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: April 24, 2018

SUBJECT: Weekly Environmental Conditions for Systems Operations

Summary

Weather Conditions and Forecast

A cold front associated with broad low pressure over the southeastern U.S. is forecast to arrive over the northwestern portion of the District by this afternoon. Locally heavy rains will break out late morning and afternoon south and east of the front, where moisture-rich air, an unstable atmosphere and diffluent winds aloft prevail. A deep layer of southwesterly to westerly flow also over the area ahead of the front should cause the heaviest rains to occur over the east-central portion of the District, particularly near the coast. Local maxima from this afternoon's rains could potentially top 3 to 4 inches in some cases. The rains should diminish over the northwestern half of the area by evening, but lingering moderate to possibly heavy rainfall could still occur over portions of the southeast into the early part of the night. After the front slides southward into the Florida Straits early Wednesday, drier conditions are expected across the District at least until Thursday afternoon. Around that time the front should return to a position over extreme south Florida or the Keys, and the lift along the front combined with plentiful moisture and diffluent winds aloft, should generally result in additional light to moderate rains over the southern half of the District; the bulk of the rains should fall from Thursday night until late Saturday. Although rain is possible over the northern half of the area during this time, the overall rain chances and rainfall totals should be much lower. For the southern third of the District, additional areal-average rainfall of 0.5 to 0.66 inches seems possible on top of the rains from early this week. The rains should generally end by Sunday except perhaps over the far south and Keys where some light rains may linger into Monday.

Kissimmee

Tuesday morning stages were 55.8 feet NGVD (0.7 feet below schedule) in East Lake Toho, 52.8 feet NGVD (0.7 feet below schedule) in Toho, and 49.4 feet NGVD (0.9 feet below schedule) in Kissimmee-Cypress-Hatchineha; headwater stages were 46.3 feet NGVD at S-65A and 25.9 feet NGVD at S-65D. Mean recession rates for the last seven days were 0.13 and 0.19 feet per week in East Lake Toho and Toho, respectively (preferred range of 0.15-0.2 feet per week) and 0.10 feet per week in Kissimmee-Cypress-Hatchineha (preferred rate is to not exceed 0.2 feet per week). Tuesday morning discharges were: 341 cfs at S-65, 240 cfs at S-65A, and 492 cfs at S-65E. Dissolved oxygen concentration in the Kissimmee River averaged 7.3 mg/L for the week. Kissimmee River mean floodplain depth on Sunday was 0.07 feet.

Lake Okeechobee

Lake Okeechobee stage is 13.24 feet NGVD having decreased 0.17 feet over the past week and 0.86 feet over the last month. Lake stages have receded approximately 2 feet over the past three months, a recession rate that is quickly drying available habitat around some wading bird colonies. However, fast recessions also hasten the return of light penetration to the sediments in the nearshore region for

important vegetation recovery and help avoid higher stages in the summer that are correlated with algal blooms on the Lake.

Estuaries

Total inflow to the St. Lucie Estuary averaged 196 cfs over the past week with no flow coming from Lake Okeechobee. Salinity remained about the same throughout the estuary. The seven-day average salinity at the US1 Bridge is in the fair range for adult eastern oysters. The highest weekly ranges of chlorophyll *a* were 4.95 – 13.26 µg/L in the South Fork. Total inflow to the Caloosahatchee Estuary averaged 855 cfs over the past week with 560 cfs coming from the Lake. Salinity slightly decreased throughout the estuary. The 30-day moving average surface salinity is 4.3 at Val I-75 and 12.6 at Ft. Myers. The 30-day moving average salinity at Val I-75 is forecast to be 4.9 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 eastern oysters at Cape Coral and at Shell Point. Chlorophyll *a* concentrations were relatively low to medium over the last week near Beautiful Island (5.31 – 18.46 µg/L), Ft. Myers (4.07 – 19.58 µg/L), and Shell Point (1.50 – 73.44 µg/L). Dissolved oxygen levels at Beautiful Island were 4.84 – 9.14 mg/L, at Ft. Myers were 3.60 – 8.11 mg/L, and at Shell Point were 4.17 – 9.59 mg/L. Although the Caloosahatchee Estuary does not need additional flows at this time, based on salinity at Val I-75, the continuation of the current releases does provide benefits to the estuary.

Stormwater Treatment Areas

Over the past week, the STAs/FEBs received approximately 9,200 acre-feet of Lake releases. The total amount of Lake releases sent to the STAs/FEBs in WY2018 (since May 1, 2017) is approximately 144,800 acre-feet. Most STA cells are at or above target depths, except many of the STA-5/6 EAV cells which are drying out. Operational restrictions are in place for vegetation rehabilitation in STA-1E, STA-2, and STA-3/4, and for construction related activities in STA-1W. The nests of Migratory Bird Treaty Act (MBTA) protected species have been observed in STA-1E, STA-2, and STA-5/6. This week, if Lake releases are sent to the WCAs, they will be sent to STA-1E Eastern Flow-way, STA-2 Flow-way 4 and the A-1 FEB/STA-3/4 Western Flow-way.

Everglades

Water management resulting in the recommended recession rates would generate the most pronounced ecological benefit for wildlife in Rotenberger Wildlife Management Area. Water management that prolongs conditions favorable for wading bird foraging in southern WCA-2A is ecologically beneficial. Wading bird foraging within the sloughs in the southern portions of WCA-2A is building and that area is predicted to be even more important for foraging in the upcoming weeks. Continued flows into northeast WCA-3A may be helping to prolong favorable foraging conditions near the Alley North Colony. Over drying in the northern portions of WCA-2A and WCA-3A puts these areas' peat soils at risk and increases the likelihood of damaging wild fires. Inflows to those areas continue to provide ecological benefit and there is little risk of a negative impact to wading bird foraging conditions. Water depths in Taylor Slough are within 2 inches of the historical averages. Salinities in Florida Bay stayed the same on average this past week and are within 3 psu of the historical average for this time of year. Mangrove zone daily average salinity decreased slightly while the 30-day moving average rose slightly.

Supporting Information

KISSIMMEE BASIN

Kissimmee Basin Rainfall

The Upper Kissimmee Basin received 0.30 inches of rainfall in the past week and the Lower Basin received 0.34 inches (SFWMD Daily Rainfall Report 4/23/2018).

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: 4/24/2018

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)						
							4/22/18	4/15/18	4/8/18	4/1/18	3/25/18	3/18/18	3/11/18
Lakes Hart and Mary Jane	S62	0	LKMJ	60.1	R	60.3	**-0.2**	-0.2	-0.3	-0.3	-0.4	-0.5	-0.4
Lakes Myrtle, Preston, and Joel	S57	0	S57	60.4	R	60.4	**0.0**	0.0	-0.2	-0.2	-0.2	-0.1	-0.1
Alligator Chain	S60	12	ALLI	63.1	R	63.0	**0.1**	0.0	-0.1	-0.2	-0.4	-0.5	-0.4
Lake Gentry	S63	38	LKGT	60.5	R	60.5	**0.0**	0.1	0.0	-0.1	-0.2	-0.3	-0.2
East Lake Toho	S59	61	TOHOE	55.9	R	56.6	**-0.7**	-0.8	-0.9	-1.1	-1.2	-1.2	-1.2
Lake Toho	S61	226	TOHOW, S61	52.9	R	53.6	**-0.7**	-0.7	-0.9	-1.1	-1.2	-1.2	-1.2
Lakes Kissimmee, Cypress, and Hatchineha	S65	392	KUB011, LKIS5B	49.4	R	50.3	**-0.9**	-1.0	-1.3	-1.4	-1.2	-1.2	-1.1

[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: 4/24/2018

Metric	Location	1-Day Average	Average for the Preceeding 7-Days[1]									
		4/22/2018	4/22/18	4/15/18	4/8/18	4/1/18	3/25/18	3/18/18	3/11/18	3/4/18	2/25/18	2/18/18
Discharge (cfs)	S-65	316	**392**	406	340	376	361	400	461	715	968	1,000
Discharge (cfs)	S-65A	244	**270**	313	257	246	245	258	319	539	764	796
Discharge (cfs)	S-65D[2]	244	**363**	384	301	324	329	343	430	730	1,047	1,018
Stage (feet NGVD)	S-65D[2]	25.79	**25.77**	25.86	25.77	25.86	25.80	25.66	25.73	25.67	25.79	25.87
Discharge (cfs)	S-65E[2]	244	**317**	355	297	325	348	317	441	733	1,088	1,059
Discharge (cfs)	S-67	0	**0**	1	0	0	0	0	0	0	133	389
DO (mg/L)[3]	Phase I river channel	7.9	**7.3**	6.1	6.8	7.5	8.2	8.3	7.0	5.9	6.0	6.2
Mean depth (feet)[4]	Phase I floodplain	0.06	**0.07**	0.07	0.06	0.07	0.09	0.07	0.09	0.14	0.19	0.22

[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)

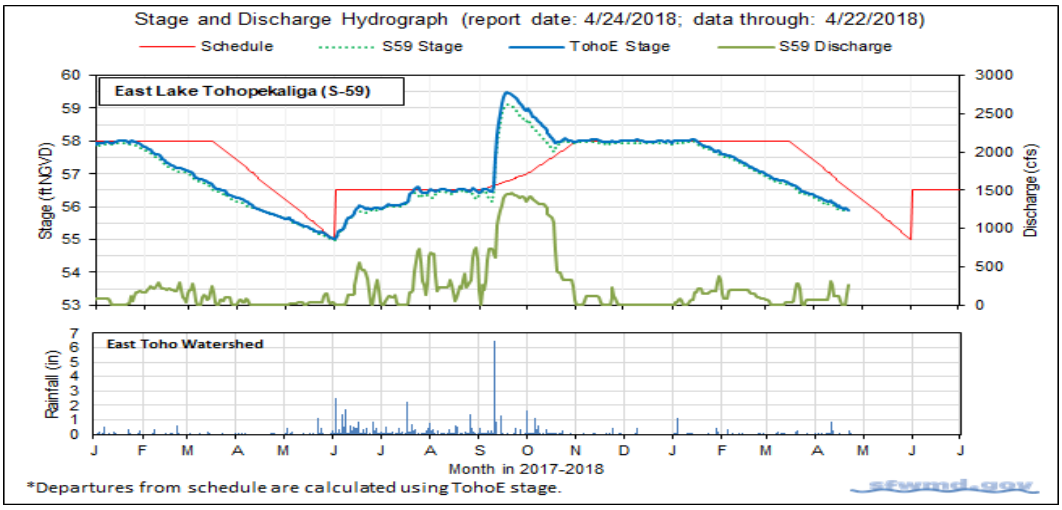


Figure 1.

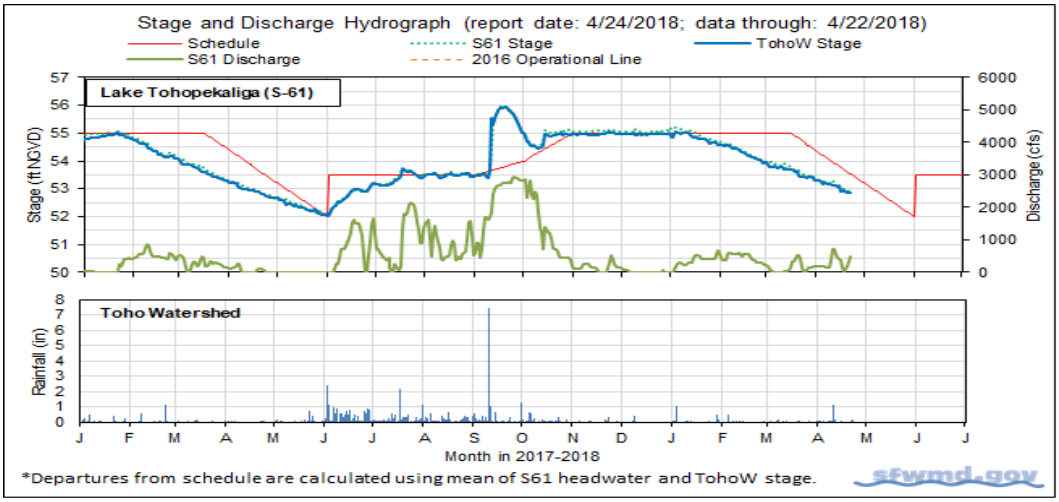


Figure 2.

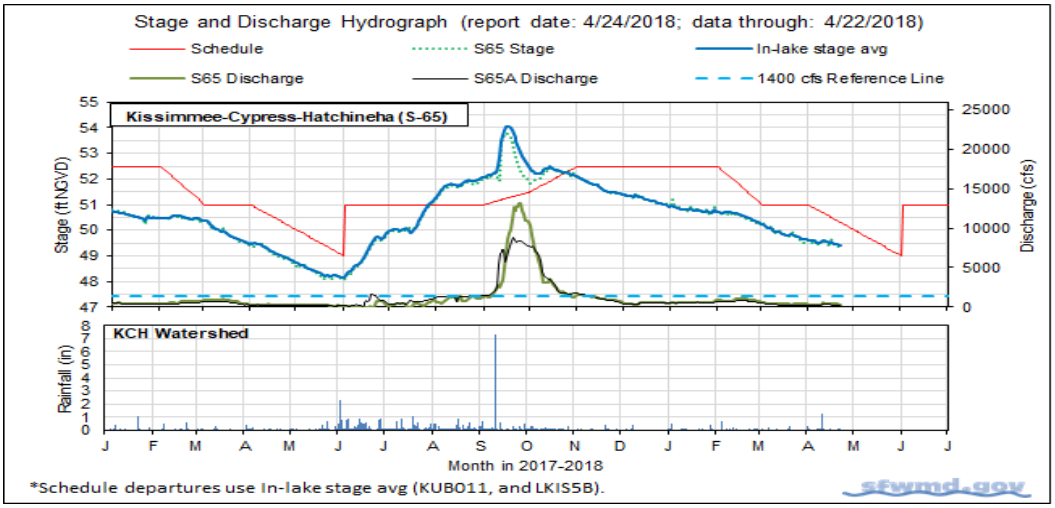


Figure 3.

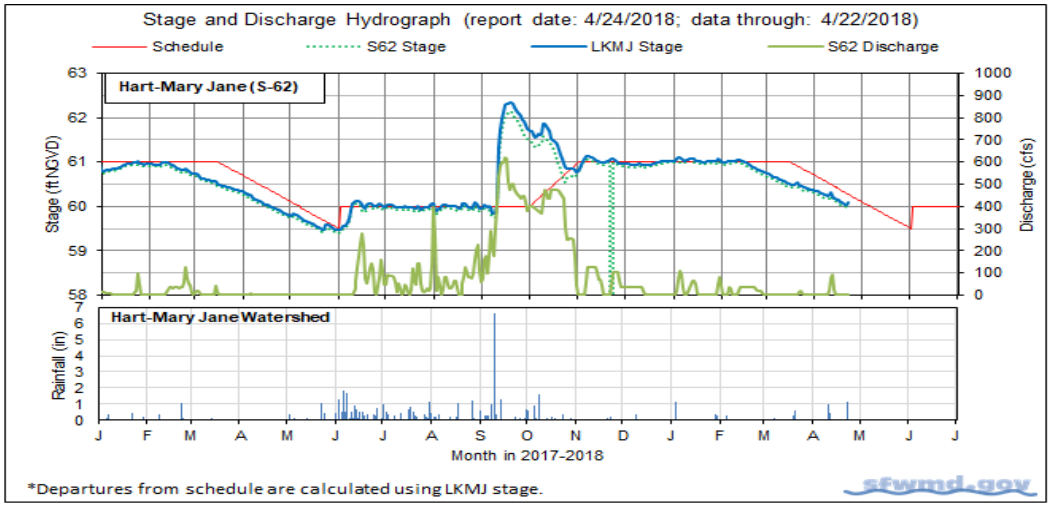


Figure 4.

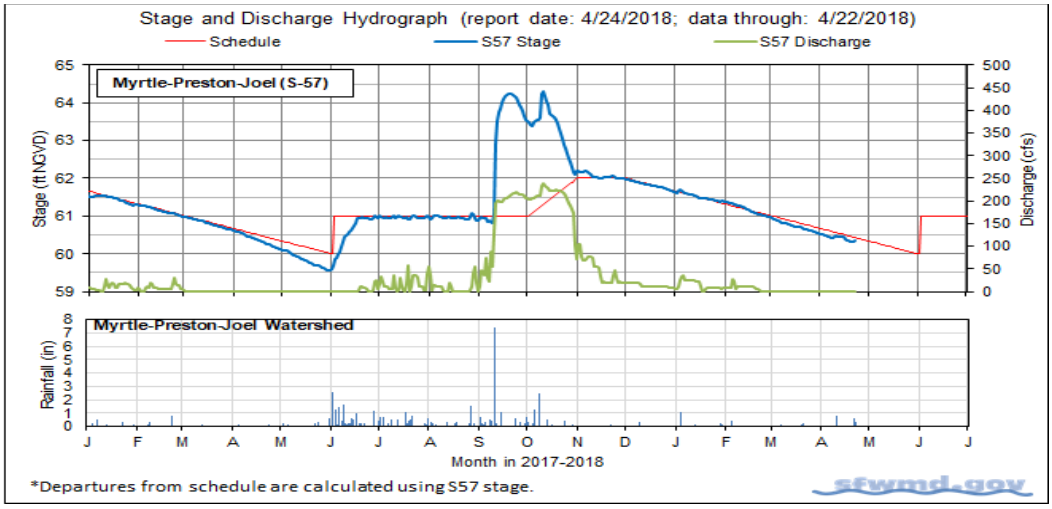


Figure 5.

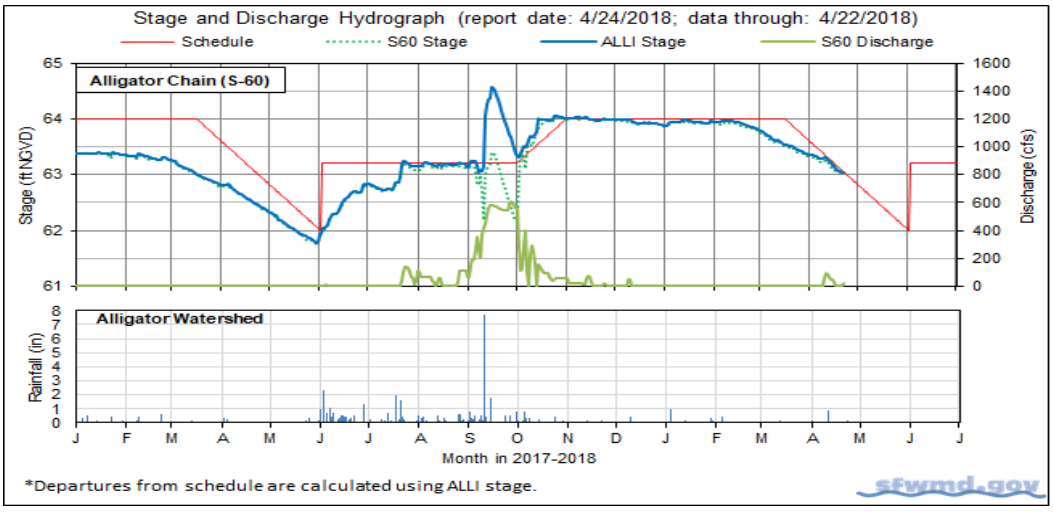


Figure 6.

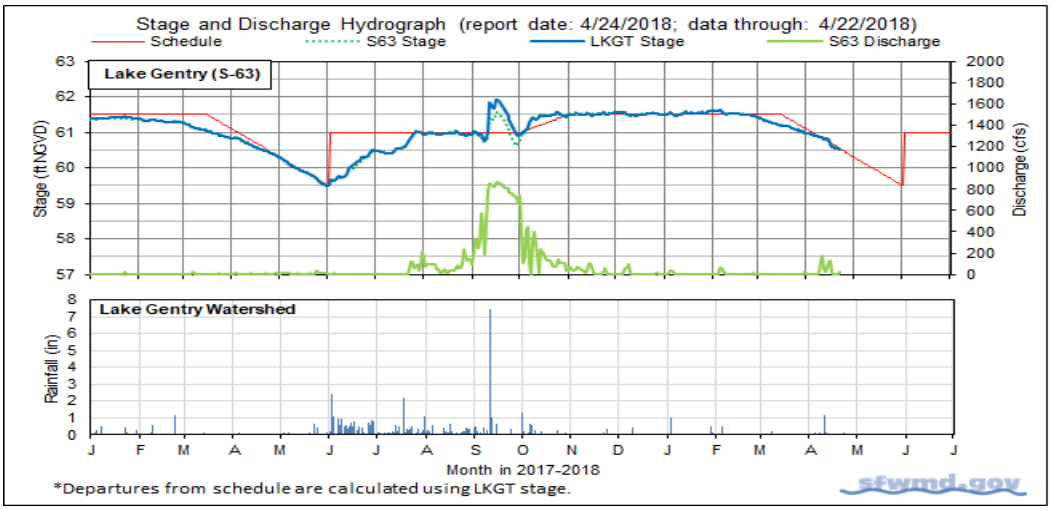


Figure 7.

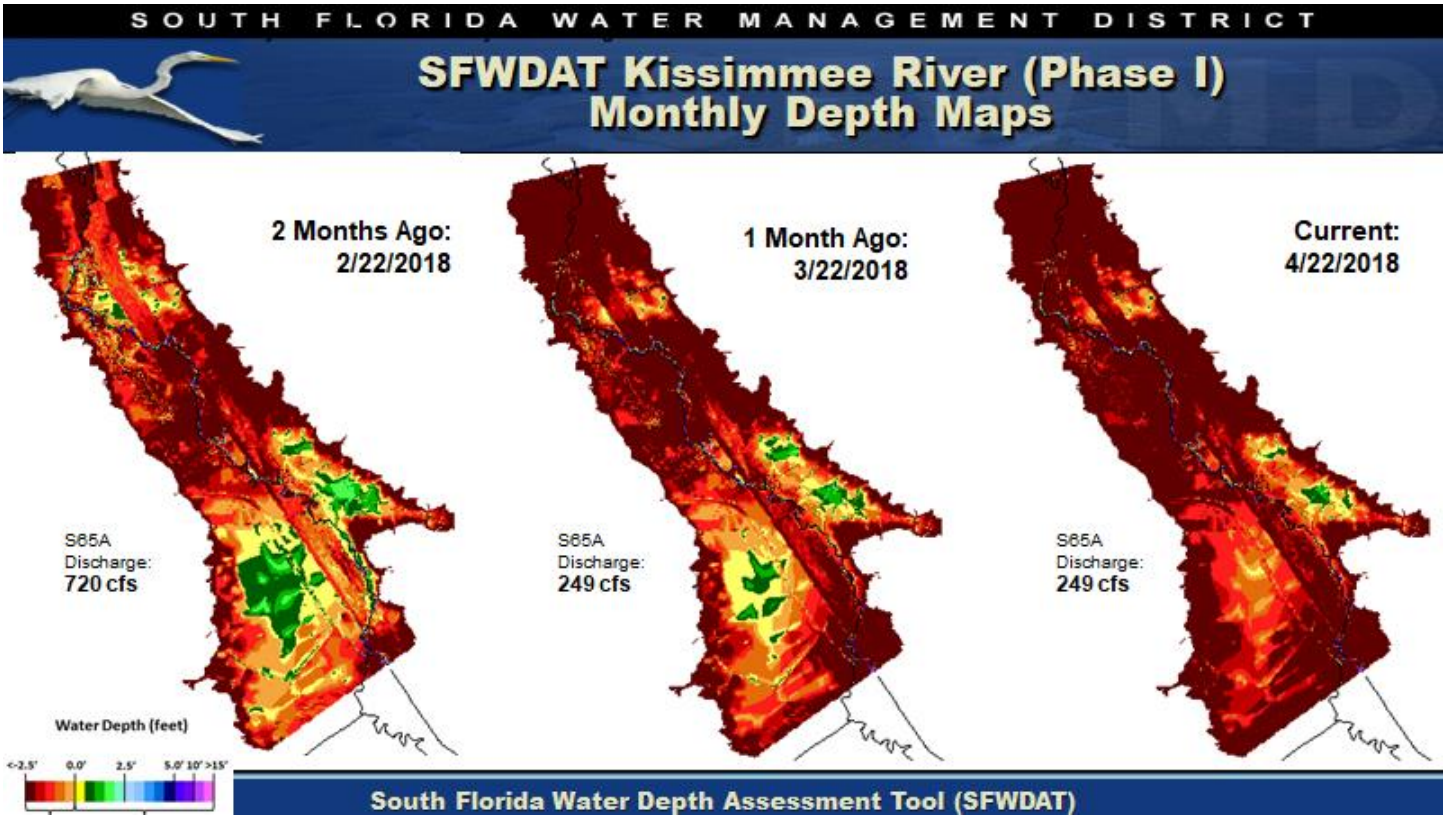


Figure 8. Phase I area floodplain water depths for this week, one month ago, and two months ago. Note that the WDAT color-coding has been modified to accommodate greater water depths; these maps are not directly comparable to Kissimmee Basin WDAT maps published prior to January 16, 2012.

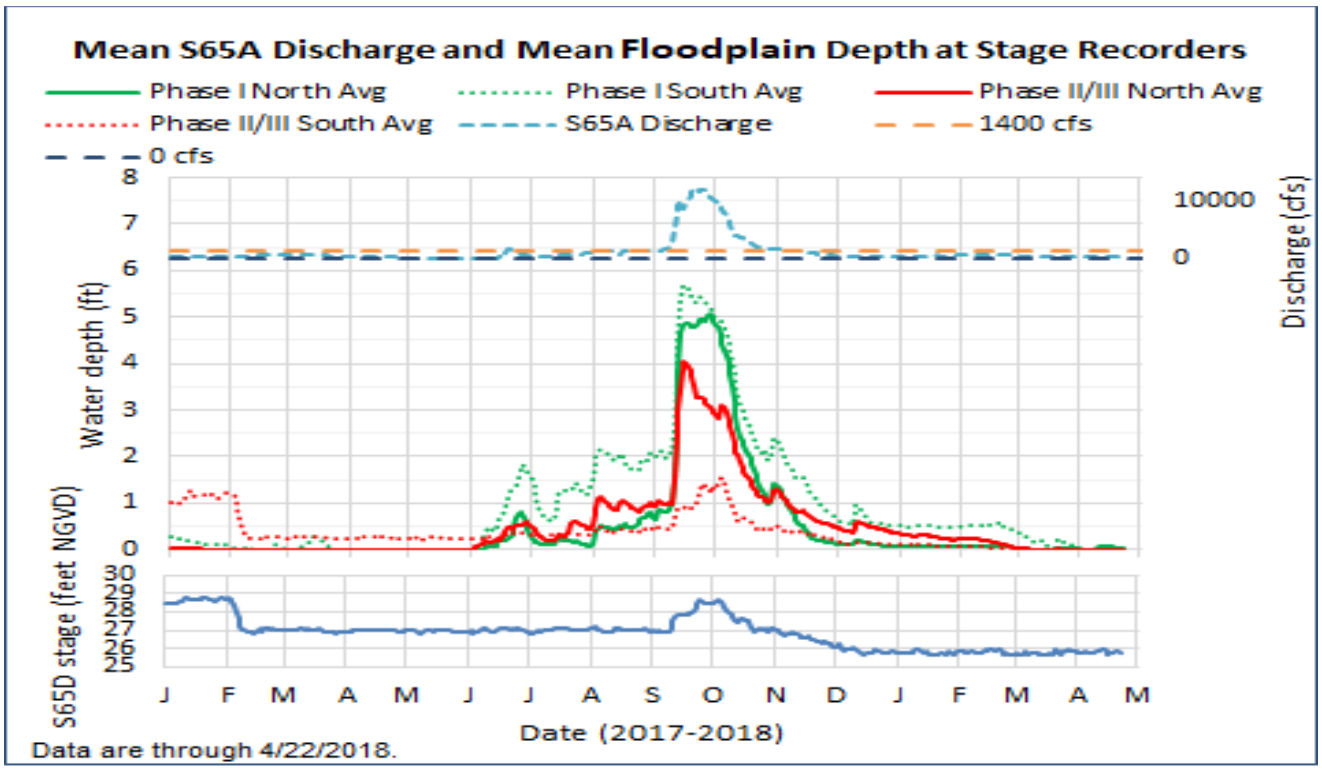


Figure 9. Mean water depth at stage recorders in the northern Phase I, southern Phase I, northern Phase II/III, and southern Phase II/III areas in relation to the S-65A discharge and S-65D headwater stage.

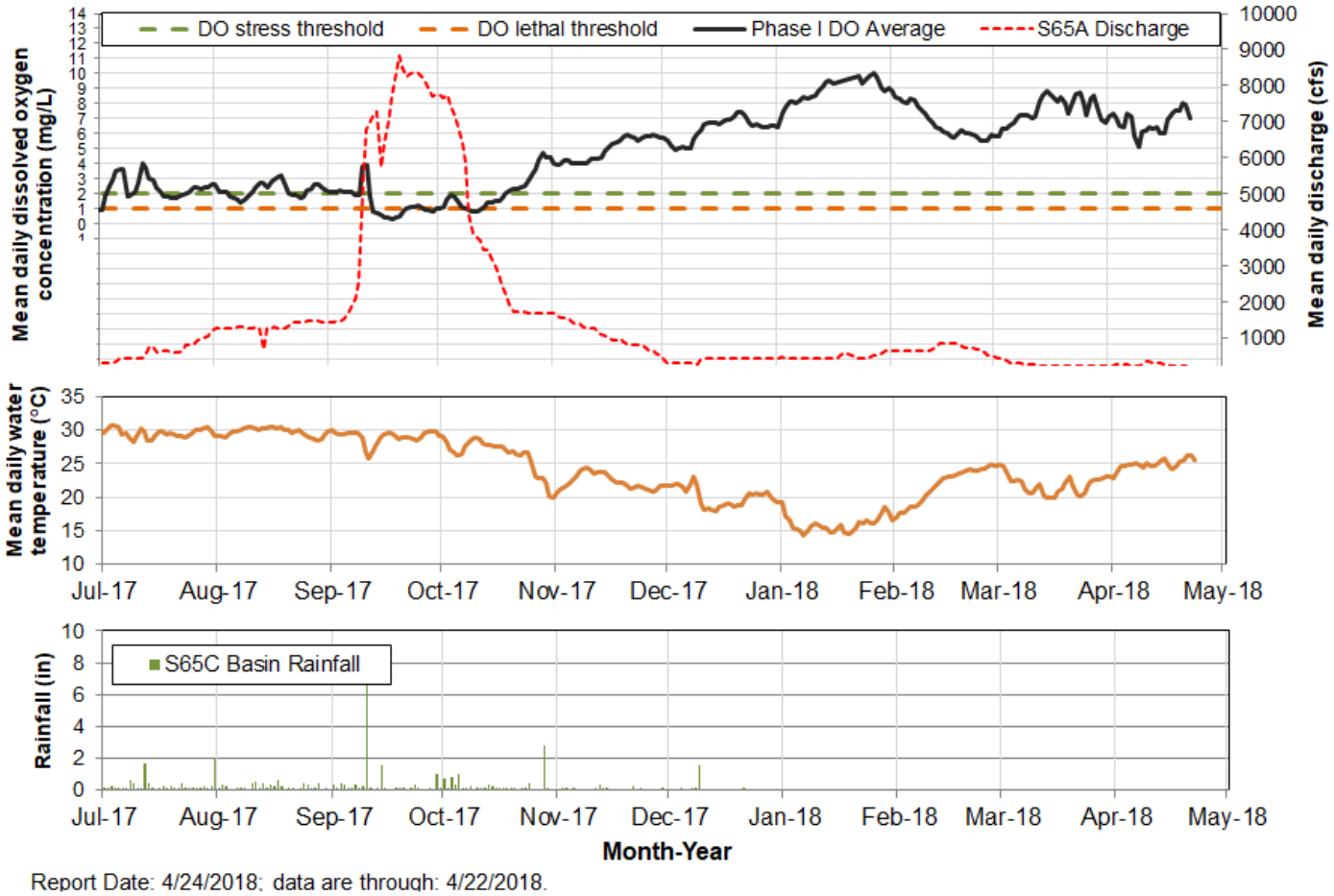


Figure 10. Mean daily dissolved oxygen, discharge, temperature and rainfall in the Phase I river channel.

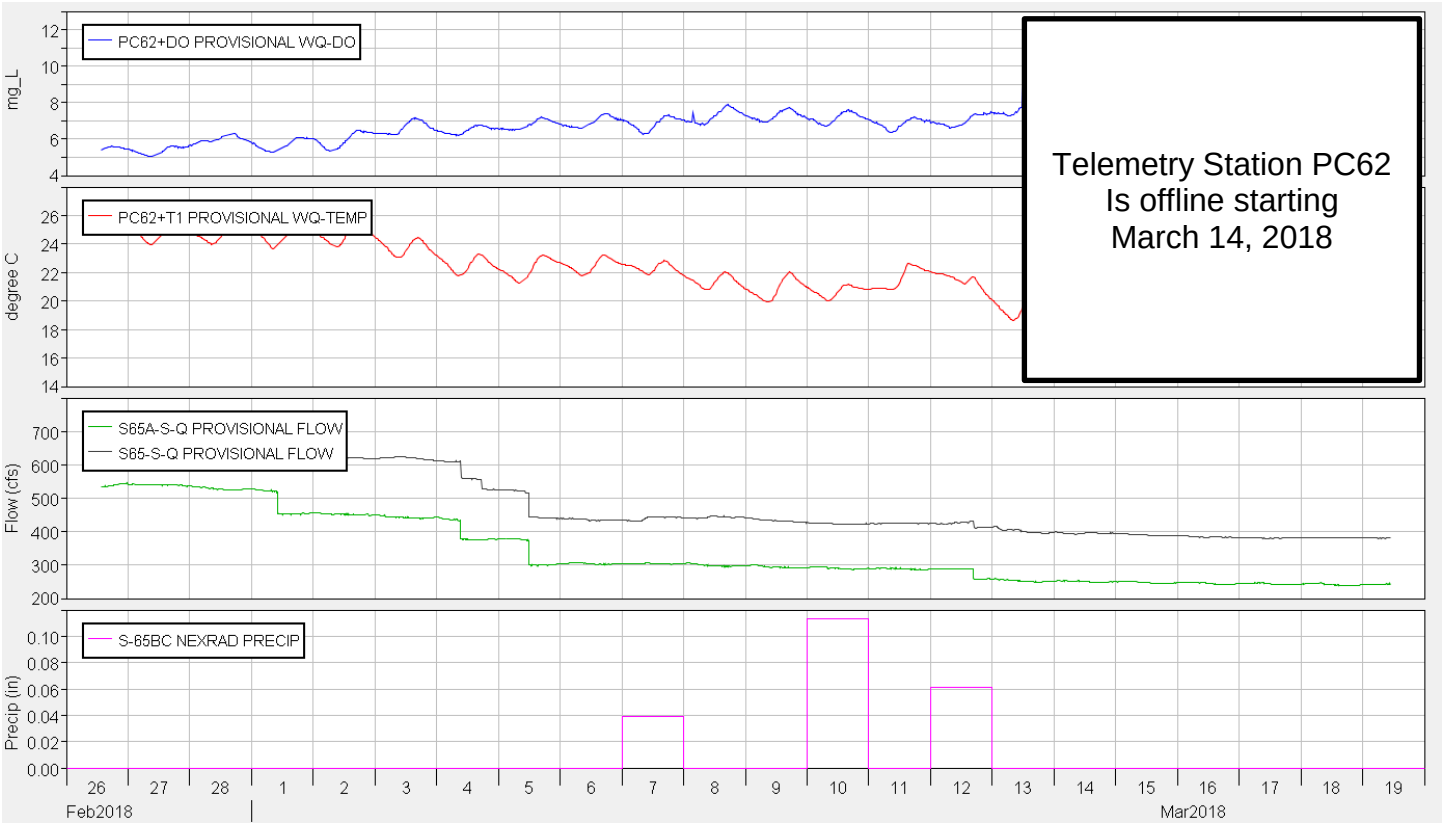


Figure 11. Phase I river channel dissolved oxygen and water temperature (measured at 15-minute intervals) and Pool BC daily rainfall.

Water Management Recommendations

Kissimmee Basin Adaptive Recommendations and Operational Actions

Date	Recommendation	Purpose	Outcome	Source
4/24/2018	No new recommendations.		N/A	
4/17/2018	No new recommendations.		N/A	
4/10/2018	No new recommendations.		N/A	
4/3/2018	No new recommendations.		N/A	
3/27/2018	No new recommendations.		N/A	
3/20/2018	No new recommendations.		N/A	
3/13/2018	No new recommendations.		N/A	
3/6/2018	No new recommendations.		N/A	
2/27/2018	No new recommendations.		N/A	
2/20/2018	No new recommendations.		N/A	
2/13/2018	No new recommendations.		N/A	
2/6/2018	No new recommendations.		N/A	
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	

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 S-65/S-65A starting with the 2016-2017 Dry Season.

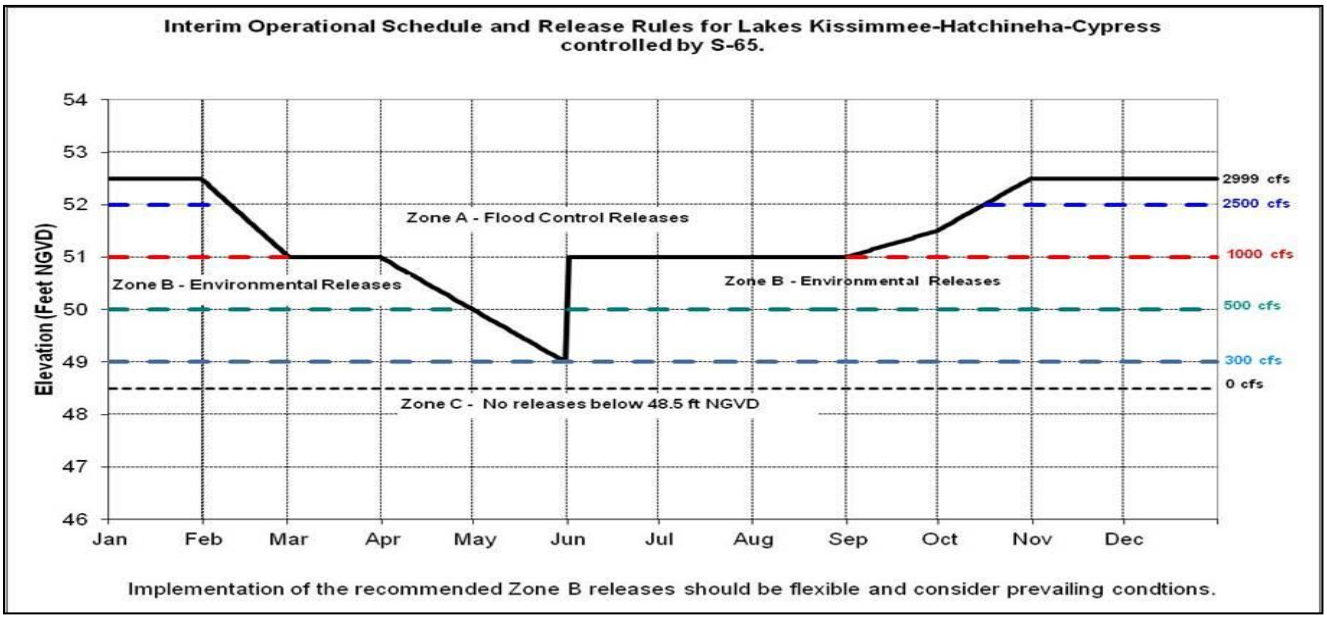


Figure 13. Interim operations schedule for S-65. The discharge schedule shown to the right has not been used in recent years.

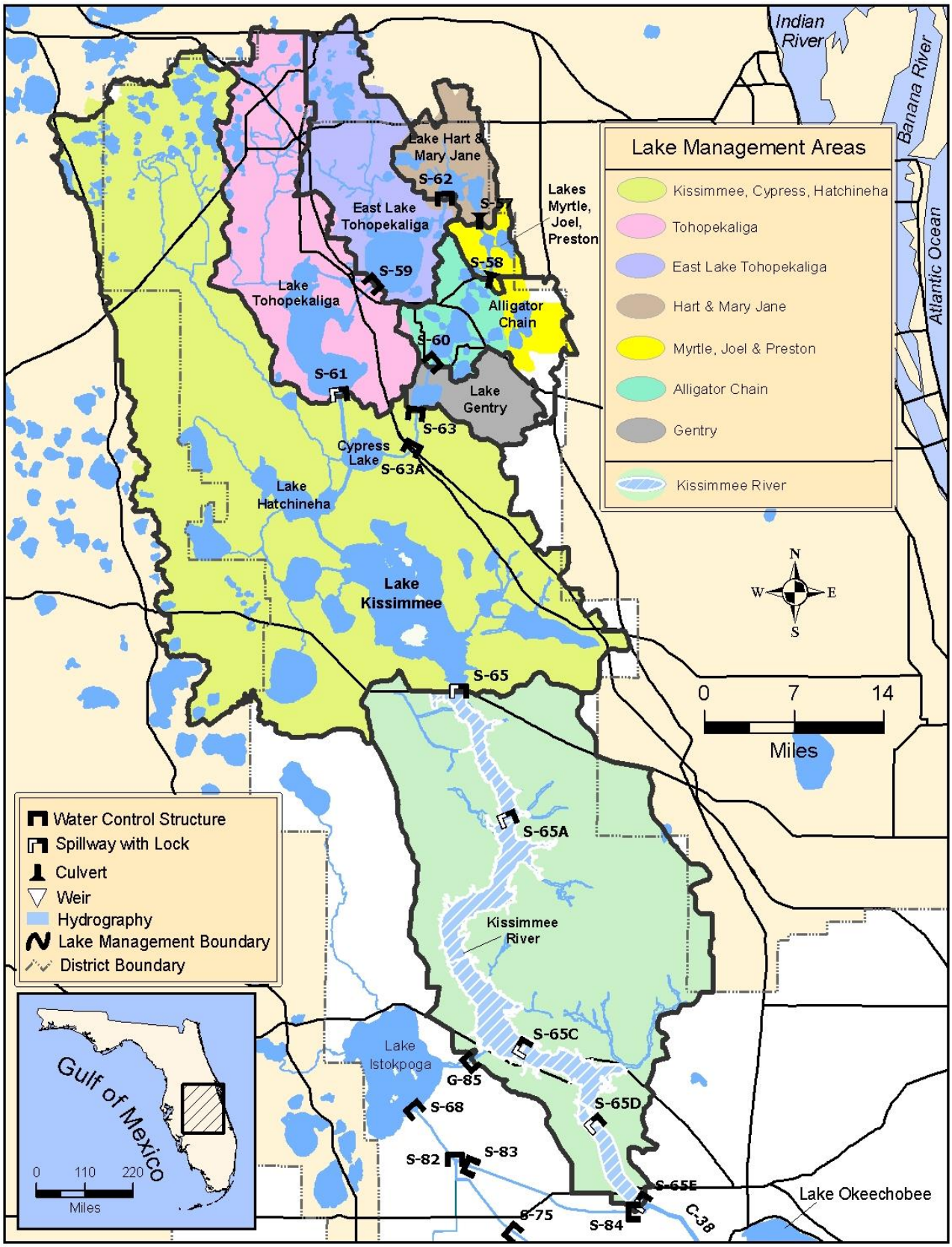


Figure 14. The Kissimmee Basin.

LAKE OKEECHOBEE

According to the USACE web site, Lake Okeechobee stage is at 13.24 feet NGVD for the period ending at midnight on April 23, 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). The Lake is now 0.86 feet lower than it was a month ago, nearly 4 feet lower than its peak in mid-October 2017, and 1.46 feet higher than a year ago (Figure 1). The Lake is now in the Base Flow sub-band (Figure 2). According to RAINDAR, 0.96 inches of rain fell over the Lake during the week April 17, 2018 – April 23, 2018 with most of the upper watershed receiving similar rainfall, but areas on the northern shore receiving between 1.0 – 2.0 inches (Figure 3).

Average daily inflows to the Lake were slightly higher than previous week at 524 cfs vs 485 cfs. Kissimmee River discharges through the S-65E structures were 313 cfs this past week, compared to 296 cfs the previous week. The S-71, S-72, and S-84 structures contributed a combined 174 cfs, while Fisheating Creek contributed an average daily 7 cfs.

Average daily outflows for the Lake increased slightly from the previous week, primarily through increases in flows through S-77 and south through the S-350 structures. Discharges went from 2,289 cfs the previous week to 2,823 cfs this past week. Discharges through S-77 increased slightly from 974 cfs the previous week to 1,163 cfs this past week, while discharges through S-308 decreased from 217 cfs to 184 cfs. Discharges south through the S-350 structures increased slightly, from an average of 874 cfs the previous week to 1,323 cfs this past week. Discharges to the L-8 canal via Culvert 10A declined again from the previous week, from 223 average daily cfs to 152 cfs. The corrected average daily evapotranspiration value for the week based on the L006 weather platform solar radiation data increased slightly to 0.19 inches.

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.

Based on the Lake Okeechobee wading bird habitat suitability index, there was a decrease of approximately 3,000 acres in habitat with suitable foraging depths for long-legged wading birds from the previous week, with 29,873 acres of suitable depth on April 23, 2018. There was also a loss of roughly 1,800 acres of suitable foraging depths for short or long-legged wading birds, going from 16,110 acres the previous week to 14,319 acres this past week as foraging habitats continue to dry out (Figure 5).

Water clarity, as measured by turbidity (ntu), declined substantially for the third straight month after reaching a near record high in January 2018 following Hurricane Irma's resuspension of mud sediments and strong winds during cold fronts in the beginning of 2018 (Figure 6). The average turbidity from pelagic stations went from a high of 185 ntu to 44 ntu in mid-April, reaching levels similar to March and April of 2017. The average of nearshore stations, while peaking at roughly 75 ntu in January and February of 2018, followed a similar pattern of decline and is now 27 ntu, also similar to April of 2017.

The most recent satellite imagery using the cyanobacteria monitoring product derived from NOAA's OLCI satellite sensor showed cyanobacteria bloom potential remains low, although some pixels are beginning to show moderate values along the west/northwestern shorelines (Figure 7). Last summer, the potential for elevated cyanobacterial levels increased in early July, when winds subsided and turbidity values plummeted.

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

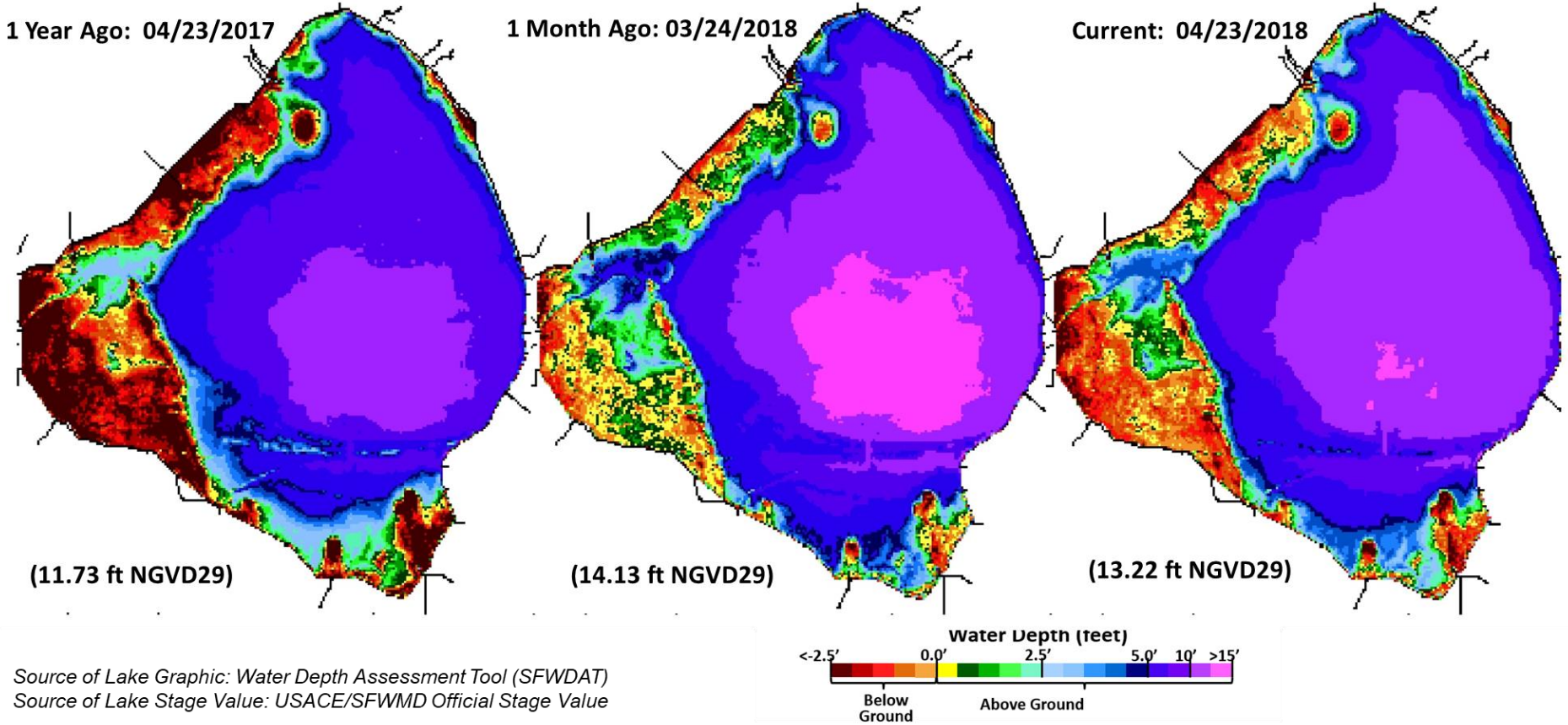
INFLOWS	Avg Daily Flow cfs	Equivalent Depth Week Total (in)
S65E & S65EX1	313	0.1
S71 & 72	109	0.0
S84 & 84X	65	0.0
Fisheating Creek	7	0.0
S154	0	0.0
S191	0	0.0
S133 P	0	0.0
S127 P	0	0.0
S129 P	0	0.0
S131 P	0	0.0
S135 P	0	0.0
S2 P	23	0.0
S3 P	0	0.0
S4 P	7	0.0
C5	0	0.0
Rainfall	2648	1.0
Total	**3172**	**1.2**

OUTFLOWS	Avg Daily Flow cfs	Equivalent Depth Week Total (in)
S77	1163	0.5
S308	184	0.1
S351	285	0.1
S352	290	0.1
S354	748	0.3
L8	152	0.1
ET	3665	1.6
Total	**6488**	**2.8**

PROVISIONAL DATA

Water Management Recommendations

Lake Okeechobee stage is 13.24 feet NGVD having decreased 0.17 feet over the past week and 0.86 feet over the last month. Lake stages have receded approximately 2 feet over the past three months, a recession rate that is quickly drying available habitat around some wading bird colonies. However, fast recessions also hasten the return of light penetration to the sediments in the nearshore region for important vegetation recovery and help avoid higher stages in the summer that are correlated with algal blooms on the Lake. Long steady recessions of water levels throughout the dry season may help promote another productive year for wading birds on the Lake as well.



Source of Lake Graphic: Water Depth Assessment Tool (SFWDAT)
Source of Lake Stage Value: USACE/SFWMD Official Stage Value

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

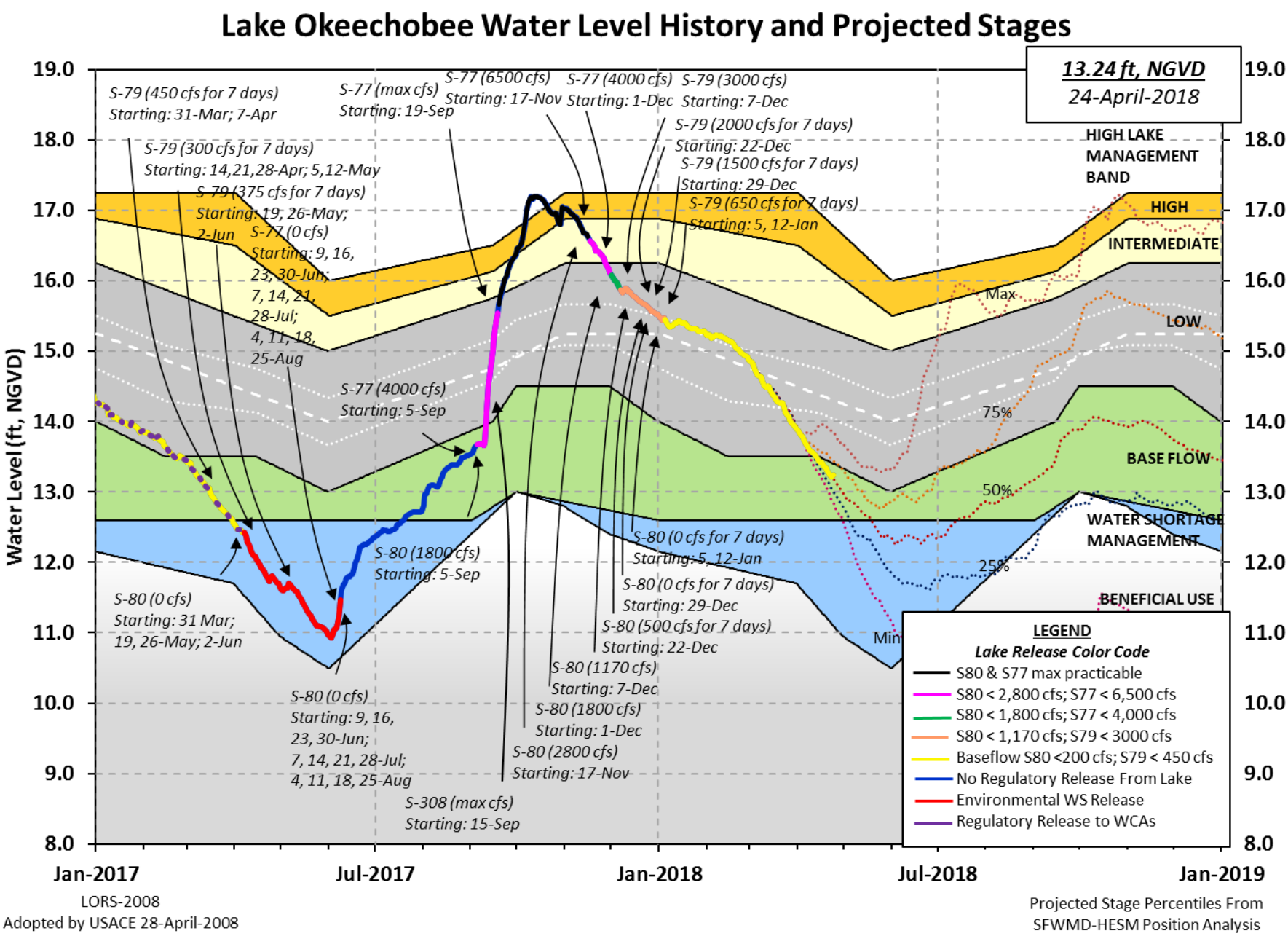


Figure 2. Recent Lake Okeechobee stage and releases, with projected stages based on a dynamic position analysis.

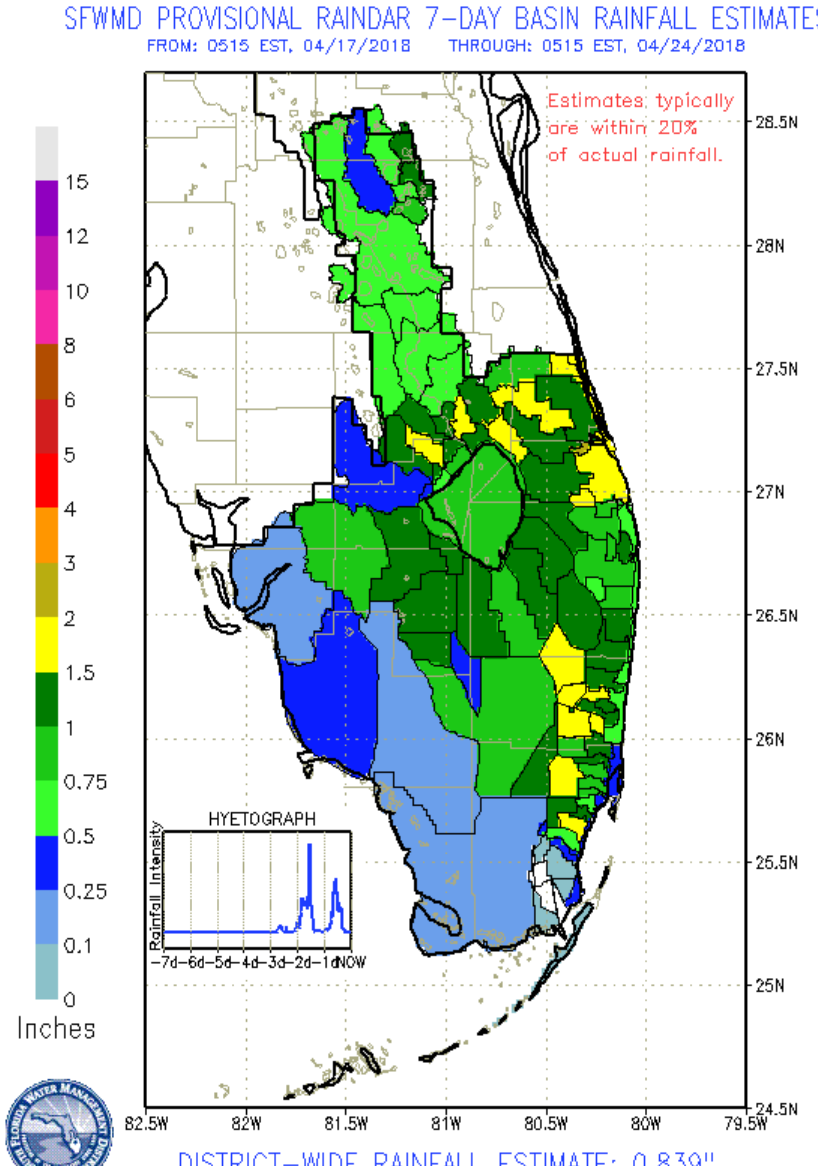


Figure 3. Rainfall estimates by basin.

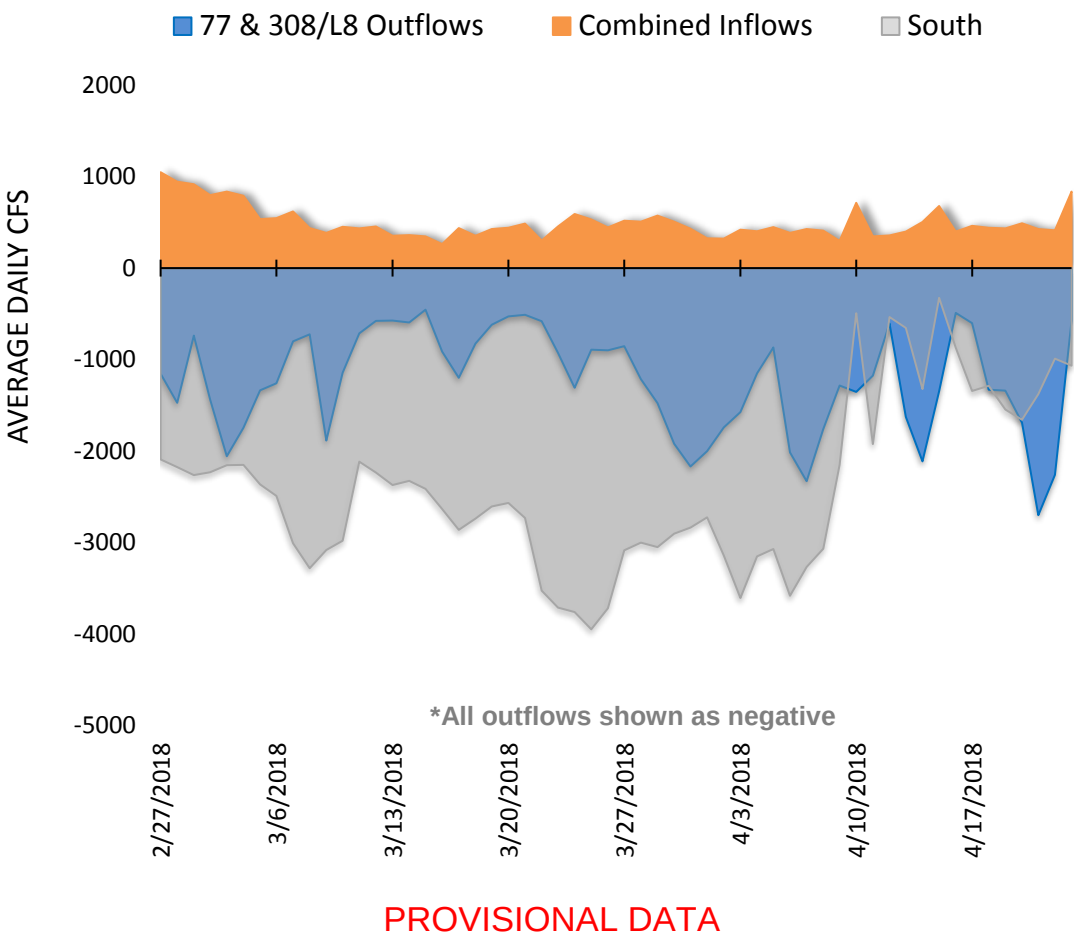
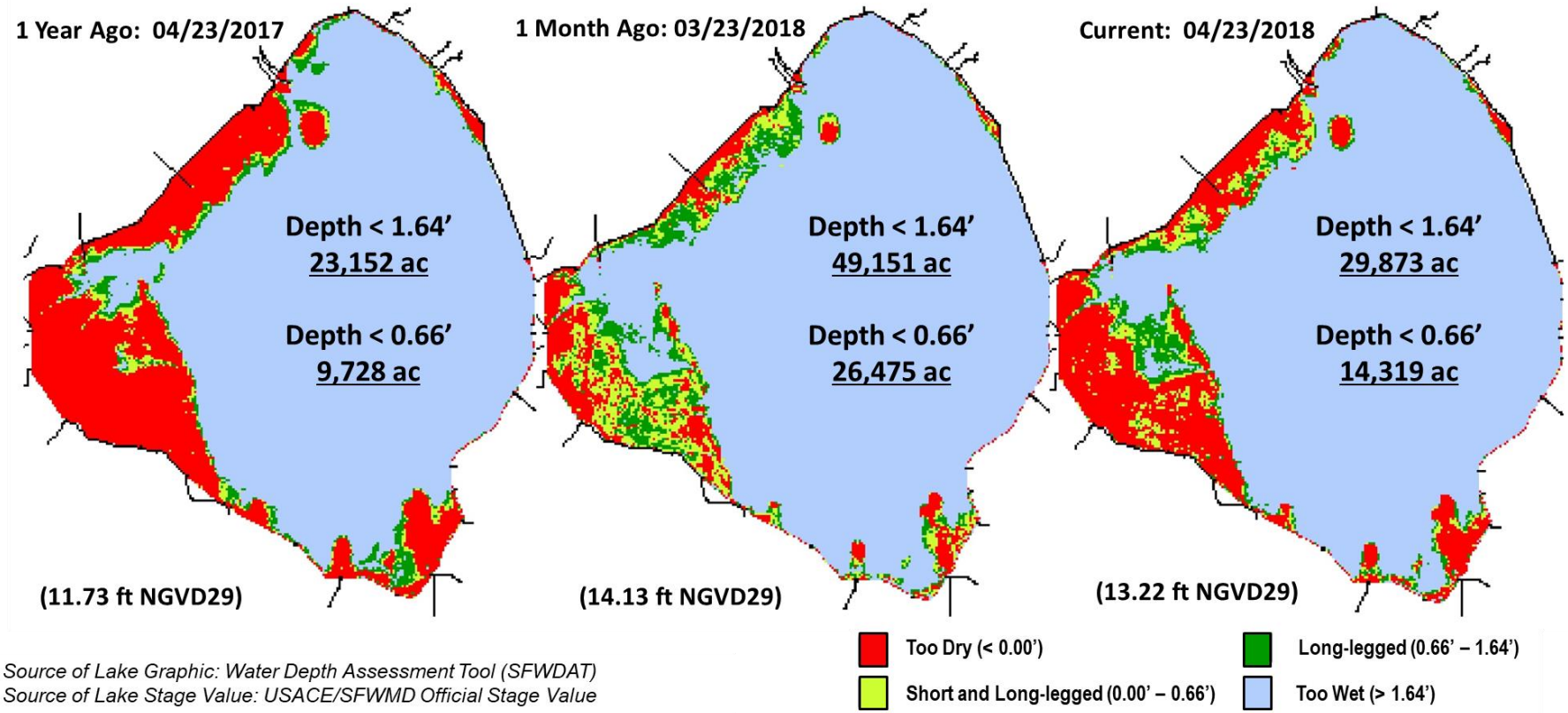


Figure 4. Major inflows and outflows of Lake Okeechobee, including the S350 structures designated as South. Inflows and outflows are shown as positive and negative, respectively, for visual purposes.



Source of Lake Graphic: Water Depth Assessment Tool (SFWDAT)
Source of Lake Stage Value: USACE/SFWMD Official Stage Value

Figure 5. Wading bird habitat suitability index for Lake Okeechobee based on the South Florida Water Depth Assessment Tool.

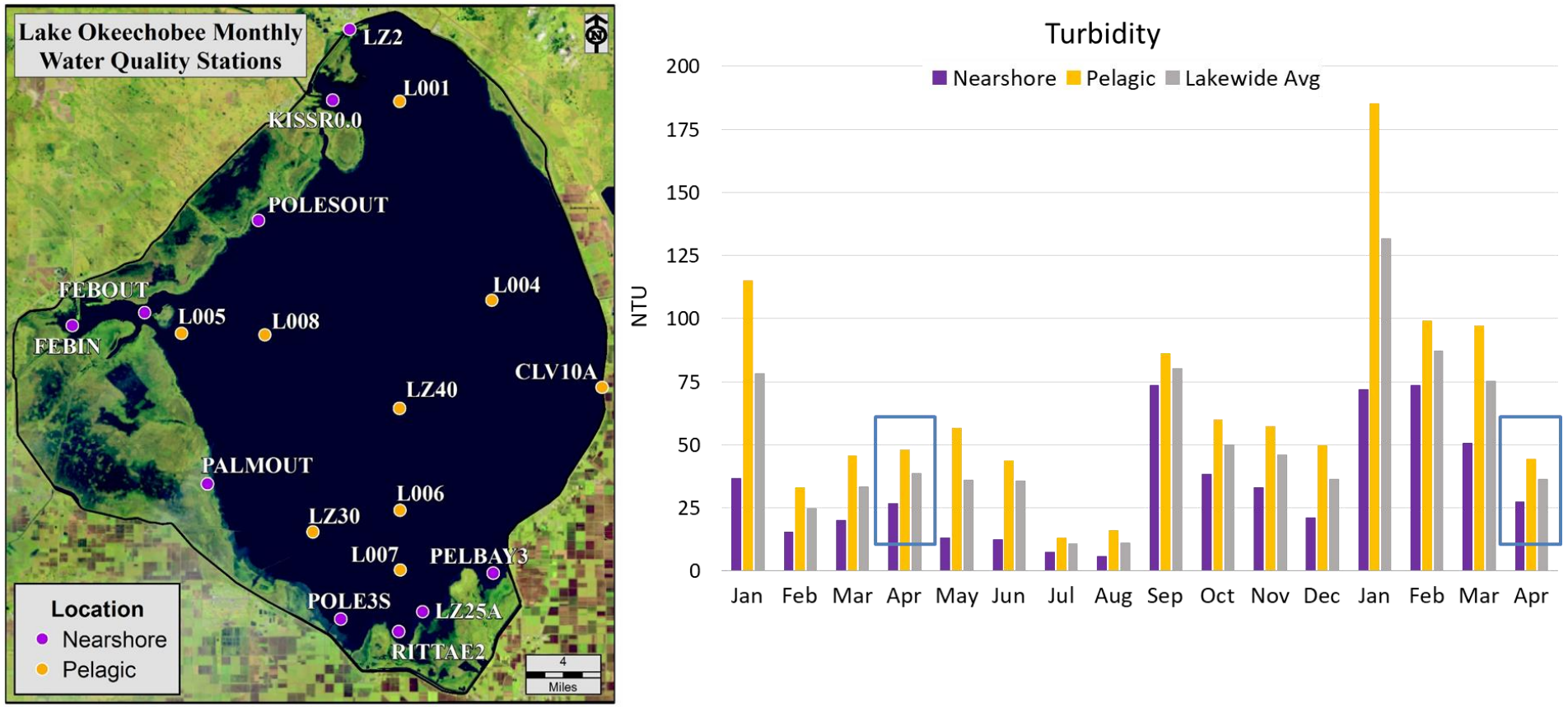


Figure 6. Turbidity (ntu) values from mid-January 2017 for nearshore (purple), pelagic (yellow), and lake-wide average (gray). Fisheating Bay stations were not included due to sporadic sampling across the period of record.

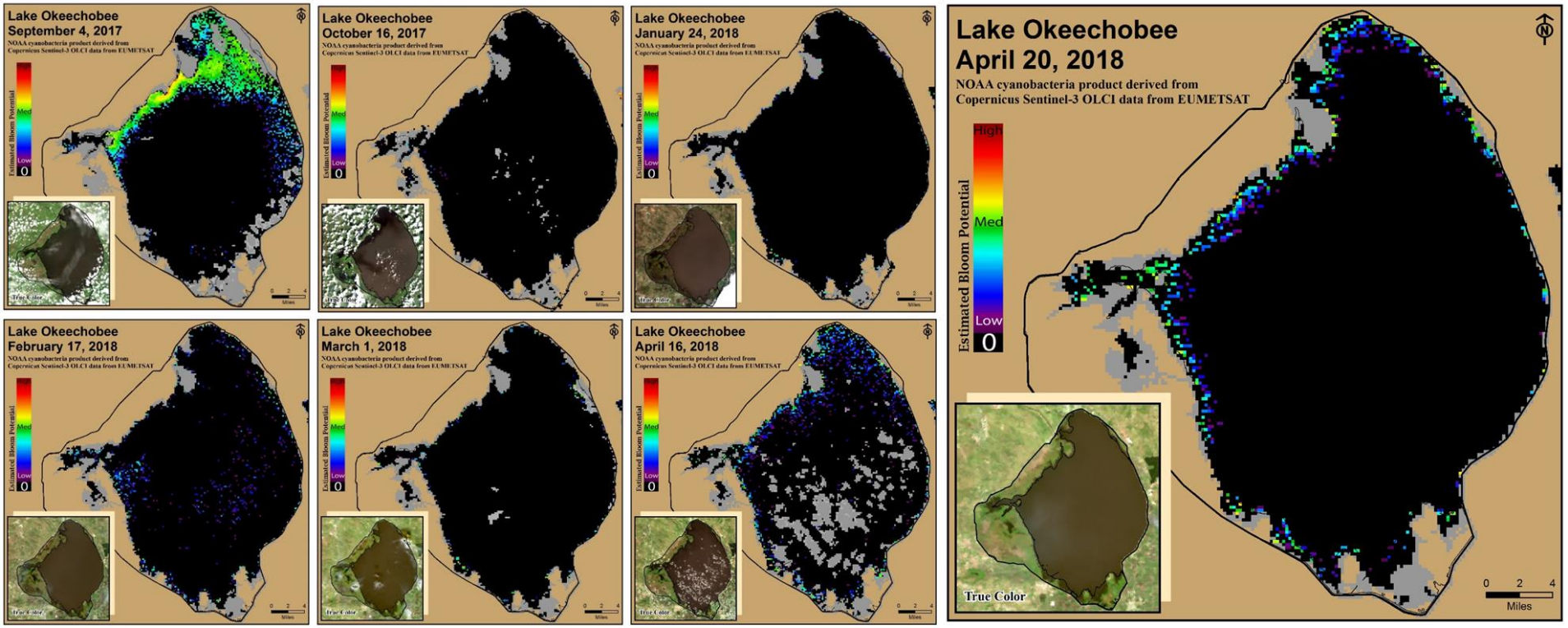


Figure 7. Potential for cyanobacterial blooms on Lake Okeechobee based on NOAA's harmful algal bloom monitoring system derived from Copernicus Sentinel-3 OLCI data from EUMETSAT.

LAKE ISTOKPOGA

Lake Istokpoga stage is 39.0 feet NGVD as of midnight April 23, 2018 and is currently 0.05 feet below its regulation schedule to accommodate construction on downstream structures (Figure 8). Average daily inflows to the lake from Josephine and Arbuckle Creeks for the week April 17 – April 23, 2018 increased slightly from the previous week, going from 92 cfs to 123 cfs this past week. Discharges via the S-68 and S-68X structures increased from just 15 average daily cfs the previous week to 99 cfs this past week. According to RAINDAR, approximately 0.56 inches of rain fell in the Lake Istokpoga basin over the past week.

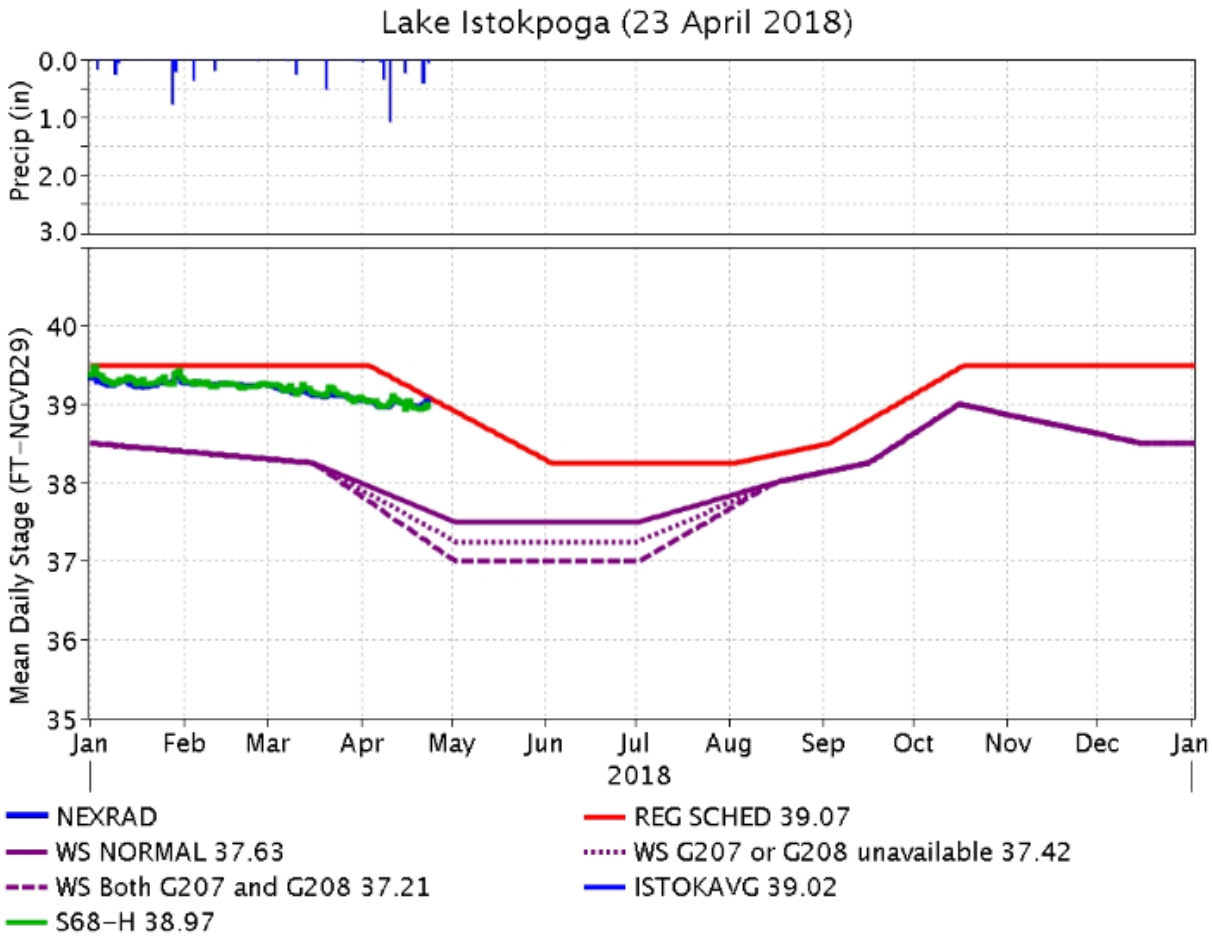


Figure 8. Recent stages on Lake Istokpoga.

ESTUARIES

St. Lucie Estuary:
Last week total inflow to the St. Lucie Estuary averaged about 196 cfs (Figures 1 and 2) and last month inflow averaged about 184 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	141
S-80	0
S-308	218
S-49 on C-24	0
S-97 on C-23	0
Gordy Rd. structure on Ten Mile Creek	55

Over the past week, salinity remained about the same 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 estimated to be 26.6. Salinity conditions in the middle estuary are in the fair 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)	**23.9** (24.5)	**25.0** (25.4)	NA[1]
US1 Bridge	**NR** (NR)	**27.2** (26.9)	10.0-26.0
A1A Bridge	**31.6** (31.2)	**32.6** (32.4)	NA[1]

[1]Envelope not applicable, NR=not reporting

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 3 and station location map is shown in Figure 5.

Table 3. 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	2.60	4.95 - 13.26	1.30	0.16	2.44
SF	1.50	3 - 8.8	6.34	5.23	7.70
NF	1.90	2.86 - 6.61	6.41	5.59	7.86
ME	1.78	2.06 - 5.53	6.24	5.55	7.31
IRL-SLE	3.53	0.16 - 3.61	6.56	6.20	7.00

NOAA satellite imagery indicates no visible cyanobacteria bloom potential in the St. Lucie Estuary this week (Figure 6).

Caloosahatchee Estuary:
Last week total inflow to the Caloosahatchee Estuary averaged about 855 cfs (Figures 7 and 8) and last month inflow averaged about 820 cfs. Last week's provisional averaged inflows from the structures are shown in Table 4.

Table 4. Weekly average inflows (data is provisional).

Location	Flow (cfs)
S-77	1143
S-78	647
S-79	747
Tidal Basin Inflow	108

Over the past week, salinity slightly decreased throughout the estuary (Table 5, Figures 9 & 10). The seven-day average salinity values are in 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 4.3 at Val I-75 and 12.6 at Ft. Myers. With no flow through S-79, daily salinity at Val I-75 is forecast in two weeks to be 7.0, and the 30-day moving average is forecast to be 4.9 (Figure 13). Salinity conditions between Val I-75 and Ft. Myers are good for tape grass.

Table 5. 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)	**2.7** (2.9)	**2.8** (3.2)	NA[1]
*Val I75	**3.8** (4.1)	**6.3** (7.3)	0.0-5.0[2]
Ft. Myers Yacht Basin	**11.4** (12.3)	**13.6** (14.1)	NA
Cape Coral	**20.9** (22.1)	**21.6** (22.3)	10.0-30.0
Shell Point	**30.4** (30.7)	**29.1** (29.4)	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 6 as concentration ranges of chlorophyll *a* and dissolved oxygen at Beautiful Island, Ft. Myers, and Shell Point in the Caloosahatchee Estuary.

Table 6. 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)	5.31 – 18.46	4.07 – 19.58	1.50 – 73.44
Dissolved Oxygen (mg/l)	4.84 – 9.14	3.60 – 8.11	4.17 – 9.59

The Florida Fish and Wildlife Research Institute reported on April 20, 2018, that *Karenia brevis, the Florida red tide dinoflagellate,* was observed at background to medium concentrations in 10 samples collected from Lee County. Fish kills and respiratory irritation were reported in Lee County over the past week.

NOAA satellite imagery indicates no visible cyanobacteria bloom potential in the Caloosahatchee Estuary this week (Figure 12).

Water Management Recommendations

Although the Caloosahatchee Estuary does not need additional flows at this time, based on salinity at Val I-75, the continuation of the current releases does provide benefits to the estuary.

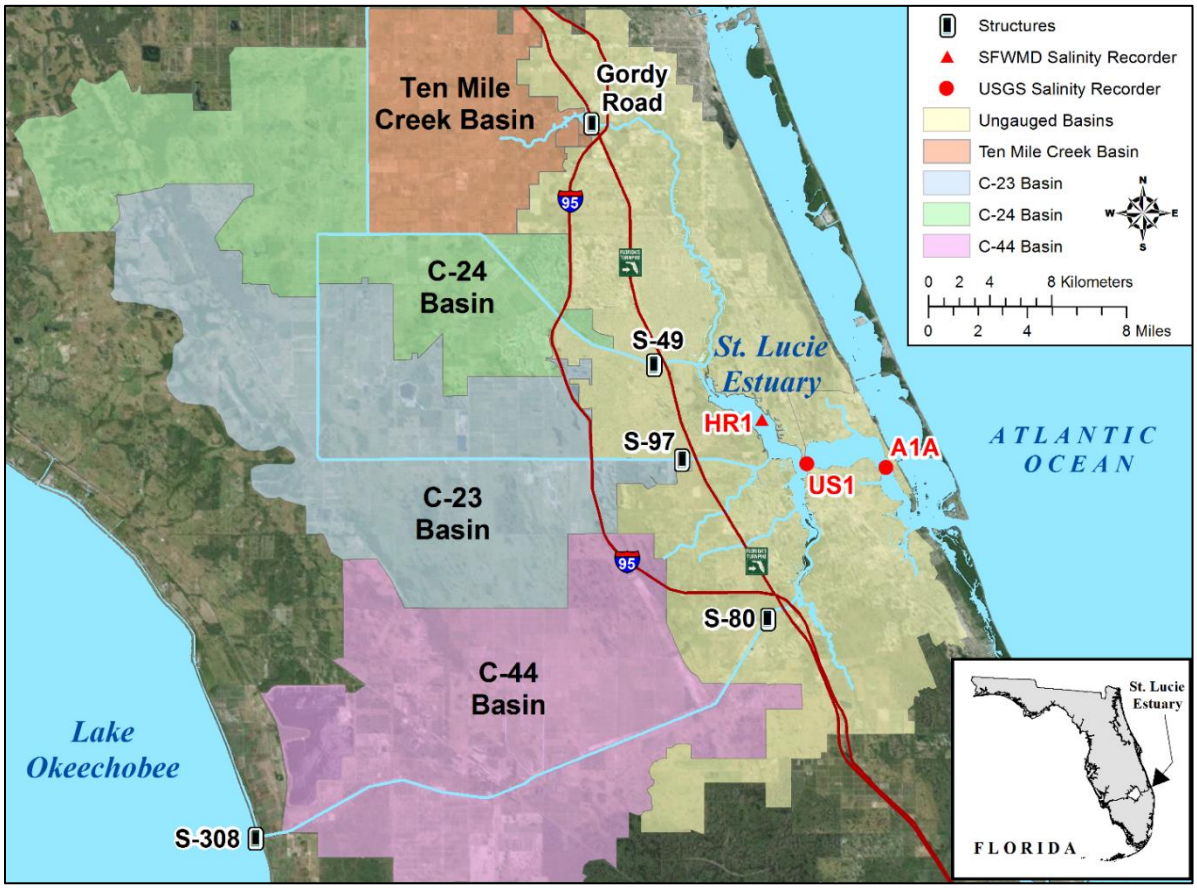


Figure 1. Basins, water control structures, and salinity monitoring for the St. Lucie Estuary.

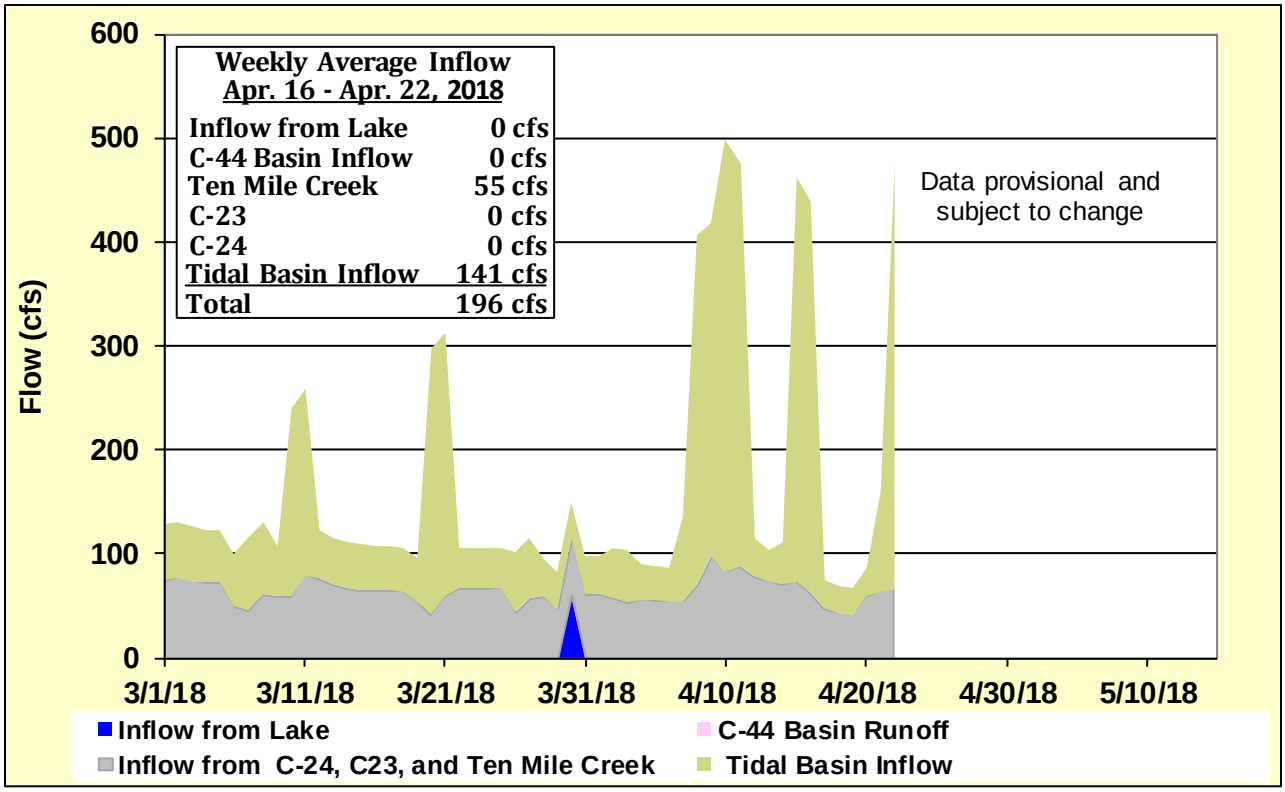


Figure 2. Estimated surface freshwater inflows from Lake Okeechobee and runoff from the C-44, C-23, C-24, Ten Mile Creek, and tidal basins into the St. Lucie Estuary.

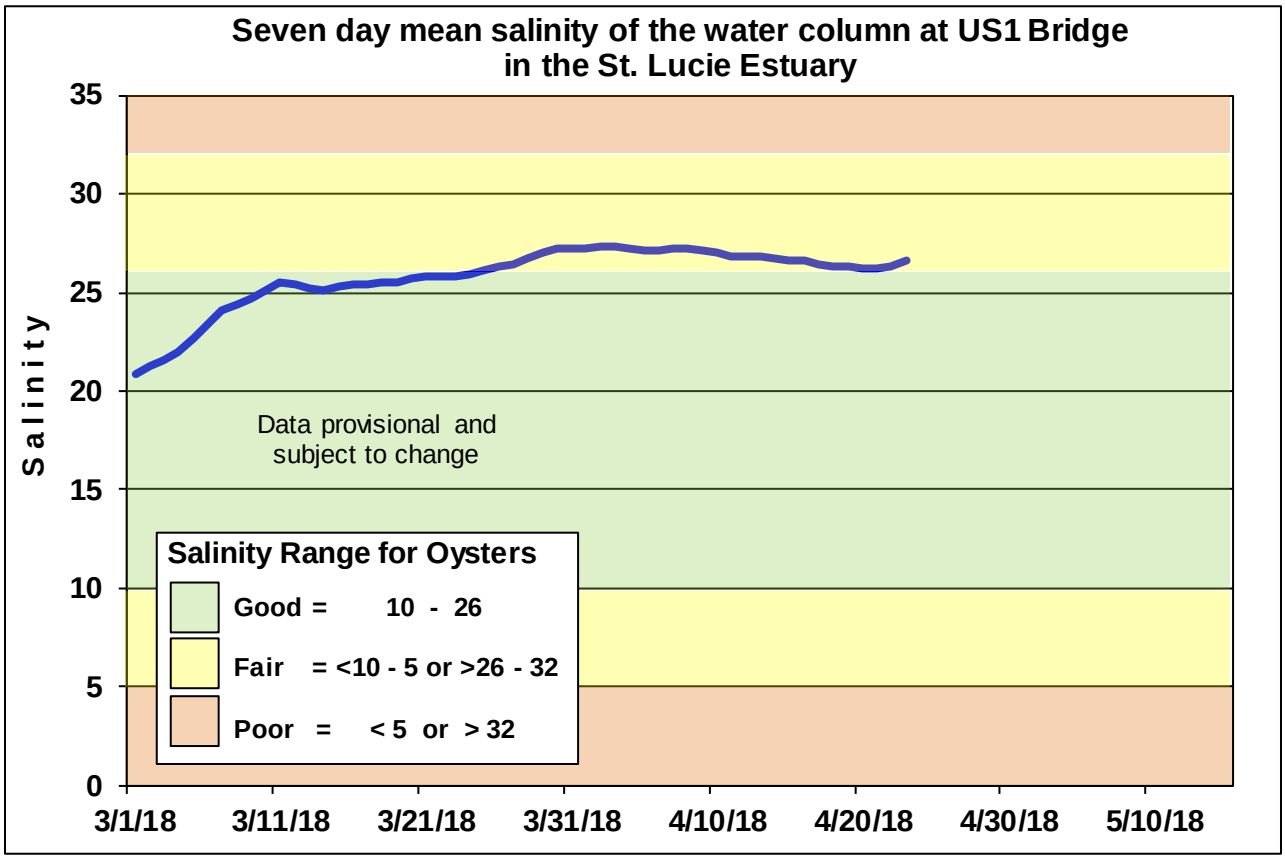


Figure 3. Seven-day mean salinity of the water column at the US1 Bridge.

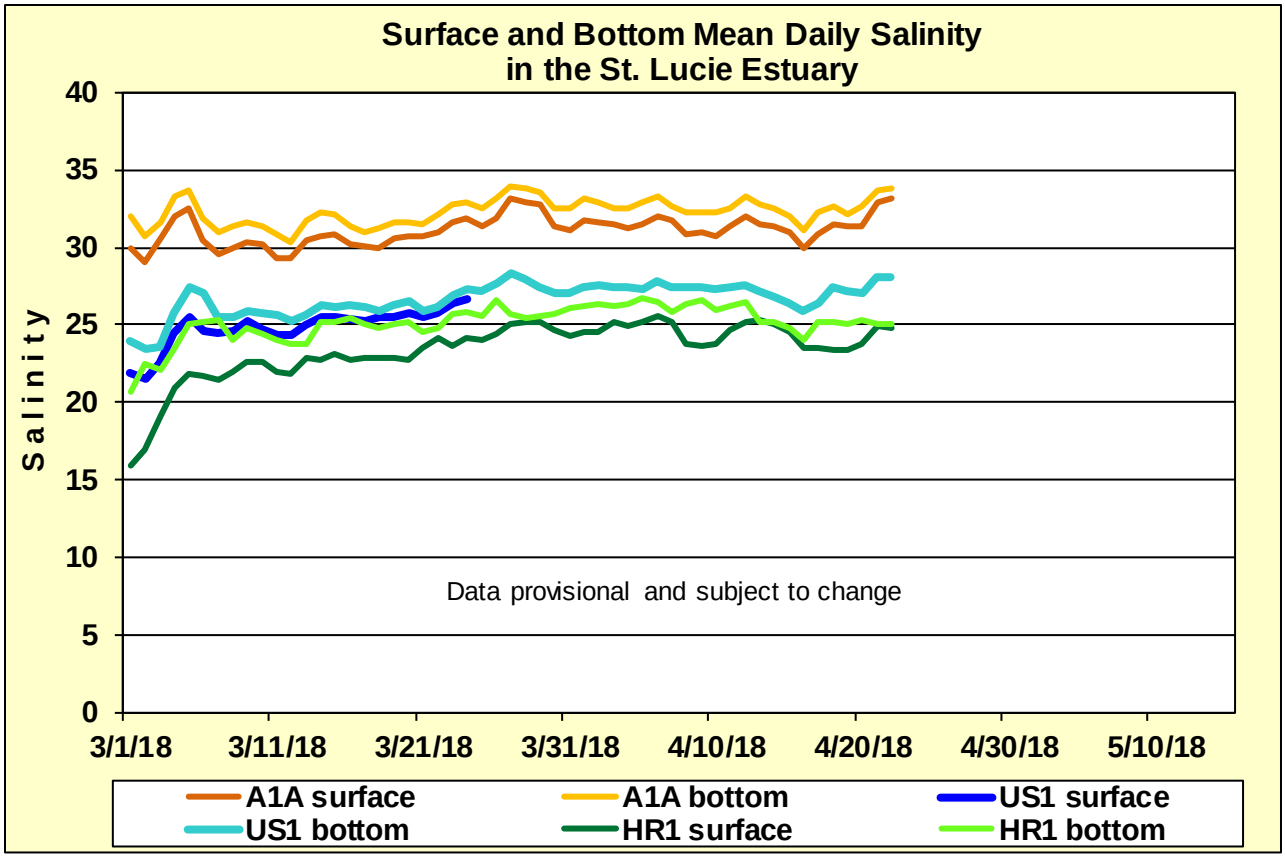


Figure 4. Daily mean salinity at the A1A, US1 and estimated HR1 stations.

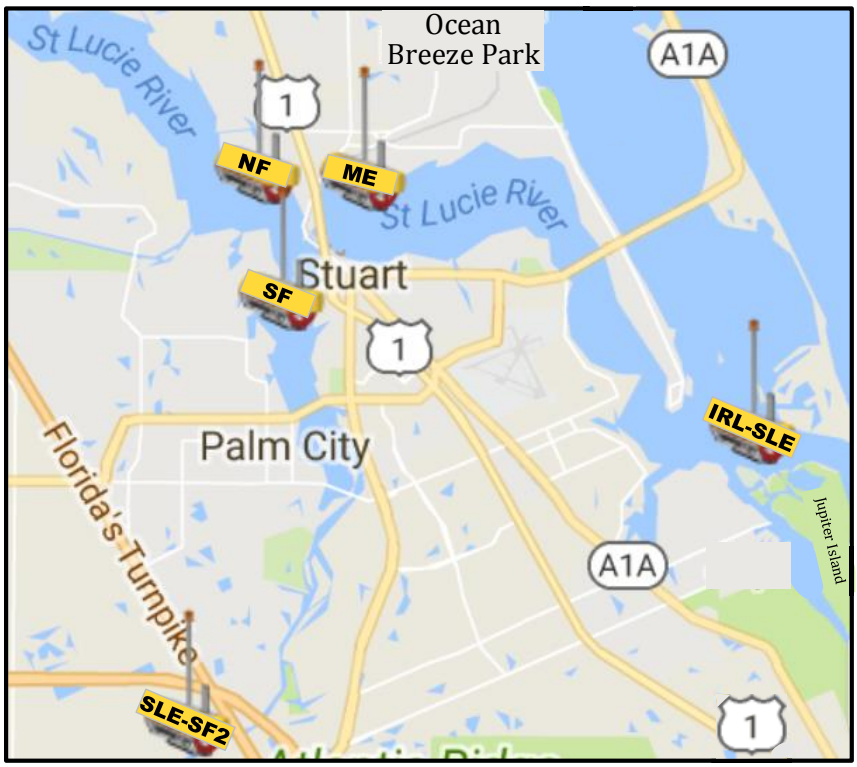


Figure 5. Location of FAU-HBOI LOBO water quality stations in the St. Lucie Estuary.

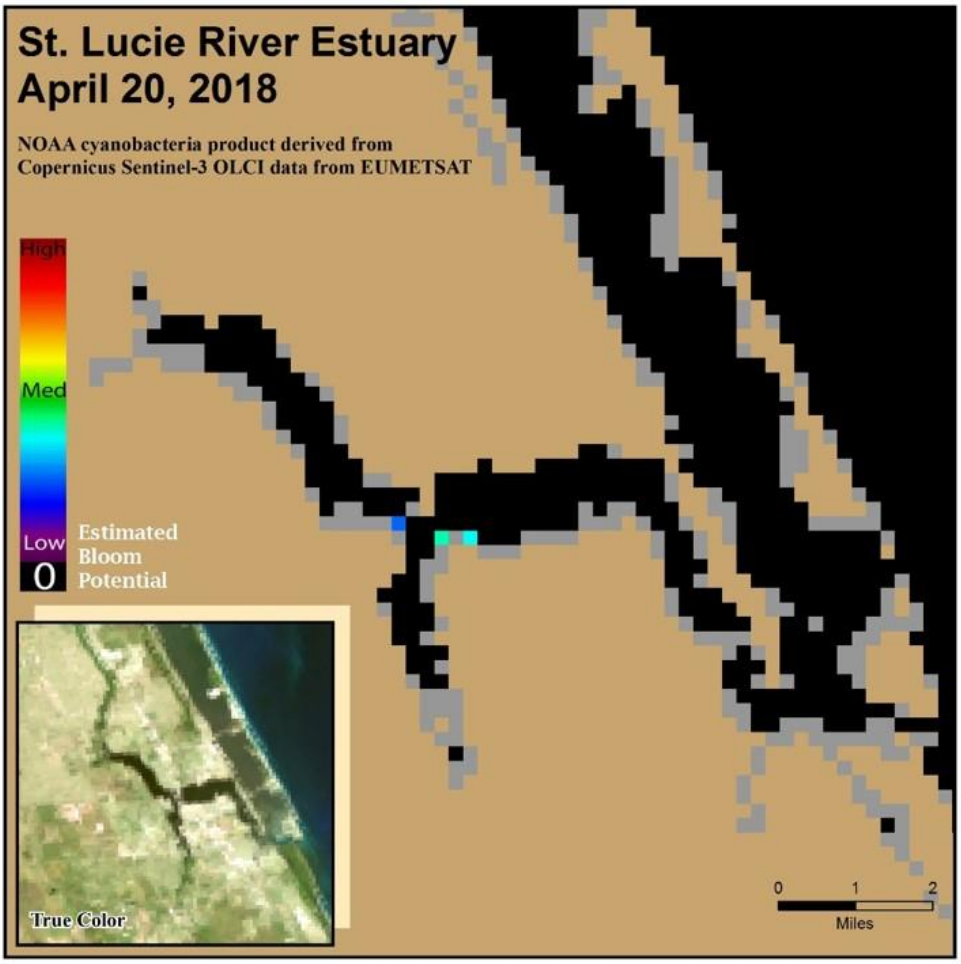


Figure 6. Sentinel 3a Satellite imagery provided by NOAA uses Ocean and Land Color Instrument (OLCI) to estimate cyanobacteria bloom potential in St. Lucie Estuary.

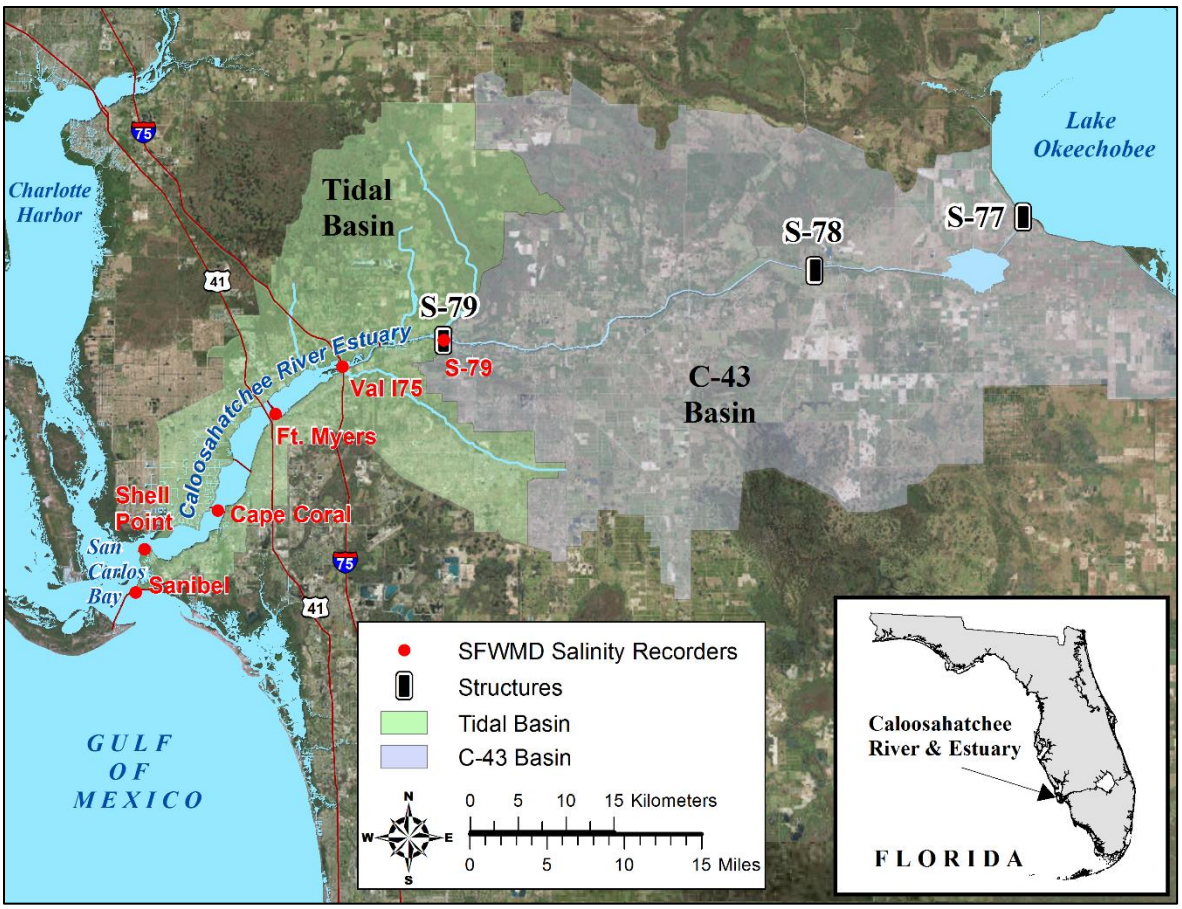


Figure 7. Basins, water control structures, and salinity monitoring for the Caloosahatchee Estuary.

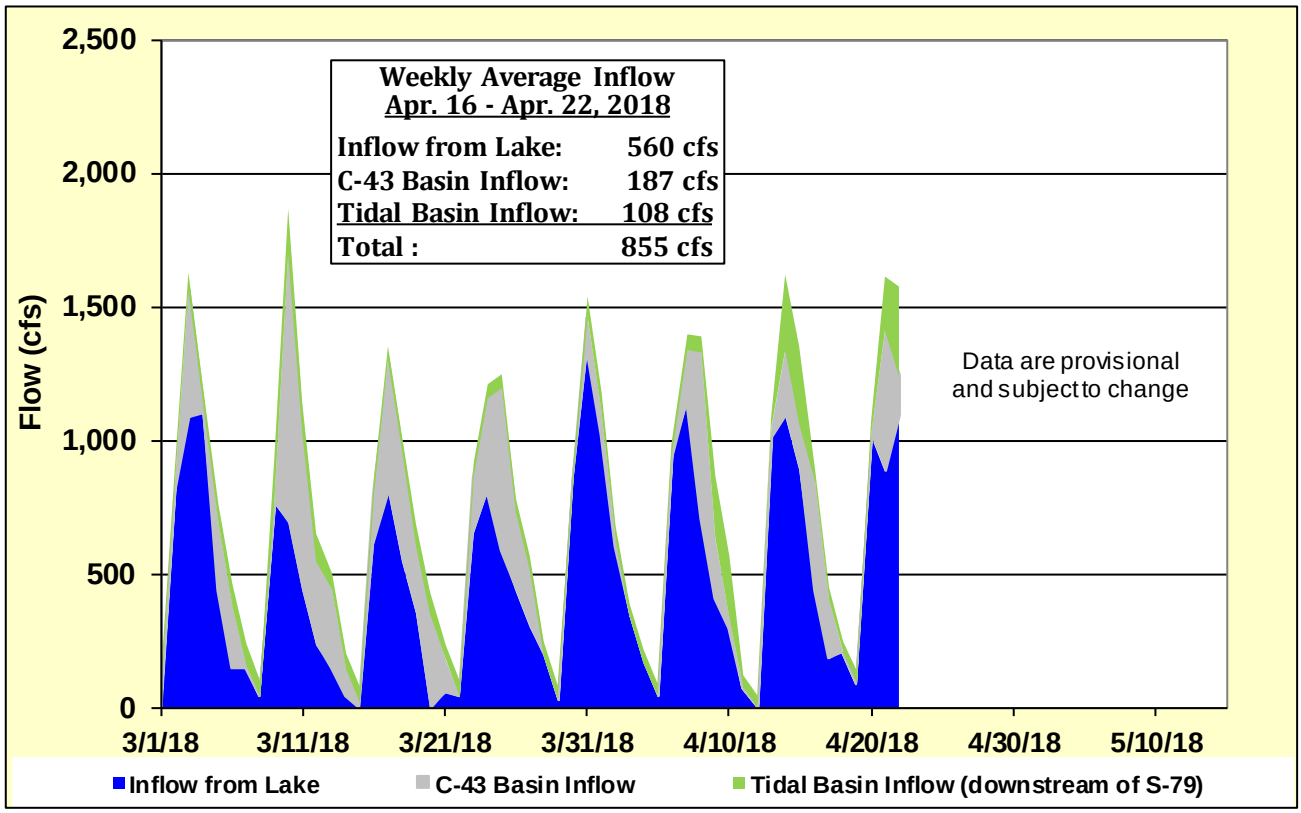


Figure 8. Freshwater inflows from Lake Okeechobee, runoff from the C-43 basin, and tributaries in the tidal basin into the Caloosahatchee River Estuary.

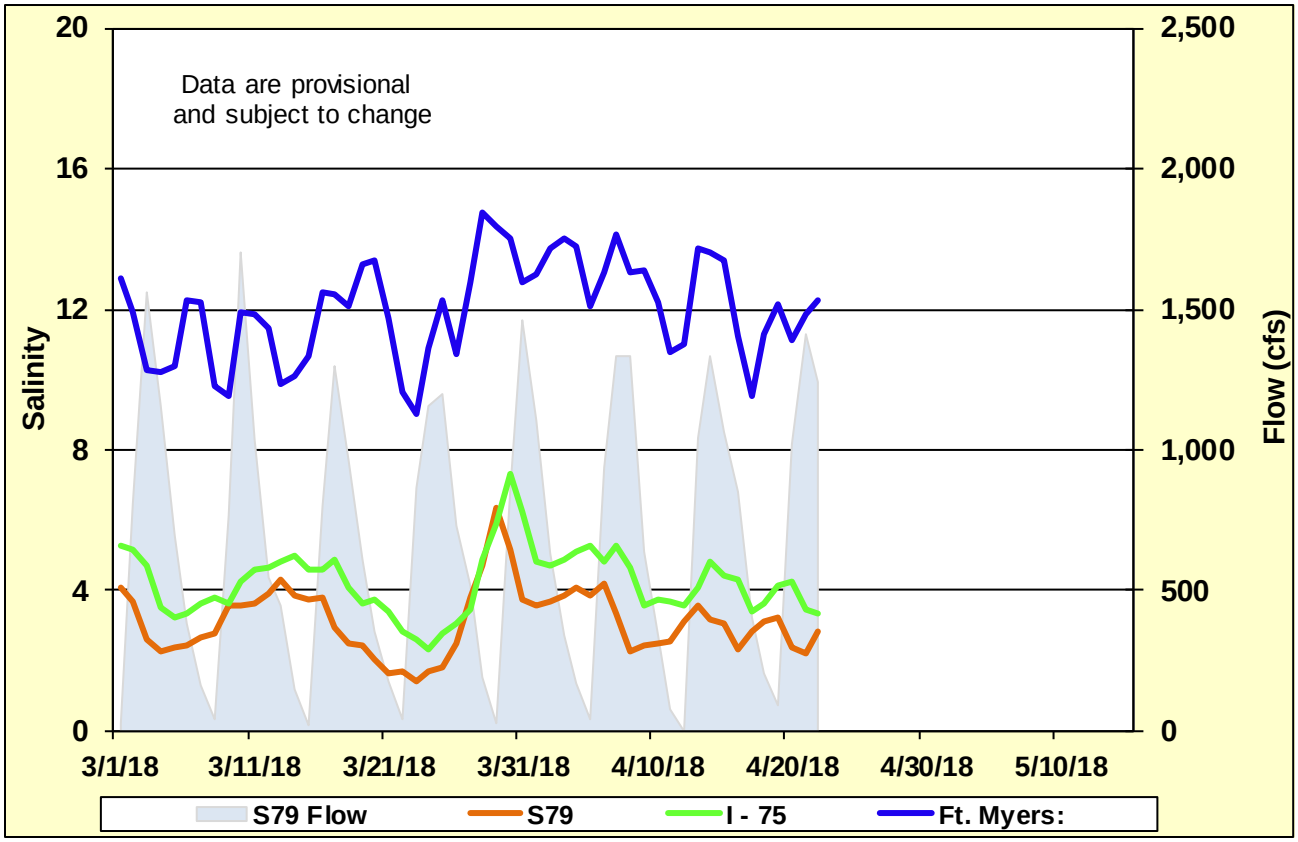


Figure 9. Daily mean flows at S-79 and salinity at upper estuary monitoring stations.

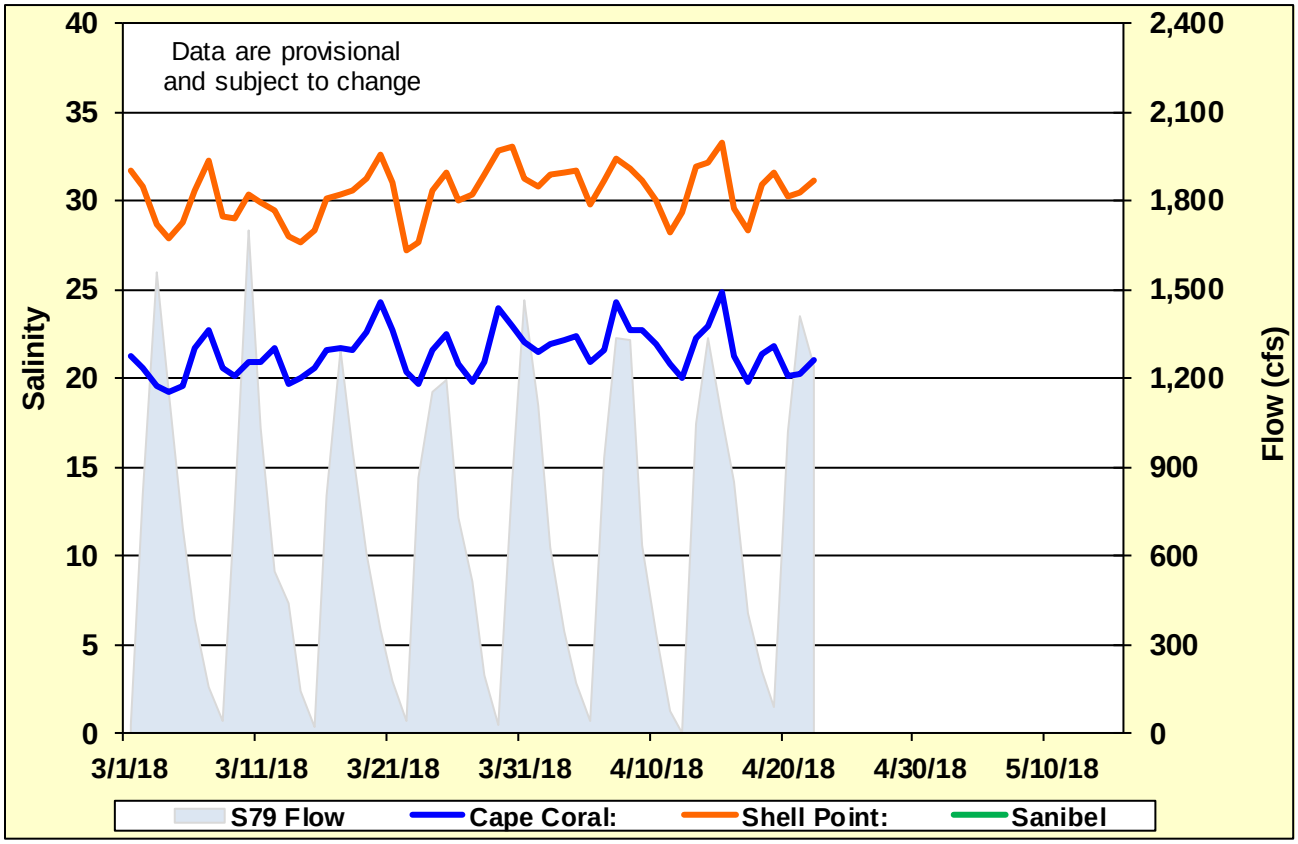


Figure 10. Daily mean flows at S-79 and salinity at lower estuary stations.

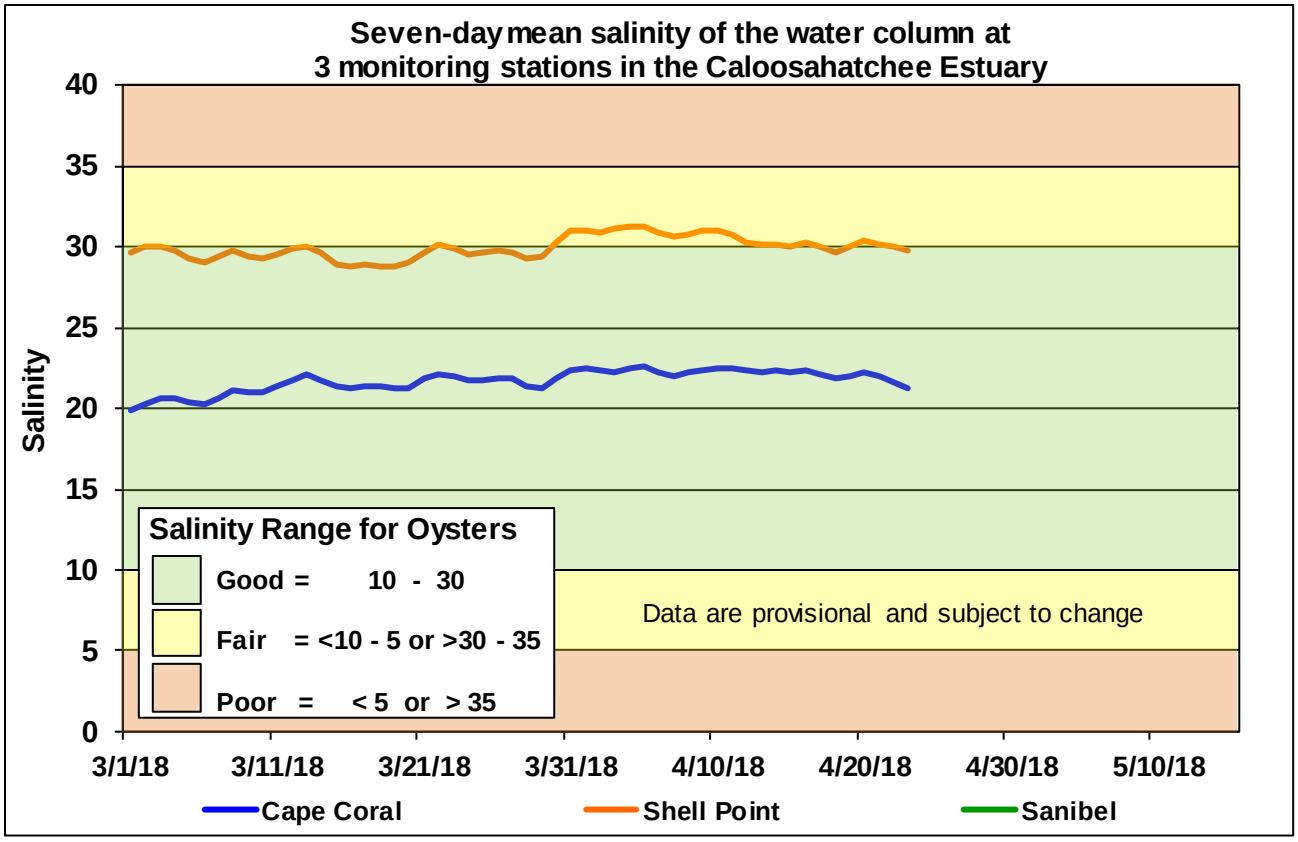


Figure 11. Seven-day mean salinity at Cape Coral Bridge, Shell Point, and Sanibel Bridge monitoring stations.

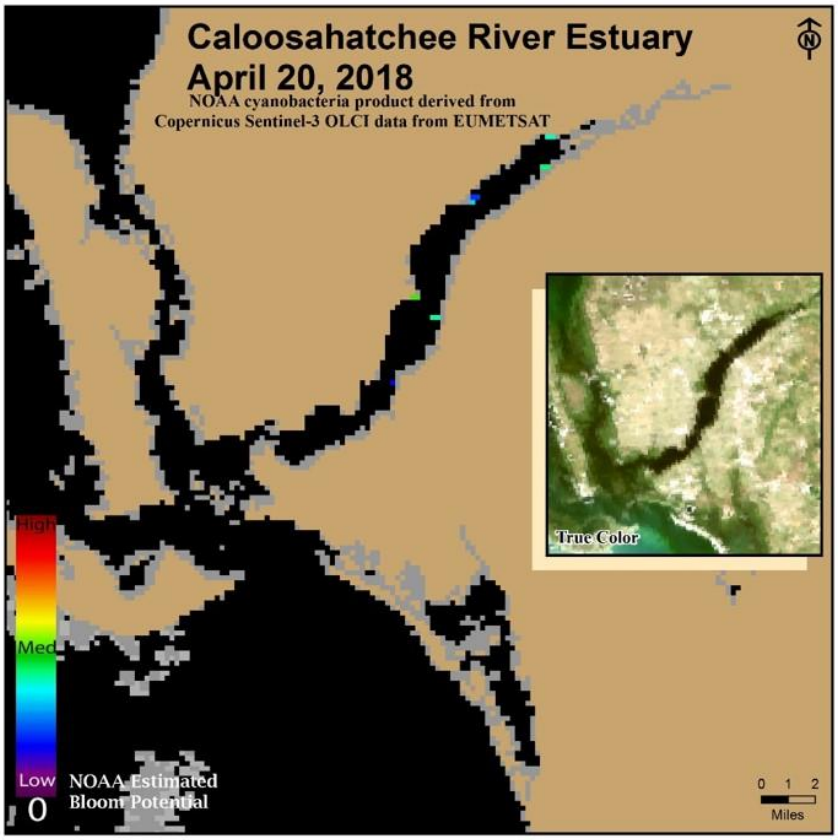


Figure 12. Sentinel 3a Satellite imagery provided by NOAA uses Ocean and Land Color Instrument (OLCI) to estimate cyanobacteria bloom potential in St. Lucie Estuary.

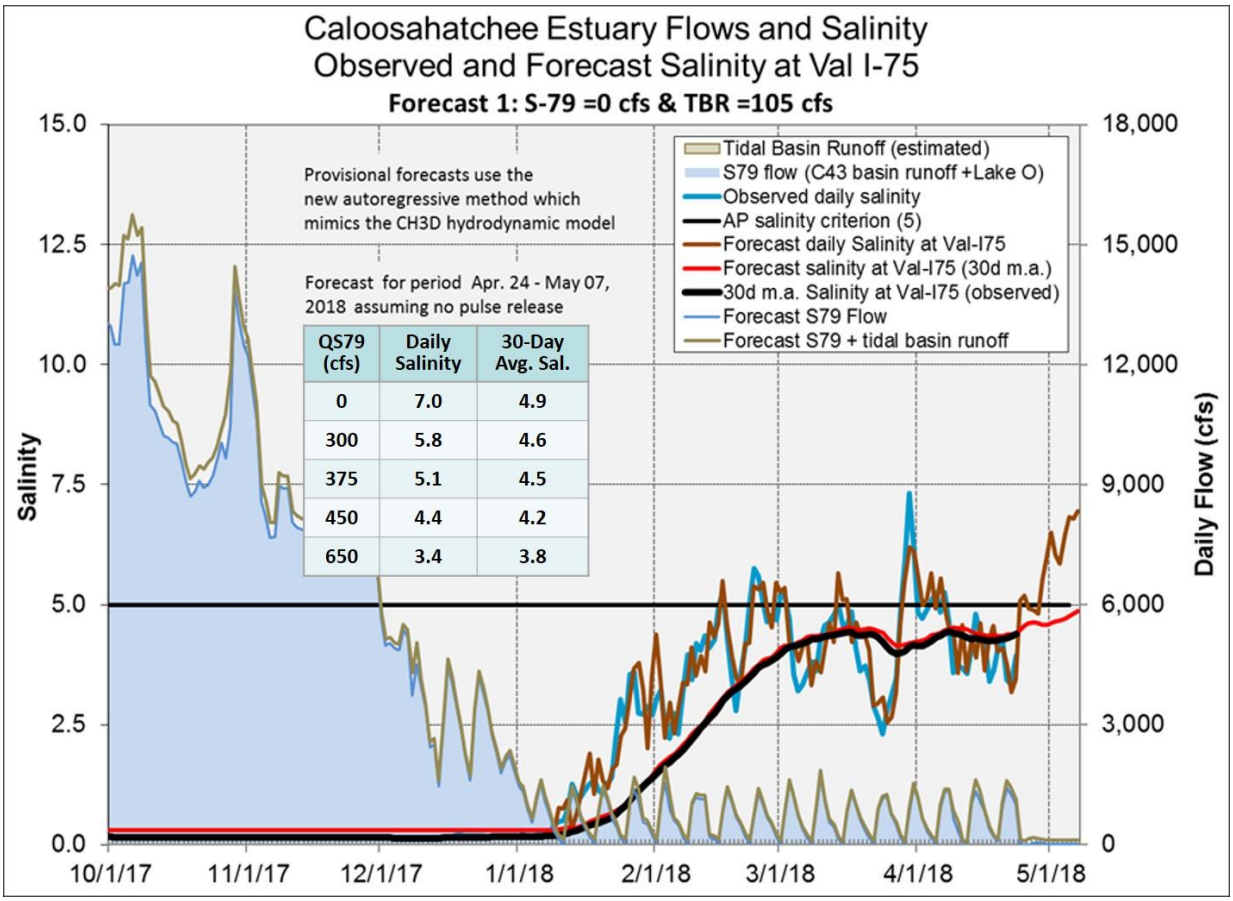


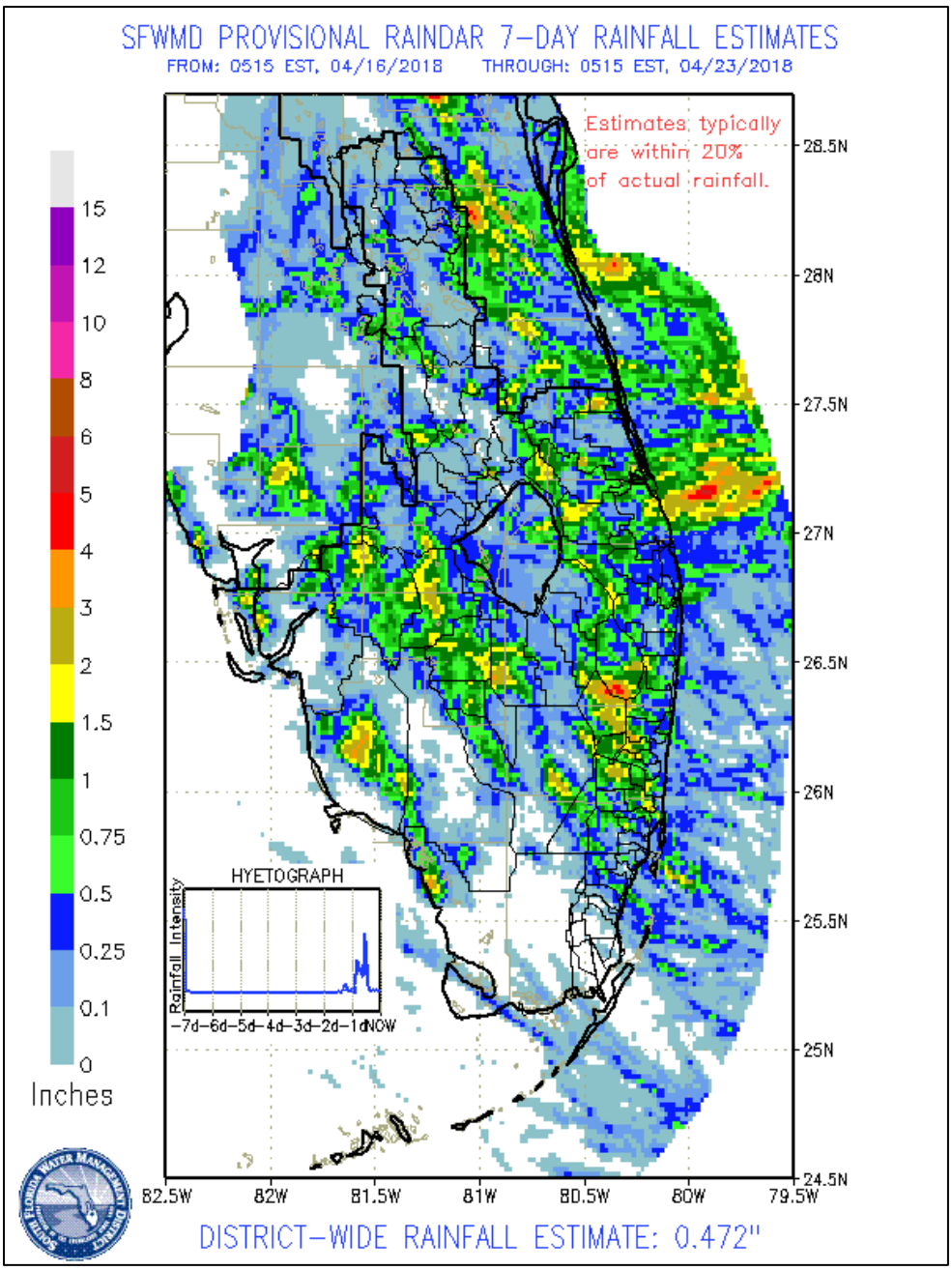
Figure 13. 14-day salinity forecast at Val I-75 assuming no releases at S-79.

EVERGLADES

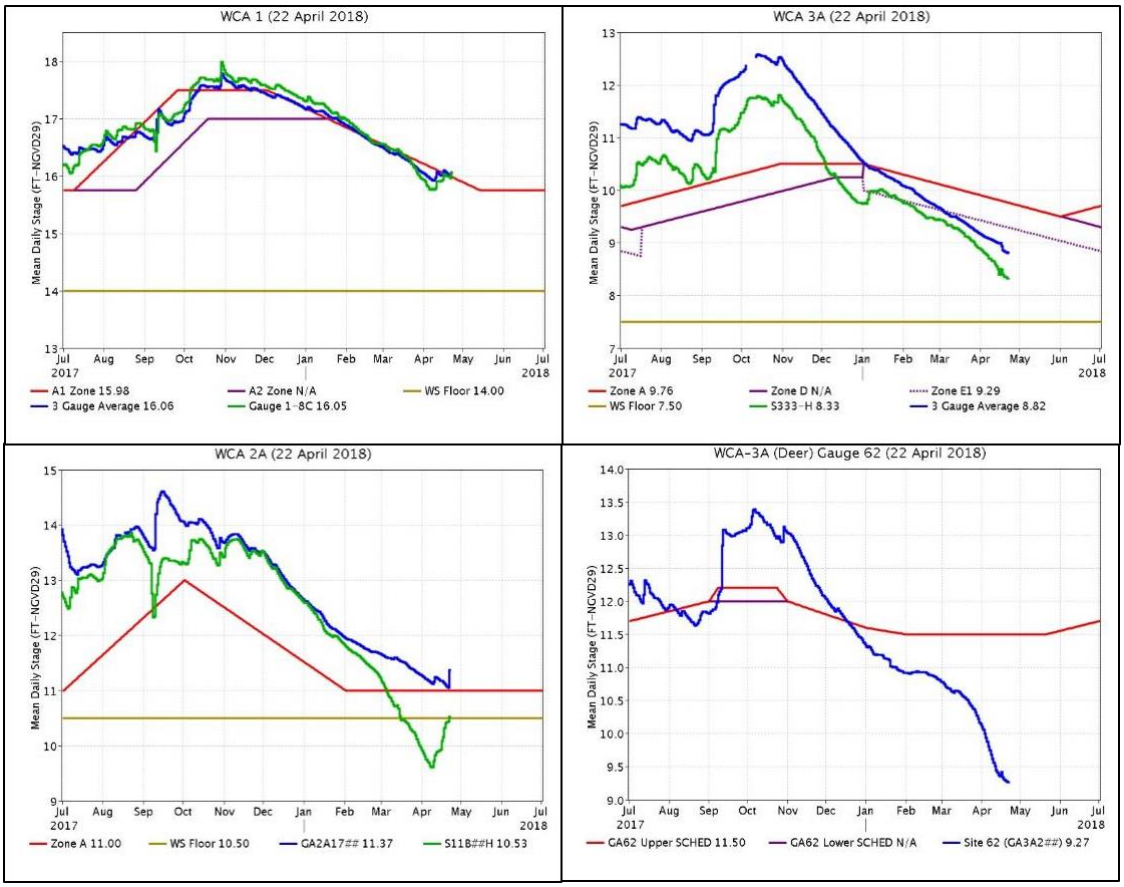
At the gauges monitored for this report, the water depth across the Everglades fell an average of 0.07 feet last week. Individual gauge changes in the WCAs ranged from +0.34 feet (WCA-2A) to −0.18 feet (northwest WCA-3A). Pan evaporation increased again and was estimated at 3.06 inches last week.

Everglades Region	Rainfall (Inches)	Stage Change (feet)
WCA-1	1.20	+0.02
WCA-2A	1.64	+0.34
WCA-2B	1.33	−0.12
WCA-3A	0.37	−0.12
WCA-3B	0.43	−0.11
ENP	0.10	−0.16

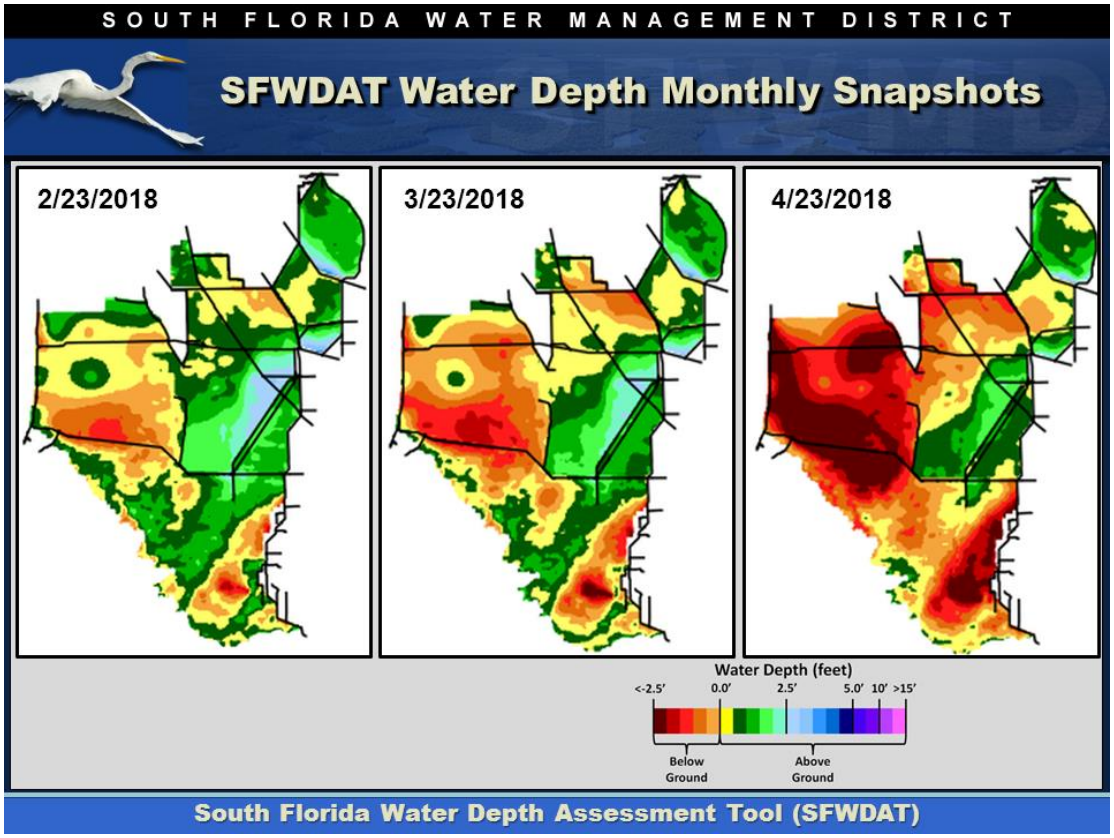
Good
Fair
Poor

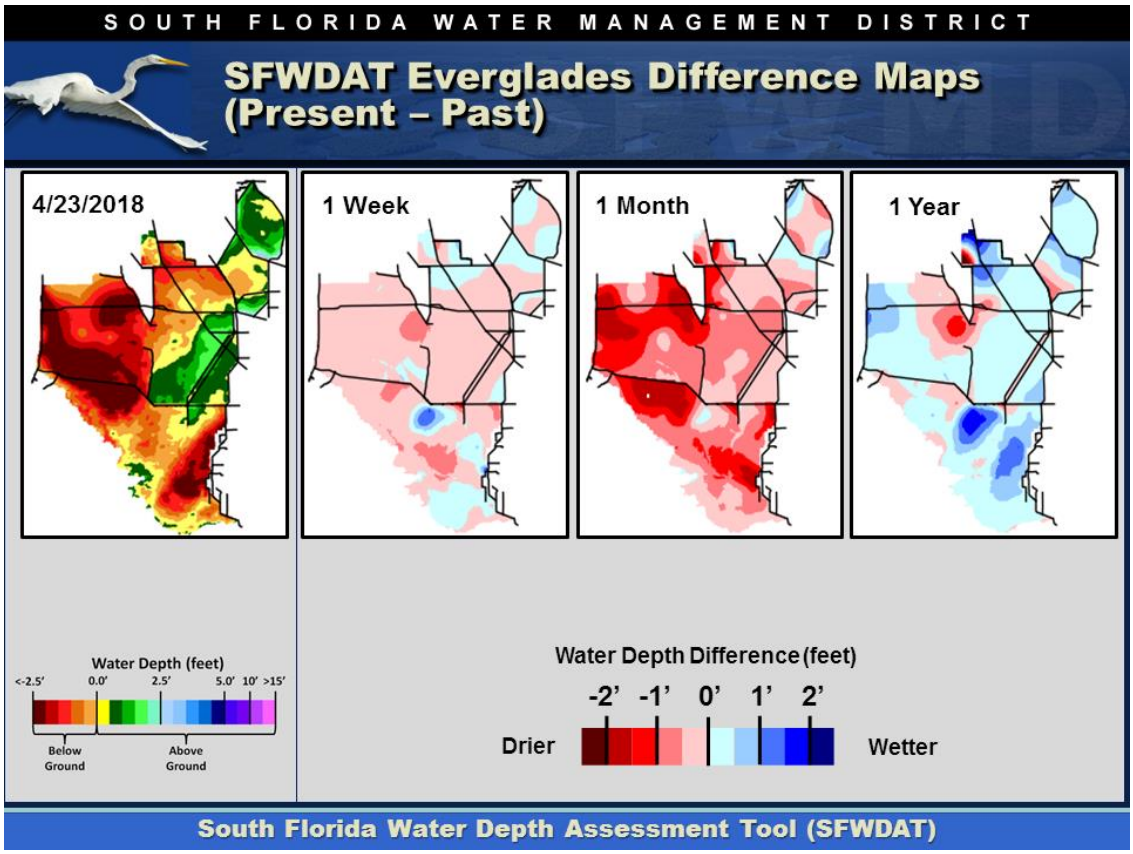


Regulation Schedules: WCA-1 three-gauge average is just 0.08 feet above Zone A1. WCA-2A canal stage at gauge S11B is now 0.03 feet above the WS Floor, and the marsh gauge is 0.37 above Zone A. WCA-3A three-gauge average stage is 0.47 feet below Zone E1 and continues to fall away from the regulation line. WCA-3A stage at gauge 62 (northwest corner) is 2.23 feet below the upper schedule and continues to trend sharply downward away from the regulation schedule.



Water Depths and Changes: The WDAT tool for spatial interpolation of depth monthly snapshots indicates drying conditions across the Everglades generally moving from north to south within the WCAs. Northern WCA-3A continues a more extreme draw down with a significant portion of that region with water levels between 1.0 to 1.5 feet below ground. Comparing WDAT water levels from present, last week water levels dropped slightly across most of WCA-3A but rose slightly in the northwestern portion of that basin. Depths in the northern half of WCA-2A rose slightly while depths along the southern perimeter fell. The southwestern half of WCA-2A is drier than it was a year ago.


SOUTH FLORIDA WATER MANAGEMENT DISTRICT
SFWDAT Water Depth Monthly Snapshots
2/23/2018
3/23/2018
4/23/2018
Water Depth (feet)
<-2.5'
0.0'
2.5'
5.0'
10'
>15'
Below Ground
Above Ground
South Florida Water Depth Assessment Tool (SFWDAT)


SOUTH FLORIDA WATER MANAGEMENT DISTRICT
SFWDAT Everglades Difference Maps
(Present – Past)
4/23/2018
1 Week
1 Month
1 Year
Water Depth (feet)
<-2.5'
0.0'
2.5'
5.0'
10'
>15'
Below Ground
Above Ground
Water Depth Difference (feet)
-2'
-1'
0'
1'
2'
Drier
Wetter
South Florida Water Depth Assessment Tool (SFWDAT)

SFWMD northern WCA wading bird foraging flight on April 23, 2018:

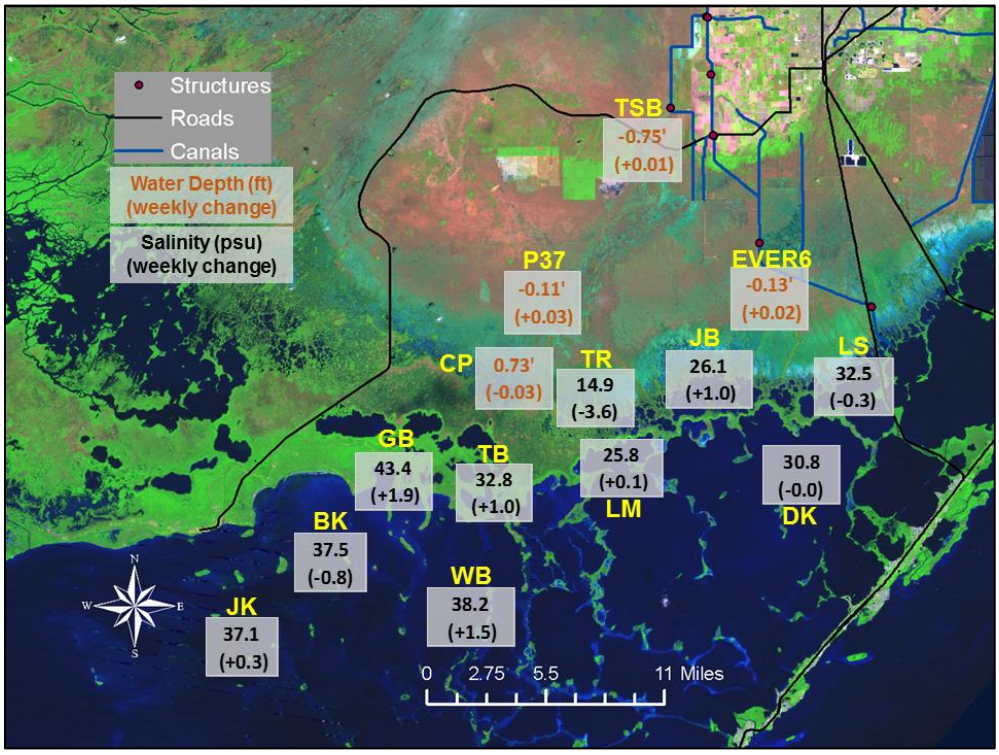
- Large mixed flocks feeding near the Alley North colony, WCA-3A South, and southern WCA-2A
- 18,000+ white ibis nesting in Alley North colony and ibis chicks are hatching
- Recent reversal had little impact on foraging or nesting conditions

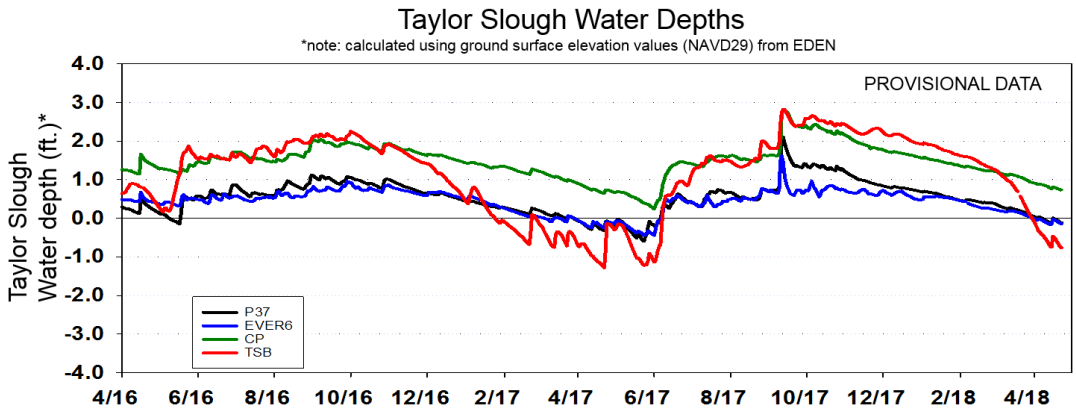
Cape Sable Seaside Sparrow survey conducted by Conservation Insight/Virzi (March 12, 2018 – April 13, 2018):

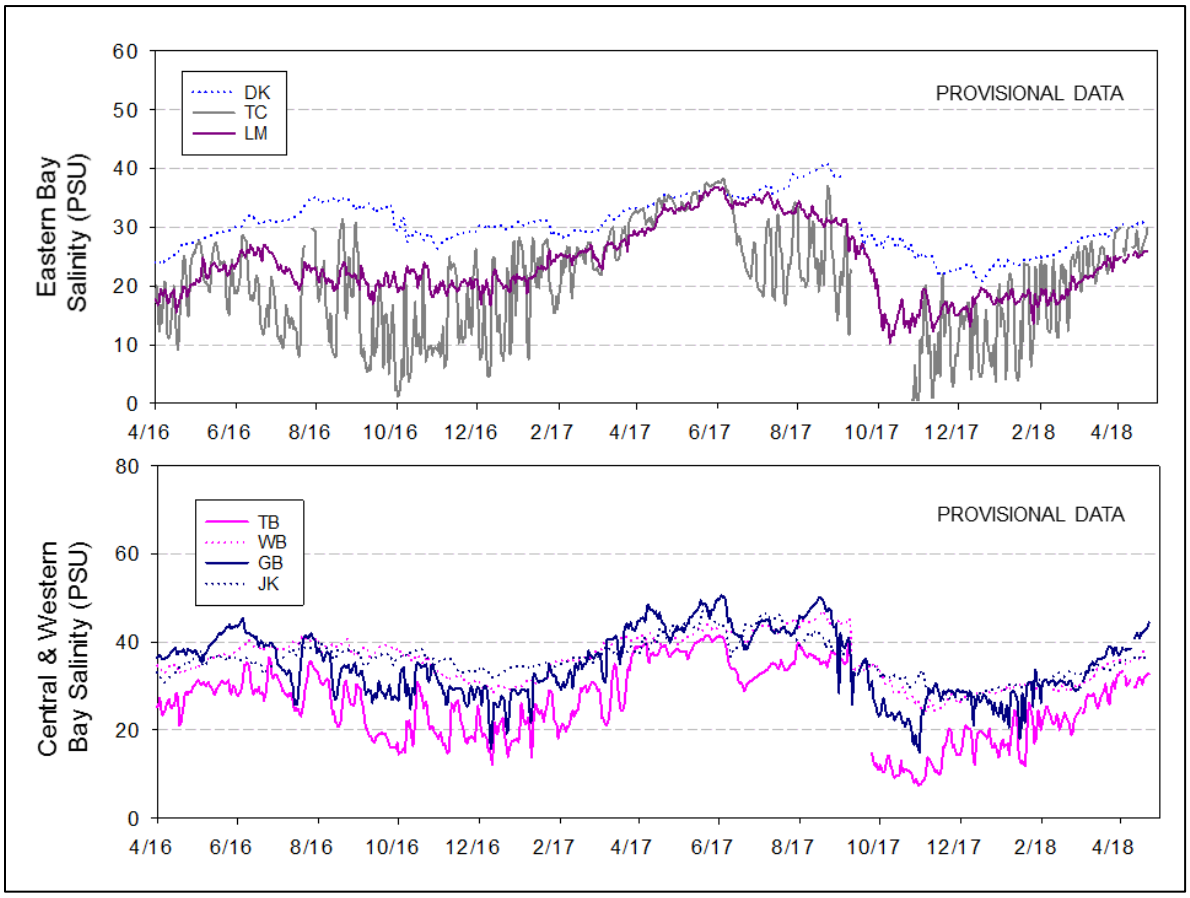
- Population A – not visited
- Population B – 17 territories, 2 active nests
- Population C – 7 territories
- Population D – 8 territories
- Population E – 25 territories, 1 active nests

Taylor Slough Water Levels: Sunday night brought an average of 0.13 inches of rain which was almost all of the rain for the week. Stage changes this week reflect last Sunday's (April 15, 2018) rainfall with northern and central Taylor Slough showing week over week increases of +0.01 feet to +0.03 feet. Water depths range from −0.75 feet to +0.73 feet and are 2 inches below to 2 inches above the historical averages.

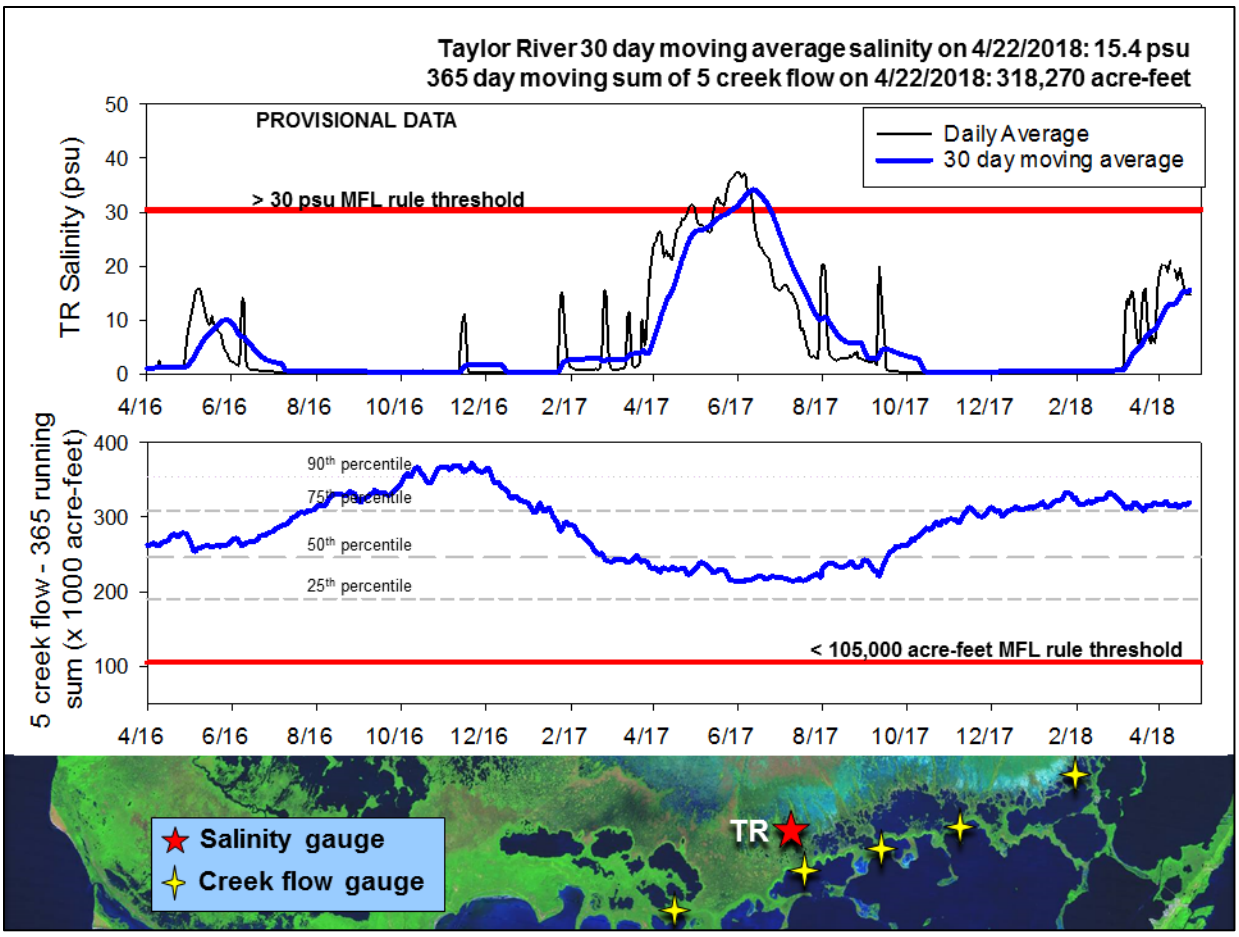
Florida Bay Salinities: Salinities in Florida Bay stayed the same on average this past week with individual station changes ranging from −2.1 psu to +1.9 psu. Salinities ranged from 26 psu in the northeast to 43 psu in the western nearshore. This range is 2 psu below to 3 psu above the historical averages.







Florida Bay MFL: Mangrove zone daily average salinity decreased slightly to 15 psu this past week. The 30-day moving average rose to 15.4 psu. At this time of the year, salinity will continue to increase until the rains start. The weekly cumulative flow from the five creeks denoted by yellow stars on the map totaled about 3,200 acre-feet for the last week. The 365-day moving sum of flow from the five creeks increased 5,000 acre-feet over the last week to end at 318,270 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

Water management that maintains the current recession rates along the regulation schedule or slightly above in Rotenberger Wildlife Management Area has great ecological benefit. Water management that moderates the current recession rates along the southern perimeter of WCA-2A could extend the period of optimum foraging conditions for wading birds, especially the record breaking number of white ibis currently nesting in the Alley North colony. The continuation of inflows that hydrate the northern sections of WCA-2A and WCA-3A provides ecological benefit by protecting these areas' peat soils and lessening the risk of damaging wildfires. The continuation of inflows to northeast WCA-3A may still be providing ecological benefit by slowing the recession rates near the Alley North Colony where wading birds are currently foraging. Inflows to Taylor Slough continue to provide ecological benefit by slowing the recession rate in that region. More specific recommendations appear in the summary table below. The red text represents new or modified information or recommendations.

SFWMD Everglades Ecological Recommendations, April 24th, 2018 (red is new)

Area	Weekly change	Cause(s)	Recommendation	Reasons
WCA-1	Stage increased by 0.02'	Rainfall, ET, management	Maintain current recession rates, following regulation schedule.	Foster conditions for wildlife and optimal wading bird foraging.
WCA-2A	Stage increased by 0.34'	Rainfall, ET, management	Maintain inflows to the northern region and raise southern canal stage	Protect peat soils and foster conditions for optimal wading bird foraging.
WCA-2B	Stages decreased by 0.12'	Rainfall, ET, management	Maintain depths at regulation schedule.	Protect upstream/downstream habitat and wildlife. Foster conditions for wading bird foraging.
WCA-3A NE	NA	Rainfall, ET, management	Maintain current recession rates, water management that provides inflows generates ecological benefit	Protect peat soils and lower risk of damaging wildfire.
WCA-3A NW	Stages decreased by 0.18'	Rainfall, ET, management	Slow current recession rates to between 0.05 and 0.09 feet per week, water management that provides inflows generates ecological benefit	
Central WCA-3A S	Stages decreased by 0.08'	Rainfall, ET, management	Maintain current recession rates near 0.05 and 0.09 feet per week	Protect habitat and wildlife, foster conditions for wading bird foraging.
Southern WCA-3A S	Stages decreased by 0.13'	Rainfall, ET, management		
WCA-3B	Stages decreased by 0.11'	Rainfall, ET, management	Maintain depths at regulation schedule.	Protect habitat and wildlife.
ENP-SRS	Stages decreased by 0.16'	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.
Taylor Slough	Stage changes ranged from −0.03' to +0.03'	Rain, ET, inflows	Move water southward as possible	When available, provide freshwater buffer for downstream conditions.
FB- Salinity	Salinity changes ranged −2.1 to +1.9 psu	Rain, ET, inflows, wind	Move water southward as possible	When available, provide freshwater to maintain low salinity buffer and promote water movement.