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 3, 2024

SUBJECT: Weekly Environmental Conditions for Systems Operations

Summary

Weather Conditions and Forecast

On Wednesday, a good coverage of afternoon rains progressing from east to west across the interior and western parts of the SFWMD are possible, while rains chances diminish along and near the east coast after widely scattered, early-day rains. Moisture and instability levels will decrease as a combination of drier mid-latitude air and a weak Saharan Air Layer (SAL) trailing Hurricane Beryl overspread the area. Consequently, overall total rainfall is predicted to decrease, even if the rain coverage will still be fair to good. Over the weekend, moisture and instability are predicted to rebound some, with easterly steering winds on Saturday maintaining the focus over the interior and the western parts of the SFWMD. A potential veering of the steering winds could change the regions of greatest rains to the interior on Sunday and the northeastern half of the SFWMD on Monday. The greatest source of uncertainty is whether moisture from the tropical wave trailing Hurricane Beryl reaches the SFWMD. The Day-6 and Day-7 QPFs reflect some influence from the passing tropical wave. However, the forecasts for both days are labeled of low confidence. For the week ending next Tuesday morning, total SFWMD rainfall is likely to be below normal and near-normal at best.

Kissimmee

Stages in East Lake Toho and Lake Toho are rising with recent rainfall, though small releases were made from East Lake Toho at the end of the week to slow the rate of rise. Weekly average discharge on June 30, 2024, was 160 cfs and 350 cfs at S-65 and S-65A, respectively. Mean weekly water depth on the Kissimmee River floodplain for the week ending June 30, 2024 increased by 0.01 feet from the previous week to 0.09 feet. The weekly average concentration of dissolved oxygen in the Kissimmee River decreased from 5.0 mg/L the previous week to 4.1 mg/L for the week ending June 30, 2024, which is well above the potentially lethal and stressful levels for largemouth bass and other sensitive species.

Lake Okeechobee

Lake Okeechobee stage was 12.14 feet NAVD88 (13.39 ft NGVD29) on June 30, 2024, which was 0.06 feet higher than the previous week and 0.44 feet higher than a month ago. Average daily inflows (excluding rainfall) decreased from the previous week, at 1,120 cfs, compared to 1,300 cfs. Average daily outflows (excluding evapotranspiration) increased slightly from the previous week, from 0 cfs to 170 cfs. Provisional taxa and toxin results from June 17-19 showed *Microcystis aeruginosa* dominated communities at 14 of the 31 sites, and nine sites had toxin levels above the 0.25 µg/L method's detection threshold, but none exceeded the EPA recreational standard of 8 µg/L. In the most recent non-obscured satellite image from June 27th, 2024, NOAA's Harmful Algal Bloom Monitoring System suggested moderate to high cyanobacteria concentrations throughout much of the Lake.

Estuaries

Total inflow to the St. Lucie Estuary averaged 1,310 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 5,340 cfs over the past week with 130 cfs coming from Lake Okeechobee. Mean salinities decreased at Cape Coral and Shell Point, and remained the same 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, June 30, 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 320,000 ac-feet. STA cells are above or near 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

Rates of stage change throughout the Everglades are returning to ecologically beneficial rates for apple snail reproduction and were categorized as good or fair in all regions this week. Average stage change in Taylor Slough showed a slight increase this week and remains above the recent average for this time of year. Average salinity decreased in Florida Bay last week and conditions continued improving in every region. The Eastern and Central regions stayed at or below estimated historical levels and the western region stayed at the lower bound of the IQR. Florida Bay MFL metrics remain well outside thresholds of harm.

Biscayne Bay

Total inflow to Biscayne Bay averaged 1,440 cfs and the previous 30-day mean inflow averaged 1,490 cfs. The seven-day mean salinity was 22.1 at BBCW8 and 20.2 at BBCW10, both within the ideal salinity range for estuarine organisms in this region (salinity less than 35). Data provided by Biscayne National Park.

Supporting Information

Kissimmee Basin

Upper Kissimmee

On June 30, 2024, mean daily lake stages were 54.3 feet NAVD (1.2 feet below schedule) in East Lake Toho, 51.1 feet NAVD (1.2 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 June 30, 2024, mean weekly discharge was 160 cfs and 350 cfs at S-65 and S-65A, respectively. Mean weekly discharge from the Kissimmee River was 350 cfs at both S-65D and S-65E (**Table KB-2**). Mean weekly headwater stages were 44.8 feet NAVD at S-65A and 24.6 feet NAVD at S-65D on June 30, 2024. Mean weekly river channel stage for the week ending on June 30, 2024 decreased by 0.3 feet from the previous week to 31.3 feet NAVD (**Figure KB-4**). Mean weekly water depth on the Kissimmee River floodplain for the week ending June 30, 2024 increased by 0.01 feet from the previous week to 0.09 feet (**Table KB-2**, **Figure KB-5**). The weekly average concentration of dissolved oxygen in the Kissimmee River decreased from 5.0 mg/L the previous week to 4.1 mg/L for the week ending June 30, 2024 (**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 ft/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)	
							6/30/24	*6/23/24*
Lakes Hart and Mary Jane	S-62	LKMJ	1	58.5	R	58.9	-0.4	-0.7
Lakes Myrtle, Preston and Joel	S-57	S-57	0	59.1	R	60.0	-0.9	-1.2
Alligator Chain	S-60	ALLI	0	61.0	R	62.2	-1.2	-1.3
Lake Gentry	S-63	LKGT	0	58.2	R	59.9	-1.7	-1.7
East Lake Toho	S-59	TOHOE	4	54.3	R	55.5	-1.2	-1.6
Lake Toho	S-61	TOHOW S-61	0	51.1	R	52.3	-1.2	-1.4
Lakes Kissimmee, Cypress and Hatchineha	S-65	KUB011 LKIS5B	160	47.8	R	49.8	-2.0	-2.1

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.

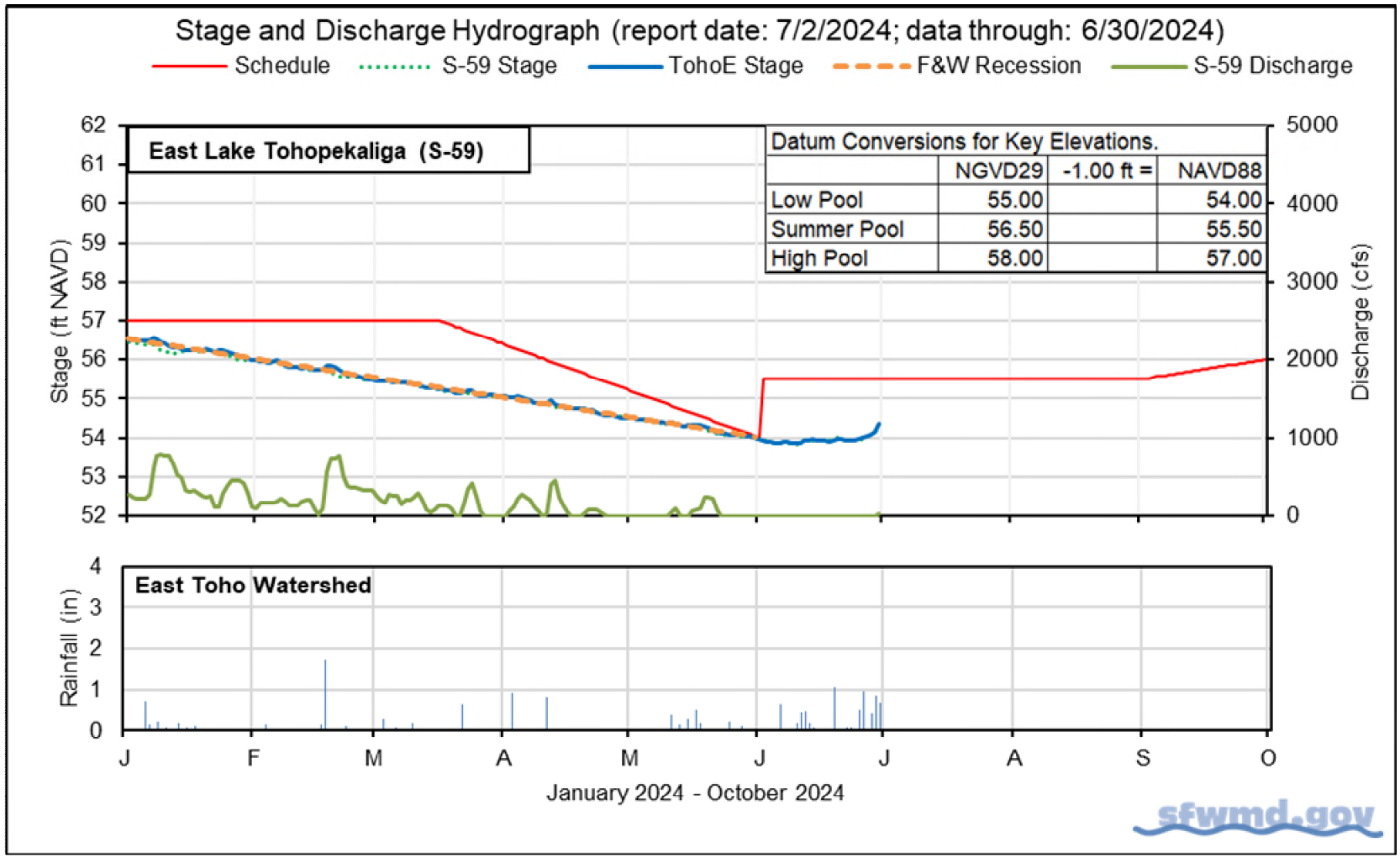


Figure KB-1. East Lake Toho regulation schedule, stage, discharge, and rainfall.

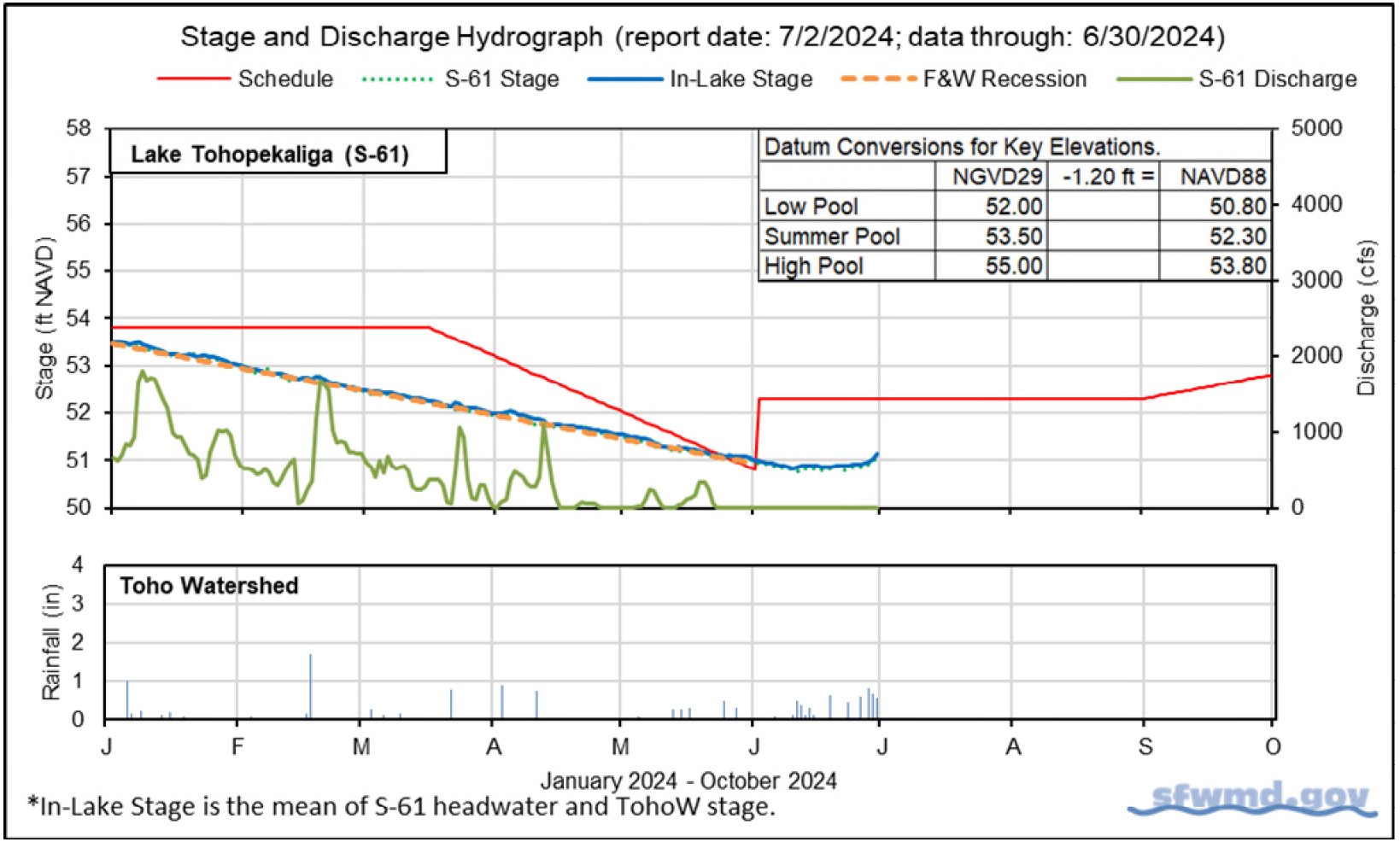


Figure KB-2. Lake Toho regulation schedule, stage, discharge, and rainfall.

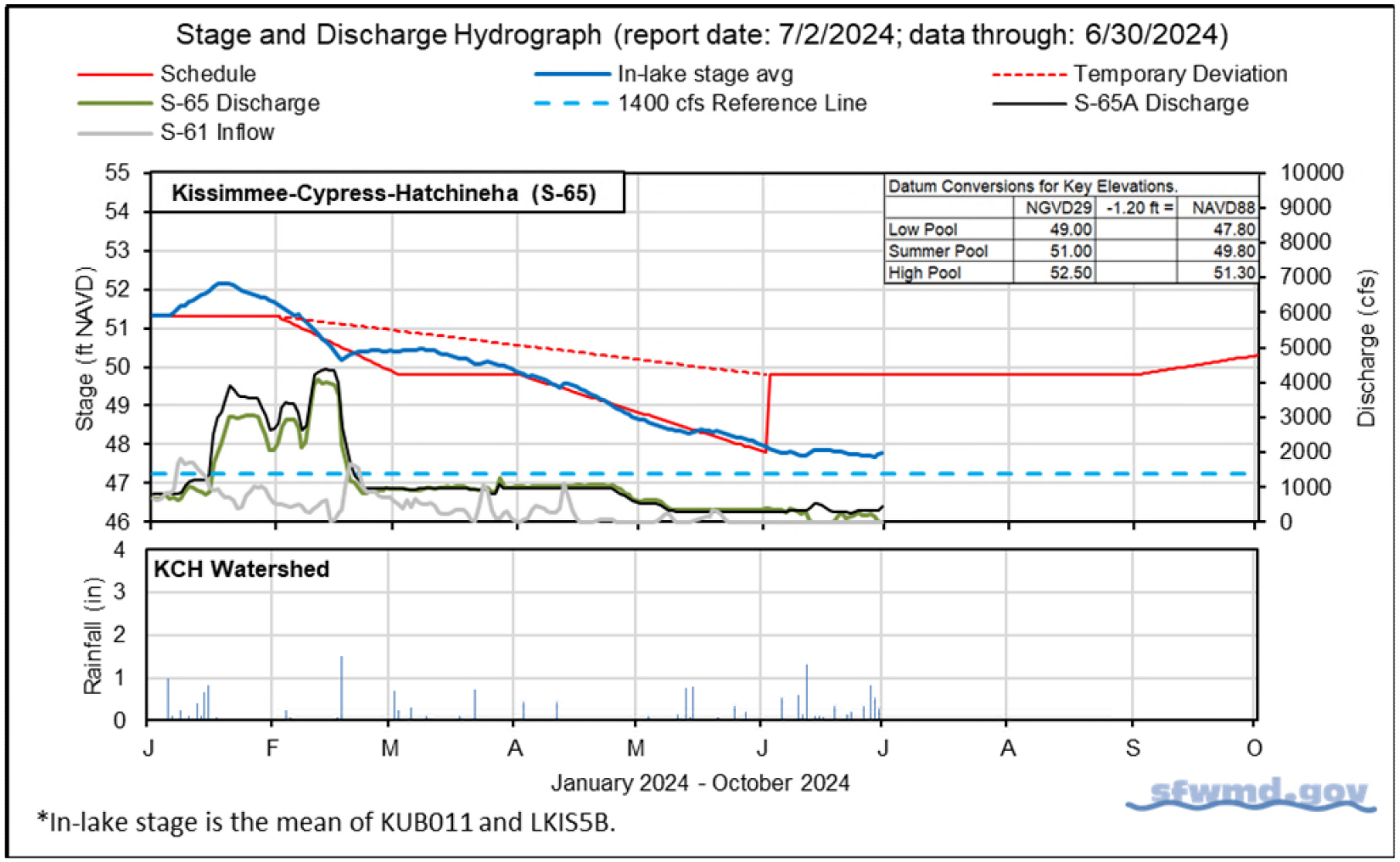


Figure KB-3. Lakes Kissimmee, Cypress and Hatchineha regulation schedule, stage, discharge, and rainfall.

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			
		6/30/24	6/30/24	6/23/24	6/16/24	6/9/24
Discharge	S-65	0	160	130	86	340
Discharge	S-65A[a]	440	350	300	430	310
Headwater Stage (feet NAVD)	S-65A	45.3	44.8	45.0	45.5	45.1
Discharge	S-65D[b]	380	350	440	450	260
Headwater Stage (feet NAVD)	S-65D[c]	24.6	24.6	24.6	24.6	24.6
Discharge (cfs)	S-65E[d]	420	350	430	450	220
Discharge (cfs)	S-67	0	0	0	0	0
Dissolved Oxygen (mg/L) [e]	Phase I, II/III river channel	3.6	4.1	5.0	6.9	7.6
River channel mean stage[f]	Phase I river channel	31.9	31.6	31.6	31.7	31.0
Mean depth (feet) [g]	Phase I floodplain	0.09	0.09	0.08	0.08	0.07

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).

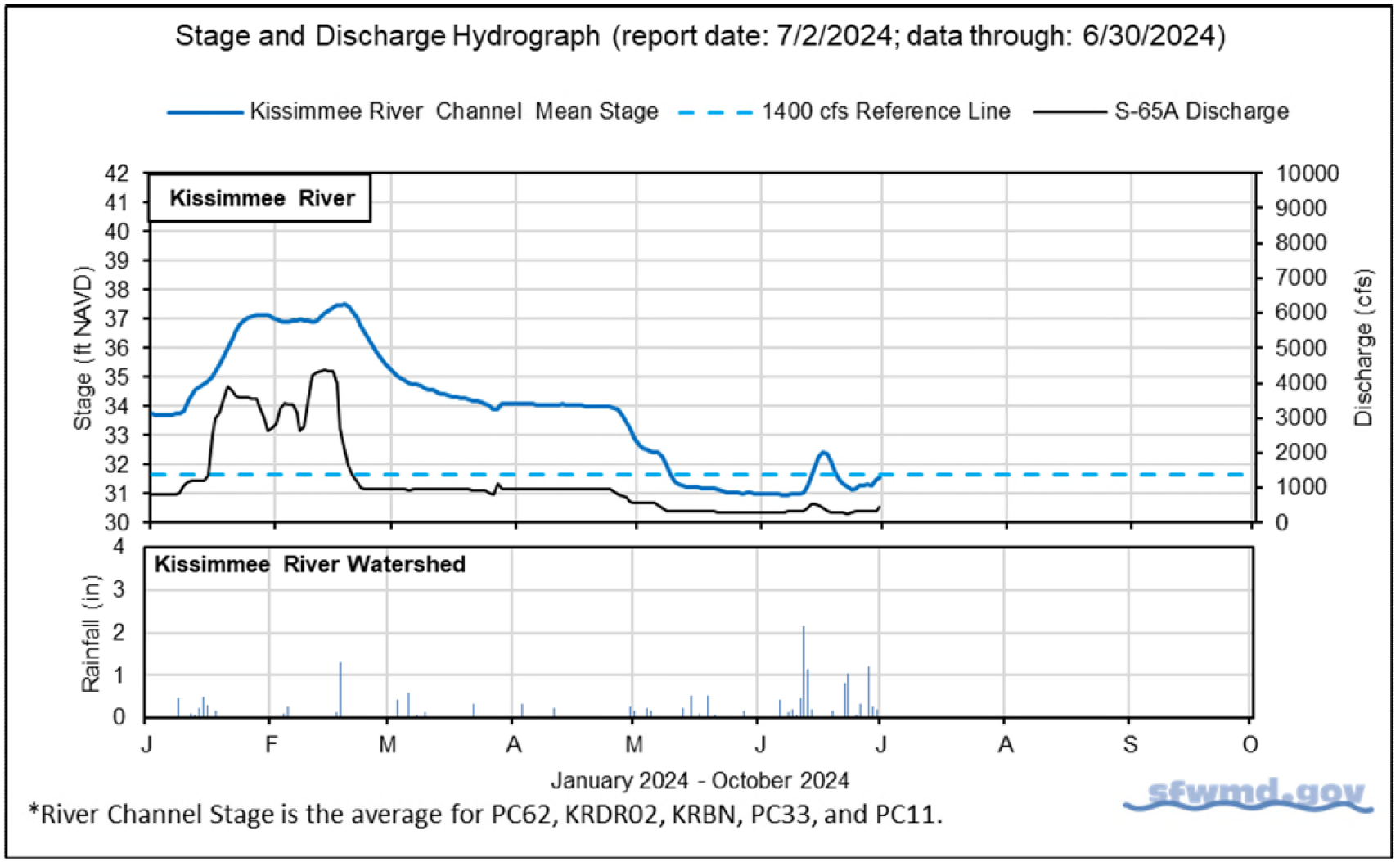


Figure KB-4. Kissimmee River stage, discharge, and rainfall.

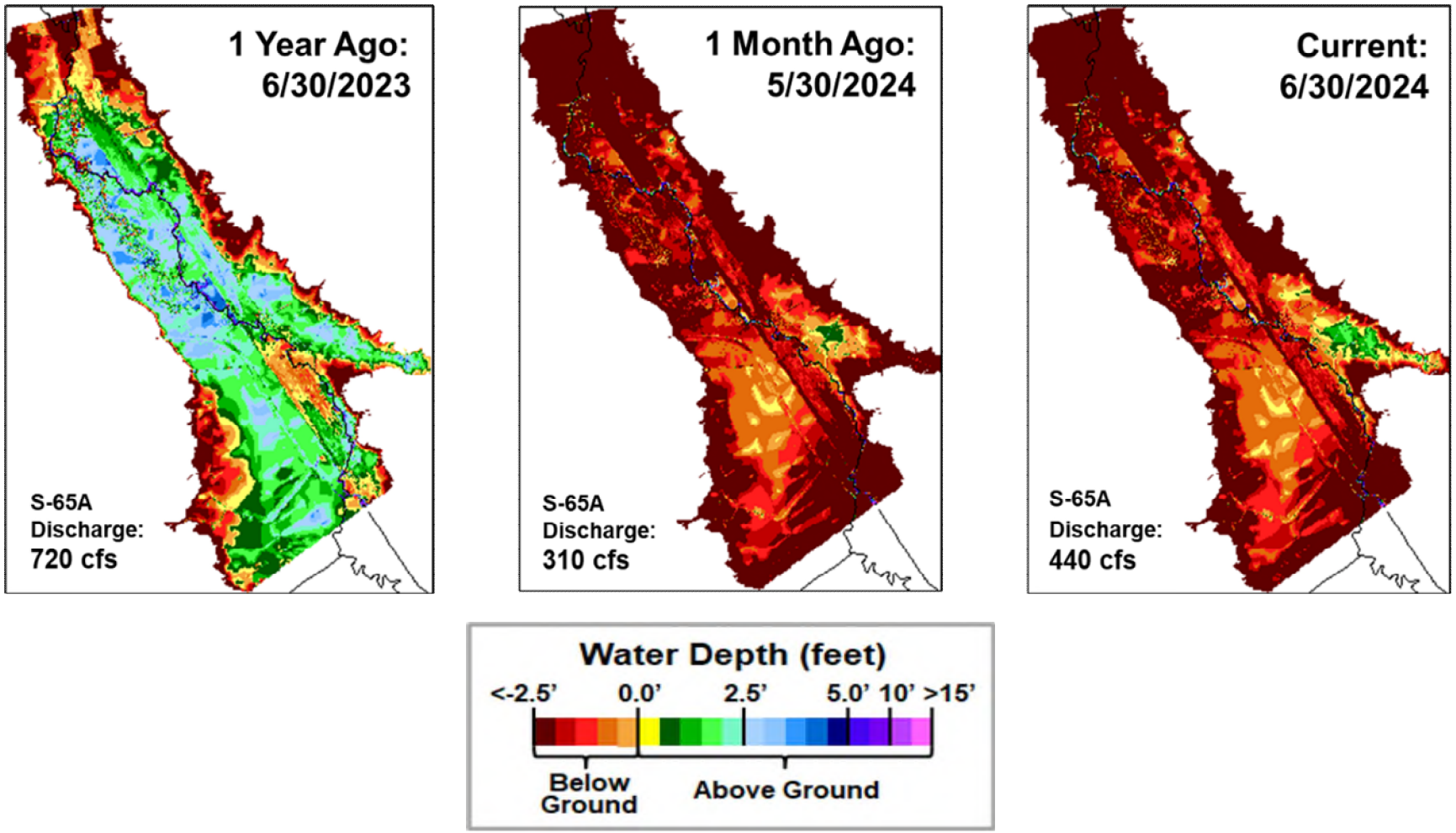


Figure KB-5. Phase I area Kissimmee River floodplain water depths (from left to right) one year ago, one month ago, and current.

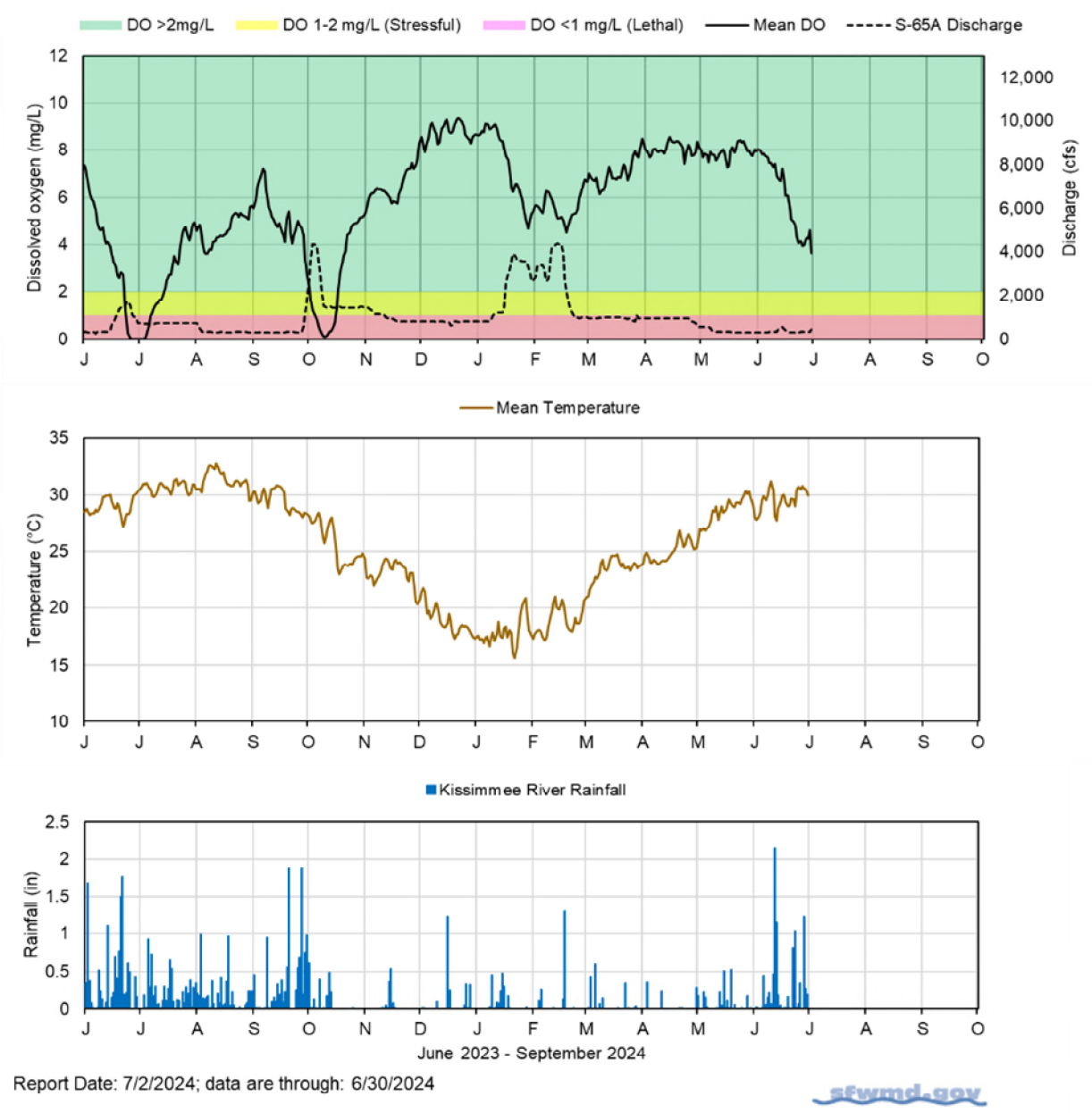


Figure KB-6. Kissimmee River channel mean daily dissolved oxygen concentration (mg/L), S-65A discharge (cfs), temperature (°C) and rainfall (inches). Dissolved oxygen (DO) and temperature are mean daily values averaged for PC62, KRDR02, KRBN, PC33, PC11, PD62R, and PD42R with an average of four stations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

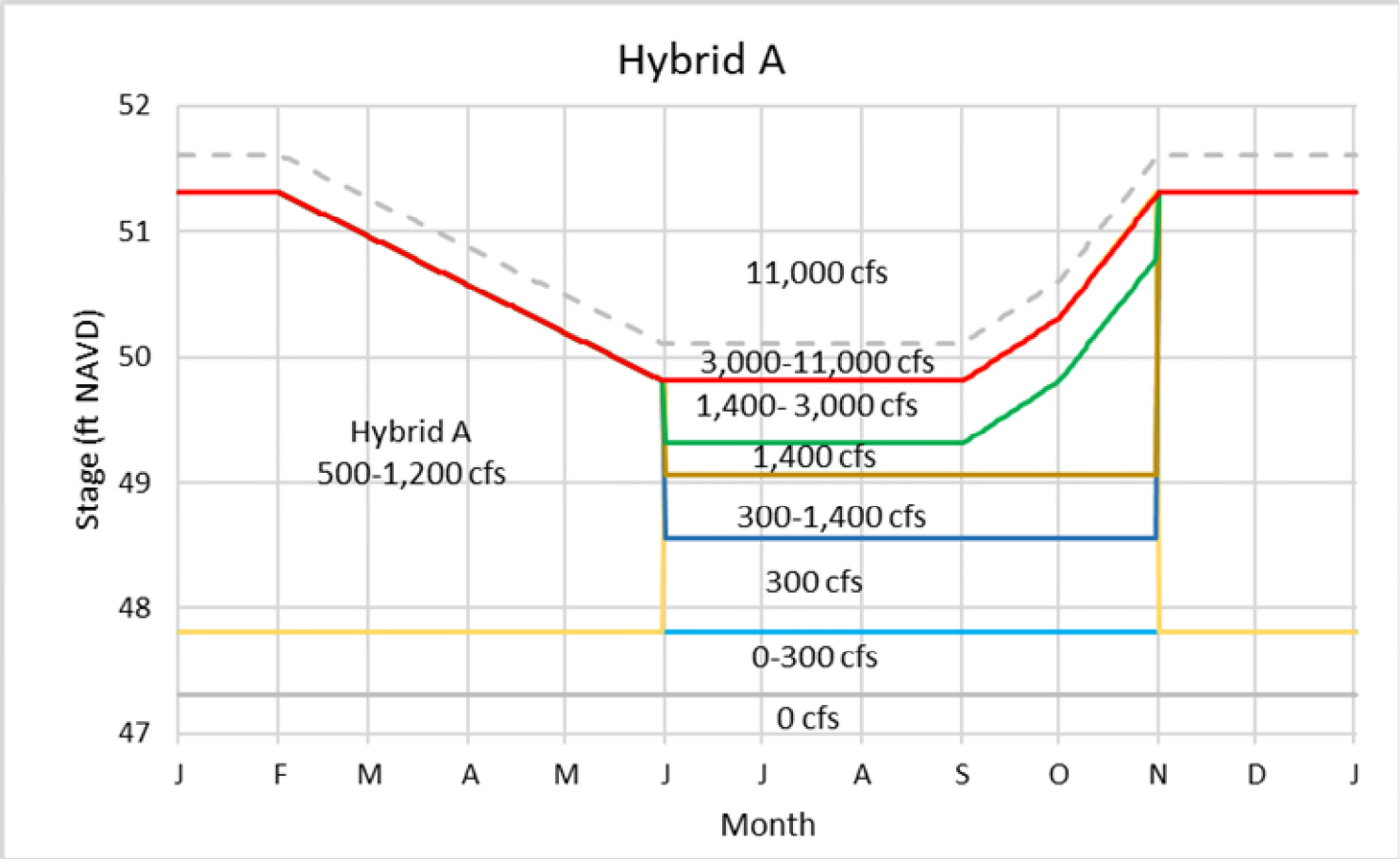


Figure KB-7. Hybrid A Discharge Plan for S-65/S-65A. Use discharge rate of change limits from IS-14-50 (Fig. KB-8).

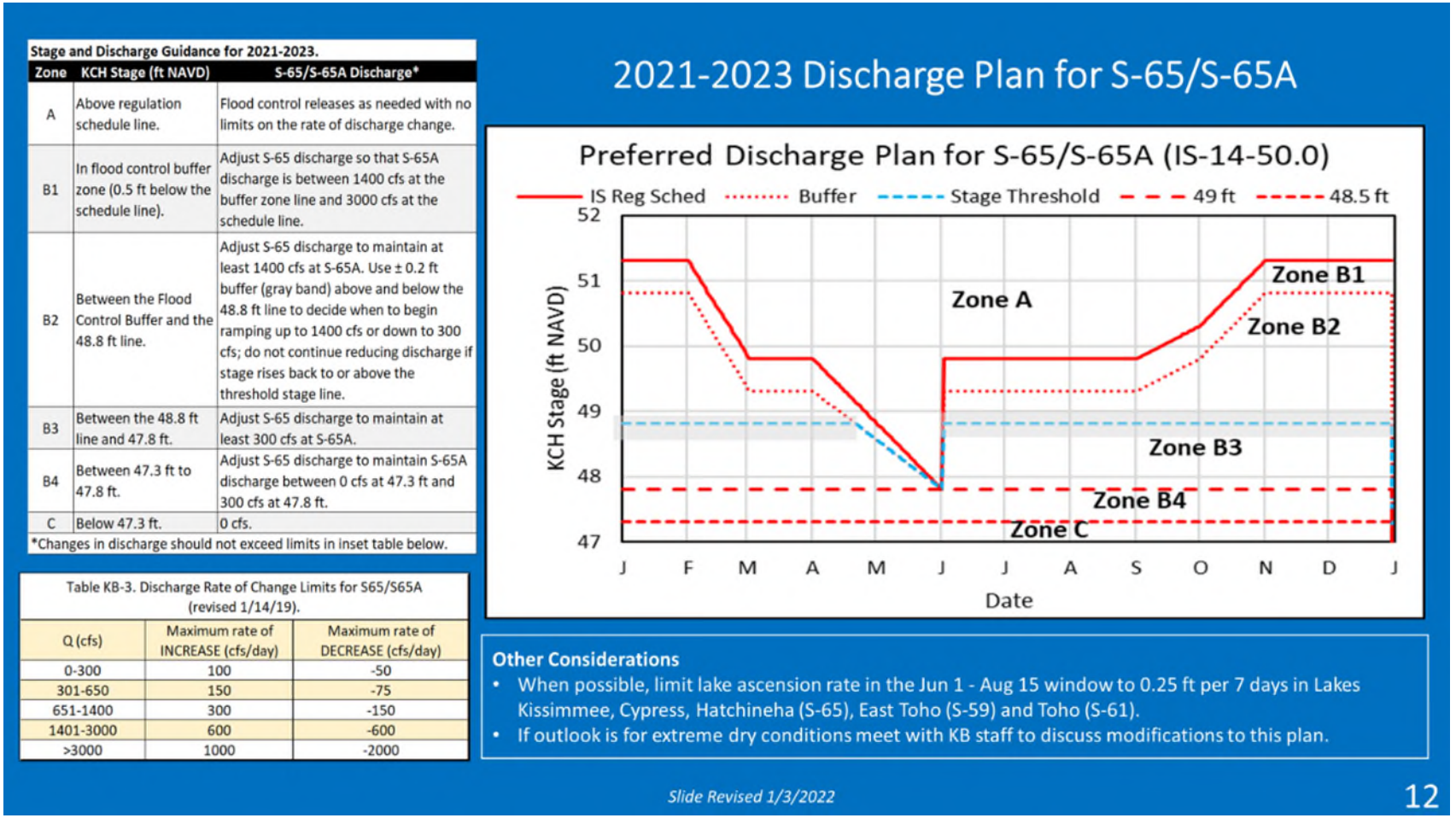


Figure KB-8. IS-14-50 Discharge Plan for S65/S65A with discharge rate of change limits (revised 1/14/19).

Lake Okeechobee

Lake Okeechobee stage was 12.14 feet NAVD88 (13.45 ft NGVD29) on June 30, 2024, which was 0.06 feet higher than the previous week and 0.44 feet higher than a month ago (**Figure LO-1**). Lake stage is in the Low sub-band (**Figure LO-2**) and was 1.70 feet above the upper limit of the recovery ecological envelope (**Figure LO-3**). According to NEXRAD, 1.72 inches of rain fell directly over the Lake last week.

Average daily inflows (excluding rainfall) decreased from the previous week, at 1,120 cfs, compared to 1,300 cfs. The largest single structure inflow came from the Kissimmee River through S65E at 350 cfs. Back-pumping through the S-2 and S-3 structures at the southern end of the Lake stopped on June 17. Average daily outflows (excluding evapotranspiration) increased slightly from the previous week, from 0 cfs to 170 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.

The second routine water quality and phytoplankton monitoring sampling trips took place on July17-19. Provisional taxa and toxin results showed *Microcystis aeruginosa* dominated communities at 14 of the 31 sites: three sites were dominated by *Dolichospermum circinale*, six had shared dominance (*Microcystis* and either *Dolichospermum, Planktolyngbya, or Raphidiopsis*), and eight were mixed. Nine sites had toxin levels above the 0.25 µg/L method's detection threshold, but none exceeded the EPA recreational standard of 8 µg/L (**Figure LO-6**). Bloom conditions (>40 µg/L chlorophyll *a*) were recorded at 12 sites, and three of those sites (FEBIN, POLE3S, RITTAE2) had values in excess of 90 µg/L. Five sites had chlorophyll *a* values >20 µg/L but <40 µg/L (**Figure LO-6**).

In the most recent non-obscured satellite image from June 27th, 2024, NOAA's Harmful Algal Bloom Monitoring System suggested moderate to high cyanobacteria concentrations throughout much of the Lake (**Figure LO-7**).

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

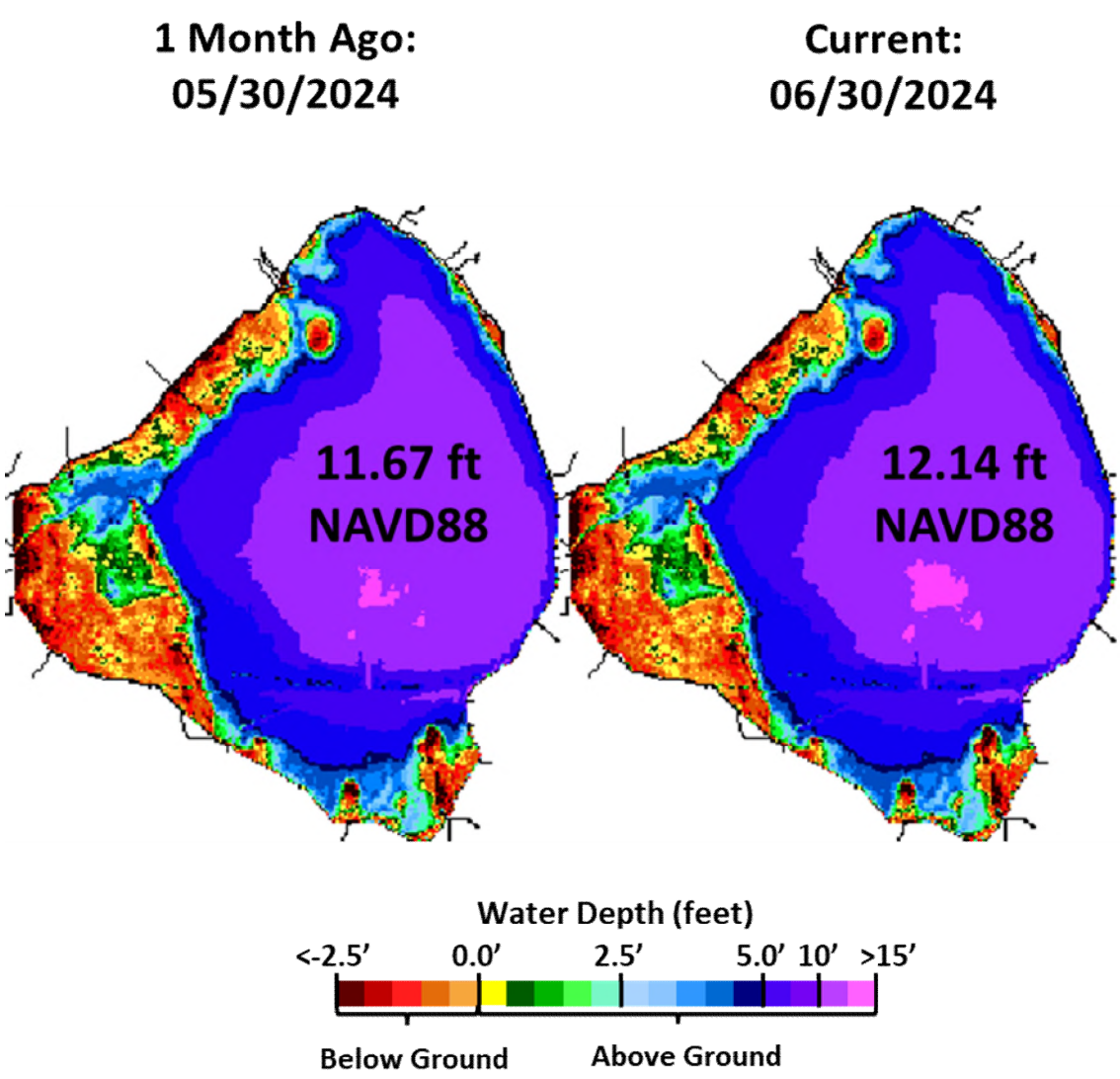


Figure LO-1. Lake Okeechobee water depth estimates based on South Florida Water Depth Assessment Tool (SFWDAT).

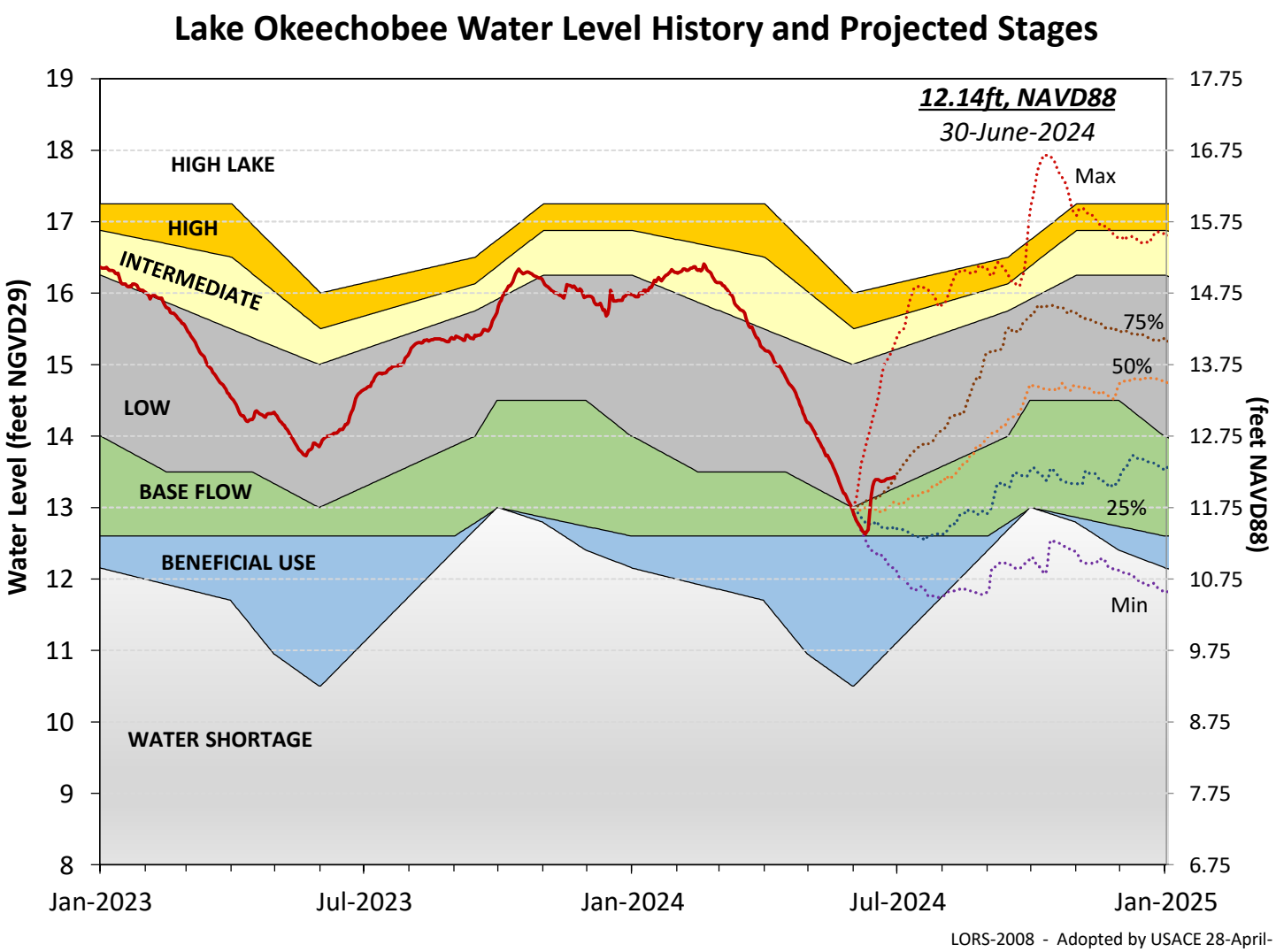


Figure LO-2. Recent Lake Okeechobee stages with projected stages based on a dynamic position analysis. Note: stages are in NGVD29, approximate NAVD88 values are shown for reference.

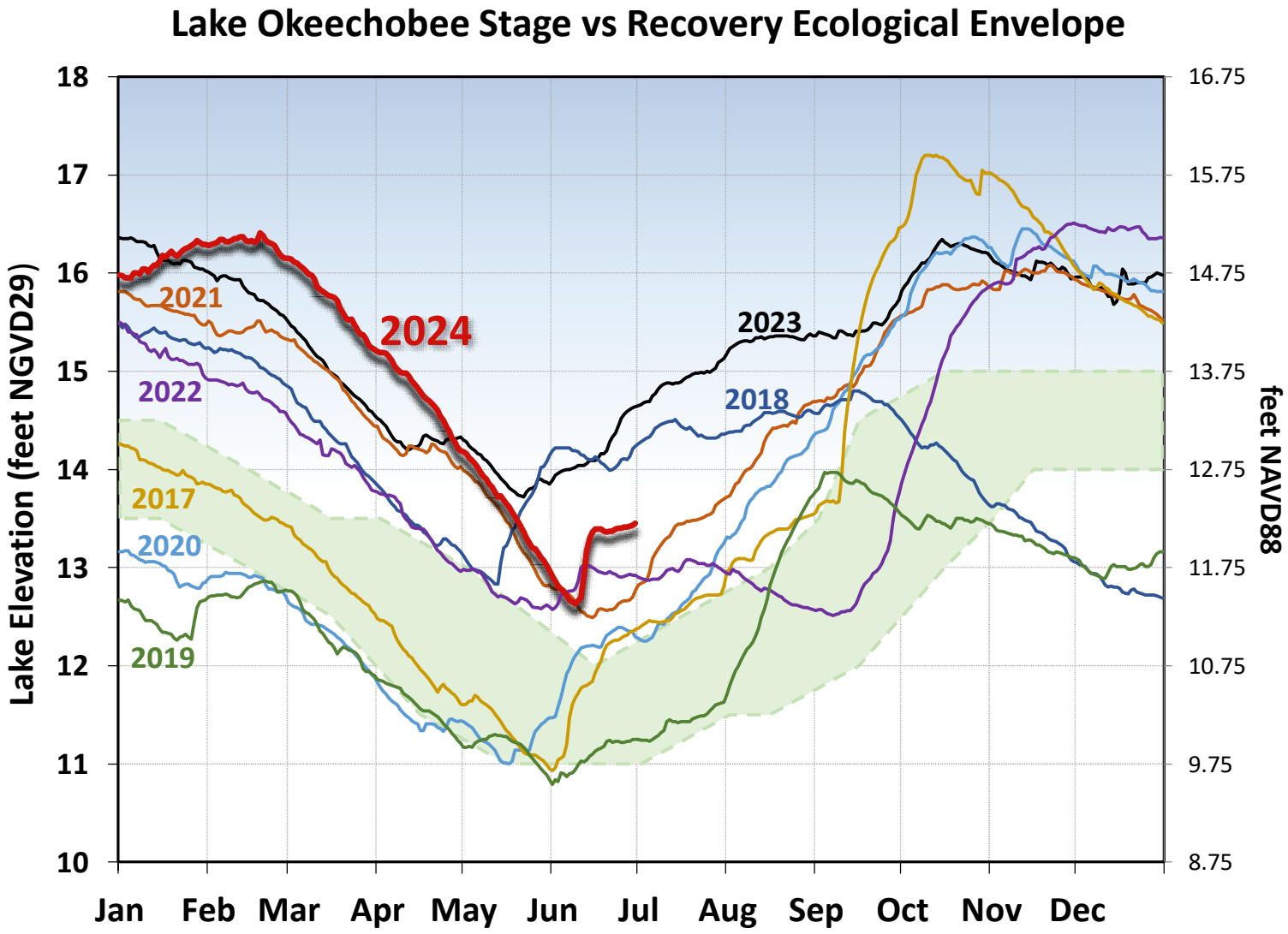


Figure LO-3. The current and seven prior year's annual stage hydrographs for Lake Okeechobee in comparison to the recovery envelope (light green). A shift from the normal ecological envelope to the recovery envelope occurred because the 30-day minimum lake stage (elevations exposed for at least 30 days,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

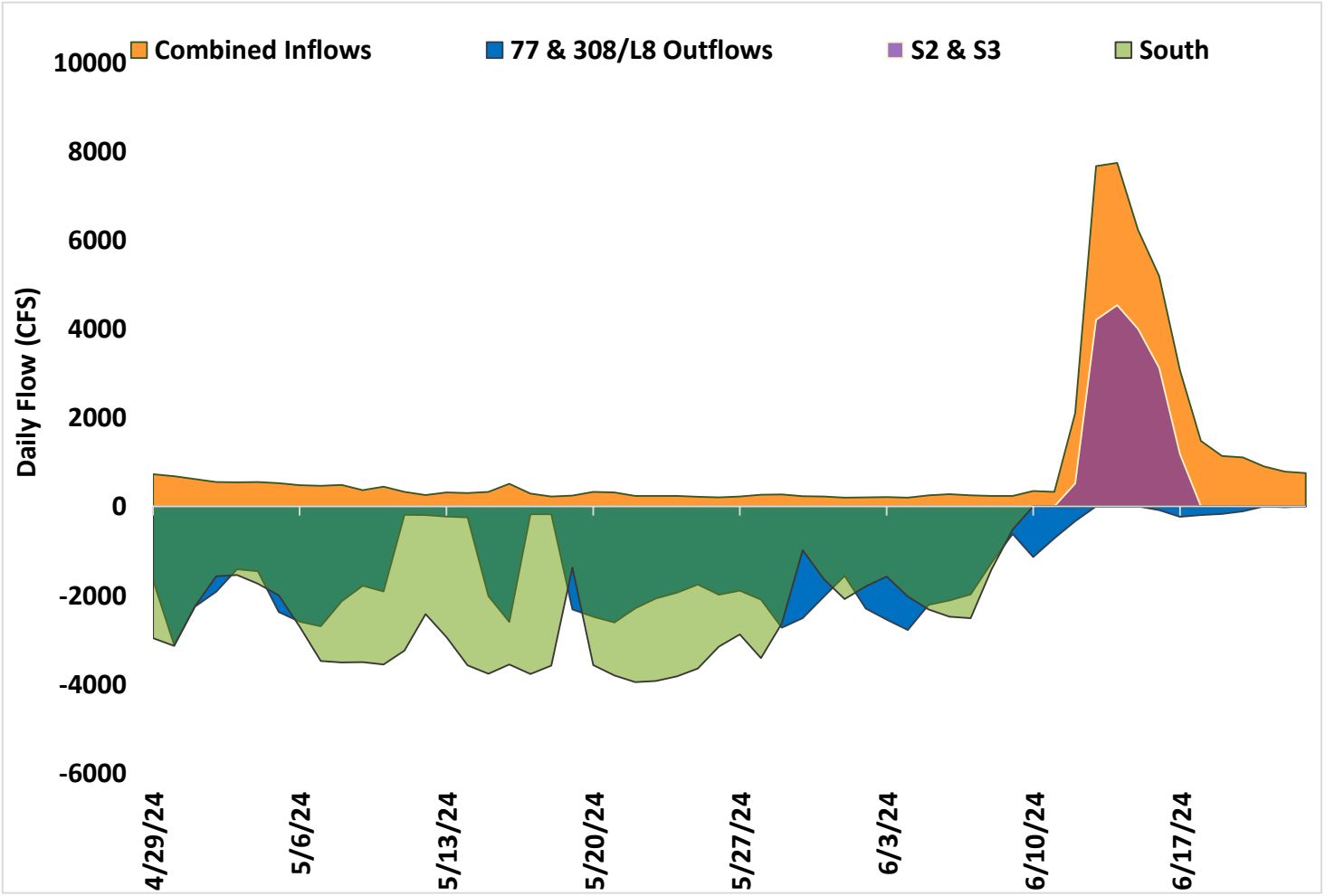


Figure LO-4. Major inflows (orange) to and outflows east and west (blue) from Lake Okeechobee. Outflows south are shown in green. Flows into Lake Okeechobee from the L-8 canal through S-271 (formerly Culvert 10A) or from the C-44 canal through the S-308 are included as inflows. Conversely, flows from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

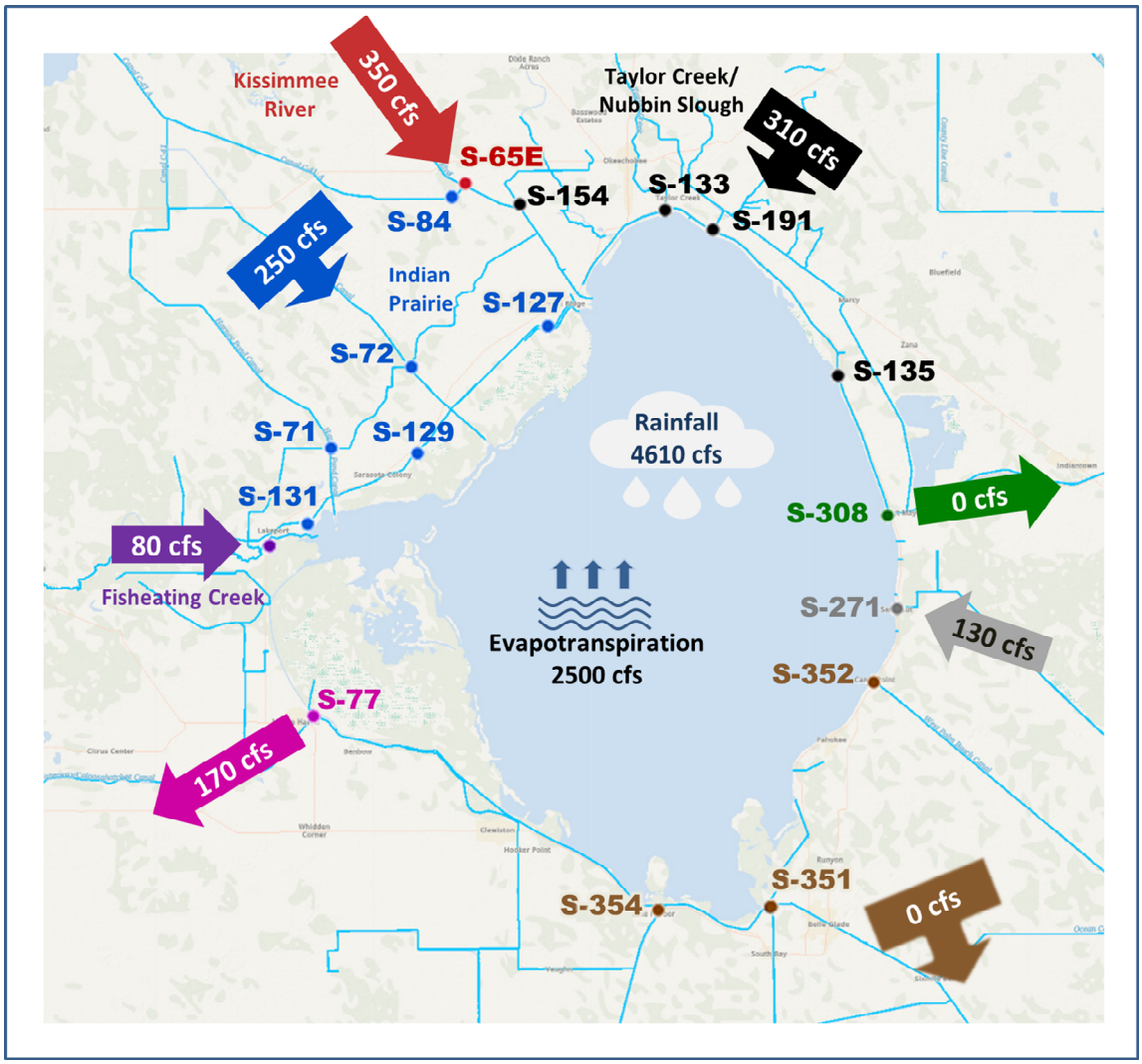


Figure LO-5. Inflows into Lake Okeechobee from Indian Prairie basins, Taylor Creek/Nubbin Slough, Kissimmee River and Fisheating Creek, and outflows to the west via S-77, to the east via S-308, to the south via S-351, S-352, S-354, and to southeast via S-271 (formerly Culvert 10A) for the week of June 24 – 30, 2024.

Collection Date: June 17-19, 2024

Station	CHL*a* (ug/L)	TOXIN (ug/L)	TAXA
FEBIN	110.0	BDL	*Micro/Raphi*
FEBOUT	*NS*	*NS*	*NS*
KISSR0.0	66.0	BDL	*mixed*
L005	55.0	BDL	*Micro/Dolic*
LZ2	67.8	BDL	*Dolichos*
KBARSE	16.2	BDL	*Microcys*
RITTAE2	93.3	0.4	*Microcys*
PELBAY3	9.0	BDL	*Microcys*
POLE3S	92.4	6.7	*Micro/Pseud*
LZ25A	26.6	2.9	*Microcys*
PALMOUT	36.5	BDL	*Dolichos*
PALMOUT1	52.8	BDL	*Dolichos*
PALMOUT2	24.0	1.6	*Micro/Dolic*
PALMOUT3	23.9	6.5	*Microcys*
POLESOUT	42.5	BDL	*Micro/Plank*
POLESOUT1	42.5	BDL	*Microcys*
POLESOUT2	13.8	BDL	*Microcys*
POLESOUT3	13.0	BDL	*mixed*
EASTSHORE	15.2	BDL	*mixed*
NES135	15.4	0.5	*mixed*
NES191	58.6	BDL	*Microcys*

Station	CHL*a* (ug/L)	TOXIN (ug/L)	TAXA
L001	63.1	BDL	*Microcys*
L004	11.1	BDL	*Microcys*
L006	14.9	5.6	*Microcys*
L007	12.2	2.2	*Microcys*
L008	9.3	0.4	*mixed*
LZ30	30.4	6.2	*Microcys*
LZ40	8.3	BDL	*mixed*
CLV10A	11.3	BDL	*mixed*
NCENTER	19.1	BDL	*mixed*
S308C	18.3	BDL	*Microcys*
S77	49.2	BDL	*Micro/Raphi*

- SFWMD considers >40 µg/L Chlorophyll *a* (Chl*a*) an algal bloom
- BDL – Below Detectable Limit of **0.25** µg/L
- ND – No Dominant taxa
- P – Pending (white squares)
- NS – Not Sampled
- Station bold font – crew observed possible BGA
- Chlorophyll *a* analyzed by SFWMD
- Toxin and Taxa analyzed by FDEP:
  Microcys = Microcystis; Cylindro = Cylindrospermopsis; Planktol = Planktolyngbya; Dolicho = Dolichospermum; Coelosph = Coelosphaerium; Raphi = Raphidiopsis

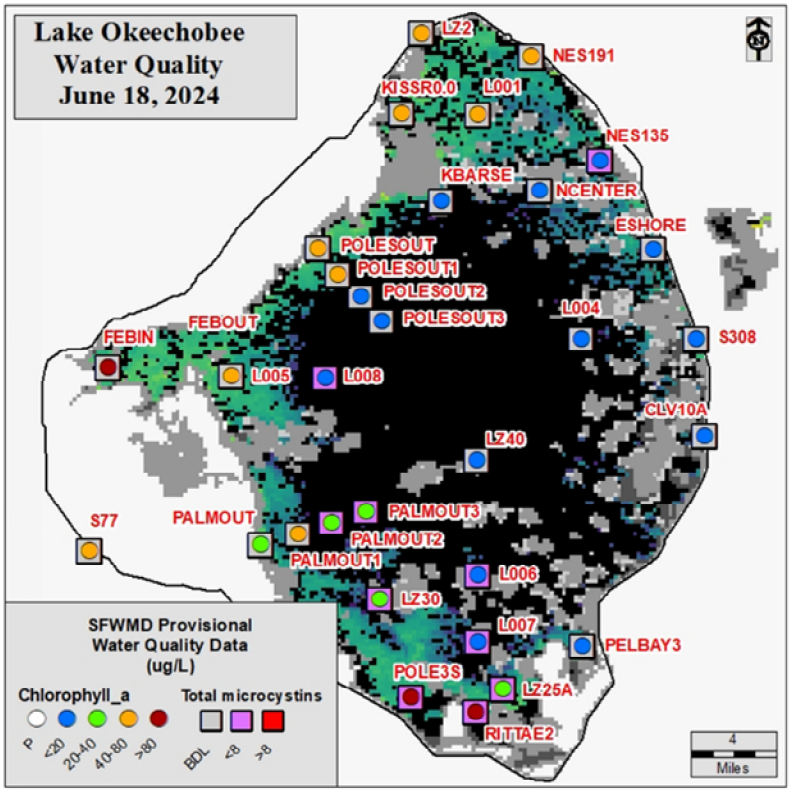


Figure LO-6. Dominant taxa, total microcystin (µg/L) and chlorophyll a (µg/L), data from June 17-19, 2024. Sampling locations, chlorophyll a, and total microcystin concentrations are overlaid on the June 18, 2024 image from NOAA's harmful algal bloom monitoring system. Gray color indicates cloud cover.

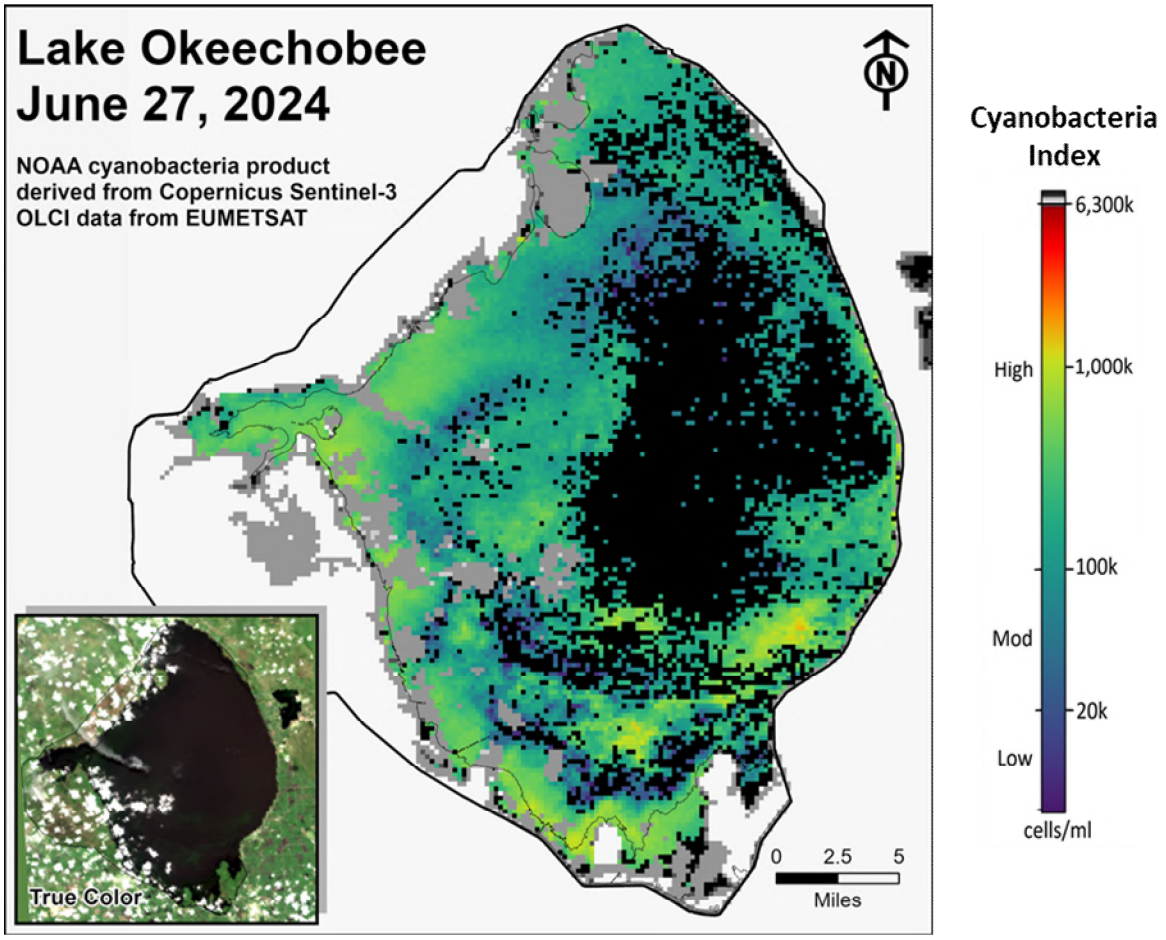


Figure LO-7. Cyanobacteria bloom index level on June 27, 2024, based on NOAA's harmful algal bloom monitoring system. Gray color indicates cloud cover. *Provisional NOAA image, subject to change*.

Estuaries

St. Lucie Estuary

Over the past week, mean total inflow to the St. Lucie Estuary was 1,310 cfs (**Figures ES-1** and **ES-2**), and the previous 30-day mean inflow was 1,110 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 17.9. Salinity conditions in the middle estuary were estimated to be within the optimal range for adult eastern oysters (**Figure ES-4**). The mean larval oyster recruitment rate reported by the Fish and Wildlife Research Institute (FWRI) was 2.8 spat/shell in June, which is similar to the previous month (**Figure ES-5**).

Caloosahatchee River Estuary

Over the past week, mean total inflow to the Caloosahatchee River Estuary was 5,340 cfs (**Figures ES-6** and **ES-7**), and the previous 30-day mean inflow was 5,000 cfs. For comparison, the historical provisional mean inflows from the contributing areas are shown in **Figure ES-7**.

Over the past week, salinities decreased at Cape Coral and Shell Point and remained the same at the all other 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 damaging 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 Fish and Wildlife Research Institute was 24.4 spat/shell at Iona Cove and 18.8 spat/shell at Bird Island for June, which is an increase at Iona Cove and a substantial decrease at Bird Island from the previous month (**Figures ES-11 and ES-12**).

Surface salinity at Val I-75 was forecasted for the next two weeks using an autoregression model (Qiu and Wan, 2013[1]) coupled with a linear reservoir model for the tidal basin. Model scenarios included pulse releases at S-79 ranging from 0 to 2,000 cfs with estimated tidal basin inflows of 1,260 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 Florida Fish and Wildlife Research Institute reported on June 28, 2024, that *Karenia brevis*, the Florida red tide dinoflagellate, was not observed in any samples collected statewide over the past week.

Water Management Recommendations

Lake stage is in the Low Sub-Band. Tributary conditions are near normal. The LORS2008 release guidance suggests up to 3000 cfs release at S-79 to the Caloosahatchee River Estuary and up to 1170 cfs release at S-80 to the St. Lucie Estuary.

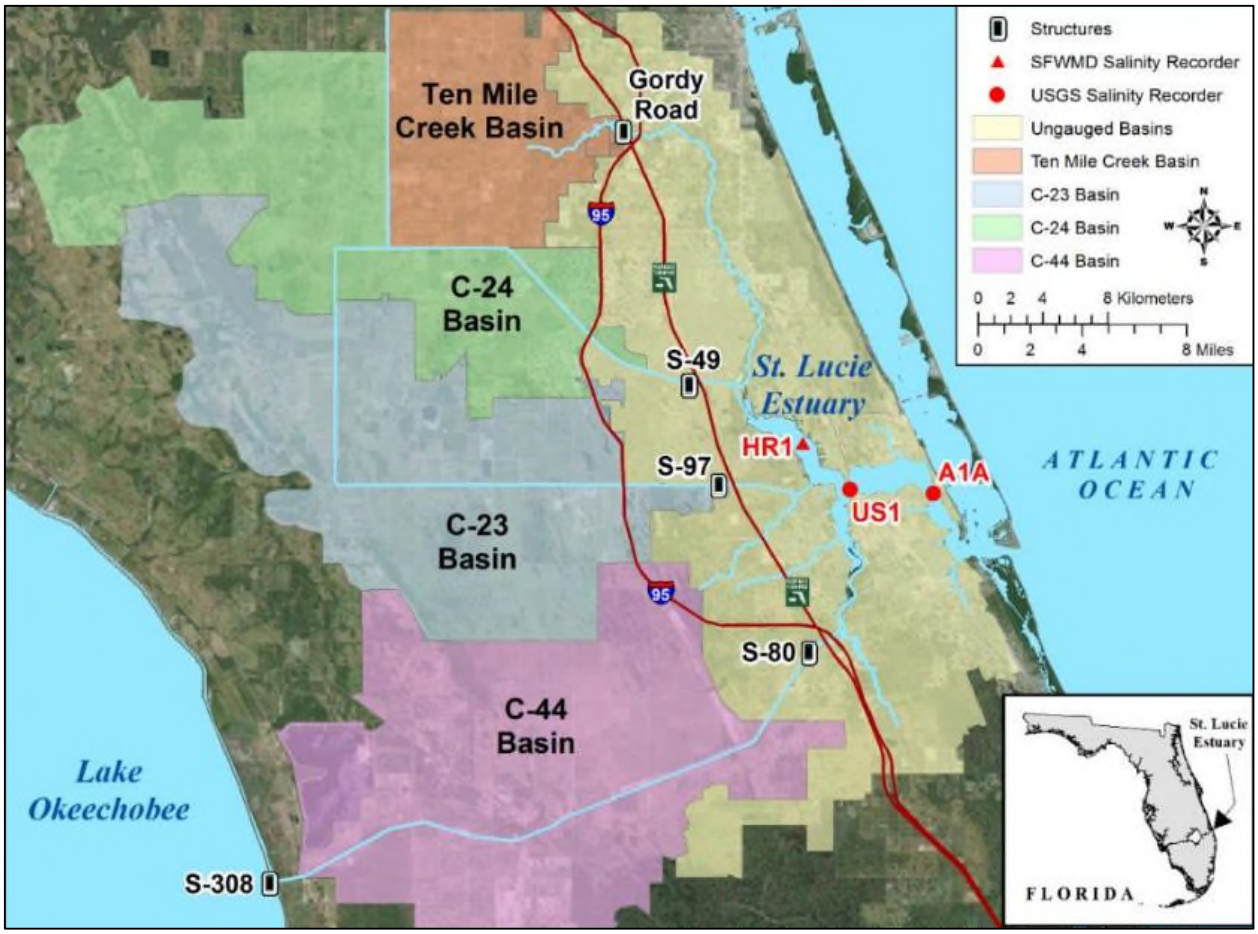


Figure ES-1. Basins, water control structures and salinity monitoring sites in the St. Lucie Estuary.

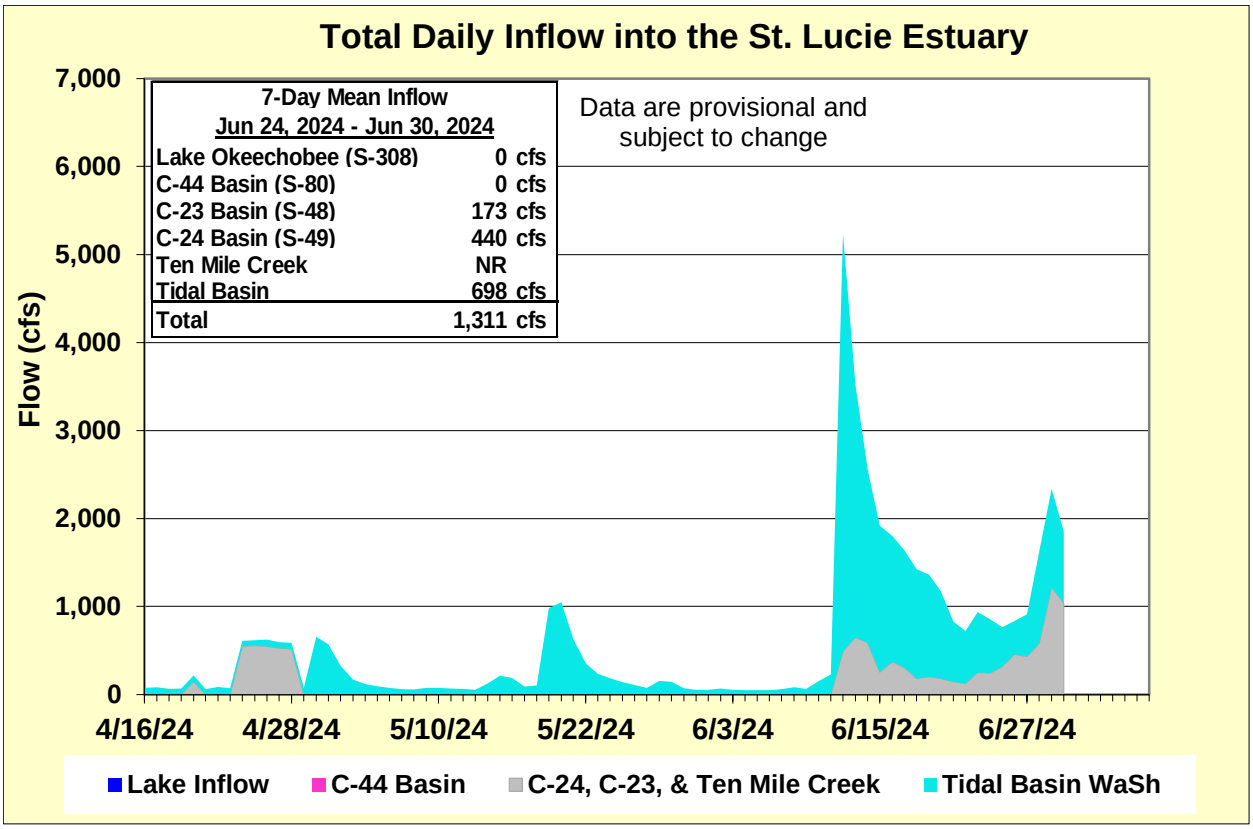


Figure ES-2. Total daily inflows from Lake Okeechobee and runoff from the C-44, C-23, C-24, Ten Mile Creek, and Tidal Basins into the St. Lucie Estuary.

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)	**10.7** (14.2)	**16.8** (19.0)	10.0 – 25.0
US1 Bridge	**17.3** (19.6)	**18.6** (20.9)	10.0 – 25.0
A1A Bridge	**24.9** (27.4)	**28.0** (29.7)	10.0 – 25.0

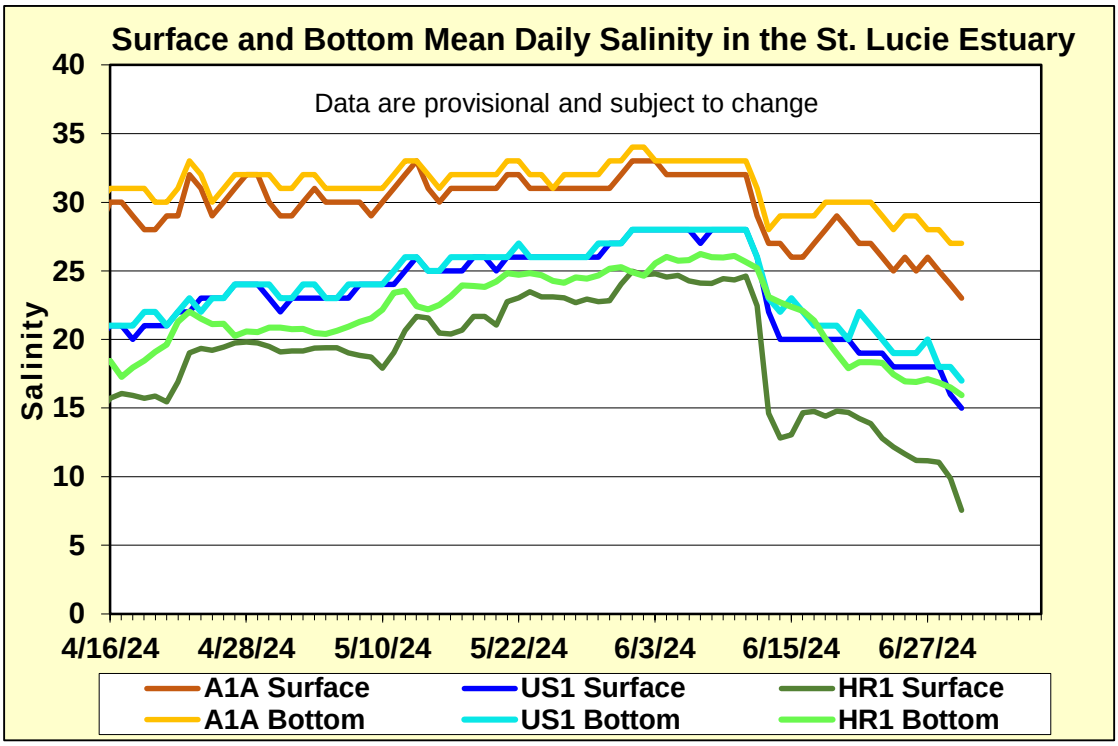


Figure ES-3. Mean daily salinity at the A1A, US1 and HR1 sites in the St. Lucie Estuary.

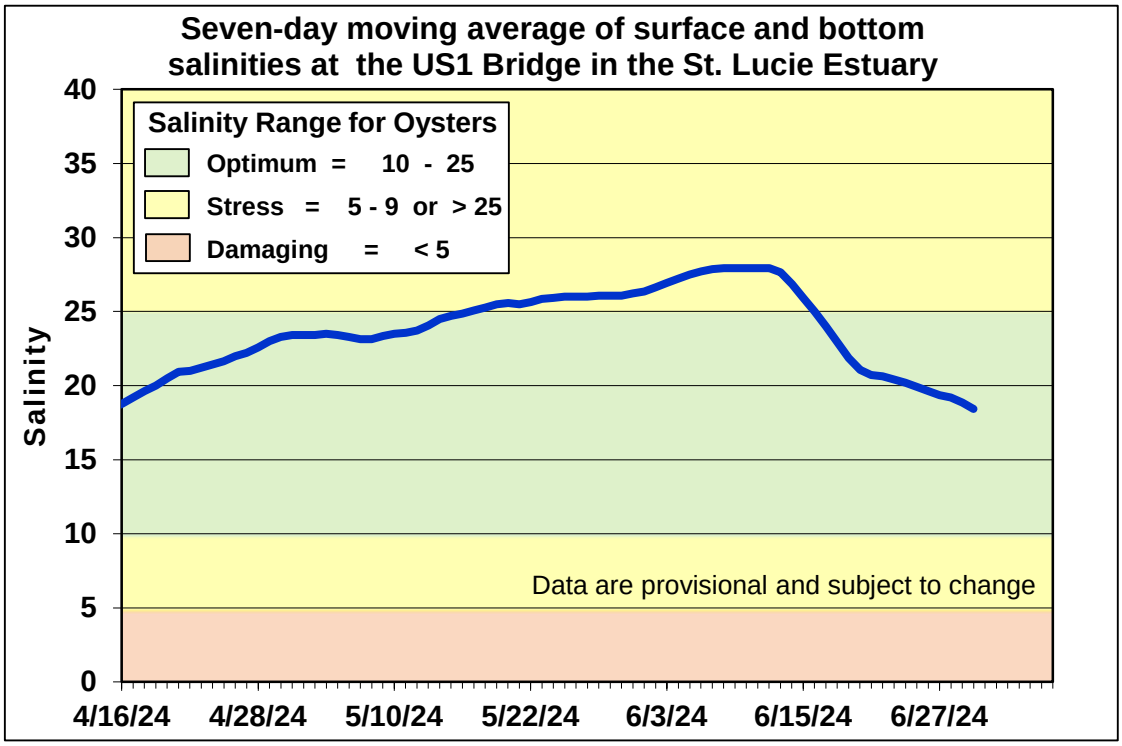


Figure ES-4. Seven-day moving average of the surface and bottom salinities at the US1 Bridge in the St. Lucie Estuary.

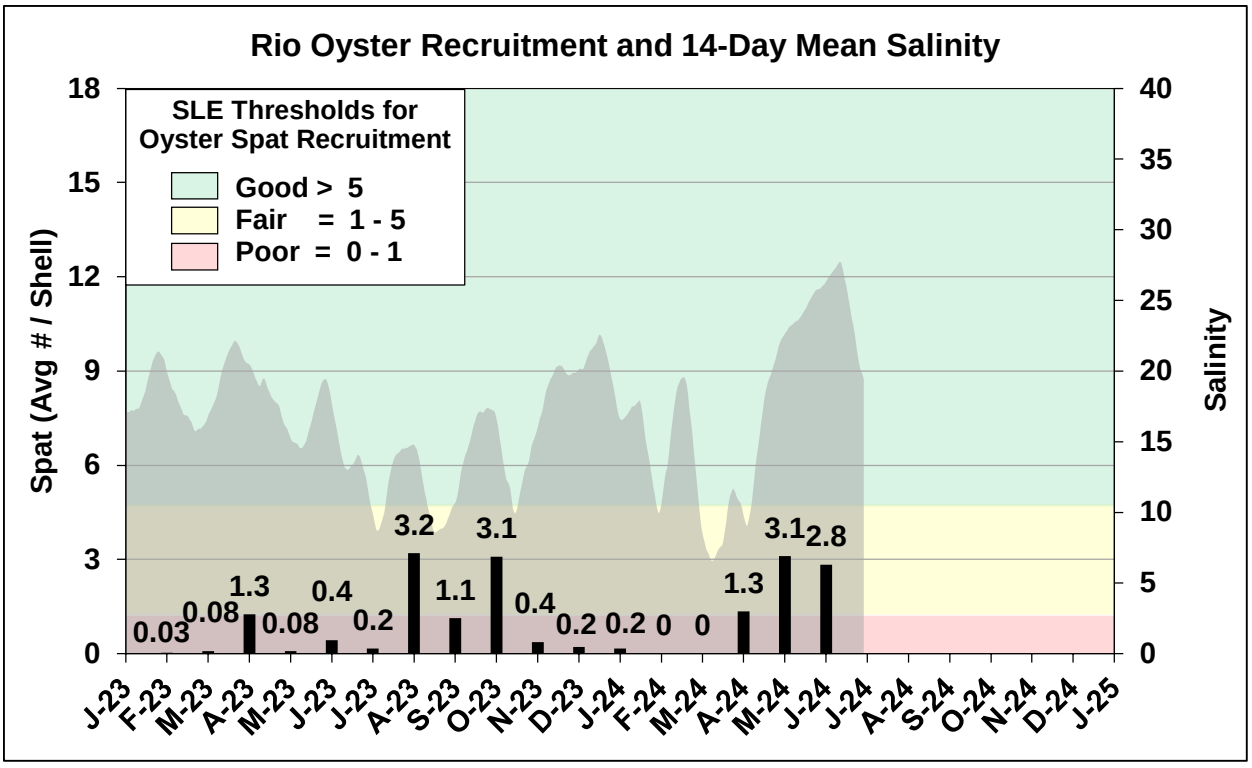


Figure ES-5. Mean oyster recruitment at the Rio oyster monitoring station and 14-day mean salinity at US1 Bridge.

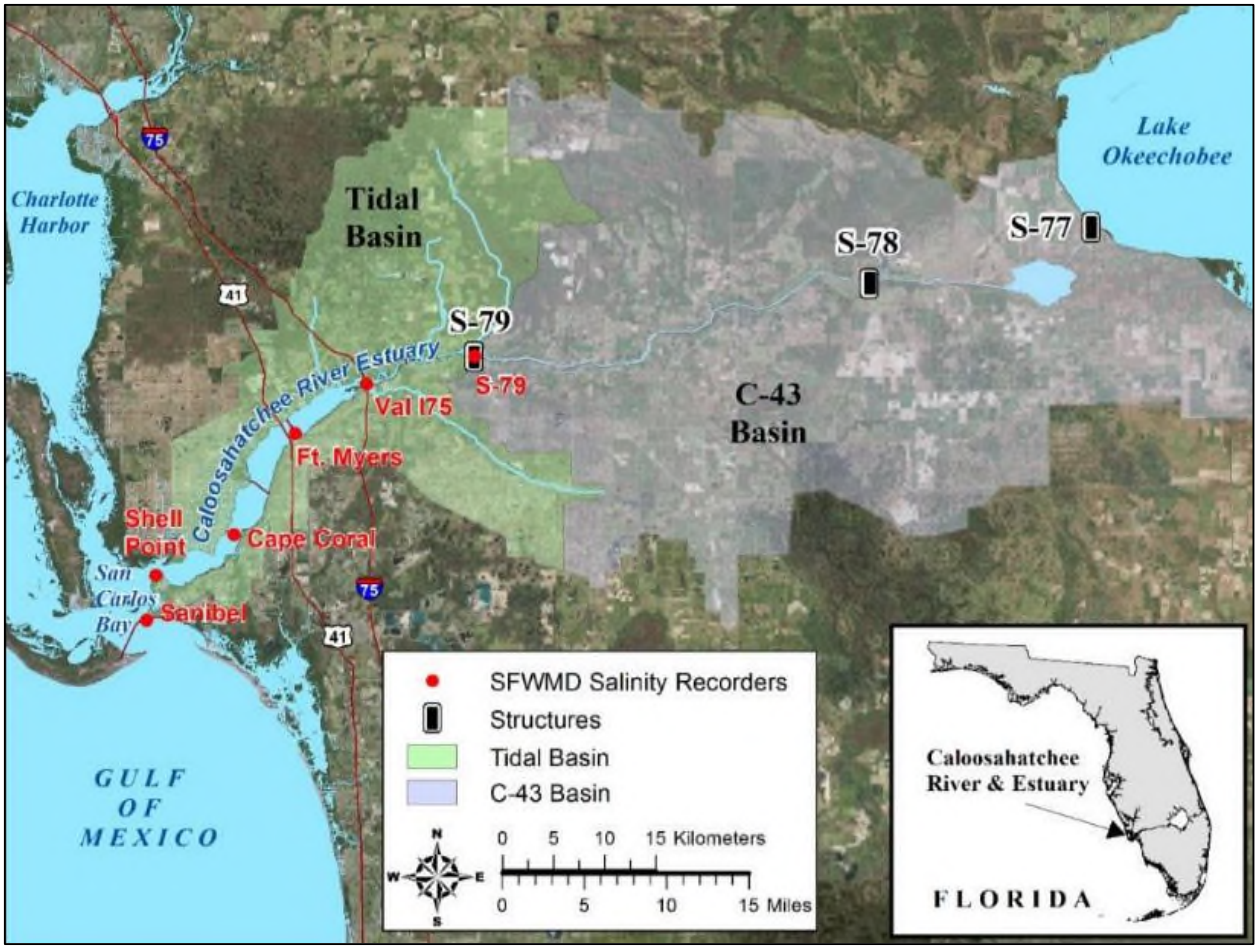


Figure ES-6. Basins, water control structures and salinity monitoring sites in the Caloosahatchee River Estuary.

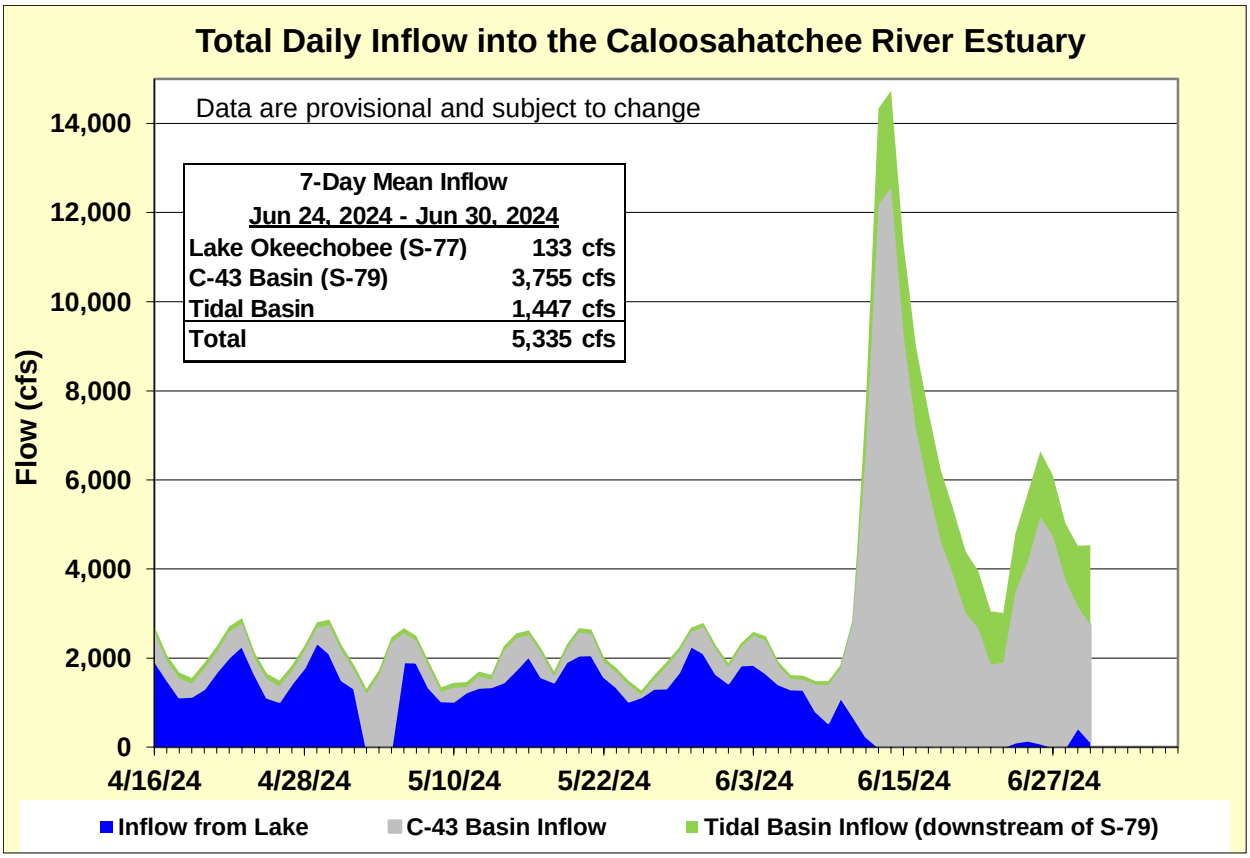


Figure ES-7. Total daily inflows from Lake Okeechobee, and runoff from the C-43 and Tidal basins into the Caloosahatchee River Estuary.

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** (0.1)	**0.2** (0.2)	0.0 – 10.0
Val I-75	**0.3** (0.2)	**0.2** (0.2)	0.0 – 10.0
Fort Myers Yacht Basin	**0.2** (0.3)	**0.3** (0.3)	0.0 – 10.0
Cape Coral	**2.8** (3.0)	**3.4** (4.8)	10.0 – 25.0
Shell Point	**15.7** (19.0)	**17.9** (21.4)	10.0 – 25.0
Sanibel	**24.7** (23.1)	**27.6** (27.9)	10.0 – 25.0

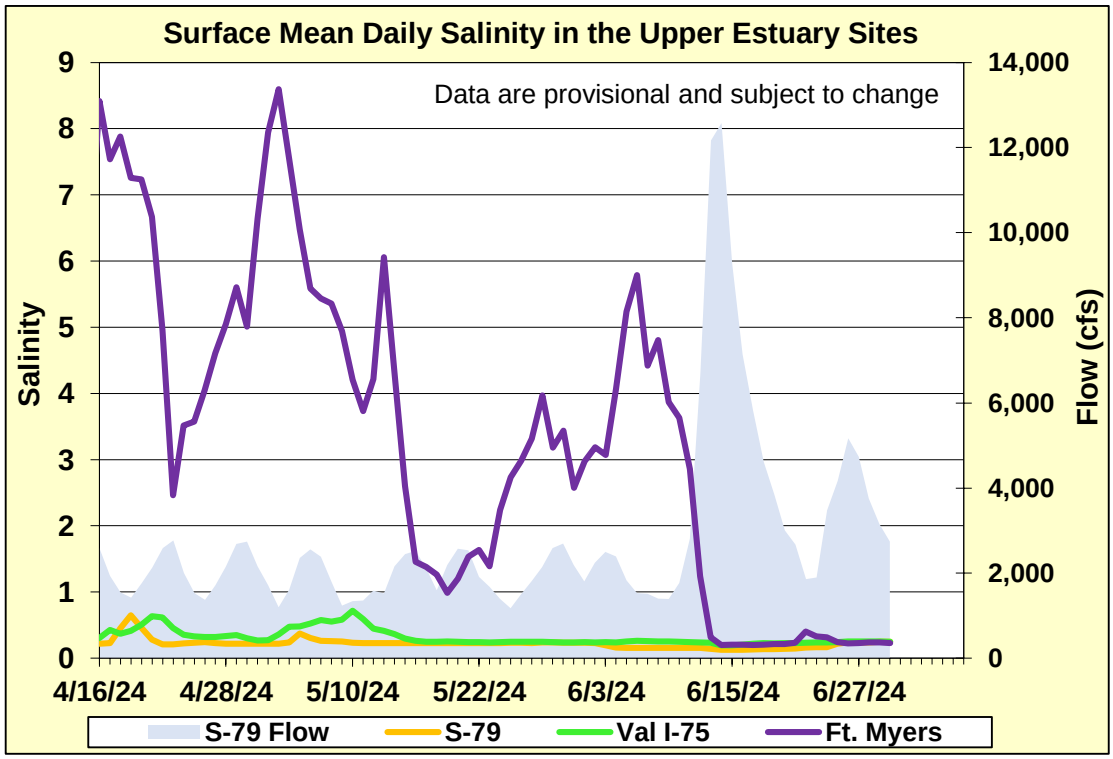


Figure ES-8. Mean daily salinity at upper Caloosahatchee River Estuary monitoring sites and mean daily flow at S-79.

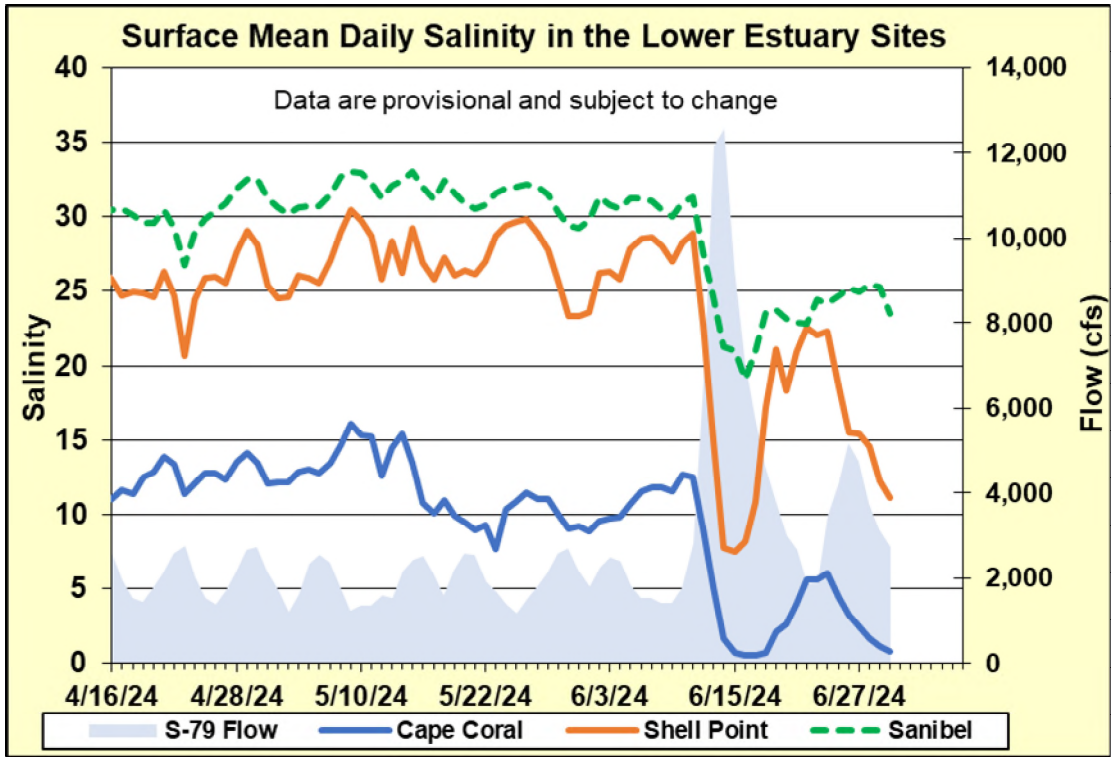


Figure ES-9. Mean daily surface salinity at lower Caloosahatchee River Estuary monitoring sites and mean daily flow at S-79.

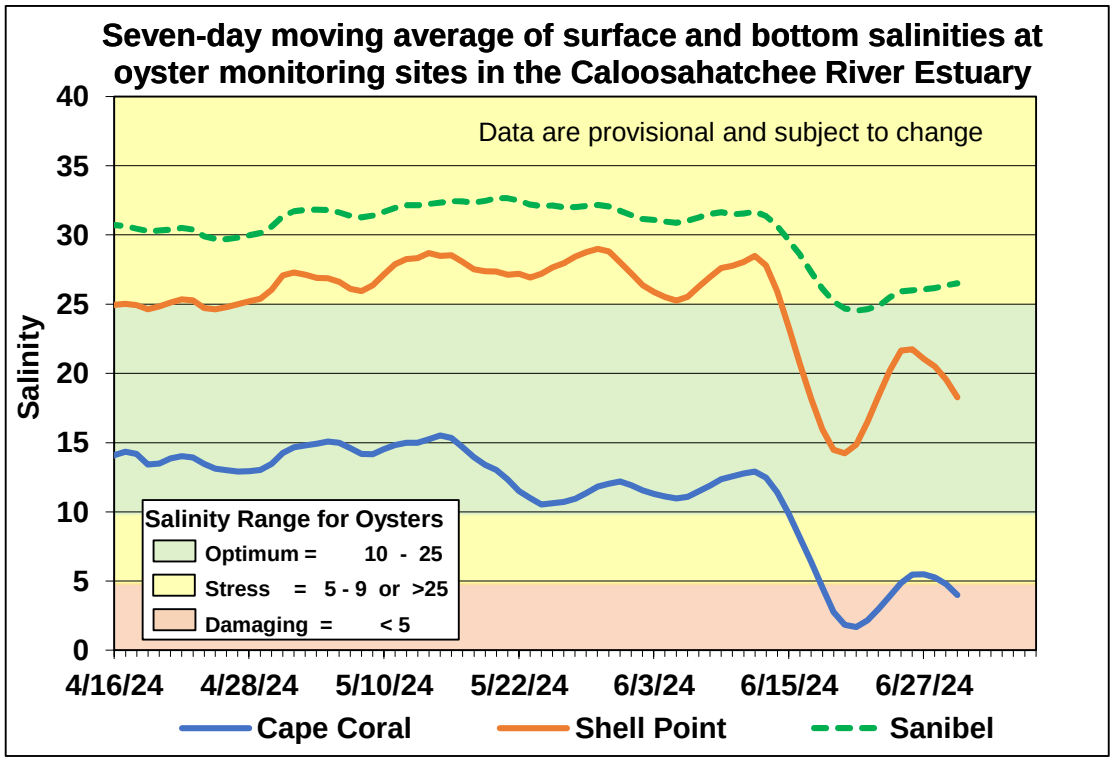


Figure ES-10. Seven-day moving average of surface and bottom salinities at Cape Coral, Shell Point and Sanibel monitoring sites in the Caloosahatchee River Estuary.

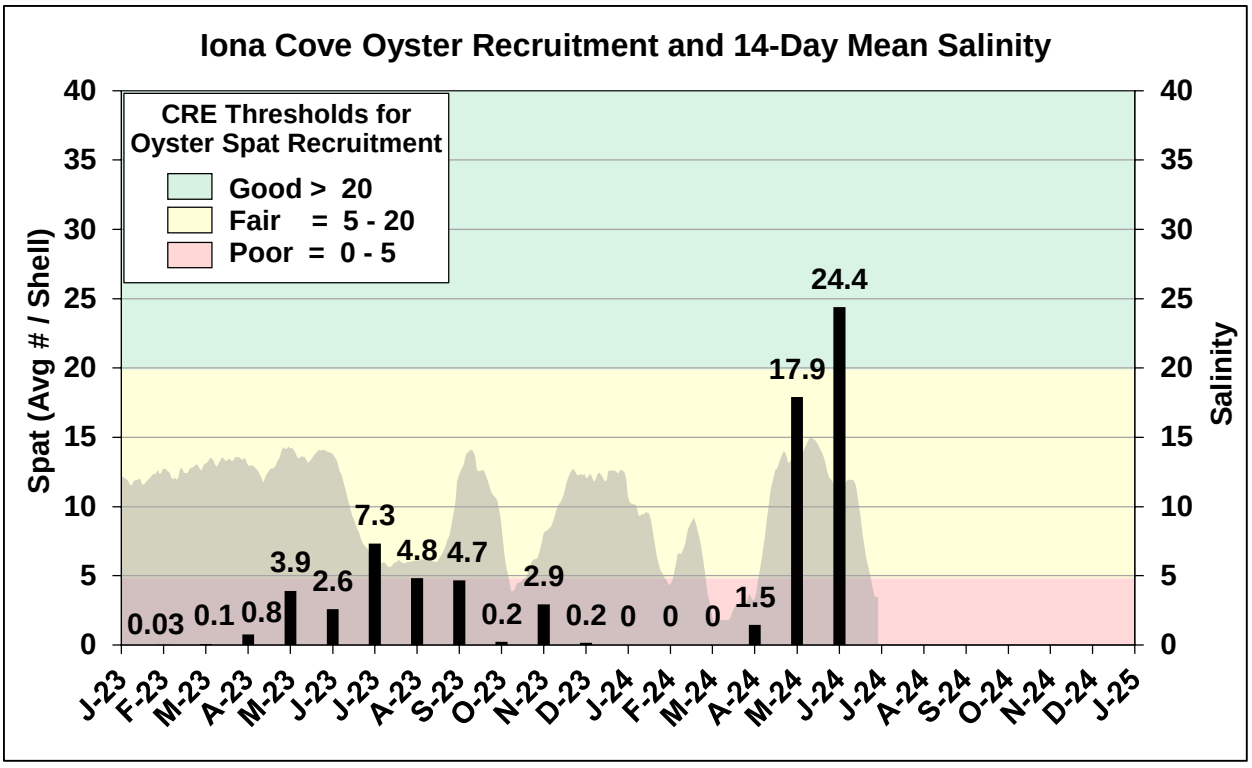


Figure ES-11. Mean oyster recruitment at the Iona Cove oyster monitoring station and 14-day mean salinity at Cape Coral.

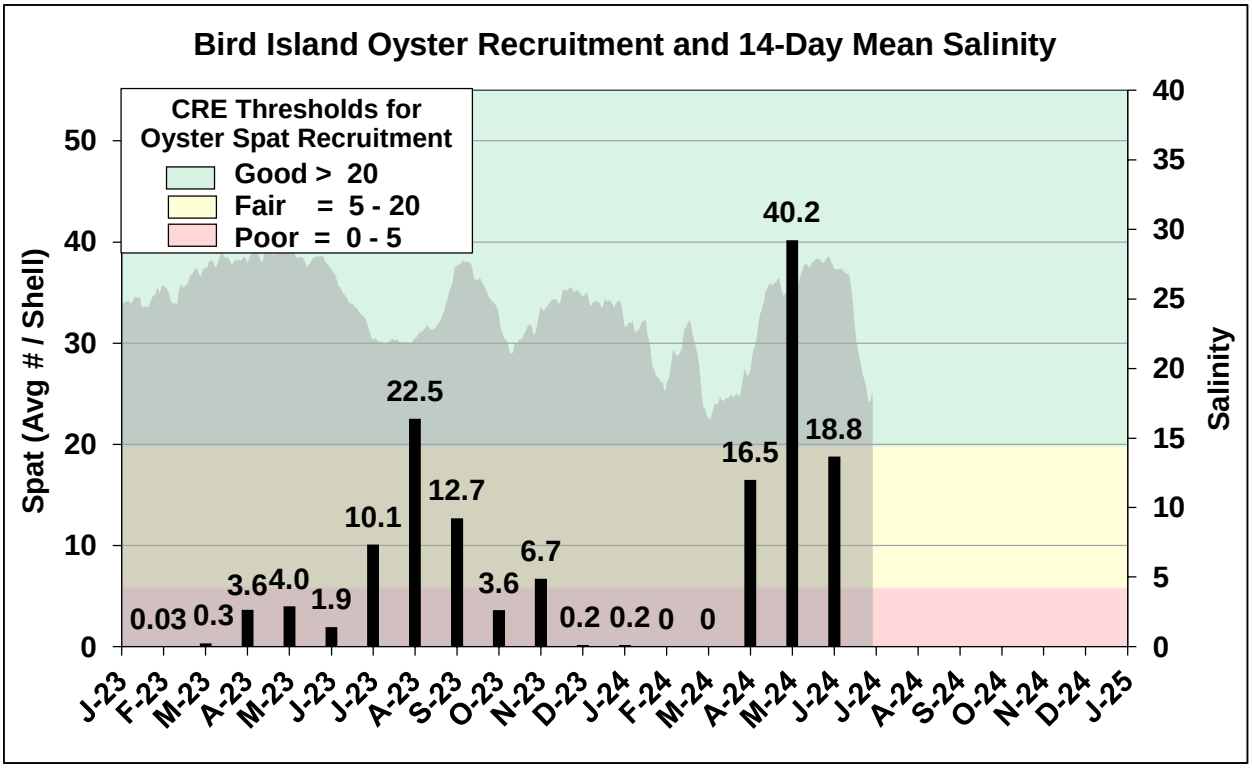


Figure ES-12. Mean oyster recruitment at the Bird Island oyster monitoring station and 14-day mean salinity at Shell Point.

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	1257	0.3	0.3
B	650	1257	0.3	0.3
C	1,200	1257	0.3	0.3
D	2,000	1257	0.3	0.3

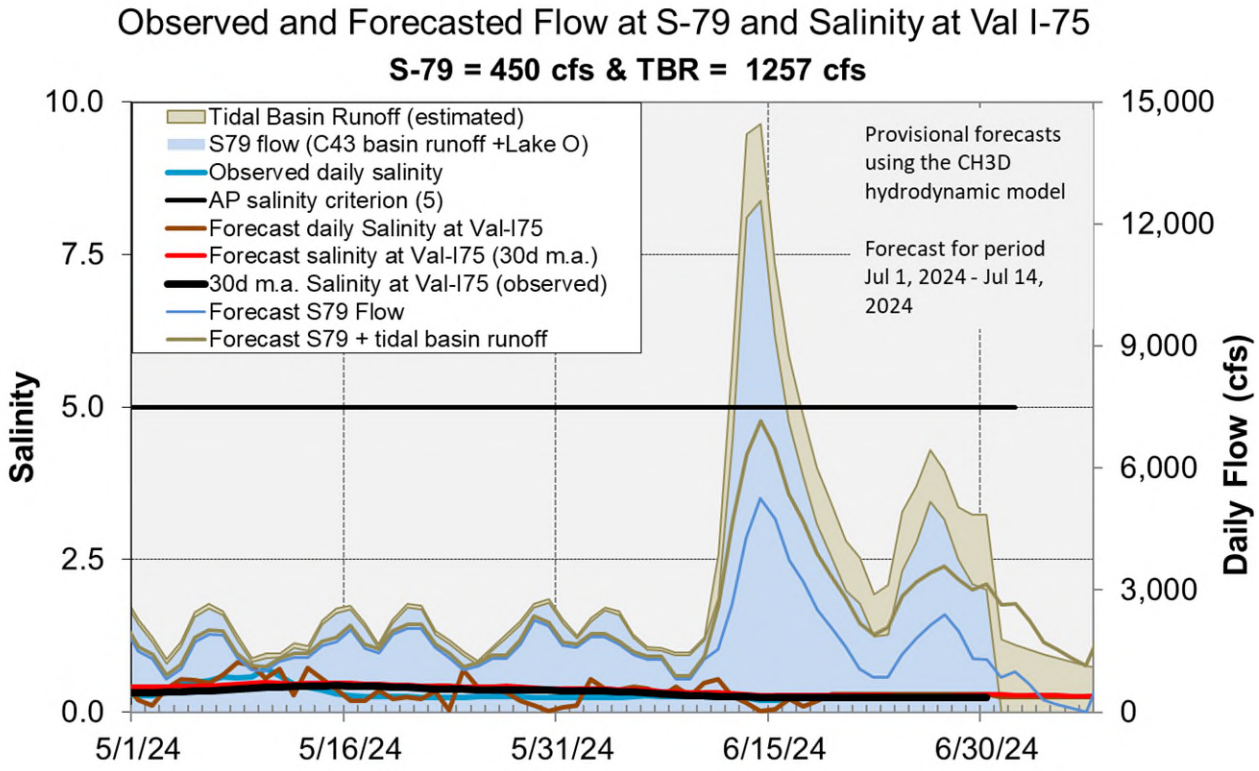


Figure ES-13. Forecast Val I-75 site surface salinity assuming 450 cfs pulse release at S-79.

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 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 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**).

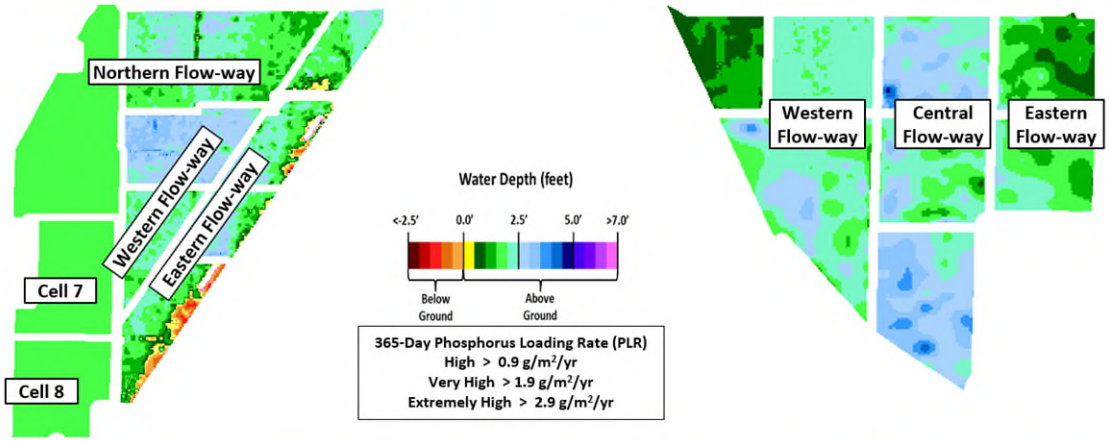
STA-2: Operational restrictions are in place in Flow-ways 2 and 4 for vegetation management activities, and in Flow-way 5 for construction activities. Online treatment cells are above target stage, and Flow-way 4 has extended deep water conditions. Vegetation in Flow-ways 2, 3, and 4 is stressed, and 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 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 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.

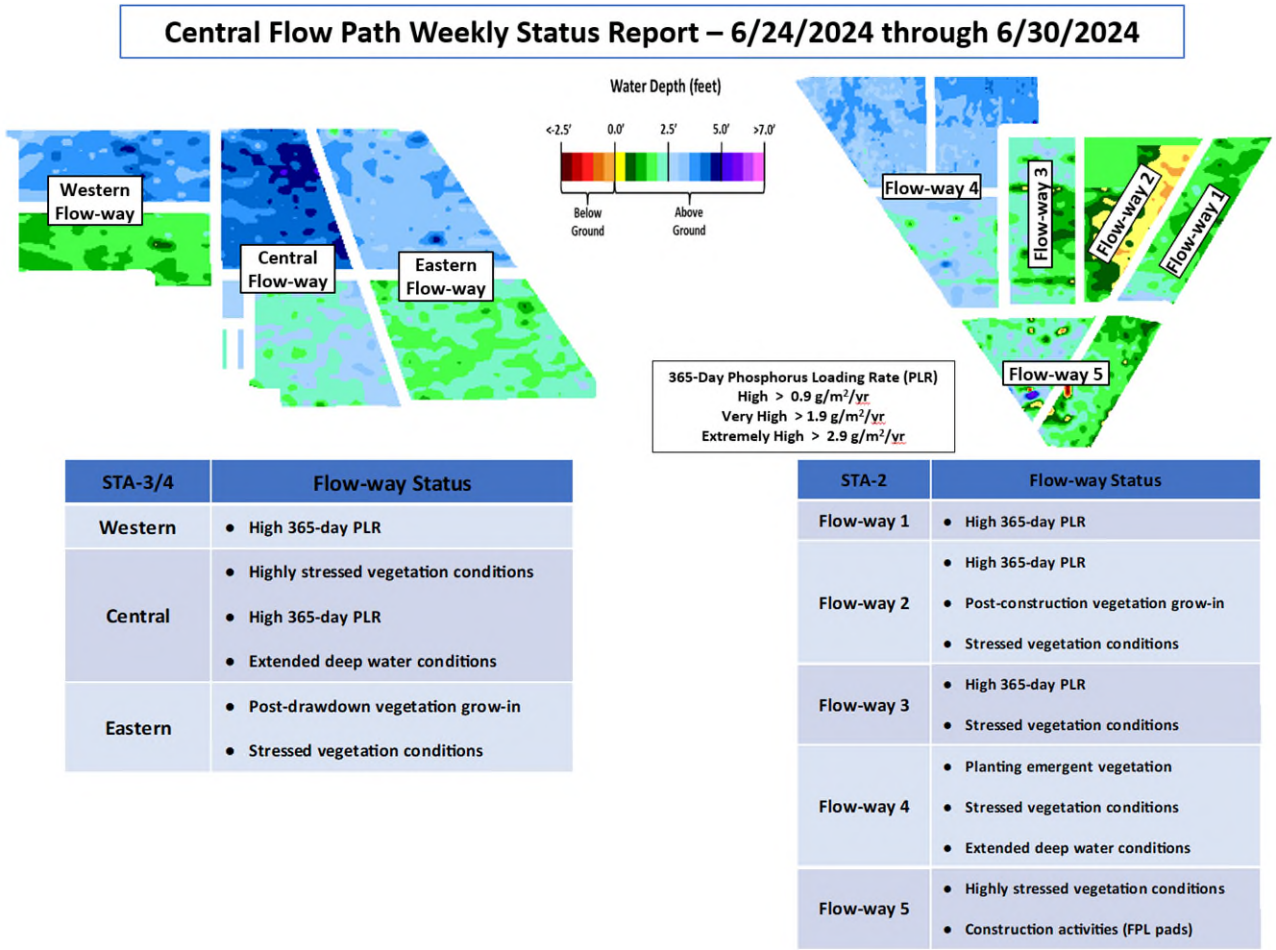
Eastern Flow Path Weekly Status Report – 6/24/2024 through 6/30/2024



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

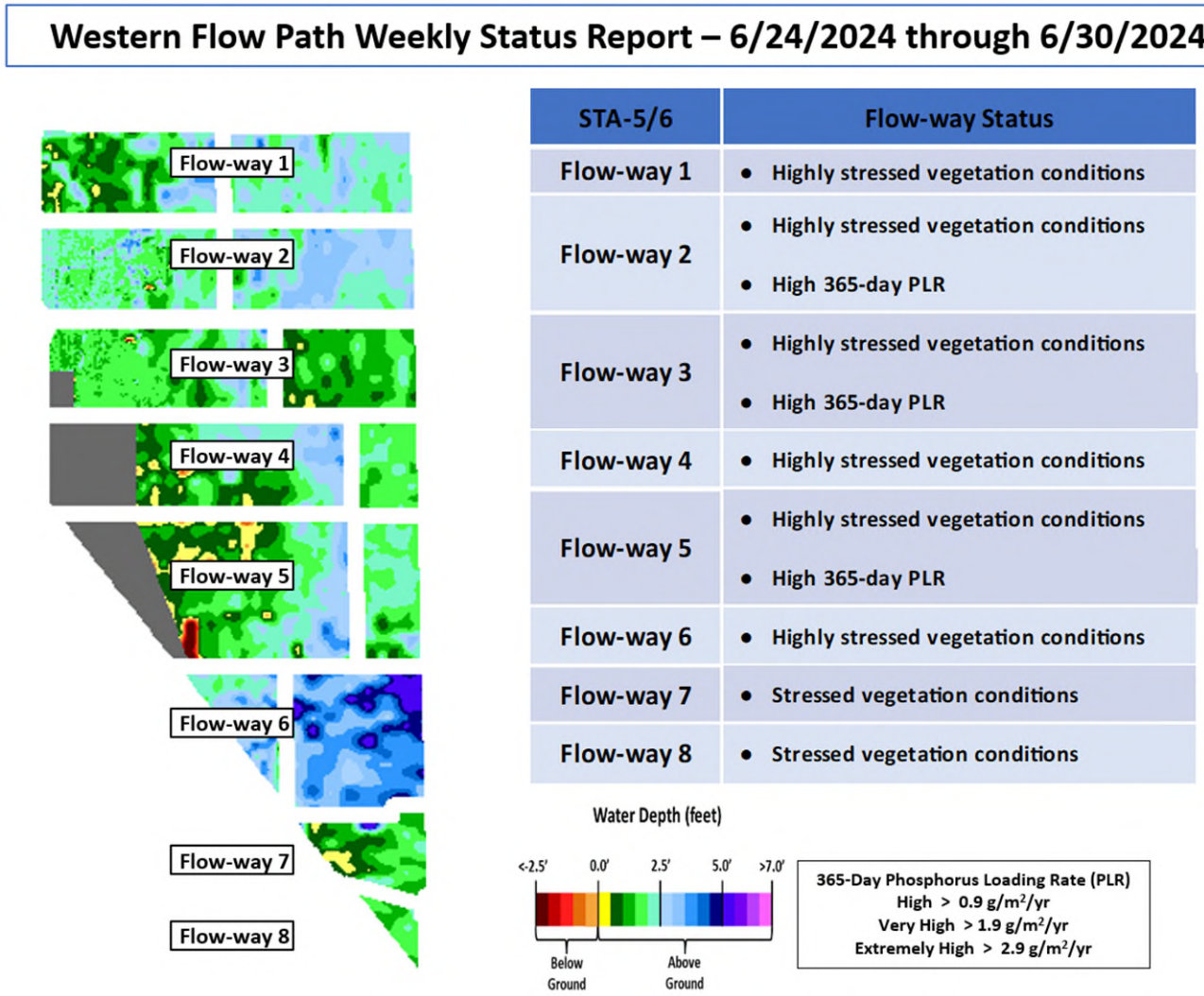


Figure S-3. Western Flow Path Weekly Status Report

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

Stages in the WCAs are starting to level out following the extreme rain event that occurred throughout the Everglades a couple weeks ago. WCA-1: Stage within the Refuge stayed above schedule last week. On Sunday the 3-Gauge average was 0.68 feet above the flat Zone A1 regulation line. WCA-2A: Stage at the S-11B_H gauge also remained above schedule last week. The average on Sunday was 0.72 feet above the flat regulation line. WCA-3A: The 3-Gauge average stage continued increasing and remains above the increasing Zone A regulation line by 0.87 feet. WCA-3A North: Stage at Gauge 62 (NW corner) has continued decreasing but remains above the increasing Upper Schedule line by 0.43 feet. See figures **EV-1** through **EV-4**.

Water Depths

The SFWDAT model output for 6/30/24 shows a hydropattern that is dramatically deeper than one month ago, especially in BCNP. Ponded conditions continue to spread along the L-67s and look to be forming in WCA-1 and BCNP. Hydrologic connectivity is maintaining across ENP, and BCNP appears to be fully inundated. Current WDAT water depth estimates are wetter when compared to one month ago across the EPA, less so in WCA-1 and WCA-2B. The comparison to modeled conditions a year ago illustrates a mix of deeper and drier conditions. Portions of WCA-1, WCA-2A and southern ENP are notably lower in depth, with the rest of system deeper particularly to the west.

Comparing current conditions to the 20-year percentiles on June 30: Depth conditions remain above the 90th percentile for this time of the year for much of WCA-3B, ENP and BCNP. Conditions remain variable in WCA-1 and WCA-2A, but are trending towards deeper. (**Figure EV-7**).

Taylor Slough and Florida Bay

Stage changes were variable across Taylor Slough over the past week, with an average increase of 0.02 feet. Changes ranged from –0.04 feet at Taylor Slough Bridge (TSB) in the northern slough, to +0.12 feet at EVER6 in the C-111 area (**Figure EV-8 and Figure EV-9**). Taylor Slough water levels remain above the recent average for this time of year by 8.1 inches compared to before the Florida Bay initiative (starting in 2017), a decrease of 1.5 inches relative to last week's comparison. Both the Craighead Pond (CP) and TSB stages are below estimated historical levels (~1900; Marshall and Wingard, 2014) by 0.33 and 0.74 feet, respectively.

Average Florida Bay salinity was 24.5, a decrease of 1.4 from last week. Salinity decreased at most sites, with changes ranging from –4.2 at Joe Bay (JB) in the eastern nearshore region, to +1.6 at Garfield Bight (GB) in the western nearshore region (**Figure EV-8**). Salinity is at the WY2001-2016 IQR 25th percentile and above estimated historical levels (~1900; Marshall and Wingard, 2014) in the western region, below both metrics in the eastern region, and below the 25th percentile and at historical levels in the central region (**Figure EV-10**). Average Florida Bay salinity remains below its recent average for this time of year by 6.7, a decrease of 0.6 from last week's comparison.

Salinity at the TR station in the mangrove zone (tracked for the Florida Bay MFL) was 3.2. The 30-day moving average was 10.4, a decrease of 2.4 from last week (**Figure EV-11**). The 365-day moving sum of flow from the five creeks was 394,432 acre-feet, a decrease of 7,082 acre-feet from last week (**Figure EV-11**).

Average rainfall across Taylor Slough and Florida Bay was 1.14 inches over the past week (6/24-6/30), based on the 18 gauges used for this report. Rainfall ranged from 0.17 at Garfield Bight (GB) in the western nearshore region to 2.72 inches at Taylor River (TR) in the eastern nearshore region (**Figure EV-12**). Wind directions and speeds in Florida Bay ranged from 0.2 mph SW on 6/24 to 18.3 mph NE on 6/30 (**Figure EV-12**).

Average daily flow from the five major creeks (McCormick, Taylor, Mud, Trout, West Highway) totaled 1,631 acre-feet last week, with net positive flows for the week. Total daily creek flow ranged from 665 acre-feet on 6/25 to 3,123 acre-feet on 6/30 (**Figure EV-13**). Average daily flow for the week was 2,956 acre-feet below estimated historical levels (~1900; Marshall and Wingard, 2014).

Implications for water management

The ecology of the Everglades would continue to benefit from ascension rates of less than 0.18' per week. Wading bird nesting has significantly declined, particularly for WOST, though a few are still nesting despite the wet conditions. 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	2.03	+0.20
WCA-2A	1.90	+0.07
WCA-2B	3.18	+0.13
WCA-3A	2.20	+0.24
WCA-3B	1.77	+0.04
ENP	1.01	+0.05

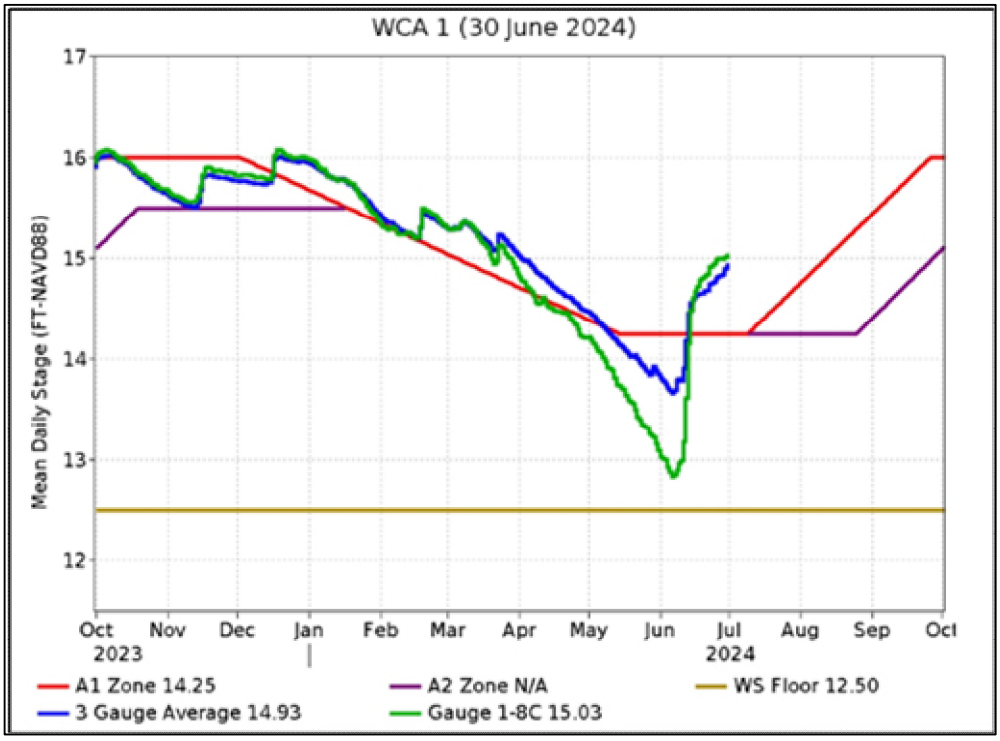


Figure EV-1. WCA-1 stage hydrographs and regulation schedule.

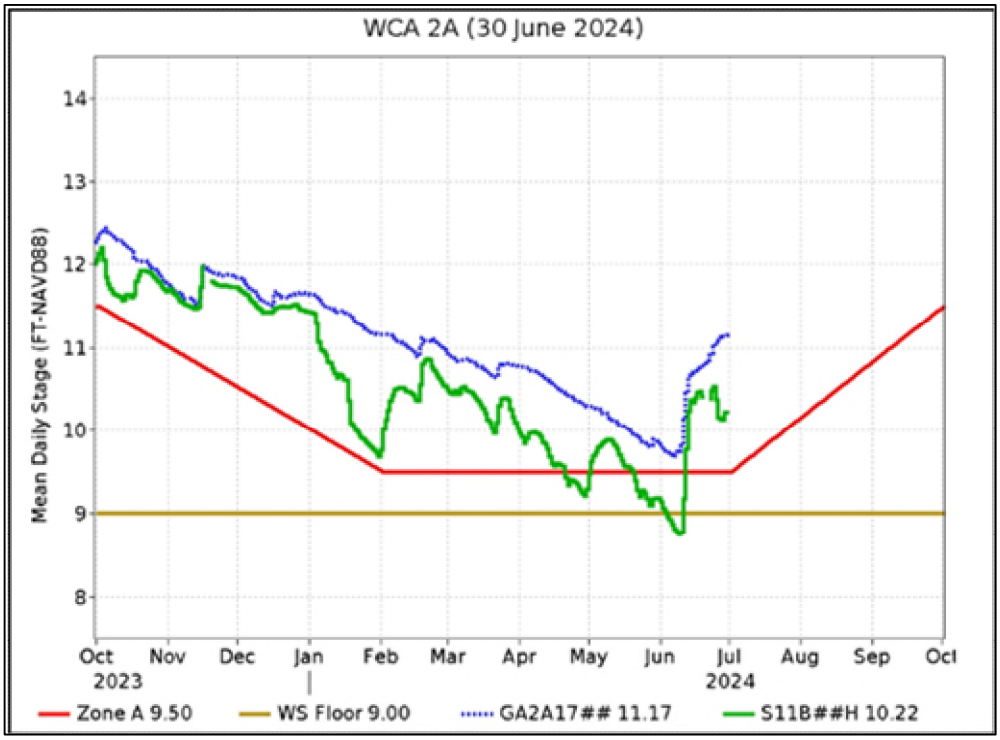


Figure EV-2. WCA-2A stage hydrographs and regulation schedule.

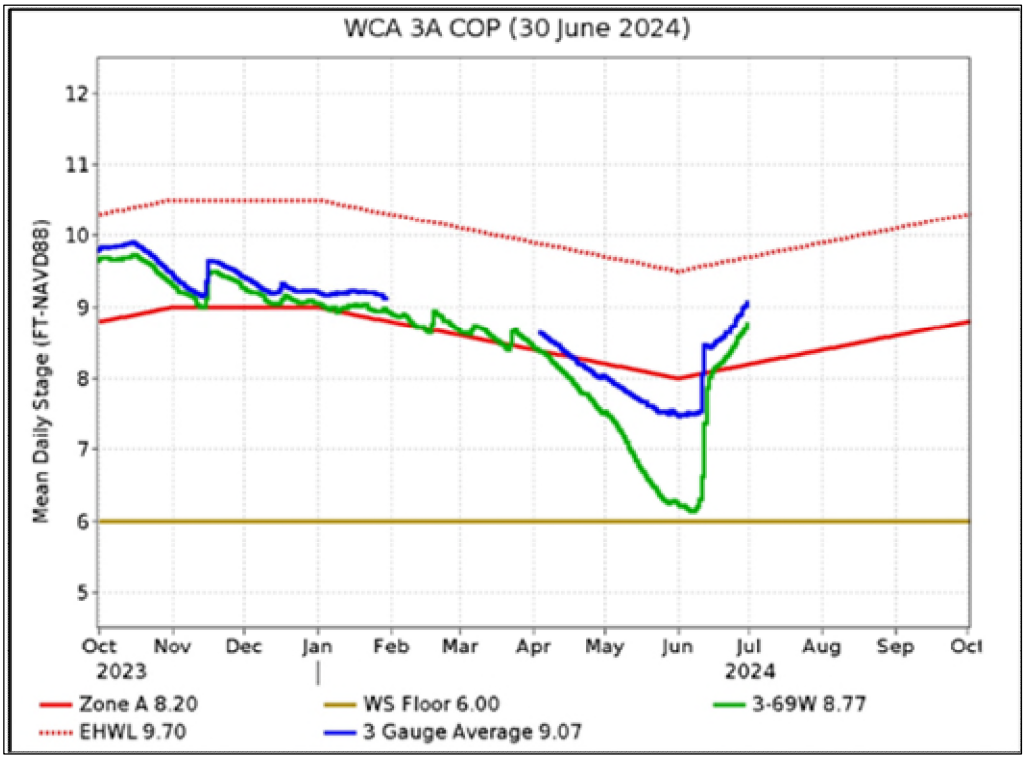


Figure EV-3. WCA-3A stage hydrographs (three-gauge average, 3-69W) and regulation schedule.

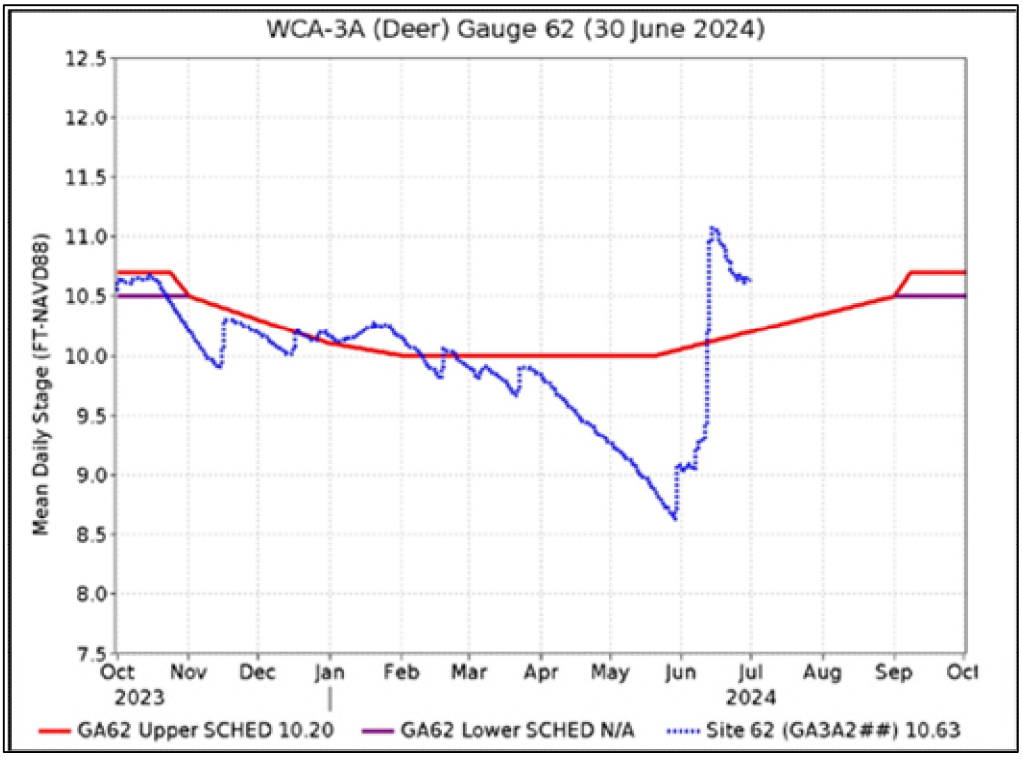


Figure EV-4. WCA-3A stage hydrograph (Deer gauge; Site 62) and GA62 regulation schedule.

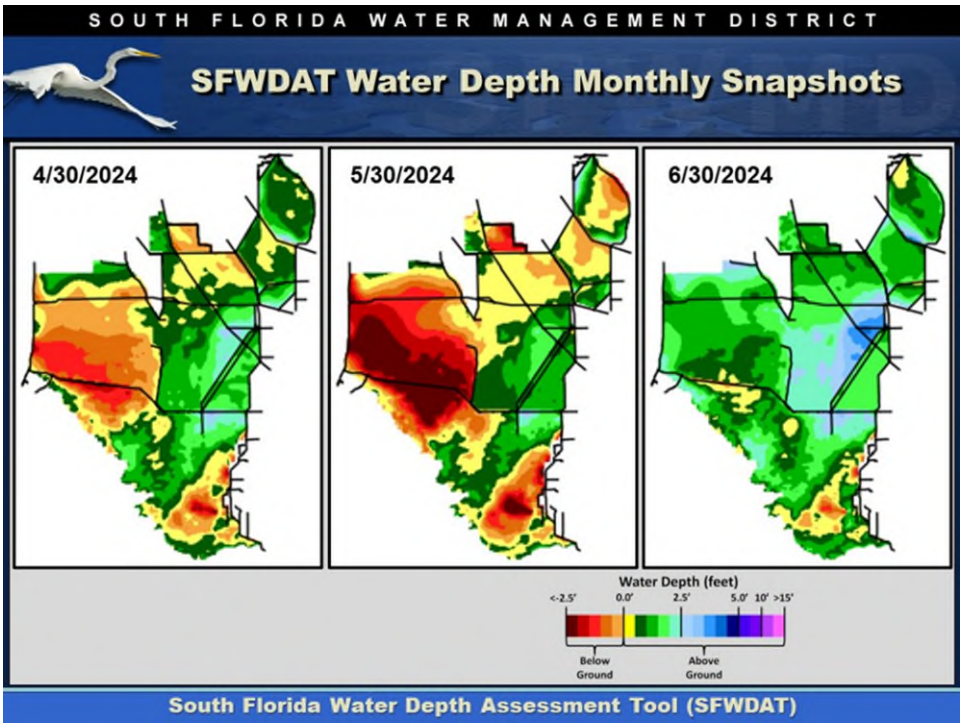


Figure EV-5. Everglades water depths from two months ago (left), one month ago (center) and present (right), based on SFWDAT.

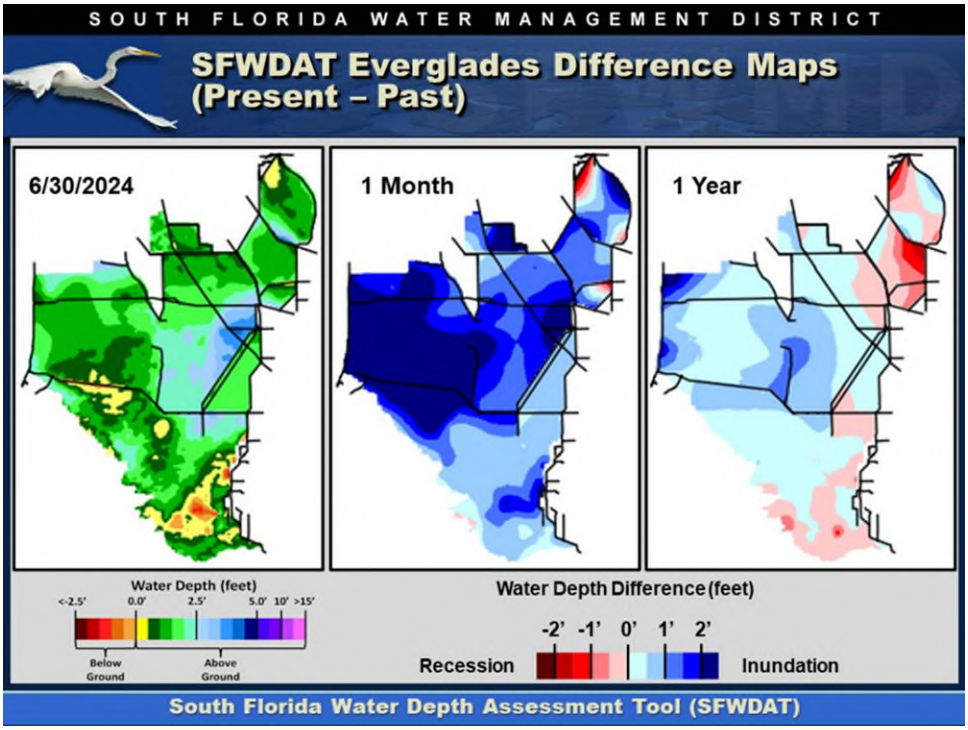


Figure EV-6. Present Everglades water depths (left) and water depth changes from one month (center) and one year (right) ago, based on SFWDAT.

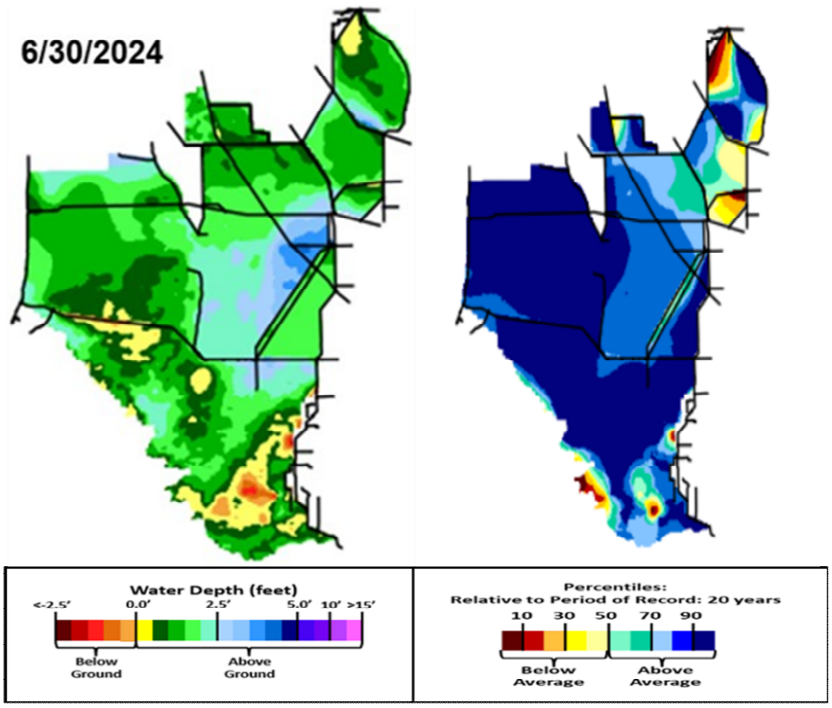


Figure EV-7. Present water depths (6/30/2024) compared to the day of year average over the previous 20 years.

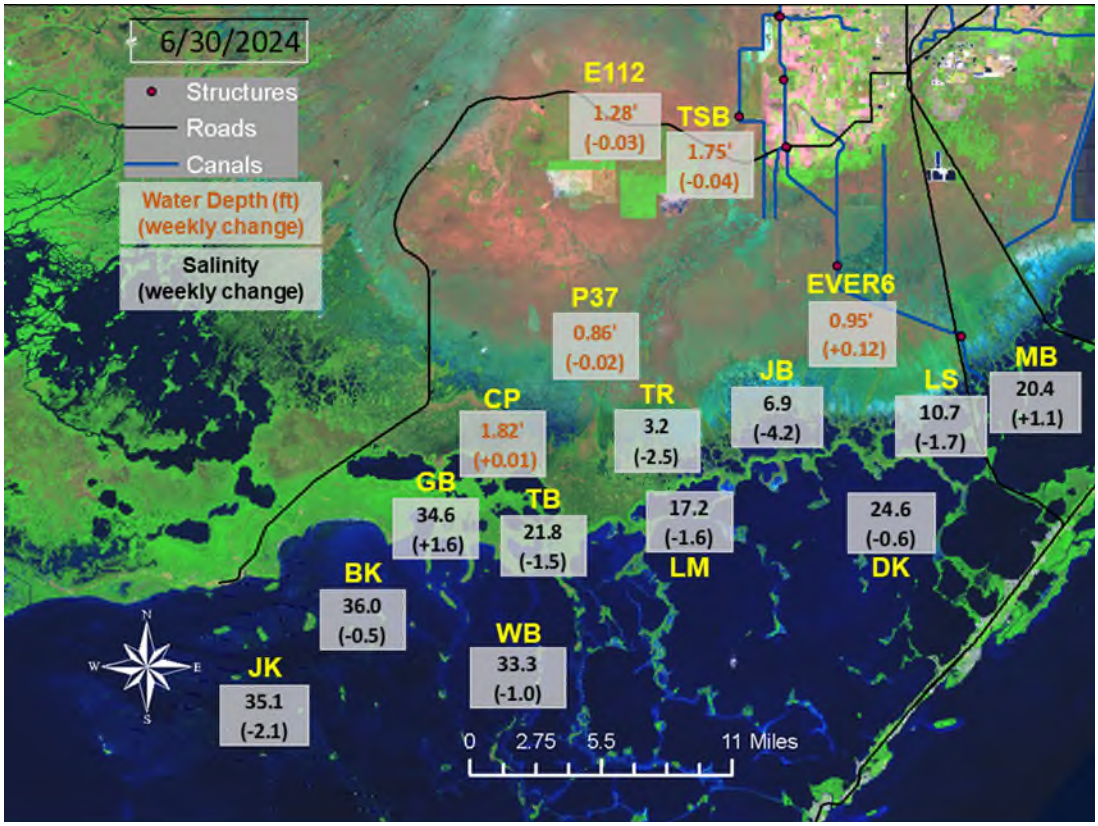


Figure EV-8. Taylor Slough water depths with changes since a week ago and Florida Bay salinities with changes since a week ago.

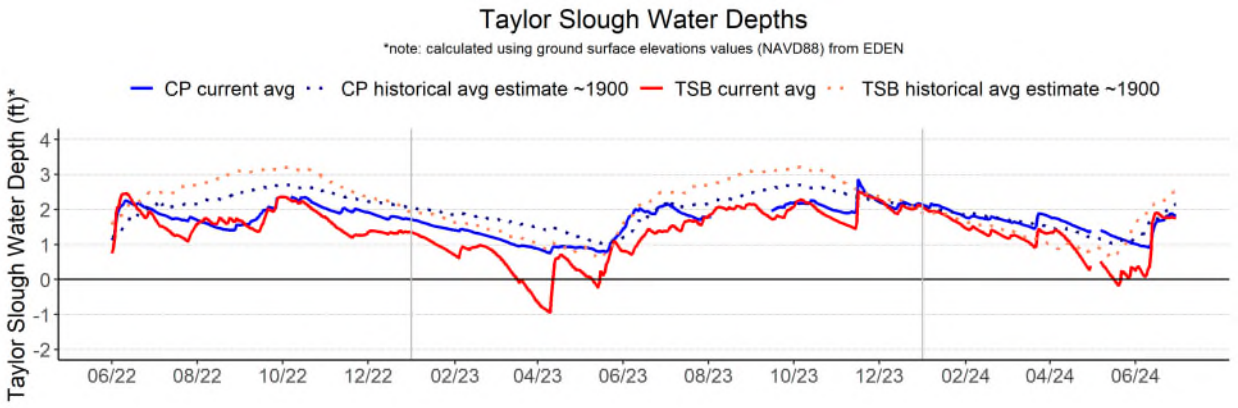


Figure EV-9. Taylor Slough water depth time series for Taylor Slough Bridge (TSB; northern slough) and Craighead Pond (CP; southern slough).

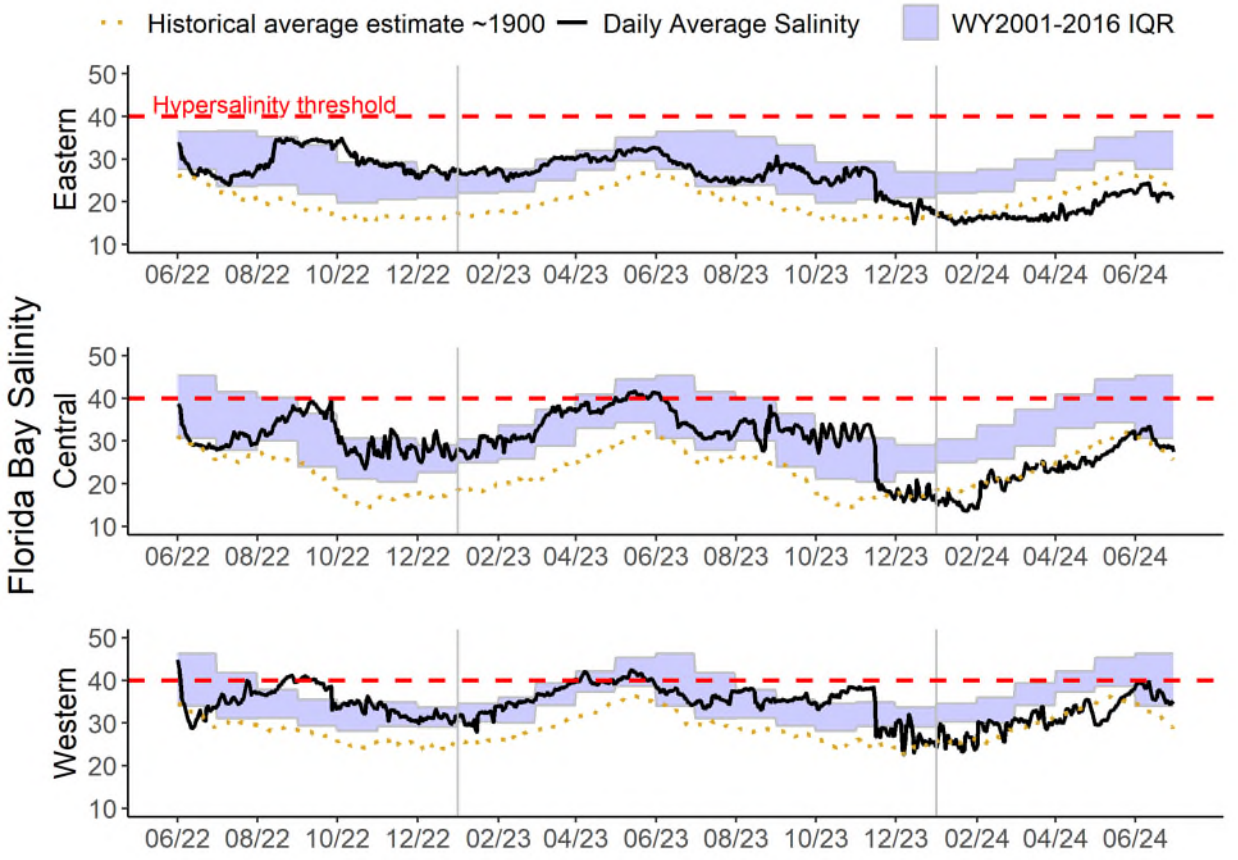


Figure EV-10. Eastern (top panel), Central (middle panel) and Western (bottom panel) Florida Bay daily average salinities with WY2001-2016 interquartile (25-75 percentile) ranges and estimated historical daily average salinities (~1900 CE). The hypersalinity threshold indicates the level at which salinities start to become harmful to seagrass.

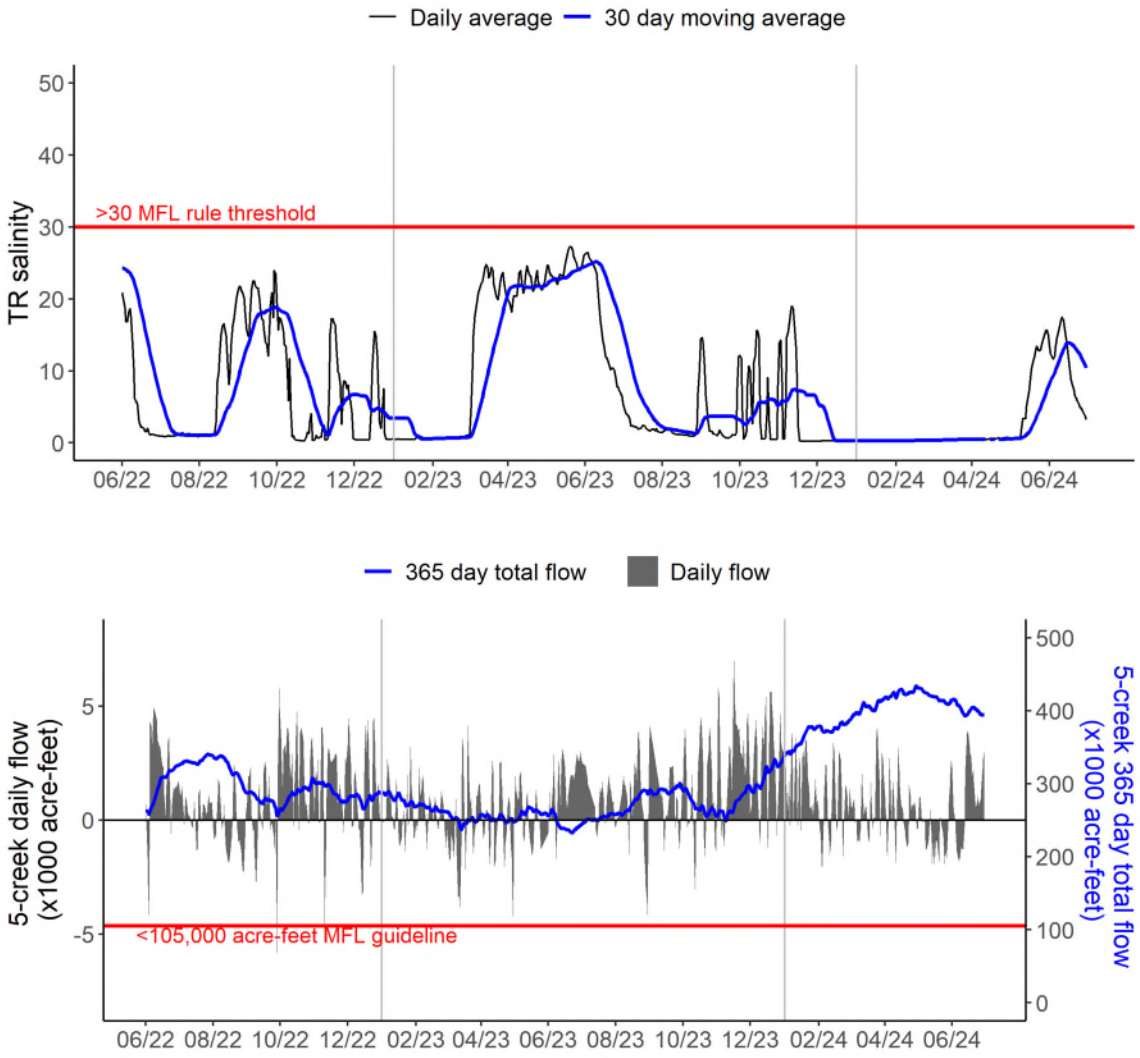


Figure EV-11. Salinity at Taylor River (TR; top) and creek inflow to Florida Bay (bottom) from the five major creeks (McCormick Creek, Taylor River, Mud Creek, Trout Creek, and West Highway Creek). The 30-day moving average salinity and 365-day total creek flow are tracked for the Florida Bay MFL criteria.

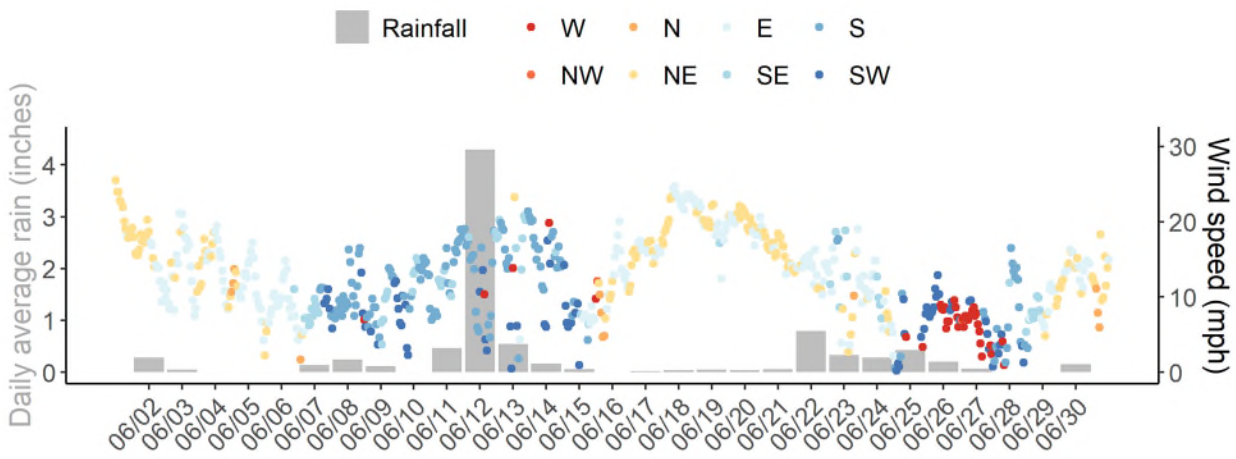


Figure EV-12. Daily average rain across Taylor Slough and Florida Bay, along with hourly average wind speed and direction (measured at Long Key) in Florida Bay over the past four weeks.

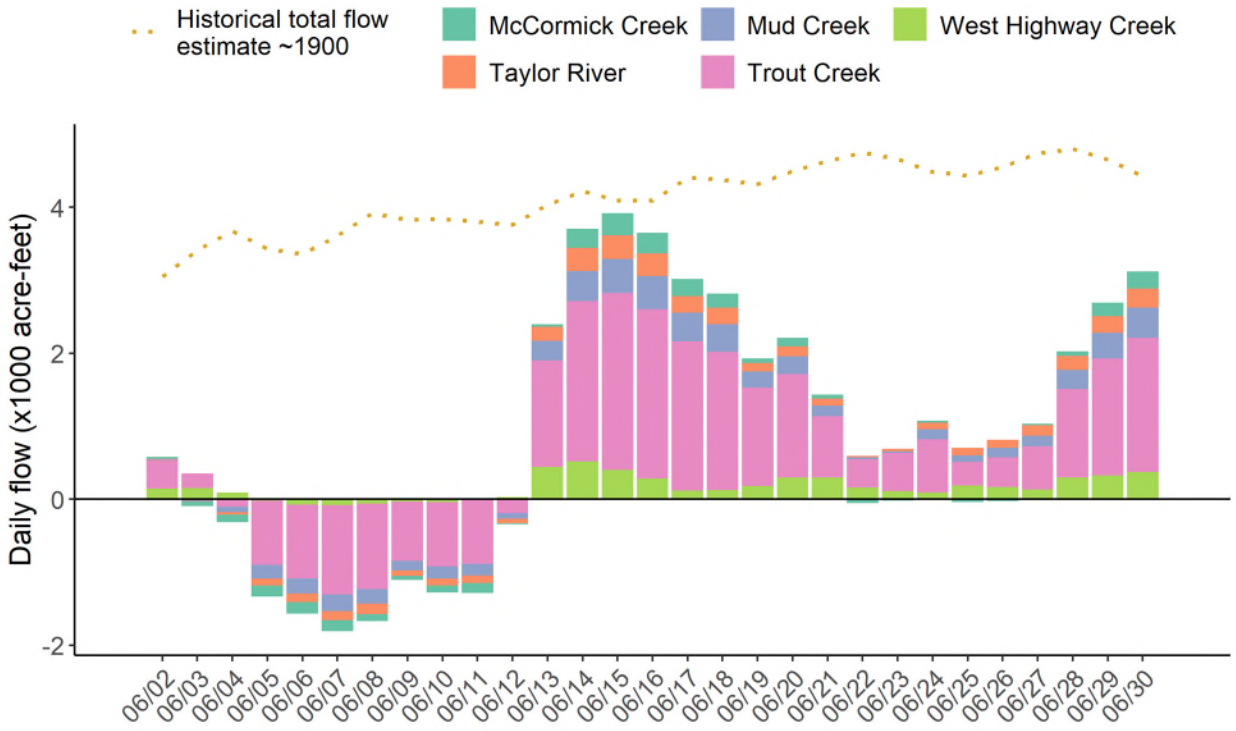


Figure EV-13. Daily average creek flow summed between five creeks with estimated historical daily flow (~1900 CE) over the past four weeks.

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

SFWMD Everglades Ecological Recommendations, June 25, 2024 (red is new)			
	Weekly change	Recommendation	Reasons
WCA-1	Stage increased by 0.20’	Ascension rate of less than 0.18’ per week.	Protect within basin and downstream habitat and wildlife.
WCA-2A	Stage increased by 0.07’	Ascension rate less than 0.18’ per week.	Protect within basin and downstream habitat and wildlife.
WCA-2B	Stage increased by 0.13’	Ascension rate of less than 0.18’ per week.	Protect within basin and downstream habitat and wildlife.
WCA-3A NE	Stage increased by 0.61’	Ascension rate of less than 0.18’ per week.	Protect within basin and downstream habitat and wildlife.
WCA-3A NW	Stage decreased by 0.05’	Ascension rate of less than 0.18’ per week.	
Central WCA-3A S	Stage increased by 0.36’	Ascension rate of less than 0.18’ per week.	Protect within basin wildlife.
Southern WCA-3A S	Stage increased by 0.04’	Ascension rate of less than 0.18’ per week.	
WCA-3B	Stage increased by 0.04’	Ascension rate of less than 0.18’ per week.	Protect within basin and downstream habitat and wildlife.
ENP-SRS	Stage increased by 0.05’	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 −0.04’ to +0.12’	Move water southward as possible.	When available, provide freshwater to promote water movement.
FB- Salinity	Salinity changes ranged from −4.2 to +1.6	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 1440 cfs, and the previous 30-day mean inflow was 1490 cfs. The seven-day mean salinity was 22.1 at BBCW8 and 20.2 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.

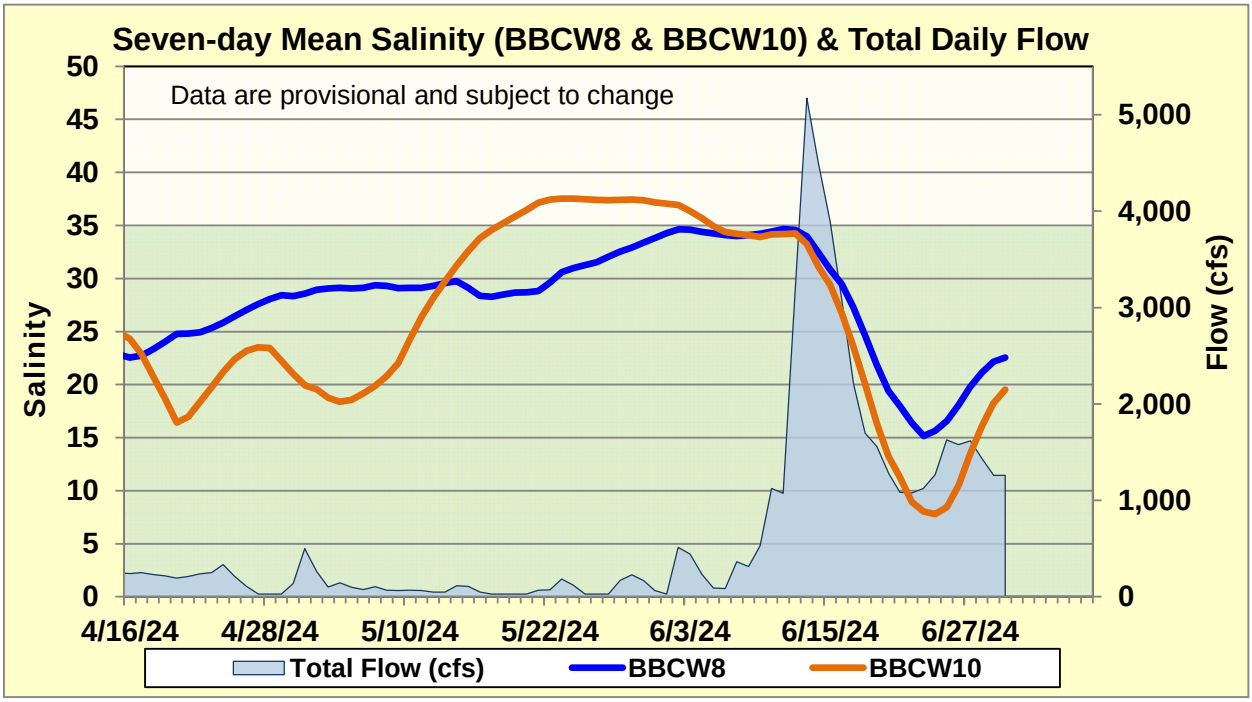


Figure BB-1. Seven-day mean salinity at BBCW8 and BBCW10 and total daily flow in Biscayne Bay. Total daily flow was calculated using flow from structures S20G, S20F, S21, S21A, S123, and S700P.