

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: January 13, 2021

SUBJECT: Weekly Environmental Conditions for Systems Operations

Summary

Weather Conditions and Forecast

Strong upper level winds and moisture streaming over the area behind a cold front is forecast to generate areas of rain mainly across the southern half of the District Wednesday with moderate to locally heavy rainfall amounts. A reinforcing cold front will push into the area Thursday and produce light showers mainly south as it stalls near the southern end of the District. A third, stronger front is forecast to push through the District Friday night and Saturday morning bringing some scattered showers and thunderstorms mainly over the northern half of the District. Drier conditions are forecast to move in Saturday night, Sunday, and Monday. Moisture is then forecast to begin creeping back north Monday night bringing some light rain to the southern half of the District. Total rainfall is forecast to be near the historical average during the first 7-day period (Week 1) with the potential for above-average rains over portions of the southern half of the District. Rainfall is then forecast to be below the historical average during the second 7-day period (Week 2).

Kissimmee

Tuesday morning stages were 58.0 feet NGVD (at schedule) in East Lake Toho, 55.0 feet NGVD (at schedule) in Toho, and 52.3 feet NGVD (0.2 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. Tuesday morning discharges were 620 cfs at S-65, 600 cfs at S-65A, 690 cfs at S-65D and 680 cfs at S-65E. Dissolved oxygen concentration in the Kissimmee River averaged 8.6 mg/L for the week through Sunday. Kissimmee River mean floodplain depth on Sunday was 0.39 feet. To the extent possible while keeping flow at S-65A at or below approximately 800 cfs, today's recommendation is to manage discharge at S-65 to lower stage in Lakes Kissimmee-Cypress-Hatchineha to reach ~51 feet NGVD on March 1.

Lake Okeechobee

Lake Okeechobee stage was 15.67 feet NGVD on January 10, 2020, 0.14 feet lower than last week and 0.32 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 0.17 feet above. Recent satellite imagery and water quality results suggest little to no bloom activity on the Lake.

Estuaries

Total inflow to the St. Lucie Estuary averaged more than 768 cfs over the past week with approximately 610 cfs coming from Lake Okeechobee. The seven-day average 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 1,093 cfs over the past week with approximately 452 cfs coming from the Lake. Seven-day average surface salinities remained almost fresh (0.2) at the two most upstream sites (S-79 and Val I75) and increased slightly 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 in the good range (10-30) for adult eastern oysters at Shell Point and Sanibel, and in the fair range (5-10) at Cape Coral. 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, 900 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 97,900 ac-feet. The total amount of inflows to the STAs in WY2021 is approximately 1,516,000 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 1, 3, 4 and 5, STA-3/4 Eastern, Central, and Western Flow-ways 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 conditions allow, releases will be sent to STA-2.

Everglades

Most of the gauges monitored for this report the WCA stages fell within the early dry season WY21 recession recommendations, one exception being WCA-2A which is receding a little faster than ecologically desirable and Northeast Shark River Slough which experienced a reversal. Depths remain above average in Taylor Slough and salinities in Florida Bay remain below the historical average for this time of year, this is good positioning to begin 2021. High concentrations of wading birds remain along the southern coast, indicating good foraging conditions moving towards nesting season. If a near optimal recession continues many more wading birds are expected in high numbers within the central Everglades soon.

Supporting Information

KISSIMMEE BASIN

Rainfall

The Upper Kissimmee Basin received 0.08 inches of rainfall in the past week and the Lower Basin received 0.01 inches (SFWMD Daily Rainfall Report 01/11/2021).

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: 1/12/2021

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)						
							1/10/21	1/3/21	12/27/20	12/20/20	12/13/20	12/6/20	11/29/20
Lakes Hart and Mary Jane	S-62	25	LKMJ	61.0	R	61.0	0.0	0.0	-0.1	0.0	0.1	-0.1	0.0
Lakes Myrtle, Preston, and Joel	S-57	15	S-57	61.5	R	61.6	-0.1	0.0	0.0	0.0	0.0	-0.1	0.0
Alligator Chain	S-60	0	ALLI	64.0	R	64.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Lake Gentry	S-63	21	LKGT	61.5	R	61.5	0.0	0.1	0.0	0.0	0.1	-0.1	0.1
East Lake Toho	S-59	22	TOHOE	58.0	R	58.0	0.0	0.0	-0.1	0.0	-0.1	0.0	0.0
Lake Toho	S-61	10	TOHOW, S-61	55.0	R	55.0	0.0	-0.1	0.0	0.0	0.0	0.0	0.0
Lakes Kissimmee, Cypress, and Hatchineha	S-65	540	KUB011, LKIS5B	52.3	R	52.5	-0.2	-0.1	0.0	0.0	0.0	0.2	0.3

¹ Seven-day average of weighted daily means through midnight.

² Names of in-lake monitoring sites and structures used to determine lake stage; if more than one site is listed, an average is reported.

³ 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: 1/12/2021

Metric	Location	1-Day Average		Average for the Preceding 7-Days ¹							
		1/10/2021	1/10/21	1/3/21	12/27/20	12/20/20	12/13/20	12/6/20	11/29/20	11/22/20	11/15/20
Discharge (cfs)	S-65	549	540	676	729	848	1,382	1,083	842	784	385
Discharge (cfs)	S-65A ²	599	600	733	809	974	1,566	1,275	1,108	1,095	724
Discharge (cfs)	S-65D ²	704	770	944	1,317	1,704	1,605	1,497	1,541	1,685	1,590
Headwater Stage (feet NGVD)	S-65D ²	25.81	25.85	25.80	25.73	26.08	26.40	26.82	26.99	26.98	27.03
Discharge (cfs)	S-65E ²	770	808	944	1,314	1,710	1,687	1,545	1,657	1,835	1,904
Discharge (cfs)	S-67	0	0	0	0	0	0	0	0	0	0
DO (mg/L) ³	Phases I & II/III river channel	8.7	8.6	8.4	7.5	6.4	7.2	6.0	5.3	4.7	5.2
Mean depth (feet) ⁴	Phase I floodplain	0.39	0.41	0.50	0.68	1.00	1.01	0.90	0.93	0.94	0.75

¹Seven-day average of weighted daily means through Sunday midnight.

²S-65A discharge combines S-65A with auxiliary structures; 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.

³DO is the average for sondes at KRBN, PC62, PC33, PD62R, and PD42R.

⁴1-day spatial average from South Florida Water Depth Assessment Tool (SFWDAT).

DATA ARE PROVISIONAL; N/A indicates that data were not available.

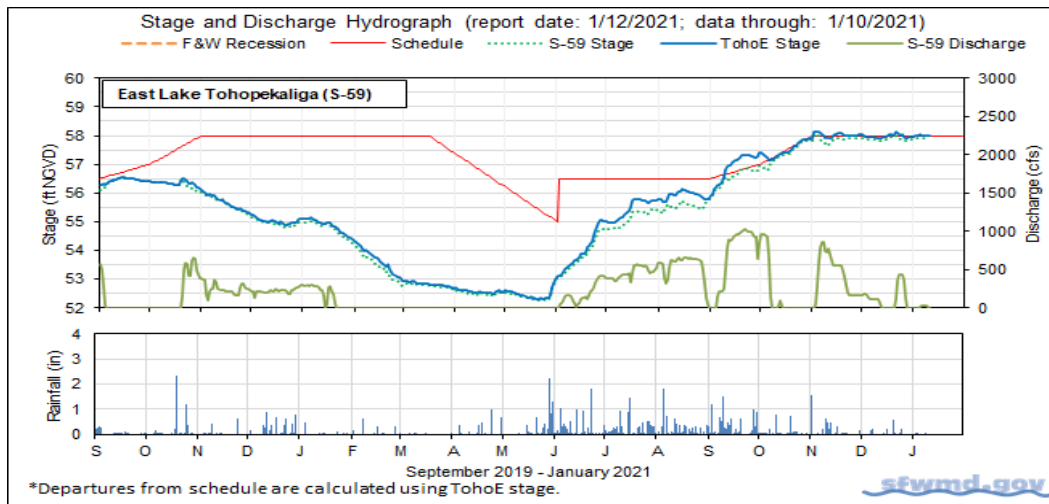


Figure 1. East Lake Toho regulation schedule, stage, discharge and rainfall.

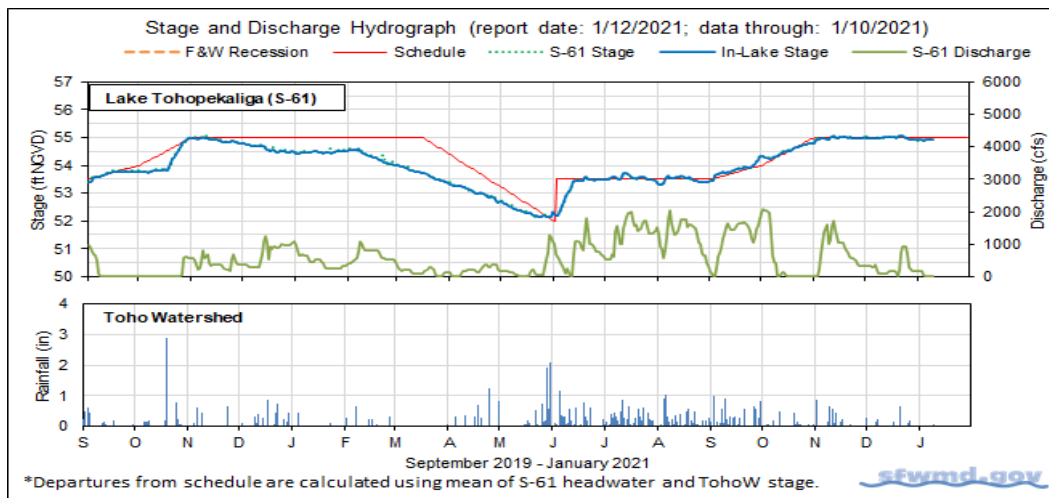


Figure 2. Lake Toho regulation schedule, stage, discharge and rainfall.

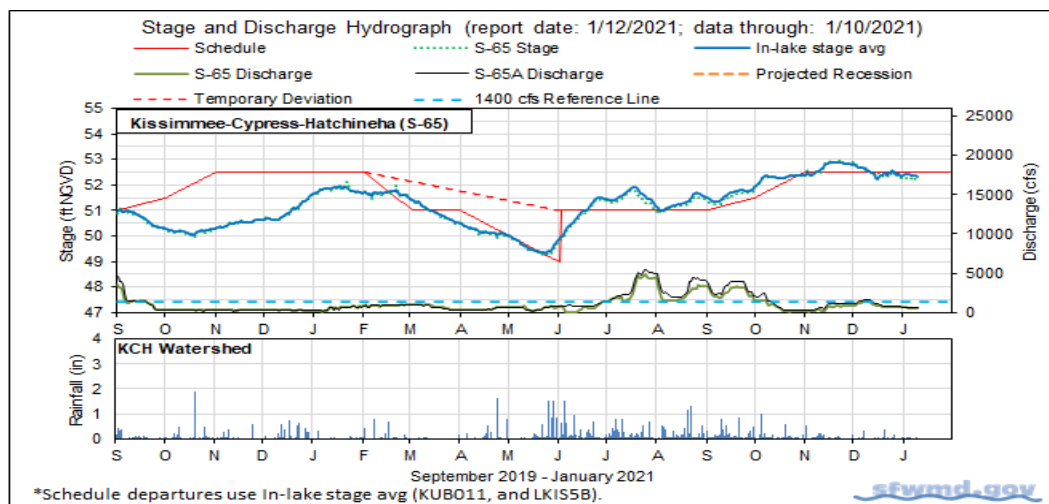


Figure 3. Lakes Kissimmee, Cypress and Hatchineha regulation schedule, stage, discharge and rainfall.

Kissimmee River Phase I Restoration Area Water Depth Maps

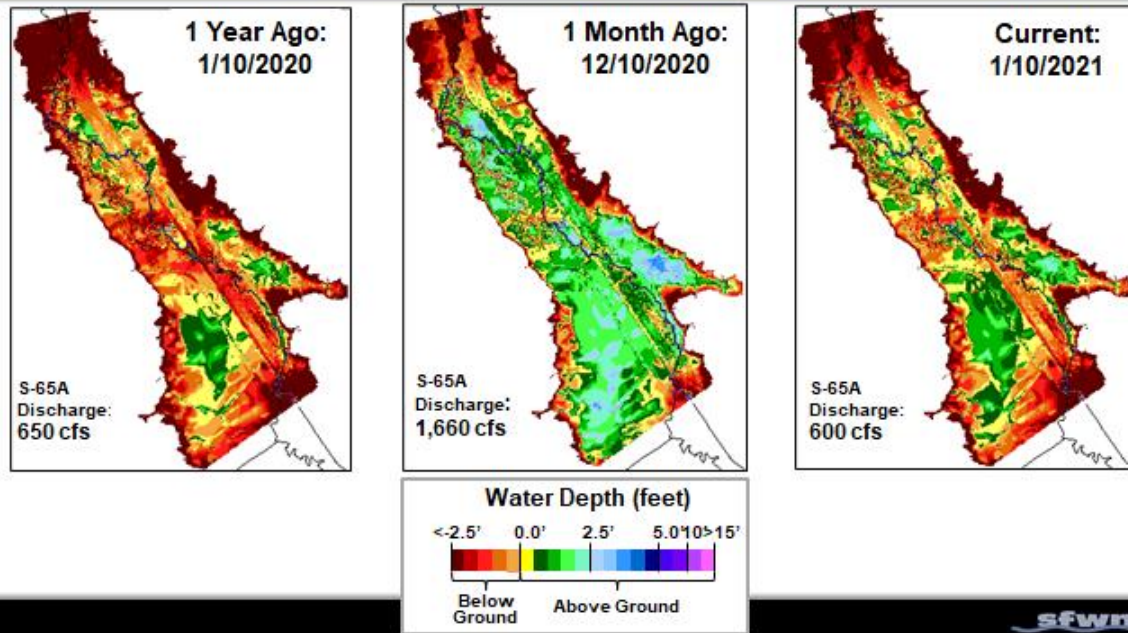


Figure 4. Phase I area floodplain water depths (from left to right) one year ago, one month ago and current. Color-coding has been modified to accommodate greater water depths; these maps are not directly comparable to Kissimmee Basin WDAT maps published prior to January 16, 2012.

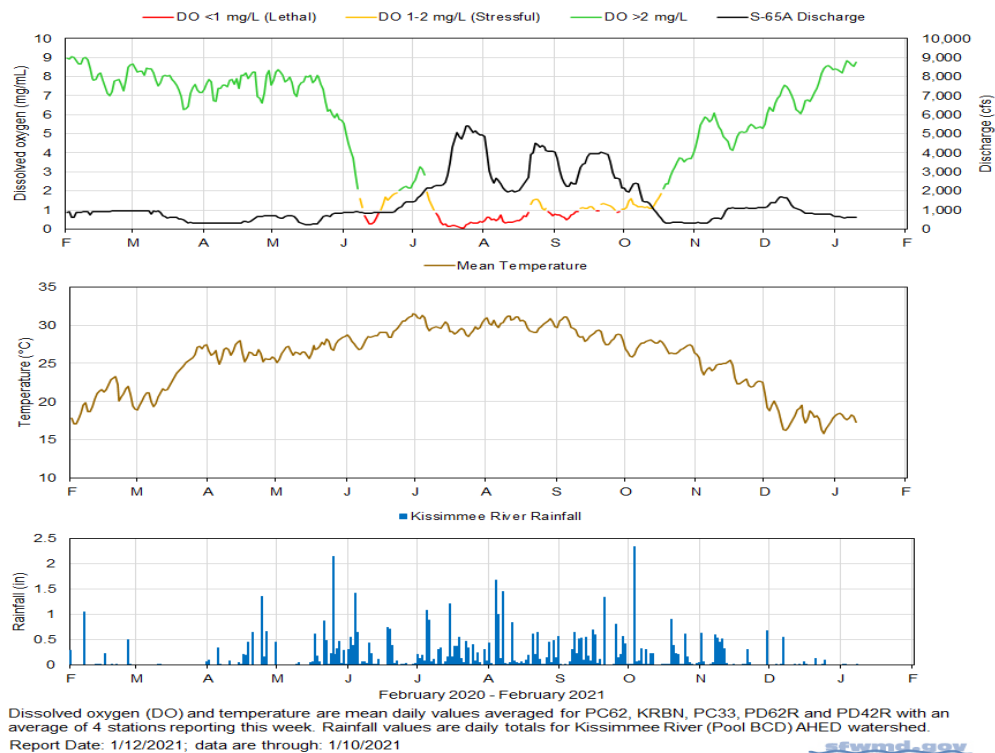


Figure 5. Restored Kissimmee river channel mean daily dissolved oxygen concentration (mg/L), S-65A discharge (cfs), temperature (°C) and rainfall (inches)

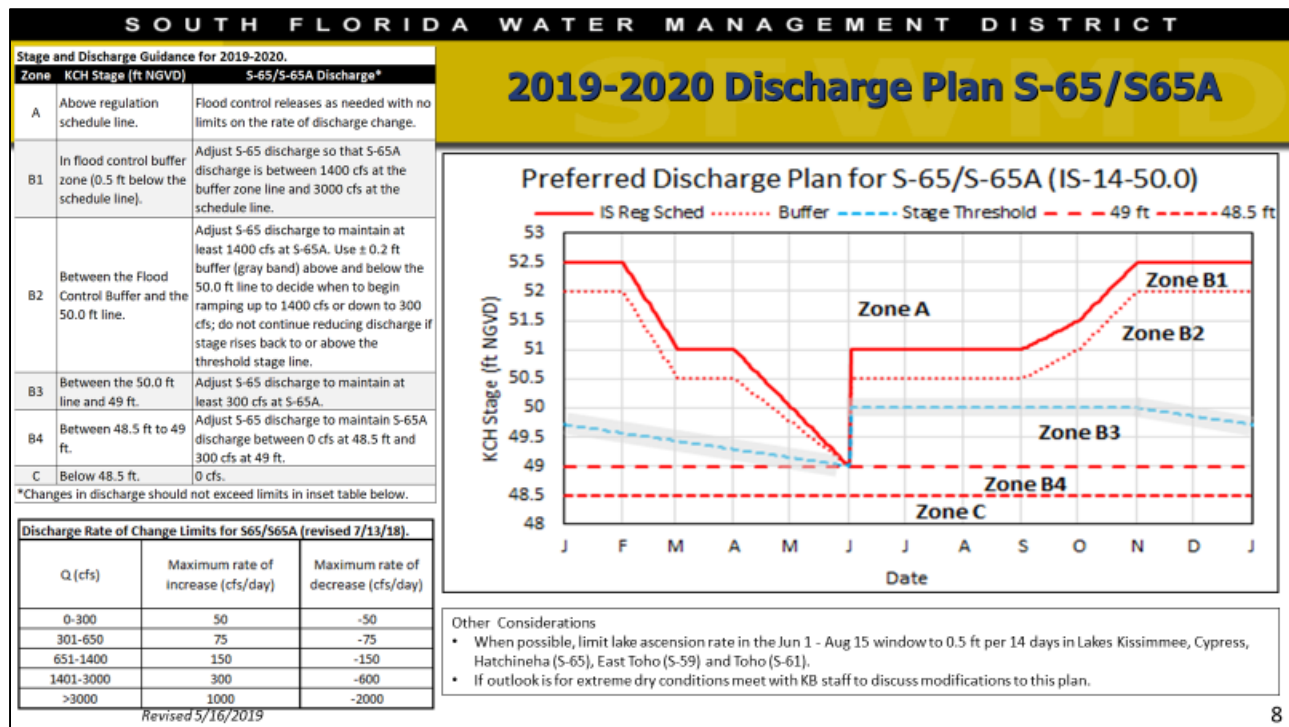


Figure 6. The 2019-2020 Discharge Plan for S-65/S-65A.

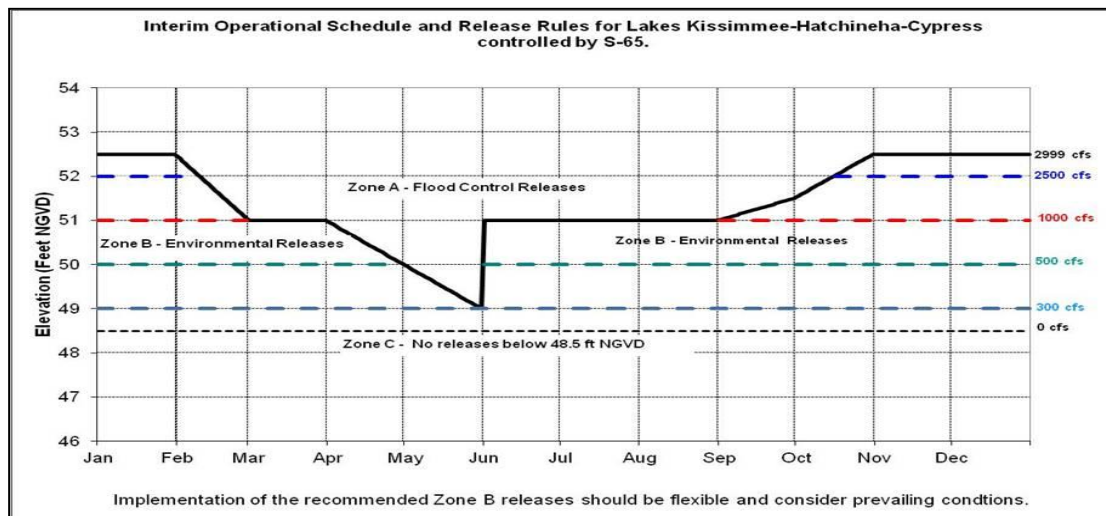


Figure 7. Interim operations schedule for S-65 (solid black line). The discharge schedule shown to the right has not been used in recent years.



Figure 8. The Kissimmee Basin.

LAKE OKEECHOBEE

Lake Okeechobee stage is 15.67 feet NGVD, 0.32 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 0.17 feet above. Lake stage reached a low of 10.99 feet on May 17 and a high of 16.45 feet on November 12 (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 RAINДАР, almost no rain fell on the Lake, and most of the watershed received less than 0.1 inches (Figure 4).

Average daily inflows (excluding rainfall) were, again, lower than the previous week, dropping from 1,545 cubic feet per second (cfs) to 1,208 cfs. Outflows (excluding evapotranspiration) increased from 1,514 cfs to 2,188 cfs. Most of the inflows came from the Kissimmee River (812 cfs through S-65E & S-65EX1) and the C-40/41 canals (172 cfs through S-71 & S-72). Releases to the west via S-77 increased slightly from 620 cfs to 673 cfs, and releases east via S-308 remained similar at 691 cfs. Releases south through the S350 structures increased from approximately 200 cfs to more than 800 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) 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. The January sampling occurred on the 5th and 6th, and all the samples had undetectable levels of cyanotoxins. Results for chlorophyll *a* and other water quality parameters are still pending.

The most recent satellite image (January 8, 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 6).

Water Management Summary

Lake Okeechobee stage was 15.67 feet NGVD on January 10, 2020, 0.14 feet lower than last week and 0.32 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 0.17 feet above. Recent satellite imagery and water quality results suggest little to no bloom activity on the Lake.

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)	OUTFLOWS	Previous week Avg Daily CFS	Avg Daily Flow cfs	Equivalent Depth Week Total (in)
S-65E & S-65EX1	942	821	0.3	S-77	620	673	0.3
S-71 & S-72	196	172	0.1	S-308	693	691	0.3
S-84 & S-84X	168	41	0.0	S-351	92	478	0.2
Fisheating Creek	115	72	0.0	S-352	101	247	0.1
S-154	14	3	0.0	S-354	8	100	0.0
S-191	0	0	0.0	L-8 Outflow			
S-133 P	29	42	0.0	ET	1403	1920	0.7
S-127 P	12	7	0.0	Total	2917	4108	1.6
S-129 P	8	5	0.0				
S-131 P	4	2	0.0				
S-135 P	56	39	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	1	2	0.0				
Rainfall	0	27	0.0				
Total	1545	1234	0.5				

Provisional Data

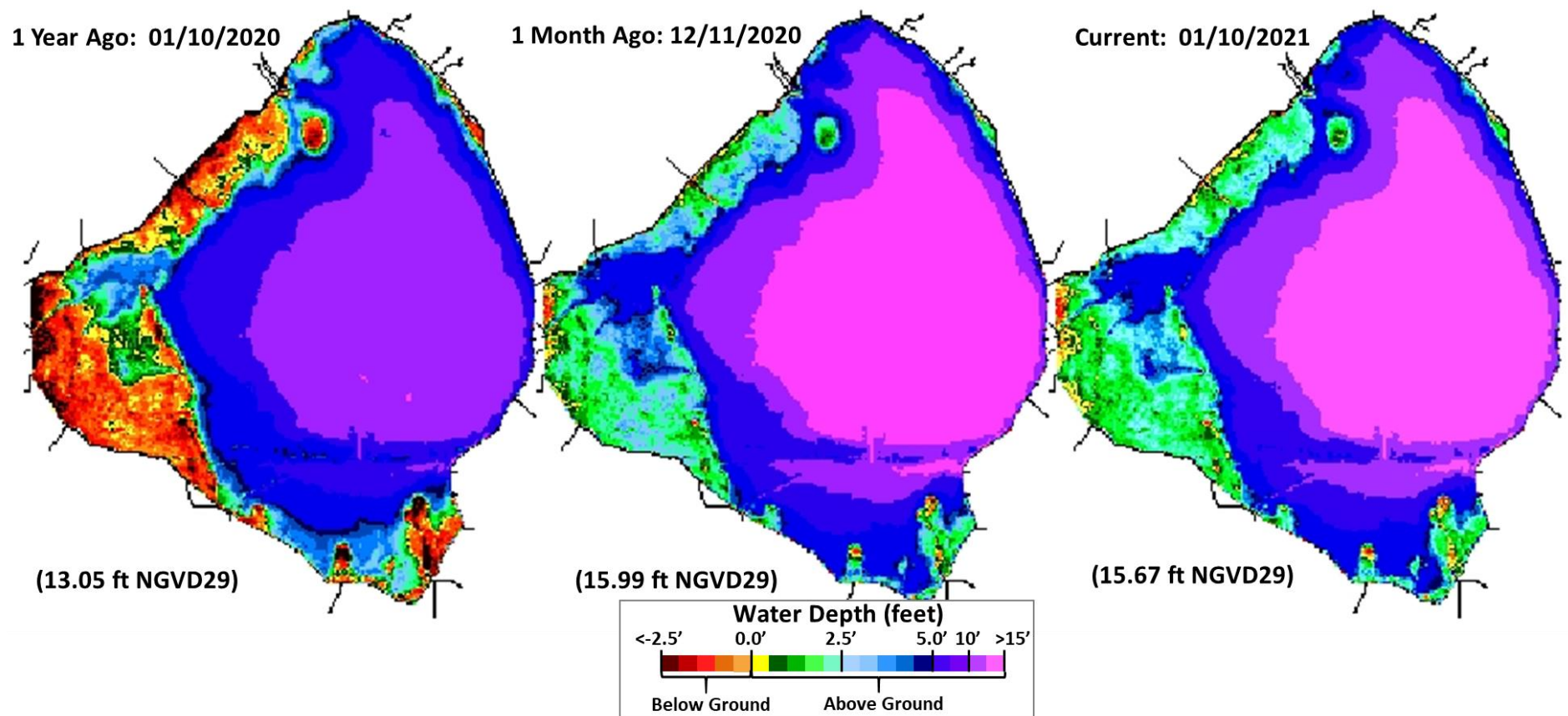


Figure 1. Water depth estimates on Lake Okeechobee based on the South Florida Water Depth Assessment Tool.

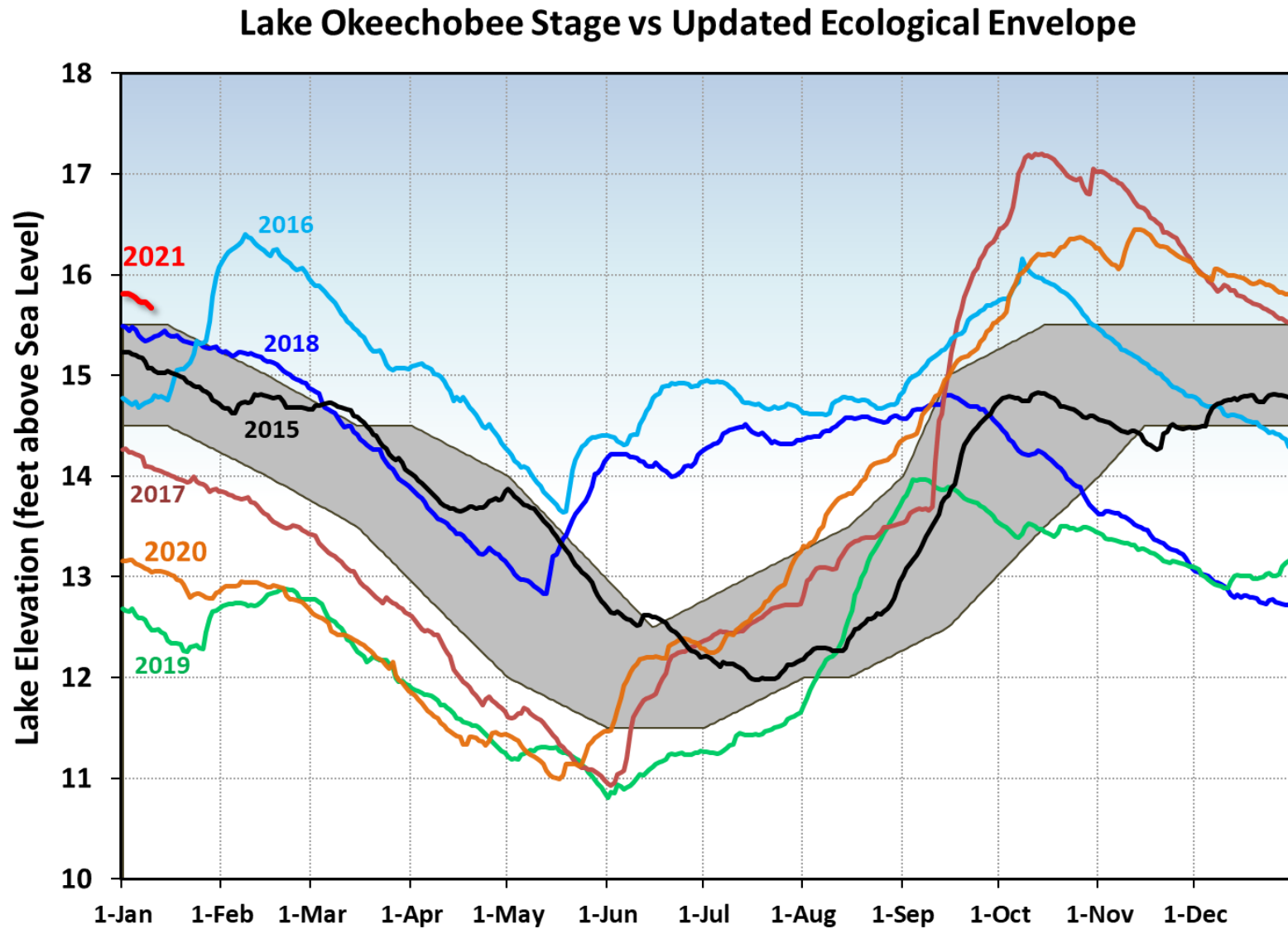


Figure 2. Select annual stage hydrographs for Lake Okeechobee in comparison to the updated Ecological Envelope.

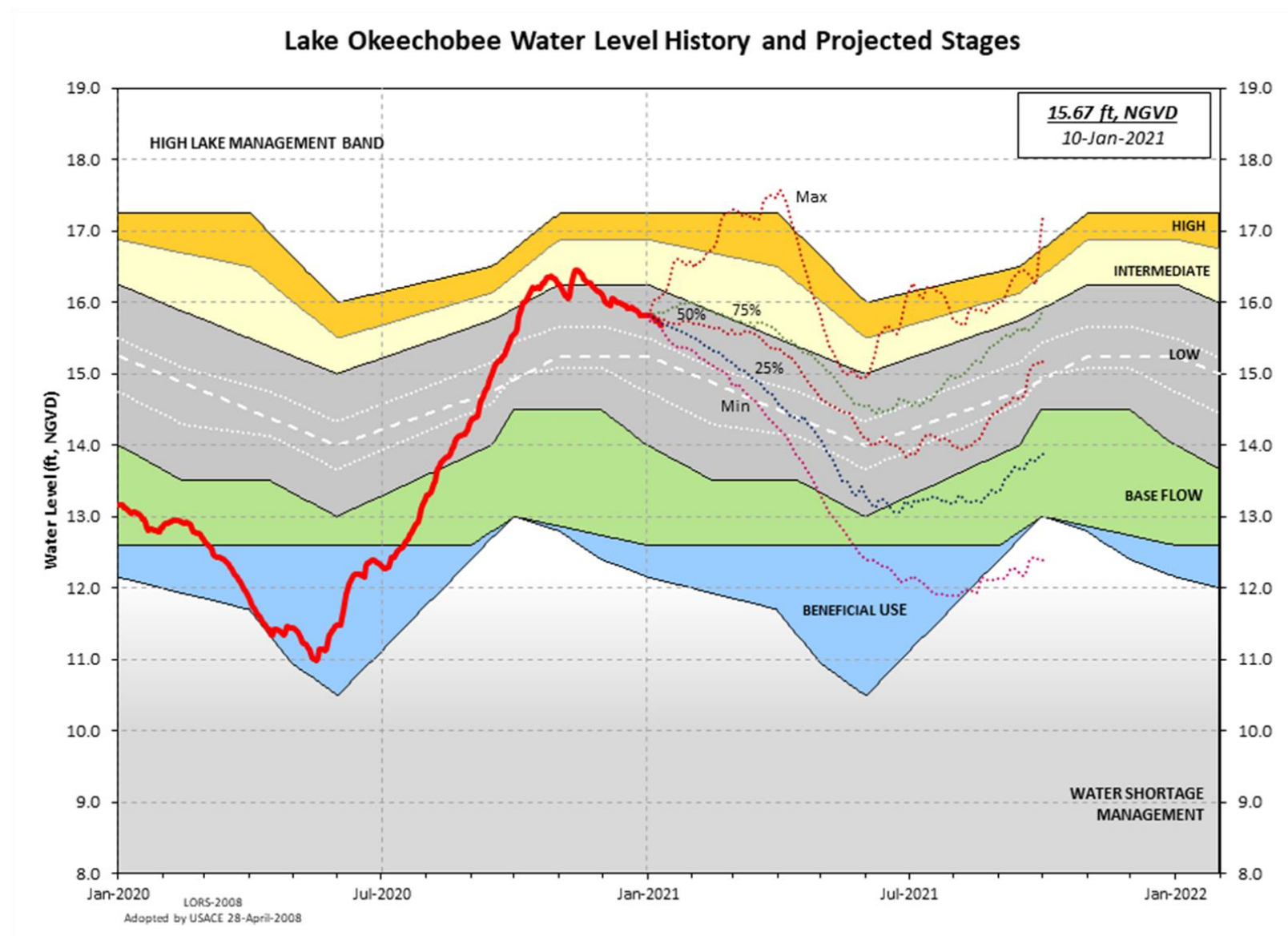


Figure 3. Recent Lake Okeechobee stages and releases, with projected stages based on a dynamic position analysis.

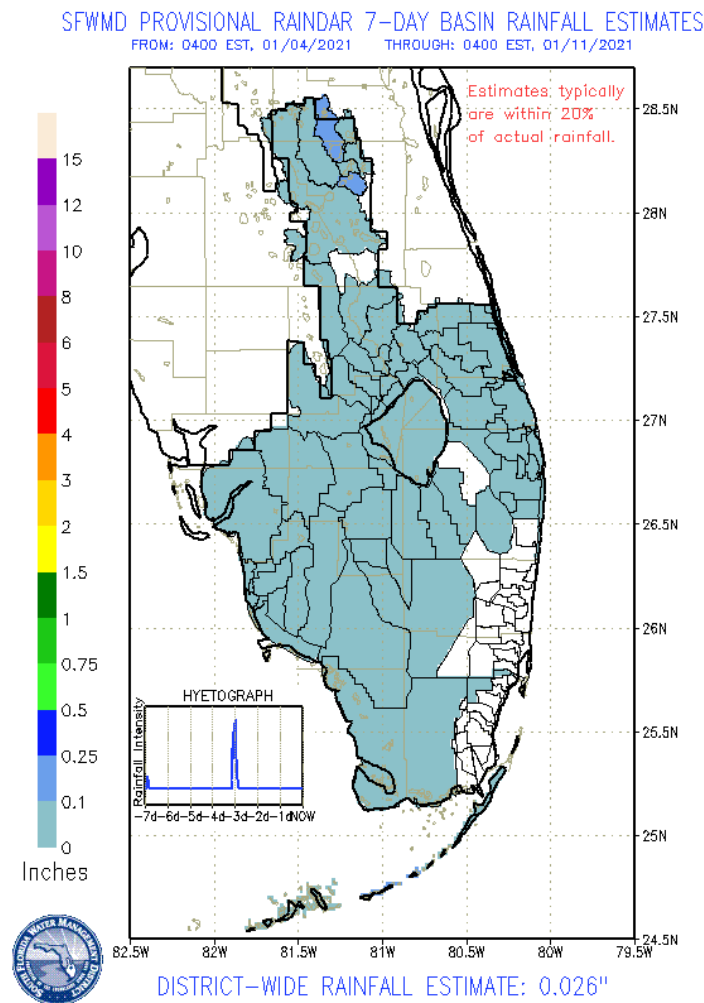


Figure 4. 7-Day rainfall estimates by RAINDAR.

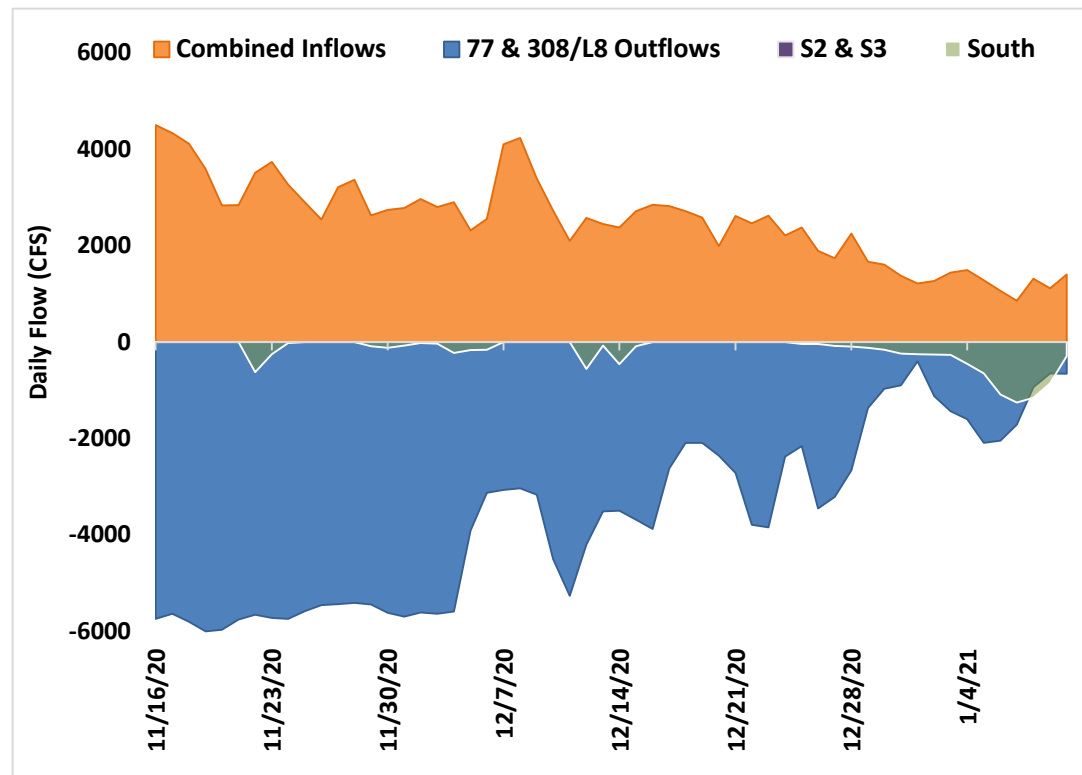


Figure 5. Major inflows (orange) and outflows (blue) of Lake Okeechobee, including the S-350 structures designated as South (green). The L-8 Canal flows through Culvert 10A are included as outflows when positive, and as inflows when backflowing into the Lake. All inflows and outflows are shown as positive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

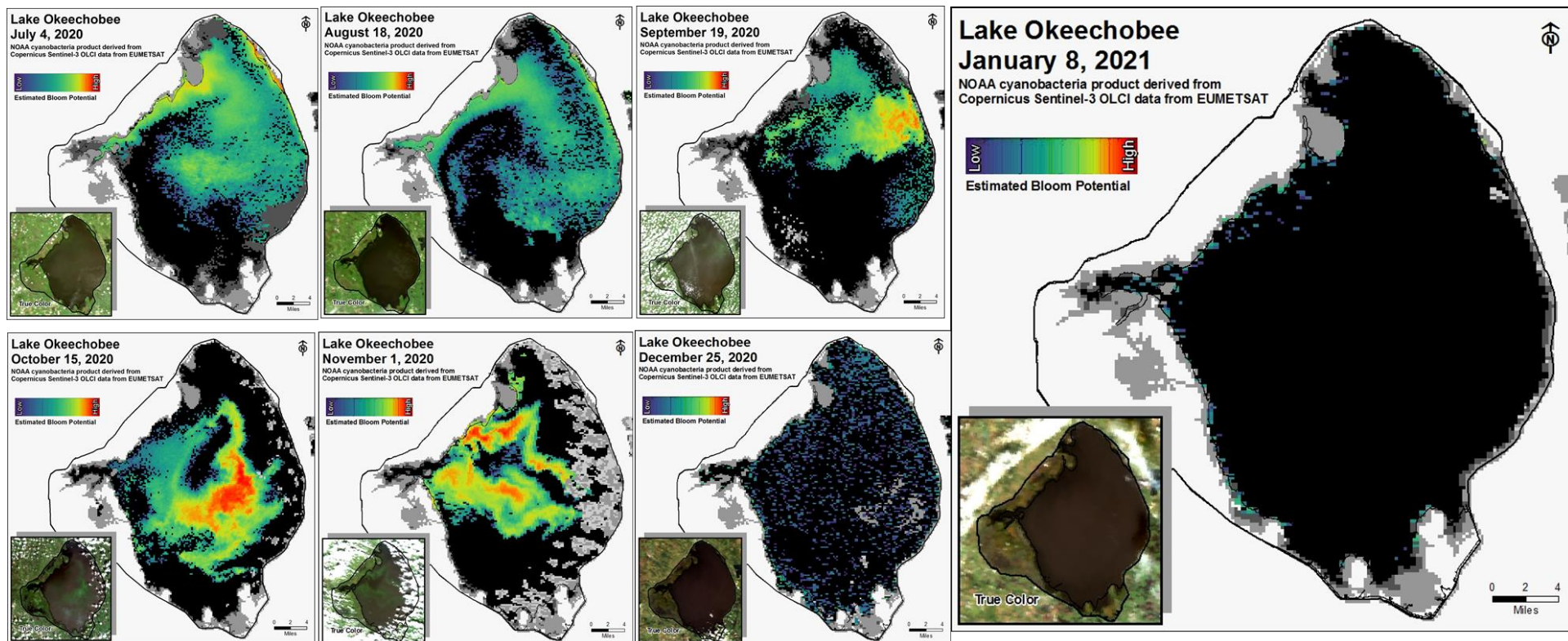


Figure 6. Cyanobacteria bloom potential based on NOAA's harmful algal bloom monitoring system. Gray color indicates cloud cover.

ESTUARIES

St. Lucie Estuary:

Last week total inflow to the St. Lucie Estuary averaged more than 768 cfs (Figures 1 and 2) and last month inflow averaged more than 1,055 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	96
S-80	610
S-308	691
S-49 on C-24	33
S-97 on C-23	29
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 is 12.5. 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)	5.8 (5.3)	8.6 (5.6)	NA ¹
US1 Bridge	10.0 (5.6)	14.9 (6.6)	10.0-26.0
A1A Bridge	17.9 (14.7)	24.4 (20.8)	NA ¹

¹Envelope not applicable

Caloosahatchee Estuary:

Last week total inflow to the Caloosahatchee Estuary averaged approximately 1,093 cfs (Figures 5 and 6) and last month inflow averaged about 2,408 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	673
S-78	510
S-79	953
Tidal Basin Inflow	140

Over the past week, surface salinity remained the same at the two upstream sites and increased slightly at the remaining sites in the estuary (Table 4, Figures 7 & 8). The seven-day average salinity values are within the fair range for adult eastern oysters at Cape Coral and in the good range at Shell Point and at Sanibel (Figure 9). The seven-day average surface salinities (Table 4) are 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)	0.2 (0.2)	0.2 (0.2)	NA ¹
Val I75	0.2 (0.2)	0.2 (0.2)	0.0-5.0 ²
Ft. Myers Yacht Basin	1.9 (1.4)	2.5 (2.5)	NA ¹
Cape Coral	8.3 (7.2)	9.4 (9.4)	10.0-30.0
Shell Point	21.4 (21.0)	22.7 (22.1)	10.0-30.0
Sanibel	27.3 (27.2)	27.8 (27.7)	10.0-30.0

¹Envelope not applicable and ²Envelope 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 1.1 or lower at the end of the two week period for pulse release at S-79 ranging from 0 to 800 cfs and estimated Tidal Basin inflows of 110 cfs. The 30-day moving average surface salinity at Val I-75 is forecast to be 0.4 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	110	1.1	0.4
B	300	110	0.6	0.3
C	450	110	0.5	0.3
D	650	110	0.3	0.3
E	800	110	0.3	0.3

Red tide

The Florida Fish and Wildlife Research Institute reported on January 8, 2021, that *Karenia brevis*, the Florida red tide dinoflagellate, was observed at background to high concentrations in and offshore of Lee County and medium to high concentrations in and offshore of Collier County in southwest Florida. Bloom concentrations were observed in 25 samples collected from Lee and Collier counties. Respiratory irritation and fish kills (suspected to be related to red tide) were also reported in Lee and Collier counties. On the east coast, red tide was not observed in samples from Brevard, St. Lucie, Martin or Palm Beach 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 releases at S-80 to the St. Lucie Estuary.

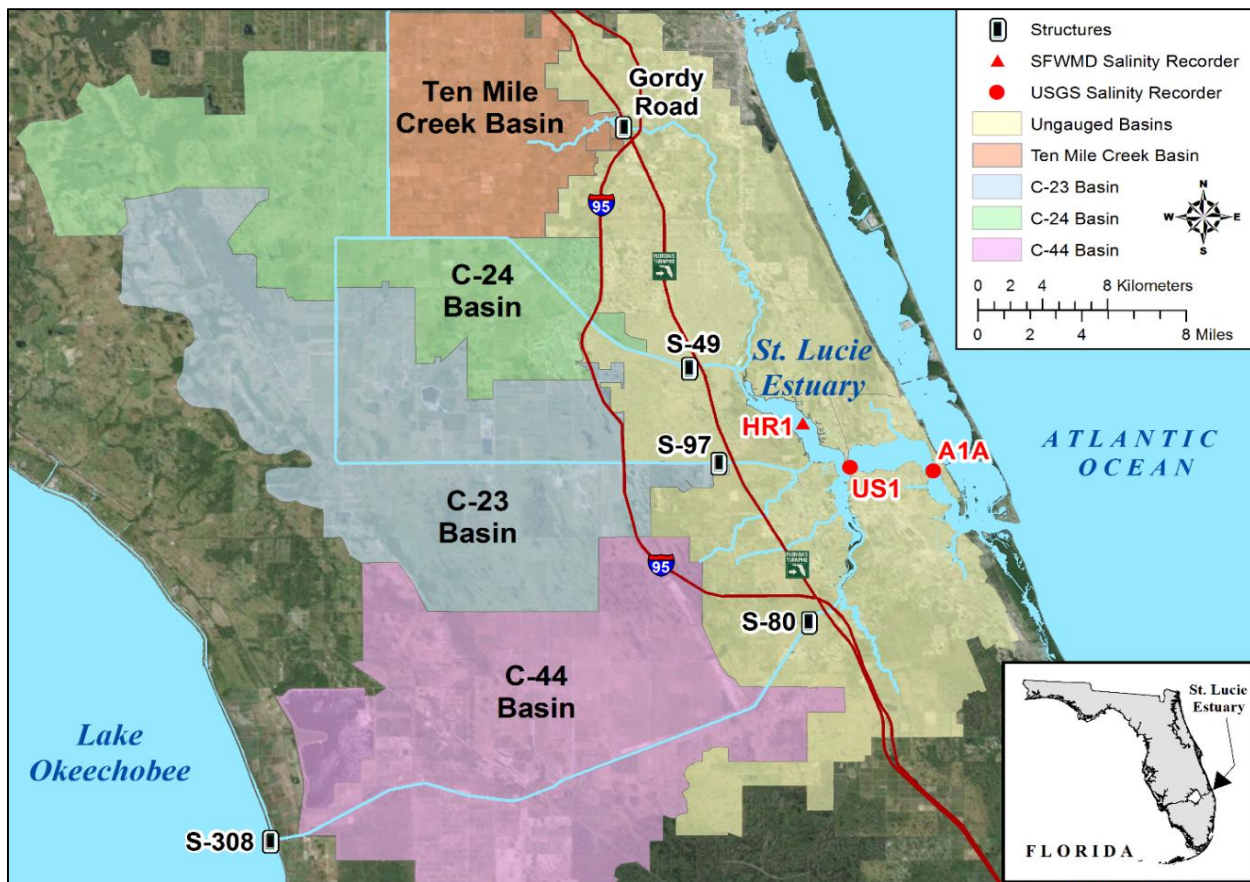


Figure 1. Basins, water control structures, and salinity monitoring for the St. Lucie Estuary.

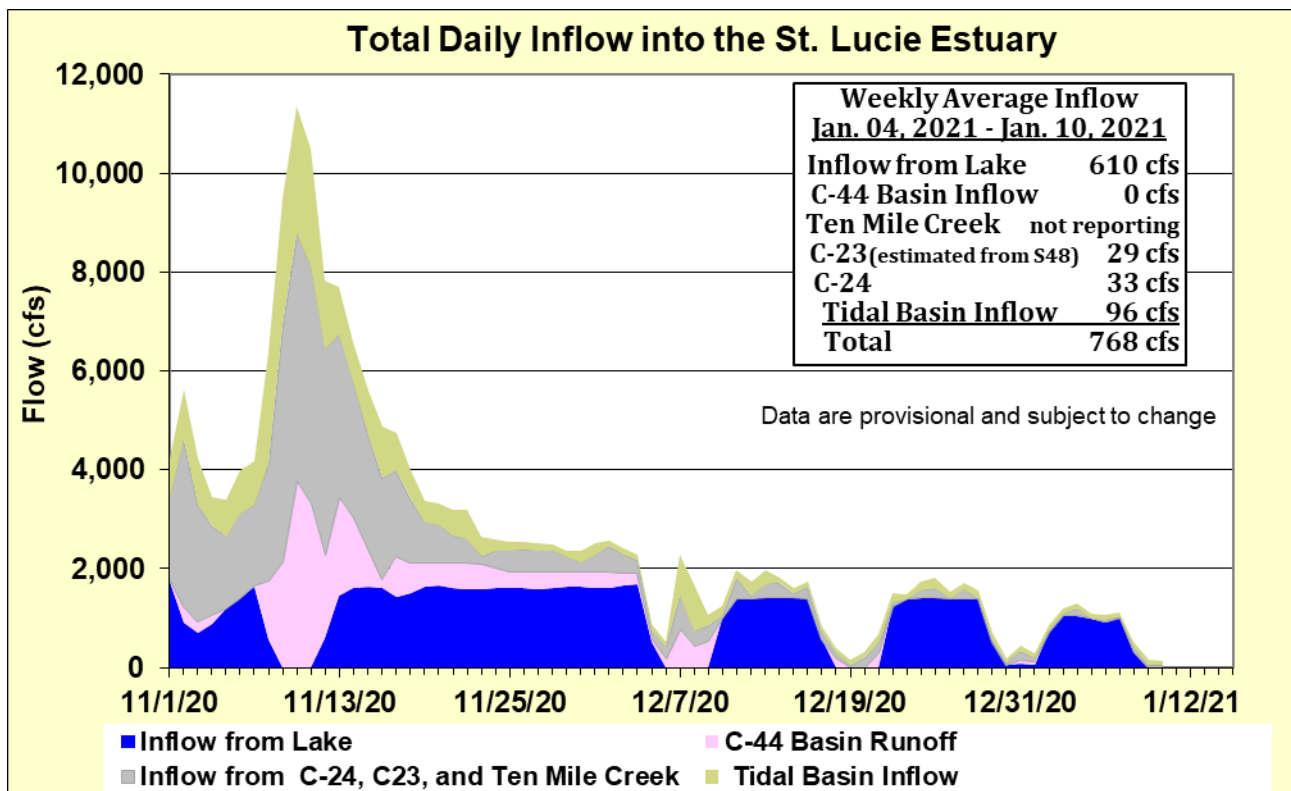


Figure 2. Total daily inflows from Lake Okeechobee and runoff from the C-44, C-23, C-24, Ten Mile Creek, and tidal basin into the St. Lucie Estuary.

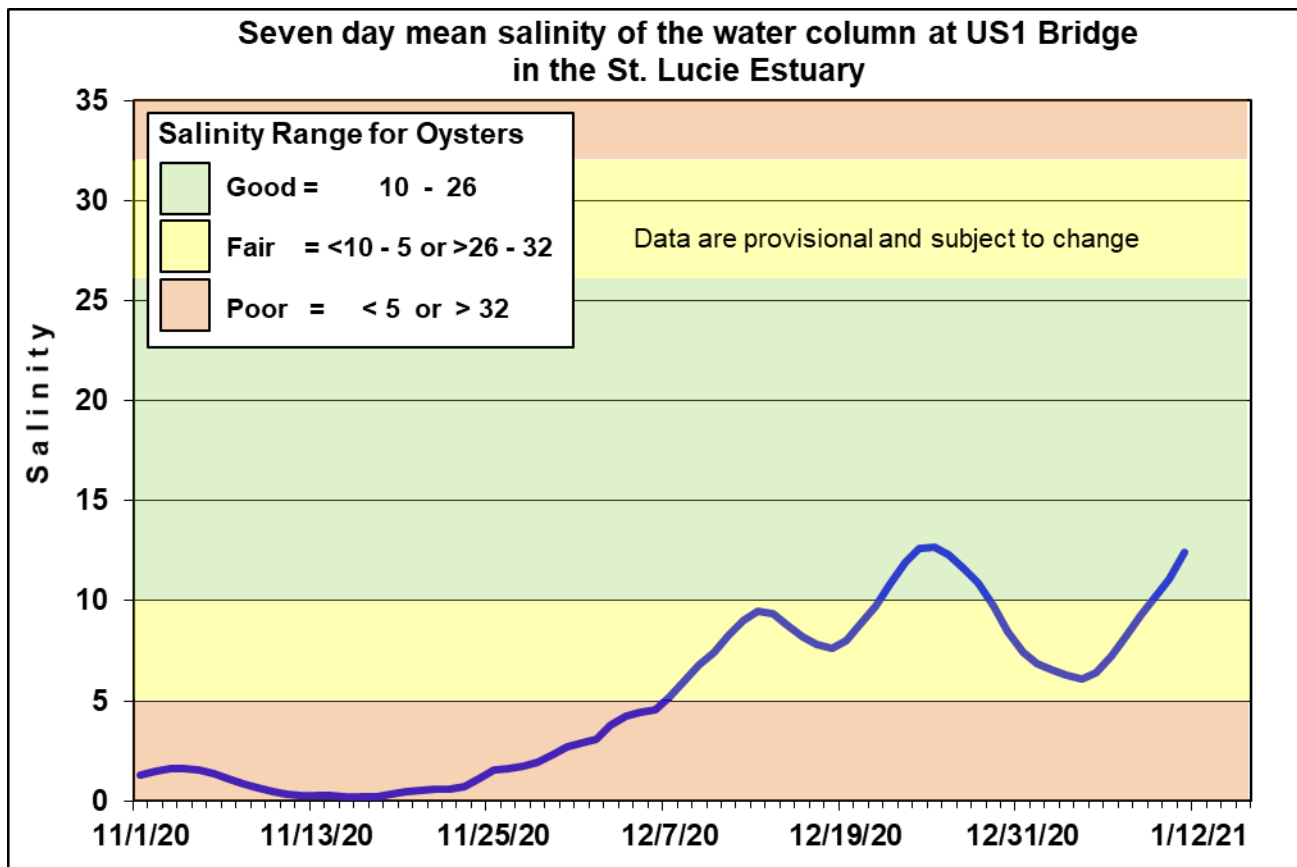


Figure 3. Seven-day mean salinity of the water column at the US1 Bridge.

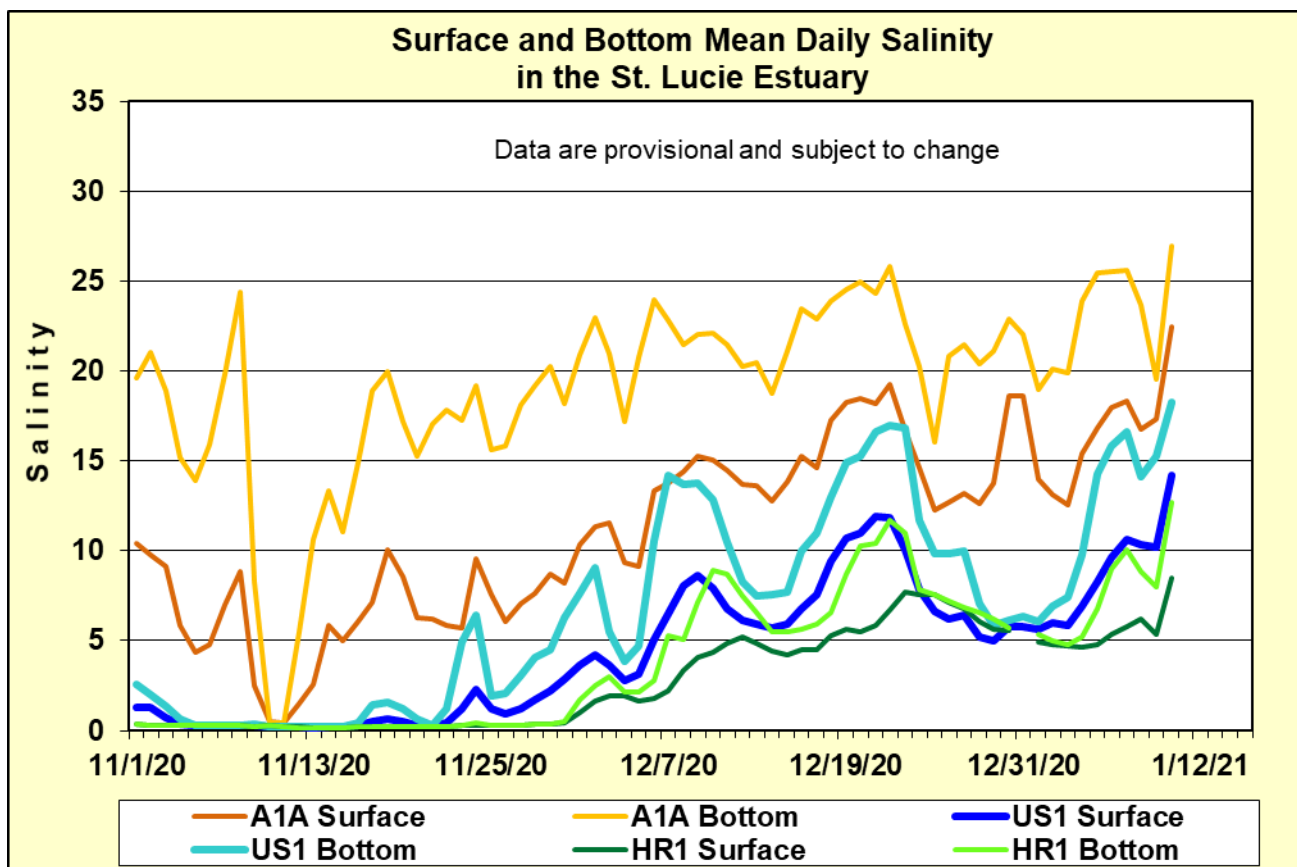


Figure 4. Daily mean salinity at the A1A, US1, and HR1 stations.

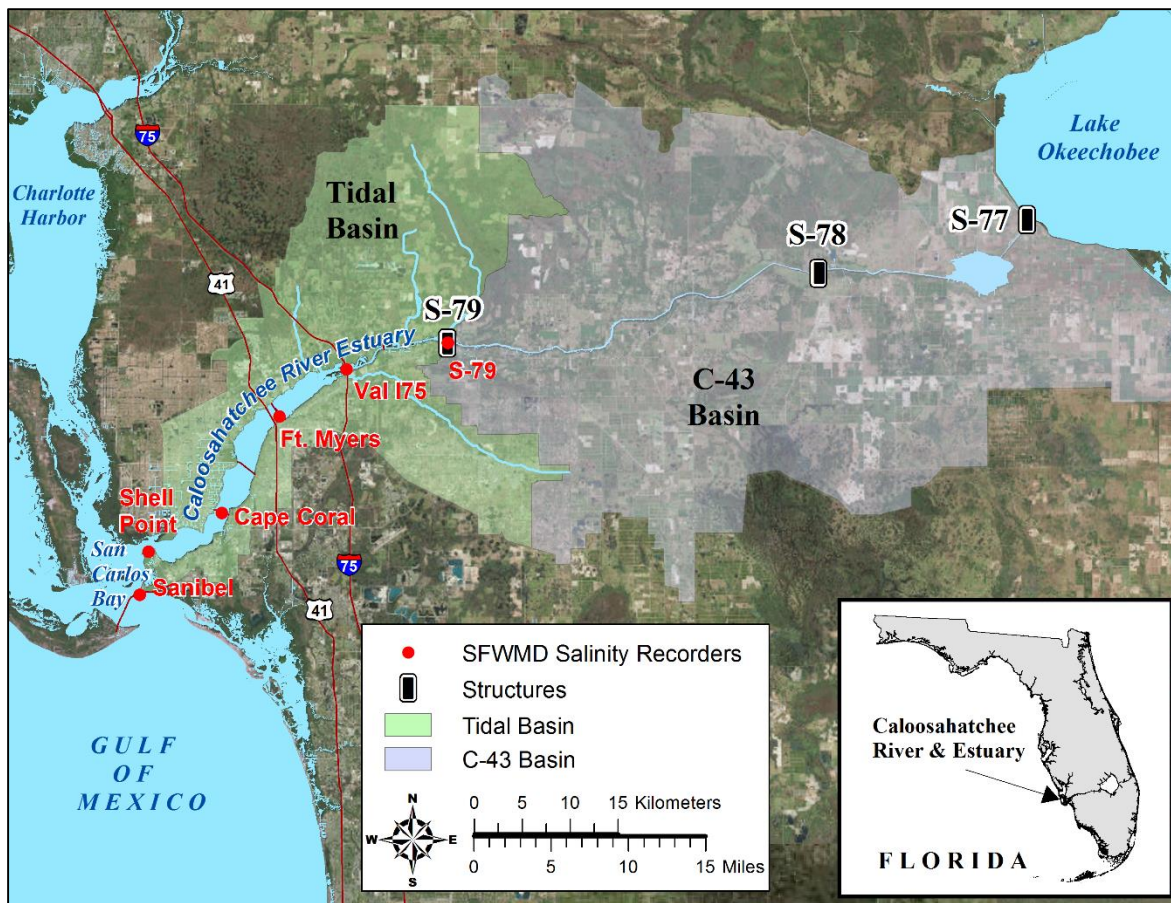


Figure 5. Basins, water control structures, and salinity monitoring for the Caloosahatchee Estuary.

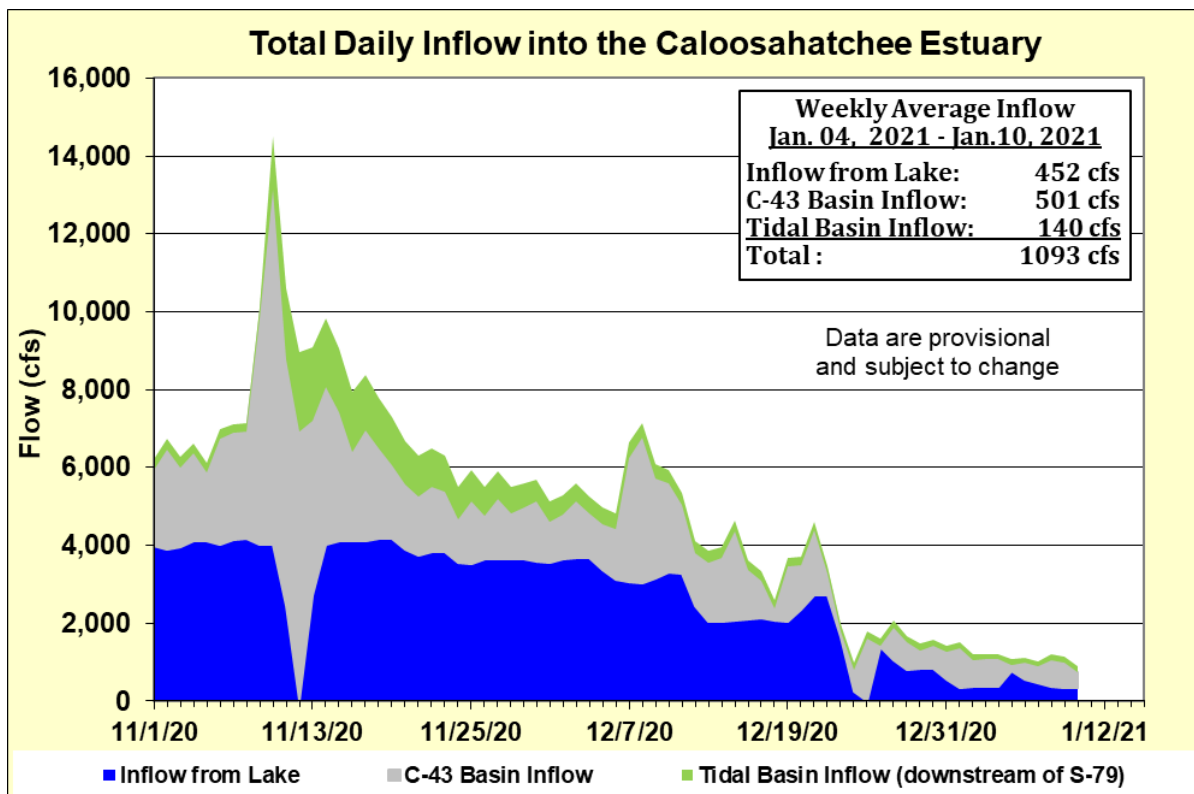


Figure 6. Total daily inflows from Lake Okeechobee, runoff from the C-43 basin, and tributaries in the tidal basin into the Caloosahatchee River Estuary.

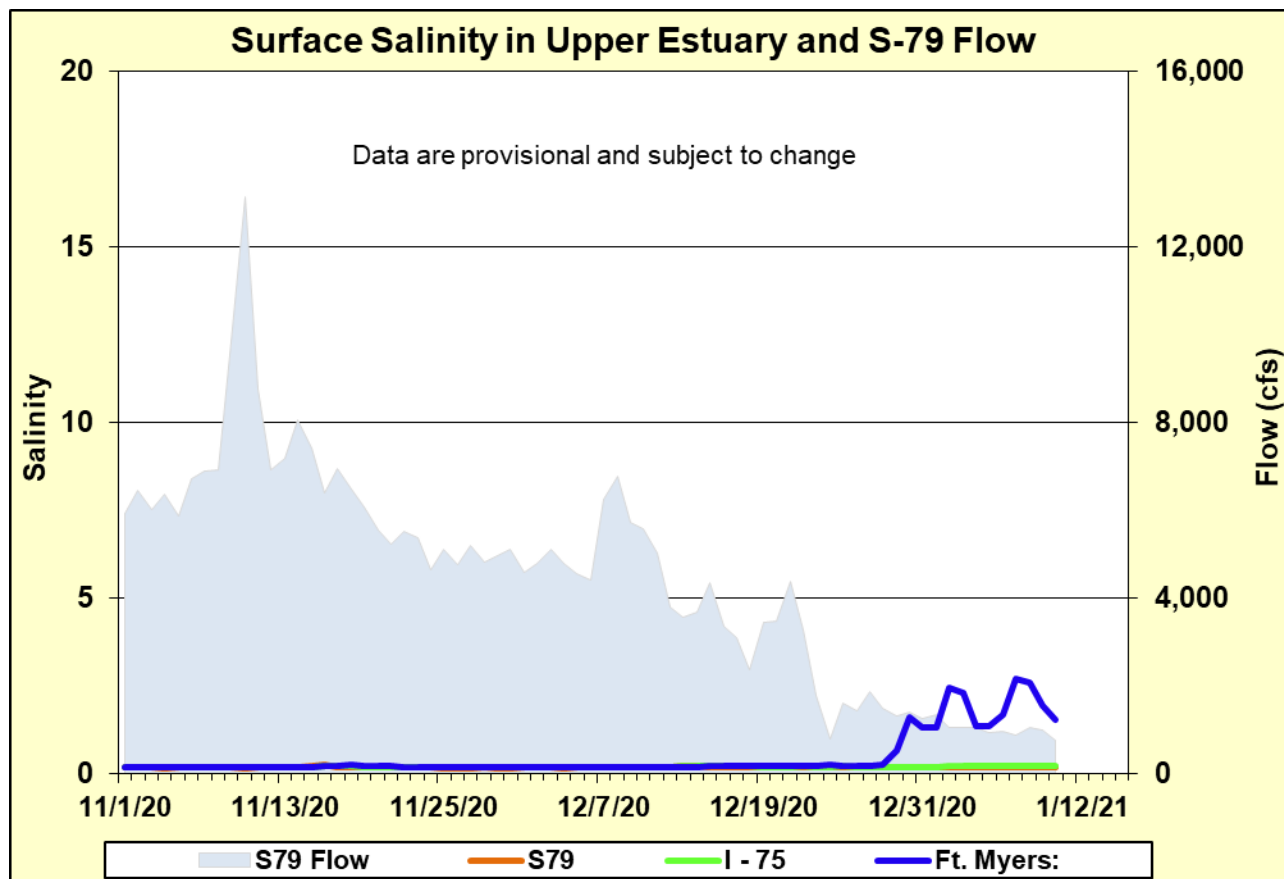


Figure 7. Daily mean flows at S-79 and salinity at upper estuary monitoring stations.

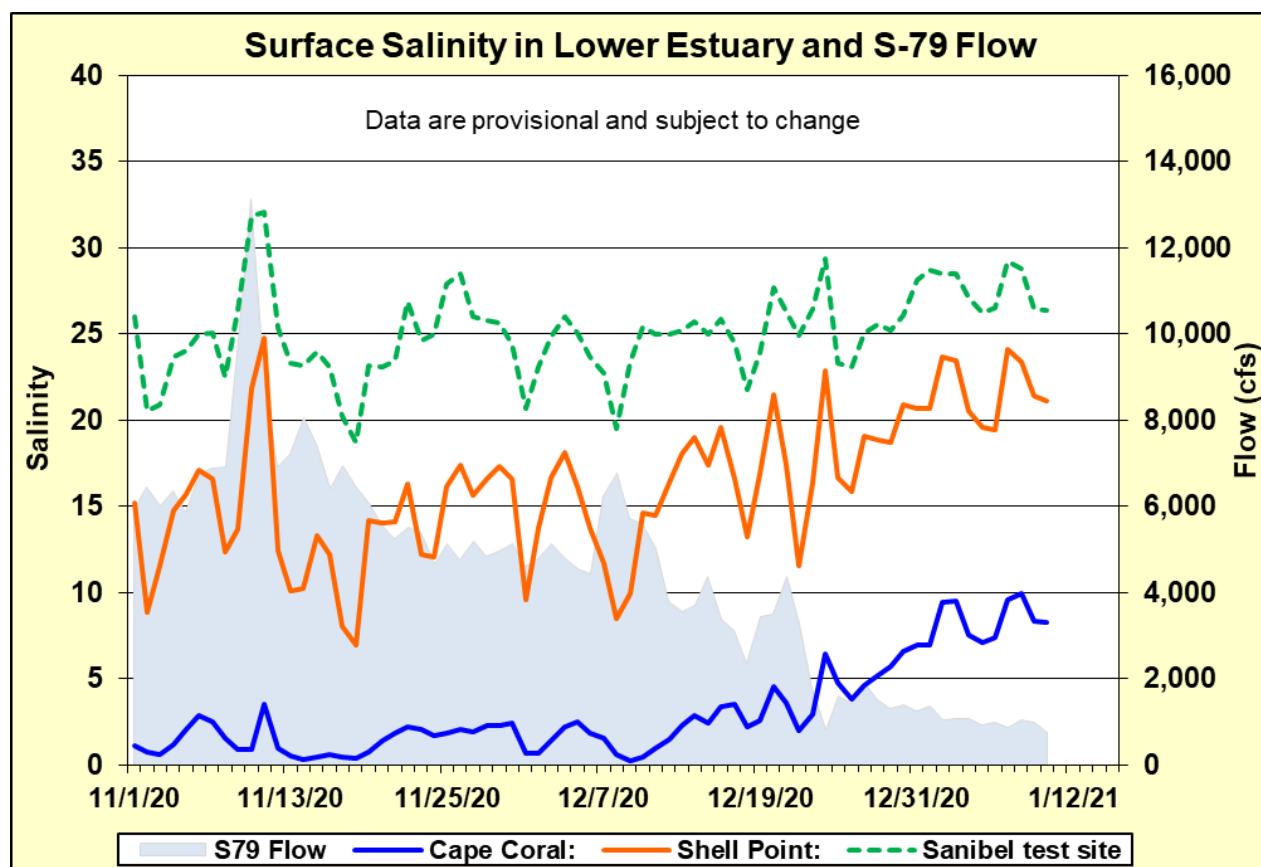


Figure 8. Daily mean flows at S-79 and salinity at lower estuary stations.

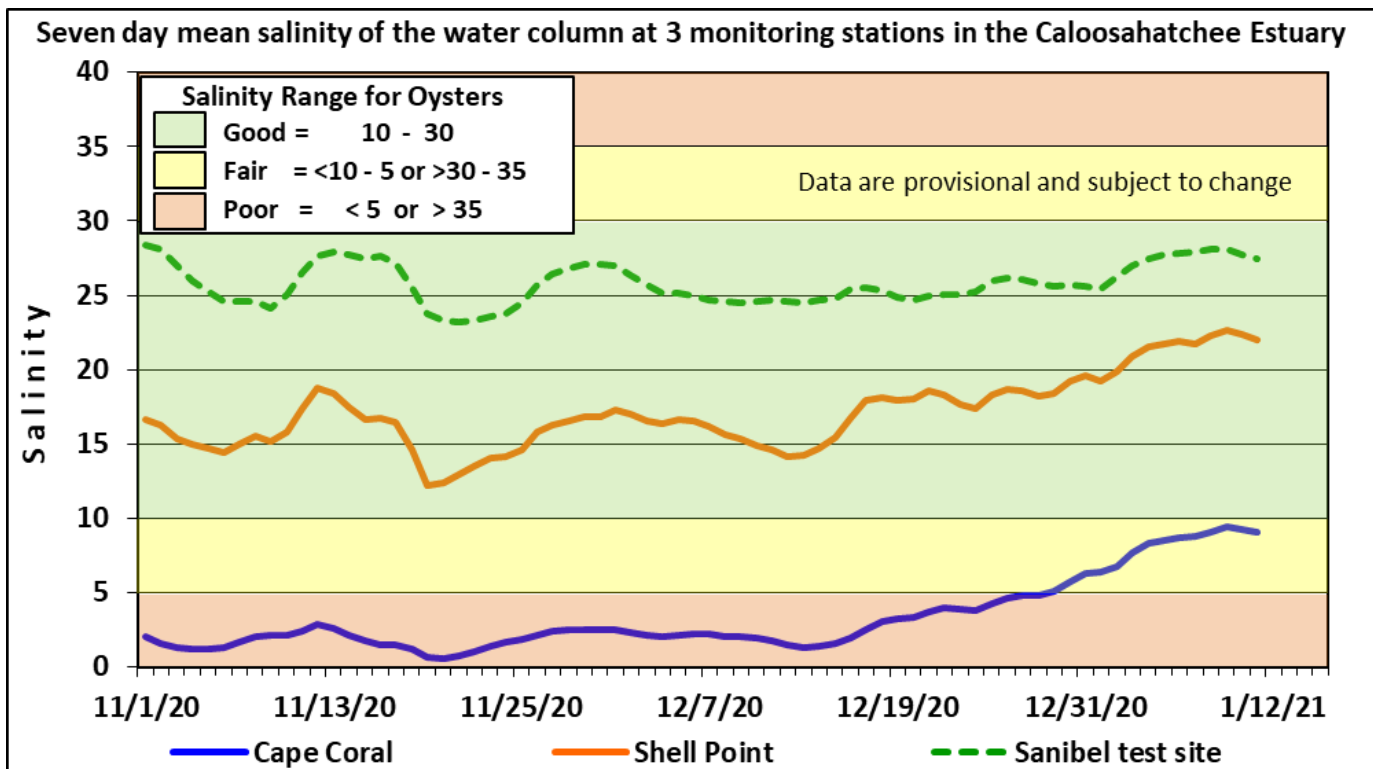


Figure 9. Seven-day mean salinity at Cape Coral, Shell Point, and Sanibel monitoring stations.

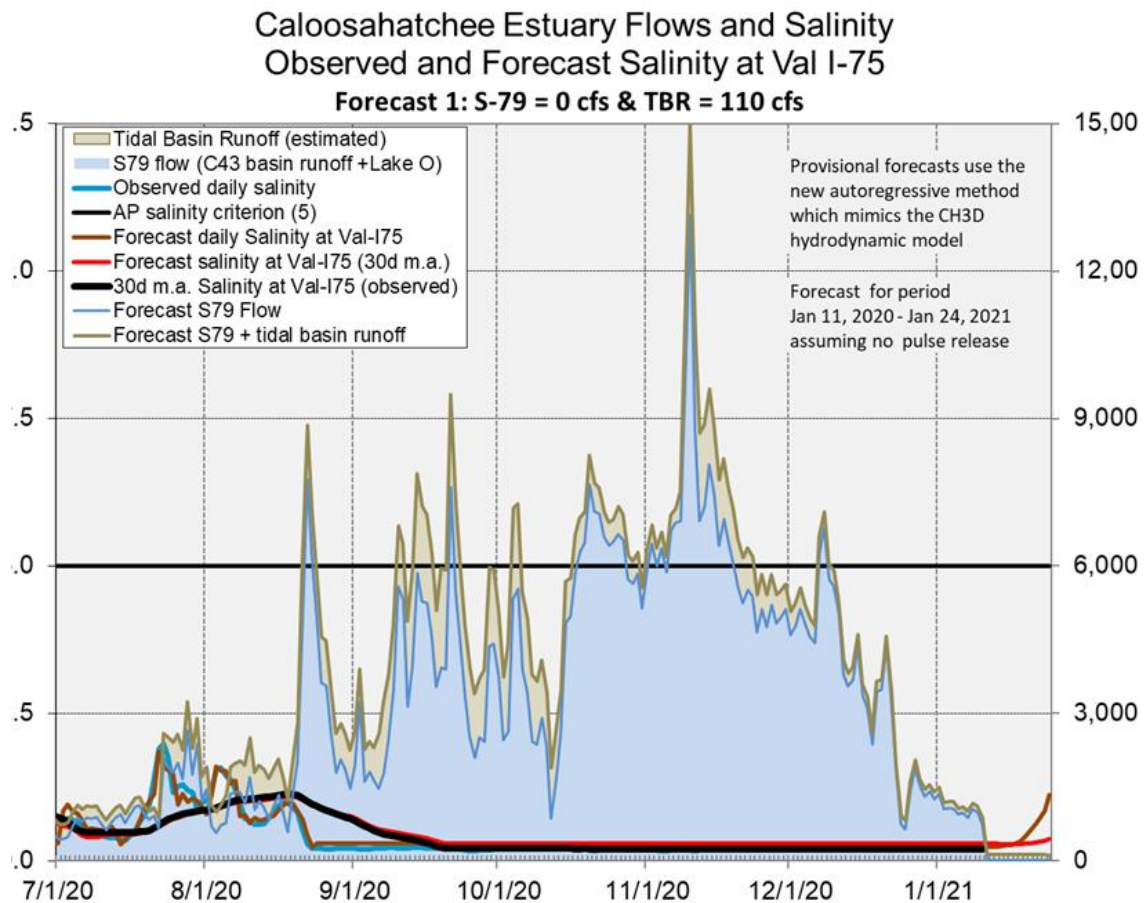
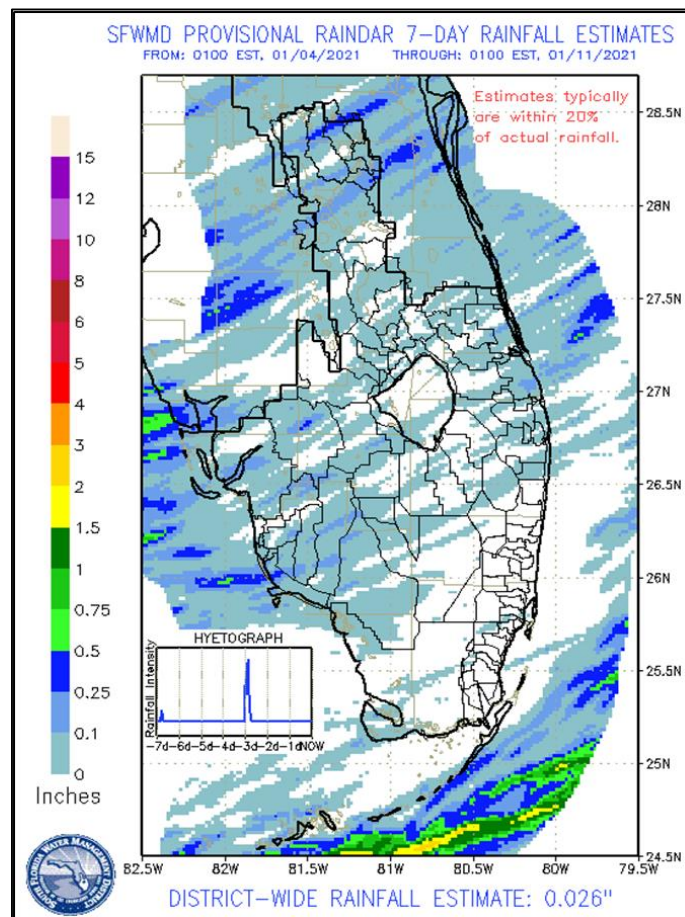


Figure 10. Forecasted Val I-75 surface salinity assuming no pulse release at S79.

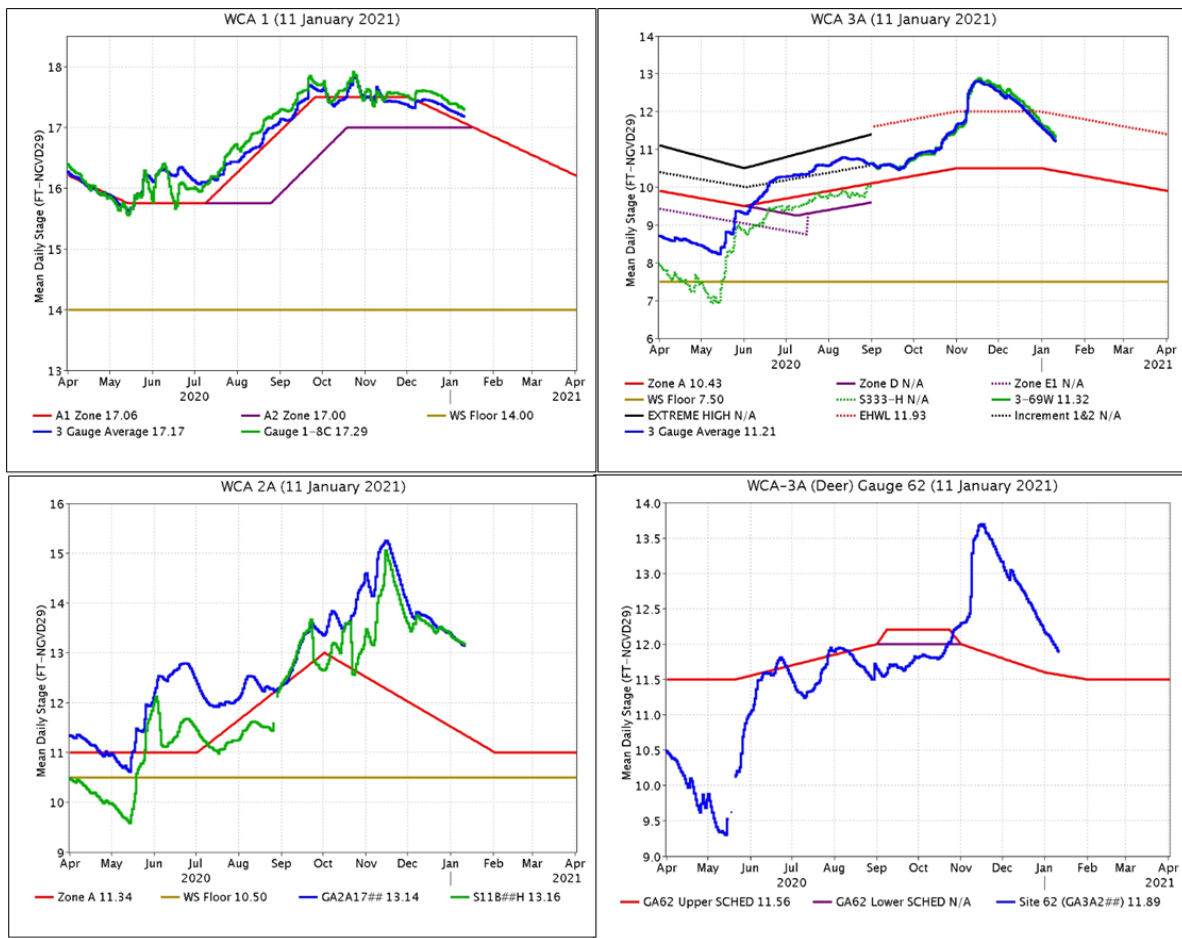
EVERGLADES

The Everglades has received very little rainfall over the last two weeks. At the gauges monitored for this report stages fell 0.17 feet on average last week, for the fourth consecutive week stages fell the most in WCA-3A. Evaporation was 0.77 inches last week, and the TTFF continues to call for maximum releases from WCA-3A.

Everglades Region	Rainfall (Inches)	Stage Change (feet)
WCA-1	0.01	-0.08
WCA-2A	<0.01	-0.15
WCA-2B	0.00	-0.16
WCA-3A	<0.01	-0.26
WCA-3B	0.00	-0.14
ENP	<0.01	+0.05



Regulation Schedules: WCA-1: Stage at the 1-8C Gauge is generally trending parallel with schedule, remaining 0.23 feet above the falling Zone A1 regulation line. WCA-2A: The recession in stage at Gauge 2-17 remained parallel to the regulation line last week at 1.80 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 0.78 feet above. WCA-3A: Stage at gauge 62 (Northwest corner) continues a sharp decline, now approaching the falling Upper Schedule, above by 0.33 feet

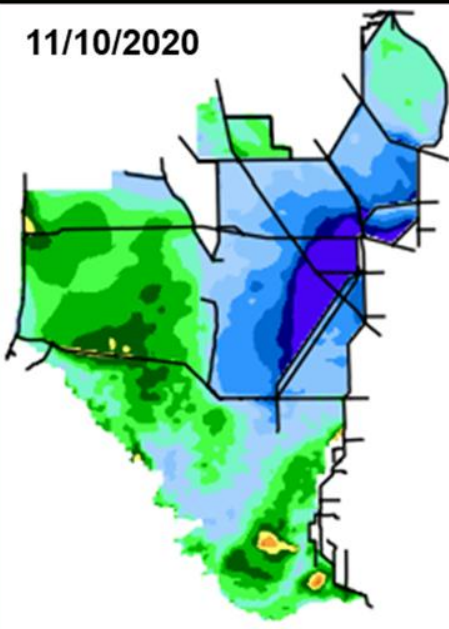


Water Depths: The WDAT tool for spatial interpolation of depth monthly snapshots indicate that there are no longer depths in excess of 5.0 feet in WCA-3A South. Flooding stress is becoming less ecologically detrimental as depths are retreating in the north of the WCAs. Northern WCA-2A is drying down quickly with depths potentially within 0.5 foot of soil surface. The northern half of WCA-3AN is now potentially within 1.0 feet of the soil surface. Comparing WDAT water levels from present, over the last month stages fell significantly across western WCA-3A (up to -1.5 feet downstream of the S-11s) and extreme northern WCA-2A. 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 (with extreme northern WCA-2A the exception), more than 2.0 feet deeper downstream of the S-11s in WCA-3A, and more 1.0 feet in southern WCA-2A.

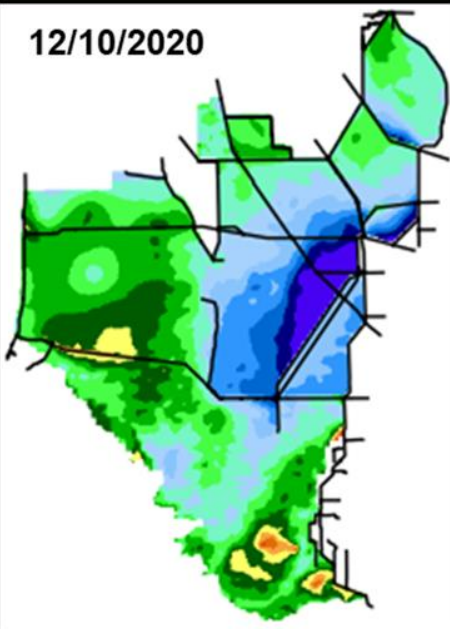


SFWDAT Water Depth Monthly Snapshots

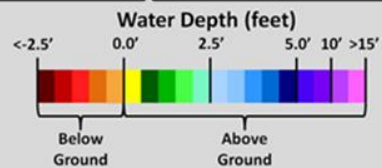
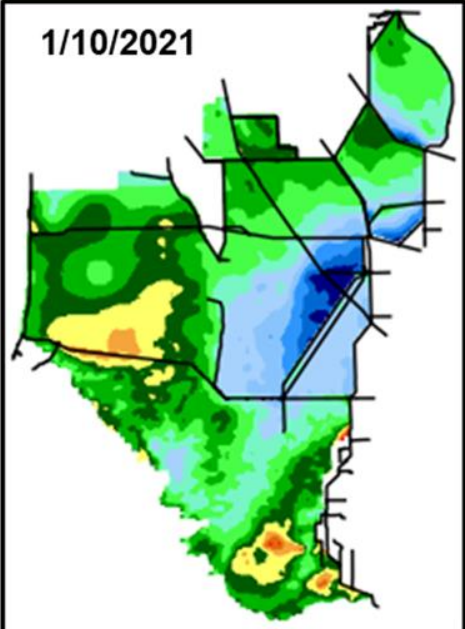
11/10/2020



12/10/2020



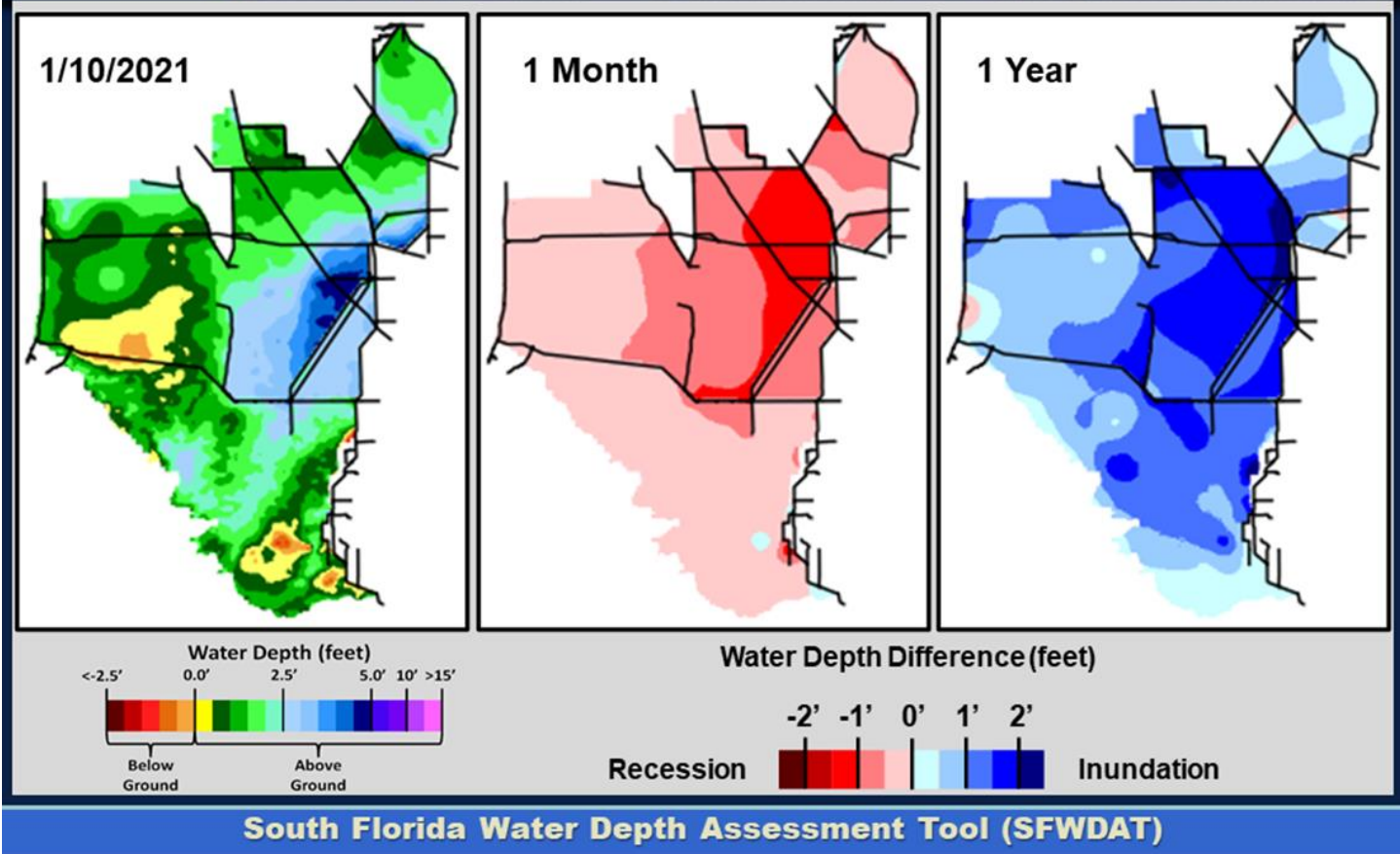
1/10/2021



South Florida Water Depth Assessment Tool (SFWDAT)

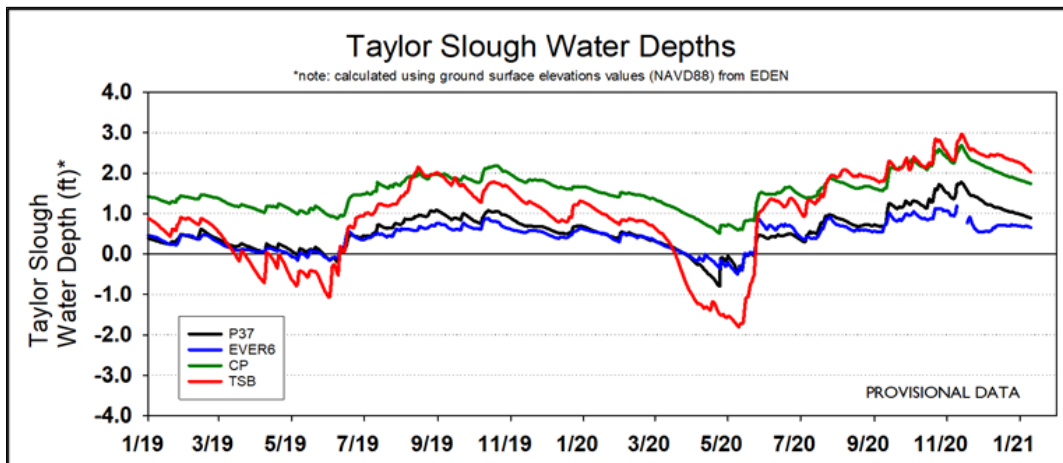
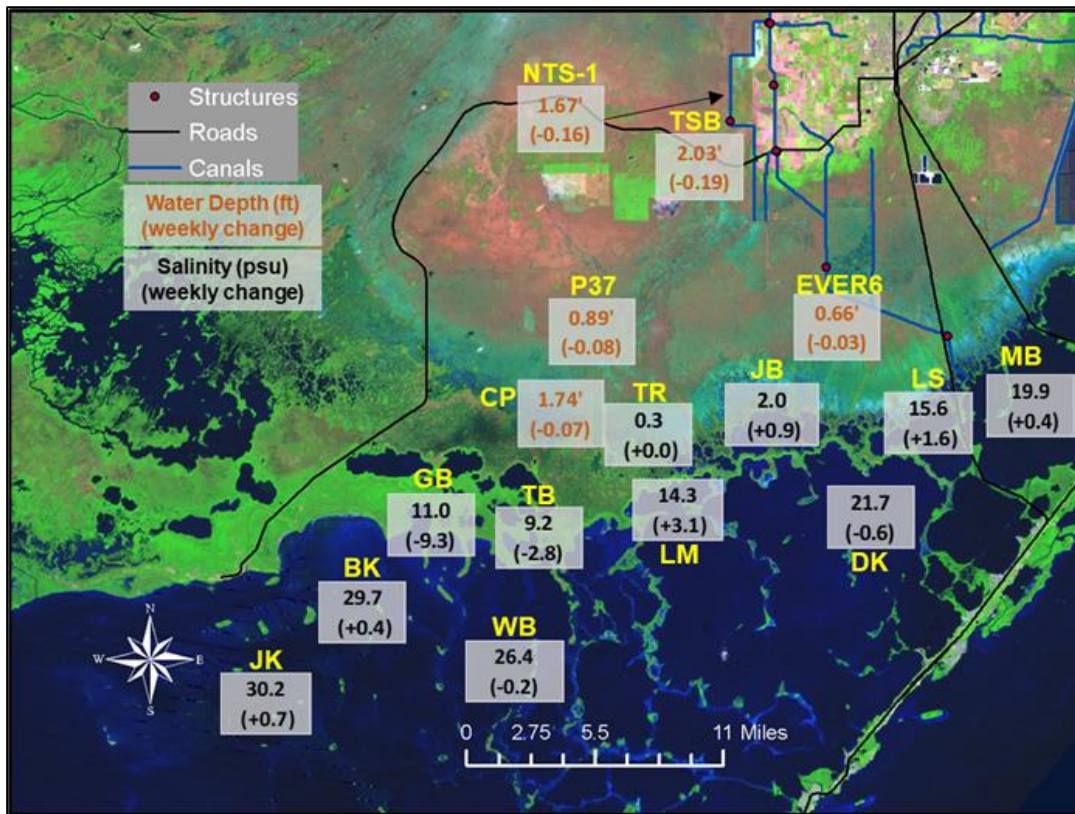


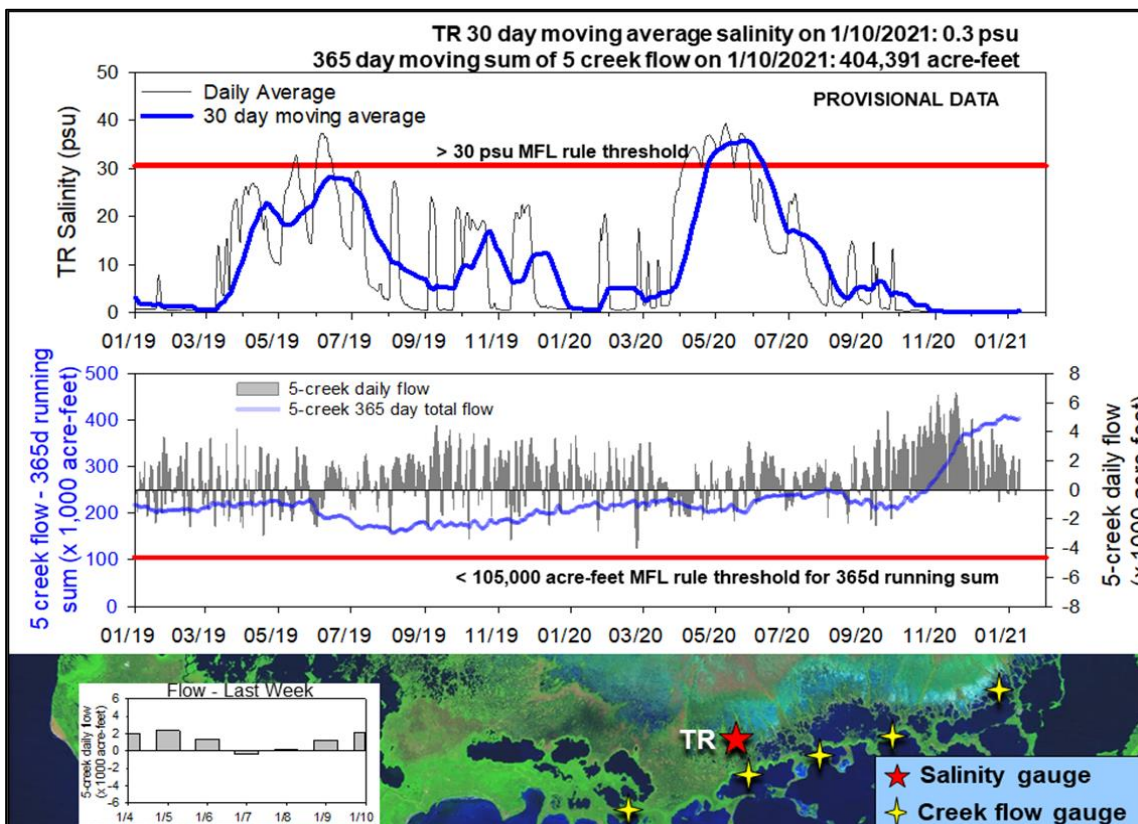
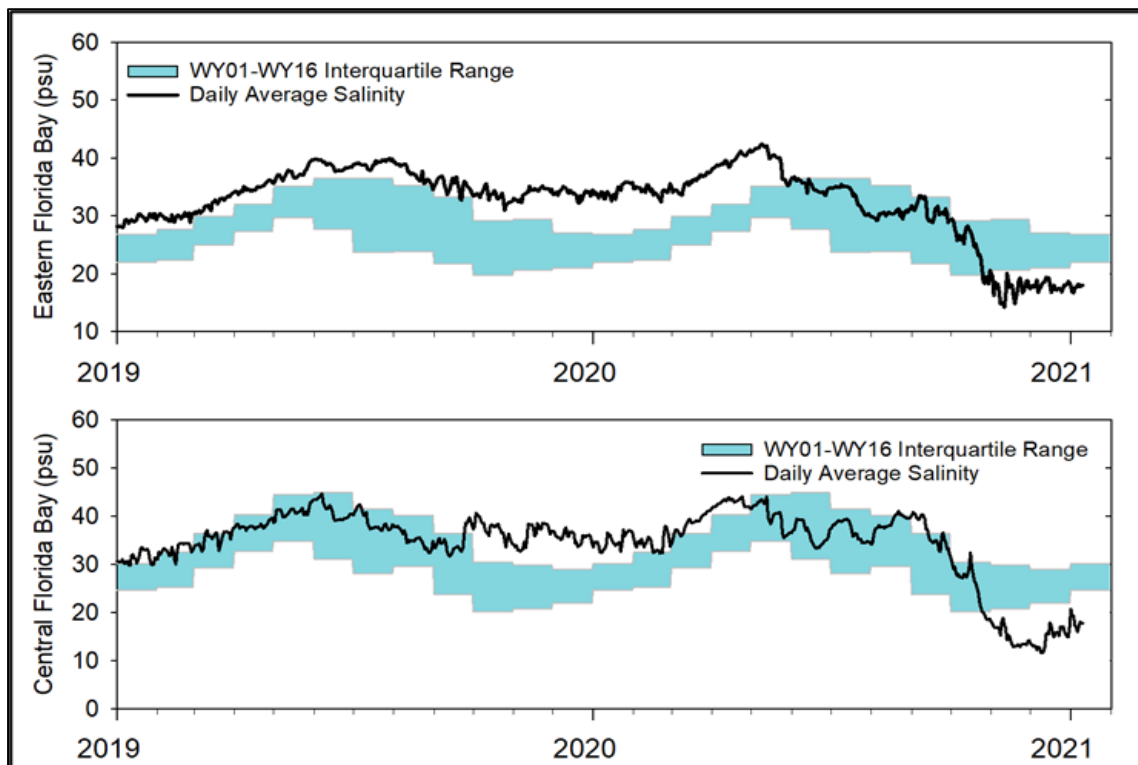
SFWDAT Everglades Difference Maps (Present – Past)



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 65% or 242 of the tree islands are currently inundated (down from 74% the week prior), and 23% of those islands 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 0.1 feet over the week. Taylor Slough is averaging 9 inches higher than the historical average for this time of year, and the northern portion of the slough is 18 inches higher than the average for this time of year which is a good position to start 2021.





Florida Bay Salinities: Salinities in Florida Bay averaged a 0.7 psu decrease over the week with individual station changes ranging from -9.3 psu in the western nearshore to +3.1 psu in the eastern nearshore. Bay-wide salinity is 7 psu lower than the historical average for this time of year while nearshore salinity is 10 psu lower than the historical average for that area (largely pulled by the central and western nearshore areas).

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 (0.3 psu or less) and the 30-day moving average has also remained low at 0.3 psu. Weekly flow from the 5 creeks identified by yellow stars on the map totaled just over 8,800 acre-feet (1,600 acre-feet more than last week). The 365-day moving sum of flow from the five creeks (tracked as part of the Florida Bay MFL criteria) ended at 404,391 acre-feet this week which is 2,000 acre-feet less than last week. That is 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

Few wading birds were detected in the central Everglades, where stages are high and stress is continuing to diminish to terrestrial wildlife. Very high numbers of wading birds were noted along the southern coast last week and conditions are indicative of a good nesting season to come. As water levels continue to recede, large numbers of ibis are expected to descend on the WCAs.

Recession rates near the high end of the recommended range of 0.05 to 0.12 feet per week have ecological benefit where depths are not in excess of 2.5 feet in WCA-1, WCA-2 and WCA-3A North. Any changes in inflows or **outflows** to WCA-2A should be offset by a reduction in outflows to tide to conserve water in the system and provide water south as conditions 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.

Managing inflows/outflows within WCA-3A South that decreases ponding in both spatial extent and the amount of time the region is inundated has benefit to the ecology of tree islands. When considering the status of tree islands in WCA-3A as a whole, the last two years of low flooding stress created a resilience to flooding stress for a single wet season. If these high stages should persist long into the dry season, ecological harm to tree islands is likely, but given the low precipitation predictions for the upcoming dry season this persistence seems unlikely as long as the District continues to maximize flows south and why at this time SFWMD Everglades ecologists are recommending a careful conservation of water in WCA-3A, once conditions move closer to average.

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 hypersalinity 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, January 12th, 2021 (red is new)			
Area	Weekly change	Recommendation	Reasons
WCA-1	Stage decreased by 0.08'	Maintain marsh stage slightly above and parallel to the regulation schedule.	Protect within basin and downstream habitat and wildlife.
WCA-2A	Stage decreased by 0.15'	Moderate the recession rate to near -.05 to -.09 feet per week and maintain marsh stage above and parallel to the falling regulation schedule.	Protect within basin and downstream habitat and wildlife from flooding stress.
WCA-2B	Stage decreased by 0.16'	Moderate the recession rate to near -.05 to -.09 feet per week.	Protect within basin and downstream habitat and wildlife from flooding stress.
WCA-3A NE	Stage decreased by 0.30'	Moderate the recession rate to near -.05 to -.09 feet per week.	Protect within basin and downstream habitat and wildlife from flooding stress.
WCA-3A NW	Stage decreased by 0.23'	Moderate the recession rate to near -.05 to -.09 feet per week.	
Central WCA-3A S	Stage decreased by 0.25'	Maintain the recession rate 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 0.27'		
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 increased by 0.05'	Make discharges to the Park according to the current deviation with a return to COP protocol as soon as high water conditions are alleviated in the upstream WCAs	Protect within basin and upstream habitat and wildlife from flooding stress.
Taylor Slough	Stage changes ranged from -0.03' to -0.19'	Move water southward as possible	When available, provide freshwater buffer for downstream conditions.
FB- Salinity	Salinity changes ranged -9.3 to +3.1 psu	Move water southward as possible	When available, provide freshwater to maintain low salinity buffer and promote water movement.

