

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:** June 16, 2015

**SUBJECT:** Weekly Environmental Conditions for Systems Operations

### Summary

Stages in Lakes East Toho, Toho, and Kissimmee-Cypress-Hatchineha (KCH) have increased with rainfall; discharge through S-65 has been maintained at ~400 cfs and at S-65A at approximately the minimum discharge to the Kissimmee River of ~300 cfs +/- 50 cfs; Sunday's average discharge at S-65E was 450 cfs; on Tuesday morning, discharge at S-65E is ~395 cfs. Kissimmee River dissolved oxygen concentration averaged 5.81 mg/L over the past week and 5.56 mg/L on Sunday. Kissimmee River mean floodplain depth is 0.33 feet.

Lake Okeechobee is at 12.60 feet NGVD and is on the border between the Beneficial Use Operational Sub-band and the Base Flow Operational Sub-band. Lake stage is optimal for this time of year. Satellite imagery indicates moderate bloom conditions in portions of the eastern and western nearshore and pelagic zones with the Florida Department of Environmental Protection (FDEP) confirming a bloom at Port Mayaca. The last wading bird survey for the season, conducted on June 11, indicated active use of the marsh for foraging and many birds still on nests.

Flows through S-80 averaged 0 cfs and averaged 2113 cfs at S-79 with almost all flow coming from the watershed due to a storm event. Salinities decreased in both estuaries but were still in the good range for adult oysters at most locations. Salinities continue to be in the fair range at Sanibel, the most downstream portion of the Caloosahatchee estuary. Salinities remain in the good range for tape grass in the upper-Caloosahatchee estuary and are forecast to remain so over the next two weeks, even with 0 cfs flow through S-79.

Rainfall was moderate across the Water Conservation Areas, causing a mix of local ascension and recessions. Water levels remain below ground in northeastern WCA-3A and northeastern Everglades National Park (ENP). Extra water continues to be needed in far northeastern WCA-3A (near the southeastern corner of STA-3/4) to protect the peat soils. The 30-day moving average salinities at the Taylor Slough Minimum Flows and Levels site increased to 26.6 psu. Creek inflow to Florida Bay rose to 133,400 cfs, higher than it has been in six months. The wading bird breeding season is extending later than usual in the WCAs, so water management should attempt to prevent rapid ascension rates if possible. Small herons seem to be nesting well at numbers higher than usual over the last decade.

### Weather Conditions and Forecast

Below average rains likely this week with a focus of afternoon storms west. Deep-layered high pressure over the southeast U.S. is producing a wind and moisture field over the District that is more typical of the mid-July to mid-August doldrums. The last 17 days of June historically yields the wettest of the year with 5 inches of rain on average. Even with the poor medium to long term forecast skill that generally exists

during our wet season, there is low confidence that amount of rain will materialize the second half of June. Following the large-scale pattern that is expected to evolve, look for an increase in showers/storms to near normal levels over the weekend as the deep-layered high weakens and shifts eastward. As a trough pushes through the southeast U.S. early next week, rains could increase to above average in about 10 days. The last week of June would then probably need to be very wet to salvage normal June rainfall.

## **KISSIMMEE BASIN**

### **Kissimmee Basin Rainfall**

The Upper Kissimmee Basin received 2.84 inches of rainfall in the past week and the Lower Basin received 2.94 inches (SFWMD Daily Rainfall Report 6/15/2015).

### **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: 6/16/2015

Water Body	Structure/Site	Discharge (cfs), week's average**	Stage Monitoring Site***	Lake Stage (feet)	Schedule*	Regulation (R) or Target (S or T) Stage (feet)	Sunday Departure (feet)						
							6/14/15	6/7/15	5/31/15	5/24/15	5/17/15	5/10/15	5/3/15
Lakes Hart and Mary Jane	S62	0	LKMJ	59.7	R	60.0	-0.3	-0.5	0.0	-0.1	-0.1	-0.1	-0.2
Lakes Myrtle, Preston, and Joel	S57	0	S57	60.5	R	61.0	-0.5	-0.8	0.0	-0.1	0.0	0.0	-0.1
Alligator Chain	S60	0	ALLI	62.8	R	63.3	-0.5	-1.1	0.2	0.0	0.0	0.1	-0.1
Lake Gentry	S63	0	LKGT	59.9	R	61.0	-1.1	-1.5	0.1	-0.1	0.0	0.0	0.0
East Lake Toho	S59	0	TOHOE	55.3	R	56.5	-1.2	-1.4	0.2	-0.1	-0.2	-0.4	-0.7
Lake Toho	S61	115	TOHOW	52.5	R	53.5	-1.0	-1.4	0.2	-0.1	-0.2	-0.2	-0.5
Lakes Kissimmee, Cypress, and Hatchineha	S65	423	LKISSP, KUB011, LKISSB	49.1	R	51.0	-1.9	-2.1	0.0	-0.2	-0.5	-0.7	-0.6

\* 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 11. Kissimmee River floodplain stages at selected stations are shown in Figure 12.

**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: 6/16/2015

Metric	Location	Sunday's 1-day average	Weekly Average**								
			6/14/15	6/7/15	5/31/15	5/24/15	5/17/15	5/10/15	5/3/15	4/26/15	4/19/15
Discharge (cfs)	S-65	427	423	392	421	421	425	837	2672	4174	2406
Discharge (cfs)	S-65A	335	331	285	285	285	288	672	2572	4181	2104
Discharge (cfs)	S-65C	650	533	390	450	450	613	2101	3389	2820	1443
Headwater stage (feet NGVD)		34.0	33.5	33.3	33.9	33.9	34.5	35.3	35.4	35.5	35.4
Discharge (cfs)	S-65D****	655	628	454	558	558	728	2257	3669	2990	1514
Discharge (cfs)	S-65E	450	468	285	380	380	487	2081	3529	2773	1336
DO concentration (mg/L)***	Phase I river channel	5.56	5.81	6.27	6.35	6.36	5.86	4.05	2.56	2.73	4.99
Mean depth (feet)*	Phase I floodplain	0.33	N/A	0.12	0.14	0.23	0.39	0.73	1.72	2.09	1.16

\* 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 of KRBN and PC62 through May 21,2015; is for PC62 only for May 22-June 1; and is the average for PC62 and PC33 starting June 2..

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

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

N/A Not applicable or data not available.

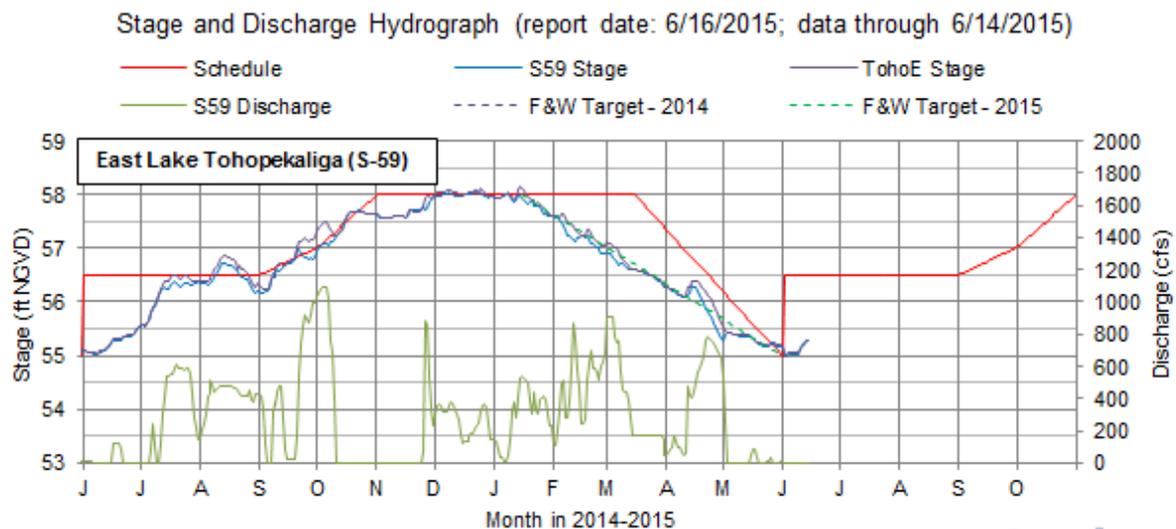
DATA ARE PROVISIONAL

## Water Management Recommendations

### **Kissimmee Basin Recommendations and Operational Actions**

<b>Date</b>	<b>Recommendation</b>	<b>Purpose</b>	<b>Outcome</b>	<b>Source</b>
6/16/2015	No new recommendations.			
6/9/2015	No new recommendations.			
6/1/2015	For S65/65A maintain 300 cfs as long as stage is above 48.5 ft. When stage approaches 50.5 ft begin transitioning to 1400 cfs using the rampup/rampdown guidelines in standing recommendation.	Allow KCH lake stage to rise	Implemented	KB Operations
5/29/2015	2015 KB Wet Season Standing Recommendations provided to Operations Control	Comprehensive wet season guidance	Implemented	KB Operations
5/26/2015	No new recommendations.			
5/19/2015	No new recommendations.			
5/12/2015	No new recommendations.			
5/5/2015	No new recommendations.			
4/7/2015	No new recommendations.			
3/31/2015	No new recommendations.			
3/24/2015	No new recommendations.			
3/17/2015	No new recommendations.			
3/9/2015	No new recommendations.			
3/4/2015	No new recommendations.			
2/23/2015	No new recommendations.			
2/17/2015	No new recommendations.			
2/10/2015	No new recommendations.			
2/3/2015	No new recommendations.			
1/27/2015	Starting today, follow a new SK recession line for KCH, which will be drawn from today's stage to regulation stage on March 1.	Snail kite recession in KCH	Implemented	
1/15/2015	Continue to follow original FWS/FWC recommendation for Lake Kissimmee (KCH).	High stage target; snail kite recession	Implemented	FWS/FWC
1/15/2015	S-65 (KCH) Use an adaptive approach that balances stage above 52 ft against discharge above 1200 cfs. Initially, slowly reduce stage (currently above schedule) to 52 feet if needed over the remainder of January to avoid a discharge rampdown below 1200 cfs, while keeping stage in KCH above 52 feet for at least 60 days. Hold discharge at S65/S65A at or above 1200 cfs as possible subject to the 52 ft stage request. Follow the KCH recession line starting in February that was proposed by FWC/FWS, subject to buffer needs for flood control operations. Follow rate of increase and decrease guidelines from draft seasonal standing recommendation.	Attempt to achieve all goals for KCH considering new rainfall and runoff estimates, forecasts, and modeling.  Implement recessions on Toho and East as requested.	Implemented	KRREP
	Toho and East Use the snail kite recession lines proposed by FWC/FWS for Toho and East, starting on Jan 15			

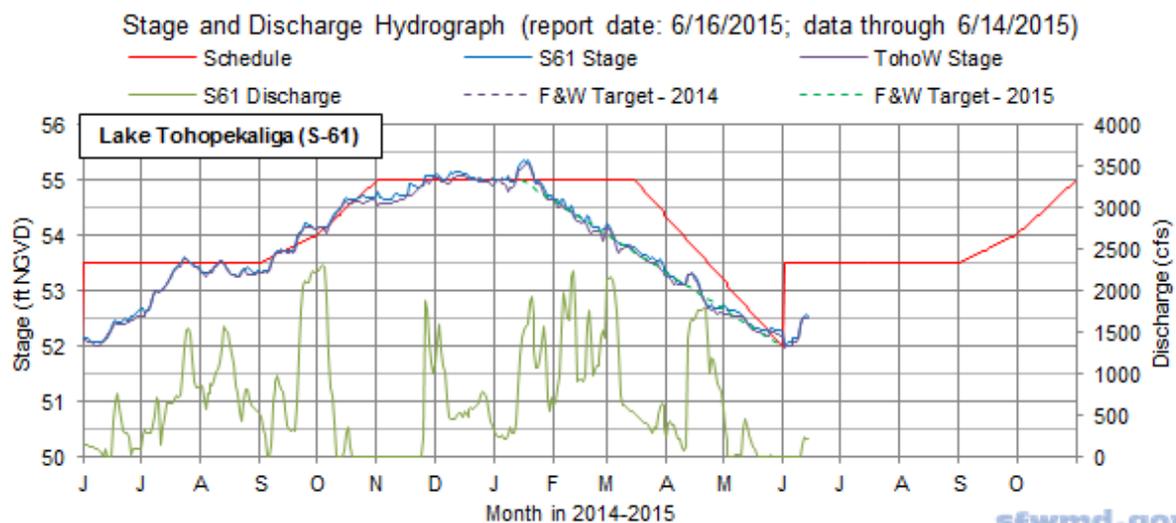
# KCOL Hydrographs (through Sunday midnight)



\*Departures from schedule are calculated using TohoE stage.

[sfwmd.gov](http://sfwmd.gov)

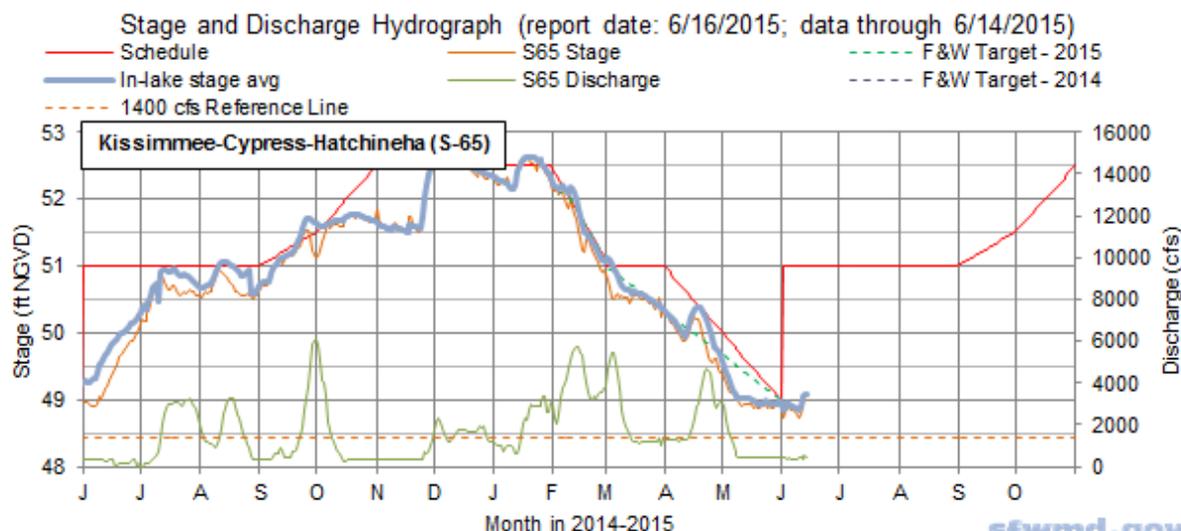
Figure 1.



\*Departures from schedule are calculated using TohoW stage.

[sfwmd.gov](http://sfwmd.gov)

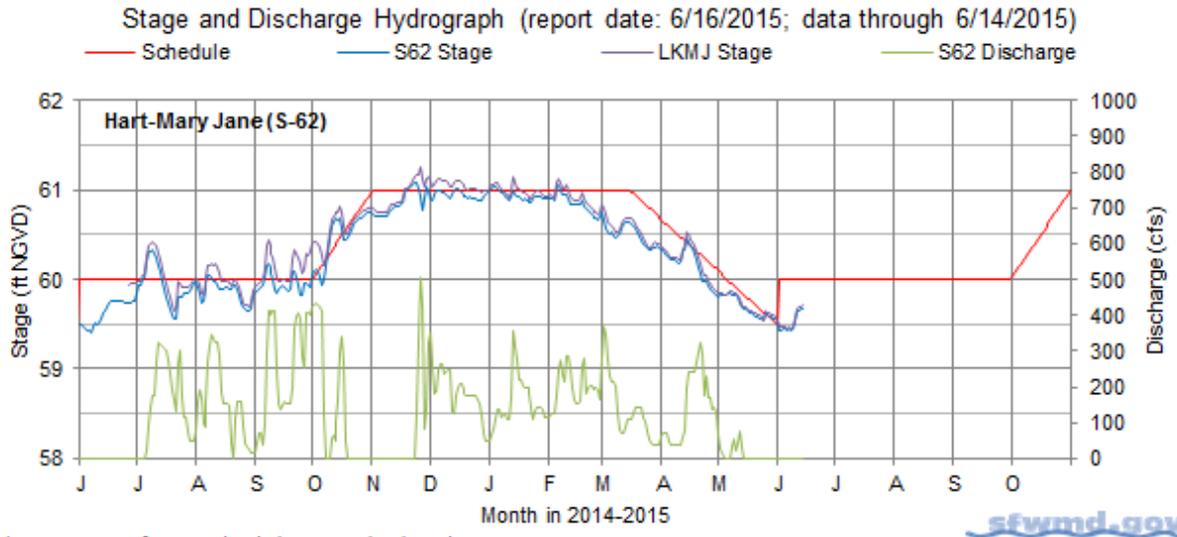
Figure 2.



\*Schedule departures use In-lake stage avg (L KISS, KUB011, and LKIS5B).

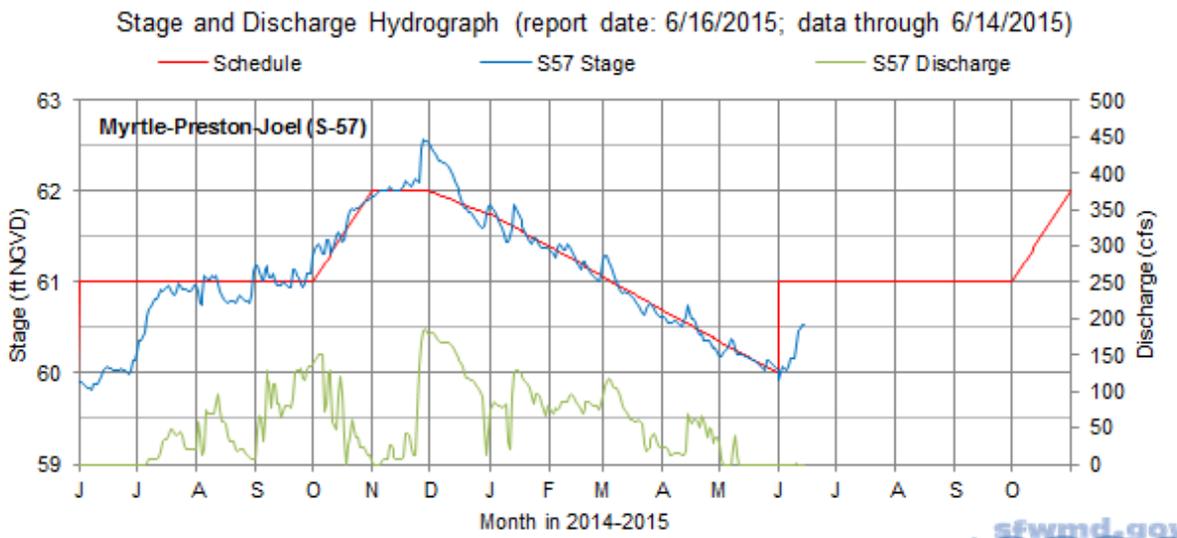
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Figure 3.



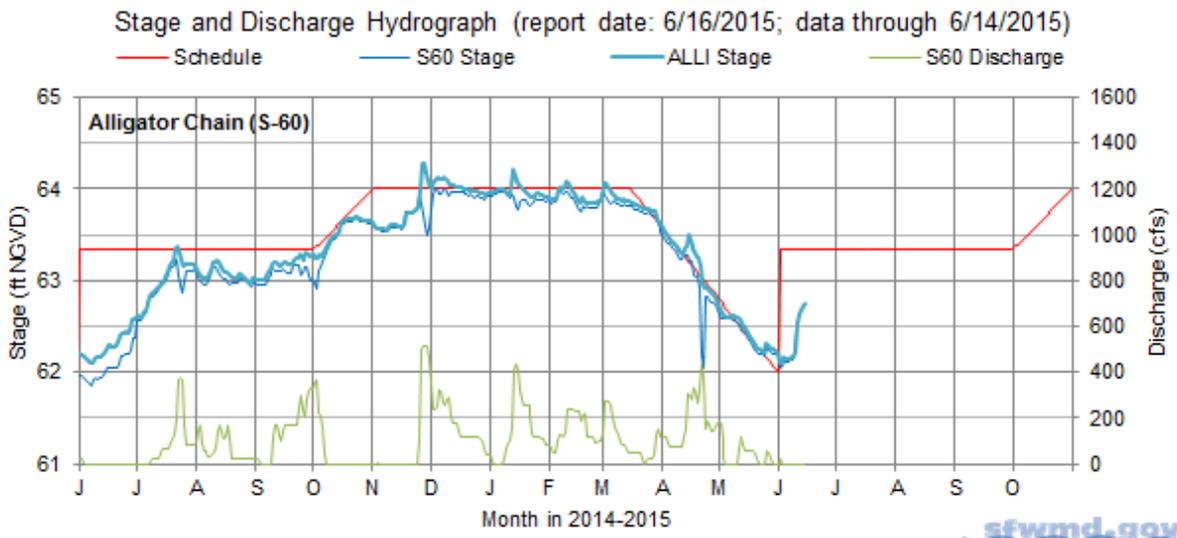
\*Departures from schedule are calculated using LKMJ stage.

Figure 4.



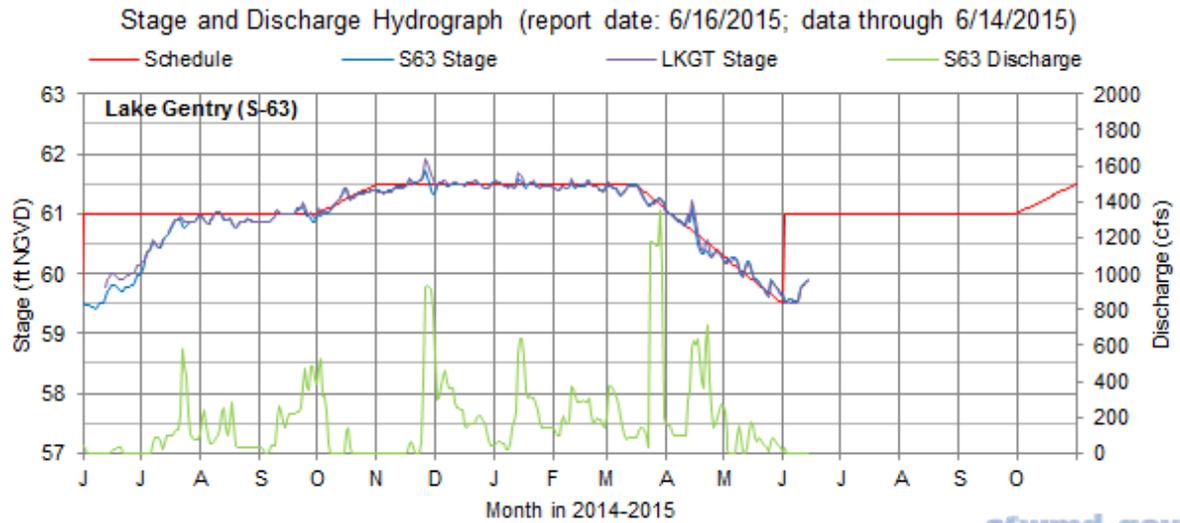
\*Departures from schedule are calculated using S57 stage.

Figure 5.



\*Departures from schedule are calculated using ALLI stage.

Figure 6.



\*Departures from schedule are calculated using LKGT stage.

Figure 7.

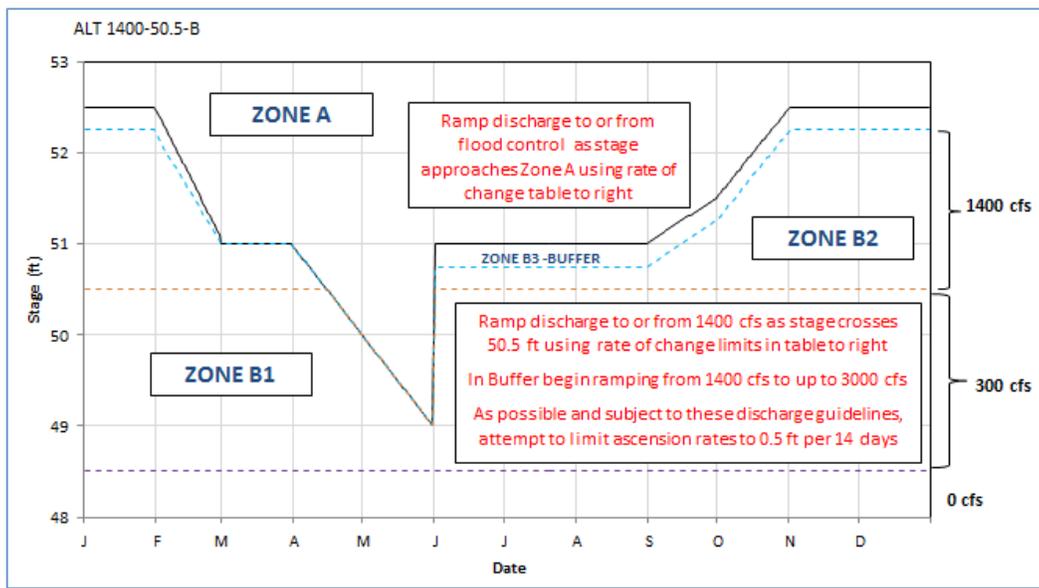
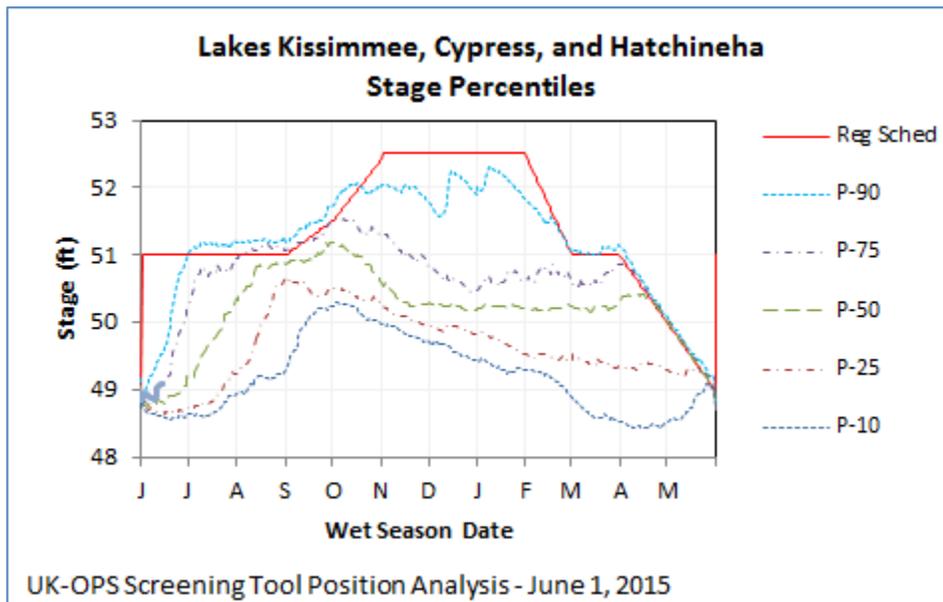


Table 1. Discharge Rate of Change Limits for S65/S65A

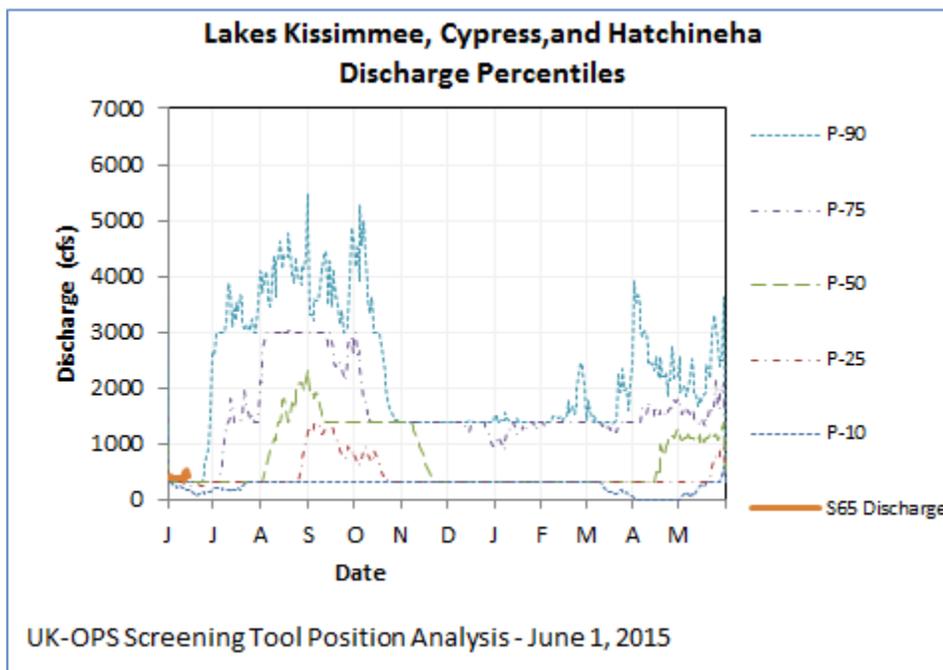
**\*\*Rate limits apply only in Zone B\*\***

	Q (cfs)	Maximum rate of increase (cfs/day)	Maximum rate of decrease (cfs/day)
Zone B	0-300	50	-50
	300-1400	150	-75
	1400-2500	300	-300
	2500-3000	1000	-1000
Zone A	No limits		

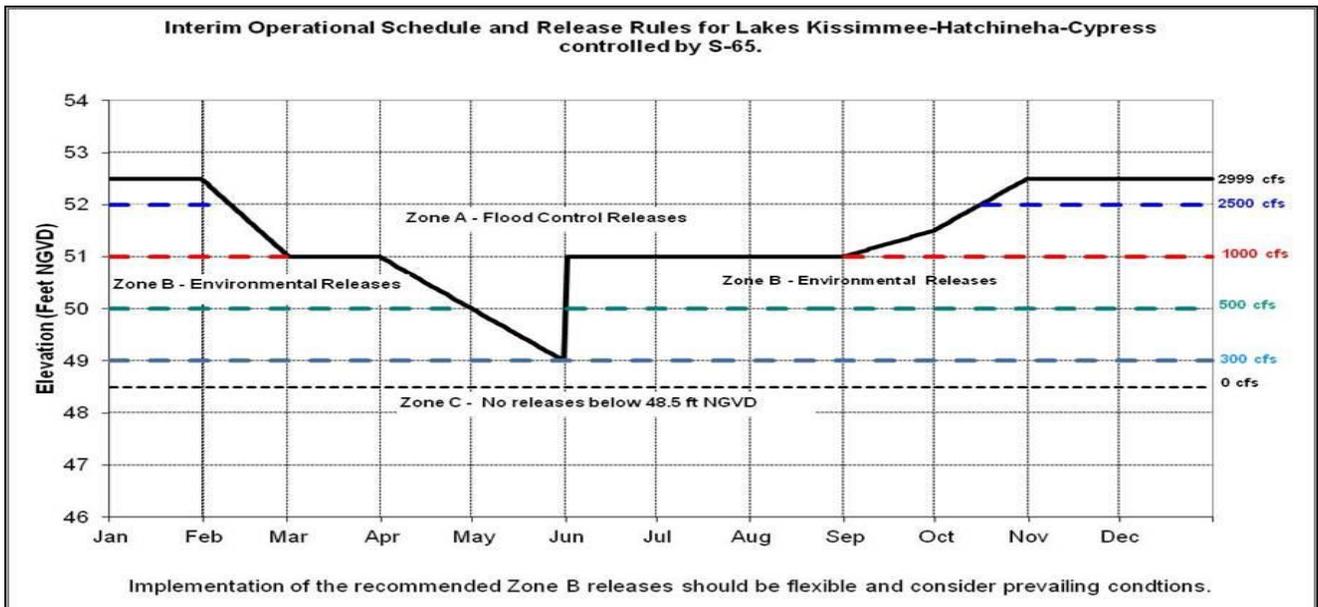
Figure 8a. Final S65 operational plan for Wet Season 2015.



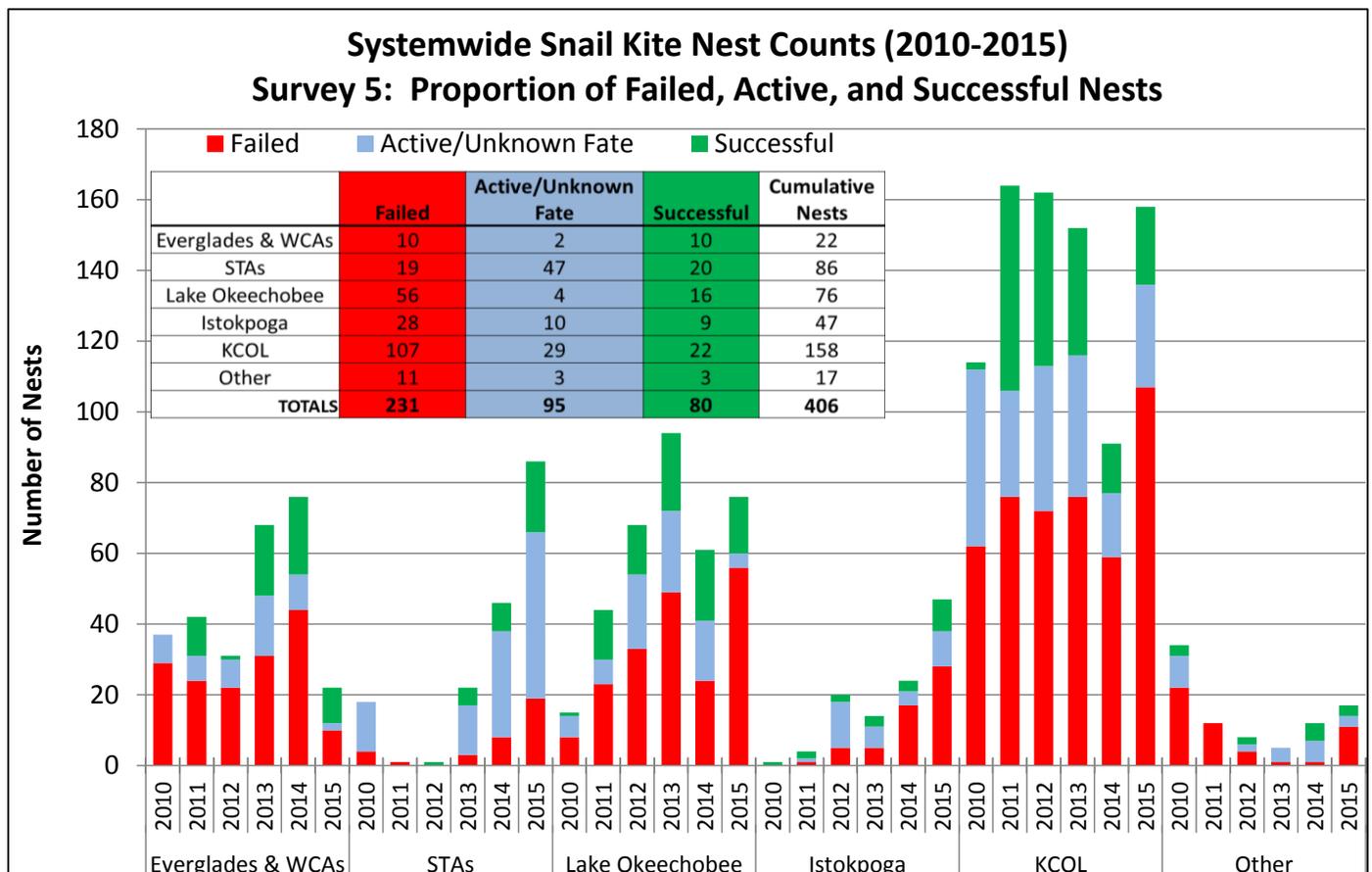
**Figure 8b.** Stage percentiles from a simulation of the accepted operational discharge plan shown in Figure 8a using the UK-OPS model in PA (position analysis) mode. The simulation starts from actual June 1 2015 stage and simulates 49 years (1965-2013).



**Figure 8c.** Discharge percentiles from a simulation of the accepted operational discharge plan shown in Figure 8a using the UK-OPS model in PA (position analysis) mode. The simulation starts from actual June 1 2015 stage and simulates 49 years (1965-2013).



**Figure 8d.** 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.



**Insert 1.** Regional snail kite nesting counts.

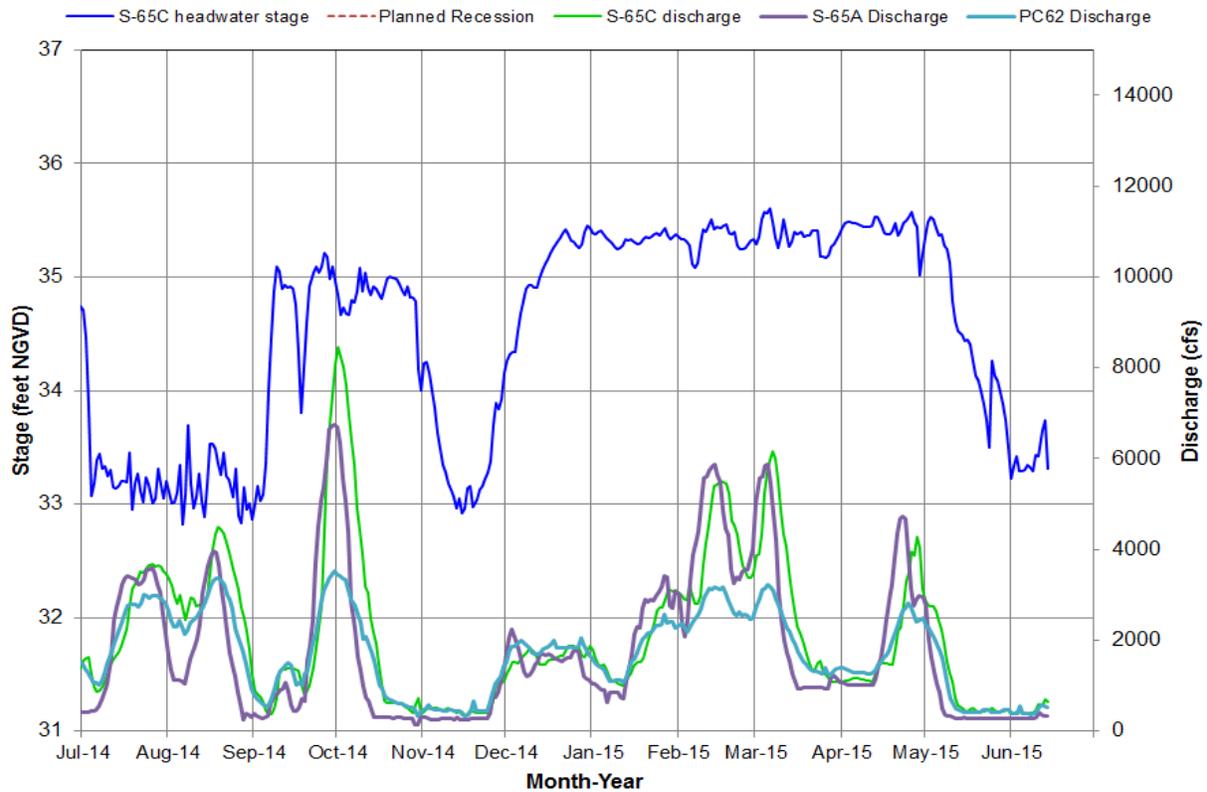


Figure 9. S-65C headwater stage in relation to discharge at S-65C, S-65A, and PC62.

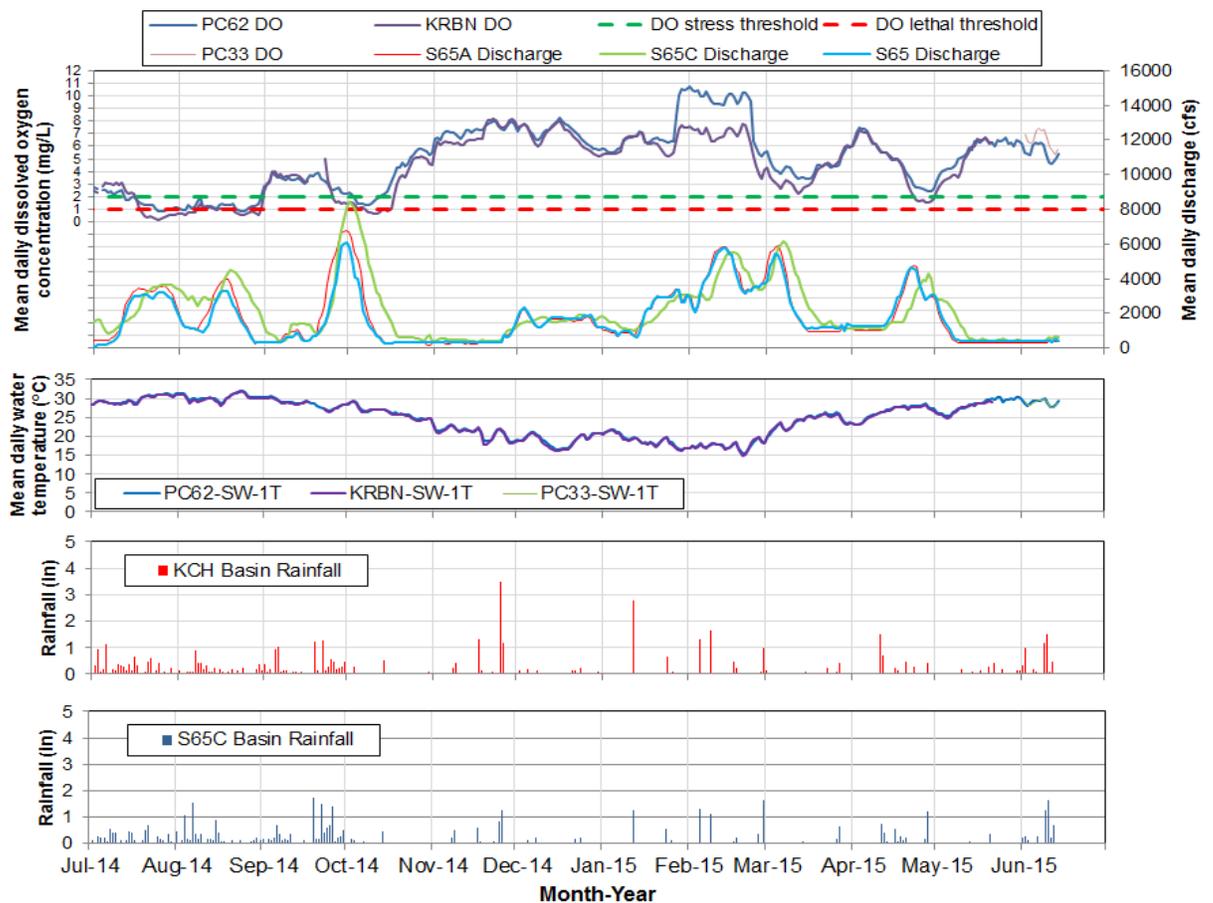
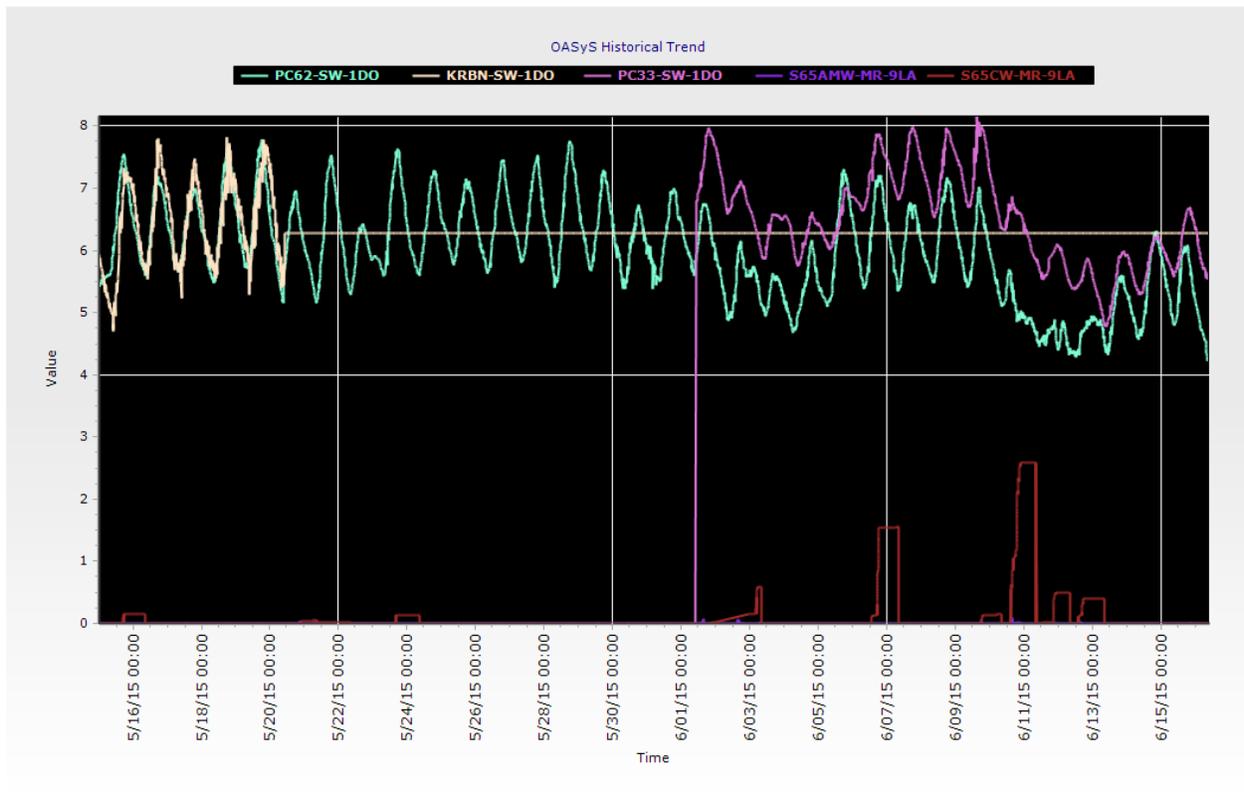
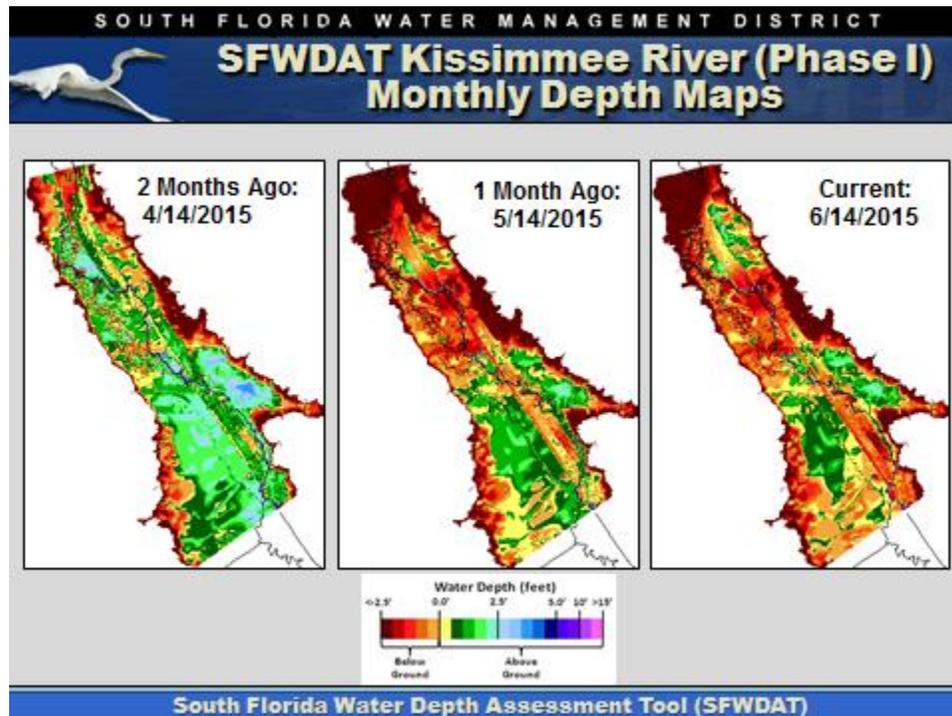


Figure 10. Mean daily DO, discharge, temperature and rainfall in the Phase I river channel.

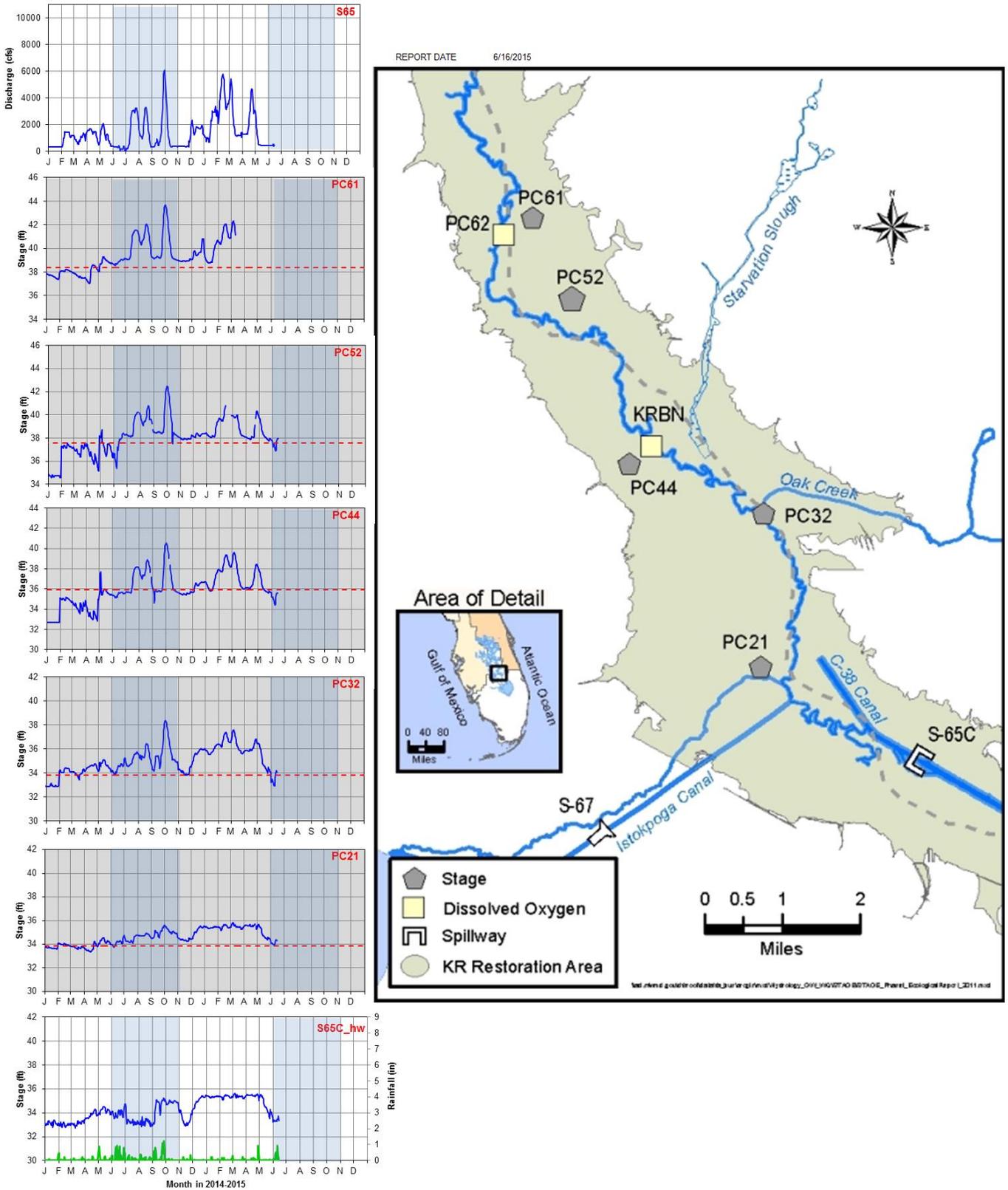


**Insert A.** Phase I river channel DO (measured at 15 minute intervals) and rainfall at S65A and S65C.



**Figure 11.** 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.

# Kissimmee River Hydrographs



**Figure 12.** 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, 2013. 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.

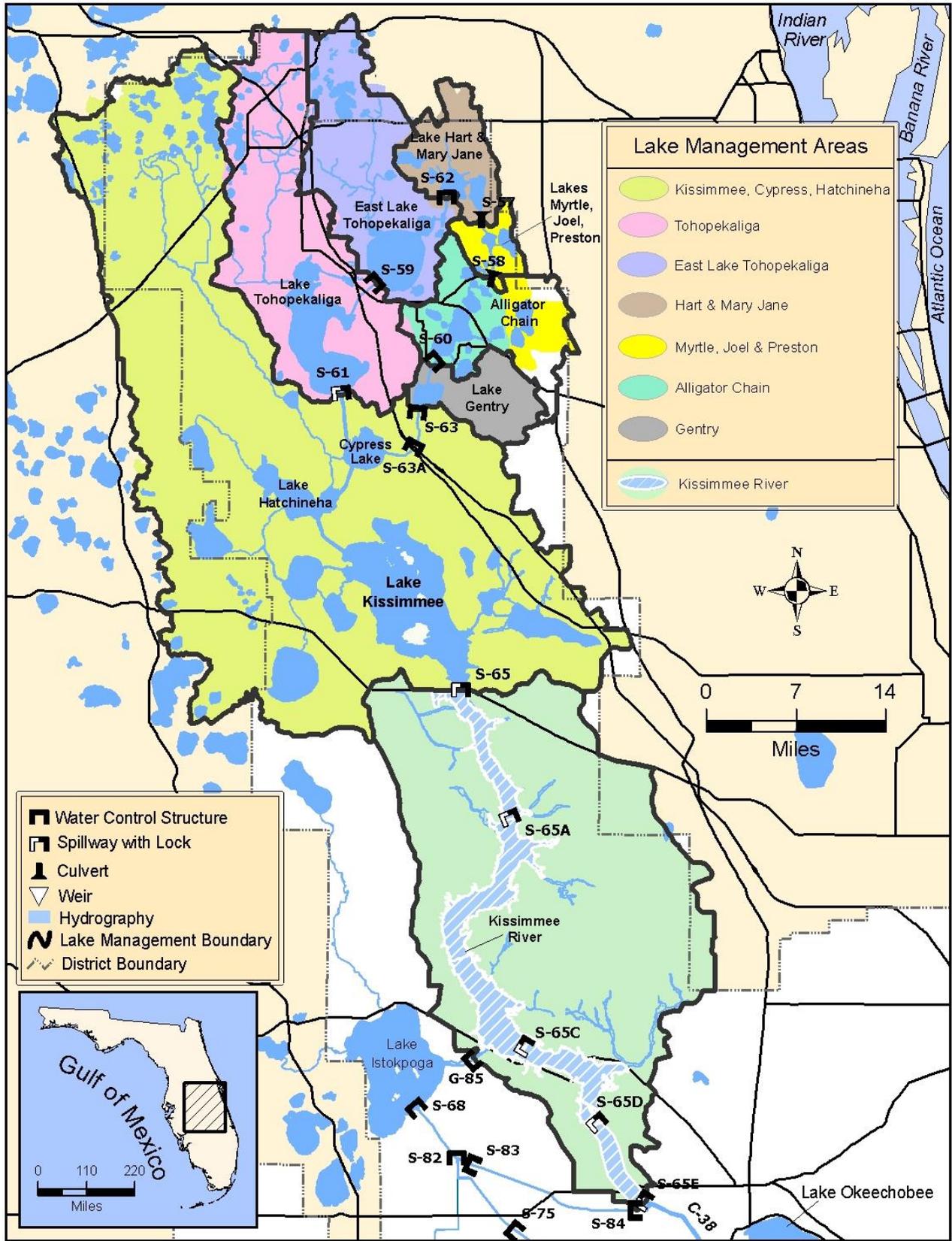


Figure 13. The Kissimmee Basin.

## LAKE OKEECHOBEE

According to the USACE web site, Lake Okeechobee stage is at 12.60 feet NGVD for the period ending at midnight on June 15, 2015. This value is based on the use of four interior Lake stations (L001, L005, L006, and LZ40) and the following three perimeter stations (S-352, S-4, and S-133). There was a net increase in Lake stage of 0.06 feet over the past seven days. The Lake is now 0.75 feet lower than it was a month ago and 0.03 feet higher than it was a year ago (Figure 1). The Lake is on the border between the Base Flow Operational Sub-band and Beneficial Use Operational Sub-band (Figure 2). The current stage is 0.58 feet below the historical average for this date and 0.58 feet above the LORS 2008 simulated average. According to RAINDAR, 1.7 inches of rain fell directly over the Lake during the past seven days. Similar or greater amounts fell in most of the surrounding watershed (Figure 3).

Current Lake inflow is approximately 1144 cfs consisting of flows as indicated below.

<b>Structure</b>	<b>Flow cfs</b>
S65E	691 (527 weekly average)
S154	0
S84	57
S71	128
S72	0
C5	0
S191	0
S133 PUMPS	0
S127 PUMPS	0
S129 PUMPS	0
S131 PUMPS	0
S135 PUMPS	0
Fisheating Creek	258
S2 Pumps	0
S3 Pumps	0
S4 Pumps	0

Outflows from the Lake consist of 1109 cfs exiting at S-351, S-352, and S-354. There is currently no water leaving the Lake through S-77 and S-308, and the L8 is reporting backflow of 25 cfs. Corrected average weekly evapotranspiration was 3500 cfs.

Change in elevation equivalents based on total weekly flows for major structures and for rainfall and evapotranspiration are presented in Figure 4.

The last wading bird survey of the season was conducted on June 11, 2015 (Figure 5). The survey identified approximately 2,500 birds foraging in the marsh including numerous roseate spoonbills. Wading bird rookeries were still surprisingly active for this time of the year. Numerous white pelicans and wood storks were also observed utilizing the Lake.

The most recent MODIS satellite imagery (June 6-7) indicates low to moderate potential bloom conditions near the mouth of Fisheating Bay, extending out into the western pelagic zone, and in areas of the eastern nearshore and pelagic zones (Figure 6). FDEP sampling confirmed bloom conditions at the S-308 structure at Port Mayaca on June 8, 2015.

## Water Management Recommendations

The Lake has now achieved an optimal Lake stage for this time of year. Future recommendations for the short term will depend in large measure on wet season rainfall patterns and amounts with the operational goal being to maintain a steady change in Lake stage not to exceed 0.5 feet per month.

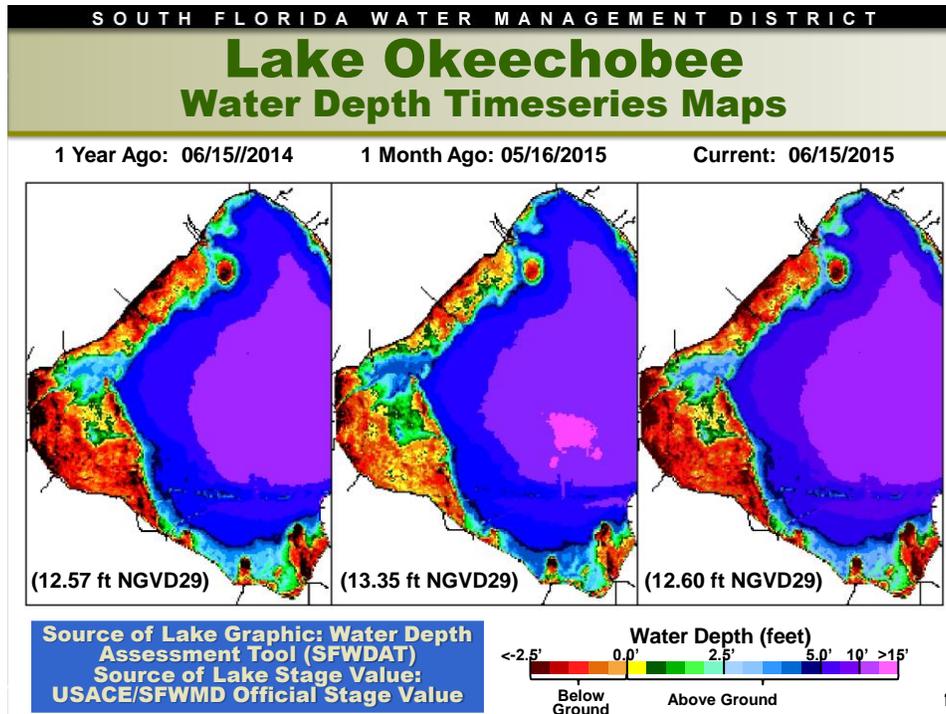


Figure 1

# Lake Okeechobee Water Level History and Projected Stages

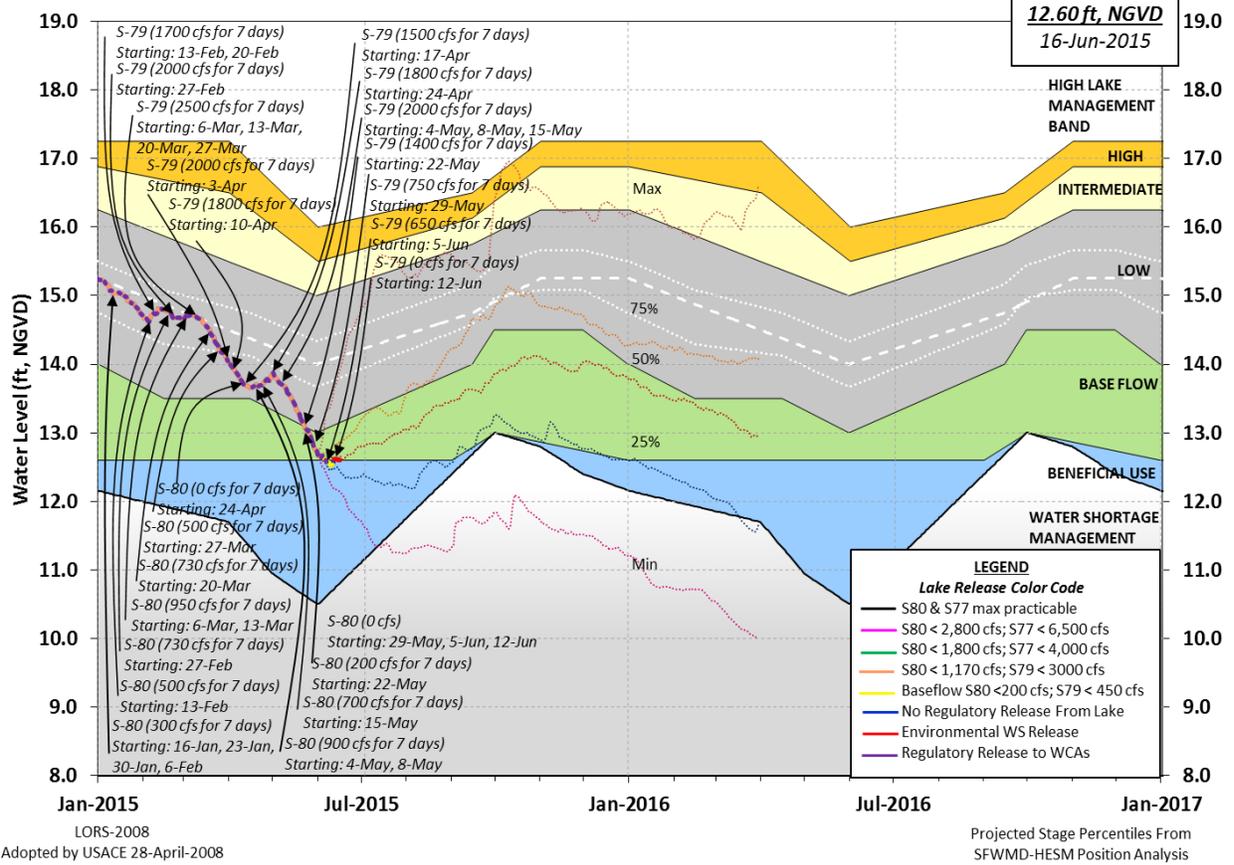


Figure 2

SFWM D PROVISIONAL RAINDAR 7-DAY BASIN RAINFALL ESTIMATES  
 FROM: 0230 EST, 06/09/2015 THROUGH: 0230 EST, 06/16/2015

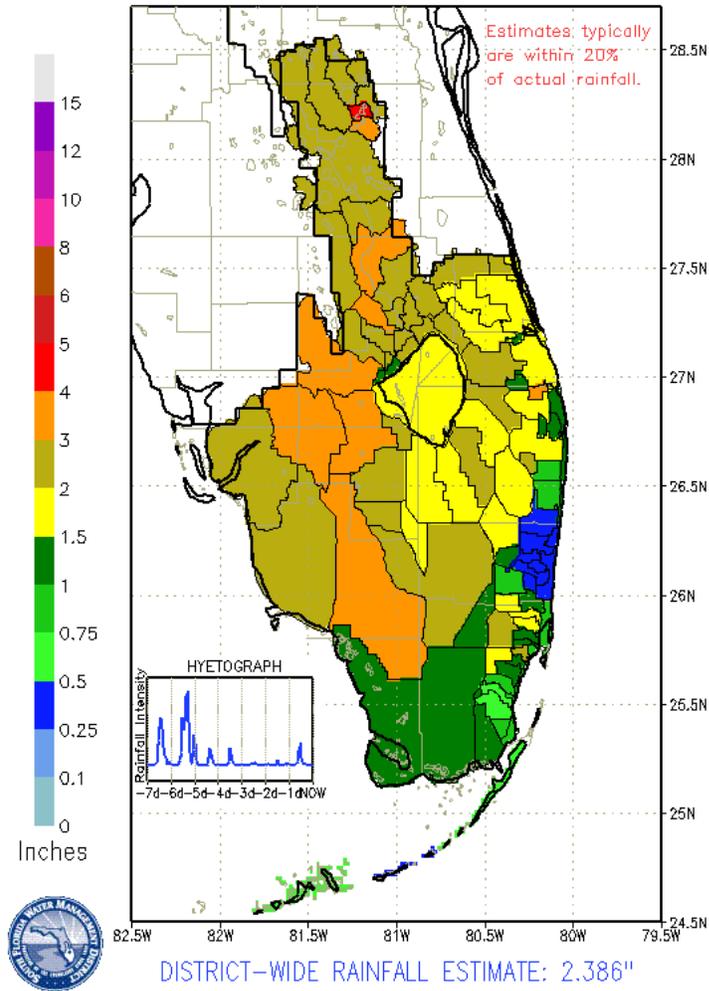


Figure 3

INFLOWS	FT OF CHANGE OVER PAST WEEK
S65E	0.020
S71 & 72	0.002
S84 & 84X	0.019
Fisheating Creek	0.002
Rainfall	0.142
OUTFLOWS	FT OF CHANGE OVER PAST WEEK
S77	0.015
S308	0.000
S351	0.013
S352	0.013
S354	0.019
ET	0.131

Figure 4

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

# Lake Okeechobee

## Wading Birds

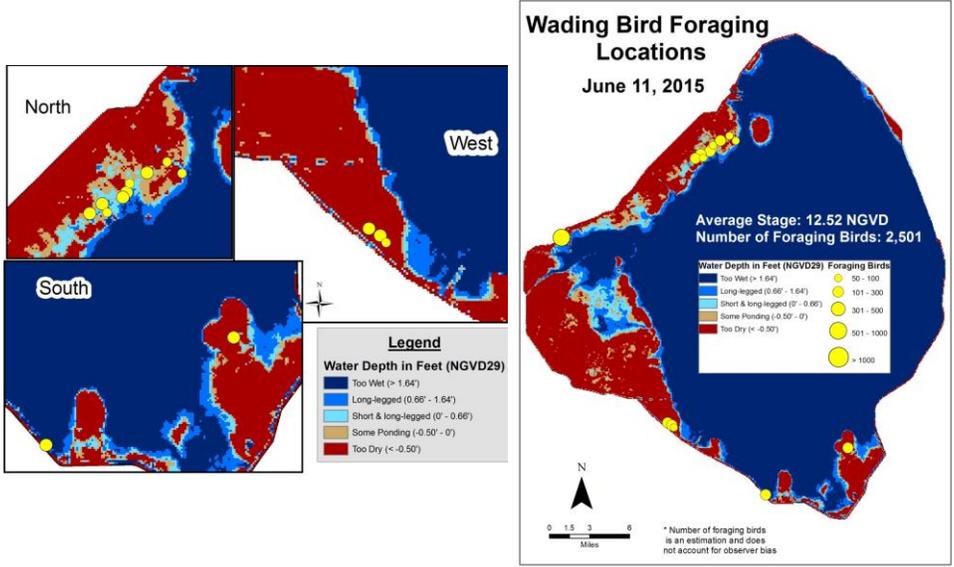


Figure 5

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

# Lake Okeechobee

## Algal Blooms

**Unvalidated Data**

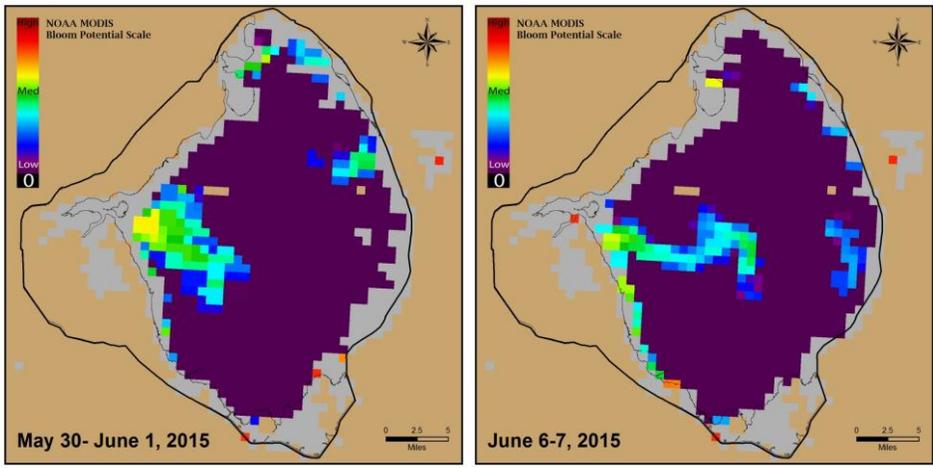


Figure 6

## Lake Istokpoga

Lake Istokpoga stage is 38.28 feet NGVD today. The Lake has reached its annual low pool stage (38.25 feet (NGVD)). It is currently 0.03 feet above its regulation schedule (Figure 7). Average flows into the Lake from Arbuckle and Josephine creeks were 165 and 145 cfs, an increase from the preceding week. Average discharge from S-68 and S-68X this past week was 545 cfs, a large increase from the preceding week. According to RAINDAR, 2.6 inches of rain fell in the Lake Istokpoga watershed during the past seven days.

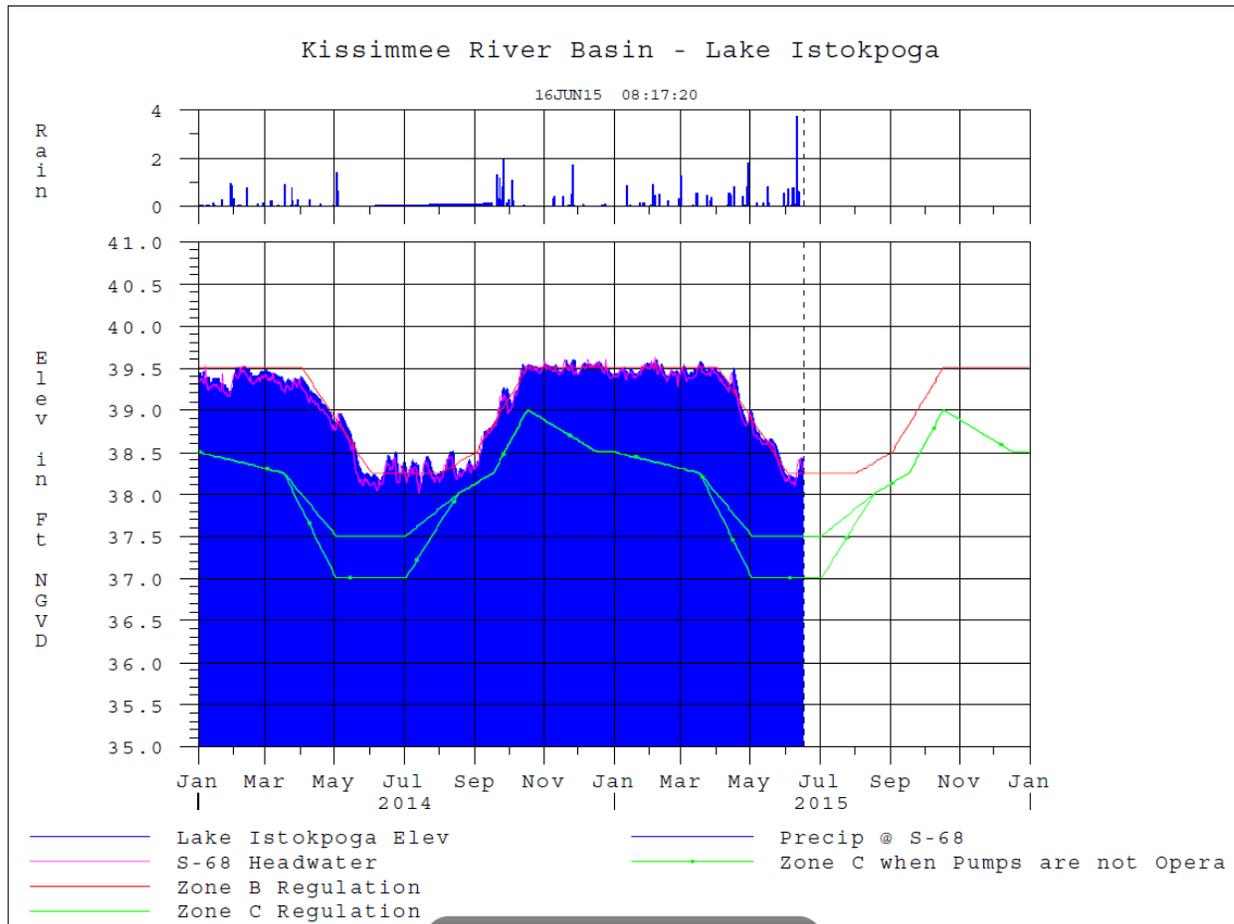


Figure 7

## ESTUARIES

### St. Lucie Estuary

Over the past week, provisional flows averaged 147 cfs at S-80, 0 cfs at S-308, 0 cfs at S-49 on C-24, 23 cfs at S-97 on C-23, and 89 cfs from Ten Mile Creek at the Gordy Road Structure. Average inflow from tidal basin tributaries is estimated to be 325 cfs (Figures 1 and 2). Total inflow averaged 584 cfs last week and 417 cfs over last month.

Over the past week in the estuary, average salinity increased downstream of US1 Bridge and decreased at A1A Bridge (Table 1, Figures 3 and 4). The seven-day moving average salinity of the water column at the US1 Bridge is 18.7. Salinity conditions in the middle estuary are in the good range for the adult eastern oyster.

Table 1. Seven-day average salinity at three monitoring stations in the St. Lucie Estuary. Current average is in bold face type, previous average in parentheses. The envelope reflects the preferred salinity range for adult eastern oysters (*Crassostrea virginica*) in the middle estuary.

Sampling Site	Surface	Bottom	Envelope
HR1 (N. Fork)	<b>13.3</b> (11.4)	<b>16.4</b> (15.9)	NA <sup>1</sup>
US1 Bridge	<b>18.6</b> (17.1)	<b>18.9</b> (18.7)	10.0-26.0
A1A Bridge	<b>25.3</b> (25.8)	<b>28.5</b> (30.1)	NA

<sup>1</sup>Envelope not applicable

### Caloosahatchee Estuary

During the past week, provisional flows averaged approximately 225 cfs at S-77, 1009 cfs at S-78, and 2113 cfs at S-79. Average inflow from tidal basin tributaries is estimated to be 758 cfs (Figures 5 and 6). Total inflow averaged 2871 cfs last week and 1524 cfs over last month.

Over the past week, average salinity decreased throughout the estuary (Table 2, Figures 7 and 8). The seven-day average salinity values are within the good range for oysters at Cape Coral, Shell Point, but in the fair range at Sanibel (Figure 9). The 30-day moving average surface salinity is 0.9 at Val I-75 and 4.1 at Ft. Myers. Salinity conditions at Val I-75 are in the good range for tape grass.

Table 2. Seven-day average salinity at six monitoring stations in the Caloosahatchee Estuary. Current average is in bold face type, previous average in parentheses. The envelope reflects the preferred salinity range for tape grass (*Vallisneria americana*) at Val I-75 and for adult eastern oysters (*Crassostrea virginica*) elsewhere.

Sampling Site	Surface	Bottom	Envelope
S-79 (Franklin Lock)	<b>0.6</b> (0.9)	<b>0.6</b> (0.9)	NA <sup>1</sup>
*Val I75	<b>1.3</b> <sup>†</sup> (1.3*)	<b>1.8</b> <sup>†</sup> (2.3*)	0.0-5.0 <sup>2</sup>
Ft. Myers Yacht Basin	<b>4.7</b> (5.3)	<b>5.5</b> (8.9)	NA
Cape Coral	<b>11.9</b> (12.5)	<b>13.5</b> (15.6)	10.0-30.0
Shell Point	<b>24.2</b> (25.6)	<b>25.8</b> (27.4)	10.0-30.0
Sanibel	<b>&gt;30.0</b> (>30.0)	<b>&gt;30.0</b> (>30.0)	10.0-30.0

<sup>1</sup>Envelope not applicable, <sup>2</sup>Envelope is based on a 30-day average.

\*Val I75 is temporarily offline due to bridge construction.

Salinity values are estimated using models developed for the site.

Salinity forecasts for the next several weeks were constructed for the following scenarios: a) no release (Figure 10), b) 100 cfs, c) 300 cfs, and d) 450 cfs pulse release. There are increased rainfall events expected over the next couple of weeks with a predicted tidal basin runoff of 900 cfs. The maximum daily salinity at the Val I75 location is predicted to be 1.9, 1.6, 1.2 and 0.9 for the four cases, respectively by June 29, 2015. And the 30-day moving average salinity is predicted to be 1.2, 1.2, 1.1 and 1.0, respectively.

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)	4.2 – 12.2	0.5 – 7.8	1.65 – 5.15
Dissolved Oxygen (mg/l)	5.1 – 9.7	2.0 – 5.2	4.5 – 7.35

The Florida Fish and Wildlife Research Institute reported on June 12, 2015, that *Karenia brevis*, the Florida red tide organism, was not detected in samples collected throughout southwest Florida this week.

### **Water Management Recommendations**

Lake Okeechobee’s water level is within the Base Flow Operational Sub-band; the tributary hydrological conditions are Normal; and the seasonal and multi-seasonal forecasts are Very Wet and Very Wet, respectively. The Lake Okeechobee Regulation Schedule (LORS) prescribes releases up to 200 cfs at S-80 and 450 cfs at S-79.

Currently, the USACE is releasing 0 cfs at S-80 and 0 cfs at S-77. There are no ecological benefits associated with additional releases from Lake Okeechobee. Considering the current Lake levels and anticipated rainfall, Lake releases into the estuary, if any under the LORS guidance, should be made at a low level and in a pulsed pattern (Table 4) to mitigate potential stratification and phytoplankton accumulation in the water column. Recommended release rates are 0 cfs at S-80 and 650 cfs at S-79.

Table 4. Schedules for 7-day pulses at S-80 and S-79

		7-day pulses at S-80							
Day	100 cfs	200 cfs	300 cfs	500 cfs	650 cfs	730 cfs	950 cfs	1100 cfs	1170 cfs
1	100	200	300	500	650	800	950	1200	1290
2	300	600	700	900	1100	1200	1400	1600	1800
3	150	300	500	800	900	1000	1200	1400	1500
4	100	200	300	600	800	800	1100	1200	1300
5	50	100	200	400	600	600	900	1000	1000
6	0	0	100	300	400	500	700	800	800
7	0	0	0	0	100	210	400	500	500
		7-day pulses at S-79							
Day	1000 cfs	1200 cfs	1500 cfs	1700 cfs	2000 cfs	2300 cfs	2500 cfs	2900 cfs	3000 cfs
1	1500	1700	2000	2200	2500	2800	3000	3400	3500
2	1900	2100	2400	2600	3100	3500	3800	4200	4300
3	1600	1800	2100	2300	2600	3000	3300	3700	3800
4	900	1100	1400	1600	1900	2200	2400	2800	2900
5	700	900	1200	1400	1700	2000	2200	2600	2700
6	400	600	900	1100	1400	1700	1800	2300	2400
7	0	200	500	700	800	900	1000	1300	1400

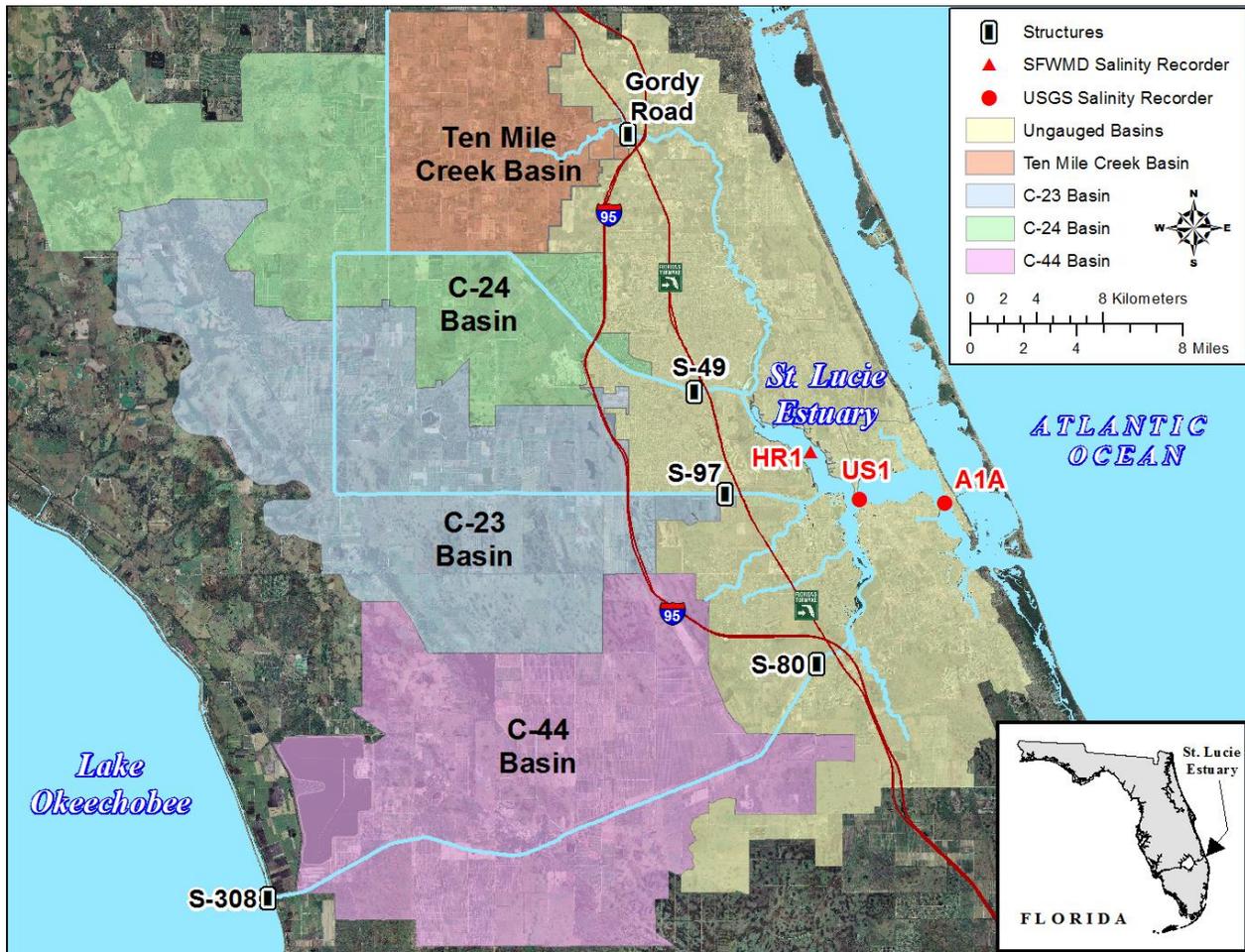


Figure 1. Basins, water control structures, and salinity monitoring for the St. Lucie Estuary.

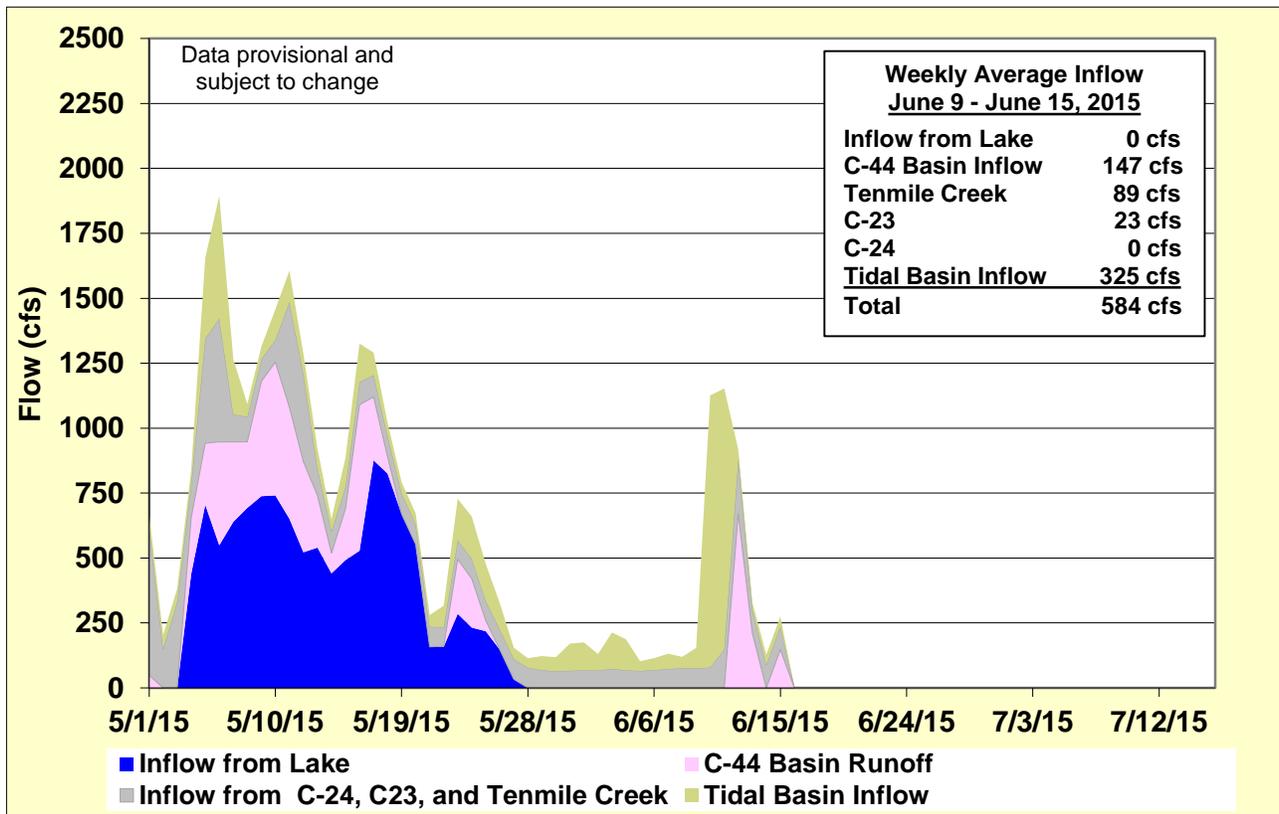


Figure 2. Estimated surface freshwater inflows from Lake Okeechobee and runoff from the C-44, C-23, C-24, Ten Mile Creek, and tidal basins into the St. Lucie Estuary.

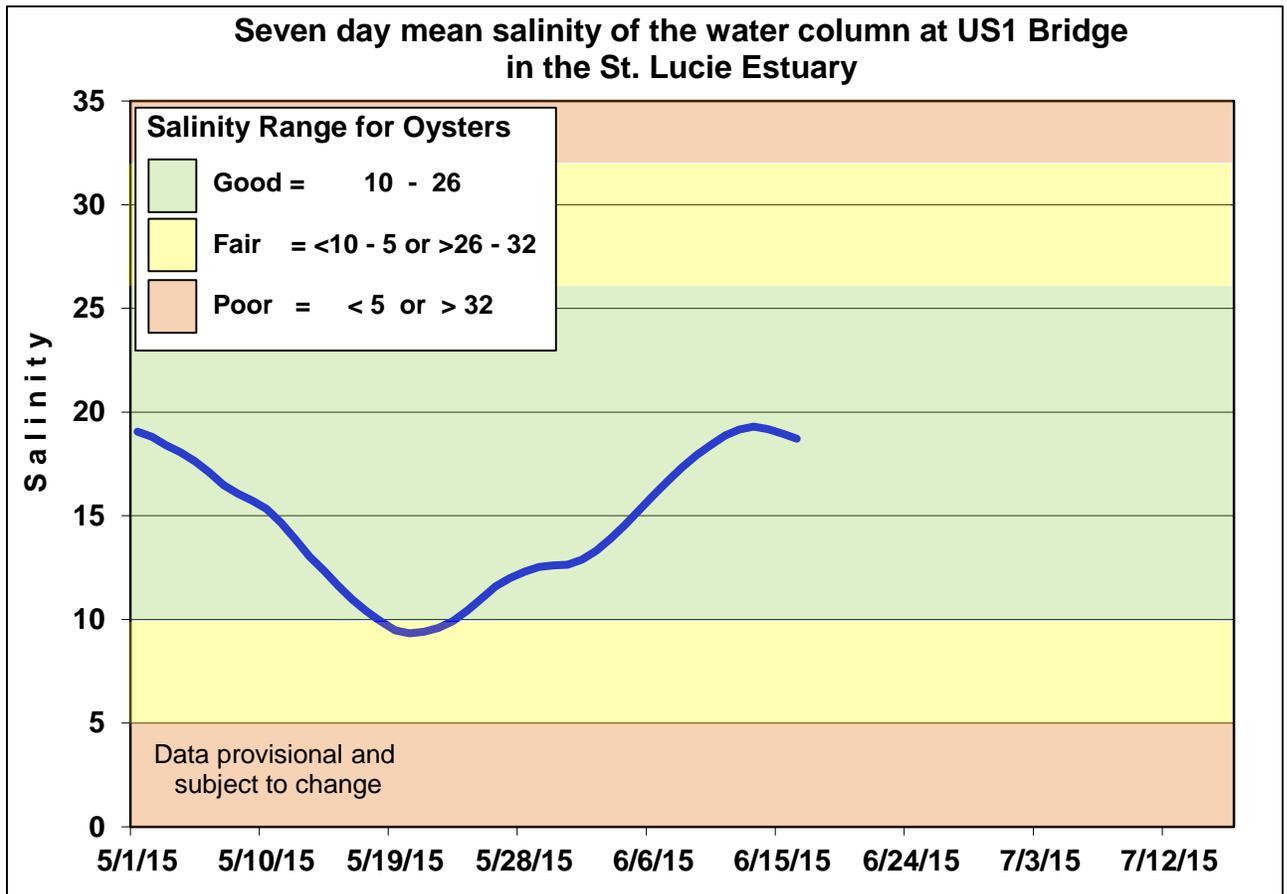


Figure 3. Seven-day mean salinity of the water column at the U.S. Highway 1 Bridge.

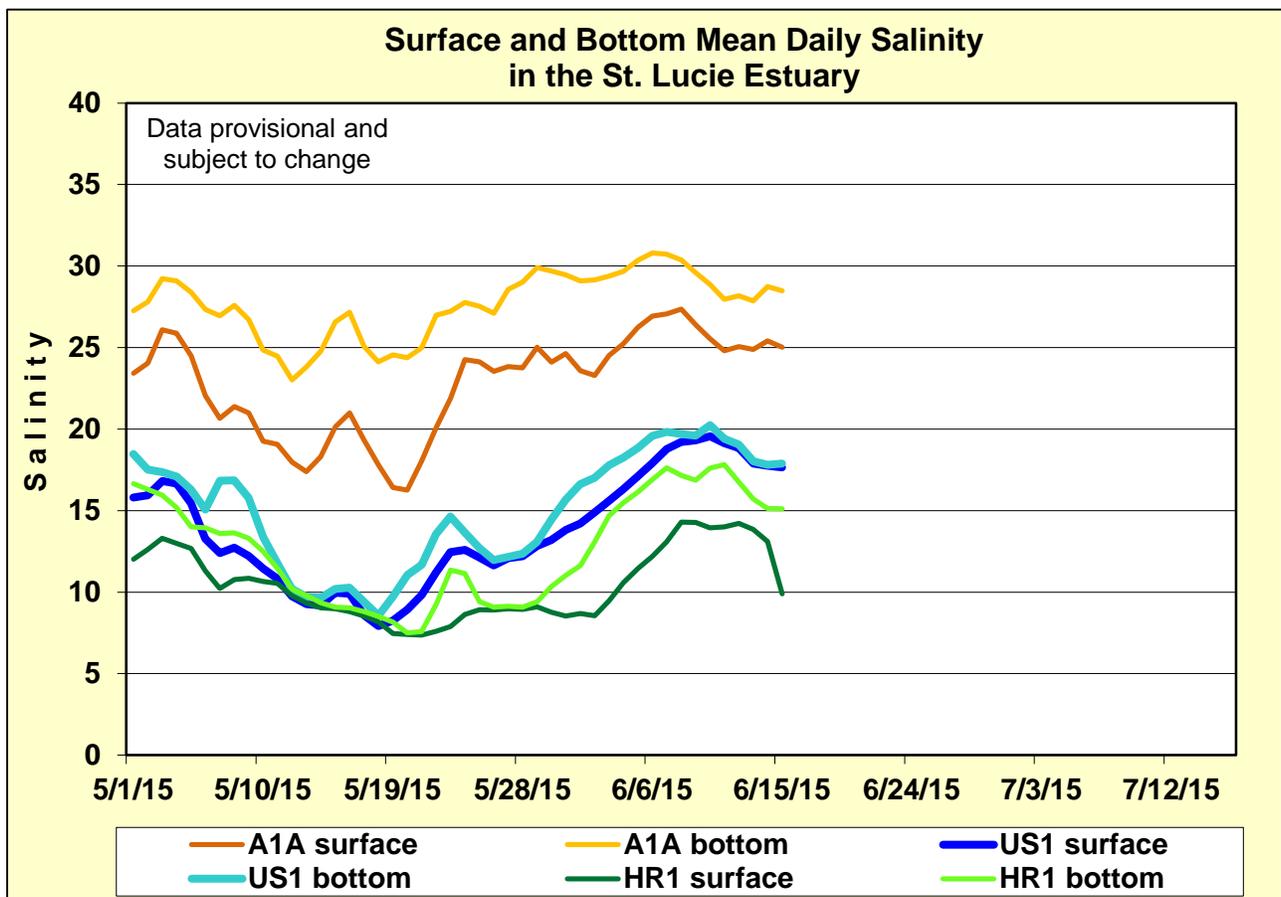


Figure 4. Daily mean salinity at the A1A, US1 and HR1 stations.

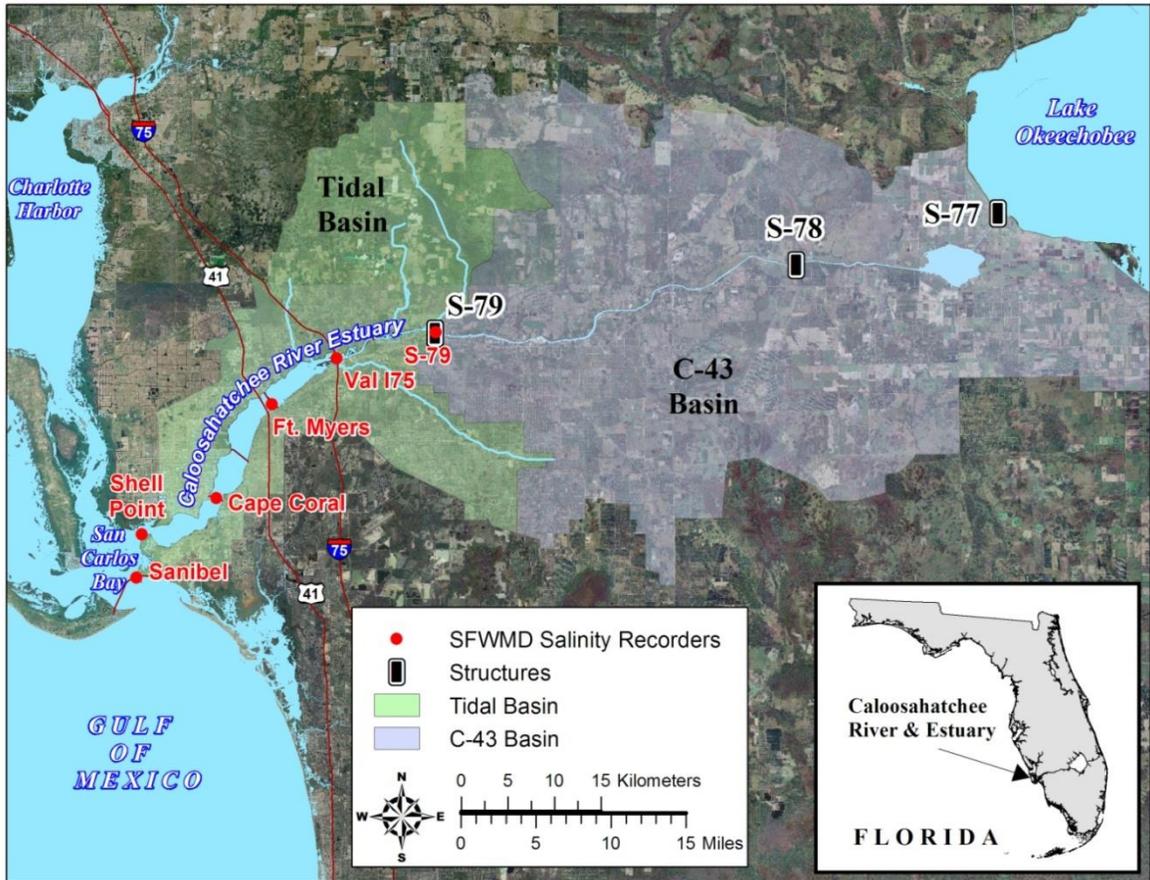


Figure 5. Basins, water control structures, and salinity monitoring for the Caloosahatchee Estuary.

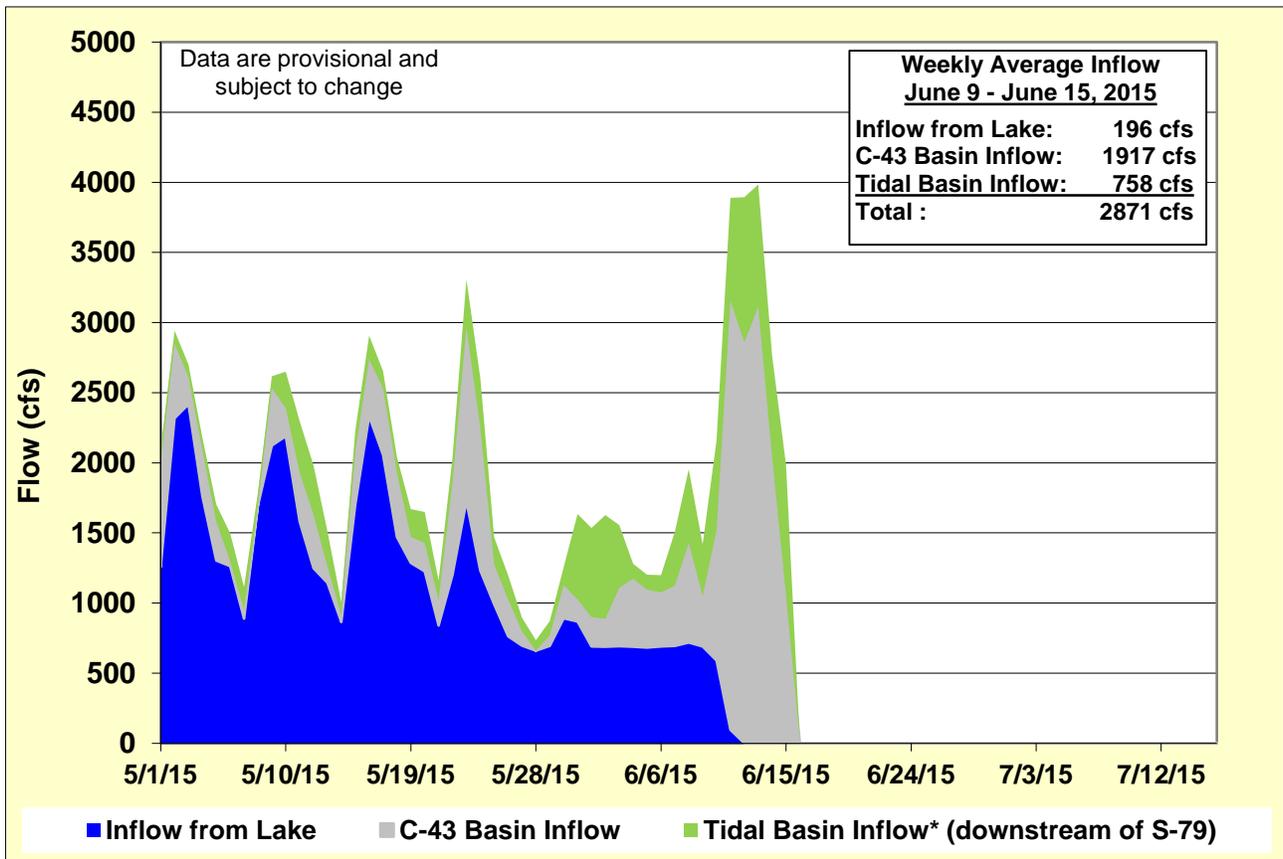


Figure 6. Surface freshwater inflows from Lake Okeechobee, runoff from the C-43 basin, and tributaries in the tidal basin into the Caloosahatchee River Estuary.

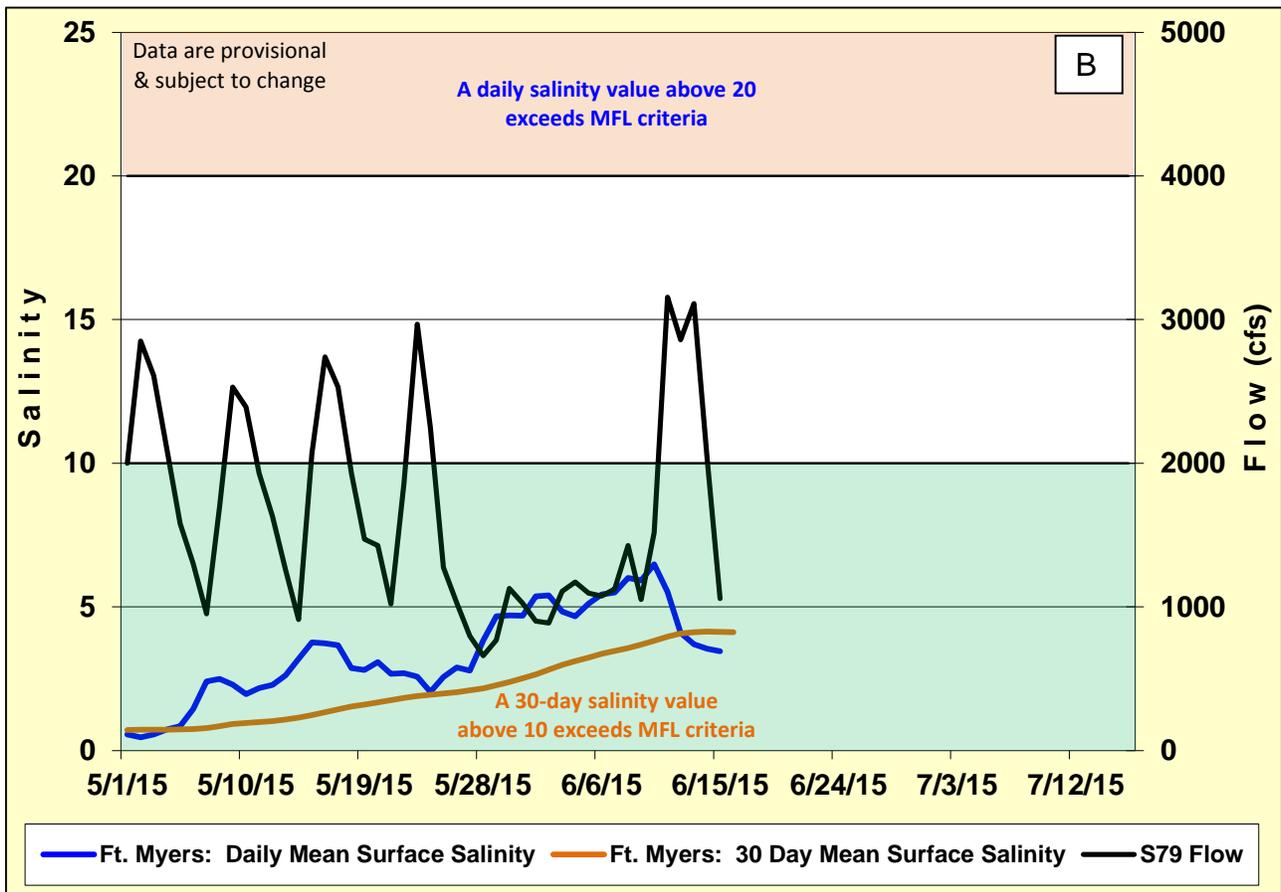
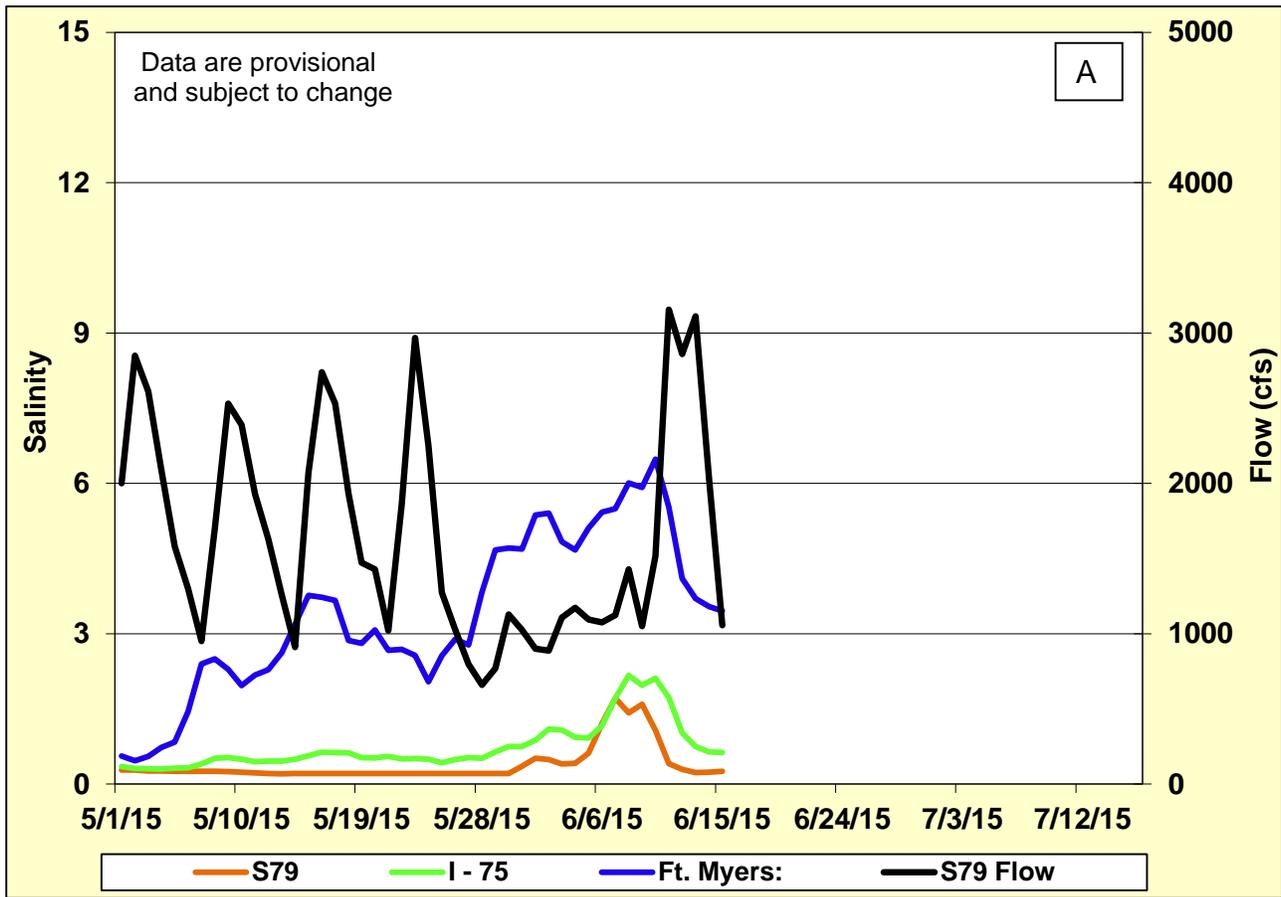


Figure 7. Daily mean flows at S-79 and salinity at upper estuary monitoring stations (A) and 30-day moving average salinity at Ft. Myers (B).

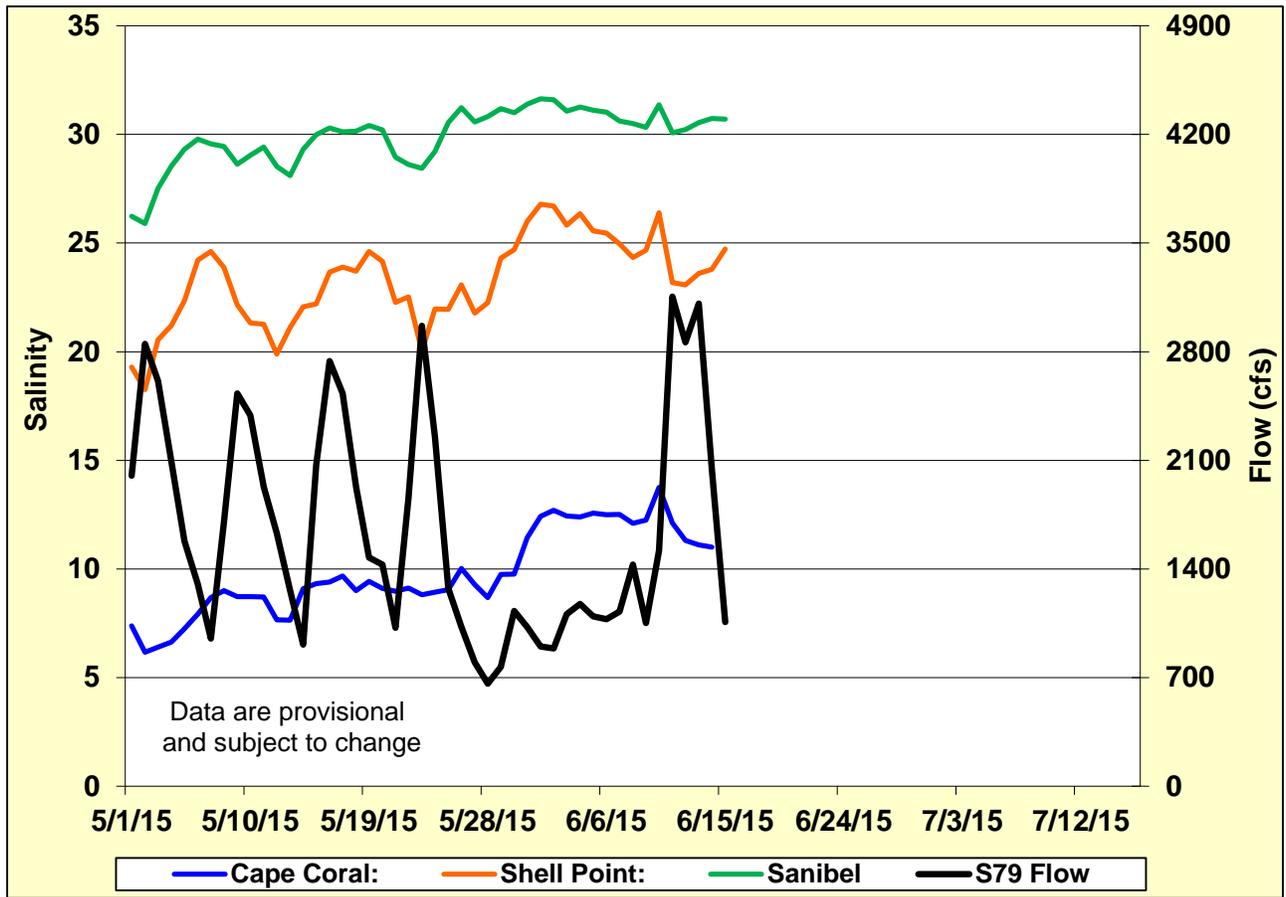


Figure 8. Daily mean flows at S-79 and salinity at lower estuary stations.

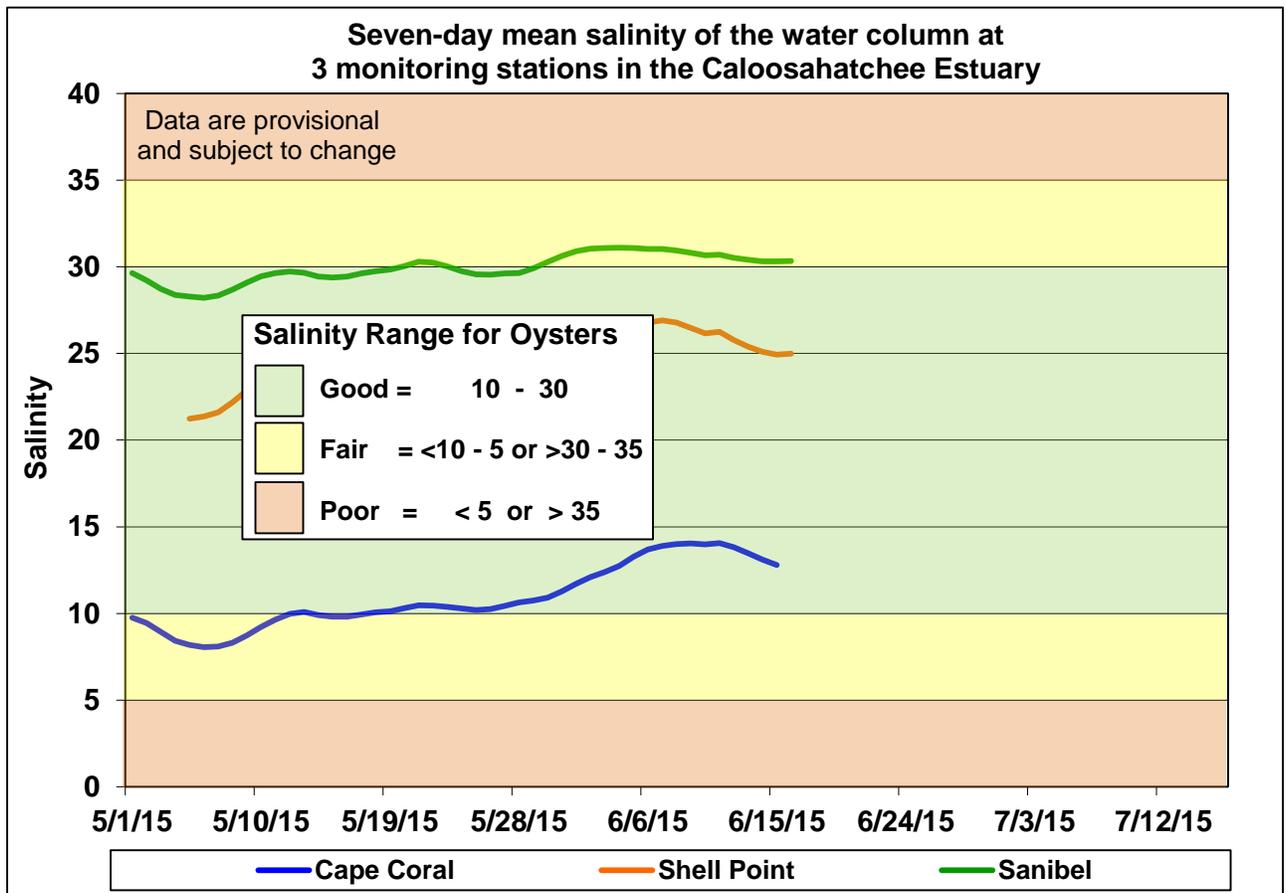


Figure 9. Seven-day mean salinity at Cape Coral Bridge, Shell Point and Sanibel Bridge monitoring stations.

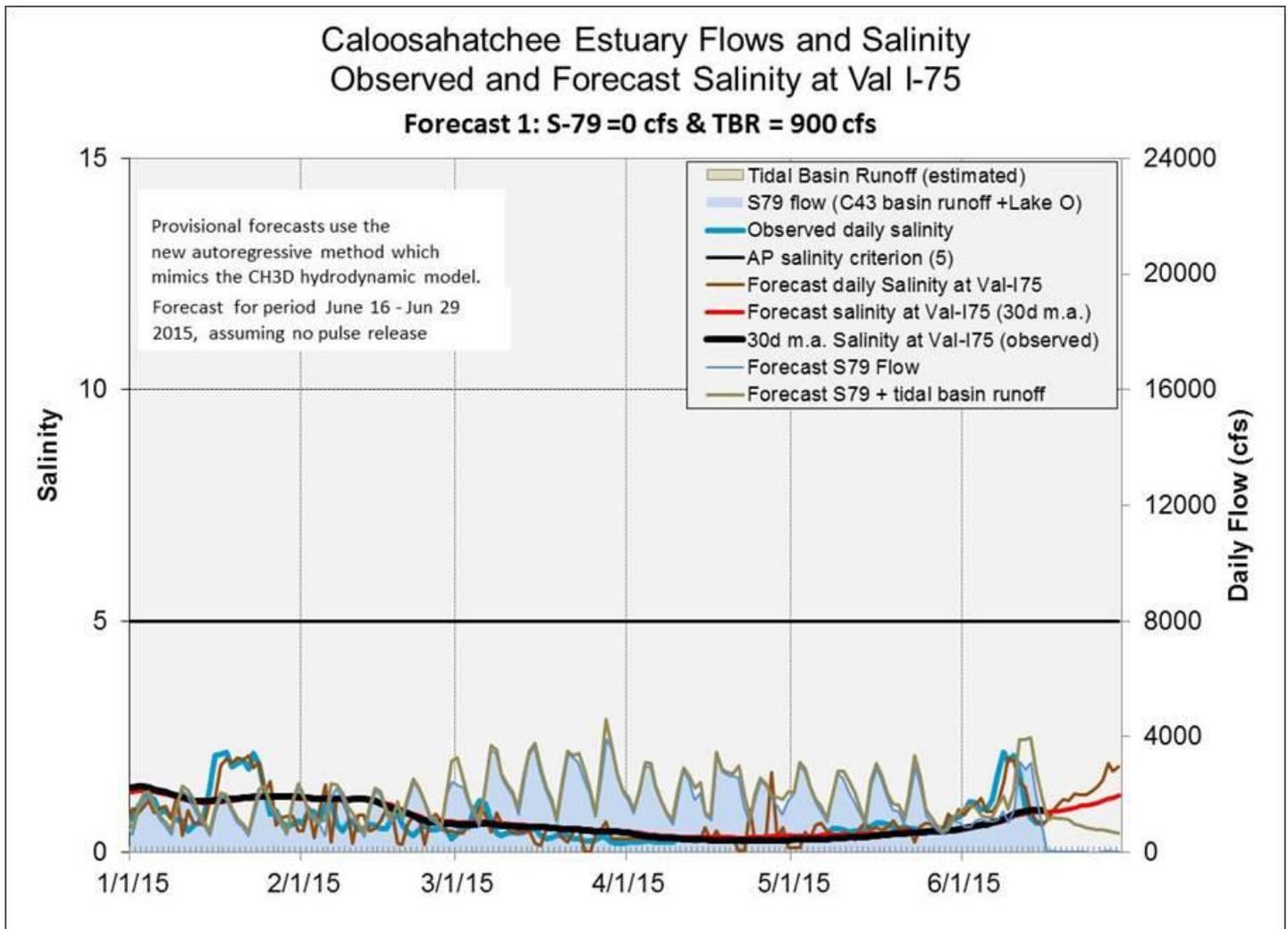
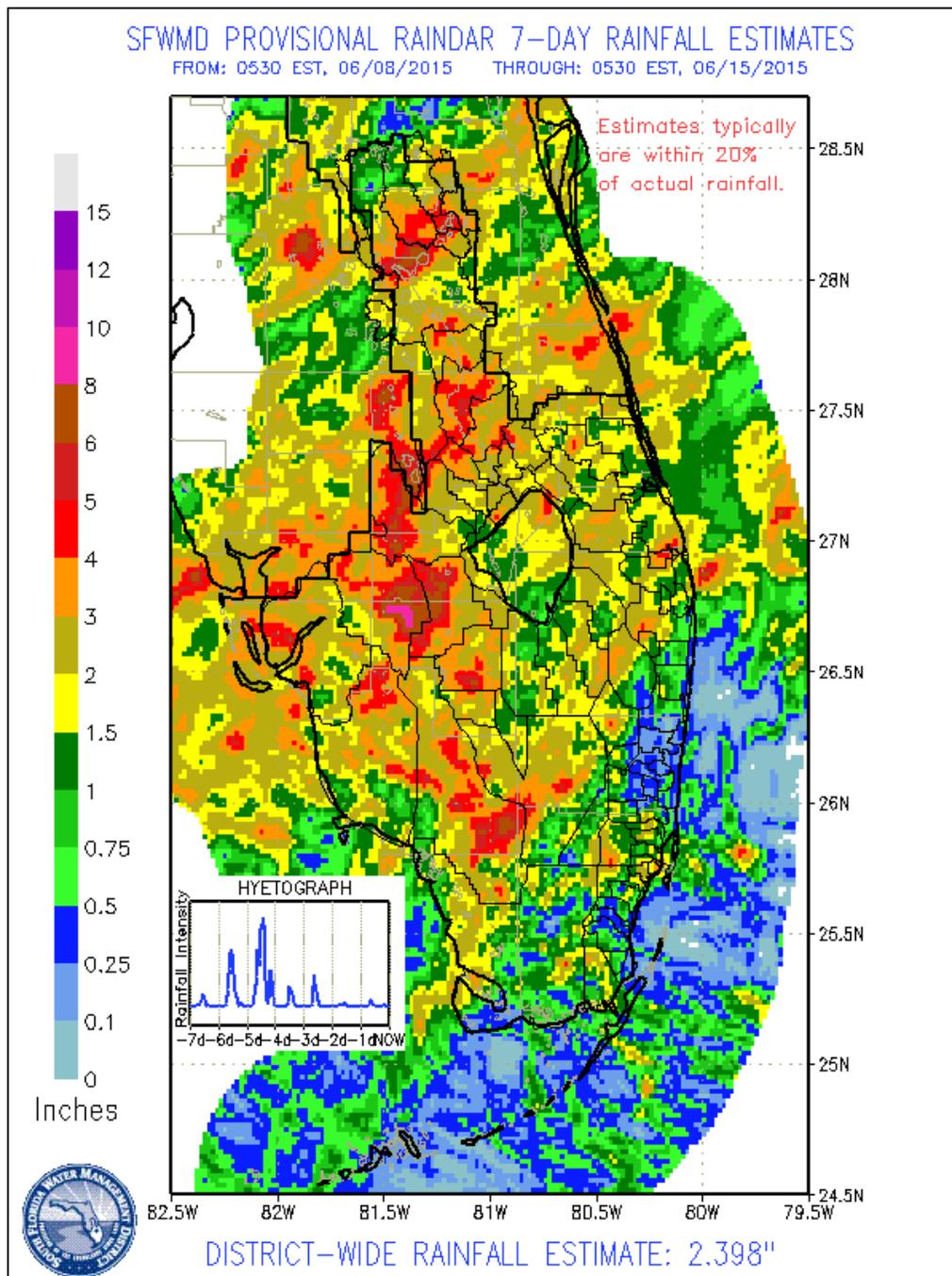


Figure 10. 2-Week Salinity Forecast for Caloosahatchee Val I-75 location assuming 0 cfs flow from S-79 and minor rainfall events within the watershed.

## GREATER EVERGLADES

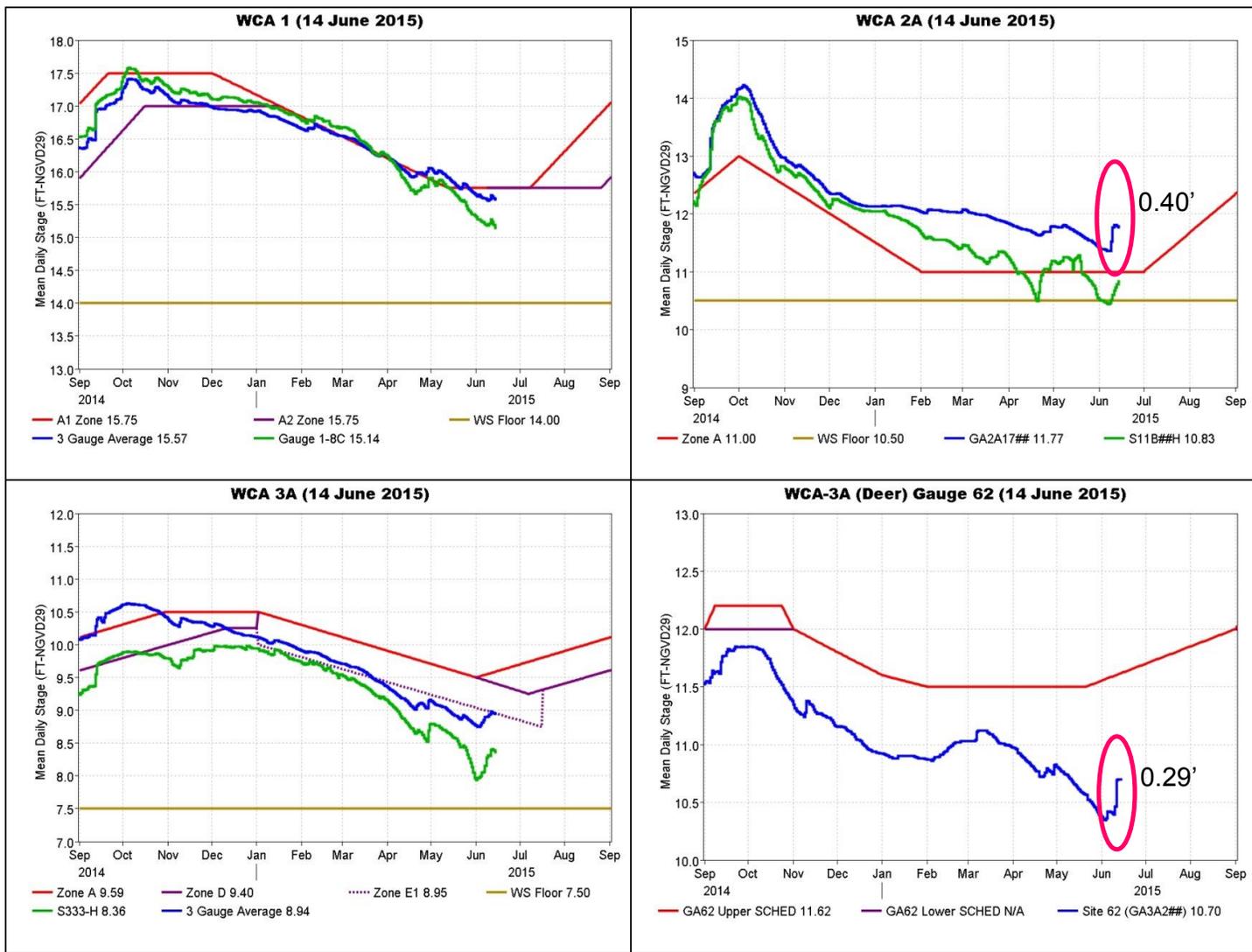
Rainfall was moderate this week with basin-wide totals ranging from 0.94 inches to 2.20 inches. Most rainfall was concentrated in the northern and western WCAs. The local maximum of 5.42 inches fell in WCA-3A. Stage changes included both recessions and ascensions with high ascension rates of 0.40 inches in WCA-2A and 0.32 inches in northeastern ENP. Pan evaporation was 1.38 inches, 11 percent below the 1.55-inch pre-project average.

Everglades Region	Rainfall (Inches)	Stage Change (feet)
WCA-1	1.65	-0.02
WCA-2A	1.72	0.40
WCA-2B	0.94	-0.09
WCA-3A	2.20	0.11
WCA-3B	1.20	0.12
ENP	1.24	0.32



### Regulation Schedules

Stages used for the regulation schedules fell in WCA-1 and rose elsewhere. In WCA-1, the three gauge average in the wetlands decreased to 0.18 feet below regulation. The WCA-2A wetlands stage rose abruptly by 0.40 feet to 0.77 feet above schedule. In WCA-3A, the three gauge average wetlands stage is at the bottom of Zone E1 and 0.65 feet below regulation. The water level at the northwestern WCA-3A gauge stage (gauge 62) jumped up by 0.29 feet to 0.92 feet below the upper schedule; this stage is 0.60 feet above ground, several feet above its previous usual end of the dry season stage only a few years ago.



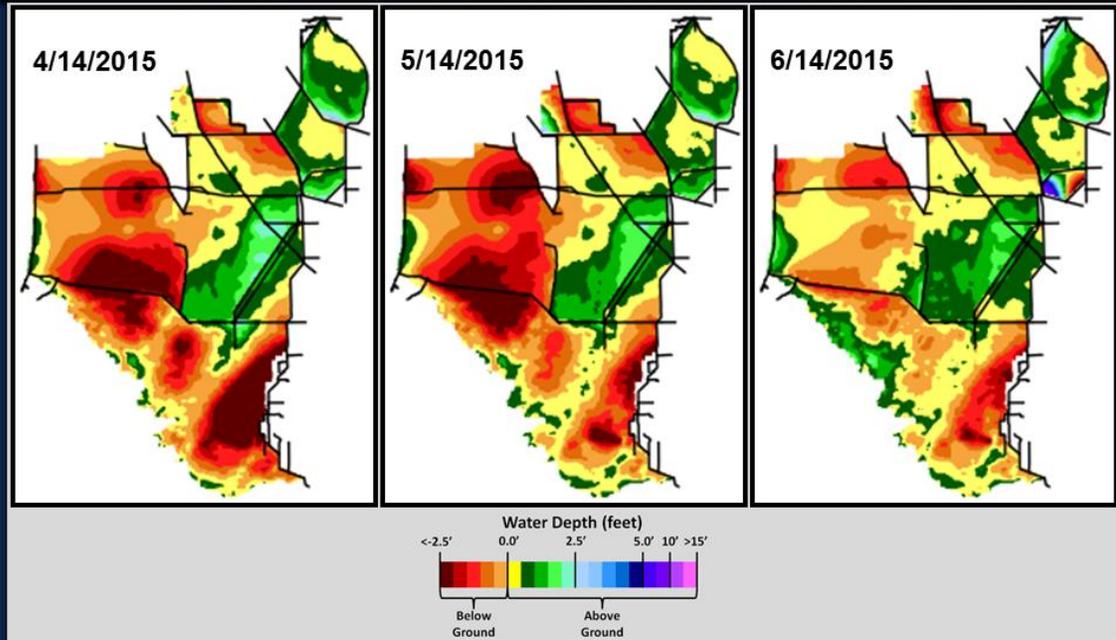
## Water Depths and Changes

Water depths on the map are generally similar to those a month ago except in northern WCA-1, southwestern WCA-3A, and WCA-3B, where stages are higher. Stage changes ranged from -0.09 to +0.40 feet. Water depths at the monitored gauges range from -0.16 feet at northeastern WCA-3A to 1.27 feet in southern WCA-3A. Stages are below ground in northeastern WCA-3A and northeastern Shark River Slough, but are close to the surface again at the latter.

Stages are mixed relative to last week, last month, and a year ago. Over these time periods, stages in northeastern WCA-3A, WCA-2A, and southern WCA-1 are consistently lower, while Holey Land Wildlife Management Area stages are consistently higher.



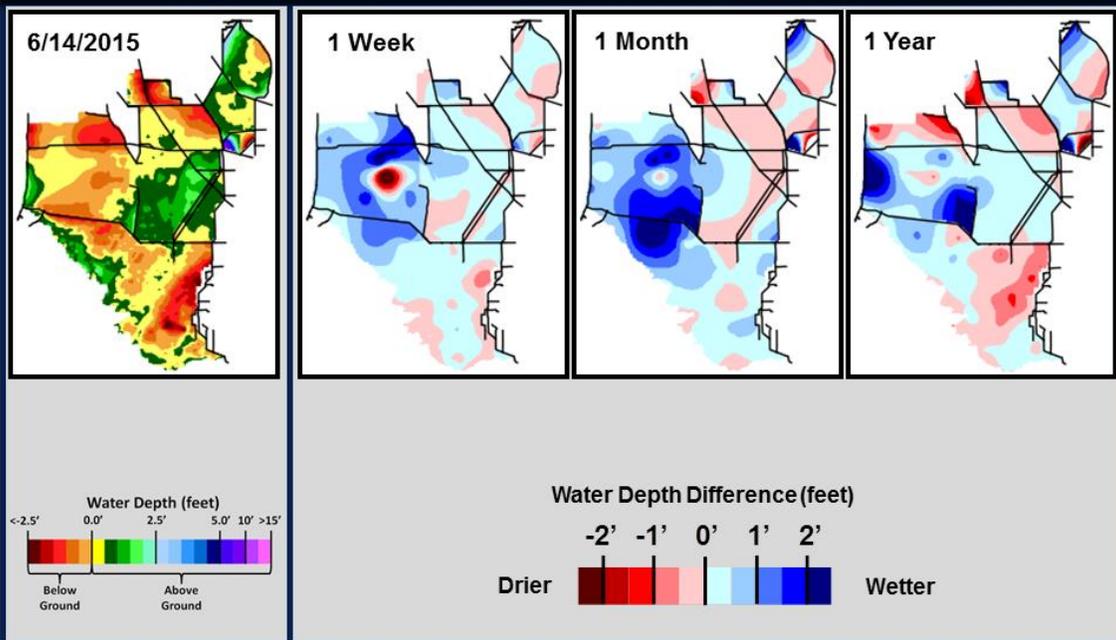
## SFWDAT Water Depth Monthly Snapshots



South Florida Water Depth Assessment Tool (SFWDAT)

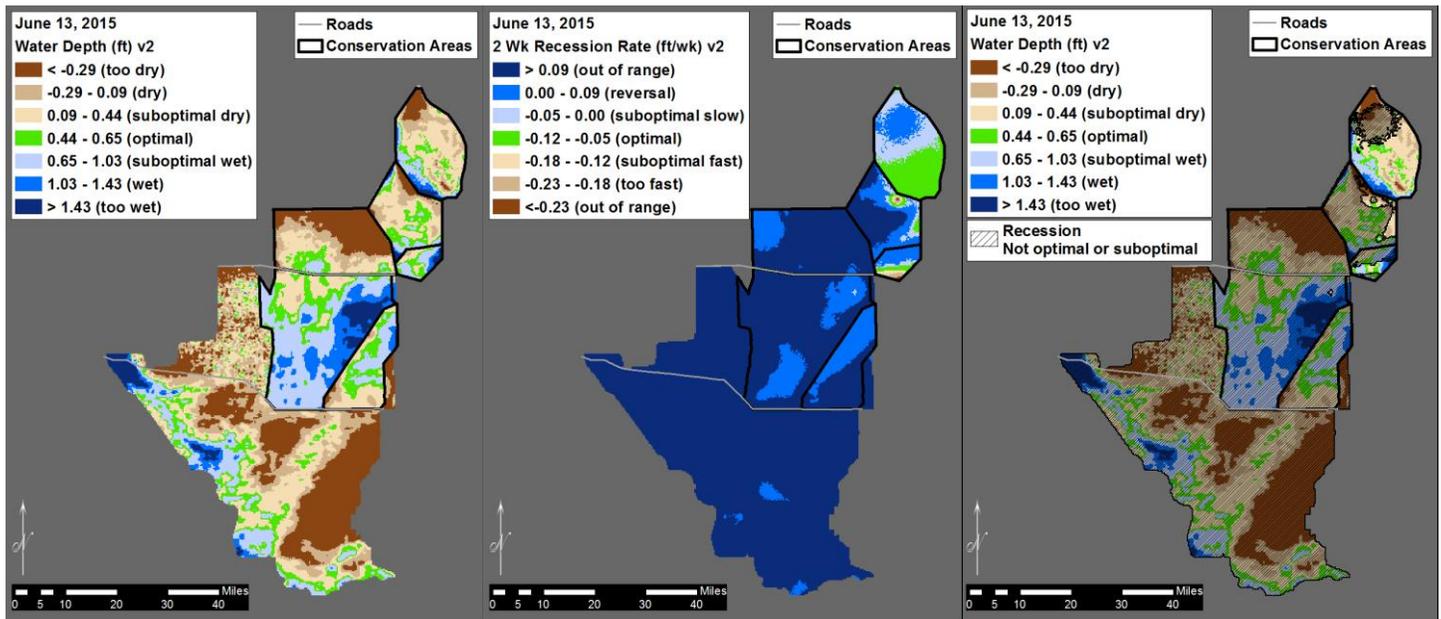


## SFWDAT Everglades Difference Maps (Present - Past)



South Florida Water Depth Assessment Tool (SFWDAT)

Wading birds and endangered species: The current Habitat Suitability Index is shown on the maps below. Good foraging depths occur across the WCAs and recession rates are also in the optimal ranges for foraging.



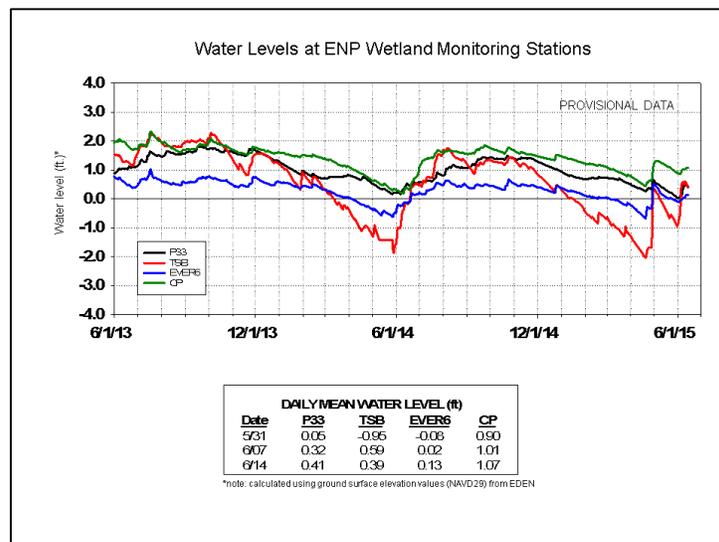
The nesting season is extending farther into the wet season than in most years. Colonies in the water conservation areas still contain chicks that have not yet fledged, including White Ibis, Little Blue Herons, Tricolor Herons, Snowy Egrets, and Great Egrets.

Cape Sable Seaside Sparrow: Subpopulations A, B, and D continue to have active nests with chicks.

Snail Kites: Two nests are still active in WCA-3A; ten nests successfully fledged chicks and an additional ten nests have failed.

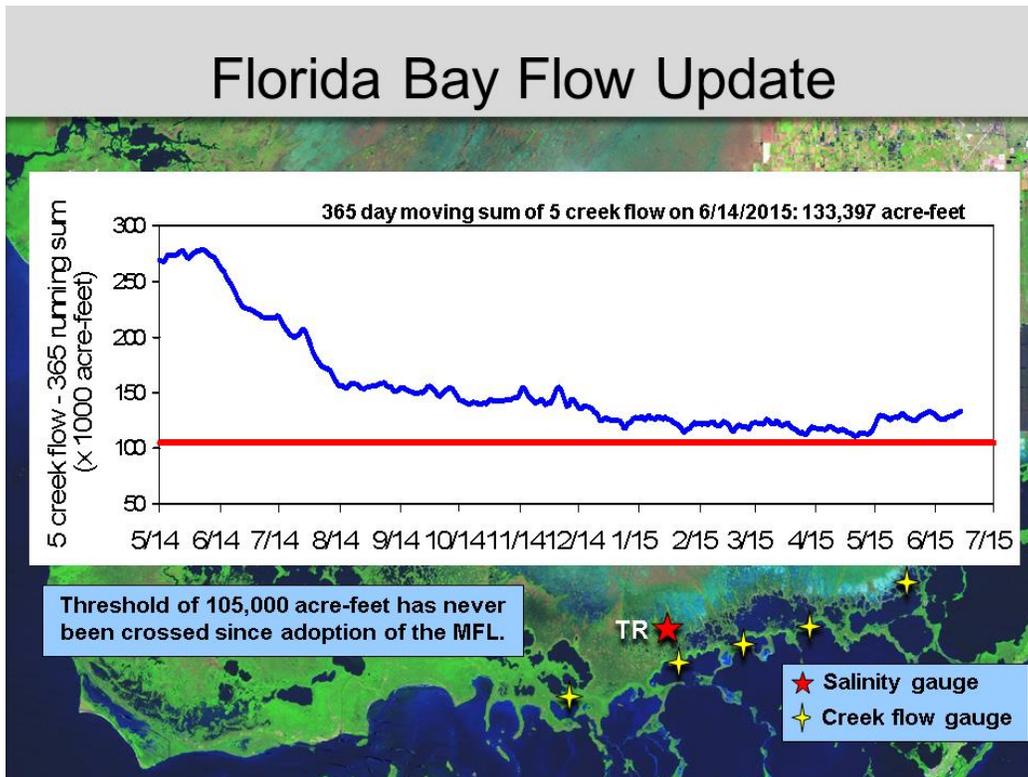
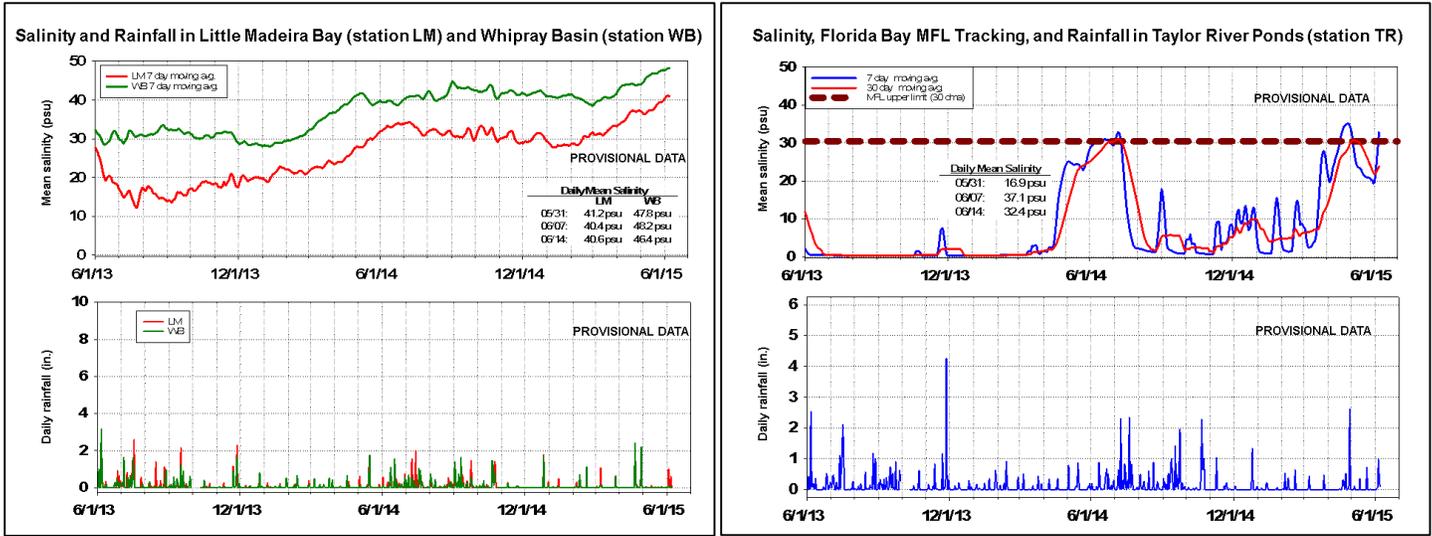
#### Everglades National Park (ENP) and Florida Bay

Water levels are generally higher than last week following the rainfall. Compared to the long-term averages, which are rising now, water levels are 3.7 inches below average in northern Taylor Slough and 0.9 inches above average in southwestern Taylor Slough.



Salinities in Florida Bay remain seven to 14 psu above average for this time of year, and salinities in the Florida Bay near-shore embayments are 40 to 50 psu. The station at Taylor Slough (TR) experienced a large drop in salinity, reducing the daily average salinity from 37 to 32 psu. Nonetheless, the 30-day moving average at TR rose to 26.6 psu because of high salinities from the week before.

The 365-day running sum of the cumulative flow from five creeks feeding Florida Bay has increased to 133,400 acre-feet, higher than it has been in over six months.



### Water Management Recommendations

- We strongly recommend making releases into northeastern WCA-3A. Once water levels rise above ground, additional releases should no longer be needed.
- Although the wet season has begun, wading birds are still nesting. With this extended breeding period, large reversals should be avoided until the nestlings have fledged. Small herons appear to be producing large numbers of chicks, in contrast to the recent decade of decline.

- To protect the breeding Cape Sable Seaside Sparrows in Subpopulation A, S-12A and S-12B should remain closed until all breeding is complete.

Site-specific recommendations appear in the summary table below. The recommendations include new targets for the wet season. The red text represents new or modified information or recommendations.

Summary of Everglades Recommendations, June 16, 2015 (SFWMD) (red is new text)				
Area	Current Condition	Cause(s)	Recommendation	Reasons
WCA-1	Stages changed -0.08' to +0.05'	Rainfall, ET, management	Limit ascension rates through mid-June to <0.10 ft/wk.	Promote native habitat and maintain wetland plant communities. Support ongoing wading bird foraging.
WCA-2A	Stage rose 0.40'	Rainfall, ET, management	Limit ascension rates through mid-June to <0.10 ft/wk.	Promote native habitat and maintain wetland plant communities. Provide foraging habitat for wading birds.
WCA-2B	Stages changed -0.19' to +0.01'	Rainfall, ET, management	Limit ascension rates through mid-June to <0.10 ft/wk.	High stages preclude wading bird use, but provide good habitat for ducks.
WCA-3A NE	Stage rose 0.14'	Rainfall, ET, management	Releases into far NE 3A are strongly recommended to protect peat and wetland ecosystems until water levels are above ground again. Average water stage of gauges 62 and 63 should remain under 11.60 feet and target 0.10 ft/wk ascension rate.	Promote native habitat and maintain wetland plant communities. Continue to provide critical foraging habitat for wading birds, large number of which are nesting on the ground and are particularly sensitive to increases in water levels.
WCA-3A NW	Stage increased 0.29'	Rainfall, ET, management	Releases into far NW 3A are strongly recommended to protect peat and wetland ecosystems until water levels are above ground again. Average water stage of gauges 62 and 63 should remain under 11.60 feet and target 0.10 ft/wk ascension rate.	Promote native habitat, maintain wetland plant communities, protect terrestrial wildlife and prevent peat fire and benefit apple snail reproduction.
Central WCA-3A S	Stage decreased -0.04'	Rainfall, ET, management	Target 3-gauge-average ascension rates of 0.10'/wk through 7/15, 0.05'/wk from 7/16-8/15; 0.07'/wk from 8/16-10/30 (8.87', 9.89', 10.67' stages).	Promote native habitat and maintain wetland plant communities. Provide foraging habitat for wading birds.
Southern WCA-3A S	Stage increased 0.03'	Rainfall, ET, management	Target 3-gauge-average ascension rates of 0.10'/wk through 7/15, 0.05'/wk from 7/16-8/15; 0.07'/wk from 8/16-10/30 (8.87', 9.89', 10.67' stages).	Promote native habitat and maintain wetland plant communities. Provide foraging habitat for wading birds.
WCA-3B	Stages changed -0.01' to 0.36'	Rainfall, ET, management	Target ascension rates of 0.10'/wk.	Promote native habitat and maintain wetland plant communities. Provide foraging habitat for wading birds.
ENP-SRS	Stage rose 0.32' and is -0.03' below ground.	ET, rainfall, topography, management	Discharges to the Park should be made in accordance with the ERTF rainfall plan. Water deliveries to Shark Slough should be made through S-333, then through S-12D and S-12C.	Promote native habitat and maintain wetland plant communities.
ENP-CSSS habitats	Nesting underway but few nests in Subpops C and D	Rainfall, ET, management	Follow ERTF schedule closures and closure plan for Frog Pond and Aerojet structures, and continue to monitor trigger levels. Manage 332 B, C, and D impoundments to avoid exacerbating above ground level water levels in adjoining marsh areas with sparrow breeding. Extend gate closures for S-12A and S-12B until end of nesting.	<b>Provide habitat and adequate nesting conditions for CSSS.</b>
ENP-Wetlands	Water levels declining.	Rain, ET, inflows	Move water southward as possible	Wetlands have rehydrated and low flows continue into Florida Bay
Taylor Slough	-3.7 inches below average in north to 0.9 inches above average in southwest.	Rain, ET, inflows	Move water southward as possible	Provide freshwater buffer for ecosystems and fresher saline conditions downstream
FB- Salinity	Still 7-14 psu above average	Rain, ET, inflows, wind.	Move water southward as possible	Southward flows are still needed to reverse/slow salinity increases