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: January 26, 2016

SUBJECT: Weekly Environmental Conditions for Systems Operations

Summary

Kissimmee
On Sunday, stage in East Lake Toho was ~0.5 below schedule and Toho was ~0.8 feet below schedule; Kissimmee-Cypress-Hatchineha (KCH) was 1.3 feet below schedule. After over two months at minimum discharge, discharge at S-65 is being managed to allow a slow reduction in discharge at S-65A after rainfall over the S-65A basin last week caused increases in discharge at S-65A. This goal is being balanced with letting stage in KCH reach 51.5 feet to start the F&W recession on Feb 1 if conditions allow. Over the past week, discharge at S-65 averaged 477 cfs and at -65A 1115cfs; discharge at S-65E averaged 2779 cfs over the past week. Tuesday morning discharges: S-65 ~745 cfs; S-65A ~880 cfs; S65C ~1980 cfs; S65E ~1980 cfs. Dissolved Oxygen in the Kissimmee River averaged 6.56mg/L over the past week and 7.01mg/L on Sunday. Kissimmee River mean floodplain depth is currently 0.92 feet.

Lake Okeechobee
The Lake stage reversal has continued and the Lake is at 15.32 feet NGVD, in the upper third of the low flow sub-band. Ecological conditions for wading birds, snail kites, and species in the nearshore region are potentially declining. The most recent (January 11 and16) MODIS images suggest the absence of potential algal blooms.

Estuaries
High discharges from the watersheds continued over past week. Total freshwater inflow averaged 2382 cfs to the St. Lucie with no releases from Lake Okeechobee and 5456 cfs to the Caloosahatchee with 118 cfs Lake releases. In the St. Lucie Estuary, salinities dropped to the fair range for adult oysters in the mid-estuary. In the Caloosahatchee Estuary, salinities decreased to the poor range at Cape Coral, and remained in the good range for adult oysters at Shell Point and Sanibel. Salinities were in the good range for tape grass in the upper Caloosahatchee Estuary.

Stormwater Treatment Areas
Over the past week, the STAs/FEBs received approximately 400 acre-feet of Lake Regulatory Releases. The total amount of Lake Releases sent to the STAs/FEBs in WY2016 (since May 1) is approximately 174,100 acre-feet. Over the past week, the STAs received basin runoff and as conditions allowed, the District released water from the A-1 FEB to STA-2 and STA-3/4. Most STA cells are at or above target depths and restrictions remain in place for structure repairs in STA-1E and vegetation rehabilitation in STA-1W. This week, it is recommended no Lake Releases be sent to the STAs/FEBs. As conditions allow, releases will be made from the A-1 FEB to STA-2 and STA-3/4 to create storage in the FEB for future rainfall/runoff events.

Everglades

Rainfall was similar to that of the prior week, ranging from 0.98 inches to 1.60 inches. Stages rose in the WCAs and Everglades National Park (ENP) and are higher than a month and a year ago. The 30-day salinity at the Florida Bay Minimum Flows and Levels (MFL) site remains a seasonally normal 1.0 psu while the cumulative inflow from the five creeks into Florida Bay increased to 209,884 acre-feet (81 percent of the average annual inflow of 257,600 acre-feet). Creek inflow has not exceeded 200,000 acre-feet since July 2014. Salinities are within two psu of their averages for this time of year, including the central and western nearshore embayments. These salinities and flow are great improvements relative to the last year. Southern WCA-3A stages have exceeded 2.5 feet, the stage monitored for tree island inundation and duration, for ten weeks but the other gauges used for the three gauge average are below 2.5 feet. This stage is not considered a problem in southern WCA-3A unless it extends considerably longer than 17 weeks and is repeated for multiple years in a row.

Weather Conditions and Forecast

Wet tomorrow and Thursday as El Nino continues to have a significant impact on our weather. Moisture is returning to the area so expect some scattered showers mainly east this afternoon. A cold front currently over Louisiana is expected to move through the District Thursday with moisture and energy streaming across the District well ahead of the front. This moisture and energy is expected to generate areas of rain with embedded heavy showers and thunderstorms beginning pre-dawn Wednesday and continuing into Wednesday night. Heaviest rains are expected to focus to across the southern half of the District. Showers and thunderstorms will then accompany the front itself as it moves through the District during the day Thursday. High pressure will bring dry and cool conditions Friday and over the weekend. The next frontal system after this week's system is expected to bring rains next Wednesday, Thursday, and Friday.

KISSIMMEE BASIN

Kissimmee Basin Rainfall

The Upper Kissimmee Basin received 0.17 inches of rainfall in the past week and the Lower Basin received 0.35 inches (SFWMD Daily Rainfall Report 1/25/2016).

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: 1/26/2016

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)						
							1/24/16	1/17/16	1/10/16	1/3/16	12/27/15	12/20/15	12/13/15
Lakes Hart and Mary Jane	S62	102	LKMJ	60.5	R	61.0	**-0.5**	-0.4	-0.5	-0.5	-0.5	-0.4	-0.5
Lakes Myrtle, Preston, and Joel	S57	62	S57	61.1	R	61.4	**-0.3**	-0.1	-0.4	-0.4	-0.4	-0.4	-0.4
Alligator Chain	S60	52	ALLI	63.5	R	64.0	**-0.5**	-0.6	-0.8	-0.8	-0.7	-0.8	-0.8
Lake Gentry	S63	117	LKGT	61.2	R	61.5	**-0.3**	-0.1	-0.2	-0.3	-0.3	-0.4	-0.2
East Lake Toho	S59	133	TOHOE	57.5	R	58.0	**-0.5**	-0.6	-0.5	-0.4	-0.4	-0.4	-0.6
Lake Toho	S61	1114	TOHOW	54.2	R	55.0	**-0.8**	-0.4	-0.5	-0.7	-0.5	-0.5	-0.5
Lakes Kissimmee, Cypress, and Hatchineha	S65	477	LKISSP, KUB011, LKIS5B	51.2	R	52.5	**-1.3**	-1.8	-2.1	-2.1	-2.1	-2.1	-2.1

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

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

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

DATA ARE PROVISIONAL

Lower Kissimmee Basin

Discharges and stages at Lower Basin structures are shown in Table 2. SFWDAT depth maps for the Phase I restoration area are shown in Figure 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: **1/26/2016**

Metric	Location	Sunday's 1-day average	Weekly Average**									
			1/24/16	1/17/16	1/10/16	1/3/16	12/27/15	12/20/15	12/13/15	12/6/15	11/29/15	11/22/15
Discharge (cfs)	S-65	926	**477**	130	347	376	375	358	247	272	267	402
Discharge (cfs)	S-65A	1042	**1115**	463	286	270	288	310	293	296	272	290
Discharge (cfs)	S-65C	2019	**2017**	877	536	459	512	584	693	674	749	687
Headwater stage (feet NGVD)		33.4	**33.7**	33.5	33.4	33.3	33.3	33.5	33.6	33.5	33.9	34.3
Discharge (cfs)	S-65D****	2351	**2716**	1318	726	553	621	718	965	834	1016	860
Discharge (cfs)	S-65E	2371	**2779**	1369	582	434	518	650	964	917	1026	806
DO concentration (mg/L)***	Phase I river channel	7.01	**6.56**	7.12	7.08	6.66	6.71	6.31	6.98	6.56	6.51	5.22
Mean depth (feet)*	Phase I floodplain	**0.92**	N/A	0.79	0.54	0.40	0.41	0.45	0.50	0.61	0.52	0.69

* 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

Water Management Recommendations

Kissimmee Basin Adaptive Recommendations and Operational Actions

Date	Recommendation	Purpose	Outcome	Source
1/20/2016	Continue to adjust discharge at S65 to follow the draft 2015-16 Dry Season SR guidelines for rampdown at S65A. Balance discharge at the two structures to maintain at least minimum discharge to the river. As stage rises above 51 ft in KCH, temporarily bypass the Fig 1 discharge plan in the SR and manage discharge to let KCH stage rise to 51.5 ft (the Feb 1 recession starting stage) if conditions allow while following rampdown guidelines. If KCH stage rises further than 51.5 ft, we will reevaluate. As changes in discharge become necessary, continue to follow the Table 1 guidelines in the SR. Switch to Table 2 rampup/rampdown guidelines on Feb 1 or when the recession line is intercepted for management of the recession in KCH.	If conditions allow, to let stage increase to 51.5 ft to intersect the Feb 1 starting stage for KCH F&W recession line.		KB Tech Team
12/10/2015	Temporarily raise from 50.5 ft to 51 ft the threshold stage for increasing discharge at S65/S65A to 1400 cfs. This is a temporary modification of the current draft 2015-16 dry season Standing Recommendation (SR). Discontinue last week's temporary change in the rate of discharge increase and return to the original per-day rates shown in Table 1 of the draft SR - i.e., increase discharge to 1400 cfs at a rate of 150 cfs/day rather than 150 cfs/2 days. If KCH stage should start to decline while ramping up but before reaching 1400 cfs, begin to ramp back down using the rates in Table 1.	Slow the effect of discharge on KCH stage, balance KCH stage and KRRP discharge objectives.	Implemented	KB Tech Team
12/9/2015	Maintain ~300 cfs at S65/S65A until average stage in KCH rises to 51 ft. This is a temporary modification of the current draft dry season SR raising the stage threshold for discharge rampup from 50.5 ft to 51 ft. Once stage reaches 51 ft, begin increasing discharge at a rate of 150 cfs/day per Table 1 in the draft 2015-16 Dry Season SR. Discontinue the temporary guidance provided below (12/2/2015) and return to the original guidelines for rate of discharge rampup per Table 1 (150 cfs/day rather than 150 cfs/2 days).	Slow the effect of discharge on KCH stage, balance KCH stage and KRRP discharge objectives.	Implemented	KB Tech Team
12/2/2015	Temporary modification of draft Dry Season SR for rainfall forecast the week of Nov. 30. If stage in KCH increases to 50.5 ft, begin increasing S65 discharge to 1400 cfs at a rate of up to 150 cfs per 2 days rather than every day – this is half the discharge increase rate in Table 1 of the draft 2015-2016 Dry Season SR.	The slower discharge increase rate is a temporary change that is intended to allow time to assess whether or not we have entered a wetter period that would allow 1400 cfs to be sustained.	TBD	KB Ops
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.			

KCOL Hydrographs (through Sunday midnight)

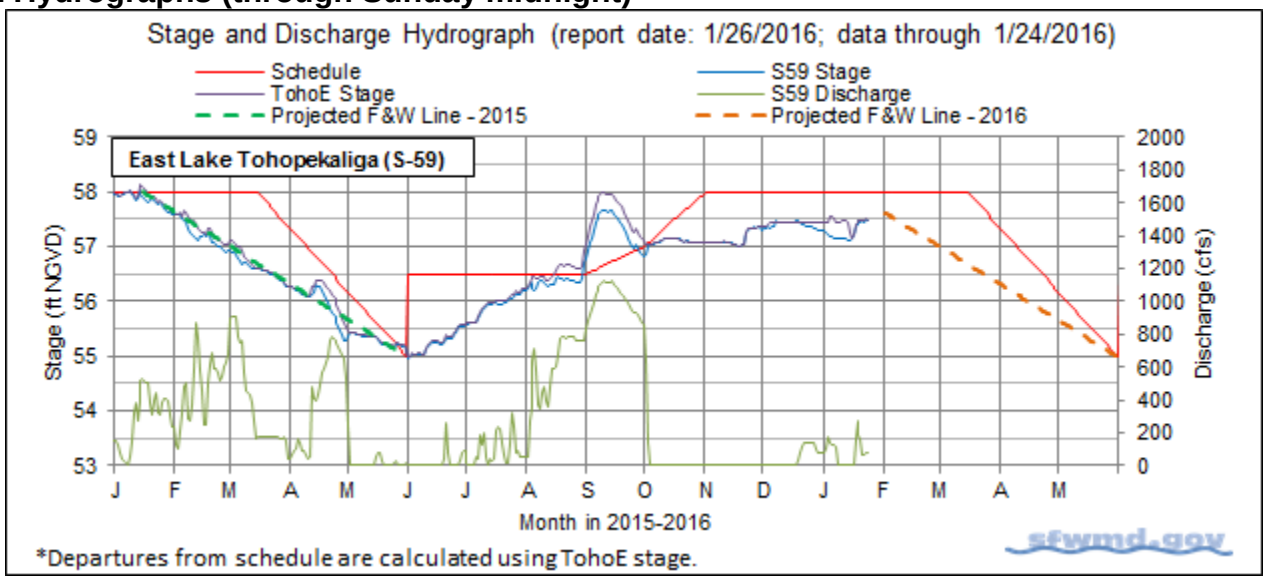

Figure 1.

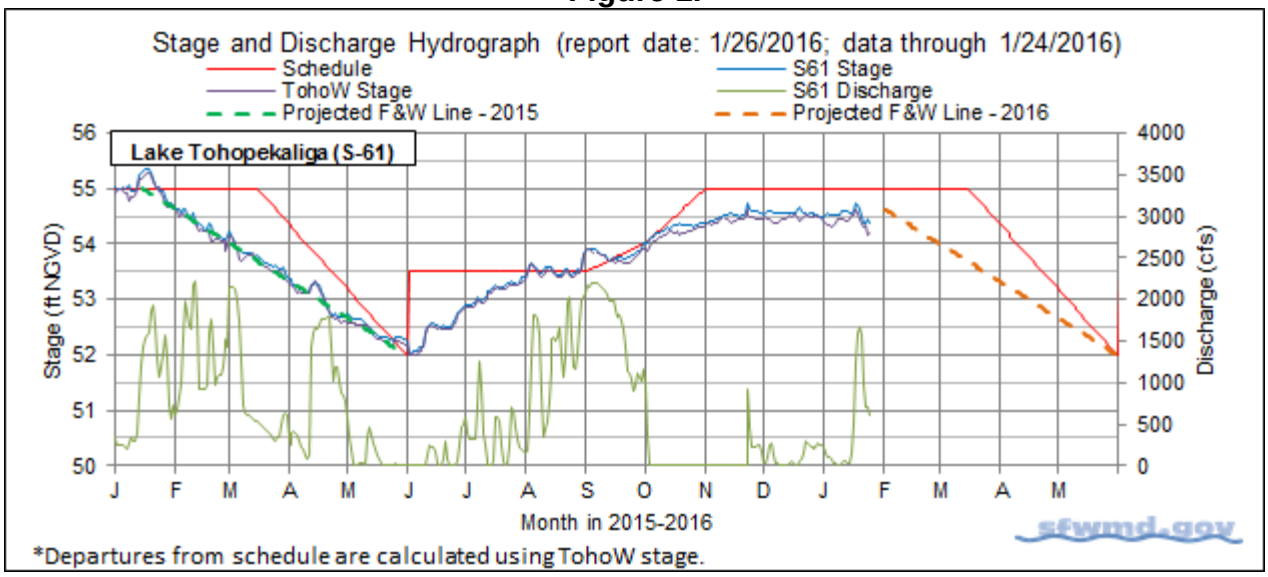

Figure 2.

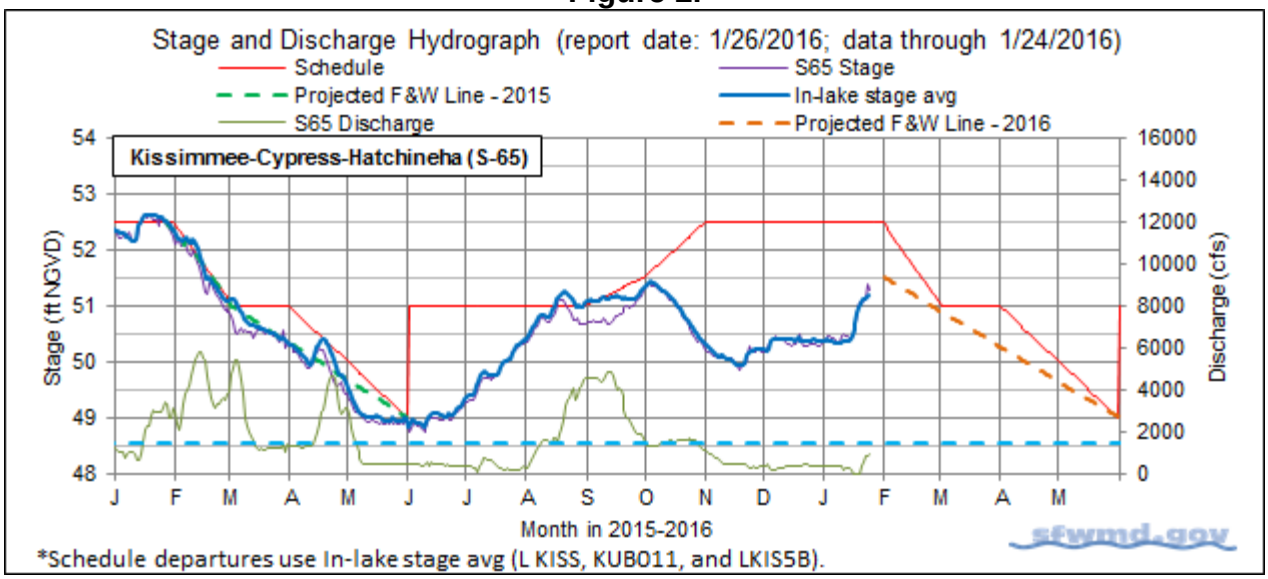

Figure 3.

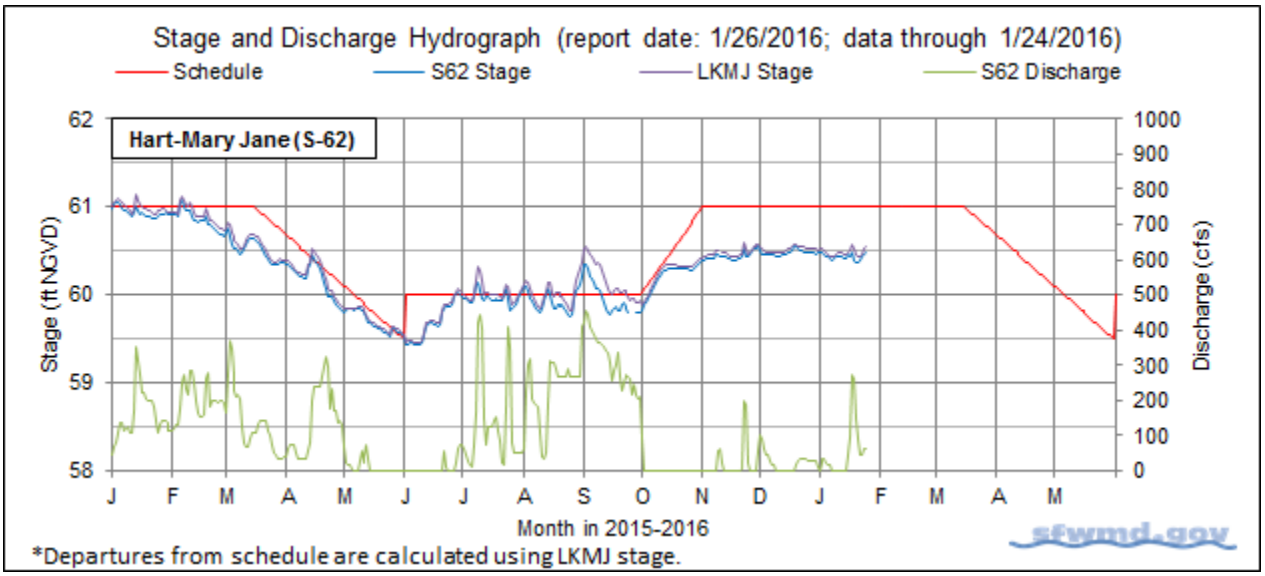

Figure 4.

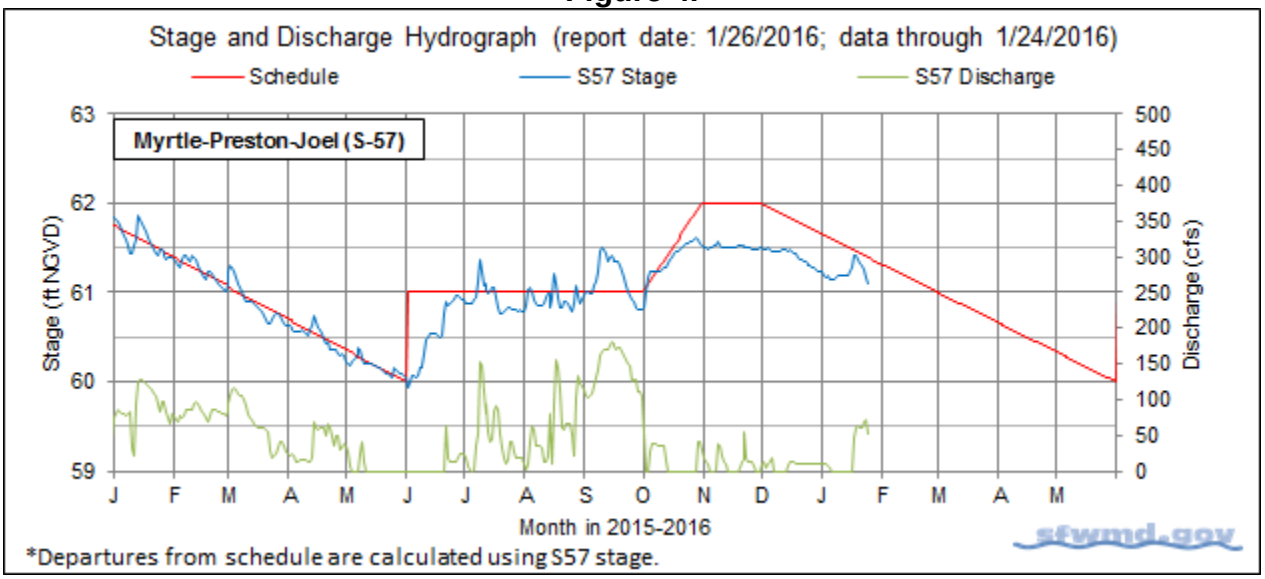

Figure 5.

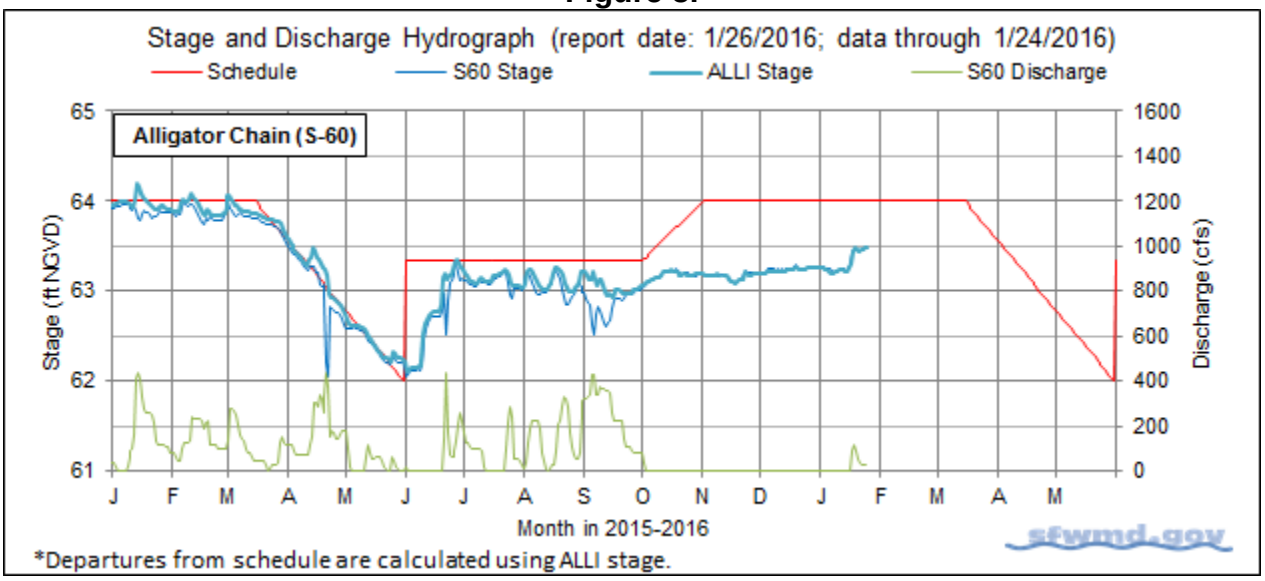

Figure 6.

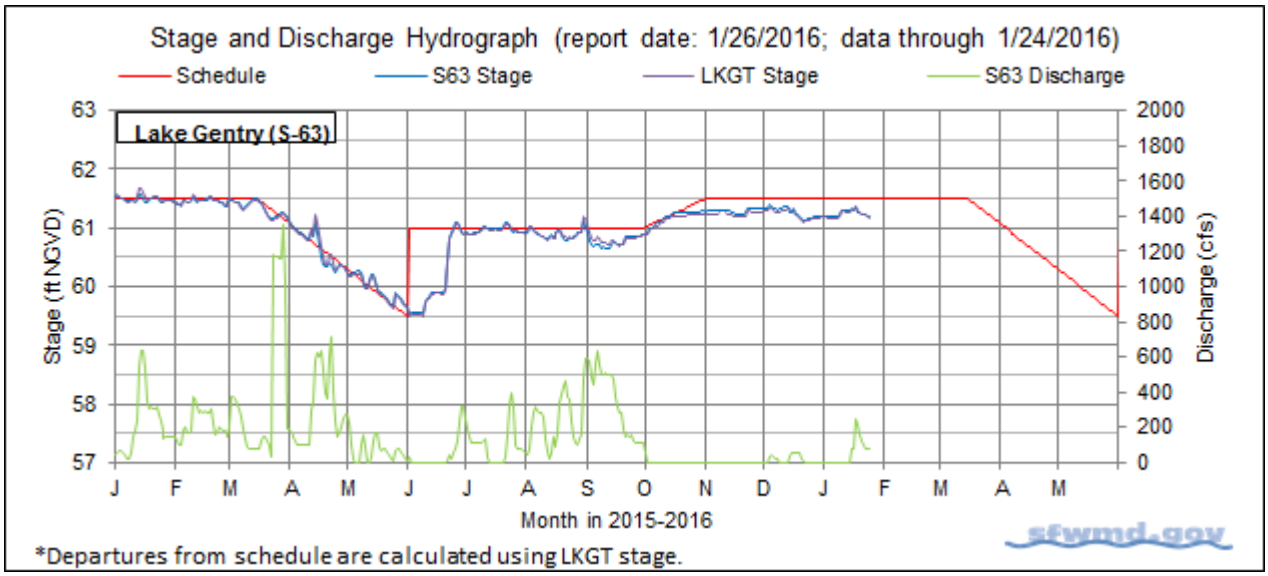

Figure 7.

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Limits on Rate of Discharge Change at S65/S65A During F&W Recessions for Dry Season 2015-2016

Table 2. Maximum discharge rate of change limits for S65/S65A for use during departures after stage has intersected the KCH F&W recession line. These are maximum rates and should be implemented with discretion and as slowly as possible.
****Rate limits apply only in Zone B****

		Departure (ft) above the F&W line				Departure (ft) below the F&W line				
		<= 0.5	> 0.5	> 0.75	> 1.0	>= -0.3	< -0.3	< -0.5	< -0.75	< -1.0
	Q (cfs)	Maximum rate of increase (cfs/day)				Maximum rate of decrease (cfs/day)				
Zone B	0-300	50	100	150	200	-50	-100	-150	-200	-250
	300-1400	150	300	450	600	-75	-150	-225	-300	-375
	1400-2500	300	600	800	800	-300	-600	-600	-600	-600
	2500-3000	1000	1000	1000	1000	-600	-600	-600	-600	-600
Zone A		No limits								

*S65 discharge plan for Wet Season 2015 was discontinued on January 20, 2016 to allow lake stage to rise by Feb 1 as conditions permit. From 2015-2016 dry season standing recommendation.

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Figure 8a. Limits on rate of discharge change at S-65/S-65A during F&W recessions for dry season 2015-2016. Table 2 is from the 2015-2016 dry season standing recommendation.

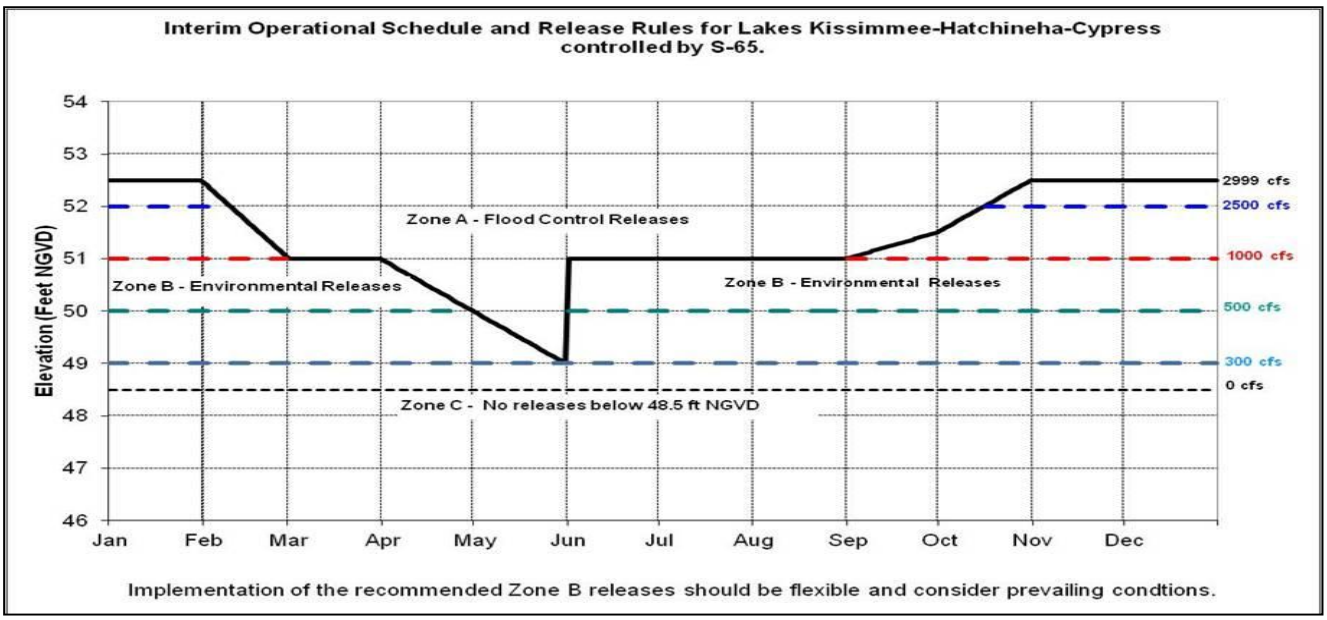


Figure 8b. Interim operations schedule for S-65. The discharge schedule shown to the right has not been used in recent years or in Wet Season 2015.

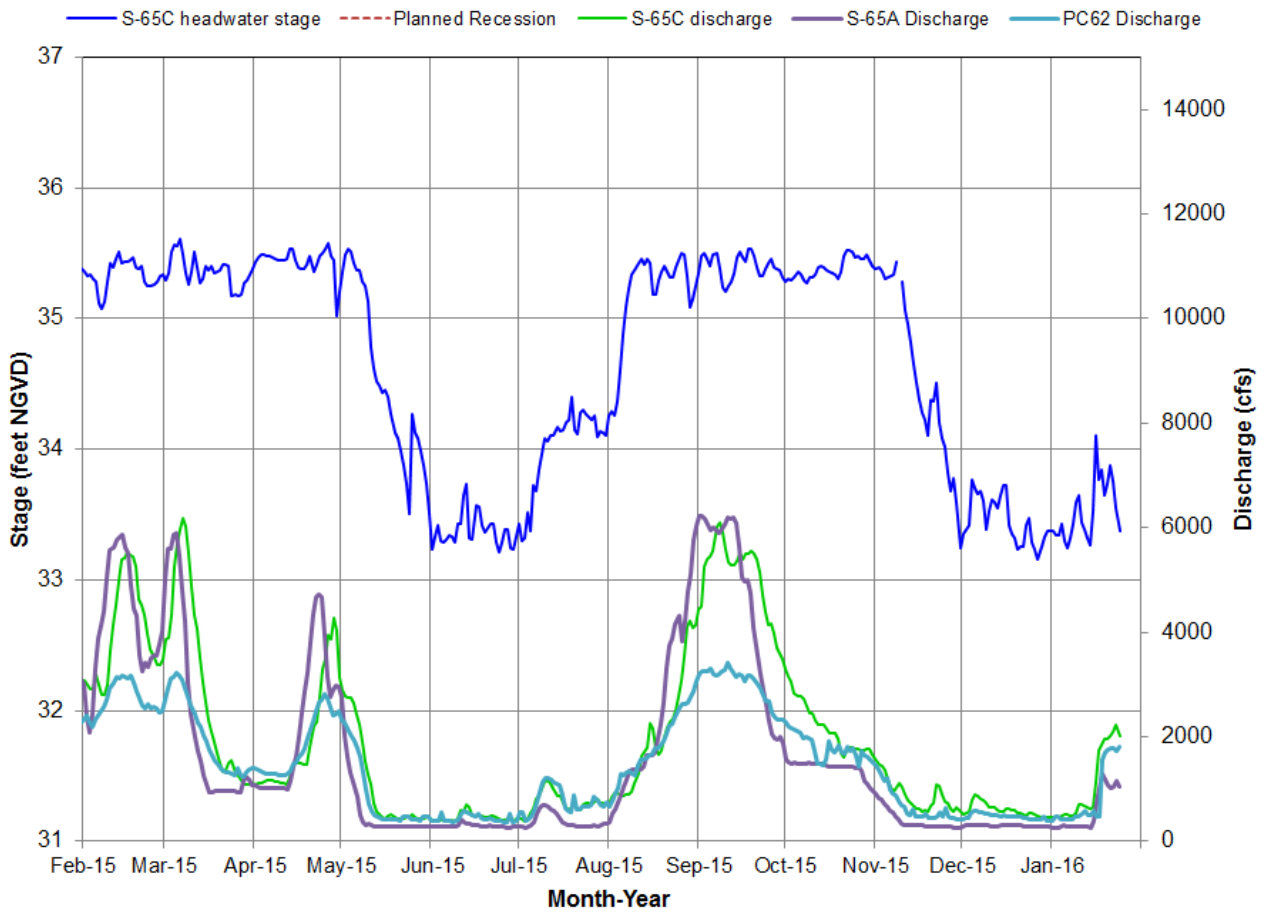


Figure 9. S-65C headwater stage in relation to discharge at S-65C, S-65A, and PC62.

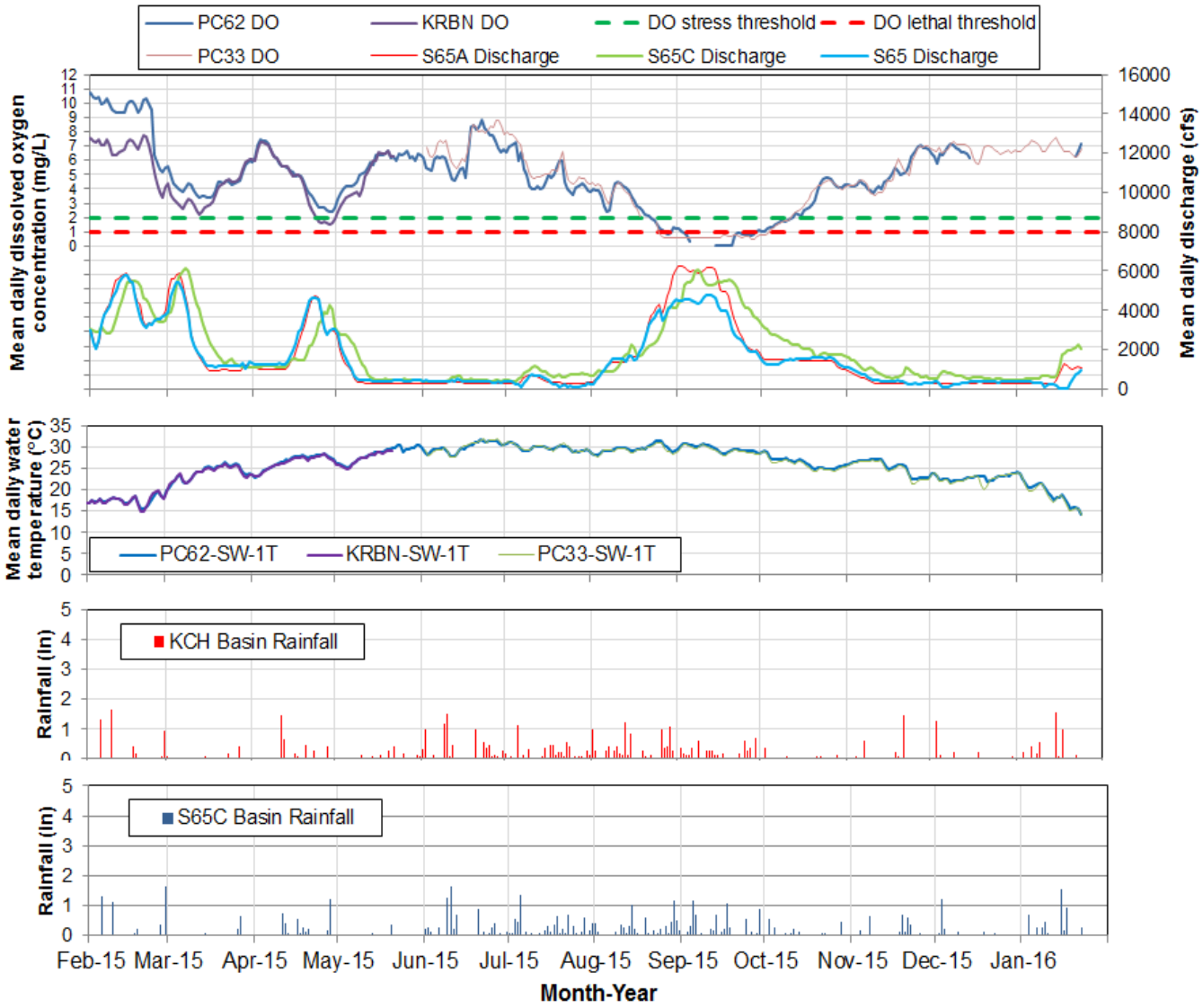
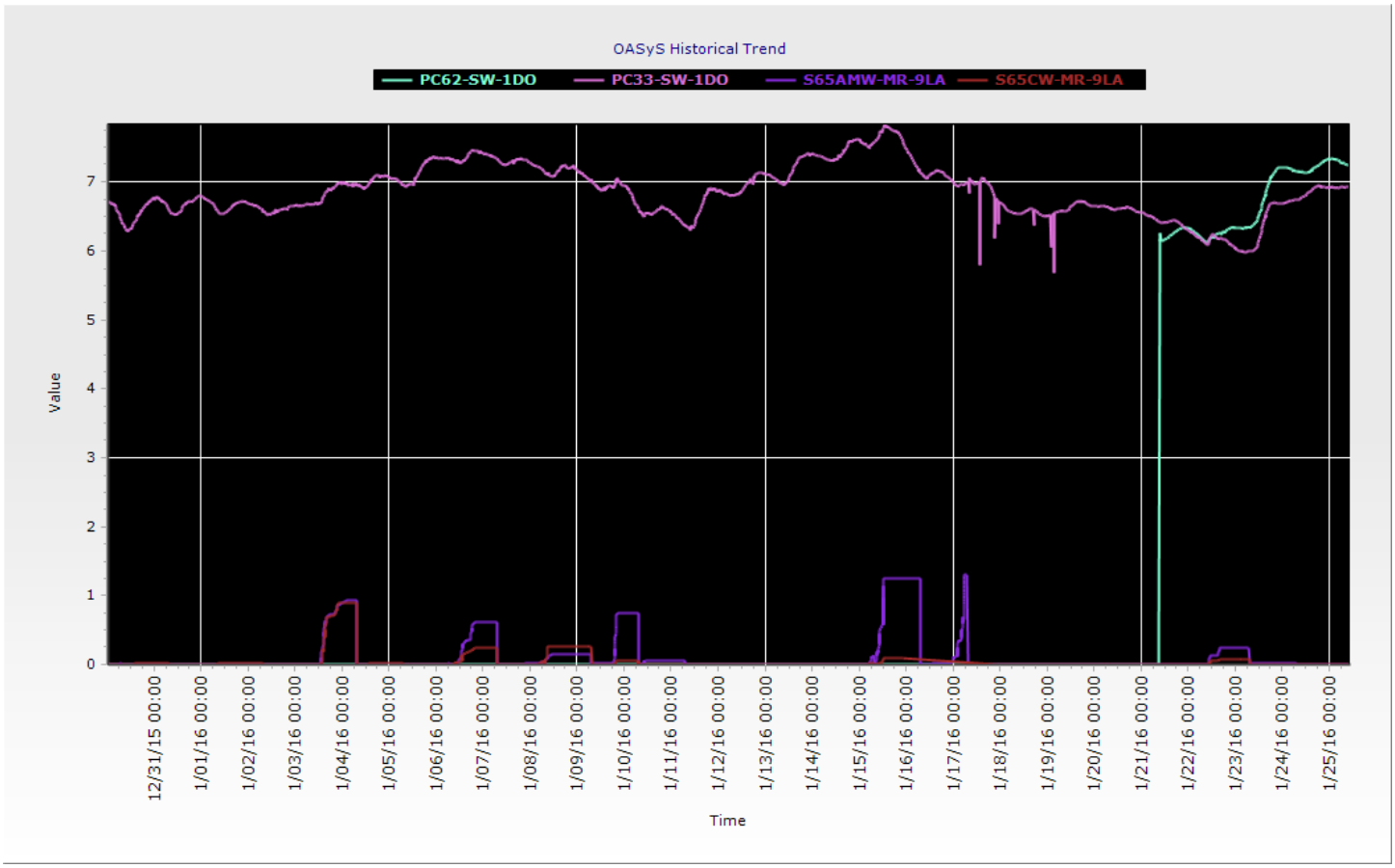


Figure 10. Mean daily Dissolved Oxygen, discharge, temperature and rainfall in the Phase I river channel.



Insert A. Phase I river channel Dissolved Oxygen (measured at 15 minute intervals) and rainfall at S-65A and S-65C.

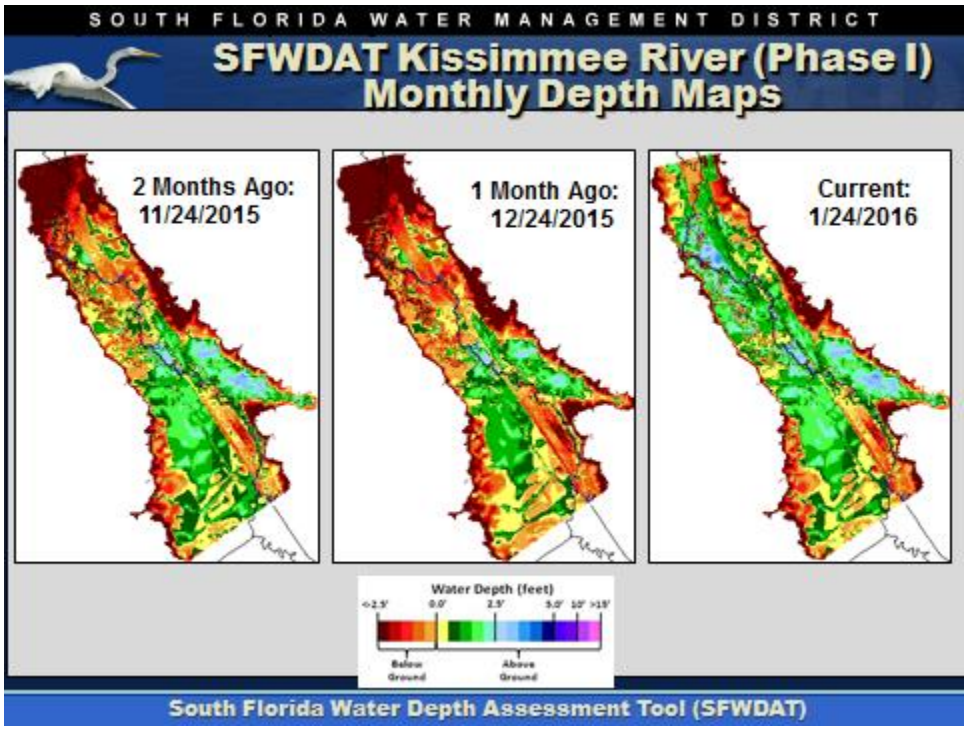
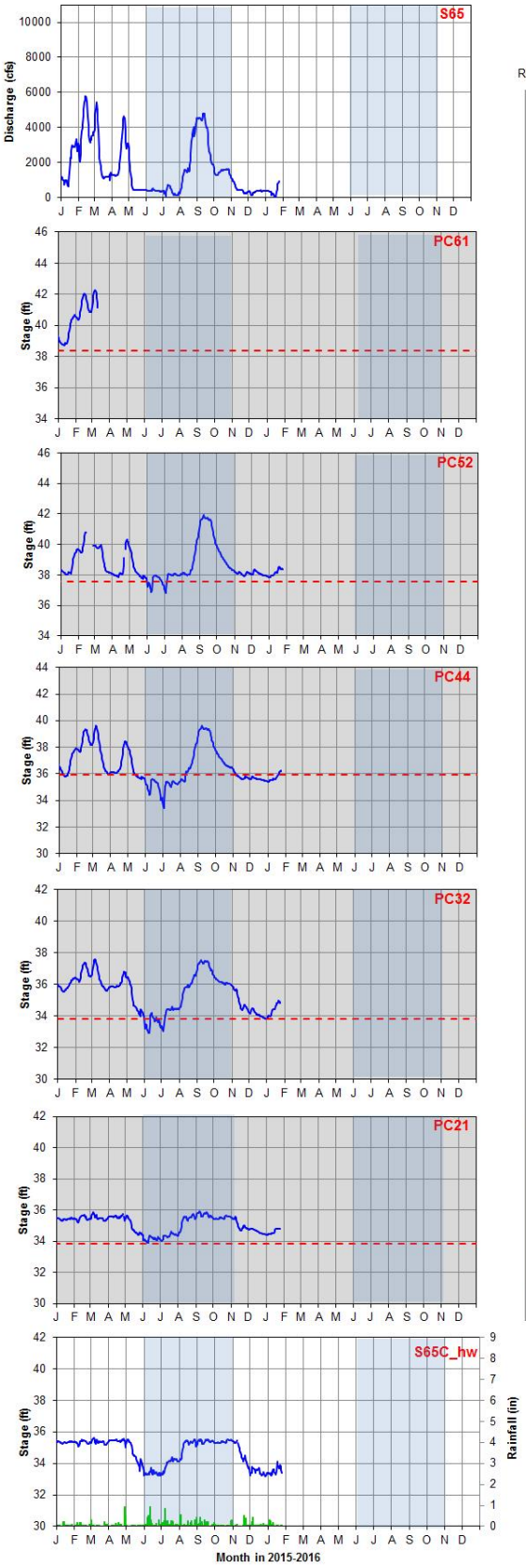


Figure 11. Phase I area floodplain water depths for this week, one month ago, and two months ago. Note that the WDAT color-coding has been modified to accommodate greater

water depths; these maps are not directly comparable to Kissimmee Basin WDAT maps published prior to Jan. 16, 2012.

Kissimmee River Hydrographs



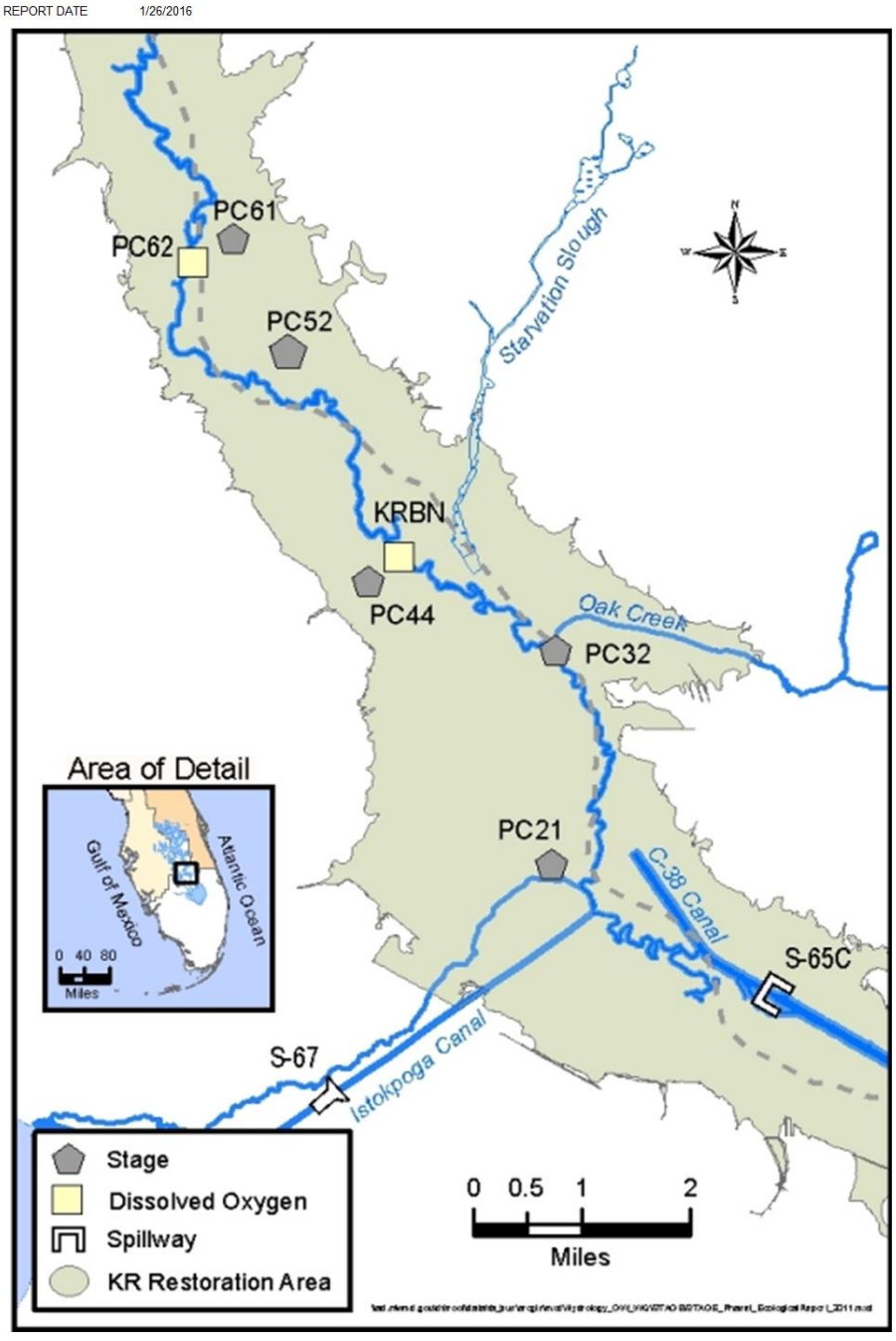


Figure 12. Discharge at S65, stages at five monitoring stations in the Phase I area of the Kissimmee River floodplain, and headwater stage at S65-C since January 1, 2013. The most recent data (~2

weeks) are provisional real-time data from SFWMD DualTrend; previous data are from SFWMD DB-HYDRO (validated). Dashed lines are ground elevations.

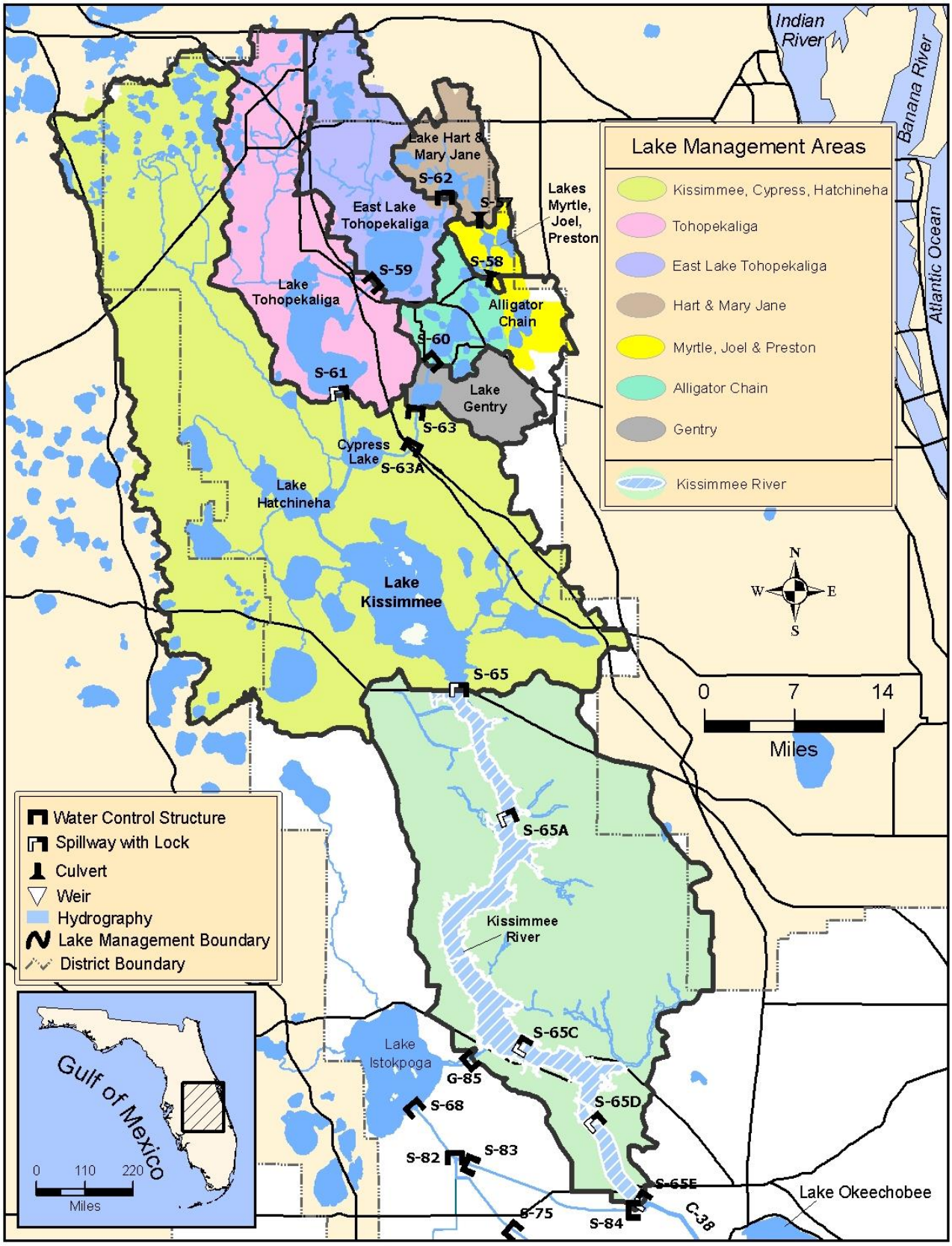


Figure 13. The Kissimmee Basin.

LAKE OKEECHOBEE

According to the United States Army Corps of Engineers (USACOE) web site, Lake Okeechobee stage is at 15.32 feet NGVD for the period ending at midnight on January 25, 2016. This value is based on the use of four interior Lake Stations (L001, L005, L006, and LZ40) and four perimeter stations (S-352, S-4, S-308 and S-133). Lake stage increased by 0.25 feet over the past week. The Lake is now 0.52 feet higher than it was a month ago and 0.47 feet higher than it was a year ago (Figure 1). The Lake is in the upper third of the low flow sub-band (Figure 2). According to RAINDAR, 1.19 inches of rain fell directly over the Lake during the past seven days. Similar to slightly higher amounts of rain fell in the eastern, southern, western and a small area of the northern portion of the watershed while lower amounts fell in the remaining northern portion of the watershed (Figure 3).

Based on USACOE reported values, current Lake Inflow is approximately 6,486 cfs, consisting of flows as indicated below.

Structure	Flow cfs
S65E	2612
S154	117
S84 & 84X	1362
S71	613
S72	333
C5(Nicodemus slough dispersed storage)	-157
S191	138
S133 PUMPS	108
S127 PUMPS	91
S129 PUMPS	60
S131 PUMPS	17
S135 PUMPS	122
Fisheating Creek	1071
S2 Pumps	0
S3 Pumps	0
S4 Pumps	0

Current Lake outflow is approximately 226 cfs exiting through S-77 and exiting to the L-8 canal through Culvert 10A (6 cfs). Corrected ET value this past week was not available.

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 43,813 acres of potentially suitable foraging habitat on the Lake. However, the continuing lack of a consistent recession in lake stages may have negative impacts, especially on short legged wading bird foraging activity (Figure 5). Only four wading bird flocks totaling 352 birds were observed during last week's wading bird foraging flight (Figure 6).

MODIS images from January 11and 16 suggest that chlorophyll levels are relatively low and no potential blooms existed at the time the images were collected (Figure 7).

Water Management Recommendations

The winter/spring dry season recession has been stalled for the past six weeks and with an increase of 0.25 feet this past week, the reversal of the past two weeks now totals 0.54 feet.

Future short term recommendations will depend in large measure on the near-term rainfall patterns and amounts. Any activities, which contribute to reestablishing the dry season recession, would be ecologically beneficial.

The operational goal continues to be to maintain a small but steady decrease in water levels not to currently exceed 0.6 feet per month (0.16 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.

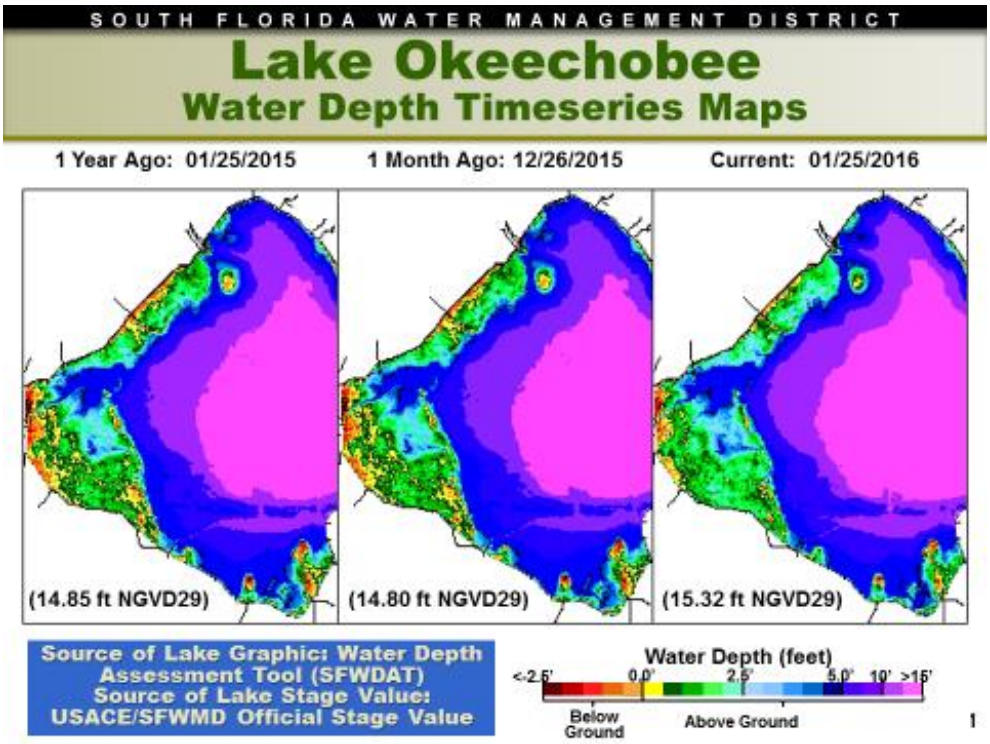


Figure 1

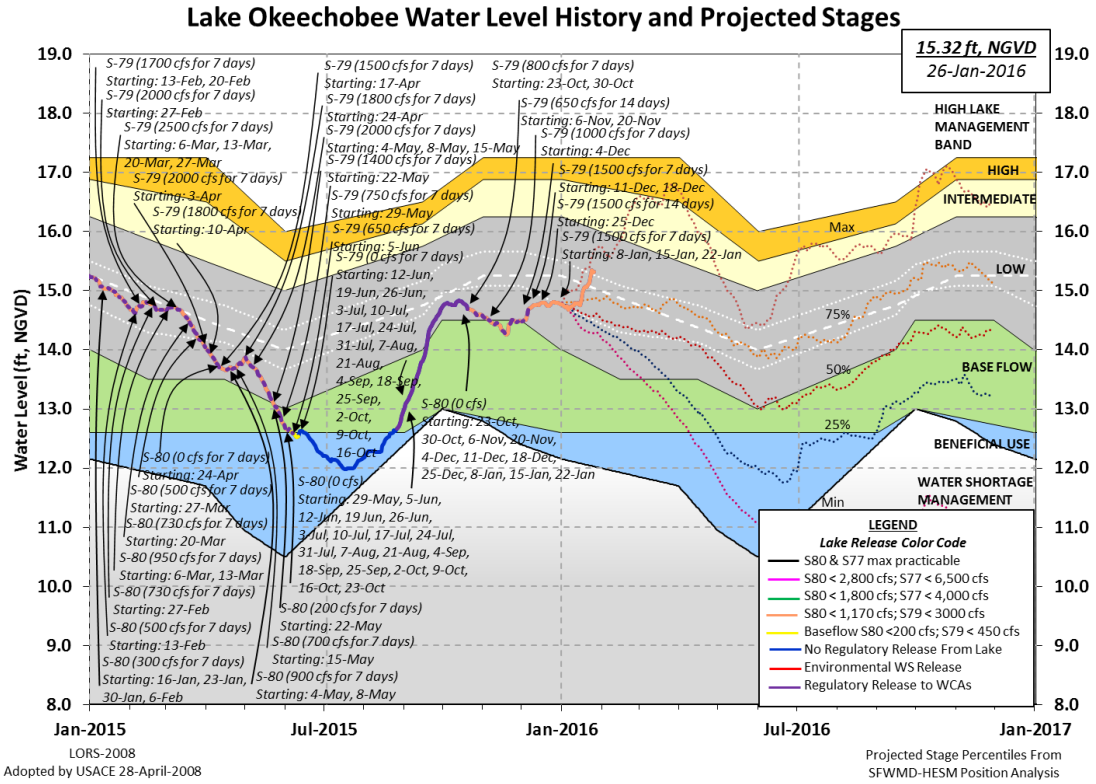

Lake Okeechobee Water Level History and Projected Stages
15.32 ft, NGVD
26-Jan-2016
Water Level (ft, NGVD)
HIGH LAKE MANAGEMENT BAND
HIGH
INTERMEDIATE
LOW
BASE FLOW
BENEFICIAL USE
WATER SHORTAGE MANAGEMENT
Max
75%
50%
25%
Min
S-79 (1700 cfs for 7 days) Starting: 13-Feb, 20-Feb
S-79 (2000 cfs for 7 days) Starting: 27-Feb
S-79 (2500 cfs for 7 days) Starting: 6-Mar, 13-Mar, 20-Mar, 27-Mar
S-79 (2000 cfs for 7 days) Starting: 3-Apr
S-79 (1800 cfs for 7 days) Starting: 10-Apr
S-79 (1500 cfs for 7 days) Starting: 17-Apr
S-79 (1800 cfs for 7 days) Starting: 24-Apr
S-79 (2000 cfs for 7 days) Starting: 4-May, 8-May, 15-May
S-79 (1400 cfs for 7 days) Starting: 22-May
S-79 (750 cfs for 7 days) Starting: 29-May
S-79 (650 cfs for 7 days) Starting: 5-Jun
S-79 (0 cfs for 7 days) Starting: 12-Jun, 19-Jun, 26-Jun, 3-Jul, 10-Jul, 17-Jul, 24-Jul, 31-Jul, 7-Aug, 21-Aug, 4-Sep, 18-Sep, 25-Sep, 2-Oct, 9-Oct, 16-Oct
S-79 (800 cfs for 7 days) Starting: 23-Oct, 30-Oct
S-79 (650 cfs for 14 days) Starting: 6-Nov, 20-Nov
S-79 (1000 cfs for 7 days) Starting: 4-Dec
S-79 (1500 cfs for 7 days) Starting: 11-Dec, 18-Dec
S-79 (1500 cfs for 14 days) Starting: 25-Dec
S-79 (1500 cfs for 7 days) Starting: 8-Jan, 15-Jan, 22-Jan
S-80 (0 cfs for 7 days) Starting: 24-Apr
S-80 (500 cfs for 7 days) Starting: 27-Mar
S-80 (730 cfs for 7 days) Starting: 20-Mar
S-80 (950 cfs for 7 days) Starting: 6-Mar, 13-Mar
S-80 (730 cfs for 7 days) Starting: 27-Feb
S-80 (500 cfs for 7 days) Starting: 13-Feb
S-80 (300 cfs for 7 days) Starting: 16-Jan, 23-Jan, 30-Jan, 6-Feb
S-80 (0 cfs) Starting: 29-May, 5-Jun, 12-Jun, 19 Jun, 26-Jun, 3 Jul, 10-Jul, 17-Jul, 24-Jul, 31-Jul, 7-Aug, 21-Aug, 4-Sep, 18-Sep, 25-Sep, 2-Oct, 9-Oct, 16-Oct, 23-Oct
S-80 (200 cfs for 7 days) Starting: 22-May
S-80 (700 cfs for 7 days) Starting: 15-May
S-80 (900 cfs for 7 days) Starting: 4-May, 8-May
S-80 (0 cfs) Starting: 23-Oct, 30-Oct, 6-Nov, 20-Nov, 4-Dec, 11-Dec, 18-Dec, 25-Dec, 8-Jan, 15-Jan, 22-Jan
LEGEND
Lake Release Color Code
S80 & S77 max practicable
S80 < 2,800 cfs; S77 < 6,500 cfs
S80 < 1,800 cfs; S77 < 4,000 cfs
S80 < 1,170 cfs; S79 < 3000 cfs
Baseflow S80 <200 cfs; S79 < 450 cfs
No Regulatory Release From Lake
Environmental WS Release
Regulatory Release to WCAs
19.0
18.0
17.0
16.0
15.0
14.0
13.0
12.0
11.0
10.0
9.0
8.0
Jan-2015
Jul-2015
Jan-2016
Jul-2016
Jan-2017
LORS-2008
Adopted by USACE 28-April-2008
Projected Stage Percentiles From
SFWMD-HESM Position Analysis

Figure 2

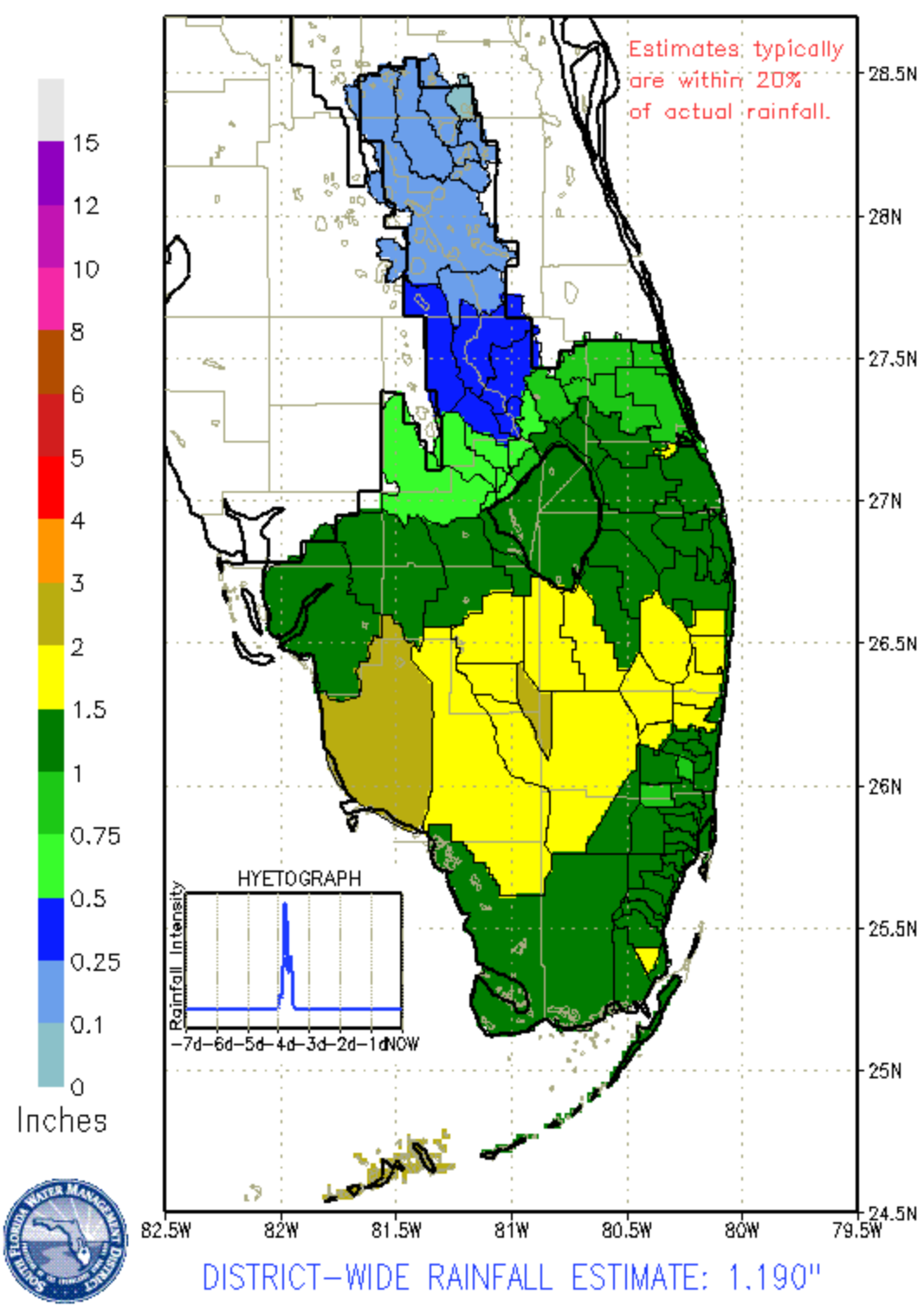

SFWMD PROVISIONAL RAINDAR 7-DAY BASIN RAINFALL ESTIMATES
FROM: 0615 EST, 01/19/2016 THROUGH: 0615 EST, 01/26/2016
Estimates typically are within 20% of actual rainfall.
15
12
10
8
6
5
4
3
2
1.5
1
0.75
0.5
0.25
0.1
0
Inches
HYETOGRAPH
Rainfall Intensity
-7d-6d-5d-4d-3d-2d-1dNOW
28.5N
28N
27.5N
27N
26.5N
26N
25.5N
25N
24.5N
82.5W
82W
81.5W
81W
80.5W
80W
79.5W
DISTRICT-WIDE RAINFALL ESTIMATE: 1.190"

Figure 3

INFLOWS	Average Daily Flow Past Week cfs	Feet of Change Past Week
S65E	2753	0.089
S71 & 72	697	0.023
S84 & 84X	1343	0.044
Fisheating Creek	1234	0.040
Rainfall	N.A.	0.099
OUTFLOWS	**Average Daily Flow Past Week cfs**	**Feet of Change Past Week**
S77	83	0.003
S308	0	0.000
S351	0	0.000
S352	0	0.000
S354	0	0.000
L8	137	0.004
ET	N.A.	N.A.

Figure 4

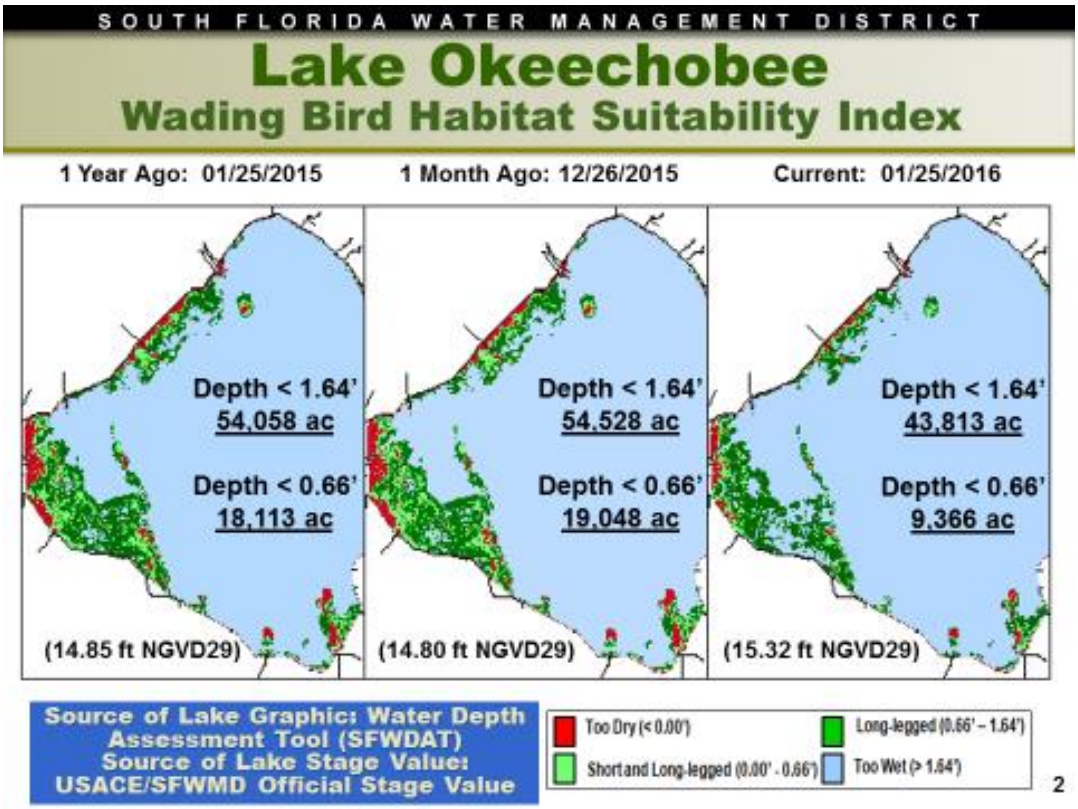


Figure 5

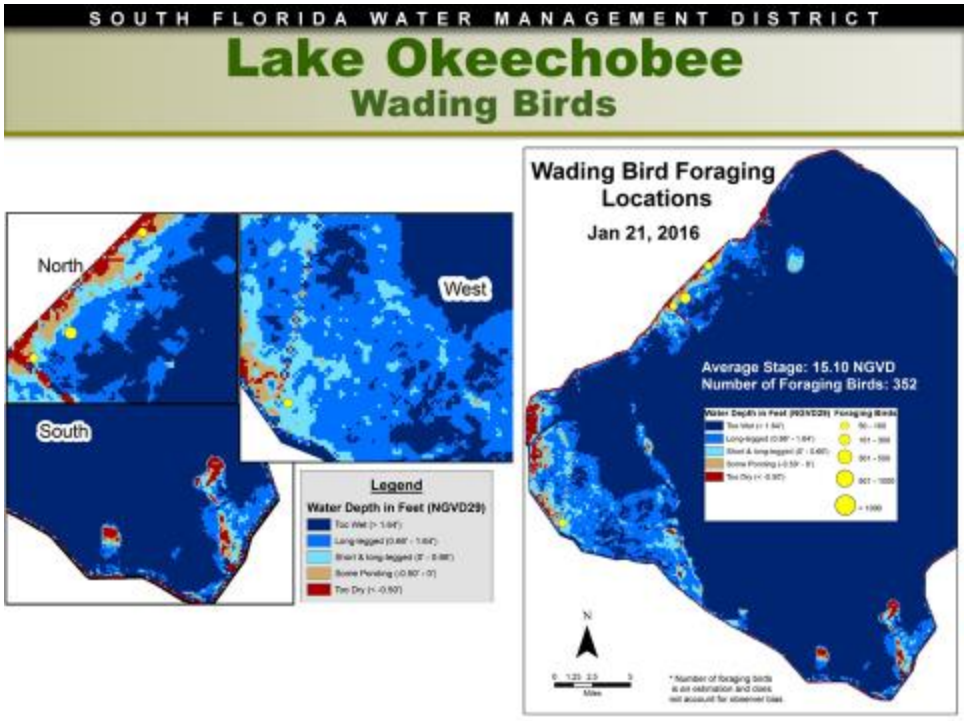


Figure 6

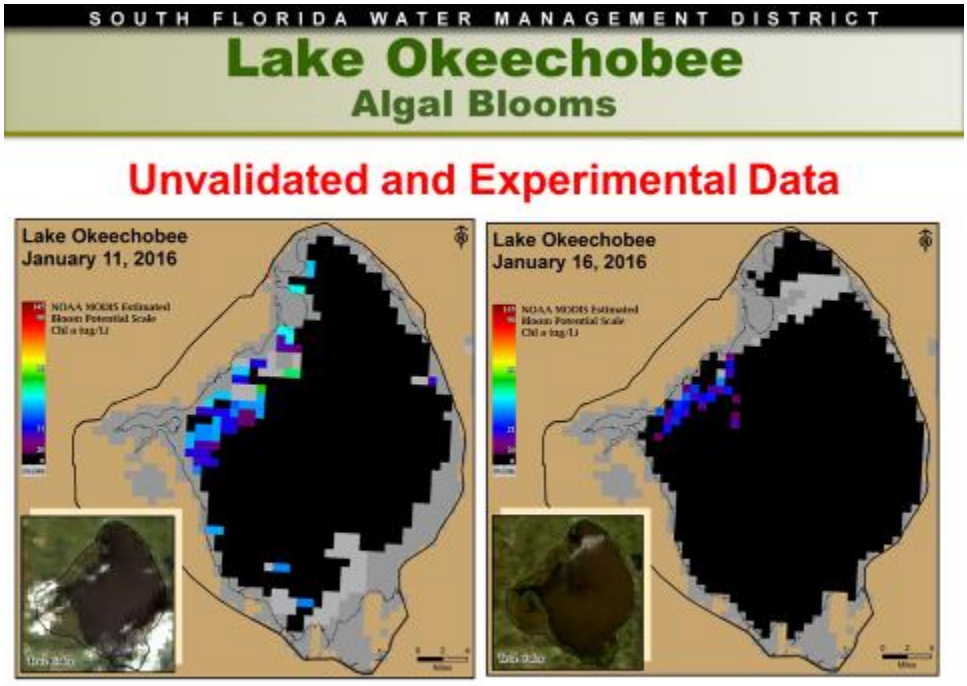


Figure 7

Lake Istokpoga:

Lake Istokpoga stage is 39.29 feet NGVD today and is currently 0.21 feet below its regulation schedule of 39.50 feet NGVD, which remains at peak high pool (Figure 8). Average flows into the Lake from Arbuckle and Josephine creeks were 770 and 208 cfs respectively, an overall increase of 31% compared to the preceding week. Average discharge from S-68 and S-68X this past week was 1206 cfs, a decrease of 10% compared to the preceding week. According to RAINDAR 0.27 inches of rain fell in the Lake Istokpoga watershed during the past seven days.

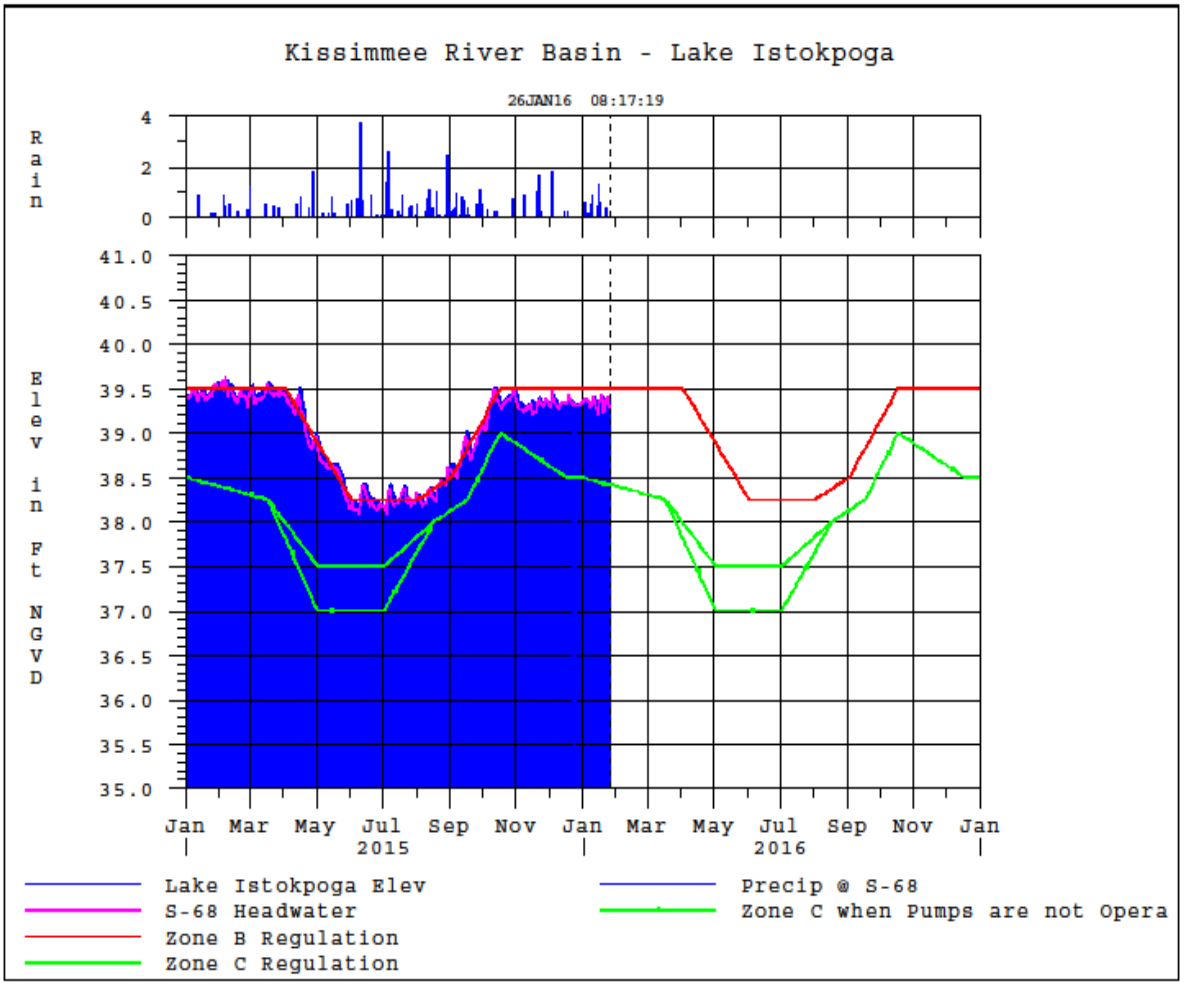


Figure 8

ESTUARIES

St. Lucie Estuary:
Over the past week, provisional flows averaged 415 cfs at S-80, 0 cfs at S-308, 622 cfs at S-49 on C-24, 445cfs at S-97 on C-23, and 223 cfs from Ten Mile Creek at the Gordy Road Structure. Average inflow from tidal basin tributaries is estimated to be 677 cfs (Figures 1 and 2). Total inflow averaged about 2382 cfs last week and 1579 cfs over last month.

Over the past week, salinity decreased throughout the estuary (Table 1, Figures 3 and 4). The seven-day moving average salinity of the water column was 7.7 at the US1 Bridge. 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)	**3.1** (7.7)	**6.2** (11.9)	NA[1]
US1 Bridge	**6.3** (11.1)	**9.2** (13.1)	10.0-26.0
A1A Bridge	**14.5** (18.6)	**21.8** (22.8)	NA

[1]Envelope not applicable

Caloosahatchee Estuary:
During the past week, provisional flows averaged approximately 118 cfs at S-77, 1125 cfs at S-78, and 3618 cfs at S-79. Average inflow from tidal basin tributaries is estimated to be 1838 cfs (Figures 5 and 6). Total inflow averaged 5456 cfs last week and 3240 cfs over last month.

Over the past week, salinity decreased throughout the estuary (Table 2, Figures 7 & 8). The seven-day average salinity values are within the good range for oysters at Shell Point, and Sanibel, but just within the poor range at Cape Coral (Figure 9). The 30-day moving average surface salinity is 1.0 at Val I-75 and 3.8 at Ft. Myers. Salinity conditions at Val I-75 are in the good range for tape grass, and are forecasted to remain so in following two weeks even without discharges at S-79 (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)	**0.2** (0.5)	**0.2** (0.5)	NA[1]
*Val I75	**0.2*** (1.0*)	**0.3*** (1.5*)	0.0-5.0[2]
Ft. Myers Yacht Basin	**0.3** (3.6)	**0.3** (4.4)	NA
Cape Coral	**4.1** (10.2)	**5.3** (11.8)	10.0-30.0
Shell Point	**15.5** (20.6)	**17.6** (22.0)	10.0-30.0
Sanibel	**22.9** (26.0)	**24.7** (26.9)	10.0-30.0

[1]Envelope not applicable, [2]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 *a* (µg/l)	4.7 – 14.0	3.5 – 5.5	2.5 – 5.2
Dissolved Oxygen (mg/l)	7.2 – 9.0	8.25 – 9.35	7.4 – 10.7

The Florida Fish and Wildlife Research Institute reported on January 22, 2016, that there were medium concentrations of *Karenia brevis* in one sample collected alongshore of northern Lee County.

Water Management Recommendations

Lake Okeechobee's water level is within the Low Operational Sub-band; the tributary hydrological conditions are Very 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 U.S. Army Corps of Engineers is implementing a 7-day release averaging 1500 cfs at S-79 and 0 cfs at S-80, and there are no ecological benefits associated with additional releases from Lake Okeechobee under the current estuarine conditions. However, considering the current high lake level and anticipated wetter than normal dry season under the influence of a strong El Nino, releases beyond this level under LORS guidance may be necessary. If such an increase is required, it is suggested that current releases be augmented by low amounts to avoid abrupt changes in flow and salinity conditions. Such releases will help reduce the risk of future high discharges associated with the strong El Nino during key spawning seasons in late spring and early summer. Pulse releases should be conducted in a pulse pattern to mitigate potential stratification and phytoplankton accumulation in the water column (Table 4).

Table 4. Schedules for 7-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

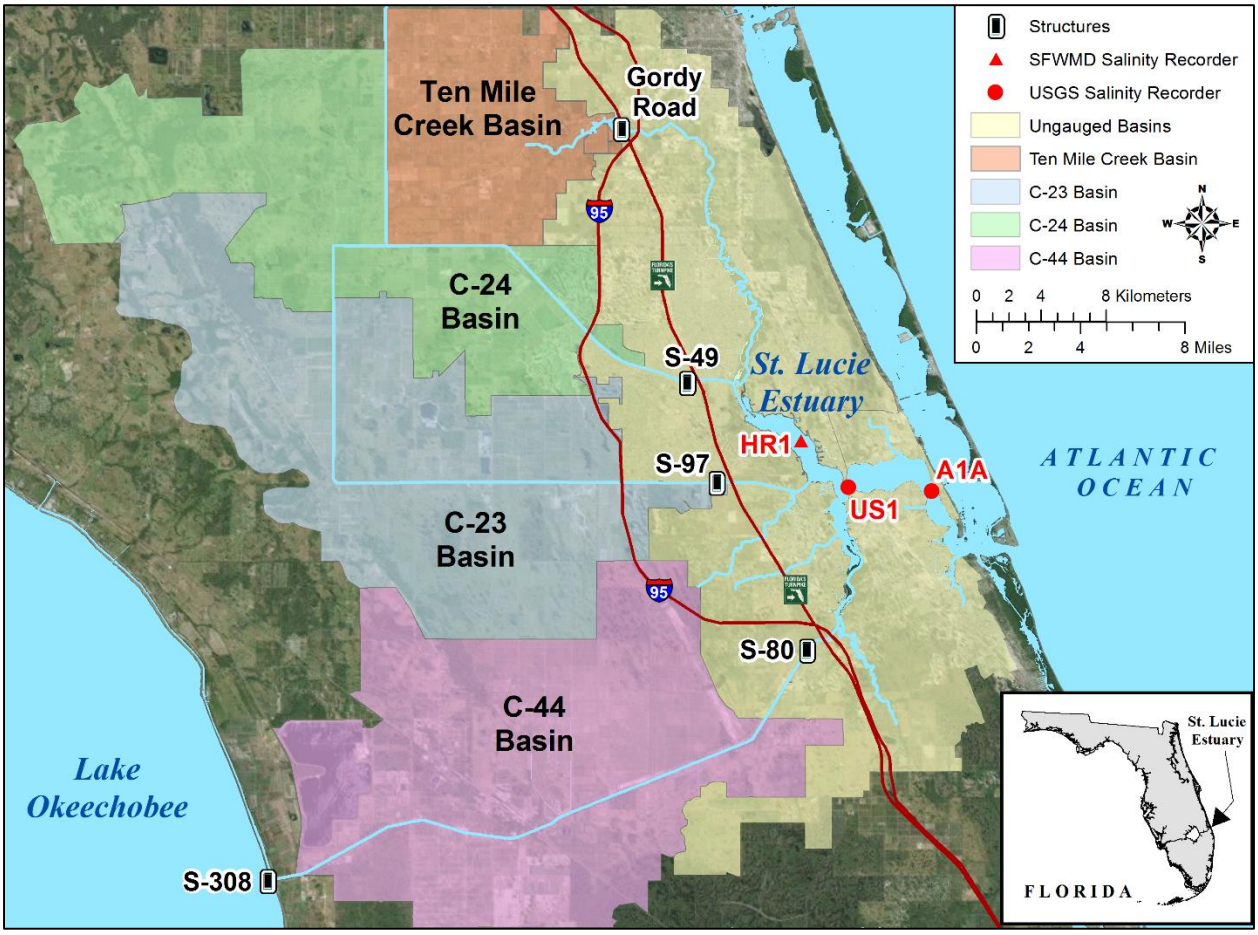


Figure 1. Basins, water control structures, and salinity monitoring for the St. Lucie Estuary.

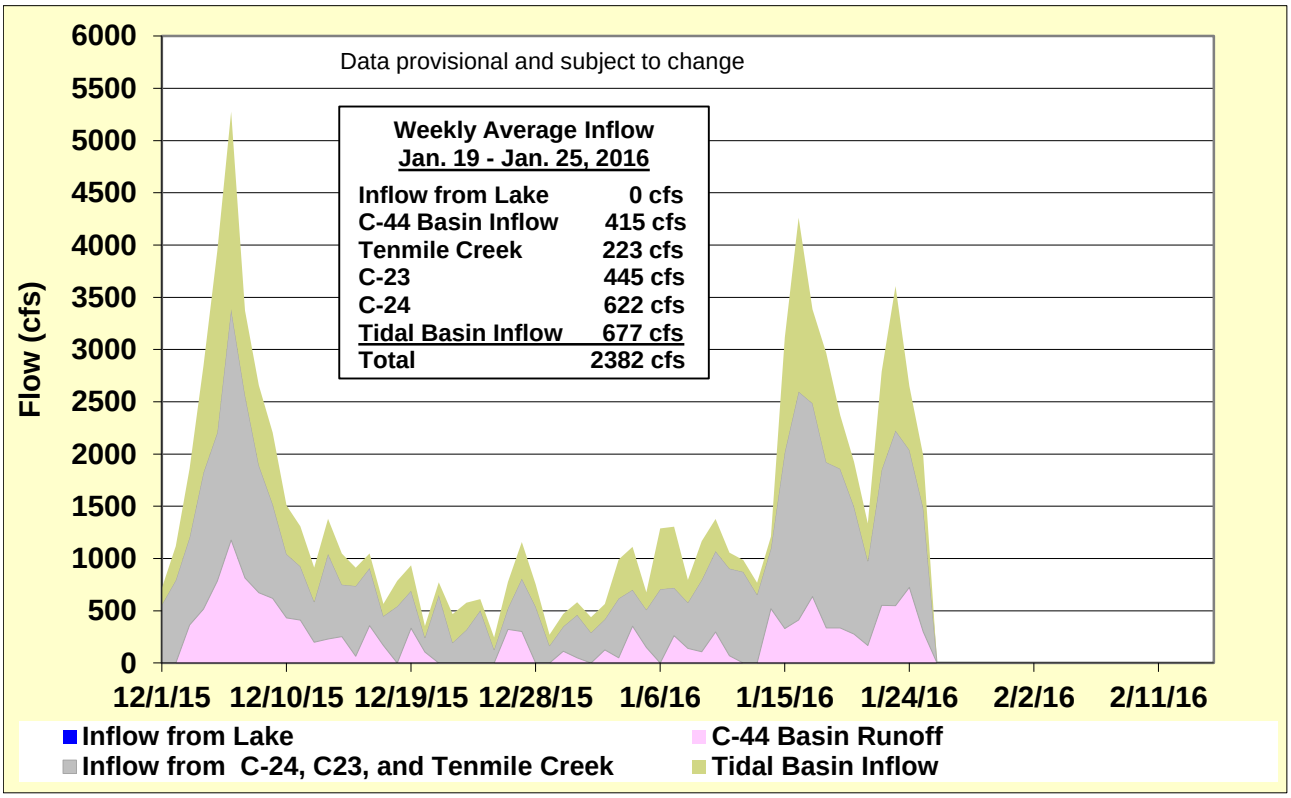


Figure 2. Estimated surface freshwater inflows from Lake Okeechobee and runoff from the C-44, C-23, C-24, Ten Mile Creek, and tidal basins into the St. Lucie Estuary.

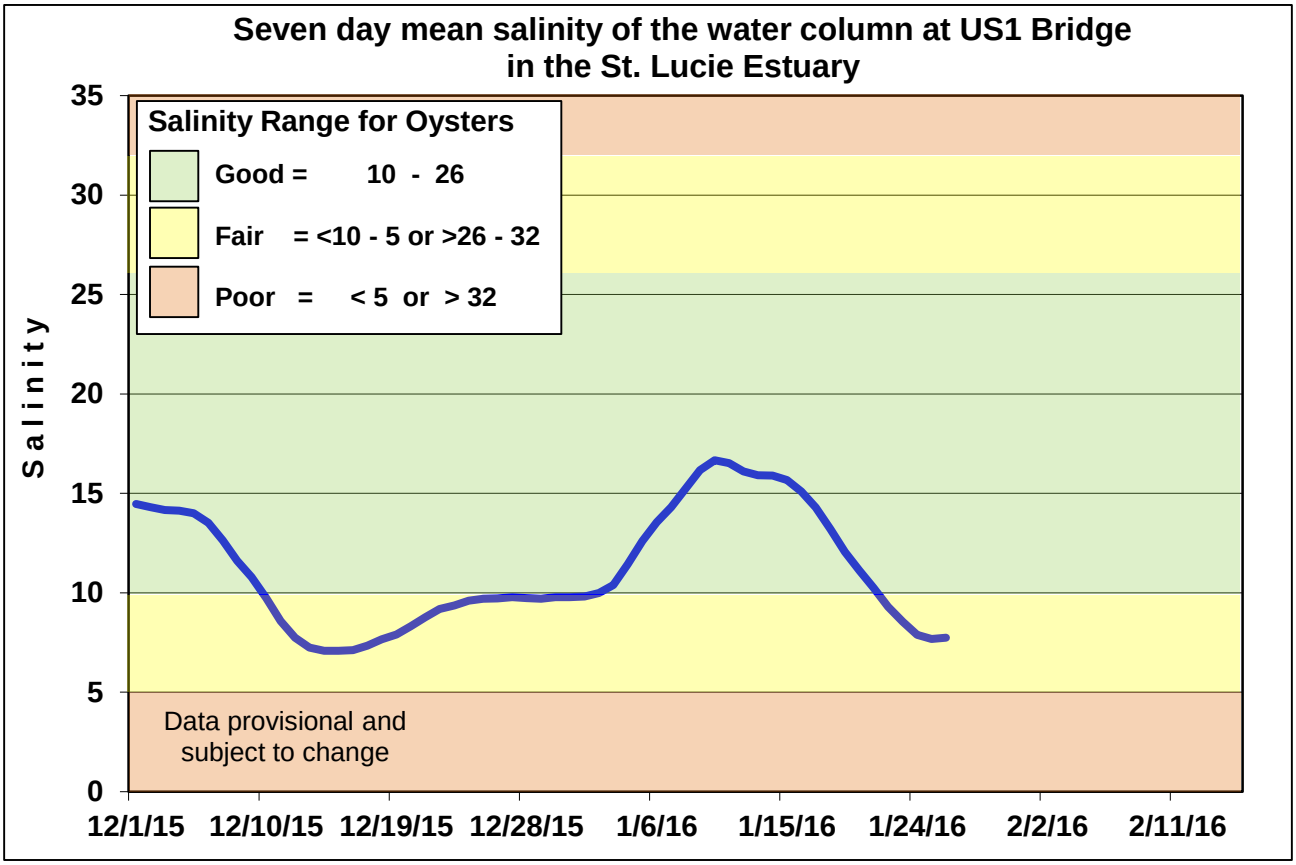


Figure 3. Seven-day mean salinity of the water column at the U.S. Highway 1 Bridge.

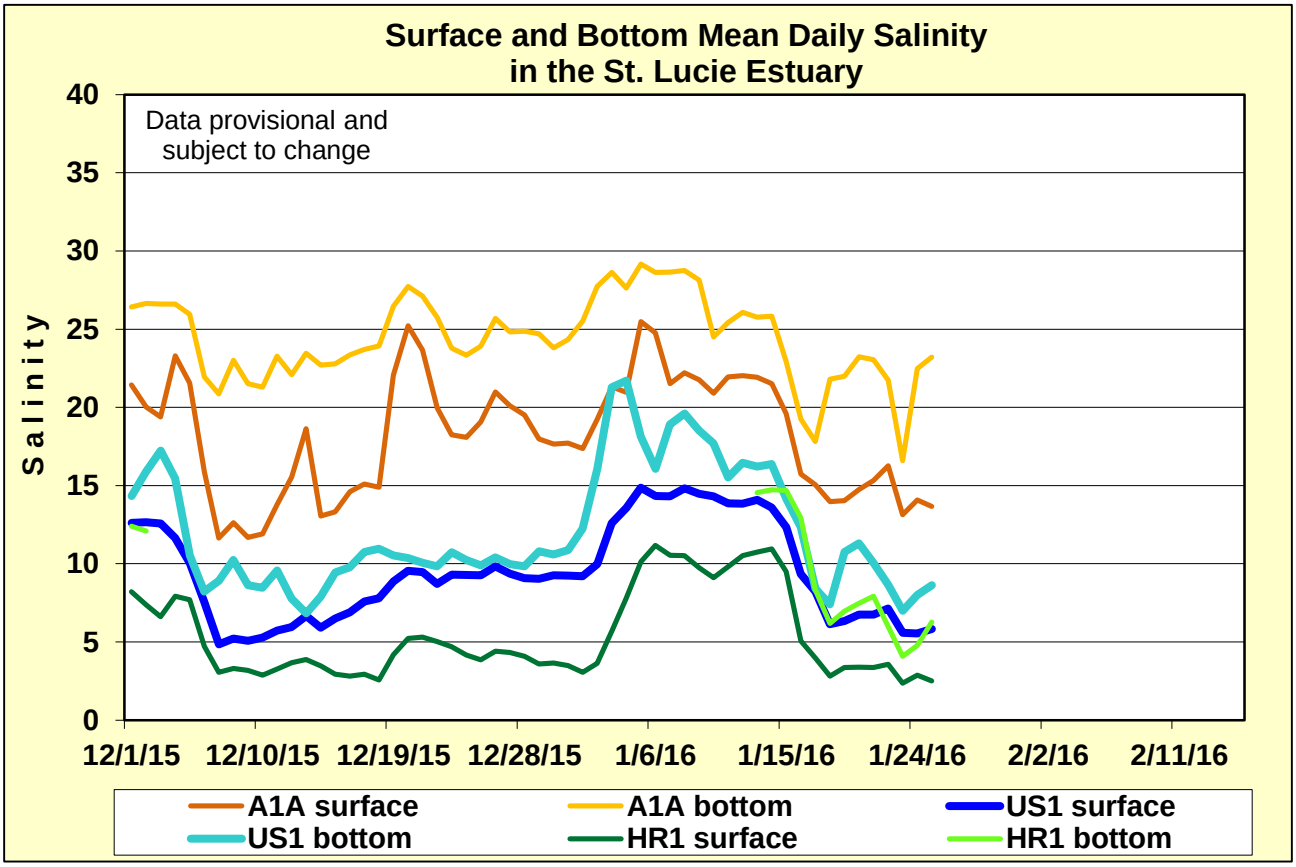


Figure 4. Daily mean salinity at the A1A, US1 and estimated HR1 stations.

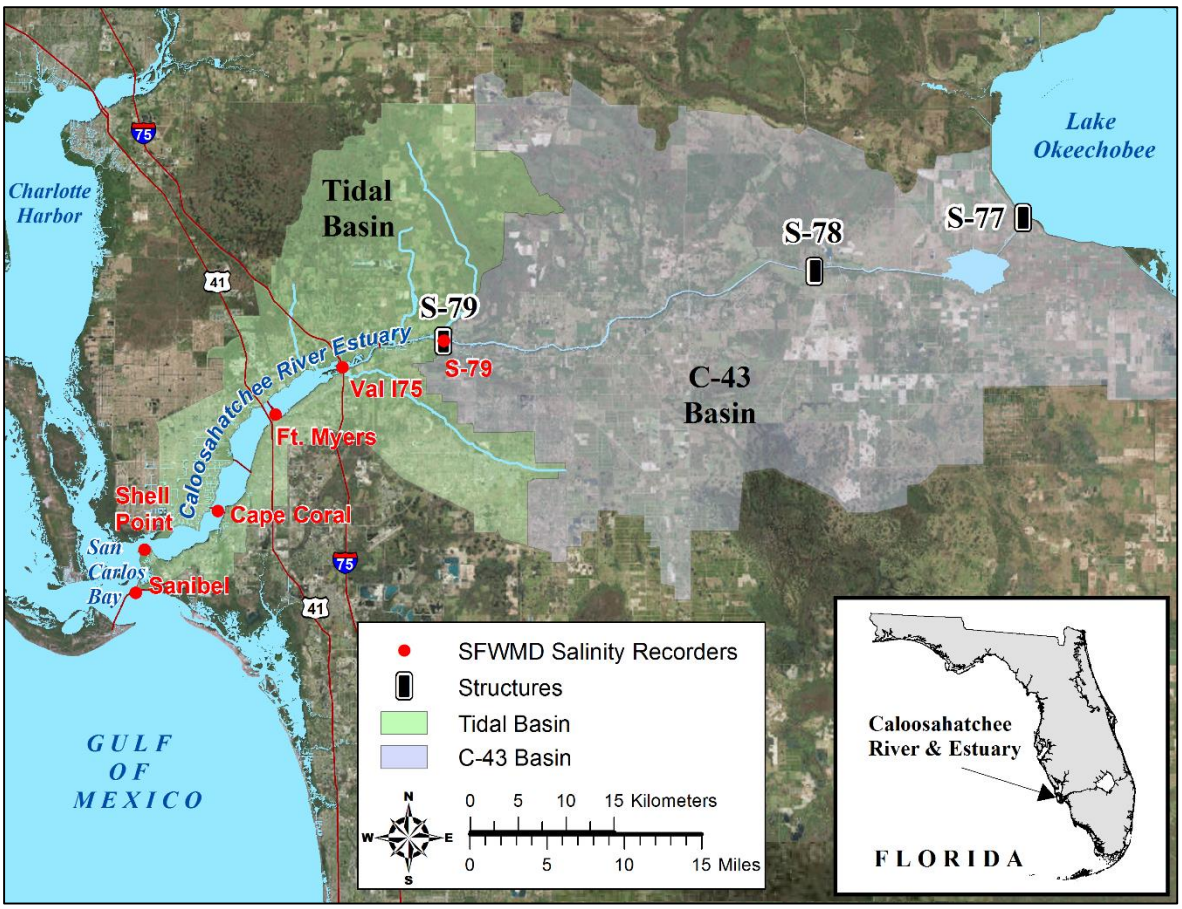


Figure 5. Basins, water control structures, and salinity monitoring for the Caloosahatchee Estuary.

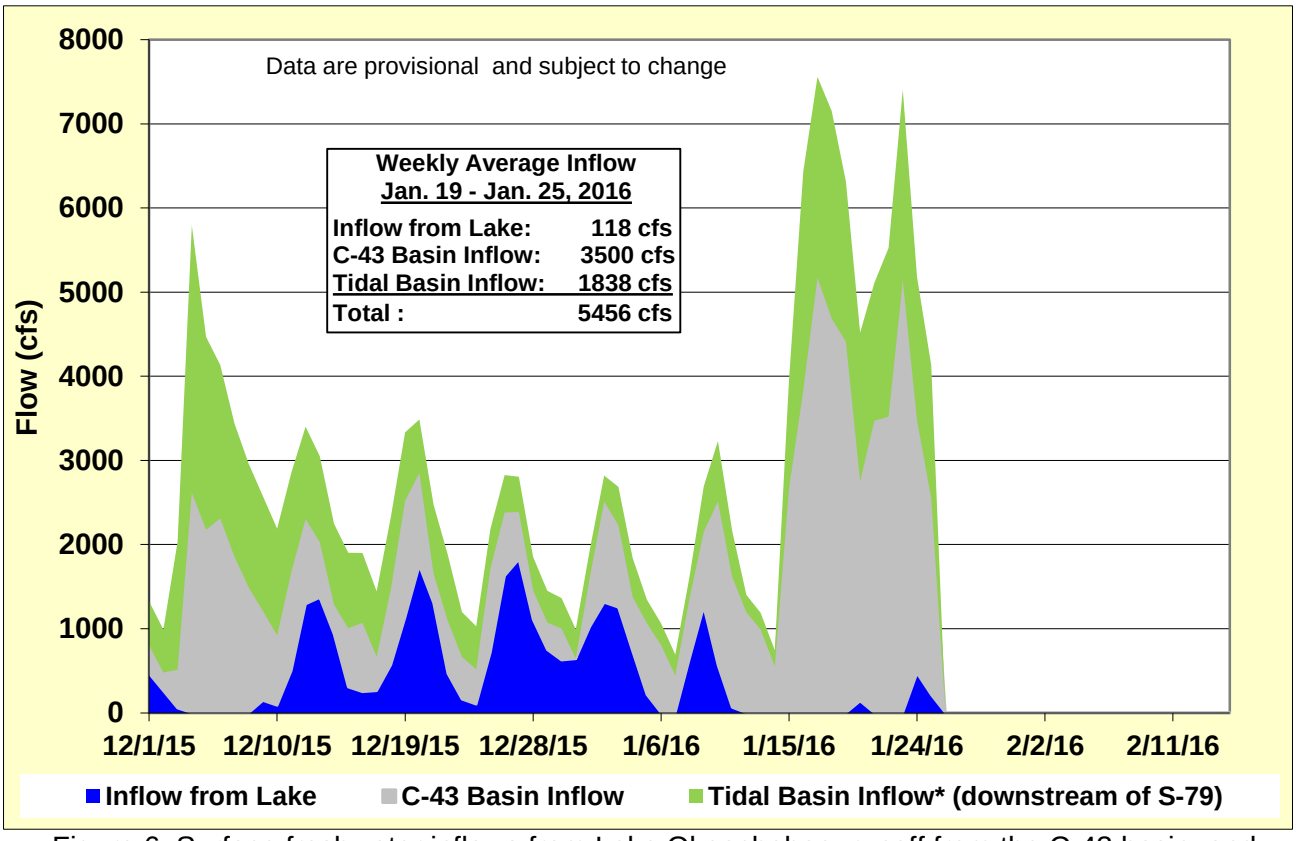


Figure 6. Surface freshwater inflows from Lake Okeechobee, runoff from the C-43 basin, and tributaries in the tidal basin into the Caloosahatchee River Estuary.

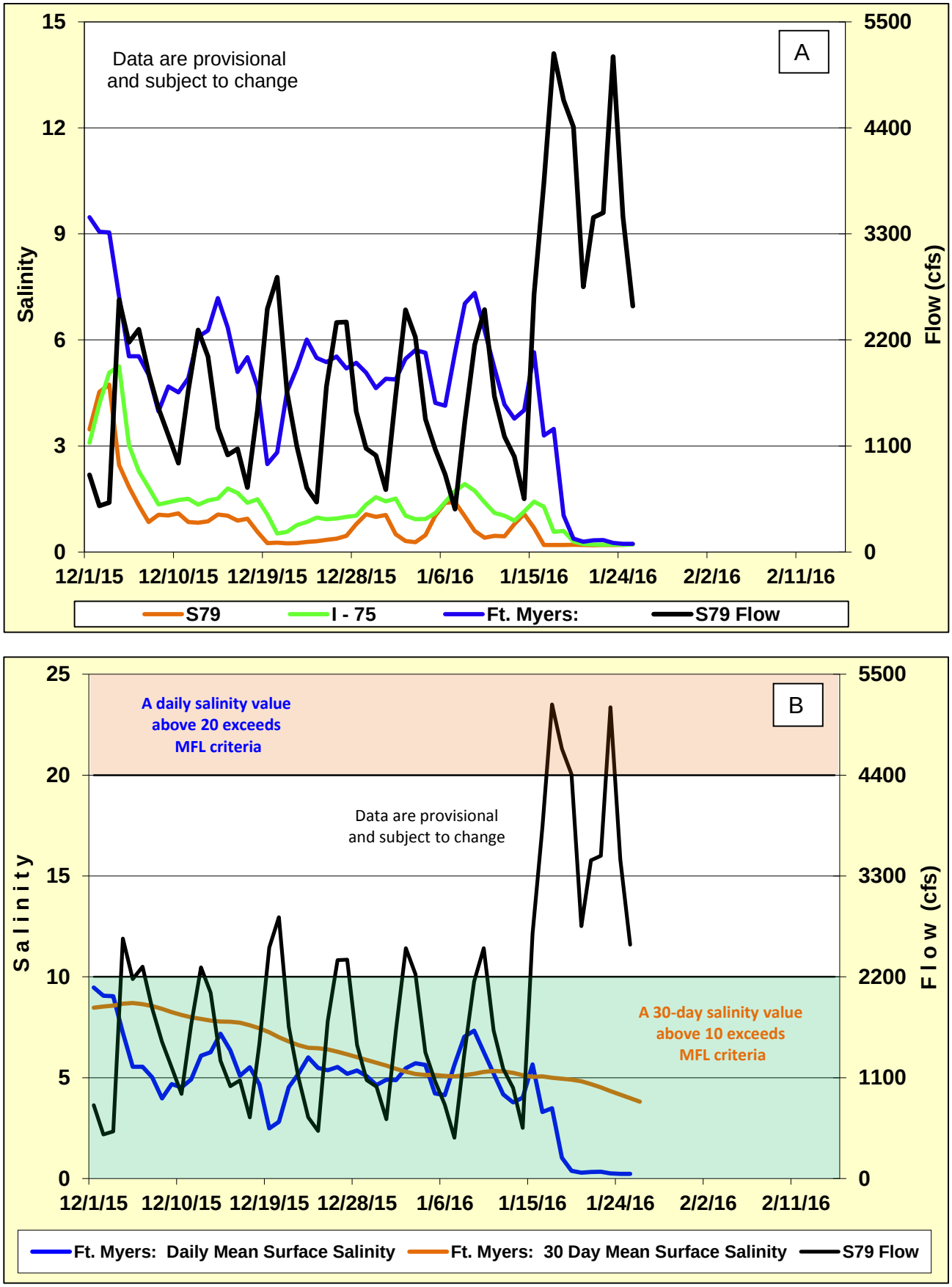


Figure 7. Daily mean flows at S-79 and salinity at upper estuary monitoring stations (A) and 30-day moving average salinity at Ft. Myers (B).

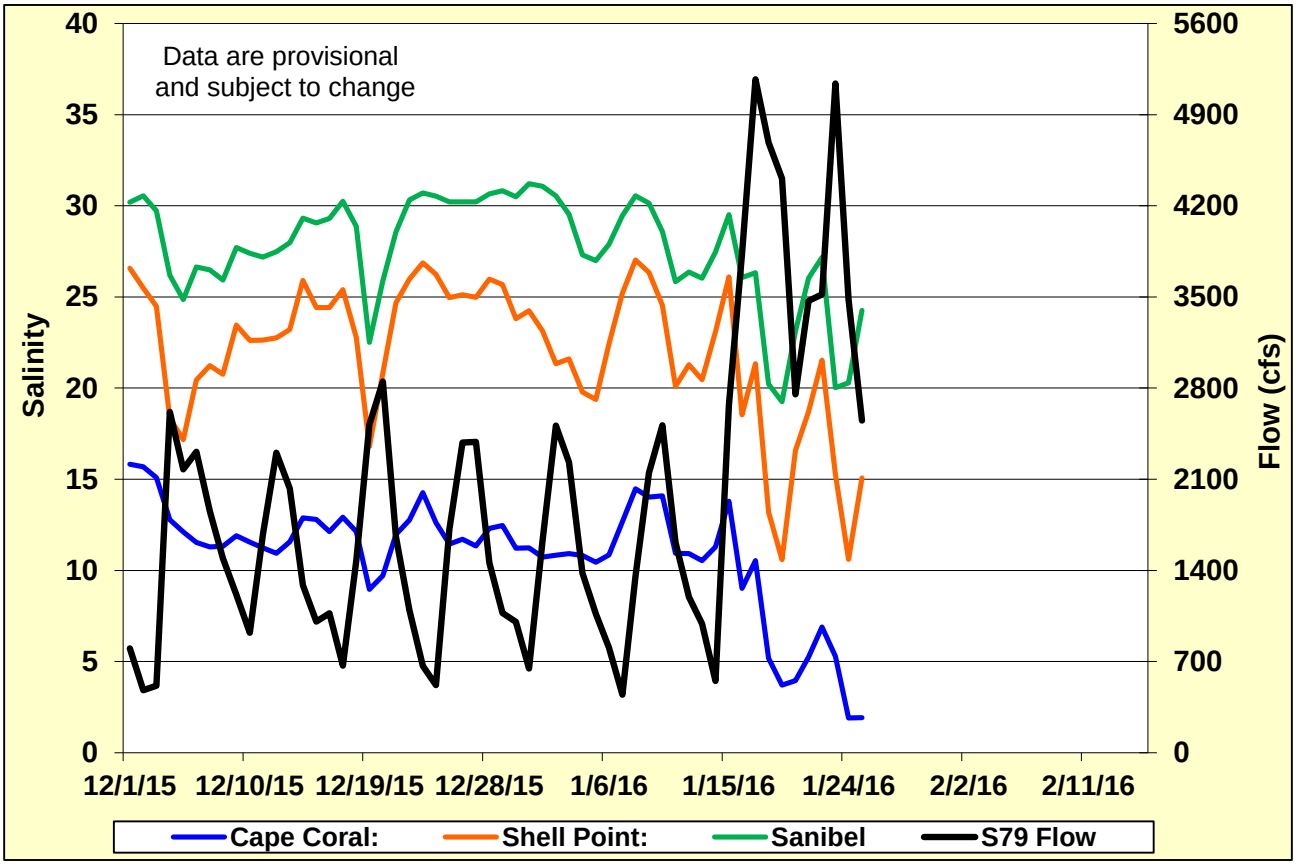


Figure 8. Daily mean flows at S-79 and salinity at lower estuary stations.

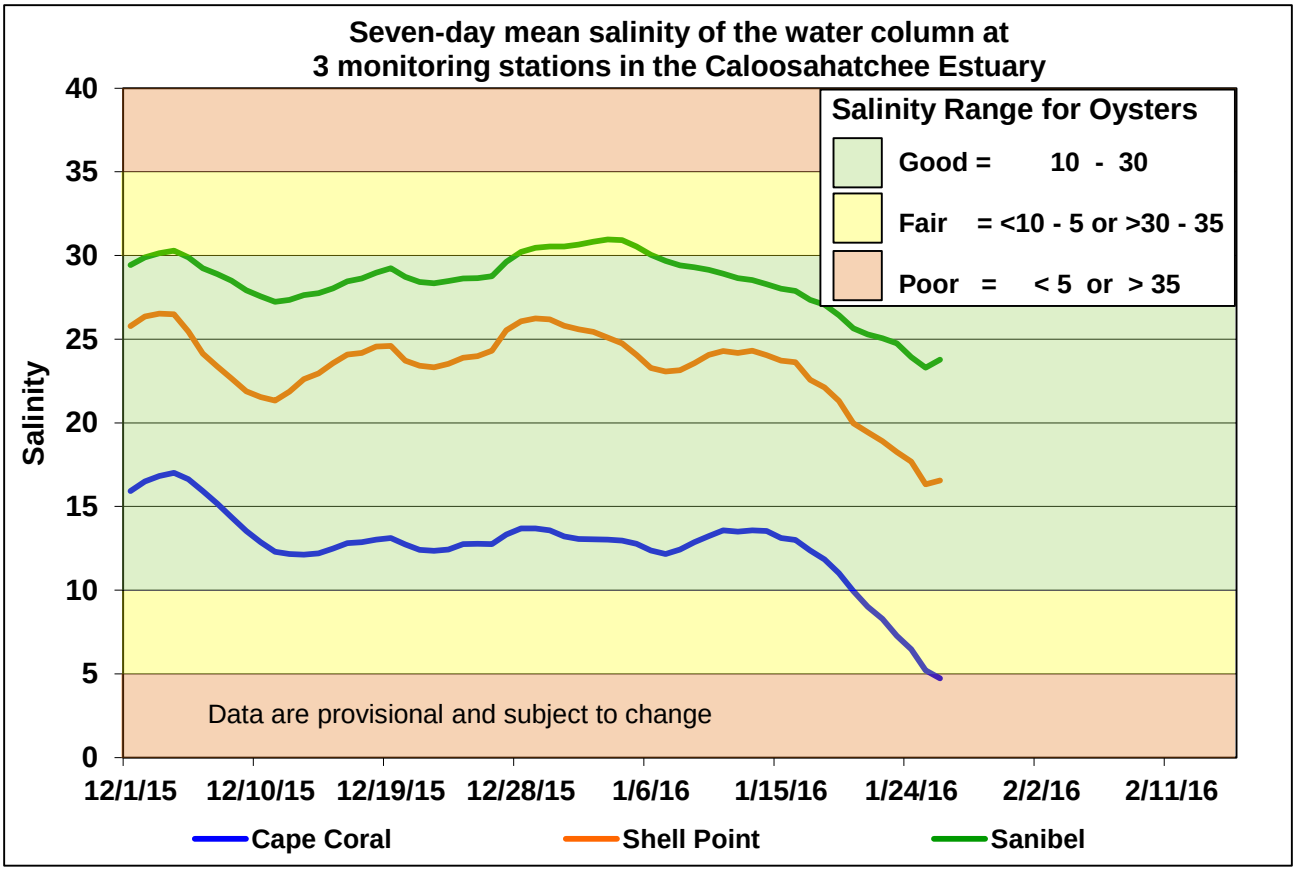


Figure 9. Seven-day mean salinity at Cape Coral Bridge, Shell Point and Sanibel Bridge monitoring stations.

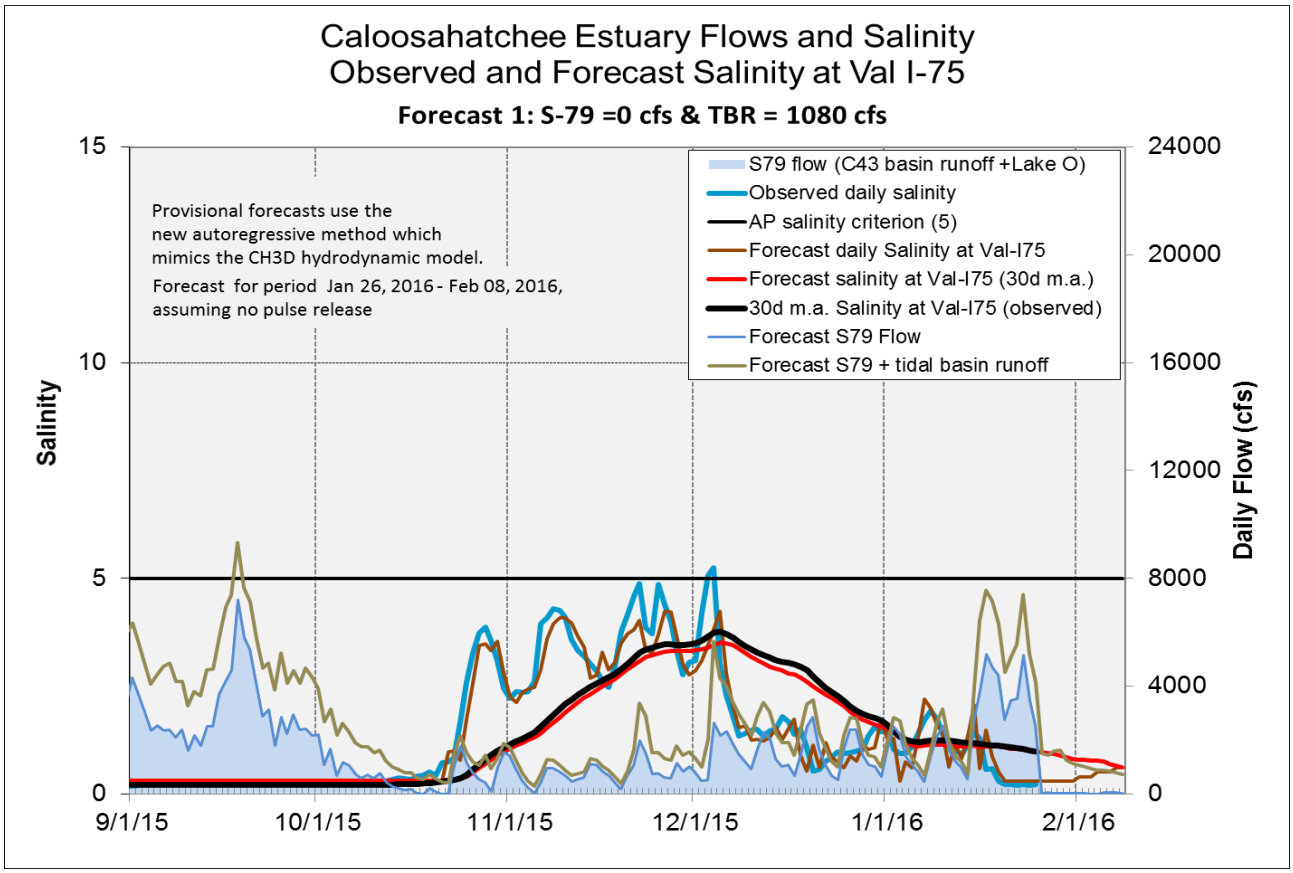
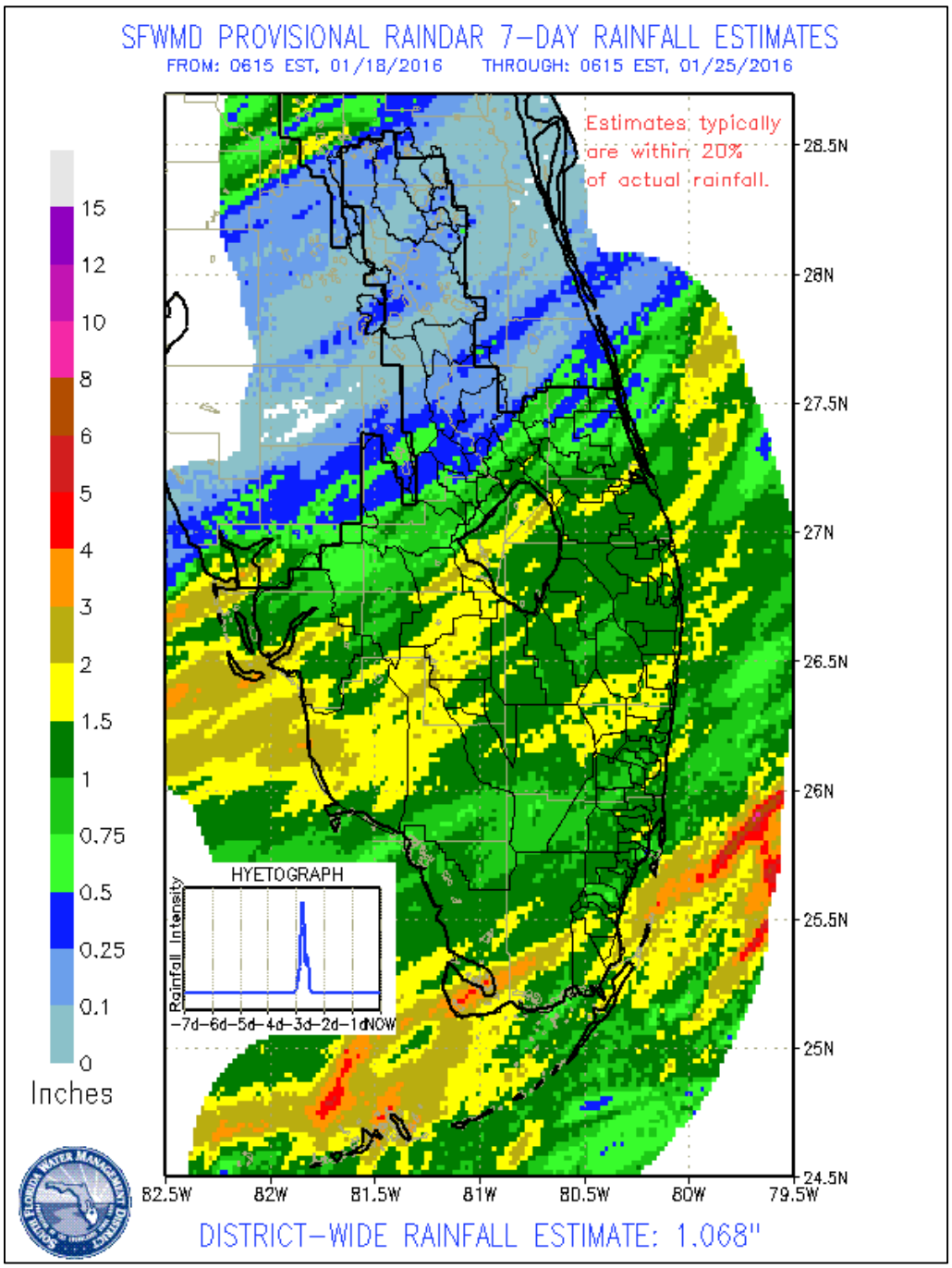


Figure 10. 14-day salinity forecast at Val I-75 assuming no releases at S-79.

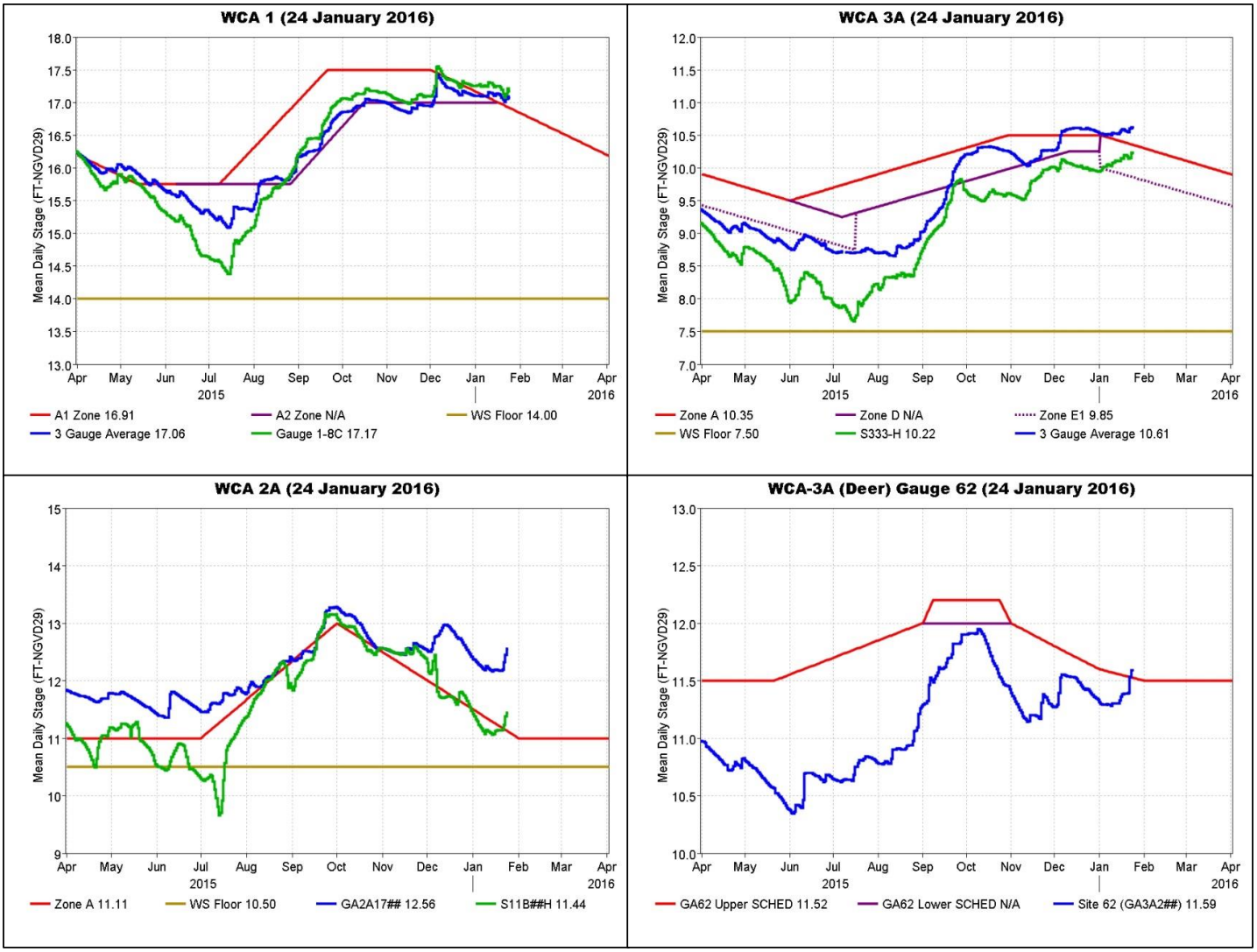
GREATER EVERGLADES

Rainfall was similar to that of the previous week in the WCAs and Everglades National Park (ENP), ranging from 0.98 inches to 1.60 inches, and with a maximum local rainfall of 4.43 inches in southwestern ENP. Except in WCA-1, stages were stable or increased with an overall range from -0.05 feet to +0.46 feet. At 0.87 inches, pan evaporation slightly exceeded the pre-project average of 0.83 inches.

Everglades Region	Rainfall (Inches)	Stage Change (feet)
WCA-1	1.24	-0.05
WCA-2A	1.60	0.46
WCA-2B	1.50	0.00
WCA-3A	1.23	0.08
WCA-3B	0.98	0.03
ENP	1.52	0.01

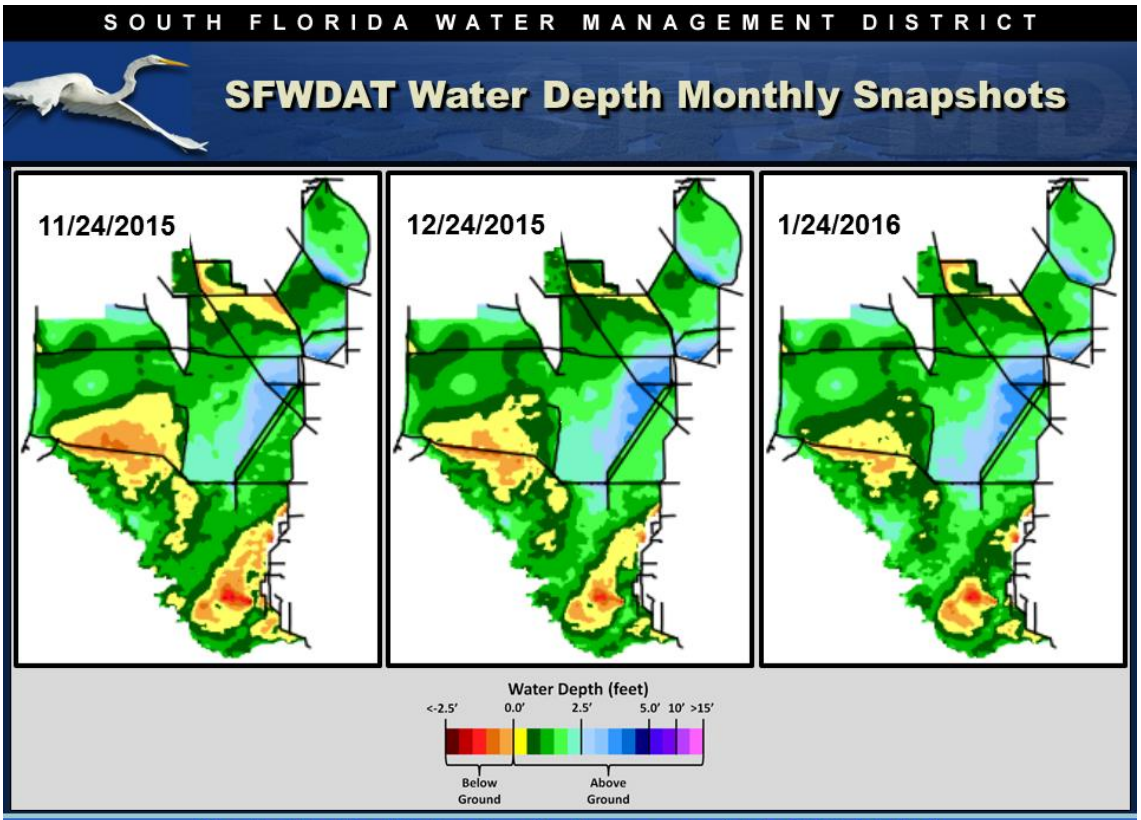


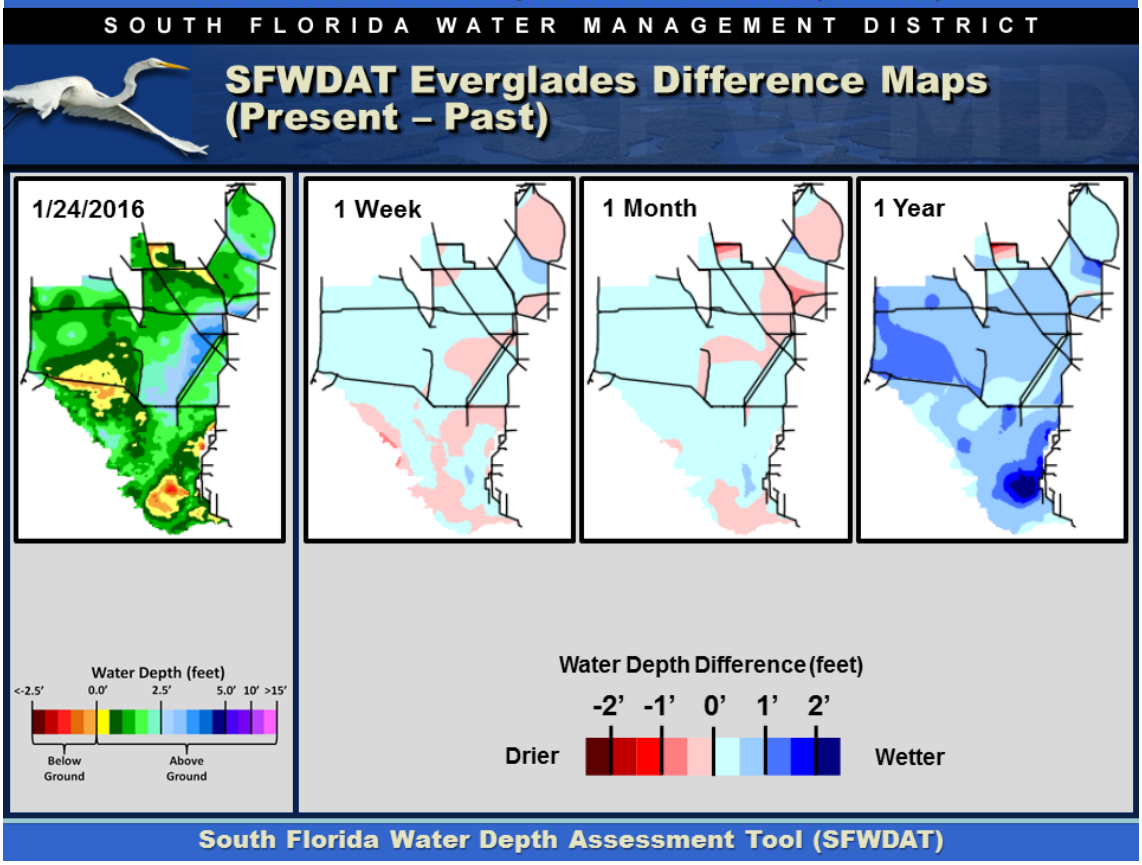
Regulation Schedules: Stage changes were higher at the regulation schedule sites this week except in WCA-1; all regulation schedules are in their descending phase and wetland stages are above regulation. The WCA-1 stage is 0.15 feet above regulation, the WCA-2A stage is 1.45 feet above regulation, and the three-gauge average stage in WCA-3A is 0.26 feet above regulation. The northwestern WCA-3A gauge stage (gauge 62) rose again and is now 0.08 feet above regulation.



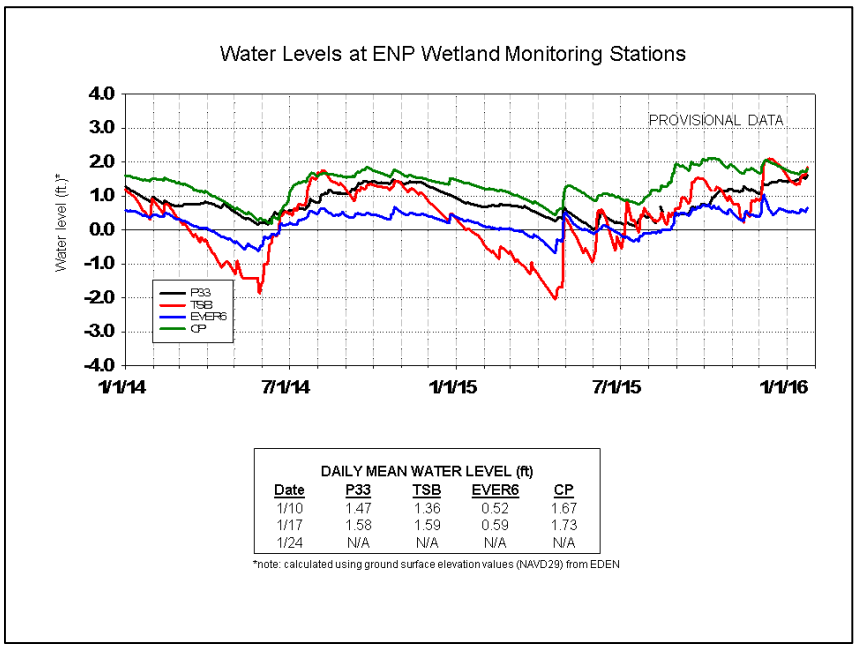
Water Depths and Changes: Water levels in the WCAs and ENP are higher than those one and two months ago. Water depths at the monitored gauges range from 1.49 feet to 2.90 feet (both in WCA-3A), excluding WCA-2B. Stages at gauge 65 in southern WCA-3A have exceeded 2.5 feet, the stage of note for tree island inundation-duration, for ten weeks. Stages at gauges 63 and 64 are below 2.5 feet.

Although mixed, stages are generally higher than a week ago and a month ago. Stages are up to two feet or more higher than a year ago. Individual stage gauges changed from -0.06 feet to +0.46 feet.





Everglades National Park (ENP) and Florida Bay: Friday's rainfall reversed the water level decline of the previous four days. Water levels were five to 16 inches above average for this time of year on Friday, but at least 1.5 inches lower than a month ago in Taylor Slough. Technical difficulties at ENP over the weekend have prevented data from being available after Friday, January 22.



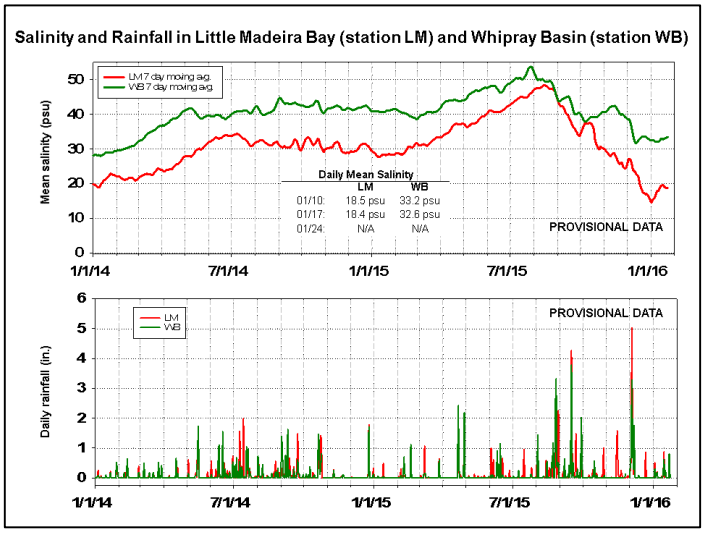
DAILY MEAN WATER LEVEL (ft)

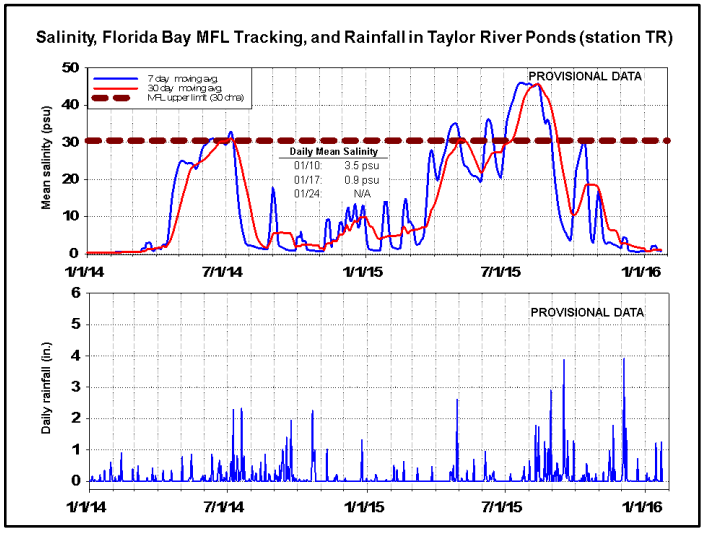
Date	P33	TSB	EVER6	CP
1/10	1.47	1.36	0.52	1.67
1/17	1.58	1.59	0.59	1.73
1/24	N/A	N/A	N/A	N/A

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

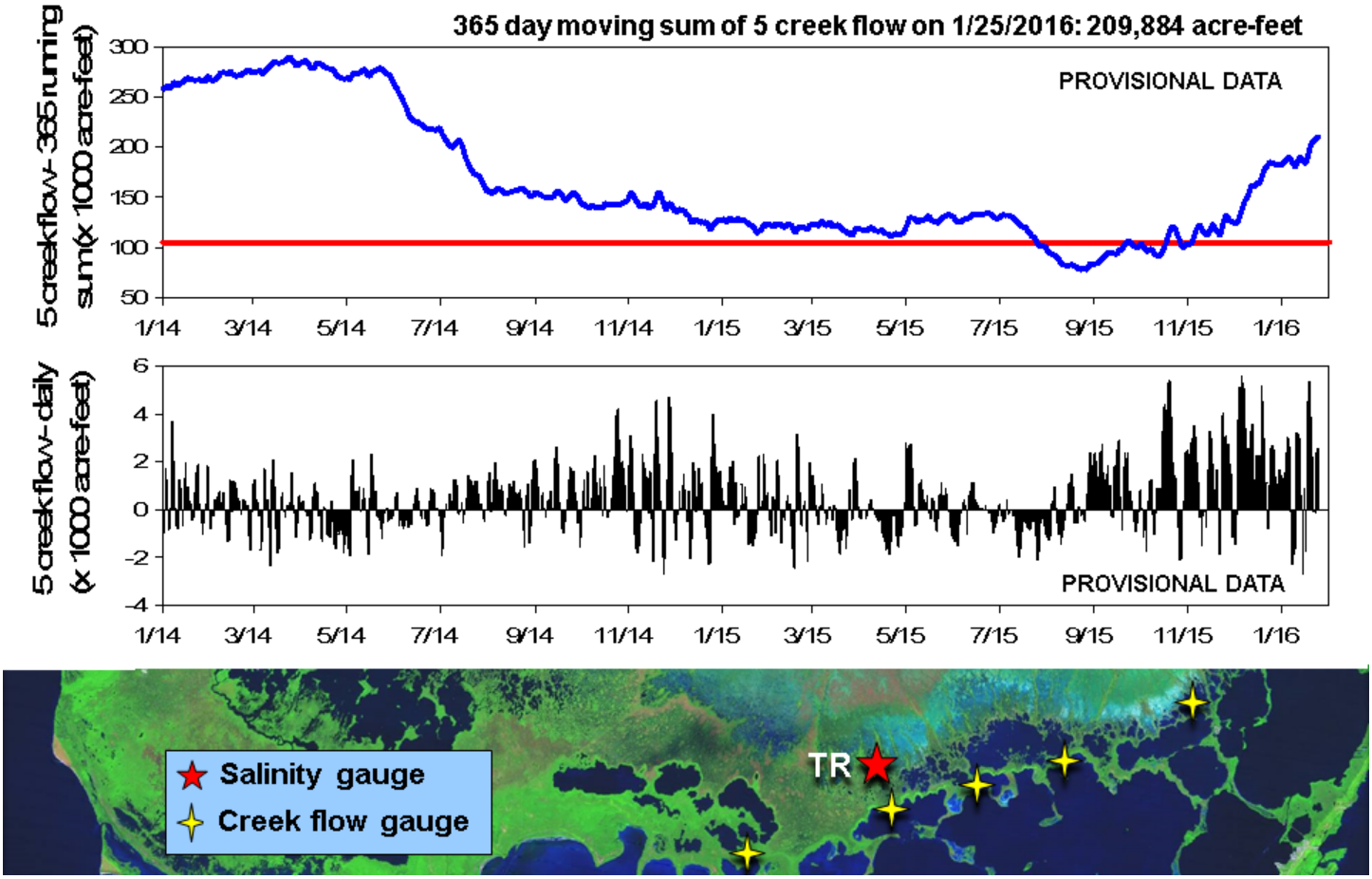
Salinities were mostly stable through Friday (the last day that data were available) with weekly changes less than one psu at most stations. The central and western nearshore embayments decreased by five to six psu, bringing these two areas to within one psu of their historic averages. However, both areas were rising and the data that would show the effects of Friday's rain are not available. The daily average salinity at the MFL sentinel site of TR is 0.9 psu. The seasonal average normally rises from now through June. The 30-day moving average salinity remains at 1.0 psu.

The 365 day running sum of the cumulative flow from the five creeks flowing into Florida Bay increased to 209,884 acre-feet (81 percent of the WY1997-2014 average of 257,628 acre-feet). This is the first time that flow has exceeded 200,000 acre-feet since July 2014. Daily differences in the 365-day running sum of the cumulative flow from the five creeks represent the difference between current daily flow and flow a year ago. The front that brought the rain on Friday caused upstream flows, but they lasted only two days. Cumulative flow from the five creeks last week (January 18 to 24) was 18,242 acre-feet, about 18,000 acre-feet above average for this time of year and almost triple the previous week's total (6,403 acre-feet, about 4,800 acre-feet above average).





5 Creek Cumulative Flow and Florida Bay MFL Flow Criteria Tracking



<u>Water management recommendations</u>:

- It is important to enhance ongoing recessions and prevent reversals to provide good wading bird habitat. Regular dry season recession rates are necessary to support wading bird foraging and nesting in the Everglades.

- Additional flow into northwestern WCA-3A is acceptable, while recession rates in northeastern WCA-3A are necessary for wading bird foraging and nesting. Reversals in northeastern 3A should be prevented as much as possible to support wading birds. Around 2000 wading birds are foraging in northeastern WCA-3A.

- We recommend moving as much water as possible south into ENP to Florida Bay to maintain seasonably normal hydrological conditions.

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

Summary of Everglades Recommendations, Jan. 26, 2016 (SFWMD) (red is new text)

Area	Current Condition	Cause(s)	Recommendation	Reasons
WCA-1	Stages changed from -0.03' to -0.06'	Rainfall, ET, management	Match inflows with outflows to achieve regulation schedule recession while allowing water levels to reflect variation in annual rainfall. Prevent repeated or ongoing reversals as much as possible.	Keep peat wet to promote native habitat and maintain wetland plant and animal communities. Provide moderate recession rates to support wading bird foraging, necessary for successful nesting.
WCA-2A	Stage increased 0.46'	Rainfall, ET, management	Follow normal seasonal practices. Prevent repeated or ongoing reversals as much as possible.	Keep peat wet to promote native habitat and maintain wetland plant and animal communities. Provide moderate recession rates to support wading bird foraging, necessary for successful nesting..
WCA-2B	Stage decreased -0.01' to 0.0'	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 decline at the end of the dry season.
WCA-3A NE	Stage changed +0.07'	Rainfall, ET, management	Releases into far northwestern 3A are acceptable. The average water stage of gauges 62 and 63 should remain under 11.60 feet for terrestrial wildlife. Prevent reversals in northeastern 3A as much as possible.	Keep peat wet to promote native habitat and maintain wetland plant and animal communities. Provide moderate recession rates to support wading bird foraging, necessary for successful nesting..
WCA-3A NW	Stage changed +0.20'	Rainfall, ET, management		
Central WCA-3A S	Stage changed +0.02'	Rainfall, ET, management	Prevent repeated or ongoing reversals. Stages at gauge 65 have exceeded 2.5' since Nov. 23 (10 weeks) but remain below 2.5' at gauges 64 and 63.	Keep peat wet to promote native habitat and maintain wetland plant and animal communities. Provide moderate recession rates to support wading bird foraging, necessary for successful nesting.
Southern WCA-3A S	Stage changed +0.03'	Rainfall, ET, management		
WCA-3B	Stages changed from +0.01' to +0.04'	Rainfall, ET, management	Follow normal seasonal practices. Prevent repeated or ongoing reversals as much as possible.	Keep peat wet to promote native habitat and maintain wetland plant and animal communities. Provide moderate recession rates to support wading bird foraging, necessary for successful nesting.
ENP-SRS	Stage changed +0.01'	ET, rainfall, topography, management	Make discharges to the Park according to the ERTP rainfall plan.	Keep peat wet to promote native habitat and maintain wetland plant and animal communities.
ENP-CSSS habitats	S-12A is closed to enhance pre-breeding dry-down	Rainfall, ET, management	Follow rainfall plan for releases. Adhere to ERTP closures for S12-A and B. Maximize flows through S333 as possible.	Provide habitat and appropriate nesting conditions for CSSS.
Taylor Slough	5-16 inches above average	Rain, ET, inflows	Move water southward as possible	Provide freshwater buffer for ecosystems and maintain low salinity conditions downstream
FB- Salinity	Within 2 psu of average	Rain, ET, inflows, wind	Move water southward as possible	Southward flows are still needed to maintain lower salinity levels.