

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:** August 14, 2024

**SUBJECT:** Weekly Environmental Conditions for Systems Operations

### **Summary**

#### **Weather Conditions and Forecast**

On Thursday, scattered showers and thunderstorms are possible across much of the SFWMD, with a higher concentration of storm activity along the east coast. On Friday, Tropical Storm Ernesto is forecast to intensify into a large hurricane as it recurves far away over the central Atlantic Ocean drawing dry midlatitude air southward into Florida. Saturday and/or Sunday could be exceptionally rare zero-rainfall days in August—something that has only occurred 21 times out of over 1,000 August days recorded in our Daily Rainfall Report since the early 1990s. Total SFWMD rainfall for the 7-day period ending next Tuesday morning could be as much as 28% of normal for this time of the year, a period typically associated with increased rainfall during the second peak of the wet season.

#### **Kissimmee**

Lake stage is approaching the regulation schedule line in East Lake Toho and Lake Toho; releases were made in the last week to slow the rate of lake stage rise and keep stage from exceeding the schedule line. Weekly average discharge on August 11, 2024, was 150 cfs and 680 cfs at S-65 and S-65A, respectively. Mean weekly water depth on the Kissimmee River floodplain increased by 0.04 feet to 0.12 feet. The weekly average concentration of dissolved oxygen in the Kissimmee River decreased from 4.6 mg/L the previous week to 3.5 mg/L, which is above the potentially lethal and stressful levels for largemouth bass and other sensitive species.

#### **Lake Okeechobee**

Lake Okeechobee stage was 12.61 feet NAVD88 (13.92 ft NGVD29) on August 11, 2024, which was 0.22 feet higher than the previous week and 0.40 feet higher than a month ago. Average daily inflows (excluding rainfall) increased from 3,940 cfs the previous week to 4,560 cfs. Average daily outflows (excluding evapotranspiration) remained low at just 70 cfs. In the most recent non-obscured satellite image from August 11, 2024, NOAA's Harmful Algal Bloom Monitoring System suggests moderate cyanobacteria abundance across the northern and nearshore regions of the Lake.

## **Estuaries**

Total inflow to the St. Lucie Estuary averaged 2,906 cfs over the past week with no flow coming from Lake Okeechobee. Mean surface salinities decreased at HR1, US1 Bridge, and A1A Bridge over the past week. Salinity in the middle estuary was in the lower stressed range (10-25) for adult eastern oysters.

Total inflow to the Caloosahatchee Estuary averaged 7,660 cfs over the past week with 74 cfs coming from Lake Okeechobee. Mean salinities remained low at S-79 and Val I-75 sites and decreased at the remaining sites in the estuary. Salinities were in the optimal range (0-10) for tape grass in the upper estuary. Salinities were in the damaging range for adult oysters at Cape Coral and in the optimal range at Shell Point and Sanibel.

## **Stormwater Treatment Areas**

For the week ending Sunday, August 11, 2024, no Lake Okeechobee water was delivered to the FEBs/STAs. The total amount of Lake releases sent to the FEBs/STAs in WY2025 (since May 1, 2024) is approximately 68,900 ac-feet. The total amount of inflows to the STAs in WY2025 is approximately 499,000 ac-feet. STA cells are near or above target stage. STA-1E Central Flow-way is offline for construction activities. Operational restrictions are in effect in STA-1E Western and Eastern Flow-ways, STA-1W Northern Flow-way, STA-2 Flow-ways 2 and 4, and STA-3/4 Eastern Flow-way for vegetation management activities. An operational restriction is in effect for STA-2 Flow-way 5 for construction activities. This week, there is no capacity for Lake releases in the STAs.

## **Everglades**

Rates of stage change over the week were fair last week, providing conditions supportive for apple snail reproduction. Stages remain above average for this time of year across most of the Everglades Protection Area except for northern WCA-1 and most of WCA-2A, which are below. Average stage in Taylor Slough increased last week and remains above the average for this time of year. Average salinity increased in Florida Bay last week but remains below its recent average. All three regions of the Bay are now within the Inter-Quartile Range. Florida Bay MFL metrics remain well outside thresholds of harm.

## **Biscayne Bay**

Total inflow to Biscayne Bay averaged 1,045 cfs and the previous 30-day mean inflow averaged 780 cfs. The seven-day mean salinity was 25.4 at BBCW8 and 29.4 at BBCW10, both within the ideal salinity range for estuarine organisms in this region (salinity less than 35). Data were provided by Biscayne National Park.

## Supporting Information

### Kissimmee Basin

#### *Upper Kissimmee*

On August 11, 2024, mean daily lake stages were 55.3 feet NAVD88 (0.2 feet below schedule) in East Lake Toho, 52.2 feet NAVD88 (0.1 feet below schedule) in Lake Toho, and 48.4 feet NAVD88 (1.4 feet below schedule) in Lakes Kissimmee-Cypress-Hatchineha (KCH) (**Table KB-1, Figures KB-1-3**).

#### *Lower Kissimmee*

For the week ending August 11, 2024, mean weekly discharge was 150 cfs and 680 cfs at S-65 and S-65A, respectively. Mean weekly discharge from the Kissimmee River was 960 cfs and 920 cfs at S-65D and S-65E, respectively (**Table KB-2**). Mean weekly headwater stages were 45.2 feet NAVD88 at S-65A and 24.6 feet NAVD88 at S-65D. Mean weekly river channel stage increased by 2.6 feet from the previous week to 34.5 feet NAVD88 (**Figure KB-4**). Mean weekly water depth on the Kissimmee River floodplain increased by 0.04 feet to 0.12 feet (**Table KB-2, Figure KB-5**). The weekly average concentration of dissolved oxygen in the Kissimmee River decreased from 4.6 mg/L the previous week to 3.5 mg/L (**Table KB-2, Figure KB-6**).

#### ***Water Management Recommendations***

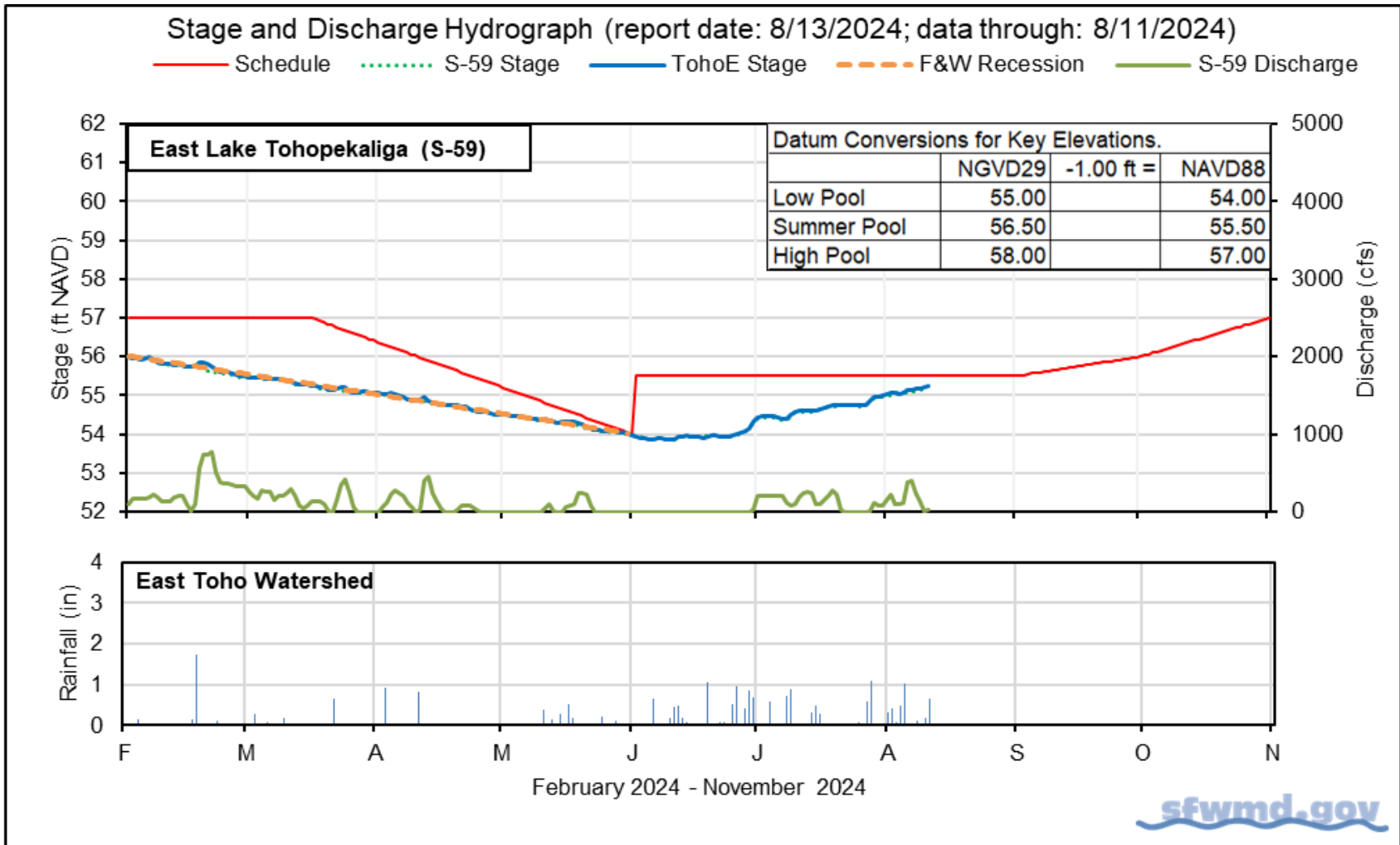
Follow the Hybrid A discharge plan for S-65/S-65A (**Figure KB-7**) until further notice. Maintain at least minimum flow (250-300 cfs) at S-65A. Allow stages to rise in Lakes East Toho, Toho, and Kissimmee, but keep ascension rates slower than 0.25 feet/week to the extent possible. Avoid sudden increases in KCH stage to help protect recent plantings.

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

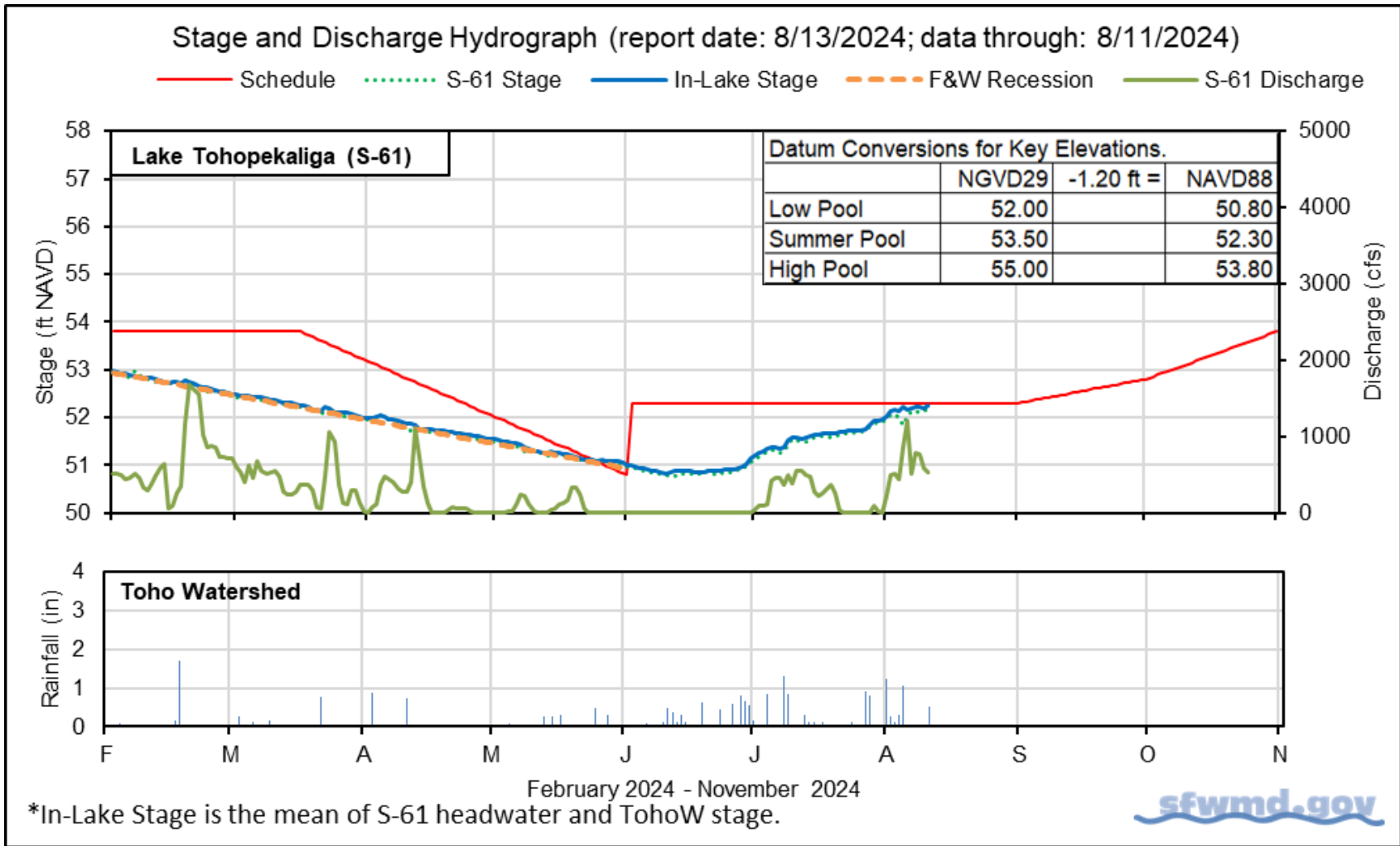
Water Body	Structure	Stage Monitoring Site	Weekly (7-Day) Average Discharge (cfs)	Sunday Lake Stage (feet NAVD88) <sup>a</sup>	Schedule Type <sup>b</sup>	Sunday Schedule Stage (feet NAVD88)	Sunday Departure from Regulation (feet)	
							8/11/24	8/4/24
Lakes Hart and Mary Jane	S-62	LKMJ	73	59.0	R	58.9	0.1	-0.1
Lakes Myrtle, Preston, and Joel	S-57	S-57	0	59.5	R	60.0	-0.5	-0.6
Alligator Chain	S-60	ALLI	0	61.6	R	62.2	-0.6	-0.8
Lake Gentry	S-63	LKGT	0	59.2	R	59.9	-0.7	-1.0
East Lake Toho	S-59	TOHOE	190	55.3	R	55.5	-0.2	-0.5
Lake Toho	S-61	TOHOW S-61	750	52.2	R	52.3	-0.1	-0.2
Lakes Kissimmee, Cypress, and Hatchineha	S-65	KUB011 LKIS5B	150	48.4	R	49.8	-1.4	-1.9

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

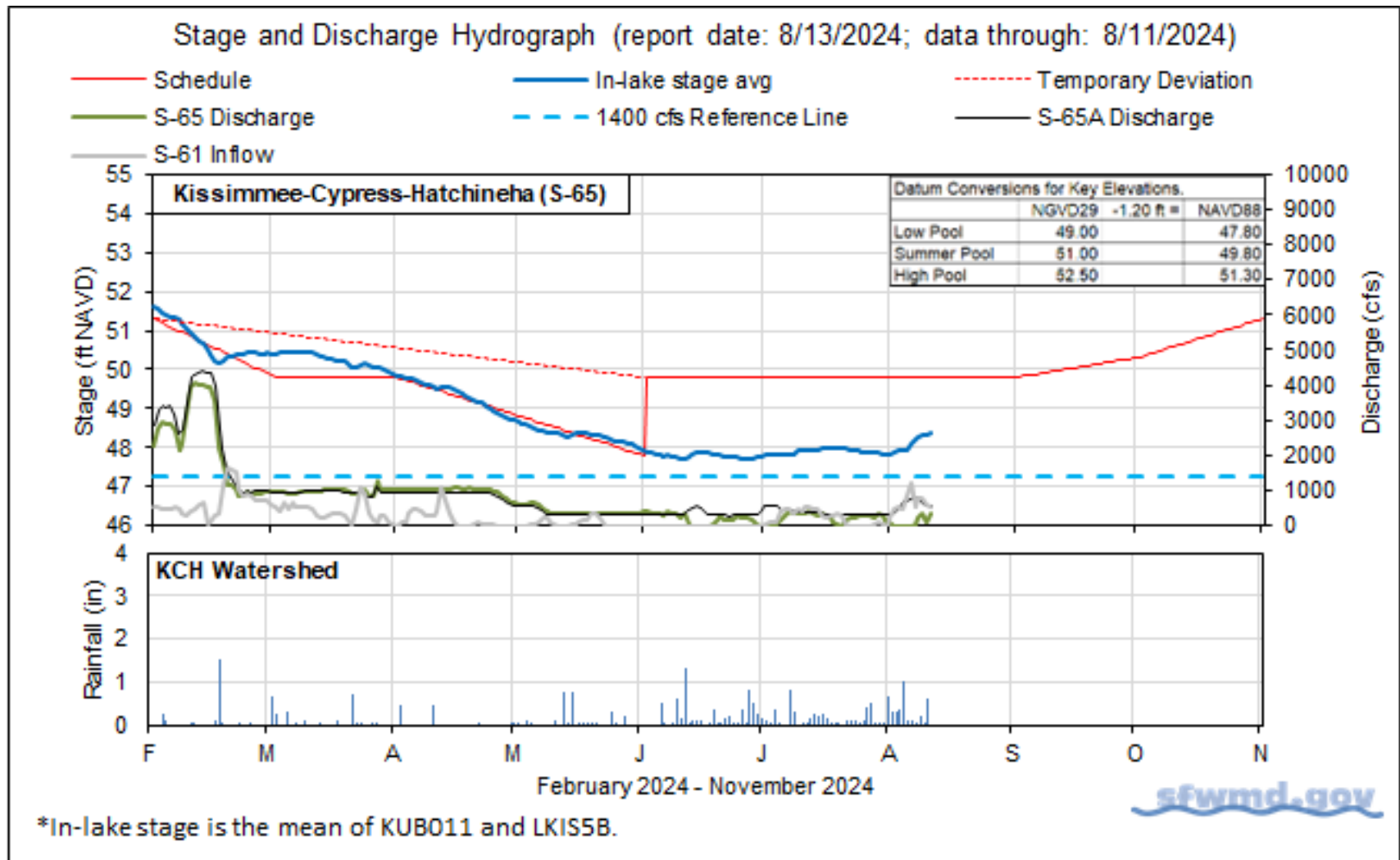
b. A: projected recession line; R: USACE regulation schedule; S: temporary recession target line; T: temporary schedule; NA: not applicable or not available.



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



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



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

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

Metric	Location	Sunday Daily Average	Weekly Average for Previous Seven Day Periods			
		8/11/24	8/11/24	8/4/24	7/28/24	7/21/24
Discharge	S-65	320	150	99	260	160
Discharge	S-65A <sup>a</sup>	530	680	420	330	330
Headwater Stage (feet NAVD88)	S-65A	44.6	45.2	45.3	45.1	45.2
Discharge	S-65D <sup>b</sup>	930	960	520	450	420
Headwater Stage (feet NAVD88)	S-65D <sup>c</sup>	24.6	24.6	24.6	24.6	24.6
Discharge (cfs)	S-65E <sup>d</sup>	900	920	520	440	390
Discharge (cfs)	S-67	0	0	0	0	0
Dissolved Oxygen (mg/L) <sup>e</sup>	Phase I, II/III river channel	3.3	3.5	4.6	4.3	4.2
River channel mean stage <sup>f</sup>	Phase I river channel	34.3	34.5	31.9	31.8	31.8
Mean depth (feet) <sup>g</sup>	Phase I floodplain	0.11	0.12	0.08	0.08	0.09

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.

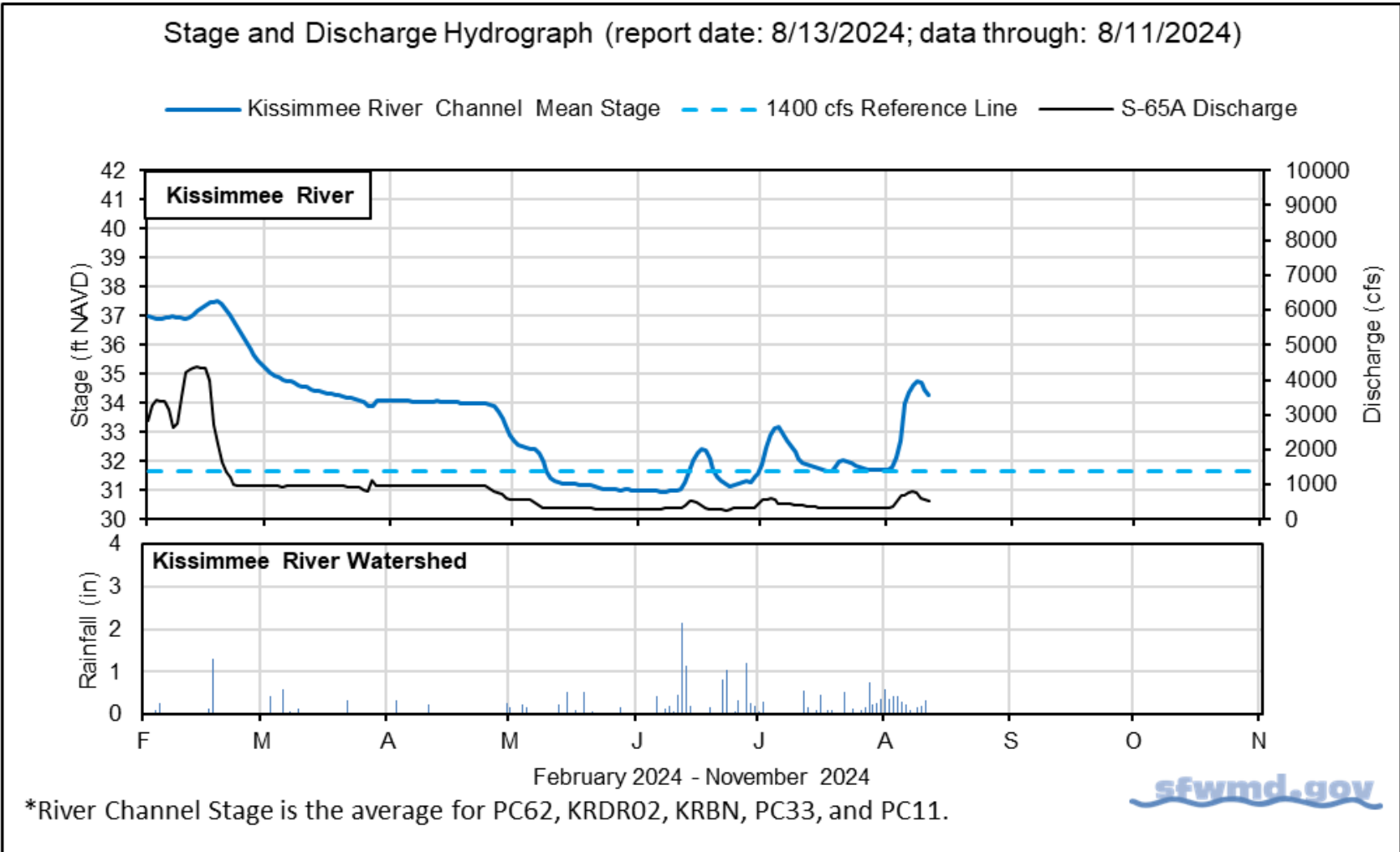
d. Combined discharge from S-65E and S-65EX1.

e. Dissolved oxygen is the average of values from sondes KRBN, PC62, PC33, PD62R, and PD42R.

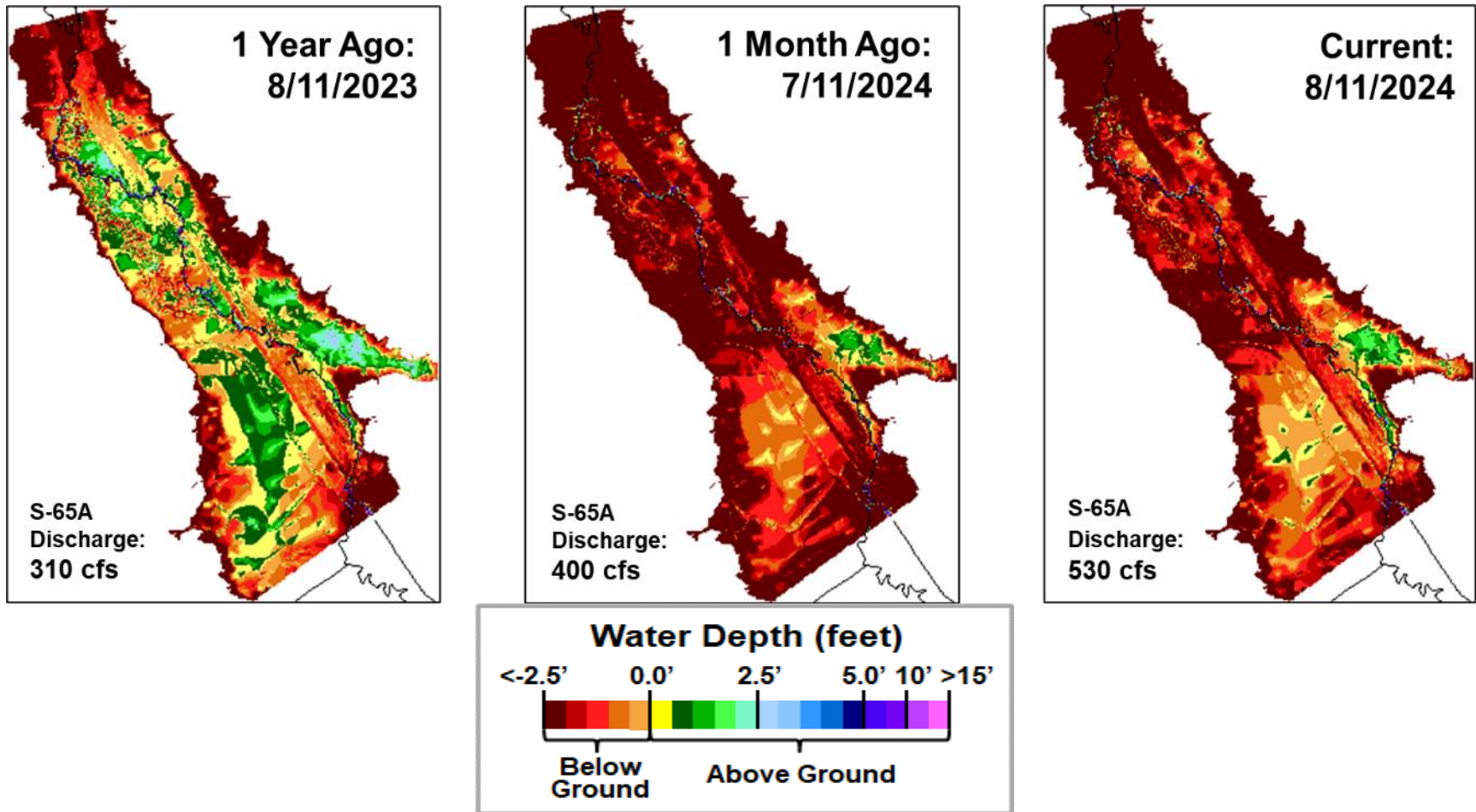
f. Mean of five river channel stations (PC62, KRDR02, KRBN, PC33, PC11) in the Phase I area.

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

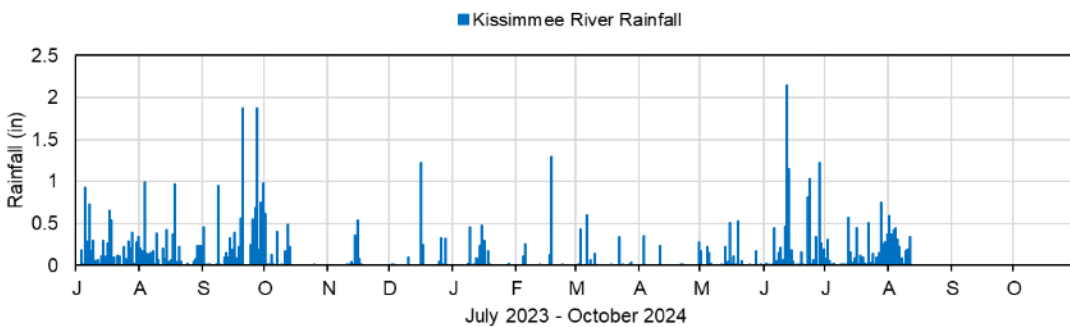
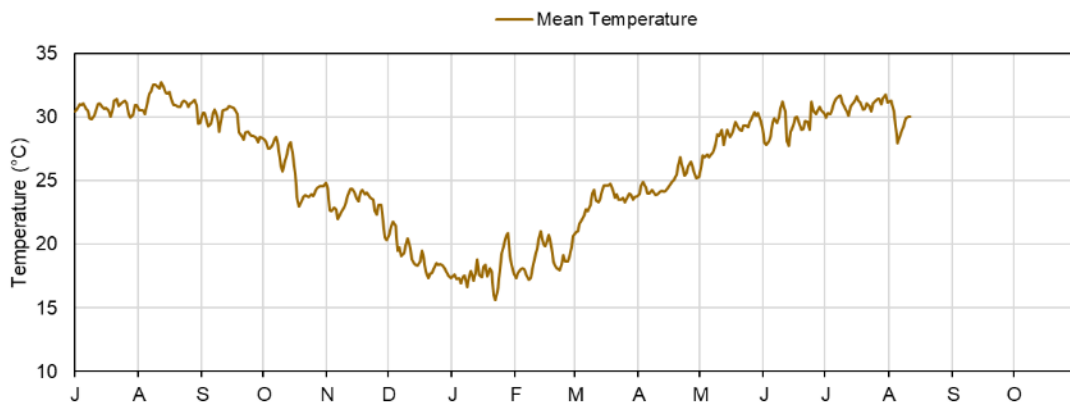
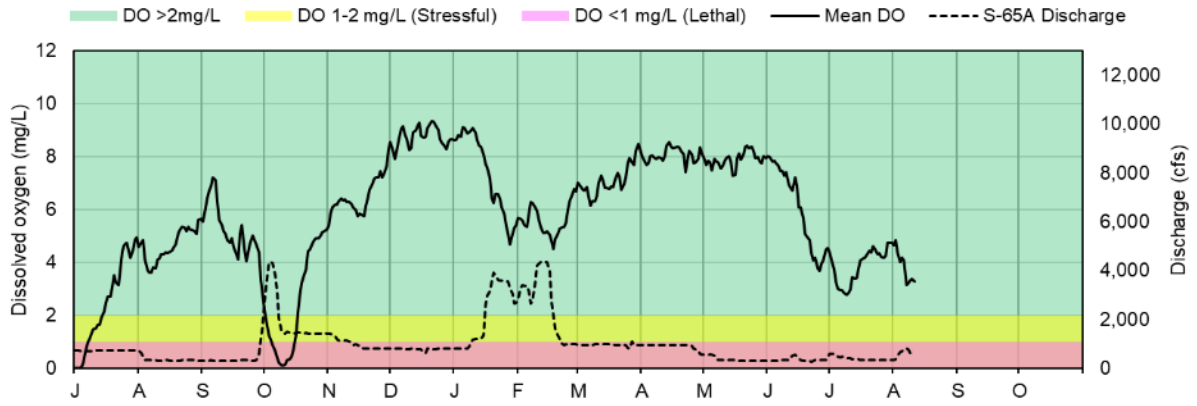




**Figure KB-4.** Kissimmee River stage, discharge, and rainfall.



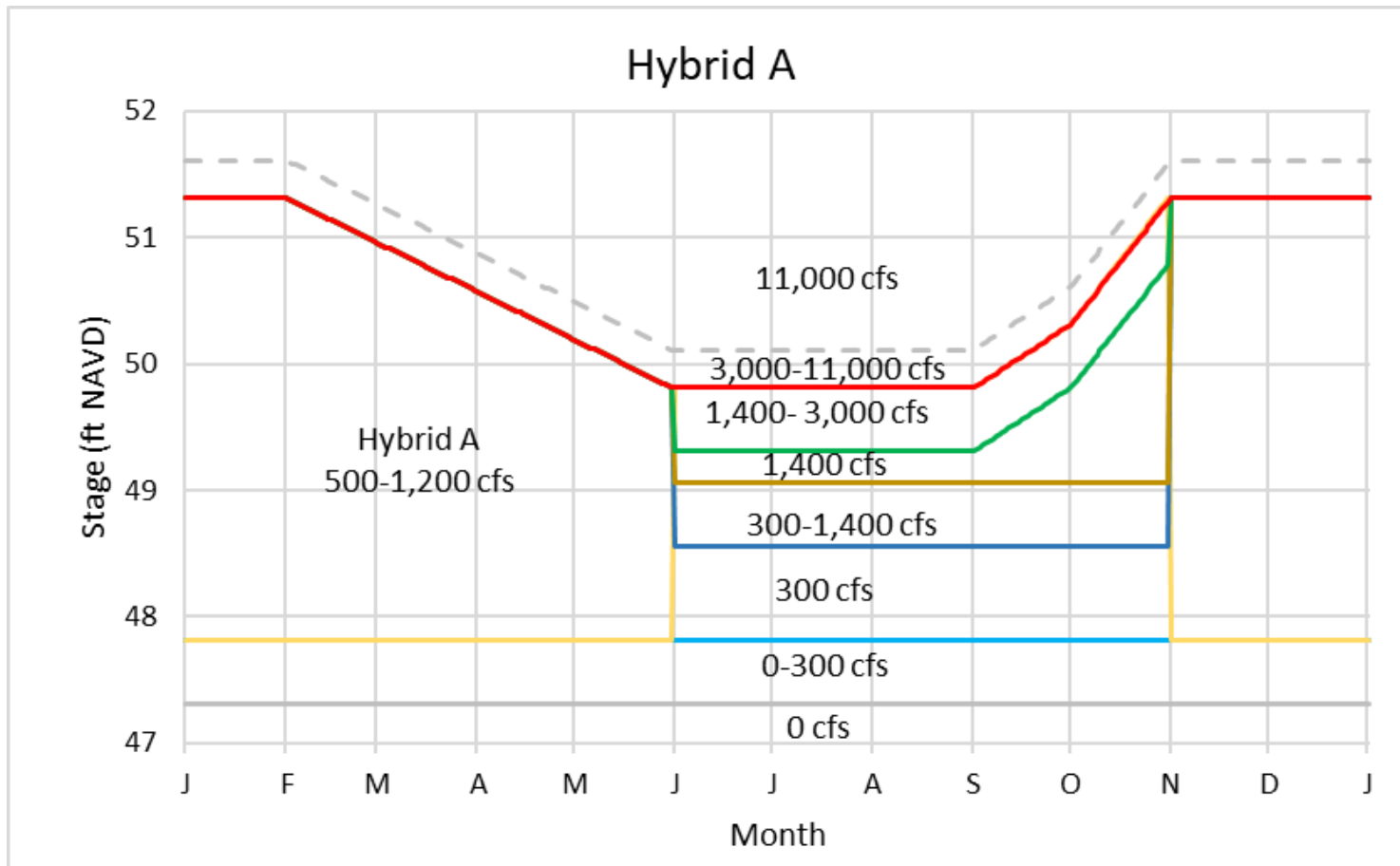
**Figure KB-5.** Phase I area Kissimmee River floodplain water depths (from left to right) one year ago, one month ago, and current.



Report Date: 8/13/2024; data are through: 8/11/2024



**Figure KB-6.** 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 four stations reporting this week. Rainfall values are daily totals for Kissimmee River (Pool BCD) AHED watershed.



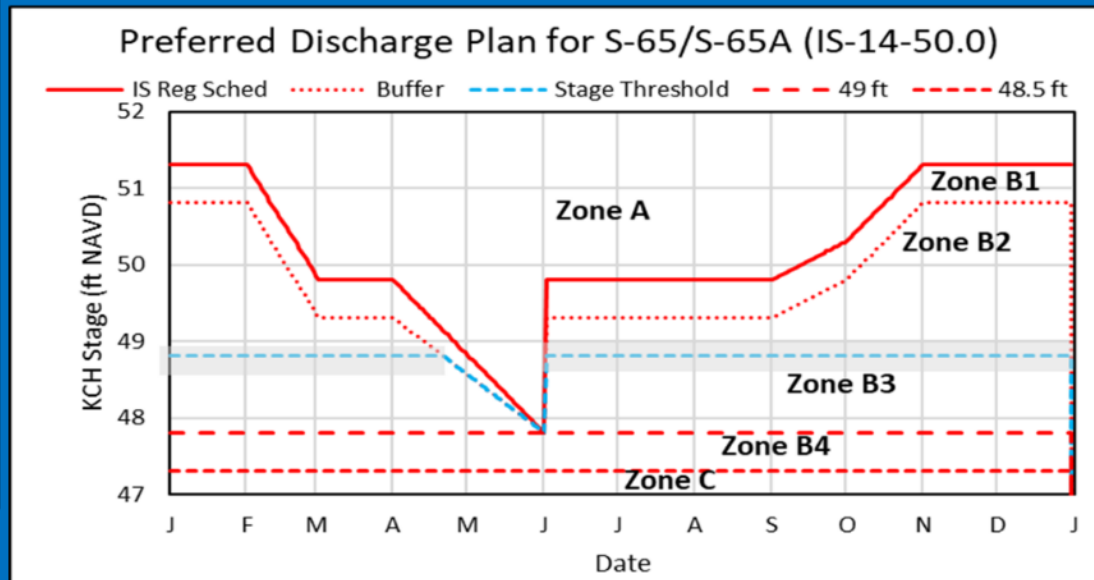
**Figure KB-7.** Hybrid A Discharge Plan for S-65/S-65A. Use discharge rate of change limits from IS-14-50 (Fig. KB-8).

Stage and Discharge Guidance for 2021-2023.		
Zone	KCH Stage (ft NAVD)	S-65/S-65A Discharge*
A	Above regulation schedule line.	Flood control releases as needed with no limits on the rate of discharge change.
B1	In flood control buffer zone (0.5 ft below the schedule line).	Adjust S-65 discharge so that S-65A discharge is between 1400 cfs at the buffer zone line and 3000 cfs at the schedule line.
B2	Between the Flood Control Buffer and the 48.8 ft line.	Adjust S-65 discharge to maintain at least 1400 cfs at S-65A. Use $\pm 0.2$ ft buffer (gray band) above and below the 48.8 ft line to decide when to begin ramping up to 1400 cfs or down to 300 cfs; do not continue reducing discharge if stage rises back to or above the threshold stage line.
B3	Between the 48.8 ft line and 47.8 ft.	Adjust S-65 discharge to maintain at least 300 cfs at S-65A.
B4	Between 47.3 ft to 47.8 ft.	Adjust S-65 discharge to maintain S-65A discharge between 0 cfs at 47.3 ft and 300 cfs at 47.8 ft.
C	Below 47.3 ft.	0 cfs.

\*Changes in discharge should not exceed limits in inset table below.

Table KB-3. Discharge Rate of Change Limits for S65/S65A (revised 1/14/19).		
Q (cfs)	Maximum rate of INCREASE (cfs/day)	Maximum rate of DECREASE (cfs/day)
0-300	100	-50
301-650	150	-75
651-1400	300	-150
1401-3000	600	-600
>3000	1000	-2000

## 2021-2023 Discharge Plan for S-65/S-65A



### Other Considerations

- When possible, limit lake ascension rate in the Jun 1 - Aug 15 window to 0.25 ft per 7 days in Lakes Kissimmee, Cypress, Hatchineha (S-65), East Toho (S-59) and Toho (S-61).
- If outlook is for extreme dry conditions meet with KB staff to discuss modifications to this plan.

Slide Revised 1/3/2022

Figure KB-8. IS-14-50 Discharge Plan for S65/S65A with discharge rate of change limits (revised 1/14/19).

## Lake Okeechobee

Lake Okeechobee stage was 12.61 feet NAVD88 (13.92 ft NGVD29) on August 11, 2024, which was 0.22 feet higher than the previous week and 0.40 feet higher than a month ago (**Figure LO-1**). Lake stage is in the Low sub-band (**Figure LO-2**) and was 1.49 feet above the upper limit of the recovery ecological envelope (**Figure LO-3**). According to NEXRAD, 1.60 inches of rain fell directly over the Lake last week.

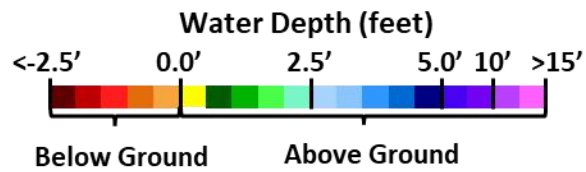
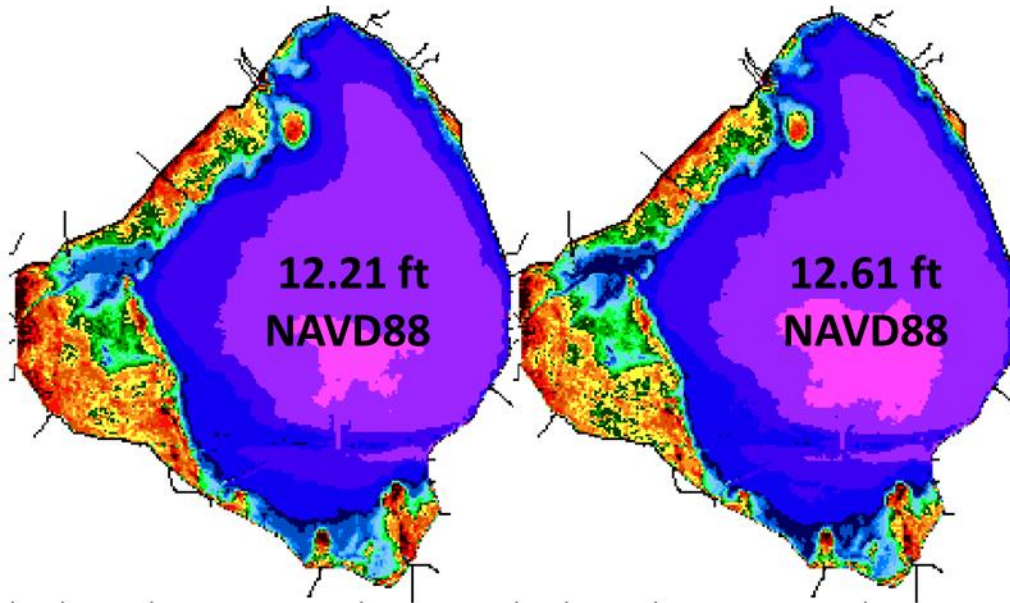
Average daily inflows (excluding rainfall) increased from 3,940 cfs the previous week to 4,560 cfs. The largest single inflow came from Fisheating Creek at 1,230 cfs, while 1,070 cfs came from the Indian Prairie watershed via the S-71 and S-72 structures. Average daily outflows (excluding evapotranspiration) remained low at just 70 cfs, all of which was released to the C-43 canal through the S-77 structure. No releases were made to the east through S-308 or to the south through the S-350 structures. **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.

In the most recent non-obscured satellite image from August 11, 2024, NOAA's Harmful Algal Bloom Monitoring System suggests that the recent storm activity reduced cyanobacteria abundance, and currently shows moderate cyanobacteria concentrations across the northern and nearshore regions of the Lake (**Figure LO-6**).

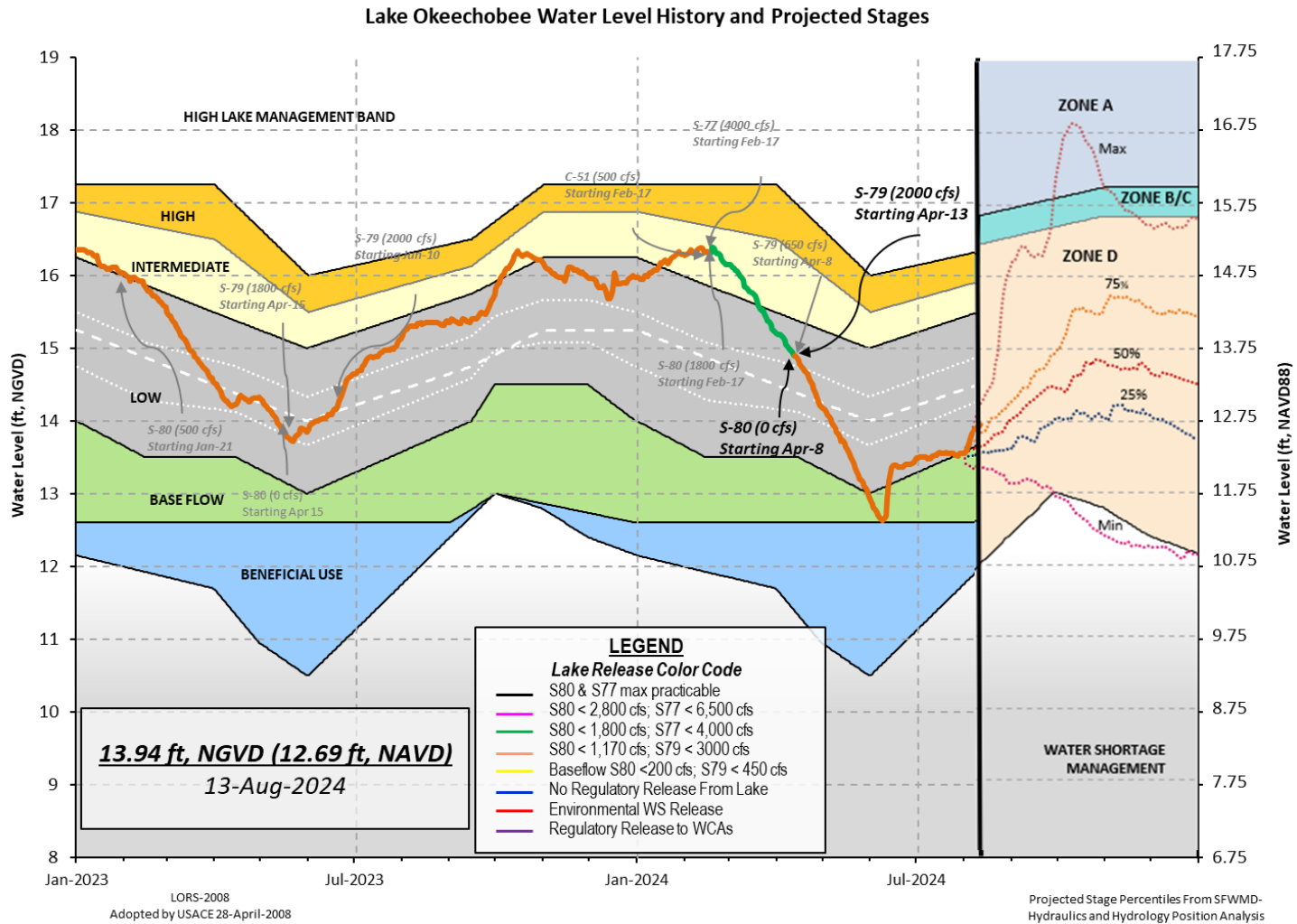
Note: All data presented in this report are provisional and are subject to change.

1 Month Ago:  
07/11/2024

Current:  
08/11/2024



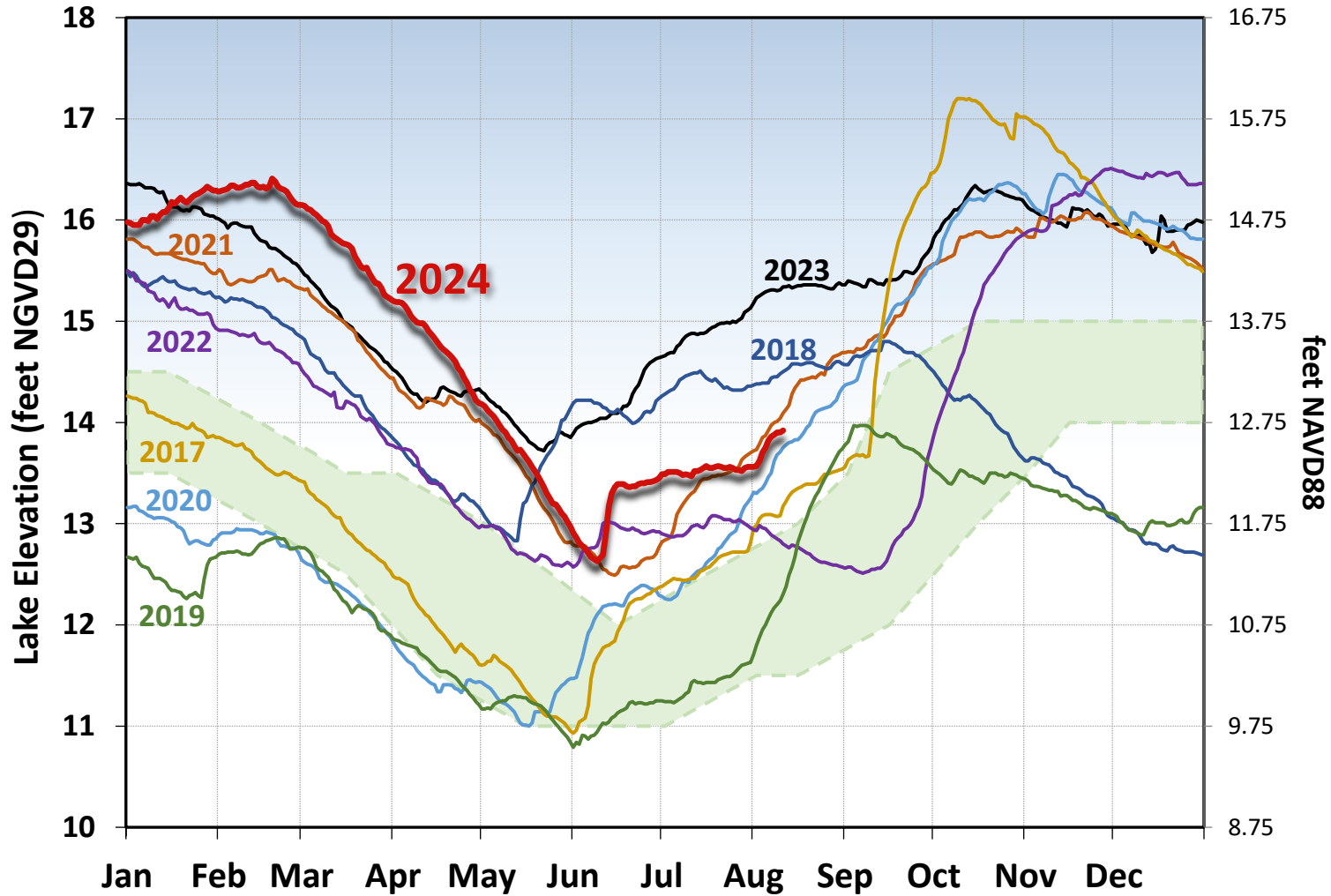
**Figure LO-1.** Lake Okeechobee water depth estimates based on South Florida Water Depth Assessment Tool (SFWDAT).



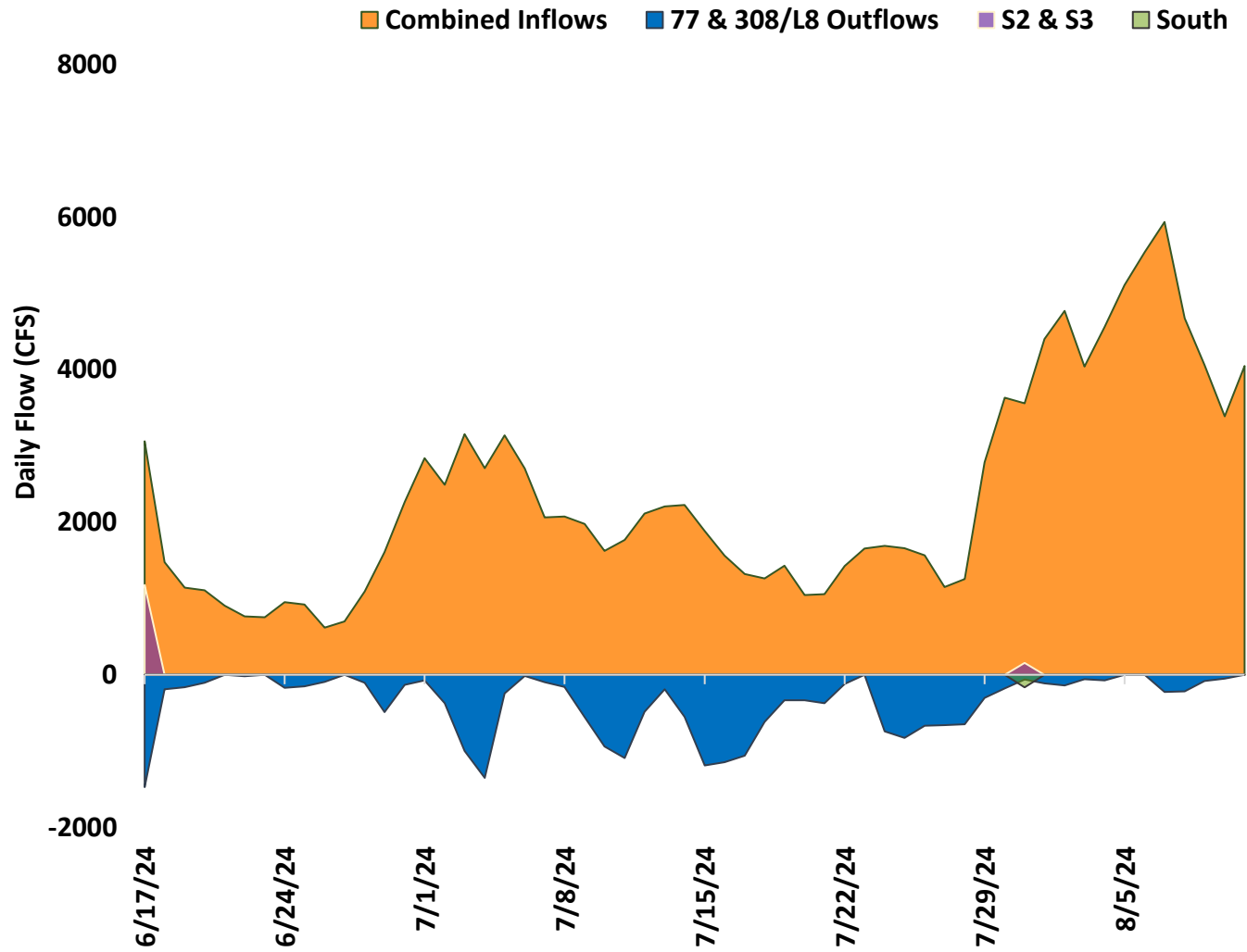
**Figure LO-2.** Recent Lake Okeechobee stages with projected stages based on a dynamic position analysis. Note: stages are in NGVD29, approximate NAVD88 values are shown for reference.



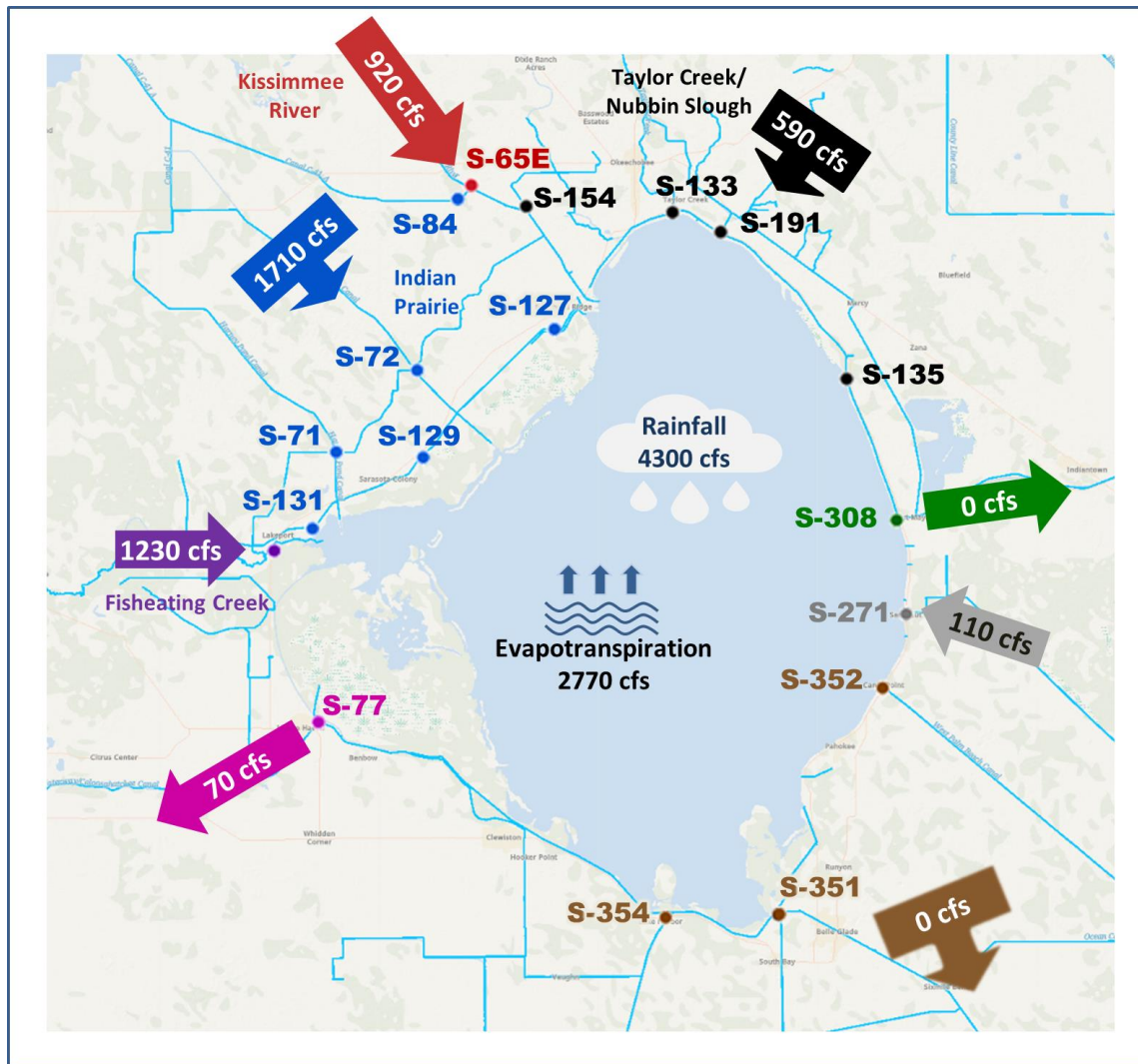
## Lake Okeechobee Stage vs Recovery Ecological Envelope



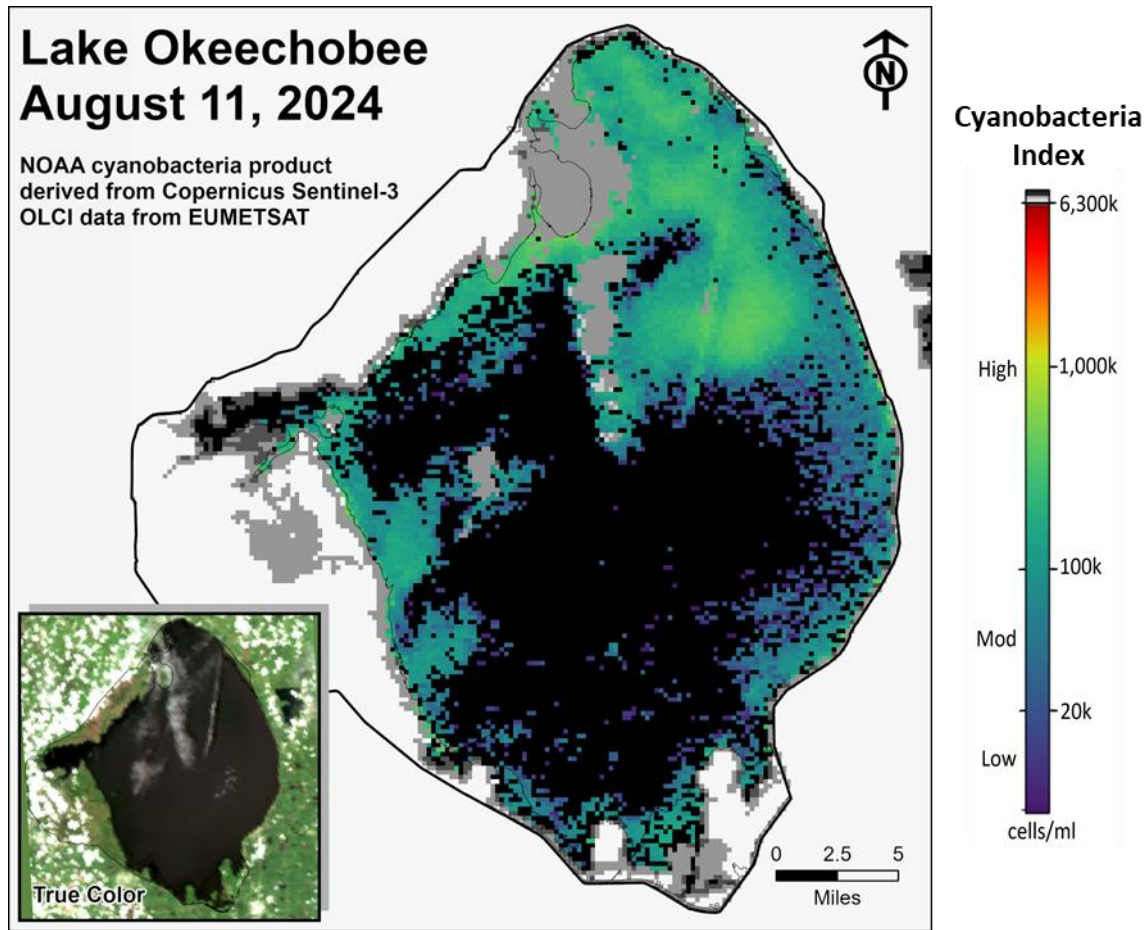
**Figure LO-3.** The current and seven prior year's annual stage hydrographs for Lake Okeechobee in comparison to the recovery envelope (light green). A shift from the normal ecological envelope to the recovery envelope occurred because the 30-day minimum lake stage (elevations exposed for at least 30 days, nonconsecutively) in the June 1 – July 31, 2023, window was >13 ft NGVD29 (11.75 ft NAVD88).



**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 5 - 11, 2024.



**Figure LO-6.** Cyanobacteria bloom index level on August 11, 2024, based on NOAA's harmful algal bloom monitoring system. Gray color indicates cloud cover. \*Provisional NOAA image, subject to change\*.

## Estuaries

### *St. Lucie Estuary*

Over the past week, mean total inflow to the St. Lucie Estuary was 2,906 cfs (**Figures ES-1 and ES-2**), and the previous 30-day mean inflow was 1,624 cfs. For comparison, the historical provisional mean inflows from the contributing areas are shown in **Figure ES-2**.

Over the past week, salinities decreased 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 7.0. Salinity conditions in the middle estuary were estimated to be within the lower stressed range for adult eastern oysters (**Figure ES-4**). The mean larval oyster recruitment rate reported by the Fish and Wildlife Research Institute (FWRI) was 0.9 spat/shell for July, which is decrease from last month (**Figure ES-5**).

### *Caloosahatchee River Estuary*

Over the past week, mean total inflow to the Caloosahatchee River Estuary was 7,660 cfs (**Figures ES-6 and ES-7**), and the previous 30-day mean inflow was 4,574 cfs. For comparison, the historical provisional mean inflows from the contributing areas are shown in **Figure ES-7**.

Over the past week, salinities remained the same at S-79 and Val I-75 and decreased at the remaining 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 Sanibel and Shell Point and in the damaging range at Cape Coral (**Figure ES-10**). The mean larval oyster recruitment rate reported by the FWRI was 1.1 spat/shell at Iona Cove and 36.6 spat/shell at Bird Island for July, which is a decrease for Iona Cove and an increase for Bird Island from the previous month (**Figures ES-11 and ES-12**).

Surface salinity at Val I-75 was forecast for the next two weeks using an autoregression model (Qiu and Wan, 2013<sup>1</sup>) coupled with a linear reservoir model for the tidal basin. Model scenarios included pulse releases at S-79 ranging from 450 to 2,000 cfs with estimated tidal basin inflows of 789 cfs. Model results from all scenarios predict daily salinity and the 30-day moving average surface salinity at the end of the two-week period to be 0.3 for all scenarios at Val I-75 (**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.

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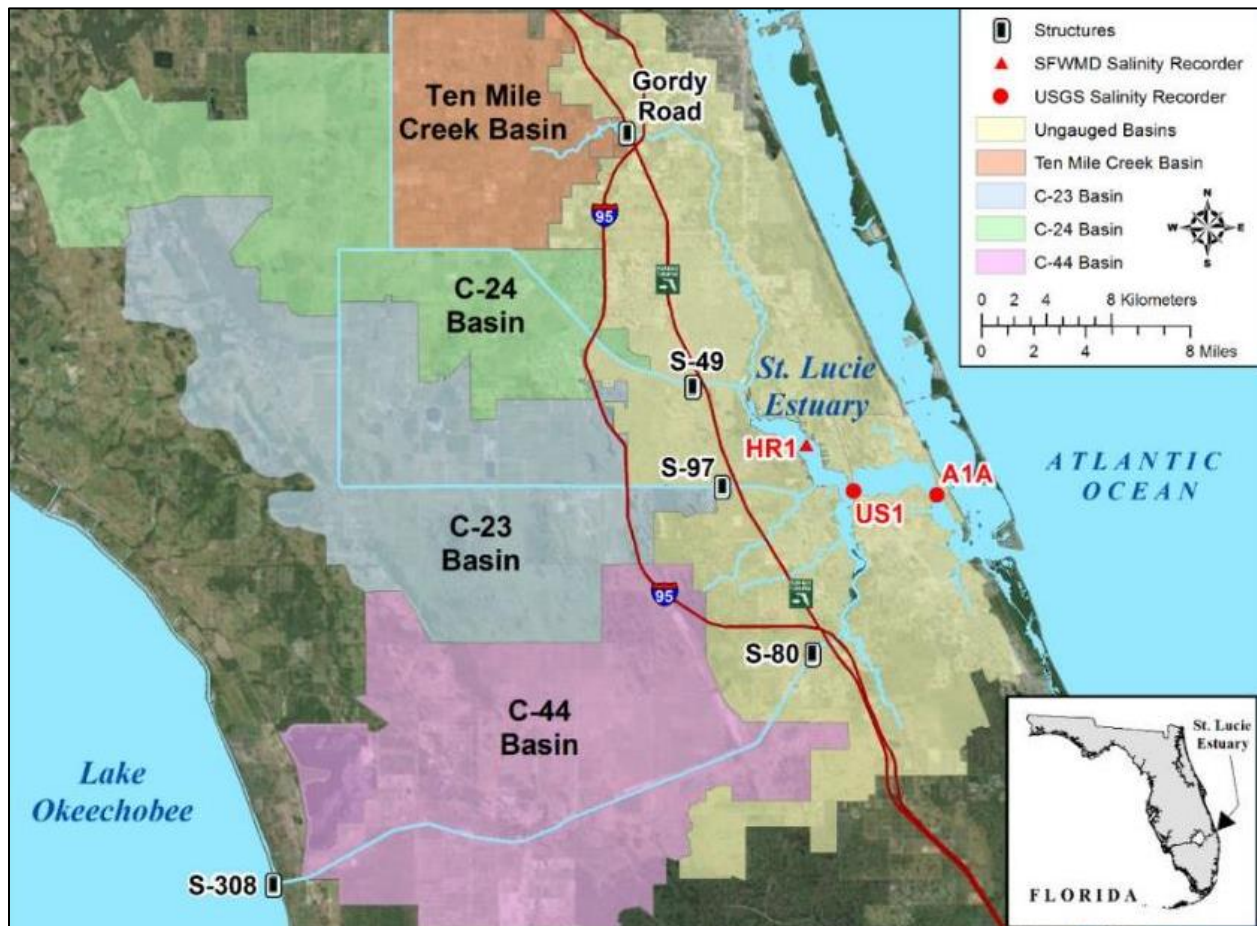
<sup>1</sup> Qiu, C., and Y. Wan. 2013. Time series modeling and prediction of salinity in the Caloosahatchee River Estuary. *Water Resources Research* 49:5804-5816.

## Red Tide

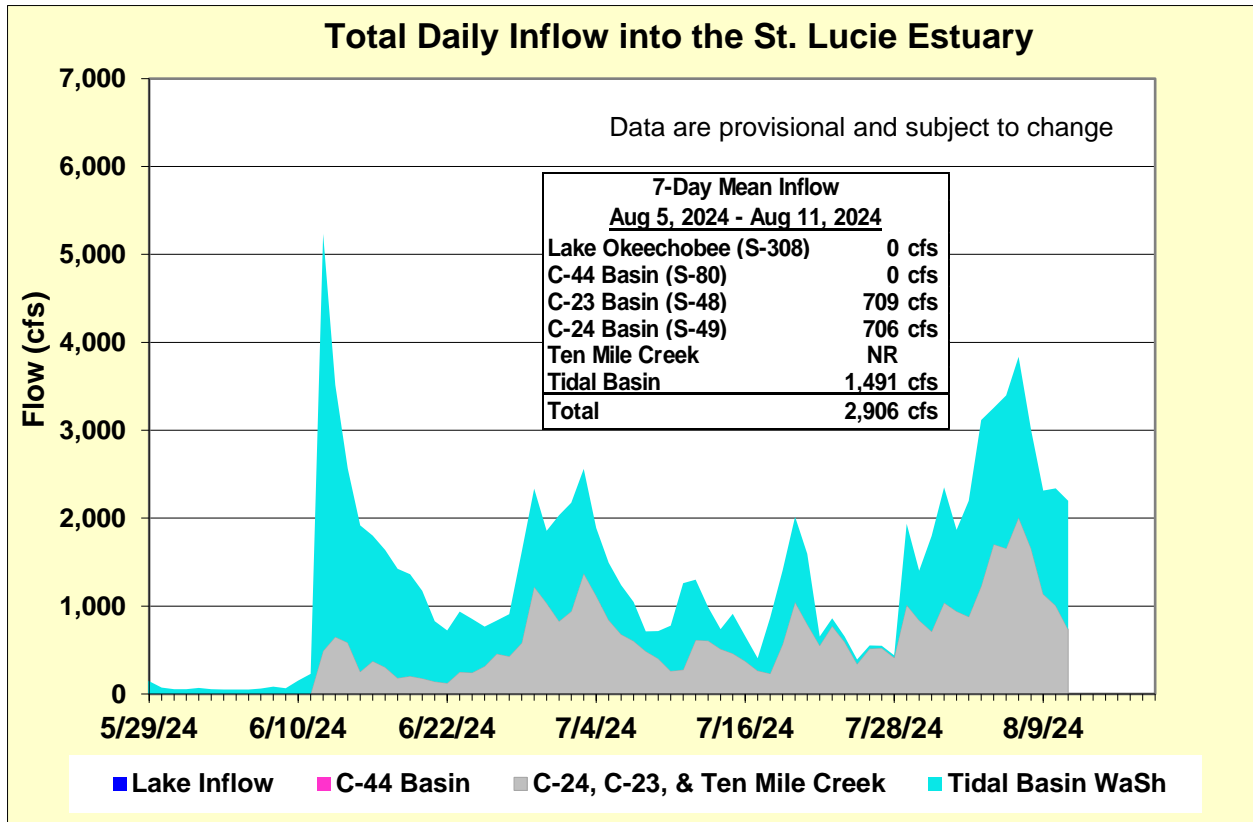
The FWRI reported on August 9, 2024, that *Karenia brevis*, the Florida red tide dinoflagellate, was not observed in any samples collected from statewide over the past week.

## Water Management Recommendations

Lake stage is in Zone D. Current climatological and hydrological conditions are normal. The LOSOM release guidance suggests up to 2,000 cfs release at S-79 to the Caloosahatchee River Estuary and no releases at S-80 to the St. Lucie Estuary.



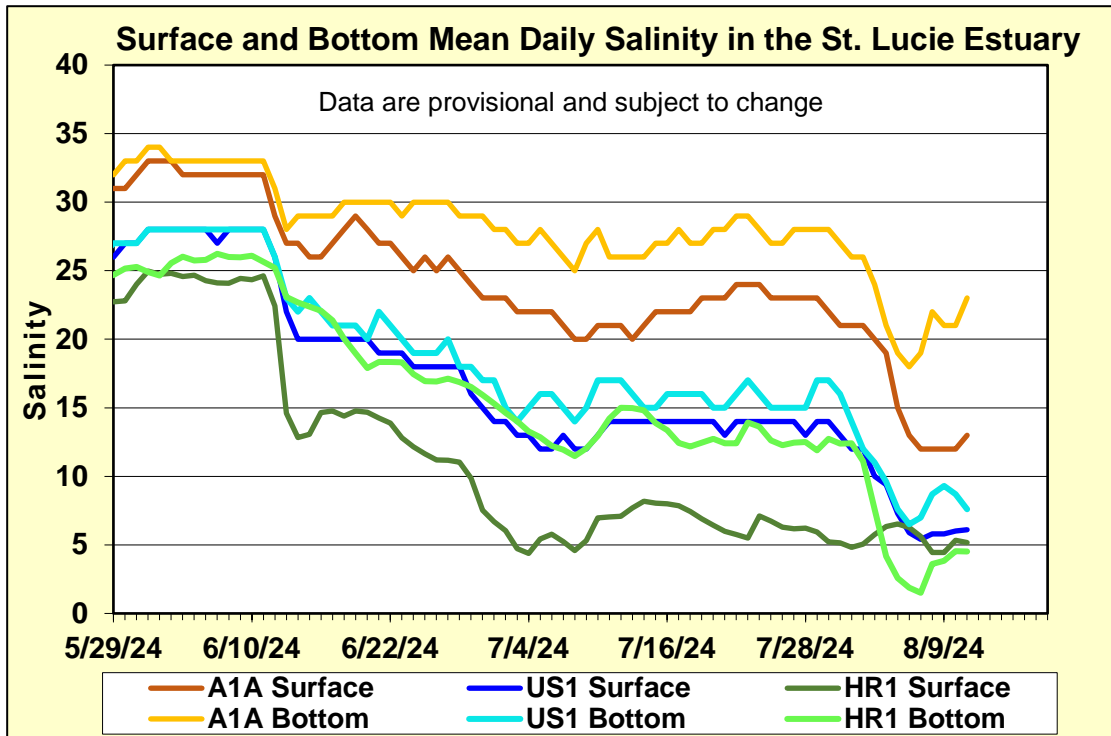
**Figure ES-1.** Basins, water control structures and salinity monitoring sites in the St. Lucie Estuary.



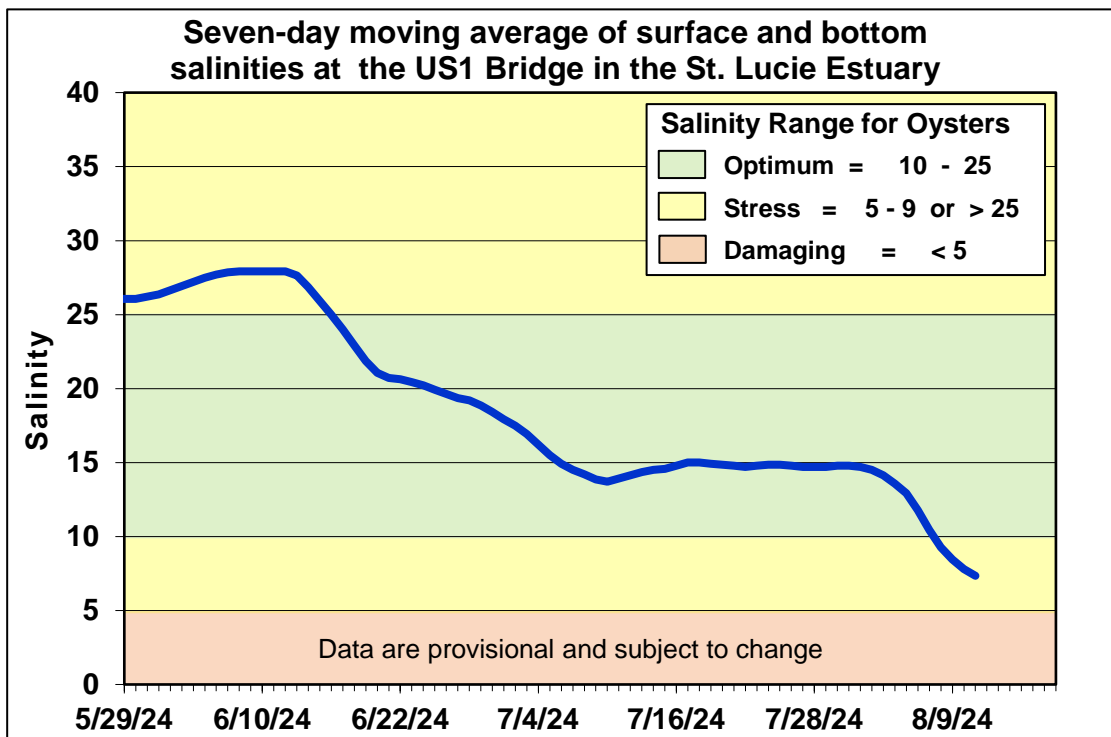
**Figure ES-2.** Total daily inflows from Lake Okeechobee and runoff from the C-44, C-23, C-24, Ten Mile Creek, and Tidal Basins into the St. Lucie Estuary.

**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)	<b>5.4</b> (5.5)	<b>3.2</b> (10.3)	10.0 – 25.0
US1 Bridge	<b>6.0</b> (12.1)	<b>7.9</b> (13.8)	10.0 – 25.0
A1A Bridge	<b>12.7</b> (21.0)	<b>20.4</b> (25.7)	10.0 – 25.0

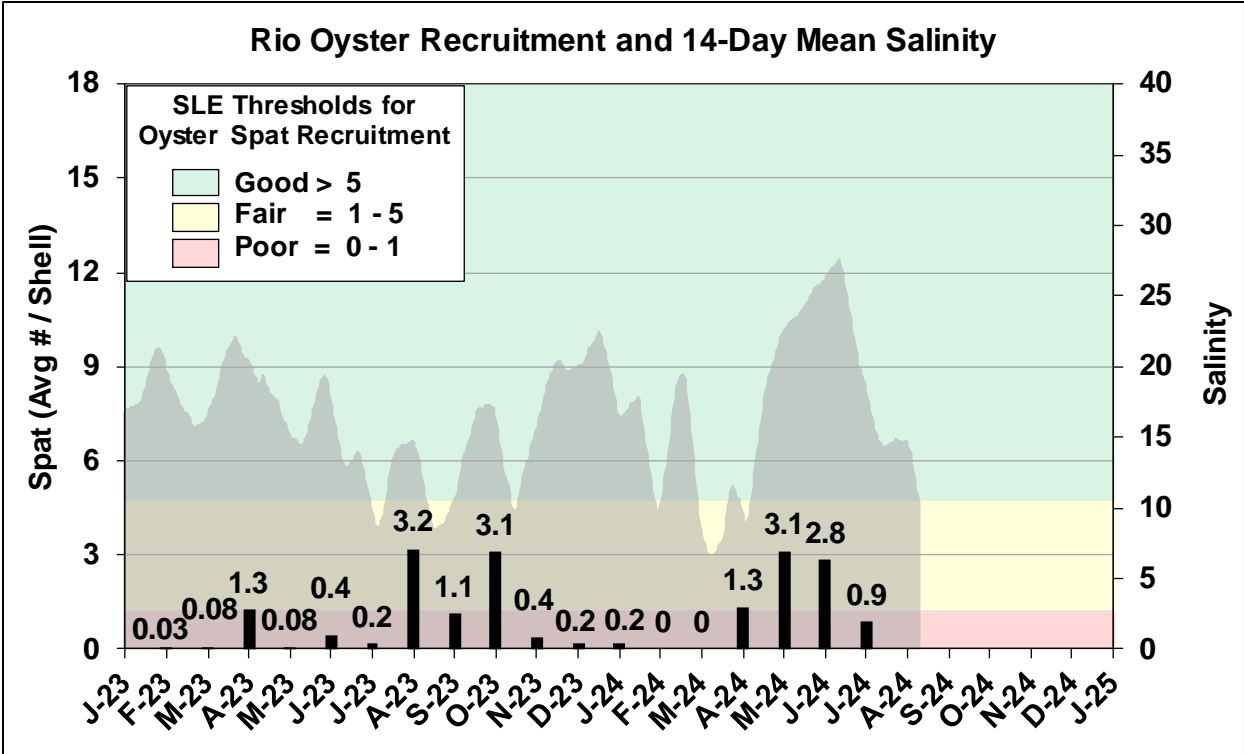


**Figure ES-3.** Mean daily salinity at the A1A, US1, and HR1 sites in the St. Lucie Estuary.

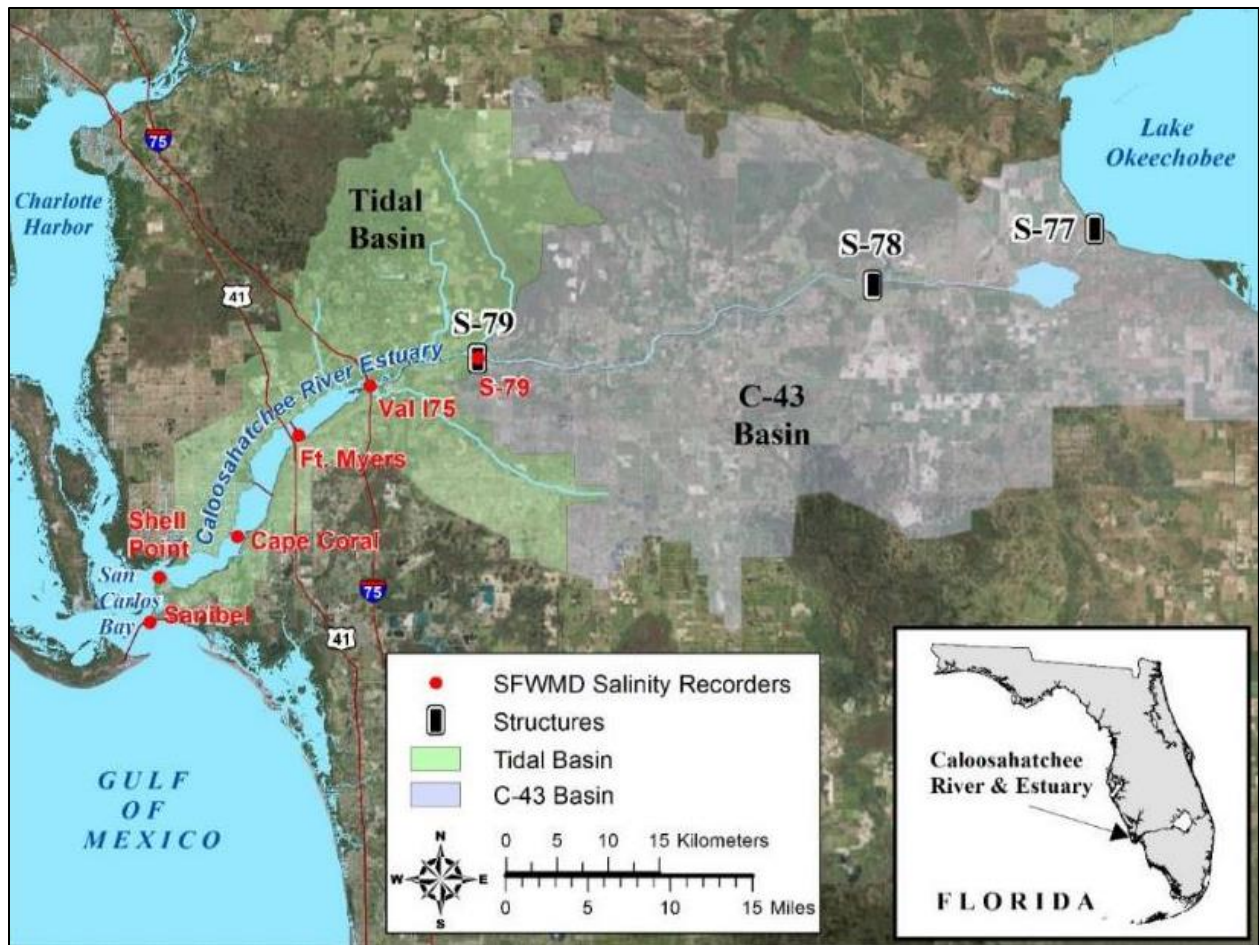


**Figure ES-4.** Seven-day moving average of the surface and bottom salinities at the US1 Bridge in the St. Lucie Estuary.

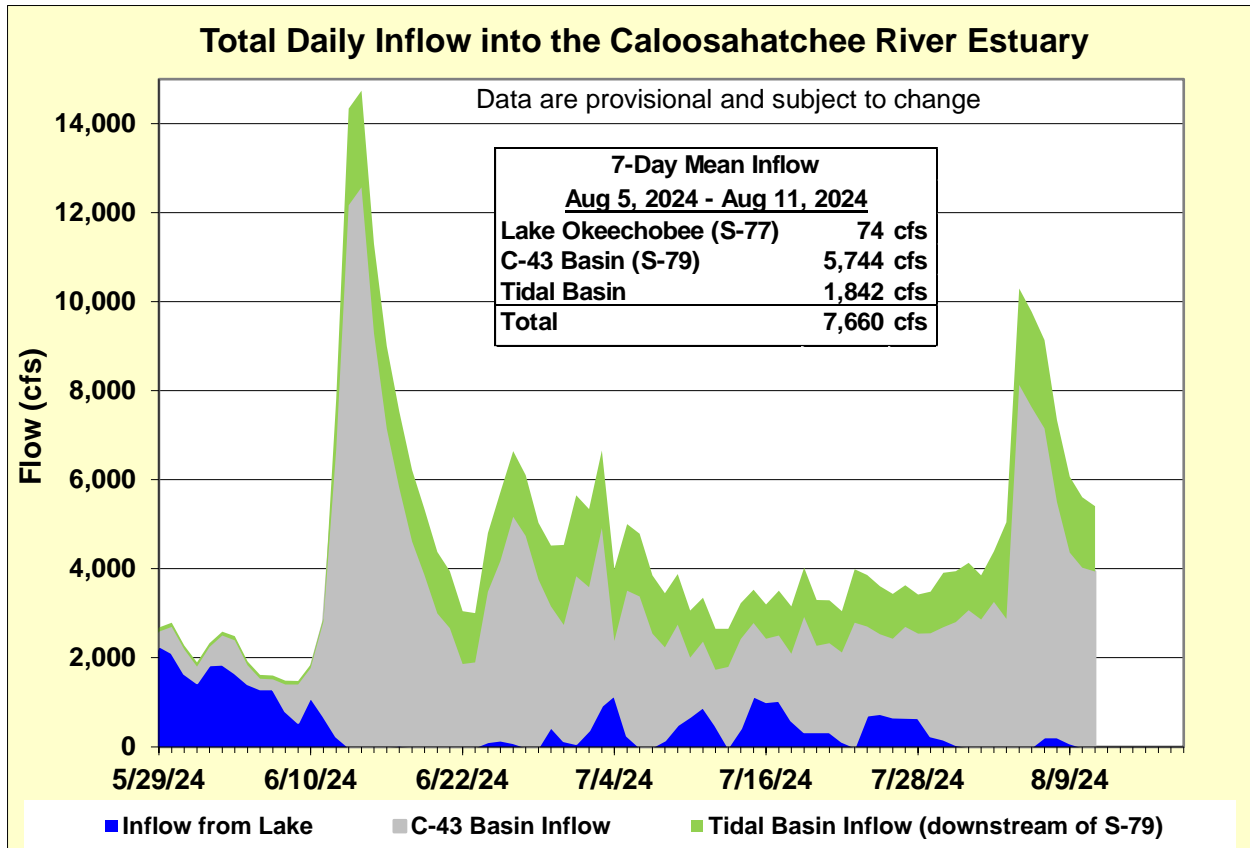




**Figure ES-5.** Mean oyster recruitment at the Rio oyster monitoring station and 14-day mean salinity at US1 Bridge.



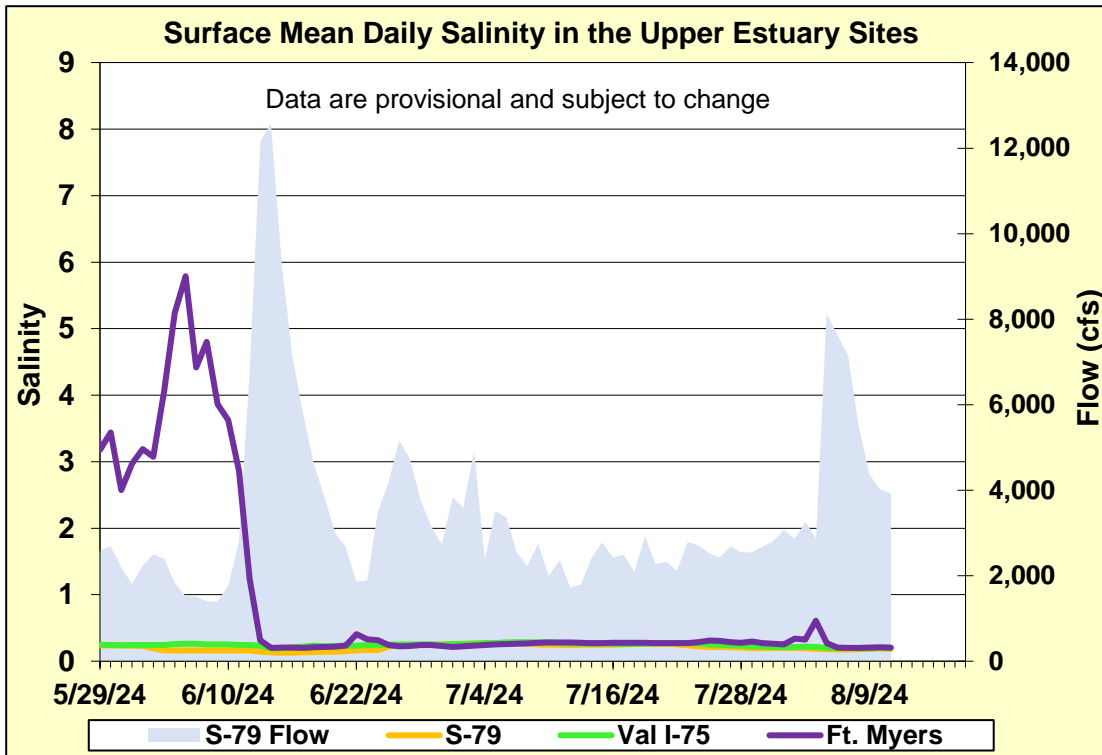
**Figure ES-6.** Basins, water control structures, and salinity monitoring sites in the Caloosahatchee River Estuary.



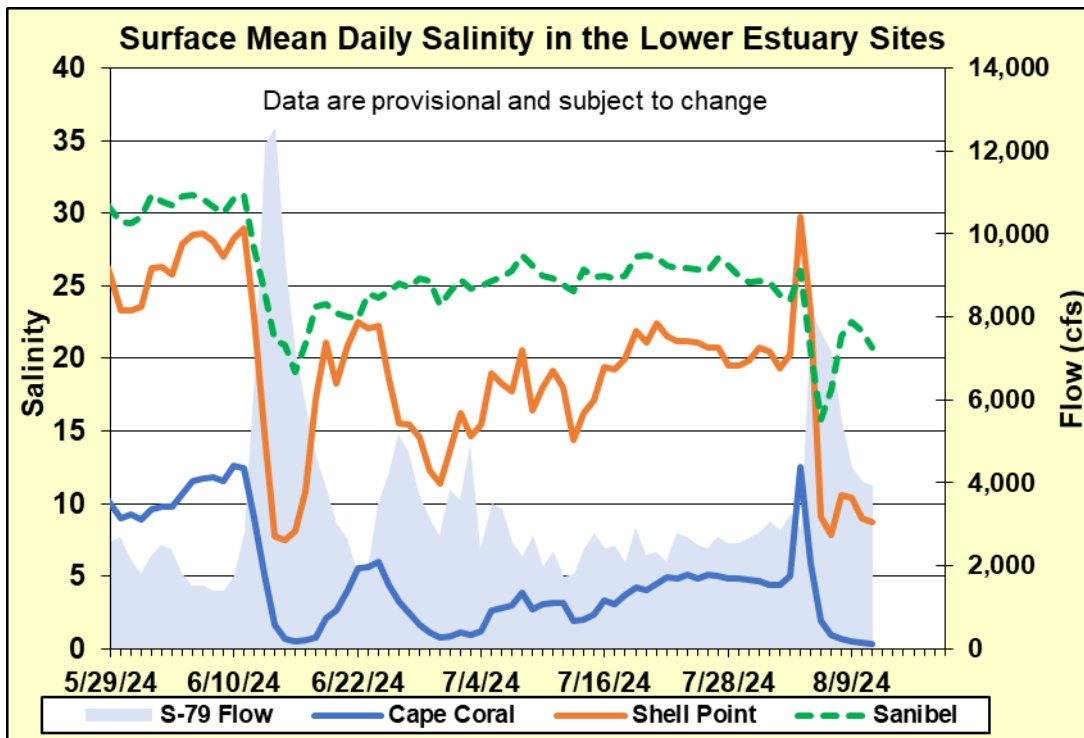
**Figure ES-7.** Total daily inflows from Lake Okeechobee, and runoff from the C-43 and Tidal basins into the Caloosahatchee River Estuary.

**Table ES-2.** Seven-day mean salinity at six monitoring sites in the Caloosahatchee River Estuary. Current means are in bold font; previous week's means are in parentheses. 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.

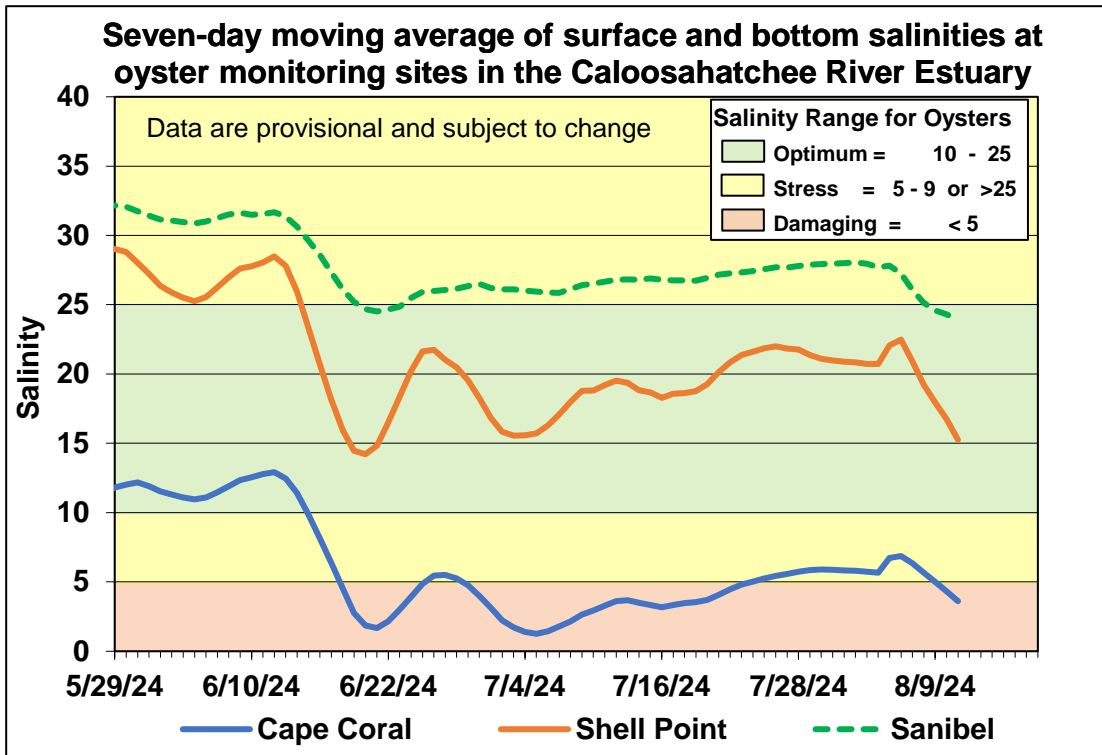
Sampling Site	Surface	Bottom	Optimum Envelope
S-79 (Franklin Lock)	<b>0.2</b> (0.2)	<b>0.2</b> (0.2)	0.0 – 10.0
Val I-75	<b>0.2</b> (0.2)	<b>0.2</b> (0.2)	0.0 – 10.0
Fort Myers Yacht Basin	<b>0.2</b> (0.3)	<b>0.2</b> (0.4)	0.0 – 10.0
Cape Coral	<b>1.5</b> (5.8)	<b>1.9</b> (7.7)	10.0 – 25.0
Shell Point	<b>11.3</b> (21.4)	<b>14.1</b> (22.7)	10.0 – 25.0
Sanibel	<b>20.1</b> (25.1)	<b>25.8</b> (30.5)	10.0 – 25.0



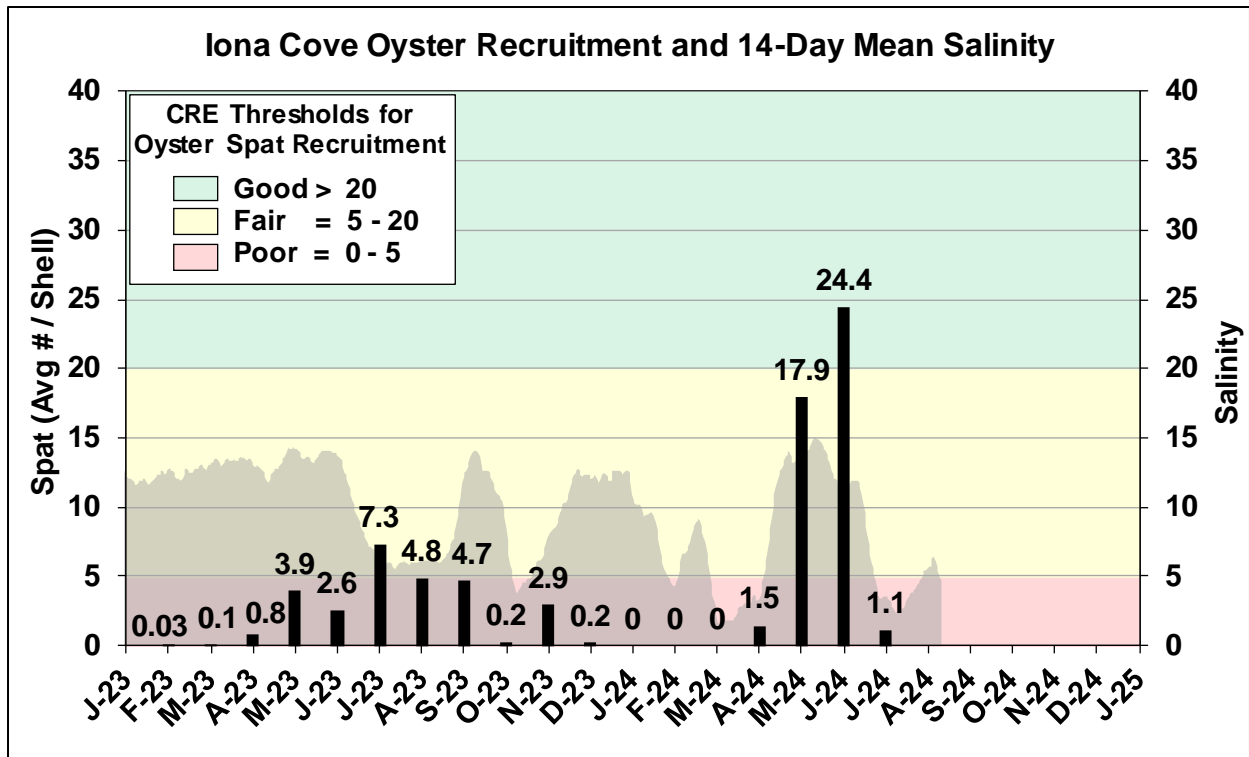
**Figure ES-8.** Mean daily salinity at upper Caloosahatchee River Estuary monitoring sites and mean daily flow at S-79.



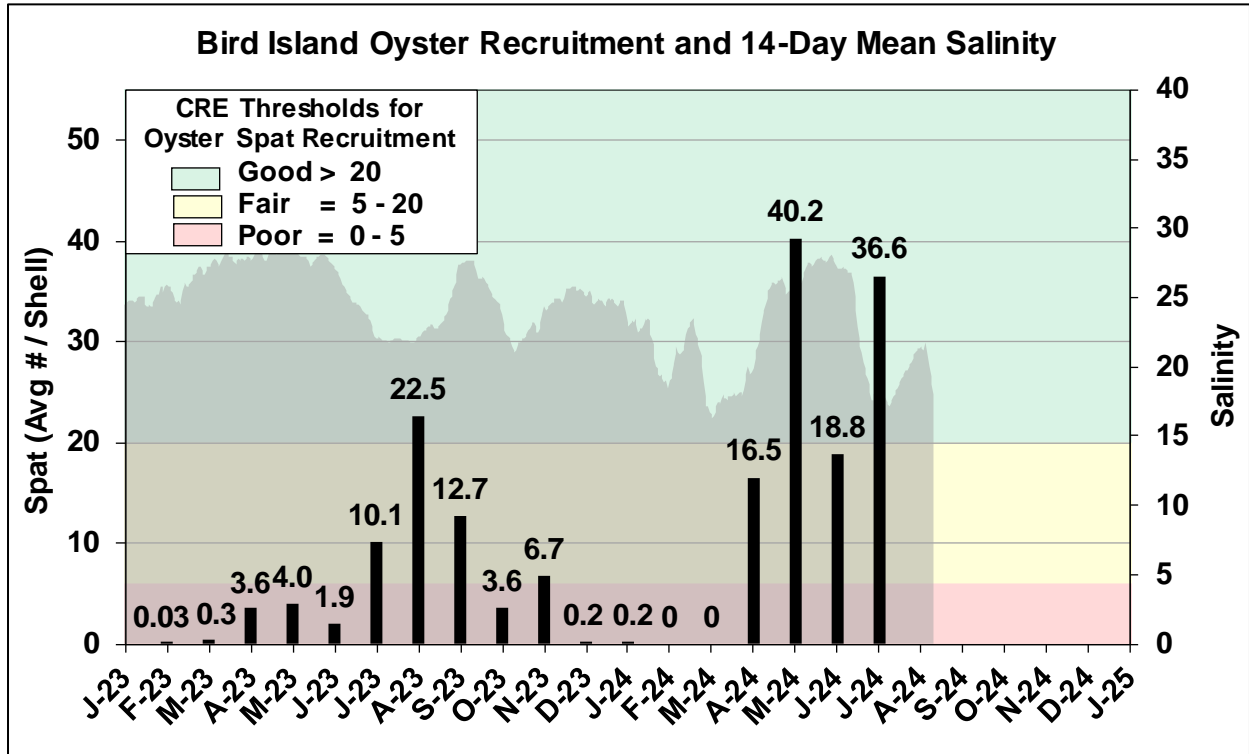
**Figure ES-9.** Mean daily surface salinity at lower Caloosahatchee River Estuary monitoring sites and mean daily flow at S-79.



**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.



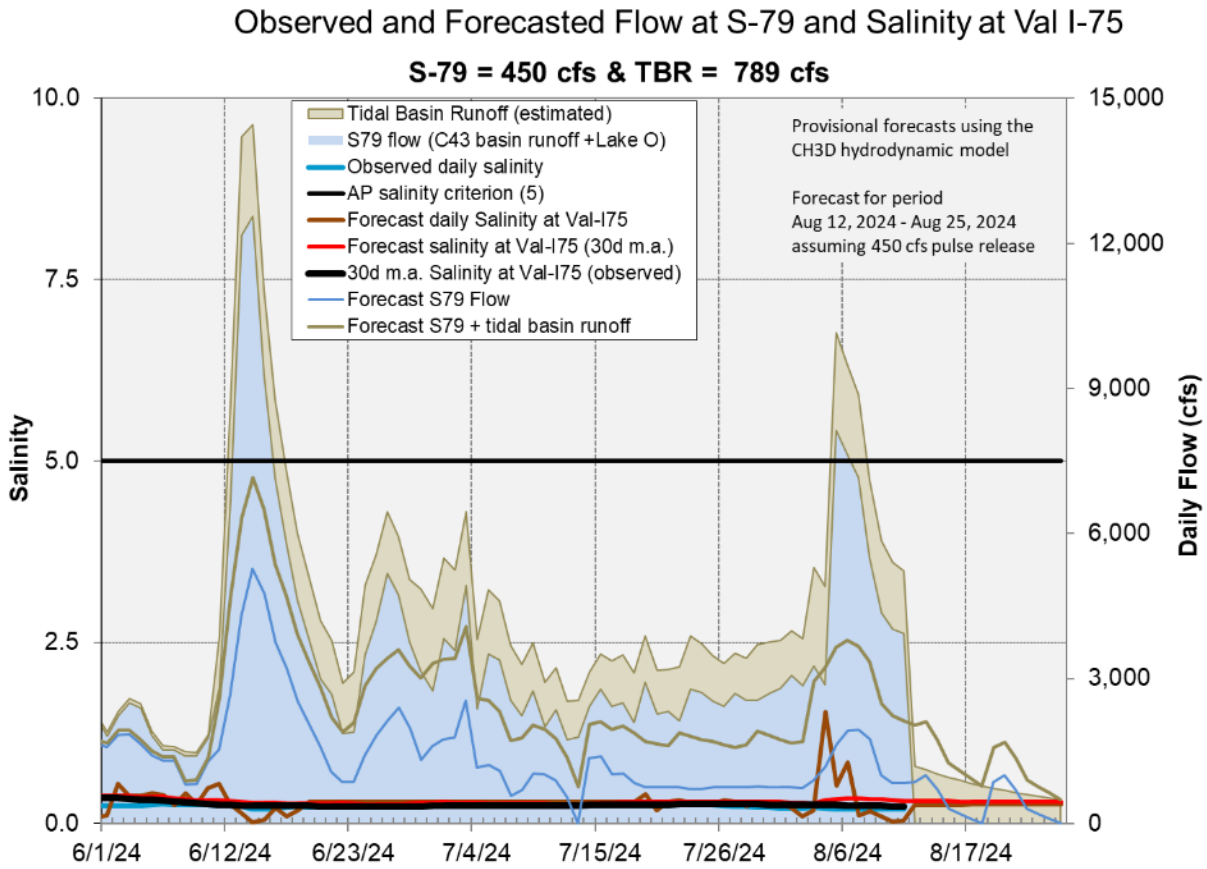
**Figure ES-11.** Mean oyster recruitment at the Iona Cove oyster monitoring station and 14-day mean salinity at Cape Coral.



**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	450	789	0.3	0.3
B	650	789	0.3	0.3
C	1,200	789	0.3	0.3
D	2,000	789	0.3	0.3



**Figure ES-13.** Surface salinity forecast at the Val I-75 site assuming a 450 cfs pulse release at S-79.

## Stormwater Treatment Areas

**STA-1E:** STA-1E Central Flow-way is offline for construction activities. An operational restriction is in place in the Western Flow-way for post-construction vegetation grow-in, and in the Eastern Flow-way for vegetation establishment following erosion repair. Online treatment cells are near or above target stage. (**Figure S-1**).

**STA-1W:** An operational restriction is in place in the Northern Flow-way for vegetation management activities. Treatment cells are near or above target stage. Vegetation in the flow-ways is highly stressed. The 365-day PLRs for the Eastern and Western Flow-ways are high, and the 365-day phosphorus loading rate (PLR) for the Northern Flow-ways is below 1.0 g/m<sup>2</sup>/year (**Figure S-1**).

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

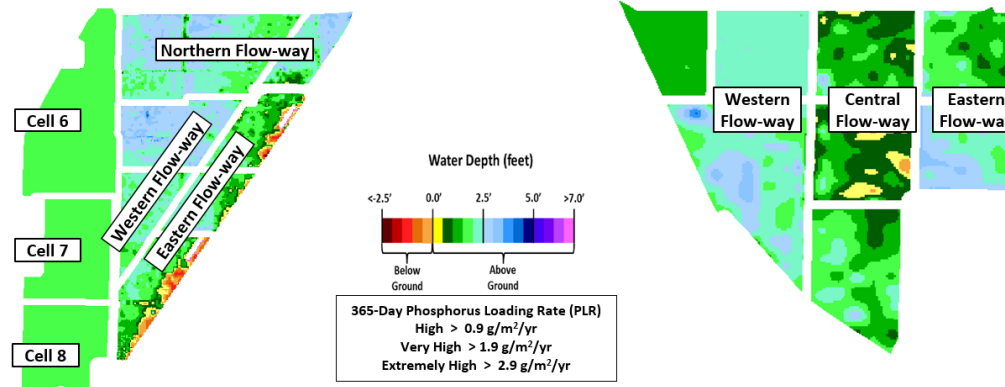
**STA-3/4:** An operational restriction is in place in the Eastern Flow-way for post-drawdown vegetation grow-in. Treatment cells are near or above target stage. Vegetation in the Central Flow-way is highly stressed and in the Eastern Flow-way is stressed. The 365-day PLRs for the Central and Western Flow-ways are high (**Figure S-2**).

**STA-5/6:** Treatment cells are near or above target stage. All treatment cells have highly stressed or stressed vegetation conditions. The 365-day PLRs for Flow-ways 1, 4, 6, 7, and 8 are below 1.0 g/m<sup>2</sup>/year, and the 365-day PLRs for Flow-ways 2, 3, and 5 are high. (**Figure S-3**).

For definitions on STA operational language see glossary following figures.



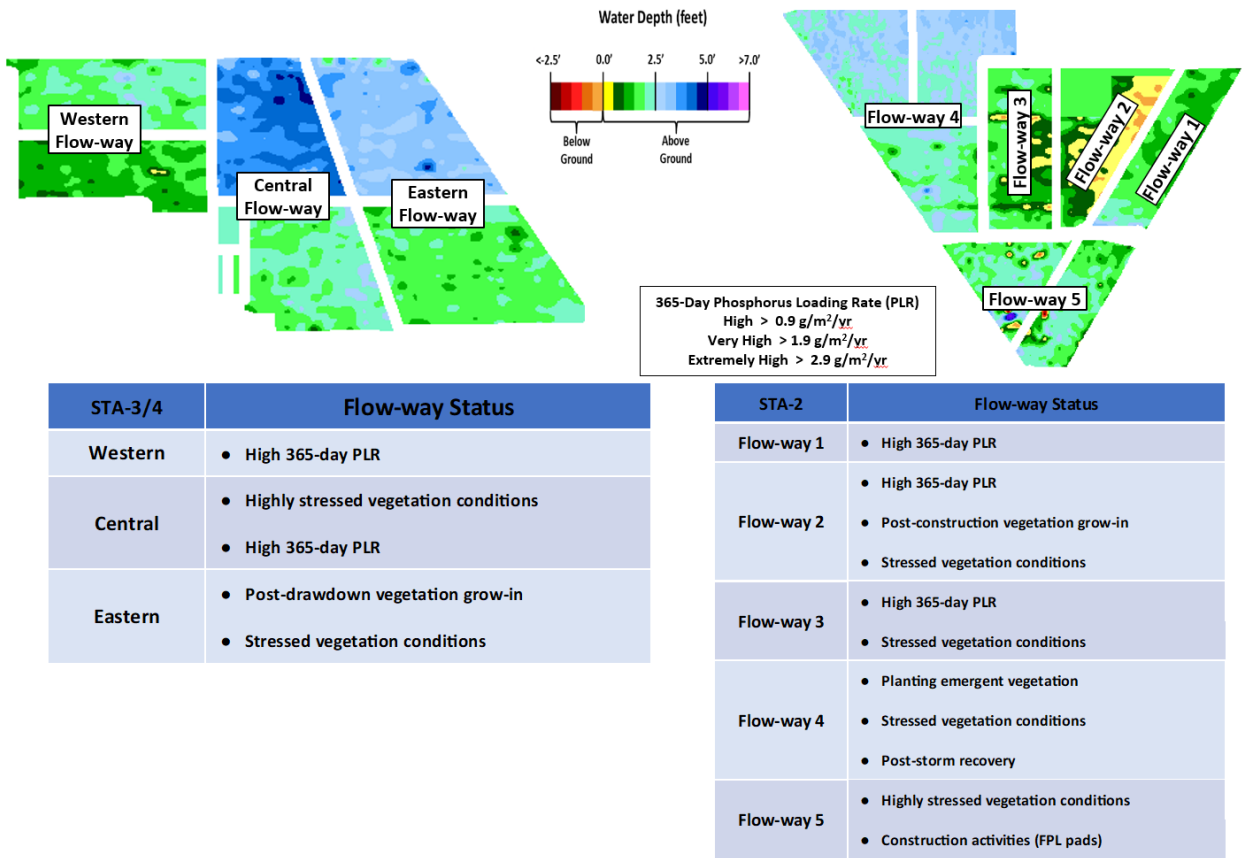
### Eastern Flow Path Weekly Status Report – 8/5/2024 through 8/11/2024



STA-1W	Flow-way Status	STA-1E	Flow-way Status
Western	<ul style="list-style-type: none"> <li>• High 365-day PLR</li> <li>• Highly stressed vegetation conditions</li> </ul>	Western	<ul style="list-style-type: none"> <li>• Post-construction vegetation grow-in</li> </ul>
Eastern	<ul style="list-style-type: none"> <li>• High 365-day PLR</li> <li>• Highly stressed vegetation conditions</li> </ul>	Central	<ul style="list-style-type: none"> <li>• Offline for construction activities</li> </ul>
Northern	<ul style="list-style-type: none"> <li>• Highly stressed vegetation conditions</li> <li>• Planting emergent vegetation</li> </ul>	Eastern	<ul style="list-style-type: none"> <li>• Online with restrictions for vegetation grow-in following erosion repair</li> </ul>
Cell 6			
Cell 7+8			

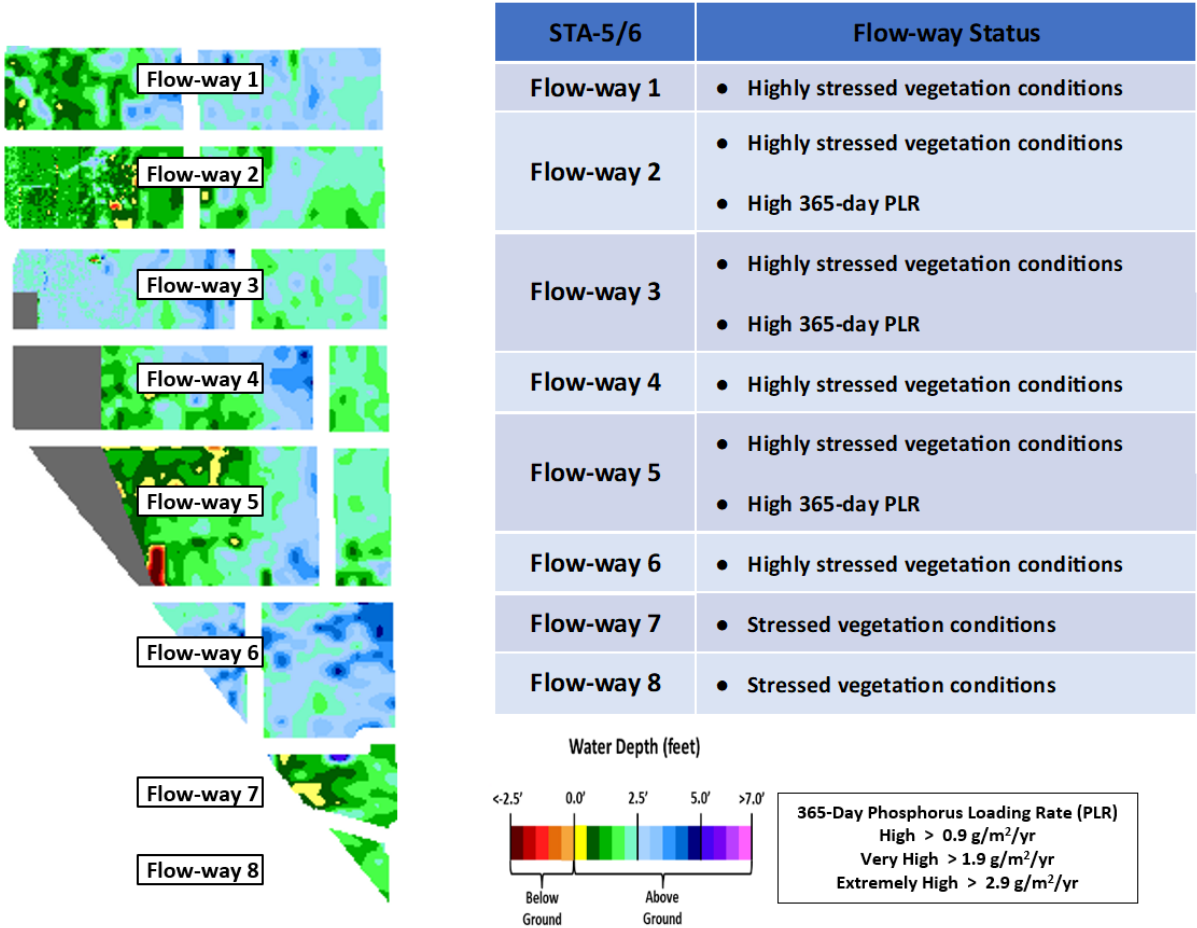
**Figure S-1.** Eastern Flow Path Weekly Status Report

## Central Flow Path Weekly Status Report – 8/5/2024 through 8/11/2024



**Figure S-2.** Central Flow Path Weekly Status Report

**Western Flow Path Weekly Status Report – 8/5/2024 through 8/11/2024**



**Figure S-3.** Western Flow Path Weekly Status Report

## 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,  $\mu\text{g/L}$  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**

Last week, less than half the previous week's rainfall fell within the Everglades. WCA-1: Stage within the Refuge fell to the schedule line last week. On Sunday, the 3-Gauge average was 0.02 feet above the Zone A1 regulation line. WCA-2A: Stage at gauge 2A-17 is trending toward the regulation line. The average on Sunday was 0.68 feet above the Zone A line. WCA-3A: The 3-Gauge average stage receded over the past week, remaining above the Zone A regulation line by 0.75 feet on Sunday. WCA-3A North: Stage at Gauge 62 (NW corner) receded towards the regulation line last week. The average on Sunday was 0.07 feet above the Upper Schedule. See figures **EV-1** through **EV-4**.

### **Water Depths**

The SFWDAT model output for August 11, 2024, shows a hydro-pattern that is deeper than two months ago, especially in the west. Ponded conditions remain stable over the last month in the upper reaches of the L-67s and southern WCA-3A. The northern end of the Refuge still has some potential for water at ground surface. Hydrologic connectivity is being well maintained within the major sloughs of Everglades National Park (ENP). Current WDAT water depth estimates show a mixture of wetter and drier conditions when compared to one month ago, with the WCA's generally drier in the north portions of those basins and the potential for slightly deeper conditions in the south. The comparison to modeled conditions a year ago also illustrates a mix of deeper and shallower conditions, though more significantly shallow in the northern regions of both WCA-1 and WCA-2A. Conditions are currently deeper than they were a year ago in the west.

Comparing current conditions to the 20-year percentiles for August 11<sup>th</sup>, depth conditions remain around the 90th percentile for this time of the year in Shark River Slough (SRS) and most of WCA-3B. Conditions are shallower than average in northern WCA-2A and northern WCA-1. See figures **EV-5** through **EV-7**.

### **Taylor Slough and Florida Bay**

Most stages increased across Taylor Slough over the past week, with an average increase of 0.08 feet. Changes ranged from -0.03 feet at P37 in the southern slough to +0.46 feet at Taylor Slough Bridge (TSB) in the northern slough (**Figure EV-8** and **Figure EV-9**). Taylor Slough water levels remain above the recent average for this time of year by 3.8 inches compared to before the Florida Bay initiative (starting in 2017), an increase of 0.5 inches relative to last week's comparison. Both the Craighead Pond (CP) and TSB stages are below estimated historical levels (circa 1900) by 0.60 and 0.94 feet, respectively.

Average Florida Bay salinity was 26.8, an increase of 1.0 from last week. Salinity changes were variable across the bay, ranging from -2.0 at Duck Key (DK) to +3.9 at Little Madeira Bay (LM), both in the eastern region (**Figure EV-8**). Salinity is above estimated historical levels (circa 1900) and at the 25<sup>th</sup> percentile of the WY2001-2016 Interquartile Range (IQR) in the eastern and central regions, and near the 75<sup>th</sup> percentile in the western region

(**Figure EV-10**). Average Florida Bay salinity remains below its recent average for this time of year by 1.5, an increase of 1.2 from last week.

Salinity at the Taylor River (TR) station in the mangrove zone (tracked for the Florida Bay MFL) was 1.0. The 30-day moving average was 1.6, with no change from last week (**Figure EV-11**). The 365-day moving sum of flow from the five major creeks (McCormick Creek, Taylor River, Mud Creek, Trout Creek, West Highway Creek) was 387,328 acre-feet, a decrease of 1,891 acre-feet from last week (**Figure EV-11**).

Average rainfall across Taylor Slough and Florida Bay was 0.30 inches over the past week, based on the 18 gauges used for this report. Rainfall ranged from 0.01 inches at EPSW in the C-111 area to 1.06 inches at TSB in the northern slough (**Figure EV-12**). Wind directions and speeds in Florida Bay ranged from 0.2 mph W on August 10<sup>th</sup> to 19.2 mph SE on August 5<sup>th</sup> (**Figure EV-12**).

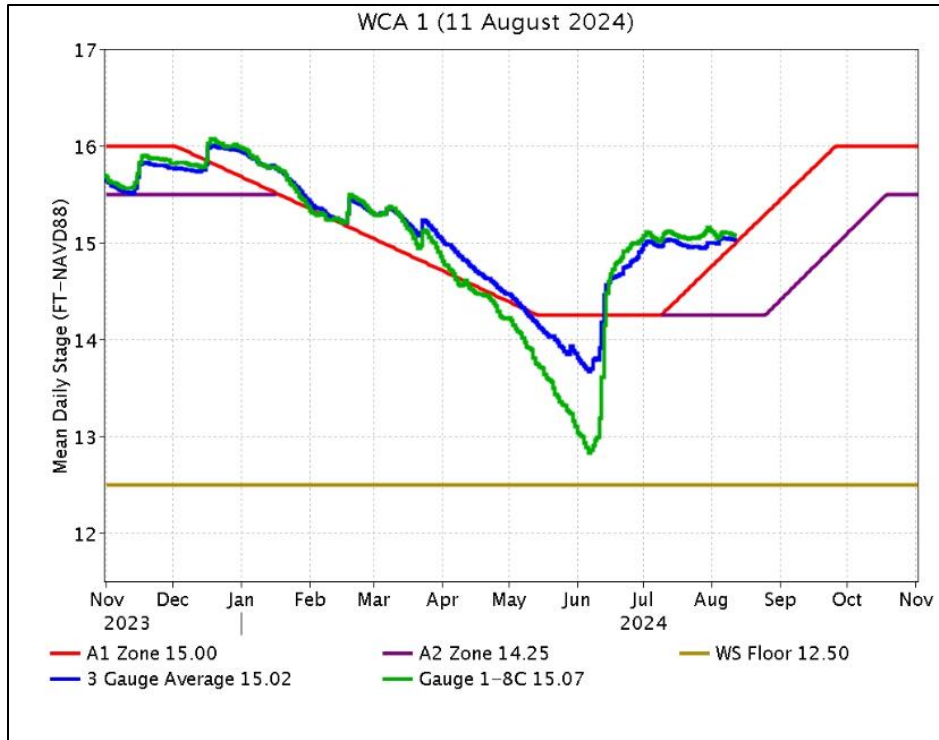
Average daily flow from the five major creeks totaled 874 acre-feet last week, with net positive flows for the week. Total daily creek flow ranged from -1,677 acre-feet on August 5<sup>th</sup> to 2,644 acre-feet on August 11<sup>th</sup> (**Figure EV-13**). Average daily flow for the week was 3,413 acre-feet below estimated historical levels (circa 1900).

### ***Implications for water management***

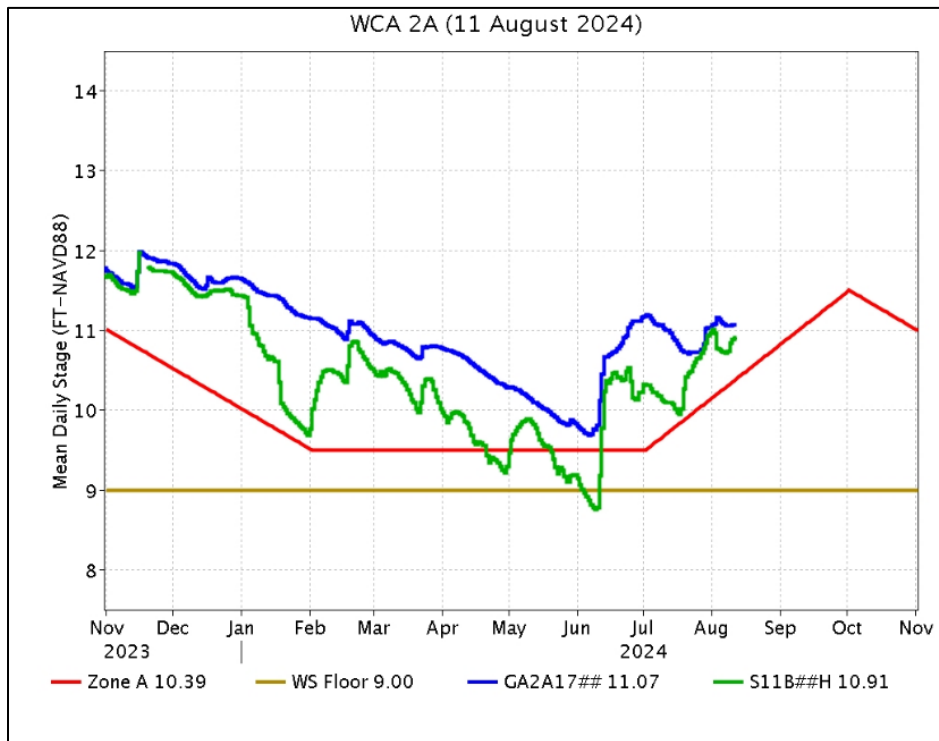
The ecology of the Everglades benefits from ascension rates of less than 0.18 feet per week. The Dynamic Position Analysis modeling for gauge 3-63 in northeast WCA-3A suggests that wetter than average conditions will be required to have the potential of reaching the threshold depths required for nesting to occur at the critical Alley North colony. Maintaining relatively long hydroperiods in northern and central WCA-3A will be critical for a successful 2025 wading bird nesting season. Continued freshwater inputs to the park and into Florida Bay is helping to maintain ecologically desirable salinities, and maintaining inputs of water southward will help to prevent ecologically undesirable salinity swings in Florida Bay nearshore areas. Individual regional recommendations can be found in **Table EV-2**.

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

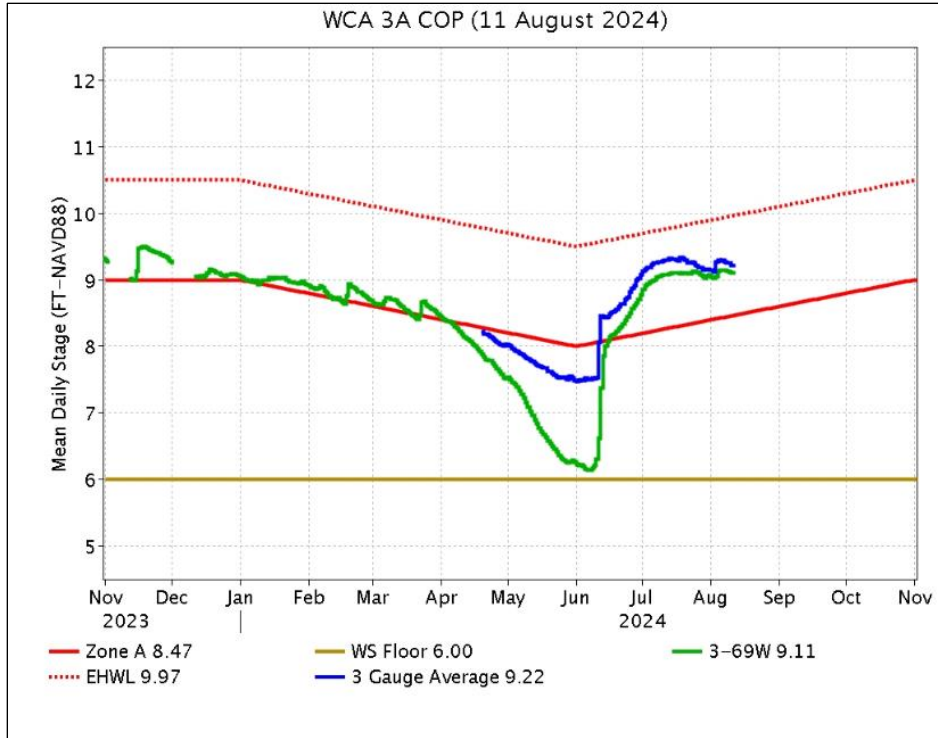
<b>Everglades Region</b>	<b>Rainfall (inches)</b>	<b>Stage change (feet)</b>
WCA-1	0.66	-0.05
WCA-2A	0.73	-0.07
WCA-2B	0.70	+0.13
WCA-3A	1.00	-0.06
WCA-3B	0.39	-0.04
ENP	0.54	-0.08



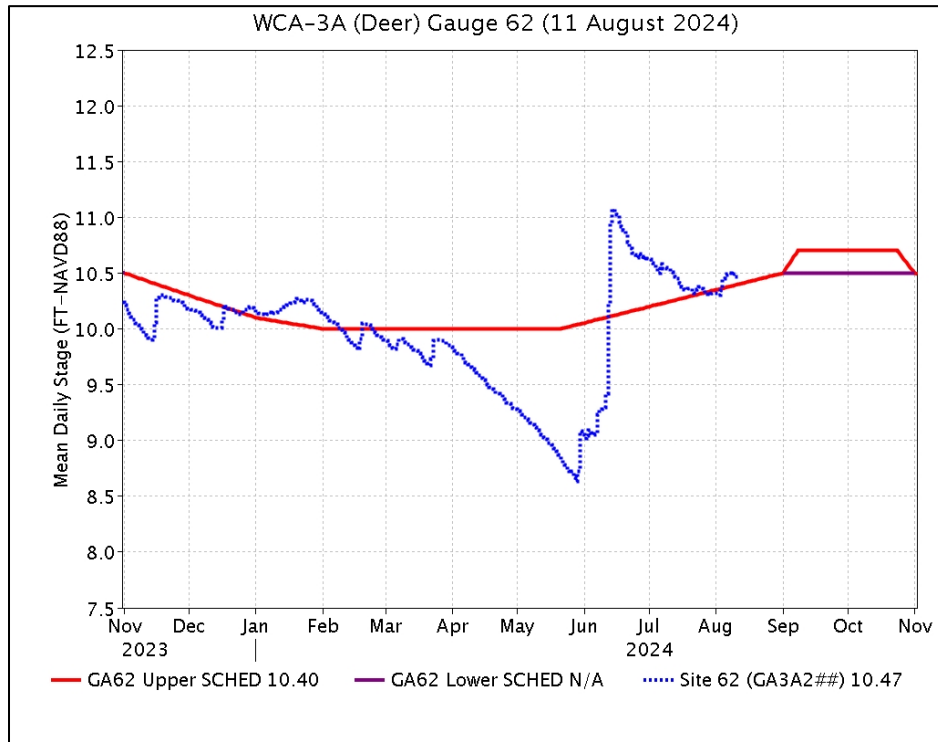
**Figure EV-1.** WCA-1 stage hydrographs and regulation schedule.



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

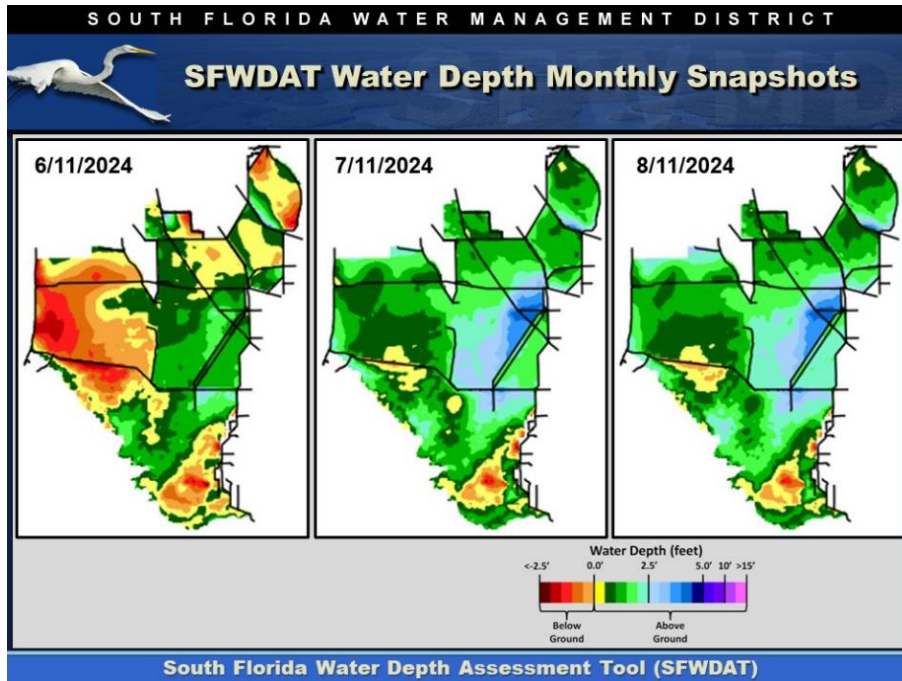


**Figure EV-3.** WCA-3A stage hydrographs (three-gauge average, 3-69W) and regulation schedule.

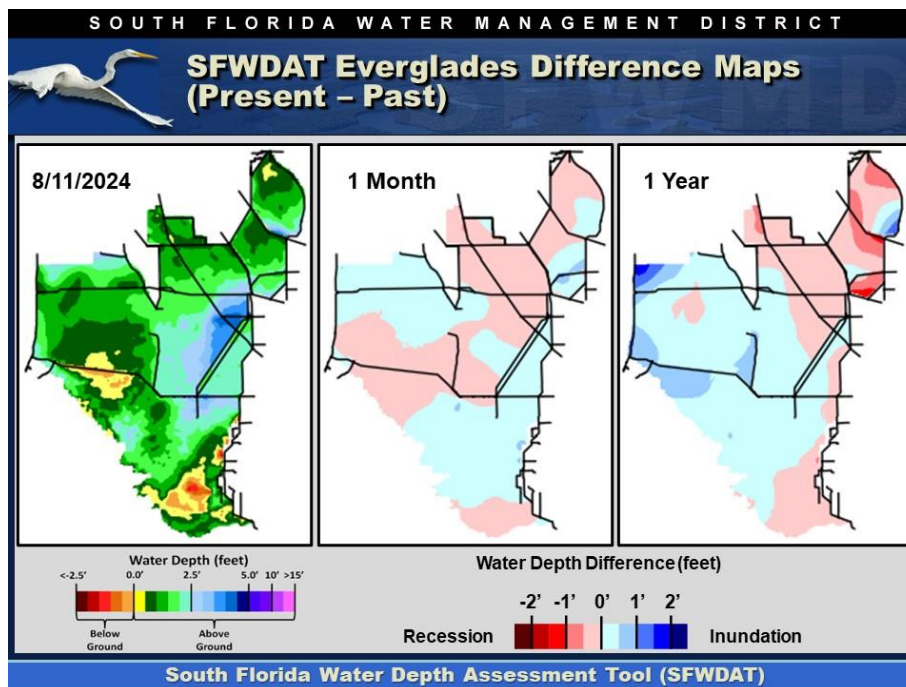


**Figure EV-4.** WCA-3A stage hydrograph (Deer gauge; Site 62) and GA62 regulation schedule.

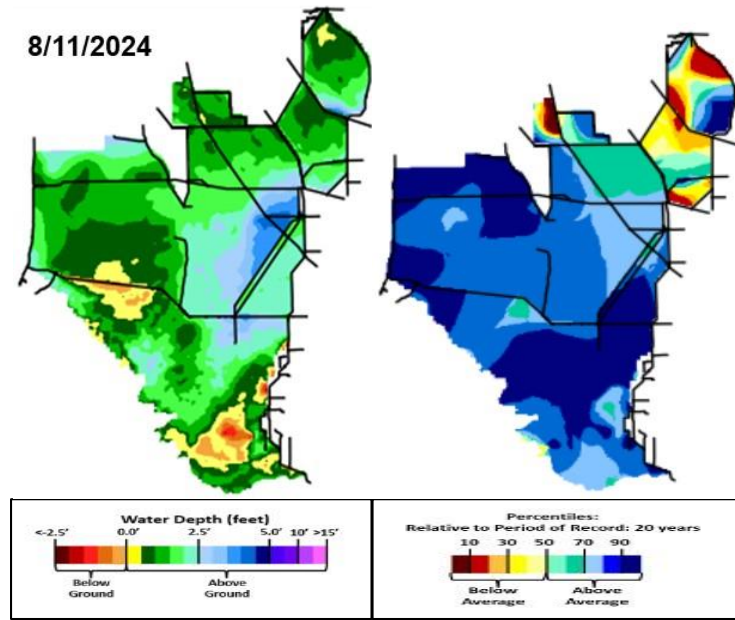




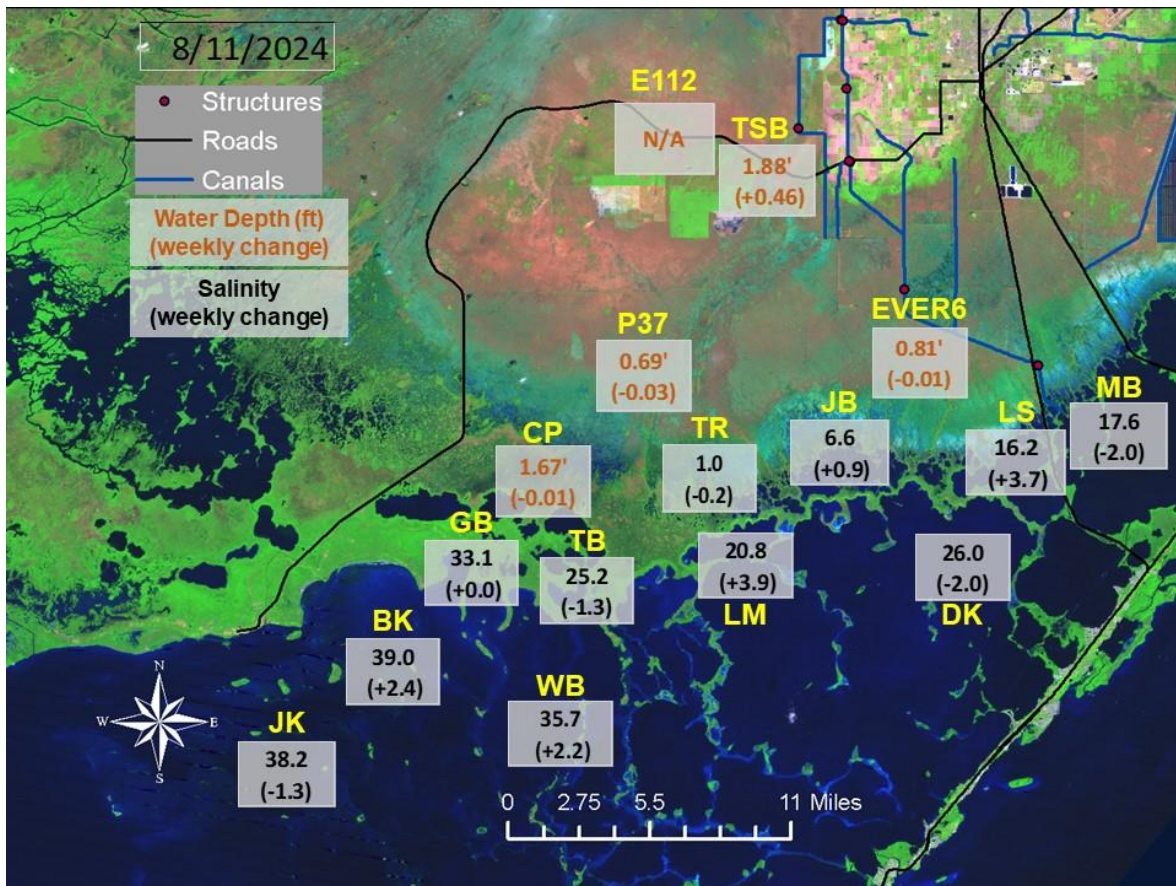
**Figure EV-5.** Everglades water depths from two months ago (left), one month ago (center) and present (right), based on SFWDAT.



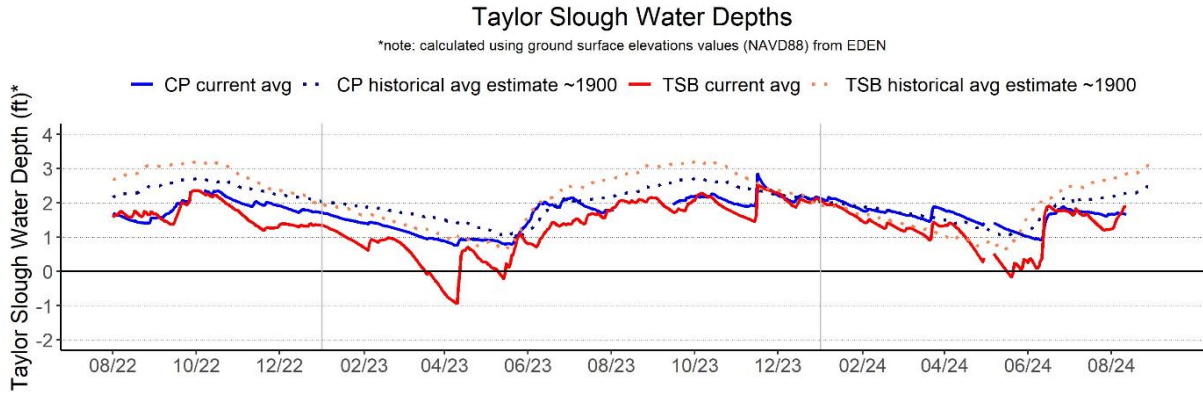
**Figure EV-6.** Present Everglades water depths (left) and water depth changes from one month (center) and one year (right) ago, based on SFWDAT.



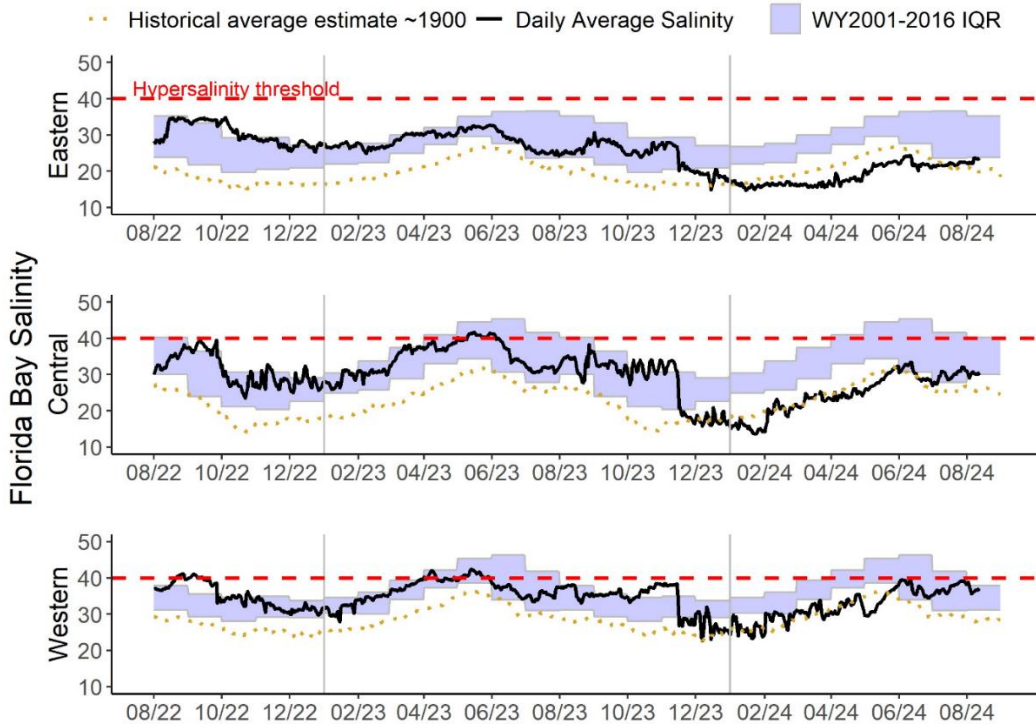
**Figure EV-7.** Present water depths (August 11<sup>th</sup>, 2024) compared to the day of year average over the previous 20 years.



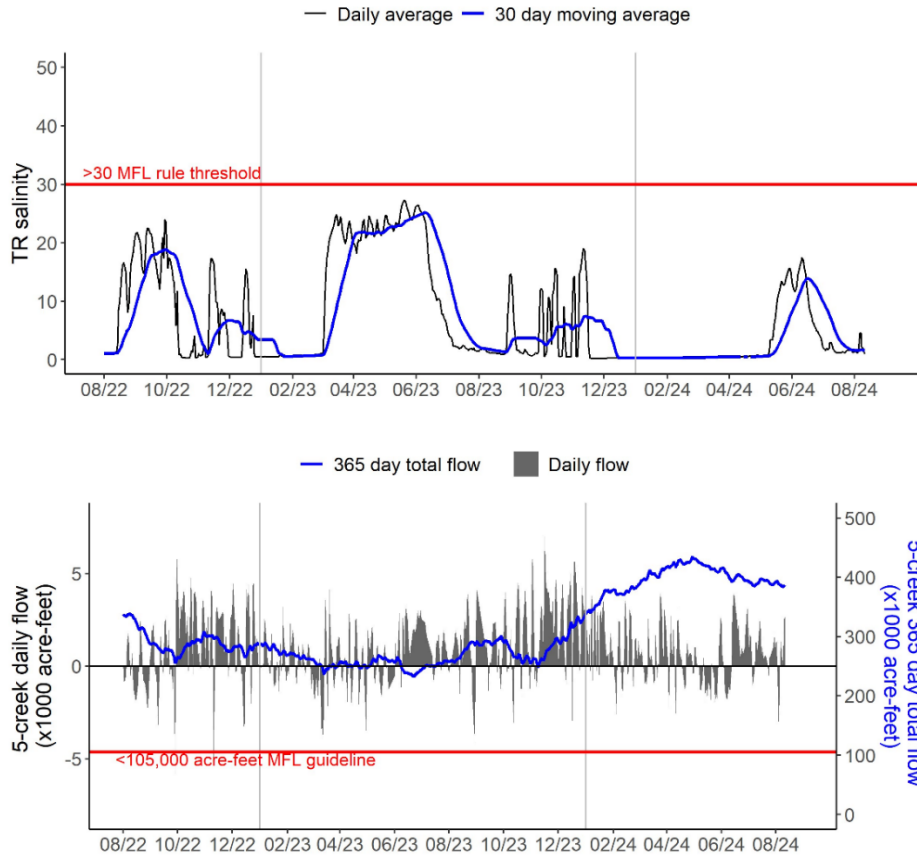
**Figure EV-8.** Taylor Slough water depths with changes since a week ago and Florida Bay salinities with changes since a week ago.



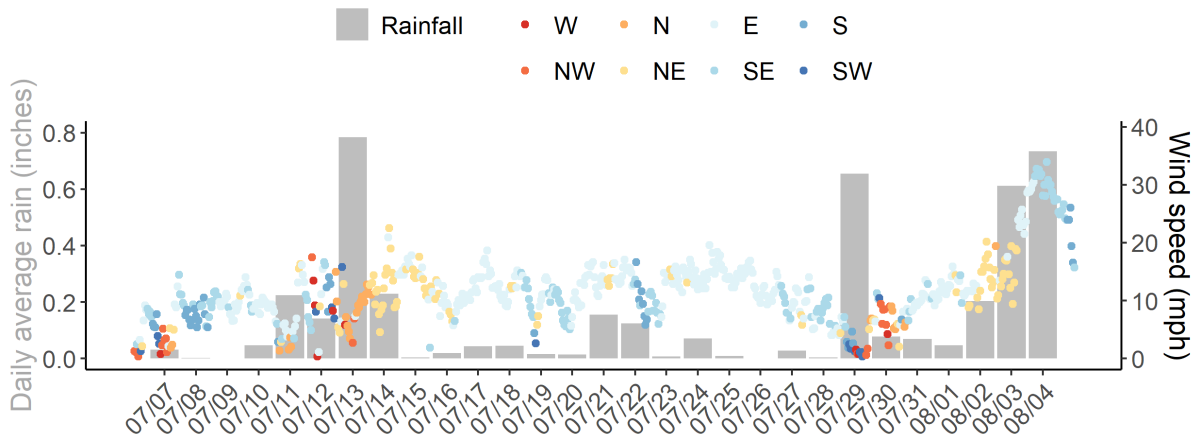
**Figure EV-9.** Taylor Slough water depth time series for Taylor Slough Bridge (TSB; northern slough) and Craighead Pond (CP; southern slough).



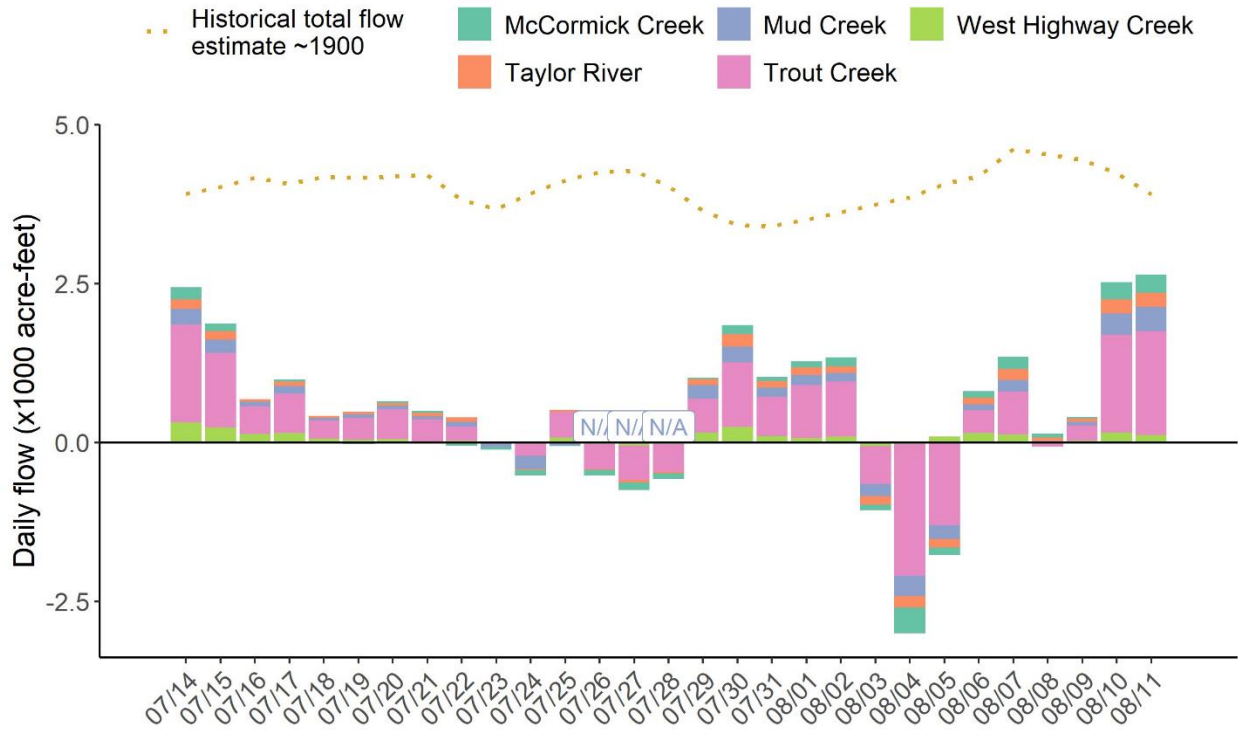
**Figure EV-10.** Eastern (top panel), Central (middle panel) and Western (bottom panel) Florida Bay daily average salinities with WY2001-2016 interquartile (25-75 percentile) ranges (IQR) and estimated historical daily average salinities. The hypersalinity threshold indicates the level at which salinities start to become harmful to seagrass.



**Figure EV-11.** Salinity at Taylor River (TR; top) and creek inflow to Florida Bay (bottom) from the five major creeks (McCormick Creek, Taylor River, Mud Creek, Trout Creek, and West Highway Creek). The 30-day moving average salinity and 365-day total creek flow are tracked for the Florida Bay MFL criteria.



**Figure EV-12.** Daily average rain across Taylor Slough and Florida Bay, along with hourly average wind speed and direction (measured at Long Key) in Florida Bay over the past four weeks.



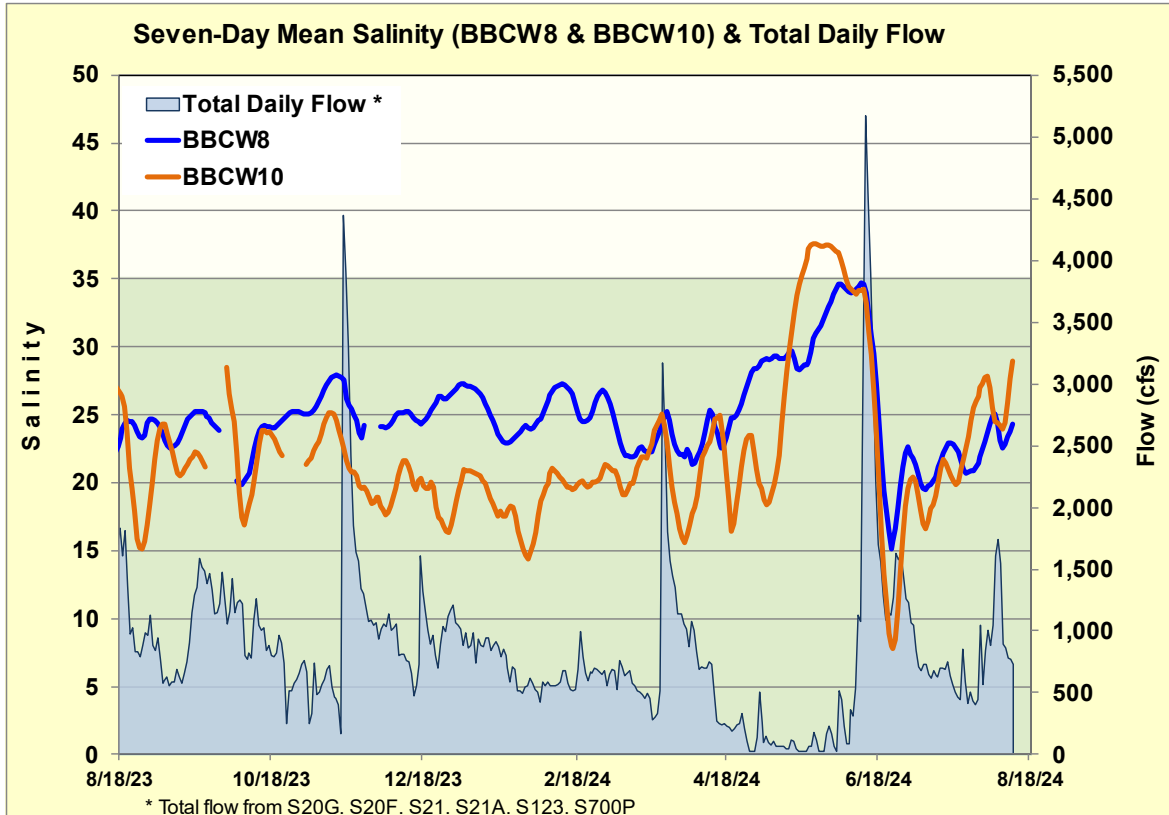
**Figure EV-13.** Daily average creek flow summed between five creeks with estimated historical daily flow over the past four weeks.

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

<b>SFWMD Everglades Ecological Recommendations, August 13, 2024 (red is new)</b>			
	Weekly change	Recommendation	Reasons
<b>WCA-1</b>	Stage decreased by 0.05 ft	Ascension rate of less than 0.18 ft per week.	Protect within basin and downstream habitat and wildlife.
<b>WCA-2A</b>	Stage decreased by 0.07 ft	Ascension rate of less than 0.18 ft per week.	Protect within basin and downstream habitat and wildlife.
<b>WCA-2B</b>	Stage increased by 0.13 ft	Ascension rate of less than 0.18 ft per week.	Protect within basin and downstream habitat and wildlife.
<b>WCA-3A NE</b>	Stage decreased by 0.09 ft	Ascension rate of less than 0.18 ft per week.	Protect within basin and downstream habitat and wildlife.
<b>WCA-3A NW</b>	Stage decreased by 0.02 ft	Ascension rate of less than 0.18 ft per week.	
<b>Central WCA-3A S</b>	Stage decreased by 0.09 ft	Ascension rate of less than 0.18 ft per week.	Protect within basin wildlife.
<b>Southern WCA-3A S</b>	Stage decreased by 0.04 ft		
<b>WCA-3B</b>	Stage decreased by 0.08 ft	Ascension rate of less than 0.18 ft per week.	Protect within basin and downstream habitat and wildlife.
<b>ENP-SRS</b>	Stage decreased by 0.21 ft	Make discharges to ENP according to COP and TTF protocol while adaptively considering upstream and downstream ecological conditions.	Protect within basin and upstream habitat and wildlife.
<b>Taylor Slough</b>	Stage changes ranged from – 0.03 ft to +0.46 ft	Move water southward as possible.	When available, provide freshwater to promote water movement.
<b>FB- Salinity</b>	Salinity changes ranged from – 2.0 to +3.9	Move water southward as possible.	When available, provide freshwater to promote water movement.

## Biscayne Bay

As shown in **Figure BB-1**, mean total inflow to Biscayne Bay was 1,045 cfs, and the previous 30-day mean inflow was 780 cfs. The seven-day mean salinity was 25.4 at BBCW8 and 29.4 at BBCW10, both within the ideal salinity range for estuarine organisms in this region (salinity less than 35). Data were 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.