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M E M O R A N D U M

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

FROM: SFWMD Staff Environmental Advisory Team

DATE: May 9, 2017

SUBJECT: Weekly Environmental Conditions for Systems Operations

Summary

Weather Conditions and Forecast

A dry week. Surface high pressure across the Gulf of Mexico and Florida will maintain dry conditions over the District today through Thursday before some spotty light showers return southeast Friday. The tail end of a cold front will push into the District this weekend and generate some widely scattered afternoon showers and a couple of thunderstorms each day Saturday through Monday, but then dry air is forecast to move back over the area.

Kissimmee

On Sunday, stage was 0.5 feet below regulation schedule in East Lake Toho and Lake Toho, and 1.2 feet below schedule in Kissimmee-Cypress-Hatchineha. Over the past week, discharge at S65, S65A, and S65E averaged 258, 184, and 260 cfs, respectively. Tuesday morning discharges were ~236 cfs, 179 cfs, and 149 cfs, respectively at S65, S65A, and S65E. Dissolved oxygen data in the Kissimmee River averaged 7.4 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

As of midnight May 7, 2017, Lake stage was 11.64 feet NGVD and in the Beneficial Use sub-band. Over the past week, Lake stage increased from 11.61 feet to 11.70 feet but began declining again over the past two days. Even with this slight reversal, the monthly recession rate of 0.68 feet still remains too high and has been suboptimal for the past two months. Total Phosphorus (TP) and Total Suspended Solids (TSS) concentrations in April increased in all regions compared to February and March values suggesting that windier conditions prevailed in April. The most recent imagery from the OLCI sensor (May 7, 2017) suggests the potential for bloom conditions may be intensifying in the north end of the Lake. Additionally, on Monday May 8, 2017, District staff observed a very light surface bloom of green flecks present at L001, the northern most weather platform, and in small localized areas in the south central pelagic region. For the remainder of the dry season, efforts should be made to limit the amount of water discharged from the Lake in an attempt to keep wading bird and snail kite foraging and nesting locations hydrated. The goal should be to slow the current recession rate and maintain it at below 0.50 feet per month.

Estuaries

Total discharge to the St. Lucie estuary averaged 364 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 declined slightly compared 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 587 cfs over the past week with 161 cfs (27%) coming from the Lake. The 30-day average

surface salinity at the Ft. Myers monitoring station is 14.7 and has been above 10 for 42 consecutive days. The 30-day average surface salinity at Val I-75 is 7.4. 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 likely in the fair range at the Sanibel Causeway. The 30-day moving average salinity at the I-75 Bridge is forecast to be 8.0 in the next two weeks if no flow comes through the S-79 structure, and the daily salinity is forecast to reach 9.0.

Stormwater Treatment Areas

Over the past week, the STAs/FEBs received approximately 2,300 acre-feet of Lake releases. The total amount of Lake releases sent to the STAs/FEBs in WY2018 (since May 1, 2017) is approximately 2,300 acre-feet. Most STA cells are at or above 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. 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-2, and STA-5/6. Due to recent basin runoff, it is recommended that no Lake Releases be sent to the STAs/FEBs this week.

Everglades

Heavy rainfall across the system led to another system wide stage reversal, particularly in WCA-1 where the maximum rainfall estimated was over four inches of rain and at the gauge 1-8T location stage rose over 0.30 feet. Foraging flocks seen in WCA-1 and WCA-2A in recent weeks were again absent this week based on a helicopter flight conducted May 8. White Ibis nesting numbers appear greatly reduced, with nest abandonment prevalent in WCA-1. Central and Southern WCA-3A still supporting lots of foraging storks, spoonbills, and egrets.

In Florida Bay the mangrove zone salinities have been fairly stable this past week. The daily average salinity at TR has been between 27 and 28 psu for the last six days. The 30-day moving average increased +0.8 to end the week at 26.8 psu.

Supporting Information

KISSIMMEE BASIN

Kissimmee Basin Rainfall

The Upper Kissimmee Basin received 0.44 inches of rainfall in the past week and the Lower Basin received 1.61 inches (SFWMD Daily Rainfall Report 05/08/2017).

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: 5/9/2017

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)						
							5/7/17	4/30/17	4/23/17	4/16/17	4/9/17	4/2/17	3/26/17
Lakes Hart and Mary Jane	S62	0	LKMJ	59.7	R	60.0	-0.3	-0.3	-0.4	-0.4	-0.3	-0.4	-0.4
Lakes Myrtle, Preston, and Joel	S57	0	S57	60.0	R	60.3	-0.3	-0.3	-0.1	-0.1	-0.1	-0.1	0.0
Alligator Chain	S60	0	ALLI	62.2	R	62.7	-0.5	-0.5	-0.5	-0.6	-0.7	-0.8	-0.8
Lake Gentry	S63	17	LKGT	60.1	R	60.2	-0.1	0.0	0.0	-0.1	-0.2	-0.3	-0.3
East Lake Toho	S59	11	TOHOE	55.5	R	56.0	-0.5	-0.7	-0.7	-0.9	-1.0	-1.0	-1.2
Lake Toho	S61	0	TOHOW, S61	52.5	R	53.0	-0.5	-0.6	-0.7	-0.8	-1.0	-1.1	-1.2
Lakes Kissimmee, Cypress, and Hatchineha	S65	258	LKISSP, KUB011, LKIS5B	48.6	R	49.8	-1.2	-1.3	-1.3	-1.3	-1.3	-1.5	-1.4

* 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: 5/9/2017

Metric	Location	Sunday's 1-day average	Weekly Average**									
			5/7/17	4/30/17	4/23/17	4/16/17	4/9/17	4/2/17	3/26/17	3/19/17	3/12/17	3/5/17
Discharge (cfs)	S-65	239	258	283	330	344	292	361	626	885	899	877
Discharge (cfs)	S-65A	175	184	205	248	262	270	277	461	681	705	682
Discharge (cfs)	S-65D****	228	252	253	286	297	288	359	679	791	685	721
Discharge (cfs)	S-65E****	202	260	225	267	282	297	372	723	855	737	769
DO concentration (mg/L)***	Phase I river channel	8.5	7.4	7.9	7.8	8.1	7.7	7.8	8.9	8.8	8.4	8.0
Mean depth (feet)*	Phase I floodplain	0.05	0.05	0.05	0.06	0.06	0.06	0.07	0.11	0.17	0.12	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
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	
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)

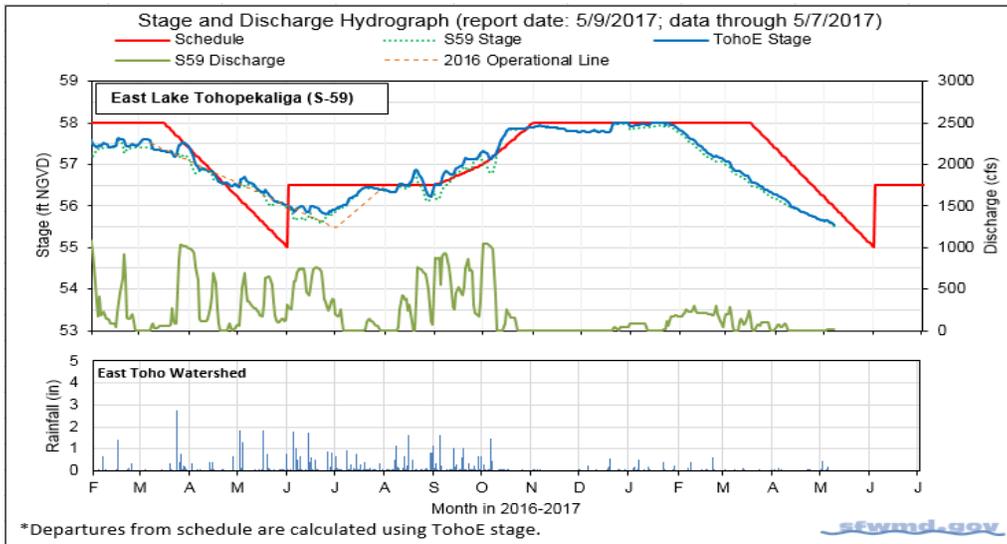


Figure 1.

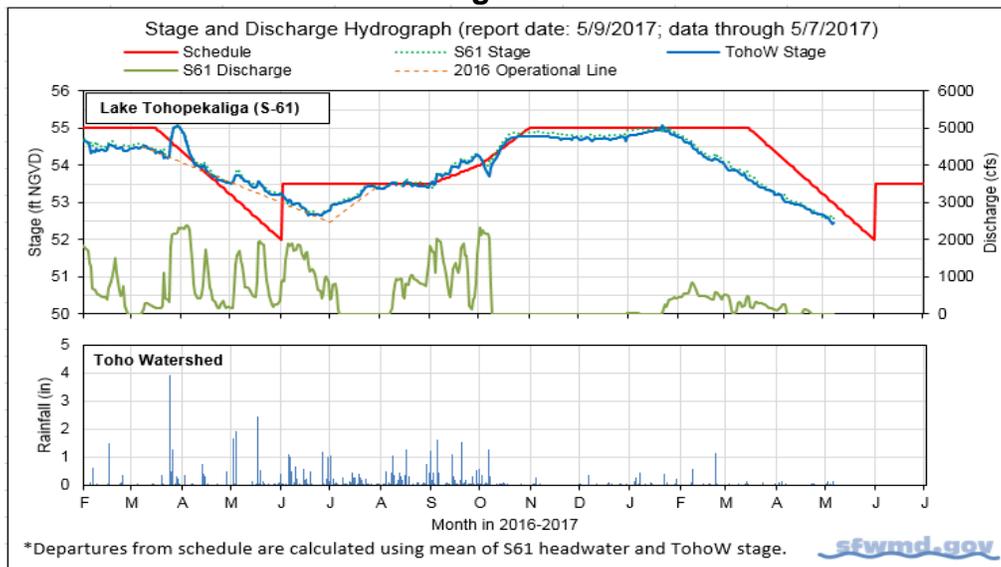


Figure 2.

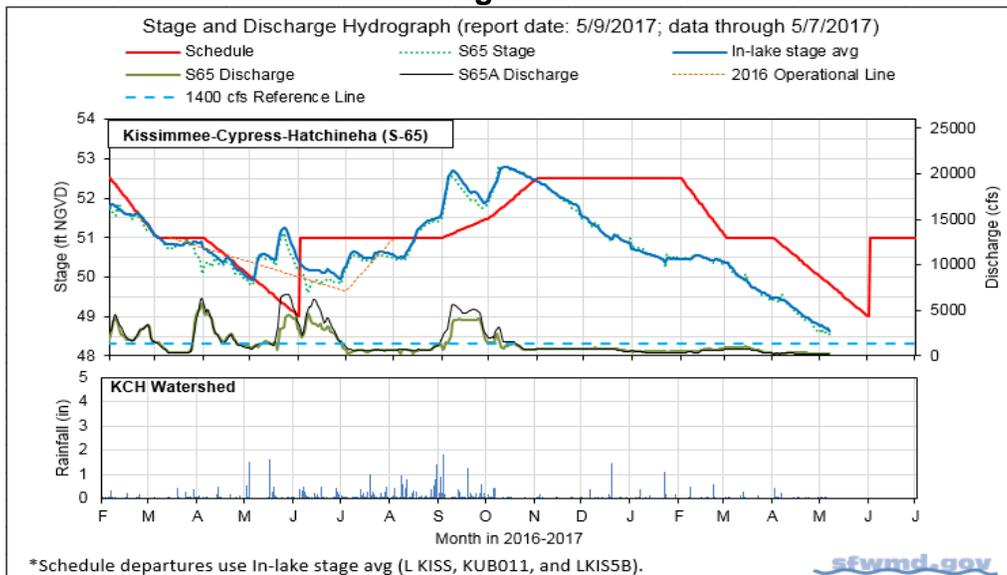


Figure 3.

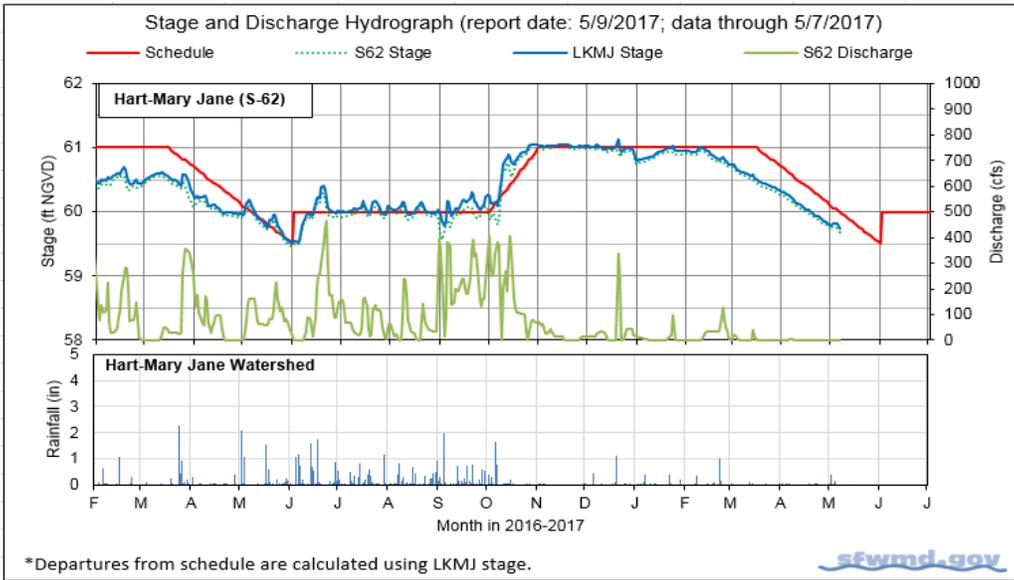


Figure 4.

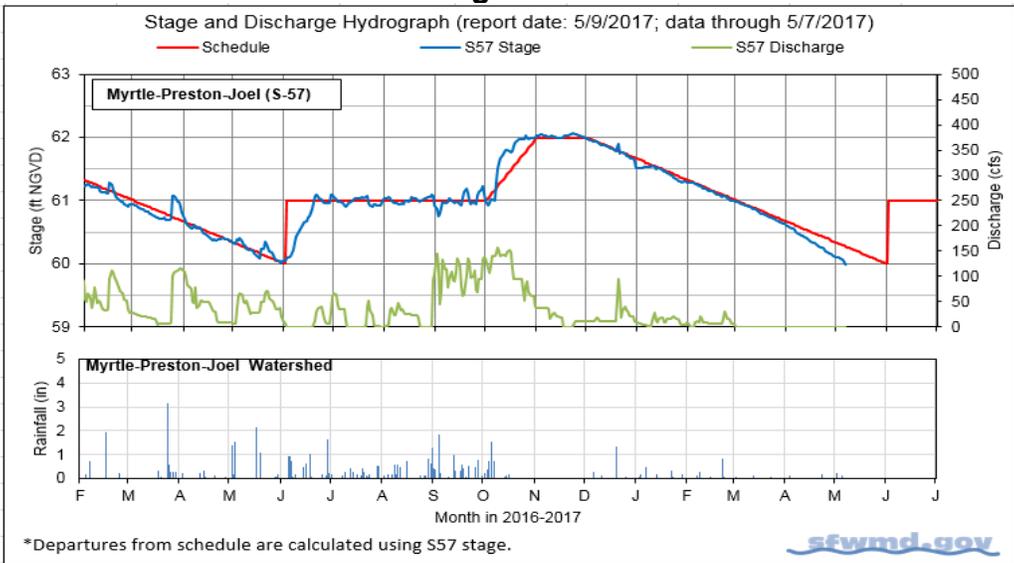


Figure 5.

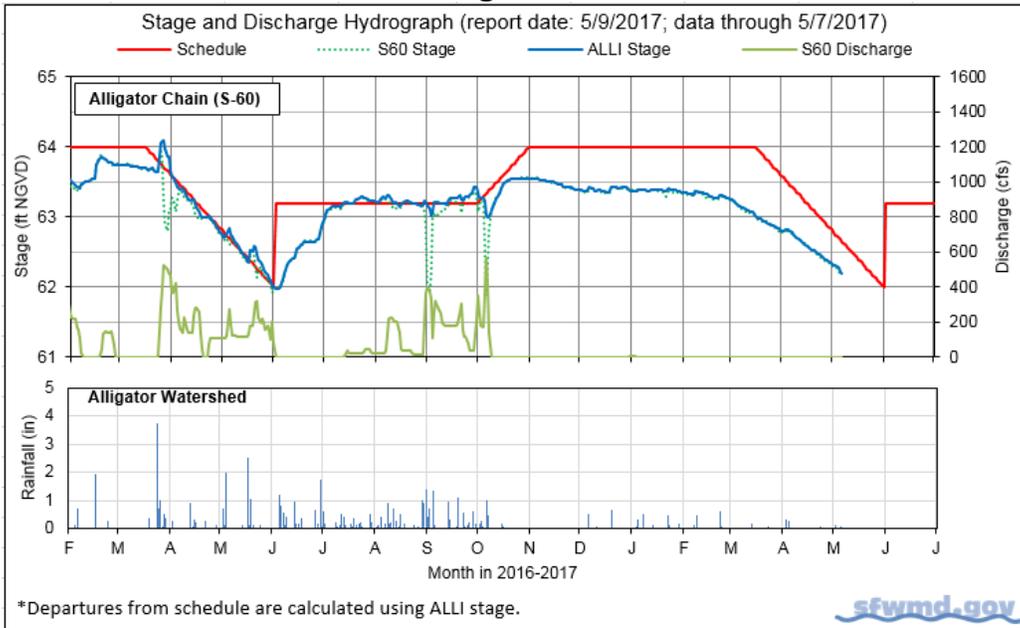


Figure 6.

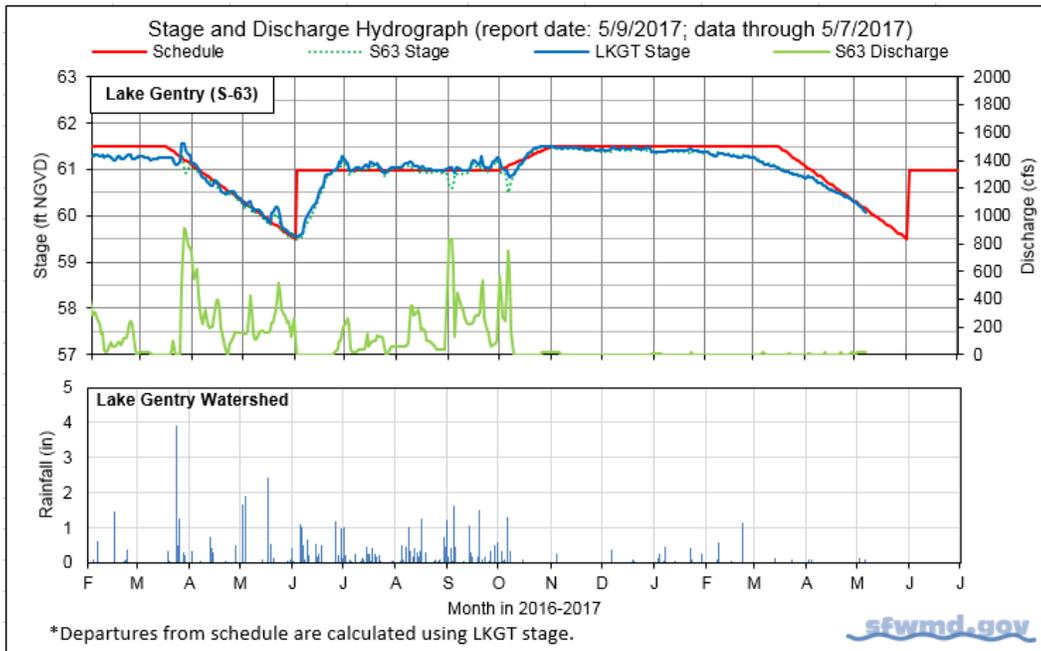


Figure 7.

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.

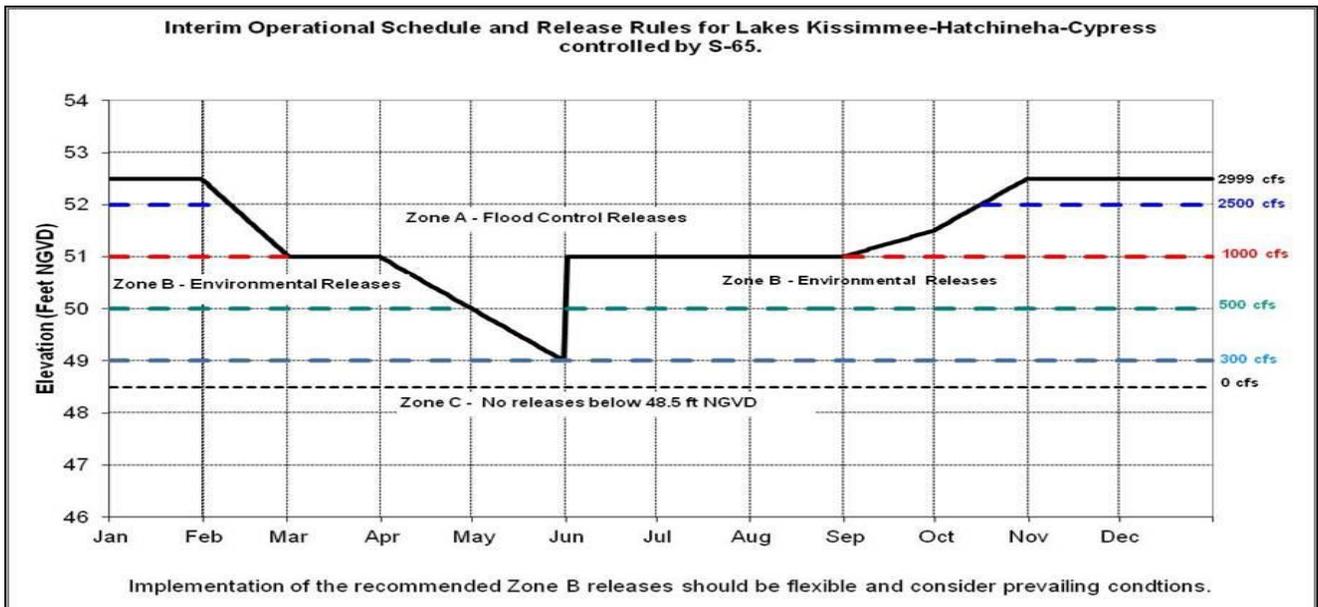


Figure 9. Interim operations schedule for S-65. The discharge schedule shown to the right has not been used in recent years or in Wet Season 2015.

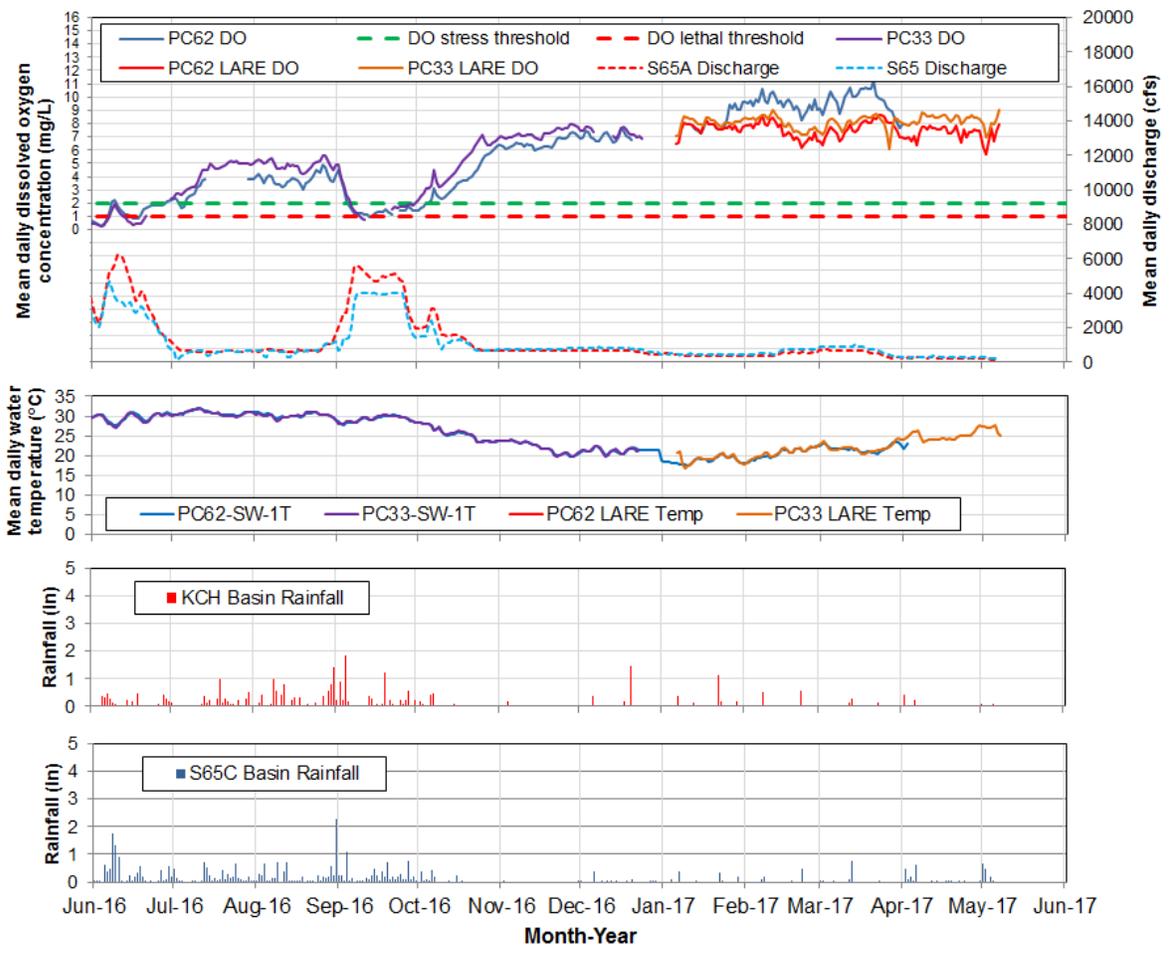


Figure 10. Mean daily Dissolved Oxygen, discharge, temperature and rainfall in the Phase I river channel.

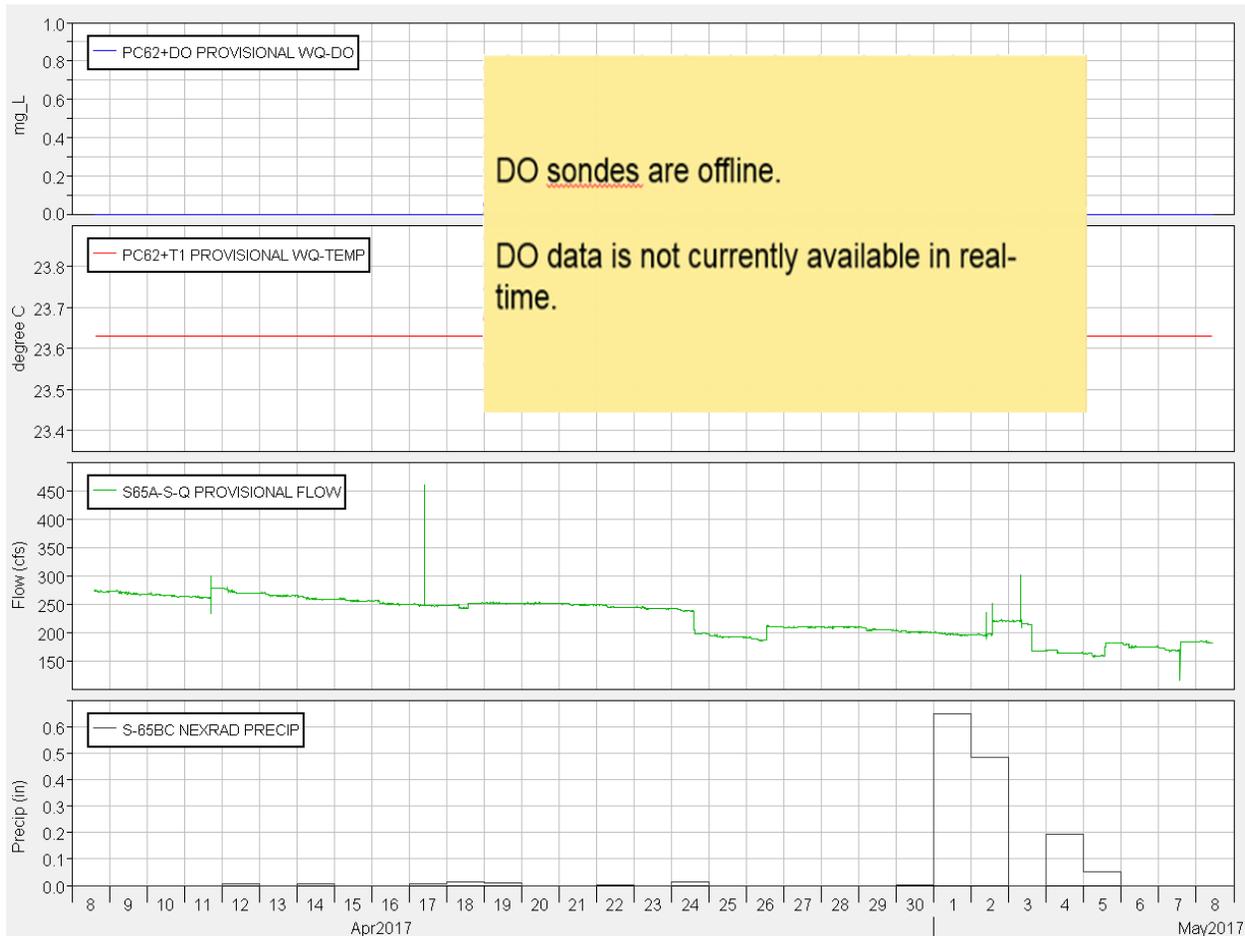


Figure 11. Phase I river channel dissolved oxygen and water temperature (measured at 15 minute intervals) and Pool BC daily rainfall.

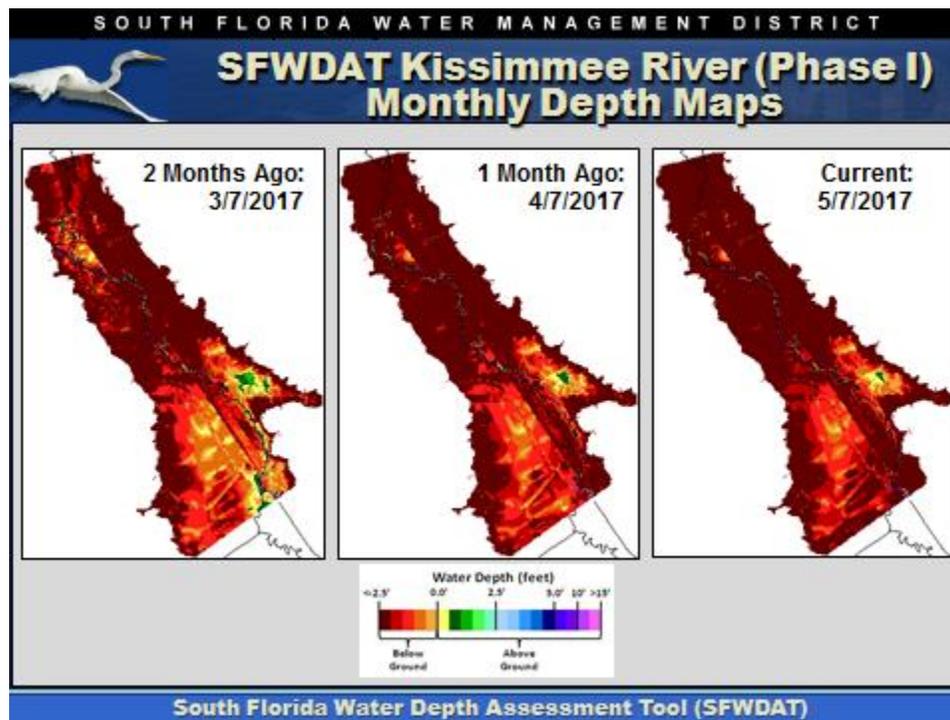
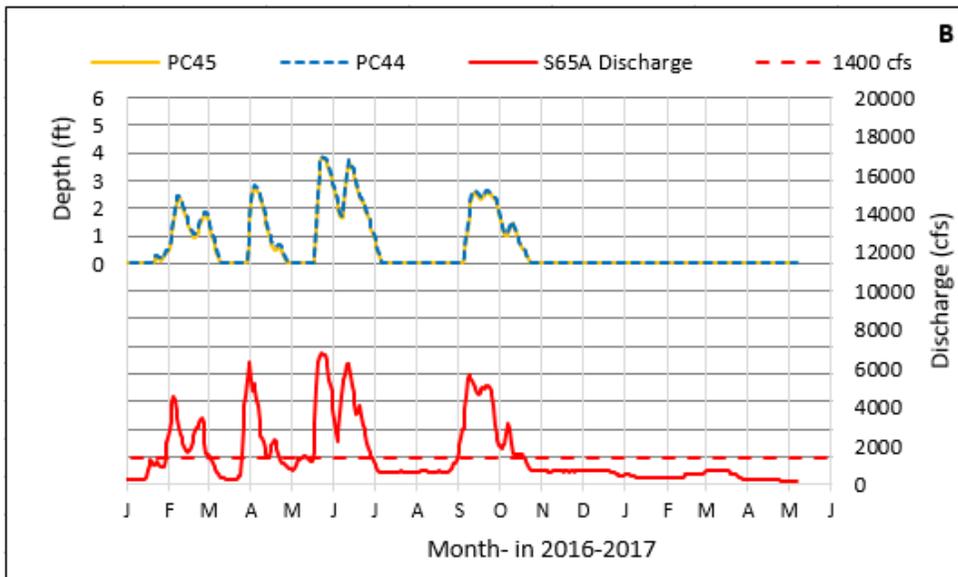
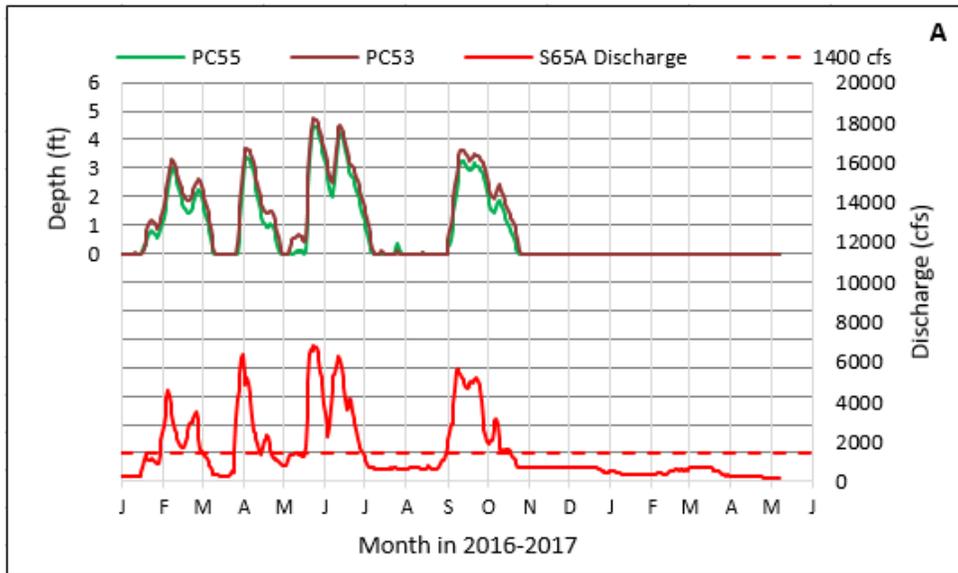


Figure 12. Phase I area floodplain water depths for this week, one month ago, and two months ago. Note that the WDAT color-coding has been modified to accommodate greater water depths; these maps are not directly comparable to Kissimmee Basin WDAT maps published prior to Jan. 16, 2012.



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

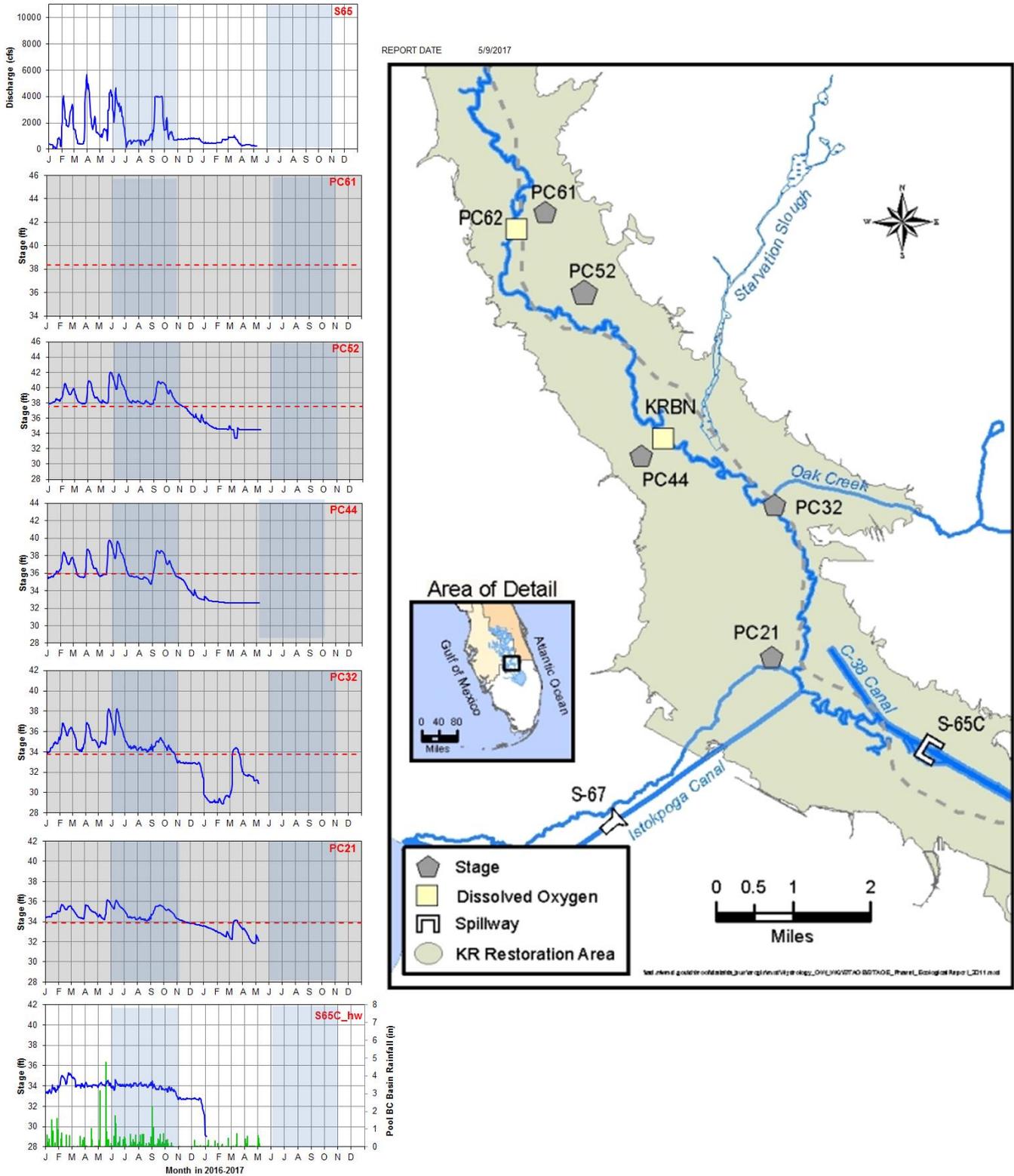


Figure 13. Discharge at S65, stages at five monitoring stations in the Phase I area of the Kissimmee River floodplain, and headwater stage at S65-C since January 1, 2015. The most recent data (~2 weeks) are provisional real-time data from SFWMD DualTrend; previous data are from SFWMD DB-HYDRO (validated).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

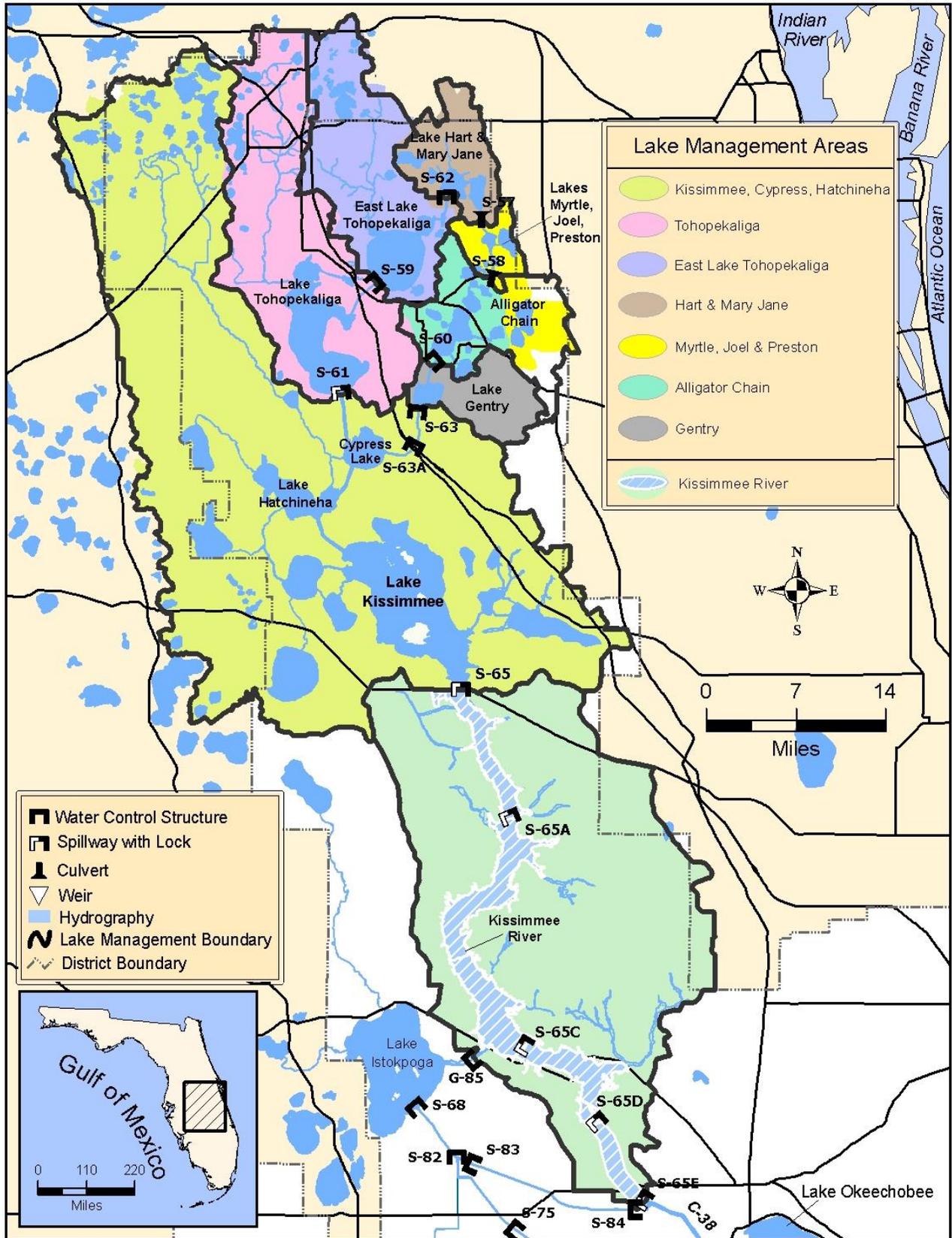


Figure 14. The Kissimmee Basin

LAKE OKEECHOBEE

According to the USACE web site, Lake Okeechobee stage is at 11.64 feet NGVD for the period ending at midnight on May 7, 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). Over the past week, Lake stage increased from 11.61 feet to 11.70 feet but began declining again over the past two days. The Lake is 0.68 feet lower than it was a month ago, 2.34 feet lower than it was a year ago (Figure 1) and currently in the Beneficial Use sub-band (Figure 2). According to RAINDAR, 1.5 inches of rain fell directly over the Lake during the past seven days (Figure 3). Similar or greater amounts of rain fell throughout most of the surrounding watershed with the exception of the upper Kissimmee Valley, the extreme lower east coast and a pocket to the west of Lake Okeechobee which received less rainfall.

Based on USACE reported values, current Lake inflow is approximately 203 cfs as detailed below.

Structure	Flow cfs
S65E	0
S65EX1	203
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 478 cfs with 573 cfs exiting at S77 but approximately 88 cfs is entering the Lake from the L8 canal through Culvert 10A and 8 cfs is entering through S308. No releases were made south through S351, S352 and S354. Corrected evapotranspiration value based on the L006 weather platform solar radiation data for this past week decreased from 3,858 cfs last week to 3,549 cfs.

Change in elevation equivalents and average weekly flows (midnight May 1, 2017 to midnight May 7, 2017) for major structures are presented in Figure 4.

Based on the Lake Okeechobee wading bird habitat suitability index, there are currently approximately 23,037 acres of suitable foraging habitat for long-legged birds and 9,418 acres for long and short-legged birds on the Lake (Figure 5).

Water quality data collected in April (April 17 and 18, 2017) are now available. Total Phosphorus (TP) and Total Suspended Solids (TSS) concentrations increased in all regions compared to February and March values suggesting that windier conditions prevailed in April (Figure 6). Average wind speed at

LZ40, the weather platform in the central region of the Lake, was 9.1 mph in February, 11.6 mph in March and 13.0 in April.

April chlorophyll data (collected April 17-18, 2017) indicated bloom conditions (>40 ug/L) at one site, L005 the weather platform in the western region (Figure 7). Five other sites had elevated values in the 20-40 ug/L range but still below what is considered bloom level. None of the six routine microcystin sampling sites had values above the 0.20 analytical limit of detection.

The most recent imagery from the OLCI sensor (May 7, 2017) suggests the potential for bloom conditions may be intensifying in the north end of the Lake (Figure 8). Additionally, on Monday May 8, 2017, District staff observed a very light surface bloom of green flecks present at L001, the northern most weather platform, and in small localized areas in the south central pelagic region.

Water Management Recommendations

Lake stage is 11.64 feet NGVD having risen by 0.03 feet from last week's level. The recent rain event increased Lake levels to 11.70 feet over the week but is now declining. Even with this slight reversal, the monthly recession rate of 0.68 feet still remains too high and has been suboptimal for the past two months. For the remainder of the dry season, efforts should be made to limit the amount of water discharged from the Lake in an attempt to keep wading bird and snail kite foraging and nesting locations hydrated.

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 submerged aquatic vegetation) and faunal (wading birds, snail kites, apple snails and fish) communities.

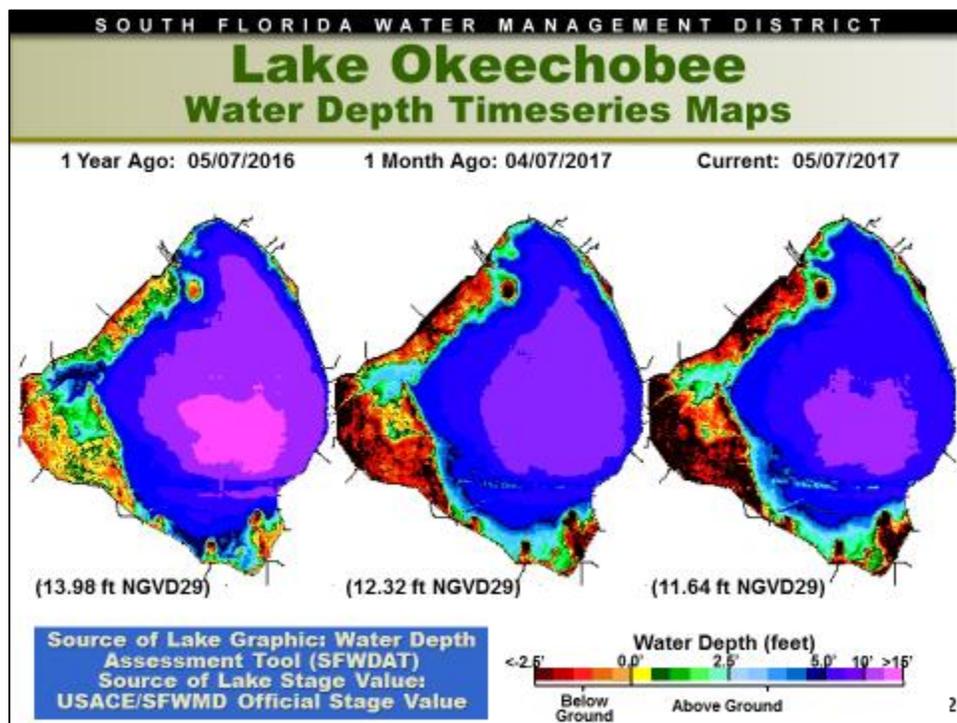
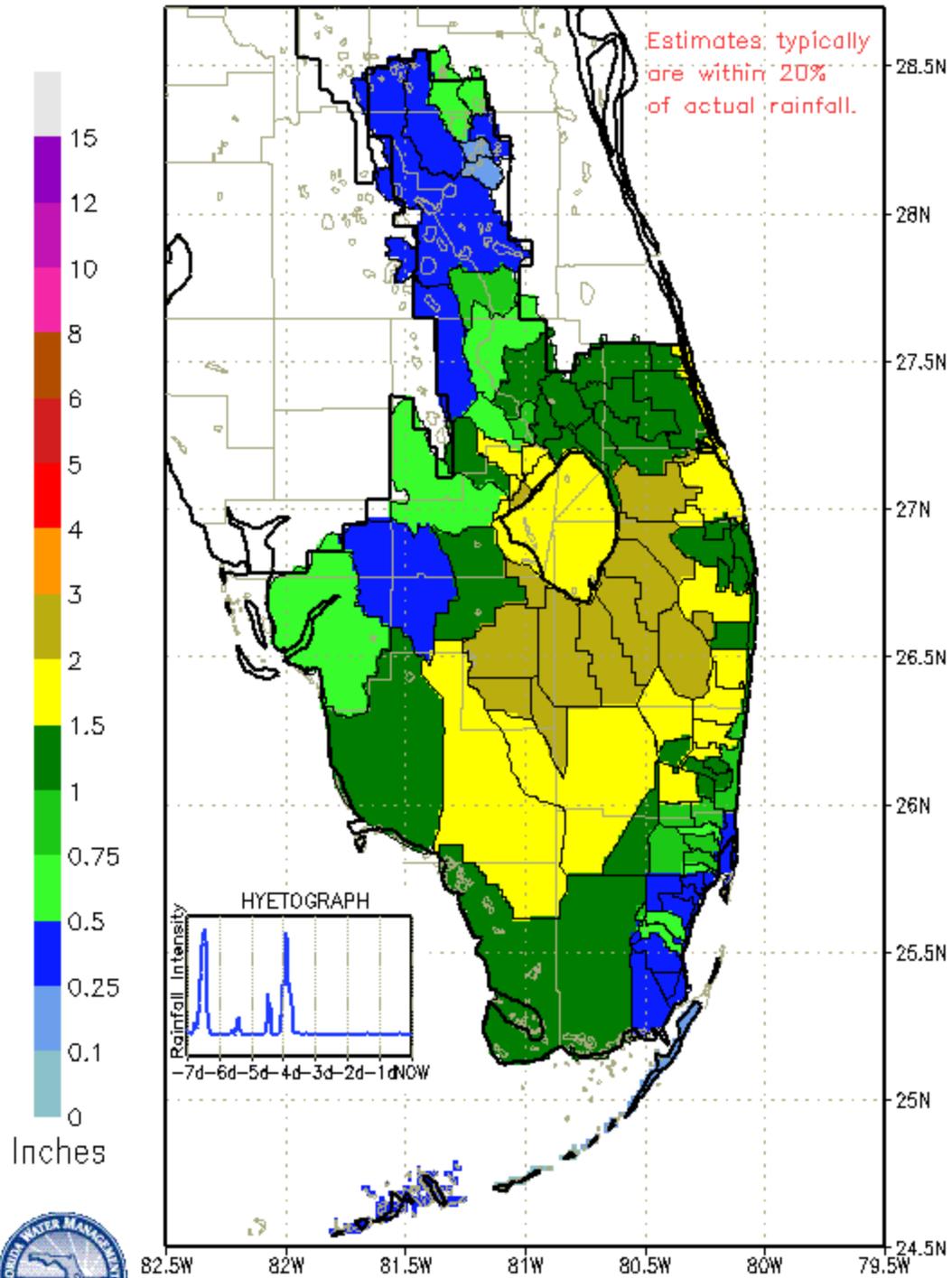


Figure 1

SFWMD PROVISIONAL RAINFAR 7-DAY BASIN RAINFALL ESTIMATES

FROM: 0515 EST, 05/02/2017 THROUGH: 0515 EST, 05/09/2017



DISTRICT-WIDE RAINFALL ESTIMATE: 1.299"

Figure 3

INFLOWS	Average Daily Flow Past Week cfs	Feet of Change Past Week
S65E & S65EX1	271	0.011
S71 & 72	156	0.006
S84 & 84X	0	0.000
Fisheating Creek	9	0.000
Rainfall	N.A.	0.125
OUTFLOWS	Average Daily Flow Past Week cfs	Feet of Change Past Week
S77	407	0.016
S308	-35	-0.001
S351	214	0.008
S352	12	0.000
S354	251	0.010
L8	-112	-0.004
ET	3549	0.140

Figure 4

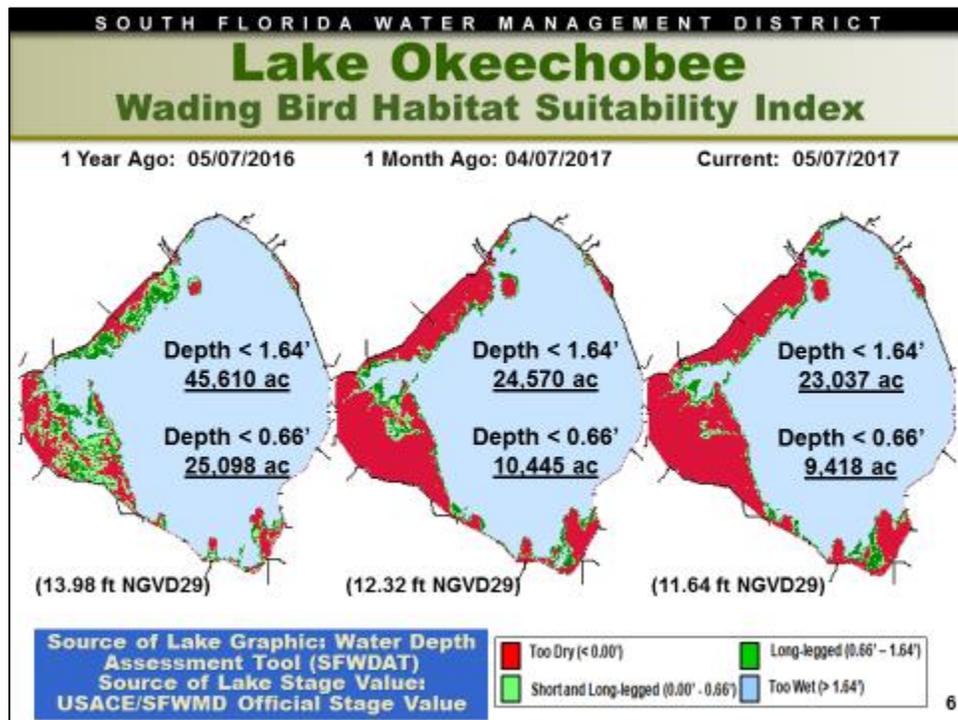


Figure 5

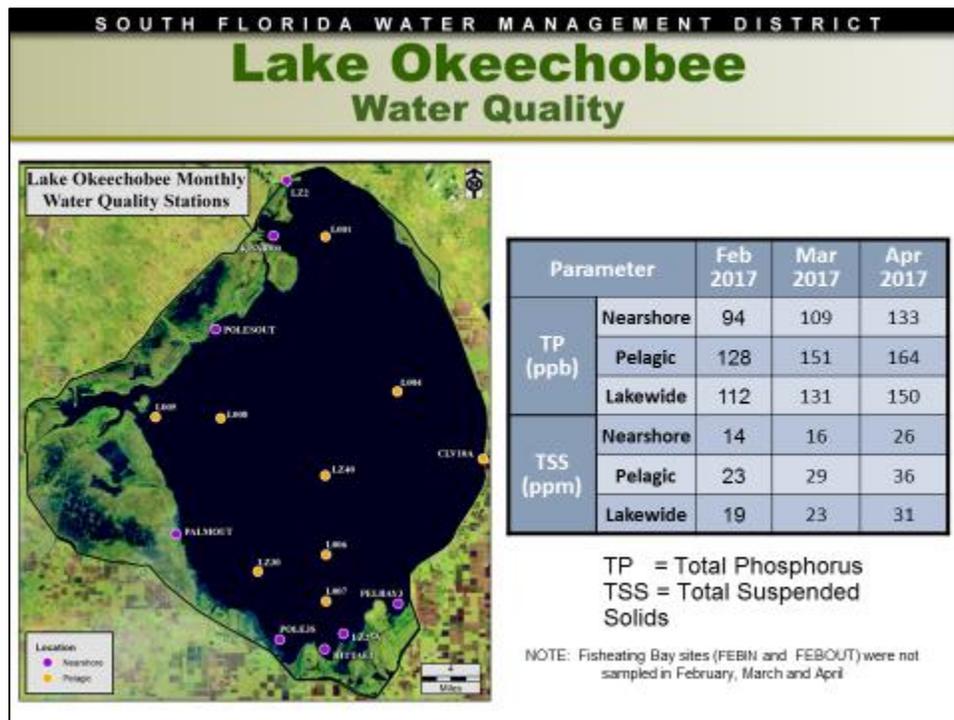


Figure 6



Figure 7

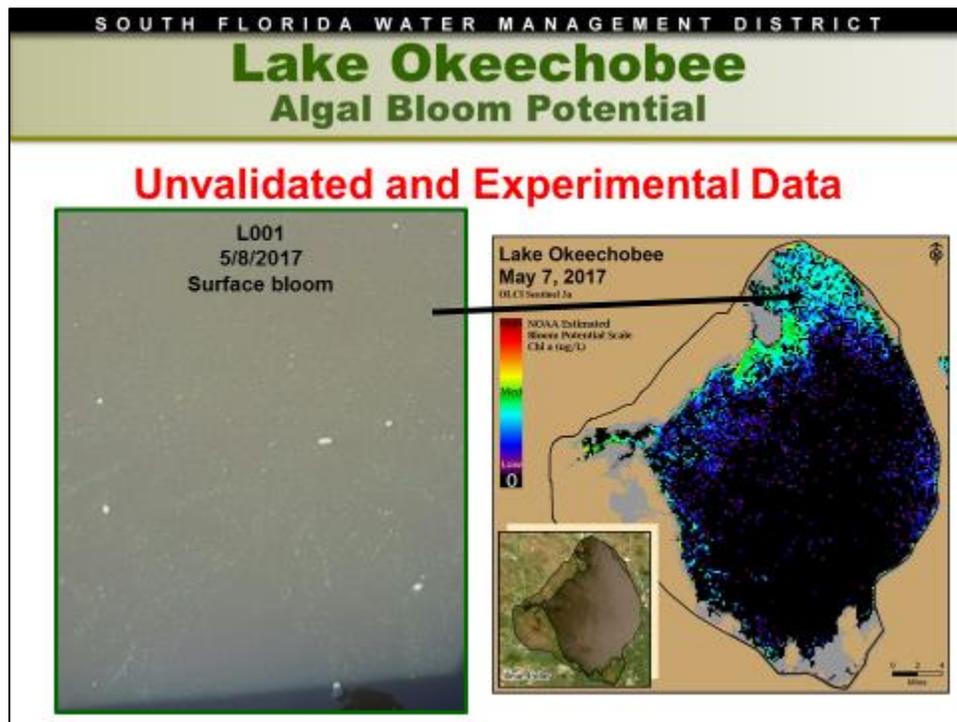


Figure 8

Lake Istokpoga

The annual recession from high pool to low pool stage on Lake Istokpoga continues. Stage is 37.95 feet NGVD as of midnight May 7, 2017 and is currently 0.81 feet below its regulation schedule of 38.76 feet NGVD (Figure 9). Average flows into the Lake from Arbuckle and Josephine creeks were -10 cfs and 5 cfs, respectively. Average discharge from S68 and S68X this past week was 21 cfs, a decrease from the previous week's flow of 96 cfs. According to RAINДАР, 0.5 inches of rain fell in the Lake Istokpoga watershed during the past seven days.

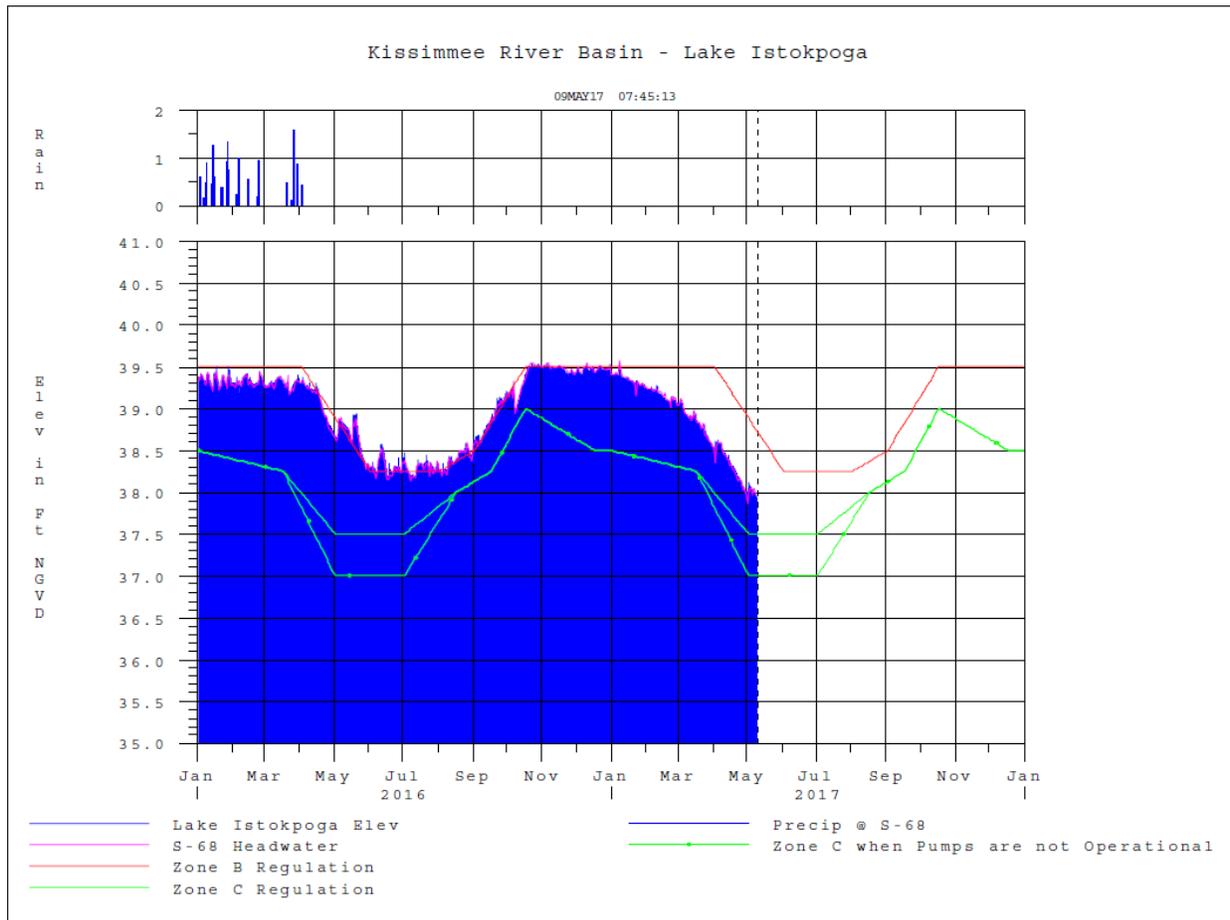


Figure 9

ESTUARIES

St. Lucie Estuary

Over the past week, provisional flows averaged about 0 cfs at S-80, 72 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 47 cfs from Ten Mile Creek at the Gordy Road Structure. Average inflow from tidal basin tributaries is estimated to be 317 cfs (Figures 1 and 2). Total inflow averaged about 364 cfs last week and 239 cfs over last month.

Over the past week, salinity decreased slightly 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 26.9. 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)	24.5 (25.9)	25.6 (26.6)	NA ¹
US1 Bridge	26.6 (27.2)	27.1 (27.5)	10.0-26.0
A1A Bridge	31.8 (32.0)	32.6 (32.5)	NA

¹Envelope not applicable

Caloosahatchee Estuary

During the past week, provisional flows averaged approximately 345 cfs at S-77, 244 cfs at S-78, and 477 cfs at S-79. Average inflow from tidal basin tributaries is estimated to be 110 cfs (Figures 5 and 6). Total inflow averaged 587 cfs last week and 464 cfs over last month.

Over the past week in the estuary, salinity decreased to Ft. Myers Yacht Basin 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, within the fair range at Shell Point, and likely within the fair range at Sanibel (Figure 9). The 30-day moving average surface salinity is 7.4 at Val I-75 and 14.7 at Ft. Myers. The 30-day moving average salinity at Ft. Myers has been above 10 for 42 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 8.0 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)	5.1 (7.0)	5.2 (7.5)	NA ¹
*Val I75	6.8 (8.2)	9.3 (10.9)	0.0-5.0 ²
Ft. Myers Yacht Basin	15.1 (16.8)	15.1 (16.5)	NA
Cape Coral	23.2 (23.0)	23.8 (23.3)	10.0-30.0
Shell Point	32.8 (32.7)	31.8 (32.0)	10.0-30.0
Sanibel	34.3 (34.8)	EM ³ (EM)	10.0-30.0

¹Envelope not applicable, ²Envelope is based on a 30-day average, ³Equipment Malfunction.

*Val I75 is temporarily offline due to site construction,

Salinity values are estimated using models developed for this site.

Monitoring data collected by the River, Estuary and Coastal Observing Network of Sanibel-Captiva Conservation Foundation using continuous sensors are summarized in Table 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)	4.60 – 9.23	3.37 – 10.82	1.29 – 3.0
Dissolved Oxygen (mg/l)	3.80 – 7.15	4.14 – 6.37	No Data

The Florida Fish and Wildlife Research Institute reported on May 5, 2017, that *Karenia brevis*, the Florida red tide organism, were not present in samples collected from Lee County.

Water Management Recommendations

The 30-day average salinity at the I-75 Bridge is forecast to exceed 5 with no inflow at S-79, and the daily salinity is forecast to reach 9.0 within two weeks. Lake stage is in the Beneficial Use sub-band of 2008 LORS. The 2008 LORS/Adaptive Protocols recommend up to 300 cfs at S-79 with flow from Lake Okeechobee supplementing as needed. However, a release greater than 650 cfs is forecast to be required to achieve a 30-day average salinity below 5 at the I-75 Bridge.

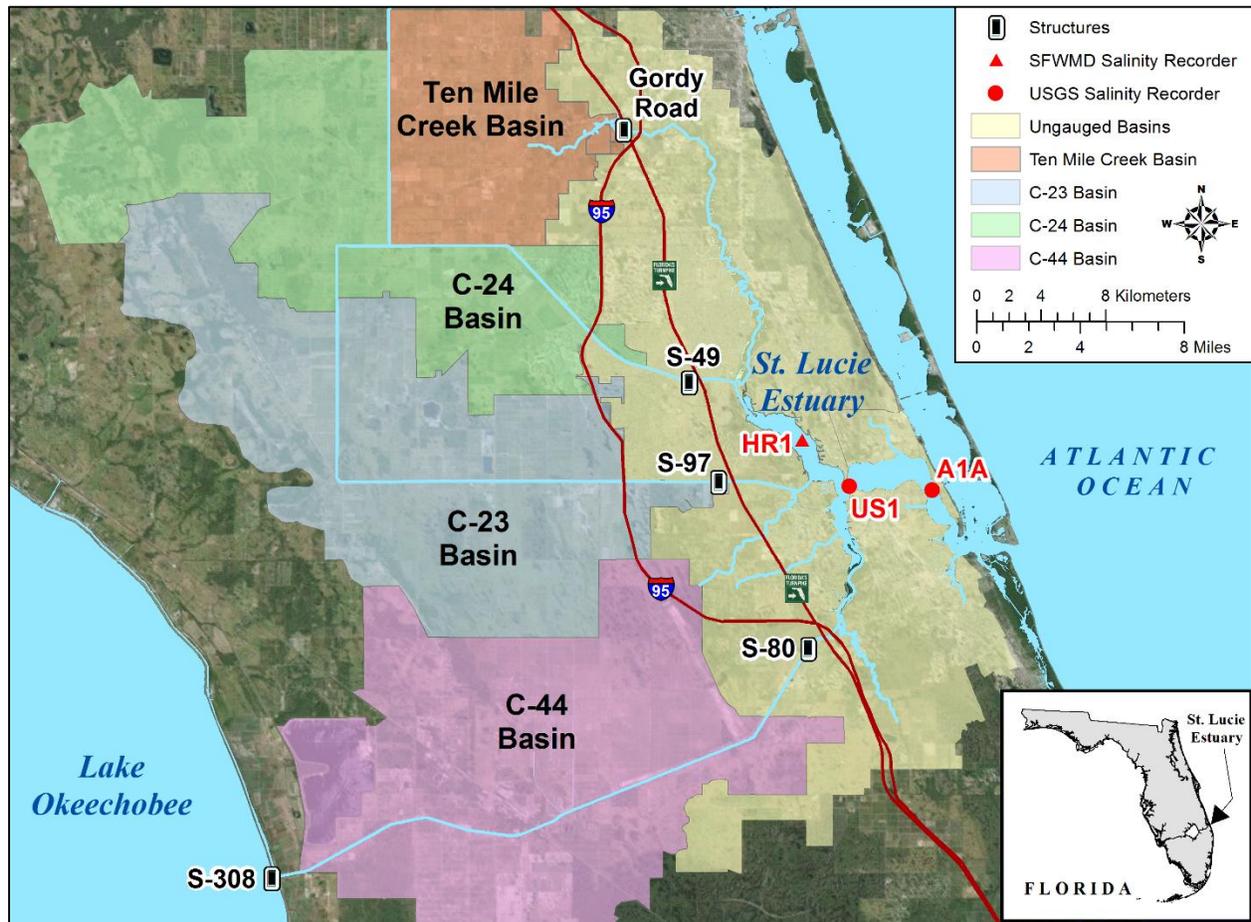


Figure 1. Basins, water control structures, and salinity monitoring for the St. Lucie Estuary.

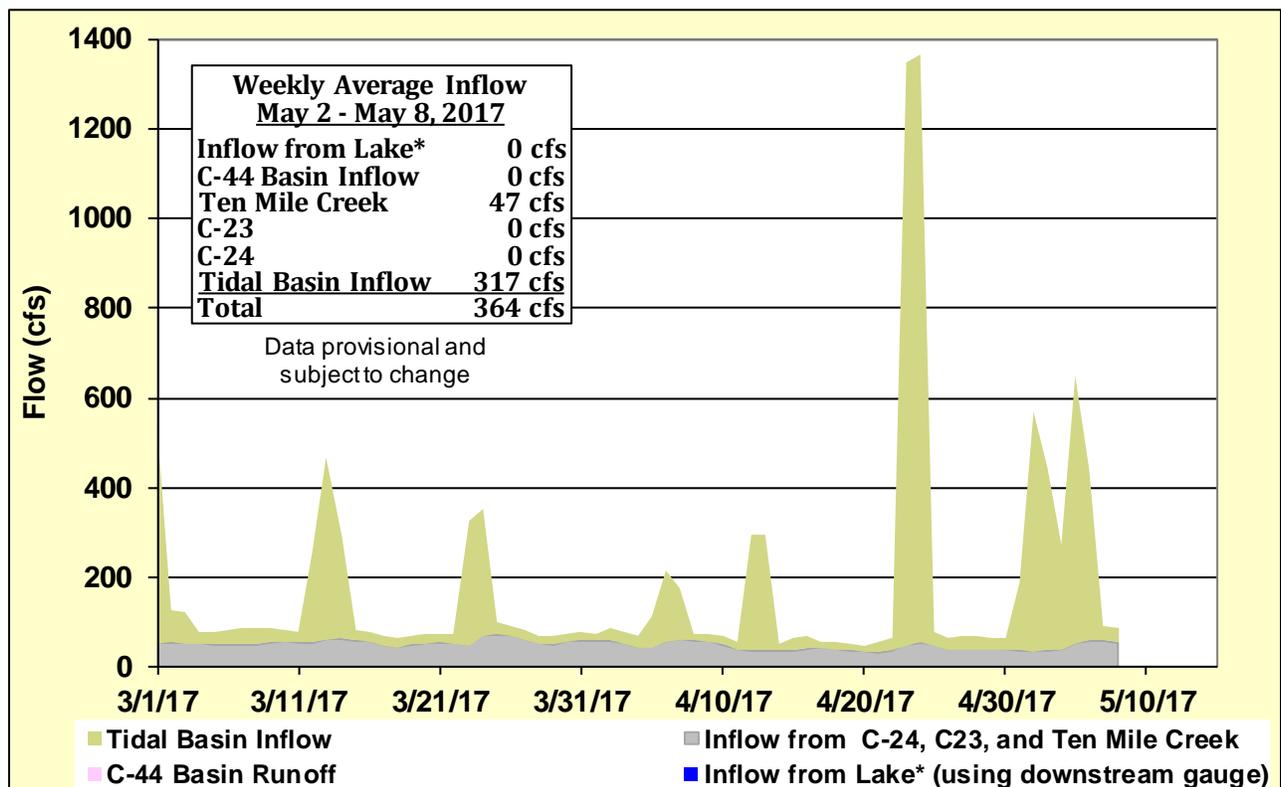


Figure 2. Estimated surface freshwater inflows from Lake Okeechobee and runoff from the C-44, C-23, C-24, Ten Mile Creek, and tidal basins into the St. Lucie Estuary.

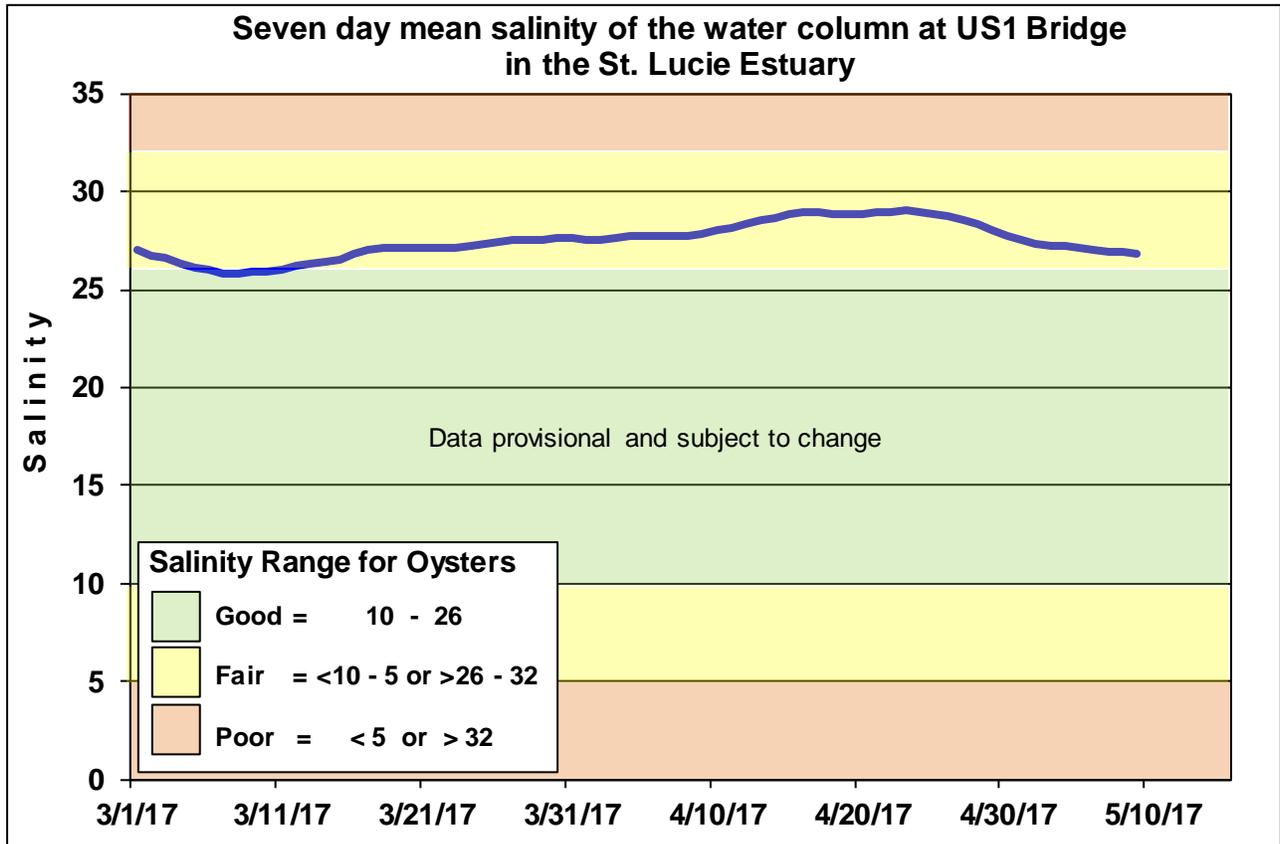


Figure 3. Seven-day mean salinity of the water column at the U.S. Highway 1 Bridge.

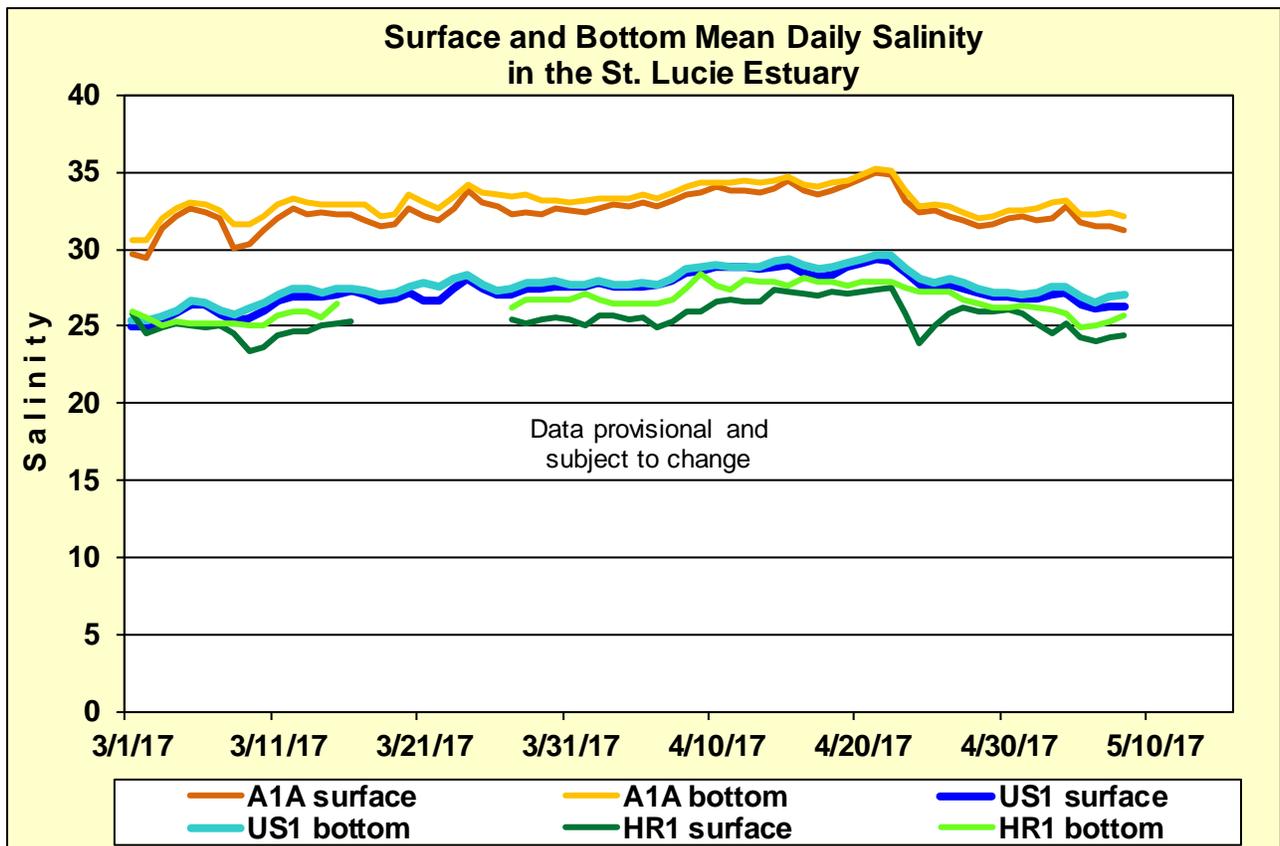


Figure 4. Daily mean salinity at the A1A, US1 and estimated HR1 stations.

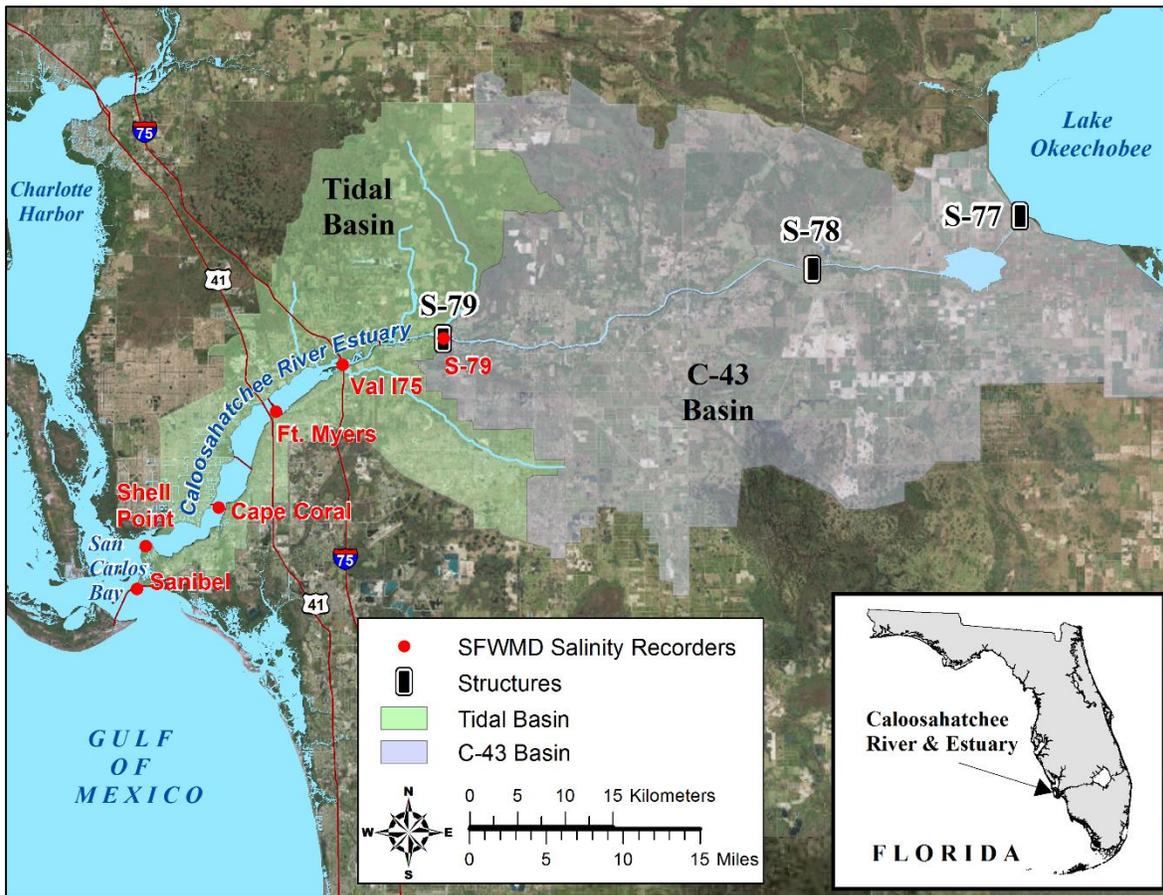


Figure 5. Basins, water control structures, and salinity monitoring for the Caloosahatchee Estuary.

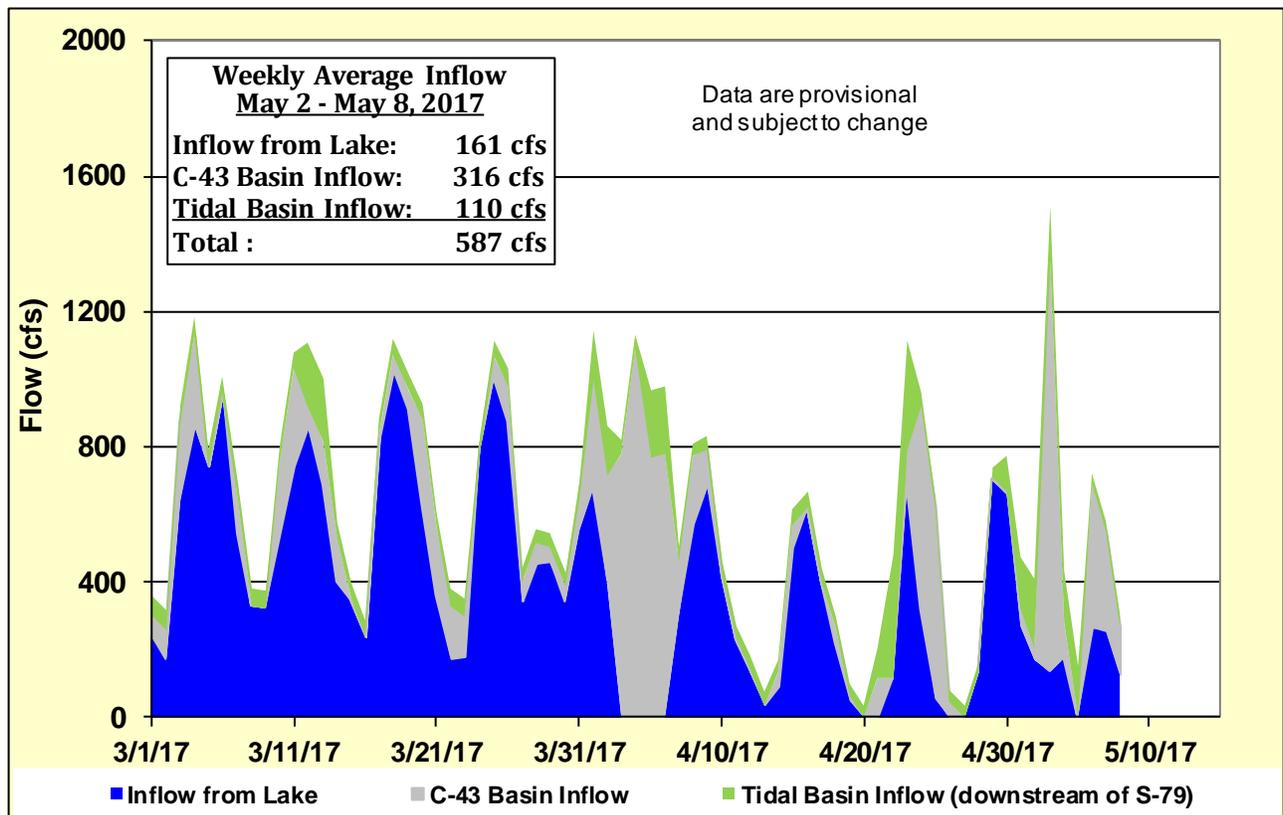


Figure 6. Freshwater inflows from Lake Okeechobee, runoff from the C-43 basin, and tributaries in the tidal basin into the Caloosahatchee River Estuary.

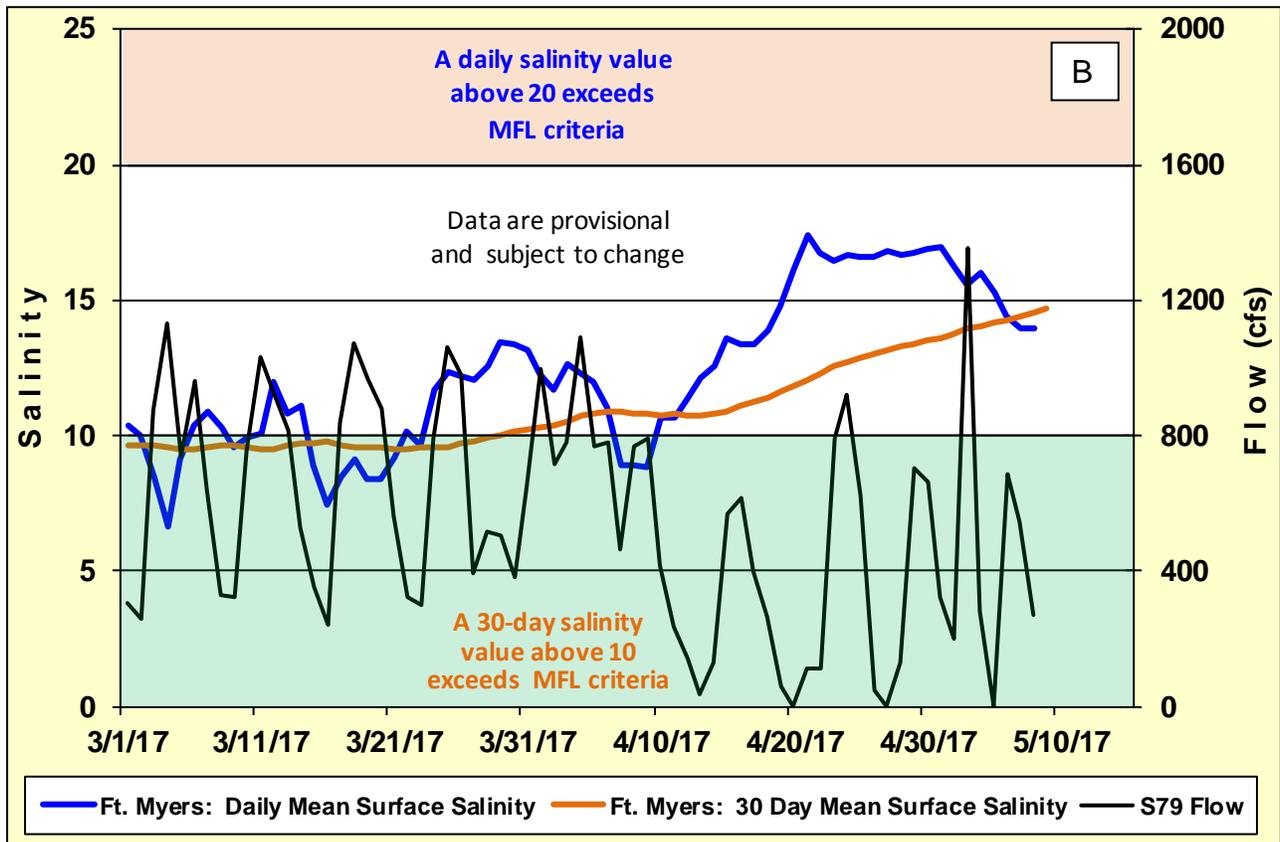
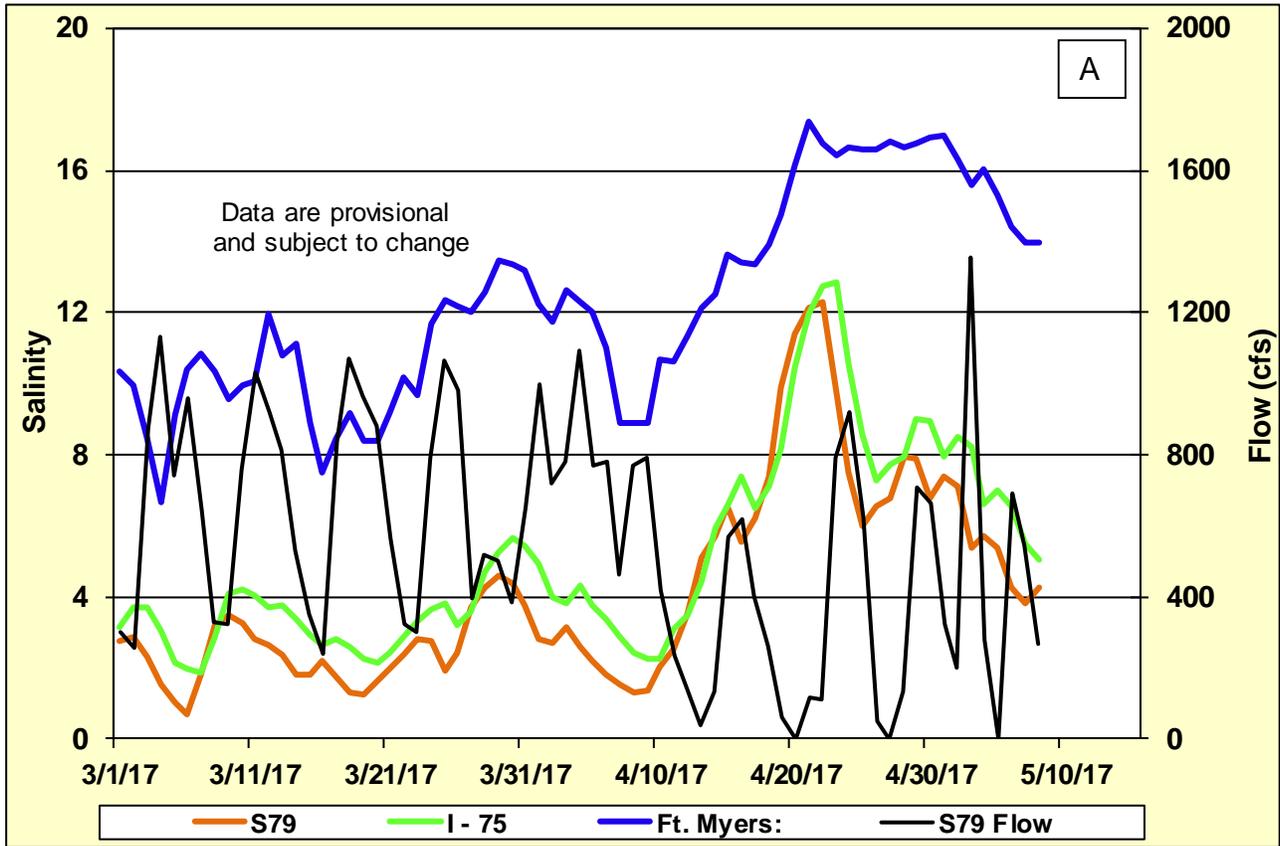


Figure 7. Daily mean flows at S-79 and salinity at upper estuary monitoring stations (A) and 30-day moving average salinity at Ft. Myers (B).

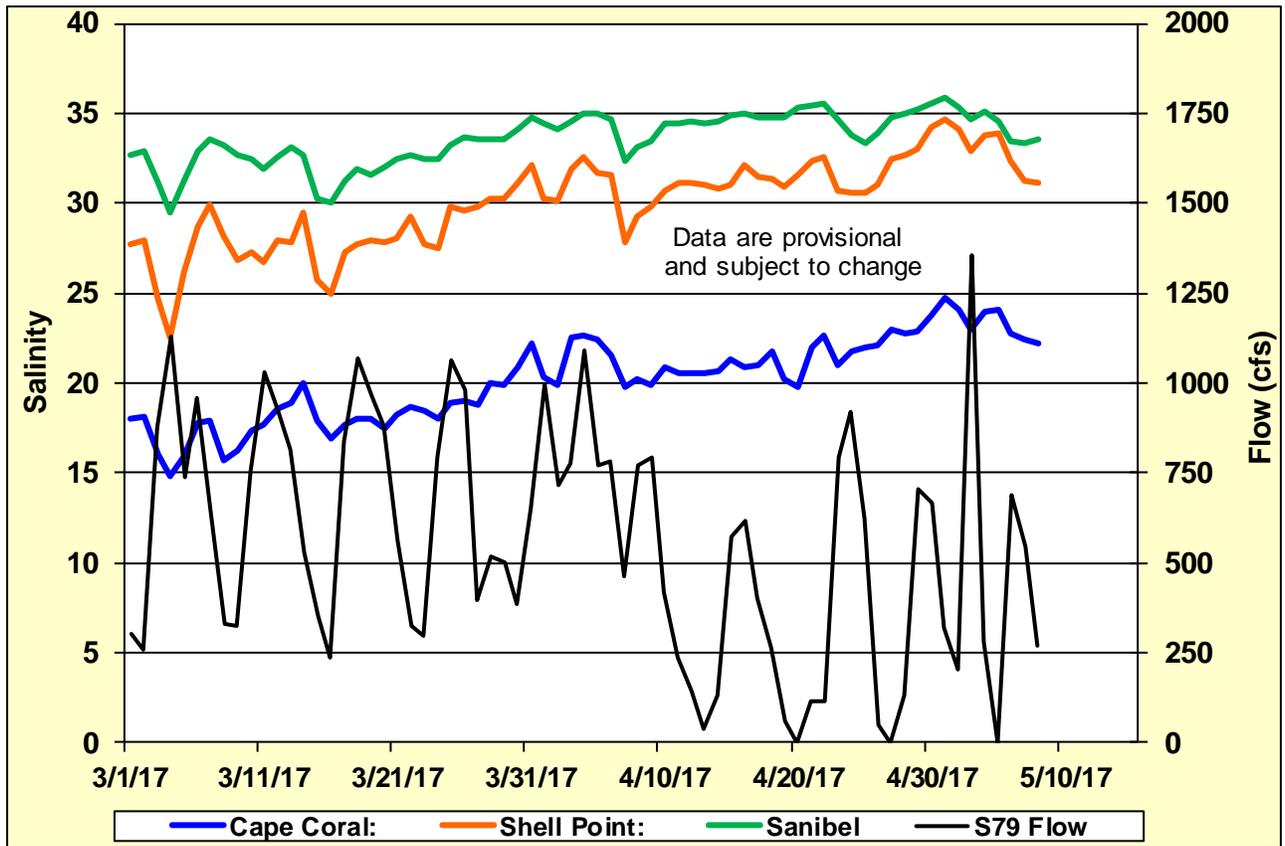


Figure 8. Daily mean flows at S-79 and salinity at lower estuary stations.

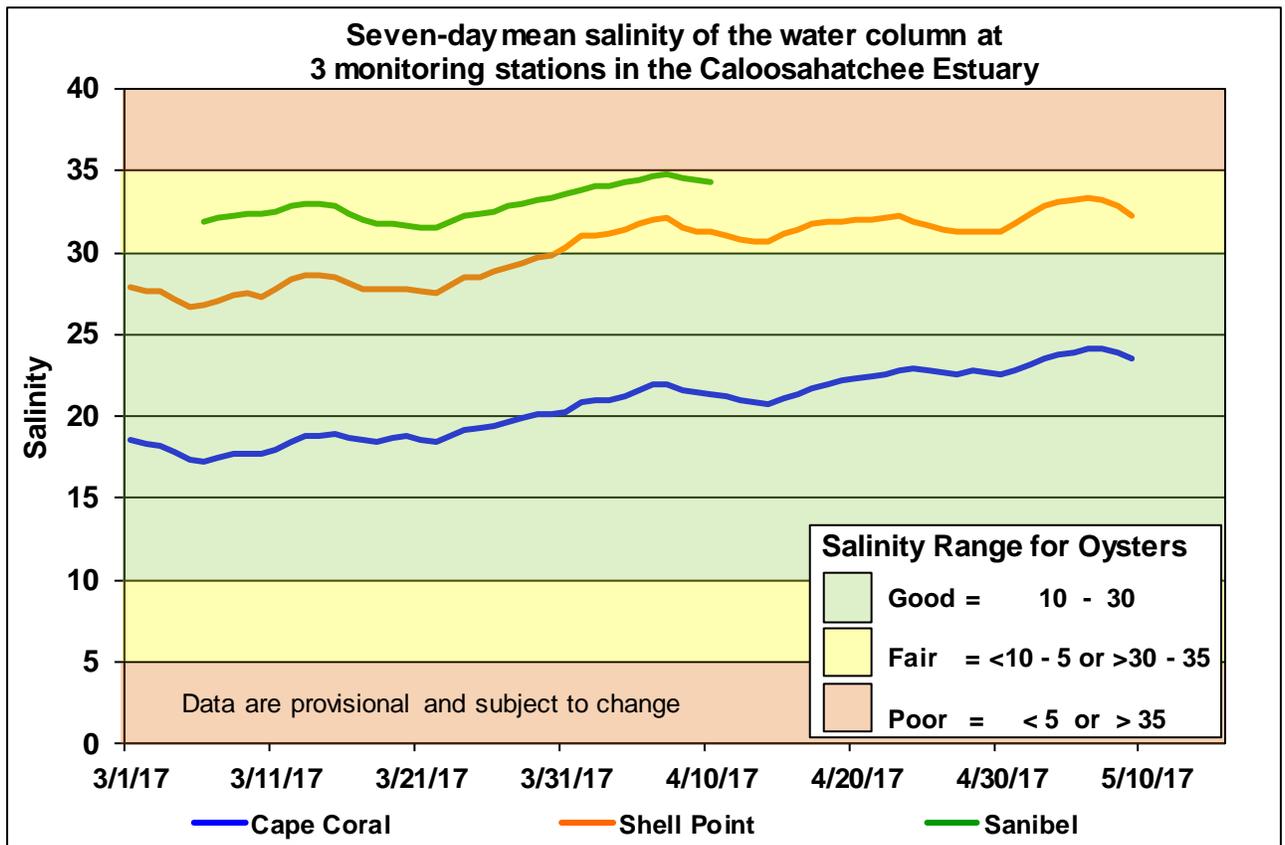


Figure 9. Seven-day mean salinity at Cape Coral Bridge, Shell Point and Sanibel Bridge monitoring stations.

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

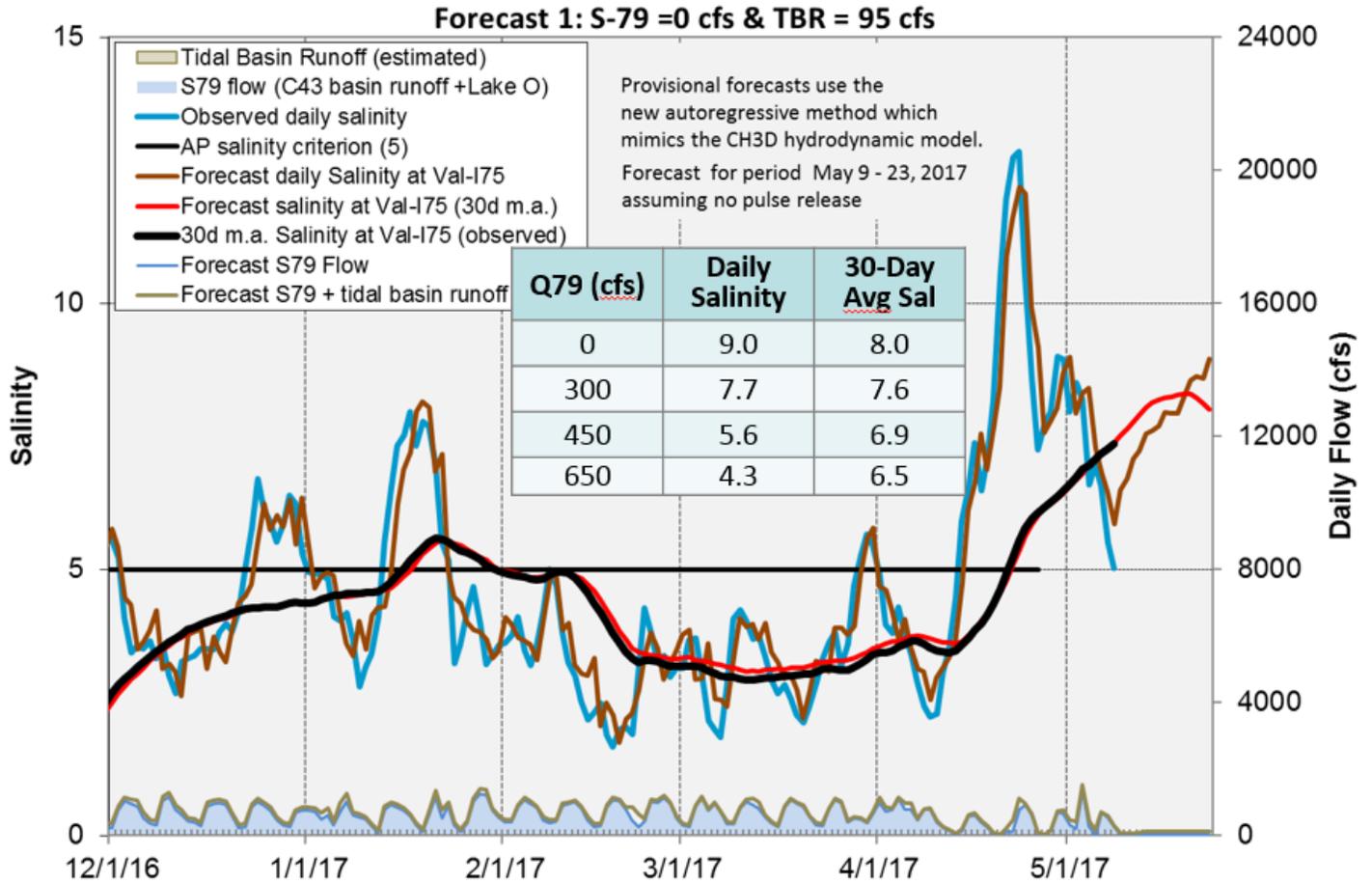


Figure 10. 14-day salinity forecast at Val I-75 assuming no releases at S-79.

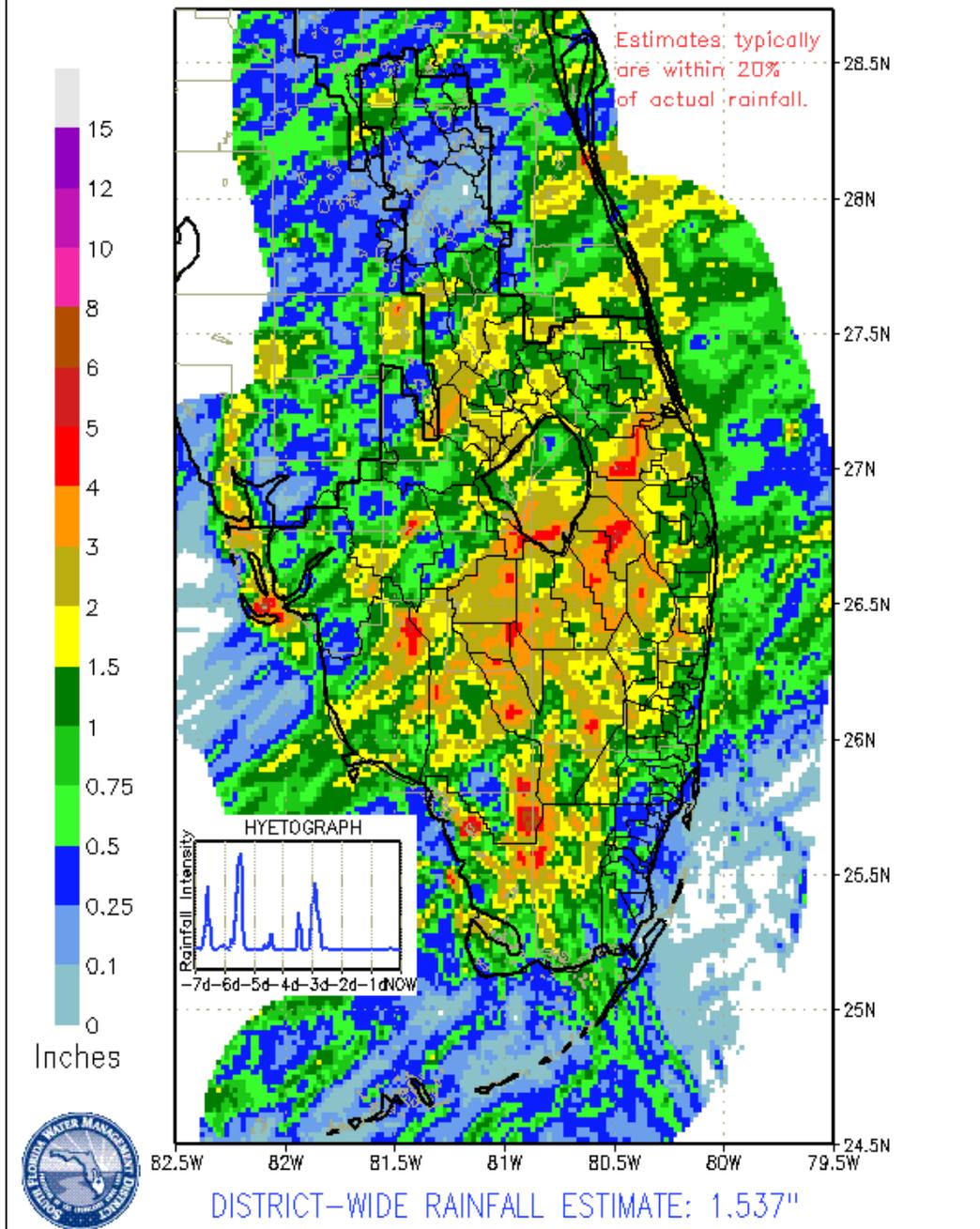
EVERGLADES

District wide rainfall averaged over 1.5 inches over the last week resulting in a stage reversal (the exception being WCA-2B).

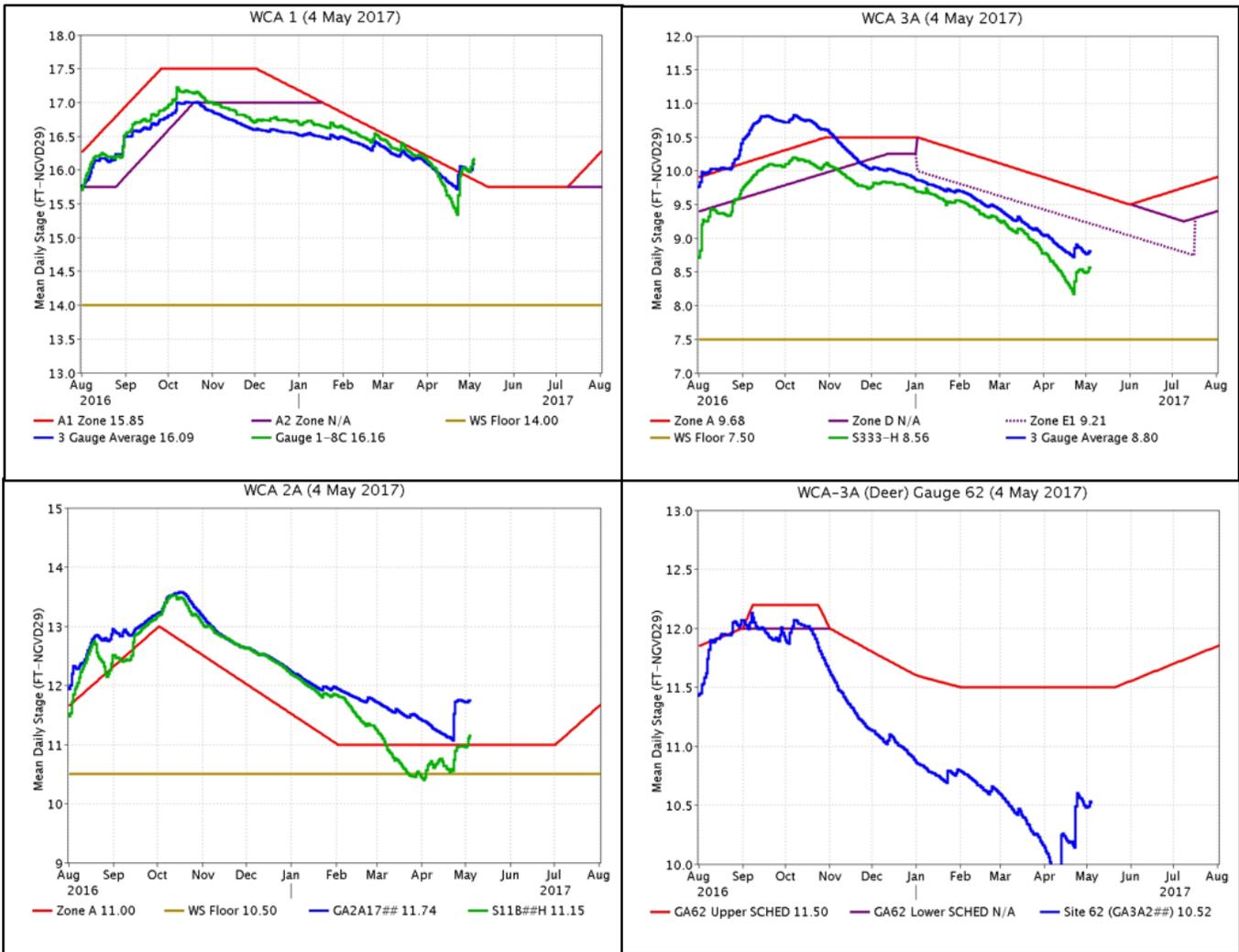
Everglades Region	Rainfall (Inches)	Stage Change (feet)	
WCA-1	2.38	0.17	<div style="display: flex; flex-direction: column; align-items: center;"> <div style="background-color: #ccffcc; width: 20px; height: 10px; margin-bottom: 5px;"></div> Good <div style="background-color: #ffff00; width: 20px; height: 10px; margin-bottom: 5px;"></div> Fair <div style="background-color: #ffcccc; width: 20px; height: 10px;"></div> Poor </div>
WCA-2A	1.86	0.02	
WCA-2B	1.56	-0.02	
WCA-3A	2.17	0.04	
WCA-3B	1.65	0.11	
ENP	1.55	0.05	

SFWMD PROVISIONAL RAINDAR 7-DAY RAINFALL ESTIMATES

FROM: 0500 EST, 05/01/2017 THROUGH: 0500 EST, 05/08/2017



Regulation Schedules: WCA-1 stage increased from 0.09 feet above zone A1 last week to 0.24 above this week. WCA-2A the marsh stage at gauge GA2A17 increased to 0.74 feet and the canal stage measured at the headwaters of S11B rose to 0.15 above zone A. WCA-3A three-gauge average is 0.41 feet below zone E1. WCA-3A at gauge 62 (Northwest corner) is .98 feet below schedule.

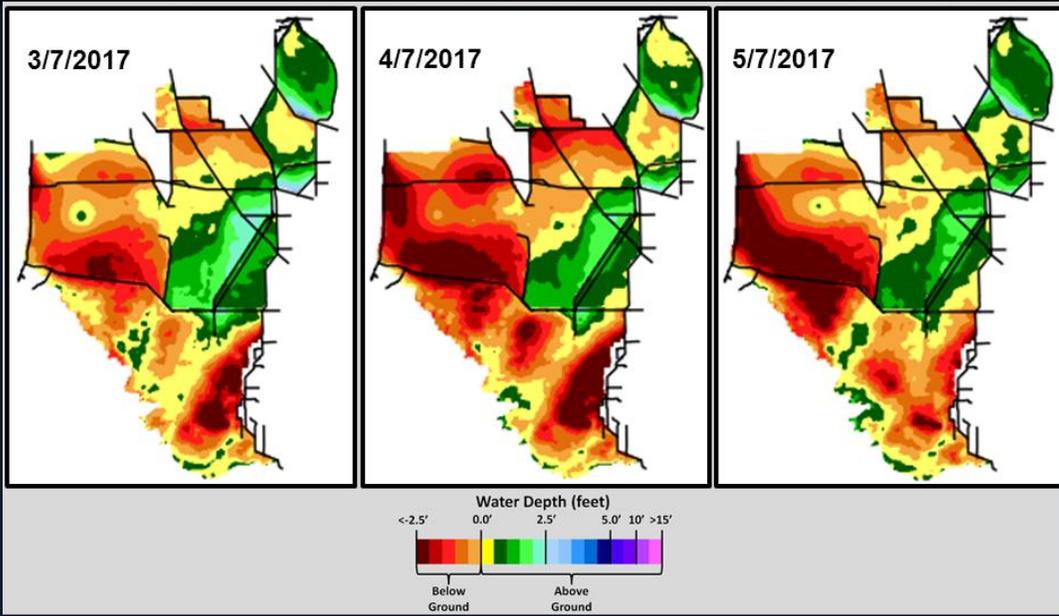


Blue – wetlands
Green – canals

Water Depths and Changes: This week's water depths at monitored gauges other than in WCA-2B range from -0.17 feet (northeast Everglades National Park {ENP}) to 1.32 feet (WCA-1). Over the last week individual gauge changes ranged from -0.05 feet (WCA-2B) to +0.31 feet (WCA1). Most areas are wetter than one month and one week ago. Note: The gauge in Northeast ENP is at its minimum operating range and has been going lower than its range this past week.



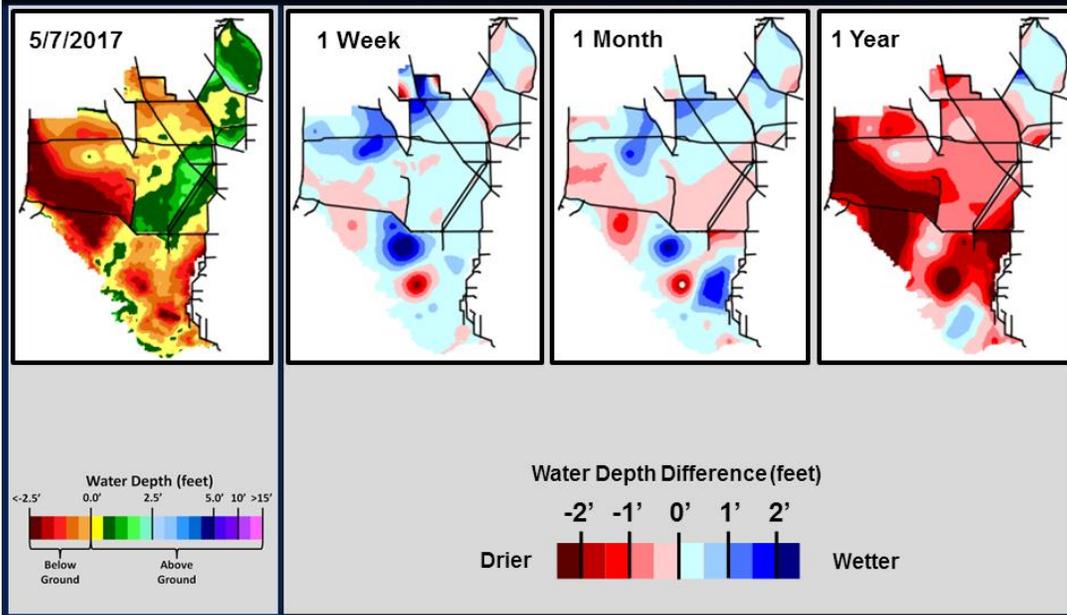
SFWDAT Water Depth Monthly Snapshots



South Florida Water Depth Assessment Tool (SFWDAT)



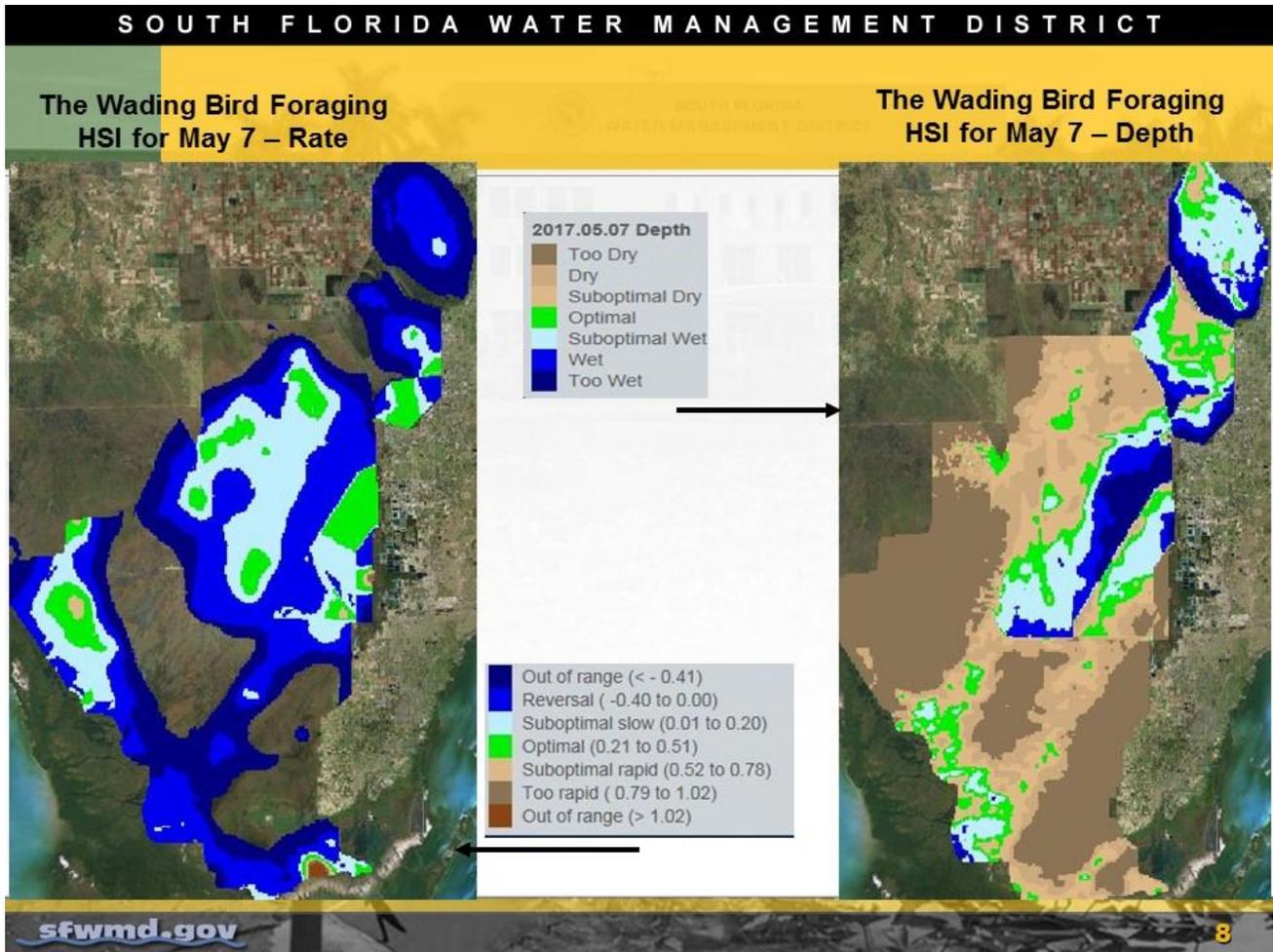
SFWDAT Everglades Difference Maps (Present - Past)



South Florida Water Depth Assessment Tool (SFWDAT)

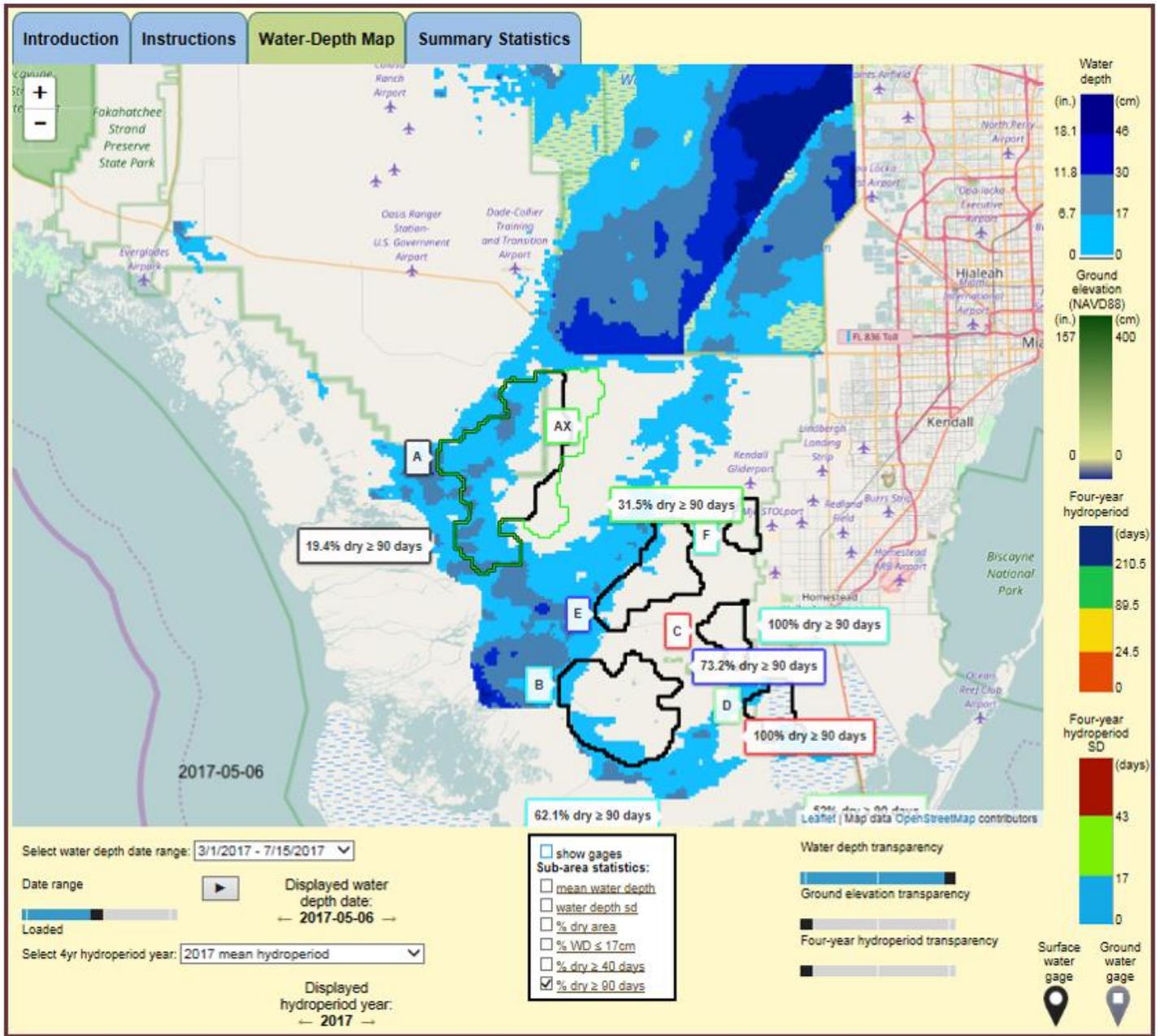
Wading Birds: Based on May 8 flight. Since the rain event of April 23 no birds have been observed foraging in WCA-1 or WCA-2A, and as of yesterday WCA-1 had lost about 4,500 ibis nests (2,500 nests remain). The fate of the 10,000 nest colony in NE WCA-3A is uncertain. The colony continues to support thousands of chicks but there are many vultures present (a sign of abandonment) and there appear to be many fewer chicks than expected given the original number of nests.

In contrast, conditions in WCA-3A South remain excellent for foraging birds, despite moderate reversals. For the past two weeks large foraging flocks of herons, egrets, storks and spoonbills (no ibis) have been observed in the central and western region of WCA-3A South. Because of these conditions, wood storks in the area have healthy nestlings that continue to fledge in large numbers. Post fledging survival is strongly linked to foraging conditions at the time of fledging so the probability that these young storks will survive to adulthood is also relatively high.



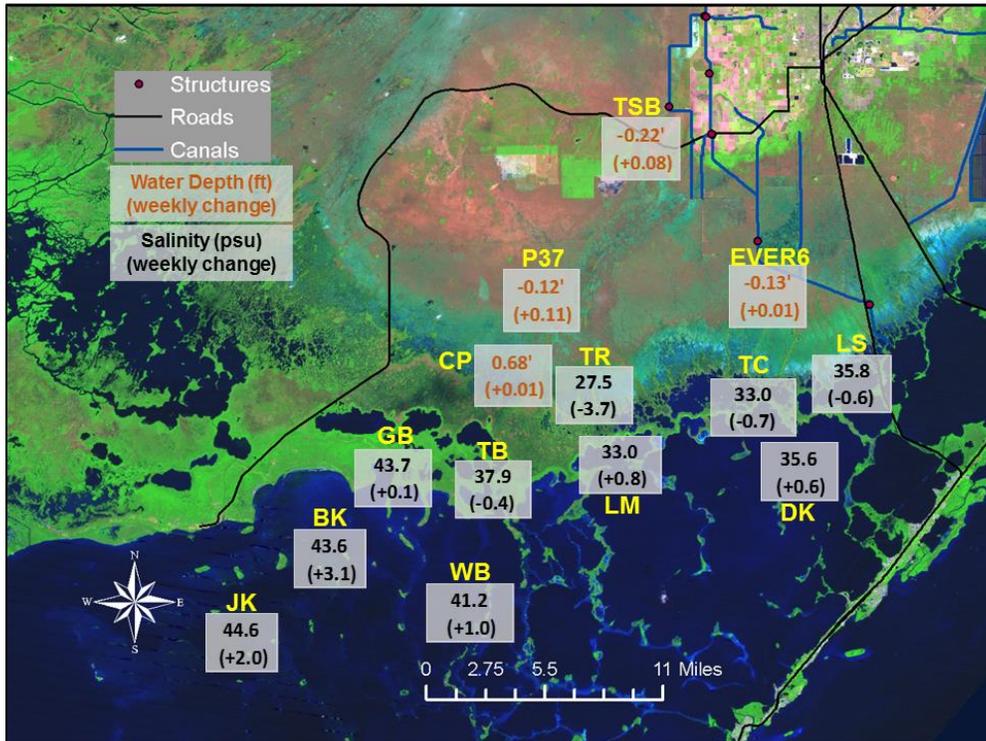
Cape Sable Seaside Sparrow: Conditions remain good for Cape Sable Seaside Sparrow nesting and the birds are responding with 13 confirmed nests as of May 5. The reversals within the subpopulations from the previous week’s rain were mostly below ground so did not affect the birds nesting. The eastern areas (subpops C and F) may be getting too dry (100% of these subpopulation areas have been dry for more than 40 days) and could benefit from some water input.

Cape Sable Seaside Sparrow (CSSS) Viewer



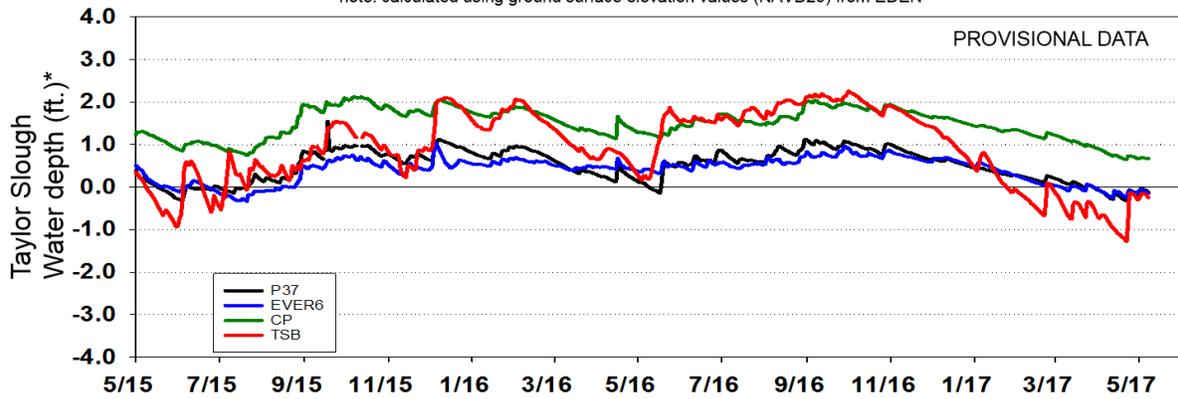
Taylor Slough: Water levels increased +0.01 to +0.11 feet in Taylor Slough. Southwestern Taylor Slough is the only area that is currently drier than a month ago. Compared to historic averages, water levels are mostly two to five inches above average.

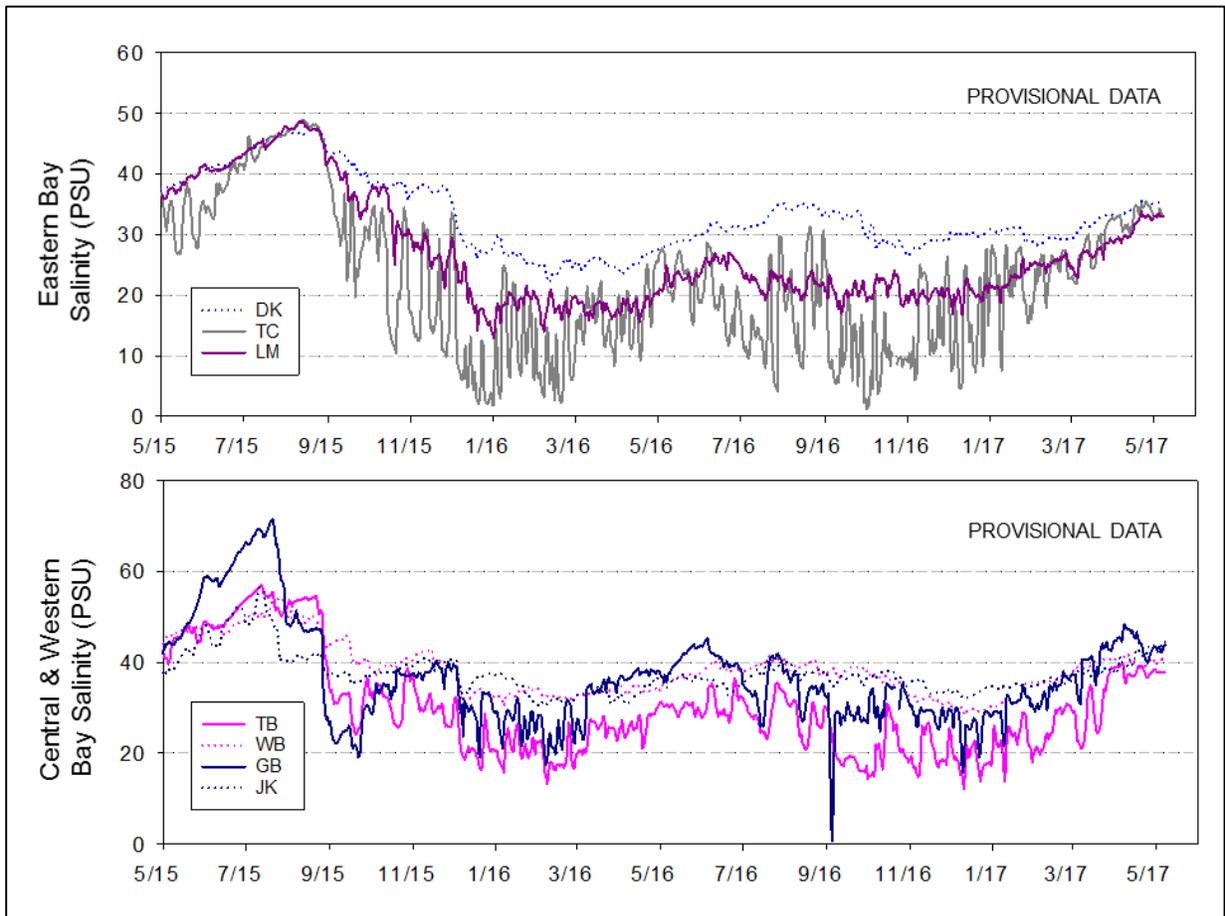
Florida Bay Salinity: Salinities in the Bay are currently average in the western nearshore areas, to +5 psu above average in the western bay. Salinities currently range from 33 psu in the eastern nearshore to 45 psu in the western bay area. Weekly changes ranged from -0.7 psu to +3.1 psu.



Taylor Slough Water Depths

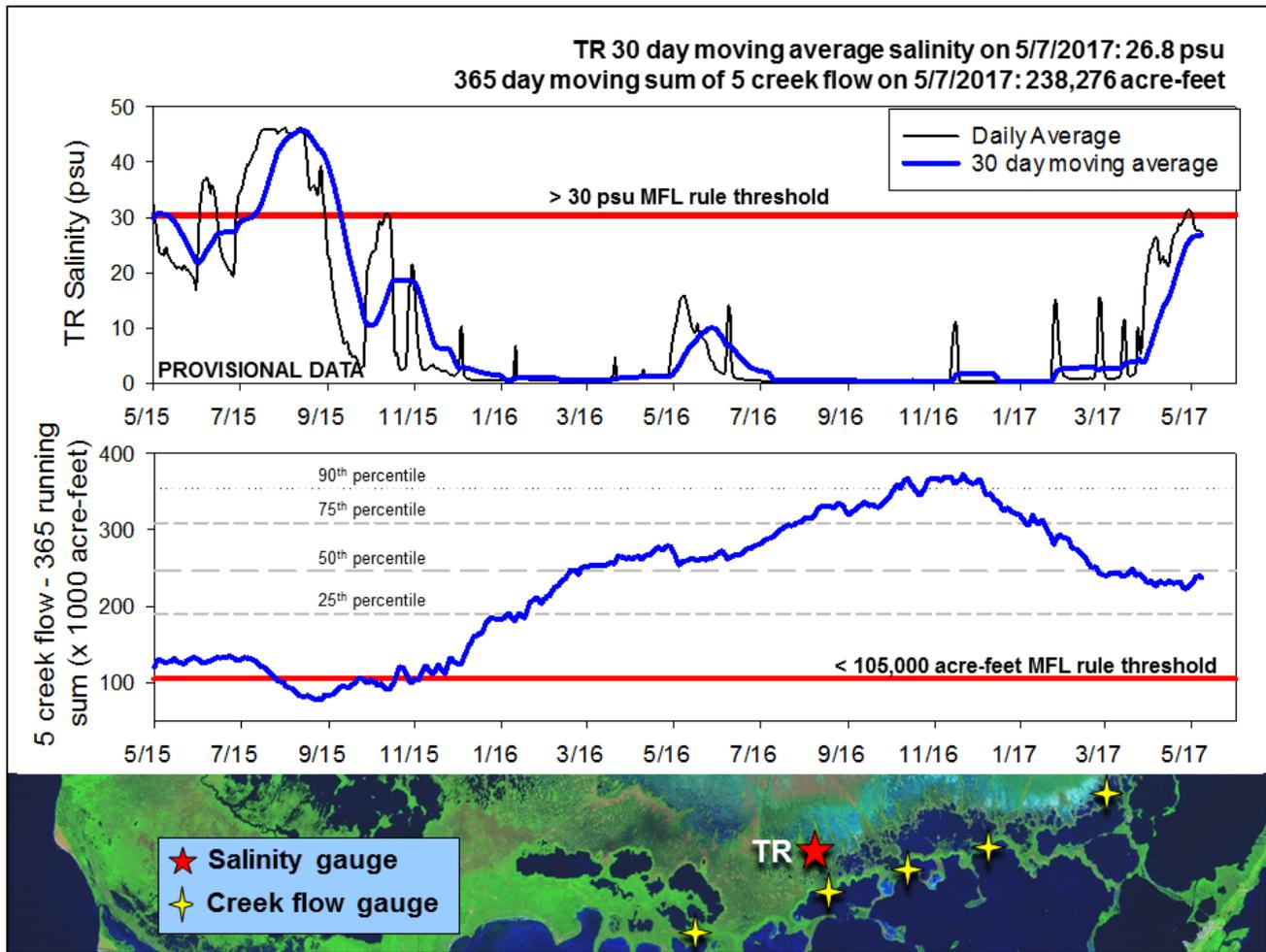
*note: calculated using ground surface elevation values (NAVD29) from EDEN





Florida Bay MFL: Mangrove zone salinities have been fairly stable this past week. The daily average salinity at TR has been between 27 and 28 psu for the last six days. The 30- day moving average increased +0.8 to end the week at 26.8 psu.

The weekly creek flow from the five creeks was almost +2,200 acre-feet, with only one day from the last week experiencing negative daily flows. The 365-day moving sum of flow from the five creeks identified by stars on the map increased about +10,000 acre-feet to end at 238,276 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

- Curtailing inputs into WCA-1 is recommended at this time in order to reestablish a natural recession rate (up to .15 feet per week). This could serve to prevent further nest abandonment in that area. At this point foraging conditions system wide are such that WCA-2A and WCA-3A North would be better suited ecologically to handle flows currently being discharged into WCA-1, if possible. Moderating accession in WCA-1 via outflow at the S-10 structures is recommended.
- Using the S-11 structure to moderate accession in WCA-2A is recommended.
- Maintaining the optimal foraging conditions in Central and Southern WCA-3A by preserving a natural recession rate (-.05 to -.09 feet per week) is recommended.

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

Everglades Ecological Recommendations, May 9th, 2017 (red is new)

Area	Current Condition	Cause(s)	Recommendation	Reasons
WCA-1	Stages increased 0.04' to 0.31'	Rainfall, ET, management	Operate for dry season conditions and allow natural recession to resume (up to 0.15 ft/wk). Diversion of STA flows to 2A or northern 3A would be beneficial. Releasing inflows through S-10s to moderate ascension is recommended.	Retain water for the upcoming dry season while protecting habitat for apple snail, snail kite and wading bird breeding season.
WCA-2A	Stages increased 0.02'	Rainfall, ET, management	Allow to return to natural recession rates (up to 0.15 ft/wk). Releasing water through S-11s to moderate inflows from the STAs is recommended.	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 changed -0.05' to +0.01'	Rainfall, ET, management	Resume natural recession rates (up to 0.15 ft/wk).	Protect habitat and wildlife. Support apple snails and nesting wading birds.
WCA-3A NE	Stages increased 0.11'	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.	Protect habitat and wildlife. Support apple snails and nesting wading birds and snail kites. Reduce fire risk as water depths are now below ground.
WCA-3A NW	Stages increased 0.03'	Rainfall, ET, management	Water for northern 3A is desired with the priority being northwestern 3A (via the G404) is also desired. NW area is the priority for STA inflows, but flows through S-150 would also be beneficial.	
Central WCA-3A S	Stages increased 0.05'	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). Allow to return to natural recession rates.	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 and snail kite breeding.
Southern WCA-3A S	Stages decreased -0.03'	Rainfall, ET, management		
WCA-3B	Stages increased 0.02' to 0.23'	Rainfall, ET, management	Restrict recession rates to -0.05' to 0.-09' per week.	Protect habitat and wildlife and prepare for wading bird and snail kite breeding season. Provide conditions to support apple snails.
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 wading birds and snail kites.
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 ERTIP 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 increased ranging from +0.01' to +0.11'	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	Average to +5 psu above average	Rain, ET, inflows, wind	Move water southward as possible	Maintain low salinity conditions and prevent early salinity increases.