

Disclaimer: Information contained in the report addresses environmental conditions only and is not the official South Florida Water Management District operations recommendation or decision.

MEMORANDUM

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

FROM: SFWMD Staff Environmental Advisory Team

DATE: April 11, 2017

SUBJECT: Weekly Environmental Conditions for Systems Operations

Summary

Weather Conditions and Forecast

Scattered light showers east. A surface low is forecast to develop north of Hispaniola Wednesday and pull slowly northward. This low will help continue our mostly dry pattern. Breezy east winds will continue to blow scattered light showers on shore along the east coast today and Wednesday and then mainly along the east and west coasts Thursday. As the low exits to the northeast, high pressure over the area is expected to continue to suppress shower development this weekend and next week.

Kissimmee

On Sunday, stage was 1.0 feet below regulation schedule in East Lake Toho and Lake Toho, and 1.3 feet below schedule in Kissimmee-Cypress-Hatchineha. Over the past week, discharge averaged 292 cfs, 270 cfs, and 297 cfs at S65, S65A, and S65E, respectively. Tuesday morning discharges were ~324 cfs, 262 cfs, and 279 cfs, respectively at S65, S65A, and S65E. Dissolved oxygen data in the Kissimmee River averaged 7.4 mg/L on Monday April 3; PC62 sonde was taken offline on April 4. Kissimmee River mean floodplain depth on Sunday was 0.06 feet. No new recommendations.

Lake Okeechobee

As of midnight April 9, 2017, Lake stage was 12.25 feet NGVD and in the Beneficial Use sub-band. The current weekly recession rate of 0.21 feet equates to a projected monthly recession rate of 0.84 feet which is well above the recommended 0.50 feet per month or lower guideline. The goal should be to slow the current recession rate and maintain it at below 0.50 feet per month. The March water quality data indicates that total phosphorus and total suspended solids were higher at all sites compared to February and chlorophyll level at a southwest nearshore site was not far from algal bloom concentration of 40 ppm.

Estuaries

Total discharge to the St. Lucie estuary averaged 113 cfs over the past week with 0 cfs (0%) coming from Lake Okeechobee as the USACE has stopped flow through the S-80 structure for the foreseeable future. Salinities throughout the estuary increased 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 824 cfs over the past week with 282 cfs (34%) coming from the Lake. The 30-day average surface salinity at the Ft. Myers monitoring station is 10.8 and has been above 10 for 14 consecutive days. The 30-day average surface salinity at Val I-75 is 3.5. 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, while in the fair range at Shellpoint and the Sanibel Causeway. The 30-day moving average salinity at the I-75 Bridge is forecast to be 4.6 in the next two weeks if no flow comes through the S-79 structure; however, daily salinity is forecast to reach 6.8.

Stormwater Treatment Areas

Over the past week, the STAs/FEBs received approximately 7,800 acre-feet of Lake releases. The total amount of Lake releases sent to the STAs/FEBs in WY2017 (since May 1, 2016) is approximately 223,300 acre-feet. Most STA cells are at or near target depths, except STA-5/6 emergent aquatic vegetation cells which are drying out. Operational restrictions are in place for structure repairs and vegetation rehabilitation in STA-1E. In addition, nests of MBTA-protected species have been observed in STA-1E. This week, if Lake releases are sent to the WCAs and the conditions allow, releases will be sent to STA-2 and STA-3/4.

Everglades

Below average rainfall and dry conditions led to an increase in the rate at which depths across the Everglades are dropping. On average in WCA-1, WCA-2A and WCA-3A fell 0.16 feet, much faster than the recommended maximum drop of 0.09 feet per week. District flights on April 6 and 10 noted large numbers of wading birds feeding along the drying front in WCA-2A.

Supporting Information

KISSIMMEE BASIN

Kissimmee Basin Rainfall

The Upper Kissimmee Basin received 0.25 inches of rainfall in the past week and the Lower Basin received 0.72 inches (SFWMD Daily Rainfall Report 04/10/2017).

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: 4/11/2017

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)						
							4/9/17	4/2/17	3/26/17	3/19/17	3/12/17	3/5/17	2/26/17
Lakes Hart and Mary Jane	S62	1	LKMJ	60.2	R	60.5	-0.3	-0.4	-0.4	-0.4	-0.4	-0.4	-0.2
Lakes Myrtle, Preston, and Joel	S57	0	S57	60.5	R	60.6	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0
Alligator Chain	S60	0	ALLI	62.7	R	63.4	-0.7	-0.8	-0.8	-0.9	-0.9	-0.8	-0.7
Lake Gentry	S63	3	LKGT	60.7	R	60.9	-0.2	-0.3	-0.3	-0.4	-0.4	-0.3	-0.2
East Lake Toho	S59	45	TOHOE	56.1	R	57.1	-1.0	-1.0	-1.2	-1.3	-1.2	-1.1	-0.8
Lake Toho	S61	153	TOHOW, S61	53.1	R	54.1	-1.0	-1.1	-1.2	-1.3	-1.2	-1.1	-0.8
Lakes Kissimmee, Cypress, and Hatchineha	S65	292	LKISSP, KUB011, LKIS5B	49.4	R	50.7	-1.3	-1.5	-1.4	-1.3	-1.0	-0.7	-0.8

* 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: 4/11/2017

Metric	Location	Sunday's 1-day average	Weekly Average**									
			4/9/17	4/2/17	3/26/17	3/19/17	3/12/17	3/5/17	2/26/17	2/19/17	2/12/17	2/5/17
Discharge (cfs)	S-65	312	292	361	626	885	899	877	732	710	507	482
Discharge (cfs)	S-65A	269	270	277	461	681	705	682	569	550	387	378
Discharge (cfs)	S-65D****	289	288	359	679	791	685	721	688	540	538	730
Discharge (cfs)	S-65E****	267	297	374	723	855	737	769	744	597	523	513
DO concentration (mg/L)***	Phase I river channel	N/A	7.4	8.3	8.9	8.8	8.4	8.0	7.7	8.3	9.0	8.5
Mean depth (feet)*	Phase I floodplain	0.06	0.06	0.06	0.11	0.17	0.12	0.07	0.07	0.06	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
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	
12/2/2016-1/3/2017	Reduce discharge at S65 to minimum (300 cfs +/- 50 cfs) using the table in Figure 8a. Continue reducing headwater stage at S65C at a rate of ~1 ft/week through mid-January per request from USACE.	To facilitate KRRP construction in Pool BC.	Implemented	USACE/WCO/KB Ops
12/20/2016	No new recommendations.		N/A	
12/13/2016	No new recommendations.		N/A	
12/6/2016	No new recommendations.		N/A	
11/29/2016	No new recommendations.		N/A	
11/22/2016	No new recommendations.		N/A	
11/15/2016	No new recommendations.		N/A	
11/8/2016	No new recommendations.		N/A	

KCOL Hydrographs (through Sunday midnight)

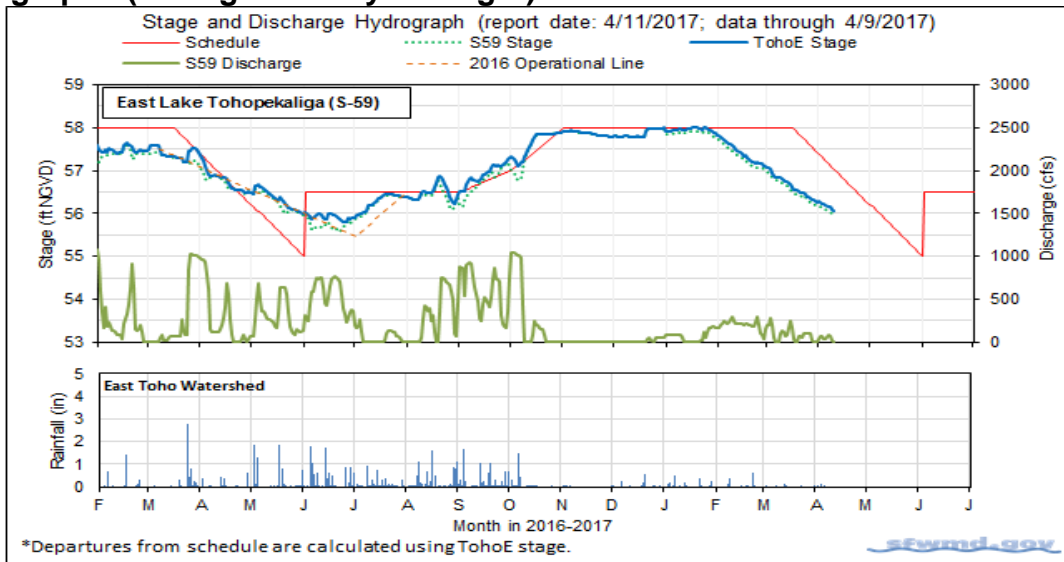


Figure 1.

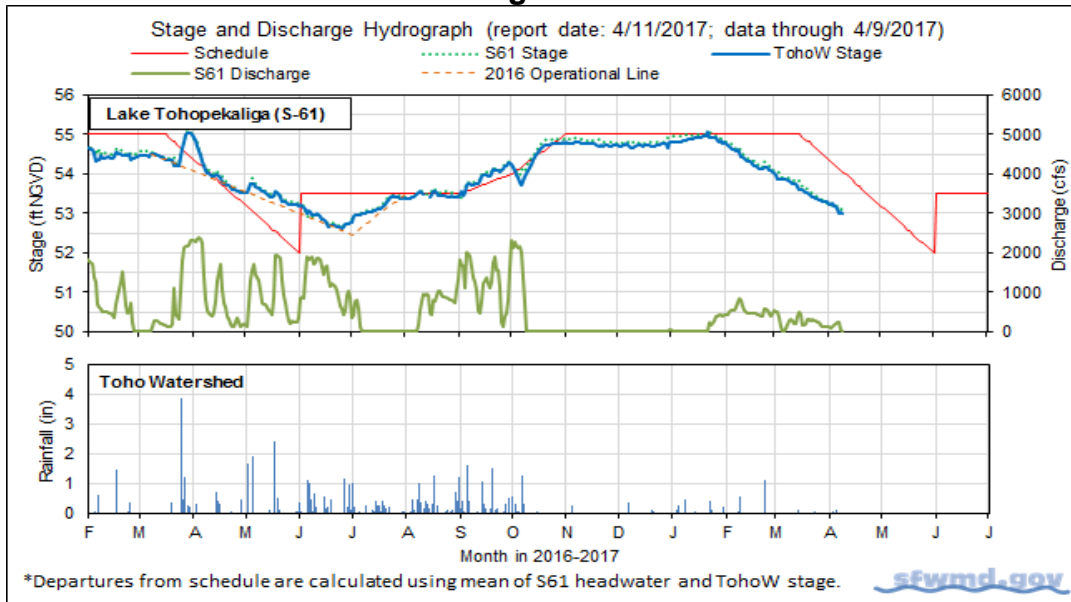


Figure 2.

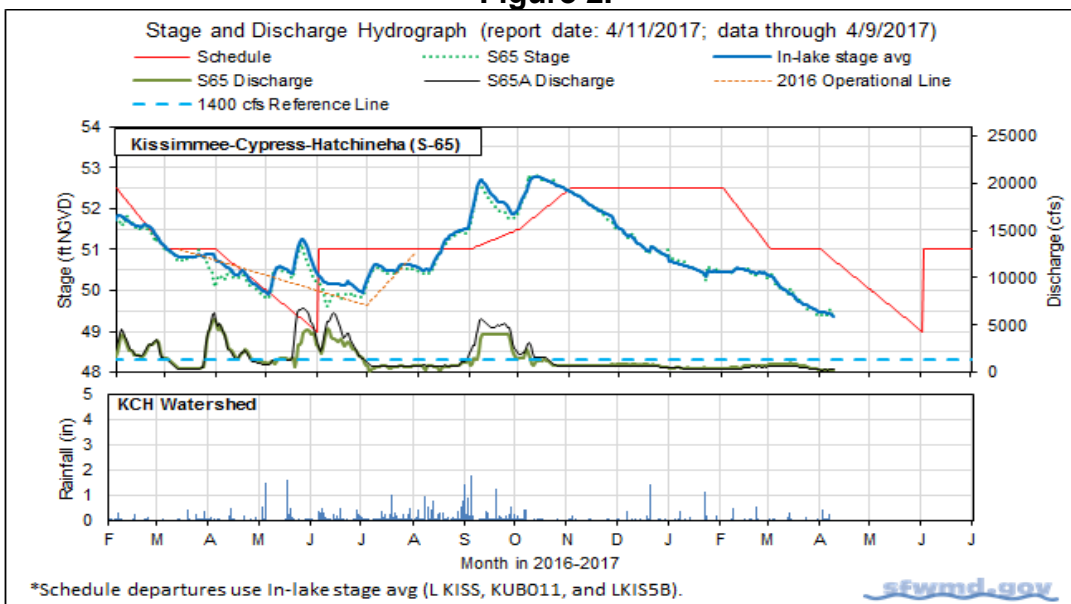


Figure 3.

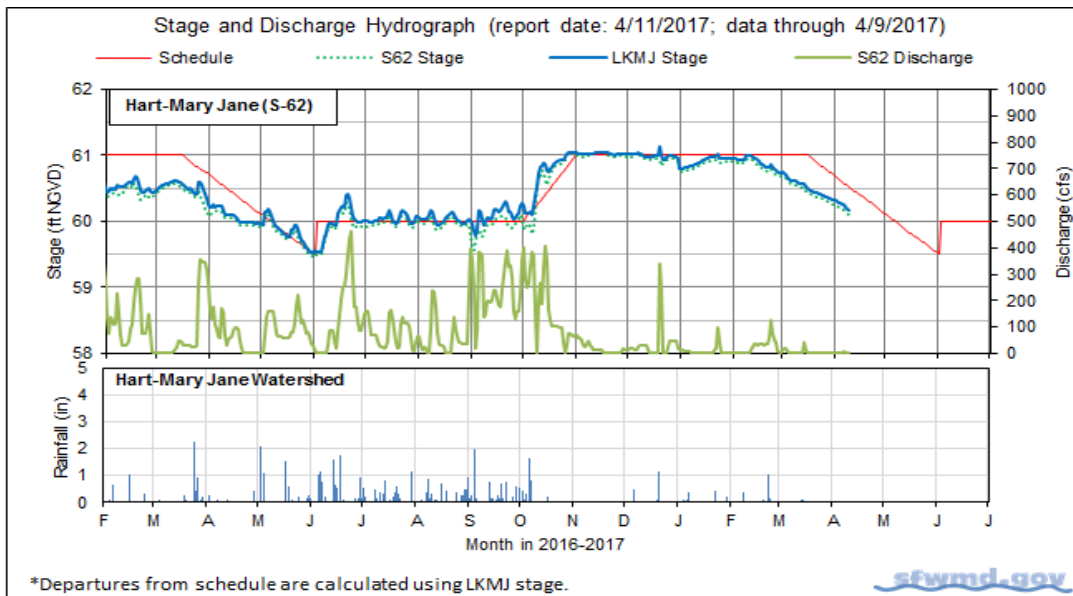


Figure 4.

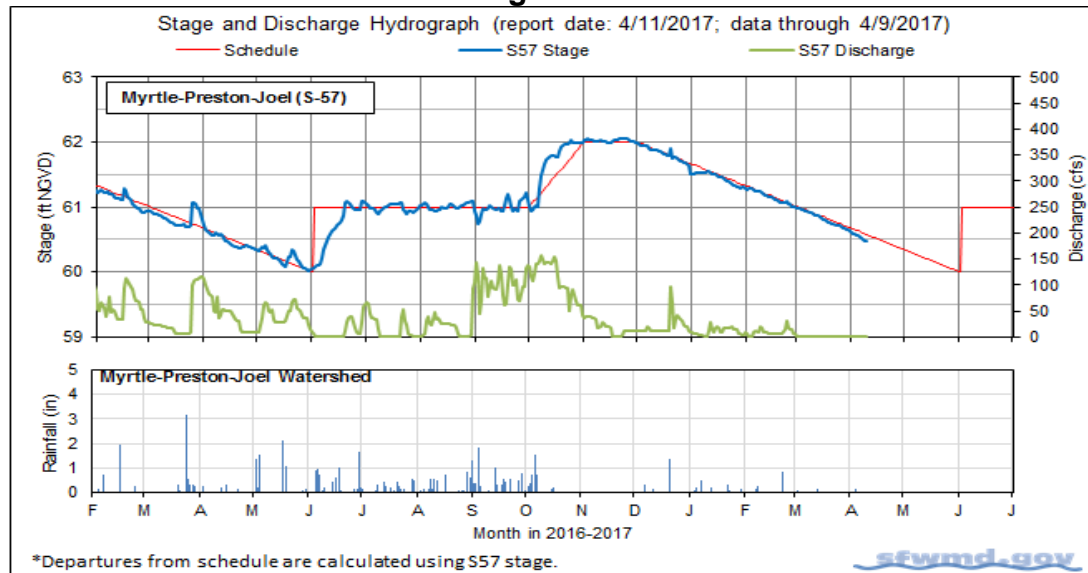


Figure 5.

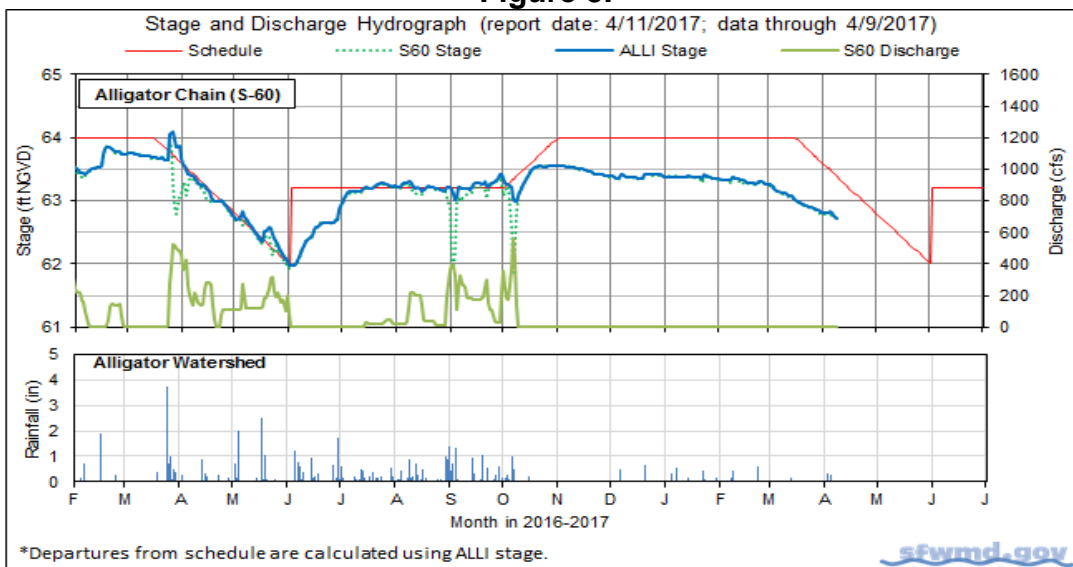


Figure 6.

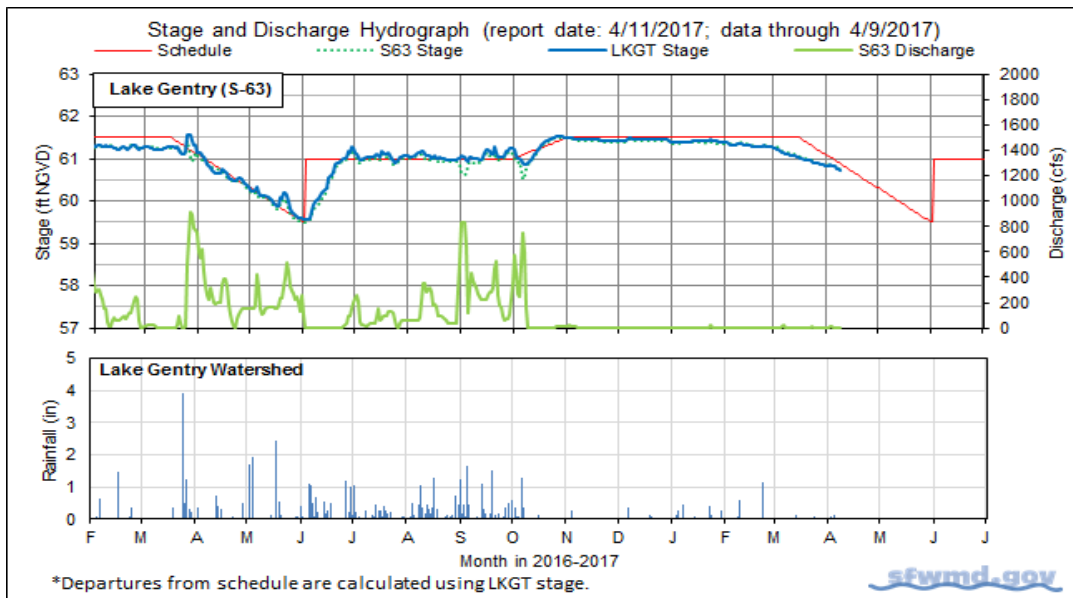


Figure 7.

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.

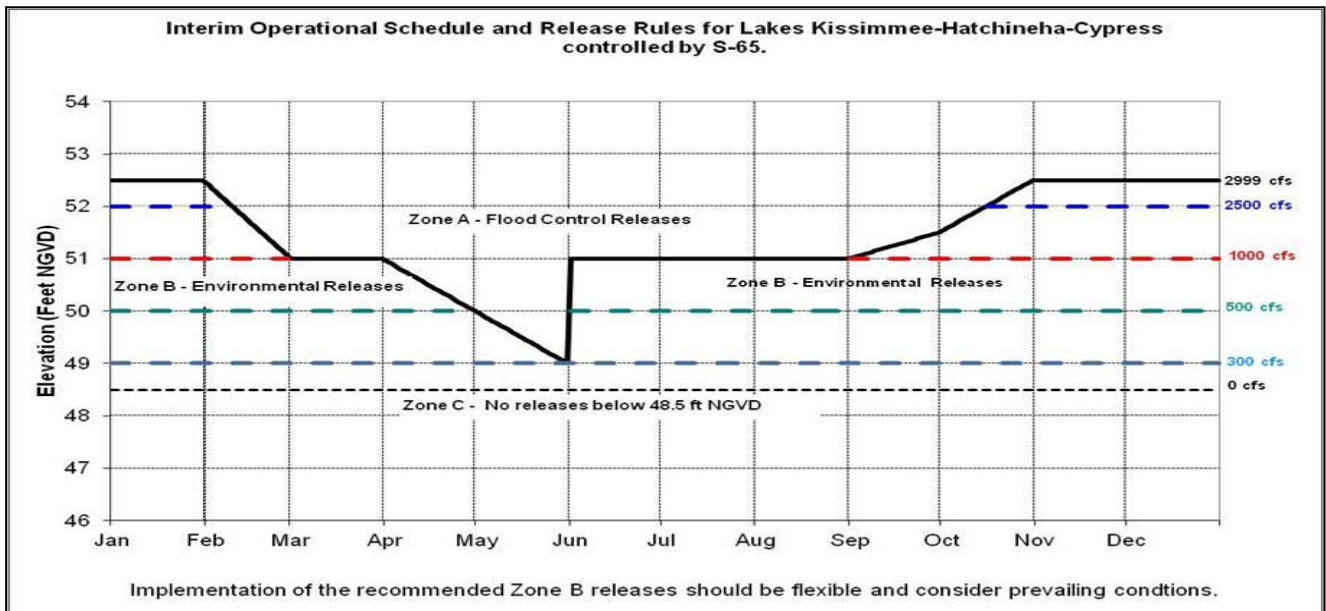


Figure 9. Interim operations schedule for S-65. The discharge schedule shown to the right has not been used in recent years or in Wet Season 2015.

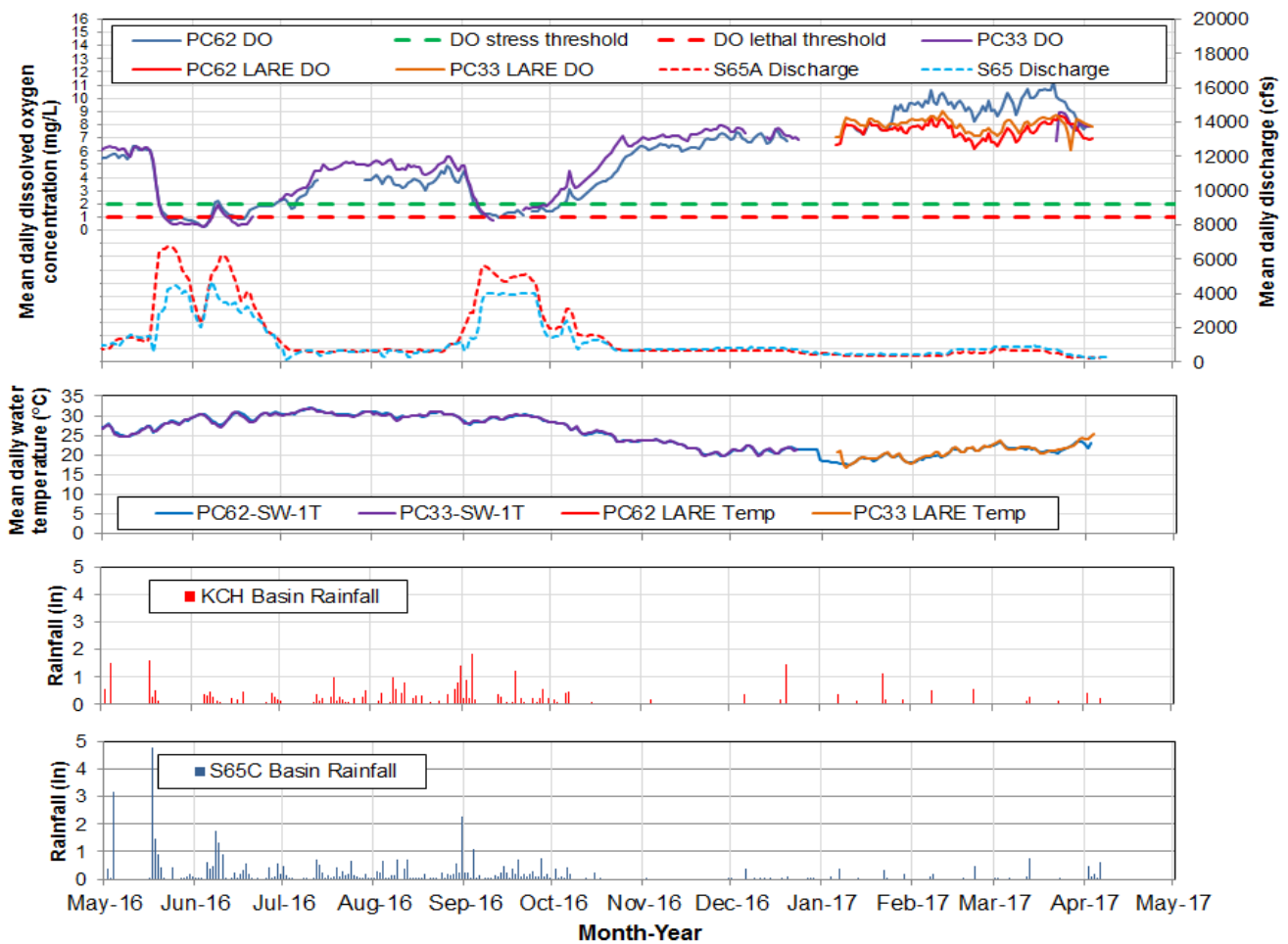


Figure 10. Mean daily Dissolved Oxygen, discharge, temperature and rainfall in the Phase I river channel.

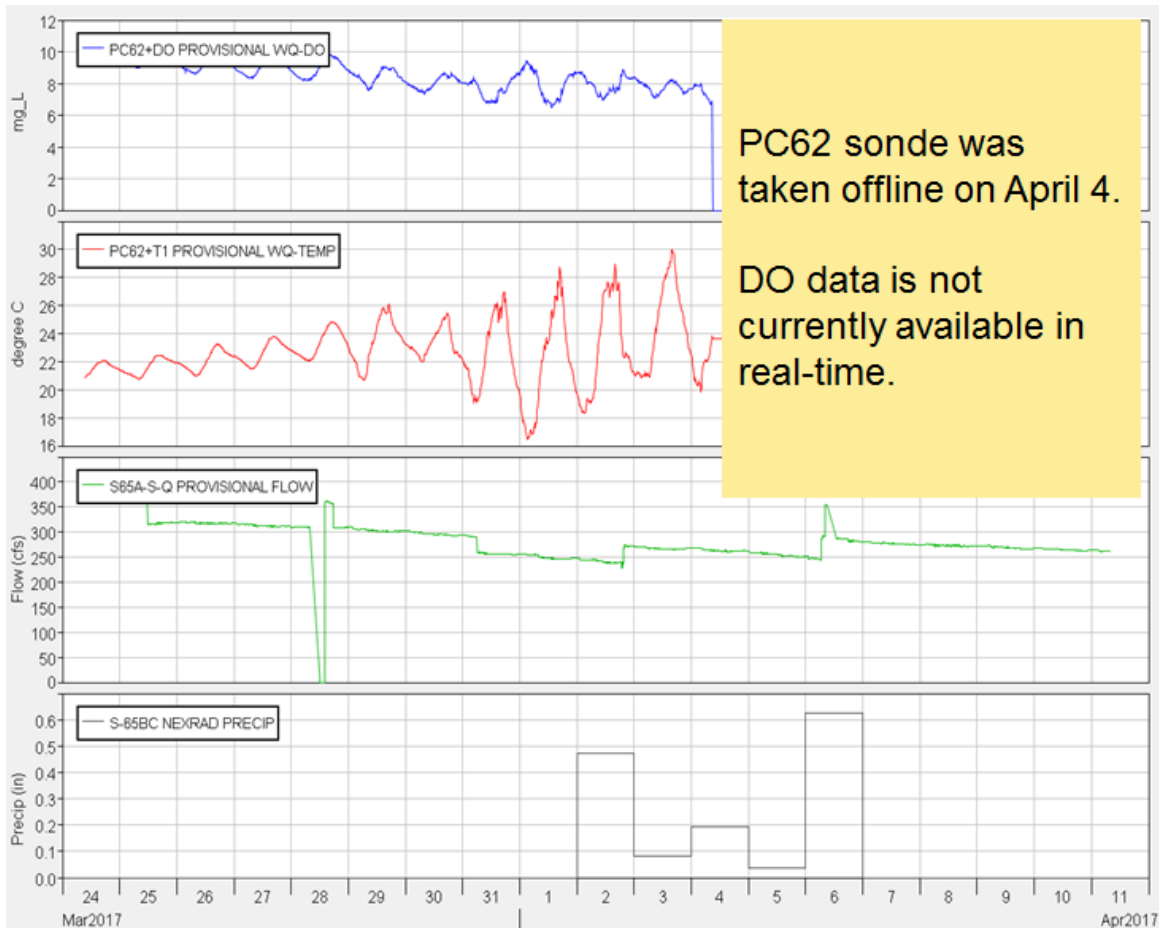


Figure 11. Phase I river channel dissolved oxygen and water temperature (measured at 15 minute intervals) and Pool BC daily rainfall.

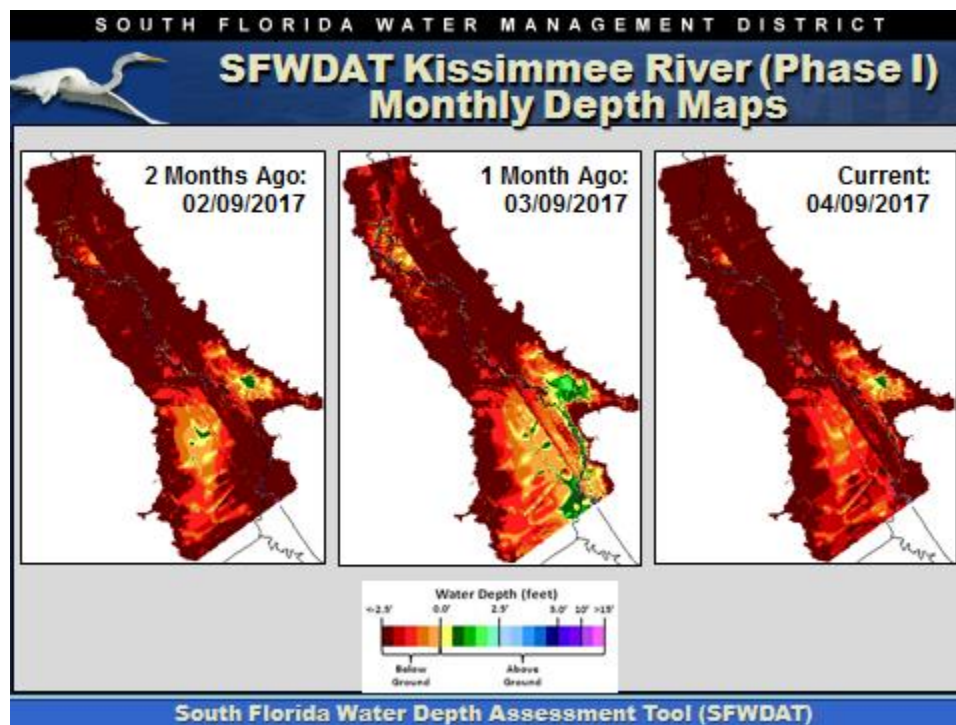
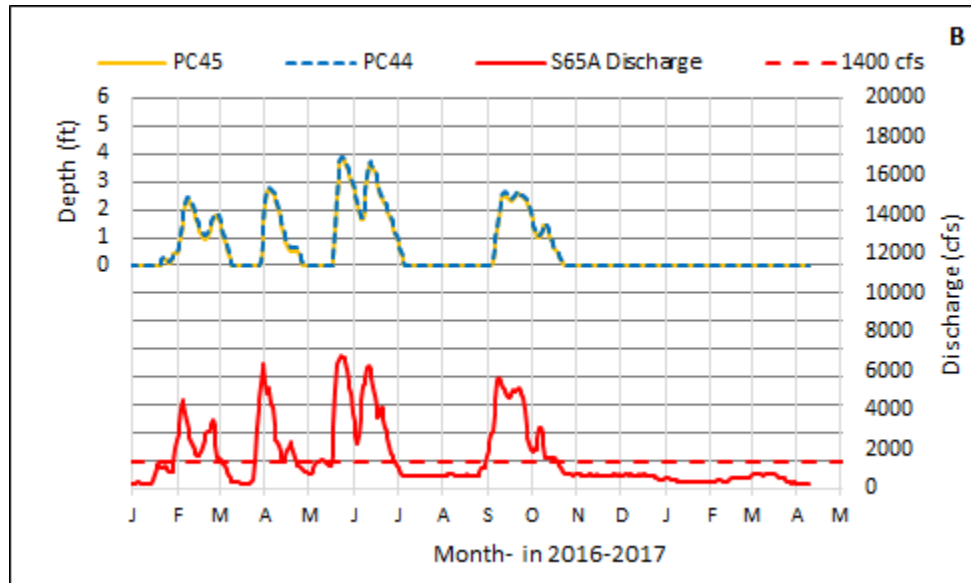
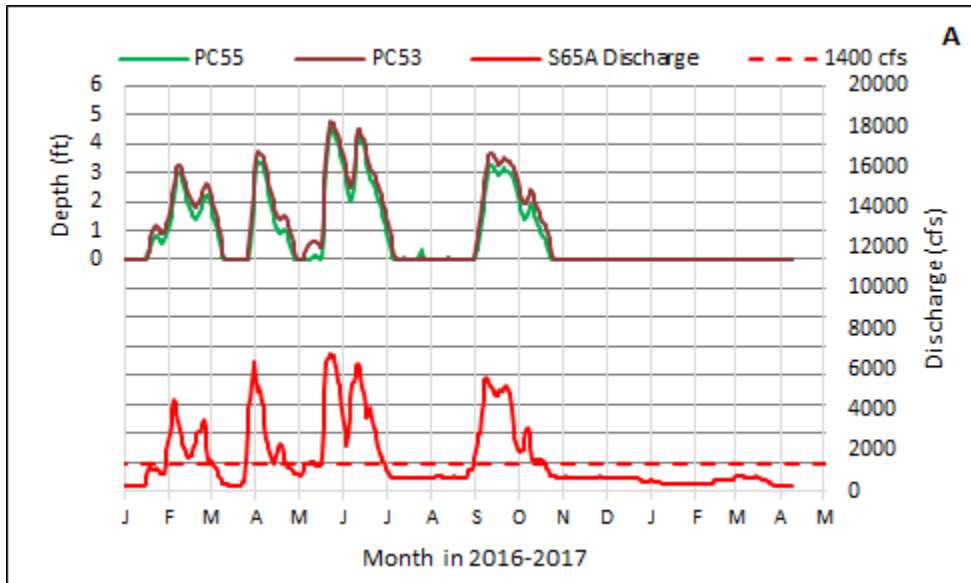


Figure 12. Phase I area floodplain water depths for this week, one month ago, and two months ago. Note that the WDAT color-coding has been modified to accommodate greater water depths; these maps are not directly comparable to Kissimmee Basin WDAT maps published prior to Jan. 16, 2012.



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

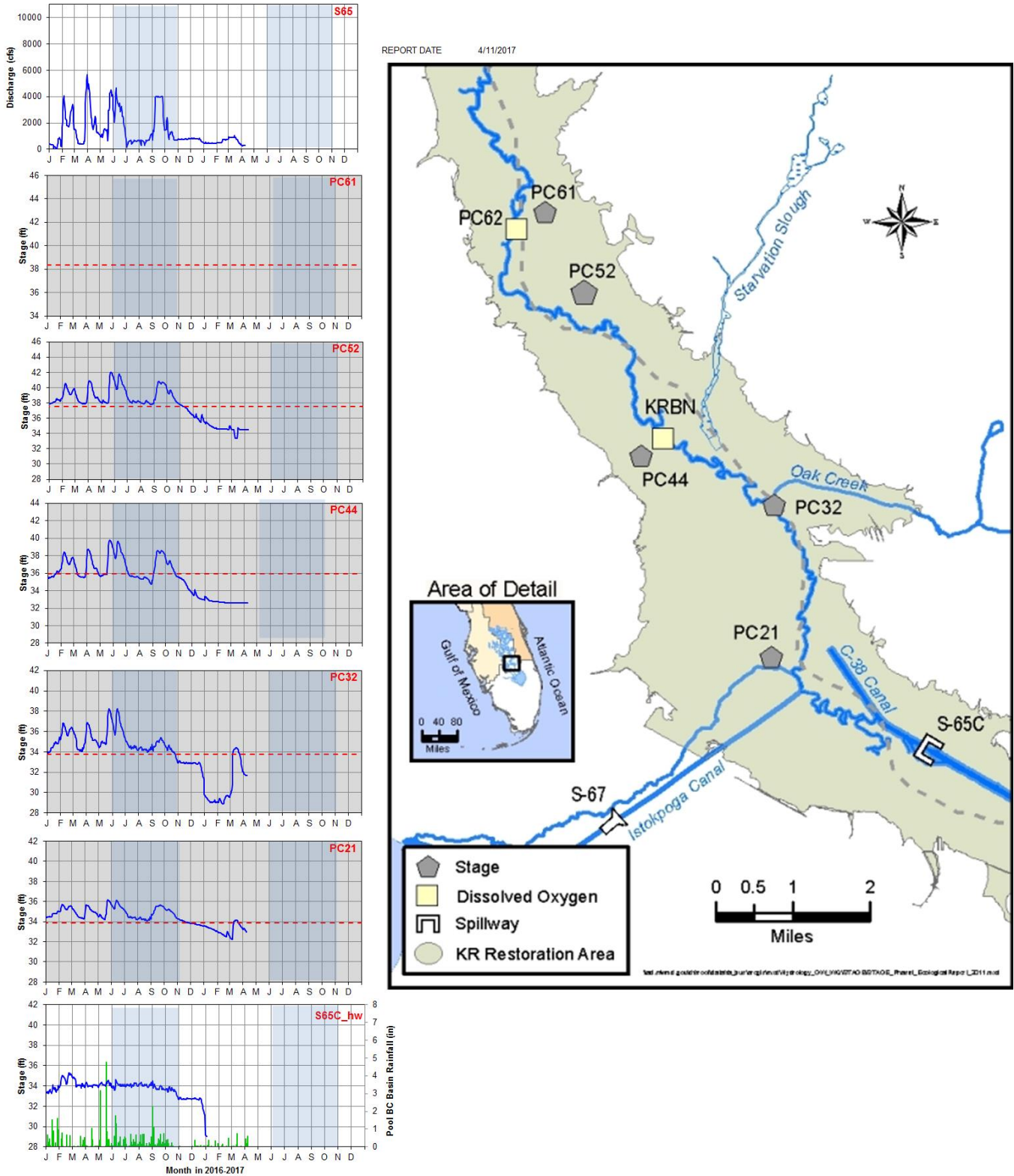


Figure 13. Discharge at S65, stages at five monitoring stations in the Phase I area of the Kissimmee River floodplain, and headwater stage at S65-C since January 1, 2015. The most recent data (~2 weeks) are provisional real-time data from SFWMD DualTrend; previous data are from SFWMD DB-HYDRO (validated).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

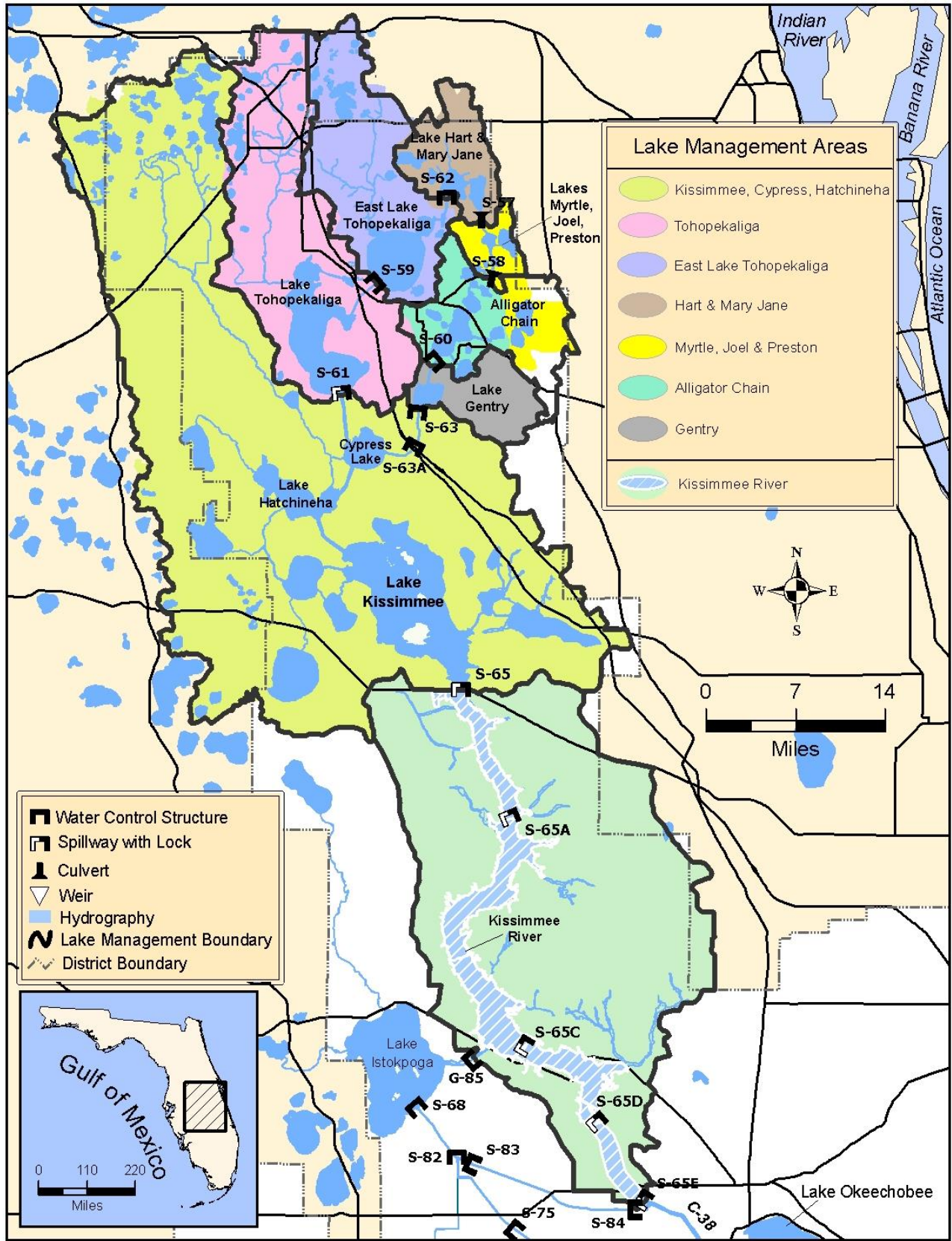


Figure 14. The Kissimmee Basin.

LAKE OKEECHOBEE

LAKE OKEECHOBEE

As of midnight April 9, 2017, Lake stage was 12.25 feet NGVD and in the Beneficial Use sub-band. The current weekly recession rate of 0.21 feet equates to a projected monthly recession rate of 0.84 feet which is well above the recommended 0.50 feet per month or lower guideline. The goal should be to slow the current recession rate and maintain it at below 0.50 feet per month. The March water quality data indicates that total phosphorus and total suspended solids were higher at all sites compared to February and chlorophyll level at a southwest nearshore site was not far from the algal bloom threshold concentration of 40 ppb.

Hydrologic Conditions

According to the USACOE web site, Lake Okeechobee stage is at 12.25 feet NGVD for the period ending at midnight on April 9, 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) although L001 and LZ40 did not have values. Lake stage decreased by 0.21 feet over the past week and is 0.90 feet lower than it was a month ago and 2.69 feet lower than it was a year ago (Figure 1). The Lake is currently in the Beneficial Use sub-band (Figure 2). According to RAINДАР, 0.15 inches of rain fell directly over the Lake during the past seven days (Figure 3). Similar or mostly less amounts of rain fell in most of the surrounding watershed with the exception of a section immediately south of the Lake and most of the northern portion of the watershed, which received greater amounts of rainfall.

Based on USACOE reported values, current Lake inflow is approximately 265 cfs as detailed below.

Structure	Flow cfs
S65E	0
S65EX1	265
S154	0
S84 & 84X	0
S71	0
S72	0
C5(Nicodemus slough dispersed storage)	0
S191	0
S133 PUMPS	0
S127 PUMPS	0
S129 PUMPS	0
S131 PUMPS	0
S135 PUMPS	0
Fisheating Creek	0
S2 Pumps	0
S3 Pumps	0
S4 Pumps	0

Current Lake outflow is approximately 3,753 cfs with 962 cfs exiting at S77, 306 cfs exiting at S308 and 32 cfs entering the Lake from the L8 canal through Culvert 10A. Approximately 2,518 cfs is being directed south through S351, S352 and S354. Corrected evapotranspiration value based on the L006

weather platform solar radiation data for this past week increased from 2,894 cfs last week to 3,453 cfs.

Change in elevation equivalents and average weekly flows (midnight April 3, 2017 to midnight April 9, 2017) for major structures are presented in Figure 4.

Based on the Lake Okeechobee wading bird habitat suitability index, there are currently approximately 24,357 acres of suitable foraging habitat for long-legged birds and 10,193 acres for long and short legged birds on the Lake (Figure 5). Currently, conditions are acceptable but tenuous for wading birds as well as for snail kites. A much slower recession rate is needed to keep wading bird and snail kite foraging areas hydrated and to help maintain water levels under wading bird and snail kite nests thereby reducing the risk of predation by raccoons and other animals.

March chlorophyll data (collected on March 21st and 22nd, 2017) indicated the absence of bloom activity at the seventeen sites that were sampled (Figure 6). Additionally, none of the six routine microcystin sampling sites had values above the analytical detection limit (0.20 µg/L). The two sites in Fisheating Bay (FEBIN and FEBOUT) were not sampled.

March Total Phosphorus (TP) and Total Suspended Solids (TSS) concentrations increased in all regions compared to February values suggesting that windier conditions prevailed in March (Figure 7). Average wind speed at LZ40, the weather platform in the central region of the Lake, was 9.1 mph in February compared to 11.6 mph in March. Additionally, the maximum wind speed for the two months was 16.6 mph and 24.4 mph, respectively.

Satellite imagery from a higher resolution sensor (OLCI) aboard the Sentinel 3a satellite is now available. This sensor has increased spatial resolution (300 m compared to 1 km for MODIS) and more optimal spectral bands for increased detection of the phycocyanin pigments found in cyanobacteria. The most recent imagery from this new OLCI sensor (March 30th and April 3rd, 2017) indicated potential algal bloom conditions may exist in small localized portions of the nearshore region, however, cloud cover in the April 3rd image prevents interpretation (Figure 8). According to visual reports on April 4th from District staff, the western area of Fisheating Bay did not have any areas that appeared to have bloom conditions.

Water Management Recommendations

Lake stage is 12.25 feet NGVD and is in the Beneficial Use sub-band. The current weekly recession rate of 0.21 feet equates to a projected monthly recession rate of 0.84 feet which is well above the recommended 0.50 feet or less per month guideline. A too rapid decrease in lake levels may jeopardize the wading bird and snail kite nesting seasons by drying out wading bird and snail kite foraging locations and lowering water levels under nests allowing for increased risk of predation.

The goal should be to slow the monthly recession rate to less than 0.50 feet per month. Actions which contribute to a slower recession are essential to protect critical components of the Lake's floral (bulrush and SAV) and faunal (wading birds, snail kites and fish) communities.

Lake Okeechobee Water Depth Timeseries Maps

1 Year Ago: 04/09/2016

1 Month Ago: 03/010/2017

Current: 04/09/2017

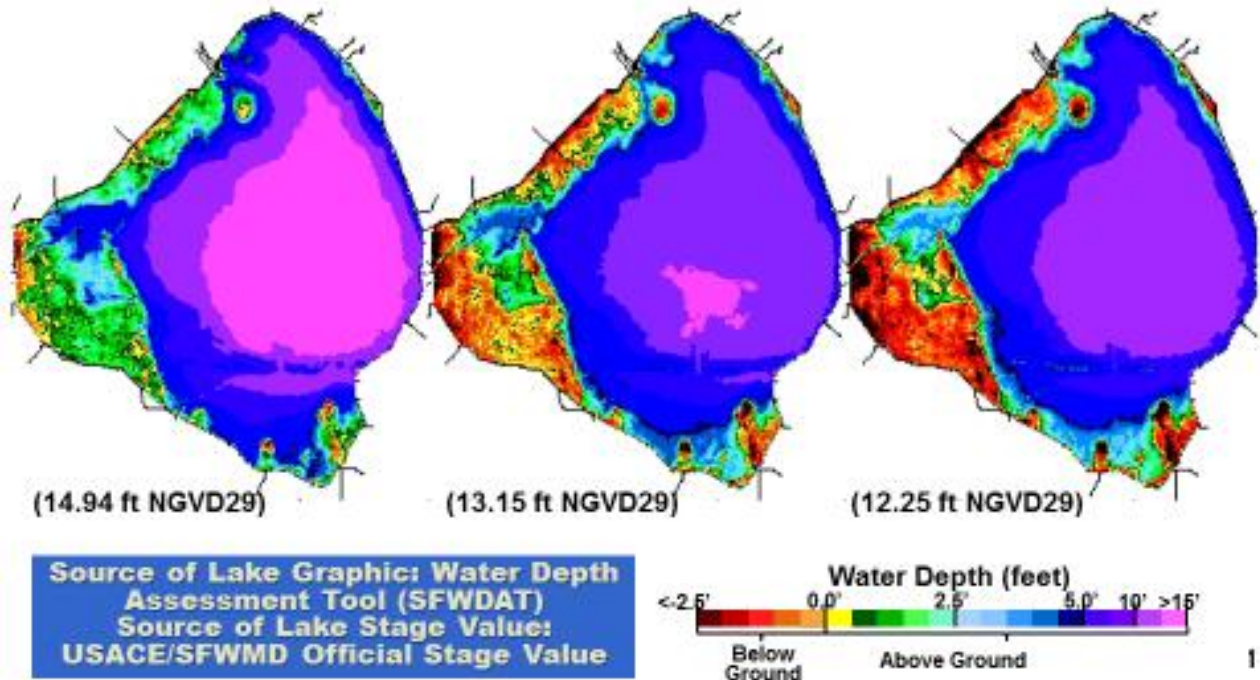
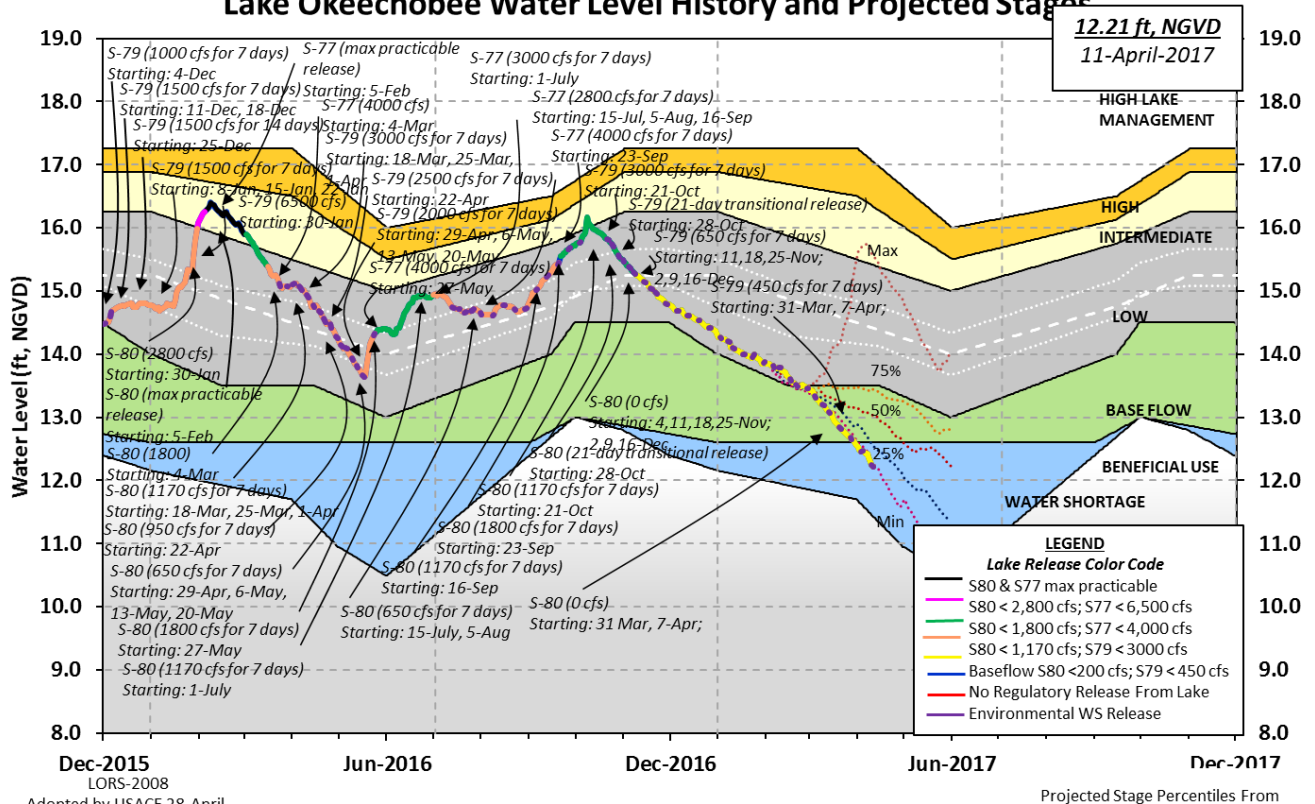


Figure 1

Lake Okeechobee Water Level History and Projected Stages



Adopted by USACE 28-April

Projected Stage Percentiles From

Figure 2

SFWMD PROVISIONAL RAINDAR 7-DAY BASIN RAINFALL ESTIMATES

FROM: 0515 EST, 04/03/2017 THROUGH: 0515 EST, 04/10/2017

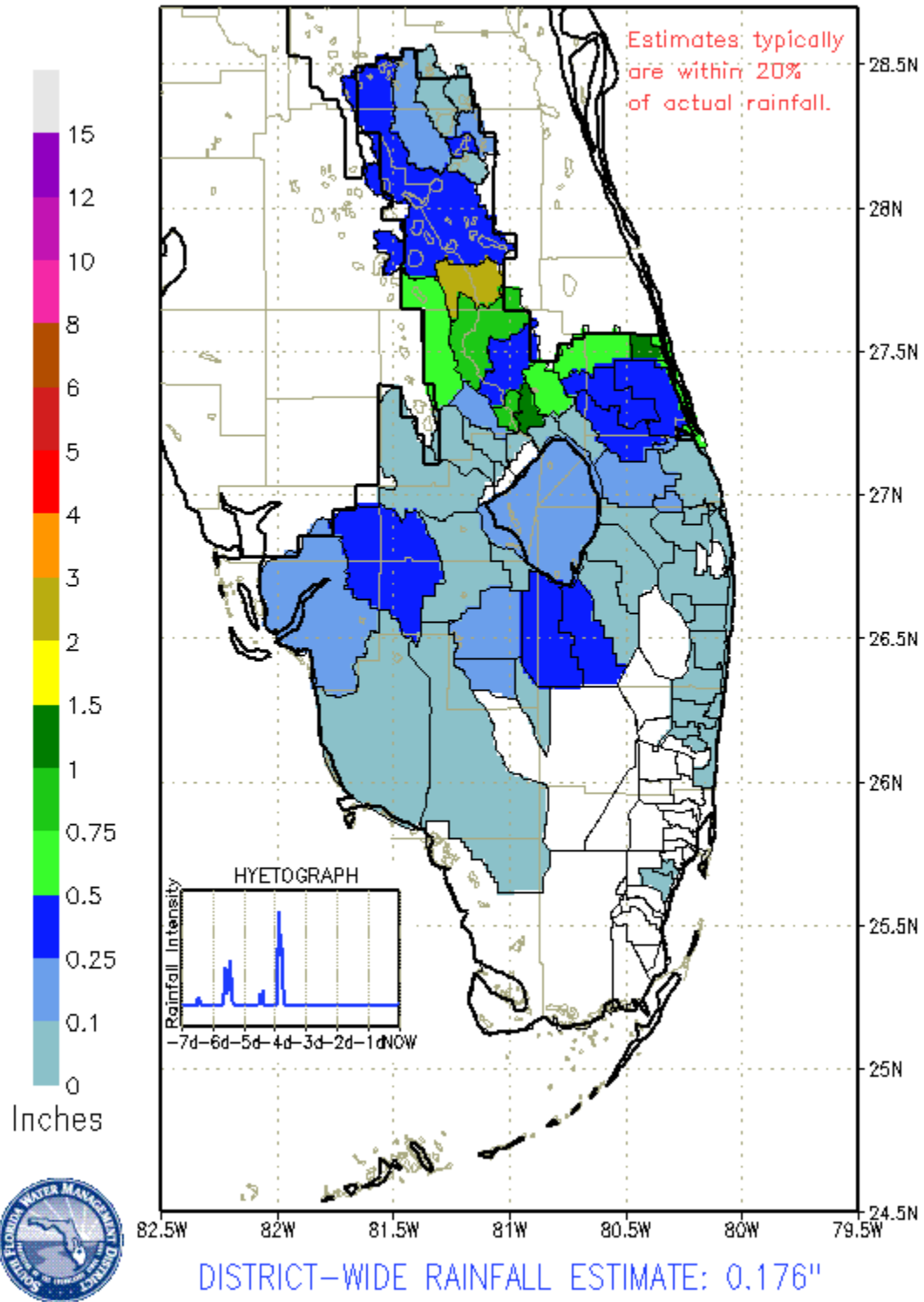


Figure 3

INFLOWS	Average Daily Flow Past Week cfs	Feet of Change Past Week
S65E & S65EX1	306	0.012
S71 & 72	0	0.000
S84 & 84X	0	0.000
Fisheating Creek	2	0.000
Rainfall	N.A.	0.013
OUTFLOWS	Average Daily Flow Past Week cfs	Feet of Change Past Week
S77	566	0.022
S308	60	0.002
S351	1156	0.044
S352	769	0.029
S354	361	0.014
L8	94	0.004
ET	3453	0.131

Figure 4

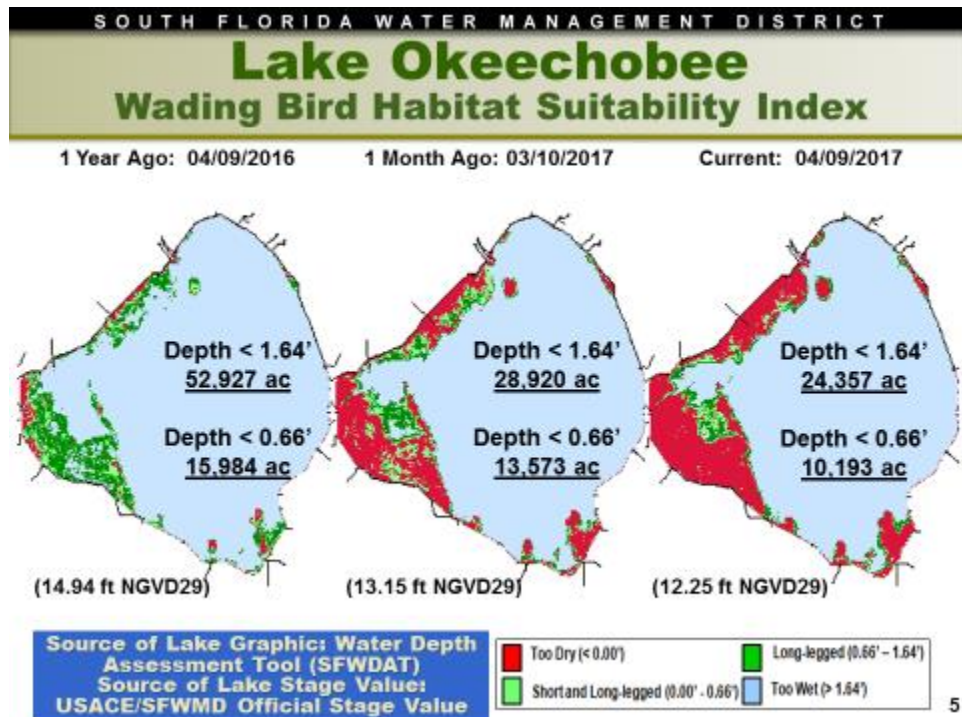


Figure 5

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Lake Okeechobee Water Quality

March 21- March 22, 2017

Site	Chlorophyll <i>a</i> (ug/L)	Microcystin (ug/L)
Nearshore Stations		
FEBIN	Not Sampled	
FEBOUT	Not Sampled	
KISSRO,0	14.1	0.20
LZ2	23.6	0.20
LZ25A	11.6	
PALMOUT	16.0	
PELBAY3	5.9	
POLE3S	34.1	
POLESOUT	24.0	0.20
RITTAE2	22.3	
Pelagic Stations		
L001	11.2	
L004	8.9	
L005	15.6	0.20
L006	10.6	
L007	7.2	
L008	7.7	
LZ30	22.1	0.20
LZ40	5.7	
CLV10A	9.8	0.20



Figure 6

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Lake Okeechobee Water Quality



Parameter	Jan 2017	Feb 2017	Mar 2017	
TP (ppb)	Nearshore	153	94	109
	Pelagic	277	129	151
	Lakewide	218	112	131
TSS (ppm)	Nearshore	41	14	16
	Pelagic	111	23	29
	Lakewide	78	19	23

NOTE: The two Fisheating Bay sites (FEBIN and FEBOUT) were not sampled.

Figure 7

Lake Okeechobee

Algal Blooms

Unvalidated and Experimental Data

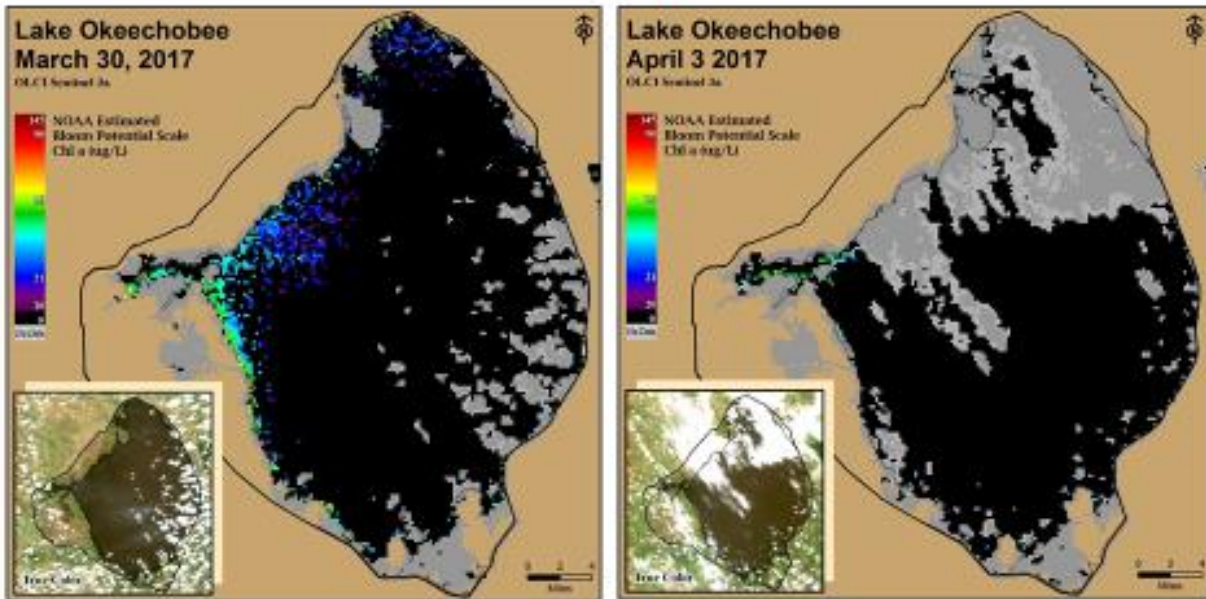


Figure 8

Lake Istokpoga:

The annual recession from high pool to low pool stage on Lake Istokpoga is underway. Stage is 38.46 feet NGVD as of April 9, 2017 and is currently 0.88 feet below its regulation schedule of 39.34 feet NGVD (Figure 9). Average flows into the Lake from Arbuckle and Josephine creeks were 35 cfs and 10 cfs respectively, which is a slight decrease compared to last week's total flow. Average discharge from S68 and S68X this past week was 52 cfs, a decrease from the previous week's flow. According to RAINДАР 0.51 inches of rain fell in the Lake Istokpoga watershed during the past seven days.

The FWC reported four new Snail Kite nests on Lake Istokpoga during their most recent survey (Survey 2, 2017) bringing the total number of nests to nine thus far this season (Figure 10). One new nest was found on both Long Island and Big Island and the other two were found on Bumblebee Island. Of the nine nests, seven are still active. None of the nests so far have been declared successful and two have failed.

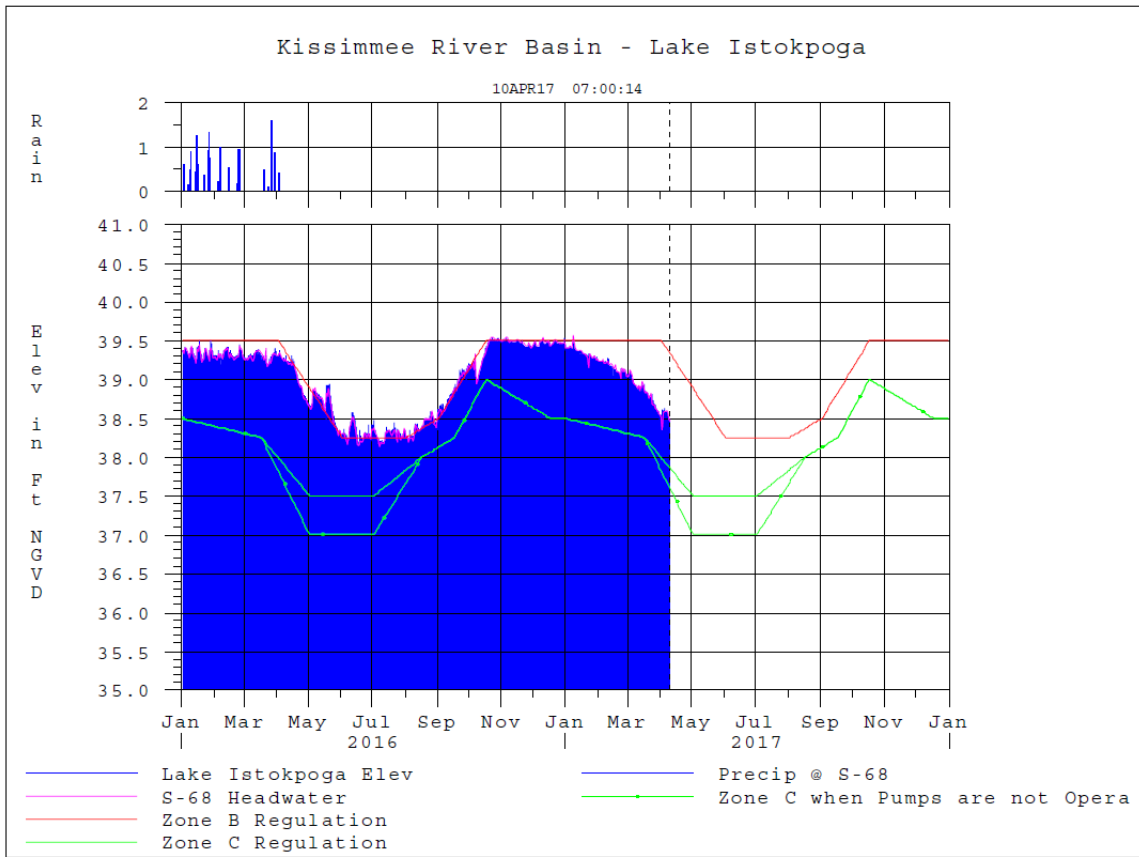


Figure 9



Figure 10

ESTUARIES

St. Lucie Estuary

Over the past week, provisional flows averaged about 0 cfs at S-80, 58 cfs downstream of S-308, 0 cfs at S-49 on C-24, 0 cfs at S-97 on C-23, and 53 cfs from Ten Mile Creek at the Gordy Road Structure. Average inflow from tidal basin tributaries is estimated to be 60 cfs (Figures 1 and 2). Total inflow averaged about 113 cfs last week and 129 cfs over last month.

Over the past week, salinity increased throughout the estuary (Table 1, Figures 3 and 4). The seven-day moving average salinity of the water column at the US1 Bridge is about 28.2. 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)	25.7 (25.4)	27.1 (26.8)	NA ¹
US1 Bridge	28.1 (27.6)	28.2 (27.8)	10.0-26.0
A1A Bridge	33.3 (32.5)	33.8 (33.3)	NA

¹Envelope not applicable

Caloosahatchee Estuary

During the past week, provisional flows averaged approximately 426 cfs downstream of S-77, 543 cfs at S-78, and 726 cfs at S-79. Average inflow from tidal basin tributaries is estimated to be 98 cfs (Figures 5 and 6). Total inflow averaged 824 cfs last week and 763 cfs over last month.

Over the past week in the estuary, salinity decreased to Ft. Myers and remained about the same downstream (Table 2, Figures 7 and 8). The seven-day average salinity values are within the good range for adult oysters at Cape Coral and in the fair range at Shell Point and at Sanibel (Figure 9). The 30-day moving average surface salinity is 3.5 at Val I-75 and 10.8 at Ft. Myers. The 30-day moving average salinity at Ft. Myers has been above 10 for 14 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 be 4.6 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)	1.8 (3.7)	1.9 (3.7)	NA ¹
*Val I75	3.0 (4.8)	4.9 (7.6)	0.0-5.0 ²
Ft. Myers Yacht Basin	10.4 (12.7)	11.3 (14.0)	NA
Cape Coral	21.1 (20.8)	21.3 (21.7)	10.0-30.0
Shell Point	30.5 (30.9)	31.6 (32.0)	10.0-30.0
Sanibel	34.0 (34.2)	34.6 (34.3)	10.0-30.0

¹Envelope not applicable, 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)	4.33 – 10.04	4.66 – 19.67	1.52 – 121.89
Dissolved Oxygen (mg/l)	4.32 – 7.05	5.28 – 8.12	No Data

The Florida Fish and Wildlife Research Institute reported on April 7, 2017, that *Karenia brevis*, the Florida red tide organism, persists in Southwest Florida from Pinellas to Lee counties. *Karenia brevis* was observed in background to low concentrations in twenty-one samples collected from Lee County. Over the past week, respiratory irritation has been reported at Bowman’s Beach in Lee County. Fish kills were reported at Bonita Beach in Lee County.

Water Management Recommendations

The 30-day average salinity at the I-75 Bridge is forecast to remain below 5 with no inflow at S-79, but the daily salinity is forecast to reach 6.8 within two weeks. Lake stage is in the Beneficial Use sub-band of 2008 LORS. The 2008 LORS/Adaptive Protocols recommend no flow from Lake Okeechobee to the Caloosahatchee Estuary. Given the high likelihood that salinity will exceed 5.0 without a release, it is recommended that a new pulse release through S-79 averaging 300 cfs be initiated.

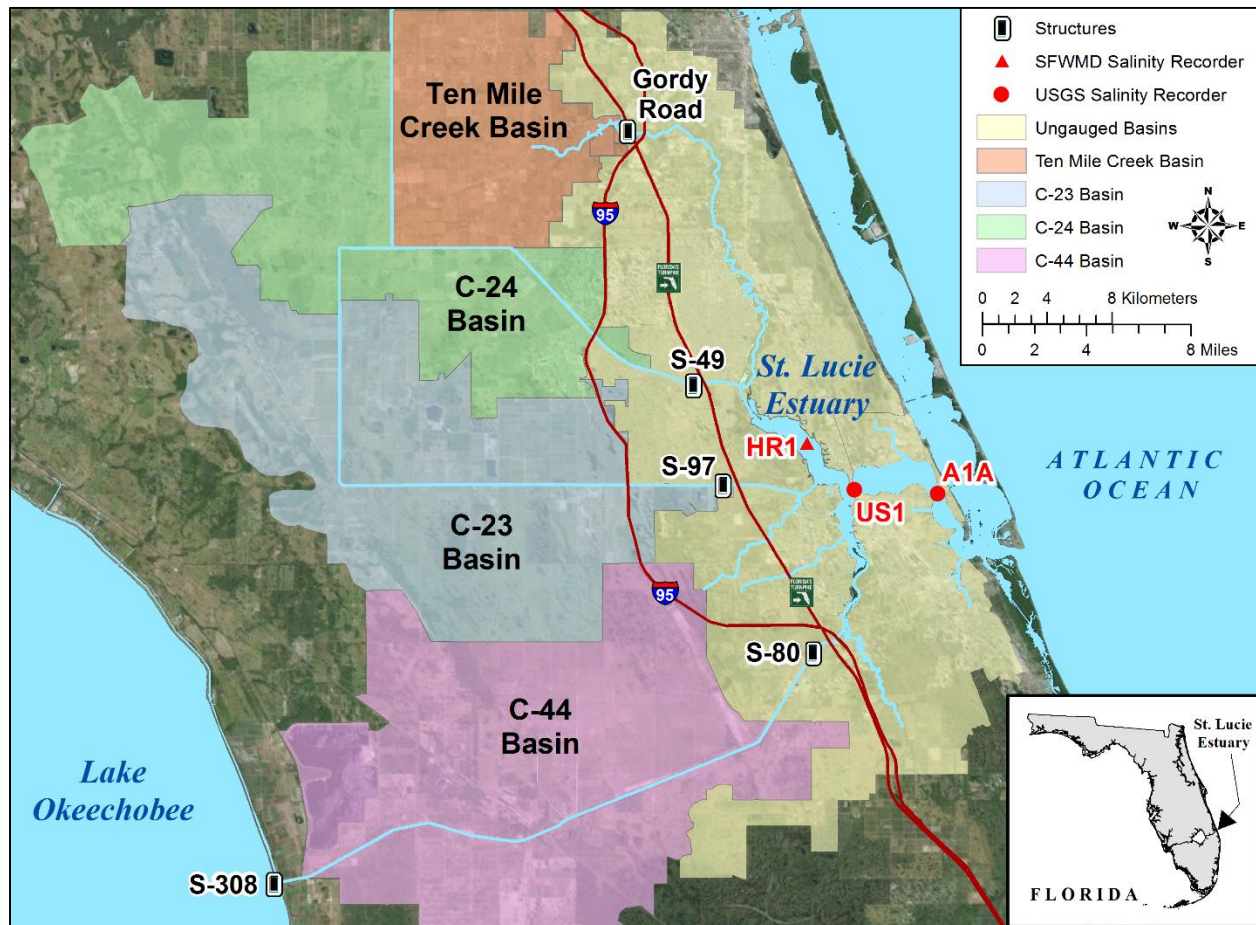


Figure 1. Basins, water control structures, and salinity monitoring for the St. Lucie Estuary.

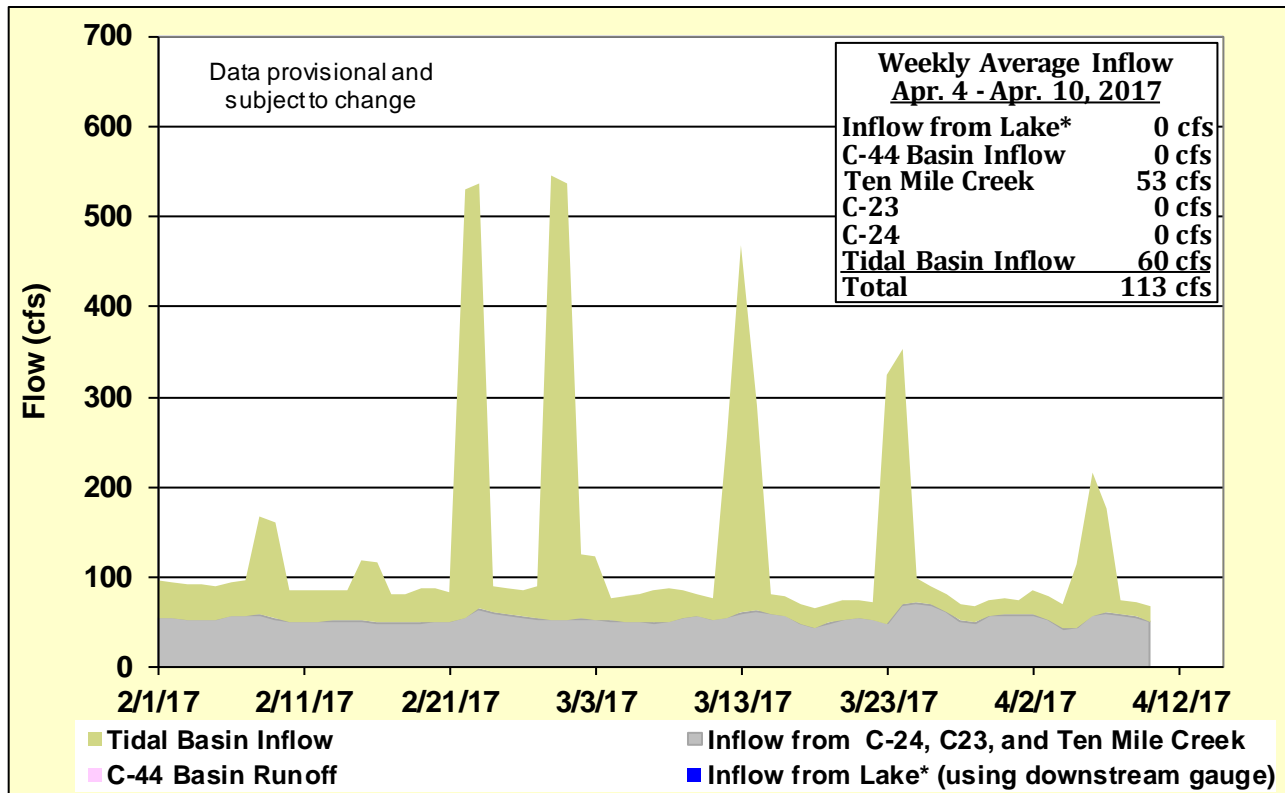


Figure 2. Estimated surface freshwater inflows from Lake Okeechobee and runoff from the C-44, C-23, C-24, Ten Mile Creek, and tidal basins into the St. Lucie Estuary.

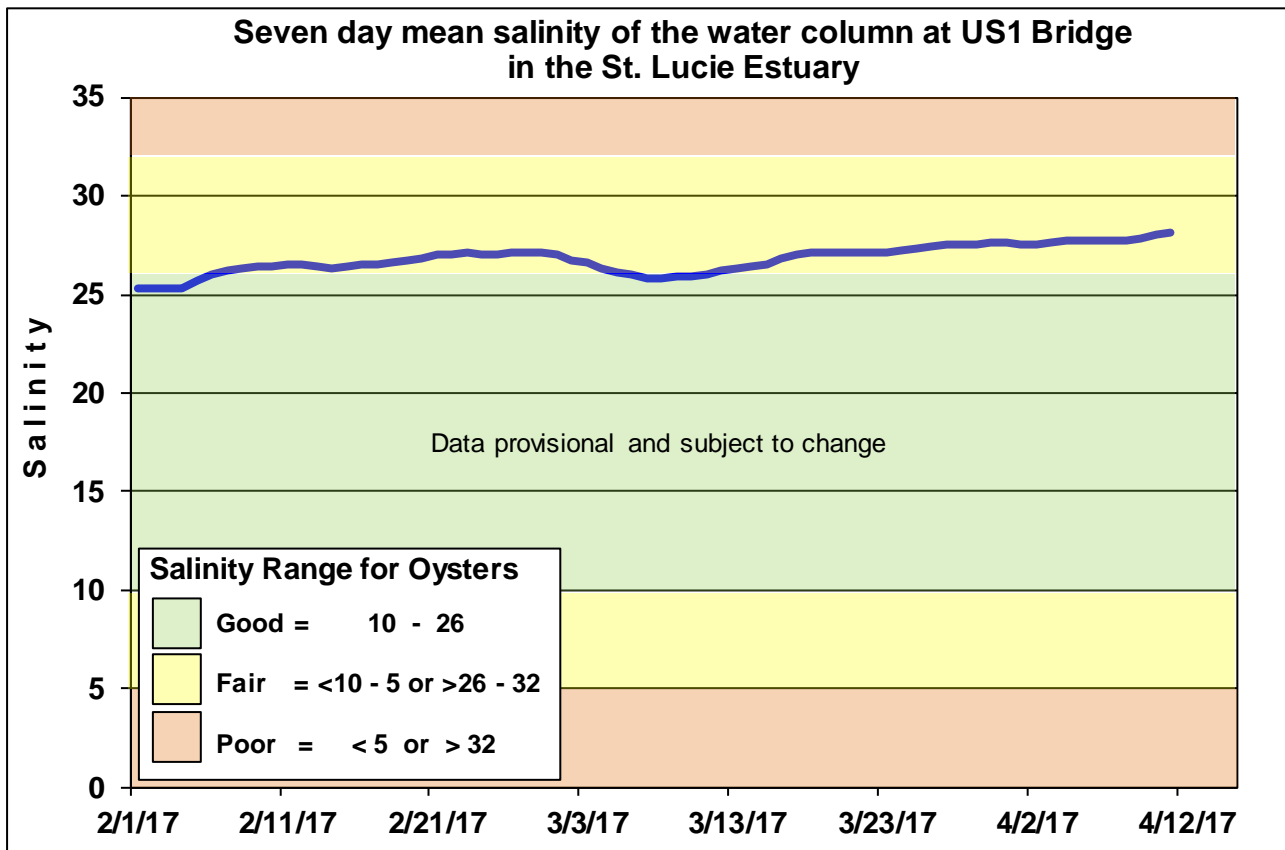


Figure 3. Seven-day mean salinity of the water column at the U.S. Highway 1 Bridge.

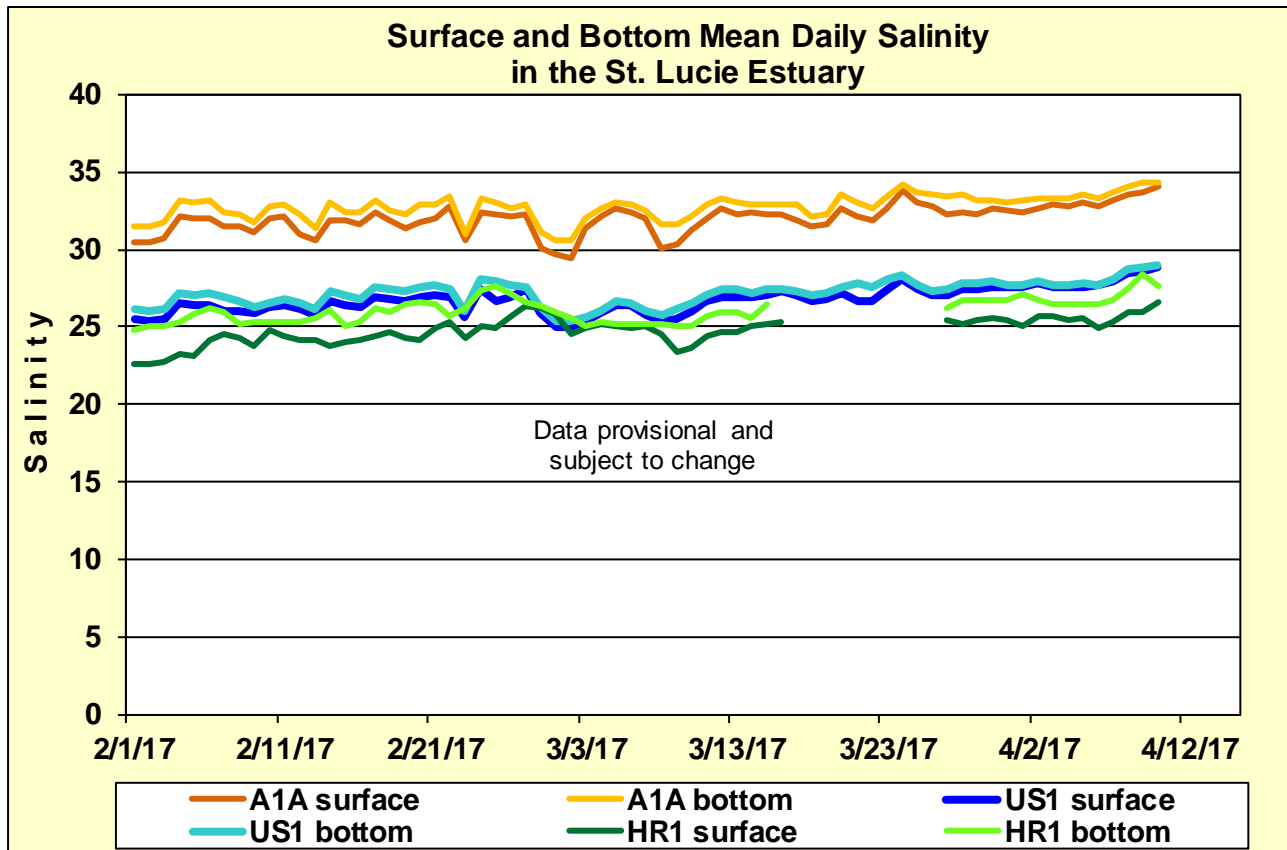


Figure 4. Daily mean salinity at the A1A, US1 and estimated HR1 stations.

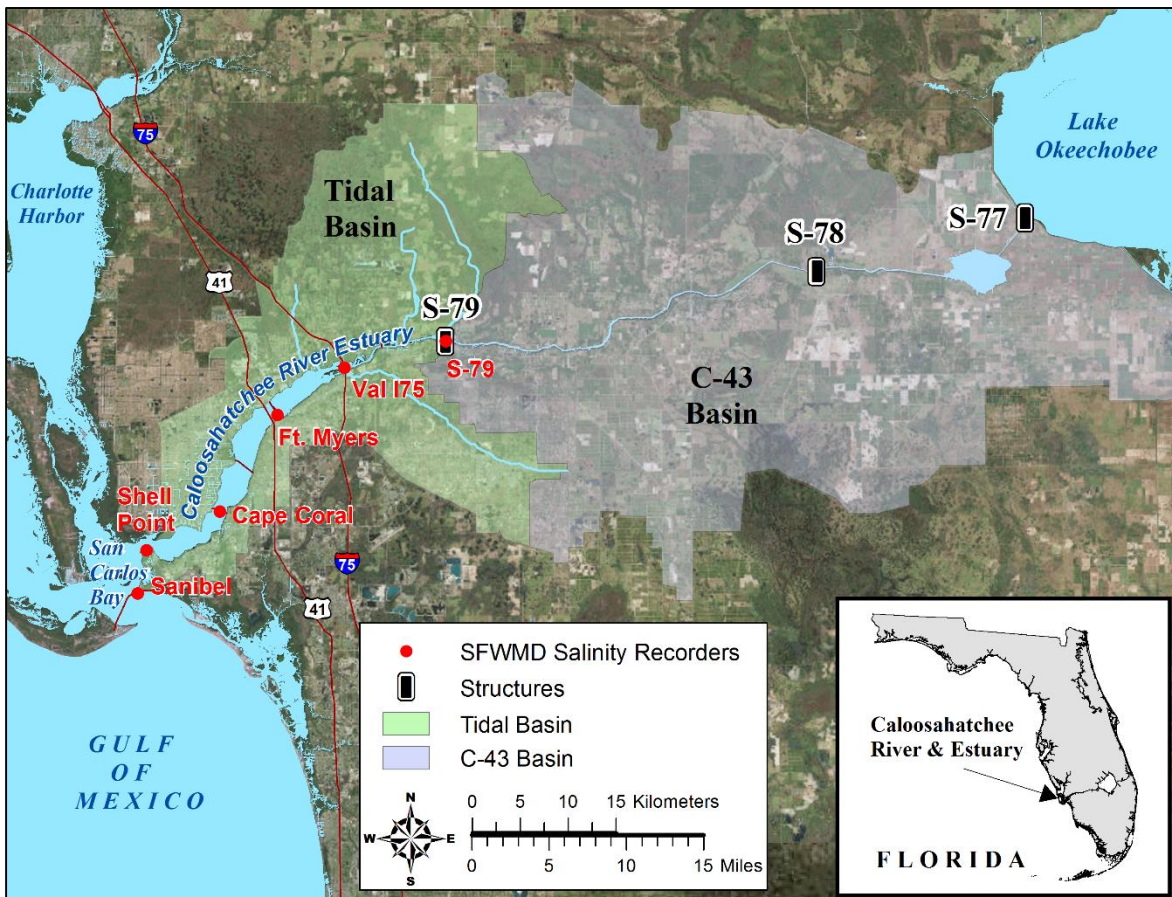


Figure 5. Basins, water control structures, and salinity monitoring for the Caloosahatchee Estuary.

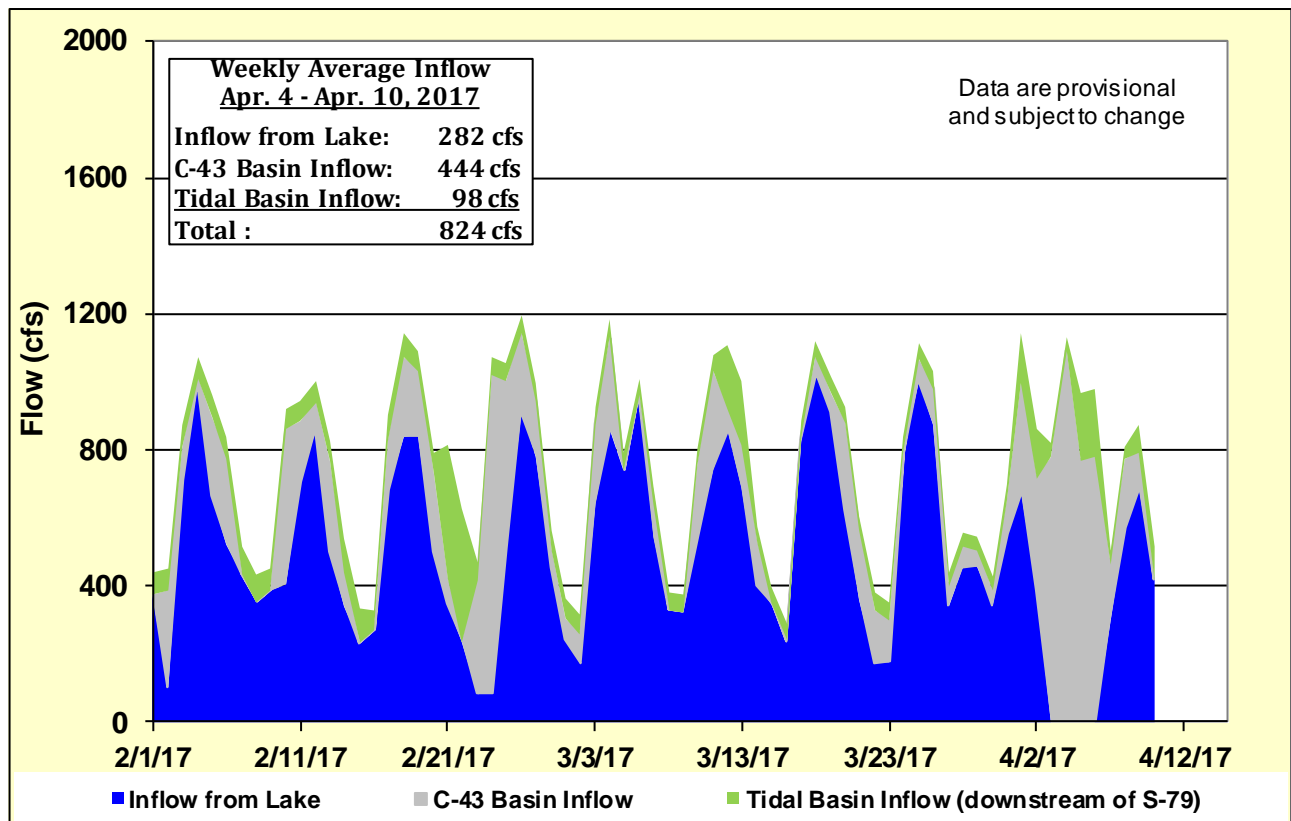
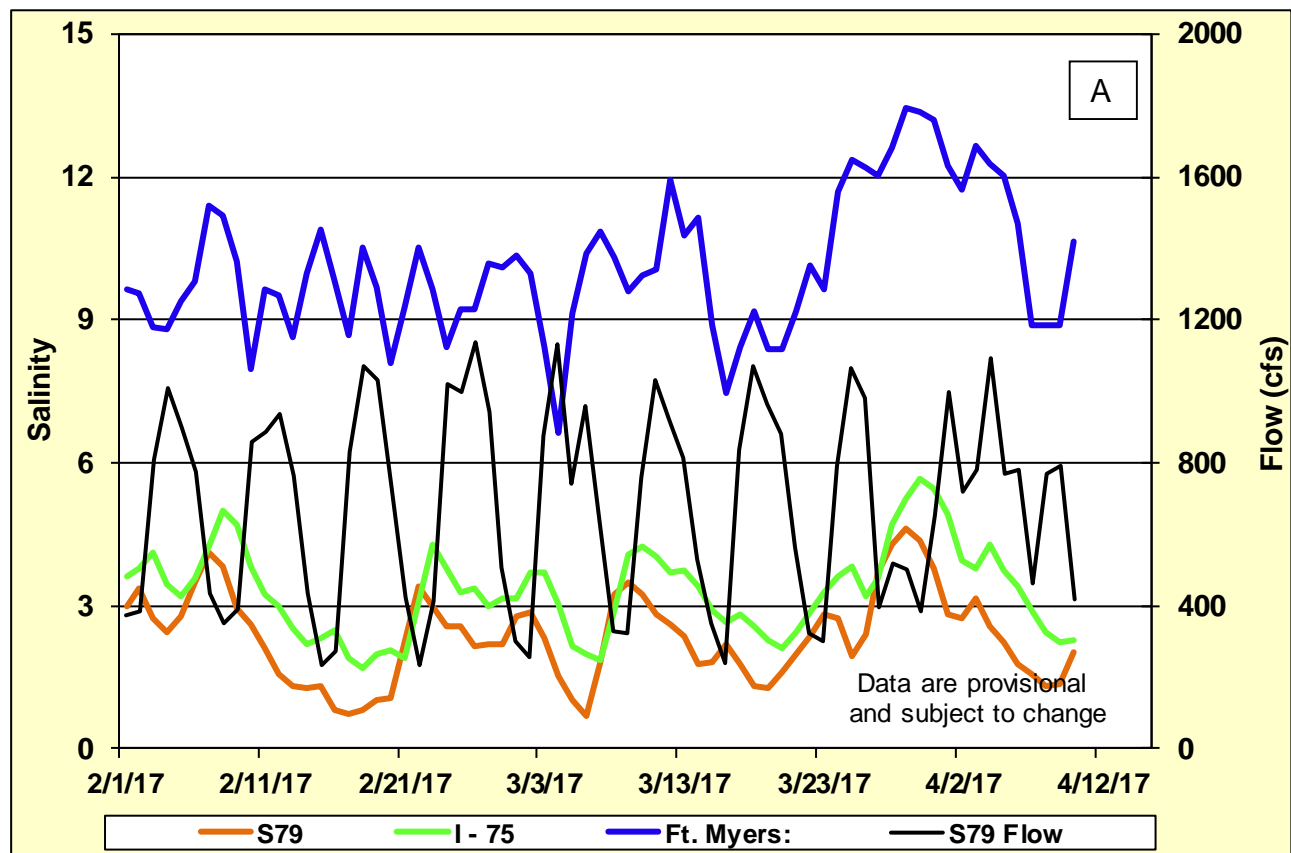


Figure 6. Freshwater inflows from Lake Okeechobee, runoff from the C-43 basin, and tributaries in the tidal basin into the Caloosahatchee River Estuary.



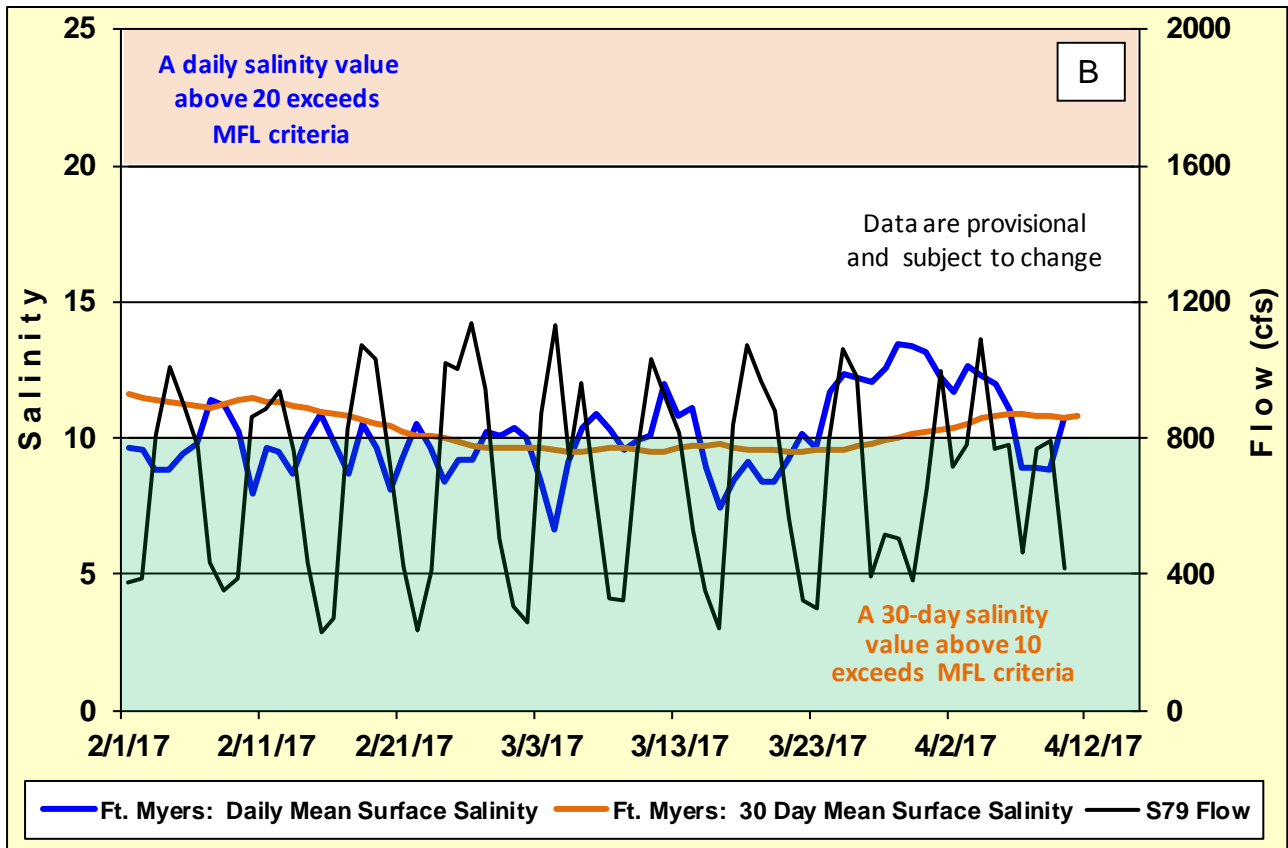


Figure 7. Daily mean flows at S-79 and salinity at upper estuary monitoring stations (A) and 30-day moving average salinity at Ft. Myers (B).

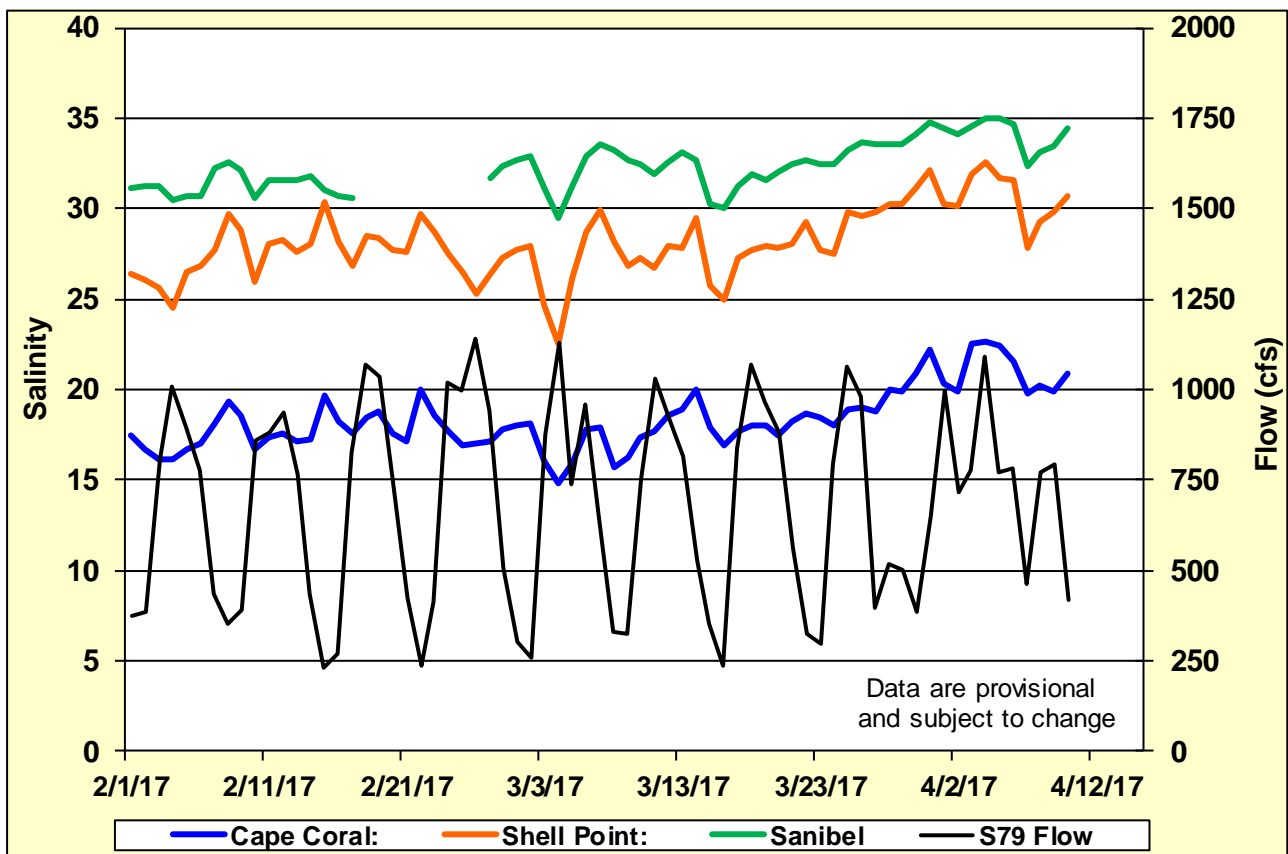


Figure 8. Daily mean flows at S-79 and salinity at lower estuary stations.

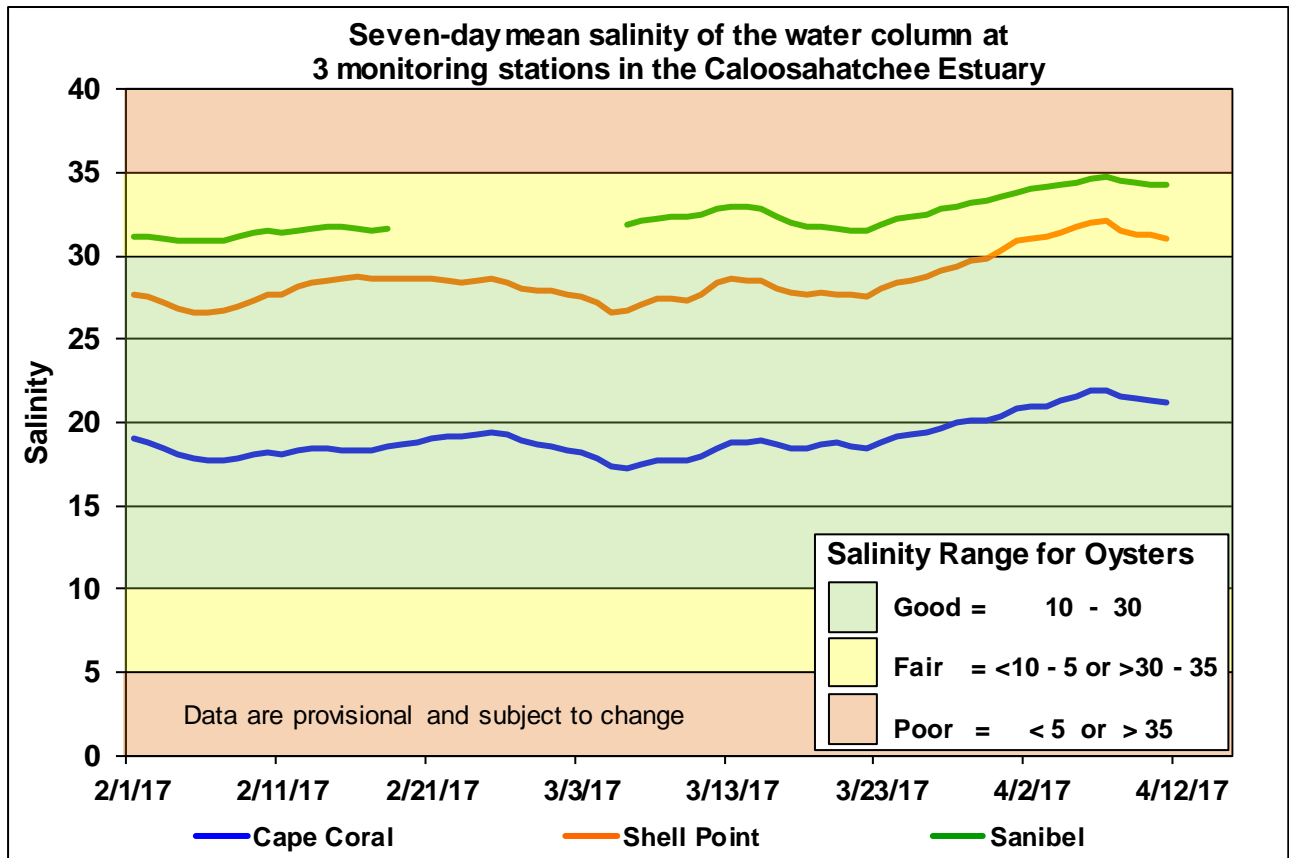


Figure 9. Seven-day mean salinity at Cape Coral Bridge, Shell Point and Sanibel Bridge monitoring stations.

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

Forecast 1: S-79 =0 cfs & TBR = 90 cfs

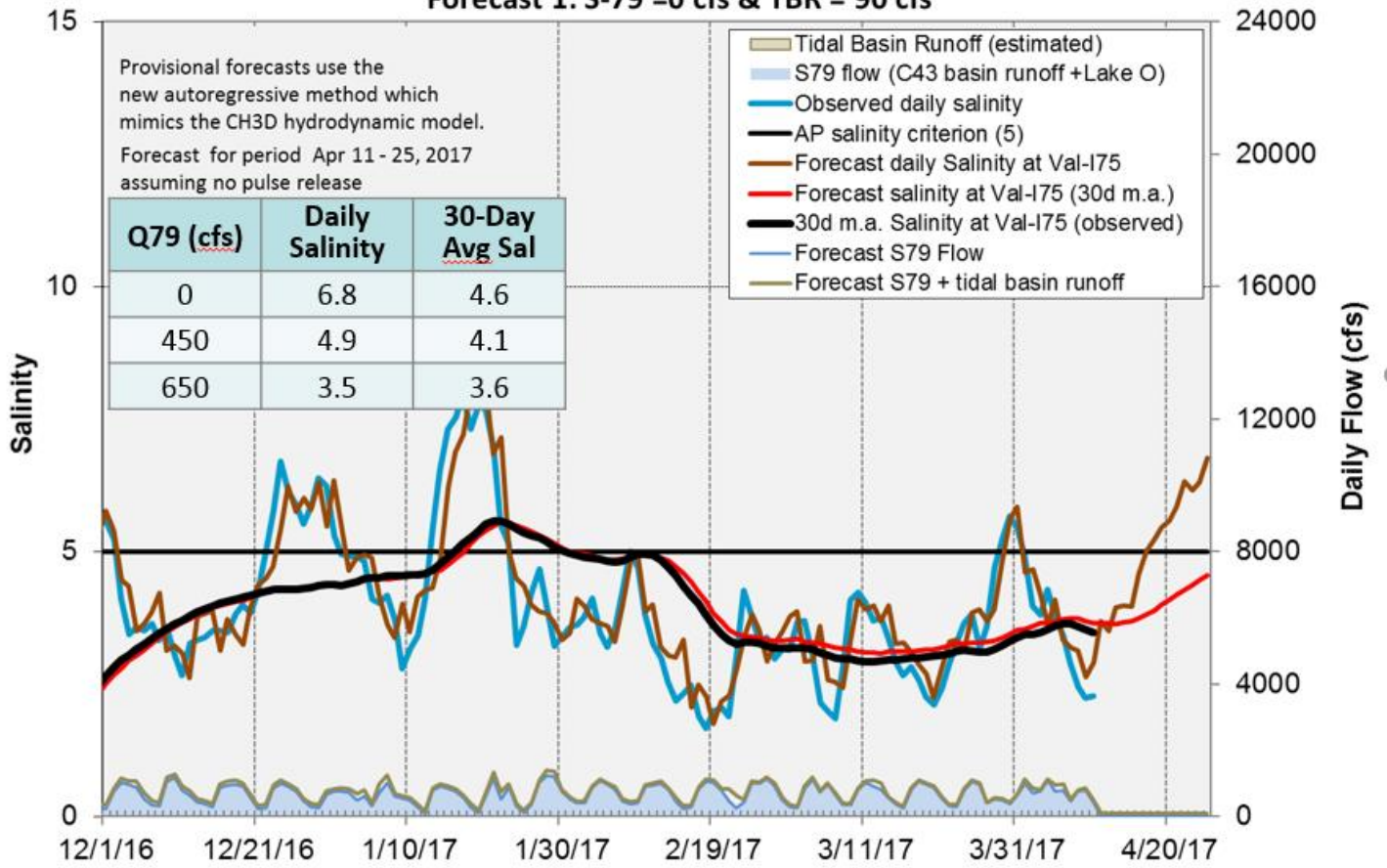


Figure 10. 14-day salinity forecast at Val I-75 assuming no releases at S-79.

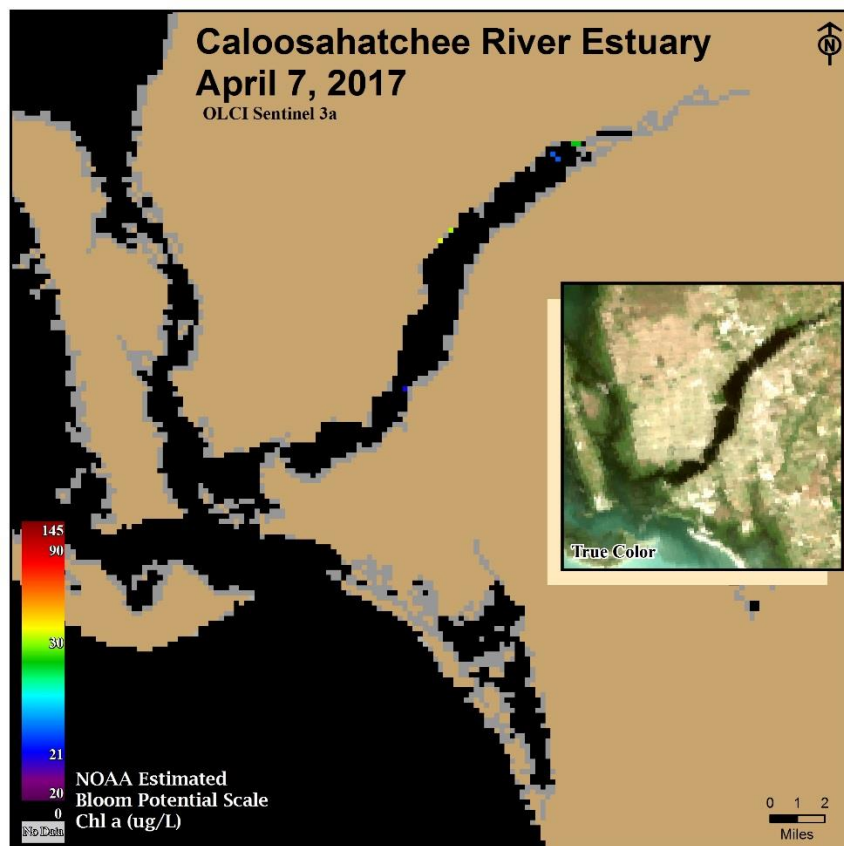
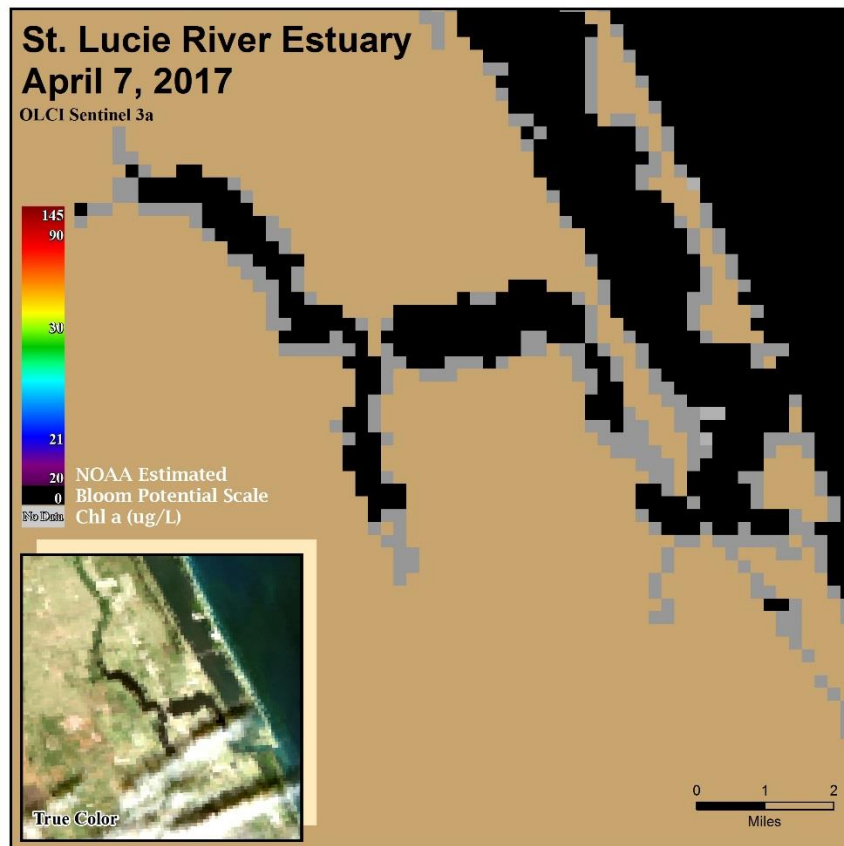
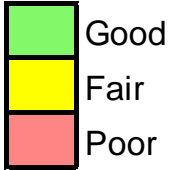


Figure 11. Sentinel 3a Satellite imagery provided by NOAA uses Ocean and Land Color Instrument (OLCI) to estimate cyanobacteria bloom potential in Caloosahatchee Estuary.

EVERGLADES

Rainfall over the last week was minimal throughout the Everglades leading to increased recession rates across the WCAs and Everglades National Park (ENP). Recessions at this rate are designated as “poor”. Current depth conditions suggest that at these rates, optimal conditions for wading bird foraging cannot be sustained throughout the nesting season.

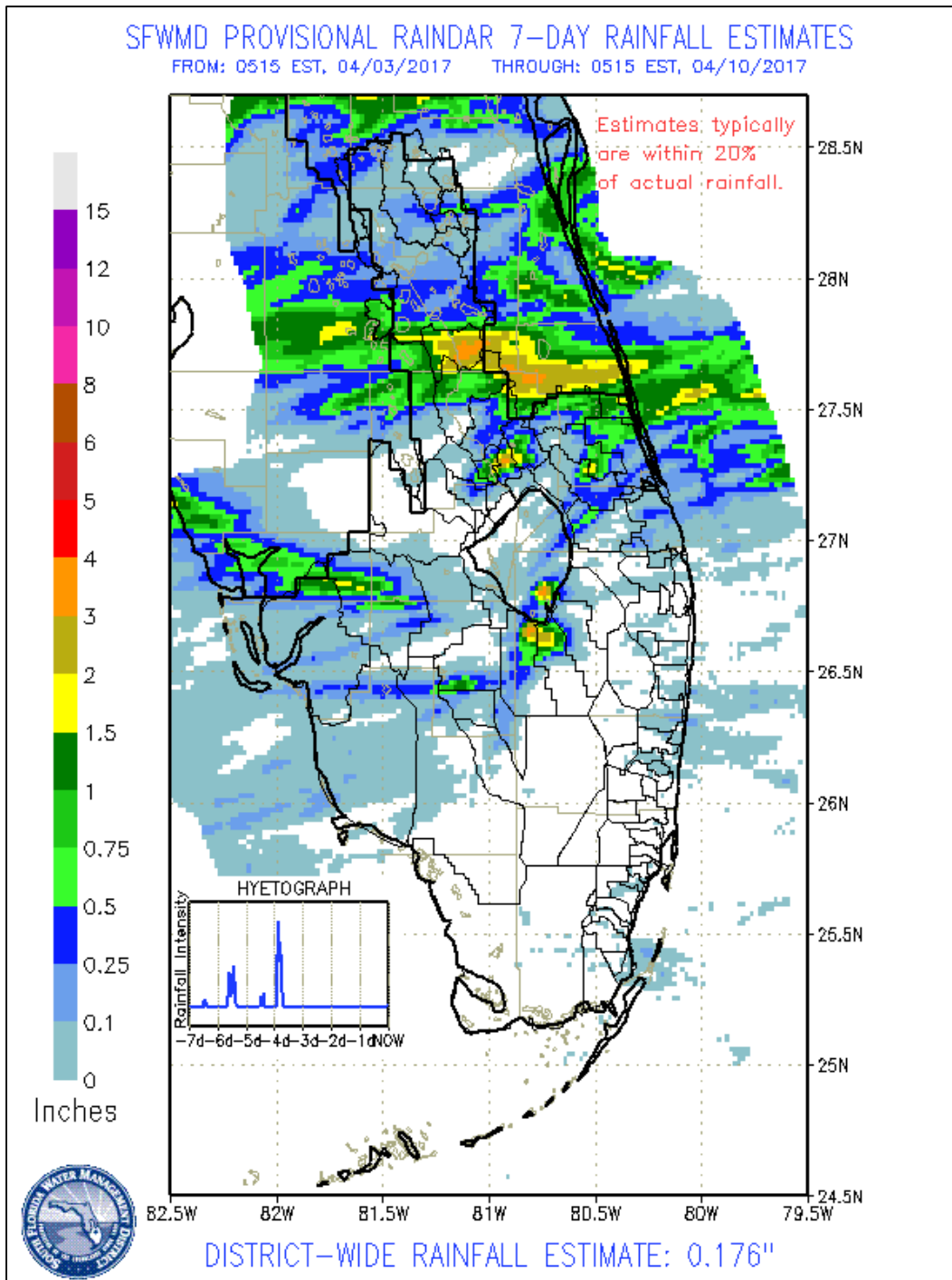
Everglades Region	Rainfall (Inches)	Stage Change (feet)
WCA-1	<0.01	-0.14
WCA-2A	0.00	-0.14
WCA-2B	<0.01	-0.21
WCA-3A	<0.01	-0.18
WCA-3B	0.00	-0.10
ENP	0.00	-0.27



A legend to the right of the table shows three colored boxes with corresponding labels: a green box for 'Good', a yellow box for 'Fair', and a red box for 'Poor'.

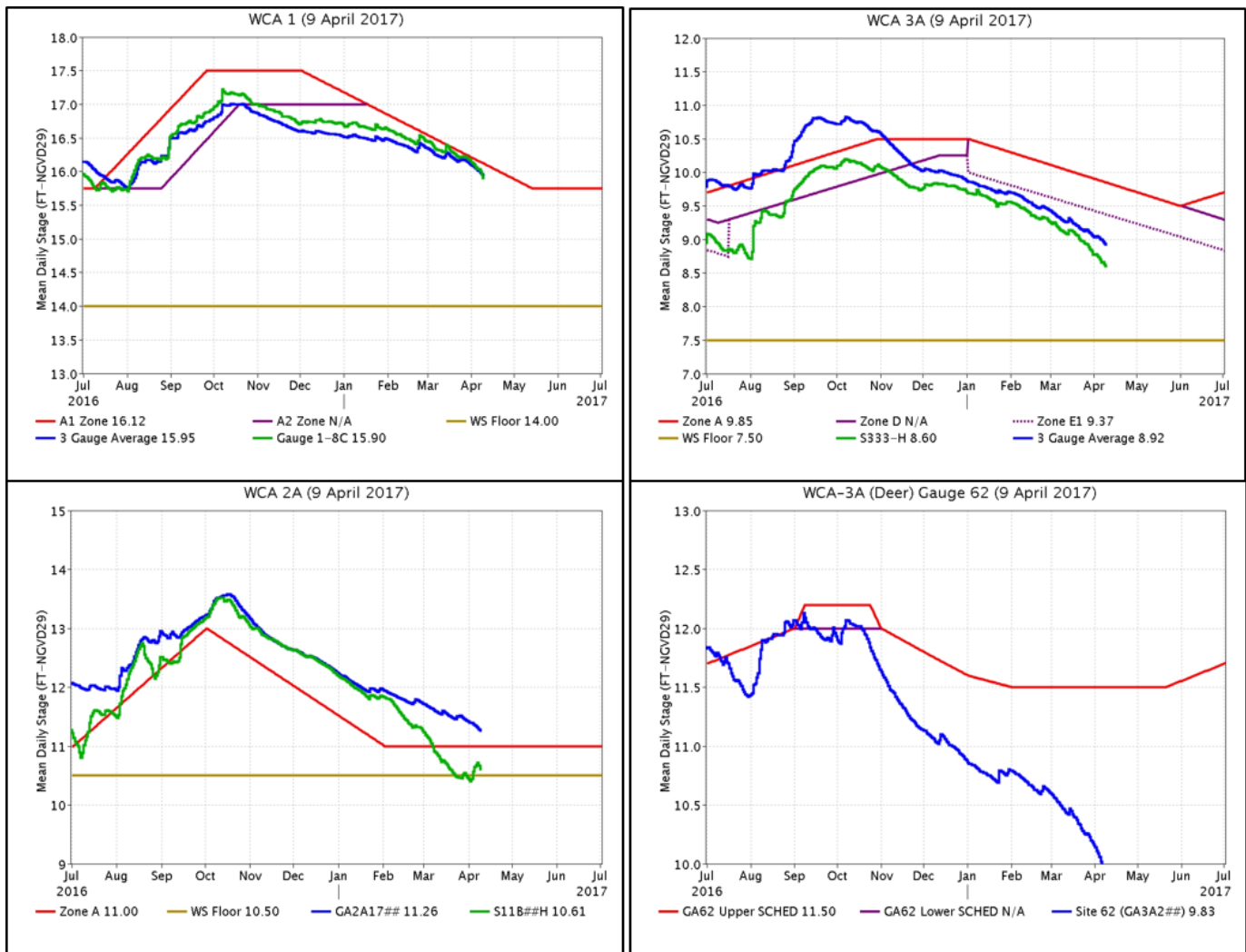
SWFMD PROVISIONAL RAINDAR 7-DAY RAINFALL ESTIMATES

FROM: 0515 EST, 04/03/2017 THROUGH: 0515 EST, 04/10/2017



Regulation Schedules: WCA-1 increased to 0.17 feet below zone A1 but is tracking the regulation line. WCA-3A three-gauge average is 0.45 feet below zone E1, and continues a deviation from the regulation line.

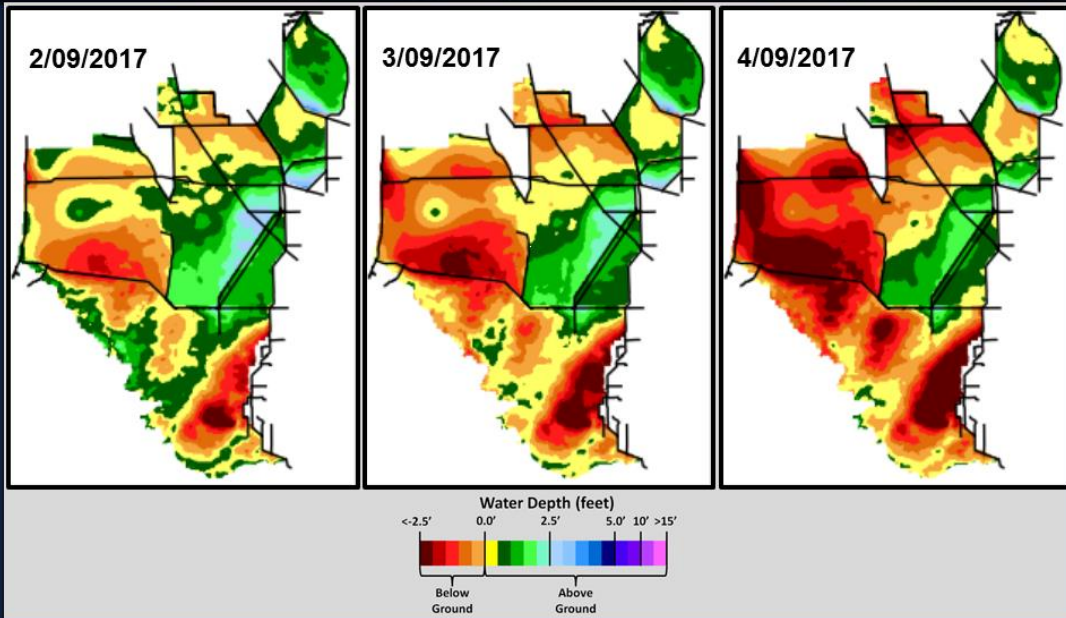
In WCA-2A the marsh stage at gauge GA2A17 is 0.26 feet above zone A1 while the canal stage measured at the headwaters of S11B rose to 0.11 feet above the floor. WCA-3A at gauge 62 (Northwest corner) remains greater than 1.5 foot below schedule.



Water Depths and Changes: This week's water depth readings at monitored gauges other than in WCA-2B range from -0.29 feet (northwest WCA-3A) to 1.44 feet (southern WCA-3A). Stages across the Everglades are for the most part lower than they were a week and month ago, and significantly lower than one year ago (of note last year stages were above average).



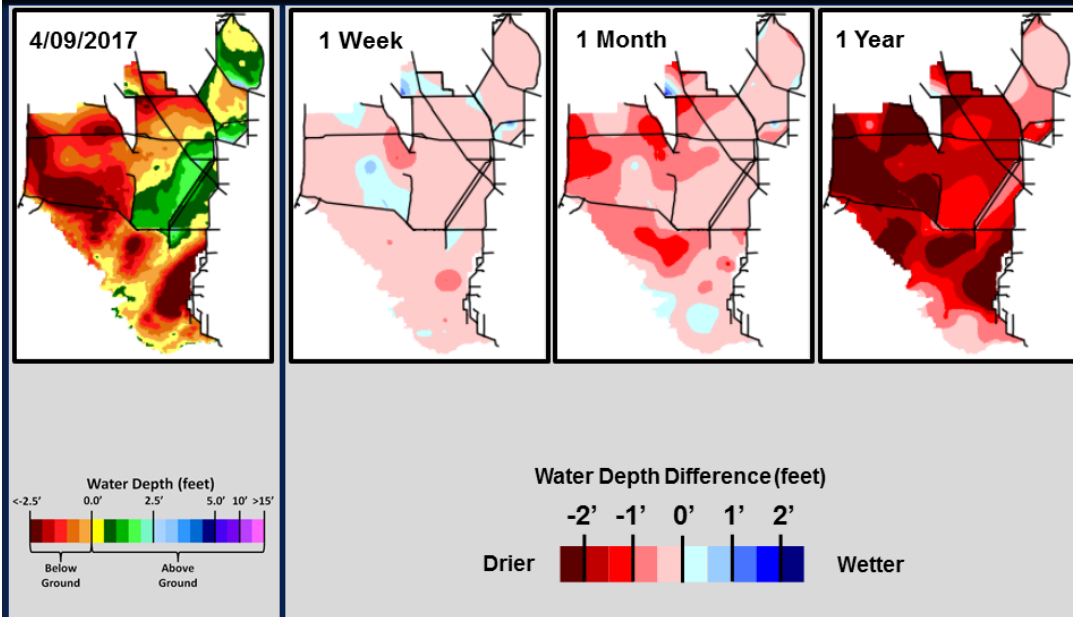
SFWDAT Water Depth Monthly Snapshots



South Florida Water Depth Assessment Tool (SFWDAT)



SFWDAT Everglades Difference Maps (Present - Past)



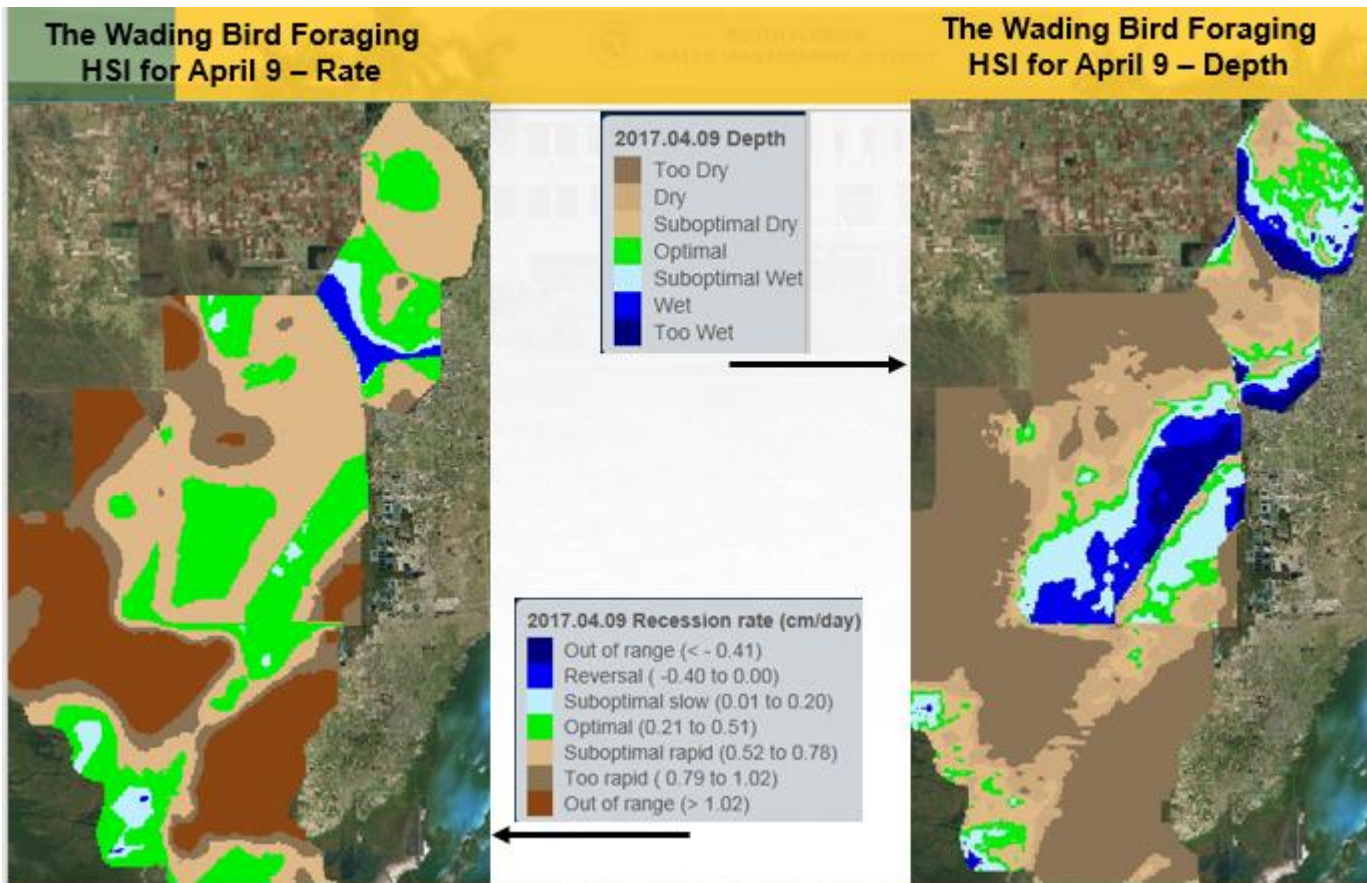
South Florida Water Depth Assessment Tool (SFWDAT)

Wading Birds: Large numbers of mixed species wading bird flocks continue to feed throughout the Everglades in areas where depths are currently optimal for wading bird foraging.

However, many areas are now very dry or are drying rapidly and are unlikely to support foraging birds beyond the end of April (e.g. WCA-2A and WCA3A-N). Slightly wetter conditions in WCA-1, WCA2-B and WCA-3AS are likely to provide foraging conditions until sometime in May. However, recession

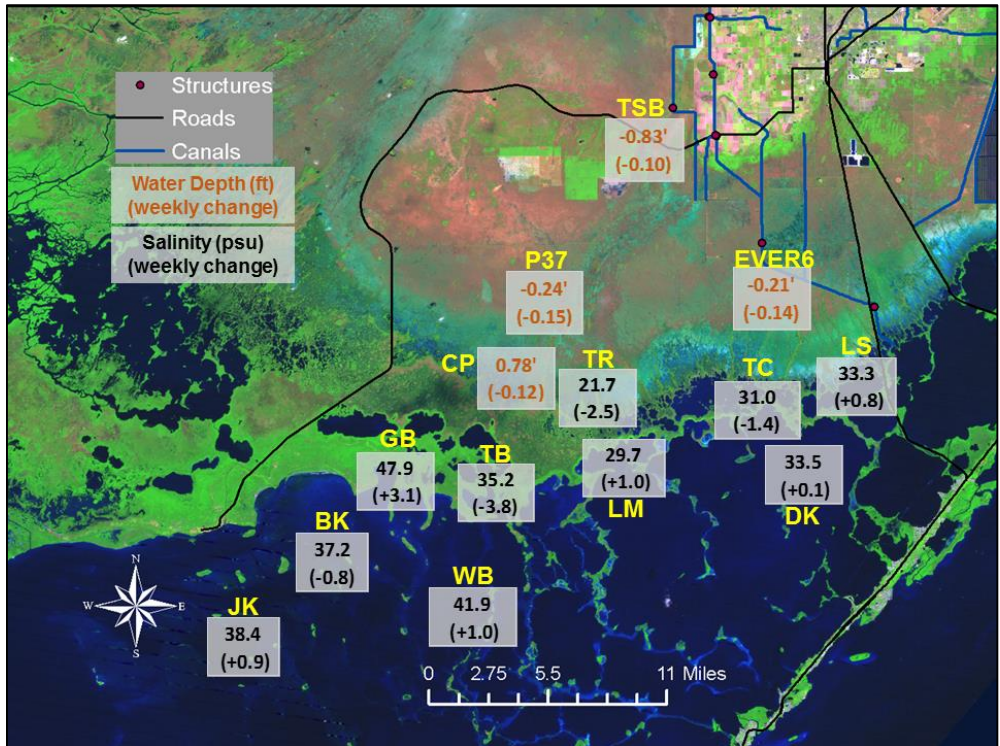
rates appear to be faster than average for this time of year and if they continue at current rates these wetter areas may dry down sooner than expected.

Nest numbers continue to increase in the WCAs (see initial colony count estimates below). The two Wood Stork colonies on the western border of WCA3A-S continue to grow and now contain about 1,010 nests, which is the largest stork nesting effort in the WCAs since the banner year of 2009 (1,460 nests) and the first nesting effort since 2014. Many nests have large, healthy nestlings which are only a few weeks from fledging (see photo), although there is a great deal of nesting asynchrony in the colonies and some birds are still incubating eggs. Numbers of white ibis nests have been steadily increasing over the past month and there are now about 15,000 nests in the WCAs (compared to 9,000 in 2016). Great egret nesting is starting to taper off as nestlings start to fledge.



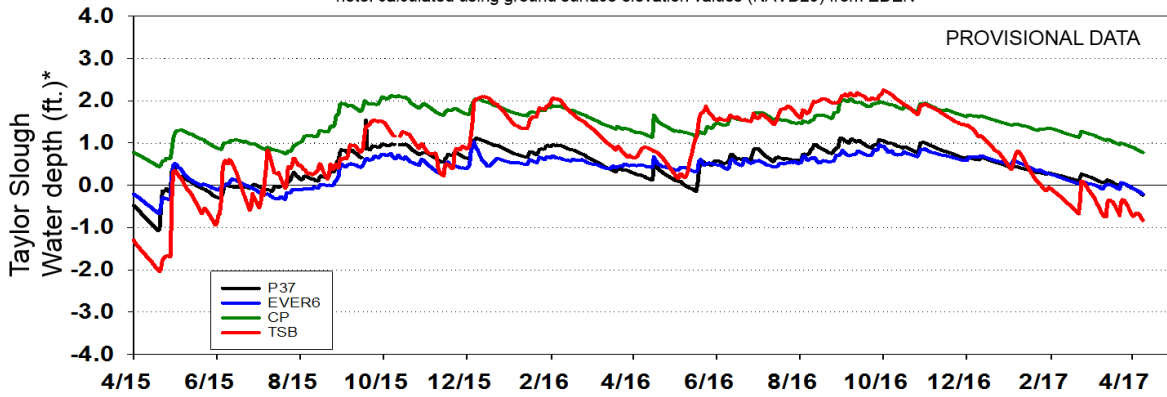
Taylor Slough: Water levels continued to decrease last week with the most rapid change (-0.15 feet) occurring in central Taylor Slough. Northern Taylor Slough recession slowed this week due to a temporary increase at the beginning of the week likely due to rainfall. Compared to historic averages, water levels are average to -3 inches below average.

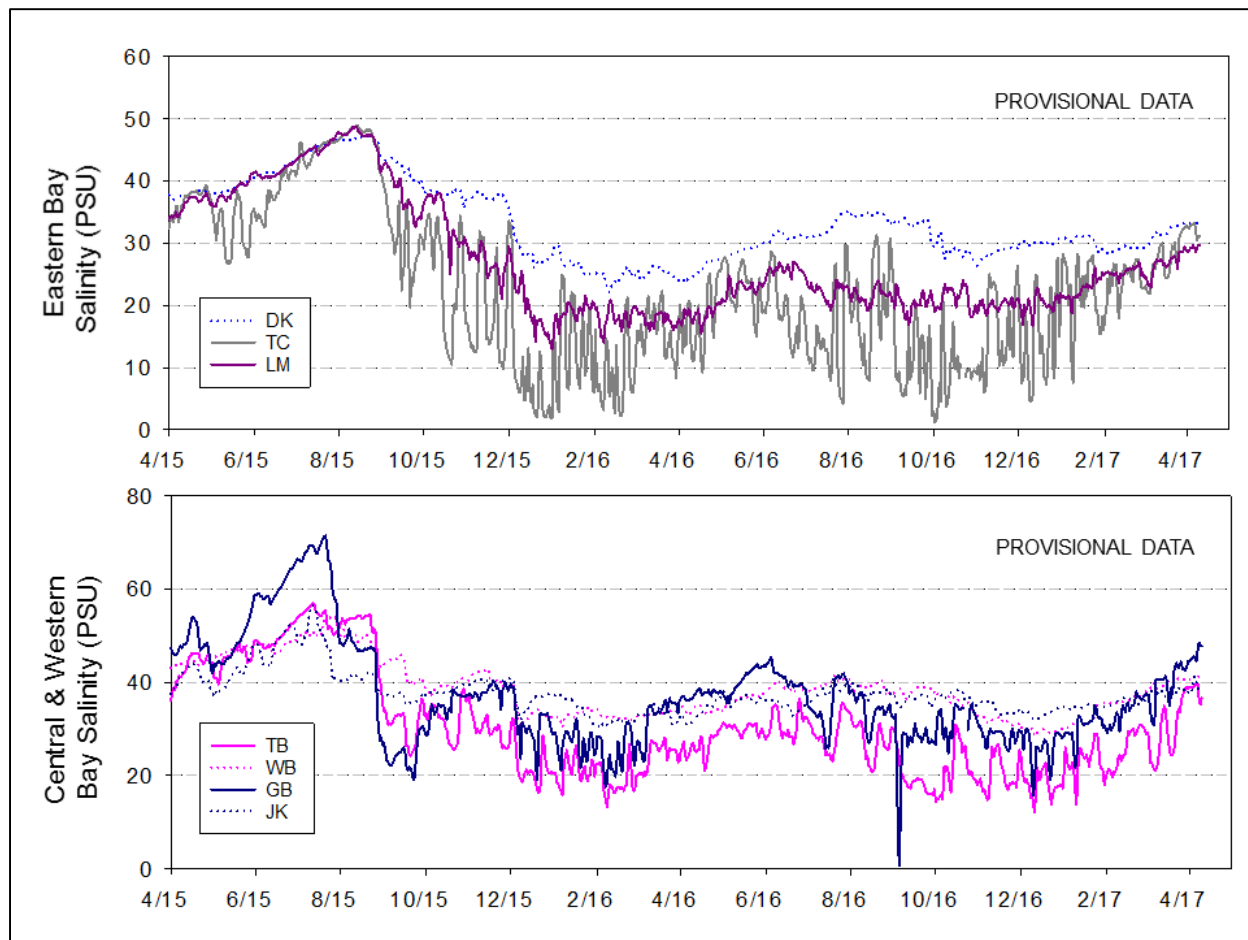
Florida Bay Salinity: Salinities in the Bay are generally elevated at this time of year due to evaporation and low flow/rain. Salinities currently range from 30 psu to 48 psu and are still +2 to +9 psu above their long-term averages. The western nearshore area is extremely shallow and salinities rise very quickly.



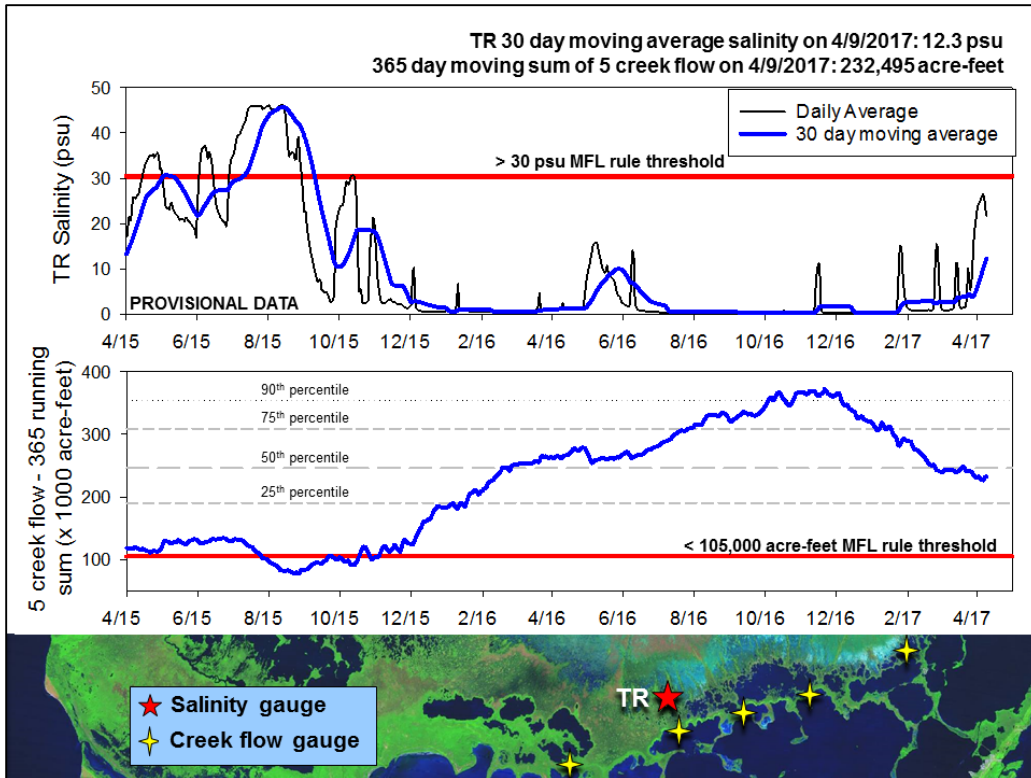
Taylor Slough Water Depths

*note: calculated using ground surface elevation values (NAVD29) from EDEN





Florida Bay MFL: Mangrove zone salinities are rising. The daily average salinity at TR increased to 26.5 psu before decreasing to 22 on April 9. Through Sunday afternoon and Monday morning, the salinity was rising again. The 30-day moving average increased 5.5 to end the week at 12.3 psu. The weekly creek flow from the five creeks was around 75 acre-feet with the positive and negative flows almost balancing out. The 365-day moving sum of flow from the five creeks identified by stars on the map decreased about -100 acre-feet to end at 232,495 acre-feet (below the long-term average of 257,628 acre-feet).



Water Management Recommendations

- Based on current stage conditions and wading bird foraging/nest reconnaissance flights we are continuing to recommend that moderating recession rates in WCA-2A has priority over moderating recession rates in WCA-3A. However, the low water depth conditions in the northern sections of WCA-3A north at gauges 62 (-0.29 feet) and 63 (-0.21 feet) suggest that available water routed into those areas would serve to protect that habitat.
- Based on current stage conditions, wading bird foraging/operations reconnaissance flights and a limited stage change analysis, we continue to support the water management option that routes water into WCA-2A via the S-7. This option seems to be prolonging the optimal foraging conditions currently being seen and modeled in WCA-2A.

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

Everglades Ecological Recommendations, April 11th, 2017 (red is new)

Area	Current Condition	Cause(s)	Recommendation	Reasons
WCA-1	Stages decreased -0.11' to -0.17'	Rainfall, ET, management	Operate for dry season conditions and, when possible, restrict recession rates to -0.03' to -0.07' per week. Moderate reversals, when possible.	Retain water for the upcoming dry season while protecting habitat for apple snail and wading bird breeding season.
WCA-2A	Stages decreased -0.14'	Rainfall, ET, management	Maintain slower recession rates. Retain water and restrict recession rates to less than -0.09' per week. Continue to prioritize WCA-2A inflows.	Protect habitat and wildlife. Support apple snails and nesting wading birds. Retain water to provide foraging habitat later in the breeding season.
WCA-2B	Stages decreased -0.18' to -0.23'	Rainfall, ET, management	Restrict recession rates to -0.05' to -0.09' per week.	Protect habitat and wildlife. Support apple snails and nesting wading birds.
WCA-3A NE	Stages decreased -0.13'	Rainfall, ET, management	Restrict recession rates to -0.05' to -0.07' per week to prevent the area from drying out too early for wading bird nesting. Continue moving water through S-150 as possible. Water for northwestern 3A (via the G404) is also desired.	Protect habitat and wildlife. Support apple snails and nesting wading birds. Reduce fire risk as water depths are now below ground.
WCA-3A NW	Stages decreased -0.29'	Rainfall, ET, management		
Central WCA-3A S	Stages decreased -0.15'	Rainfall, ET, management	Restrict recession rates to -0.05' to -0.09' per week. 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. Protect habitat, wildlife and support wading bird breeding.
Southern WCA-3A S	Stages decreased -0.16'	Rainfall, ET, management		
WCA-3B	Stages decreased - 0.07' to -0.16'	Rainfall, ET, management	Restrict recession rates to -0.05' to 0.-09' per week.	Protect habitat and wildlife and prepare for wading bird breeding season. Provide conditions to support apple snails.
ENP-SRS	Stages decreased -0.27'	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, wildlife and wading birds.
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 forecasted conditions are conducive for a successful sparrow breeding season. Dry conditions are expected for much of the sparrow breeding season.
Taylor Slough	Stages decreased by -0.08' to -0.15'	Rain, ET, inflows	Move water southward as possible	Provide freshwater buffer for ecosystems, maintain low salinity conditions downstream, and maintain slow recession rates.
FB- Salinity	+2 psu to +9 psu above average	Rain, ET, inflows, wind	Move water southward as possible	Maintain low salinity conditions and prevent early salinity increases.