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M E M O R A N D U M

TO: John Mitnik, Assistant Executive Director, Executive Office Staff

FROM: SFWMD Staff Environmental Advisory Team

DATE: October 2, 2024

SUBJECT: Weekly Environmental Conditions for Systems Operations

Summary

Weather Conditions and Forecast

On Wednesday, a weak cold front will drift southward to just north of Lake Okeechobee. The moisture-rich environment surrounding the cold front will enhance rainfall over the northern and central parts of the SFWMD. The southern third of the District is expected to see significantly less rain. On Thursday, rainfall once again will be enhanced over the central and northern SFWMD. Concurrently, a stream of high moisture from a tropical disturbance entering the Gulf of Mexico is likely to lead to a significant increase in rainfall over the Florida Keys, possibly extending into the far southern SFWMD. Most forecasts indicate that by Friday, widespread rainfall is possible, with the heaviest confined to south and southwest of Lake Okeechobee through the west coast. As we approach the weekend, a decrease of total SFWMD rainfall is expected, even though moisture levels from the tropical disturbance will be high. However, early next week, a significant rainfall event lasting two to three days has been modeled with total rainfall Monday through Wednesday next week estimated to be from one to three inches, with additional hazards such as strong winds, tornadoes, and storm surge possible. How the storm develops is uncertain. Thus, SFWMD interests are encouraged to monitor this system carefully. For the week ending next Tuesday morning, total rainfall across the SFWMD is anticipated to be above or significantly above normal.

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 29, 2024, was 1,700 cfs and 1,900 cfs at S-65 and S-65A, respectively. Mean weekly water depth on the Kissimmee River floodplain increased by 0.06 feet to 1.26 feet. The weekly average concentration of dissolved oxygen in the Kissimmee River decreased from 0.8 mg/L the previous week to 0.5 mg/L, which is below the stressful and potentially lethal levels for largemouth bass and other sensitive species. While the weekly average continued to decline, the daily average dissolved oxygen began to rise during the week but increased to only 0.7 mg/L by Sunday, September 29, 2024, which was the 11th

consecutive day that it had been below the potentially lethal level of 1.0 mg/L (**Figure KB-6**).

Lake Okeechobee

Lake Okeechobee stage was 14.02 feet NAVD88 (15.32 ft NGVD29) on September 29, 2024, which was 0.19 feet higher than the previous week and 1.06 feet higher than a month ago. Average daily inflows (excluding rainfall) decreased from 7,230 cfs the previous week, to 5,510 cfs. Average daily outflows (excluding evapotranspiration) were zero. In the most recent non-obscured satellite image from September 29, 2024, NOAA's Harmful Algal Bloom Monitoring System suggests patches of moderate cyanobacteria abundance in the northwestern region of the Lake and outside of Fisheating Bay.

Estuaries

Total inflow to the St. Lucie Estuary averaged 770 cfs over the past week with no flow coming from Lake Okeechobee. Mean salinities decreased at the A1A and US1 bridges. The recorder at HR1 is currently under repair and not reporting values for the past week. Salinity in the middle estuary was in the damaging range (< 5) for adult eastern oysters.

Total inflow to the Caloosahatchee Estuary averaged 5,062 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 increased 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 lower stressed range for adult oysters at Cape Coral, the optimal range at Shell Point, and upper stressed range at Sanibel.

Stormwater Treatment Areas

For the week ending Sunday, September 29, 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 806,000 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 across the Everglades Protection Area (EPA). Stages at Gauge 63 in northeastern WCA 3A have reached the target depths supportive of nesting at the Alley North colony. Stages remain well above average across most of the EPA. Average stage in Taylor Slough increased last week and remains above the average for this time of year. Average salinity increased slightly in Florida Bay last week but remain within the inter-quartile range in all regions of the bay. Florida Bay MFL metrics remain well outside thresholds of harm.

Biscayne Bay

Total inflow to Biscayne Bay averaged 1,413 cfs, and the previous 30-day mean inflow averaged 1,419 cfs. The seven-day mean salinity was 21.0 at BBCW8 and 23.3 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 29, 2024, mean daily lake stages were 55.9 feet NAVD88 (0.1 feet below schedule) in East Lake Toho, 52.8 feet NAVD88 (at schedule) in Lake Toho, and 50.5 feet NAVD88 (0.3 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 29, 2024, mean weekly discharge was 1,700 cfs and 1,900 cfs at S-65 and S-65A, respectively. Mean weekly discharge from the Kissimmee River was 2,100 cfs and 2,200 cfs at S-65D and S-65E, respectively (**Table KB-2**). Mean weekly headwater stages were 45.0 feet NAVD88 at S-65A and 26.1 feet NAVD88 at S-65D. Mean weekly river channel stage increased by 0.2 feet to 36.4 feet NAVD88 (**Figure KB-4**). Mean weekly water depth on the Kissimmee River floodplain increased by 0.06 feet to 1.26 feet (**Table KB-2, Figure KB-5**). The weekly average concentration of dissolved oxygen in the Kissimmee River decreased from 0.8 mg/L the previous week to 0.5 mg/L (**Table KB-2, Figure KB-6**).

Water Management Recommendations

Follow the Headwater 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) ^a	Schedule Type ^b	Sunday Schedule Stage (feet NAVD88)	Sunday Departure from Regulation (feet)	
							9/29/24	9/22/24
Lakes Hart and Mary Jane	S-62	LKMJ	160	59.0	R	58.9	0.1	0.3
Lakes Myrtle, Preston, and Joel	S-57	S-57	43	60.0	R	60.0	0.0	0.1
Alligator Chain	S-60	ALLI	170	62.0	R	62.2	-0.2	-0.1
Lake Gentry	S-63	LKGT	240	59.6	R	59.9	-0.3	0.0
East Lake Toho	S-59	TOHOE	430	55.9	R	56.0	-0.1	0.3
Lake Toho	S-61	TOHOW S-61	870	52.8	R	52.8	0.0	0.1
Lakes Kissimmee, Cypress and Hatchineha	S-65	KUB011 LKIS5B	1700	50.5	T	50.8	-0.3	-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.

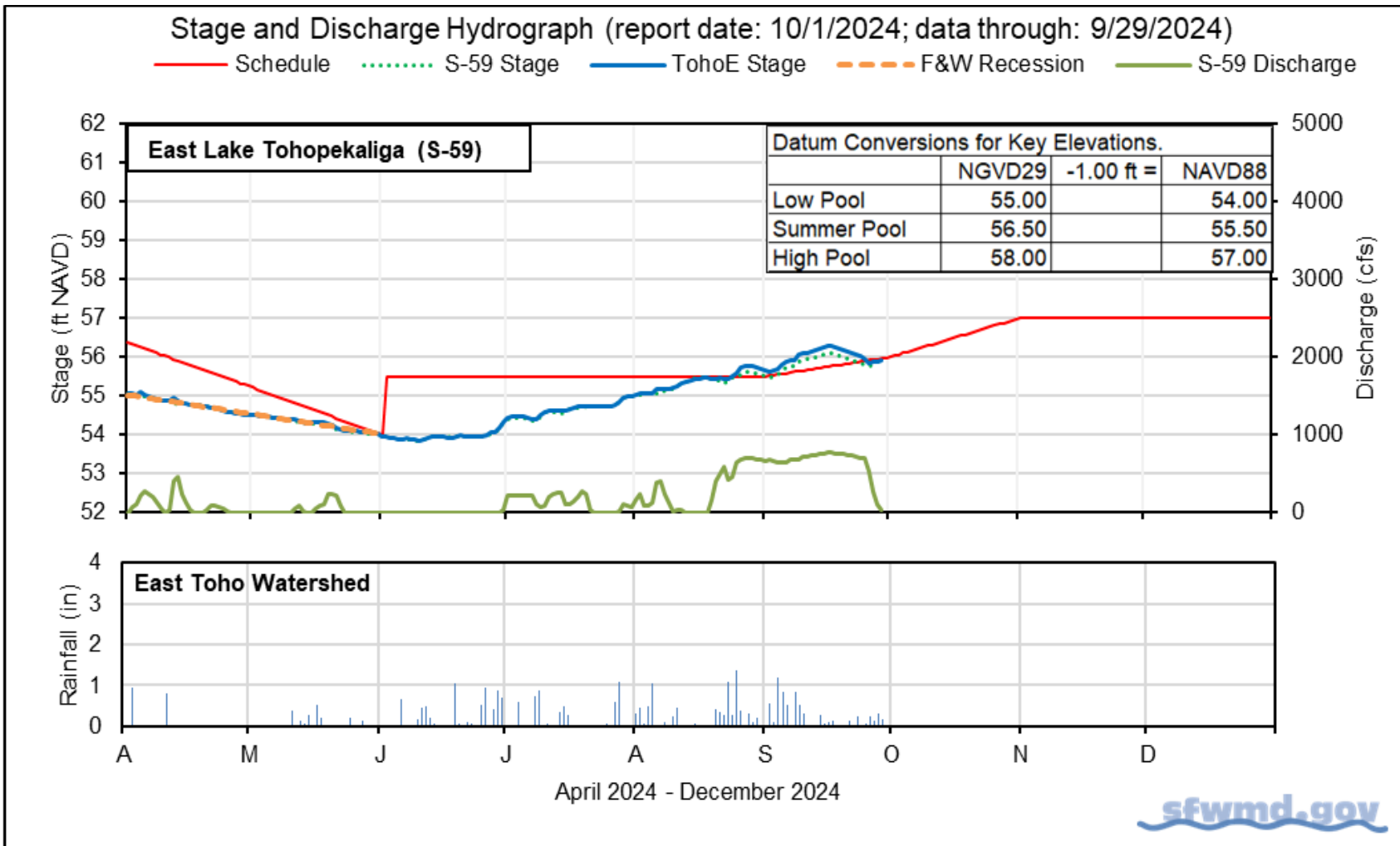


Figure KB-1. East Lake Toho regulation schedule, stage, discharge, and rainfall.

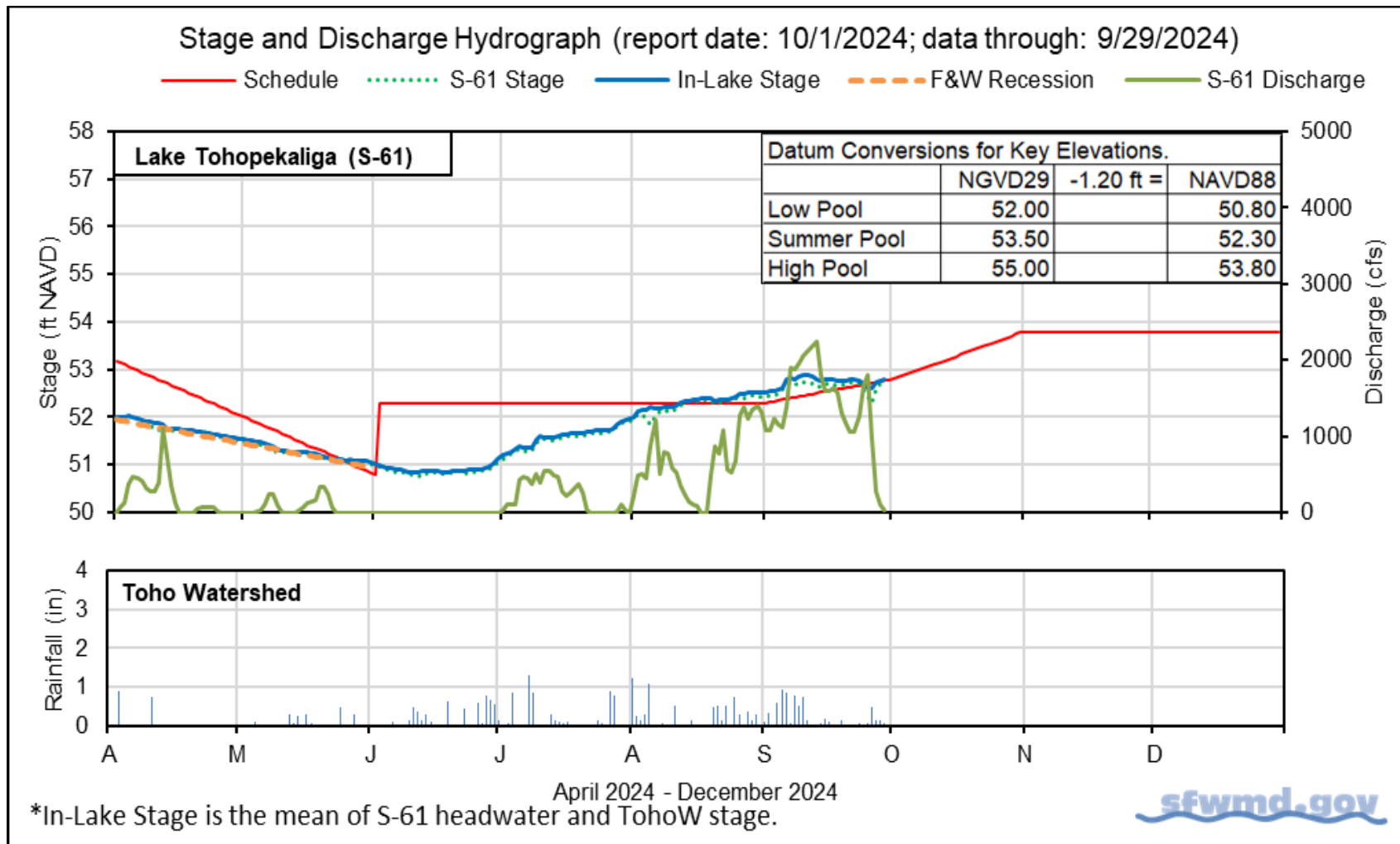


Figure KB-2. Lake Toho regulation schedule, stage, discharge, and rainfall.

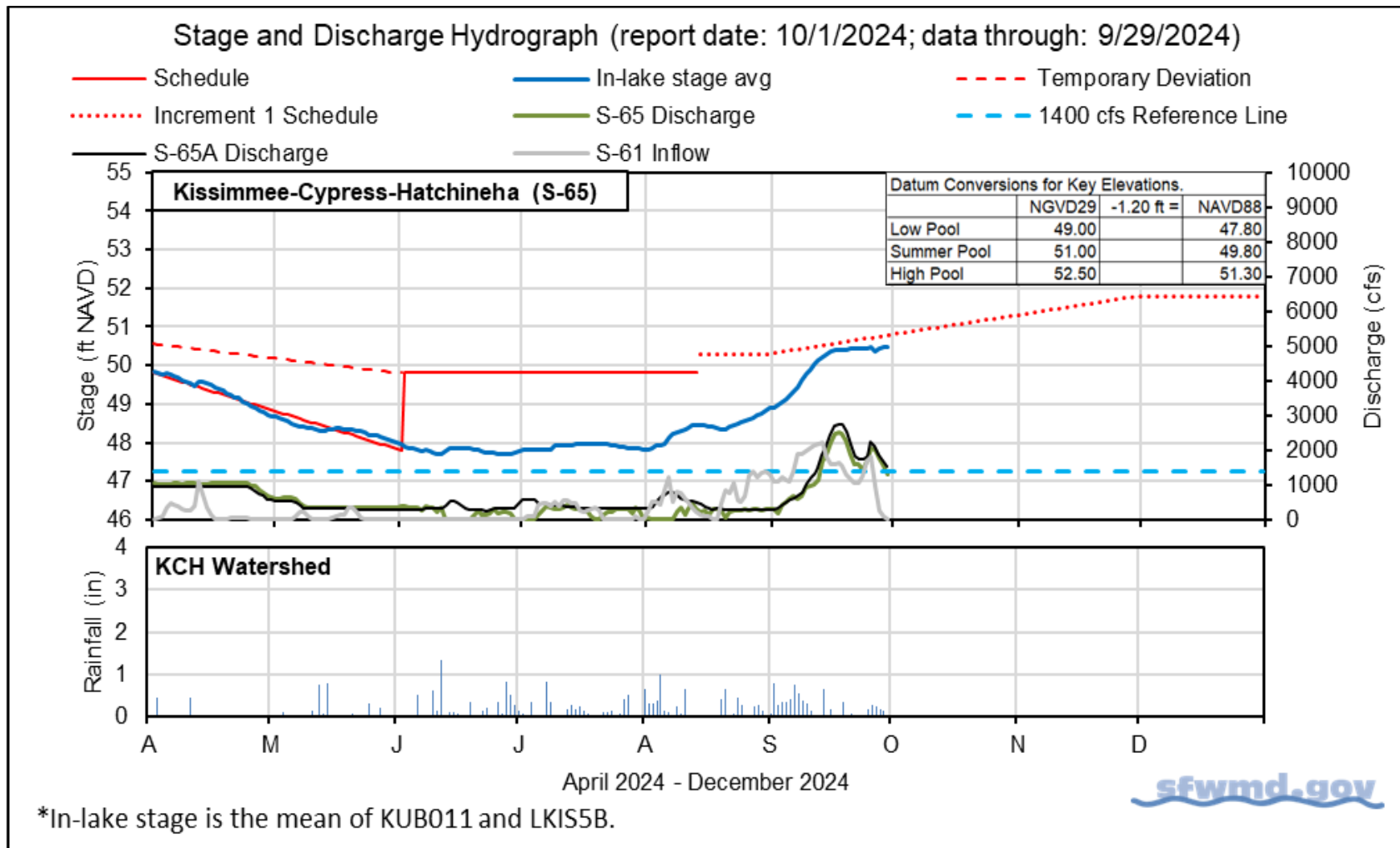


Figure KB-3. Lakes Kissimmee, Cypress and Hatchineha regulation schedule, stage, discharge, and rainfall.

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			
		9/29/24	9/29/24	9/22/24	9/15/24	9/8/24
Discharge	S-65	1,300	1,700	2,100	1,400	530
Discharge	S-65A ^a	1,500	1,900	2,400	1,600	570
Headwater Stage (feet NAVD88)	S-65A	45.2	45.0	45.2	44.8	44.7
Discharge	S-65D ^b	2,300	2,100	1,800	1,300	830
Headwater Stage (feet NAVD88)	S-65D ^c	26.2	26.1	25.9	25.0	24.6
Discharge (cfs)	S-65E ^d	2,200	2,200	1,800	1,500	880
Discharge (cfs)	S-67	0	0	0	0	0
Dissolved Oxygen (mg/L) ^e	Phase I, II/III river channel	0.7	0.5	0.8	3.6	4.9
River channel mean stage ^f	Phase I river channel	36.3	36.4	36.2	34.8	32.5
Mean depth (feet) ^g	Phase I floodplain	1.25	1.26	1.20	0.74	0.41

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).

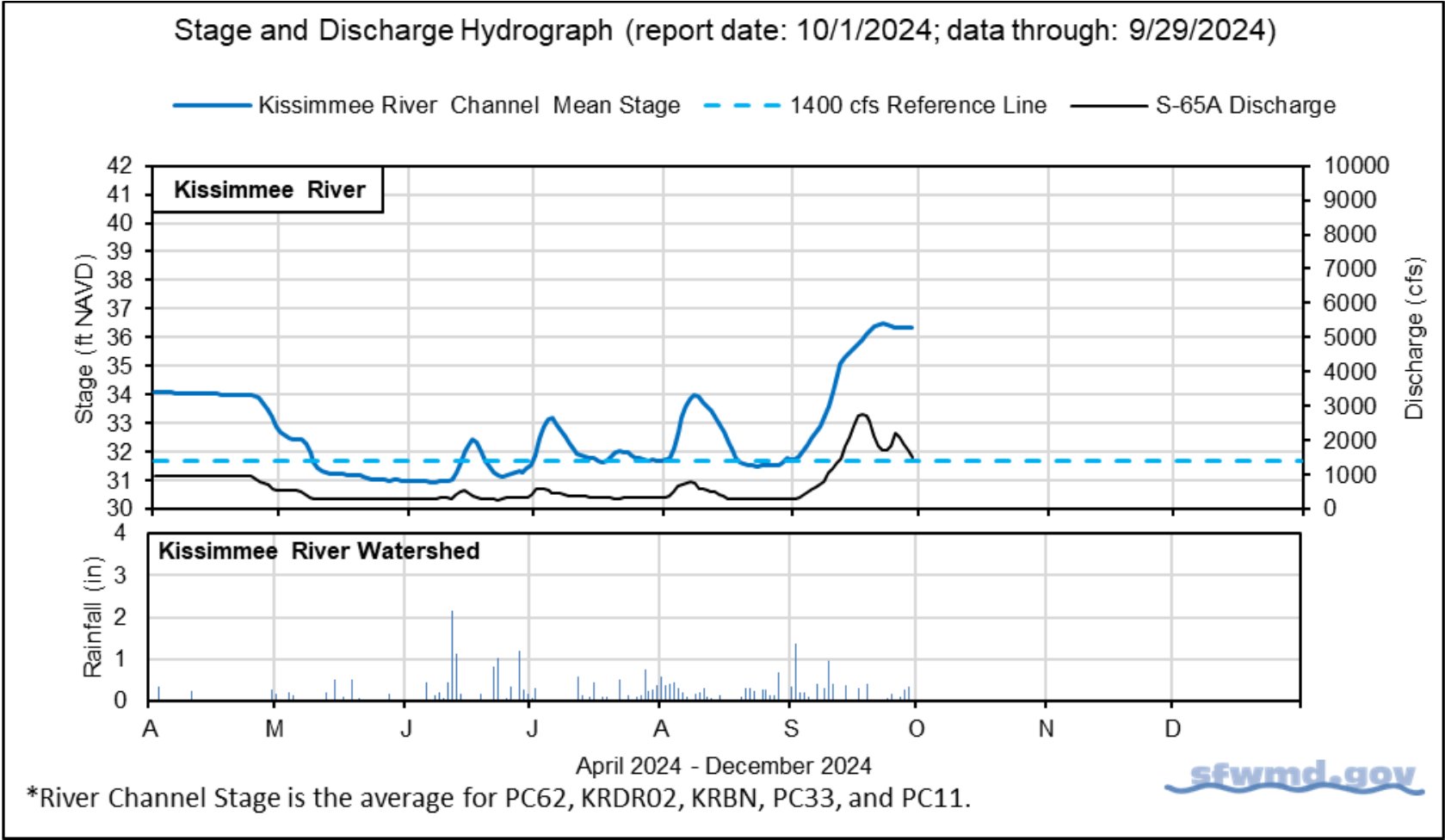


Figure KB-4. Kissimmee River stage, discharge, and rainfall.

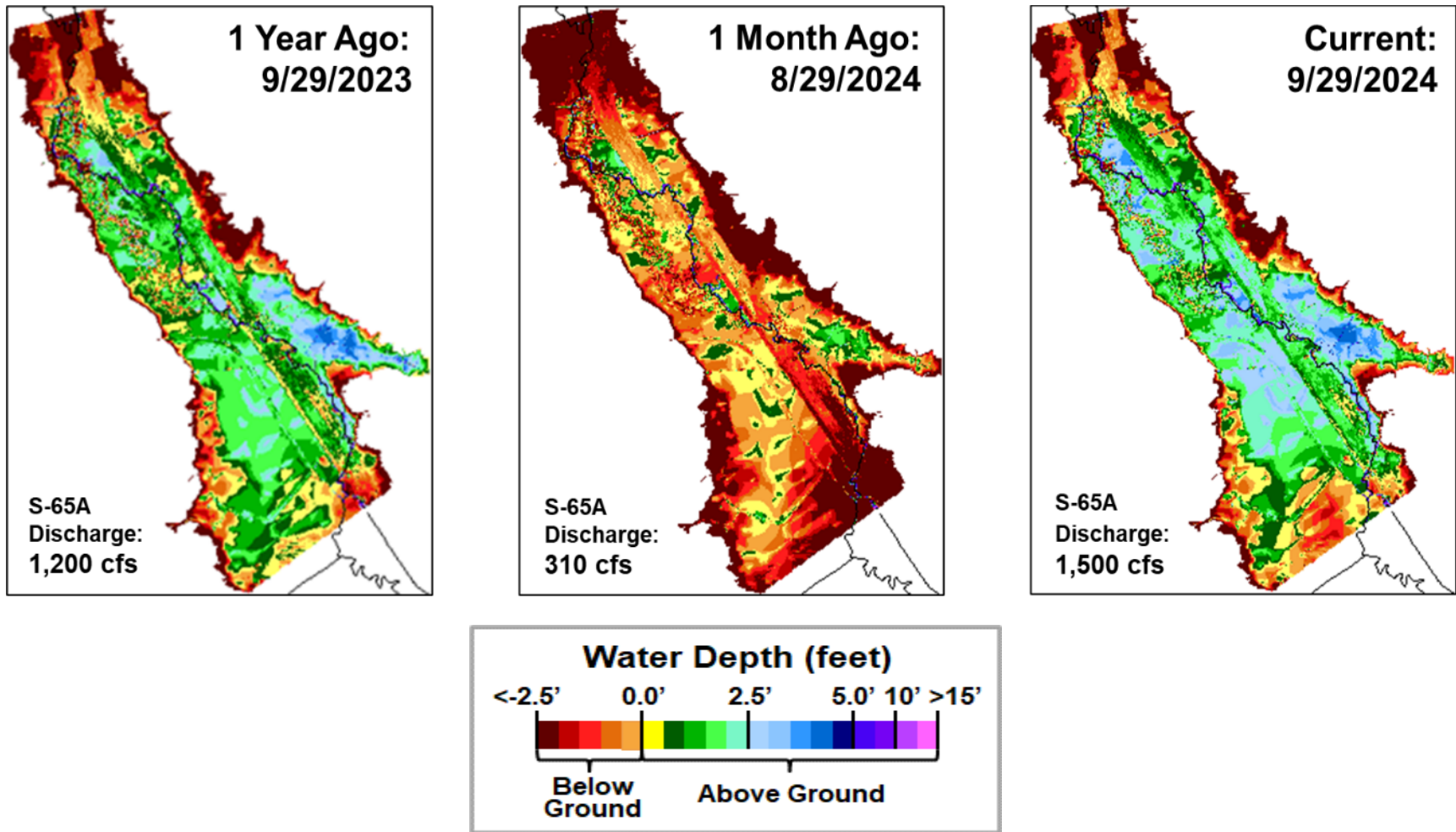
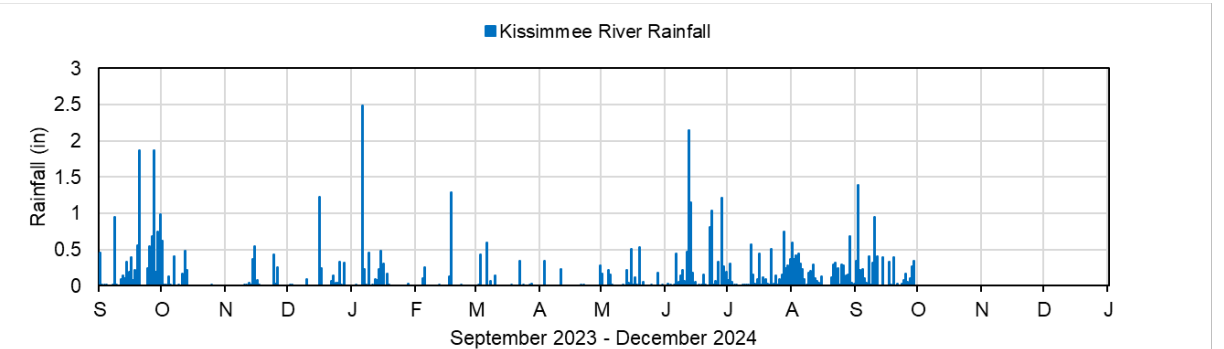
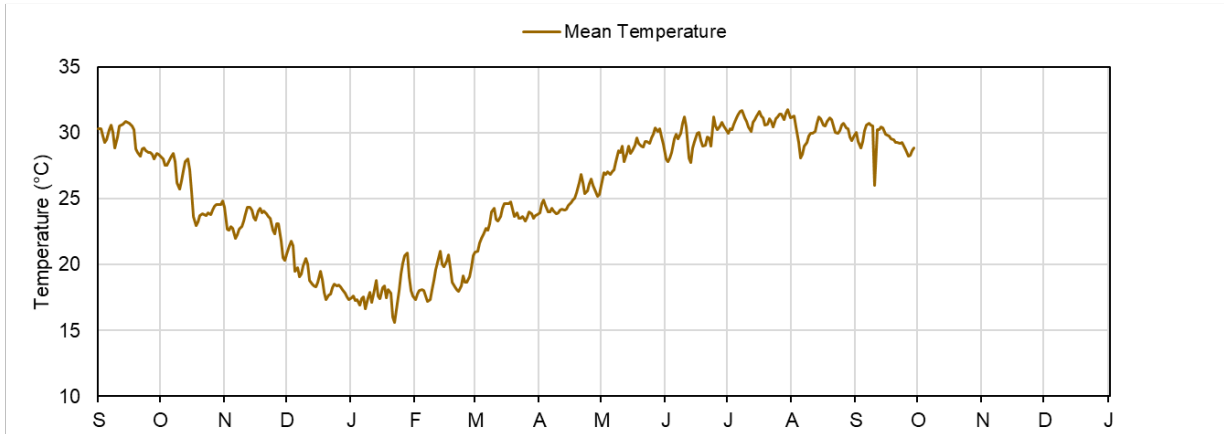
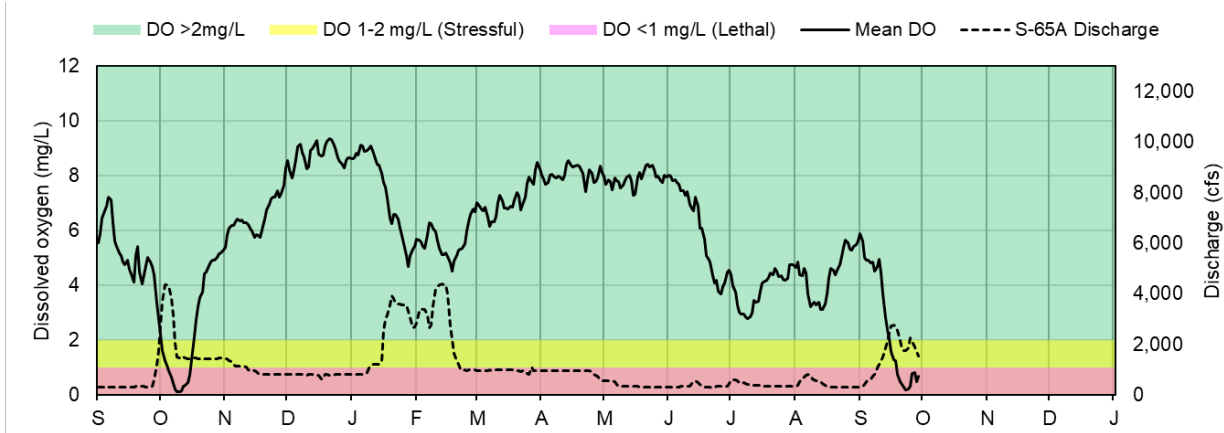


Figure KB-5. Phase I area Kissimmee River floodplain water depths (from left to right) one year ago, one month ago, and current.



Report Date: 10/1/2024; data are through: 9/29/2024



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

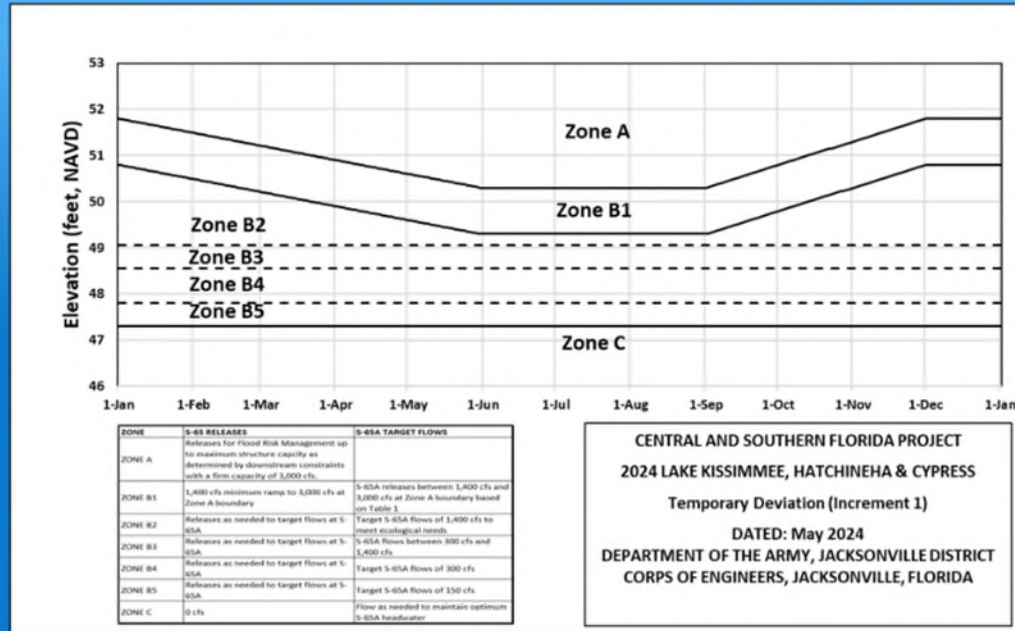


Table KB-3. Maximum Rate of Change Limits for S-65A

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 14.02 feet NAVD88 (15.32 ft NGVD29) on September 29, 2024, which was 0.19 feet higher than the previous week and 1.06 feet higher than a month ago (**Figure LO-1**). Lake stage is in Zone D of the regulation schedule (**Figure LO-2**) and was 0.59 feet above the upper limit of the recovery ecological envelope (**Figure LO-3**). According to NEXRAD, 1.20 inches of rain fell directly over the Lake last week.

Average daily inflows (excluding rainfall) decreased from 7,230 cfs the previous week, to 5,510 cfs. The largest single inflow came from the Kissimmee River via the S65E structure (2,160 cfs) followed by Fisheating Creek (1,510 cfs). For the third 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 29, 2024, NOAA's Harmful Algal Bloom Monitoring System suggests patches of moderate cyanobacteria abundance in the northwestern region of the Lake and outside of Fisheating Bay (**Figure LO-6**).

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

1 Month Ago:
08/29/2024

Current:
09/29/2024

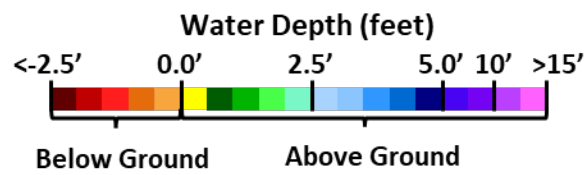
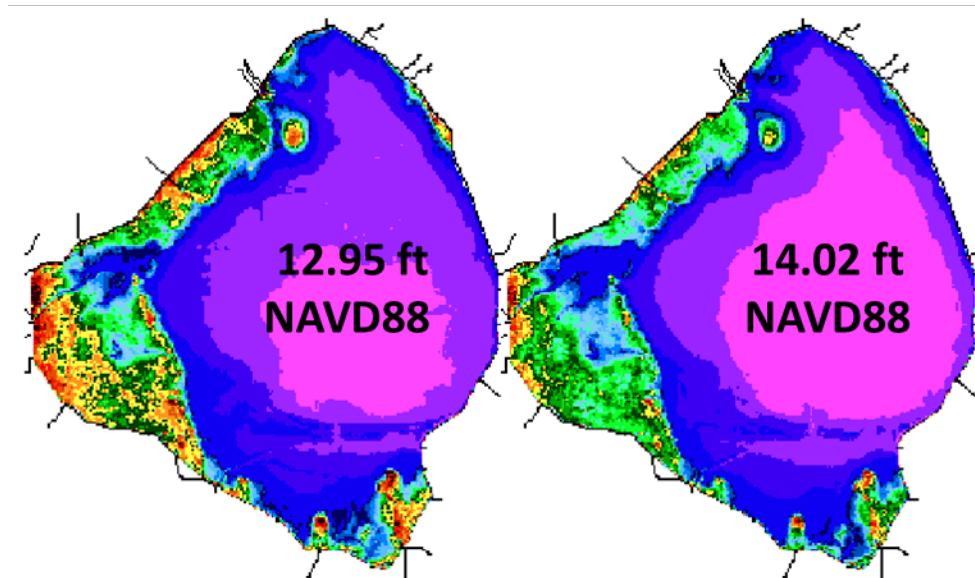


Figure LO-1. Lake Okeechobee water depth estimates based on South Florida Water Depth Assessment Tool (SFWDAT).

Lake Okeechobee Water Level History and Projected Stages

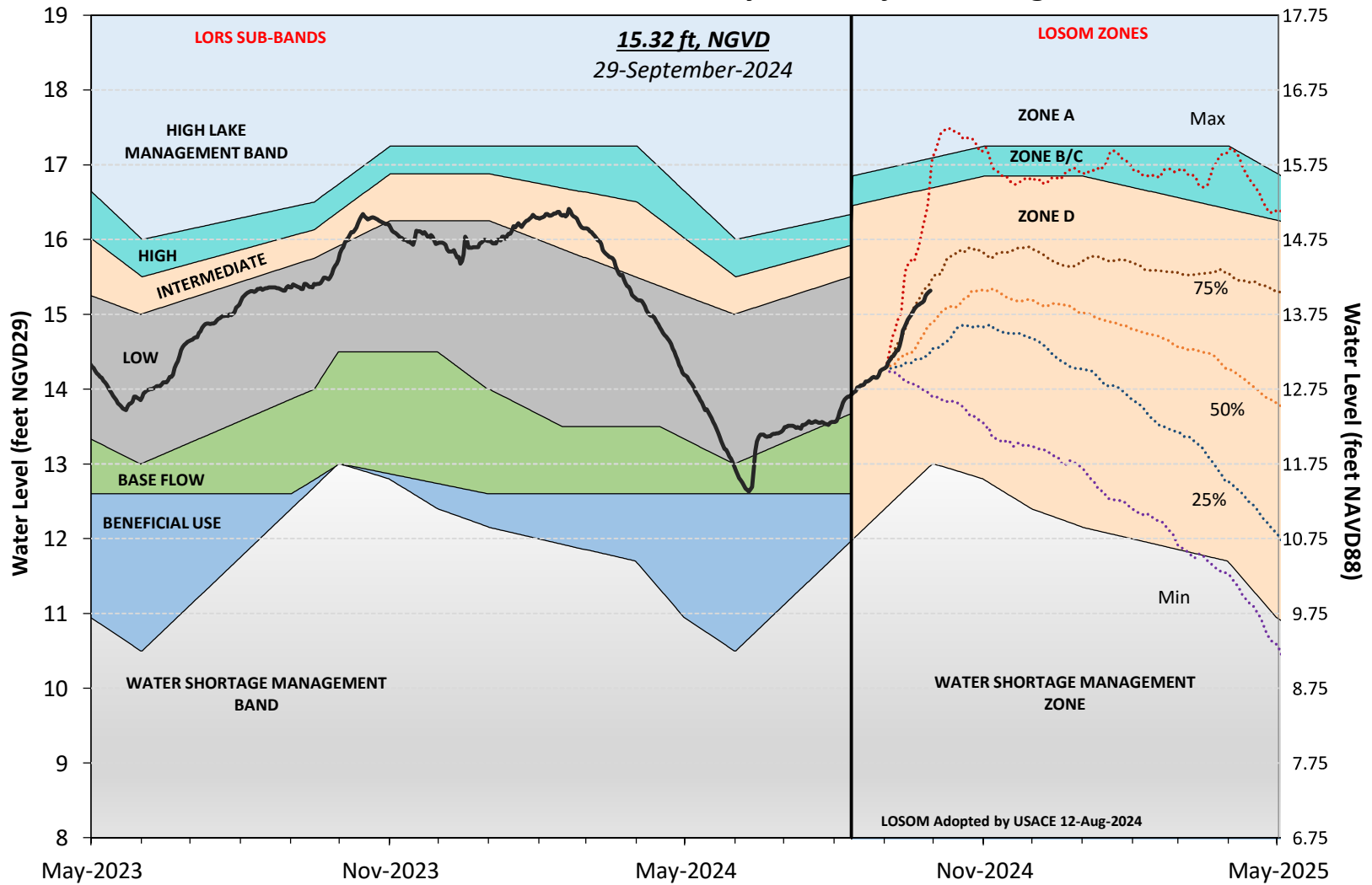


Figure LO-2. Recent Lake Okeechobee stages with projected stages based on a dynamic position analysis. Note: stages are in NGVD29, approximate NAVD88 values are shown for reference.

Lake Okeechobee Stage vs Recovery Ecological Envelope

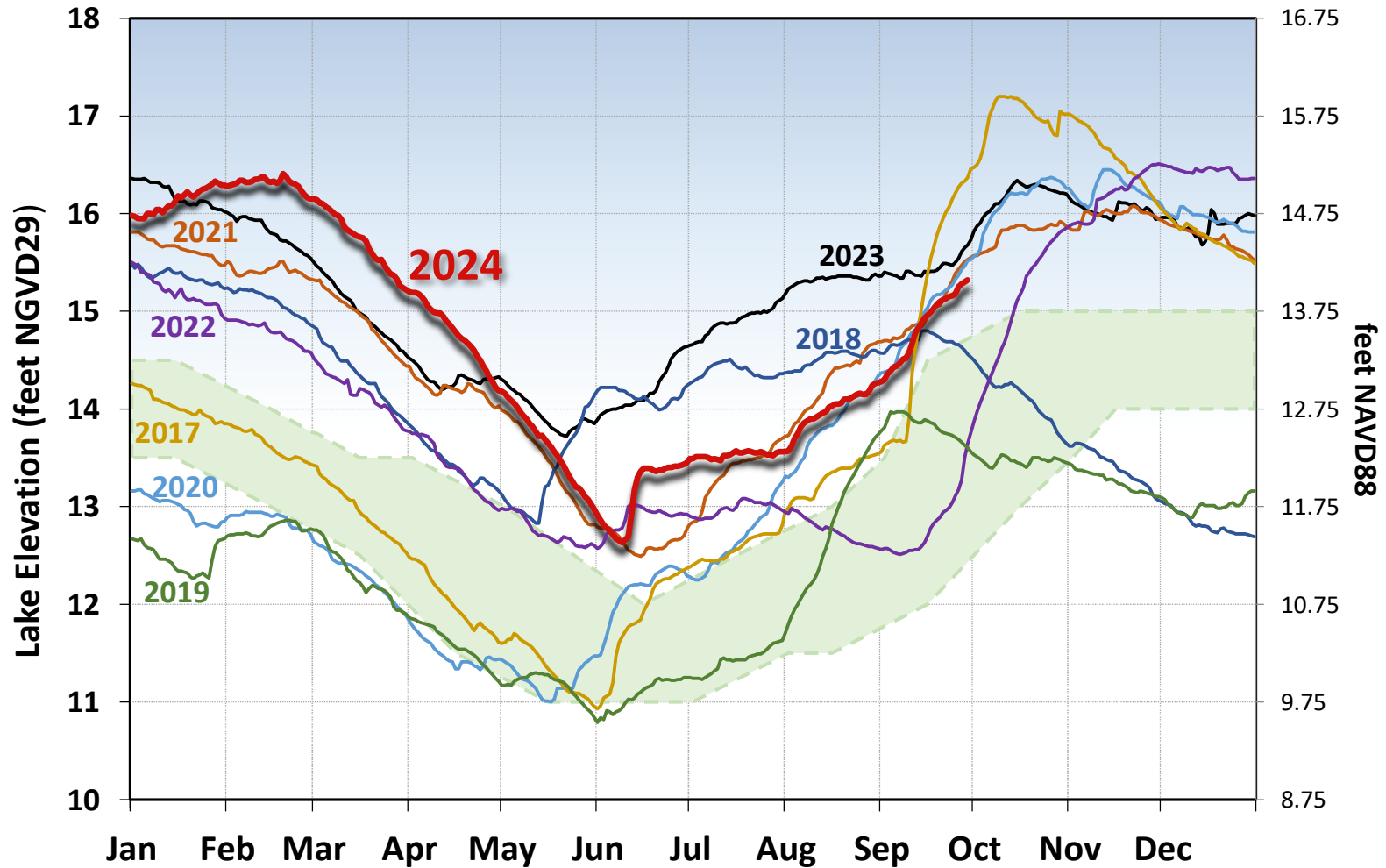


Figure LO-3. The current and seven prior year's annual stage hydrographs for Lake Okeechobee in comparison to the recovery envelope (light green). A shift from the normal ecological envelope to the recovery envelope occurred because the 30-day minimum lake stage (elevations exposed for at least 30 days,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

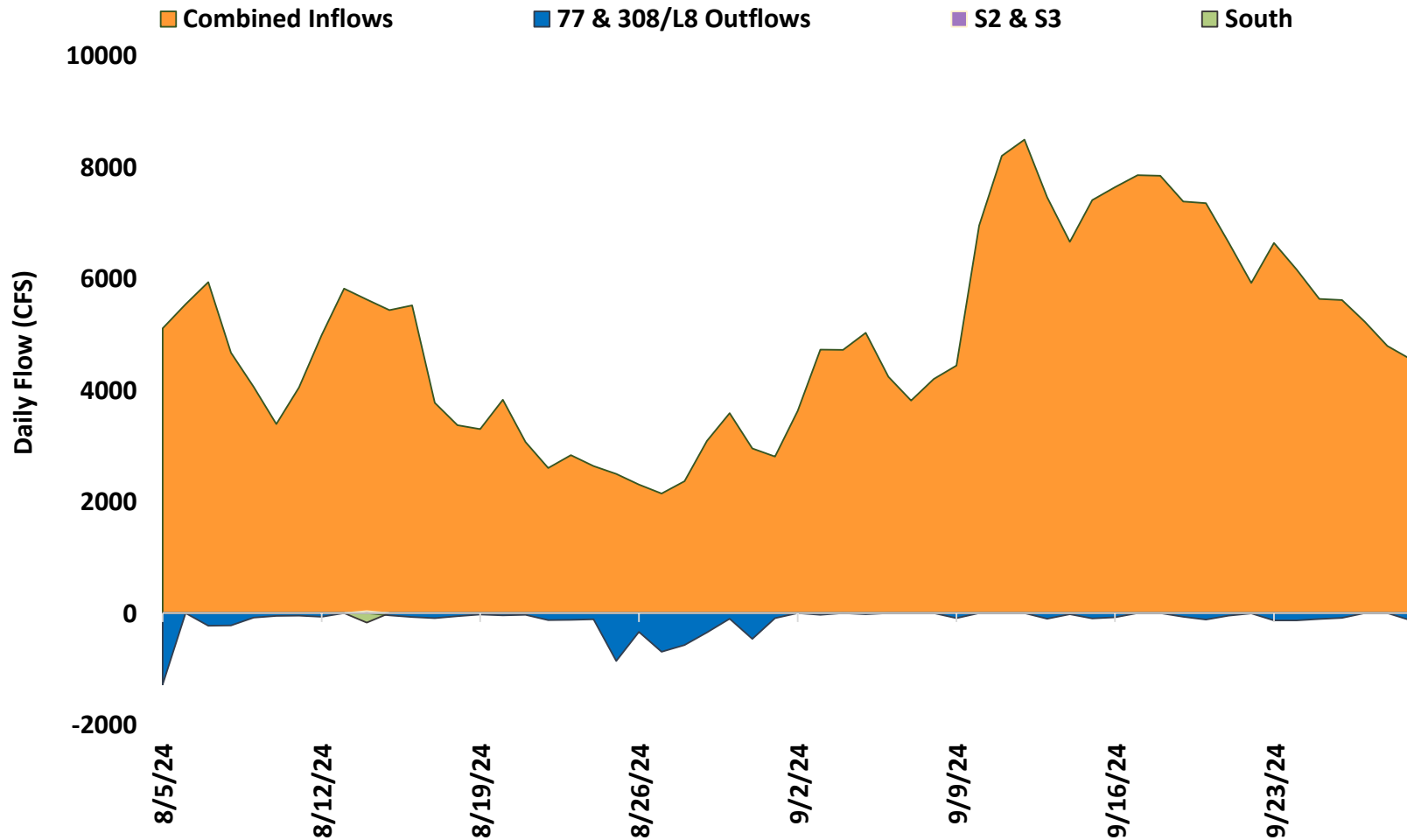


Figure LO-4. Major inflows (orange) to and outflows east and west (blue) from Lake Okeechobee. Outflows south are shown in green. Flows into Lake Okeechobee from the L-8 canal through S-271 (formerly Culvert 10A) or from the C-44 canal through the S-308 are included as inflows. Conversely, flows from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

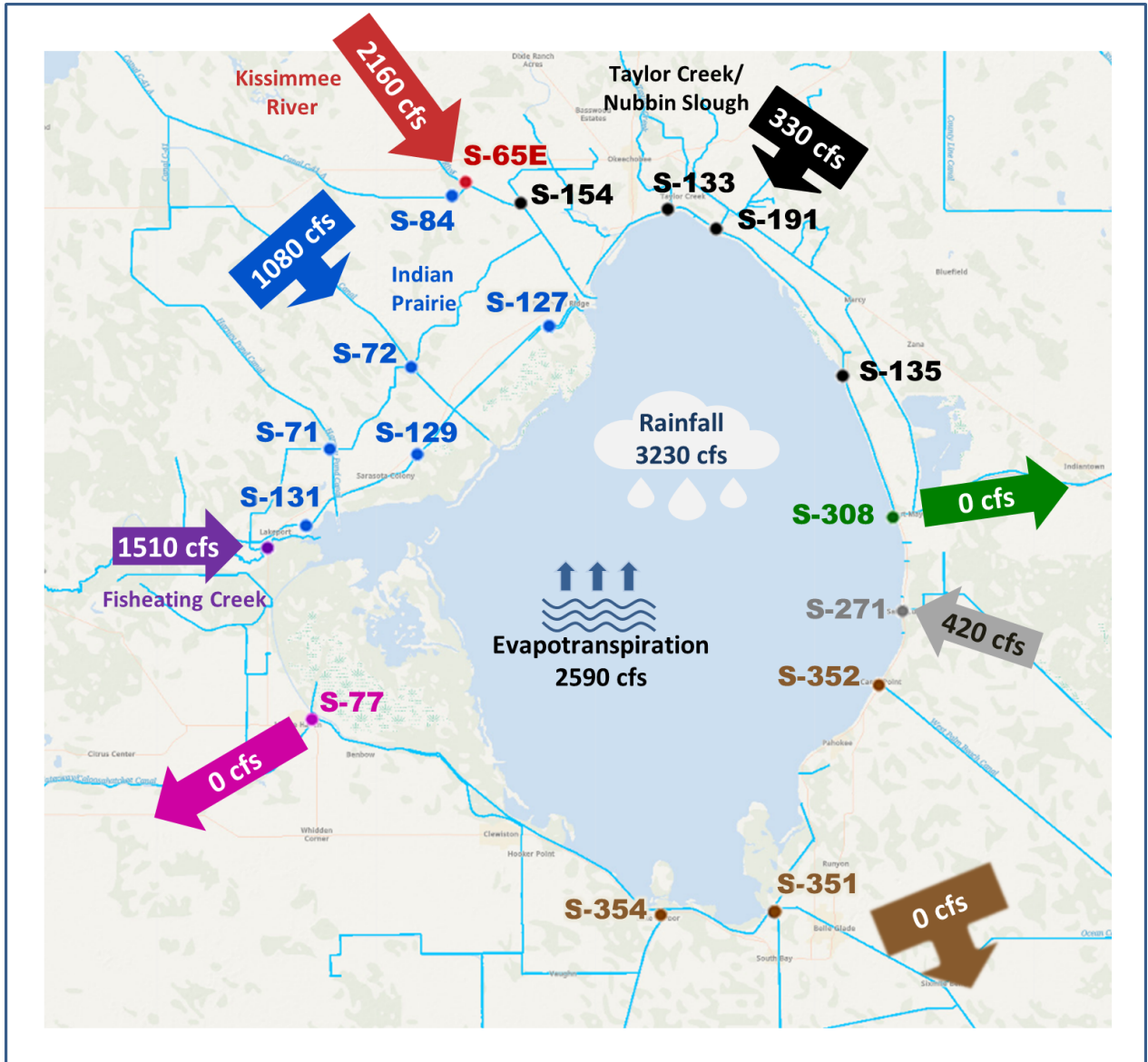


Figure LO-5. Inflows into Lake Okeechobee from Indian Prairie basins, Taylor Creek/Nubbin Slough, Kissimmee River and Fisheating Creek, and outflows to the west via S-77, to the east via S-308, to the south via S-351, S-352, S-354, and to southeast via S-271 (formerly Culvert 10A) for the week of September 23 - 29, 2024.

Lake Okeechobee September 29, 2024

NOAA cyanobacteria product
derived from Copernicus Sentinel-3
OLCI data from EUMETSAT

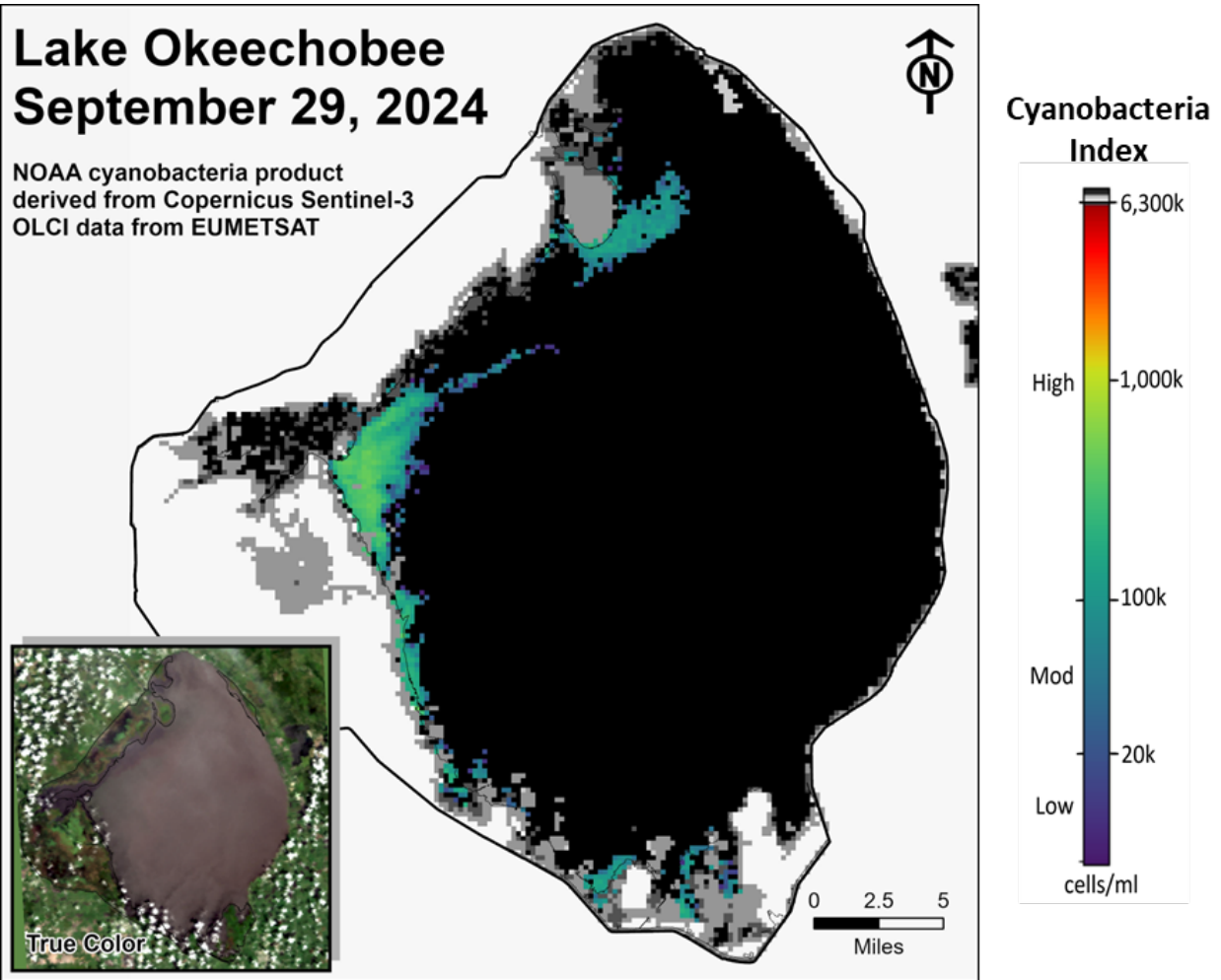


Figure LO-6. Cyanobacteria bloom index level on Lake Okeechobee, based on NOAA's harmful algal bloom monitoring system. Gray color indicates cloud cover. *Provisional NOAA image, subject to change*.

Estuaries

St. Lucie Estuary

Over the past week, mean total inflow to the St. Lucie Estuary was 2,515 cfs (**Figures ES-1 and ES-2**), and the previous 30-day mean inflow was 3,342 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 the A1A and US1 Bridge sites. The recorder at HR1 is currently under repair and was not reporting values for the past week (**Table ES-1 and Figure ES-3**). The seven-day moving average of the surface and bottom salinities at the US1 Bridge was 3.6. Salinity conditions in the middle estuary were estimated to be within the damaging 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, similar to the previous month (**Figure ES-5**).

Caloosahatchee River Estuary

Over the past week, mean total inflow to the Caloosahatchee River Estuary was 5,062 cfs (**Figures ES-6 and ES-7**), and the previous 30-day mean inflow was 6,105 cfs. For comparison, the historical provisional mean inflows from the contributing areas are shown in **Figure ES-7**.

Over the past week, salinities remained < 1 at S-79, Val I-75, and Ft. Myers and increased at the remaining sites in the estuary (**Table ES-2 and Figures ES-8 and ES-9**). Cape Coral and Sanibel salinity recorders stopped reporting on September 26, 2024, likely from the passing of Hurricane Helene so data reported only represent four days at these stations. The seven-day mean salinities (**Table ES-2**) were in the optimal range (0-10) for tape grass in the upper estuary. Based on the available data for the past seven days, mean salinity values were within the lower stressed range for adult eastern oysters at Cape Coral, in the optimal range at Shell Point, and in the upper stressed range at Sanibel (**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, 2013¹) 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 and estimated tidal basin inflows of 1,302 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

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

keeps predicted salinities in the upper estuary within the optimal salinity range (0-10) for tape grass.

Red Tide

The FWRI reported on September 20, 2024, that *Karenia brevis*, the Florida red tide dinoflagellate, was not observed at bloom concentrations 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.

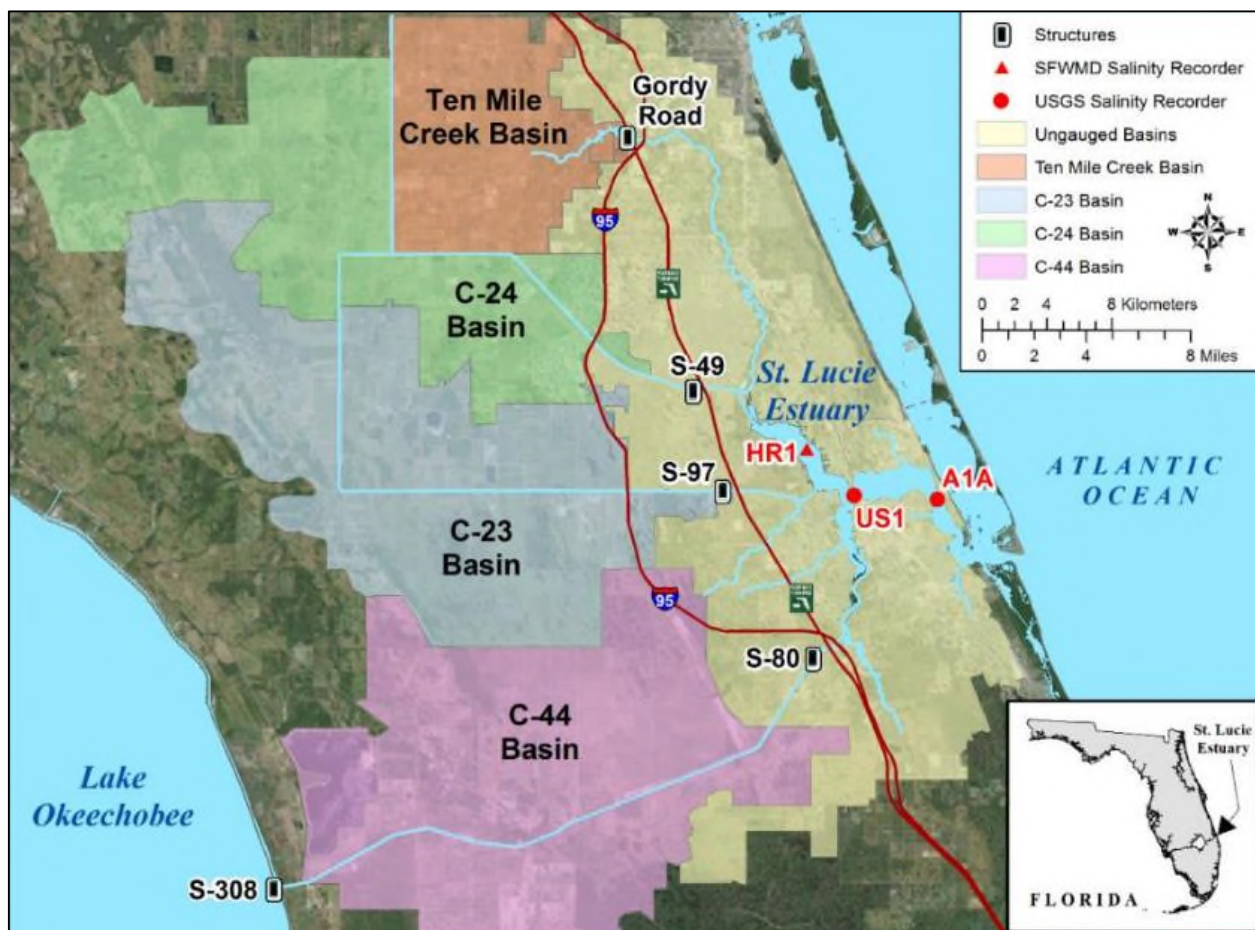


Figure ES-1. Basins, water control structures and salinity monitoring sites in the St. Lucie Estuary.

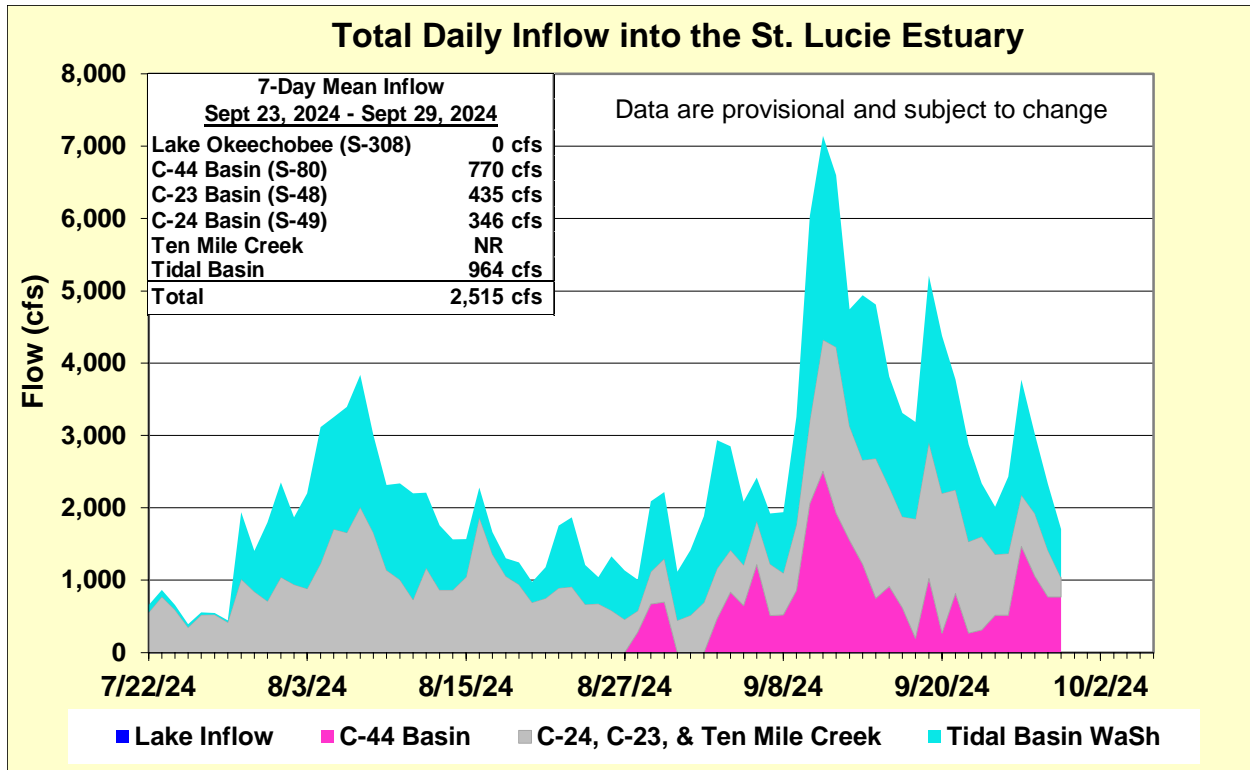


Figure ES-2. Total daily inflows from Lake Okeechobee and runoff from the C-44, C-23, C-24, Ten Mile Creek, and Tidal Basins into the St. Lucie Estuary.

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. NR is not reporting.

Sampling Site	Surface	Bottom	Optimum Envelope
HR1 (North Fork)	NR- (1.3)	NR- (4.2)	10.0 – 25.0
US1 Bridge	3.0 (4.4)	4.2 (6.9)	10.0 – 25.0
A1A Bridge	10.0 (12.1)	18.1 (20.7)	10.0 – 25.0

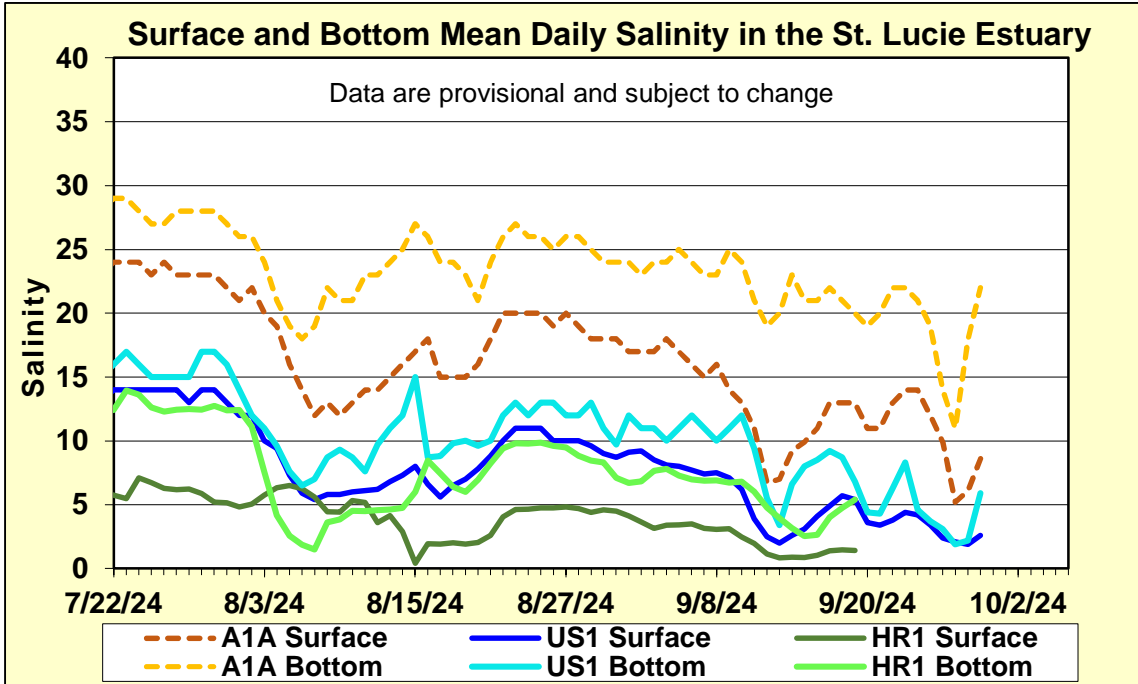


Figure ES-3. Mean daily salinity at the A1A, US1, and HR1 sites in the St. Lucie Estuary.

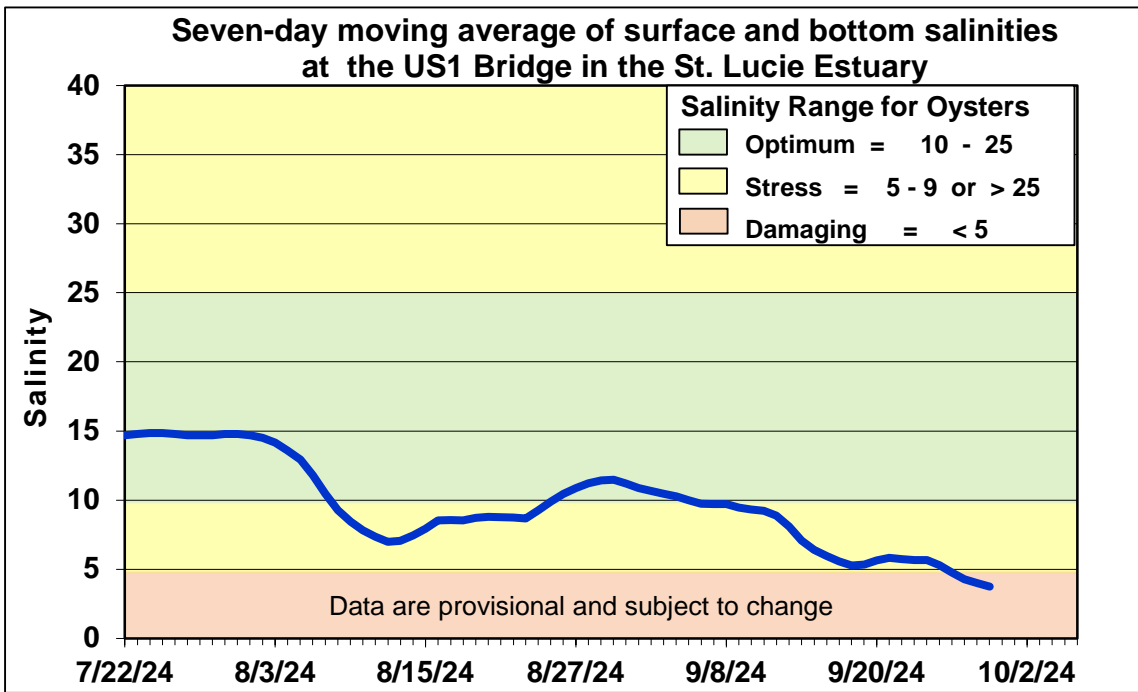


Figure ES-4. Seven-day moving average of the surface and bottom salinities at the US1 Bridge in the St. Lucie Estuary.

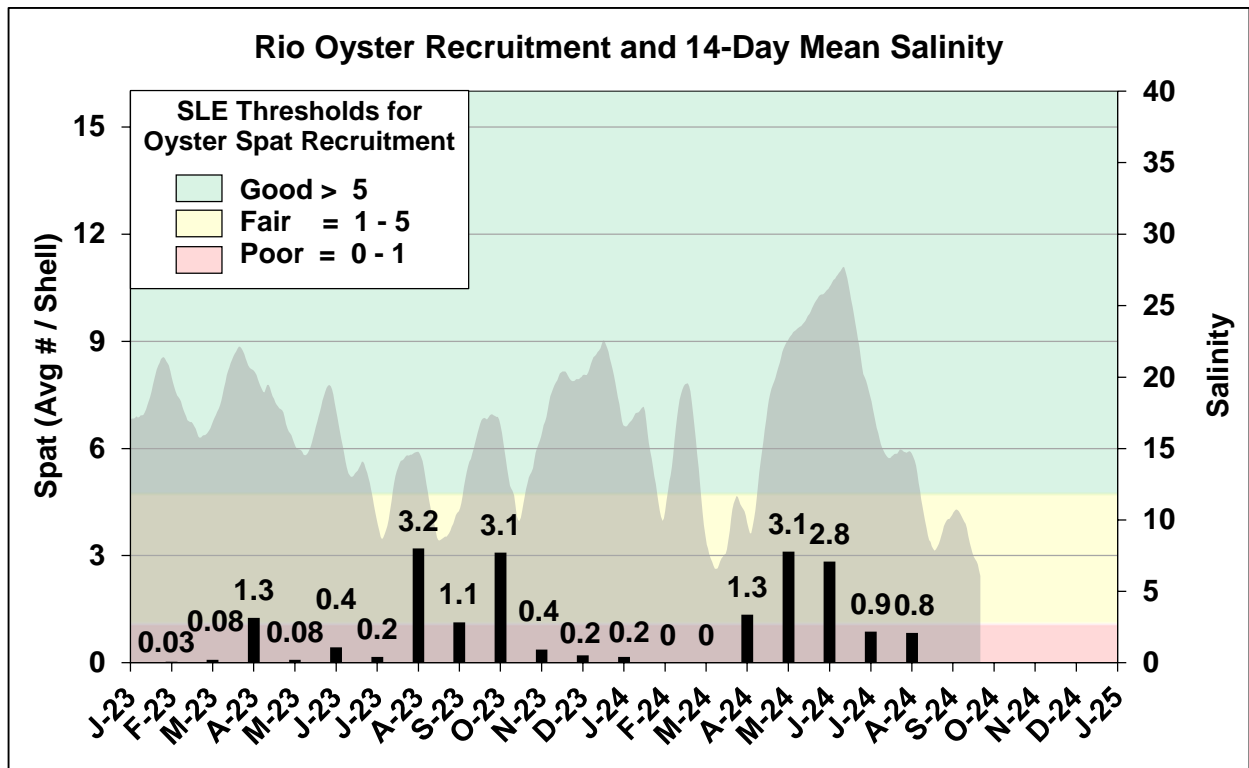


Figure ES-5. Mean oyster recruitment at the Rio oyster monitoring station and 14-day mean salinity at US1 Bridge.

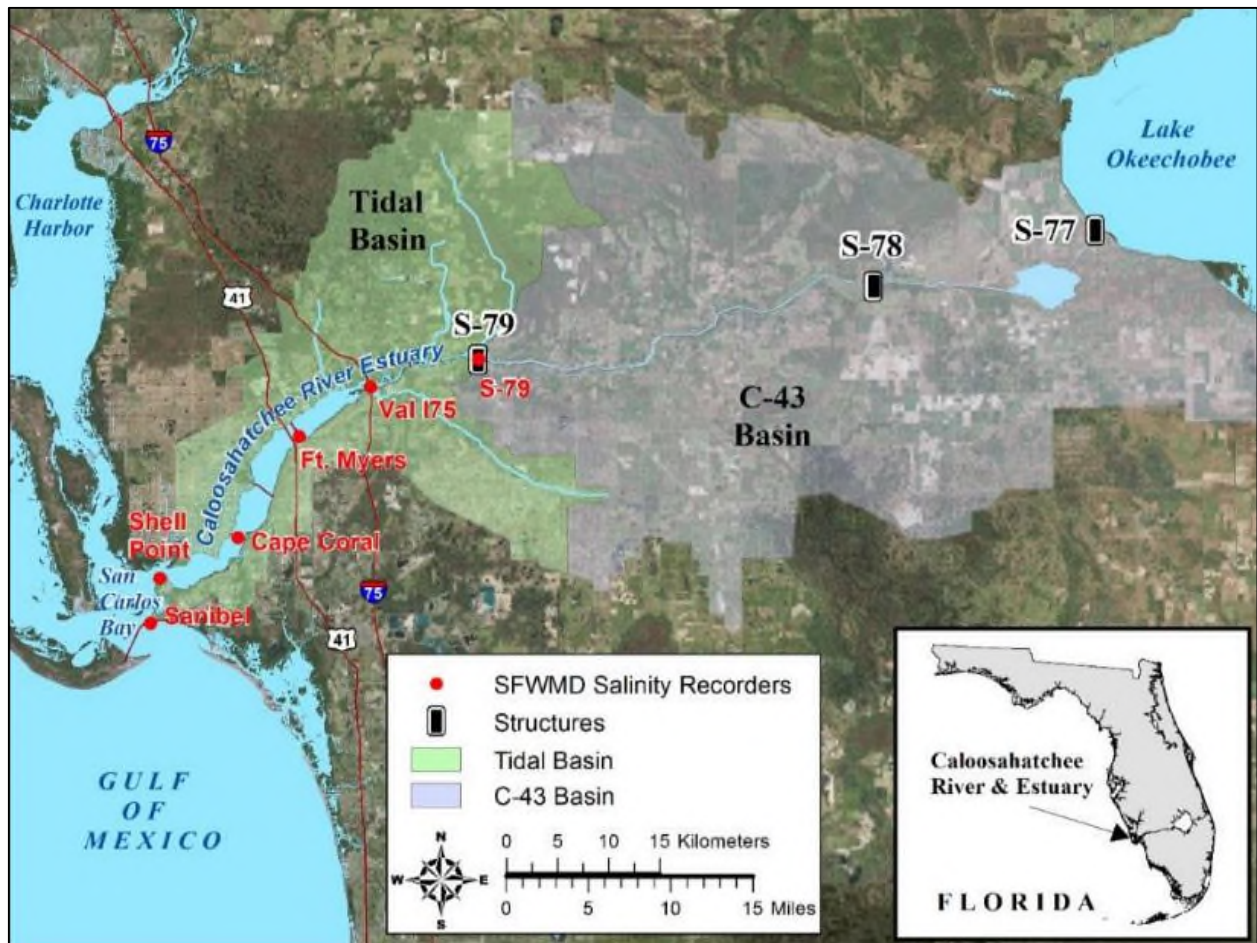


Figure ES-6. Basins, water control structures, and salinity monitoring sites in the Caloosahatchee River Estuary.

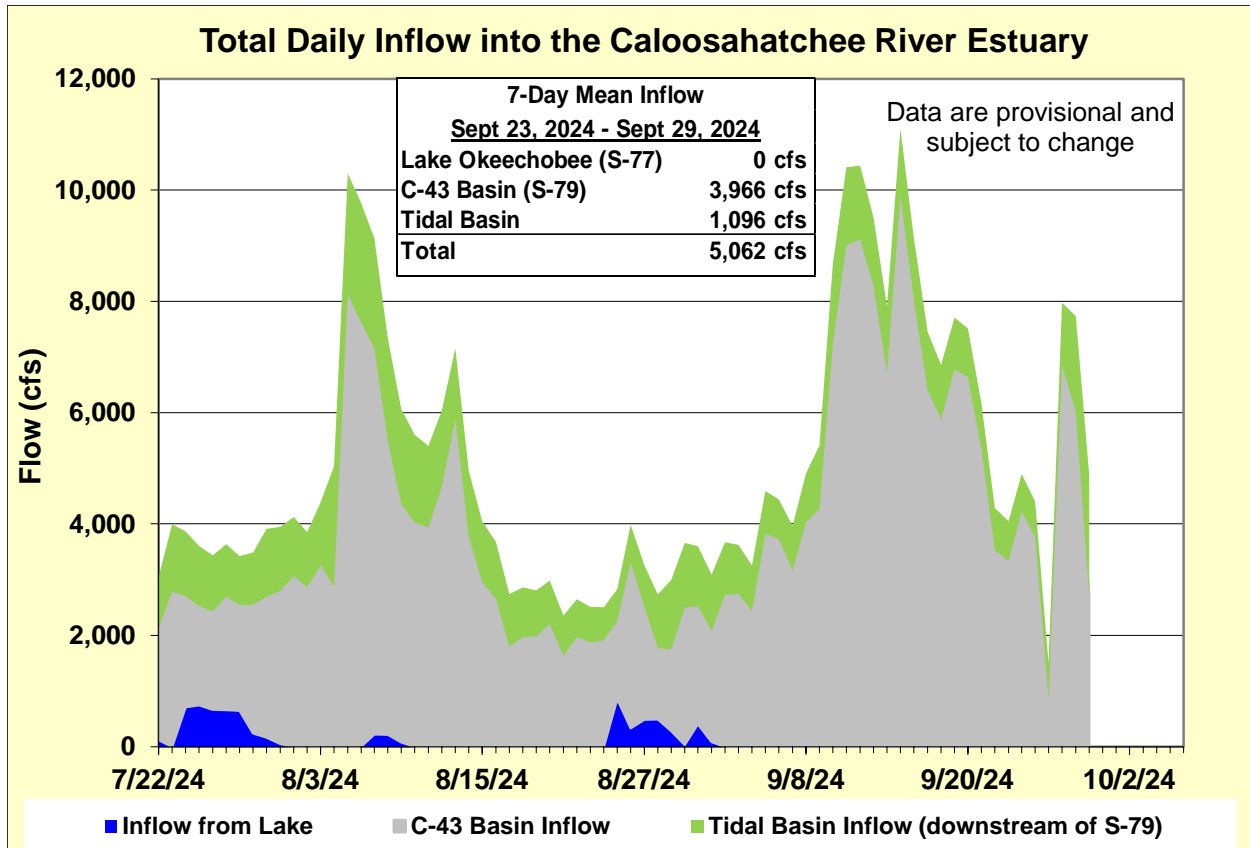


Figure ES-7. Total daily inflows from Lake Okeechobee, and runoff from the C-43 and Tidal basins into the Caloosahatchee River Estuary.

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)	0.2 (0.2)	0.2 (0.2)	0.0 – 10.0
Val I-75	0.2 (0.2)	0.2 (0.2)	0.0 – 10.0
Fort Myers Yacht Basin	0.4 (0.2)	0.4 (0.2)	0.0 – 10.0
Cape Coral	6.0 (0.9)	8.1 (1.3)	10.0 – 25.0
Shell Point	21.2 (15.6)	24.8 (16.5)	10.0 – 25.0
Sanibel	28.8 (24.5)	28.4 (25.2)	10.0 – 25.0

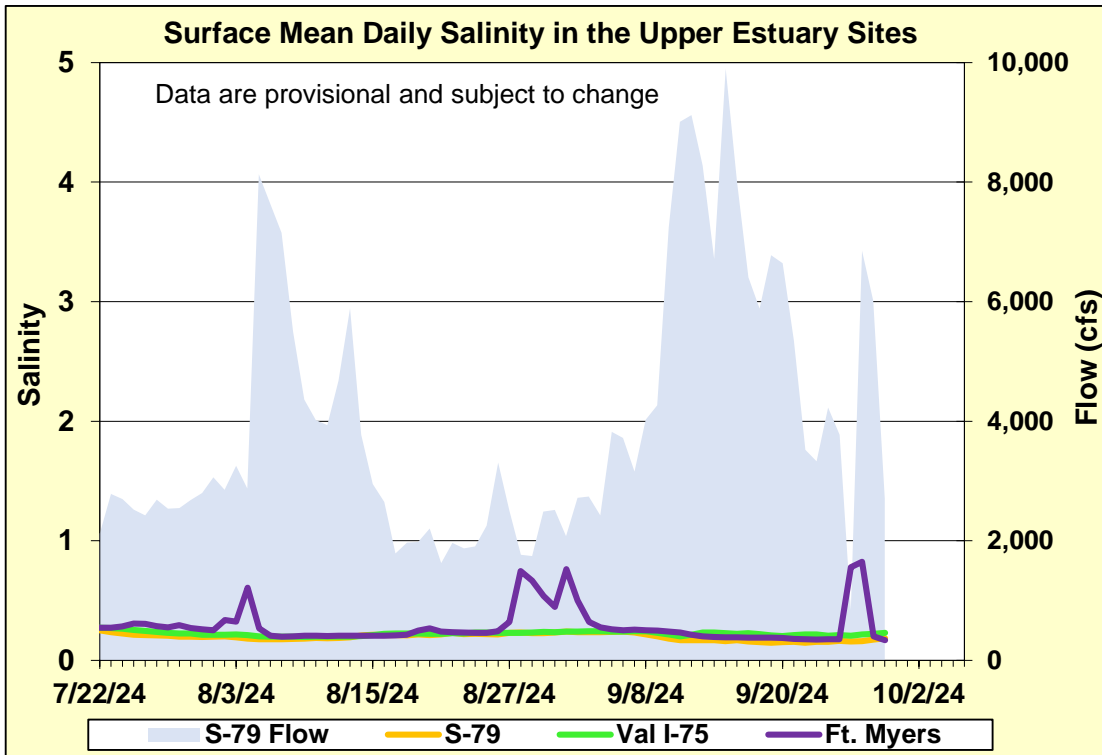


Figure ES-8. Mean daily salinity at upper Caloosahatchee River Estuary monitoring sites and mean daily flow at S-79.

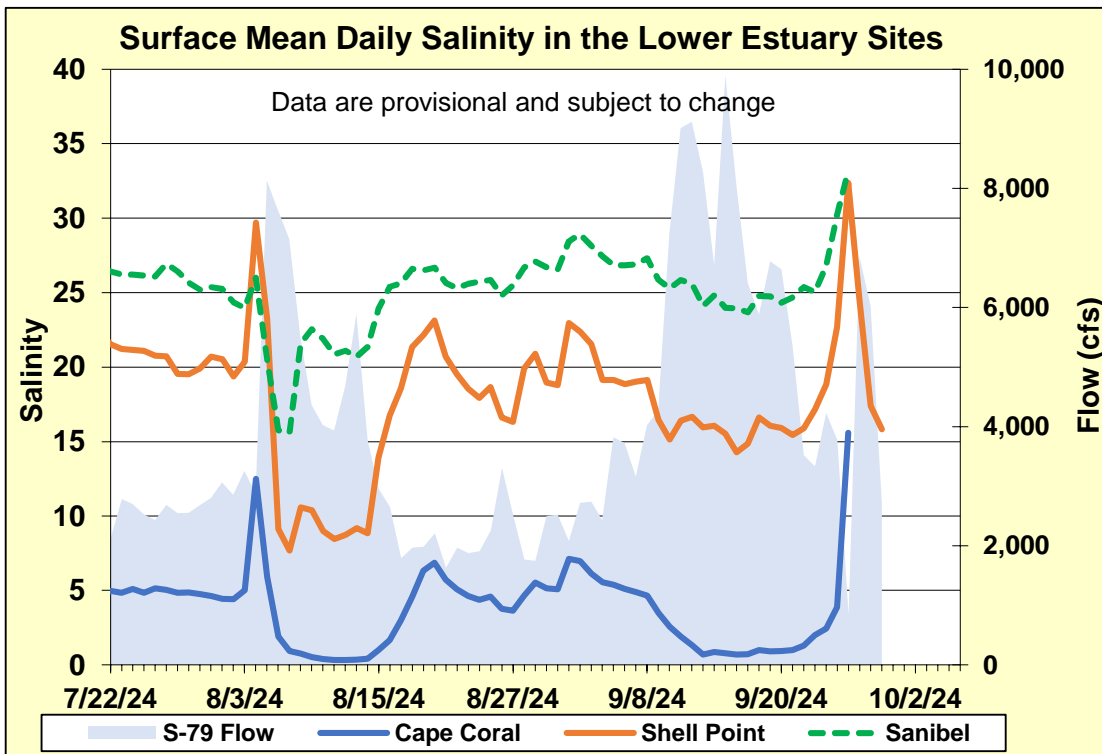


Figure ES-9. Mean daily surface salinity at lower Caloosahatchee River Estuary monitoring sites and mean daily flow at S-79.

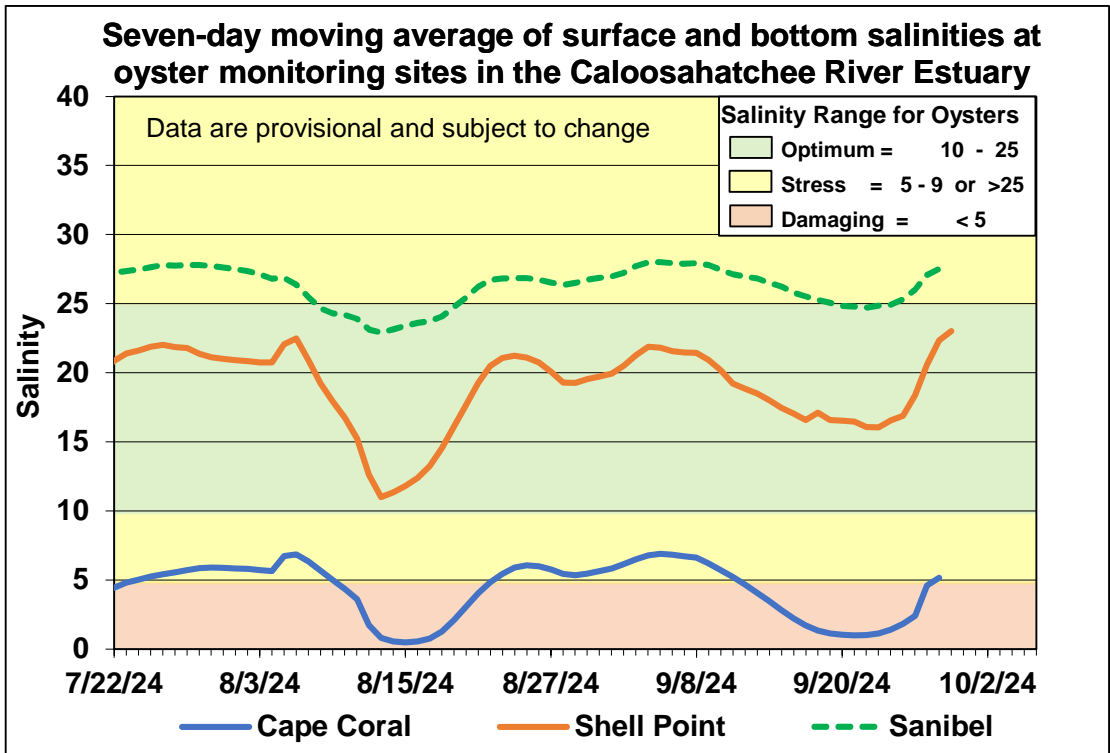


Figure ES-10. Seven-day moving average of surface and bottom salinities at Cape Coral, Shell Point, and Sanibel monitoring sites in the Caloosahatchee River Estuary.

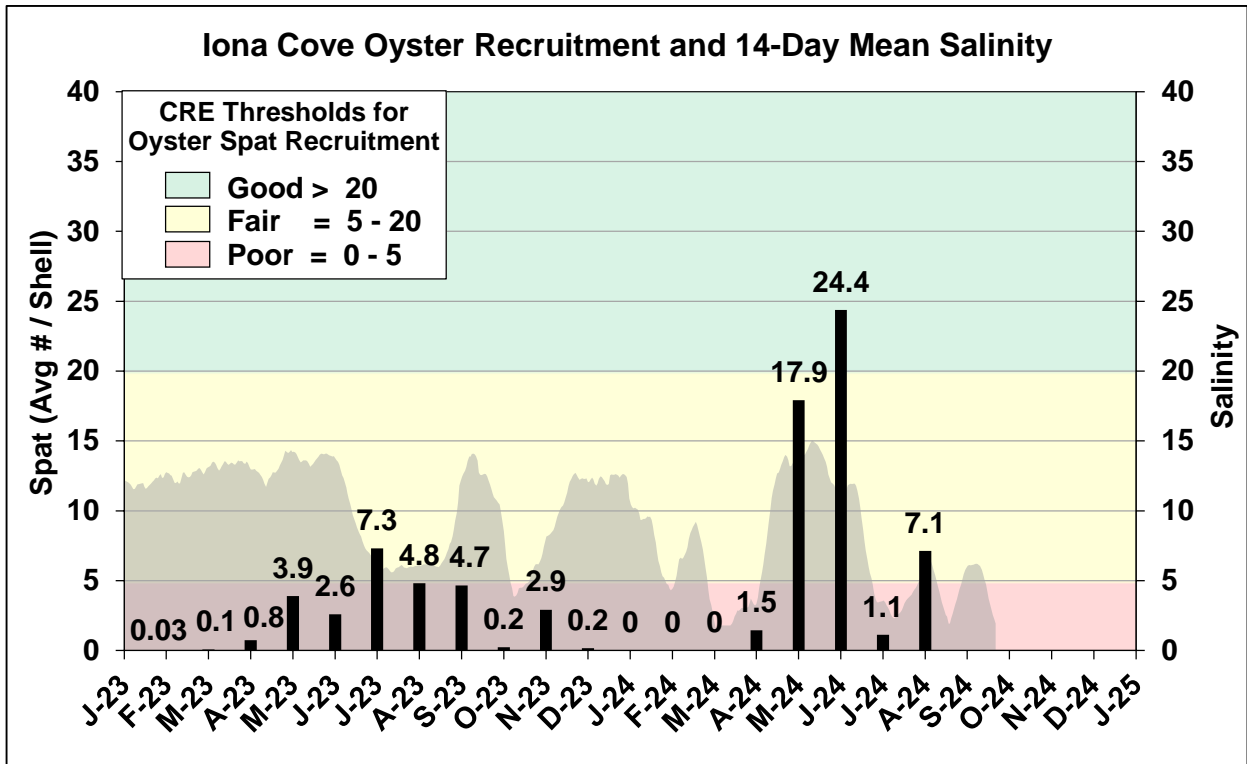


Figure ES-11. Mean oyster recruitment at the Iona Cove oyster monitoring station and 14-day mean salinity at Cape Coral.

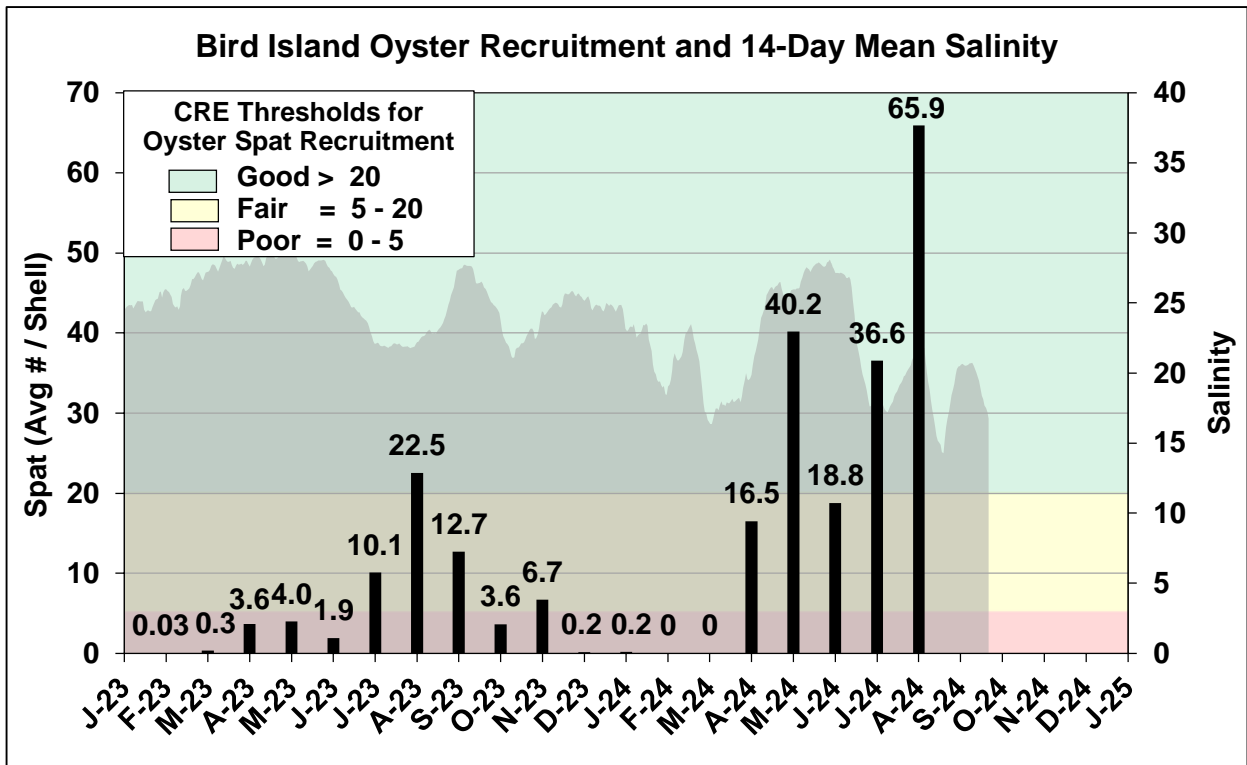


Figure ES-12. Mean oyster recruitment at the Bird Island oyster monitoring station and 14-day mean salinity at Shell Point.

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	1302	0.3	0.3
B	650	1302	0.3	0.3
C	1200	1302	0.3	0.3
D	2000	1302	0.3	0.3

Observed and Forecasted Flow at S-79 and Salinity at Val I-75

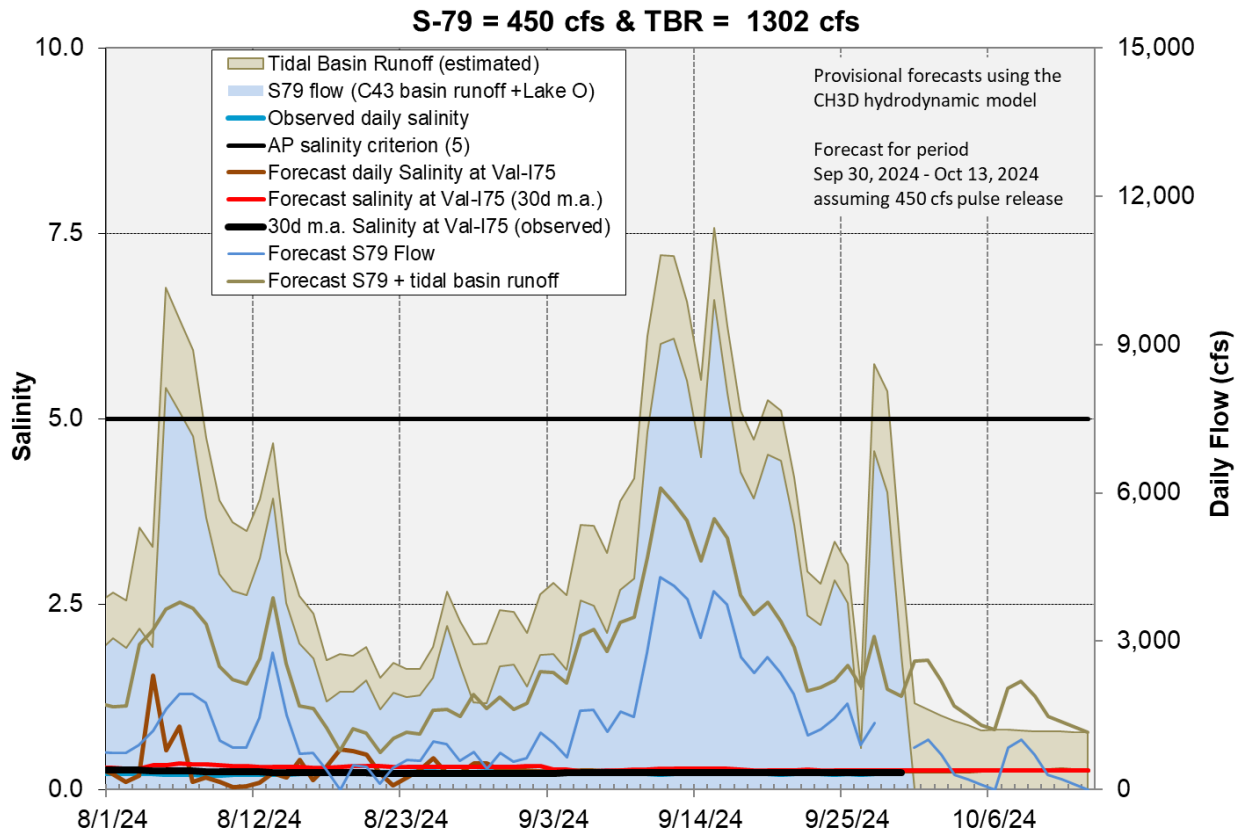


Figure ES-13. Surface salinity forecast at the Val I-75 site assuming a 450 cfs pulse release at S-79.

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 g/m²/year (**Figure S-1**).

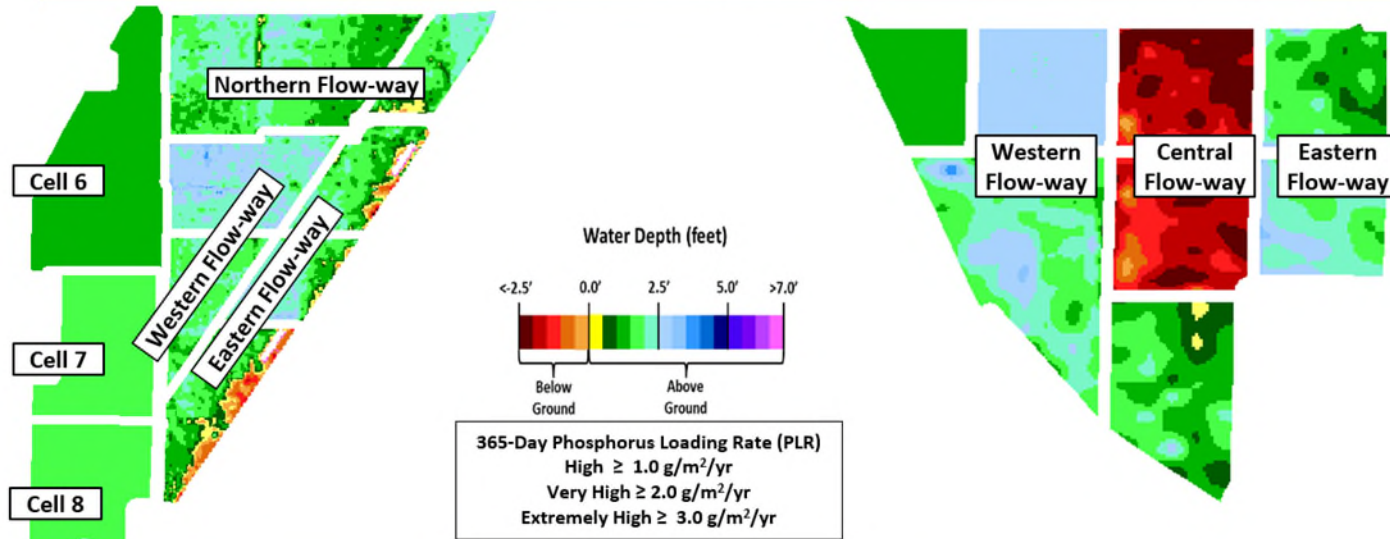
STA-2: Operational restrictions are in place in Flow-ways 2 and 4 for vegetation management activities. Online treatment cells are above target stage. Vegetation in Flow-ways 2, 3, and 4 is stressed, and in 5 is highly stressed. The 365-day PLRs for Flow-ways 1, 4, and 5 are below 1.0 g/m²/year. The 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, 6, 7, and 8 are below 1.0 g/m²/year, and the 365-day PLRs for Flow-ways 2, 3, 4, and 5 are high. (**Figure S-3**).

For definitions on STA operational language see glossary following figures.

Eastern Flow Path Weekly Status Report – 9/23/2024 through 9/29/2024

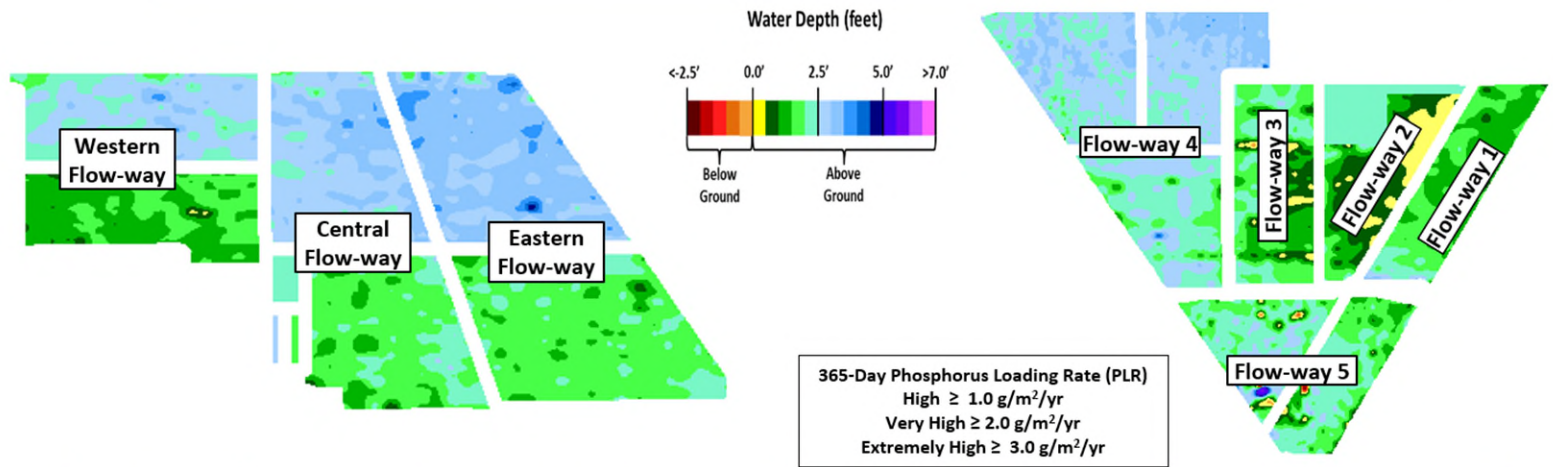


STA-1W	Flow-way Status
Western	<ul style="list-style-type: none"> • High 365-day PLR • Highly stressed vegetation conditions
Eastern	<ul style="list-style-type: none"> • High 365-day PLR • Highly stressed vegetation conditions
Northern	<ul style="list-style-type: none"> • Stressed vegetation conditions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

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

Figure S-1. Eastern Flow Path Weekly Status Report

Central Flow Path Weekly Status Report – 9/23/2024 through 9/29/2024

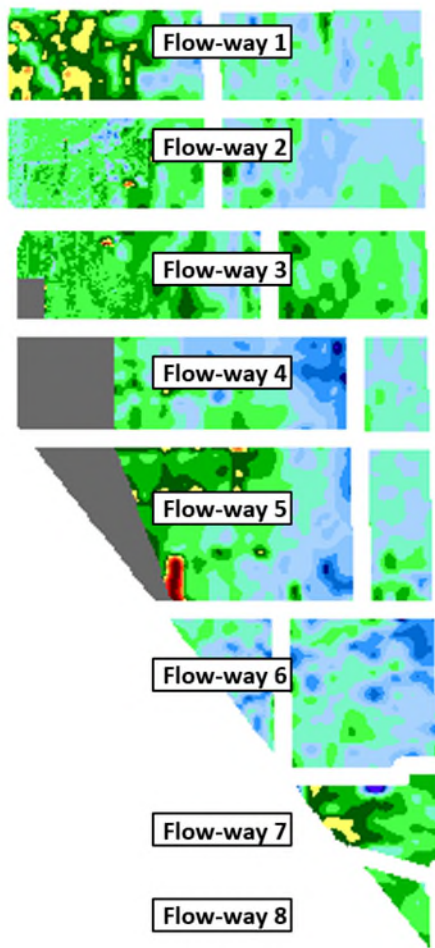


STA-3/4	Flow-way Status
Western	<ul style="list-style-type: none"> High 365-day PLR
Central	<ul style="list-style-type: none"> Highly stressed vegetation conditions High 365-day PLR
Eastern	<ul style="list-style-type: none"> Post-drawdown vegetation grow-in

STA-2	Flow-way Status
Flow-way 1	<ul style="list-style-type: none"> Upstream FAV control
Flow-way 2	<ul style="list-style-type: none"> High 365-day PLR Post-construction vegetation grow-in Stressed vegetation conditions Upstream FAV control
Flow-way 3	<ul style="list-style-type: none"> High 365-day PLR Stressed vegetation conditions Upstream FAV control
Flow-way 4	<ul style="list-style-type: none"> Planting emergent vegetation Upstream FAV control
Flow-way 5	<ul style="list-style-type: none"> Highly stressed vegetation conditions

Figure S-2. Central Flow Path Weekly Status Report

Western Flow Path Weekly Status Report – 9/23/2024 through 9/29/2024



STA-5/6	Flow-way Status
Flow-way 1	<ul style="list-style-type: none"> Highly stressed vegetation conditions
Flow-way 2	<ul style="list-style-type: none"> Highly stressed vegetation conditions High 365-day PLR
Flow-way 3	<ul style="list-style-type: none"> Highly stressed vegetation conditions High 365-day PLR
Flow-way 4	<ul style="list-style-type: none"> Stressed vegetation conditions High 365-day PLR
Flow-way 5	<ul style="list-style-type: none"> Highly stressed vegetation conditions High 365-day PLR
Flow-way 6	<ul style="list-style-type: none"> Highly stressed vegetation conditions
Flow-way 7	<ul style="list-style-type: none"> Stressed vegetation conditions
Flow-way 8	<ul style="list-style-type: none"> Stressed vegetation conditions

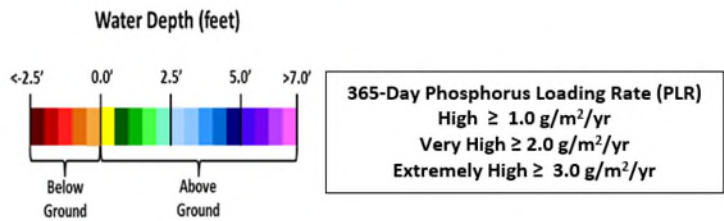


Figure S-3. Western Flow Path Weekly Status Report

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

Less rainfall occurred throughout the region over the past week despite the tropical activity. WCA-1: Stages were relatively unchanged last week in the Refuge. On Sunday, September 29, 2024, the 3-Gauge average was approximately 0.5 feet below the A1 Zone regulation line. WCA-2A: Stage receded at gauge 2A-17 last week but remains above the Zone A regulation line by 0.99 feet as of Sunday. WCA-3A: The 3-Gauge average stage ascended over last week, remaining above the Zone A regulation line on Sunday by 0.86 feet. WCA-3A North: Stage change at Gauge 62 (NW corner) remained close to flat last week but continues trending above the upper schedule line. On Sunday stage was 0.23 feet above the upper schedule line. See figures **EV-1** through **EV-4**.

Water Depths

The SFWDAT model output for September 29, 2024, illustrates a hydropattern of overall much wetter conditions compared to a month ago, especially the southern regions of the WCAs and northern Everglades National Park (ENP). Ponded conditions continue to expand in southern WCA-3A and northern Shark River Slough. Water levels have risen to near ground surface in southern Big Cypress over the past month. Hydrologic connectivity continues to strengthen 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 deeper in northern WCA-3A, WCA-2A and WCA-1. The comparison to modeled conditions a year ago show a more mixed trend exhibiting slightly shallower conditions in southern WCA-3A/northern ENP and WCA-1. The rest of the EPA is experiencing slightly deeper conditions.

Comparing current conditions to the 20-year percentiles for September 29th; only southern WCA-3A and southern Big Cypress National Preserve (BCNP) are below the 70th percentile of the interquartile range (IQR) for this time of year. WCA-3B remains above the 90th percentile across most of that sub-basin, and large portions of eastern ENP also remain well above average. See figures **EV-5** through **EV-7**.

Taylor Slough and Florida Bay

Stage changes were variable across Taylor Slough over the past week, with an average increase of 0.10 feet. Changes ranged from -0.09 feet at Taylor Slough Bridge (TSB) in the northern slough to +0.35 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 6.7 inches compared to before the Florida Bay initiative (starting in 2017), an increase of 0.4 inches relative to last week's comparison. The CP stage is now approximately equal to estimated historical levels (circa 1900) while the TSB stage is below by 0.92 feet.

Average Florida Bay salinity was 26.1, an increase of 0.1 from last week. Stormy conditions resulted in variable salinity changes ranging from -2.1 at Buoy Key (BK) in the western region to +9.6 at Joe Bay (JB) in the eastern nearshore region (Figure **EV-8**). Salinity is above estimated historical levels (circa 1900) and at the WY2001-2016 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 above its recent average for this time of year by 1.2, an increase of 0.5 from last week.

Salinity at the Taylor River (TR) station in the mangrove zone (tracked for the Florida Bay MFL) was 11.9. The 30-day moving average was 3.5, an increase of 1.4 from last week (Figure **EV-11**). Some creek flow data were missing this week, but based on the data available, the 365-day moving sum of flow from the five major creeks (McCormick Creek, Taylor River, Mud Creek, Trout Creek, West Highway Creek) was 373,951 acre-feet, a decrease of 2,368 acre-feet from last week (Figure **EV-11**).

Average rainfall across Taylor Slough and Florida Bay was 1.49 inches over the past week, based on the 18 gauges used for this report. Rainfall ranged from 0.52 inches at Duck Key (DK) in the eastern region to 2.51 inches at CP in the southern slough (Figure **EV-12**). Wind directions and speeds in Florida Bay ranged from 2.5 mph S on September 28th to 38.8 mph SE on September 26th (Figure **EV-12**). Average daily flow from the five major creeks was unable to be assessed this week due to missing data, but total flow was likely net positive for the week (Figure **EV-13**).

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 becomes more important now as the peak stage has reached a level that should protect the colony from a dry out during the upcoming wading bird nesting season. Wading birds in the EPA have had below average nesting success for three consecutive years. Continued freshwater inputs to ENP and Florida Bay are 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	1.11	-0.02
WCA-2A	1.05	-0.17
WCA-2B	1.31	-0.06
WCA-3A	1.18	+0.13
WCA-3B	1.23	+0.00
ENP	1.19	-0.01

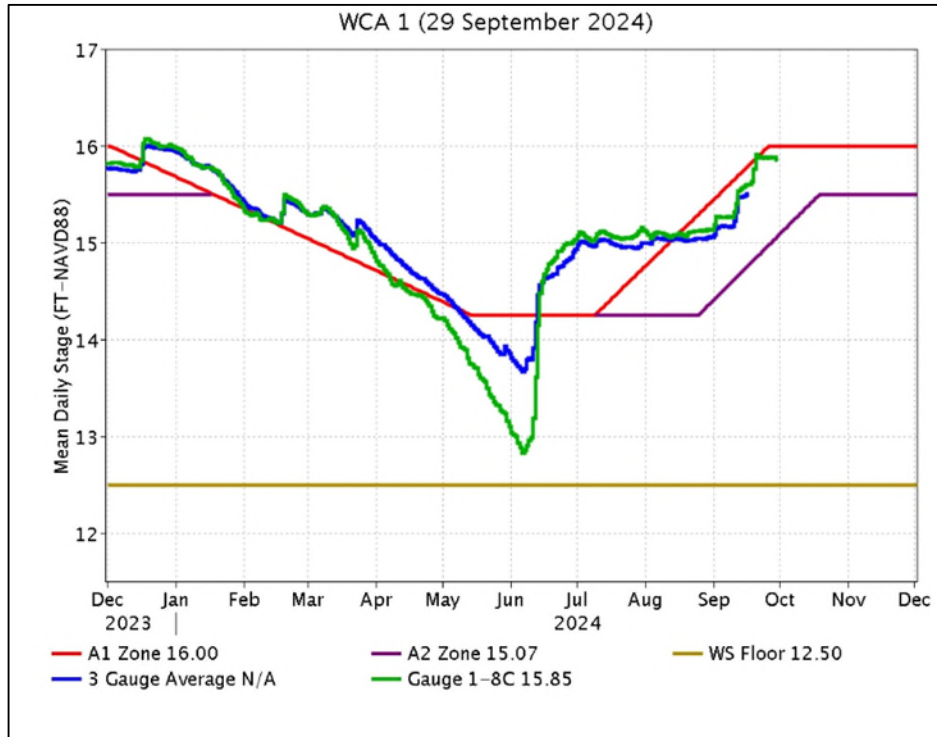


Figure EV-1. WCA-1 stage hydrographs and regulation schedule.

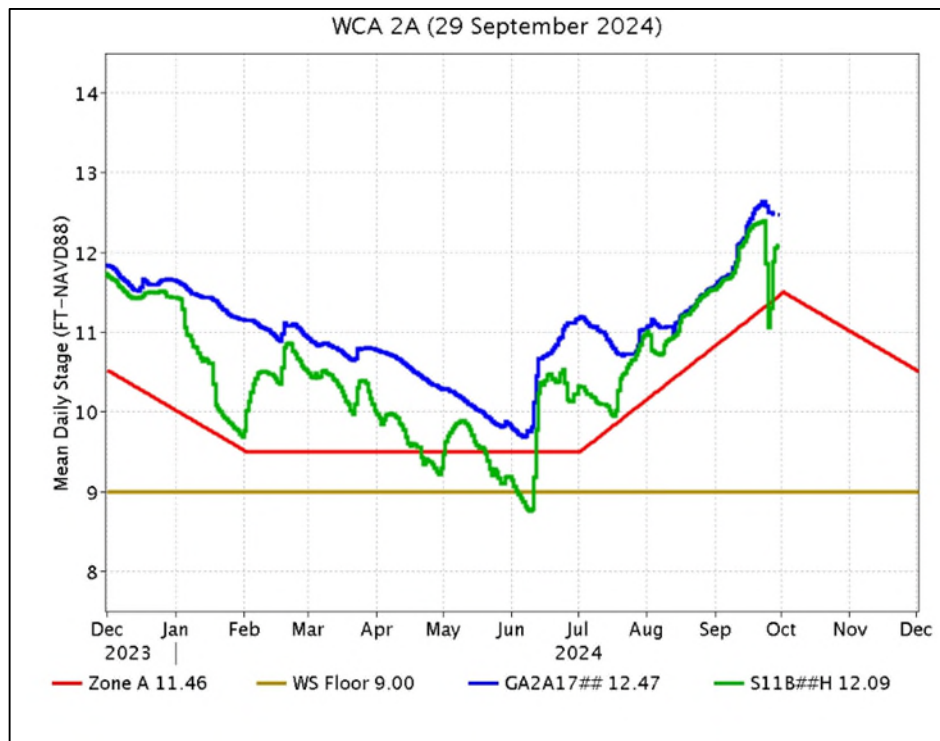


Figure EV-2. WCA-2A stage hydrographs and regulation schedule.

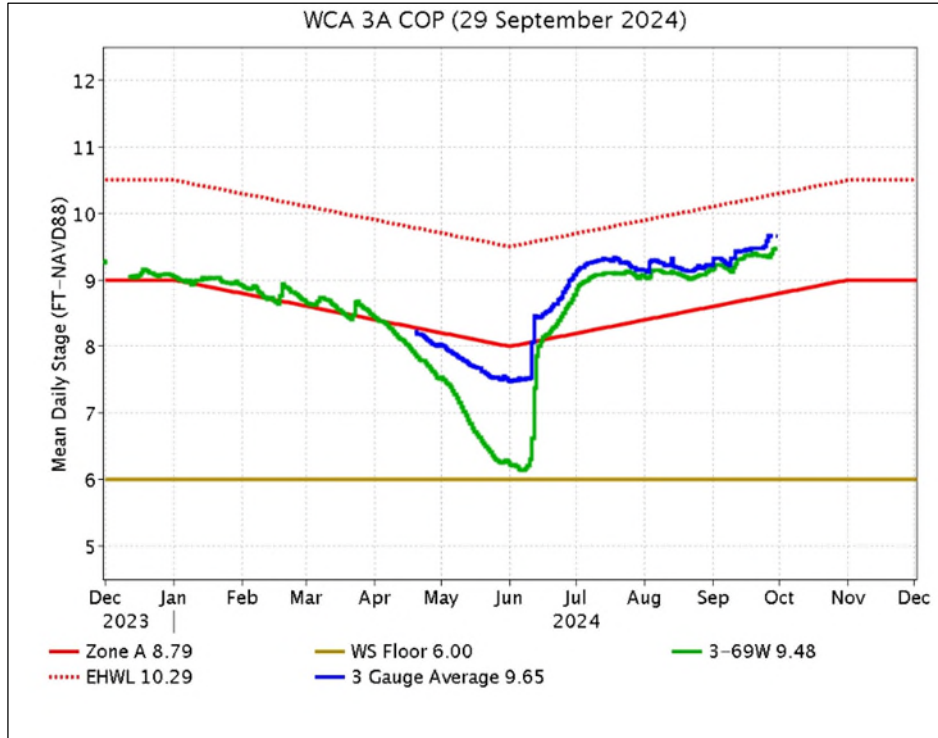


Figure EV-3. WCA-3A stage hydrographs (three-gauge average, 3-69W) and regulation schedule.

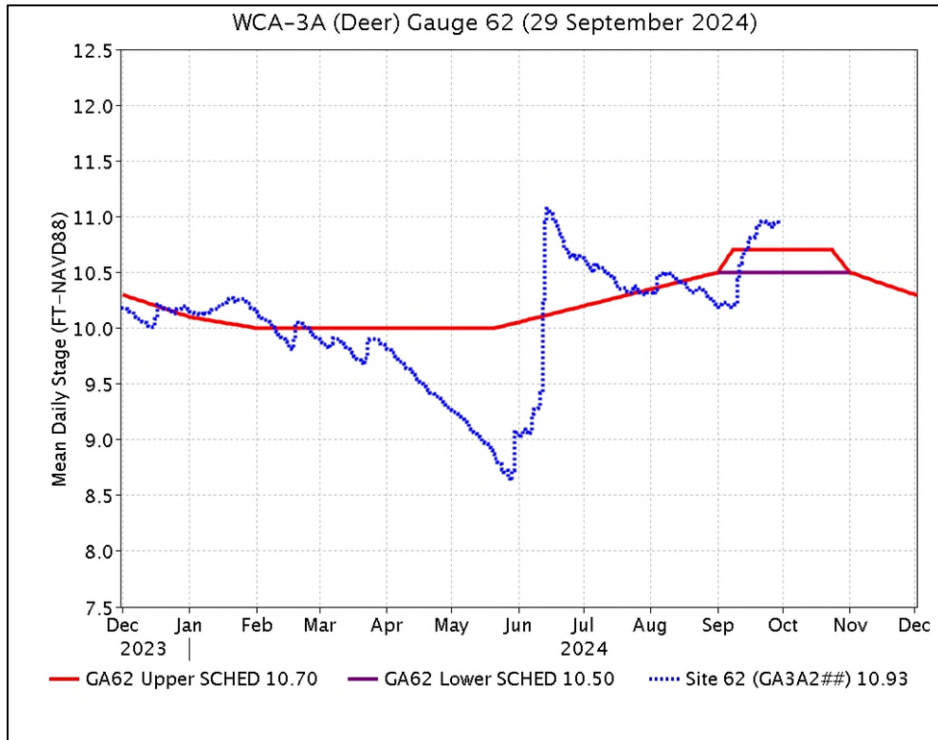


Figure EV-4. WCA-3A stage hydrograph (Deer gauge; Site 62) and GA62 regulation schedule.

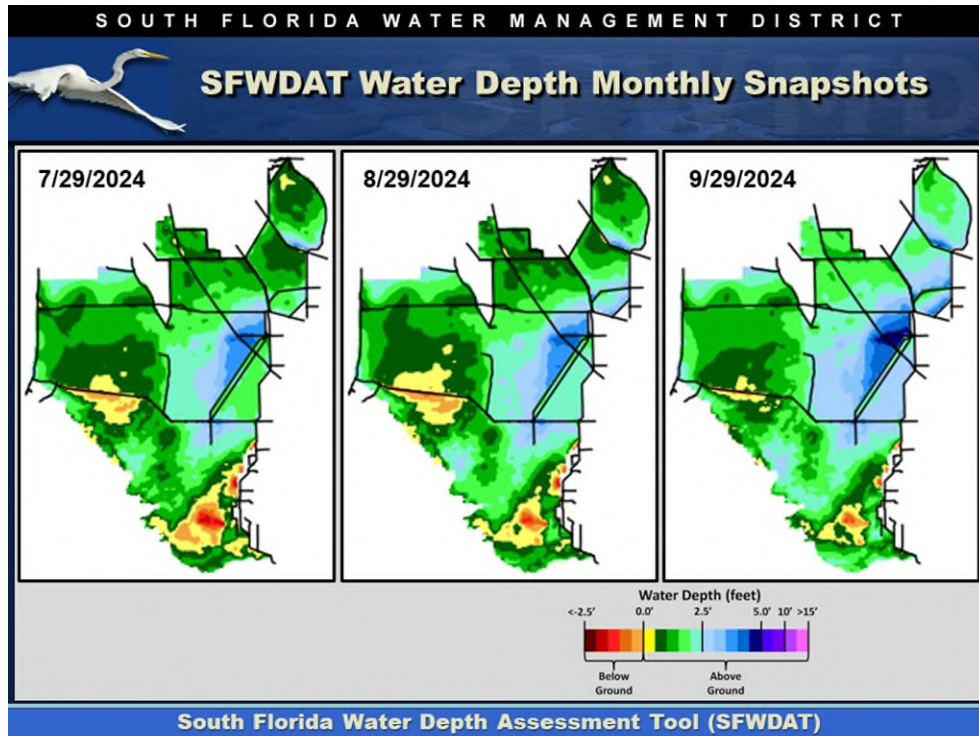


Figure EV-5. Everglades water depths from two months ago (left), one month ago (center) and present (right), based on SFWDAT.

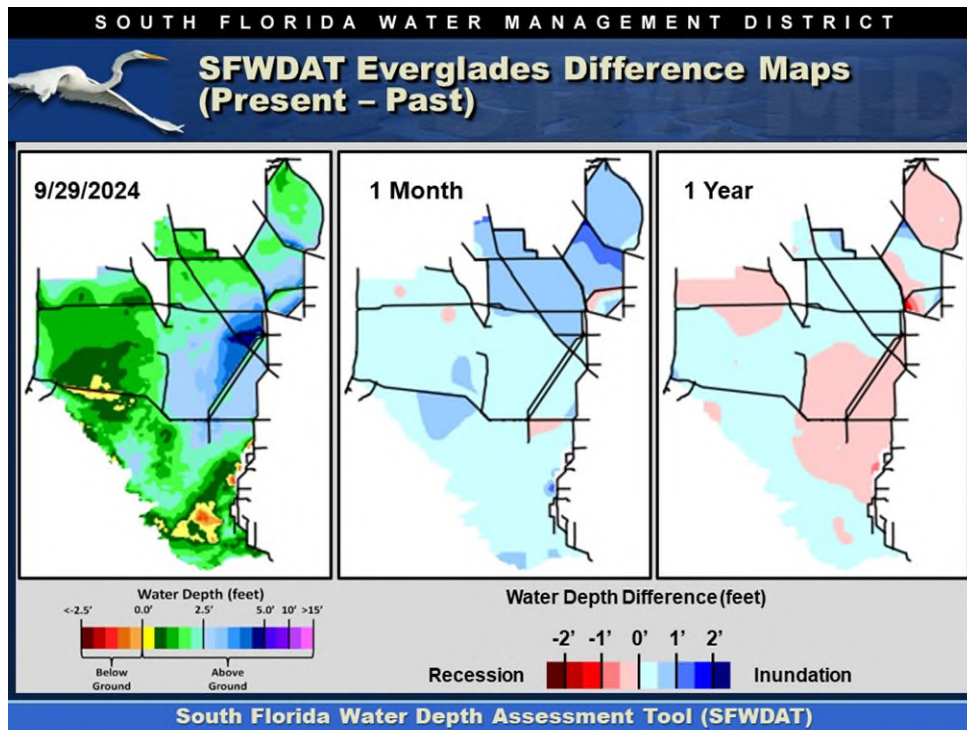


Figure EV-6. Present Everglades water depths (left) and water depth changes from one month (center) and one year (right) ago, based on SFWDAT.

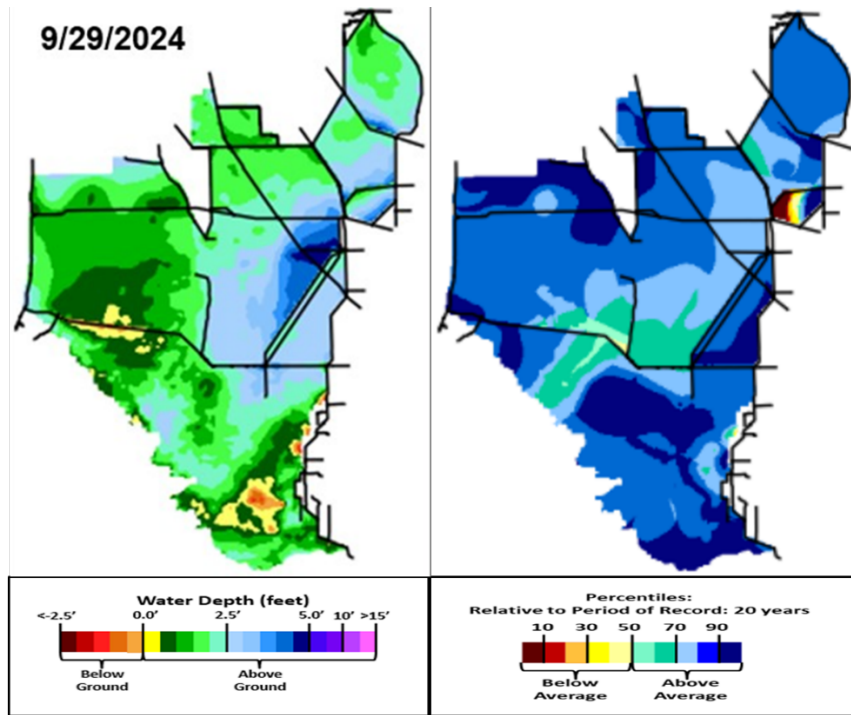


Figure EV-7. Present water depths (September 29, 2024) compared to the day of year average over the previous 20 years.

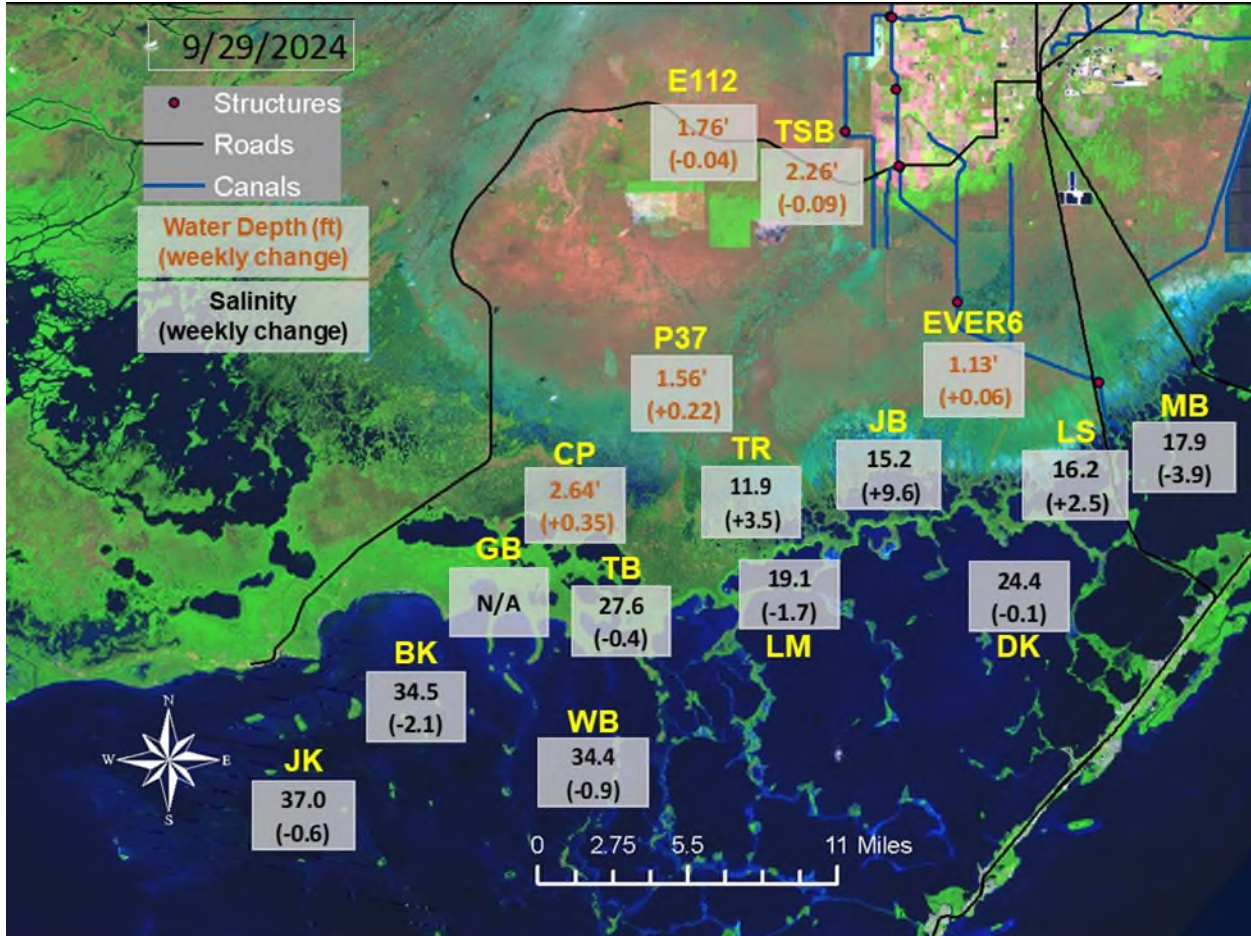


Figure EV-8. Taylor Slough water depths and Florida Bay salinities with changes from a week ago.

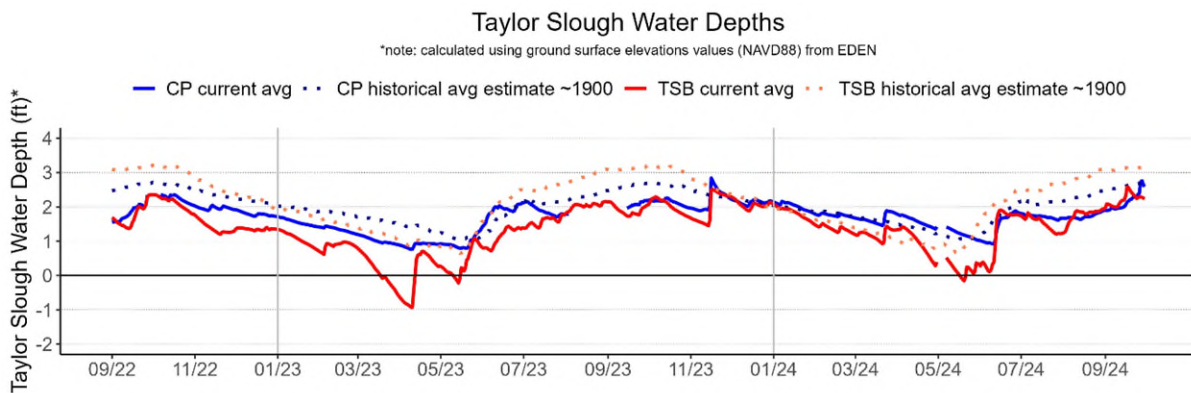


Figure EV-9. Taylor Slough water depth time series for Taylor Slough Bridge (TSB; northern slough) and Craighead Pond (CP; southern slough).

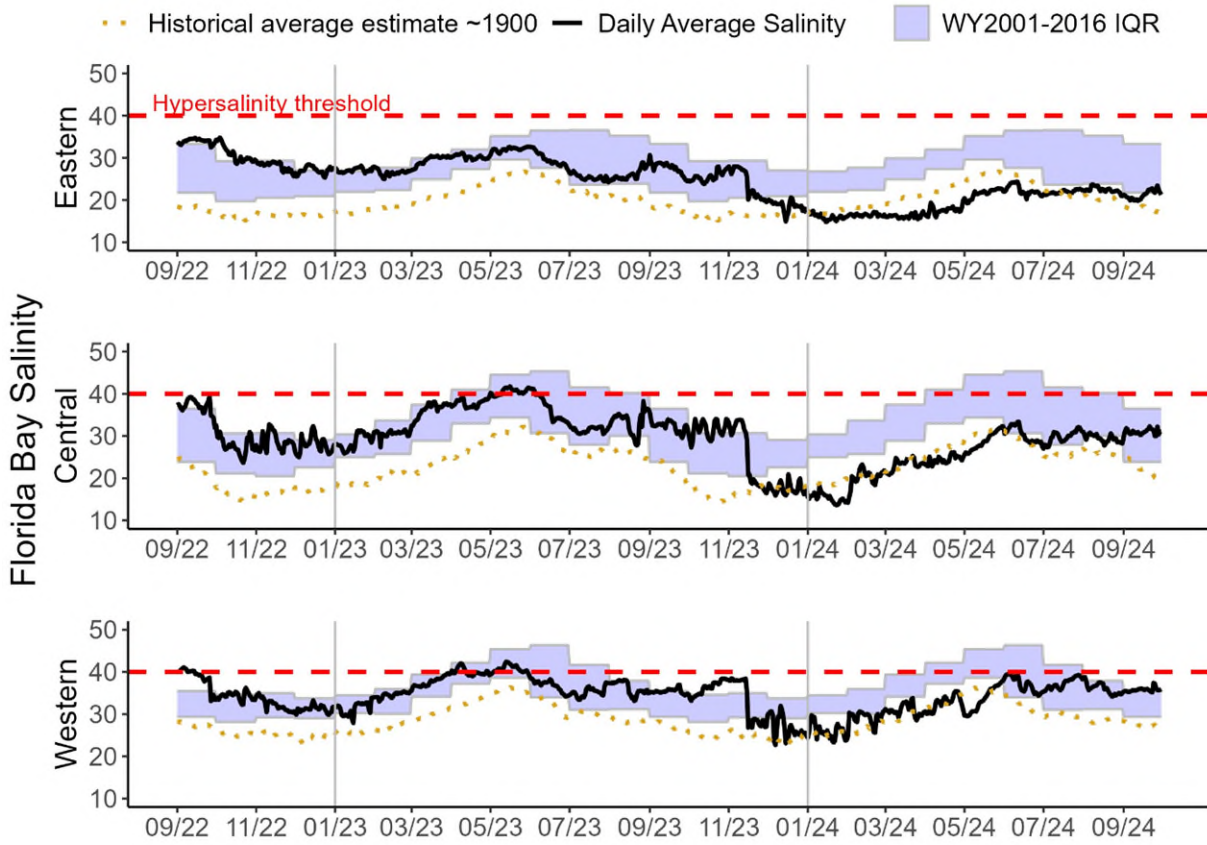


Figure EV-10. Eastern (top panel), Central (middle panel) and Western (bottom panel) Florida Bay daily average salinities with WY2001-2016 interquartile (25-75 percentile) ranges (IQR) and estimated historical daily average salinities. The hypersalinity threshold indicates the level at which salinities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

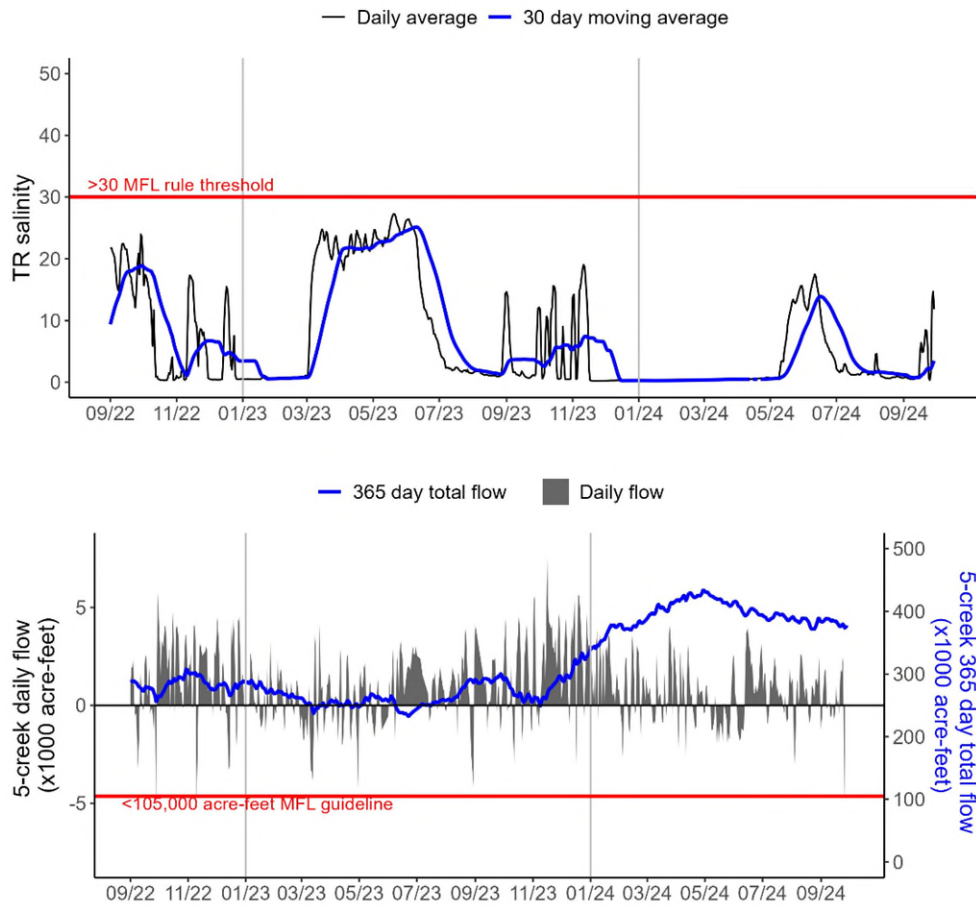


Figure EV-11. Salinity at Taylor River (TR; top) and creek inflow to Florida Bay (bottom) from the five major creeks (McCormick Creek, Taylor River, Mud Creek, Trout Creek, and West Highway Creek). The 30-day moving average salinity and 365-day total creek flow are tracked for the Florida Bay MFL criteria.

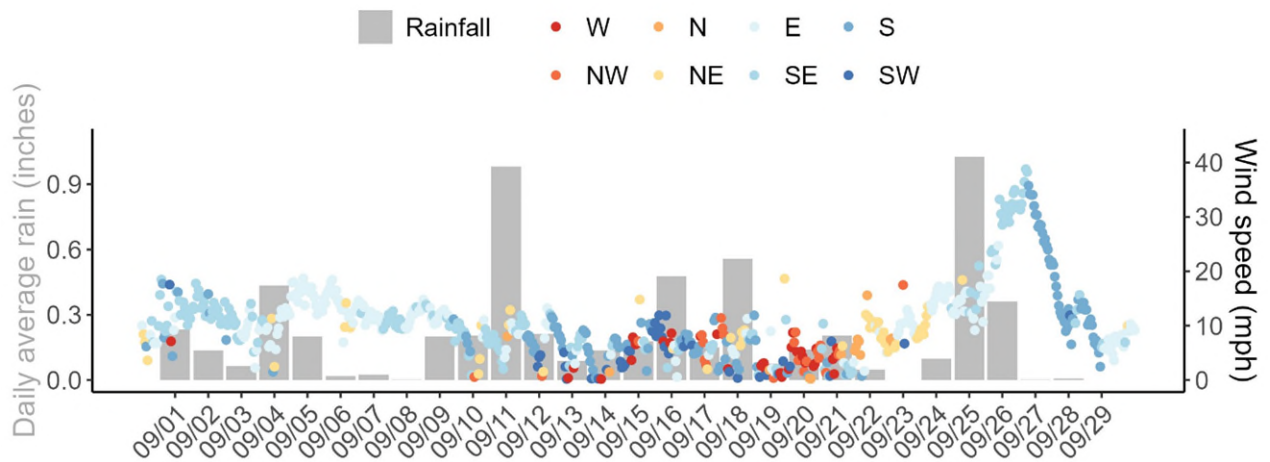


Figure EV-12. Daily average rain across Taylor Slough and Florida Bay, along with hourly average wind speed and direction (measured at Long Key) in Florida Bay over the past four weeks.

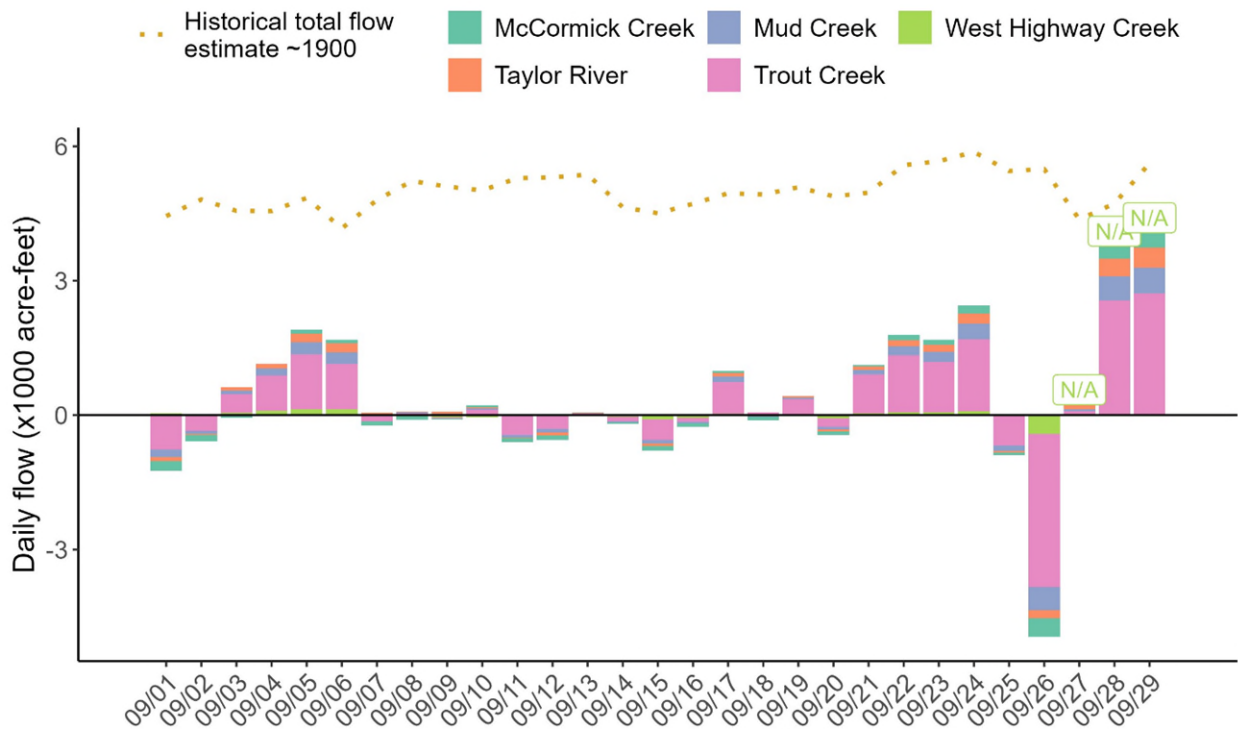


Figure EV-13. Daily average creek flow summed between five creeks with estimated historical daily flow over the past four weeks.

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

SFWMD Everglades Ecological Recommendations, October 1, 2024 (red is new)			
	Weekly change	Recommendation	Reasons
WCA-1	Stage decreased by 0.02 feet	Ascension rate of less than 0.25 feet per week.	Protect within basin and downstream habitat and wildlife.
WCA-2A	Stage decreased by 0.17 feet	Ascension rate of less than 0.25 feet per week.	Protect within basin and downstream habitat and wildlife.
WCA-2B	Stage decreased by 0.06 feet	Ascension rate of less than 0.25 feet per week or 0.5' per two weeks.	Protect within basin and downstream habitat and wildlife.
WCA-3A NE	Stage increased by 0.39 feet	Ascension rate of less than 0.25 feet per week.	Protect within basin and downstream habitat and wildlife.
WCA-3A NW	Stage decreased by 0.03 feet	Ascension rate of less than 0.25 feet per week.	
Central WCA-3A S	Stage increased by 0.13 feet	Ascension rate of less than 0.18 feet per week.	Protect within basin wildlife.
Southern WCA-3A S	Stage increased by 0.01 feet		
WCA-3B	Stage remained unchanged	Ascension rate of less than 0.18 feet per week.	Protect within basin and downstream habitat and wildlife.
ENP-SRS	Stage decreased by 0.01 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.
Taylor Slough	Stage changes ranged from -0.09 feet to +0.35 feet	Move water southward as possible.	When available, provide freshwater to promote water movement.
FB- Salinity	Salinity changes ranged from -2.1 to +9.6	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 1,413 cfs, and the previous 30-day mean inflow was 1,419 cfs. The seven-day mean salinity was 21.0 at BBCW8 and 23.3 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.

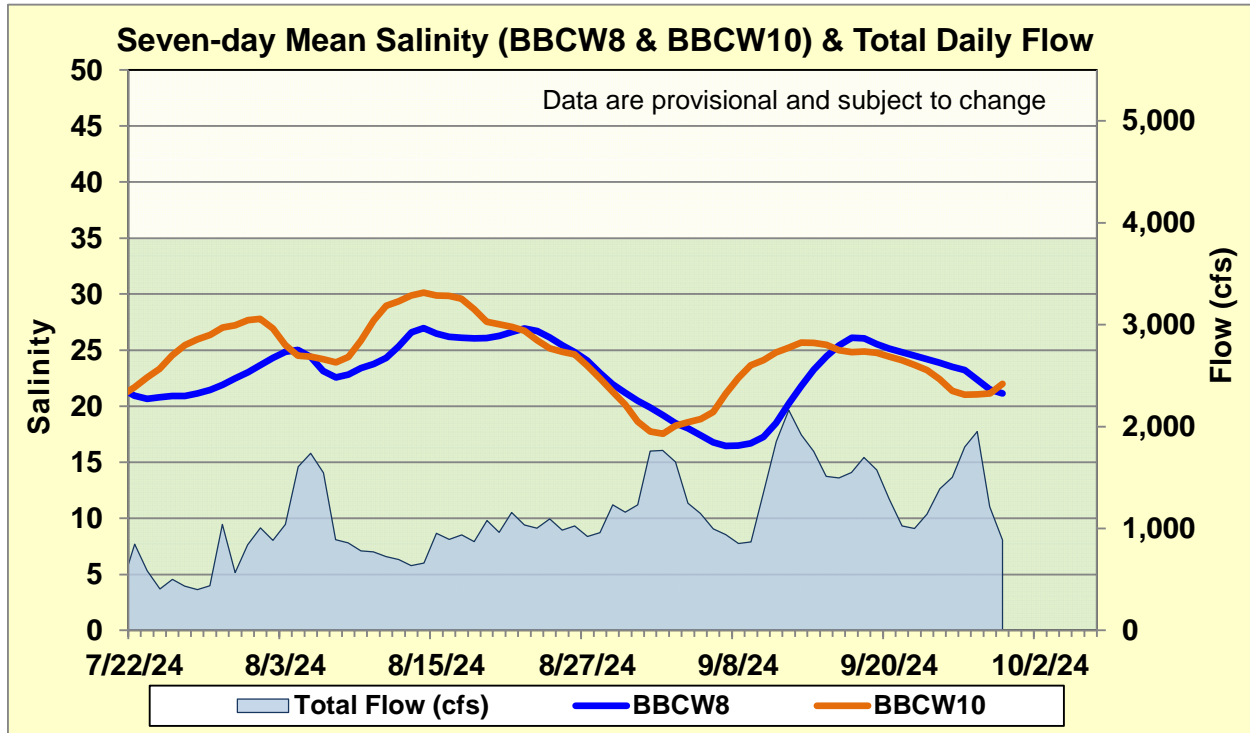


Figure BB-1. Seven-day mean salinity at BBCW8 and BBCW10 and total daily flow in Biscayne Bay. Total daily flow was calculated using flow from structures S20G, S20F, S21, S21A, S123, and S700P.