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MEMORANDUM

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

FROM: SFWMD Staff Environmental Advisory Team

DATE: June 7, 2016

SUBJECT: Weekly Environmental Conditions for Systems Operations

Summary

Kissimmee

On Sunday, stage in East Lake Toho was 0.6 feet below schedule; Lake Toho was 0.5 feet below schedule and Kissimmee-Cypress-Hatchineha was 0.8 feet below schedule. Over the past week, discharge at S65 averaged 2,899 cfs and at S65A 3,348 cfs; discharge at S65E averaged 5,005 cfs. Tuesday morning discharges: S65 ~4,589 cfs; S65A ~4,913 cfs; S65C ~3,472 cfs; S65E ~3,929 cfs. Dissolved oxygen (DO) sag in the Kissimmee River continued with mean daily values below 2 mg/L for 18 consecutive days and below 1 mg/L for 16 consecutive days. DO in the Kissimmee River averaged 0.48 mg/L over the past week and 0.44 mg/L on Sunday. Kissimmee River mean floodplain depth on Sunday was 1.75 feet.

Lake Okeechobee

Lake Okeechobee is at 14.40 feet NGVD in the Low Flow Sub-band. There has been no net change in Lake stage over the past week. The wading bird nesting season appears to have drawn to a close. Lake levels are too high for this time of year and there is a potential for negative impacts to apple snail reproduction and submerged aquatic vegetation and an increased likelihood of cyanobacterial blooms.

Estuaries

With the increase in Lake Okeechobee stage, releases from the Lake to the estuaries increased compared to last week. In the St. Lucie Estuary, total freshwater inflow was 123 cfs higher than last week, averaging 2,642 cfs, however the flow from the Lake increased to 1,742 cfs (66% of total flow). Salinity was similar to last week throughout the estuary, and the seven-day average salinity remained in the poor range for adult oysters at the US1 Bridge. In the Caloosahatchee Estuary, total freshwater inflow increased compared to last week and averaged 5,202 cfs, and flow from the Lake increased to 3,521 cfs (68% of total flow). Salinity conditions in the upper estuary are suitable for tape grass. At the Cape Coral Bridge, salinity fell into the poor range for adult oysters but remained in the good range at the Shell Point and Sanibel monitoring stations. The 30-day average salinity at the I-75 Bridge is below 5.

Stormwater Treatment Areas

Over the past week, the STAs/FEBs received approximately 1,100 acre-feet of Lake regulatory releases. The total amount of Lake regulatory releases sent to the STAs/FEBs in WY2017 (since May 1, 2016) is approximately 18,500 acre-feet. Most STA cells are at or above target depths; however, some cells in STA-5/6 are below target. Operational restrictions are in place for vegetation rehabilitation in STA-1E, STA-1W, STA-3/4 and STA-5/6 and structure repairs are underway in STA-1E. In addition, nests of ESA and/or MBTA-protected species have been observed in STA-1E, STA-1W, STA-2, and

STA-5/6. This week, if 2008 LORS recommends Lake releases to the WCAs and the conditions allow, releases will be sent to the A-1 FEB, and A-1 FEB releases will be sent to STA-3/4.

Everglades

Water level changes this past week were mixed with approximately half of the region decreasing and the other half increasing. Much of the good foraging habitat for wading birds was lost with rising water levels, leaving northern WCA-3A as the only foraging support for nesting wading birds. Many of the white ibis nests within this region have been abandoned as a result. The 30-day moving average salinity at the Florida Bay MFL site remains low at 8 psu and the cumulative inflow from the five creeks into Florida Bay is above the long-term average at 271,528 acre-feet. Florida Bay salinities are within 8 psu of their long-term averages.

Weather Conditions and Forecast

Tropical Storm Colin is exiting northeast off the coast of the Carolinas and its trailing trough is dropping southward through central Florida. Showers and thunderstorms will persist along this trough as it stalls near Lake Okeechobee and daytime heating will generate some scattered thunderstorms south of Lake Okeechobee mainly east. The trough will continue to enhance thunderstorm development over portions of the District Wednesday and Thursday. A pattern of afternoon seabreeze thunderstorms should then begin setting up Friday and this coming weekend.

KISSIMMEE BASIN

Kissimmee Basin Rainfall

The Upper Kissimmee Basin received 1.46 inches of rainfall in the past week and the Lower Basin received 1.03 inches (SFWM D Daily Rainfall Report 06/06/2016).

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 SFWM D OASyS DualTrend; reported values are averages through midnight of the Sunday prior to the report date unless otherwise specified.

Report Date: 6/7/2016		Sunday Departure (feet)											
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)	6/5/16	5/29/16	5/22/16	5/15/16	5/8/16	5/1/16	4/24/16
Lakes Hart and Mary Jane	S62	12	LKMJ	59.5	R	60.0	-0.5	-0.1	0.2	0.0	0.0	-0.1	-0.2
Lakes Myrtle, Preston, and Joel	S57	6	S57	60.1	R	61.0	-0.9	0.0	0.2	-0.1	0.0	0.0	0.0
Alligator Chain	S60	55	ALLI	62.0	R	63.2	-1.2	0.0	0.2	0.0	0.1	-0.1	0.0
Lake Gentry	S63	71	LKGT	59.6	R	61.0	-1.4	0.0	0.3	0.0	0.0	0.0	0.0
East Lake Toho	S59	303	TOHOE	55.9	R	56.5	-0.6	1.0	0.8	0.7	0.7	0.3	0.1
Lake Toho	S61	938	TOHOW, S61	53.0	R	53.5	-0.5	1.1	1.0	0.8	0.8	0.3	0.1
Lakes Kissimmee, Cypress, and Hatchineha	S65	2899	LKISSP, KUB011, LKIS5B	50.2	R	51.0	-0.8	1.6	1.9	0.9	0.8	0.0	-0.1

* T = temporary schedule, R = USACE flood control schedule, S = temporary snail kite schedule, A = projected ascension line, N/A = not applicable or data not available.

** Seven-day average of weighted daily means through Sunday midnight.

*** Names of in-lake monitoring sites and structures used to determine lake stage; if more than one site is listed, an average is reported.

DATA ARE PROVISIONAL

Lower Kissimmee Basin

Discharges and stages at Lower Basin structures are shown in Table 2. SFWDAT depth maps for the Phase I restoration area are shown in Figure 12. Kissimmee River floodplain stages at selected stations are shown in Figure 13.

Table 2. Mean weekly discharge at S-65x structures, and mean weekly Phase I area river channel dissolved oxygen and floodplain mean water depth. Discharge and stage data are provisional real-time data from SFWMD OASyS DualTrend; reported values are averages through midnight of the Sunday prior to the report date unless otherwise specified.

Report Date: 6/7/2016												
Metric	Location	Sunday's 1-day average	Weekly Average**									
			6/5/16	5/29/16	5/22/16	5/15/16	5/8/16	5/1/16	4/24/16	4/17/16	4/10/16	4/3/16
Discharge (cfs)	S-65	3567	2899	4304	2029	1480	1091	1125	1775	1812	3289	5062
Discharge (cfs)	S-65A	3665	3348	6187	4379	1352	1143	925	1656	1710	3395	5407
Discharge (cfs)	S-65C	3785	4792	6914	3320	1603	1337	1543	2082	2759	4387	2902
Headwater stage (feet NGVD)		33.9	33.9	34.2	34.3	34.1	34.3	34.0	34.1	34.0	34.0	34.1
Discharge (cfs)	S-65D****	4087	5186	7868	2979	1641	1391	1584	2132	2872	4648	2755
Discharge (cfs)	S-65E	3943	5005	7470	2873	1531	1268	1471	1983	2766	4507	2657
DO concentration (mg/L)***	Phase I river channel	0.44	0.48	0.72	3.62	6.06	5.94	5.65	4.84	3.82	3.12	3.83
Mean depth (feet)*	Phase I floodplain	1.75	N/A	2.81	3.09	0.71	0.80	0.57	0.94	1.08	1.76	2.32

* 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 PC62 and PC33 starting June 2. PC33 omitted for week of Aug16. DO for week of Sept 15-22 is for PC33 only.

**** 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.

Water Management Recommendations

Kissimmee Basin Adaptive Recommendations and Operational Actions

Date	Recommendation	Purpose	Outcome	Source
6/7/2016	No new recommendations.			
5/31/2016	No new recommendations.			
5/24/2016	No new recommendations.			
5/17/2016	No new recommendations.			
5/10/2016	No new recommendations.			
5/3/2016	No new recommendations.			
4/26/2016	No new recommendations.			
4/19/2016	No new recommendations.			
4/12/2016	No new recommendations.			
4/5/2016	No new recommendations.			
3/29/2016	No new recommendations.			
3/22/2016	No new recommendations.			
3/15/2016	No new recommendations.			
3/8/2016	No new recommendations.			
3/1/2016	No new recommendations.			
2/23/2016	No new recommendations.			
2/16/2016	No new recommendations.			
2/9/2016	No new recommendations.			
2/1/2016	Begin F&W recessions in East Toho, Toho, and KCH per the requested recession lines shown in the 2015-16 Dry Season Standing Recommendation (SR). Use Table 2 for guidance on rates of change in discharge to control departures from the line in KCH, and the reversal guidelines shown in the SR for Toho and East.	Initiate and manage lake stage recessions in East Toho, Toho, and KCH for the benefit of fish and wildlife, while avoiding harm to the Kissimmee River	TBD	KB Tech Team
1/20/2016	Continue to adjust discharge at S65 to follow the 2015-16 Dry Season SR guidelines for rampdown at S65A. Balance discharge at the two structures to maintain at least minimum discharge to the river. As stage rises above 51 ft in KCH, temporarily bypass the Fig 1 discharge plan in the SR and manage discharge to let KCH stage rise to 51.5 ft (the Feb 1 recession starting stage) if conditions allow while following rampdown guidelines. If KCH stage rises further than 51.5 ft, we will reevaluate. As changes in discharge become necessary, continue to follow the Table 1 guidelines in the SR. Switch to Table 2 rampup/rampdown guidelines on Feb 1 or when the recession line is intercepted for management of the recession in KCH.	If conditions allow, let stage increase to 51.5 ft to intersect the Feb 1 starting stage for KCH F&W recession line.	Implemented	KB Tech Team
12/10/2015	Temporarily raise from 50.5 ft to 51 ft the threshold stage for increasing discharge at S65/S65A to 1400 cfs. This is a temporary modification of the current draft 2015-16 dry season Standing Recommendation (SR). Discontinue last week's temporary change in the rate of discharge increase and return to the original per-day rates shown in Table 1 of the draft SR - i.e., increase discharge to 1400 cfs at a rate of 150 cfs/day rather than 150 cfs/2 days. If KCH stage should start to decline while ramping up but before reaching 1400 cfs, begin to ramp back down using the rates in Table 1.	Slow the effect of discharge on KCH stage, balance KCH stage and KRRP discharge objectives.	Implemented	KB Tech Team

KCOL Hydrographs (through Sunday midnight)

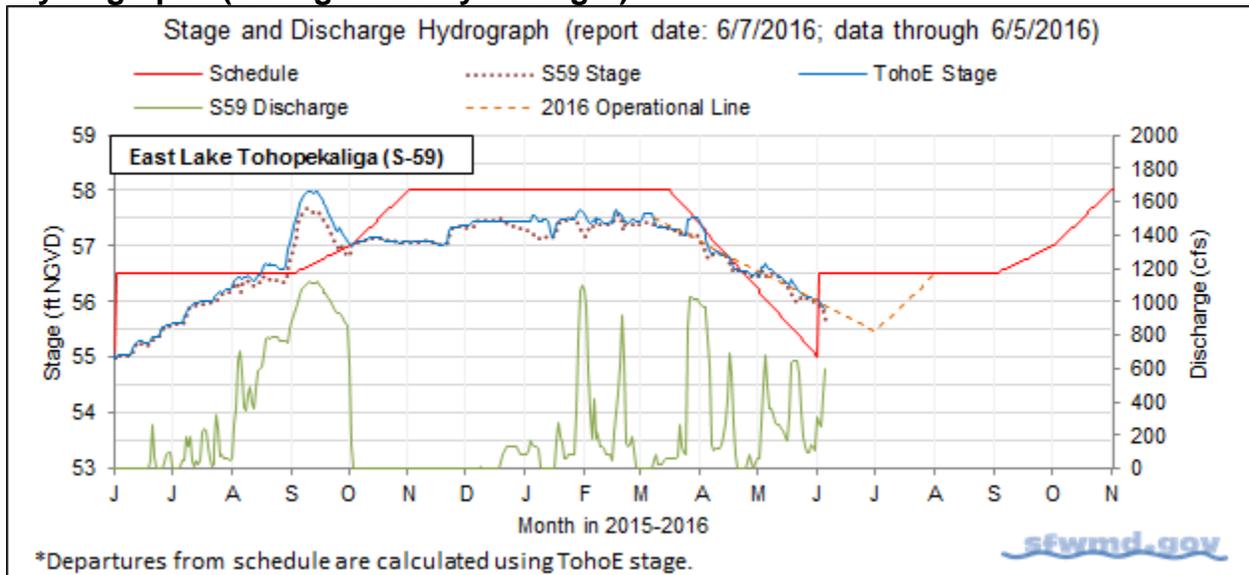


Figure 1.

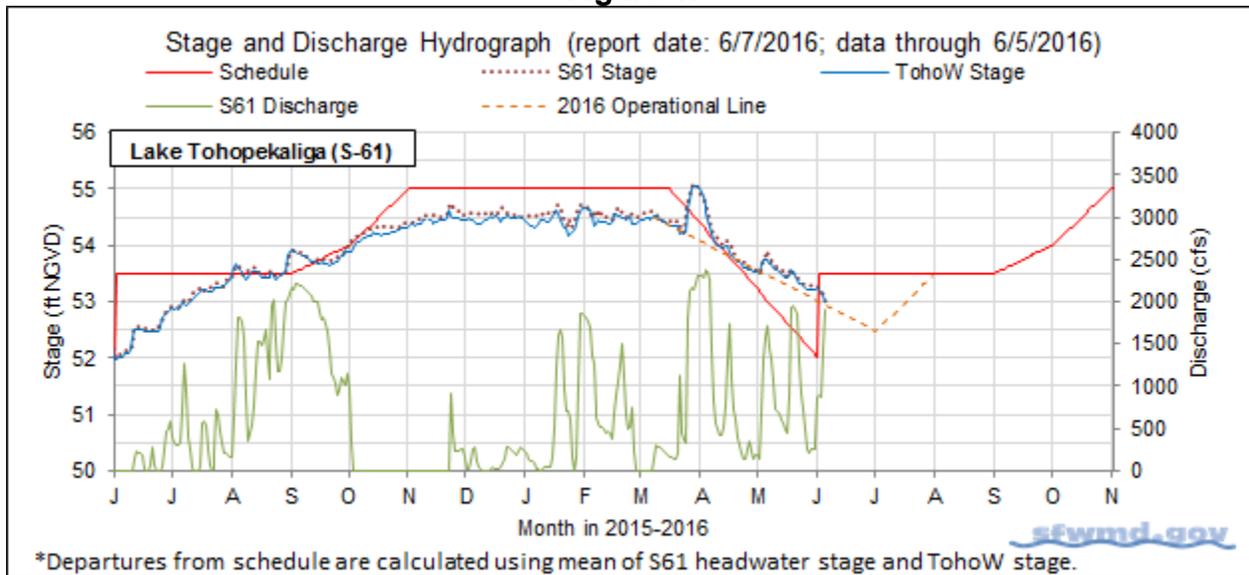


Figure 2.

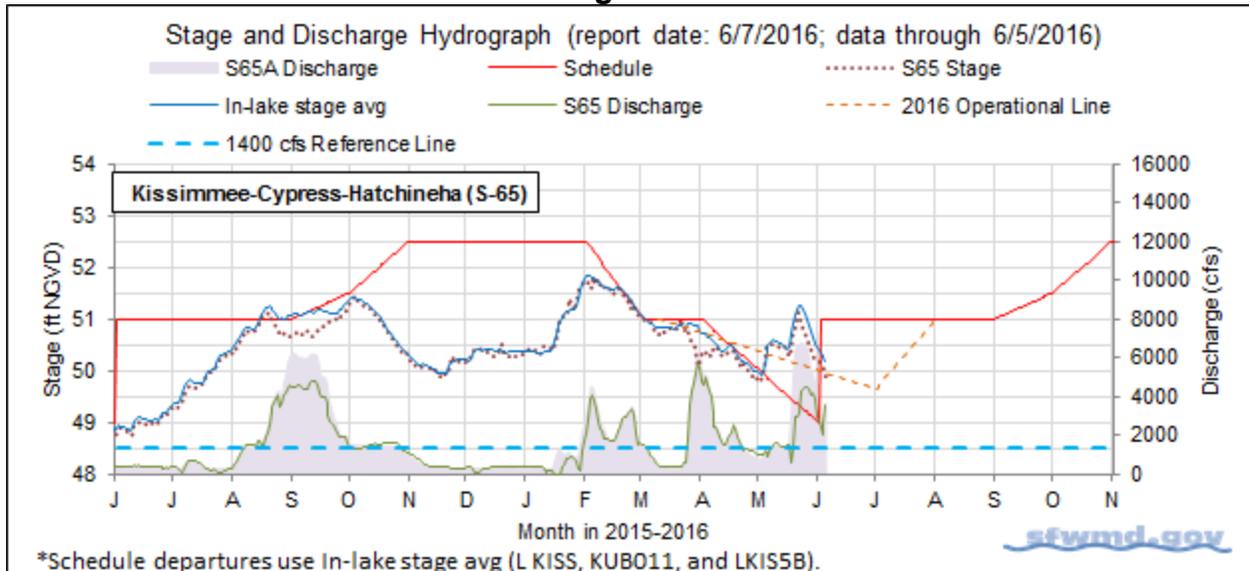


Figure 3.

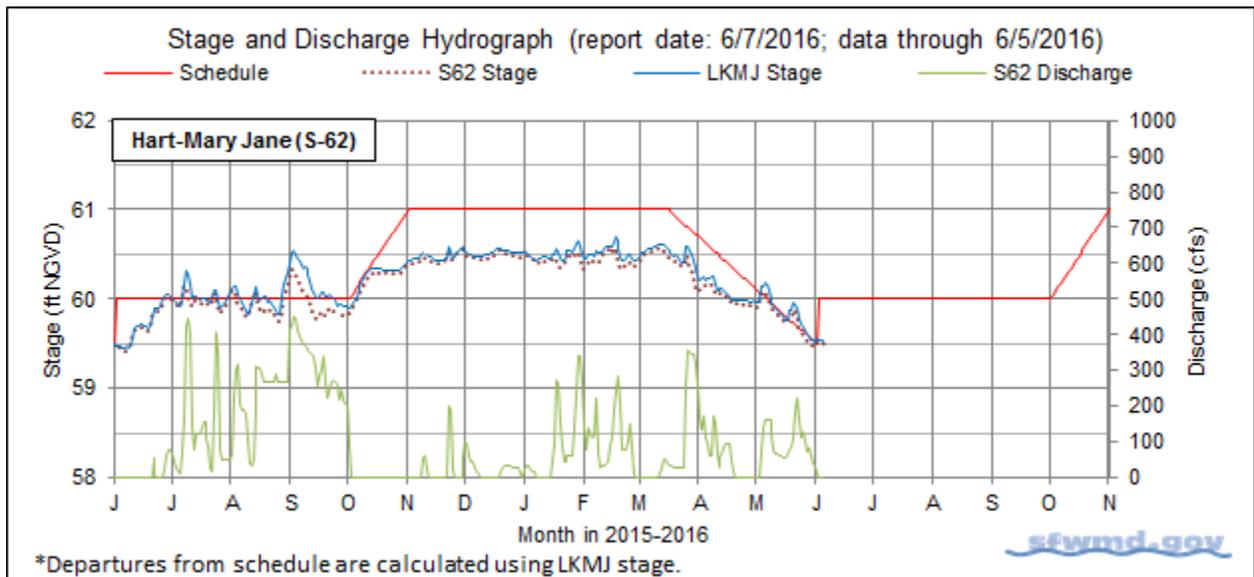


Figure 4.

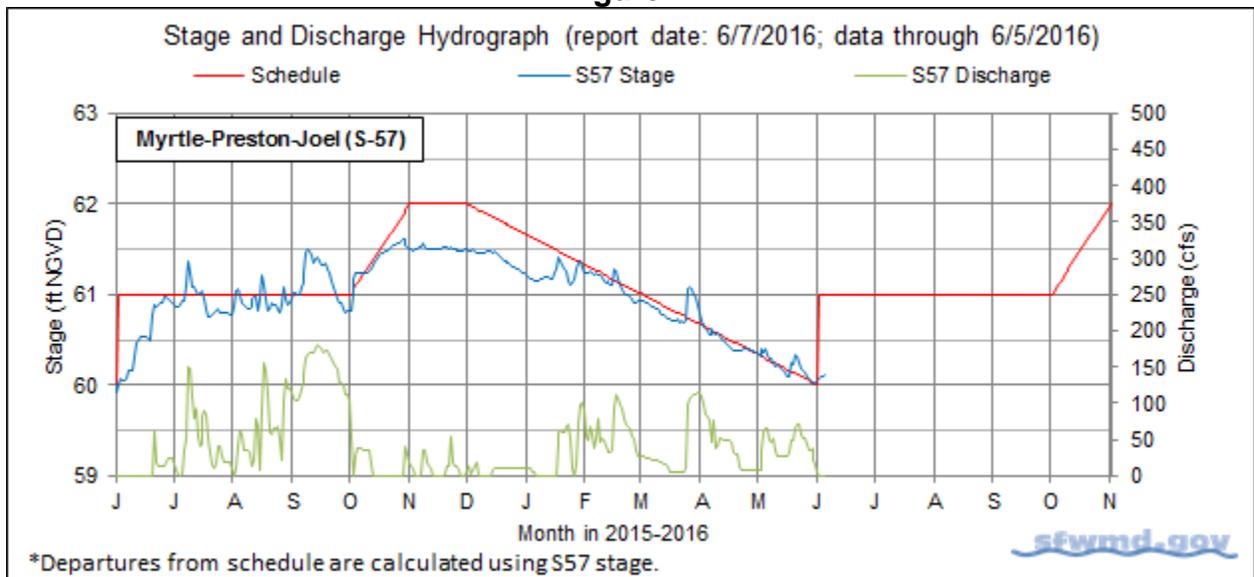


Figure 5.

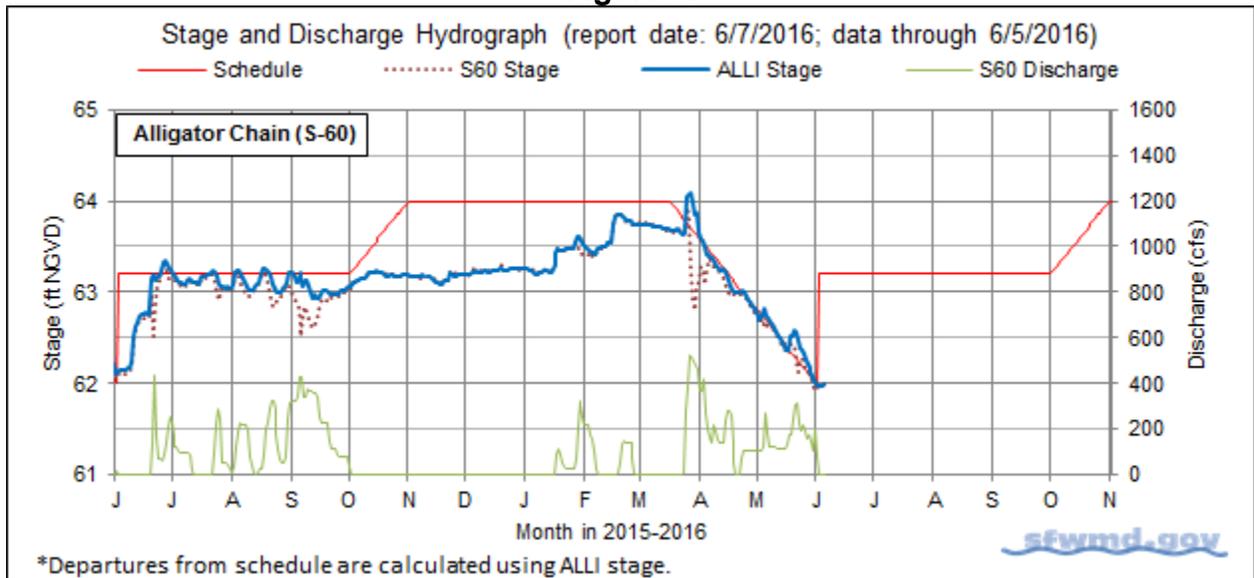


Figure 6.

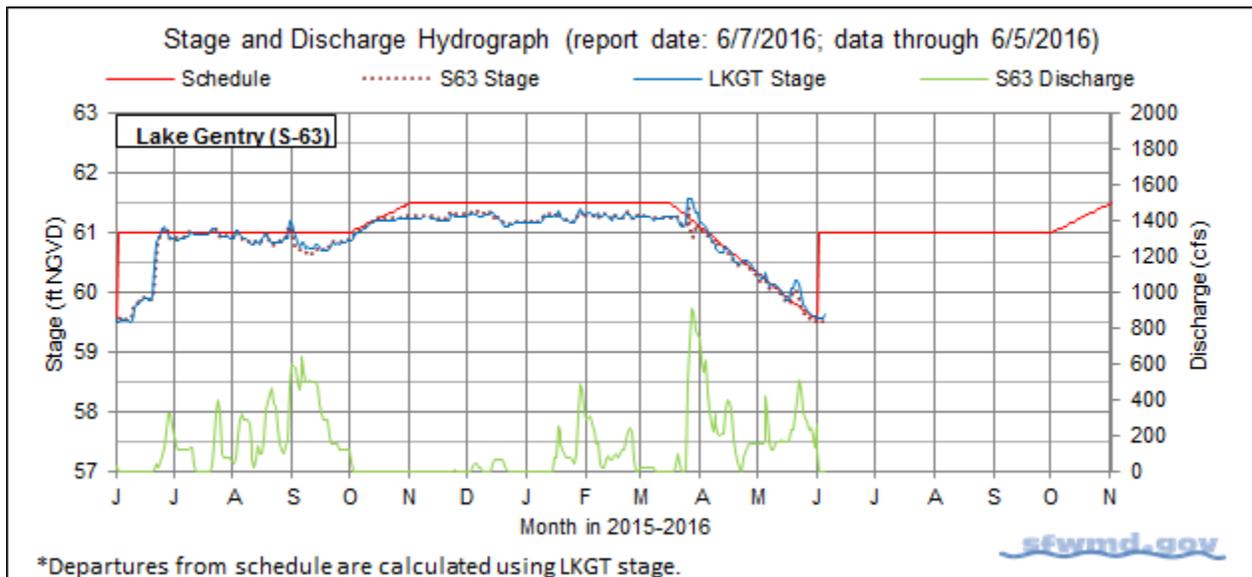


Figure 7.

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		
*DRY FLOODPLAIN RULE. When the Kissimmee River floodplain is dry (>7 days at 300 cfs), increases above 1200 cfs should be made in consultation with LRE Operations (Steve Bousquin and David Anderson).			

Figure 8a. Limits on rate of discharge change at S65/S65A from the 2015-2016 Dry Season Standing Recommendation.

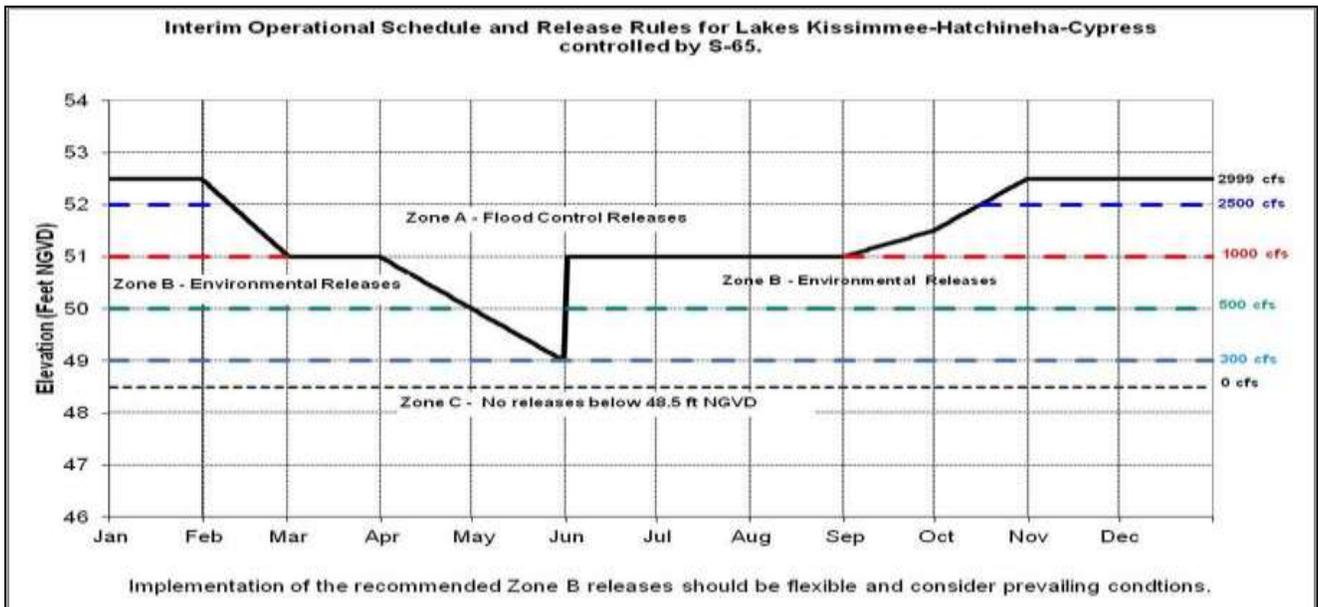


Figure 8b. Interim operations schedule for S-65. The discharge schedule shown to the right has not been used in recent years or in Wet Season 2015.

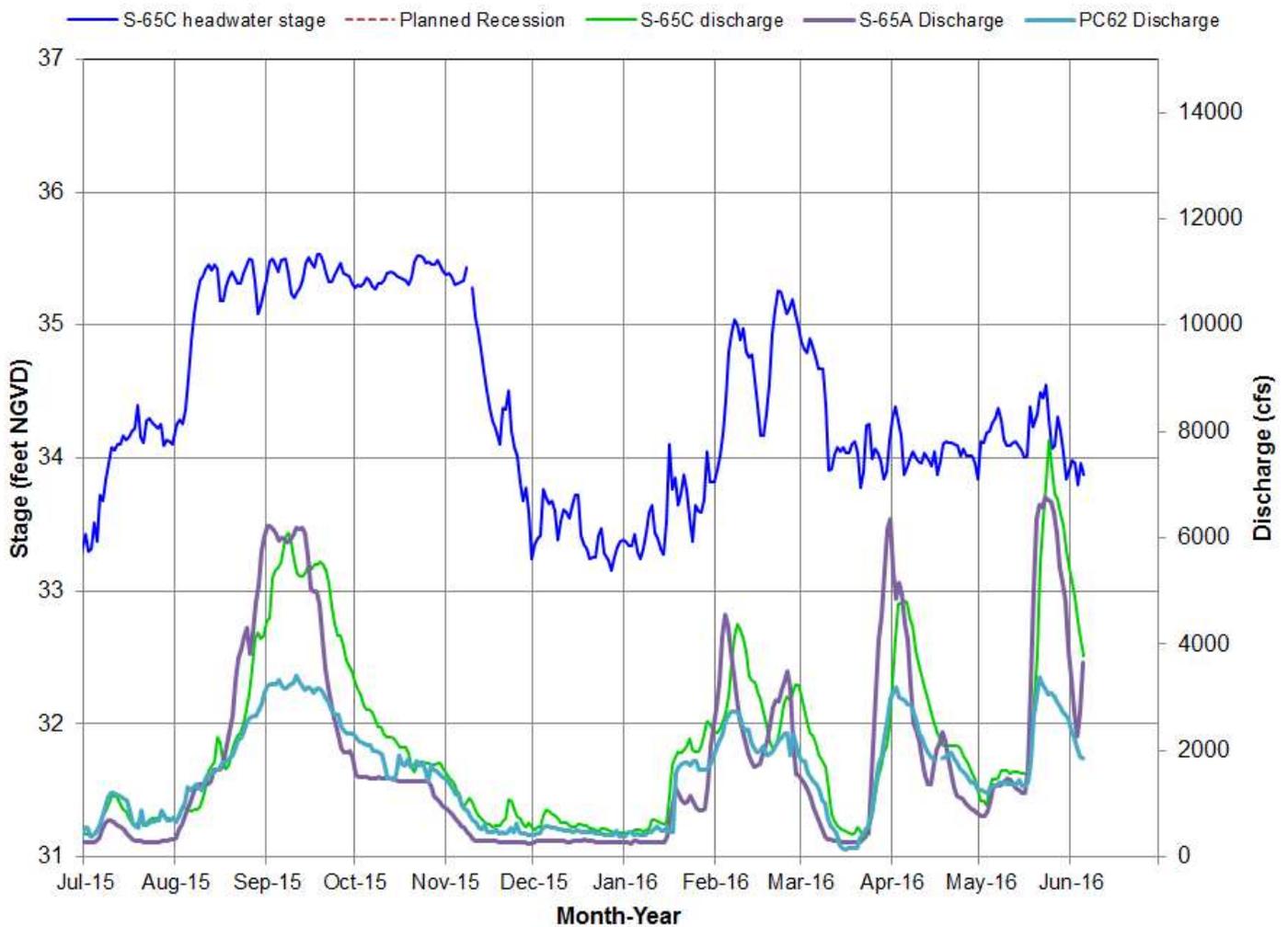


Figure 9. S-65C headwater stage in relation to discharge at S-65C, S-65A, and PC62.

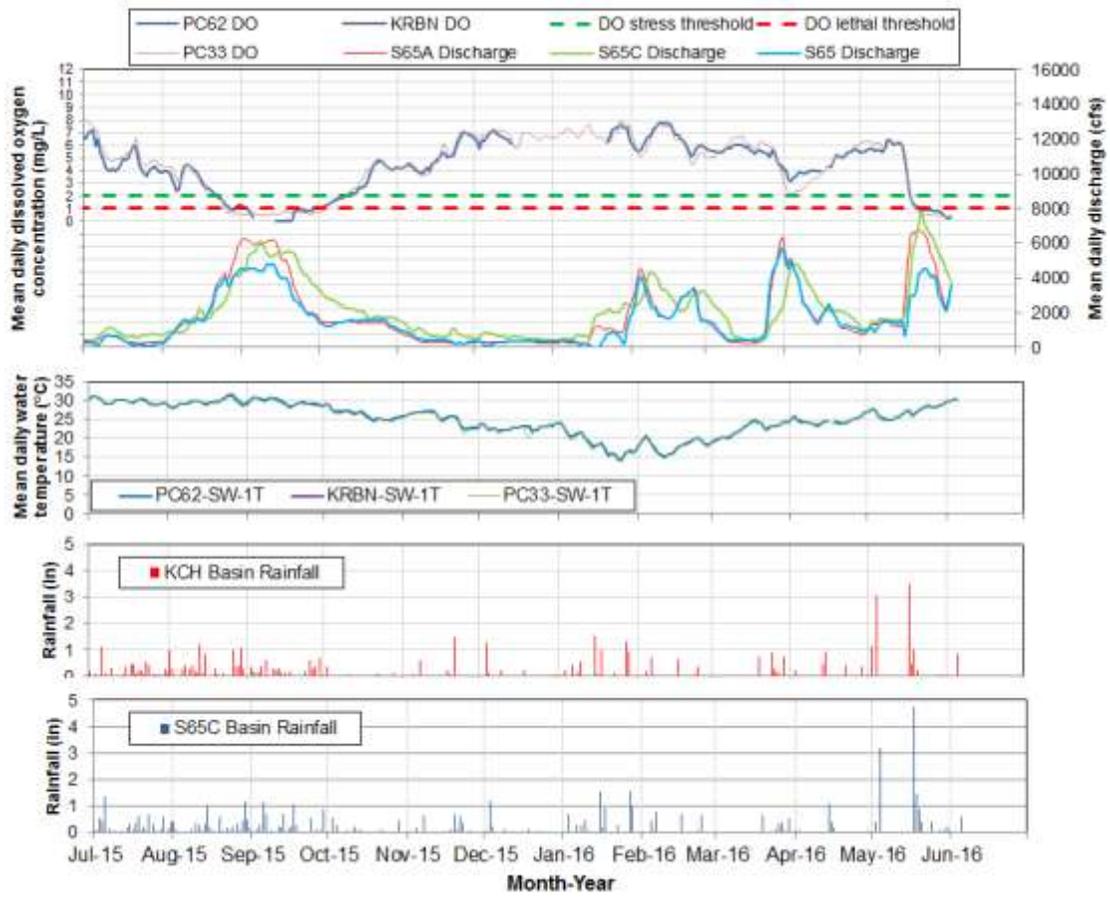


Figure 10. Mean daily Dissolved Oxygen, discharge, temperature and rainfall in the Phase I river channel.

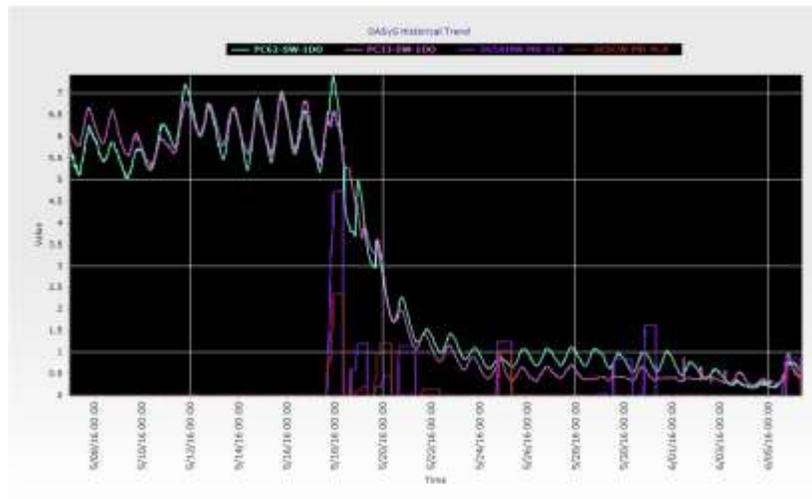
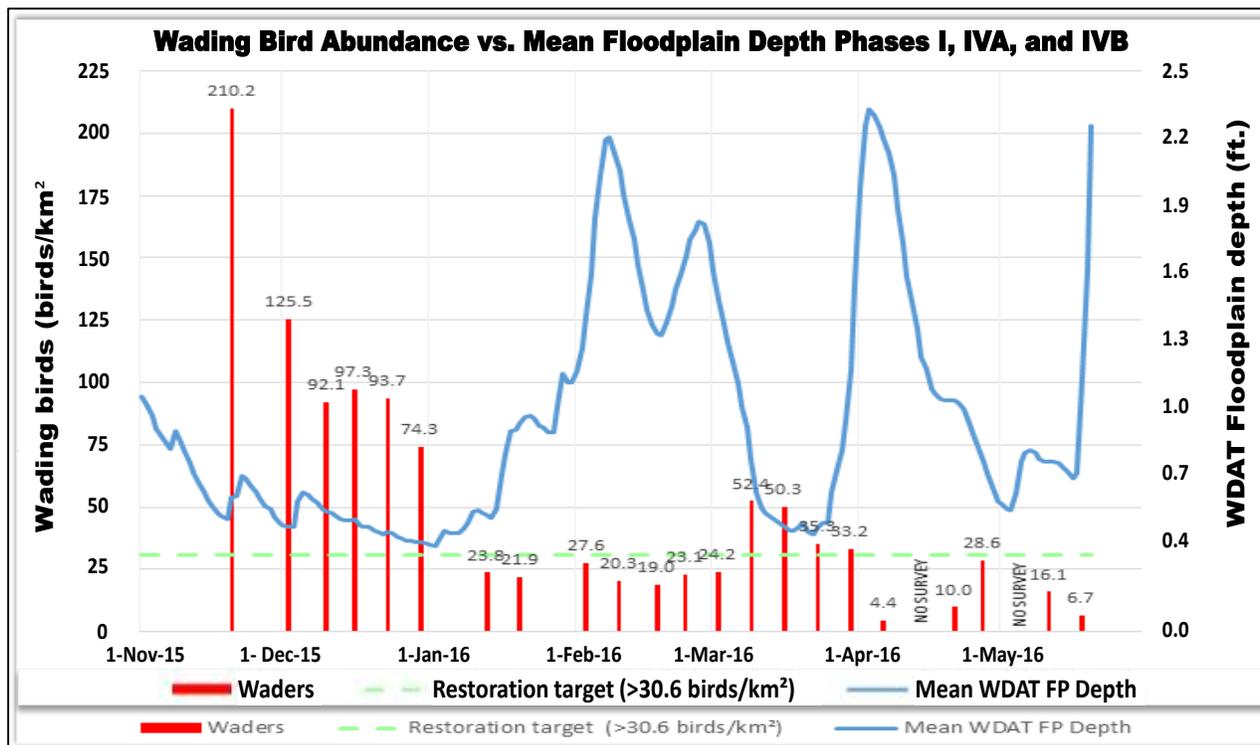


Figure 11. Phase I river channel dissolved oxygen (measured at 15 minute intervals) and rainfall at S65A and S65C.



Insert 1. Wading bird abundance on the Kissimmee River floodplain in 2015-2016 dry season. Stage reversals (increases in water depth) are caused by increases in flow at S65/S65A following rainfall. Stage reversals affect the ability of wading birds to use floodplain habitats because they cannot forage in water that is too deep.

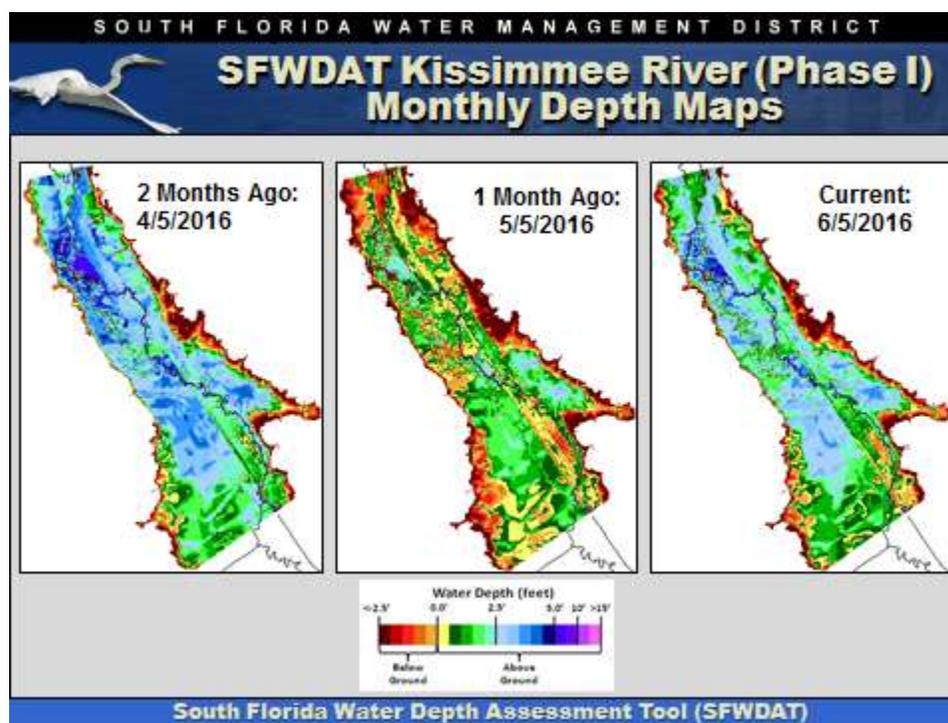


Figure 12. Phase I area floodplain water depths for this week, one month ago, and two months ago. Note that the WDAT color-coding has been modified to accommodate greater water depths; these maps are not directly comparable to Kissimmee Basin WDAT maps published prior to Jan. 16, 2012.

Kissimmee River Hydrographs

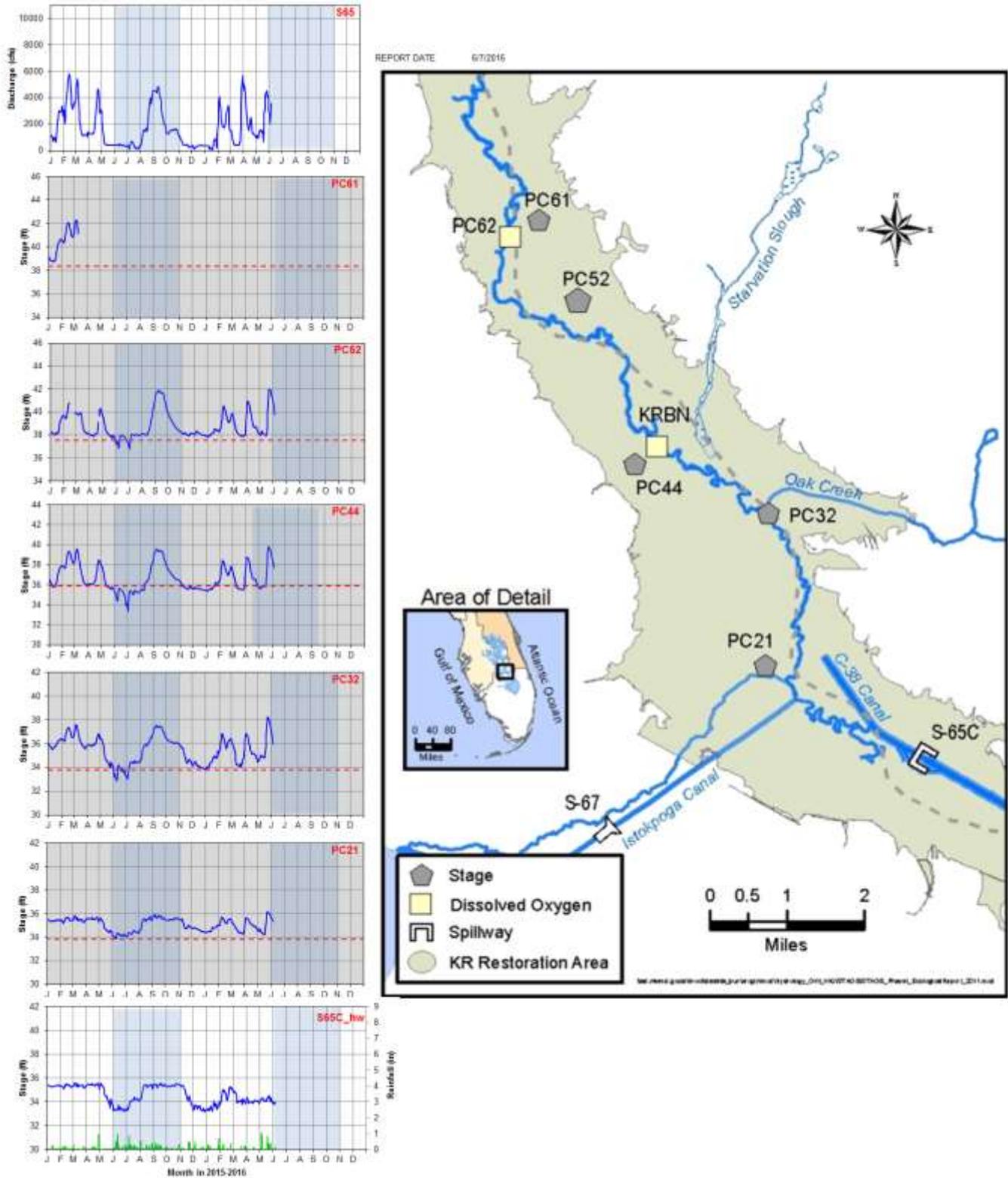


Figure 13. Discharge at S65, stages at five monitoring stations in the Phase I area of the Kissimmee River floodplain, and headwater stage at S65-C since January 1, 2015. The most recent data (~2 weeks) are provisional real-time data from SFWMD DualTrend; previous data are from SFWMD DB-HYDRO (validated).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

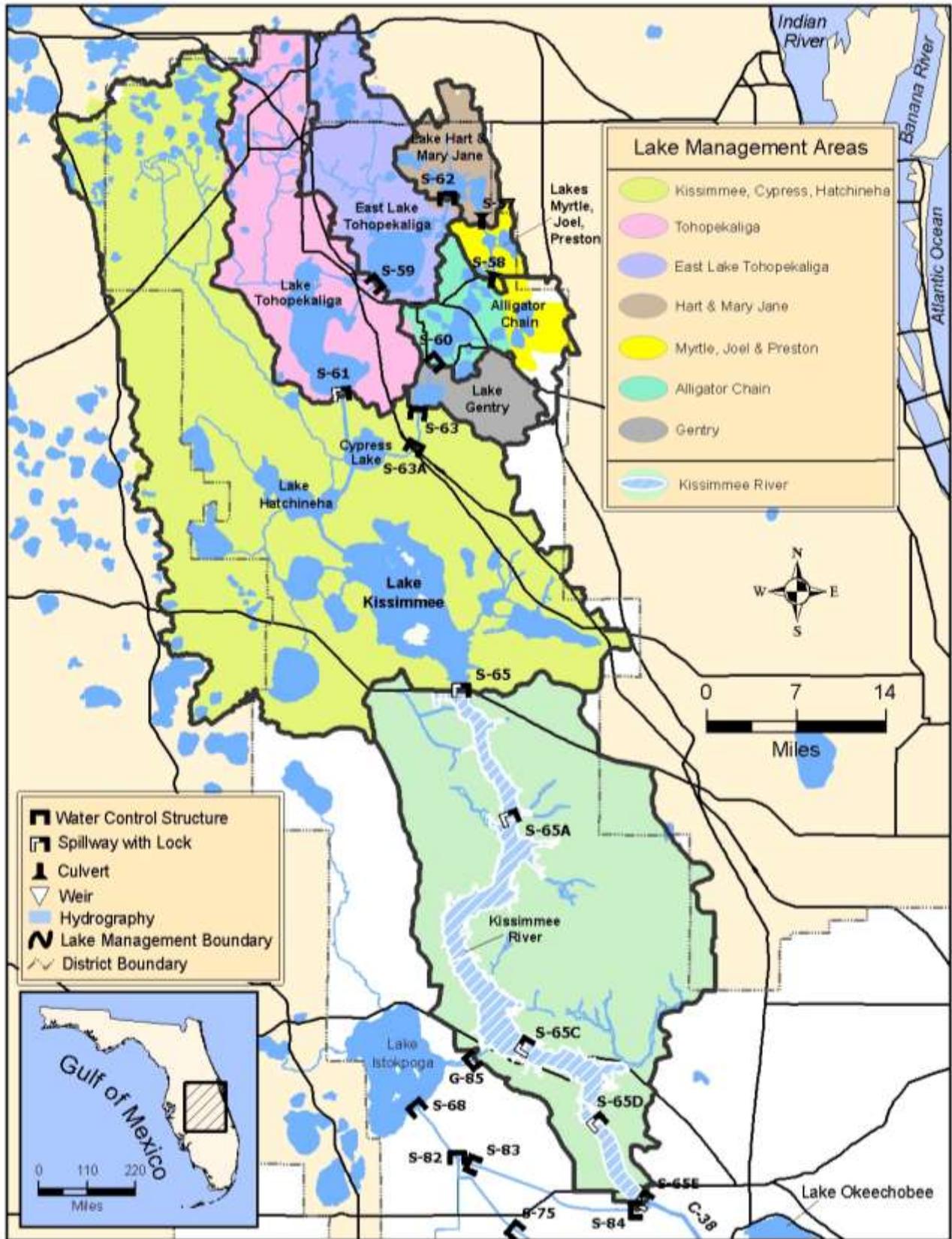


Figure 14. The Kissimmee Basin

LAKE OKEECHOBEE

According to the USACE web site, Lake Okeechobee stage is at 14.40 feet NGVD for the period ending at midnight on June 6, 2016. This value is based on the use of four interior Lake stations (L001, L005, L006, and LZ40) and four perimeter stations (S352, S4, S308 and S133). Lake stage has remained essentially static over the past week and is 0.42 feet higher than it was a month ago and 1.83 feet higher than it was a year ago (Figure 1). The Lake is in the Low Flow Sub-band (Figure 2). According to RAINDAR, 1.42 inches of rain fell directly over the Lake during the past seven days. Similar amounts of rain fell in the surrounding watershed, except for the upper Kissimmee Valley where higher amounts prevailed.

Based on USACE reported values, current Lake inflow is approximately 6,001 cfs, consisting of flows as indicated below.

Structure	Flow cfs
S65E	3,905
S154	0
S84 & 84X	184
S71	186
S72	339
C5 (Nicodemus slough dispersed storage)	-124
S191	0
S133 PUMPS	149
S127 PUMPS	50
S129 PUMPS	68
S131 PUMPS	32
S135 PUMPS	286
Fisheating Creek	112
S2 Pumps	0
S3 Pumps	0
S4 Pumps	0

Current Lake outflow is approximately 5,556 cfs exiting at S77 (3,772 cfs), S308 (1,603 cfs) and to the L8 canal through Culvert C10A (191 cfs). Water supply demands have decreased in the EAA contributing to less water moving south. Corrected evapotranspiration value based on the L006 weather platform solar radiation data for this past week was 3800 cfs.

Change in elevation equivalents and average weekly flows for major structures are presented in Figure 4. Weekly average values for S77 and S308 are based on USGS data for the below structure gauges.

Florida Atlantic University avian scientists report that the wading bird nesting season on Lake Okeechobee is drawing to a close with most chicks now in the fledgling stage.

The most recent MODIS satellite image for June 3 appears to indicate a potential for bloom development in the central pelagic zone (Figure 5).

Water Management Recommendations

The winter/spring dry season has ended and despite continued high release rates through S77 and S308, Lake stage has remained essentially static as a result of increased rainfall and inflows, reflecting

the beginning of the wet season. It is unclear whether any additional short-term recession of Lake stage is to be anticipated unless it results from USACE management actions or unusually dry climatic conditions. The current Lake stage is probably too high for this time of year and not beneficial to breeding snail kites. It may also result in an increased loss of submerged aquatic vegetation (SAV), inundation of apple snail eggs and an increased risk of cyanobacterial blooms. Future short-term recommendations are highly dependent on the near-term rainfall patterns and amounts. The goal should be to limit the rate of Lake stage increase or initiate an unseasonable recession in Lake stage to avoid exceeding the top of the preferred stage envelope (15.5 feet NGVD) during the wet season.

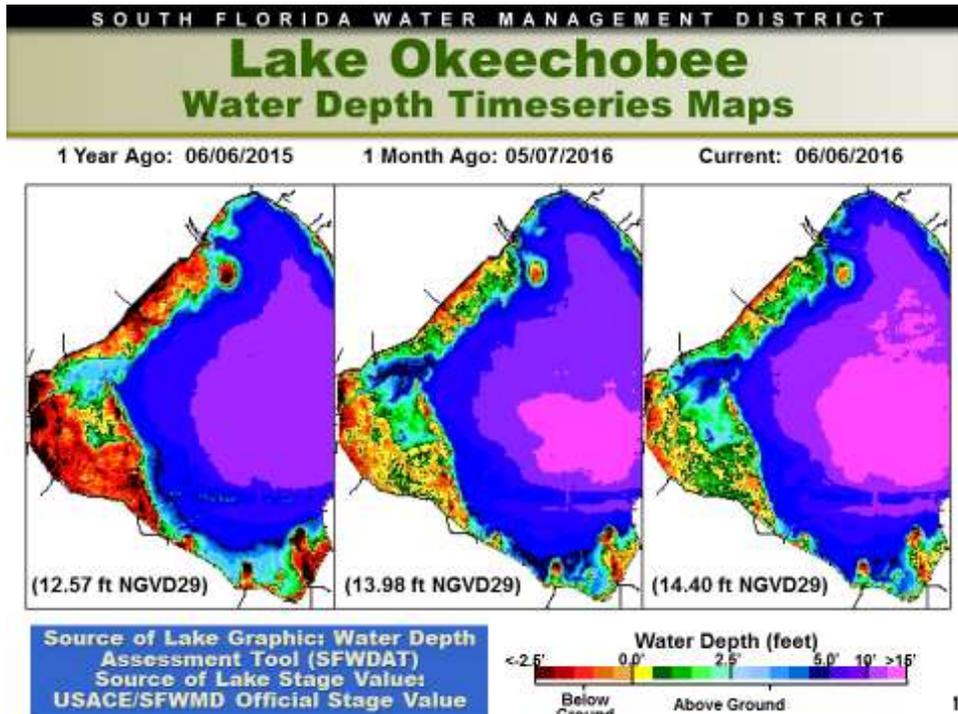


Figure 1

Lake Okeechobee Water Level History and Projected Stages

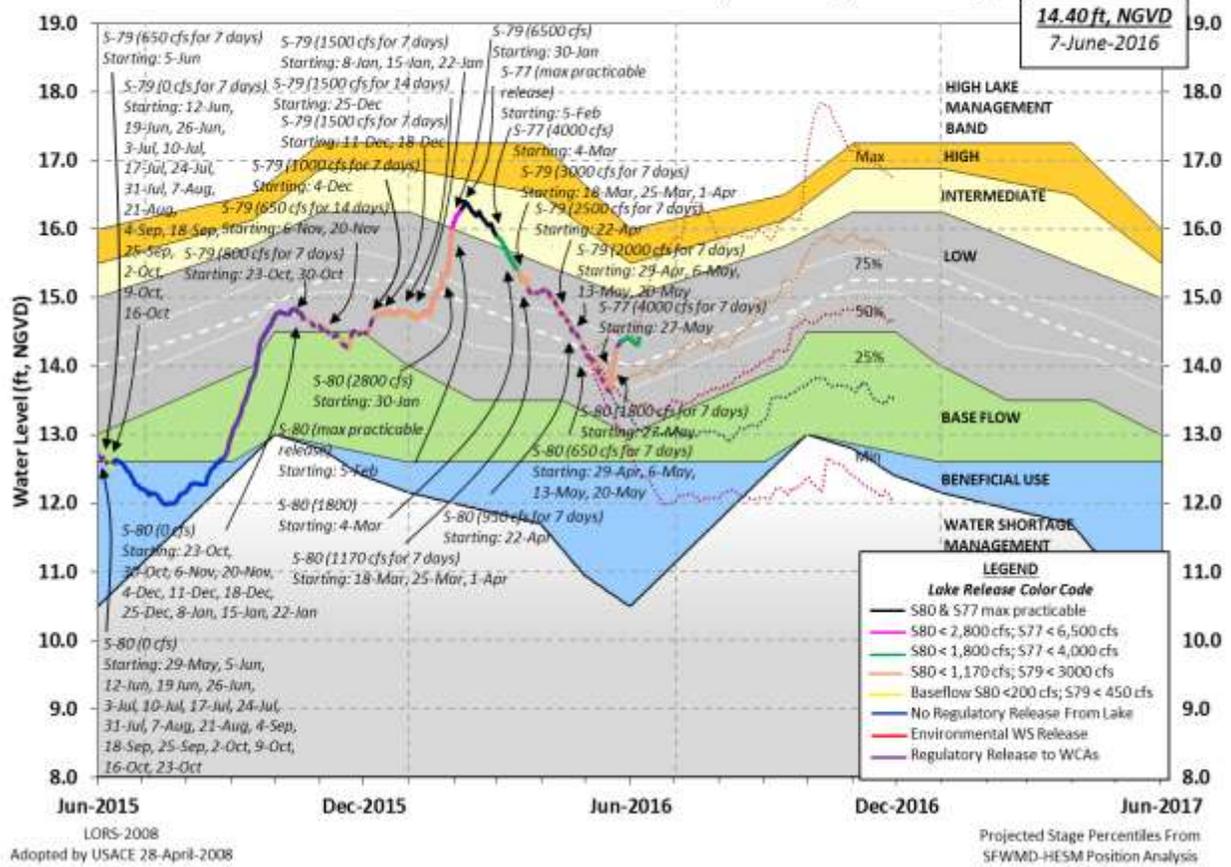
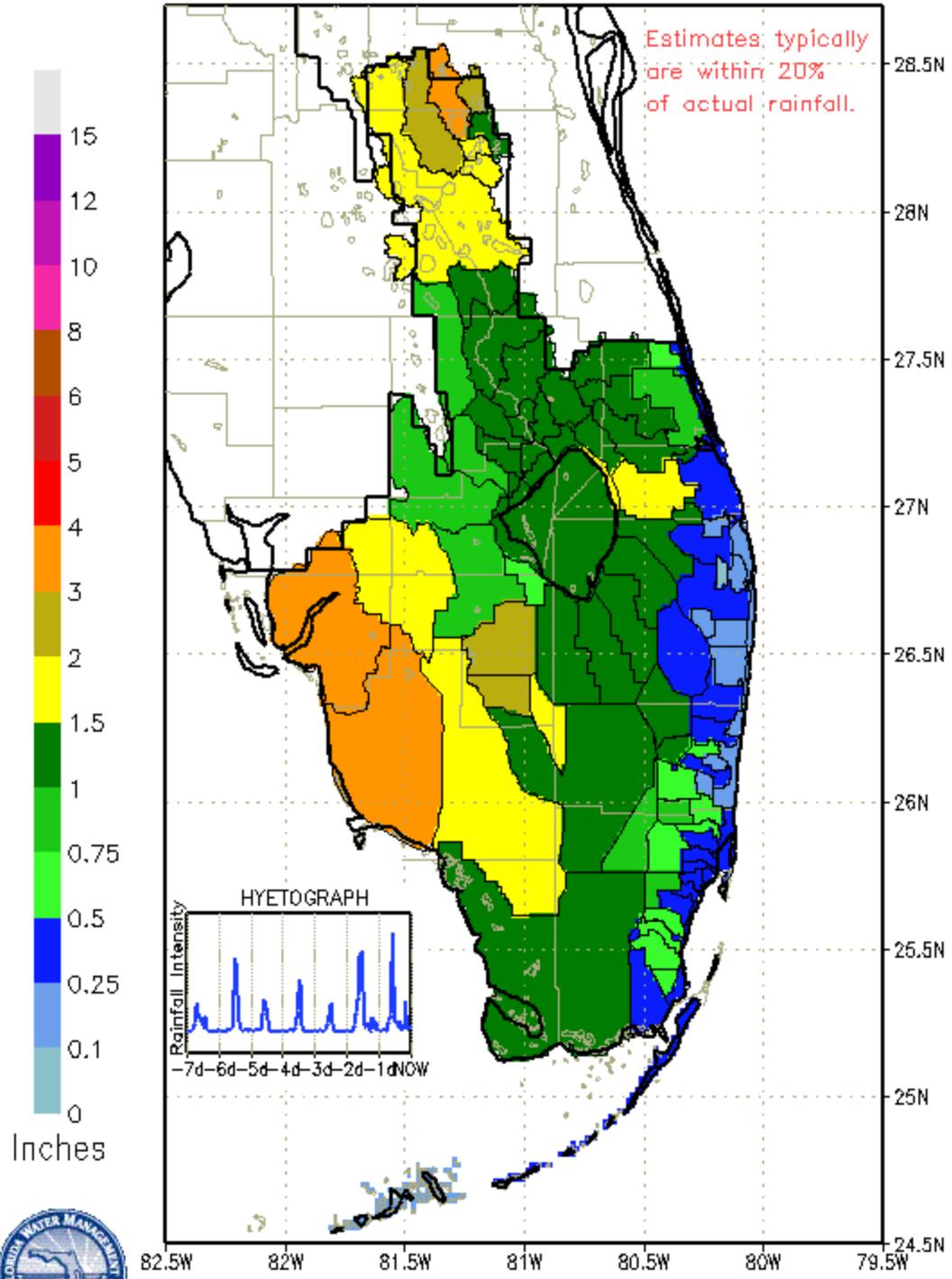


Figure 2

SFWMD PROVISIONAL RAINFAR 7-DAY BASIN RAINFALL ESTIMATES

FROM: 0530 EST, 05/31/2016 THROUGH: 0530 EST, 06/07/2016



DISTRICT-WIDE RAINFALL ESTIMATE: 1.504"

Figure 3

INFLOWS	Average Daily Flow Past Week cfs	Feet of Change Past Week
S65E	4448	0.150
S71 & 72	117	0.004
S84 & 84X	794	0.027
Fisheating Creek	320	0.011
Rainfall	N.A.	0.118
OUTFLOWS	Average Daily Flow Past Week cfs	Feet of Change Past Week
S77	3871	0.131
S308	1741	0.059
S351	233	0.008
S352	138	0.005
S354	174	0.006
L8	326	0.011
ET	3800	0.129

Figure 4

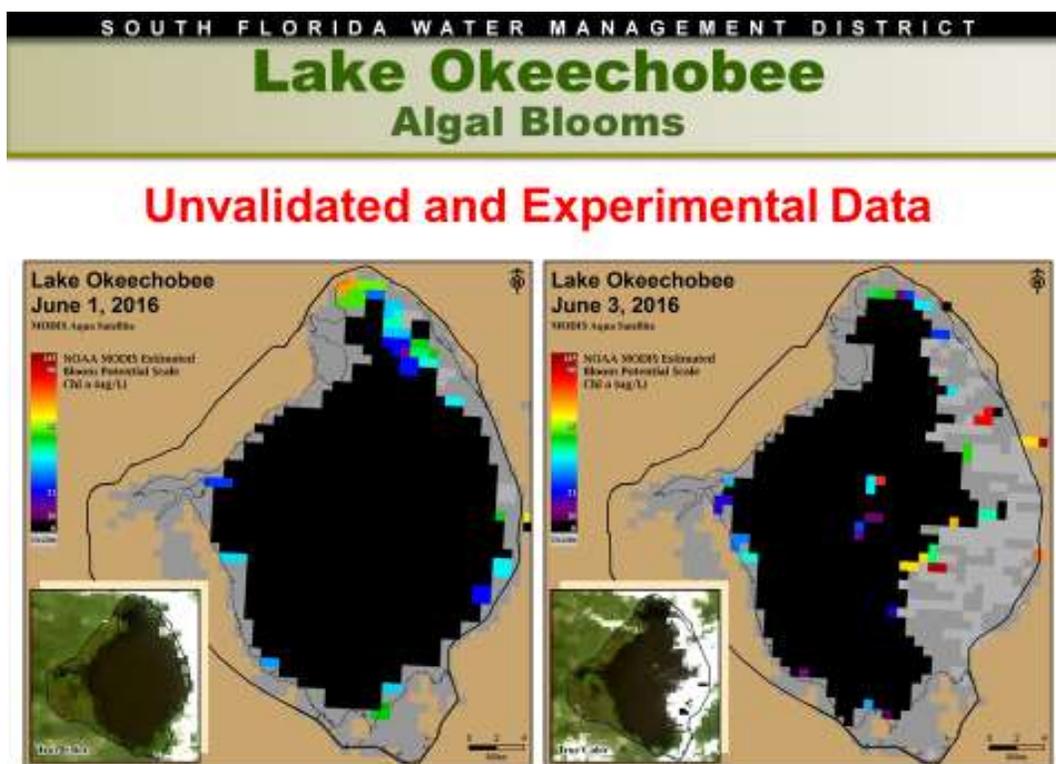


Figure 5

Lake Istokpoga

The spring recession to low pool stage was completed last week with Lake stage decreasing by 0.10 feet. Lake stage is 38.21 feet NGVD today and is currently 0.04 feet below its low pool regulation schedule stage of 38.25 (Figure 6). Average flows into the Lake from Arbuckle and Josephine creeks

were 545 and 182 cfs respectively, a decrease from the preceding week. Average discharge from S68 and S68X this past week was 885 cfs, a decrease compared to the preceding week. According to RAINDAR, 0.94 inches of rain fell in the Lake Istokpoga watershed during the past seven days.

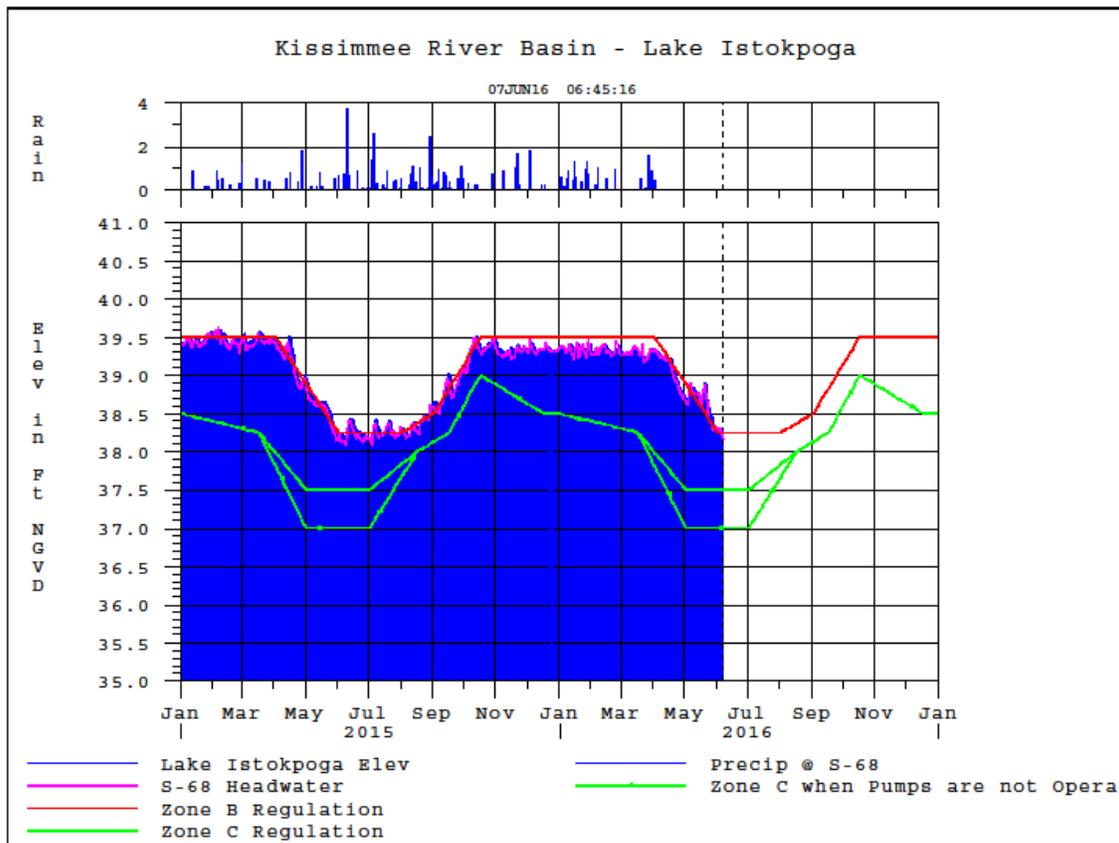


Figure 6

ESTUARIES

St. Lucie Estuary

Over the past week, provisional flows averaged about 1,808 cfs at S-80, 1,742 cfs downstream of S-308, 247 cfs at S-49 on C-24, 166 cfs at S-97 on C-23, and 109 cfs from Ten Mile Creek at the Gordy Road Structure. Average inflow from tidal basin tributaries is estimated to be 312 cfs (Figures 1 and 2). Total inflow averaged about 2,642 cfs last week and 2,496 cfs over last month.

Over the past week, salinity remained about the same 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 3.9. Salinity conditions in the middle estuary are in the poor 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)	1.0 (0.8)	1.8 (2.0)	NA ¹
US1 Bridge	3.1 (3.3)	4.7 (5.4)	10.0-26.0
A1A Bridge	11.7 (12.3)	19.2 (21.1)	NA

¹Envelope not applicable

Caloosahatchee Estuary

During the past week, provisional flows averaged approximately 3,871 cfs downstream of S-77, 3,521 cfs at S-78, and 4,821 cfs at S-79. Average inflow from tidal basin tributaries is estimated to be 381 cfs (Figures 5 and 6). Total inflow averaged 5,202 cfs last week and 3,996 cfs over last month.

Over the past week, surface salinity remained about the same throughout the estuary (Table 2, Figures 7 & 8). The seven-day average salinity values are within the good range for adult oysters at Shell Point and at Sanibel and just within the poor range at Cape Coral (Figure 9). The 30-day moving average surface salinity is 0.2 at Val I-75 and 0.5 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)	0.2 (0.2)	0.2 (0.2)	NA ¹
Val I75	0.2 (0.2*)	0.2* (0.2*)	0.0-5.0 ²
Ft. Myers Yacht Basin	0.2 (0.2)	0.3 (0.4)	NA
Cape Coral	3.0 (3.2)	4.1 (7.0)	10.0-30.0
Shell Point	16.1 (16.3)	20.6 (21.1)	10.0-30.0
Sanibel	26.7 (26.7)	28.3 (28.8)	10.0-30.0

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

*Val I75 is temporarily offline due to bridge 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)	5.2 – 9.3	1.3 – 9.7	1.2 – 5.6 Spike to 110 (6/5/16)
Dissolved Oxygen (mg/l)	2.9 – 5.7	3.3 – 6.4	4.5 – 6.8

The Florida Fish and Wildlife Research Institute reported on June 3, 2016, that *Karenia brevis*, the Florida red tide organism, was not observed in samples collected from Lee County.

Water Management Recommendations

Given the current estuarine conditions, there are no ecological benefits associated with additional releases from Lake Okeechobee.

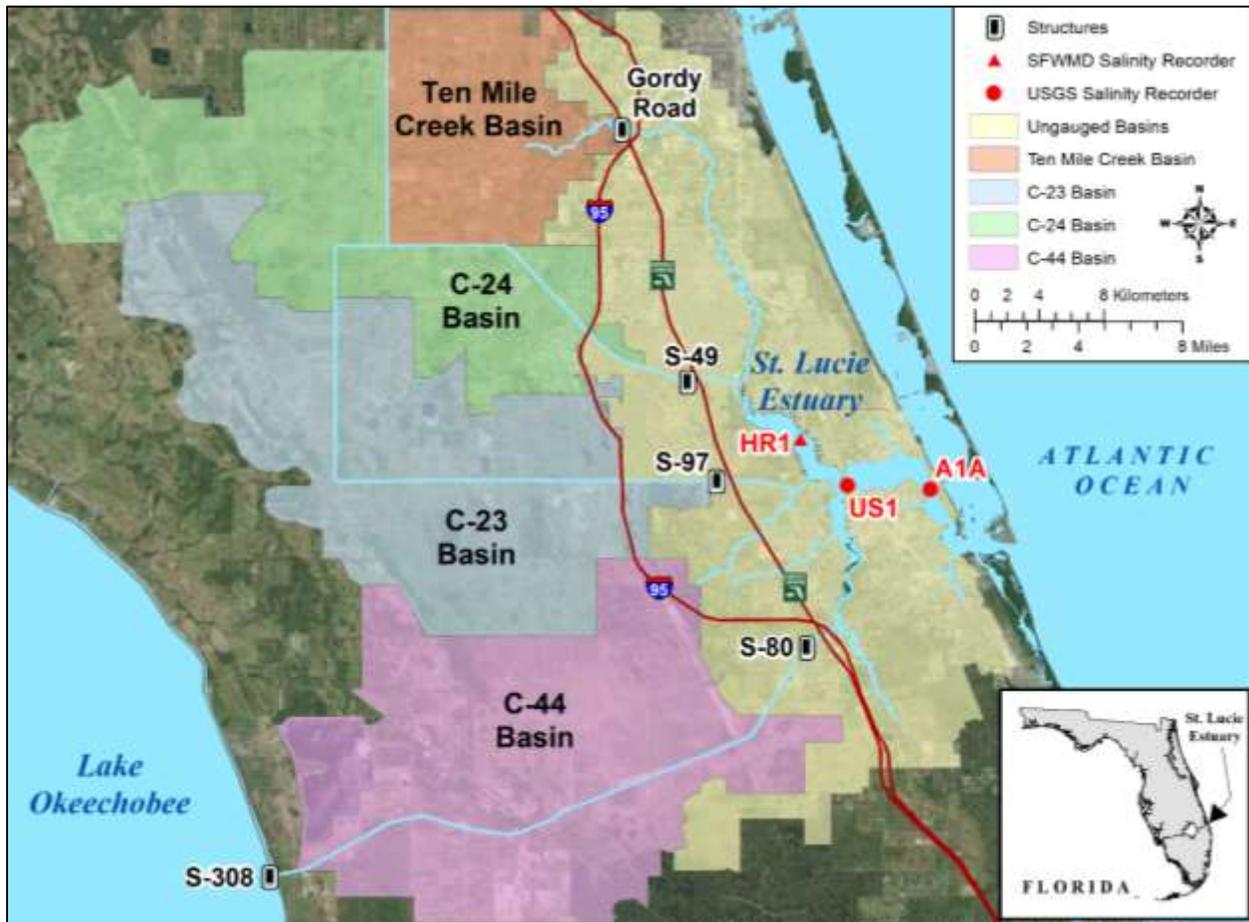


Figure 1. Basins, water control structures, and salinity monitoring for the St. Lucie Estuary.

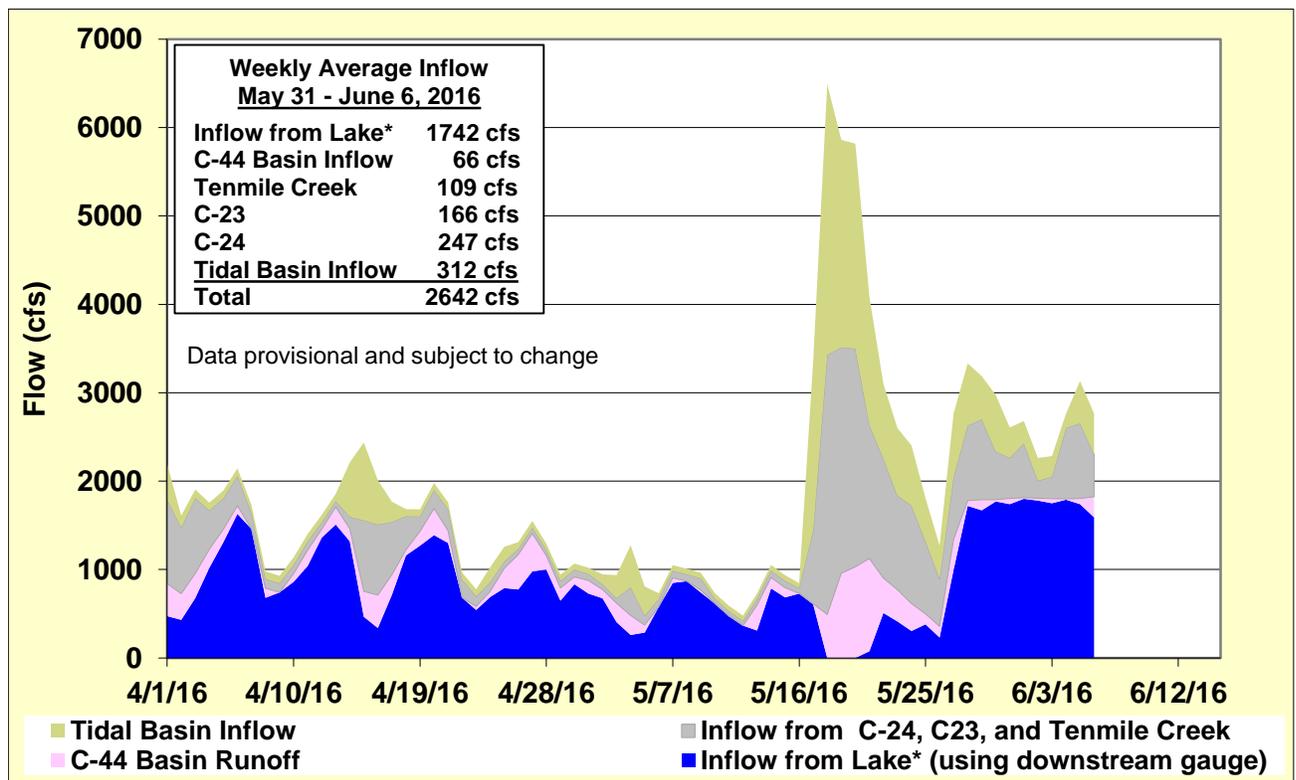


Figure 2. Estimated surface freshwater inflows from Lake Okeechobee and runoff from the C-44, C-23, C-24, Ten Mile Creek, and tidal basins into the St. Lucie Estuary.

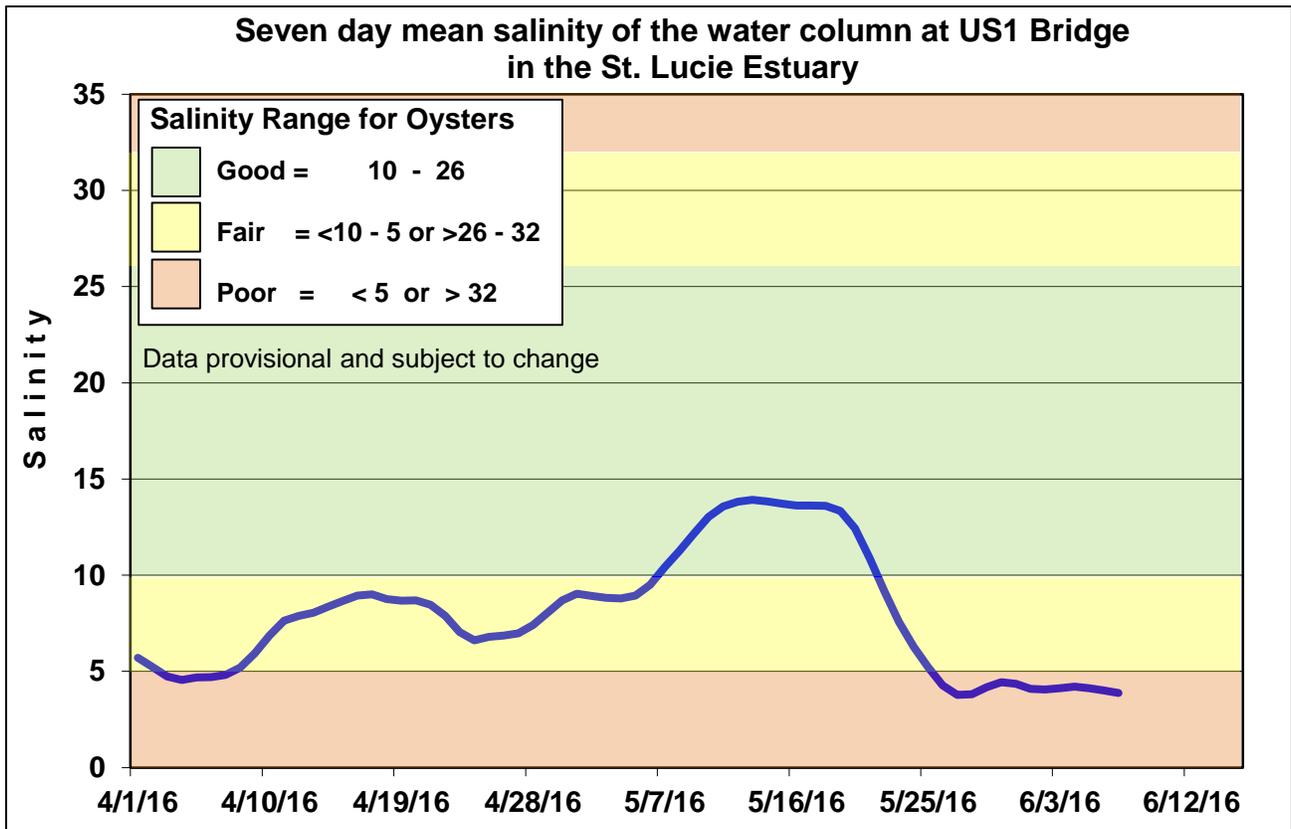


Figure 3. Seven-day mean salinity of the water column at the U.S. Highway 1 Bridge.

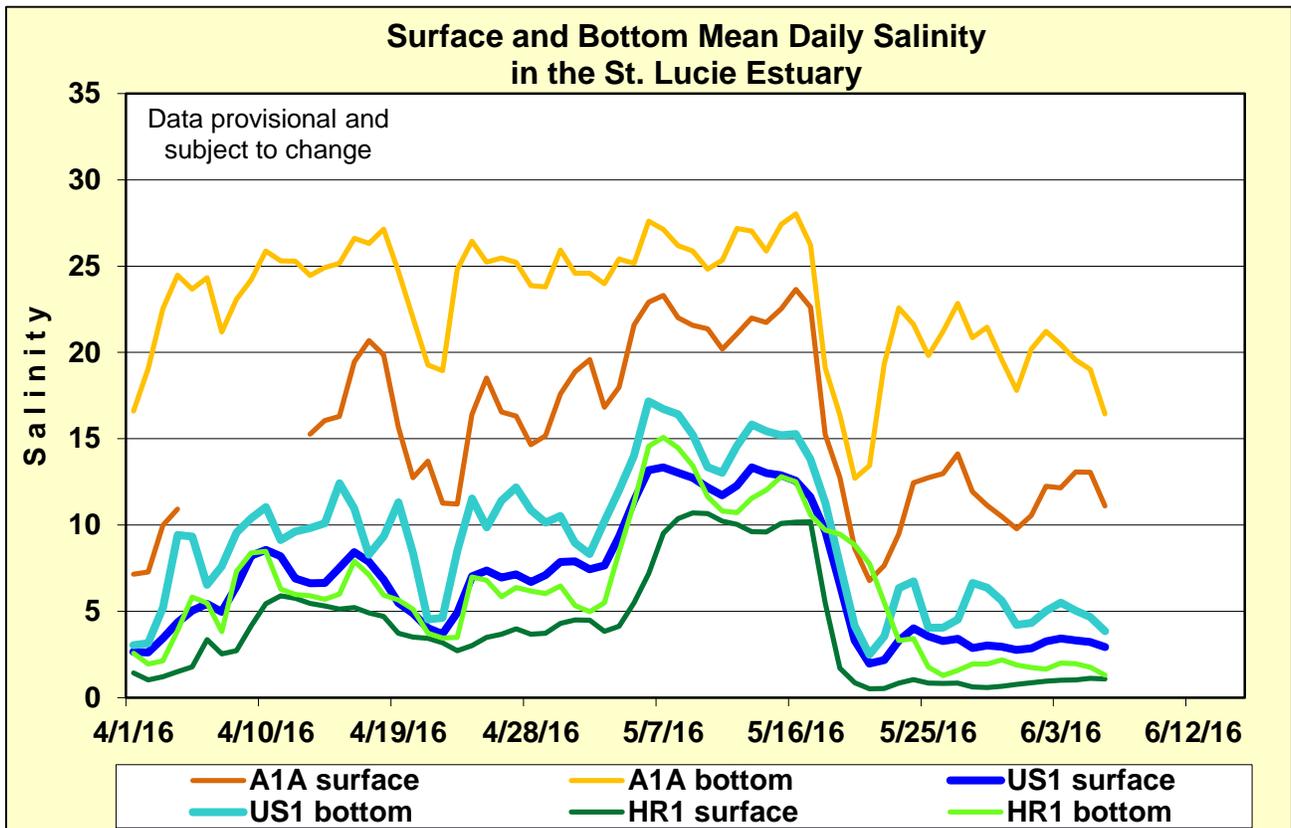


Figure 4. Daily mean salinity at the A1A, US1 and estimated HR1 stations.

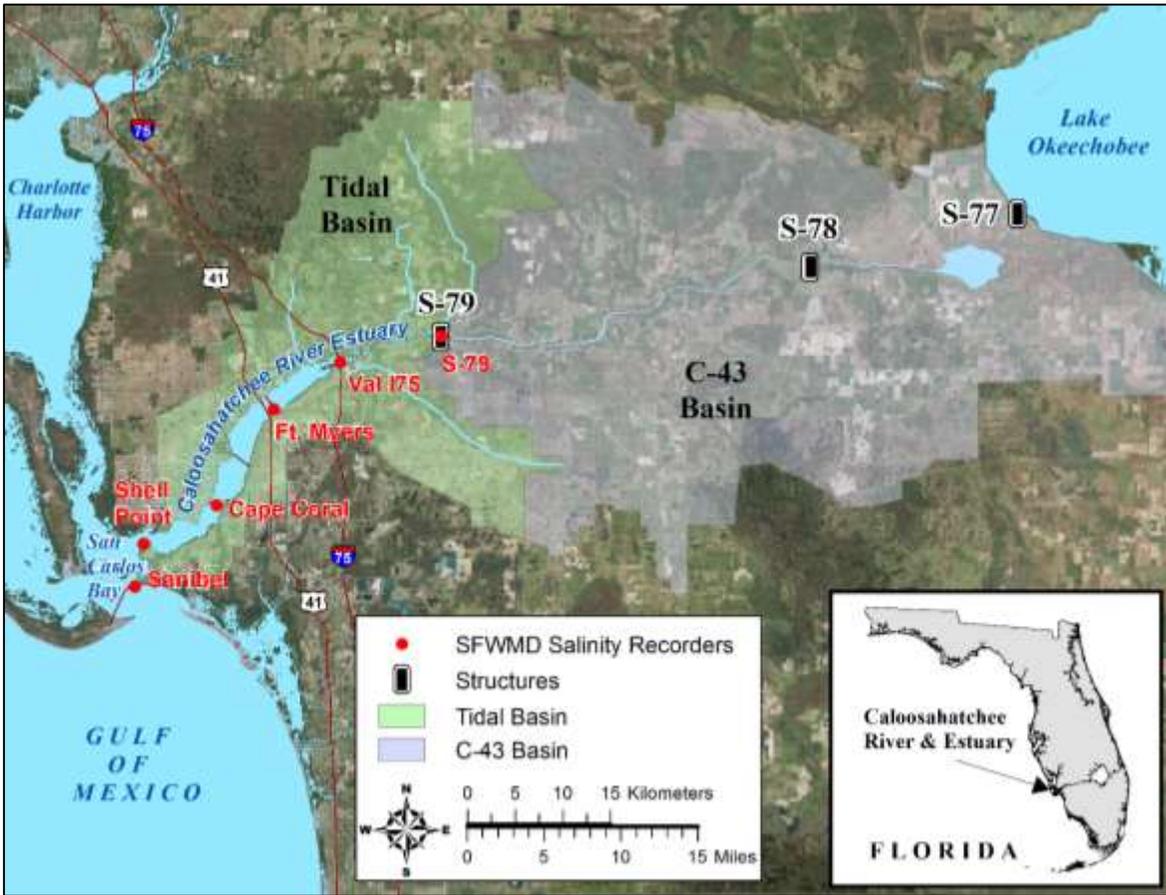


Figure 5. Basins, water control structures, and salinity monitoring for the Caloosahatchee Estuary.

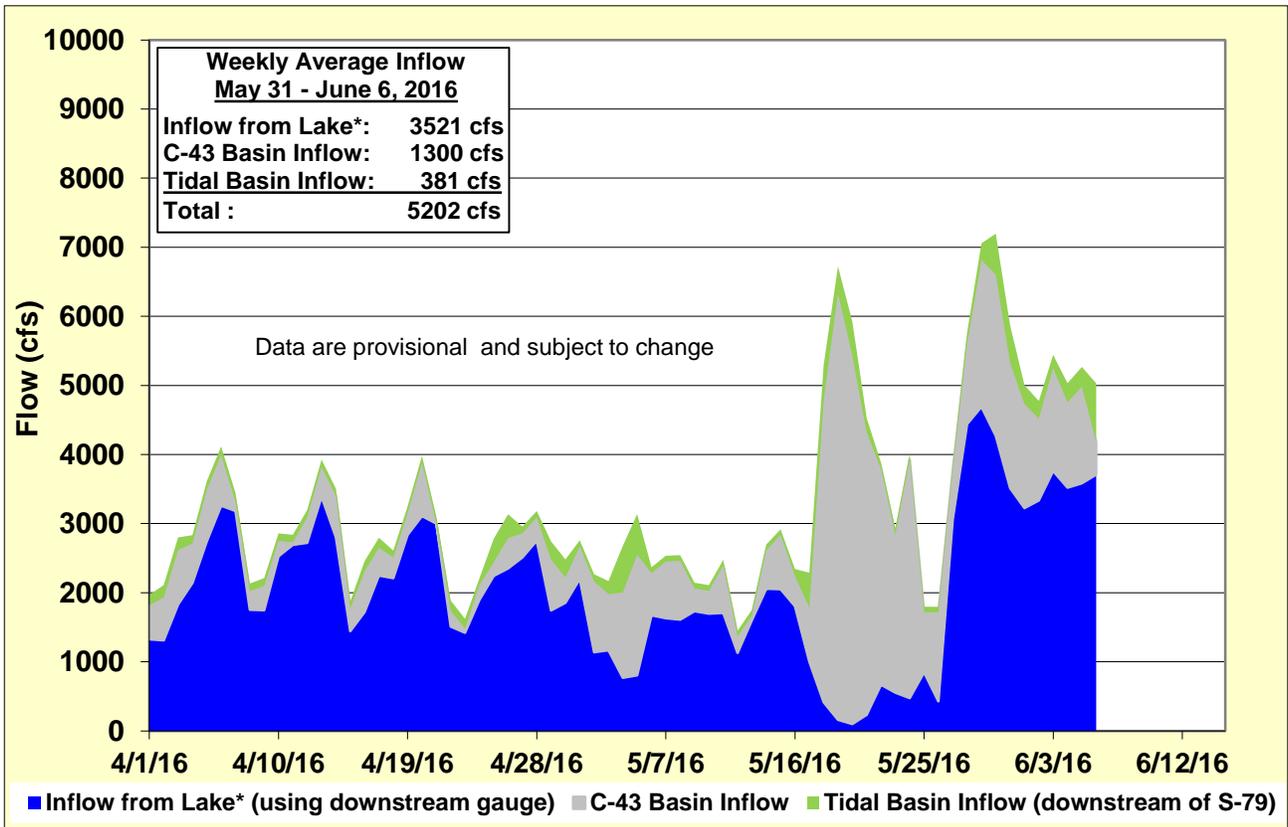


Figure 6. Freshwater inflows from Lake Okeechobee, runoff from the C-43 basin, and tributaries in the tidal basin into the Caloosahatchee River Estuary.

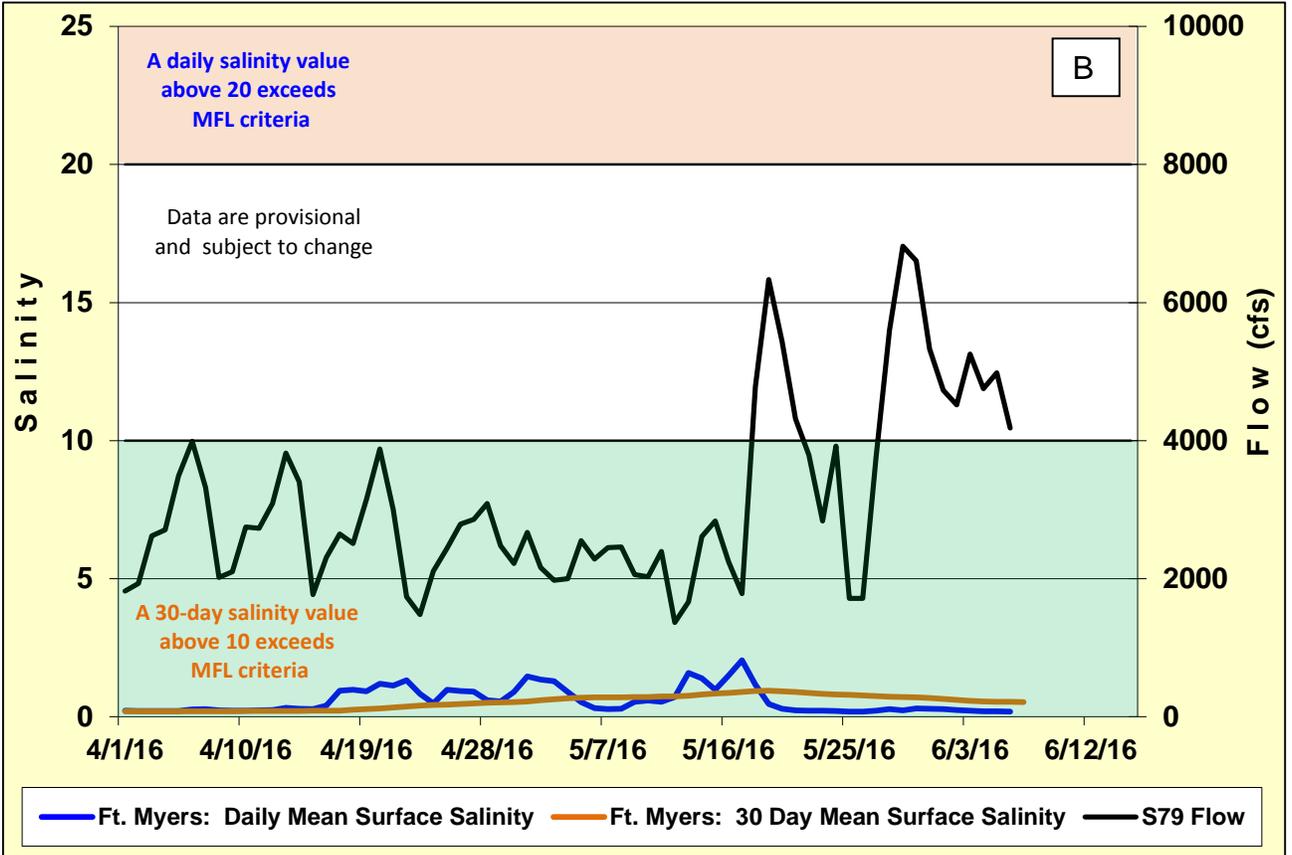
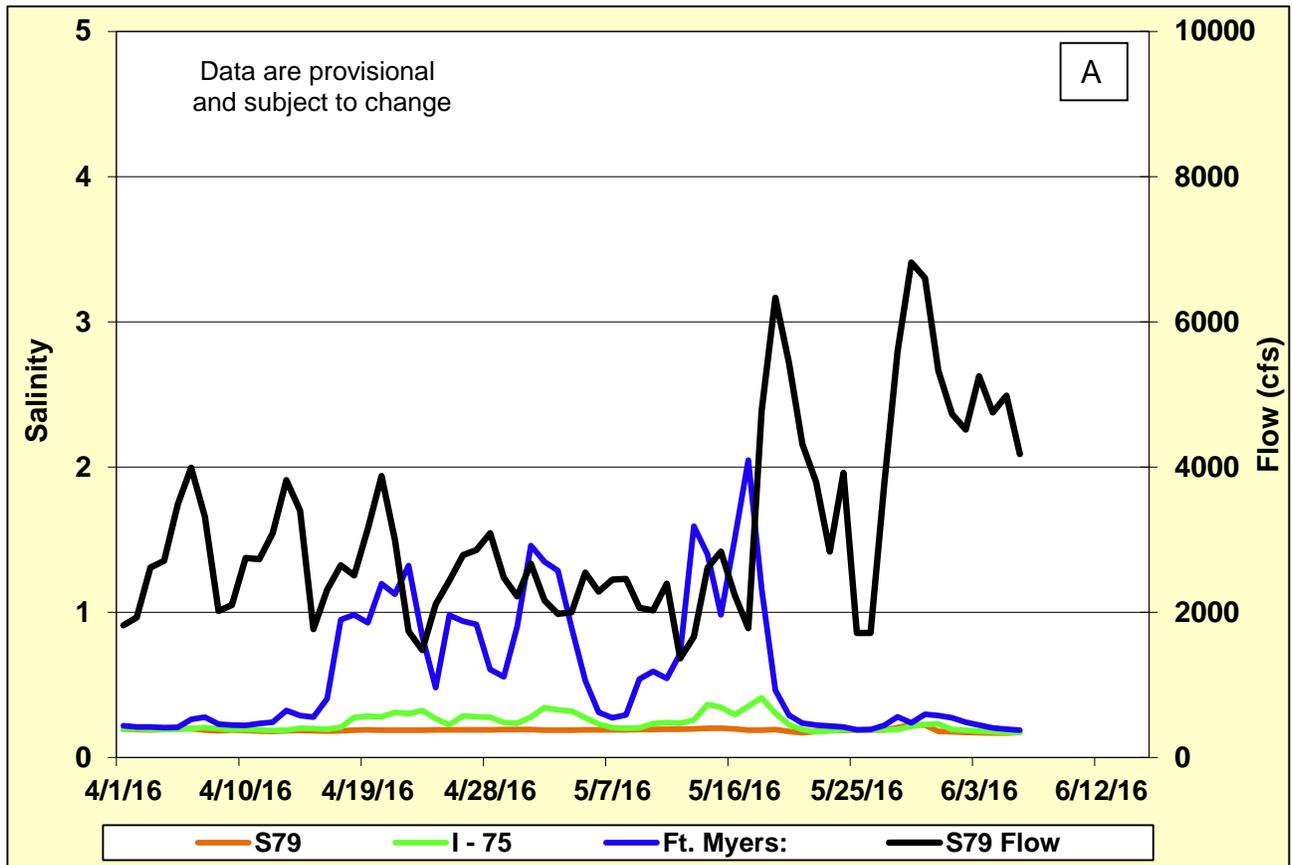


Figure 7. Daily mean flows at S-79 and salinity at upper estuary monitoring stations (A) and 30-day moving average salinity at Ft. Myers (B).

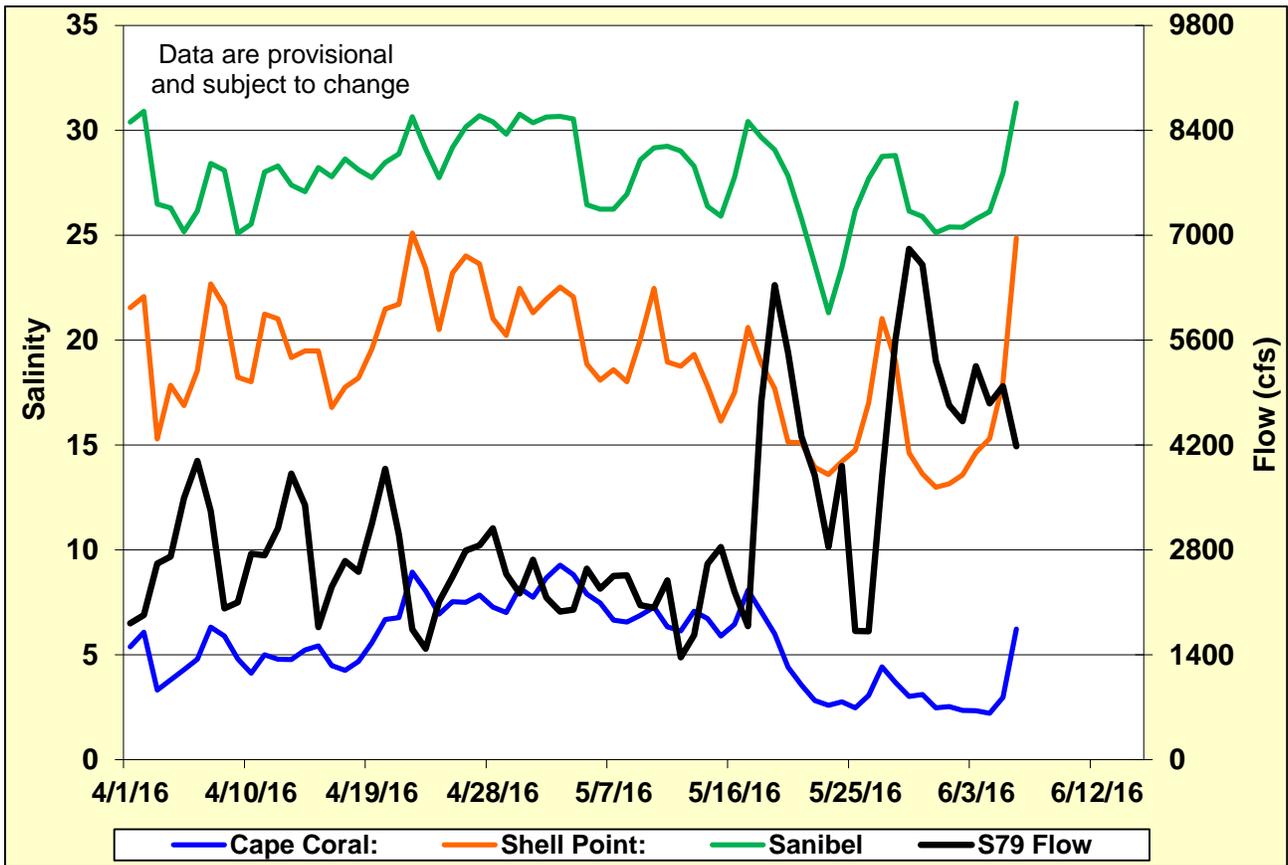


Figure 8. Daily mean flows at S-79 and salinity at lower estuary stations.

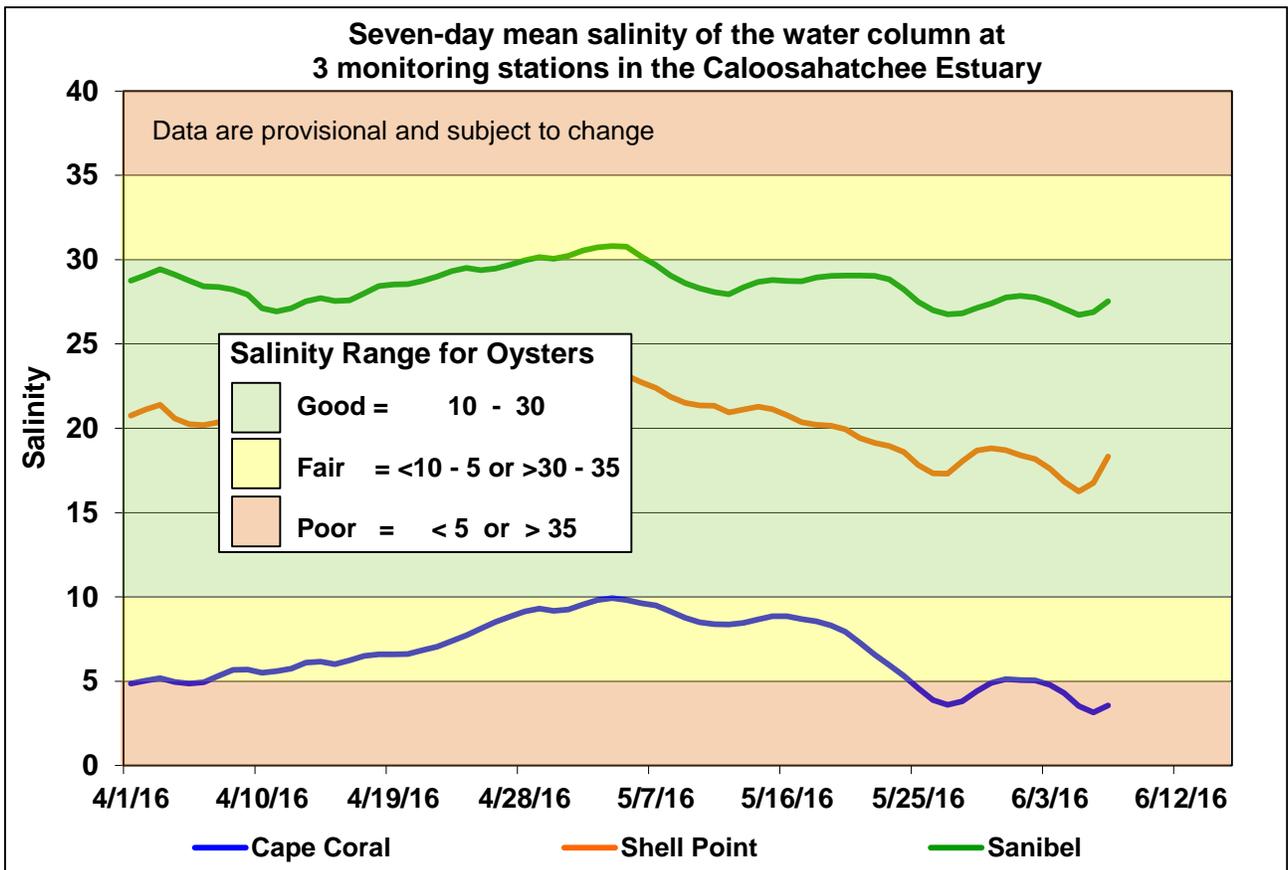


Figure 9. Seven-day mean salinity at Cape Coral Bridge, Shell Point and Sanibel Bridge monitoring stations.

GREATER EVERGLADES

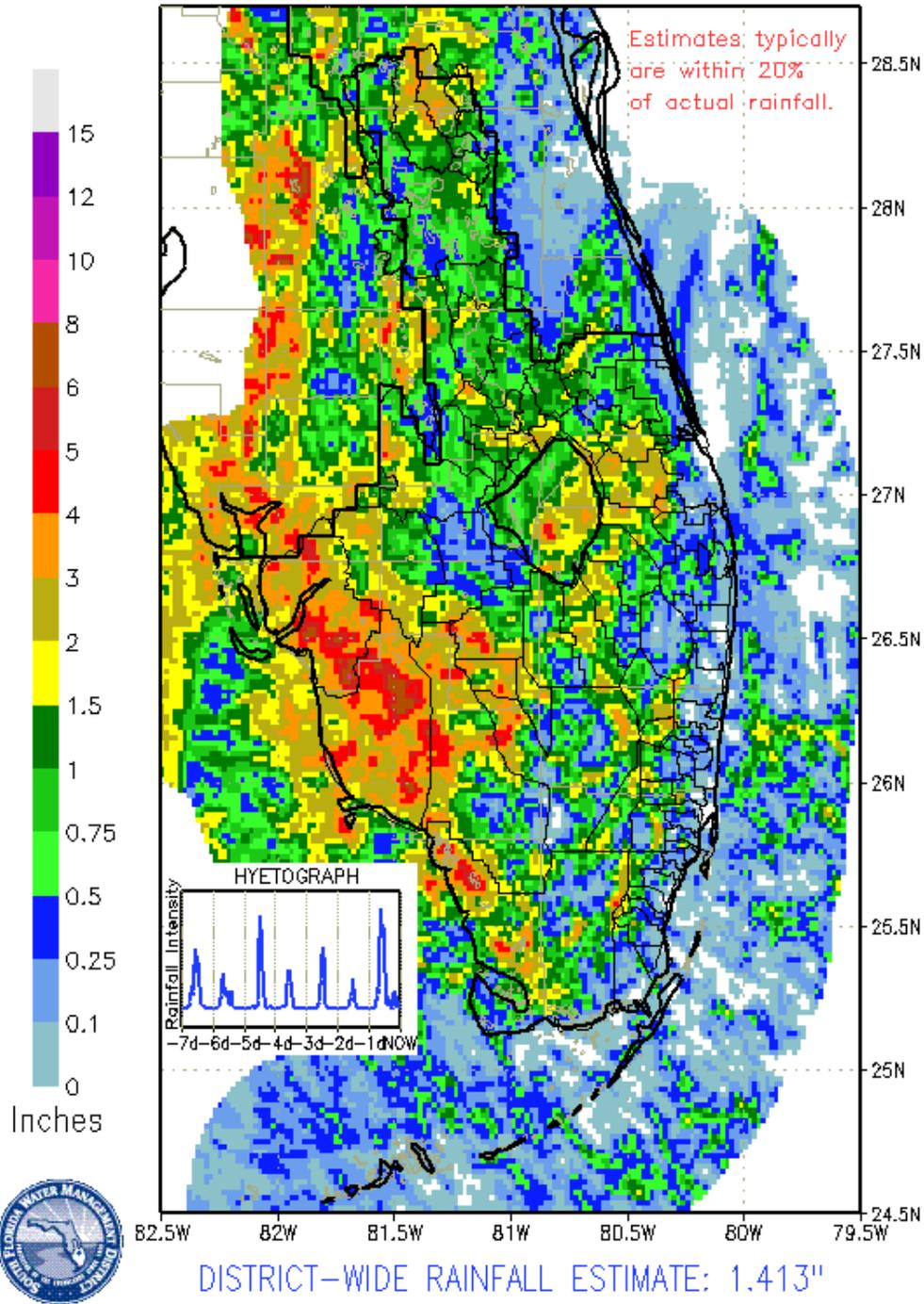
Rainfall increased slightly this week with only WCA-1 having a basin average of less than 1 inch. The local maximum rainfall (6.56 inches) was in Everglades National Park (ENP) for the second week in a row. Weekly basin stage changes ranged from -0.11 feet to 0.14 feet.

Everglades Region	Rainfall (Inches)	Stage Change (feet)
WCA-1	0.37	-0.11
WCA-2A	1.07	0.02
WCA-2B	1.71	0.14
WCA-3A	1.15	-0.01
WCA-3B	1.07	-0.01
ENP	1.25	-0.11

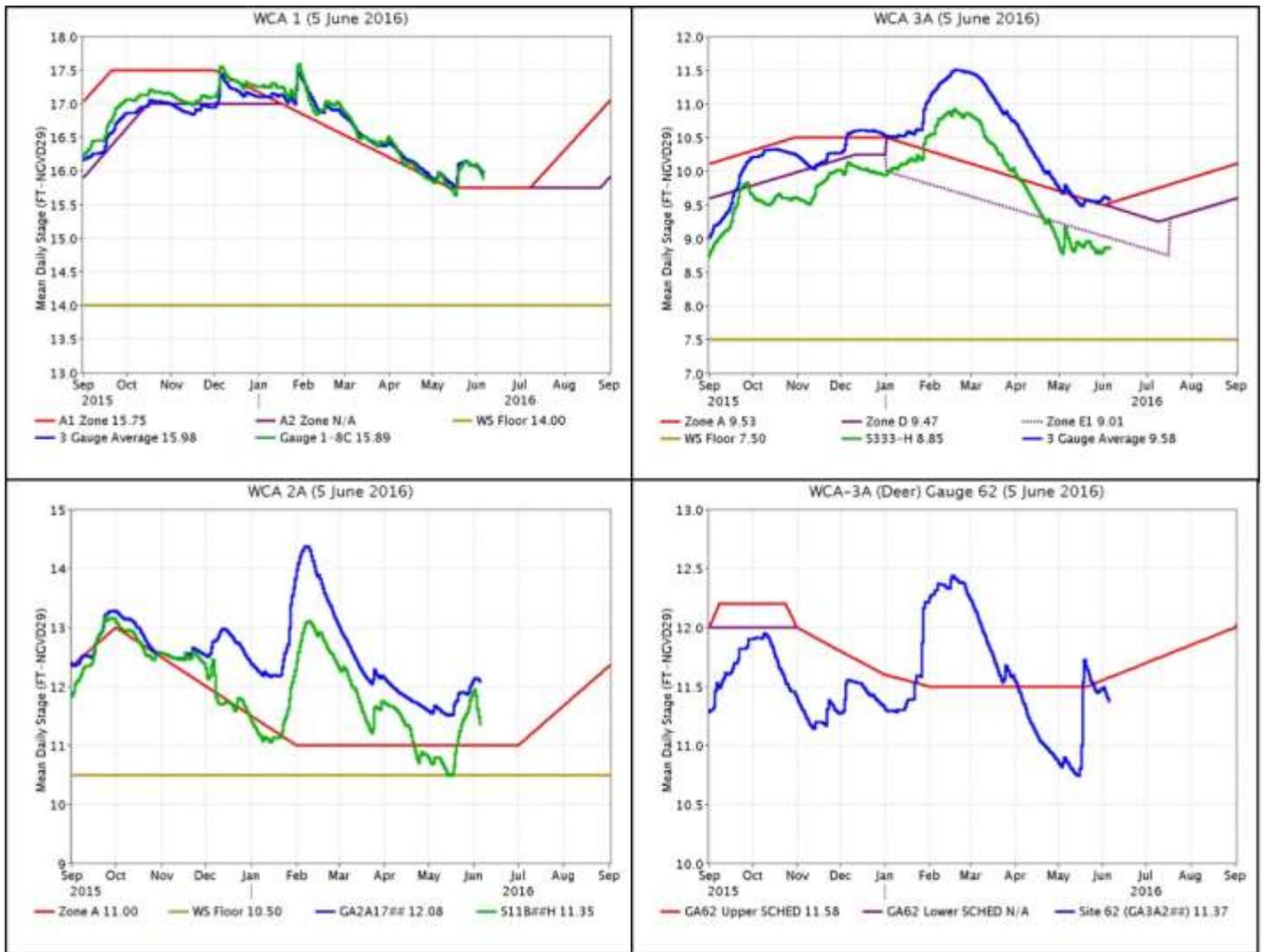
	Good
	Fair
	Poor

SFWMD PROVISIONAL RAINDAR 7-DAY RAINFALL ESTIMATES

FROM: 0530 EST, 05/30/2016 THROUGH: 0530 EST, 06/06/2016



Regulation Schedules: Water levels were declining over the weekend at all regulation schedule gauges, but WCA-2A and -3A both ended higher than the previous week. WCA-1 is 0.23 feet above regulation. The WCA-2A stage rose to 1.08 feet above regulation, and WCA-3A stage is 0.05 feet above regulation. The northwestern WCA-3A gauge stage (gauge 62) has decreased to -0.21 feet below schedule.

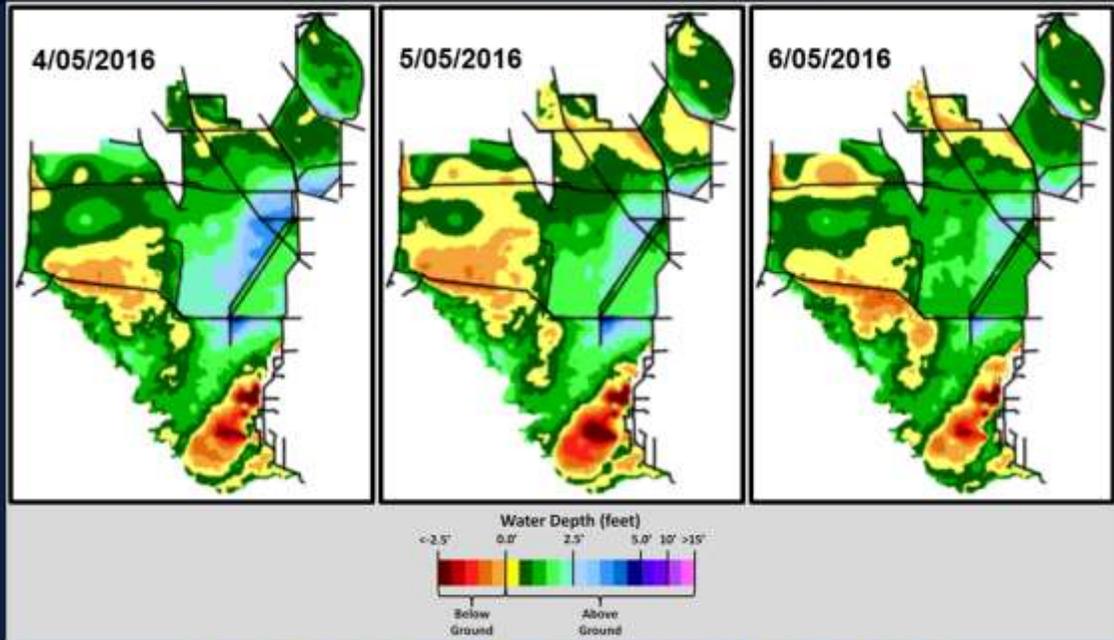


Water Depths and Changes: Month to month water level changes have been mixed. WCA-3A has been drying over the last two months. Big Cypress, ENP, and WCA-1 are wetter than a month ago, but drier than two months ago. WCA-2A is wetter than two months ago. Water depths at the monitored gauges (except WCA-2B) range from 0.78 feet to 1.67 feet (in southern WCA-3A).

Stage changes this past week were mixed with almost 50% of the area increasing and 50% decreasing. Gauge changes ranged from -0.13 feet to +0.15 feet which is similar to last week. Compared to a year ago, stages are higher, and up to two feet or more locally in parts of the WCAs and ENP.



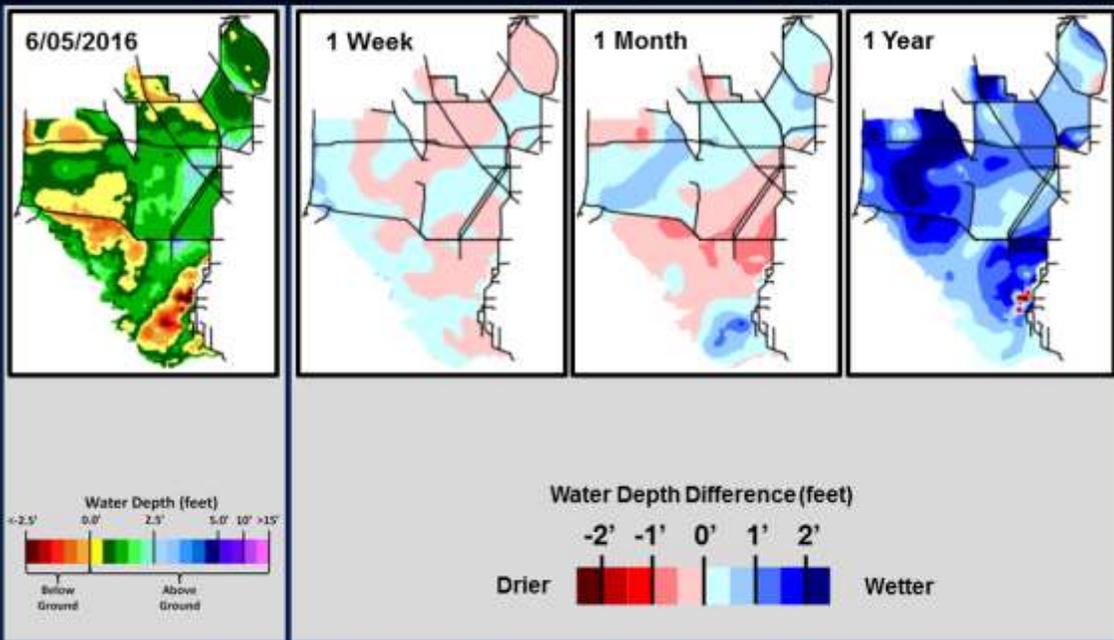
SFWDAT Water Depth Monthly Snapshots



South Florida Water Depth Assessment Tool (SFWDAT)



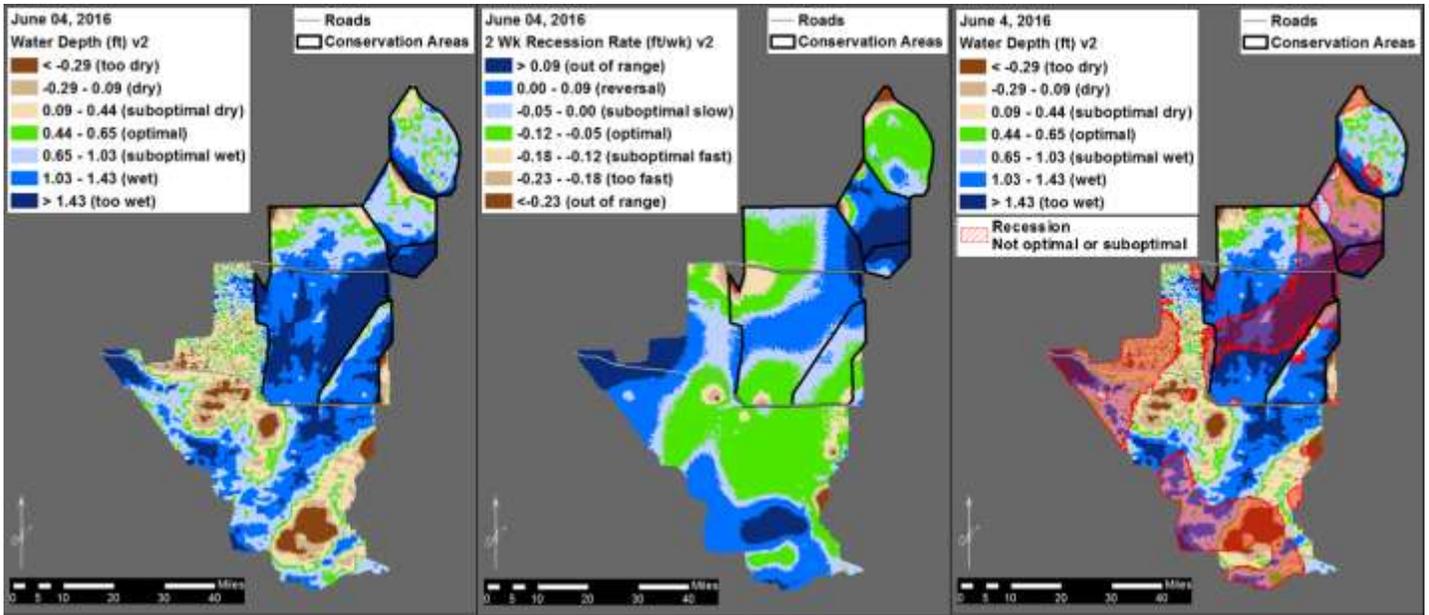
SFWDAT Everglades Difference Maps (Present - Past)



South Florida Water Depth Assessment Tool (SFWDAT)

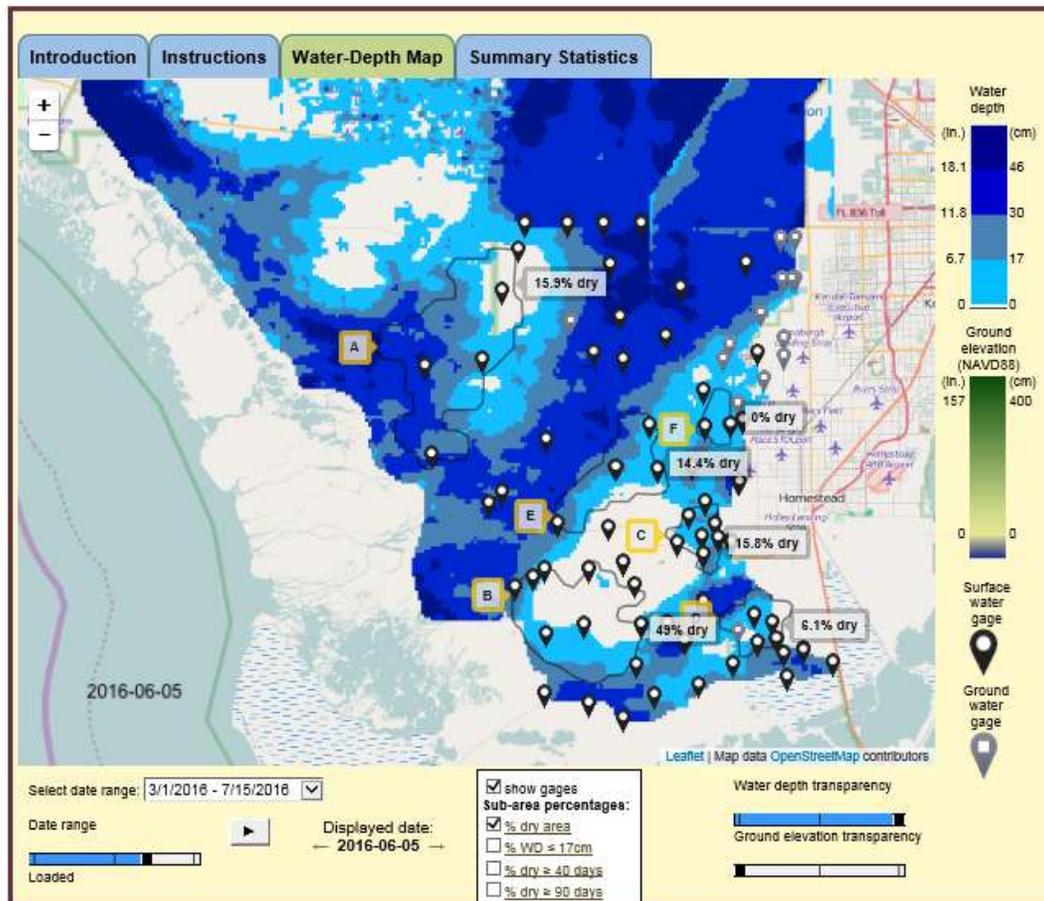
Wading birds: Major reversals in WCA-2A over the past two weeks has impacted the large foraging flock (4,000 to 8,000 birds) that had been witnessed there. During the last survey flight on June 2, 2016, no foraging birds were seen at this location and the large nesting colony of white ibis at Colony

99 had decreased from 6,500 nests to 300 nests as a result. The only suitable foraging area remaining is northern WCA-3A, which should be protected against reversals as much as possible.



Cape Sable Seaside Sparrows: No new update available. Conditions are slightly wetter in the breeding areas than last week.

Cape Sable Seaside Sparrow (CSSS) Viewer

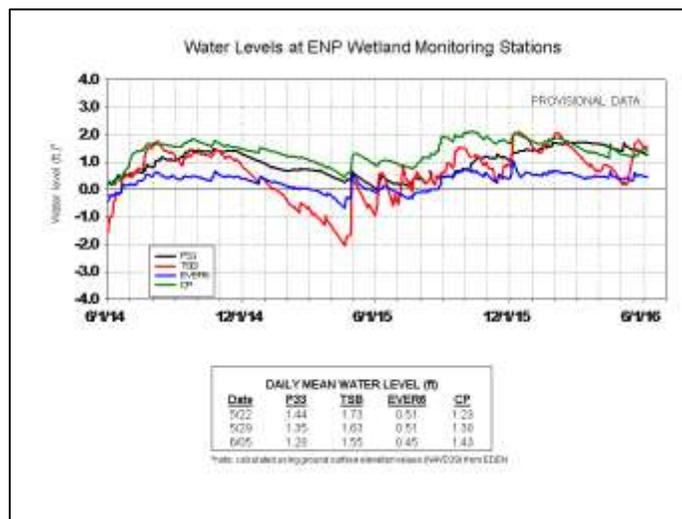
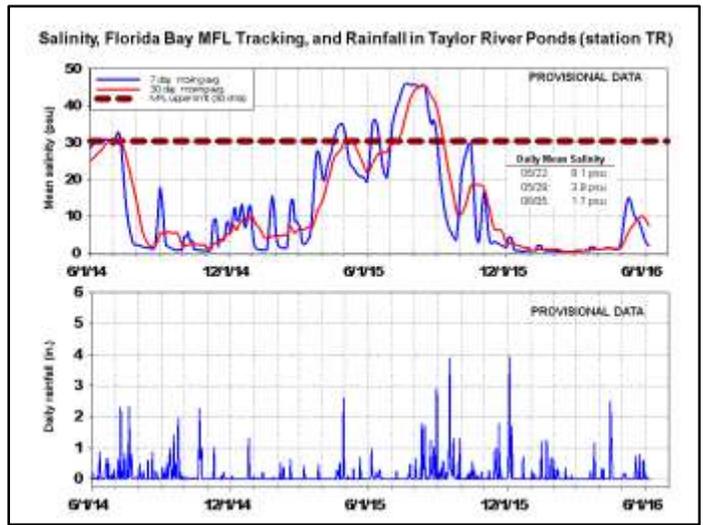
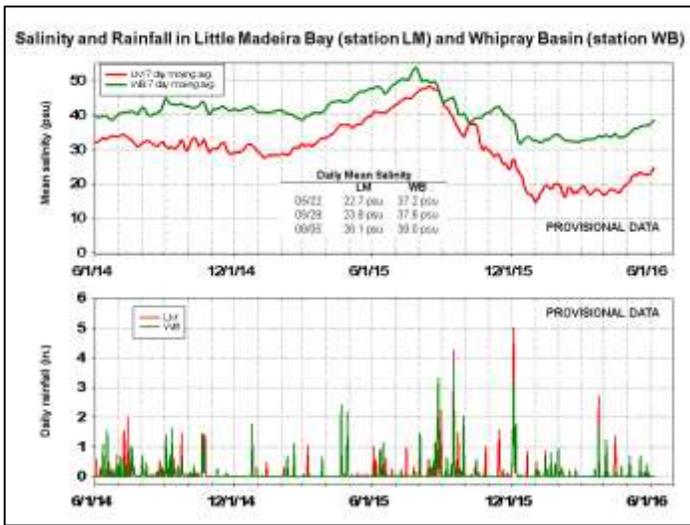


Everglades National Park (ENP) and Florida Bay: Despite having generally decreased this past week in Taylor Slough, water levels are still higher than a month ago, and the historic averages are rising at this time of year. Northern Taylor Slough is still 16 inches above average, and southern Taylor Slough is 6-11 inches above average.

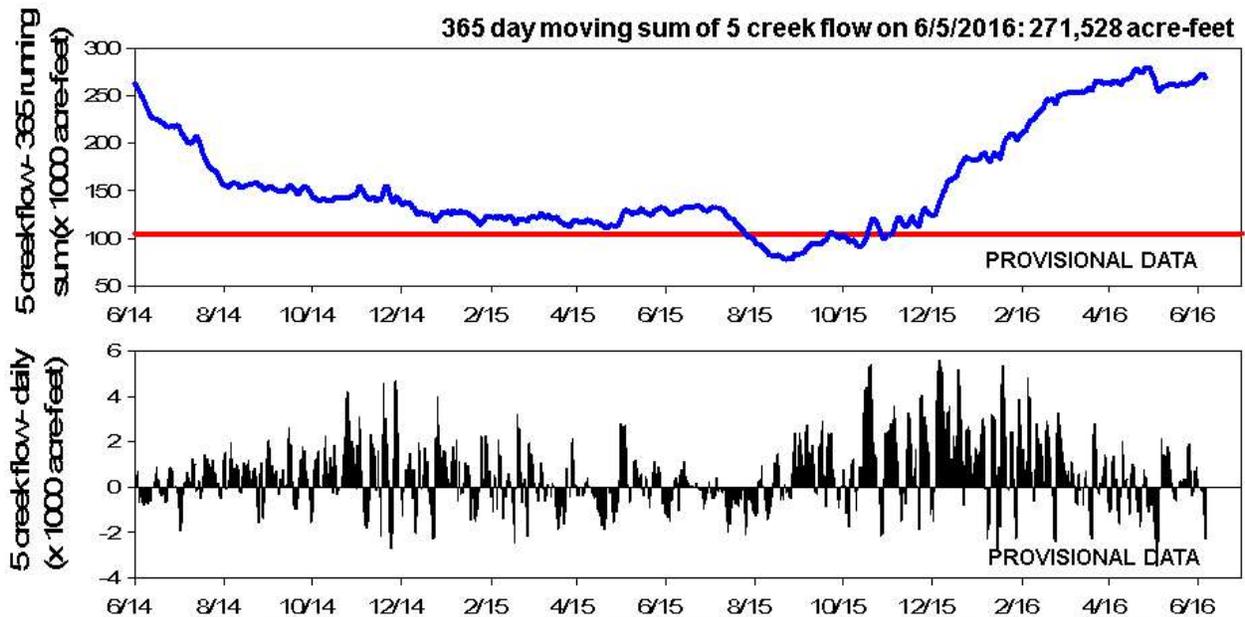
Salinities rose slightly (largest change was 2.5 psu) in most areas of Florida Bay this past week. The seasonal average salinities are beginning to decrease. Salinities are -8 psu below average to +4 psu above average. Daily average salinities range from 20 to 45 psu with the highest salinity still occurring in the nearshore western embayments.

Upstream in the mangrove ecotone, the daily average salinity at the MFL sentinel site of TR decreased again to 1.7 psu, and it is still well below the seasonal average of 23 psu. The 30-day moving average salinity at TR decreased to 8.0 psu and should continue to decrease through the wet season.

The 365-day running sum of the cumulative flow from the five creeks feeding Florida Bay increased very slightly to 271,528 acre-feet this week, which is above the average 365-day running sum for the five creek flow of 257,628 acre-feet. The weekly cumulative flow from the five creeks decreased to 524 acre-feet. Creek flow is provisional data from the USGS and is highly variable.



5 Creek Cumulative Flow and Florida Bay MFL Flow Criteria Tracking



Water Management Recommendations

- Loss of the foraging habitat in WCA-2A due to increased water levels has caused many nesting birds to abandon their nests. The only remaining foraging area for currently nesting birds within the WCAs is northern WCA-3A, which should be protected from rapid water level increases. Recession rates of -0.05 feet to -0.12 feet per week would be optimal, but if recession cannot be attained, ascension rates should not exceed 0.25 feet per week.
- Lower stages throughout the WCAs are ecologically necessary for wading bird foraging and ecosystem improvement through June. For the upcoming wet season, water depths should remain below 2.5 feet through far southern WCA-3A to protect tree island forests.
- Water levels in the Cape Sable Seaside Sparrow habitats are high and need to continue to recede. It appears that Sparrows in dry areas are still courting and may re-nest.

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

Everglades Ecological Recommendations, June 7, 2016 (red is new)

Area	Current Condition	Cause(s)	Recommendation	Reasons
WCA-1	Stages decreased -0.09' to -0.13'	Rainfall, ET, management	Match inflows with outflows to achieve regulation schedule recession while allowing water levels to reflect variation in annual rainfall. Prevent repeated or ongoing reversals as much as possible.	Provide natural recession rates that support wading bird foraging, necessary for successful nesting (-0.05' to 0.12') and protect habitat.
WCA-2A	Stage increased 0.02'	Rainfall, ET, management	Begin wet season operations for this area, including maintaining ascension rates <0.25 ft/week	Beginning wet season operations in this area will be protective of nesting wading birds in NE 3A.
WCA-2B	Stages increased +0.13' to +0.15'	Rainfall, ET, management	Follow normal seasonal practices. Limiting ascension rates to <0.25 ft/week will be protective of reproducing apple snails.	High stages generally preclude wading bird use.
WCA-3A NE	Stage decreased -0.01'	Rainfall, ET, management	Provide recession rates within the wading bird foraging range (-0.05' to 0.12'). Limiting ascension rates to <0.25 ft/week if recession cannot be achieved.	Lower stages throughout the WCAs are ecologically necessary for wading bird foraging and ecosystem improvement. Wading bird foraging in northeast WCA-3A is especially critical since this is the only foraging area left for remaining nesting wading birds. Limiting ascension rates to <0.25 ft/week will be protective of reproducing apple snails.
WCA-3A NW	Stage decreased -0.11'	Rainfall, ET, management		
Central WCA-3A S	Stage increased +0.13'	Rainfall, ET, management	Prevent repeated or ongoing reversals and target <0.25 ft/week. Water depths are below 2.5'. Water depths should remain below 2.5 feet over this upcoming wet season to protect the island forests. When flows are changed a gradual reduction is recommended (stepping down over several days).	Moderate recession rates would be beneficial to habitat and wildlife. Keeping depths below 2.5' is important to allow tree island vegetation to recover from stress of the recent extended inundation duration. Limiting ascension rates to <0.25 ft/week will be protective of reproducing apple snails.
Southern WCA-3A S	Stage decreased -0.04'	Rainfall, ET, management		
WCA-3B	Stages changed -0.05' to +0.04'	Rainfall, ET, management	Follow normal seasonal practices. Prevent repeated or ongoing reversals as much as possible.	Moderate recession rates would be beneficial to habitat and wildlife.
ENP-SRS	Stages decreased -0.11'	ET, rainfall, topography, management	Make discharges to the Park according to the ERTTP rainfall plan.	Keep peat wet to promote native habitat and maintain wetland plant and animal communities.
ENP-CSSS habitats	S-12A and S-12B remain closed to enhance dry-down.	Rainfall, ET, management	Follow rainfall plan for releases. Adhere to ERTTP closures for S12-A and B. Gradual reduction in flows through S333, S12C and D, as possible, is recommended (stepping down over several days). Reduced flows through S333 would benefit wildlife. Follow guidance in C-111 western spreader canal project operations manual.	Provide appropriate hydrological and habitat conditions for Cape Sable Seaside Sparrow breeding.
Taylor Slough	6-16 inches above average	Rain, ET, inflows	Move water southward as needed	Provide freshwater buffer for ecosystems and maintain low salinity conditions downstream
FB- Salinity	-8 psu below to +4 psu above average	Rain, ET, inflows, wind	Move water southward as needed	Maintain lower salinity levels.