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, Assistant Executive Director, Executive Office Staff

FROM: SFWMD Staff Environmental Advisory Team

DATE: February 5, 2020

SUBJECT: Weekly Environmental Conditions for Systems Operations

Summary

Weather Conditions and Forecast

A cool and dry air mass associated with surface high pressure over the western Atlantic will dominate the District's weather through Wednesday. As the high-pressure area shifts to the east during the next 24 hours, a warmer southeasterly wind flow will help to modify the air mass but a rebound in moisture is not anticipated until later Wednesday. Thus, dry conditions are expected to prevail today and again on Wednesday. The one exception could be isolated, very light showers developing over interior portions of the District Wednesday afternoon that would produce minimal rainfall. A storm system moving out of the Four Corners region today will cross the Plains on Wednesday and 'lift out' and weaken as it moves into the eastern United States on Friday. A line or mass of moderately heavy showers and a few thunderstorms are expected to push across the Florida Panhandle Thursday afternoon and evening ahead of the storm system's associated cold front before reaching the far northwestern part of the District Thursday evening to around midnight. The showers and thunderstorms could become somewhat heavier while spreading rapidly southeastward across the District during the early morning hours on Friday, producing a widespread coverage of rains over a large part of the District by daybreak on Friday. The progressive nature of the storm system and the predicted weakening of its associated upper-level disturbance would favor generally no more than a quarter to a half of an inch of large-areal average rainfall, with the greatest amounts consistently shown by the models to be over the northwestern half or two-thirds of the District. By Friday morning the remaining rains, some moderately heavy still, should be confined to the southeastern half of the District but are expected to diminish from northwest to southeast as the cold front clears the areas by mid-morning. Although post-frontal light showers could continue over parts of the District Friday afternoon and evening, most areas should experience a relative drying. A second jet stream impulse passing through the eastern United States over the weekend is predicted to be slightly stronger/far south compared to yesterday's solutions, which would keep the frontal boundary south of the area from returning as a warm front. This subtle change since yesterday has resulted in a greater likelihood of drying over the weekend, and today's quantitative precipitation forecast (QPF) reflects this possibility by showing less rain. However, the forecast maintains at least a chance of some shower activity, particularly over the southeast and with a greater chance along/near the east coast. For the week ending next Tuesday morning, the deterministic total QPF is about six tenths of an inch or about 120% of normal while the model probabilistic output indicates a 50-60% chance of rainfall at or above normal for the long-term mean. The large-scale pattern the following week is likely to be feature a strengthening area of mid-level high pressure near or over Florida that would probably begin to weaken by or just after mid-month. The strong area of mid-level high pressure would favor below normal rainfall over Florida and surrounding areas, and given the forecast strength of the high, there is moderate confidence in this outcome.

Kissimmee

Tuesday morning stages were 54.2 feet NGVD (3.8 feet below schedule) in East Lake Toho, 54.6 feet NGVD (0.4 feet below schedule) in Toho, and 51.6 feet NGVD (0.7 feet below schedule) in Kissimmee-Cypress-Hatchineha; headwater stages were 46.3 feet NGVD at S-65A and 25.6 feet NGVD at S-65D. Tuesday morning discharges were 528 cfs at S-65, 875 cfs at S-65A, 853 cfs at S-65D and 1057 cfs at S-65E. Dissolved oxygen concentrations in the Kissimmee River averaged 9.6 mg/L for the previous week through Sunday and mean floodplain depth on Sunday was 0.22 feet. Recommendation: Maintain S-65A discharge at or below 900 cfs to protect USACE construction work on the Kissimmee River and floodplain.

Lake Okeechobee

Lake Okeechobee stage was 12.91 feet NGVD on February 3, 2020, up 0.11 feet from the previous week and down 0.26 feet from the previous month. The Lake remains in the Base Flow sub-band, where it has been since September 11, 2019. Water levels moved below the ecological envelope (which varies seasonally from 12.5 – 15.5 feet NGVD +/- 0.5 feet) on October 15, 2019 and are currently 1.3 feet below the bottom of the envelope. Lake stages below the ecological envelope will continue to benefit recovering submerged and emergent marsh vegetation at low elevations but will reduce aquatic habitat for fish and wildlife. Wading bird and snail kite nesting efforts are likely to be lower for the second consecutive year on the Lake if stages continue below the ecological envelope throughout the breeding season.

Estuaries

Total inflow to the St. Lucie Estuary averaged 1,147 cfs over the past week with no flow coming from Lake Okeechobee. Salinities little changed in the estuary. Salinity at the US1 Bridge is in the good range for adult eastern oysters.

Total inflow to the Caloosahatchee Estuary averaged 1,128 cfs over the past week with 183 cfs coming from the Lake. Salinity little changed in the estuary. Salinities are in the good range for tape grass at Val I-75 and in the fair range at Ft. Myers. Salinities are in the good range for adult eastern oysters at Cape Coral and Shell Point and in the fair range at Sanibel.

Tributary hydrologic conditions are normal. The 2008 LORS release guidance suggests up to 450 cfs at S-79 and up to 200 cfs at S-80.

Everglades Stormwater Treatment Areas

Over the past week, 3,100 acre-feet of Lake Okeechobee water was delivered to the FEBs/STAs. The total amount of Lake releases sent to the FEBs/STAs in WY2020 (since May 1, 2019) is approximately 80,000 acre-feet. The total amount of inflows to the STAs in WY2020 is approximately 858,000 acre-feet. Most STA cells are above target, except STA-1E cells which are near target and STA-5/6 cells that continue to dry out. STA-1E Western Flow-way is offline for West Distribution Cell levee repairs and the Restoration Strategies project to fill and grade Cells 5 and 7. Operational restrictions are in place in STA-1W Northern Flow-way related to STA-1W Expansion #1 startup activities, in STA-3/4 Eastern Flow-way for energy dissipator installation, in STA-1E Eastern and Central Flow-way for Eastern Distribution Cell levee repairs, in STA-1E Central Flow-way, STA-2 Flow-way 3, and STA-2 Flow-way 4 for vegetation management activities, and in STA-5/6 Flow-ways 2 and 3 following the Restoration Strategies project to grade non-effective treatment areas. This week, if 2008 LORS recommends Lake releases to the WCAs and the conditions allow, releases will be sent to STA-2 or A-1 FEB/STA-3/4.

Everglades

A significant amount of rainfall occurred throughout the Everglades last week, particularly in WCA-3A. However, current stages in WCA-3A remain below average (Site 62 in the northwest is -0.20 below and

Site 63 in the northeast is -0.50 below) for this time of year and salinities are above average in Florida Bay. Conserving fresh water in the Everglades, distributing it to where depths are low (WCA-3A North) and allowing it to flow south has important ecological benefit. As wading bird nesting begins in the Everglades, ecological recommendations move toward moderating recession rates where and when possible. Generally, this time of year rates from -0.05 to -0.09 feet per week are desirable to optimize conditions for prey concentration and capture. However, given the below-average stages in key foraging areas it currently remains ecologically desirable to conserve as much water as possible. This recommendation is expected to change as wading bird nesting increases in the Everglades. Significant rain fell over Taylor Slough and Florida Bay this last week causing stage increases and a slight reduction in average salinity, however the lack of an estuarine gradient between the nearshore and the bay remains problematic.

Supporting Information

KISSIMMEE BASIN

Kissimmee Basin Rainfall

The Upper Kissimmee Basin received 0.38 inches of rainfall in the past week and the Lower Basin received 0.88 inches (SFWMD Daily Rainfall Report 2/3/2020).

Upper Kissimmee Basin

Stages and departures in the Kissimmee Chain of Lakes (KCOL) are shown in **Table 1**. KCOL stage hydrographs with respective regulation schedules and rainfall are shown in Figures 1-3.

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: 2/4/2020

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)						
							2/2/20	1/26/20	1/19/20	1/12/20	1/5/20	12/29/19	12/22/19
Lakes Hart and Mary Jane	S-62	0	LKMJ	61.0	R	61.0	**0.0**	0.0	-0.1	0.0	0.0	0.2	0.0
Lakes Myrtle, Preston, and Joel	S-57	10	S-57	61.4	R	61.3	**0.1**	0.0	0.0	0.1	0.1	0.1	0.0
Alligator Chain	S-60	0	ALLI	63.5	R	64.0	**-0.5**	-0.6	-0.5	-0.5	-0.5	-0.7	-0.9
Lake Gentry	S-63	0	LKGT	61.5	R	61.5	**0.0**	-0.1	-0.1	-0.1	-0.1	-0.3	-0.6
East Lake Toho	S-59	0	TOHOE	54.3	R	58.0	**-3.7**	-3.4	-3.2	-3.1	-2.8	-2.9	-3.1
Lake Toho	S-61	351	TOHOW, S-61	54.6	R	55.0	**-0.4**	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
Lakes Kissimmee, Cypress, and Hatchineha	S-65	808	KUB011, LKIS5B	51.7	R	52.5	**-0.8**	-0.7	-0.6	-0.6	-0.7	-1.0	-1.4

[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] A = projected ascension line, R = USACE regulation schedule, S = temporary recession target line, T = temporary schedule, 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: **2/4/2020**

Metric	Location	1-Day Average	Average for the Preceeding 7-Days[1]								
		2/2/2020	2/2/20	1/26/20	1/19/20	1/12/20	1/5/20	12/29/19	12/22/19	12/15/19	12/8/19
Discharge (cfs)	S-65	1,016	808	719	606	408	211	283	317	347	359
Discharge (cfs)	S-65A[2]	915	727	737	557	445	314	317	315	302	318
Discharge (cfs)	S-65D[2]	832	785	777	632	438	553	454	408	344	346
Headwater Stage (feet NGVD)	S-65D[2]	25.85	25.76	25.77	25.78	25.76	25.75	25.84	25.76	25.81	25.88
Discharge (cfs)	S-65E[2]	800	759	713	601	434	502	441	386	342	307
Discharge (cfs)	S-67	0	0	0	0	4	0	0	0	0	0
DO (mg/L)[3]	Phases I & II/III river channel	9.4	9.6	9.0	8.3	9.1	9.0	9.2	9.7	9.7	9.3
Mean depth (feet)[4]	Phase I floodplain	0.22	0.18	0.18	0.25	0.20	0.26	0.23	0.16	0.11	0.11

[1]Seven-day average of weighted daily means through Sunday midnight.
[2]S-65A discharge combines S-65A with auxillary strucutures; S-65D discharge combines discharge at S-65D, S-65DX1, and S-65DX2; S-65D stage averages stage at S-65D and S-65DX1; S-65E discharge combines S-65E and S-65EX1.
[3]DO is the average for sondes at KRBN, PC62, PC33, PD62R, and PD42R.
[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)

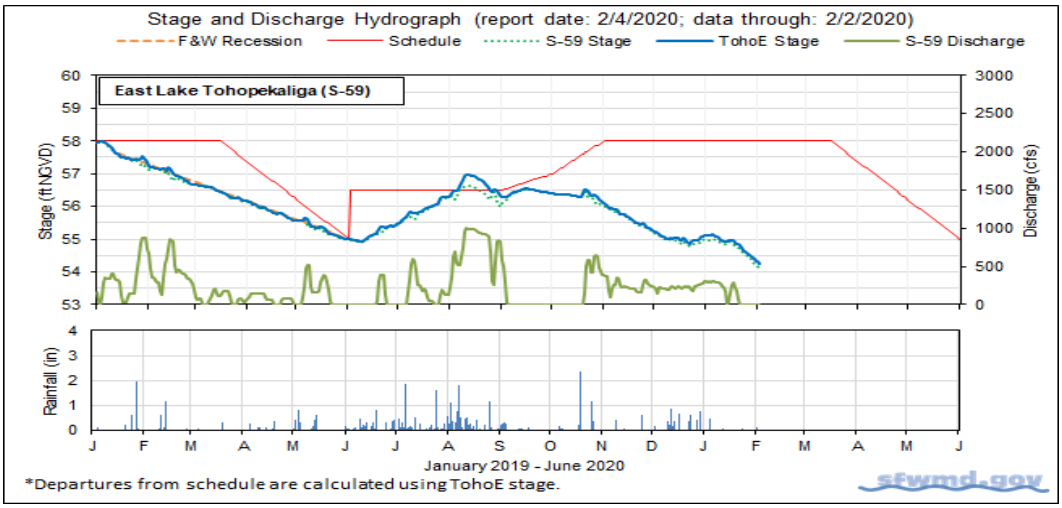


Figure 1.

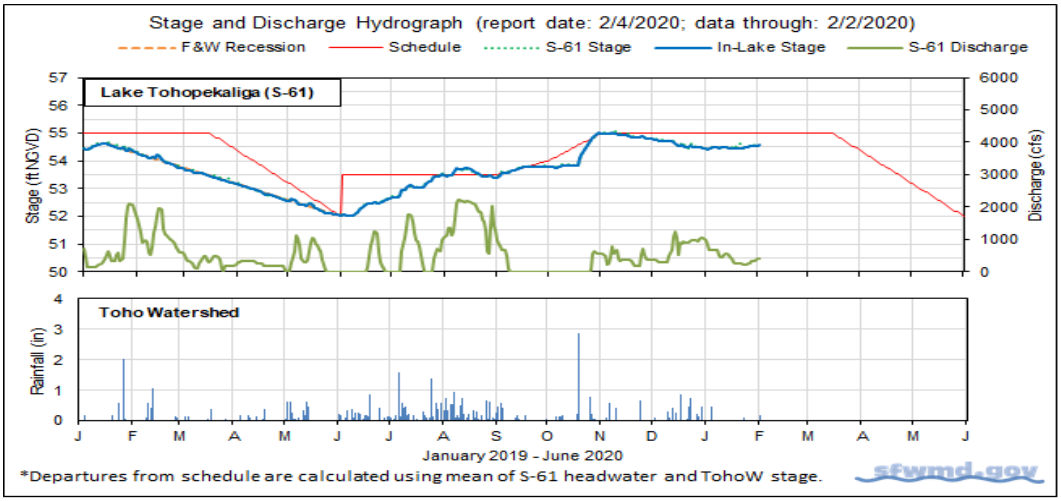


Figure 2.

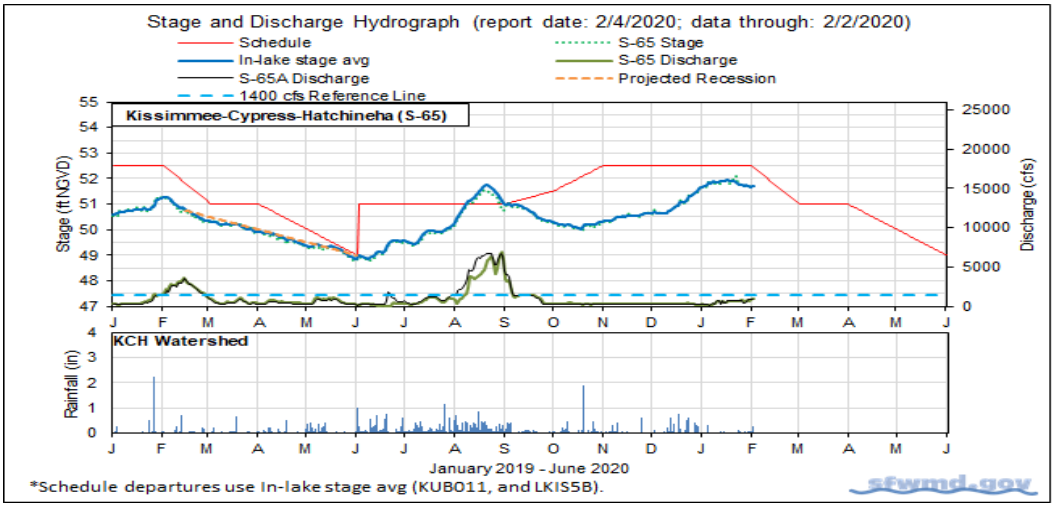


Figure 3.

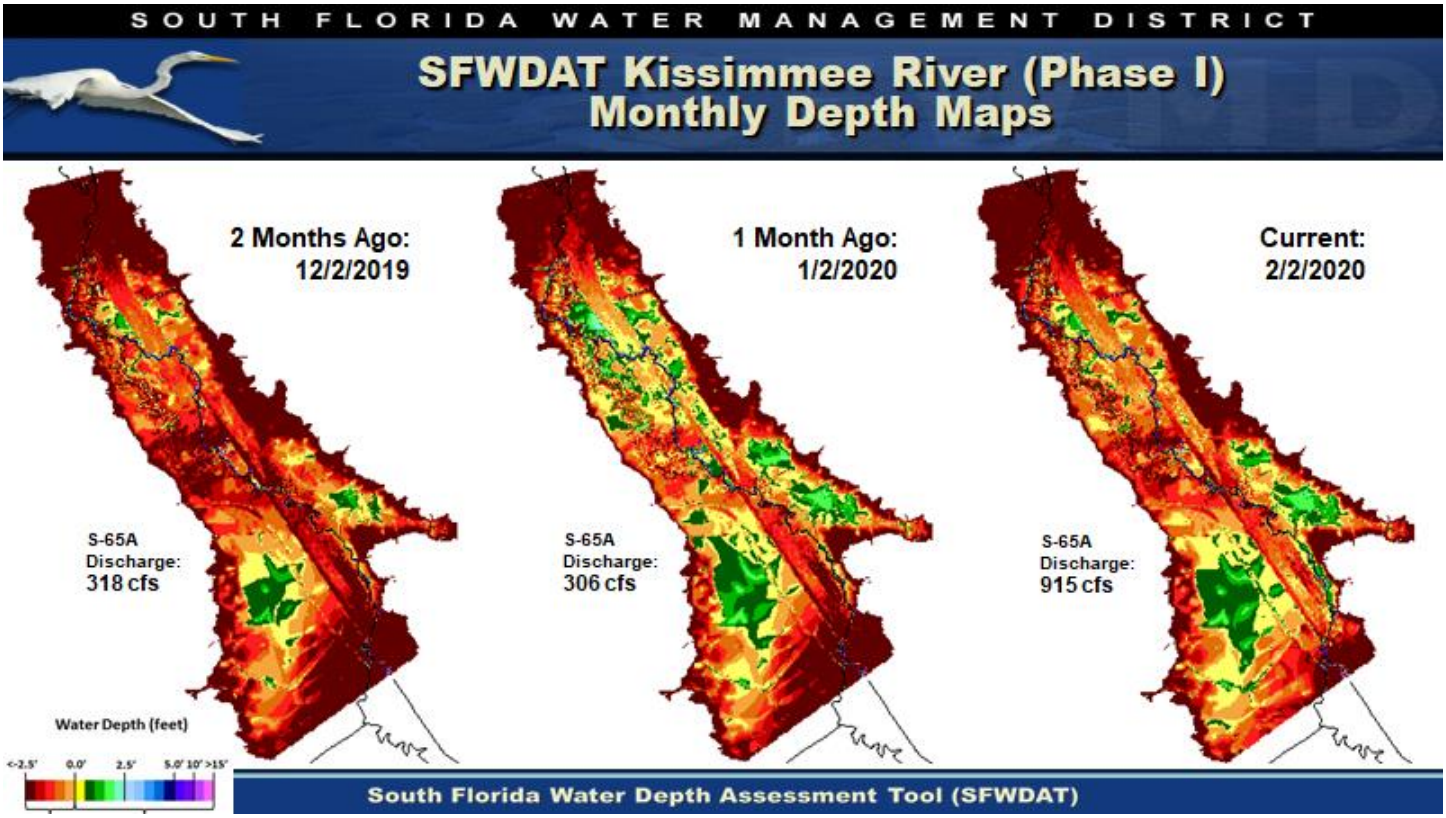


Figure 4. Phase I area floodplain water depths for this week, one month ago, and two months ago. Note that the WDAT color-coding has been modified to accommodate greater water depths; these maps are not directly comparable to Kissimmee Basin WDAT maps published prior to January 16, 2012.

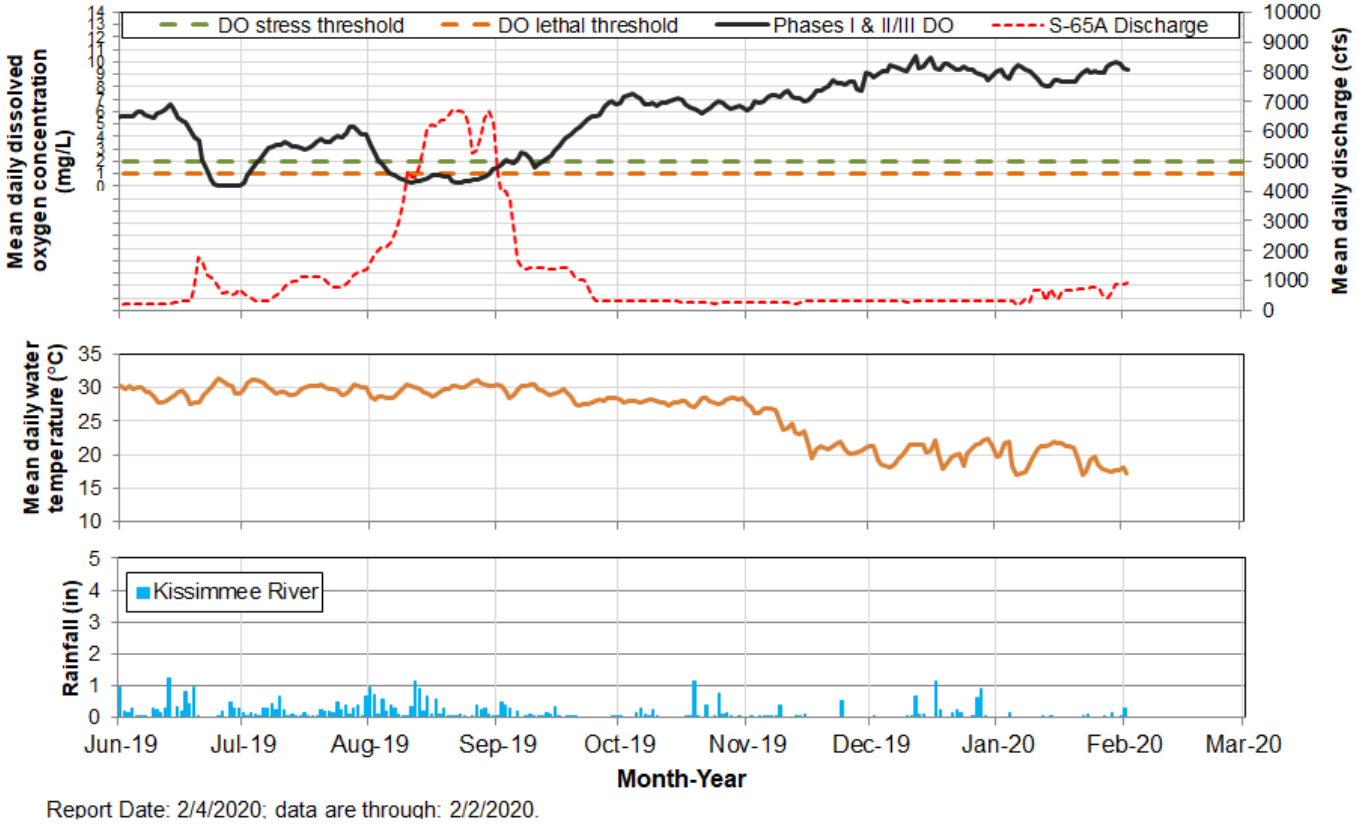


Figure 5. Mean daily dissolved oxygen, discharge, temperature and rainfall in the Phases I/II/III river channel.

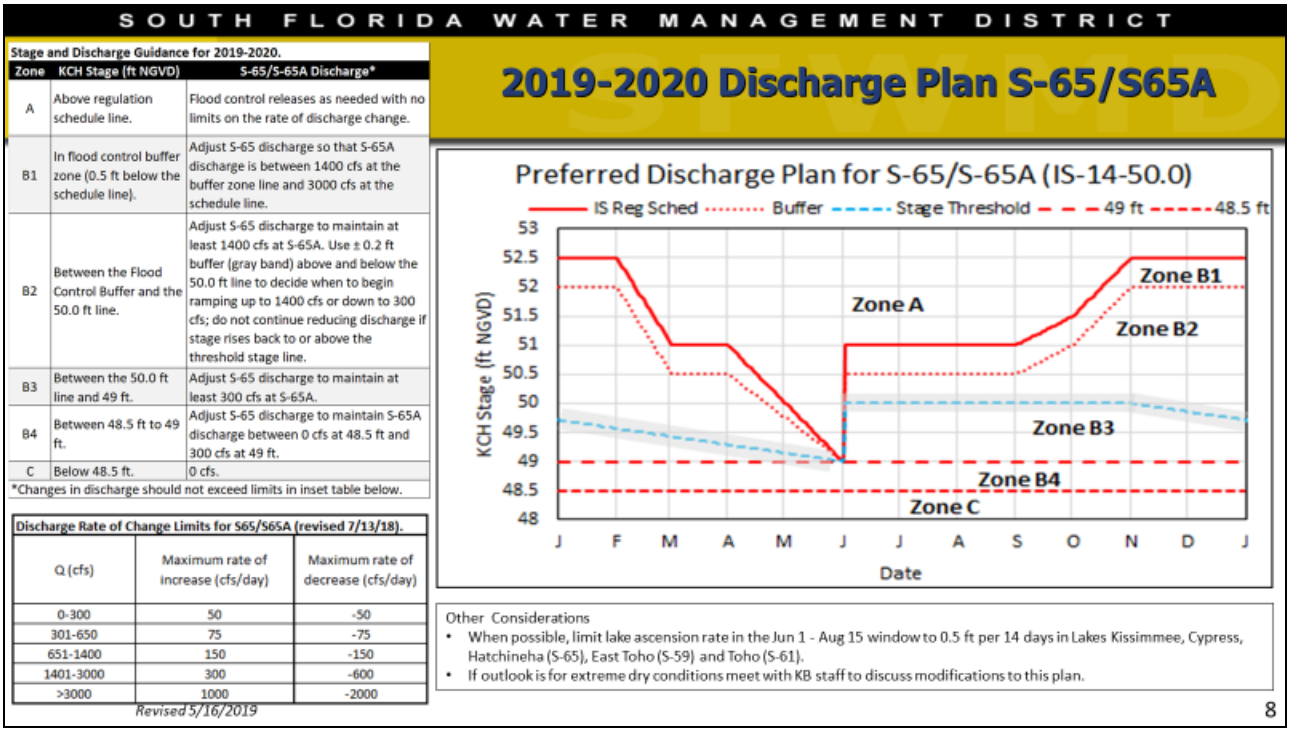


Figure 6. The 2019-2020 Discharge Plan for S-65/S-65A.

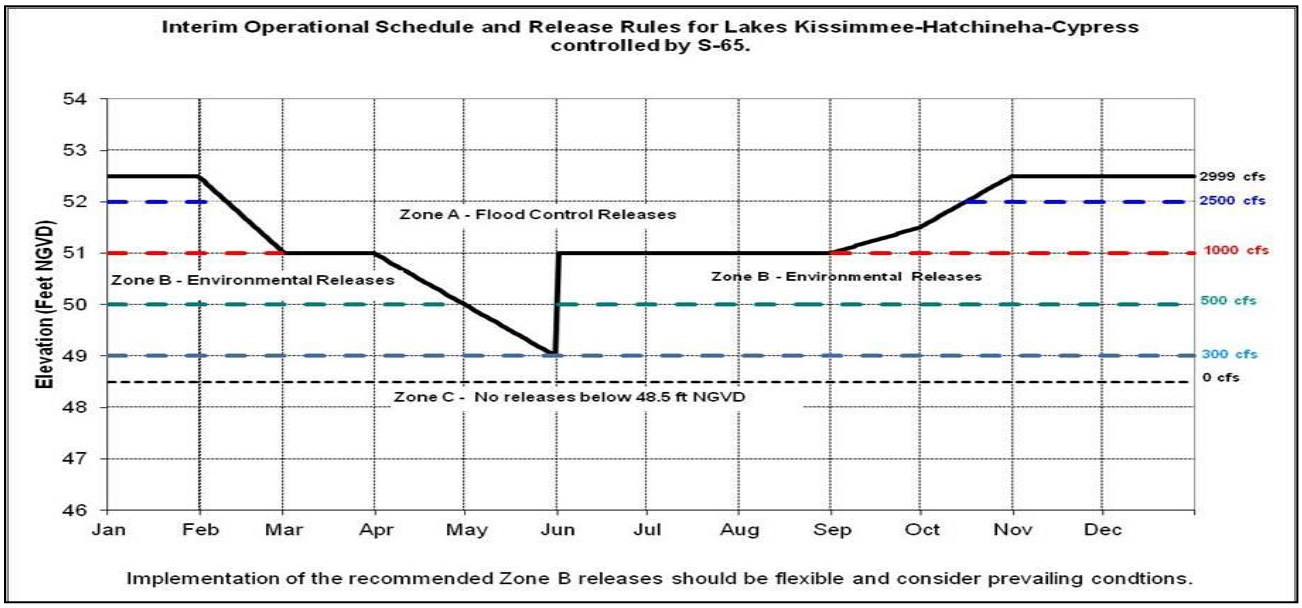


Figure 7. Interim operations schedule for S-65. The discharge schedule shown to the right has not been used in recent years.

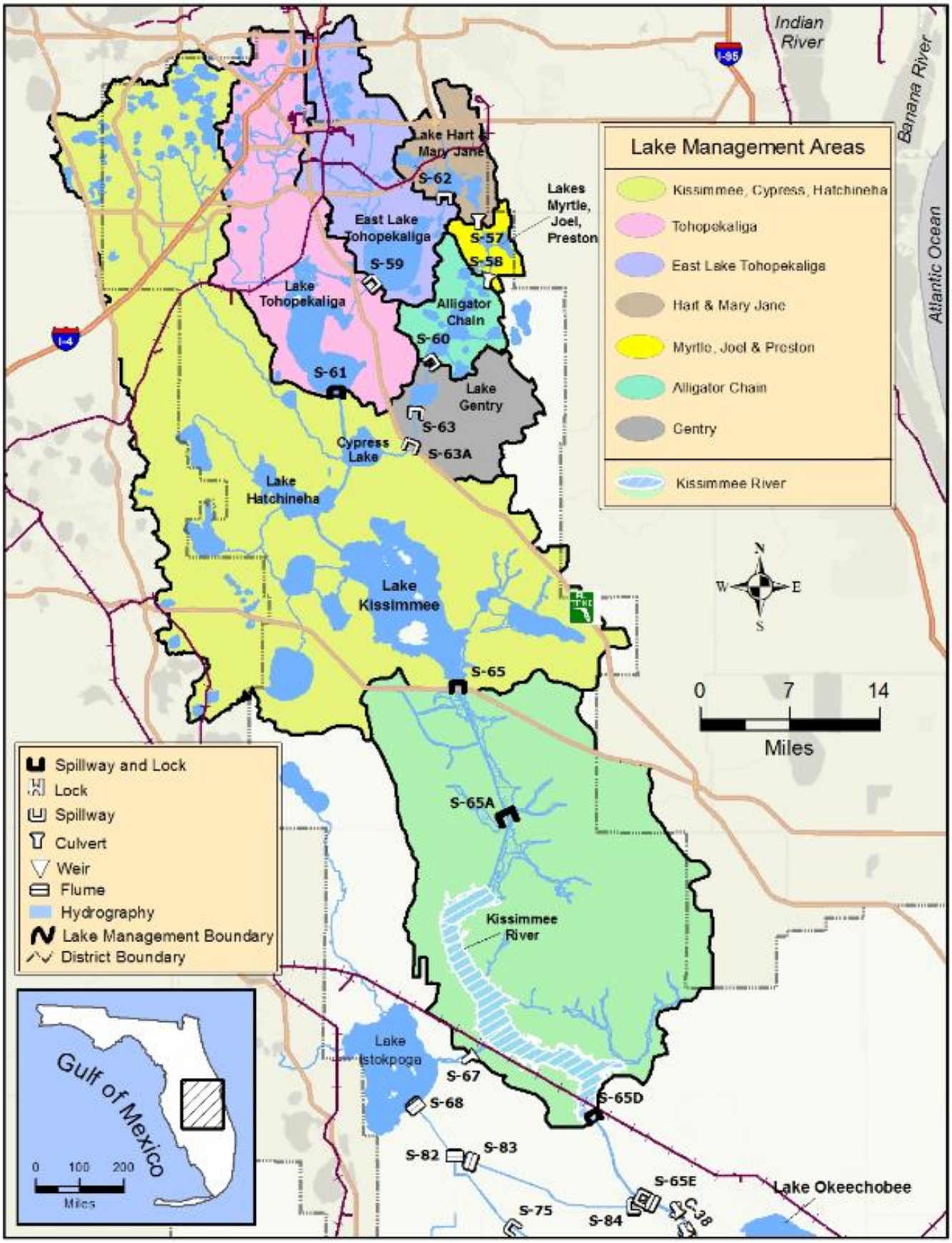


Figure 8. The Kissimmee Basin.

LAKE OKEECHOBEE

Lake Okeechobee stage is 0.26 feet lower than a month ago and 0.2 feet higher than a year ago (Figure 1). The Lake is currently 1.3 feet below the preferred ecological envelope (Figure 2). Lake stages moved up into the Low sub-band on September 4, 2019 then moved back down into the Base Flow sub-band on September 11, 2019 where it has remained since (Figure 3). Lake stage has hovered around 13.0 feet since late November 2019. According to RAINDAR, 1.6 inches of rain fell directly over the Lake during the past week, while much of the northern watershed received less than 0.5 inches (Figure 4).

The average daily inflows (minus rainfall) rose slightly from the previous week, while outflows decreased. Most of the inflow came from the Kissimmee River (S-65E & S-65EX1), while most of the outflows were released south through the S-350 structures. Total lake inflows and outflows for the past 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 5 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 three-month averages (November – January) for select water quality samples are compared to the same period over the past five water years (2015 – 2019) in Figure 6. All the 2020 nearshore zone averages were similar to values prior to Hurricane Irma (the effects of which are reflected in 2018 values). Dissolved inorganic nitrogen (DIN), total phosphorus (TP), and turbidity were slightly higher in the pelagic zone than 2016 or 2015 but reduced from 2017 or 2018 levels. Passing cold fronts can substantially alter water quality during this time of year, as windy conditions easily resuspend sediments across the large, shallow lake.

The most recent available satellite imagery (February 2, 2020) using NOAA's cyanobacteria monitoring product derived from EUMETSAT's Sentinel 3 OLCI sensor data showed that bloom potential is low across the majority of the central and eastern portions of the Lake, with a continued moderate risk along the western shoreline (Figure 7).

Water Management Summary

Lake Okeechobee stage increased 0.11 feet from the previous week and is 0.2 feet higher than last year. The Lake remains well below (1.3 feet) the ecological envelope for this time of year, which improves light penetration in shallow nearshore areas but reduces available habitat for fish and wildlife. Potential for cyanobacterial blooms on the Lake remains low, though the west and southwest shorelines continue to show higher bloom potential than the rest of the Lake according to satellite monitoring products. January water quality samples showed slightly elevated levels of Chlorophyll *a* (>20 µg/L) in the same south/southwest vicinity.

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

INFLOWS	Previous week Avg Daily CFS	Avg Daily Flow cfs	Equivalent Depth Week Total (in)
S-65E & S-65EX1	730	773	0.3
S-71 & S-72	0	39	0.0
S-84 & S-84X	0	5	0.0
Fisheating Creek	13	18	0.0
S-154	0	0	0.0
S-191	0	0	0.0
S-133 P	0	0	0.0
S-127 P	0	0	0.0
S-129 P	0	5	0.0
S-131 P	3	5	0.0
S-135 P	0	0	0.0
S-2 P	0	0	0.0
S-3 P	0	0	0.0
S-4 P	0	0	0.0
L-8 Backflow		18	0.0
Rainfall	155	3633	1.6
Total	**901**	**4498**	**2.0**

OUTFLOWS	Previous week Avg Daily CFS	Avg Daily Flow cfs	Equivalent Depth Week Total (in)
S-77	799	231	0.1
S-308	612	399	0.2
S-351	335	274	0.1
S-352	241	133	0.1
S-354	902	312	0.1
L-8 Outflow	7		
ET	1205	1441	0.6
Total	**4102**	**2790**	**1.3**

Provisional Data

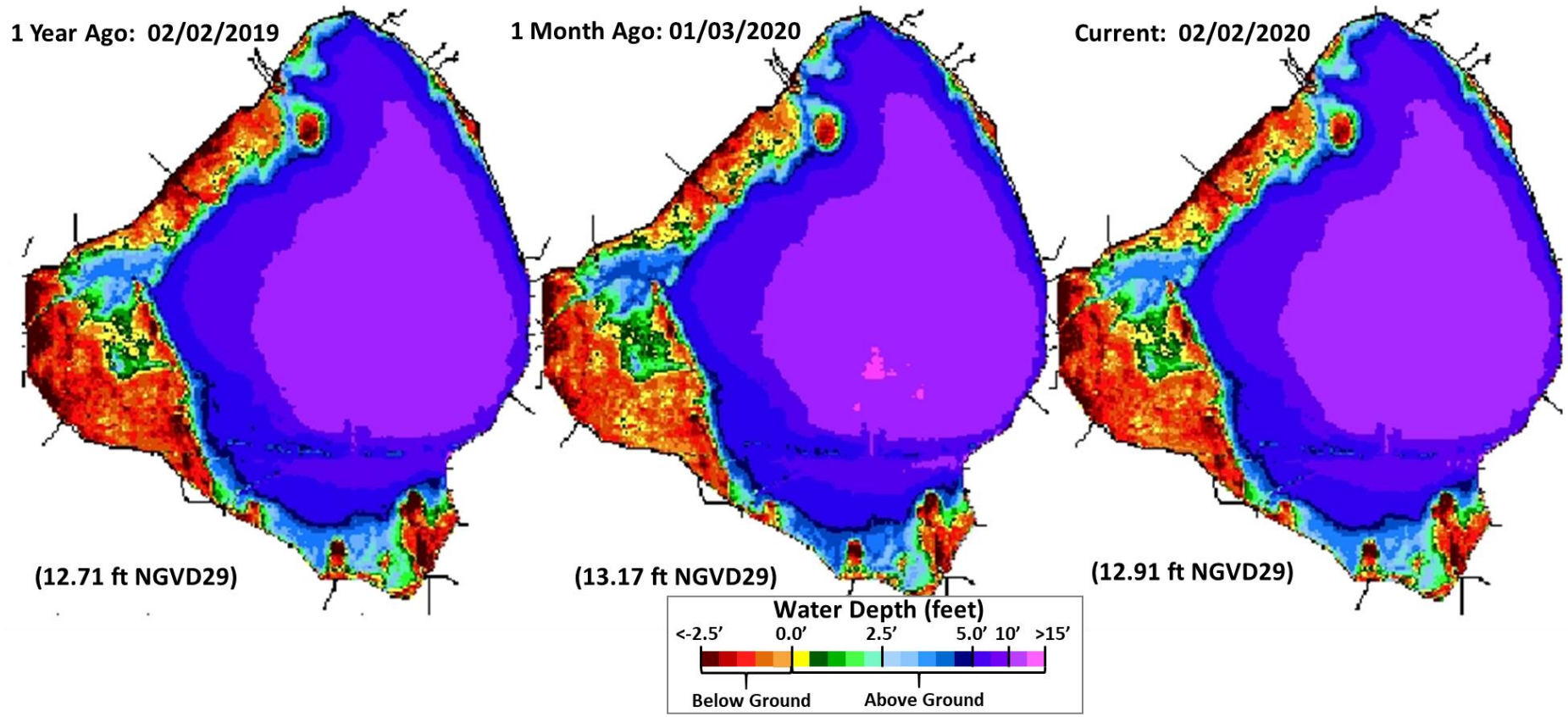


Figure 1. Water depth estimates on Lake Okeechobee based on the South Florida Water Depth Assessment Tool.

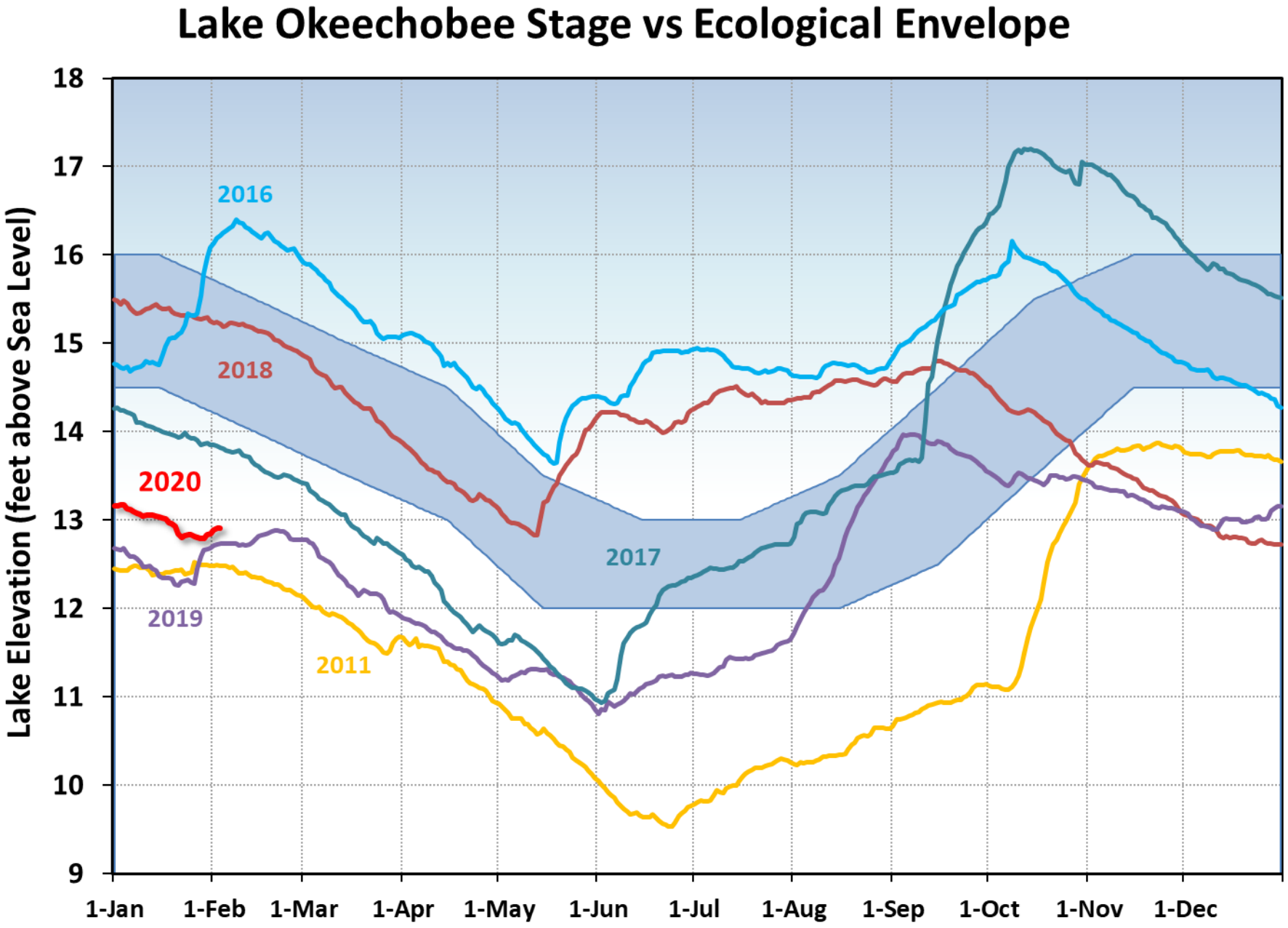


Figure 2. Select annual stage hydrographs for Lake Okeechobee in comparison to the Ecological Envelope.

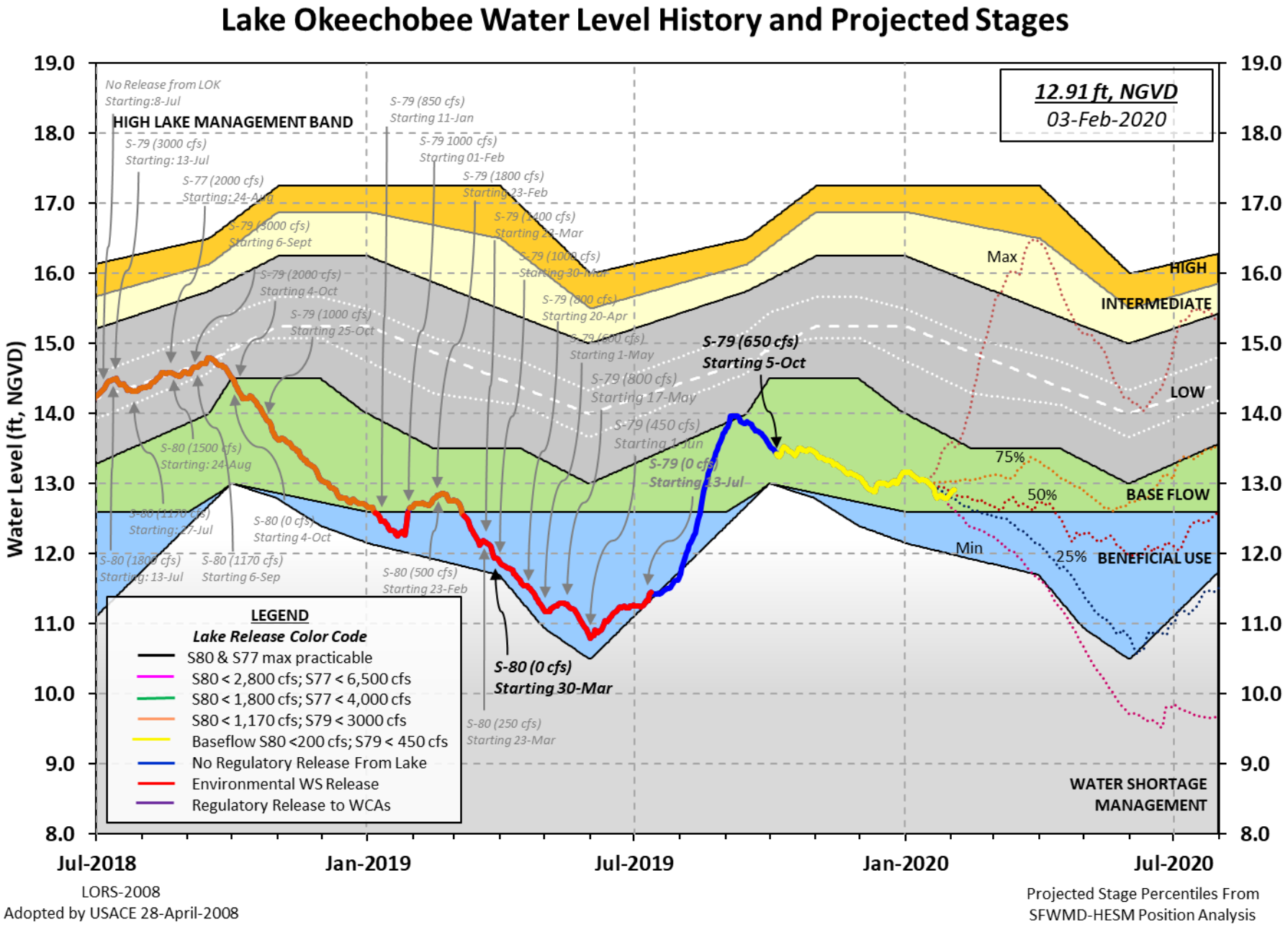


Figure 3. Recent Lake Okeechobee stage and releases, with projected stages based on a dynamic position analysis.

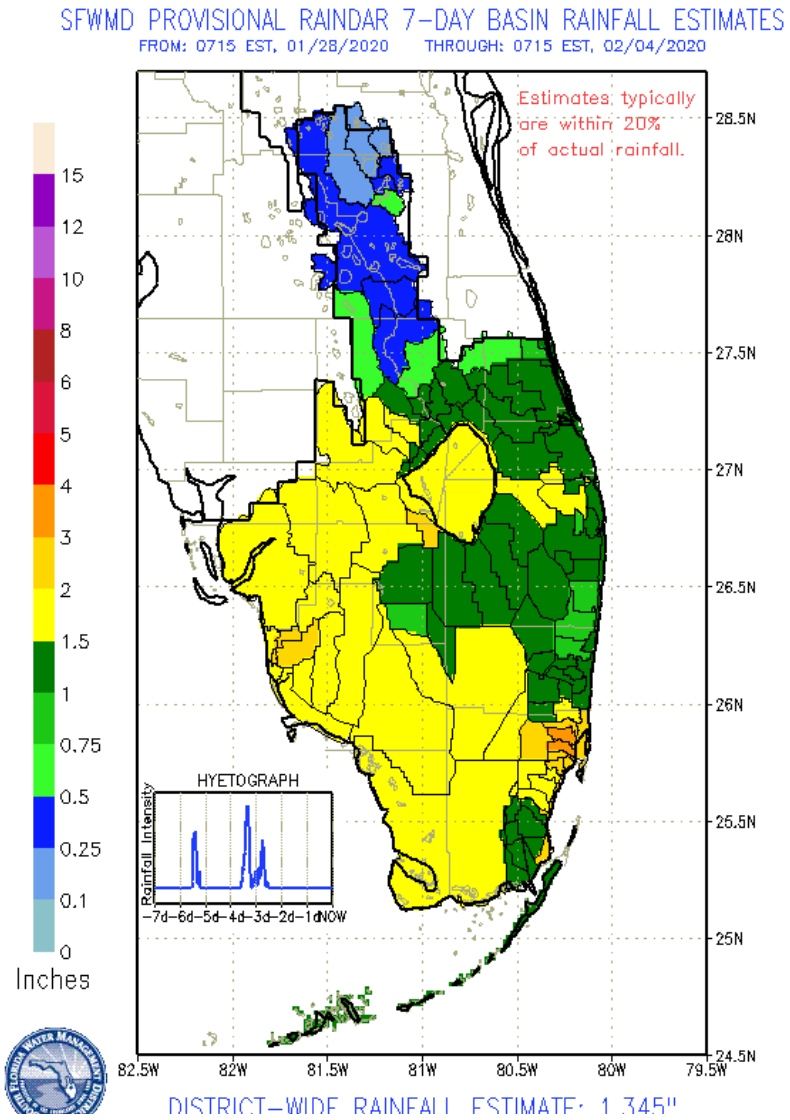


Figure 4. 7-Day rainfall estimates by RAINDAR.

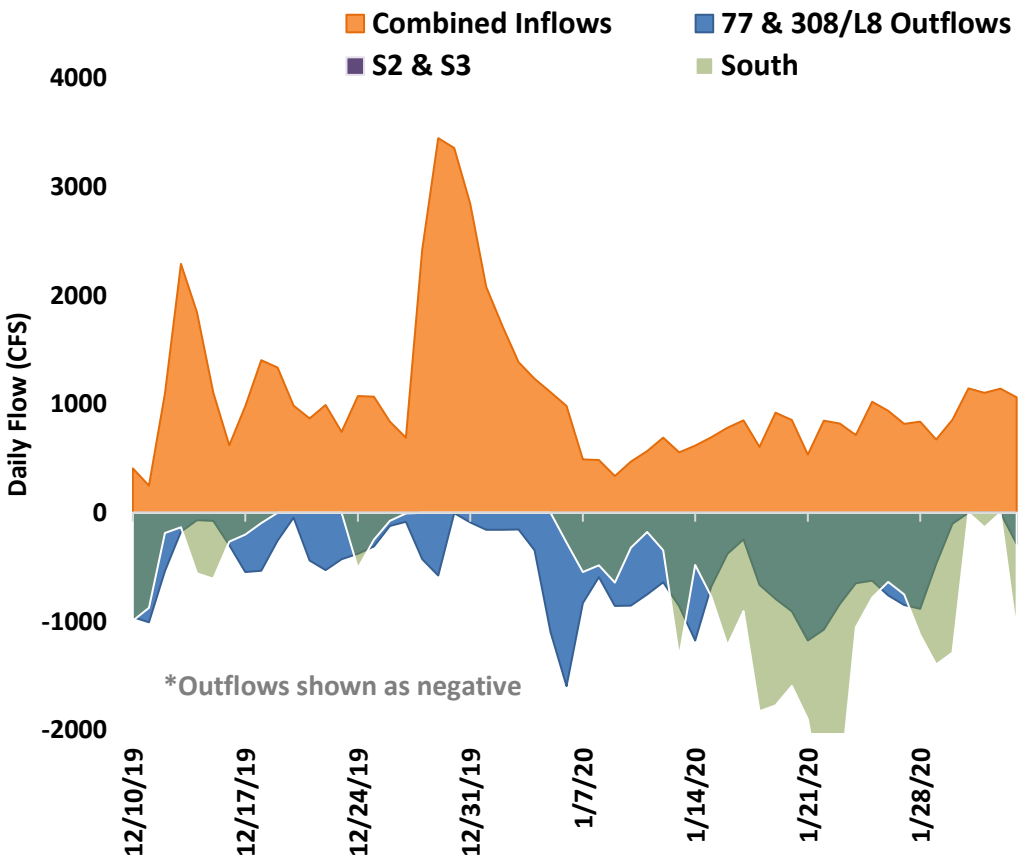
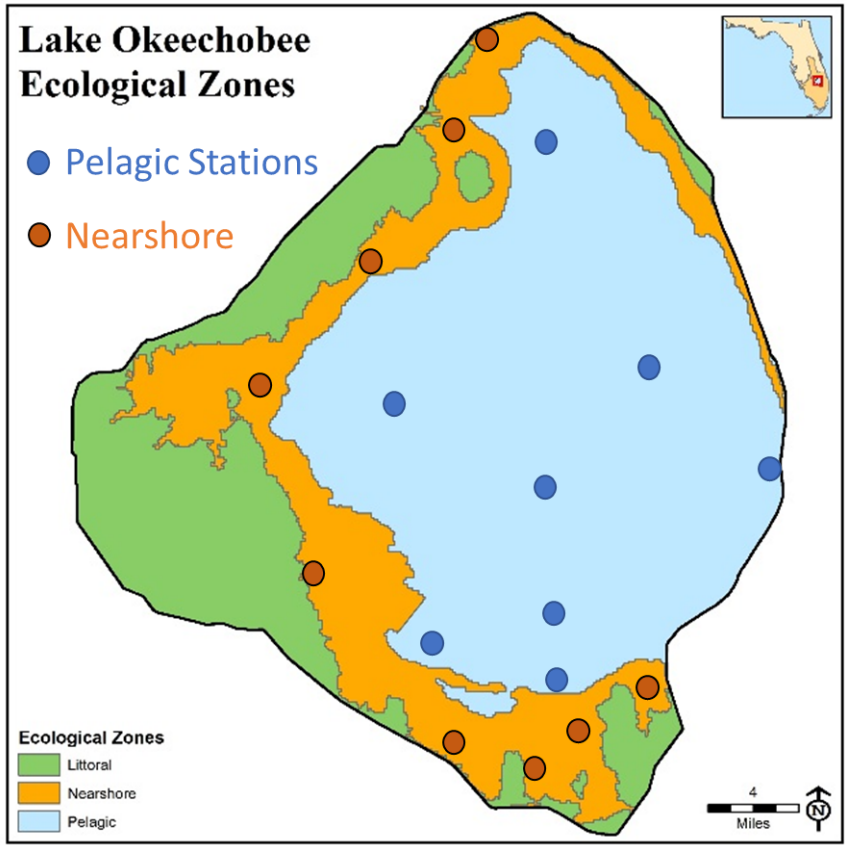


Figure 5. Major inflows (orange) and outflows (blue) of Lake Okeechobee, including the S-350 structures designated as South (green). The L-8 Canal flows through Culvert 10A are included as outflows when positive, and as inflows when backflowing into the Lake. All inflows and outflows are shown as positive and negative, respectively, for visual purposes. Outflows through the S-77 and S-308 structures are shown based on their downstream gauges to account for lock openings for navigation.



Average November – January WQ for water years 2015-2020*

Location	Year	Chla (ug/L)	DIN (mg/L)	TN (mg/L)	SRP (mg/L)	TP (mg/L)	Turbidity (NTU)
Nearshore	2015	22.5	0.181	1.3	0.030	0.093	13.3
	2016	21.2	0.213	1.26	0.026	0.089	15.3
	2017	21.5	0.214	1.37	0.030	0.110	21.1
	2018	9.9	0.454	1.82	0.091	0.197	40.8
	2019	27.0	0.066	1.41	0.013	0.091	15.0
	2020	17.3	0.172	1.25	0.024	0.087	12.8
Pelagic	2015	12.2	0.222	1.37	0.044	0.141	44.9
	2016	12.6	0.242	1.42	0.042	0.139	44.7
	2017	10.3	0.395	1.70	0.048	0.191	70.1
	2018	5.6	0.538	2.11	0.076	0.254	105.6
	2019	16.9	0.178	1.33	0.045	0.142	36.8
	2020	10.6	0.310	1.49	0.047	0.153	50.1

Chlorophyll *a* (Chla), Dissolved Inorganic Nitrogen (DIN), Total Nitrogen (TN), Soluble Reactive Phosphorus (SRP), Total Phosphorus (TP).
Color bars are scaled to values by column.

Figure 6. Recent three-month averages (November 2019 – January 2020) for select water quality parameters averaged across nearshore (n=9) and pelagic (n=8) monitoring stations, compared across the previous five years (2015 – 2019). Colored bars are scaled by values in each column for ease of interpretation. Measured parameters are Chlorophyll *a* (Chla), Dissolved Inorganic Nitrogen (NH4 and NOx), Total Nitrogen (TN), Soluble Reactive Phosphorus (SRP = OPO4), Total Phosphorus (TP), and turbidity. Data are provisional.

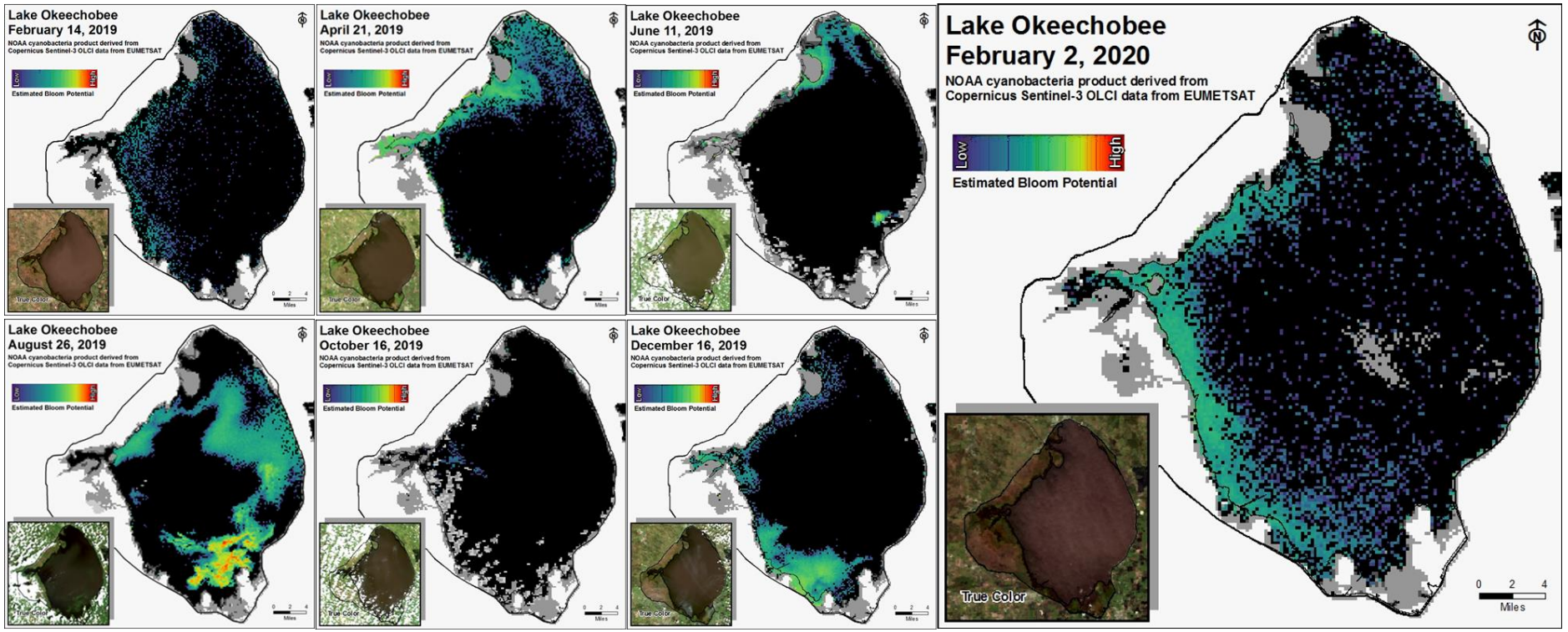


Figure 7. Potential for cyanobacterial blooms on Lake Okeechobee in 2019 and 2020, based on NOAA's harmful algal bloom monitoring system derived from Copernicus Sentinel-3 OLCI data from EUMETSAT. Gray indicates cloud cover.

ESTUARIES

St. Lucie Estuary:

Last week total inflow to the St. Lucie Estuary averaged approximately 1,147 cfs (Figures 1 and 2) and last month inflow averaged about 636 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 are provisional).

Location	Flow (cfs)
Tidal Basin Inflow	853
S-80	0
S-308	399
S-49 on C-24	73
S-97 on C-23	113
Gordy Rd. structure on Ten Mile Creek	108

Over the past week in the estuary, surface salinity increased at HR1, remained about the same at US1 Bridge, and decreased at A1A Bridge (Table 2, Figures 3 and 4). The seven-day moving average of the water column (an average of the surface and bottom salinity) at the US1 Bridge is 19.8. Salinity conditions in the middle estuary are estimated to be within 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)	**15.1** (13.4)	**18.3** (19.4)	NA[1]
US1 Bridge	**18.6** (18.4)	**20.6** (21.1)	10.0-26.0
A1A Bridge	**24.7** (25.8)	**27.5** (28.7)	NA[1]

[1]Envelope not applicable

Caloosahatchee Estuary:

Last week total inflow to the Caloosahatchee Estuary averaged approximately 1,128 cfs (Figures 5 and 6) and last month inflow averaged about 942 cfs. Last week's provisional averaged inflows from the structures are shown in Table 3.

Table 3. Weekly average inflows (data is provisional).

Location	Flow (cfs)
S-77	231
S-78	597
S-79	1009
Tidal Basin Inflow	119

Over the past week in the estuary, salinity increased to Ft. Myers Yacht Basin, decreased to Shell Point, and remained about the same at Sanibel (Table 4, Figures 7 & 8). The seven-day average salinity values are within the good range for adult eastern oysters at Cape Coral and at Shell Point and in the fair range at Sanibel (Figure 9). The seven-day average surface salinities (Table 4) are in the good range for tape grass at Val I-75 and in the fair range at Ft. Myers.

Table 4. Seven-day average salinity at six monitoring stations in the Caloosahatchee Estuary. Current average is in bold, previous average in parentheses. The envelope reflects the preferred salinity range for associated sampling sites.

Sampling Site	Surface	Bottom	Envelope
S-79 (Franklin Lock)	**4.0** (3.5)	**4.1** (3.6)	NA[1]
Val I75	**4.7** (4.6)	**6.5** (5.8)	0.0-5.0[2]
Ft. Myers Yacht Basin	**10.8** (10.1)	**13.6** (12.9)	NA
Cape Coral	**17.6** (18.3)	**19.4** (20.0)	10.0-30.0
Shell Point	**26.2** (27.1)	**27.1** (27.6)	10.0-30.0
Sanibel	**30.7** (30.7)	**31.3** (30.8)	10.0-30.0

[1]Envelope not applicable and [2]Envelope is based on a 2-week forecast 30-day average (see Table 5 below).

Forecast of surface salinity (Table 5 and Figure 10) at Val I-75 for the next two weeks using the autoregression model (Qiu and Wan, 2013) coupled with a linear reservoir model for the tidal basin predicts daily salinity ranging from 3.4 to 7.1 at the end of the two week period for pulse release at S-79 ranging from 0 to 1000 cfs and Tidal Basin inflows of 115 cfs. The 30-day moving average surface salinity at Val I-75 is forecast to be between 3.9 and 5.2 (Table 5). The current salinity conditions at Val I-75 are within the envelope of salinity 0.0-5.0 for this site (Table 4).

Table 5. Predicted salinity at Val I-75 at the end of forecast period

Scenario	Q79 (cfs)	TB runoff (cfs)	Daily salinity	30 day Mean
A	0	115	7.1	5.2
B	450	115	5.6	4.6
C	650	115	4.1	4.2
D	800	115	3.8	4.1
E	1000	115	3.4	3.9

Red tide

The Florida Fish and Wildlife Research Institute reported on January 31, 2020, that *Karenia brevis, the Florida red tide dinoflagellate,* was observed at very low concentrations in one sample collected from Lee County. *Karenia brevis* was not observed in samples collected from Palm Beach, Broward or Miami-Dade counties (no samples were analyzed this week from St. Lucie or Martin counties).

Water Management Recommendations

Lake stage is in the Base Flow sub-band. Tributary conditions are normal. SFWMD's Lake Okeechobee Adaptive Protocol's Release Guidance suggests up to 450 cfs @ S-79 and up to 200 cfs @S-80.

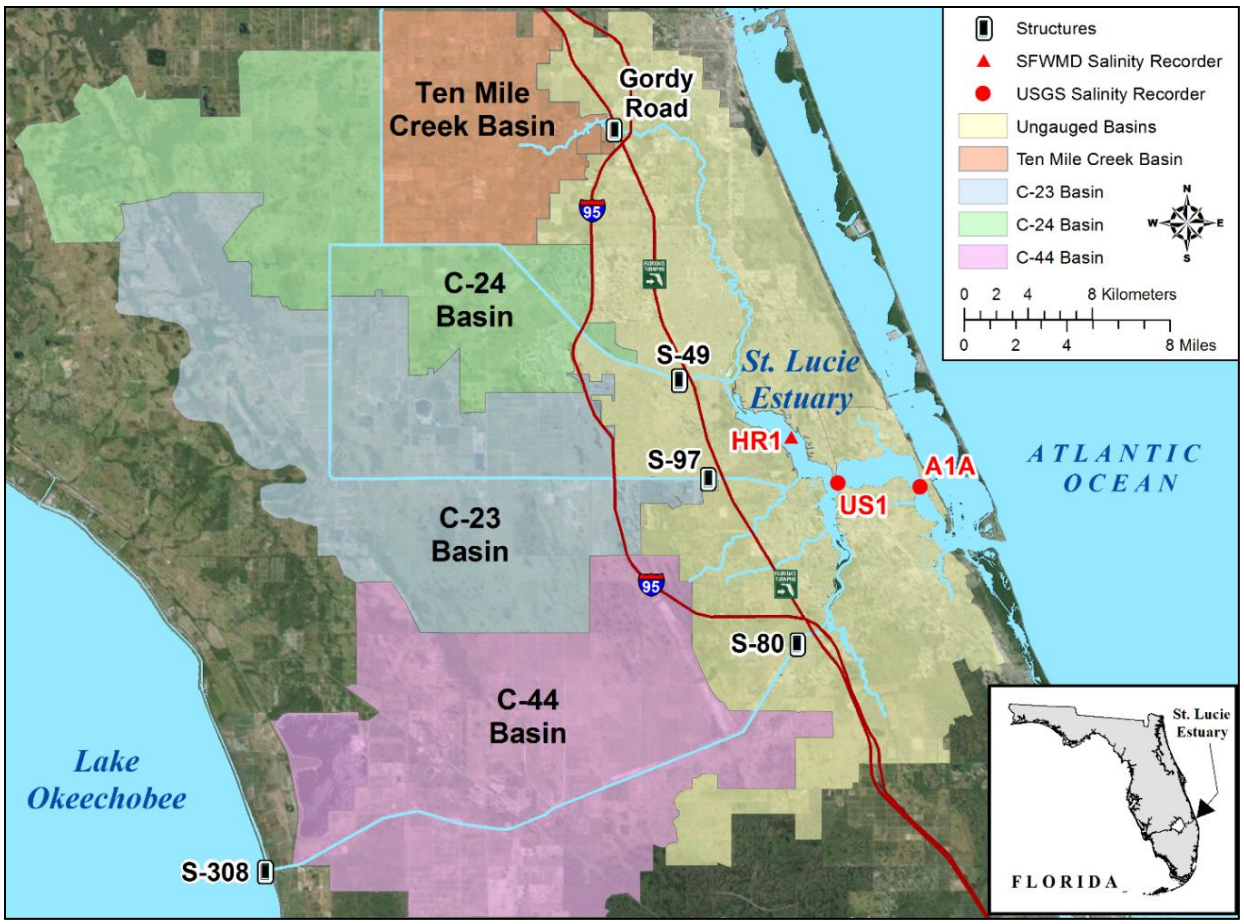


Figure 1. Basins, water control structures, and salinity monitoring for the St. Lucie Estuary.

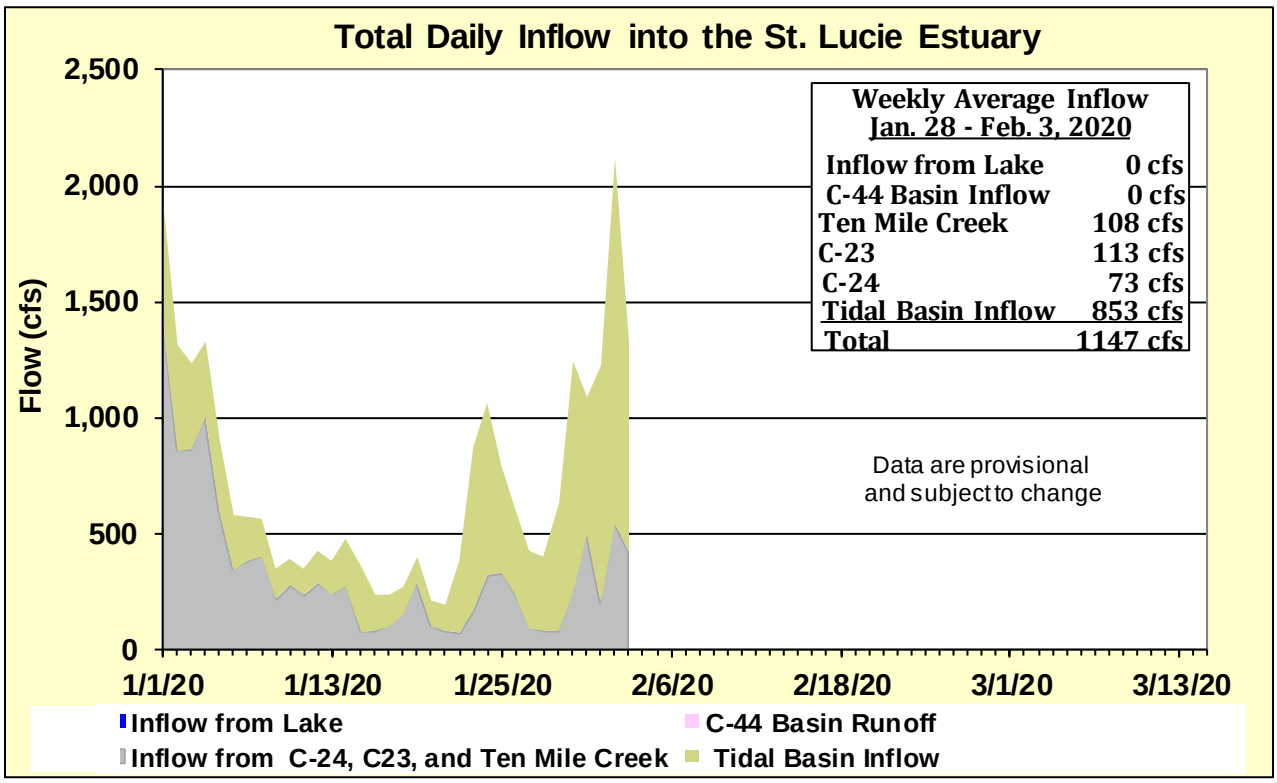


Figure 2. Total daily inflows from Lake Okeechobee and runoff from the C-44, C-23, C-24, Ten Mile Creek, and tidal basin into the St. Lucie Estuary.

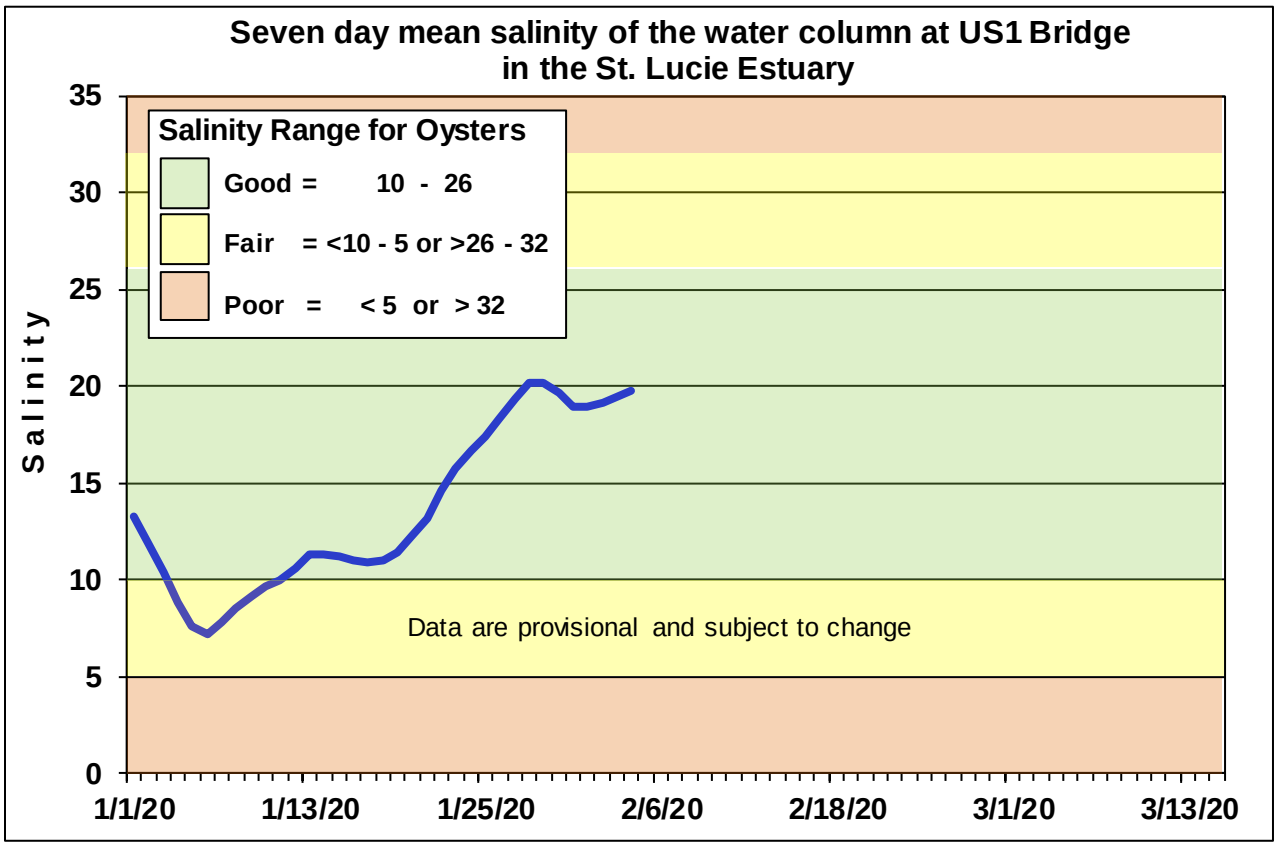


Figure 3. Seven-day mean salinity of the water column at the US1 Bridge.

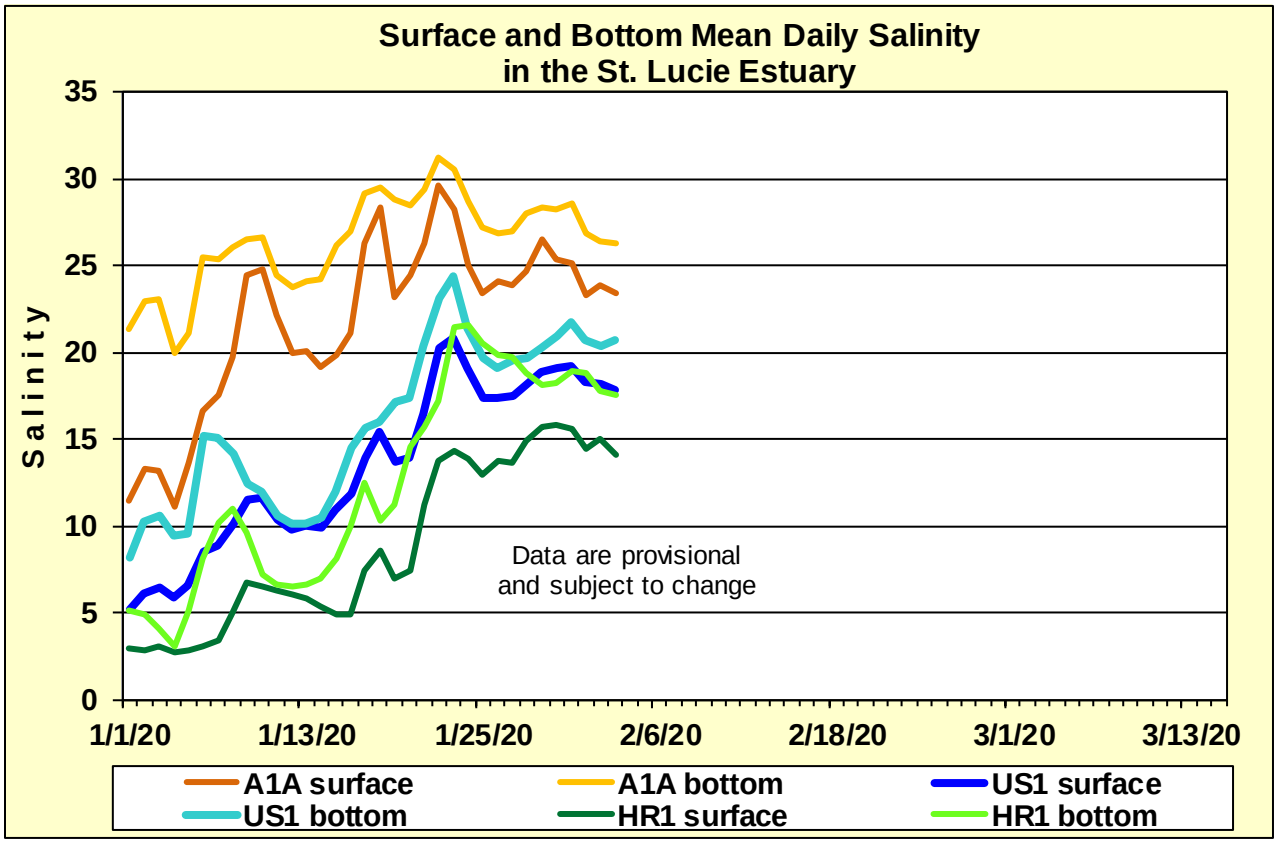


Figure 4. Daily mean salinity at the A1A, US1, and HR1 stations.

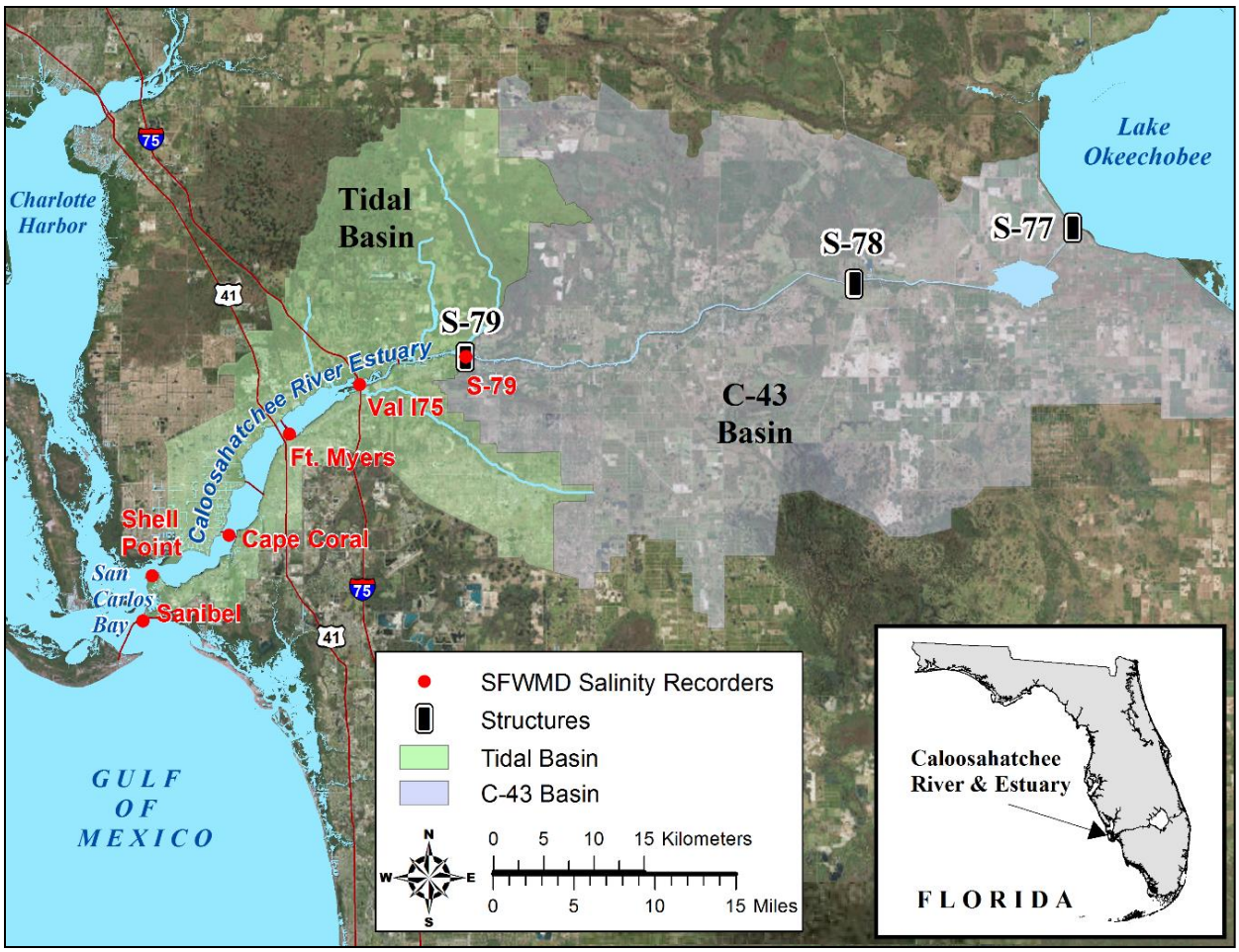


Figure 5. Basins, water control structures, and salinity monitoring for the Caloosahatchee Estuary.

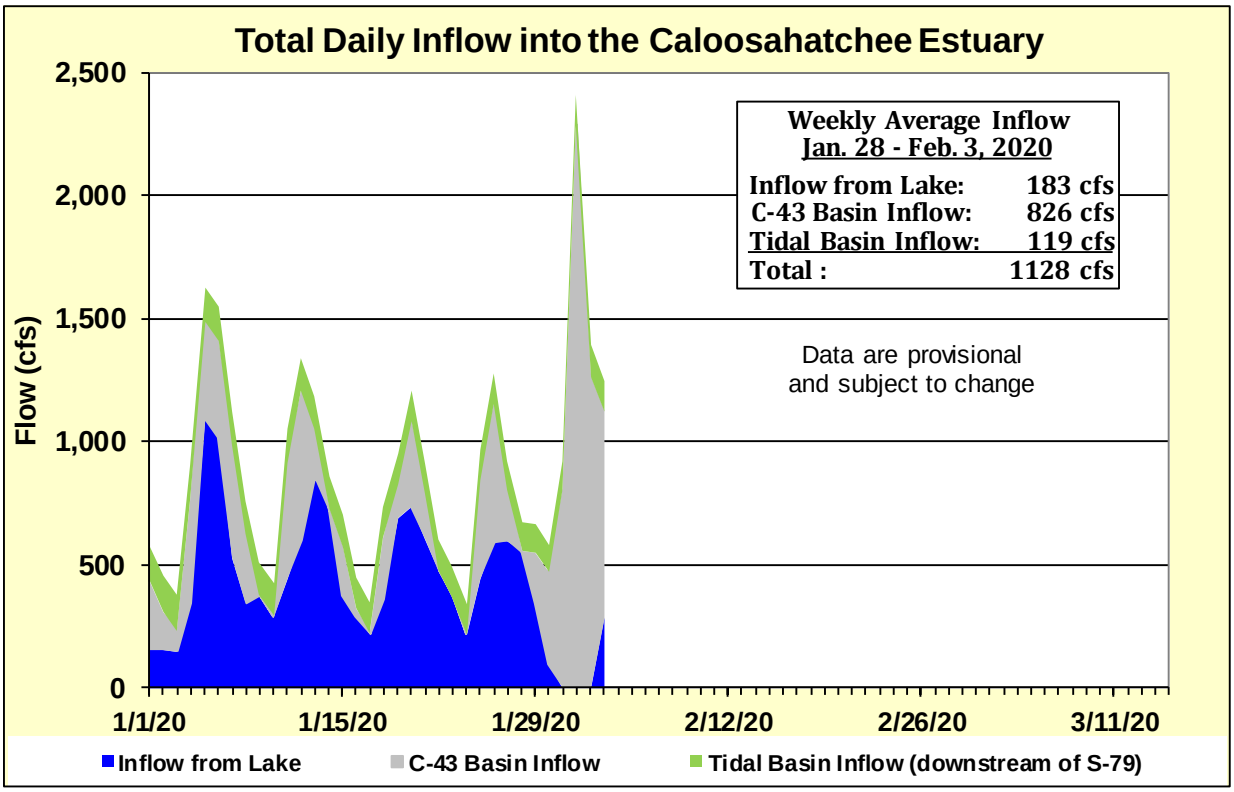


Figure 6. Total daily inflows from Lake Okeechobee, runoff from the C-43 basin

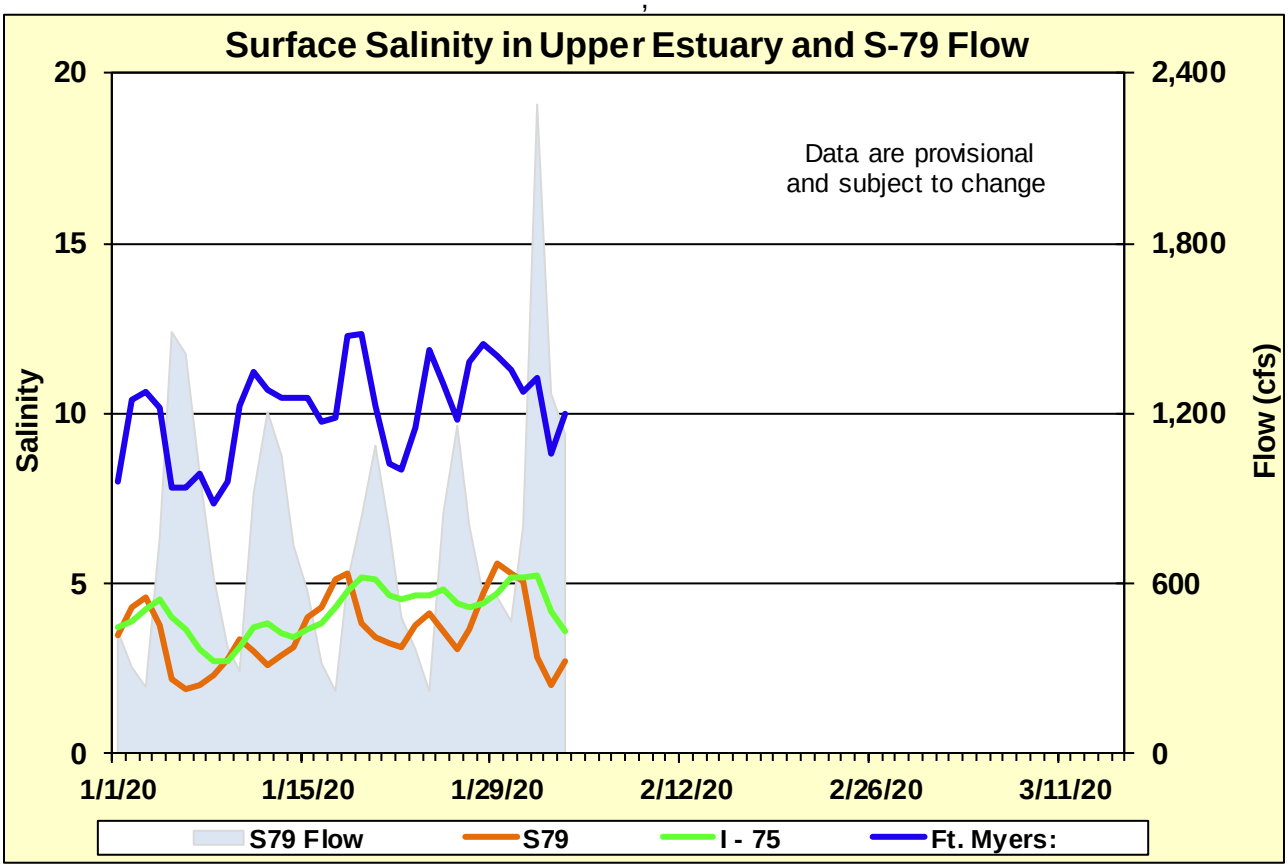


Figure 7. Daily mean flows at S-79 and salinity at upper estuary monitoring stations.

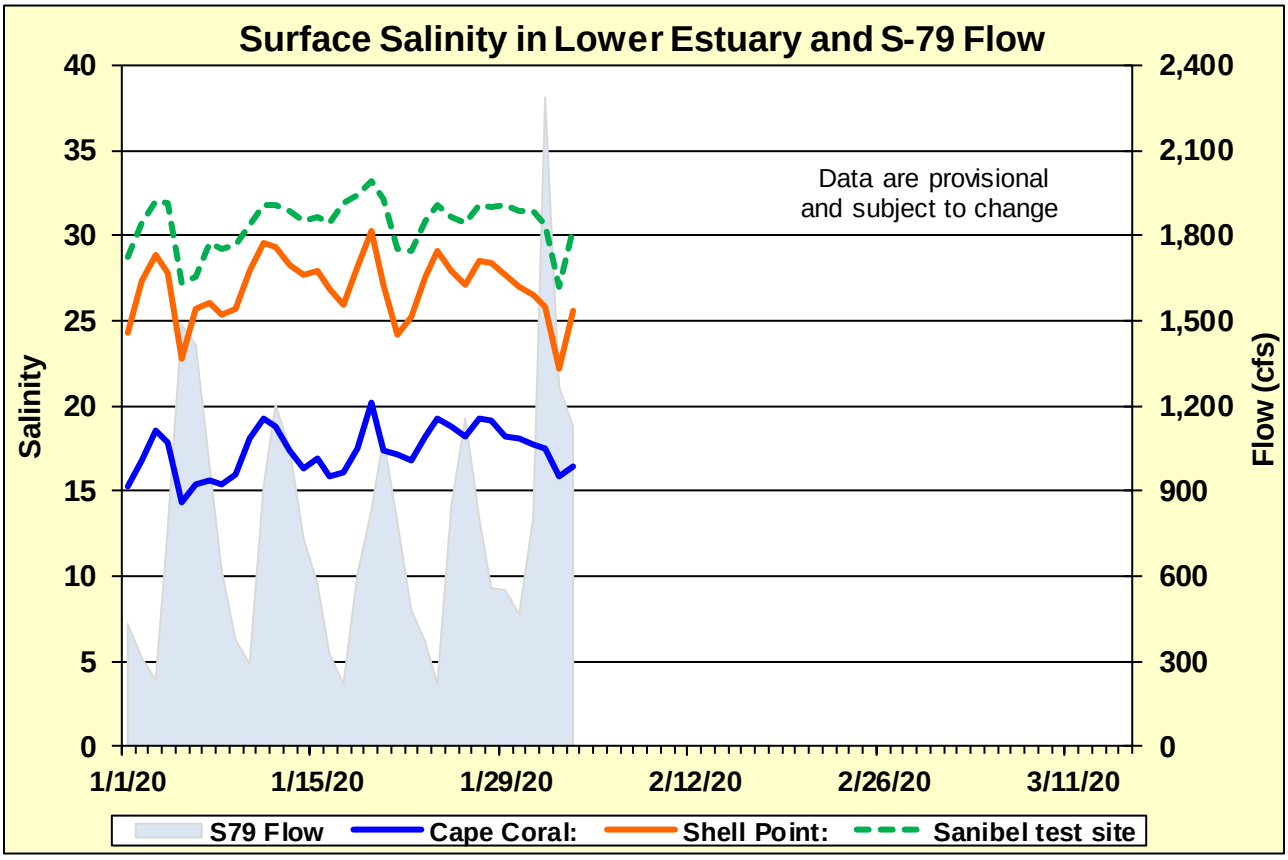


Figure 8. Daily mean flows at S-79 and salinity at lower estuary stations.

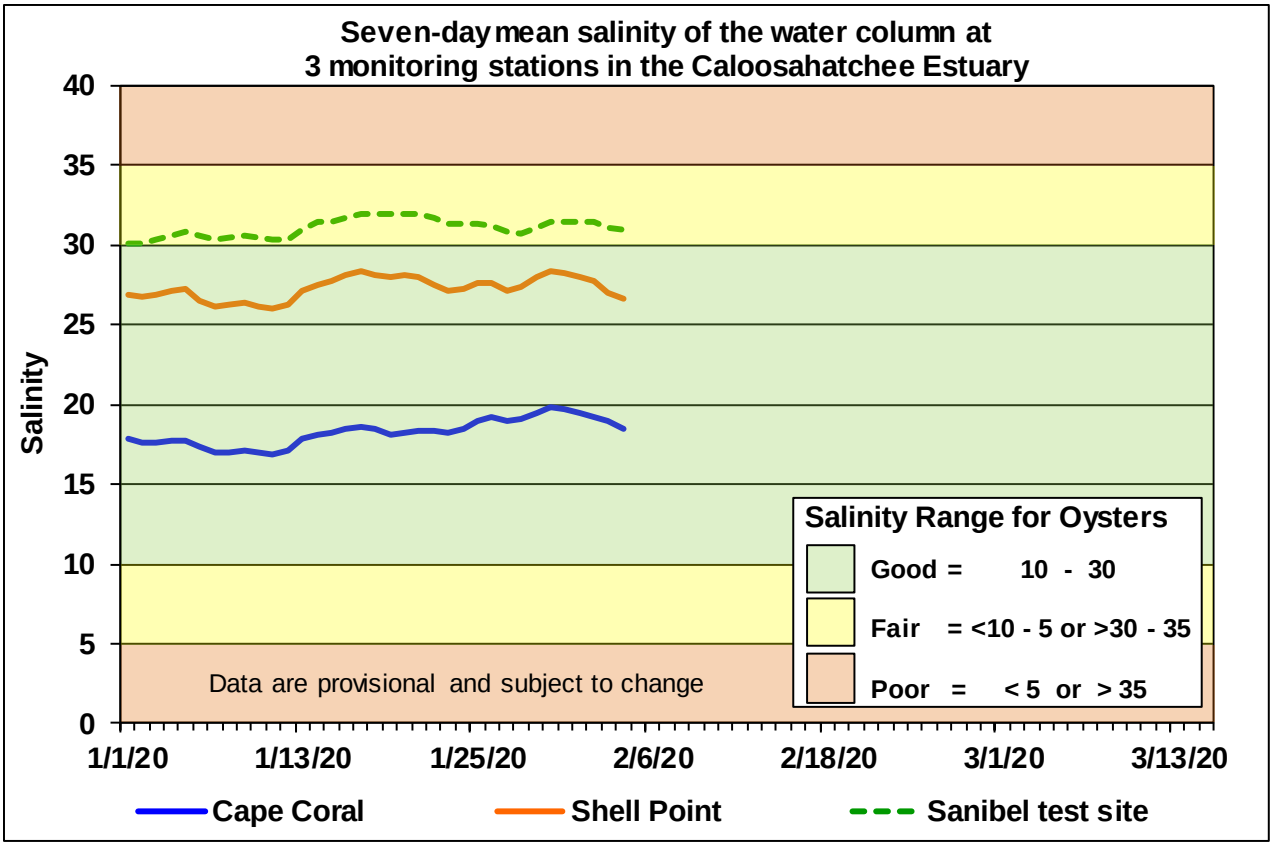


Figure 9. Seven-day mean salinity at Cape Coral, Shell Point, and Sanibel monitoring stations.

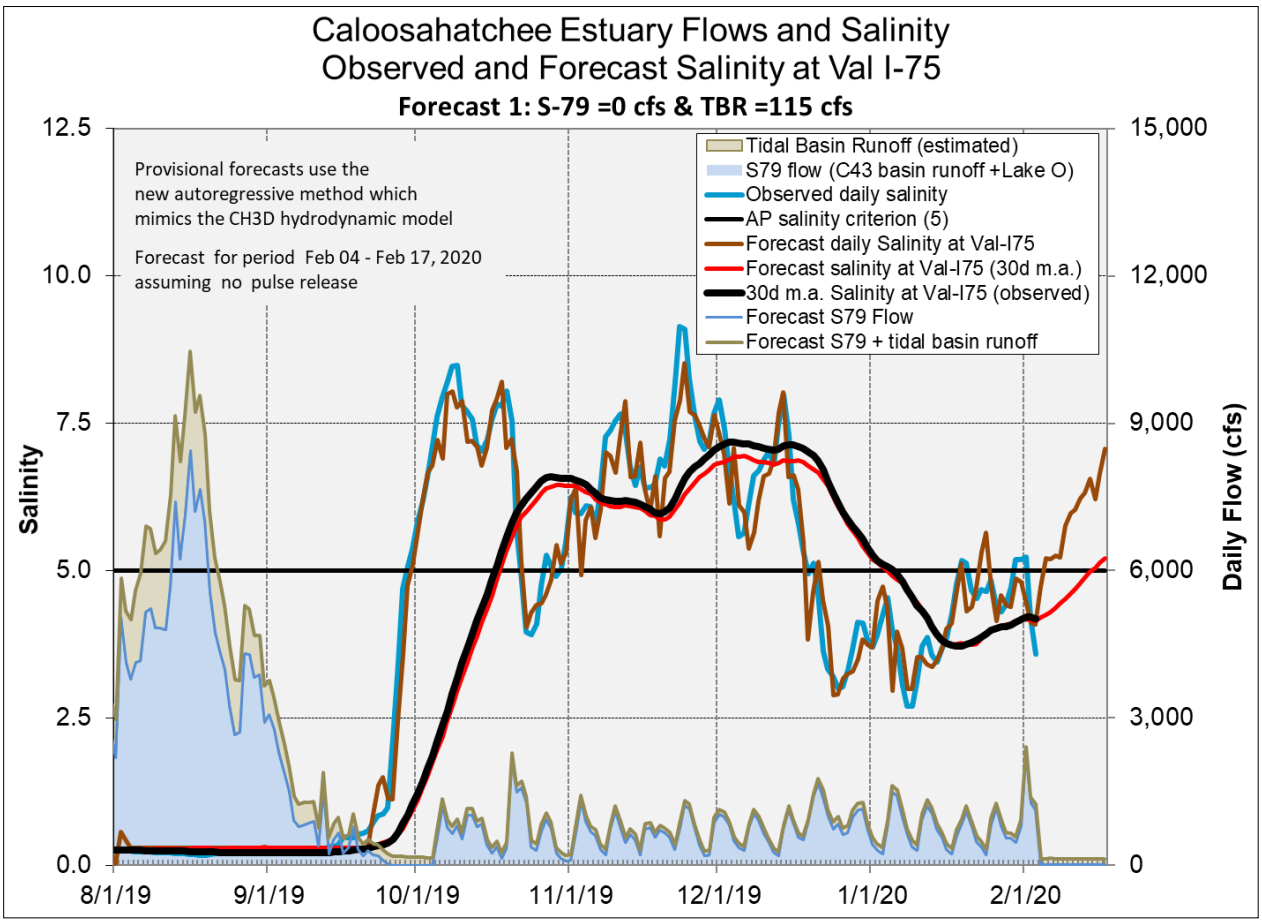
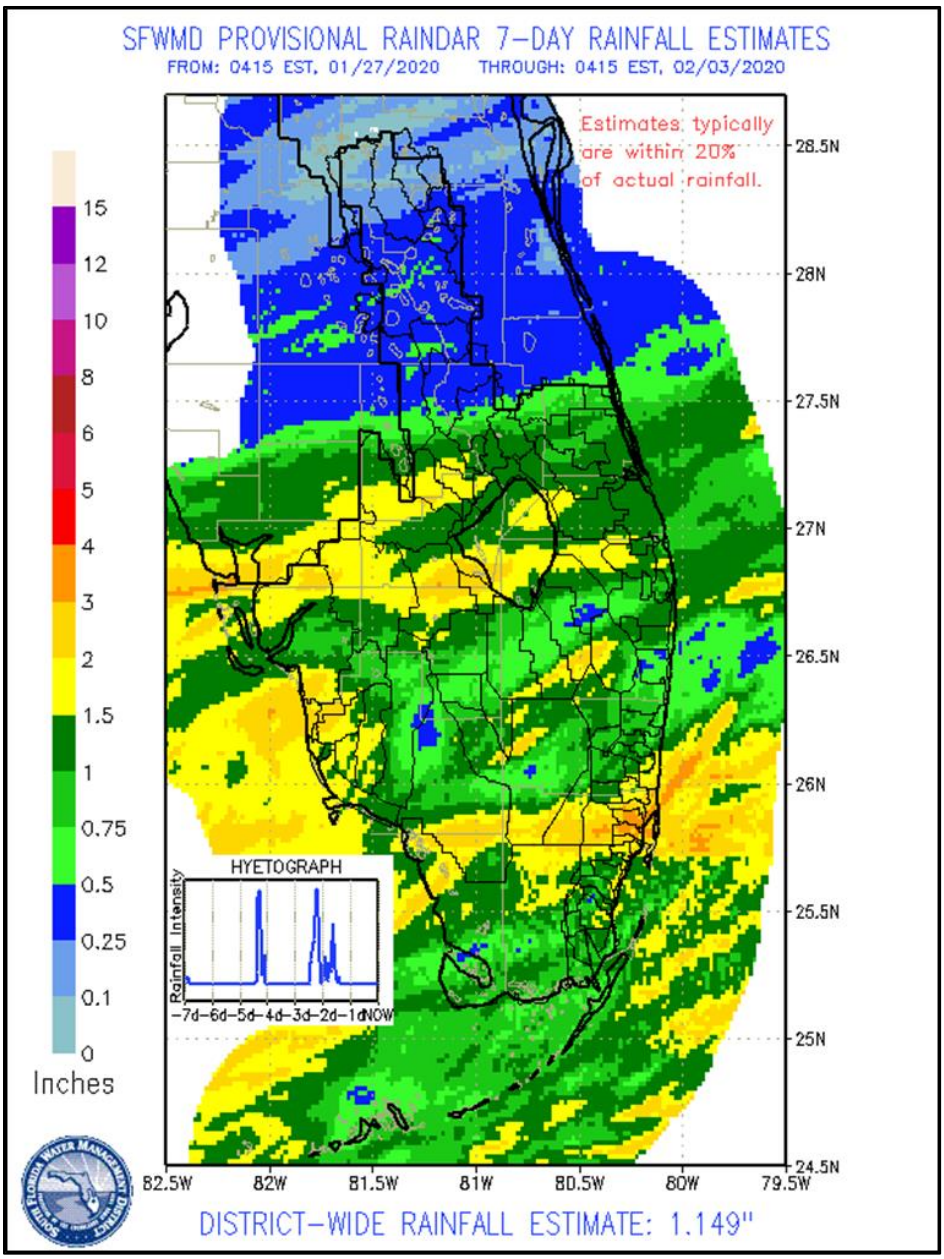


Figure 10. Forecasted Val I-75 surface salinity assuming no pulse release at S-79.

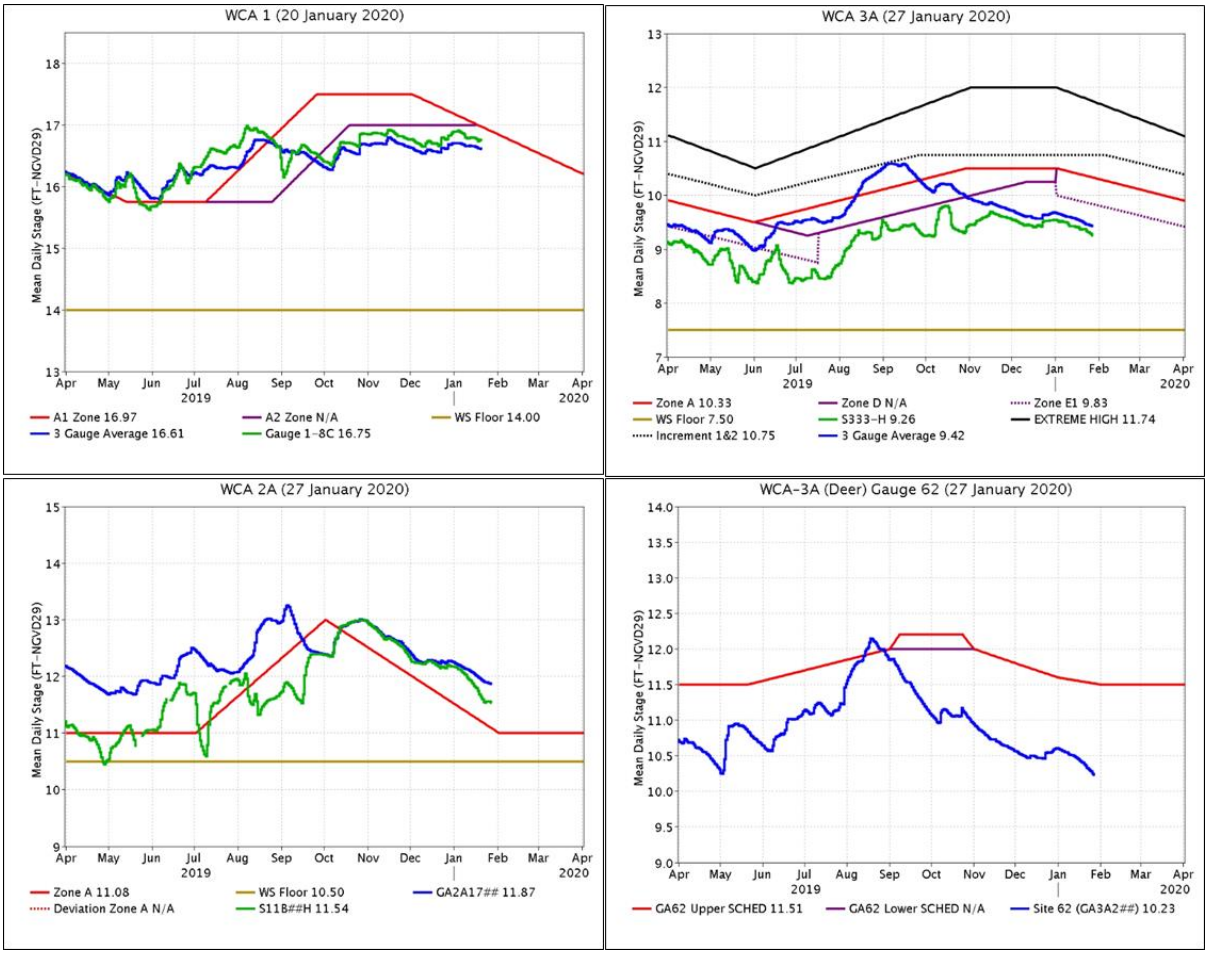
EVERGLADES

Significant precipitation across the Everglades last week and stages rose. At the gauges monitored for this report stages ascended on average 0.09 feet last week. Pan evaporation was estimated at 1.00 inches.

Everglades Region	Rainfall (Inches)	Stage Change (feet)
WCA-1	1.22	+0.10
WCA-2A	1.15	+0.04
WCA-2B	0.95	+0.00
WCA-3A	1.14	+0.13
WCA-3B	1.77	+0.11
ENP	1.23	+0.10



Regulation Schedules: WCA-1: Stage at the 1-8C Gauge continues to hold parallel to the Zone A1 reg line last week, currently equal to the falling regulation line. WCA-2A: Stage at Gauge S11-B falls parallel the Zone A regulation line now 0.52 above the falling regulation line. WCA-3A: The three-gauge average stage remains parallel the falling Zone E1 regulation line last week, currently 0.31 feet below that line. WCA-3A at gauge 62 (northwest corner): Stage ascended quickly last week but generally trends downward away from the falling upper schedule, currently 0.94 feet below.

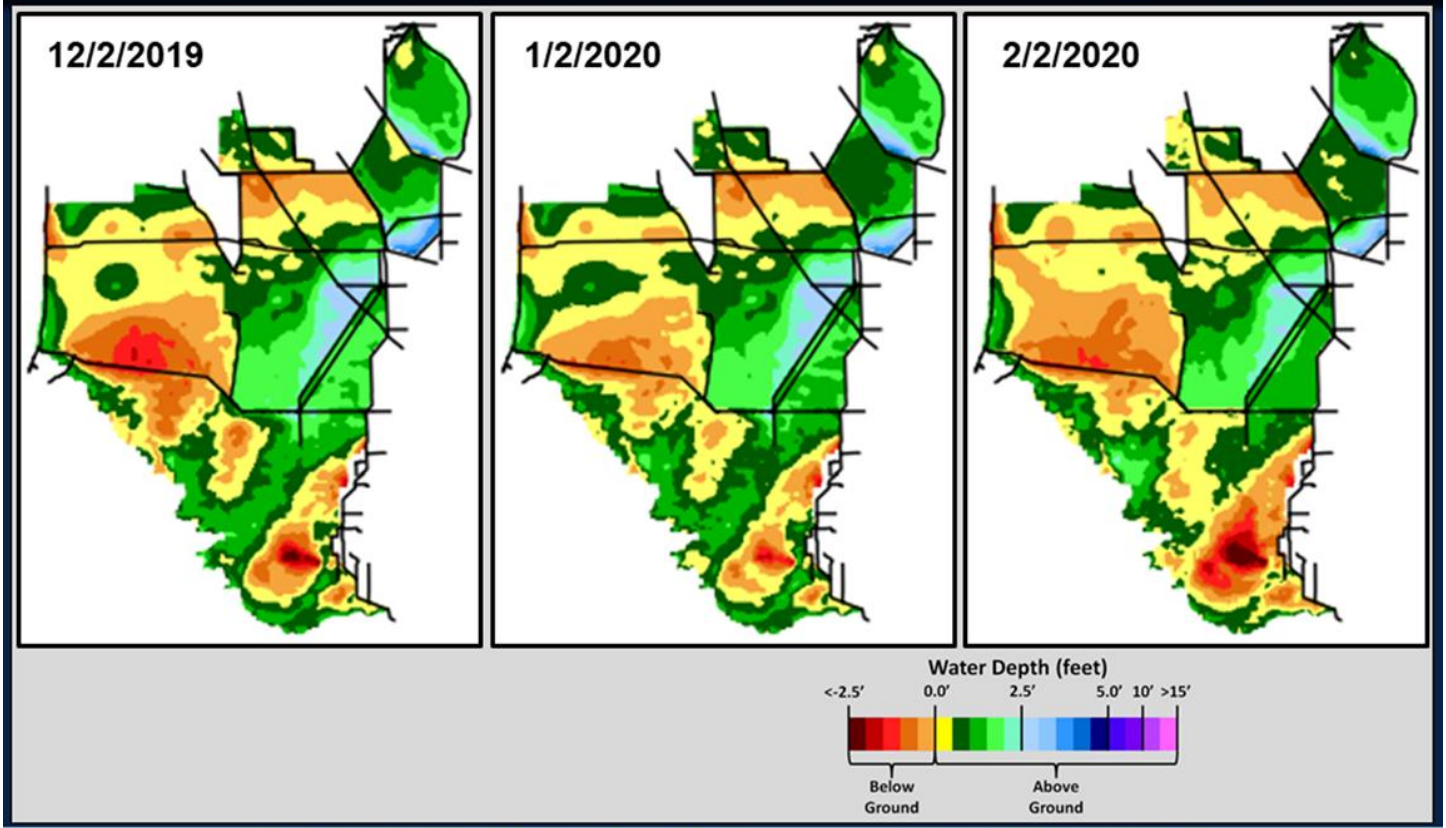


Water Depths: The WDAT tool for spatial interpolation of depth monthly snapshots indicate depths significantly below ground across most of WCA-3A North, with depths more than 1.0 feet below ground in the extreme northeast corner of that basin. Depths remain stable and near 3.5 feet across parts of WCA-2B and extreme southern WCA-1. Hydrologic connectivity was diminished over the last month in SRS and Taylor Slough. Comparing WDAT water levels from present, water depths changes over the last month are mixed but generally lower and not highly significant. Looking back one year the stage differences are mixed and more significant. The northwest corner of WCA-3A is significantly lower in stage and the rest of the basin slightly drier. Differences in WCA-1 are mixed with the northwest side significantly higher in stage and the northeast slightly lower.

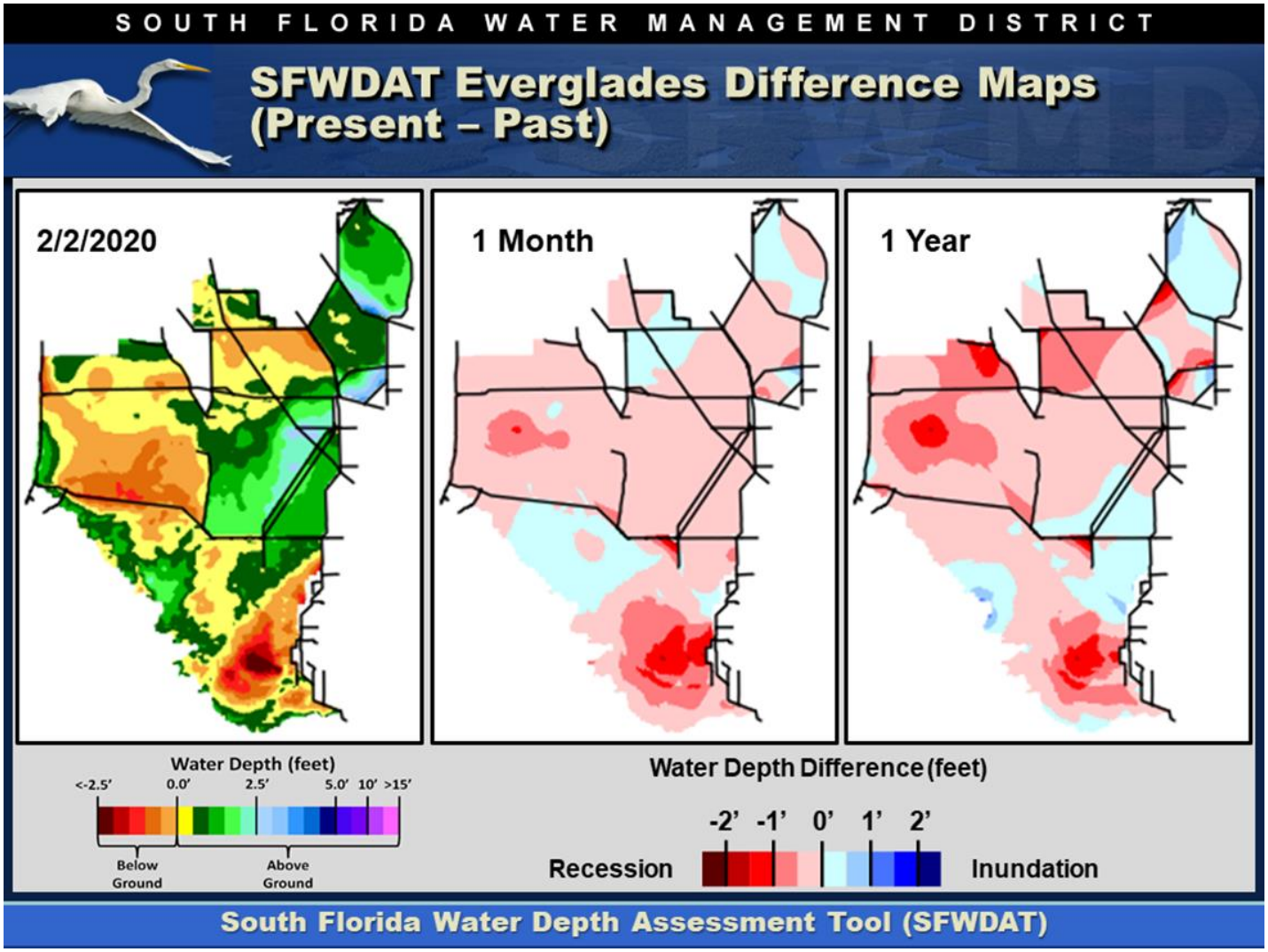
* Model updates are causing some problems with difference calculations in WCA-2B.

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

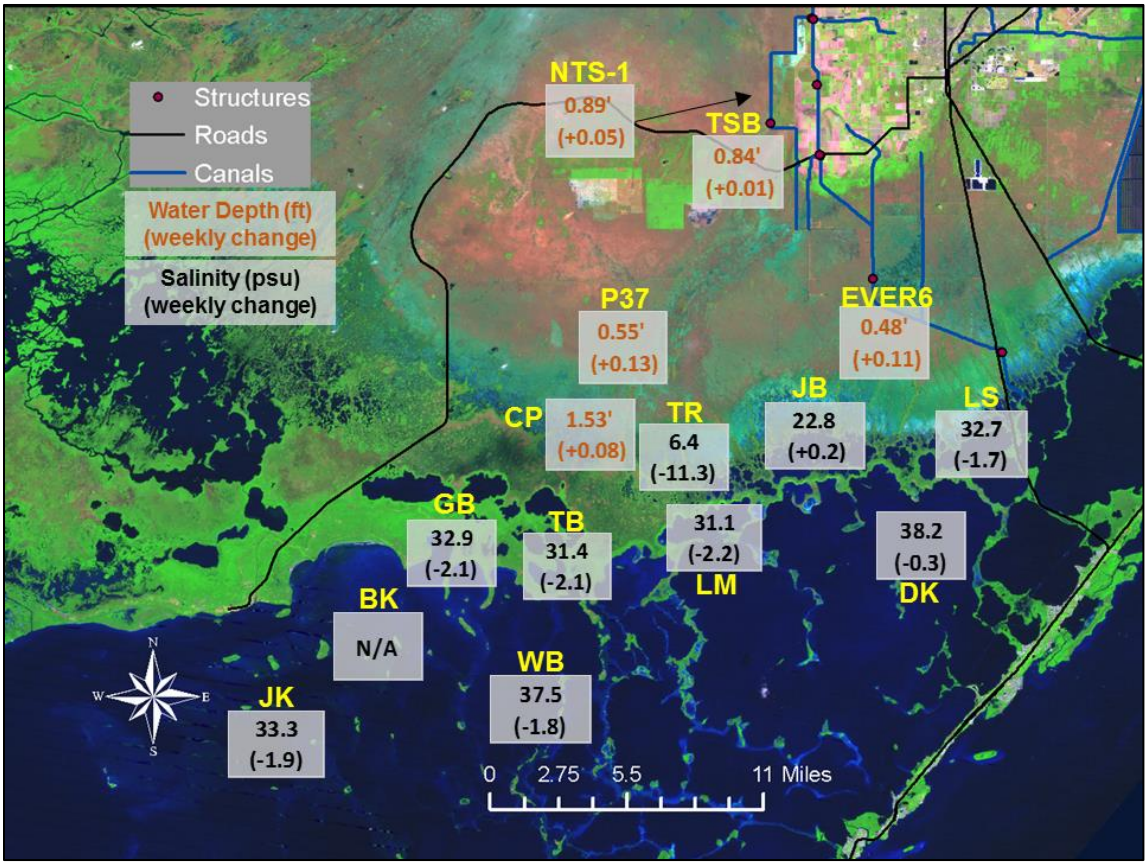
SFWDAT Water Depth Monthly Snapshots

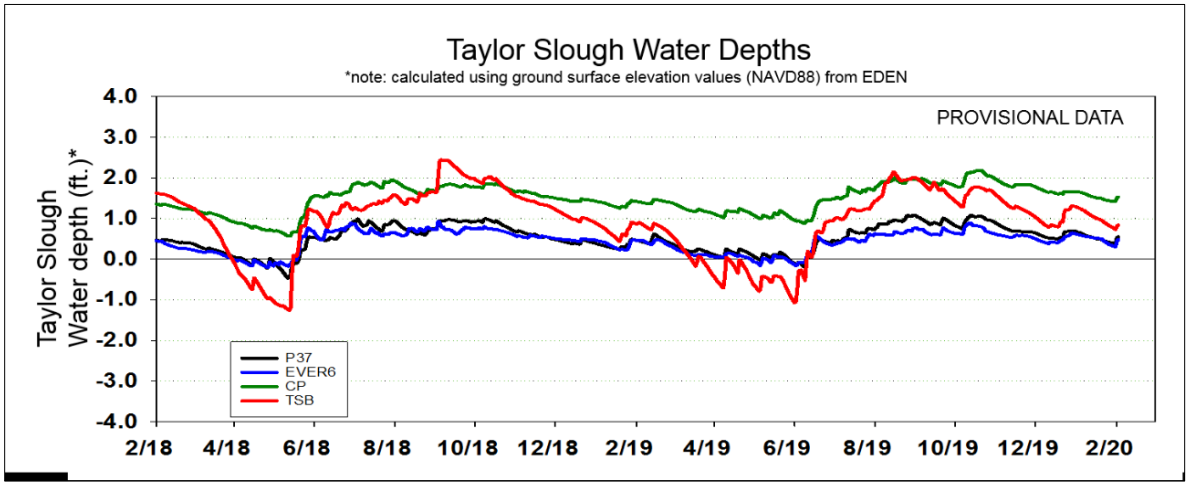


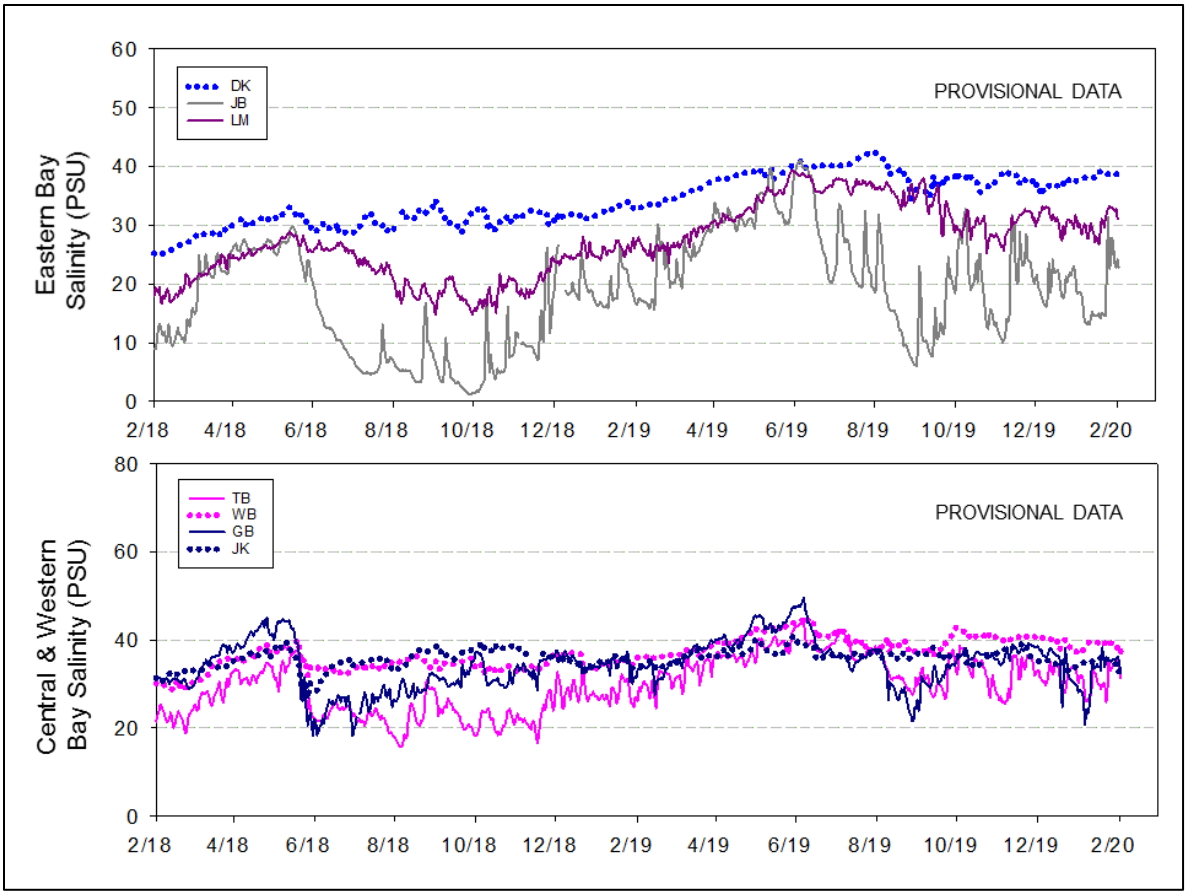
South Florida Water Depth Assessment Tool (SFWDAT)

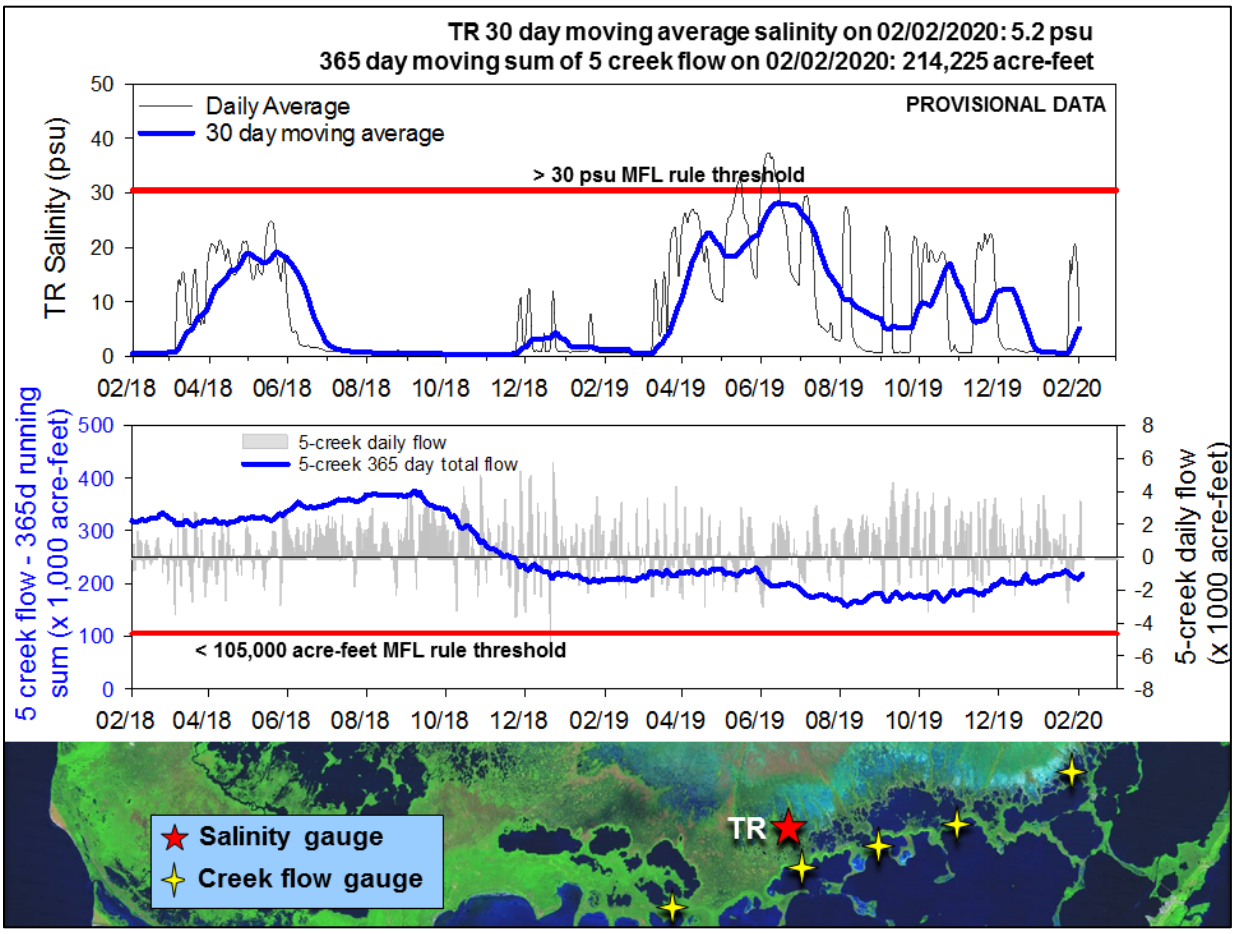


Taylor Slough Water Levels: An average of 1.36 inches of rain fell over Taylor Slough and Florida Bay this last week causing stage increases averaging 0.08 feet. Upper Taylor Slough (west of S-332D impoundment) is 15 inches higher than its historical average while the rest of Taylor Slough is 5 inches higher than the historical average.


Structures
Roads
Canals
Water Depth (ft) (weekly change)
Salinity (psu) (weekly change)
NTS-1
0.89'
(+0.05)
TSB
0.84'
(+0.01)
P37
0.55'
(+0.13)
EVER6
0.48'
(+0.11)
CP
1.53'
(+0.08)
TR
6.4
(-11.3)
JB
22.8
(+0.2)
LS
32.7
(-1.7)
GB
32.9
(-2.1)
TB
31.4
(-2.1)
31.1
(-2.2)
LM
38.2
(-0.3)
DK
BK
N/A
WB
37.5
(-1.8)
JK
33.3
(-1.9)
N
W
E
S
0 2.75 5.5 11 Miles


Taylor Slough Water Depths
*note: calculated using ground surface elevation values (NAVD88) from EDEN
PROVISIONAL DATA
Taylor Slough Water depth (ft.)*
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
P37
EVER6
CP
TSB
2/18
4/18
6/18
8/18
10/18
12/18
2/19
4/19
6/19
8/19
10/19
12/19
2/20


Eastern Bay Salinity (PSU)
DK
JB
LM
PROVISIONAL DATA
60
50
40
30
20
10
0
2/18
4/18
6/18
8/18
10/18
12/18
2/19
4/19
6/19
8/19
10/19
12/19
2/20
Central & Western Bay Salinity (PSU)
TB
WB
GB
JK
PROVISIONAL DATA
80
60
40
20
0


TR 30 day moving average salinity on 02/02/2020: 5.2 psu
365 day moving sum of 5 creek flow on 02/02/2020: 214,225 acre-feet
TR Salinity (psu)
Daily Average
30 day moving average
PROVISIONAL DATA
> 30 psu MFL rule threshold
50
40
30
20
10
0
02/18
04/18
06/18
08/18
10/18
12/18
02/19
04/19
06/19
08/19
10/19
12/19
02/20
5 creek flow - 365d running sum (x 1,000 acre-feet)
5-creek daily flow
5-creek 365 day total flow
< 105,000 acre-feet MFL rule threshold
500
400
300
200
100
0
8
6
4
2
0
-2
-4
-6
-8
5-creek daily flow (x 1000 acre-feet)
Salinity gauge
Creek flow gauge
TR

Florida Bay Salinities: Average salinity in Florida Bay decreased 1.5 psu to end at 32.5 psu this past week (still 7 psu above average). The nearshore area is 8 psu above average at 32 psu presenting very little estuarine gradient within the bay which is problematic as the dry season progresses.

Florida Bay MFL: Salinity at the TR station in the mangrove zone (tracked for the Florida Bay MFL) had increased to 20 psu last week before decreasing back to 6 psu over the weekend. The 30-day moving average ended at 5.2 psu (3.6 psu higher than last week). Weekly flow from the 5 creeks identified by yellow stars on the map totaled about 3,300 acre-feet last week. The week started out with negative flows but returned to positive flows for the second half. The 365-day moving sum of flow from the five creeks (tracked as part of the Florida Bay MFL criteria) increased 329 acre-feet this week to end at 214,225 acre-feet, between the 25th percentile (192,885 acre-feet) and the median (249,091 acre-feet). Creek flow are provisional USGS data.

Water Management Recommendations

Current stages in WCA-3A are low for this time of year and salinities are high in Florida Bay. Conserving water within the WCA-3A and moving low nutrient water south has water has many ecological benefits, these benefits are unrealized when flows are lost to tide. Discharges into northern WCA-3A have the potential to slow recessions near the important Alley North wading bird colony and the only foraging flocks of note currently in the WCAs. Maintaining saturated soils in over-drained portions of the Everglades, like WCA-3A Northeast, conserves peat and lowers the risk of muck fires, and depths there are well below average. Discharges into the area as well as rainfall recovered water depths in WCA-3A Northwest last week, however stage remains below average. At the present time flows are restricted from being discharged into the northeast WCA-3A via the S-150 as construction of the l38-West plug nears completion. Any available water sent through the S-150 post construction into Northeastern WCA-3A would have greater ecological value than the same amount of water discharged in Northwestern 3A, however both areas are in need of hydration. Flows towards Taylor Slough and Florida Bay freshen salinity conditions within the nearshore areas of Florida Bay and decrease the currently stressful conditions for seagrasses and fauna as nearshore salinities remain elevated, decreasing the estuarine gradient within the bay which is problematic as the dry season progresses. More specific recommendations appear in the summary table below. The red text represents new or modified information or recommendations.

SFWMD Everglades Ecological Recommendations, February 4th, 2020 (red is new)			
Area	Weekly change	Recommendation	Reasons
WCA-1	Stage increased by 0.10'	Conserving water in this basin has ecological benefit as current water depths are below seasonal averages.	Protect downstream habitat and wildlife. Provide wading bird foraging opportunities later in the dry season.
WCA-2A	Stage increased by 0.04'	Moderating the recession rate and conserving water in this basin has ecological benefit as downstream basins are below seasonal average.	Protect upstream/downstream habitat and wildlife. Provide wading bird foraging opportunities later in the dry season.
WCA-2B	Stage remained unchanged	Conserving water in this basin has benefit as current water depths in downstream basins are below seasonal averages.	Protect upstream/downstream habitat and wildlife.
WCA-3A NE	Stage increased by 0.04'	Conserving water in this basin has ecological benefit as current water depths are below seasonal averages.	Protect and conserve peat soils. Provide stage conditions that are conducive for succesful wading bird nesting at the Alley North wading bird colony.
WCA-3A NW	Stage increased by 0.33'	Conserving water and slowing the recession in this basin has ecological benefit as current water depths are below seasonal averages. Inflows to this region have ecological benefit.	
Central WCA-3A S	Stage increased by 0.05'	Conserving water in this basin has ecological benefit as current water depths are below seasonal averages.	Protect upstream/downstream habitat and wildlife. Provide wading bird foraging oppurtunitys later in the dry season.
Southern WCA-3A S	Stage increased by 0.09'		
WCA-3B	Stage increased by 0.11'	Conserving water in this basin has benefit as current water depths are below seasonal averages.	Protect tree islands, upstream/downstream habitat and wildlife.
ENP-SRS	Stage increased by 0.10'	Make discharges to the Park according to the 2012 WCP rainfall plan.	Protect upstream/downstream habitat and wildlife.
Taylor Slough	Stage changes ranged from +0.01' to +0.13'	Move water southward as possible	When available, provide freshwater buffer for downstream conditions.
FB- Salinity	Salinity changes ranged −2.2 to +0.2 psu	Move water southward as possible	When available, provide freshwater to maintain low salinity buffer and promote water movement.