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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: November 1, 2016

SUBJECT: Weekly Environmental Conditions for Systems Operations

Summary

Weather Conditions and Forecast

Scattered showers east. Drier air has settled in over the District so no shower activity is expected during the day today. A weak front is forecast to move from the southeastern U.S. to north Florida by Wednesday morning and then slide southward into the District during the day Wednesday bringing some scattered showers north and northeast late tonight and Wednesday. Shower activity should decrease on Thursday as the frontal boundary becomes diffuse but then a second cold front should bring scattered moderate rainfall Friday and Saturday morning as it moves through the District.

Kissimmee

On Sunday, stage in East Lake Toho was at schedule, Lake Toho was 0.1 feet below, and Kissimmee-Cypress-Hatchineha was 0.1 feet above schedule. Over the past week, discharge at S65, S65A, and S65E averaged 706, 708, and 1,269 cfs, respectively. Tuesday morning discharges were ~750 cfs, ~692 cfs, ~997 cfs, and ~967 cfs, respectively at S65, S65A, S65C, and S65E. Dissolved oxygen in the Kissimmee River averaged 6.15 mg/L over the past week. Kissimmee River mean floodplain depth on Sunday was 0.34 feet. Recommendation is to reduce S65C headwater stage to 33 feet NGVD to facilitate MacArthur Ditch backfilling in Pool C.

Lake Okeechobee

Lake stage has fallen 0.24 feet over the past week and is currently in the Low sub-band. Lake stage dropped below the top of the preferred stage envelope (15.5 feet NGVD). So far this year, a record 111 successful kite nests have been recorded on the Lake out of a total of 245 nesting attempts (45%). There are still 23 active nests on the Lake.

Estuaries

Total discharge to the St. Lucie estuary average 1,410 cfs over the past week with 1,134 cfs (80%) coming from Lake Okeechobee. The seven-day average salinity at the US1 Bridge is in the fair range for adult oysters. Salinity increased in the North Fork and the main stem of the estuary, while decreasing at the US1 Bridge. Total inflow to the Caloosahatchee estuary averaged 3,285 cfs over the past week with 2,262 cfs (69%) coming from the Lake. Salinity conditions are good for tape grass in the upper estuary. Salinity conditions are good for adult oysters at the Sanibel Causeway and Shellpoint, but in the fair range at the Cape Coral Bridge.

Stormwater Treatment Areas

Over the past week, the STAs/FEBs received approximately 4,300 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 80,200 acre-feet. All STA cells are at or above target depths. Operational

restrictions are in place for structure repairs and vegetation rehabilitation in STA-1E. This week, if 2008 LORS recommends Lake releases to the WCAs and the conditions allow, releases will be sent to STA-1E, STA-1W and the A-1 FEB, and the A-1 FEB releases will be sent to STA-2.

Everglades

Rainfall was sparse in the northern WCAs and moderate to the south. Evaporation was high. Everglades stage changes ranged from -0.21 feet and +0.12 feet. The 30-day moving average salinity at the Florida Bay Minimum Flows and Levels (MFL) site remains 0.3 psu and the cumulative 365-day inflow from the five creeks into Florida Bay increased last week by nearly 19,000 acre-feet to 368,716 acre-feet.

Supporting Information

KISSIMMEE BASIN

Kissimmee Basin Rainfall

The Upper Kissimmee Basin received 0.00 inches of rainfall in the past week and the Lower Basin received 0.02 inches (SFWMD Daily Rainfall Report 10/31/2016).

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

Report Date: 11/1/2016							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)	10/30/16	10/23/16	10/16/16	10/9/16	10/2/16	9/25/16	9/18/16
Lakes Hart and Mary Jane	S62	52	LKMJ	61.1	R	60.9	0.2	0.2	0.2	0.2	0.1	0.0	0.2
Lakes Myrtle, Preston, and Joel	S57	68	S57	62.0	R	61.9	0.1	0.3	0.3	0.3	-0.1	0.0	0.1
Alligator Chain	S60	0	ALLI	63.6	R	64.0	-0.4	-0.3	-0.1	-0.3	0.1	0.1	0.1
Lake Gentry	S63	13	LKGT	61.5	R	61.5	0.0	0.1	0.1	-0.2	0.1	0.0	0.1
East Lake Toho	S59	0	TOHOE	57.9	R	57.9	0.0	0.2	0.3	0.0	0.3	0.2	0.2
Lake Toho	S61	0	TOHOW, S61	54.8	R	54.9	-0.1	0.1	0.1	-0.2	0.2	0.2	0.2
Lakes Kissimmee, Cypress, and Hatchineha	S65	706	LKISSP, KUB011, LKISSB	52.5	R	52.4	0.1	0.4	0.7	1.0	0.6	0.6	0.9

* 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: 11/1/2016

Metric	Location	Sunday's 1-day average	Weekly Average**									
			10/30/16	10/23/16	10/16/16	10/9/16	10/2/16	9/25/16	9/18/16	9/11/16	9/4/16	8/28/16
Discharge (cfs)	S-65	715	706	1019	1131	1718	1968	4001	3991	3290	1080	841
Discharge (cfs)	S-65A	701	708	1147	1570	2557	2557	4966	4861	5101	2538	808
Discharge (cfs)	S-65C	1066	1298	2164	3124	3250	4459	5247	5054	3760	2124	928
Headwater stage (feet NGVD)		32.7	33.1	33.5	33.7	33.6	33.6	33.8	33.7	33.8	34.1	34.1
Discharge (cfs)	S-65D****	1857	2155	2922	3859	4185	5532	6302	5224	3971	2172	1181
Discharge (cfs)	S-65E	988	1269	2230	3553	3841	4960	5802	5246	4077	2900	910
DO concentration (mg/L)***	Phase I river channel	6.43	6.15	4.84	3.38	2.83	1.78	1.55	1.20	1.35	3.88	4.75
Mean depth (feet)*	Phase I floodplain	0.34	0.42	0.80	1.25	1.55	2.11	2.49	2.28	1.71	0.65	0.28

* 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.

DATA ARE PROVISIONAL

Water Management Recommendations

Kissimmee Basin Adaptive Recommendations and Operational Actions

Date	Recommendation	Purpose	Outcome	Source
10/25/2016	Allow S65C headwater stage to decline to approximately 33 feet NGVD over the next few days.	To help reduce stage in Pool C to facilitate MacArthur Ditch backfilling	Implemented	USACE/ KB Ops
10/24/2016	No new recommendations.			
10/17/2016	Temporarily reduce discharge at S65A to 700 cfs following the discharge rampdown schedule in Figure 8a.	To facilitate MacArthur Ditch backfilling over the next 2-3 weeks.	Implemented	KB Operations
10/10/2016	No new recommendations.			
10/3/2016	No new recommendations.			
9/27/2016	<ul style="list-style-type: none"> Begin reducing discharge when Ops and management feel the time is right (could be now) Use the discharge table below to ramp down to 1400 cfs; however, if stage should stop declining or start to rise during the rampdown, hold the current discharge unless stage begins to decline again If KCH stage reaches ~50.5 ft, hold ~1400 cfs while KCH stage is at or above ~50.5 ft, then: <ul style="list-style-type: none"> If KCH stage declines below ~50.5 ft, continue reducing discharge, potentially to minimum discharge. However, if stage stops declining or starts to rise during the rampdown, hold or increase current discharge until stage begins to decline again or until it rises to ~50.5 ft If KCH stage rises or stays above ~50.5 ft, hold ~1400 cfs unless stage approaches ~0.25 ft below the regulation line. If stage continues to rise into this buffer zone, use the discharge table to ramp up in anticipation of flood control releases 	To the extent possible, avoid repeated wet/dry cycles in the Kissimmee River floodplain and extend the period of continuous floodplain inundation without decreasing lake stage too much. The recommendation is similar to the discharge plan used last wet season that balanced the river, the KCOL, and downstream waterbodies.	TBD	KB Operations
9/20/2016	No new recommendations.			
9/13/2016	No new recommendations.			
9/6/2016	No new recommendations.			
8/30/2016	Use figure 8a as possible for discharge rampup/rampdown at S65/S65A.			
8/23/2016	No new recommendations.			
8/16/2016	No new recommendations.			
8/9/2016	No new recommendations.			
8/2/2016	No new recommendations.			
7/26/2016	No new recommendations.			
7/19/2016	No new recommendations.			
7/12/2016	No new recommendations.			
6/30/2016	Ramp down S65/S65A discharge by 150 cfs per day to 650 cfs and hold at 650 cfs until lake stage rises to Zone A of the schedule. When stage enters Zone A, ramp up S65 discharge to 1,400 cfs as stage rises from 0.0 to 0.6 feet above the regulation line unless there is a large rainfall event. This ramp up schedule will be reevaluated when the regulation schedule reaches 52.0 feet NGVD.	The ramp down in S65/S65A discharge is intended to lessen the impact of Lake Okeechobee releases on naturally occurring algal blooms. Holding discharge at 650 cfs reflects consideration for the Snail Kites nesting in the Kissimmee River floodplain.	Implemented	SFWMD Operations Control
6/28/2016	No new recommendations.			
6/21/2016	No new recommendations.			
6/14/2016	No new recommendations.			
6/7/2016	No new recommendations.			

KCOL Hydrographs (through Sunday midnight)

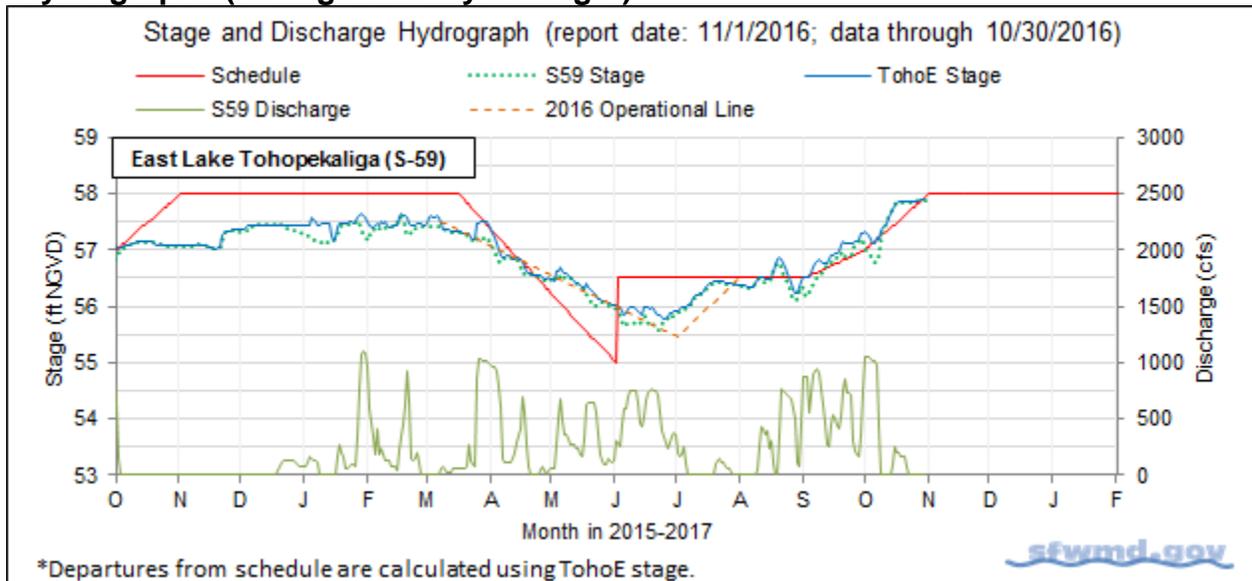


Figure 1.

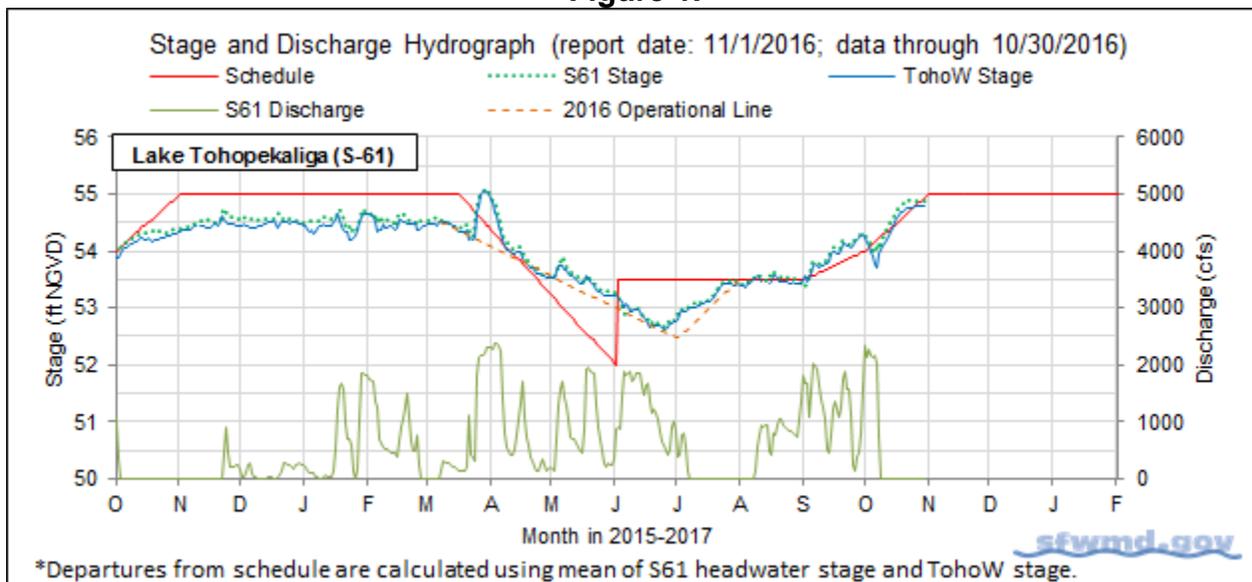


Figure 2.

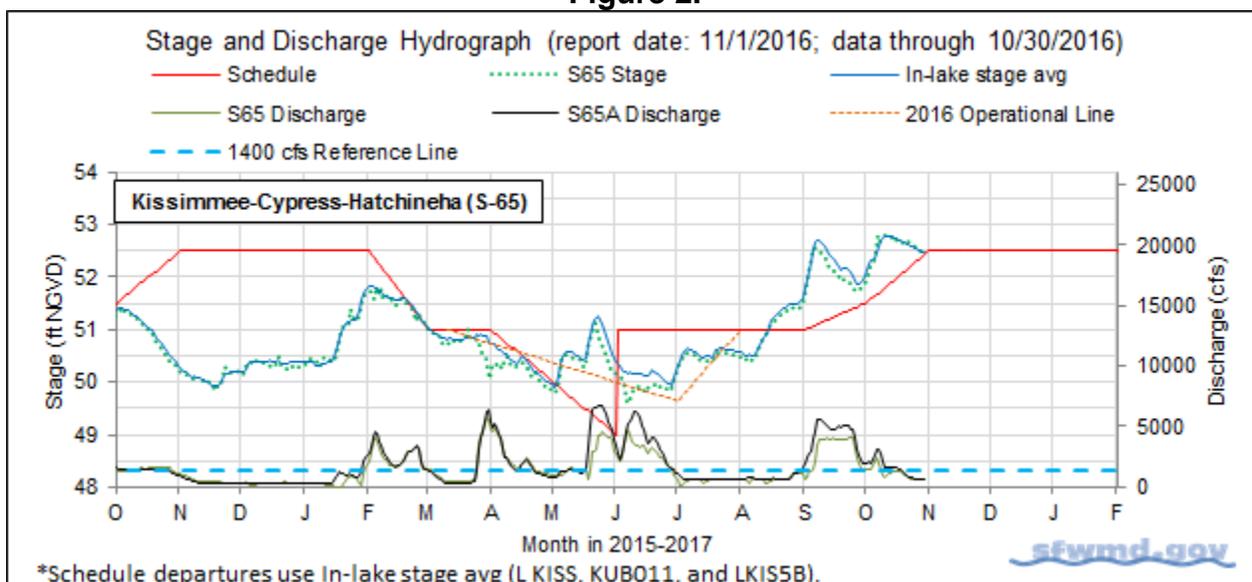


Figure 3.

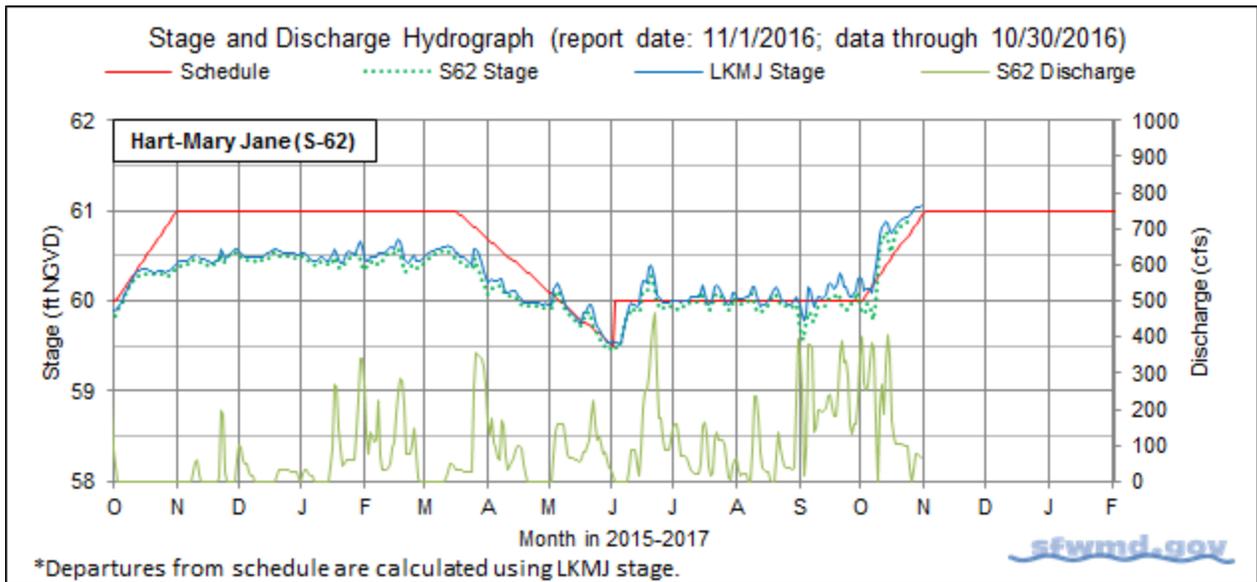


Figure 4.

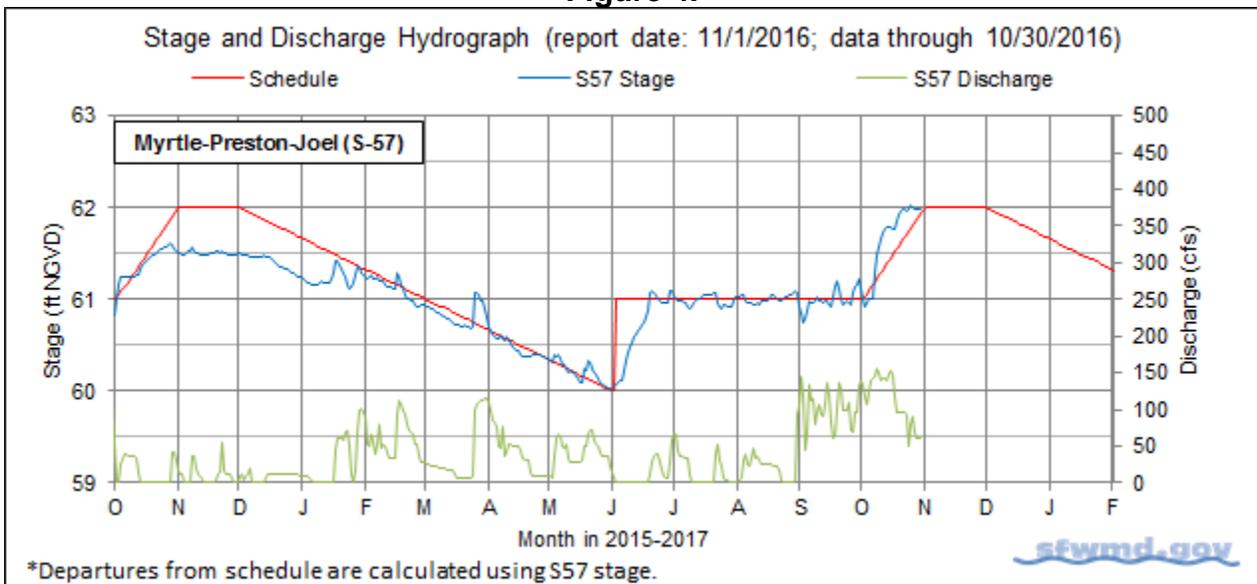


Figure 5.

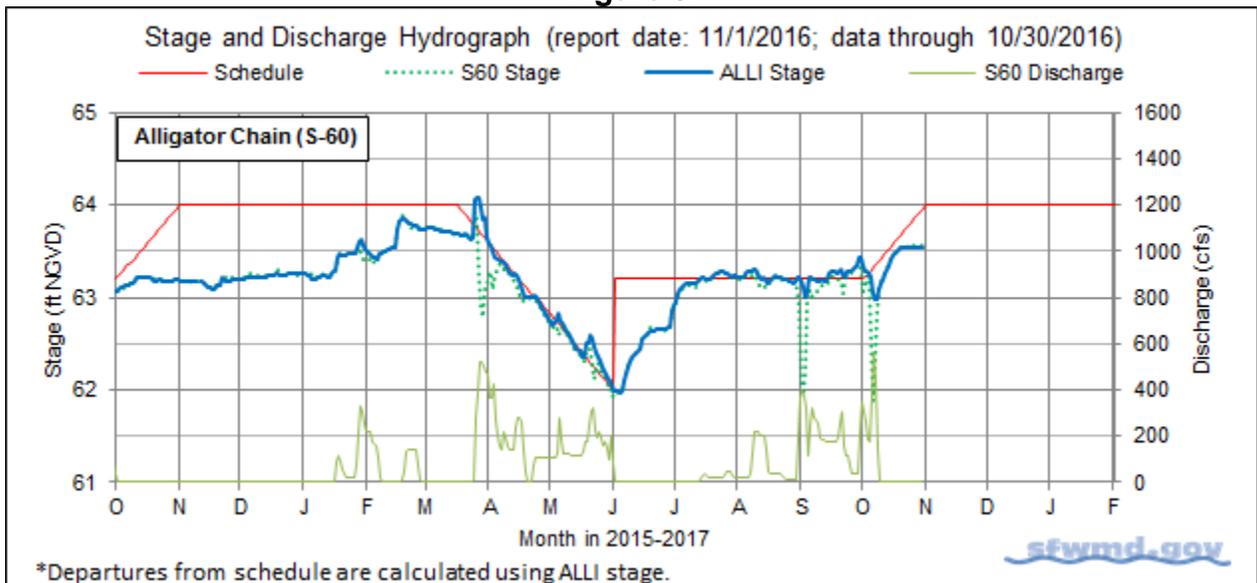


Figure 6.

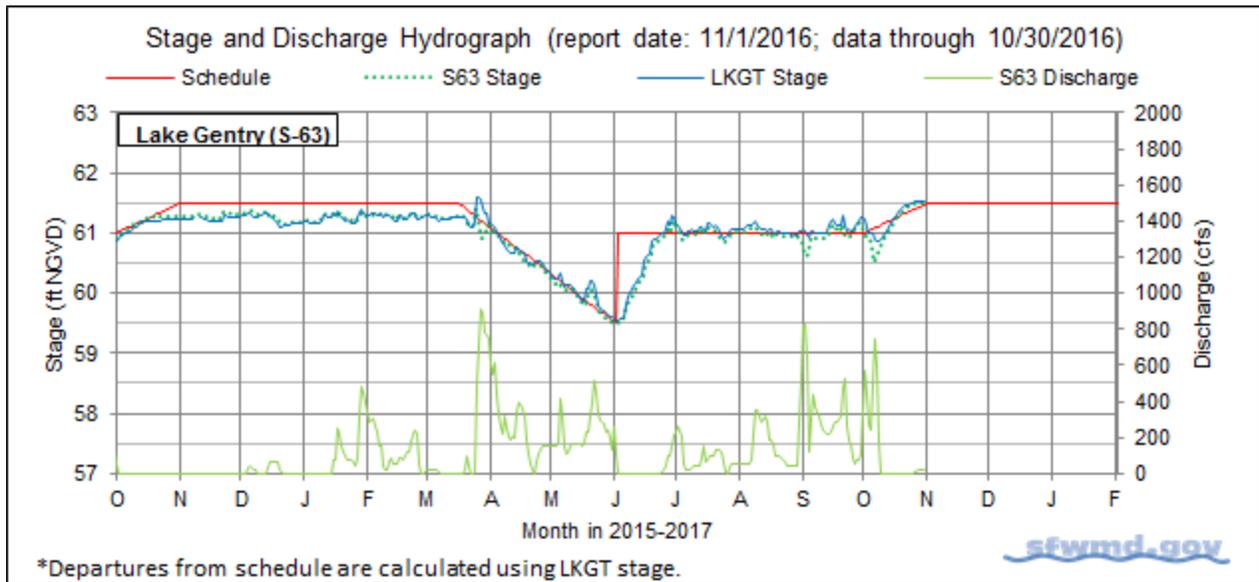


Figure 7.

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Limits on Rate of Discharge Change at S65/S65A During Wet Season 2016

Discharge Rate of Change Limits for S65/S65A (revised 10/18/16).	
Q (cfs)	Maximum rate of increase or decrease (cfs/day)
650-1700	150
1700-3000	300
>3000	1000

1-3

Figure 8a. Limits on rate of discharge change at S65/S65A for the 2016 Wet Season.

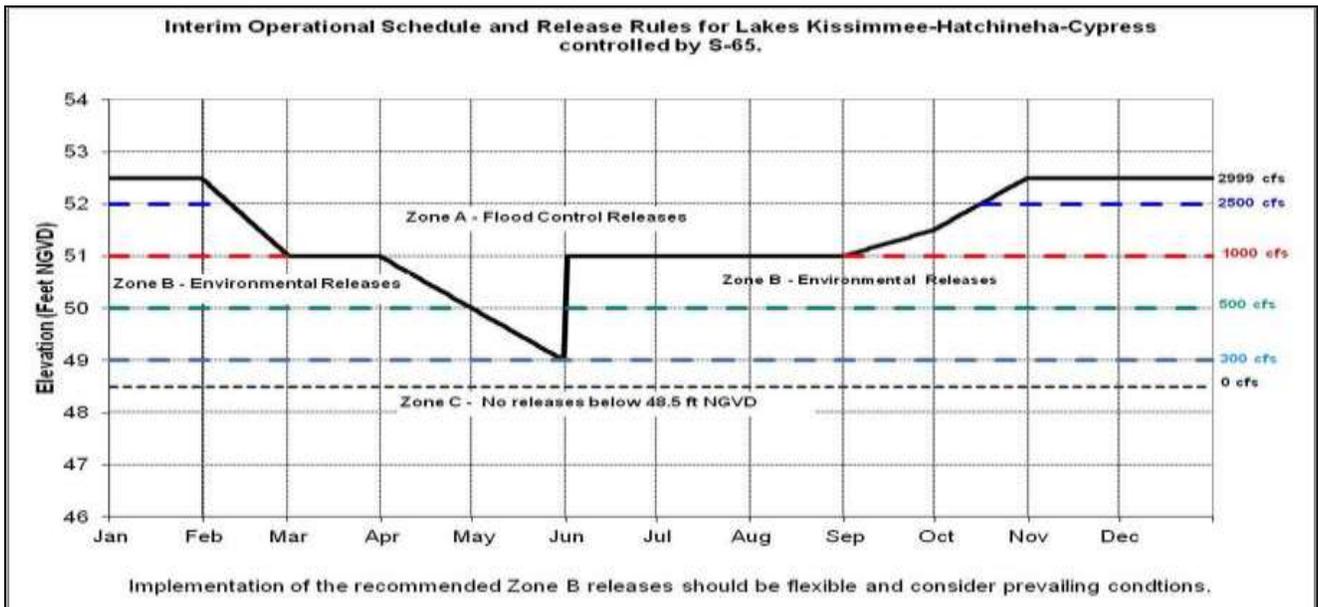


Figure 8b. Interim operations schedule for S-65. The discharge schedule shown to the right has not been used in recent years or in Wet Season 2015.

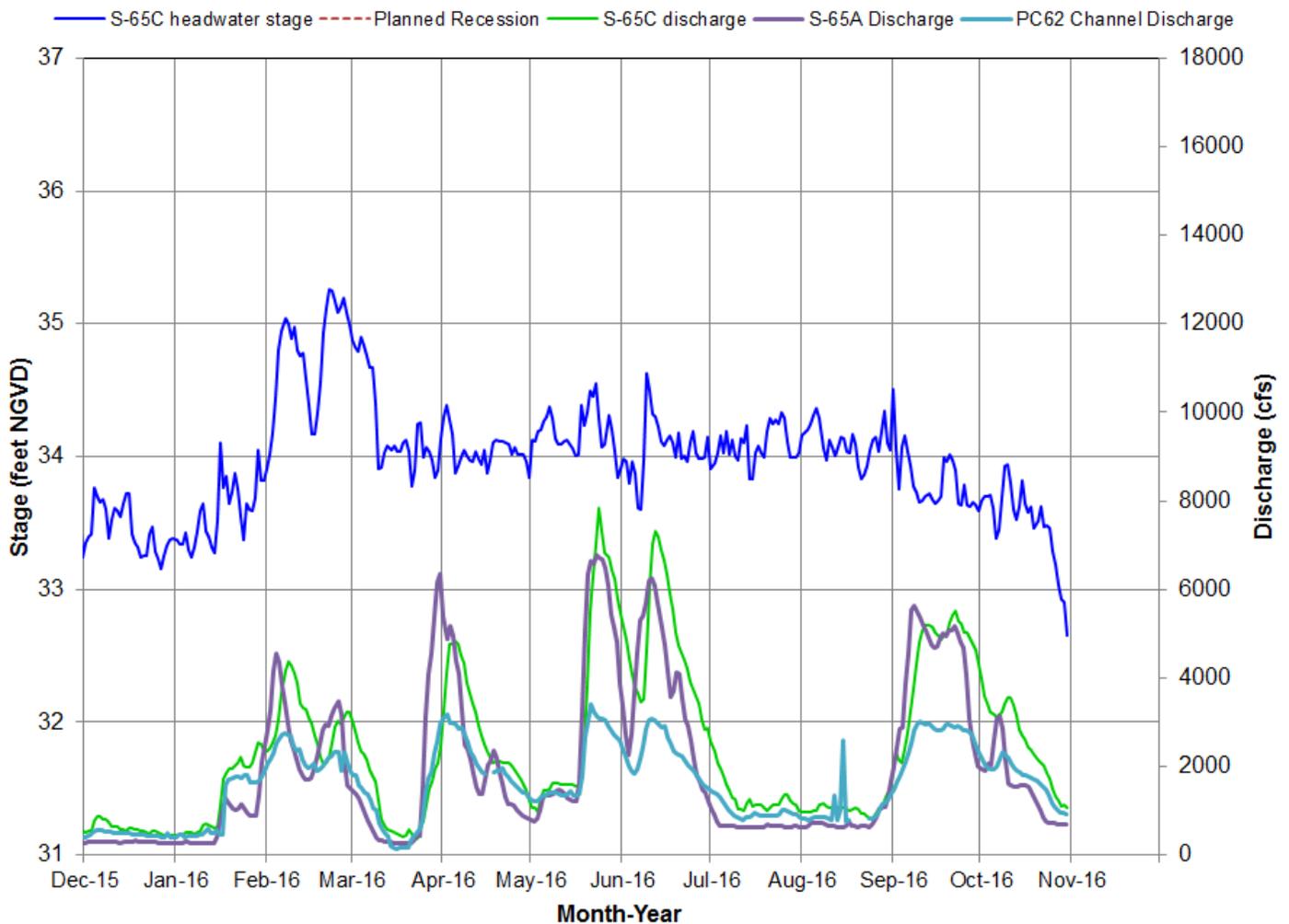


Figure 9. S-65C headwater stage in relation to discharge at S-65C, S-65A, and PC62.

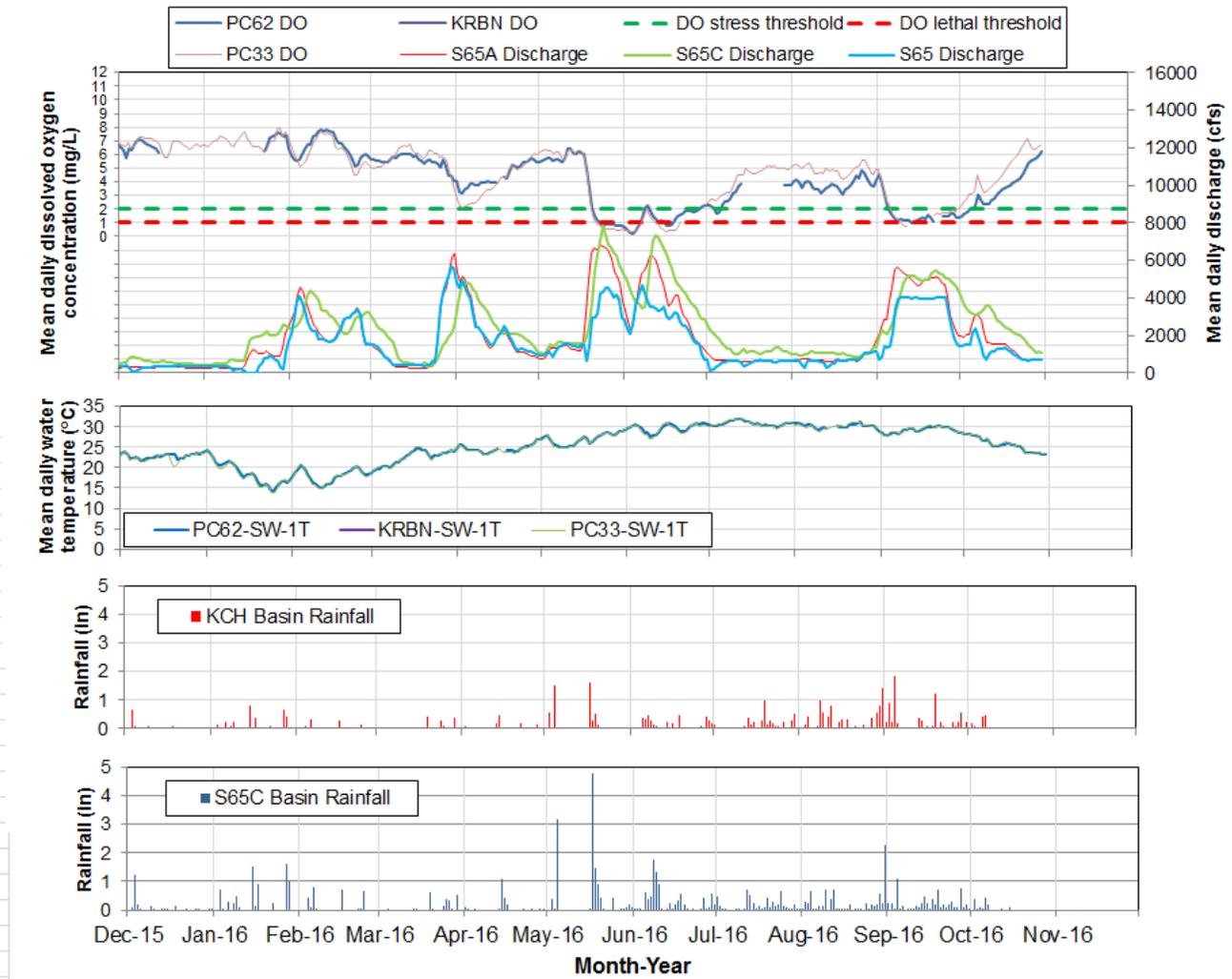


Figure 10. Mean daily Dissolved Oxygen, discharge, temperature and rainfall in the Phase I river channel.

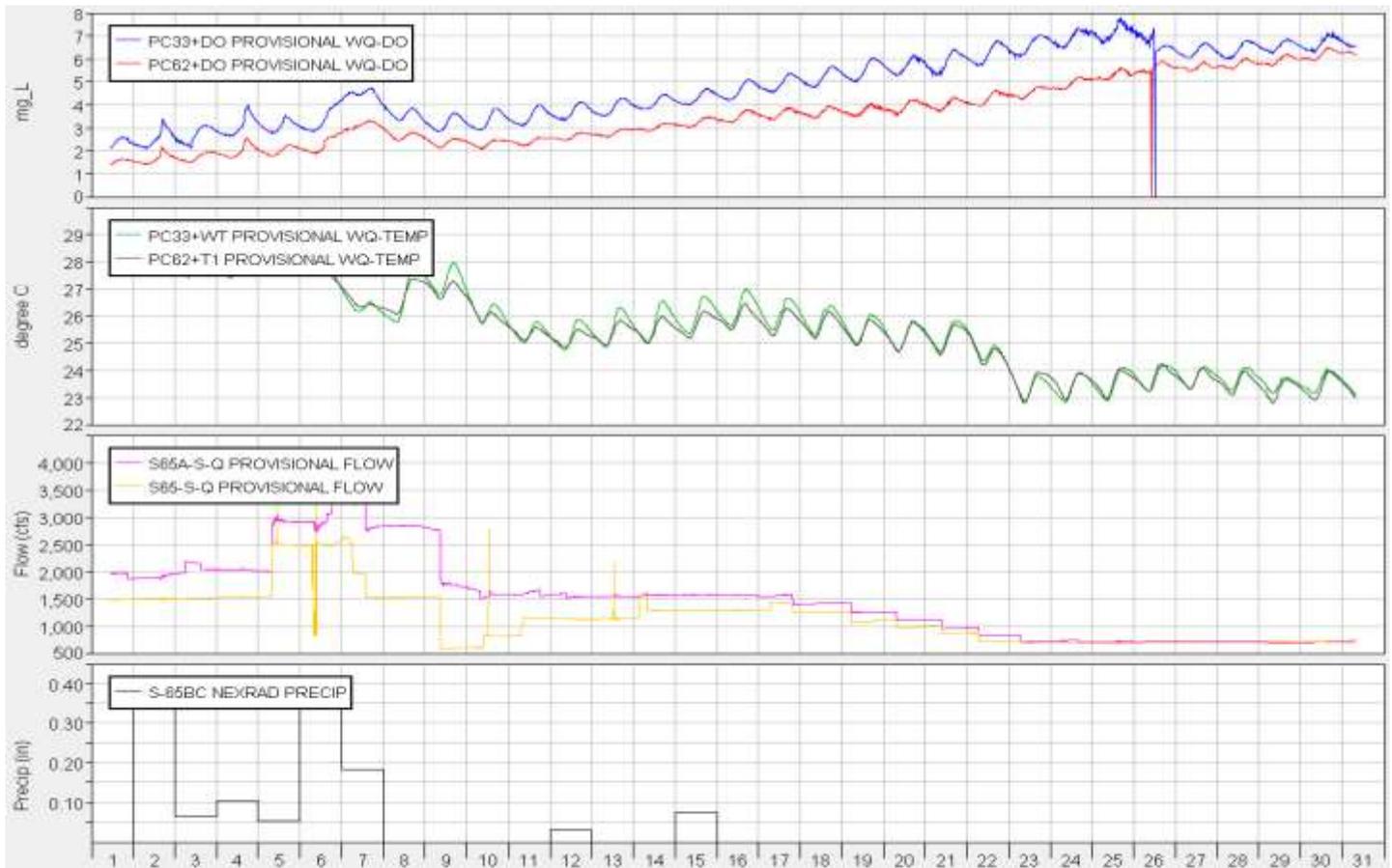


Figure 11. Phase I river channel dissolved oxygen and water temperature (measured at 15 minute intervals) and Pool BC daily rainfall.

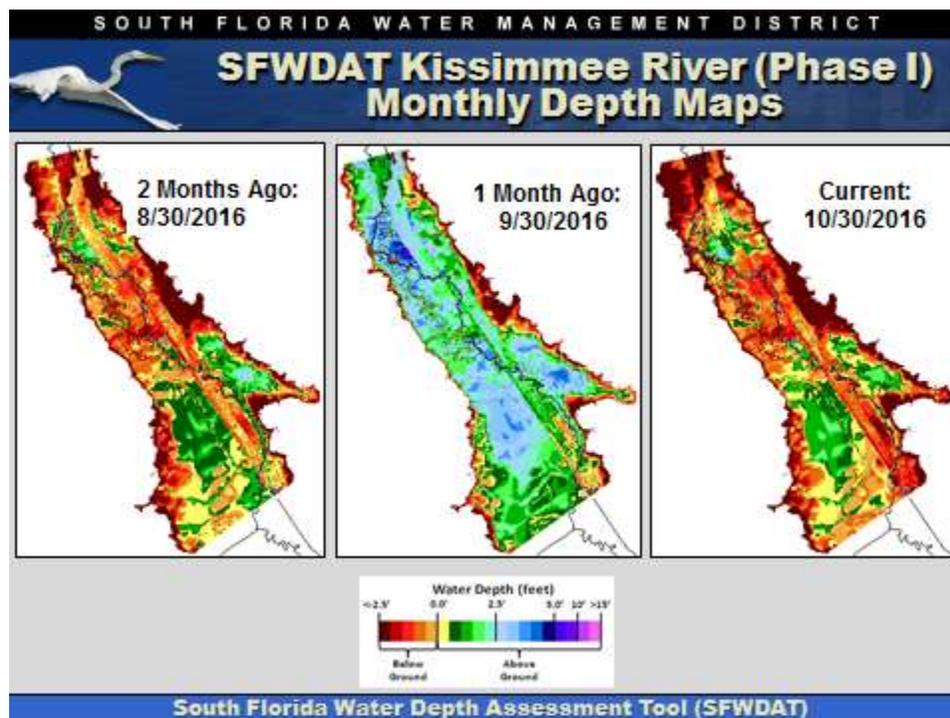
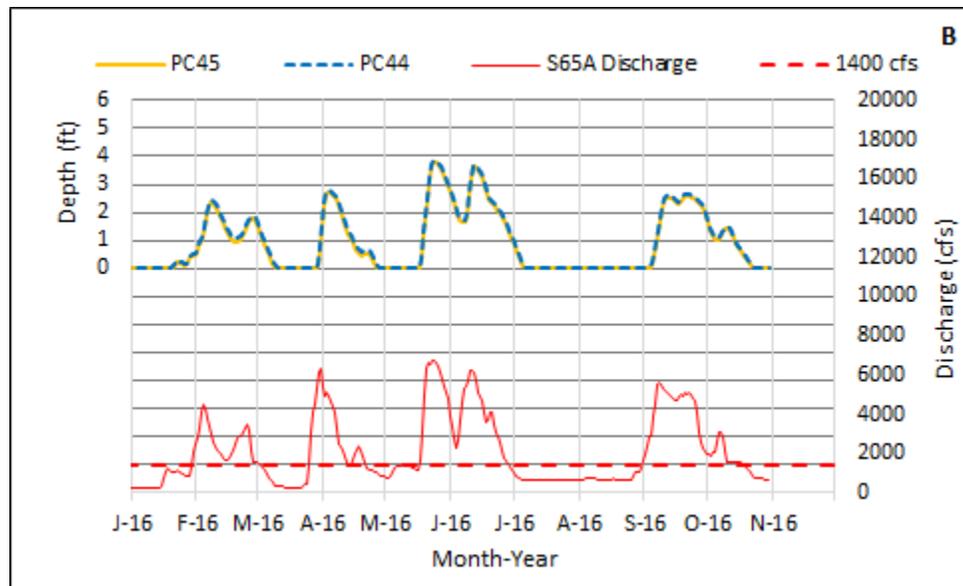
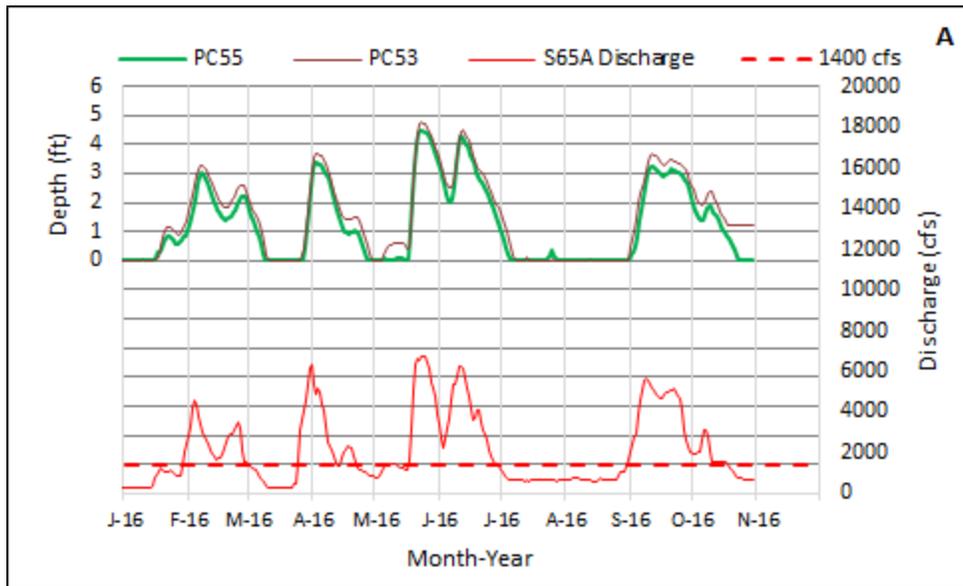


Figure 12. Phase I area floodplain water depths for this week, one month ago, and two months ago. Note that the WDAT color-coding has been modified to accommodate greater water depths; these maps are not directly comparable to Kissimmee Basin WDAT maps published prior to Jan. 16, 2012.



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

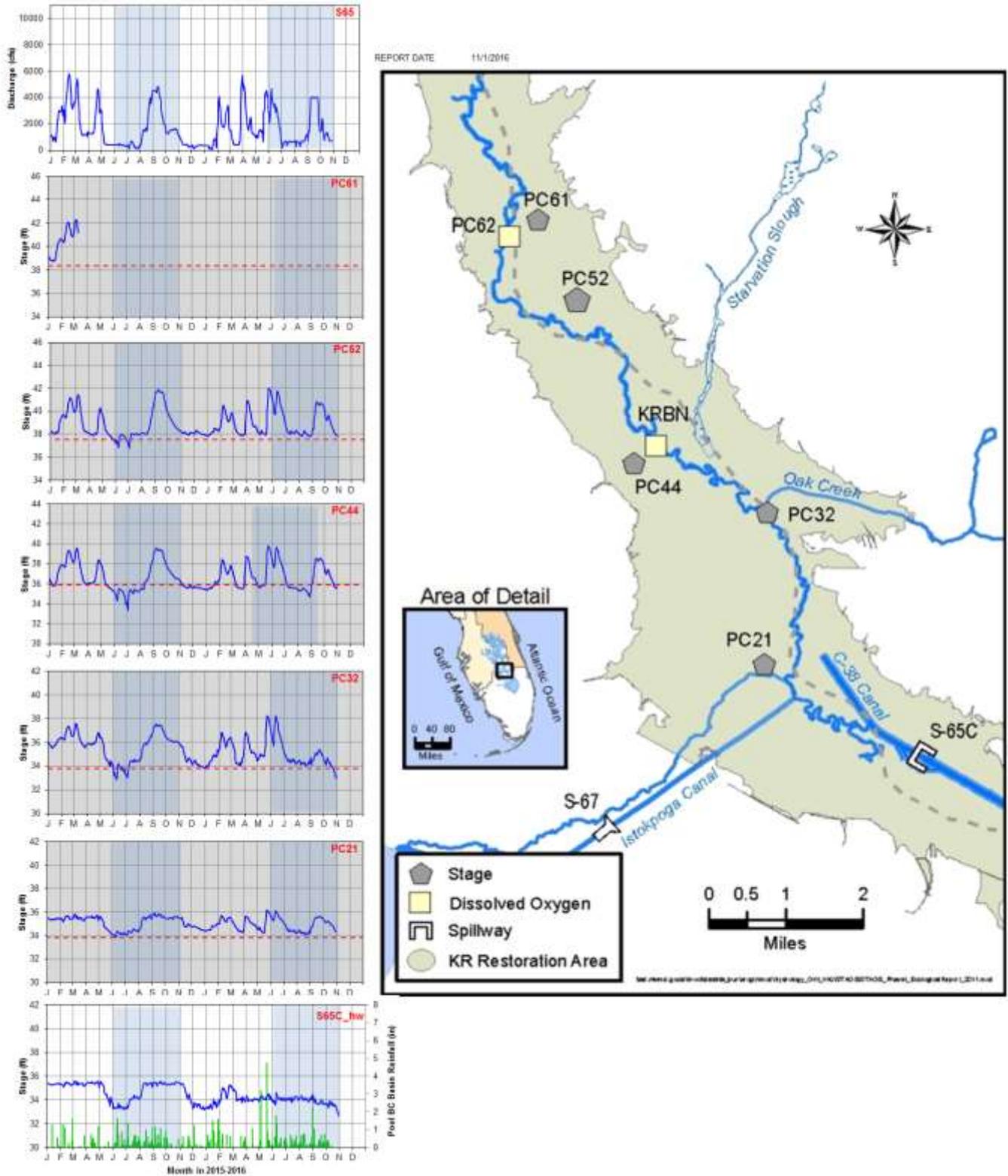


Figure 13. Discharge at S65, stages at five monitoring stations in the Phase I area of the Kissimmee River floodplain, and headwater stage at S65-C since January 1, 2015. The most recent data (~2 weeks) are provisional real-time data from SFWMD DualTrend; previous data are from SFWMD DB-HYDRO (validated).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

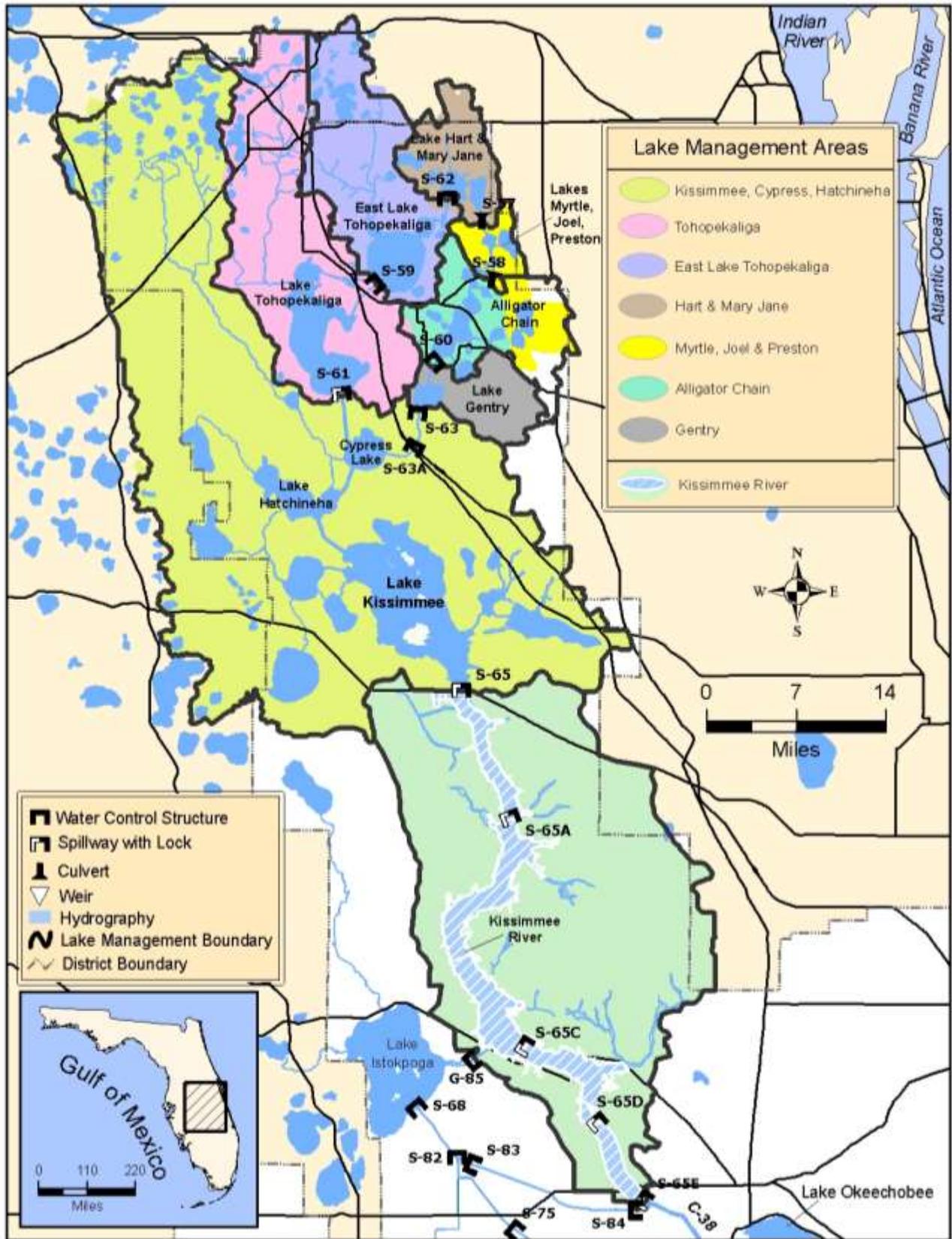


Figure 14. The Kissimmee Basin

LAKE OKEECHOBEE

According to the USACE web site, Lake Okeechobee stage is at 15.46 feet NGVD for the period ending at midnight on October 31, 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 decreased by 0.24 feet over the past week and is 0.30 feet lower than it was a month ago and 0.90 feet higher than it was a year ago (Figure 1). The Lake is currently in the Low sub-band (Figure 2). According to RAINDAR, 0.029 inches of rain fell directly over the Lake during the past seven days (Figure 3). Similar or lesser amounts fell to the north, east and west of the Lake while slightly greater amounts fell to the south.

Based on USACE reported values, current Lake inflow is approximately 1,622 cfs as detailed below.

Structure	Flow cfs
S65E	953
S154	38
S84 & 84X	241
S71	22
S72	0
C5 (Nicodemus slough dispersed storage)	-108
S191	0
S133 PUMPS	193
S127 PUMPS	0
S129 PUMPS	45
S131 PUMPS	0
S135 PUMPS	192
Fisheating Creek	46
S2 Pumps	0
S3 Pumps	0
S4 Pumps	0

Current Lake outflow is approximately 6,437 cfs with 3,260 cfs exiting at S77, 889 cfs exiting at S308 and 226 cfs exiting the L8 canal through Culvert 10A. Approximately 2,062 cfs exited through S351, S352 and S354 combined. Corrected evapotranspiration value based on the L006 weather platform solar radiation data for this past week was 849 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.

No new MODIS imagery is available due to extensive cloud cover.

The Fish and Wildlife Commission snail kite coordinator reported that during the October Lake Okeechobee survey 23 nests were active, all but one of them in the cattail treatment areas in moonshine bay (Figure 5). So far this year, a record 111 successful kite nests have been recorded on the Lake out of a total of 245 nesting attempts (45%).

Water Management Recommendations

Lake stage decreased by 0.24 feet over the past week dropping just below the top of the preferred stage envelope (15.5 feet NGVD). Future short-term recommendations are to lower Lake levels. From an ecological perspective, the Lake has been too high since the February rain event resulting in a loss of submerged aquatic vegetation and increased cyanobacterial blooms and associated toxins.

The goal should be to lower Lake levels at a rate of no more than 0.5 feet per month keeping levels within the preferred stage envelope and reaching a Lake stage of approximately 12.5 feet NGVD by the end of the dry season. Near optimal Lake stages will be necessary this coming spring and summer to provide conditions conducive to the reestablishment of the submerged aquatic vegetation acreage lost this year due to high Lake stages.

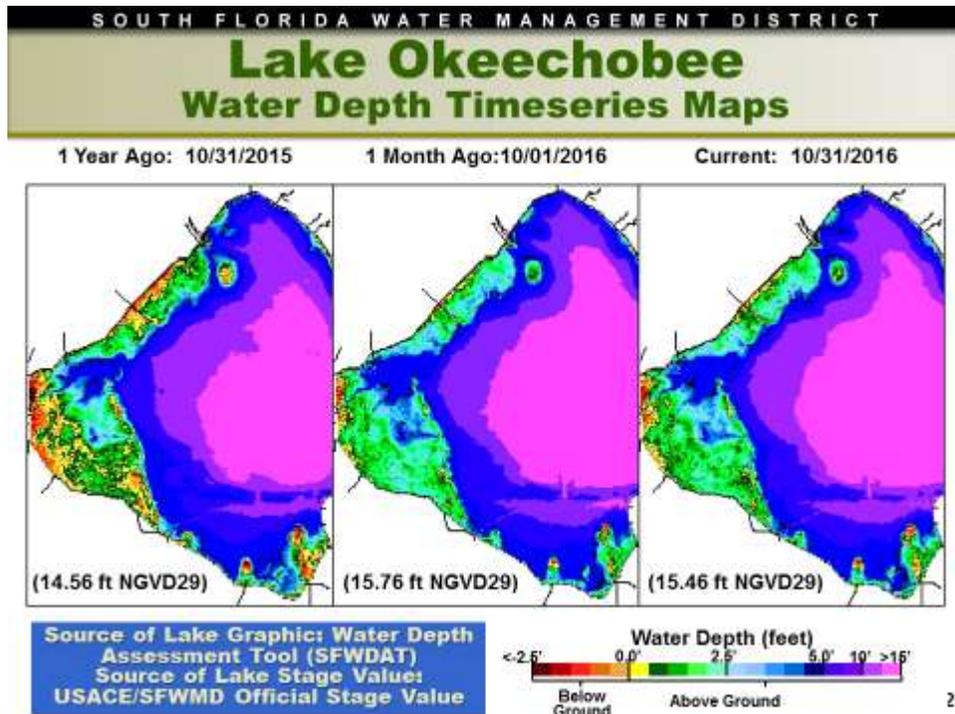


Figure 1

Lake Okeechobee Water Level History and Projected Stages

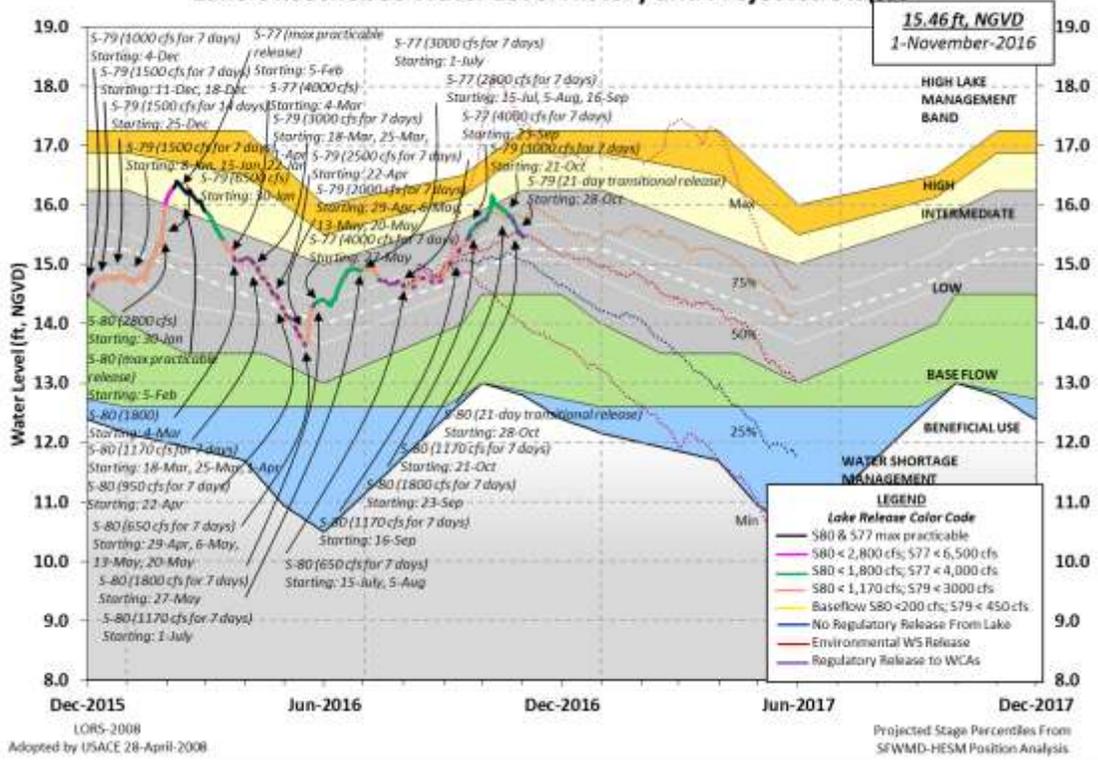


Figure 2

SFWMD PROVISIONAL RAINDAR 7-DAY BASIN RAINFALL ESTIMATES

FROM: 0515 EST, 10/25/2016 THROUGH: 0515 EST, 11/01/2016

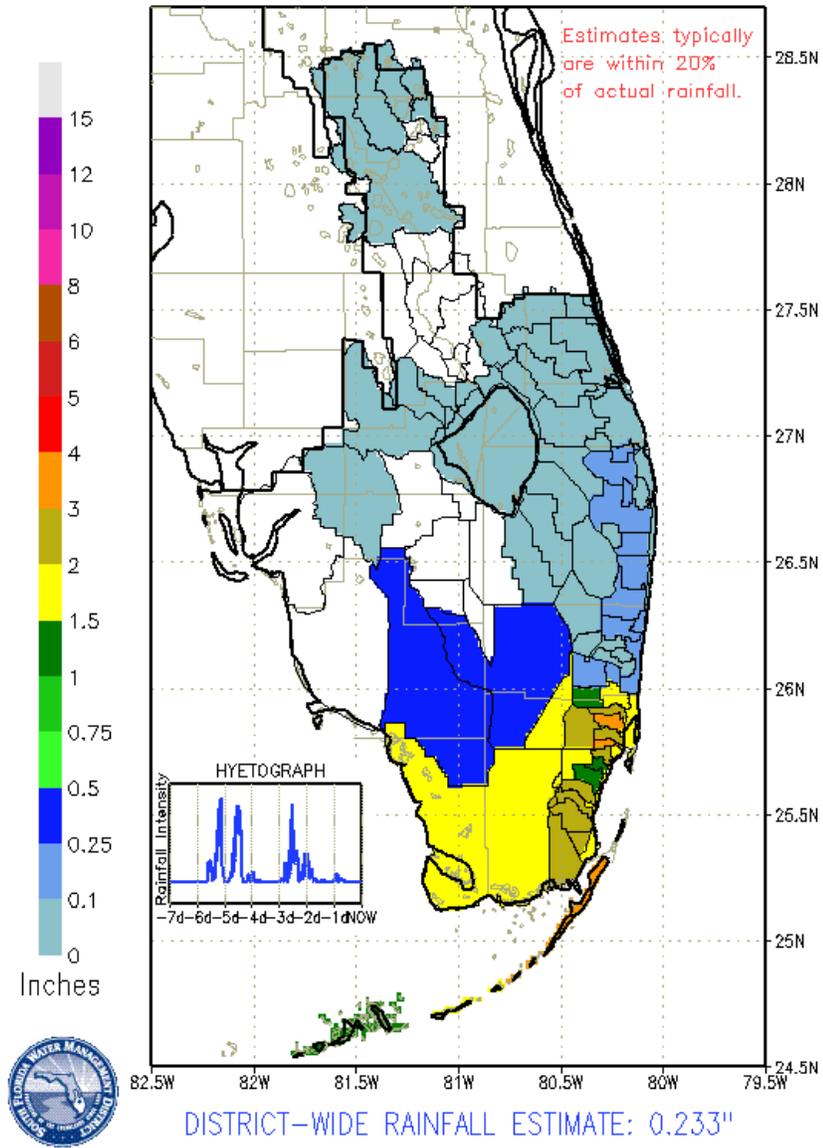


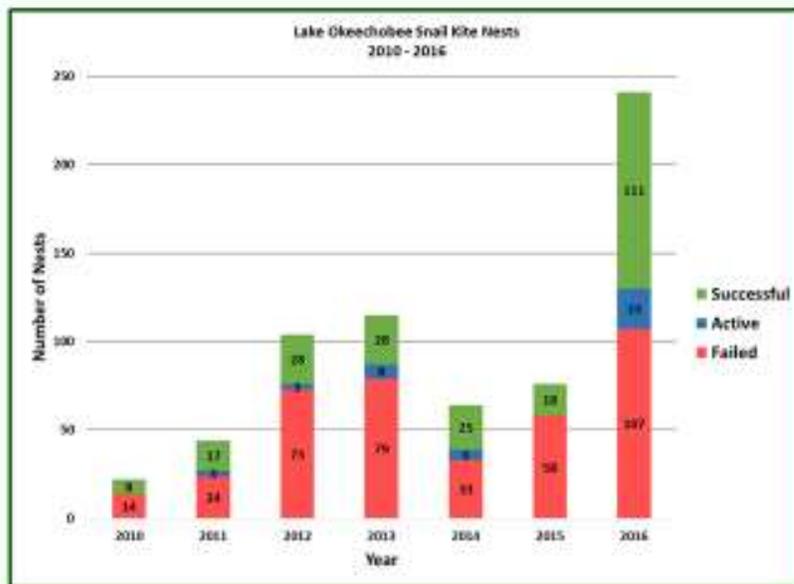
Figure 3

INFLOWS	Average Daily Flow Past Week cfs	Feet of Change Past Week
S65E	1222	0.032
S71 & 72	43	0.001
S84 & 84X	328	0.009
Fisheating Creek	295	0.008
Rainfall	N.A.	0.002
OUTFLOWS	Average Daily Flow Past Week cfs	Feet of Change Past Week
S77	3510	0.092
S308	1437	0.038
S351	508	0.013
S352	1002	0.026
S354	364	0.010
L8	230	0.006
ET	849	0.022

Figure 4

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Lake Okeechobee Snail Kites



- Total Nests – 245
- Successful – 111
- Failed – 107
- Still Active – 23
- Unknown - 4

Figure 5

Lake Istokpoga

The Lake Istokpoga regulation schedule has reached winter pool stage of 39.50 feet NGVD. Lake stage is 39.47 feet NGVD and is currently 0.03 feet below regulation stage (Figure 6). Average flows into the Lake from Arbuckle and Josephine creeks were 317 cfs and 61 cfs, respectively, a decrease in total flow from the previous week. Average discharge from S68 and S68X this past week was 523 cfs, an increase from the preceding week. According to RAINDAR, no rain fell in the Lake Istokpoga watershed during the past seven days.

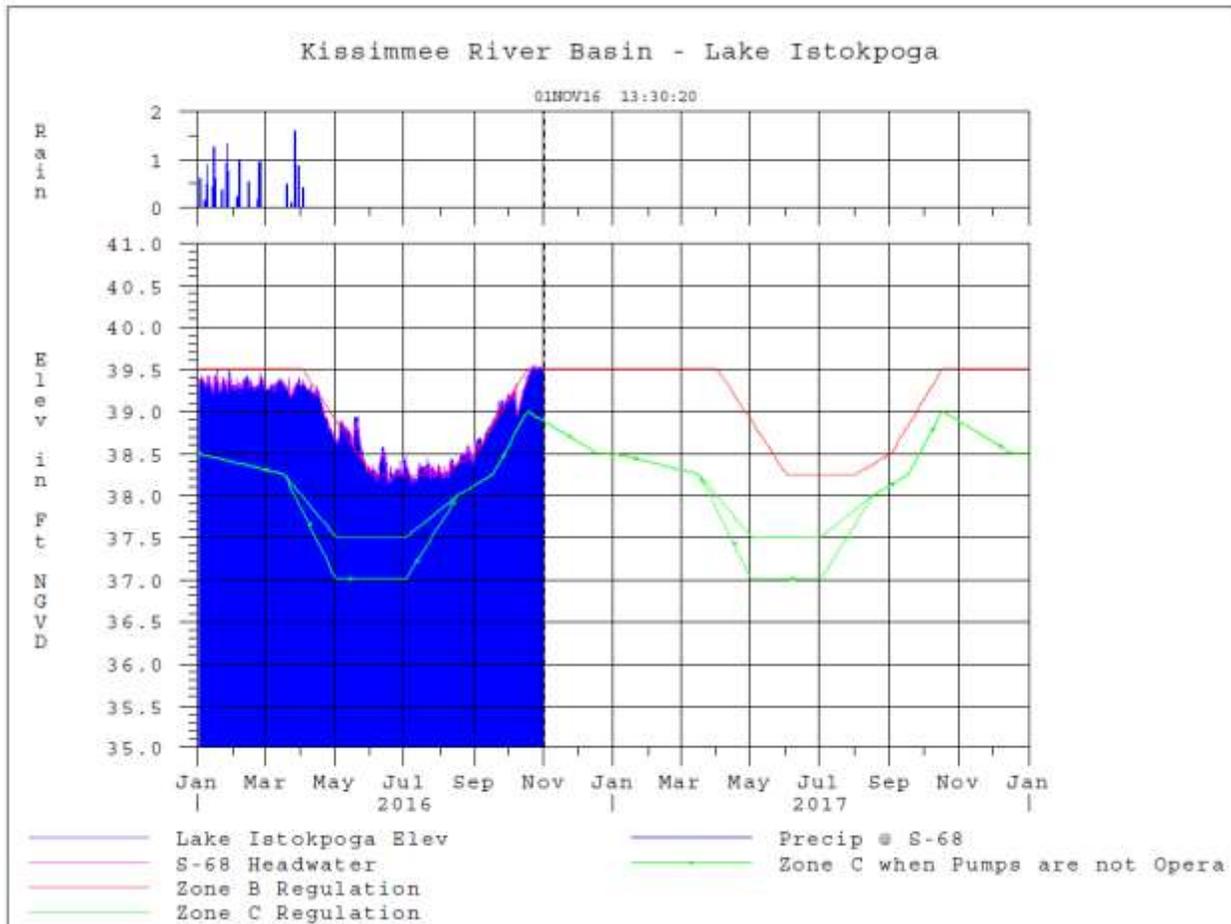


Figure 6

ESTUARIES

St. Lucie Estuary

Over the past week, provisional flows averaged about 1,187 cfs at S-80, 1,437 cfs downstream of S-308, 0 cfs at S-49 on C-24, 0 cfs at S-97 on C-23, and 103 cfs from Ten Mile Creek at the Gordy Road Structure. Average inflow from tidal basin tributaries is estimated to be 120 cfs (Figures 1 and 2). Total inflow averaged about 1,410 cfs last week and 2,762 cfs over last month.

Over the past week in the estuary, surface salinity increased at HR1 and at A1A Bridge but decreased at US1 Bridge (Table 1, Figures 3 and 4). The seven-day moving average salinity of the water column at the US1 Bridge is about 5.9. 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)	5.1 (2.0)	6.6 (5.7)	NA ¹
US1 Bridge	4.6 (5.6)	5.7 (10.0)	10.0-26.0
A1A Bridge	15.9 (15.8)	22.9 (24.0)	NA

¹Envelope not applicable

Caloosahatchee Estuary

During the past week, provisional flows averaged approximately 3,510 cfs downstream of S-77, 2,262 cfs at S-78, and 2,966 cfs at S-79. Average inflow from tidal basin tributaries is estimated to be 319 cfs (Figures 5 and 6). Total inflow averaged 3,285 cfs last week and 5,892 cfs over last month.

Over the past week in the estuary, salinity remained about fresh to Cape Coral Bridge and increased downstream (Table 2, Figures 7 and 8). The seven-day average salinity values are within the good range for adult oysters at Shell Point and at Sanibel and in the fair range at Cape Coral (Figure 9). The 30-day moving average surface salinity is 0.2 at Val I-75 and 0.3 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)	0.3 (0.2)	0.0-5.0 ²
Ft. Myers Yacht Basin	0.7 (0.2)	0.9 (0.2)	NA
Cape Coral	5.0 (3.5)	7.9 (6.0)	10.0-30.0
Shell Point	17.5 (13.8)	21.1 (17.6)	10.0-30.0
Sanibel	28.0 (26.1)	29.5 (27.9)	10.0-30.0

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

*Val I75 is temporarily offline due to site construction, Salinity values are estimated using models developed for this site.

Monitoring data collected by the River, Estuary and Coastal Observing Network of Sanibel-Captiva Conservation Foundation using continuous sensors are summarized in Table 3 as concentration ranges of Chlorophyll *a* and dissolved oxygen at Beautiful Island, Ft. Myers, and Shell Point in the Caloosahatchee Estuary.

Table 3. Weekly ranges of Chlorophyll *a* (a measure of algal biomass) and dissolved oxygen concentrations at three monitoring stations maintained by the Sanibel-Captiva Conservation Foundation.

	RECON Monitoring Stations		
	Beautiful Island	Ft. Myers	Shell Point
Chlorophyll <i>a</i> (µg/l)	4.1 – 9.1	4.55 – 5.65	2.2 – 7.3
Dissolved Oxygen (mg/l)	5.3 – 6.6	7.25 – 8.1	6.1 – 7.45

The Florida Fish and Wildlife Research Institute reported on October 28, 2016, that *Karenia brevis*, the Florida red tide organism, was observed in background to medium concentrations in 19 samples

collected from Lee County, two of which were in Pine Island Sound (Red Fish Pass and west of Mondongo Island).

Water Management Recommendations

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

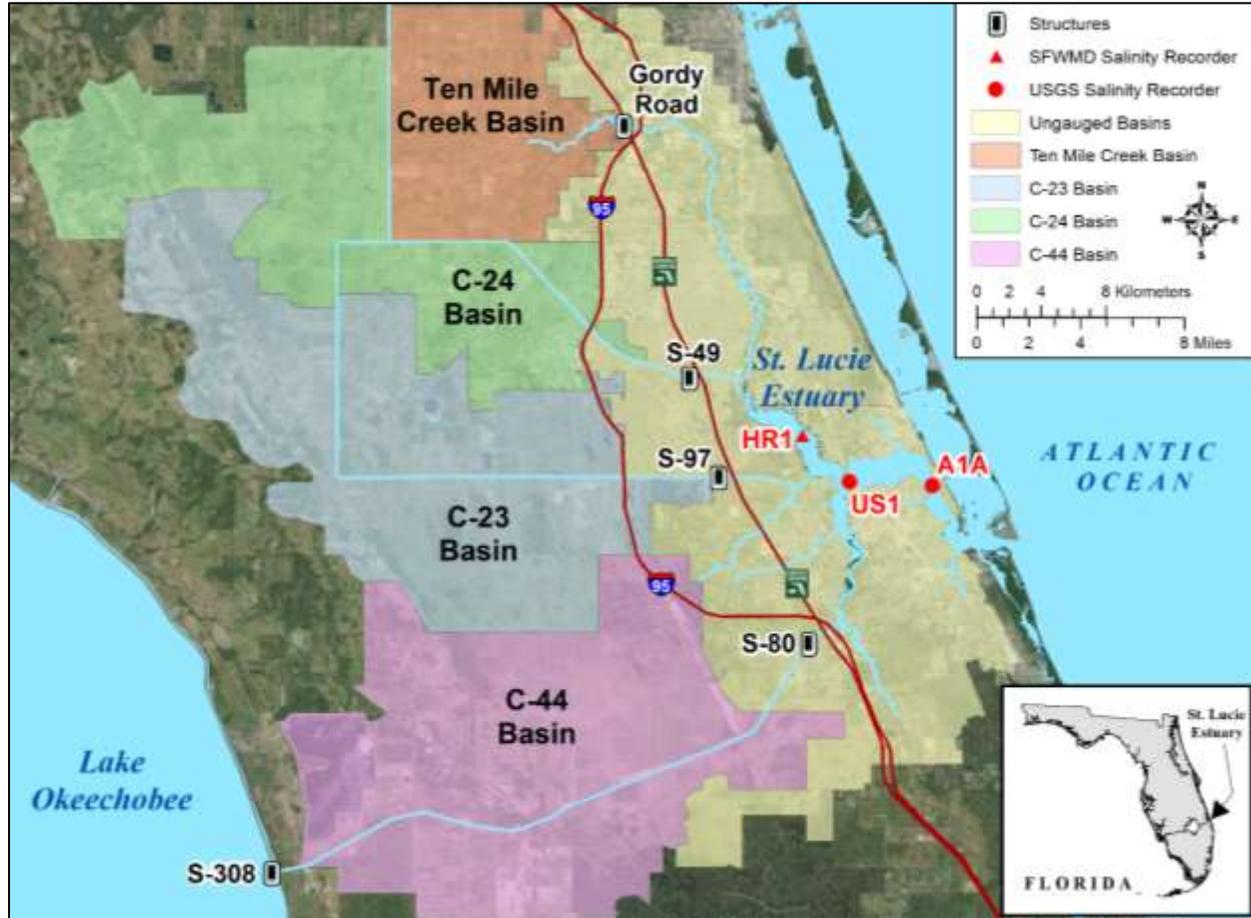


Figure 1. Basins, water control structures, and salinity monitoring for the St. Lucie Estuary.

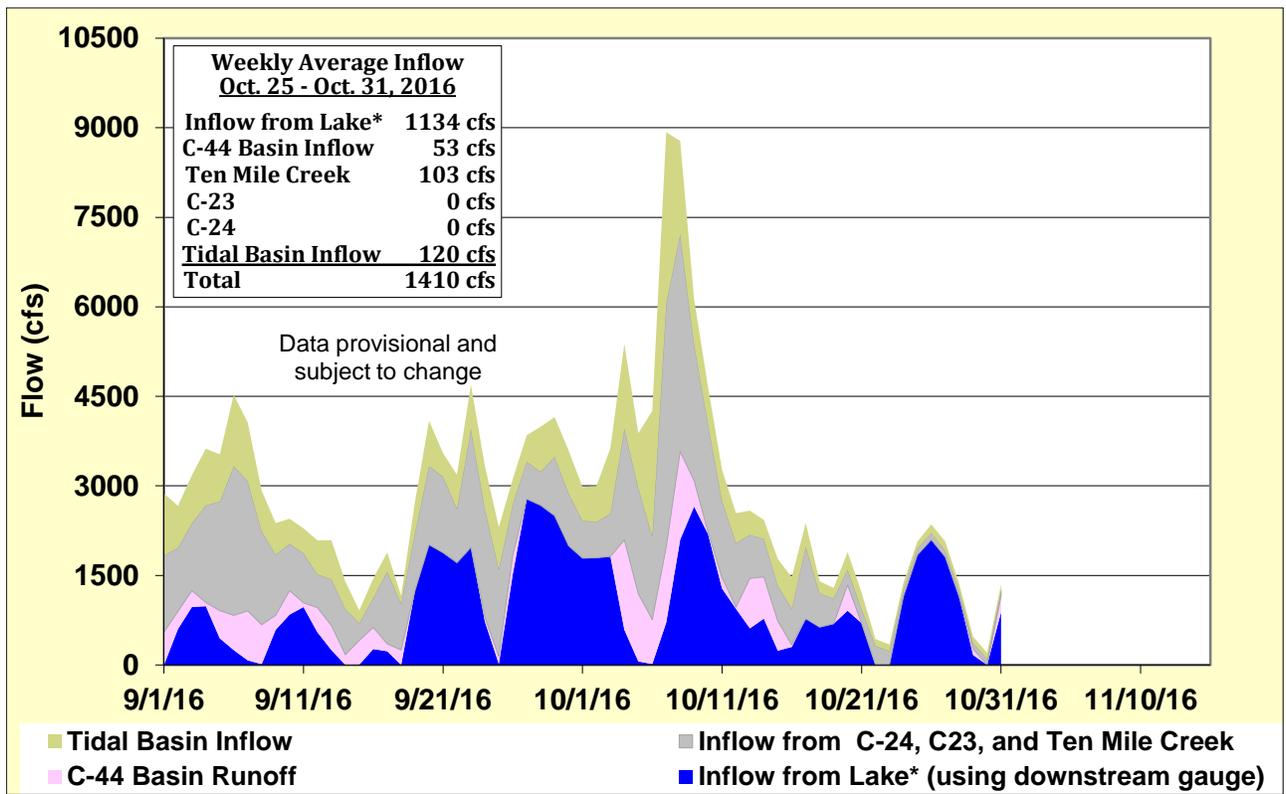


Figure 2. Estimated surface freshwater inflows from Lake Okeechobee and runoff from the C-44, C-23, C-24, Ten Mile Creek, and tidal basins into the St. Lucie Estuary.

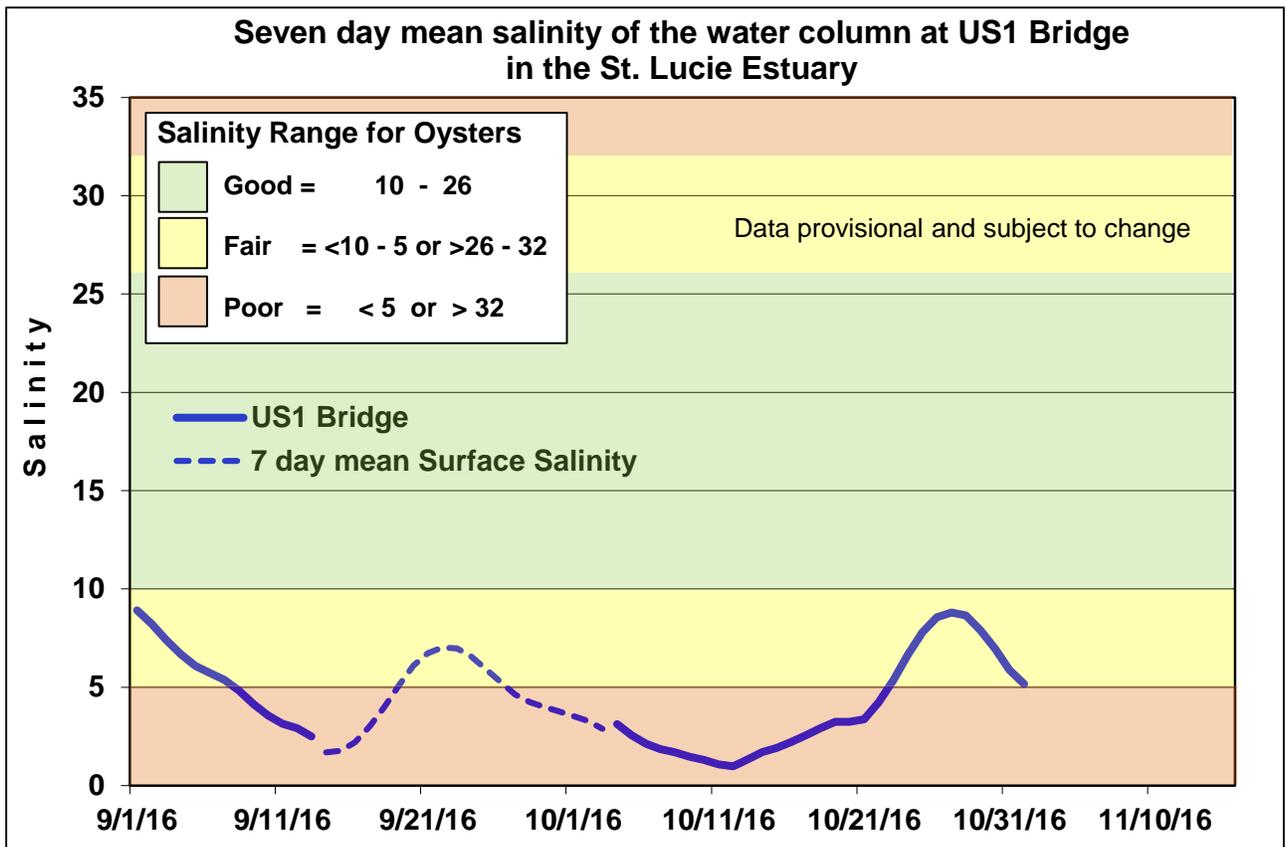


Figure 3. Seven-day mean salinity of the water column at the U.S. Highway 1 Bridge.

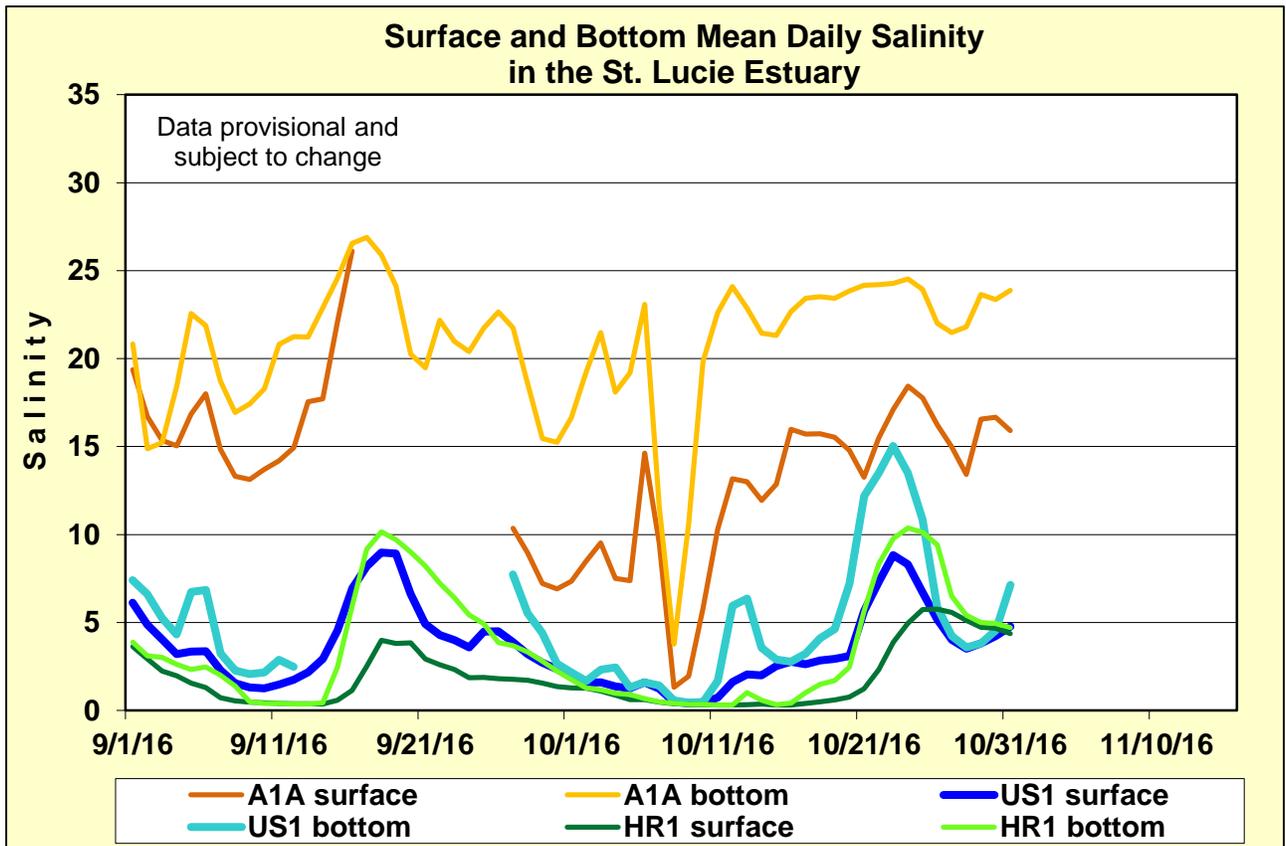


Figure 4. Daily mean salinity at the A1A, US1 and estimated HR1 stations.

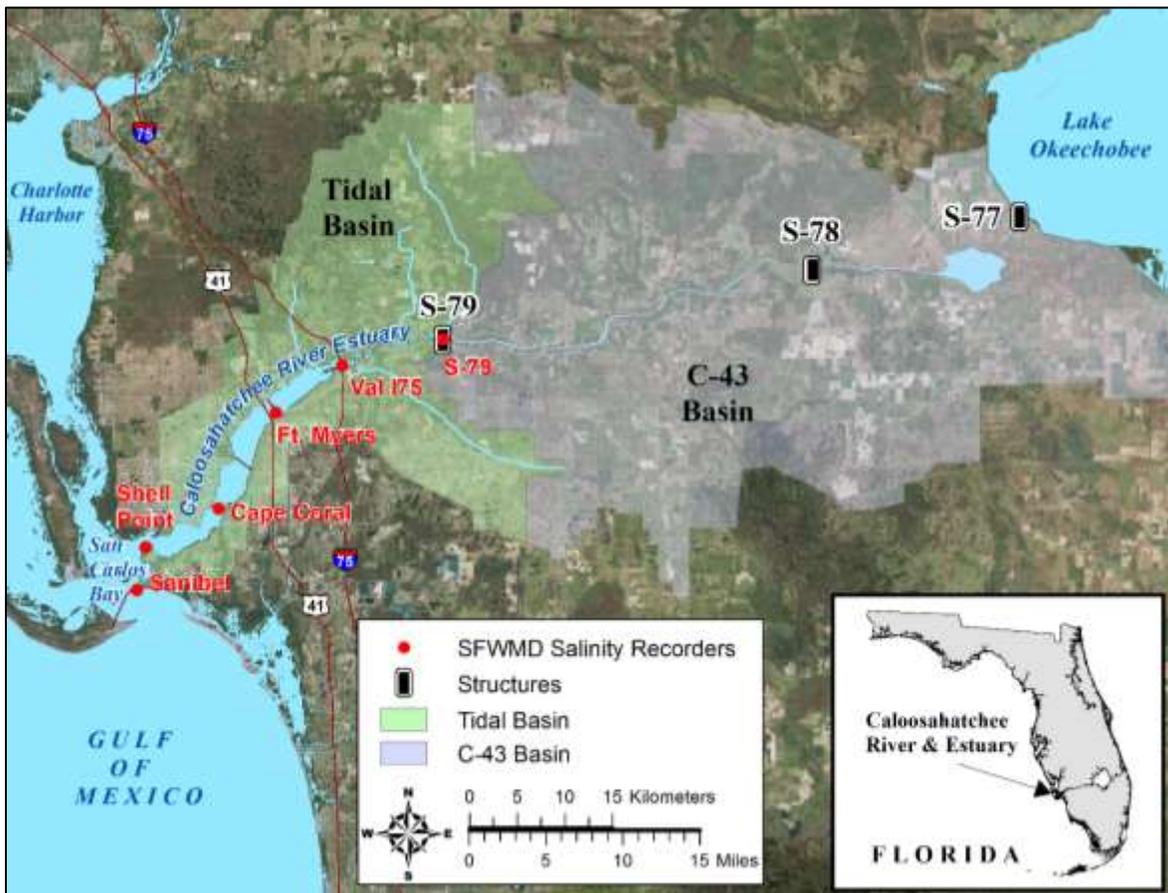


Figure 5. Basins, water control structures, and salinity monitoring for the Caloosahatchee Estuary.

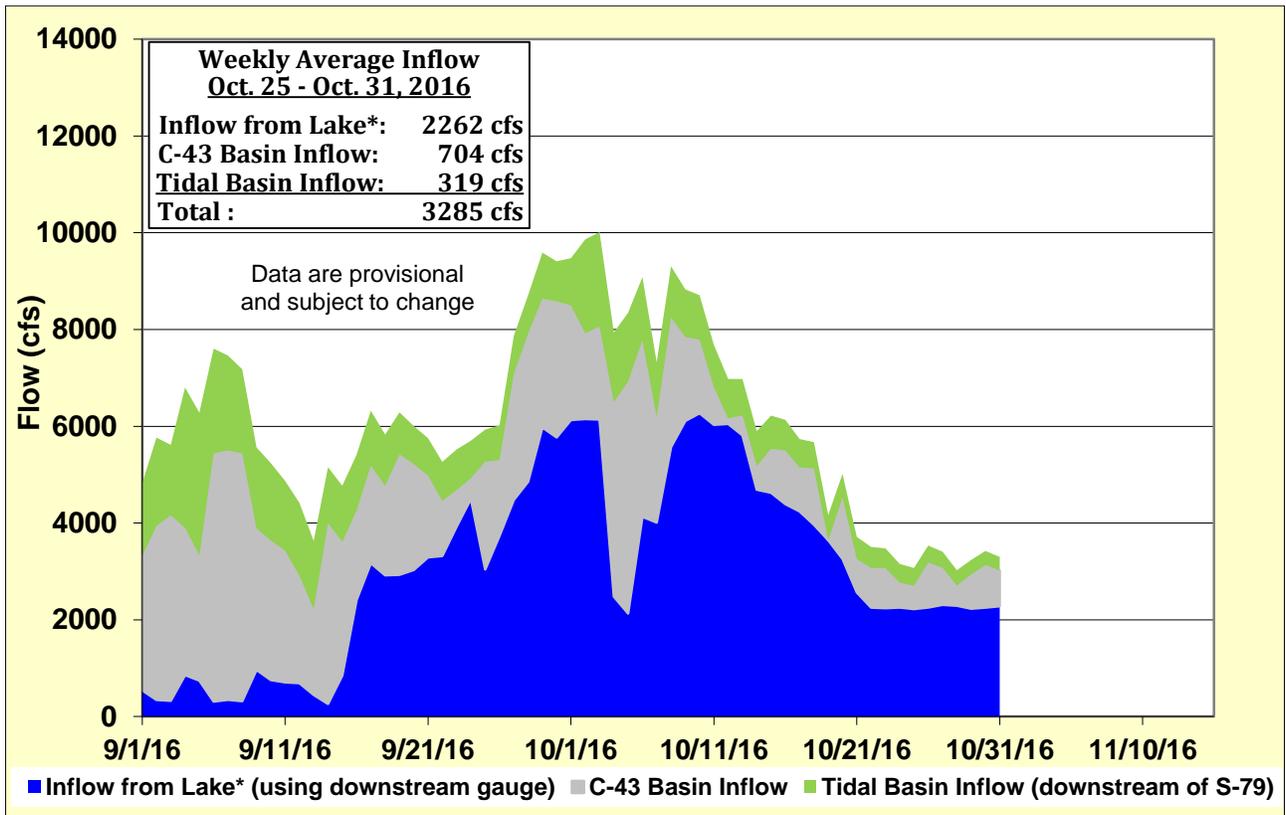
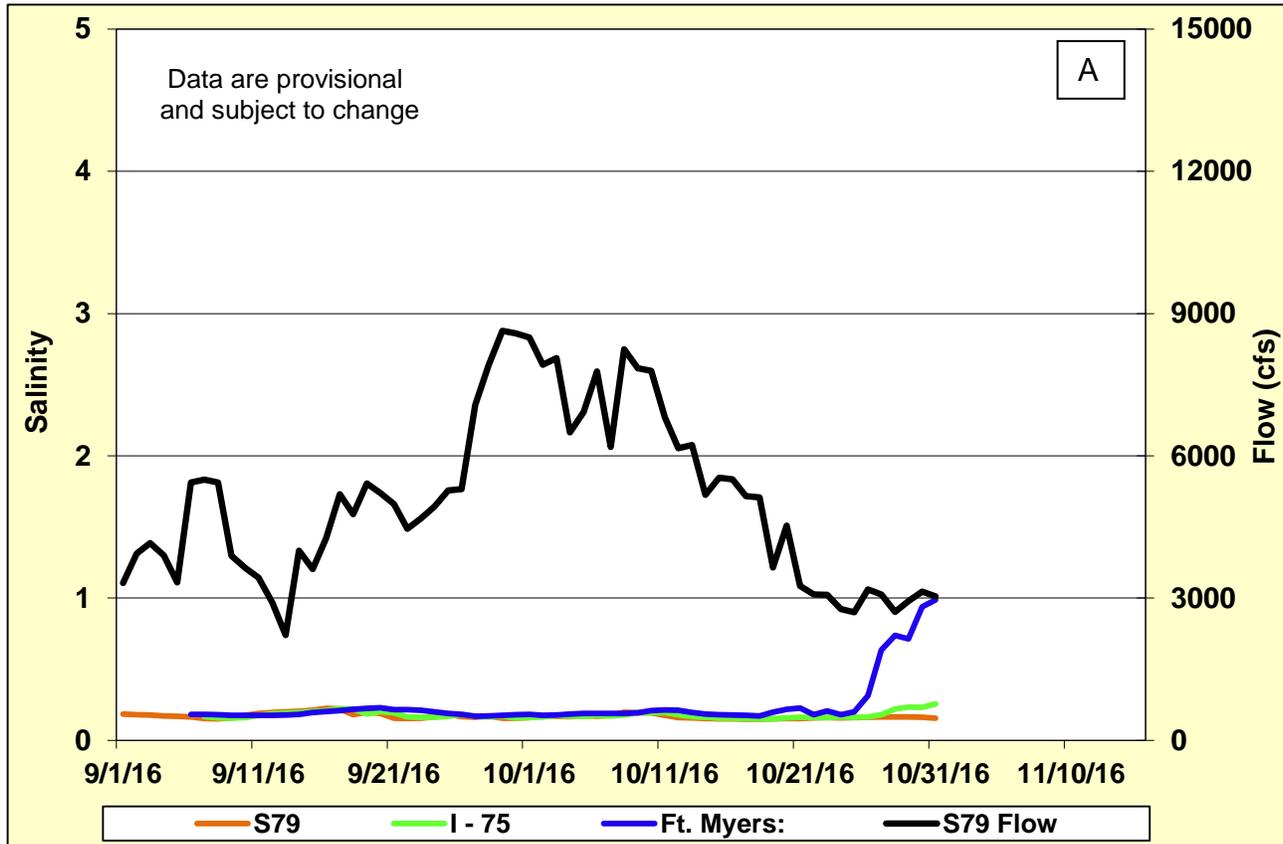


Figure 6. Freshwater inflows from Lake Okeechobee, runoff from the C-43 basin, and tributaries in the tidal basin into the Caloosahatchee River Estuary.



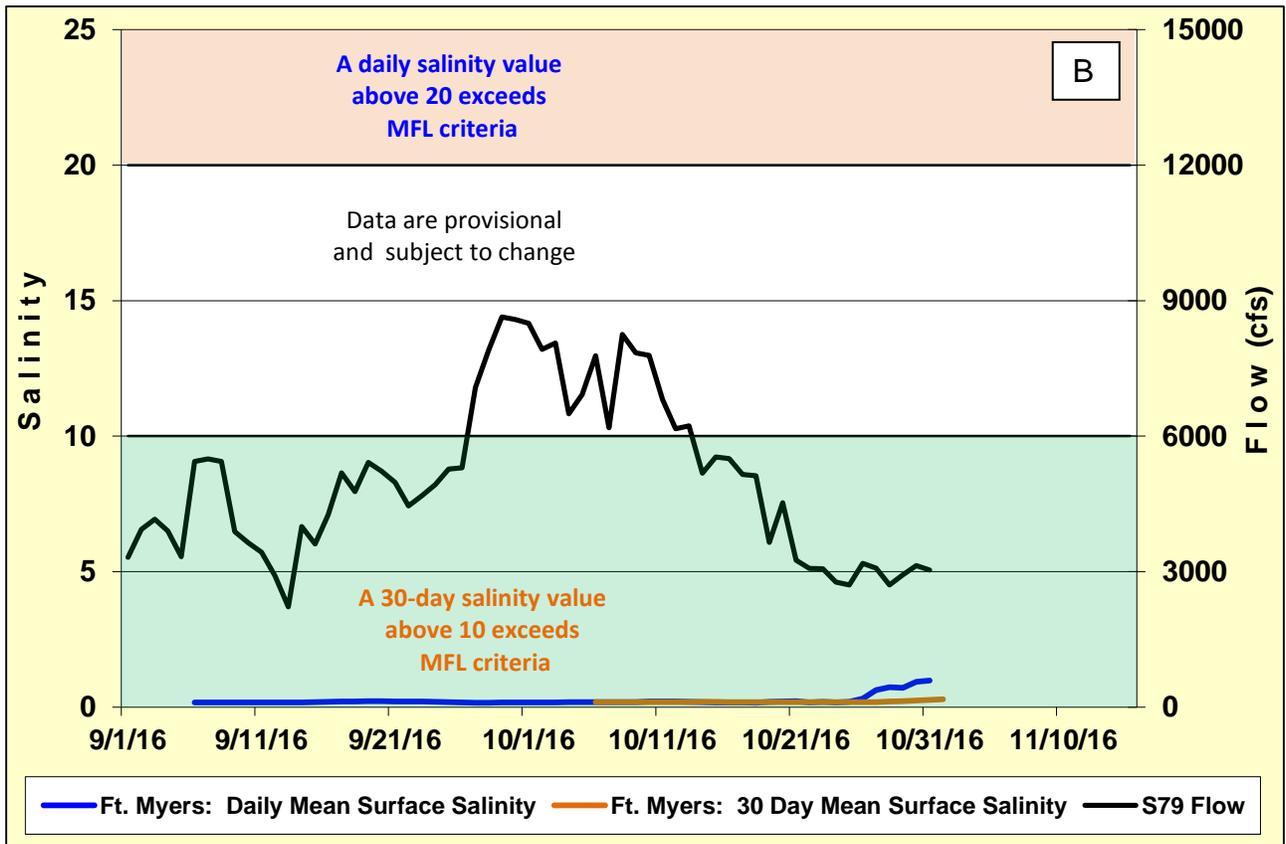


Figure 7. Daily mean flows at S-79 and salinity at upper estuary monitoring stations (A) and 30-day moving average salinity at Ft. Myers (B).

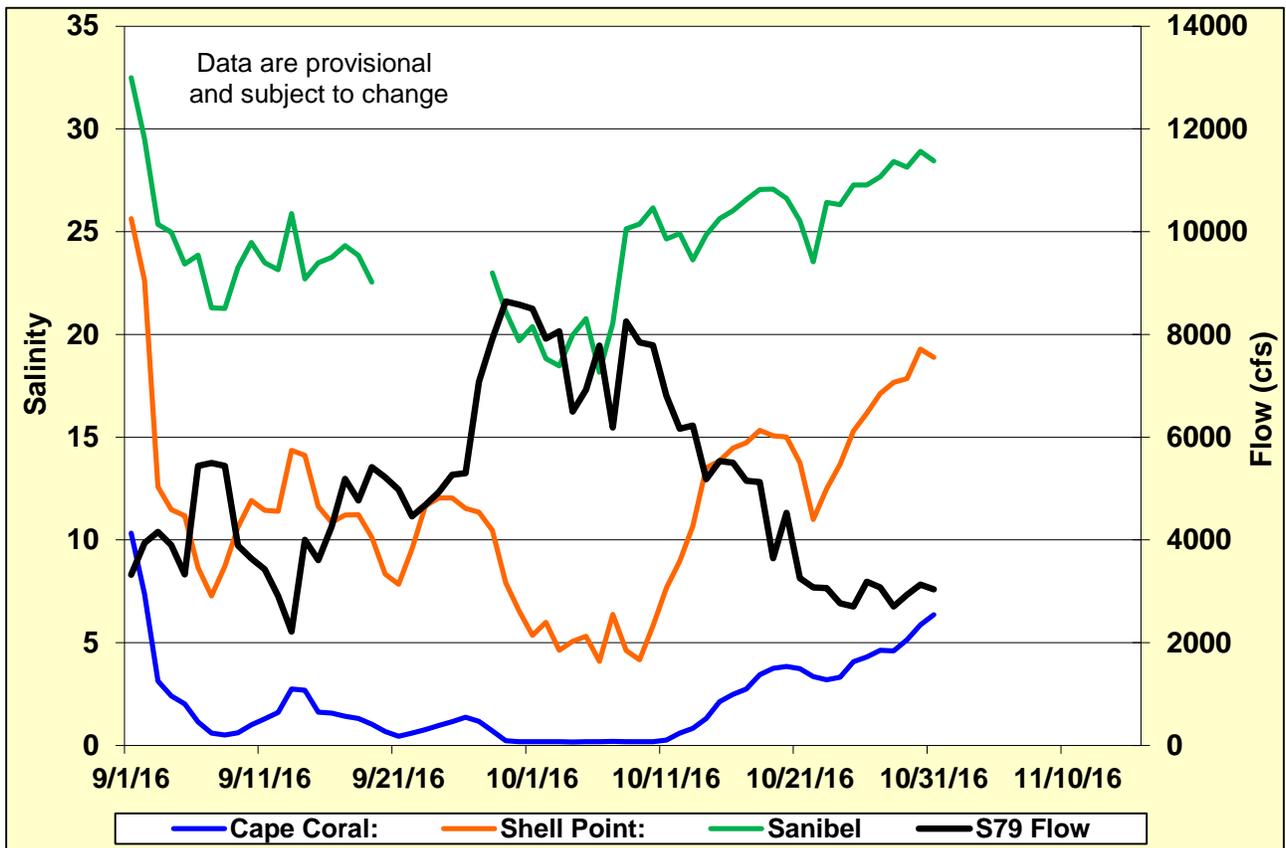


Figure 8. Daily mean flows at S-79 and salinity at lower estuary stations.

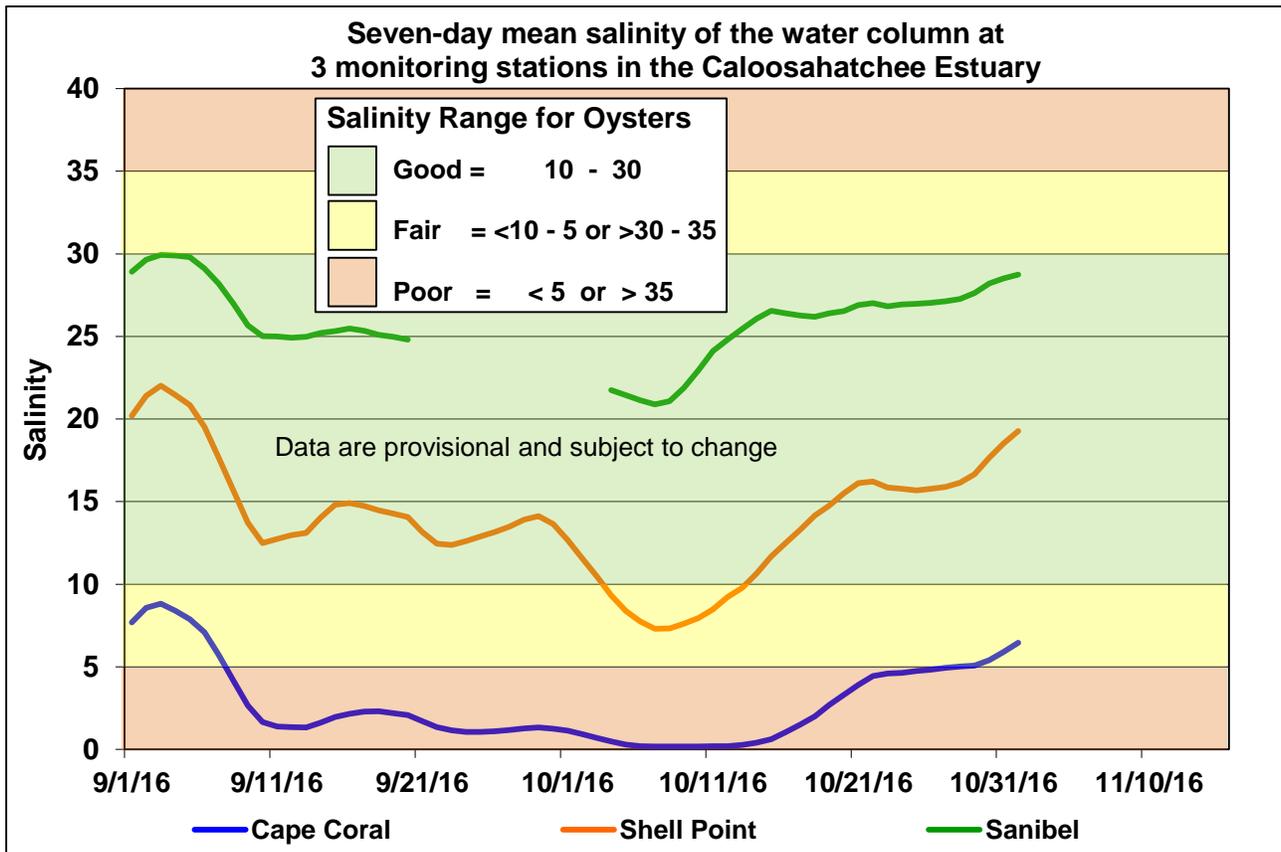


Figure 9. Seven-day mean salinity at Cape Coral Bridge, Shell Point and Sanibel Bridge monitoring stations.

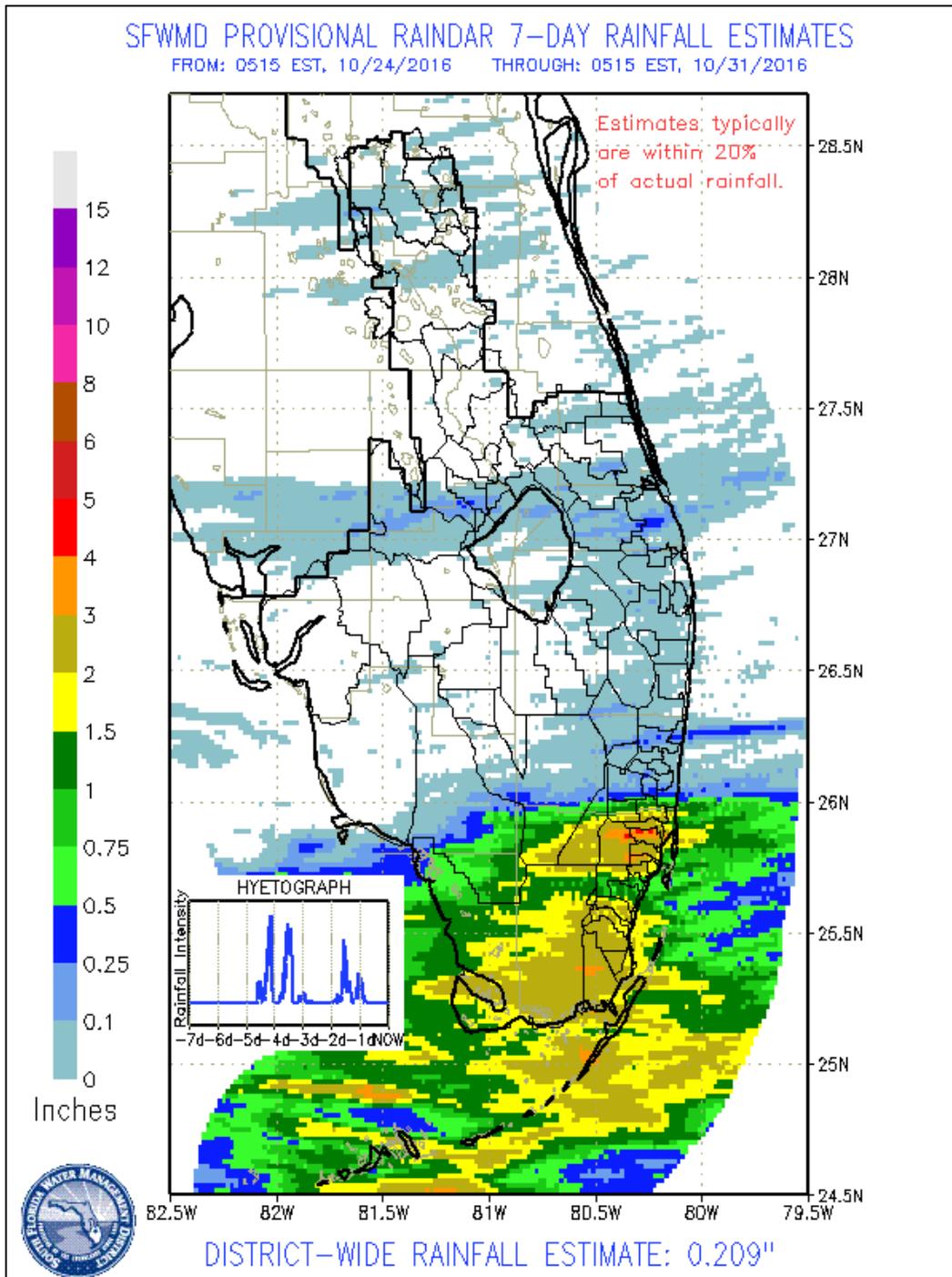
GREATER EVERGLADES

Rainfall was sparse in the northern half of the WCAs and moderate south of there through Everglades National Park (ENP). Basin average rainfall ranged from 0.02 to 1.73 inches with the highest maximum local rainfall of 3.15 inches in ENP. Stage changes ranged from -0.21 to 0.12 feet. Pan evaporation was 1.25 inches which is 23 percent above the pre-project average of 1.02 inches.

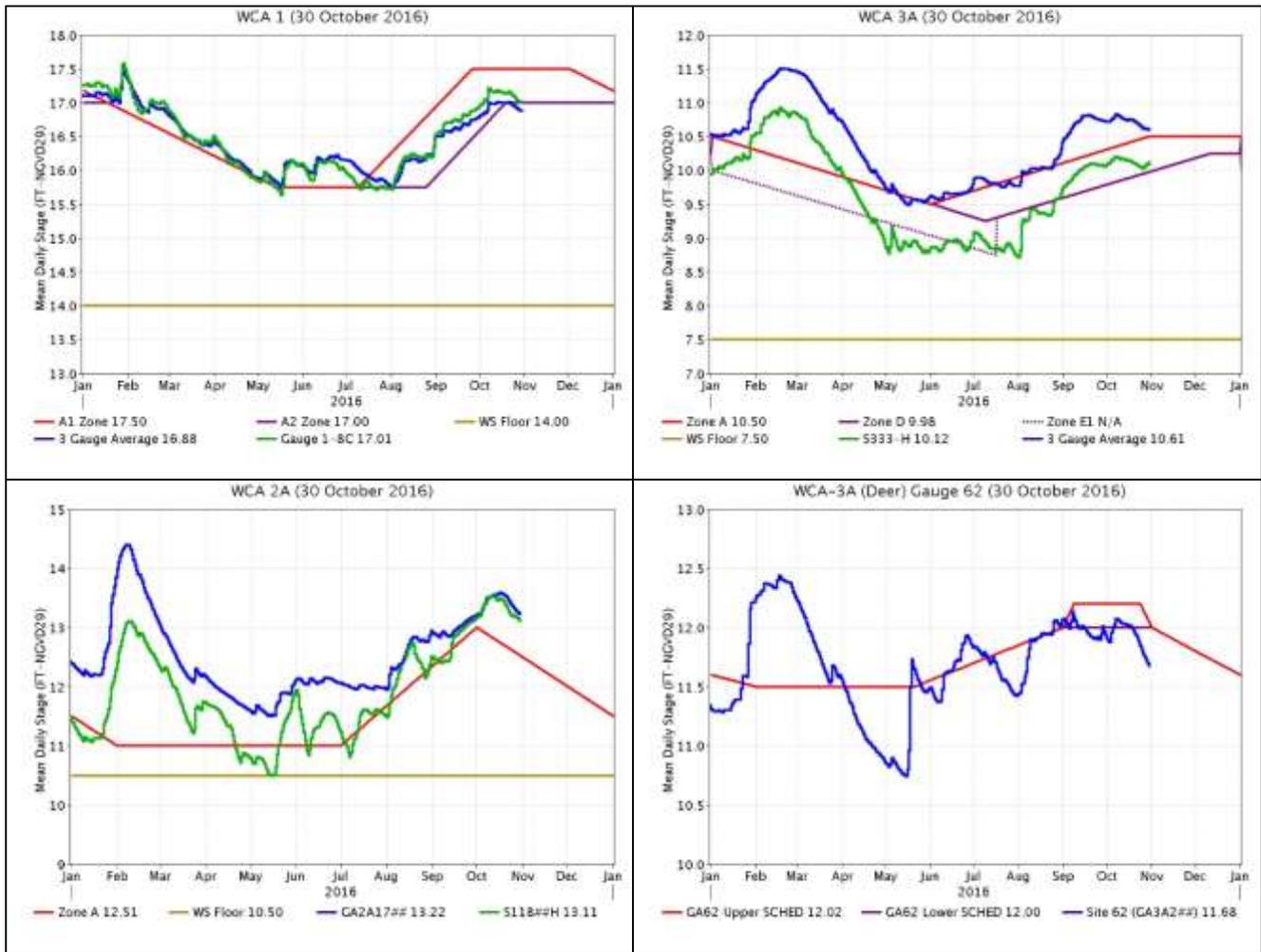
Everglades Region	Rainfall (Inches)	Stage Change (feet)
WCA-1	0.02	-0.08
WCA-2A	0.07	-0.21
WCA-2B	0.07	0.07
WCA-3A	0.33	-0.10
WCA-3B	1.73	0.11
ENP	1.70	0.12

SFWM District-wide Rainfall 7-Day Rainfall Estimates

FROM: 0515 EST, 10/24/2016 THROUGH: 0515 EST, 10/31/2016



Regulation Schedules: Stages remain below regulation for only two of the four areas. The WCA-1 three-gauge average is -0.62 feet below zone A1, and the northwestern WCA-3A gauge stage (gauge 62) is -0.34 feet below the upper schedule. The other two areas remain above schedule: WCA-2A stage is 0.71 feet above regulation and the WCA-3A three-gauge average stage is 0.11 feet above regulation.

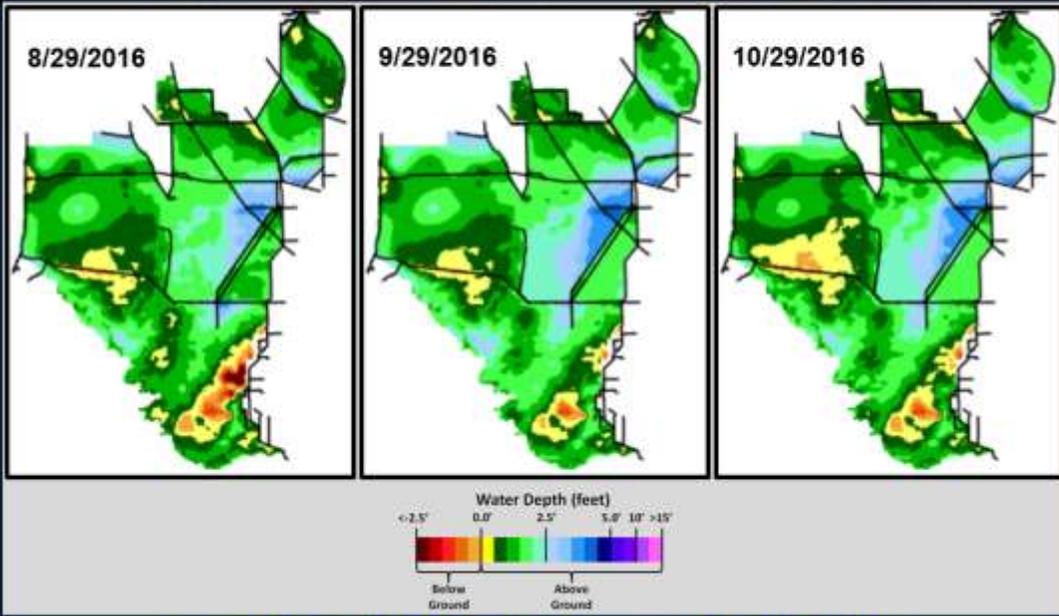


Water Depths and Changes: Water levels in WCA-1 and -2A are higher than those in September and August while other areas are mixed in comparison. Water depths at monitored gauges other than in WCA-2B range from 1.48 feet to 2.82 feet. The two-gauge average for northern WCA-3A has fallen to 11.27 feet.

Stages decreased in most areas of the northern WCAs but were slightly higher in southern WCA-3A and ENP. Individual gauge changes ranged from 0.23 feet in WCA-3B to -0.21 feet in WCA-2A. Stages are generally lower than a month ago and are above those a year ago except in WCA-1.



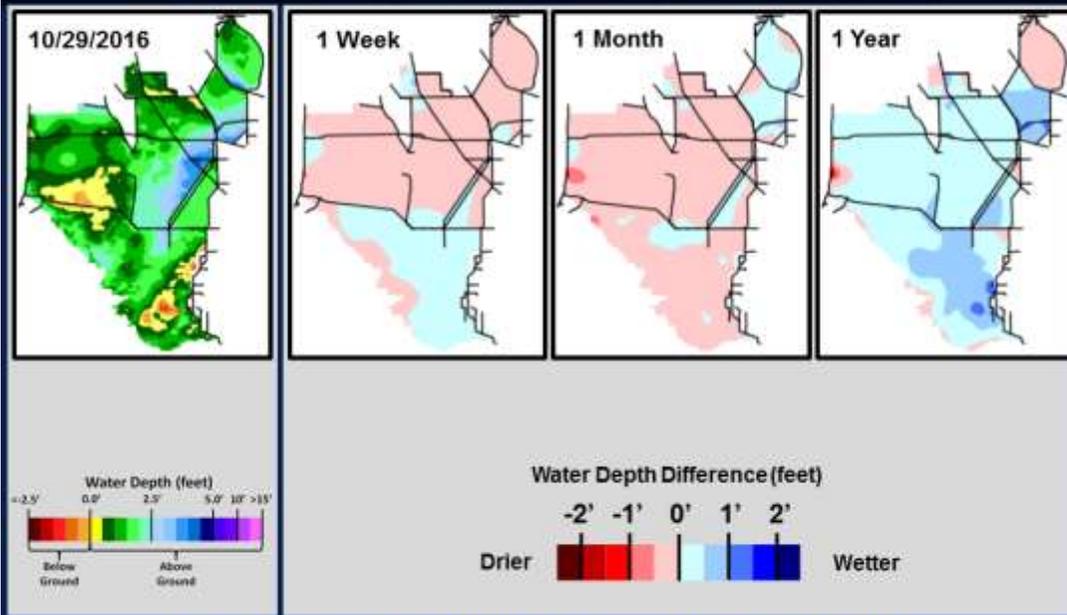
SFWDAT Water Depth Monthly Snapshots



South Florida Water Depth Assessment Tool (SFWDAT)



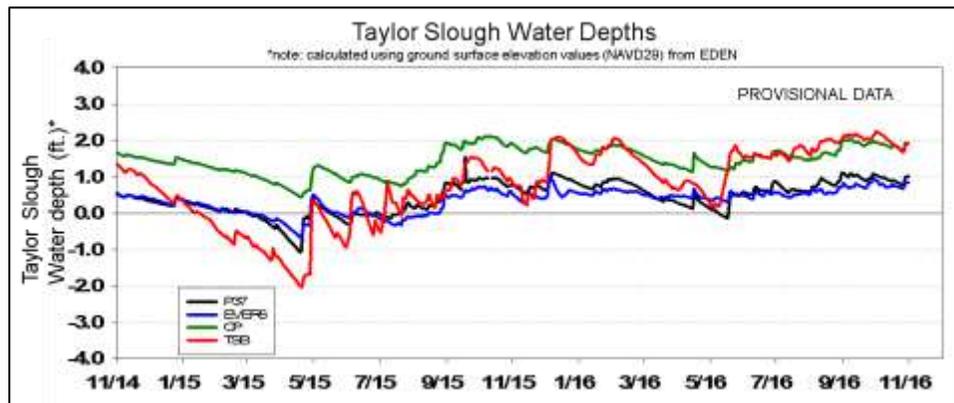
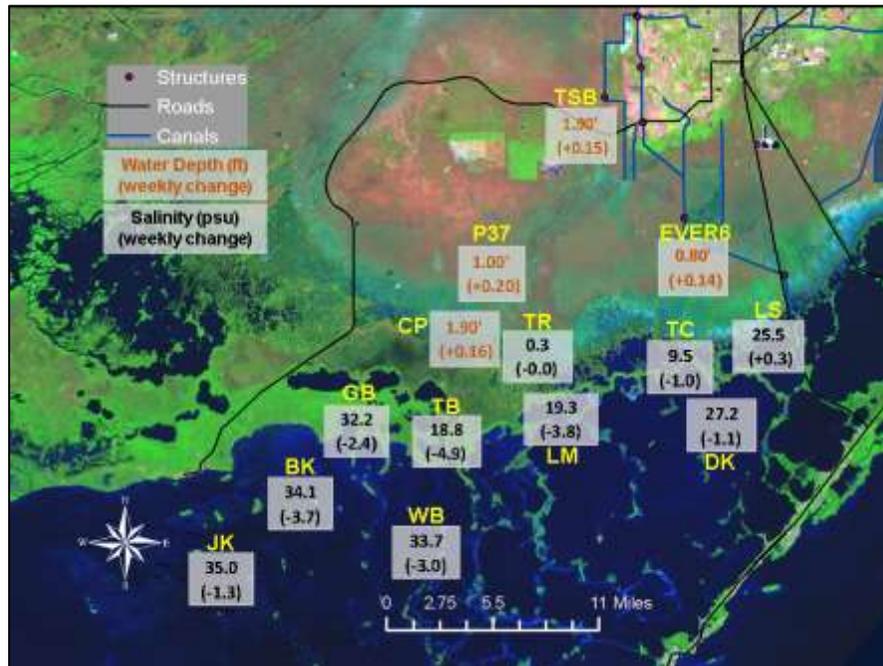
SFWDAT Everglades Difference Maps (Present - Past)

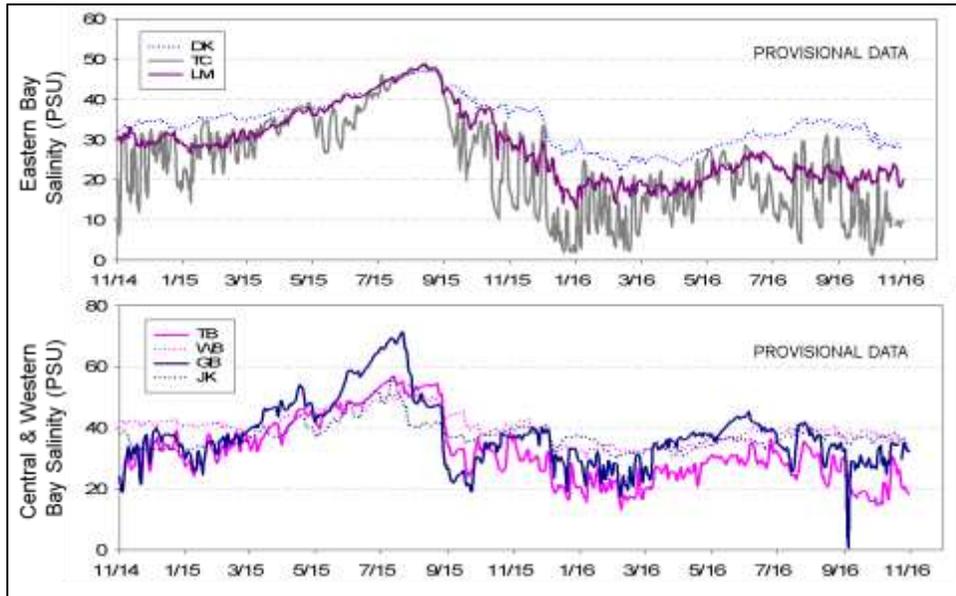


South Florida Water Depth Assessment Tool (SFWDAT)

Taylor Slough and Florida Bay: The moderate to heavy rainfall over Taylor Slough and Florida Bay caused water levels to increase last week. All areas are two to seven inches above average with northern Taylor Slough still being the furthest from average. Compared to a month ago, water levels are lower.

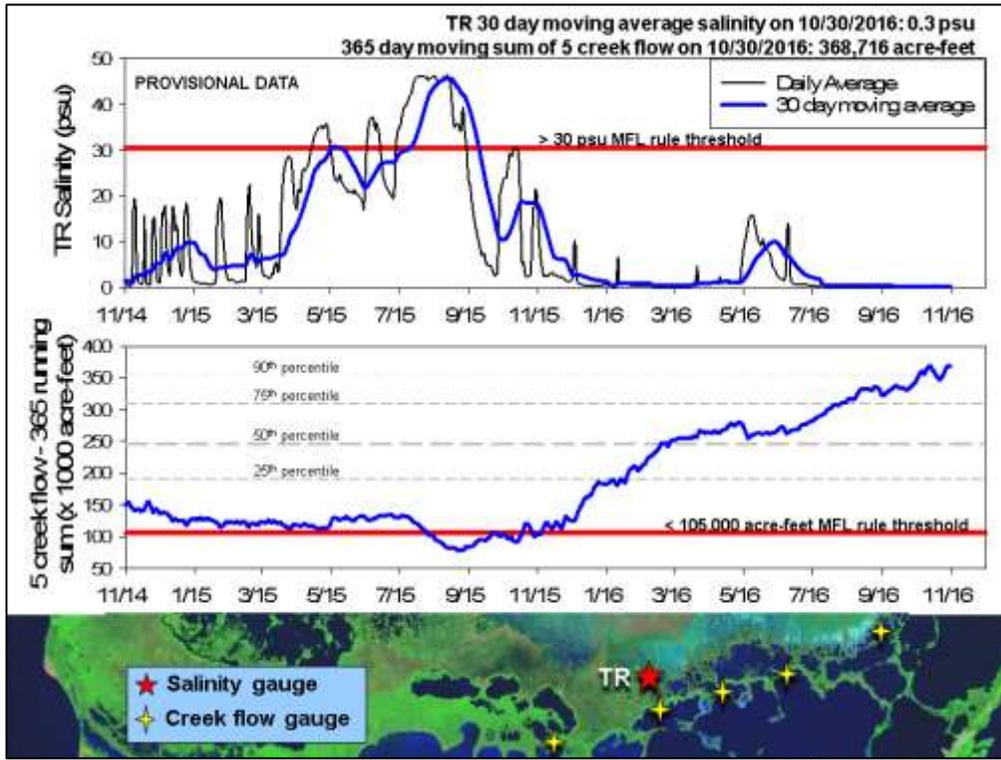
Salinities in Florida Bay mostly decreased with the weekly changes ranging from -4.9 psu in the central nearshore area to $+0.3$ psu in the C-111 embayments. Salinities currently range from 10 psu in northeast Florida Bay to 35 psu in western Florida Bay. These salinities are -1 psu below to 12 psu above the historic averages with the largest difference in the C-111 embayments (LS).





Florida Bay MFL:

The MFL sentinel site TR in the mangrove zone remains near fresh at 0.3 psu, and the 30-day moving average salinity at TR is also at a seasonal 0.3 psu. The 365-day running sum of the cumulative flow from the five creeks feeding Florida Bay increased nearly 19,000 acre-feet last week to 368,716 acre-feet (still above the average of 257,628 acre-feet). Creek flow is provisional data from the USGS and is highly variable.



Water Management Recommendations

- Water levels in southern WCA-3A remain too high. The depth at gauge 65 has increased to 2.82 feet and should be lowered. We recommend that water depths in southern WCA-3A stay below 2.5 feet throughout this wet season to protect tree island forests that were inundated for over 20 weeks in the dry season. This is now the ninth additional consecutive week that water levels have been above 2.5 feet.
- Ascension rates need to remain under 0.25 feet/week to protect habitat and wildlife, including apple snails, prey of the endangered snail kite.

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

Everglades Ecological Recommendations, Nov. 1, 2016 (red is new)				
Area	Current Condition	Cause(s)	Recommendation	Reasons
WCA-1	Stages changed -0.06' to -0.10'	Rainfall, ET, management	Limit ascension rates to a maximum of 0.25 ft/week.	Ascension rates of <0.25'/week will protect habitat and wildlife including reproducing apple snails.
WCA-2A	Stages fell -0.21'	Rainfall, ET, management	Maintain ascension rates <0.25 ft/week. FWC has lifted WCA closures with decreasing water levels.	Ascension rates of <0.25'/week will protect habitat and wildlife including reproducing apple snails, prey for endangered snail kites.
WCA-2B	Stages rose 0.07'	Rainfall, ET, management	Limit ascension rates to extent possible with a maximum of 0.25 ft/week.	Ascension rates of <0.25'/week will protect habitat and wildlife including reproducing apple snails.
WCA-3A NE	Stage fell -0.20'	Rainfall, ET, management	FWC has lifted WCA closures with decreasing water levels.	Closures may eliminate deer hunting and possibly hunting of other species. They will also eliminate access to tree islands in WCAs -3A and 2A. Ascension rates not exceeding 0.25'/week will protect habitat and wildlife including reproducing apple snails.
WCA-3A NW	Stage fell -0.20'	Rainfall, ET, management	Ascension rates should be limited to the extent possible of <0.25 ft/week.	
Central WCA-3A S	Stage fell -0.04'	Rainfall, ET, management	Lower water depth at gauge 65. Slow the ascension rates to the extent possible with a maximum of 0.25 ft/week. When flows are changed a gradual reduction is recommended (stepping down over several days).	Water depths at gauge 65 should remain below 2.5 feet over this upcoming wet season. 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. Ascension rates of <0.25'/week will protect habitat and wildlife including reproducing apple snails.
Southern WCA-3A S	Stage rose 0.06'	Rainfall, ET, management		
WCA-3B	Stages changed -0.04' to +0.23'	Rainfall, ET, management	Limit ascension rates to extent possible with a maximum of 0.25 ft/week.	Ascension rates of <0.25'/week will protect habitat and wildlife including reproducing apple snails.
ENP-SRS	Stage rose 0.12'	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 are open	Rainfall, ET, management	Follow rainfall plan for releases. Decreases in flow should be gradual through S333 and the S-12 structures when they occur (stepping down over several days). Follow guidance in C-111 Western Spreader Canal Project operations manual.	Future operations need to continue to provide appropriate hydrological and habitat conditions for breeding in subpopulation A.
Taylor Slough	2 to 7 inches above average	Rain, ET, inflows	Move water southward as possible	Provide freshwater buffer for ecosystems and maintain low salinity conditions downstream
FB- Salinity	-1 psu below to 12 psu above average	Rain, ET, inflows, wind	Move water southward as possible	Maintain low salinity conditions and prevent early salinity increases.