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: September 1, 2015

SUBJECT: Weekly Environmental Conditions for Systems Operations

Summary

Stages in Lakes East Toho, Toho, and Kissimmee-Cypress-Hatchineha (KCH) are at or above their regulation schedule lines. Discharge from all three lake groups is being adjusted to return to or below lake regulation lines while moderating changes in flow to the Kissimmee River at S65/S65A. On Sunday, discharge at S65 averaged 4400 cfs and at S65A 5760 cfs. Discharge at S65E averaged 3540 cfs over the past week. Tuesday morning discharges: S65 ~4500 cfs; S65A ~6200 cfs; S65C ~4550 cfs; S65E ~4635 cfs. A Dissolved Oxygen (DO sag is in progress in the Kissimmee River and resulted in a small fish kill. DO concentration averaged 0.97 mg/L over the past week and 0.94 mg/L on Sunday. Kissimmee River mean floodplain depth is currently 1.73 ft.

Lake Okeechobee is at 13.02 feet NGVD, having risen 0.39 feet over the past week, and 0.79 feet over the past month. This ascension rate is faster than the preferred rate of no more than 0.5 feet per month. The lake remains in the base flow sub-band. Satellite imagery indicates low to moderate bloom conditions in most of the Lake's nearshore zone and low bloom conditions in the northwest, west and southwest outer portions of the pelagic zone.

Over past week, total freshwater inflow to both estuaries were dominated by local basin runoff, averaging 1985 cfs to the St. Lucie and 5324 cfs to the Caloosahatchee. In the St. Lucie Estuary, salinity was in the good range for adult oysters. In the Caloosahatchee Estuary, salinity continued to be in the good range for adult oysters at Shell Point and Sanibel, and in the poor range at Cape Coral. Salinities were also in the good range for tape grass in the upper Caloosahatchee Estuary, and is forecast to remain so over the next two weeks, even with no flow through S-79.

Everglades water levels rose last week with relatively high rainfall, ranging from 1.92 inches to 3.76 inches. Stages rose from 0.06 feet to 1.00 feet. Northeastern WCA-3A remains up to two feet below ground, but stages are rising. Heavy rainfall in southern Everglades National Park has caused the MFL salinity to decrease a couple psu to 40.8

psu and flow to begin again from the five creeks into Florida Bay. Much more rainfall is required to approach normal conditions in the Everglades and Florida Bay.

Weather Conditions and Forecast

Scattered afternoon showers and thunderstorms mainly over the interior this afternoon. The remnant moisture and energy from Erika has shifted northward into the northeastern Gulf of Mexico and north Florida and some drier air is spreading across the southern half of the District. Expect afternoon heating to generate scattered shower activity mainly over the interior and north this afternoon and evening. Southeasterly steering winds will focus scattered afternoon thunderstorms over the interior and west Wednesday and then the interior and north Thursday. A trough is then forecast to develop over the eastern Gulf of Mexico Friday and increase daily thunderstorm activity over the District Friday and Saturday.

KISSIMMEE BASIN

Kissimmee Basin Rainfall

The Upper Kissimmee Basin received 3.90 inches of rainfall in the past week and the Lower Basin received 3.23 inches (SFWMD Daily Rainfall Report 8/31/2015).

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: 9/1/2015

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)						
							8/30/15	8/23/15	8/16/15	8/9/15	8/2/15	7/26/15	7/19/15
Lakes Hart and Mary Jane	S62	272	LKMJ	60.3	R	60.0	**0.3**	-0.1	0.0	-0.2	0.2	-0.1	0.0
Lakes Myrtle, Preston, and Joel	S57	88	S57	60.9	R	61.0	**-0.1**	-0.1	0.2	-0.2	0.0	-0.2	-0.2
Alligator Chain	S60	113	ALLI	63.2	R	63.3	**-0.1**	-0.3	-0.1	-0.3	-0.1	-0.2	-0.1
Lake Gentry	S63	195	LKGT	61.2	R	61.0	**0.2**	-0.2	-0.1	-0.2	0.0	-0.1	0.0
East Lake Toho	S59	769	TOHOE	56.9	R	56.5	**0.4**	0.2	0.1	0.0	-0.1	-0.3	-0.5
Lake Toho	S61	1568	TOHOW	53.8	R	53.5	**0.3**	-0.1	-0.1	-0.1	0.1	-0.3	-0.3
Lakes Kissimmee, Cypress, and Hatchineha	S65	3970	LKISSP, KUB011, LKIS5B	51.1	R	51.0	**0.1**	0.2	0.1	-0.2	-0.5	-0.7	-1.0

* 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: **9/1/2015**

Metric	Location	Sunday's 1-day average	Weekly Average**									
			8/30/15	8/23/15	8/16/15	8/9/15	8/2/15	7/26/15	7/19/15	7/12/15	7/5/15	6/28/15
Discharge (cfs)	S-65	4399	**3970**	2629	1557	1125	250	145	447	513	314	352
Discharge (cfs)	S-65A	5759	**4585**	2783	1488	1030	345	284	411	597	277	273
Discharge (cfs)	S-65C	4094	**3464**	1995	1710	905	752	682	762	958	430	435
Headwater stage (feet NGVD)		36.6	**35.3**	35.3	35.4	34.8	34.2	34.2	34.2	33.9	33.4	33.3
Discharge (cfs)	S-65D****	4402	**3764**	2328	1759	1059	881	774	872	1076	480	515
Discharge (cfs)	S-65E	4201	**3539**	2122	1551	885	724	550	652	870	325	361
DO concentration (mg/L)***	Phase I river channel	0.94	**0.97**	2.23	3.84	3.54	4.30	4.85	4.90	5.15	7.26	8.09
Mean depth (feet)*	Phase I floodplain	**1.73**	N/A	1.29	0.95	1.09	0.51	0.44	0.47	0.68	0.22	0.19

* 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 of KRBN and PC62 through May 21,2015; is for PC62 only for May 22-June 1; and is the average for PC62 and PC33 starting June 2.PC33 omitted for week of Aug17-24

**** 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.

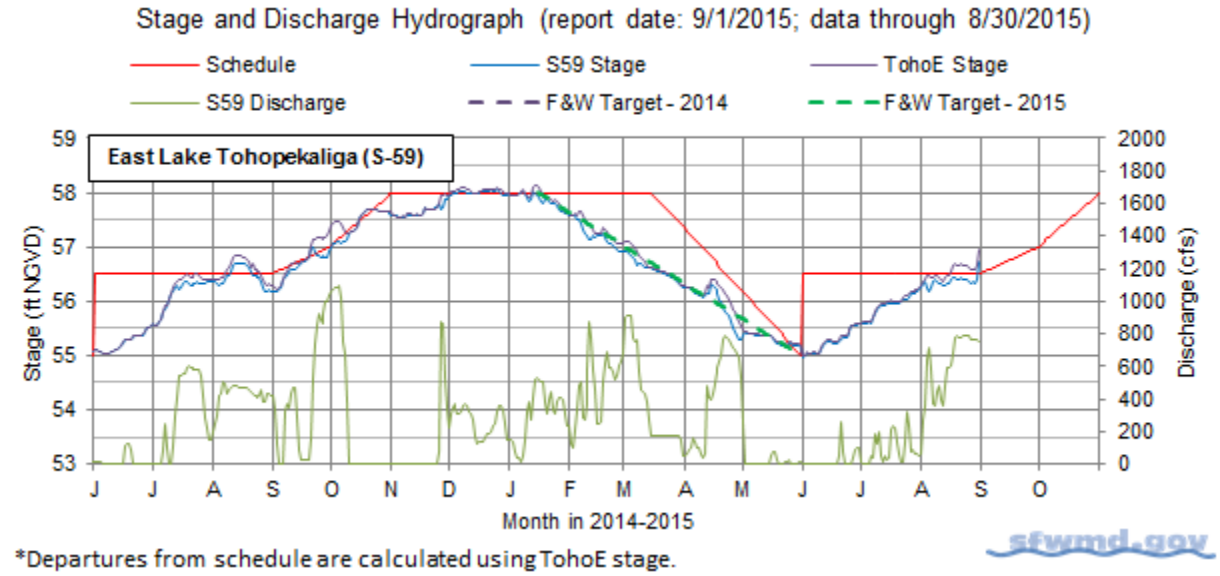
DATA ARE PROVISIONAL

Water Management Recommendations

Kissimmee Basin Recommendations and Operational Actions

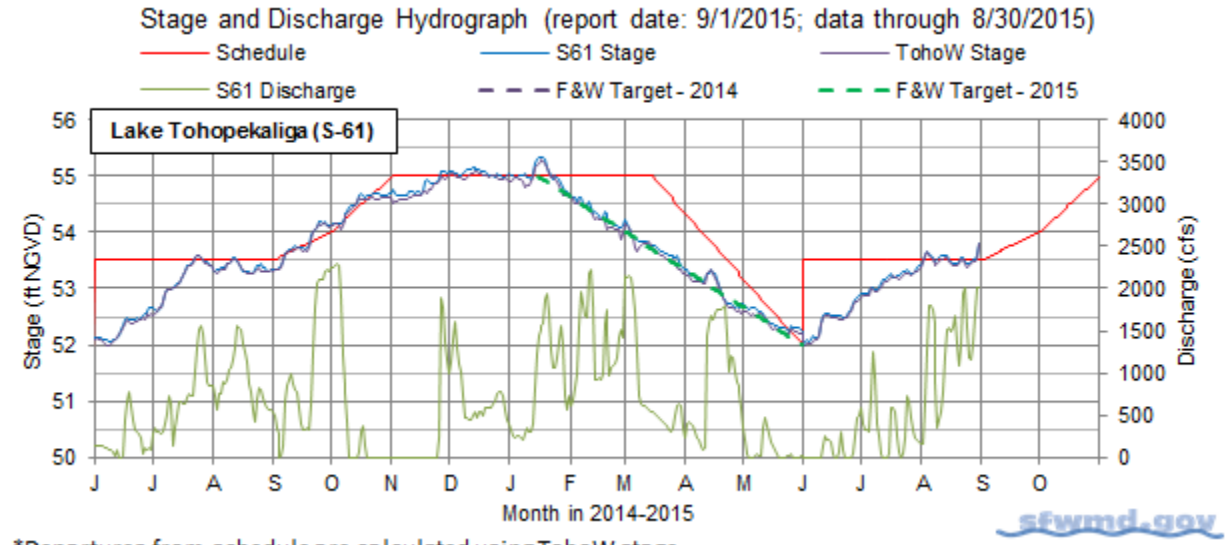
Date	Recommendation	Purpose	Outcome	Source
9/1/2015	No new recommendations.			
8/25/2015	No new recommendations.			
8/18/2015	No new recommendations.			
8/11/2015	No new recommendations.			
8/4/2015	No new recommendations.			
7/28/2015	No new recommendations.			
7/14/2015	No new recommendations.			
6/30/2015	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.			
2/23/2015	No new recommendations.			
2/17/2015	No new recommendations.			
2/10/2015	No new recommendations.			
2/3/2015	No new recommendations.			
1/27/2015	Starting today, follow a new SK recession line for KCH, which will be drawn from today's stage to regulation stage on March 1.	Snail kite recession in KCH	Implemented	

KCOL Hydrographs (through Sunday midnight)



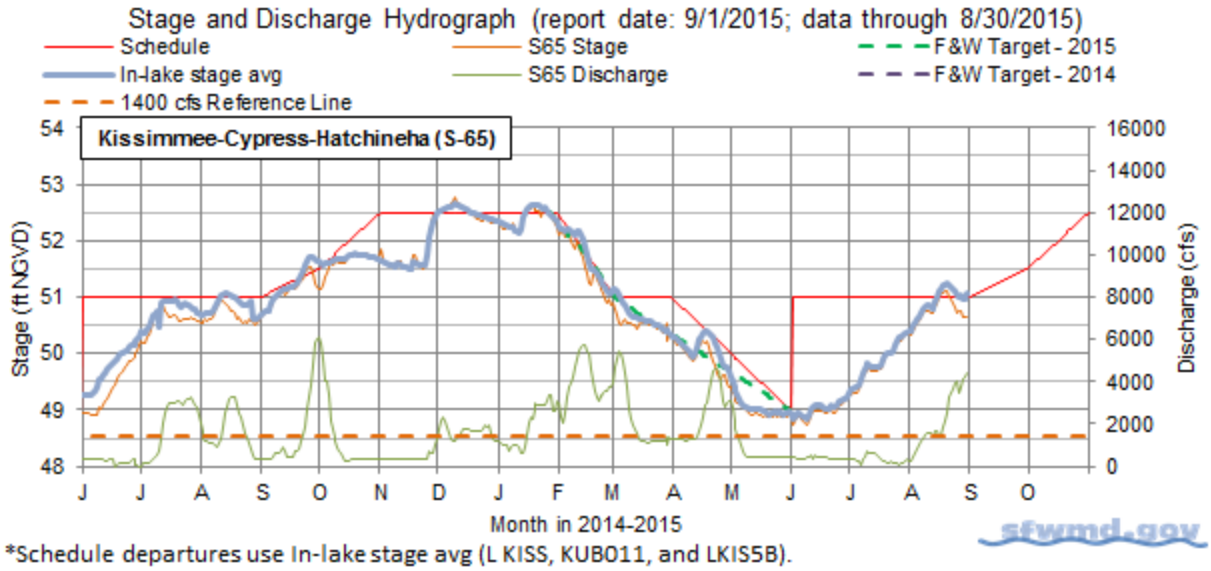
*Departures from schedule are calculated using TohoE stage.

Figure 1.



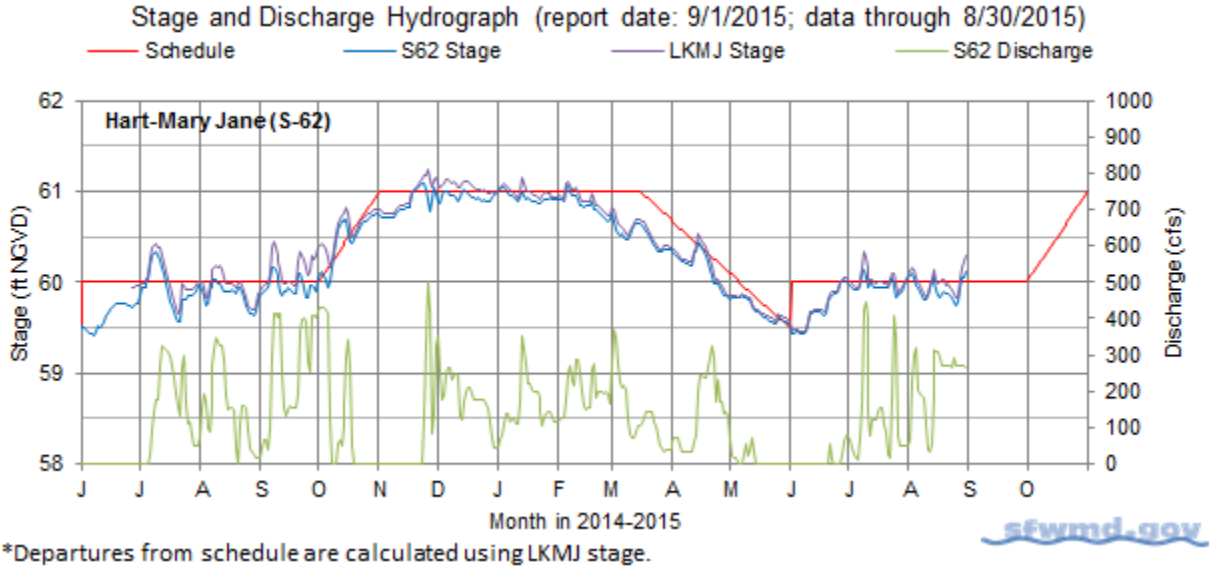
*Departures from schedule are calculated using TohoW stage.

Figure 2.



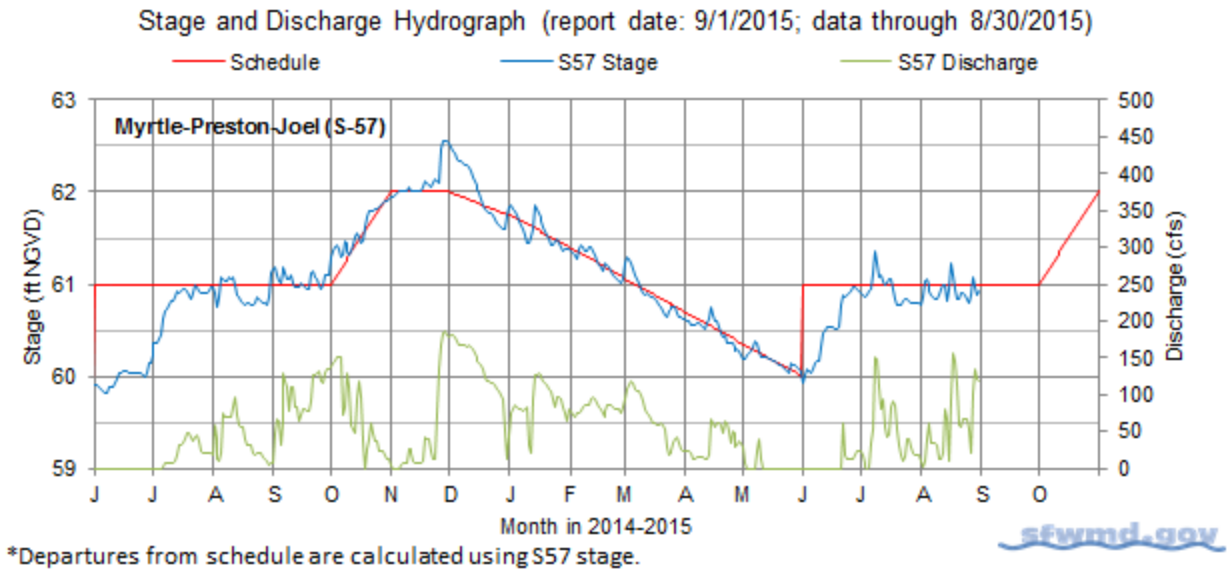
*Schedule departures use In-lake stage avg (L KISS, KUBO11, and LKIS5B).

Figure 3.



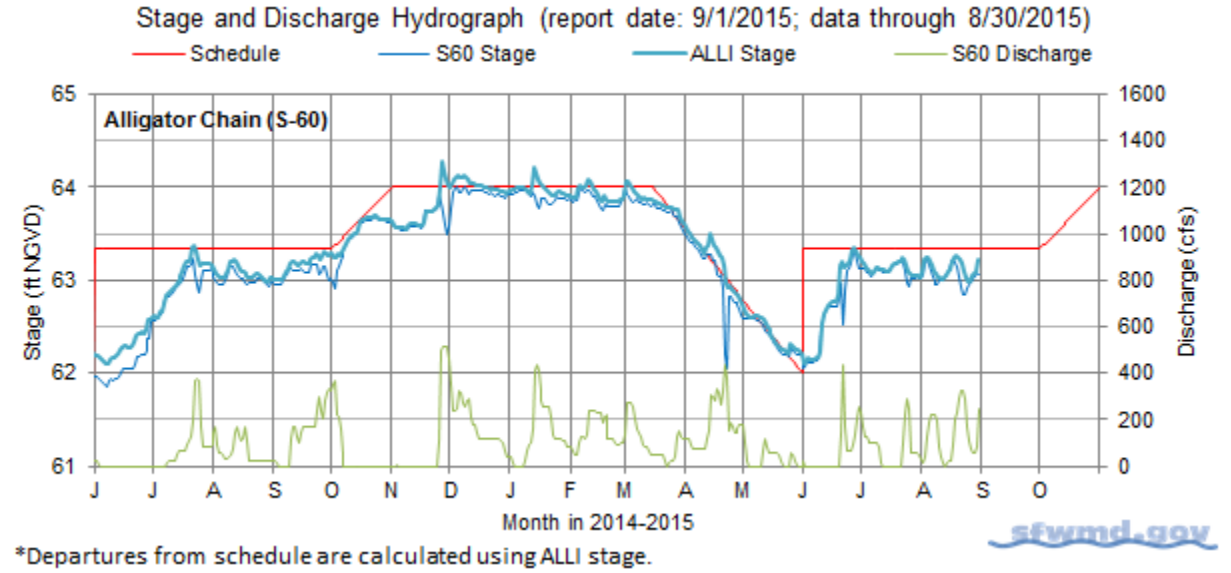
*Departures from schedule are calculated using LKMJ stage.

Figure 4.



*Departures from schedule are calculated using S57 stage.

Figure 5.



*Departures from schedule are calculated using ALLI stage.

Figure 6.

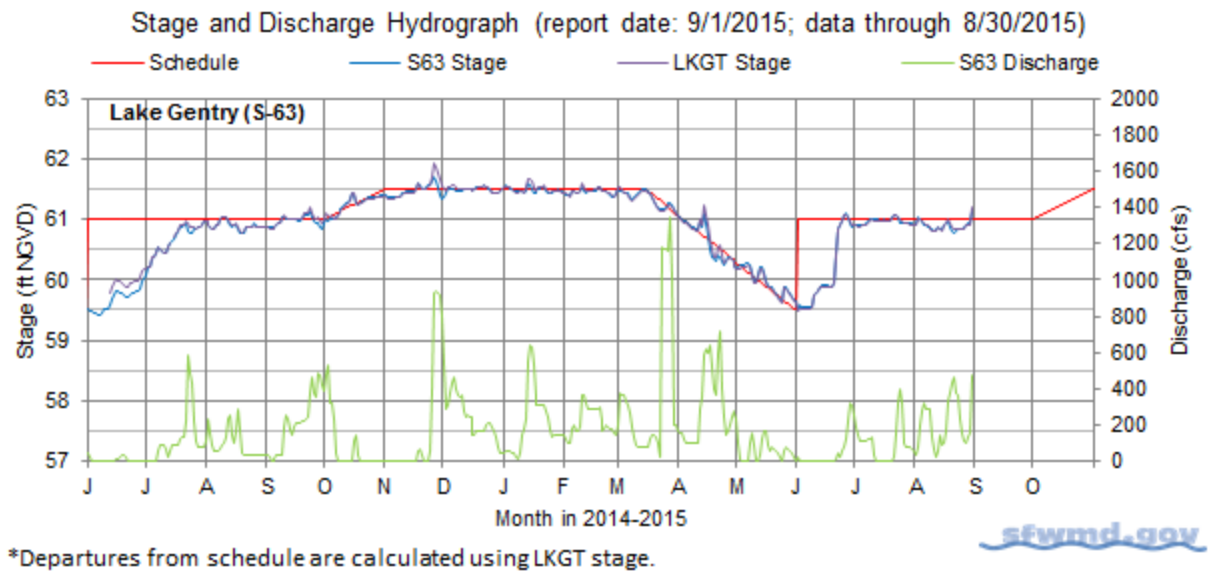


Figure 7.

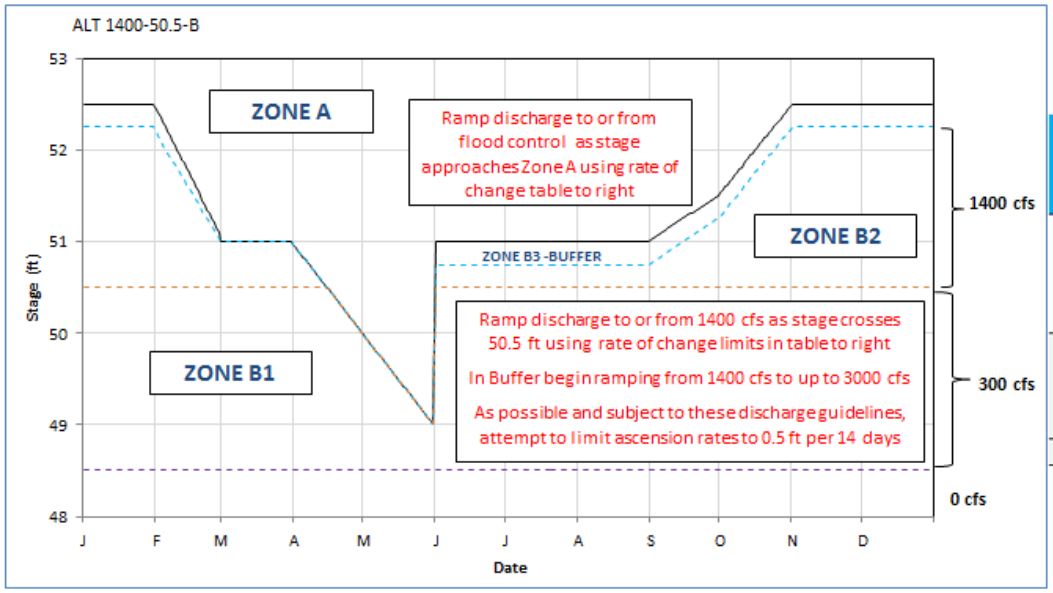


Table 1. Discharge Rate of Change Limits for S65/S65A
****Rate limits apply only in Zone B****

	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. Final S65 operational plan for Wet Season 2015.

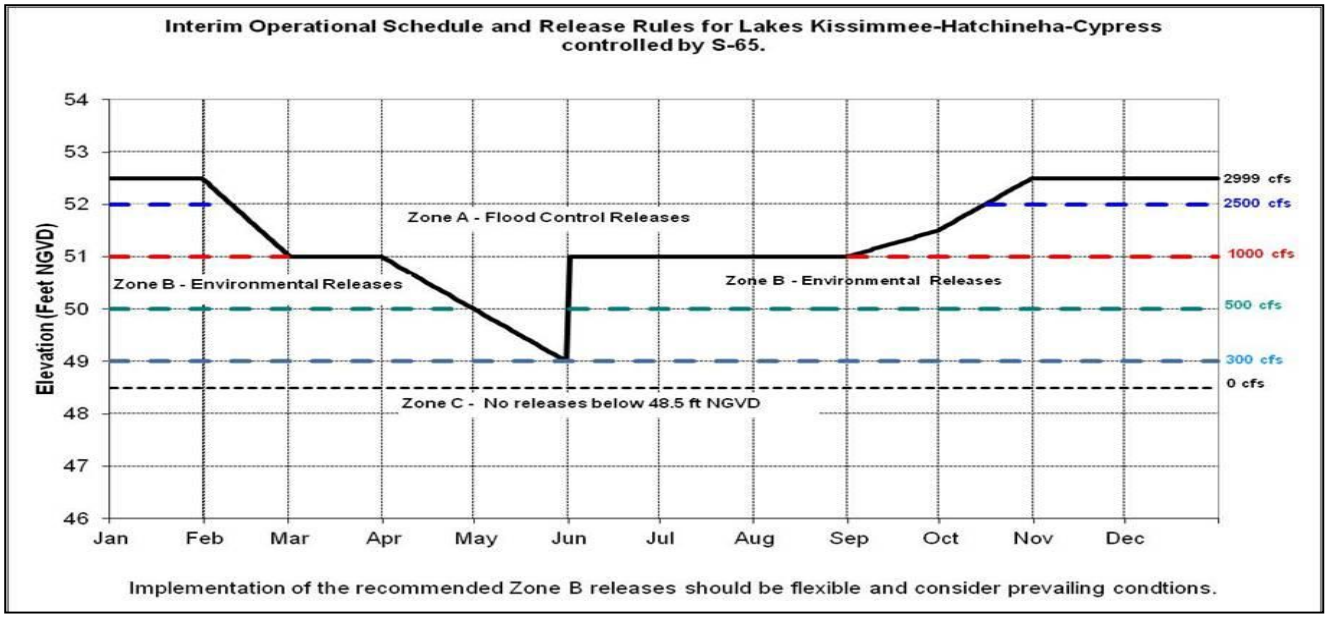


Figure 8b. Interim operations schedule for S-65. The discharge schedule shown to the right has not been used in recent years or in Wet Season 2015.

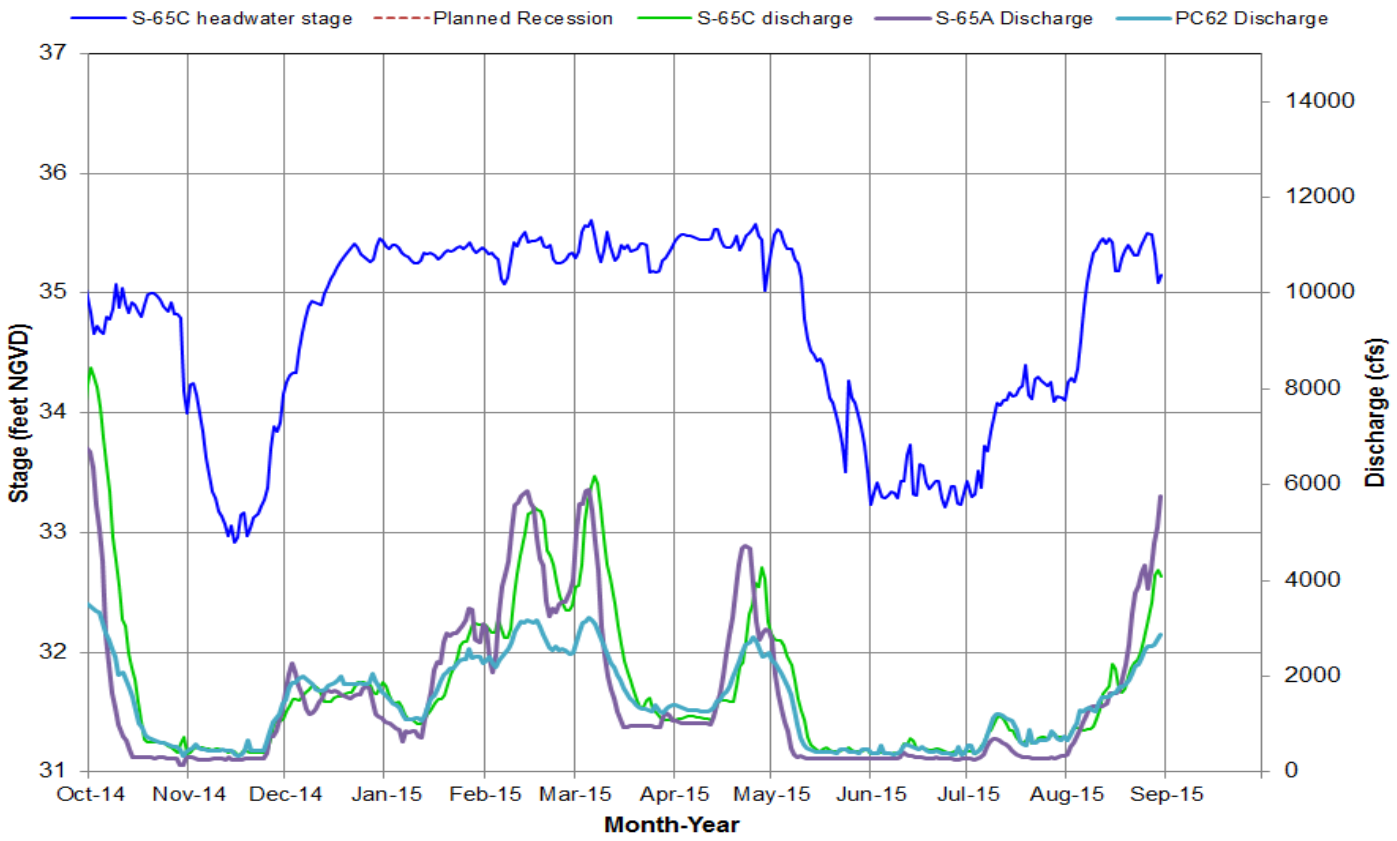


Figure 9. S-65C headwater stage in relation to discharge at S-65C, S-65A, and PC62.

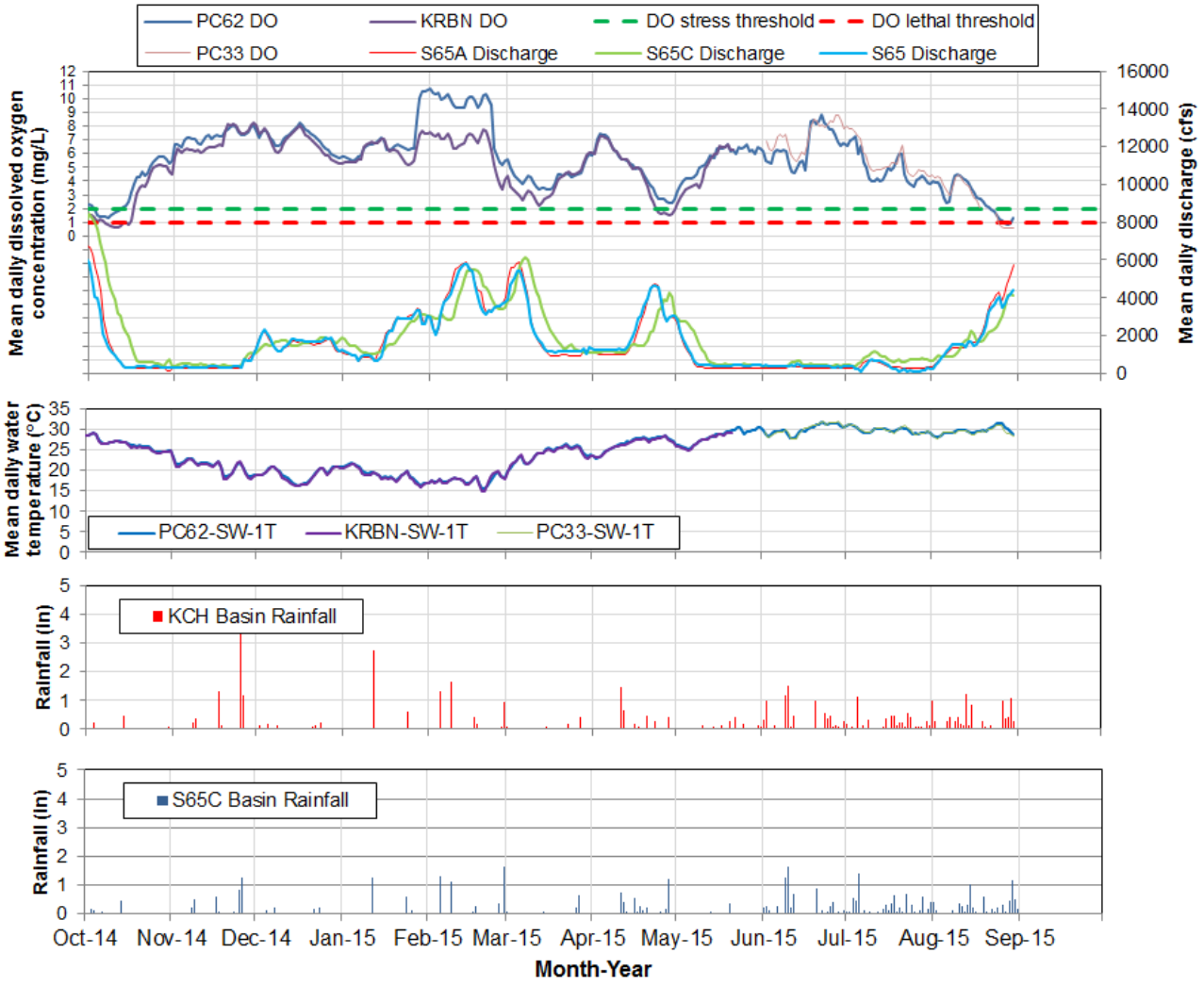
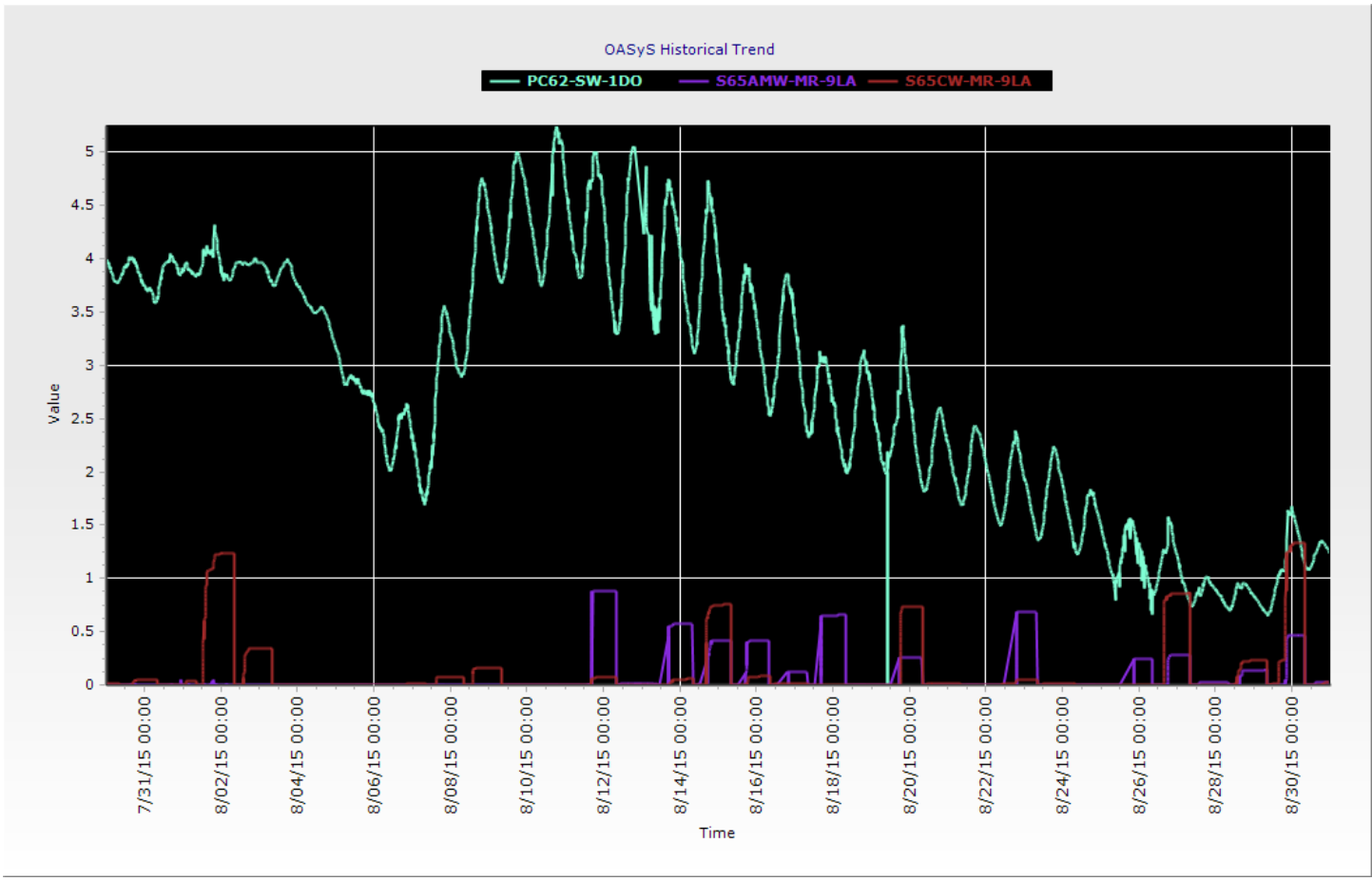


Figure 10. Mean daily DO, discharge, temperature and rainfall in the Phase I river channel.



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

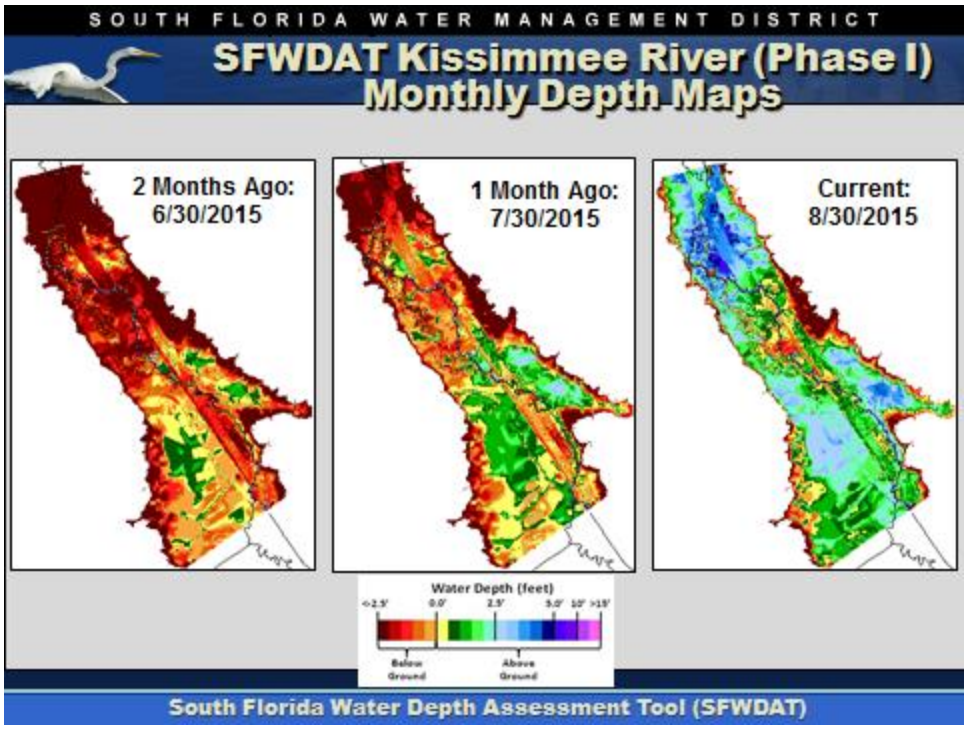


Figure 11. Phase I area floodplain water depths for this week, one month ago, and two months ago. Note that the WDAT color-coding has been modified to accommodate greater water depths; these maps are not directly comparable to Kissimmee Basin WDAT maps published prior to Jan. 16, 2012.

Kissimmee River Hydrographs

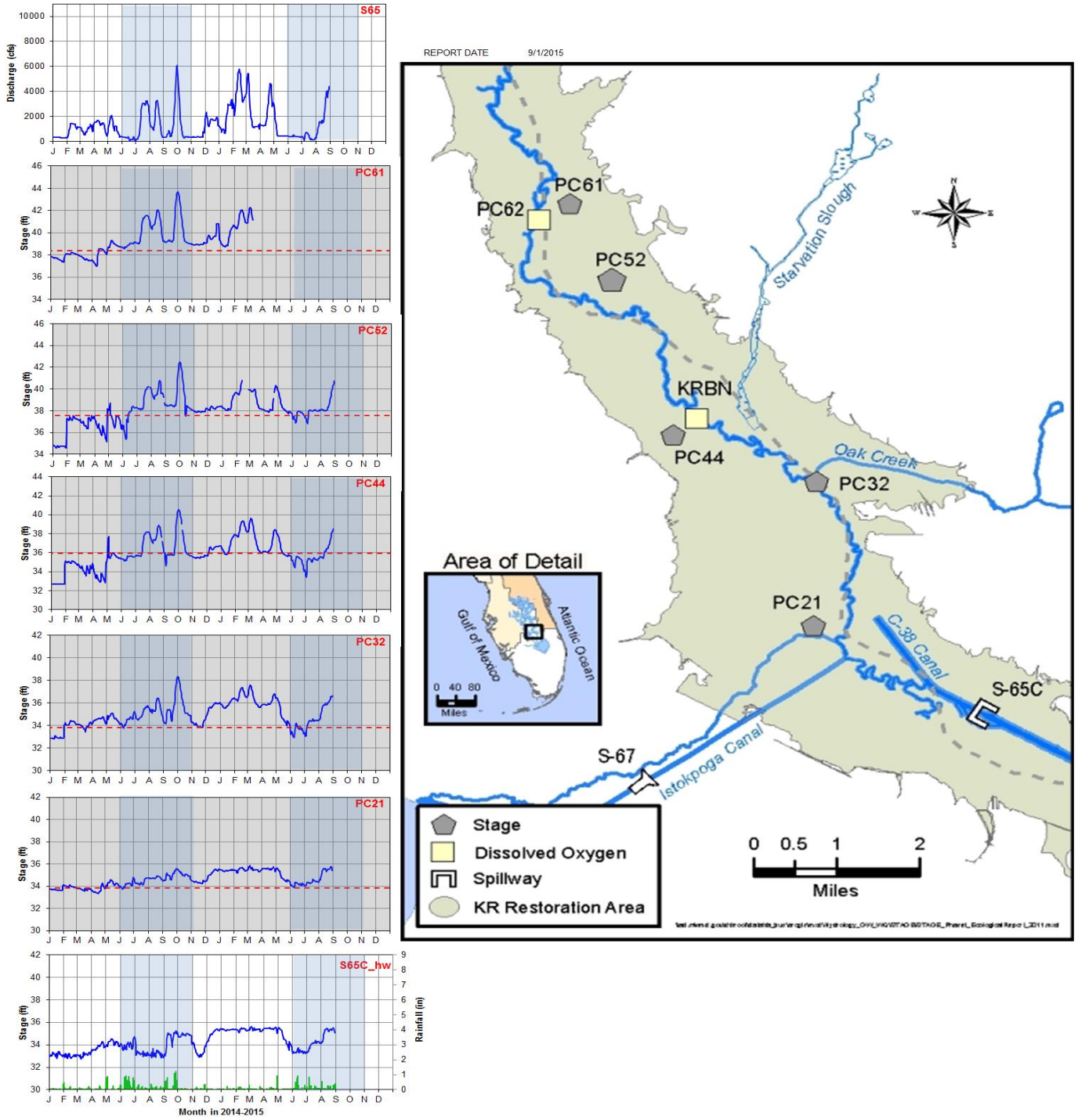


Figure 12. Discharge at S65, stages at five monitoring stations in the Phase I area of the Kissimmee River floodplain, and headwater stage at S65-C since January 1, 2013. The most recent data (~2 weeks) are provisional real-time data from SFWMD DualTrend; previous data are from SFWMD DB-HYDRO (validated).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

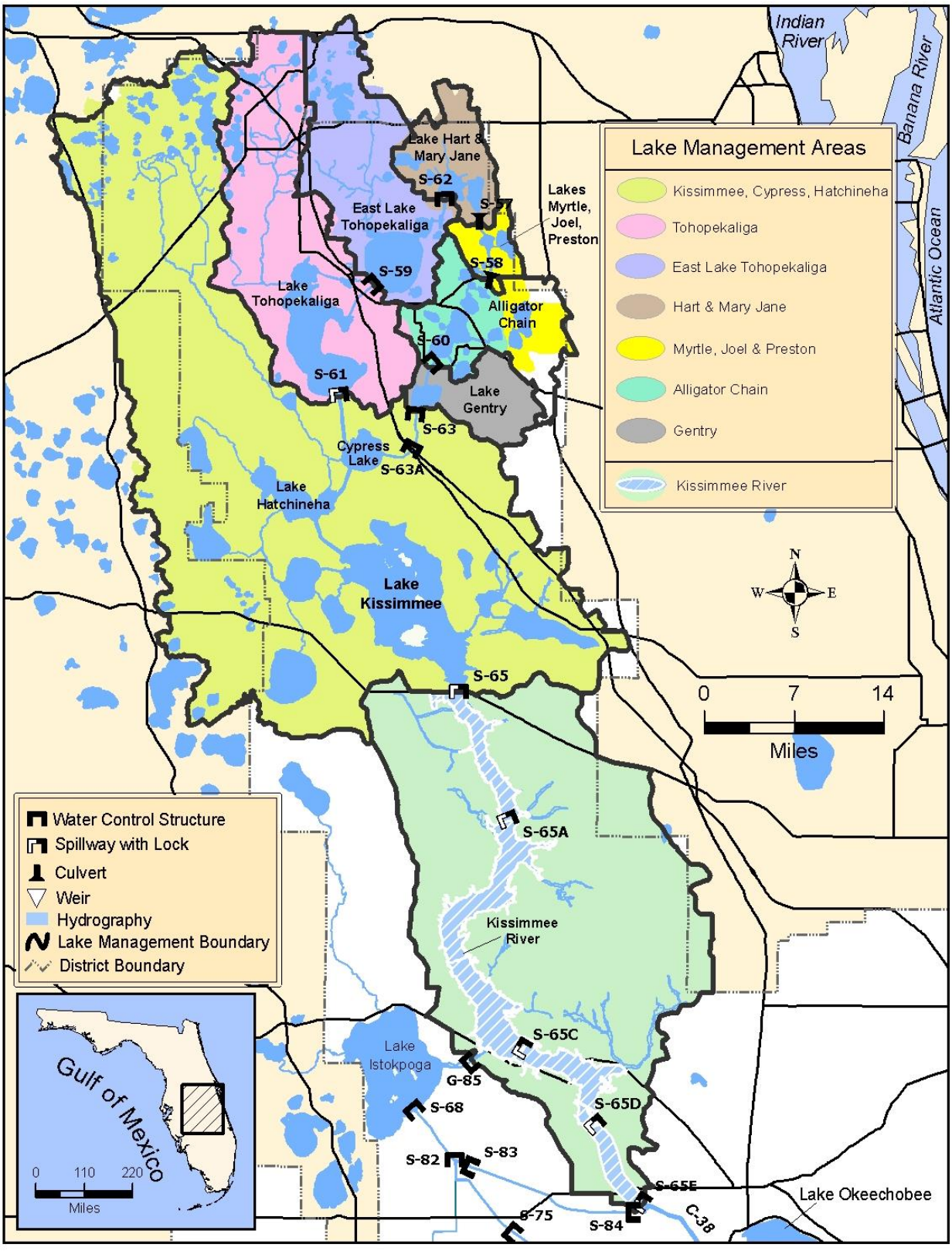

Lake Management Areas
Kissimmee, Cypress, Hatchineha
Tohopekaliga
East Lake Tohopekaliga
Hart & Mary Jane
Myrtle, Joel & Preston
Alligator Chain
Gentry
Kissimmee River
Lake Hart & Mary Jane
S-62
S-7
Lakes Myrtle, Joel, Preston
East Lake Tohopekaliga
S-58
S-59
Lake Tohopekaliga
Alligator Chain
S-60
S-61
Lake Gentry
S-63
Cypress Lake
S-63A
Lake Hatchineha
Lake Kissimmee
S-65
S-65A
Kissimmee River
S-65C
Lake Istokpoga
G-85
S-68
S-65D
S-82
S-83
S-65E
S-84
S-75
C-38
Lake Okeechobee
Indian River
Banana River
Atlantic Ocean
N
W
E
S
0
7
14
Miles
Water Control Structure
Spillway with Lock
Culvert
Weir
Hydrography
Lake Management Boundary
District Boundary
Gulf of Mexico
0
110
220
Miles

Figure 13. The Kissimmee Basin.

LAKE OKEECHOBEE

Lake Okeechobee is at 13.02 feet NGVD, having risen 0.39 feet over the past week, and 0.79 feet over the past month. This ascension rate is faster than the preferred rate of no more than 0.5 feet per month. The lake remains in the base flow sub-band. Satellite imagery indicates low to moderate bloom conditions in most of the Lake's nearshore zone and low bloom conditions in the northwest, west and southwest outer portions of the pelagic zone.

Hydrologic Conditions

According to the United States Army Corps of Engineers (USACOE) web site, Lake Okeechobee stage is at 13.02 feet NGVD for the period ending at midnight on August 31, 2015. Lake stage increased by 0.39 feet over the past week. The Lake is now 0.79 feet higher than it was a month ago and 1.44 feet lower than it was a year ago (Figure 1). The Lake is in the base flow sub-band (Figure 2). According to RAINDAR, 2.11 inches of rain fell directly over the Lake during the past seven days. Similar to slightly higher amounts fell in most of the surrounding watersheds with significantly higher rainfall in the upper Kissimmee Valley and in the Istokpoga basin (Figure 3).

Based on USACOE reported values, current Lake inflow is approximately 10605 cfs consisting of flows as indicated below.

Structure	Flow cfs
S65E	4612
S154	5
S84 & 84X	1242
S71	746
S72	225
C5	0
S191	965
S133 PUMPS	0
S127 PUMPS	93
S129 PUMPS	0
S131 PUMPS	0
S135 PUMPS	0
Fisheating Creek	1554
S2 Pumps	0
S3 Pumps	0
S4 Pumps	359

There was a small Lake outflow reported at S127 culvert (28 cfs) and the L8 structure is reporting a small flow (47 cfs) back into the Lake for an overall backflow of 19 cfs. Average corrected ET this past week was equivalent to an outflow of 2700 cfs.

Change in elevation equivalents and average weekly flows for major structures are presented in Figure 4.

The most recent MODIS satellite image (August 25) (Figure 5) indicates low to moderate chlorophyll values throughout much of the nearshore zone with some low chlorophyll values in the northwest, west and southwest portions of the outer pelagic zone.

August water quality data, which were collected early in the month, are presented in Figure 6. Total phosphorus (TP) and total suspended solids (TSS) concentrations continue relatively low and stable; probably reflecting limited resuspension of the internal sediment and nutrient pool due to the absence of major wind events and reduced early summer rainfall and basin inflows.

Water Management Recommendations

The summer increase in Lake levels is continuing with current weekly and monthly ascension rates exceeding the preferred rate of 0.5 feet per month. It is probable that this ascension rate will have some negative impacts on apple snail recruitment due to drowning egg clutches. However, the Lake remains below the optimal stage for this time of year. Future recommendations for the short term will depend in large measure on wet season rainfall patterns and amounts. The operational goal continues to be to maintain a steady increase in Lake Stage, not to exceed 0.5 feet per month (0.125 feet/week) throughout the wet season.

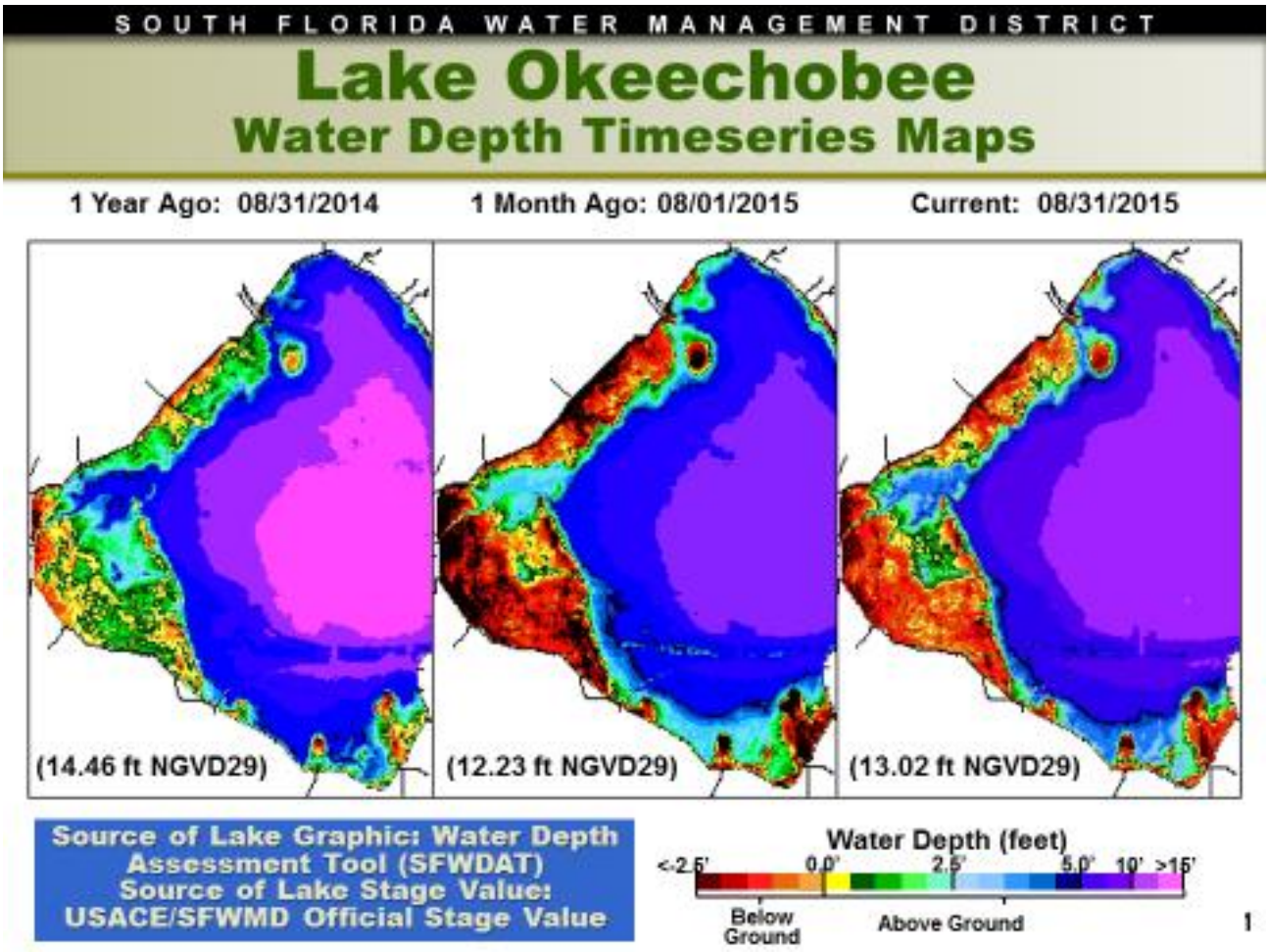

SOUTH FLORIDA WATER MANAGEMENT DISTRICT
Lake Okeechobee
Water Depth Timeseries Maps
1 Year Ago: 08/31/2014
1 Month Ago: 08/01/2015
Current: 08/31/2015
(14.46 ft NGVD29)
(12.23 ft NGVD29)
(13.02 ft NGVD29)
Source of Lake Graphic: Water Depth Assessment Tool (SFWDAT)
Source of Lake Stage Value: USACE/SFWMD Official Stage Value
Water Depth (feet)
<-2.5'
0.0'
2.5'
5.0'
10'
>15'
Below Ground
Above Ground
1

Figure 1

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Lake Okeechobee
Stage Hydrograph

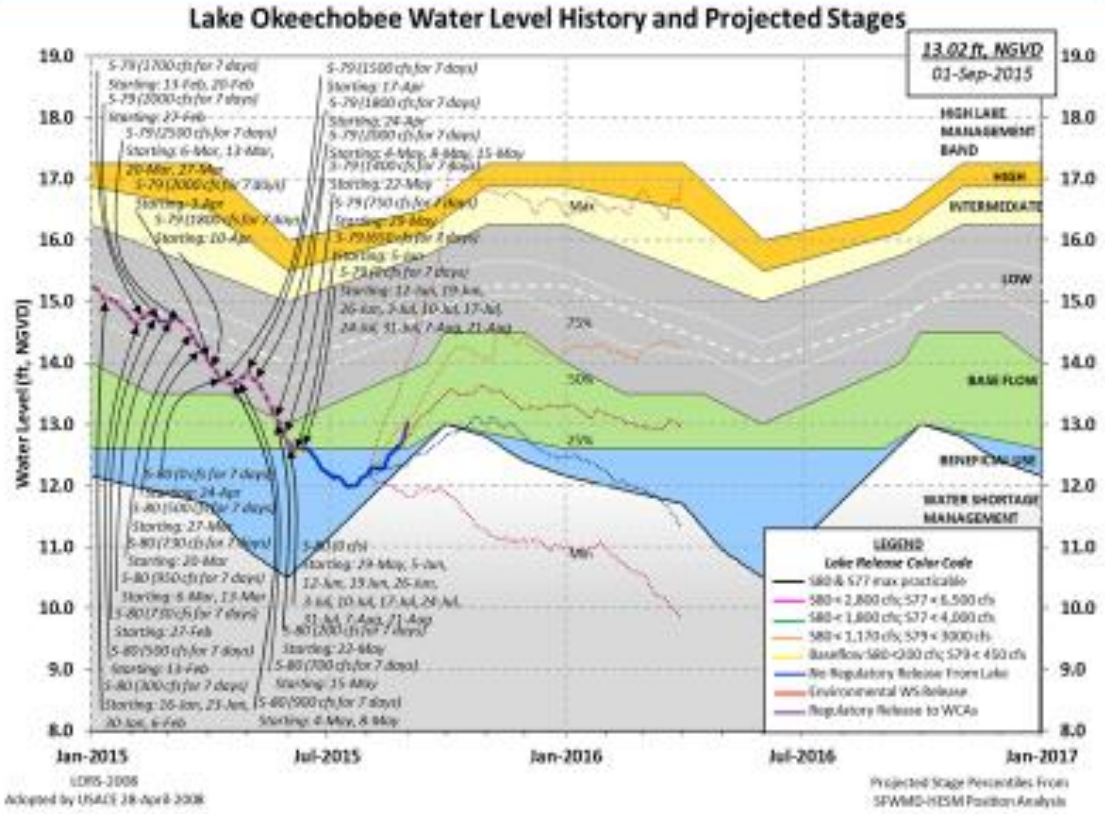


Figure 2

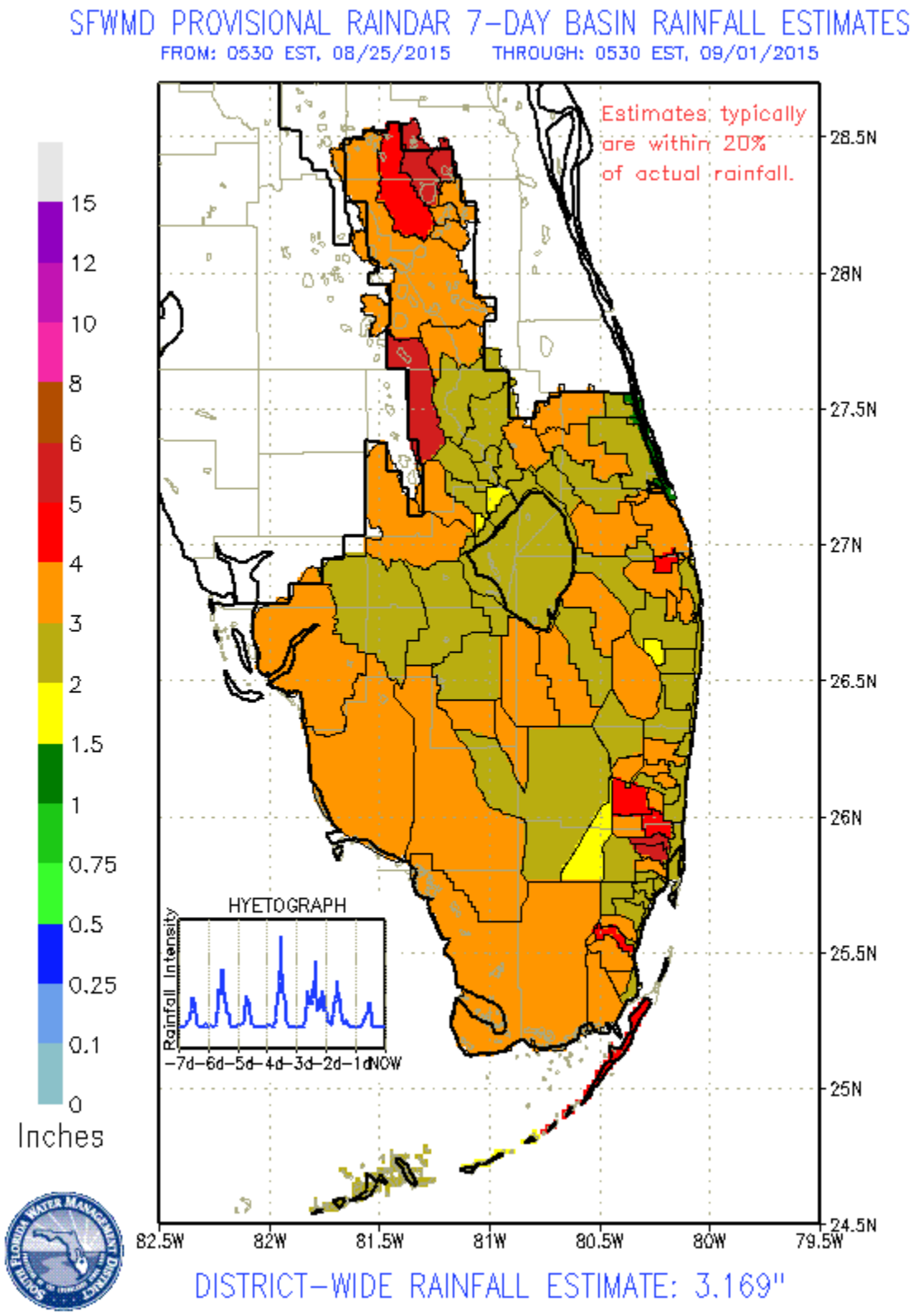

SFWMD PROVISIONAL RAINDAR 7-DAY BASIN RAINFALL ESTIMATES
FROM: 0530 EST, 08/25/2015 THROUGH: 0530 EST, 09/01/2015
Estimates typically are within 20% of actual rainfall.
15
12
10
8
6
5
4
3
2
1.5
1
0.75
0.5
0.25
0.1
0
Inches
HYETOGRAPH
Rainfall Intensity
-7d-6d-5d-4d-3d-2d-1dNOW
28.5N
28N
27.5N
27N
26.5N
26N
25.5N
25N
24.5N
82.5W
82W
81.5W
81W
80.5W
80W
79.5W
DISTRICT-WIDE RAINFALL ESTIMATE: 3.169"

Figure 3

INFLOWS	Average Daily Flow Past Week cfs	Feet of Change Past Week
S65E	3818	0.139
S71 & 72	626	0.023
S84 & 84X	626	0.036
Fisheating Creek	1366	0.050
Rainfall	N.A.	0.175
OUTFLOWS	**Average Daily Flow Past Week cfs**	**Feet of Change Past Week**
S77	0	0.000
S308	0	0.000
S351	0	0.000
S352	0	0.000
S354	0	0.000
L8	42	0.002
ET	2700	0.098

Figure 4

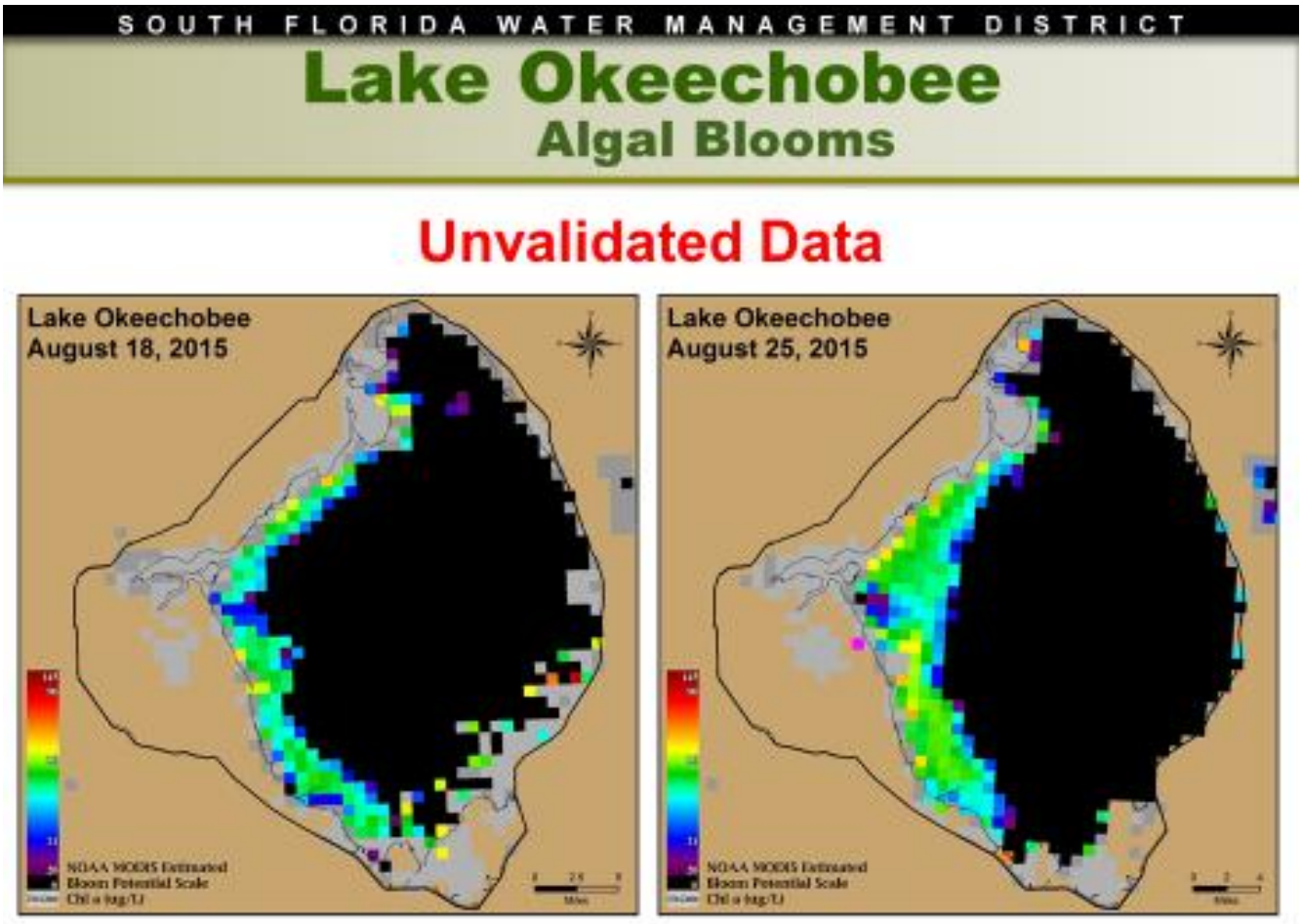
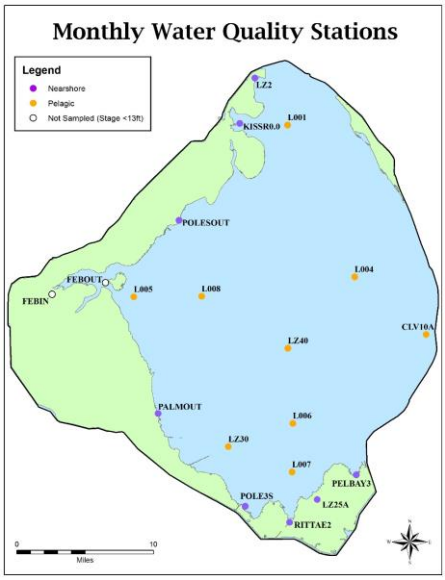

SOUTH FLORIDA WATER MANAGEMENT DISTRICT
Lake Okeechobee
Algal Blooms
Unvalidated Data
Lake Okeechobee
August 18, 2015
Lake Okeechobee
August 25, 2015

Figure 5

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Lake Okeechobee
Water Quality



Parameter		Jun 2015	Jul 2015	Aug 2015
TP ppb	Nearshore	92	67	52
	Pelagic	130	97	107
	Lakewide	112	83	81
TSS ppm	Nearshore	10	11	9
	Pelagic	20	18	21
	Lakewide	16	15	15

Figure 6

Lake Istokpoga:

Lake Istokpoga stage is 38.64 feet NGVD today and is currently 0.15 feet above its regulation schedule (38.49 ft. NGVD) which is now undergoing its annual rise to high pool stage (Figure 7). Average flows into the Lake from Arbuckle and Josephine creeks were 412 and 239 cfs respectively, a net increase from last week. Average discharge from S68 and S68X this past week was 970 cfs, roughly one and three quarters times higher than the preceding week. According to RAINDAR 5.6 inches of rain fell in the Lake Istokpoga watershed during the past seven days.

August 25 satellite imagery for Lake Istokpoga (Figure 8) indicated moderate chlorophyll concentrations over most of the Lake and potential severe bloom conditions in the southwestern region.

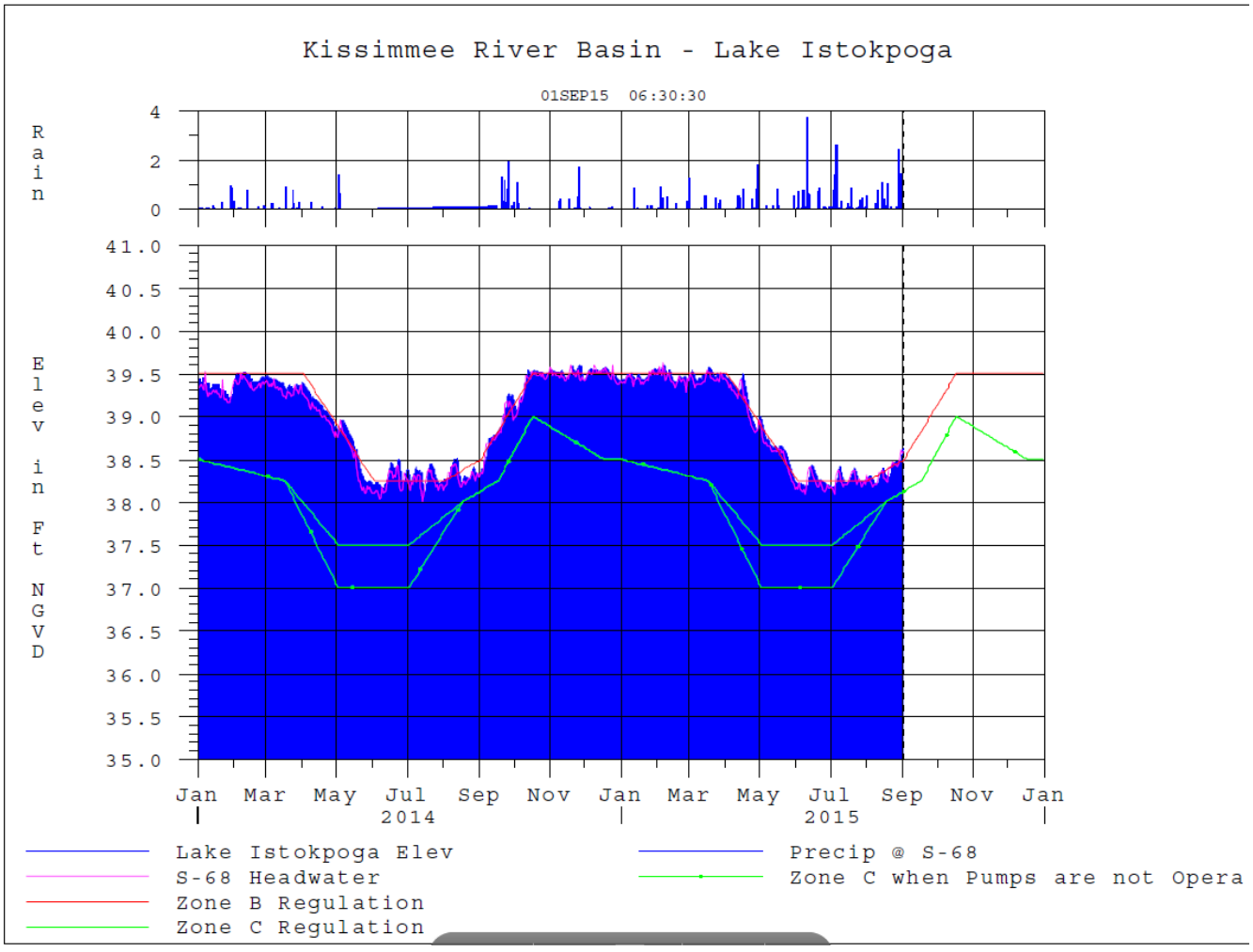
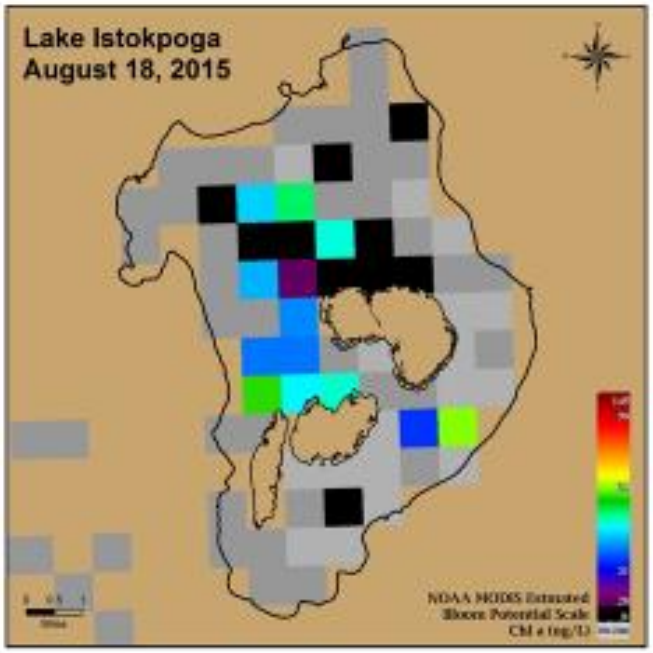


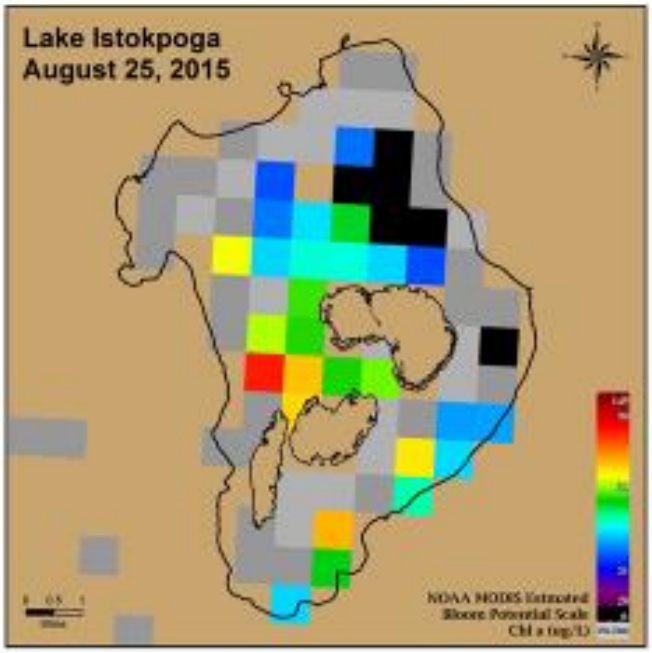
Figure 7

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Lake Istokpoga
Algal Blooms

Unvalidated Data





ESTUARIES

St. Lucie Estuary:
Over the past week, provisional flows averaged 342 cfs at S-80, 0 cfs at S-308, 662 cfs at S-49 on C-24, 247 cfs at S-97 on C-23, and 123 cfs from Ten Mile Creek at the Gordy Road Structure. Average inflow from tidal basin tributaries are estimated to be 611 cfs (Figures 1 and 2). Total inflow averaged 1985 cfs last week and 1101 cfs over last month.

Over the past week in the estuary, salinity decreased in the estuary (Table 1, Figures 3 and 4). The seven-day moving average salinity of the water column at the US1 Bridge is 13.9. Salinity conditions in the middle estuary are 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)	**6.9** (6.8)	**12.9** (13.7)	NA[1]
US1 Bridge	**12.6** (14.1)	**15.2** (16.9)	10.0-26.0
A1A Bridge	**21.2** (22.9)	**25.3** (27.3)	NA

[1]Envelope not applicable

Caloosahatchee Estuary:
During the past week, provisional flows averaged approximately 0 cfs at S-77, 823 cfs at S-78, and 2902 cfs at S-79. Average inflow from tidal basin tributaries are estimated to be 2422 cfs (Figures 5 and 6). Total inflow averaged 5324 cfs last week and 4364 cfs over last month.

Over the past week in the estuary, salinity remained fresh from S-79 to Ft. Myers and changed slightly downstream (Table 2, Figures 7 and 8). The seven-day average salinity values are within the good range for oysters at Shell Point and Sanibel, but within the poor range at Cape Coral (Figure 9). The 30-day moving average surface salinity is 0.2 at Val I-75 and 0.3 at Ft. Myers. Salinity conditions at Val I-75 are in the good range for tape grass.

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

Sampling Site	Surface	Bottom	Envelope
S-79 (Franklin Lock)	**0.2** (0.2)	**0.2** (0.2)	NA[1]
*Val I75	**0.2*** (0.2*)	**0.2*** (0.2*)	0.0-5.0[2]
Ft. Myers Yacht Basin	**0.2** (0.2)	**0.2** (0.2)	NA
Cape Coral	**1.5** (1.5)	**1.9** (1.9)	10.0-30.0
Shell Point	**14.2** (12.5)	**15.6** (16.5)	10.0-30.0
Sanibel	**24.1** (25.4)	**25.8** (27.8)	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 the site.

Salinity forecasts during the next two weeks were constructed for the following two scenarios of flow at S-79: a) no release (Figure 10), and b) 450 cfs pulse release. Due to high levels of flow from the watershed, the predicted daily salinity and the 30-day

moving average at the Val I75 location would be 0.3 for both cases by September 15, 2015.

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	NA	3.9 – 12.3
Dissolved Oxygen (mg/l)	NA	NA	3.4 – 7.7

The Florida Fish and Wildlife Research Institute reported on August 28, 2015, that *Karenia brevis*, the Florida red tide organism, was not detected in samples collected this week from in, along, or offshore of, Pinellas, Hillsborough, Manatee, Sarasota, Charlotte, Lee, Collier, or Monroe counties.

Water Management Recommendations

Lake Okeechobee's water level is within the Base Flow Sub-band; the tributary hydrological conditions are Very Wet; and the seasonal and multi-seasonal forecasts are Very Wet and Wet, respectively. The current and forecasted 30-day average salinities at the Val-I75 site are below the five psu threshold within the next two weeks. The Lake Okeechobee Regulation Schedule (LORS) recommends up to 450 cfs at S-79 and 200 cfs at S-80. The Lake Okeechobee Adaptive Protocols (LOAP) prescribe no lake releases at S-77.

Currently, the USACE is not releasing water from Lake Okeechobee to the Caloosahatchee and St. Lucie estuaries. Local basin runoff is more than sufficient to maintain salinity within the preferred ranges for oysters and submerged aquatic vegetation in both estuaries. There are no ecological benefits associated with additional releases from Lake Okeechobee.

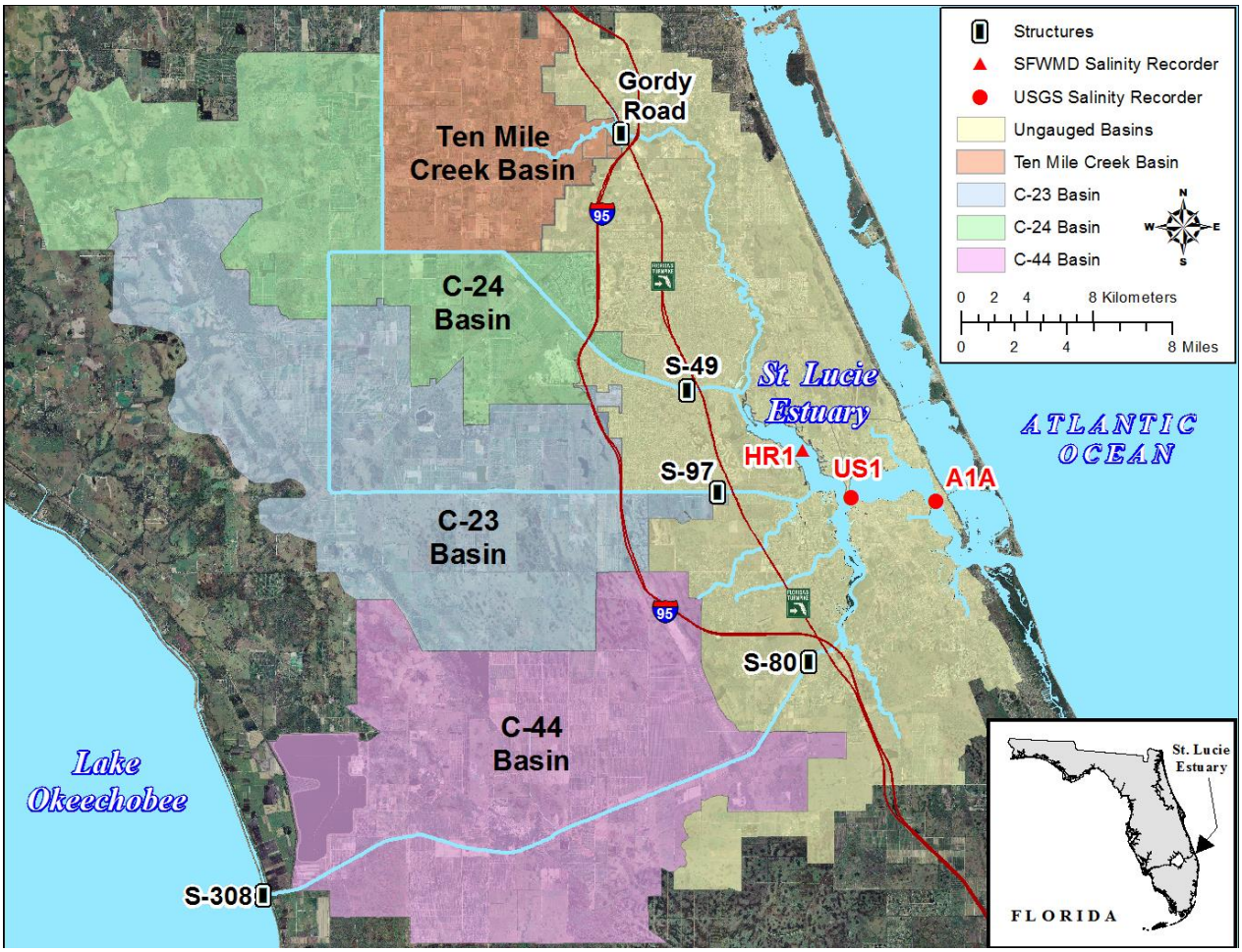


Figure 1. Basins, water control structures, and salinity monitoring for the St. Lucie Estuary.

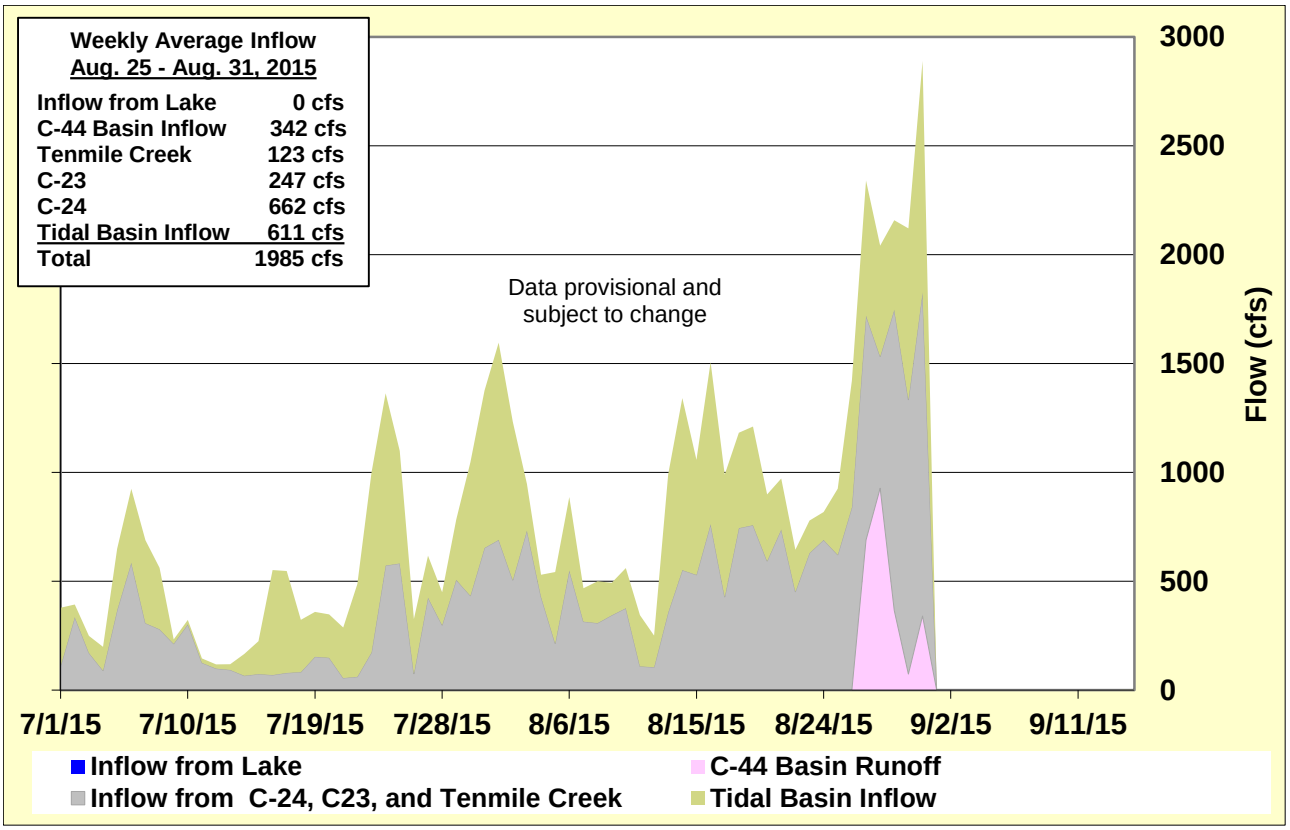


Figure 2. Estimated surface freshwater inflows from Lake Okeechobee and runoff from the C-44, C-23, C-24, Ten Mile Creek, and tidal basins into the St. Lucie Estuary.

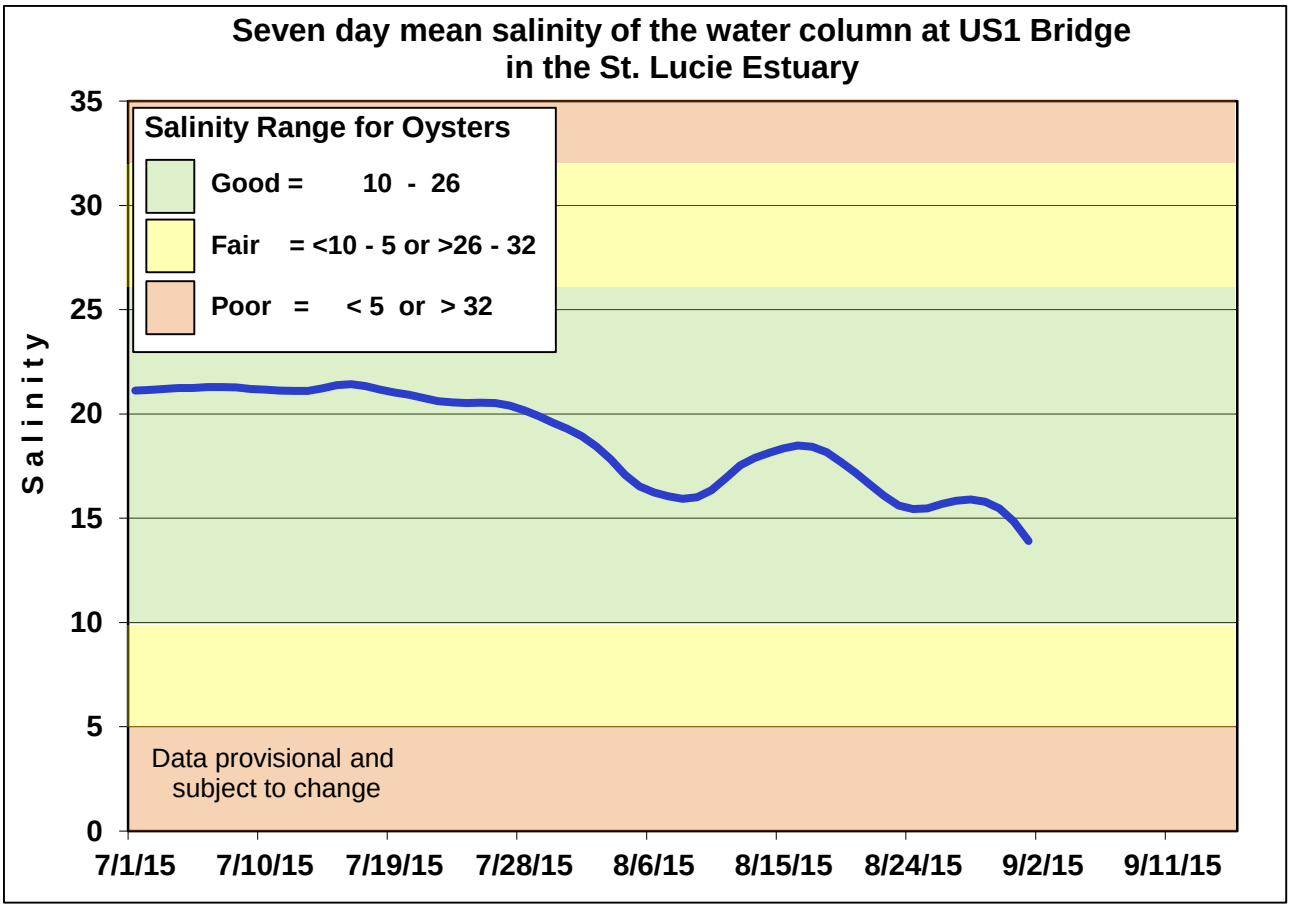


Figure 3. Seven-day mean salinity of the water column at the U.S. Highway 1 Bridge.

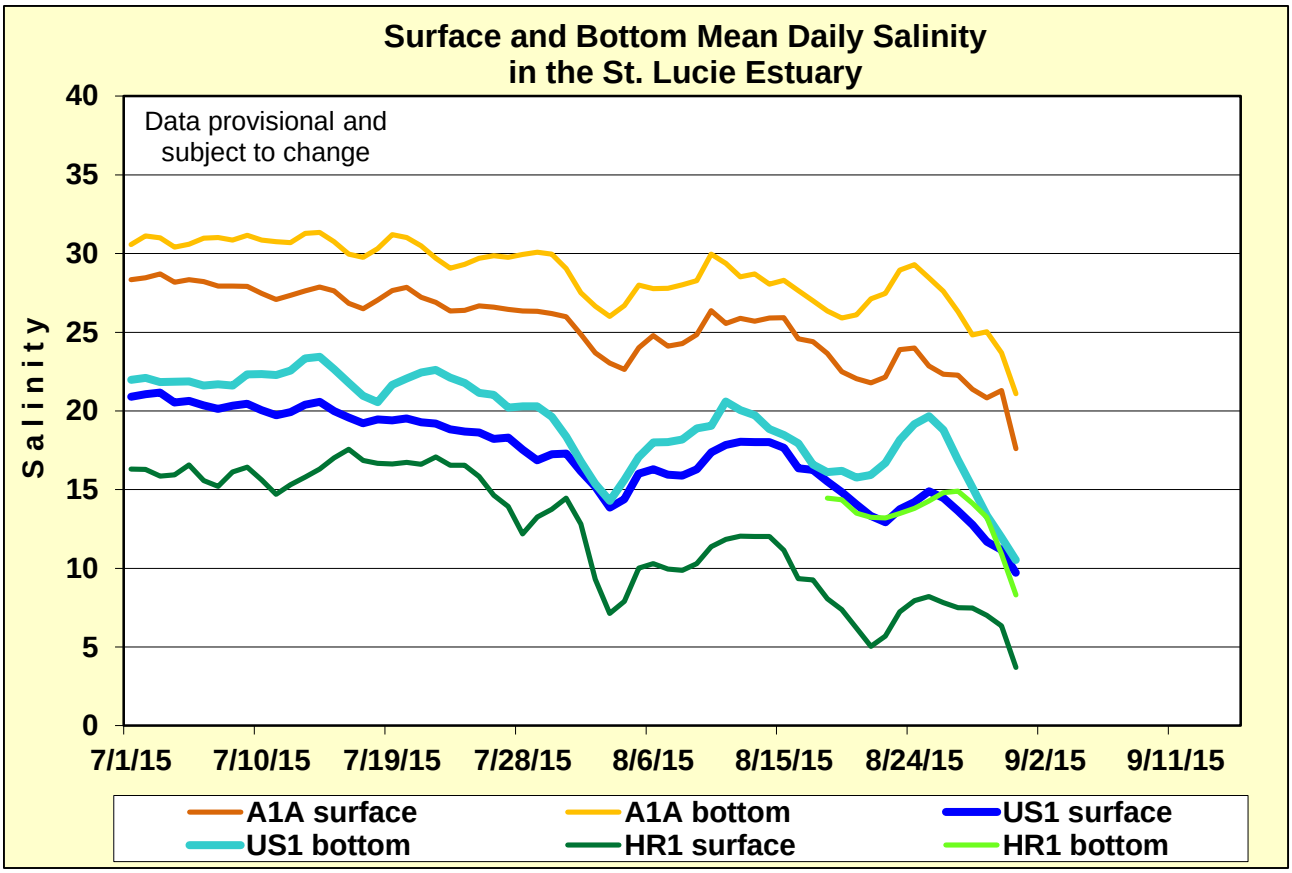


Figure 4. Daily mean salinity at the A1A, US1 and estimated HR1 stations.

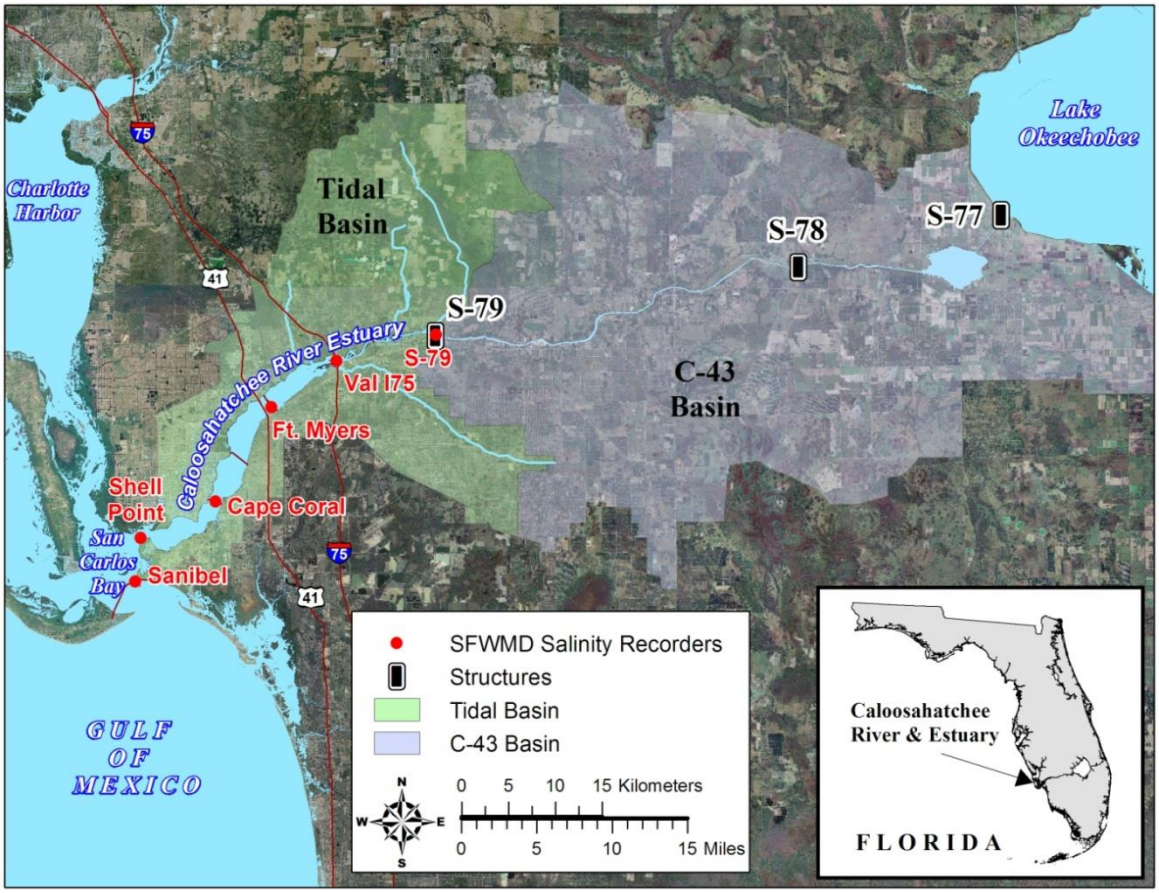


Figure 5. Basins, water control structures, and salinity monitoring for the Caloosahatchee Estuary.

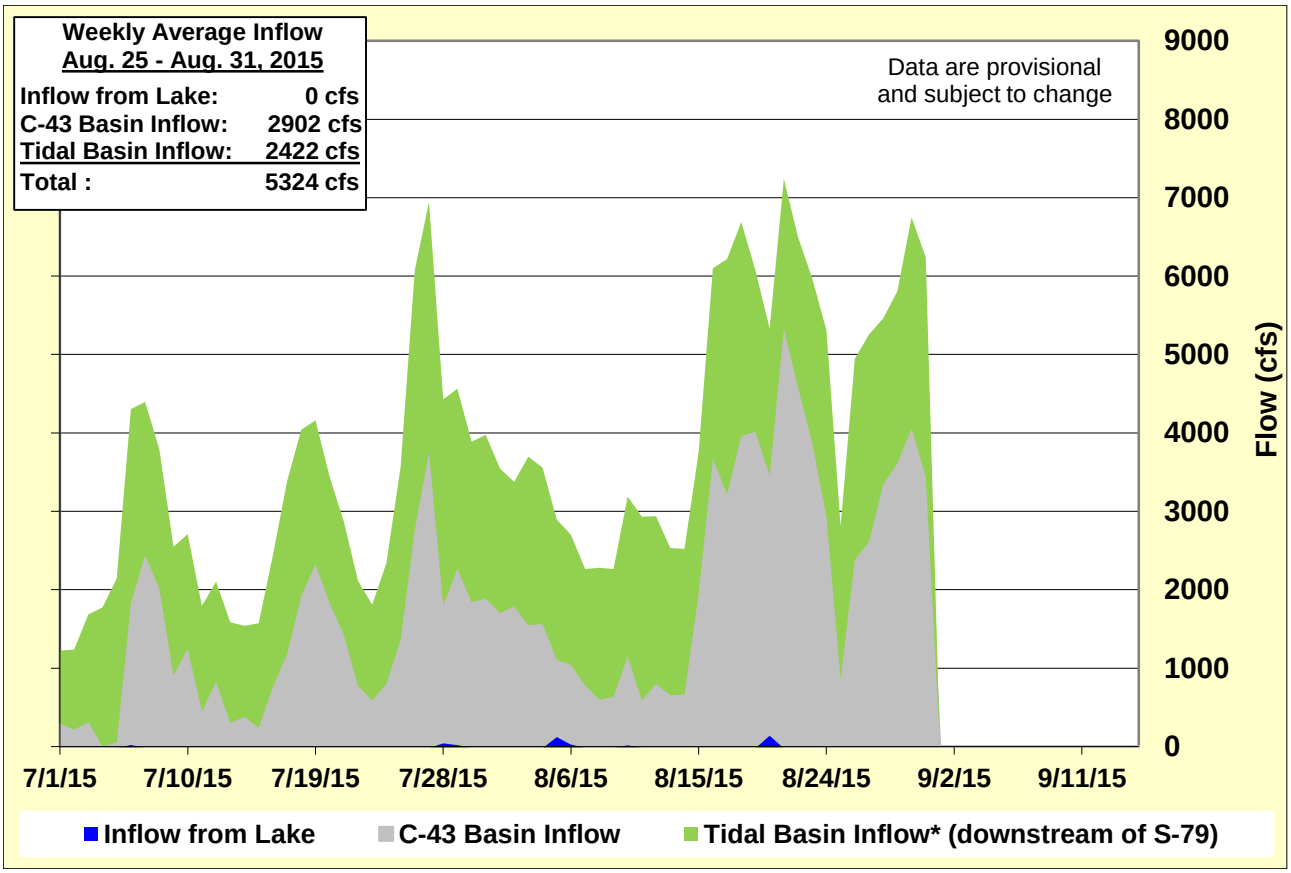
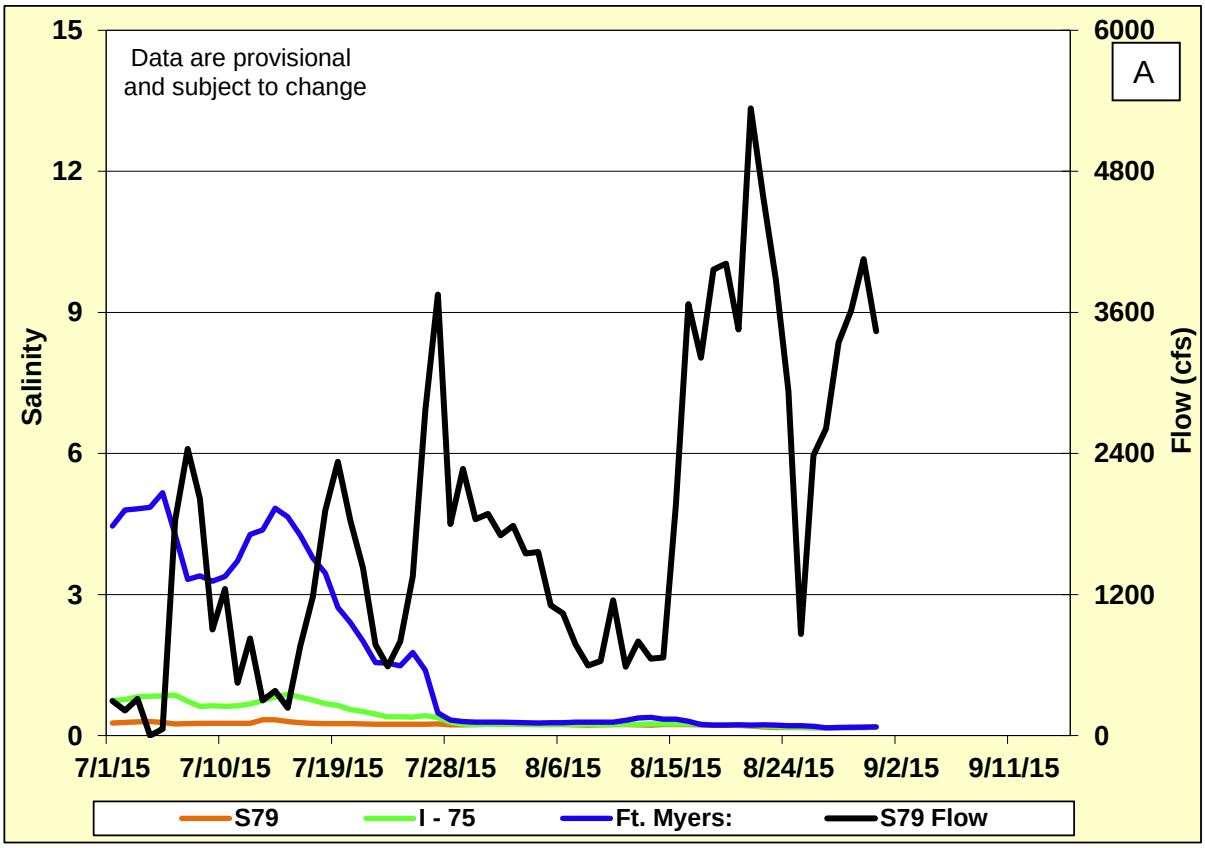


Figure 6. Surface freshwater inflows from Lake Okeechobee, runoff from the C-43 basin, and tributaries in the tidal basin into the Caloosahatchee River Estuary.



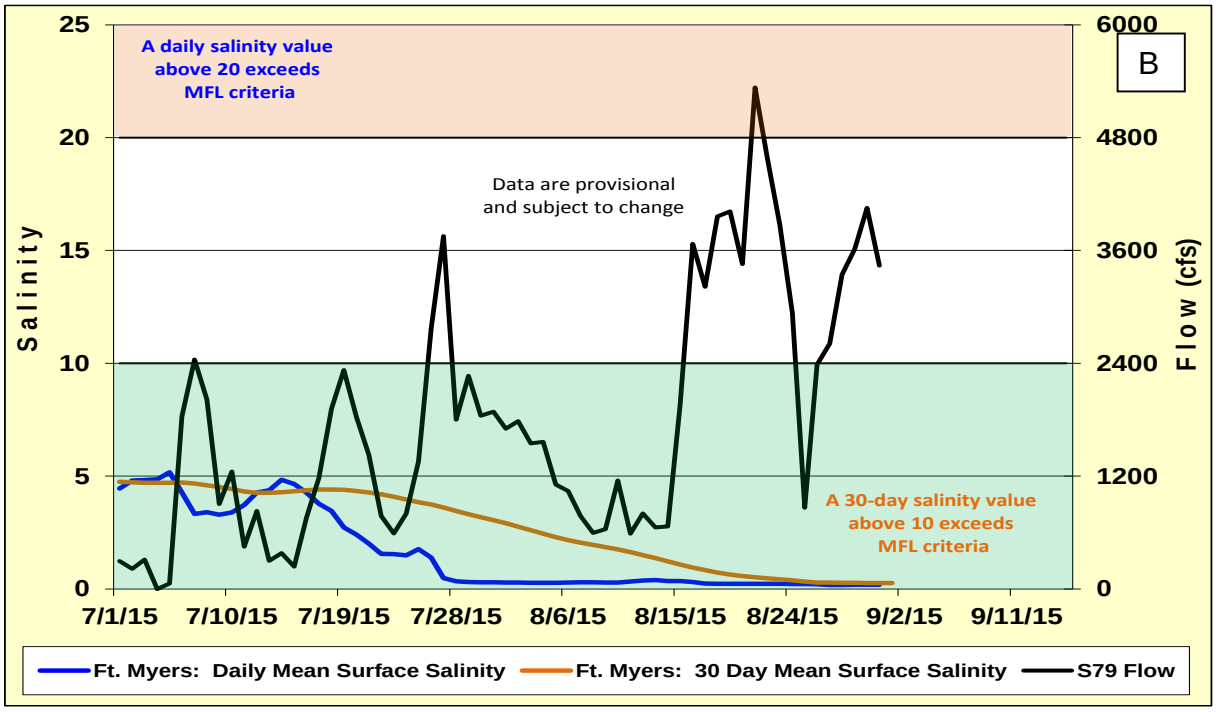


Figure 7. Daily mean flows at S-79 and salinity at upper estuary monitoring stations (A) and 30-day moving average salinity at Ft. Myers (B).

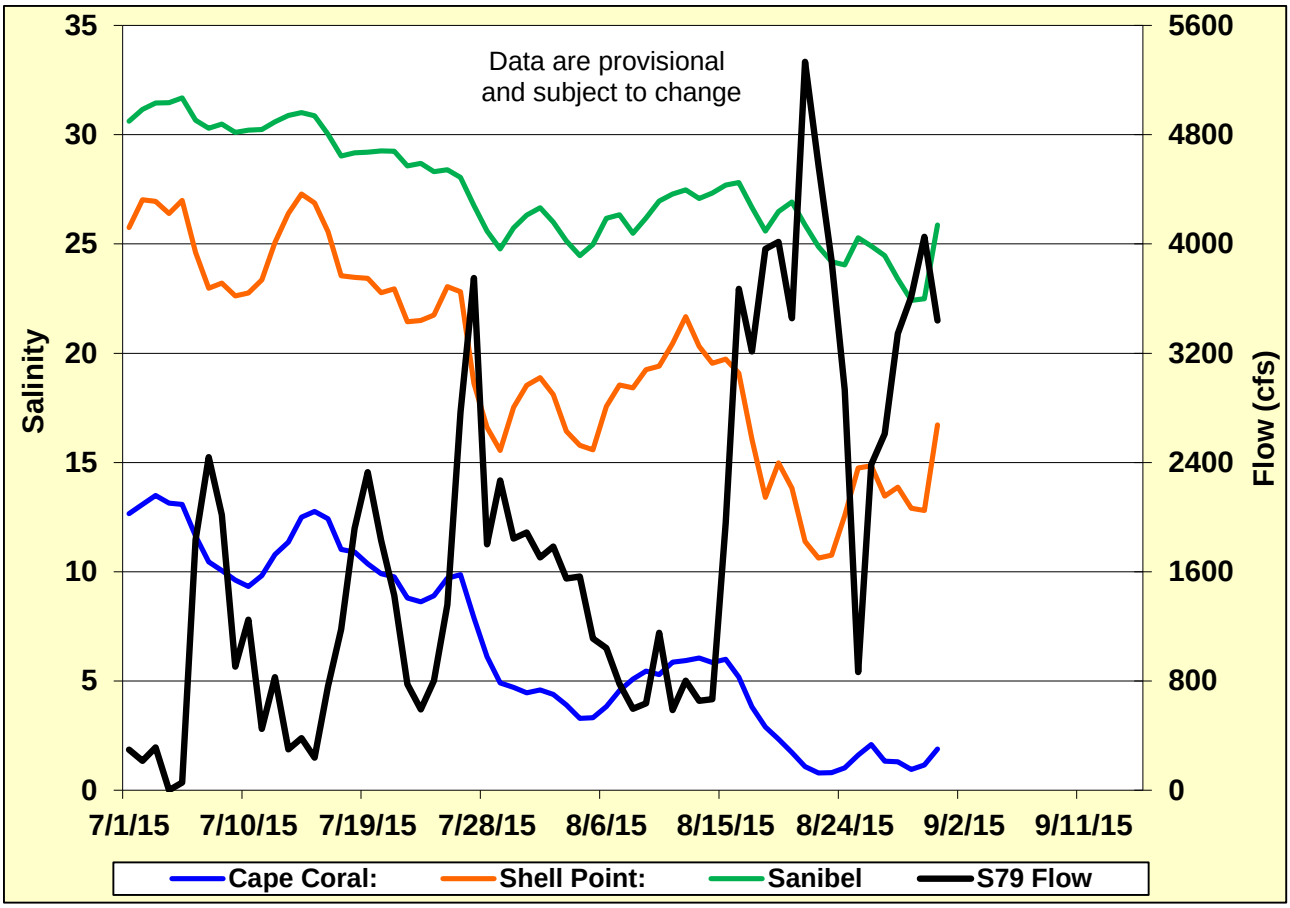


Figure 8. Daily mean flows at S-79 and salinity at lower estuary stations.

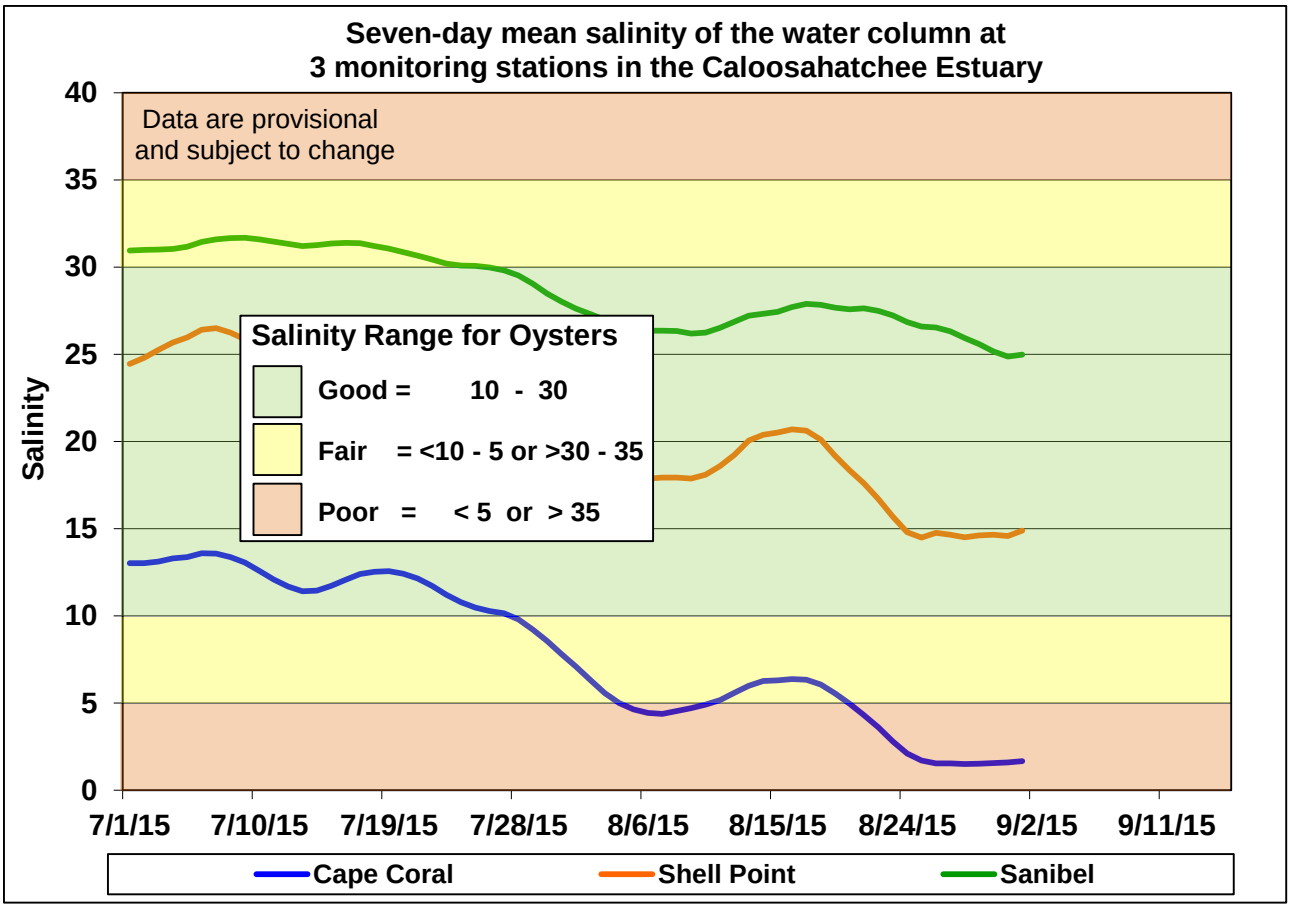


Figure 9. Seven-day mean salinity at Cape Coral Bridge, Shell Point and Sanibel Bridge monitoring stations.

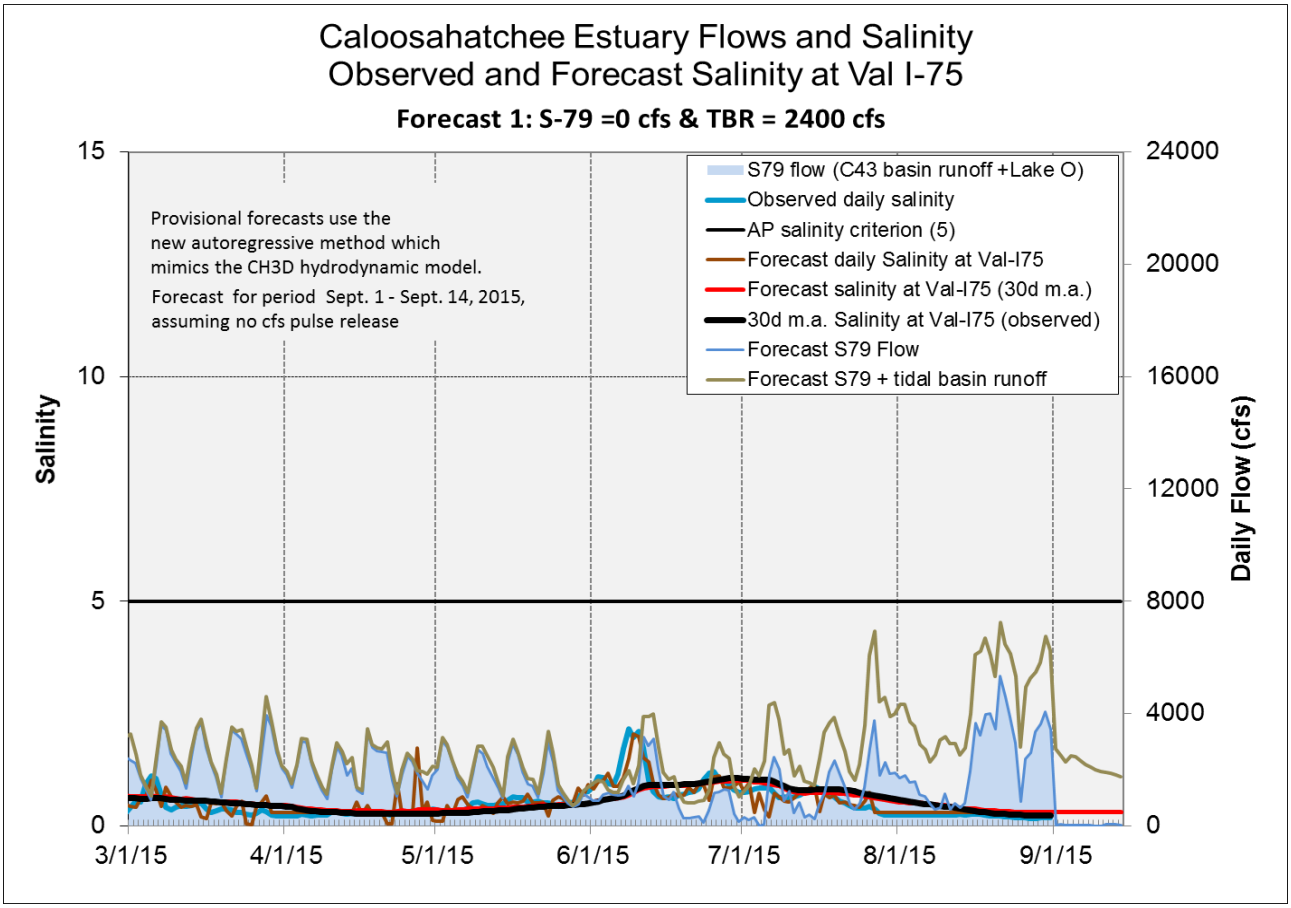
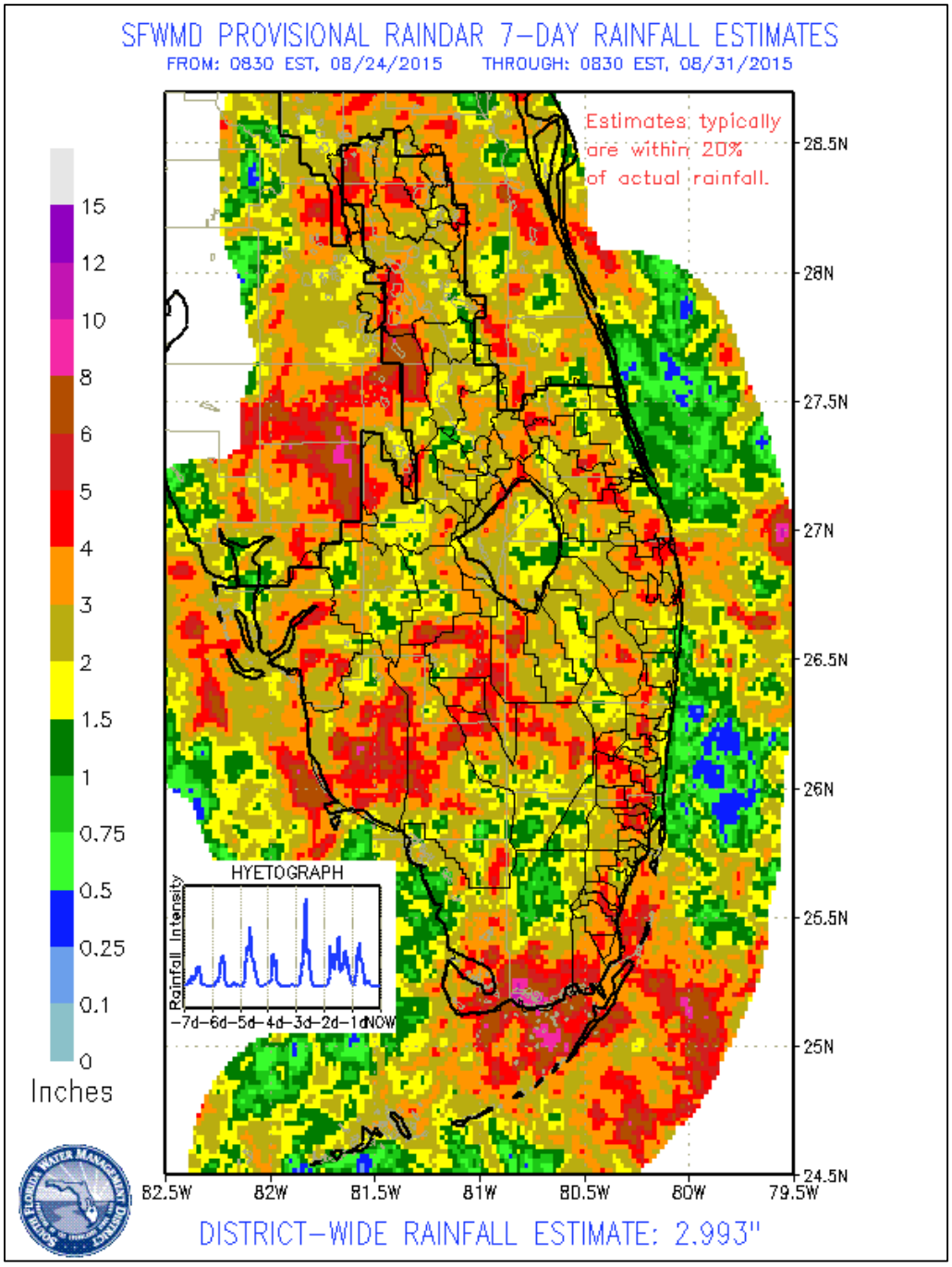


Figure 10. Two-Week Salinity Forecast for Caloosahatchee Val I-75 location assuming 0 cfs flow from S-79.

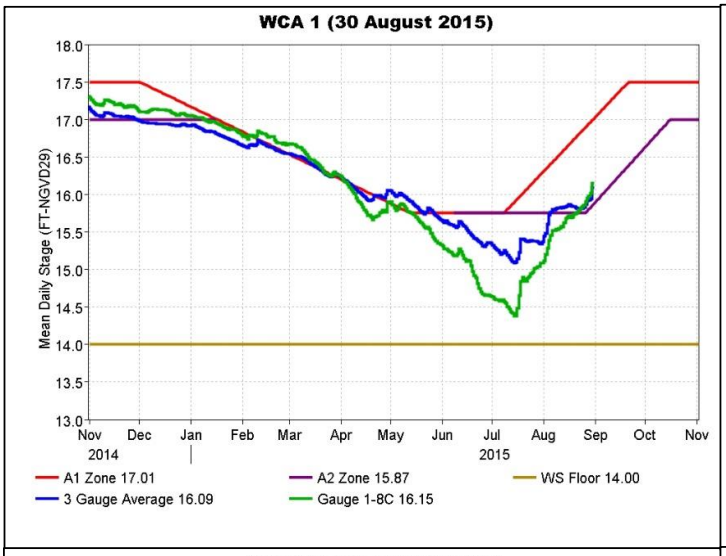
GREATER EVERGLADES

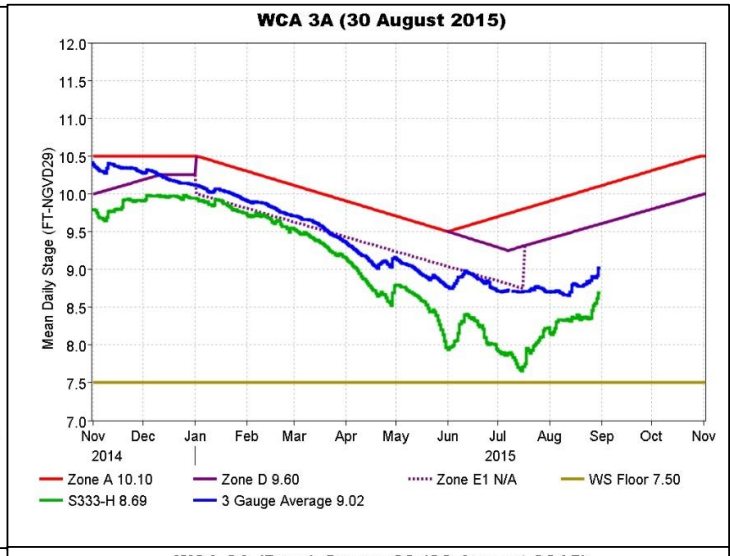
Rainfall was high with basin averages ranging from 1.92 inches in WCA-3B to 3.76 inches in WCA-2B. The local basin maximum rainfall was 11.3 inches in ENP. Stages rose throughout the Everglades. Pan evaporation was 1.45 inches, slightly above the 1.36 inches pre-project average.

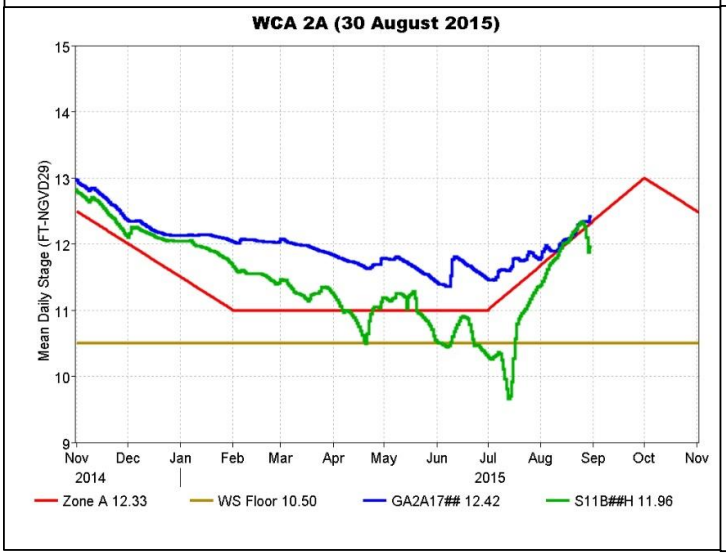
Everglades Region	Rainfall (Inches)	Stage Change (feet)
WCA-1	3.05	0.37
WCA-2A	2.01	0.09
WCA-2B	3.76	1.00
WCA-3A	2.90	0.23
WCA-3B	1.92	0.06
ENP	3.12	0.15

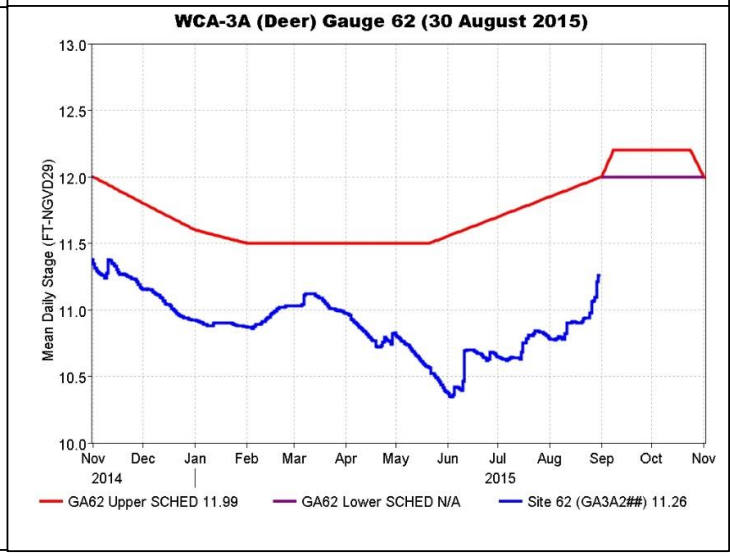


Regulation Schedules: Following last week's rainfall, stages rose throughout the Everglades. In WCA-1, the three gauge average wetlands stage is now 0.22 feet above the Zone A2 line and 0.92 feet below regulation. The WCA-2A stage remains close to regulation, 0.09 feet above it. In WCA-3A, stages remain low; the three gauge average is 0.52 feet below Zone D and 1.08 feet below regulation. The water level at the northwestern WCA-3A gauge stage (gauge 62) ascended rapidly to 0.73 feet below the upper regulation schedule.







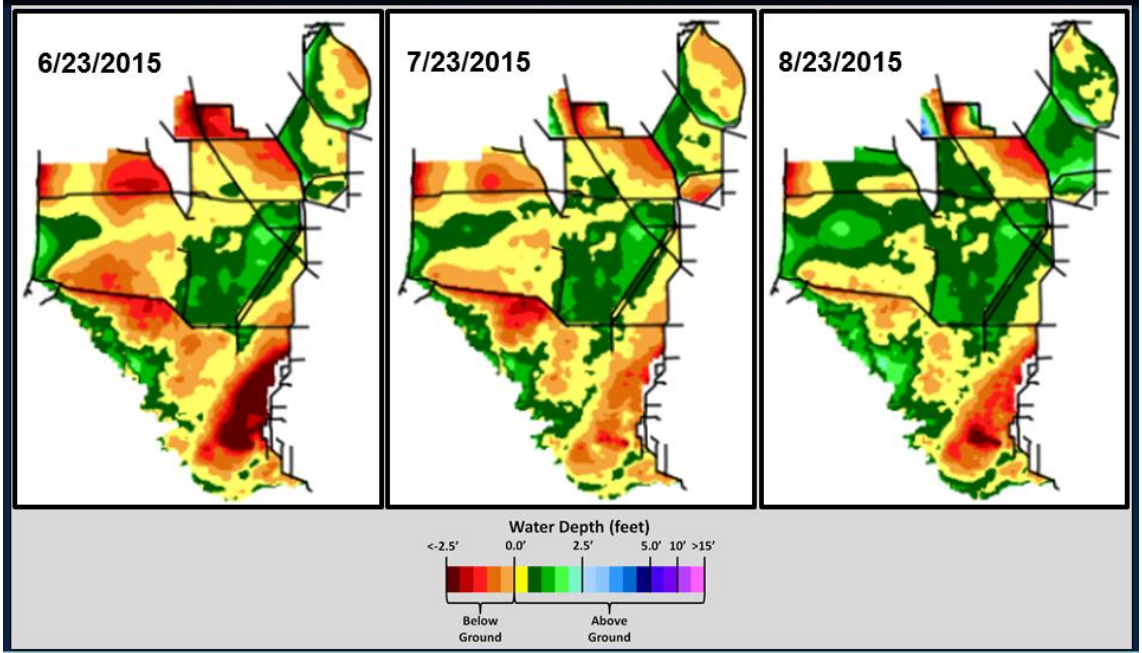


Water Depths and Changes: Water levels are higher than a month ago and higher than two months ago, but are still much lower than usual at this time of the wet season. Depths, while very low for this time of year, are beginning to resemble those much earlier in the wet season (July). Water depths at the monitored gauges range from 0.25 feet (WCA-3A) to 1.33 feet (WCA-1). While depths are rising in northeastern WCA-3A, they remain up to 1.5 feet below ground.

Stages are higher than a week ago and up to two feet or more above stages a month ago. Compared to a year ago, stages remain up to two feet lower. Stage gauge changes ranged from 0.05 feet in WCA-3A to 1.79 feet in WCA-2B.

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

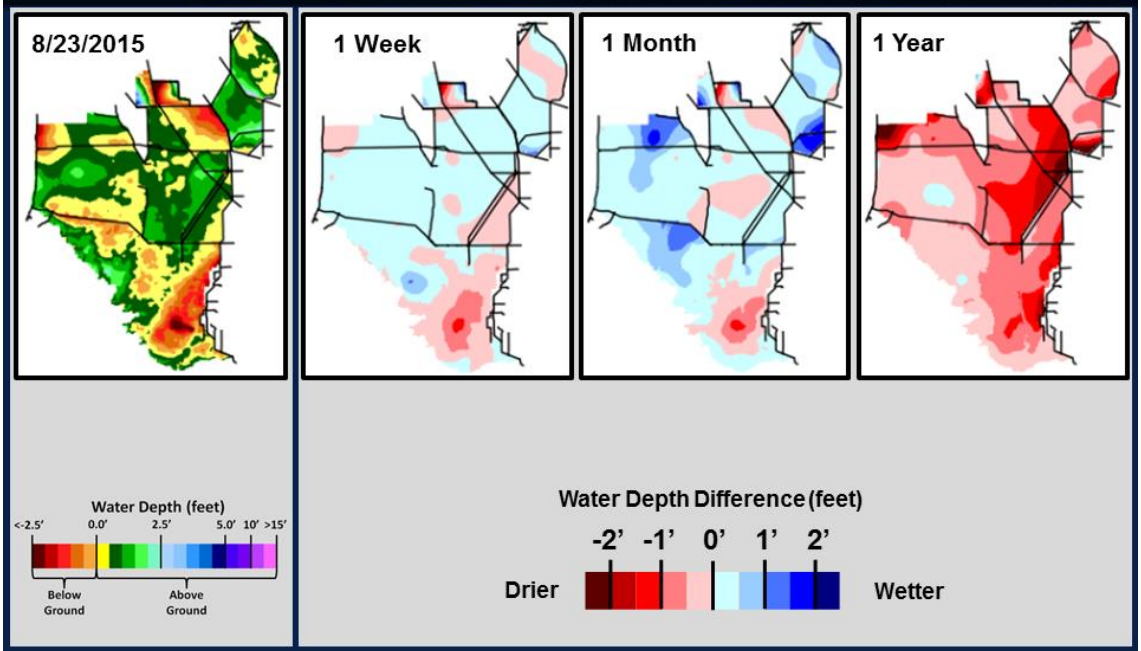
SFWDAT Water Depth Monthly Snapshots



South Florida Water Depth Assessment Tool (SFWDAT)

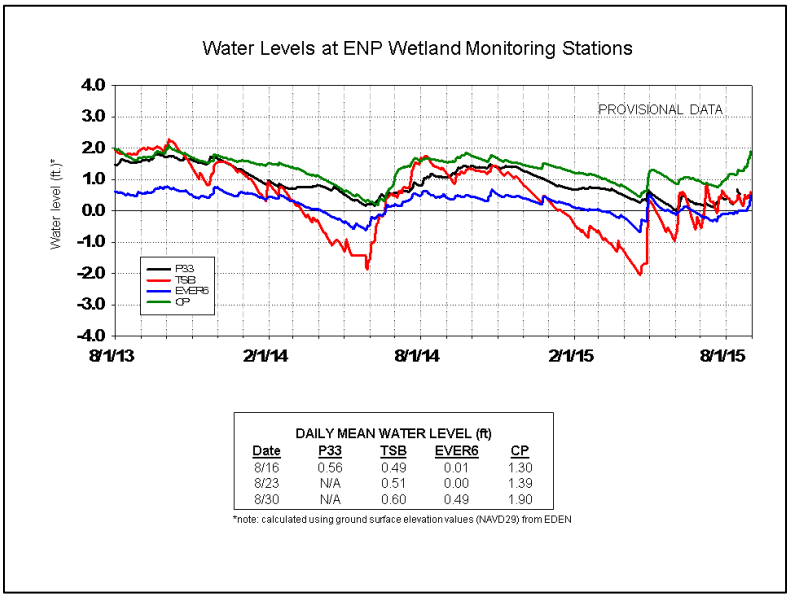
SOUTH FLORIDA WATER MANAGEMENT DISTRICT

SFWDAT Everglades Difference Maps (Present – Past)



South Florida Water Depth Assessment Tool (SFWDAT)

Everglades National Park (ENP) and Florida Bay: Water levels increased a result of the heavy rainfall. Compared to the long term averages, the central and southwestern areas of Taylor Slough are now 1.2 to 2.4 inches above average. The site at TSB in northern Taylor Slough remains almost a foot below average. Pumps at S-332B, C, and D were operating Monday to move water into the Frog Pond Detention Area. Pumps at S-199 and S-200 are also operating to move water into the Aerojet Canal near the eastern boundary of ENP.



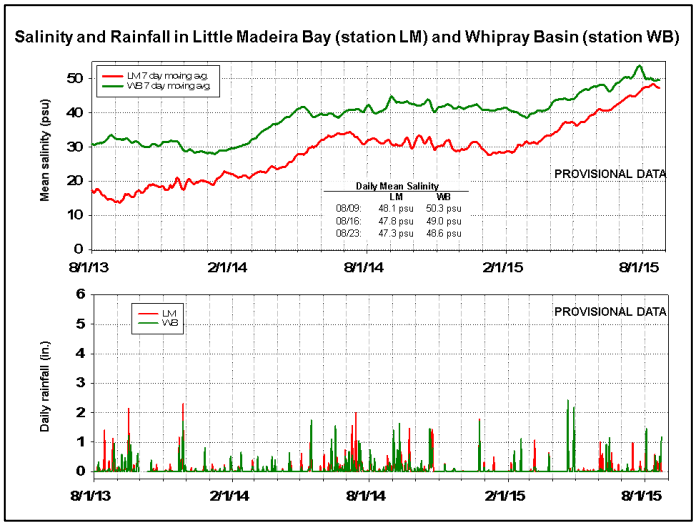
DAILY MEAN WATER LEVEL (ft)

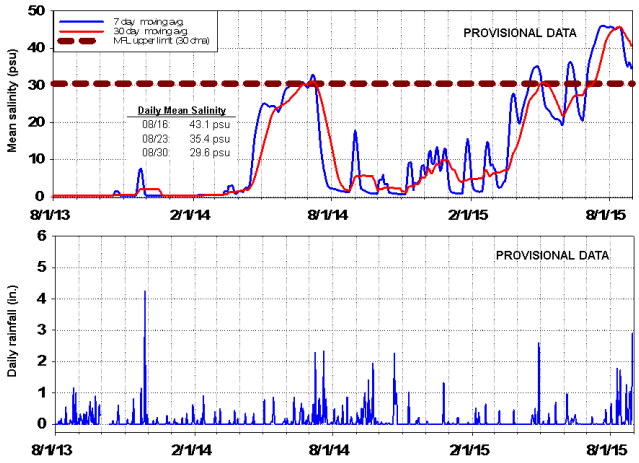
Date	P33	TSB	EVER6	CP
8/16	0.56	0.49	0.01	1.30
8/23	N/A	0.51	0.00	1.39
8/30	N/A	0.60	0.49	1.90

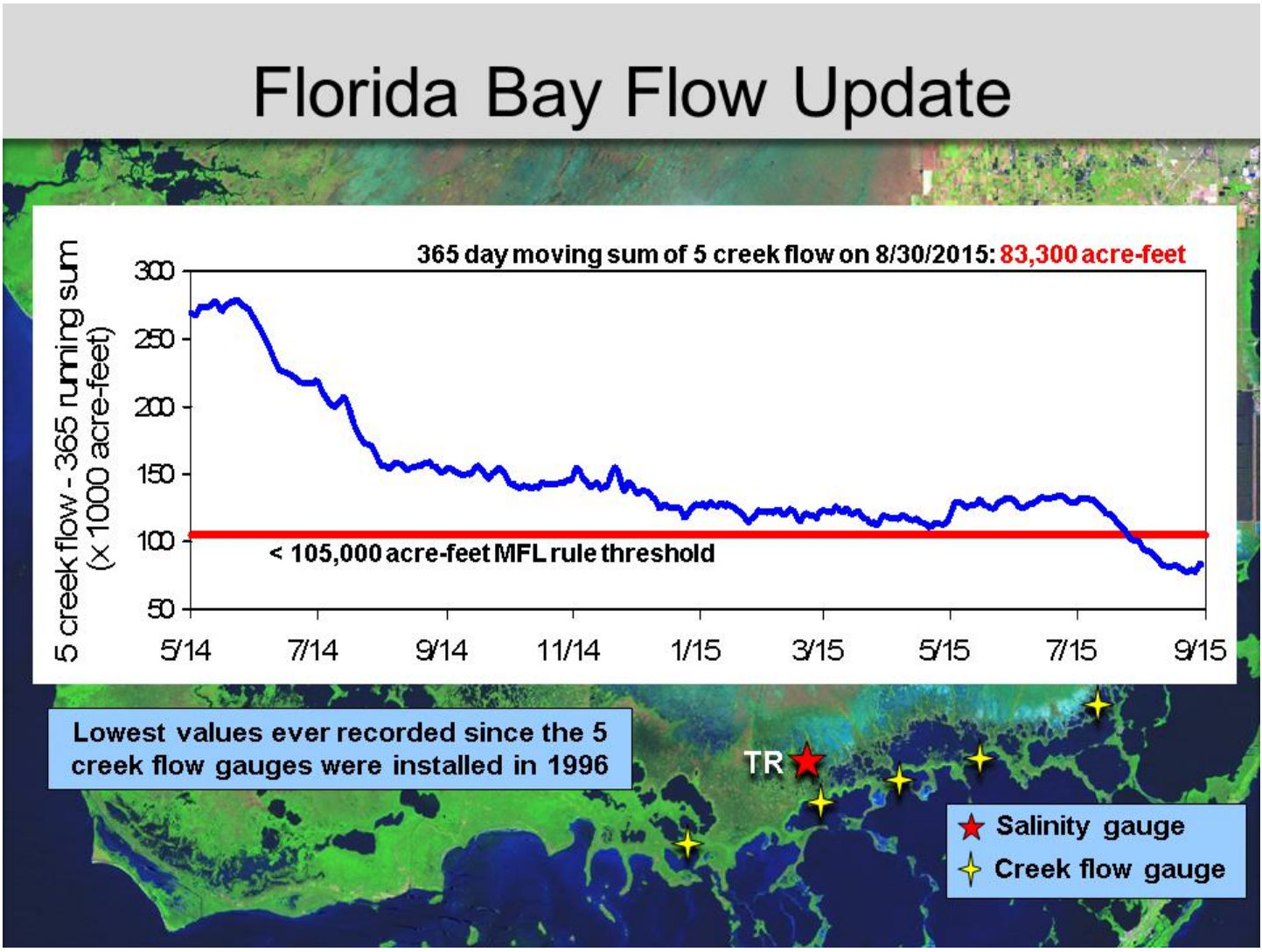
*note: calculated using ground surface elevation values (NAVD29) from EDEN

Salinities in Florida Bay remain five to 30 psu above average for this time of year, but are decreasing as a result of the heavy rainfall. Salinities in central nearshore Florida Bay experienced the largest change; salinities dropped below 40 psu (38.8) for the first time since early April. The upstream station at Taylor River (TR) daily salinity dropped to 29.6 psu, and the 30-day moving average salinity decreased by 2.5 psu to 40.8 psu.

As of last Wednesday, all five creeks began flowing again into Florida Bay. The 365-day running sum of the cumulative flow from these five creeks feeding Florida Bay increased slightly to 83,300 acre-feet as of August 30, which is still below the 105,000 acre-feet criteria for the Florida Bay MFL. Creek flow data are provisional USGS data.


Salinity and Rainfall in Little Madeira Bay (station LM) and Whipray Basin (station WB)
LM 7 day moving avg
WB 7 day moving avg
Mean salinity (psu)
PROVISIONAL DATA
Daily Mean Salinity
LM WB
08/09: 48.1 psu 50.3 psu
08/16: 47.8 psu 49.0 psu
08/23: 47.3 psu 48.6 psu
8/1/13
2/1/14
8/1/14
2/1/15
8/1/15
LM
WB
Daily rainfall (in.)
PROVISIONAL DATA


Salinity, Florida Bay MFL Tracking, and Rainfall in Taylor River Ponds (station TR)
7 day moving avg
30 day moving avg
MFL upper limit (30 cms)
Mean salinity (psu)
PROVISIONAL DATA
Daily Mean Salinity
08/16: 43.1 psu
08/23: 35.4 psu
08/30: 29.6 psu
8/1/13
2/1/14
8/1/14
2/1/15
8/1/15
Daily rainfall (in.)
PROVISIONAL DATA



Water management recommendations:

- Water levels are far below normal in the Everglades and Florida Bay. Increased water is needed throughout the system, particularly in ENP to Florida Bay through Taylor Slough.

- We recommend moving water south as much as possible and storing water whenever possible in the natural systems.

- We continue to recommend releases into northeastern WCA-3A through S-150 while conditions are very dry. If water levels rise above ground, additional releases should no longer be needed. Gauge 63 has risen to 0.25 feet above ground but stages north of the gauge are over two feet below ground.

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

Summary of Everglades Recommendations, September 1, 2015 (SFWMD) (red is new text)

Area	Current Condition	Cause(s)	Recommendation	Reasons
WCA-1	Stages increased from 0.32' to 0.43'	Rainfall, ET, management	Target rainfall driven wetland stages at the top of Zone A2. Recommend ascension rates up to 0.25 ft/wk, or 0.5 ft/14 days.	Promote native habitat and maintain wetland plant communities. Moderate ascension rates to protect habitats and sensitive species and to take advantage of rain events.
WCA-2A	Stage increased 0.09'	Rainfall, ET, management	Recommend ascension rates up to 0.25 ft/wk, or 0.5 ft/14 days. High season target stage of 13 ft NGVD at 2-17 on Oct 1	Promote native habitat and maintain wetland plant communities. Moderate ascension rates to protect habitats and sensitive species and to take advantage of rain events.
WCA-2B	Stage increased 0.02' to 1.79'.	Rainfall, ET, management	Recommend ascension rates up to 0.25 ft/wk, or 0.5 ft/14 days.	High stages preclude wading bird use, but provide good habitat for ducks.
WCA-3A NE	Stage increased 0.34'; gauge 63 is 0.25' above ground	Rainfall, ET, management	Water levels at gauge 63 are finally above ground, but farther northeast remains dry. Recommend continuing releases into far NE 3A to protect peat and wetlands until all water levels are above ground again. Average water stage of gauges 62 and 63 should remain under 11.60 feet. Recommend ascension rates up to 0.25 ft/wk, or 0.5 ft/14 days.	Promote native habitat and maintain wetland plant communities. 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 0.34'	Rainfall, ET, management		
Central WCA-3A S	Stage increased 0.07'	Rainfall, ET, management	Move water into WCA-3A as much as possible. Season's dry conditions jeopardize peat and prey populations for the upcoming dry season conditions. Wet season target is 10.67 3AVG by Oct 30. Recommend ascension rates up to 0.25 ft/wk, or 0.5 ft/14 days.	Promote native habitat and maintain wetland plant communities. Moderate ascension rates to protect habitats and sensitive species in 3A, and take advantage of rain events. Avoid or minimize discharge through S-12A and S-12B through at least August 15 and as long as possible to benefit Cape Sable seaside sparrow nesting and habitat conditions.
Southern WCA-3A S	Stage increased 0.07'	Rainfall, ET, management		
WCA-3B	Stages increased from 0.05' to 0.07'	Rainfall, ET, management	Recommend ascension rates up to 0.25 ft/wk, or 0.5 ft/14 days.	Promote native habitat and maintain wetland plant communities. Provide foraging habitat for wading birds.
ENP-SRS	Stage increased 0.15'	ET, rainfall, topography, management	Discharges to the Park with the ERTP rainfall plan. Water deliveries to Shark Slough should be made through S-333, then through S-12D and S-12C.	Promote native habitat and maintain wetland plant communities.
ENP-CSSS habitats	Nesting appears to be complete. Conditions are still fairly dry.	Rainfall, ET, management	Request for extended closures for S-12A and S-12B is ended.	Provide habitat and appropriate nesting conditions for CSSS.
Taylor Slough	12 inches below average in the north. 2.4 inches above average in southwest.	Rain, ET, inflows	Move water southward as possible	Provide freshwater buffer for ecosystems and freshen saline conditions downstream
FB- Salinity	Hypersaline but decreasing. Still 5-30 psu above average	Rain, ET, inflows, wind.	Move water southward as possible	Southward flows are still needed to reverse/slow salinity increases