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: October 20, 2021

SUBJECT: Weekly Environmental Conditions for Systems Operations

Summary

Weather Conditions and Forecast

No significant rain over the District is expected through Wednesday. Dry air has spread over the District behind a cold front preventing shower activity over the area except for some very light showers near the east coast Wednesday. Some limited moisture is expected to begin returning in from the east and south Wednesday night yielding some scattered light shower activity east. As moisture increases, scattered moderate shower activity is forecast south and east for Thursday. Strong upper level winds and a stalling cold front are forecast to interact with moisture moving northward over the south half of the District Friday through Sunday bringing moderate to locally heavy shower activity south and east. However, confidence in the details of this rain is currently low. During the first 7-day period (Week 1), total rainfall is forecast to be below the historical average over most of the District but above average south and east. During the second 7-day period (Week 2), total rainfall is forecast to be near the historical average over much of the District but above average along the Lower East Coast.

Kissimmee

Flow at S-65A continues to be too low for complete inundation of the Kissimmee River floodplain, and mean floodplain water depth declined to 0.93 feet by October 17, 2021. The concentration of dissolved oxygen in the Kissimmee River has been improving, with the station average above 2.0 mg/L on October 17, 2021

Lake Okeechobee

Lake Okeechobee stage was 15.88 feet NGVD on October 17, 2021 and it was 0.89 feet higher than a month ago (**Figure LO-1**). Lake stages have been above or at the very top of the ecological envelope for all of 2021, and are currently 0.4 ft above (**Figure LO-2**). There have been essentially no outflows from the lake since late June 2021. Recent satellite imagery (October 17, 2021) showed low to medium bloom potential in the western part of the Lake (**Figure LO-6**).

Estuaries

Total inflow to the St. Lucie Estuary averaged approximately 1,033 cfs over the past week with no flow coming from Lake Okeechobee. Mean surface salinities increased at HR1 and decreased at the US1 Bridge and A1A Bridge sites over the past week. Salinity at the US1 Bridge was in the good range (10-26) for adult eastern oysters.

Total inflow to the Caloosahatchee Estuary averaged 3,003 cfs over the past week with no flow coming from the Lake. Mean surface salinities remained the same at S-79 and Val I-75, increased at Ft. Myers, and decreased at Cape Coral, Shell Point, and Sanibel over the past week. Salinities were in the good range (0-10) for tape grass at Val I-75 and Ft. Myers. Salinities were also in the good range (10-30) for adult eastern oysters at Sanibel and Shell Point and in the fair range at Cape Coral.

Stormwater Treatment Areas

For the week ending Sunday, October 17, 2021, no Lake Okeechobee water was delivered to the FEBs/STAs. The total amount of Lake releases sent to the FEBs/STAs in WY2022 (since May 1, 2021) is approximately 61,000 ac-feet. The total amount of inflows to the STAs in WY2022 is over 800,000 ac-feet. Most STA cells are near or above target stage. STA-1E Western Flow-way is offline for the Restoration Strategies project to fill and grade Cells 5 and 7, STA-3/4 Eastern Flow-way is offline for vegetation rehabilitation/drawdown, 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 for construction activities. Operational restrictions are in effect in STA-1E Central Flow-way and STA-2 Flow-ways 3 and 4 for vegetation management activities. An operational restriction is also in effect in STA-5/6 Flow-way 3 for repair of the G-342G and G-342H stage sensors. This week, there is no capacity for Lake releases in the STAs.

Everglades

Rehydration rates were generally fair to good across the Everglades. Depths in WCA-3A North remain below the average for this time of the year and tree island model output indicate drier than average conditions. Responding to heavy rains in Florida Bay salinities decreased on average over the last week, however stages decreased in Taylor Slough. Both central and western Florida Bay remain above the 75th percentile of the historical average for this time but trended downwards last week. Most of the Bay remains marine, a bad position to start the dry season.

SUPPORTING INFORMATION

Kissimmee Basin

Upper Kissimmee

On October 17, 2021, lake stages were 57.3 feet NGVD (0.2 feet below schedule) in East Lake Toho, 54.1 feet NGVD (0.4 feet below schedule) in Lake Toho, and 50.7 feet NGVD (1.3 feet below schedule) in Lakes Kissimmee-Cypress-Hatchineha (KCH) (**Table KB-1**, **Figures KB-1-3**).

Lower Kissimmee

Discharges to the Kissimmee River on October 17, 2021 were 1,400 cfs at S-65 and 1,410 cfs at S-65A; discharges from the Kissimmee River were 1,810 cfs at S-65D and 1,870 cfs at S-65E (**Table KB-2**). Headwater stages were 46.4 feet NGVD at S-65A and 28.1 feet NGVD at S-65D on October 17, 2021. With lower water temperatures, little rainfall, and reduced discharge at S-65A, the concentration of dissolved oxygen in the Kissimmee River has been improving (**Table KB-2**, **Figure KB-4**), with the daily average above 2.0 mg/L on October 17. Flow at S-65A remains too low for complete inundation of the Kissimmee River floodplain, and mean floodplain depth decreased to 0.93 feet by October 17, 2021 (**Figure KB-5**).

Water Management Recommendations

Maintain at least 1,400 cfs at S65/S65A while stage in KCH is at or above 50 ft NGVD, per the IS-14-50 discharge plan (**Figure KB-6**).

Table KB-1. Average discharge for the preceding seven days and Sunday's average daily stage and departures from KCL flood regulation or temporary schedules. All data are provisional.

Water Body	Structure	Stage Monitoring Site	7-Day Average Discharge (cfs)	Lake Stage (feet NGVD)[a]	Schedule Type[b]	Schedule Stage (feet NGVD)	Departure from Regulation (feet)	
							10/17/21	*10/10/21*
Lakes Hart and Mary Jane	S-62	LKMJ	45	60.3	R	60.5	-0.2	0.0
Lakes Myrtle, Preston and Joel	S-57	S-57	47	61.6	R	61.5	0.1	0.0
Alligator Chain	S-60	ALLI	0	63.7	R	63.6	0.1	0.1
Lake Gentry	S-63	LKGT	22	61.3	R	61.3	0.0	0.1
East Lake Toho	S-59	TOHOE	0	57.3	R	57.5	-0.2	-0.1
Lake Toho	S-61	TOHOW S-61	0	54.1	R	54.5	-0.4	-0.2
Lakes Kissimmee, Cypress and Hatchineha	S-65	KUB011 LKIS5B	1,377	50.7	R	52.0	-1.3	-0.7

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

b. A: projected recession line; R: USACE regulation schedule; S: temporary recession target line; T: temporary schedule; NA: not applicable or not available.

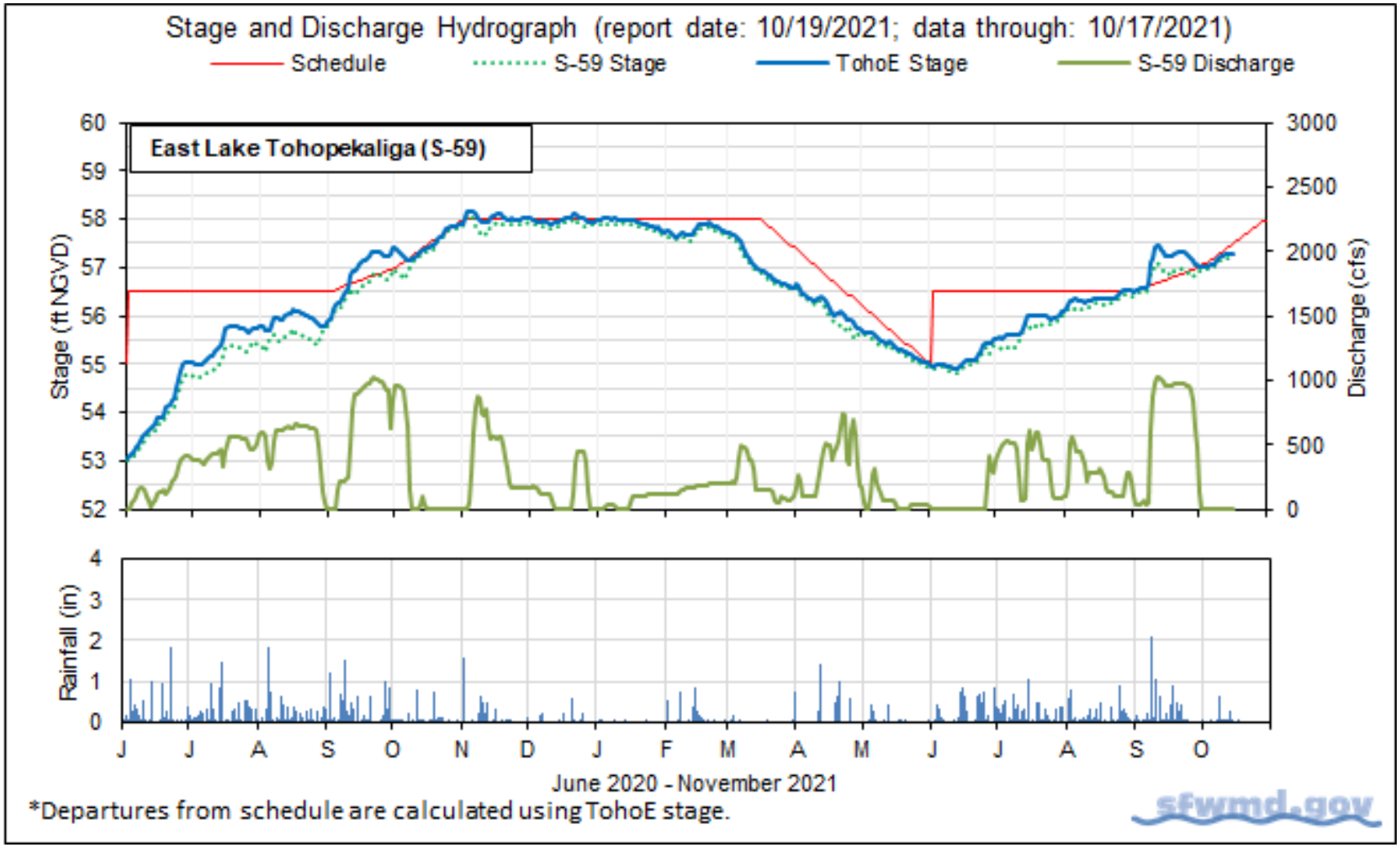


Figure KB-1. East Lake Toho regulation schedule, stage, discharge and rainfall.

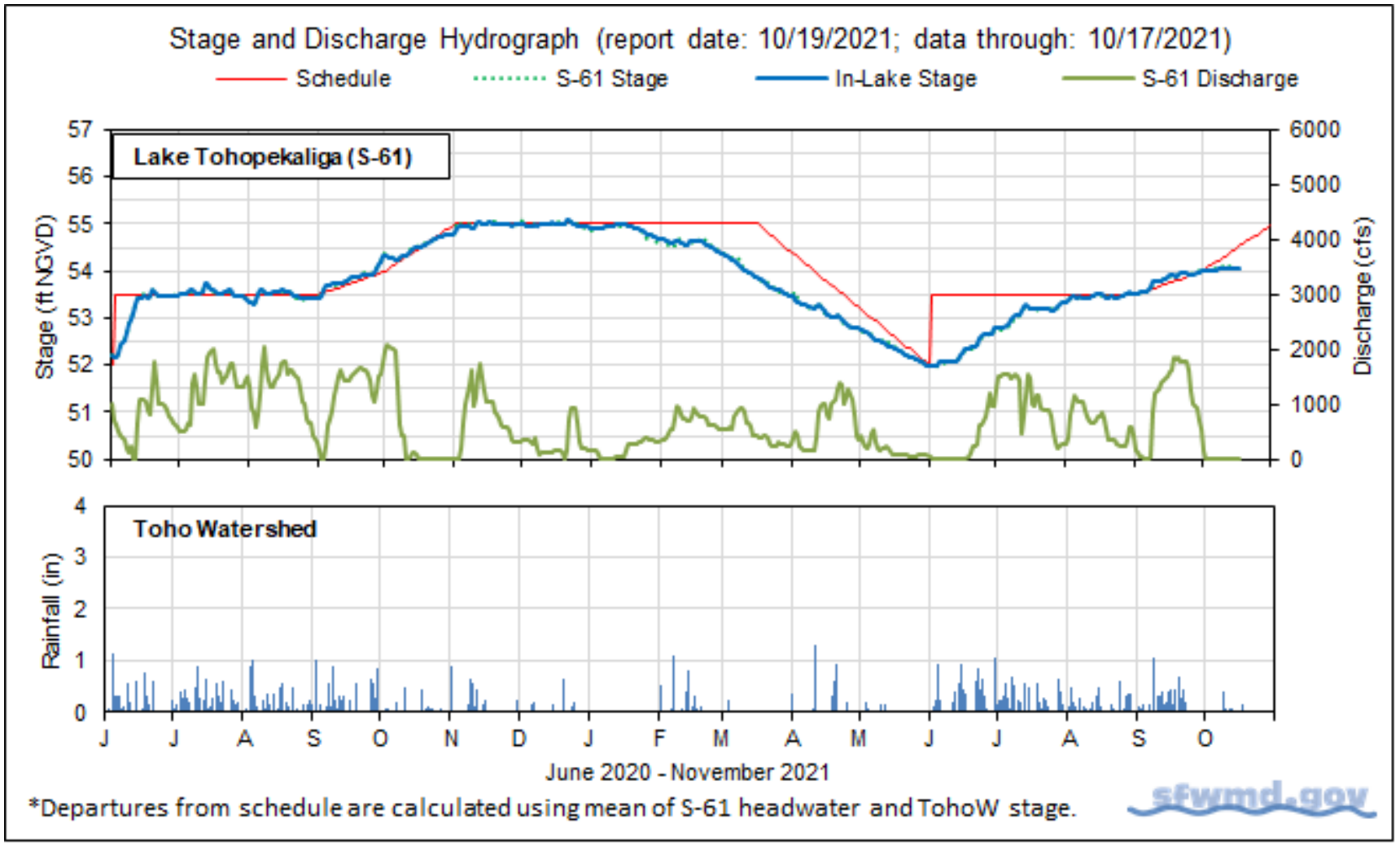


Figure KB-2. Lake Toho regulation schedule, stage, discharge and rainfall.

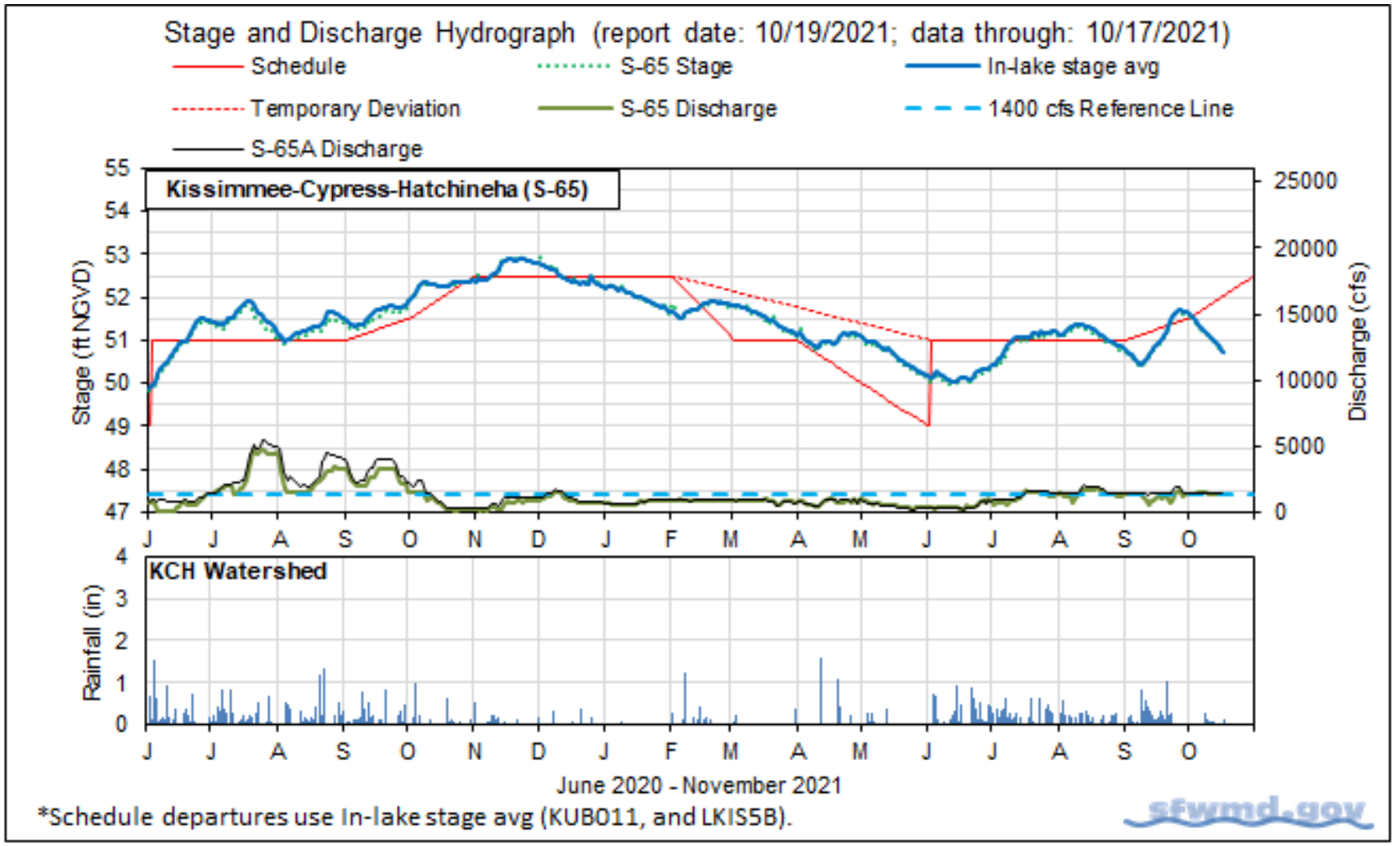


Figure KB-3. Lakes Kissimmee, Cypress and Hatchineha regulation schedule, stage, discharge and rainfall.

Table KB-2. One- and seven-day average discharge and stage at Lower Kissimmee basin structures, river channel dissolved oxygen concentrations and water depths in the Phase I area floodplain. All data are provisional.

Metric	Location	Daily Average	Average for Previous Seven Day Periods			
		10/17/21	10/17/21	10/10/21	10/3/21	9/26/21
Discharge	S-65	1,400	1,380	1,440	1,340	1,170
Discharge	S-65A[a]	1,410	1,410	1,460	1,500	1,650
Headwater Stage (feet NGVD)	S-65A	46.4	46.4	46.4	46.2	46.4
Discharge	S-65D[b]	1,810	1,760	2,030	2,880	2,650
Headwater Stage (feet NGVD)	S-65D[c]	28.1	28.5	28.5	28.6	28.7
Discharge (cfs)	S-65E[d]	1,870	1,850	2,150	3,010	2,770
Discharge (cfs)	S-67	0	0	0	0	0
Dissolved Oxygen (mg/L) [e]	Phase I, II/III river channel	2.8	2.6	2.1	0.9	0.8
Mean depth (feet) [f]	Phase I floodplain	0.93	0.96	1.07	1.40	1.52

a. Combined discharge from main and auxiliary structures.

b. Combined discharge from S-65D, S-65DX1 and S-65DX2.

c. Average stage from S-65D and S-65DX1.

d. Combined discharge from S-65E and S-65EX1.

e. Dissolved oxygen is the average of values from sondes KRBN, PC62, PC63, PD62R and PD42R.

f. One-day spatial average obtained from the South Florida Water Depth Assessment Tool (SFWDAT).

Table KB-3. Discharge rate of change limits for S65/S-65A (revised 1/14/19).

Discharge (cfs)	Maximum Rate of Increase (cfs/day)	Maximum Rate of Decrease (cfs/day)
0-300	100	-50
301-650	150	-75
651-1,400	300	-150
1,401-3,000	600	-600
>3,000	1,000	-2,000

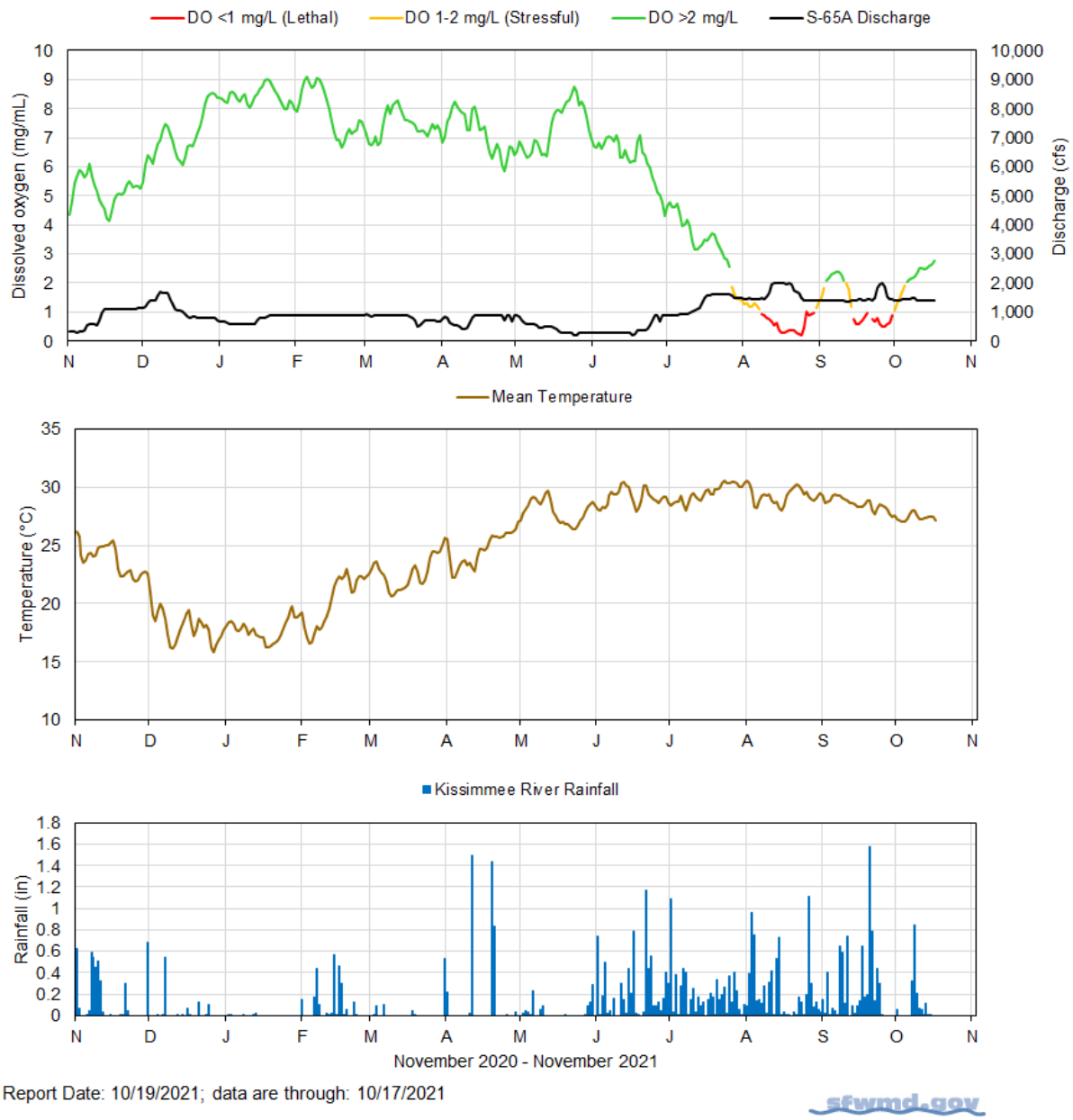


Figure KB-4. Restored Kissimmee river channel mean daily dissolved oxygen concentration (mg/L), S-65A discharge (cfs), temperature (°C) and rainfall (inches). Dissolved oxygen (DO) and temperature are mean daily values averaged for PC62, KRBN, PC33, PD62R, and PD42R with an average of four stations reporting this week. Rainfall values are daily totals for Kissimmee River (Pool BCD) AHED watershe

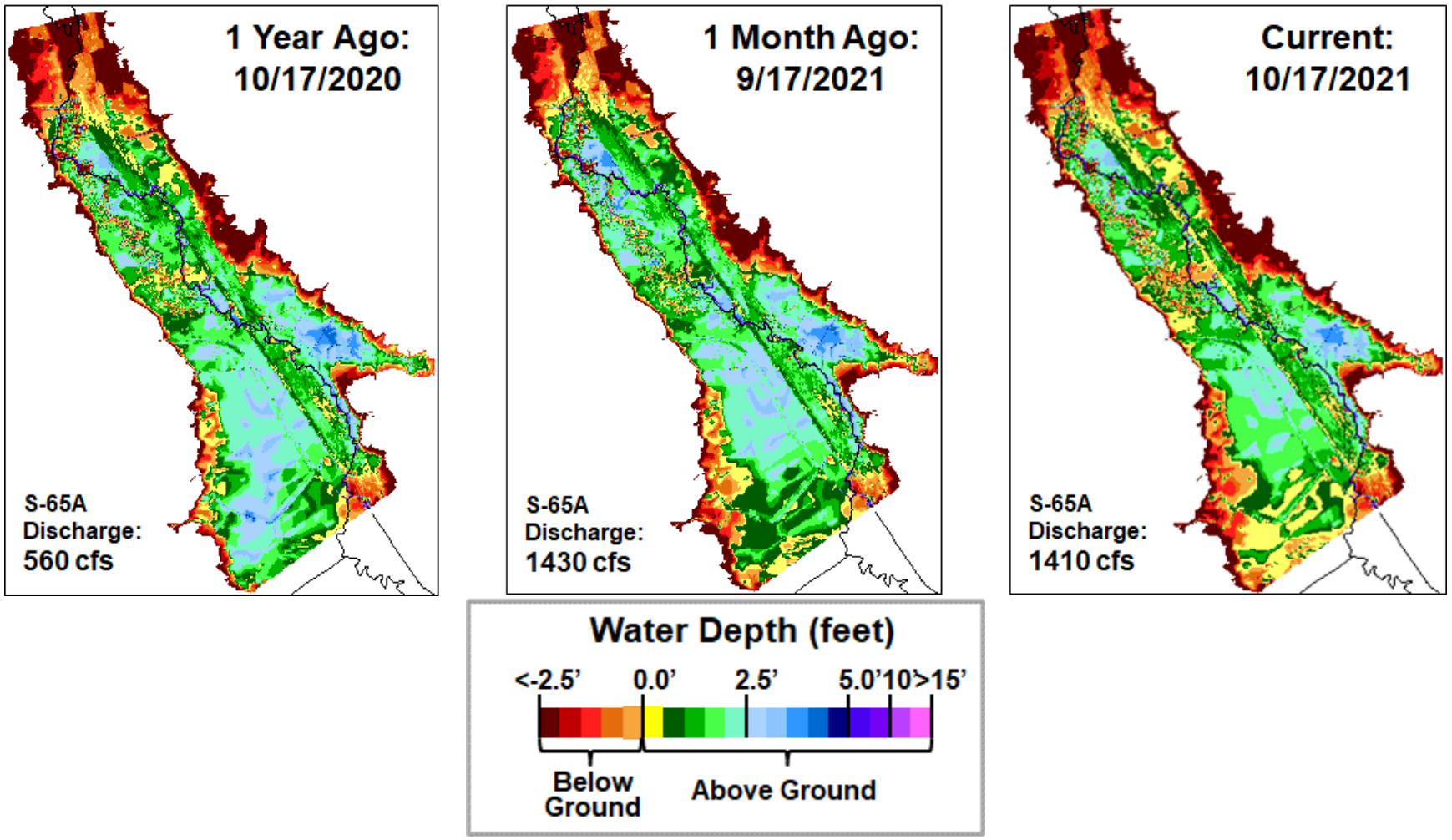


Figure KB-5. Phase I area Kissimmee River floodplain water depths (from left to right) one year ago, one month ago and current.

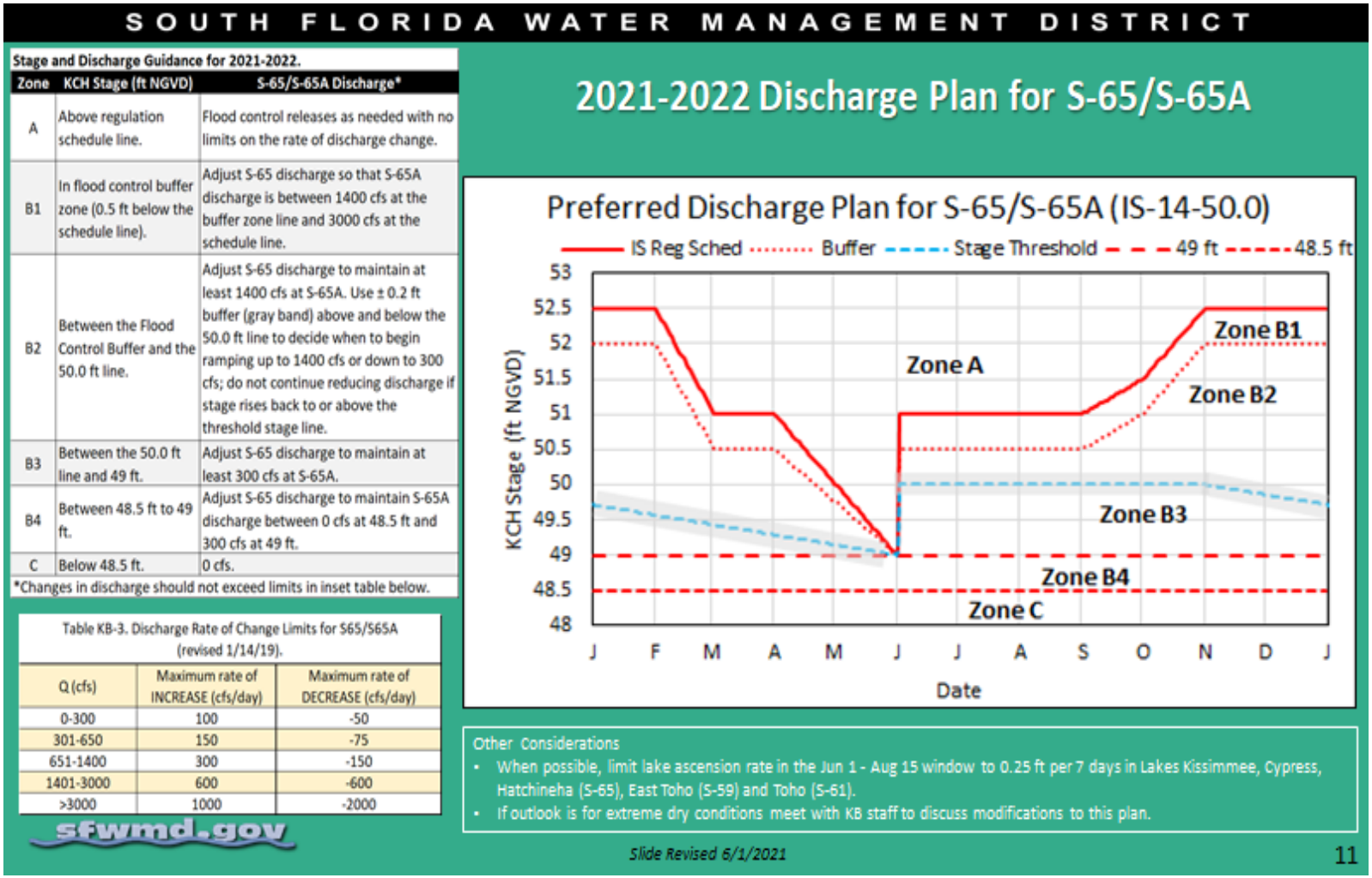


Figure KB-6. IS-14-50 Discharge Plan for S65/S65A with discharge rate of change limits (revised 1/14/19).

Lake Okeechobee

Lake Okeechobee stage was 15.88 feet NGVD on October 17, 2021 and it was 0.89 feet higher than a month ago (**Figure LO-1**). Lake stage is currently 0.4 ft above the ecological envelope, having been either above or at the very top of the envelope for all of 2021 (**Figure LO-2**). Lake stage remained in the Low sub-band last week (**Figure LO-3**). According to NEXRAD, 0.07 inches of rain fell directly on the Lake last week.

Average daily inflows (excluding rainfall) decreased from the previous week, going from 4,596 cubic feet per second (cfs) to 4,275 cfs. Average daily outflows (excluding evapotranspiration) remained 0 cfs. There have been essentially no outflows from the Lake since late June 2021. Most of the inflows (1,847 cfs) came from the Kissimmee River through S-65E & S-65EX1 structures. The second and third highest inflows were received from the Indian Prairie basins (921 cfs) and Fisheating Creek (554 cfs), respectively. There was no outflow to the west via S-77, to the east via S-308 or to the south via S-351, S-352 and S-354 structures. There was backflow from the L-8 canal via the S-271 structure at the average daily rate of 401 cfs. **Figures LO-4 and LO-5** show the combined average daily inflows and outflows for the Lake over the past eight weeks, and average inflows and outflows last week, respectively. These data are provisional and are subject to change.

The most recent satellite image (October 17, 2021) from the NOAA cyanobacteria monitoring product derived from EUMETSAT's Sentinel 3 OLCI sensor data showed low to medium bloom potential in the western part of the Lake (**Figure LO-6**). The October 4-7, 2021 survey results revealed that approximately 34% of the samples had microcystin concentration above the detection limit (> 0.25 µg/L) and ~ 12% had above the EPA recommended threshold for recreational waters (8 µg/L). The maximum toxin concentration (44 µg/L) was recorded at PALMOUT2 in the southwestern part of the Lake. Approximately 62% of the samples had mixed communities, while the rest were dominated by *Microcystis aeruginosa*. The October 4-7, 2021 survey results are shown in **Table LO-1** and **Figure LO-7**.

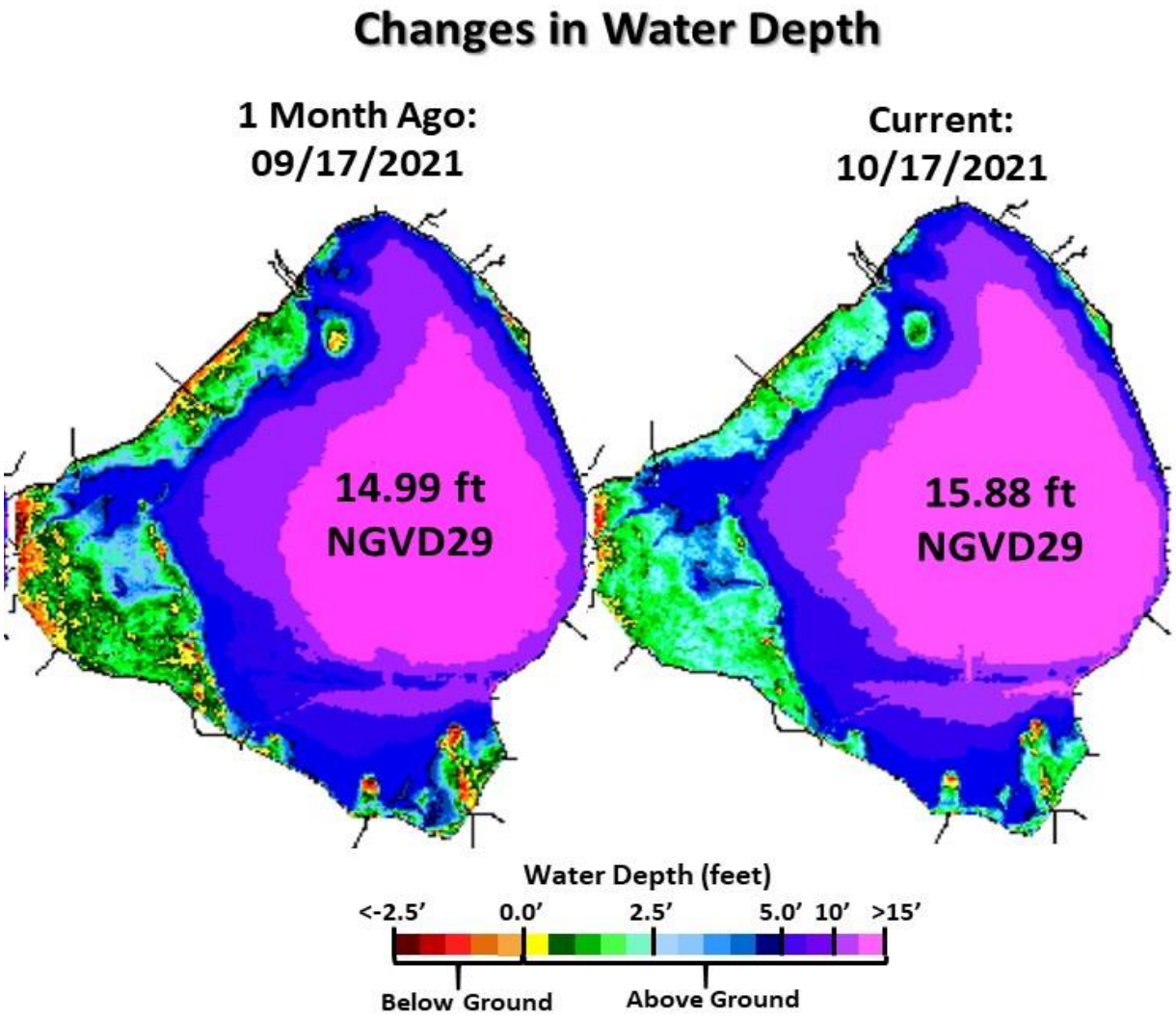


Figure LO-1. Lake Okeechobee water depth estimates based on South Florida Water Depth Assessment Tool (SFWDAT).

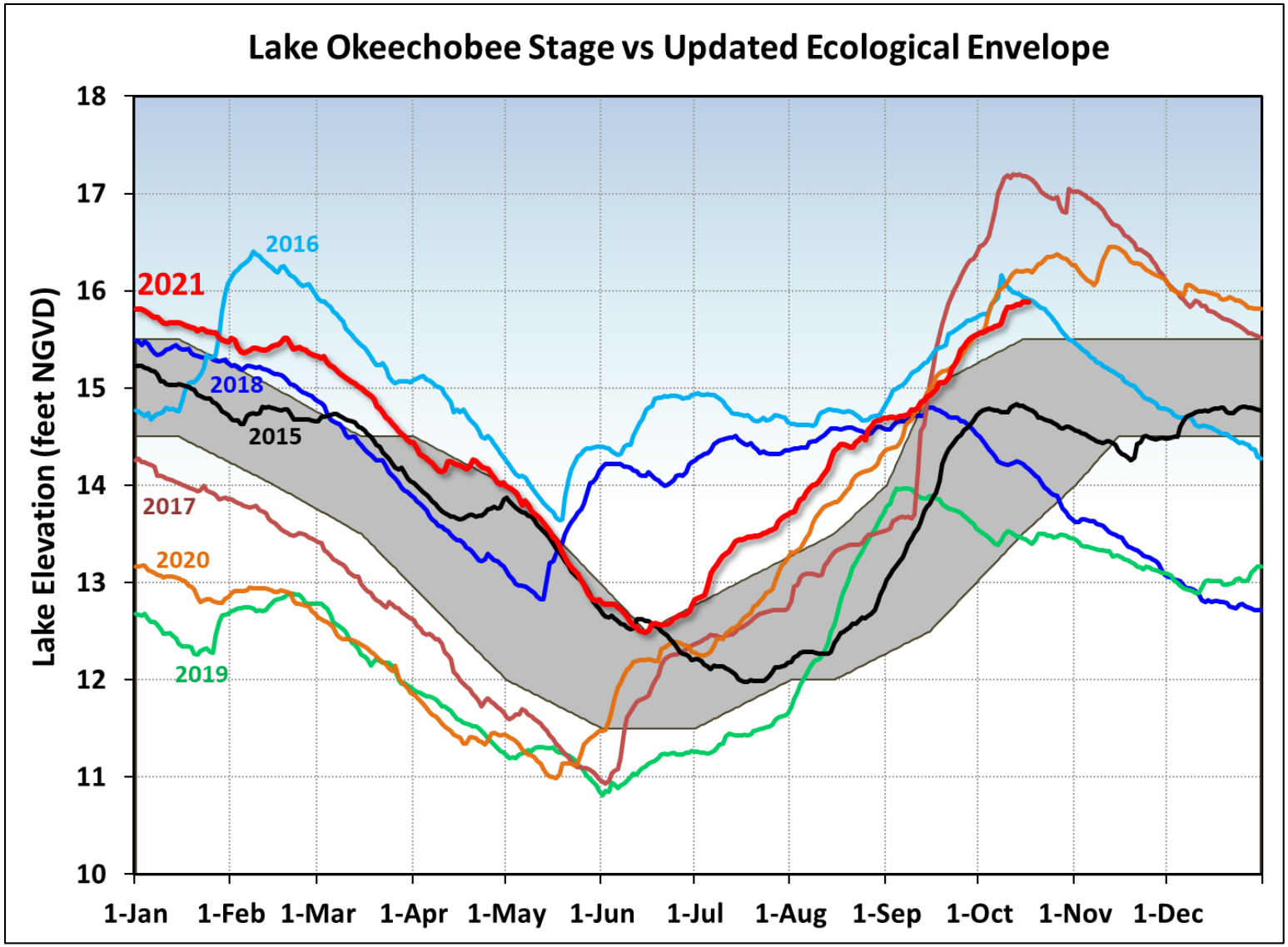


Figure LO-2. Select annual stage hydrographs for Lake Okeechobee in comparison to the updated ecological envelope.

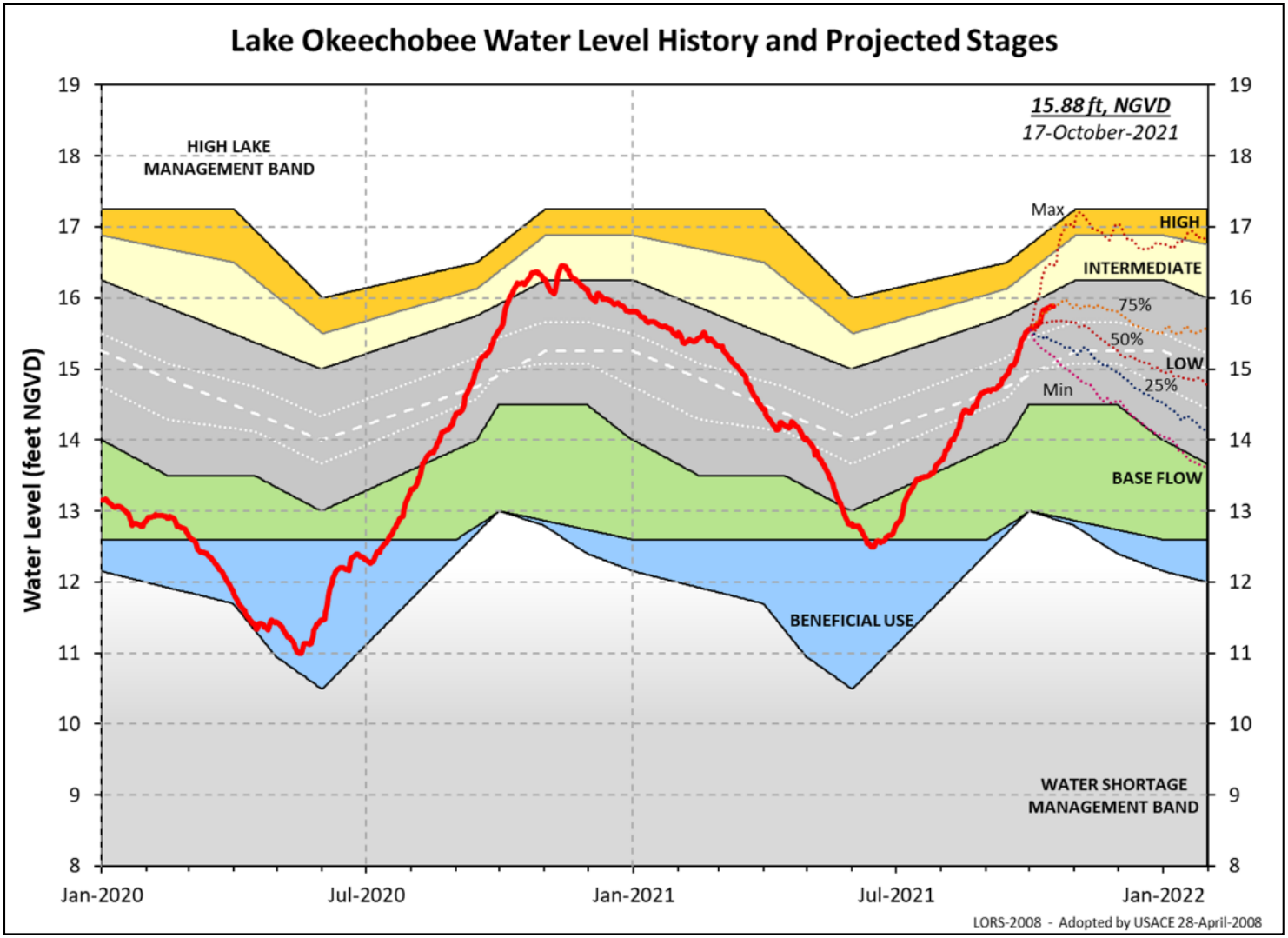


Figure LO-3. Recent Lake Okeechobee stages and releases, with projected stages based on a dynamic position analysis.

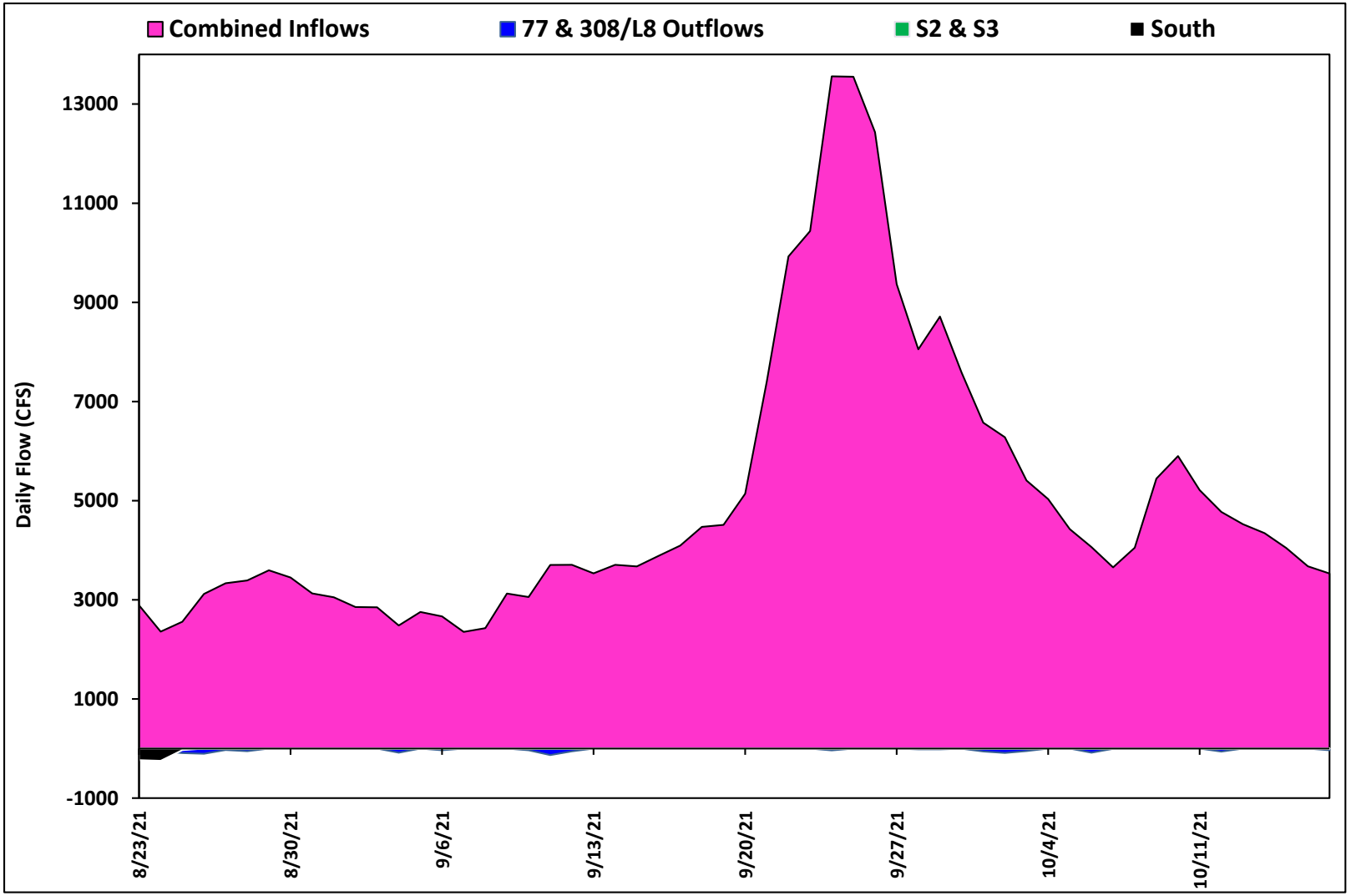


Figure LO-4. Major inflows (pink) to and outflows east and west (blue) from Lake Okeechobee. Outflows south are shown in black. Flows into Lake Okeechobee from the L-8 canal through S-271 (formerly Culvert 10A) or from the C-44 canal through the S-308 are included as inflows. Conversely, flows from Lake Okeechobee into the L-8 or C-44 canals are included with outflows. Inflows are shown as positive values; outflows are negative. Outflows through the S-77 (Caloosahatchee) and S-308 (C-44 Canal) structures are based on downstream gauges to include flows to lock openings for navigation.

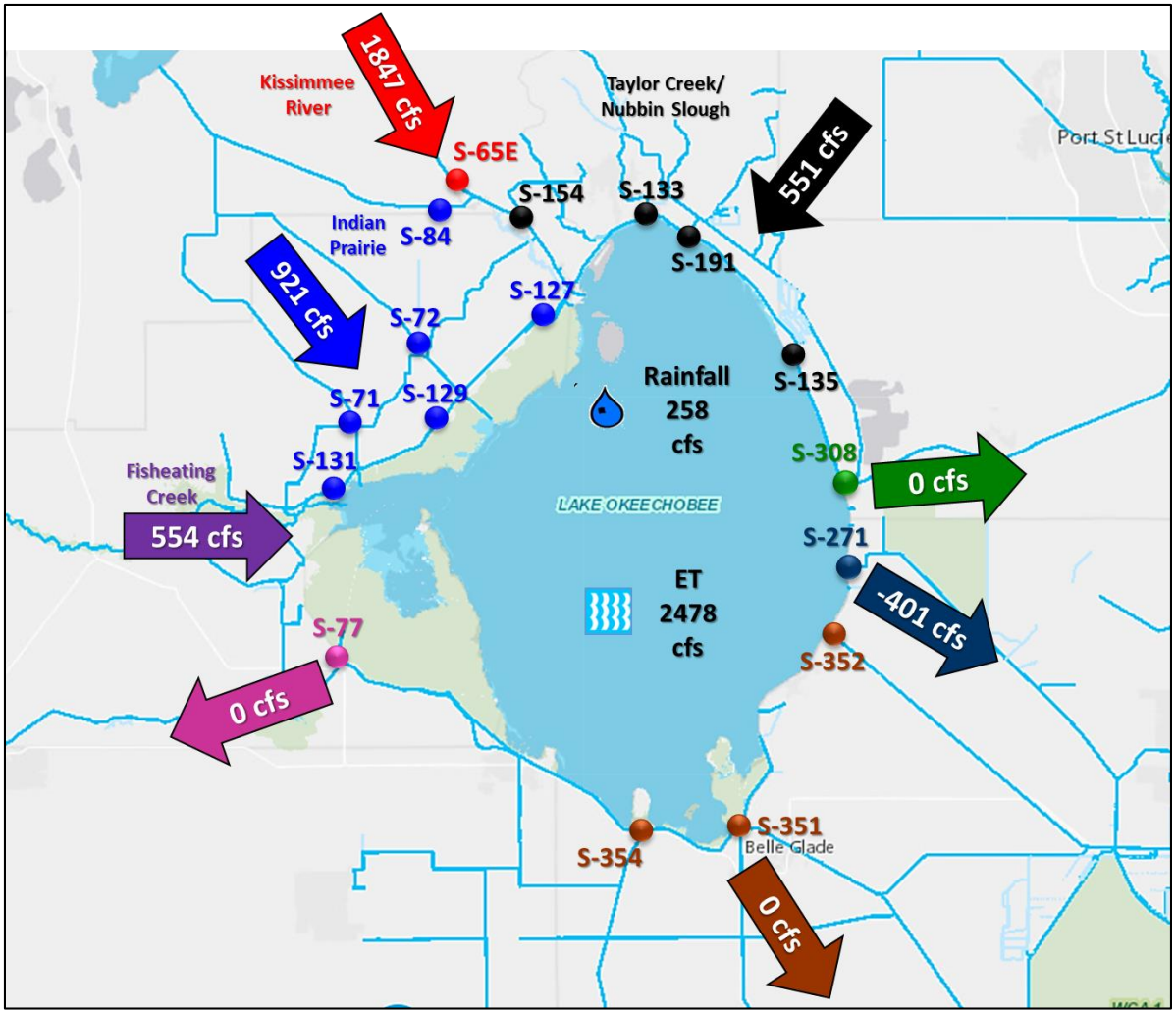


Figure LO-5. Inflows into Lake Okeechobee from Indian Prairie basins, Taylor Creek/Nubbin Slough, Kissimmee River and Fisheating Creek, and outflows to the west via S-77, to the east via S-308, to the south via S-351, S-352, S-354, and to SW via S-271 (formerly Culvert 10A).

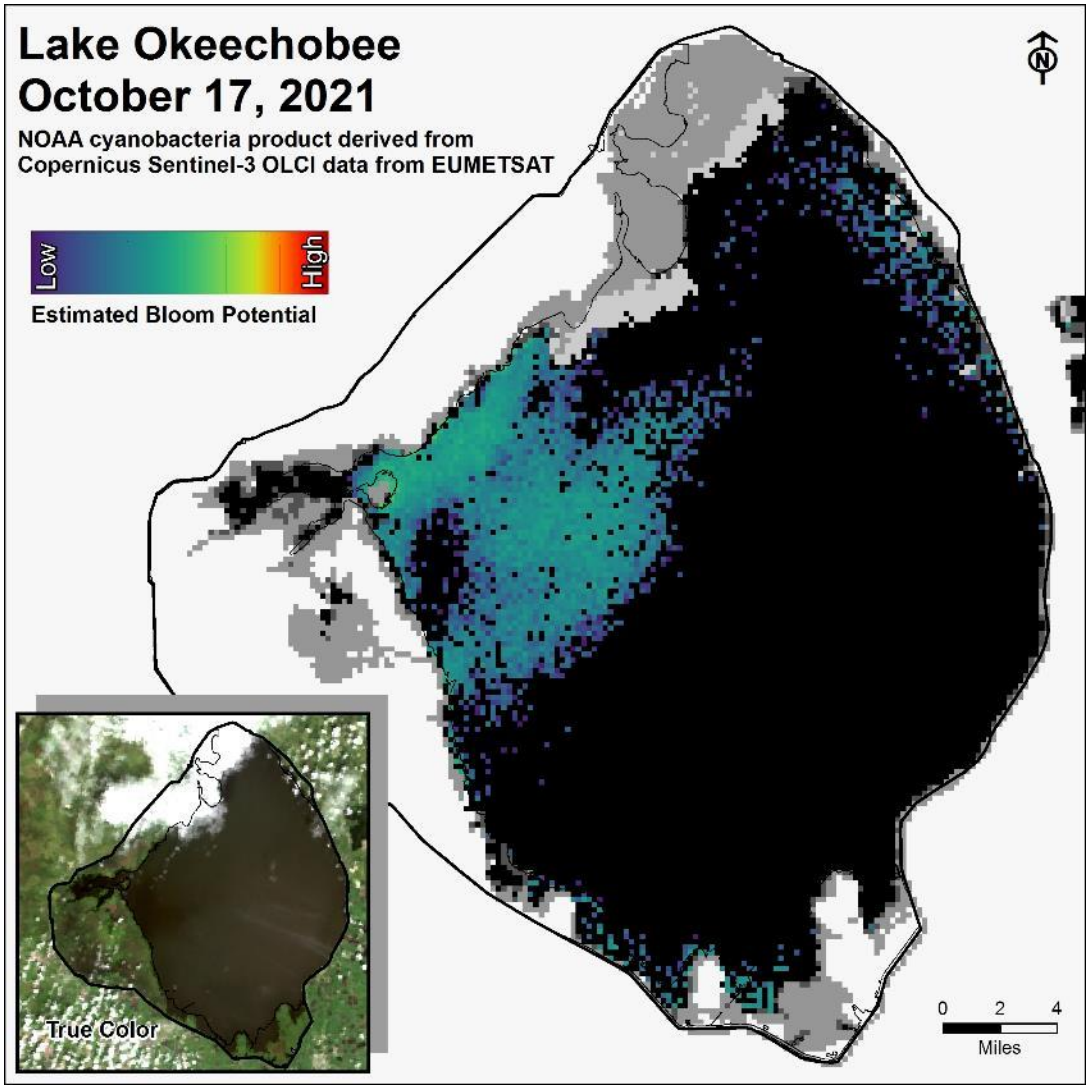


Figure LO-6. Cyanobacteria bloom potential on October 17, 2021 based on NOAA's harmful algal bloom monitoring system. Gray color indicates cloud cover.

Table LO-1. Provisional results of chlorophyll *a* concentrations and cyanobacteria taxa from sampling trips on October 4-7, 2021. Color coding generally follows the legend in **Figure LO-6**.

Collection Date: October 4-7, 2021

Station	CHLa (ug/L)	TOXIN (ug/L)	TAXA
FEBIN	P	BDL	*mixed*
FEBOUT	P	BDL	*mixed*
KISSR0.0	P	BDL	*mixed*
L005	P	BDL	*Microcys*
LZ2	P	BDL	*mixed*
KBARSE	P	BDL	*mixed*
RITTAE2	P	**0.4**	*Microcys*
PELBAY3	P	BDL	*Microcys*
POLE3S	P	**1.1**	*Microcys*
LZ25A	P	**0.3**	*Microcys*
PALMOUT	P	**3.5**	*Microcys*
PALMOUT1	P	**14.0**	*Microcys*
PALMOUT2	P	**44.0**	*Microcys*
PALMOUT3	P	**27.0**	*Microcys*
POLESOUT	P	BDL	*mixed*
POLESOUT1	P	BDL	*mixed*
POLESOUT2	P	BDL	*mixed*
POLESOUT3	P	BDL	*mixed*
EASTSHORE	P	BDL	*mixed*
NES135	P	BDL	*mixed*
NES191	P	BDL	*mixed*

Station	CHLa (ug/L)	TOXIN (ug/L)	TAXA
L001	P	BDL	*mixed*
L004	P	BDL	*mixed*
L006	P	**1.5**	*mixed*
L007	P	BDL	*Microcys*
L008	P	BDL	*mixed*
LZ30	P	**15.0**	*Microcys*
LZ40	P	**2**	*Microcys*
CLV10A	P	**0.4**	*mixed*
NCENTER	P	BDL	*mixed*

S308C	P	BDL	*mixed*
S77	P	BDL	*mixed*

- 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
- Station bold font – crew observed possible BGA
- Chlorophyll *a* analyzed by SFWMD
- Toxin and Taxa analyzed by FDEP:
  Microcys = Microcystis; Cylindro = Cylindrospermopsis; Planktol = Planktolyngbya; Dolicho = Dolichospermum

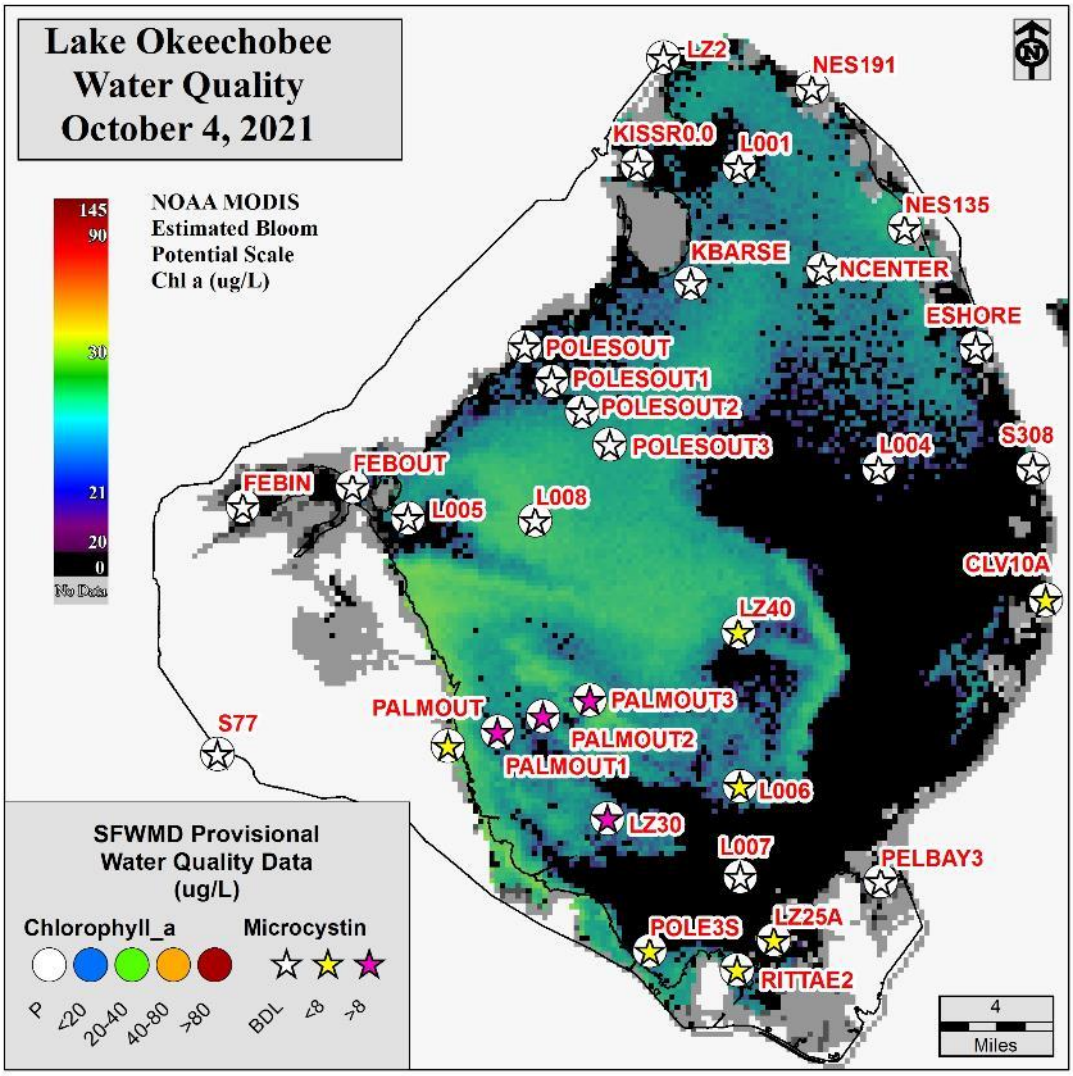


Figure LO-7. Expanded monitoring network and provisional results from samples collected October 4-7, 2021.

Estuaries

St. Lucie Estuary

Over the past week, mean total inflow to the St. Lucie Estuary was approximately 1,033 cfs (**Figures ES-1** and **ES-2**) and the previous 30-day mean inflow was approximately 1,594 cfs. For comparison, the historical provisional mean inflows from the contributing areas are shown in **Figure ES-2**.

Over the past week, surface salinities increased at HR1 and decreased at the US1 Bridge and A1A Bridge sites (**Table ES-1** and **Figure ES-3**). The seven-day moving average of the surface and bottom salinities at the US1 Bridge was 11.6. Salinity conditions in the middle estuary were estimated to be within the good range for adult eastern oysters (**Figure ES-4**).

Caloosahatchee River Estuary

Over the past week, mean total inflow to the Caloosahatchee River Estuary was approximately 3,003 cfs (**Figures ES-5** and **ES-6**) and the previous 30-day mean inflow was approximately 5,550 cfs. For comparison, the historical provisional mean inflows from the contributing areas are shown in **Figure ES-6**.

Over the past week, surface salinities remained the same at S-79 and Val I-75, increased at Ft. Myers, and decreased at Cape Coral, Shell Point, and Sanibel (**Table ES-2** and **Figures ES-7** and **ES-8**). The seven-day mean surface salinities (**Table ES-2**) were in the good range (0-10) for tape grass at Val I-75 and at Ft. Myers. The seven-day mean surface salinity values were within the good range for adult eastern oysters at Shell Point and Sanibel, and in the fair range at Cape Coral (**Figure ES-9**).

Surface salinity at Val I-75 was forecasted for the next two weeks, using an autoregression model (Qiu and Wan, 2013[1]) coupled with a linear reservoir model for the tidal basin. Model scenarios included pulse releases at S-79 ranging from 0 to 1,500 cfs and a steady release at 2,000 cfs with estimated tidal basin inflows of 352 cfs. Model results from all scenarios predict daily salinity to be 0.8 or lower and the 30-day moving average surface salinity to be 0.3 at Val I-75 at the end of the two-week period (**Table ES-3** and **Figure ES-10**). This keeps predicted salinities at Val I-75 within the LORS 2008 salinity range (0.0-5.0).

Red Tide

The Florida Fish and Wildlife Research Institute reported on October 15, 2021, that *Karenia brevis*, the Florida red tide dinoflagellate, was observed at background to medium concentrations in Charlotte County, and background to medium concentrations in or

[1] Qui, C., and Y. Wan. 2013. Time series modeling and prediction of salinity in the Caloosahatchee River Estuary. *Water Resources Research* 49:5804-5816.

offshore of Lee County. On the east coast, red tide was not observed in samples from Palm Beach or Miami-Dade counties.

Water Management Recommendations

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

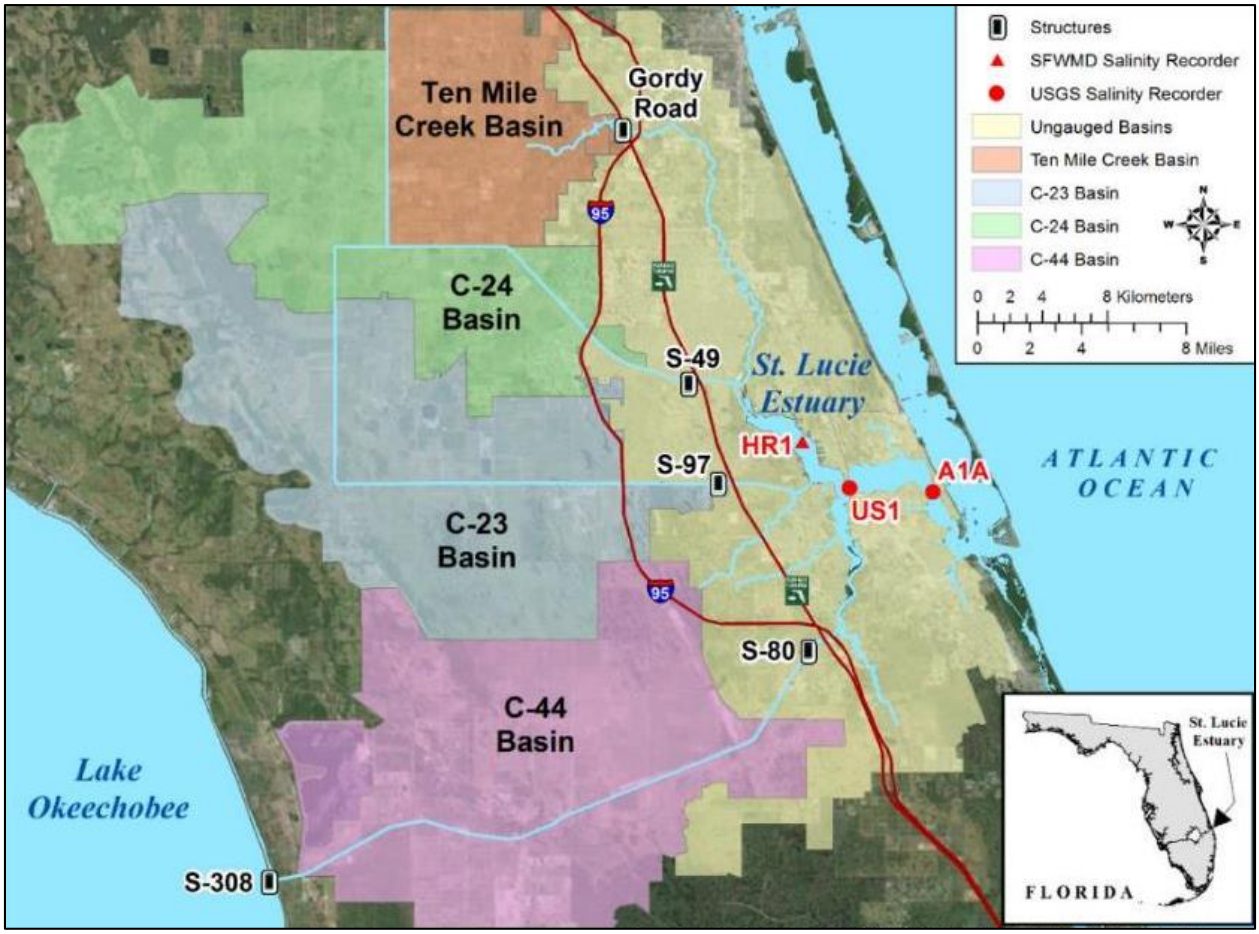


Figure ES-1. Basins, water control structures and salinity monitoring sites in the St. Lucie Estuary.

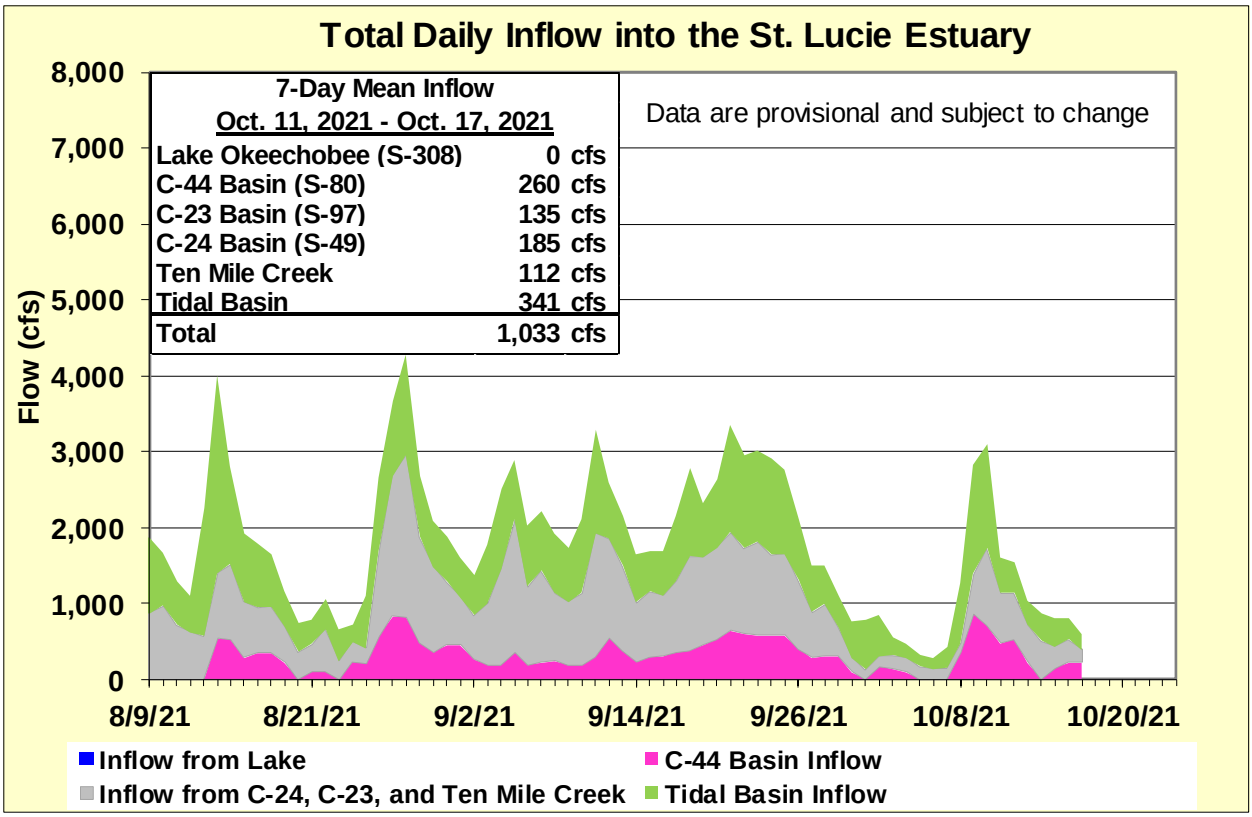


Figure ES-2. Total daily inflows from Lake Okeechobee and runoff from the C-44, C-23, C-24, Ten Mile Creek, and Tidal Basins into the St. Lucie Estuary.

Table ES-1. Seven-day mean salinity at oyster monitoring sites in the St. Lucie Estuary. Current means are in bold font; previous week's means are in parentheses. The envelope reflects the preferred salinity range for adult eastern oysters (*Crassostrea virginica*) in the middle estuary. Data are provisional.

Sampling Site	Surface	Bottom	Envelope
HR1 (North Fork)	**5.7** (4.5)	**9.3** (8.5)	NA [a]
US1 Bridge	**9.9** (10.3)	**13.2** (12.8)	10.0 – 26.0
A1A Bridge	**18.4** (20.3)	**24.7** (25.3)	NA [a]

a. The envelope is not applicable.

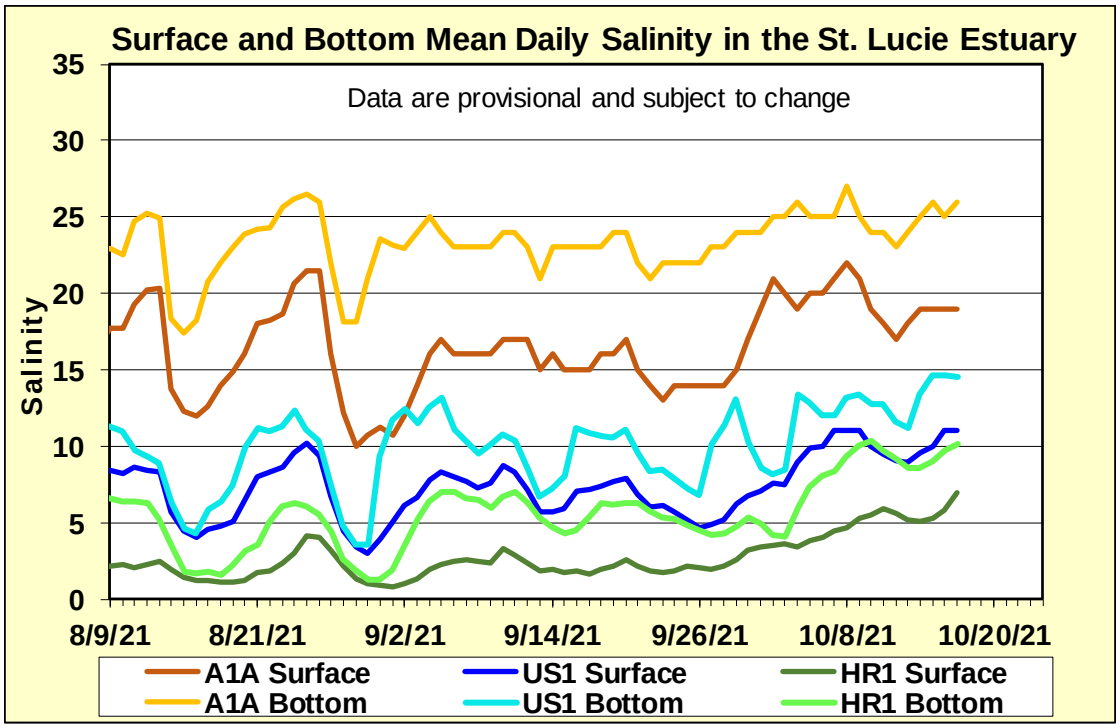


Figure ES-3. Mean daily salinity at the A1A, US1 and HR1 sites in the St. Lucie Estuary.

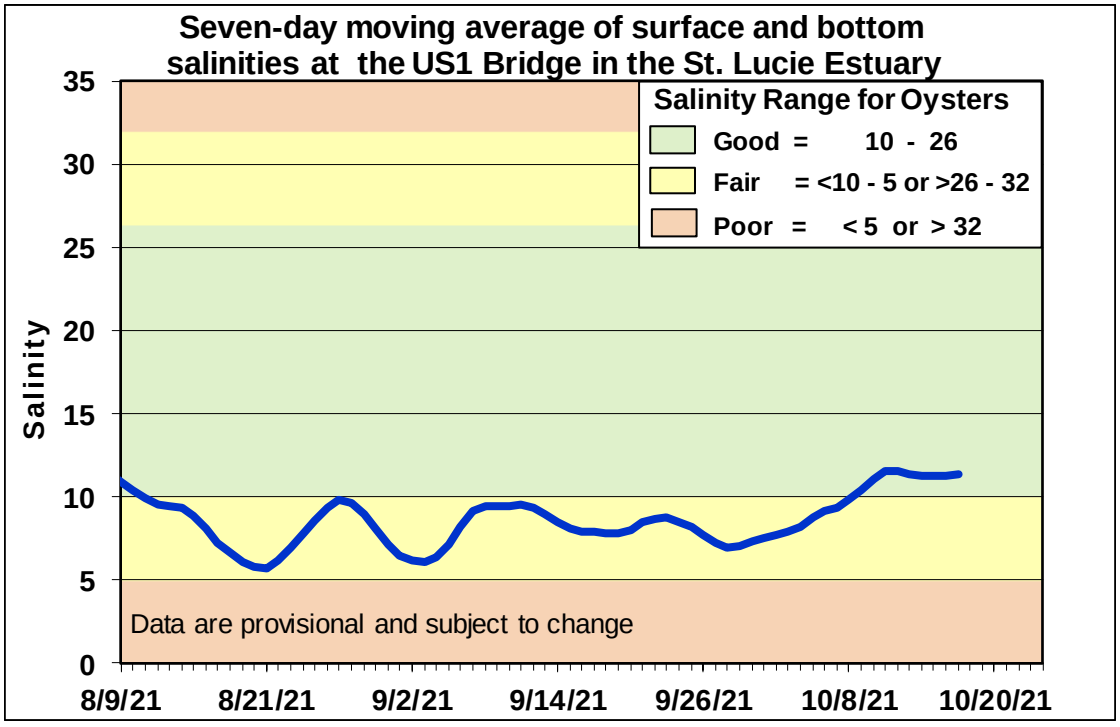


Figure ES-4. Seven-day moving average of the surface and bottom salinities at the US1 Bridge in the St. Lucie Estuary.

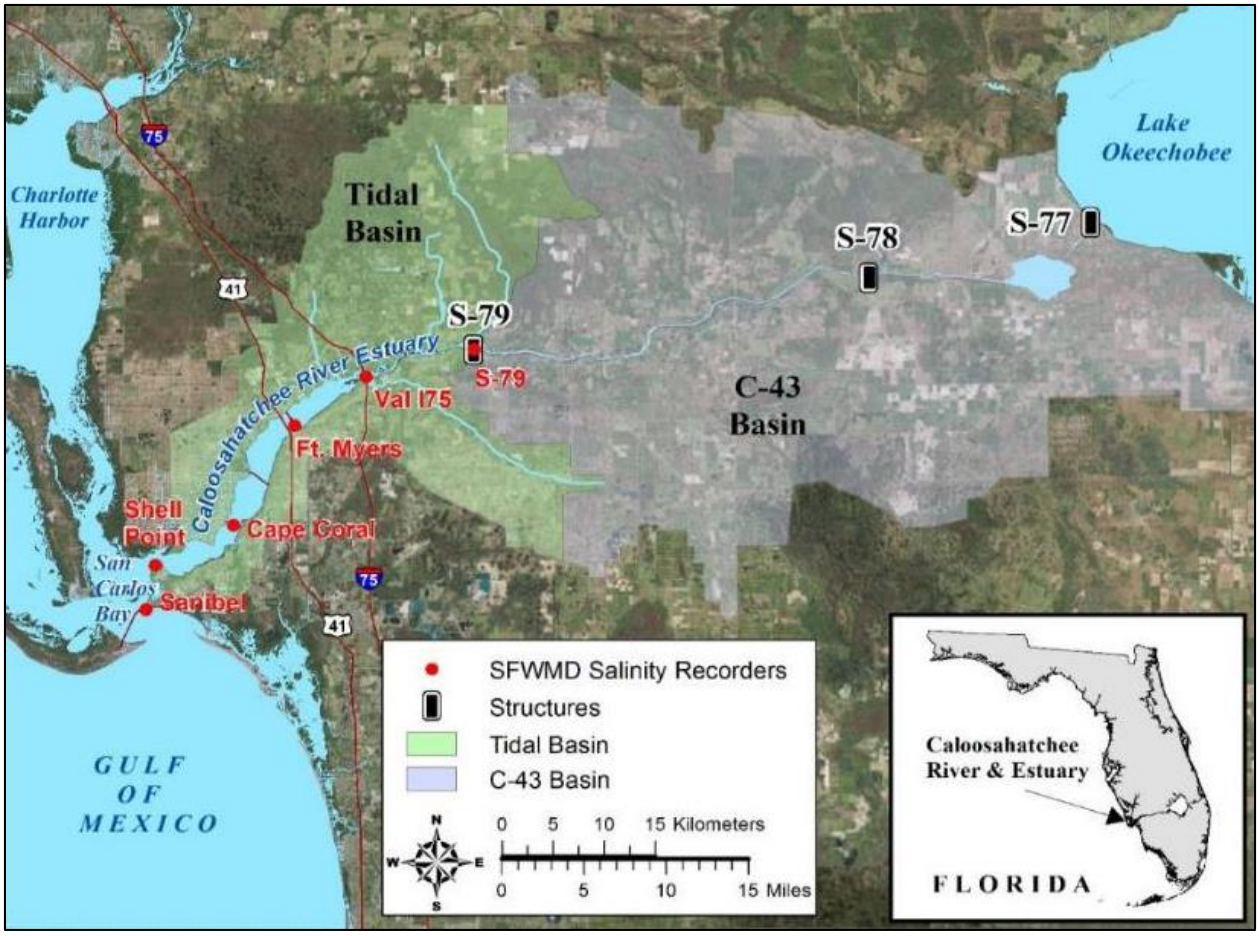


Figure ES-5. Basins, water control structures and salinity monitoring sites in the Caloosahatchee River Estuary.

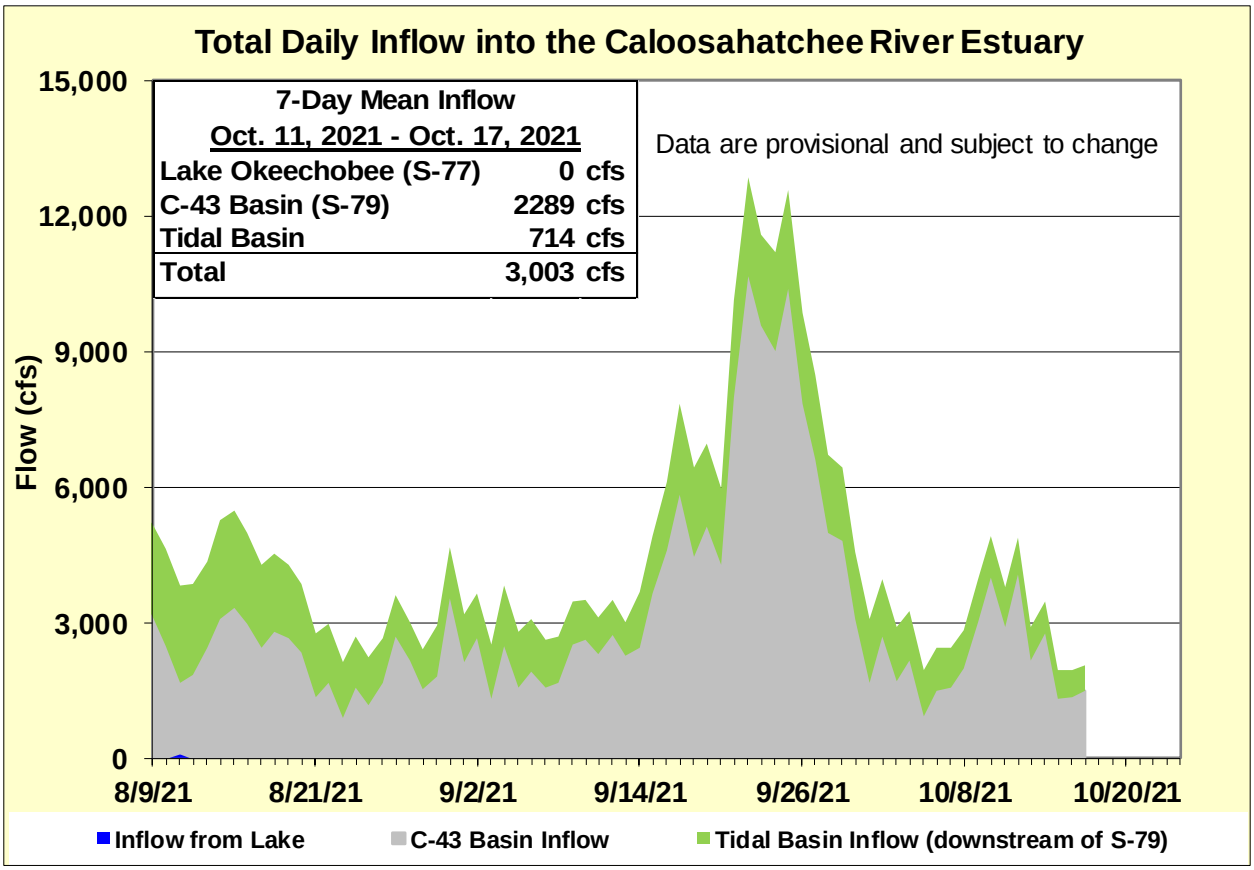


Figure ES-6. Total daily inflows from Lake Okeechobee, and runoff from the C-43 and Tidal basins into the Caloosahatchee River Estuary.

Table ES-2. Seven-day mean salinity at six monitoring sites in the Caloosahatchee River Estuary. Current means are in bold font; previous week's means are in parentheses. The envelope at I-75 is for the protection of tape grass in the upper estuary and the envelope in the lower estuary is the preferred salinity range for adult eastern oysters (*Crassostrea virginica*). Data are provisional.

Sampling Site	Surface	Bottom	Envelope
S-79 (Franklin Lock)	**0.2** (0.2)	**0.1** (0.2)	NA [a]
Val I-75	**0.2** (0.2)	**0.2** (0.2)	0.0 – 5.0 [b]
Fort Myers Yacht Basin	**1.4** (0.6)	**2.5** (0.8)	NA [a]
Cape Coral	**6.0** (6.6)	**8.6** (8.5)	10.0 – 30.0
Shell Point	**19.8** (21.1)	**21.4** (22.0)	10.0 – 30.0
Sanibel	**27.3** (27.9)	**29.0** (29.8)	10.0 – 30.0

a. The envelope is not applicable.
b. The envelope is based on the predicted 30-day mean for the next two weeks.

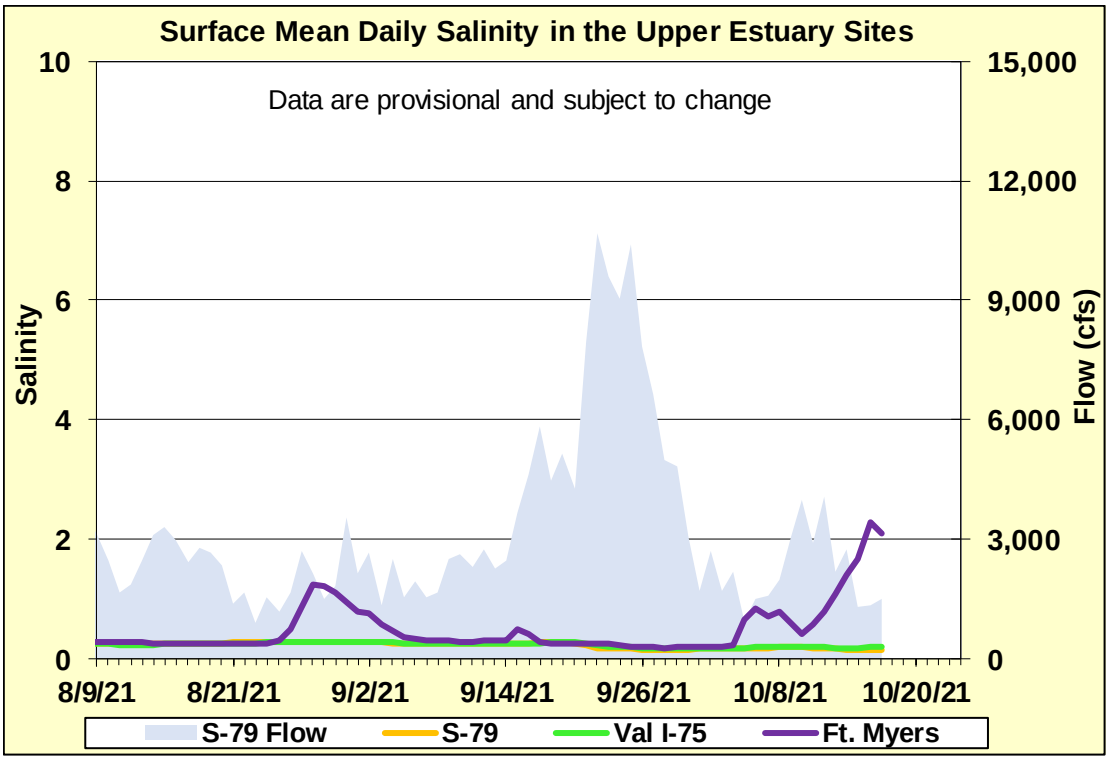


Figure ES-7. Mean daily salinity at upper Caloosahatchee River Estuary monitoring sites and mean daily flow at S-79.

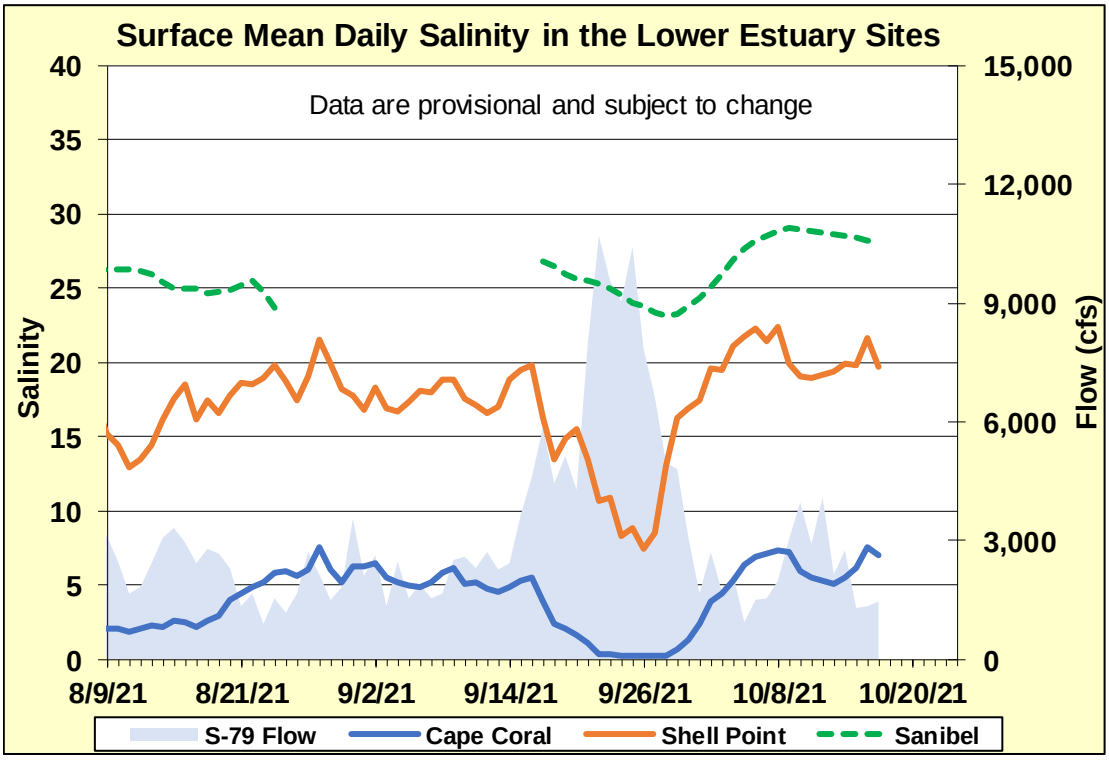


Figure ES-8. Mean daily surface salinity at lower Caloosahatchee River Estuary monitoring sites and mean daily flow at S-79.

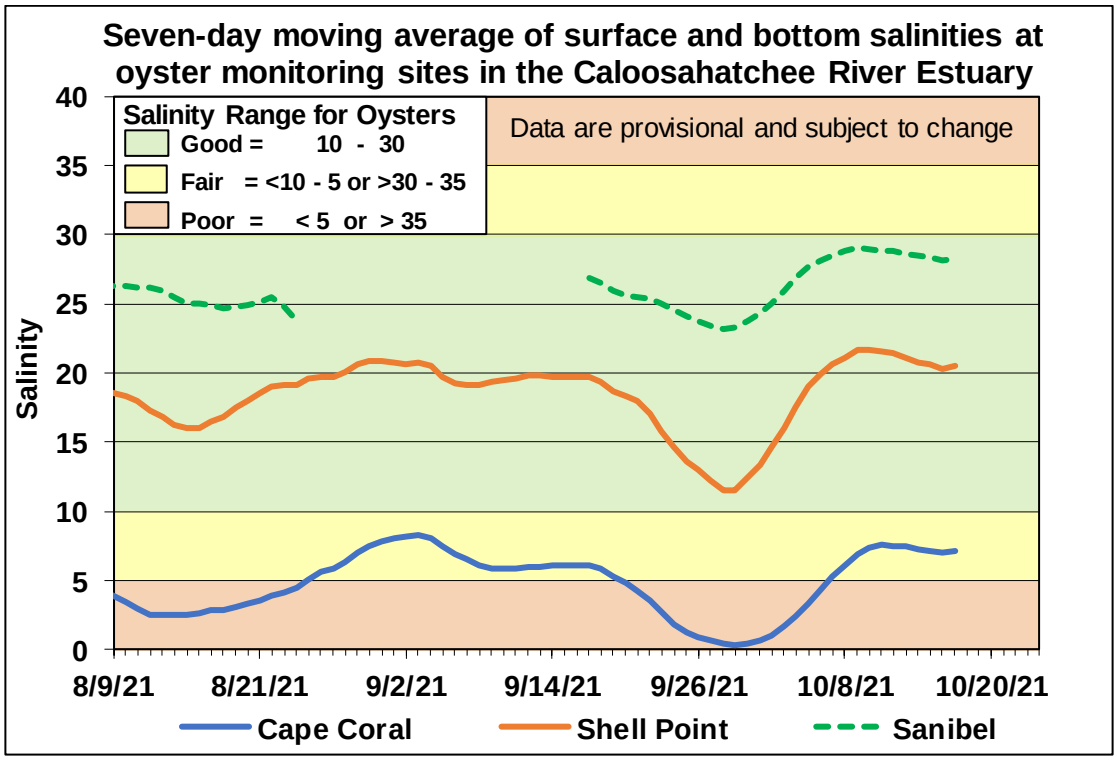


Figure ES-9. Seven-day moving average of surface and bottom salinities at Cape Coral, Shell Point and Sanibel monitoring sites in the Caloosahatchee River Estuary.

Table ES-3. Predicted salinity at Val I-75 in the Caloosahatchee River Estuary at the end of the forecast period for various S-79 flow release scenarios.

Scenario	Simulated S-79 Flow (cfs)	Tidal Basin Runoff (cfs)	Daily Salinity	30-Day Mean Salinity
A	0	352	0.8	0.3
B	450	352	0.4	0.3
C	800	352	0.3	0.3
D	1000	352	0.3	0.3
E	1500	352	0.3	0.3
F	2000	352	0.3	0.3

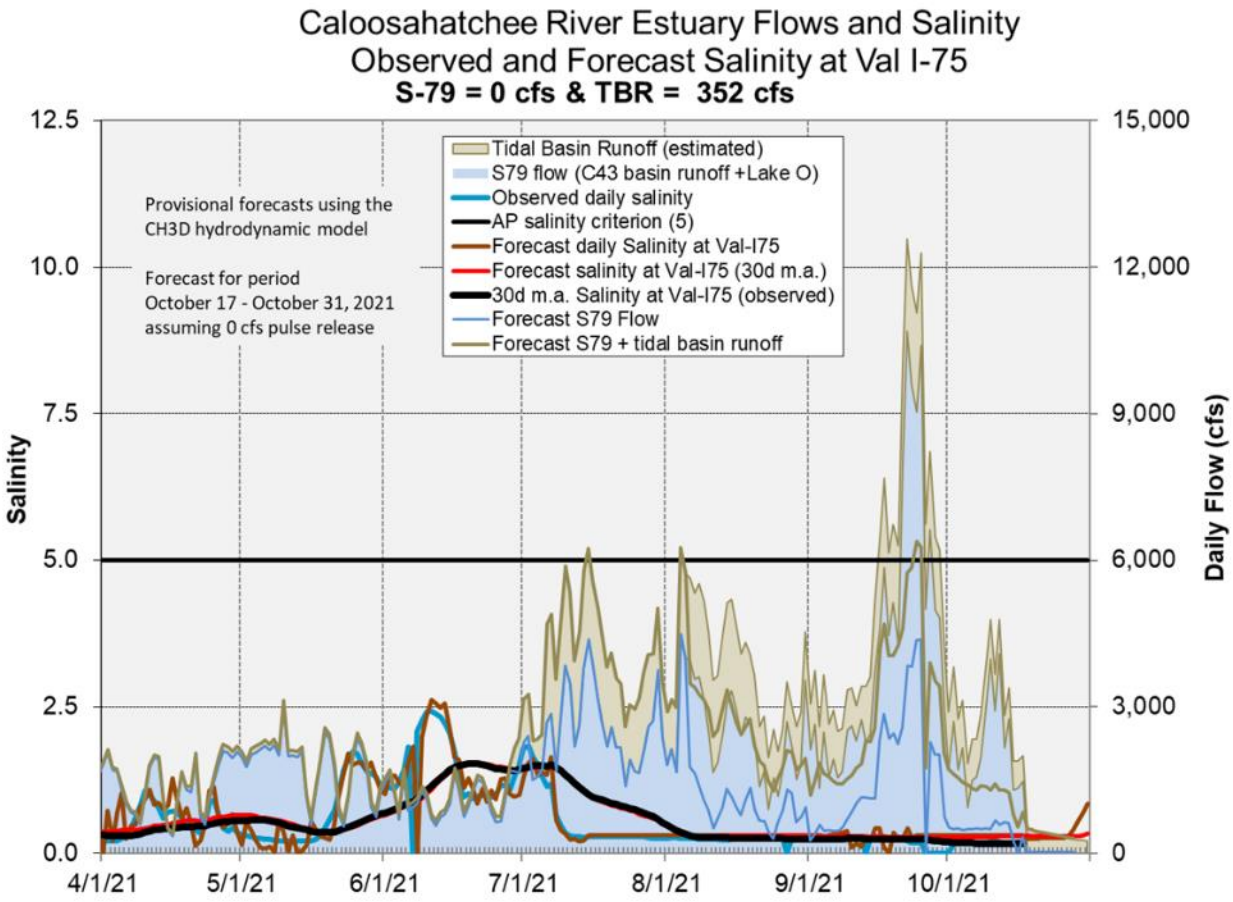


Figure ES-10. Forecasted Val I-75 site surface salinity assuming no pulse release at S-79.

Stormwater Treatment Areas

STA-1E: STA-1E Western Flow-way is offline for the Restoration Strategies project to fill and grade Cells 5 and 7. Operational restrictions are in place in STA-1E Central Flow-way for vegetation management activities. Online treatment cells are at or above target stage and vegetation in these cells is stressed and highly stressed. The 365-day phosphorus loading rates (PLRs) for the Eastern and Central Flow-ways are very high (**Figure S-1**).

STA-1W: Operational restrictions are in place in STA-1W Western, Eastern, and Northern Flow-ways due to construction activities. Most treatment cells are at target stage. Vegetation in the flow-ways is stressed and highly stressed. The 365-day PLRs for the Northern and Western Flow-ways are below 1.0 g/m^2/year. The 365-day PLR for the Eastern Flow-way is high (**Figure S-2**).

STA-2: STA-2 Flow-way 2 is offline for construction activities. Operational restrictions are in place in STA-2 Flow-ways 3 and 4 for vegetation management activities. Most treatment cells are above target stage. Vegetation in Flow-ways 1 and 3 is stressed, and in Flow-ways 2, 4 and 5 is highly stressed. The 365-day PLRs for Flow-ways 1, 4 and 5 are below 1.0 g/m^2/year. The 365-day PLR for Flow-way 3 is high (**Figure S-3).**

STA-3/4: STA-3/4 Eastern Flow-way is offline for vegetation rehabilitation/drawdown. Most online treatment cells are above target stage. Vegetation in the Eastern and Central Flow-ways is highly stressed and in the Western Flow-way is stressed. The 365-day PLR for the Western Flow-way is below 1.0 g/m^2/year. The 365-day PLR for the Central Flow-way is high (**Figure S-4**).

STA-5/6: An operational restriction is in place in STA-5/6 Flow-way 3 for repair of the G-342G and G-342H stage sensors. Most treatment cells are above target stage. All treatment cells have highly stressed vegetation conditions except Flow-ways 7 and 8 which are healthy. The 365-day PLRs for most flow-ways are high (**Figure S-5** and **S-6**).

For definitions on STA operational language see glossary following figures.

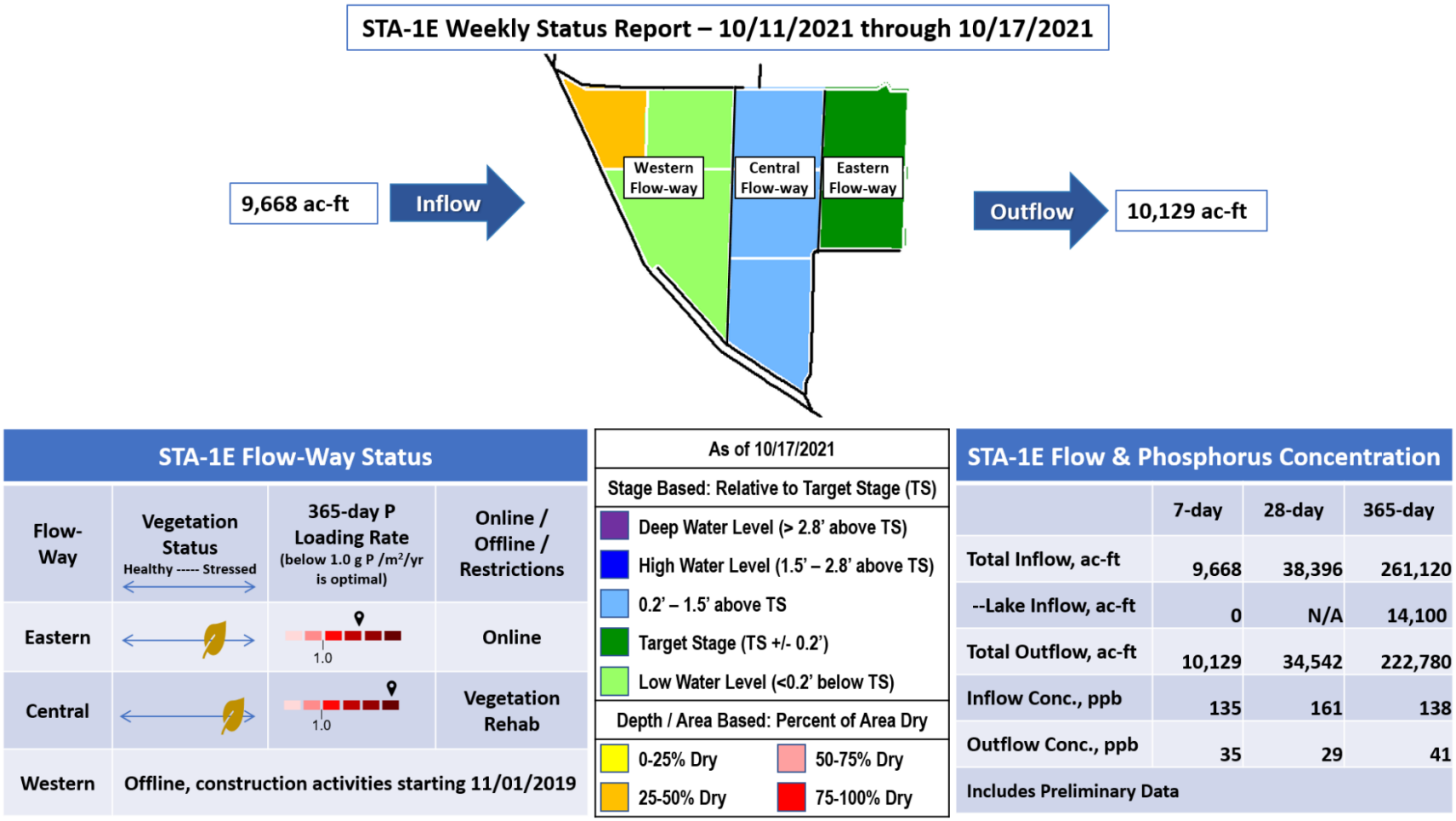


Figure S-1. STA-1E Weekly Status Report

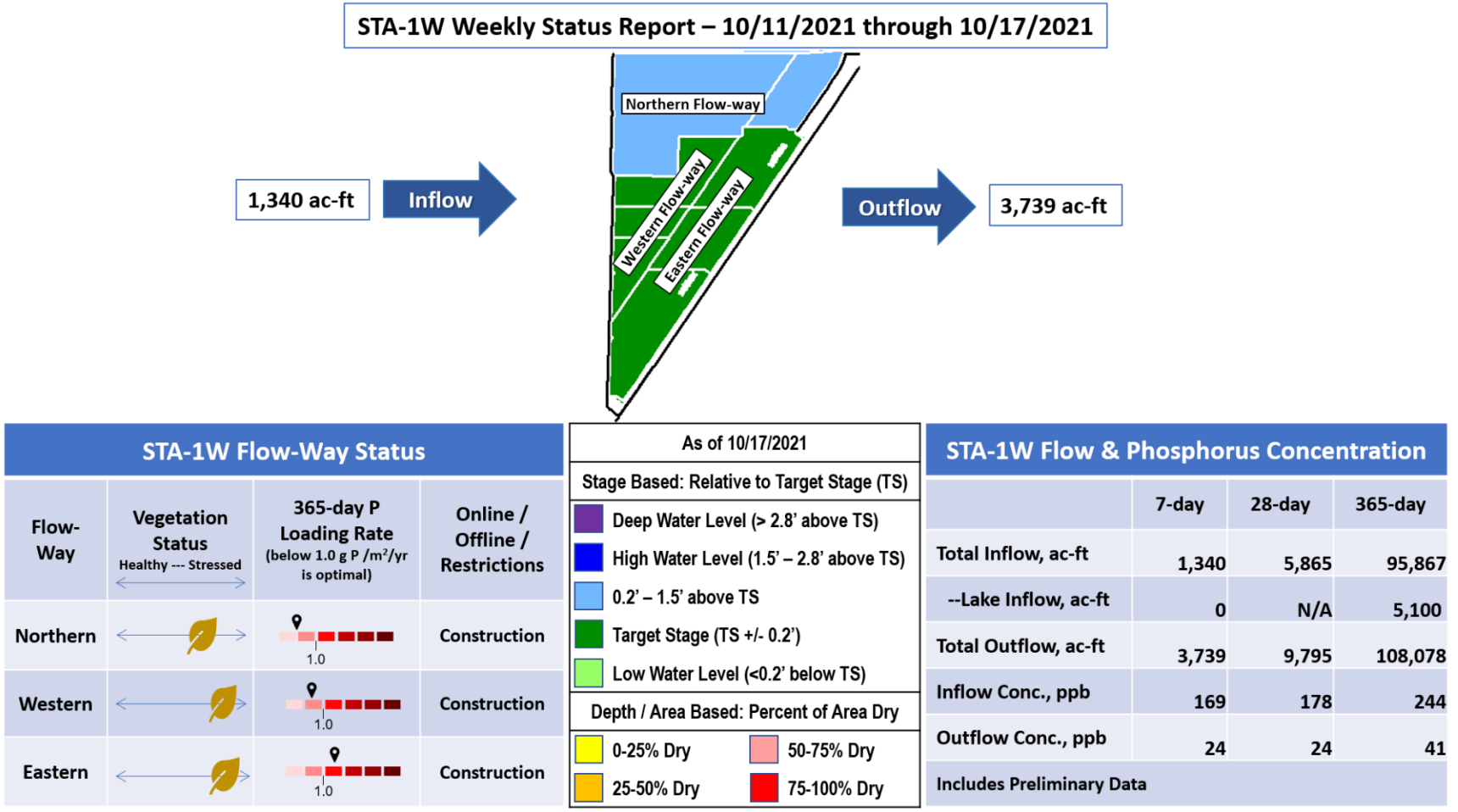
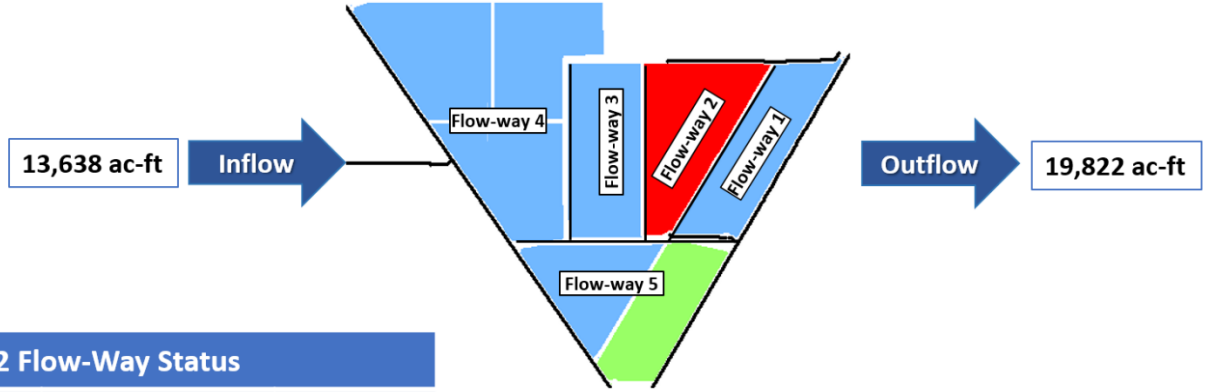


Figure S-2. STA-1W Weekly Status Report

STA-2 Weekly Status Report – 10/11/2021 through 10/17/2021



STA-2 Flow-Way Status

Flow-Way	Vegetation Status (Healthy ------ Stressed)	365-day P Loading Rate (below 1.0 g P /m²/yr is optimal)	Online / Offline / Restrictions
1		1.0	Online
2	Offline, construction activities as of 9/7/2021		
3		1.0	Vegetation Rehab
4		1.0	Vegetation Rehab
5		1.0	Online

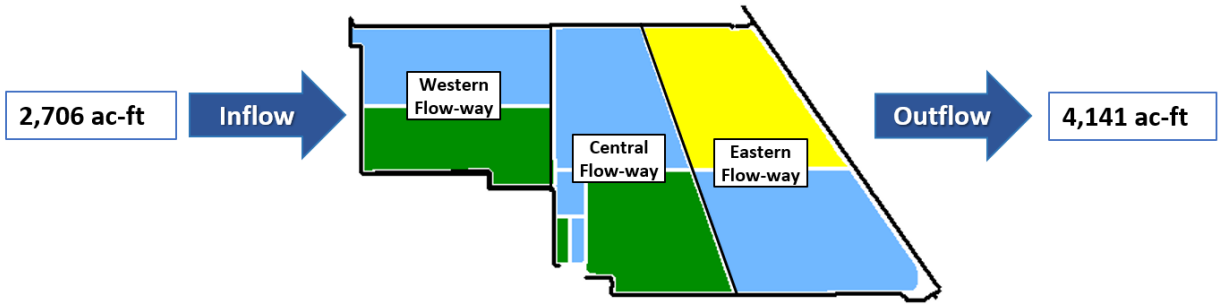
As of 10/17/2021	
Stage Based: Relative to Target Stage (TS)	
Deep Water Level (> 2.8' above TS)	
High Water Level (1.5' – 2.8' above TS)	
0.2' – 1.5' above TS	
Target Stage (TS +/- 0.2')	
Low Water Level (<0.2' below TS)	
Depth / Area Based: Percent of Area Dry	
0-25% Dry	50-75% Dry
25-50% Dry	75-100% Dry

STA-2 Flow & Phosphorus Concentration

	7-day	28-day	365-day
Total Inflow, ac-ft	13,638	51,427	419,310
--Lake Inflow, ac-ft	0	N/A	71,000
Total Outflow, ac-ft	19,822	64,232	453,586
Inflow Conc., ppb	144	127	95
Outflow Conc., ppb	18	16	18
Includes Preliminary Data			

Figure S-3. STA-2 Weekly Status Report

STA-3/4 Weekly Status Report – 10/11/2021 through 10/17/2021



STA-3/4 Flow-Way Status

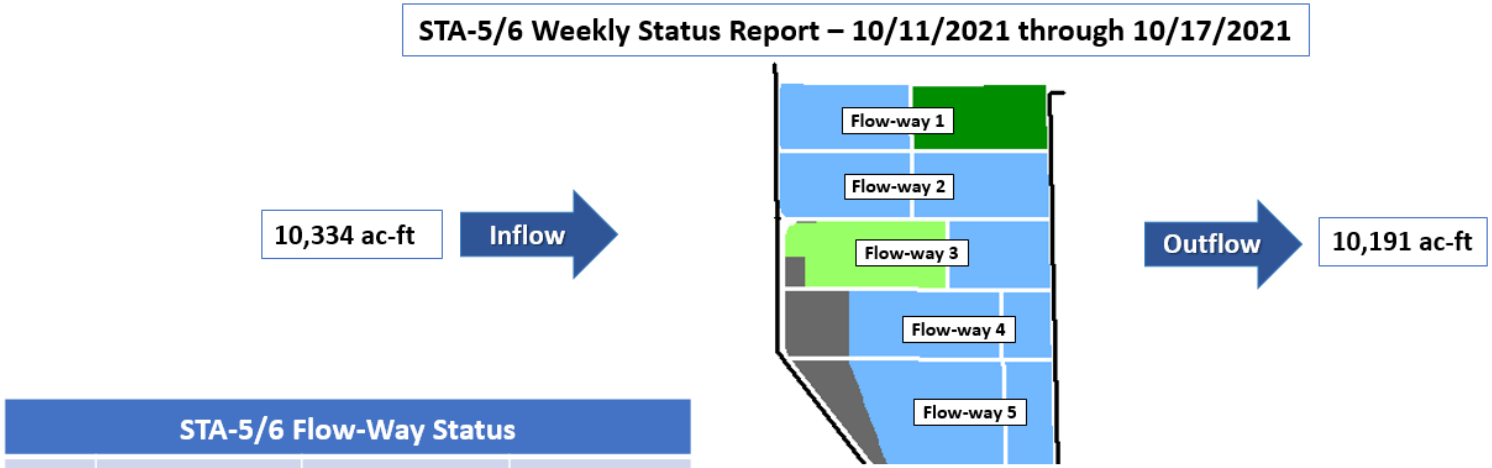
Flow-Way	Vegetation Status (Healthy ------ Stressed)	365-day P Loading Rate (below 1.0 g P /m²/yr is optimal)	Online / Offline / Restrictions
Eastern	Offline, vegetation management drawdown as of 3/1/2021		
Central		1.0	Online
Western		1.0	Online

As of 10/17/2021	
Stage Based: Relative to Target Stage (TS)	
Deep Water Level (> 2.8' above TS)	
High Water Level (1.5' – 2.8' above TS)	
0.2' – 1.5' above TS	
Target Stage (TS +/- 0.2')	
Low Water Level (<0.2' below TS)	
Depth / Area Based: Percent of Area Dry	
0-25% Dry	50-75% Dry
25-50% Dry	75-100% Dry

STA-3/4 Flow & Phosphorus Concentration

	7-day	28-day	365-day
Total Inflow, ac-ft	2,706	55,511	528,470
--Lake Inflow, ac-ft	0	N/A	47,700
Total Outflow, ac-ft	4,141	57,636	484,523
Inflow Conc., ppb	84	83	69
Outflow Conc., ppb	13	14	14
Includes Preliminary Data			

Figure S-4. STA-3/4 Weekly Status Report



STA-5/6 Flow-Way Status

Flow-Way	Vegetation Status (Healthy ------ Stressed)	365-day P Loading Rate (below 1.0 g P /m²/yr is optimal)	Online / Offline / Restrictions
1		1.0	Online
2		N/A	Online
3		N/A	Sensor repair
4		1.0	Online
5		1.0	Online

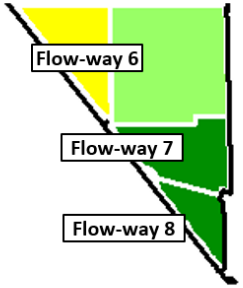
As of 10/17/2021	
Stage Based: Relative to Target Stage (TS)	
Deep Water Level (> 2.8' above TS)	
High Water Level (1.5' – 2.8' above TS)	
0.2' – 1.5' above TS	
Target Stage (TS +/- 0.2')	
Low Water Level (<0.2' below TS)	
Depth / Area Based: Percent of Area Dry	
0-25% Dry	50-75% Dry
25-50% Dry	75-100% Dry

STA-5/6 Flow & Phosphorus Concentration

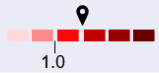
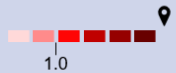
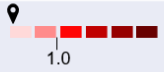
	7-day	28-day	365-day
Total Inflow, ac-ft	10,334	63,671	221,393
--Lake Inflow, ac-ft	0	N/A	9,000
Total Outflow, ac-ft	10,191	58,466	225,849
Inflow Conc., ppb	218	276	292
Outflow Conc., ppb	38	62	73
Includes Preliminary Data			

Figure S-5. STA-5/6 Weekly Status Report (Flow-ways 1 – 5)

STA-5/6 Weekly Status Report – 10/11/2021 through 10/17/2021



STA-5/6 Flow-Way Status

Flow-Way	Vegetation Status Healthy ------ Stressed	365-day P Loading Rate (below 1.0 g P /m²/yr is optimal)	Online / Offline / Restrictions
6			Online
7			Online
8			Online

As of 10/17/2021

Stage Based: Relative to Target Stage (TS)

- Deep Water Level (> 2.8' above TS)
- High Water Level (1.5' – 2.8' above TS)
- 0.2' – 1.5' above TS
- Target Stage (TS +/- 0.2')
- Low Water Level (<0.2' below TS)

Depth / Area Based: Percent of Area Dry

- 0-25% Dry
- 25-50% Dry
- 50-75% Dry
- 75-100% Dry

Figure S-6. STA-5/6 Weekly Status Report (Flow-ways 6 – 8)

Basic Concepts and Definitions for STA Weekly Status Report

- **Inflow**: Sum of flow volume at all inflow structures to an STA.
- **Lake Inflow**: Portion of the STA total inflow volume that originates from Lake Okeechobee.
- **Outflow**: Sum of flow volume at outflow structures from an STA.
- **Total Phosphorus** (TP): Total mass of phosphorus in all its forms; including particulate, dissolved, etc.
- **Inflow Concentration**: TP concentration is the mass of TP in micrograms per liter of water, µg/L or ppb. Inflow concentration refers to the flow-weighted mean TP from all inflow structures over a period of time.
- **Outflow Concentration**: The flow-weighted mean TP from all outflow structures over a period of time. The outflow concentration represents the reduction of inflow TP achieved by STA treatment of the inflow water.
- **WQBEL**: The STA outflow concentration that is required upon completion of the Restoration Strategies projects by December 2025. The outflow concentration shall not exceed 13 ppb as an annual flow weighted mean in more than 3 out of 5 water years on a rolling basis and shall not exceed 19 ppb as an annual flow weighted in any water year.
- **Flow-Way** (FW): One or more treatment cells connected in series. Cells typically have emergent aquatic vegetation (EAV) in the front portion of the flow-way followed by a mix of EAV and submerged aquatic vegetation (SAV)
- **Vegetation Status**: Healthy means the vegetation condition is good and will allow the STA to perform as designed. Stressed means the vegetation is showing signs of poor health, such as browning or areas of vegetation die-off, or the cell contains undesirable vegetation such as floating exotic vegetation requiring treatment. The TP reduction capability of the STA is affected when the vegetation condition is poor.
- **Phosphorus Loading Rate** (PLR): Mass of inflow TP in grams, divided by total treatment area of STA in square meters, per year. In general, a 365-day value of less than 1.0 is needed for an STA to perform optimally. A PLR of 2.0 is considered very high and a PLR of 3.0 is considered extremely high. The TP reduction capability of the STA is affected when the PLR is high, very high and extremely high.
- **Online**: Online status means the FW can receive and treat inflow.
- **Online with Restriction**: The FW can receive and treat inflow, but the amount of flow or water level may be limited temporarily. For example, a vegetation rehabilitation effort may require reduced flows through an area while the new plants are establishing, or nesting by protected species may require a certain water level not to be exceeded.
- **Offline**: The FW is unable to receive and treat inflow due to repairs, construction, or other prohibitive reasons.
- **Depth**: Difference between the average surface water level in a cell and the average ground elevation in that cell. Target depths, or depths between flow events, are between 1.25 ft to 1.5 ft. As depth approaches or drops below zero, an increasing percentage of the cell is considered dry and STA conditions deteriorate. An increase in depth above target depth is expected with increasing flow. However, as depth increases much above the target depth and is sustained over a period of time, it can be detrimental to vegetation health and overall STA treatment performance.
- **Note**: The data provided in this summary report were developed using a combination of provisional and quality-assured flow and water quality data. In some cases, best professional judgment was used to estimate missing data and revise questionable data. Values provided are not considered final but are appropriate for use in STA operational decision-making.

Everglades

Water Conservation Area Regulation Schedules

WCA-1: The Three-gauge average stages rose to just below the Zone A1 regulation line last week, the average on Sunday was 0.08 feet below that line. WCA-2A: Stage at 2A-17 declined last week, the average on Sunday was 1.21 feet higher than the falling Zone A regulation line (nearly the same as the previous week). WCA-3A: The Three Gauge Average stage remained above the Zone A regulation line last week. Stage averaged 0.13 feet above the rising schedule line on Sunday. WCA-3A: Stage at gauge 62 (Northwest corner) fell last week. The average on Sunday was 0.48 feet below the flat Upper Schedule. (**Figures EV-1 through EV-4**).

Water Depths

The WDAT tool indicates that water depths in the WCAs are lowest in northeastern WCA-3A. Depths are between 1.5 – 2.0 feet across northern WCA-2A, and vegetation conditions within the marsh were recently surveyed in the field and little stress was detected. North to South hydrologic connectivity remains within all Everglades National Park (ENP) sloughs, strengthening in Shark River Slough and Taylor Slough. (**Figure EV-5**). Comparing WDAT water levels from present over the last month, stages generally increased, most significantly in WCA-2B. Looking back one year ago, WCA-3A is slightly drier significantly so in the east. WCA-1 and BCNP are close to the same depth, while WCA-2A is slightly wetter (**Figure EV-6**). Compared to the 20 year median water depths, western WCA-3A moved closer to the 50th percentile last week with parts of the northeast still significantly below. The western sloughs in ENP remain well below average; while western BCNP, WCA-1, -2A, northeastern ENP are significantly above the median. (**Figure EV-7**).

Taylor Slough and Florida Bay

The southernmost area of the District (Taylor Slough and Florida Bay) received the largest amount of rain within the District over the week ending Sunday (10/17). Stage decreased an average of 0.03 feet over the week as water deliveries slowed (**Figure EV-8**). The central areas of the slough showed small weekly increases while other areas continued to recede (**Figure EV-9**). The Slough as a whole is 1.5 inches above the historical average for this time of year while the northern parts of the Slough are 3.2 inches above its historical average. It should be noted that Northern Taylor Slough historical averages are from before the alterations to the system to facilitate water movement and that this area is expected to be higher than the historical average as a result of these modifications even with less water directly delivered.

Salinities in Florida Bay averaged a decrease of 1 over the week ending 10/17, but individual stations had weekly changes ranging from −3.5 to +0.3 (**Figure EV-8**). The largest weekly decreases occurred in the central and western nearshore areas (TB and GB) with about a decrease of about 3.5. Both the central and western areas remain above their respective 75th percentiles but are decreasing (**Figure EV-10**). Most of the Bay is still marine or higher and is averaging 6 higher than the historical average for this

time of year. This is a bad position to start the dry season with given the expectation of a drier than average dry season.

Water Management Recommendations

Ascension rates that do not exceed 0.25 feet per week or 0.50 feet per two weeks are considered ecologically healthy. Conserving water in the northern basins, then allowing that water to move downstream maximizes the ecological benefit of freshwater on the landscape. Flows into northeastern WCA-3A that move downstream continue to have an ecological benefit. Continued freshwater into Florida Bay will push the estuarine front further into the Bay helping to buffer potentially elevated dry season salinity conditions. Individual regional recommendations can be found in **Table EV-2**.

Table EV-2. Previous week's rainfall and water depth changes in Everglades regions.

Everglades Region	Rainfall (inches)	Stage change (feet)
WCA-1	0.18	+0.04
WCA-2A	0.18	−0.18
WCA-2B	0.31	+0.20
WCA-3A	0.57	−0.01
WCA-3B	0.79	+0.00
ENP	0.95	−0.23

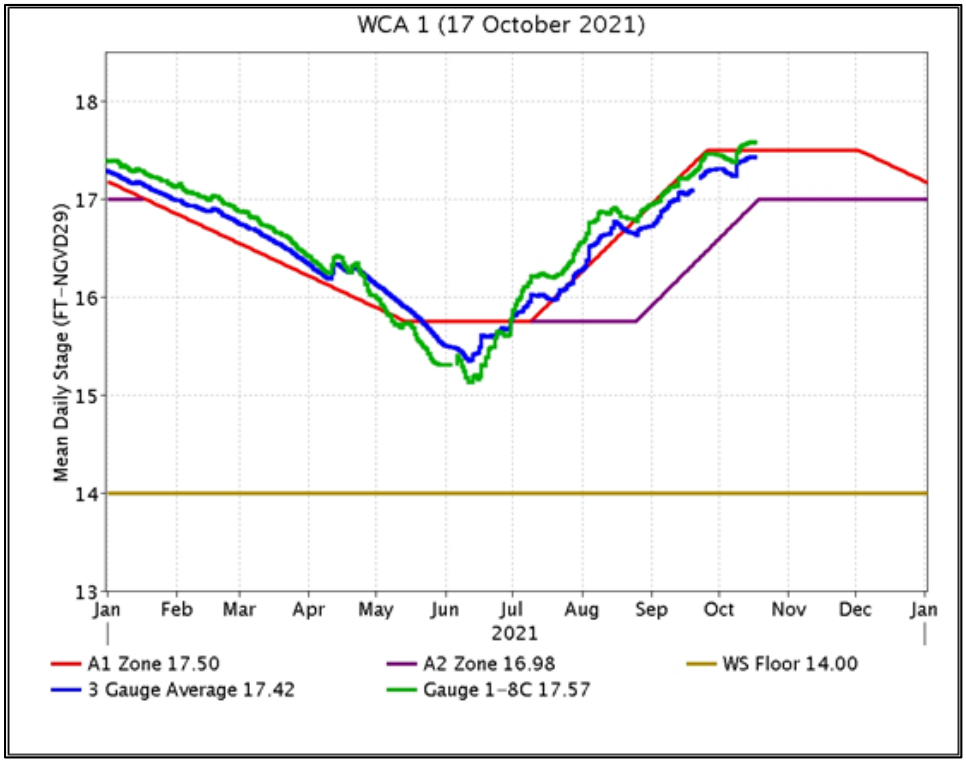


Figure EV-1. WCA-1 stage hydrographs and regulation schedule.

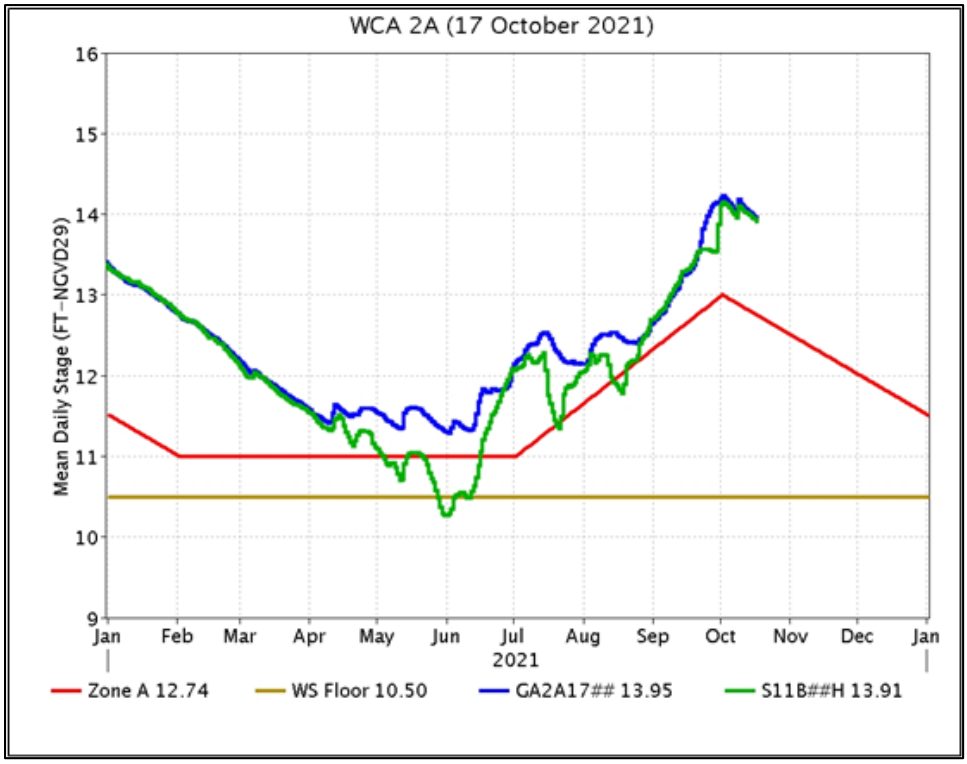


Figure EV-2. WCA-2A stage hydrographs and regulation schedule.

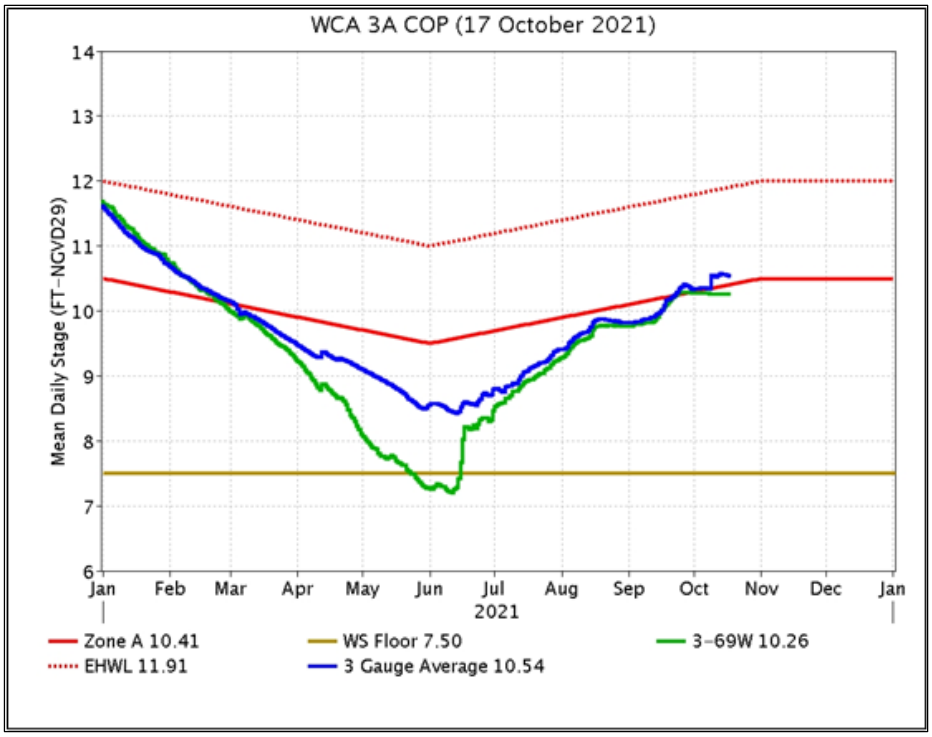


Figure EV-3. WCA-3A stage hydrographs (three-gauge average, S-333 headwater) and regulation schedule.

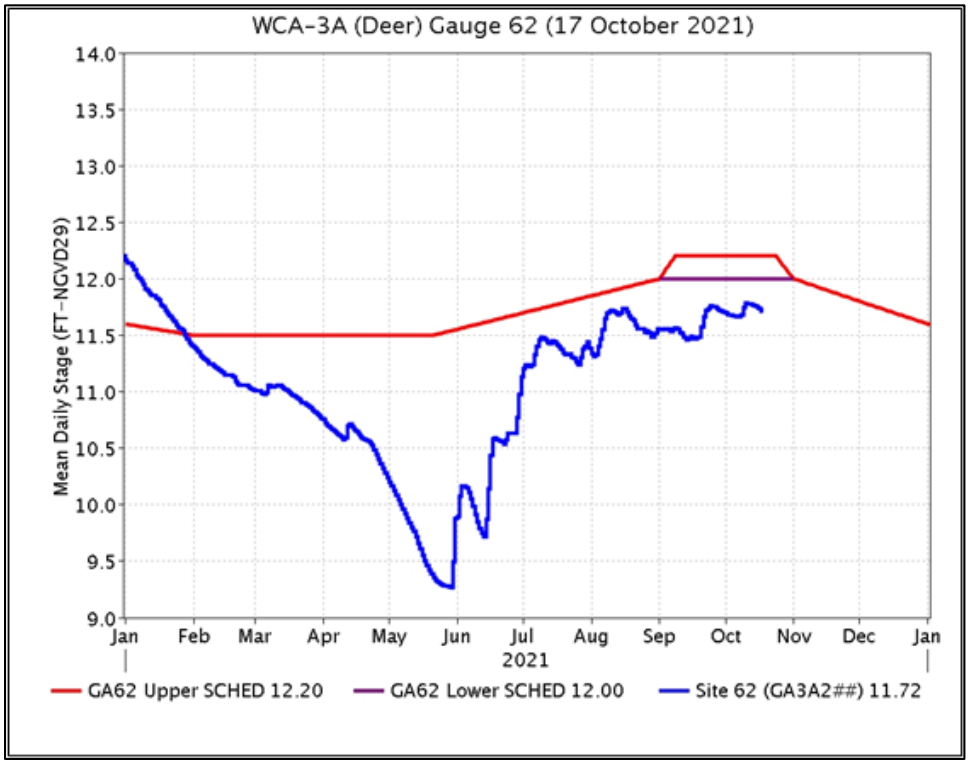


Figure EV-4. WCA-3A stage hydrograph (Deer gauge; Site 62) and CA62 regulation schedule.

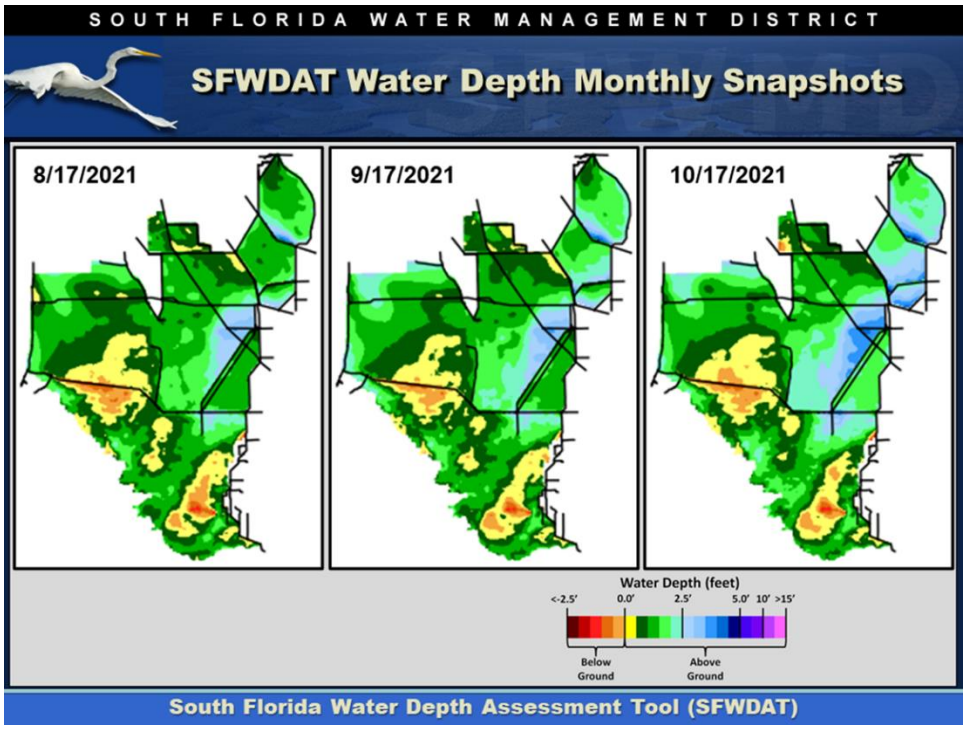


Figure EV-5. Everglades water depths from two months ago (left), one month ago (center) and present (right), based on SFWDAT.

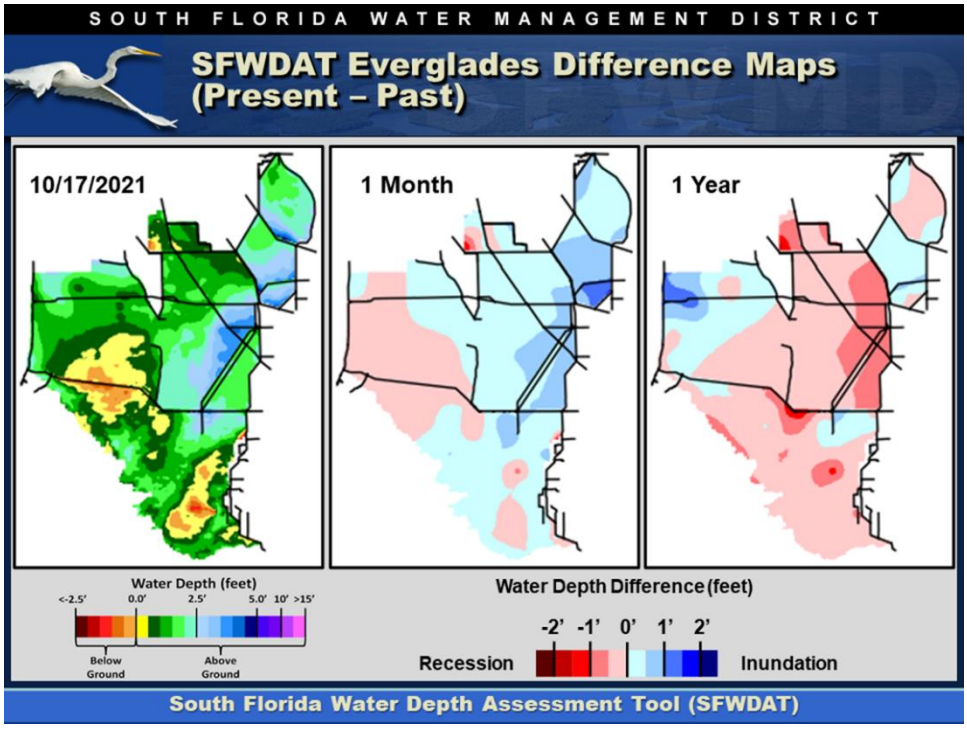


Figure EV-6. Present Everglades water depths (left) and water depth changes from one month (center) and one year (right) ago, based on SFWDAT.

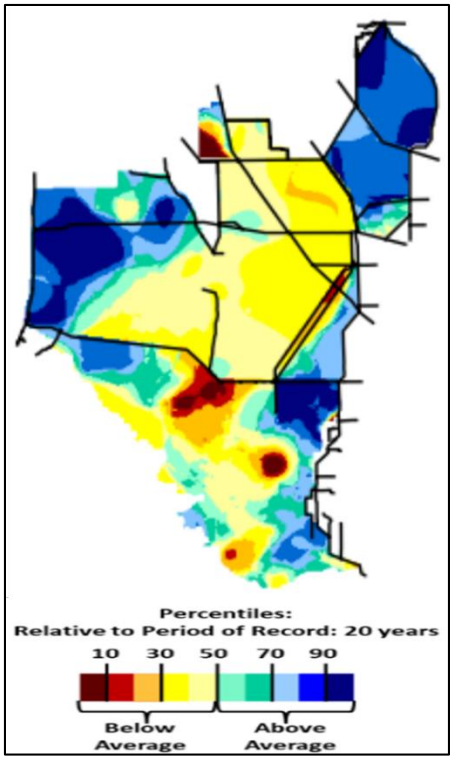


Figure EV-7. Present water depths compared to the day of year median over the previous 20 years.

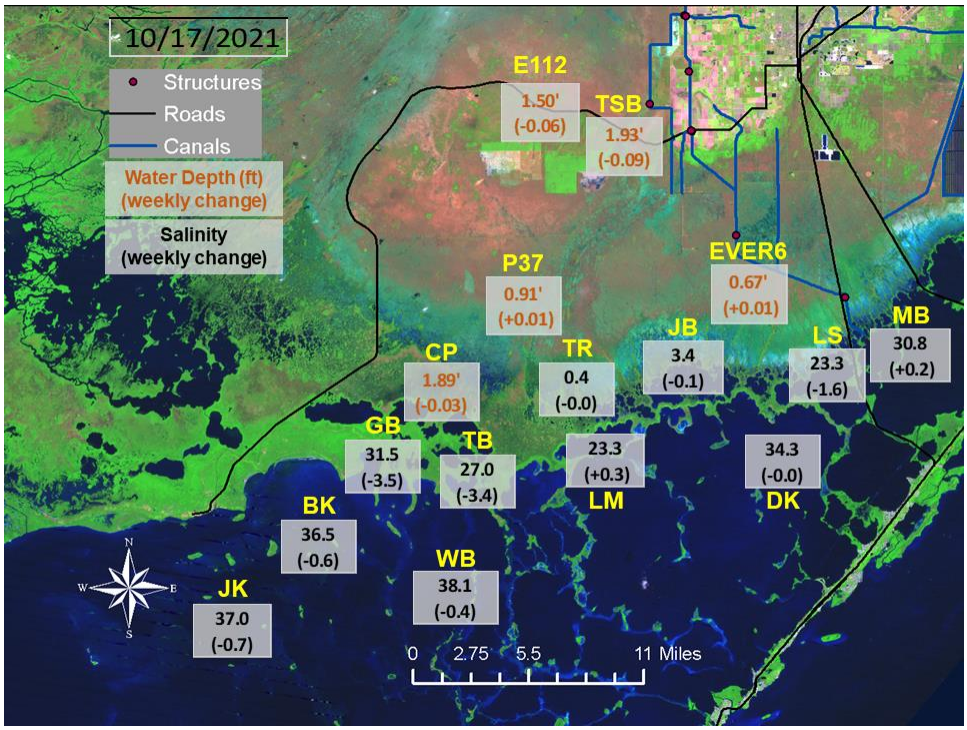


Figure EV-8. Taylor Slough water depths with changes since a week ago and Florida Bay salinities with changes since a week ago.

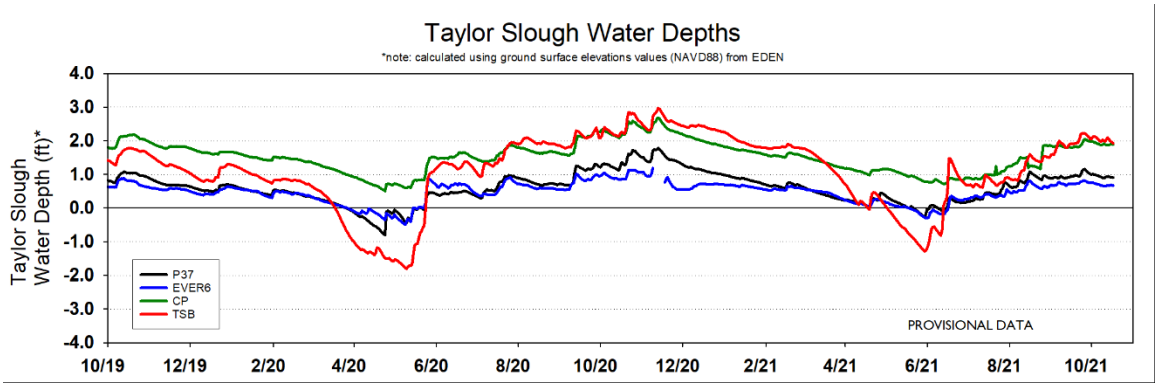


Figure EV-9. Taylor Slough water depth time series.

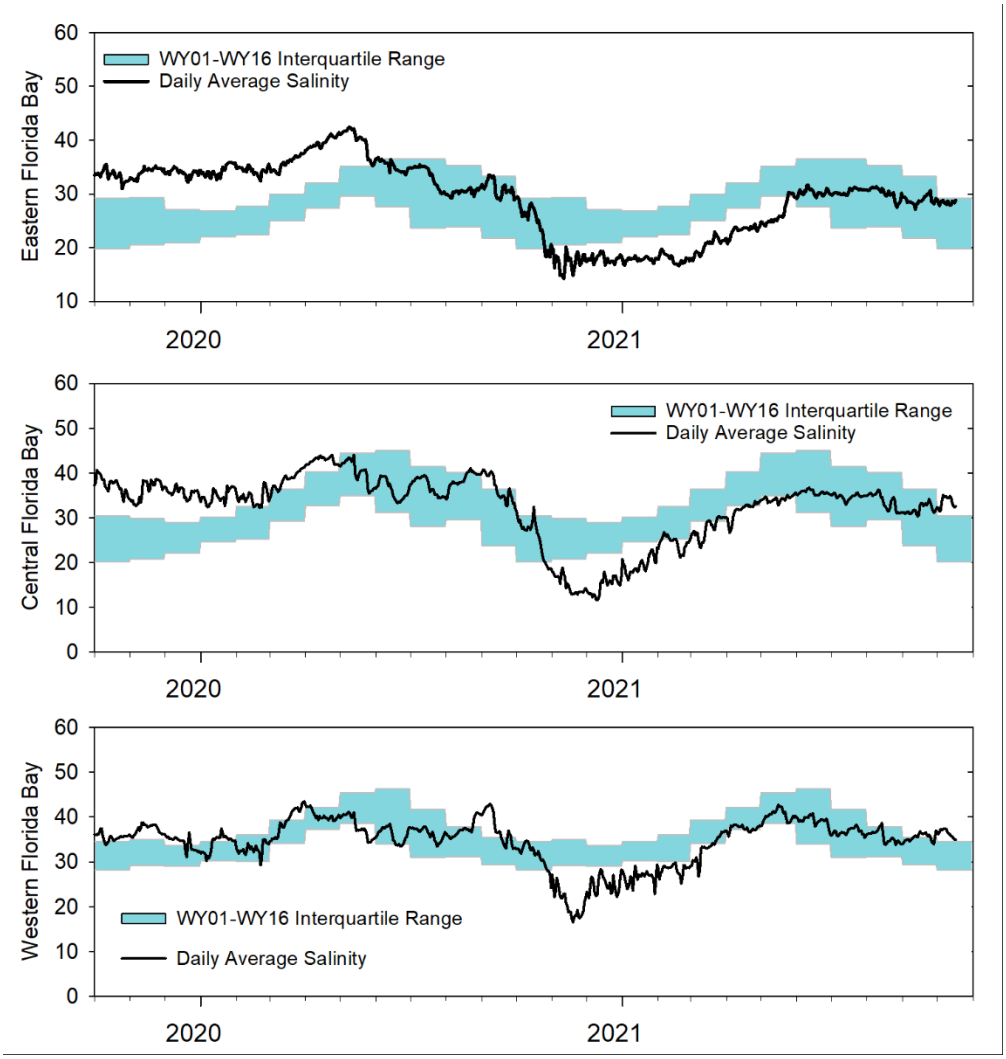


Figure EV-10. Eastern (top panel), Central (middle panel) and Western (bottom panel) Florida Bay daily average salinities with interquartile (25-75 percentile) ranges.

Table EV-2. Weekly water depth changes and water management recommendations

SFWMD Everglades Ecological Recommendations, October 12, 2021 (red is new)			
Area	Weekly change	Recommendation	Reasons
WCA-1	Stage increased by 0.4'	Maintain ascension rates of less than 0.25 feet per week or 0.50 feet per two weeks.	Protect within basin and downstream habitat and wildlife.
WCA-2A	Stage decreased by 0.18'	Hold stage above the regulation line, allowing a recession to begin November 1st.	Protect within basin and downstream habitat and wildlife.
WCA-2B	Stage increased by 0.20'	Maintain ascension rates of less than 0.50 feet per two weeks. Moderate inflows.	Protect within basin and downstream habitat and wildlife. Depths in excess of 4.0 feet.
WCA-3A NE	Stage remained unchanged.	Initiate an ascension rate of less than 0.25 feet per week or 0.50 feet per two weeks, while moving water through the system.	Protect within basin peat soils and downstream habitat and wildlife.
WCA-3A NW	Stage decreased by 0.08'	Initiate an ascension rates of less than 0.25 feet per week or 0.50 feet per two weeks, while moving water through the system.	
Central WCA-3A S	Stage increased by 0.01'	Maintain an ascension rates of less than 0.25 feet per week or 0.50 feet per two weeks, while moving water through the system.	Protect within basin and downstream habitat and wildlife.
Southern WCA-3A S	Stage increased by 0.01'		
WCA-3B	Stage remained unchanged	Initiate an ascension rates of less than 0.25 feet per week or 0.50 feet per two weeks, while moving water through the system.	Protect within basin and downstream habitat and wildlife.
ENP-SRS	Stage decreased by 0.23'	Make discharges to the Park according to COP and TTFF protocol while considering upstream and downstream ecological conditions.	Protect within basin and upstream habitat and wildlife.
Taylor Slough	Stage changes ranged from −0.09' to +0.01'	Move water southward as possible.	When available, provide freshwater buffer for downstream conditions.
FB- Salinity	Salinity changes ranged −3.5 to +0.3	Move water southward as possible.	When available, provide freshwater to maintain low salinity buffer and promote water movement.