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 3, 2021

SUBJECT: Weekly Environmental Conditions for Systems Operations

Summary

Weather Conditions and Forecast

A chilly and very dry air mass will be over the District through Wednesday. Dry conditions will continue the next couple of days, with the air mass over the District Wednesday afternoon expected to be the driest so far this winter season. As a high-pressure area settles directly over Florida Wednesday night, strong radiational cooling and the extremely dry near-surface air will result in low temperatures Thursday morning, with the possibility of frost in the agricultural areas surrounding Lake Okeechobee. Low-level winds are forecast to veer easterly or southeasterly on Thursday, allowing for an influx of relatively warmer air across the area. The warming trend that begins Thursday afternoon will last into the weekend. A surge of high moisture from the northwestern Caribbean Sea is predicted to overspread the District on Saturday. The return of considerable moisture should fuel an increase of shower activity by Saturday afternoon. A slow-moving cold front could come into the District during the day on Sunday and produce a large increase of rain over the northwestern half of the District either Saturday night or Sunday morning. The widespread moderately heavy or heavy rains should gradually shift from north and central Florida southeastward across the District on Sunday, with some potential for the rains to result in a *significant District rain event* (a half of an inch or more of total rainfall) by the time they diminish late Sunday or overnight. Most indications are that the front would eventually slip southward enough by Monday morning or afternoon that a drying would occur over the District. However, there is a lower and non-trivial chance that the front would stall somewhere over the southern half of the District and continue to produce some rain over this region on Monday.

Kissimmee

Tuesday morning stages were 57.8 feet NGVD (0.2 feet below schedule) in East Lake Toho, 54.7 feet NGVD (0.3 feet below schedule) in Toho, and 51.9 feet NGVD (0.6 feet below schedule) in Kissimmee-Cypress-Hatchineha; headwater stages were 46.3 feet NGVD at S-65A and 25.7 feet NGVD at S-65D. Tuesday morning discharges were 900 cfs at S-65, 890 cfs at S-65A, 1040 cfs at S-65D and 860 cfs at S-65E. Dissolved oxygen concentration in the Kissimmee River averaged 8.4 mg/L for the week through Sunday. Kissimmee River mean floodplain depth on Sunday was 0.37 feet. Today's recommendation is to continue to follow the USACE request to keep S-65A discharge below 800-900 cfs to facilitate construction in the Lower Kissimmee Basin. Requests from USFWS and FWC for snail kite recessions and habitat are as follows: Priority 1: reduce stage to 54.5 feet NGVD on West Toho on or about Feb 11; Priority 2: target 51 feet NGVD on Kissimmee on or about Mar 18; Priority 3: target recession rate of ~0.14 ft/week on East Toho as other priorities allow.

Lake Okeechobee

Lake Okeechobee stage was 15.47 feet NGVD on January 31, 2021, 0.11 feet lower than last week and 0.34 feet lower than a month ago. The Lake is currently in the Low Sub-band. Stage has been above or near the top of the preferred ecological envelope since August 1, 2020 and is currently 0.23

feet above. Recent satellite imagery and water quality results suggest there is little to no algal bloom activity on the Lake, though three stations along the western shoreline had chlorophyll-*a* values between 20 - 30 µg/L in early January.

Estuaries

Total inflow to the St. Lucie Estuary averaged more than 132 cfs over the past week with no flow coming from Lake Okeechobee. The seven-day average surface salinities increased throughout the estuary over the past week. Salinity at the US1 Bridge is in the good range (10-26) for adult eastern oysters. Total inflow to the Caloosahatchee Estuary averaged 1,156 cfs over the past week with approximately 596 cfs coming from Lake Okeechobee. Seven-day average surface salinities decreased at S-79 but increased at the remaining sites in the estuary over the past week. Salinities are in the good range (0-10) for tape grass at Val I-75 and Ft. Myers. Salinities are also in the good range (10-30) for adult eastern oysters at Cape Coral, Shell Point and Sanibel. Lake stage is in the Low Sub-Band of 2008 LORS. Tributary hydrological conditions are normal. The LORS2008 Release Guidance suggests up to 450 cfs release at S-79 to the Caloosahatchee Estuary and up to 200 cfs release at S-80 to the St. Lucie Estuary.

Stormwater Treatment Areas

Over the past week, 100 ac-ft of Lake Okeechobee water was delivered to the FEBs/STAs. The total amount of Lake releases sent to the FEBs/STAs in WY2021 (since May 1, 2020) is approximately 98,100 ac-feet. The total amount of inflows to the STAs in WY2021 is approximately 1,535,000 ac-feet. Most STA cells are near target stage. STA-1E Western Flow-way is offline for the Restoration Strategies project to fill and grade Cells 5 and 7, and STA-2 Flow-way 2 is offline for construction activities. Operational restrictions are in place in STA-1W Western, Eastern, and Northern Flow-ways due to discharge canal plug construction activities, in STA-1E Central Flow-way, STA-2 Flow-ways 3, 4 and 5, STA-3/4 Eastern, Central, and Western Flow-ways for vegetation management activities, in STA-3/4 Eastern Flow-way for drawdown preparation 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 conditions allow, releases will be sent to STA-2.

Everglades

At all the gauges monitored for this report, WCA weekly stage fell within the good or fair with respect to early dry season WY21 ecological recession recommendations. Depths remain above average in Taylor Slough, and salinities in Florida Bay remain below the historical average for this time of year, suggesting continued good positioning for early 2021. Large numbers of wading birds continue to forage along the southern coast, and nesting has begun in colonies across the Everglades. Larger flocks of wading birds are now foraging along the northern border of WCA-3A North east of the Miami Canal as more birds move into optimal foraging habitat along the drying fronts.

Supporting Information

KISSIMMEE BASIN

Rainfall

The Upper Kissimmee Basin received 0.38 inches of rainfall in the past week and the Lower Basin received 0.26 inches (SFWMD Daily Rainfall Report 02/01/2021).

Upper Kissimmee

Table 1 lists stage and discharge for several KCL water bodies using data from lake outfall structures. KCL stage hydrographs with respective regulation schedules and rainfall are shown in **Figures 1-3**.

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

Report Date: 2/2/2021

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)						
							1/31/21	1/24/21	1/17/21	1/10/21	1/3/21	12/27/20	12/20/20
Lakes Hart and Mary Jane	S-62	23	LKMJ	61.0	R	61.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0
Lakes Myrtle, Preston, and Joel	S-57	16	S-57	61.3	R	61.3	0.0	0.1	0.0	-0.1	0.0	0.0	0.0
Alligator Chain	S-60	0	ALLI	63.9	R	64.0	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0
Lake Gentry	S-63	21	LKGT	61.5	R	61.5	0.0	0.0	0.0	0.0	0.1	0.0	0.0
East Lake Toho	S-59	116	TOHOE	57.7	R	58.0	-0.3	-0.1	0.0	0.0	0.0	-0.1	0.0
Lake Toho	S-61	349	TOHOW, S-61	54.7	R	55.0	-0.3	-0.1	0.0	0.0	-0.1	0.0	0.0
Lakes Kissimmee, Cypress, and Hatchineha	S-65	894	KUB011, LKIS5B	51.7	R	52.5	-0.8	-0.7	-0.3	-0.2	-0.1	0.0	0.0

[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

Discharges at lower basin structures are shown in **Table 2**. **Figure 4** compares floodplain inundation depths from one year and one month ago with current inundation depths in the Phase I restored area of the Kissimmee River. **Figure 5** shows dissolved oxygen concentration along with S-65A discharge, water temperature and rainfall. **Figures 6-8** are included for reference: **Figure 6** is the current guide for operation of S-65 and S-65A, called the "Preferred Discharge Plan IS-14-50.0". This is developed collaboratively each year between ecologists and SFWMD water managers based on prevailing ecological and hydrologic conditions. A preferred discharge plan and the interim regulation schedule (**Figure 7**) will be used until the Headwaters Lakes Revitalization regulation schedule is implemented. **Figure 8** is a map of the Kissimmee Basin showing Central and Southern Florida (C&SF) flood control project structures and color-coded watersheds.

Table 2. One- and seven-day average discharge at lower basin structures, dissolved oxygen concentration in phases I and II/III area river channel, and depth in the Phase I area floodplain using provisional, real-time data from SFWMD.

Report Date: 2/2/2021

Metric	Location	1-Day Average	Average for the Preceeding 7-Days[1]								
		1/31/2021	1/31/21	1/24/21	1/17/21	1/10/21	1/3/21	12/27/20	12/20/20	12/13/20	12/6/20
Discharge (cfs)	S-65	874	894	869	644	540	676	729	848	1,382	1,083
Discharge (cfs)	S-65A[2]	882	892	856	641	600	733	809	974	1,566	1,275
Discharge (cfs)	S-65D[2]	910	914	838	701	770	944	1,317	1,704	1,605	1,497
Headwater Stage (feet NGVD)	S-65D[2]	25.92	25.83	25.79	25.87	25.85	25.80	25.73	26.08	26.40	26.82
Discharge (cfs)	S-65E[2]	811	873	849	719	808	944	1,314	1,710	1,687	1,545
Discharge (cfs)	S-67	0	0	0	0	0	0	0	0	0	0
DO (mg/L)[3]	Phases I & II/III river channel	8.3	8.4	8.8	8.4	8.4	8.4	7.5	6.4	7.2	6.0
Mean depth (feet)[4]	Phase I floodplain	0.37	0.38	0.36	0.33	0.40	0.50	0.68	1.00	1.01	0.90

[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.

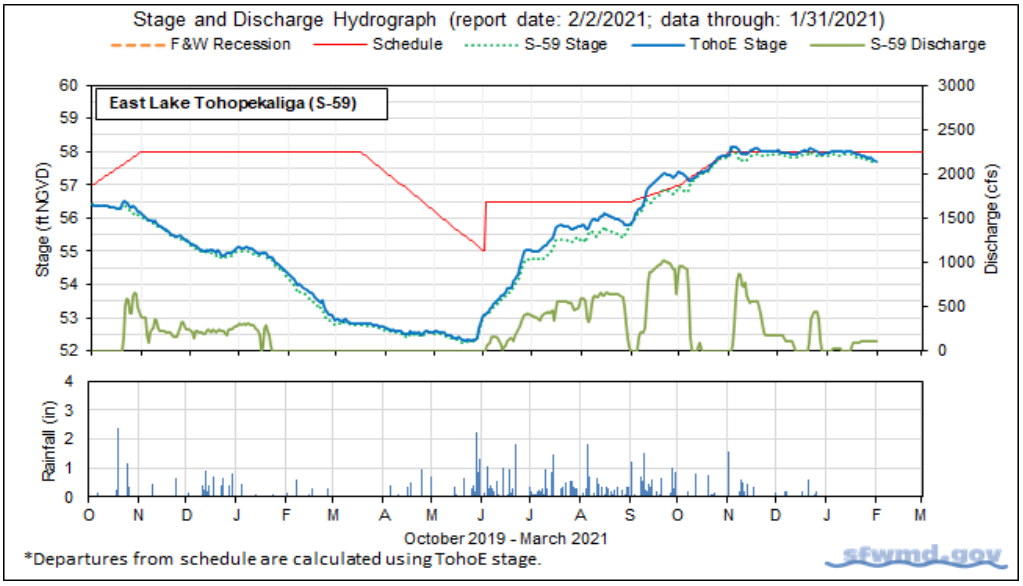


Figure 1. East Lake Toho regulation schedule, stage, discharge, and rainfall.

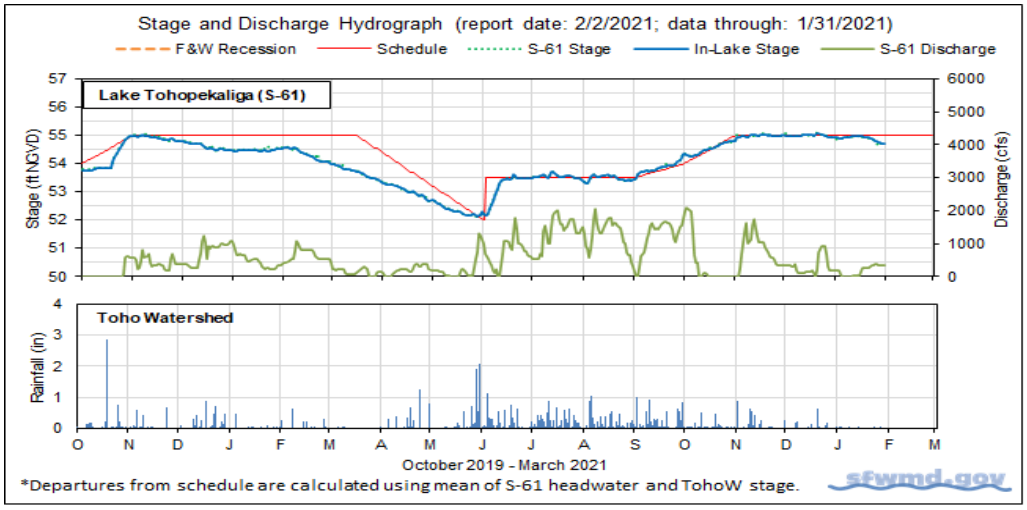


Figure 2. Lake Toho regulation schedule, stage, discharge, and rainfall.

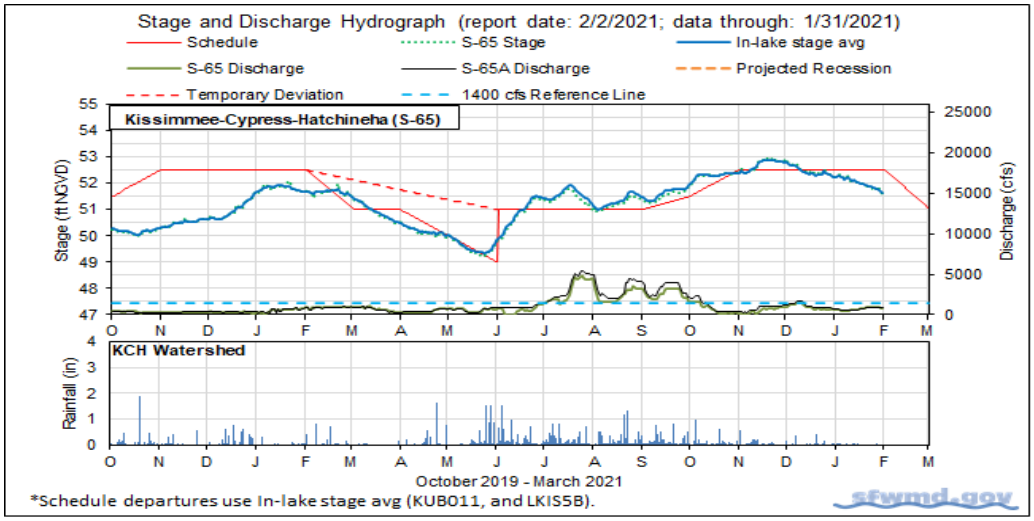


Figure 3. Lakes Kissimmee, Cypress and Hatchineha regulation schedule, stage, discharge, and rainfall.

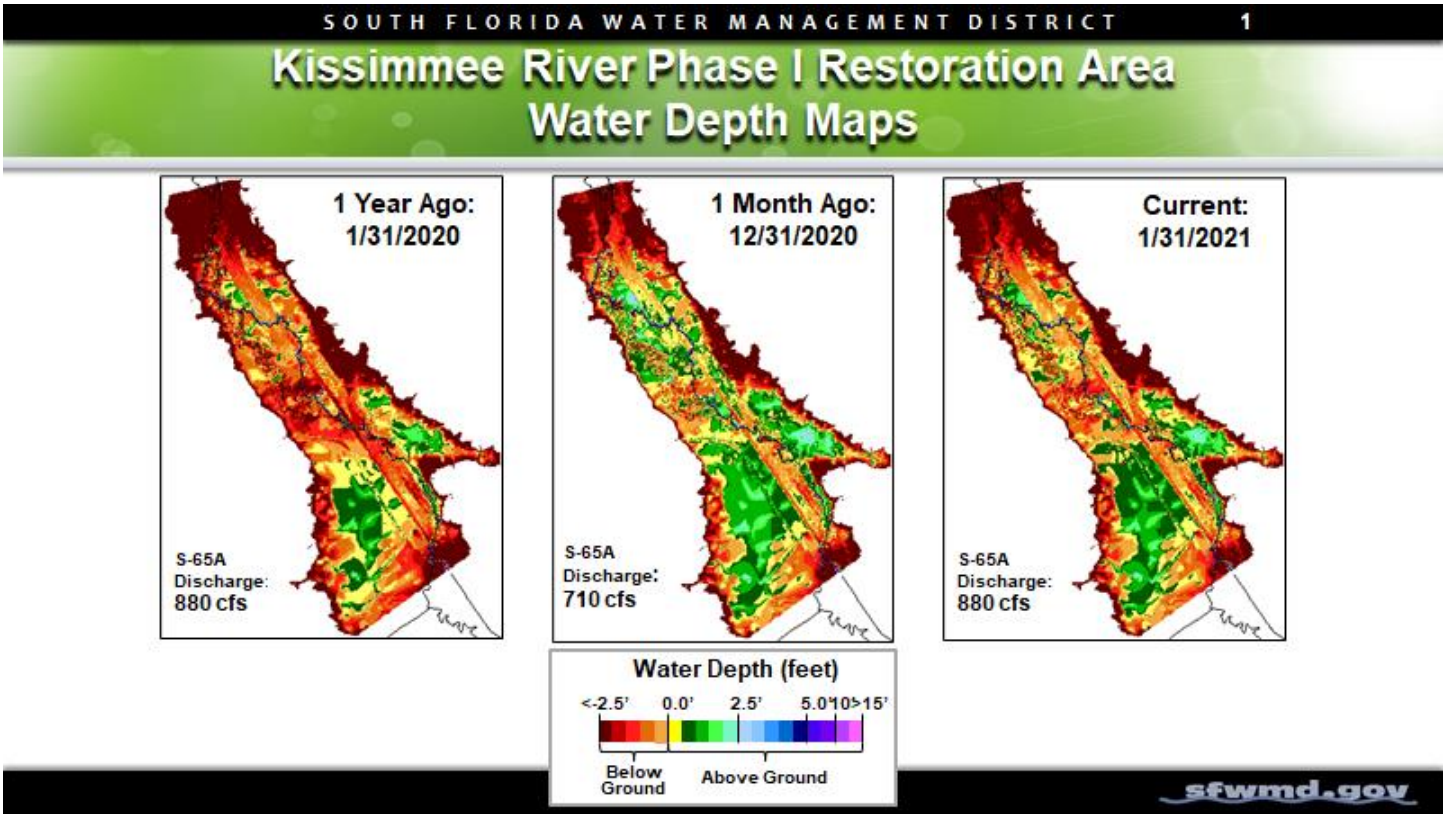


Figure 4. Phase I area floodplain water depths (from left to right) one year ago, one month ago and current. Color-coding has been modified to accommodate greater water depths; these maps are not directly comparable to Kissimmee Basin WDAT maps published prior to January 16, 2012.

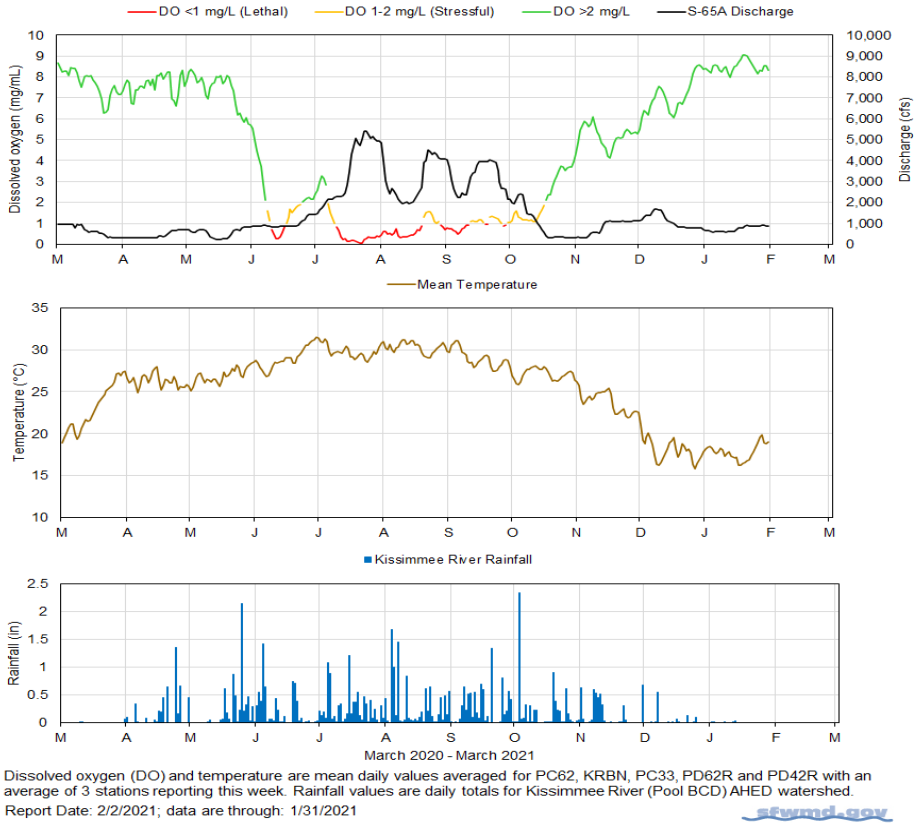


Figure 5. Restored Kissimmee river channel mean daily dissolved oxygen concentration (mg/L), S-65A discharge (cfs), temperature (°C) and rainfall (inches)

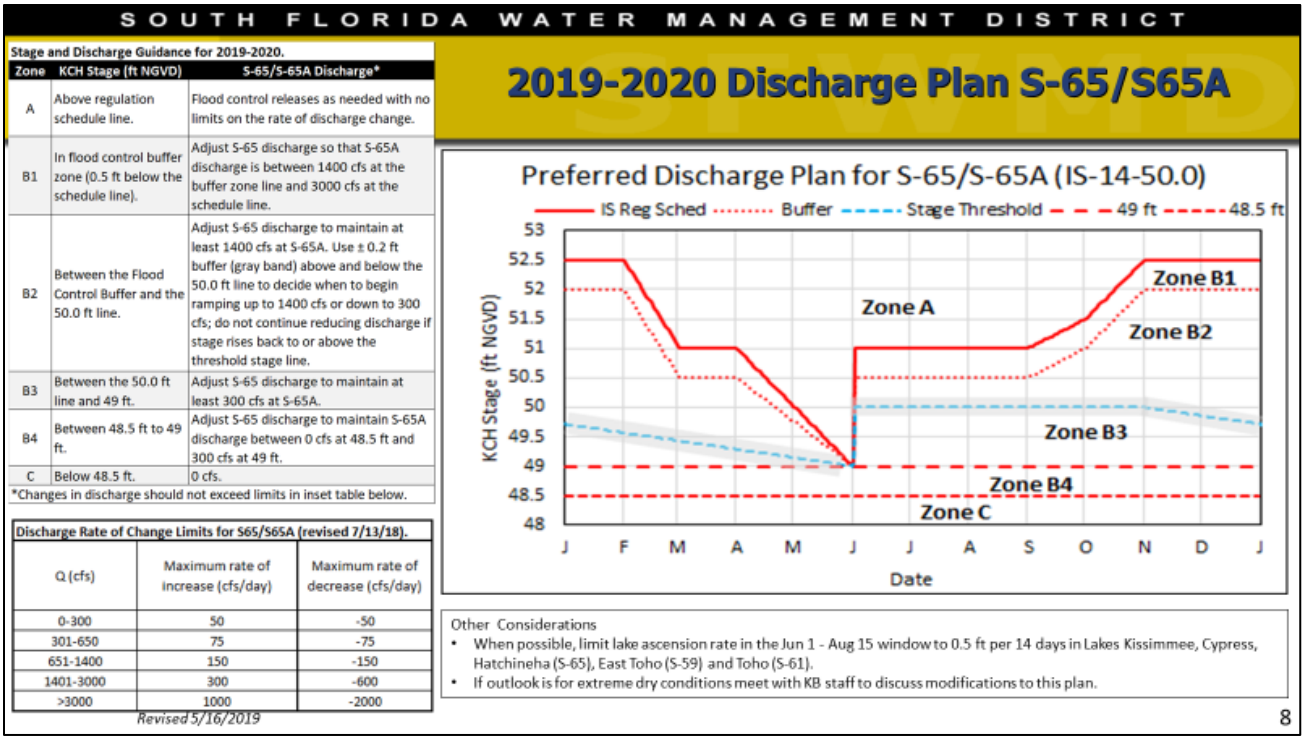


Figure 6. The 2019-2020 Discharge Plan for S-65/S-65A.

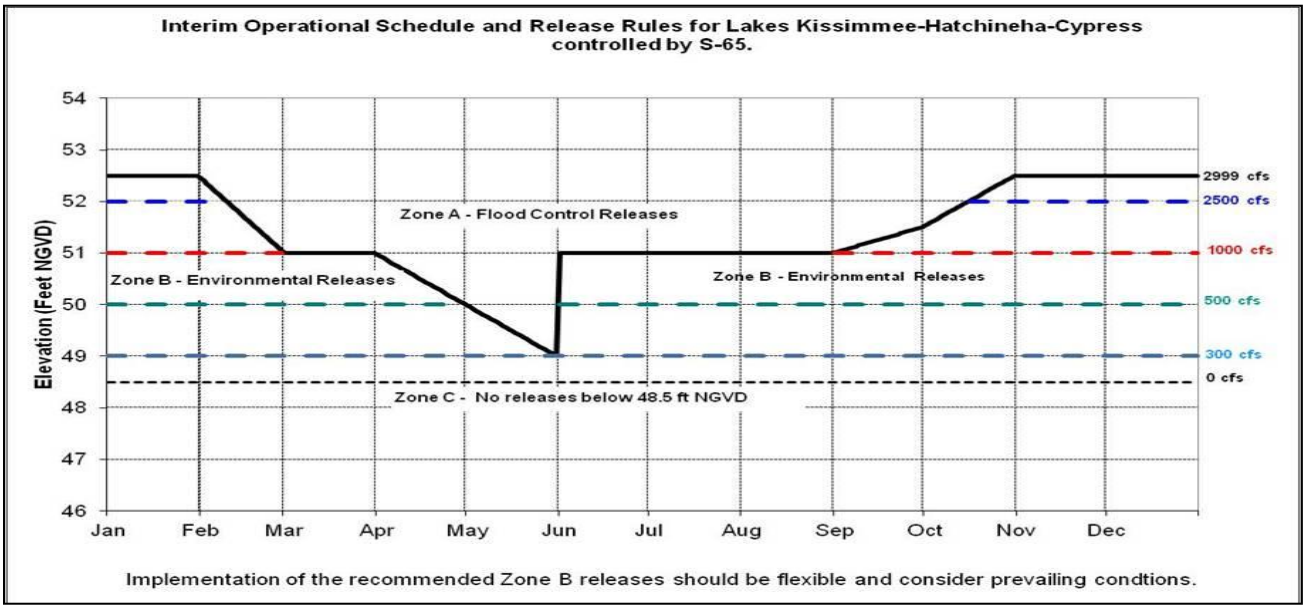


Figure 7. Interim operations schedule for S-65 (solid black line). The discharge schedule shown to the right has not been used in recent years.

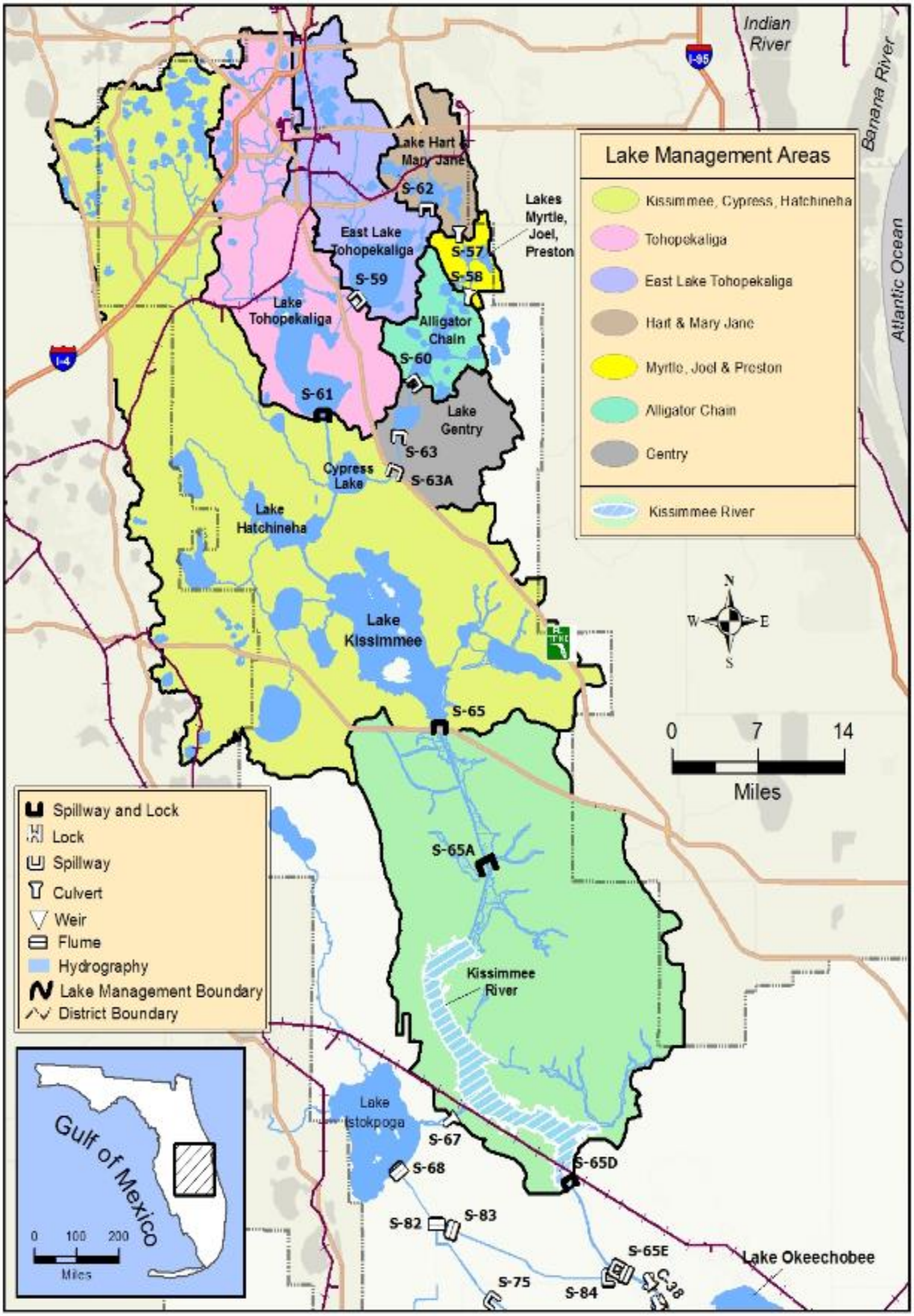


Figure 8. The Kissimmee Basin.

LAKE OKEECHOBEE

Lake Okeechobee stage was 15.47 feet NGVD on January 31, 2021, 0.34 feet lower than a month ago, and 2.62 feet higher than one year ago **(Figure 1**). Lake stages rose into the lower portion of the preferred ecological envelope on June 2, 2020 (**Figure 2**) but have been above the envelope since August 1, 2020; currently 0.23 feet above. Lake stage reached a low of 10.99 feet on May 17, 2020 and a high of 16.45 feet on November 12, 2020 (post Tropical Storm Eta), a difference of 5.5 feet (**Figure 3**). Lake stage has declined since mid-November and is currently in the Low sub-band. According to RAINDAR, no rain fell on the Lake or most of the watershed (**Figure 4**).

Average daily inflows (excluding rainfall) decreased slightly from the previous week going from 1,088 cubic feet per second (cfs) to 971 cfs. Outflows (excluding evapotranspiration) increased from 1,720 cfs to 1,839 cfs. Most of the inflows came from the Kissimmee River (873 cfs through S-65E & S-65EX1). Releases to the west via S-77 decreased from 767 cfs to 666 cfs from the prior week, while there have been no releases east via S-308 since January 9, 2021. Releases south through the S-350 structures increased from approximately 950 cfs to 1,175 cfs. Average inflows and outflows through water control structures surrounding the Lake for the previous two weeks (cfs) are shown in **Table 1**. The resultant Lake elevation change in inches (in) due to each structure's flow for the past week is also shown in **Table 1**. **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.

Water quality sampling is now on the non-bloom season schedule (November – April), occurring once monthly at approximately 30 stations for chlorophyll-*a,* and at 9 stations for taxonomic identification and toxin analyses. Sampling on January 5-6, 2021 showed no samples had detectable levels of cyanotoxins and algal communities were described as mixed, with no dominant taxa (**Figure 6**). Chlorophyll-*a* results showed three stations on the western shore above 20 µg/L but all well below the bloom threshold of 40 µg/L.

The most recent satellite image (January 30, 2021) from the NOAA cyanobacteria monitoring product derived from EUMETSAT's Sentinel 3 OLCI sensor data showed continued low bloom potential on the Lake (**Figure 7**).

Water Management Summary

Lake Okeechobee stage was 15.47 feet NGVD on January 31, 2021, 0.11 feet lower than last week and 0.34 feet lower than a month ago. The Lake is currently in the Low Sub-band. Stage has been above or near the top of the preferred ecological envelope since August 1, 2020 and is currently 0.23 feet above. Recent satellite imagery and water quality results suggest there is little to no algal bloom activity on the Lake, though three stations along the western shoreline had chlorophyll-*a* values between 20 - 30 µg/L in early January 2021.

Table 1. Average daily inflows and outflows for the most recent two weeks and 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	849	873	0.3
S-71 & S-72	8	0	0.0
S-84 & S-84X	135	0	0.0
Fisheating Creek	34	31	0.0
S-154	0	0	0.0
S-191	0	0	0.0
S-133 P	18	35	0.0
S-127 P	7	8	0.0
S-129 P	5	5	0.0
S-131 P	2	4	0.0
S-135 P	26	14	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	4		
Rainfall	0	0	0.0
Total	**1088**	**971**	**0.4**

OUTFLOWS	Previous week Avg Daily CFS	Avg Daily Flow cfs	Equivalent Depth Week Total (in)
S-77	767	666	0.3
S-308	0	0	0.0
S-351	518	604	0.2
S-352	176	205	0.1
S-354	259	247	0.1
L-8 Outflow		119	0.0
ET	2026	2067	0.8
Total	**3746**	**3906**	**1.5**

Provisional Data

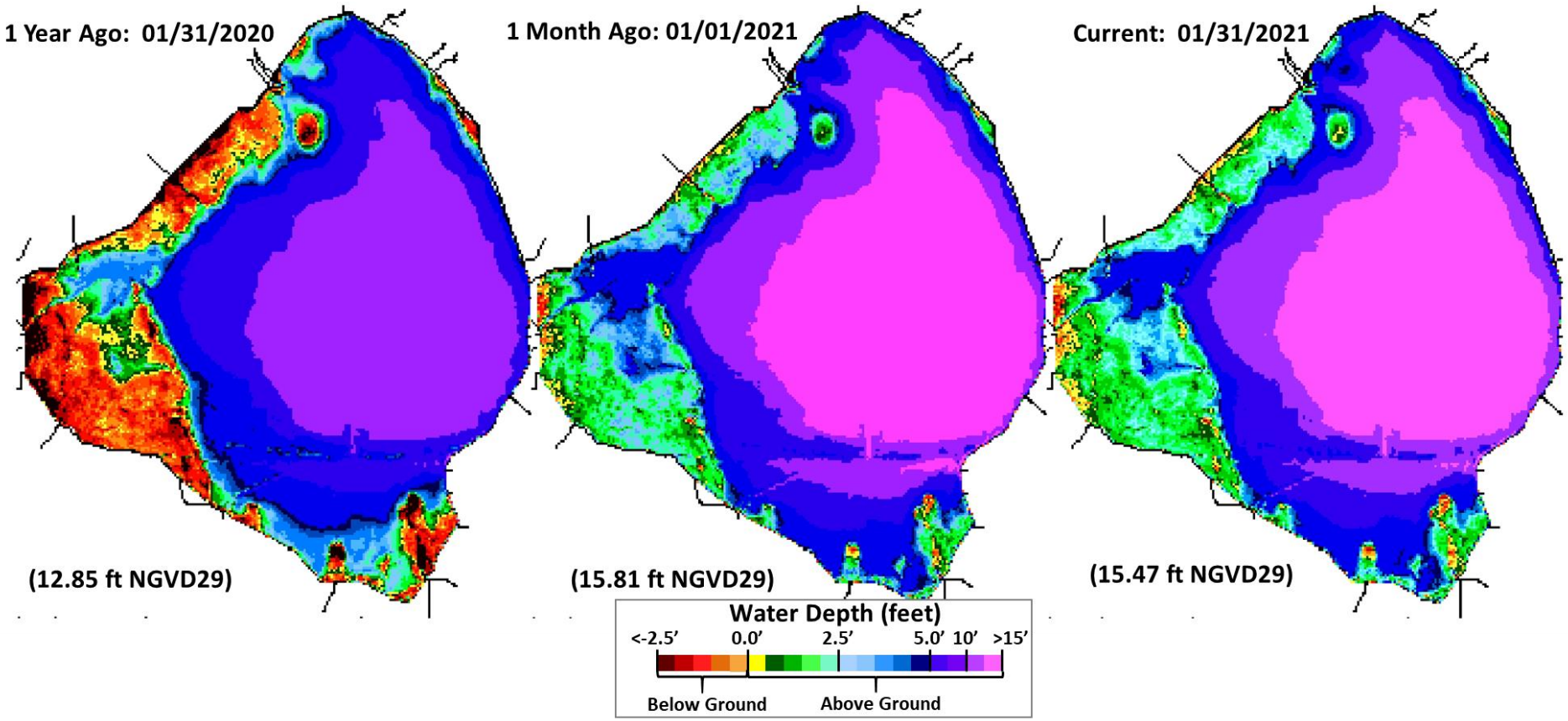


Figure 1. Water depth estimates on Lake Okeechobee based on the South Florida Water Depth Assessment Tool.

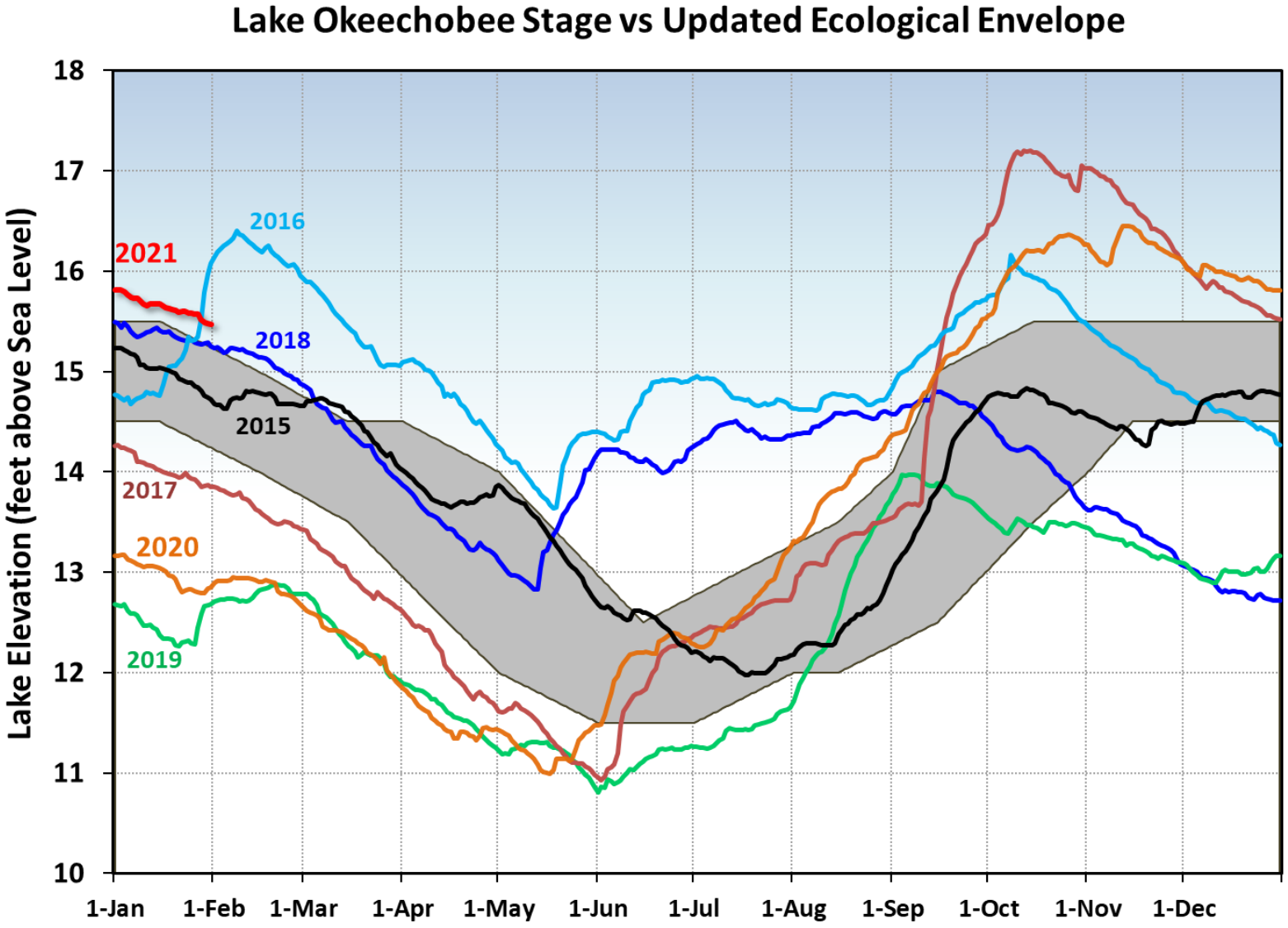


Figure 2. Select annual stage hydrographs for Lake Okeechobee in comparison to the updated Ecological Envelope.

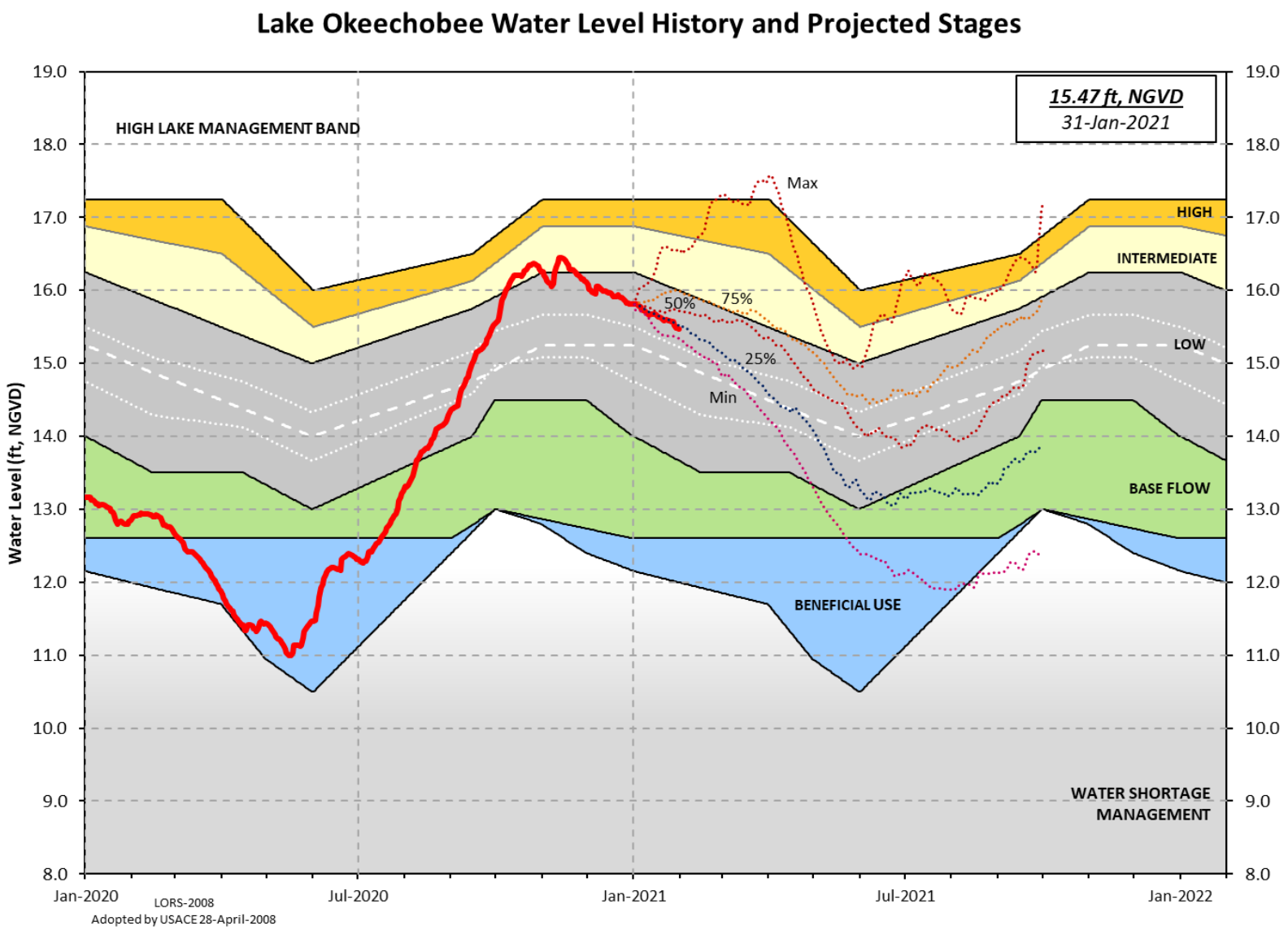


Figure 3. Recent Lake Okeechobee stages and releases, with projected stages based on a dynamic position analysis.

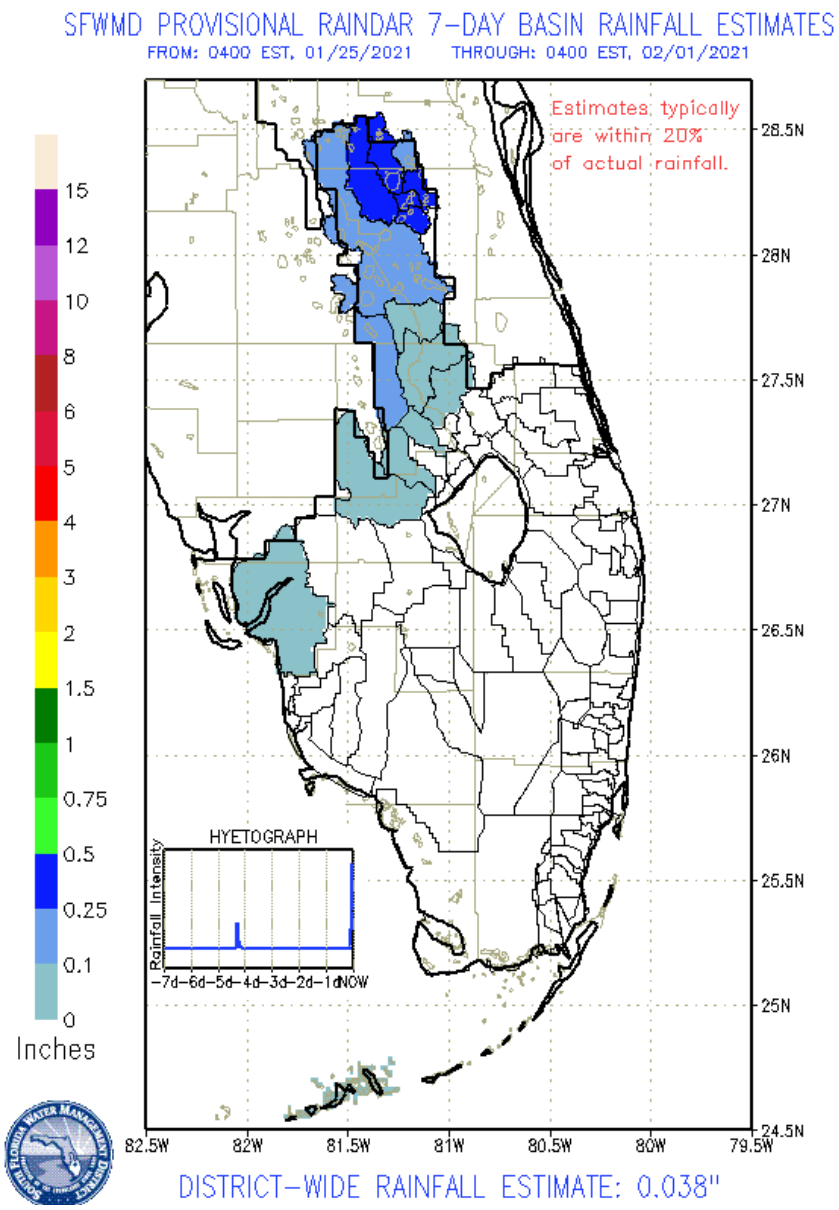


Figure 4. 7-Day rainfall estimates by RAINDAR.

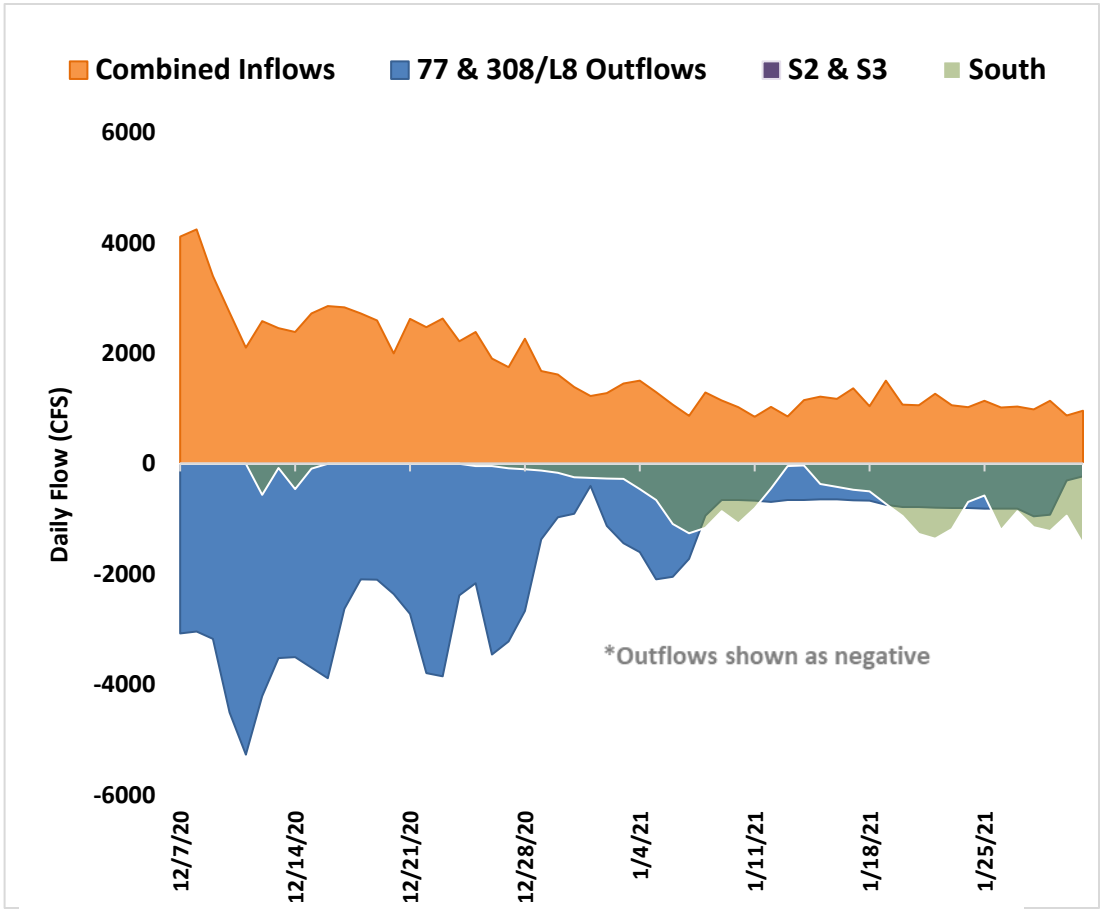


Figure 5. Major inflows (orange) and outflows (blue) of Lake Okeechobee, including the S-350 structures designated as South (green). The L-8 Canal flows through Culvert 10A are included as outflows when positive, and as inflows when backflowing into the Lake. All inflows and outflows are shown as positive 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.

Collection Date: January 5-6, 2021

Station	CHL*a* (ug/L)	TOXIN (ug/L)	TAXA
FEBIN (1/4)	**29.9**		
FEBOUT (1/4)	**27.4**		
KISSR0.0	17.8	BDL	mixed
L005	5.9	BDL	mixed
LZ2	11.0	BDL	mixed
KBARSE	8.6		
RITTAE2	7.8	BDL	mixed
PELBAY3	5.5		
POLE3S	6.6		
LZ25A	6.7		
PALMOUT	19.5	BDL	mixed
PALMOUT1	7.0		
PALMOUT2	5.7		
PALMOUT3	5.3		
POLESOUT	**30.5**	BDL	mixed
POLESOUT1	15.8		
POLESOUT2	9.4		
POLESOUT3	8.4		
EASTSHORE	3.9		
NES135	4.1		
NES191	6.0		

Station	CHL*a* (ug/L)	TOXIN (ug/L)	TAXA
L001	5.2		
L004	6.2		
L006	4.4		
L007	7.8		
L008	9.2		
LZ30	7.0	BDL	mixed
LZ40	4.5		
CLV10A	4.0	BDL	mixed
NCENTER	4.8		
Sampled 1/11			
S308C	6.5	BDL	mixed
S77	5.2		

- SFWMD considers >40 µg/L Chlorophyll *a* (Chl*a*) an algal bloom
- BDL – Below Detectable Limit of **0.25** µg/L
- ND – No Dominant taxa
- P – Pending
- NS – Not Sampled
- Bold – crew observed possible BGA
- Chlorophyll *a* analyzed by SFWMD
- Toxin and Taxa analyzed by FDEP

Cylindro = Cylindrospermopsis
Planktol = Planktolyngbya
Dolicho = Dolichospermum

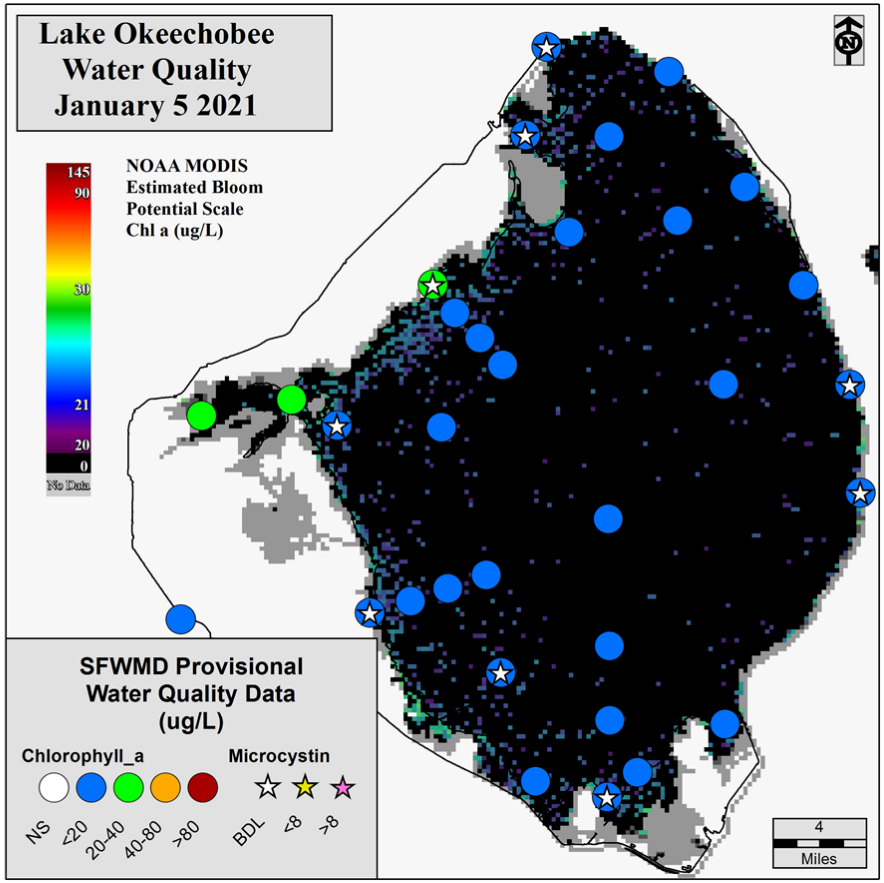


Figure 6. Provisional results from the expanded monitoring sampling trips January 5 - 6, 2021.

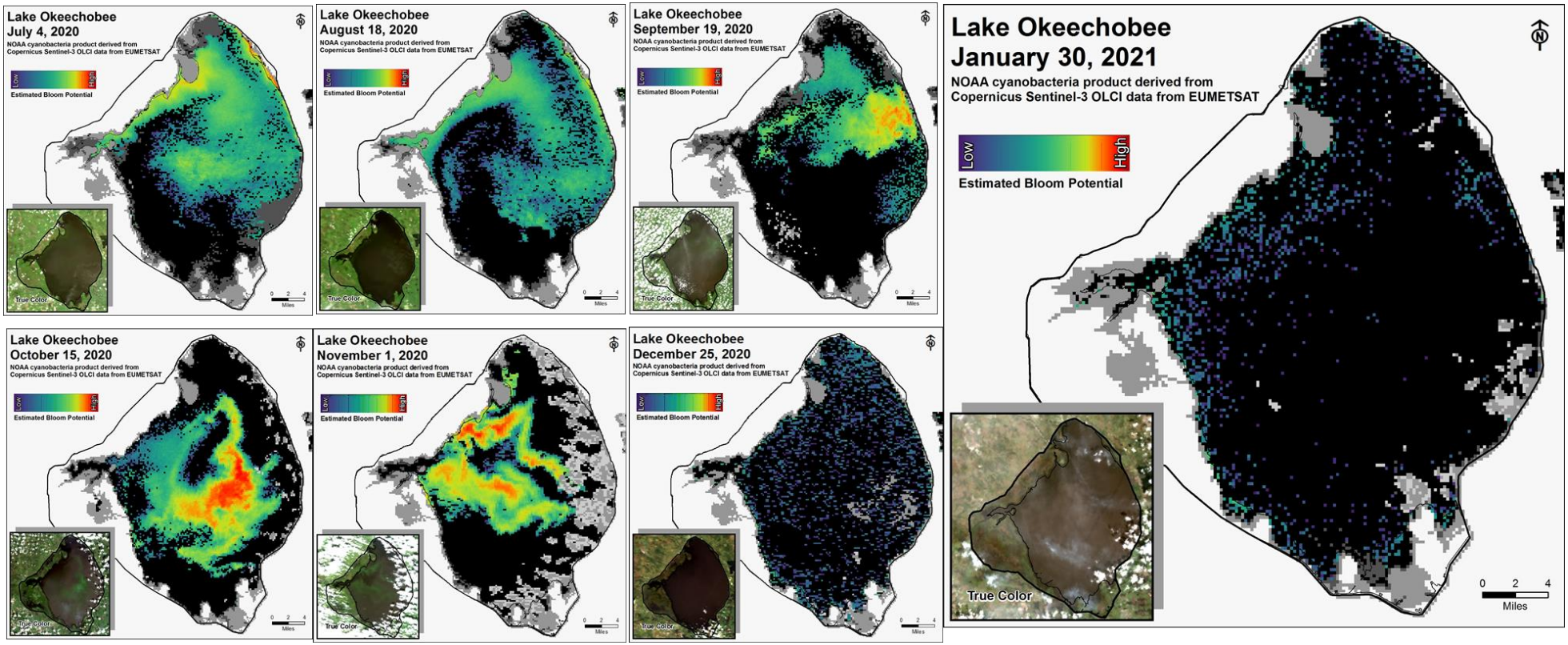


Figure 7. Cyanobacteria bloom potential based on NOAA's harmful algal bloom monitoring system. Gray color indicates cloud cover.

ESTUARIES

St. Lucie Estuary:
Last week, total inflow to the St. Lucie Estuary averaged more than 132 cfs (**Figures 1** and **2**) while last month inflow averaged more than 354 cfs. Note these numbers do not include contributions from the Gordy Road Structure due to missing data. Last week's provisional averaged inflows from the tidal basin and the structures are shown in **Table 1**. (Note: Recorder at Gordy Road structure was removed due to bridge construction)

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

Location	Flow (cfs)
Tidal Basin Inflow	80
S-80	0
S-308	0
S-49 on C-24	34
S-97 on C-23	18
Gordy Rd. structure on Ten Mile Creek	Not reporting

Over the past week, salinity increased throughout the estuary (**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 was 21.4. Salinity conditions in the middle estuary were 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)	**16.8** (13.9)	**18.4** (17.5)	NA[1]
US1 Bridge	**20.8** (18.1)	**21.9** (20.6)	10.0-26.0
A1A Bridge	**28.5** (24.5)	**29.9** (27.3)	NA[1]

[1]Envelope not applicable

Caloosahatchee Estuary:
Last week total inflow to the Caloosahatchee Estuary averaged approximately 1,156 cfs (**Figures 5** and 6) while last month inflow averaged about 1,125 cfs. Last week's provisional averaged inflows from the structures and the tidal basin are shown in **Table 3**.

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

Location	Flow (cfs)
S-77	666
S-78	586
S-79	1049
Tidal Basin Inflow	106

Over the past week, surface salinity decreased at S-79 but increased at the remaining sites in the estuary (**Table 4**, **Figures 7** and **8**). The seven-day average surface salinity values are within the good range for adult eastern oysters at Cape Coral, Shell Point and Sanibel (**Figure 9**). The data logger at Sanibel is offline therefore salinities for this week were estimated. The seven-day average surface salinities (**Table 4**) were in the good range (0-10) for tape grass at Val I-75 and 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 at Val I-75 is for the protection of tape grass in the upper estuary and the envelope in the lower estuary reflects the preferred salinity range for adult eastern oysters (*Crassostrea virginica*).

Sampling Site	Surface	Bottom	Envelope
S-79 (Franklin Lock)	**0.3** (0.4)	**0.3** (0.4)	NA[1]
Val I-75	**0.7** (0.4)	**0.9** (1.0)	0.0-5.0[2]
Ft. Myers Yacht Basin	**4.8** (4.2)	**5.6** (6.5)	NA
Cape Coral	**12.7** (10.1)	**13.9** (12.6)	10.0-30.0
Shell Point	**24.6** (22.0)	**25.2** (23.6)	10.0-30.0
Sanibel	**29.6** (27.9)	**30.2** (28.4)	10.0-30.0

[1]Envelope not applicable and [2]Envelope is based on a 2-week forecast 30-day average

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 to be 3.3 or lower at the end of the two week period for pulse release at S-79 ranging from 0 to 1200 cfs and estimated Tidal Basin inflows of 90 cfs. The 30-day moving average surface salinity at Val I-75 is forecast to be 1.1 or lower (**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	90	3.3	1.1
B	300	90	2.7	1.0
C	450	90	2.2	0.9
D	650	90	1.4	0.7
E	800	90	1.0	0.6
F	1000	90	0.6	0.5
G	1200	90	0.3	0.5

Red tide

The Florida Fish and Wildlife Research Institute reported on January 15, 2021, that *Karenia brevis*, the Florida red tide dinoflagellate, was observed at background to high concentrations on and offshore of Lee County, and background to medium concentrations on and offshore of Collier County. Bloom concentrations were observed in 14 samples collected from Lee and Collier counties. On the east coast, red tide was not observed in samples from Brevard, Palm Beach or Broward counties.

Water Management Recommendations

Lake stage is in the Low Sub-Band. Tributary conditions are normal. The LORS2008 release guidance suggests up to 450 cfs release at S-79 to the Caloosahatchee Estuary and up to 200 cfs release at S-80 to the St. Lucie Estuary.

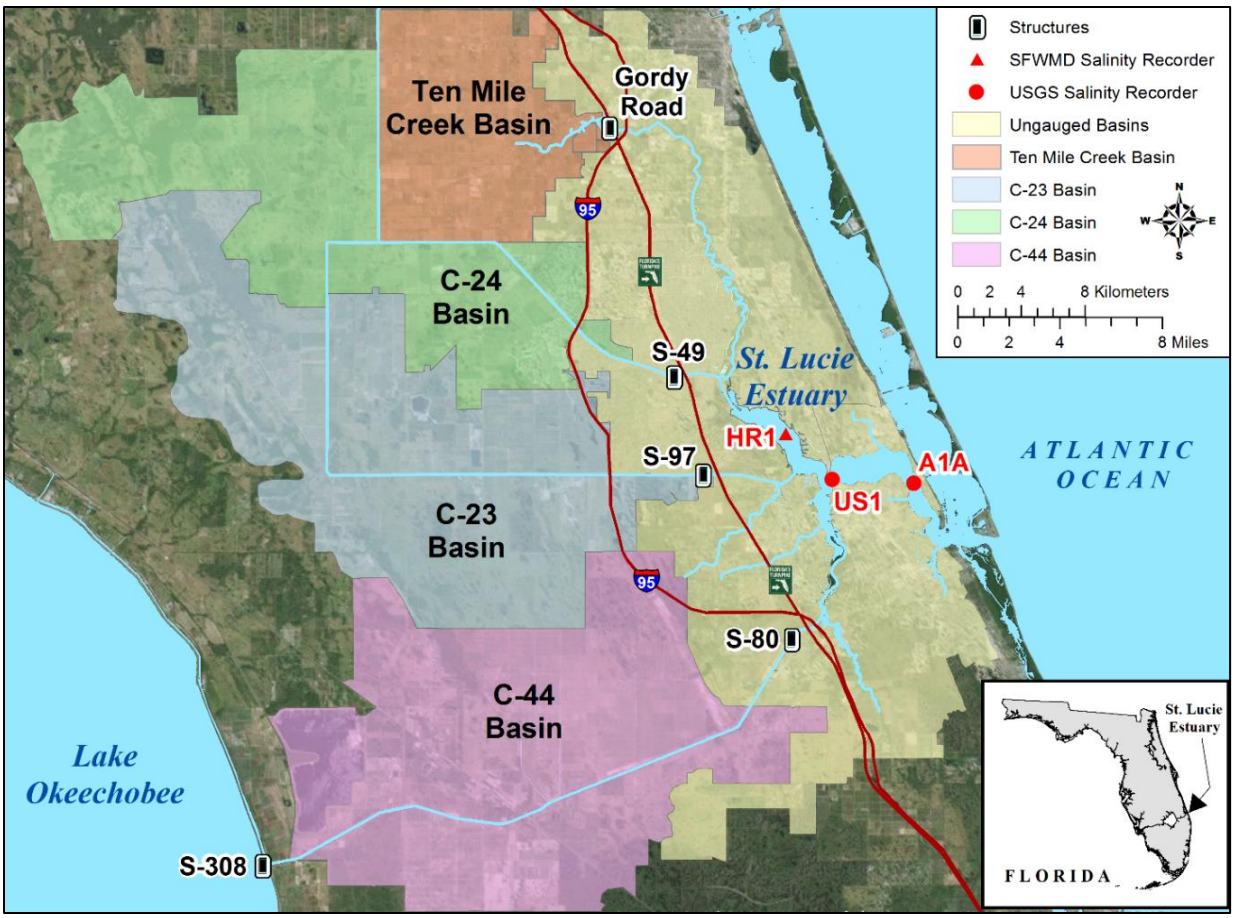


Figure 1. Basins, water control structures, and salinity monitoring for the St. Lucie Estuary.

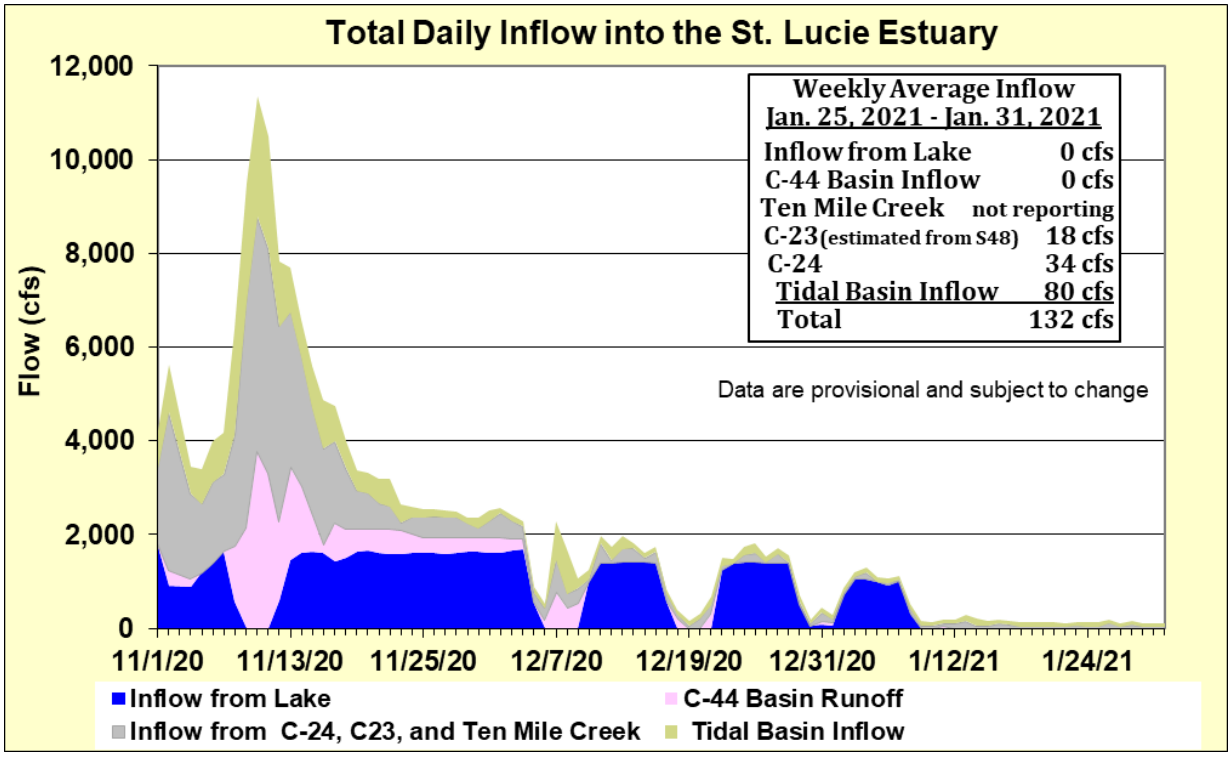


Figure 2. Total daily inflows from Lake Okeechobee and runoff from the C-44, C-23, C-24, Ten Mile Creek, and tidal basin into the St. Lucie Estuary.

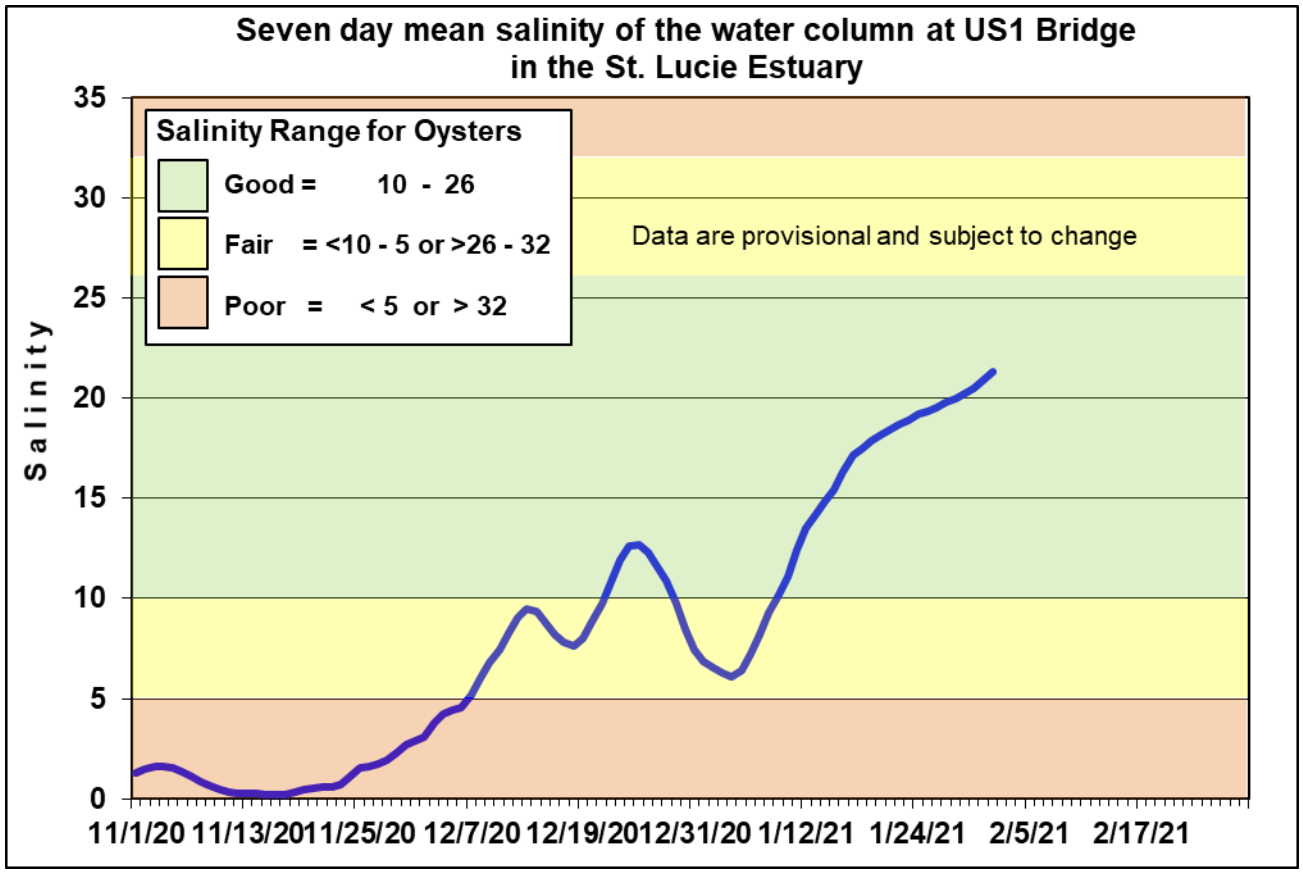


Figure 3. Seven-day mean salinity of the water column at the US1 Bridge.

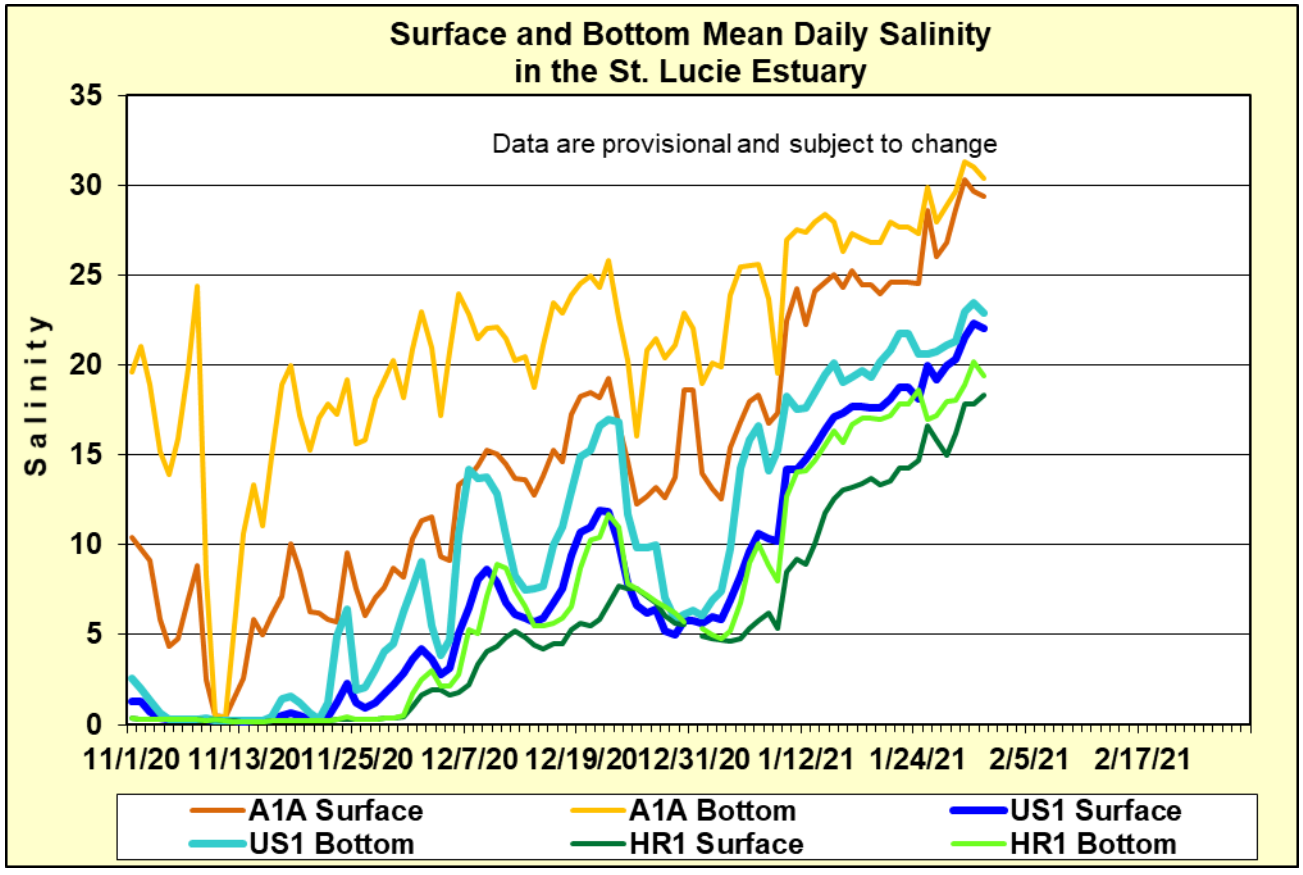


Figure 4. Daily mean salinity at the A1A, US1, and HR1 stations.

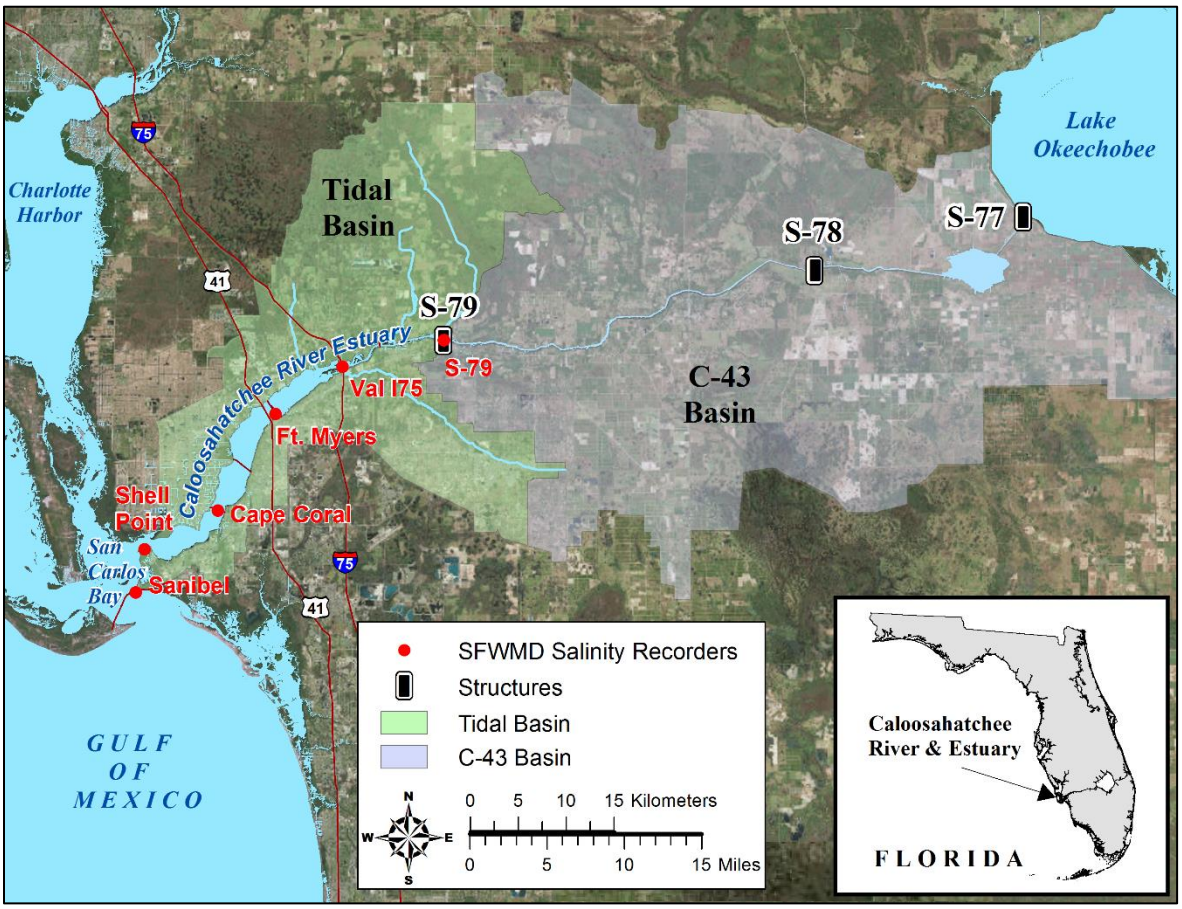


Figure 5. Basins, water control structures, and salinity monitoring for the Caloosahatchee Estuary.

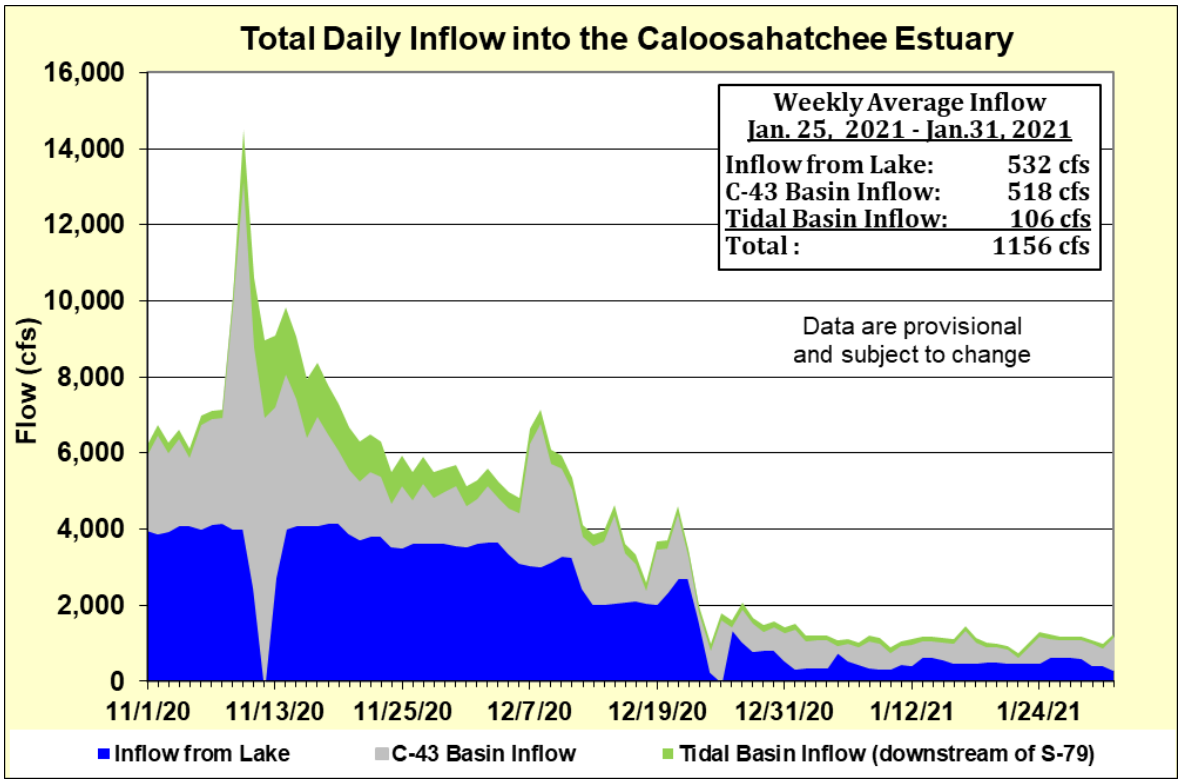


Figure 6. Total daily inflows from Lake Okeechobee, runoff from the C-43 basin and tributaries in the tidal basin into the Caloosahatchee River Estuary.

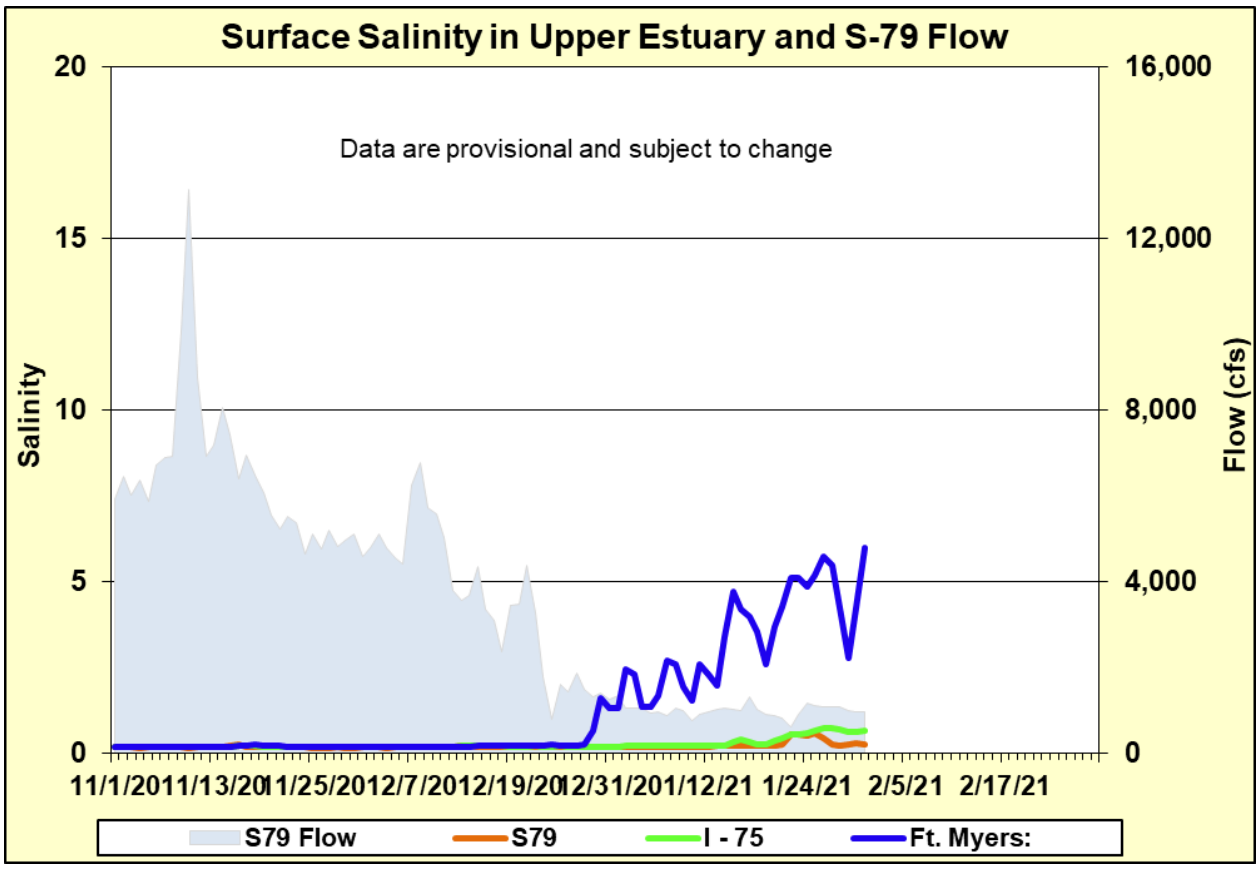


Figure 7. Daily mean flows at S-79 and salinity at upper estuary monitoring stations.

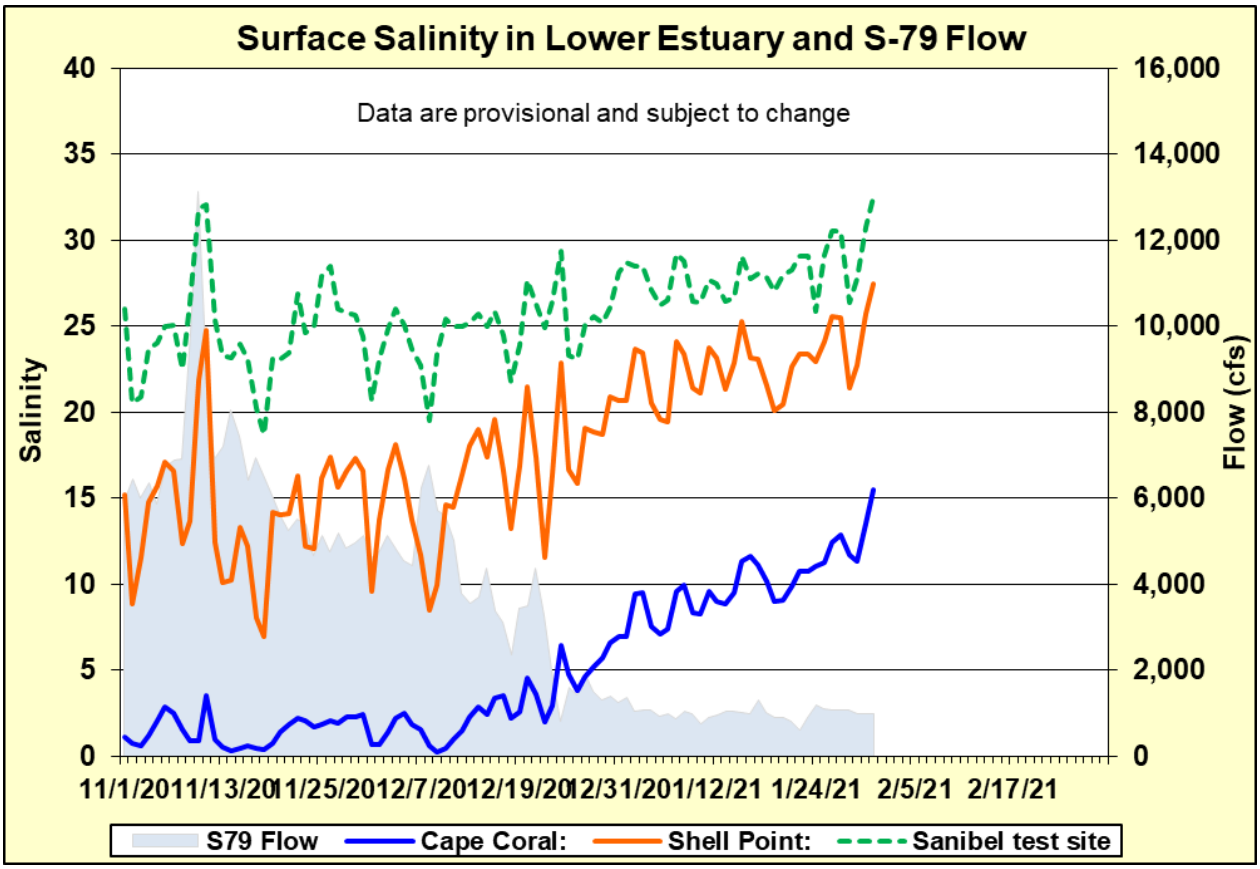


Figure 8. Daily mean flows at S-79 and salinity at lower estuary stations.

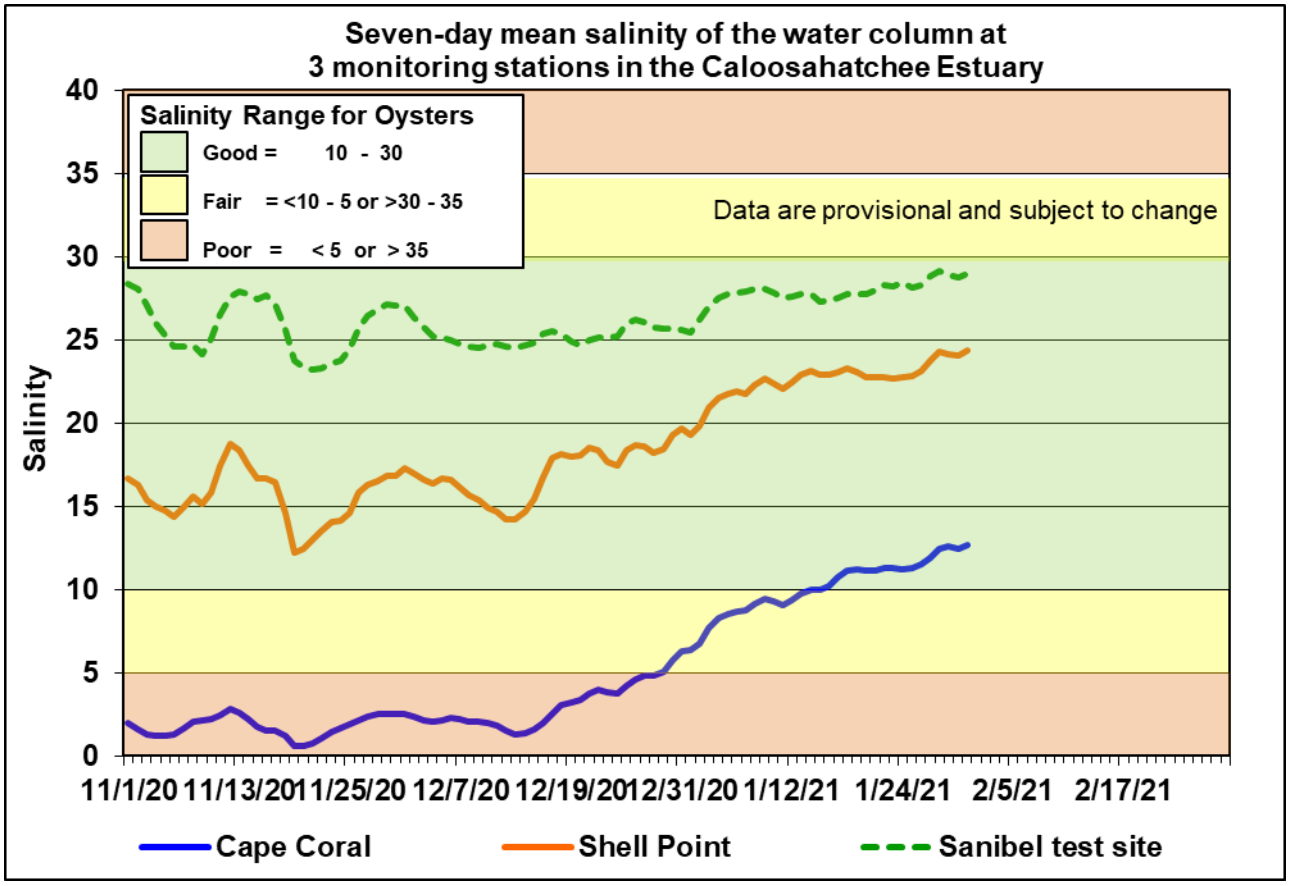


Figure 9. Seven-day mean salinity at Cape Coral, Shell Point, and Sanibel monitoring stations.

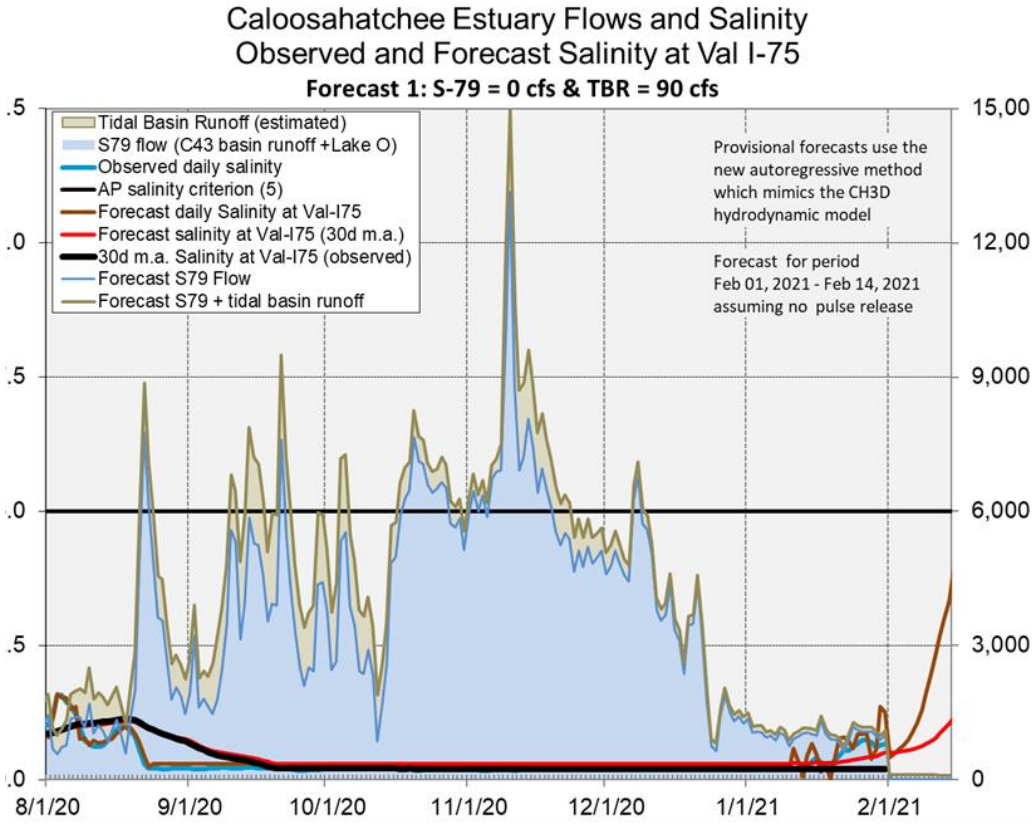
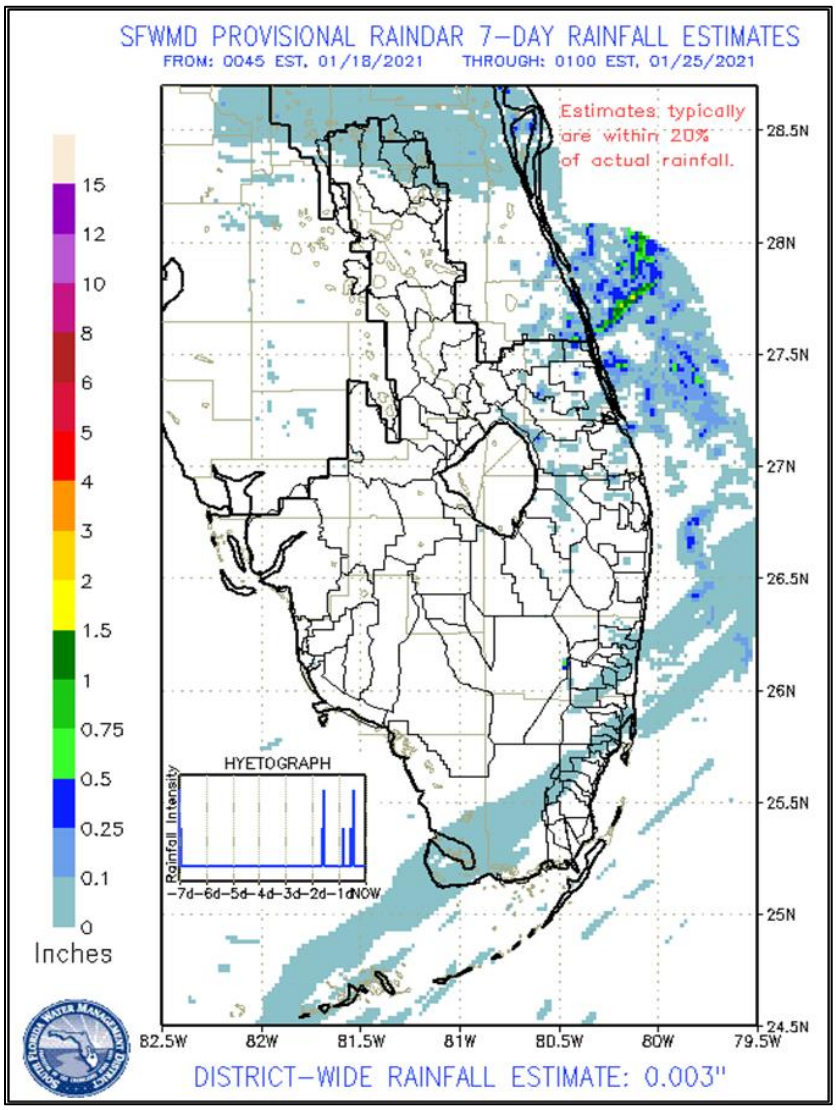


Figure 10. Forecasted Val I-75 surface salinity assuming no pulse release at S-79.

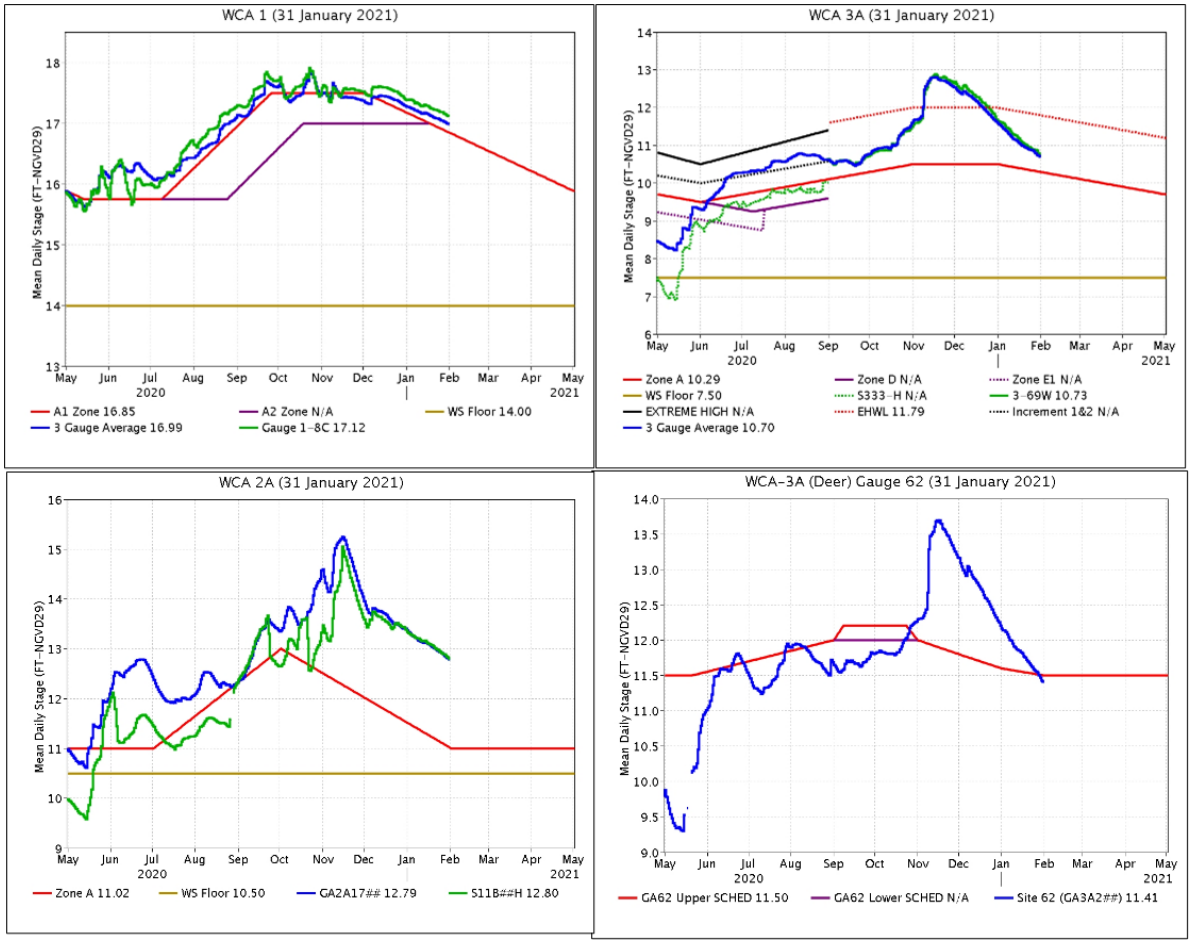
EVERGLADES

The Everglades received no appreciable rainfall over the last week for the second consecutive week. At the gauges monitored for this report stages fell 0.14 feet on average last week. Evaporation was 0.88 inches last week, a 0.08-inch increase from the week prior.

Everglades Region	Rainfall (Inches)	Stage Change (feet)
WCA-1	0.00	−0.08
WCA-2A	0.00	−0.15
WCA-2B	0.00	−0.14
WCA-3A	0.00	−0.19
WCA-3B	0.00	−0.14
ENP	0.00	−0.04

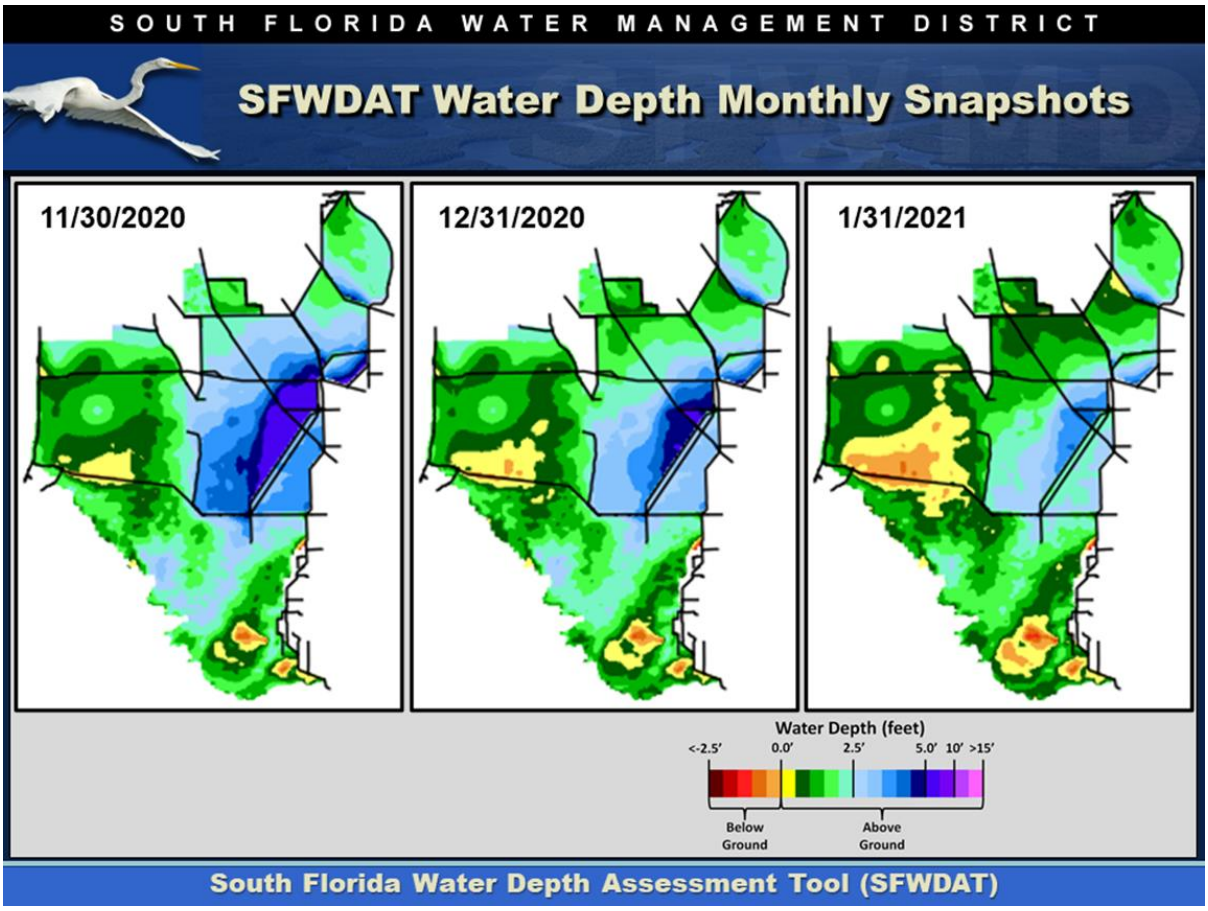


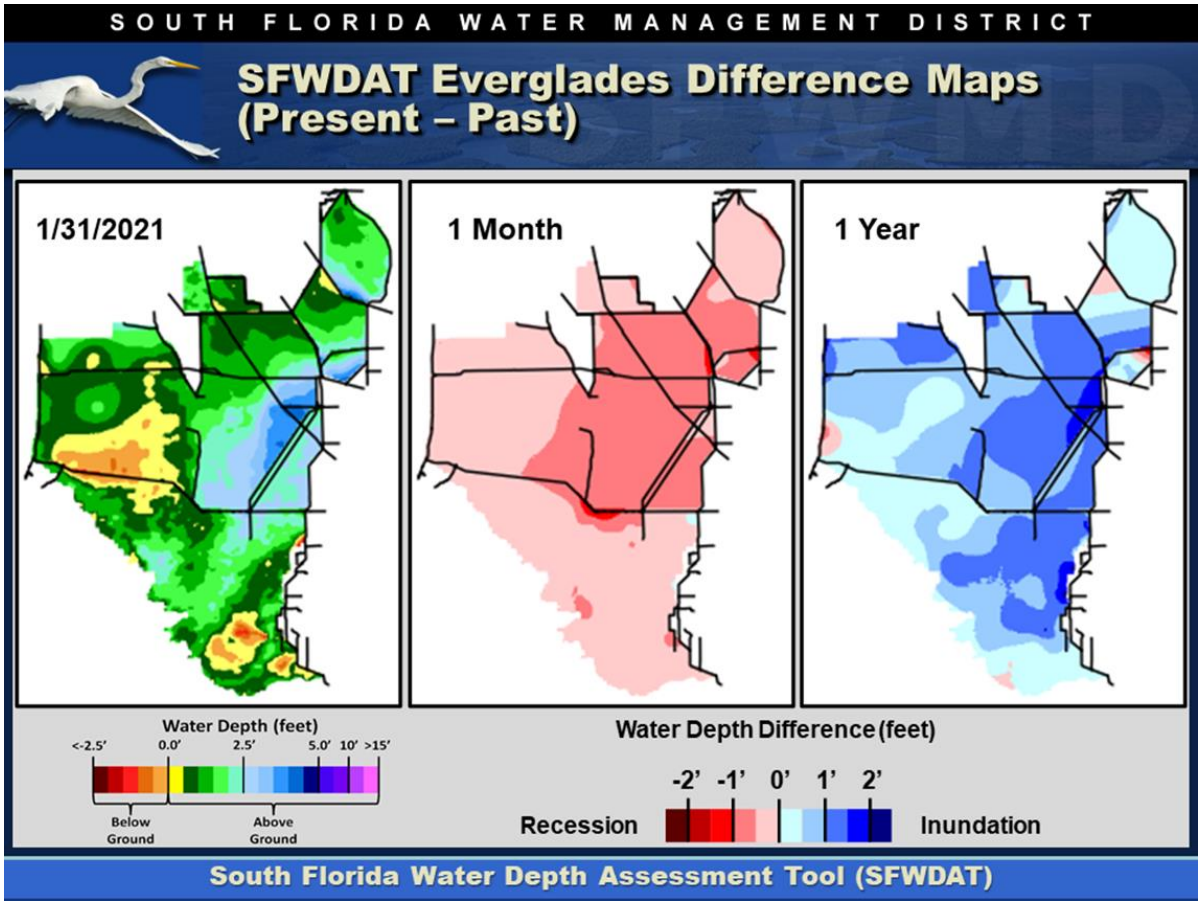
Regulation Schedules: WCA-1: Stage at the 1-8C Gauge is trending parallel with schedule, now 0.27 feet above the falling Zone A1 regulation line. WCA-2A: The recession in stage at S11B-HW remained parallel to the regulation line last week remaining at 1.78 feet above the falling schedule. WCA-3A: The Three Gauge Average stages continued to recede towards the falling Zone A regulation line last week, currently 0.41 feet above. WCA-3A: Stage at gauge 62 (Northwest corner) continues a sharp decline, now below the falling Upper Schedule at 0.09 feet below.



Water Depths: The WDAT tool for spatial interpolation of depth monthly snapshots indicate that flooding stress is becoming less ecologically unfavorable as depths are retreating in the north of the WCAs. Northern WCA-2A is drying down quickly with depths potentially at the soil surface. The northern half of WCA-3AN, particularly west of the Miami Canal, is now potentially within 1.0 feet of the soil surface.

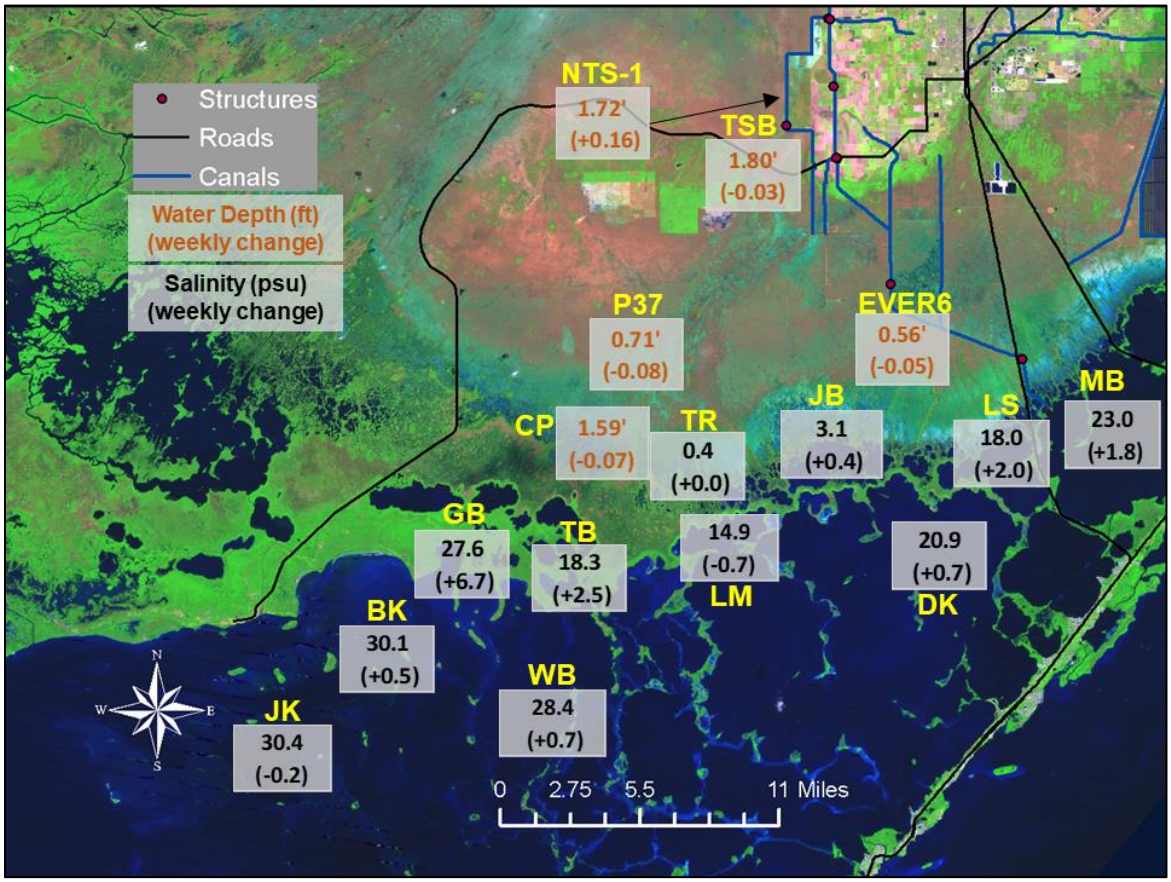
Hydrologic connectivity remains established within the major sloughs in ENP as conditions begin to dry down in the western marl prairies and large portions of southern BCNP. Comparing WDAT water levels from present, over the last month stages fell significantly across WCA-3A and WCA-2A more so along the western perimeter of WCA-3A (the lower reach of the L-38) and downstream of S-12 and S343 in Everglades National Park. Looking back one year the stage difference patterns are strikingly different than one month ago. Compared to one year ago the entire region is significantly deeper than it was a year ago, most significantly so in the upper reaches of the L-67 canal/levee in WCA-3A. Northern WCA-2A is trending shallower than it was a year ago.

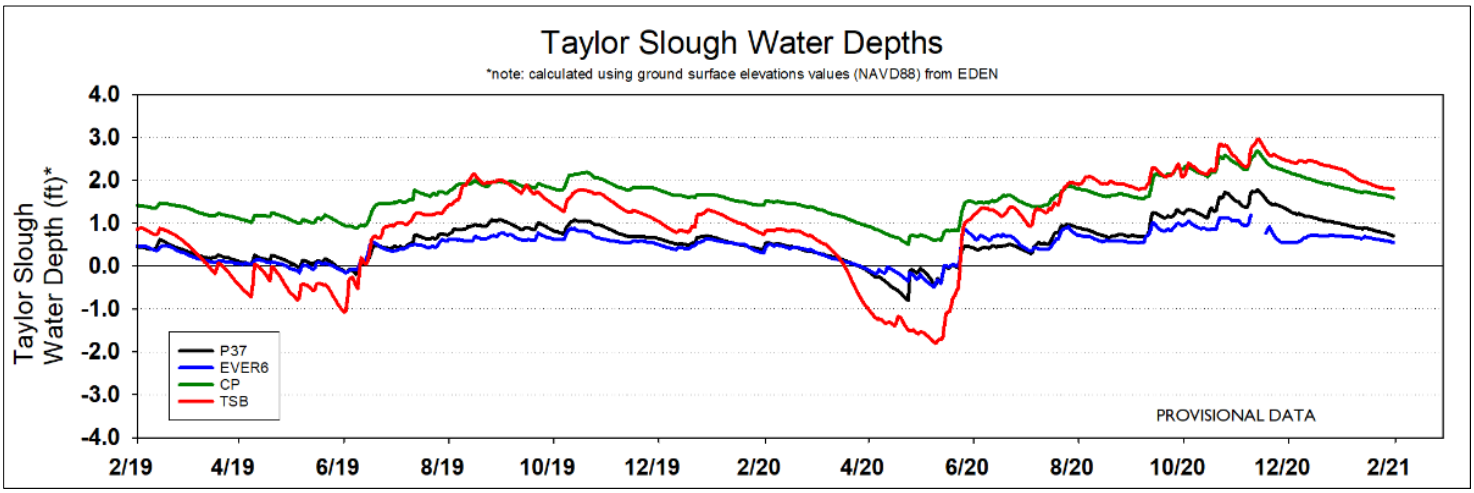

SOUTH FLORIDA WATER MANAGEMENT DISTRICT
SFWDAT Water Depth Monthly Snapshots
11/30/2020
12/31/2020
1/31/2021
Water Depth (feet)
<-2.5'
0.0'
2.5'
5.0'
10'
>15'
Below Ground
Above Ground
South Florida Water Depth Assessment Tool (SFWDAT)

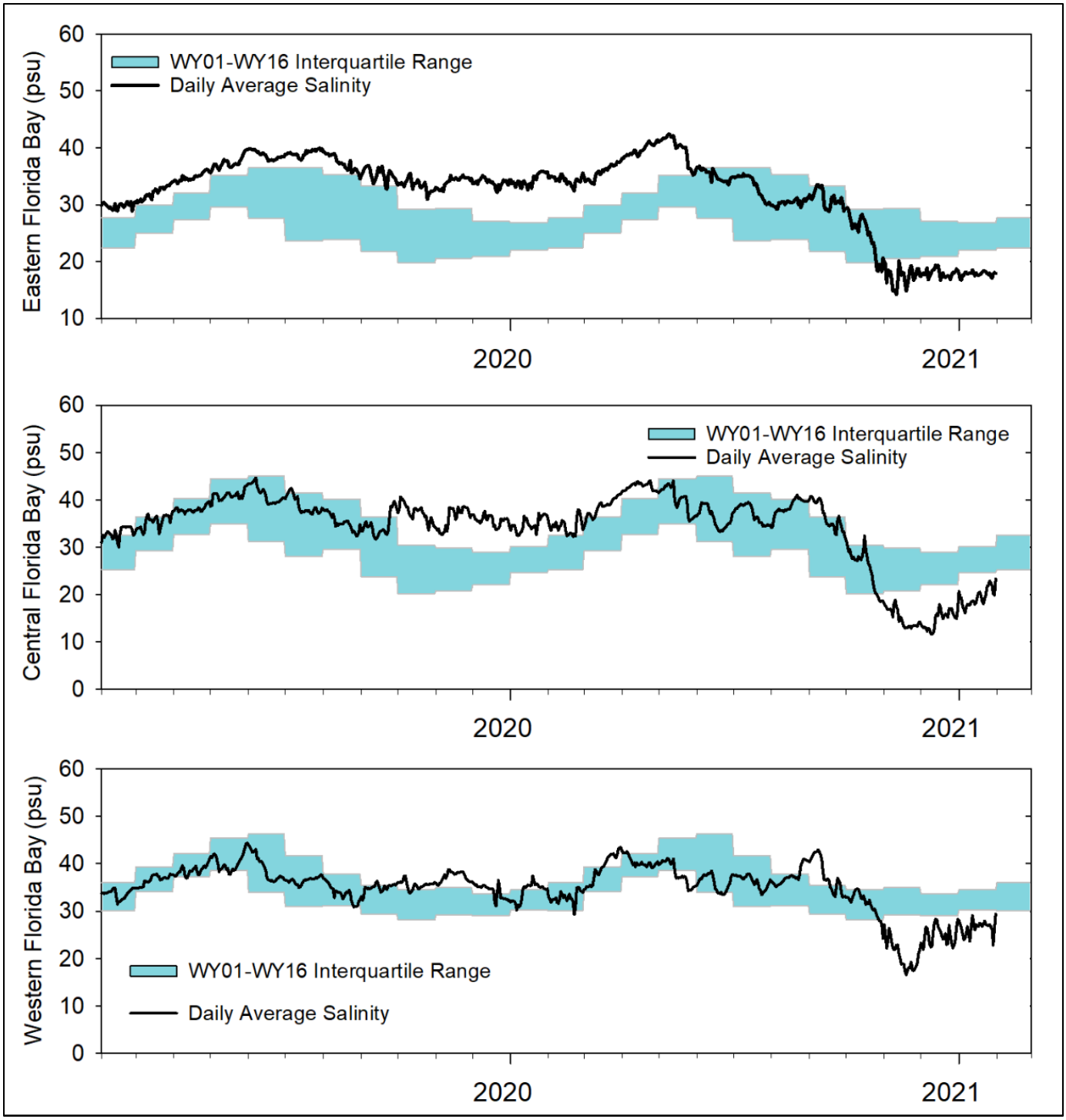

SOUTH FLORIDA WATER MANAGEMENT DISTRICT
SFWDAT Everglades Difference Maps
(Present – Past)
1/31/2021
1 Month
1 Year
Water Depth (feet)
<-2.5'
0.0'
2.5'
5.0'
10'
>15'
Below Ground
Above Ground
Water Depth Difference (feet)
-2'
-1'
0'
1'
2'
Recession
Inundation
South Florida Water Depth Assessment Tool (SFWDAT)

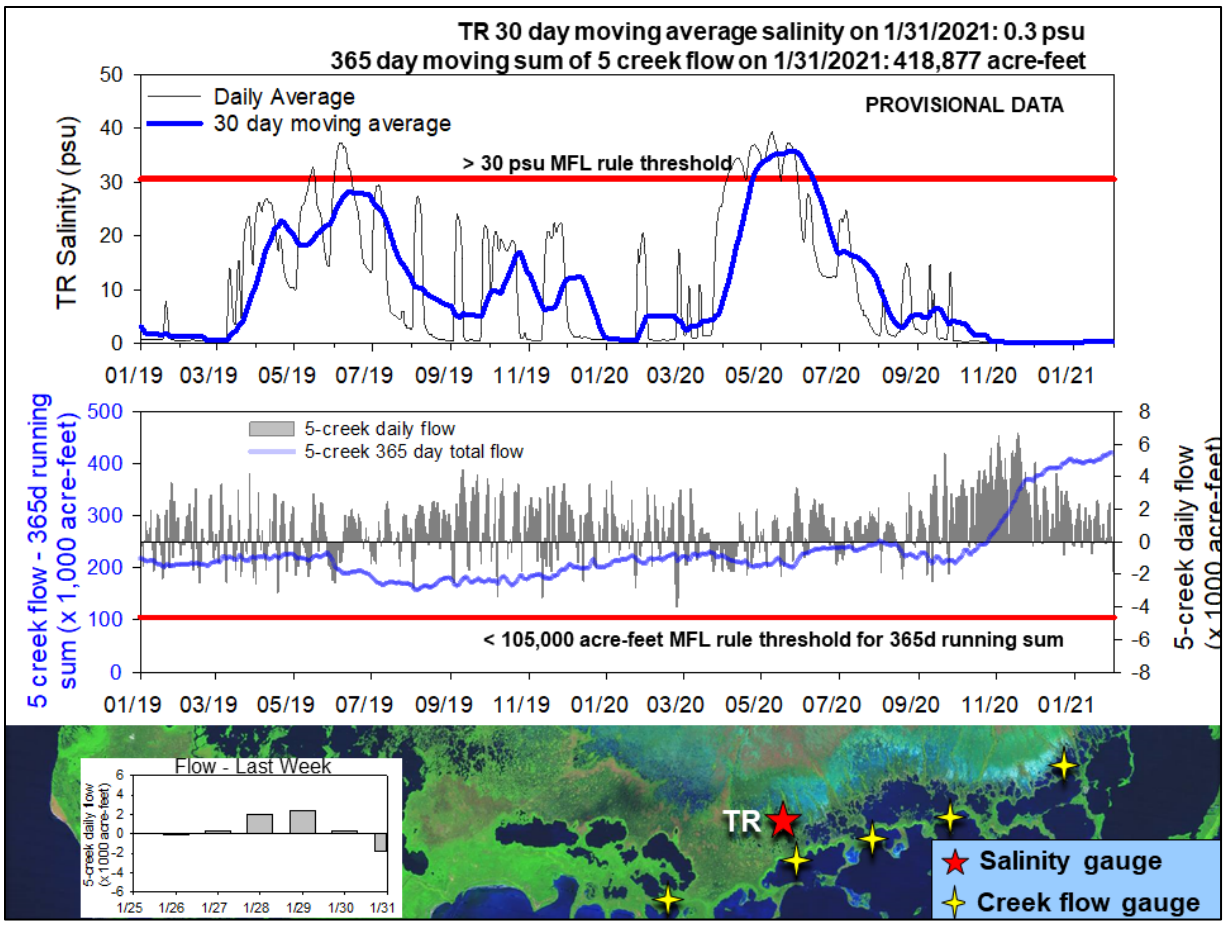
Tree island inundation in WCA-3A, WCA-3B and ENP: 371 Tree Islands of known elevation within WCA-3A, -3B, and Everglades National Park's Shark Slough. Current preliminary estimates using WDAT indicate that 46% or 173 of the tree islands are currently inundated (down from 56% the week prior), and 45% of those islands continue to have been inundated for more than 120 days. Inundation for more than 120 days will cause ecological harm to sensitive islands.

Taylor Slough Water Levels: Next to no rain fell over Taylor Slough and Florida Bay this week, and water levels in Taylor Slough decreased by 0.015 feet over the week. The only stations that increased over the week were the ones closest to the L31W (example: NTS-1). Taylor Slough is still averaging 9 inches higher than the historical average for this time of year, and the northern portion of the slough is 20 inches higher than the average for this time of year, which is a good position for early 2021.






Eastern Florida Bay (psu)
60
50
40
30
20
10
WY01-WY16 Interquartile Range
Daily Average Salinity
2020
2021
Central Florida Bay (psu)
60
50
40
30
20
10
0
WY01-WY16 Interquartile Range
Daily Average Salinity
2020
2021
Western Florida Bay (psu)
60
50
40
30
20
10
0
WY01-WY16 Interquartile Range
Daily Average Salinity
2020
2021



Florida Bay Salinities: Salinities in Florida Bay averaged a 1.4 psu increase over the week with individual station changes ranging from -0.7 psu in the eastern nearshore to +6.7 psu in the western nearshore. Bay-wide salinity is 4 psu lower than the historical average for this time of year. All stations are lower than their historical averages with the far eastern areas being the furthest from the average (6 psu lower).

Florida Bay MFL: The salinity at the TR station in the mangrove zone (tracked for the Florida Bay MFL) has continued to be near fresh (<0.4 psu), and the 30-day moving average also remained low at 0.3 psu but it is slowly rising. Weekly flow from the 5 creeks identified by yellow stars on the map totaled just over 3,000 acre-feet (one third of last week's total). Negative flows occurred on 3 of the 7 days last week. The 365-day moving sum of flow from the five creeks (tracked as part of the Florida Bay MFL criteria) ended at 418,877 acre-feet this week, which is 2,400 acre-feet more than last week. Conditions are still higher than the 95th percentile of historical data (390,830 acre-feet). These values have not been seen since October of 2012. Creek flows are provisional USGS data.

Water Management Recommendations

As expected wading birds are responding to the nearly optimal foraging conditions in WCA-3A North east of the Miami canal (around 8,000 wading birds) and conditions to the west of that canal are drying down rapidly (an average recession rate of 0.20 feet per week over the last 5 weeks).

Stage conditions are very high in WCA-2A, falling in northeastern WCA-3A and getting dry in northwestern WCA-3A. The current recommendation from the STA group is that only STA-2 has capacity for Lake Okeechobee discharges, and STA 3/4 is currently discharging very little. These conditions would suggest that moving water south from STA-2/WCA-2A by way of the S-7 as opposed to the S-11s into WCA-3A would make ecological sense, should that need become reality as conditions warrant the restriction of discharges to tide from WCA-2A now that the WCA-3A deviation transition is

well under way. Recession rates within the recommended range of 0.05 to 0.10 feet per week have ecological benefit in WCA-1, WCA-2 and WCA-3A North in order to preserve water high in the system and reap the ecological benefit to wading birds of a long dry down. At this point in the dry season, maintaining the recession where possible in WCA-3A South and Central even when faster than traditional (but less than 0.25 feet per week) ecological recession rate recommendations has ecological benefit as long as there is no downstream deleterious ecological impact.

Continued flows towards Taylor Slough and Florida Bay maintain hydration in the marshes and lower salinity conditions within the nearshore areas of Florida Bay and will provide a freshwater buffer against the drier than average dry season that is expected which would delay the start of the salinity increases that occur within the dry season and possibly prevent the occurrence of extreme hyper-salinity towards the end of the dry season.

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

SFWMD Everglades Ecological Recommendations, February 2nd, 2021 (red is new)

Area	Weekly change	Recommendation	Reasons
WCA-1	Stage decreased by 0.08'	Maintain marsh stage slightly above and parellel to the regulation schedule.	Protect within basin and downstream habitat and wildlife. Maintaining optimal recession rates prepares the habitat for conducive wading bird foraging.
WCA-2A	Stage decreased by 0.15'	Moderate the recession rate to near -.05 to -.12 feet per week and maintain marsh stage above and parallel to the falling regulation schedule.	Protect within basin and downstream habitat and wildlife. Maintaining optimal recession rates prepares the habitat for conducive wading bird foraging.
WCA-2B	Stage decreased by 0.14'	Moderate the recession rate to near -.05 to -.12 feet per week.	Protect within basin and downstream habitat and wildlife from flooding stress.
WCA-3A NE	Stage decreased by 0.20'	Moderate the recession rate to near -.05 to -.10 feet per week.	Protect within basin and downstream habitat and wildlife. Moderating the recession preserves peat soils and extends the time that foraging is optimal on the landscape.
WCA-3A NW	Stage decreased by 0.18'	Moderate the recession rate to near -.05 to -.10 feet per week.	
Central WCA-3A S	Stage decreased by 0.18'	Maintain the recession rate up to 0.25 feet per week to return marsh stage to more average conditions.	Protect within basin, upstream/downstream habitat and wildlife. Tree island ecology is diminished by flooding
Southern WCA-3A S	Stage decreased by 0.20'		
WCA-3B	Stage decreased by 0.14'	Maintain the recession rate to lower marsh stage.	Protect within basin and downstream habitat and wildlife from flooding stress. Tree island ecology is diminished by flooding
ENP-SRS	Stage decreased by 0.04'	Make discharges to the Park according to the current deviation transition plan with a return to COP protocol as soon as conditions allow	Protect within basin and upstream habitat and wildlife from flooding stress.
Taylor Slough	Stage changes ranged from −0.08' to +0.16'	Move water southward as possible	When available, provide freshwater buffer for downstream conditions.
FB- Salinity	Salinity changes ranged −0.7 to +6.7 psu	Move water southward as possible	When available, provide freshwater to maintain low salinity buffer and promote water movement.