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: July 10, 2024

SUBJECT: Weekly Environmental Conditions for Systems Operations

Summary

Weather Conditions and Forecast

On Wednesday and Thursday, a good supply of moisture over the northeastern half of the SFWMD is likely to result in numerous afternoon rains north and east of Lake Okeechobee while lingering effects of the Saharan Air Layer will sharply reduce rainfall south of Lake Okeechobee, except along and near the east coast. On Friday, southwesterly steering winds should prevail across much of the SFWMD, colliding with the east-coast sea breeze moving inland. Moisture-rich environment, good instability, and greatest forced ascent over the interior of the SFWMD will probably focus numerous afternoon showers and thunderstorms over inland areas, producing widespread coverage of rainfall. Over the weekend, high levels of moisture and reasonably good instability, combined with the southeasterly steering winds, will cause afternoon rains to concentrate over the interior but especially the western part of the SFWMD, a typical July pattern. The southeasterly steering wind regime will be associated with early-day and overnight rains over the eastern part of the SFWMD, with interior and western rains peaking from the mid-afternoon to around sunset. Early next week, moisture from a tropical wave will possibly overspread the SFWMD. How much rain to expect is questionable due to the uncertain influence of the tropical wave. For the week ending next Tuesday morning, total SFWMD rainfall is forecast to be below to near-normal.

Kissimmee

Lake stage in East Lake Toho and Lake Toho is being allowed to rise with rainfall. Releases were made from East Lake Toho and Lake Toho in the last seven days to slow the rate of lake stage rise. Weekly average discharge on July 7, 2024, was 120 cfs and 530 cfs at S-65 and S-65A, respectively. Mean weekly water depth on the Kissimmee River floodplain for the week ending July 7th increased by 0.01 feet from the previous week to 0.10 feet. The weekly average concentration of dissolved oxygen in the Kissimmee River decreased from 4.1 mg/L the previous week to 3.5 mg/L for the week ending July 7, 2024, which is above the potentially lethal and stressful levels for largemouth bass and other sensitive species.

Lake Okeechobee

Lake Okeechobee stage was 12.19 feet NAVD88 (13.50 ft NGVD29) on July 07, 2024, which was 0.05 feet higher than the previous week and 0.83 feet higher than a month ago. Average daily inflows (excluding rainfall) increased from 1,120 cfs the previous week to 2,710 cfs. Average daily outflows (excluding evapotranspiration) increased from 130 cfs the previous week to 420 cfs. In the most recent non-obscured satellite image from July 7, 2024, NOAA's Harmful Algal Bloom Monitoring System suggested high cyanobacteria concentrations in the central and eastern portions of the Lake.

Estuaries

Total inflow to the St. Lucie Estuary averaged 1,776 cfs over the past week with no flow coming from Lake Okeechobee. Mean salinities decreased at all sites in the estuary over the past week. Salinity in the middle estuary was in the optimal range (10-25) for adult eastern oysters.

Total inflow to the Caloosahatchee Estuary averaged 5,041 cfs over the past week with 397 cfs coming from Lake Okeechobee. Mean salinities remained the same at S-79 and Val I-75 and decreased at the remaining sites in the estuary over the past week. Salinities were in the optimal range (0-10) for tape grass in the upper estuary. Salinities were in the damaging range for adult oysters at Cape Coral, in the optimal range at Shell Point, and in the upper stressed range at Sanibel.

Stormwater Treatment Areas

For the week ending Sunday, July 7, 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 69,300 ac-feet. The total amount of inflows to the STAs in WY2025 is approximately 352,000 ac-feet. STA cells are near or above target stage. STA-1E Eastern Flow-way is offline for rehydration and vegetation establishment following erosion repair. Operational restrictions are in effect in STA-1E Western Flow-way, STA-2 Flow-ways 2 and 4, and STA-3/4 Eastern Flow-way for vegetation management activities. An operational restriction is in effect for STA-2 Flow-way 5 for construction activities. This week, there is no capacity for Lake releases in the STAs.

Everglades

Only northeastern and central WCA-3A had elevated rates of stage change over the past two weeks. Stages are above average for this time of year across most of the Everglades Protection Area. Average stage change in Taylor Slough decreased slightly this week but remains above the average for this time of year. Average salinity increased in Florida Bay last week and is within the Interquartile Range in the central and western regions. Florida Bay MFL metrics remain well outside thresholds of harm.

Biscayne Bay

Total inflow to Biscayne Bay averaged 830 cfs, and the previous 30-day mean inflow averaged 1,626 cfs. The seven-day mean salinity was 19.7 at BBCW8 and 17.2 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 July 7, 2024, mean daily lake stages were 54.4 feet NAVD (1.1 feet below schedule) in East Lake Toho, 51.4 feet NAVD (0.9 feet below schedule) in Lake Toho, and 47.8 feet NAVD (2.0 feet below schedule) in Lakes Kissimmee-Cypress-Hatchineha (KCH) (**Table KB-1**, **Figures KB-1-3**).

Lower Kissimmee

For the week ending July 7, 2024, mean weekly discharge was 120 cfs and 530 cfs at S-65 and S-65A, respectively. Mean weekly discharge from the Kissimmee River was 650 cfs and 610 cfs at S-65D and S-65E, respectively (**Table KB-2**). Mean weekly headwater stages were 45.3 feet NAVD at S-65A and 24.6 feet NAVD at S-65D. Mean weekly river channel stage for the week ending on July 7, 2024, increased by 1.5 feet from the previous week to 32.8 feet NAVD (**Figure KB-4**). Mean weekly water depth on the Kissimmee River floodplain for the week ending July 7, 2024, increased by 0.01 feet from the previous week to 0.10 feet (**Table KB-2**, **Figure KB-5**). The weekly average concentration of dissolved oxygen in the Kissimmee River decreased from 4.1 mg/L the previous week to 3.5 mg/L (**Table KB-2**, **Figure KB-6**).

Water Management Recommendations

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

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

Water Body	Structure	Stage Monitoring Site	Weekly (7-Day) Average Discharge (cfs)	Sunday Lake Stage (feet NAVD)[a]	Schedule Type[b]	Sunday Schedule Stage (feet NAVD)	Sunday Departure from Regulation (feet)	
							7/7/24	*6/30/24*
Lakes Hart and Mary Jane	S-62	LKMJ	0	58.9	R	58.9	0.0	-0.4
Lakes Myrtle, Preston and Joel	S-57	S-57	0	58.9	R	60.0	-1.1	-1.0
Alligator Chain	S-60	ALLI	0	60.9	R	62.2	-1.3	-1.2
Lake Gentry	S-63	LKGT	0	58.1	R	59.9	-1.8	-1.7
East Lake Toho	S-59	TOHOE	210	54.4	R	55.5	-1.1	-1.2
Lake Toho	S-61	TOHOW S-61	240	51.4	R	52.3	-0.9	-1.2
Lakes Kissimmee, Cypress and Hatchineha	S-65	KUB011 LKIS5B	120	47.8	R	49.8	-2.0	-2.0

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.

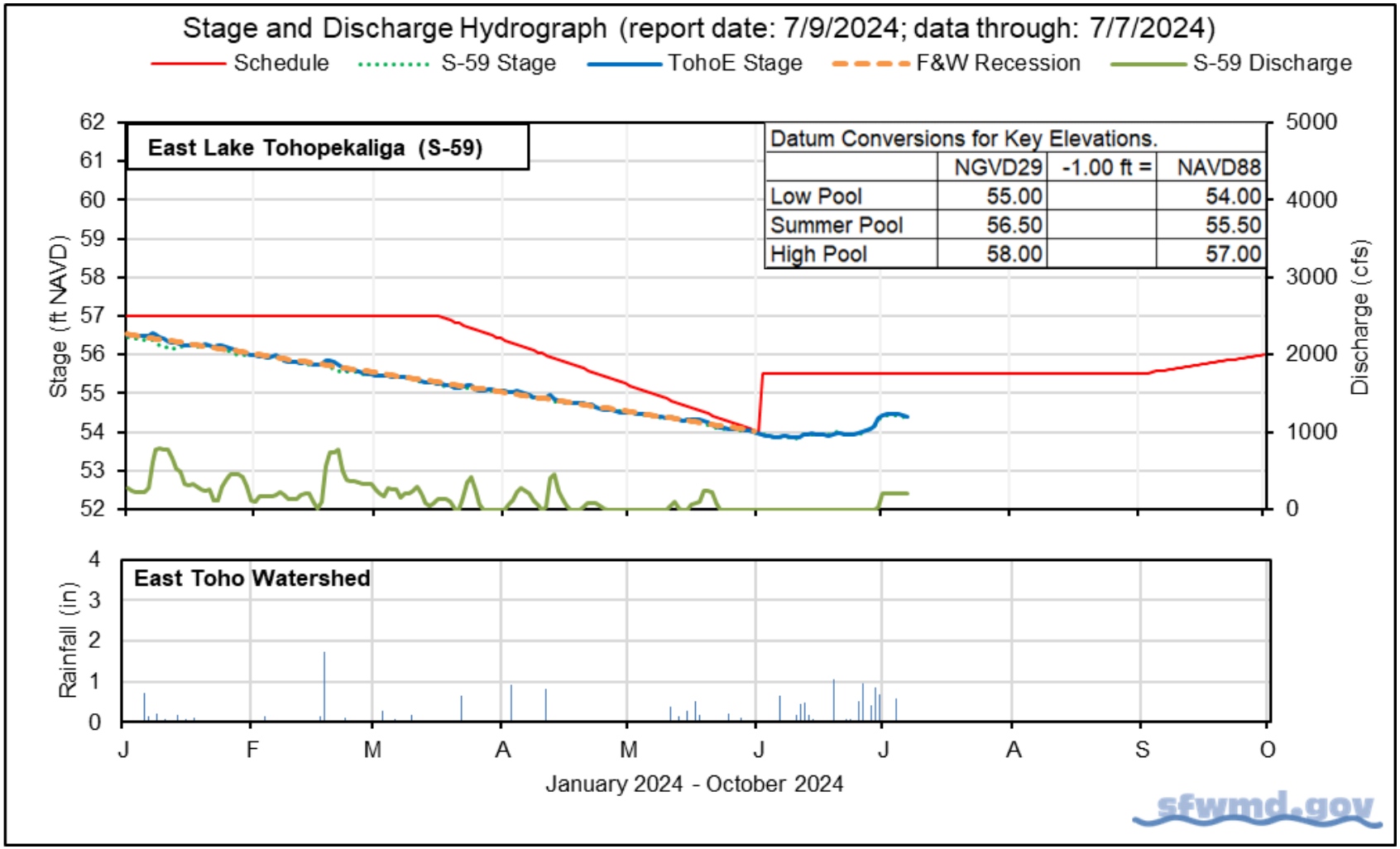


Figure KB-1. East Lake Toho regulation schedule, stage, discharge, and rainfall.

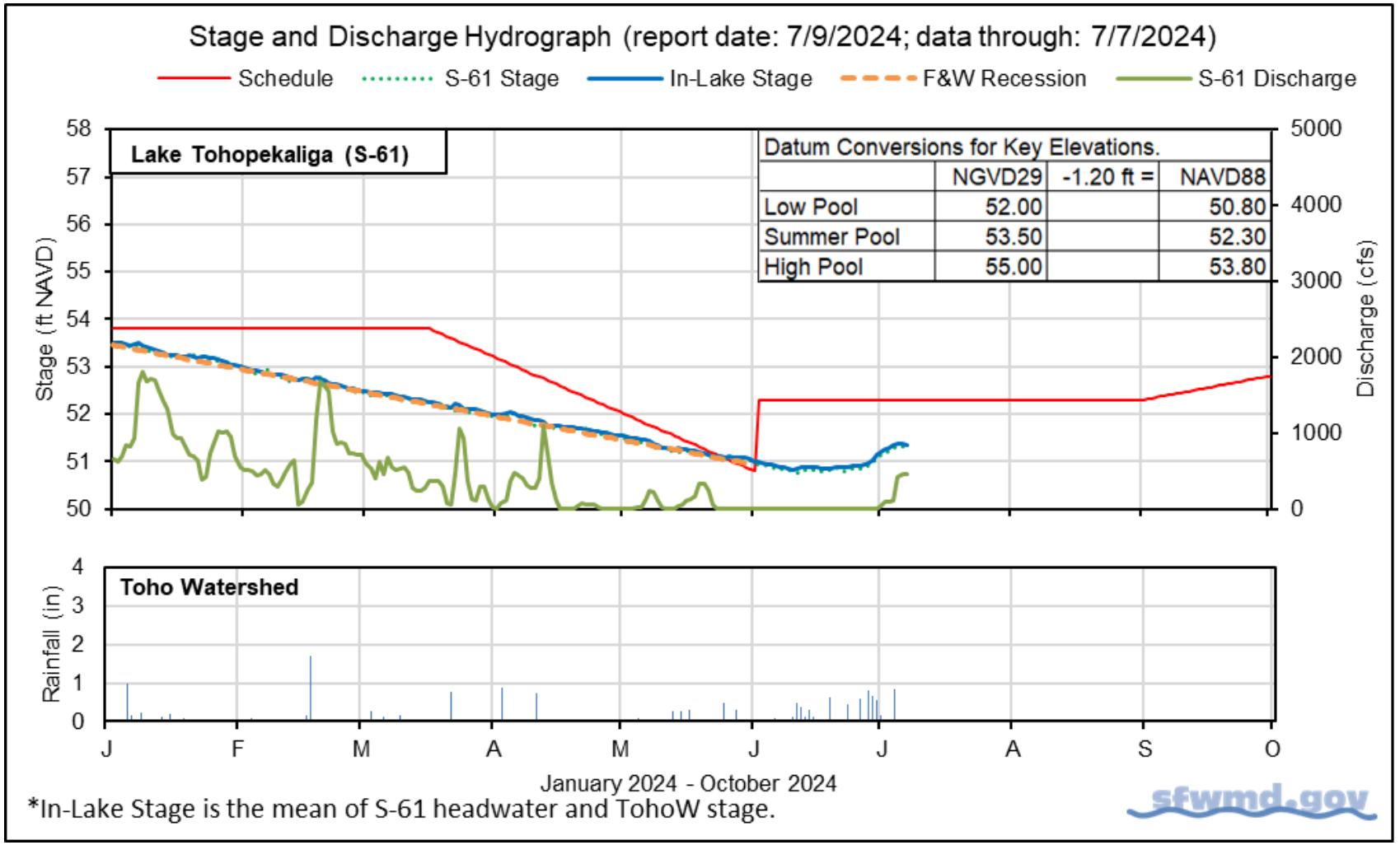


Figure KB-2. Lake Toho regulation schedule, stage, discharge, and rainfall.

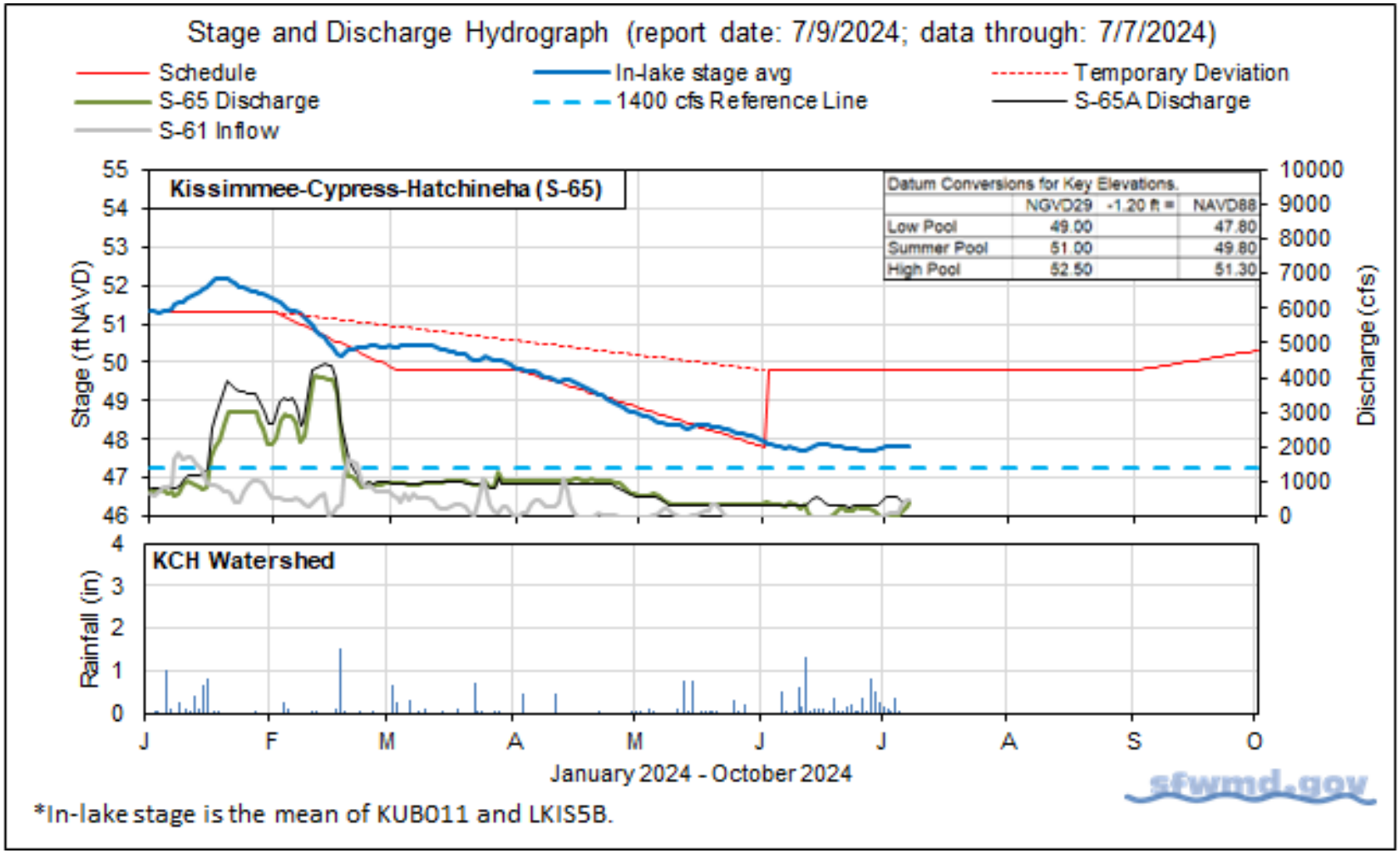


Figure KB-3. Lakes Kissimmee, Cypress and Hatchineha regulation schedule, stage, discharge, and rainfall.

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			
		7/7/24	7/7/24	6/30/24	6/23/24	6/16/24
Discharge	S-65	400	120	160	130	86
Discharge	S-65A[a]	460	530	350	300	430
Headwater Stage (feet NAVD)	S-65A	45.1	45.3	44.8	45.0	45.5
Discharge	S-65D[b]	690	650	350	440	450
Headwater Stage (feet NAVD)	S-65D[c]	24.6	24.6	24.6	24.6	24.6
Discharge (cfs)	S-65E[d]	630	610	350	430	450
Discharge (cfs)	S-67	0	0	0	0	0
Dissolved Oxygen (mg/L) [e]	Phase I, II/III river channel	2.9	3.5	4.1	5.0	6.9
River channel mean stage[f]	Phase I river channel	32.7	32.8	31.3	31.6	31.7
Mean depth (feet) [g]	Phase I floodplain	0.10	0.10	0.09	0.09	0.08

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).

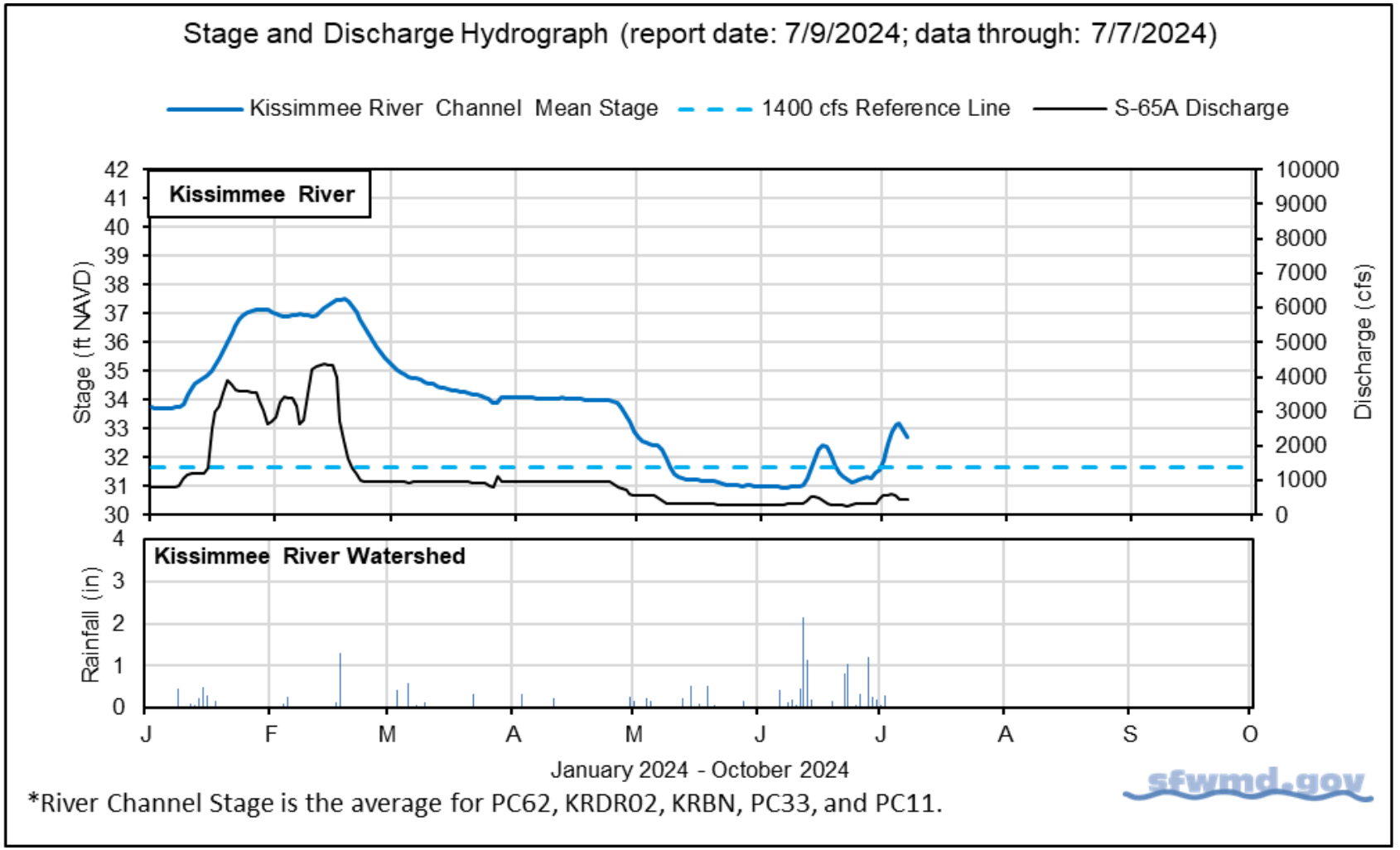


Figure KB-4. Kissimmee River stage, discharge, and rainfall.

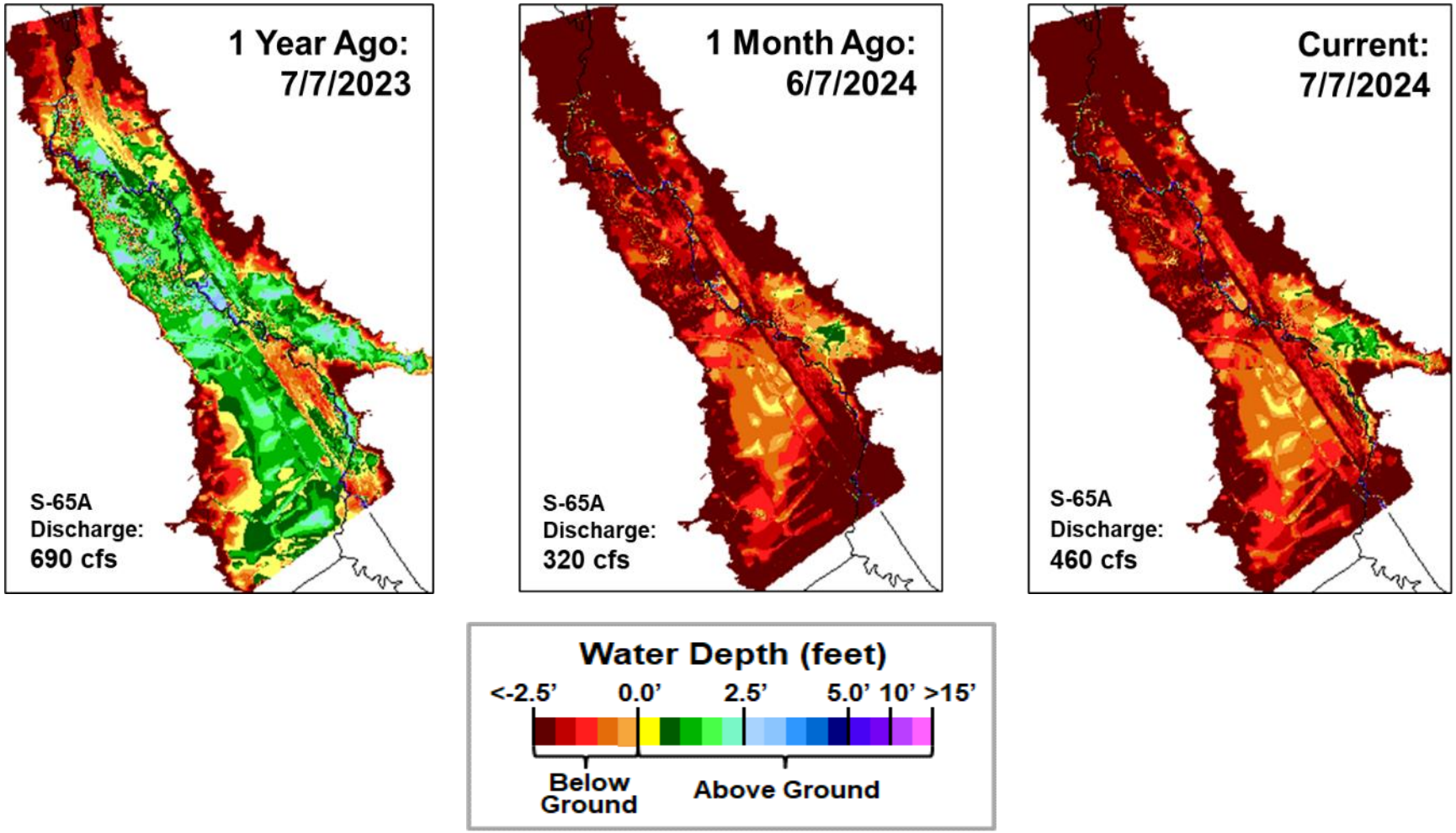


Figure KB-5. Phase I area Kissimmee River floodplain water depths (from left to right) one year ago, one month ago, and current.

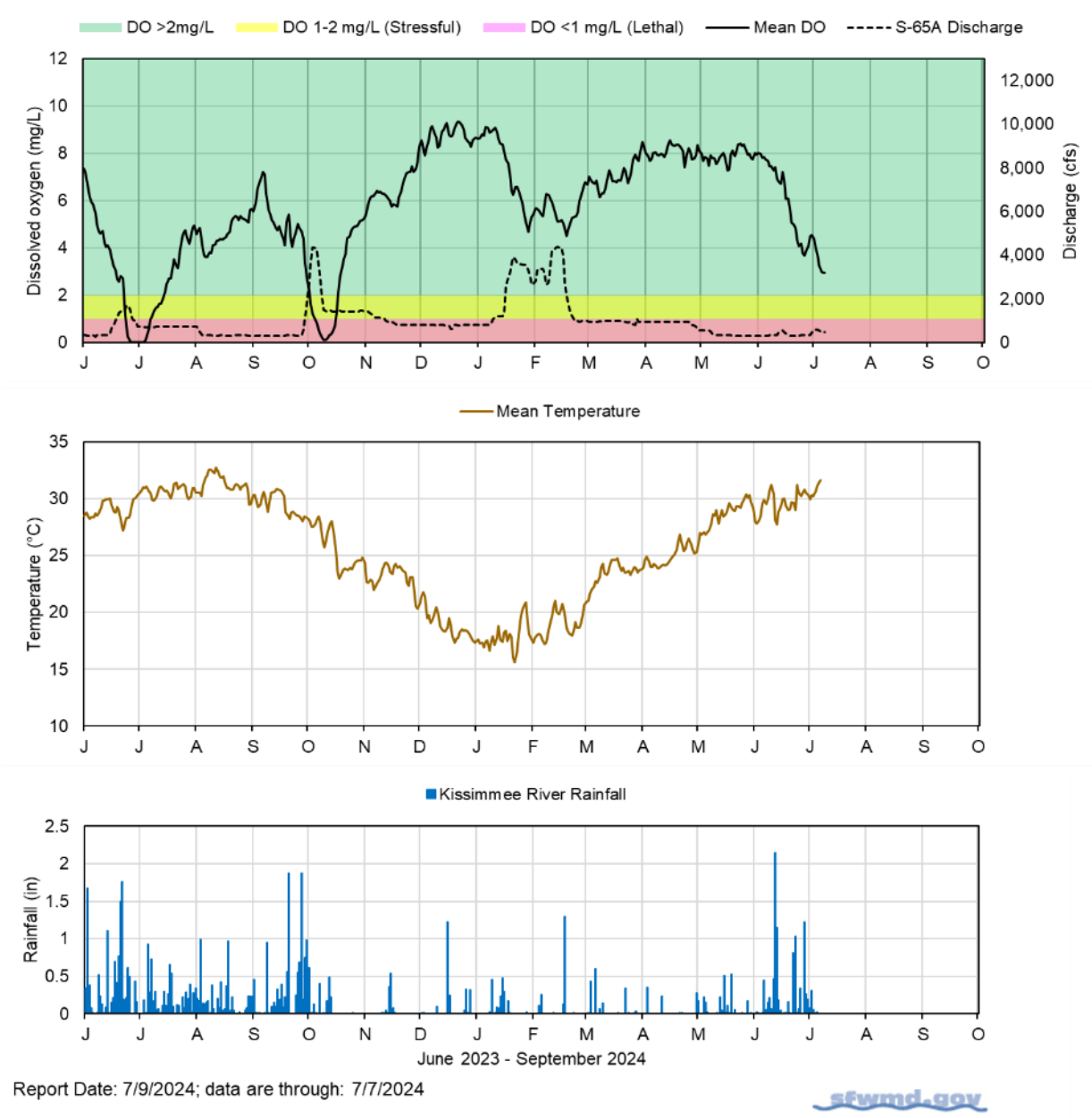


Figure KB-6. Kissimmee River channel mean daily dissolved oxygen concentration (mg/L), S-65A discharge (cfs), temperature (°C) and rainfall (inches). Dissolved oxygen (DO) and temperature are mean daily values averaged for PC62, KRDR02, KRBN, PC33, PC11, PD62R, and PD42R with an average of four stations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

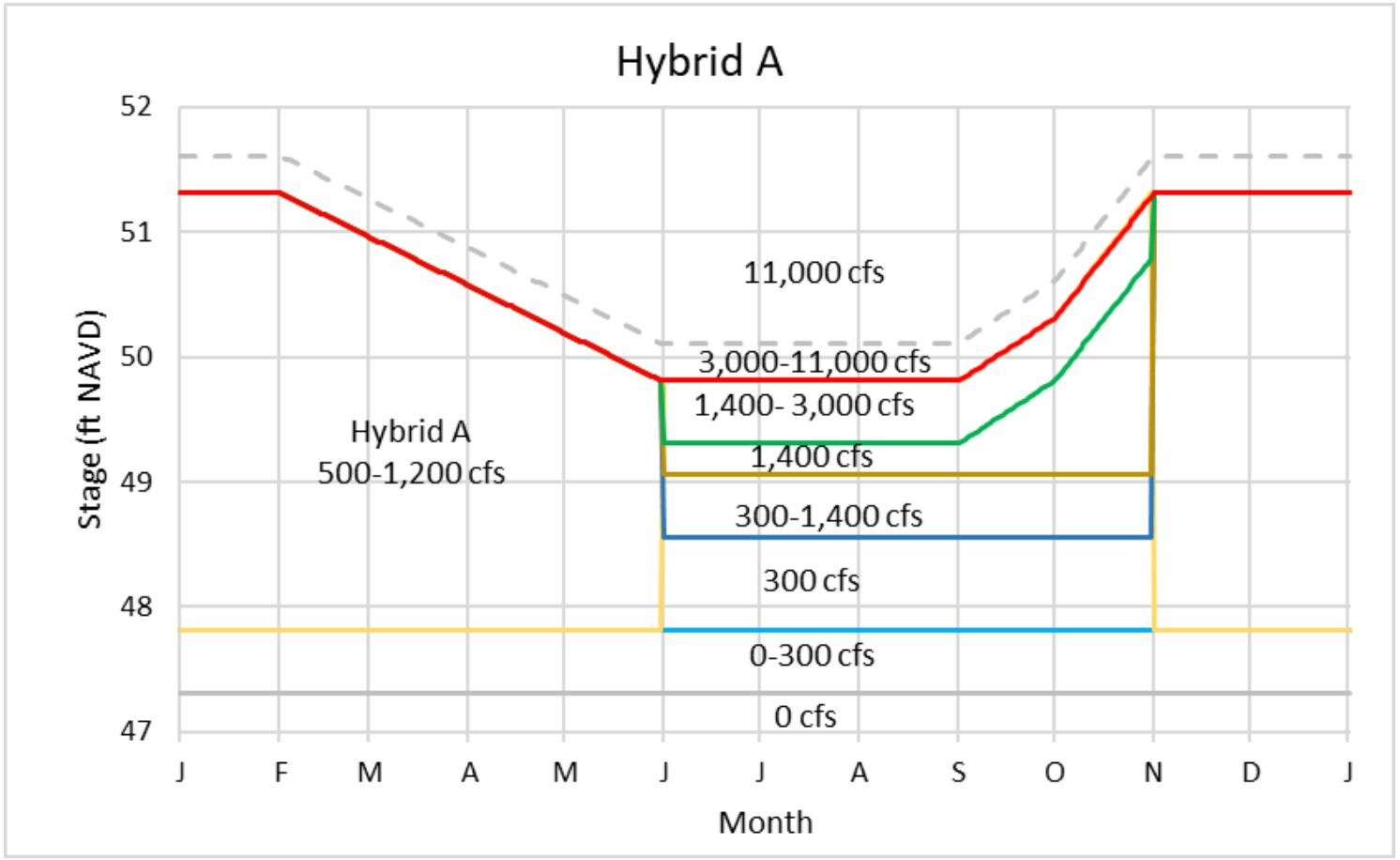


Figure KB-7. Hybrid A Discharge Plan for S-65/S-65A. Use discharge rate of change limits from IS-14-50 (Fig. KB-8).

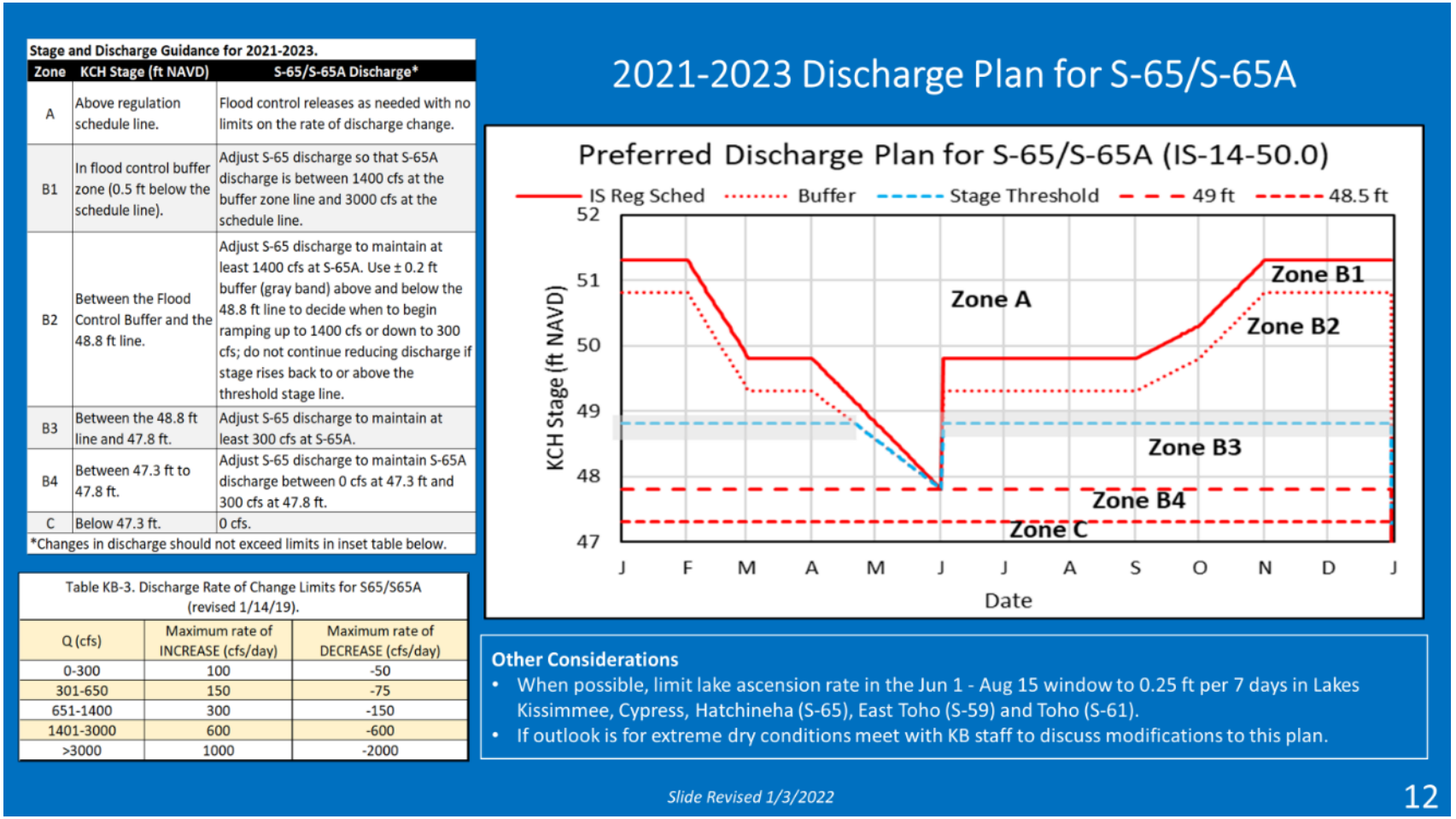


Figure KB-8. IS-14-50 Discharge Plan for S65/S65A with discharge rate of change limits (revised 1/14/19).

Lake Okeechobee

Lake Okeechobee stage was 12.19 feet NAVD88 (13.50 ft NGVD29) on July 07, 2024, which was 0.05 feet higher than the previous week and 0.83 feet higher than a month ago (**Figure LO-1**). Lake stage is in the Low sub-band (**Figure LO-2**) and was 1.63 feet above the upper limit of the recovery ecological envelope (**Figure LO-3**). According to NEXRAD, 0.39 inches of rain fell directly over the Lake last week.

Average daily inflows (excluding rainfall) increased from 1,120 cfs the previous week to 2,710 cfs. The largest single structure inflow came from Fisheating Creek at 650 cfs. Average daily outflows (excluding evapotranspiration) increased from 130 cfs the previous week to 420 cfs, all of which was released to the C-44 canal through the S-77 structure. No releases were made to the south or east. **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 July 7, 2024, NOAA's Harmful Algal Bloom Monitoring System suggested high cyanobacteria concentrations in the central and eastern portions of the Lake (**Figure LO-6**).

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

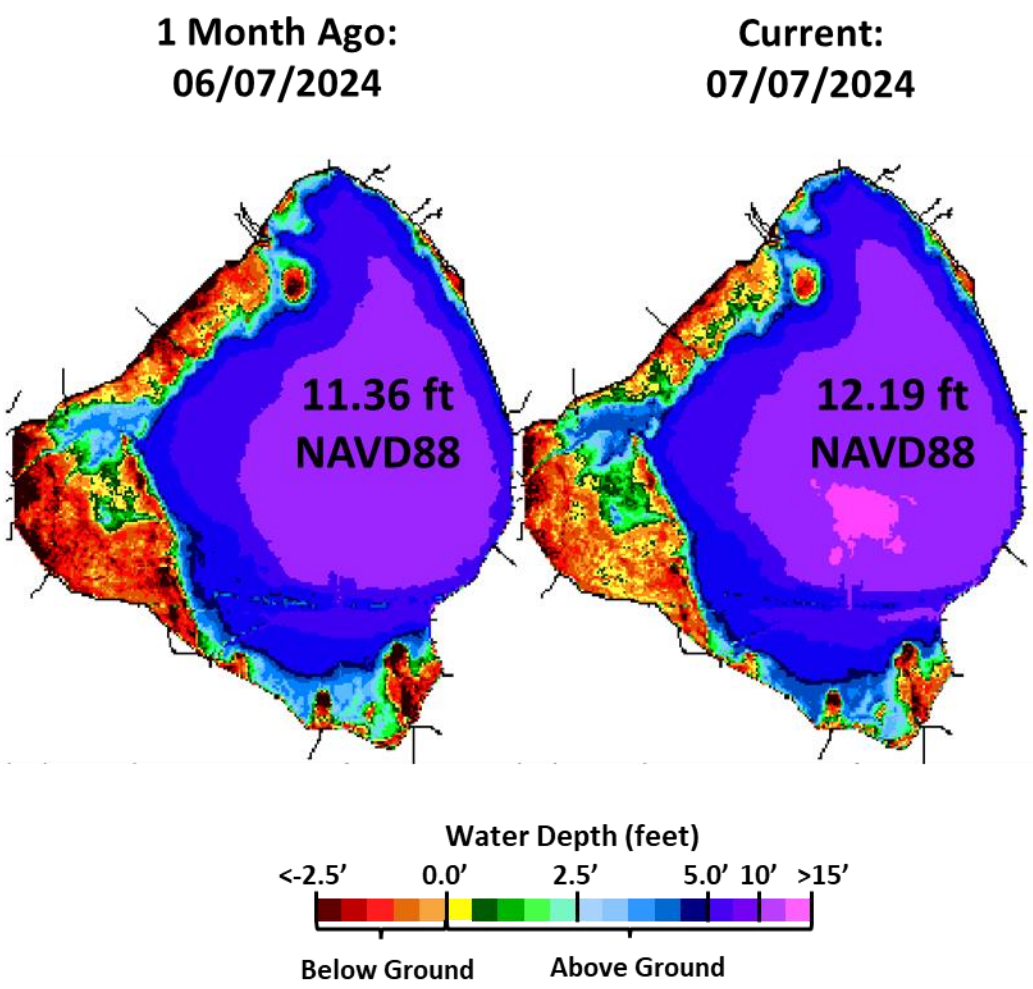


Figure LO-1. Lake Okeechobee water depth estimates based on South Florida Water Depth Assessment Tool (SFWDAT).

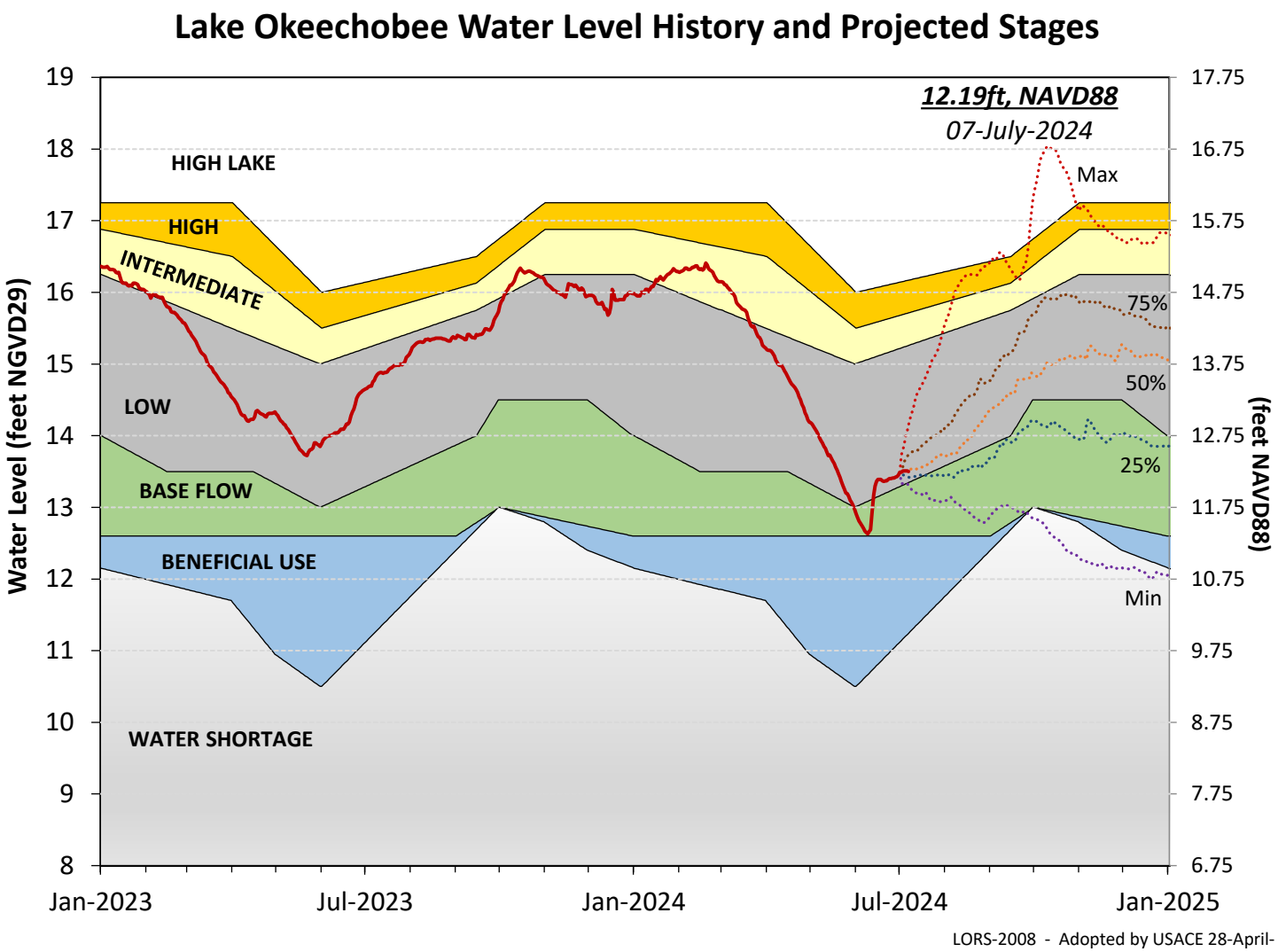


Figure LO-2. Recent Lake Okeechobee stages with projected stages based on a dynamic position analysis. Note: stages are in NGVD29, approximate NAVD88 values are shown for reference.

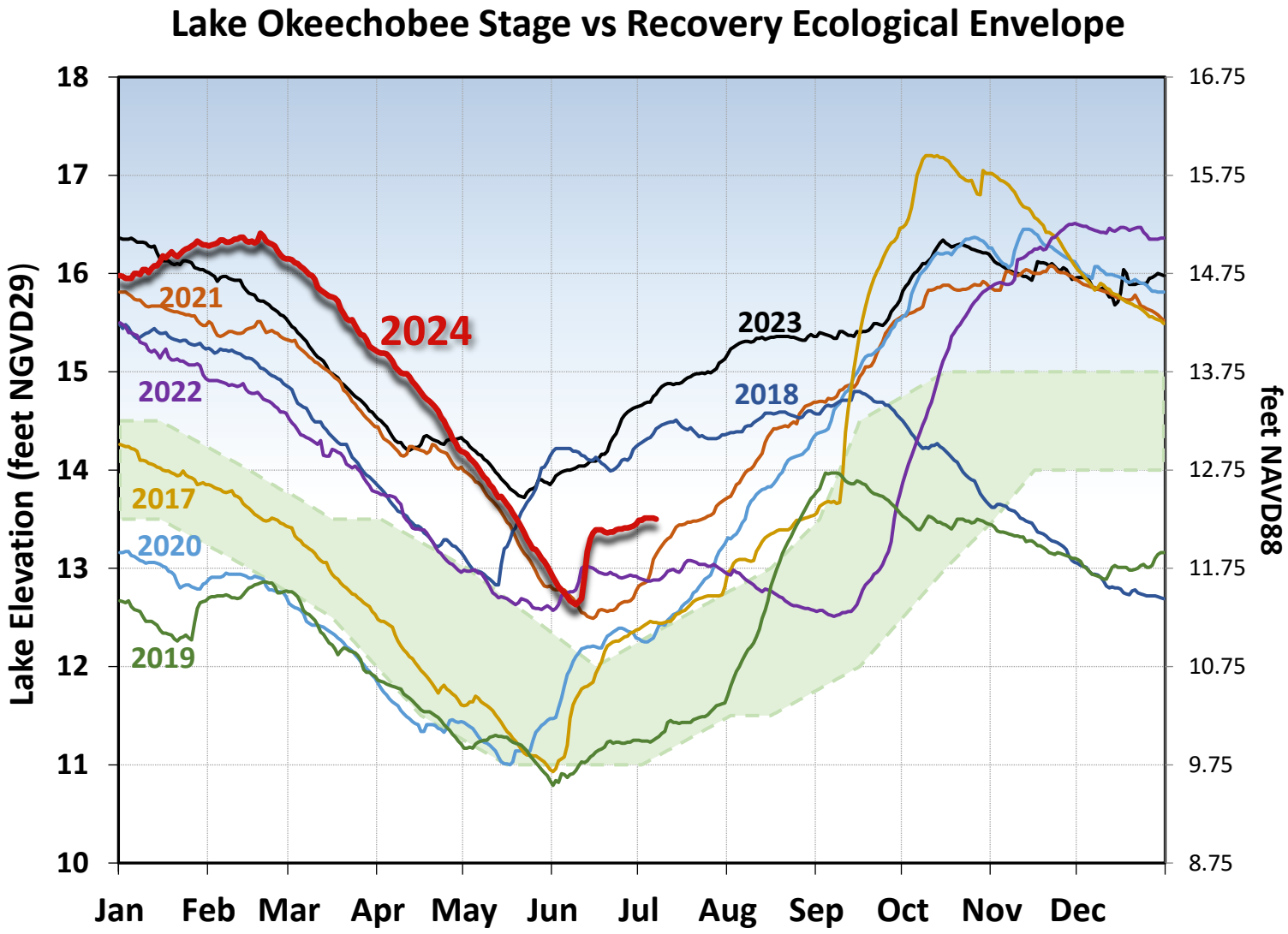


Figure LO-3. The current and seven prior year's annual stage hydrographs for Lake Okeechobee in comparison to the recovery envelope (light green). A shift from the normal ecological envelope to the recovery envelope occurred because the 30-day minimum lake stage (elevations exposed for at least 30 days,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

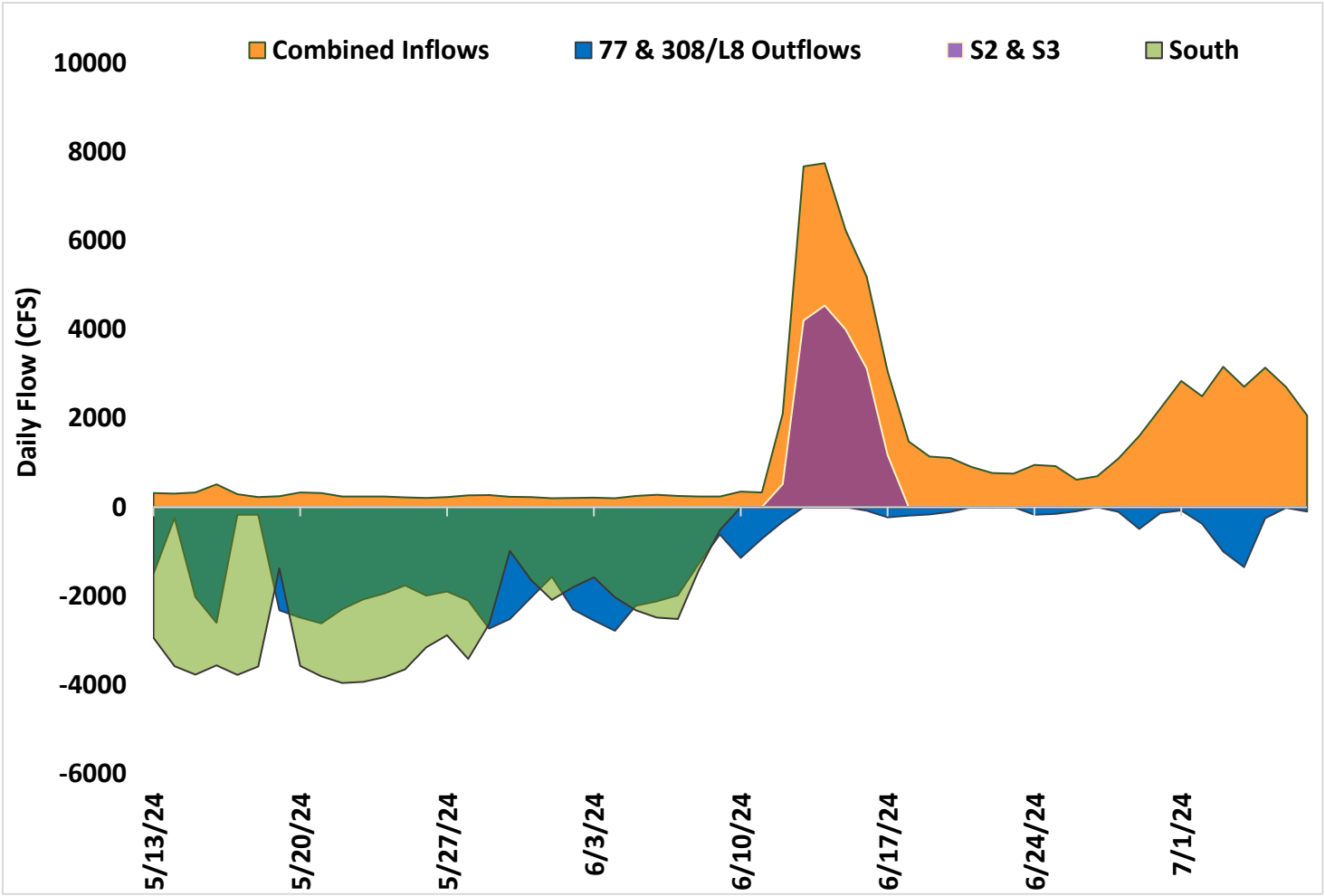


Figure LO-4. Major inflows (orange) to and outflows east and west (blue) from Lake Okeechobee. Outflows south are shown in green. Flows into Lake Okeechobee from the L-8 canal through S-271 (formerly Culvert 10A) or from the C-44 canal through the S-308 are included as inflows. Conversely, flows from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

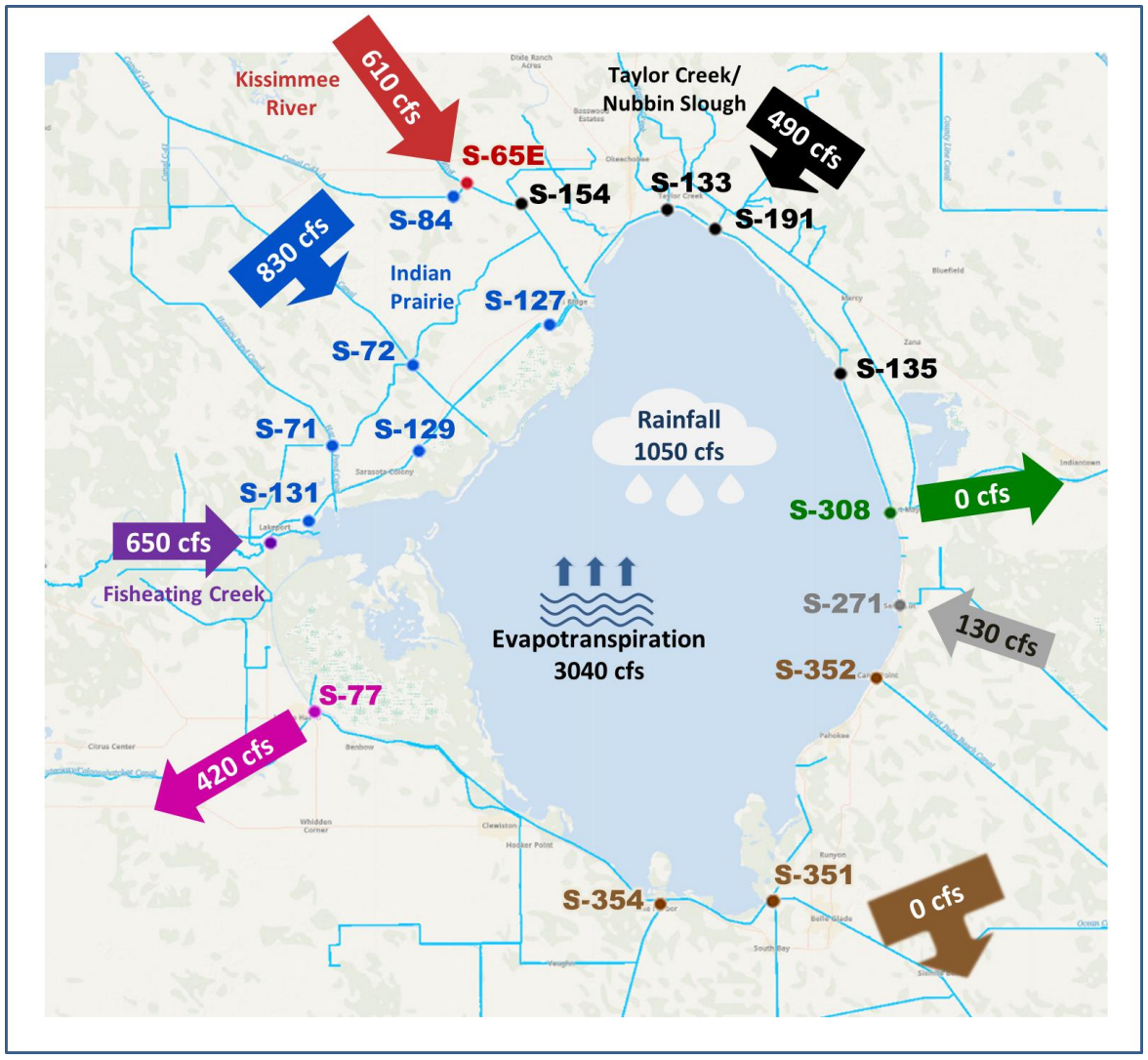


Figure LO-5. Inflows into Lake Okeechobee from Indian Prairie basins, Taylor Creek/Nubbin Slough, Kissimmee River and Fisheating Creek, and outflows to the west via S-77, to the east via S-308, to the south via S-351, S-352, S-354, and to southeast via S-271 (formerly Culvert 10A) for the week of July 01 – 07, 2024.

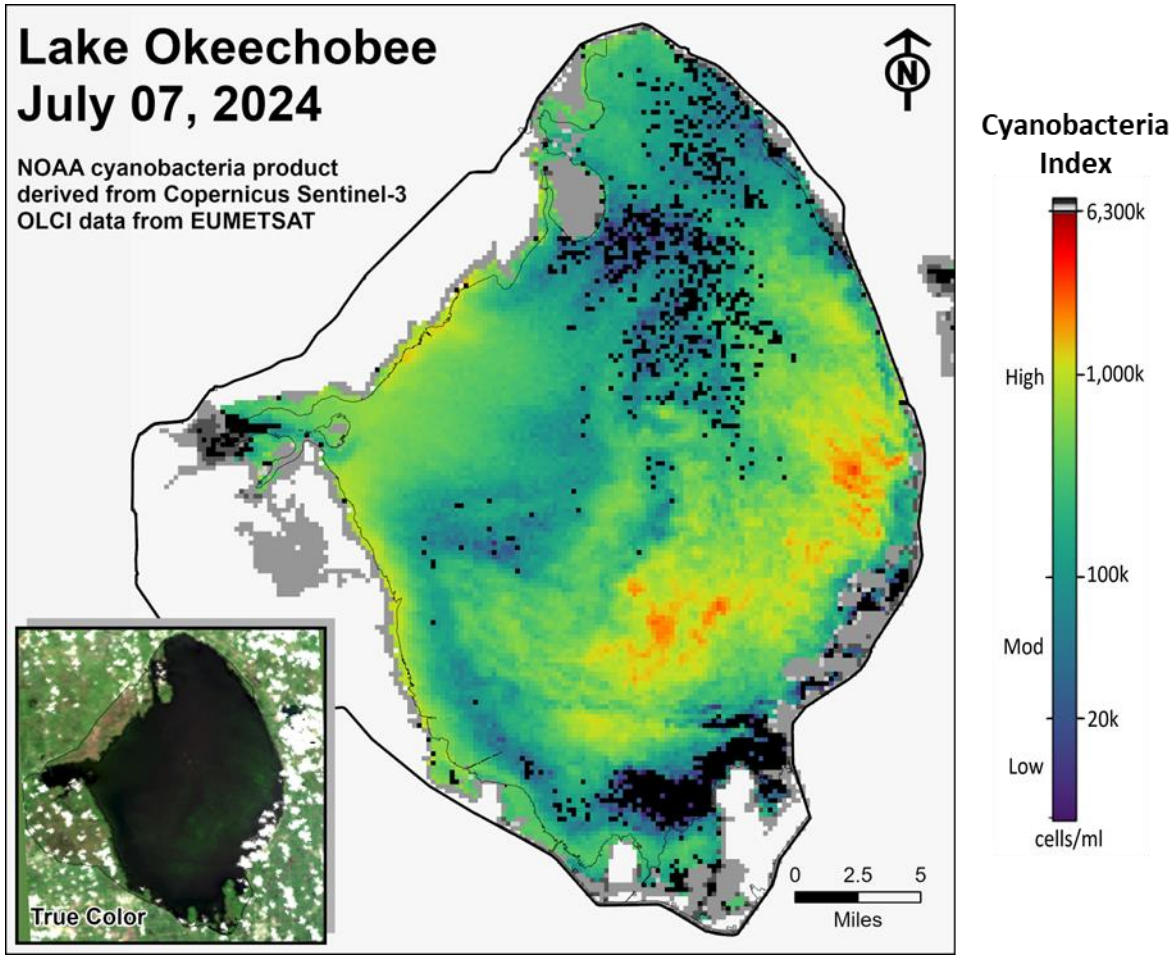


Figure LO-6. Cyanobacteria bloom index level on July 07, 2024, based on NOAA's harmful algal bloom monitoring system. Gray color indicates cloud cover. *Provisional NOAA image, subject to change*.

Estuaries

St. Lucie Estuary

Over the past week, mean total inflow to the St. Lucie Estuary was 1,776 cfs (**Figures ES-1** and **ES-2**), and the previous 30-day mean inflow was 1,509 cfs. For comparison, the historical provisional mean inflows from the contributing areas are shown in **Figure ES-2**.

Over the past week, salinities decreased at all sites in the estuary (**Table ES-1** and **Figure ES-3**). The seven-day moving average of the surface and bottom salinities at the US1 Bridge was 14.2. Salinity conditions in the middle estuary were estimated to be within the optimal range for adult eastern oysters (**Figure ES-4**). The mean larval oyster recruitment rate reported by the Fish and Wildlife Research Institute (FWRI) was 2.8 spat/shell for June, which is normal for this time of year (**Figure ES-5**).

Caloosahatchee River Estuary

Over the past week, mean total inflow to the Caloosahatchee River Estuary was 5,041 cfs (**Figures ES-6** and **ES-7**), and the previous 30-day mean inflow was 5,699 cfs. For comparison, the historical provisional mean inflows from the contributing areas are shown in **Figure ES-7**.

Over the past week, salinities remained the same at S-79 and Val I-75 and decreased at the remaining sites in the estuary (**Table ES-2** and **Figures ES-8** and **ES-9**). The seven-day mean salinities (**Table ES-2**) were in the optimal range (0-10) for tape grass in the upper estuary. The seven-day mean salinity values were within the stressed range for adult Eastern Oysters at Sanibel, the optimal range at Shell Point, and the damaging range at Cape Coral (**Figure ES-10**). The mean larval oyster recruitment rate reported by the FWRI was 24.4 spat/shell at Iona Cove and 18.8 spat/shell at Bird Island for June, which is normal for this time of year (**Figures ES-11 and ES-12**).

Surface salinity at Val I-75 was forecasted for the next two weeks using an autoregression model (Qiu and Wan, 2013[1]) coupled with a linear reservoir model for the tidal basin. Model scenarios included pulse releases at S-79 ranging from 450 to 2,000 cfs, with estimated tidal basin inflows of 942 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.

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

Red Tide

The FWRI reported on July 3, 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 the Low Sub-Band. Tributary conditions are Near Normal. The LORS2008 release guidance suggests up to 450 cfs release at S-79 to the Caloosahatchee River Estuary and up to 200 cfs release at S-80 to the St. Lucie Estuary.

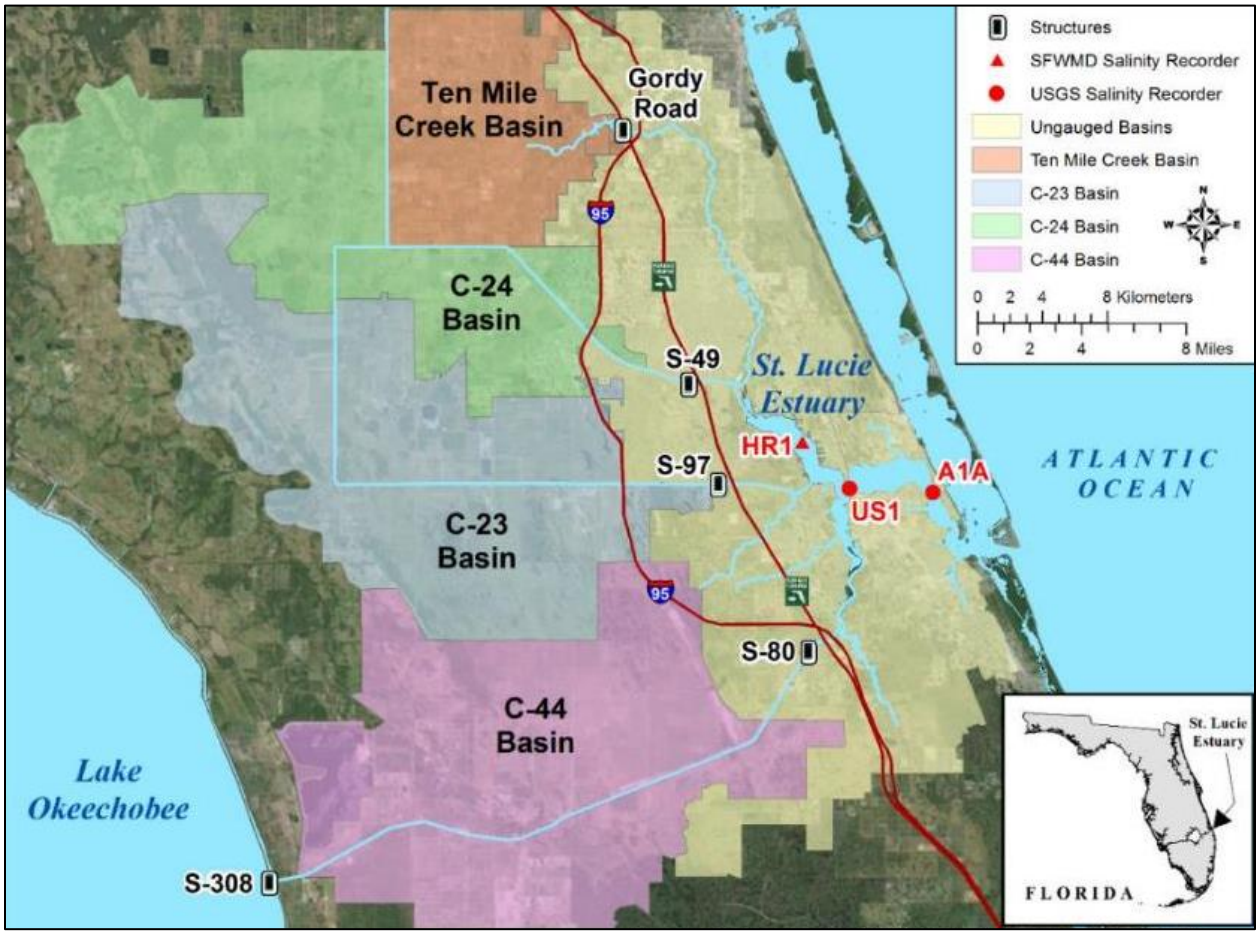


Figure ES-1. Basins, water control structures and salinity monitoring sites in the St. Lucie Estuary.

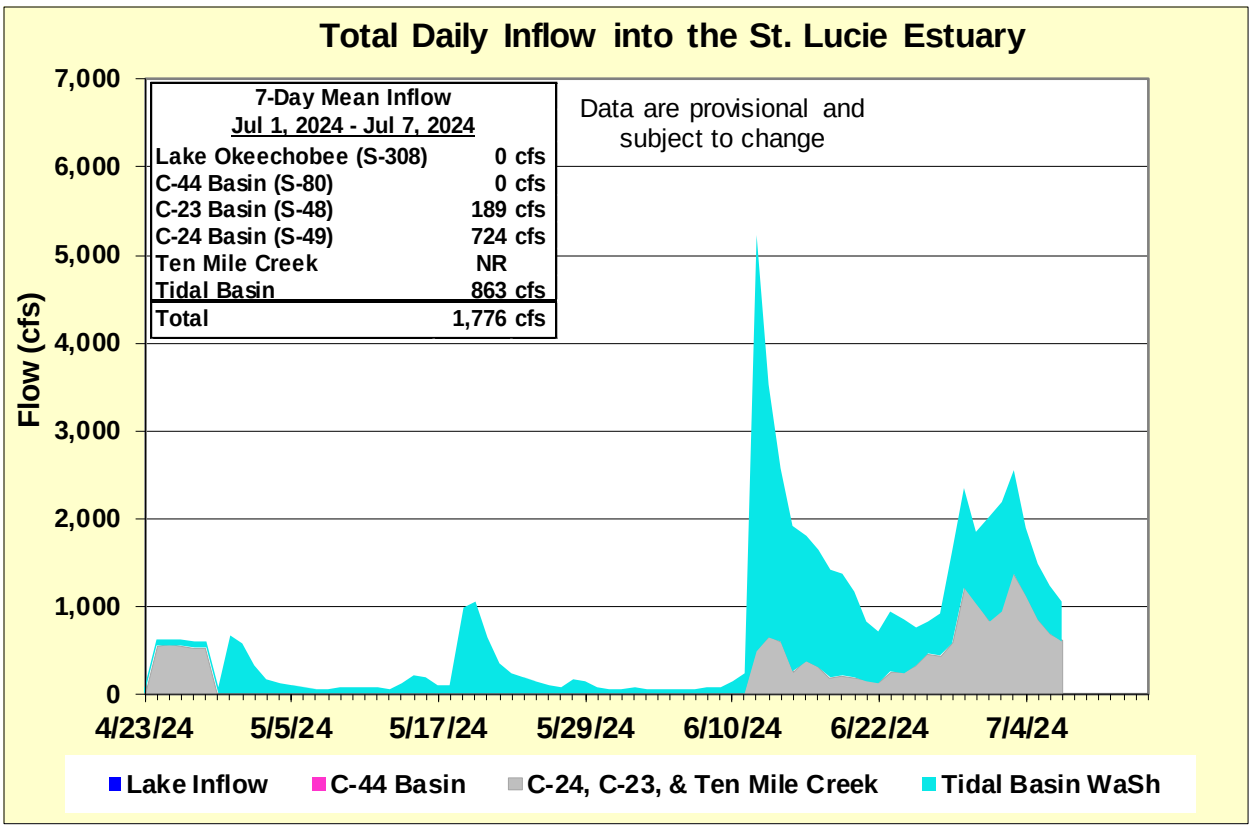


Figure ES-2. Total daily inflows from Lake Okeechobee and runoff from the C-44, C-23, C-24, Ten Mile Creek, and Tidal Basins into the St. Lucie Estuary.

Table ES-1. Seven-day mean salinity at oyster monitoring sites in the St. Lucie Estuary. Current means are in bold font; previous week's means are in parentheses. The envelope reflects the optimum salinity range for adult eastern oysters (*Crassostrea virginica*) in the estuary. Data are provisional.

Sampling Site	Surface	Bottom	Optimum Envelope
HR1 (North Fork)	**5.5** (10.7)	**13.5** (16.8)	10.0 – 25.0
US1 Bridge	**13.0** (17.3)	**15.4** (18.6)	10.0 – 25.0
A1A Bridge	**22.1** (24.9)	**27.3** (29.6)	10.0 – 25.0

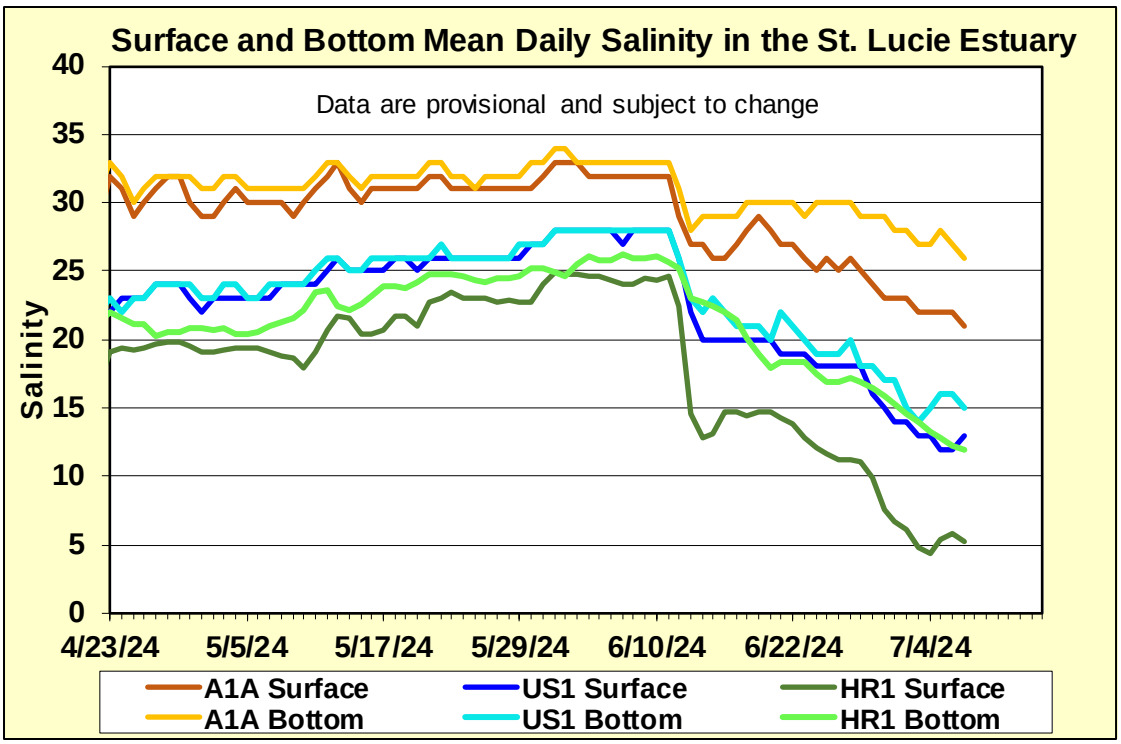


Figure ES-3. Mean daily salinity at the A1A, US1, and HR1 sites in the St. Lucie Estuary.

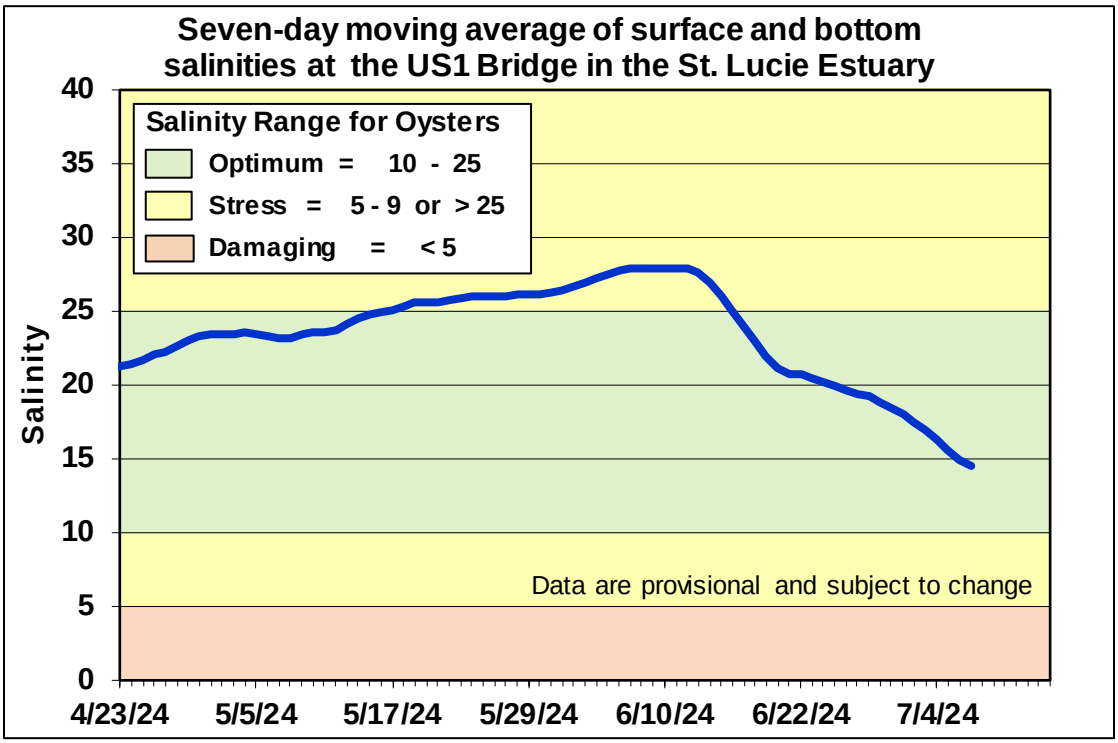


Figure ES-4. Seven-day moving average of the surface and bottom salinities at the US1 Bridge in the St. Lucie Estuary.

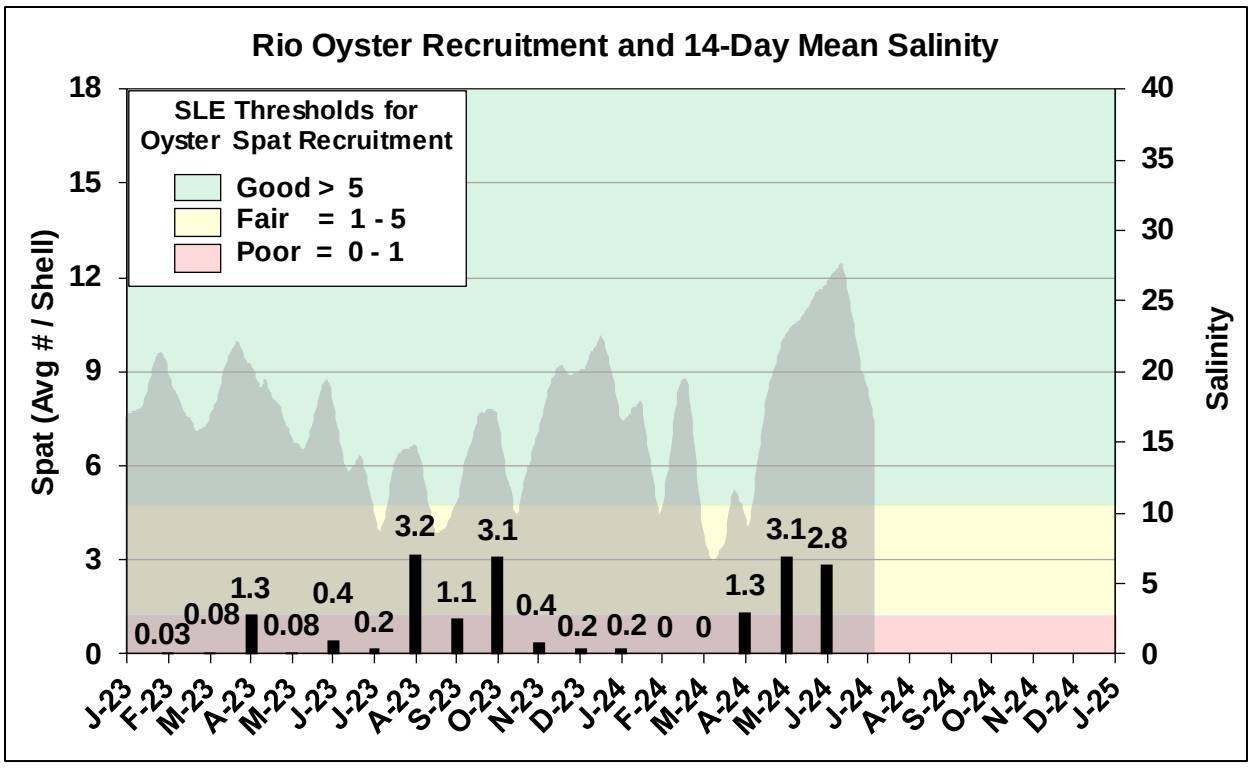


Figure ES-5. Mean oyster recruitment at the Rio oyster monitoring station and 14-day mean salinity at US1 Bridge.

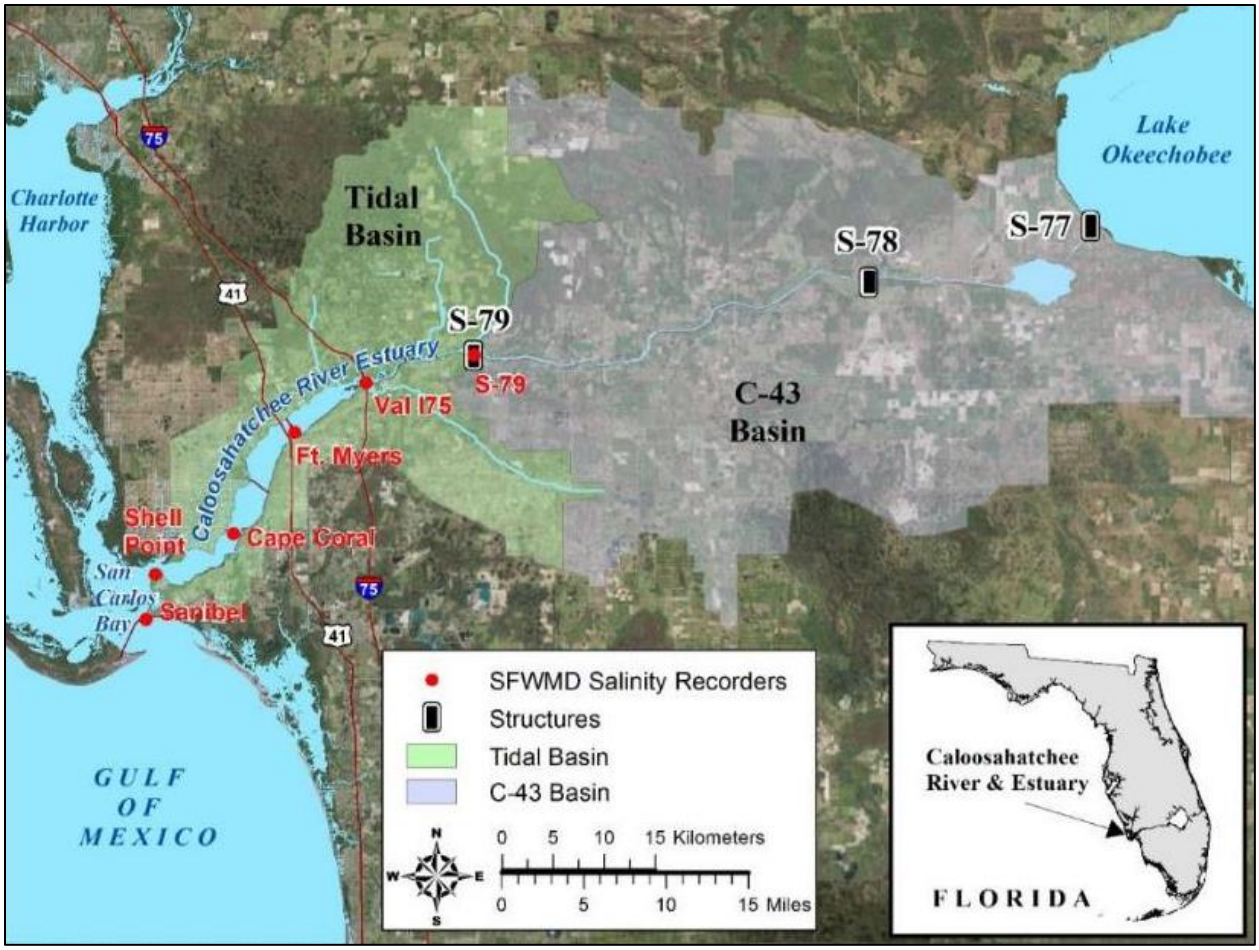


Figure ES-6. Basins, water control structures, and salinity monitoring sites in the Caloosahatchee River Estuary.

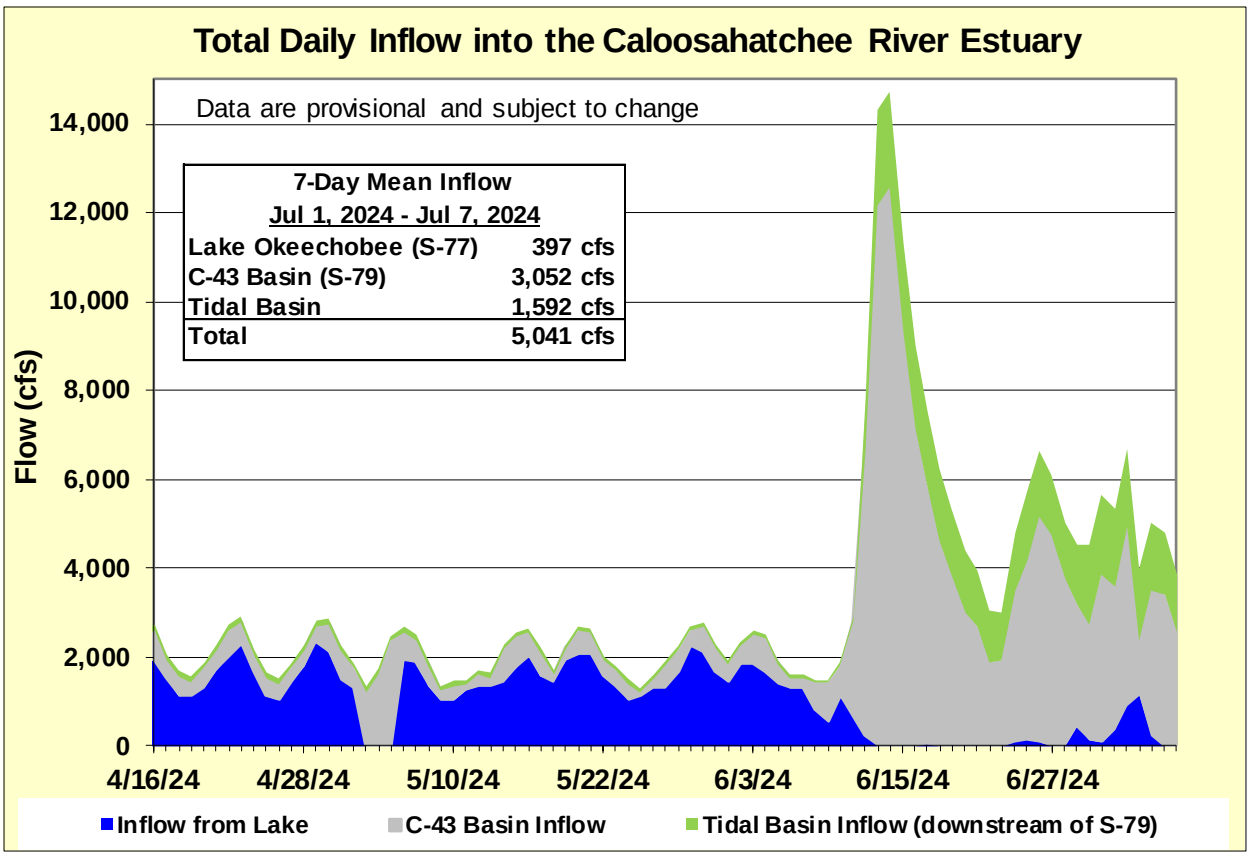


Figure ES-7. Total daily inflows from Lake Okeechobee, and runoff from the C-43 and Tidal basins into the Caloosahatchee River Estuary.

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)	**0.3** (0.2)	**0.3** (0.2)	0.0 – 10.0
Val I-75	**0.3** (0.3)	**0.3** (0.2)	0.0 – 10.0
Fort Myers Yacht Basin	**0.2** (0.2)	**0.2** (0.3)	0.0 – 10.0
Cape Coral	**1.8** (2.8)	**2.5** (3.4)	10.0 – 25.0
Shell Point	**16.5** (15.7)	**19.7** (18.0)	10.0 – 25.0
Sanibel	**25.4** (24.8)	**27.1** (27.6)	10.0 – 25.0

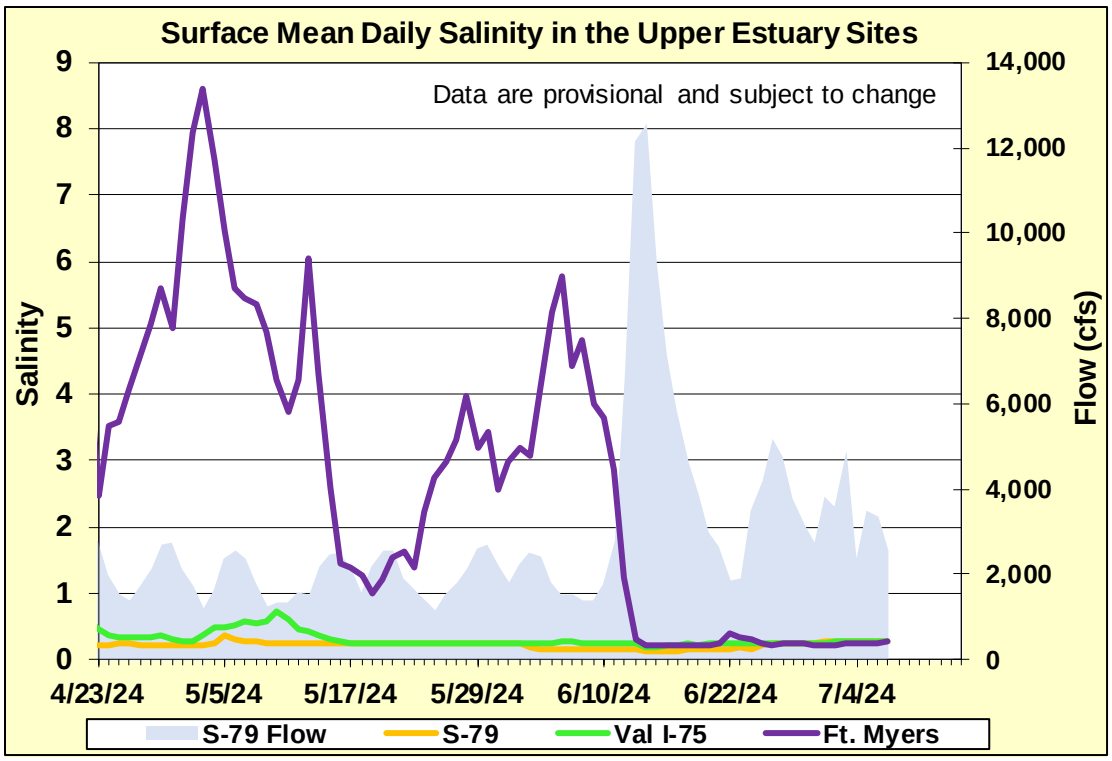


Figure ES-8. Mean daily salinity at upper Caloosahatchee River Estuary monitoring sites and mean daily flow at S-79.

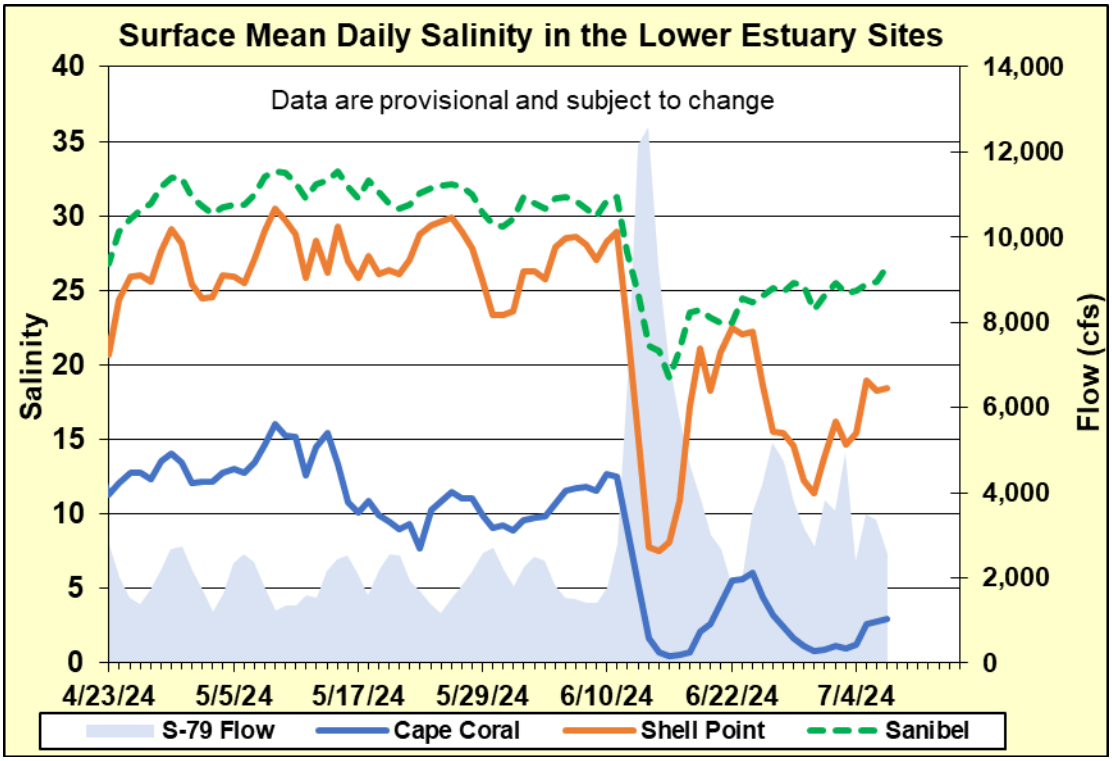


Figure ES-9. Mean daily surface salinity at lower Caloosahatchee River Estuary monitoring sites and mean daily flow at S-79.

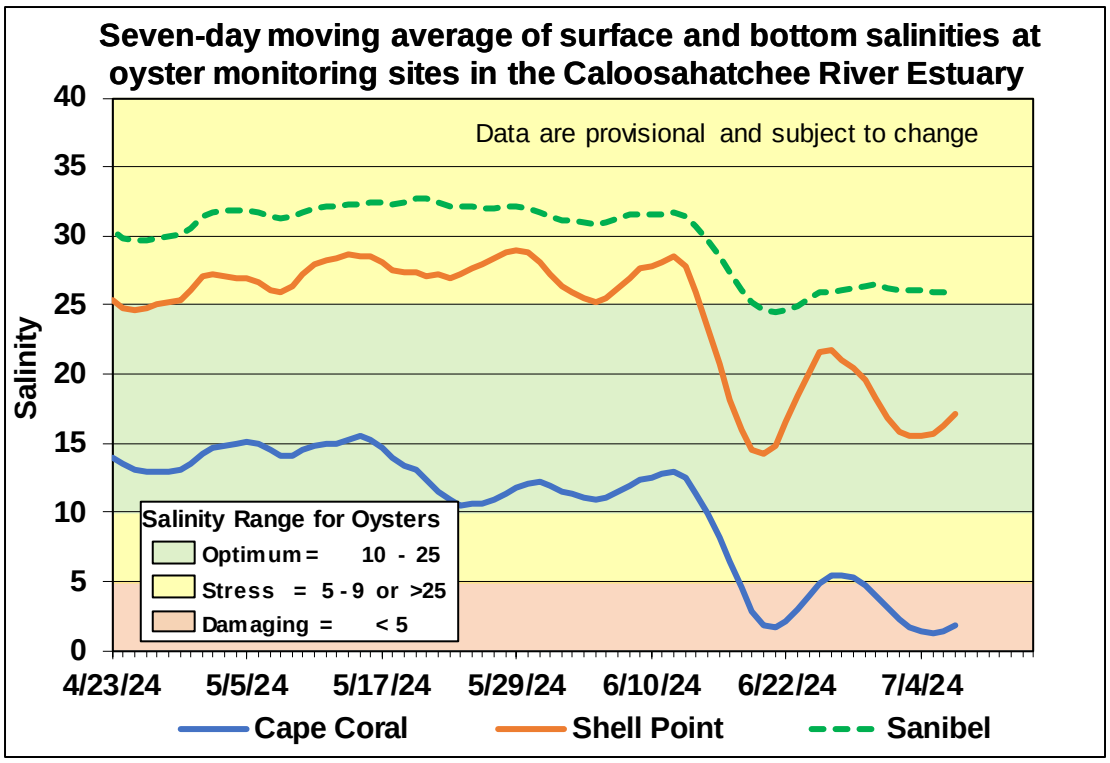


Figure ES-10. Seven-day moving average of surface and bottom salinities at Cape Coral, Shell Point, and Sanibel monitoring sites in the Caloosahatchee River Estuary.

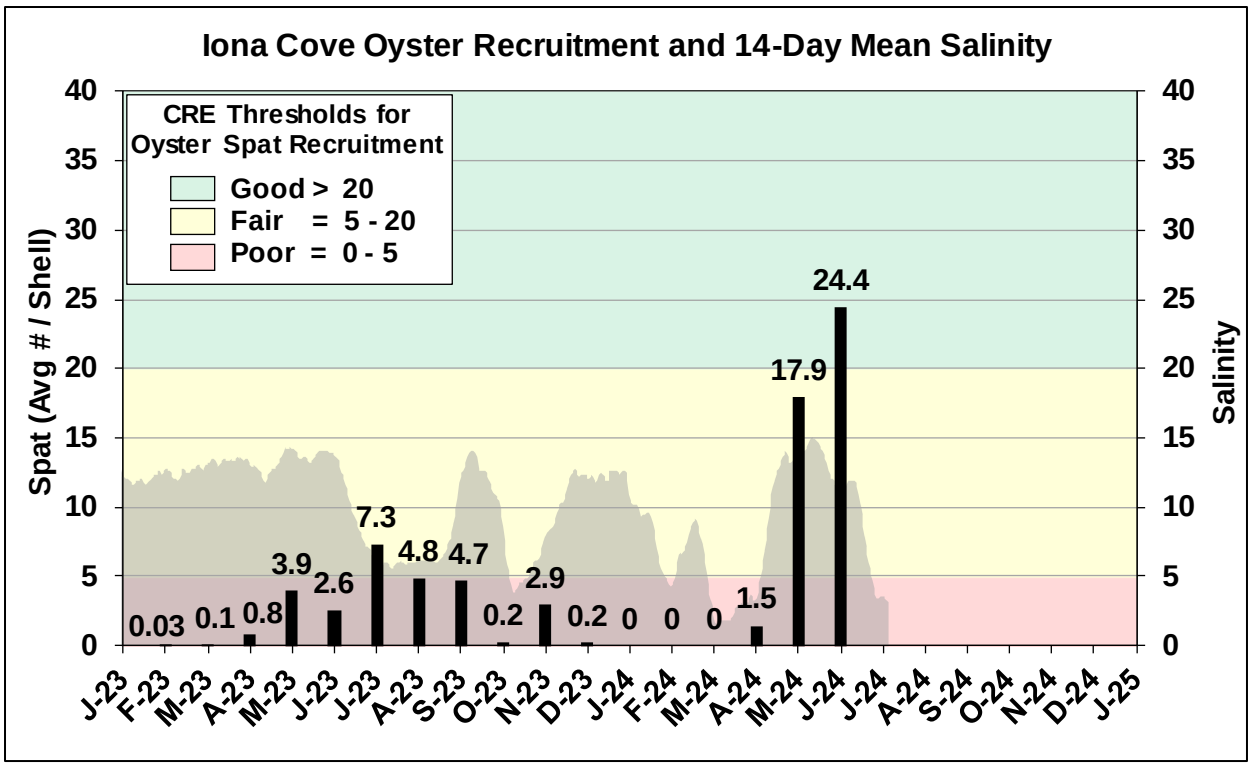


Figure ES-11. Mean oyster recruitment at the Iona Cove oyster monitoring station and 14-day mean salinity at Cape Coral.

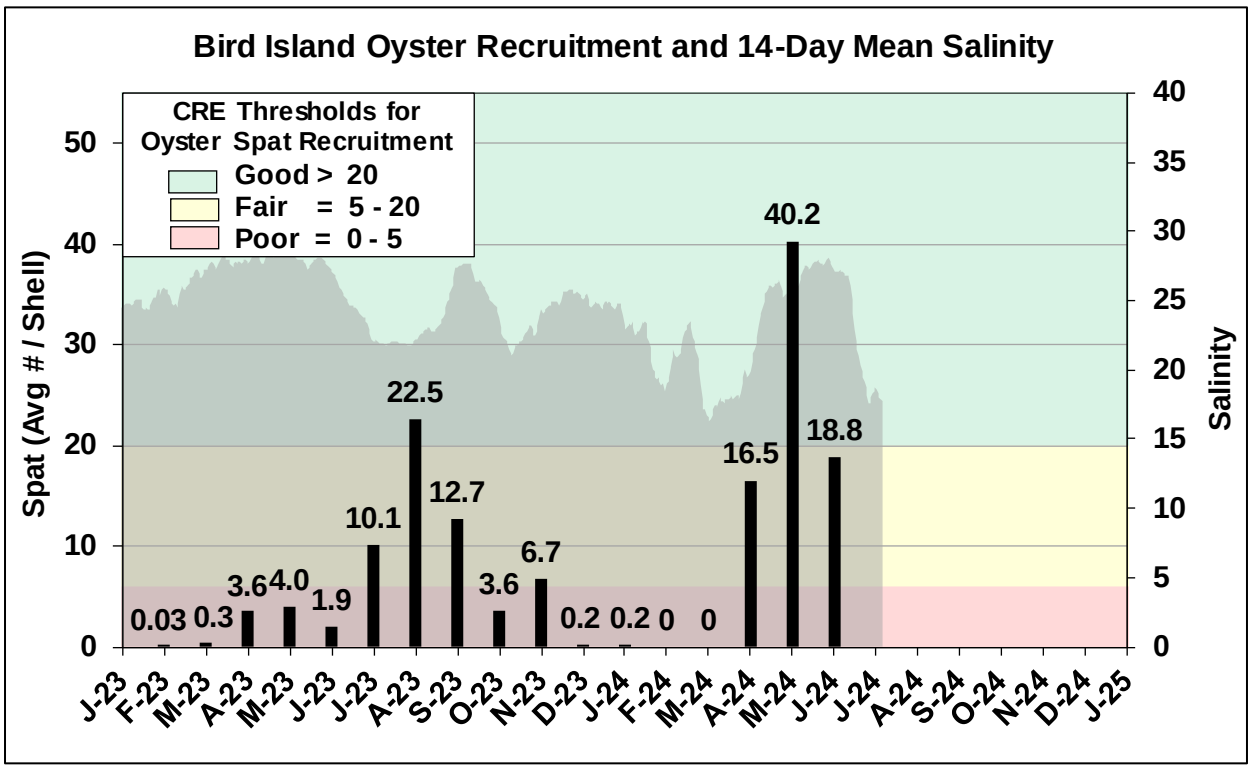


Figure ES-12. Mean oyster recruitment at the Bird Island oyster monitoring station and 14-day mean salinity at Shell Point.

Table ES-3. Predicted salinity at Val I-75 in the Caloosahatchee River Estuary at the end of the forecast period for various S-79 flow release scenarios.

Scenario	Simulated S-79 Flow (cfs)	Tidal Basin Runoff (cfs)	Daily Salinity	30-Day Mean Salinity
A	450	942	0.3	0.3
B	750	942	0.3	0.3
C	1,000	942	0.3	0.3
D	1,500	942	0.3	0.3

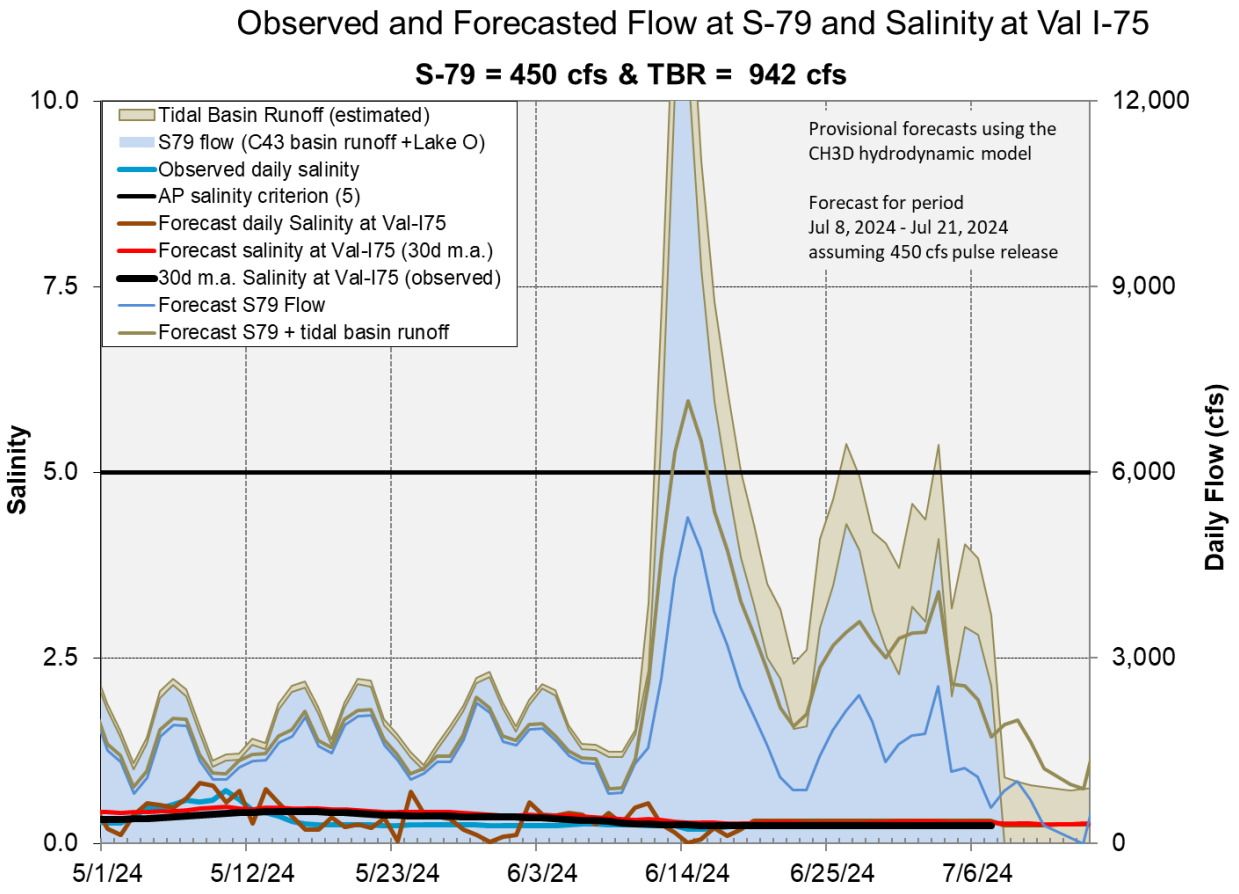


Figure ES-13. Forecasted Val I-75 site surface salinity assuming no pulse release at S-79.

Stormwater Treatment Areas

STA-1E: STA-1E Eastern Flow-way is offline for rehydration and vegetation establishment following erosion repair. An operational restriction is in place in STA-1E Western Flow-way for post-construction vegetation grow-in. Online treatment cells are near or above target stage. Vegetation in the Central flow-way is highly stressed. The 365-day phosphorus loading rate (PLR) for the Central Flow-way is high. (**Figure S-1**).

STA-1W: Treatment cells are near or above target stage. Vegetation in the flow-ways is highly stressed. The 365-day PLRs for the Eastern and Western Flow-ways are high, and the 365-day PLR for the Northern Flow-ways is below 1.0 g/m^2/year (**Figure S-1**).

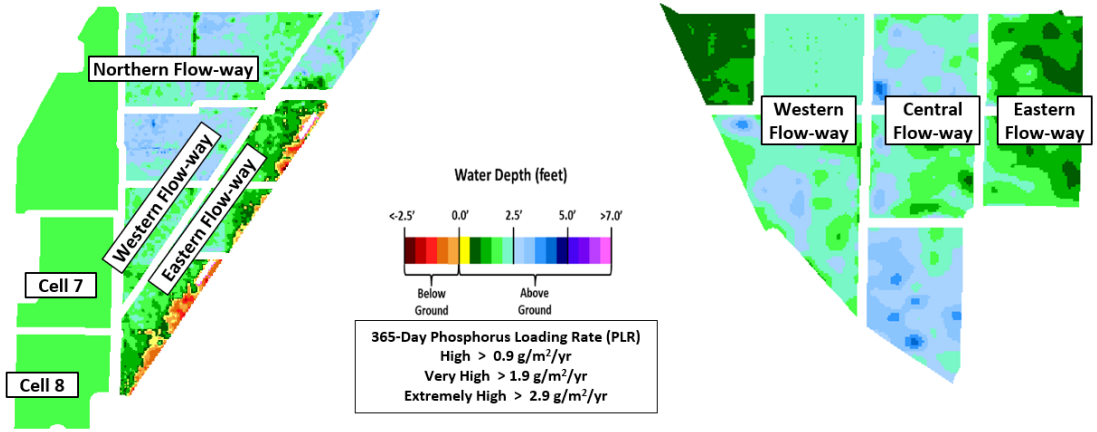
STA-2: Operational restrictions are in place in Flow-ways 2 and 4 for vegetation management activities, and in Flow-way 5 for construction activities. Online treatment cells are near or above target stage, and Flow-way 4 has extended deep water conditions. Vegetation in Flow-ways 2, 3, and 4 is stressed,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

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

STA-5/6: Treatment cells are near or above target stage. All treatment cells have highly stressed or stressed vegetation conditions. The 365-day PLRs for Flow-ways 1, 4, 6, 7, and 8 are below 1.0 g/m^2/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.

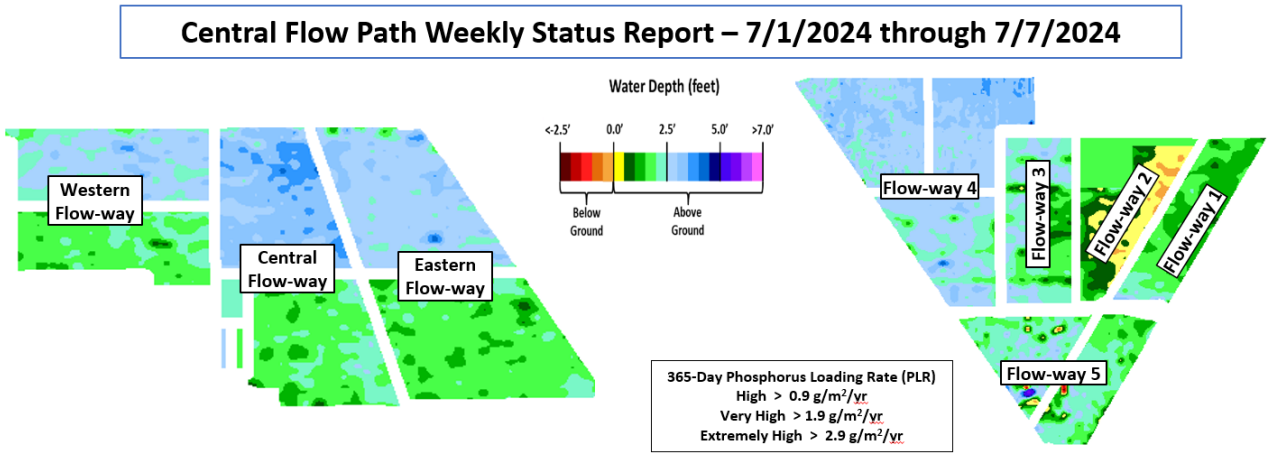
Eastern Flow Path Weekly Status Report – 7/1/2024 through 7/7/2024



STA-1W	Flow-way Status
Western	• High 365-day PLR • Highly stressed vegetation conditions
Eastern	• High 365-day PLR • Highly stressed vegetation conditions
Northern	• Highly stressed vegetation conditions
Cell 6	
Cell 7+8	

STA-1E	Flow-way Status
Western	• Post-construction vegetation grow-in
Central	• High 365-day PLR • Highly stressed vegetation conditions
Eastern	• Offline for vegetation grow-in following erosion repair

Figure S-1. Eastern Flow Path Weekly Status Report

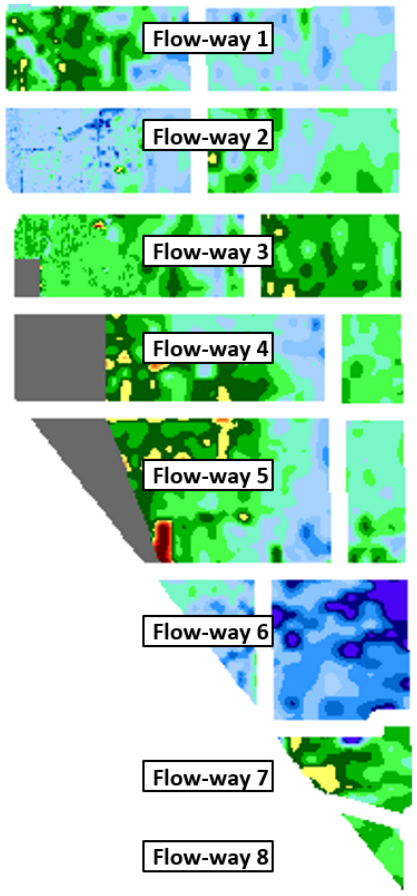


STA-3/4	Flow-way Status
Western	• High 365-day PLR
Central	• Highly stressed vegetation conditions • High 365-day PLR • Extended deep water conditions
Eastern	• Post-drawdown vegetation grow-in • Stressed vegetation conditions

STA-2	Flow-way Status
Flow-way 1	• High 365-day PLR
Flow-way 2	• High 365-day PLR • Post-construction vegetation grow-in • Stressed vegetation conditions
Flow-way 3	• High 365-day PLR • Stressed vegetation conditions
Flow-way 4	• Planting emergent vegetation • Stressed vegetation conditions • Extended deep water conditions
Flow-way 5	• Highly stressed vegetation conditions • Construction activities (FPL pads)

Figure S-2. Central Flow Path Weekly Status Report

Western Flow Path Weekly Status Report – 7/1/2024 through 7/7/2024



STA-5/6	Flow-way Status
Flow-way 1	• Highly stressed vegetation conditions
Flow-way 2	• Highly stressed vegetation conditions • High 365-day PLR
Flow-way 3	• Highly stressed vegetation conditions • High 365-day PLR
Flow-way 4	• Highly stressed vegetation conditions
Flow-way 5	• Highly stressed vegetation conditions • High 365-day PLR
Flow-way 6	• Highly stressed vegetation conditions
Flow-way 7	• Stressed vegetation conditions
Flow-way 8	• Stressed vegetation conditions

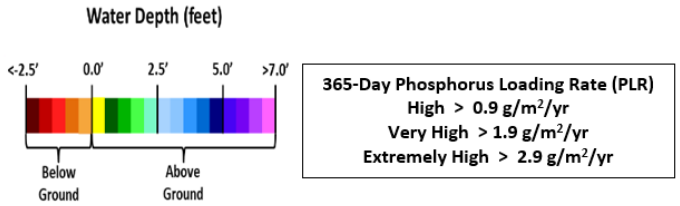


Figure S-3. Western Flow Path Weekly Status Report

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, µg/L or ppb. Inflow concentration refers to the flow-weighted mean TP from all inflow structures over a period of time.
- **Outflow Concentration**: The flow-weighted mean TP from all outflow structures over a period of time. The outflow concentration represents the reduction of inflow TP achieved by STA treatment of the inflow water.
- **WQBEL**: The STA outflow concentration that is required upon completion of the Restoration Strategies projects by December 2025. The outflow concentration shall not exceed 13 ppb as an annual flow weighted mean in more than 3 out of 5 water years on a rolling basis and shall not exceed 19 ppb as an annual flow weighted in any water year.
- **Flow-Way** (FW): One or more treatment cells connected in series. Cells typically have emergent aquatic vegetation (EAV) in the front portion of the flow-way followed by a mix of EAV and submerged aquatic vegetation (SAV)
- **Vegetation Status**: Healthy means the vegetation condition is good and will allow the STA to perform as designed. Stressed means the vegetation is showing signs of poor health, such as browning or areas of vegetation die-off, or the cell contains undesirable vegetation such as floating exotic vegetation requiring treatment. The TP reduction capability of the STA is affected when the vegetation condition is poor.
- **Phosphorus Loading Rate** (PLR): Mass of inflow TP in grams, divided by total treatment area of STA in square meters, per year. In general, a 365-day value of less than 1.0 is needed for an STA to perform optimally. A PLR of 2.0 is considered very high and a PLR of 3.0 is considered extremely high. The TP reduction capability of the STA is affected when the PLR is high, very high and extremely high.
- **Online**: Online status means the FW can receive and treat inflow.
- **Online with Restriction**: The FW can receive and treat inflow, but the amount of flow or water level may be limited temporarily. For example, a vegetation rehabilitation effort may require reduced flows through an area while the new plants are establishing, or nesting by protected species may require a certain water level not to be exceeded.
- **Offline**: The FW is unable to receive and treat inflow due to repairs, construction, or other prohibitive reasons.
- **Depth**: Difference between the average surface water level in a cell and the average ground elevation in that cell. Target depths, or depths between flow events, are between 1.25 ft to 1.5 ft. As depth approaches or drops below zero, an increasing percentage of the cell is considered dry and STA conditions deteriorate. An increase in depth above target depth is expected with increasing flow. However, as depth increases much above the target depth and is sustained over a period of time, it can be detrimental to vegetation health and overall STA treatment performance.
- **Note**: The data provided in this summary report were developed using a combination of provisional and quality-assured flow and water quality data. In some cases, best professional judgment was used to estimate missing data and revise questionable data. Values provided are not considered final but are appropriate for use in STA operational decision-making.

Everglades

Water Conservation Area Regulation Schedules

Daily rainfall occurred throughout the Everglades last week with higher amounts in Everglades National Park (ENP). WCA-1: Stage within the Refuge remains above schedule. On Sunday the 3-Gauge average was 0.72 feet above the flat Zone A1 regulation line. WCA-2A: Stage at gauge 2A-17 also remains above schedule but started receding late in the week. The average on Sunday was 1.46 feet above the flat regulation line. WCA-3A: The 3-Gauge average stage continued increasing but the ascension slowed over the week, remaining above the Zone A regulation line by 1.02 feet. WCA-3A North: Stage at Gauge 62 (NW corner) continues to fall but remains above the increasing Upper Schedule line by 0.31 feet. See figures **EV-1** through **EV-4**.

Water Depths

The SFWDAT model output for July 7, 2024 shows a hydropattern that is dramatically deeper than one month ago, especially in Big Cypress National Preserve (BCNP). Ponded conditions continue to expand from the upper reaches of the L-67s south to the historically ponded region of southern WCA-3A and downstream in northern ENP. The northern end of the refuge still has some potential for water at ground surface. Hydrologic connectivity is being maintained within the major sloughs of ENP, building in the east. Current SFWDAT water depth estimates are wetter when compared to one month ago across the Everglades Protection Area , less so in WCA-1 and WCA-2B. The comparison to modeled conditions a year ago illustrates a mix of slightly deeper and drier conditions. Portions of WCA-1, southern ENP, and most of WCA-2A are significantly shallower, with the rest of system being deeper, particularly to the west.

Comparing current conditions to the 20-year percentiles on July 7th, depth conditions remain above the 90th percentile for this time of the year for much of WCA-3B, ENP and BCNP. In WCA-1 and WCA-2A, conditions remain variable but are trending deeper (**Figure EV-7**).

Taylor Slough and Florida Bay

Stage changes were variable across Taylor Slough over the past week, with an average decrease of 0.03 feet. Changes ranged from –0.08 feet at EVER6 in the C-111 area, to +0.03 feet at Taylor Slough Bridge (TSB) in the northern slough (**Figure EV-8 and Figure EV-9**). Taylor Slough water levels remain above the recent average for this time of year by 6.9 inches compared to before the Florida Bay initiative (starting in 2017), a decrease of 1.2 inches relative to last week's comparison. Both the Craighead Pond (CP) and TSB stages are below estimated historical levels by 0.38 and 0.70 feet, respectively.

Average Florida Bay salinity was 25.2, an increase of 0.7 from last week. Salinity increased at most sites, with changes ranging from –1.0 at Joe Bay (JB) in the eastern nearshore region, to +3.9 at Terrapin Bay (TB) in the central nearshore region (**Figure EV-8**). Salinity is now within the WY2001-2016 Interquartile Range and above estimated historical levels in the western and central regions and remains below both metrics in the

eastern region (**Figure EV-10**). Average Florida Bay salinity remains below its recent average for this time of year by 5.0, an increase of 1.7 from last week's comparison.

Salinity at the Taylor River (TR) station in the mangrove zone (tracked for the Florida Bay MFL) was 2.0. The 30-day moving average was 7.9, a decrease of 2.5 from last week (**Figure EV-11**). The 365-day moving sum of flow from the five creeks was 385,884 acre-feet, a decrease of 8,548 acre-feet from last week (**Figure EV-11**).

Average rainfall across Taylor Slough and Florida Bay was 1.44 inches over the past week, based on the 18 gauges used for this report. Rainfall ranged from 0.05 inches at TB in the central nearshore region to 4.49 inches at TSB in the northern slough (**Figure EV-12**). Wind directions and speeds in Florida Bay ranged from 0.4 mph S on July 2nd to 18.8 mph NE on July 4th (**Figure EV-12**).

Average daily flow from the five major creeks (McCormick, Taylor, Mud, Trout, West Highway) totaled 676 acre-feet last week, with net positive flows for the week. Total daily creek flow ranged from –1,026 acre-feet on July 6th to 2,083 acre-feet on July 1st (**Figure EV-13**). Average daily flow for the week was 3,706 acre-feet below estimated historical levels.

Implications for water management

The ecology of the Everglades would continue to benefit from ascension rates of less than 0.18 feet per week. Wading bird nesting surveys have ended for this season. Continued freshwater inputs to the park and into Florida Bay is helping to maintain ecologically desirable salinities, and maintaining inputs of water southward will help to prevent ecologically undesirable salinity swings in Florida Bay nearshore areas. Individual regional recommendations can be found in **Table EV-2**.

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

Everglades Region	Rainfall (inches)	Stage change (feet)
WCA-1	1.17	+0.01
WCA-2A	1.63	−0.09
WCA-2B	0.91	+0.00
WCA-3A	1.54	+0.12
WCA-3B	1.82	+0.06
ENP	2.25	+0.03

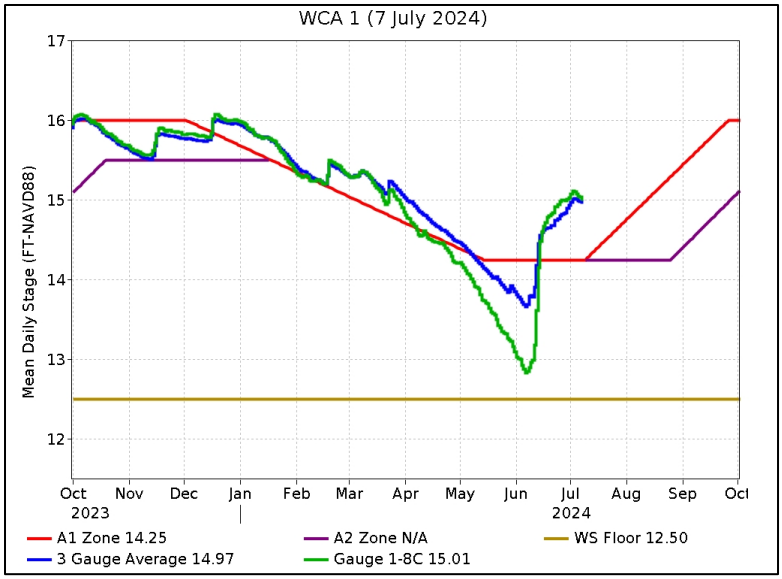


Figure EV-1. WCA-1 stage hydrographs and regulation schedule.

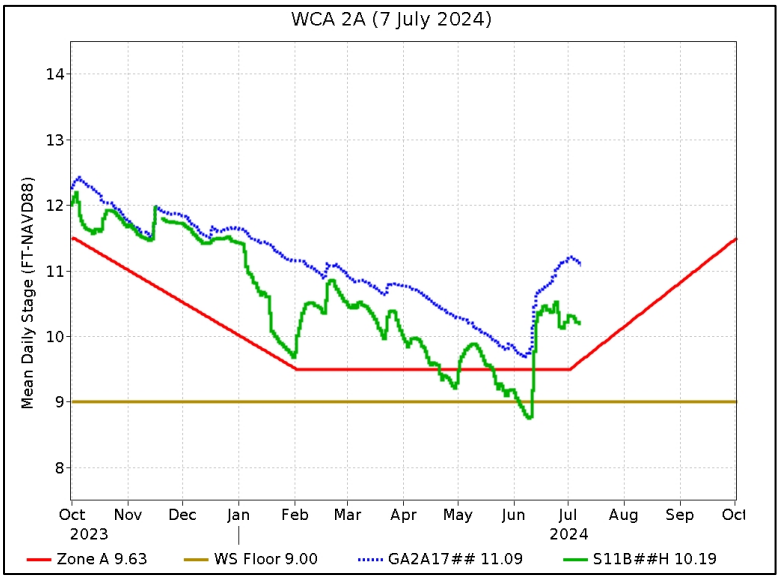


Figure EV-2. WCA-2A stage hydrographs and regulation schedule.

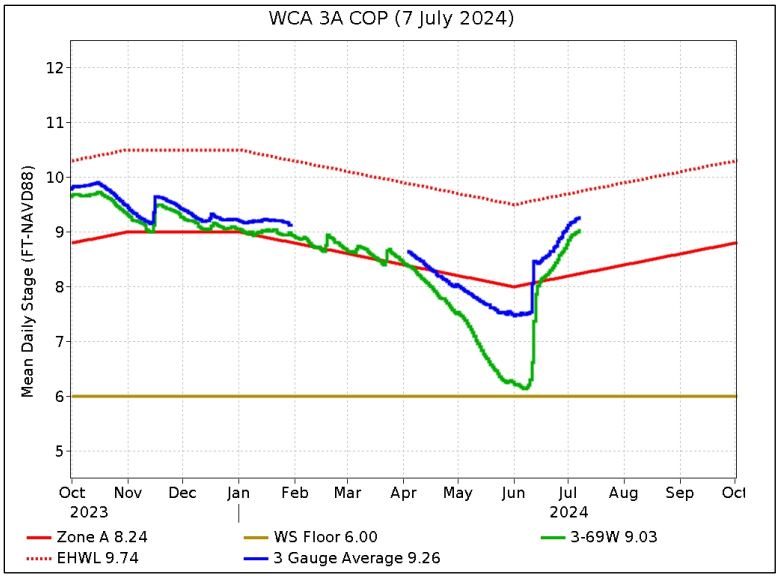


Figure EV-3. WCA-3A stage hydrographs (three-gauge average, 3-69W) and regulation schedule.

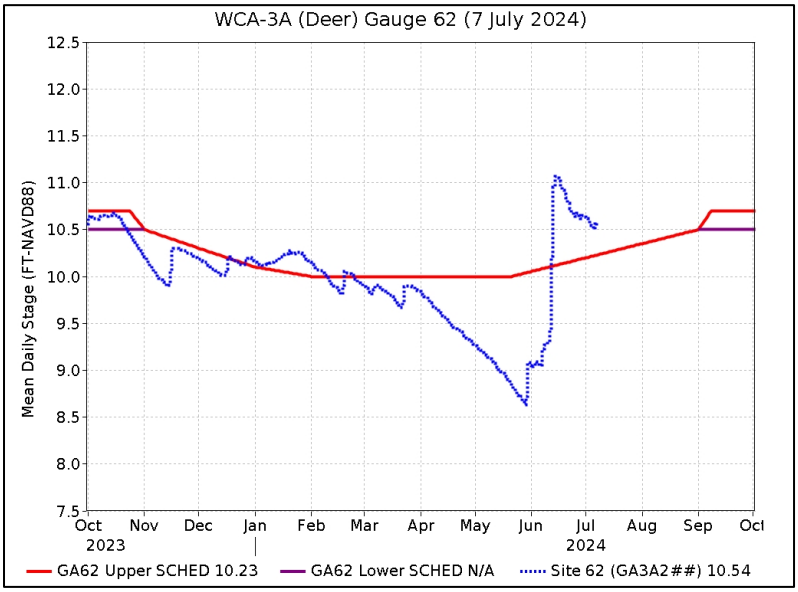


Figure EV-4. WCA-3A stage hydrograph (Deer gauge; Site 62) and GA62 regulation schedule.

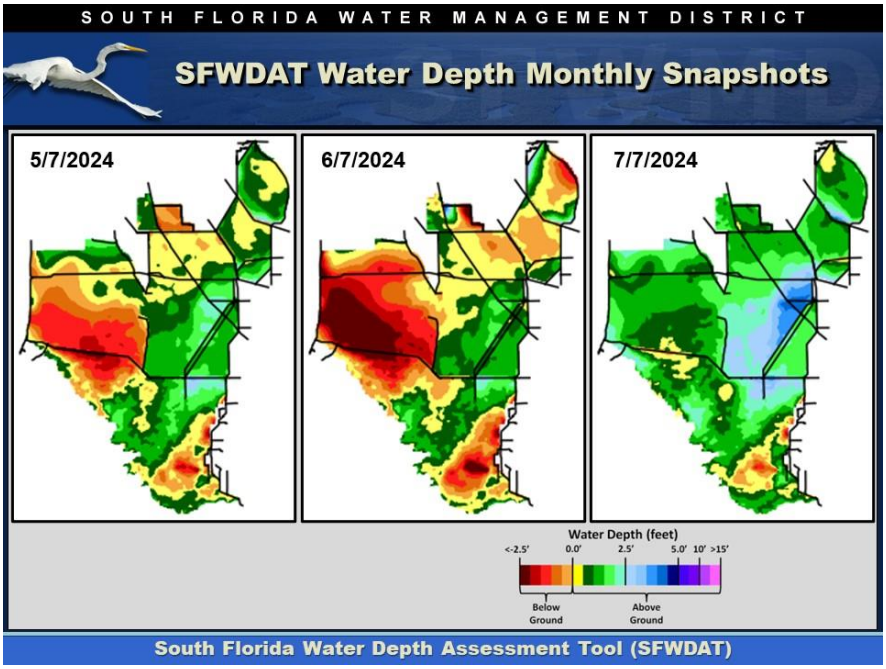


Figure EV-5. Everglades water depths from two months ago (left), one month ago (center), and present (right), based on SFWDAT.

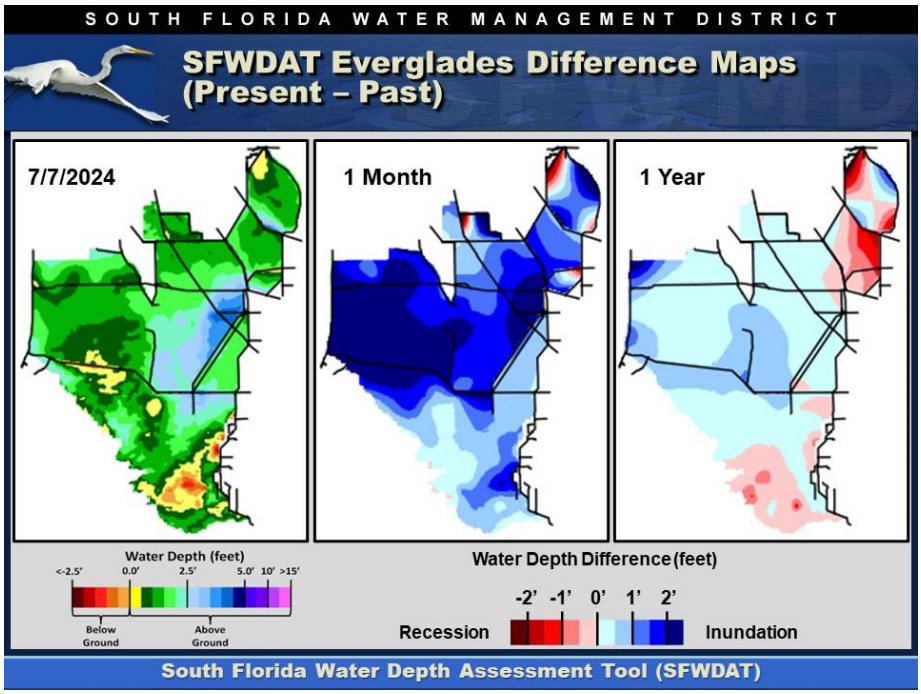


Figure EV-6. Present Everglades water depths (left) and water depth changes from one month (center) and one year (right) ago based on SFWDAT.

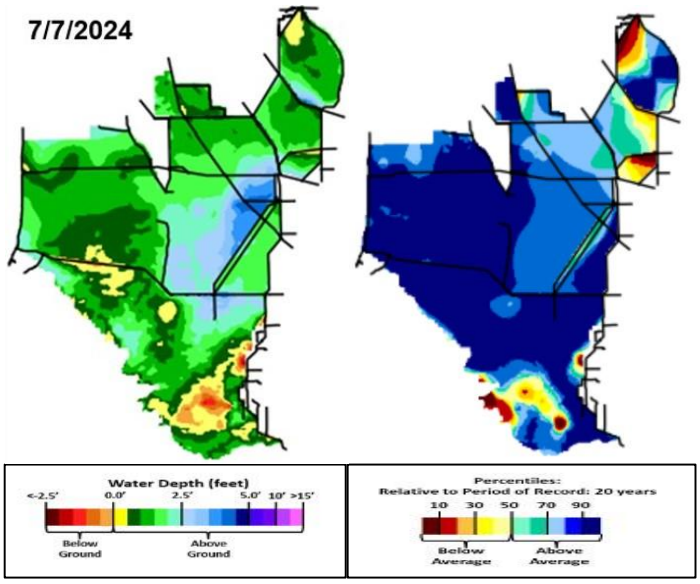


Figure EV-7. Present water depths (July 7, 2024) compared to the day of year average over the previous 20 years.

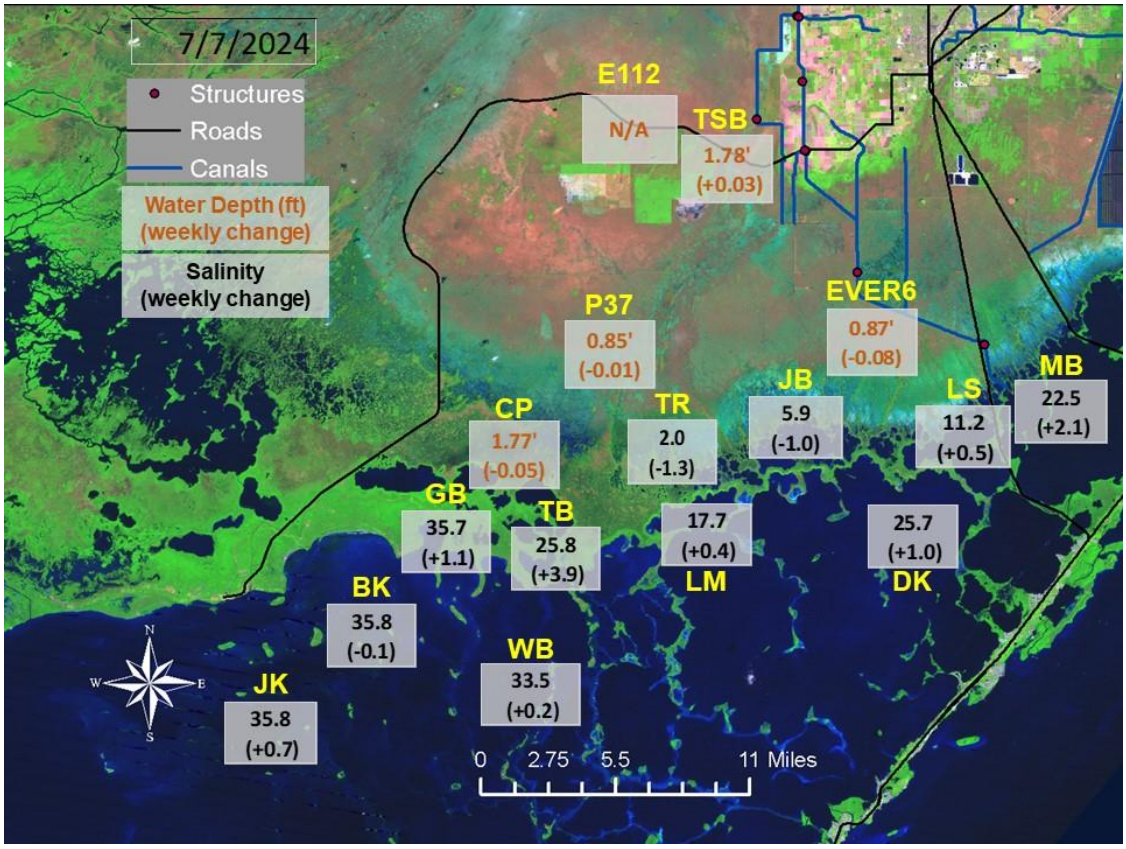


Figure EV-8. Taylor Slough water depths with changes since a week ago and Florida Bay salinities with changes since a week ago.

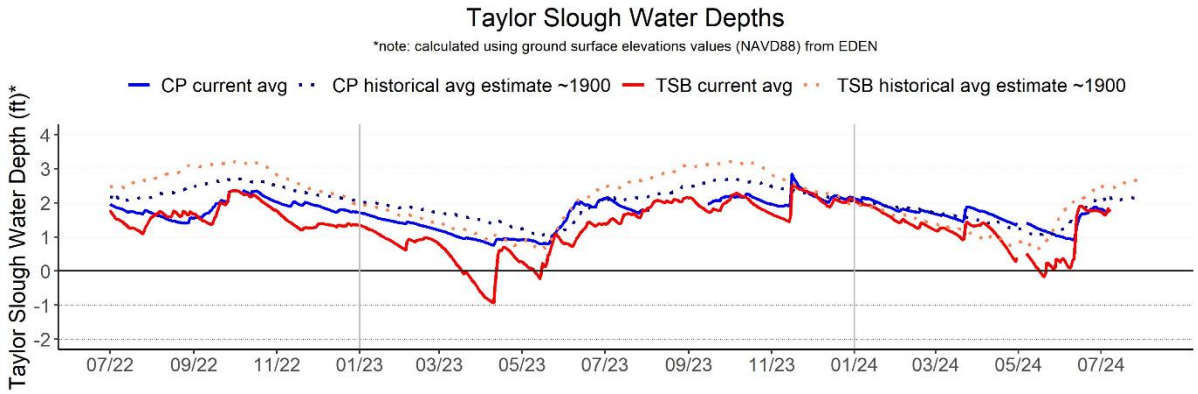


Figure EV-9. Taylor Slough water depth time series for Taylor Slough Bridge (TSB; northern slough) and Craighead Pond (CP; southern slough).

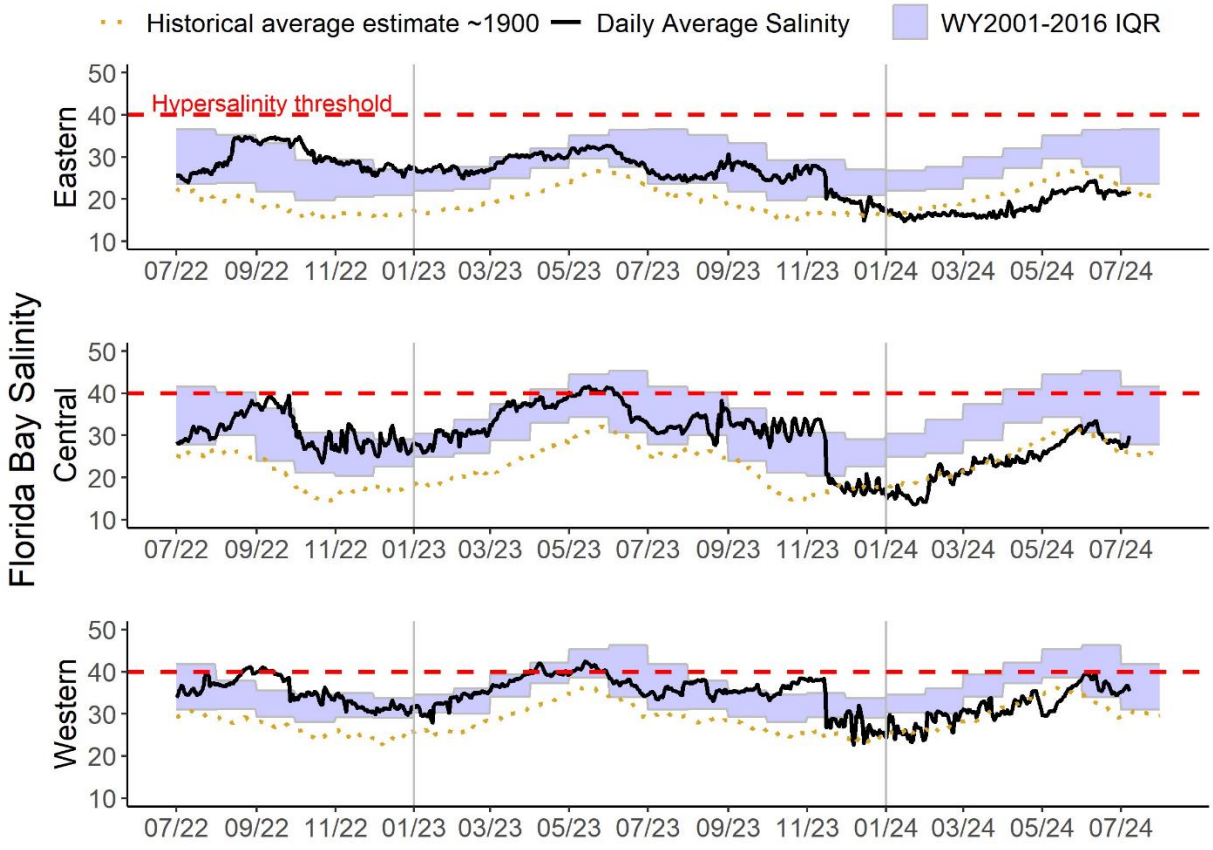


Figure EV-10. Eastern (top panel), Central (middle panel) and Western (bottom panel) Florida Bay daily average salinities with WY2001-2016 interquartile (25-75 percentile) ranges (IQR) and estimated historical daily average salinities. The hypersalinity threshold indicates the level at which salinities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

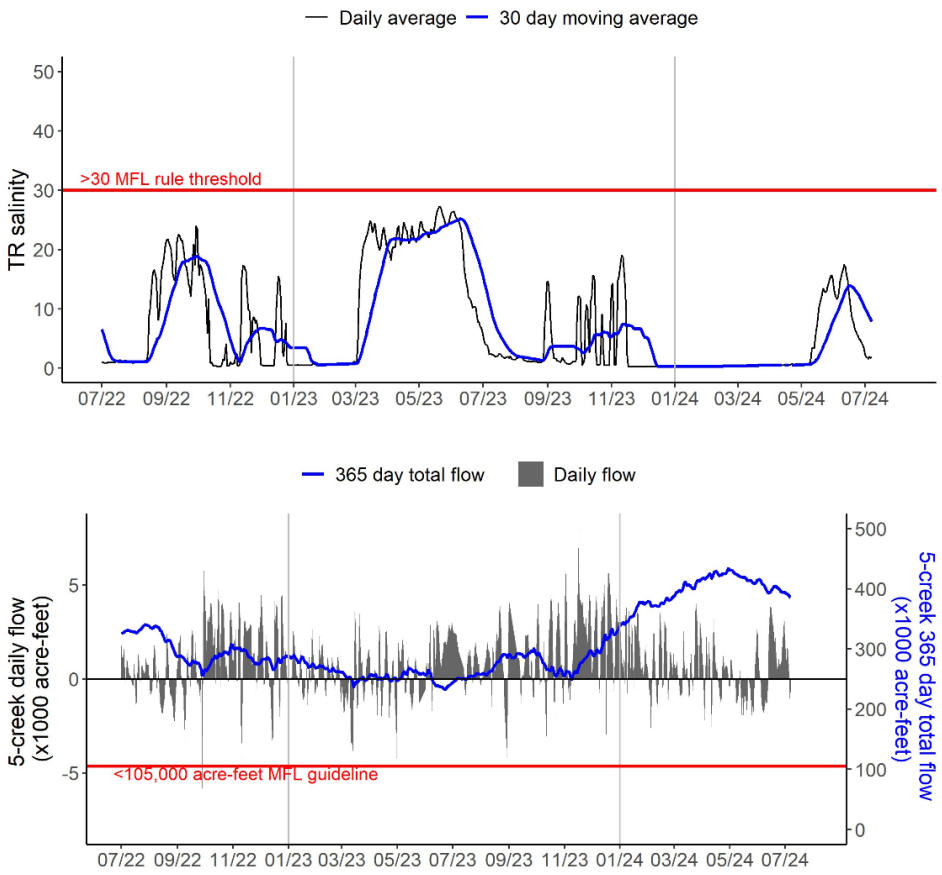


Figure EV-11. Salinity at Taylor River (TR; top) and creek inflow to Florida Bay (bottom) from the five major creeks (McCormick Creek, Taylor River, Mud Creek, Trout Creek, and West Highway Creek). The 30-day moving average salinity and 365-day total creek flow are tracked for the Florida Bay MFL criteria.

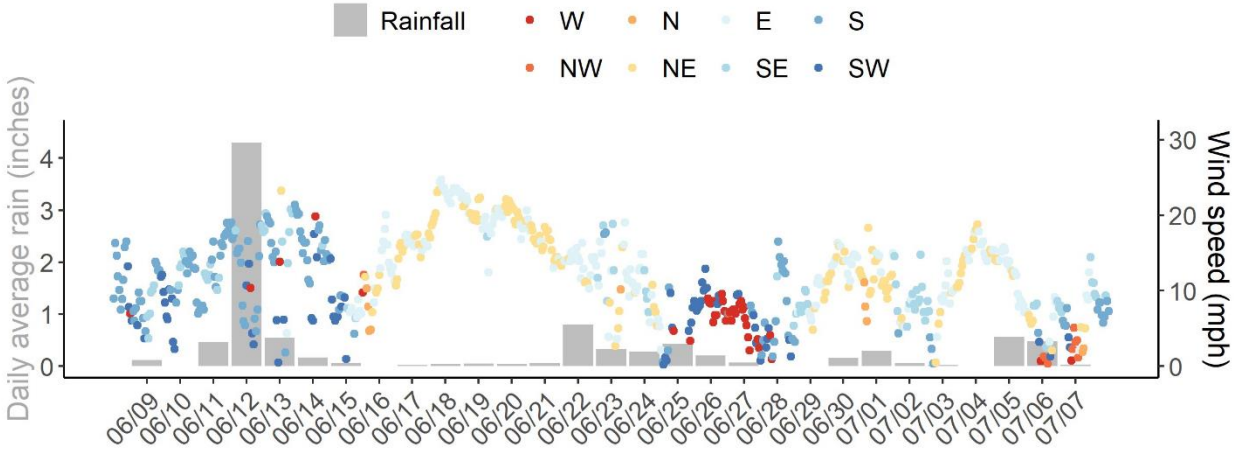


Figure EV-12. Daily average rain across Taylor Slough and Florida Bay, along with hourly average wind speed and direction (measured at Long Key) in Florida Bay over the past four weeks.

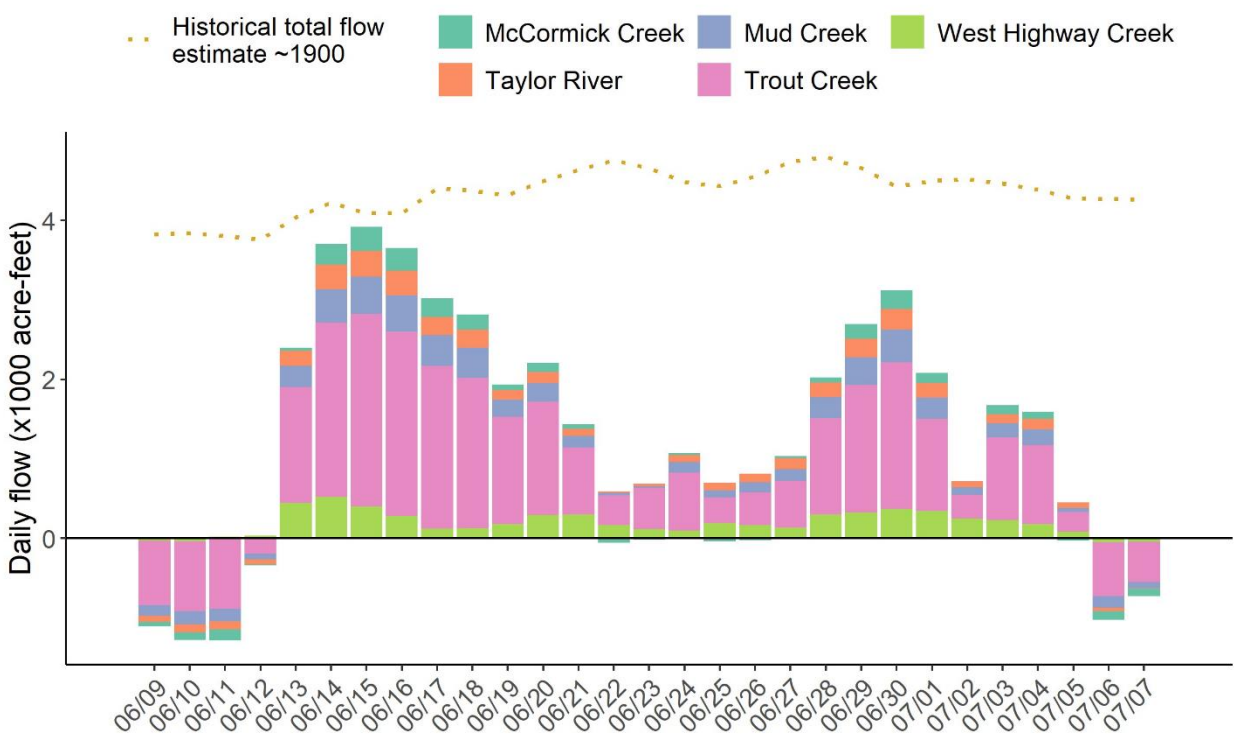


Figure EV-13. Daily average creek flow summed between five creeks with estimated historical daily flow over the past four weeks.

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

SFWMD Everglades Ecological Recommendations, July 9, 2024 (red is new)			
	Weekly change	Recommendation	Reasons
WCA-1	Stage increased by 0.01’	Ascension rate of less than 0.18’ per week.	Protect within basin and downstream habitat and wildlife.
WCA-2A	Stage decreased by 0.09’	Ascension rate less than 0.18’ per week.	Protect within basin and downstream habitat and wildlife.
WCA-2B	Stage was unchanged	Ascension rate of less than 0.18’ per week.	Protect within basin and downstream habitat and wildlife.
WCA-3A NE	Stage increased by 0.20’	Ascension rate of less than 0.18’ per week.	Protect within basin and downstream habitat and wildlife.
WCA-3A NW	Stage decreased by 0.07’	Ascension rate of less than 0.18’ per week.	
Central WCA-3A S	Stage increased by 0.16’	Ascension rate of less than 0.18’ per week.	Protect within basin wildlife.
Southern WCA-3A S	Stage increased by 0.20’	Ascension rate of less than 0.18’ per week.	
WCA-3B	Stage increased by 0.06’	Ascension rate of less than 0.18’ per week.	Protect within basin and downstream habitat and wildlife.
ENP-SRS	Stage increased by 0.03’	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 −0.08’ to +0.03’	Move water southward as possible.	When available, provide freshwater to promote water movement.
FB- Salinity	Salinity changes ranged from −1.0 to +3.9	Move water southward as possible.	When available, provide freshwater to promote water movement.

Biscayne Bay

As shown in **Figure BB-1**, mean total inflow to Biscayne Bay was 830 cfs, and the previous 30-day mean inflow was 1,626 cfs. The seven-day mean salinity was 19.7 at BBCW8 and 17.2 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.

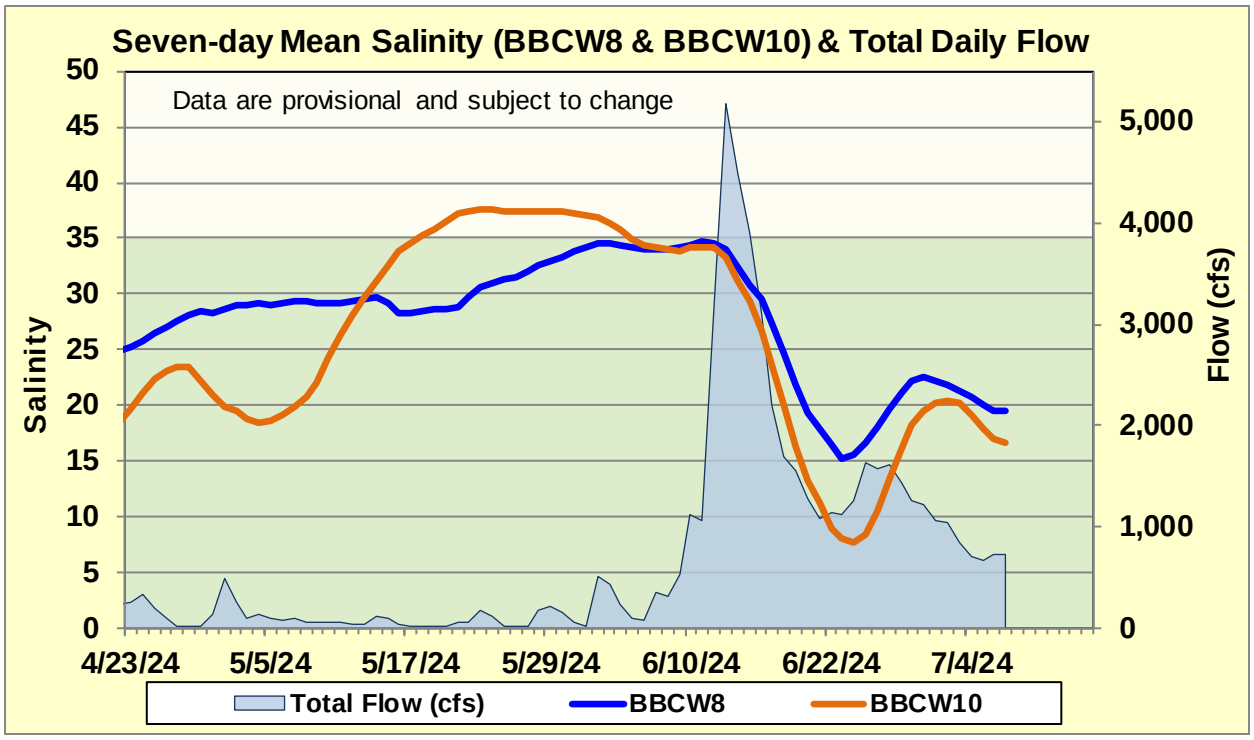


Figure BB-1. Seven-day mean salinity at BBCW8 and BBCW10 and total daily flow in Biscayne Bay. Total daily flow was calculated using flow from structures S20G, S20F, S21, S21A, S123, and S700P.