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, Operations, Engineering and Construction Bureau
Paul Linton, Chief, Operations Section

FROM: SFWMD Staff Environmental Advisory Team

DATE: January 30, 2018

SUBJECT: Weekly Environmental Conditions for Systems Operations

Summary

Weather Conditions and Forecast

Cool and dry conditions have spread over the District behind a cold front. Spotty to light showers will return east Wednesday and Thursday. A cold front is forecast to move into the area Friday and stall south of the District. The frontal boundary is expected to produce only limited shower activity until some moisture and energy move over the area Sunday/Monday.

Kissimmee

Tuesday morning stages were 57.7 feet NGVD (0.3 feet below schedule) in East Lake Toho, 54.7 feet NGVD (0.3 feet below schedule) in Toho, and 50.8 feet NGVD (1.7 feet below schedule) in Kissimmee-Cypress-Hatchineha; headwater stages were 46.3 feet NGVD at S65A and 25.8 feet NGVD at S65D. Mean recession rates for the last seven days in East Lake Toho, Toho and Kissimmee-Cypress-Hatchineha were 0.14, 0.11 and 0.03 feet per week, respectively (preferred maximum rate is 0.2 feet per week). Tuesday morning discharges were: 727 cfs at S65, 639 cfs at S65A, and 737 cfs at S65E. Dissolved oxygen concentration in the Kissimmee River averaged 9.7 milligrams per liter (mg/L) for the week. Kissimmee River mean floodplain depth on Sunday was 0.17 feet**.**

Lake Okeechobee

Lake Okeechobee stage is 15.29 feet NGVD having decreased 0.02 feet over the past week and 0.23 feet over the last month. Following Hurricane Irma, stages exceeded 16.0 feet NGVD for 72 days, the longest period since late 2004, which was 73 days. Stages also exceeded 15.5 feet NGVD for 105 days, the longest period since late 2004. The submerged aquatic and emergent vegetation coverage in the nearshore areas of the Lake are expected to decline over the coming months and possibly years due to the high water and turbidity from resuspended Lake sediment. The high inflows and resuspended Lake sediment associated with Hurricane Irma also increased water column total phosphorus, which could lead to algal blooms as turbidity continues to decline and water temperatures rise. Lower Lake stages near the end of WY2018 would help to recover these important communities, and long, steady recessions of water levels throughout the dry season may help promote another productive year for wading birds on the Lake as well.

Estuaries

Total inflow to the St. Lucie Estuary averaged 279 cfs over the past week with no flows coming from Lake Okeechobee. Salinity increased throughout the estuary. The seven-day average salinity at the US1 Bridge is in the good range for adult oysters. Average weekly dissolved oxygen levels at HR1 station in the North Fork were 6.83 mg/L near the surface and 4.61 mg/L near the bottom. The highest weekly ranges of chlorophyll *a* were 3.98 – 21.79 µg/L in the South Fork.

Total inflow to the Caloosahatchee Estuary averaged 824 cfs over the past week with 164 cfs coming from the Lake. Salinity increased throughout the estuary. The 30-day moving average surface salinity is 1.2 at Val I-75 and 4.2 at Ft. Myers. The 30-day moving average salinity at Val I-75 is forecast to be 3.2 in two weeks with no flow through S-79. Salinity conditions between Val I-75 and Ft. Myers are good for tape grass. Salinity conditions are in the good range for adult oysters at Shell Point and at Cape Coral. Chlorophyll *a* concentrations near Shell Point were low (1.70 – 3.60 µg/L) over the last week. Dissolved oxygen levels at Shell Point were 6.71 – 9.28 mg/L. Given the current estuarine conditions, there are no ecological benefits associated with freshwater releases from Lake Okeechobee.

Stormwater Treatment Areas

Over the past week, the STAs/FEBs received approximately 11,500 acre-feet of Lake regulatory releases. The total amount of Lake releases sent to the STAs/FEBs in WY2018 (since May 1, 2017) is approximately 41,300 acre-feet. Most STA cells are at or near target depths, except many of the STA-5/6 cells which are below target. Operational restrictions are in place for vegetation rehabilitation in STA-1E and STA-2. This week, if 2008 LORS recommends Lake releases to the WCAs and the conditions allow, releases will be sent to STA-1E Eastern Flow-way, and STA-2 Flow-ways 1, 4, and 5.

Everglades

While there continues to be a need to relieve high water conditions in the southern part of WCA-3A, in the northern regions of that basin, depths have reached levels of ecological importance. At gauge 62, representing the northwestern region, the water depth fell 0.07 feet over the last week and 0.33 feet over the last month (−0.08 feet/week). In the northeastern region, at gauge 63, depths fell 0.13 feet last week and 0.61 feet last month (−0.15 feet/week). WCA-2A is experiencing a recession rate that falls within the recommendations for fair wading bird foraging. Within that basin, water depths at gauge 2-17 dropped 0.11 feet last week, and 0.62 feet over the last month (−0.16 feet/week). Keeping recession rates between −0.05 and −0.09 feet/week is important to maintain optimal wading bird foraging conditions. Keeping depths below 2.5 feet at gauge 65 in WCA-3A is important to moderate the stress to tree islands caused by flooding when durations last longer than 60-90 days. The depth on Sunday at that location decreased to 2.55 feet, and has exceeded 2.5 feet for 227 days. In Taylor Slough, water levels remain 2 to 16 inches above the historic average for this time of year. Salinities in Florida Bay range from 4 psu below to 4 psu above historic averages for this time of the year.

Supporting Information

KISSIMMEE BASIN

Kissimmee Basin Rainfall

The Upper Kissimmee Basin received 0.67 inches of rainfall in the past week and the Lower Basin received 0.76 inches (SFWMD Daily Rainfall Report 1/29/2018).

Upper Kissimmee Basin

Stages and departures in the Kissimmee Chain of Lakes (KCOL) are shown in Table 1.

Table 1. Average discharge (cfs) for the preceding seven days, one-day stage (feet NGVD), and departures from KCOL flood regulation (R) or temporary schedules (T, A, or S). Provisional, real-time data are from SFWMD.

Report Date: 1/30/2018

Water Body	Structure	7-day Average Discharge (cfs)[1]	Stage Monitoring Site[2]	Lake Stage (feet)	Schedule Type[3]	Schedule Stage (feet)	Daily Departure (feet)						
							1/28/18	1/21/18	1/14/18	1/7/18	12/31/17	12/24/17	12/17/17
Lakes Hart and Mary Jane	S62	0	LKMJ	61.0	R	61.0	**0.0**	0.0	0.1	0.0	0.0	0.0	-0.1
Lakes Myrtle, Preston, and Joel	S57	8	S57	61.4	R	61.4	**0.0**	0.1	0.0	0.0	0.0	0.0	0.0
Alligator Chain	S60	0	ALLI	63.9	R	64.0	**-0.1**	-0.1	0.0	-0.1	-0.1	-0.1	-0.1
Lake Gentry	S63	0	LKGT	61.6	R	61.5	**0.1**	0.0	0.1	0.0	0.0	0.0	0.0
East Lake Toho	S59	169	TOHOE	57.7	R	58.0	**-0.3**	-0.1	0.1	0.0	0.0	0.0	0.0
Lake Toho	S61	402	TOHOW, S61	54.7	R	55.0	**-0.3**	-0.2	0.0	0.1	0.0	0.0	0.0
Lakes Kissimmee, Cypress, and Hatchineha	S65	583	KUB011, LKIS5B	50.7	R	52.5	**-1.8**	-1.8	-1.7	-1.7	-1.6	-1.4	-1.3

[1] Seven-day average of weighted daily means through midnight.
[2] Names of in-lake monitoring sites and structures used to determine lake stage; if more than one site is listed, an average is reported.
[3] 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.
DATA ARE PROVISIONAL

Lower Kissimmee Basin

Discharges at Lower Basin structures are shown in Table 2. SFWDAT depth maps for the Phase I restoration area are shown in Figure 8. Kissimmee River floodplain stages at selected stations are shown in Figure 9.

Table 2. One-day and seven-day averages of discharge at S-65x structures, of dissolved oxygen concentration in the Phase I area river channel, and water depth in the Phase I area floodplain. Data are provisional real-time data from SFWMD.

Report Date: **1/30/2018**

Metric	Location	1-Day Average	Average for the Preceeding 7-Days[1]									
		1/28/2018	1/28/18	1/21/18	1/14/18	1/7/18	12/31/17	12/24/17	12/17/17	12/10/17	12/3/17	11/26/17
Discharge (cfs)	S-65	643	**583**	572	567	540	517	553	540	368	586	925
Discharge (cfs)	S-65A	510	**468**	506	446	452	443	446	441	306	486	817
Discharge (cfs)	S-65D[2]	514	**632**	692	764	696	718	770	796	595	989	1,425
Stage (feet NGVD)	S-65D[2]	25.88	**25.77**	25.72	25.85	25.74	25.77	25.82	25.77	25.97	26.16	26.38
Discharge (cfs)	S-65E[2]	514	**679**	730	837	751	777	857	865	658	980	1,436
Discharge (cfs)	S-67	348	**241**	97	404	396	399	322	0	0	0	0
DO (mg/L)[3]	Phase I river channel	10.0	**9.7**	9.2	8.8	7.7	6.5	7.1	6.6	5.2	5.7	5.8
Mean depth (feet)[4]	Phase I floodplain	0.17	**0.17**	0.20	0.23	0.22	0.23	0.27	0.31	0.26	0.34	0.53

[1] Seven-day average of weighted daily means through Sunday midnight.
[2] S-65D discharge combines discharge at S-65D, S-65DX1, and S-65DX2; S-65D stage averages stage at S65D and S65DX1; S65E discharge combines S65E and S65EX1.
[3] DO is the average for sondes at PC62 and PC33.
[4] 1-day spatial average from South Florida Water Depth Assessment Tool (SFWDAT).
DATA ARE PROVISIONAL; N/A indicates that data were not available.

KCOL Hydrographs (through Sunday midnight)

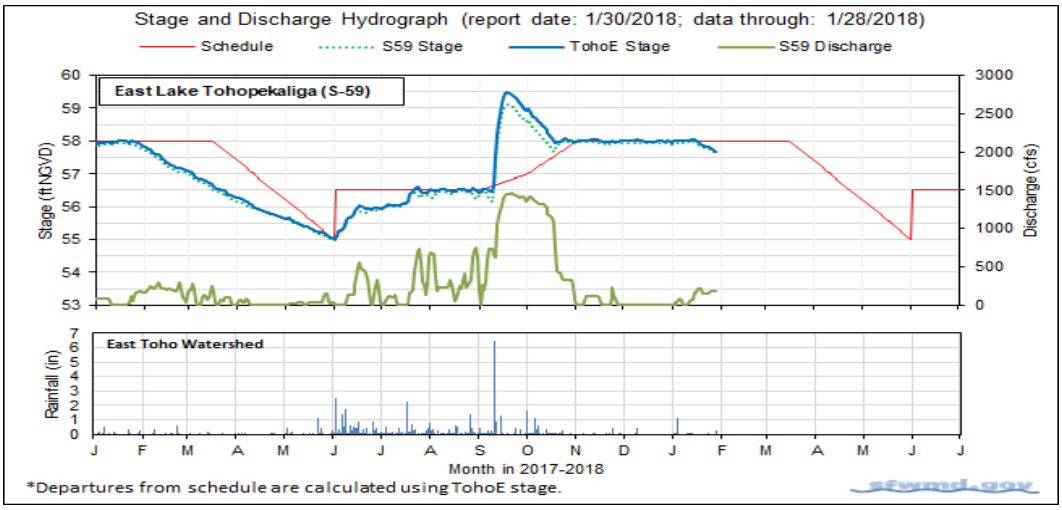


Figure 1.

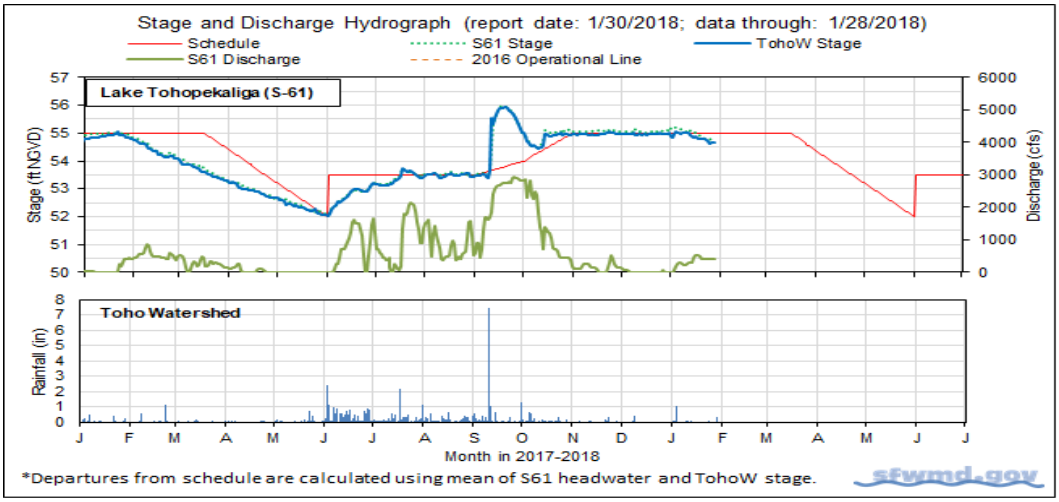


Figure 2.

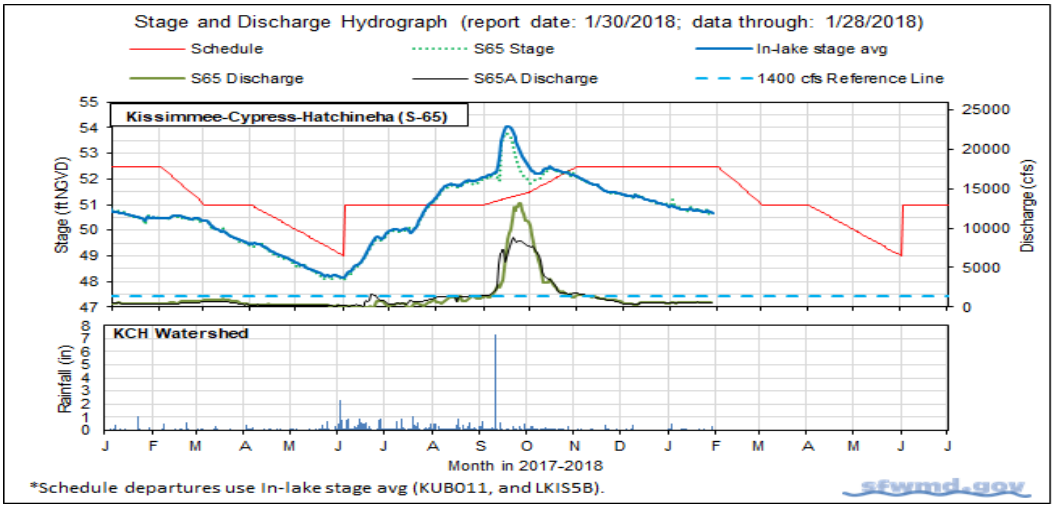


Figure 3.

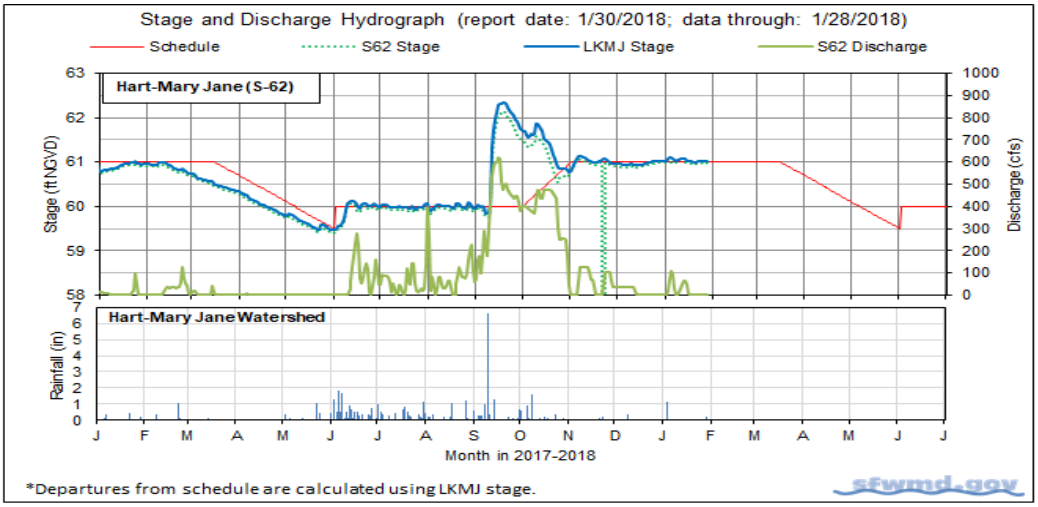


Figure 4.

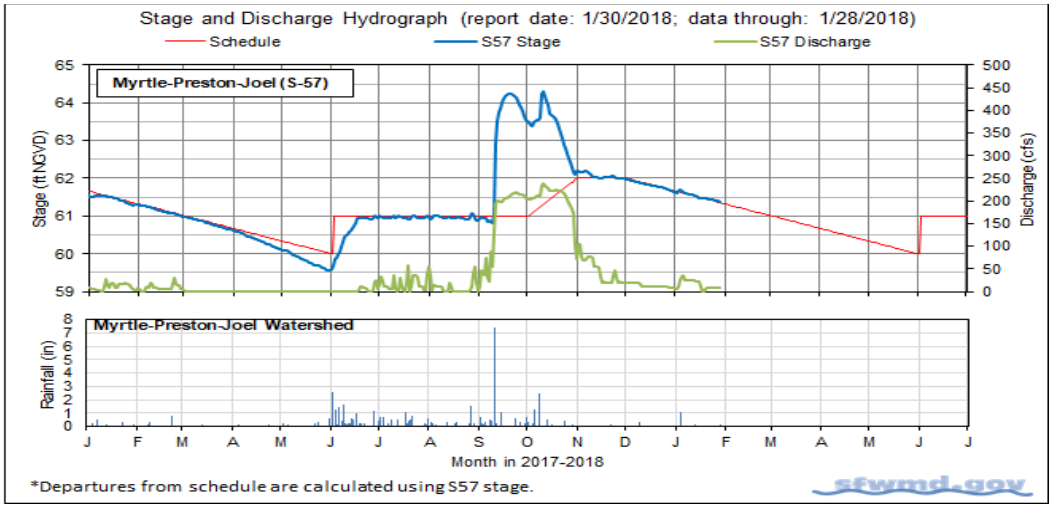


Figure 5.

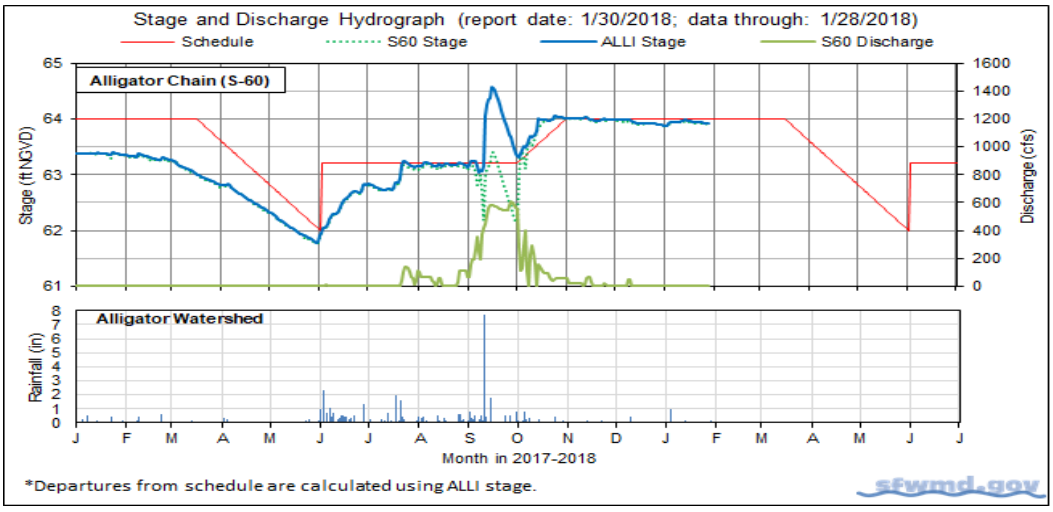


Figure 6.

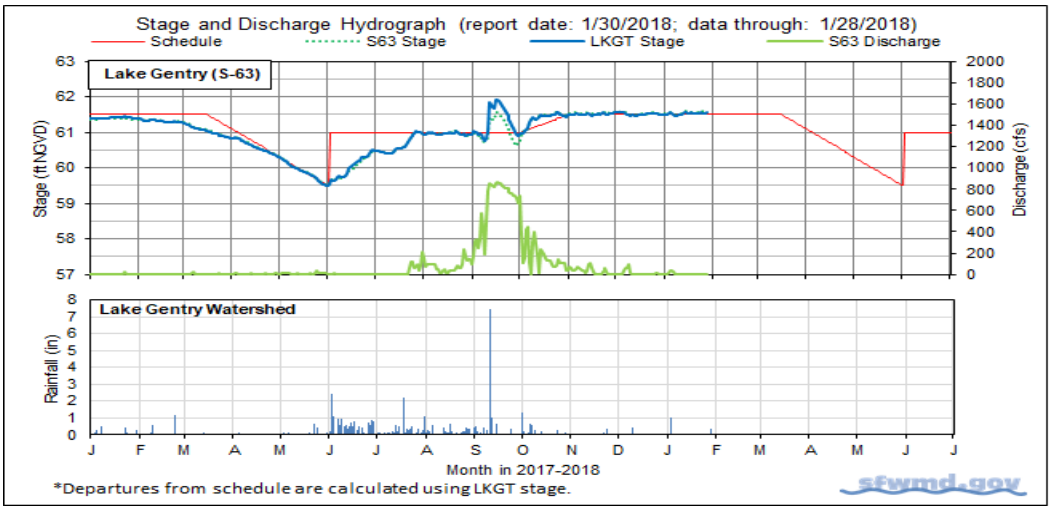


Figure 7.

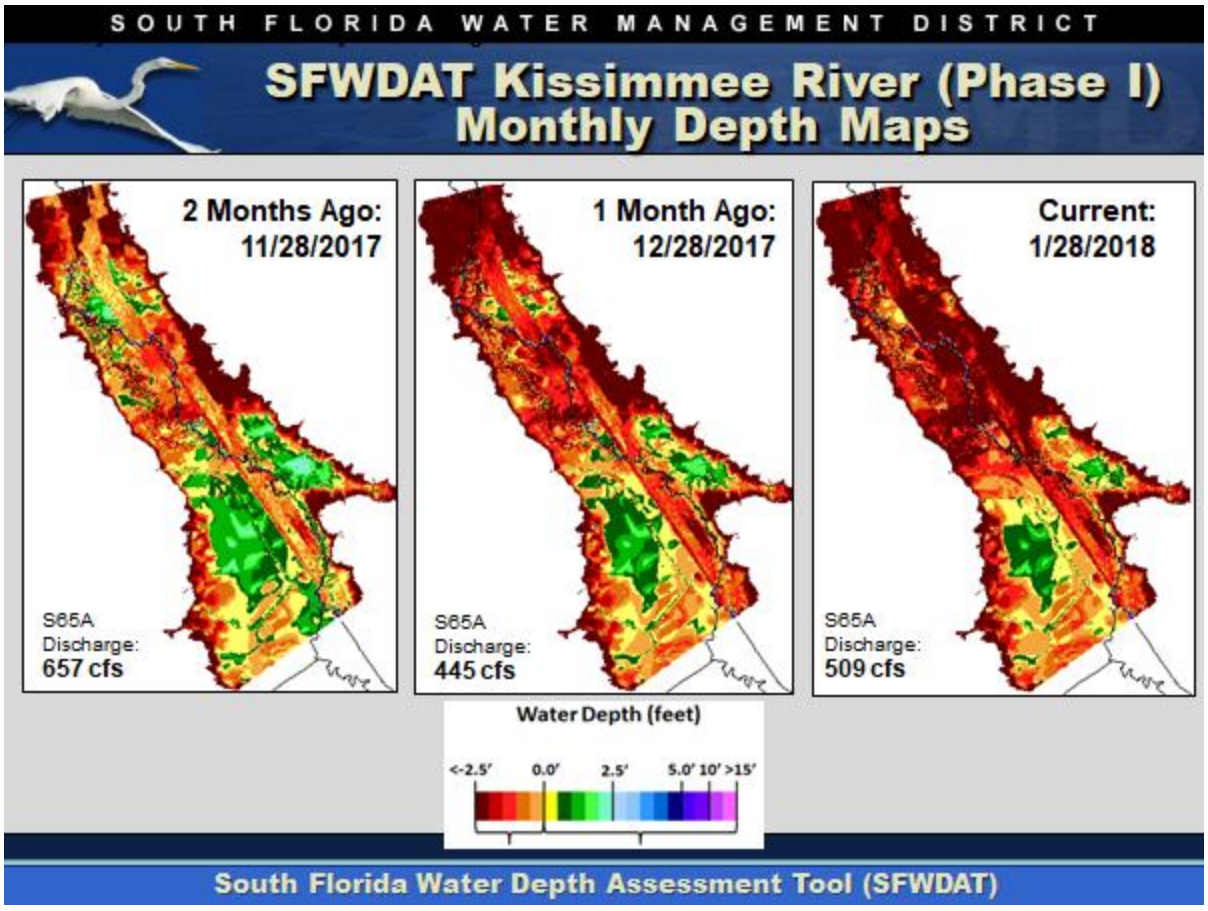


Figure 8. Phase I area floodplain water depths for this week, one month ago, and two months ago. Note that the WDAT color-coding has been modified to accommodate greater water depths; these maps are not directly comparable to Kissimmee Basin WDAT maps published prior to January 16, 2012.

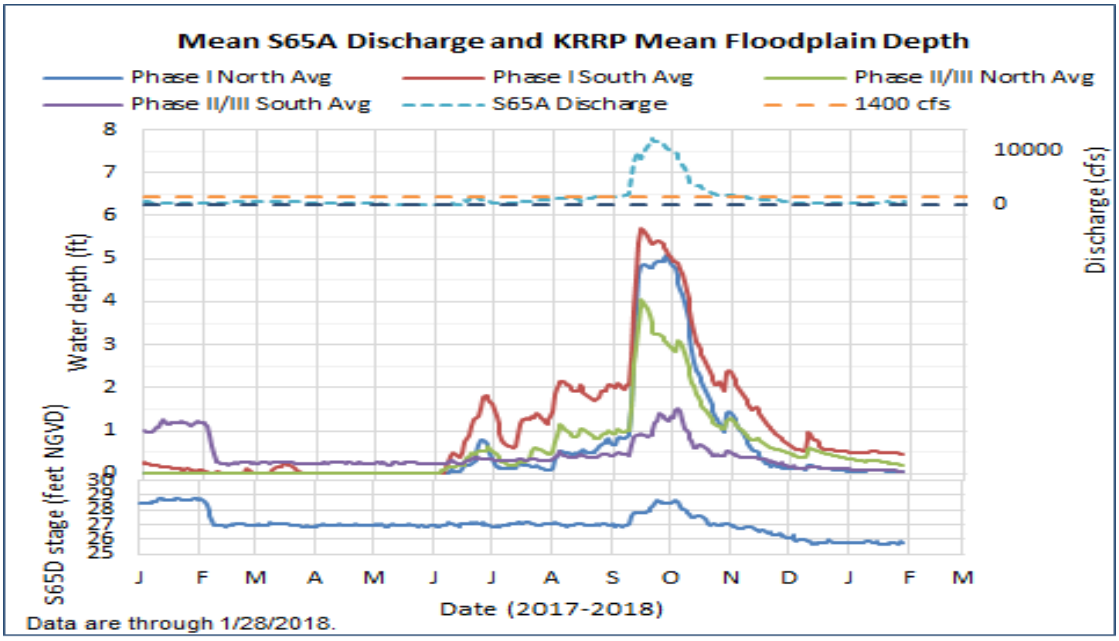


Figure 9. Mean water depth in the northern Phase I, southern Phase I, northern Phase II/III, and southern Phase II/III areas in relation to the S65A discharge and S65D headwater stage.

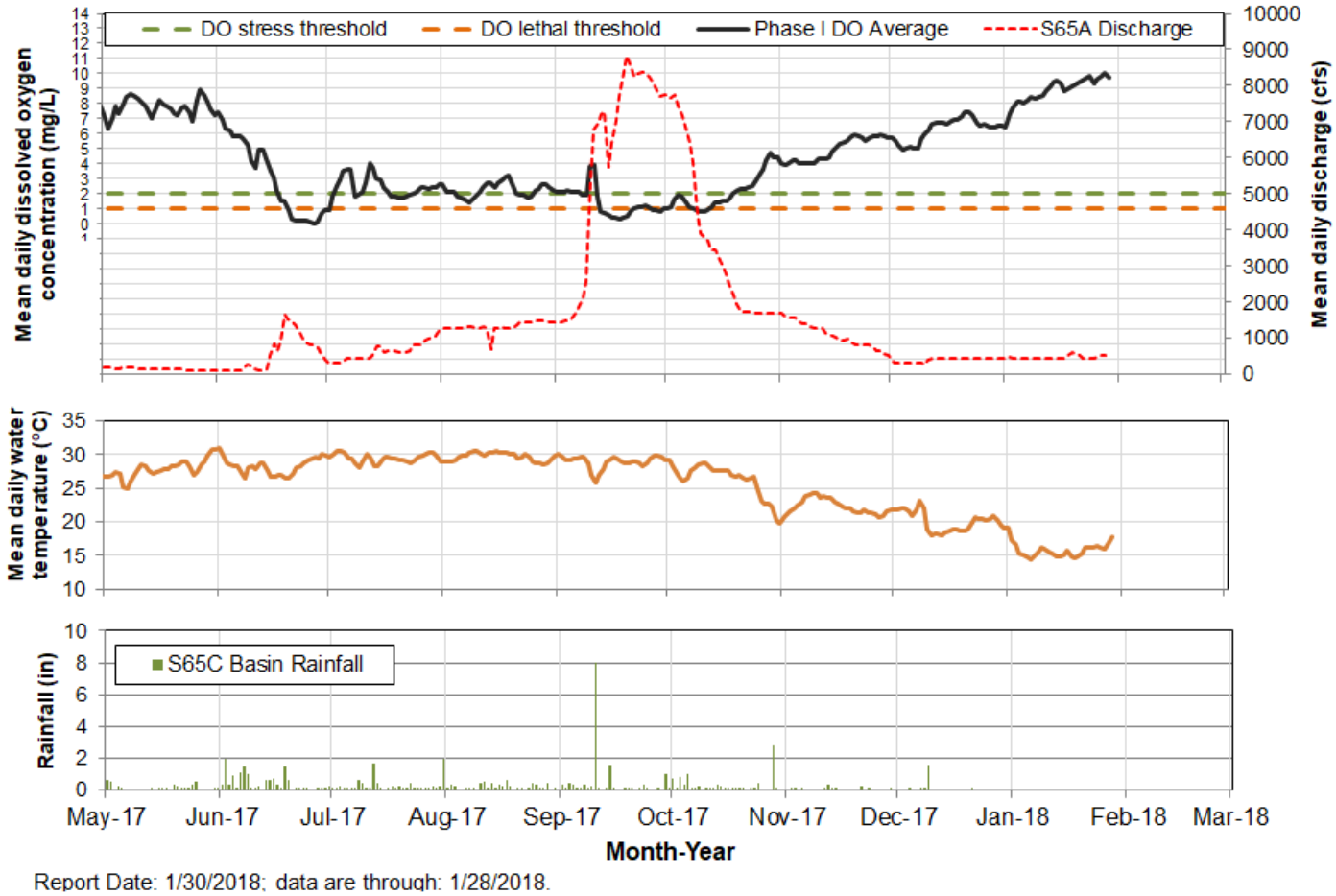


Figure 10. Mean daily dissolved oxygen, discharge, temperature and rainfall in the Phase I river channel.

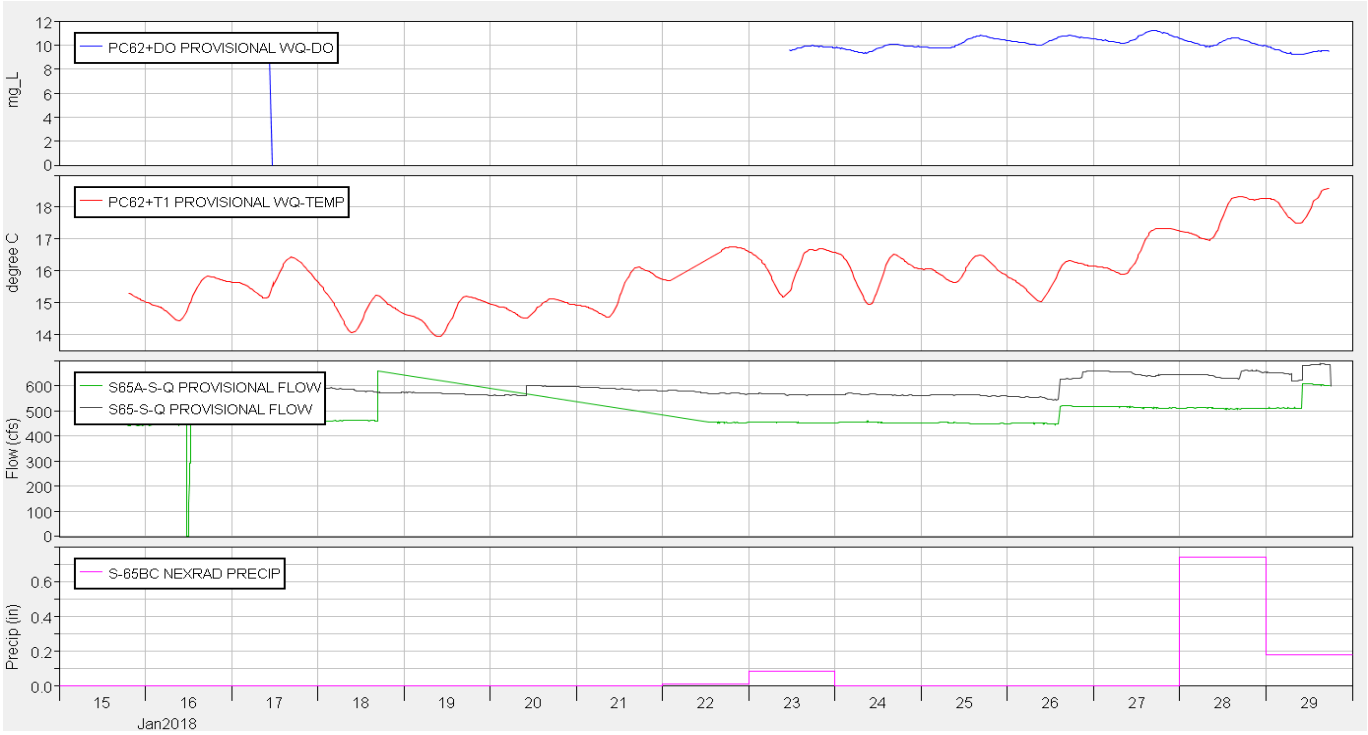


Figure 11. Phase I river channel dissolved oxygen and water temperature (measured at 15 minute intervals) and Pool BC daily rainfall.

Water Management Recommendations

Kissimmee Basin Adaptive Recommendations and Operational Actions

Date	Recommendation	Purpose	Outcome	Source
1/30/2018	No new recommendations.		N/A	
1/23/2018	No new recommendations.		N/A	
1/16/2018	No new recommendations.		N/A	
1/9/2018	No new recommendations.		N/A	
12/19/2017	Begin discharge of 400 cfs from S67 into Istokpoga Canal.	Increase navigability by scouring channel and reducing sandbar at canal mouth.	Implemented	KB Ops/SFWMD Water Mgt
12/19/2017	Begin a stage recession on January 1 in Lakes Kissimmee-Cypress-Hatchineha starting at stage on January 1 to reach low pool on May 31. Recession rate not to exceed 0.2 ft/week as possible. Subject to SFWMD planned operations hierarchy.	Achieve fish and wildlife benefits by slowing lake stage recession rates relative to the regulation schedule recession rates.	-	KB Ops/SFWMD Water Mgt
12/19/2017	Begin stage recessions on January 15 in Lakes East Toho and Toho starting at stage on January 15, to reach low pools on May 31. Recession rate not to exceed 0.2 ft/week if possible. Subject to SFWMD planned operations hierarchy.	Achieve fish and wildlife benefits by slowing lake stage recession rates relative to the regulation schedule recession rates.	-	KB Ops/SFWMD Water Mgt
12/12/2017	No new recommendations.		N/A	
12/5/2017	No new recommendations.		N/A	
11/28/2017	No new recommendations.		N/A	
11/21/2017	No new recommendations.		N/A	
11/13/2017	No new recommendations.		N/A	
11/1/2017	No new recommendations.		N/A	
10/24/2017	No new recommendations.		N/A	
10/17/2017	No new recommendations.		N/A	
10/10/2017	No new recommendations.		N/A	
10/3/2017	No new recommendations.		N/A	
9/25/2017	No new recommendations.		N/A	
9/19/2017	No new recommendations.		N/A	
9/5/2017	No new recommendations.		N/A	
8/29/2017	No new recommendations.		N/A	
8/22/2017	No new recommendations.		N/A	
8/15/2017	No new recommendations.		N/A	
8/4/2017	Increase S65A discharge by 150 cfs to about 1400 cfs.	Reduce rate of stage rise in KCH.		SFWMD Water Mgt, KB Ops
8/1/2017	No new recommendations.		N/A	

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

S65/S65A Limits on Rate of Change in Discharge

Discharge Rate of Change Limits for S65/S65A (revised 11/16/16).	
Q (cfs)	Maximum rate of increase or decrease (cfs/day)
300-650	75
650-1700	150
1700-3000	300
>3000	1000

Figure 12. Limits on rate of discharge change at S65/S65A starting with the 2016-2017 Dry Season.

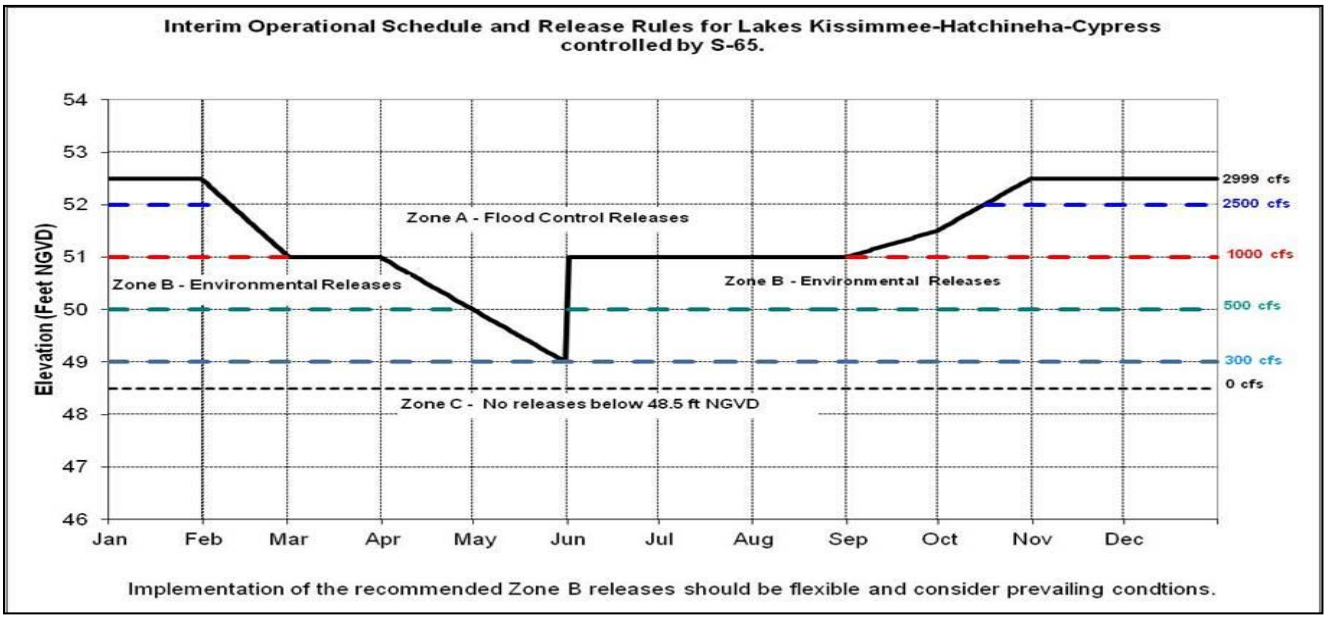


Figure 13. Interim operations schedule for S-65. The discharge schedule shown to the right has not been used in recent years.

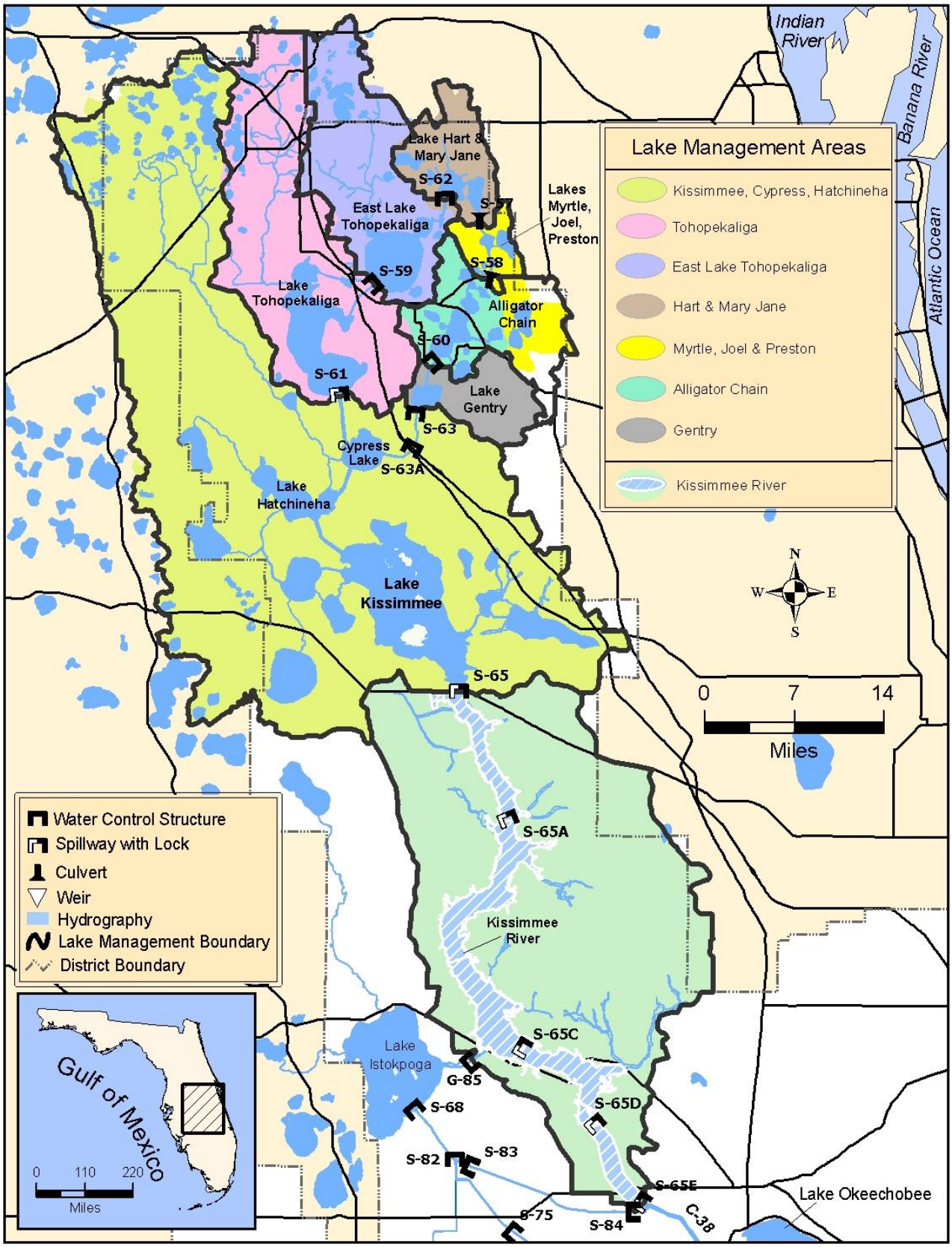


Figure 14. The Kissimmee Basin.

LAKE OKEECHOBEE

According to the USACE web site, Lake Okeechobee stage is at 15.29 feet NGVD for the period ending at midnight on January 29, 2018. This value is based on the use of four interior Lake stations (L001, L005, L006 and LZ40) and four perimeter stations (S308, S352, S4 and S133). Lake stage last peaked at 17.20 feet NGVD on October 13, 2017 before declining to 16.8 feet NGVD on October 28, 2017 and then back up to 17.02 feet NGVD. The Lake is now 0.23 feet lower than it was a month ago, but 1.43 feet higher than a year ago (Figure 1). The Lake is now in the Low sub-band (Figure 2). According to RAINDAR, 0.34 inches of rain fell over the Lake during the week January 23, 2018 – January 29, 2018 with much of the northern watershed receiving substantially more, between 0.5-1.5 inches (Figure 3).

Average daily inflows to the Lake increased slightly from the past week, from 859 cfs to 920 cfs. Most of the inflows were from the Kissimmee River via the S65E structures, averaging 727 cfs daily, with another 73 cfs from the S84 structures. The S71 and S72 structures, along with Fisheating Creek and the northern pumps, contributed a combined 120 average daily cfs as well.

Average daily outflows for the Lake decreased from the previous week, going from 1,737 cfs to 1,365 cfs, primarily through decreases in discharges at the S77 structure. S77 discharges went from 548 cfs the previous week to 171 cfs this past week, while S308 discharges went from 40 cfs to 0 cfs. Discharges south through the S350 structures increased from an average of 928 cfs the previous week to 1,009 cfs this past week. Discharges to the L8 canal via Culvert 10A this week averaged 184 daily cfs compared to 220 daily cfs last week. The corrected evapotranspiration value based on the L006 weather platform solar radiation data was 0.09 inches for the past week.

Total Lake inflows and outflows for the last week are detailed in Table 1, as well as the approximate change in Lake stage from each major structure's total flows over the period. Figure 4 shows the combined average daily cfs for inflows and outflows for the Lake over the past eight weeks. These data are provisional, and are subject to change.

The most recent satellite imagery had substantial cloud cover, but based on the most recent cyanobacteria monitoring product derived from NOAA's OLCI satellite sensor, algal bloom potential has remained very low over the past four months. Potential for elevated cyanobacterial levels were last observed in the northern portion of the Lake in early September 2017 (Figure 5). Along with decreasing temperatures, high winds from Hurricane Irma may have further reduced bloom potential on the Lake by increasing turbidity, but elevated TP levels from high inflows and resuspended Lake sediment are expected to produce high bloom potentials next year as turbidity continues to decline and temperatures increase.

Based on the Lake Okeechobee wading bird habitat suitability index, there are approximately 45,162 acres of suitable foraging habitat for long-legged birds and 9,558 acres for long and short legged birds on the Lake (Figure 6).

Table 1. Average daily inflows and outflows and the approximate depth equivalents on Lake Okeechobee for various structures.

INFLOWS	Avg Daily Flow cfs	Equivalent Depth Week Total (in)
S65E & S65EX1	727	0.3
S71 & 72	18	0.0
S84 & 84X	73	0.0
Fisheating Creek	35	0.0
S154	0	0.0
S191	0	0.0
S133 P	37	0.0
S127 P	11	0.0
S129 P	6	0.0
S131 P	5	0.0
S135 P	9	0.0
S2 P	0	0.0
S3 P	0	0.0
S4 P	0	0.0
C5	0	0.0
Rainfall	931	0.3
Total	**1851**	**0.7**

OUTFLOWS	Avg Daily Flow cfs	Equivalent Depth Week Total (in)
S77	171	0.1
S308	0	0.0
S351	548	0.2
S352	32	0.0
S354	429	0.2
L8	184	0.1
ET	1709	0.7
Total	**3074**	**1.2**

PROVISIONAL DATA

Water Management Recommendations

The Lake stage is 15.29 feet NGVD having decreased 0.02 feet from the week prior and 0.23 feet over the past month. Submerged and emergent vegetation communities in the nearshore region have experienced stages >16.0 feet NGVD three times in less than two years, and stages >15.5 feet NGVD for 105 consecutive days this water year, the longest period since late 2004 (112 consecutive days). These stages, combined with turbid conditions from Hurricane Irma's winds, will likely cause substantial declines in these communities over the coming months and/or years. Lower Lake stages near the end of WY2018 would help to recover these important communities, and long, steady recessions of water levels throughout the dry season may help promote another productive year for wading birds on the Lake as well.

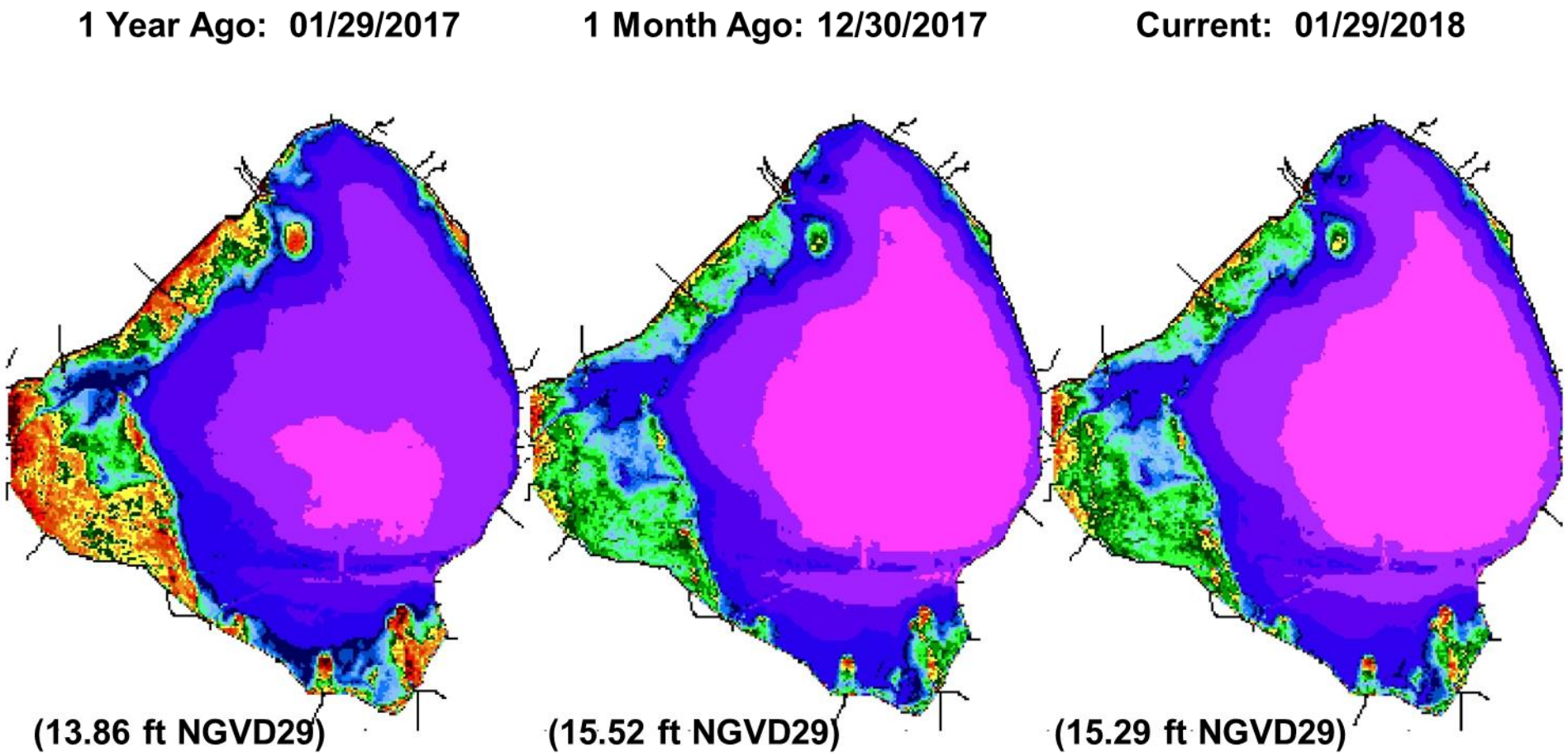


Figure 1. Water depth estimates on Lake Okeechobee based on the South Florida Water Depth Assessment Tool.

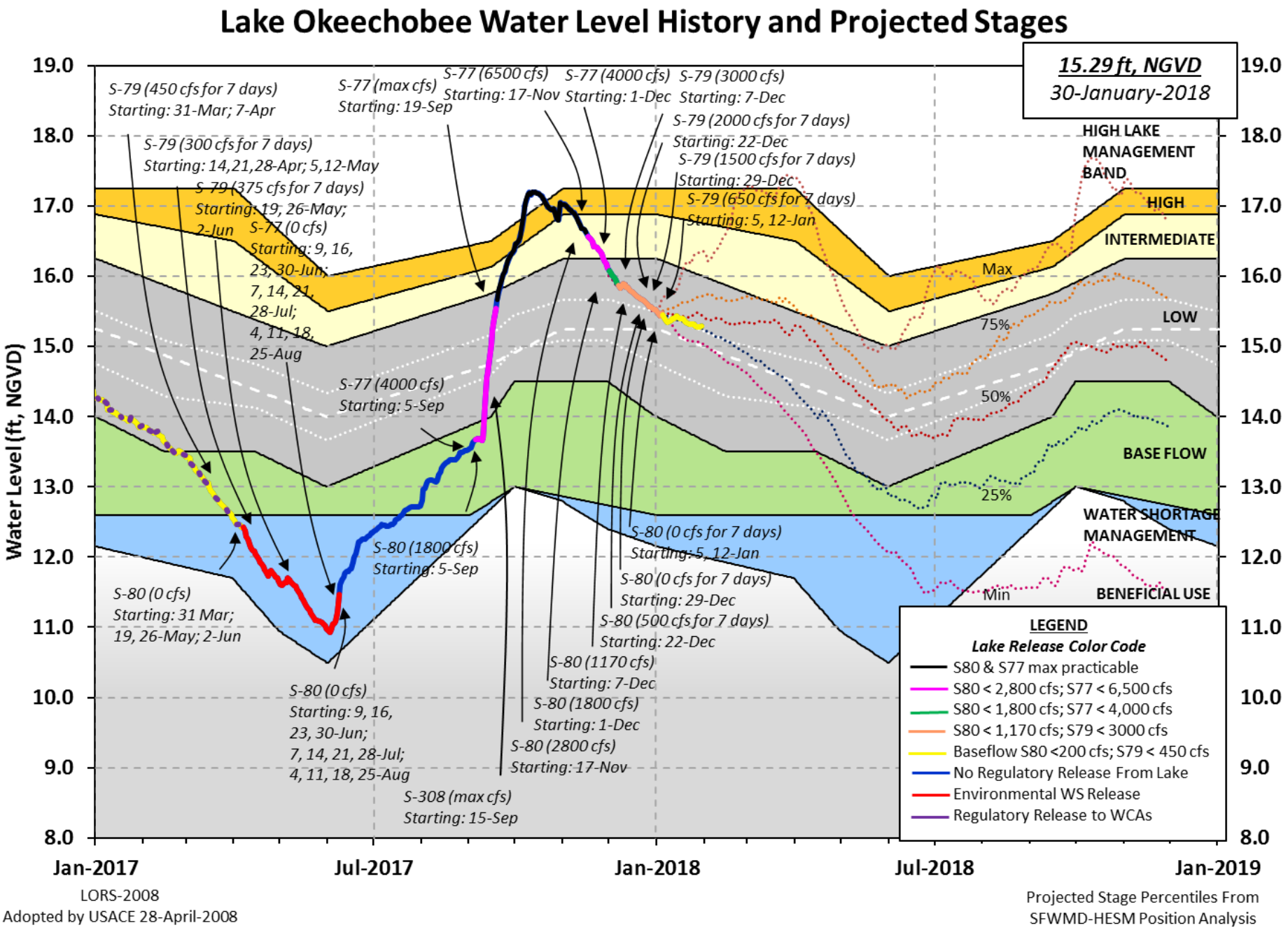


Figure 2. Recent Lake Okeechobee stage and releases, with projected stages based on a dynamic position analysis.

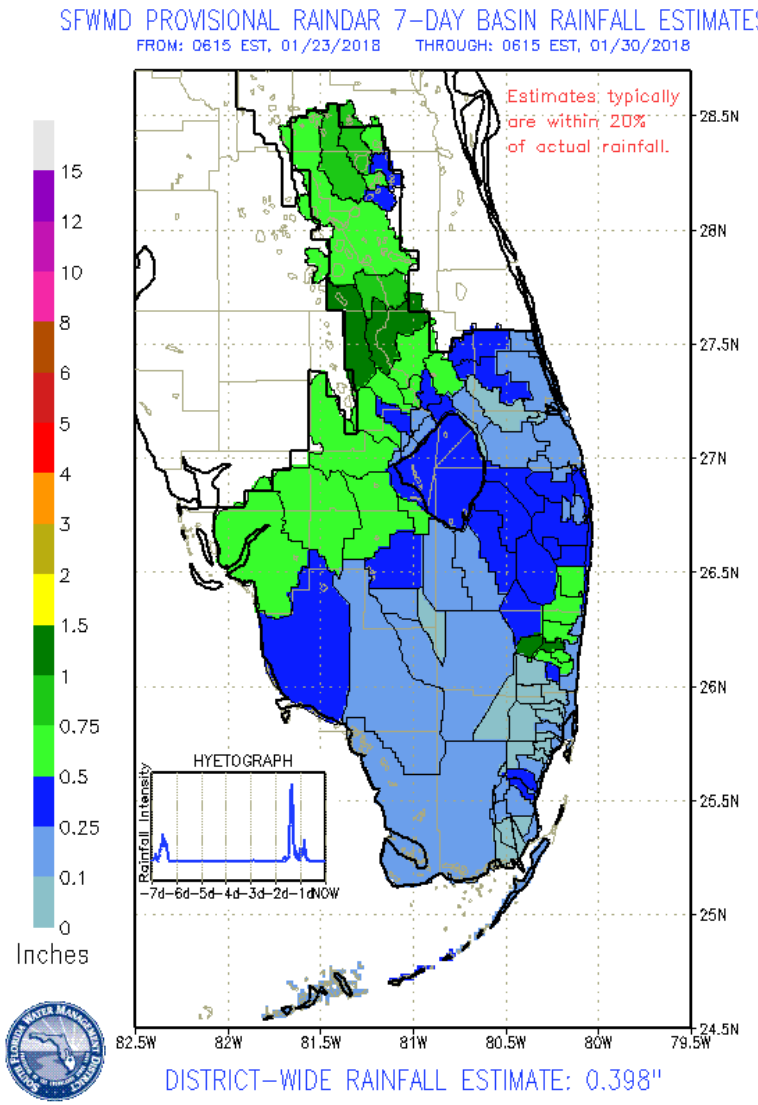
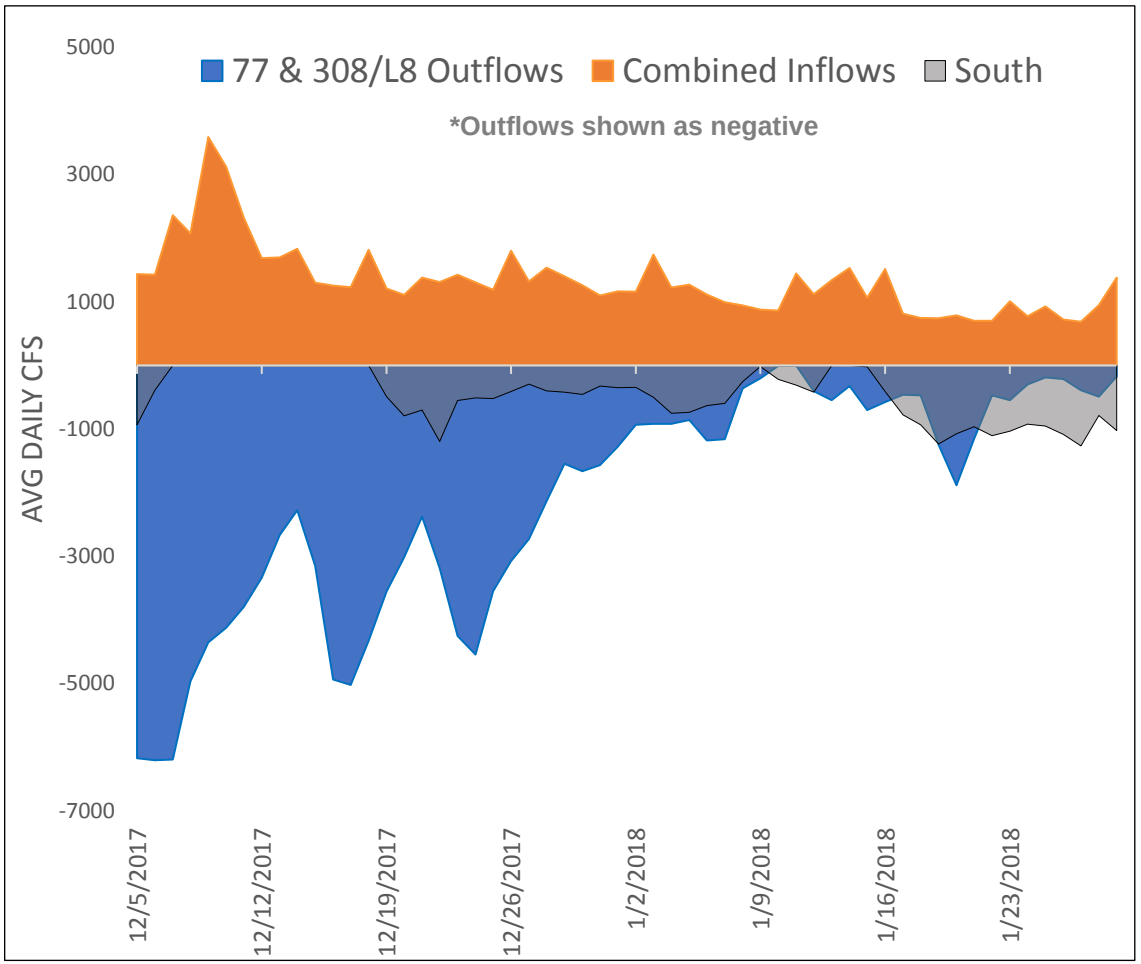


Figure 3. Rainfall estimates by basin.



PROVISIONAL DATA

Figure 4. Major inflows and outflows of Lake Okeechobee, including the S350 structures designated as South. Inflows and outflows are shown as positive and negative, respectively, for visual purposes.

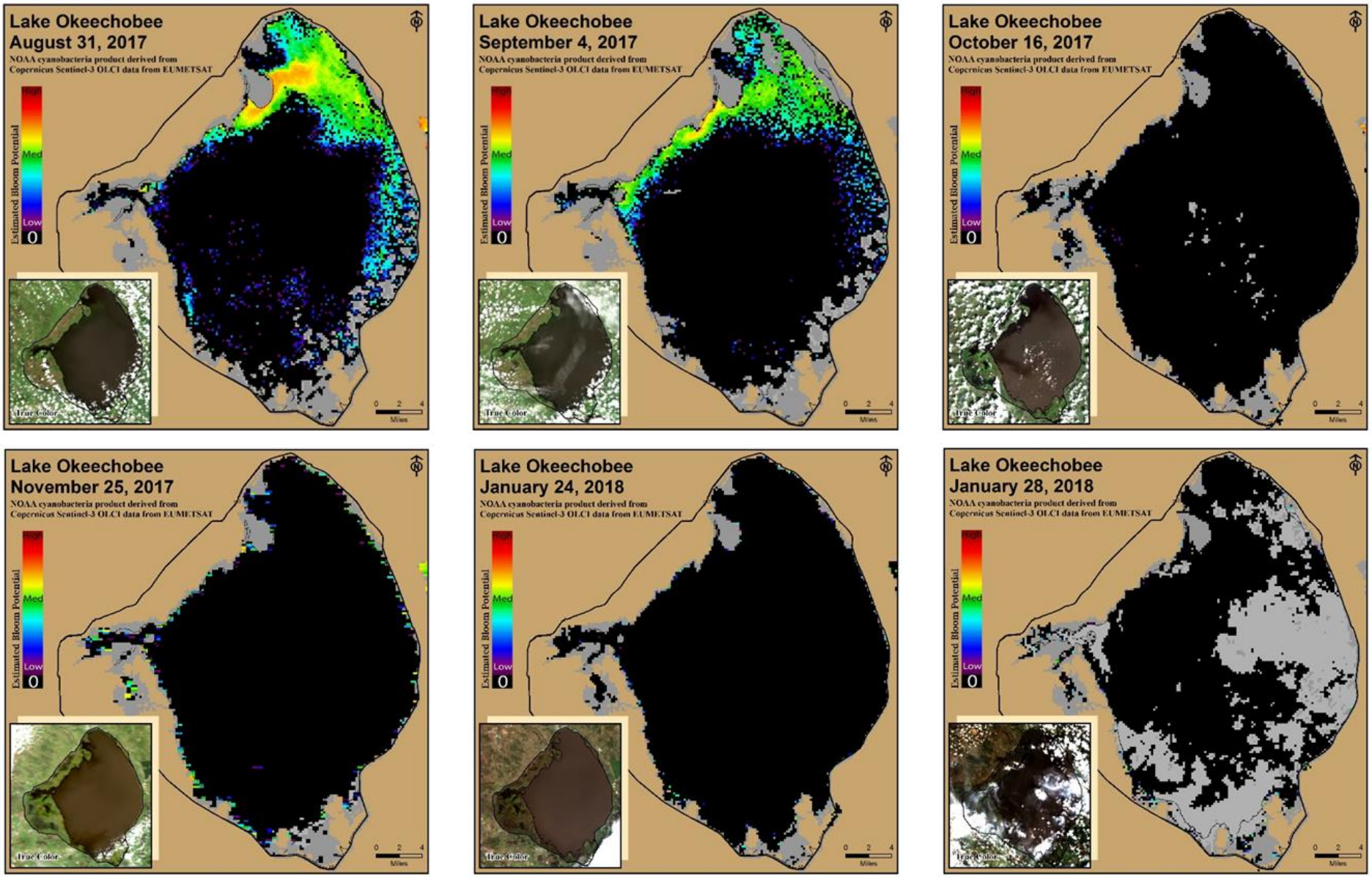


Figure 5. Potential for cyanobacterial blooms on Lake Okeechobee based on NOAA's harmful algal bloom monitoring system derived from Copernicus Sentinel-3 OLCI data from EUMETSAT.

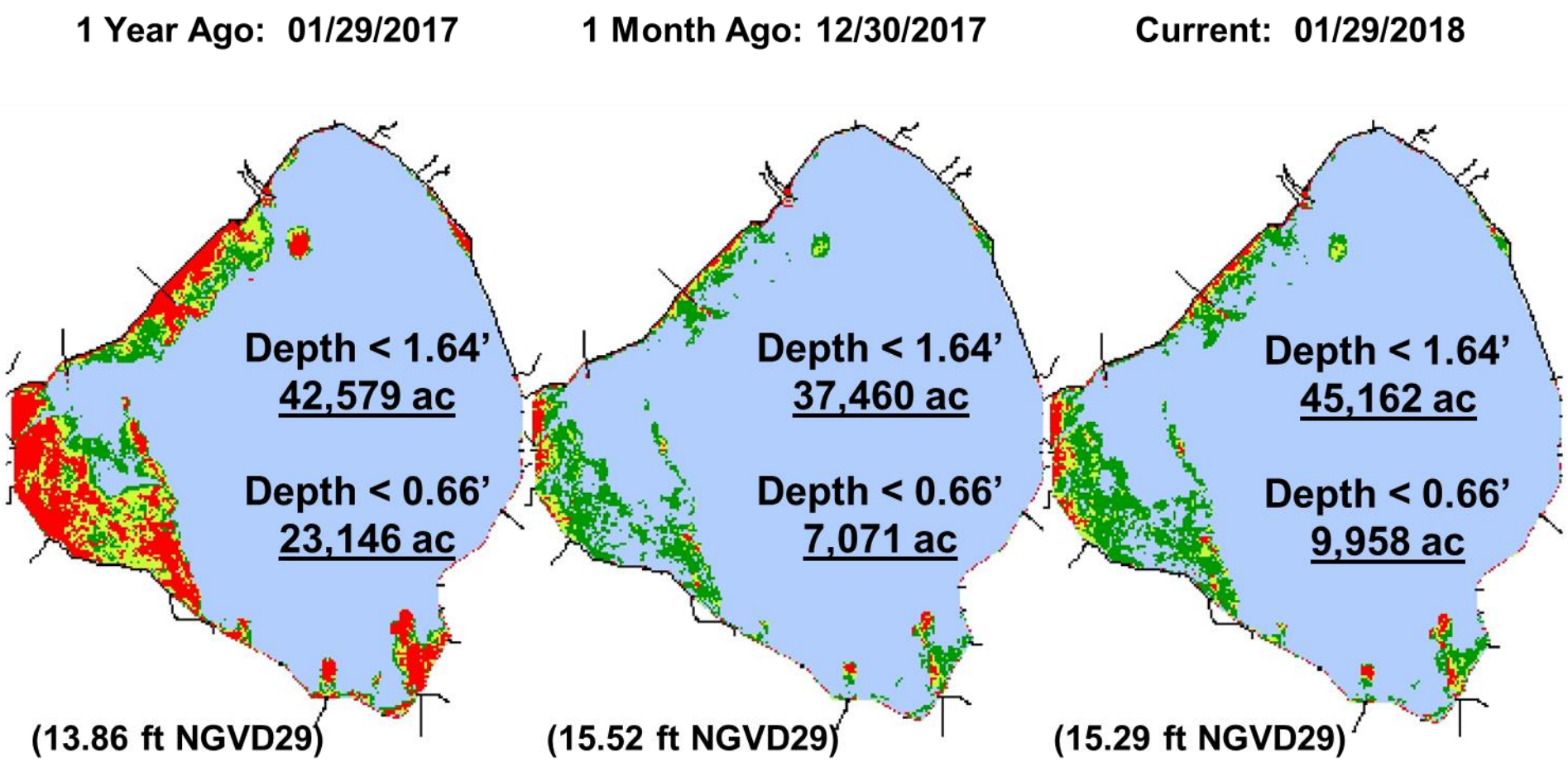


Figure 6. Wading bird habitat suitability index for Lake Okeechobee based on the South Florida Water Depth Assessment Tool.

LAKE ISTOKPOGA

Lake Istokpoga stage is 39.35 feet NGVD as of midnight January 29, 2018 and is currently 0.15 feet below its regulation schedule to accommodate construction on downstream structures (Figure 7). Average daily flows into the lake from Josephine Creek for the week January 23, 2018 – January 29, 2018 were the same as the previous week, at 45 cfs. No data have been reported for Arbuckle Creek since July 4, 2017 as the gauge is being recalibrated after construction in the area. Average daily discharge from S68 and S68X over the past week increased from 5 cfs to 66 cfs the week prior. According to RAINDAR, only 1.0 inches of rain fell in the Lake Istokpoga basin over the past week.

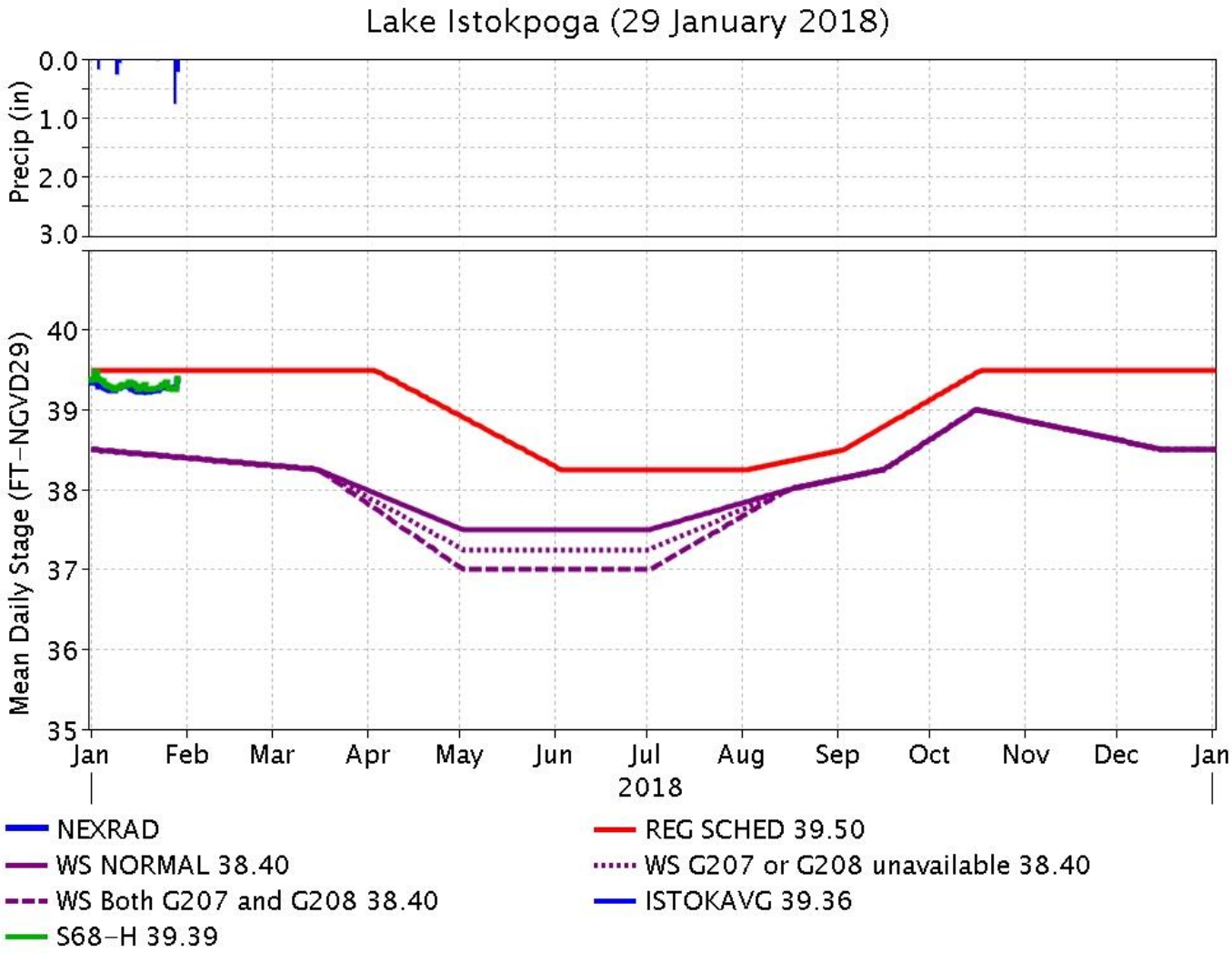


Figure 7. Recent stages on Lake Istokpoga.

ESTUARIES

St. Lucie Estuary:

Last week total inflow into the St. Lucie Estuary averaged about 279 cfs (Figures 1 and 2) and last month inflow averaged about 475 cfs. Last week's provisional averaged inflows from the tidal basin and the structures are shown in Table 1.

Table 1. Weekly average inflows (data is provisional).

Location	Flow (cfs)
Tidal Basin Inflow	113
S-80	0
S-308	0
S-49 on C-24	38
S-97 on C-23	32
Gordy Rd. structure on Ten Mile Creek	96

Over the past week, surface salinity increased throughout the estuary (Table 2, Figures 3 and 4). The seven-day moving average salinity of the water column (an average of the surface and bottom salinity) at the US1 Bridge is 17.3. Salinity conditions in the middle estuary are in the good range for adult eastern oysters (Figure 3).

Table 2. Seven-day average salinity at three monitoring sites 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 (North Fork)	**13.3** (12.3)	**14.5** (16.0)	NA[1]
US1 Bridge	**16.6** (15.4)	**18.0** (18.6)	10.0-26.0
A1A Bridge	**26.1** (23.6)	**28.2** (26.4)	NA[1]

[1]Envelope not applicable.

Continuous monitoring of water quality is conducted at HR1 in the North Fork. Weekly dissolved oxygen data are summarized in Table 3.

Table 3. Weekly dissolved oxygen conditions at HR1 in the North Fork of the St. Lucie Estuary.

Location	Depth	Average DO (mg/l)	Minimum DO (mg/l)	Maximum DO (mg/l)
HR1	surface	6.83	5.55	7.91
HR1	bottom	4.61	2.80	7.61

Continuous monitoring of water quality is conducted at five Land/Ocean Biogeochemical Observatory (LOBO) stations located in the St. Lucie Estuary and maintained by Florida Atlantic University/Harbor Branch Oceanographic Institute (FAU-HBOI). Data are summarized in Table 4 and station location map is shown in Figure 5.

Table 4. Weekly ranges of instrument depth, chlorophyll *a* (a measure of algal biomass) and dissolved oxygen concentrations at five FAU-HBOI LOBO stations located in the St. Lucie Estuary.

Location	Depth (m)	Chlorophyll *a* (µg/l)	Average DO (mg/l)	Minimum DO (mg/l)	Maximum DO (mg/l)
SF2	2.67	5.95 - 21.79	5.62	3.66	6.97
SF	1.53	3.98 - 9.20	8.62	7.95	9.30
NF	2.03	3.28 - 5.68	7.53	6.90	8.19
ME	1.85	3.55 - 14.44	7.81	7.24	8.28
IRL-SLE	3.42	0.91 - 3.93	6.28	5.76	6.57

NOAA satellite imagery indicates low to medium potential for cyanobacteria blooms in the St. Lucie Estuary (Figure 6).

Caloosahatchee Estuary:
Last week total inflow into the Caloosahatchee Estuary averaged about 824 cfs (Figures 7 and 8) and last month inflow averaged about 919 cfs. Last week's provisional averaged inflows from the structures are shown in Table 5.

Table 5. Weekly average inflows (data is provisional).

Location	Flow (cfs)
S-77	171
S-78	568
S-79	664

Over the past week, salinity increased throughout the estuary (Table 6, Figures 9 & 10). The seven-day average salinity values are within the good range for adult eastern oysters at Cape Coral and at Shell Point (Figure 11). Salinity data were not available at Sanibel. The 30-day moving average surface salinity is 1.2 at Val I-75 and 4.2 at Ft. Myers. With no flow through S-79, daily salinity at Val I-75 is forecast in two weeks to be 6.5, and the 30-day moving average is forecast to be 3.2 (Figure 13). Salinity conditions between Val I-75 and Ft. Myers are good for tape grass.

Table 6. 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)	**2.3** (0.9)	**2.5** (1.0)	NA[1]
*Val I75	**2.9** (1.2)	**4.6** (2.4)	0.0-5.0[2]
Ft. Myers Yacht Basin	**8.3** (5.1)	**10.5** (8.6)	NA
Cape Coral	**15.5** (13.0)	**17.4** (15.6)	10.0-30.0
Shell Point	**25.9** (23.5)	**25.6** (23.5)	10.0-30.0
Sanibel	**NR**[3](NR)	**NR** (NR)	10.0-30.0

[1]Envelope not applicable, [2]Envelope is based on a 30-day average, and [3]Not Reporting.
*Val I75 is temporarily unavailable (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 7 as concentration ranges of chlorophyll *a* and dissolved oxygen at Beautiful Island, Ft. Myers, and Shell Point in the Caloosahatchee Estuary.

Table 7. 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.

Parameter Name	RECON Monitoring Stations		
	Beautiful Island	Ft. Myers	Shell Point
Chlorophyll *a* (µg/l)	Down since 07/11/17	Operational 01/29/18 at 16:00 hours	1.70 – 3.60
Dissolved Oxygen (mg/l)	Down since 07/11/17	Will report next week	6.71 – 9.28

The Florida Fish and Wildlife Research Institute reported on January 26, 2018, that *Karenia brevis, the Florida red tide dinoflagellate,* was observed in very low to low concentrations in eleven samples collected from Lee County. A fish kill was reported in Lee County at Bowman's Beach (1/24 and 1/25). Slight respiratory irritation was reported in Lee County at Causeway Islands Park (1/21) and at Bowman's Beach (1/24).

NOAA satellite imagery indicates low to medium potential for cyanobacteria blooms in the Caloosahatchee River Estuary (Figure 12).

Water Management Recommendations

Lake stage is in the Low sub-band of 2008 LORS. Tributary hydrological conditions are normal. The 2008 LORS recommends up to 450 cfs at S-79 and up to 200 cfs at S-80. Given the current estuarine conditions, there are no ecological benefits associated with freshwater releases from Lake Okeechobee.

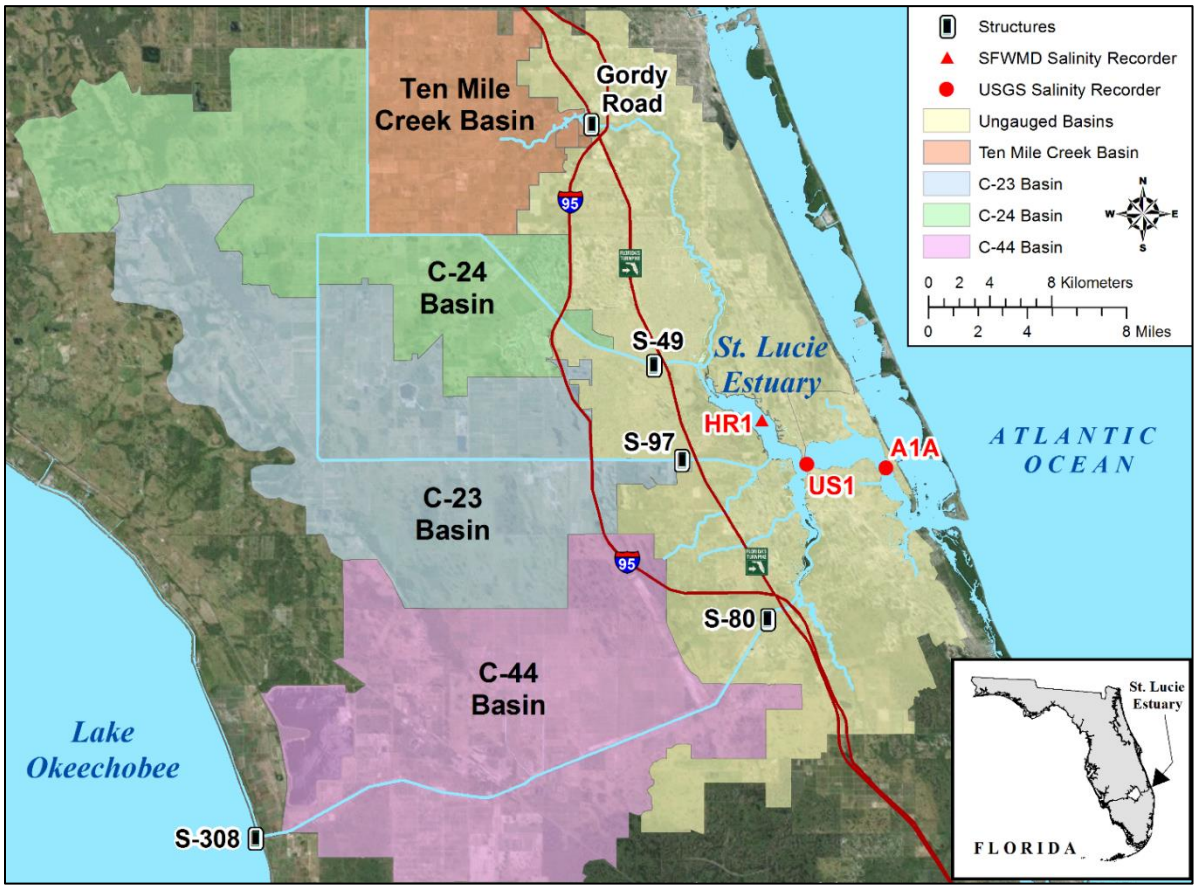


Figure 1. Basins, water control structures, and salinity monitoring for the St. Lucie Estuary.

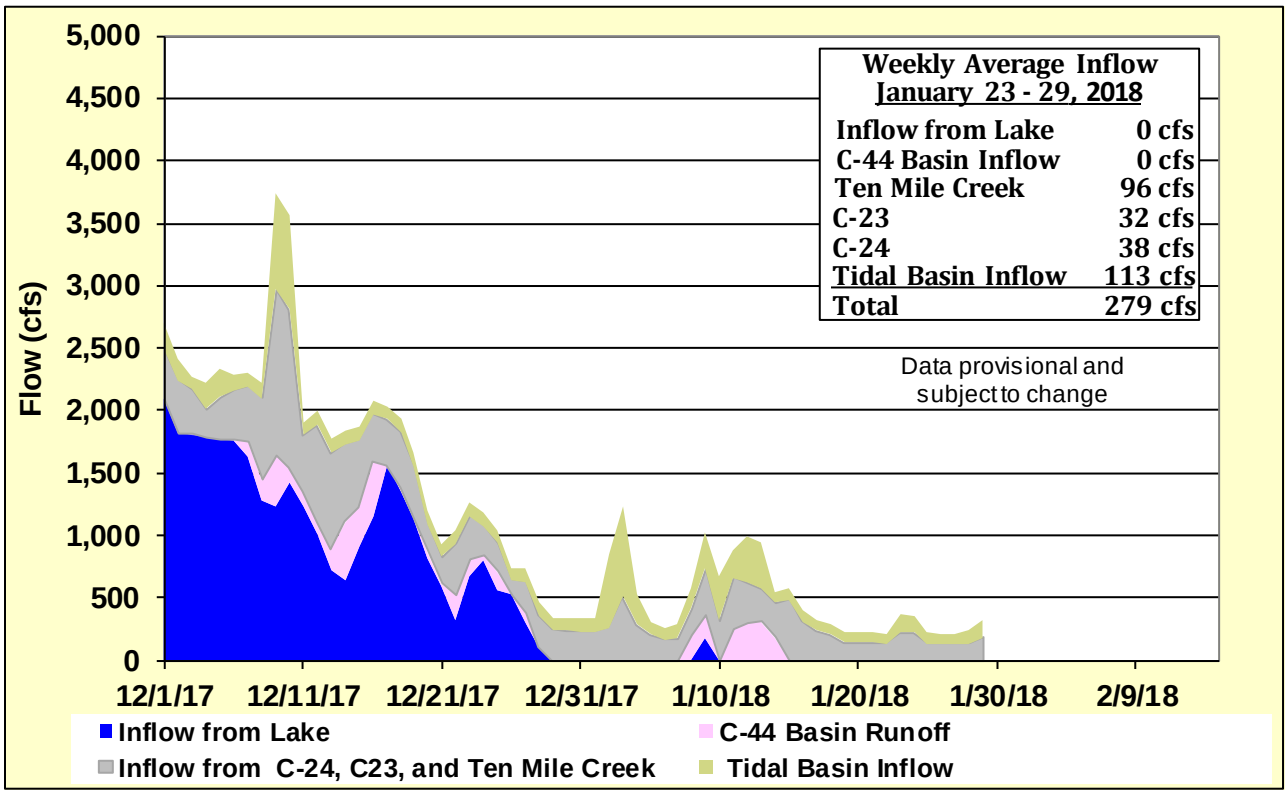


Figure 2. Estimated surface freshwater inflows from Lake Okeechobee and runoff from the C-44, C-23, C-24, Ten Mile Creek, and tidal basins into the St. Lucie Estuary.

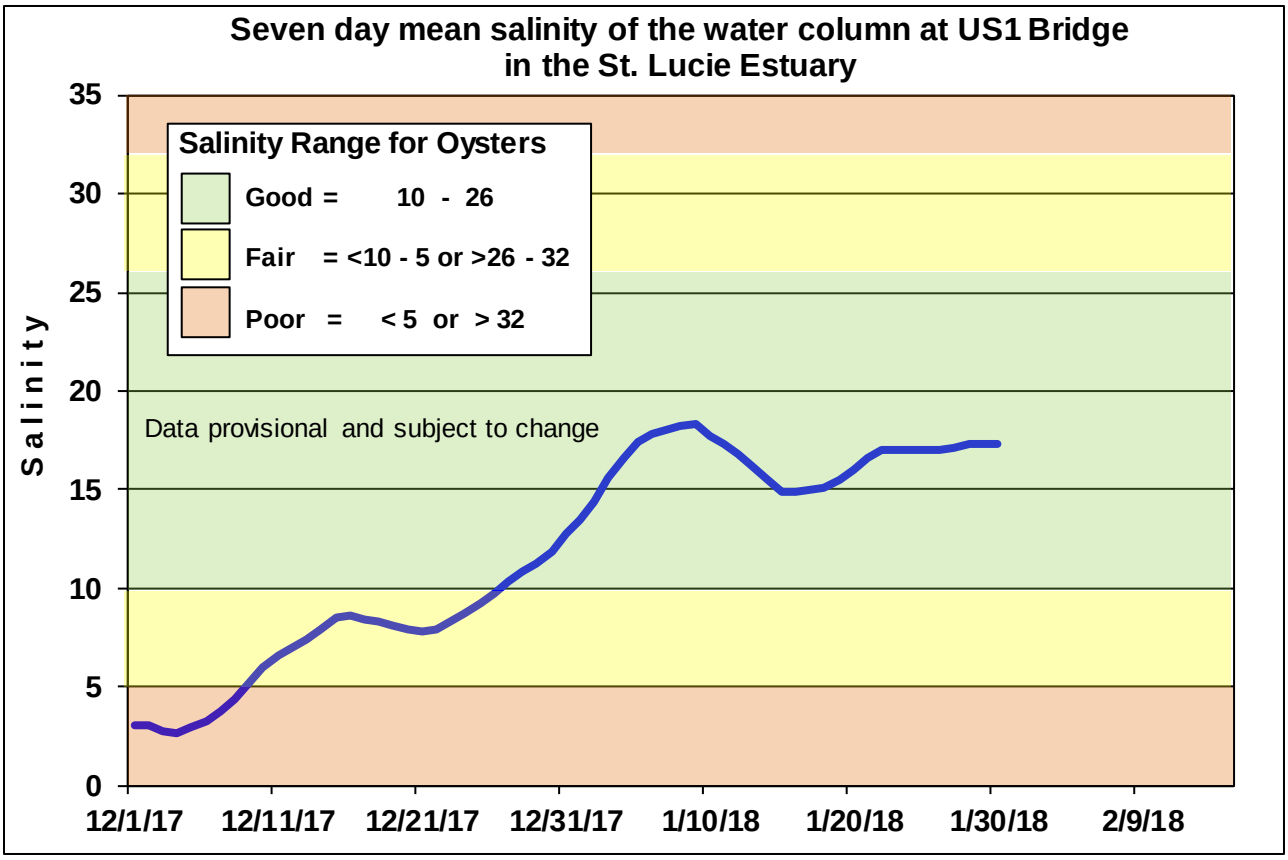


Figure 3. Seven-day mean salinity of the water column at the US1 Bridge.

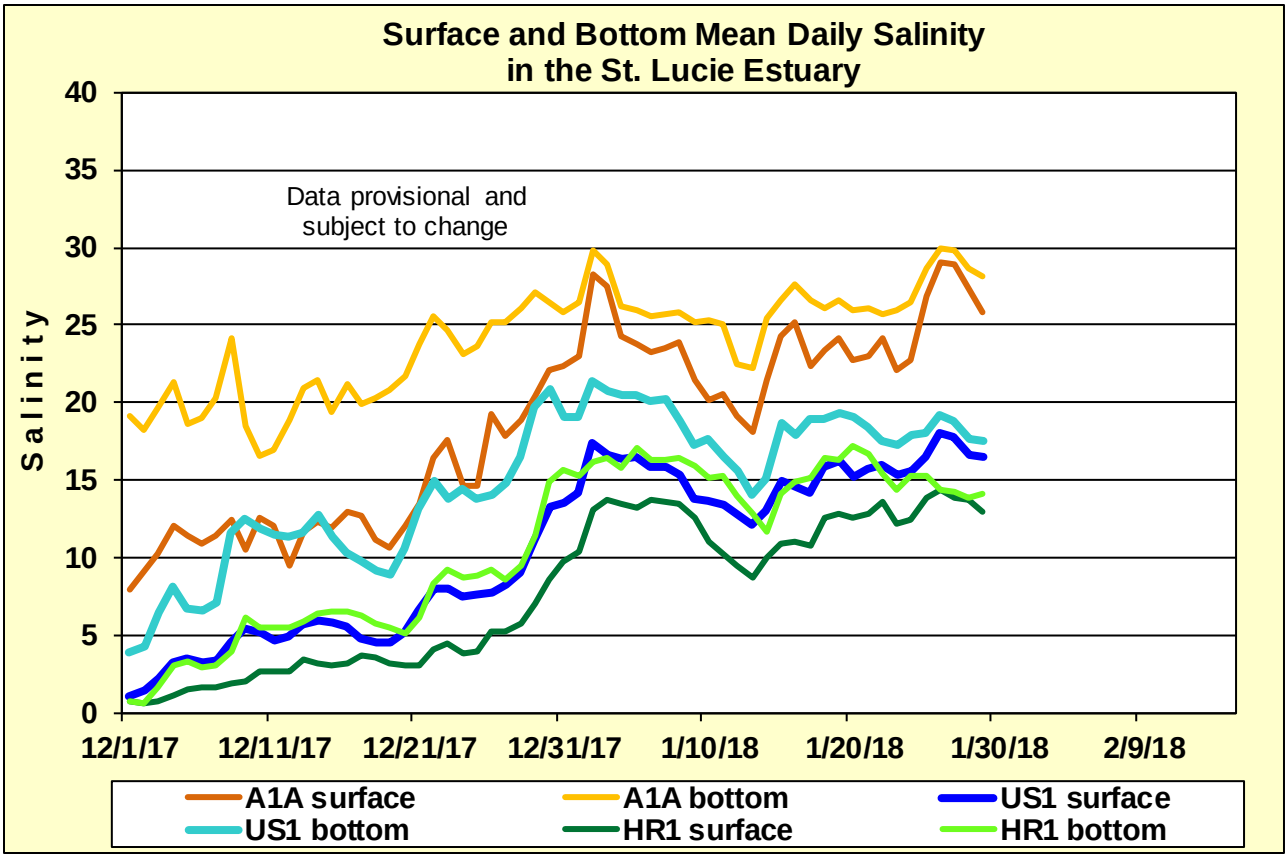


Figure 4. Daily mean salinity at the A1A, US1 and estimated HR1 stations.

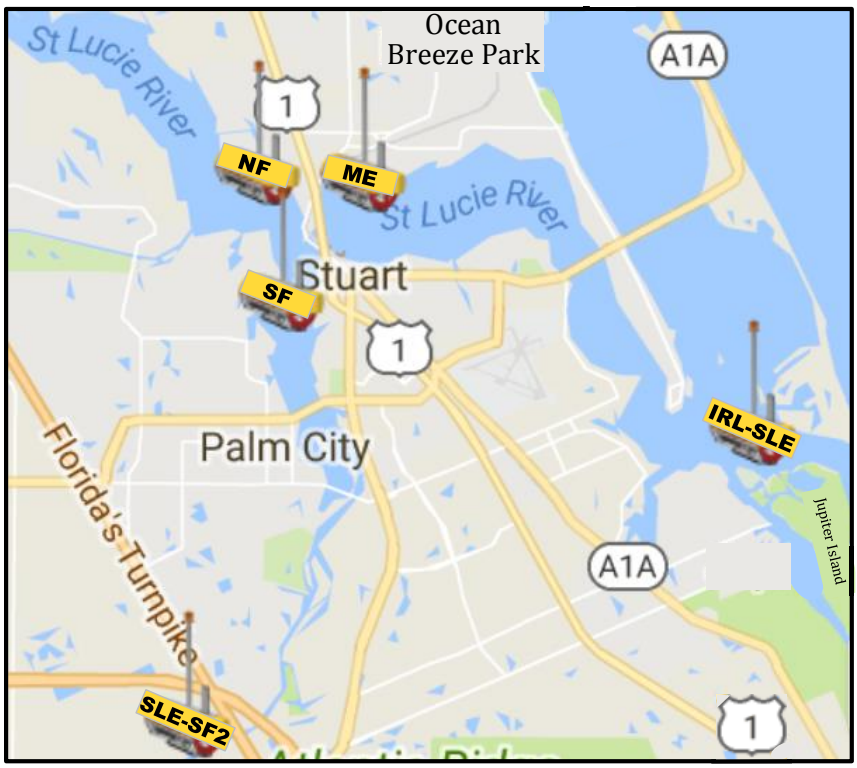


Figure 5. Location of FAU-HBOI LOBO water quality stations in the St. Lucie Estuary.

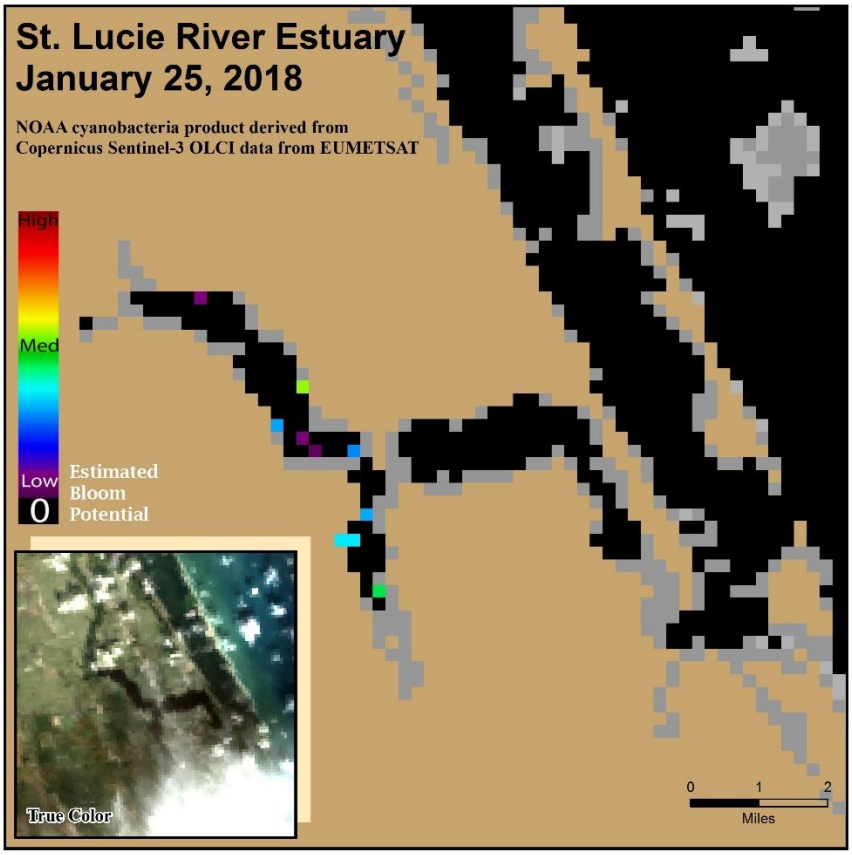


Figure 6. Sentinel 3a Satellite imagery provided by NOAA uses Ocean and Land Color Instrument (OLCI) to estimate cyanobacteria bloom potential in St. Lucie Estuary.

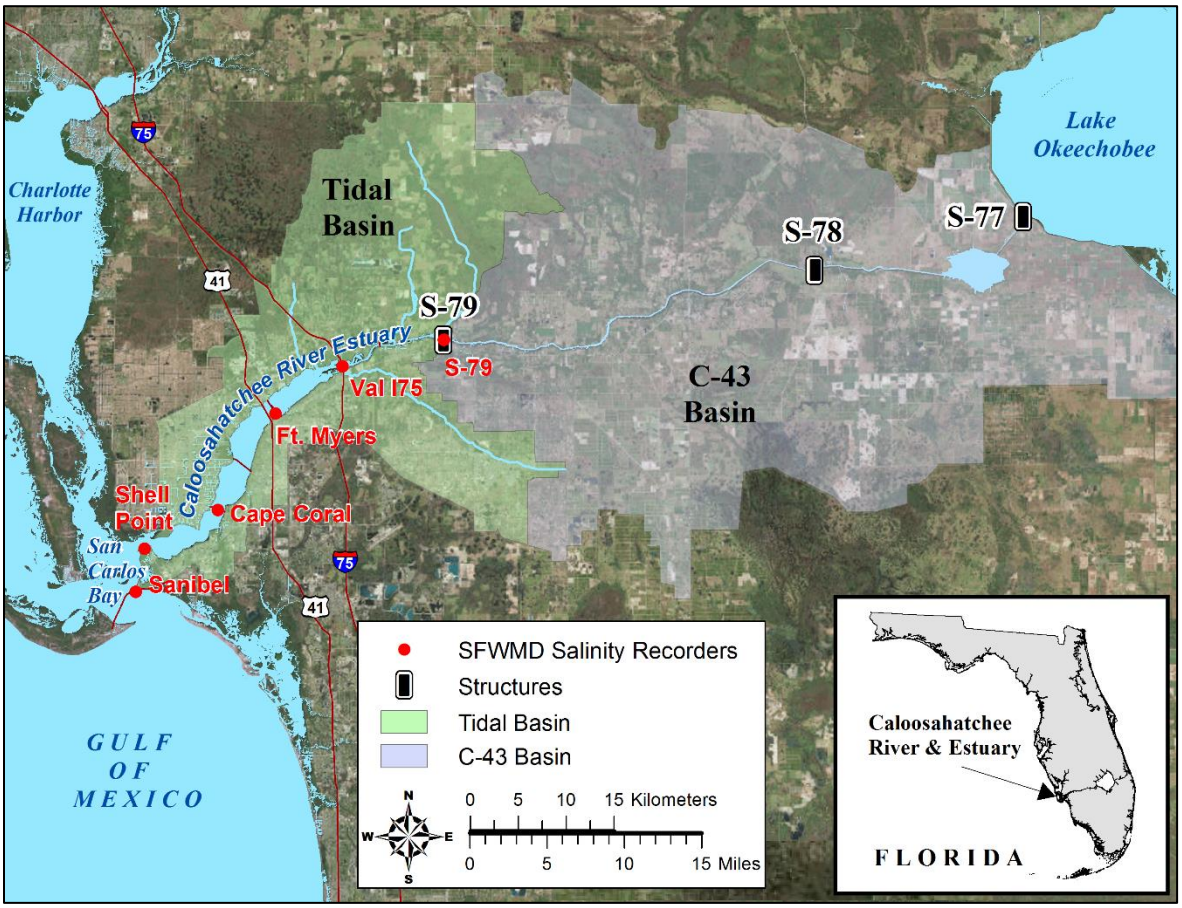


Figure 7. Basins, water control structures, and salinity monitoring for the Caloosahatchee Estuary.

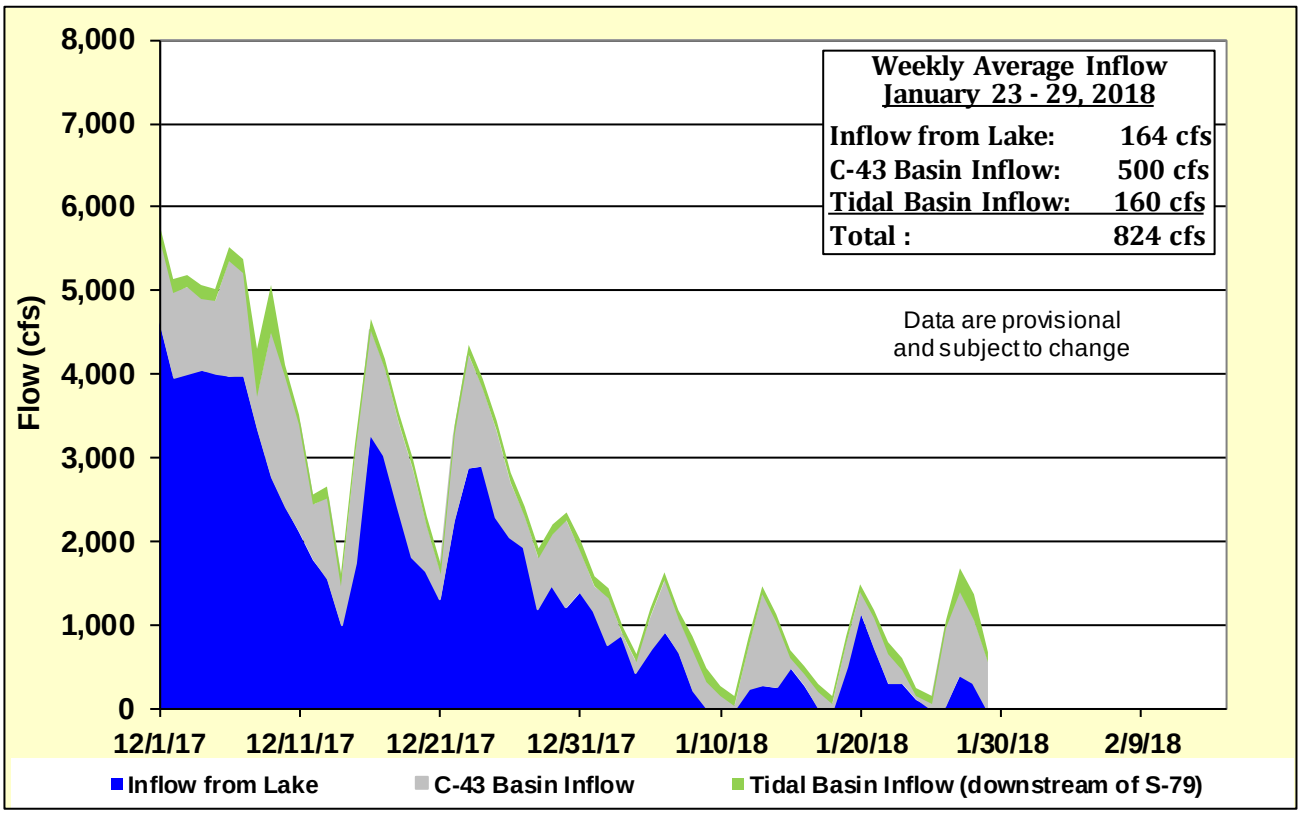


Figure 8. Freshwater inflows from Lake Okeechobee, runoff from the C-43 basin, and tributaries in the tidal basin into the Caloosahatchee River Estuary.

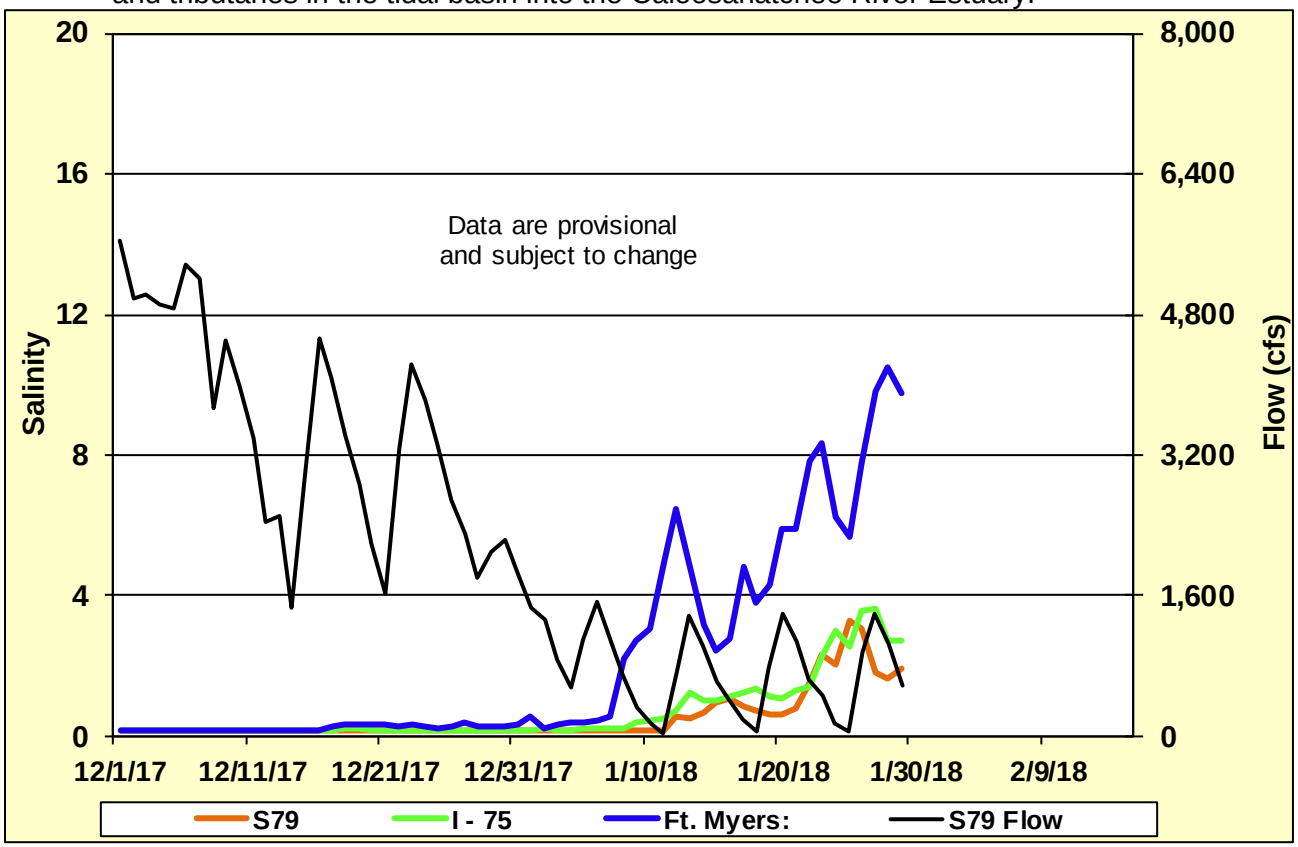


Figure 9. Daily mean flows at S-79 and salinity at upper estuary monitoring stations.

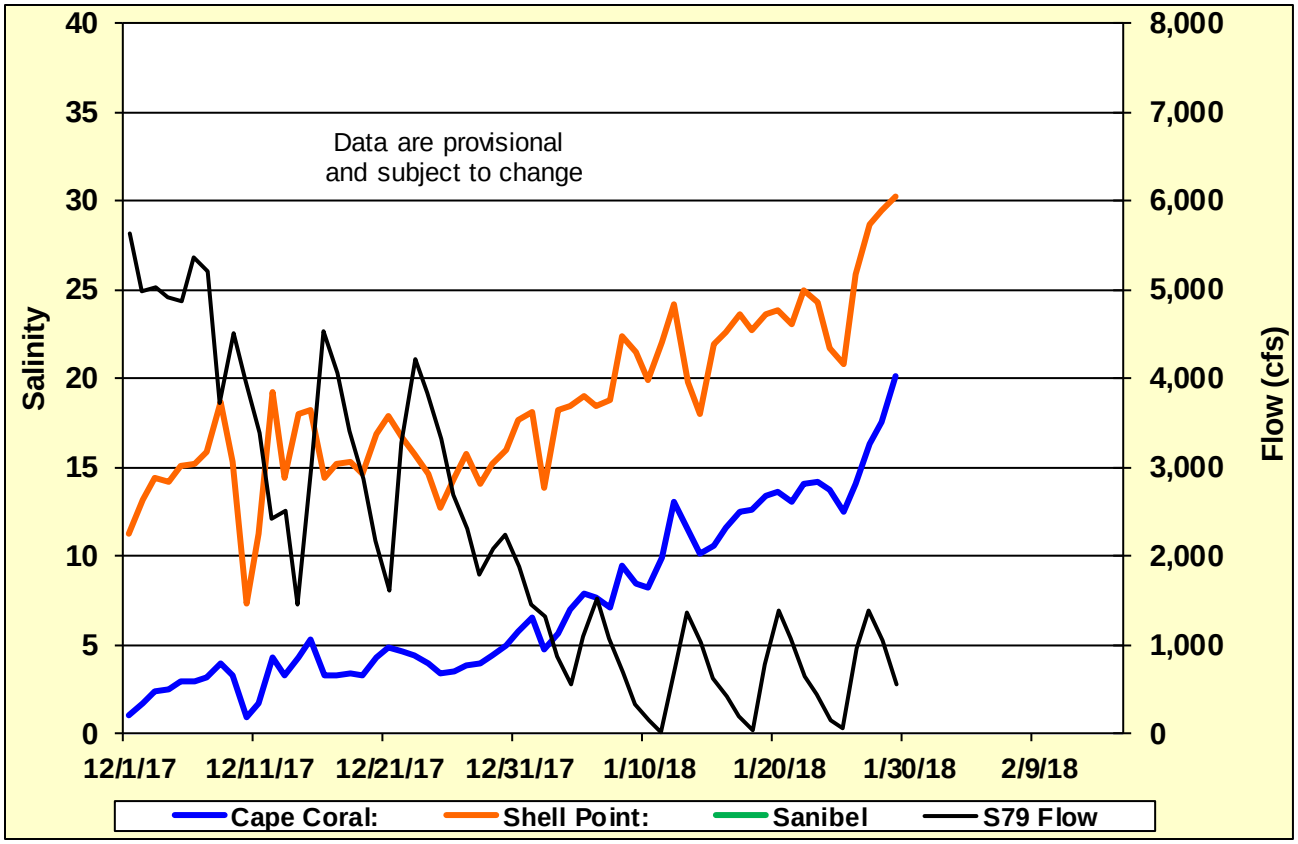


Figure 10. Daily mean flows at S-79 and salinity at lower estuary stations.

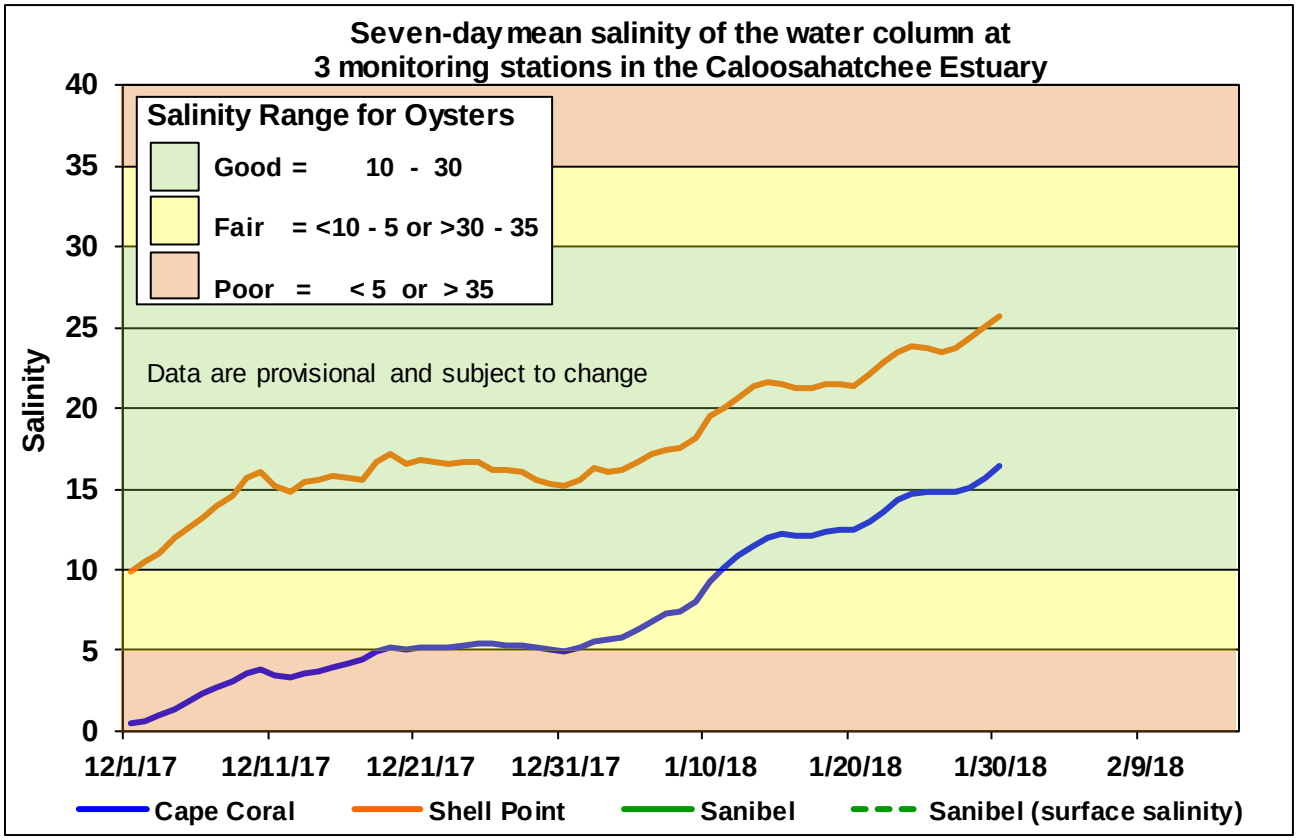


Figure 11. Seven-day mean salinity at Cape Coral Bridge, Shell Point, and Sanibel Bridge monitoring stations.

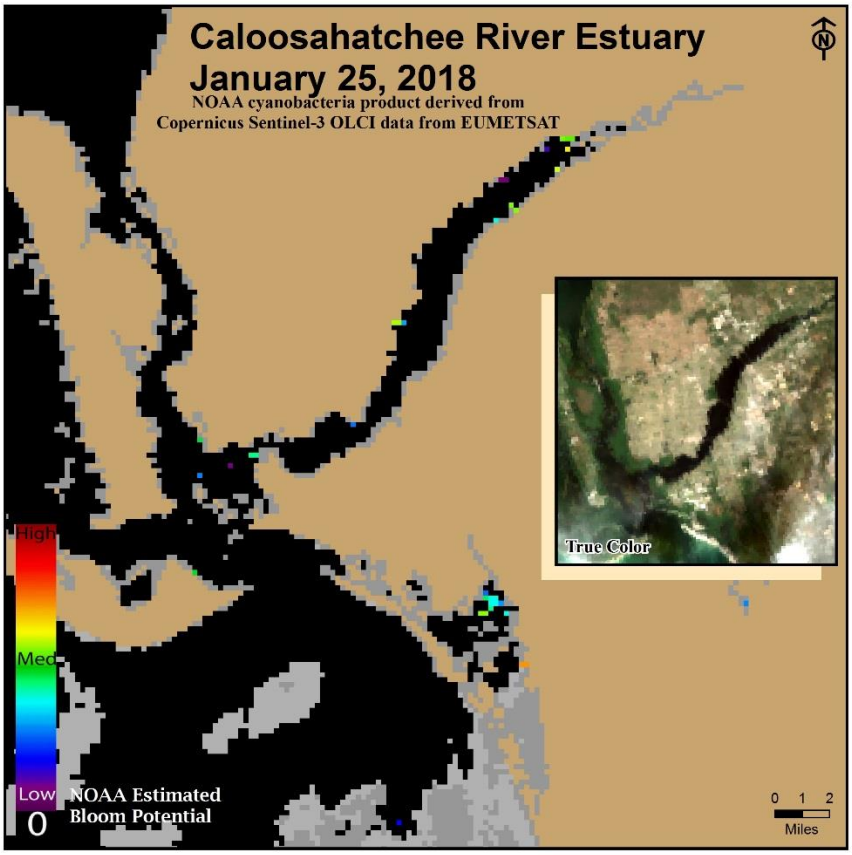


Figure 12. Sentinel 3a Satellite imagery provided by NOAA uses Ocean and Land Color Instrument (OLCI) to estimate cyanobacteria bloom potential in St. Lucie Estuary.

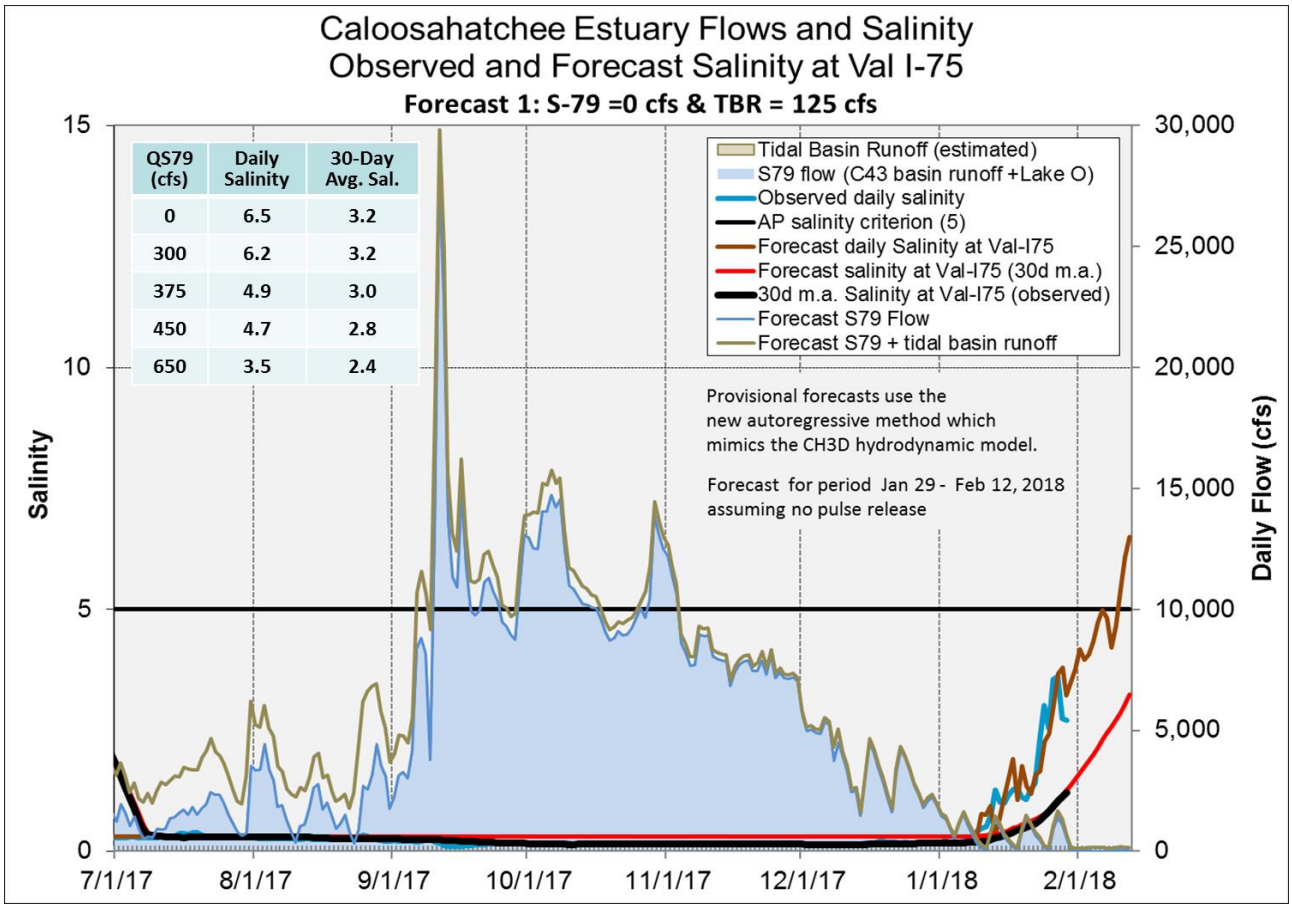
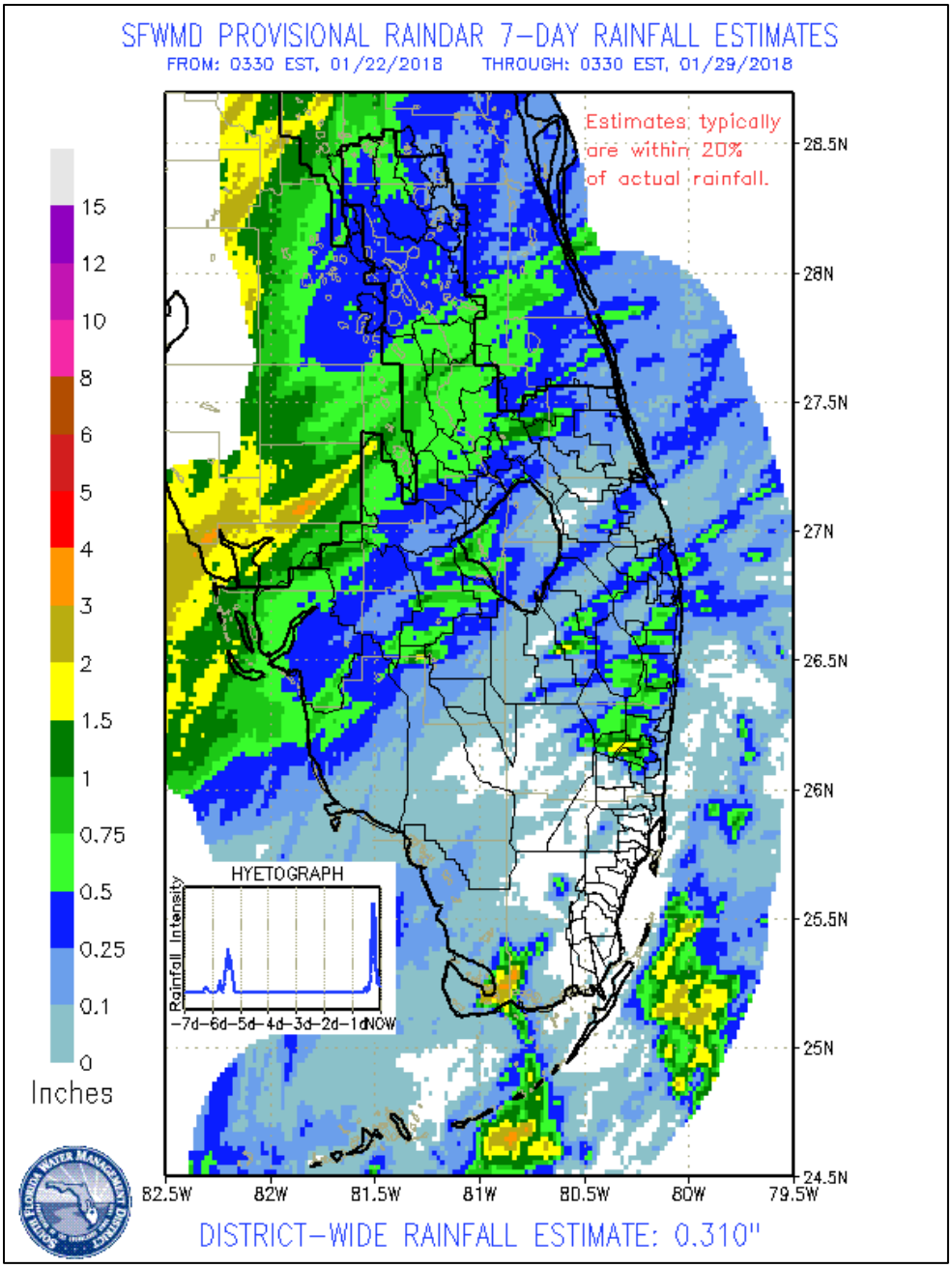


Figure 13. 14-day salinity forecast at Val I-75 assuming no releases at S-79.

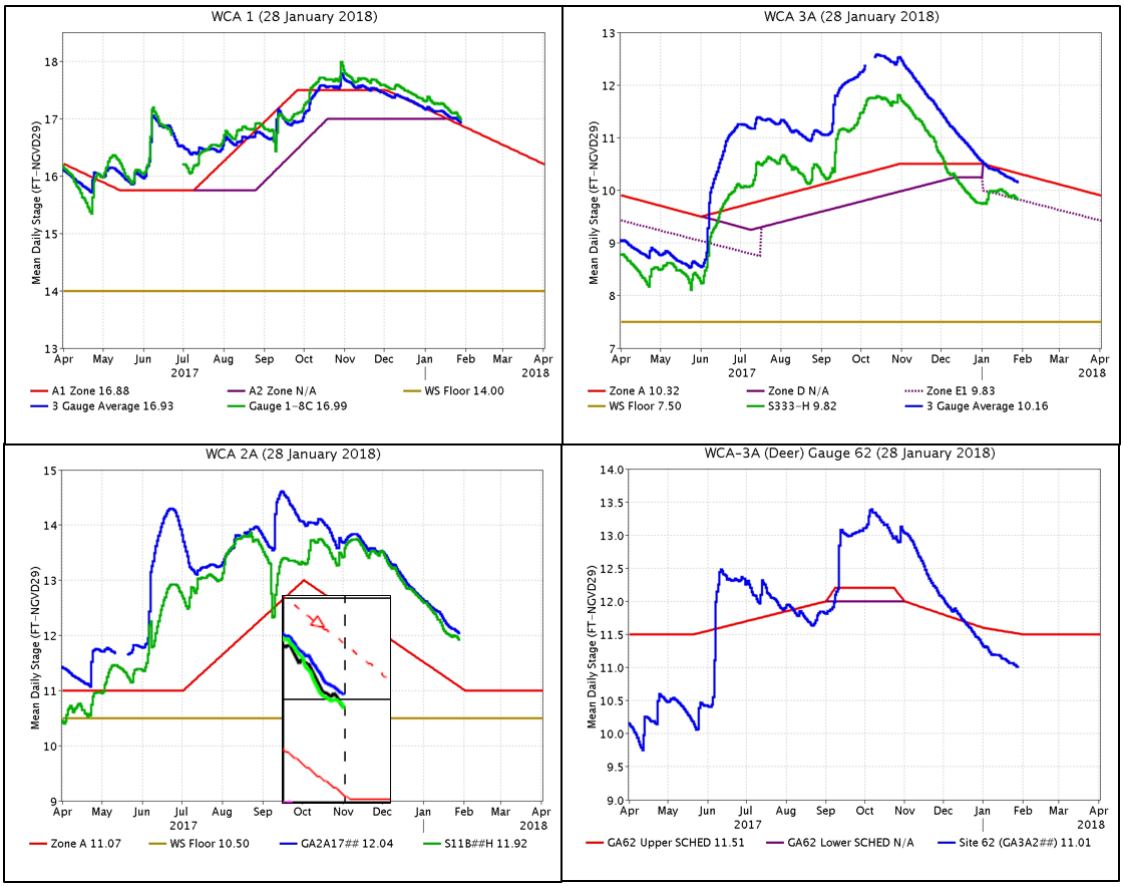
EVERGLADES

At the gauges monitored for this report, the water depth across the Everglades averaged a drop of 0.08 feet last week. Individual gauge changes in the WCAs ranged from −0.03 feet (WCA-2B) to −0.14 feet (Everglades National Park). Pan evaporation was estimated at 0.83 inches last week.

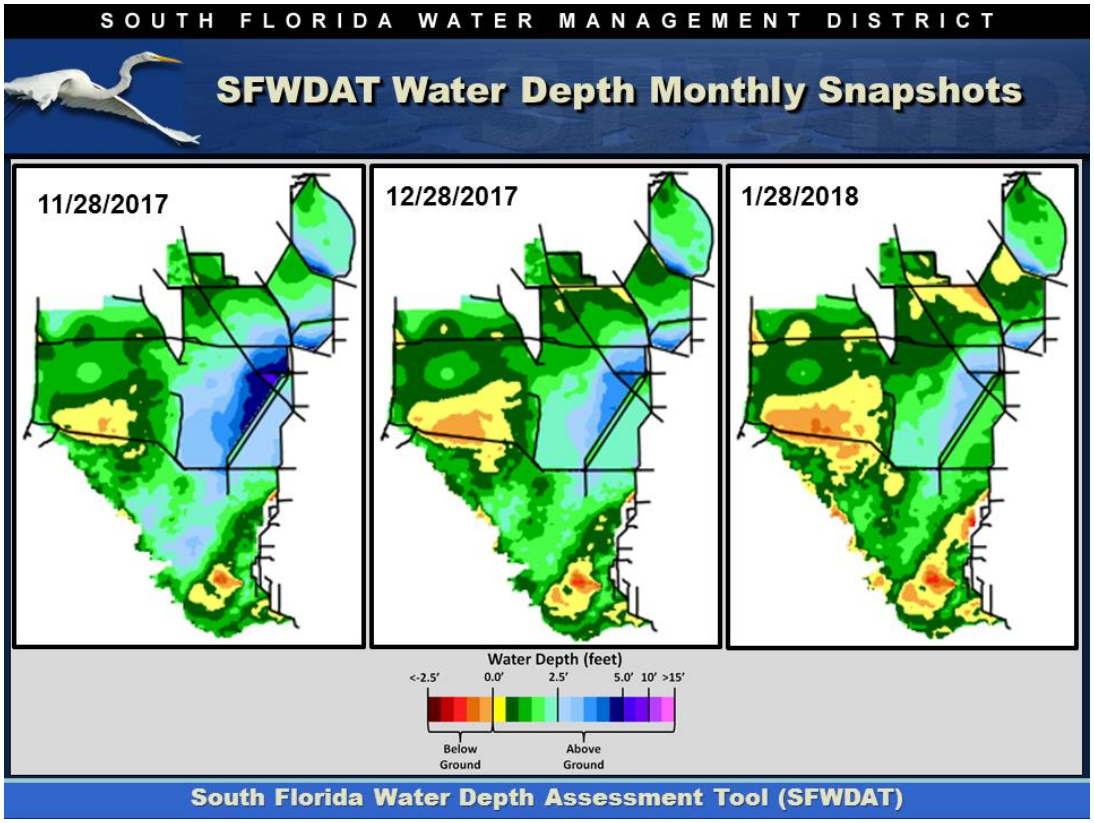
Everglades Region	Rainfall (Inches)	Stage Change (feet)
WCA-1	0.41	−0.08
WCA-2A	0.32	−0.11
WCA-2B	1.04	−0.03
WCA-3A	0.04	−0.08
WCA-3B	<0.01	−0.06
ENP	0.23	−0.14

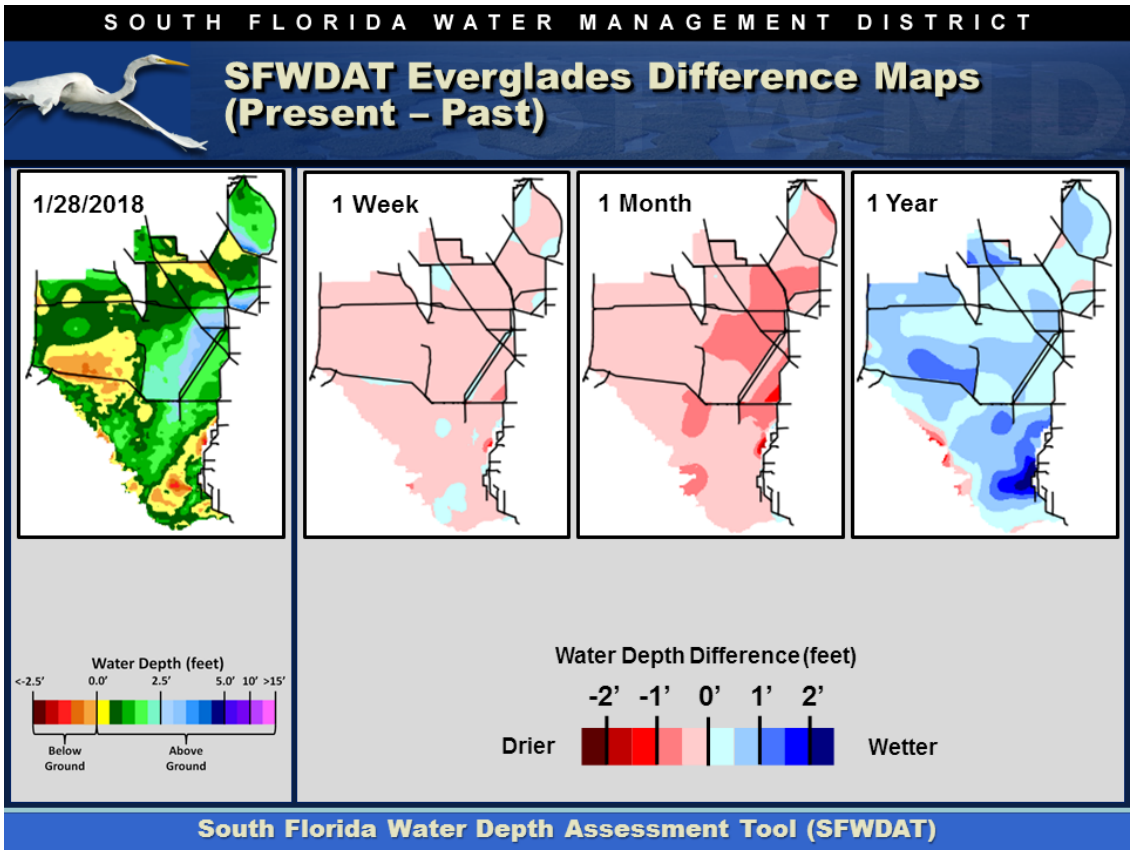


Regulation Schedules: WCA-1 three-gauge average stage continues trending along the top of the Zone A1 schedule, at 0.05 feet above. WCA-2A (subject to a temporary deviation – see inset) marsh stage at gauge GA2A17 remains 0.97 feet above Zone A1, below the temporary schedule, and falls away from the temporary schedule. WCA-3A three-gauge average stage is 0.16 feet below Zone A and falls away from the regulation line. WCA-3A stage at gauge 62 (Northwest corner) continues to fall away from the upper schedule at 0.50 feet below.



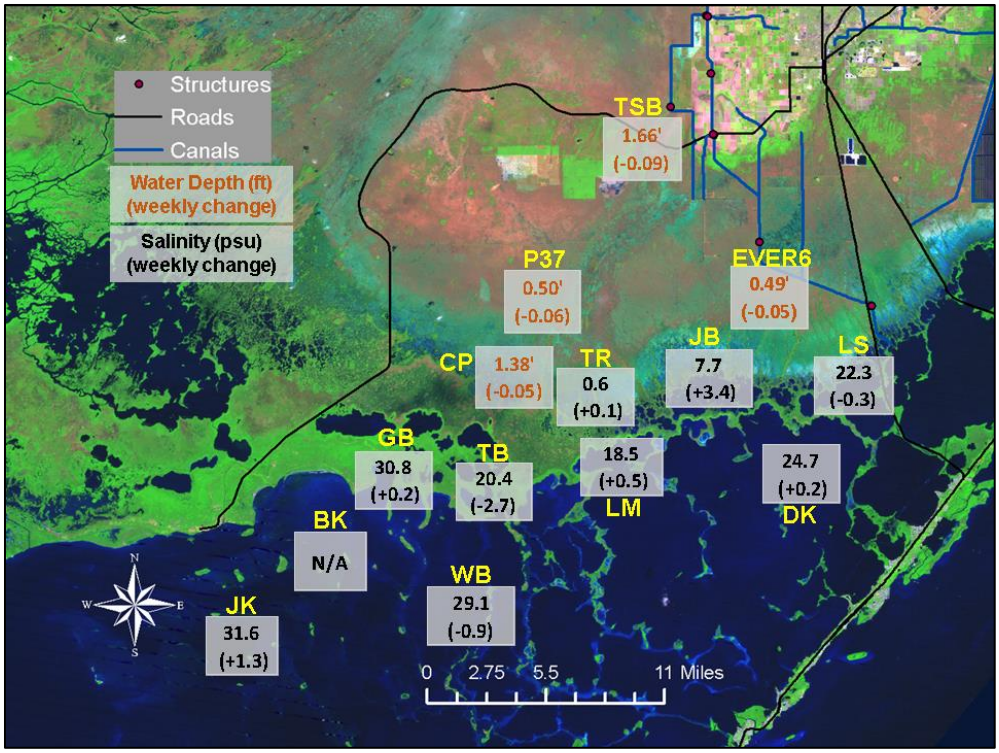
Water Depths and Changes: The WDAT tool for spatial interpolation of depth indicates a range from a low of −0.5 feet to 0.0 feet in the northeastern corner of WCA-3A, to a high of 3.5 feet to 4.0 feet in the southern regions of WCA-1 and WCA-2B. Comparing WDAT water levels from present, water depths over the last week fell across most of the Everglades, with the exceptions being the northwestern and southeastern regions of WCA-1 and northwestern WCA-3A. Looking back one month, depths in all of WCAs are lower (except extreme northeastern WCA-1), with a majority of WCA-3A and 2A being significantly lower, and the southeastern corner of WCA-3B showing greater than −1.0 feet difference.

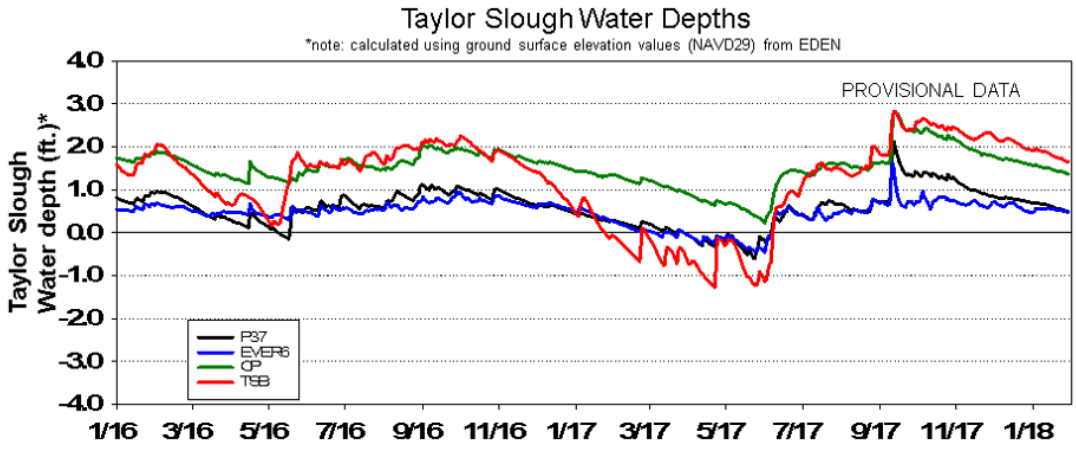


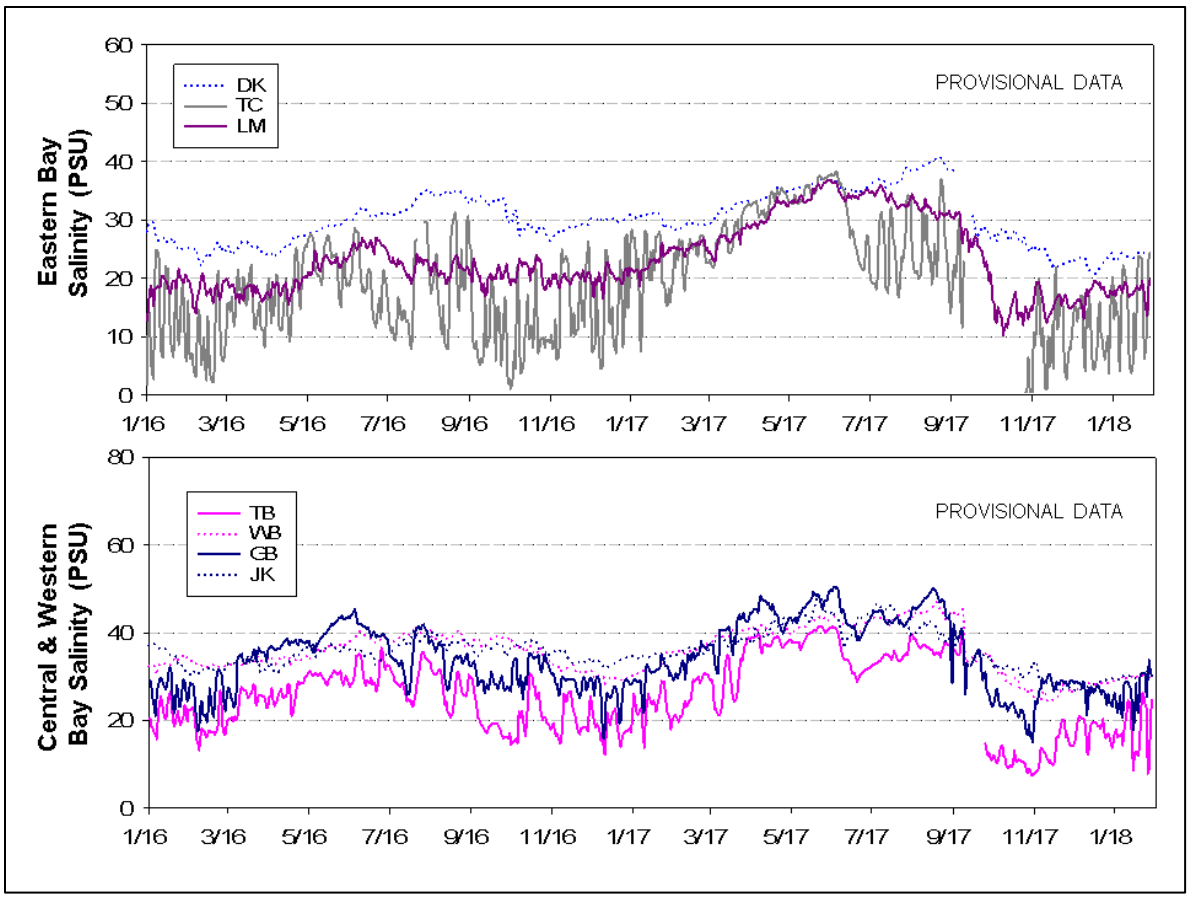


Taylor Slough stages: Water levels are decreasing in Taylor Slough with changes this past week ranging from −0.05 to −0.09 feet. Water levels are 2 to 16 inches above the historic average for this time of year with the largest divergence occurring in northern Taylor Slough.

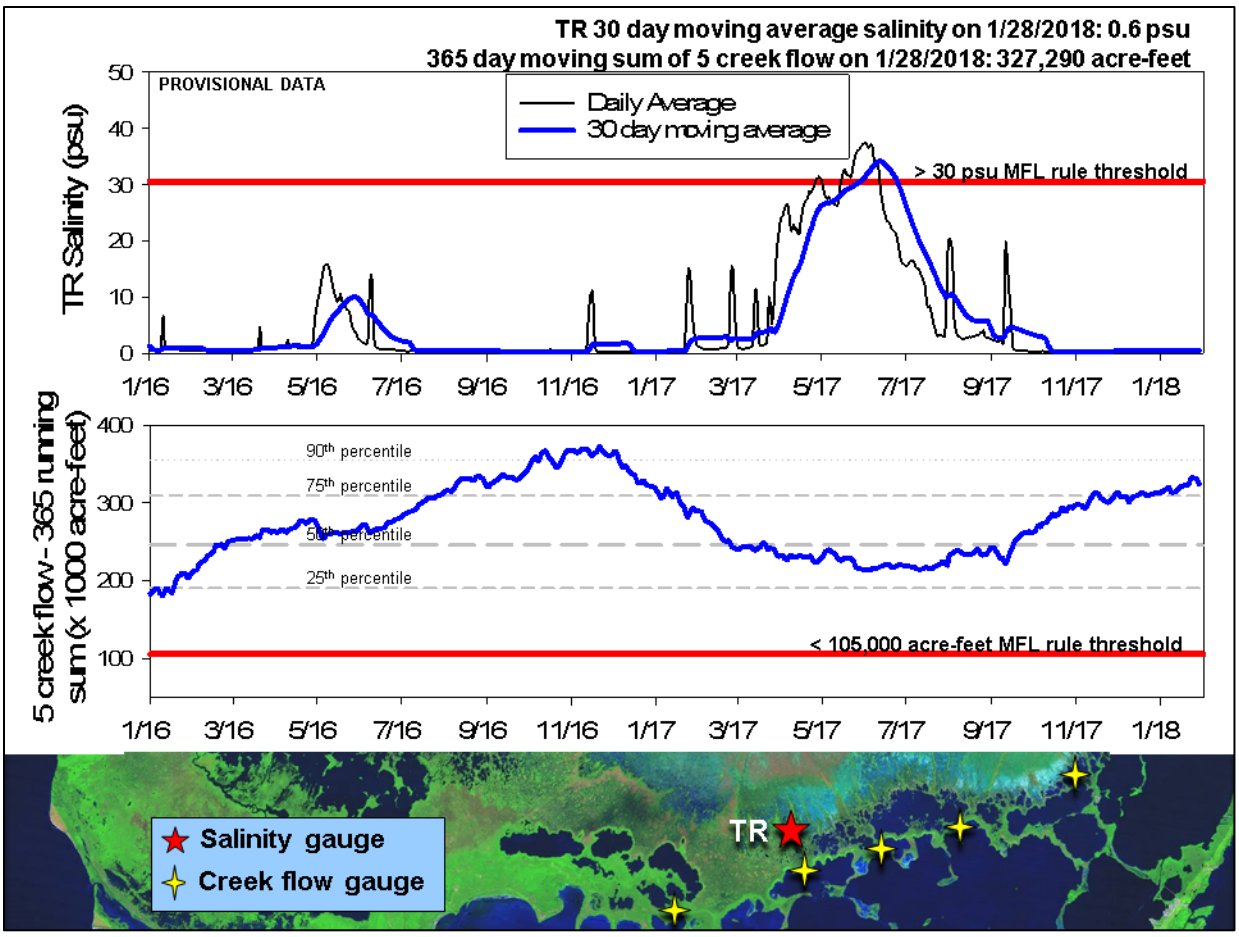
Florida Bay Salinities: Salinity changes over the last week ranged from −2.7 psu in the central nearshore region to +3.4 psu in the northeastern embayments. Current salinities range from 8 psu in the northeastern embayments to 32 psu in the western bay. Compared to historic averages, salinities range from 4 psu below to 4 psu above average.







Florida Bay MFL: Mangrove zone daily average salinity remains near fresh at 0.6 psu. The 30-day moving average is 0.6 psu. The weekly cumulative flow from the five creeks denoted by yellow stars on the map decreased by 1,000 acre-feet over the last week to end at 5,200 acre-feet. This is 3,400 acre-feet higher than the historical average for this time of year as flows are expected to decrease through the dry season. The 365-day moving sum of flow from the five creeks identified by yellow stars on the map increased about 4,000 acre-feet over the last week to end at 327,290 acre-feet (still greater than the long-term average of 257,628 acre-feet). Creek flow is provisional data from the USGS and is highly variable.



Water Management Recommendations

Deep water conditions persist in southern WCA-3A causing stress to tree islands, however the severity is lessening. Water managers should continue using all practicable means to lower water levels in southern WCA-3A until that region reaches appropriate depths for this time of year. In contrast, northeastern WCA-3A stages are receding quickly at 0.15 feet per week. Slowing these recession rates to the optimums for wading bird foraging, between −0.05 and −0.09 feet per week, would help to maintain that area for foraging as well as help maintain open water around the important Alley North colony. Keeping water within the Everglades system by routing to areas in need of water better serves the ecology of the Everglades.

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

Everglades Ecological Recommendations, January 30th, 2018 (red is new)

Area	Current Condition	Cause(s)	Recommendation	Reasons
WCA-1	Stages decreased −0.08'	Rainfall, ET, management	Maintain 0.07 and 0.1 ft/week recession rates.	Protect habitat and facilitate invasive plant treatments.
WCA-2A	Stages decreased −0.11'	Rainfall, ET, management	Maintain depths at temporary regulation schedule or slightly above. Maintain moderate recession rates.	Foster conditions for wildlife and optimal wading bird foraging. Protect nesting habitat.
WCA-2B	Stages decreased −0.03'	Rainfall, ET, management	Maintain depths at regulation schedule or slightly above.	Protect upstream/downstream habitat and wildlife. Foster conditions for wildlife and wading bird foraging
WCA-3A NE	Stages decreased −0.13'	Rainfall, ET, management	Slower recession rates would be beneficial.	Protect habitat and wildlife, foster conditions for optimal wildlife and wading bird foraging and protect nesting habitat.
WCA-3A NW	Stages decreased −0.07'	Rainfall, ET, management	Maintain recession rates and continue current flows.	
Central WCA-3A S	Stages decreased −0.08'	Rainfall, ET, management	Maintain recession rates as stages reach 2.5 feet. Manage for relief of high water conditions.	Water depths above 2.5 feet at gauge 65 are indicative that tree islands are flooded and under stress. Depths exceeded that mark on 18 June, meaning the tree islands have been flooded for **227** days. Reach optimal depths and recession rates for wildlife.
Southern WCA-3A S	Stages decreased −0.05'	Rainfall, ET, management		
WCA-3B	Stages decreased −0.06'	Rainfall, ET, management	Maintain depths at regulation schedule.	Protect habitat and wildlife from high water stress.
ENP-SRS	Stages decreased −0.14'	ET, rainfall, topography, management	Make discharges to the Park according to the 2012 WCP rainfall plan.	Keep peat wet to promote native habitat and maintain wetland plant and animal communities. Protect habitat and wildlife, including apple snail reproduction.
Taylor Slough	Stage changes ranged from −0.05' to −0.09'	Rain, ET, inflows	Move water southward as possible	When available, provide freshwater buffer for downstream conditions.
FB- Salinity	Salinity changes ranged −2.7 to +3.4 psu.	Rain, ET, inflows, wind	Move water southward as possible	When available, provide freshwater to main low salinity buffer and promote water movement.