

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:** December 1, 2015

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

### Summary

#### Kissimmee

On Sunday, stages in East Lake Toho and Toho were both ~0.6 below schedule; Kissimmee-Cypress-Hatchineha (KCH) was 2.3 feet below schedule. With stage in KCH below 50.5 feet, S65 has been reduced to minimum discharge to the Kissimmee River (~300 cfs +/- 50 cfs); if KCH stage rises above 50.5 feet, discharge will be managed according the dry season standing recommendation. Over the past week, discharge averaged 267 cfs at S65, 272 cfs at S65A, and 1026 cfs at S65E. Tuesday morning discharges: S65 ~320 cfs; S65A ~260 cfs; S65C ~520 cfs; S65E ~600 cfs. Dissolved oxygen in the Kissimmee River averaged 6.51 mg/L over the past week and 6.93 mg/L on Sunday. Kissimmee River mean floodplain depth is currently 0.52 feet.

#### Lake Okeechobee

A slow recession in Lake stage recommenced over the past week. Lake stage is at 14.48 feet NGVD, and is in the Low Flow Sub-band. Ecological conditions continue to be good. Algal concentrations cannot be evaluated since no MODIS images were available this past week.

#### Estuaries

Over the past week, total freshwater inflow averaged 766 cfs to the St. Lucie with no releases from Lake Okeechobee and 1483 cfs to the Caloosahatchee with 308 cfs Lake releases. In the St. Lucie Estuary, salinity remained in the good range for adult oysters in the mid-estuary. In the Caloosahatchee Estuary, salinity conditions were in the good range for adult oysters at Cape Coral, Shell Point, and Sanibel. Salinities were also in the good range for tape grass in the upper Caloosahatchee Estuary. Releases under LORS guidance will help maintain salinities in the healthy ranges for adult oysters and submerged aquatic vegetation in both estuaries.

#### Everglades

With sparse rainfall, basin-wide stages decreased in the Everglades. Water levels are mixed relative to a month ago and two months ago. The 30-day salinity at the Florida Bay Minimum Flows and Levels (MFL) site has decreased to 5.3 psu and the cumulative inflow from the five creeks into Florida Bay has increased to 126,500 acre-feet (49% of the average annual inflow of 257,800 acre-feet). Salinity in Florida Bay has been relatively stable over the last three weeks. Much more rainfall and inflow are required to approach seasonally normal conditions in Florida Bay and Everglades National Park.

### Weather Conditions and Forecast

High pressure will dominate for one last day before we transition into a stormy period as a strong and complex trough moves through the southeastern U.S. The initial surge of deeper moisture could combine with some exiting energy to bring some showers/storms over southeastern sections of the District as

early as predawn Thursday. However, the main onslaught of showers/storms should be Thursday evening through Friday afternoon. Moisture and energy will both be quite impressive with heaviest rainfall expected southwest through east of the Lake. Activity should diminish through Friday afternoon, then very strong northeast winds are expected Friday night and Saturday before the potential for move heavy rains returns early next week.

## **KISSIMMEE BASIN**

### **Kissimmee Basin Rainfall**

The Upper Kissimmee Basin received 0.08 inches of rainfall in the past week and the Lower Basin received 0.10 inches (SFWM Daily Rainfall Report 12/1/2015).

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

Report Date: 12/1/2015							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)	11/29/15	11/22/15	11/15/15	11/8/15	11/1/15	10/25/15	10/18/15
Lakes Hart and Mary Jane	S62	30	LKMJ	60.6	R	61.0	-0.4	-0.4	-0.6	-0.5	-0.6	-0.5	-0.3
Lakes Myrtle, Preston, and Joel	S57	9	S57	61.5	R	62.0	-0.5	-0.5	-0.5	-0.4	-0.5	-0.2	-0.1
Alligator Chain	S60	0	ALLI	63.2	R	64.0	-0.8	-0.8	-0.9	-0.8	-0.8	-0.7	-0.5
Lake Gentry	S63	0	LKGT	61.3	R	61.5	-0.2	-0.2	-0.3	-0.2	-0.3	-0.2	-0.1
East Lake Toho	S59	0	TOHOE	57.4	R	58.0	-0.6	-0.7	-0.9	-0.9	-0.9	-0.7	-0.4
Lake Toho	S61	363	TOHOW	54.4	R	55.0	-0.6	-0.4	-0.6	-0.6	-0.7	-0.6	-0.4
Lakes Kissimmee, Cypress, and Hatchineha	S65	267	LKISSP, KUB011, LKISSB	50.2	R	52.5	-2.3	-2.4	-2.5	-2.4	-2.2	-1.7	-1.1

\* 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.

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

Report Date: 12/1/2015

Metric	Location	Sunday's 1-day average	Weekly Average**									
			11/29/15	11/22/15	11/15/15	11/8/15	11/1/15	10/25/15	10/18/15	10/11/15	10/4/15	9/27/15
Discharge (cfs)	S-65	328	267	402	443	828	1317	1593	1540	1370	1534	2329
Discharge (cfs)	S-65A	264	272	290	325	656	1133	1419	1457	1483	1694	2655
Discharge (cfs)	S-65C	646	749	687	840	1211	1713	1758	2151	2579	3300	4558
Headwater stage (feet NGVD)		33.6	33.9	34.3	34.9	35.4	35.4	35.5	35.4	35.4	35.3	35.3
Discharge (cfs)	S-65D****	852	1016	860	957	1316	1978	1790	2291	2882	3891	5253
Discharge (cfs)	S-65E	813	1026	806	769	1170	1771	1677	2203	2787	3853	5133
DO concentration (mg/L)***	Phase I river channel	6.93	6.51	5.22	3.99	4.32	4.25	4.18	2.50	1.65	0.93	0.74
Mean depth (feet)*	Phase I floodplain	0.52	N/A	0.69	0.59	0.90	1.05	1.17	1.25	1.44	1.64	2.06

\* 1-day spatial average from South Florida Water Depth Assessment Tool (SFWDAT).

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

\*\*\* DO is the average for 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.

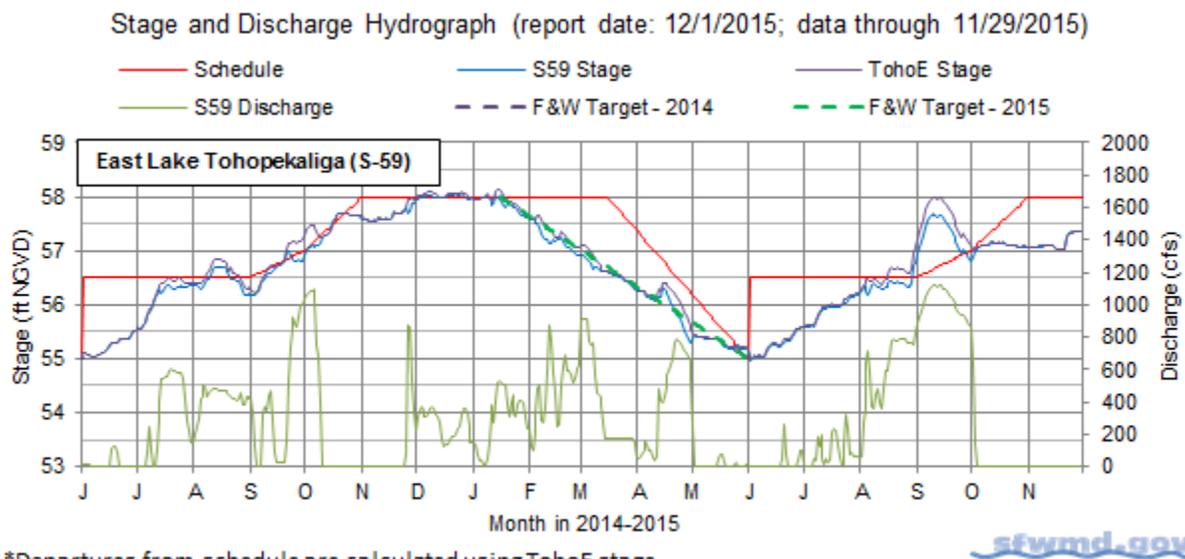
DATA ARE PROVISIONAL

## Water Management Recommendations

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

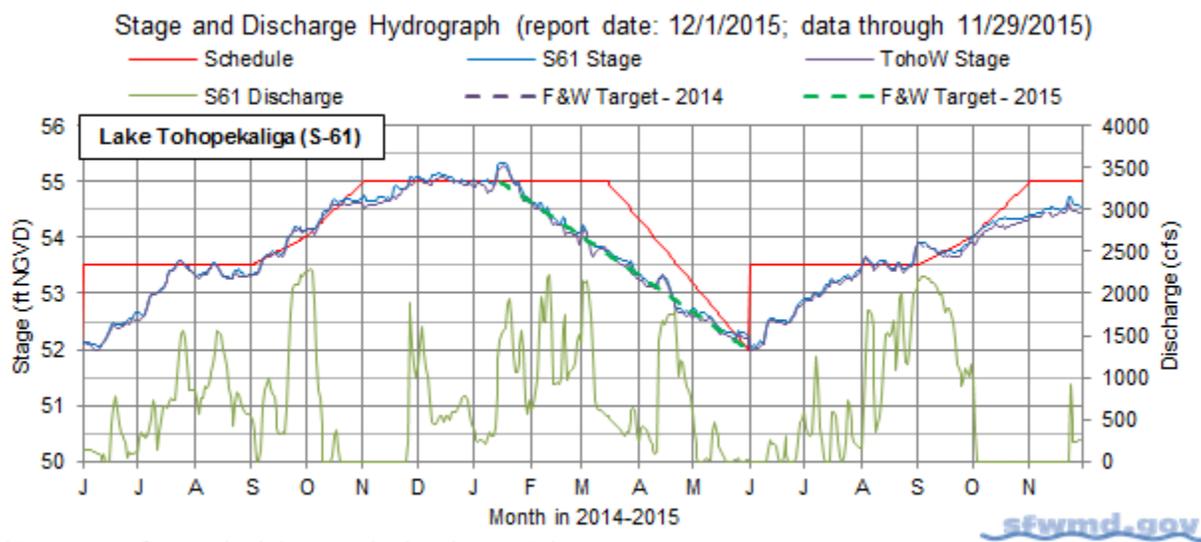
<b>Date</b>	<b>Recommendation</b>	<b>Purpose</b>	<b>Outcome</b>	<b>Source</b>
12/1/2015	No new recommendations.			
11/24/2015	No new recommendations.			
11/17/2015	No new recommendations.			
11/10/2015	No new recommendations.			
11/3/2015	No new recommendations.			
10/27/2015	No new recommendations.			
10/20/2015	No new recommendations.			
10/13/2015	No new recommendations.			
10/6/2015	No new recommendations.			
9/28/2015	No new recommendations.			
9/22/2015	No new recommendations.			
9/15/2015	No new recommendations.			
9/8/2015	No new recommendations.			
9/1/2015	No new recommendations.			
8/25/2015	No new recommendations.			
8/18/2015	No new recommendations.			
8/11/2015	No new recommendations.			
8/4/2015	No new recommendations.			
7/28/2015	No new recommendations.			
7/14/2015	No new recommendations.			
6/30/2015	No new recommendations.			
6/23/2015	No new recommendations.			
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.			

# KCOL Hydrographs (through Sunday midnight)



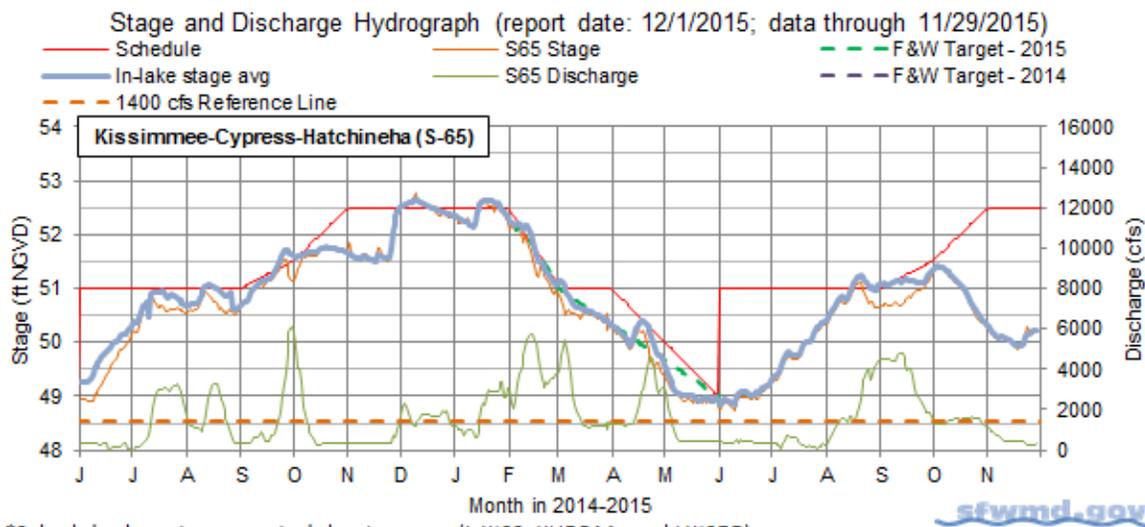
\*Departures from schedule are calculated using TohoE stage.

**Figure 1.**



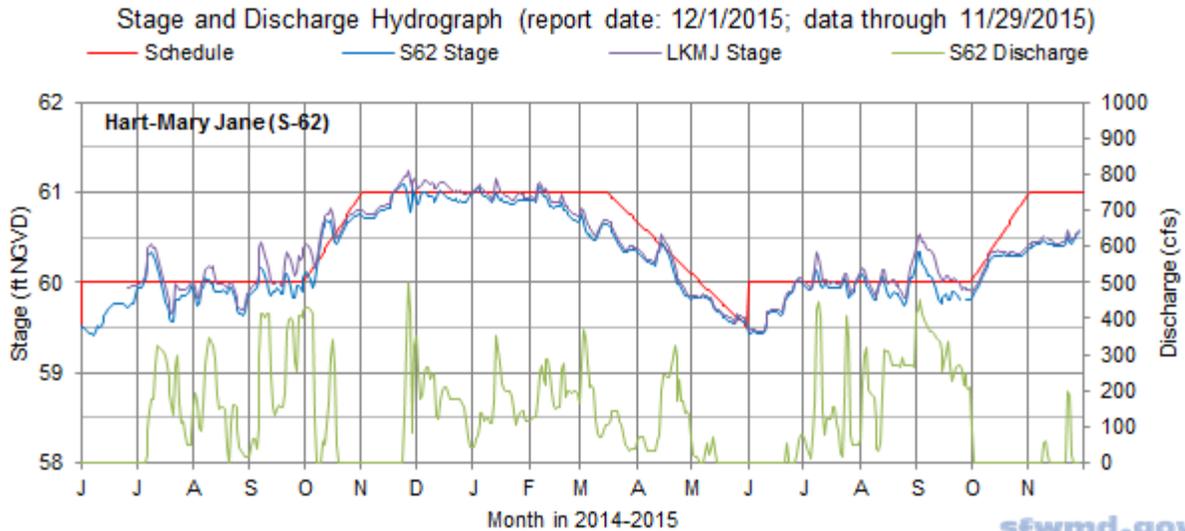
\*Departures from schedule are calculated using TohoW stage.

**Figure 2.**



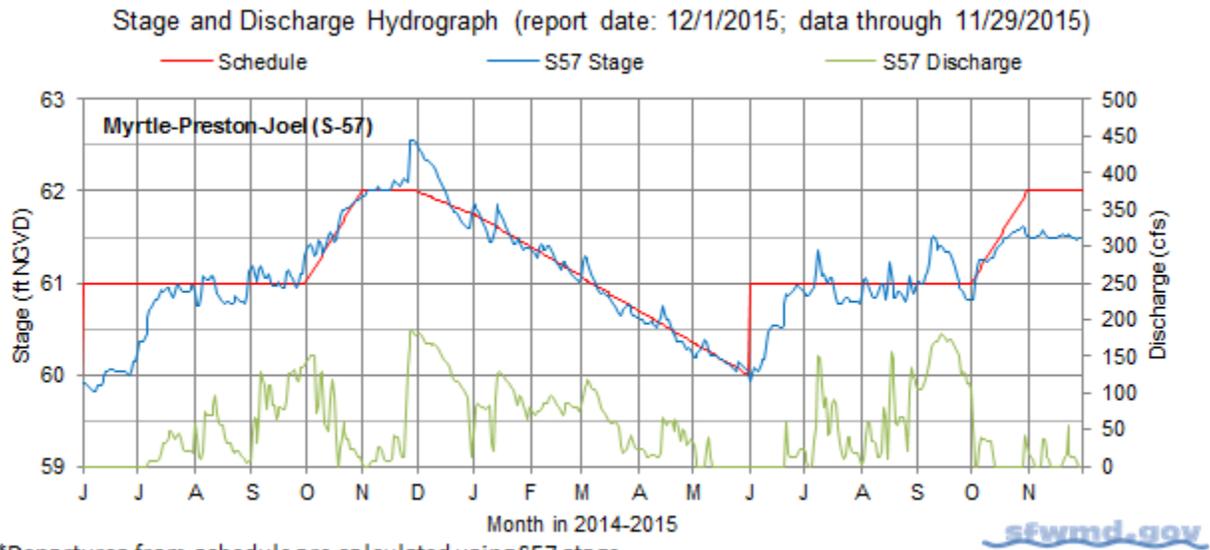
\*Schedule departures use In-lake stage avg (L KISS, KUB011, and LKIS5B).

**Figure 3.**



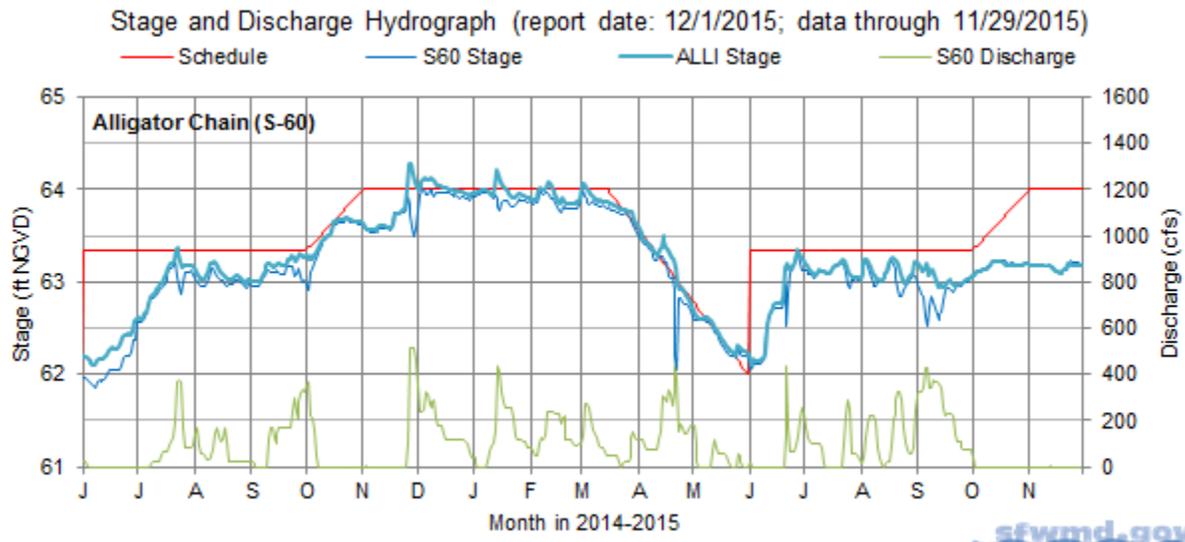
\*Departures from schedule are calculated using LKMJ stage.

**Figure 4.**



\*Departures from schedule are calculated using S57 stage.

**Figure 5.**



\*Departures from schedule are calculated using ALLI stage.

**Figure 6.**

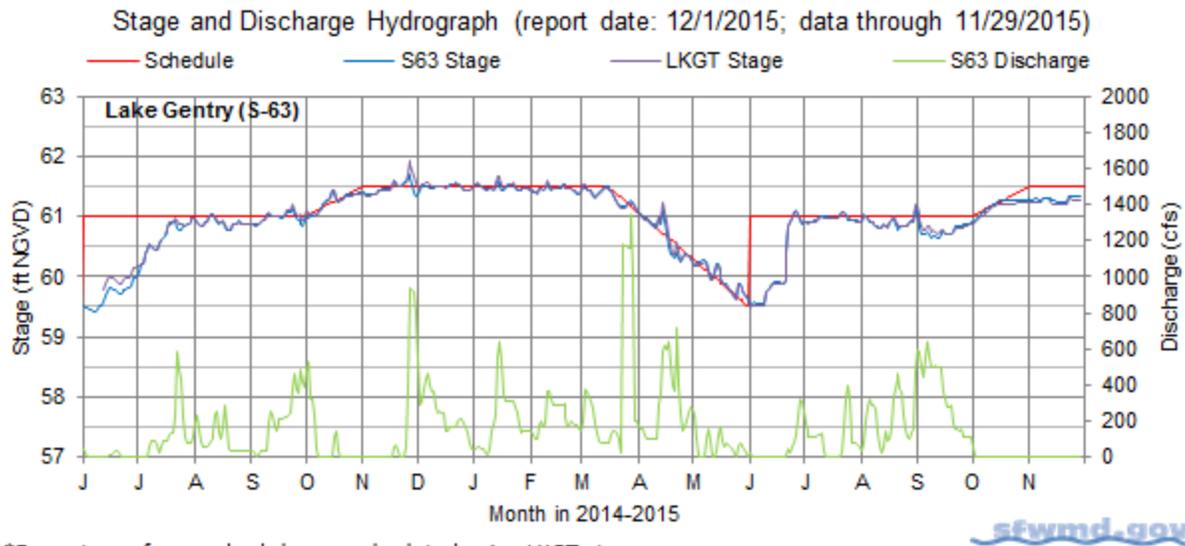


Figure 7.

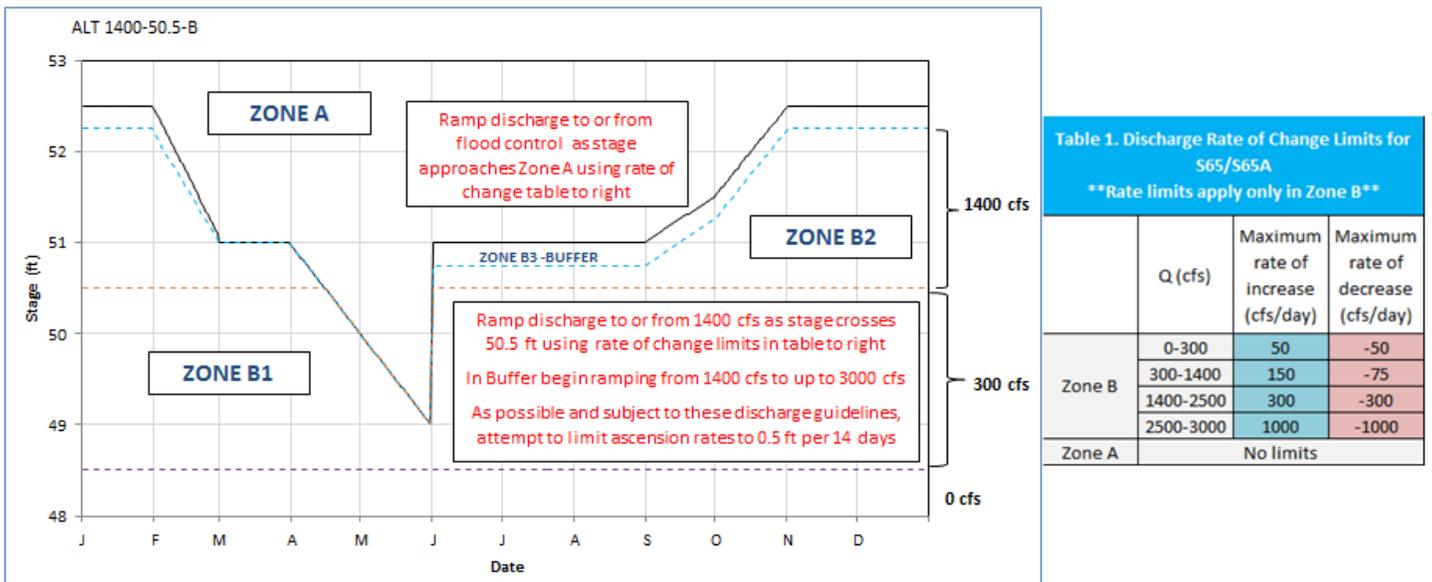
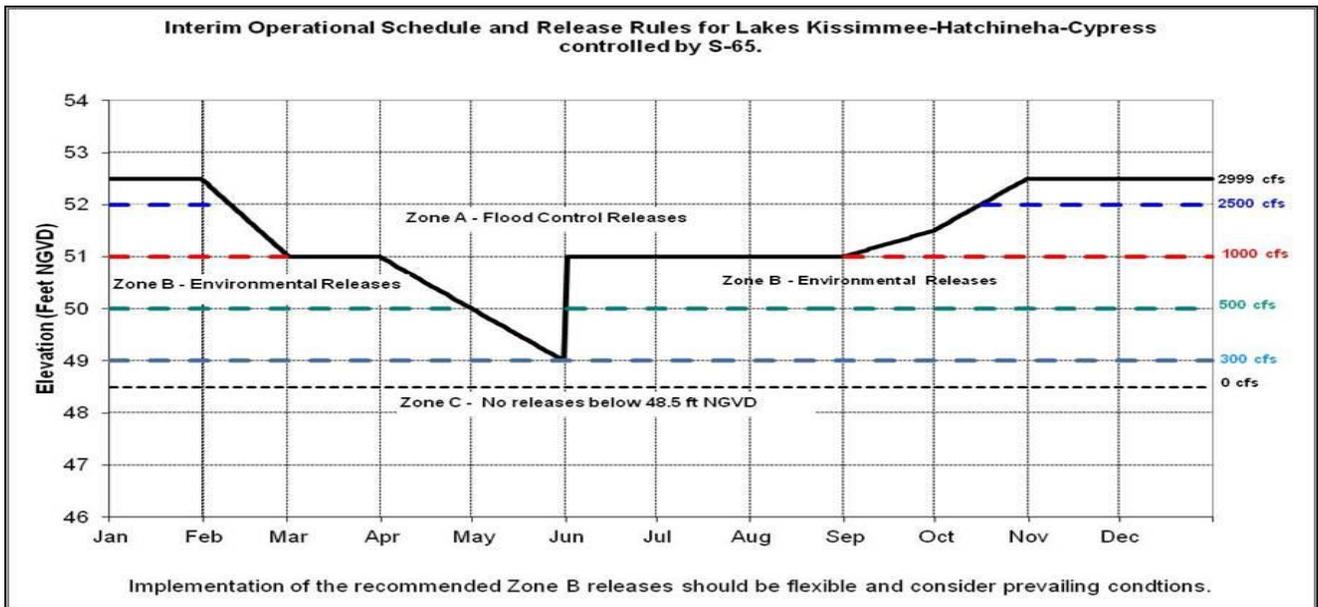
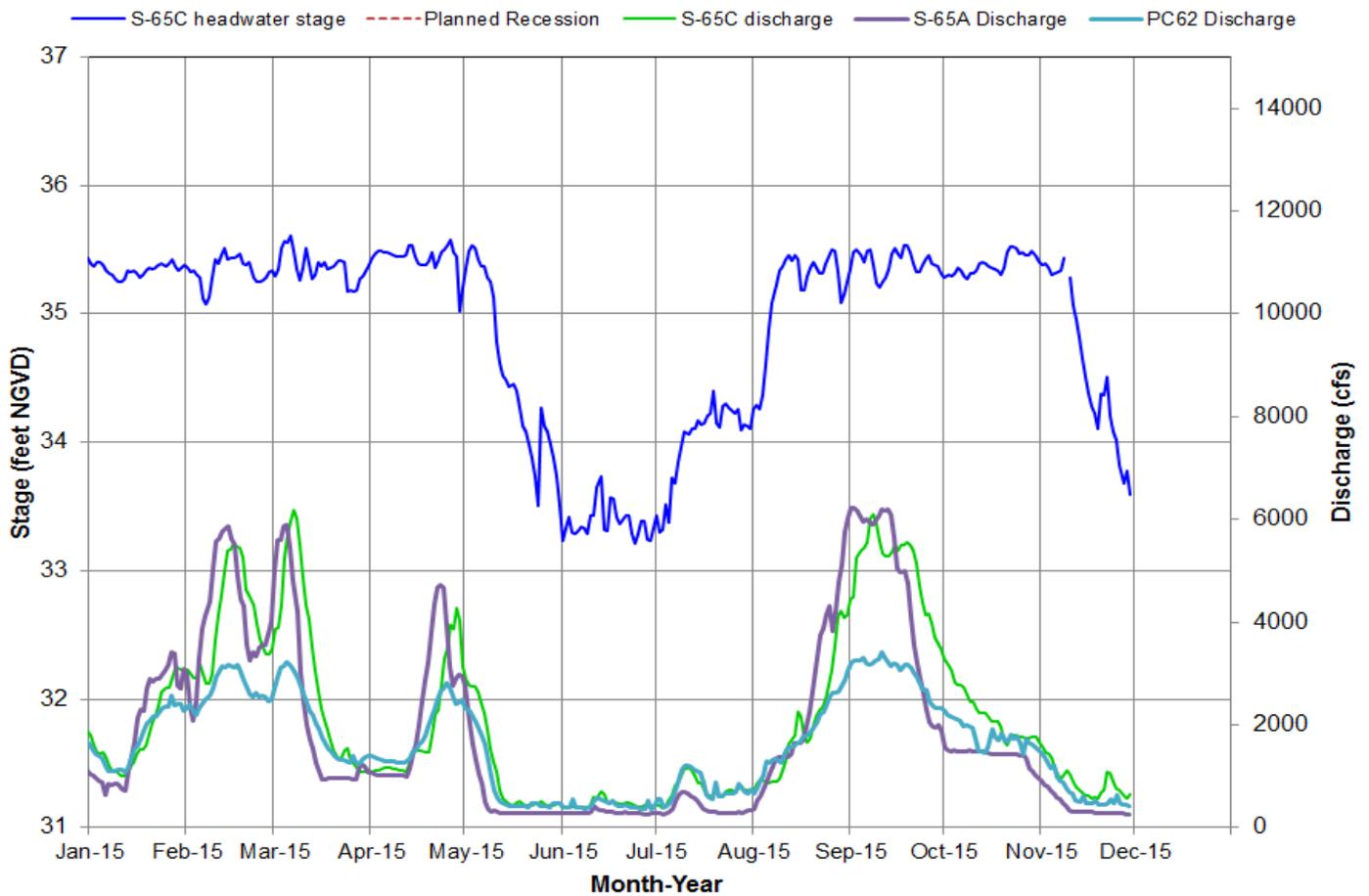


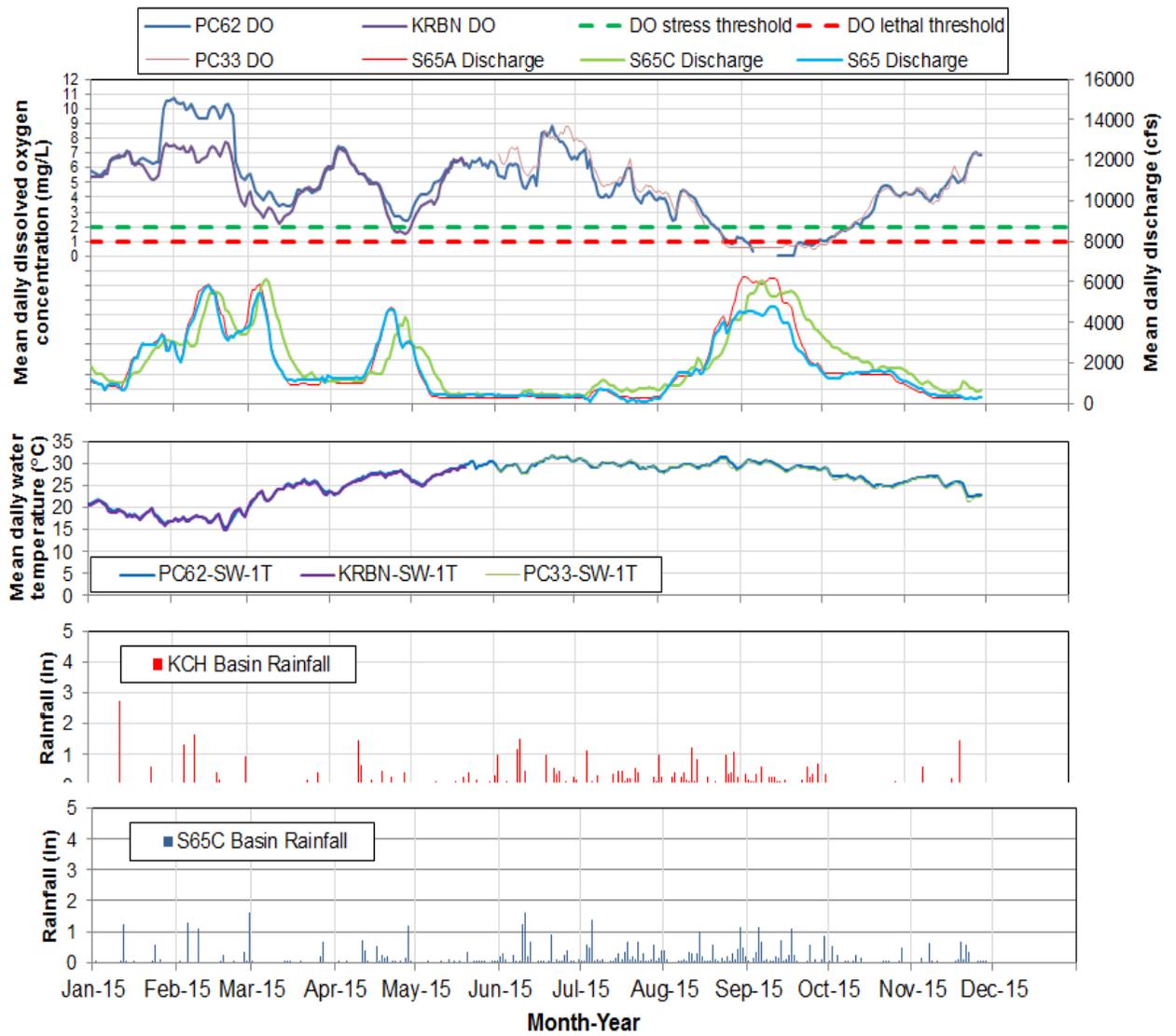
Figure 8a. S65 discharge plan for Wet Season 2015 and November 2015 – January 2016. F&W recession line to begin February 1 2016 (recession rate to be determined).



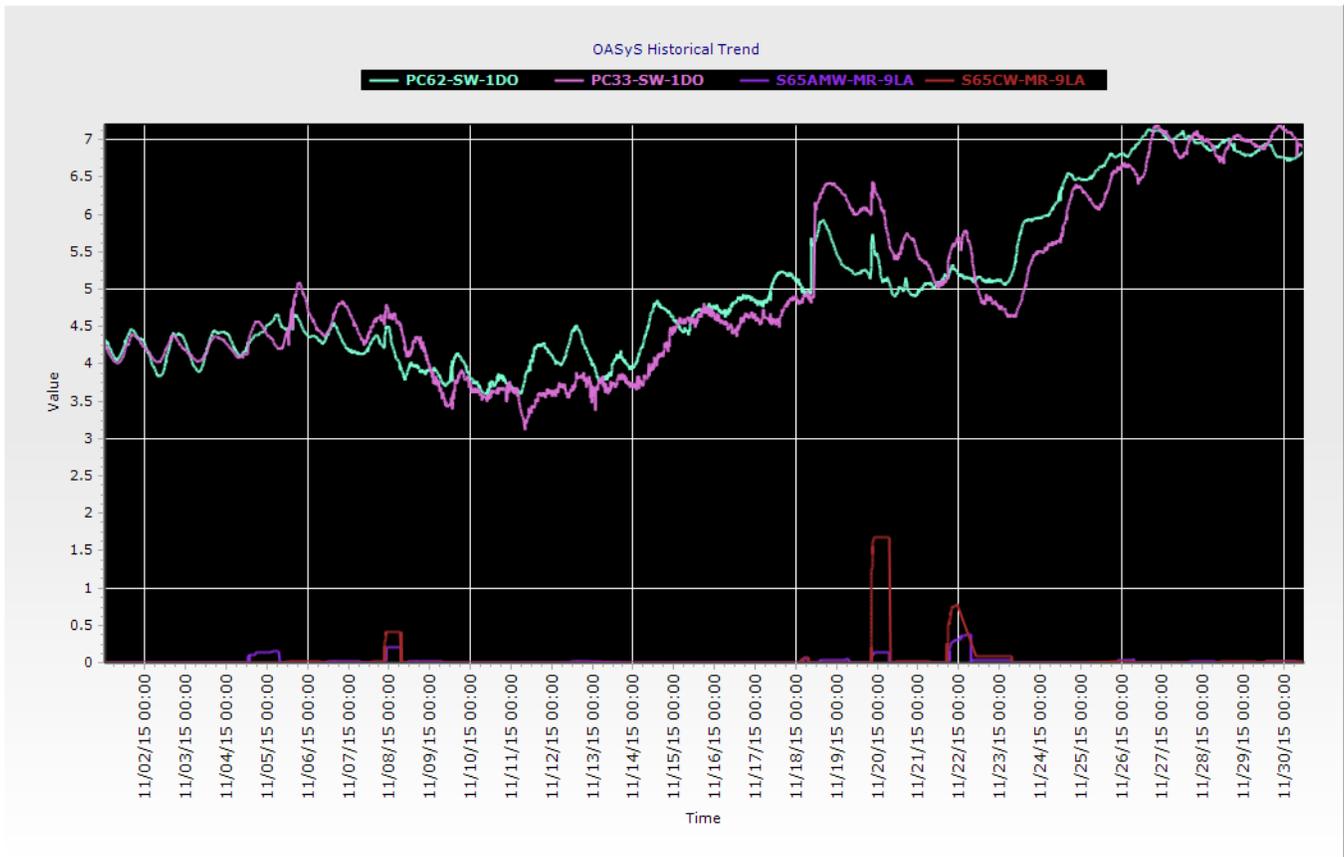
**Figure 8b.** Interim operations schedule for S-65. The discharge schedule shown to the right has not been used in recent years or in Wet Season 2015.



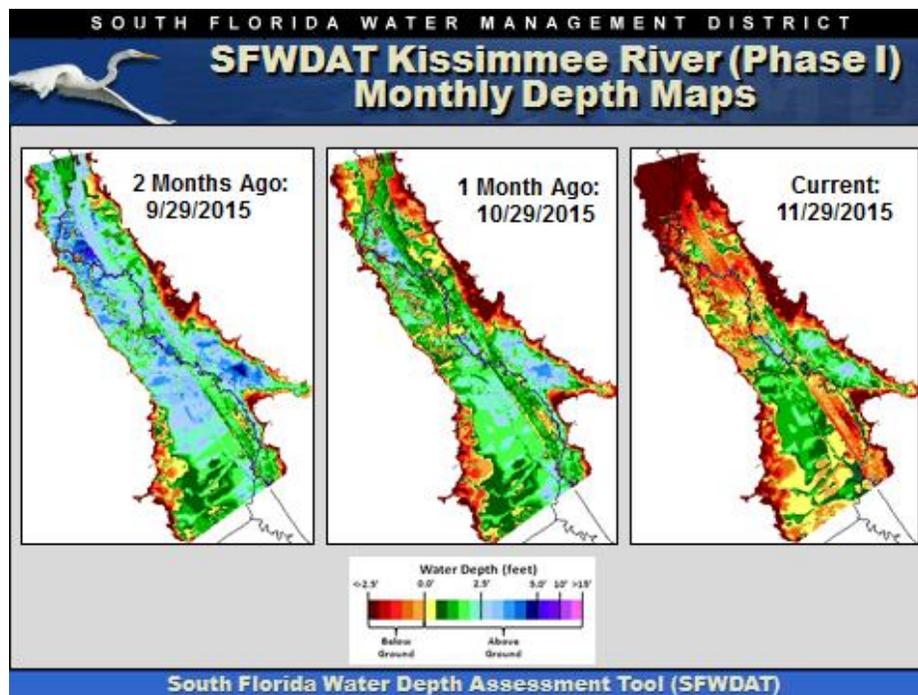
**Figure 9.** S-65C headwater stage in relation to discharge at S-65C, S-65A, and PC62.



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

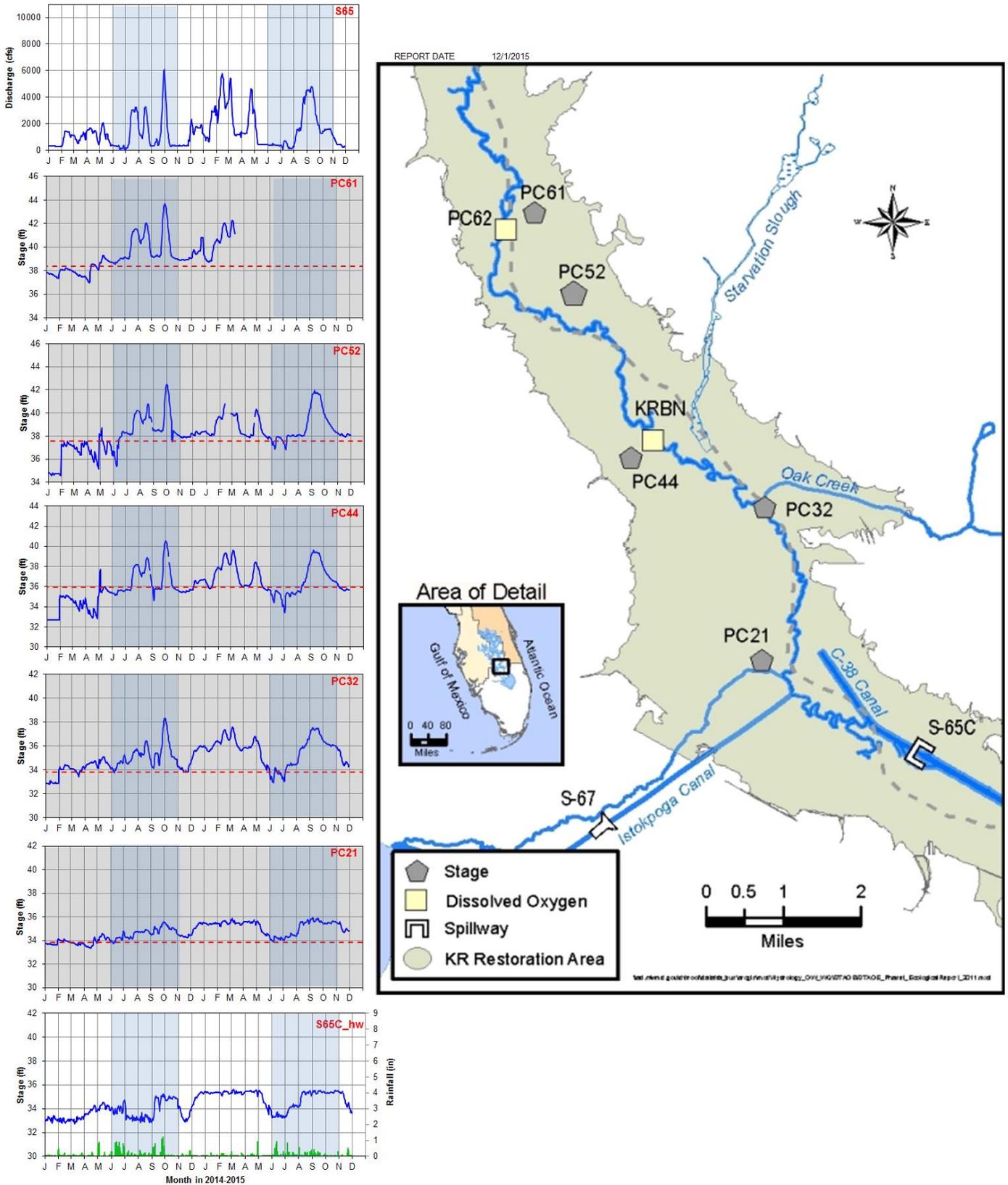


**Insert A.** Phase I river channel Dissolved Oxygen (measured at 15 minute intervals) and rainfall at S65A and S65C.



**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.

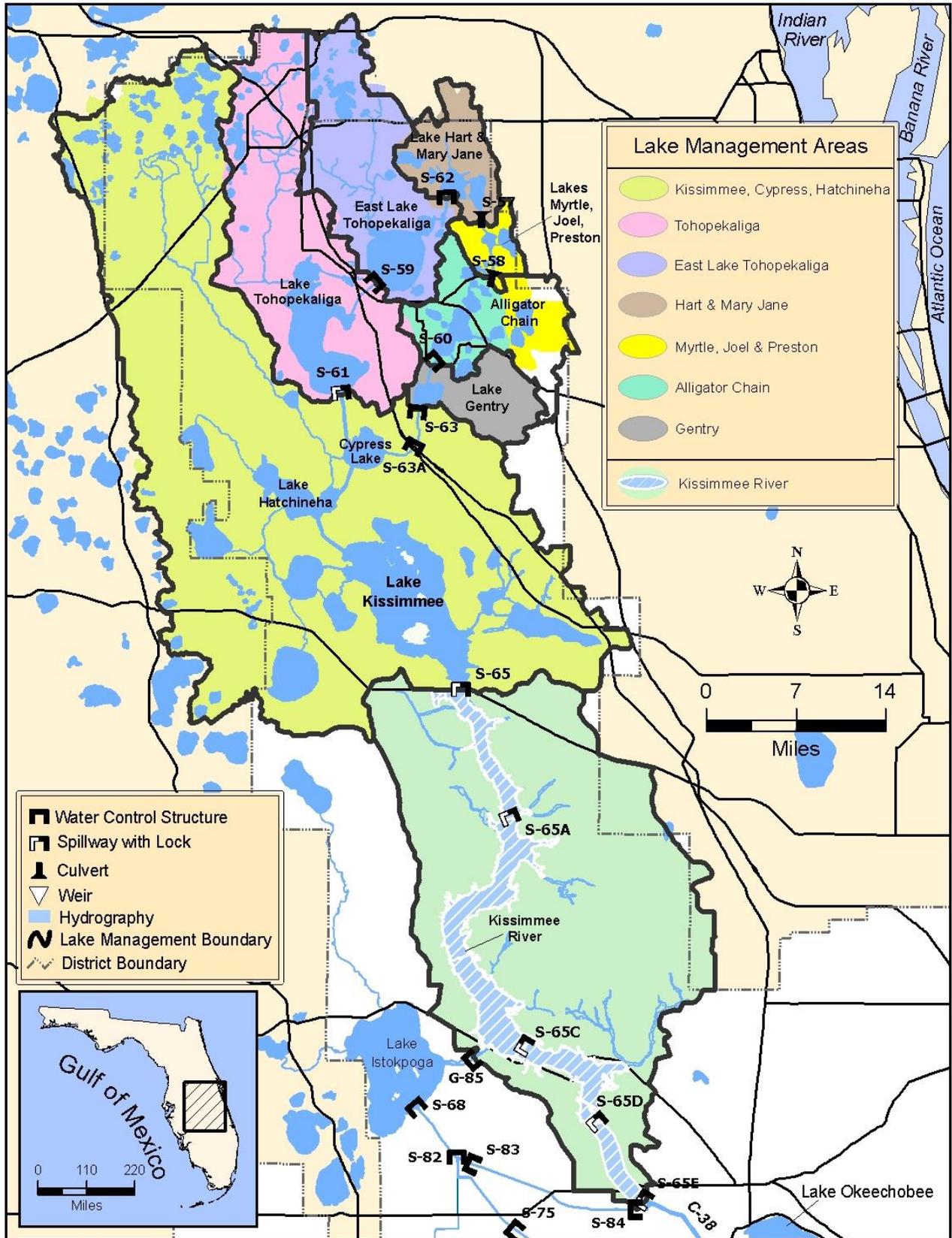


Figure 13. The Kissimmee Basin.

## **LAKE OKEECHOBEE**

According to the USACE web site, Lake Okeechobee stage is at 14.48 feet NGVD for the period ending at midnight on November 30, 2015. Lake stage decreased by 0.03 feet over the past week. The Lake is now 0.08 feet lower than it was a month ago and 1.10 feet lower than it was a year ago (Figure 1). The Lake is in the Low Flow Sub-band and on the upper edge of the Base Flow Sub-band (Figure 2). According to RAINDAR, 0.047 inches of rain fell directly over the Lake during the past seven days. Similar amounts fell in most of the surrounding watershed with slightly greater amounts falling in a few small basins in the far north and in the northeast and east portions of the watershed. (Figure 3).

Based on USACE reported values, current Lake inflow is approximately 2441 cfs, consisting of inflows as indicated below.

<b>Structure</b>	<b>Flow cfs</b>
S65E	964
S154	8
S84 & 84X	729
S71	381
S72	0
C5	0
S191	0
S133 PUMPS	0
S127 PUMPS	0
S129 PUMPS	0
S131 PUMPS	0
S135 PUMPS	0
Fisheating Creek	87
S2 Pumps	0
S3 Pumps	0
S4 Pumps	0

Current Lake outflow is approximately 741 cfs, exiting at S77 (544 cfs) and to the L8 canal through Culvert 10A (197 cfs). Corrected evapotranspiration this past week was equivalent to an outflow of 2000 cfs. Change in elevation equivalents and average weekly flows for major structures are presented in Figure 4.

Based on the Lake Okeechobee wading bird habitat suitability index, there are currently approximately 54,431 acres of suitable foraging habitat on the Lake (Figure 5).

No updated MODIS satellite imagery was available this week.

### **Water Management Recommendations**

A slow recession in Lake stage has recommenced this past week. Any activities which contribute to maintaining the recession would be ecologically beneficial.

Future short-term recommendations will depend in large measure on the near-term rainfall patterns and amounts. The operational goal continues to be to maintain a small but steady decrease in water levels not to exceed 0.3 feet per month (0.07 feet/week) to achieve a Lake stage of approximately 12.5 feet NGVD by the end of the dry season and avoid reversals in Lake stage.

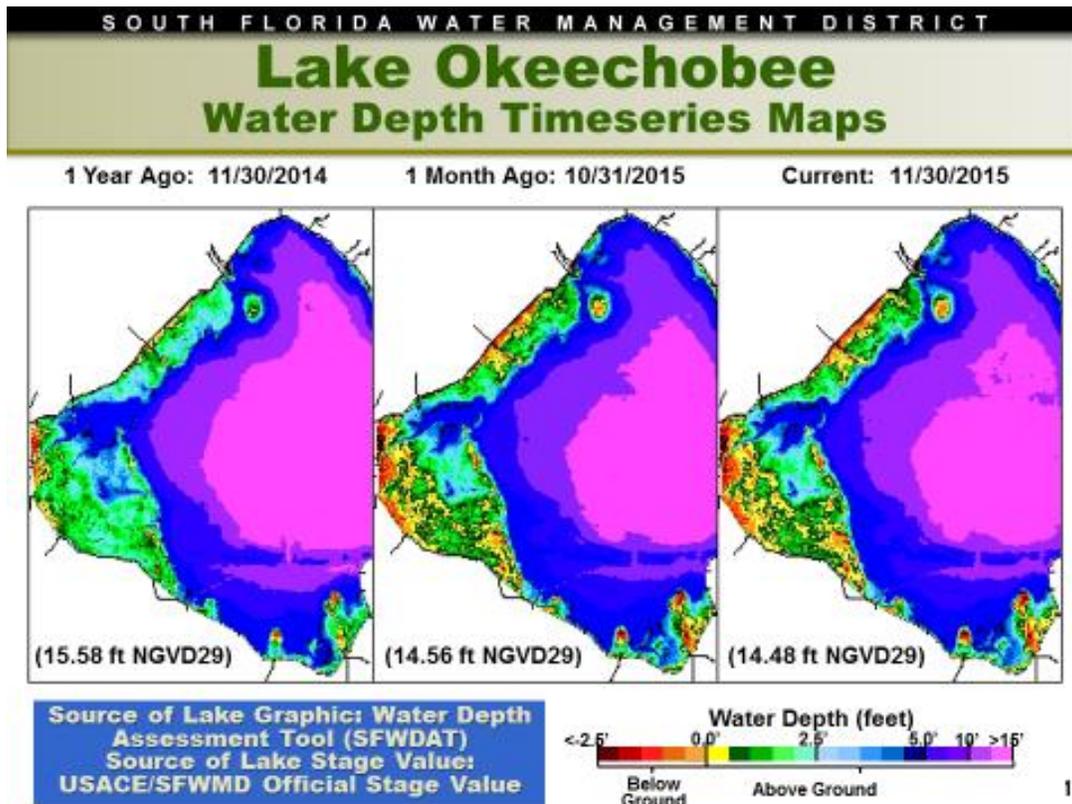


Figure 1

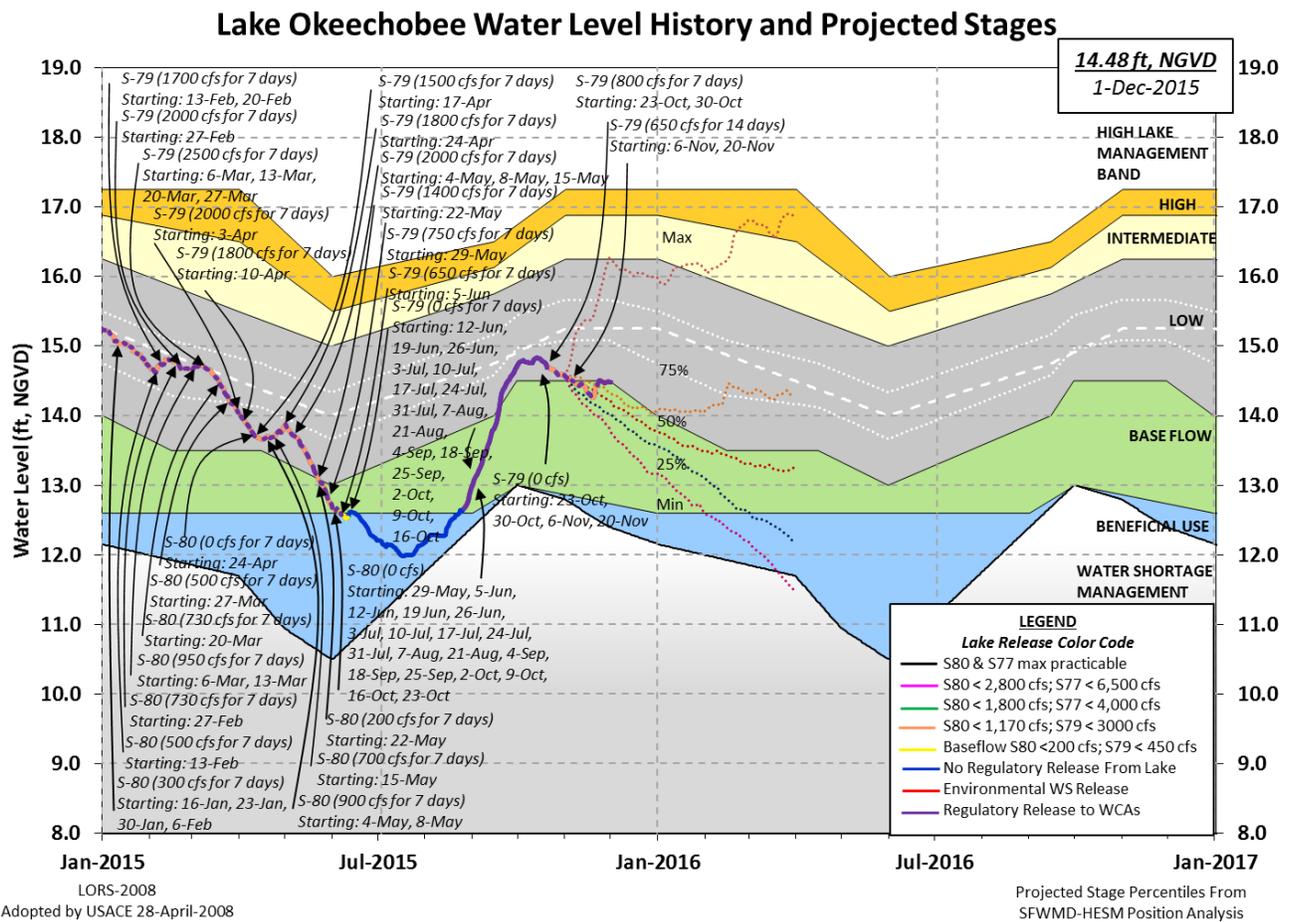
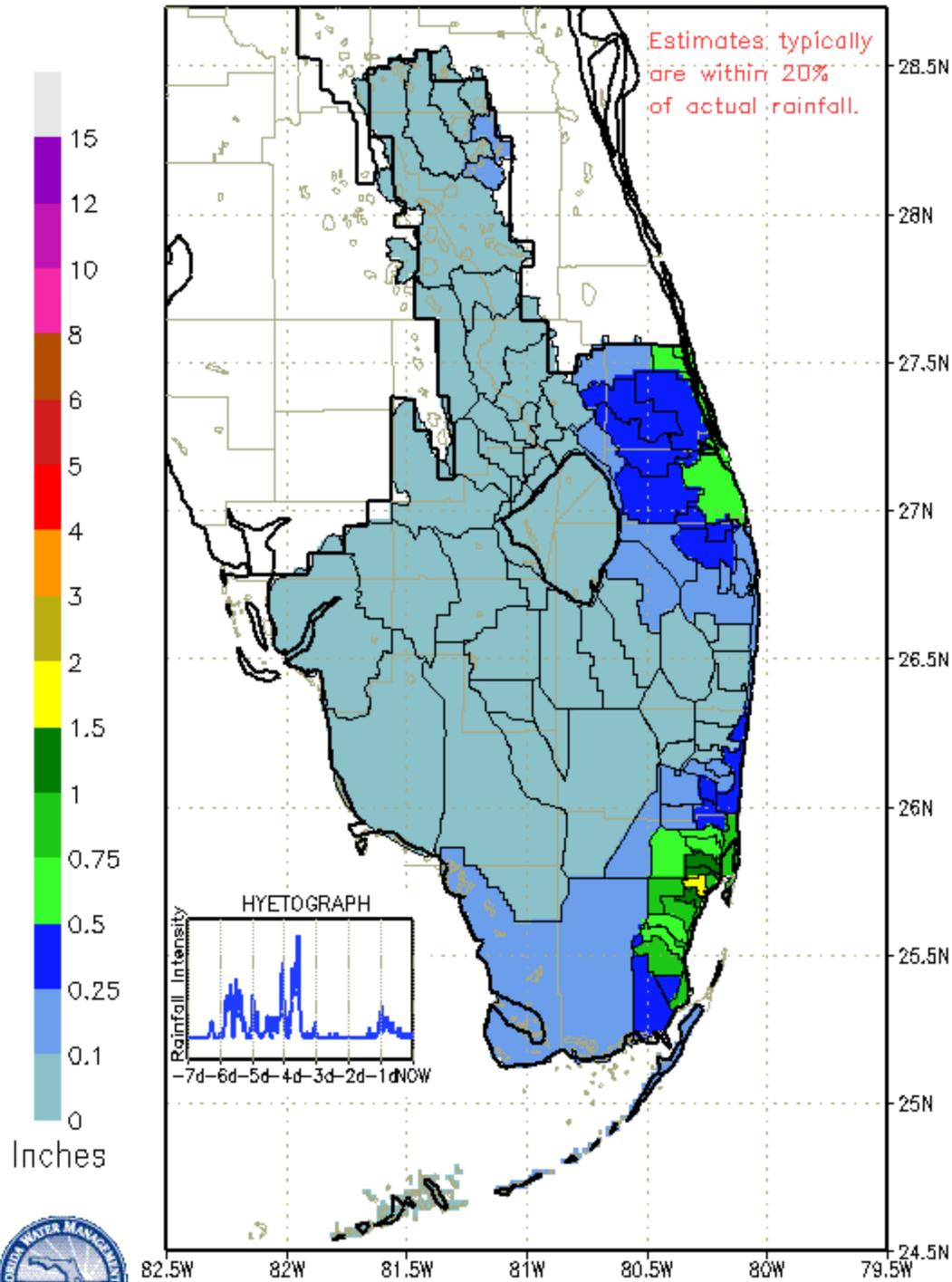


Figure 2

# SFWMD PROVISIONAL RAINFAR 7-DAY BASIN RAINFALL ESTIMATES

FROM: 0615 EST, 11/24/2015 THROUGH: 0615 EST, 12/01/2015



DISTRICT-WIDE RAINFALL ESTIMATE: 0.125"

Figure 3

INFLOWS	Average Daily Flow Past Week cfs	Feet of Change Past Week
S65E	1010	0.034
S71 & 72	413	0.014
S84 & 84X	521	0.018
Fisheating Creek	1411	0.006
Rainfall	N.A.	0.004
OUTFLOWS	Average Daily Flow Past Week cfs	Feet of Change Past Week
S77	403	0.014
S308	0	0.000
S351	0	0.000
S352	0	0.000
S354	0	0.000
L8	244	0.008
ET	2000	0.067

Figure 4

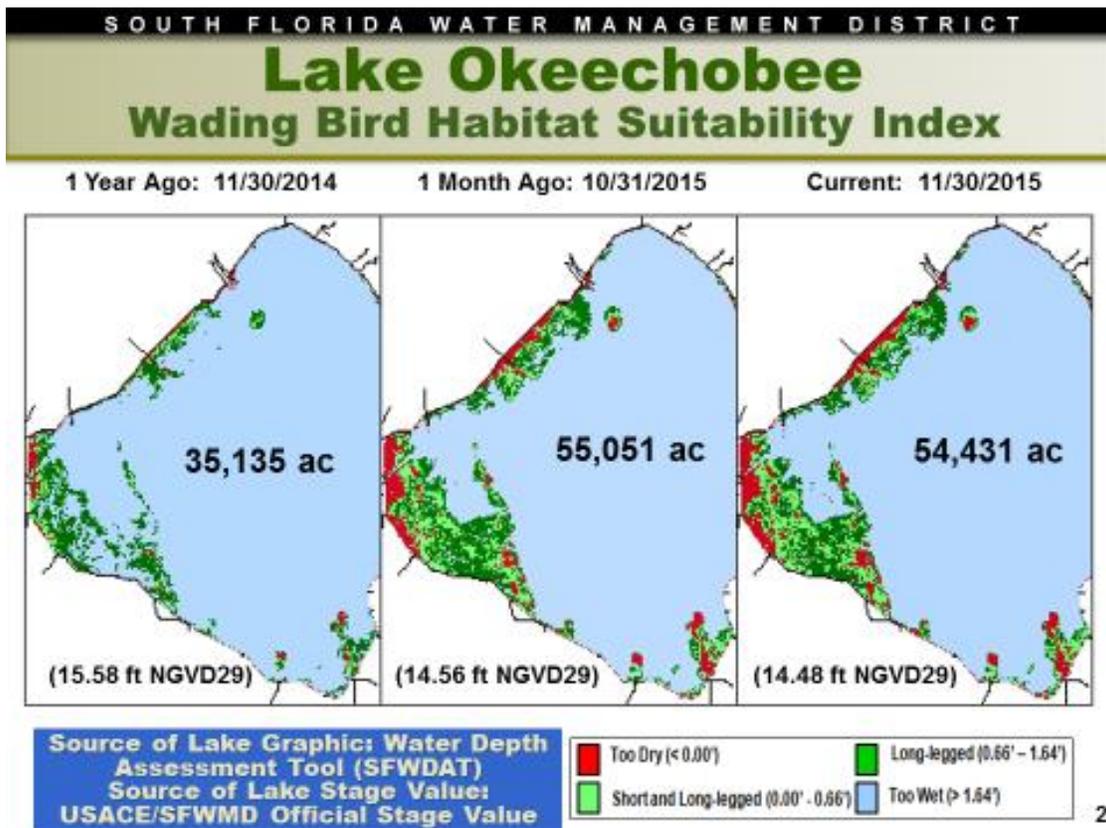


Figure 5

## Lake Istokpoga

Lake Istokpoga stage is 39.30 feet NGVD today and is currently 0.20 feet below its regulation schedule of 39.50 feet NGVD, which remains at peak high pool (Figure 6). Average flows into the Lake from Arbuckle and Josephine creeks were 414 and 100 cfs respectively, a small decrease for Arbuckle and an increase of about twice as much flow for Josephine creek from last week. Average discharge from S68 and S68X this past week was 372 cfs, a decrease of approximately 63% from the preceding week. According to RAINDAR, 0.07 inches of rain fell in the Lake Istokpoga watershed during the past seven days.

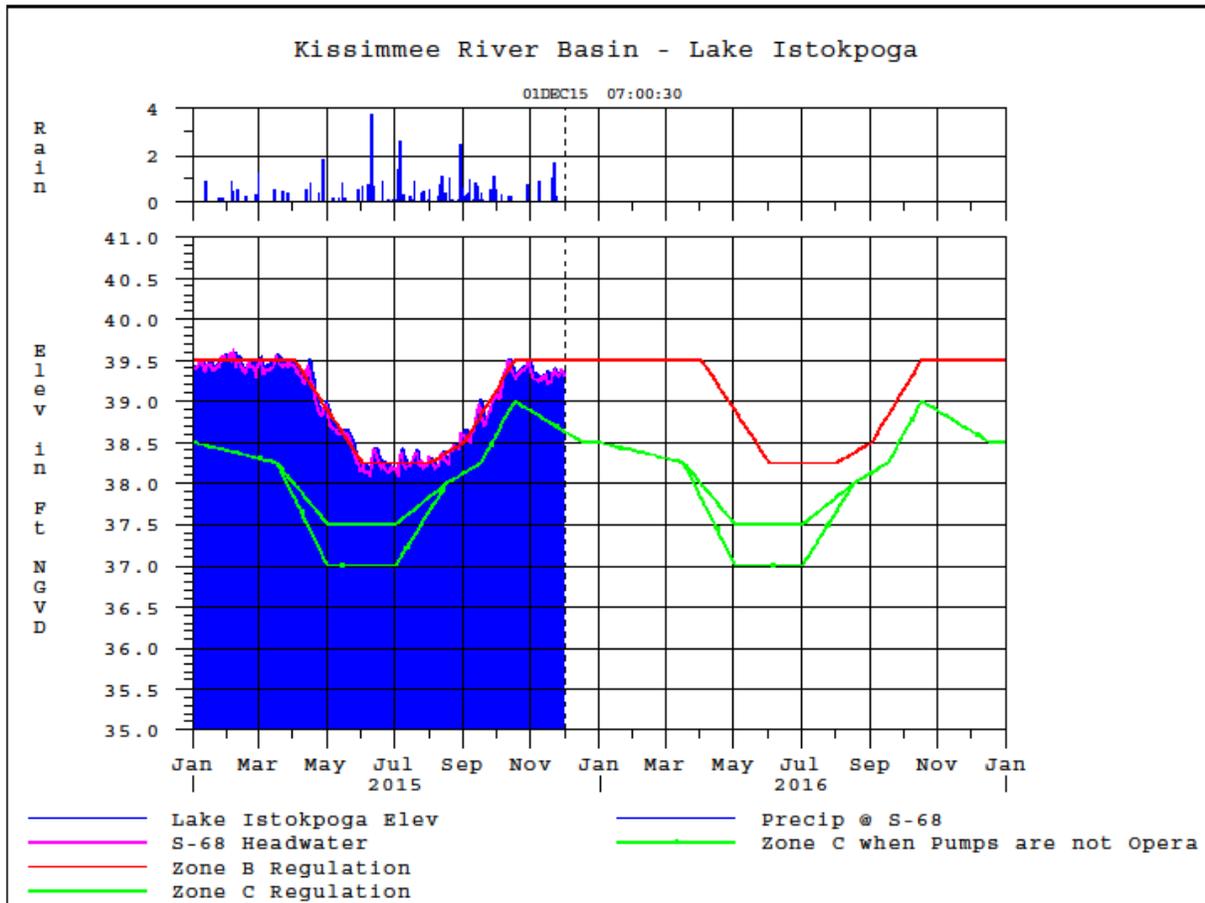


Figure 6

## ESTUARIES

### St. Lucie Estuary

Over the past week, provisional flows averaged 7 cfs at S-80, 0 cfs at S-308, 158 cfs at S-49 on C-24, 131 cfs at S-97 on C-23, and 199 cfs from Ten Mile Creek at the Gordy Road Structure. Average inflow from tidal basin tributaries is estimated to be 271 cfs (Figures 1 and 2). Total inflow averaged about 766 cfs last week and 707 cfs over last month.

Over the past week in the estuary, salinity decreased to just downstream of A1A Bridge where salinity slightly increased (Table 1, Figures 3 and 4). The seven-day moving average salinity of the water column is 14.5 at the US1 Bridge. Salinity conditions in the middle estuary remain 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>9.5</b> (11.6)	<b>12.6</b> (16.2)	NA <sup>1</sup>
US1 Bridge	<b>13.9</b> (16.6)	<b>15.1</b> (18.1)	10.0-26.0
A1A Bridge	<b>25.0</b> (24.8)	<b>28.9</b> (27.8)	NA

<sup>1</sup>Envelope not applicable

### Caloosahatchee Estuary

During the past week, provisional flows averaged approximately 357 cfs at S-77, 379 cfs at S-78, and 808 cfs at S-79. Average inflow from tidal basin tributaries is estimated to be 675 cfs (Figures 5 and 6). Total inflow averaged 1483 cfs last week and 1206 cfs over last month.

Salinity decreased throughout the estuary (Table 2, Figures 7 & 8). The seven-day average salinity values are within the good range for oysters at Cape Coral, Shell Point, and Sanibel (Figure 9). The 30-day moving average surface salinity is 3.5 at Val I-75 and 8.5 at Ft. Myers. Salinity conditions at Val I-75 are in the good range for tape grass. However, if there were no discharges at S-79, daily salinity at Val I-75 would continue to increase, reaching about 5.8 in two weeks, and the 30-day moving average is predicted to rise to 3.8 (Figure 10).

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

Sampling Site	Surface	Bottom	Envelope
S-79 (Franklin Lock)	<b>2.9</b> (3.3)	<b>2.8</b> (3.3)	NA <sup>1</sup>
*Val I75	<b>3.7</b> (3.8*)	<b>5.0</b> (6.4*)	0.0-5.0 <sup>2</sup>
Ft. Myers Yacht Basin	<b>9.0</b> (9.3)	<b>10.6</b> (13.5)	NA
Cape Coral	<b>15.2</b> (15.8)	<b>16.6</b> (18.4)	10.0-30.0
Shell Point	<b>25.4</b> (27.0)	<b>26.2</b> (27.7)	10.0-30.0
Sanibel	<b>29.1</b> (31.4)	<b>29.8</b> (32.0)	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 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)	NA	3.6 – 8.4	1.75 – 5.8
Dissolved Oxygen (mg/l)	NA	7.35 – 8.85	5.4 – 7.0

The Florida Fish and Wildlife Research Institute reported on November 25, 2015, that a bloom of *Karenia brevis*, the Florida red tide organism, was detected in background to low concentrations in eight samples collected in, along and offshore of Lee County.

**Water Management Recommendations**

Lake Okeechobee’s water level is within the Base Flow Sub-band; the tributary hydrological conditions are Normal; and the seasonal and multi-seasonal forecasts are Wet and Wet, respectively. The Lake Okeechobee Regulation Schedule (LORS) recommends discharges to the Caloosahatchee of up to 450 cfs at S-79 and to the St. Lucie of up to 200 cfs at S-80. The Lake Okeechobee Adaptive Protocols (LOAP) recommends no releases to the Caloosahatchee.

Currently, the USACE is implementing a 14-day release consisting of two seven-day pulses averaging 650 cfs at S-79 and 0 cfs at S-80. Such releases, while helping maintain salinity conditions favorable for submerged aquatic vegetation and oysters in the estuaries, should be conducted in a pulse pattern to mitigate potential stratification and phytoplankton accumulation in the water column (Table 4).

Table 4. Schedules for seven-day pulse releases at S-80 and S-79

7-day pulses at S-80								
Day	200 cfs	300 cfs	400 cfs	500 cfs	650 cfs	800 cfs	950 cfs	1170 cfs
1	200	300	400	500	650	800	950	1290
2	600	700	800	900	1100	1200	1400	1800
3	300	500	650	800	900	1100	1200	1500
4	200	300	450	600	800	900	1100	1300
5	100	200	300	400	600	700	900	1000
6	0	100	200	300	400	600	700	800
7	0	0	0	0	100	300	400	500
7-day pulses at S-79								
Day	450 cfs	650 cfs	1000 cfs	1200 cfs	1500 cfs	2000 cfs	2600 cfs	3000 cfs
1	850	1150	1500	1700	2000	2500	3100	3500
2	1000	1400	1900	2100	2400	3100	3900	4300
3	700	900	1600	1800	2100	2600	3400	3800
4	300	600	900	1100	1400	1900	2500	2900
5	200	400	700	900	1200	1700	2300	2700
6	100	100	400	600	900	1400	2000	2400
7	0	0	0	200	500	800	1000	1400

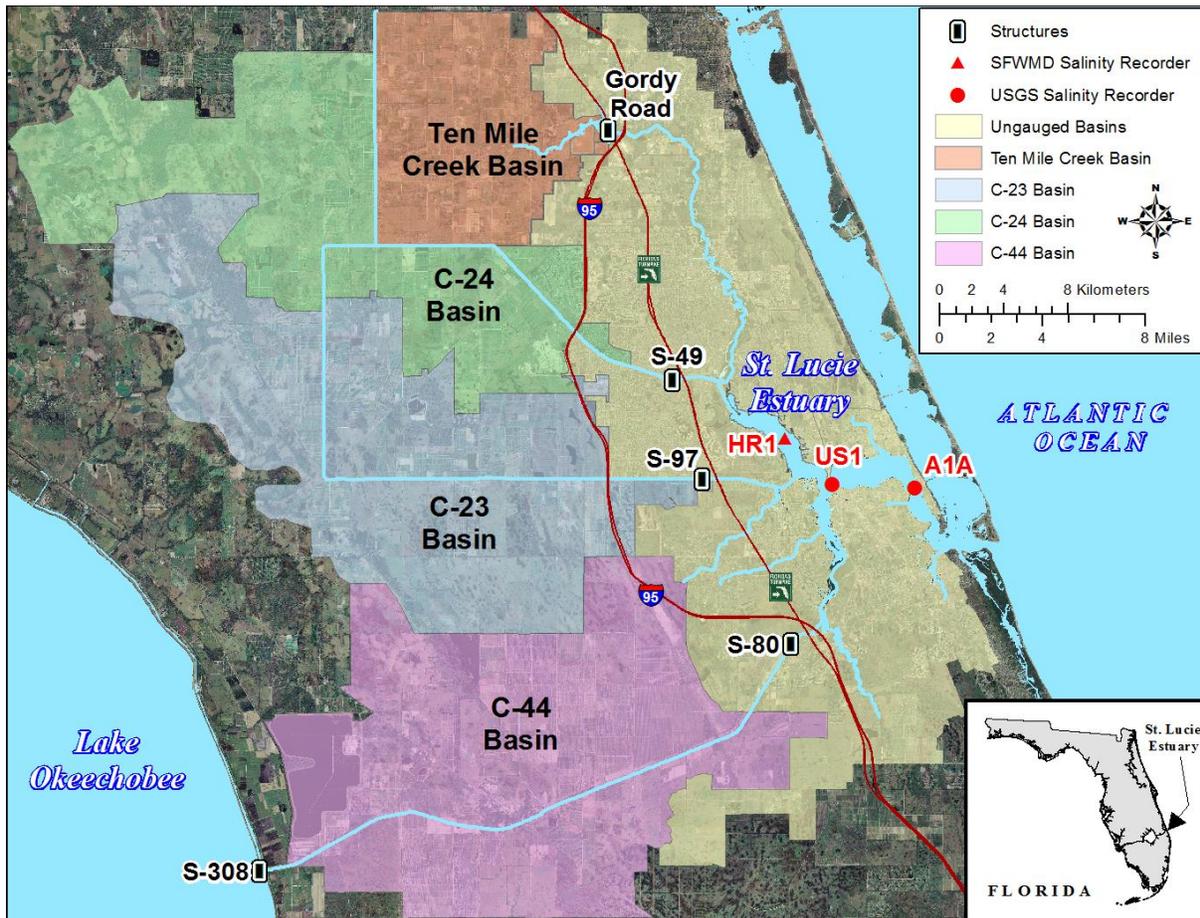


Figure 1. Basins, water control structures, and salinity monitoring for the St. Lucie Estuary.

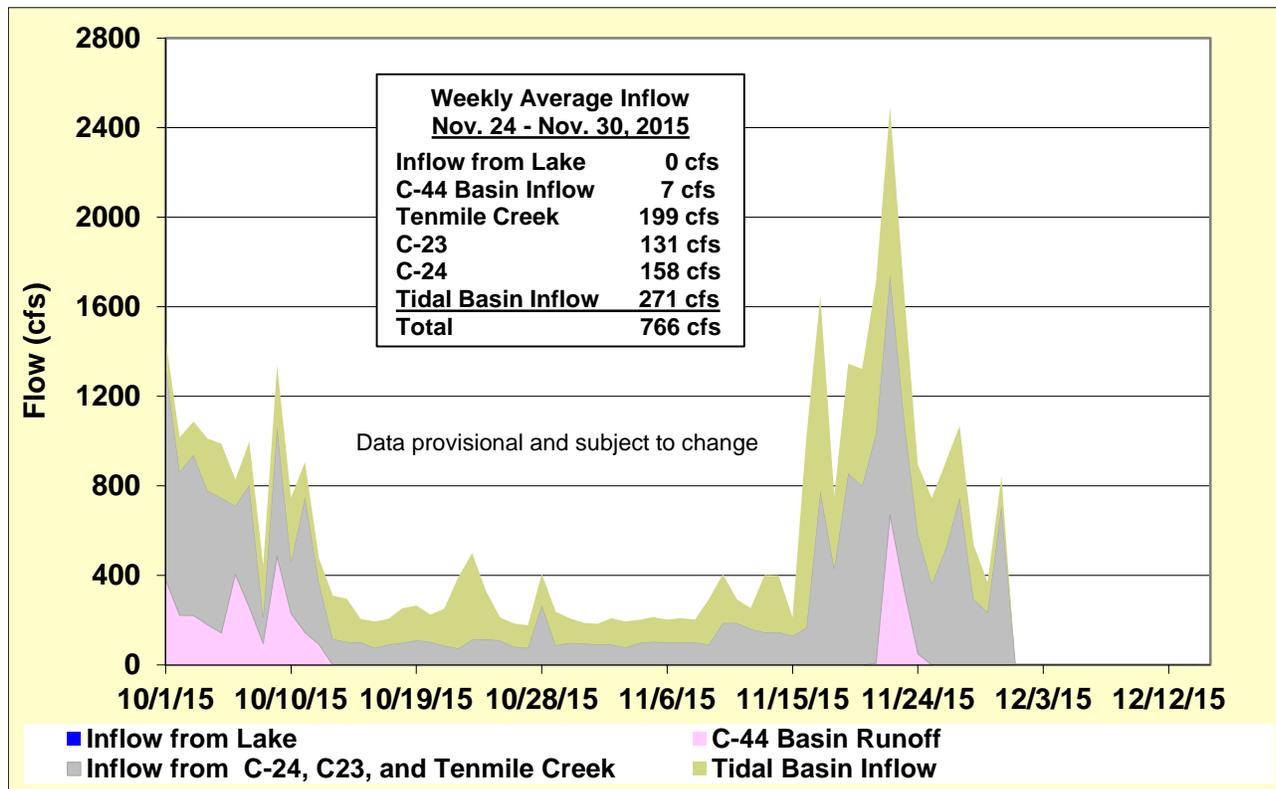


Figure 2. Estimated surface freshwater inflows from Lake Okeechobee and runoff from the C-44, C-23, C-24, Ten Mile Creek, and tidal basins into the St. Lucie Estuary.

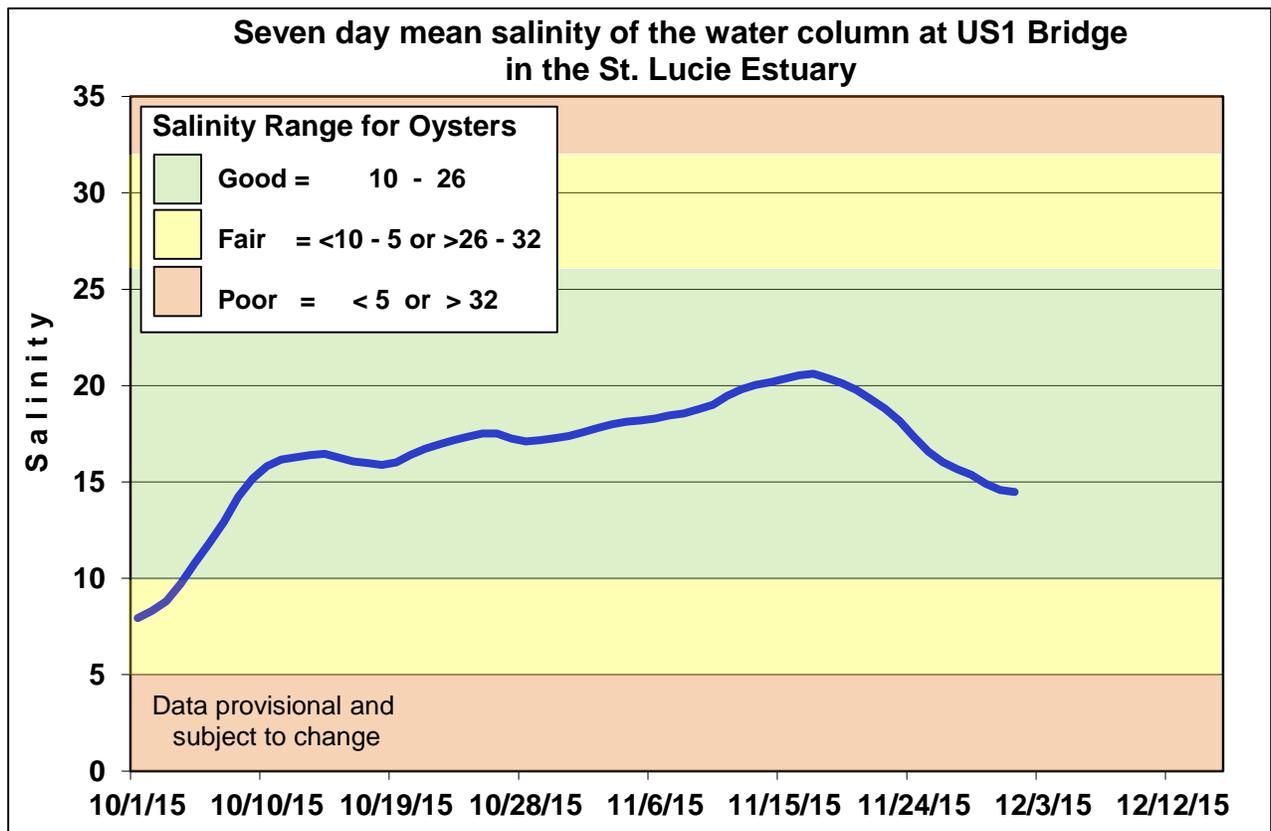


Figure 3. Seven-day mean salinity of the water column at the U.S. Highway 1 Bridge.

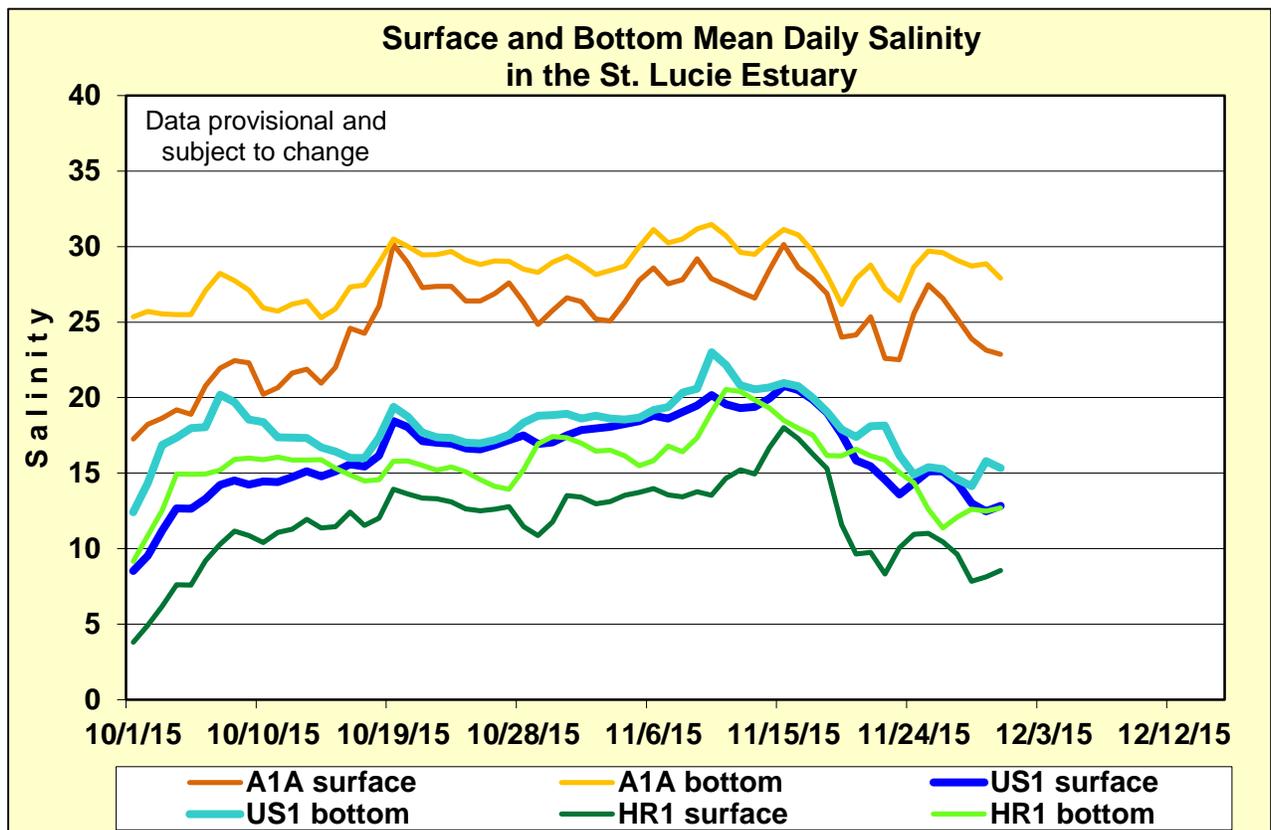


Figure 4. Daily mean salinity at the A1A, US1 and estimated HR1 stations.

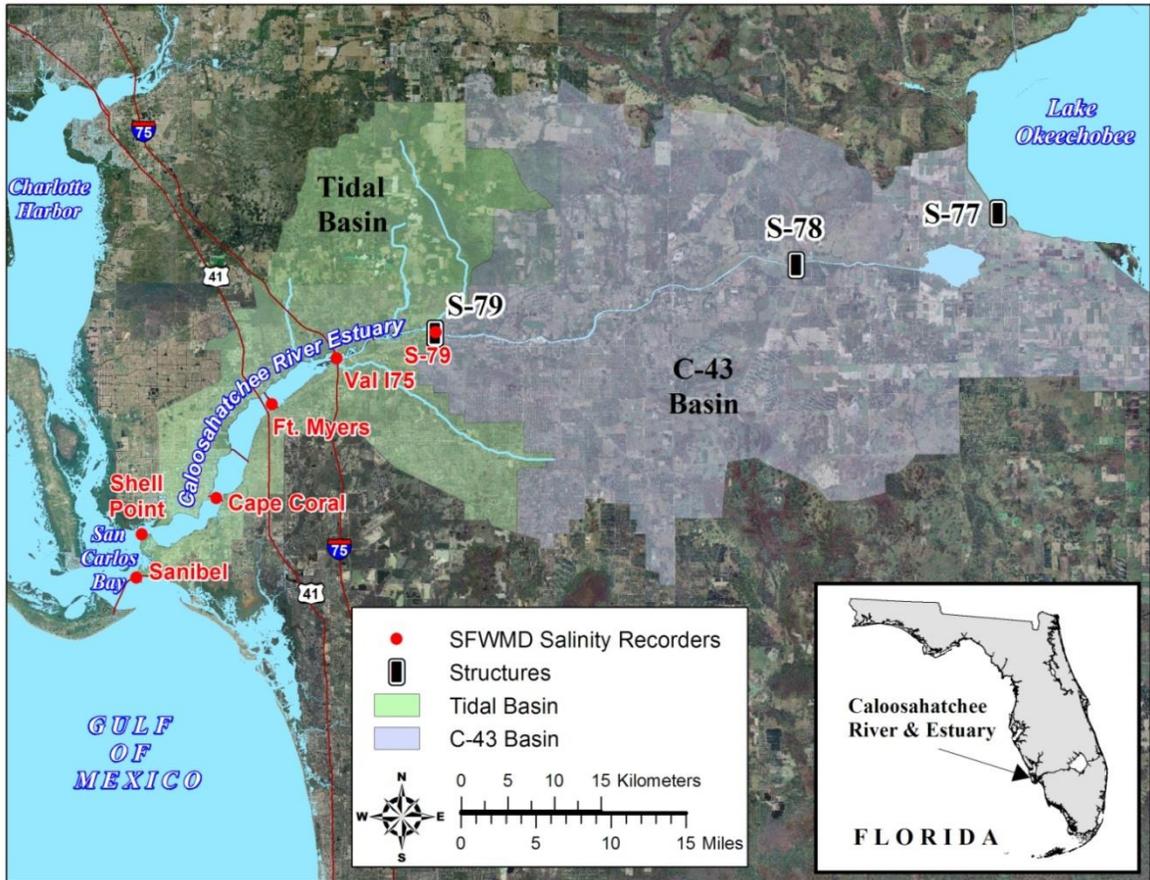


Figure 5. Basins, water control structures, and salinity monitoring for the Caloosahatchee Estuary.

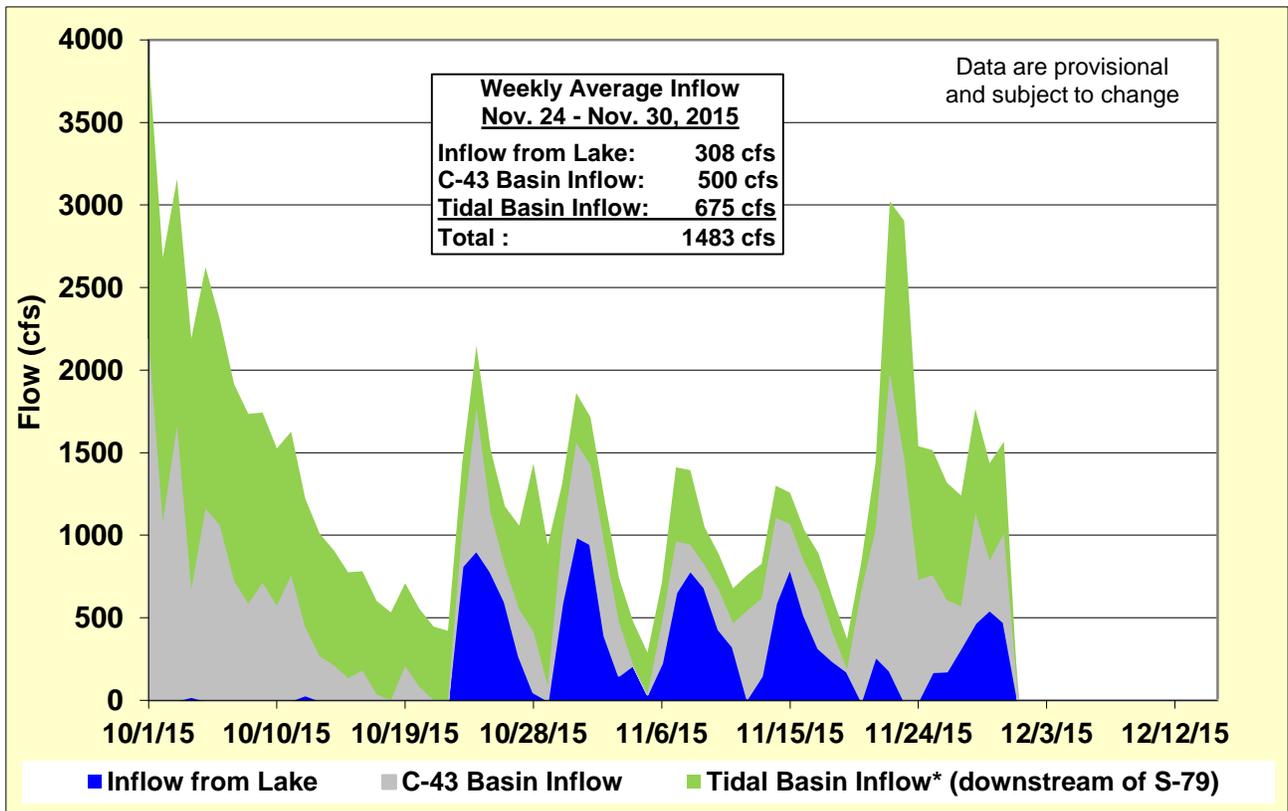


Figure 6. Surface freshwater inflows from Lake Okeechobee, runoff from the C-43 basin, and tributaries in the tidal basin into the Caloosahatchee River Estuary.

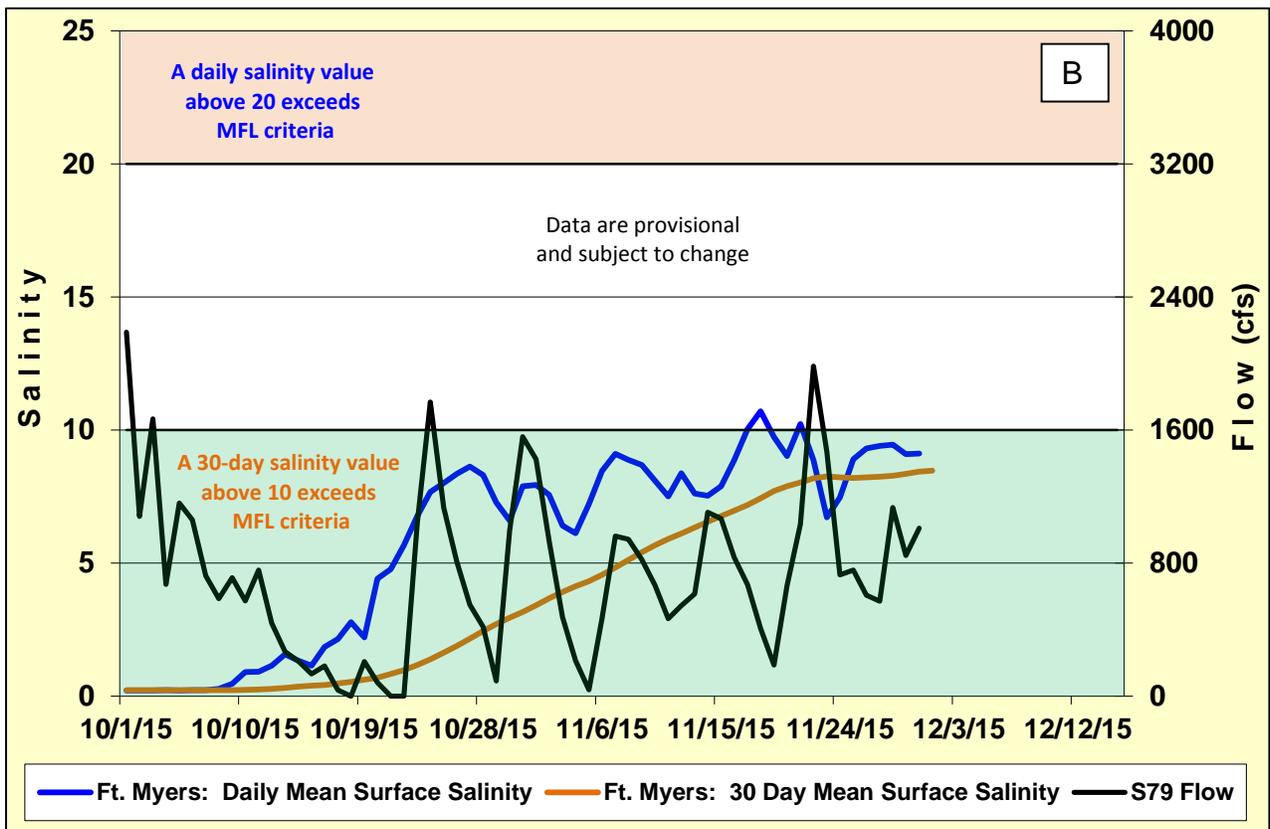
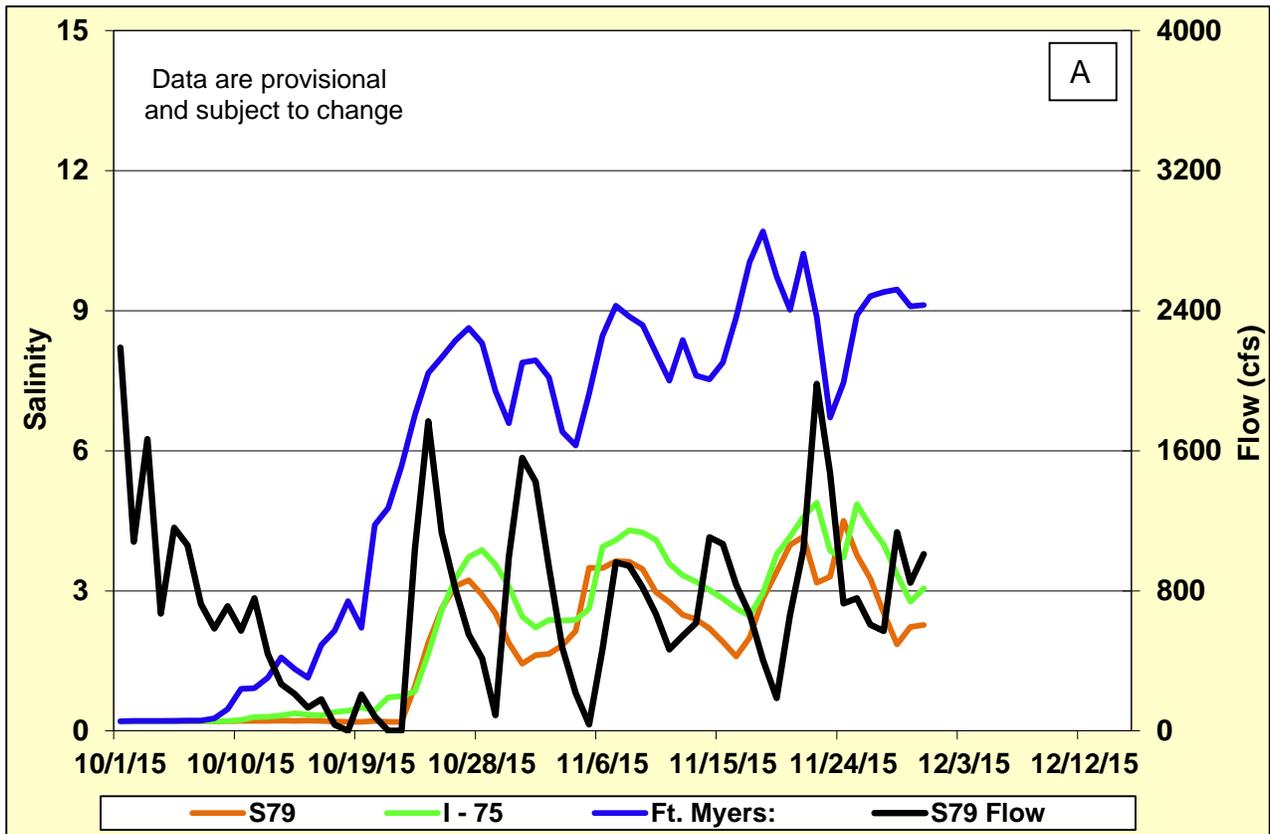


Figure 7. Daily mean flows at S-79 and salinity at upper estuary monitoring stations (A) and 30-day moving average salinity at Ft. Myers (B).

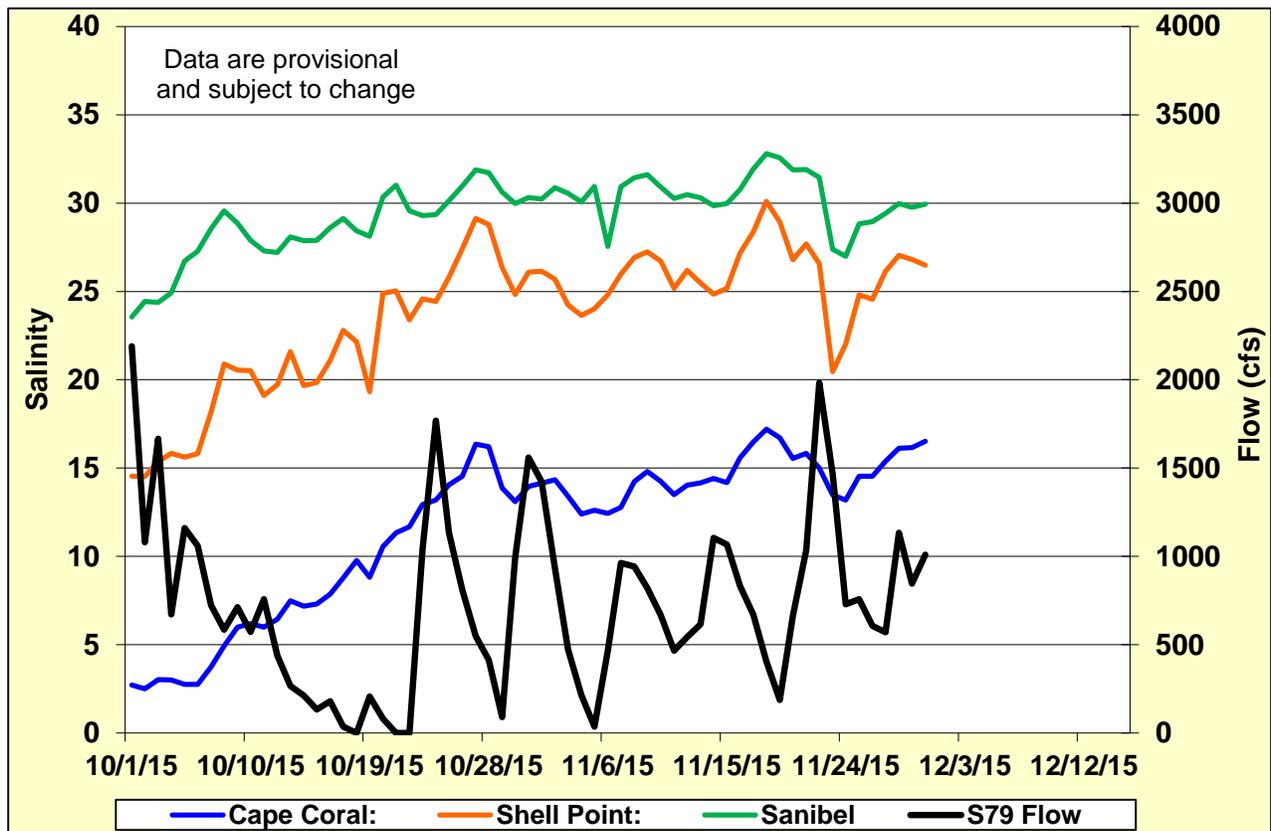


Figure 8. Daily mean flows at S-79 and salinity at lower estuary stations.

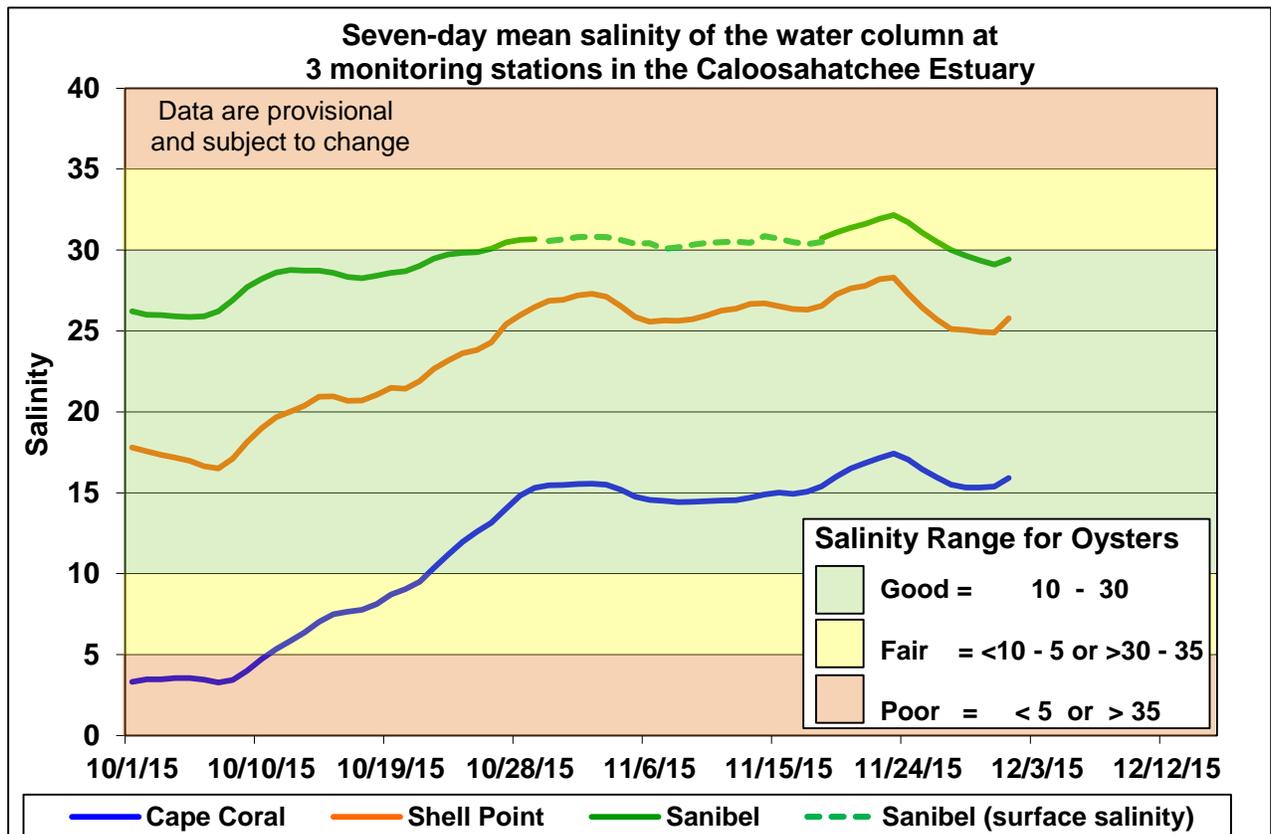


Figure 9. Seven-day mean salinity at Cape Coral Bridge, Shell Point and Sanibel Bridge monitoring stations.

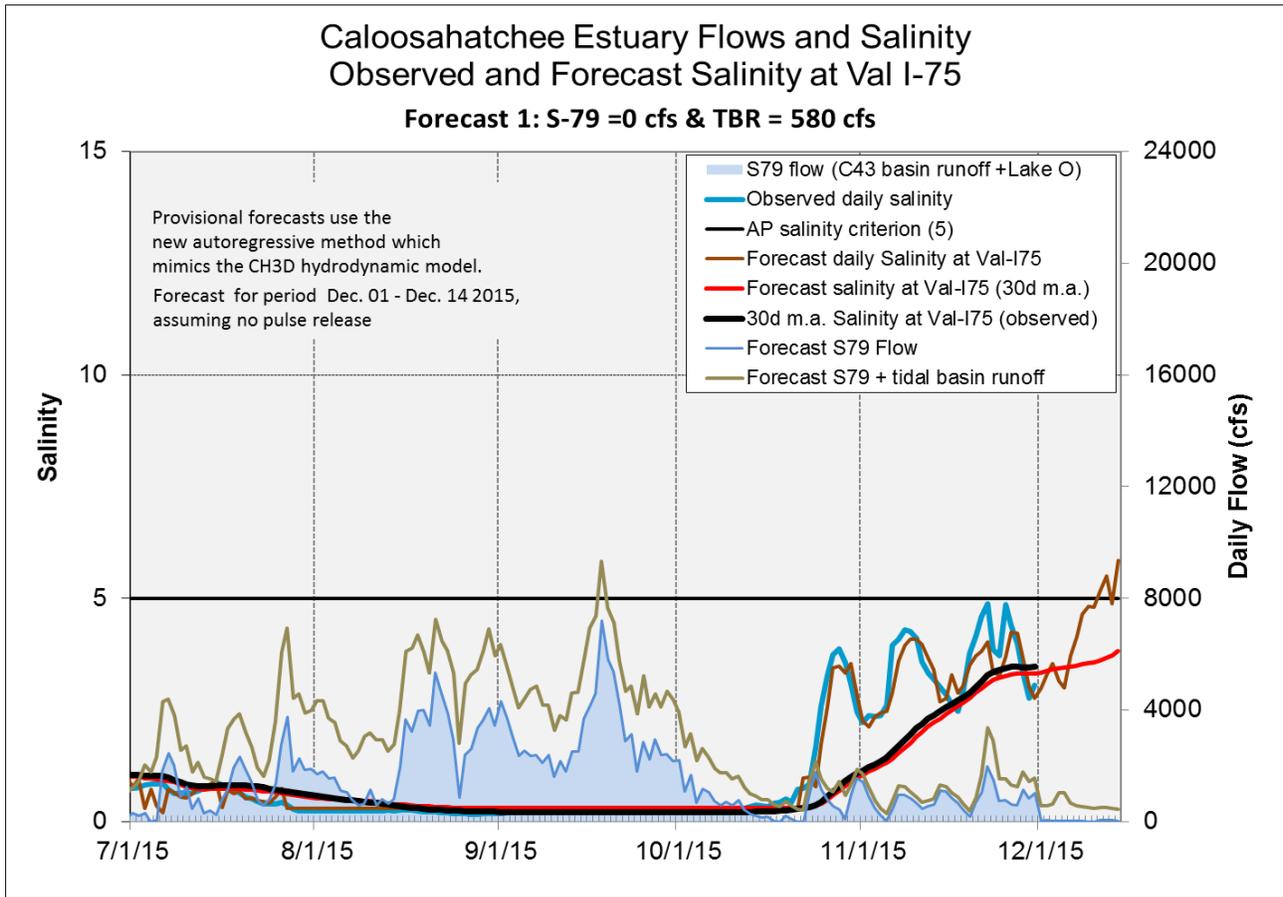


Figure 10. 14-day salinity forecast at Val I-75 assuming no releases at S-79.

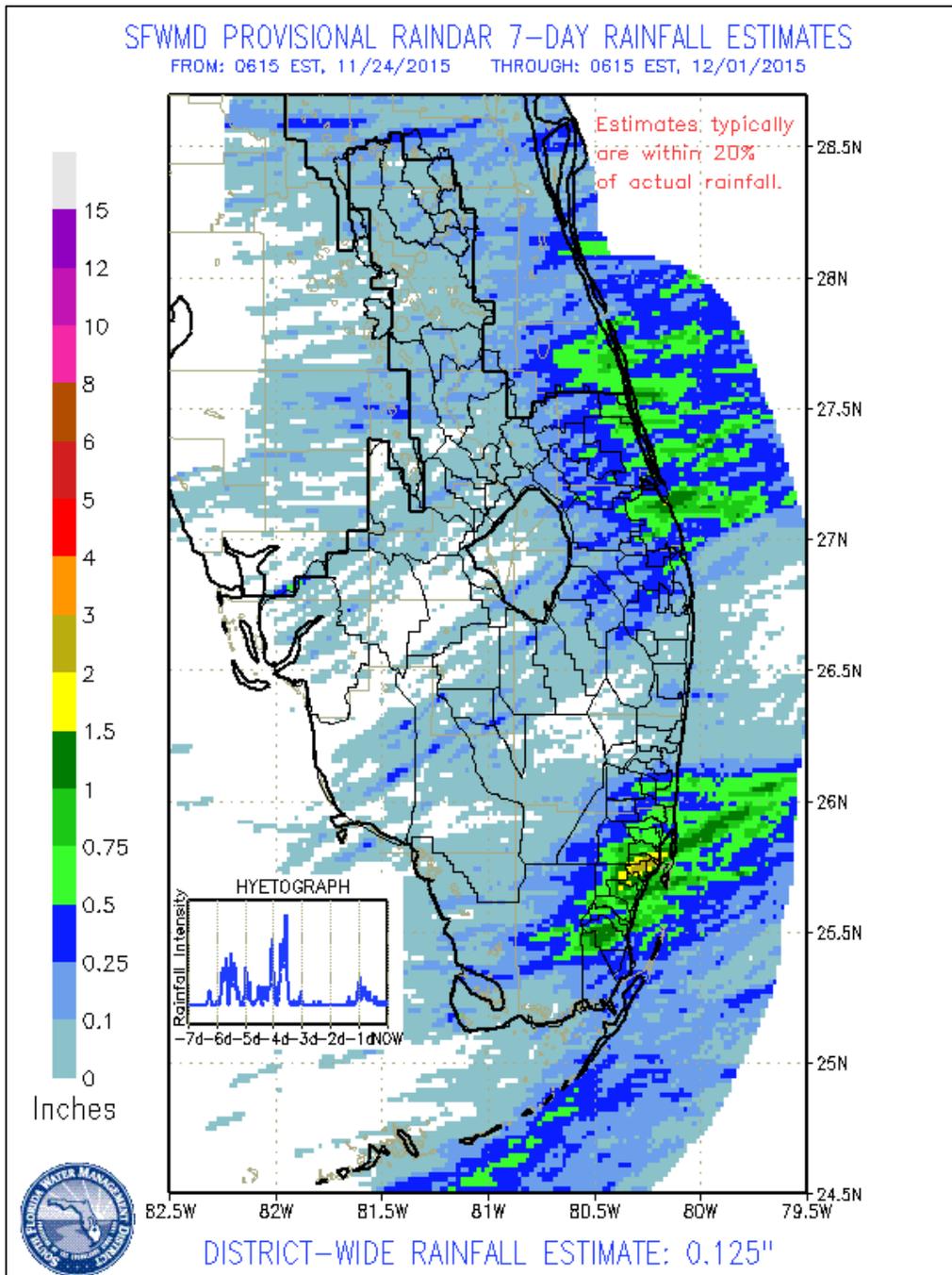
## **GREATER EVERGLADES**

Rainfall was sparse, with basin averages ranging from 0.01 inches to 0.20 inches. The maximum local rainfall was 0.90 inches in Everglades National Park (ENP). Stages decreased from -0.03 inches to -0.12 inches throughout the region. Pan evaporation is 0.92 inches, slightly above the pre-project average of 0.82 inches.

<b>Everglades Region</b>	<b>Rainfall (Inches)</b>	<b>Stage Change (feet)</b>
WCA-1	0.06	-0.03
WCA-2A	0.01	-0.12
WCA-2B	0.01	-0.04
WCA-3A	0.04	-0.03
WCA-3B	0.20	-0.04
ENP	0.16	-0.07

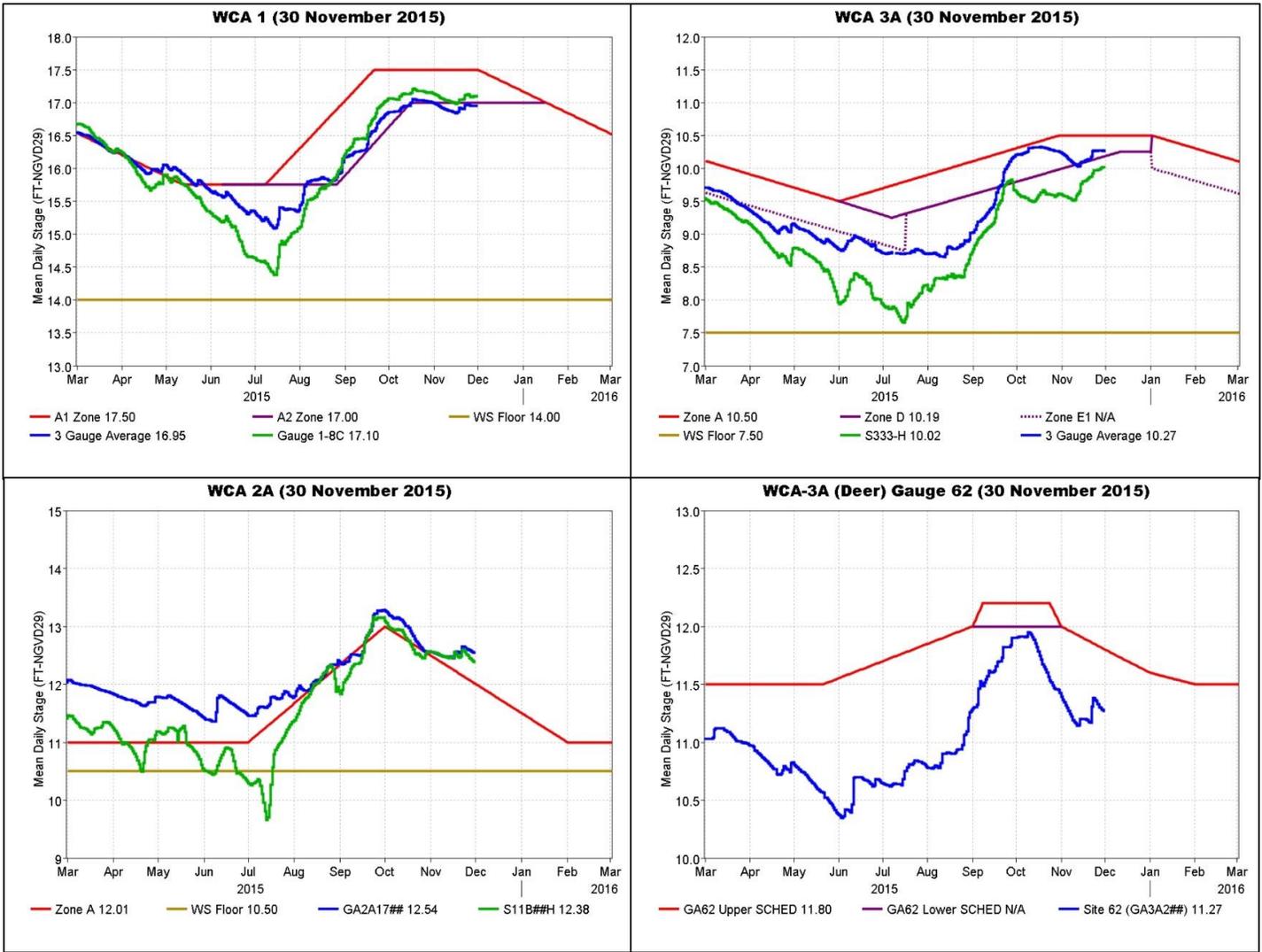
# SFWM District-wide Rainfall 7-Day Rainfall Estimates

FROM: 0615 EST, 11/24/2015 THROUGH: 0615 EST, 12/01/2015



## Regulation Schedules

Stage changes decreased at the regulation schedule sites last week. The WCA-1 stage remains slightly below the Zone A2 line. The WCA-2A stage is 0.53 feet above the declining regulation line. The three-gauge average stage in WCA-3A remains in Zone D, 0.08 feet above the Zone D line. The stage at the northwestern WCA-3A gauge stage (gauge 62) is 0.53 feet below the upper regulation schedule.



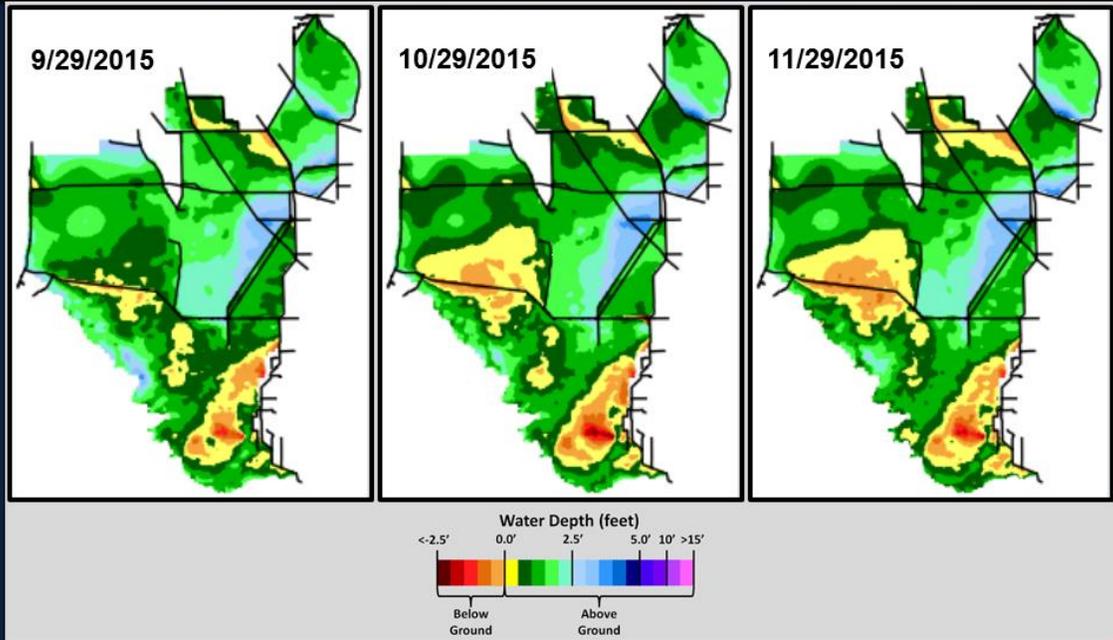
### Water Depths and Changes

Water levels in the WCAs and ENP are similar to those one month ago and generally lower than two months ago. Water depths at the monitored gauges range from 1.17 feet to 2.67 feet (both in WCA-3A), excluding WCA-2B.

Stages are mixed relative to those last week, a month ago, and a year ago. Stages in southern WCA-3A are generally higher over those time periods, and those in northeastern WCA-3A and WCA-1 are generally lower. Individual stage gauge changes ranged from +0.07 feet to -0.12 feet.



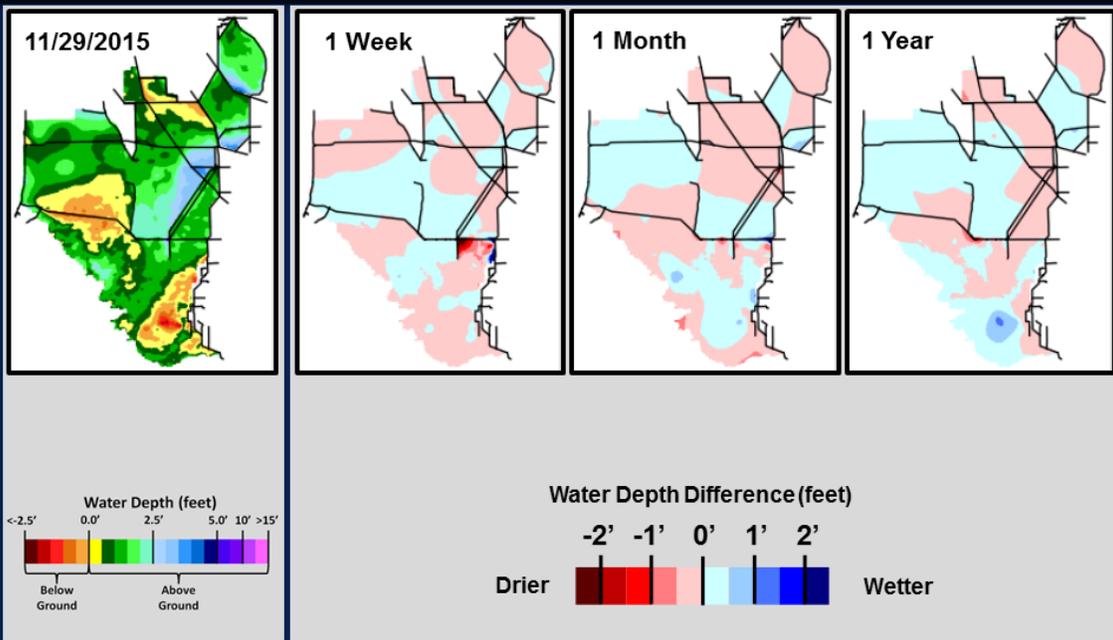
### SFWDAT Water Depth Monthly Snapshots



South Florida Water Depth Assessment Tool (SFWDAT)



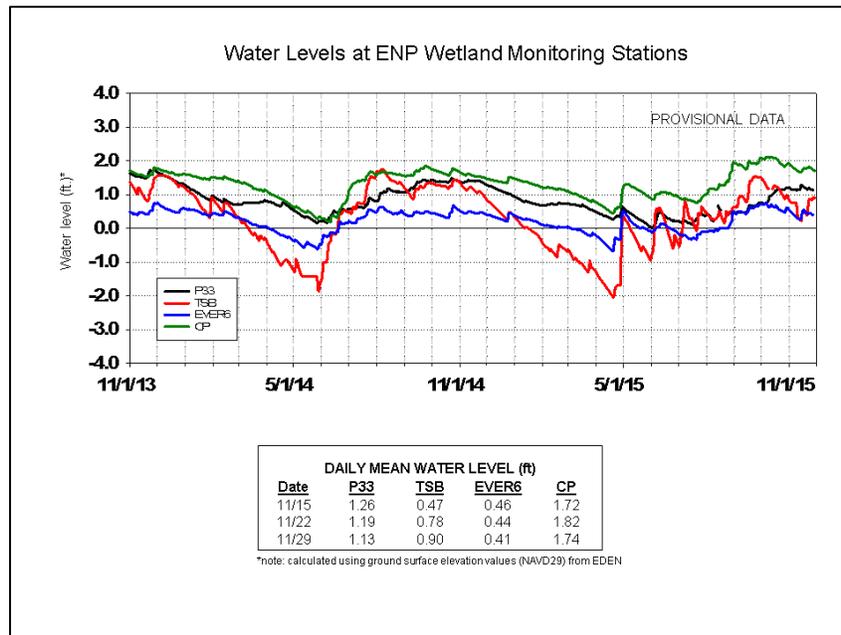
### SFWDAT Everglades Difference Maps (Present - Past)



South Florida Water Depth Assessment Tool (SFWDAT)

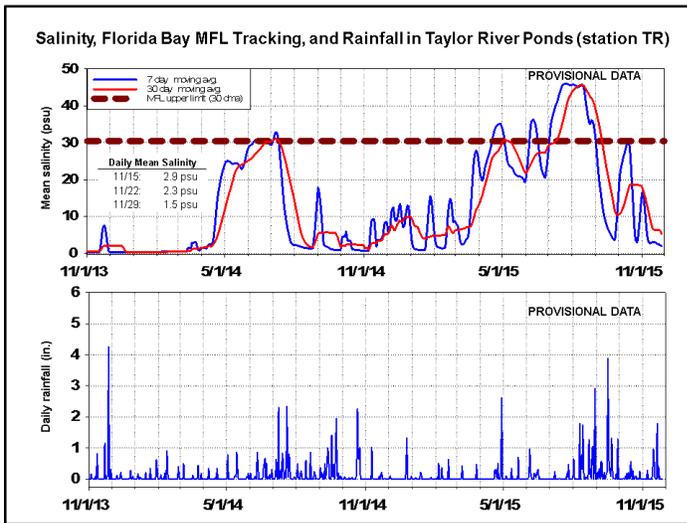
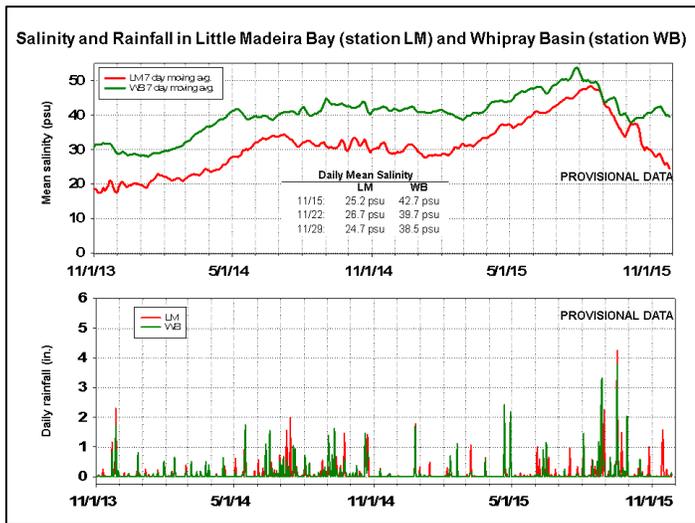
Everglades National Park (ENP) and Florida Bay  
 Water levels decreased in most areas but increased in Northern Taylor Slough. Water levels remain lower than a month ago. Stages in northern Taylor Slough are now about average while stages in

southwestern Taylor Slough and the ENP panhandle remain approximately 3 inches and 1 inch above average, respectively, probably because of local sea level rise.

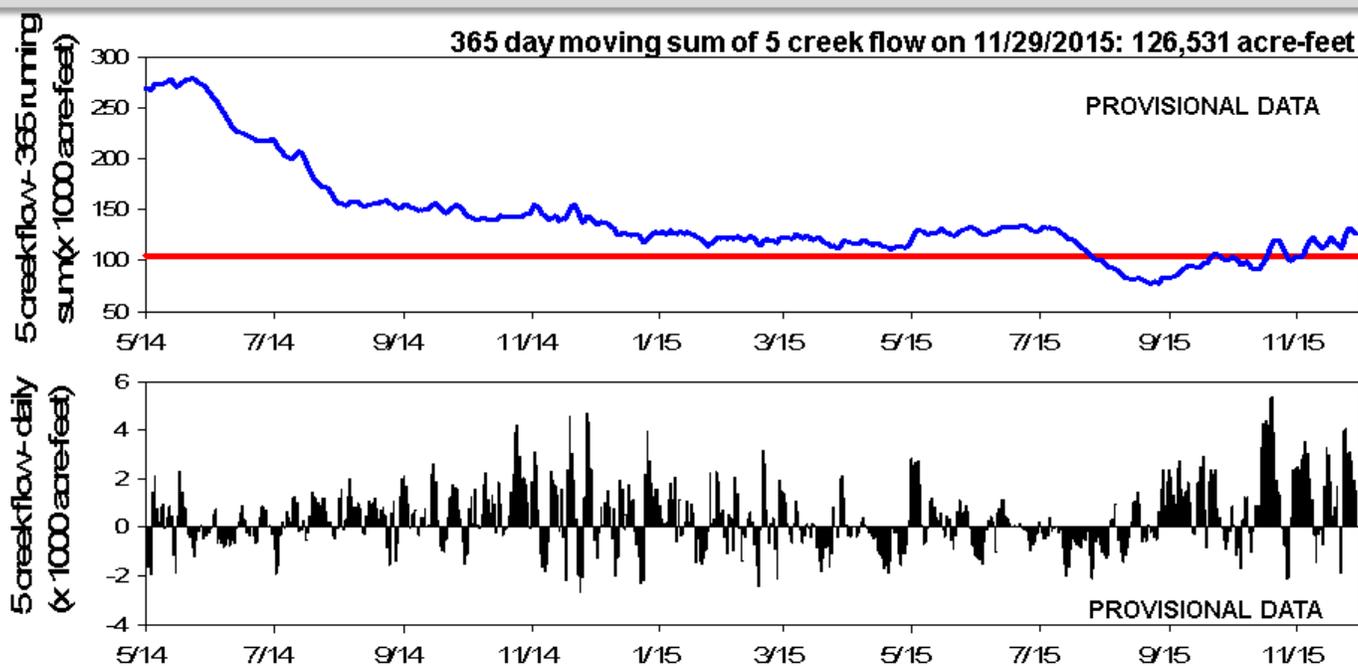


Salinities were stable last week in Florida Bay with weekly changes generally under 1 psu. The largest change was a decrease of 5.3 psu in the central nearshore embayments. Salinities are seven to 12 psu above average in the eastern bay, eight to nine psu above average in the central and western bay, eight psu above average in the central nearshore embayments, and still 16 psu above average in the western nearshore embayments. Salinities in central and western Florida Bay are 39 to 41 psu; historic averages for this time of year are 30 to 34 psu. The daily average salinity at the MFL sentinel site of TR decreased to 1.5 psu, which is almost average. The 30 day moving average salinity decreased to 5.3 psu.

This week, the 365-day running sum of the cumulative flow from the five creeks feeding Florida Bay increased to 126,531 acre-feet. Daily differences in this 365-day cumulative flow from the five creeks represents the difference between current daily flow and flow a year ago. The average creek flow from WY1997-2014 is 257,628 acre-feet. Cumulative flow from the five creeks for the last week (11/23-11/29) was 20,300 acre-feet, about 14,000 acre-feet higher than average for this time of year and much higher than last week (6,040 acre-feet, roughly 500 acre-feet below average). Creek flow is provisional from the USGS and is highly variable from day to day.



### 5 Creek Cumulative Flow and Florida Bay MFL Flow Criteria Tracking



### Water Management Recommendations

- We recommend moving as much water south into ENP and Florida Bay as possible and for as long as possible because conditions there remain hydrologically poor.

- Starting in January, regular dry season recessions are needed to support wading bird foraging and nesting.
- Additional inflow into both northeastern and northwestern WCA-3A is recommended for the short term.

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

<b>Summary of Everglades Recommendations, Dec. 1, 2015 (SFWMD) (red is new text)</b>				
<b>Area</b>	<b>Current Condition</b>	<b>Cause(s)</b>	<b>Recommendation</b>	<b>Reasons</b>
<b>WCA-1</b>	Stage decreased from -0.02' to -0.04'	Rainfall, ET, management	Follow normal seasonal practices.	Promote native habitat and maintain wetland plant communities. Provide moderate ascension rates to protect habitats and sensitive species and to take advantage of rain events.
<b>WCA-2A</b>	Stage decreased - 0.12'	Rainfall, ET, management	Follow normal seasonal practices.	Promote native habitat and maintain wetland plant communities. Provide moderate ascension rates to protect habitats and sensitive species and to take advantage of rain events.
<b>WCA-2B</b>	Stage decreased - 0.03' to -0.05'	Rainfall, ET, management	Follow normal seasonal practices.	High stages generally preclude wading bird use, but can provide good habitat for wading bird foraging as stages drop at the end of the dry season.
<b>WCA-3A NE</b>	Stage decreased - 0.06'	Rainfall, ET, management	Continuing releases into far northeastern and northwestern 3A are recommended. Average water stage of gauges 62 and 63 should remain under 11.60 feet for terrestrial wildlife.	Promote native habitat and maintain wetland plant communities. Provide moderate ascension rates to protect habitats and sensitive species in 3A, and also to allow taking advantage of rain events.
<b>WCA-3A NW</b>	Stage decreased - 0.11'	Rainfall, ET, management		
<b>Central WCA-3A S</b>	Stage decreased - 0.01'	Rainfall, ET, management	Continue to move water into WCA-3A. If El Nino conditions produce higher than normal dry season stages, then additional inflow will not be needed from then on.	Promote native habitat and maintain wetland plant communities. Provide moderate ascension rates to protect habitats and sensitive species in 3A, and take advantage of rain events.
<b>Southern WCA-3A S</b>	Stage increased 0.07'	Rainfall, ET, management		
<b>WCA-3B</b>	Stages changed from 0.00' to -0.09'	Rainfall, ET, management	Follow normal seasonal practices.	Promote native habitat and maintain wetland plant communities. Provide foraging habitat for wading birds.
<b>ENP-SRS</b>	Stage decreased - 0.07'	ET, rainfall, topography, management	Make discharges to the Park according to the ERTF rainfall plan.	Promote native habitat and maintain wetland plant communities.
<b>ENP-CSSS habitats</b>	S-12A and S-12B are closed to begin the pre-nesting dry-down for spring breeding	Rainfall, ET, management	Follow rainfall plan for releases	Provide habitat and appropriate nesting conditions for CSSS.
<b>Taylor Slough</b>	Average in the north to 3" above average in the south	Rain, ET, inflows	Move water southward as possible	Provide freshwater buffer for ecosystems and freshen saline conditions downstream
<b>FB- Salinity</b>	Remains 7-16 psu above average	Rain, ET, inflows, wind	Move water southward as possible	Southward flows are still needed to reverse/slow salinity increases