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 12, 2022

SUBJECT: Weekly Environmental Conditions for Systems Operations

Summary

Weather Conditions and Forecast

Moisture streaming east-northeastward from a tropical disturbance over the southwestern Gulf of Mexico, combined with strong *forced ascent* from an approaching trough, will result in some increase of rains on Wednesday and an even larger increase on Thursday. Wednesday's and Thursday's rainfall will account for nearly all of the rain this week, and between the two days, a widespread coverage of rainfall is expected along with the enhanced risk of localized, significant rainfall, especially on Thursday. A cold front associated with an upper-air trough will dive southward into the southeastern U.S. on Wednesday and the Florida Panhandle Thursday afternoon before sweeping southward to north of Lake Okeechobee during the early morning hours on Friday. The front should then lie nearly midway between the southeast coast of Florida and Lake Okeechobee around daybreak on Friday with a few light showers possible ahead of it. After a full frontal passage by the middle or late morning on Friday, a clearing will occur with dry, breezy, and somewhat cooler temperatures likely for the remainder of the day. The dry weather pattern is forecast to extend through Monday next week, even though the breezy conditions should diminish by late Saturday. For the week ending next Tuesday morning, total SFWMD rainfall is forecast to be below normal. However, if Wednesday and Thursday are wetter than currently predicted, total SFWMD rainfall could be near normal.

Kissimmee

Hurricane Ian passed over the Kissimmee Basin on September 28-29, 2022, bringing considerable rainfall that raised water levels in East Lake Toho (S-59), Lake Toho (S-61) and KCH (S-65) further above their respective regulation schedules. Discharge at their outlet structures is being adjusted to bring stage in each lake back to its respective regulation schedule. S-65A discharge was increased to 12,000 cfs to control a rainfall-driven stage rise in Pool A. With S-65A discharge continuing to rise above bank-full, water depth on the Kissimmee River floodplain rose to a mean depth of 5.23 feet on October 9, 2022. The average concentration of dissolved oxygen in the Kissimmee River increased from 0.8 mg/L to 1.3 mg/L over the week ending on October 9, 2022, only slightly above the potentially lethal level for largemouth bass of 1.0 mg/L.

Lake Okeechobee

Lake Okeechobee stage was 14.53 feet NGVD on October 9, 2022, with water levels 0.56 feet higher than previous week and 2 feet higher than a month ago. Lake stage was in the Low Flow band and within the ecological envelope. Average daily inflows (excluding rainfall) increased from the previous week. No outflows (excluding evapotranspiration) were reported last week**.** Pumping into the lake occurred at the S-3 pumping station in the southern part of the Lake. The most recent satellite image (October 8, 2022) from NOAA's Harmful Algal Bloom Monitoring System showed that bloom potential was low to moderate in the western part of the lake. The bloom potential decreased throughout the Lake since the previous week. Microcystins were not detected in the water during the October 3 - 5 routine survey. Chlorophyll *a* exceeded 40 µg/L (Lake-wide bloom threshold) at one site, with the highest value (49 µg/L) recorded at the PALMOUT location in the southwestern part of the Lake. Communities at 97% of the sites were mixed and at 3% were dominated by *Microcystis wesenbergii*.

Estuaries

Total inflow to the St. Lucie Estuary averaged 2,875 cfs over the past week with no flow coming from Lake Okeechobee. Mean salinities increased at all sites over the past week. Salinity in the middle estuary was in the stressful range (5-9) for adult eastern oysters.

Total inflow to the Caloosahatchee Estuary averaged 5,134 cfs over the past week with no flow coming from Lake Okeechobee. All deployed South Florida Water Management District 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 reporting again on October 5, 2022. Salinity is only reported for the period October 5-9, 2022 at the Val I-75 site where the average was 0.2 on the surface and bottom.

Stormwater Treatment Areas

For the week ending Sunday, October 9th, 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 770,000 ac-feet. STA cells are at or above 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 were in the “fair” or “good” category as rising water depths slowed in the aftermath of rainfall from Hurricane Ian. Depths remain near average for this time of year in WCA-3A North, and stages look favorable for wading bird nesting in that region, success will depend on the prey response. Taylor slough stages fell last week but remain above average depths for this time of the year. On average salinities fell last week in Florida Bay; the eastern region of the Bay remains above the inter quartile range but is trending downwards with positive creek flow.

Biscayne Bay

Total inflow to Biscayne Bay averaged 999 cfs and the previous 30-day mean inflow averaged 1,525 cfs. The seven-day mean salinity was 26.1 at BBCW8 and 22.8 at BBCW10, both below the preferred maximum salinity of 35. Salinity data provided as a courtesy by Biscayne National Park.

Supporting Information

Kissimmee Basin

Upper Kissimmee

On October 9, 2022, lake stages were 60.7 feet NGVD (3.4 feet above schedule) in East Lake Toho, 56.6 feet NGVD (2.3 feet above schedule) in Lake Toho, and 53.9 feet NGVD (2.1 feet above schedule) in Lakes Kissimmee-Cypress-Hatchineha (KCH) (**Table KB-1**, **Figures KB-1-3**).

Lower Kissimmee

On October 9, 2022, average daily discharge was increased to 13,000 cfs at S-65 and 12,000 cfs at S-65A to manage rainfall-driven rising water levels in KCH and Pool A, respectively. Average daily discharge from the Kissimmee River was 13,000 cfs at S-65D and 14,000 cfs at S-65E (**Table KB-2**). Headwater stages were 51.0 feet NGVD at S-65A and 28.5 feet NGVD at S-65D on October 9, 2022. As S-65A discharge to the Kissimmee River and local runoff increased, mean river channel stage rose by 0.45 feet (**Figure KB-4**) and water depth on the Kissimmee River floodplain increased to a mean depth of 5.23 feet on October 9, 2022 (**Figure KB-5**). The average concentration of dissolved oxygen in the Kissimmee River increased from 0.8 mg/L to 1.3 mg/L over the week ending on October 9, 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 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)	
							10/9/22	*10/2/22*
Lakes Hart and Mary Jane	S-62	LKMJ	400	63.8	R	60.3	3.5	3.8
Lakes Myrtle, Preston and Joel	S-57	S-57	0	65.7	R	61.3	4.4	4.4
Alligator Chain	S-60	ALLI	750	64.8	R	63.4	1.4	1.7
Lake Gentry	S-63	LKGT	1100	62.0	R	61.1	0.9	1.1
East Lake Toho	S-59	TOHOE	2000	60.7	R	57.3	3.4	3.6
Lake Toho	S-61	TOHOW S-61	2100	56.6	R	54.3	2.3	2.6
Lakes Kissimmee, Cypress and Hatchineha	S-65	KUB011 LKIS5B	13000	53.9	R	51.8	2.1	2.6

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.

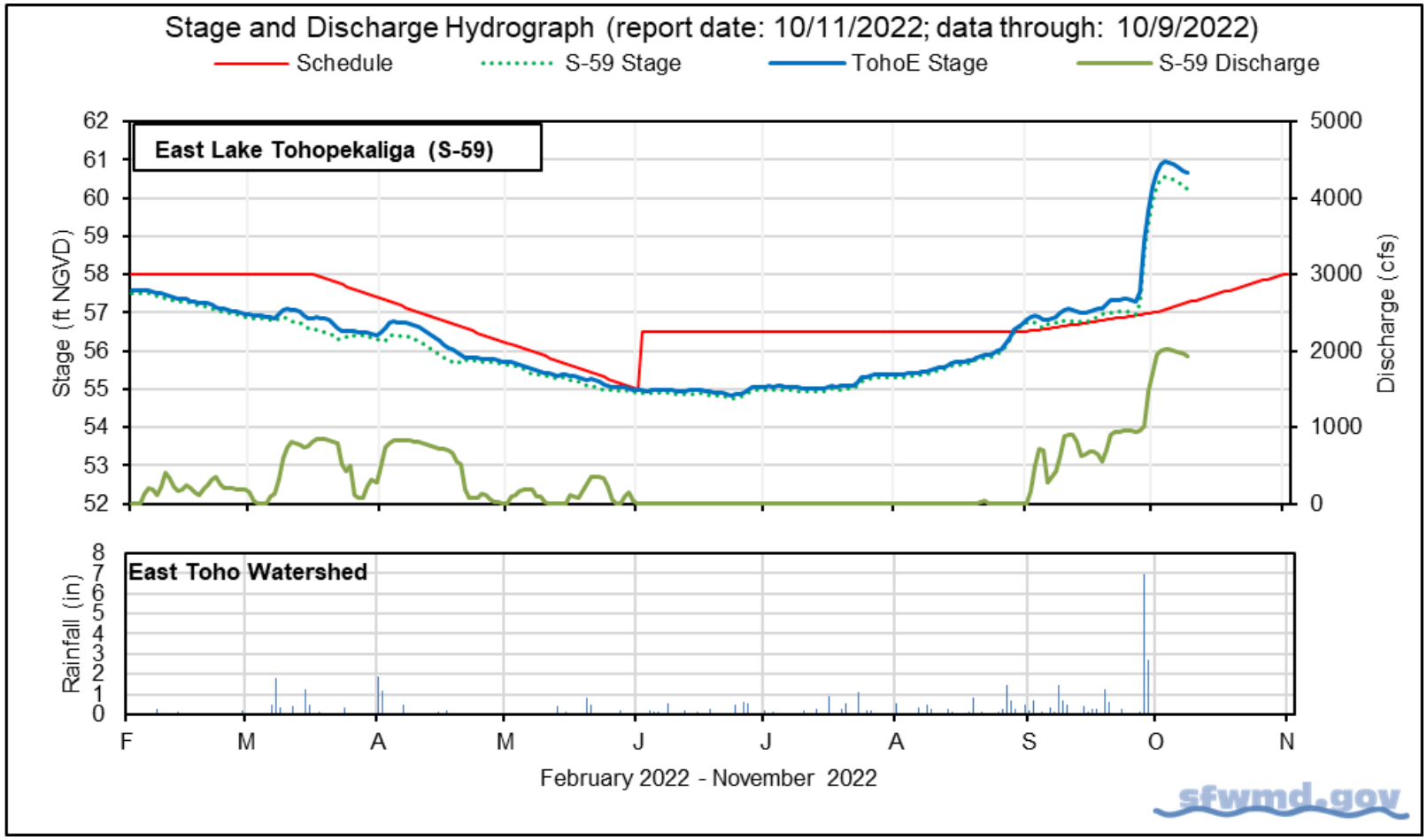


Figure KB-1. East Lake Toho regulation schedule, stage, discharge and rainfall.

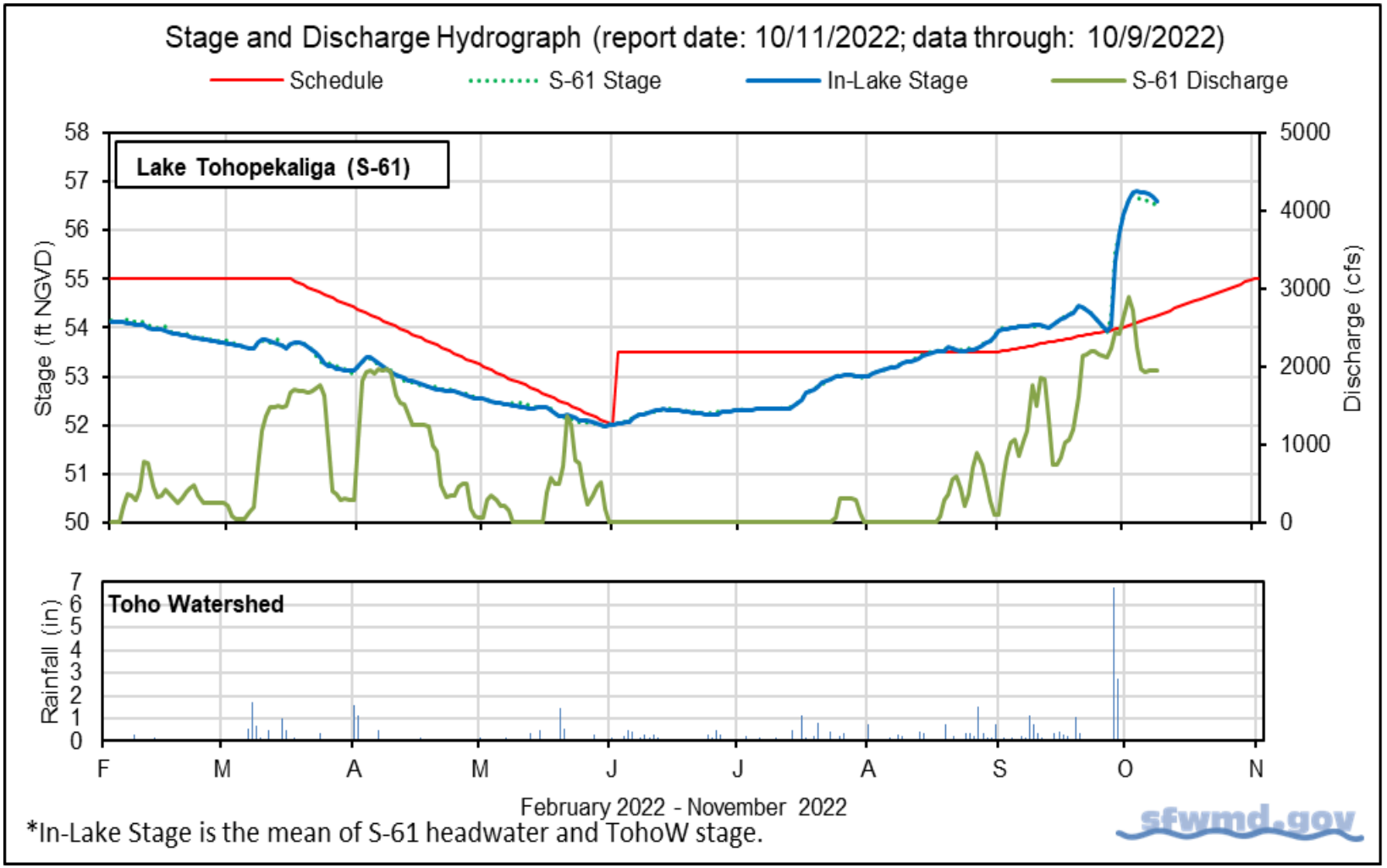


Figure KB-2. Lake Toho regulation schedule, stage, discharge and rainfall.

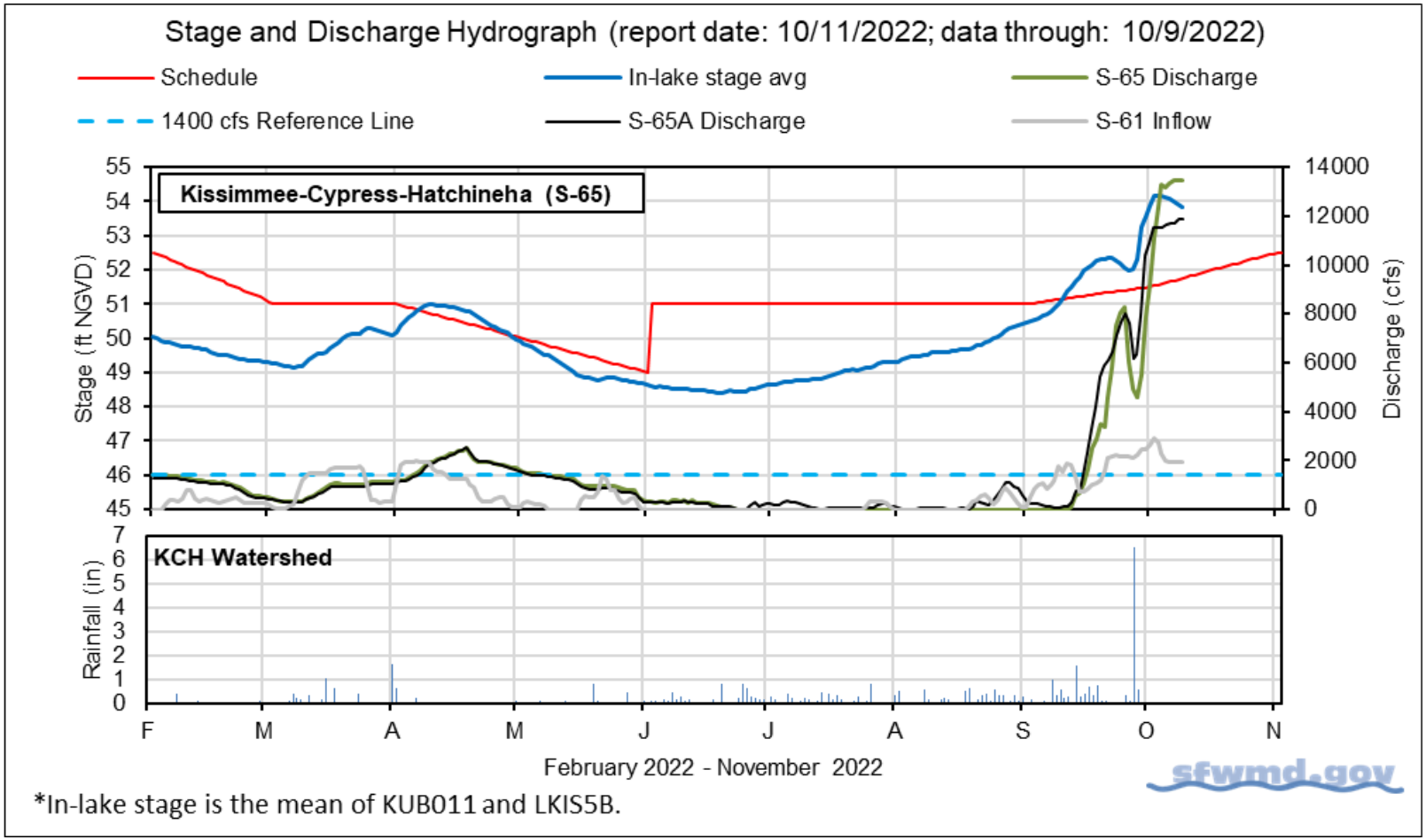


Figure KB-3. Lakes Kissimmee, Cypress and Hatchineha regulation schedule, stage, discharge and rainfall.

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			
		10/9/22	10/9/22	10/2/22	9/25/22	9/18/22
Discharge	S-65	13,000	13,000	7,000	5,900	1,300
Discharge	S-65A[a]	12,000	12,000	8,700	6,700	1,900
Headwater Stage (feet NGVD)	S-65A	51.0	51.0	49.2	47.9	46.8
Discharge	S-65D[b]	13,000	12,000	7,800	2,200	710
Headwater Stage (feet NGVD)	S-65D[c]	28.5	28.7	28.6	27.5	26.3
Discharge (cfs)	S-65E[d]	14,000	12,000	7,600	2,100	670
Discharge (cfs)	S-67	0	0	0	0	0
Dissolved Oxygen (mg/L) [e]	Phase I, II/III river channel	1.3	1.1	1.0	1.0	3.2
Mean depth (feet) [f]	Phase I floodplain	5.23	5.10	3.79	2.15	0.35

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).

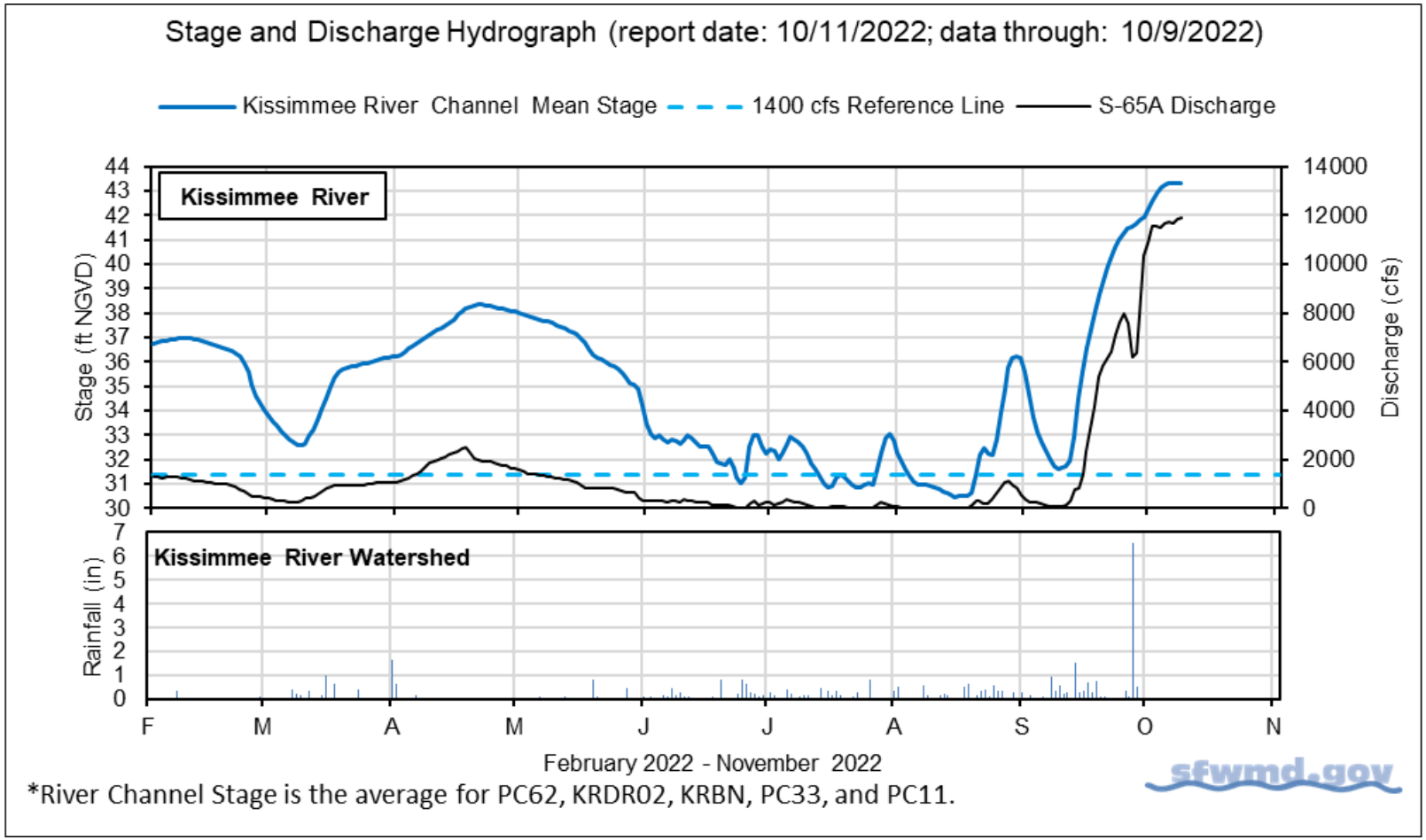


Figure KB-4. Kissimmee River stage, discharge and rainfall.

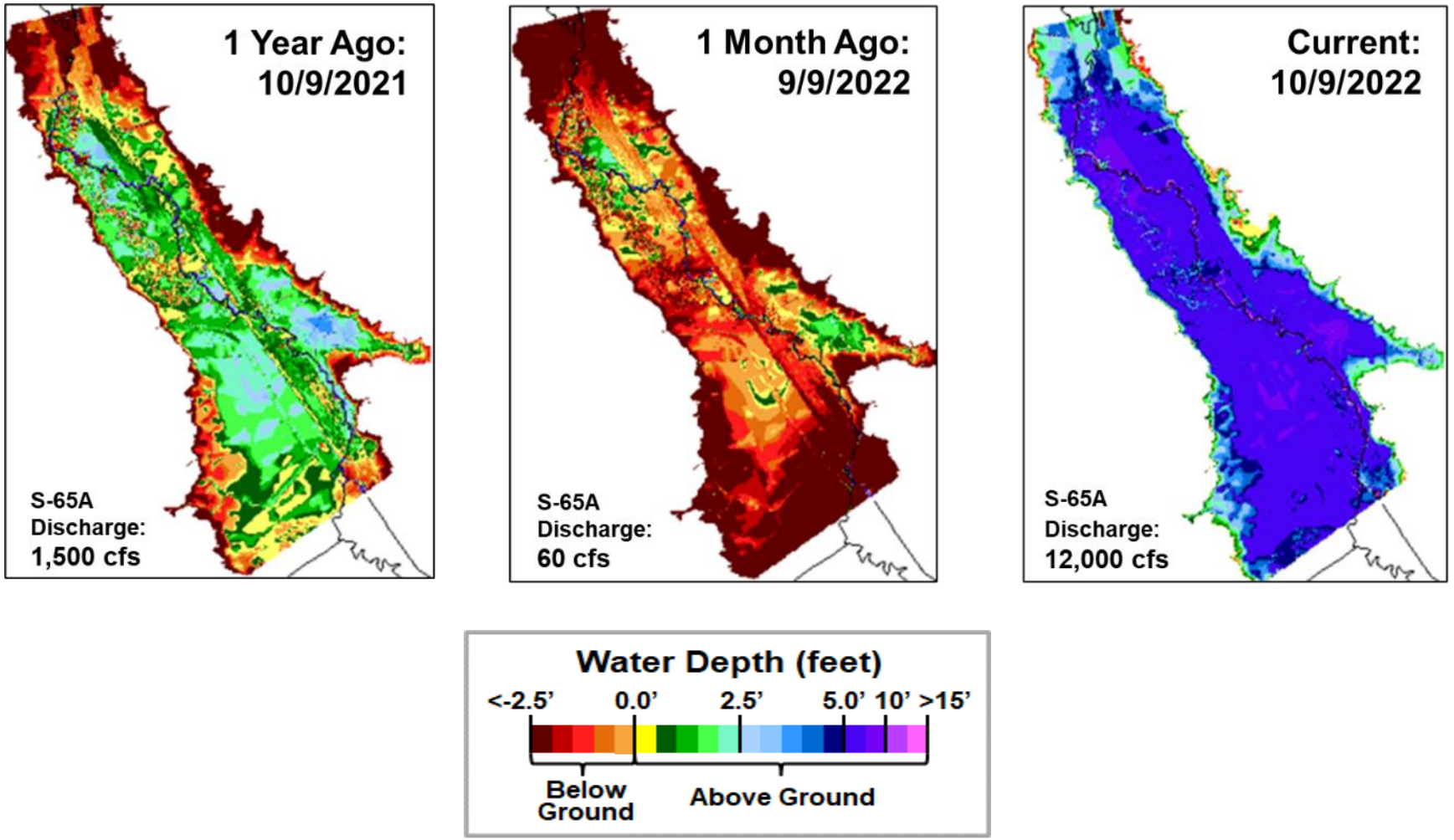


Figure KB-5. Phase I area Kissimmee River floodplain water depths (from left to right) one year ago, one month ago and current.

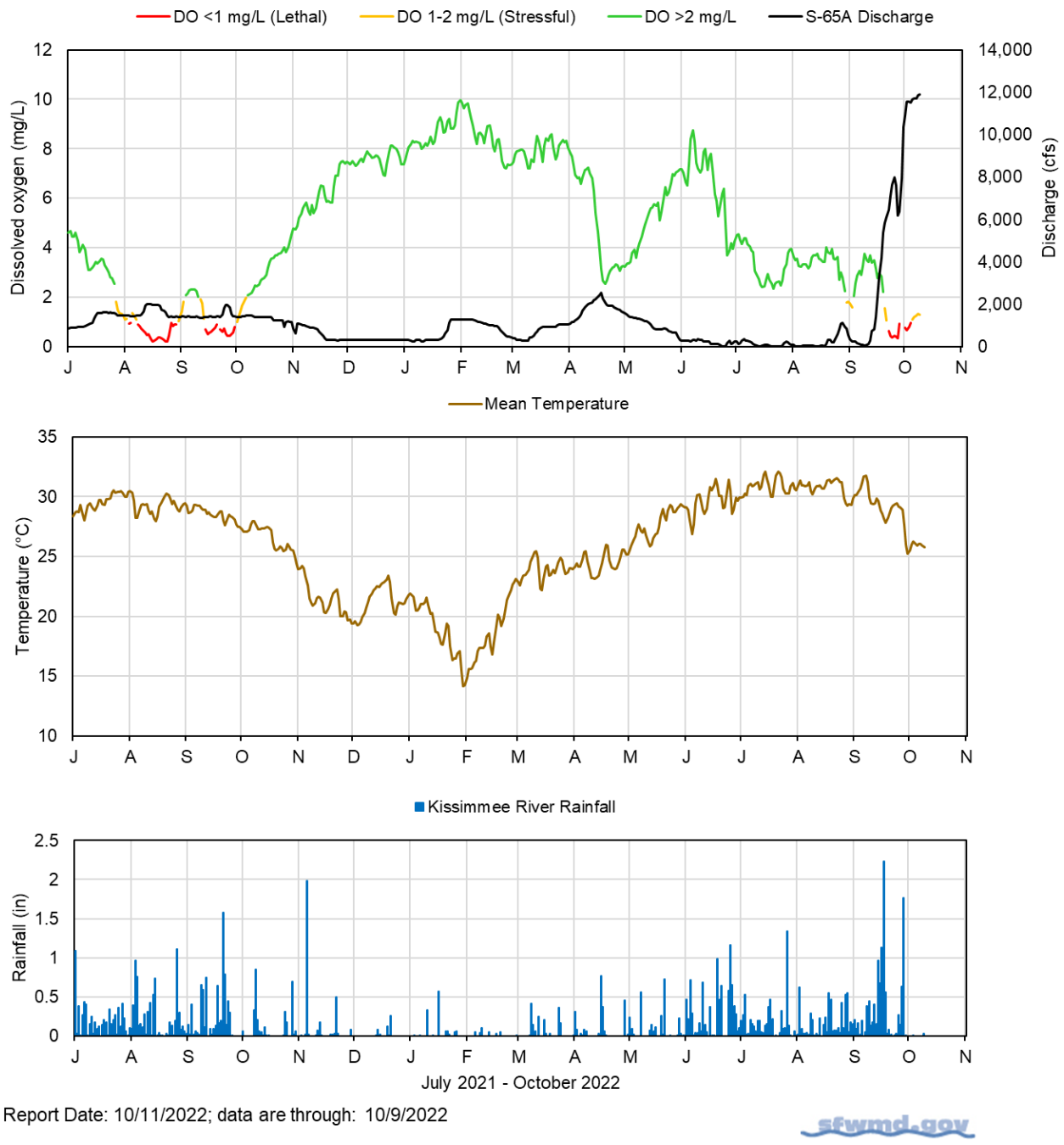


Figure KB-6. Restored Kissimmee river channel mean daily dissolved oxygen concentration (mg/L), S-65A discharge (cfs), temperature (°C) and rainfall (inches). Dissolved oxygen (DO) and temperature are mean daily values averaged for PC62, KRDR02, KRBN, PC33, PC11, PD62R, and PD42R with an average of five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

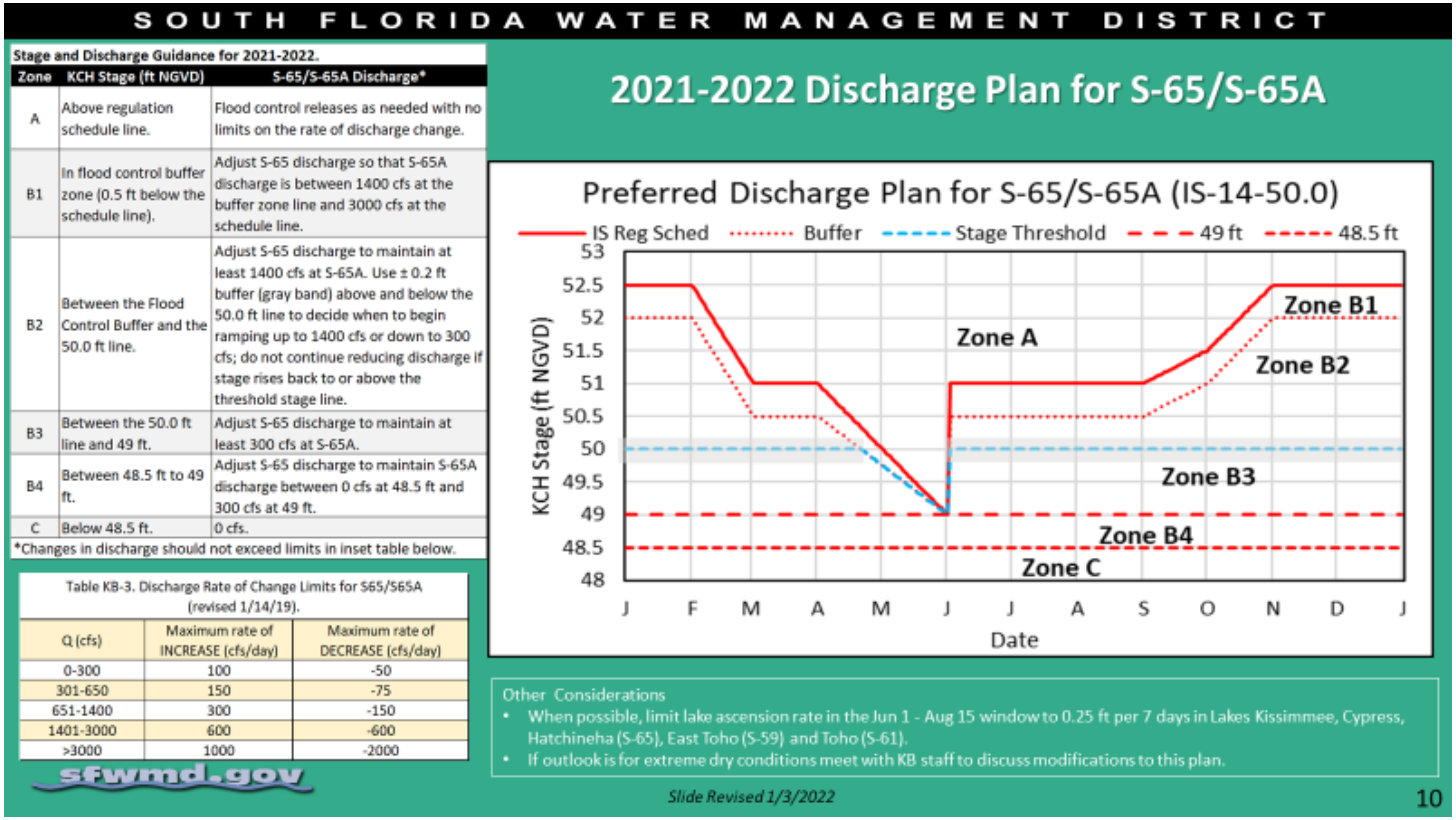


Figure KB-7. IS-14-50 Discharge Plan for S65/S65A with discharge rate of change limits (revised 1/14/19).

Lake Okeechobee

Lake Okeechobee stage was 14.53 feet NGVD on October 9, 2022, with water levels 0.56 feet higher than the previous week and 2 feet higher than a month ago (**Figure LO-1**). Lake stage entered the Low Flow sub band (**Figure LO-2**) and remains within the ecological envelope (**Figure LO-3**). According to NEXRAD, 0.06 inches of rain fell directly on the Lake last week.

Average daily inflows (excluding rainfall) increased from the previous week, going from 18,436 cfs to 19,609 cfs. Average daily outflows (excluding evapotranspiration) were 0 cfs for the fourth consecutive week. The highest inflow came from the Kissimmee River (C-38 Canal, 12,495 cfs), followed by 2,814 cfs from Fisheating Creek, 2,656 from the C-41a Canal (through S-84 & S-84X), and 715 cfs from the C-41 Canal (through S-71). Back flow was recorded from the L-8 Canal via the S-271 structure at an average daily rate of 363 cfs and the S-308 structure at an average daily rate of 8 cfs. There was no outflow to the west via the S-77 structure or to the south via the S-350 structures. Water was pumped into the Lake at the S-3 pumping station in the southern part of the Lake at an average rate of 65 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.

Surface water temperature remains 5 – 7 °C lower at the continuous monitoring stations on the Lake due to the sustained high canal inflows and lower air temperatures following the passage of Hurricane Ian. Water transparency decreased throughout the Lake as a result of increased turbidity following the passage of H. Ian.

The most recent satellite image (October 8, 2022) from NOAA's Harmful Algal Bloom Monitoring System showed that bloom potential was low to moderate in the western part of the lake. Overall bloom potential decreased across the Lake since last week (**Figure LO-6**). The October 3 - 5 survey revealed that only one site had chlorophyll *a* concentration above 40 µg/L (Lake-wide bloom threshold). The highest value (49 µg/L) was recorded at the PALMOUT location in the southwestern part of the Lake. All sites had total microcystins concentrations below detection limit (BDL). Communities at 97% of the sites were mixed, and 3% of the sites were dominated by *Microcystis wesenbergii* (**Figure LO-7).** Overall, the percentage of mixed taxa communities increased, and total phytoplankton biomass decreased throughout the Lake following the passage of H. Ian.

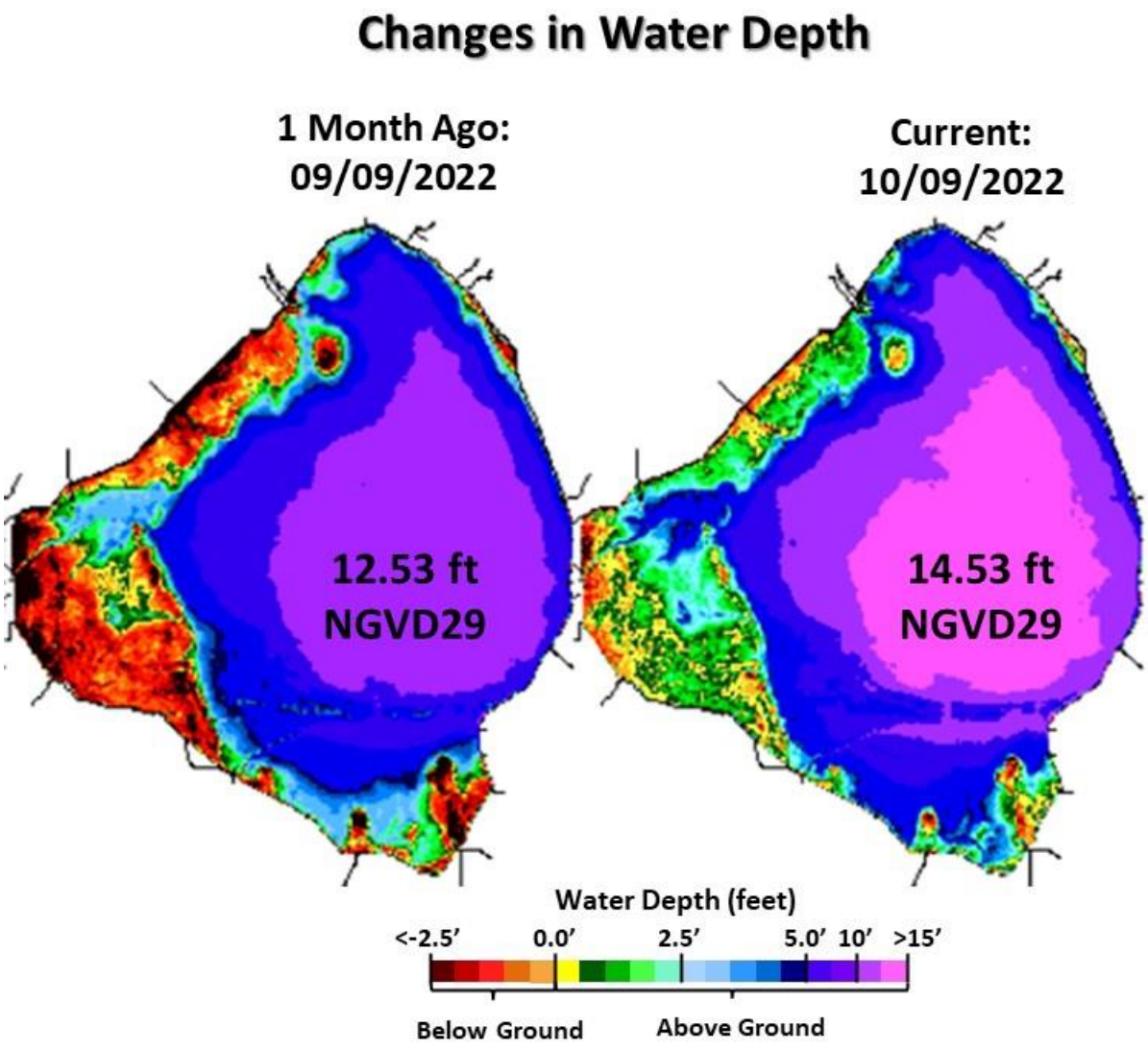


Figure LO-1. Lake Okeechobee water depth estimates based on South Florida Water Depth Assessment Tool (SFWDAT).

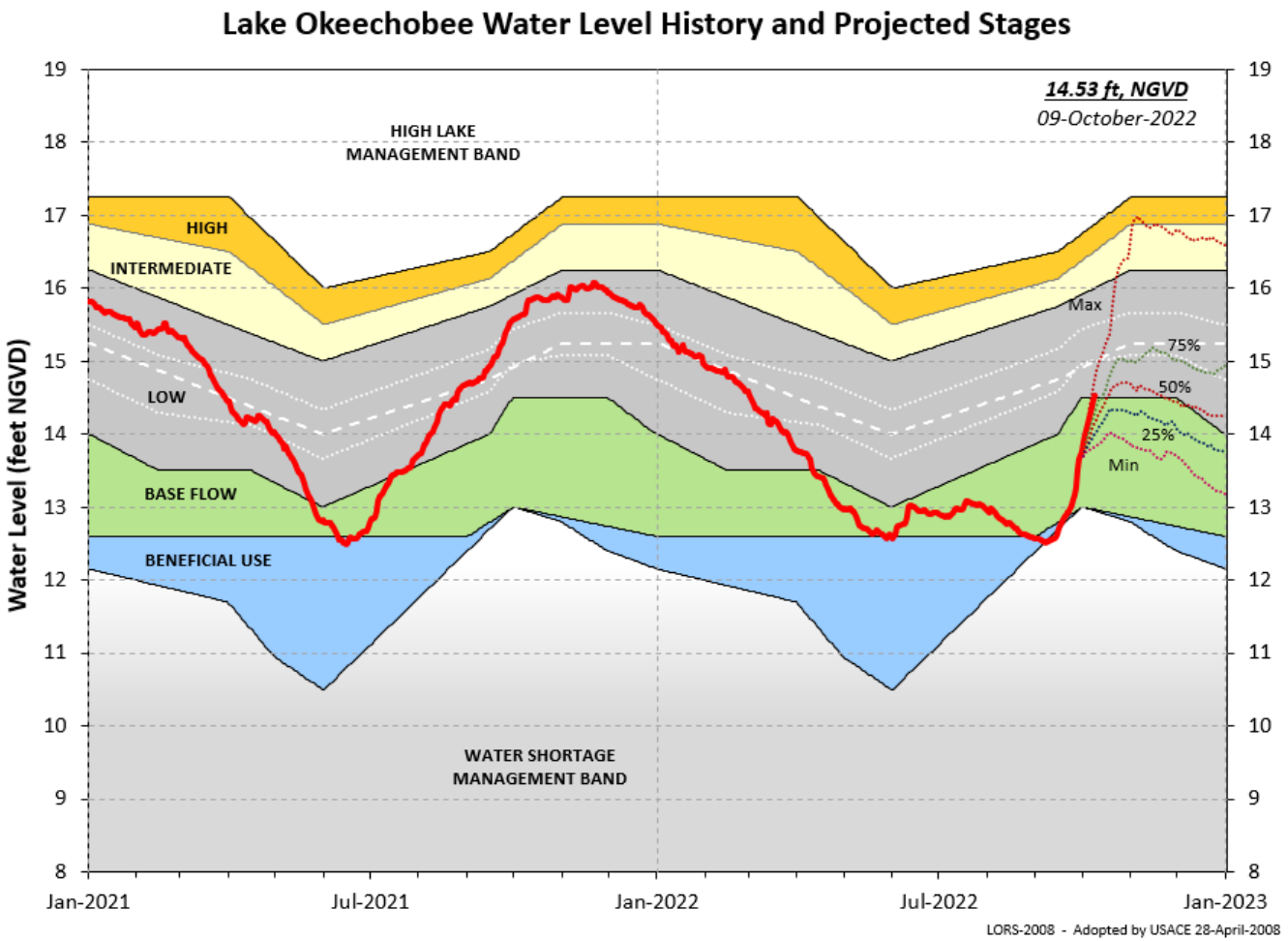


Figure LO-2. Recent Lake Okeechobee stages with projected stages based on a dynamic position analysis.

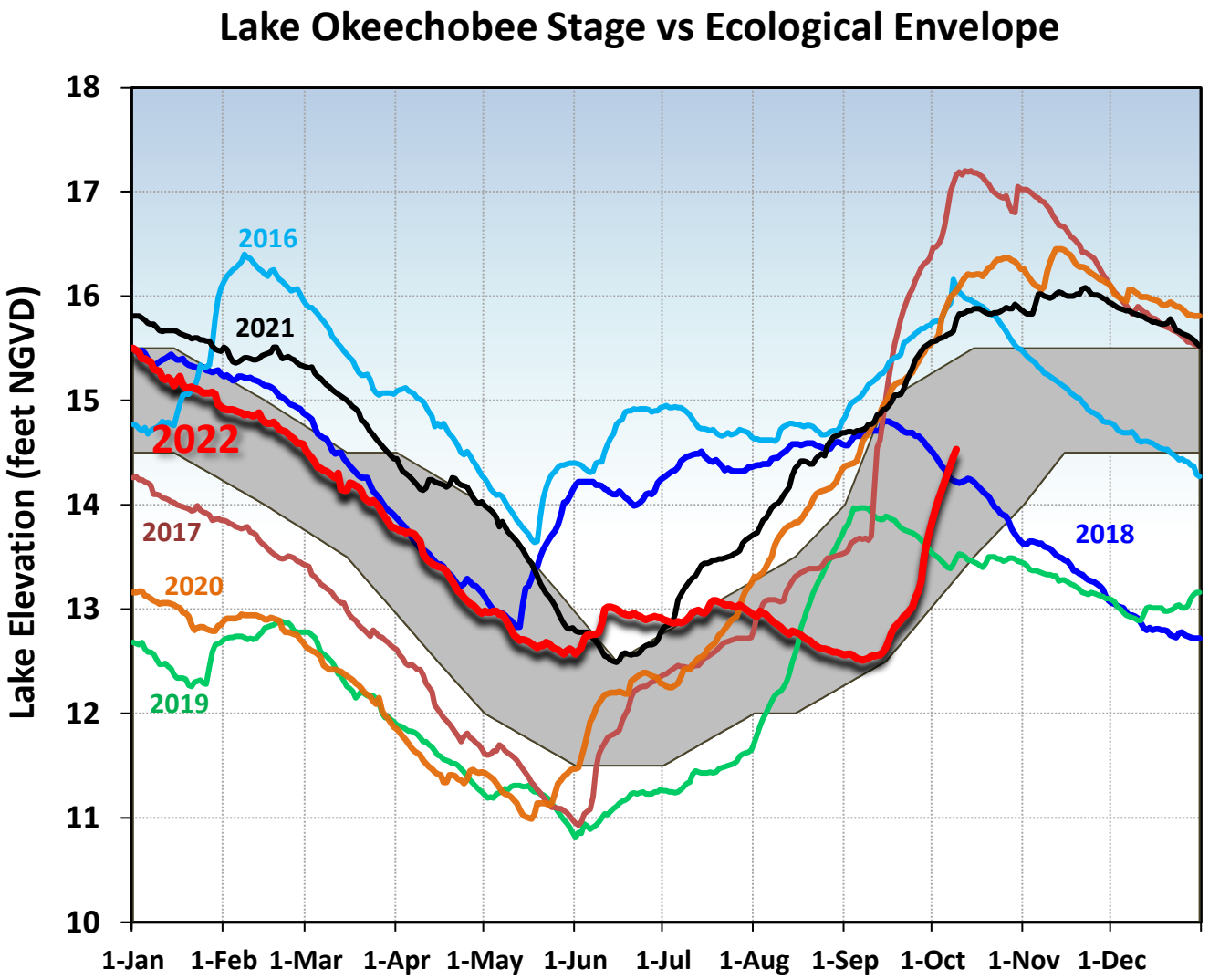


Figure LO-3. The prior six years of annual stage hydrographs for Lake Okeechobee in comparison to the ecological envelope.

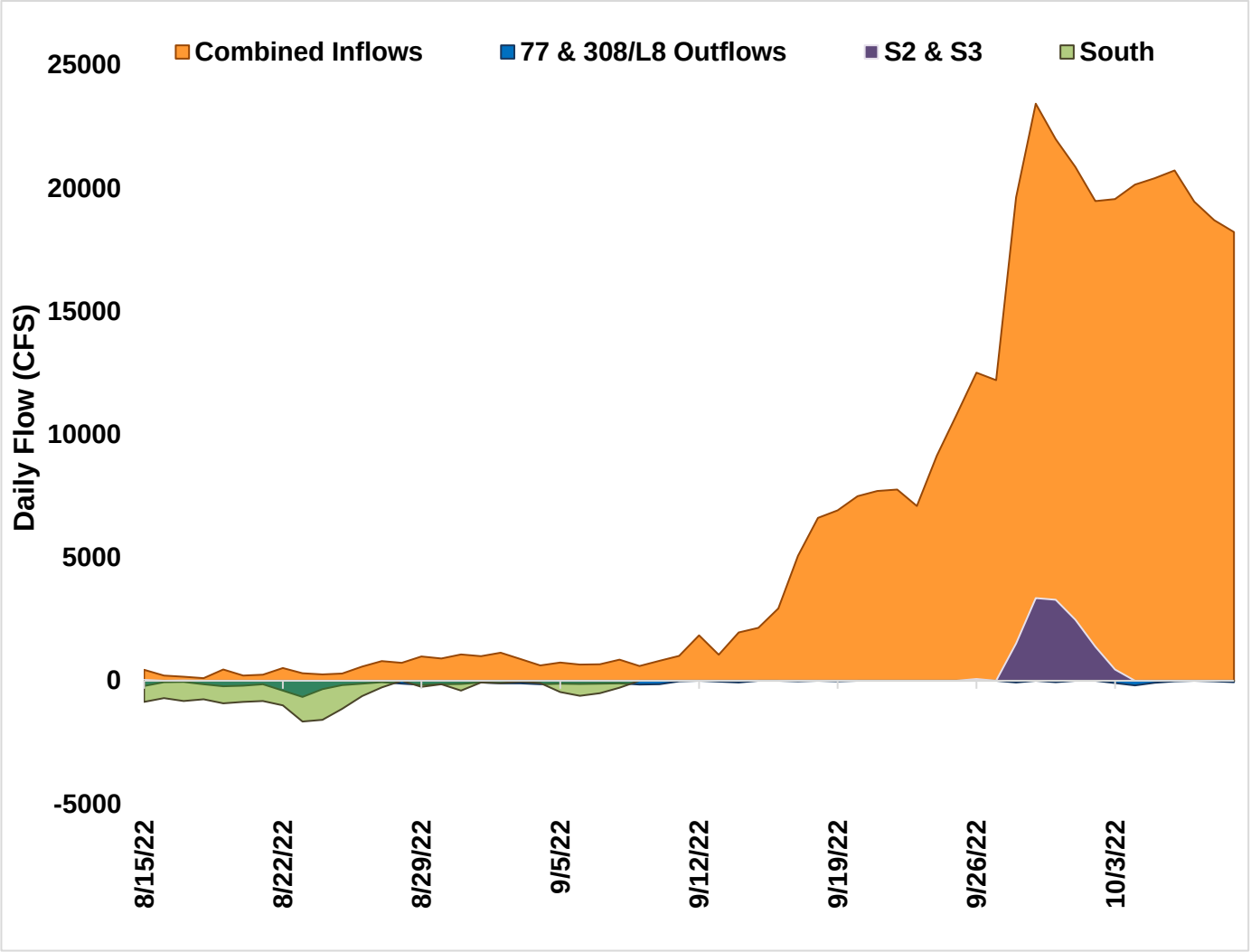


Figure LO-4. Major inflows (orange) to and outflows east and west (blue) from Lake Okeechobee. Outflows south are shown in green. Flows into Lake Okeechobee from the L-8 canal through S-271 (formerly Culvert 10A) or from the C-44 canal through the S-308 are included as inflows. Conversely, flows from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

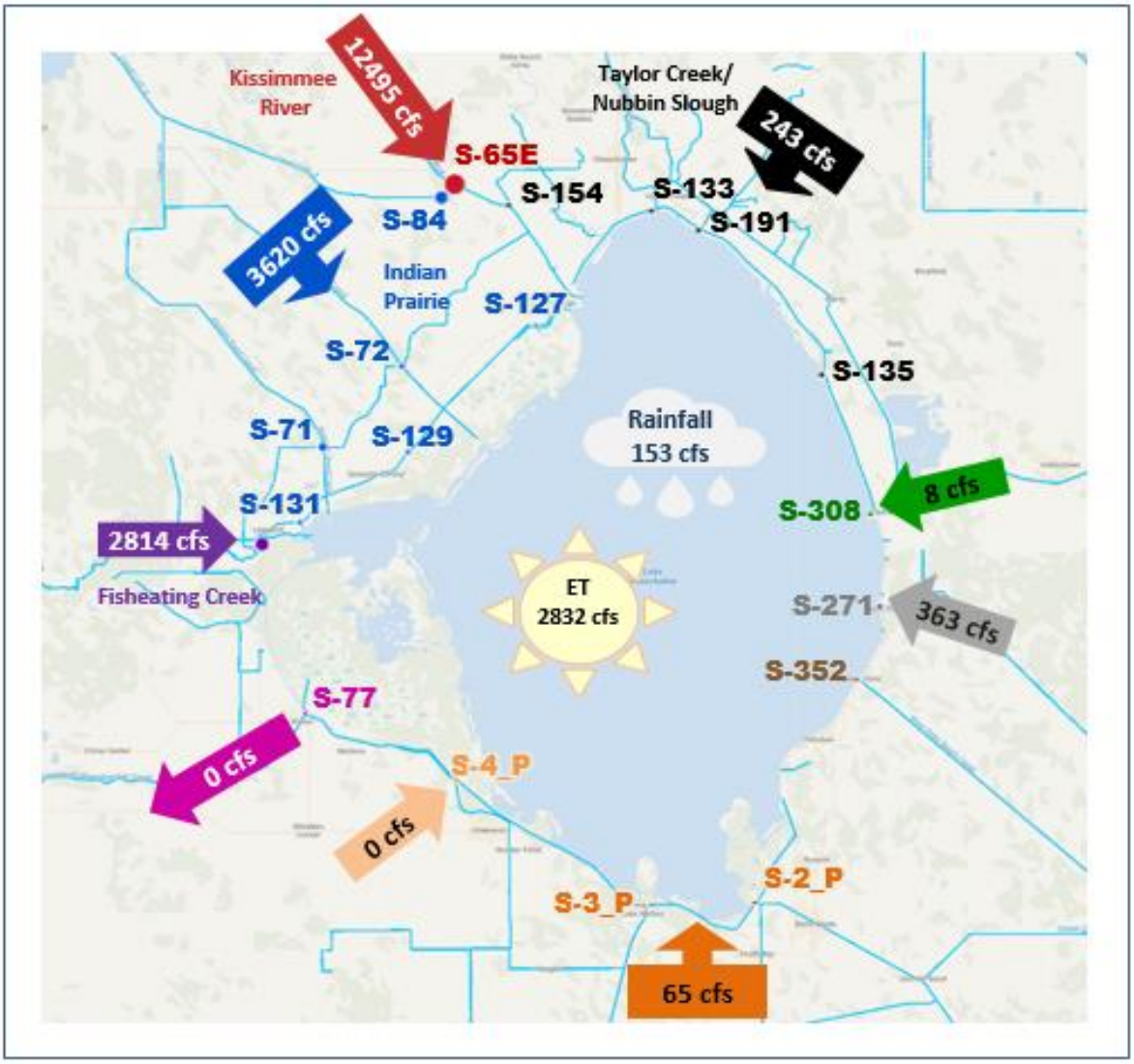


Figure LO-5. Inflows into Lake Okeechobee from Indian Prairie basins, Taylor Creek/Nubbin Slough, Kissimmee River and Fisheating Creek, and outflows to the west via S-77, to the east via S-308, to the south via S-351, S-352, S-354, and to southeast via S-271 (formerly Culvert 10A) for the week of October 3 - 9, 2022.

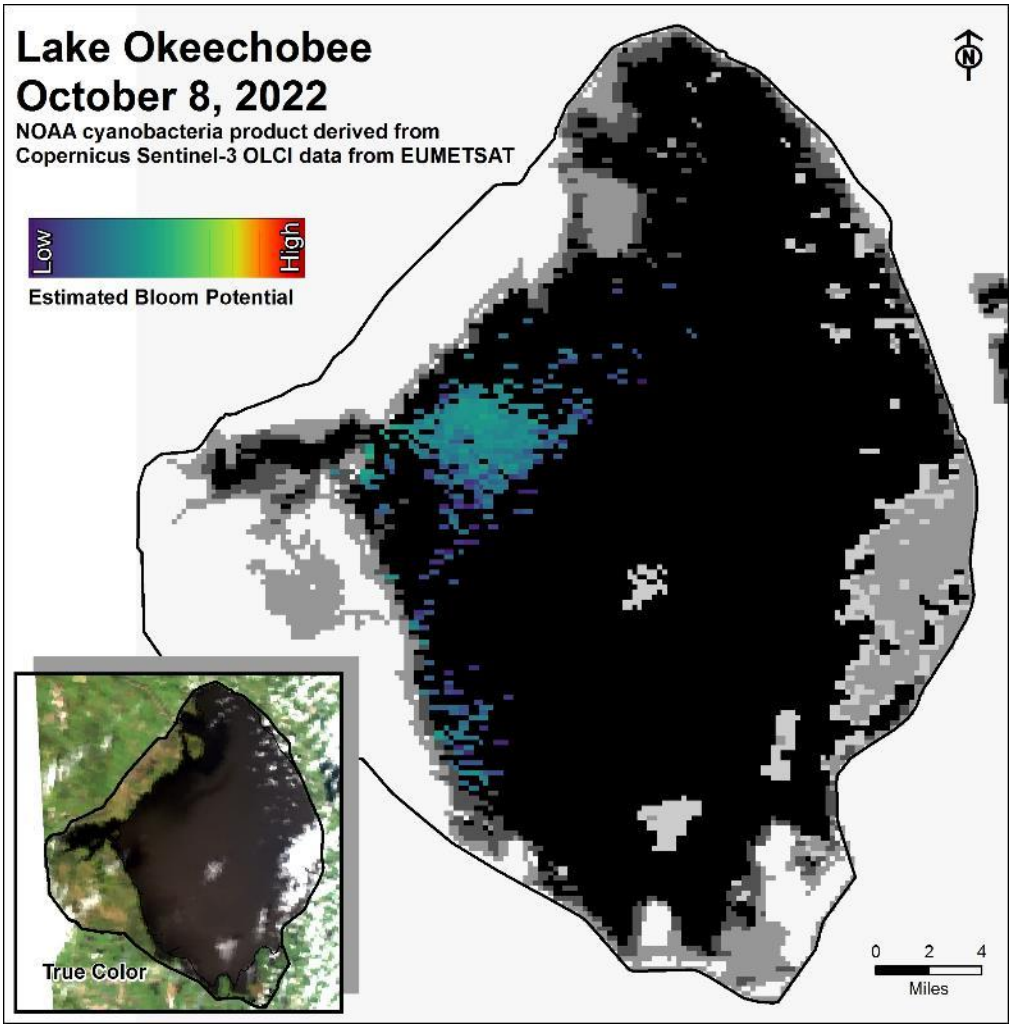


Figure LO-6. Cyanobacteria bloom potential on October 8, 2022 based on NOAA's harmful algal bloom monitoring system. Gray color indicates cloud cover.

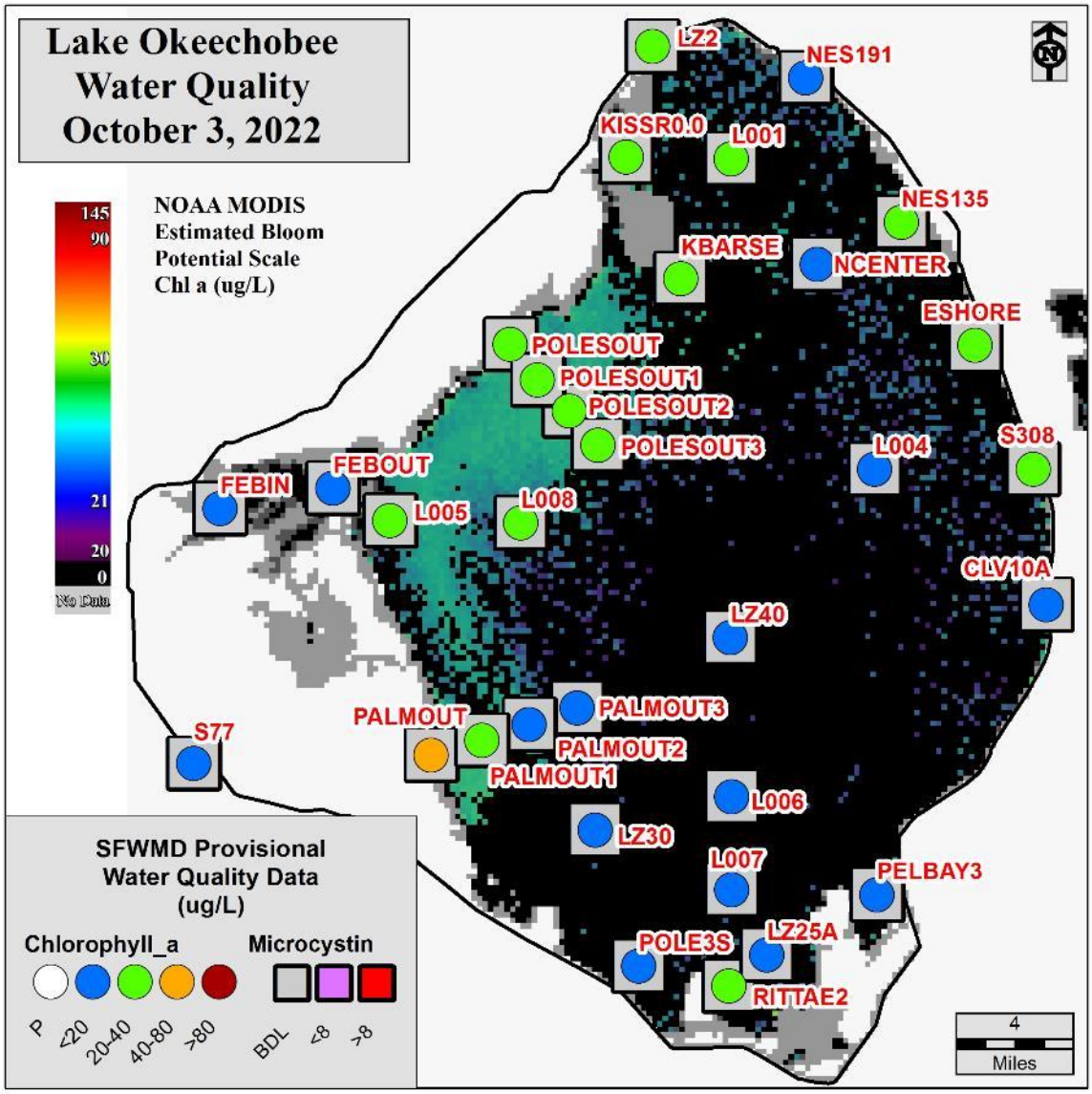


Figure LO-7. Expanded monitoring network and provisional chlorophyll *a* (µg/L) and total microcystins (µg/L) concentrations results from samples collected October 3 - 5, 2022.

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 2,875 cfs (**Figures ES-1** and **ES-2**) and the previous 30-day mean inflow was 3,875 cfs. For comparison, the historical provisional mean inflows from the contributing areas are shown in **Figure ES-2**.

Over the past week, 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 8.4. Salinity conditions in the middle estuary were estimated to be within the stressful 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**). Mean oyster density increased to 545 oysters/m^2 during the early September survey.

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 South Florida Water Management District 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, 2022.

Over the past week, mean total inflow to the Caloosahatchee River Estuary was 5,134 cfs (**Figures ES-6** and **ES-7**) and the previous 30-day mean inflow was 8,347 cfs. For comparison, the historical provisional mean inflows from the contributing areas are shown in **Figure ES-7**.

Salinity is only reported for the period October 5-9, 2022 at the Val I-75 site where the average was 0.2 on the surface and bottom (**Table ES-2** and **Figures ES-8** and **ES-9**). The mean larval oyster recruitment rate reported by the Fish and Wildlife Research Institute in September was 2.6 spat/shell at Iona Cove and 6.4 spat/shell at Bird Island (**Figures ES-11 and ES-12**). Mean oyster density increased to 183 oysters/m^2 at Iona Cove and 837 oysters/m^2 at Bird Island during the early September survey.

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 1500 cfs, and a steady release at 2,000 cfs with estimated tidal basin inflows of 570 cfs. Model results from all scenarios predict daily salinity to be 0.5 or lower and the 30-day moving average surface salinity to be 0.3 or lower at Val I-75 at the end of the two-week period (**Table ES-3** and **Figure ES-13**). 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 7, 2022, that *Karenia brevis*, the Florida red tide dinoflagellate, was not observed in any samples collected within the District region; however, no samples were collected from Charlotte, Lee or Collier counties. On the east coast, red tide was not observed in samples from Palm Beach County.

Water Management Recommendations

Lake stage is in the Low Sub-Band. Tributary conditions are very 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.

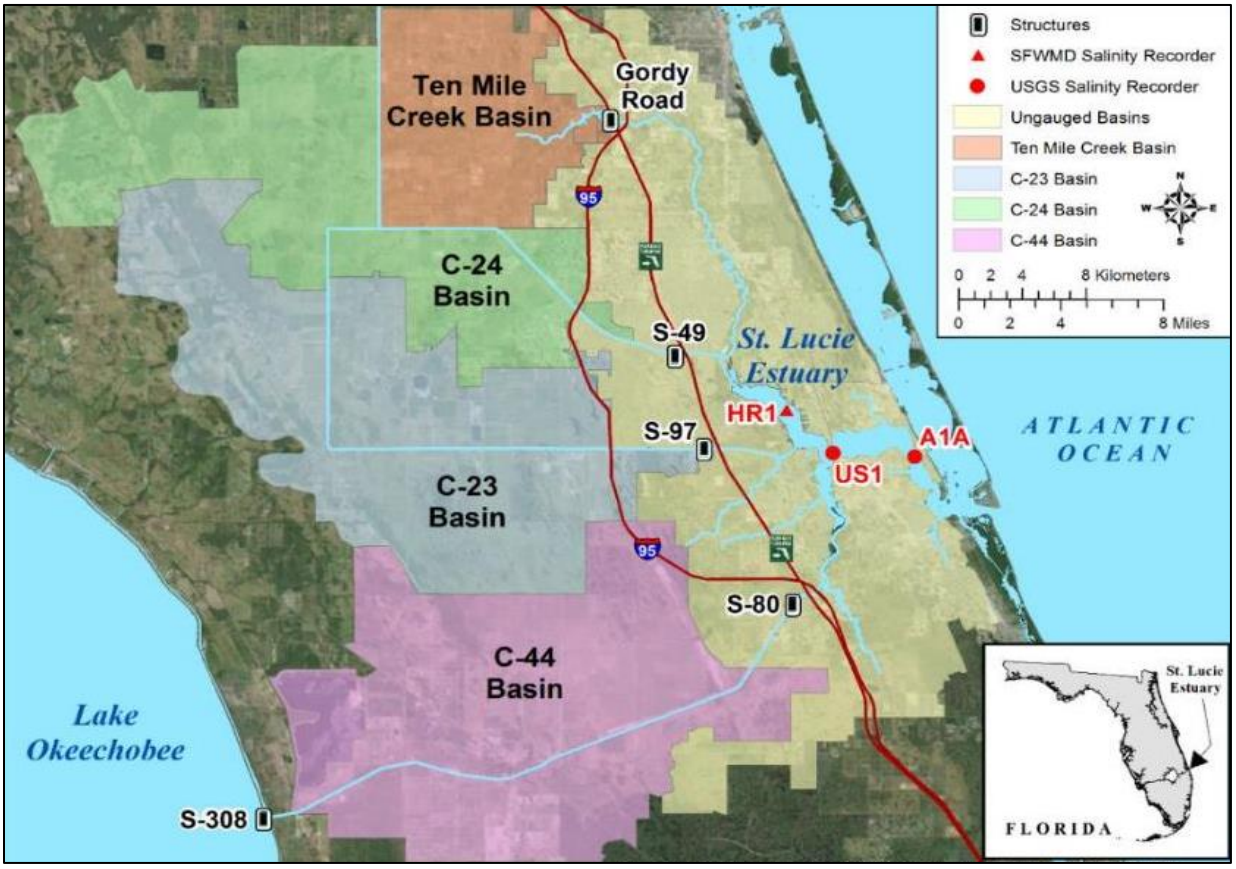


Figure ES-1. Basins, water control structures and salinity monitoring sites in the St. Lucie Estuary.

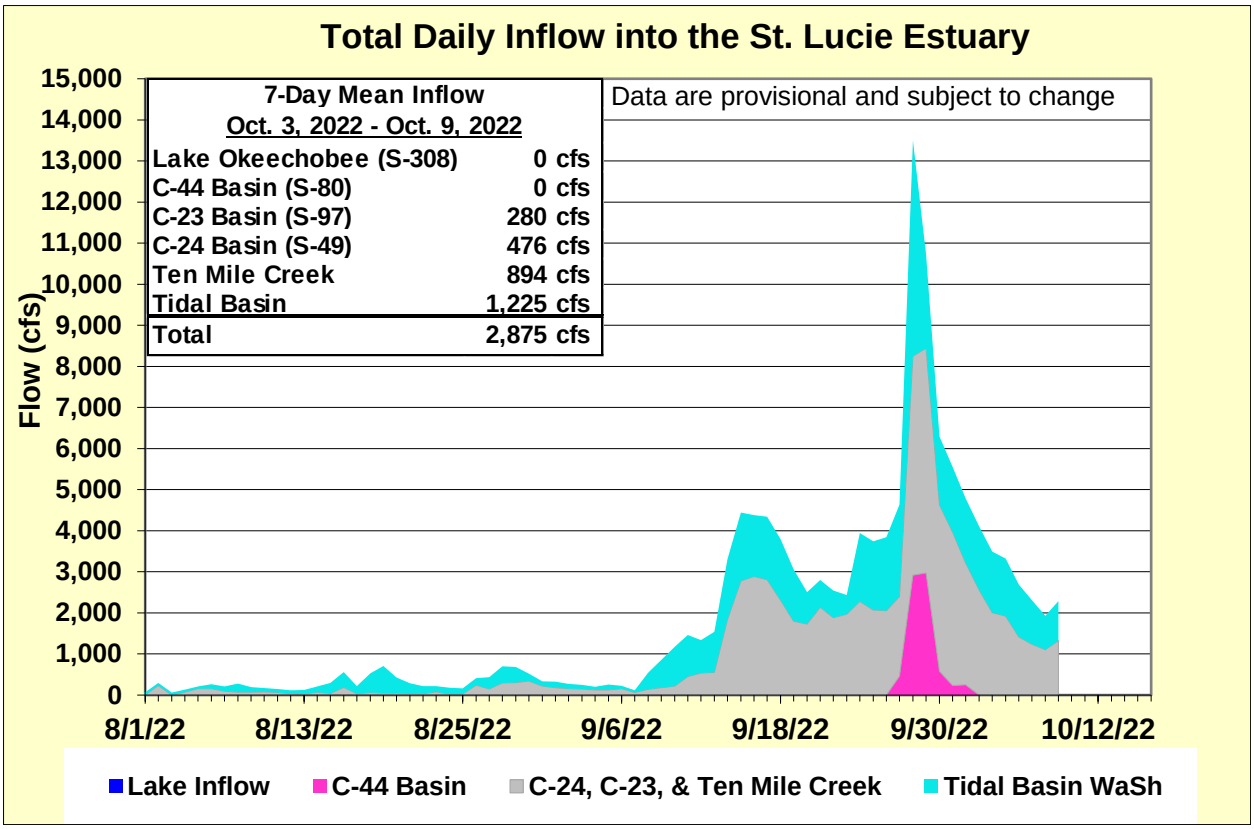


Figure ES-2. Total daily inflows from Lake Okeechobee and runoff from the C-44, C-23, C-24, Ten Mile Creek, and Tidal Basins into the St. Lucie Estuary.

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

Sampling Site	Surface	Bottom	Optimum Envelope
HR1 (North Fork)	**1.9** (0.8)	**3.8** (1.7)	10.0 – 25.0
US1 Bridge	**6.2** (3.0)	**10.6** (4.2)	10.0 – 25.0
A1A Bridge	**15.7** (8.1)	**24.0** (14.7)	10.0 – 25.0

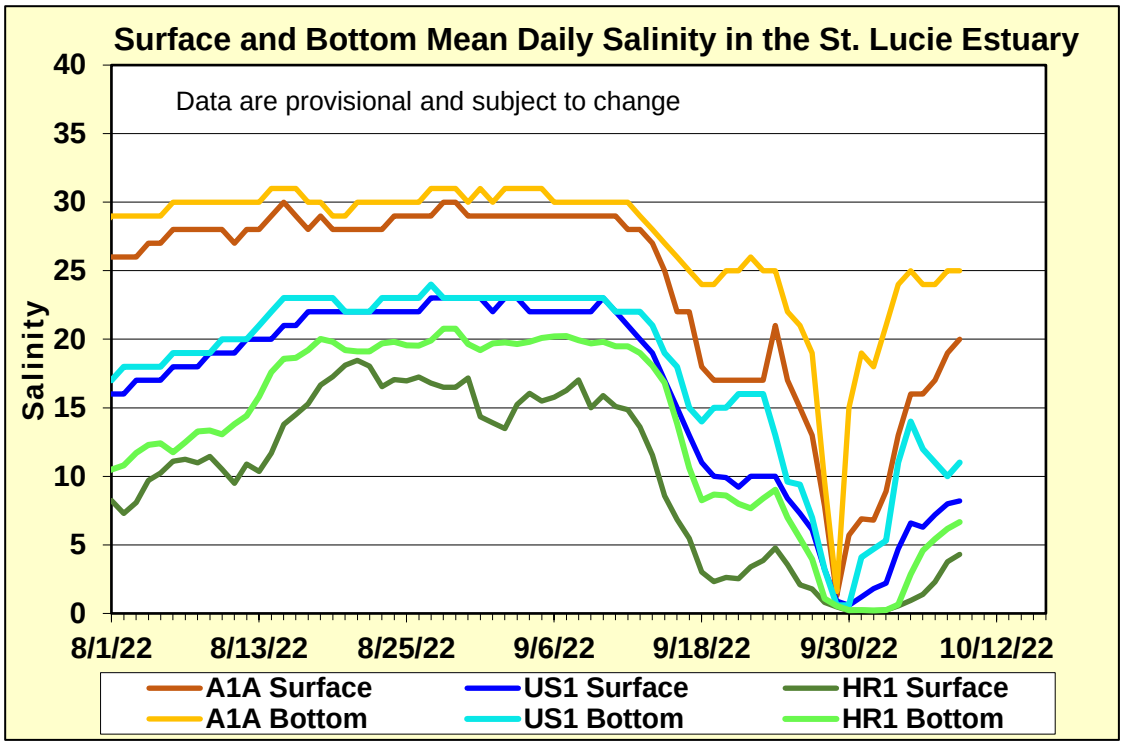


Figure ES-3. Mean daily salinity at the A1A, US1 and HR1 sites in the St. Lucie Estuary.

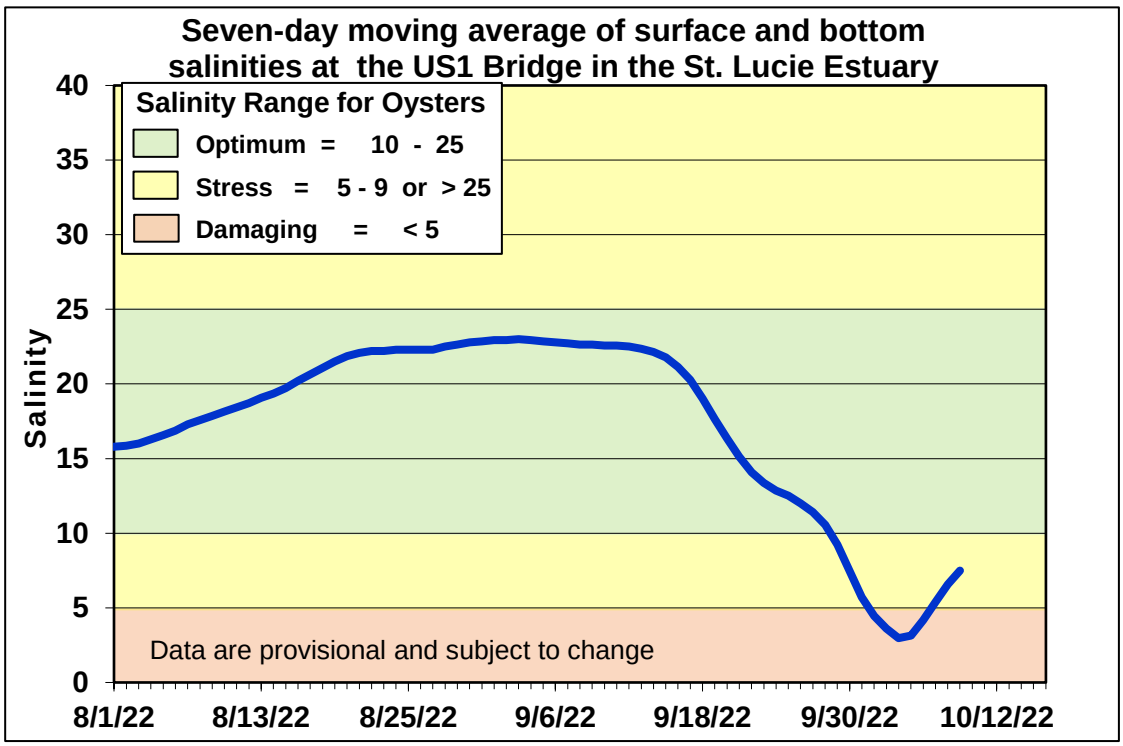


Figure ES-4. Seven-day moving average of the surface and bottom salinities at the US1 Bridge in the St. Lucie Estuary.

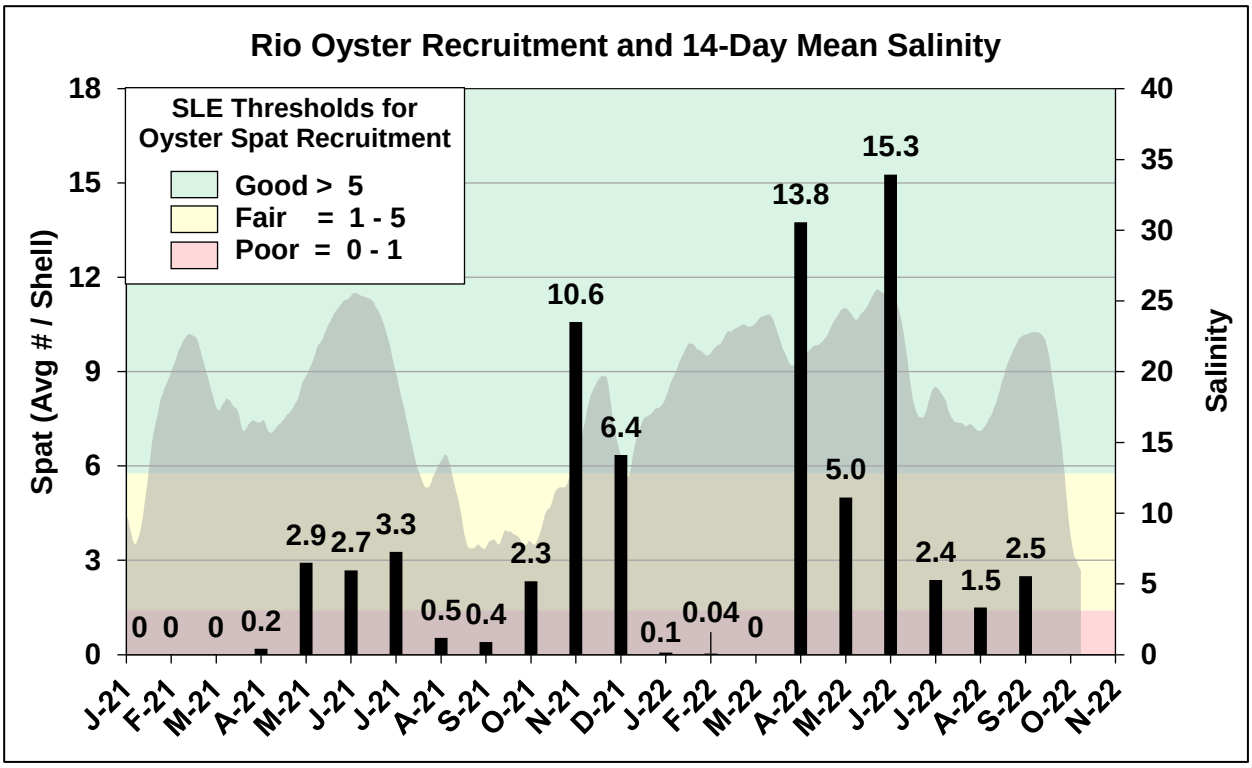


Figure ES-5. Mean oyster recruitment at the Rio oyster monitoring station and 14-day mean salinity at US1 Bridge.

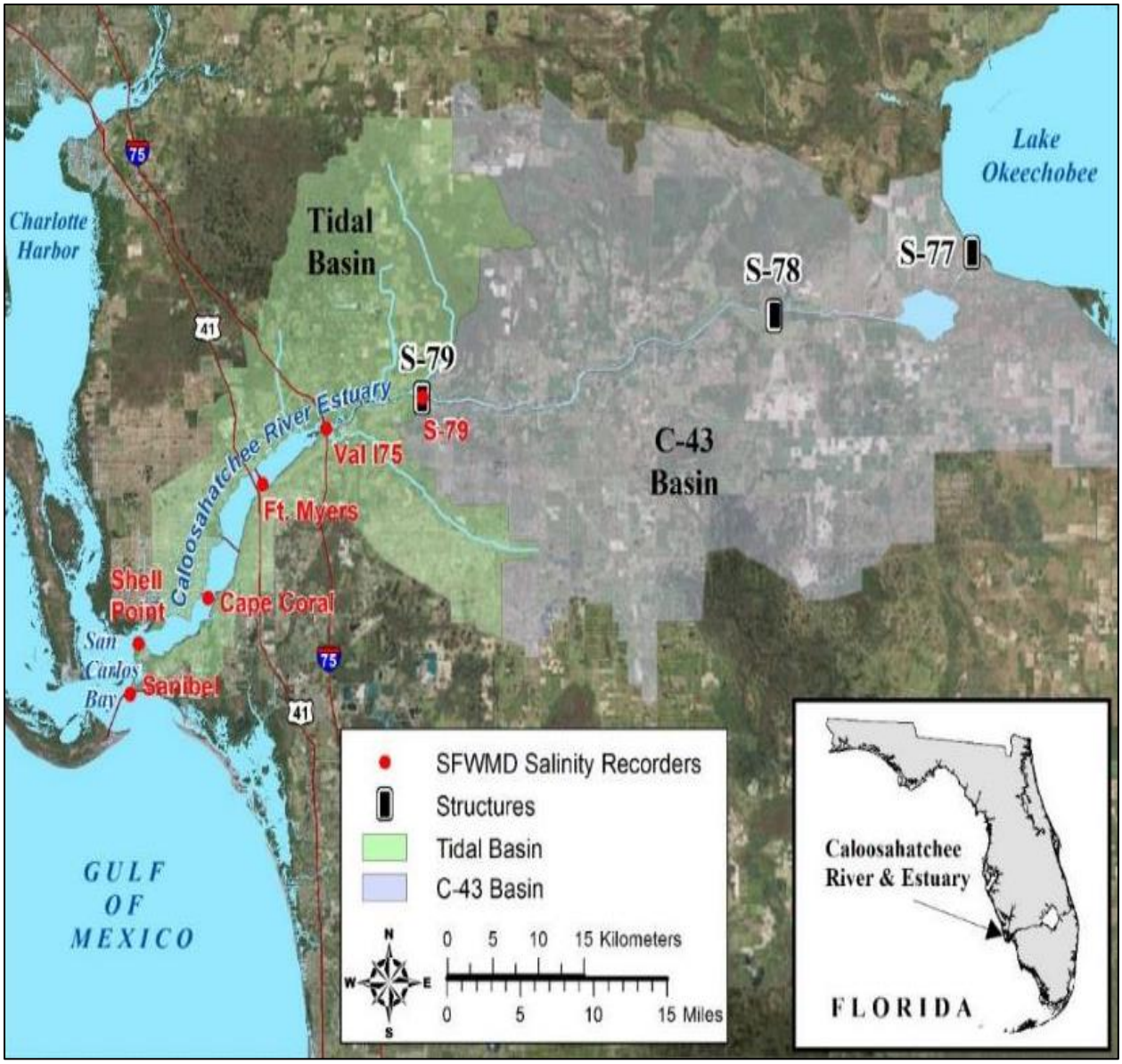


Figure ES-6. Basins, water control structures and salinity monitoring sites in the Caloosahatchee River Estuary.

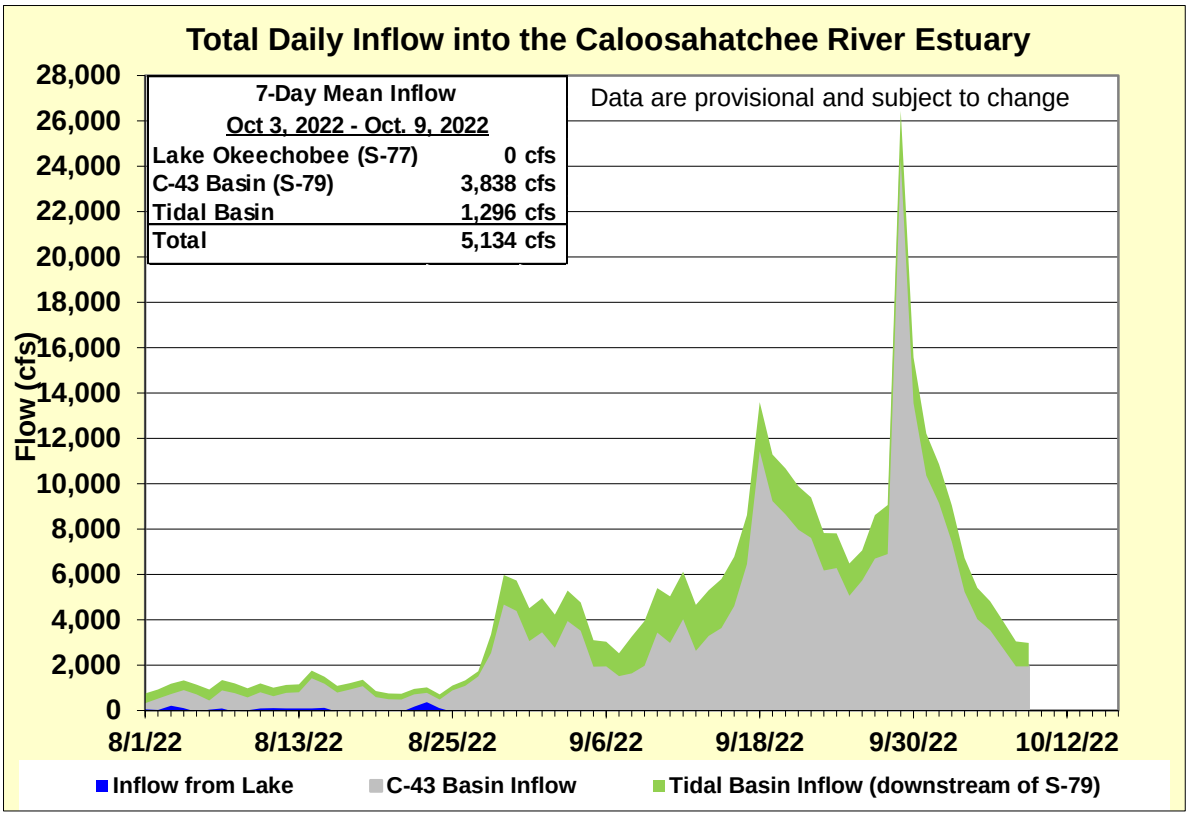


Figure ES-7. Total daily inflows from Lake Okeechobee, and runoff from the C-43 and Tidal basins into the Caloosahatchee River Estuary.

Table ES-2. Mean salinity at six monitoring sites in the Caloosahatchee River Estuary. Current means are in bold font; previous week's means are in parentheses. No salinity data (NR) were available 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. Average salinity at the Val I-75 monitoring station reflects the period 10/5/2022-10/9/2022. Previous week's means reflect the period 9/26/2022-9/27/2022 except Sanibel (9/26/2022 only). 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)	**NR** (0.2)	**NR** (0.2)	0.0 – 10.0
Val I-75	**0.2** (0.2)	**0.2** (0.2)	0.0 – 10.0
Fort Myers Yacht Basin	**NR** (0.2)	**NR** (0.2)	0.0 – 10.0
Cape Coral	**NR** (0.8)	**NR** (1.2)	10.0 – 25.0
Shell Point	**NR** (12.4)	**NR** (13.8)	10.0 – 25.0
Sanibel	**NR** (24.3)	**NR** (23.5)	10.0 – 25.0

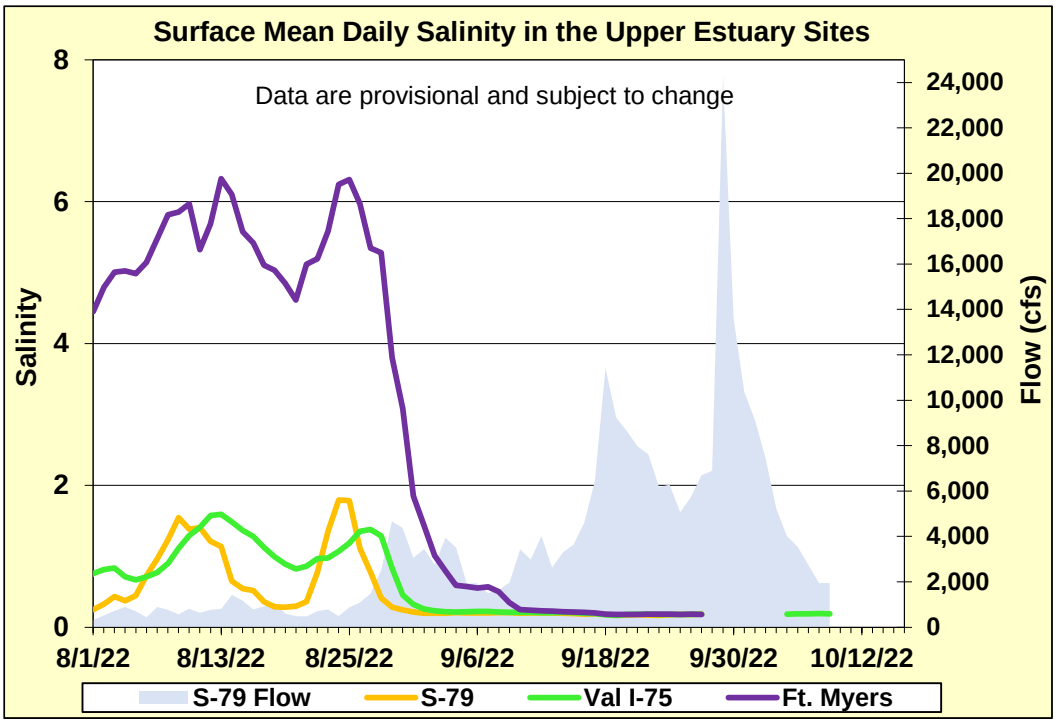


Figure ES-8. Mean daily salinity at upper Caloosahatchee River Estuary monitoring sites and mean daily flow at S-79. No salinity data were available at any sites after 9/28/2022 when Hurricane Ian damaged equipment; however, the sensor at Val I-75 began reporting again on October 5, 2022.

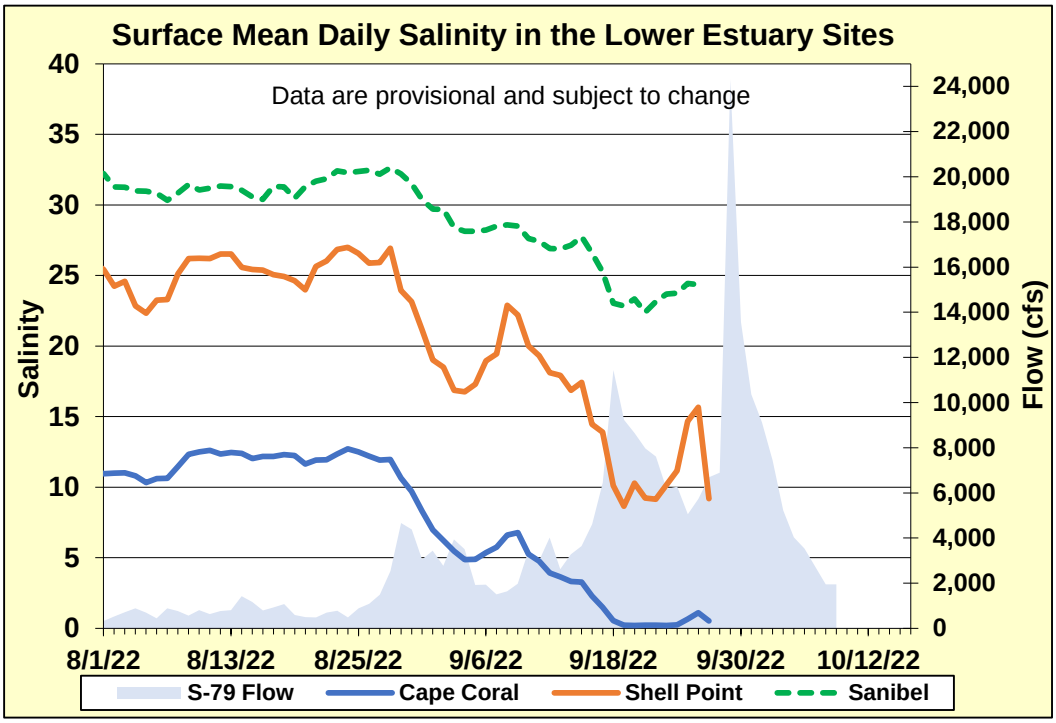


Figure ES-9. Mean daily surface salinity at lower Caloosahatchee River Estuary monitoring sites and mean daily flow at S-79. No salinity data were available at any sites after 9/28/2022 when Hurricane Ian damaged equipment.

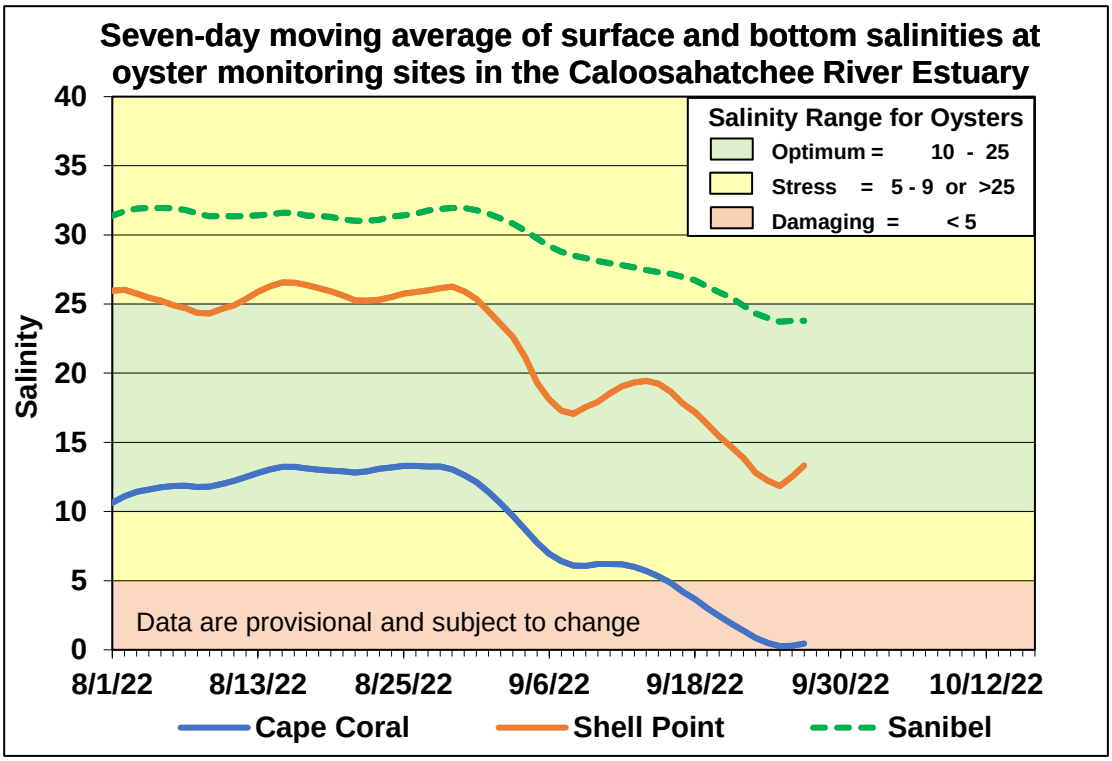


Figure ES-10. Seven-day moving average of surface and bottom salinities at Cape Coral, Shell Point and Sanibel monitoring sites in the Caloosahatchee River Estuary. No seven-day moving average salinity data were available at any sites after 9/28/2022 when Hurricane Ian damaged equipment.

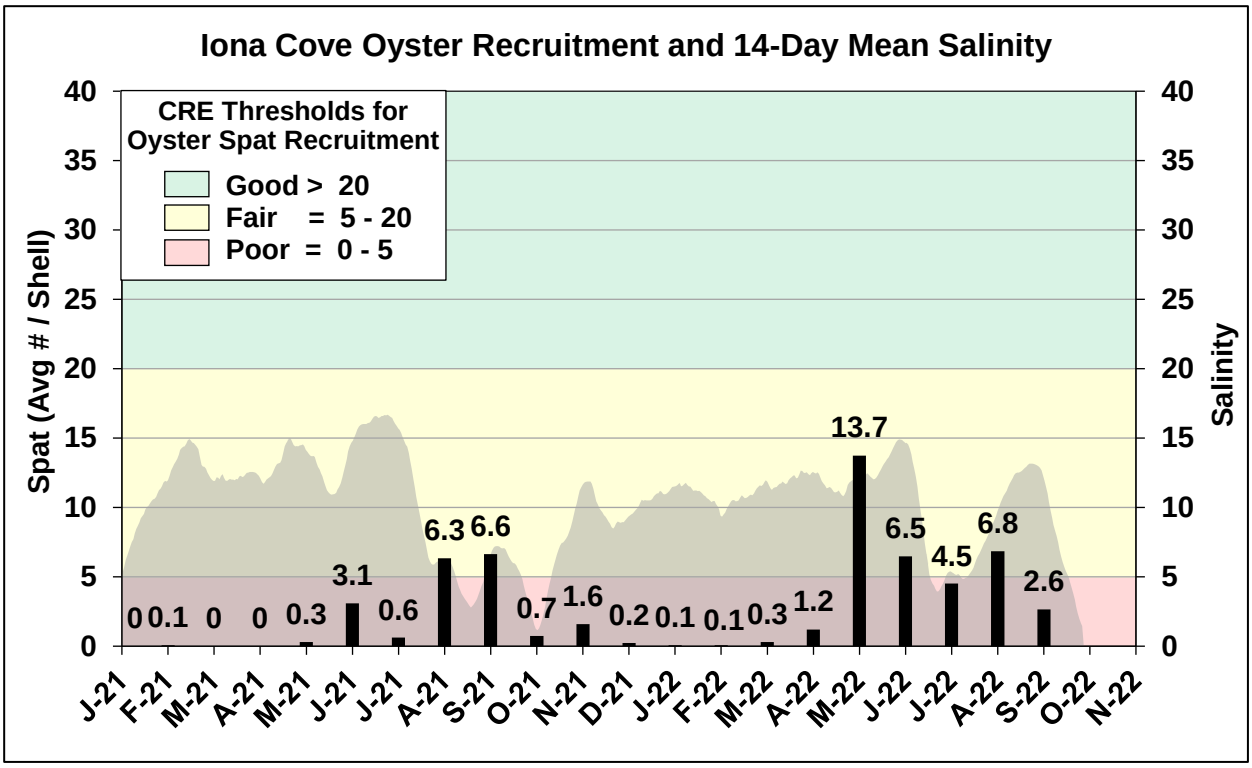


Figure ES-11. Mean oyster recruitment at the Iona Cove oyster monitoring station and 14-day mean salinity at Cape Coral.

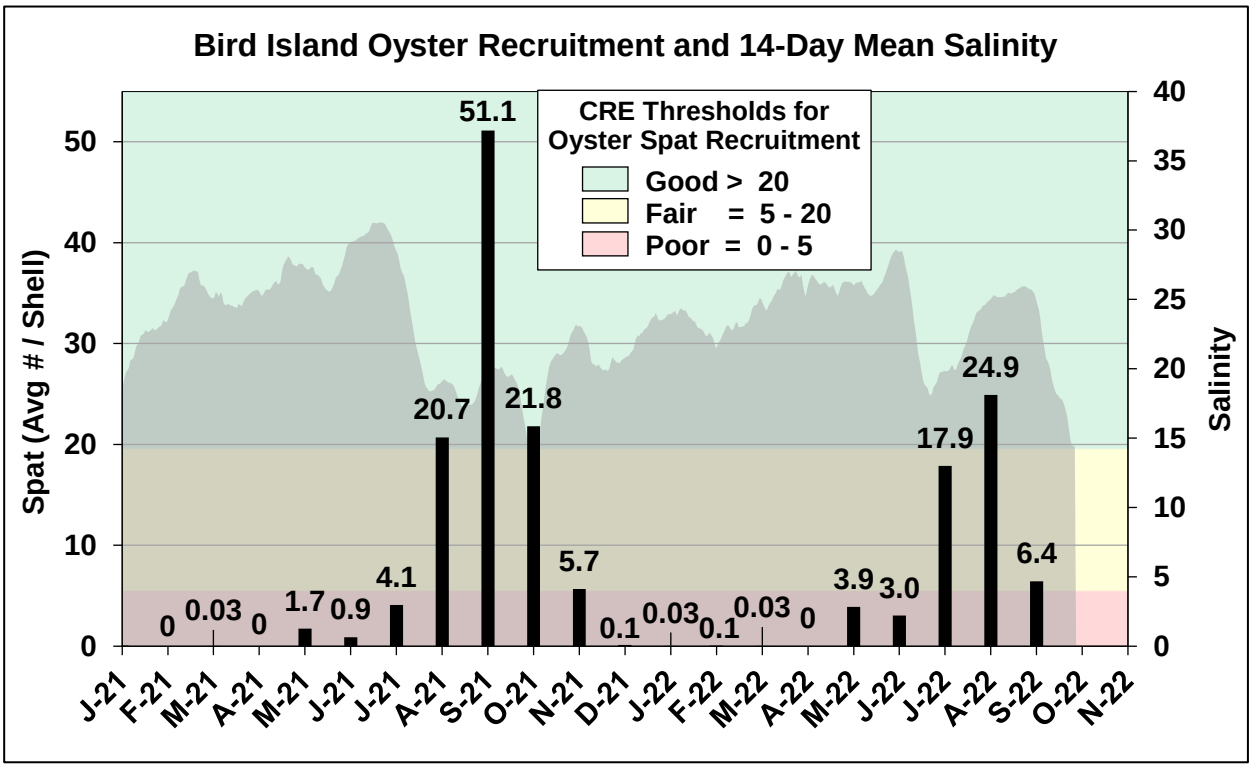


Figure ES-12. Mean oyster recruitment at the Bird Island oyster monitoring station and 14-day mean salinity at Shell Point.

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	570	0.5	0.3
B	450	570	0.3	0.3
C	750	570	0.3	0.3
D	1000	570	0.3	0.3
E	1500	570	0.3	0.3
F	2000	570	0.3	0.3

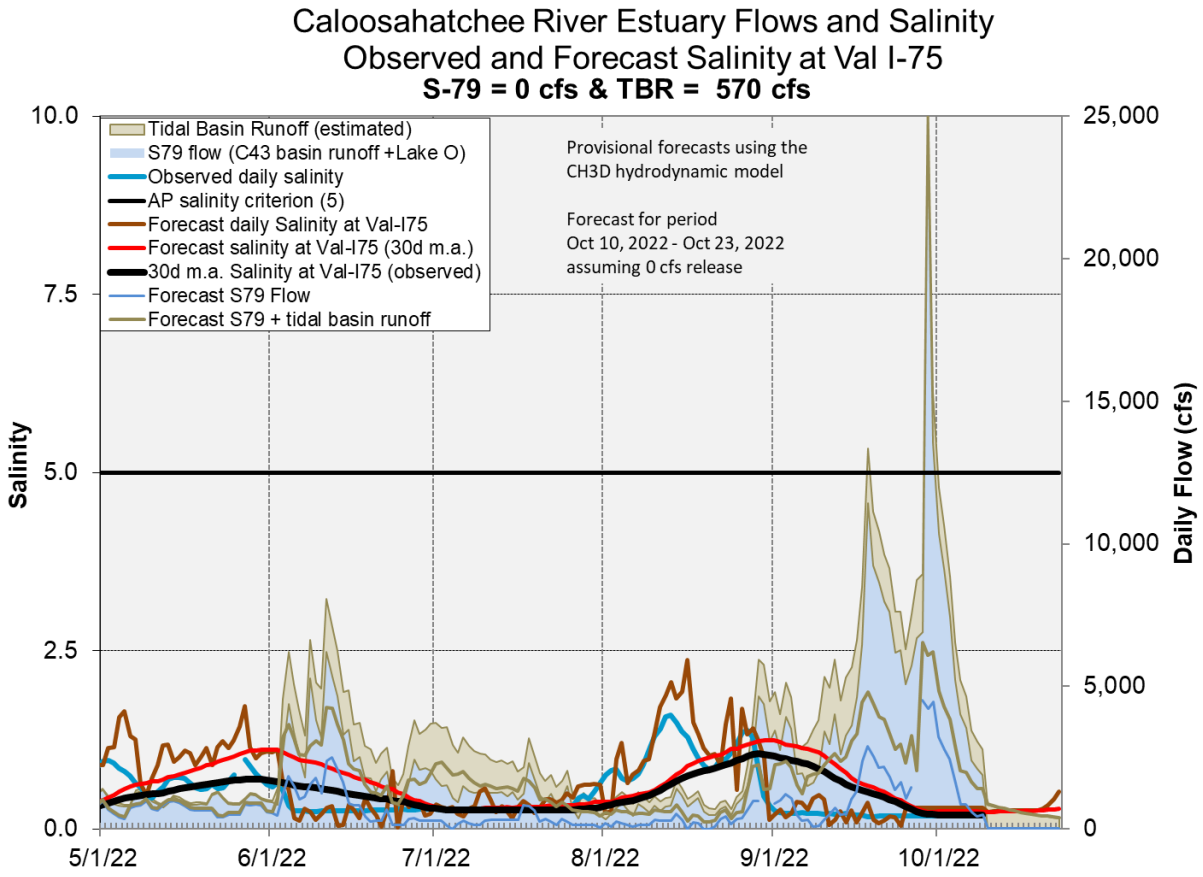


Figure ES-13. Forecasted Val I-75 site surface salinity assuming no pulse release at S-79.

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 at or above 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**).

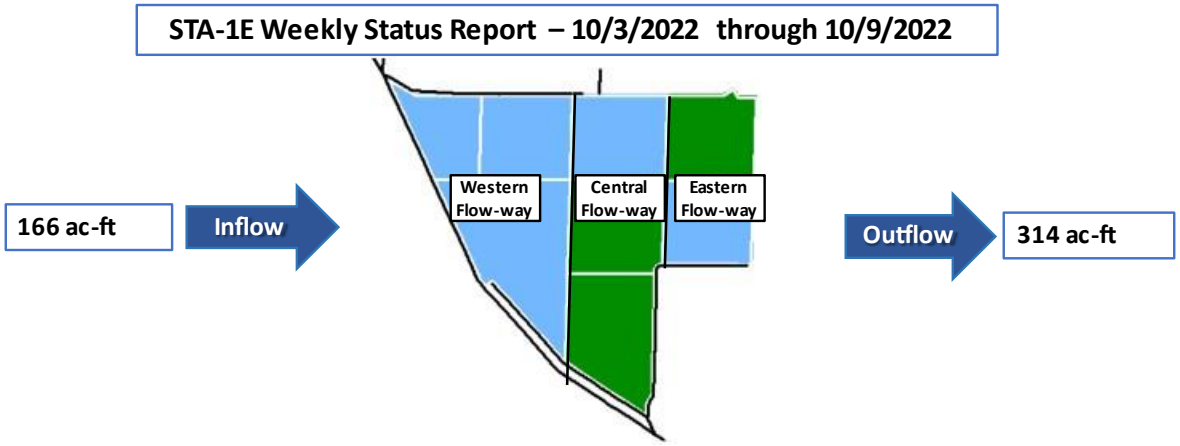
STA-1W: Operational restrictions are in place in STA-1W Western, Eastern, and Northern Flow-ways for vegetation management activities. Treatment cells are at or above target stage. Vegetation in the flow-ways is stressed and highly stressed. The 365-day PLRs for the Northern, Western, and Eastern Flow-ways are 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 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 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 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 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 all flow-ways are below 1.0 g/m^2/year (**Figure S-5** and **S-6**).

For definitions on STA operational language see glossary following figures.



STA-1E 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		1.0	Vegetation management
Central		1.0	Vegetation rehabilitation
Western	Offline, post-construction grow in starting 3/28/2022		

As of 10/9/2022	
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-1E Flow & Phosphorus Concentration			
	7-day	28-day	365-day
Total Inflow, acft	166	32,559	150,012
--Lake Inflow, acft	0	N/A	2,600
Total Outflow, acft	314	27,197	121,329
Inflow Conc., ppb	85	132	112
Outflow Conc., ppb	29	26	25
Includes Preliminary Data			

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

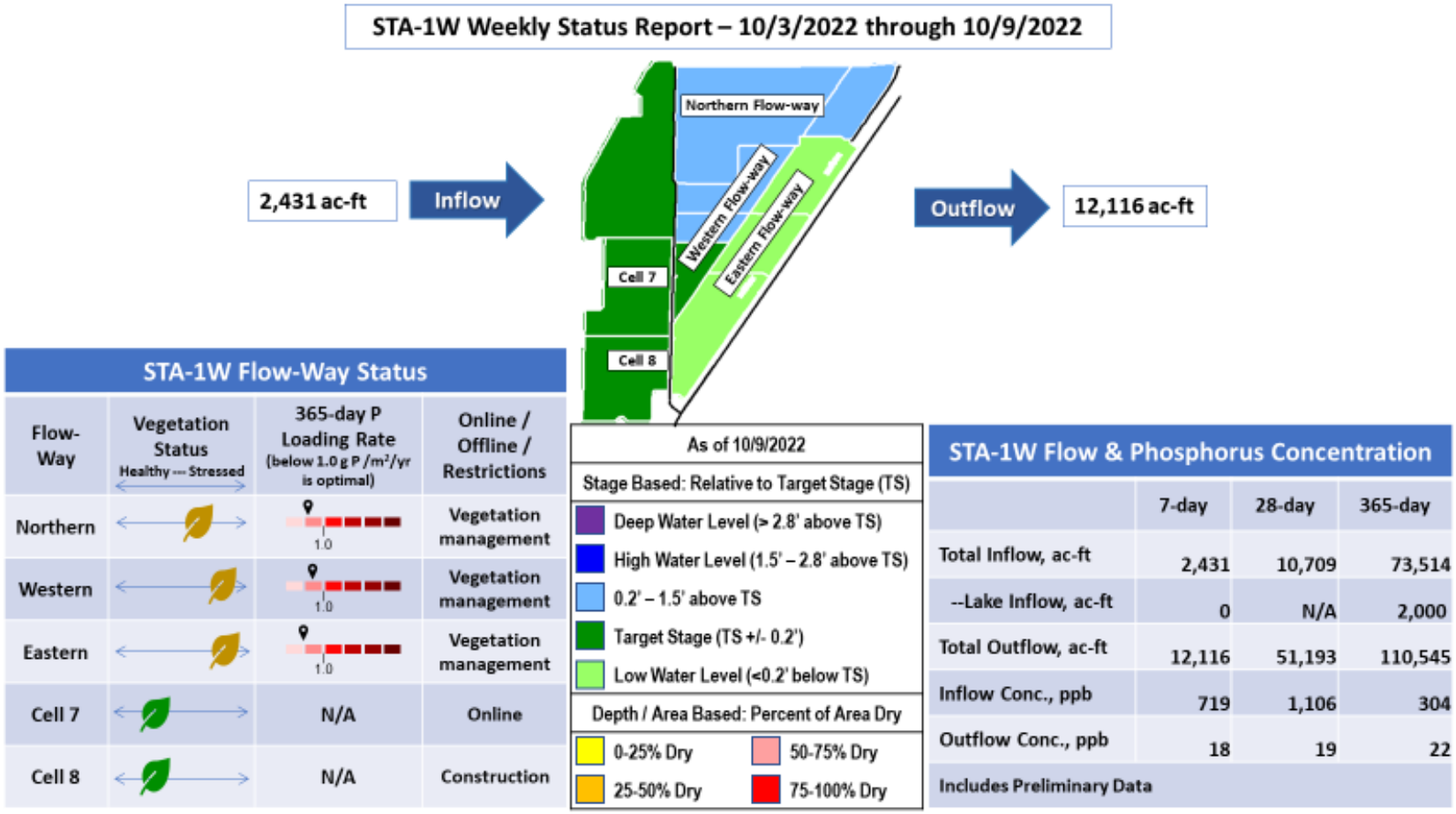


Figure S-2. STA-1W Weekly Status Report

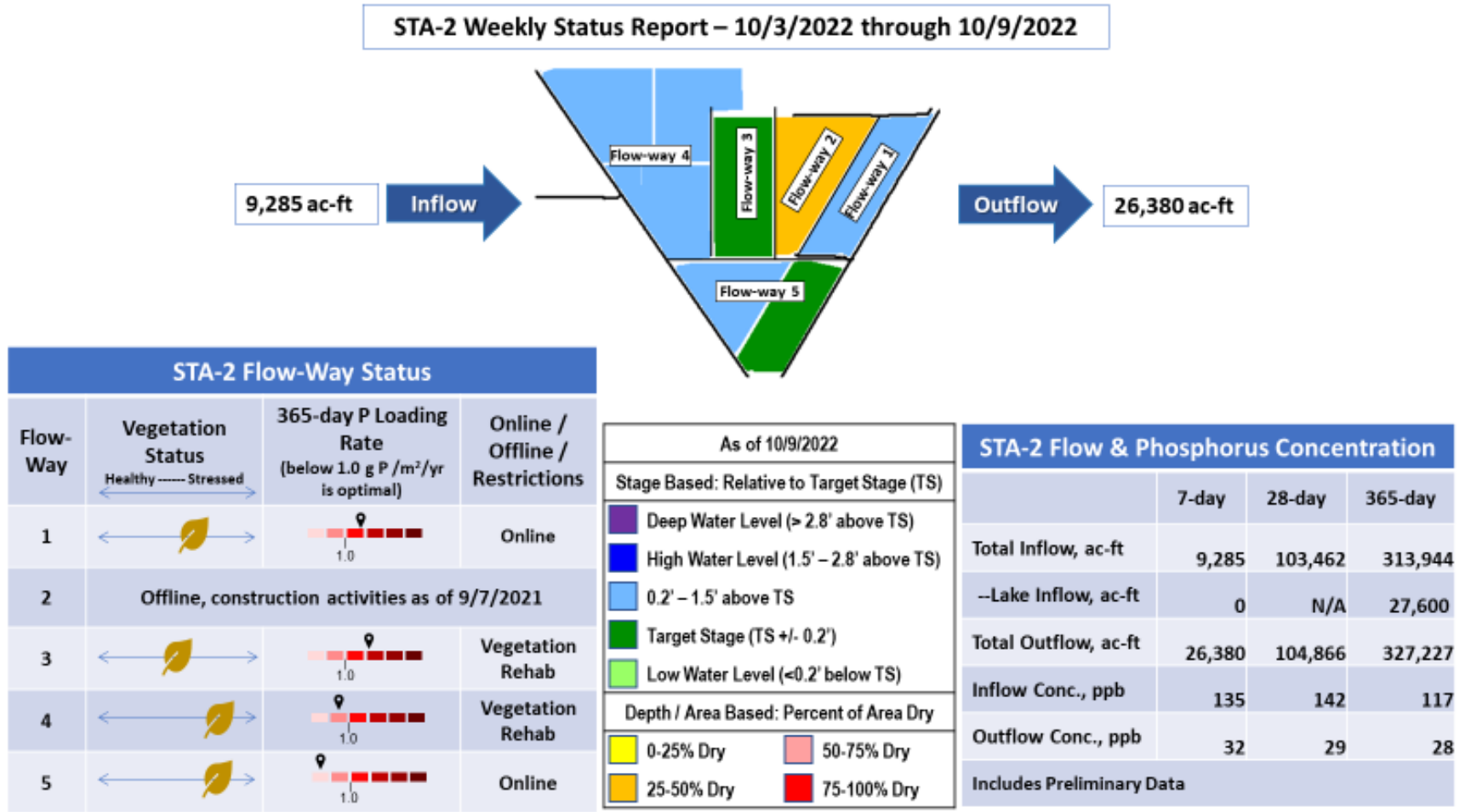
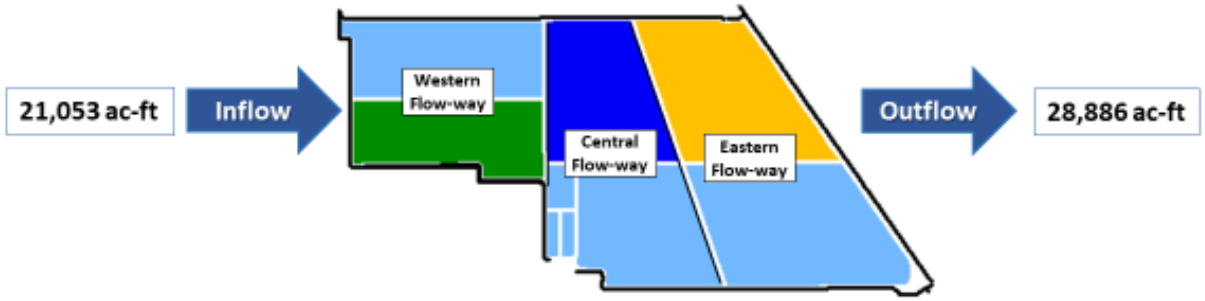


Figure S-3. STA-2 Weekly Status Report

STA-3/4 Weekly Status Report – 10/3/2022 through 10/9/2022



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 10/9/2022	
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	21,053	110,505	287,308
--Lake Inflow, ac-ft	0	N/A	5,300
Total Outflow, ac-ft	28,886	103,243	274,764
Inflow Conc., ppb	101	119	94
Outflow Conc., ppb	12	17	16
Includes Preliminary Data			

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

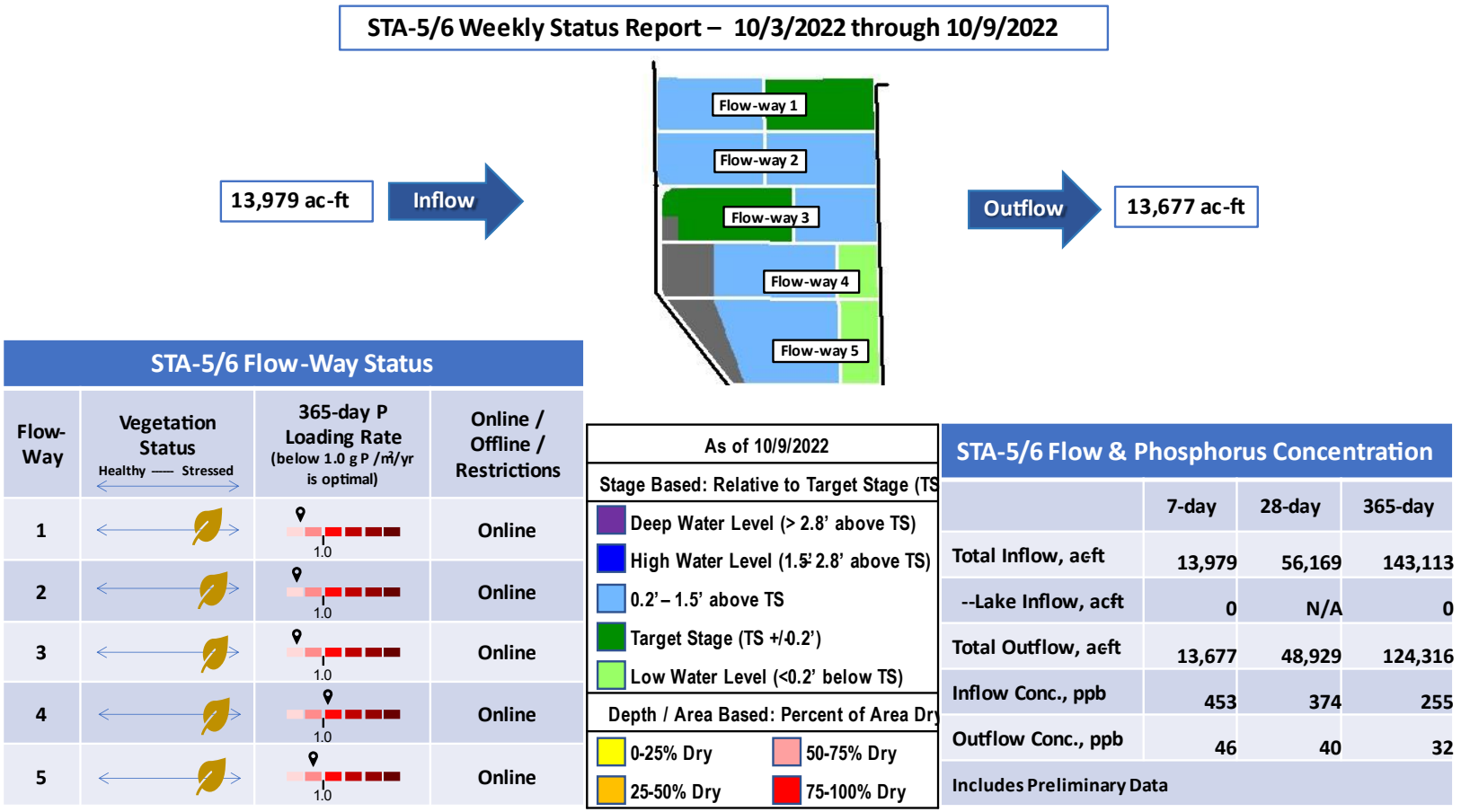
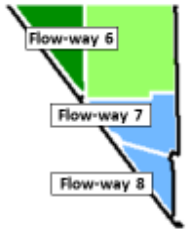


Figure S-5. STA-5/6 Weekly Status Report (Flow-ways 1 – 5)

STA-5/6 Weekly Status Report – 10/3/2022 through 10/9/2022



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		1.0	Online
7		1.0	Online
8		1.0	Online

As of 10/9/2022	
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 rose slowly 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 fell then rebounded at the end of the week. The average on Sunday was 0.96 feet above the falling regulation line. WCA-3A: Last week the Three Gauge Average stages continued a steady ascension then flattened late in the week. The average stage was 0.32 feet above the rising regulation line on Sunday. WCA-3A North: At gauge 62 (Northwest corner) stage fell last week, the average on Sunday was 0.04 feet below the flat Upper schedule line (**Figures EV-1** through **EV-4**).

Water Depths

The SFWDAT tool illustrates the response in water depths to tropical rainfall comparing depths over the last two months. WCA-2A depths have increased above 2.5 feet in the southern region. Along the northern reach of the L-67s depths continue to increase and the spatial extent of those deeper conditions has expanded. Comparing current WDAT water depths to one month ago conditions within the EPA are much wetter, significantly deeper in northern and eastern WCA-3A and northern WCA-2A. Looking back a year ago, southern WCA-2A is significantly shallower; conditions are significantly deeper east of the Miami Canal in WCA-3A (**Figure EV-5 and Figure EV-6)**. Comparing current conditions to the 20-year median: Above average conditions remain in northern WCA-3A and northern WCA-2A moves nearer to average conditions. ENP continues to experience drier than average conditions to the west and wetter in northeast Shark River Slough (**Figure EV-7**).

Taylor Slough and Florida Bay

Taylor Slough and Florida Bay received an average of 0.45 inches of total rain this past week based on 17 gauges where data is available. This was 5 inches less than the previous week, when precipitation associated with Hurricane Ian occurred. Precipitation ranged from 0.04 to 1.09 inches. After increasing last week, Taylor Slough stages decreased at all sites where data is available, with an average decrease of -0.15 feet (**Figure EV-8 and Figure EV-9**). Taylor Slough water levels are still above the historical average for this time of year by +5.10 inches compared to before the Florida Bay initiative (starting in 2017). However, this water level difference decreased by 1 inch from that calculated for the previous week (6.10 inches).

Average Florida Bay salinity is 28.4, a decrease of −2.9 from the previous week. Salinity changes ranged from a decrease of −10.5 in Joe Bay (JB) in the eastern nearshore region to an increase of +2.2 at Buoy Key (BK) in the western bay on 10/9 (**Figure EV-8**). Salinities decreased at all stations except for BK and Johnson Key (JK) in the western bay. Salinities remain within the 2001-2016 Interquartile Range for the Central and Western regions and the Eastern Bay is decreasing toward the 75th percentile (**Figure EV-10**). Florida Bay salinity is 4.55 above its historical average for this time of year, a decrease of −2.3 from last week. Positive flows were measured all week from four major creeks into the Bay, excluding McCormick Creek where data are not available.

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 large abrupt changes in water depth as flow through diminishes has an ecological benefit. Steady flows into northern perimeter WCA-3A would continue to benefit the ecology of that region by helping to provide enough water to protect recession rates needed to sustain surface water in the Alley North region in the dry season. 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	0.10	+0.07
WCA-2A	0.27	+0.01
WCA-2B	0.31	−0.03
WCA-3A	0.44	+0.11
WCA-3B	0.52	−0.05
ENP	0.45	−0.02

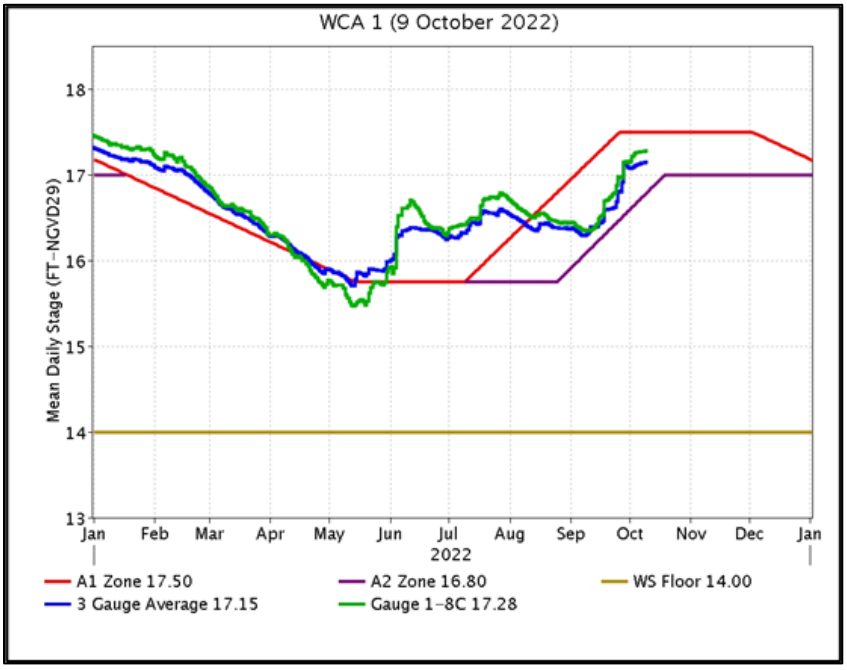


Figure EV-1. WCA-1 stage hydrographs and regulation schedule.

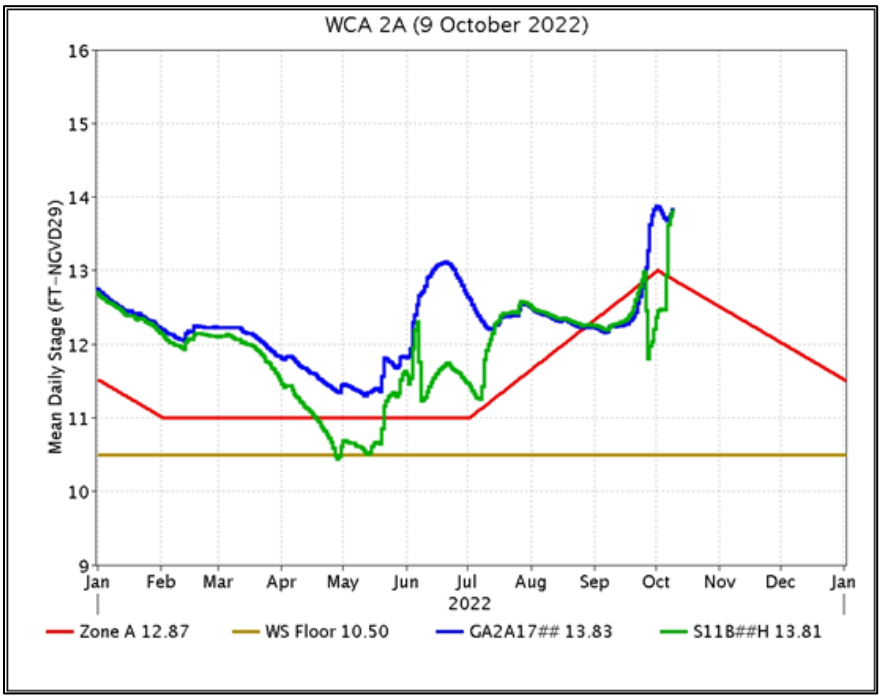


Figure EV-2. WCA-2A stage hydrographs and regulation schedule.

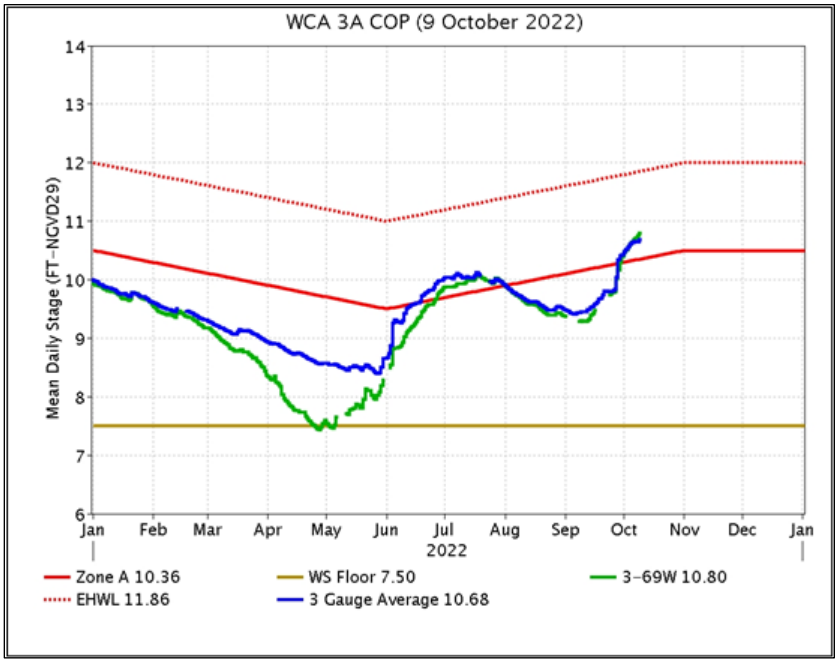


Figure EV-3. WCA-3A stage hydrographs (three-gauge average, S-333 headwater) and regulation schedule.

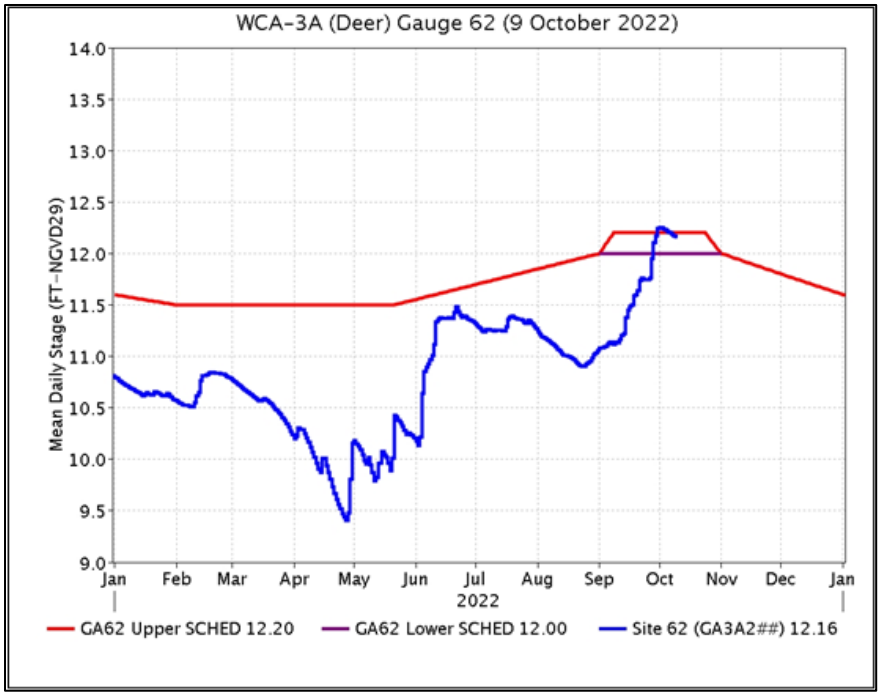


Figure EV-4. WCA-3A stage hydrograph (Deer gauge; Site 62) and CA62 regulation schedule.

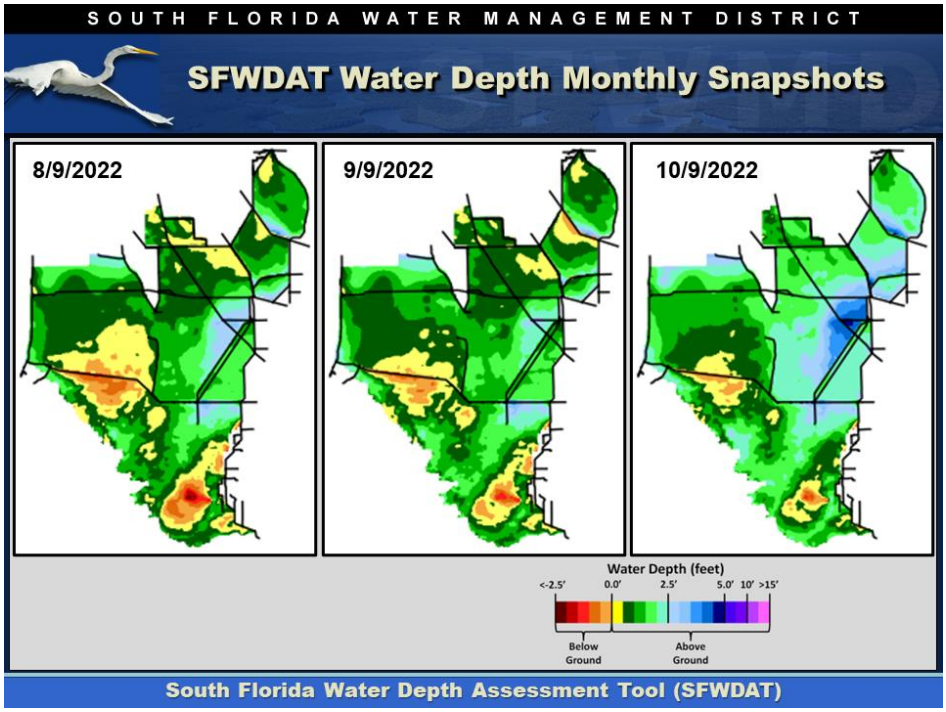


Figure EV-5. Everglades water depths from two months ago (left), one month ago (center) and present (right), based on SFWDAT.

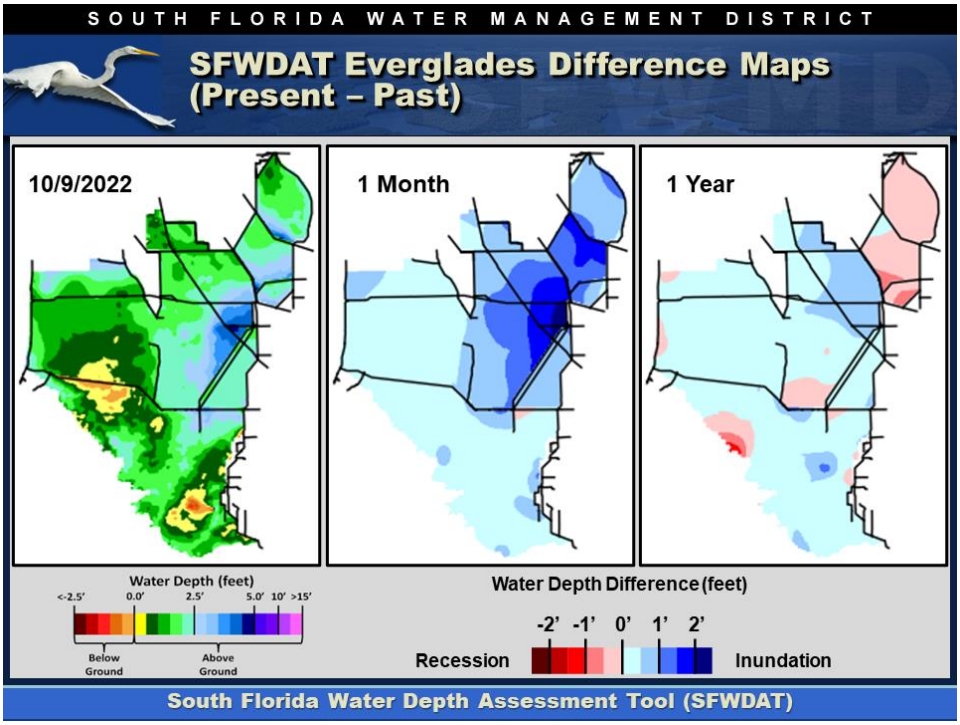


Figure EV-6. Present Everglades water depths (left) and water depth changes from one month (center) and one year (right) ago, based on SFWDAT.

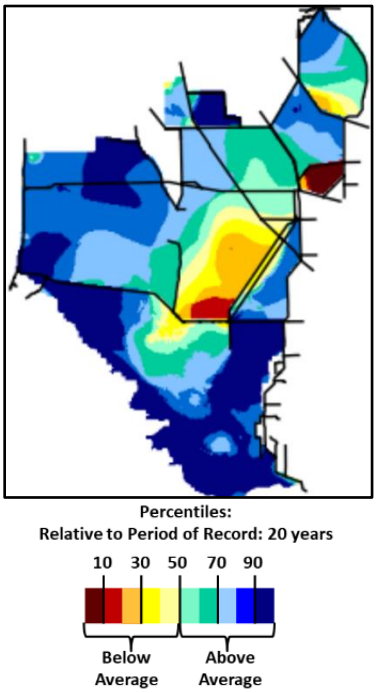


Figure EV-7. Present water depths (10/10/2022) compared to the day of year median over the previous 20 years.

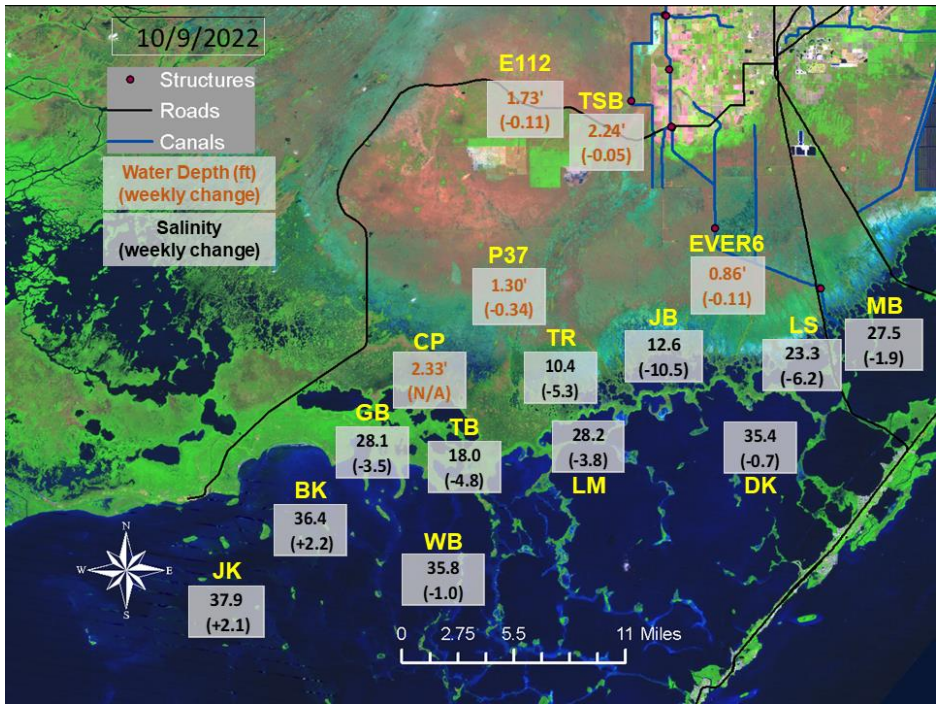


Figure EV-8. Taylor Slough water depths with changes since a week ago and Florida Bay salinities with changes since a week ago.

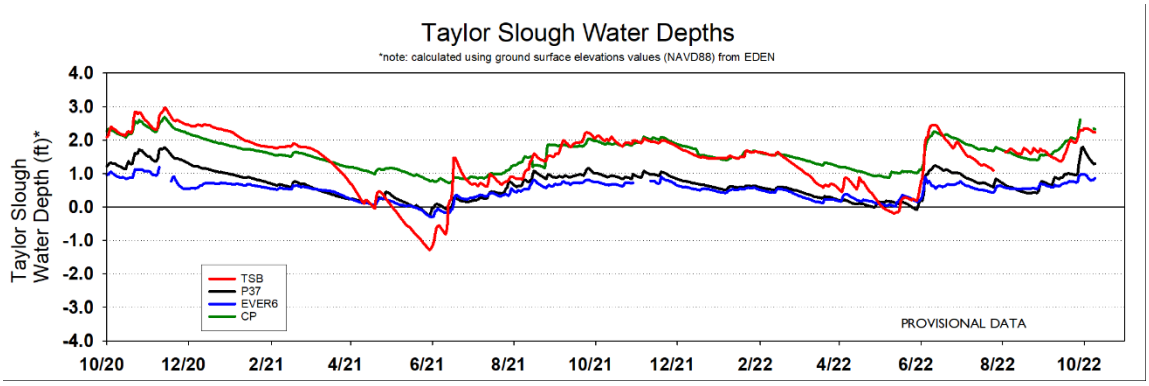


Figure EV-9. Taylor Slough water depth time series.

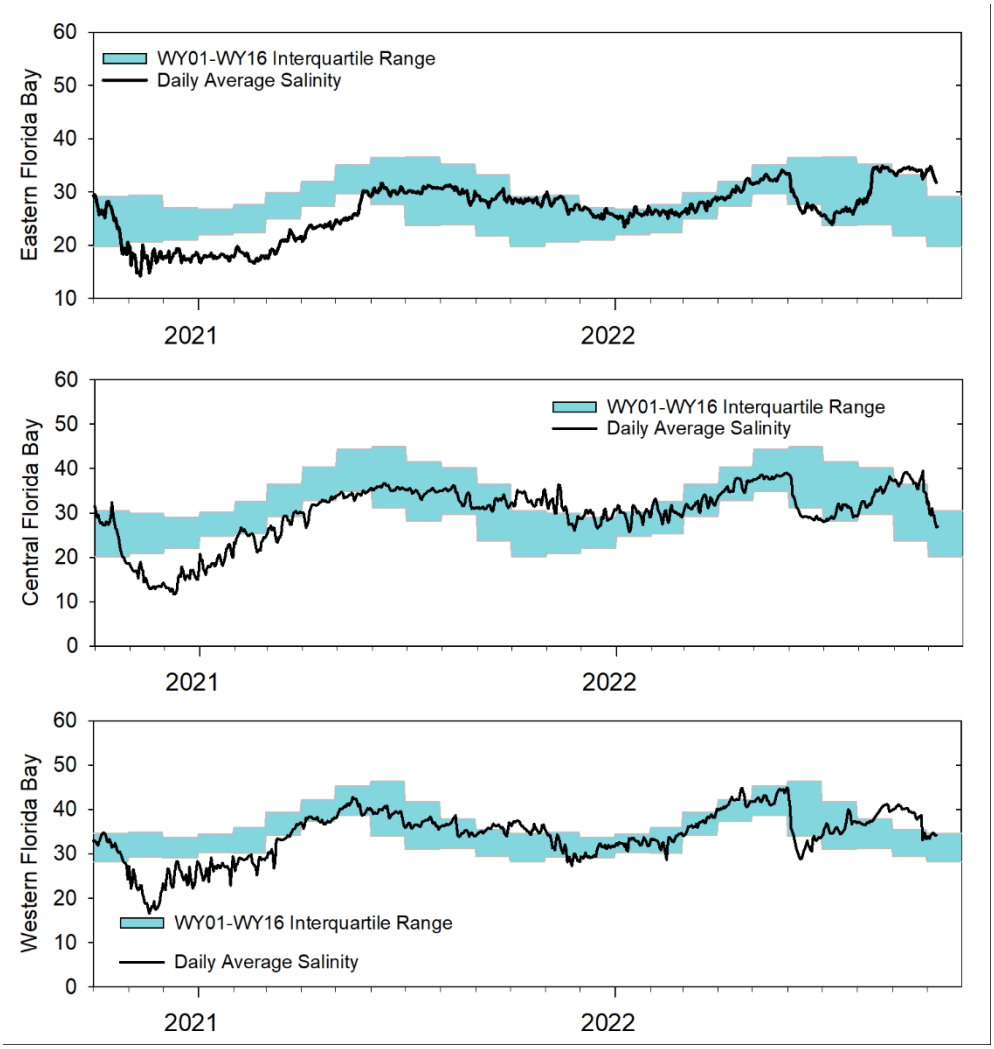


Figure EV-10. Eastern (top panel), Central (middle panel) and Western (bottom panel) Florida Bay daily average salinities with interquartile (25-75 percentile) ranges.

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

SFWMD Everglades Ecological Recommendations, October 11th, 2022 (red is new)			
Area	Weekly change	Recommendation	Reasons
WCA-1	Stage increased by 0.07’	Ascension rate of less than 0.25 feet per week.	Protect within basin and downstream habitat and wildlife.
WCA-2A	Stage increased by 0.01’	Ascension rate of less than 0.25 feet per week.	Protect within basin and downstream habitat and wildlife.
WCA-2B	Stage decreased by 0.03’	Ascension rate of less than 0.25 feet per week.	Protect within basin and downstream habitat and wildlife.
WCA-3A NE	Stage increased by 0.05’	Ascension rate of less than 0.25 feet per week.	Protect within basin and downstream habitat and wildlife. Lower fire risk.
WCA-3A NW	Stage decreased by 0.07’	Ascension rate of less than 0.25 feet per week.	
Central WCA-3A S	Stage increased by 0.29’	Ascension rate of less than 0.25 feet per week.	Protect within basin and downstream habitat and wildlife.
Southern WCA-3A S	Stage increased by 0.17’		
WCA-3B	Stage decreased by 0.05’	Ascension rate of less than 0.25 feet per week.	Protect within basin and downstream habitat and wildlife. Lower fire risk.
ENP-SRS	Stage decreased by 0.11’	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 −0.341’ to −0.046’	Move water southward as possible.	When available, provide freshwater buffer for downstream conditions.
FB- Salinity	Salinity changes ranged −13.1 to +2.8	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 999 cfs and the previous 30-day mean inflow was 1,525 cfs. The seven-day mean salinity was 26.1 at BBCW8 and 22.8 at BBCW10, both below the preferred maximum salinity of 35 for these sites. Data provided by Biscayne National Park.

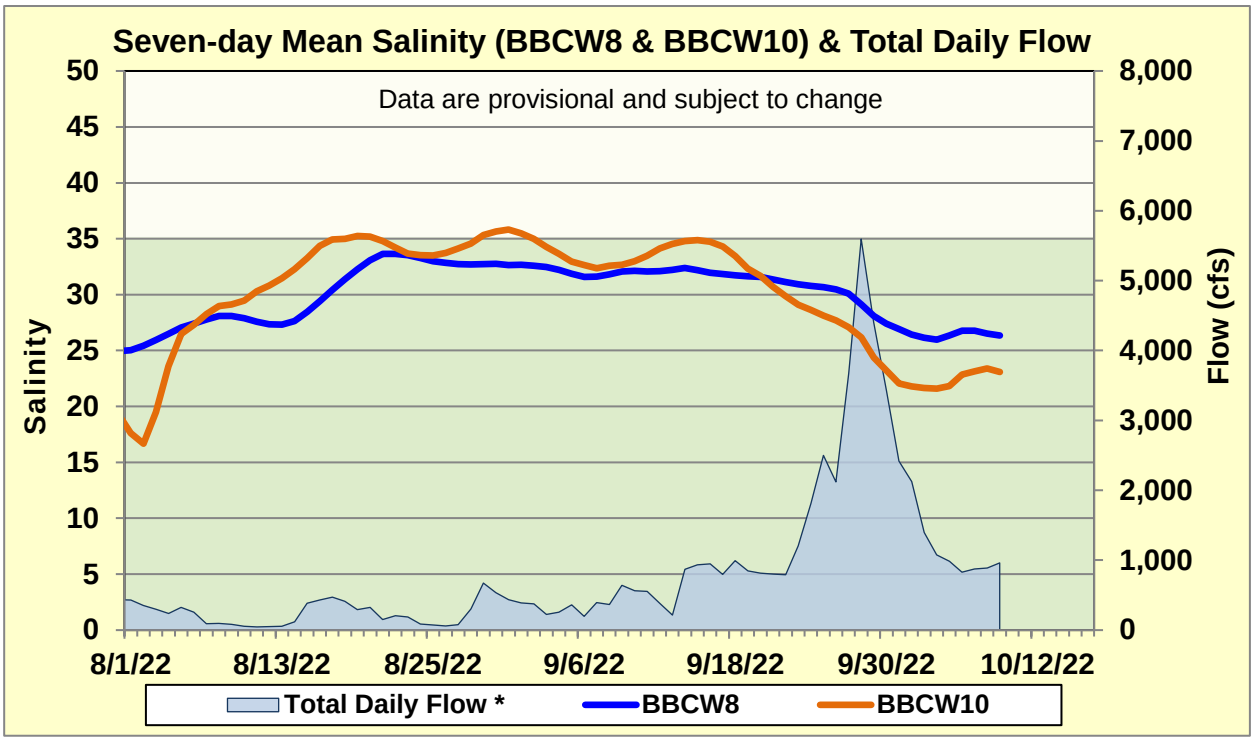


Figure BB-1. Seven-day mean salinity at BBCW8 and BBCW10 and total daily flow in Biscayne Bay. Total daily flow was calculated using flow from structures S20G, S20F, S21, S21A, S123, and S700P.