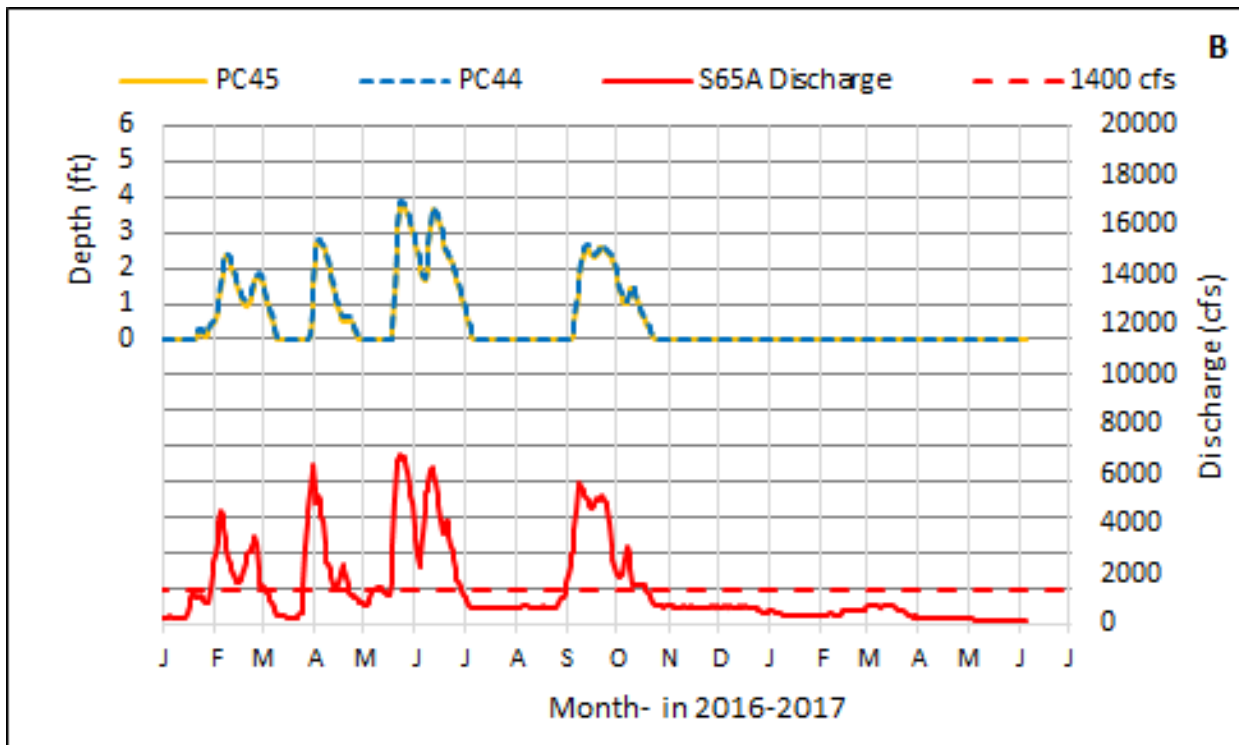
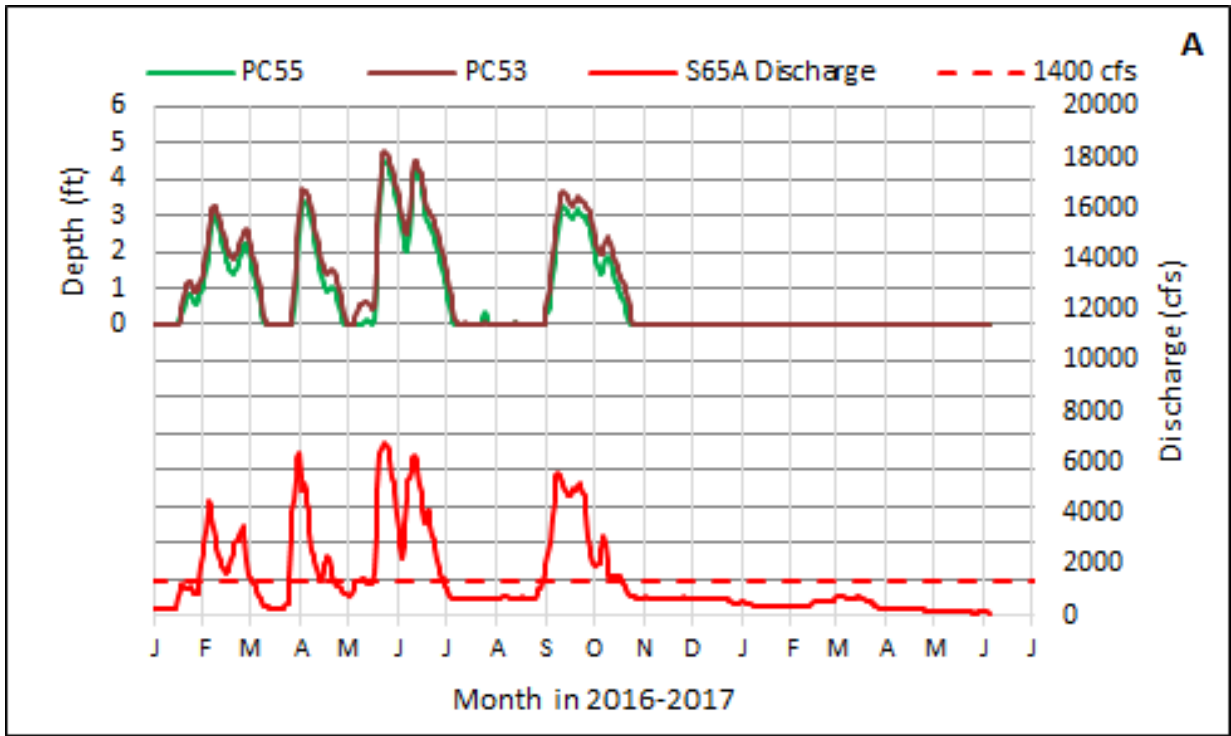


Figure 12. Phase I area floodplain water depths for this week, one month ago, and two months ago. Note that the WDAT color-coding has been modified to accommodate greater water depths; these maps are not directly comparable to Kissimmee Basin WDAT maps published prior to Jan. 16, 2012.



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

Kissimmee River Hydrographs

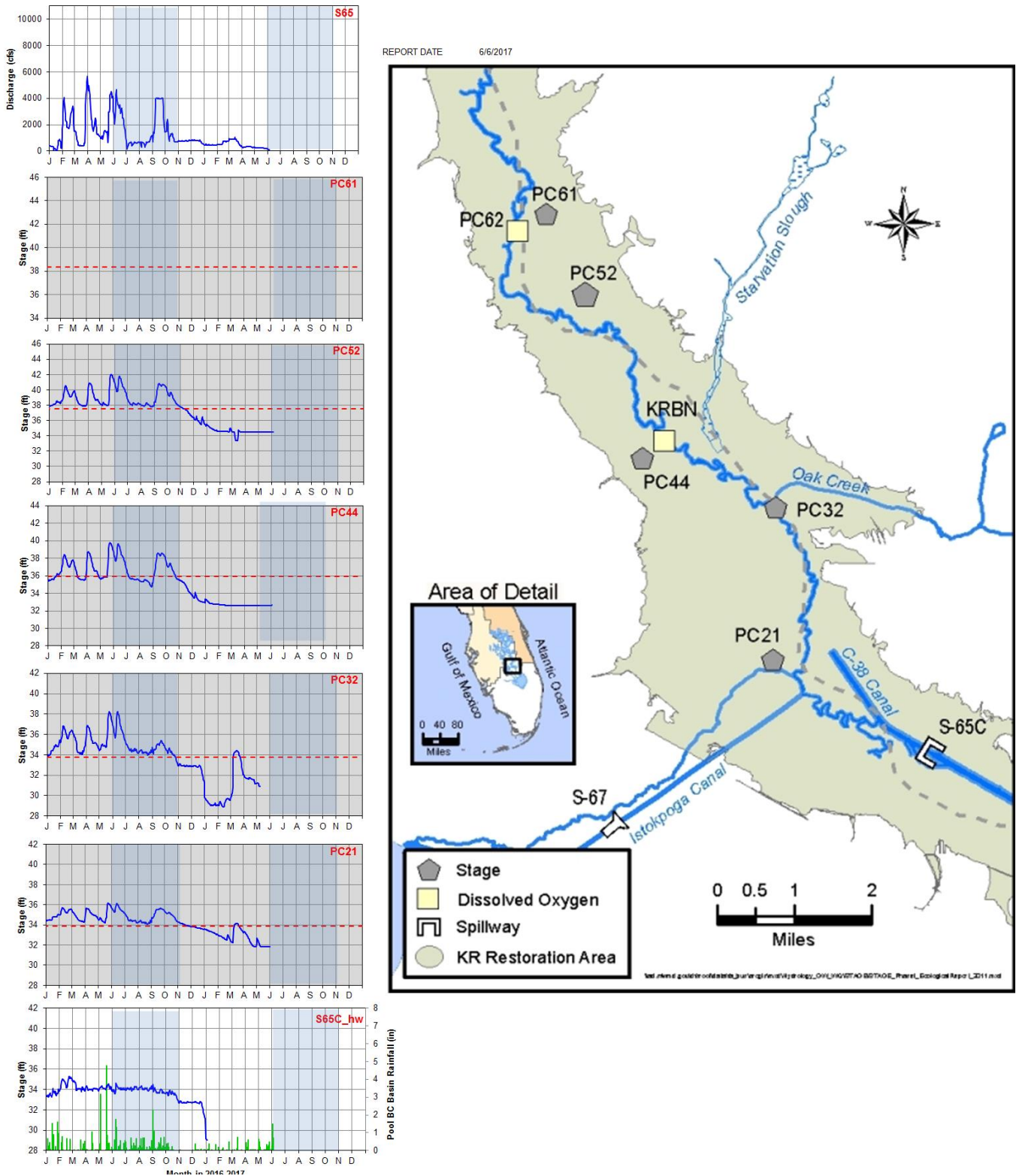


Figure 13. Discharge at S65, stages at five monitoring stations in the Phase I area of the Kissimmee River floodplain, and headwater stage at S65-C since January 1, 2015. The most recent data (~2 weeks) are provisional real-time data from SFWMD DualTrend; previous data are from SFWMD DB-HYDRO (validated).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

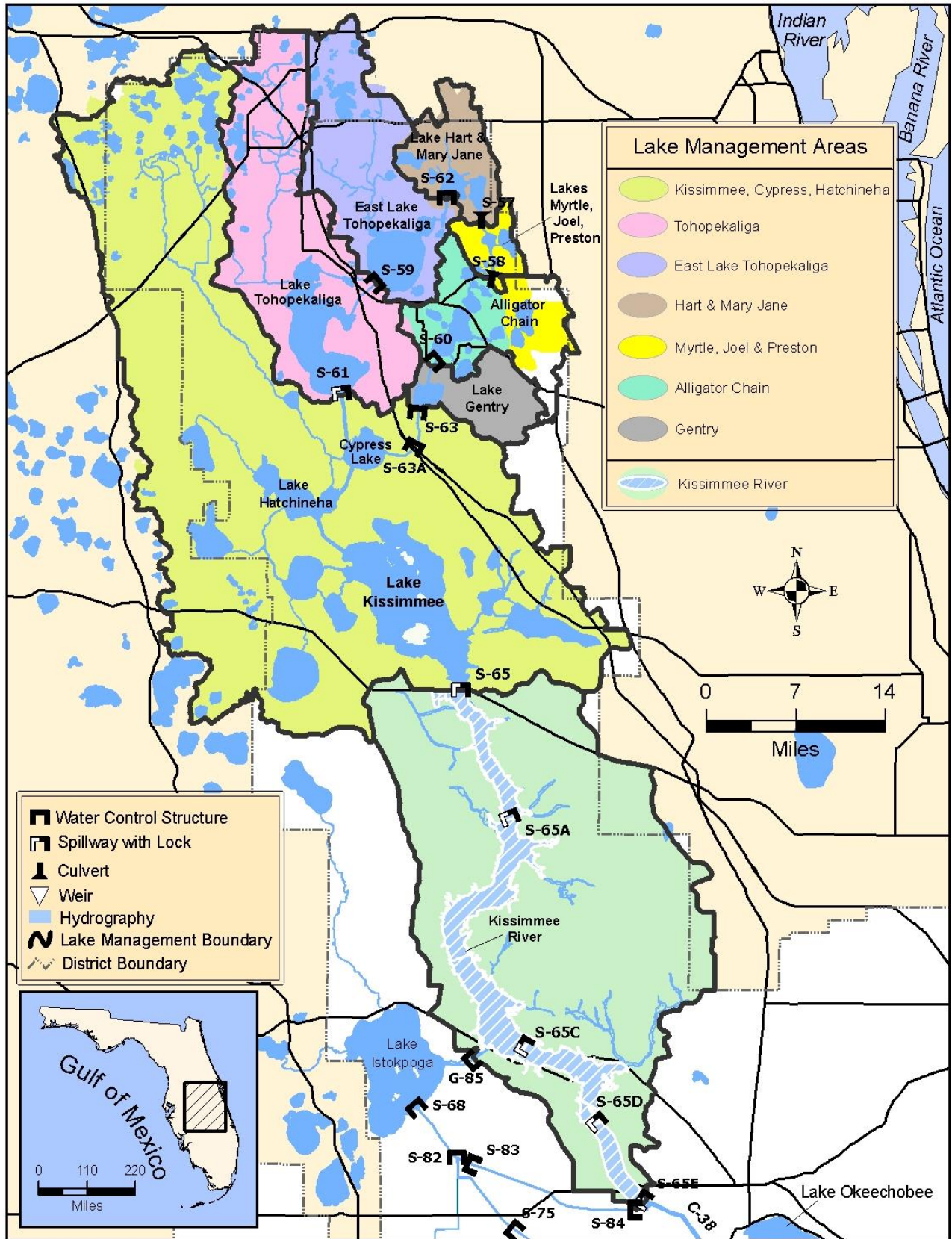


Figure 14. The Kissimmee Basin

LAKE OKEECHOBEE

According to the USACE web site, Lake Okeechobee stage is at 11.06 feet NGVD for the period ending at midnight on June 4, 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 decreased by 0.01 feet over the past week and is 0.64 feet lower than it was a month ago and 3.25 feet lower than it was a year ago (Figure 1). The Lake is currently in the Beneficial Use sub-band and is 0.50 feet above the Water Shortage Management sub-band (Figure 2). According to RAINDAR, 2.05 inches of rain fell directly over the Lake during the past seven days (Figure 3). Similar or greater amounts of rain fell to the north and in the surrounding watershed while the lower east and west coasts received less amounts of rainfall.

Based on USACE reported values, current Lake inflow is approximately 566 cfs as detailed below.

Structure	Flow cfs
S65E	0
S65EX1	193
S154	0
S84 & 84X	53
S71	169
S72	95
C5 (Nicodemus slough dispersed storage)	0
S191	0
S133 PUMPS	0
S127 PUMPS	0
S129 PUMPS	0
S131 PUMPS	56
S135 PUMPS	0
Fisheating Creek	0
S2 Pumps	0
S3 Pumps	0
S4 Pumps	0

Current Lake outflow is approximately -159 cfs with approximately 477 cfs entering the Lake from the L8 canal through Culvert 10A. Approximately 318 cfs is being directed south through S351, S352 and S354 and no flow exited at S77. Flow from S308 is not available. Corrected evapotranspiration value based on the L006 weather platform solar radiation data for this past week decreased from 3,858 cfs last week to 3,453 cfs.

Change in elevation equivalents and average weekly flows (midnight May 29, 2017 to midnight June 4, 2017) for major structures are presented in Figure 4. Flow for S308 is not available.

Based on the Lake Okeechobee wading bird habitat suitability index, there are currently approximately 23,387 acres of suitable foraging habitat for long-legged birds and 9,424 acres for long and short-legged birds on the Lake (Figure 5).

Quarterly submerged aquatic vegetation (SAV) monitoring was completed during the past several weeks. Results indicate that SAV distribution has remained relatively stable (Figure 6). The northern and western sites maintained the SAV beds that were present during the previous three quarters

(August, October and February) but the *Chara* beds that typically dominate the southern and southwestern nearshore zones still have not recovered from the high Lake stages experienced during last year's growing season. The lower Lake levels reduced the number of sites that could be sampled in the north due to dry conditions.

The most recent imagery from the OLCI sensor (May 30 and 31, 2017) suggests a moderate potential for bloom conditions in the north and western regions of the Lake (Figure 7) but chlorophyll concentrations from the monthly Lake Okeechobee water quality sampling (conducted on May 23 and 24, 2017) are not yet available for validation.

Water Management Recommendations

A slight reversal occurred with Lake stage having increased by 0.01 feet over the past week. The Lake is 11.06 feet NGVD, in the Beneficial Use sub-band, and 0.50 feet above the Water Shortage Management sub-band. While most of the marsh remains dry, it appears that the wet season refilling of the Lake may have begun.

Once the wet season begins, 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.

Future short-term recommendations are highly dependent on the near-term rainfall patterns and amounts. From an ecological perspective, the ideal strategy would be to balance inflows with outflows to mitigate against a too rapid ascension rate.

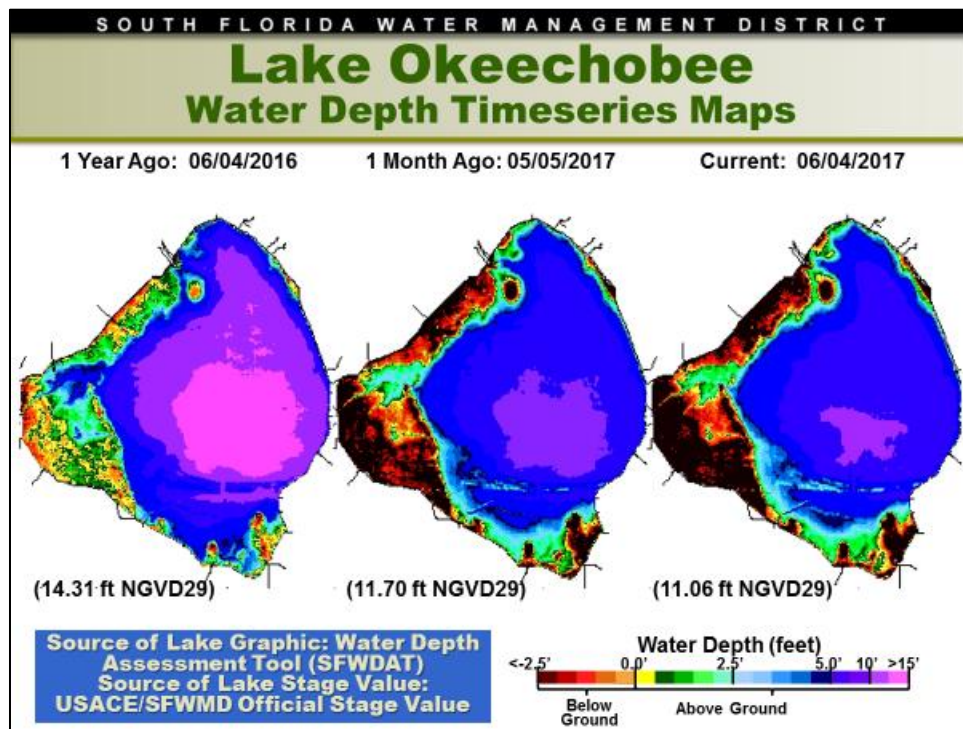


Figure 1

Weekly Stage Hydrograph

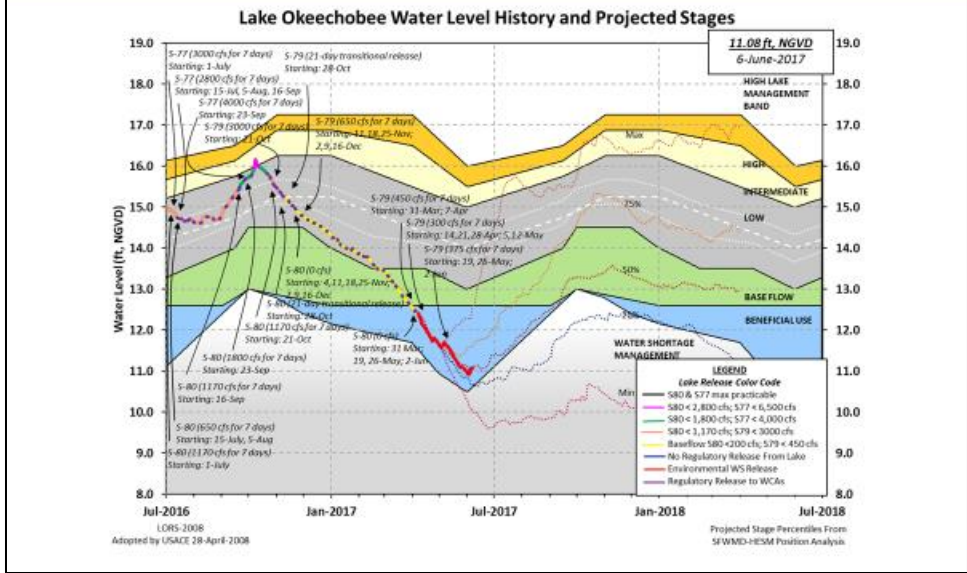
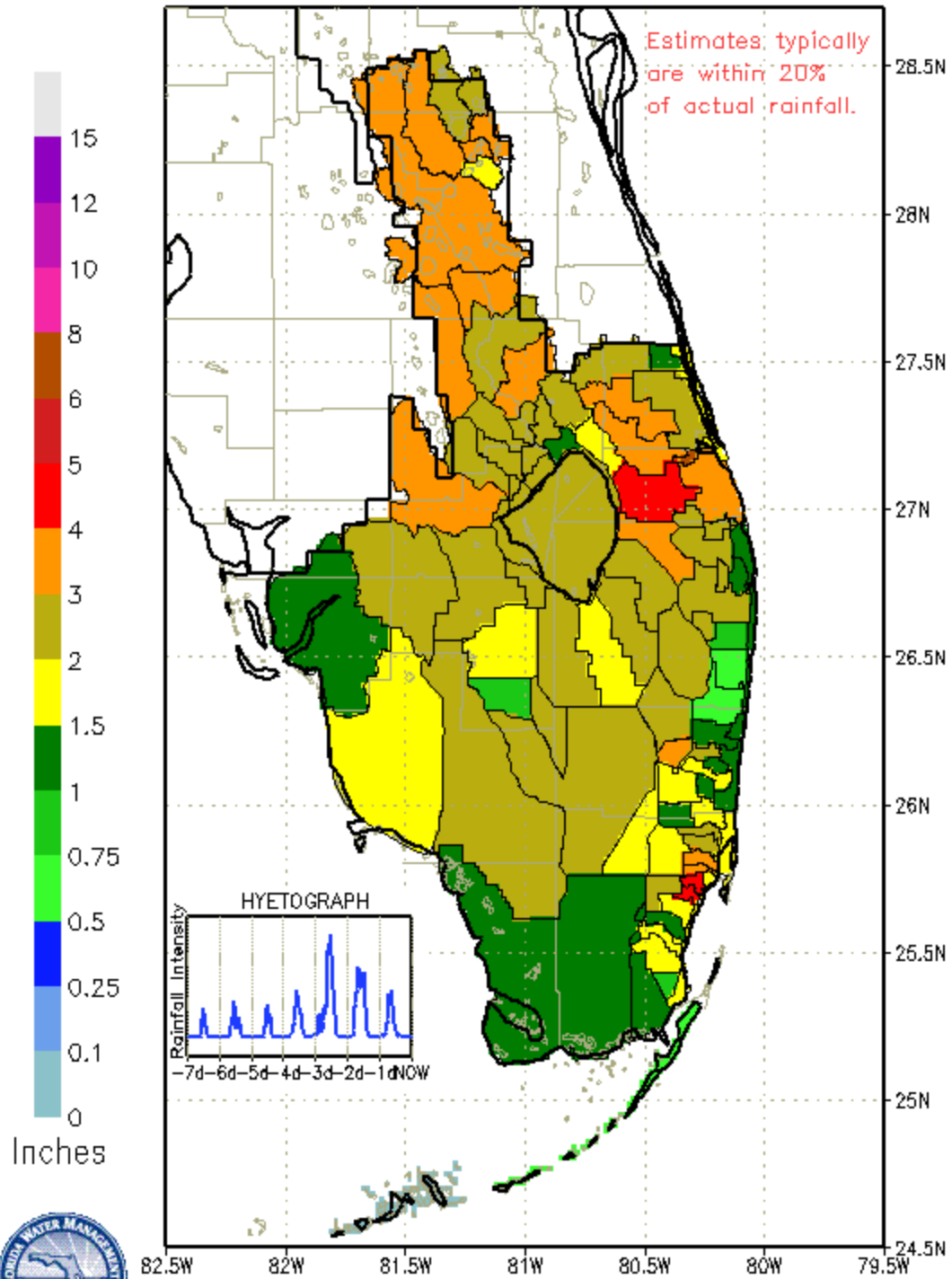


Figure 2

SFWMD PROVISIONAL RAINFAR 7-DAY BASIN RAINFALL ESTIMATES

FROM: 0530 EST, 05/29/2017 THROUGH: 0530 EST, 06/05/2017



DISTRICT-WIDE RAINFALL ESTIMATE: 2.382"

Figure 3

INFLOWS	Average Daily Flow Past Week cfs	Feet of Change Past Week
S65E & S65EX1	257	0.011
S71 & 72	22	0.001
S84 & 84X	0	0.000
Fisheating Creek	7	0.000
Rainfall	N.A.	0.171
OUTFLOWS	Average Daily Flow Past Week cfs	Feet of Change Past Week
S77	328	0.013
S308	-9	0.000
S351	581	0.024
S352	286	0.012
S354	516	0.021
L8	-170	-0.007
ET	3453	0.141

Figure 4

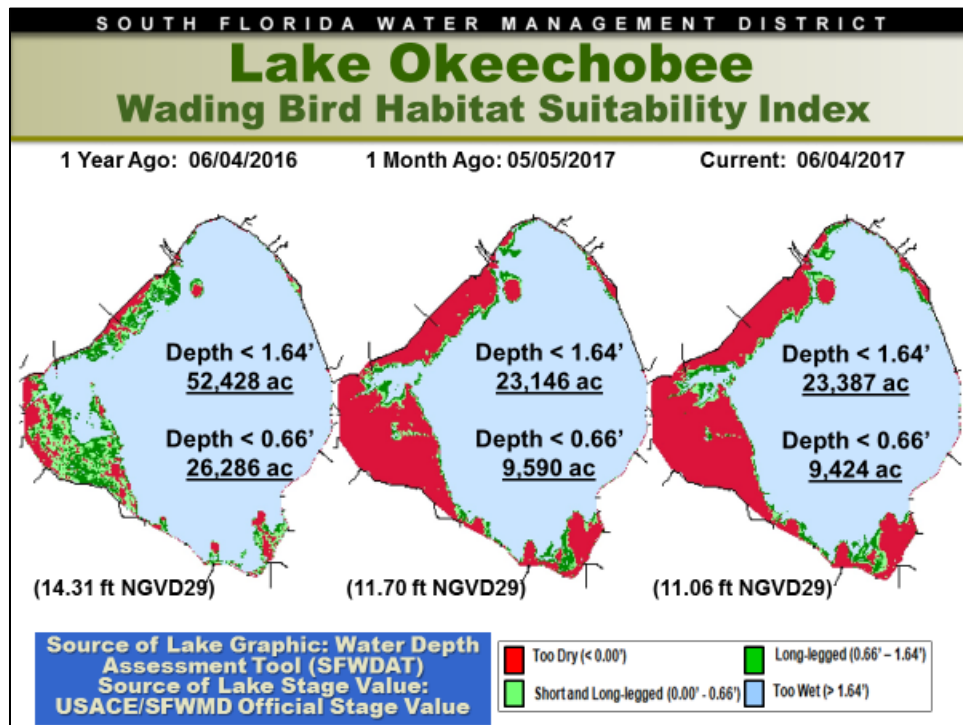


Figure 5

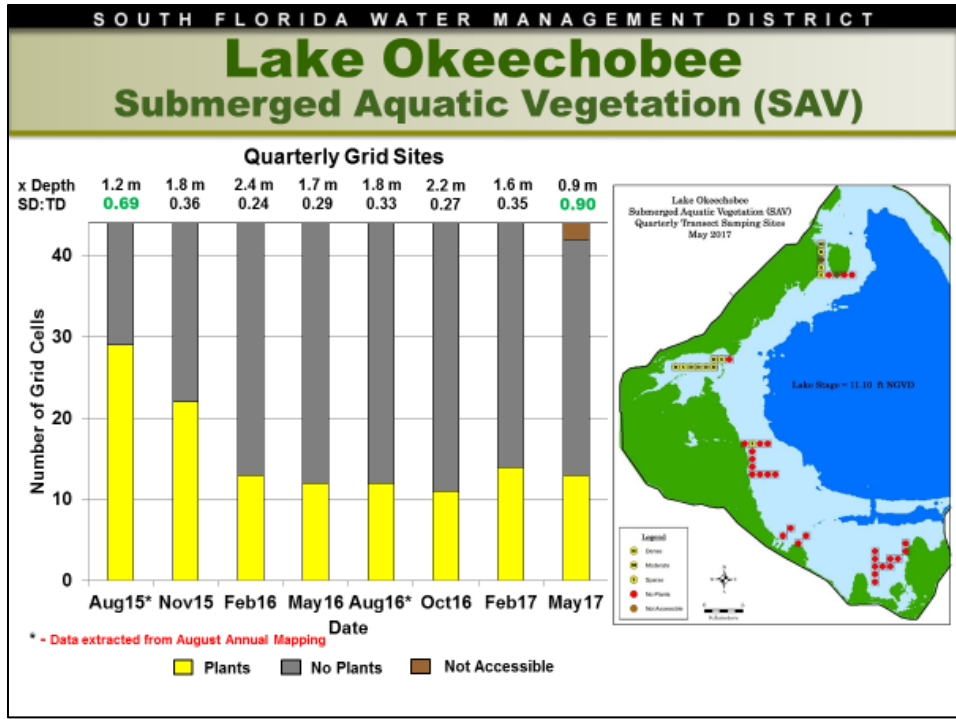


Figure 6

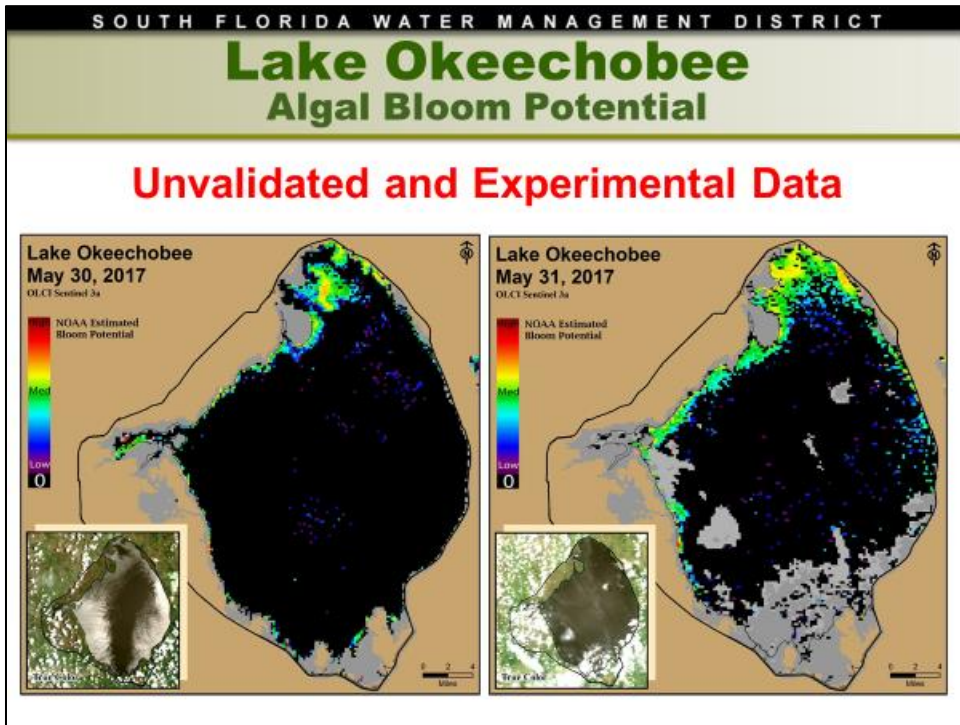


Figure 7

Lake Istokpoga

Lake Istokpoga stage is 37.83 feet NGVD as of midnight June 4, 2017 and is currently 0.42 feet below its low pool regulation schedule of 38.25 feet NGVD (Figure 8). Average flows into the Lake from Arbuckle and Josephine creeks over the past week increased to 25 cfs and 5 cfs, respectively. Average discharge from S68 and S68X this past week was 13 cfs, a decrease from the previous week's flow of 41 cfs. According to RAINДАР, 3.28 inches of rain fell in the Lake Istokpoga watershed during the past seven days.

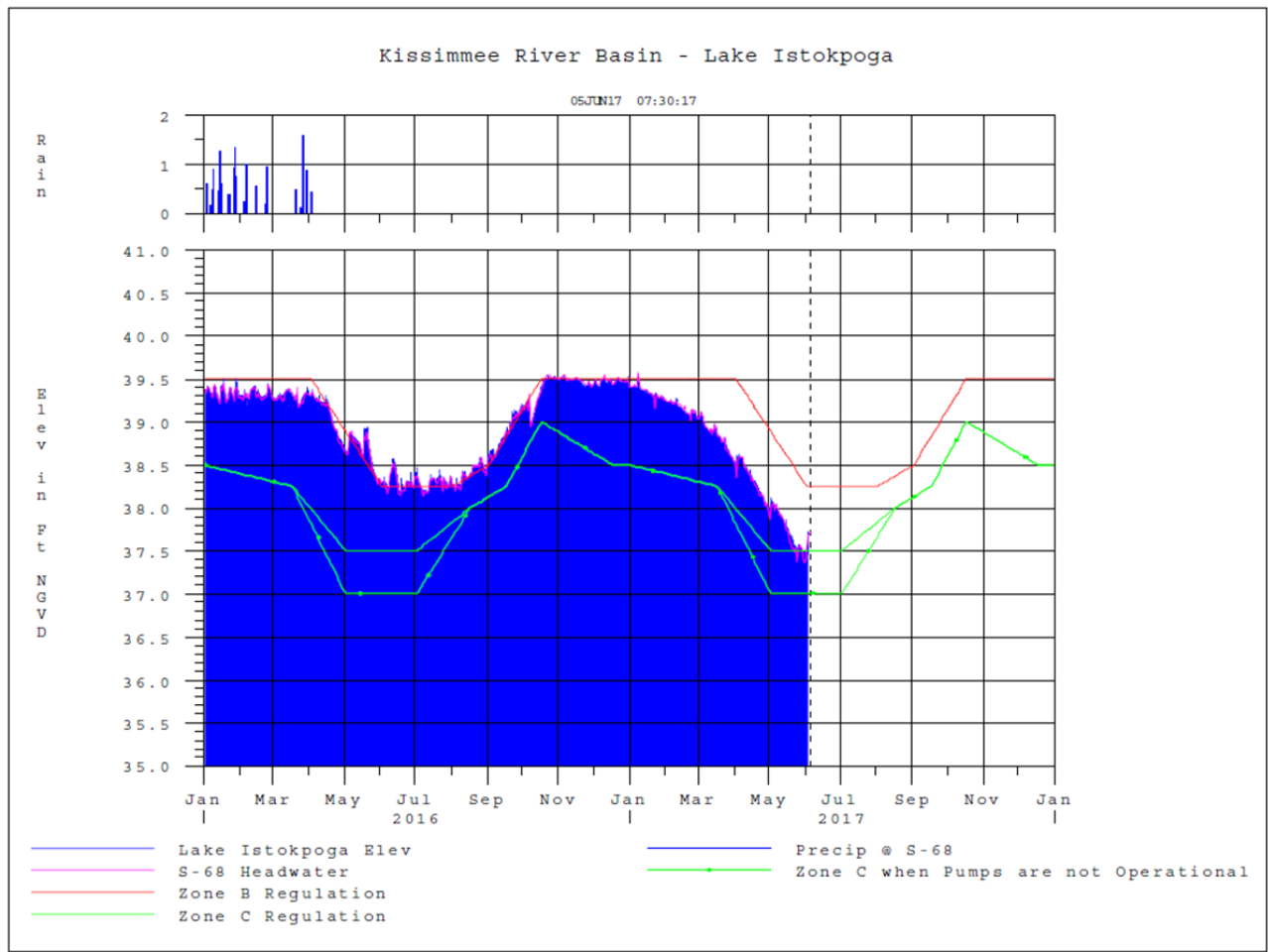


Figure 8

ESTUARIES

St. Lucie Estuary

Over the past week, provisional flows averaged about 11 cfs at S-80, 202 cfs downstream of S-308 flowing into Lake Okeechobee (gates closed, lock open during the day and closed at night), 0 cfs at S-49 on C-24, 0 cfs at S-97 on C-23, and 92 cfs from Ten Mile Creek at the Gordy Road Structure. Average inflow from tidal basin tributaries is estimated to be 627 cfs (Figures 1 and 2). Total inflow averaged about 730 cfs last week and 284 cfs over last month.

Over the past week, surface 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 27.6. 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)	25.0 (25.3)	27.1 (26.7)	NA ¹
US1 Bridge	27.2 (27.8)	27.9 (28.1)	10.0-26.0
A1A Bridge	31.9 (32.4)	32.9 (33.1)	NA

¹Envelope not applicable

Caloosahatchee Estuary

During the past week, provisional flows averaged approximately 102 cfs at S-77, 231 cfs at S-78, and 387 cfs at S-79. Average inflow from tidal basin tributaries is estimated to be 414 cfs (Figures 5 & 6). Total inflow averaged 801 cfs last week and 549 cfs over last month.

Over the past week in the estuary, surface salinity slightly decreased except at Ft. Myers Yacht Basin (Table 2, Figures 7 and 8). The seven-day average salinity values are within the good range for adult oysters at Cape Coral, within the fair range at Shell Point, and within the poor range at Sanibel (Figure 9). The 30-day moving average surface salinity is 6.7 at Val I-75 and 15.0 at Ft. Myers. The 30-day moving average salinity at Ft. Myers has been above 10 for 70 consecutive days. Salinity conditions between Val I-75 and Ft. Myers are likely to result in tape grass deterioration. Without discharges at S-79, the 30-day moving average salinity at Val I-75 is forecast to be 5.9 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)	5.8 (5.3)	5.9 (5.4)	NA ¹
*Val I75	6.6 (6.8)	9.7 (9.3)	0.0-5.0 ²
Ft. Myers Yacht Basin	15.0 (14.5)	17.0 (15.3)	NA
Cape Coral	22.4 (23.4)	24.6 (24.5)	10.0-30.0
Shell Point	32.4 (32.9)	32.3 (32.7)	10.0-30.0
Sanibel	35.3 (35.6)	36.6 (36.7)	10.0-30.0

¹Envelope not applicable and ²Envelope 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 <i>a</i> (µg/l)	3.70 – 11.73	3.27 – 7.46	1.05 – 4.70
Dissolved Oxygen (mg/l)	3.13 – 5.89	2.77 – 5.27	No Data

The Florida Fish and Wildlife Research Institute reported on June 2, 2017, that *Karenia brevis*, the Florida red tide organism, was observed at background concentrations in one sample collected from Lee County.

Water Management Recommendations

The 30-day average salinity at the I-75 Bridge is 6.7 and is forecast to continue to exceed 5 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. A release through S-79 greater than 450 cfs is forecast to be required to achieve a 30-day average salinity below 5 at the I-75 Bridge.

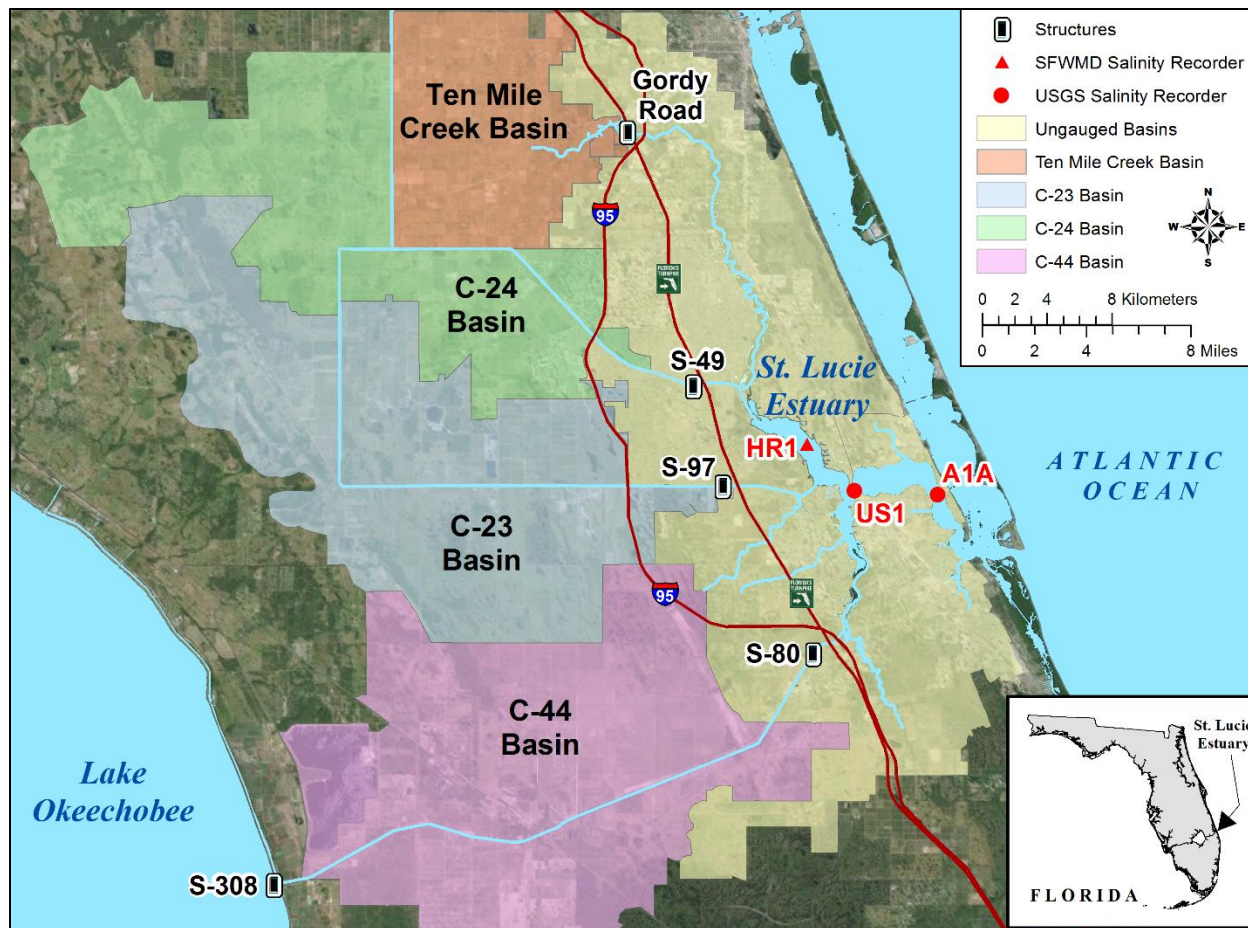


Figure 1. Basins, water control structures, and salinity monitoring for the St. Lucie Estuary.

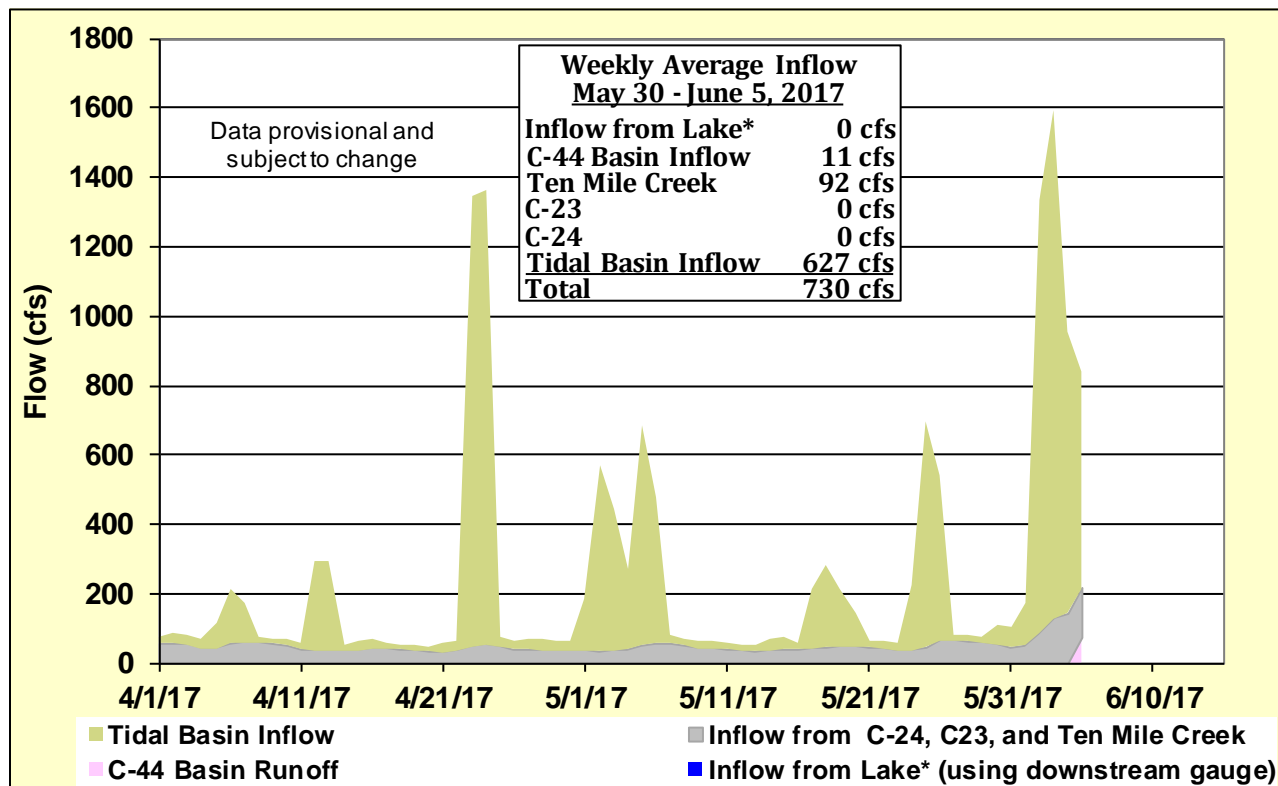


Figure 2. Estimated surface freshwater inflows from Lake Okeechobee and runoff from the C-44, C-23, C-24, Ten Mile Creek, and tidal basins into the St. Lucie Estuary.

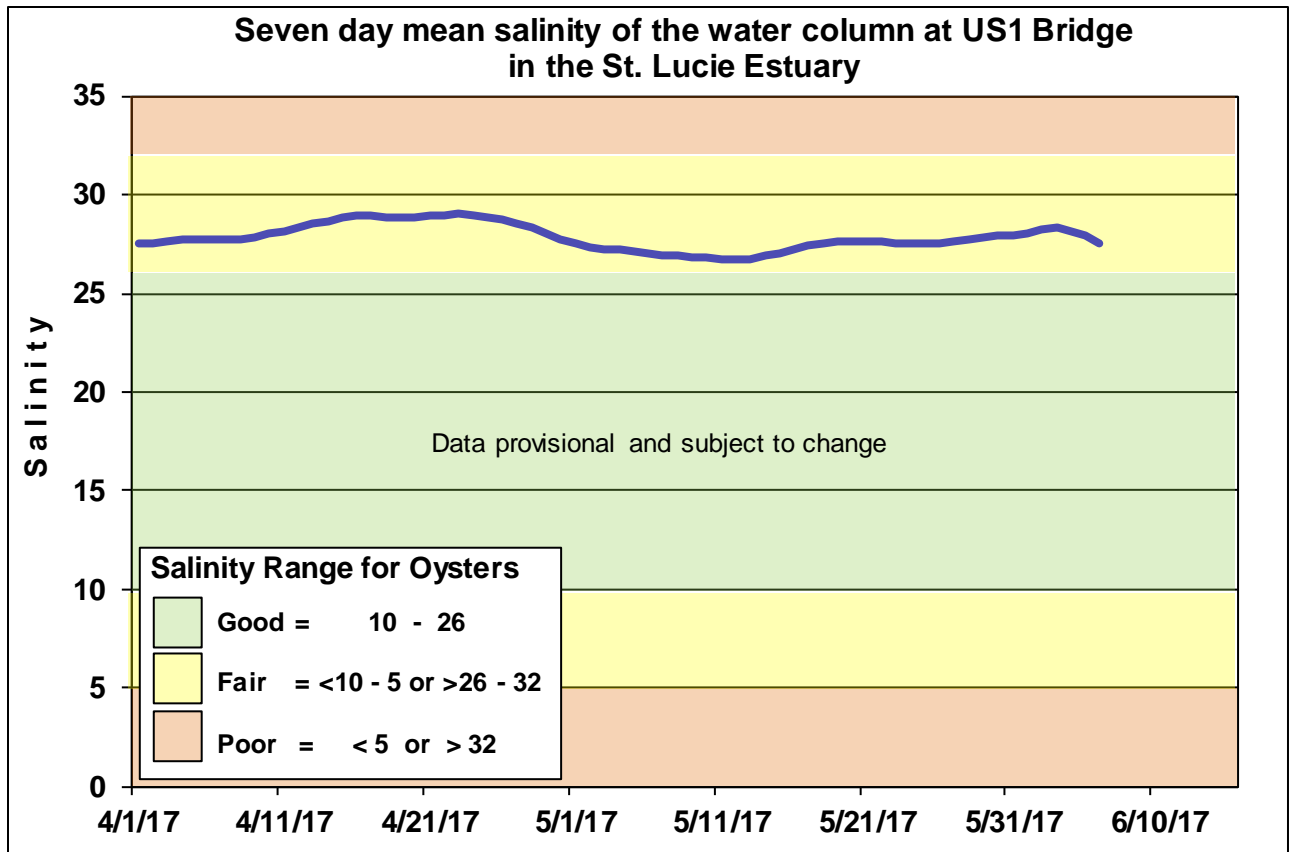


Figure 3. Seven-day mean salinity of the water column at the U.S. Highway 1 Bridge.

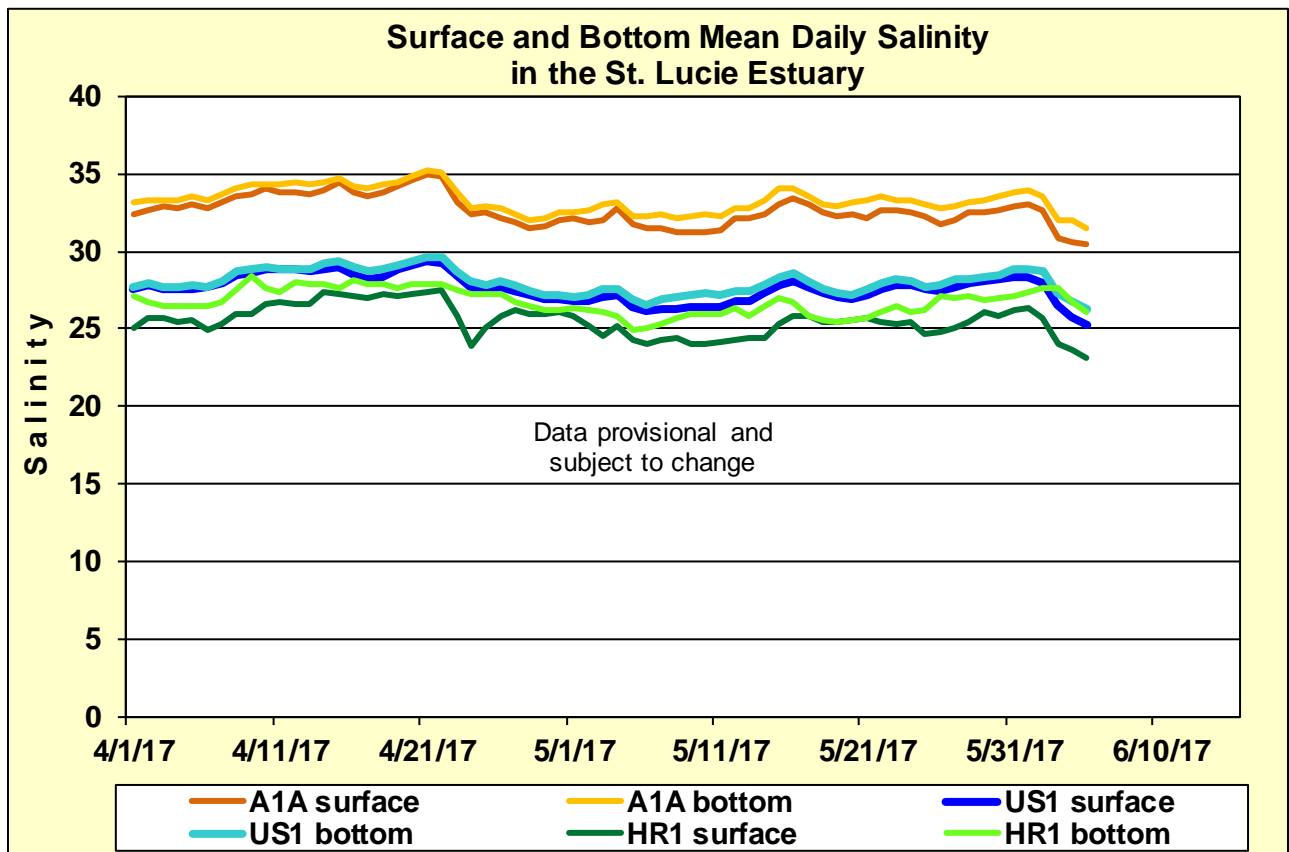


Figure 4. Daily mean salinity at the A1A, US1 and estimated HR1 stations.

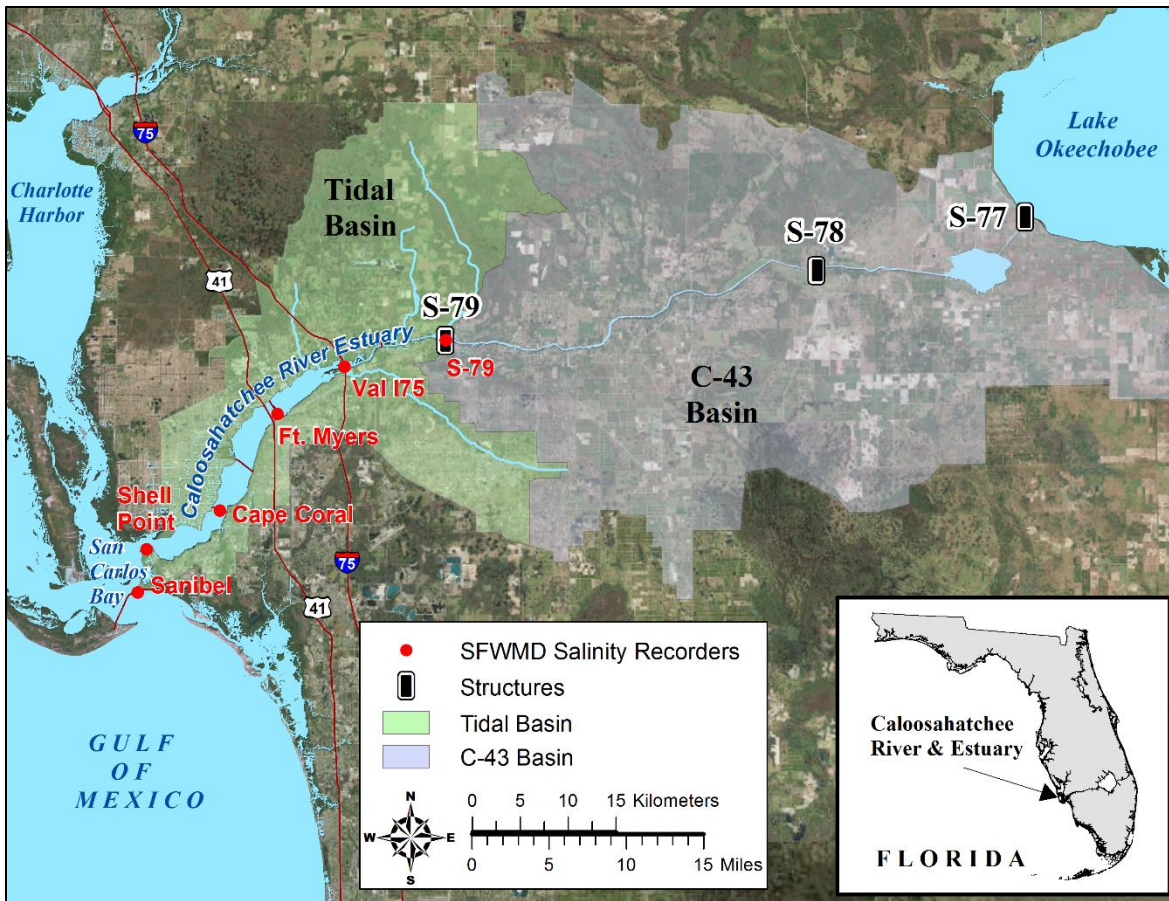


Figure 5. Basins, water control structures, and salinity monitoring for the Caloosahatchee Estuary.

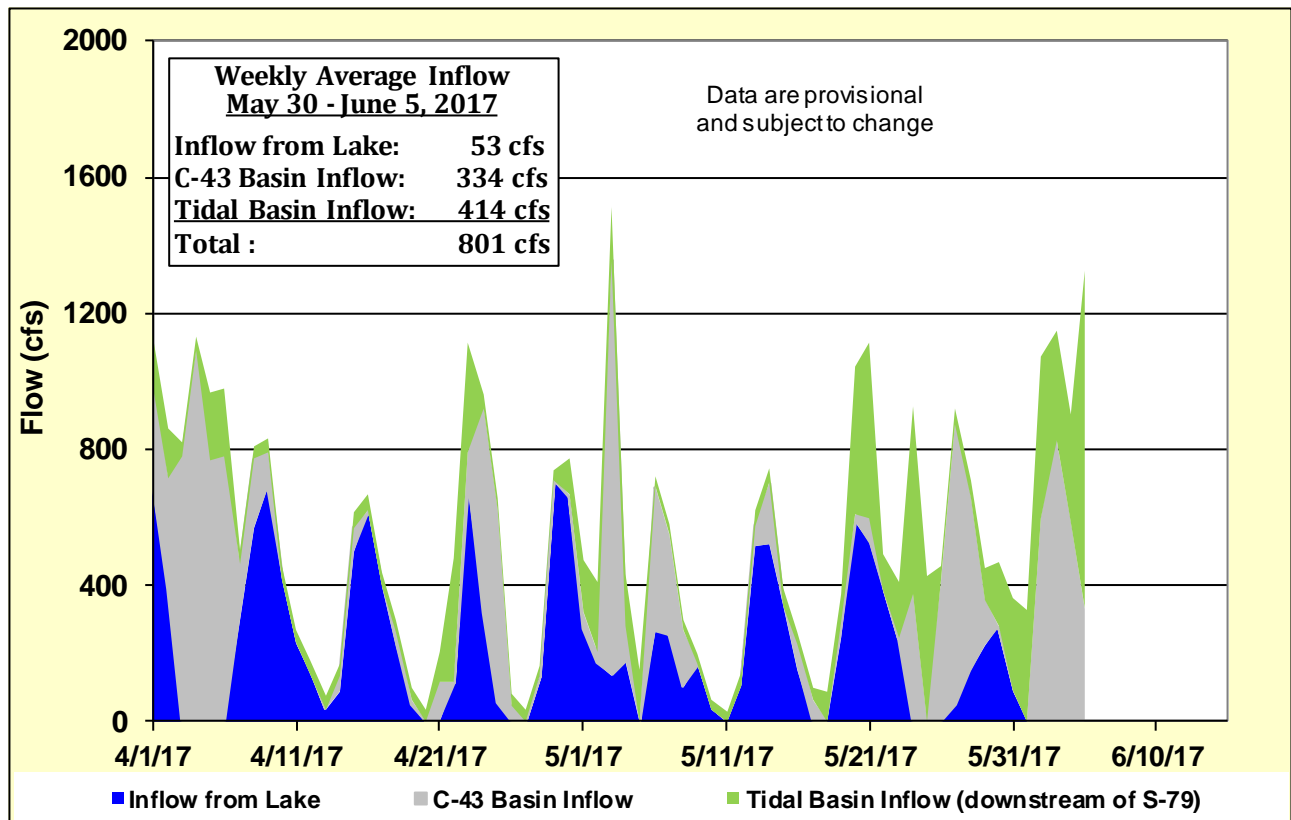


Figure 6. Freshwater inflows from Lake Okeechobee, runoff from the C-43 basin, and tributaries in the tidal basin into the Caloosahatchee River Estuary.

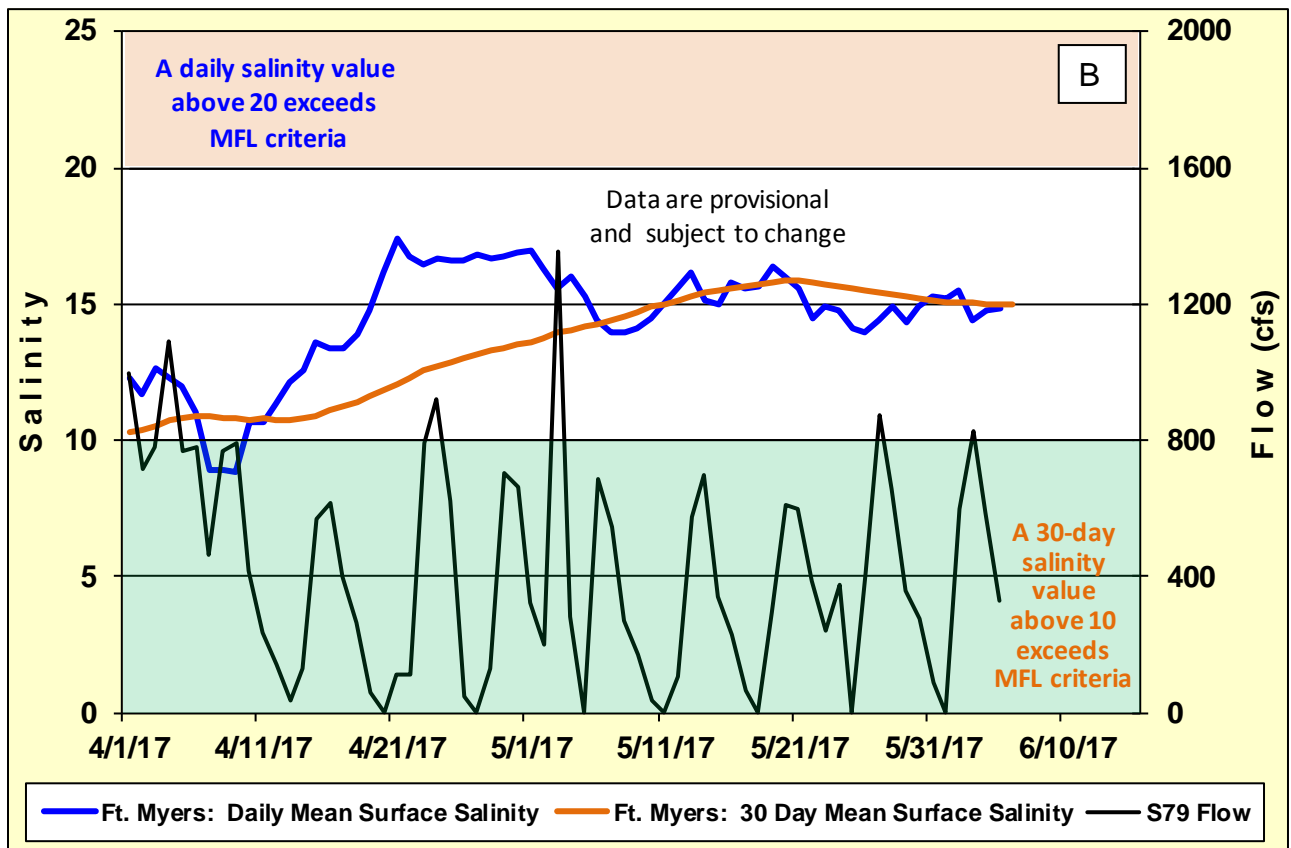
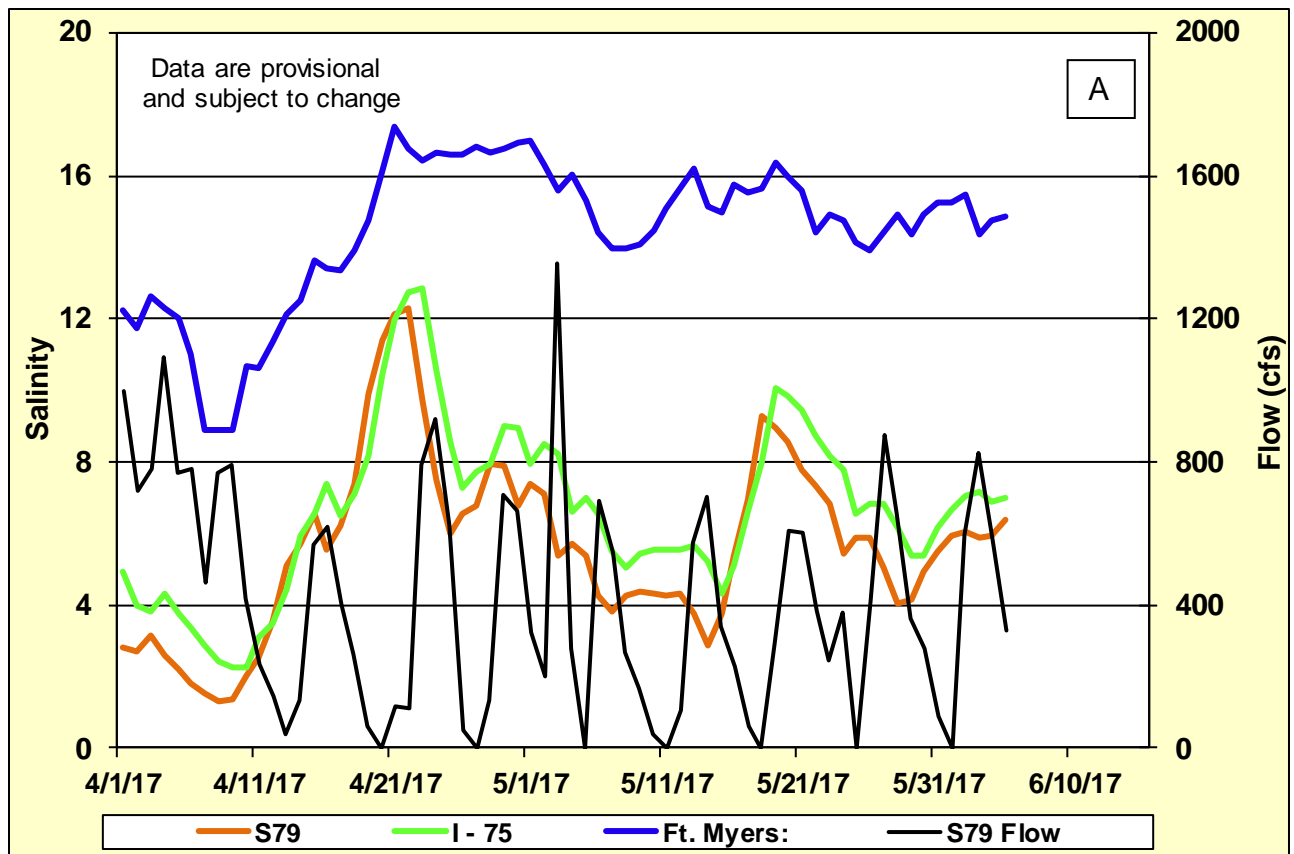


Figure 7. Daily mean flows at S-79 and salinity at upper estuary monitoring stations (A) and 30-day moving average salinity at Ft. Myers (B).

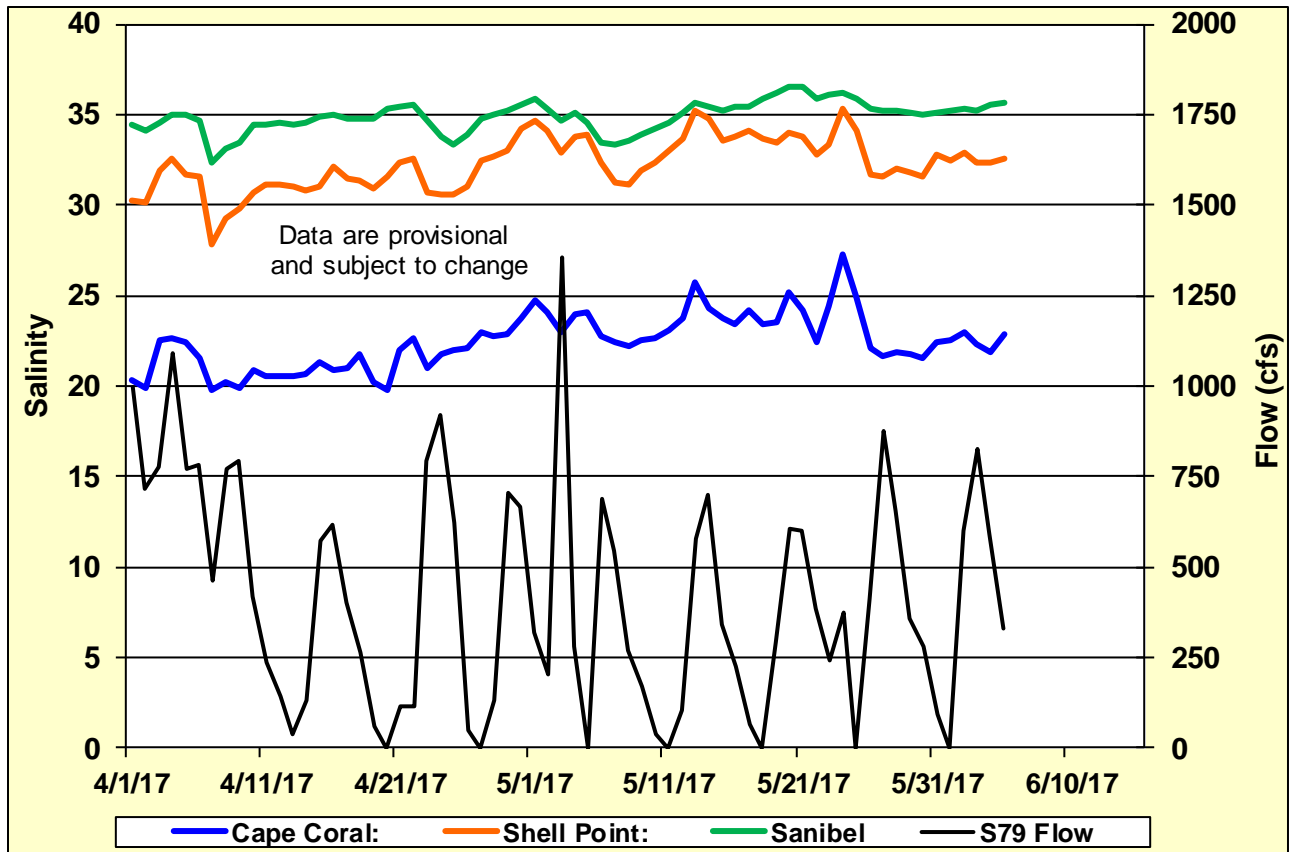


Figure 8. Daily mean flows at S-79 and salinity at lower estuary stations.

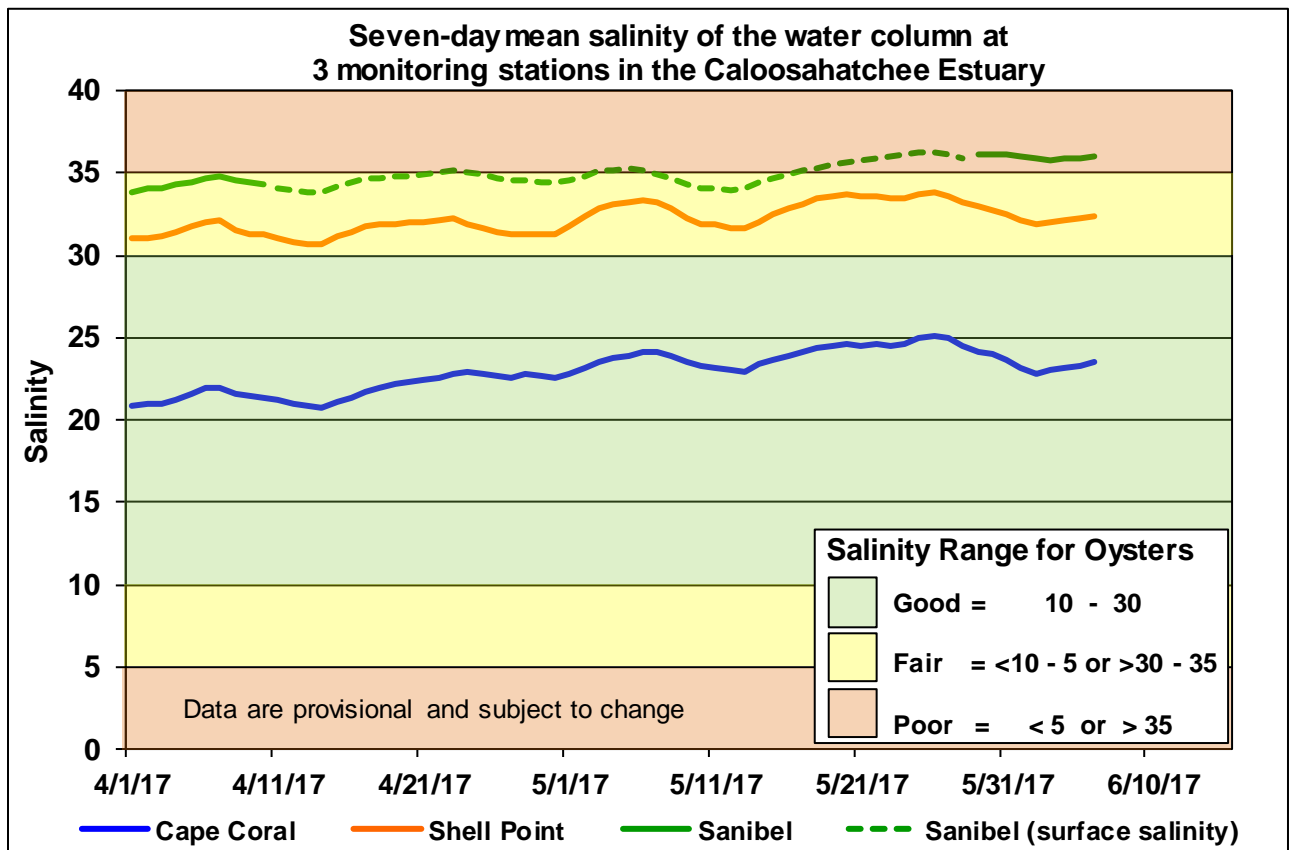


Figure 9. Seven-day mean salinity at Cape Coral Bridge, Shell Point and Sanibel Bridge monitoring stations.

Caloosahatchee Estuary Flows and Salinity Observed and Forecast Salinity at Val I-75

Forecast 1: S-79 =0 cfs & TBR = 925 cfs

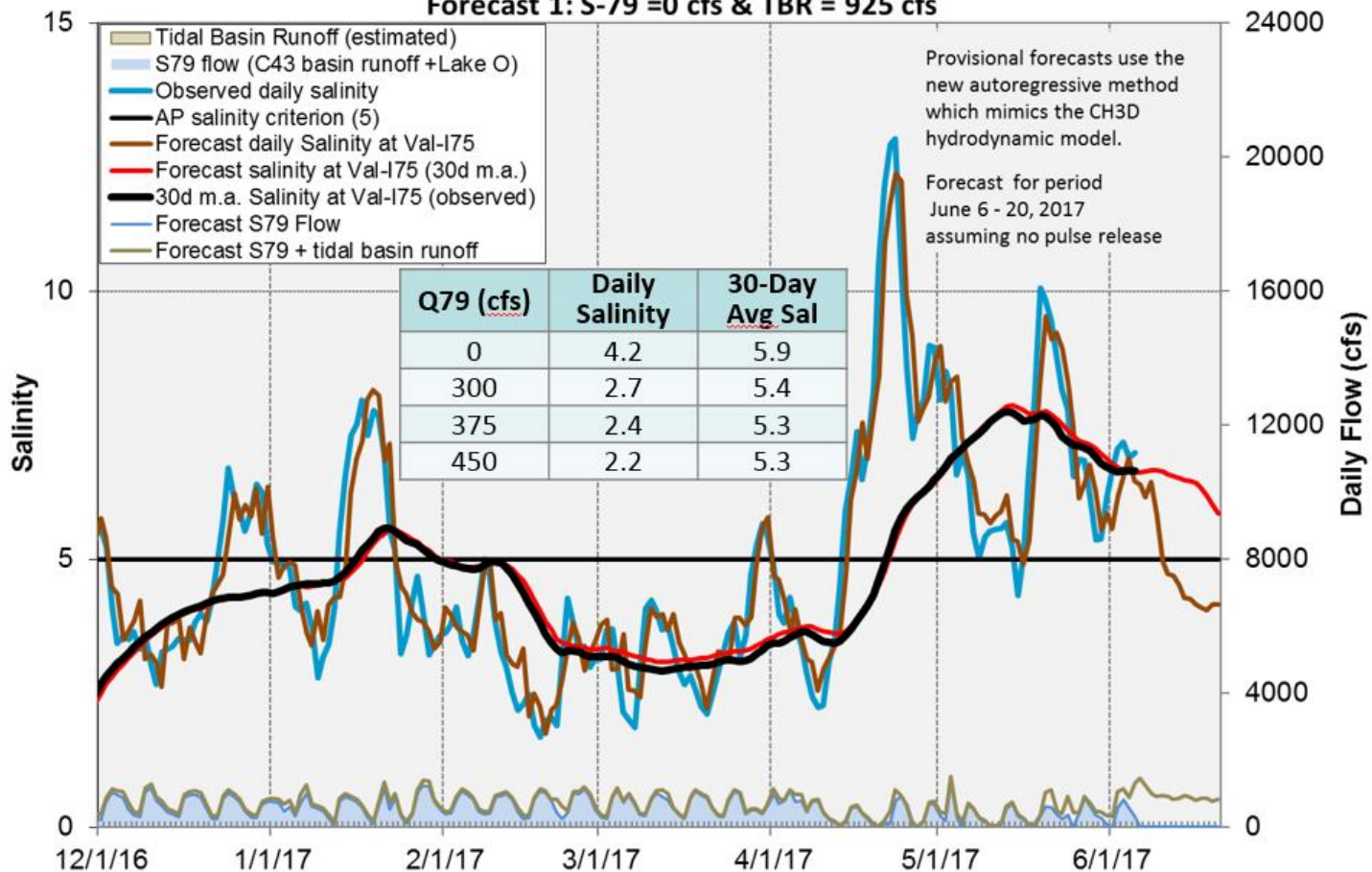


Figure 10. 14-day salinity forecast at Val I-75 assuming no releases at S-79.

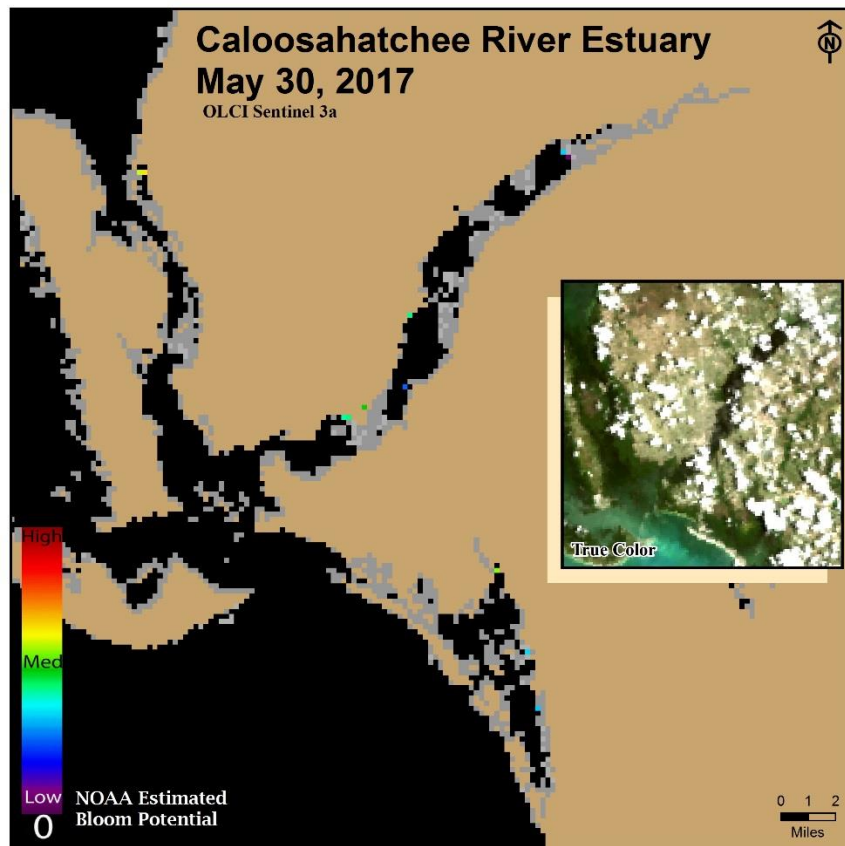
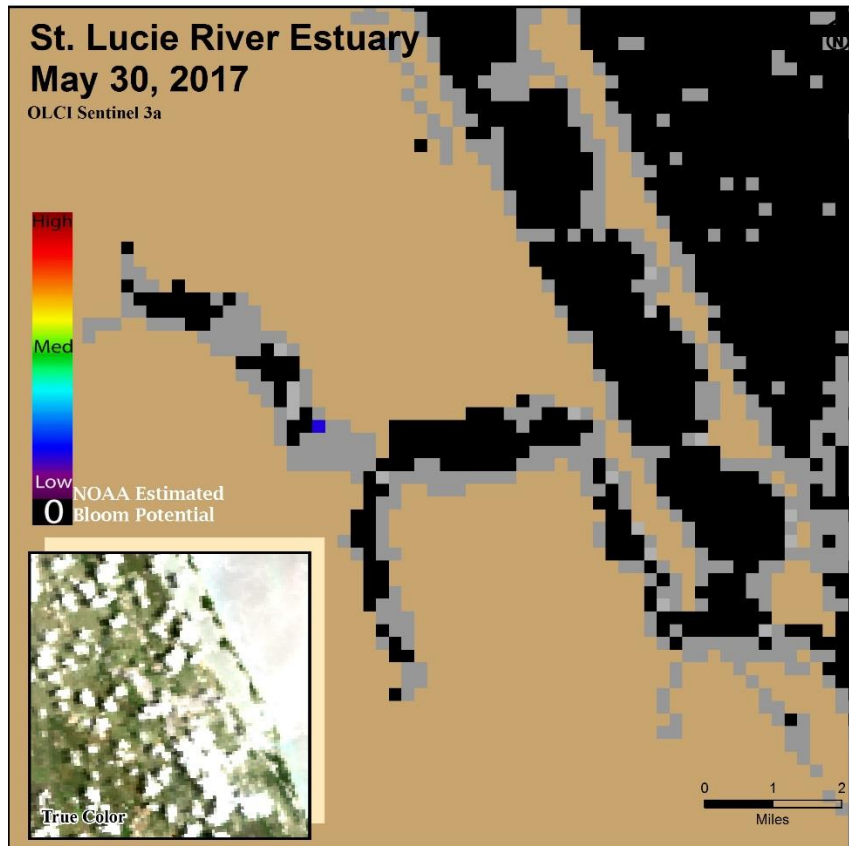



Figure 11. Sentinel 3a Satellite imagery provided by NOAA uses Ocean and Land Color Instrument (OLCI) to estimate cyanobacteria bloom potential in Caloosahatchee Estuary.

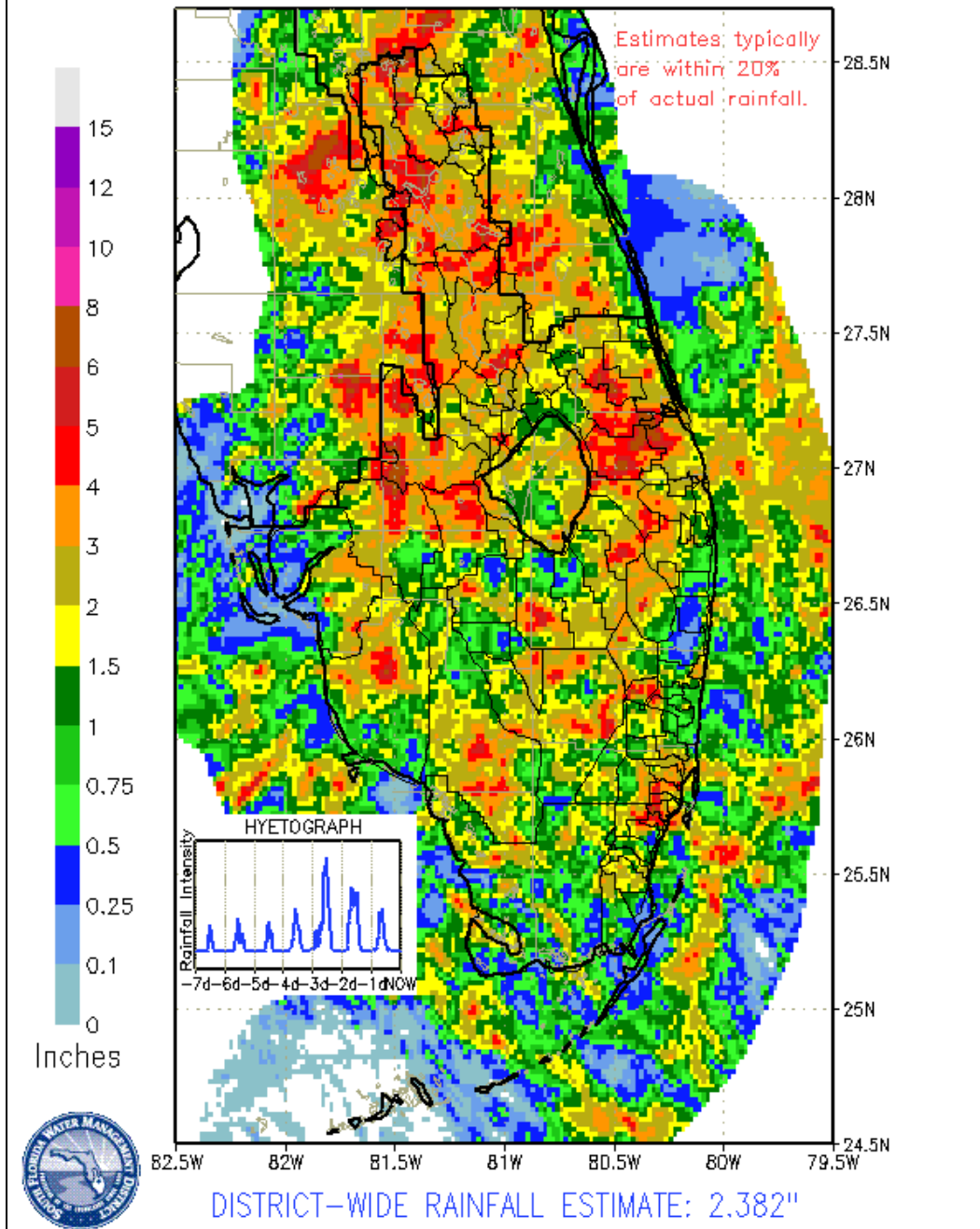
EVERGLADES

Widespread rain resulted in increases in stage across the Everglades.

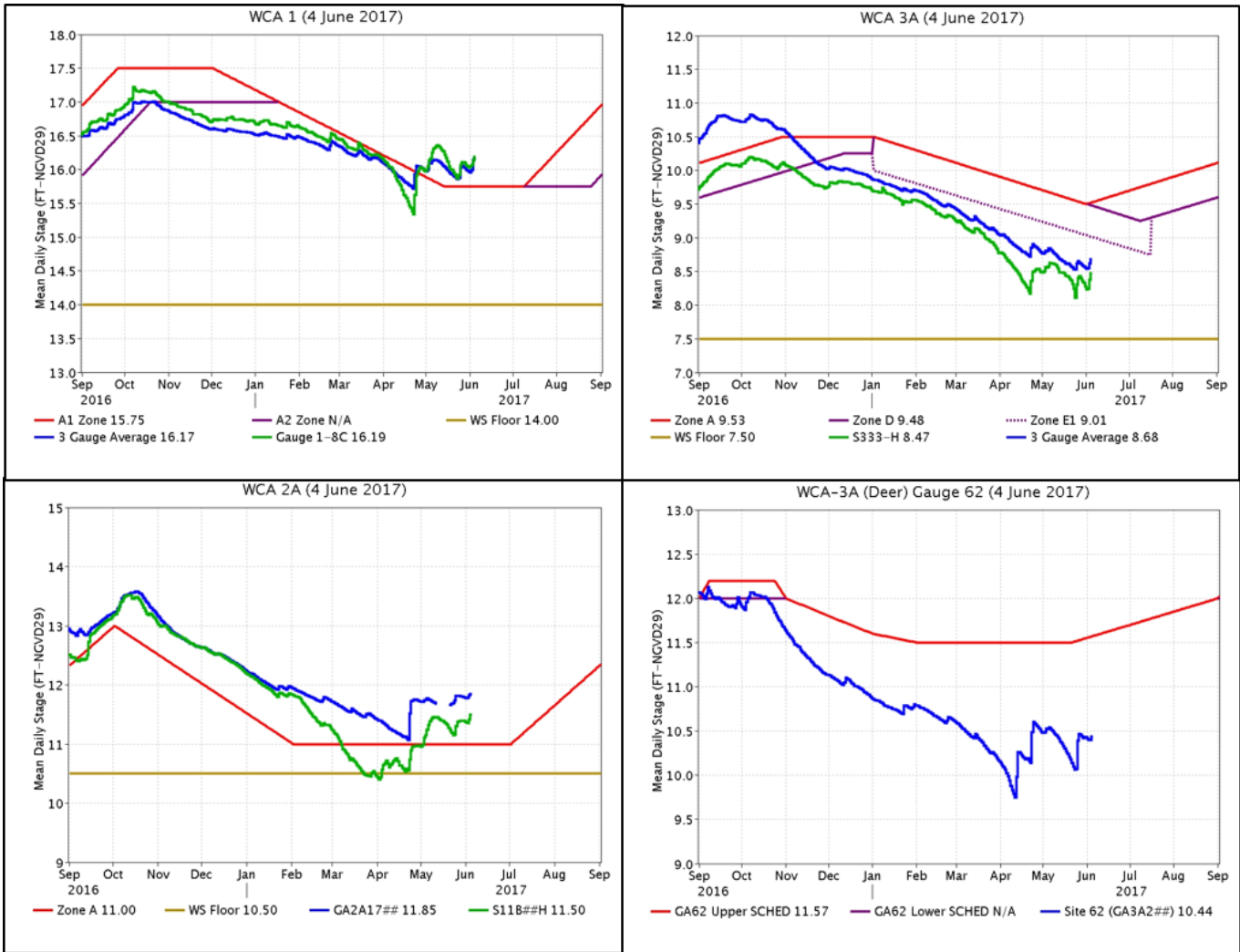
Everglades Region	Rainfall (Inches)	Stage Change (feet)	
WCA-1	2.37	0.18	
WCA-2A	2.20	0.06	
WCA-2B	3.52	0.13	
WCA-3A	2.05	0.08	
WCA-3B	1.54	0.14	
ENP	1.26	0.25	

SFWM PROVISIONAL RAINDAR 7-DAY RAINFALL ESTIMATES

FROM: 0530 EST, 05/29/2017 THROUGH: 0530 EST, 06/05/2017



Regulation Schedules: WCA-1 stage is .42 feet above Zone A. In WCA-2A the marsh stage at gauge GA2A17 is currently above zone A (+0.85 feet) and above canal stage. WCA-3A three-gauge average is 0.33 feet below zone E1, but generally tracking that line. WCA-3A at gauge 62 (Northwest corner) remains 1.1 feet below schedule.

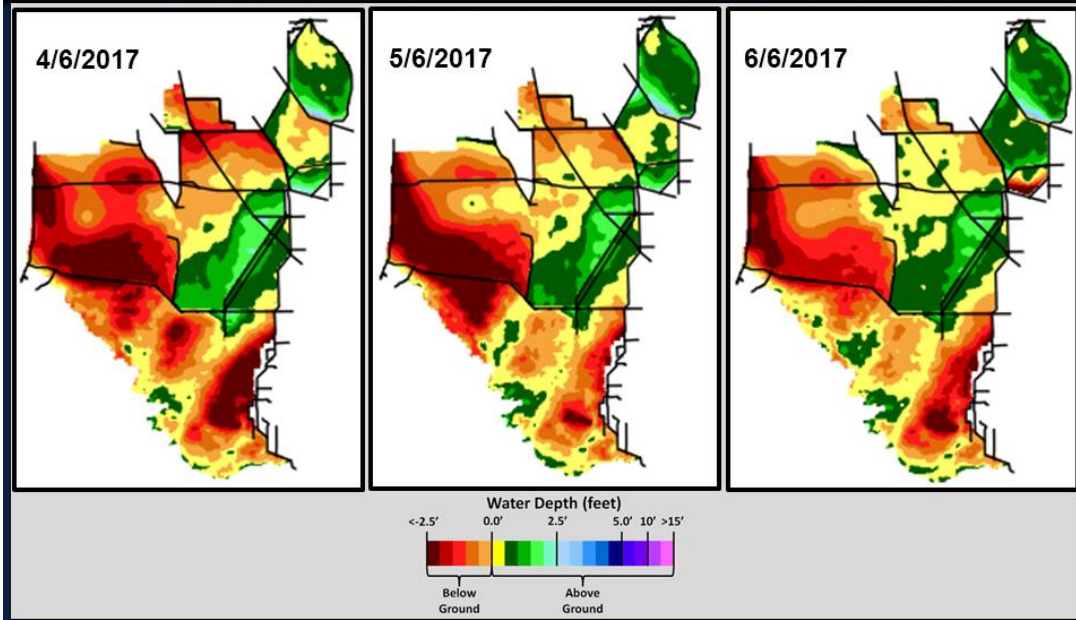


Blue – wetlands
Green – canals

Water Depths and Changes: This week's water depths at functioning monitored gauges other than in WCA-2B range from -0.21 feet (northeast WCA-3A) to 1.44 feet (WCA-1). Over the last week individual gauge changes ranged from -0.01 feet (WCA-2B) to +.32 feet (WCA-1).



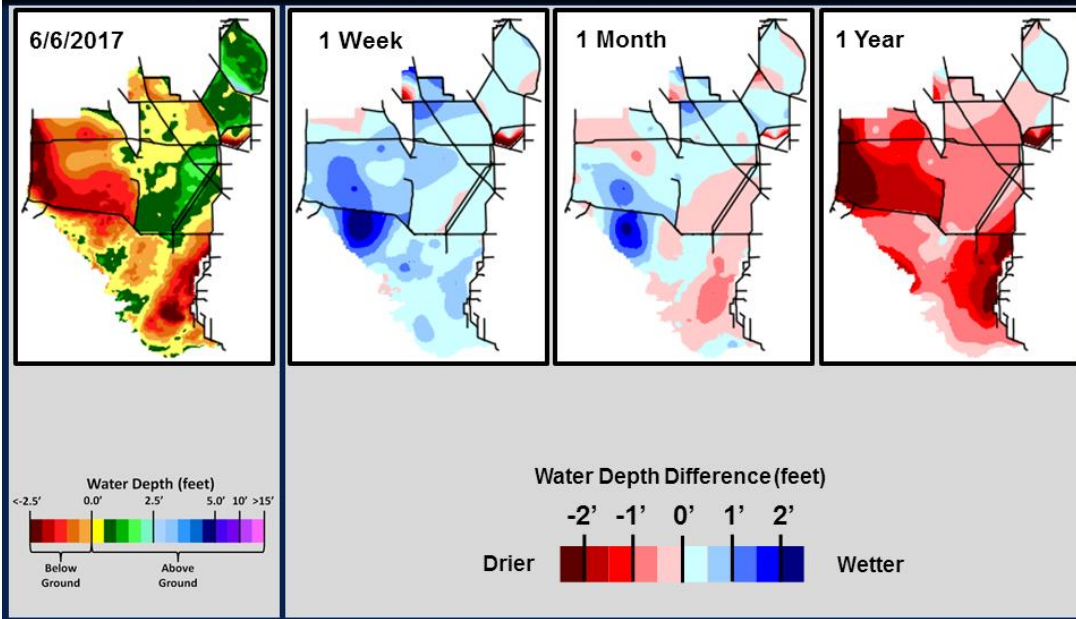
SFWDAT Water Depth Monthly Snapshots



South Florida Water Depth Assessment Tool (SFWDAT)



SFWDAT Everglades Difference Maps (Present - Past)

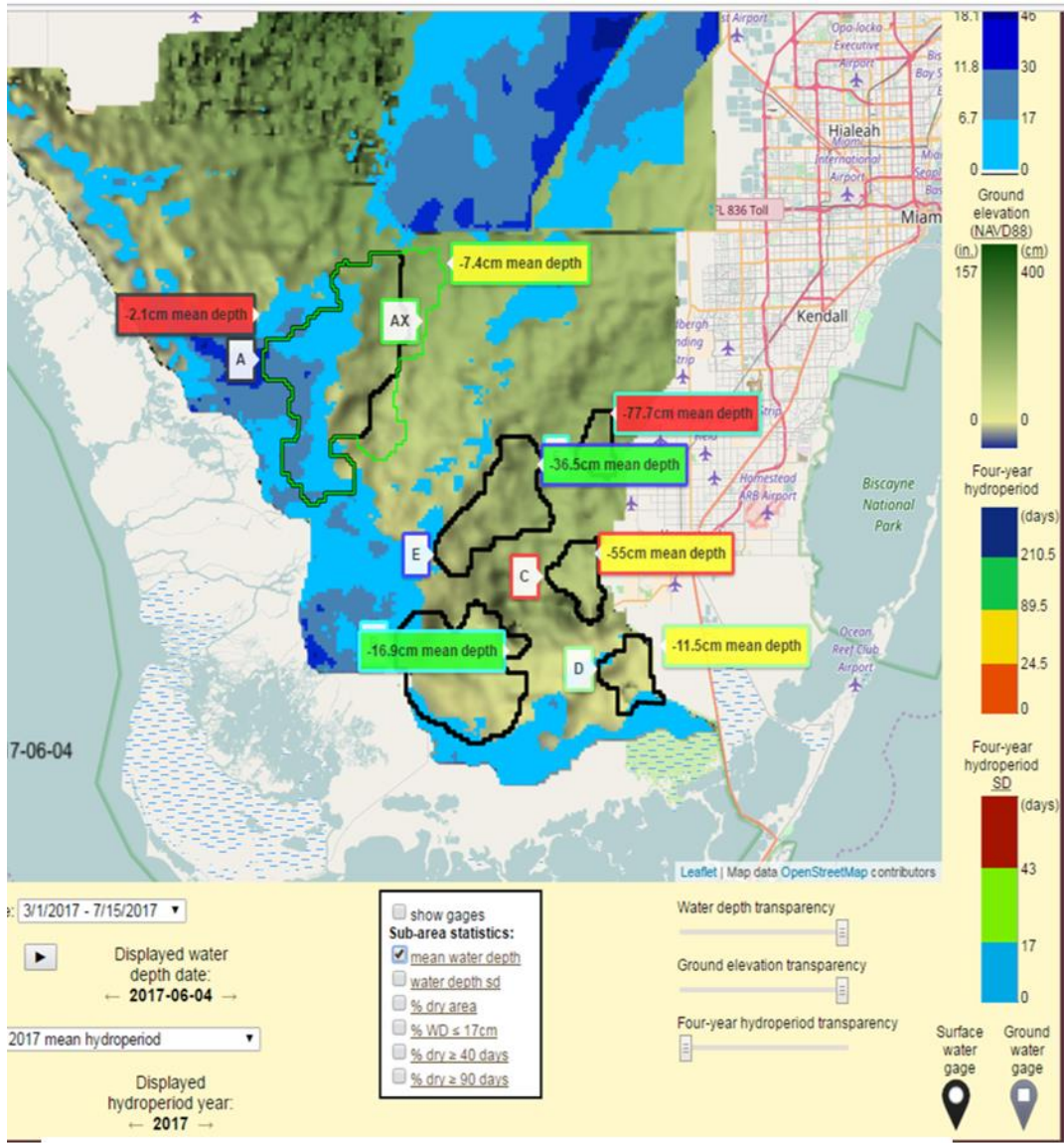


South Florida Water Depth Assessment Tool (SFWDAT)

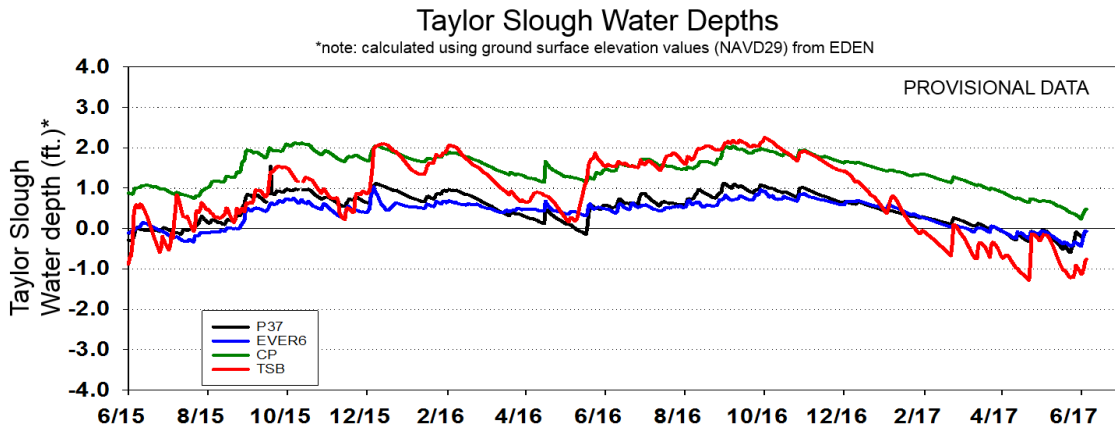
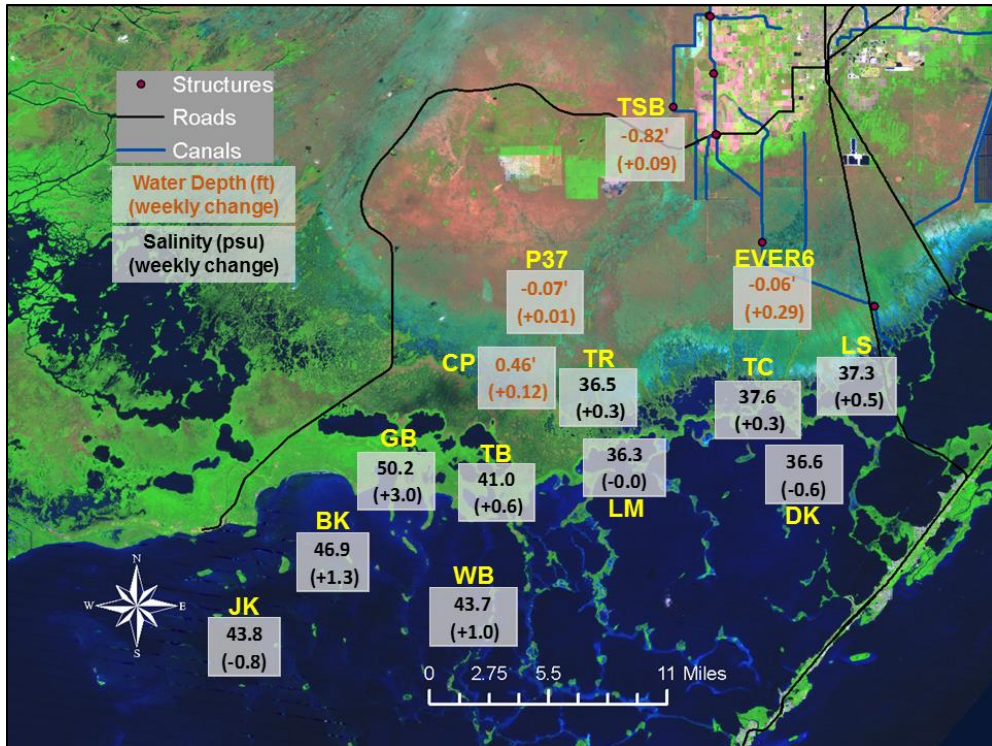
Wildlife update: Wading Birds, Cape Sable Seaside Sparrow, Snail Kites: Current reports indicate above average wading bird nesting success; there are still some white ibis nesting in WCA-1.

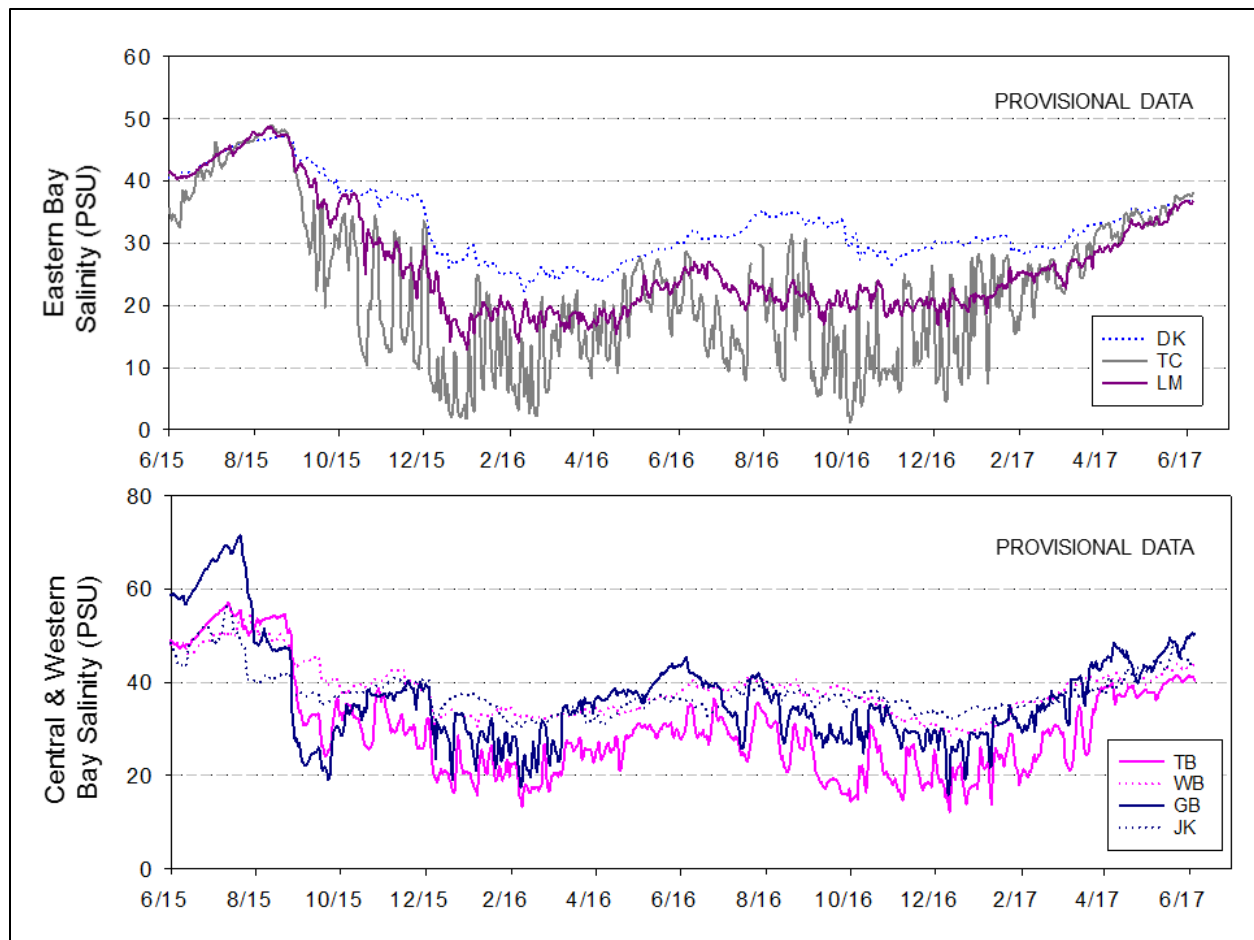
Snail kites did not nest within the Everglades this year. Moderate accretion rates may be particularly important to apple snail reproduction this wet season.

Cape Sable Seaside Sparrows have been experiencing good habitat conditions during their nesting season (currently meeting targets for 90 consecutive dry days and 40% dry habitat) and nesting is active.



Mean water depth for CSSS sub pops



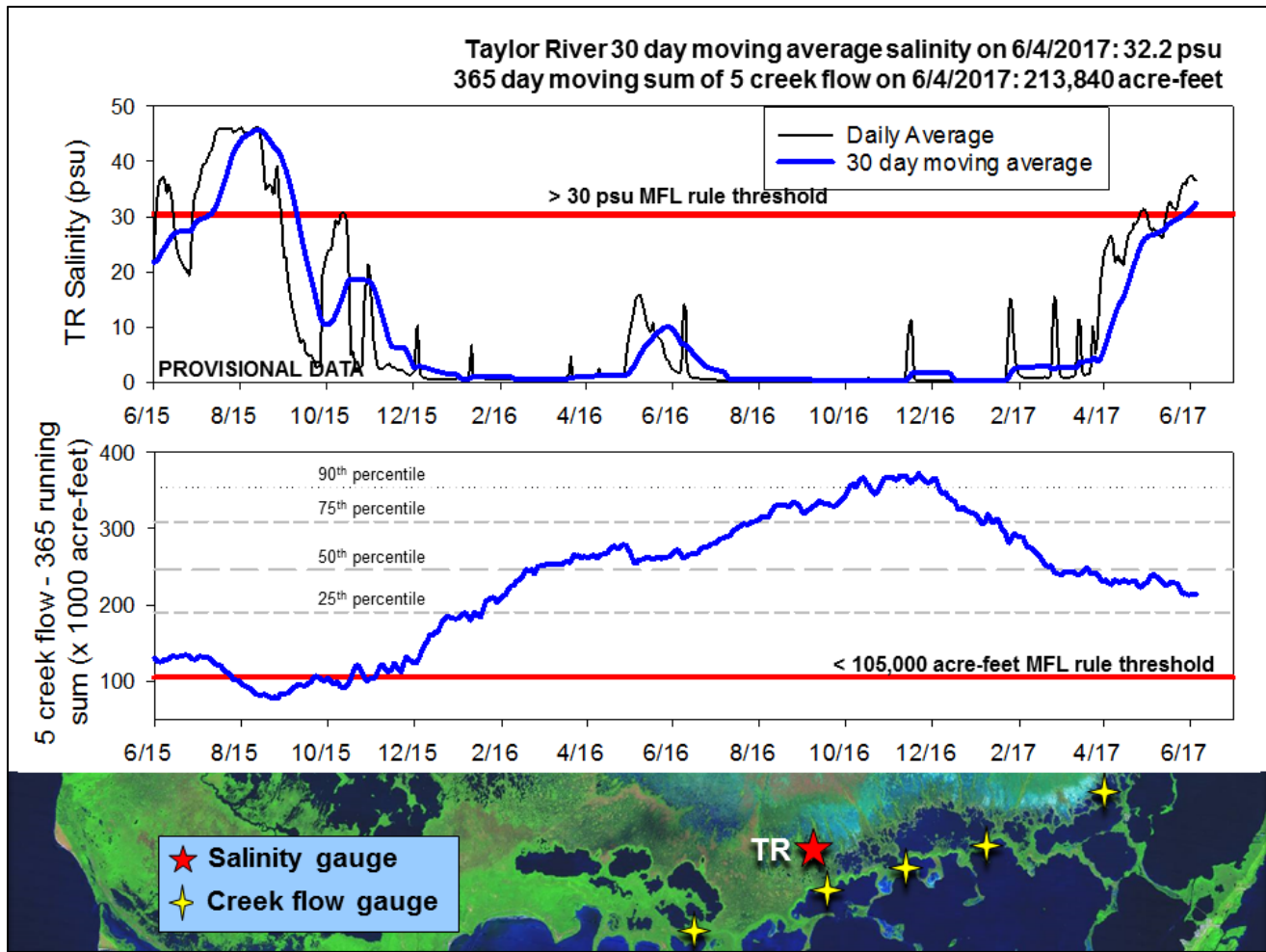


Taylor Slough stages: Water levels increased in central and northern Taylor Slough last week with changes ranging from +0.01 to +0.29 feet. Only southwestern Taylor Slough (which is below sea level) is above ground still. Compared to historic averages, water levels are -11 inches below average in northern Taylor Slough to +2 inches above average in central Taylor Slough.

Florida Bay salinity: Salinities in the Bay are currently +3 to +9 psu above average and range from 36 psu in the eastern nearshore to 50 psu in the western nearshore. Salinities were mostly stable this week with changes being less than 1.3 psu. The only exception was Garfield Bight (GB) in the western nearshore which increased 3 psu.

Florida Bay MFL: Mangrove zone daily average salinity peaked at 37 psu on Friday before decreasing to 36 again. The 30-day moving average increased +1.8 to end the week at 32.2 psu.

The cumulative weekly flow from the five creeks identified by the stars on the map was just over 580 acre-feet as some positive flows resumed. The 365-day moving sum of flow from the five creeks identified by stars on the map decreased ~1,000 acre-feet to 213,840 acre-feet (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 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 6th, 2017 (red is new)

Area	Current Condition	Cause(s)	Recommendation	Reasons
WCA-1	Stages increased 0.11' to 0.32'	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 0.06'	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 changes -0.01' to 0.27'	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 0.09'	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 increased 0.03'	Rainfall, ET, management		
Central WCA-3A S	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.
Southern WCA-3A S	Stages increased 0.06'	Rainfall, ET, management		
WCA-3B	Stages increased 0.04'	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 at or below minimum for gauge	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	S-12A, S-12B, S-344, S-343A, S-343B are closed. S-333 closed	Rainfall, ET, management	Follow rainfall plan for releases and current ERTTP 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 forecasted conditions are conducive for continuation of a successful sparrow breeding season.
Taylor Slough	Stage increases ranged +0.01 to +0.29'	Rain, ET, inflows	Move water southward as possible	When available provide freshwater buffer for ecosystems and slow recession rates.
FB- Salinity	Salinity changes ranged -1 to +3 psu.	Rain, ET, inflows, wind	Move water southward as possible	When available provide freshwater to buffer hypersalinity conditions.