

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 25, 2024

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

### **Summary**

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

Tropical Storm Helene is a large system with an expansive rain shield. By Wednesday, the storm is forecast to move through the Yucatan Channel and quickly intensify into a hurricane over the southern Gulf of Mexico, tracking northwest toward the northeast Gulf Coast. Heavy rain bands are forecast to move onshore all coastal areas on Wednesday, contributing to significant localized and potentially area-wide rainfall. The heaviest rainfall is forecast along the lower east coast, southwest coast, and Florida Keys, though there remains some uncertainty about how far inland the rain will extend into central and northern interior. By Thursday, the storm is forecast to rapidly intensify into a dangerous major hurricane, making landfall over the Florida Big Bend region late Thursday night. The National Hurricane Center has issued Tropical Storm and Storm Surge Watches for the southwestern coast of South Florida and the Florida Keys, with tropical storm conditions possible and gusts up to 50-55 mph in heavy rain bands. Strong onshore winds could lead to a storm surge of 2-4 feet along the southwest coast, with 1-3 feet possible in the Keys. Elsewhere, breezy conditions with winds of 20-25 mph, and gusts up to 40-45 mph, are forecast along parts of the east coast, particularly in heavier rain bands. These rain bands could also produce significant localized rainfall along all coastal regions on Thursday, and tropical storm conditions could reach as far inland as the far northern interior, depending on far east the hurricane moves. Most wind and coastal flooding impacts will subside quickly after landfall. However, the storm could leave behind a trail of tropical moisture that could fuel additional heavy showers and thunderstorms on Friday and Saturday, before diminishing by Sunday. Total SFWMD rainfall for the 7-day period ending next Tuesday morning could be over 185% of normal for this time of the year.

## **Kissimmee**

Releases in the last week from East Lake Toho and Lake Toho were needed to bring lake stage back to their respective regulation schedules. Weekly average discharge on September 22, 2024, was 2,100 cfs and 2,400 cfs at S-65 and S-65A, respectively. Mean weekly water depth on the Kissimmee River floodplain increased by 0.46 feet to 1.20 feet. The weekly average concentration of dissolved oxygen in the Kissimmee River decreased from 3.6 mg/L the previous week to 0.9 mg/L, which is below the stressful and potentially lethal levels for largemouth bass and other sensitive species. Daily average dissolved oxygen continued to decline over the week, reaching 0.3 mg/L on September 22, 2024, which is well below the potentially lethal level of 1.0 mg/L.

## **Lake Okeechobee**

Lake Okeechobee stage was 13.82 feet NAVD88 (15.13 ft NGVD29) on September 22, 2024, which was 0.20 feet higher than the previous week and 1.00 feet higher than a month ago. Average daily inflows (excluding rainfall) increased slightly from 7,080 cfs the previous week to 7,230 cfs. Average daily outflows (excluding evapotranspiration) were zero. In the most recent non-obscured satellite image from September 22, 2024, NOAA's Harmful Algal Bloom Monitoring System suggests patches of moderate cyanobacteria abundance along much of the western region of the Lake.

## **Estuaries**

Total inflow to the St. Lucie Estuary averaged 3,794 cfs over the past week with no flow coming from Lake Okeechobee. Mean salinities increased on the surface but decreased on the bottom at the A1A and US1 bridges and remained the same at HR1 over the past week. Salinity in the middle estuary was in the lower stressed range (5-10) for adult eastern oysters.

Total inflow to the Caloosahatchee Estuary averaged 7,019 cfs over the past week with no flow coming from Lake Okeechobee. Over the past week, salinities remained the same at S-79, Val I-75 and Fort Myers, 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, September 22, 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 69,200 ac-feet. The total amount of inflows to the STAs in WY2025 is approximately 755,000 ac-feet. STA cells are 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. This week, there is no capacity for Lake releases in the STAs.

## Everglades

Rates of stage change over the week were mostly categorized as fair or good with exceptions in WCA-1 and WCA-2A which had a 2-week sum above the 0.50-foot mark indicating poor conditions for apple snail reproduction. Conditions in WCA-3A North experienced a continuation of wet conditions this past week bringing stage to 11.32 feet on October 1st, which is 0.18 feet below the preferred 11.5 foot-mark beneficial for wading bird nesting. Average stage in Taylor Slough increased last week and remains above average for this time of year. Average salinity increased slightly in Florida Bay last week; salinities in the eastern region of Florida Bay are now in the 25th percentile of the Inter-Quartile Range (IQR), the central region is near the 50th percentile, and the western region is at the 75th percentile for this time of year. Florida Bay MFL metrics remain well outside thresholds of harm.

## Biscayne Bay

Total inflow to Biscayne Bay averaged 1,376 cfs, and the previous 30-day mean inflow averaged 1,335 cfs. The seven-day mean salinity was 24.3 at BBCW8 and 22.9 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 September 22, 2024, mean daily lake stages were 56.1 feet NAVD88 (0.2 feet above schedule) in East Lake Toho, 52.8 feet NAVD88 (0.1 feet above schedule) in Lake Toho, and 50.5 feet NAVD88 (0.2 feet below the Increment 1 temporary deviation schedule) in Lakes Kissimmee-Cypress-Hatchineha (KCH) (**Table KB-1, Figures KB-1-3**).

#### *Lower Kissimmee*

For the week ending September 22, 2024, mean weekly discharge was 2,100 cfs and 2,400 cfs at S-65 and S-65A, respectively. Mean weekly discharge from the Kissimmee River was 1,800 cfs at both S-65D and S-65E (**Table KB-2**). Mean weekly headwater stages were 45.2 feet NAVD88 at S-65A and 25.9 feet NAVD88 at S-65D. Mean weekly river channel stage increased by 1.4 feet to 36.2 feet NAVD88 (**Figure KB-4**). Mean weekly water depth on the Kissimmee River floodplain increased by 0.46 feet to 1.20 feet (**Table KB-2, Figure KB-5**). The weekly average concentration of dissolved oxygen in the Kissimmee River decreased from 3.6 mg/L the previous week to 0.9 mg/L (**Table KB-2, Figure KB-6**).

#### **Water Management Recommendations**

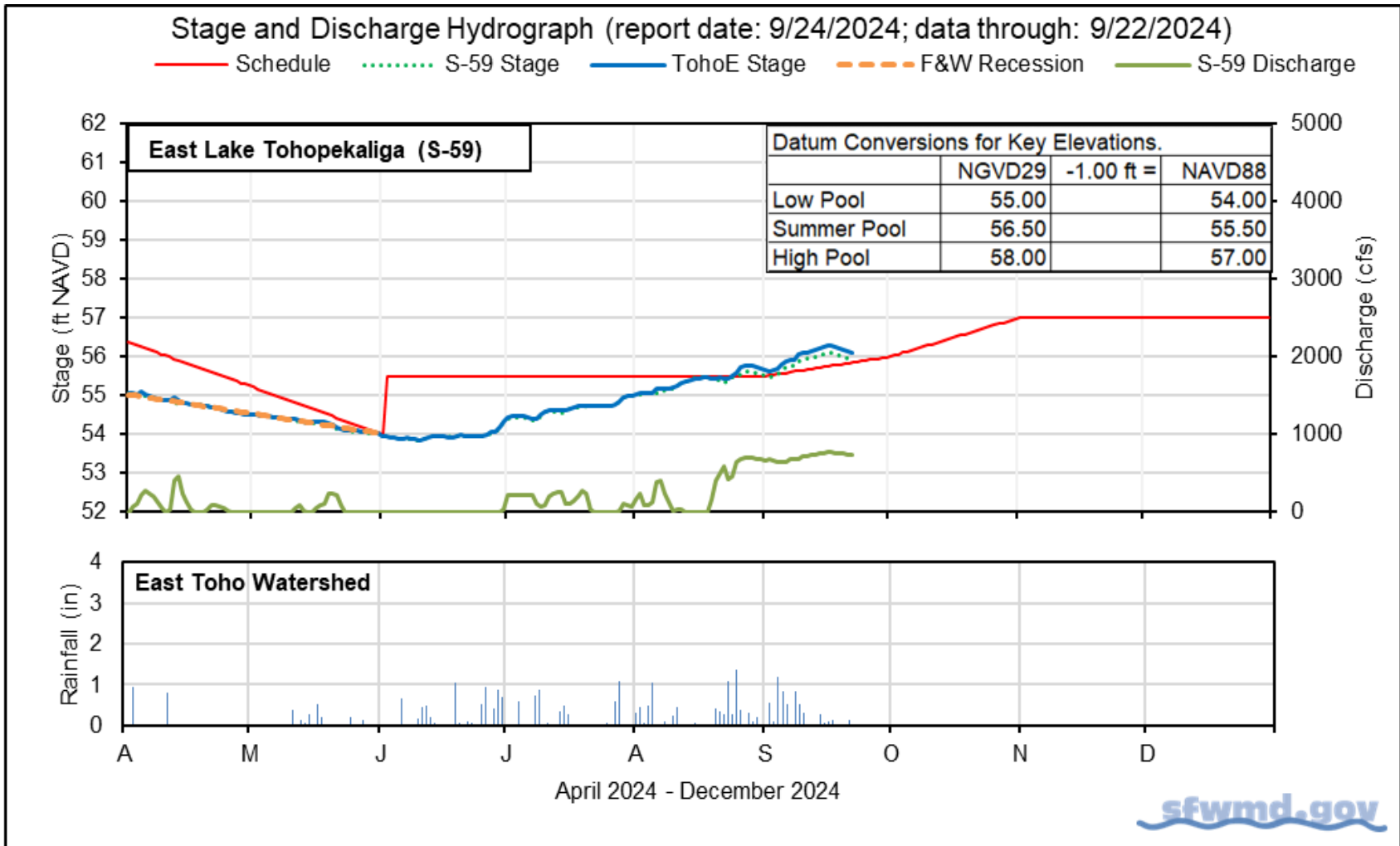
Follow the Headwaters Revitalization Schedule (HRS) Increment 1 Temporary Deviation Discharge Plan for S-65/S-65A (**Figure KB-7**). Maintain at least minimum flow (250-300 cfs) at S-65A.

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

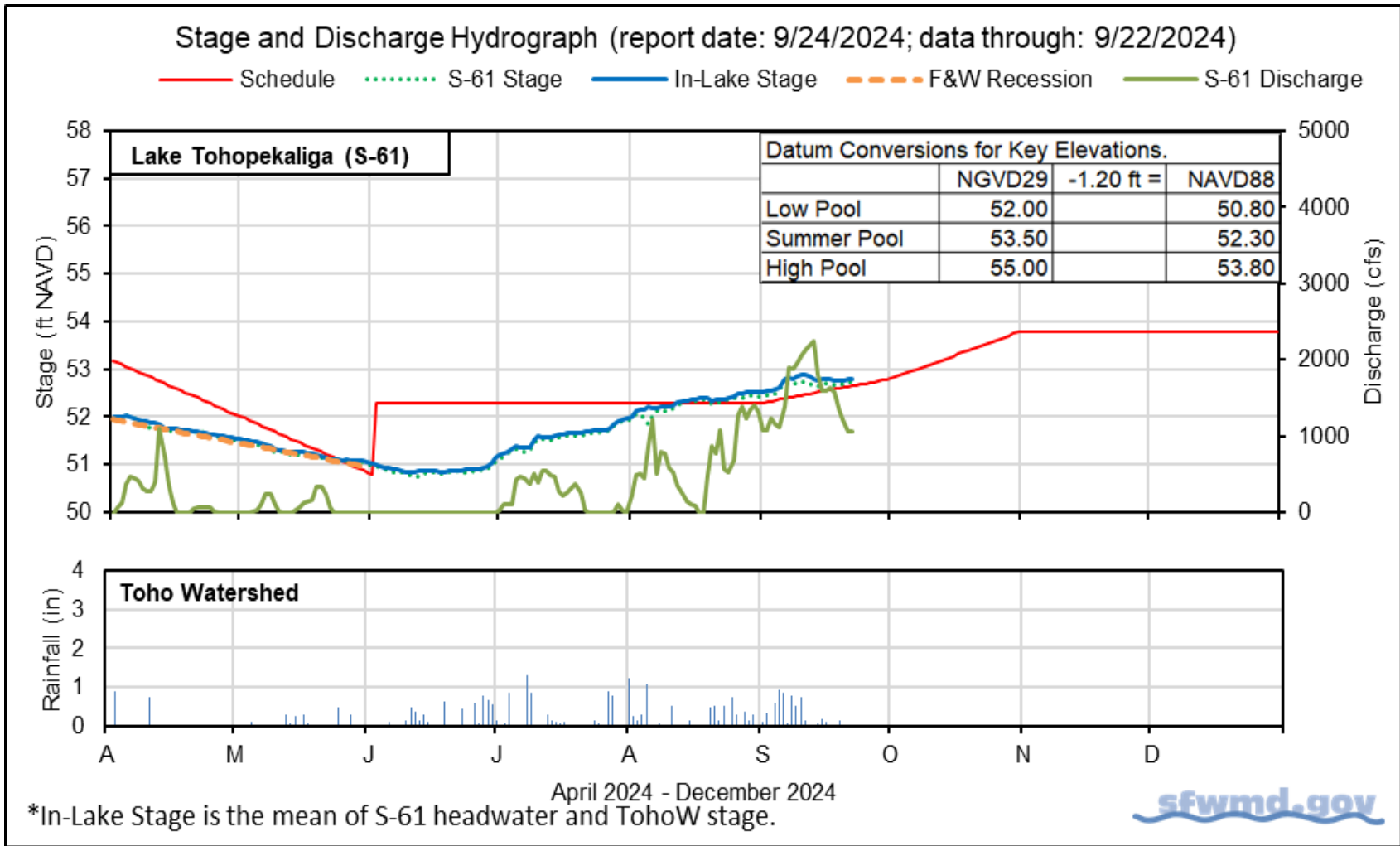
Water Body	Structure	Stage Monitoring Site	Weekly (7-Day) Average Discharge (cfs)	Sunday Lake Stage (feet NAVD88) <sup>a</sup>	Schedule Type <sup>b</sup>	Sunday Schedule Stage (feet NAVD88)	Sunday Departure from Regulation (feet)	
							9/22/24	9/15/24
Lakes Hart and Mary Jane	S-62	LKMJ	320	59.2	R	58.9	0.3	0.5
Lakes Myrtle, Preston, and Joel	S-57	S-57	62	60.1	R	60.0	0.1	0.2
Alligator Chain	S-60	ALLI	190	62.1	R	62.2	-0.1	-0.1
Lake Gentry	S-63	LKGT	240	59.9	R	59.9	0.0	0.0
East Lake Toho	S-59	TOHOE	750	56.1	R	55.9	0.2	0.5
Lake Toho	S-61	TOHOW S-61	1300	52.8	R	52.7	0.1	0.3
Lakes Kissimmee, Cypress and Hatchineha	S-65	KUB011 LKIS5B	2100	50.5	T	50.7	-0.2	-0.2

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

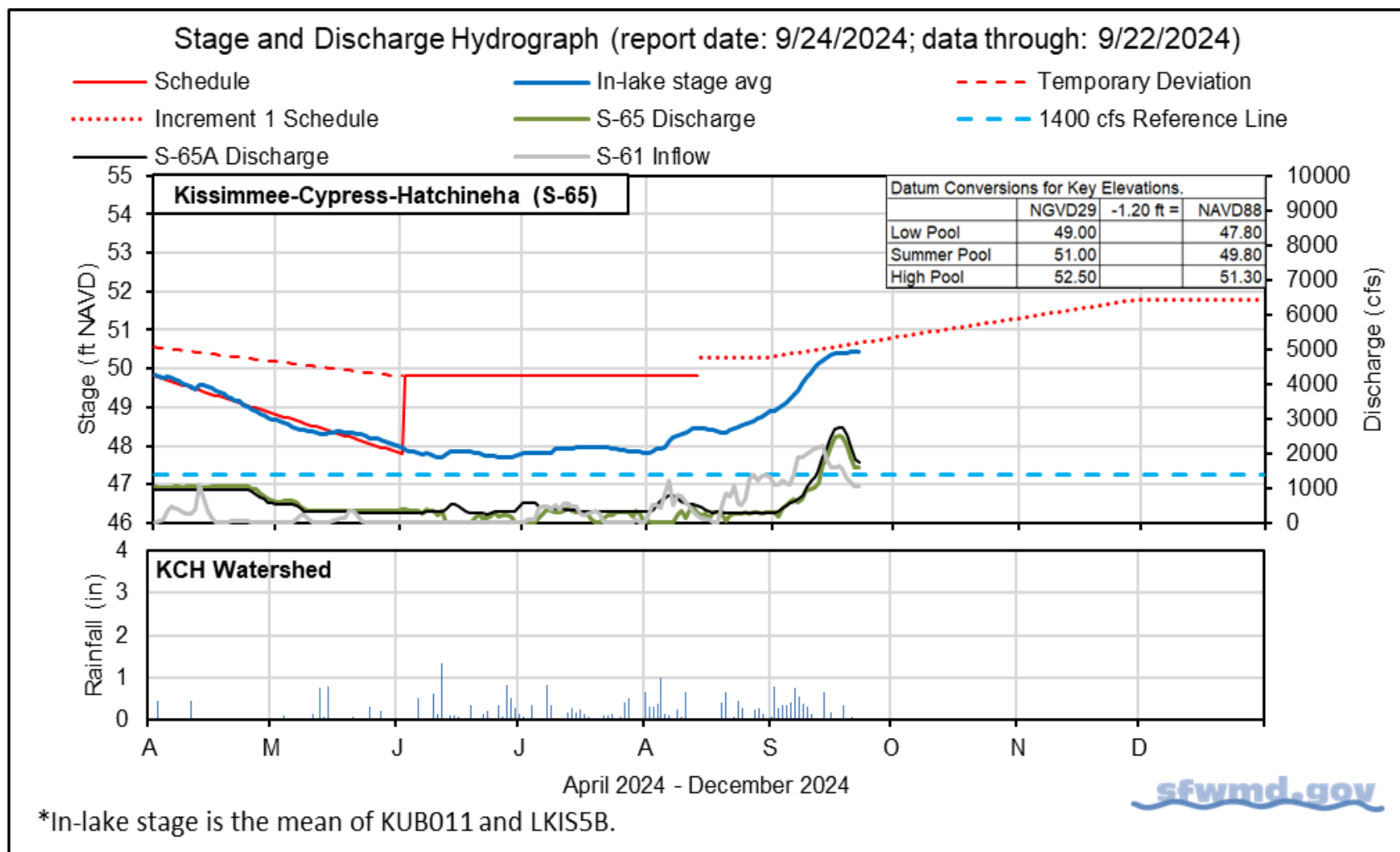
b. A: projected recession line; R: USACE regulation schedule; S: temporary recession target line; T: temporary schedule; NA: not applicable or not available.



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



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



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

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

Metric	Location	Sunday Daily Average	Weekly Average for Previous Seven Day Periods			
		9/22/24	9/22/24	9/15/24	9/8/24	9/1/24
Discharge	S-65	1,600	2,100	1,400	530	300
Discharge	S-65A <sup>a</sup>	1,700	2,400	1,600	570	310
Headwater Stage (feet NAVD88)	S-65A	45.1	45.2	44.8	44.7	45.2
Discharge	S-65D <sup>b</sup>	2,000	1,800	1,300	830	490
Headwater Stage (feet NAVD88)	S-65D <sup>c</sup>	25.9	25.9	25.0	24.6	24.6
Discharge (cfs)	S-65E <sup>d</sup>	1,900	1,800	1,500	880	550
Discharge (cfs)	S-67	0	0	0	0	0
Dissolved Oxygen (mg/L) <sup>e</sup>	Phase I, II/III river channel	0.3	0.9	3.6	4.9	5.5
River channel mean stage <sup>f</sup>	Phase I river channel	36.5	36.2	34.8	32.5	31.6
Mean depth (feet) <sup>g</sup>	Phase I floodplain	1.32	1.20	0.74	0.41	0.21

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.

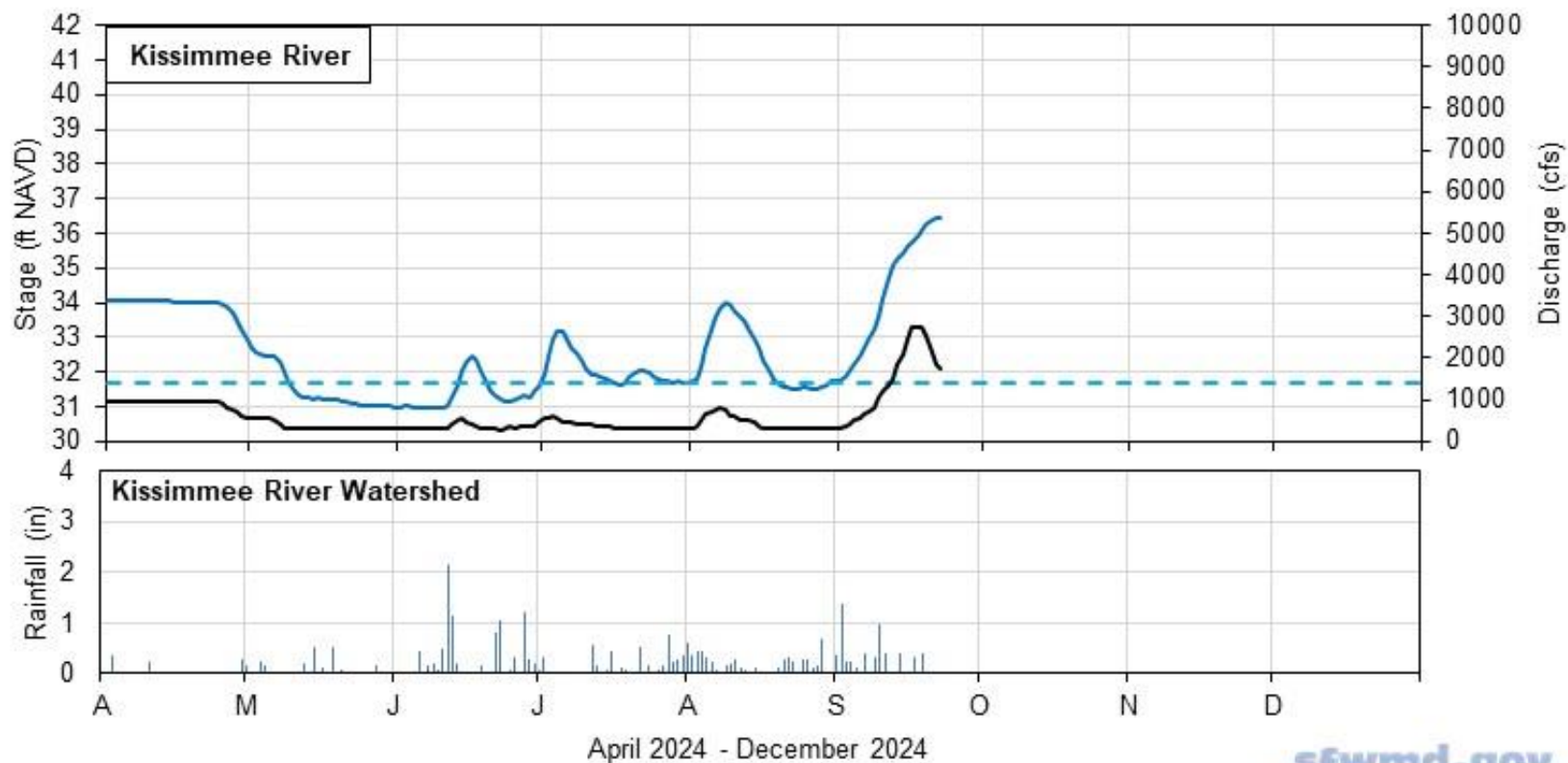
f. Mean of five river channel stations (PC62, KRDR02, KRBN, PC33, PC11) in the Phase I area.

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



Stage and Discharge Hydrograph (report date: 9/24/2024; data through: 9/22/2024)

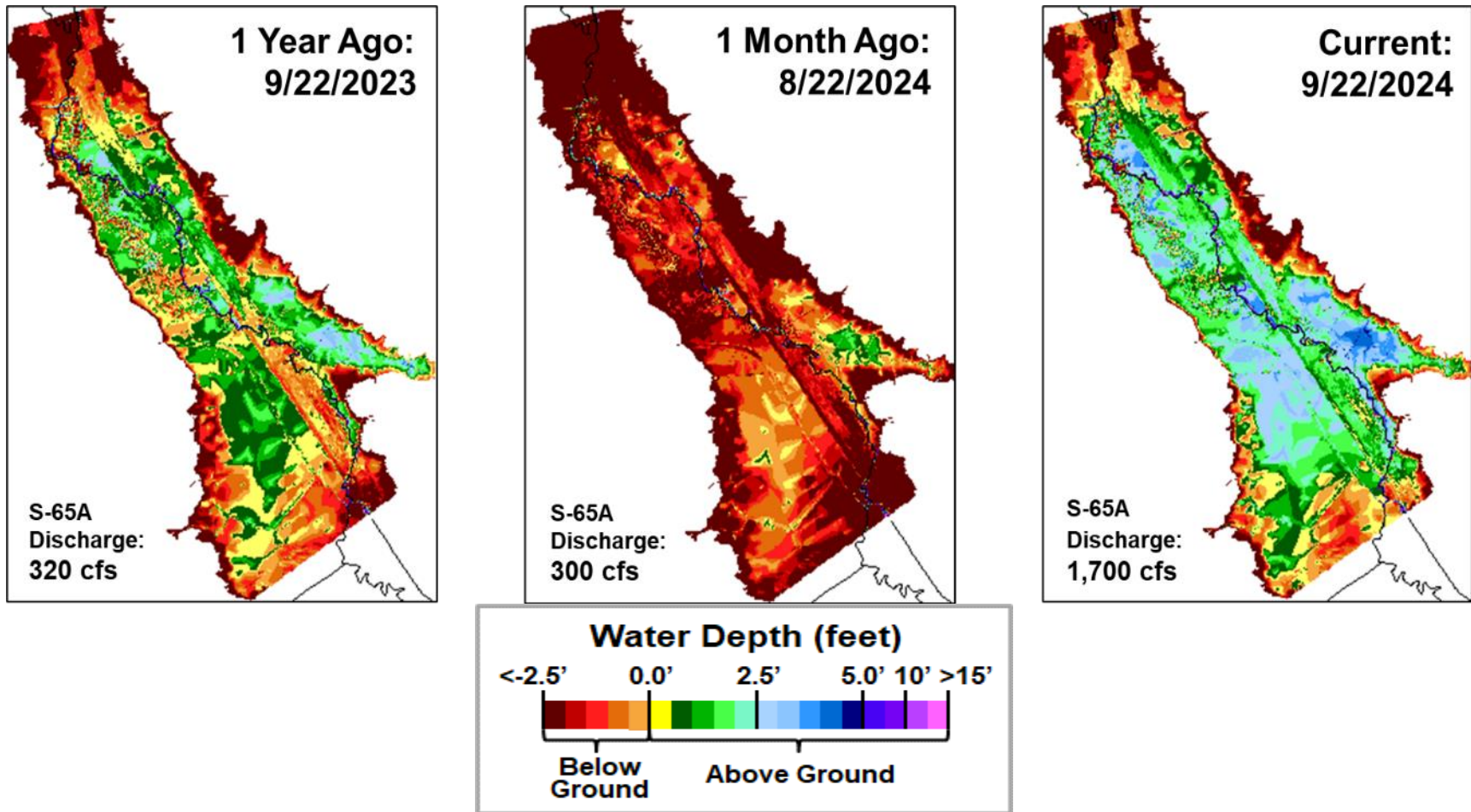
— Kissimmee River Channel Mean Stage    - - - 1400 cfs Reference Line    — S-65A Discharge



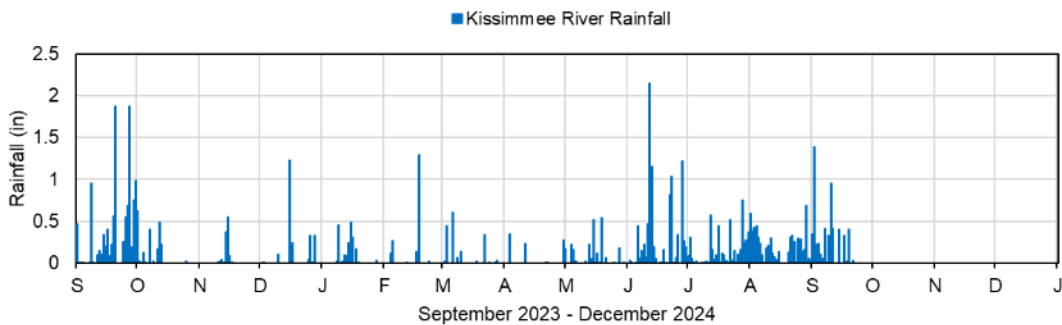
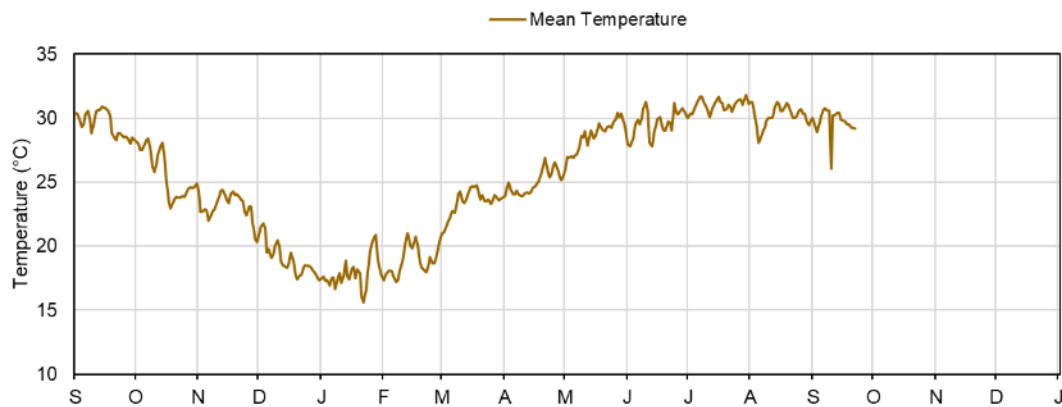
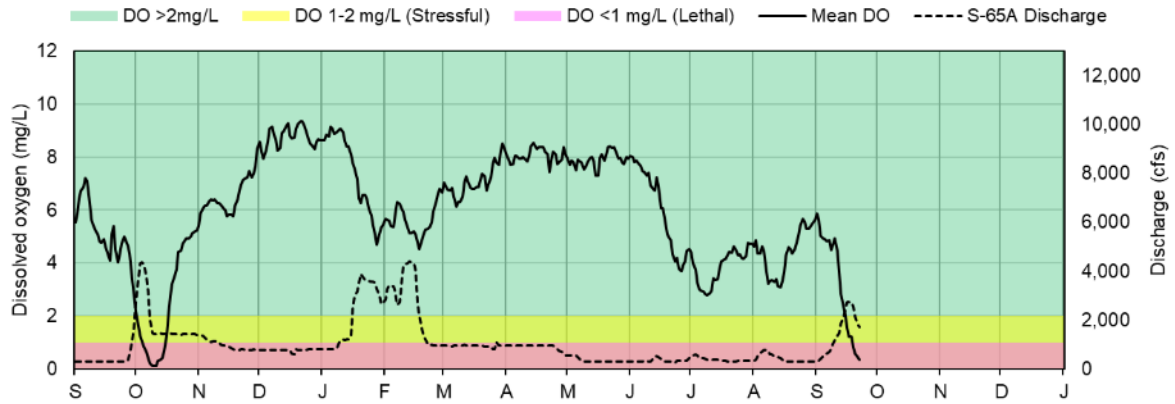
\*River Channel Stage is the average for PC62, KRDR02, KRBN, PC33, and PC11.



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.



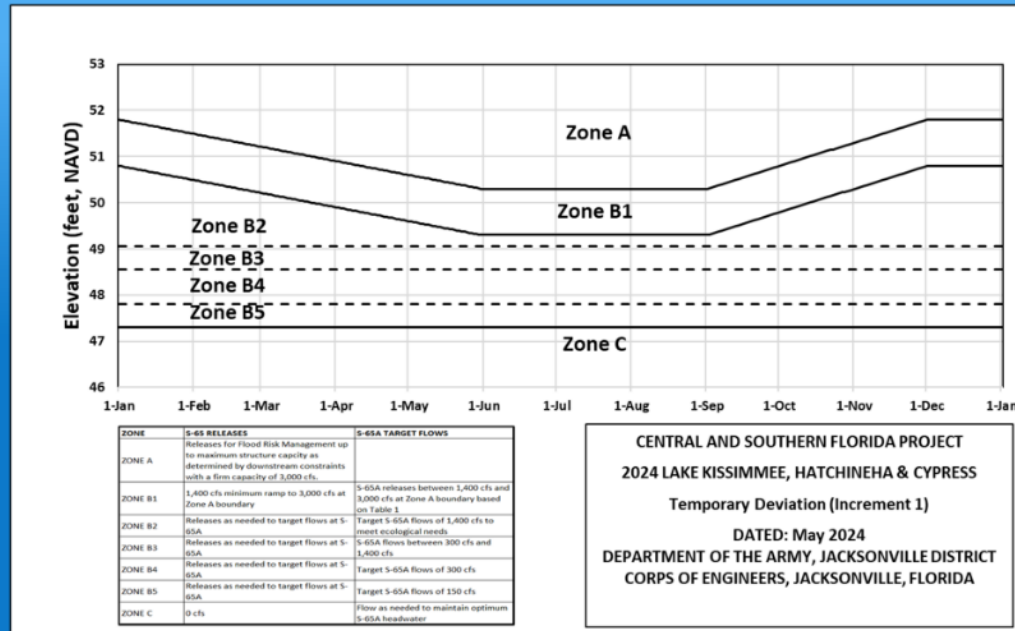
Report Date: 9/24/2024; data are through: 9/22/2024



**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 five stations reporting this week. Rainfall values are daily totals for Kissimmee River (Pool BCD) AHED watershed.

# HRS Increment 1 Temporary Deviation Discharge Plan for S-65/S-65A

Discharge Guidance for Increment 1 Temporary Deviation Discharge Plan		
ZONE	S-65 RELEASES	S-65A TARGET FLOWS
ZONE A	Releases for Flood Risk Management up to maximum structure capacity as determined by downstream constraints with a firm capacity of 3,000 cfs.	
ZONE B1	1,400 cfs minimum ramp to 3,000 cfs at Zone A boundary	S-65A releases between 1,400 cfs and 3,000 cfs at Zone A boundary based on Table 1
ZONE B2	Releases as needed to target flows at S-65A	Target S-65A flows of 1,400 cfs to meet ecological needs
ZONE B3	Releases as needed to target flows at S-65A	S-65A flows between 300 cfs and 1,400 cfs
ZONE B4	Releases as needed to target flows at S-65A	Target S-65A flows of 300 cfs
ZONE B5	Releases as needed to target flows at S-65A	Target S-65A flows of 150 cfs
ZONE C	0 cfs	Flow as needed to maintain optimum S-65A headwater



**Table KB-3. Maximum Rate of Change Limits for S-65A**

MAXIMUM Release Rate of Change Limits for S-65A. In general recommended rates of change will be slower than shown in this table.

Q (cfs)	Maximum rate of INCREASE (cfs/day)	Maximum rate of DECREASE (cfs/day)
0-300	50	-50
301-650	75	-75
651-1400	150	-150
1401-3000	300	-600
>3000	1000	-2000

**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.

**Figure KB-7.** Headwaters Revitalization Schedule (HRS) Increment 1 Temporary Deviation Discharge Plan for S-65/S-65A.

## Lake Okeechobee

Lake Okeechobee stage was 13.82 feet NAVD88 (15.13 ft NGVD29) on September 22, 2024, which was 0.20 feet higher than the previous week and 1.00 feet higher than a month ago (**Figure LO-1**). Lake stage is in Zone D of the regulation schedule (**Figure LO-2**) and was 0.51 feet above the upper limit of the recovery ecological envelope (**Figure LO-3**). According to NEXRAD, 0.91 inches of rain fell directly over the Lake last week.

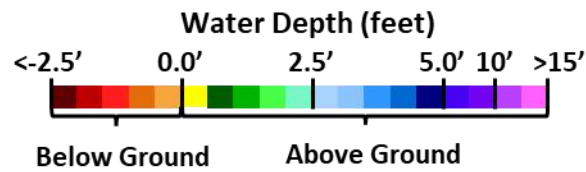
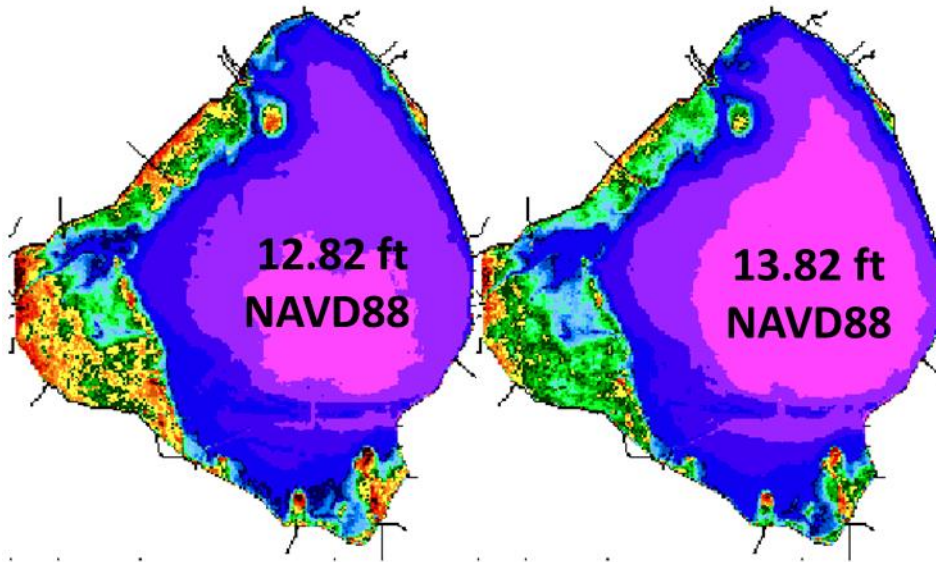
Average daily inflows (excluding rainfall) increased slightly from 7,080 cfs the previous week, to 7,230 cfs. The largest single inflow came from Fisheating Creek (2,470 cfs), followed by the Kissimmee River (1,830 cfs) via the S65E structure. For the second week in a row, average daily outflows (excluding evapotranspiration) were zero, as no water was released from the Lake. **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 September 22, 2024, NOAA's Harmful Algal Bloom Monitoring System suggests patches of moderate cyanobacteria abundance across much of the western region of the Lake, especially in the southwestern nearshore region (**Figure LO-6**).

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

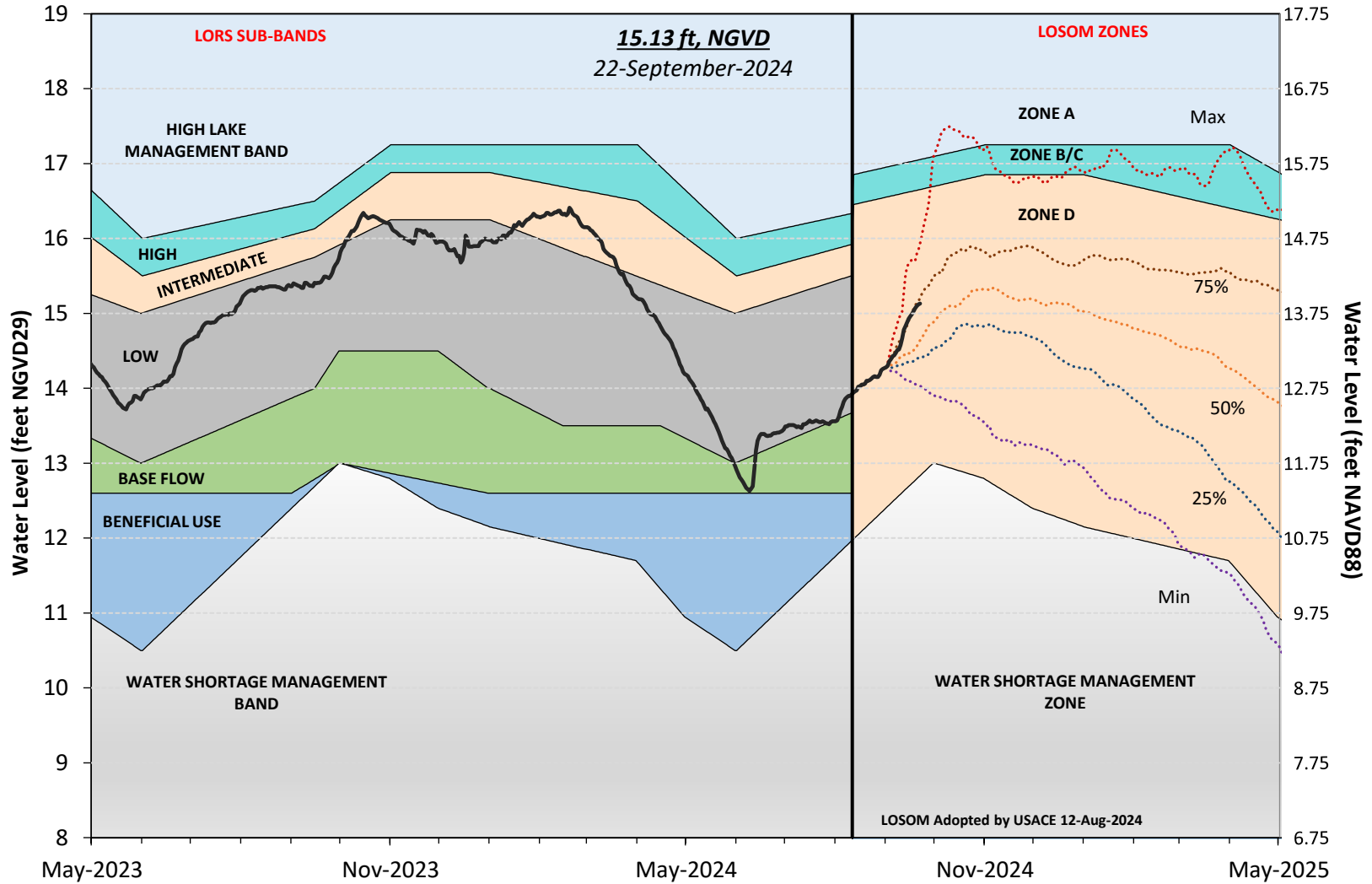
1 Month Ago:  
08/22/2024

Current:  
09/22/2024



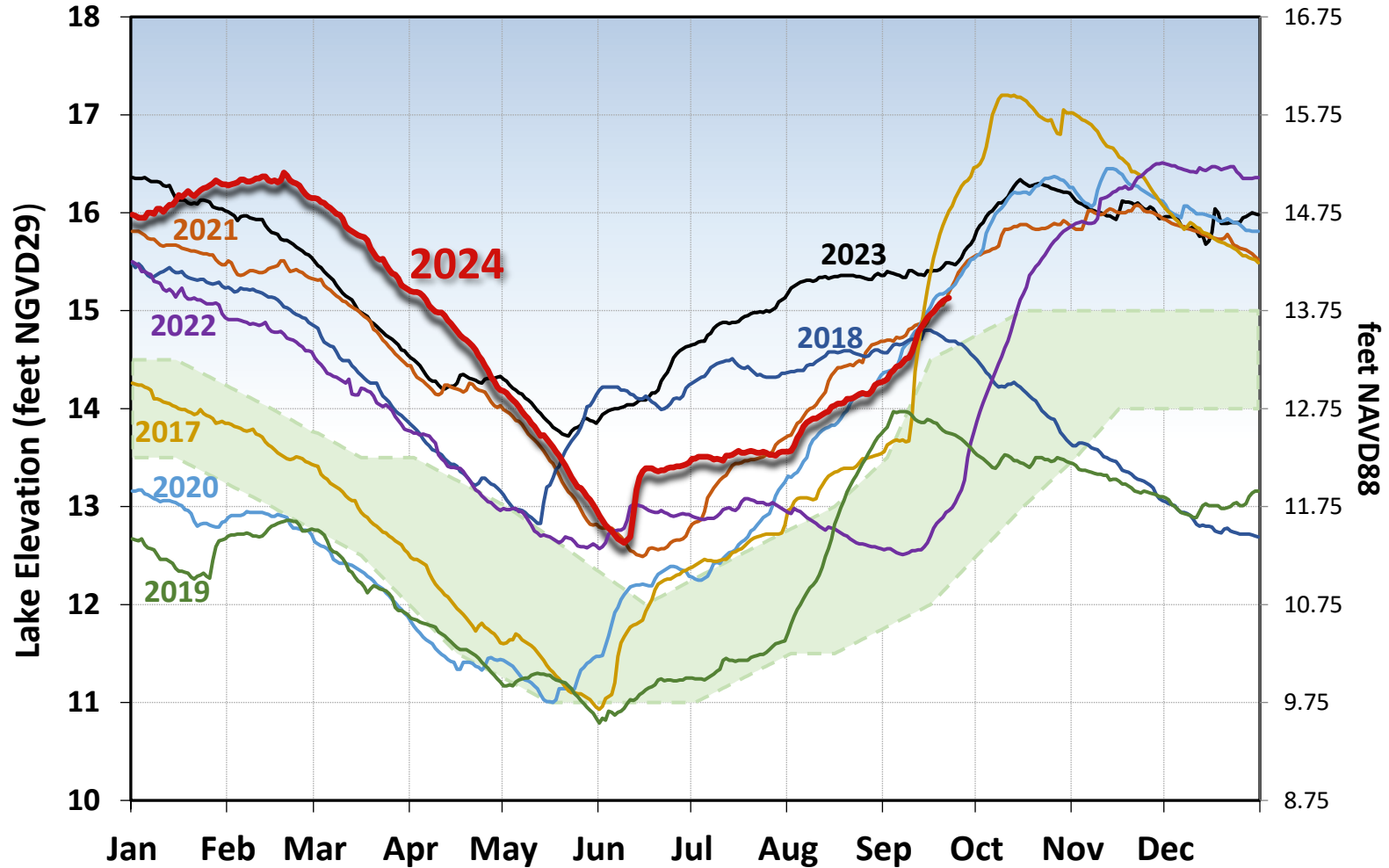
**Figure LO-1.** Lake Okeechobee water depth estimates based on South Florida Water Depth Assessment Tool (SFWDAT).

## Lake Okeechobee Water Level History and Projected Stages



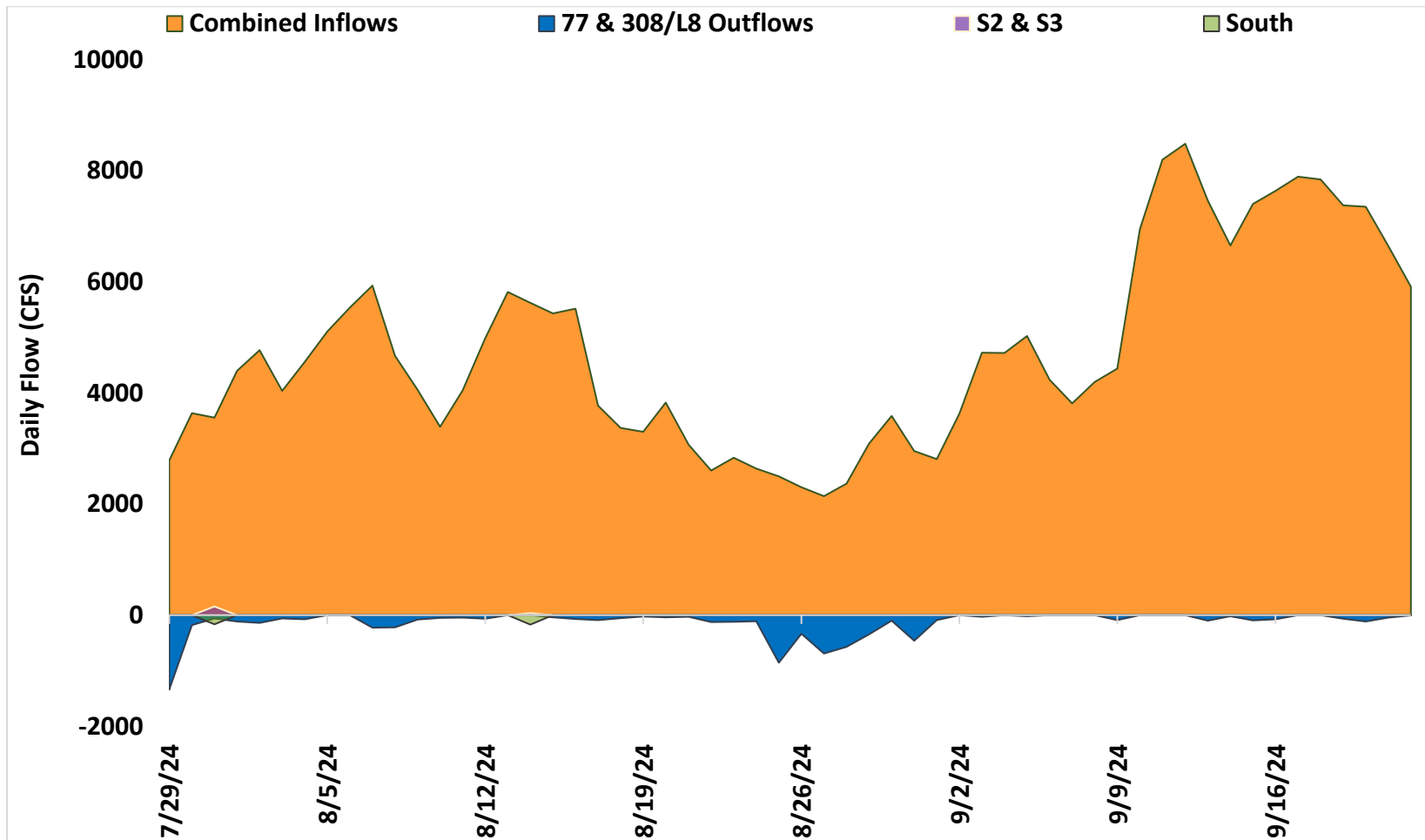
**Figure LO-2.** Recent Lake Okeechobee stages with projected stages based on a dynamic position analysis. Note: stages are in NGVD29, approximate NAVD88 values are shown for reference.

# Lake Okeechobee Stage vs Recovery Ecological Envelope

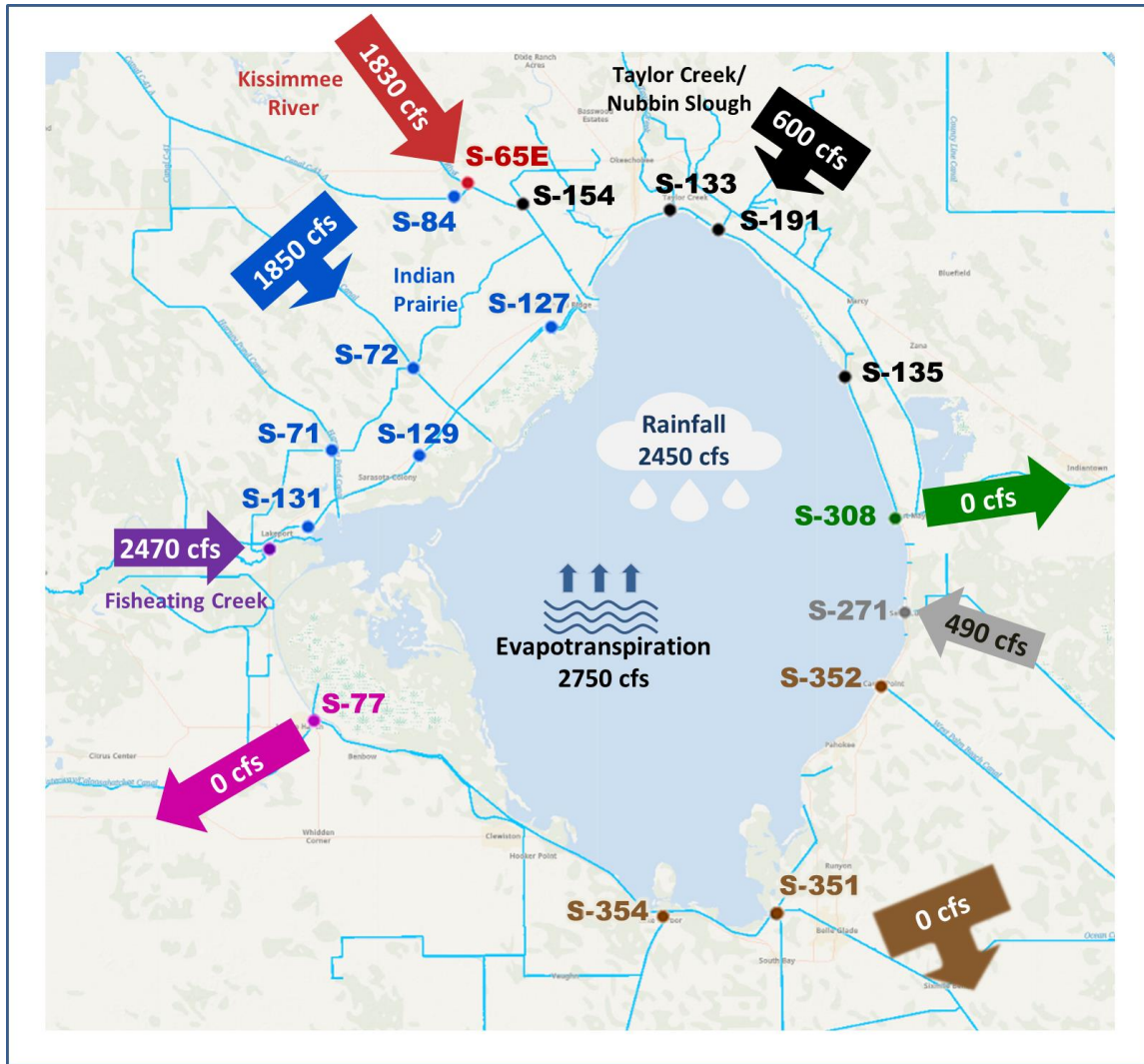


**Figure LO-3.** The current and seven prior year's annual stage hydrographs for Lake Okeechobee in comparison to the recovery envelope (light green). A shift from the normal ecological envelope to the recovery envelope occurred because the 30-day minimum lake stage (elevations exposed for at least 30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

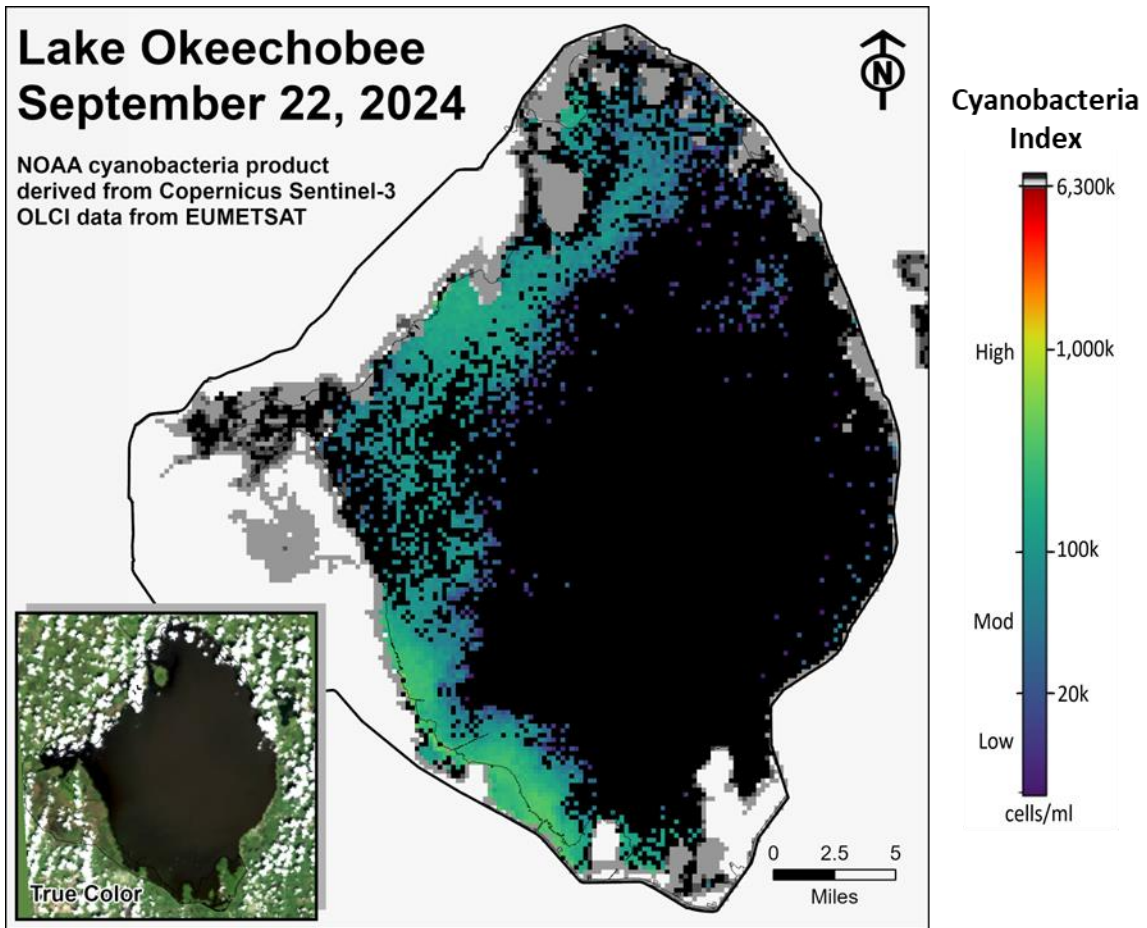




**Figure LO-4.** Major inflows (orange) to and outflows east and west (blue) from Lake Okeechobee. Outflows south are shown in green. Flows into Lake Okeechobee from the L-8 canal through S-271 (formerly Culvert 10A) or from the C-44 canal through the S-308 are included as inflows. Conversely, flows 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 September 16 - 22, 2024.



**Figure LO-6.** Cyanobacteria bloom index level on Lake Okeechobee, 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 3,794 cfs (**Figures ES-1 and ES-2**), and the previous 30-day mean inflow was 3,089 cfs. For comparison, the historical provisional mean inflows from the contributing areas are shown in **Figure ES-2**.

Over the past week, salinities increased at the surface and decreased at the bottom at both the A1A Bridge and US1 Bridge sites. Salinity remained the same at HR1. (**Table ES-1 and Figure ES-3**). The seven-day moving average of the surface and bottom salinities at the US1 Bridge was 5.7. 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 0.8 spat/shell for August, which is similar to the previous month (**Figure ES-5**).

### *Caloosahatchee River Estuary*

Over the past week, mean total inflow to the Caloosahatchee River Estuary was 7,019 cfs (**Figures ES-6 and ES-7**), and the previous 30-day mean inflow was 5,655 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, Val I-75, Ft. Myers 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 7.1 spat/shell at Iona Cove and 65.9 spat/shell at Bird Island for August, which is an increase at both sites 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 0 to 2,000 cfs with estimated tidal basin inflows of 1,672 cfs. Model results from all scenarios predict daily salinity to be 0.3 or lower and the 30-day moving average surface salinity to be 0.3 or lower at Val I-75 at the end of the two-week period (**Table ES-3 and Figure ES-13**). This keeps predicted salinities in the upper estuary within the optimal salinity range (0-10) for tape grass.

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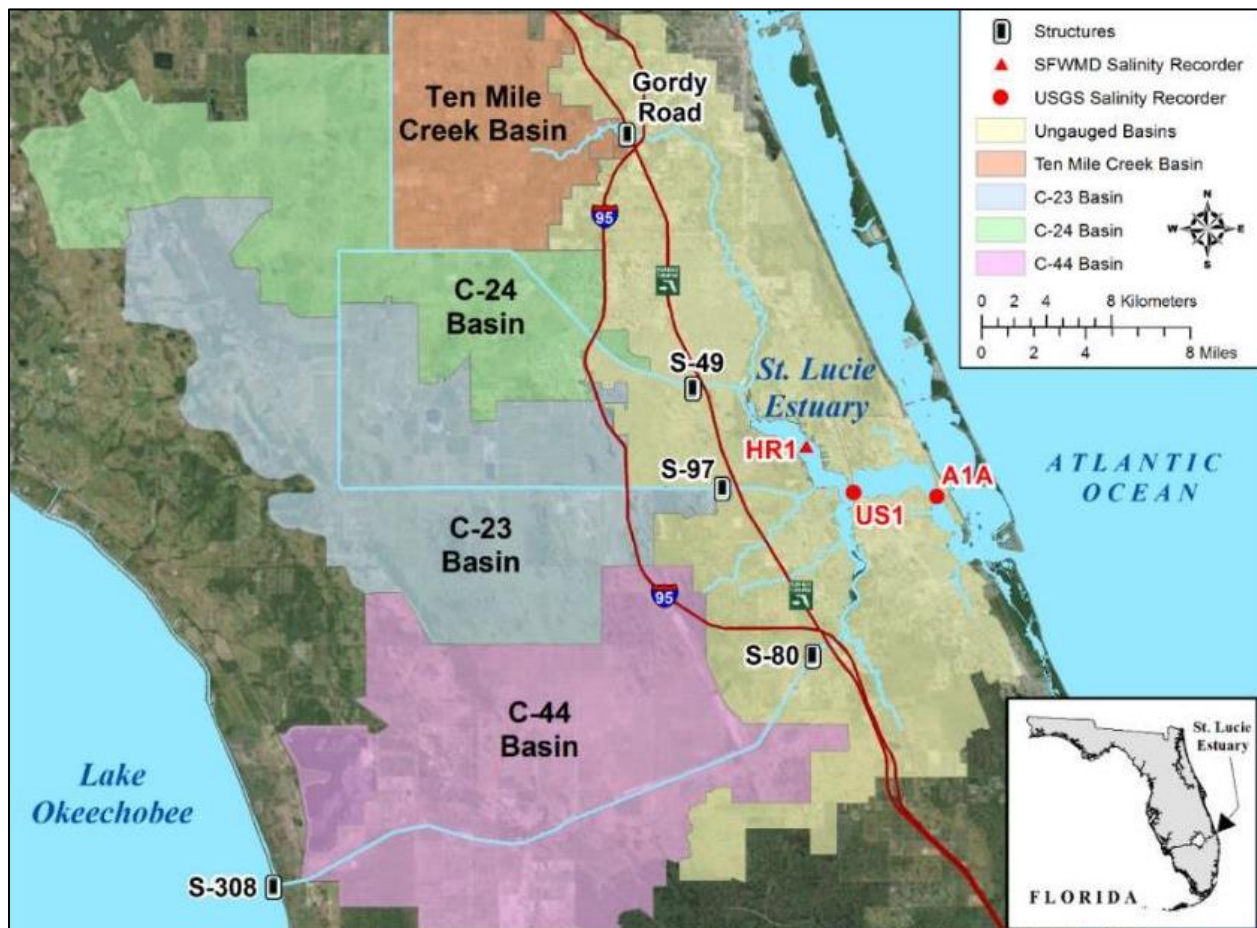
<sup>1</sup> Qiu, C., and Y. Wan. 2013. Time series modeling and prediction of salinity in the Caloosahatchee River Estuary. *Water Resources Research* 49:5804-5816.

## Red Tide

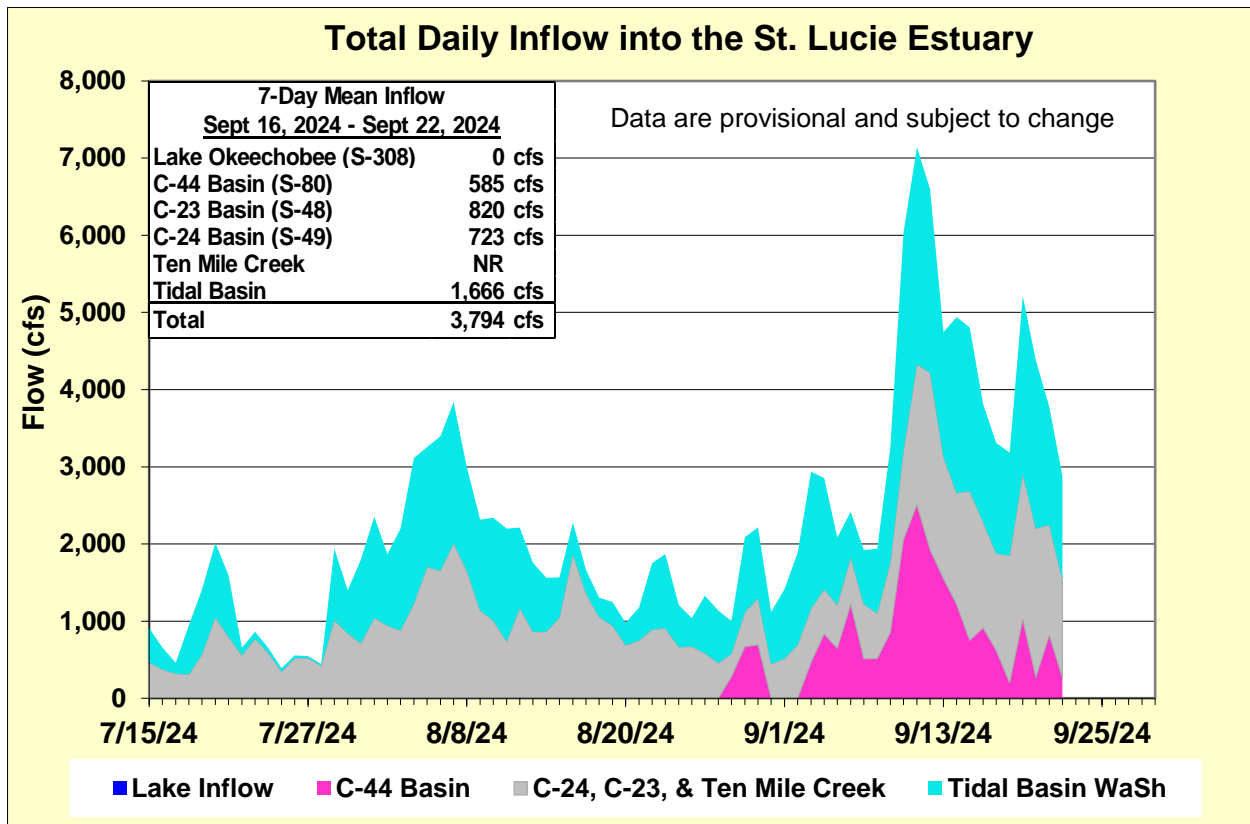
The FWRI reported on September 20, 2024, that *Karenia brevis*, the Florida red tide dinoflagellate, was not observed in any samples collected within the District region.

## 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.



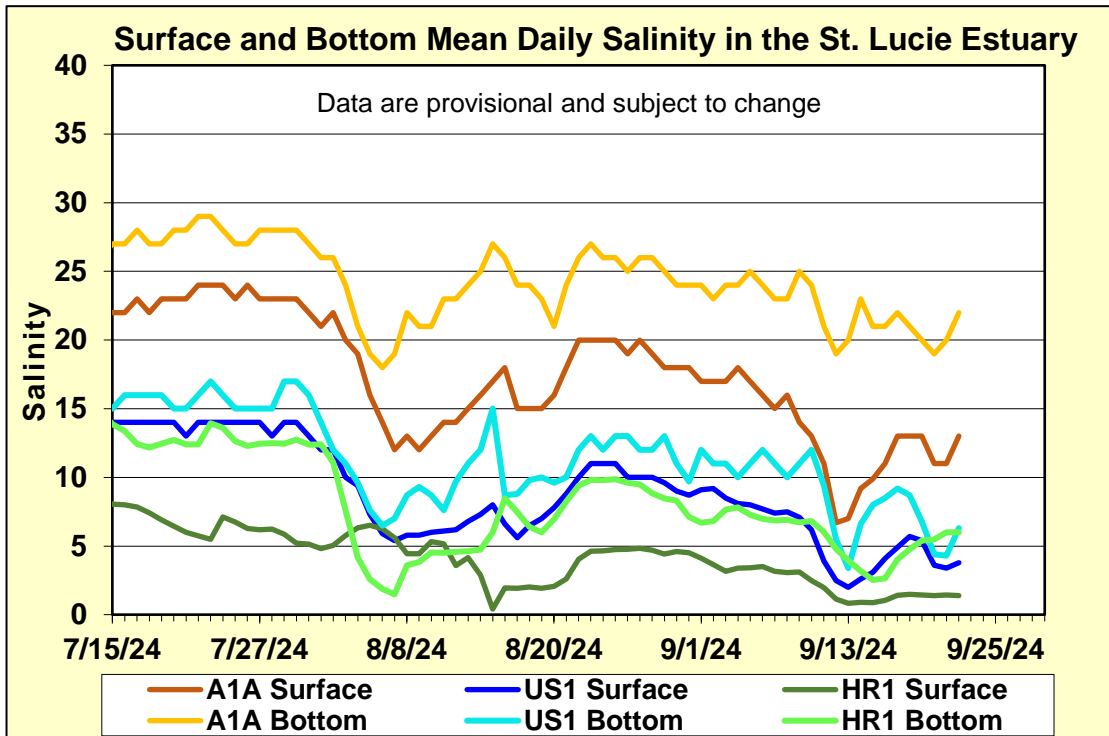
**Figure ES-1.** Basins, water control structures and salinity monitoring sites in the St. Lucie Estuary.



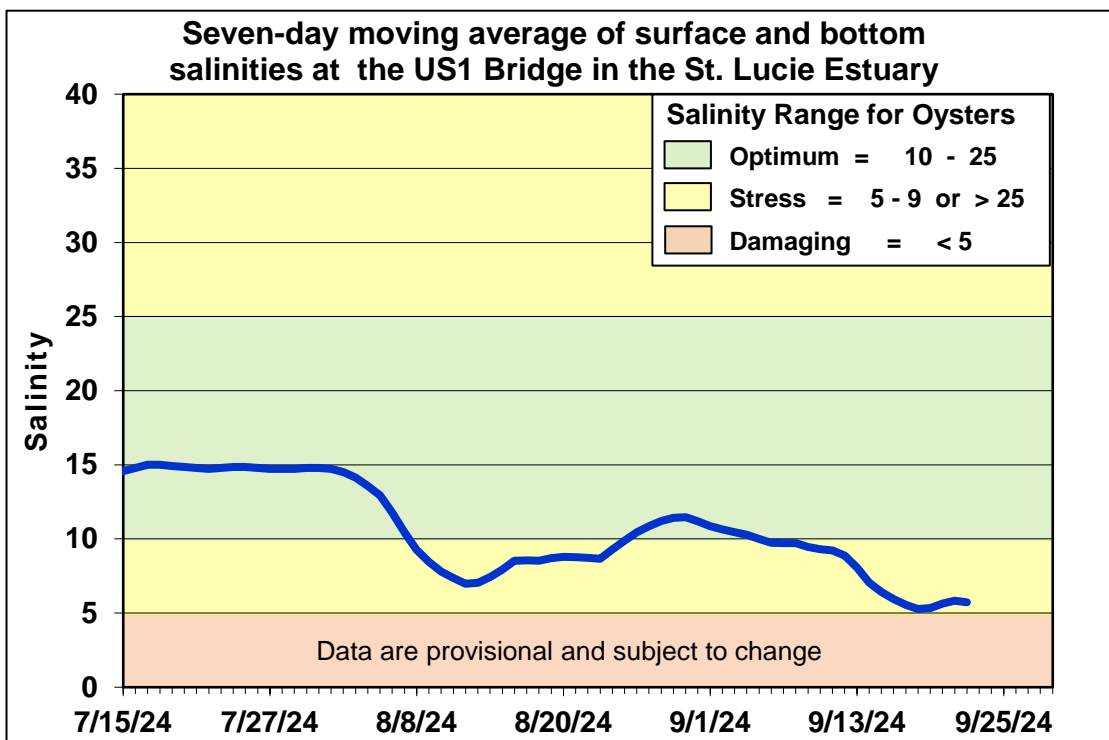
**Figure ES-2.** Total daily inflows from Lake Okeechobee and runoff from the C-44, C-23, C-24, Ten Mile Creek, and Tidal Basins into the St. Lucie Estuary.

**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.

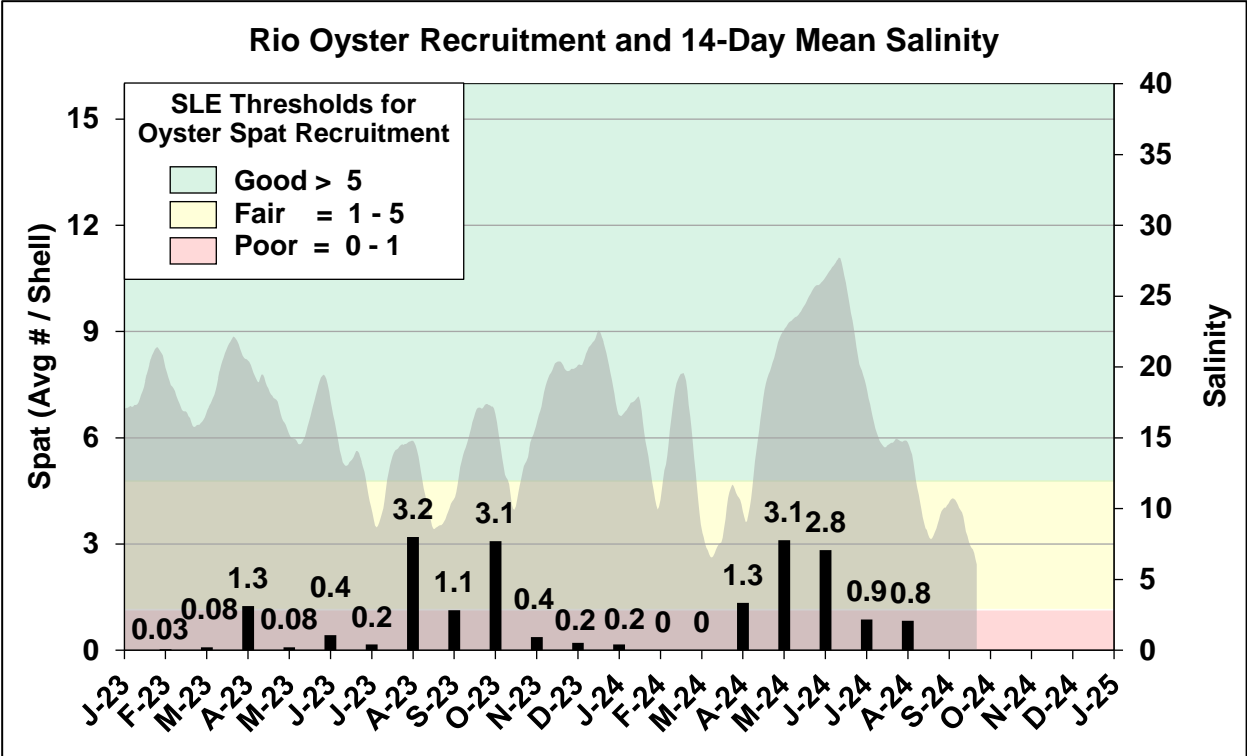
Sampling Site	Surface	Bottom	Optimum Envelope
HR1 (North Fork)	<b>1.4</b> (1.6)	<b>4.9</b> (4.9)	10.0 – 25.0
US1 Bridge	<b>4.4</b> (3.9)	<b>6.9</b> (8.0)	10.0 – 25.0
A1A Bridge	<b>12.1</b> (10.1)	<b>20.7</b> (21.9)	10.0 – 25.0



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

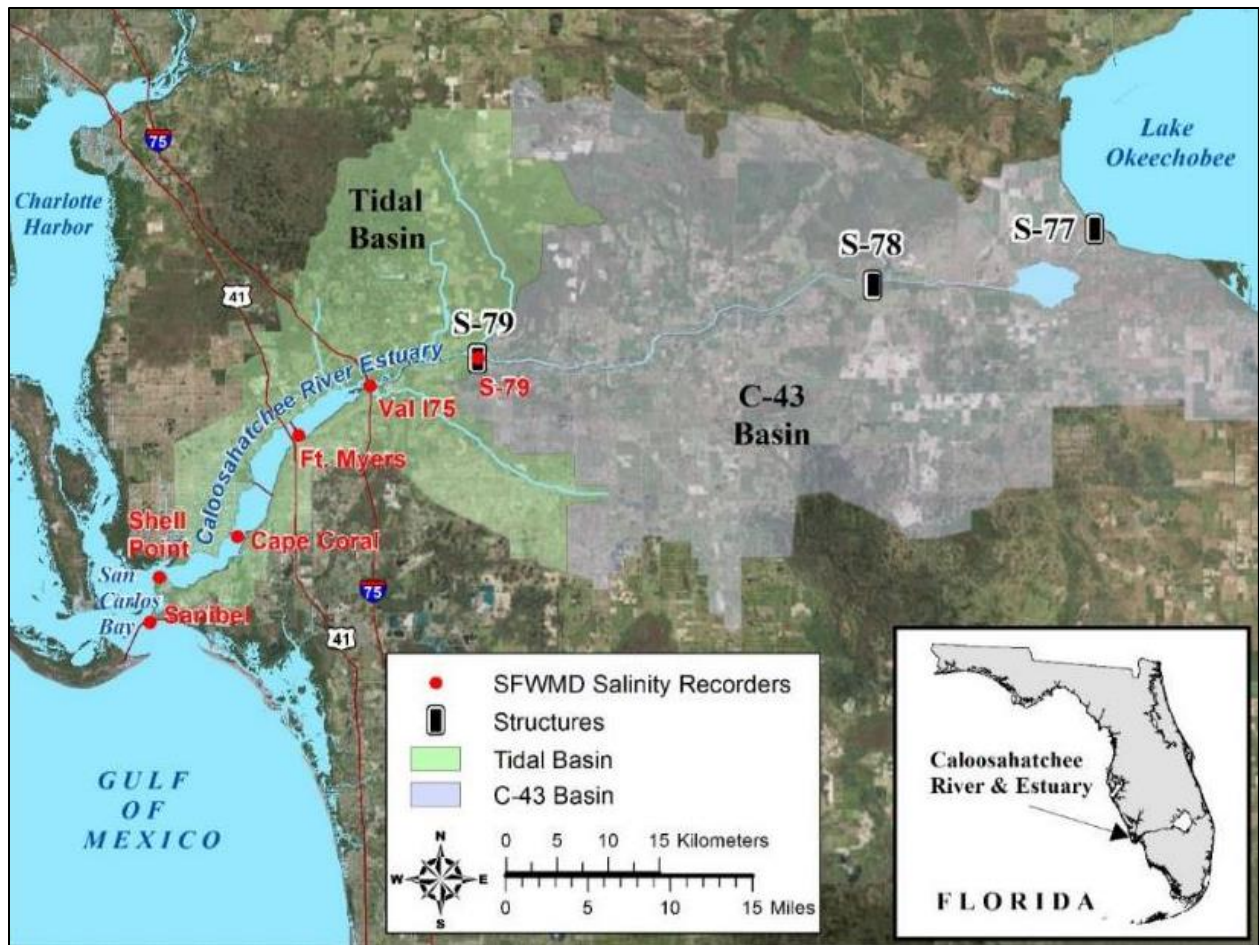


**Figure ES-4.** Seven-day moving average of the surface and bottom salinities at the US1 Bridge in the St. Lucie Estuary.

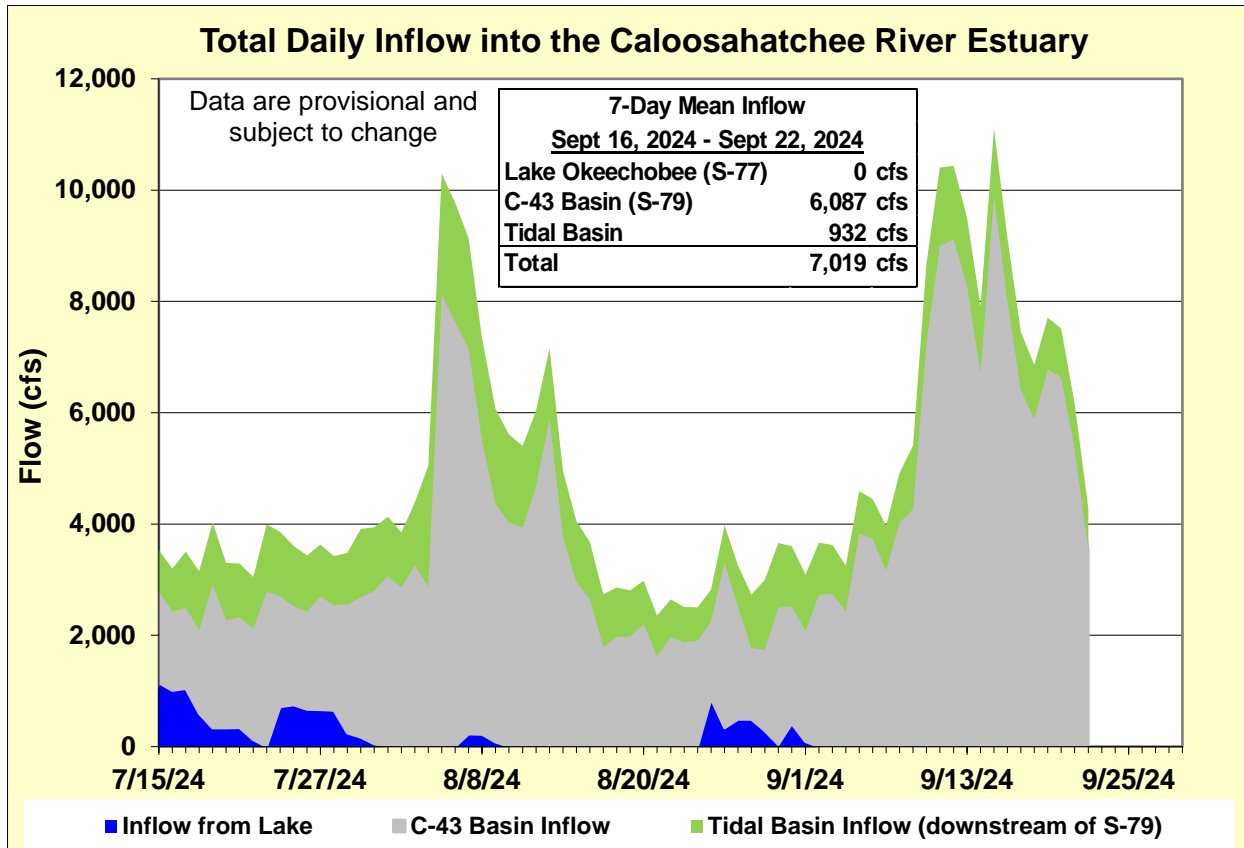


**Figure ES-5.** Mean oyster recruitment at the Rio oyster monitoring station and 14-day mean salinity at US1 Bridge.





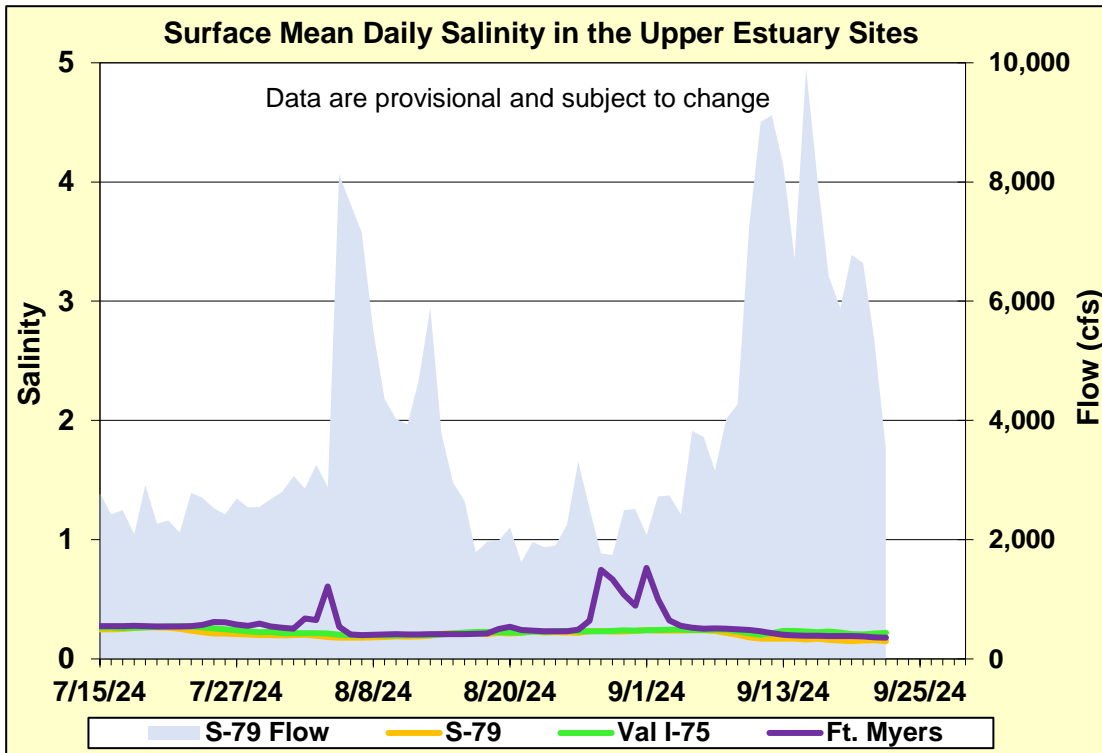
**Figure ES-6.** Basins, water control structures, and salinity monitoring sites in the Caloosahatchee River Estuary.



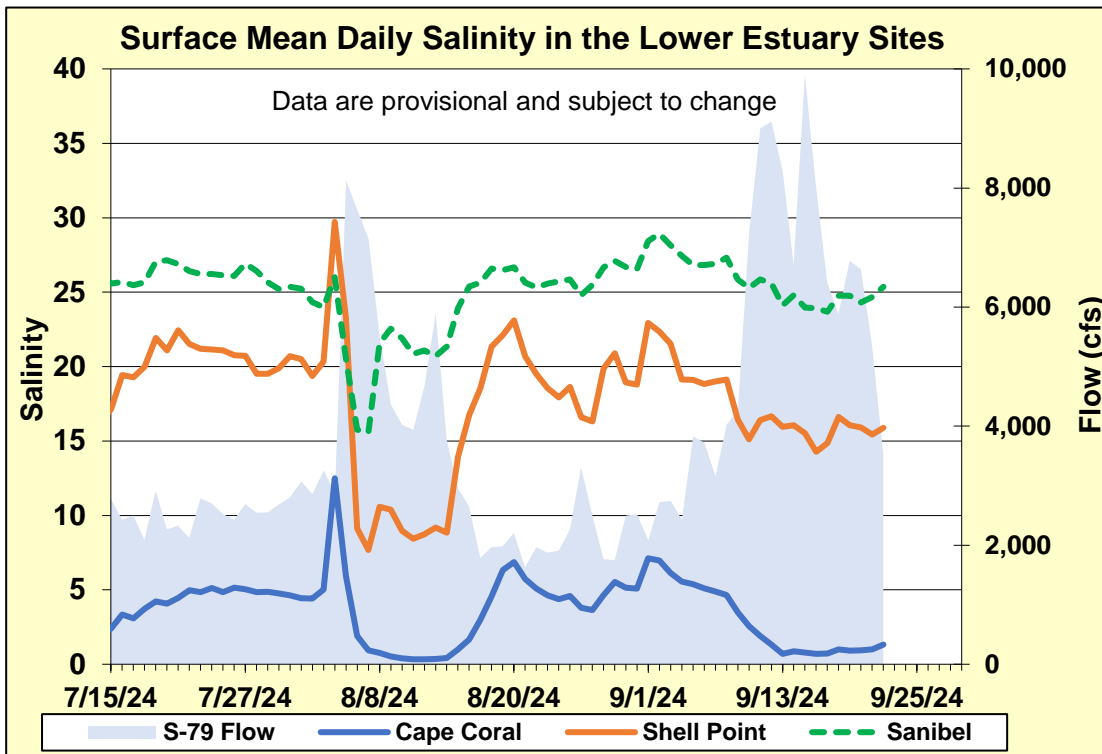
**Figure ES-7.** Total daily inflows from Lake Okeechobee, and runoff from the C-43 and Tidal basins into the Caloosahatchee River Estuary.

**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.

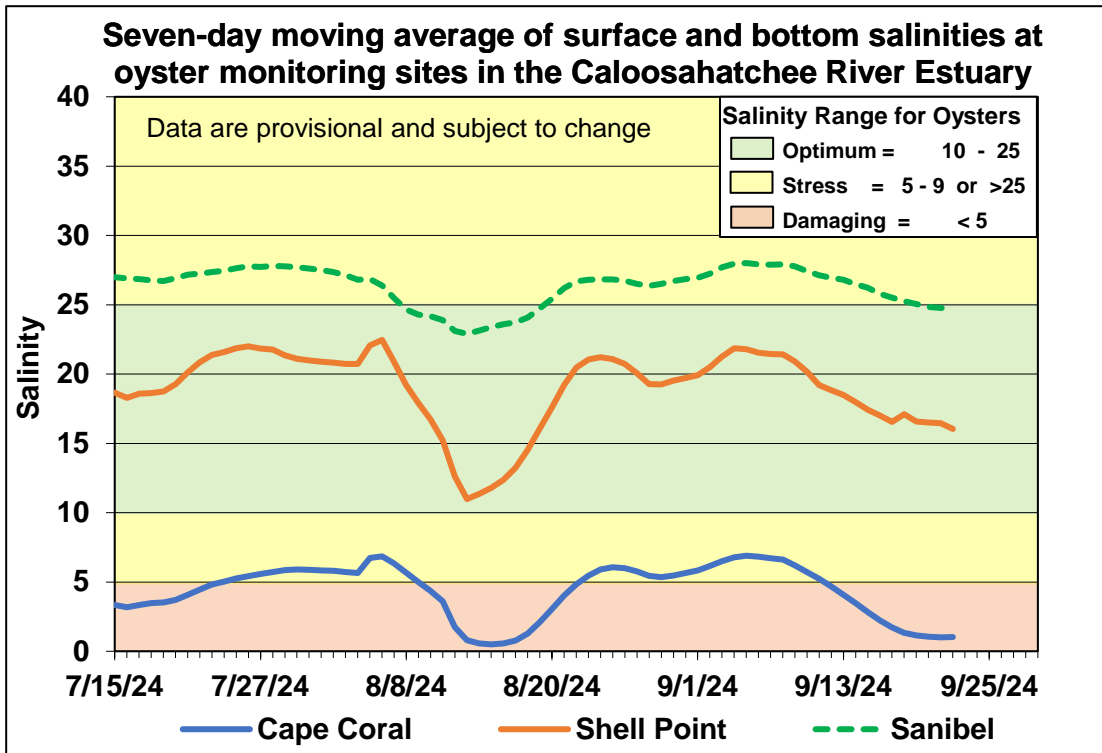
Sampling Site	Surface	Bottom	Optimum Envelope
S-79 (Franklin Lock)	<b>0.2</b> (0.2)	<b>0.2</b> (0.2)	0.0 – 10.0
Val I-75	<b>0.2</b> (0.2)	<b>0.2</b> (0.2)	0.0 – 10.0
Fort Myers Yacht Basin	<b>0.2</b> (0.2)	<b>0.2</b> (0.2)	0.0 – 10.0
Cape Coral	<b>0.9</b> (1.7)	<b>1.3</b> (2.8)	10.0 – 25.0
Shell Point	<b>15.6</b> (16.0)	<b>16.5</b> (18.0)	10.0 – 25.0
Sanibel	<b>24.5</b> (25.1)	<b>25.2</b> (26.5)	10.0 – 25.0



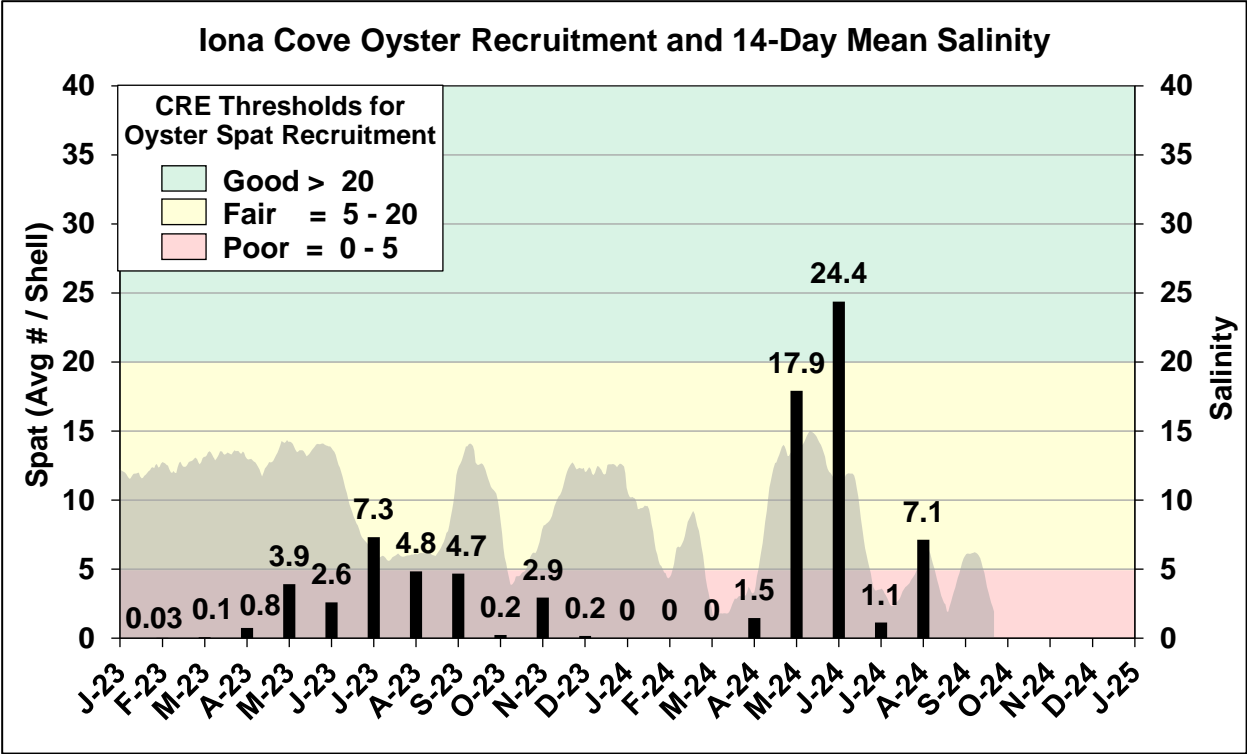
**Figure ES-8.** Mean daily salinity at upper Caloosahatchee River Estuary monitoring sites and mean daily flow at S-79.



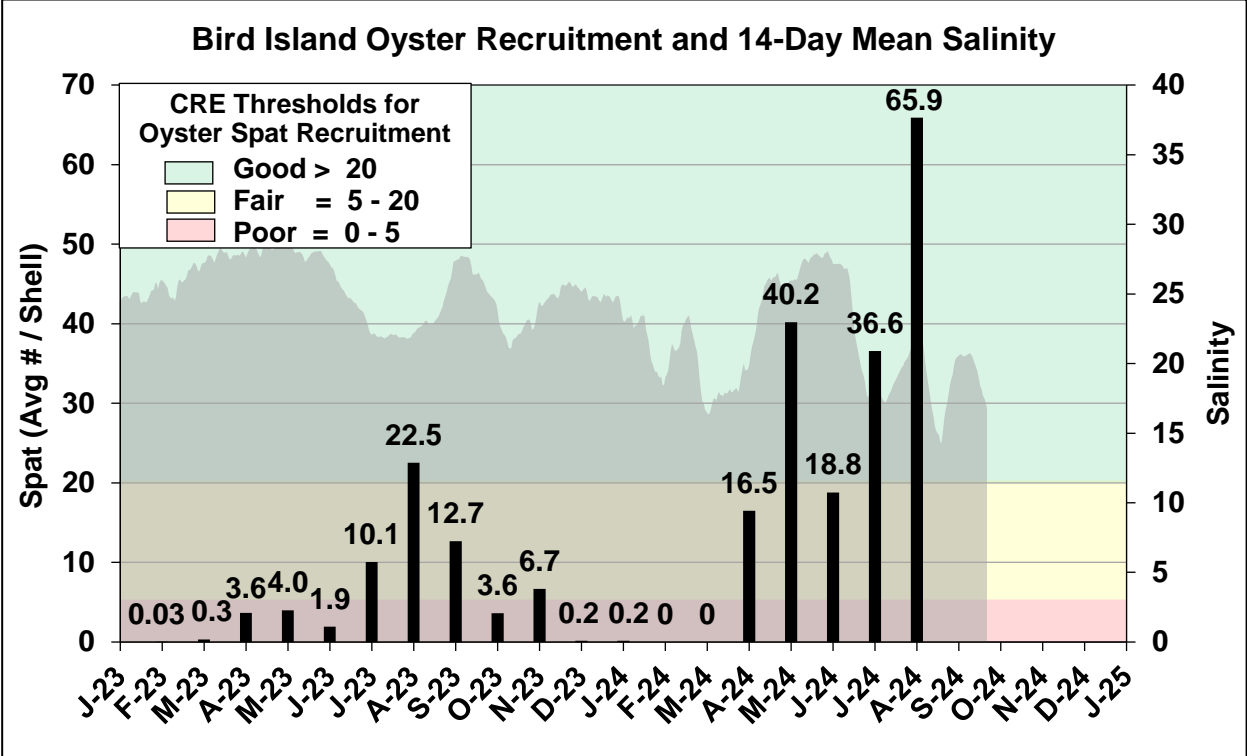
**Figure ES-9.** Mean daily surface salinity at lower Caloosahatchee River Estuary monitoring sites and mean daily flow at S-79.



**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.



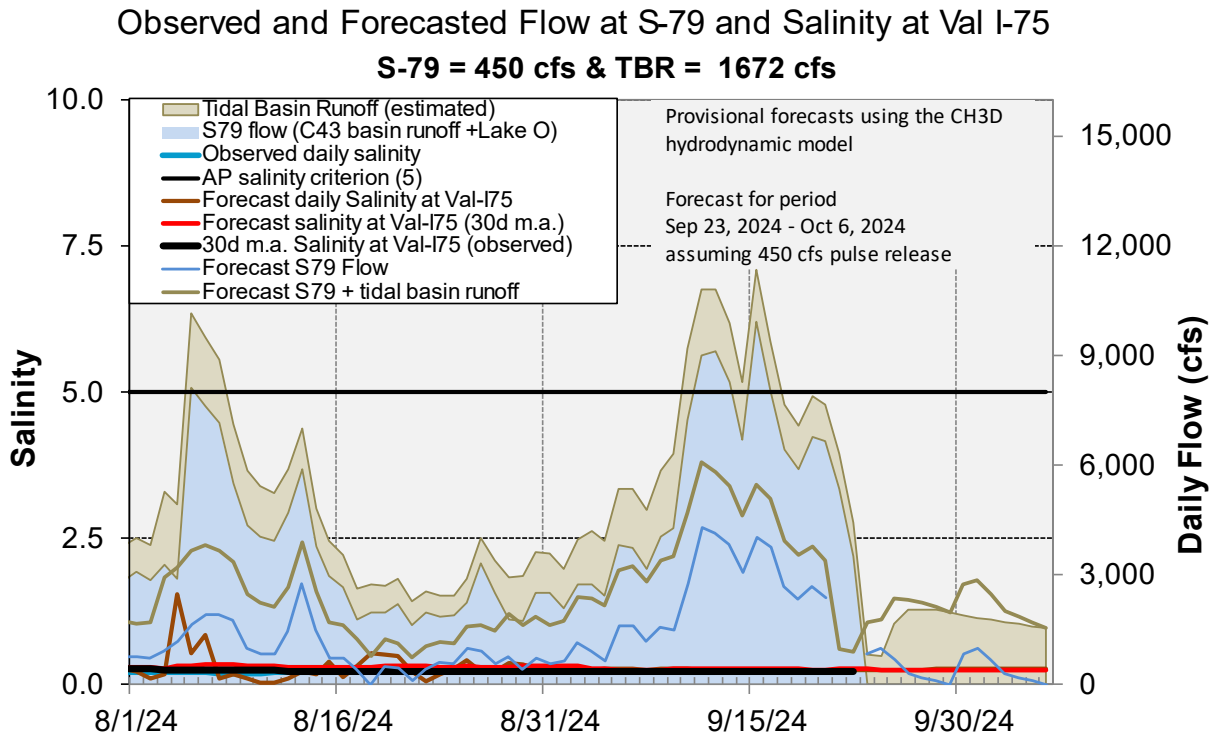
**Figure ES-11.** Mean oyster recruitment at the Iona Cove oyster monitoring station and 14-day mean salinity at Cape Coral.



**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	1,672	0.3	0.3
B	650	1,672	0.3	0.3
C	1,200	1,672	0.3	0.3
D	2,000	1,672	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 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 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 PLR for the Northern Flow-ways is below  $1.0 \text{ g/m}^2/\text{year}$  (**Figure S-1**).

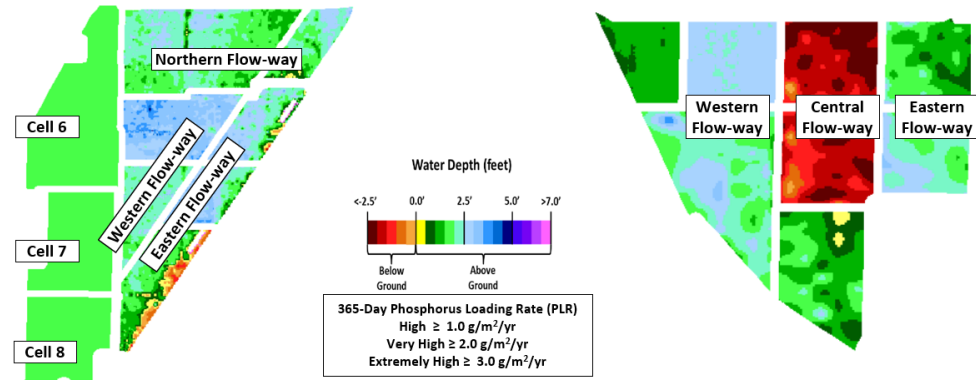
**STA-2:** Operational restrictions are in place in Flow-ways 2 and 4 for vegetation management activities. Online treatment cells are above target stage. Vegetation in Flow-ways 2, 3, and 4 is stressed, and in 5 is highly stressed. The 365-day PLRs for Flow-ways 1, 4, and 5 are below  $1.0 \text{ g/m}^2/\text{year}$ . The 365-day PLRs for Flow-ways 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 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 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  $1.0 \text{ g/m}^2/\text{year}$ , 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 – 9/16/2024 through 9/22/2024



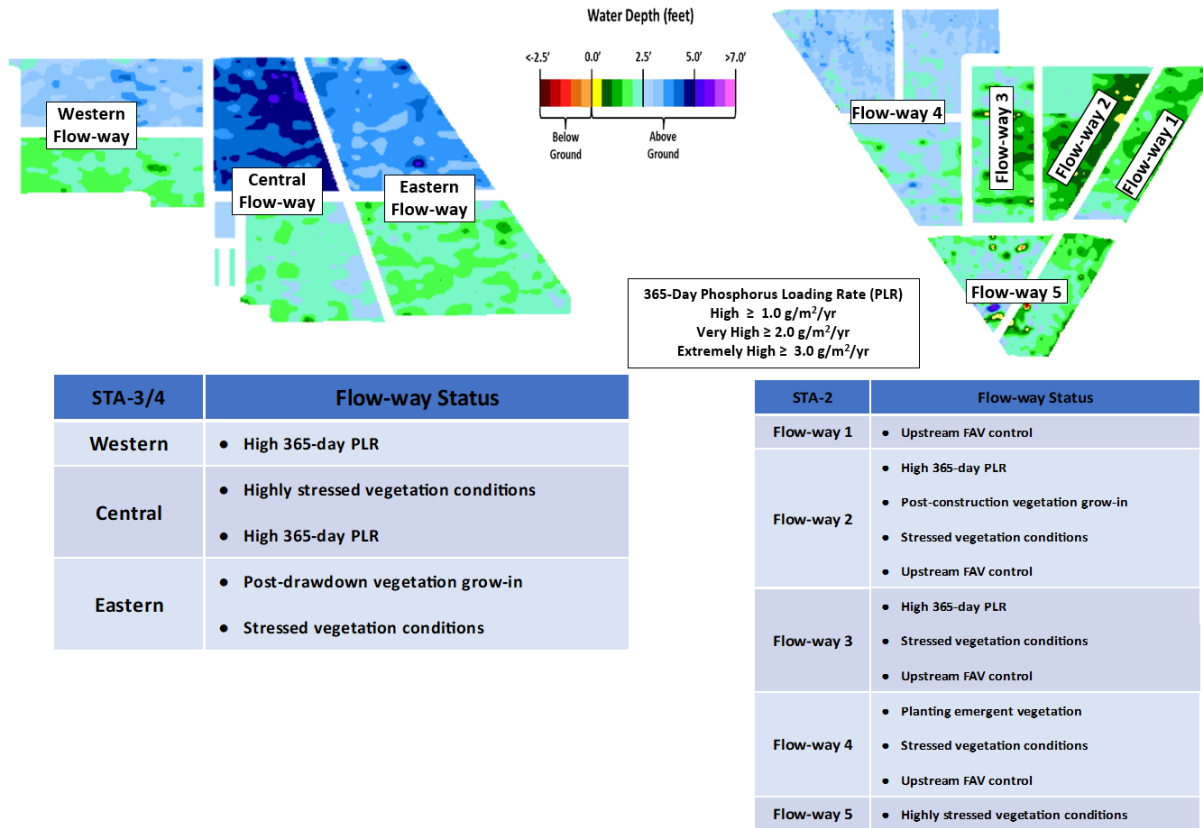
STA-1W	Flow-way Status
Western	<ul style="list-style-type: none"> <li>High 365-day PLR</li> <li>Highly stressed vegetation conditions</li> </ul>
Eastern	<ul style="list-style-type: none"> <li>High 365-day PLR</li> <li>Highly stressed vegetation conditions</li> </ul>
Northern	<ul style="list-style-type: none"> <li>Highly stressed vegetation conditions</li> <li>Planting emergent vegetation</li> </ul>
Cell 6	
Cell 7+8	

STA-1E	Flow-way Status
Western	<ul style="list-style-type: none"> <li>Post-construction vegetation grow-in</li> </ul>
Central	<ul style="list-style-type: none"> <li>Offline for construction activities</li> </ul>
Eastern	<ul style="list-style-type: none"> <li>Online with restrictions for vegetation grow-in following erosion repair</li> </ul>

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

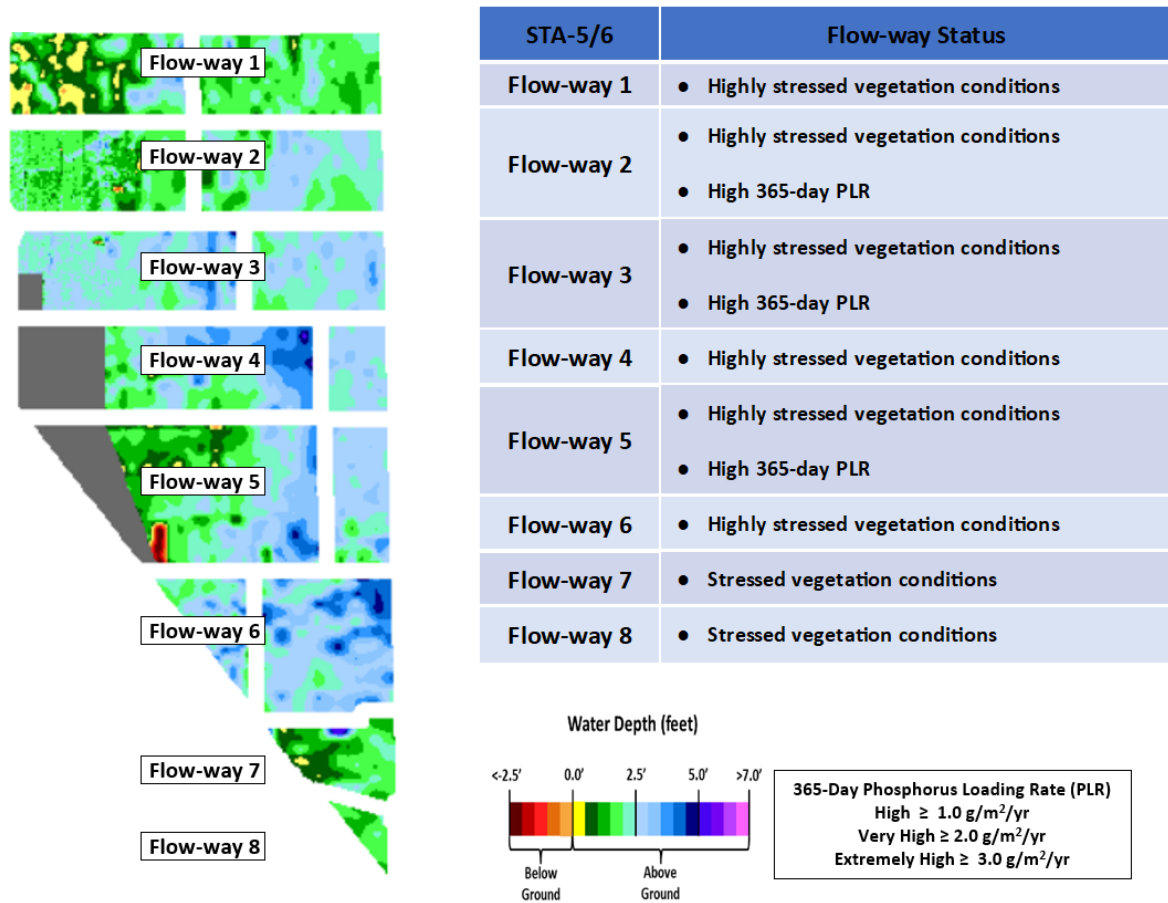


## Central Flow Path Weekly Status Report – 9/16/2024 through 9/22/2024



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

**Western Flow Path Weekly Status Report – 9/16/2024 through 9/22/2024**



**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***

Generally, less rainfall occurred throughout the region over the past week, with most occurring in WCA-1 and least in Everglades National Park (ENP). WCA-1: Stages within the Refuge continued to increase during the week leveling off toward the end of the week. On September 22, 2024, the 3-Gauge average was approximately 0.43 feet below the A1 Zone regulation line. WCA-2A: Stage ascension at gauge 2A-17 continued an upward trend and remains above the Zone A regulation line by approximately 1.2 ft. WCA-3A: The 3-Gauge average stage remained steady over the last week, remaining above the Zone A regulation line by around 0.65 feet on Sunday. WCA-3A North: Stage at Gauge 62 (NW corner) continued an increasing trend last week and remains above the upper schedule line by 0.26 ft. See figures **EV-1** through **EV-4**.

### ***Water Depths***

The SFWDAT model output for September 22, 2024, indicates overall wetter conditions compared to a month ago, especially throughout the WCA's and ENP. Ponded conditions have expanded over the last month in southern WCA-3A and northern Shark River Slough. Water levels in the Big Cypress area have stayed fairly stable over the past month. Hydrologic connectivity is expanding within the major sloughs of ENP. Current WDAT water depth estimates, when compared to one month ago, indicate that the majority of the Everglades Protection Area (EPA) is slightly deeper, with WCA 2A and the eastern portion of WCA 2B being significantly deeper. The comparison to modeled conditions a year ago shows a more mixed trend with slightly shallower conditions from the southeast region of Big Cypress through the eastern region of WCA-3A. The rest of the EPA has slightly deeper conditions. Comparing current conditions to the 20-year percentiles for September 22<sup>nd</sup>; depth conditions remain above average in the southeast region of Big Cypress through the eastern region of WCA-3A and WCA-2A, and above the 90th percentile for this time of the year in WCA-1, the NW region of Big Cypress and WCA-3A and in ENP. Conditions are below average in southwest portion of WCA-2B. See figures **EV-5** through **EV-7**.

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

All stages increased across Taylor Slough over the past week, with an average increase of 0.15 feet. Changes ranged from +0.09 feet at EPSW in the C-111 area and E112 in the northern slough to +0.28 feet at Craighead Pond (CP) in the southern slough (Figure **EV-8** and Figure **EV-9**). Taylor Slough water levels remain above the recent average for this time of year by 6.3 inches compared to before the Florida Bay initiative (starting in 2017), an increase of 1.6 inches relative to last week's comparison. Both the CP and Taylor Slough Bridge (TSB) stages are below estimated historical levels (circa 1900) by 0.37 and 0.80 feet, respectively.

Average Florida Bay salinity was 26.0, an increase of 0.5 from last week. Salinity increased at most stations, with changes ranging from -1.5 at Garfield Bight (GB) in the western nearshore region to +3.5 at Little Madeira Bay (LM) in the eastern nearshore

region (Figure **EV-8**). Salinity is above estimated historical levels (circa 1900) and just above the WY2001-2016 Interquartile Range (IQR) 25th percentile in the eastern region, near the 50th percentile in the central region, and at the 75th percentile in the western region (Figure **EV-10**). Average Florida Bay salinity is now above its recent average for this time of year by 0.7, an increase of 1.1 from last week.

Salinity at the Taylor River (TR) station in the mangrove zone (tracked for the Florida Bay MFL) was 8.3. The 30-day moving average was 2.1, an increase of 1.4 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 376,319 acre-feet, a decrease of 8,141 acre-feet from last week (Figure **EV-11**).

Average rainfall across Taylor Slough and Florida Bay was 1.67 inches over the past week, based on the 18 gauges used for this report. Rainfall ranged from 0.27 inches at Whipray Basin (WB) in the central region to 5.88 inches at TSB (Figure **EV-12**). Wind directions and speeds in Florida Bay ranged from 0.2 mph N on September 20th to 18.6 mph NE on September 19th (Figure **EV-12**).

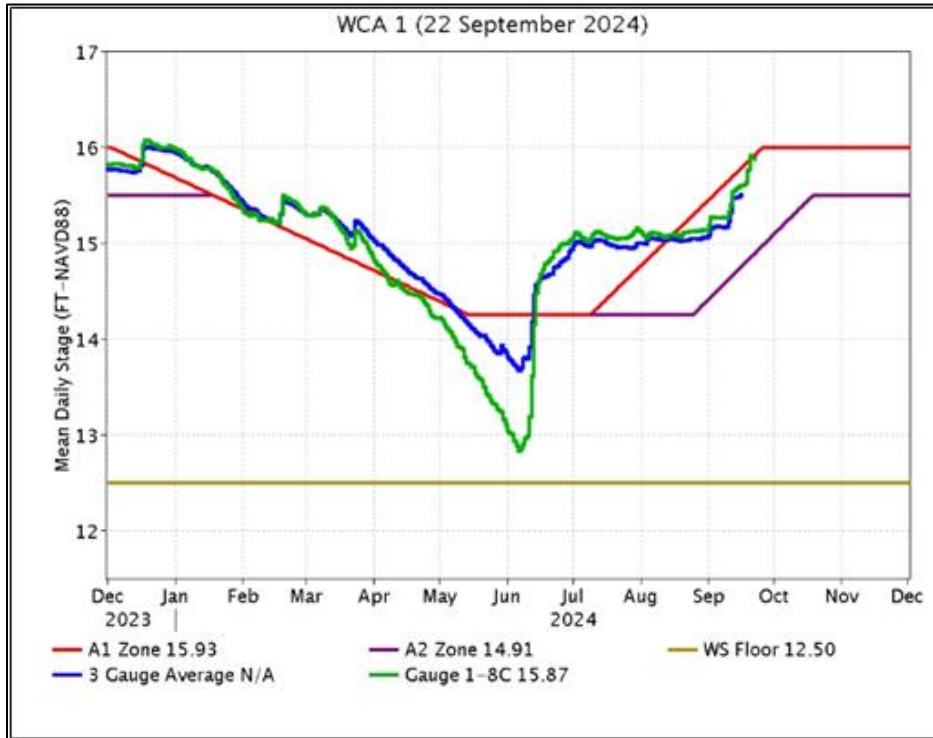
Average daily flow from the five major creeks totaled 508 acre-feet last week, with net positive flows for the week. Total daily creek flow ranged from -448 acre-feet on September 20th to 1,790 acre-feet on September 22nd (Figure **EV-13**). Average daily flow for the week was -4,508 acre-feet below estimated historical levels (circa 1900).

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

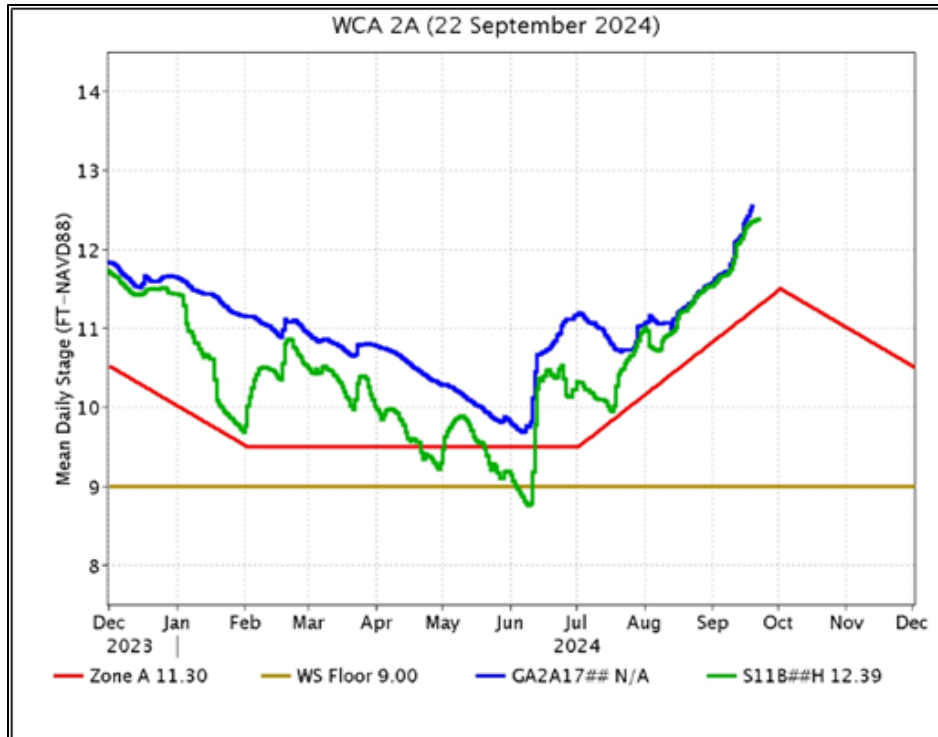
The ecology of the Everglades benefits from ascension rates of less than 0.25 feet per week this time of year. Maintaining a hydroperiod supportive of upcoming wading bird nesting at the Alley North colony in WCA-3A North is important as it is now trending toward a higher chance of hitting the 11.5-foot stage, which is beneficial for wading bird nesting. Continued freshwater inputs to ENP and 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.

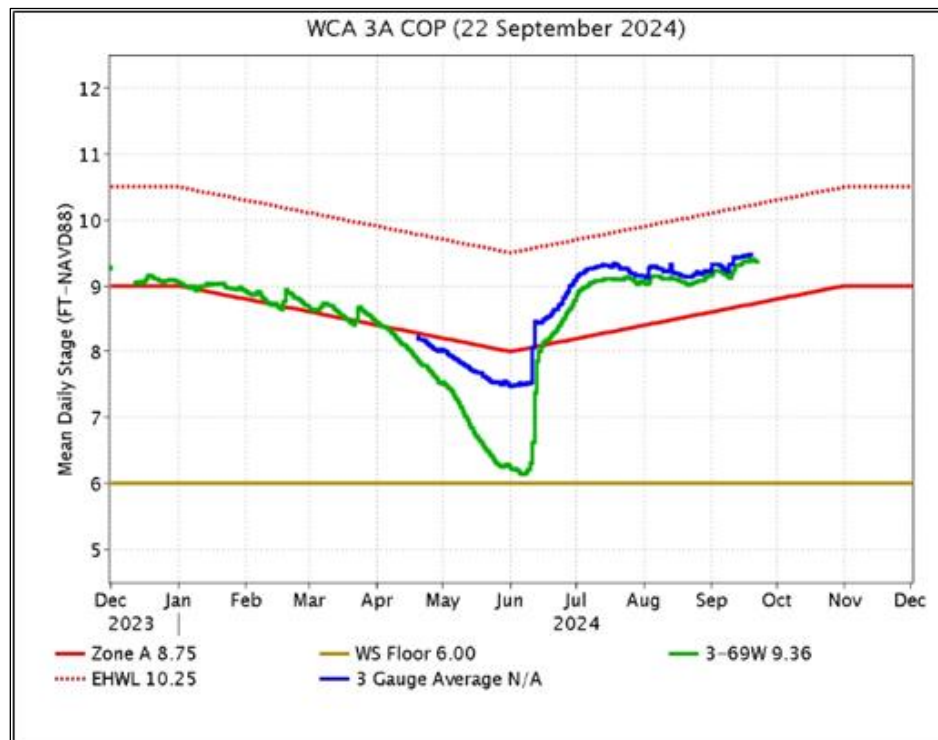
Everglades Region	Rainfall (inches)	Stage change (feet)
WCA-1	4.08	+0.36
WCA-2A	2.25	+0.46
WCA-2B	1.55	+0.11
WCA-3A	1.73	+0.09
WCA-3B	2.10	+0.09
ENP	1.31	-0.10



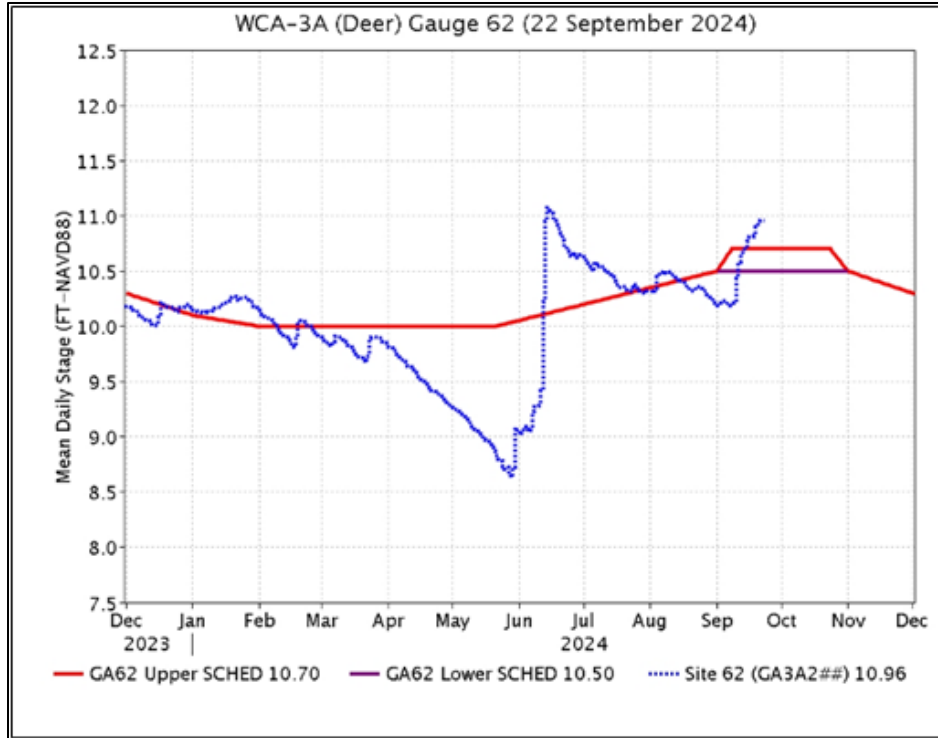
**Figure EV-1.** WCA-1 stage hydrographs and regulation schedule.



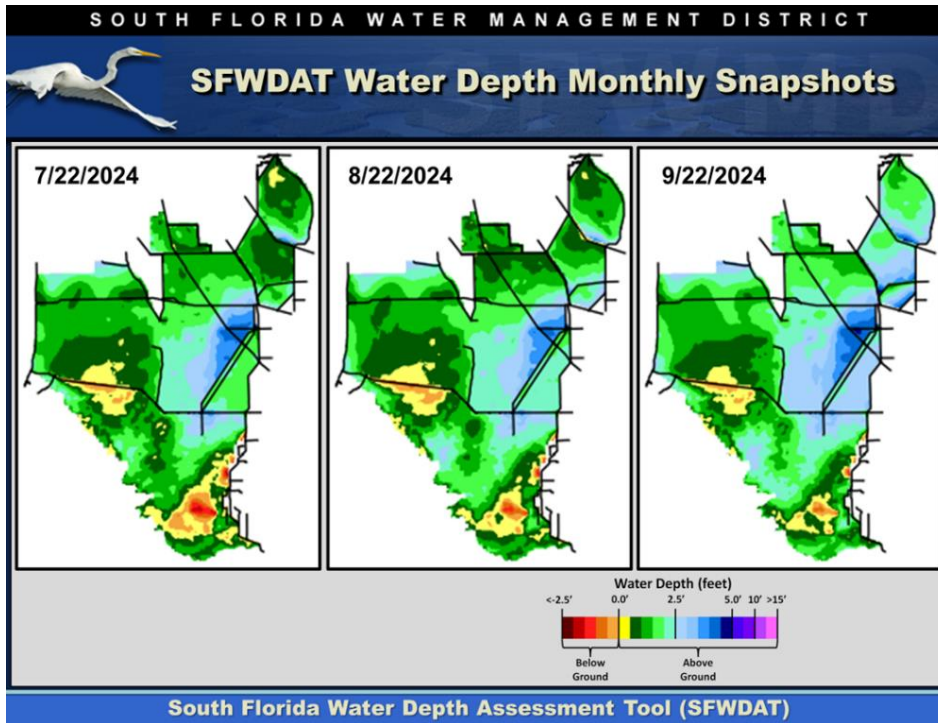
**Figure EV-2.** WCA-2A stage hydrographs and regulation schedule.



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

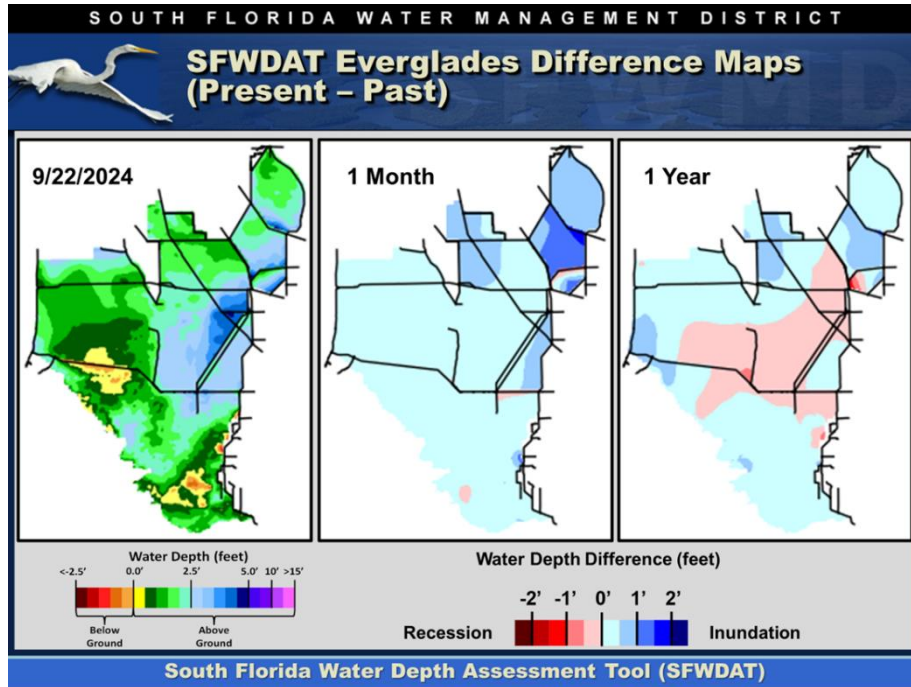


**Figure EV-4.** WCA-3A stage hydrograph (Deer gauge; Site 62) and GA62 regulation schedule.

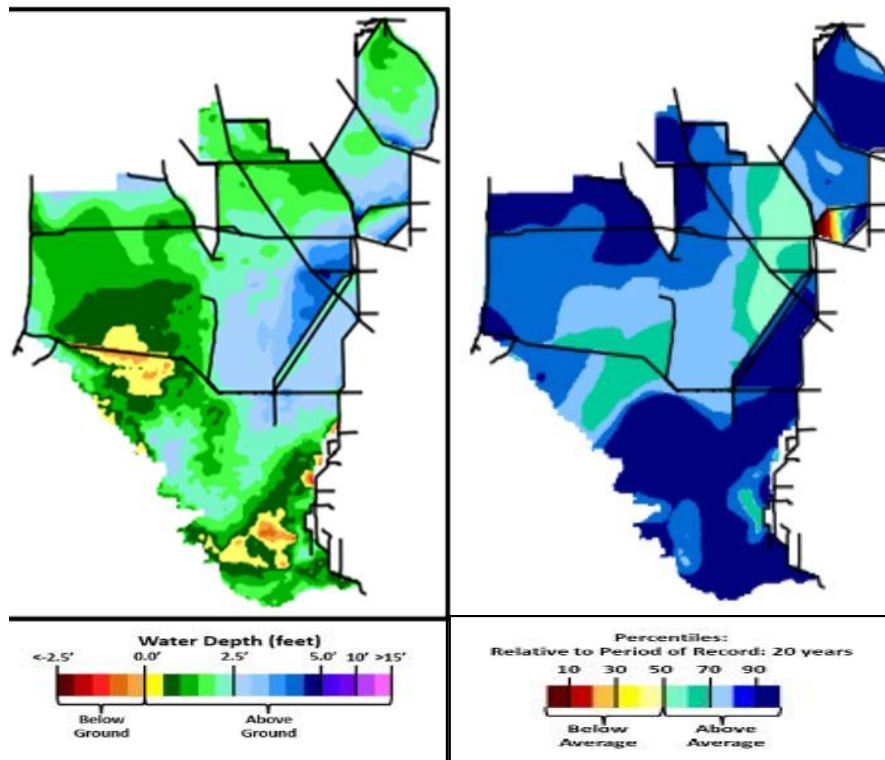


**Figure EV-5.** Everglades water depths from two months ago (left), one month ago (center) and present (right), based on SFWDAT.

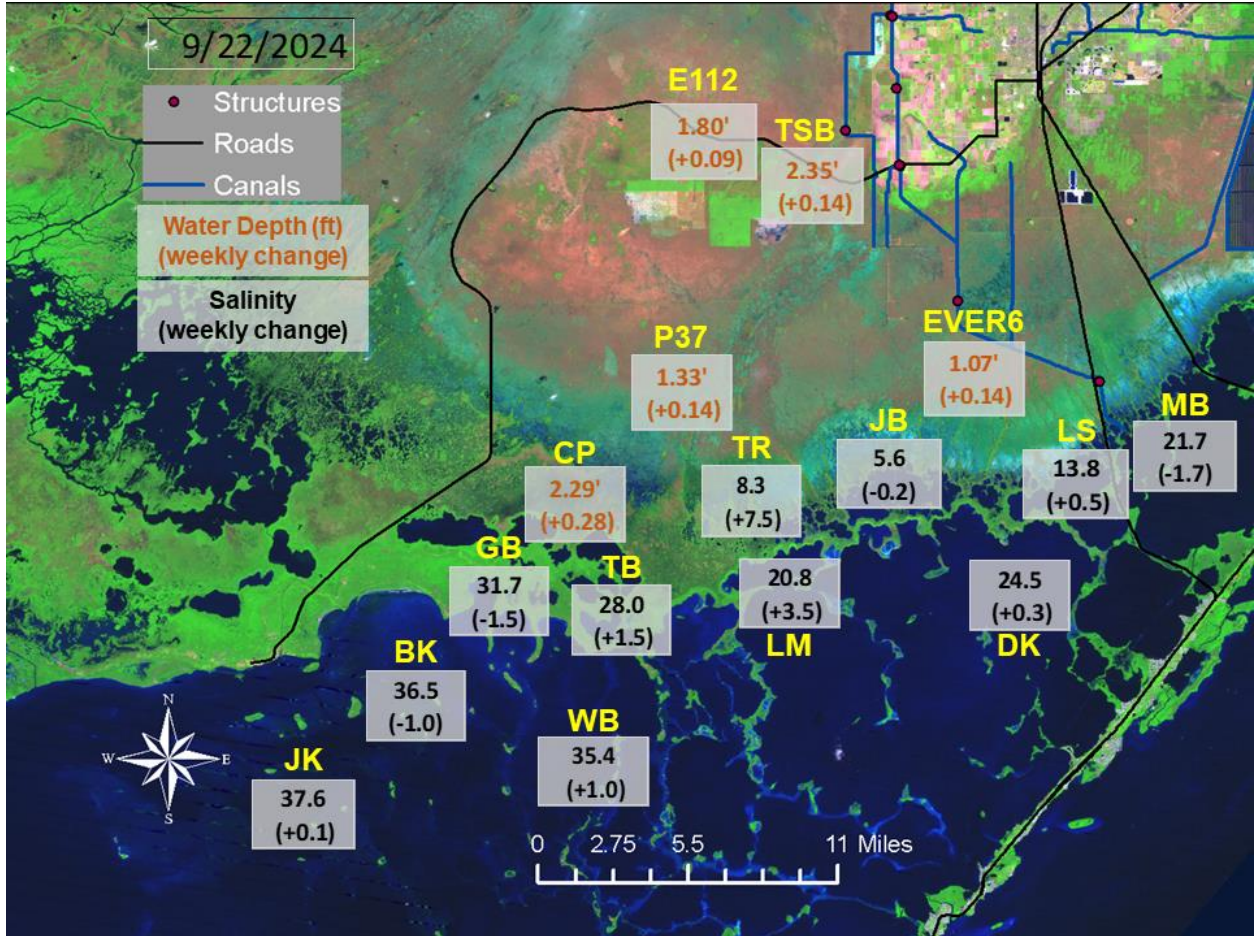




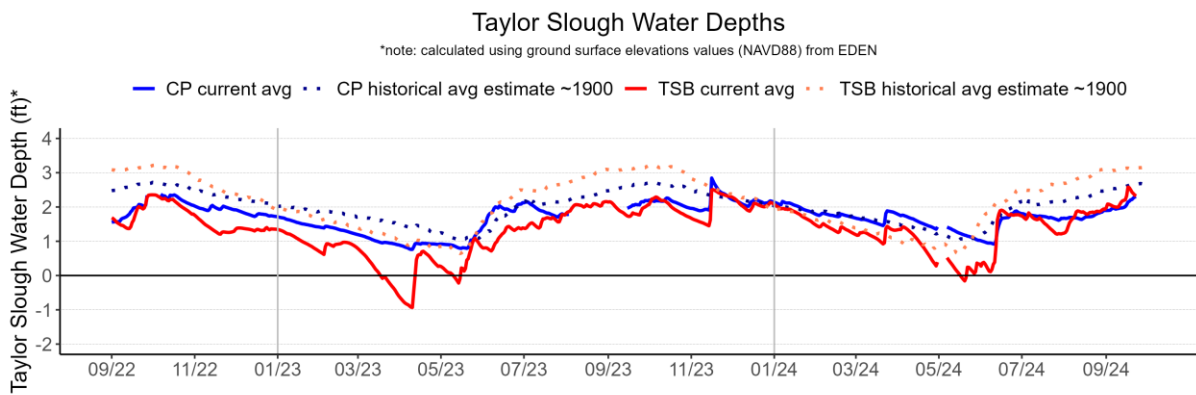
**Figure EV-6.** Present Everglades water depths (left) and water depth changes from one month (center) and one year (right) ago, based on SFWDAT.



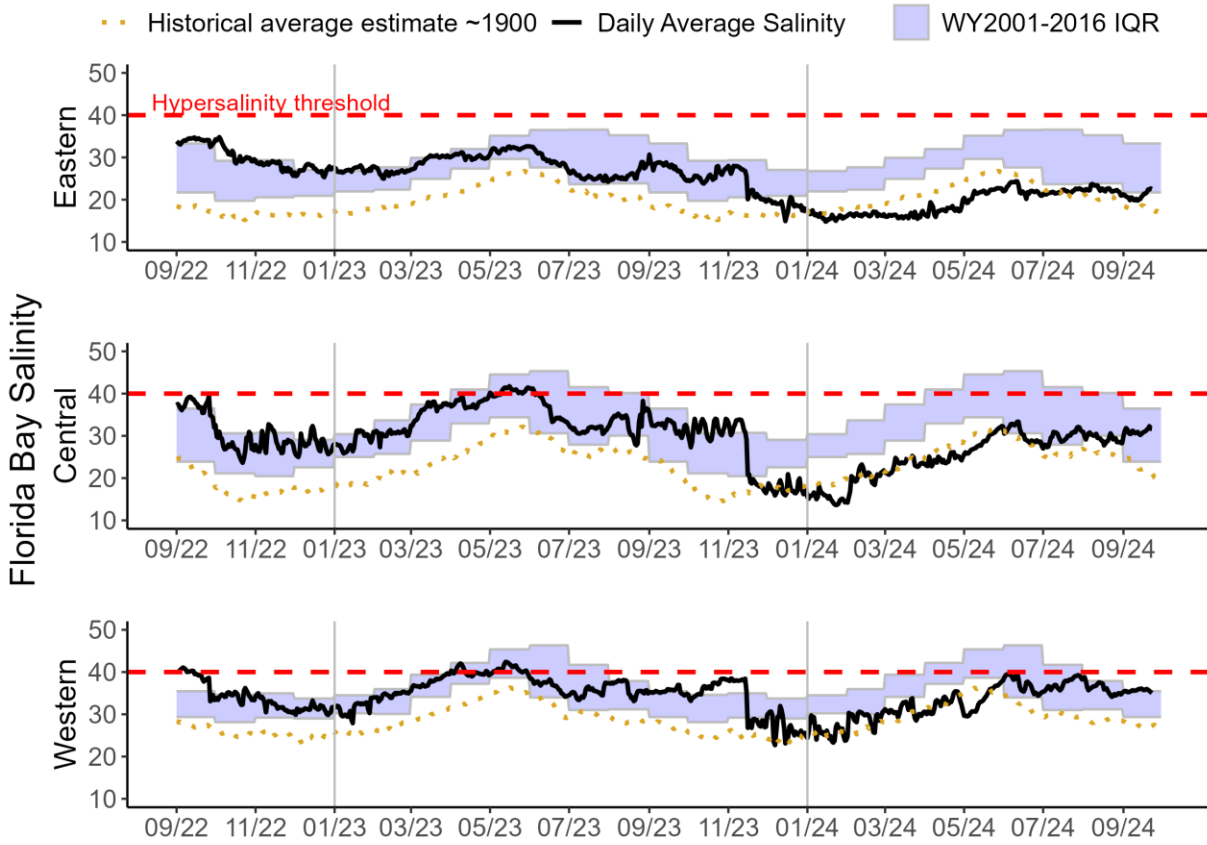
**Figure EV-7.** Present water depths (September 8<sup>th</sup>, 2024) compared to the day of year average over the previous 20 years.



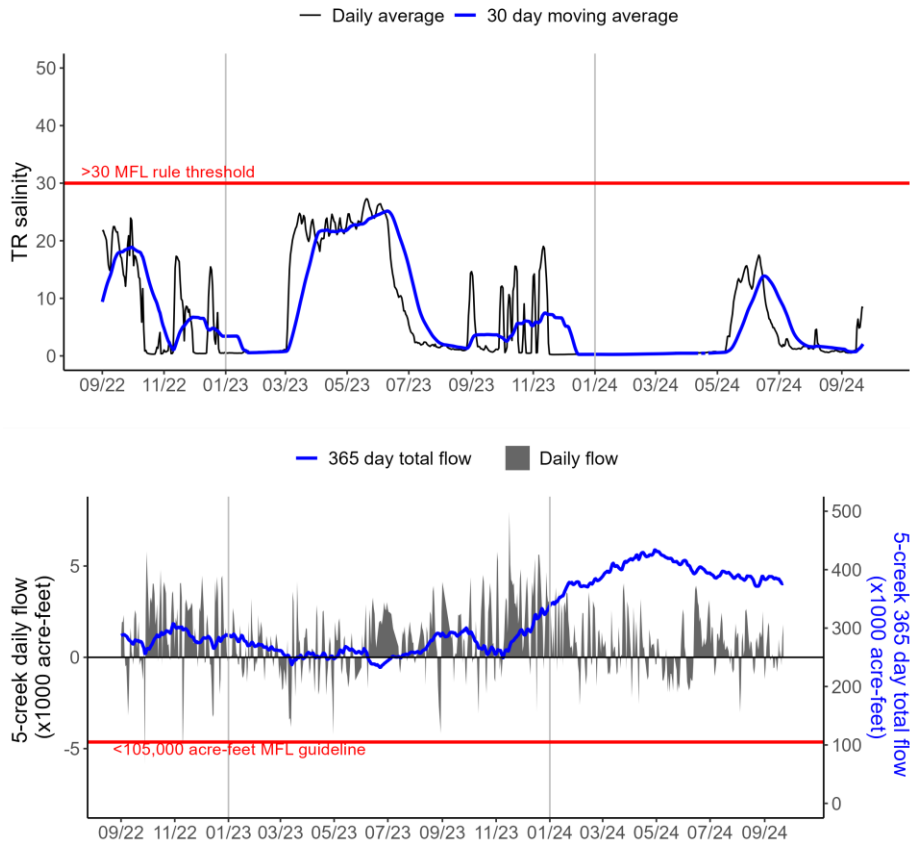
**Figure EV-8.** Taylor Slough water depths and Florida Bay salinities with changes from a week ago.



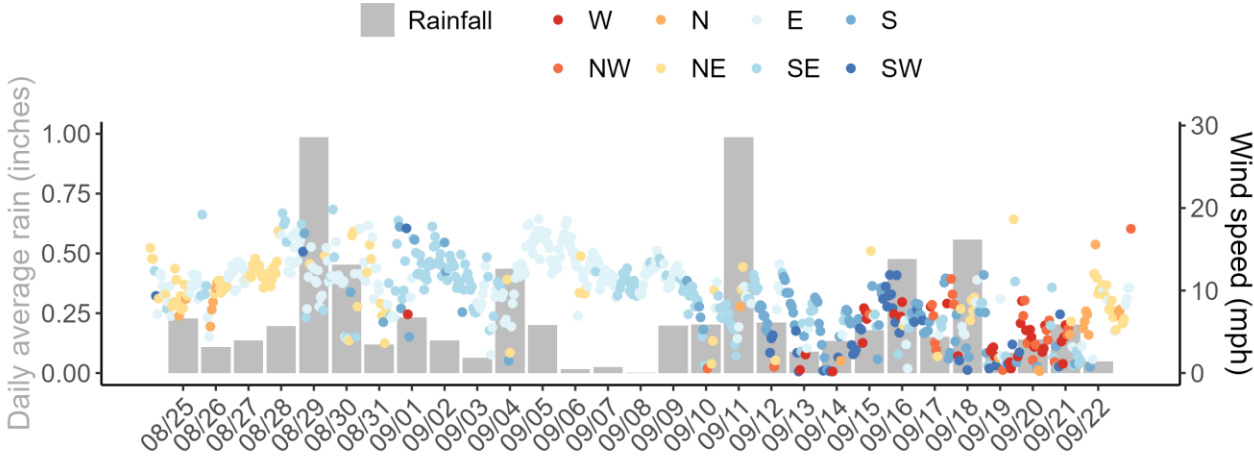
**Figure EV-9.** Taylor Slough water depth time series for Taylor Slough Bridge (TSB; northern slough) and Craighead Pond (CP; southern slough).



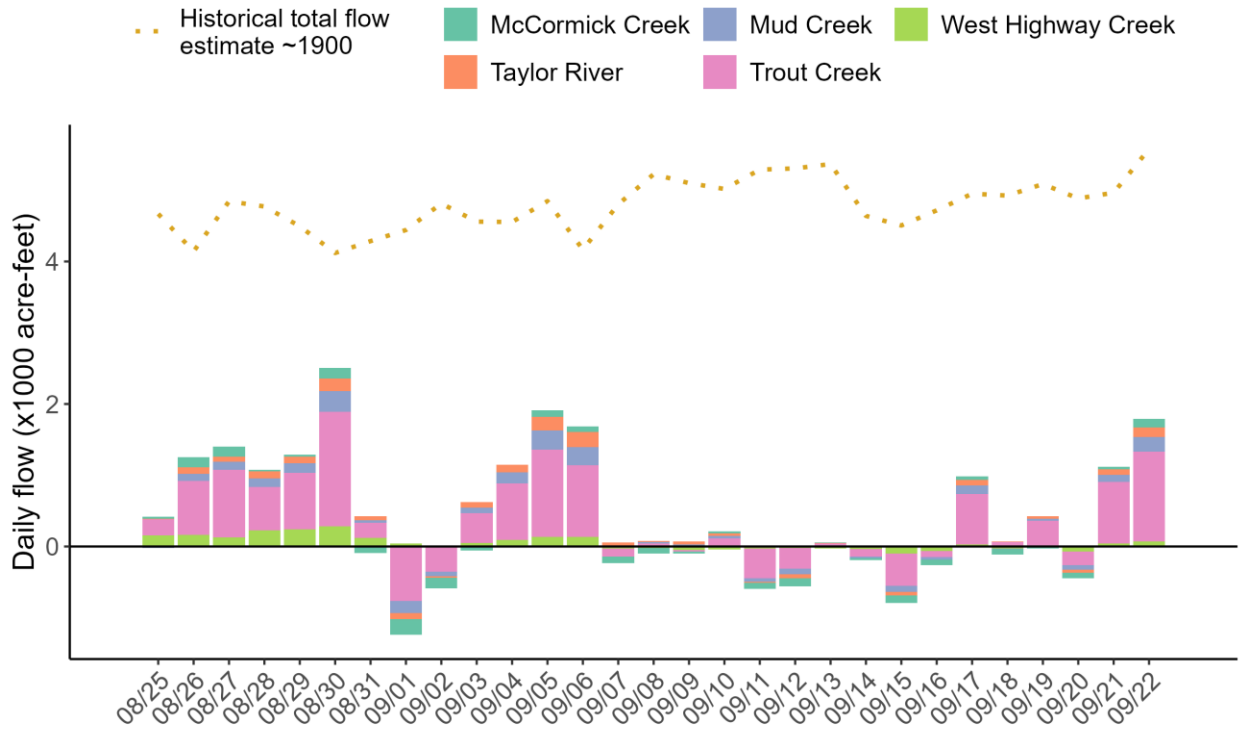
**Figure EV-10.** Eastern (top panel), Central (middle panel) and Western (bottom panel) Florida Bay daily average salinities with WY2001-2016 interquartile (25-75 percentile) ranges (IQR) and estimated historical daily average salinities. The hypersalinity threshold indicates the level at which salinities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



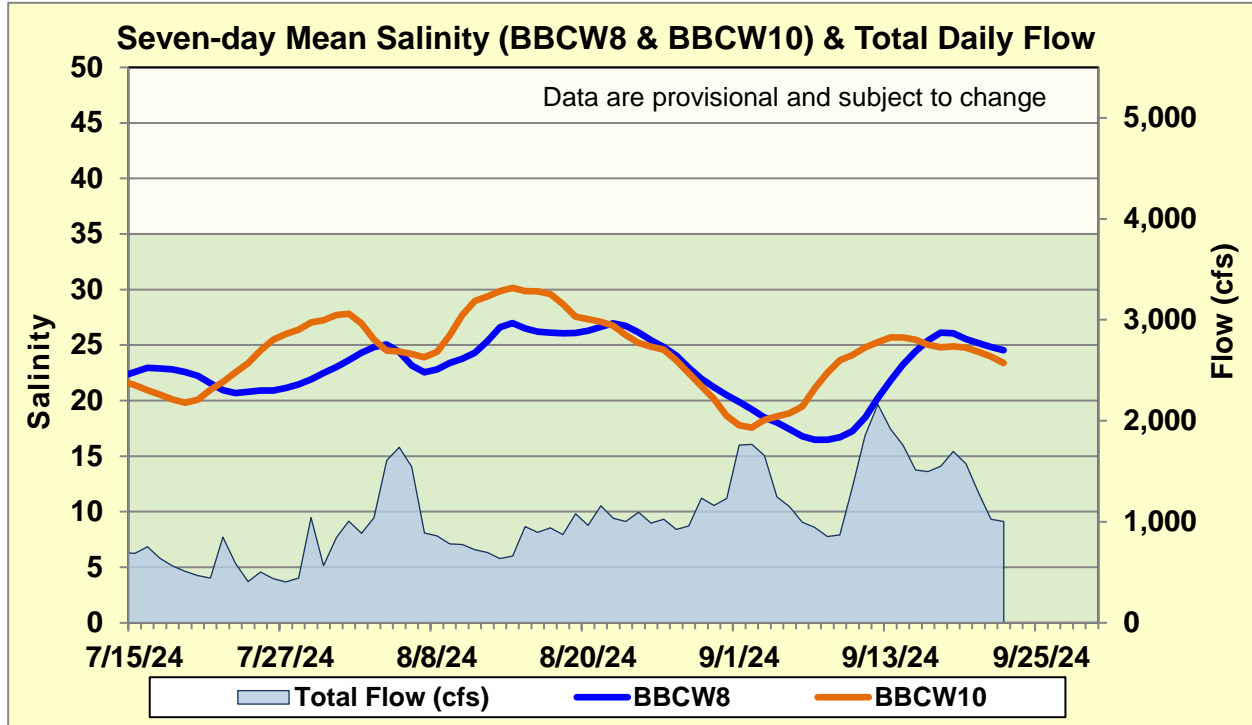
**Figure EV-13.** Daily average creek flow summed between five creeks with estimated historical daily flow over the past four weeks.

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

<b>SFWMD Everglades Ecological Recommendations, September 24, 2024 (red is new)</b>			
	Weekly change	Recommendation	Reasons
<b>WCA-1</b>	Stage increased by 0.36 feet	Ascension rate of less than 0.25 feet per week.	Protect within basin and downstream habitat and wildlife.
<b>WCA-2A</b>	Stage increased by 0.46 feet	Ascension rate of less than 0.25 feet per week.	Protect within basin and downstream habitat and wildlife.
<b>WCA-2B</b>	Stage increased by 0.11 feet	Ascension rate of less than 0.25 feet per week or 0.5 feet per two weeks.	Protect within basin and downstream habitat and wildlife.
<b>WCA-3A NE</b>	Stage increased by 0.16 feet	Ascension rate of less than 0.25 feet per week.	Protect within basin and downstream habitat and wildlife.
<b>WCA-3A NW</b>	Stage increased by 0.22 feet	Ascension rate of less than 0.25 feet per week.	
<b>Central WCA-3A S</b>	Stage increased by 0.01 feet	Ascension rate of less than 0.18 feet per week.	Protect within basin wildlife.
<b>Southern WCA-3A S</b>	Stage decreased by 0.04 feet		
<b>WCA-3B</b>	Stage increased by 0.09 feet	Ascension rate of less than 0.18 feet per week.	Protect within basin and downstream habitat and wildlife.
<b>ENP-SRS</b>	Stage decreased by 0.10 feet	Make discharges to ENP according to COP and TTFF 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 +0.09 feet to +0.28 feet	Move water southward as possible.	When available, provide freshwater to promote water movement.
<b>FB- Salinity</b>	Salinity changes ranged from -1.5 to +3.5	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 1,376 cfs, and the previous 30-day mean inflow was 1,335 cfs. The seven-day mean salinity was 24.3 at BBCW8 and 22.9 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.