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: November 02, 2022

SUBJECT: Weekly Environmental Conditions for Systems Operations

Summary

Weather Conditions and Forecast

A cold front will promote widespread scattered storms across the SFWMD on Wednesday, occurring mostly between the southwest coast and the Lake. The cold front will move into south Florida on Thursday and stall out. The interior will be dry Thursday and Friday, while the east coast will have scattered light-to-moderate rains throughout the day. On Saturday, the front will move as far south as the southern Bahamas resulting in dry inland conditions. Strong winds will develop and persist through Monday over most of south Florida. Although most of the central and western interior are expected to receive little precipitation during this period, the breezy NE flow will increase precipitation right along the immediate east coast. There is also a remote possibility that a subtropical cyclone could develop over the Bahamas early next week. There are no indications that the cyclone would head to the SFWMD, but it could further enhance the east coast rainfall during the week 2 period. Below to near average rainfall is expected for the 7-day period ending next Tuesday morning.

Kissimmee

A month after Hurricane Ian, water levels are declining, with most lake stages approaching their regulation schedules. Discharges out of most lakes are being reduced to slow rates of stage decline. For the week ending on October 30, 2022, weekly average discharges at S-65 and S-65A were 2,800 cfs and 3,600 cfs, respectively, both are decreases from the previous week. Average weekly water depth on the Kissimmee River floodplain decreased to a mean of 2.7 feet. The weekly average dissolved oxygen concentration in the Kissimmee River decreased from 1.4 mg/L the previous week to 1.2 mg/L this week, above the potentially lethal level for largemouth bass and other sensitive species, but still within the physiologically stressful range.

Lake Okeechobee

Lake Okeechobee stage was 15.83 feet NGVD on October 30, 2022, with water levels 0.26 feet higher than previous week and 2.07 feet higher than a month ago. Lake stage was in the Low sub-band and 0.33 inches above the upper limit of the ecological envelope. Average daily inflows (excluding rainfall) and outflows (excluding

evapotranspiration) decreased from the previous week. The most recent satellite image (October 30, 2022) from NOAA's Harmful Algal Bloom Monitoring System showed a very low bloom potential in the southwestern part of the Lake, a decrease from the previous week. The October 17-19, 2022, routine water quality and phytoplankton survey revealed that communities were mixed, and microcystins toxins were below detection limit at all Lake monitoring sites. Bloom conditions (>40 µg/L chlorophyll *a*) were detected at two locations in the northwestern nearshore region of the Lake, with the highest chlorophyll *a* concentration (47.5 µg/L) detected at the POLESOUT site**.**

Estuaries

Total inflow to the St. Lucie Estuary averaged 355 cfs over the past week with no flow coming from Lake Okeechobee. Mean surface salinities increased at all sites over the past week and was in the optimal range (5-9) for adult eastern oysters in the mid-estuary. Total inflow to the Caloosahatchee Estuary averaged 921 cfs over the past week with no flow coming from Lake Okeechobee. Mean surface salinities remained the same at S-79 and I-75 and increased at Cape Coral and Sanibel over the past week. No surface salinity data was available at the Ft. Myers and Shell Point sites. Salinities were in the optimal range (0-10) for tape grass in the upper estuary and in the stressed range for adult eastern oysters at Sanibel (>25) and Cape Coral (<10).

Stormwater Treatment Areas

For the week ending October 30, 2022, no Lake Okeechobee water was delivered to the FEBs/STAs. The total amount of Lake releases sent to the FEBs/STAs in WY2023 (since May 1, 2022) is approximately 12,500 ac-feet. The total amount of inflows to the STAs in WY2023 is approximately 883,000 ac-feet. STA cells are at or near target stage. STA-1E Western Flow-way is offline for post-construction vegetation grow in, 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 effect in STA-1E Central and Eastern Flow-ways, STA-1W Eastern, Western, and Northern Flow-ways, and STA-2 Flow-ways 3 and 4 for vegetation management activities. This week, there is no capacity for Lake releases in the STAs.

Everglades

Last week rates of stage change in WCA-2A and WCA-3A North moved into the "poor" category as those regions experienced elevated recession rates. However, depths remain above average for this time of year in WCA-3A North. Above average stages have the potential to be favorable for wading bird nesting and the general ecology of that region if recession rates are reduced. Taylor slough stages fell last week but remain above average. On average salinities remained stable last week in Florida Bay and remain above average, but within the inter quartile range.

Biscayne Bay

Total inflow to Biscayne Bay averaged 744 cfs, and the previous 30-day mean inflow averaged 980 cfs. The seven-day mean salinity was 27.2 at BBCW8 and 22.4 at BBCW10, both below the preferred maximum salinity of 35. Salinity data are provided as a courtesy by Biscayne National Park.

Supporting Information

Kissimmee Basin

Upper Kissimmee

On October 30, 2022, lake stages were 58.3 feet NGVD (0.4 feet above schedule) in East Lake Toho, 55.0 feet NGVD (just above schedule) in Lake Toho, and 52.4 feet NGVD (at schedule) in Lakes Kissimmee-Cypress-Hatchineha (KCH) (**Table KB-1**, **Figures KB-1-3**).

Lower Kissimmee

On October 30, 2022, average daily discharge was reduced to 2,100 cfs at S-65 and 2,500 cfs at S-65A as water levels in KCH and Pool A continued to decline. Average daily discharge from the Kissimmee River was 5,600 cfs at S-65D and 5,700 cfs at S-65E (**Table KB-2**). Daily average headwater stages were 46.4 feet NGVD at S-65A and 28.5 feet NGVD at S-65D on October 30, 2022. With S-65A discharge being reduced, October 30 daily mean river channel stage decreased from the previous day's mean to 39.4 feet (**Figure KB-4**). Average weekly water depth on the Kissimmee River floodplain decreased from the previous week to a mean of 2.7 feet (**Figure KB-5**). The weekly average concentration of dissolved oxygen in the Kissimmee River decreased from 1.4 mg/L the previous week to 1.2 mg/L over the week ending on October 30, 2022 (**Table KB-2**, **Figure KB-6**).

Water Management Recommendations

Per the IS-14-50.0 discharge plan, adjust S-65 discharge to maintain a minimum flow of at least 1,400 cfs at S-65A to the Kissimmee River. Note general guidance for discharge and maximum rates of change in discharge (**Figure KB-7**).

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

Water Body	Structure	Stage Monitoring Site	Weekly (7-Day) Average Discharge (cfs)	Sunday Lake Stage (feet NGVD)[a]	Schedule Type[b]	Sunday Schedule Stage (feet NGVD)	Sunday Departure from Regulation (feet)	
							10/30/22	*10/23/22*
Lakes Hart and Mary Jane	S-62	LKMJ	290	60.9	R	60.9	0.0	0.8
Lakes Myrtle, Preston and Joel	S-57	S-57	120	62.1	R	61.9	0.2	2.4
Alligator Chain	S-60	ALLI	340	64.0	R	64.0	0.0	0.2
Lake Gentry	S-63	LKGT	420	61.5	R	61.5	0.0	0.1
East Lake Toho	S-59	TOHOE	1300	58.3	R	57.9	0.4	1.4
Lake Toho	S-61	TOHOW S-61	1600	55.0	R	54.9	0.1	0.2
Lakes Kissimmee, Cypress and Hatchineha	S-65	KUB011 LKIS5B	2800	52.4	R	52.4	0.0	0.2

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.

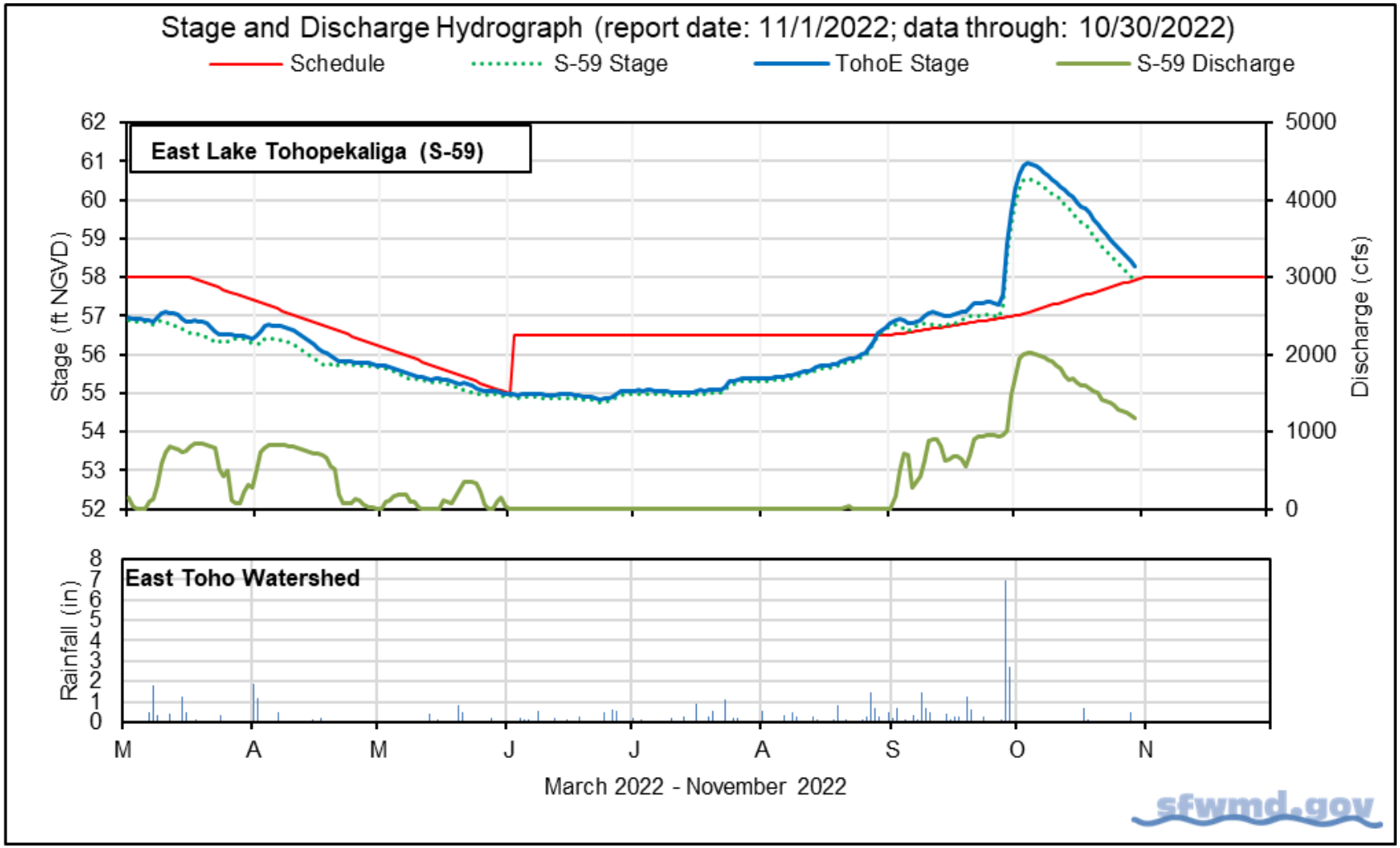


Figure KB-1. East Lake Toho regulation schedule, stage, discharge and rainfall.

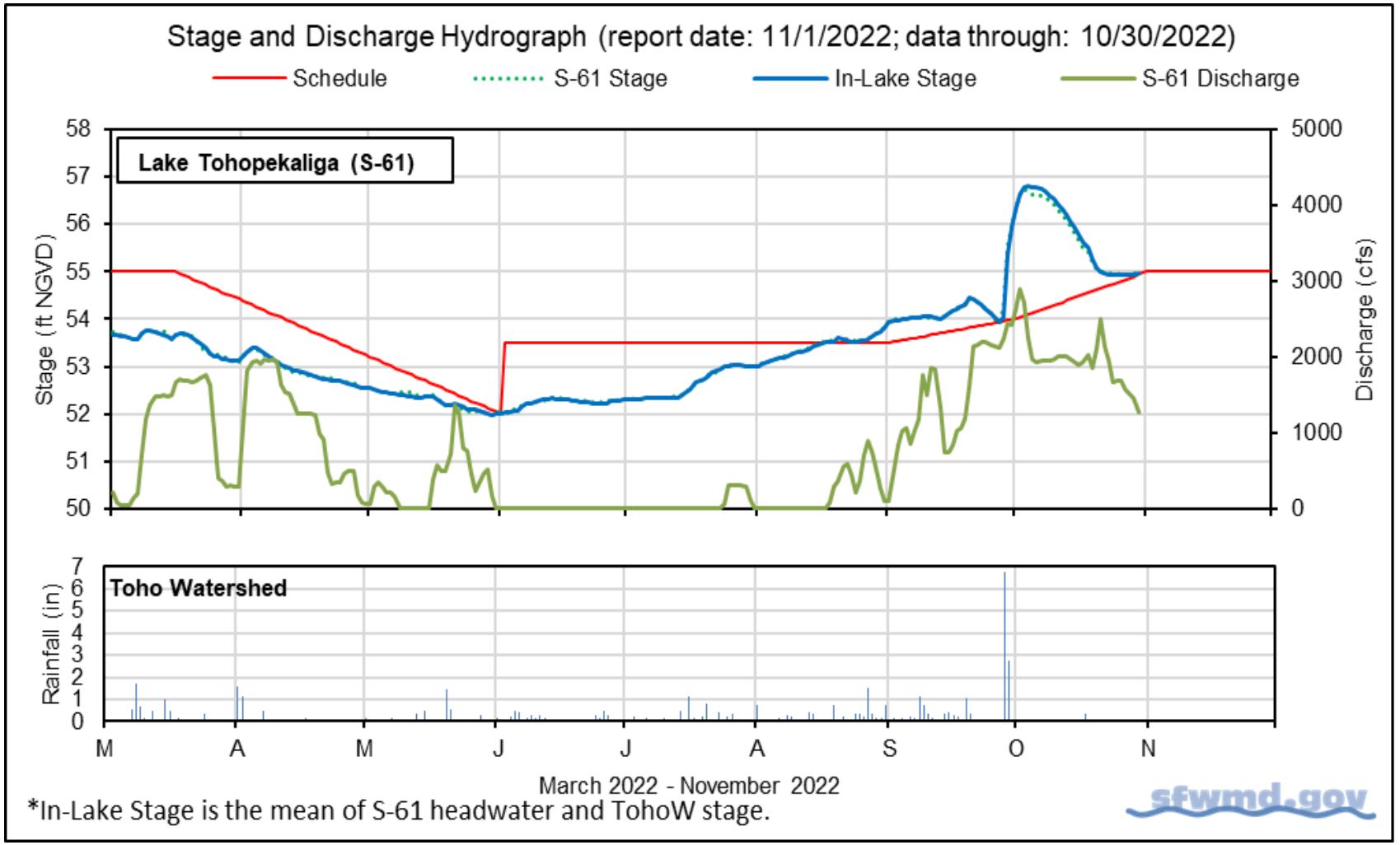


Figure KB-2. Lake Toho regulation schedule, stage, discharge and rainfall.

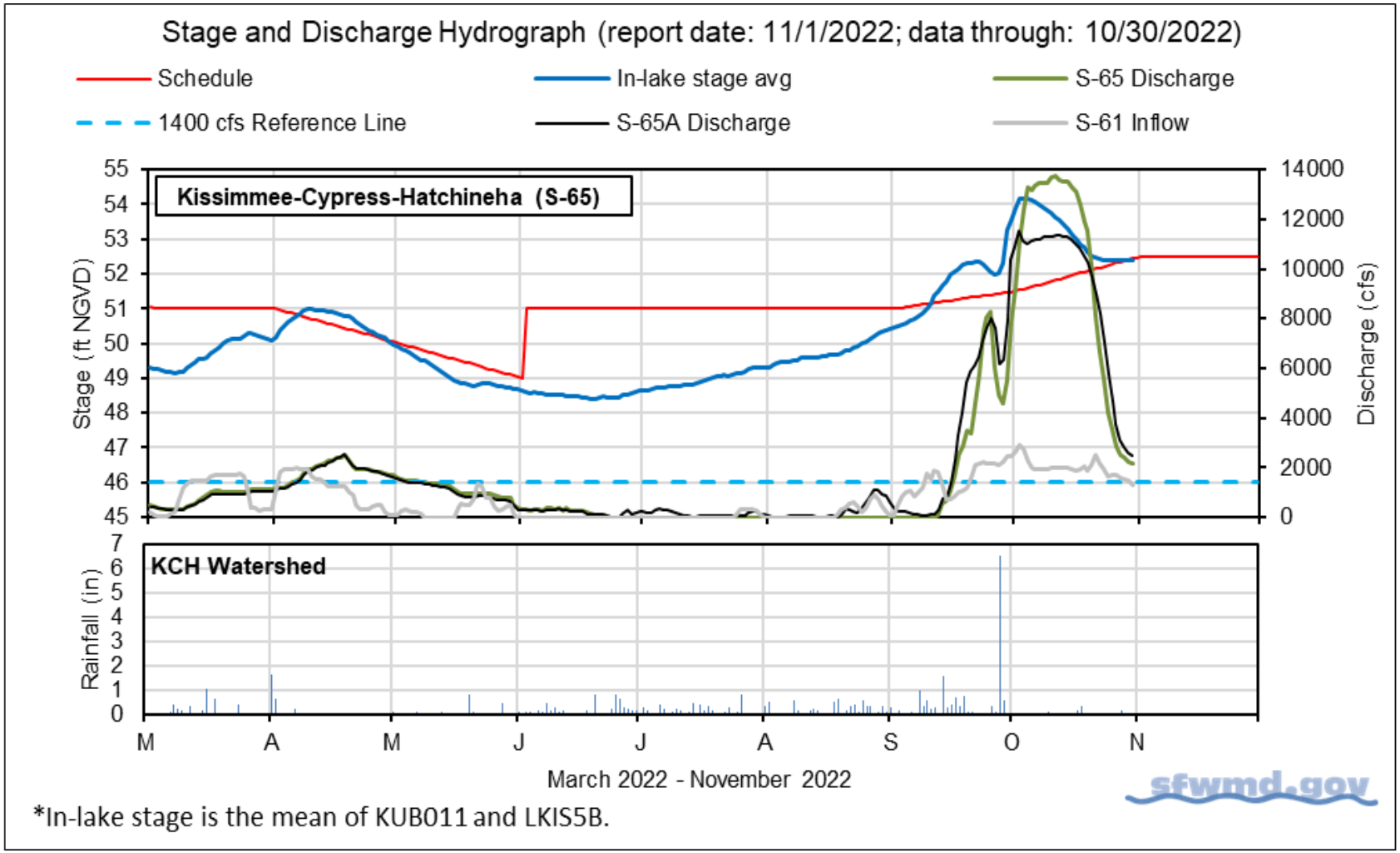


Figure KB-3. Lakes Kissimmee, Cypress and Hatchineha regulation schedule, stage, discharge and rainfall.

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	Sunday Daily Average	Weekly Average for Previous Seven Day Periods			
		10/30/22	10/30/22	10/23/22	10/16/22	10/9/22
Discharge	S-65	2,100	2,800	9,500	13,000	13,000
Discharge	S-65A[a]	2,500	3,600	9,400	11,000	11,000
Headwater Stage (feet NGVD)	S-65A	46.4	46.7	49.7	50.9	51.0
Discharge	S-65D[b]	5,600	8,100	13,000	14,000	12,000
Headwater Stage (feet NGVD)	S-65D[c]	28.5	28.5	28.5	28.5	28.7
Discharge (cfs)	S-65E[d]	5,700	7,900	12,000	14,000	12,000
Discharge (cfs)	S-67	0	0	0	0	0
Dissolved Oxygen (mg/L) [e]	Phase I, II/III river channel	1.0	1.2	1.4	1.0	1.1
Mean depth (feet) [f]	Phase I floodplain	2.01	2.70	4.52	5.03	5.10

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, PC33, PD62R and PD42R.

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

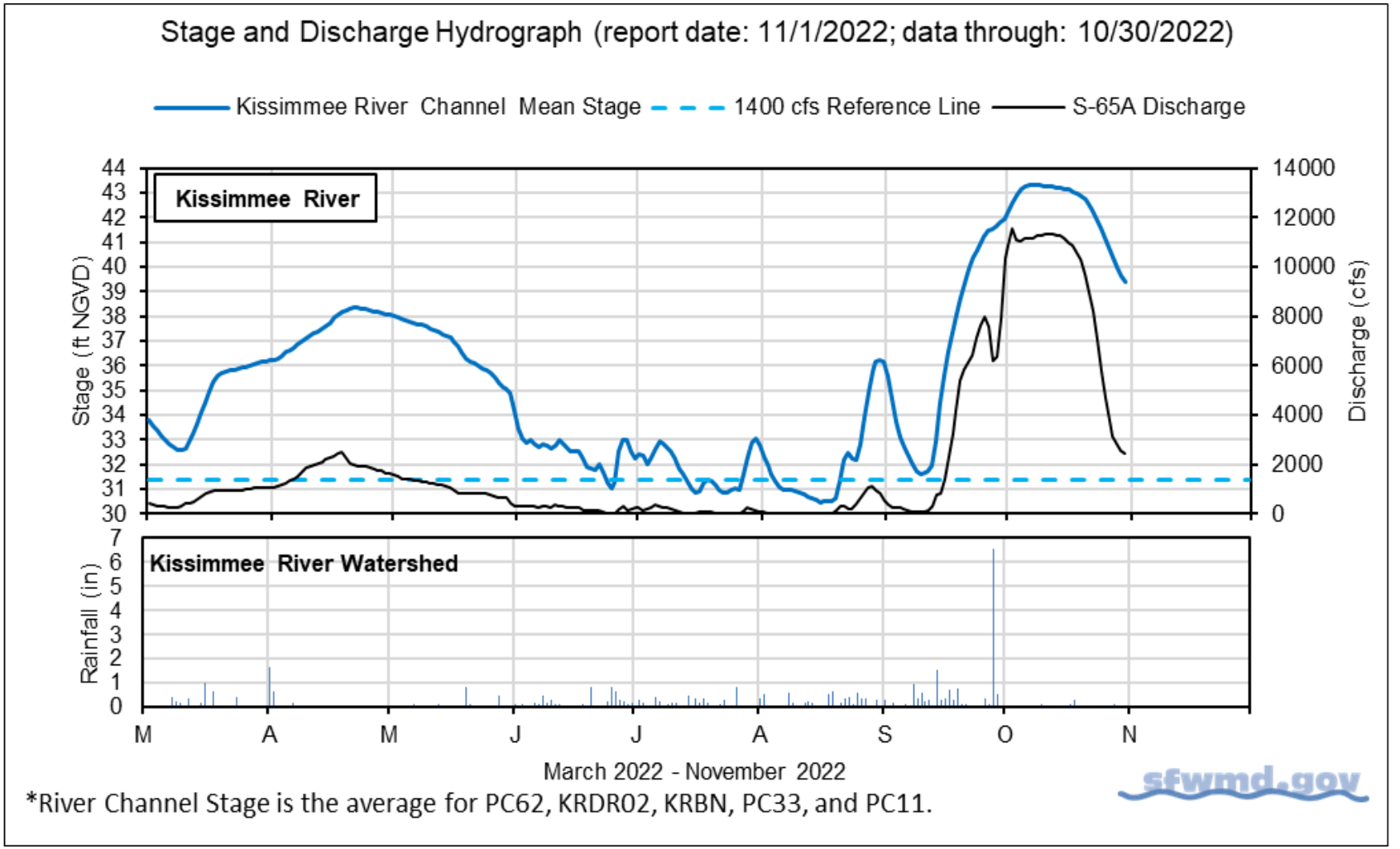


Figure KB-4. Kissimmee River stage, discharge and rainfall.

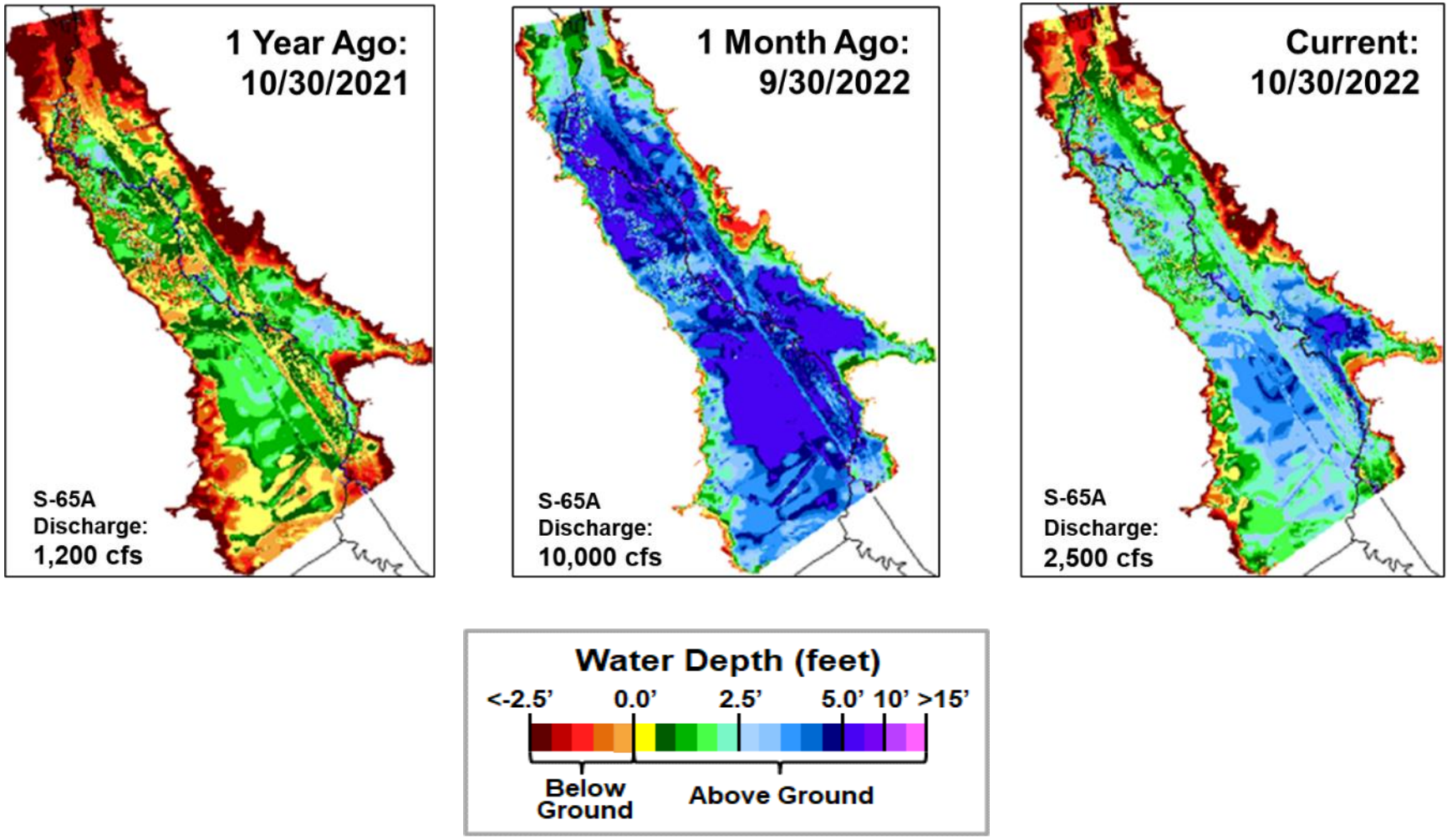


Figure KB-5. Phase I area Kissimmee River floodplain water depths (from left to right) one year ago, one month ago and current.

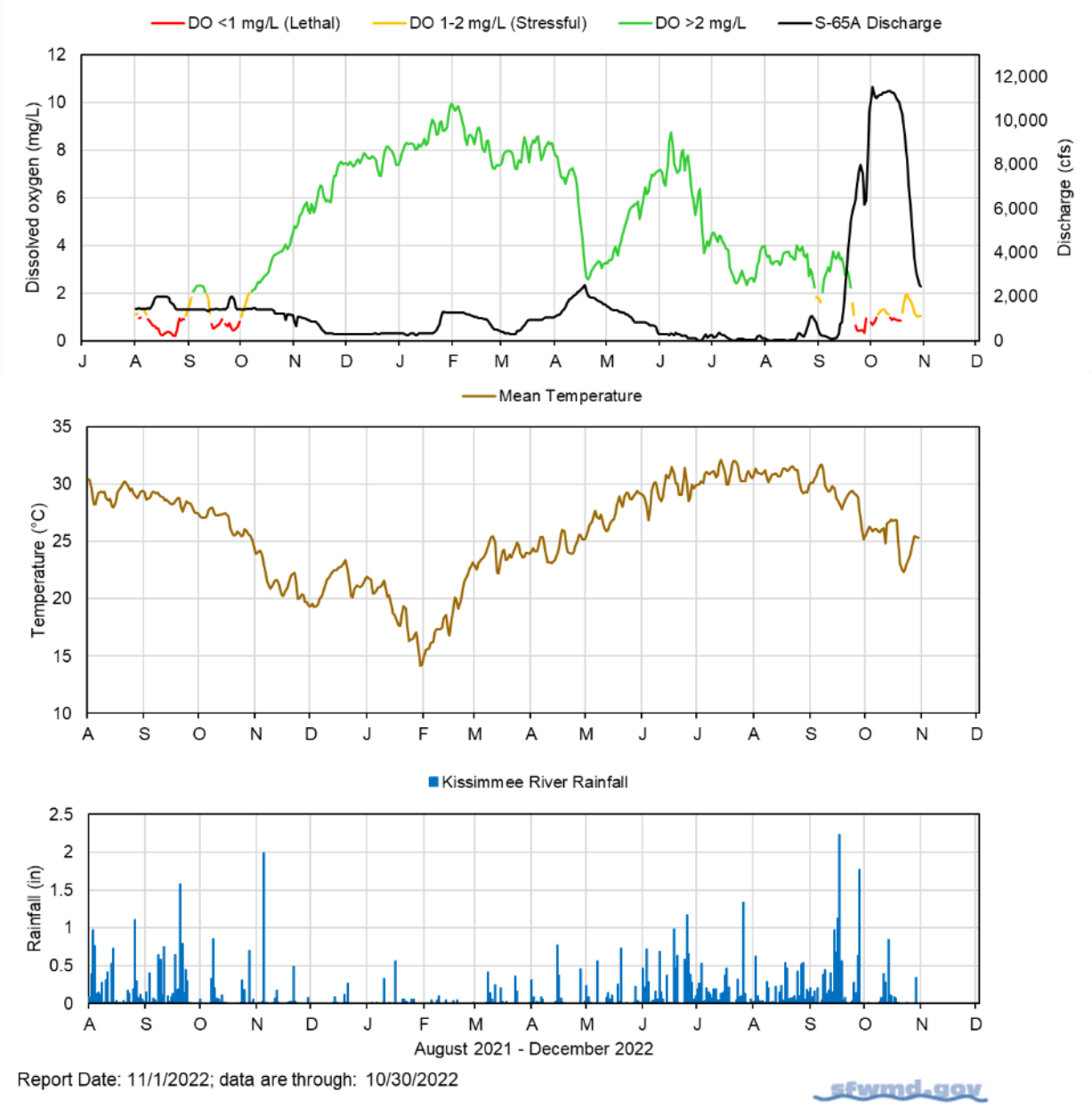


Figure KB-6. Restored Kissimmee River channel mean daily dissolved oxygen concentration (mg/L), S-65A discharge (cfs), temperature (°C) and rainfall (inches). Dissolved oxygen (DO) and temperature are mean daily values averaged for PC62, KRDR02, KRBN, PC33, PC11, PD62R, and PD42R with an average of five stations reporting this week. Rainfall values are daily totals for Kissimmee River (Pool BCD) AHED watershed.

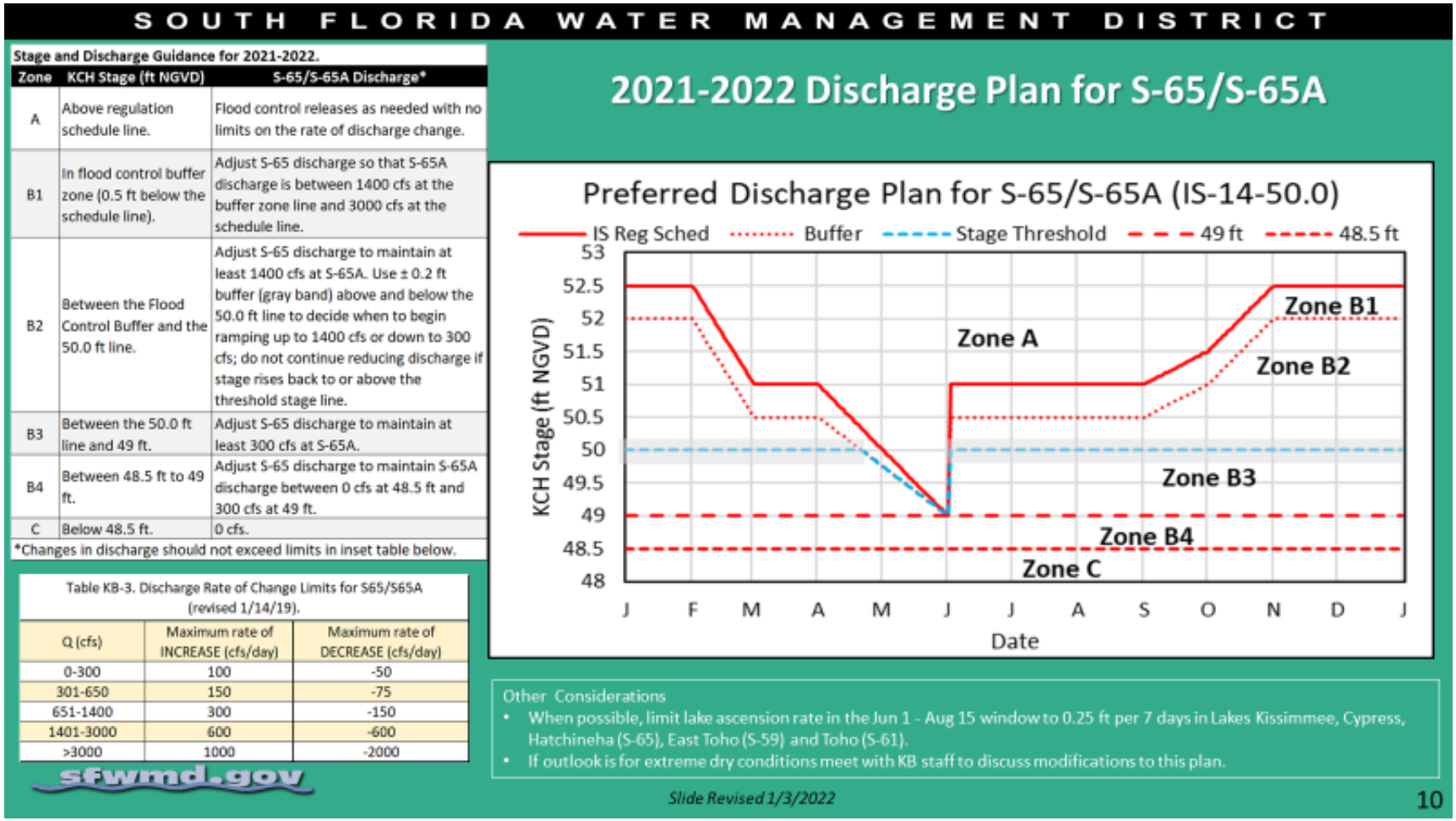


Figure KB-7. IS-14-50 Discharge Plan for S65/S65A with discharge rate of change limits (revised 1/14/19).

Lake Okeechobee

Lake Okeechobee stage was 15.83 feet NGVD on October 30, 2022, with water levels 0.26 feet higher than the previous week and 2.07 feet higher than a month ago (**Figure LO-1**). Lake stage remains within the Low sub band (**Figure LO-2**) and is currently 0.33 feet above the upper limit of the ecological envelope (**Figure LO-3**). According to NEXRAD, 0.04 inches of rain fell directly on the Lake last week.

Average daily inflows (excluding rainfall) decreased from the previous week, going from 15,143 cfs to 9,173 cfs. Average daily outflows (excluding evapotranspiration) decreased from the previous week going from 171 cfs to 112 cfs. The highest inflow came from the Kissimmee River (C-38 Canal; 7,913 cfs), followed by inflow via the S-84 & S-84X structures from the C-41A Canal (744 cfs) and Fisheating Creek (368 cfs). Back flow was recorded from the L-8 Canal via the S-271 structure at an average daily rate of 3 cfs. Outflow to the east via the S-308 structure into the C-44 Canal was 57 cfs and to the south via the S-350 structures was 55 cfs. There was no outflow to the west via the S-77 structure. **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 30, 2022) from NOAA's Harmful Algal Bloom Monitoring System showed only a very low bloom potential in the southwestern part of the Lake. Bloom potential decreased in that region since previous week (**Figure LO-6**). The October 17-19, 2022, routine water quality and phytoplankton monitoring on the Lake revealed that communities at all Lake sites were mixed, and total microcystins concentrations were below detection limit. Bloom conditions (>40 µg/L chlorophyll *a*) were detected at only two locations in the northwestern nearshore region of the Lake, with the highest chlorophyll *a* concentration (47.5 µg/L) detected at the POLESOUT site (**Figure LO-7**).

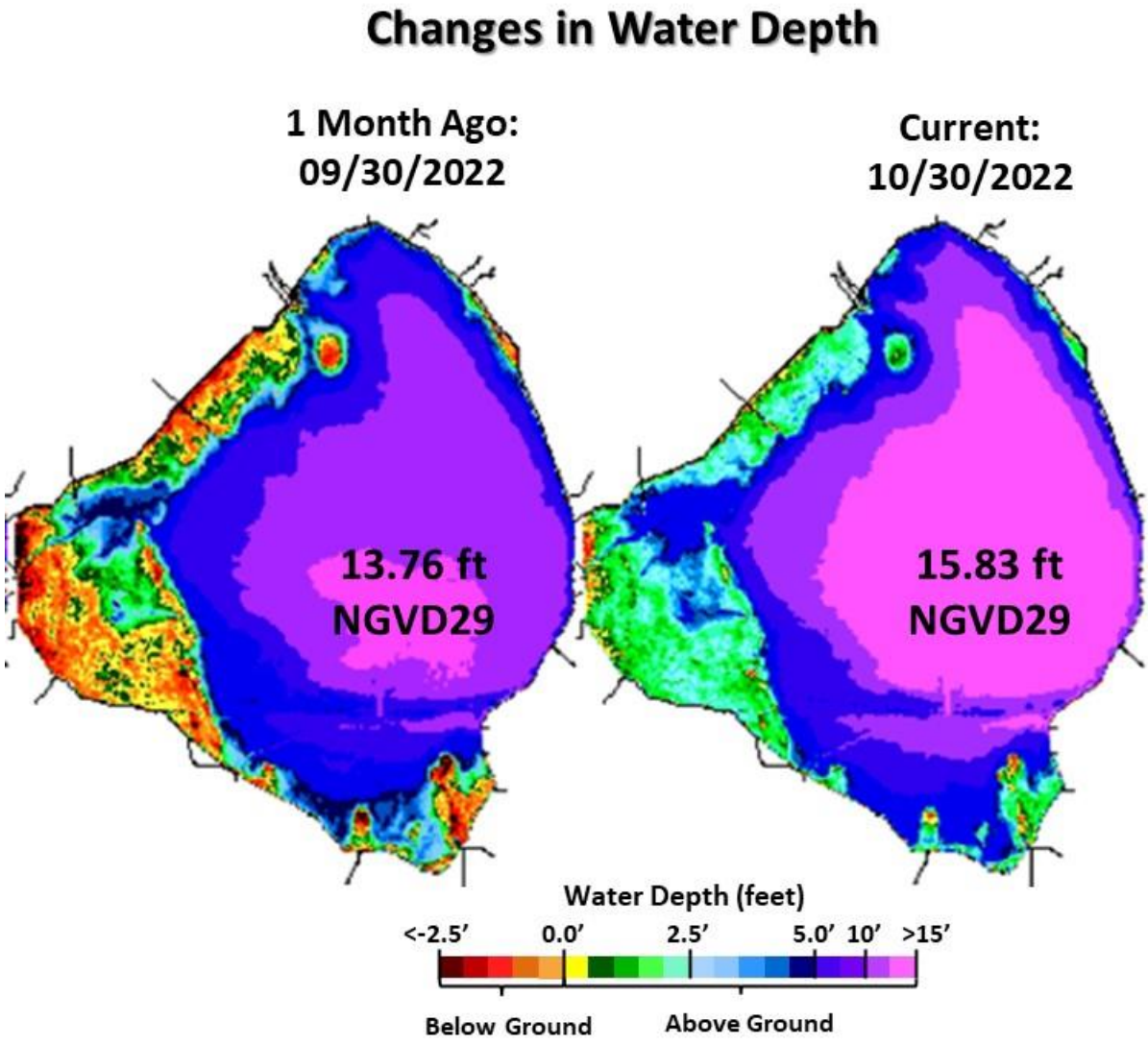


Figure LO-1. Lake Okeechobee water depth estimates based on South Florida Water Depth Assessment Tool (SFWDAT).

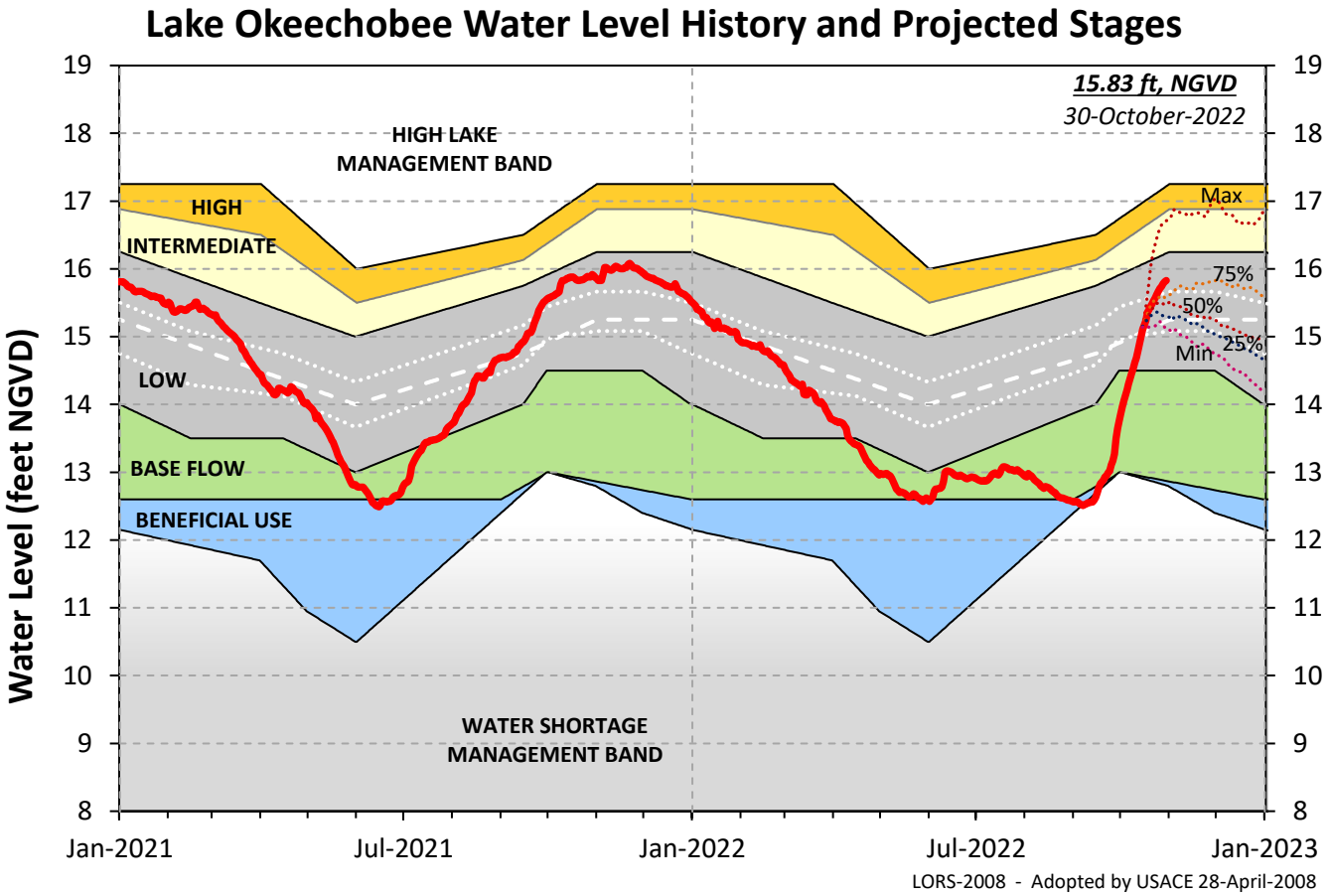


Figure LO-2. Recent Lake Okeechobee stages with projected stages based on a dynamic position analysis.

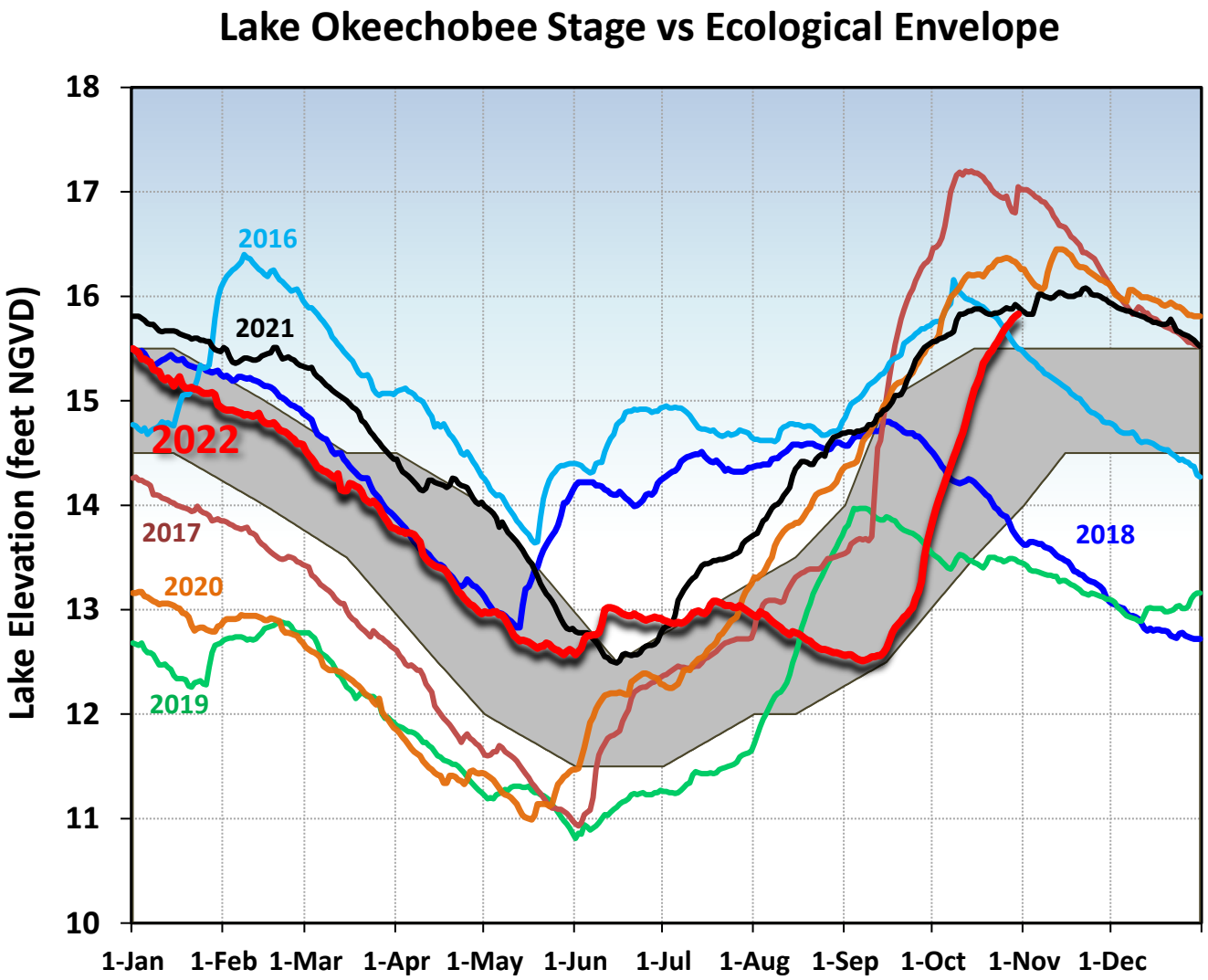


Figure LO-3. The prior six years of annual stage hydrographs for Lake Okeechobee in comparison to the ecological envelope.

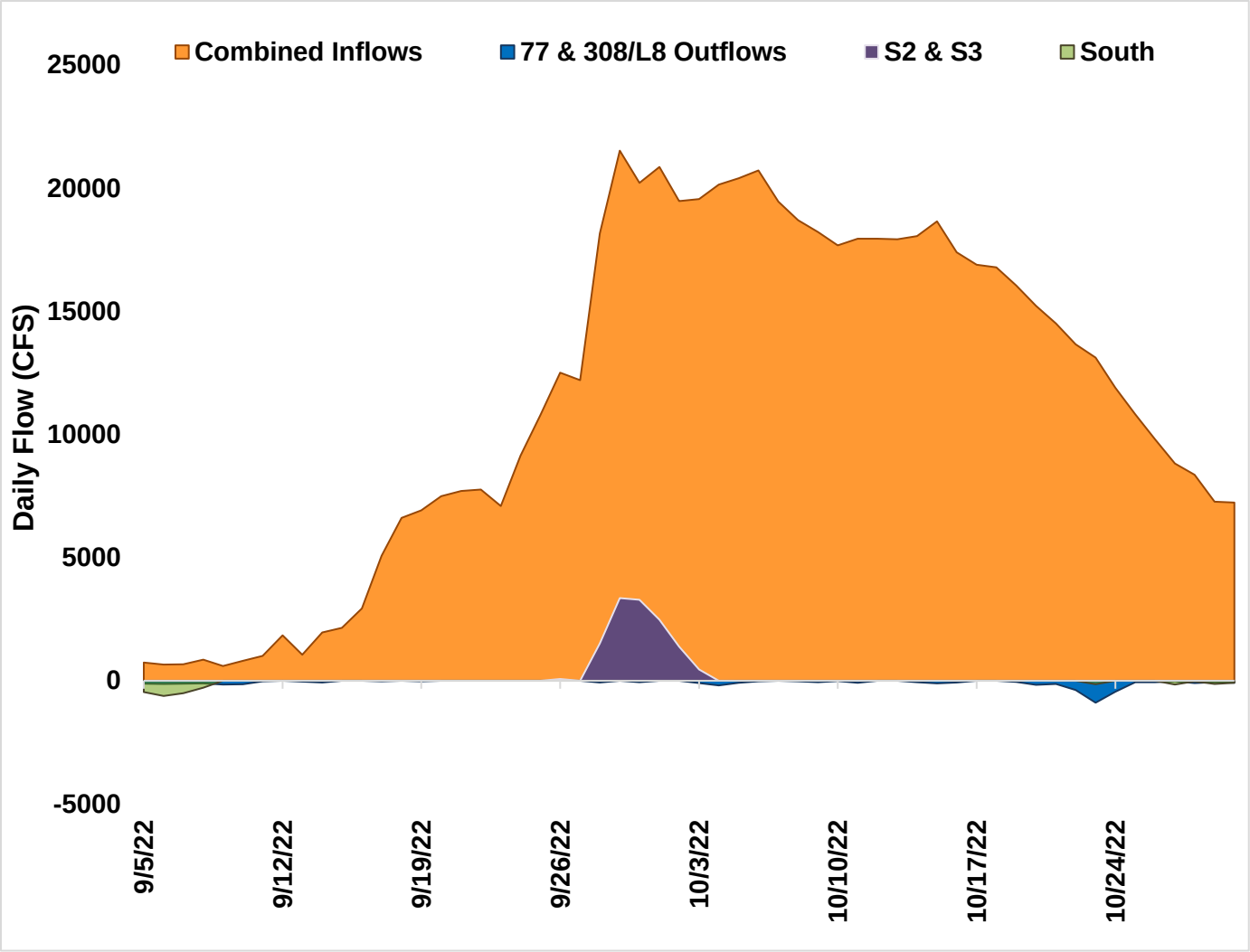


Figure LO-4. Major inflows (orange) to and outflows east and west (blue) from Lake Okeechobee. Outflows south are shown in green. Flows into Lake Okeechobee from the L-8 canal through S-271 (formerly Culvert 10A) or from the C-44 canal through the S-308 are included as inflows. Conversely, flows from 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.

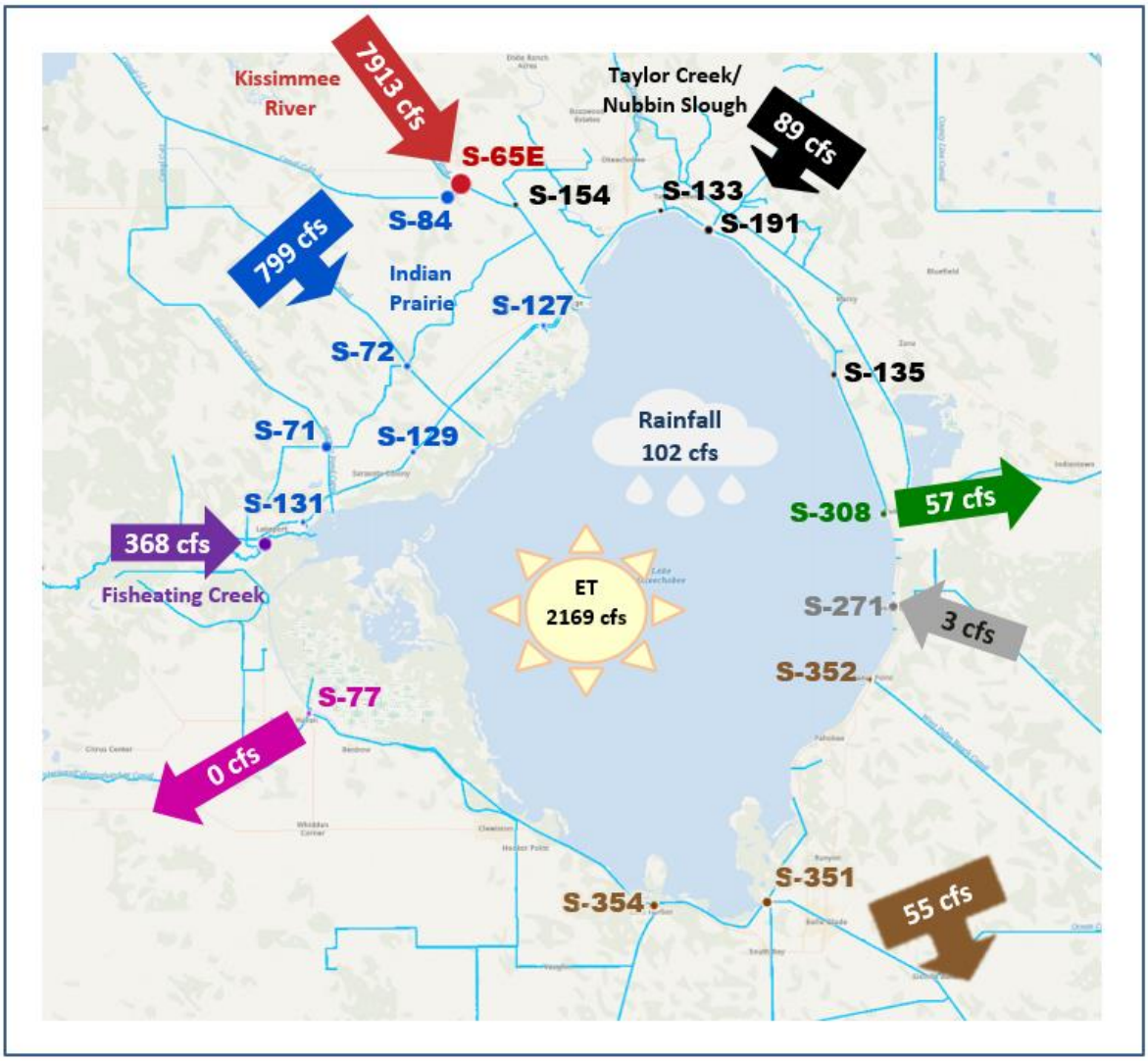


Figure LO-5. Inflows into Lake Okeechobee from Indian Prairie basins, Taylor Creek/Nubbin Slough, Kissimmee River and Fisheating Creek, and outflows to the west via S-77, to the east via S-308, to the south via S-351, S-352, S-354, and to southeast via S-271 (formerly Culvert 10A) for the week of October 24 - 30, 2022.

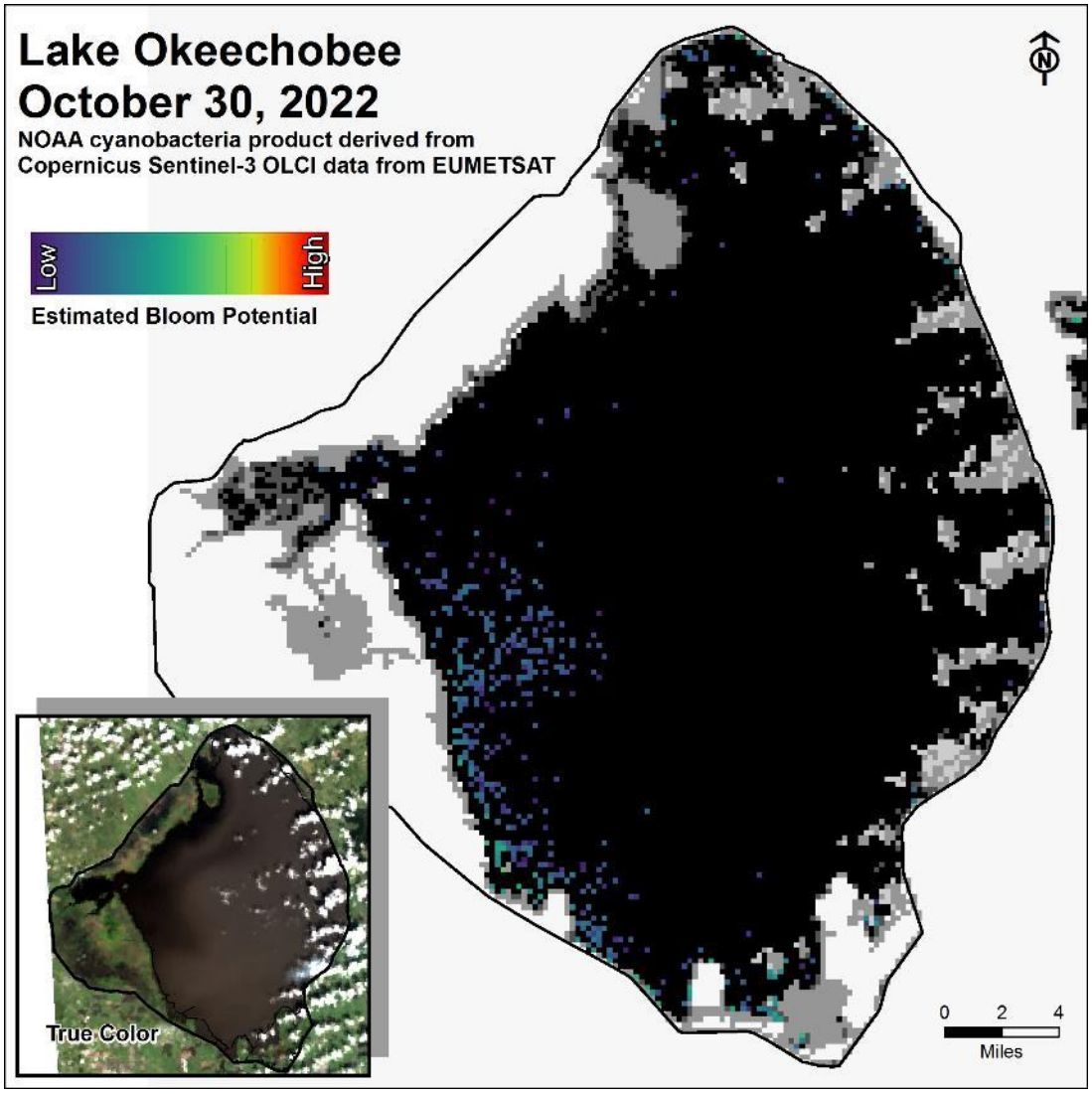


Figure LO-6. Cyanobacteria bloom potential on October 30, 2022, based on NOAA's harmful algal bloom monitoring system. Gray color indicates cloud cover.

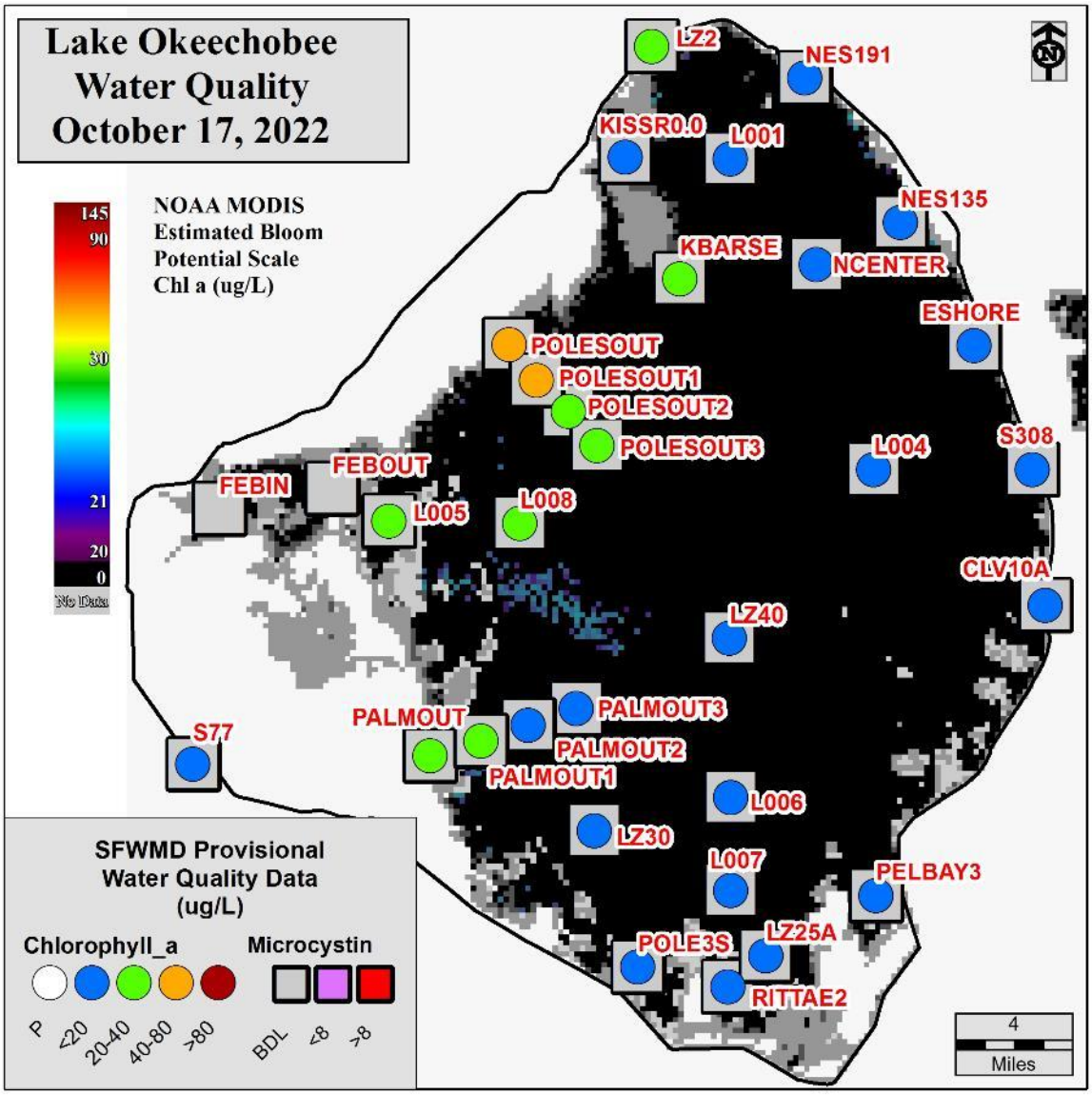


Figure LO-7. Expanded monitoring network and provisional chlorophyll *a* (µg/L) and total microcystins (µg/L) concentrations results from samples collected October 17 - 19, 2022.

Estuaries

St. Lucie Estuary

The St. Lucie estuary was impacted by Hurricane Ian on September 27 and 28, 2022 with most of the freshwater inflow coming from the basins (**Figure ES-2**). This inflow resulted in a rapid decrease in salinity throughout the estuary, but salinity began recovering quickly (**Figure ES-3**). Long-term impacts to oyster populations are unlikely but will be monitored.

Over the past week, mean total inflow to the St. Lucie Estuary was 355 cfs (**Figures ES-1** and **ES-2**), and the previous 30-day mean inflow was 1,893 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 all sites in the estuary (**Table ES-1** and **Figure ES-3**). The seven-day moving average of the surface and bottom salinities at the US1 Bridge was 16.0. Salinity conditions in the middle estuary were estimated to be within the optimal range for adult eastern oysters (**Figure ES-4**). The mean larval oyster recruitment rate reported by the Fish and Wildlife Research Institute in September was 2.5 spat/shell (**Figure ES-5**).

Caloosahatchee River Estuary

The Caloosahatchee River Estuary received system-wide impacts from damaging winds and large storm surge following the landfall of Hurricane Ian 20 miles WNW of Fort Myers, Florida at 3:05 PM Wednesday, September 28, 2022, as a category 4 storm. All SFWMD water quality sensors in the estuary were affected by the storm and ceased to function on September 28, 2022. The sensor at the Val I-75 station began functioning and reporting again on October 5, the sensor at S-79 began functioning again on October 14, the sensors at Fort Myers and Cape Coral began functioning again on October 15, and the sensor at Sanibel began functioning again on October 17, 2022.

Over the past week, mean total inflow to the Caloosahatchee River Estuary was 921 cfs (**Figures ES-6** and **ES-7**), and the previous 30-day mean inflow was 3,621 cfs. For comparison, the historical provisional mean inflows from the contributing areas are shown in **Figure ES-7**.

Over the past week, surface salinities remained the same at S-79 and Val I-75 and increased at Cape Coral and Sanibel (**Table ES-2** and **Figures ES-8** and **ES-9**). No surface salinity data was available at the Ft. Myers and Shell Point sites. The seven-day mean salinities (**Table ES-2**) were in the optimal range (0-10) for tape grass in the upper estuary. The seven-day mean salinity values were within the stressed range for adult eastern oysters at Cape Coral and Sanibel (**Figure ES-10**). No updated oyster recruitment data are available at this time. FWC will redeploy recruitment collectors once water quality conditions improve.

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 198 cfs. Model results from all scenarios predict daily salinity to be 2.5 or lower, and the 30-day moving average surface salinity to be 0.6 or lower at Val I-75 at the end of the two-week period (**Table ES-3** and **Figure ES-11**). This keeps predicted salinities in the upper estuary within the optimal salinity range (0-10) for tape grass.

Red Tide

The Florida Fish and Wildlife Research Institute reported on October 28, 2022, that *Karenia brevis*, the Florida red tide dinoflagellate, was observed at bloom concentrations in samples collected from Charlotte, Lee and Collier Counties over the past week. On the east coast, red tide was not observed in samples from St. Lucie, Martin, Palm Beach or Miami-Dade counties.

Water Management Recommendations

Lake stage is in the Low Sub-Band. Tributary conditions are very wet. The LORS2008 release guidance suggests up to 3,000 cfs release at S-79 to the Caloosahatchee River Estuary and up to 1,170 cfs release at S-80 to the St. Lucie Estuary.

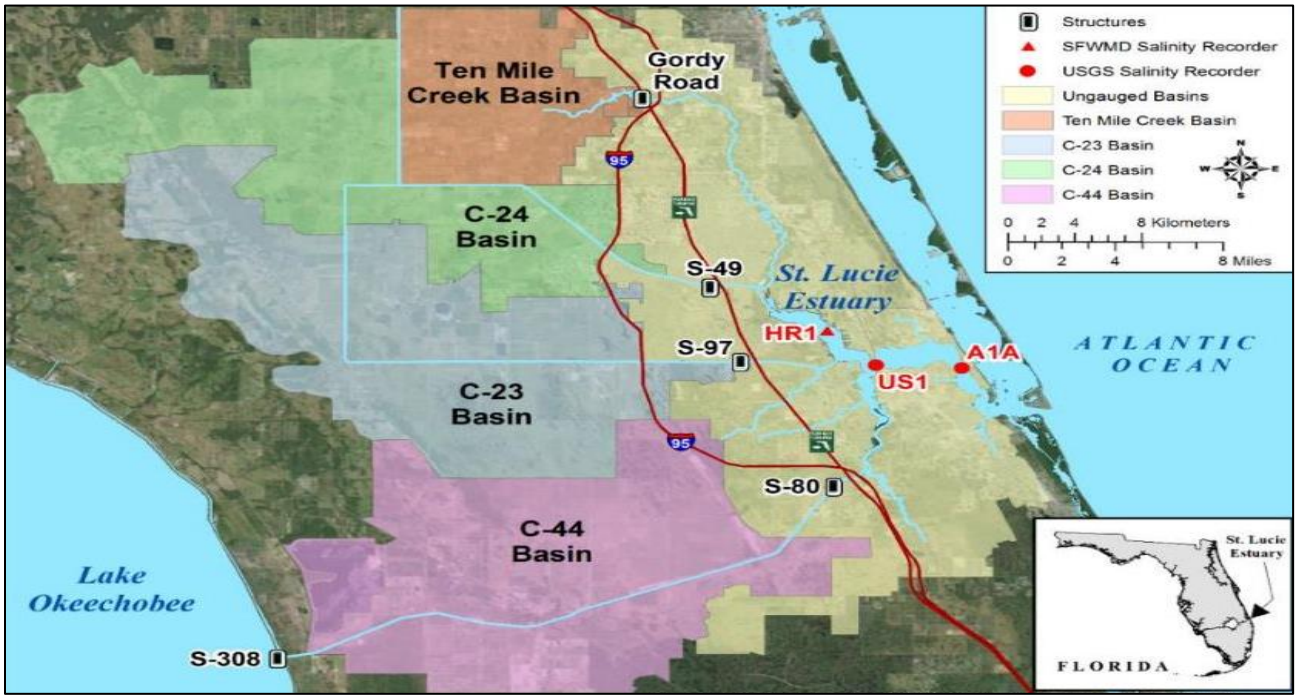


Figure ES-1. Basins, water control structures and salinity monitoring sites in the St. Lucie Estuary.

[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.

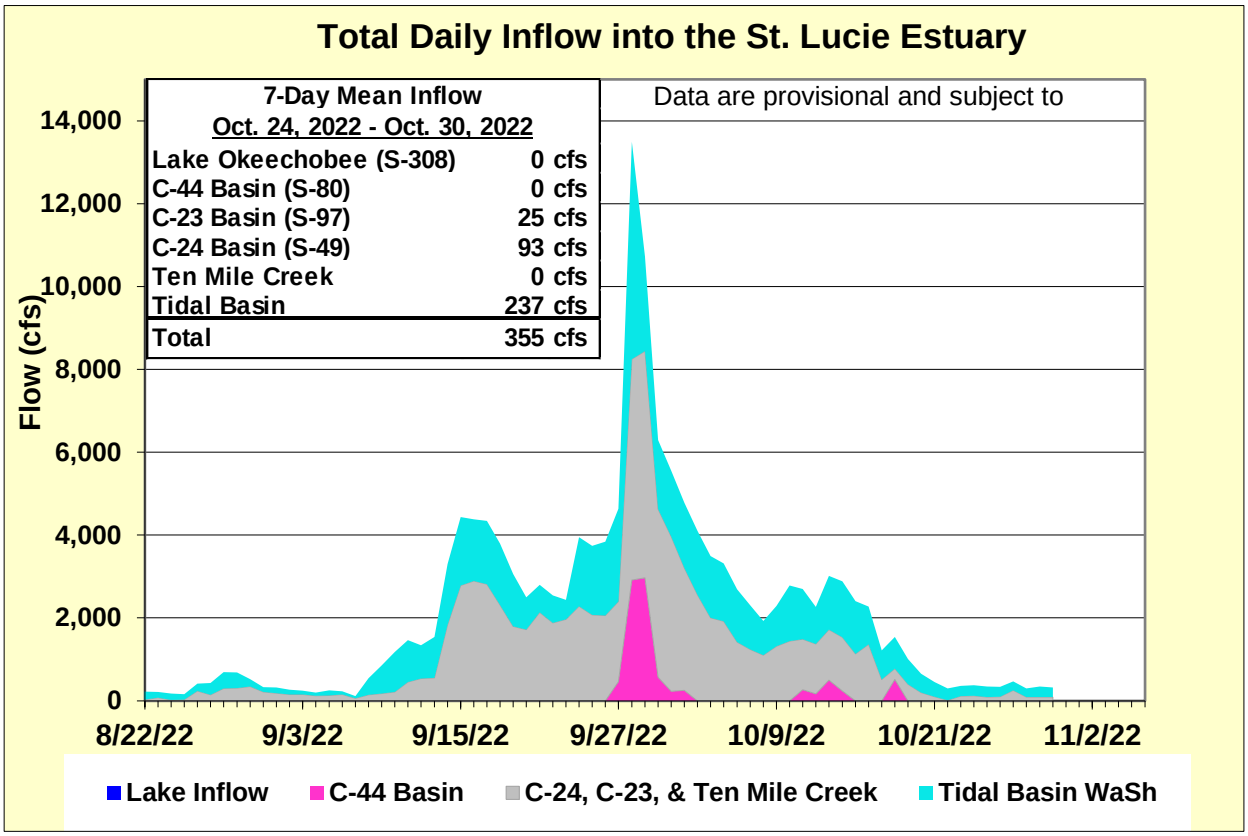


Figure ES-2. Total daily inflows from Lake Okeechobee and runoff from the C-44, C-23, C-24, Ten Mile Creek, and Tidal Basins into the St. Lucie Estuary.

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 optimum salinity range for adult eastern oysters (*Crassostrea virginica*) in the estuary. Data are provisional.

Sampling Site	Surface	Bottom	Optimum Envelope
HR1 (North Fork)	**11.0** (6.6)	**14.1** (8.2)	10.0 – 25.0
US1 Bridge	**15.1** (11.1)	**16.9** (17.1)	10.0 – 25.0
A1A Bridge	**23.7** (18.6)	**27.1** (24.7)	10.0 – 25.0

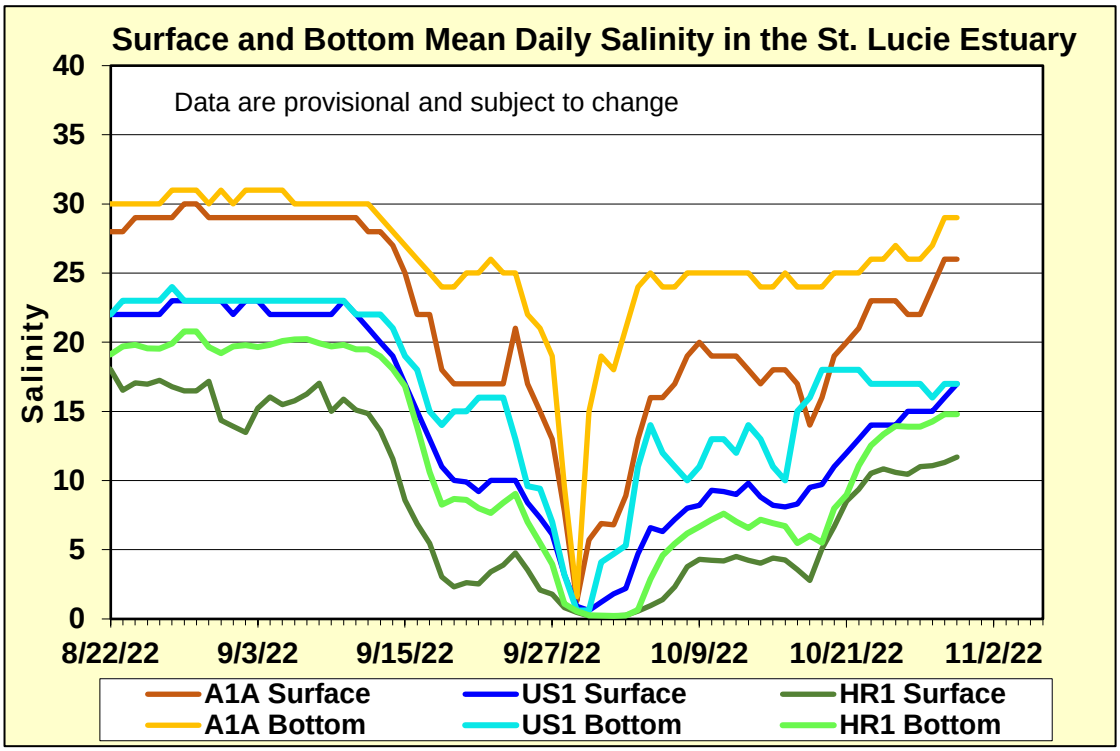


Figure ES-3. Mean daily salinity at the A1A, US1 and HR1 sites in the St. Lucie Estuary.

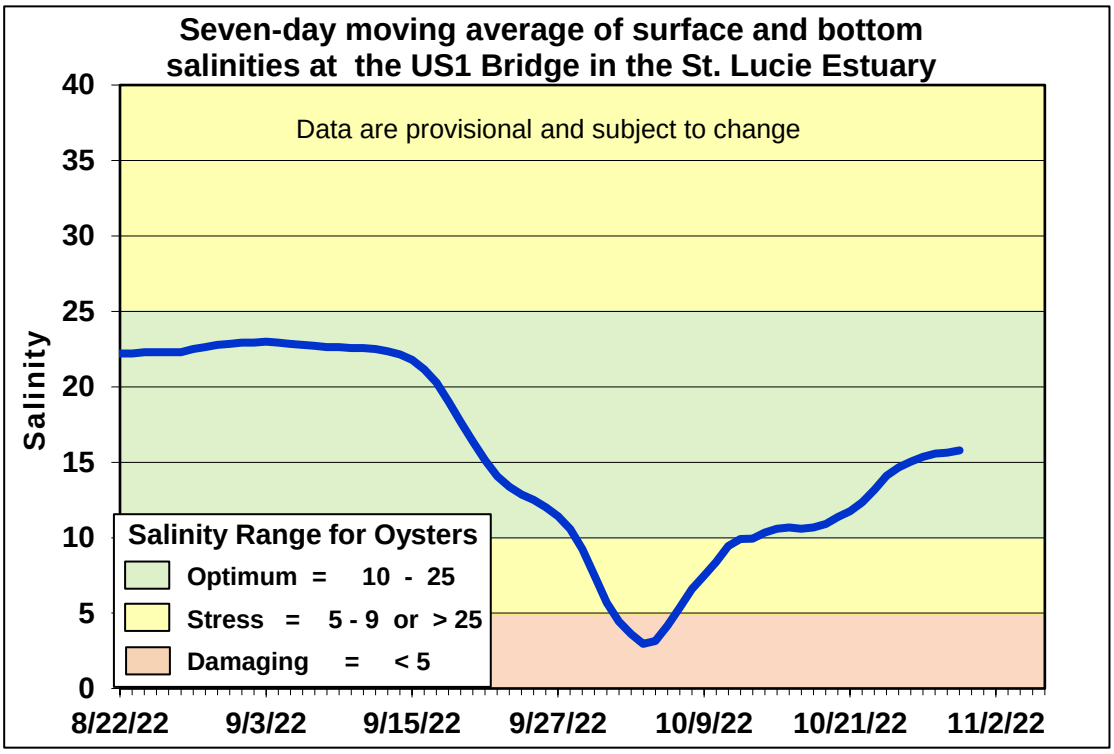


Figure ES-4. Seven-day moving average of the surface and bottom salinities at the US1 Bridge in the St. Lucie Estuary.

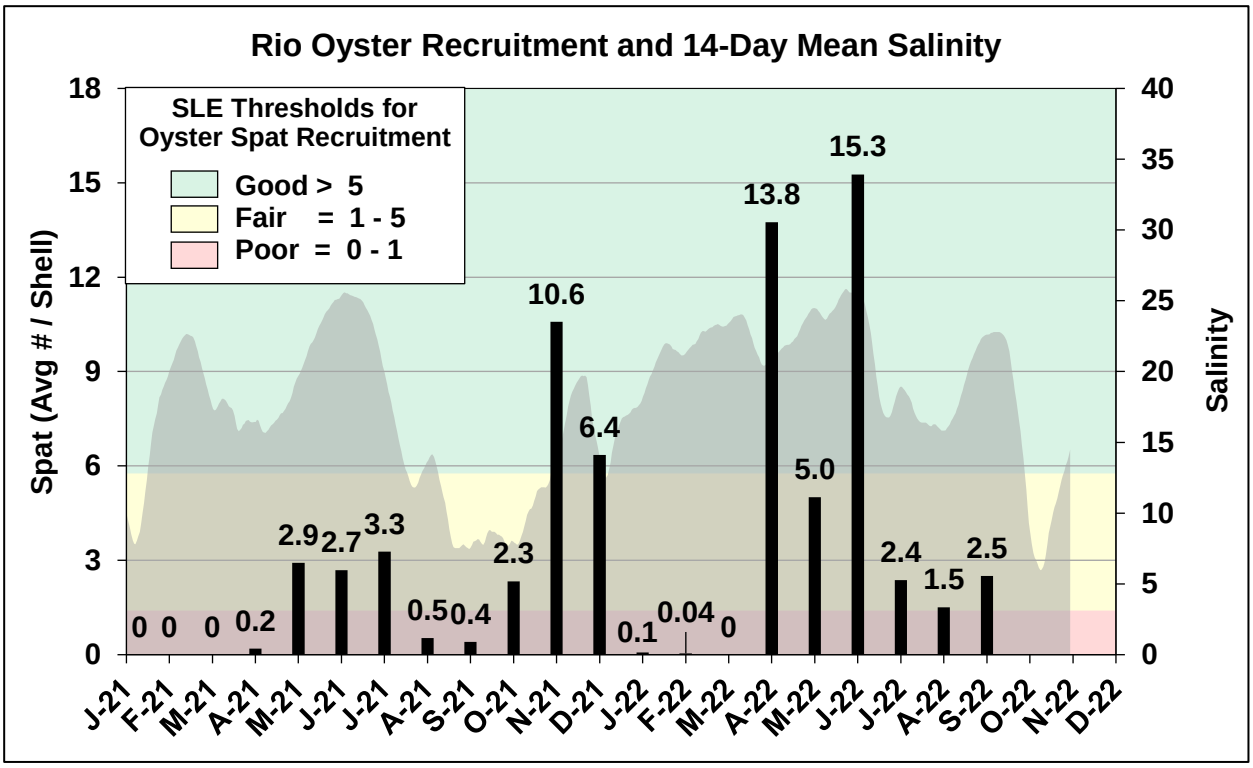


Figure ES-5. Mean oyster recruitment at the Rio oyster monitoring station and 14-day mean salinity at US1 Bridge.

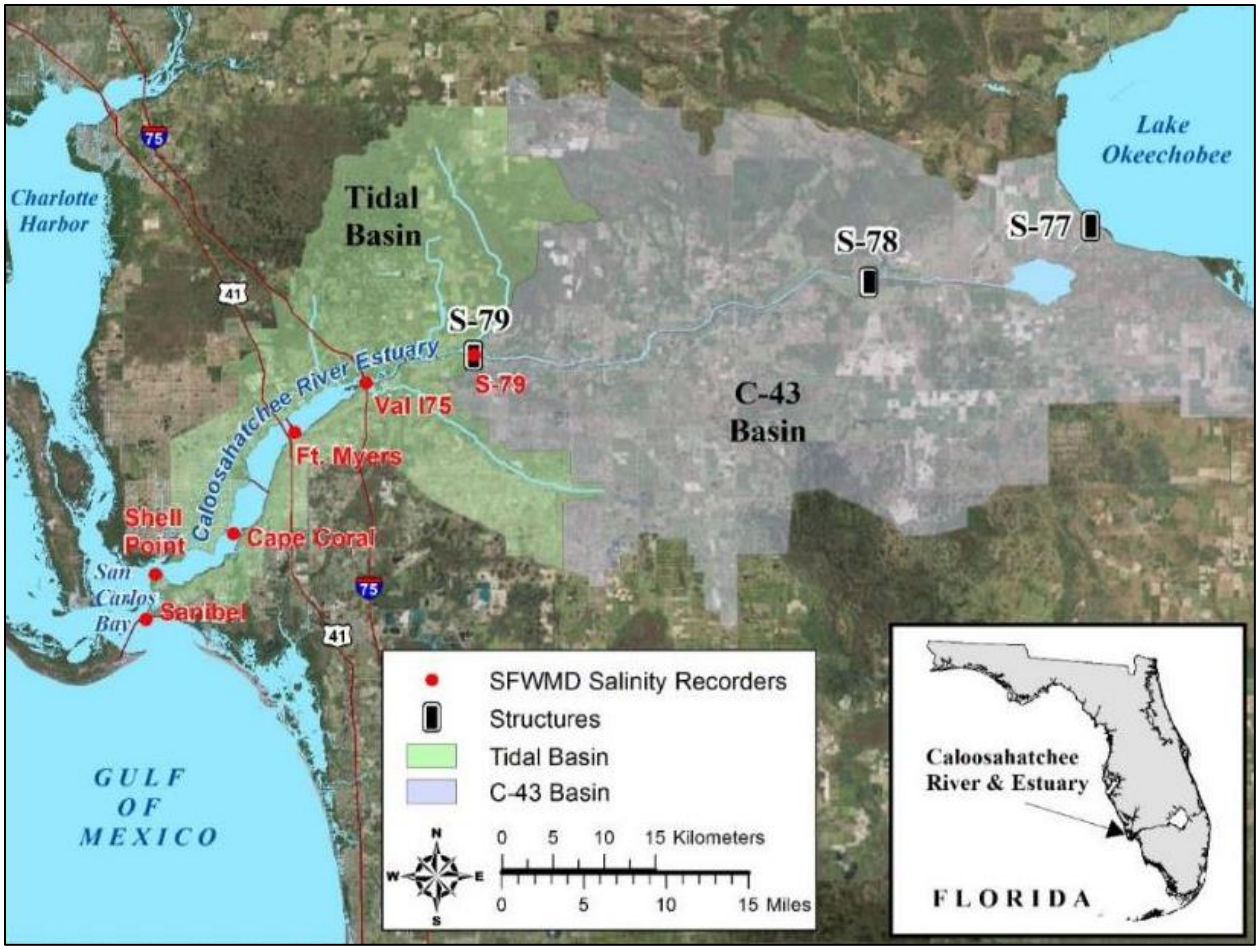


Figure ES-6. Basins, water control structures and salinity monitoring sites in the Caloosahatchee River Estuary.

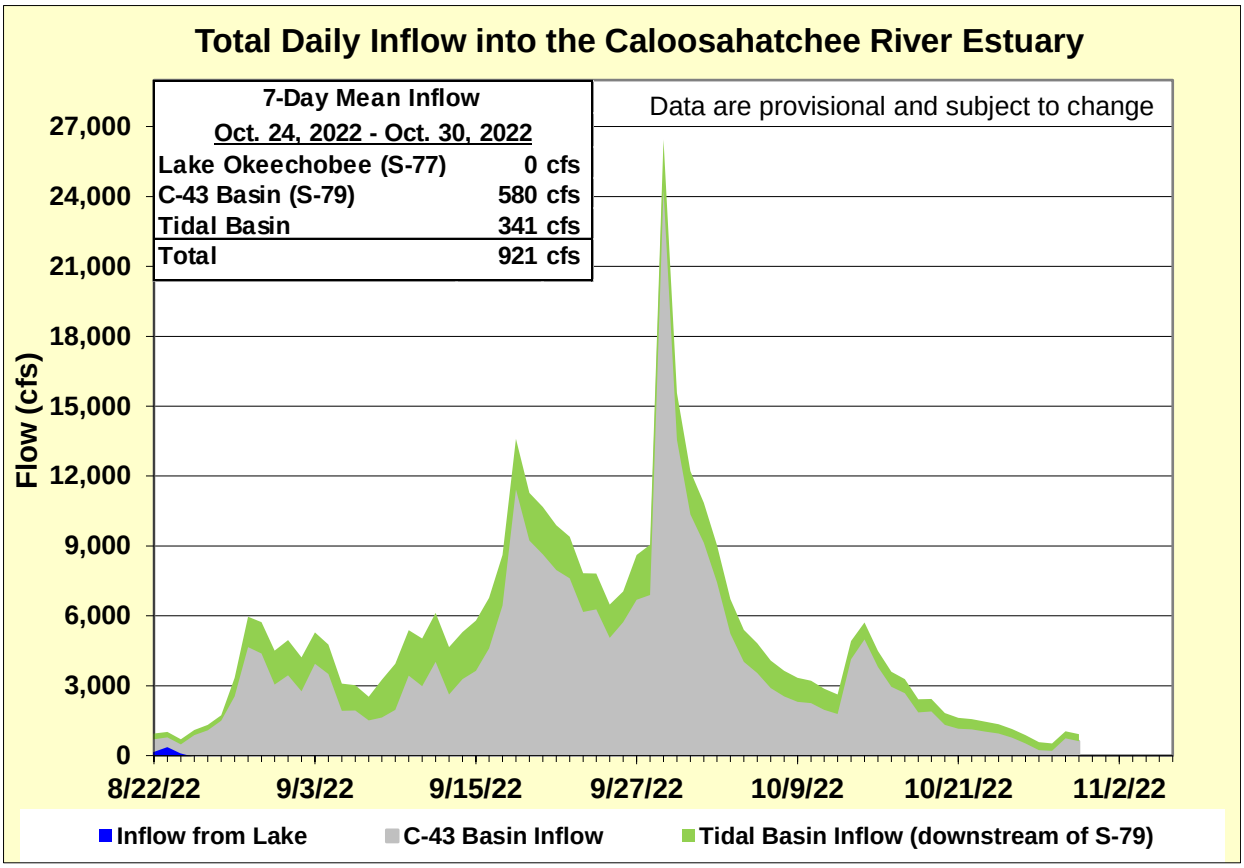


Figure ES-7. Total daily inflows from Lake Okeechobee, and runoff from the C-43 and Tidal basins into the Caloosahatchee River Estuary.

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. Salinity data were not reported (NR) at any sites after 9/28/2022 when Hurricane Ian damaged equipment; however, the sensor at Val I-75 began reporting again on 10/5/2022 but the bottom sensor has stopped reporting again as of 10/26/22, the sensor at S-79 began reporting again on 10/14/2022. The sensors at Fort Myers and Cape Coral began functioning again on October 15, 2022, but the surface layer sensor at Ft. Myers has stopped reporting again as of 10/25/22, and the sensor at Sanibel began functioning again on 10/17/2022. The envelope in the upper estuary sites is for the protection of tape grass and the envelope in the lower estuary is the optimum salinity range for adult eastern oysters (*Crassostrea virginica*). Data are provisional.

Sampling Site	Surface	Bottom	Optimum Envelope
S-79 (Franklin Lock)	**0.2** (0.2)	**0.2** (0.2)	0.0 – 10.0
Val I-75	**0.2** (0.2)	**NR** (0.2)	0.0 – 10.0
Fort Myers Yacht Basin	**NR** (0.2)	**4.4** (0.3)	0.0 – 10.0
Cape Coral	**9.7** (4.2)	**10.7** (4.5)	10.0 – 25.0
Shell Point	**NR** (NR)	**NR** (NR)	10.0 – 25.0
Sanibel	**27.9** (22.4)	**28.9** (26.1)	10.0 – 25.0

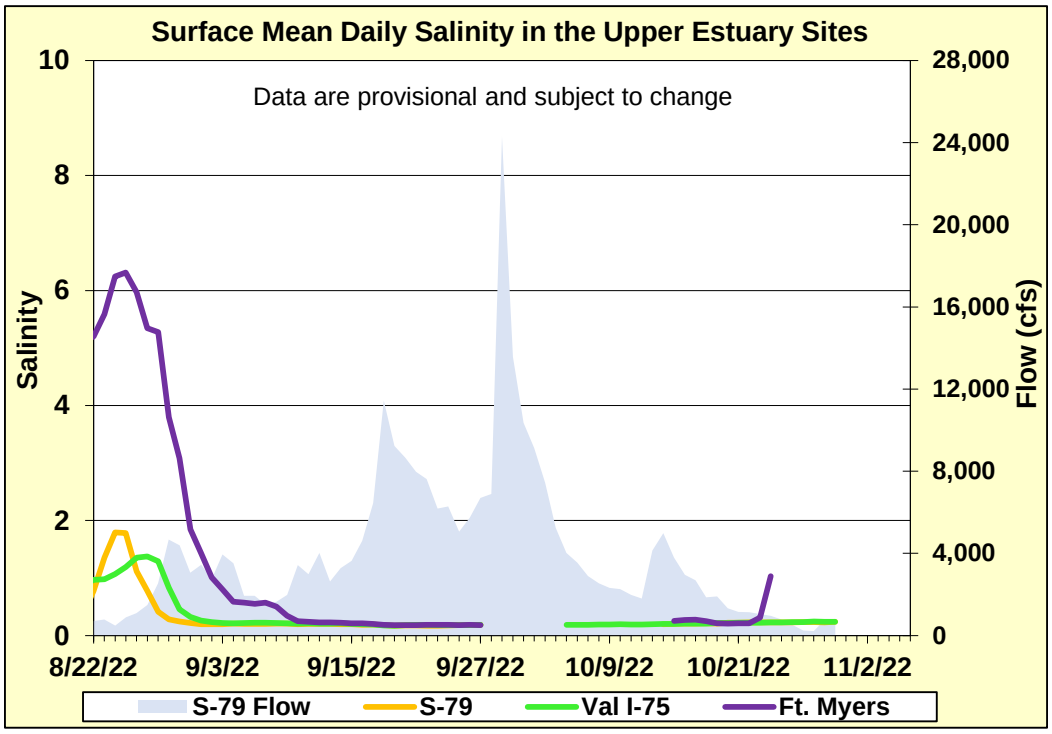


Figure ES-8. Mean daily salinity at upper Caloosahatchee River Estuary monitoring sites and mean daily flow at S-79.

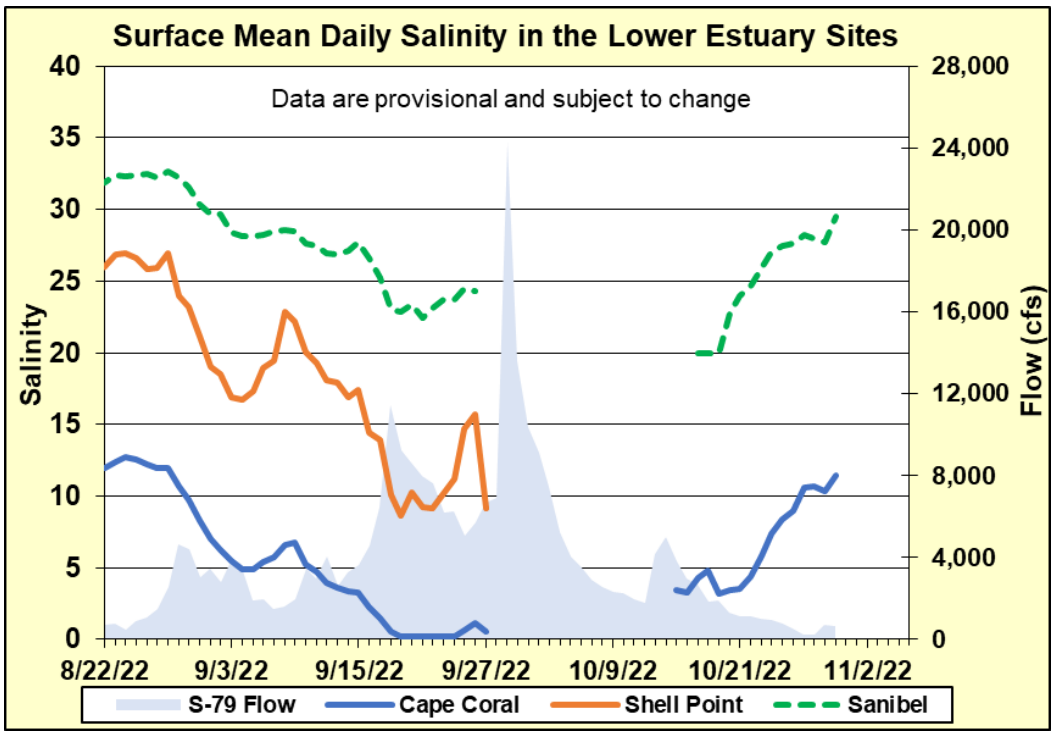


Figure ES-9. Mean daily surface salinity at lower Caloosahatchee River Estuary monitoring sites and mean daily flow at S-79.

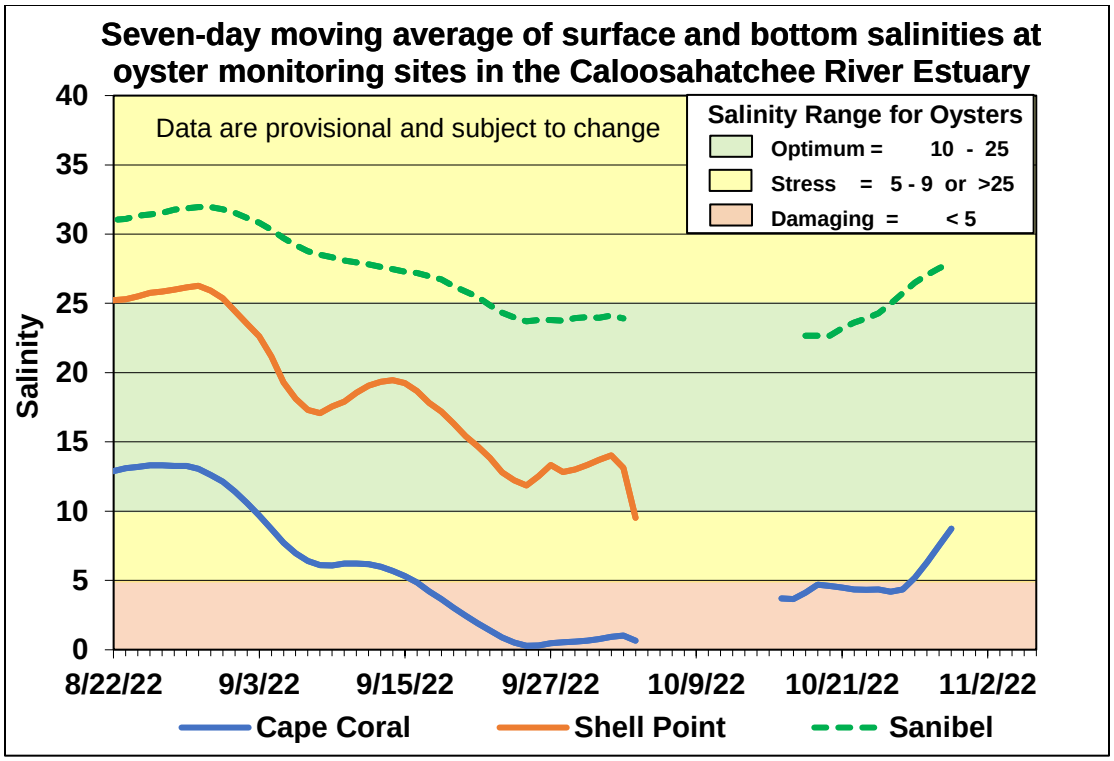


Figure ES-10. Seven-day moving average of surface and bottom salinities at Cape Coral, Shell Point and Sanibel monitoring sites in the Caloosahatchee River Estuary.

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	198	2.5	0.6
B	450	198	1.5	0.5
C	750	198	0.9	0.4
D	1000	198	0.5	0.3
E	1500	198	0.3	0.3
F	2000	198	0.3	0.3

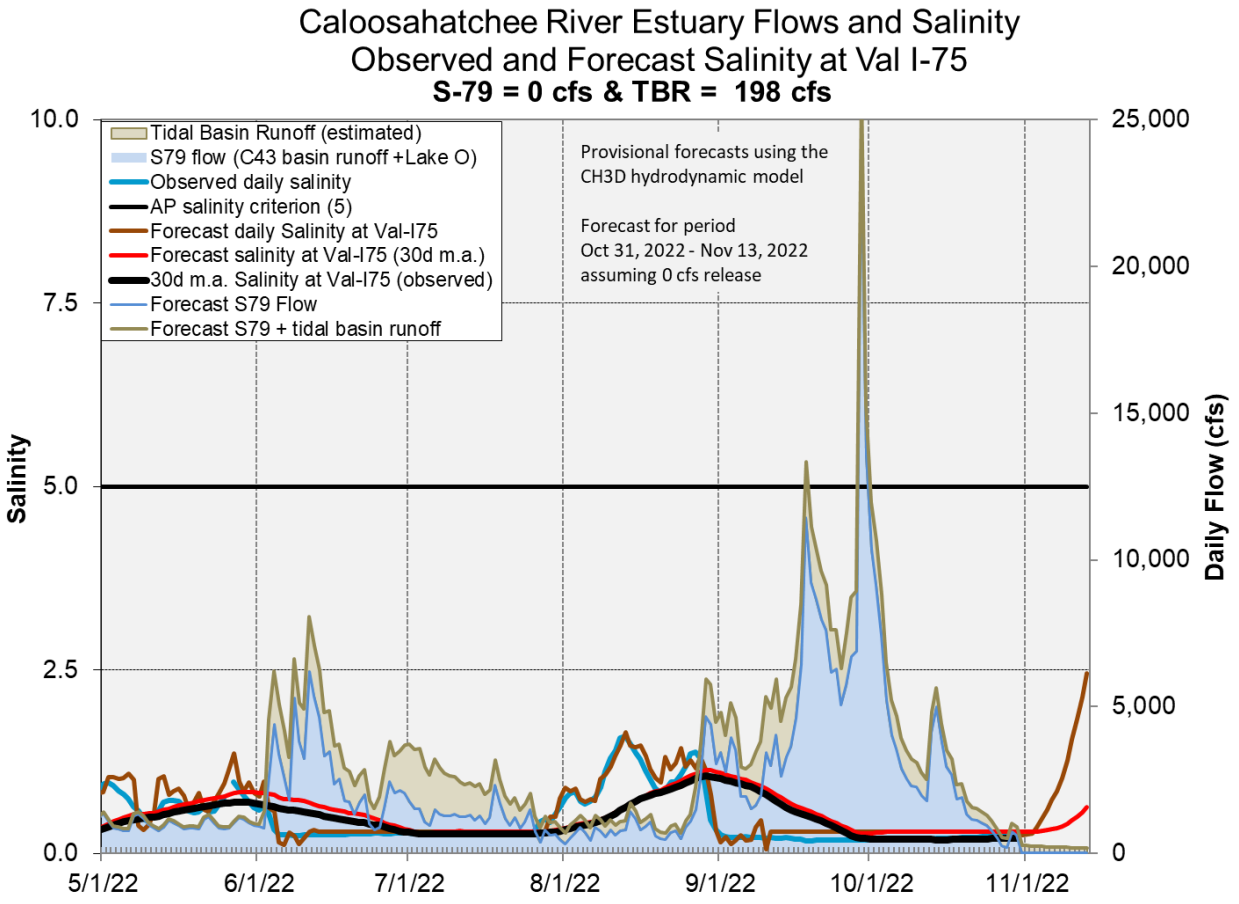


Figure ES-11. Forecasted Val I-75 site surface salinity assuming no pulse release at S-79.

Stormwater Treatment Areas

STA-1E: STA-1E Western Flow-way is offline for post-construction vegetation grow in. Operational restrictions are in place in STA-1E Central and Eastern Flow-ways for vegetation management activities. Online treatment cells are near target stage and vegetation in the flow-ways is stressed and highly stressed. The 365-day phosphorus loading rates (PLRs) are high for the Eastern and Central Flow-way (**Figure S-1**).

STA-1W: Operational restrictions are in place in STA-1W Western, Eastern, and Northern Flow-ways for vegetation management activities. Treatment cells are at or near target stage. Vegetation in the flow-ways is stressed and highly stressed. The 365-day PLRs for the Northern, Western, and Eastern Flow-ways are at or below 1.0 g/m^2/year (**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. Online treatment cells are at or near 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 4 and 5 are below 1.0 g/m^2/year. The 365-day PLR for Flow-ways 1 and 3 are high (**Figure S-3).**

STA-3/4: STA-3/4 Eastern Flow-way is offline for vegetation rehabilitation/drawdown. Online treatment cells are near or 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 PLRs for the Central and Western Flow-ways are below 1.0 g/m^2/year (**Figure S-4**).

STA-5/6: All flow-ways in STA-5/6 are online. Treatment cells are at or near 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 below 1.0 g/m^2/year, except Flow-way 4 which is high (**Figure S-5** and **S-6**).

For definitions on STA operational language see glossary following figures.

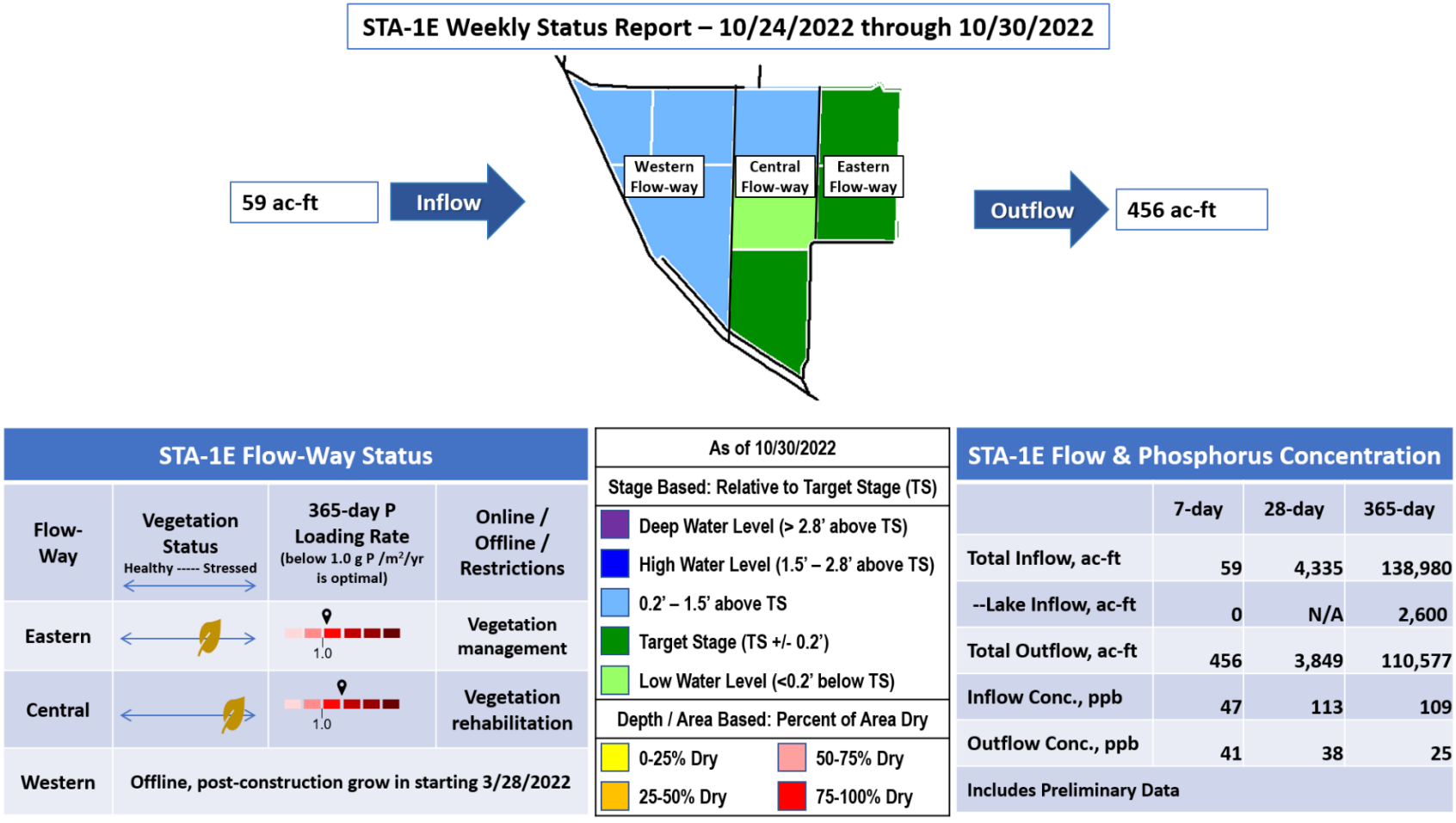


Figure S-1. STA-1E Weekly Status Report

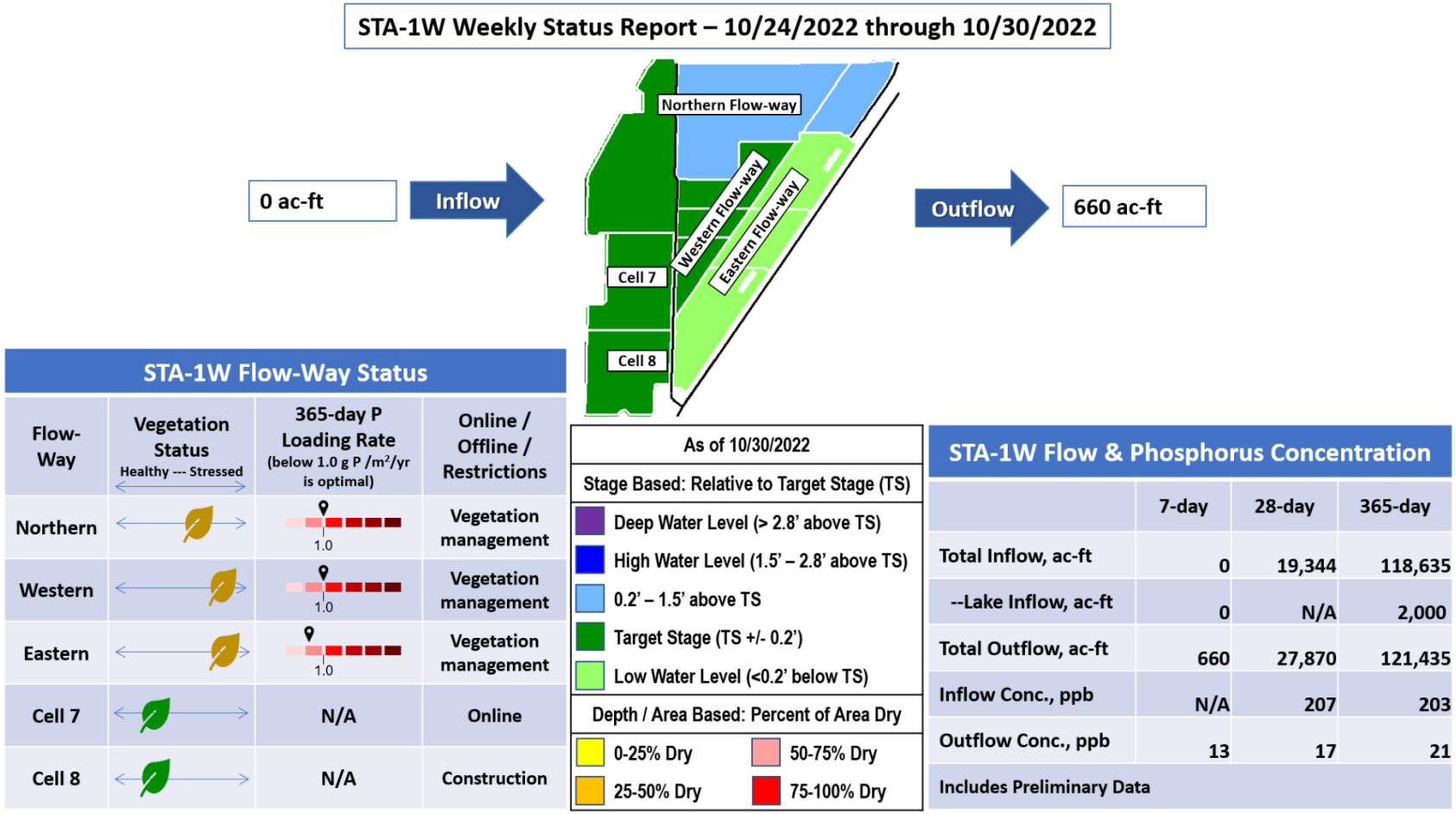
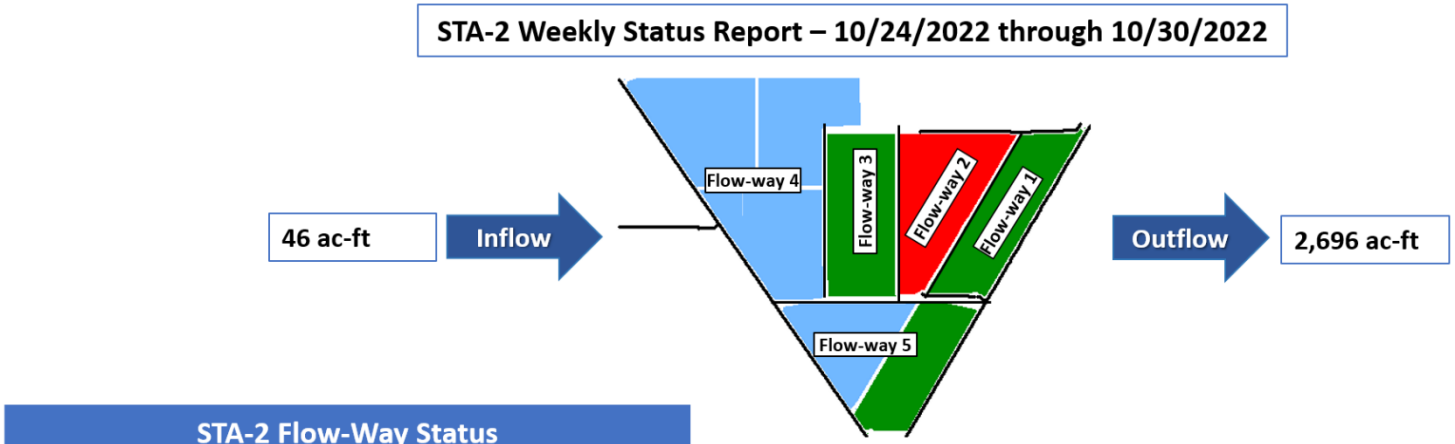


Figure S-2. STA-1W Weekly Status Report



STA-2 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

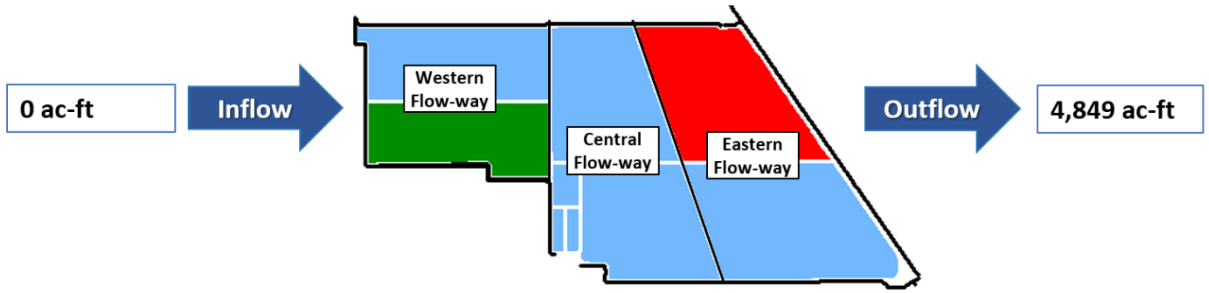
As of 10/30/2022	
Stage Based: Relative to Target Stage (TS)	
Deep Water Level (> 2.8' above TS)	
High Water Level (1.5' – 2.8' above TS)	
0.2' – 1.5' above TS	
Target Stage (TS +/- 0.2')	
Low Water Level (<0.2' below TS)	
Depth / Area Based: Percent of Area Dry	
0-25% Dry	50-75% Dry
25-50% Dry	75-100% Dry

STA-2 Flow & Phosphorus Concentration

	7-day	28-day	365-day
Total Inflow, ac-ft	46	30,087	310,517
--Lake Inflow, ac-ft	0	N/A	27,600
Total Outflow, ac-ft	2,696	56,452	333,684
Inflow Conc., ppb	16	98	114
Outflow Conc., ppb	23	33	29
Includes Preliminary Data			

Figure S-3. STA-2 Weekly Status Report

STA-3/4 Weekly Status Report – 10/24/2022 through 10/30/2022



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 10/30/2022	
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

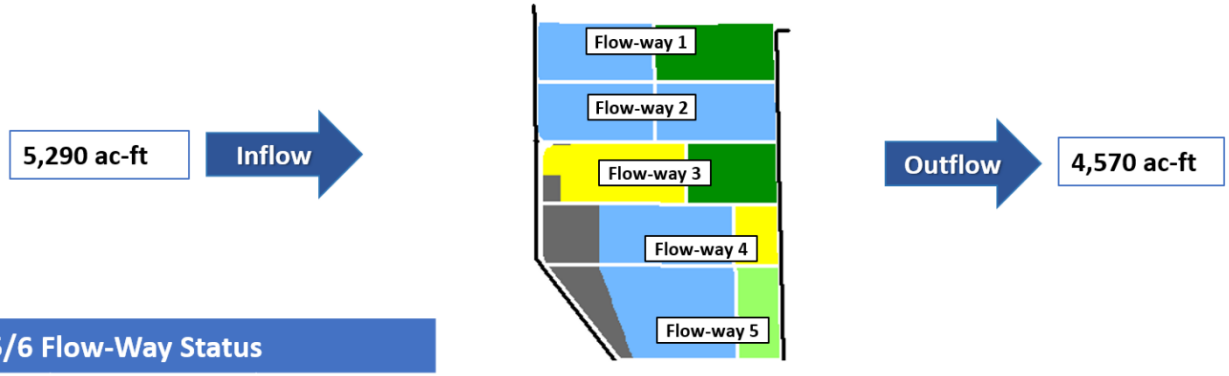
STA-3/4 Flow & Phosphorus Concentration

	7-day	28-day	365-day
Total Inflow, ac-ft	0	50,694	312,652
--Lake Inflow, ac-ft	0	N/A	5,300
Total Outflow, ac-ft	4,849	64,249	303,561
Inflow Conc., ppb	N/A	80	92
Outflow Conc., ppb	9	12	15

Includes Preliminary Data

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

STA-5/6 Weekly Status Report – 10/24/2022 through 10/30/2022



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		1.0	Online
3		1.0	Online
4		1.0	Online
5		1.0	Online

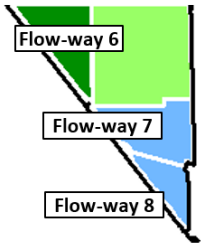
As of 10/30/2022	
Stage Based: Relative to Target Stage (TS)	
Deep Water Level (> 2.8' above TS)	
High Water Level (1.5' – 2.8' above TS)	
0.2' – 1.5' above TS	
Target Stage (TS +/- 0.2')	
Low Water Level (<0.2' below TS)	
Depth / Area Based: Percent of Area Dry	
0-25% Dry	50-75% Dry
25-50% Dry	75-100% Dry

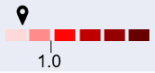
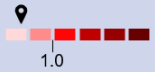
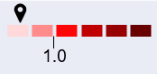
STA-5/6 Flow & Phosphorus Concentration

	7-day	28-day	365-day
Total Inflow, ac-ft	5,290	45,724	155,789
--Lake Inflow, ac-ft	0	N/A	0
Total Outflow, ac-ft	4,570	50,930	149,458
Inflow Conc., ppb	206	293	256
Outflow Conc., ppb	35	51	38
Includes Preliminary Data			

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

STA-5/6 Weekly Status Report – 10/24/2022 through 10/30/2022



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 10/30/2022	
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

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: Stage at the 1-8C gauge fell gradually last week. The average on Sunday was 0.22 feet below the flat Zone A1 regulation line. WCA-2A: Stage at the 2-17 gauge continues to recede, and the slope was steeper last week compared to the week prior. The average on Sunday was 1.07 feet above the falling regulation line. WCA-3A: Last week the Three Gauge Average receded slowly over the week. The average stage was 0.20 feet above the rising regulation line on Sunday. WCA-3A North: At gauge 62 (Northwest corner) stage continued a steep decent last week, the average on Sunday was 0.26 feet below the flat Lower schedule line. (**Figures EV-1** through **EV-4**).

Water Depths

The SFWDAT tool illustrates current conditions drier than one month ago but wetter than two months ago. Currently WCA-2A depths are above 2.5 feet in the southern one-third of that basin. Along the northern reach of the L-67s, depths have increased, and the extent of those deeper conditions expands to the south and west. Connectivity in the sloughs of Everglades National Park (ENP) remains strong. Comparing current SFWDAT water depths to one month ago, conditions within the Everglades Protection Area (EPA) are much drier and significantly deeper along the southern reach of the L-67 in eastern WCA-3A. Looking back a year ago, WCA-1 and northern WCA-2A are shallower; conditions are significantly deeper along the L-38W and in the upper reaches of the L67s within WCA-3A (**Figure EV-5 and Figure EV-6)**. Comparing current conditions to the 20-year average on October 30th; conditions move closer to average in most regions of the EPA, with northern Shark River Slough and extreme southern WCA-2A well above average (**Figure EV-7**).

Taylor Slough and Florida Bay

Taylor Slough and Florida Bay received an average of 0.3 inches of total rain this past week based on 17 gauges available for this report. Rainfall was highly localized, and nearly all of the rain was recorded on Sunday 10/30. Average total rainfall was 0.1 inch more than the previous week. Precipitation ranged from 0.01 inches in Trout Creek (TC) in the eastern nearshore region to 0.80 inches just upstream in Joe Bay (JB). Taylor Slough stages decreased at all stations. The average change was −0.14 feet (**Figure EV-8 and Figure EV-9**). Taylor Slough water levels remain above the historical average for this time of year by +4.1 inches compared to before the Florida Bay initiative (starting in 2017), a decrease of 0.3 inches from last week.

Average Florida Bay salinity is 26.8, the same as the previous week. Salinity changes ranged from a decrease of 14.7 at TC (not shown on map) nearshore in the east, where positive flows most of the week reached over 1,200 cfs, to an increase of 3.9 in Terrapin Bay (TB) in the central nearshore region (**Figure EV-8**). Salinities in central Florida Bay are near the 50th percentile for this time of year. In the Eastern and Western regions, salinities decreased this past week back into the interquartile range. (**Figure EV-10**). Florida Bay salinity is 4.1 above its historical average for this time of year, a decrease of 0.4 from the previous week.

Water Management Recommendations

We continue to recommend high level discussions on strategies that could prevent further degradation of NE-WCA3A. Conserving water in this region may prove critical for the upcoming wading bird nesting season. Maintaining a moderate rate of stage change within the marsh of WCA-2A and northern WCA-3A, avoiding abrupt changes in water depth, and conserving water high in the system has an ecological benefit. Given current stages, continuing to maximize the volume of water moving (via pumping in the northwest versus gravity flow in the northeast) into the northern perimeter of WCA-3A will benefit the ecology of that region by providing an overall greater volume of water into the basin as conditions transition to a dry season predicted to be drier than average. Priority of flows from the west to the east is expected to change as the dry season progresses. When water is available, discharge downstream through Taylor Slough. Individual regional recommendations can be found in **Table EV-2**.

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

Everglades Region	Rainfall (inches)	Stage change (feet)
WCA-1	0.07	−0.07
WCA-2A	0.03	−0.20
WCA-2B	0.05	+0.16
WCA-3A	0.02	−0.11
WCA-3B	0.01	−0.04
ENP	0.08	−0.01

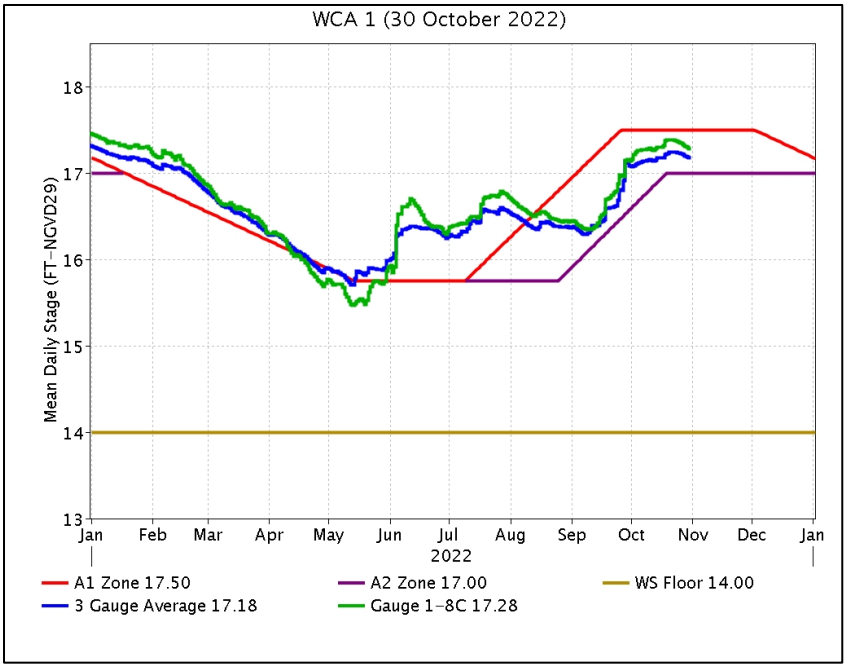


Figure EV-1. WCA-1 stage hydrographs and regulation schedule.

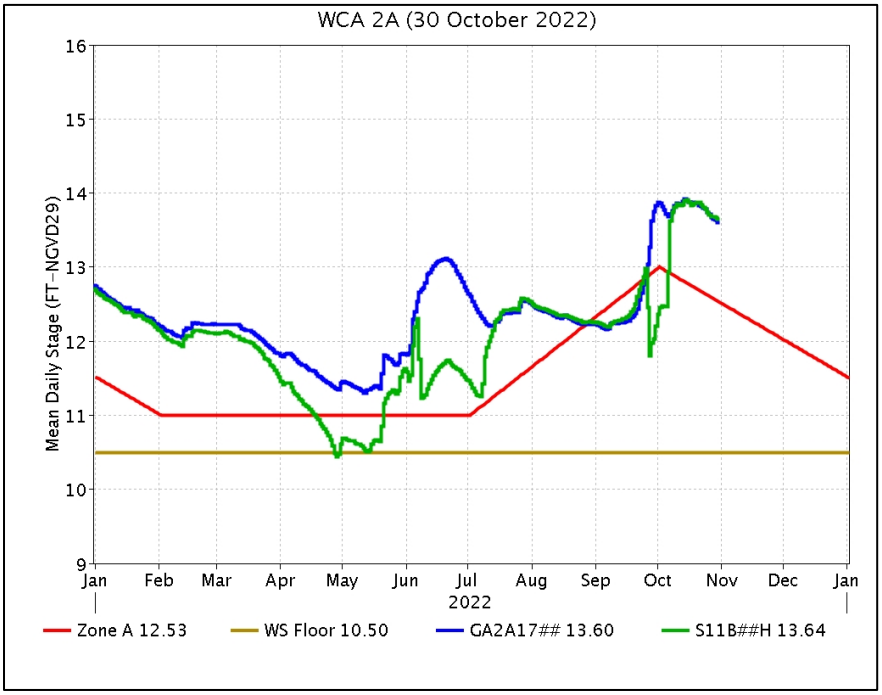


Figure EV-2. WCA-2A stage hydrographs and regulation schedule.

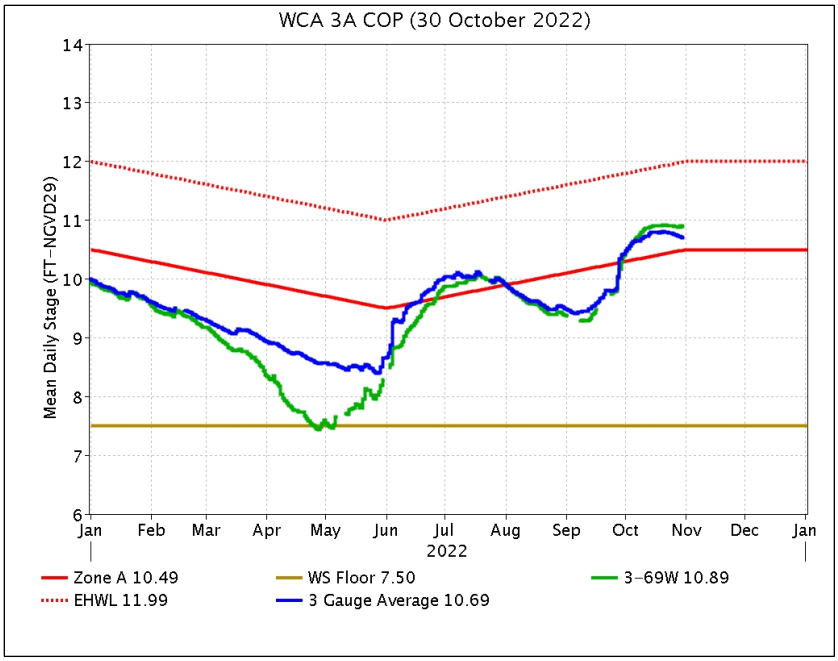


Figure EV-3. WCA-3A stage hydrographs (three-gauge average, S-333 headwater) and regulation schedule.

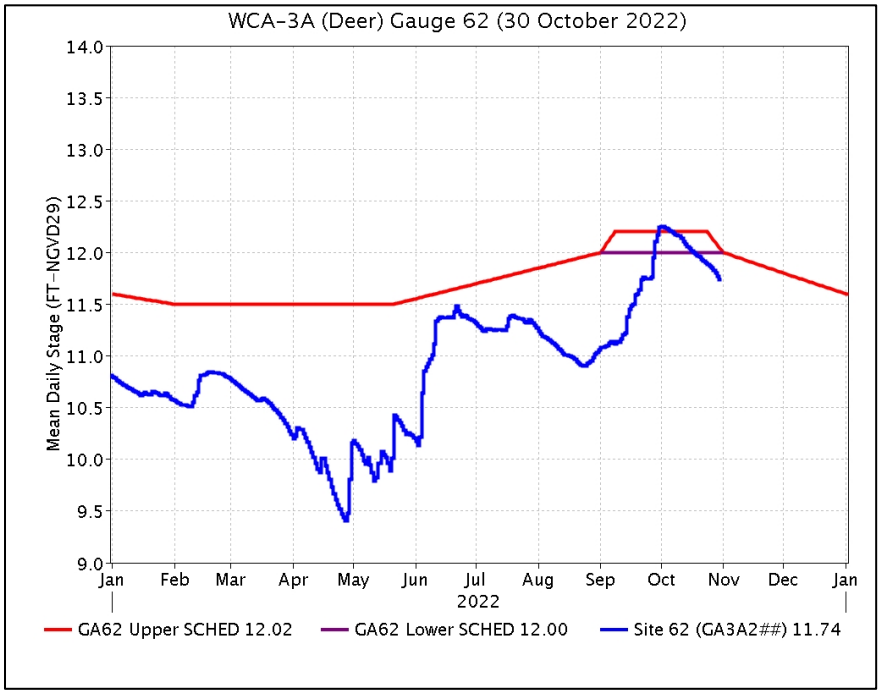


Figure EV-4. WCA-3A stage hydrograph (Deer gauge; Site 62) and CA62 regulation schedule.

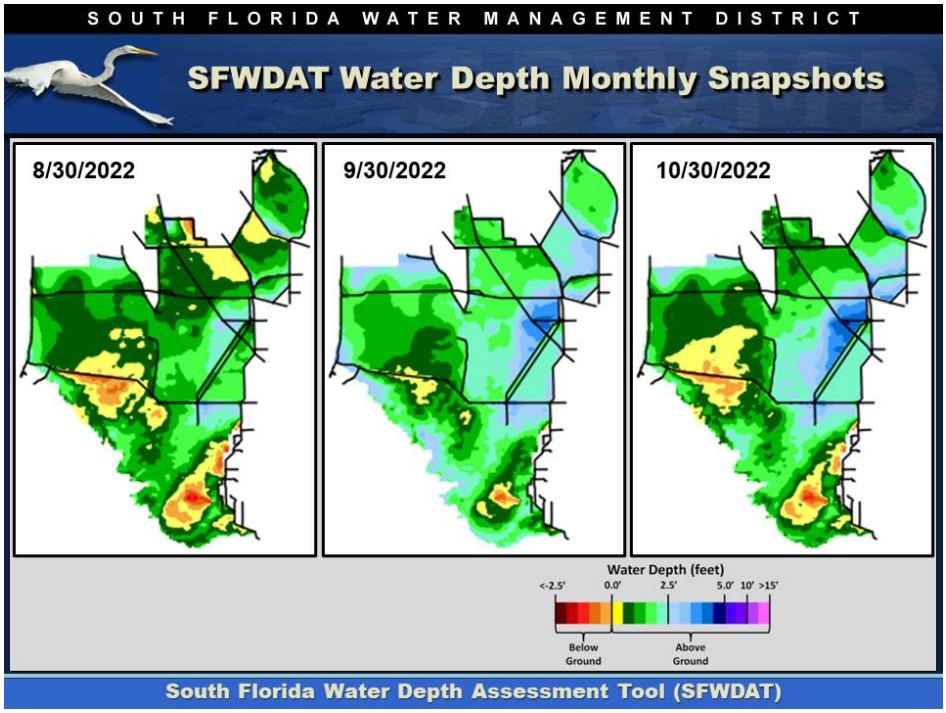


Figure EV-5. Everglades water depths from two months ago (left), one month ago (center) and present (right), based on SFWDAT.

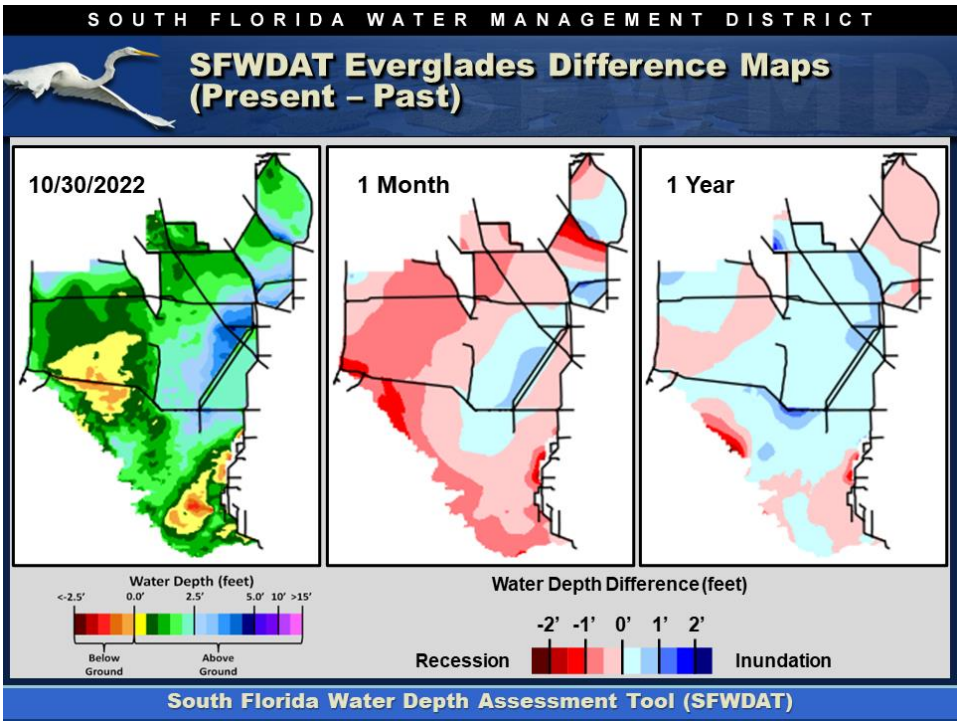


Figure EV-6. Present Everglades water depths (left) and water depth changes from one month (center) and one year (right) ago, based on SFWDAT.

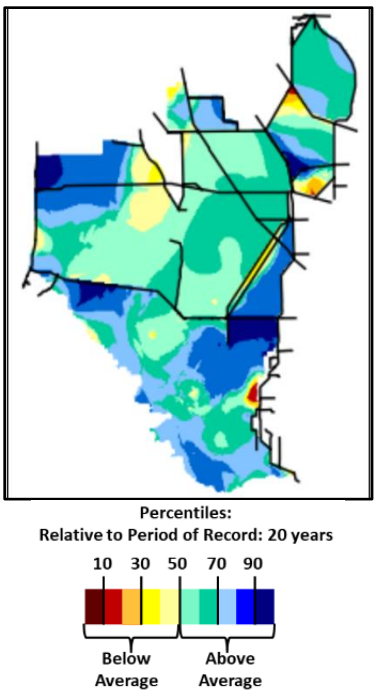


Figure EV-7. Present water depths (10/30/2022) compared to the day of year median over the previous 20 years.

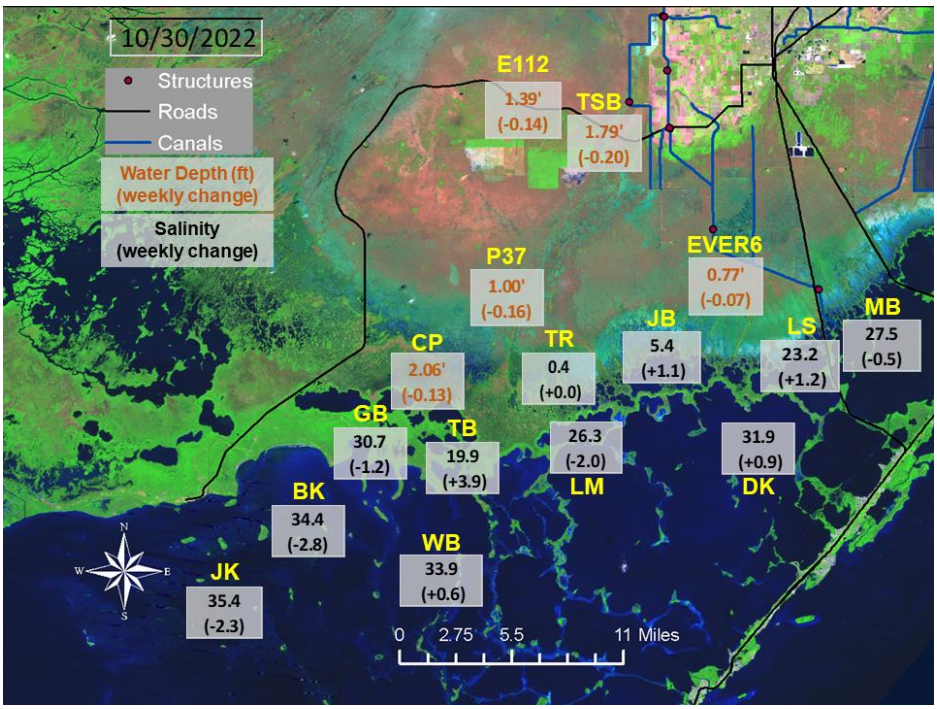


Figure EV-8. Taylor Slough water depths with changes since a week ago and Florida Bay salinities with changes since a week ago.

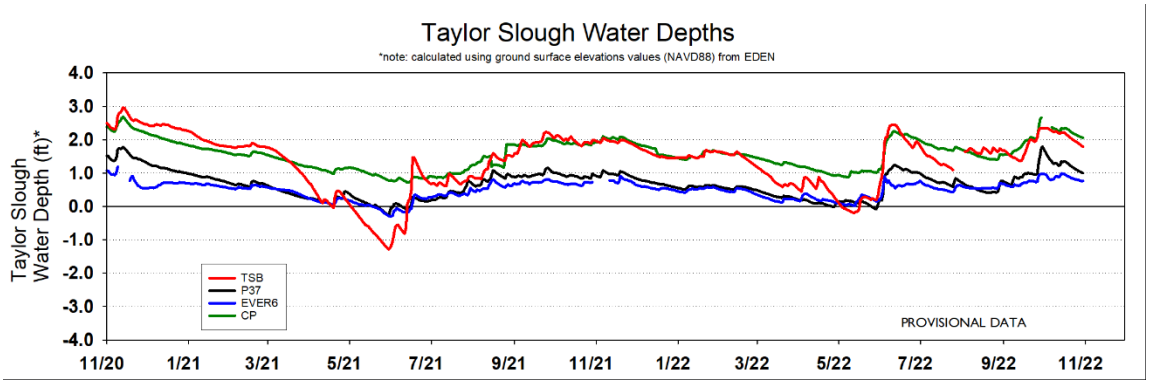


Figure EV-9. Taylor Slough water depth time series.

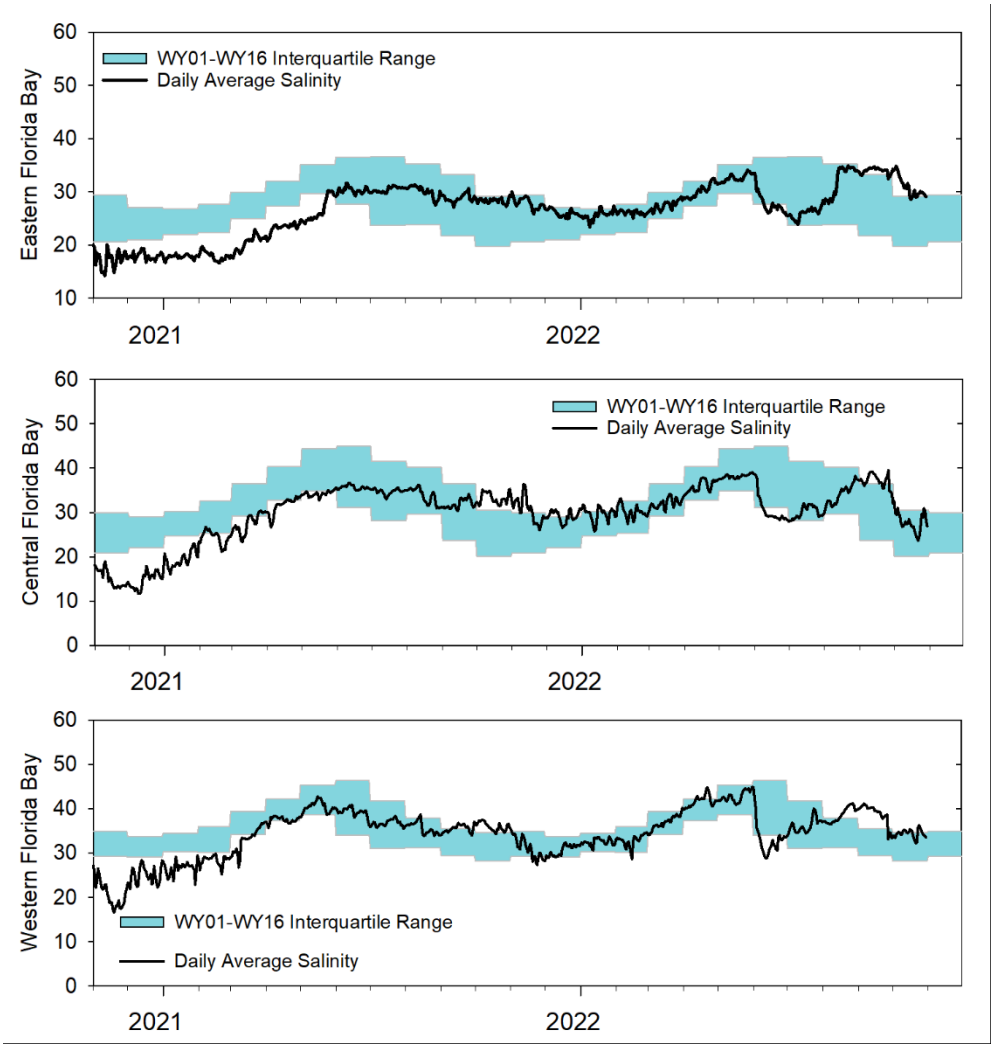


Figure EV-10. Eastern (top panel), Central (middle panel) and Western (bottom panel) Florida Bay daily average salinities with interquartile (25-75 percentile) ranges.

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

SFWMD Everglades Ecological Recommendations, November 1st, 2022 (red is new)			
Area	Weekly change	Recommendation	Reasons
WCA-1	Stage decreased by 0.07’	Conserve water in this basin as possible. Recession rate of less than 0.06’ per week.	Protect within basin and downstream habitat and wildlife.
WCA-2A	Stage decreased by 0.20’	Conserve water in this basin as possible. Recession rate of less than 0.06’ per week.	Protect within basin and downstream habitat and wildlife. Protect conditions conducive to wading bird foraging later in the season.
WCA-2B	Stage increased by 0.16’	Ascension rate of less than 0.25 feet per week.	Protect within basin and downstream habitat and wildlife.
WCA-3A NE	Stage decreased by 0.16’	Conserve water in this basin as possible. Recession rate of less than 0.06’ per week	Protect within basin and downstream habitat and wildlife. Protect conditions conducive to wading bird foraging later in the season.
WCA-3A NW	Stage decreased by 0.17’	Conserve water in this basin as possible. Recession rate of less than 0.06’ per week	
Central WCA-3A S	Stage decreased by 0.07’	Conserve water in this basin as possible. Recession rate of less than 0.12’ per week	Protect within basin and downstream habitat and wildlife.
Southern WCA-3A S	Stage decreased by 0.05’		
WCA-3B	Stage decreased by 0.04’	Recession rate of less than 0.12’ per week.	Protect within basin and downstream habitat and wildlife. Lower fire risk.
ENP-SRS	Stage decreased by 0.01’	Make discharges to ENP according to COP and TTFF protocol while adaptively considering upstream and downstream ecological conditions. Discussions on water management within the system should be continued.	Protect within basin and upstream habitat and wildlife.
Taylor Slough	Stage changes ranged from −0.200’ to −0.067’	Move water southward as possible.	When available, provide freshwater buffer for downstream conditions.
FB- Salinity	Salinity changes ranged from −2.8 to +3.9	Move water southward as possible	When available, provide freshwater to maintain low salinity buffer and promote water movement.

Biscayne Bay

As shown in **Figure BB-1**, mean total inflow to Biscayne Bay was 744 cfs, and the previous 30-day mean inflow was 980 cfs. The seven-day mean salinity was 27.2 at BBCW8 and 22.4 at BBCW10, both below the preferred maximum salinity of 35 for these sites. Data are provided by Biscayne National Park.

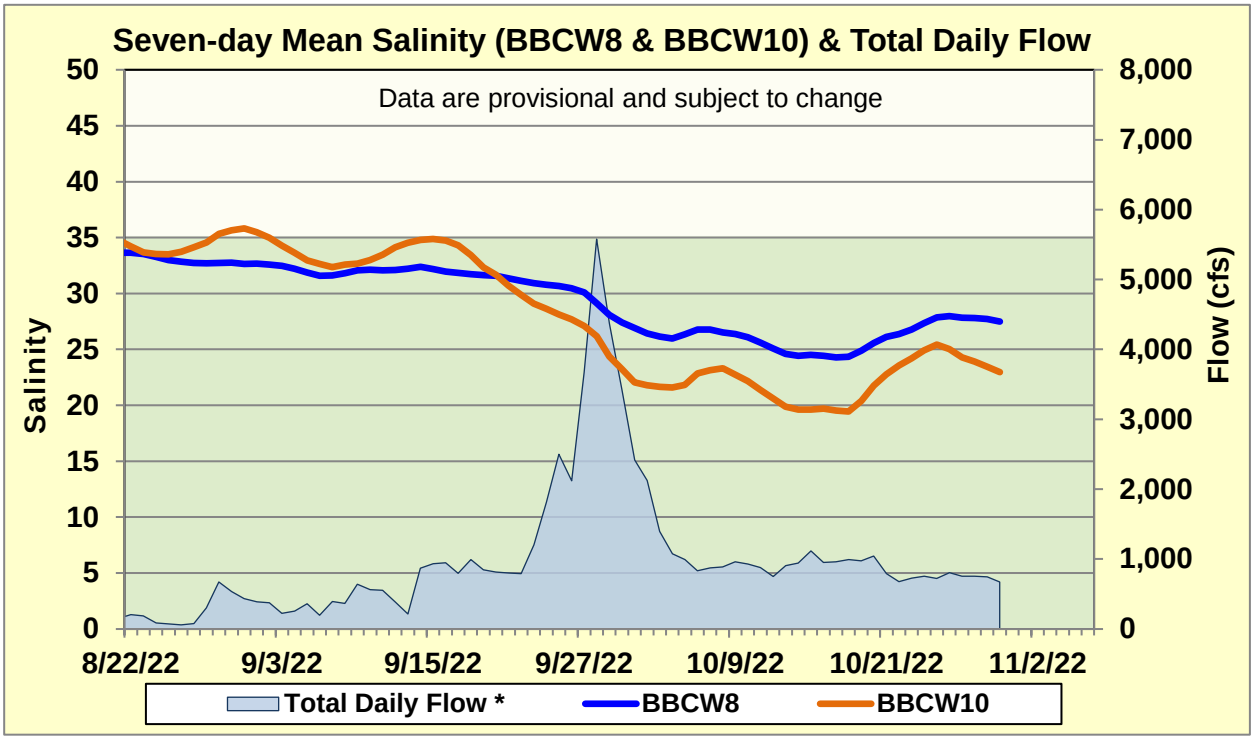


Figure BB-1. Seven-day mean salinity at BBCW8 and BBCW10 and total daily flow in Biscayne Bay. Total daily flow was calculated using flow from structures S20G, S20F, S21, S21A, S123, and S700P.