Disclaimer: Information contained in the report addresses environmental conditions only and is not the official South Florida Water Management District operations recommendation or decision.

M E M O R A N D U M

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

FROM: SFWMD Staff Environmental Advisory Team

DATE: November 24, 2015

SUBJECT: Weekly Environmental Conditions for Systems Operations

Summary

Kissimmee
On Sunday, stages in East Lake Toho and Toho were ~0.7 and ~0.4 feet below schedule, respectively; Kissimmee-Cypress-Hatchineha (KCH) was 2.4 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 at S65 averaged 402 cfs and at S65A 290 cfs; discharge at S65E averaged 806 cfs over the past week. Tuesday morning discharges: S65 ~240 cfs; S65A ~275 cfs; S65C ~945 cfs; S65E ~1300cfs. Dissolved oxygen in the Kissimmee River averaged 5.22 mg/L over the past week and 5.15 mg/L on Sunday. Kissimmee River mean floodplain depth is currently 0.69 feet.

Lake Okeechobee
A reversal in Lake stage occurred over the past week. Lake stage is at 14.51 feet NGVD and is in the Low Flow Operational Sub-band. Ecological conditions are good although reversals have potential negative impacts on Lake fauna and flora at this time of year. Algal concentrations cannot be evaluated since no MODIS images were available this past week.

Estuaries
Over past week, total freshwater inflow averaged 1573 cfs to the St. Lucie with no releases from Lake Okeechobee and 1422 cfs to the Caloosahatchee with 168 cfs Lake releases. In the St. Lucie Estuary, salinity was lower than in previous week but 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 and Shell Point, and in the upper fair range at 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 moderate to heavy rainfall, basin-wide stages increased 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 6.3 psu and the cumulative inflow from the five creeks into Florida Bay has decreased again to 112,200 acre-feet (44% of the average annual inflow of 257,800 acre-feet). Salinity in Florida Bay has been relatively stable over the last two weeks. Much more rainfall and inflow are required to approach seasonally normal conditions in Florida Bay and Everglades National Park.

Weather Conditions and Forecast

Breezy this week with some light showers east. High pressure over the area is expected to bring breezy winds to the District through Thanksgiving weekend. These winds will bring a few clouds over eastern areas as well as some spotty light rain this afternoon and evening. Patches of clouds will persist east Wednesday and Thursday along with some scattered showers. Clouds and shower activity should decrease Friday and Saturday.

KISSIMMEE BASIN

Kissimmee Basin Rainfall

The Upper Kissimmee Basin received 1.65 inches of rainfall in the past week and the Lower Basin received 2.78 inches (SFWMD Daily Rainfall Report 11/24/2015).

Upper Kissimmee Basin

Stages and departures in the Kissimmee Chain of Lakes (KCOL) are shown in Table1.

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: **11/24/2015**

Water Body	Structure/Site	Discharge (cfs), week's average**	Stage Monitoring Site***	Lake Stage (feet)	Schedule*	Regulation (R) or Target (S or T) Stage (feet)	Sunday Departure (feet)						
							11/22/15	11/15/15	11/8/15	11/1/15	10/25/15	10/18/15	10/11/15
Lakes Hart and Mary Jane	S62	30	LKMJ	60.6	R	61.0	**-0.4**	-0.6	-0.5	-0.6	-0.5	-0.3	0.0
Lakes Myrtle, Preston, and Joel	S57	12	S57	61.5	R	62.0	**-0.5**	-0.5	-0.4	-0.5	-0.2	-0.1	-0.1
Alligator Chain	S60	0	ALLI	63.2	R	64.0	**-0.8**	-0.9	-0.8	-0.8	-0.7	-0.5	-0.4
Lake Gentry	S63	0	LKGT	61.3	R	61.5	**-0.2**	-0.3	-0.2	-0.3	-0.2	-0.1	-0.1
East Lake Toho	S59	0	TOHOE	57.3	R	58.0	**-0.7**	-0.9	-0.9	-0.9	-0.7	-0.4	-0.1
Lake Toho	S61	0	TOHOW	54.6	R	55.0	**-0.4**	-0.6	-0.6	-0.7	-0.6	-0.4	-0.1
Lakes Kissimmee, Cypress, and Hatchineha	S65	402	LKISSP, KUB011, LKIS5B	50.1	R	52.5	**-2.4**	-2.5	-2.4	-2.2	-1.7	-1.1	-0.5

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

Report Date: **11/24/2015**

Metric	Location	Sunday's 1-day average	Weekly Average**									
			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	9/20/15
Discharge (cfs)	S-65	337	**402**	443	828	1317	1593	1540	1370	1534	2329	3923
Discharge (cfs)	S-65A	285	**290**	325	656	1133	1419	1457	1483	1694	2655	5089
Discharge (cfs)	S-65C	1078	**687**	840	1211	1713	1758	2151	2579	3300	4558	5476
Headwater stage (feet NGVD)		34.5	**34.3**	34.9	35.4	35.4	35.5	35.4	35.3	35.3	35.4	35.5
Discharge (cfs)	S-65D****	1488	**860**	957	1316	1978	1790	2291	2882	3891	5253	6193
Discharge (cfs)	S-65E	1641	**806**	769	1170	1771	1677	2203	2787	3853	5133	6064
DO concentration (mg/L)***	Phase I river channel	5.15	**5.22**	3.99	4.32	4.25	4.18	2.50	1.65	0.93	0.74	0.34
Mean depth (feet)*	Phase I floodplain	**0.69**	N/A	0.59	0.90	1.05	1.17	1.25	1.44	1.64	2.06	2.76

* 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.

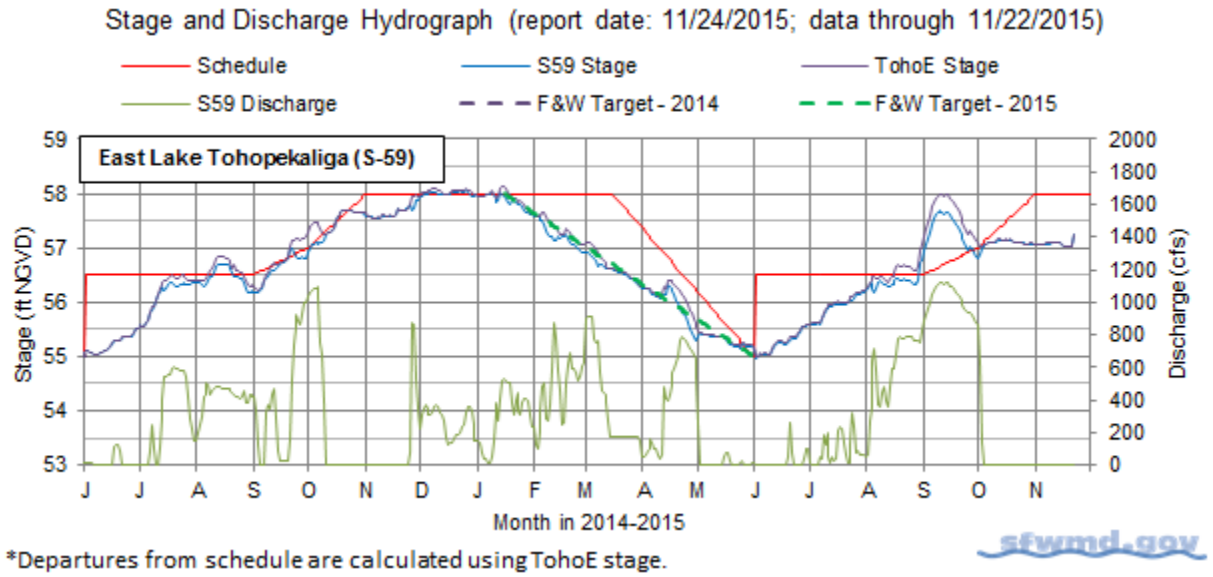
DATA ARE PROVISIONAL

Water Management Recommendations

Kissimmee Basin Recommendations and Operational Actions

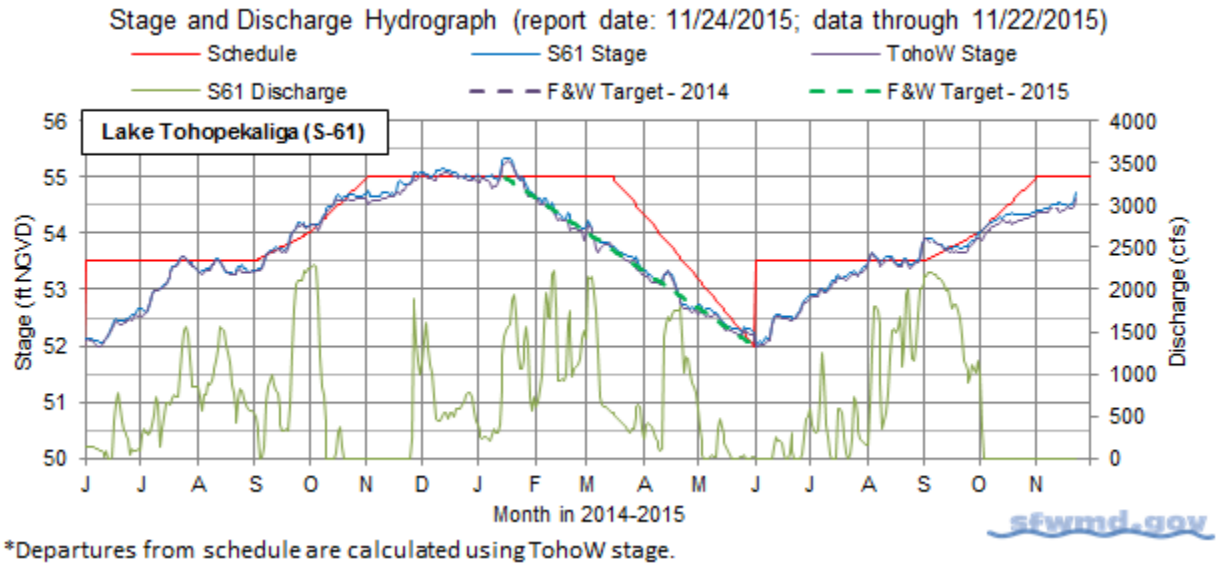
Date	Recommendation	Purpose	Outcome	Source
11/24/2015	No new recommendations.			
11/17/2015	No new recommendations.			
11/10/2015	No new recommendations.			
11/3/2015	No new recommendations.			
10/27/2015	No new recommendations.			
10/20/2015	No new recommendations.			
10/13/2015	No new recommendations.			
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)



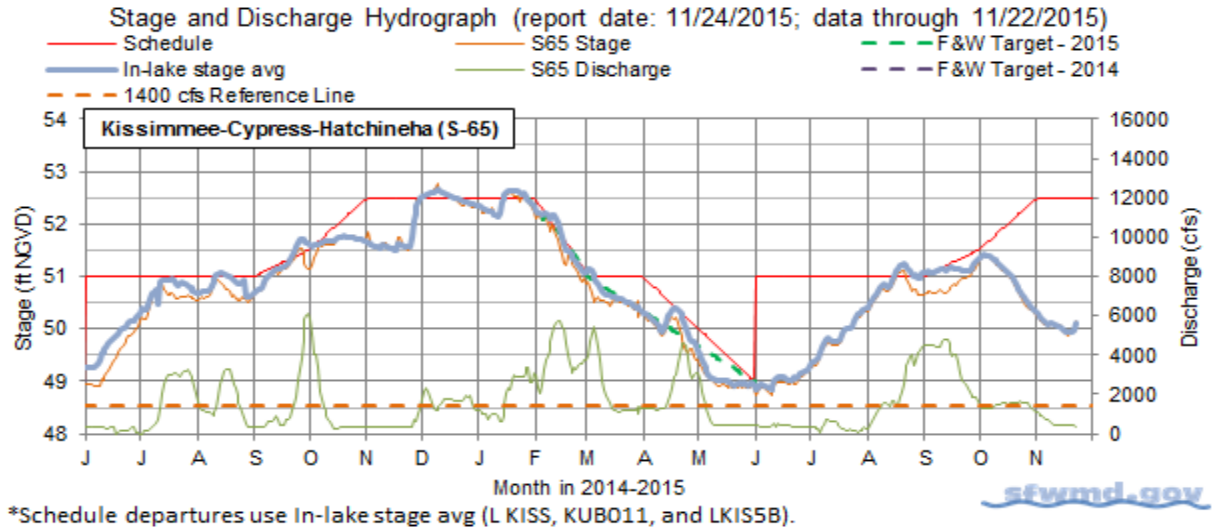
*Departures from schedule are calculated using TohoE stage.

Figure 1.



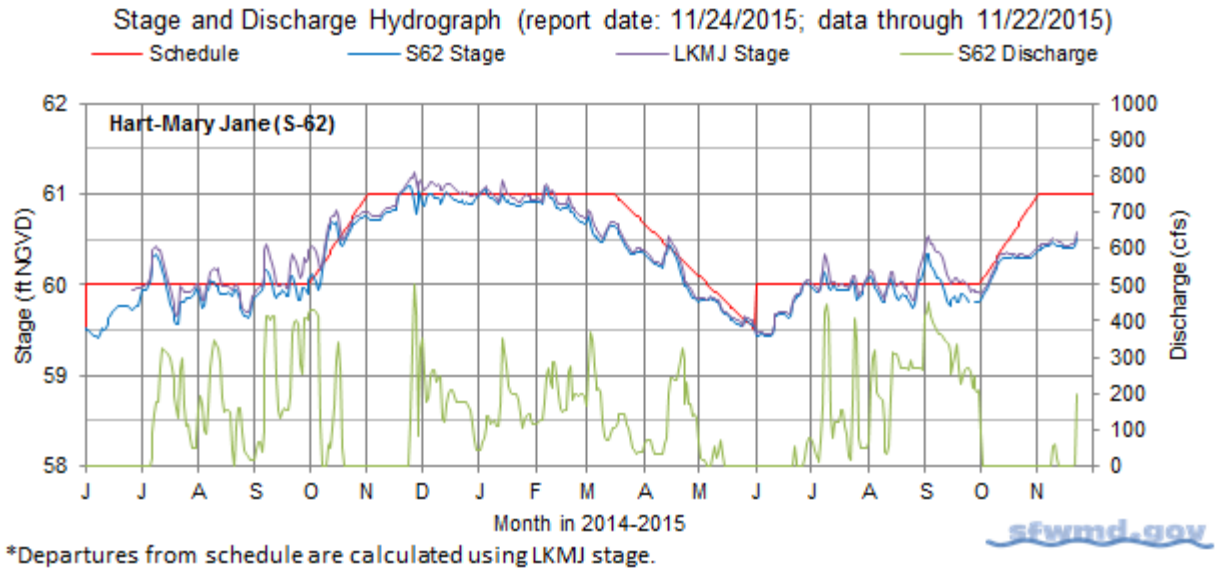
*Departures from schedule are calculated using TohoW stage.

Figure 2.



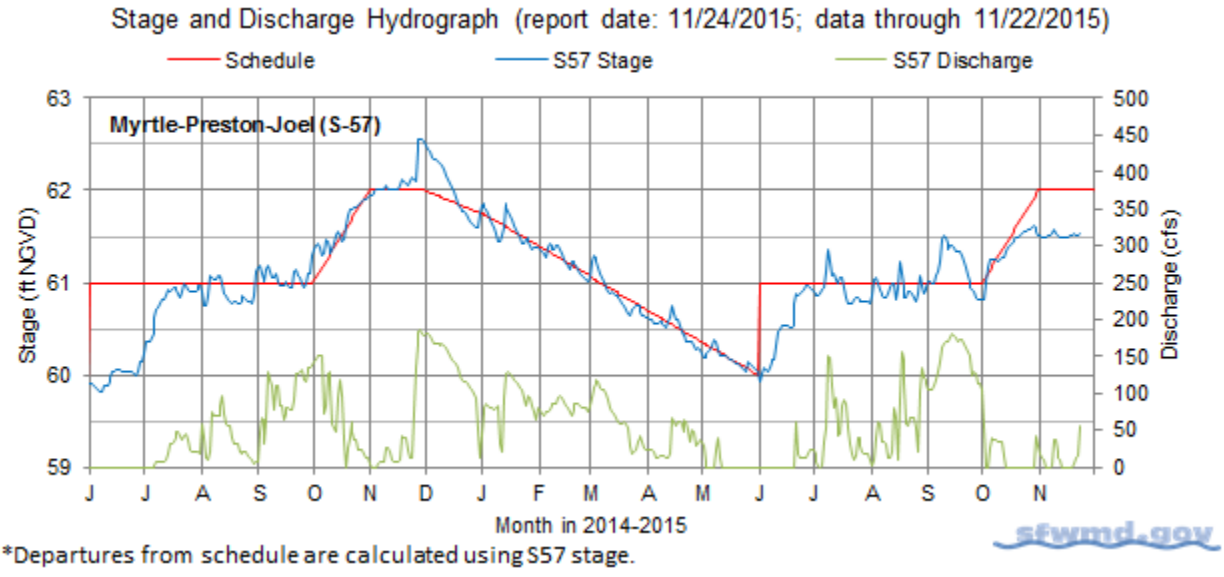
*Schedule departures use In-lake stage avg (L KISS, KUBO11, and LKIS5B).

Figure 3.



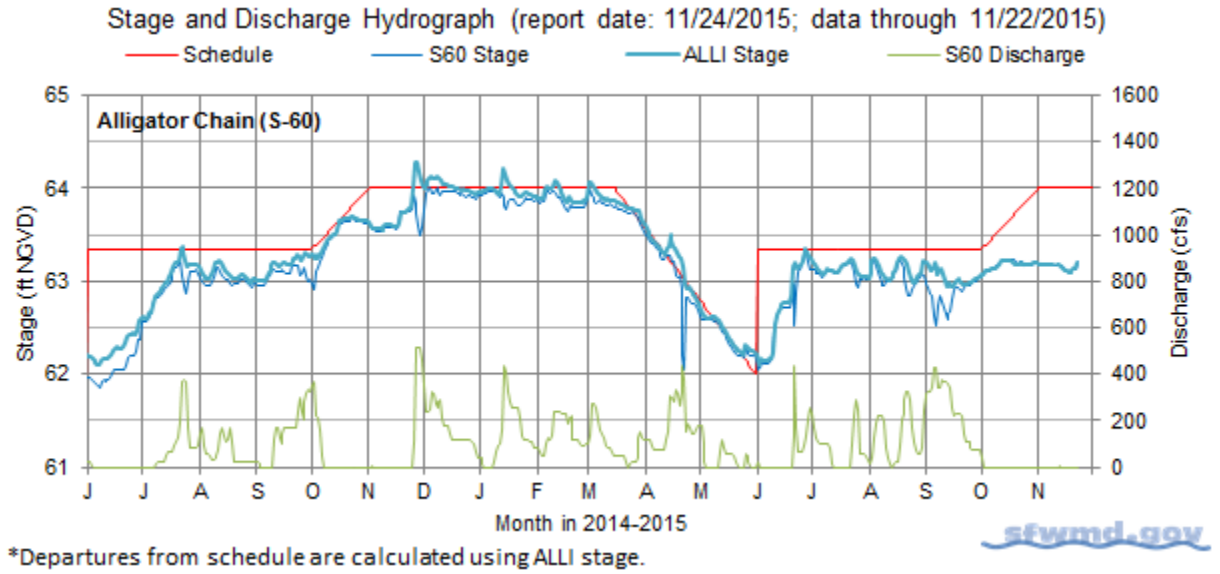
*Departures from schedule are calculated using LKMJ stage.

Figure 4.



*Departures from schedule are calculated using S57 stage.

Figure 5.



*Departures from schedule are calculated using ALLI stage.

Figure 6.

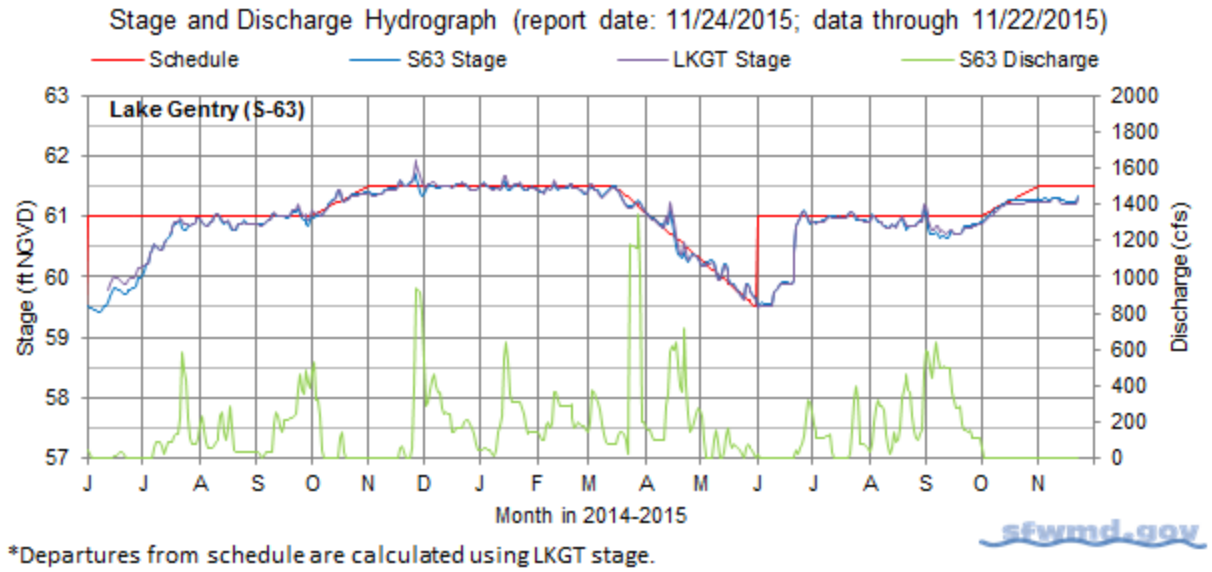


Figure 7.

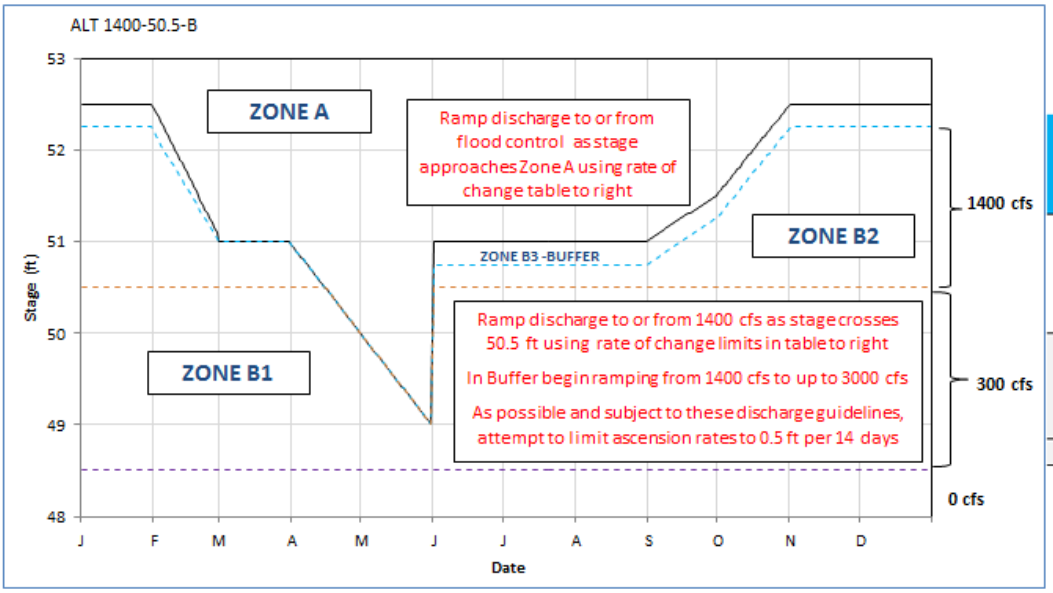


Table 1. Discharge Rate of Change Limits for S65/S65A
****Rate limits apply only in Zone B****

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

Figure 8a. 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).

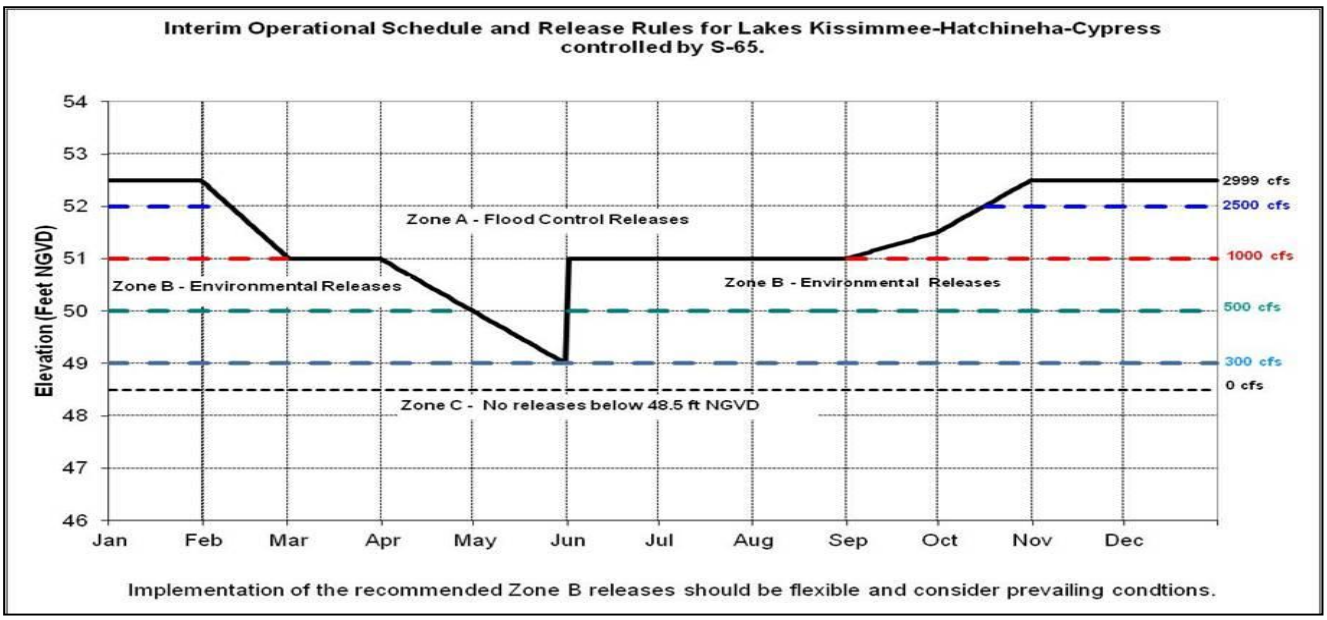


Figure 8b. Interim operations schedule for S-65. The discharge schedule shown to the right has not been used in recent years or in Wet Season 2015.

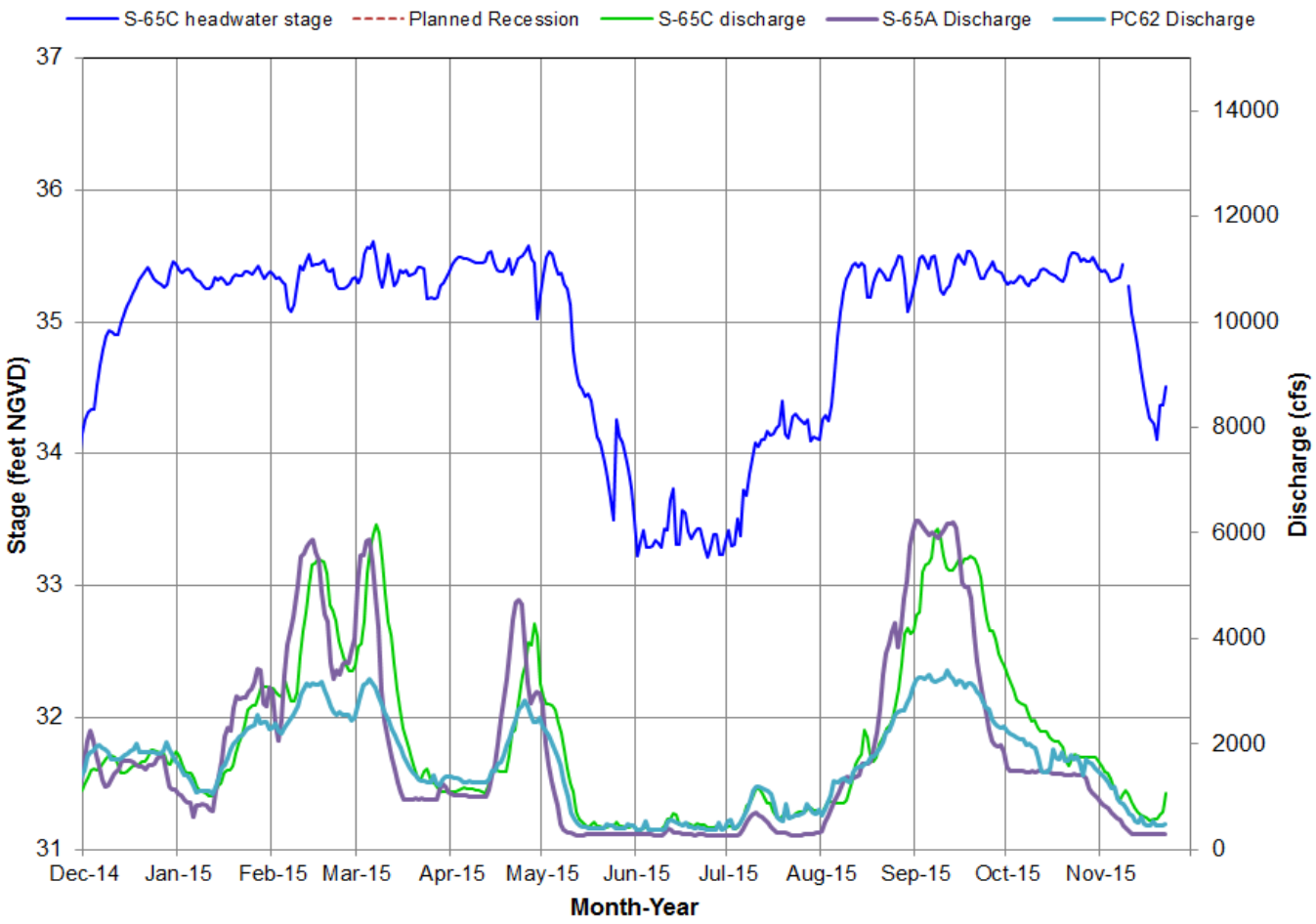


Figure 9. S-65C headwater stage in relation to discharge at S-65C, S-65A, and PC62.

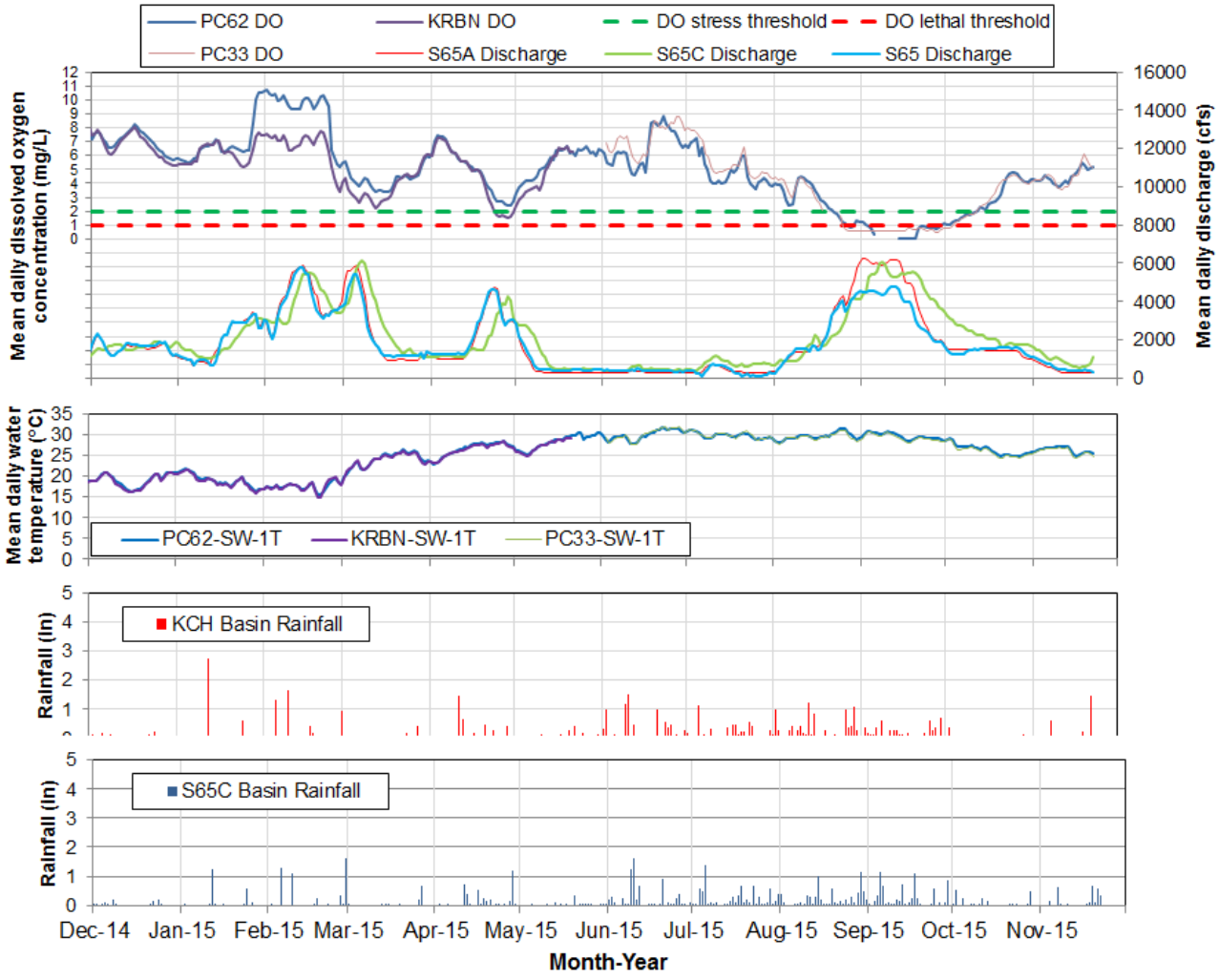
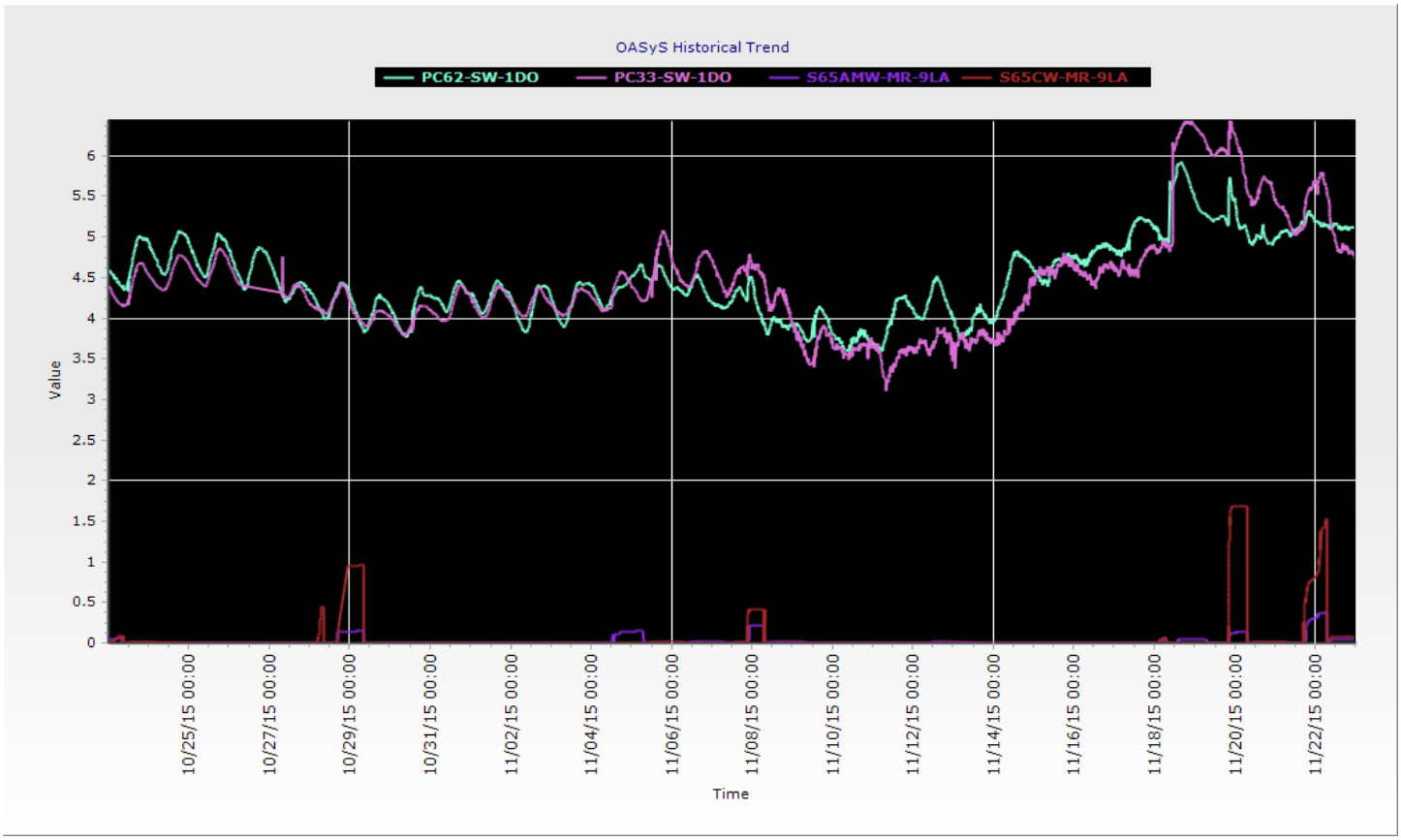


Figure 10. Mean daily Dissolved Oxygen, discharge, temperature and rainfall in the Phase I river channel.



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

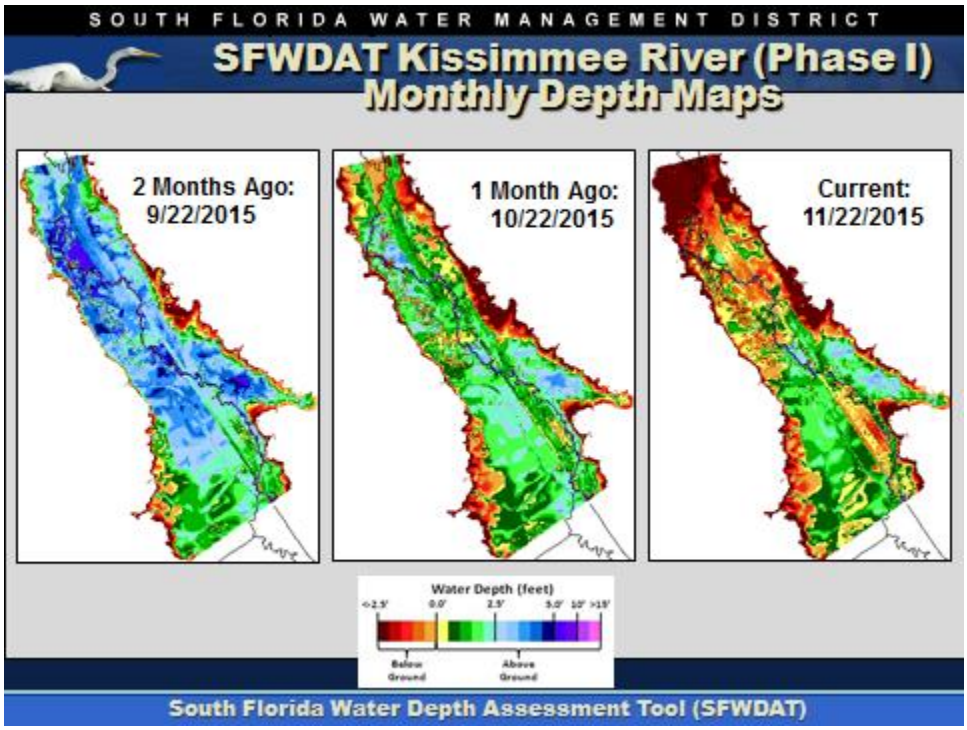


Figure 11. Phase I area floodplain water depths for this week, one month ago, and two months ago. Note that the WDAT color-coding has been modified to accommodate greater water depths; these maps are not directly comparable to Kissimmee Basin WDAT maps published prior to Jan. 16, 2012.

Kissimmee River Hydrographs

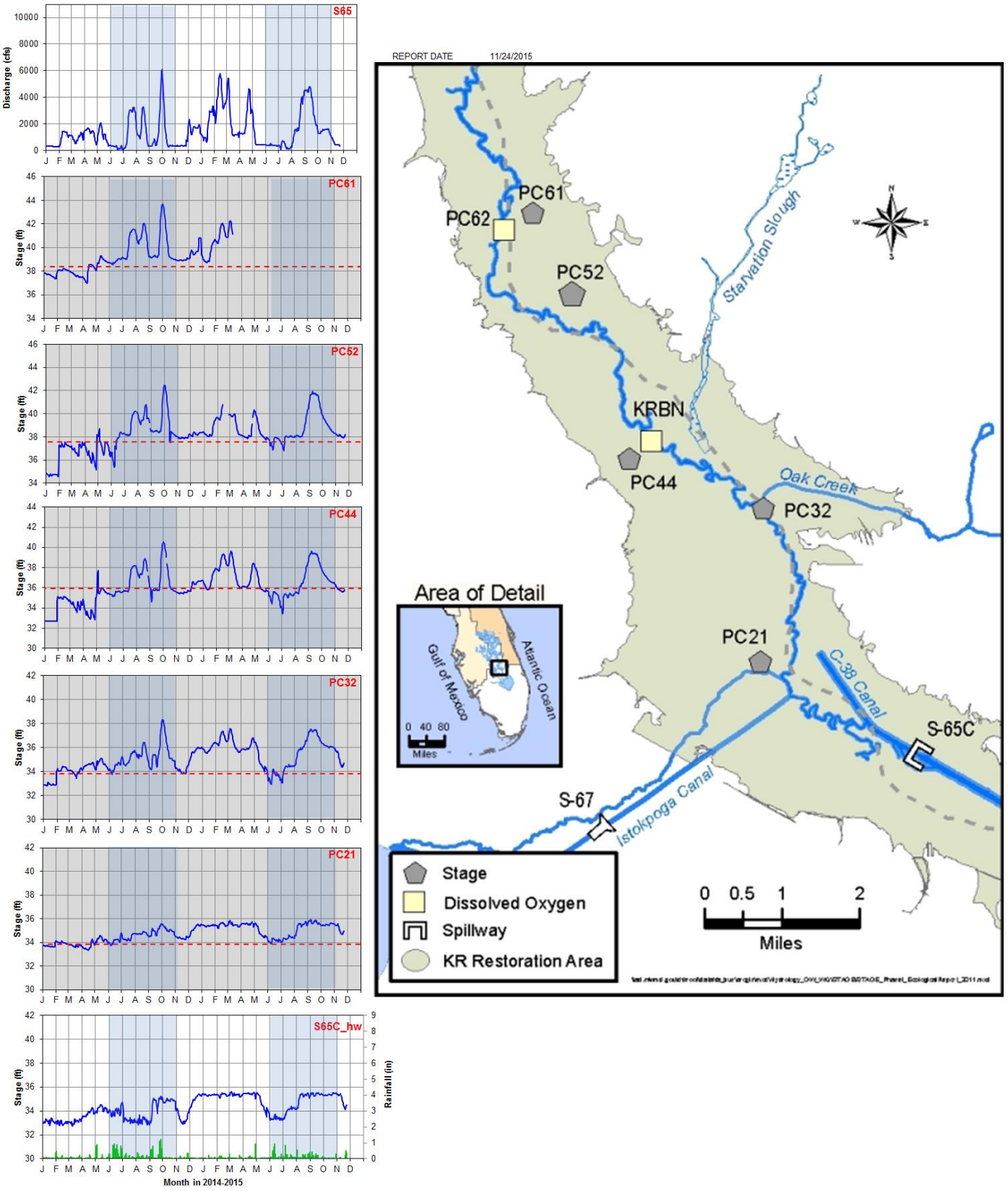


Figure 12. Discharge at S65, stages at five monitoring stations in the Phase I area of the Kissimmee River floodplain, and headwater stage at S65-C since January 1, 2013. The most recent data (~2 weeks) are provisional real-time data from SFWMD DualTrend; previous data are from SFWMD DB-HYDRO (validated). Dashed lines are ground elevations.

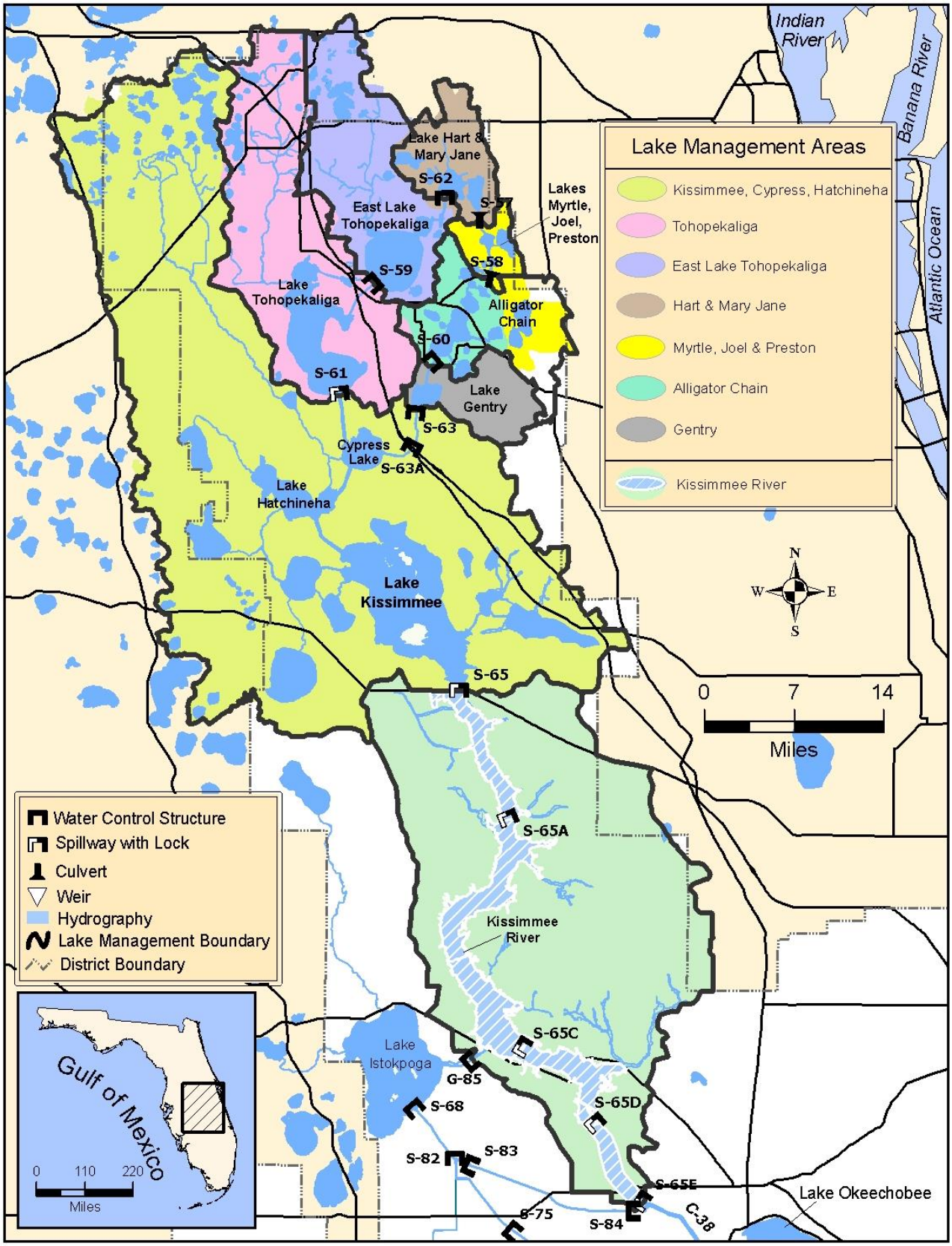


Figure 13. The Kissimmee Basin.

LAKE OKEECHOBEE

According to the USACE web site, Lake Okeechobee stage is at 14.51 feet NGVD for the period ending at midnight on November 23, 2015. Lake stage increased by 0.2 feet over the past week. The Lake is now 0.13 feet lower than it was a month ago and 1.03 feet lower than it was a year ago (Figure 1). The Lake has re-entered the Low Flow Operational Sub-band (Figure 2). According to RAINDAR, 2.38 inches of rain fell directly over the Lake during the past seven days. Somewhat greater amounts of rain fell in the northwest portions of the surrounding watershed, with similar to lesser amounts falling in the rest of the watershed (Figure 3).
Based on USACE reported values, current Lake inflow is approximately 6005 cfs, consisting of inflows as indicated below.

Structure	Flow cfs
S65E	1631
S154	63
S84 & 84X	2153
S71	1480
S72	414
C5	0
S191	0
S133 PUMPS	6
S127 PUMPS	85
S129 PUMPS	43
S131 PUMPS	43
S135 PUMPS	0
Fisheating Creek	87
S2 Pumps	0
S3 Pumps	0
S4 Pumps	0

Current Lake outflow is approximately 204 cfs, exiting to the L8 canal through Culvert 10A (204 cfs). Corrected evapotranspiration this past week was equivalent to an outflow of 985 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 53,600 acres of suitable foraging habitat on the Lake (Figure 5).

No updated MODIS satellite imagery was available this week.

Water Management Recommendations

The recent slow recession in Lake stage has reversed. Reversals have potentially negative consequences for Lake flora and fauna, particularly submerged aquatic vegetation and avian foragers this time of year. Any activities that contribute to reinstituting a slow recession rate would be ecologically beneficial.

Future recommendations for the short term 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 additional reversals in Lake stage.

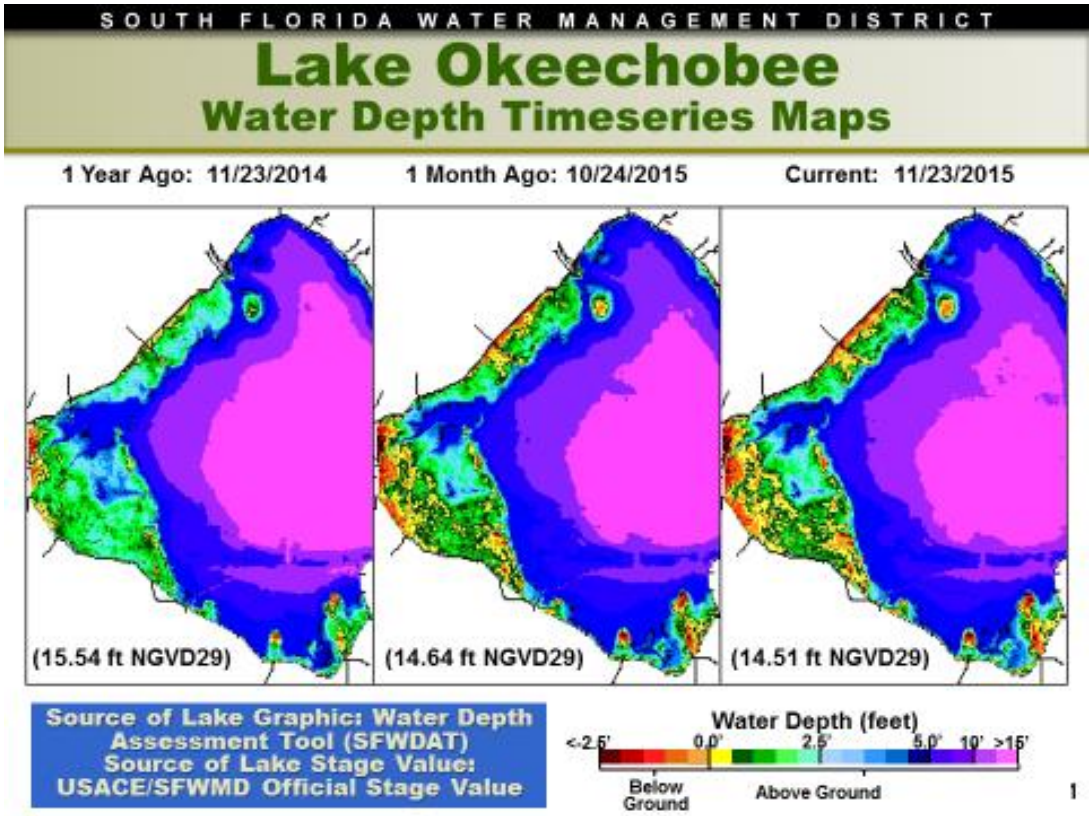


Figure 1

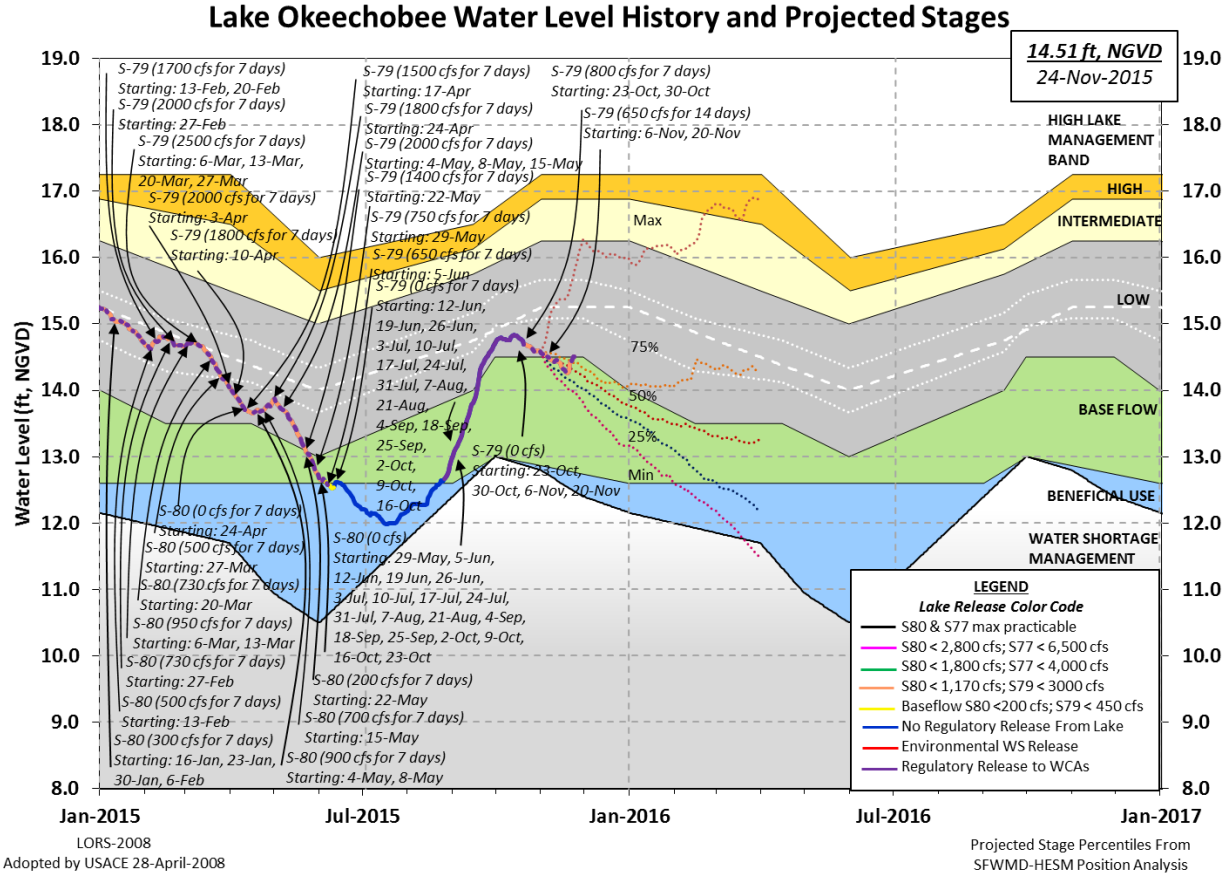


Figure 2

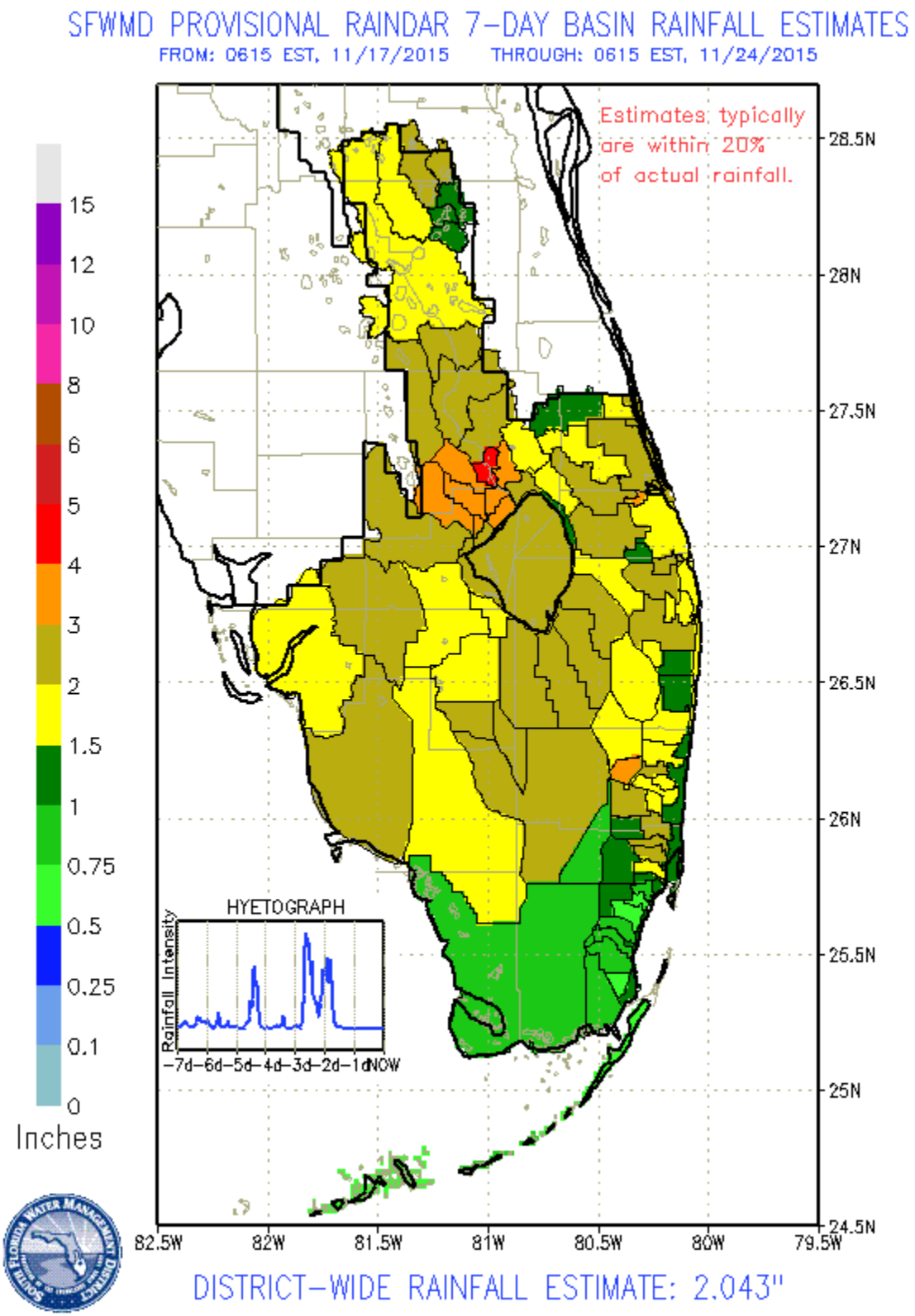


Figure 3

INFLOWS	Average Daily Flow Past Week cfs	Feet of Change Past Week
S65E	1007	0.034
S71 & 72	654	0.022
S84 & 84X	1061	0.036
Fisheating Creek	1411	0.004
Rainfall	N.A.	0.198
OUTFLOWS	**Average Daily Flow Past Week cfs**	**Feet of Change Past Week**
S77	335	0.011
S308	0	0.000
S351	91	0.003
S352	48	0.002
S354	28	0.001
L8	212	0.007
ET	985	0.033

Figure 4

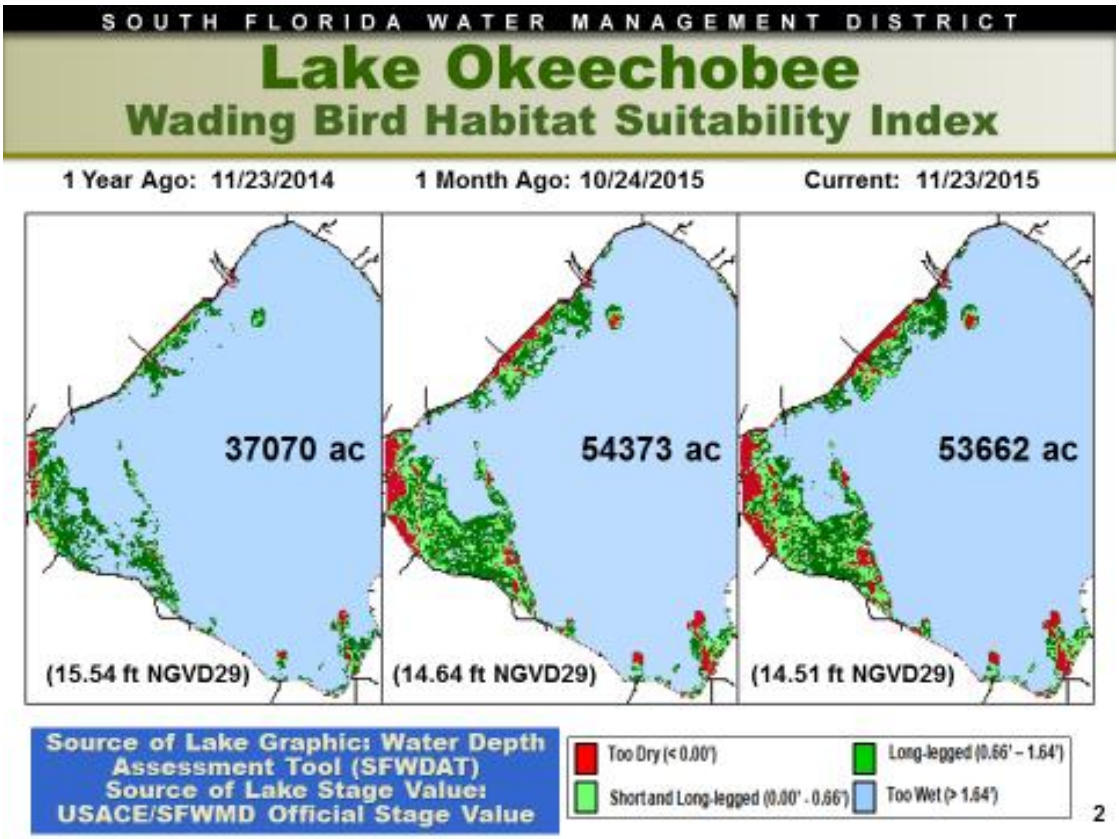


Figure 5

Lake Istokpoga

Lake Istokpoga stage is 39.27 feet NGVD today and is currently 0.23 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 420 and 48 cfs respectively, a small decrease for Arbuckle and the same flow for Josephine creek from last week. Average discharge from S68 and S68X this past week was 1006 cfs, an increase of approximately 60% from the preceding week. According to RAINDAR, 2.17 inches of rain fell in the Lake Istokpoga watershed during the past seven days.

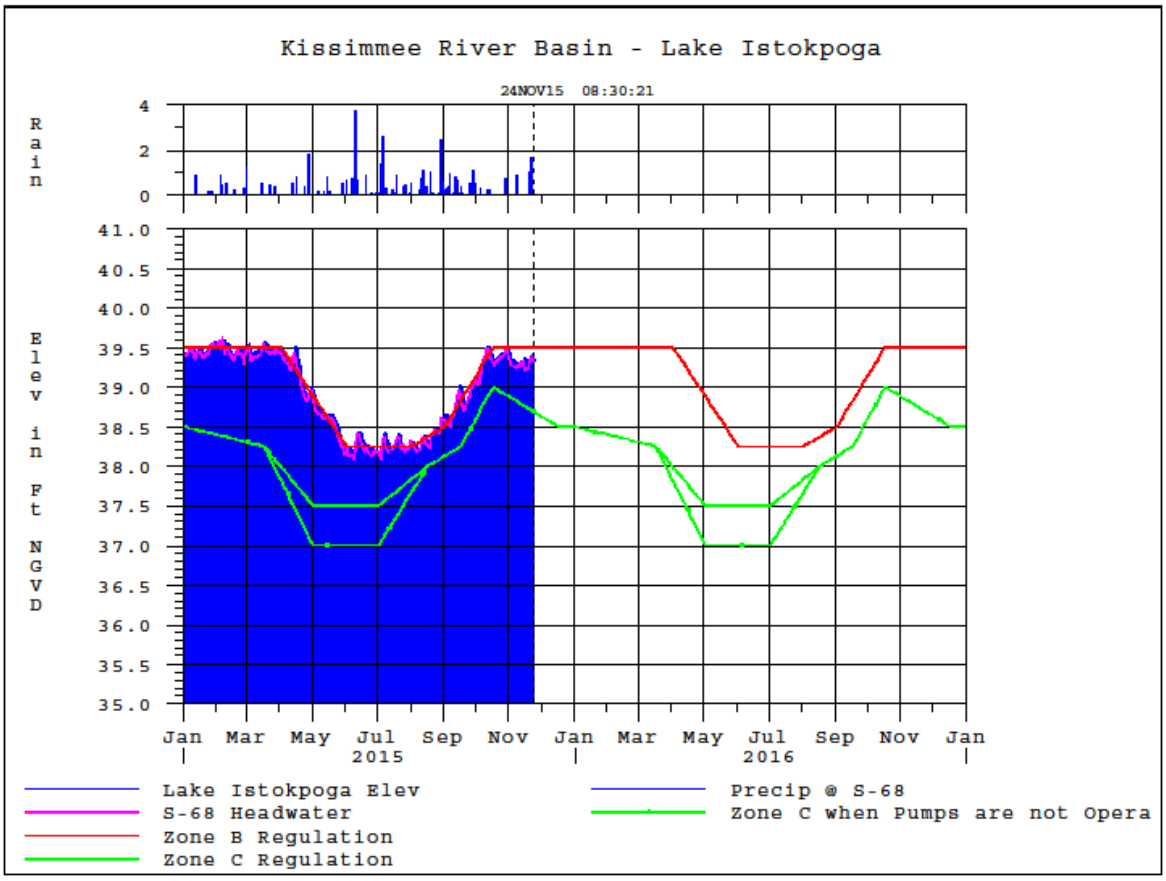


Figure 6

ESTUARIES

St. Lucie Estuary

Over the past week, provisional flows averaged 146 cfs at S-80, 0 cfs at S-308, 277 cfs at S-49 on C-24, 211 cfs at S-97 on C-23, and 331 cfs from Ten Mile Creek at the Gordy Road Structure. Average inflow from tidal basin tributaries is estimated to be 608 cfs (Figures 1 and 2). Total inflow averaged about 1573 cfs last week and 584 cfs over last month.

Salinity decreased throughout the estuary (Table 1, Figures 3 and 4). The seven-day moving average salinity of the water column is 17.3 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)	**11.6** (15.8)	**16.2** (19.4)	NA[1]
US1 Bridge	**16.6** (20.0)	**18.1** (21.3)	10.0-26.0
A1A Bridge	**24.8** (28.0)	**27.8** (30.5)	NA

[1]Envelope not applicable

Caloosahatchee Estuary

During the past week, provisional flows averaged approximately 296 cfs at S-77, 340 cfs at S-78, and 916 cfs at S-79. Average inflow from tidal basin tributaries is estimated to be 506 cfs (Figures 5 and 6). Total inflow averaged 1422 cfs last week and 1166 cfs over last month.

Salinity increased throughout the estuary (Table 2, Figures 7 & 8). The seven-day average salinity values are within the good range for oysters at Cape Coral and Shell Point, and the fair range at Sanibel (Figure 9). The 30-day moving average surface salinity is 3.4 at Val I-75 and 8.2 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 5.9 in two weeks, and the 30-day moving average is predicted to rise to 4.0 (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)	**3.3** (2.3)	**3.3** (2.3)	NA[1]
*Val I75	**3.8*** (3.2*)	**6.4*** (3.9*)	0.0-5.0[2]
Ft. Myers Yacht Basin	**9.3** (8.0)	**13.5** (9.2)	NA
Cape Coral	**15.8** (14.3)	**18.4** (15.8)	10.0-30.0
Shell Point	**27.0** (25.8)	**27.7** (26.8)	10.0-30.0
Sanibel	**31.4** (30.4)	**32.0** (NR[3])	10.0-30.0

[1]Envelope not applicable, [2]Envelope is based on a 30-day average, [3]Not Reporting.
*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 *a* (µg/l)	NA	3.5 – 6.7	1.7 – 5.2
Dissolved Oxygen (mg/l)	NA	5.2 – 7.6	4.8 – 7.0

The Florida Fish and Wildlife Research Institute reported on November 20, 2015, that a bloom of *Karenia brevis*, the Florida red tide organism, was detected in background to low concentrations in four samples collected alongshore of Lee County.

Water Management Recommendations

Lake Okeechobee's water level is within the Low Flow Operational Sub-band; the tributary hydrological conditions are Wet; 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 3000 cfs at S-79 and to the St. Lucie of up to 1170 cfs at S-80.

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

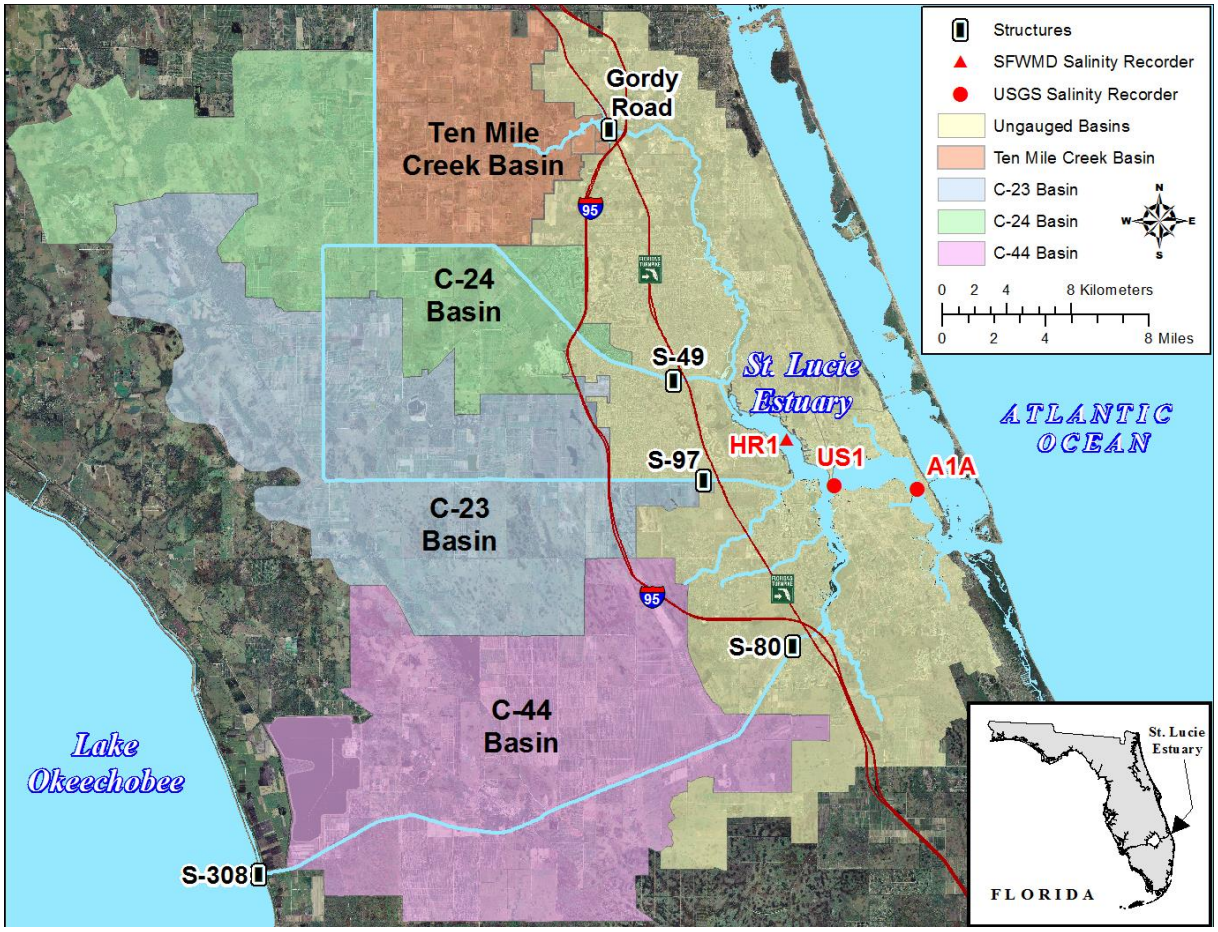


Figure 1. Basins, water control structures, and salinity monitoring for the St. Lucie Estuary.

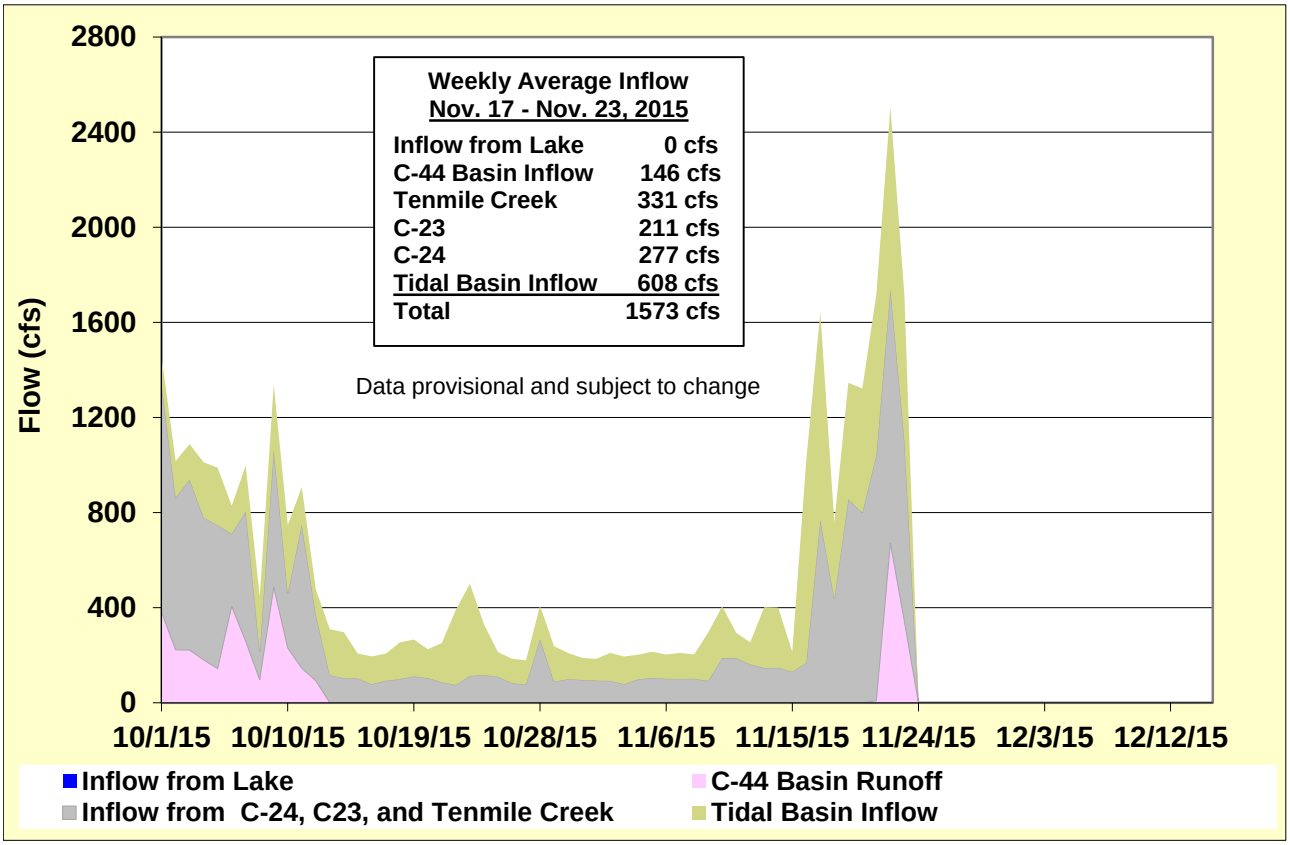


Figure 2. Estimated surface freshwater inflows from Lake Okeechobee and runoff from the C-44, C-23, C-24, Ten Mile Creek, and tidal basins into the St. Lucie Estuary.

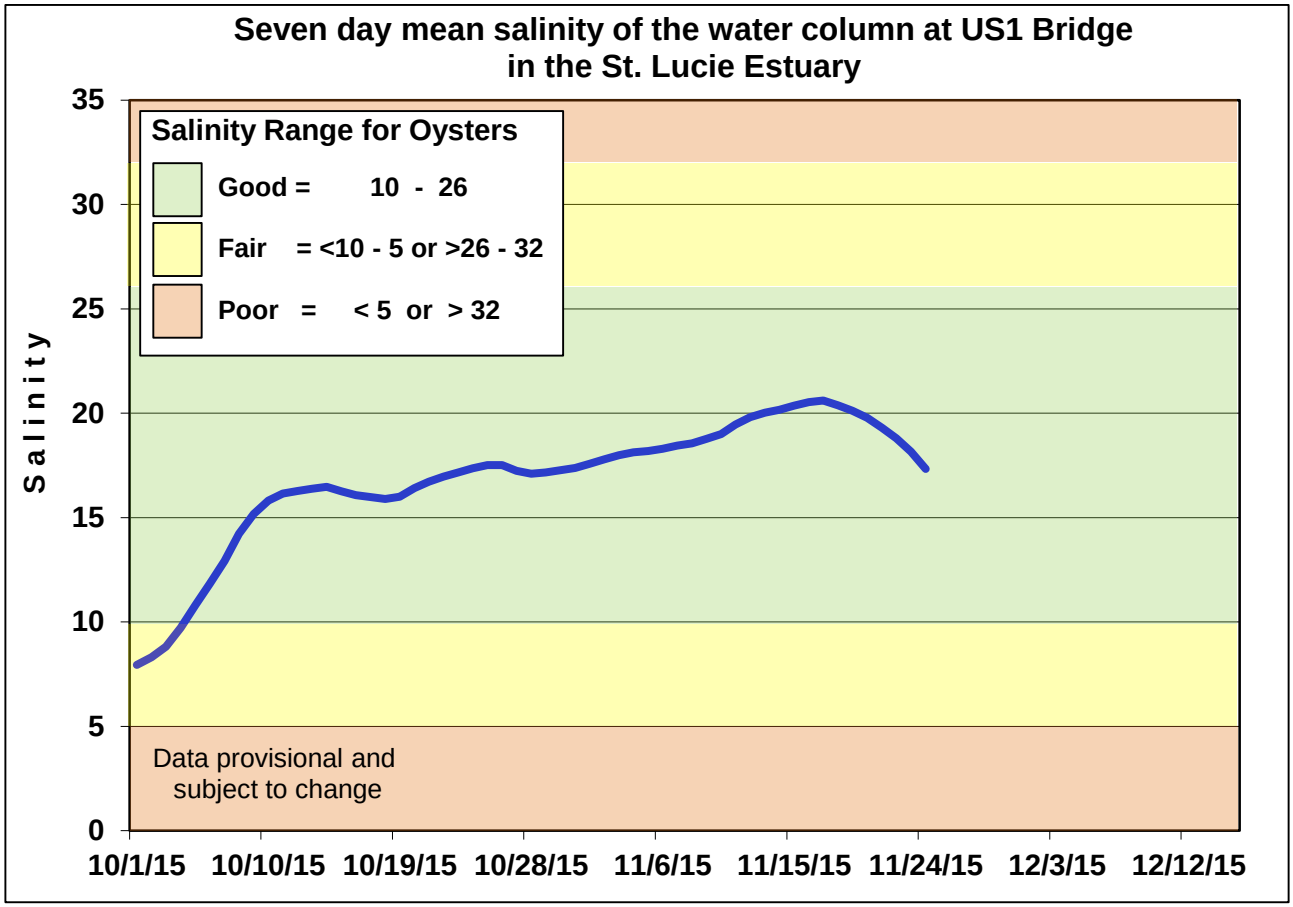


Figure 3. Seven-day mean salinity of the water column at the U.S. Highway 1 Bridge.

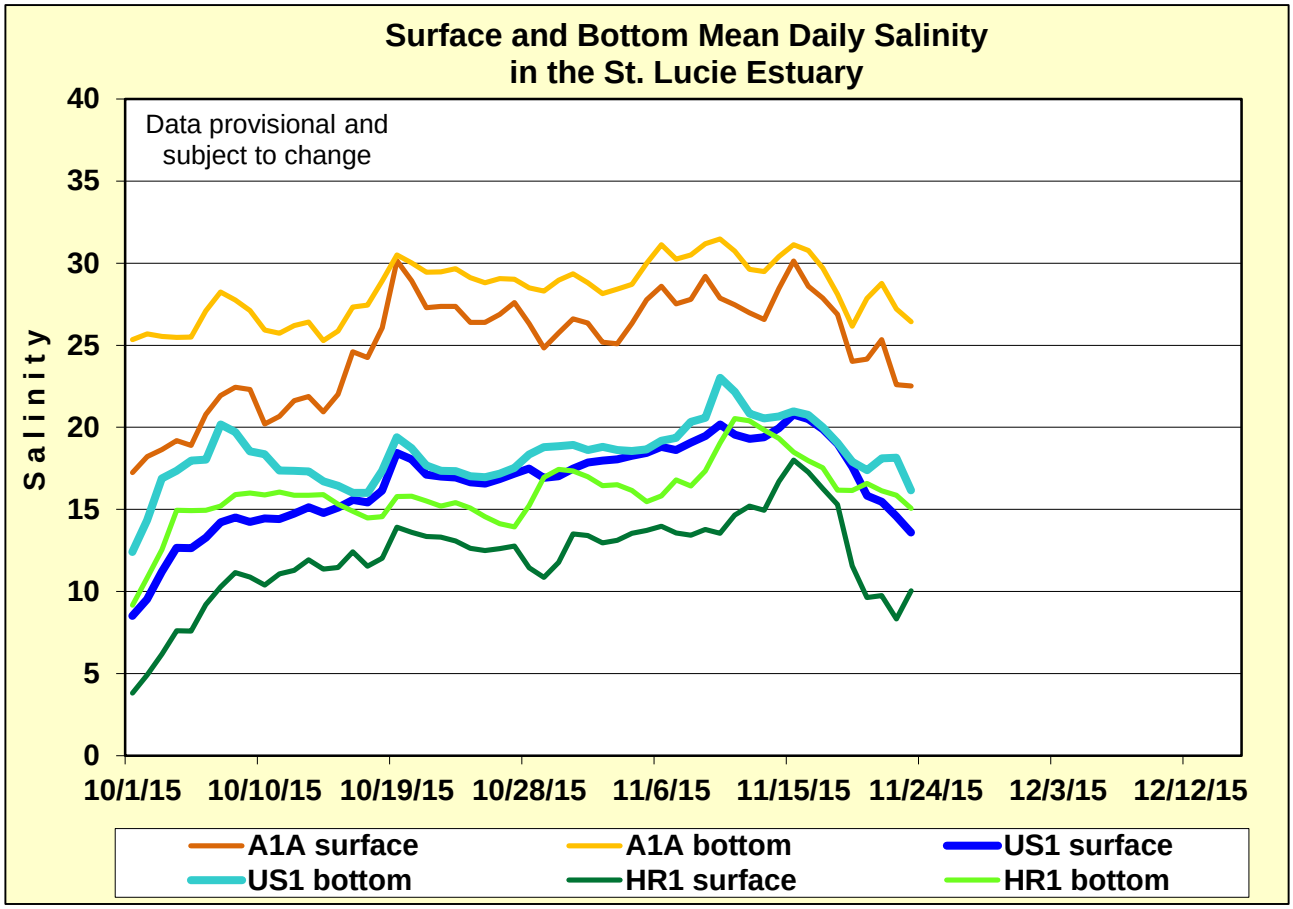


Figure 4. Daily mean salinity at the A1A, US1 and estimated HR1 stations.

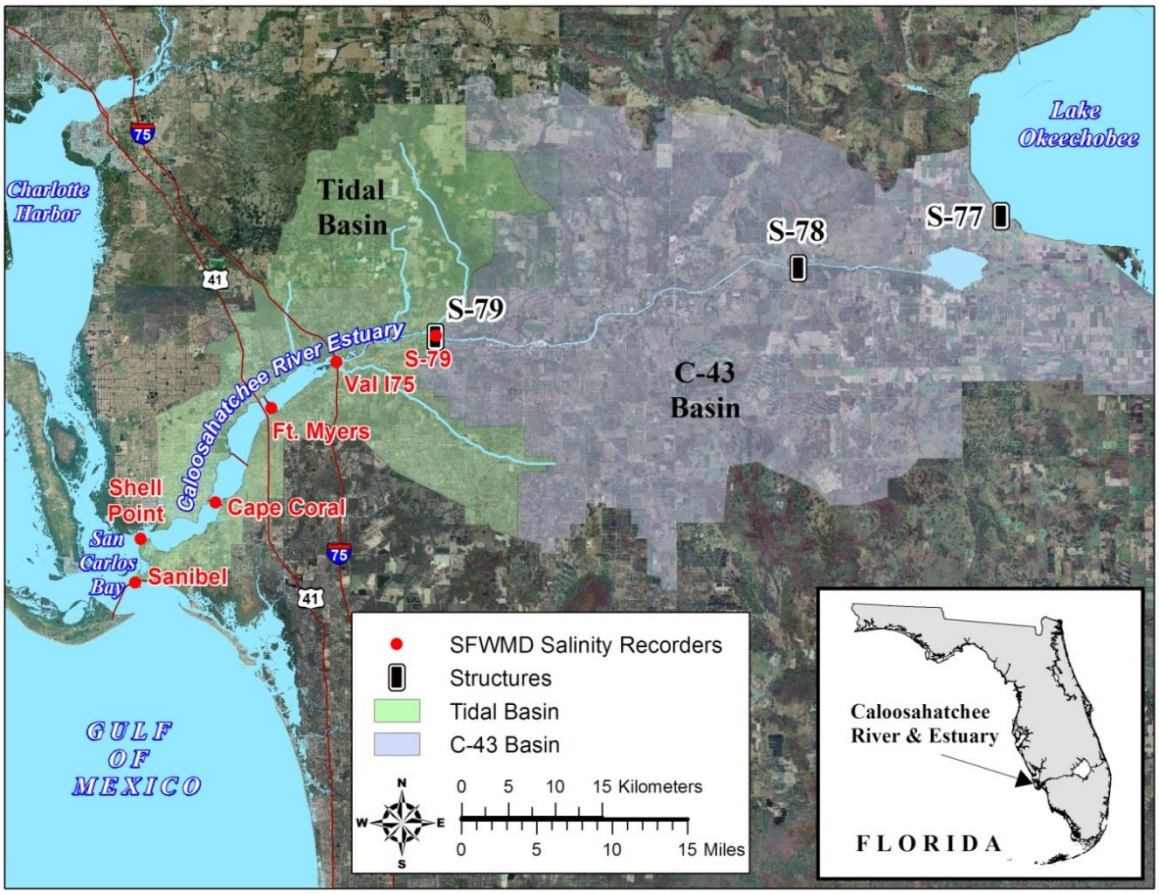


Figure 5. Basins, water control structures, and salinity monitoring for the Caloosahatchee Estuary.

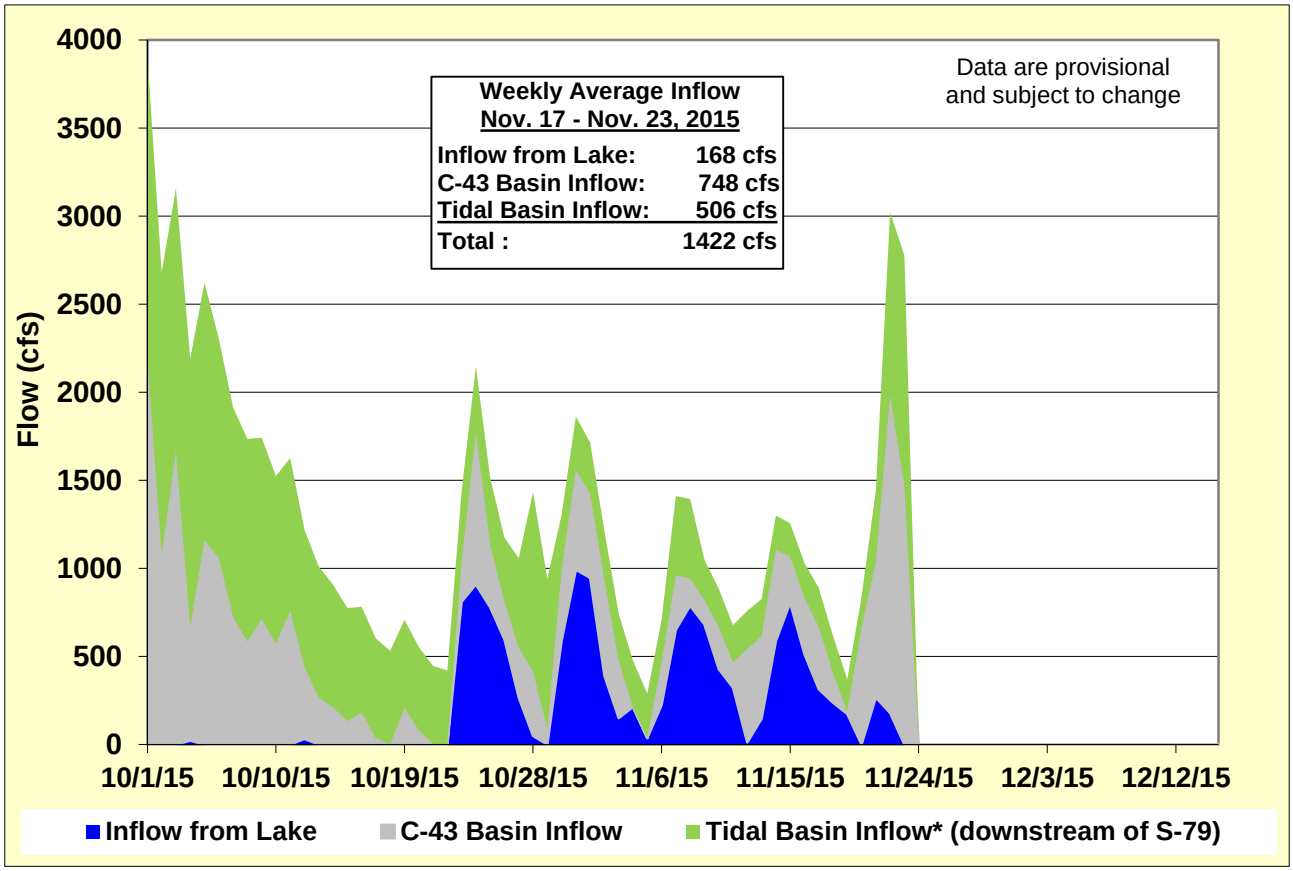
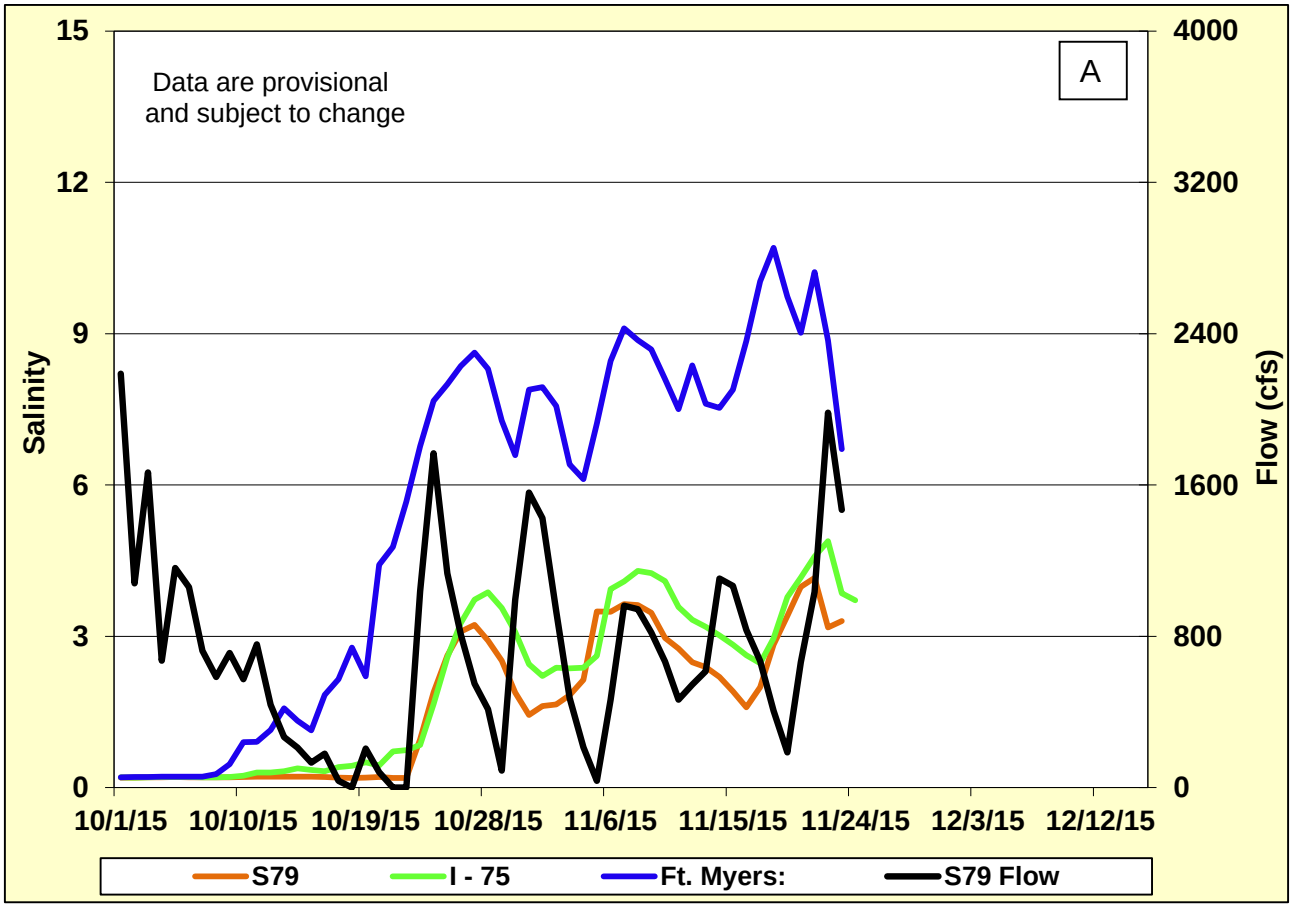


Figure 6. Surface freshwater inflows from Lake Okeechobee, runoff from the C-43 basin, and tributaries in the tidal basin into the Caloosahatchee River Estuary.



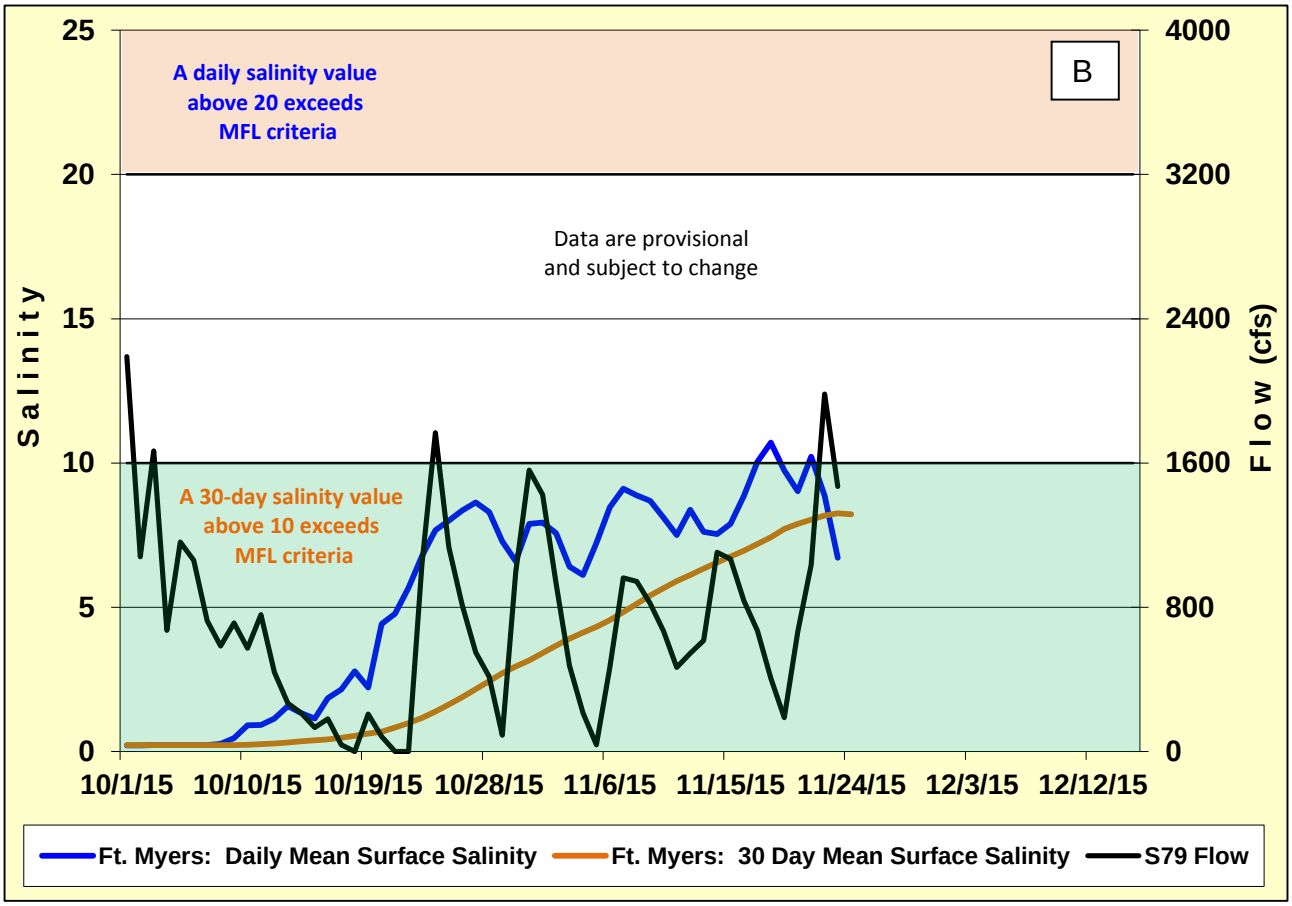


Figure 7. Daily mean flows at S-79 and salinity at upper estuary monitoring stations (A) and 30-day moving average salinity at Ft. Myers (B).

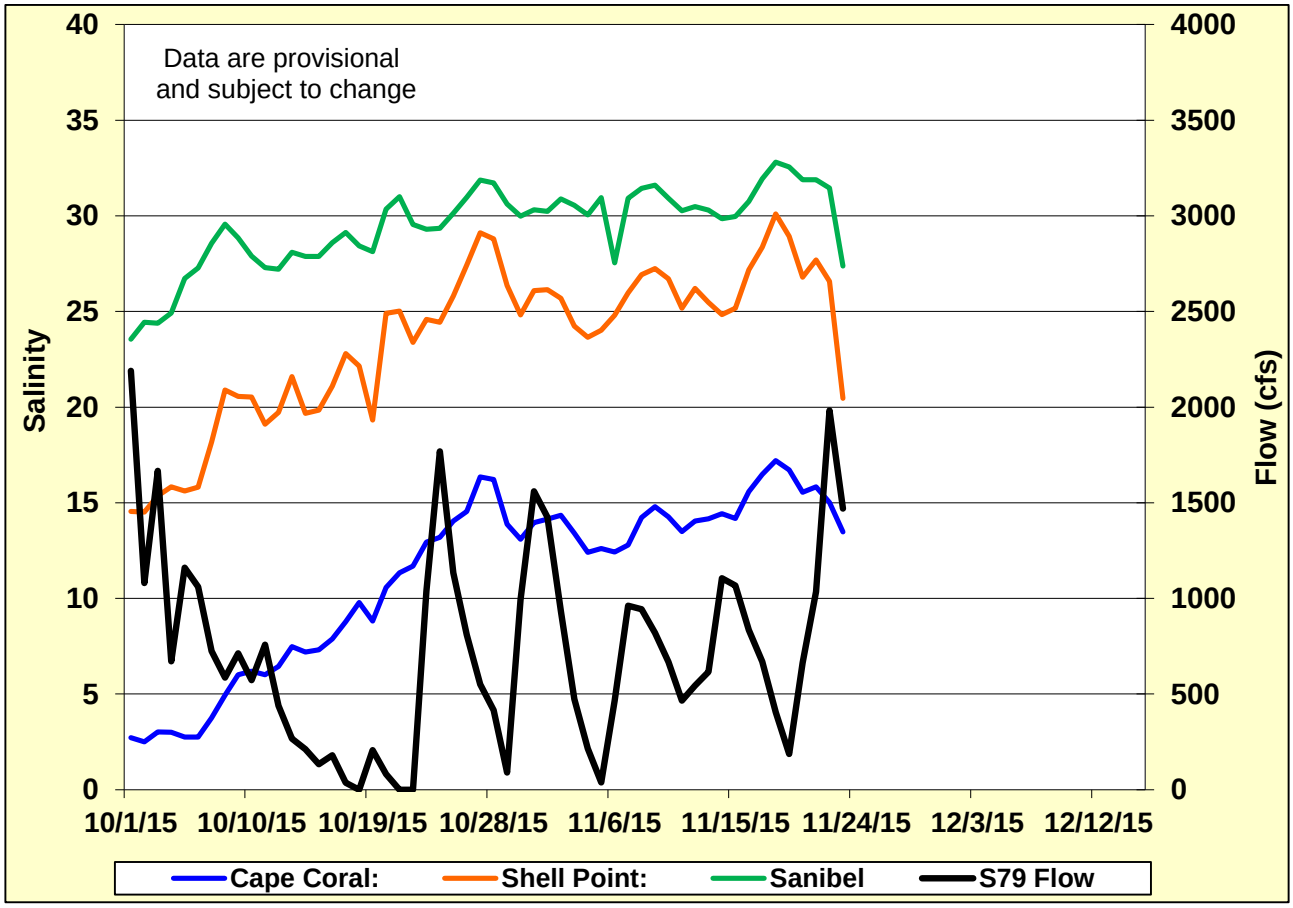


Figure 8. Daily mean flows at S-79 and salinity at lower estuary stations.

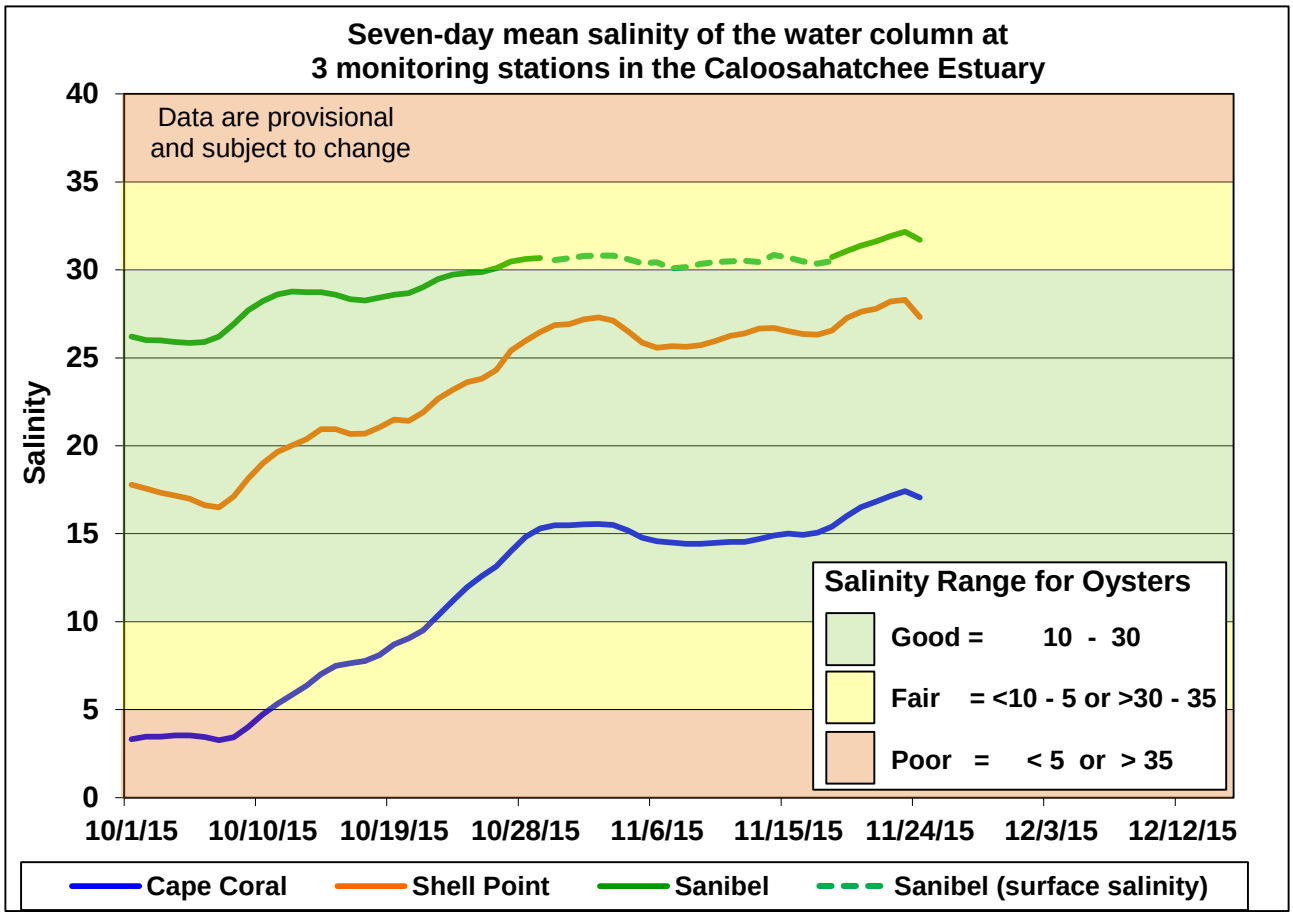


Figure 9. Seven-day mean salinity at Cape Coral Bridge, Shell Point and Sanibel Bridge monitoring stations.

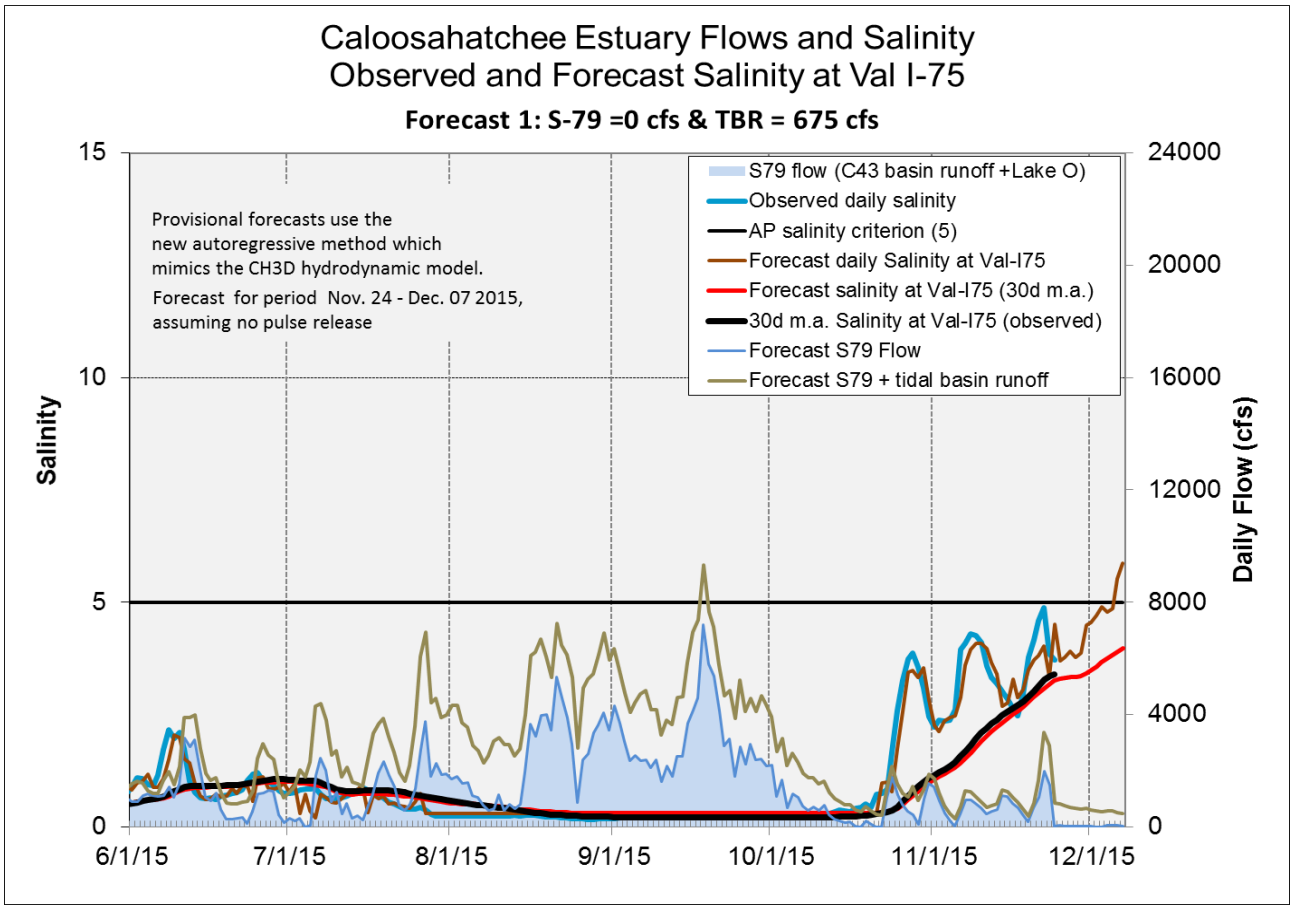
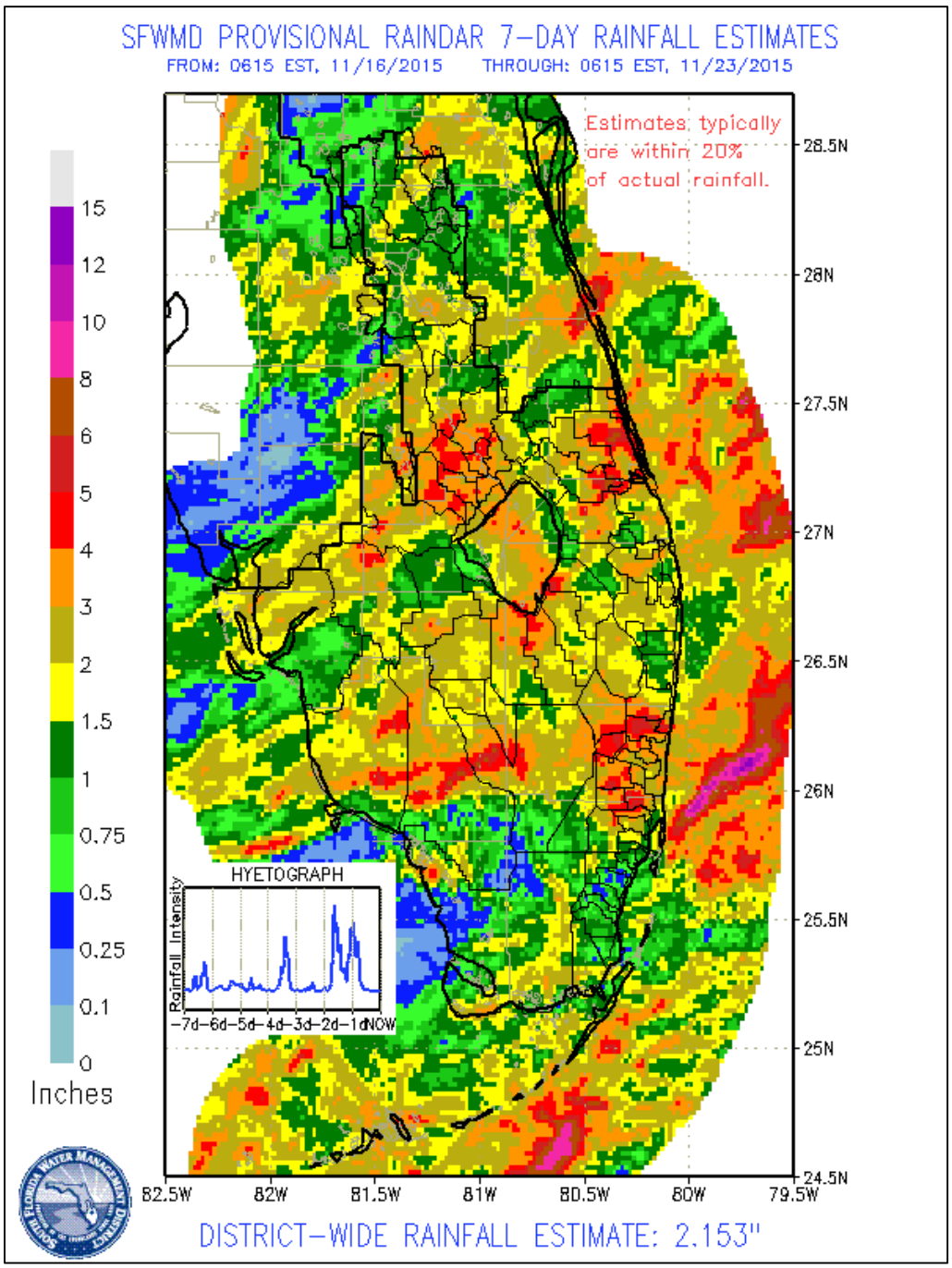


Figure 10. 14-day salinity forecast at Val I-75 assuming no releases at S-79.

GREATER EVERGLADES

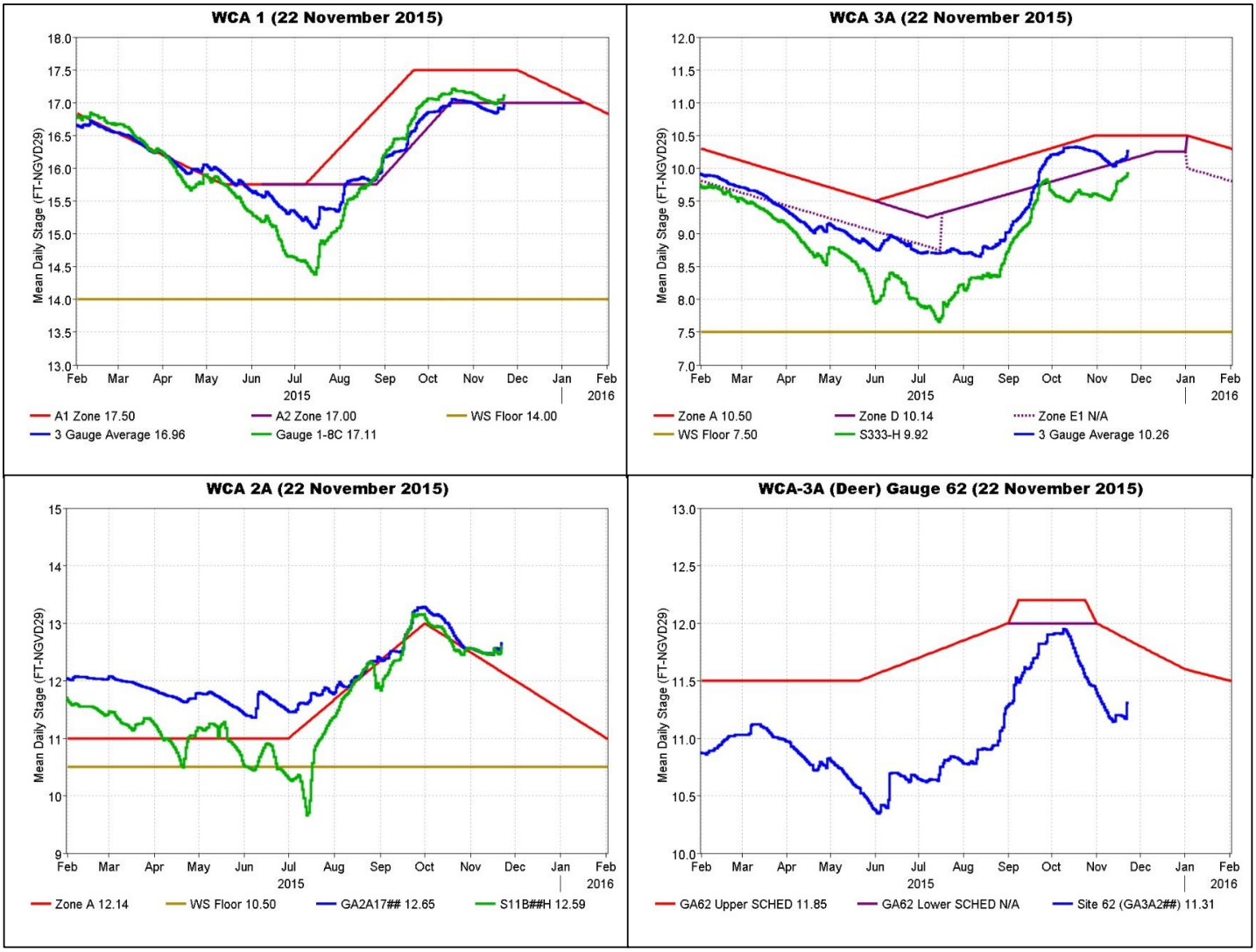
Rainfall was relatively heavy with basin averages ranging from 1.27 inches to 4.56 inches. The maximum local rainfall was 6.30 inches in WCA-3A. Basin-wide stages increased throughout the region. Pan evaporation is 1.05 inches, 21% above the 0.87-inch pre-project average.

Everglades Region	Rainfall (Inches)	Stage Change (feet)
WCA-1	2.16	0.14
WCA-2A	3.10	0.20
WCA-2B	4.56	0.48
WCA-3A	2.36	0.17
WCA-3B	1.39	0.07
ENP	1.27	0.03



Regulation Schedules

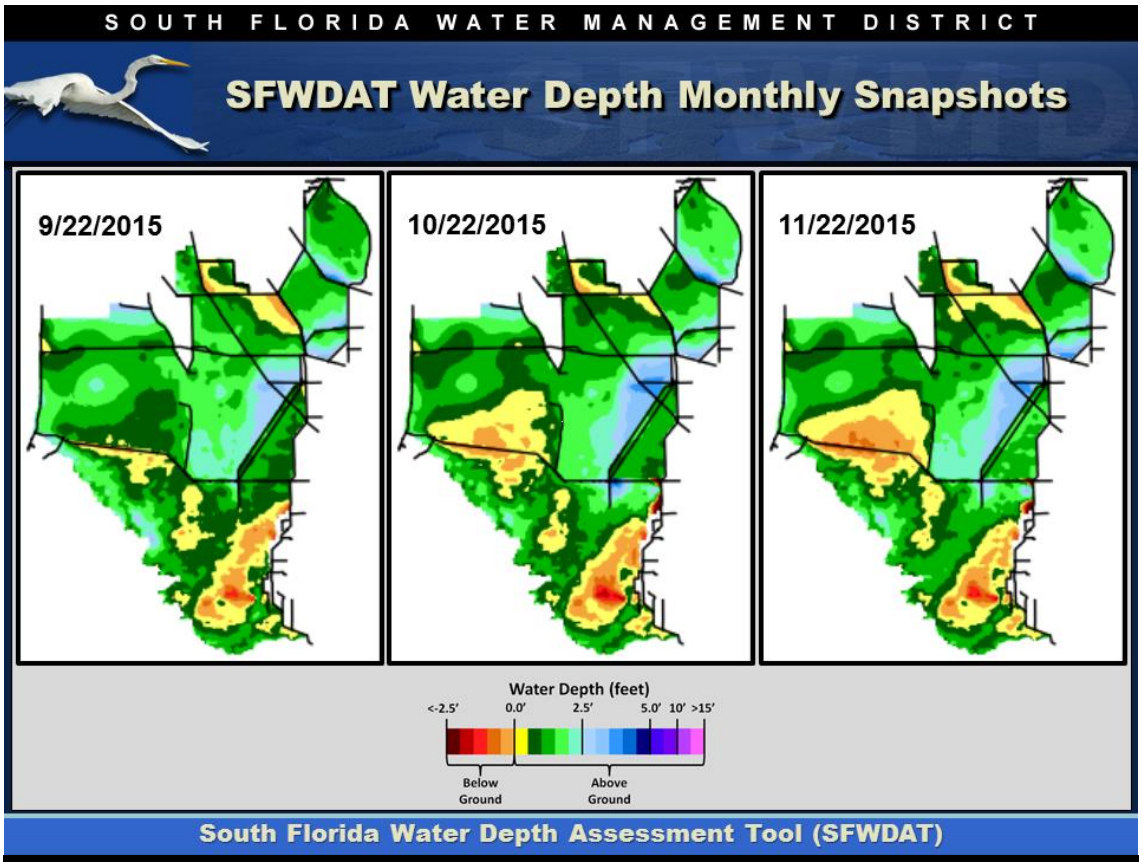
Stage changes increased at the regulation schedule sites last week. The WCA-1 stage is still slightly below the Zone A2 line, but rising. The WCA-2A stage is 0.51 feet above the declining regulation line. The three-gauge average stage in WCA-3A is in Zone D, 0.12 feet above the Zone D line. The stage at the northwestern WCA-3A gauge stage (gauge 62) rose to 0.54 feet below the lower regulation schedule.

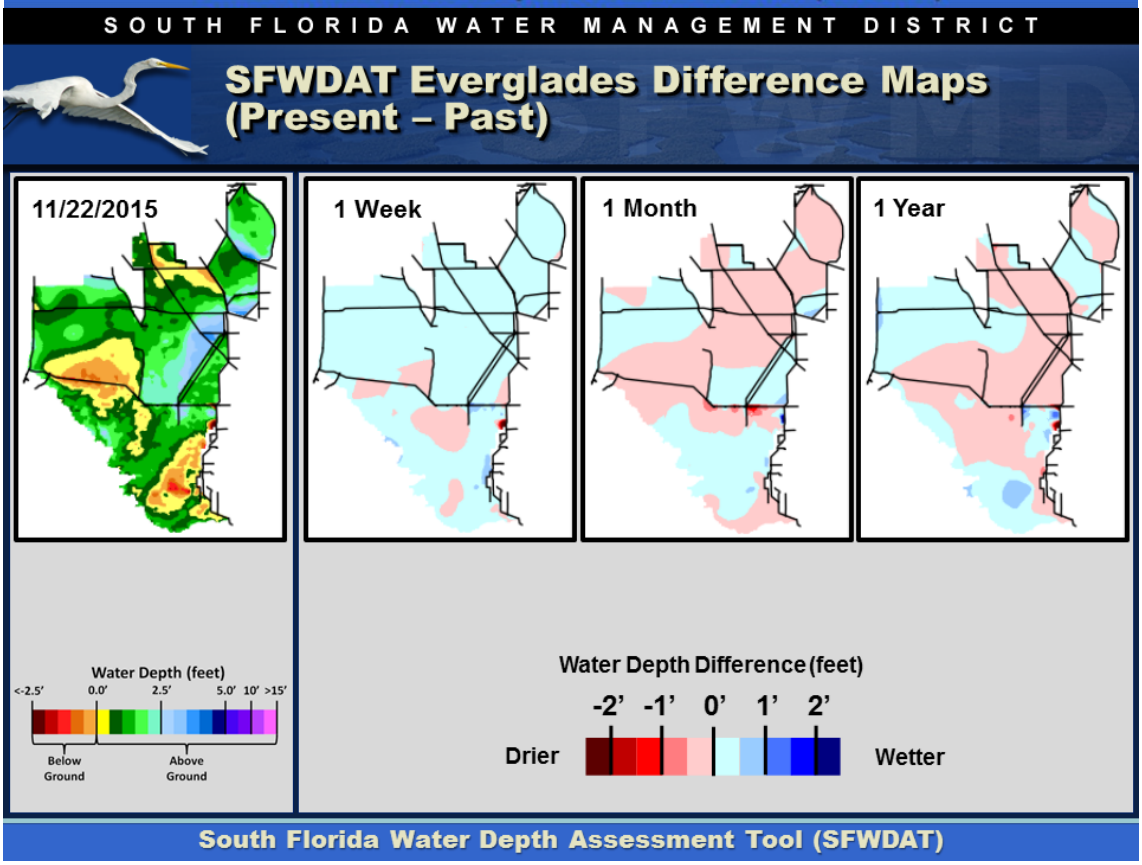


Water Depths and Changes

Water levels in the WCAs and Everglades National Park (ENP) are mixed relative to one month ago and two months ago. Water depths at the monitored gauges range from 1.28 feet to 2.60 feet (both in WCA-3A), excluding WCA-2B.

Stages rose last week nearly everywhere except in parts of ENP. They are mixed relative to a month ago, lower in the northern half and higher southward. They are also mixed relative to a year ago. Individual stage gauge changes increased from 0.03 feet to 0.50 feet.

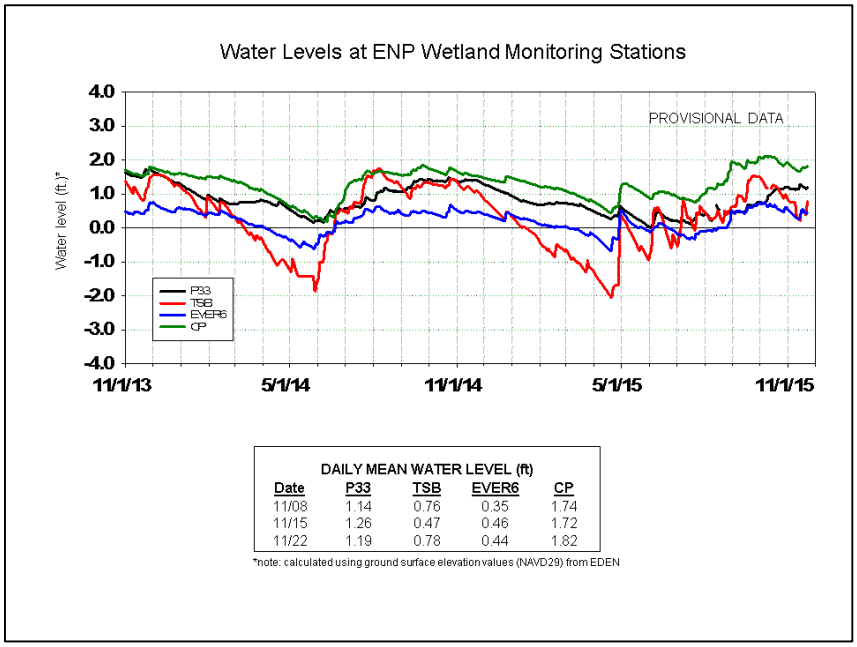




Everglades National Park (ENP) and Florida Bay

Water levels increased in Taylor Slough while they decreased slightly in Northern Shark River Slough and the ENP panhandle. Water levels are still lower than a month ago in Taylor Slough and the C-111 panhandle. The Northern Taylor Slough stage is now three inches below average while southwestern

Taylor Slough and the ENP panhandle are approximately three and one inch above average, respectively.



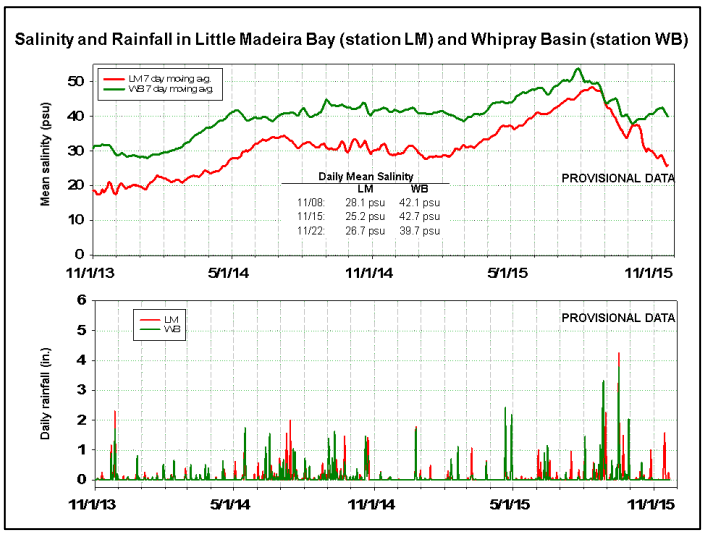
DAILY MEAN WATER LEVEL (ft)

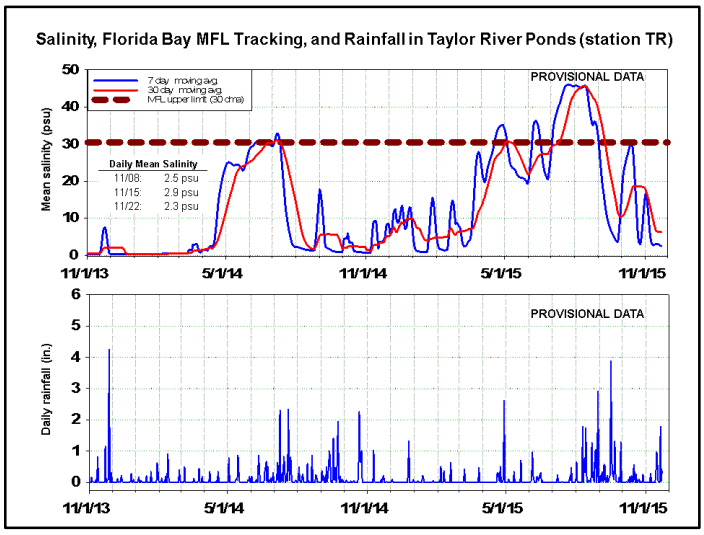
Date	P33	TSB	EVER6	CP
11/08	1.14	0.76	0.35	1.74
11/15	1.26	0.47	0.46	1.72
11/22	1.19	0.78	0.44	1.82

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

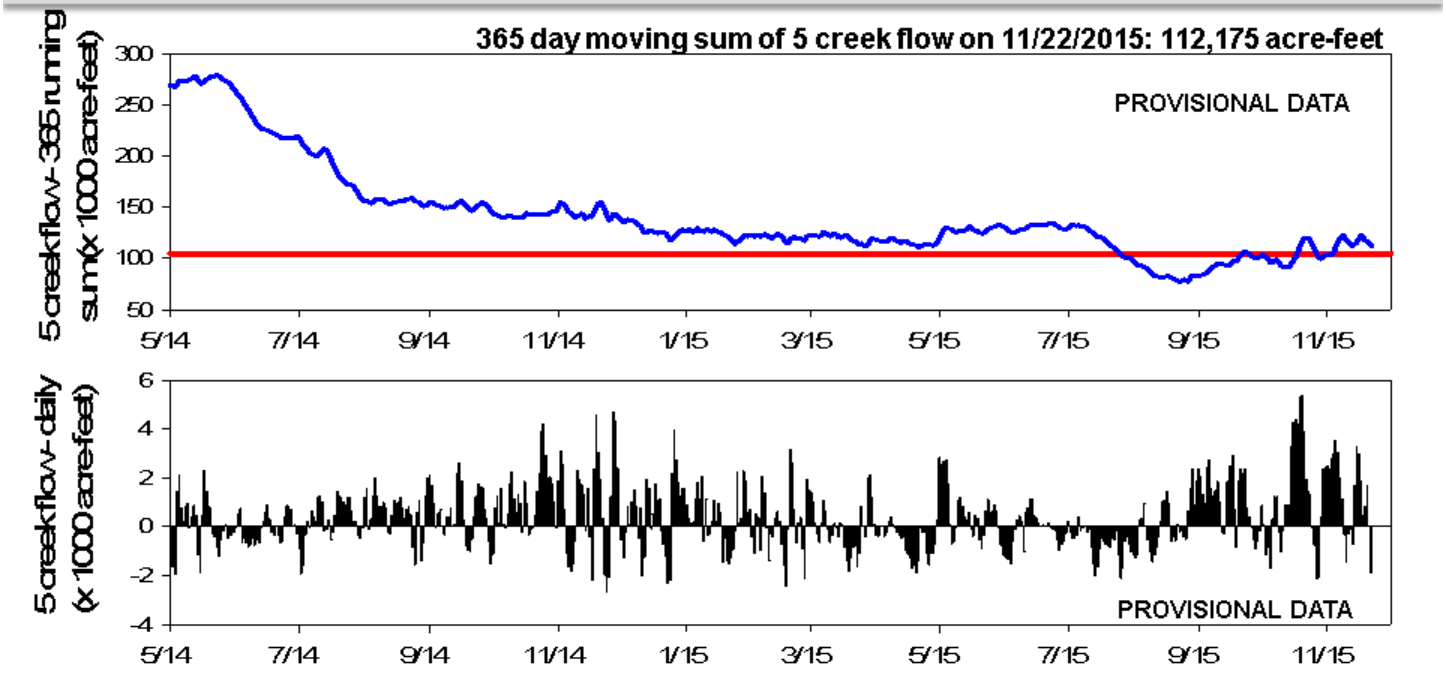
Salinities were mostly stable last week in Florida Bay with most weekly changes below 0.6 psu. Salinity in central Florida Bay decreased by 3 psu, a place where salinities are still 10 psu above average. Salinities are nine to 12 psu above average in the eastern bay, 14 to 15 psu above average in the central and western nearshore embayments, and 7 to 10 psu above average in the central and western bay. Central and western Florida Bay stations are still at 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 2.3 psu (slightly above the seasonal average of under one psu). The 30-day moving average salinity decreased to 6.3 psu.

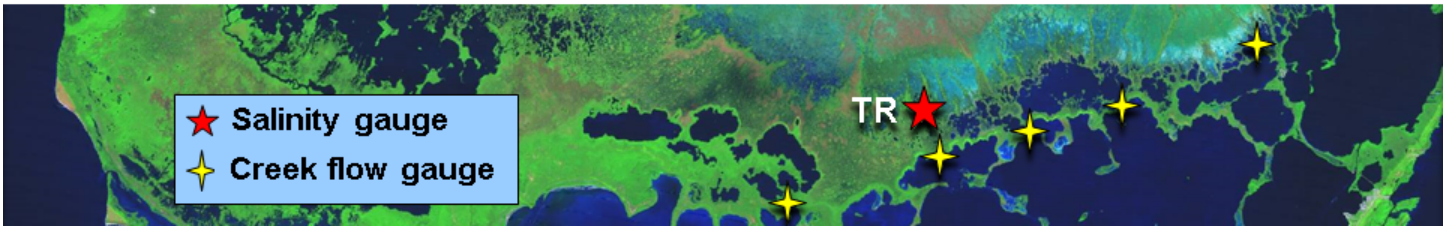
The 365-day running sum of the cumulative flow from the five creeks feeding Florida Bay decreased to 112,175 acre-feet (44 percent of 257,600 acre-feet annual average). Daily differences in the 365-day running sum of the cumulative flow from these creeks represents the difference between current daily flow and flow a year ago. Cumulative flow from the five creeks for the last week (November 16 to 22) was 6,040 acre-feet, 500 acre-feet below average for this time of year, and is higher than last week (2,092 acre-feet, 5,000 acre-feet below average). Creek flow is provisional data 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.

- Rising stages in the WCAs are appropriate for this time of year, but 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.

Summary of Everglades Recommendations, Nov. 24, 2015 (SFWMD) (red is new text)

Area	Current Condition	Cause(s)	Recommendation	Reasons
WCA-1	Stage increased from 0.12' to 0.16'	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.
WCA-2A	Stage increased 0.20'	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.
WCA-2B	Stage increased 0.46' to 0.50'	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.
WCA-3A NE	Stage increased 0.31'	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.
WCA-3A NW	Stage increased 0.18'	Rainfall, ET, management		
Central WCA-3A S	Stage increased 0.06'	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.
Southern WCA-3A S	Stage increased 0.14'	Rainfall, ET, management		
WCA-3B	Stages increased from 0.06' to 0.08'	Rainfall, ET, management	Follow normal seasonal practices.	Promote native habitat and maintain wetland plant communities. Provide foraging habitat for wading birds.
ENP-SRS	Stage increased 0.03'	ET, rainfall, topography, management	Make discharges to the Park according to the ERTP rainfall plan.	Promote native habitat and maintain wetland plant communities.
ENP-CSSS habitats	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.
Taylor Slough	3" below 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
FB- Salinity	Remains 7-15 psu above average	Rain, ET, inflows, wind	Move water southward as possible	Southward flows are still needed to reverse/slow salinity increases