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: September 07, 2022

SUBJECT: Weekly Environmental Conditions for Systems Operations

Summary

Weather Conditions and Forecast

An upper-air trough of low pressure extending from the Ohio Valley through the northwestern Gulf Coast will become better established, with a piece of the trough forecast to *cut off* over Louisiana by Friday. The formation of this weather feature will cause an interruption to the strong subtropical high-pressure that has dominated the SFWMD's weather for the past several weeks. With the change to the weather pattern, greater moisture and instability will be transported across the area resulting in widespread coverage of rainfall each day, with total SFWMD rainfall nearing or possibly above the long-term daily average, and an enhanced risk of localized, significant rainfall accumulations. The heaviest rains will be focused over the western half of the area. By the weekend, the upper-air trough will be weakening and *lifting out* while subtropical high pressure rebuilds into Florida. With Hurricane Earl well to the northeast and a mid-level high pressure centered east of Florida, an unusual northwesterly to northerly steering wind flow is predicted across the SFWMD Sunday and Monday while moisture levels remain relatively high. As a result, daily rainfall early next week should be near or just below the daily climatological average with a greater focus over the eastern half of the area. Early next week a vigorous trough of low pressure will be forming from the Midwest through the central Gulf Coast, setting up a scenario for wetter conditions across the SFWMD, starting either Monday or Tuesday next week. For the week ending next Tuesday morning, total SFWMD rainfall is forecast to be below normal with a credible chance that total weekly SFWMD rainfall could be near to somewhat above normal.

Kissimmee

Stages in East Lake Toho and Lake Toho have risen to their respective regulation schedules; flow at S-59 and S-61 is being adjusted to hold stages at their regulation schedules. Flow at S-65 remained at 0 cfs to allow KCH stage to rise slowly; S-65A discharge was decreased to 230 cfs after having been increased briefly to 1,100 cfs to control a rainfall-driven stage rise in Pool A. With S-65A discharge remaining below

bankfull, water depth on the Kissimmee River floodplain was steady over the week, with a mean depth of 0.17 feet on September 4, 2022. The concentration of dissolved oxygen in the Kissimmee River decreased to 1.6 mg/L during the week but increased to 2.6 mg/L by the end of the week.

Lake Okeechobee

Lake Okeechobee stage was 12.55 feet NGVD on September 4, 2022, with water levels 0.4 feet lower than a month ago. Lake stage was in the Beneficial Use sub-band and in the ecological envelope, and just 0.11 feet above the Water Shortage Management band. Average daily inflows (excluding rainfall) increased and outflows (excluding evapotranspiration) decreased from the previous week**.** The most recent satellite image (September 2, 2022) from NOAA's Harmful Algal Bloom Monitoring System showed that bloom potential was moderate to high in western, northwestern, and southwestern parts of the lake. The bloom potential decreased along the northern and northeastern areas of the Lake since previous week.

Estuaries

Total inflow to the St. Lucie Estuary averaged 363 cfs over the past week with no flow coming from Lake Okeechobee. Mean surface salinities decreased at HR1 and increased slightly at the US1 and A1A Bridge sites over the past week. Salinity in the middle estuary was within the optimal range (10-25) for adult eastern oysters.

Total inflow to the Caloosahatchee Estuary averaged 4,780 cfs over the past week with no flow coming from the Lake. Mean salinities decreased at all sites in the estuary over the past week. Salinities were in the optimal range (0-10) for tape grass in the upper estuary. Salinities were in the optimal range (10-25) for adult eastern oysters at Shell Point and in the stressed range at Cape Coral (<10) and Sanibel (>25).

Stormwater Treatment Areas

For the week ending Sunday, September 4, 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 429,000 ac-feet. Most STA cells are near or below target stage. STA-1E Western Flow-way is offline for post-construction vegetation grow in. Additionally, STA-3/4 Eastern Flow-way is offline for vegetation rehabilitation/drawdown, STA-2 Flow-way 2 is offline for construction activities, and STA-5/6 Flow-way 4 is offline for vegetation management 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

Less rain meant rates of stage change fell into the “poor” category in most regions of the EPA. Dry conditions continue to dominate the northern portions of all the WCAs, and WCA-3A NE has remained in the poor category the last 6 weeks. Another recently reported wildfire in northern WCA-3A (west of the Miami canal), details are emerging, but the fire seems more significant in size than the others. Taylor slough stages rose last week and remain just above average. Salinities remain above average across Florida Bay but decreased over the week. Wide swings in salinity levels can be stressful to benthic vegetation. Low rainfall and creek flow in the western bay (versus the eastern bay) have meant a persistent algal bloom there.

Biscayne Bay

Total inflow to Biscayne Bay averaged 403 cfs and the previous 30-day mean inflow averaged 236 cfs. The seven-day mean salinity was 31.9 at BBCW8 and 32.9 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 September 4, 2022, lake stages were 56.9 feet NGVD (0.3 feet above schedule) in East Lake Toho, 54.0 feet NGVD (0.4 feet above schedule) in Lake Toho, and 50.6 feet NGVD (0.5 feet below schedule) in Lakes Kissimmee-Cypress-Hatchineha (KCH) (**Table KB-1**, **Figures KB-1-3**).

Lower Kissimmee

Discharges to the Kissimmee River were reduced to 0 cfs at S-65 and S-65A on Wednesday June 22, 2022 to slow the rate of stage decline in KCH. On September 4, 2022, discharge at S-65 was still 0 cfs; discharge at S-65A had declined to 230 cfs after having been increased briefly to 1,100 cfs to control the rise in S-65A headwater stage due to rainfall. Discharges from the Kissimmee River were 440 cfs at S-65D and 400 cfs at S-65E (**Table KB-2**). Headwater stages were 46.5 feet NGVD at S-65A and 26.2 feet NGVD at S-65D on September 4, 2022. As S-65A discharge and local runoff have decreased, mean river channel stage in the Kissimmee River decreased by 3.14 ft within the last week to 33.11 ft NGVD (**Figure KB-4**). With S-65A discharge remaining below bankfull, water depth on the Kissimmee River floodplain remained steady over the week, with a mean depth of 0.17 feet on September 4, 2022 (**Figure KB-5**). The concentration of dissolved oxygen in the Kissimmee River had decreased to 1.6 mg/L in the last week but had risen to 2.6 mg/L by the end of the week as discharge was reduced (**Table KB-2**, **Figure KB-6**).

Water Management Recommendations

Encourage stage in KCH to rise gradually by continuing 0 cfs discharge at S-65 and S-65A except when S-65A flow can be increased to manage stage in Pool A. 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)	
							9/4/22	*8/28/22*
Lakes Hart and Mary Jane	S-62	LKMJ	190	60.0	R	60.0	0.0	0.0
Lakes Myrtle, Preston and Joel	S-57	S-57	74	61.1	R	61.0	0.1	0.1
Alligator Chain	S-60	ALLI	0	63.1	R	63.2	-0.1	-0.4
Lake Gentry	S-63	LKGT	0	60.6	R	61.0	-0.4	-0.6
East Lake Toho	S-59	TOHOE	200	56.9	R	56.6	0.3	-0.2
Lake Toho	S-61	TOHOW S-61	480	54.0	R	53.6	0.4	0.2
Lakes Kissimmee, Cypress and Hatchineha	S-65	KUB011 LKIS5B	0	50.6	R	51.1	-0.5	-0.7

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

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

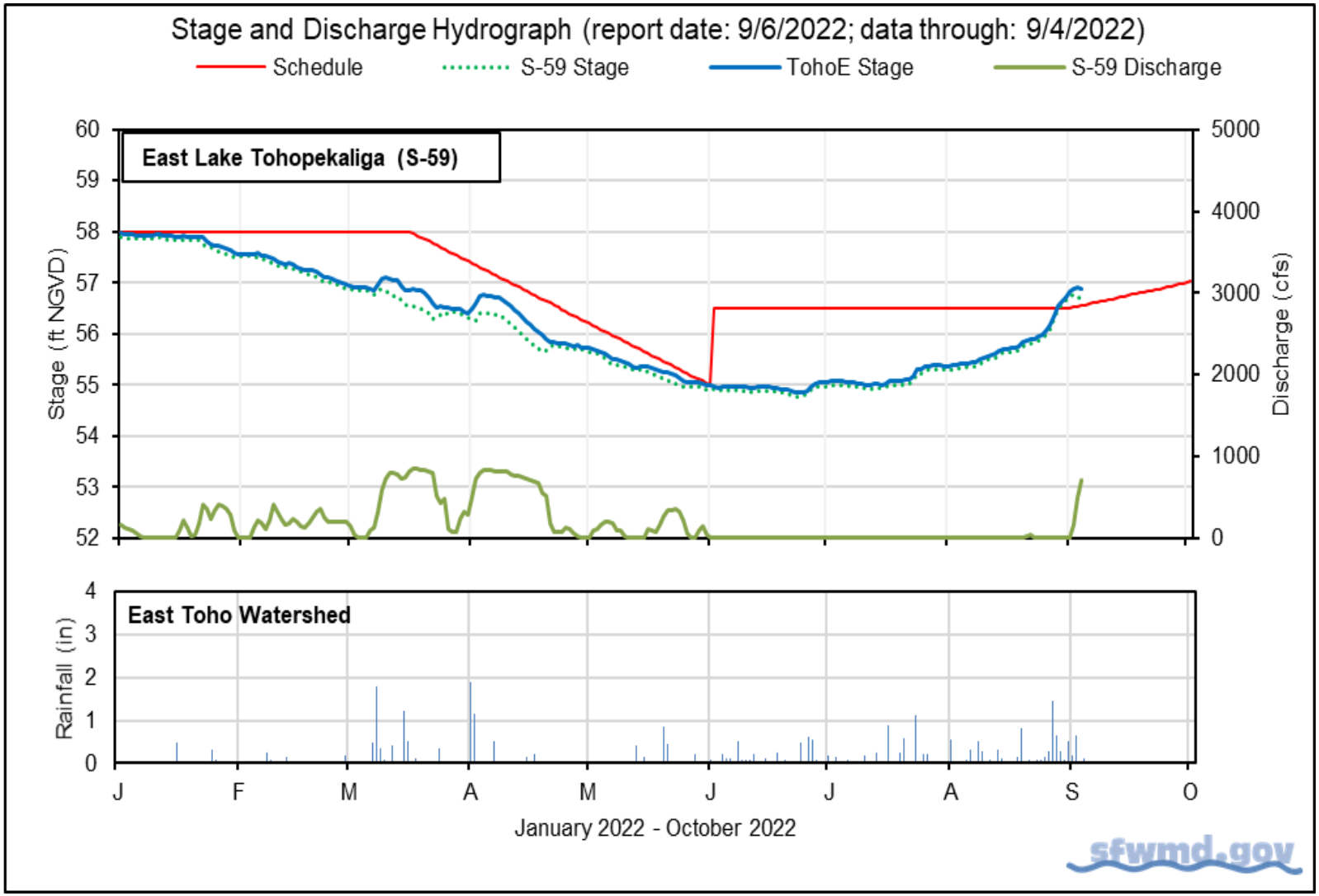


Figure KB-1. East Lake Toho regulation schedule, stage, discharge and rainfall.

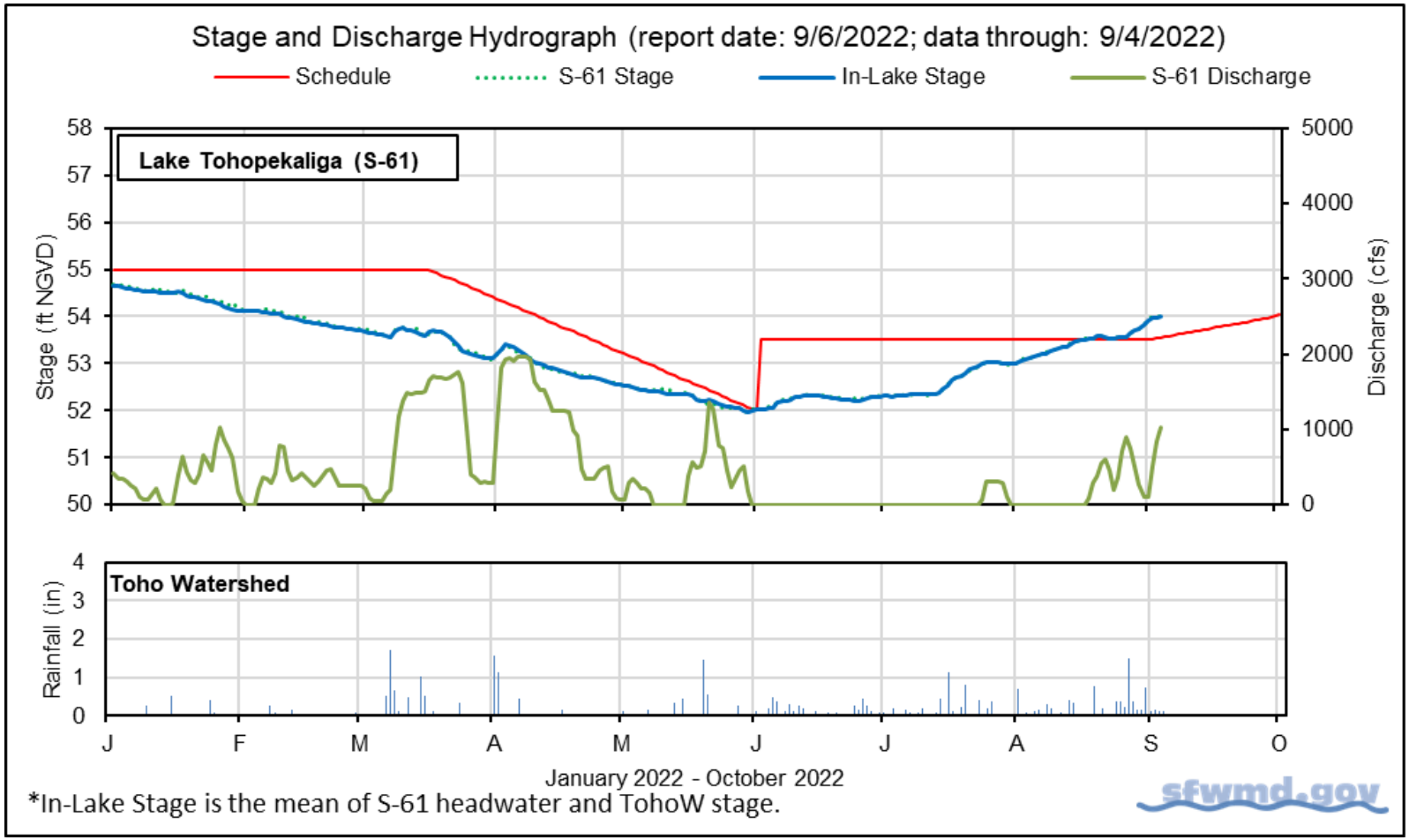


Figure KB-2. Lake Toho regulation schedule, stage, discharge and rainfall.

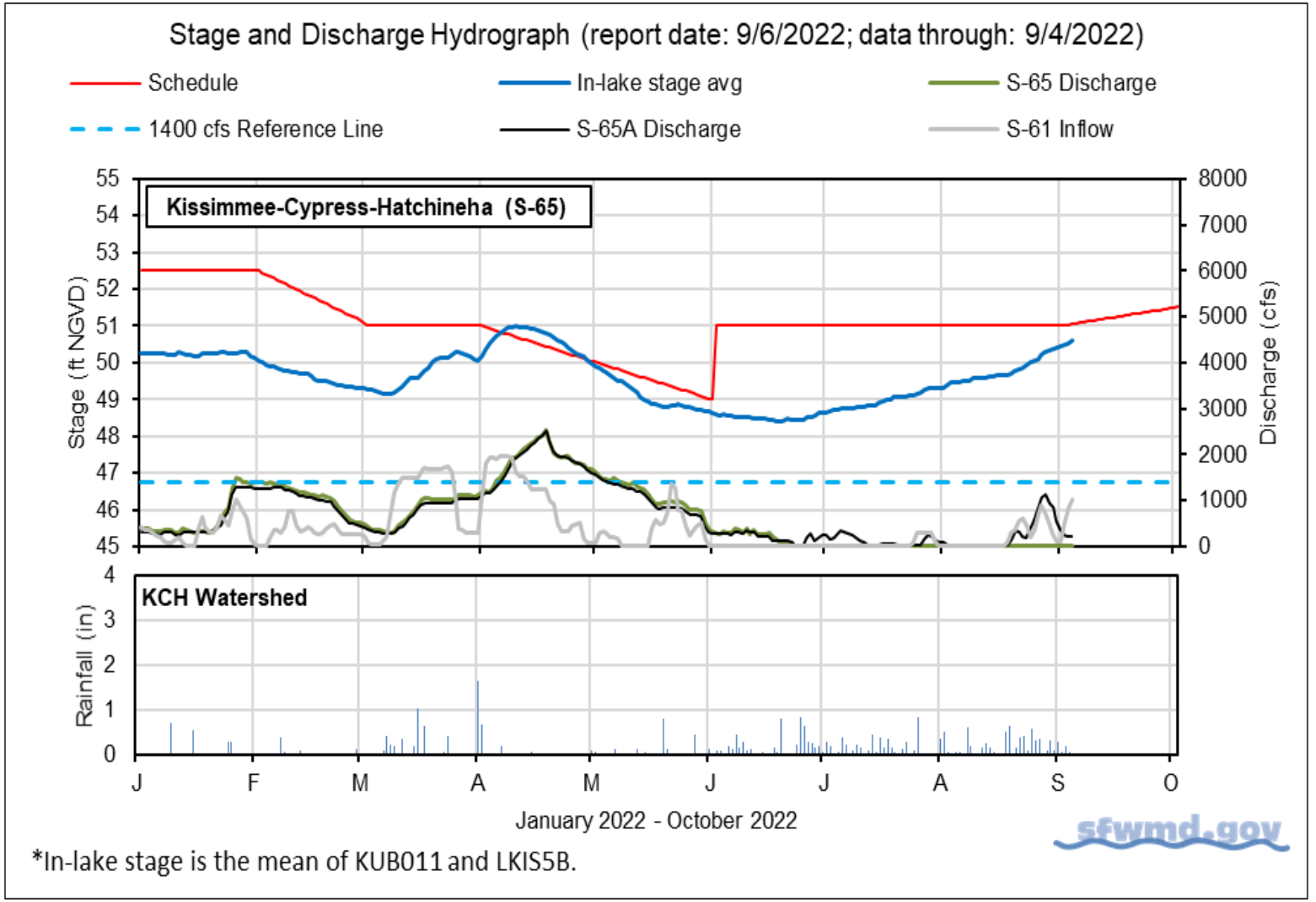


Figure KB-3. Lakes Kissimmee, Cypress and Hatchineha regulation schedule, stage, discharge and rainfall.

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

Metric	Location	Daily Average	Average for Previous Seven Day Periods			
		9/4/22	9/4/22	8/28/22	8/21/22	8/14/22
Discharge	S-65	0	0	0	0	0
Discharge	S-65A[a]	230	490	630	130	29
Headwater Stage (feet NGVD)	S-65A	46.5	46.5	47.0	46.5	46.4
Discharge	S-65D[b]	440	800	400	80	80
Headwater Stage (feet NGVD)	S-65D[c]	26.2	26.3	26.2	26.2	26.2
Discharge (cfs)	S-65E[d]	400	740	380	86	86
Discharge (cfs)	S-67	0	0	0	0	0
Dissolved Oxygen (mg/L) [e]	Phase I, II/III river channel	2.6	2.0	3.3	3.6	3.5
Mean depth (feet) [f]	Phase I floodplain	0.17	0.20	0.10	0.11	0.14

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).

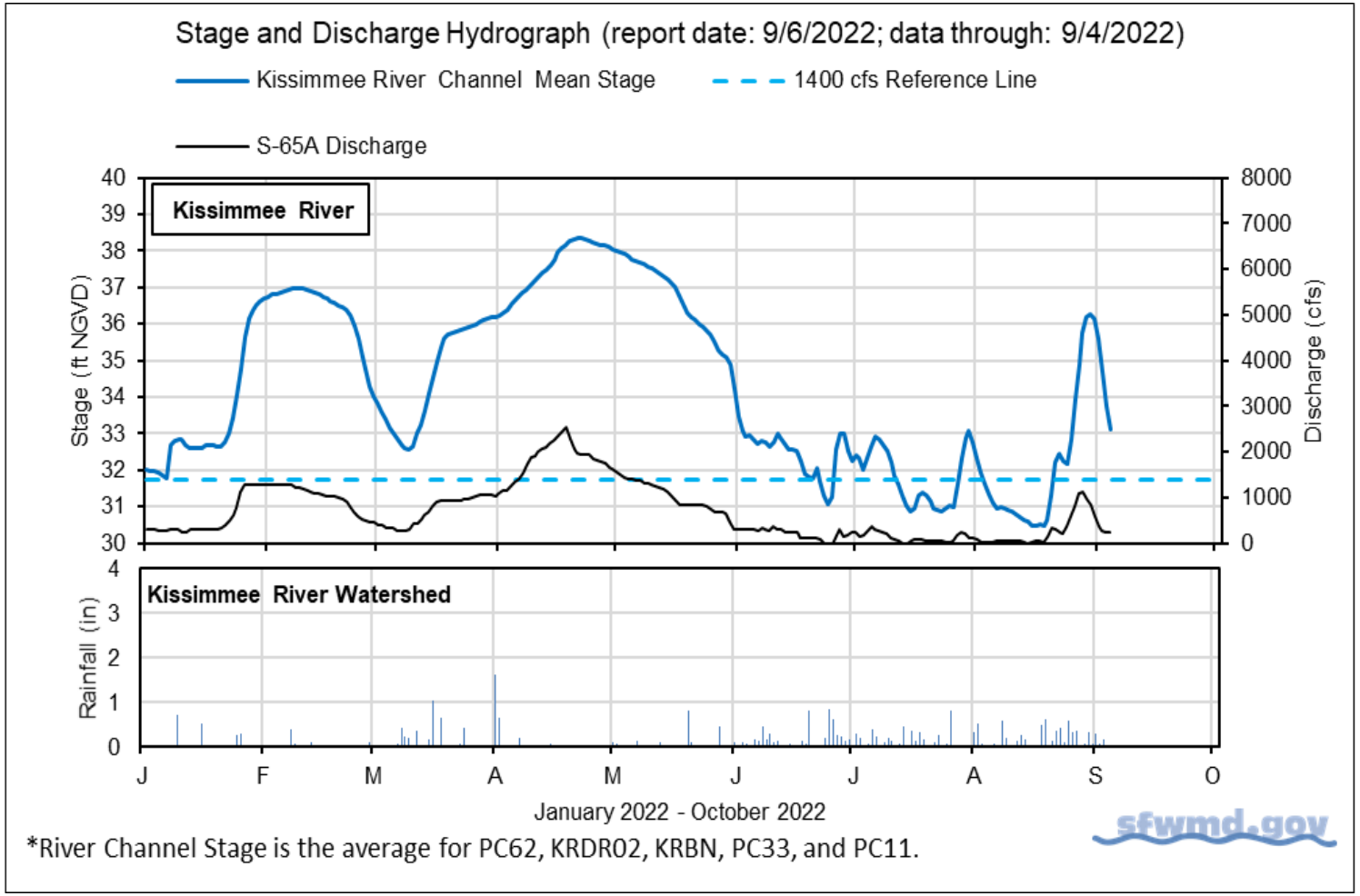


Figure KB-4. Kissimmee River stage, discharge and rainfall.

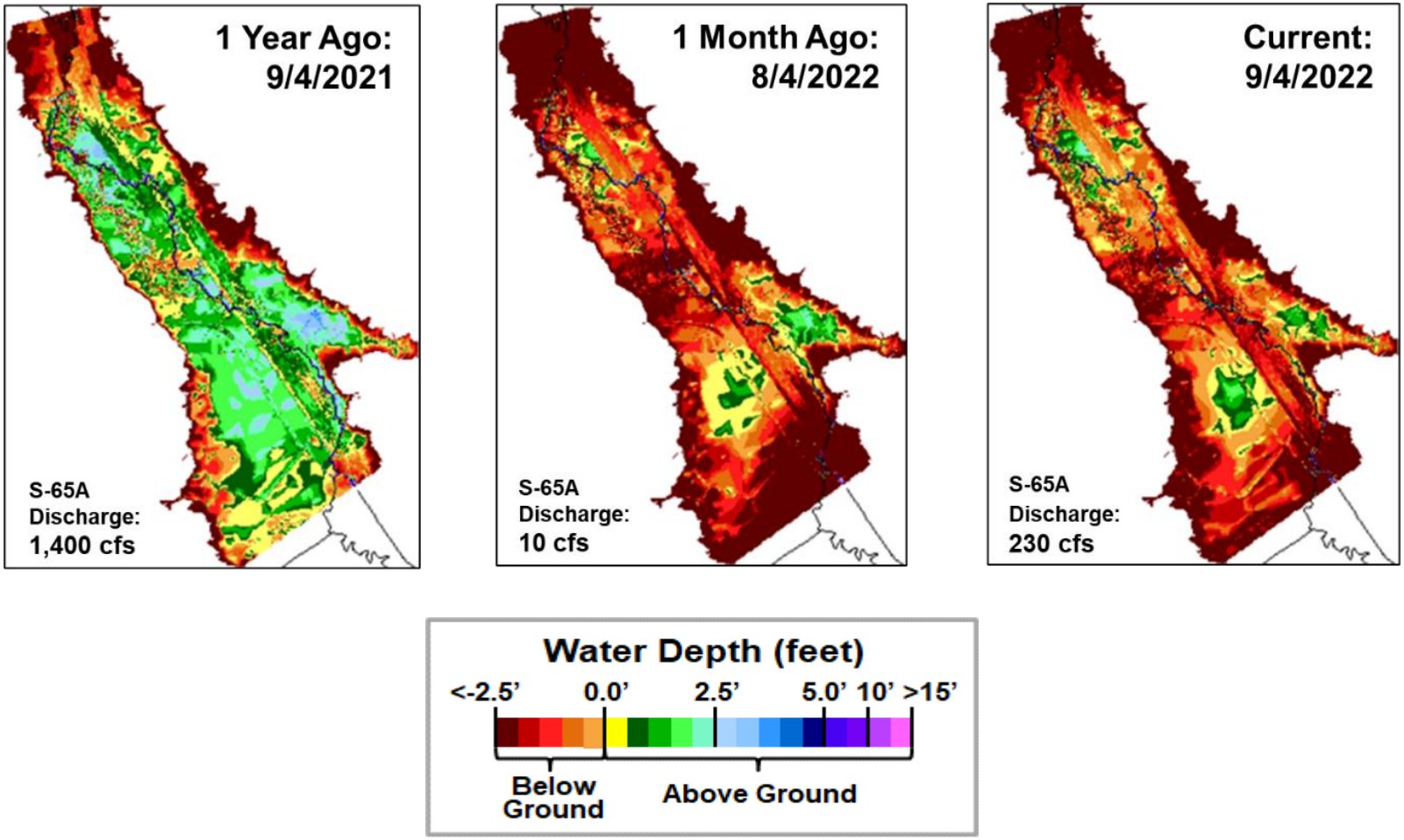


Figure KB-5. Phase I area Kissimmee River floodplain water depths (from left to right) one year ago, one month ago and current.

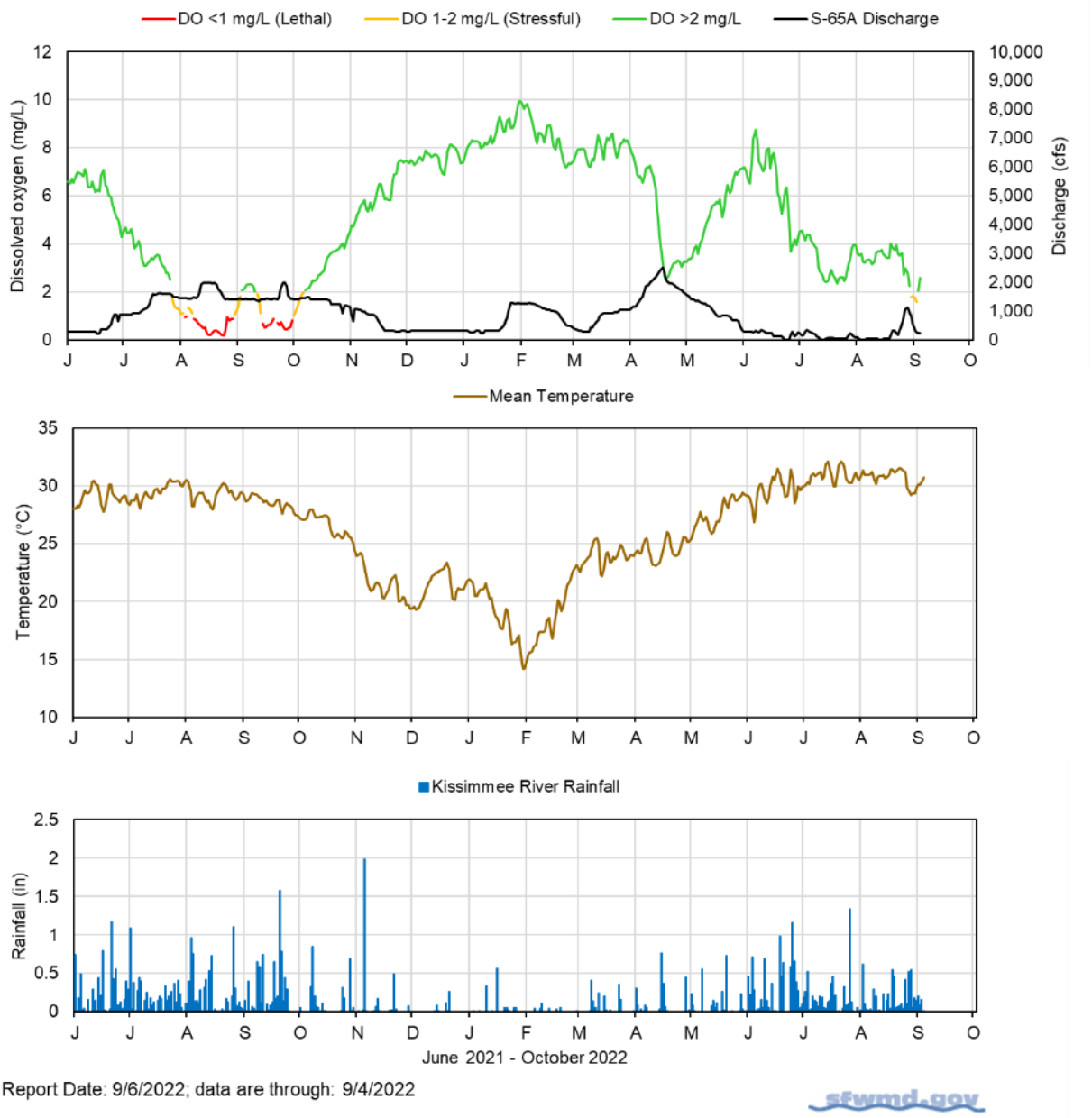


Figure KB-6. Restored Kissimmee river channel mean daily dissolved oxygen concentration (mg/L), S-65A discharge (cfs), temperature (°C) and rainfall (inches). Dissolved oxygen (DO) and temperature are mean daily values averaged for PC62, KRDR02, KRBN, PC33, PC11, PD62R, and PD42R with an average of three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

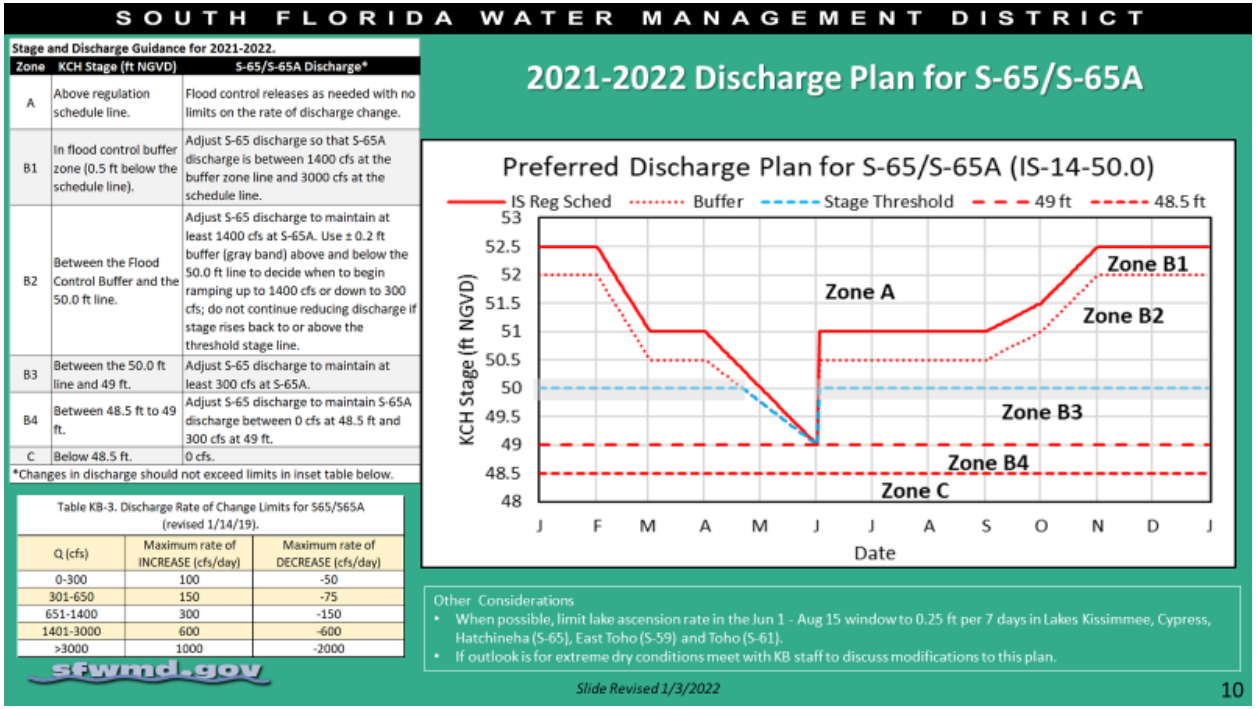


Figure KB-7. IS-14-50 Discharge Plan for S65/S65A with discharge rate of change limits (revised 1/14/19).

Lake Okeechobee

Lake Okeechobee stage was 12.55 feet NGVD on September 4, 2022, with water levels 0.4 feet lower than a month ago (**Figure LO-1**). Lake stage was in the Beneficial Use sub-band (**Figure LO-2**) and just 0.11 feet above the Water Shortage Management band. Lake stage remained within the ecological envelope where it has been for more than 90% of 2022 (**Figure LO-3**). According to NEXRAD, 0.03 inches of rain fell directly on the Lake last week.

Average daily inflows (excluding rainfall) increased from the previous week, going from 465 cfs to 876 cfs. Average daily outflows (excluding evapotranspiration) decreased, going from 1,144 cfs to 266 cfs. The highest inflow came from the Kissimmee River/C-38 Canal via the S-65E and S-65EX1 structures (737 cfs). Outflows to the southeast via the S-271 into the L-8 Canal was 109 cfs, and to the south via the S-350 structures was 157 cfs. There was no outflow to the east via the S-308 structure and 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 (September 2, 2022) from NOAA's Harmful Algal Bloom Monitoring System showed that bloom potential was moderate to high in western, northwestern, and southwestern parts of the lake. The bloom potential decreased along the northern and northeastern areas of the Lake since previous week (**Figure LO-6**).

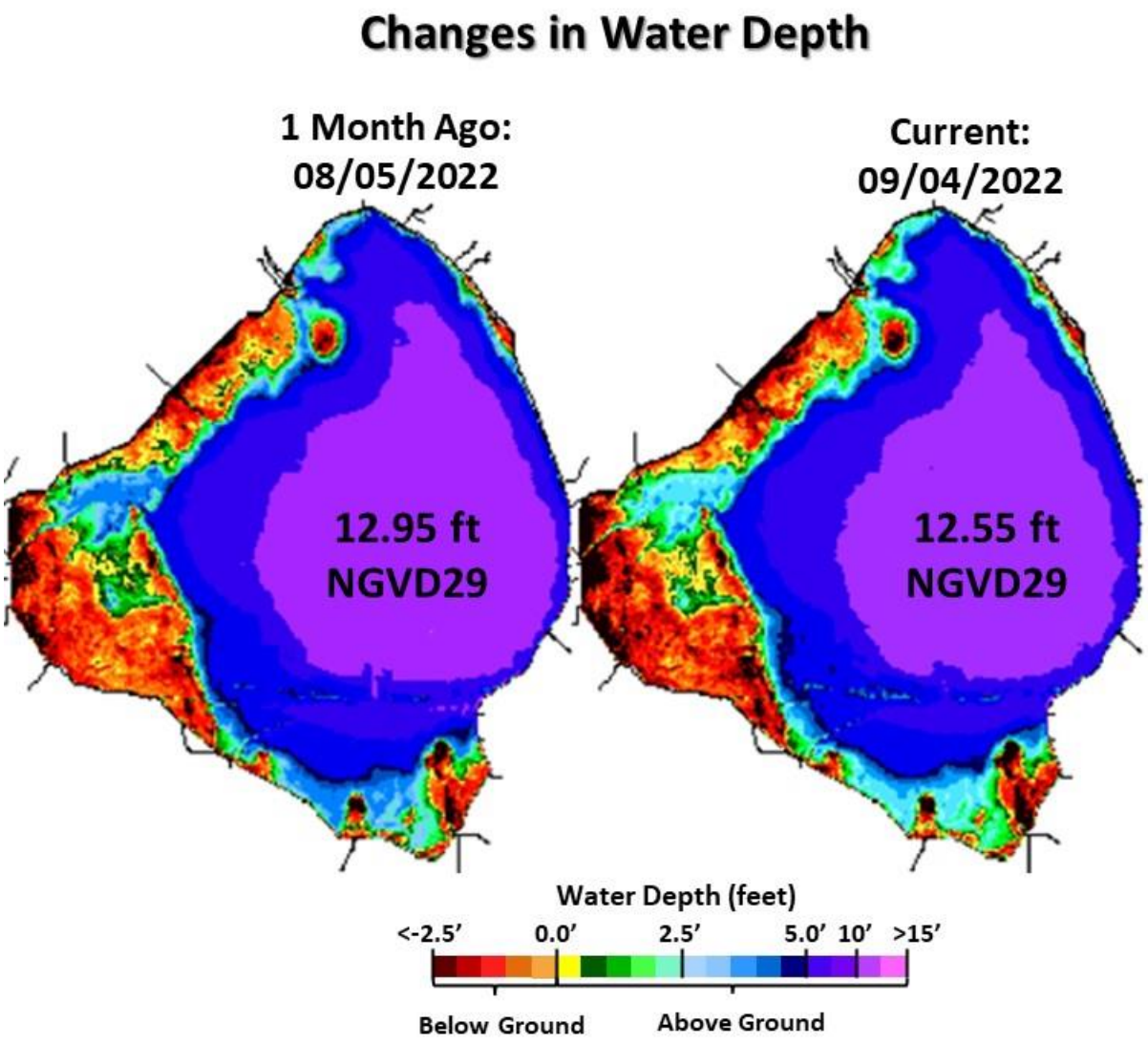


Figure LO-1. Lake Okeechobee water depth estimates based on South Florida Water Depth Assessment Tool (SFWDAT).

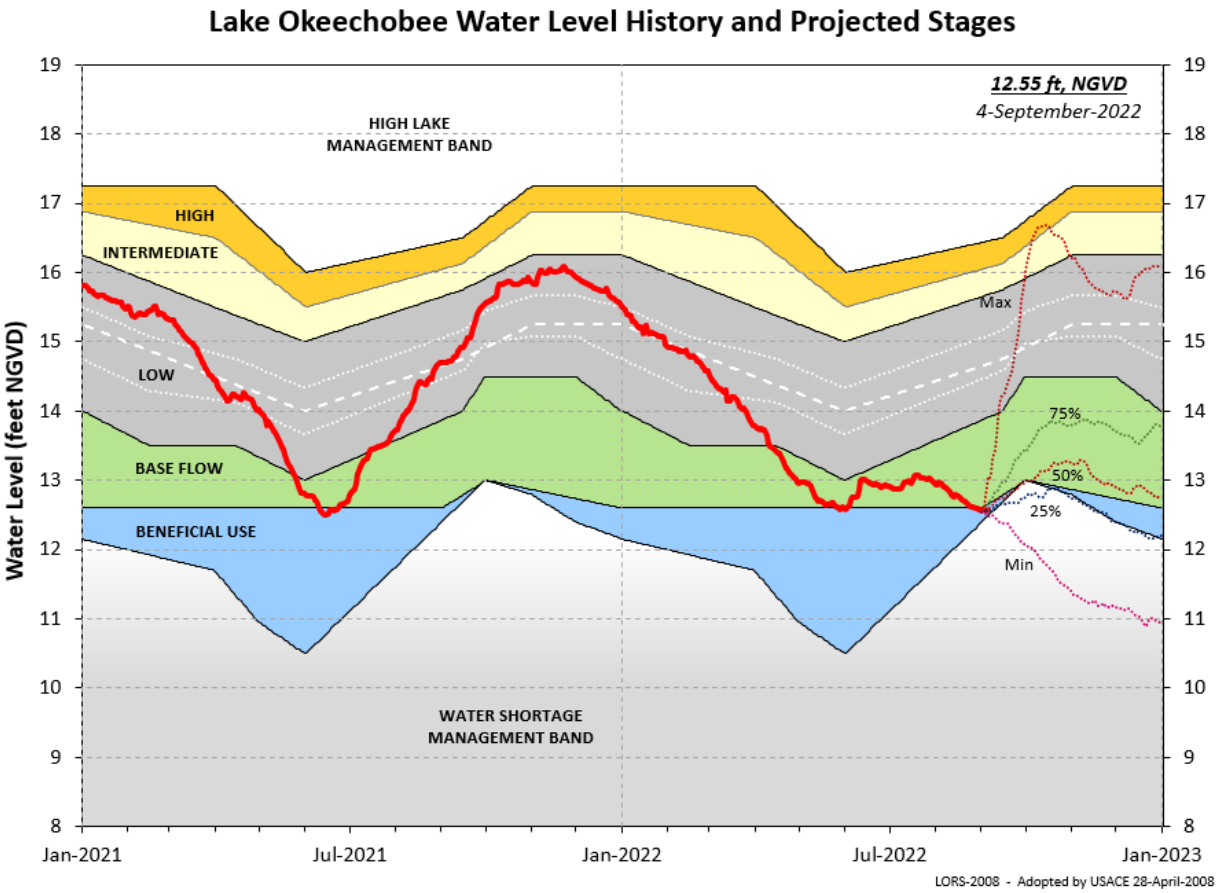


Figure LO-2. Recent Lake Okeechobee stages with projected stages based on a dynamic position analysis.

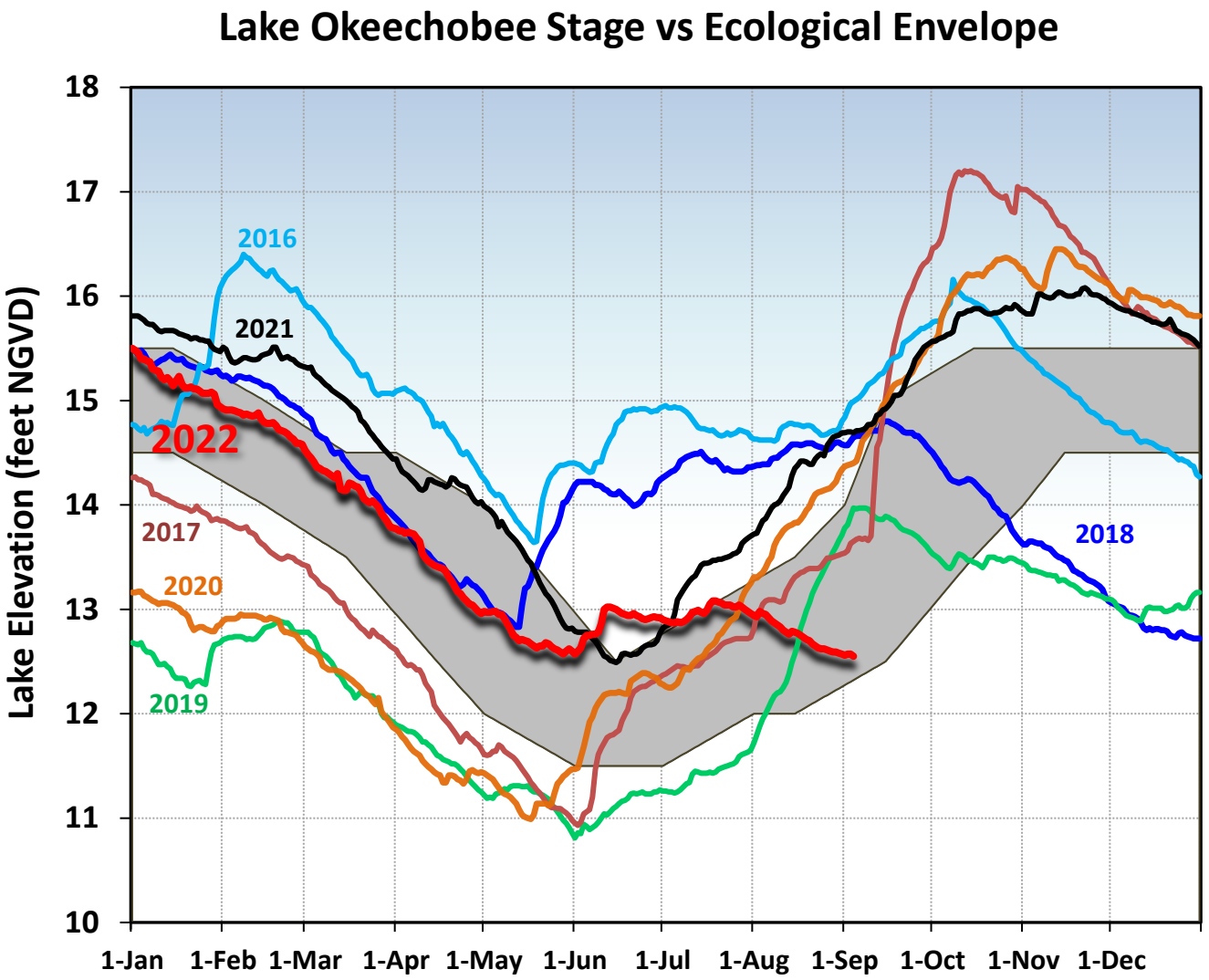


Figure LO-3. The prior six years of annual stage hydrographs for Lake Okeechobee in comparison to the ecological envelope.

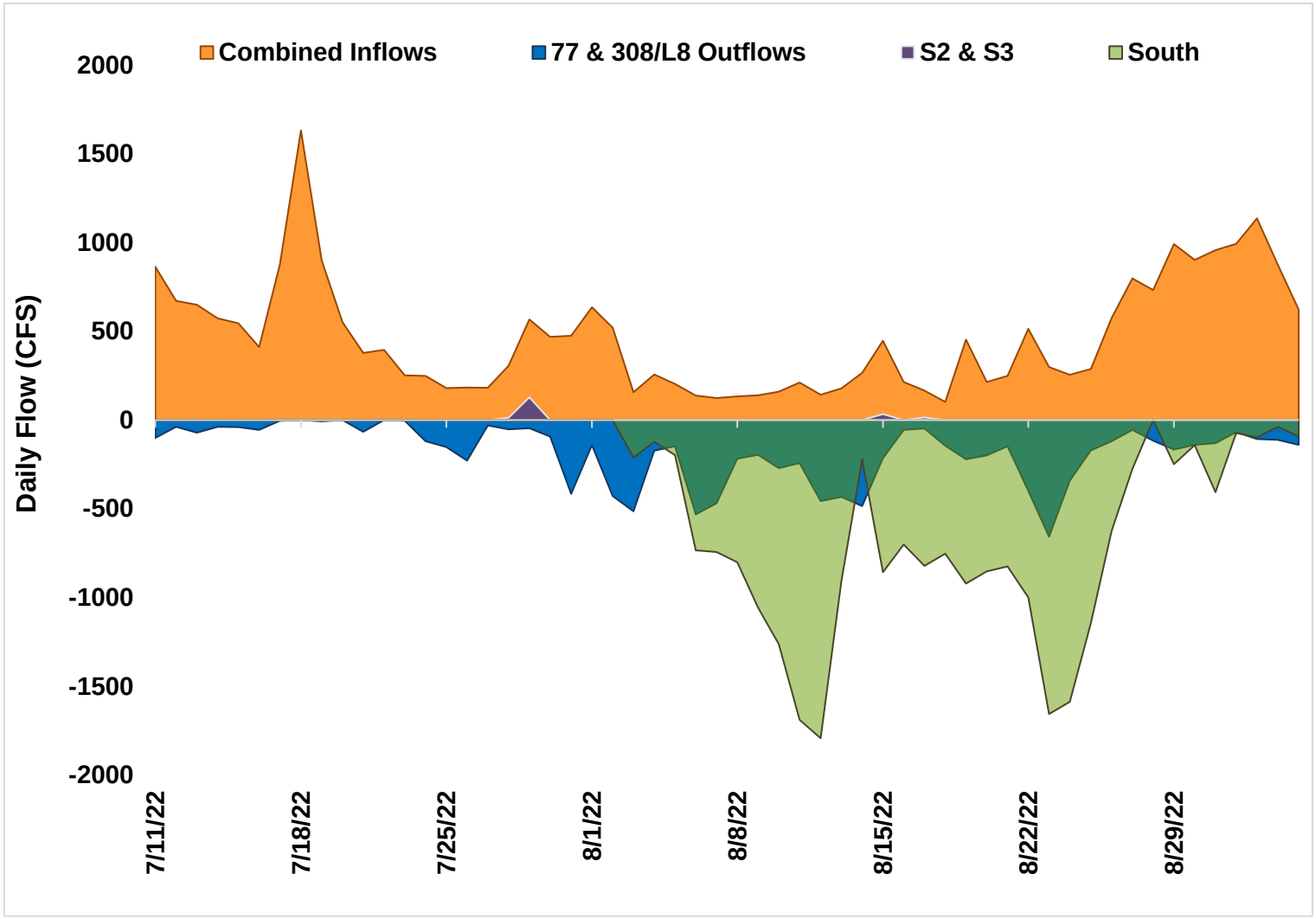


Figure LO-4. Major inflows (orange) to and outflows east and west (blue) from Lake Okeechobee. Outflows south are shown in green. Flows into Lake Okeechobee from the L-8 canal through S-271 (formerly Culvert 10A) or from the C-44 canal through the S-308 are included as inflows. Conversely, flows from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

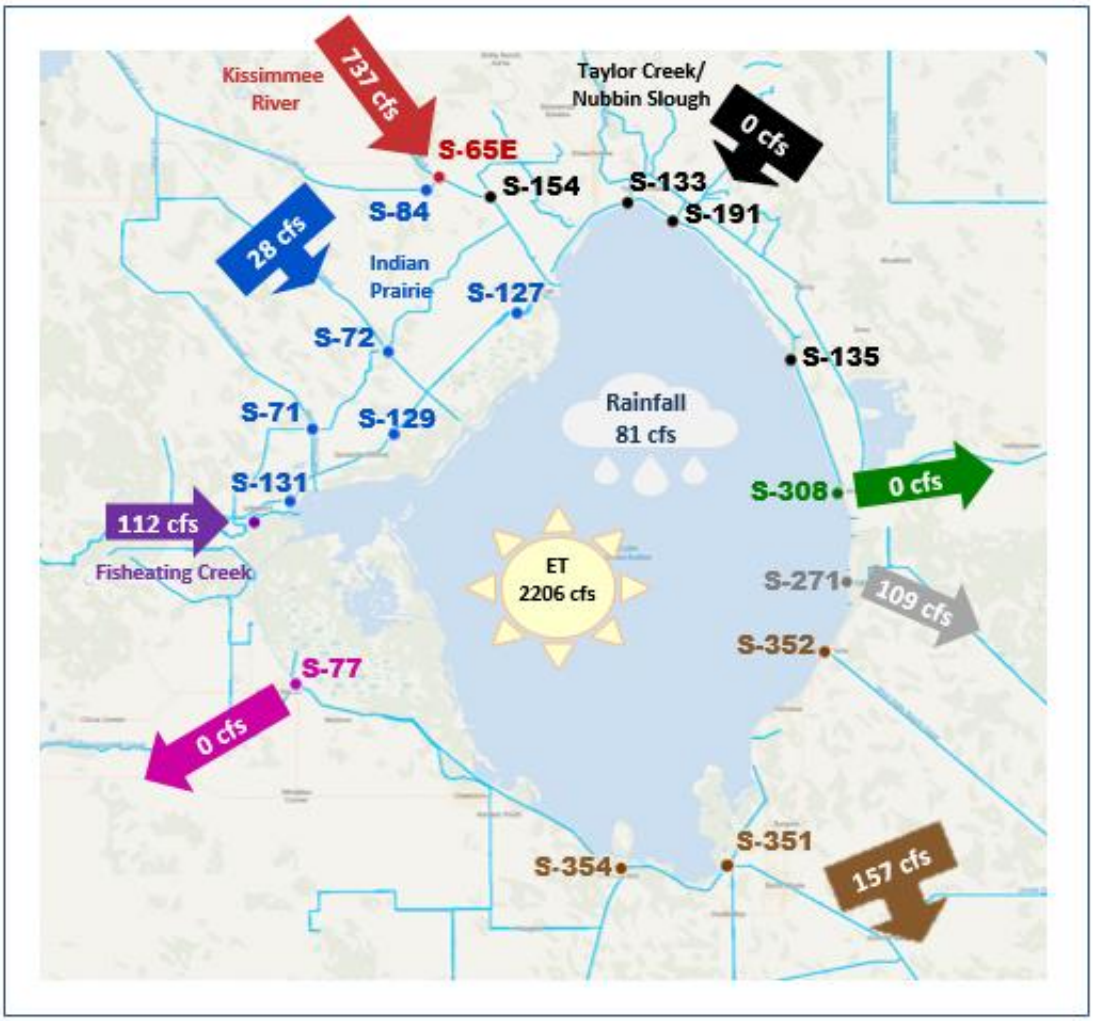


Figure LO-5. Inflows into Lake Okeechobee from Indian Prairie basins, Taylor Creek/Nubbin Slough, Kissimmee River and Fisheating Creek, and outflows to the west via S-77, to the east via S-308, to the south via S-351, S-352, S-354, and to southeast via S-271 (formerly Culvert 10A) for the week of August 29 – September 4, 2022.

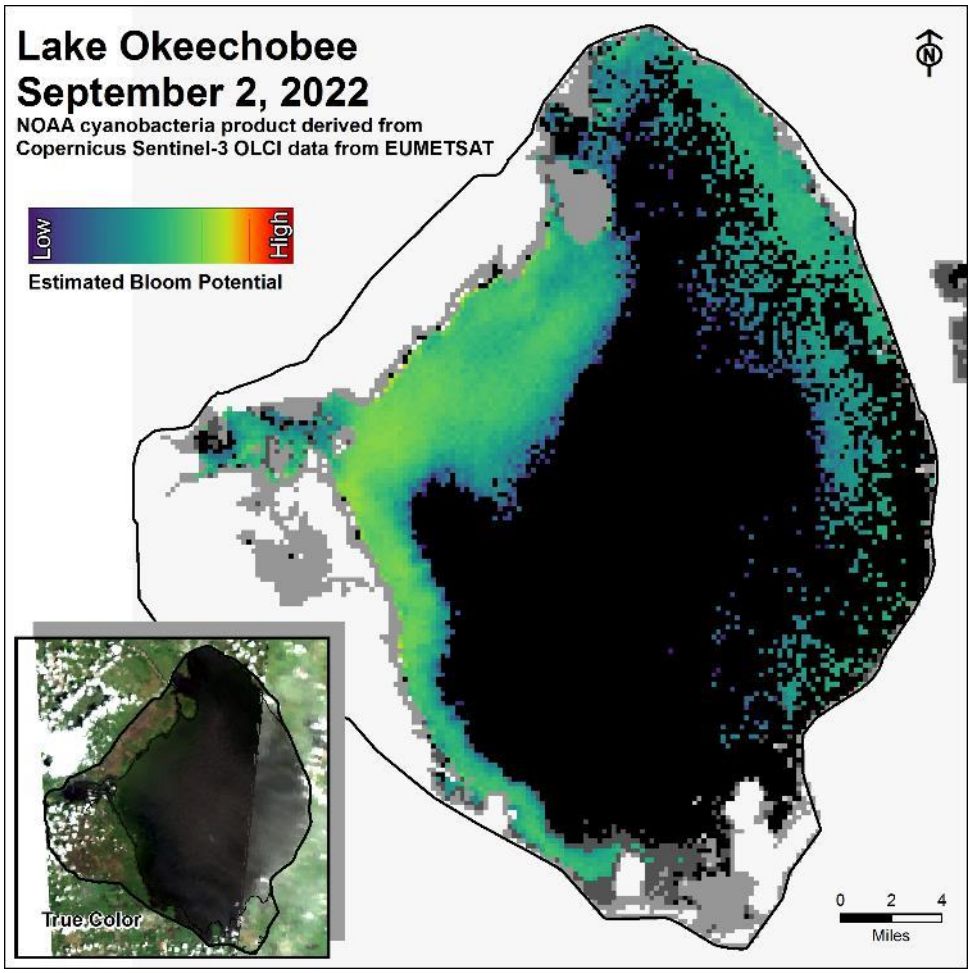


Figure LO-6. Cyanobacteria bloom potential on September 2, 2022 based on NOAA's harmful algal bloom monitoring system. Gray color indicates cloud cover.

Estuaries

St. Lucie Estuary

Over the past week, mean total inflow to the St. Lucie Estuary was 363 cfs (**Figures ES-1** and **ES-2**) and the previous 30-day mean inflow was 319 cfs. For comparison, the historical provisional mean inflows from the contributing areas are shown in **Figure ES-2**.

Over the past week, surface salinities decreased at HR1 and increased slightly at the US1 and A1A Bridge sites (**Table ES-1** and **Figure ES-3**). The seven-day moving average of the surface and bottom salinities at the US1 Bridge was 22.9. 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 was 1.5 spat/shell in August (**Figure ES-5**).

Caloosahatchee River Estuary

Over the past week, mean total inflow to the Caloosahatchee River Estuary was 4,780 cfs (**Figures ES-6** and **ES-7**) and the previous 30-day mean inflow was 2,058 cfs. For comparison, the historical provisional mean inflows from the contributing areas are shown in **Figure ES-7**.

Over the past week, salinities decreased at all sites in the estuary (**Table ES-2** and **Figures ES-8** and **ES-9**). 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 optimal range for adult eastern oysters at Shell Point, and in the stressed range at Cape Coral and Sanibel (**Figure ES-10**). The mean larval oyster recruitment rate reported by the Fish and Wildlife Research Institute was 6.8 spat/shell at Iona Cove and 24.9 spat/shell at Bird Island in August (**Figures ES-11 and ES-12**).

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 838 cfs. Model results from all scenarios predict daily salinity to be 2.8 or lower and the 30-day moving average surface salinity to be 1.4 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.

[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.

Red Tide

The Florida Fish and Wildlife Research Institute reported on September 2, 2022, that *Karenia brevis*, the Florida red tide dinoflagellate, was not observed in any samples collected within the District region. On the east coast, red tide was not observed in samples from Palm Beach, Broward or Miami-Dade counties.

Water Management Recommendations

Lake stage is in the Beneficial Use Sub-Band. Tributary conditions are dry. The LORS2008 release guidance suggests no lake releases to the Caloosahatchee River Estuary or the St. Lucie Estuary to manage Lake stages.

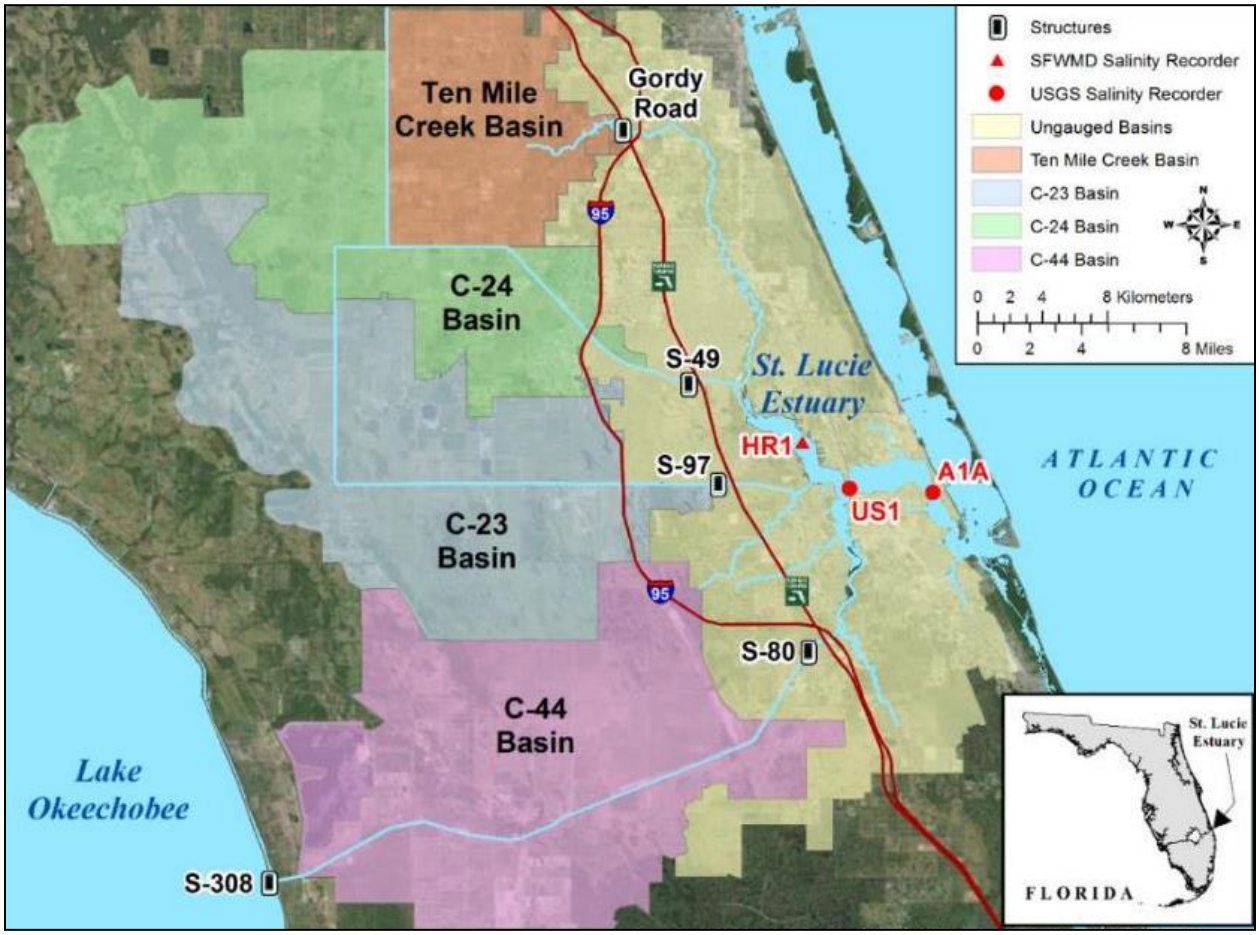


Figure ES-1. Basins, water control structures and salinity monitoring sites in the St. Lucie Estuary.

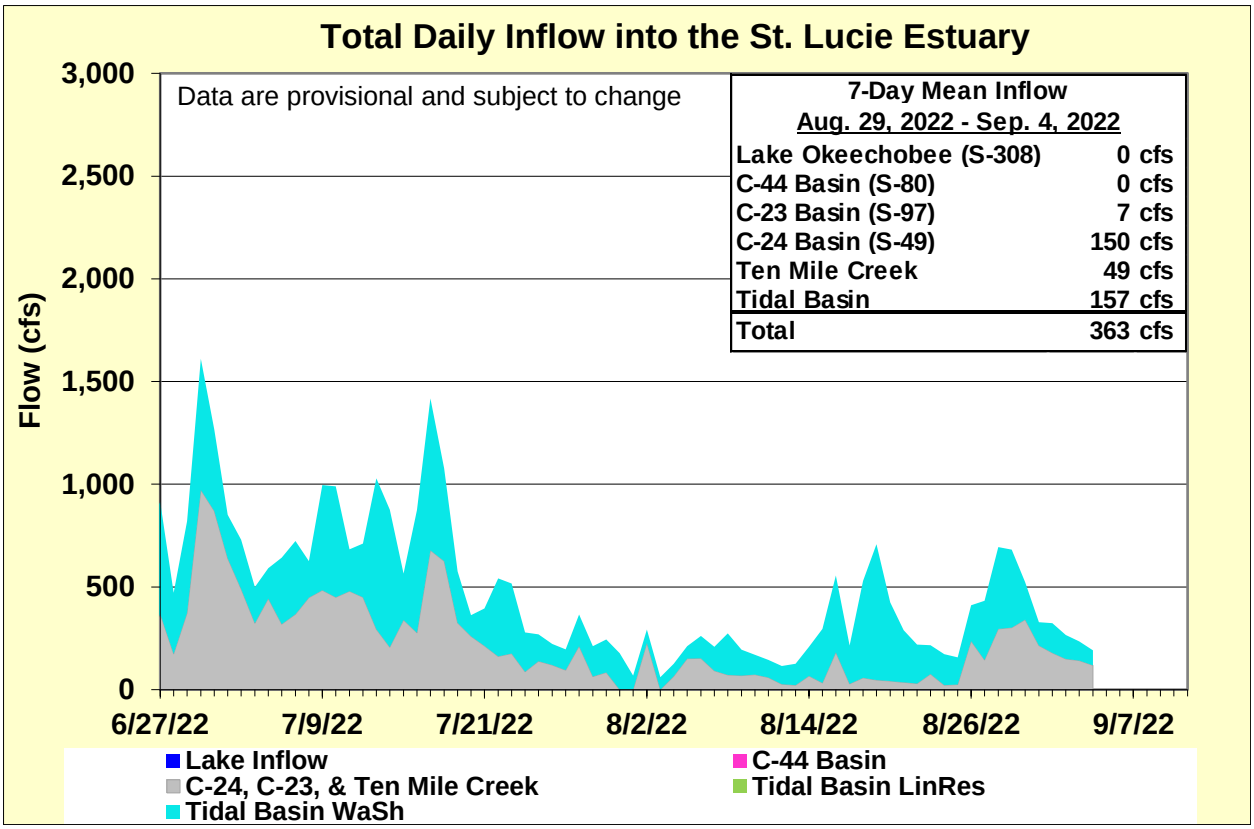


Figure ES-2. Total daily inflows from Lake Okeechobee and runoff from the C-44, C-23, C-24, Ten Mile Creek, and Tidal Basins into the St. Lucie Estuary.

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)	**15.2** (17.0)	**19.8** (19.8)	10.0 – 25.0
US1 Bridge	**22.7** (22.3)	**23.0** (23.0)	10.0 – 25.0
A1A Bridge	**29.1** (28.9)	**30.7** (30.3)	10.0 – 25.0

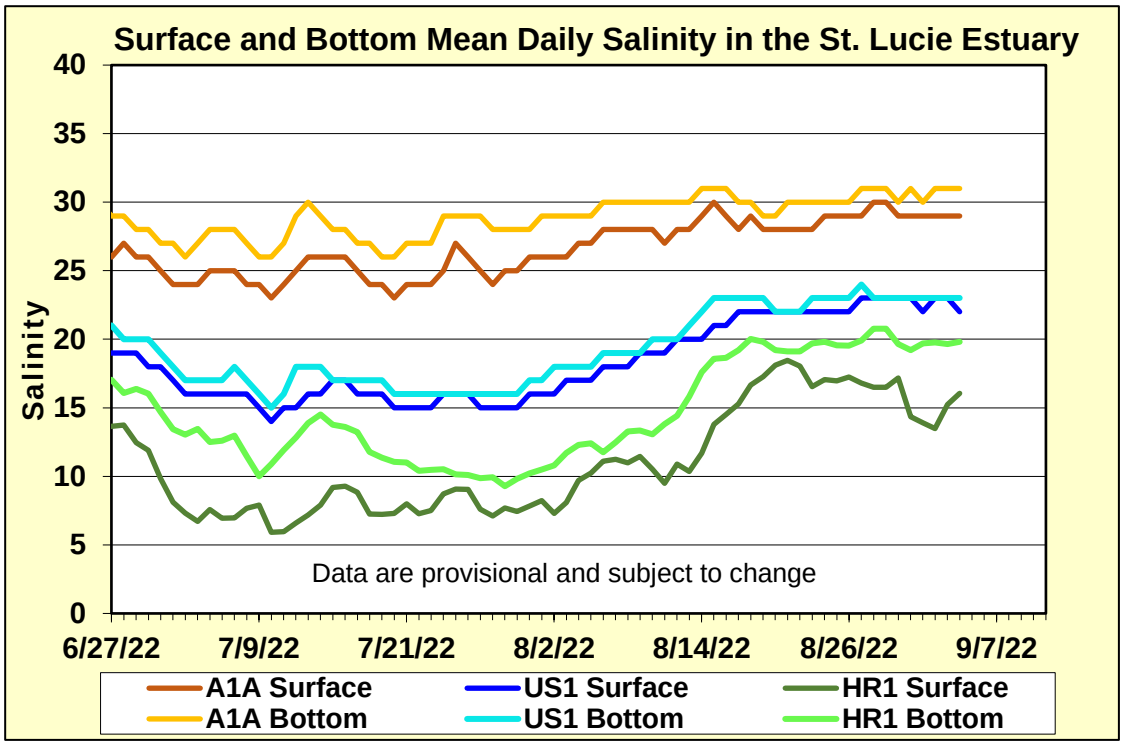


Figure ES-3. Mean daily salinity at the A1A, US1 and HR1 sites in the St. Lucie Estuary.

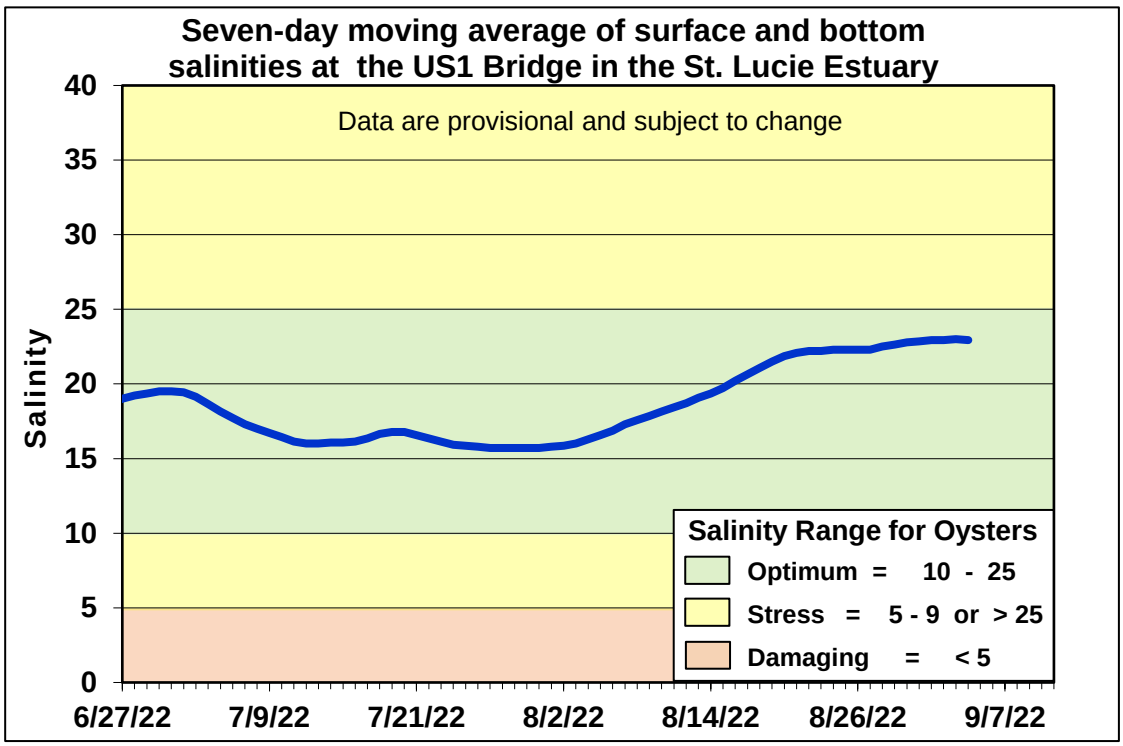


Figure ES-4. Seven-day moving average of the surface and bottom salinities at the US1 Bridge in the St. Lucie Estuary.

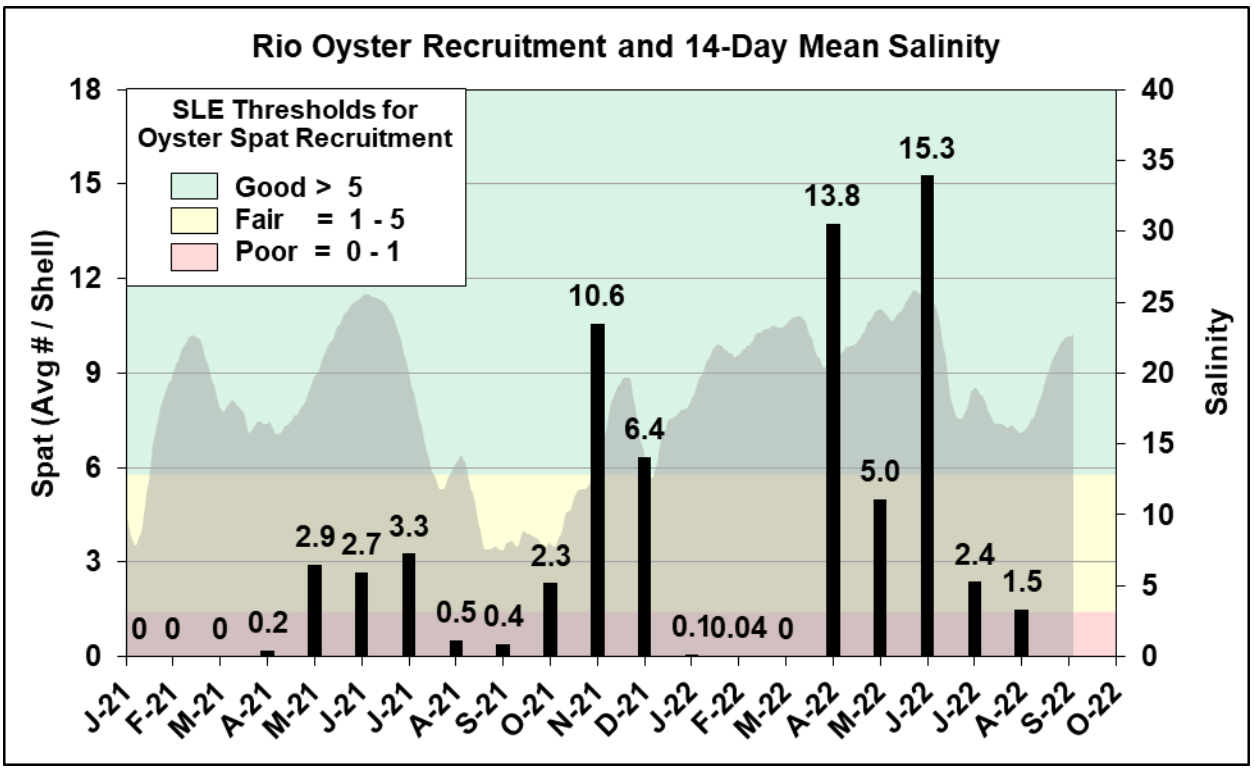


Figure ES-5. Mean oyster recruitment at the Rio oyster monitoring station and 14-day mean salinity at US1 Bridge.

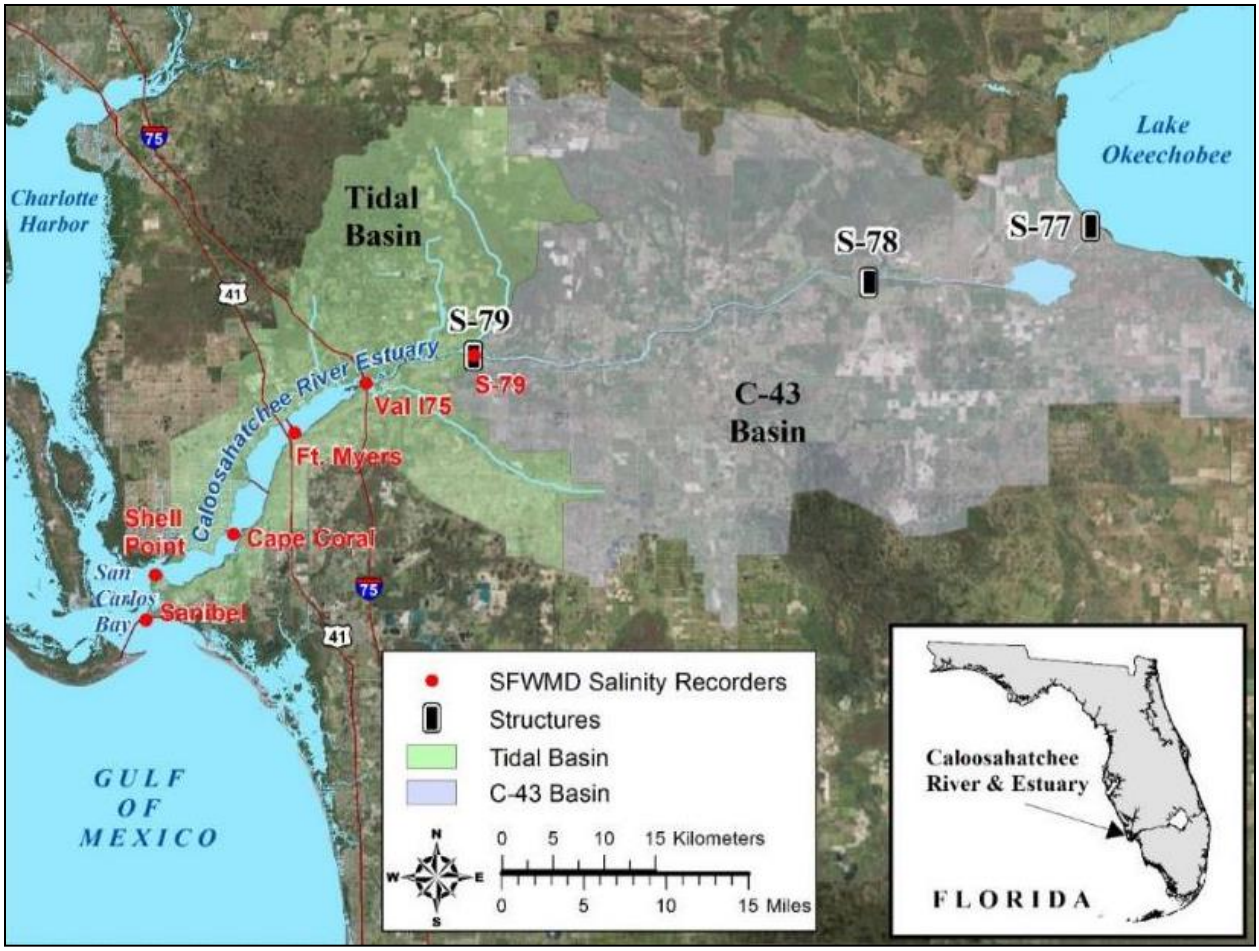


Figure ES-6. Basins, water control structures and salinity monitoring sites in the Caloosahatchee River Estuary.

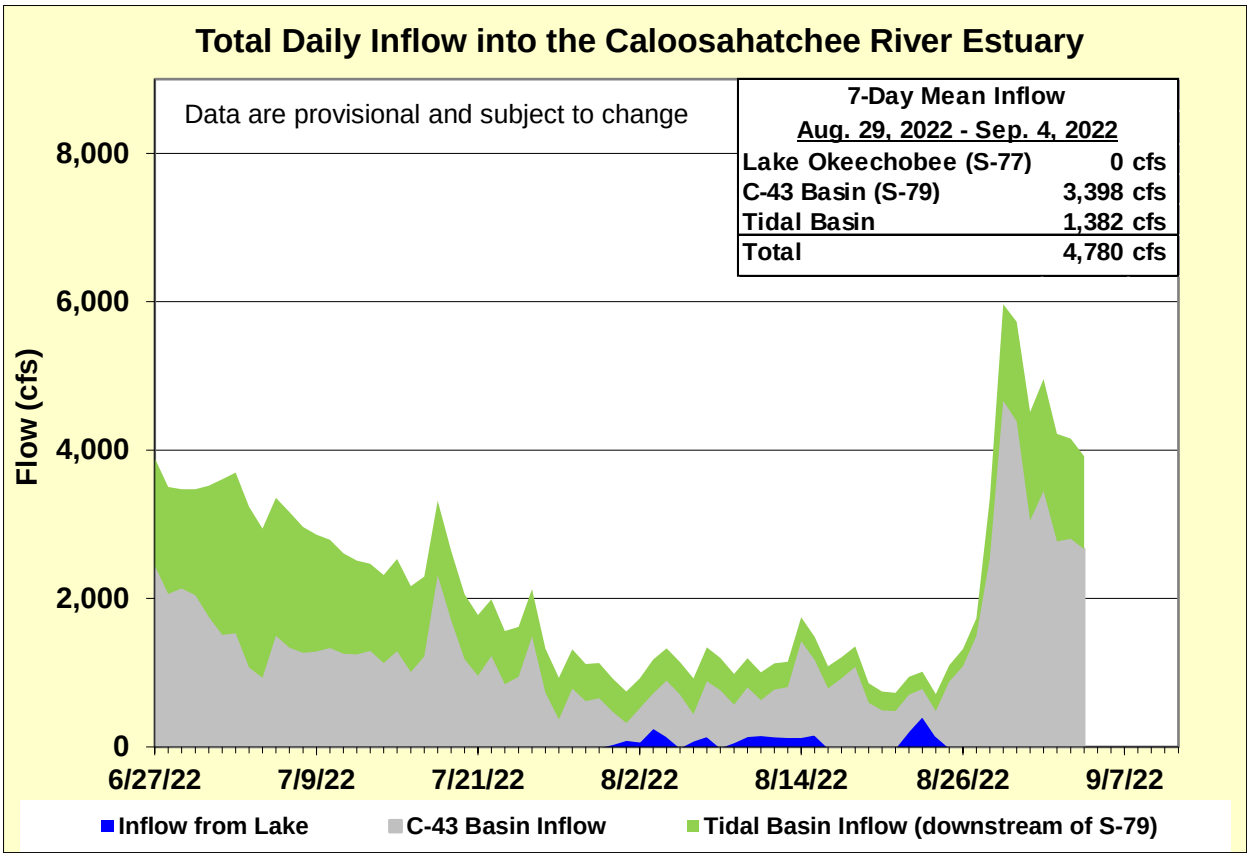


Figure ES-7. Total daily inflows from Lake Okeechobee, and runoff from the C-43 and Tidal basins into the Caloosahatchee River Estuary.

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. 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** (1.1)	**0.2** (1.1)	0.0 – 10.0
Val I-75	**0.4** (1.2)	**0.4** (1.8)	0.0 – 10.0
Fort Myers Yacht Basin	**1.8** (5.7)	**2.3** (7.9)	0.0 – 10.0
Cape Coral	**7.5** (12.2)	**8.0** (13.9)	10.0 – 25.0
Shell Point	**19.9** (26.5)	**18.7** (26.1)	10.0 – 25.0
Sanibel	**30.0** (32.3)	**29.4** (31.6)	10.0 – 25.0

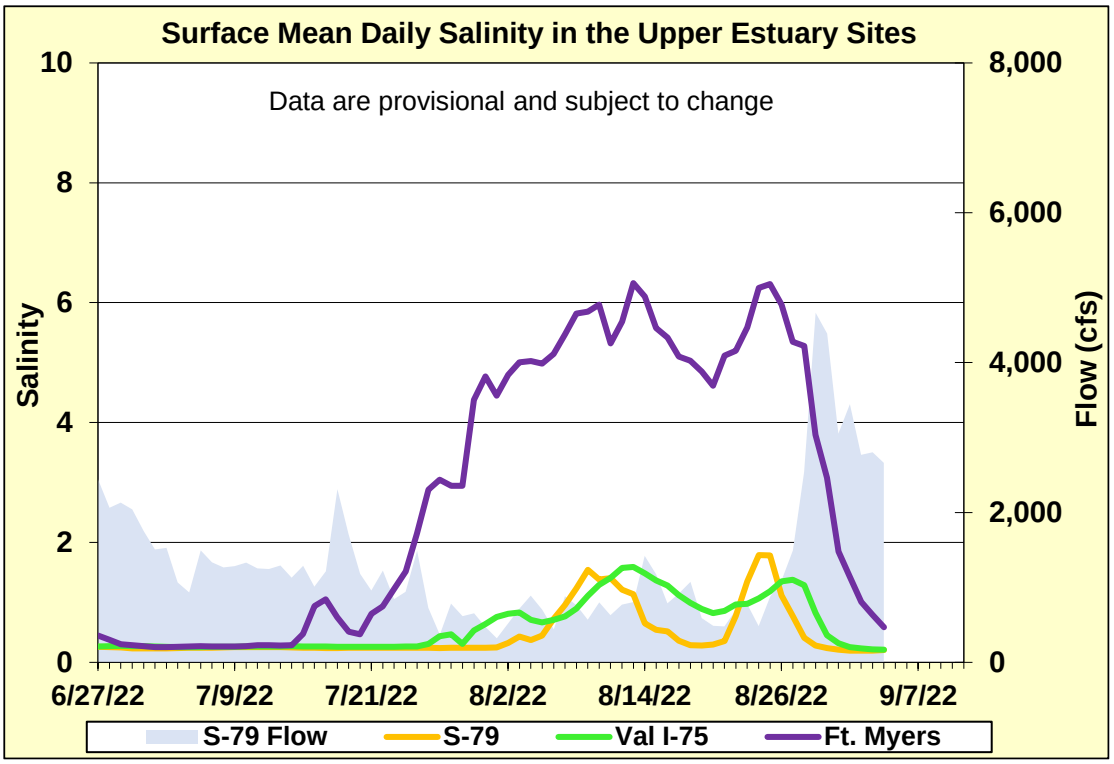


Figure ES-8. Mean daily salinity at upper Caloosahatchee River Estuary monitoring sites and mean daily flow at S-79.

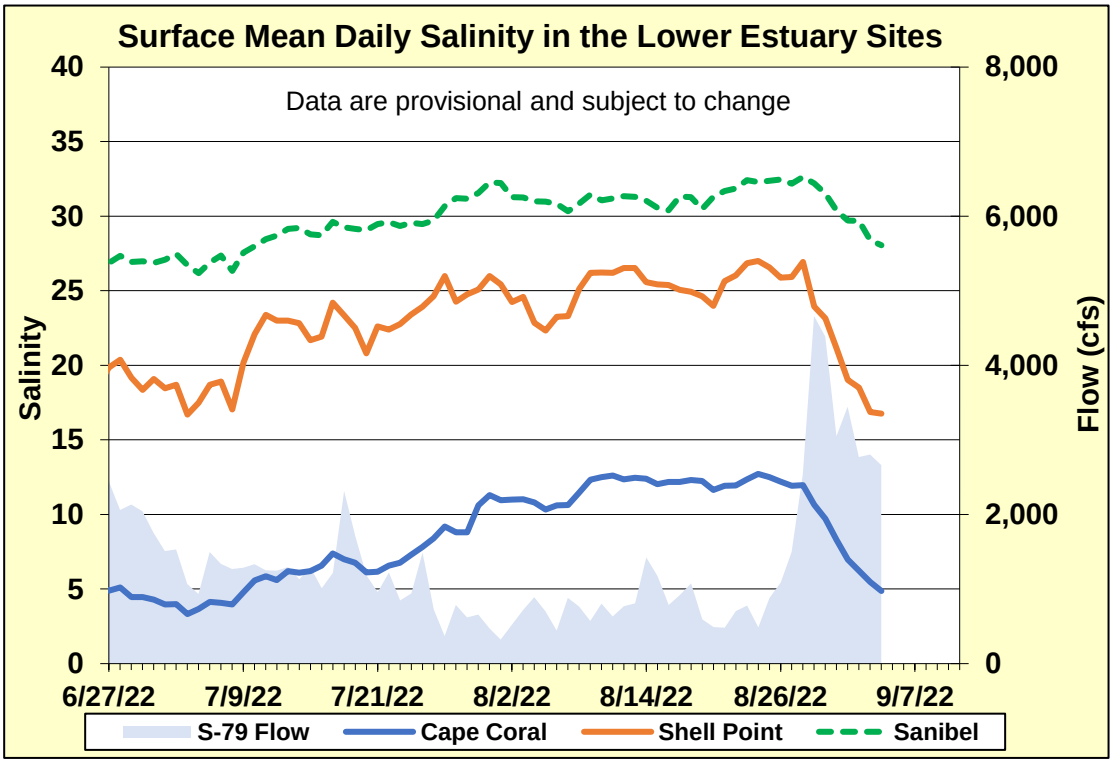


Figure ES-9. Mean daily surface salinity at lower Caloosahatchee River Estuary monitoring sites and mean daily flow at S-79.

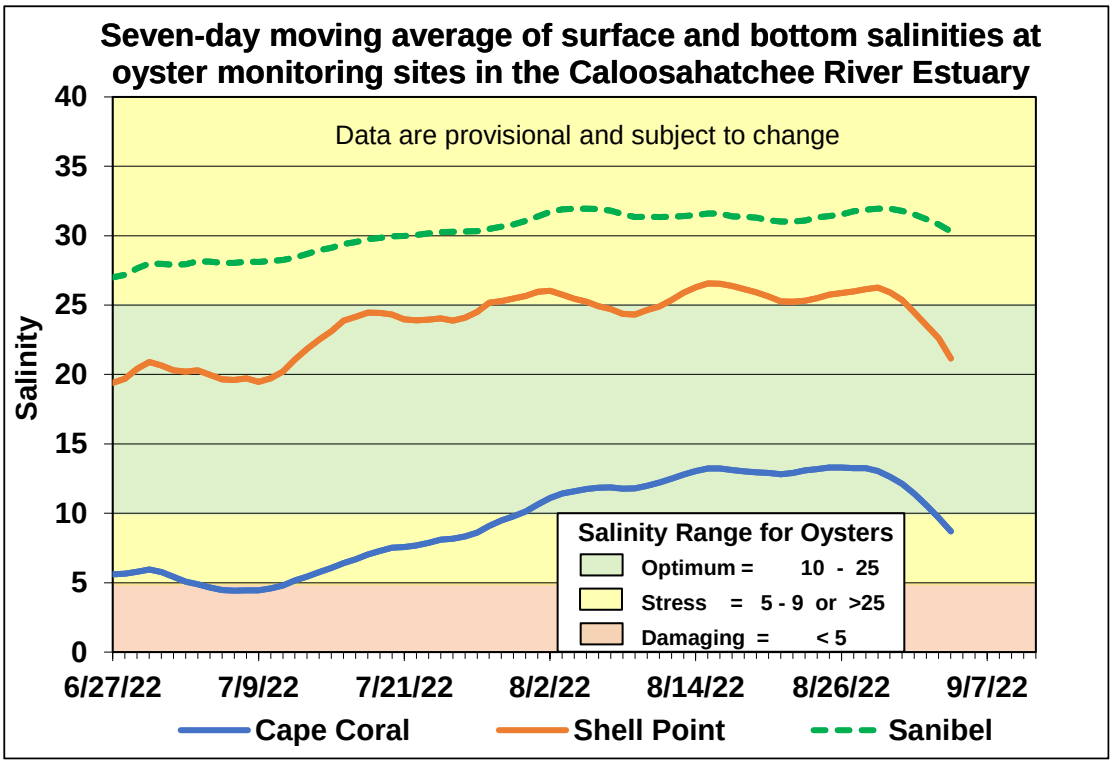


Figure ES-10. Seven-day moving average of surface and bottom salinities at Cape Coral, Shell Point and Sanibel monitoring sites in the Caloosahatchee River Estuary.

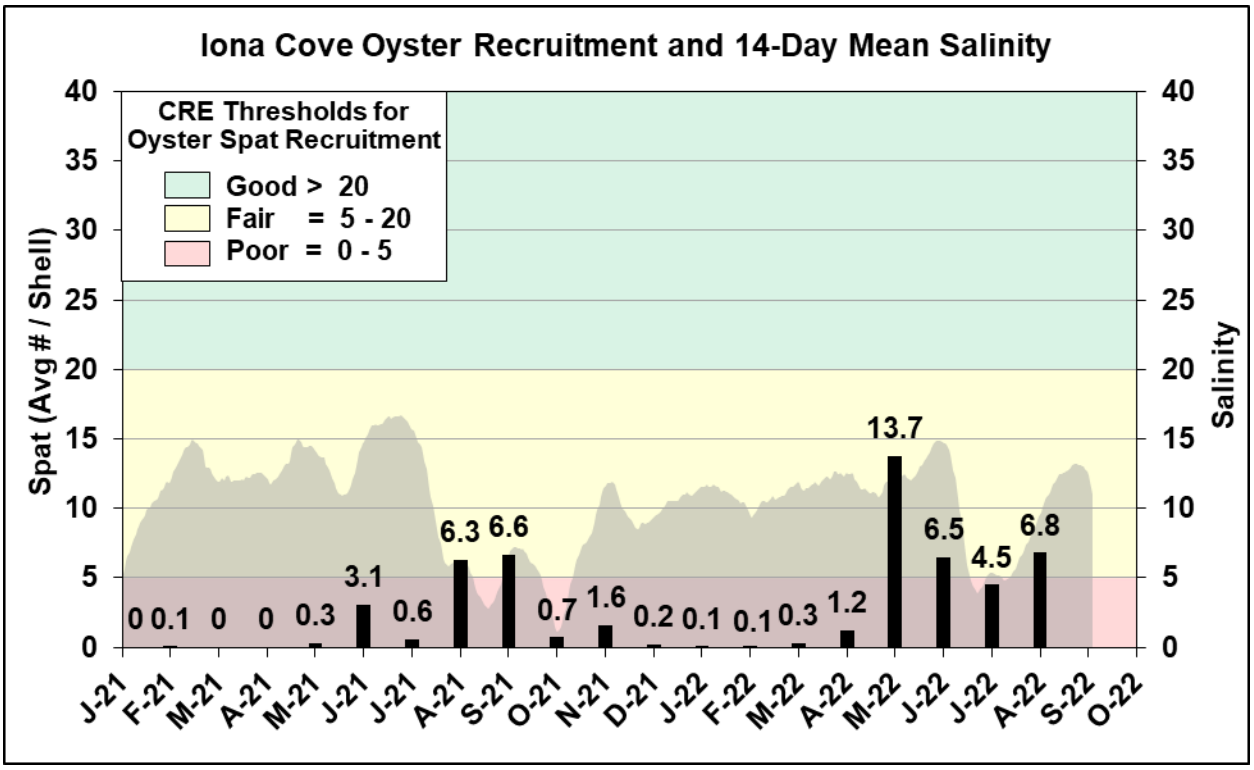


Figure ES-11. Mean oyster recruitment at the Iona Cove oyster monitoring station and 14-day mean salinity at Cape Coral.

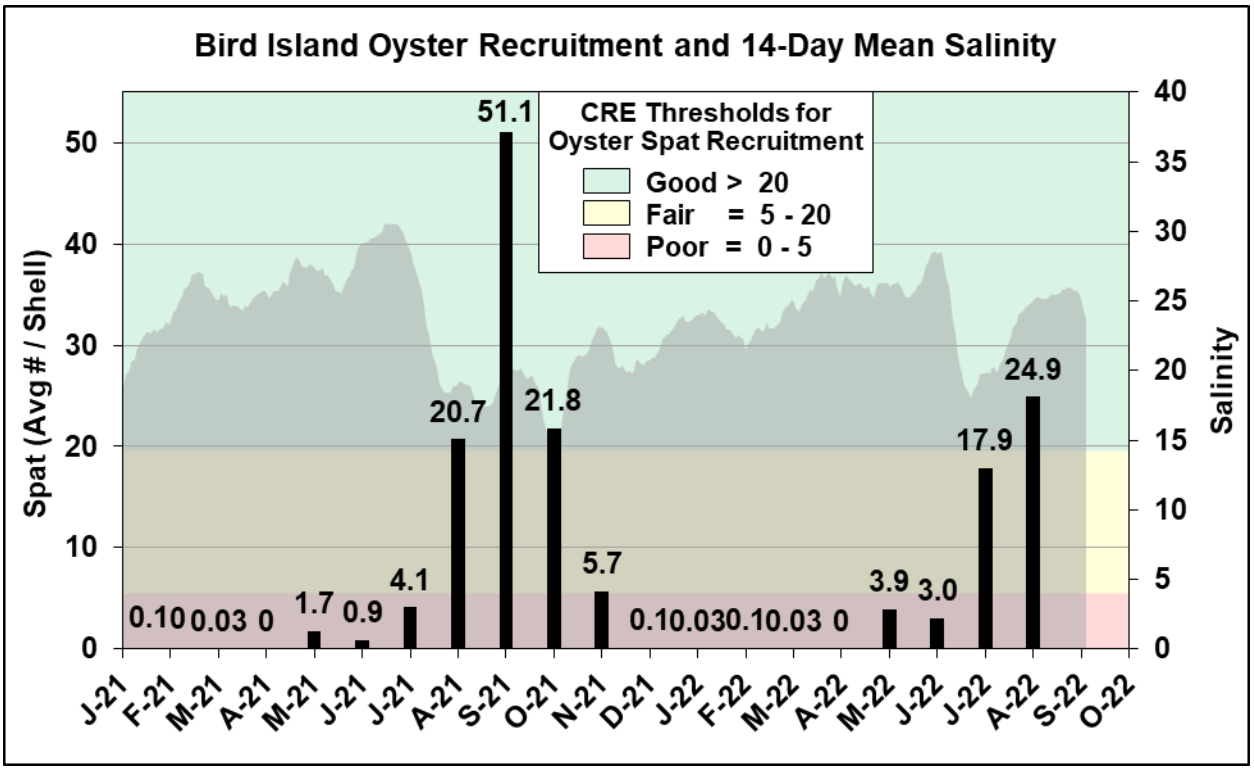


Figure ES-12. Mean oyster recruitment at the Bird Island oyster monitoring station and 14-day mean salinity at Shell Point.

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	838	2.8	1.4
B	450	838	1.8	1.1
C	750	838	1.2	1.0
D	1000	838	0.8	0.9
E	1500	838	0.4	0.8
F	2000	838	0.0	0.8

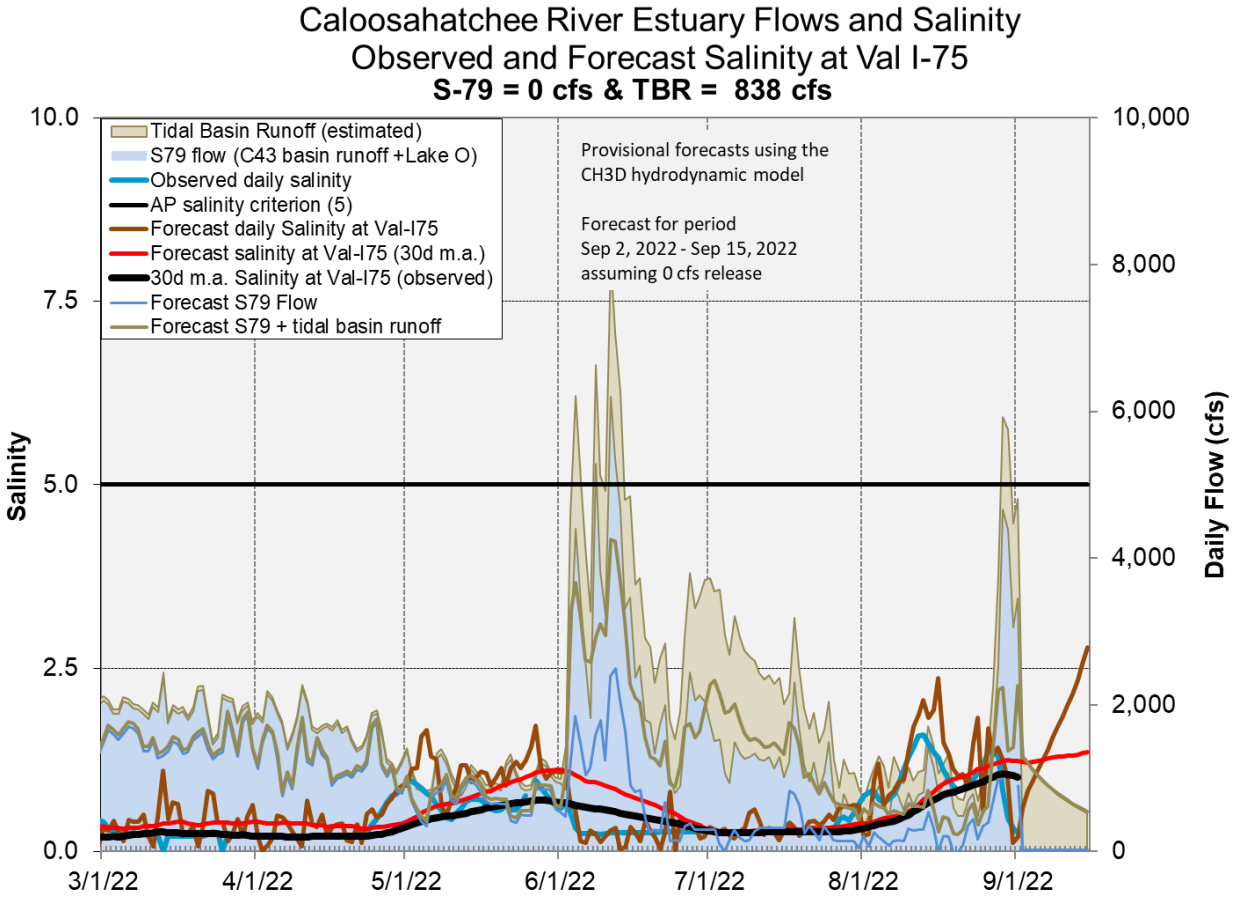


Figure ES-13. Forecasted Val I-75 site surface salinity assuming no pulse release at S-79.

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 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**).

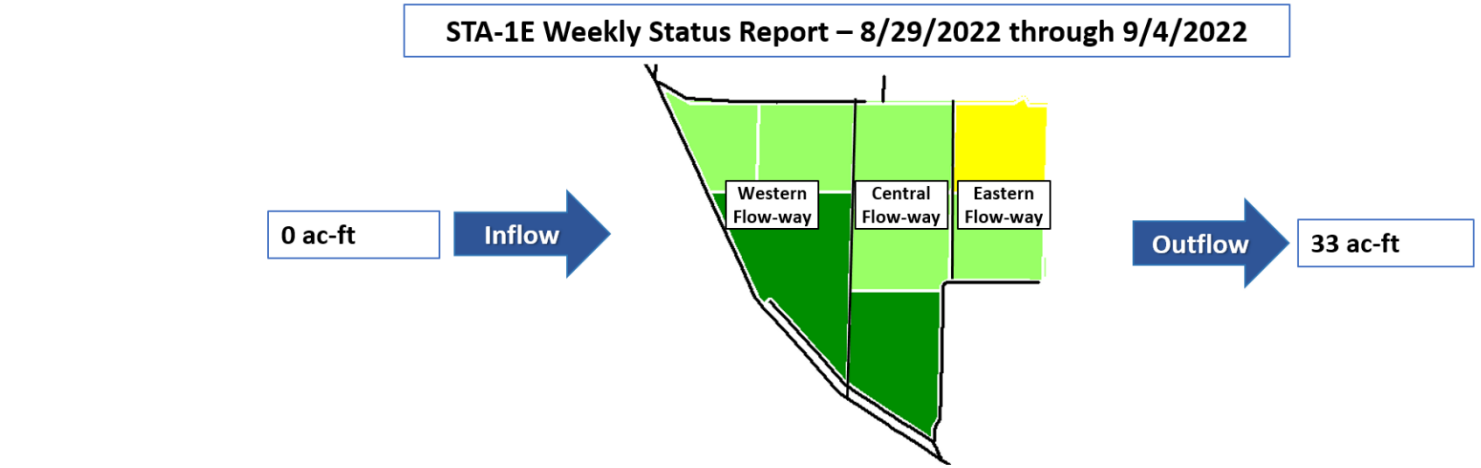
STA-1W: Operational restrictions are in place in STA-1W Western, Eastern, and Northern Flow-ways for vegetation management activities. Most treatment cells are near or below target stage. Vegetation in the flow-ways is stressed and highly stressed. The 365-day PLRs for the Northern, Western, and Eastern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

STA-3/4: STA-3/4 Eastern Flow-way is offline for vegetation rehabilitation/drawdown. Online treatment cells are at or near 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.



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	← leaf →	1.0	Vegetation management
Central	← leaf →	1.0	Vegetation rehabilitation
Western	Offline, post-construction grow in starting 3/28/2022		

As of 9/4/2022	
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, ac-ft	0	64	158,505
--Lake Inflow, ac-ft	0	N/A	2,600
Total Outflow, ac-ft	33	110	131,594
Inflow Conc., ppb	N/A	37	118
Outflow Conc., ppb	21	20	24
Includes Preliminary Data			

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

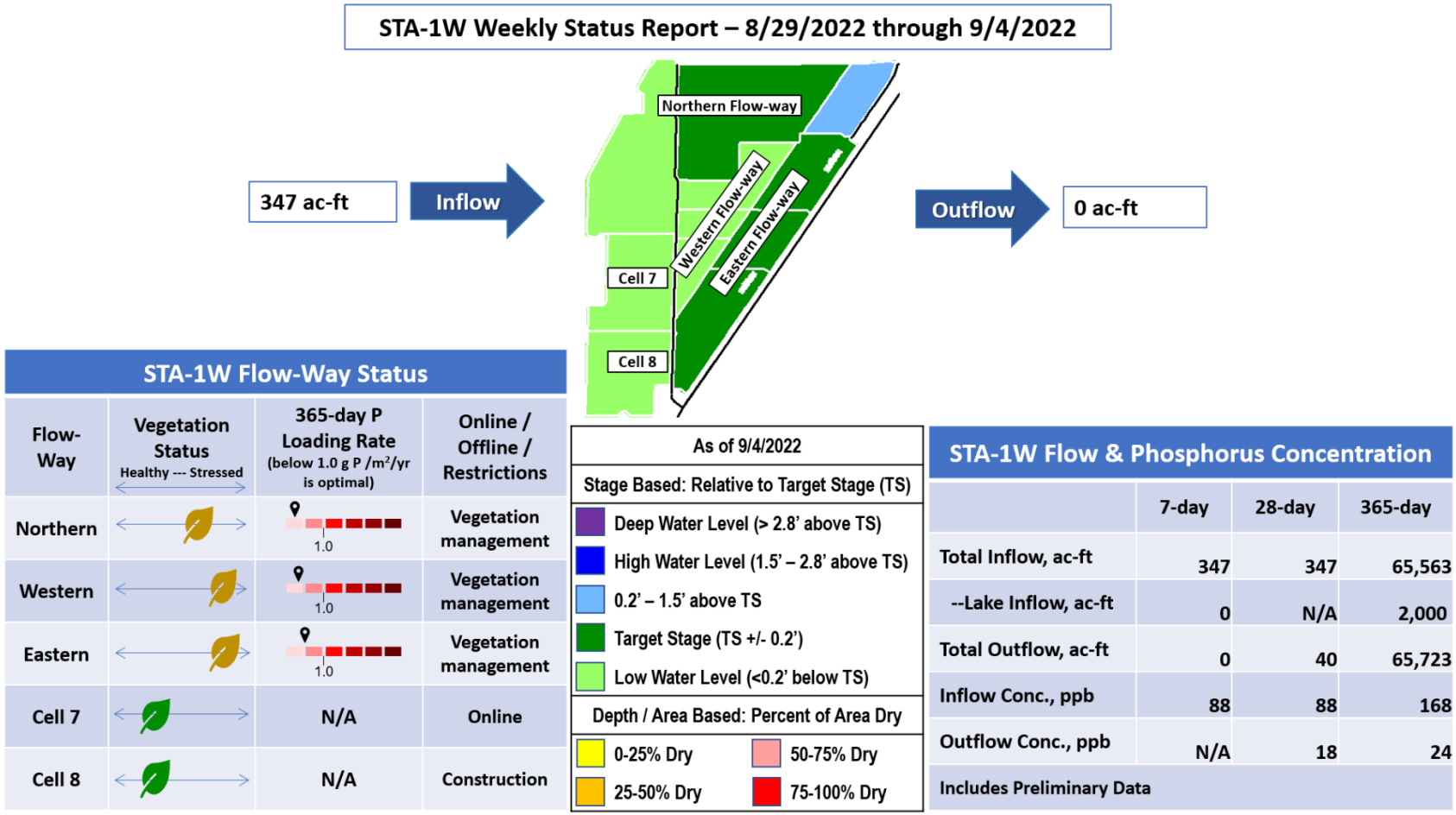
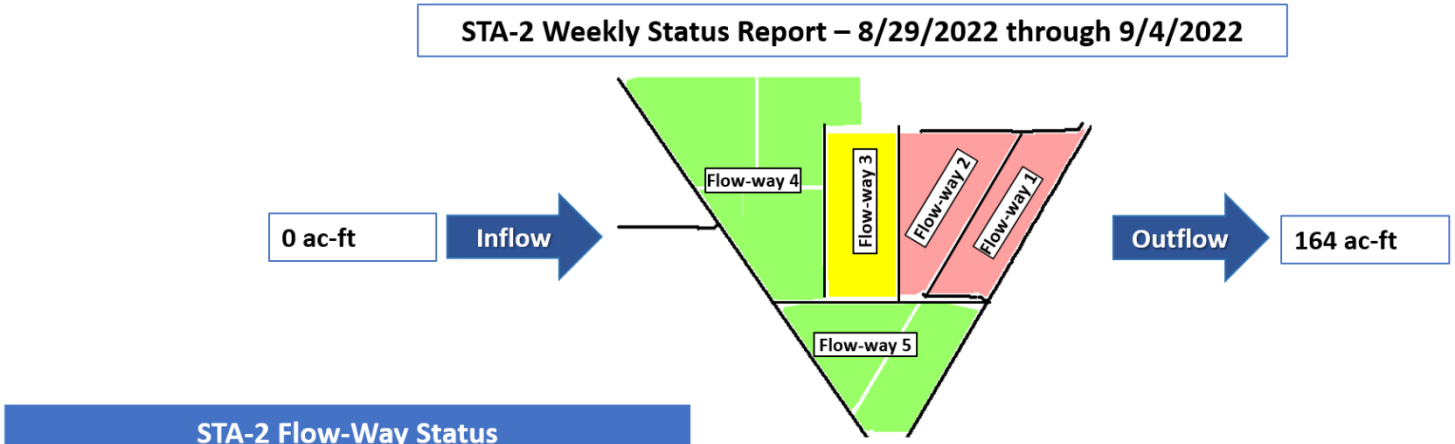


Figure S-2. STA-1W Weekly Status Report



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

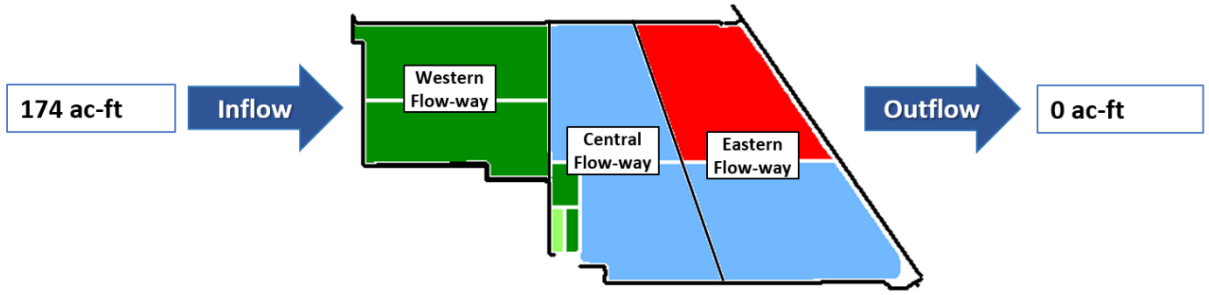
As of 9/4/2022	
Stage Based: Relative to Target Stage (TS)	
Deep Water Level (> 2.8' above TS)	
High Water Level (1.5' – 2.8' above TS)	
0.2' – 1.5' above TS	
Target Stage (TS +/- 0.2')	
Low Water Level (<0.2' below TS)	
Depth / Area Based: Percent of Area Dry	
0-25% Dry	50-75% Dry
25-50% Dry	75-100% Dry

STA-2 Flow & Phosphorus Concentration

	7-day	28-day	365-day
Total Inflow, ac-ft	0	0	271,792
--Lake Inflow, ac-ft	0	N/A	27,600
Total Outflow, ac-ft	164	805	292,826
Inflow Conc., ppb	N/A	N/A	106
Outflow Conc., ppb	18	16	24
Includes Preliminary Data			

Figure S-3. STA-2 Weekly Status Report

STA-3/4 Weekly Status Report – 8/29/2022 through 9/4/2022



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 9/4/2022	
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

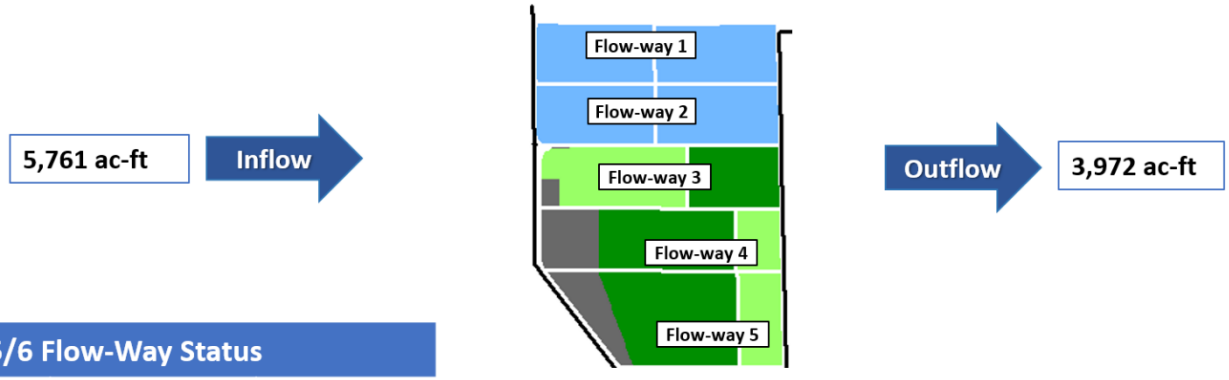
STA-3/4 Flow & Phosphorus Concentration

	7-day	28-day	365-day
Total Inflow, ac-ft	174	-6	257,165
--Lake Inflow, ac-ft	0	N/A	5,300
Total Outflow, ac-ft	0	68	244,020
Inflow Conc., ppb	37	43	89
Outflow Conc., ppb	N/A	14	15

Includes Preliminary Data

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

STA-5/6 Weekly Status Report – 8/29/2022 through 9/4/2022



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

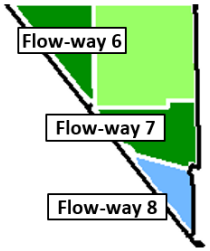
As of 9/4/2022	
Stage Based: Relative to Target Stage (TS)	
Deep Water Level (> 2.8' above TS)	
High Water Level (1.5' – 2.8' above TS)	
0.2' – 1.5' above TS	
Target Stage (TS +/- 0.2')	
Low Water Level (<0.2' below TS)	
Depth / Area Based: Percent of Area Dry	
0-25% Dry	50-75% Dry
25-50% Dry	75-100% Dry

STA-5/6 Flow & Phosphorus Concentration

	7-day	28-day	365-day
Total Inflow, ac-ft	5,761	14,708	151,855
--Lake Inflow, ac-ft	0	N/A	0
Total Outflow, ac-ft	3,972	8,942	136,980
Inflow Conc., ppb	181	194	221
Outflow Conc., ppb	23	21	47
Includes Preliminary Data			

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

STA-5/6 Weekly Status Report – 8/29/2022 through 9/4/2022



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 9/4/2022	
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 continues to trend down and away from the rising schedule. The average on Sunday was 0.64 feet below the Zone A1 regulation line. WCA-2A: Stage at the 2-17 gauge continues a steady decline. The average on Sunday was 0.23 feet below the rising regulation line. WCA-3A: Last week the Three Gauge Average stages trend opposite to the slope of the Zone A reg line. The average stage was 0.71 feet below the rising regulation line on Sunday. WCA-3A North: At gauge 62 (Northwest corner) stages ascended, the average on Sunday was 1.01 feet below the rising Upper schedule line (**Figures EV-1** through **EV-4**).

Water Depths

The SFWDAT indicates that within the last month the northern regions of WCA-2A and WCA-3A have dried down. Along the northern reach of the L-67s depths have receded and the spatial extent of those deeper conditions continue to decrease. Southern BCNP (north of US41) looks to have recovered some depths over the last month. There is potential for a loss of connectivity in the western sloughs of ENP, while the eastern sloughs connectivity remains strong. Comparing current WDAT water depths to one month ago most of the EPA is lower with eastern WCA-3A (including the Alley north region) significantly so. Looking back a year ago, northern WCA-2A, central WCA-1 and east central WCA-3A are shallower; conditions are deeper to the south, significantly so in portions of WCA-3B and in SRS within ENP (**Figure EV-5 and Figure EV-6)**. Comparing current conditions to the 20-year median: All of WCA-2A and WCA-3A are now near the 10th percentile, southern BCNP is also well below average; WCA-3B and NESRS remain in the upper percentiles (**Figure EV-7**).

Taylor Slough and Florida Bay

Taylor Slough and Florida Bay received an average of 1.35 inches of total rain this past week, similar to the previous week. Stages in Taylor Slough increased slightly in the past week, with an average difference of +0.04 feet (**Figure EV-8 and Figure EV-9**). Taylor Slough is now 0.05 inches higher than its historical average for this time of year (pre-Florida Bay initiative which started in 2017).

Average Florida Bay salinity is 34.7, a decrease of −1.9 for the week ending 9/4. Salinities decreased at most stations with the greatest decrease of −8.8 at Joe Bay (JB) where highest rainfall was received (2.4 inches). The maximum salinity increase was +0.1 at Johnson Key (JK) (**Figure EV-8**). Last week on 8/28, salinity downstream of JB at Trout Creek (TC; not shown) in the eastern nearshore region increased by +14.6, coinciding with decrease in flows between 8/21-8/27. This week, salinities at TC decreased by −13.5, coinciding with an increase in flows by +1,100 cfs from 8/23-9/4. Eastern Florida Bay salinity has just exceeded the 2001-2016 Interquartile Range, the Central Bay is at the 75th percentile, and Western region salinity has exceeded the 75th percentile since 8/16 (**Figure EV-10**). Florida Bay salinity is 6.6 above its historical average for this time of year, a decrease from last week when salinity was higher by 7.1.

Water Management Recommendations

We recommend a continuation of high level discussions on strategies that could prevent further degradation of NE-WCA3A and mitigate the short-term wildfire potential at the Ally North colony continue as risk to the resource elevates with ongoing drier than average conditions. Maintaining a very moderate rate of stage change within the marsh of WCA-2A would have an ecological benefit. Flows into northern WCA-3A would benefit the ecology of that region by helping to provide enough water to protect the Alley North colony 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	0.66	−0.06
WCA-2A	0.55	−0.07
WCA-2B	0.62	−0.12
WCA-3A	0.69	−0.08
WCA-3B	1.16	−0.01
ENP	1.25	+0.06

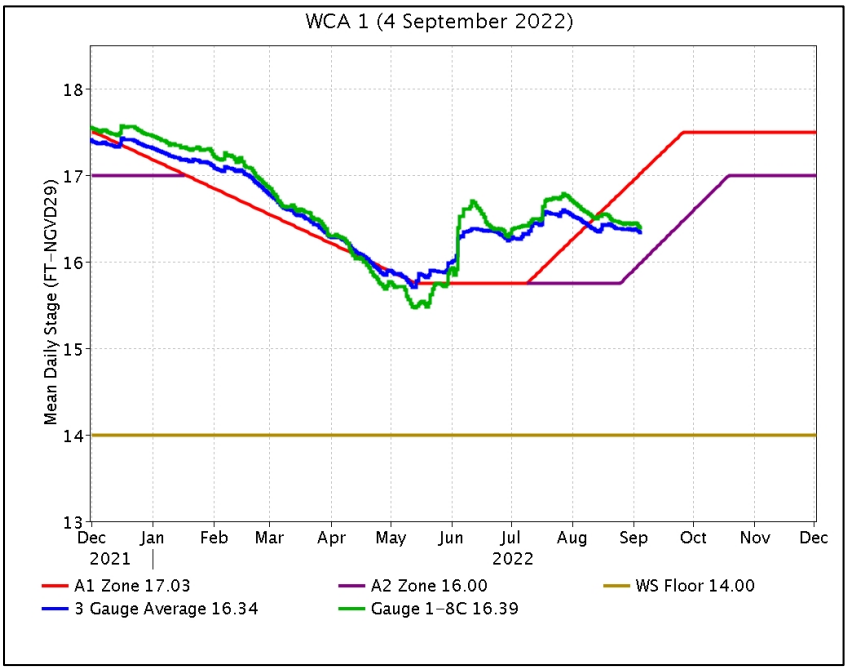


Figure EV-1. WCA-1 stage hydrographs and regulation schedule.

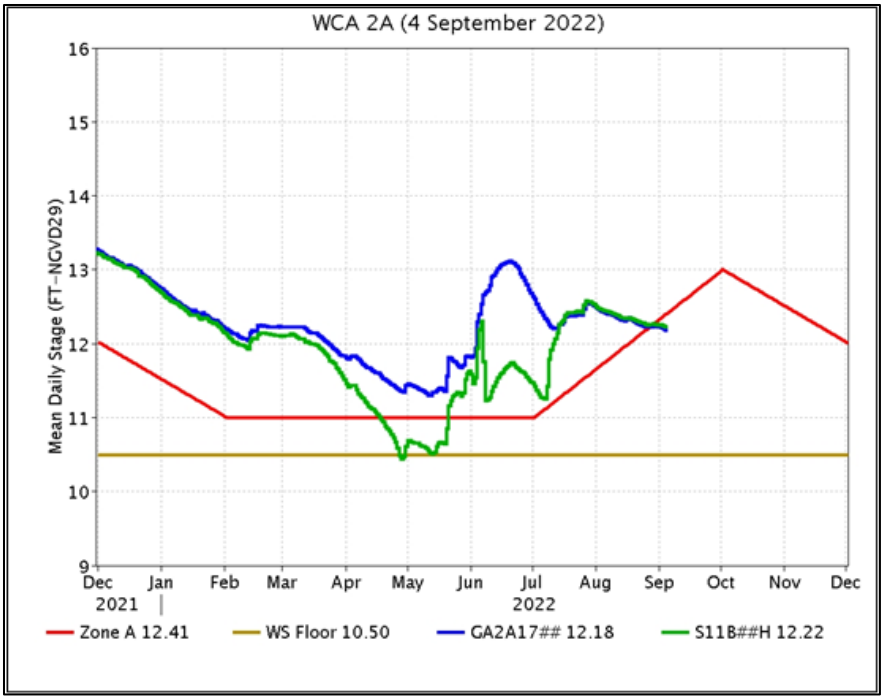


Figure EV-2. WCA-2A stage hydrographs and regulation schedule.

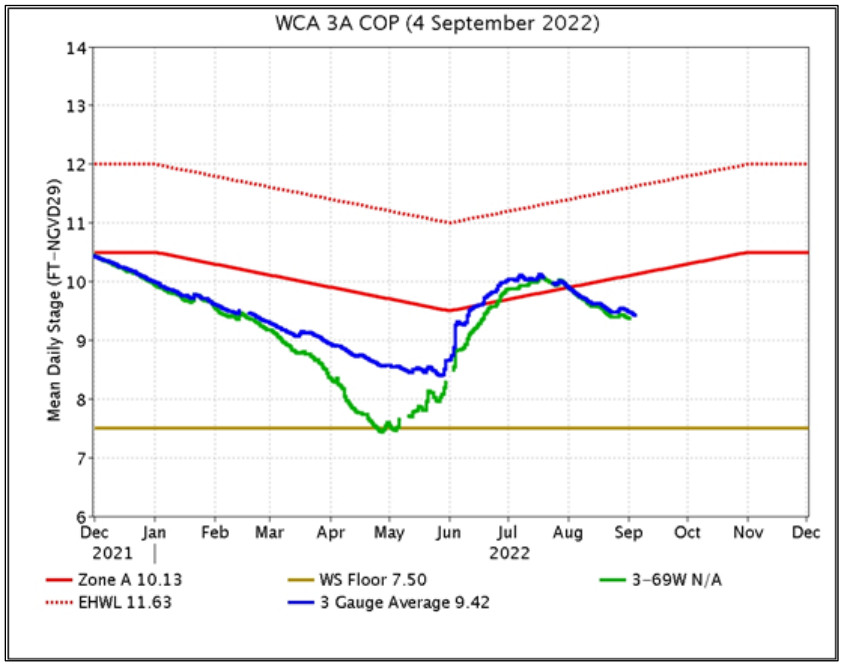


Figure EV-3. WCA-3A stage hydrographs (three-gauge average, S-333 headwater) and regulation schedule.

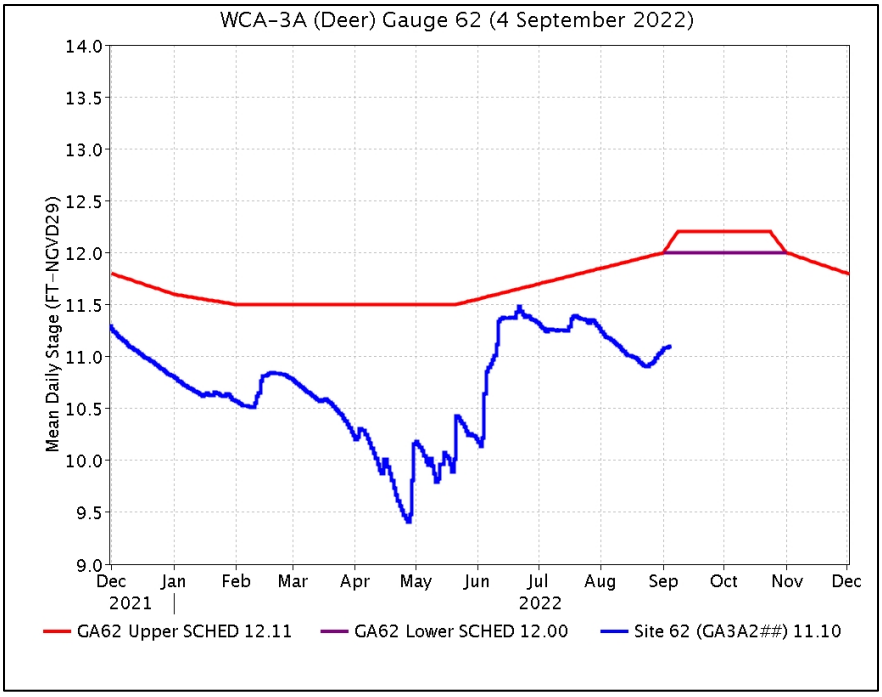


Figure EV-4. WCA-3A stage hydrograph (Deer gauge; Site 62) and CA62 regulation schedule.

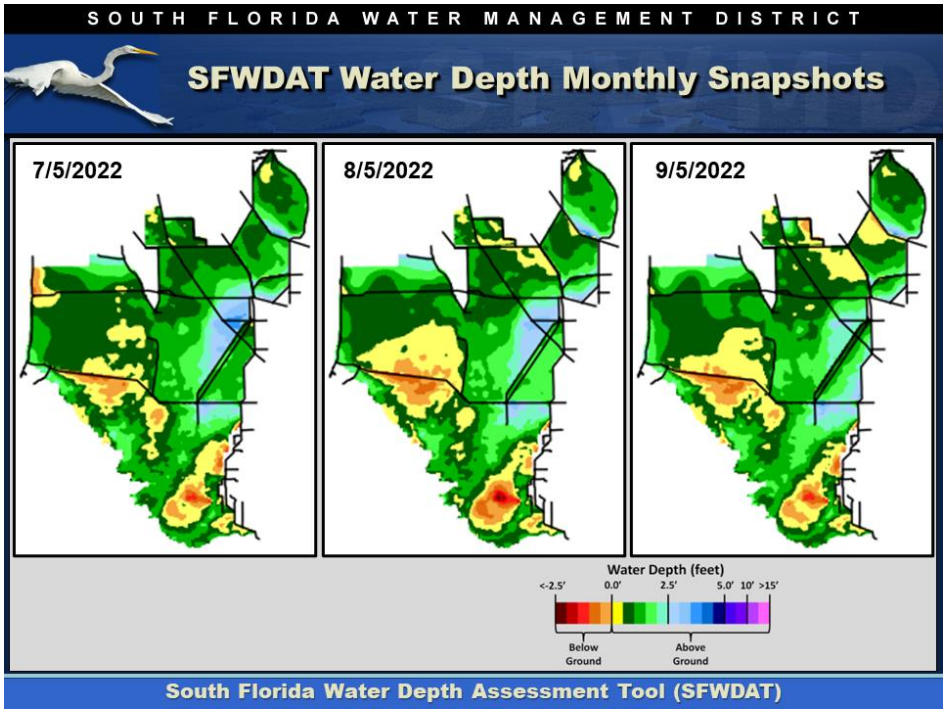


Figure EV-5. Everglades water depths from two months ago (left), one month ago (center) and present (right), based on SFWDAT.

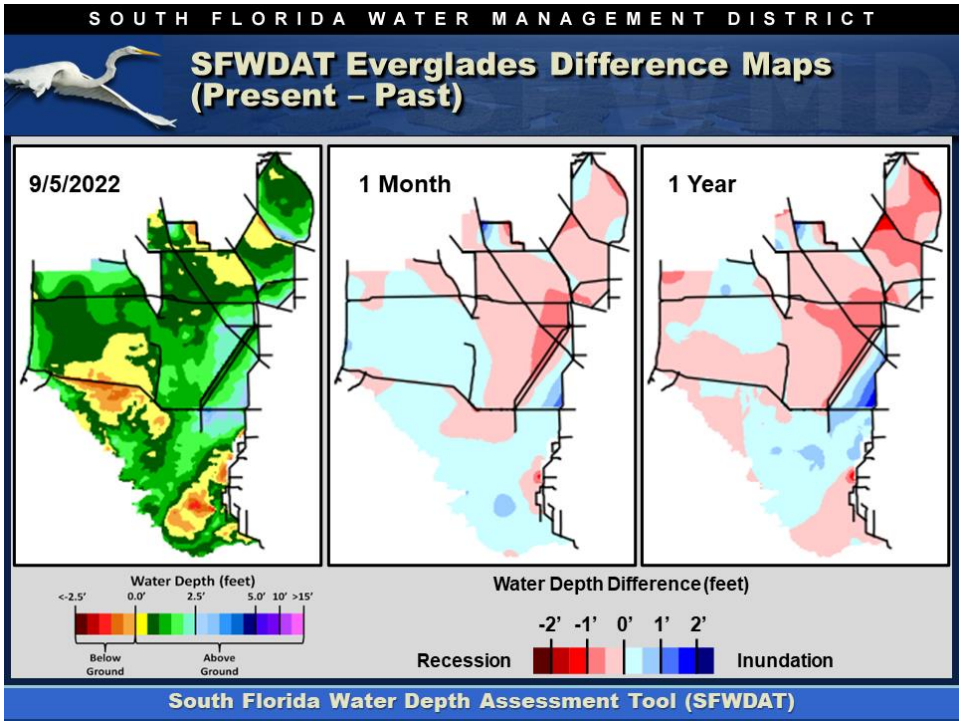


Figure EV-6. Present Everglades water depths (left) and water depth changes from one month (center) and one year (right) ago, based on SFWDAT.

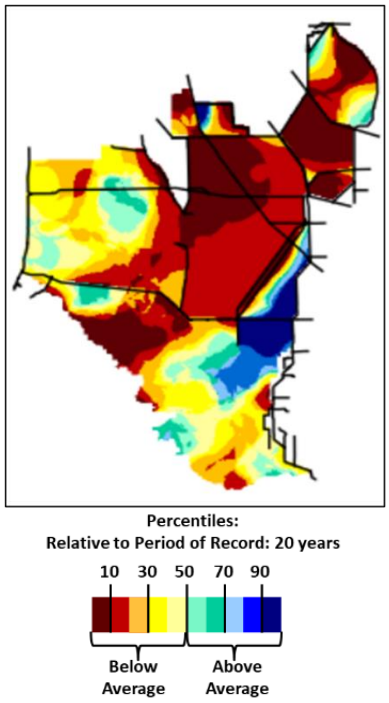


Figure EV-7. Present water depths (9/5/2022) compared to the day of year median over the previous 20 years.

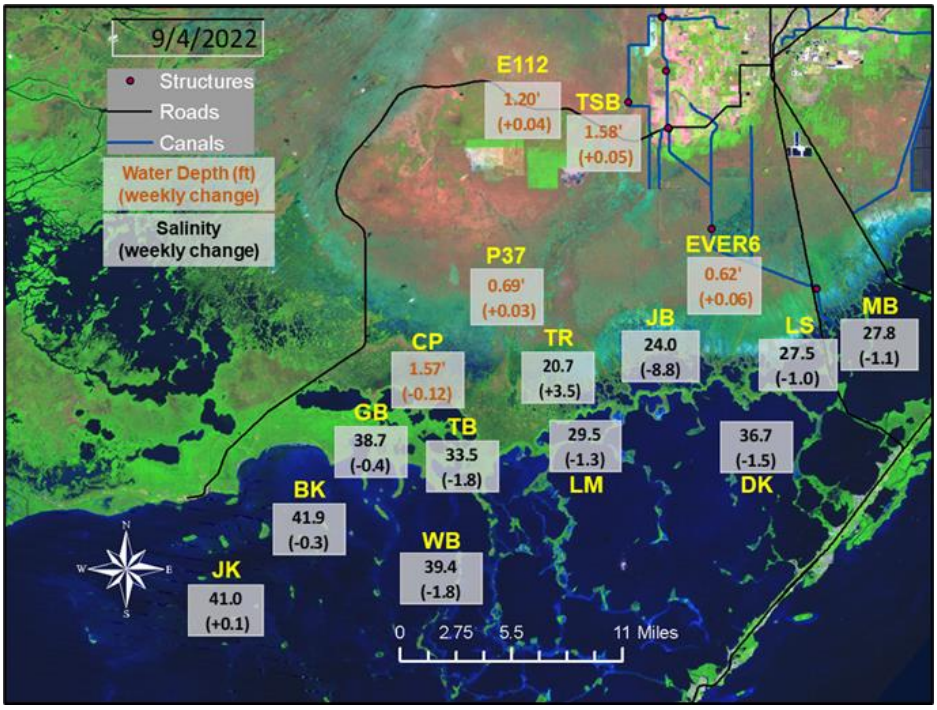


Figure EV-8. Taylor Slough water depths with changes since a week ago and Florida Bay salinities with changes since a week ago.

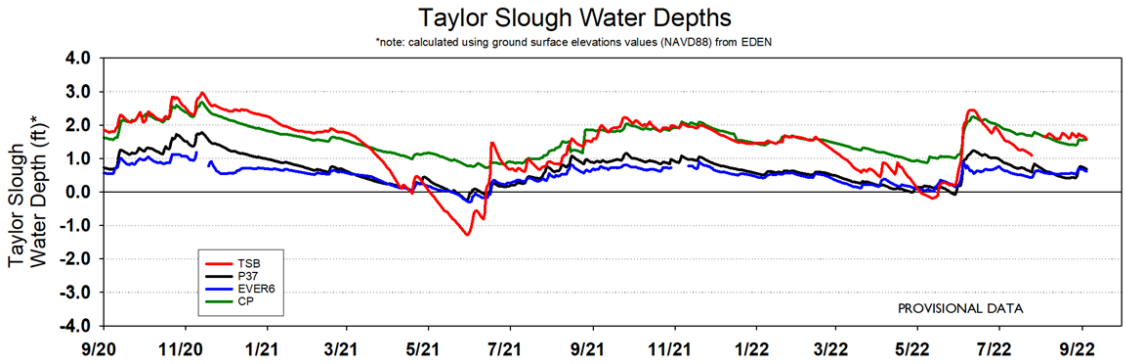


Figure EV-9. Taylor Slough water depth time series.

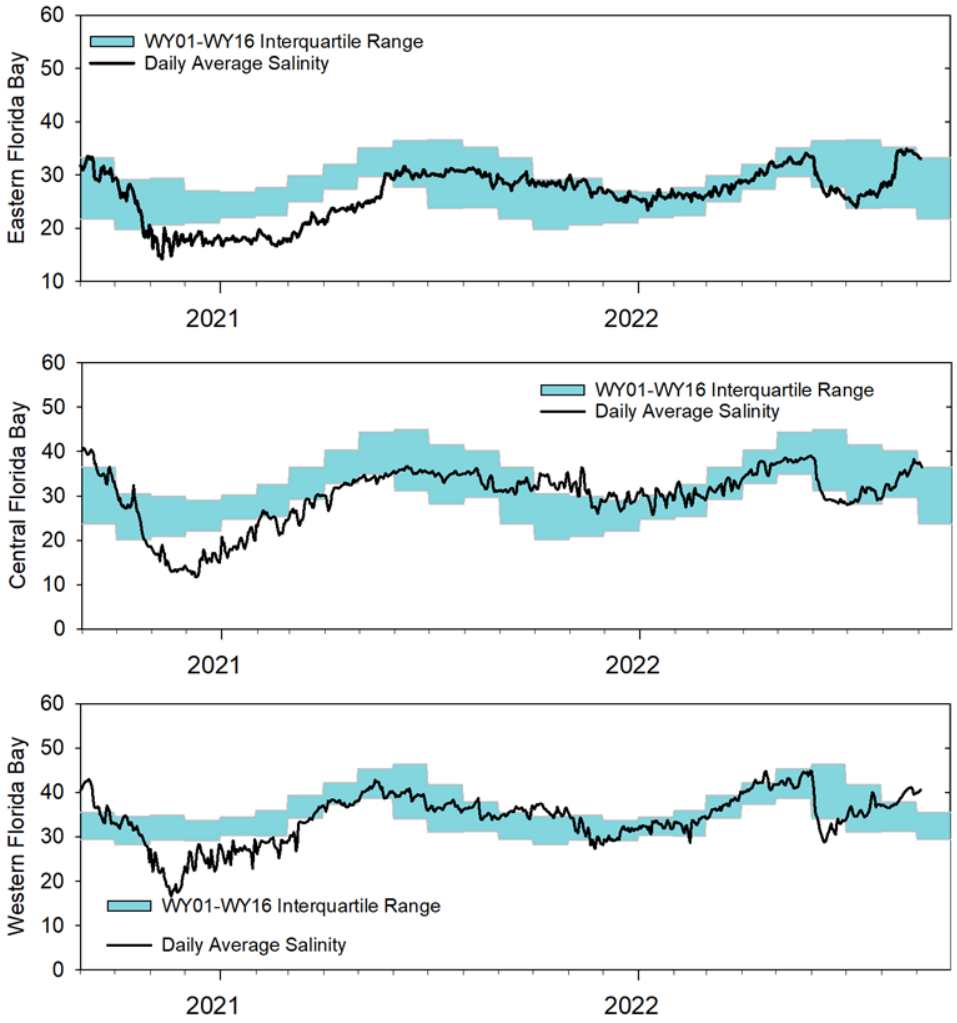


Figure EV-10. Eastern (top panel), Central (middle panel) and Western (bottom panel) Florida Bay daily average salinities with interquartile (25-75 percentile) ranges.

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

SFWMD Everglades Ecological Recommendations, September 6th, 2022 (red is new)			
Area	Weekly change	Recommendation	Reasons
WCA-1	Stage decreased by 0.06’	Ascension rate of less than 0.25 feet per week.	Protect within basin and downstream habitat and wildlife.
WCA-2A	Stage decreased by 0.07’	Ascension rate of less than 0.25 feet per week.	Protect within basin and downstream habitat and wildlife.
WCA-2B	Stage decreased by 0.12’	Ascension rate of less than 0.25 feet per week.	Protect within basin and downstream habitat and wildlife.
WCA-3A NE	Stage decreased by 0.10’	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 increased by 0.11’	Maintain ascension rate of less than 0.25 feet per week.	
Central WCA-3A S	Stage decreased by 0.20’	Ascension rate of less than 0.25 feet per week.	Protect within basin and downstream habitat and wildlife.
Southern WCA-3A S	Stage decreased by 0.12’		
WCA-3B	Stage decreased by 0.01’	Ascension rate of less than 0.25 feet per week.	Protect within basin and downstream habitat and wildlife. Lower fire risk.
ENP-SRS	Stage increased by 0.06’	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 −0.122’ to +0.205’	Move water southward as possible.	When available, provide freshwater buffer for downstream conditions.
FB- Salinity	Salinity changes ranged −8.8 to +0.1	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 403 cfs and the previous 30-day mean inflow was 236 cfs. The seven-day mean salinity was 31.9 at BBCW8 and 32.9 at BBCW10, both below the preferred maximum salinity of 35 for these sites. Data provided by Biscayne National Park.

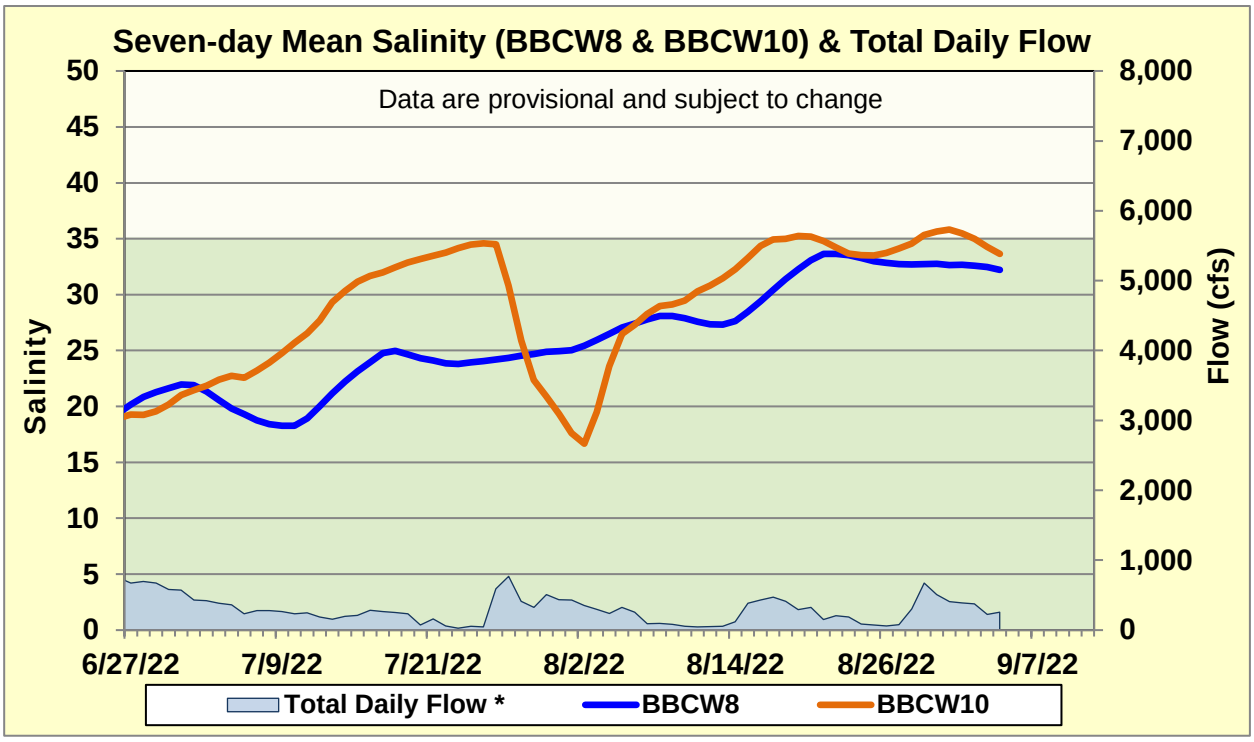


Figure BB-1. Seven-day mean salinity at BBCW8 and BBCW10 and total daily flow in Biscayne Bay. Total daily flow was calculated using flow from structures S20G, S20F, S21, S21A, S123, and S700P.