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: April 24, 2024

SUBJECT: Weekly Environmental Conditions for Systems Operations

Summary

Weather Conditions and Forecast

An area of surface high pressure will help maintain a dry weather pattern across the area. By the weekend, a polar air mass will reinforce the dry conditions already in place across most of the SFWMD and bring temperatures down a notch to near-seasonable averages. However, shallow moisture blowing off the Atlantic waters could cause light shower activity along portions of the east coast both Saturday and Sunday, with an isolated area possibly seeing a heavier rainfall even though area-averaged rainfall is likely to be minimal. Early next week, strong stability of the atmosphere will ensure dry weather with a warming trend through at least Tuesday. For the week ending next Tuesday morning, total SFWMD rainfall is likely to be much below normal. Given the very dry forecast for the next several days, April 2024 will finish the second driest over the last 32 years of record and in the top 10 lowest since 1932. Finally, for the week-2 period (30 April – 6 May), there is a rather strong signal for much below normal rainfall to continue, thanks in large part to the weather pattern during the latter part of the current forecast period repeating itself again in week-2.

Kissimmee

Releases were made from East Lake Toho and Lake Toho to continue spring lake stage recessions to low pool. Weekly average discharge on April 21, 2024, was 1,100 cfs and 960 cfs at S-65 and S-65A, respectively. Mean weekly water depth on the Kissimmee River floodplain decreased by 0.03 feet to 0.16 feet over the week ending April 21, 2024. The weekly average concentration of dissolved oxygen in the Kissimmee River increased from 8.1 mg/L last week to 8.3 mg/L for the week ending April 21, 2024, which is well above the potentially lethal and stressful levels for largemouth bass and other sensitive species.

Lake Okeechobee

Lake Okeechobee stage was 13.36 feet NAVD88 (14.64 ft NGVD29) on April 21, 2024, which was 0.23 feet lower than the previous week and 0.88 feet lower than a month ago. Average daily inflows (excluding rainfall) were slightly lower than the previous week, at 850 cfs, compared to 880 cfs. Average daily outflows (excluding evapotranspiration)

increased from the previous week, going from 3,120 cfs to 4,350 cfs. The April 21, 2024, satellite image from NOAA's Harmful Algal Bloom Monitoring System moderate to high cyanobacteria concentrations along most of the northern and western shorelines, and moderate concentrations along the remaining shallow shorelines of the Lake.

Estuaries

Total inflow to the St. Lucie Estuary averaged 70 cfs over the past week with all of the flow coming from the Tidal Basin. Mean salinities increased at all three 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 2,110 cfs over the past week with 1,275 cfs coming from Lake Okeechobee. Mean surface salinities decreased at Cape Coral and Shell point and increased at the remaining sites. Salinities were in the optimal range (0-10) for tape grass in the upper estuary. Salinities were in the optimal range (10-25) for adult eastern oysters at Cape Coral and in the upper stressed range (> 25) at Shell Point and Sanibel.

Stormwater Treatment Areas

For the week ending Sunday, April 21, 2024, 1,500 ac-ft of Lake Okeechobee water was delivered to the FEBs/STAs. The total amount of Lake releases sent to the FEBs/STAs in WY2024 (since May 1, 2023) is approximately 73,900 ac-feet. The total amount of inflows to the STAs in WY2024 is approximately 1,460,000 ac-feet. Most 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-1W Northern Flow-way, STA-2 Flow-ways 2 and 4, STA-3/4 Eastern Flow-way, and STA-5/6 Flow-way 4 for vegetation management activities. This week, if 2008 LORS recommends Lake releases to the WCAs and conditions allow, releases will be sent to the A-1 FEB, STA-3/4, or STA-5/6.

Everglades

The last four week's rates of stage change (Sunday to Sunday) were generally favorable for wading bird foraging and dry season Everglades ecology. Stages decreased on average in Taylor Slough last week, but depths remain above historical estimates for this time of year. Salinity increased on average in Florida Bay last week, but conditions are at or below historical estimates for this time of year and well below the 25th percentile. Florida Bay MFL metrics remain well below thresholds of harm. Wading bird foraging and nesting numbers remain well below average in the WCAs but drier weather has meant a recent increase in foraging. White Ibis continue to nest in numbers at Alley North and within the Refuge (~15,000). Unfortunately, Wood Storks have initiated late nesting in WCA-3A after abandoning nests earlier in the season from water level reversals. These nests are highly likely to fail as there is not enough time left before the wet season and rising water levels.

Biscayne Bay

Total inflow to Biscayne Bay averaged 220 cfs and the previous 30-day mean inflow averaged 930 cfs. The seven-day mean salinity was 24.7 at BBCW8 and 15.1 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 April 21, 2024, mean daily lake stages were 54.7 feet NAVD88 (0.9 feet below schedule) in East Lake Toho, 51.7 feet NAVD88 (0.9 feet below schedule) in Lake Toho, and 49.2 feet NAVD88 (1.1 feet below the temporary deviation schedule) in Lakes Kissimmee-Cypress-Hatchineha (KCH) (**Table KB-1**, **Figures KB-1-3**).

Lower Kissimmee

For the week ending April 21, 2024, mean weekly discharge was 1,100 cfs and 960 cfs at S-65 and S-65A, respectively. Mean weekly discharge from the Kissimmee River was 960 cfs at S-65D and 820 cfs at S-65E (**Table KB-2**). Mean weekly headwater stages were 45.2 feet NAVD88 at S-65A and 24.6 feet NAVD88 at S-65D on April 21, 2024. Mean weekly river channel stage decreased by 0.1 ft from the previous week's stage of 34.1 feet NAVD88 over the week ending on April 21, 2024 (**Figure KB-4**). Mean weekly water depth on the Kissimmee River floodplain decreased by 0.03 feet to 0.16 feet over the week ending April 21, 2024 (**Table KB-2**, **Figure KB-5**). The weekly average concentration of dissolved oxygen in the Kissimmee River increased from 8.1 mg/L the previous week to 8.3 mg/L for the week ending April 21, 2024 (**Table KB-2**, **Figure KB-6**).

Water Management Recommendations

Continue the stage recessions in Lakes East Toho and Toho to reach their low pools on May 31, 2024. Follow the Hybrid A discharge plan for S-65/S-65A (Fig. KB-7) through May 31, 2024, except as otherwise indicated. Maintain at least minimum flow (250-300 cfs) at S-65A. Maintain S-65/S-65A flow at ~950 cfs to facilitate S-69 repairs. To the extent possible, modify S-65D headwater stage to meet USACE's objectives for S-69 repairs.

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

Water Body	Structure	Stage Monitoring Site	Weekly (7-Day) Average Discharge (cfs)	Sunday Lake Stage (feet NAVD88)[a]	Schedule Type[b]	Sunday Schedule Stage (feet NAVD88)	Sunday Departure from Regulation (feet)	
							4/21/24	*4/14/24*
Lakes Hart and Mary Jane	S-62	LKMJ	1	59.0	R	59.3	-0.3	-0.3
Lakes Myrtle, Preston and Joel	S-57	S-57	1	59.4	R	59.4	0.0	0.0
Alligator Chain	S-60	ALLI	41	62.0	R	62.0	0.0	0.0
Lake Gentry	S-63	LKGT	51	59.6	R	59.5	0.1	0.0
East Lake Toho	S-59	TOHOE	41	54.7	R	55.6	-0.9	-1.1
Lake Toho	S-61	TOHOW S-61	34	51.7	R	52.6	-0.9	-1.1
Lakes Kissimmee, Cypress and Hatchineha	S-65	KUB011 LKIS5B	1100	49.2	T	50.3	-1.1	0.2

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

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

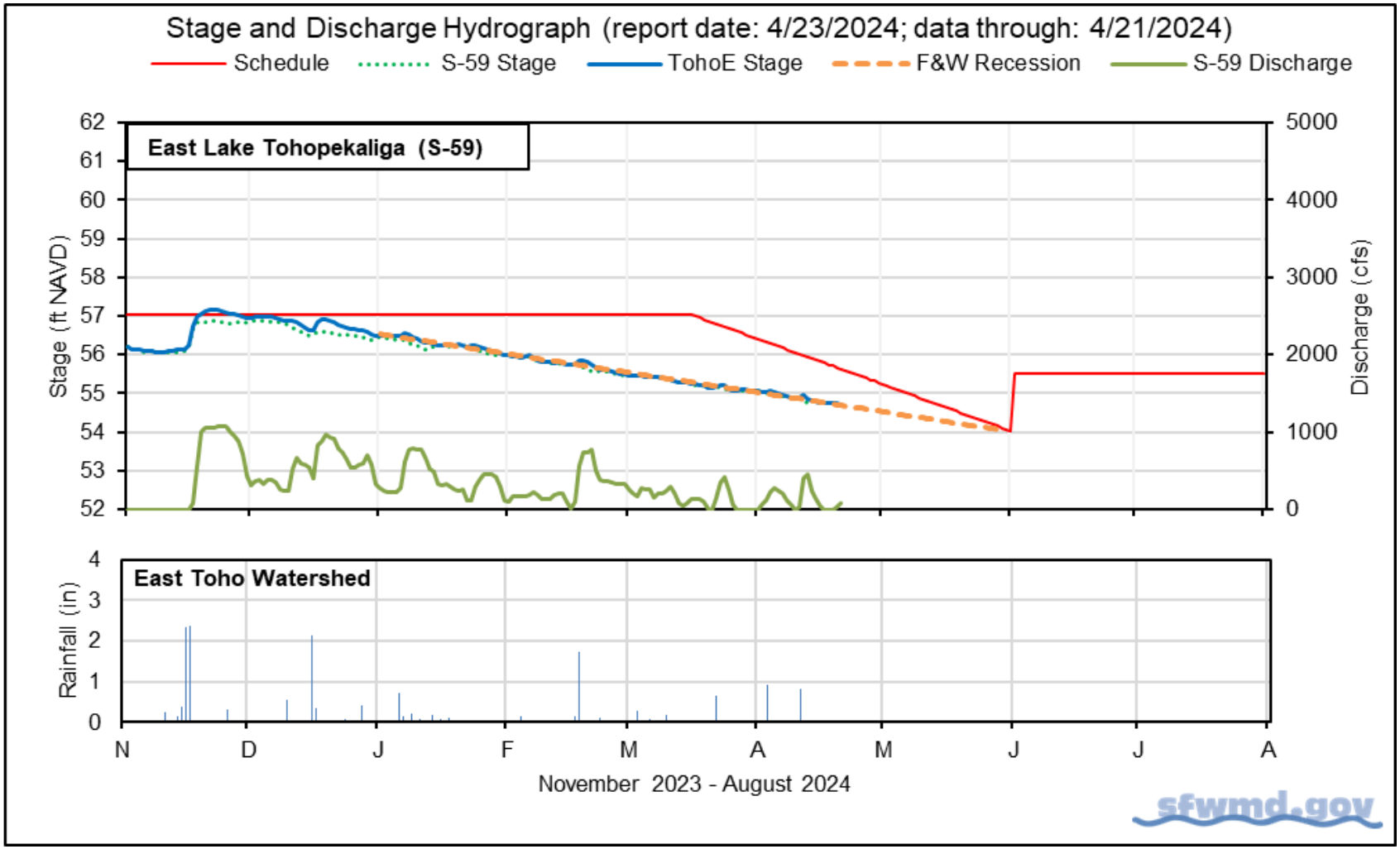


Figure KB-1. East Lake Toho regulation schedule, stage, discharge, and rainfall.

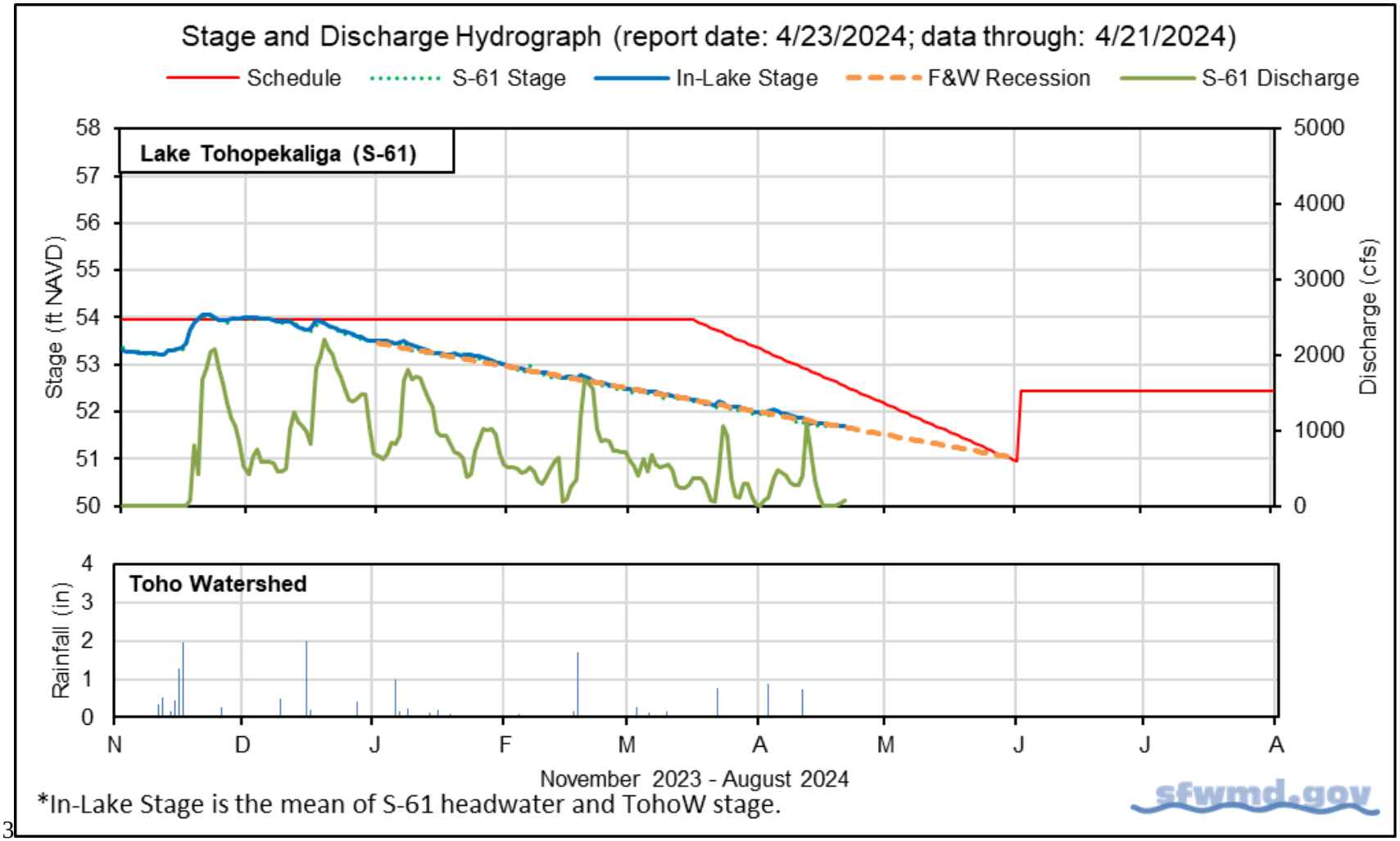


Figure KB-2. Lake Toho regulation schedule, stage, discharge, and rainfall.

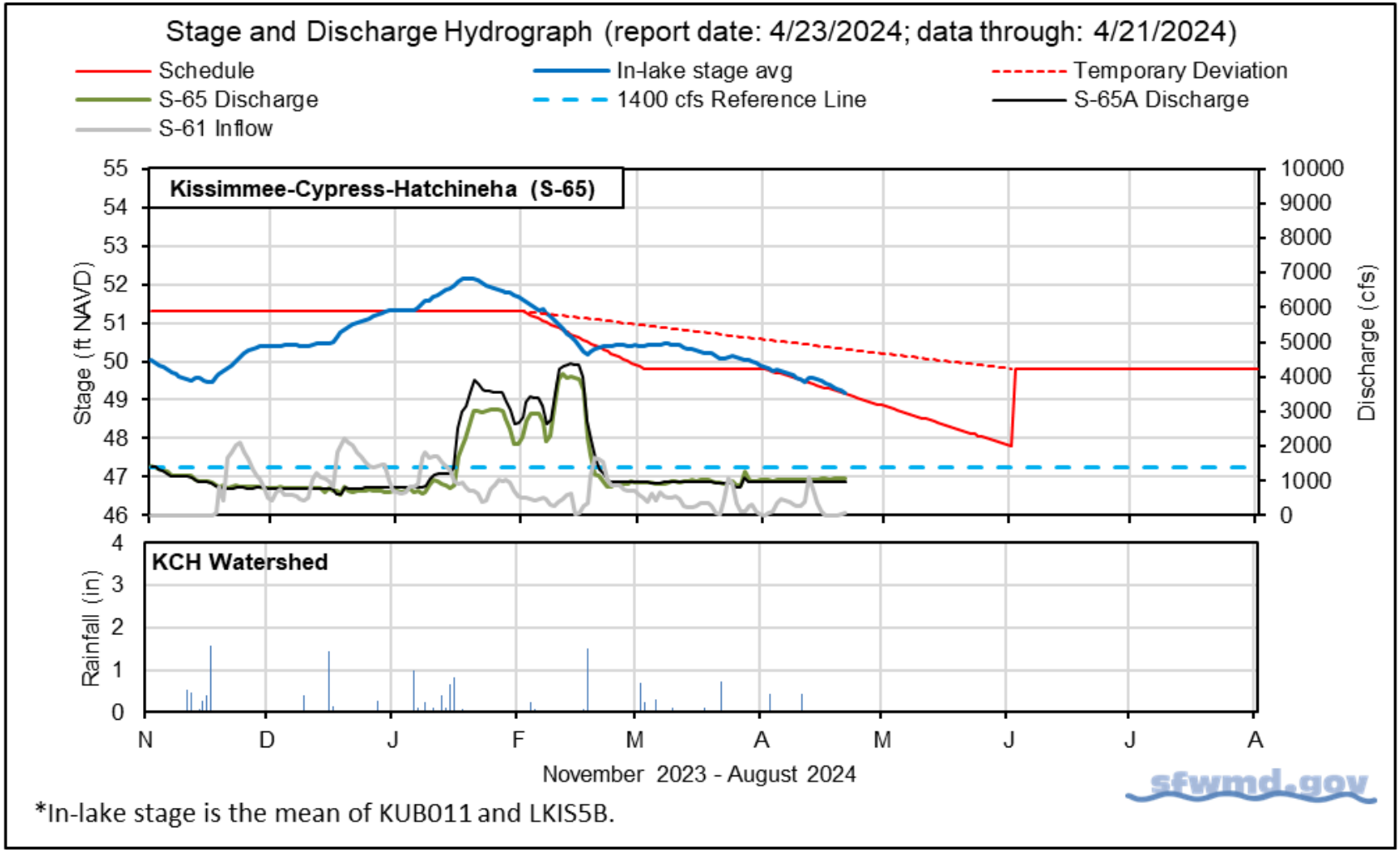


Figure KB-3. Lakes Kissimmee, Cypress and Hatchineha regulation schedule, stage, discharge, and rainfall.

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

Metric	Location	Sunday Daily Average	Weekly Average for Previous Seven Day Periods			
		4/21/24	4/21/24	4/14/24	4/7/24	3/31/24
Discharge	S-65	1,100	1,100	1,000	1,000	1,000
Discharge	S-65A[a]	970	960	960	960	940
Headwater Stage (feet NAVD)	S-65A	45.2	45.2	45.1	45.2	45.0
Discharge	S-65D[b]	970	960	970	970	950
Headwater Stage (feet NAVD)	S-65D[c]	24.7	24.6	24.7	24.6	24.5
Discharge (cfs)	S-65E[d]	800	820	860	860	850
Discharge (cfs)	S-67	0	0	N/A	0	0
Dissolved Oxygen (mg/L) [e]	Phase I, II/III river channel	8.1	8.3	8.1	7.9	8.0
River channel mean stage[f]	Phase I river channel	34.0	34.0	34.1	34.1	34.0
Mean depth (feet) [g]	Phase I floodplain	0.14	0.16	0.19	0.20	0.23

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 (NAVD88).

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

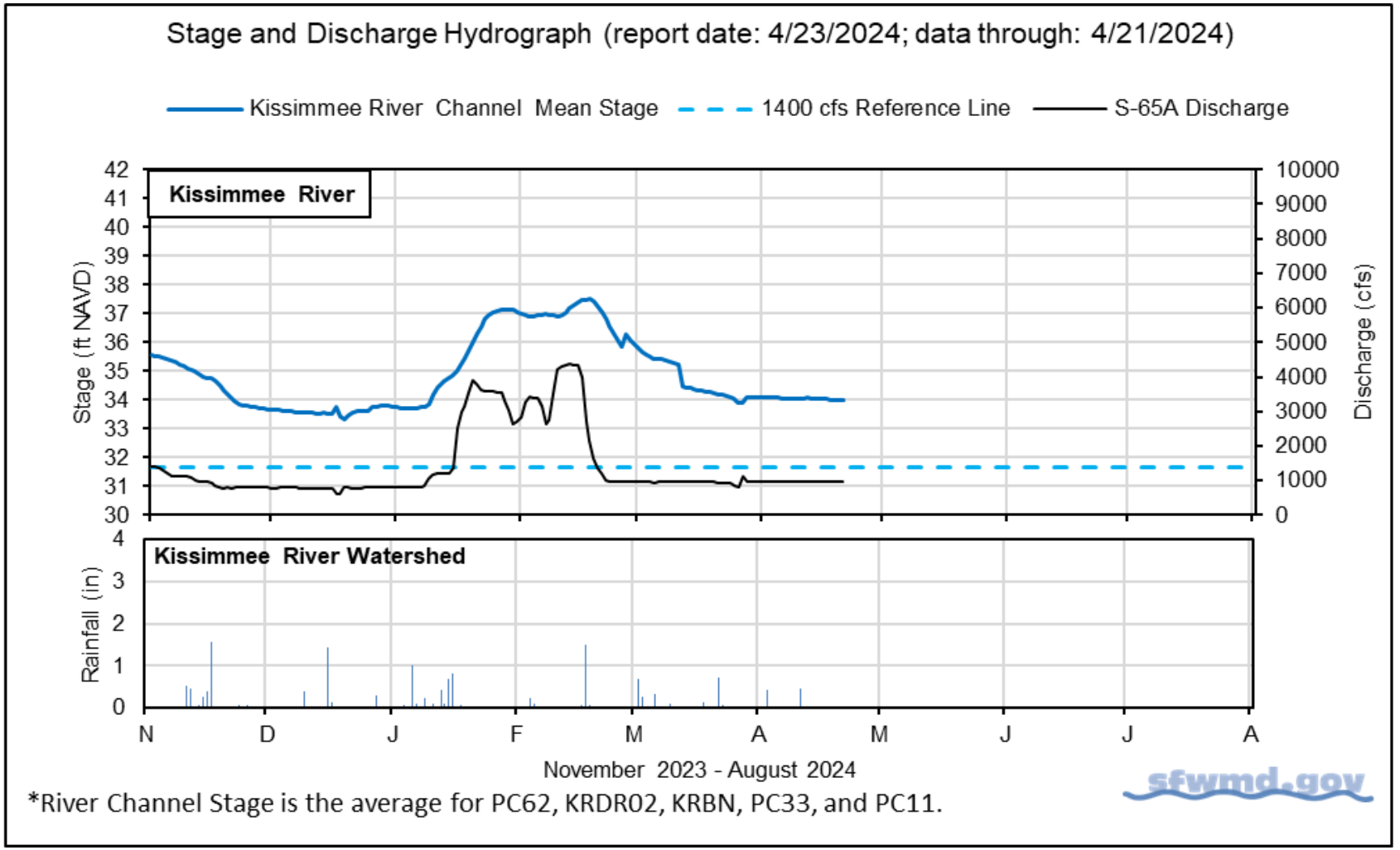


Figure KB-4. Kissimmee River stage, discharge, and rainfall.

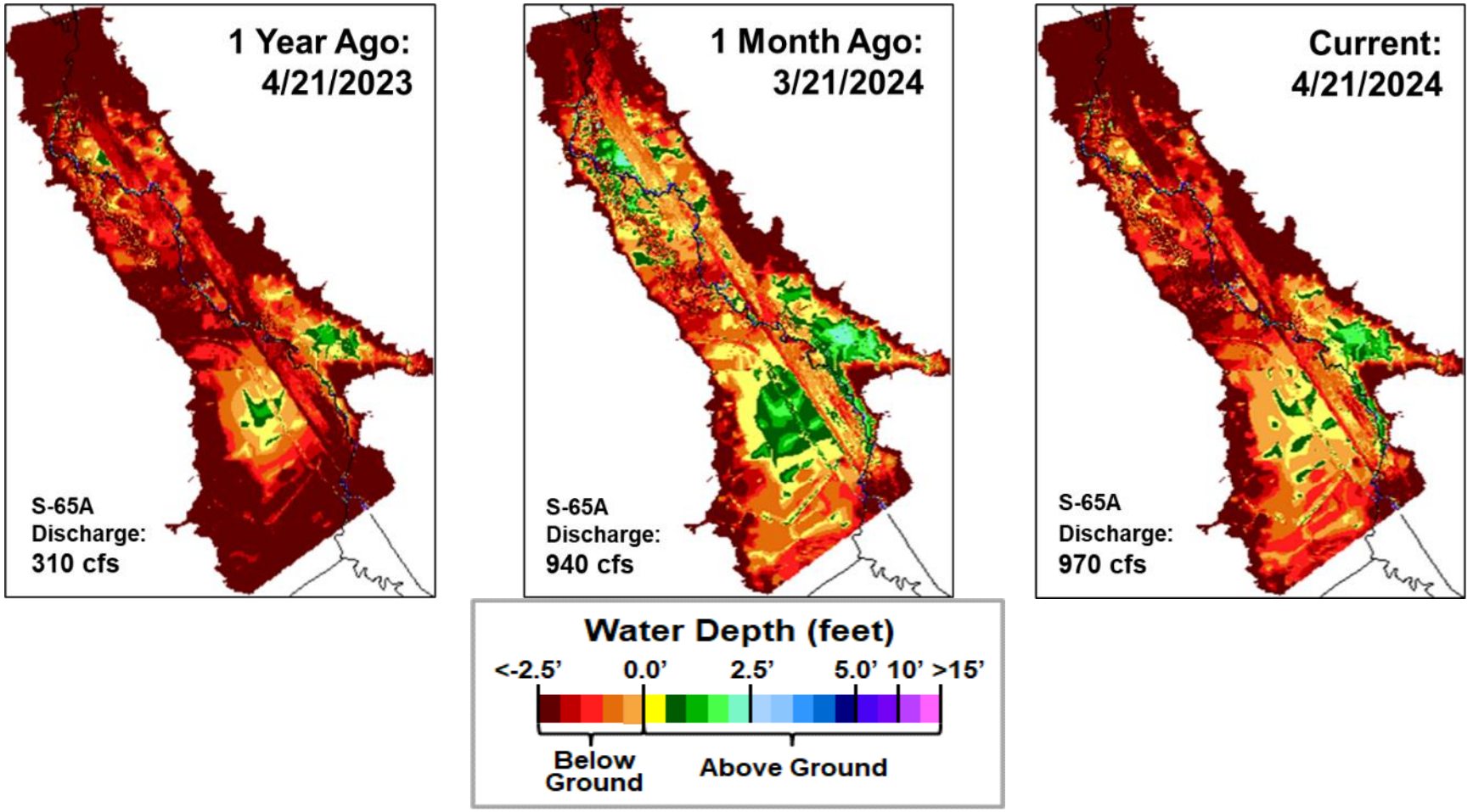


Figure KB-5. Phase I area Kissimmee River floodplain water depths (from left to right) one year ago, one month ago, and current.

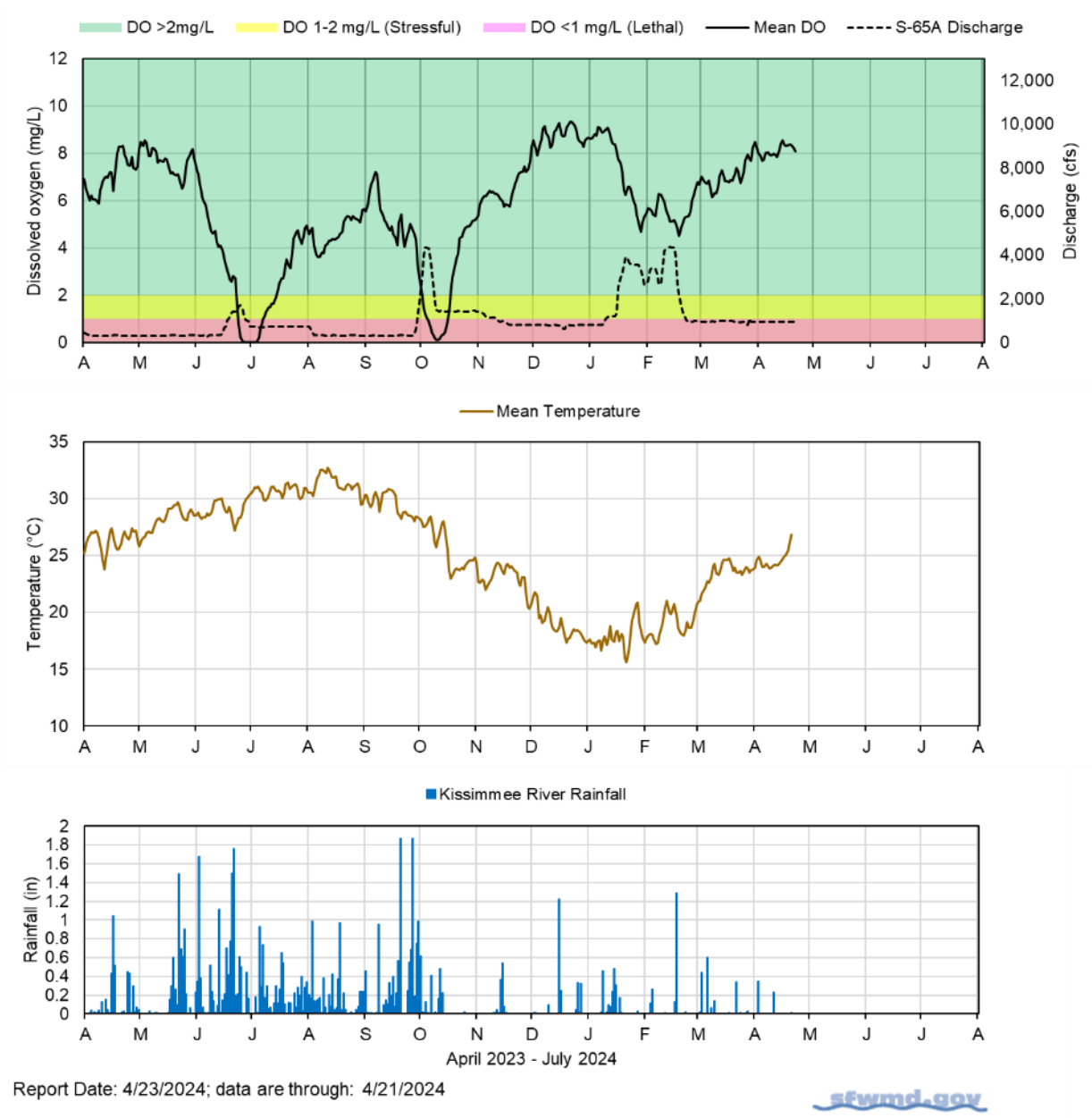


Figure KB-6. Kissimmee River channel mean daily dissolved oxygen concentration (mg/L), S-65A discharge (cfs), temperature (°C) and rainfall (inches). Dissolved oxygen (DO) and temperature are mean daily values averaged for PC62, KRDR02, KRBN, PC33, PC11, PD62R, and PD42R with an average of six stations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

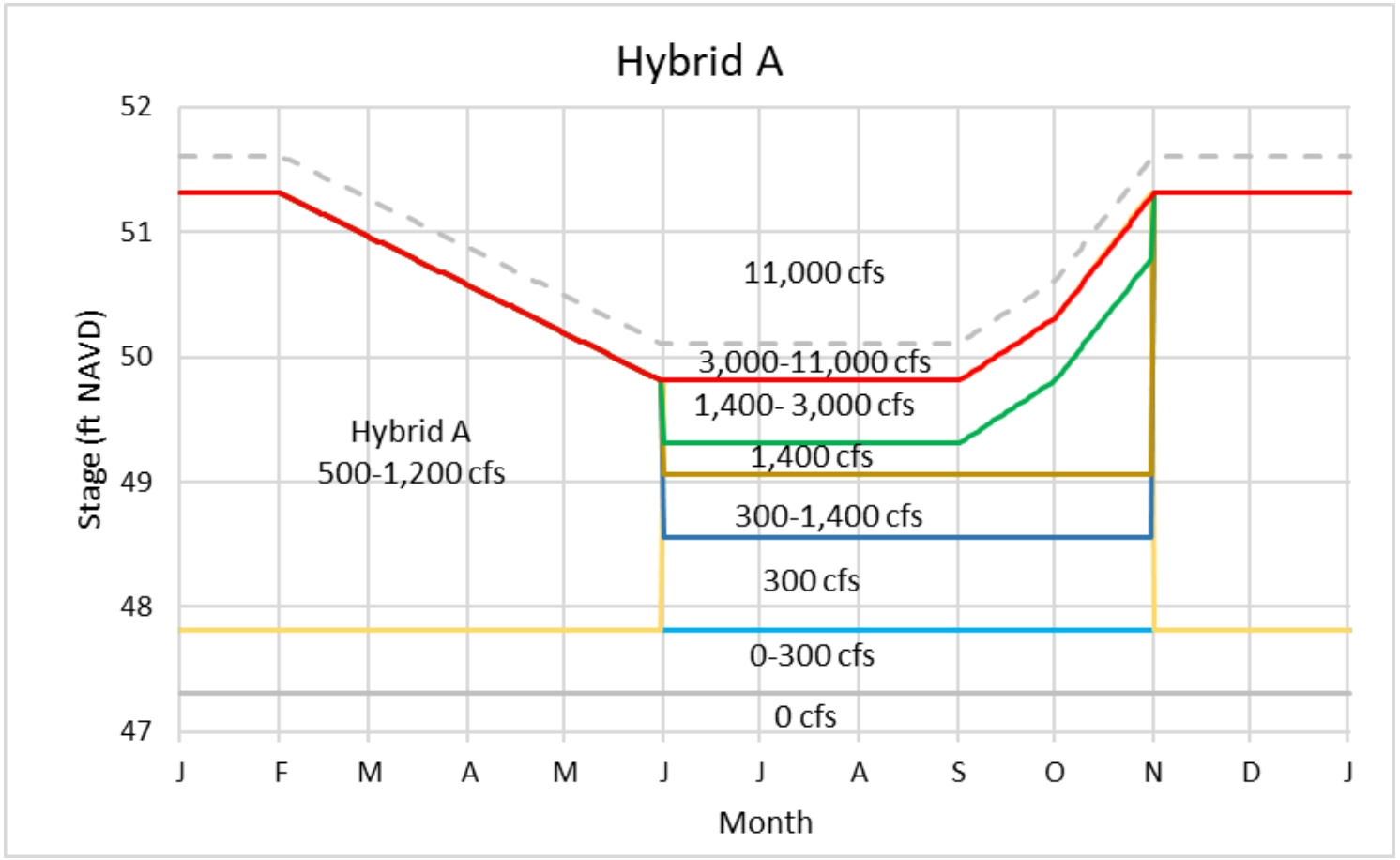


Figure KB-7. Hybrid A Discharge Plan for S-65/S-65A. Use discharge rate of change limits from IS-14-50 (Fig. KB-8).

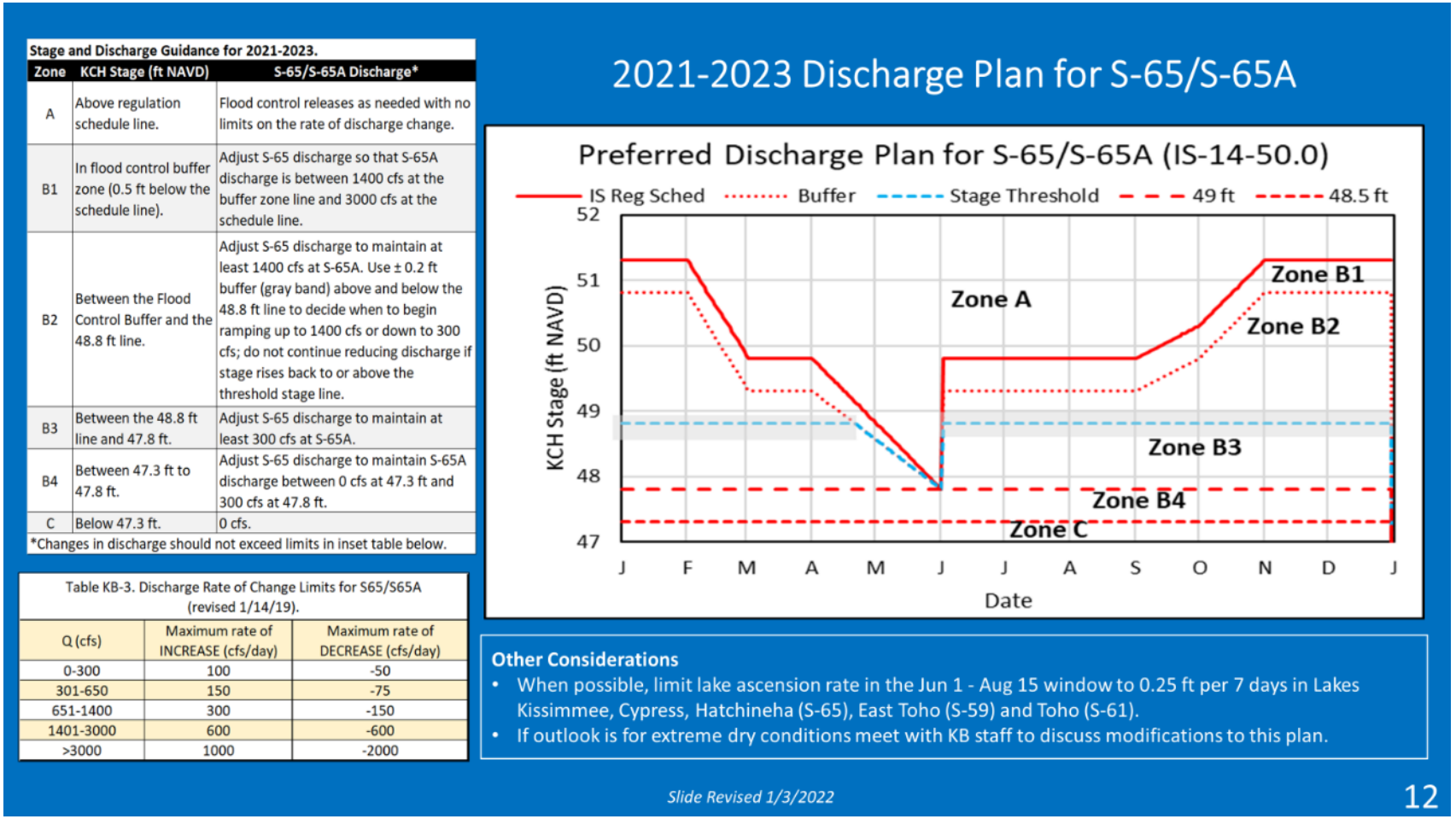


Figure KB-8. IS-14-50 Discharge Plan for S65/S65A with discharge rate of change limits (revised 1/14/19).

Lake Okeechobee

Lake Okeechobee stage was 13.36 feet NAVD88 (14.64 ft NGVD29) on April 21, 2024, which was 0.23 feet lower than the previous week and 0.88 feet lower than a month ago (**Figure LO-1**). Lake stage remained in the Low sub-band (**Figure LO-2**) and was 1.47 feet above the upper limit of the recovery ecological envelope (**Figure LO-3**). According to NEXRAD, 0.27 inches of rain fell directly over the Lake last week.

Average daily inflows (excluding rainfall) were slightly lower than the previous week, at 850 cfs, compared to 880 cfs. The highest structure inflow came from the C-38 Canal via the S-65E/65EX1 structure (810 cfs). Average daily outflows (excluding evapotranspiration) increased from the previous week, going from 3,120 cfs to 4,350 cfs. The highest average single structure outflow was recorded at the S-77 structure into the C-43 canal (1,940 cfs), while an average of 2,310 cfs was released south through the S-350 structures. No water was released to the east through S-308 into the C-44 canal. **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.

April is the final month the routine water quality and phytoplankton monitoring is on the off-bloom season schedule, with WQ samples collected once per month at all in-lake sites, and cyanobacteria taxa/toxins samples collected at 9 sites. Provisional results from the April 01 - 08 sampling show *Microcystis aeruginosa* dominated communities at 6 of the 9 sites sampled for toxins and shared dominance with *Dolichospermum* at the remaining 3 sites, 2 of which had toxin levels above the 0.25 µg/L method's detection threshold (**Figure LO-6**). Bloom conditions (>40 µg/L chlorophyll *a*) were recorded at 7 sites, and 9 sites had chlorophyll *a* values >20 µg/L but <40 µg/L (**Figure LO-6**).

In the most recent non-obscured satellite image from April 21st, 2024, NOAA's Harmful Algal Bloom Monitoring System suggested moderate to high cyanobacteria concentrations along most of the northern and western shorelines, and moderate concentrations along the remaining shallow shorelines of the Lake (**Figure LO-7**).

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

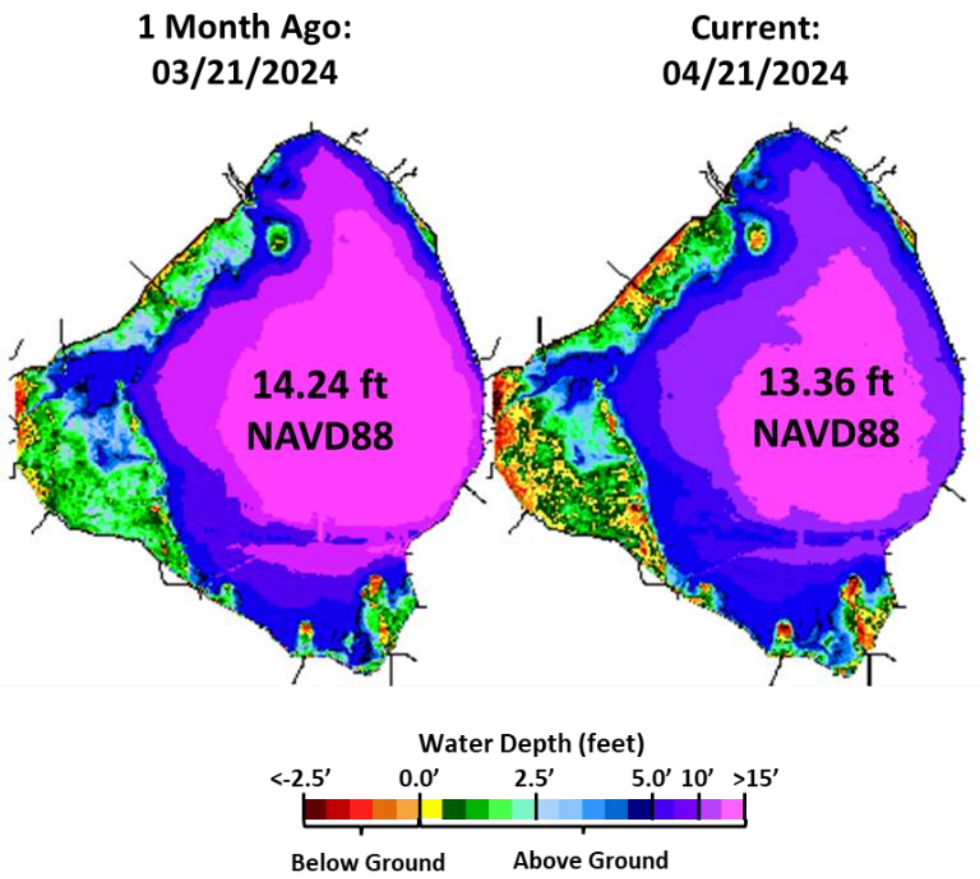


Figure LO-1. Lake Okeechobee water depth estimates based on South Florida Water Depth Assessment Tool (SFWDAT).

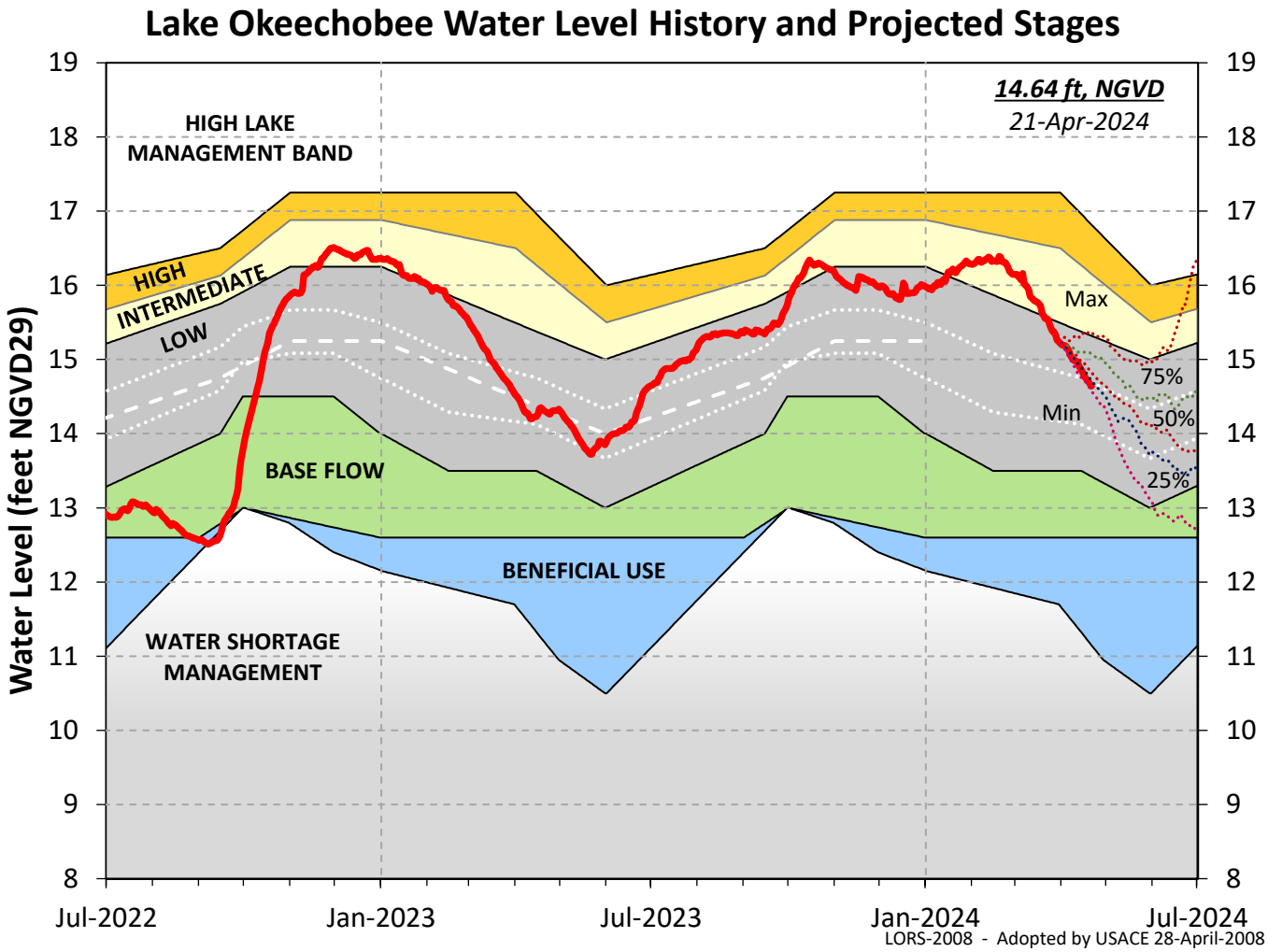


Figure LO-2. Recent Lake Okeechobee stages with projected stages based on a dynamic position analysis. Note stages are in NGVD29 in this graphic vs NAVD88 in others.

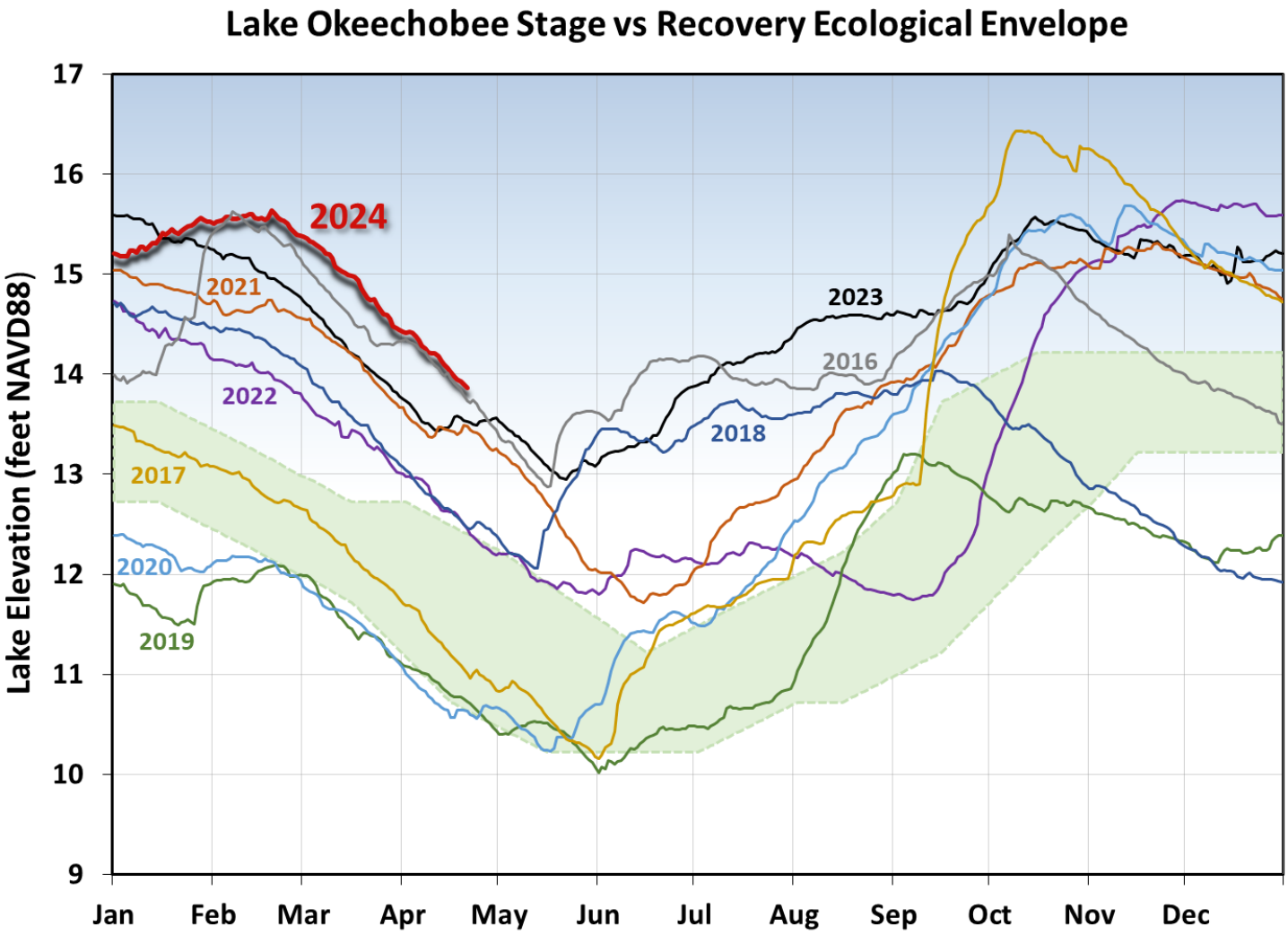


Figure LO-3. The current and eight prior year's annual stage hydrographs for Lake Okeechobee in comparison to the recovery envelope (light green). A shift from the normal ecological envelope to the recovery envelope occurred because the 30-day minimum lake stage (elevations exposed for at least 30 days, nonconsecutively) in the June 1 – July 31, 2023 window was >11.72 ft NAVD88 (13 ft NGVD29).

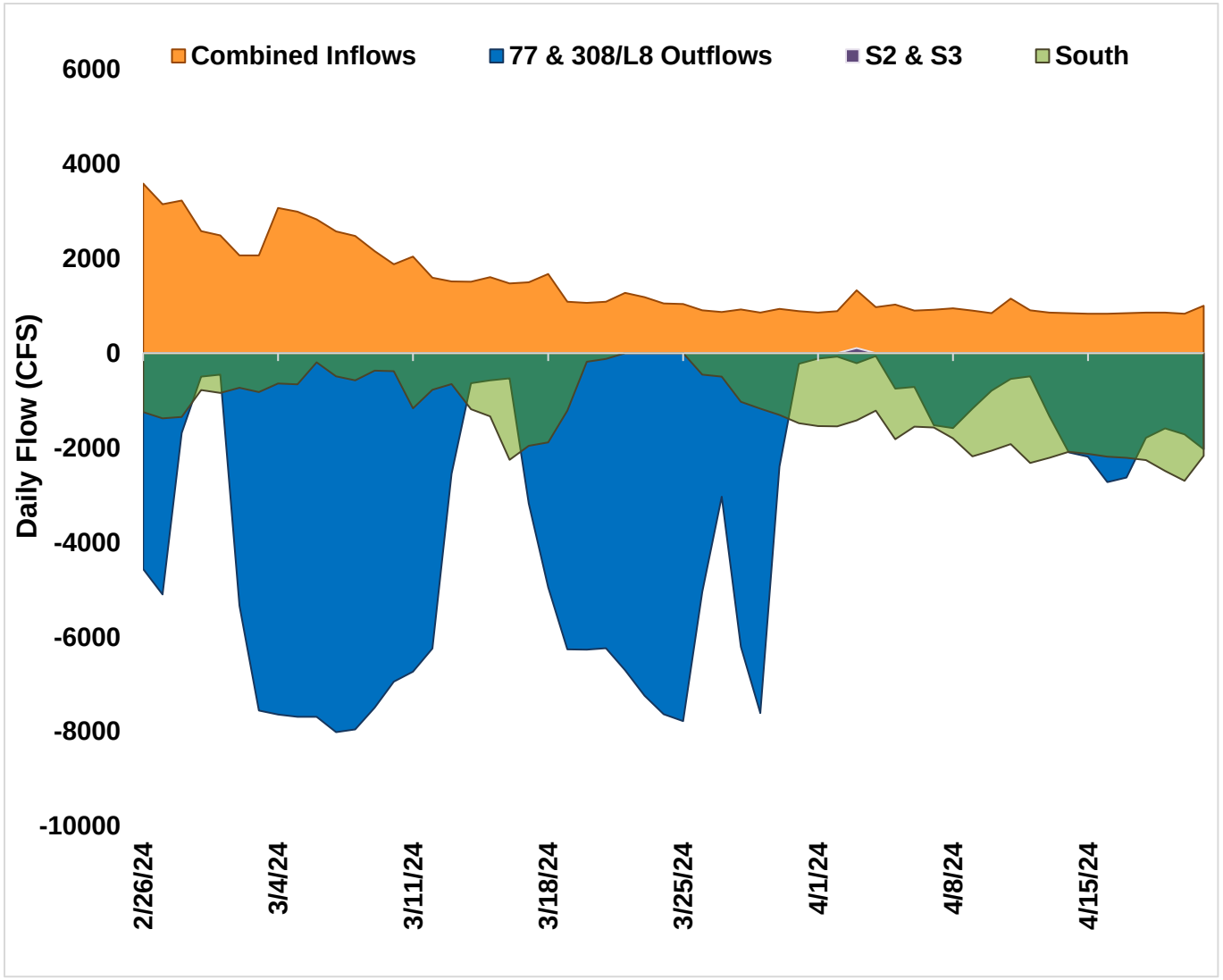


Figure LO-4. Major inflows (orange) to and outflows east and west (blue) from Lake Okeechobee. Outflows south are shown in green. Flows into Lake Okeechobee from the L-8 canal through S-271 (formerly Culvert 10A) or from the C-44 canal through the S-308 are included as inflows. Conversely, flows from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

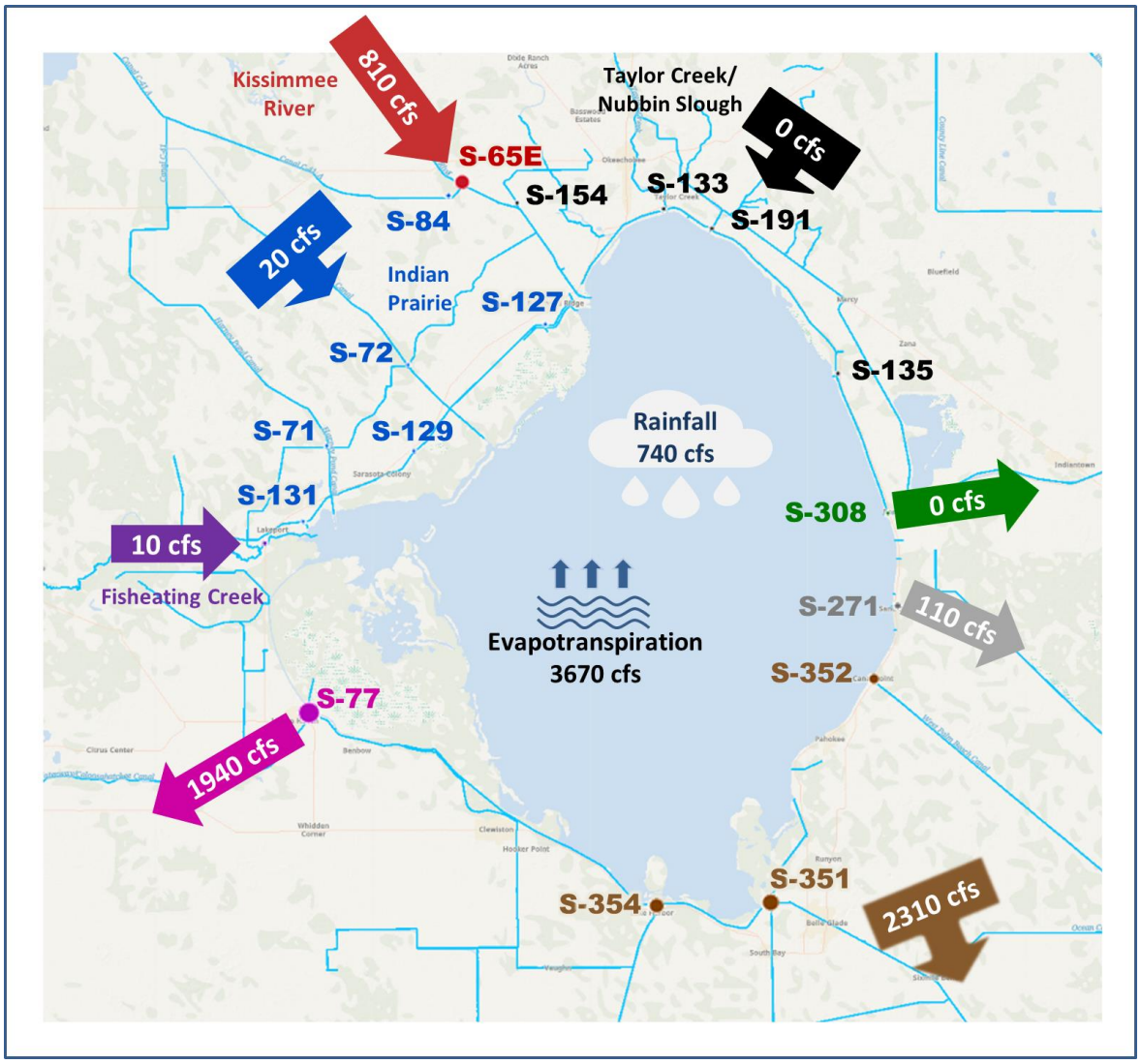


Figure LO-5. Inflows into Lake Okeechobee from Indian Prairie basins, Taylor Creek/Nubbin Slough, Kissimmee River and Fisheating Creek, and outflows to the west via S-77, to the east via S-308, to the south via S-351, S-352, S-354, and to southeast via S-271 (formerly Culvert 10A) for the week of April 15 - 21, 2024.

Collection Date: April 01-08, 2024

Station	CHL*a* (ug/L)	TOXIN (ug/L)	TAXA
FEBIN	*NS*		
FEBOUT	*NS*		
KISSR0.0	58.8	BDL	*Microcys*
L005	60.6	0.3	*Micro/Dolic*
LZ2	57.5	BDL	*Micro/Dolic*
KBARSE	43.2		
RITTAE2	37.6	BDL	*Microcys*
PELBAY3	13.0		
POLE3S	40.7		
LZ25A	20.4		
PALMOUT	37.8	BDL	*Microcys*
PALMOUT1	39.1		
PALMOUT2	19.2		
PALMOUT3	9.6		
POLESOUT	84.3	0.4	*Micro/Dolic*
POLESOUT1	14.1		
POLESOUT2	11.5		
POLESOUT3	10.6		
EASTSHORE	22.4		
NES135	28.2		
NES191	39.4		

Station	CHL*a* (ug/L)	TOXIN (ug/L)	TAXA
L001	41.1		
L004	10.8		
L006	7.1		
L007	5.7		
L008	9.2		
LZ30	6.2	BDL	*Microcys*
LZ40	7.7		
CLV10A	9.0	BDL	*Microcys*
NCENTER	30.4		
S308C	26.3	BDL	*Microcys*
S77	59.4		

- 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

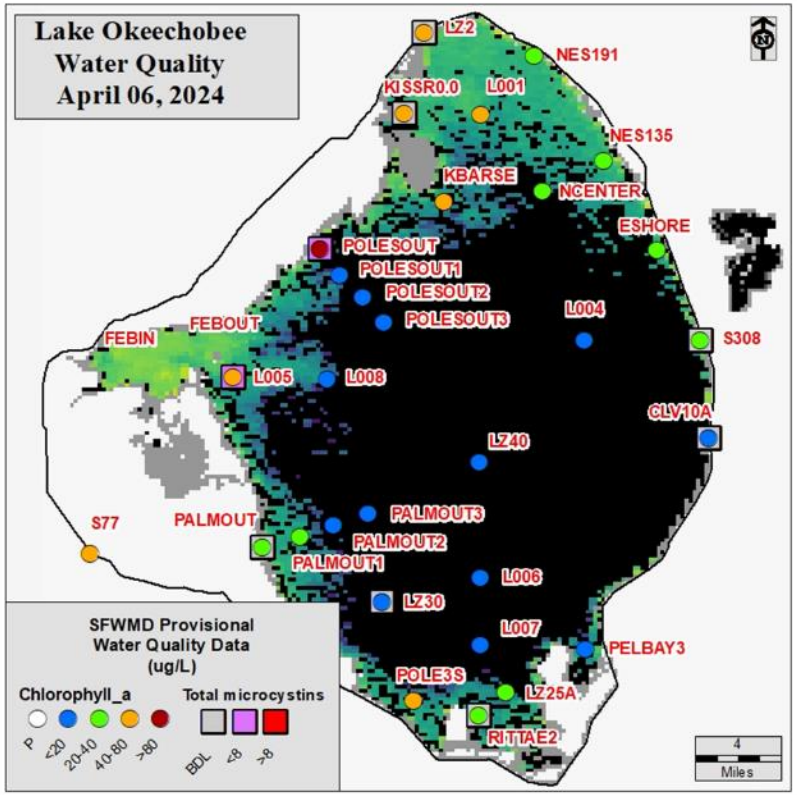


Figure LO-6. Total microcystins (µg/L) and chlorophyll *a* (µg/L) data from April 01 - 08, 2024 survey. Sampling locations are overlaid on the April 06, 2024 image from NOAA's harmful algal bloom monitoring system. Gray color indicates cloud cover.

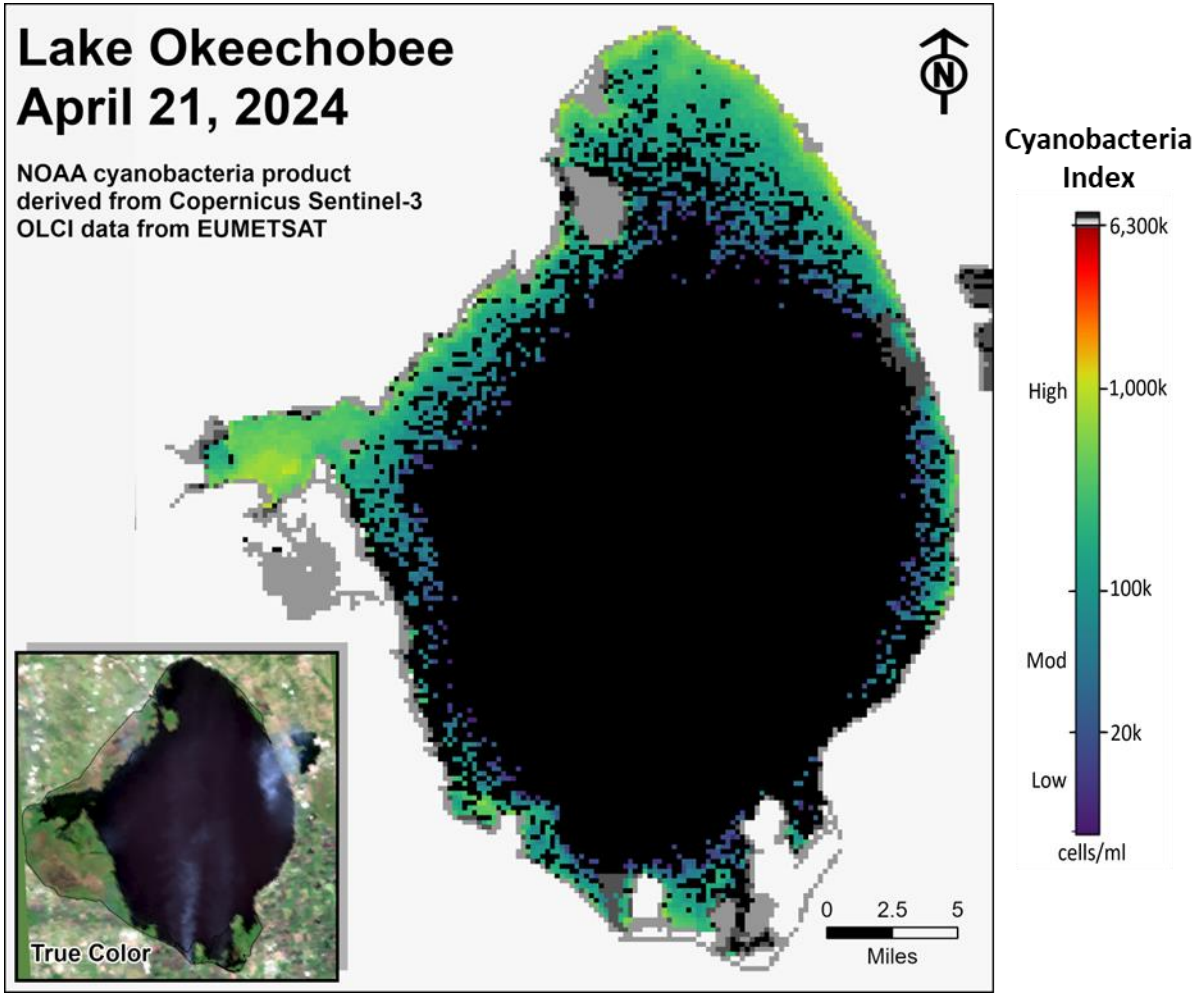


Figure LO-7. Cyanobacteria bloom index level on April 21, 2024, based on NOAA's harmful algal bloom monitoring system. Gray color indicates cloud cover. *Provisional NOAA image, subject to change*

Estuaries

St. Lucie Estuary

Over the past week, mean total inflow to the St. Lucie Estuary was 70 cfs (**Figures ES-1** and **ES-2**), and the previous 30-day mean inflow was 140 cfs. For comparison, the historical provisional mean inflows from the contributing areas are shown in **Figure ES-2**.

Over the past week, salinities increased at 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 21.1. 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 0.0 spat/shell for samples retrieved in March indicating that the spring spawning season had not yet started (**Figure ES-5**).

Caloosahatchee River Estuary

Over the past week, mean total inflow to the Caloosahatchee River Estuary was 2,110 cfs (**Figures ES-6** and **ES-7**), and the previous 30-day mean inflow was 2,000 cfs. For comparison, the historical provisional mean inflows from the contributing areas are shown in **Figure ES-7**.

Over the past week, surface salinities decreased at Cape Coral and Shell Point, and increased at the remaining sites in the estuary (**Table ES-2** and **Figures ES-8** and **ES-9**). The seven-day mean salinities (**Table ES-2**) were in the optimal range (0-10) for tape grass in the upper estuary. The seven-day mean salinity values were within the optimal range for adult eastern oysters at Cape Coral, and in the upper stressed range at Shell Point and Sanibel (**Figure ES-10**). The mean larval oyster recruitment rate reported by the Fish and Wildlife Research Institute was 0.0 spat/shell at Iona Cove and Bird Island for samples retrieved in March indicating that spring spawning season had not yet started (**Figures ES-11 and ES-12**).

Surface salinity at Val I-75 was forecast for the next two weeks using an autoregression model (Qiu and Wan, 2013[1]) coupled with a linear reservoir model for the tidal basin. Model scenarios included 450, 750, and 2000 cfs pulse releases at S-79 with estimated tidal basin inflows of 110 cfs. Model results from all scenarios predict daily salinity to be 0.9 or lower and the 30-day moving average surface salinity to be 0.4 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 April 19, 2024, that *Karenia brevis*, the Florida red tide dinoflagellate, was not observed in any samples collected within the District region. On the east coast, red tide was not observed in samples from St. Lucie, Palm Beach, or Miami-Dade counties.

Water Management Recommendations

Lake stage is in the Low Sub-Band. Tributary conditions are 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.

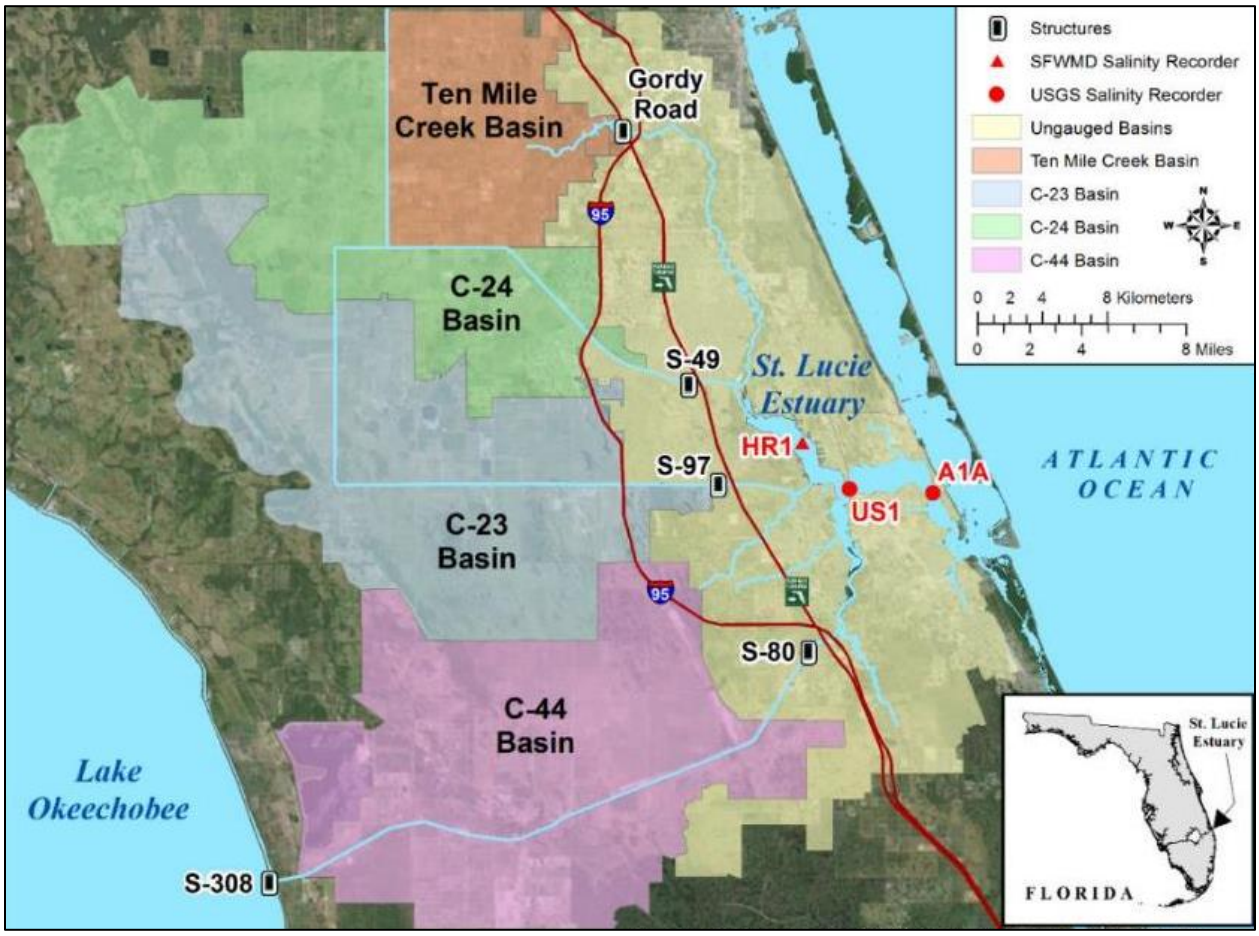


Figure ES-1. Basins, water control structures and salinity monitoring sites in the St. Lucie Estuary.

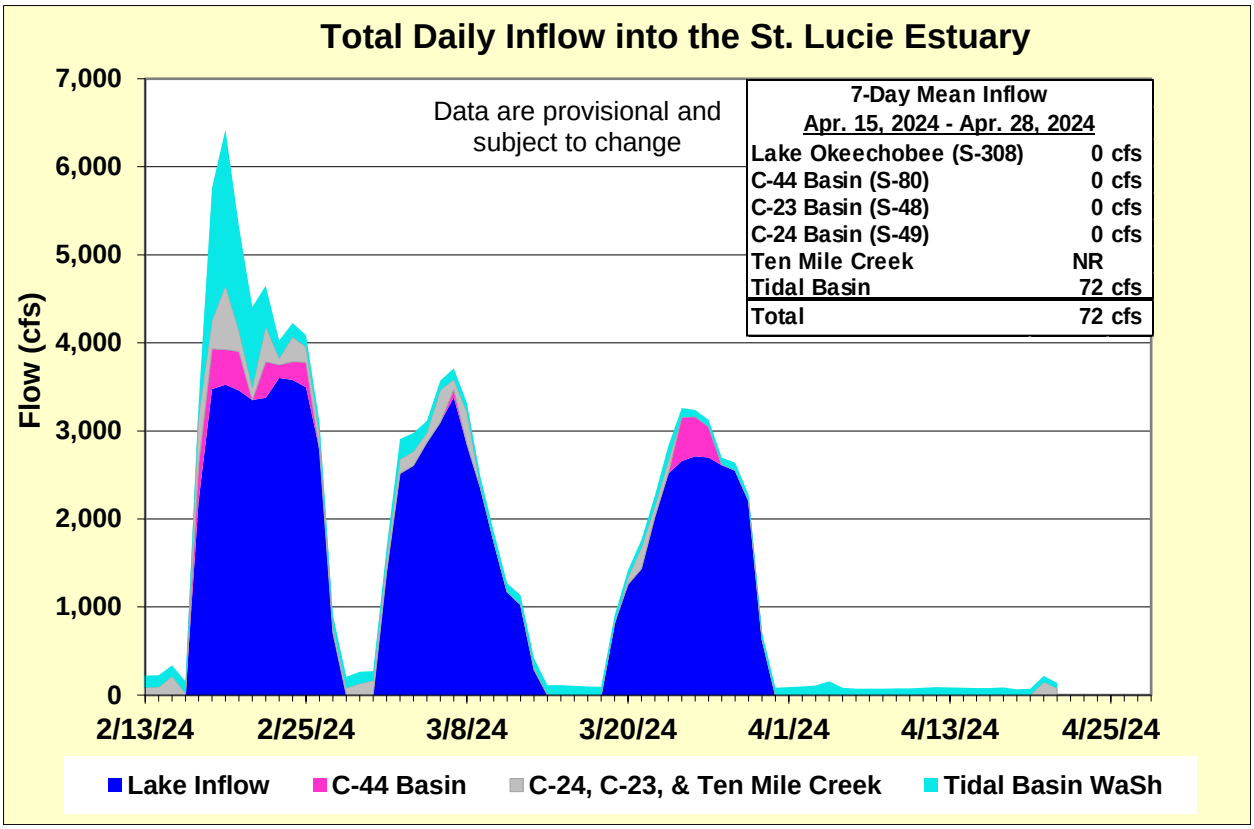


Figure ES-2. Total daily inflows from Lake Okeechobee and runoff from the C-44, C-23, C-24, Ten Mile Creek, and Tidal Basins into the St. Lucie Estuary.

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)	**15.7** (13.8)	**18.4** (15.9)	10.0 – 25.0
US1 Bridge	**20.7** (18.1)	**21.4** (18.7)	10.0 – 25.0
A1A Bridge	**28.9** (27.0)	**30.6** (29.0)	10.0 – 25.0

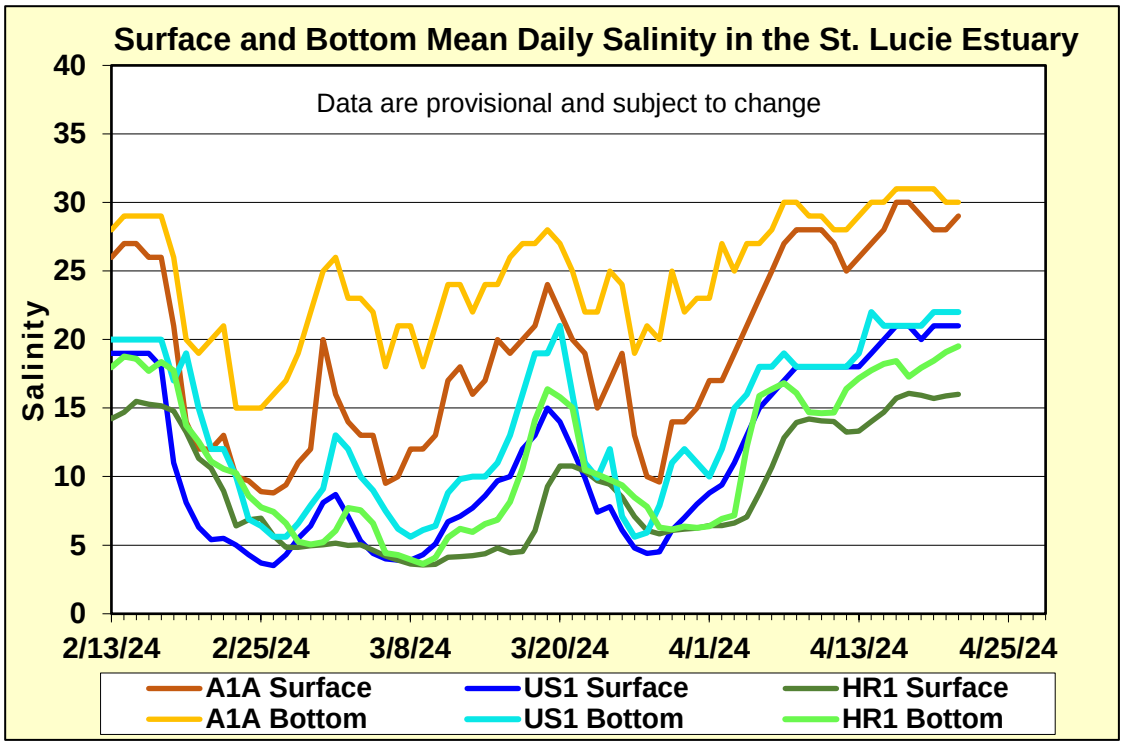


Figure ES-3. Mean daily salinity at the A1A, US1 and HR1 sites in the St. Lucie Estuary.

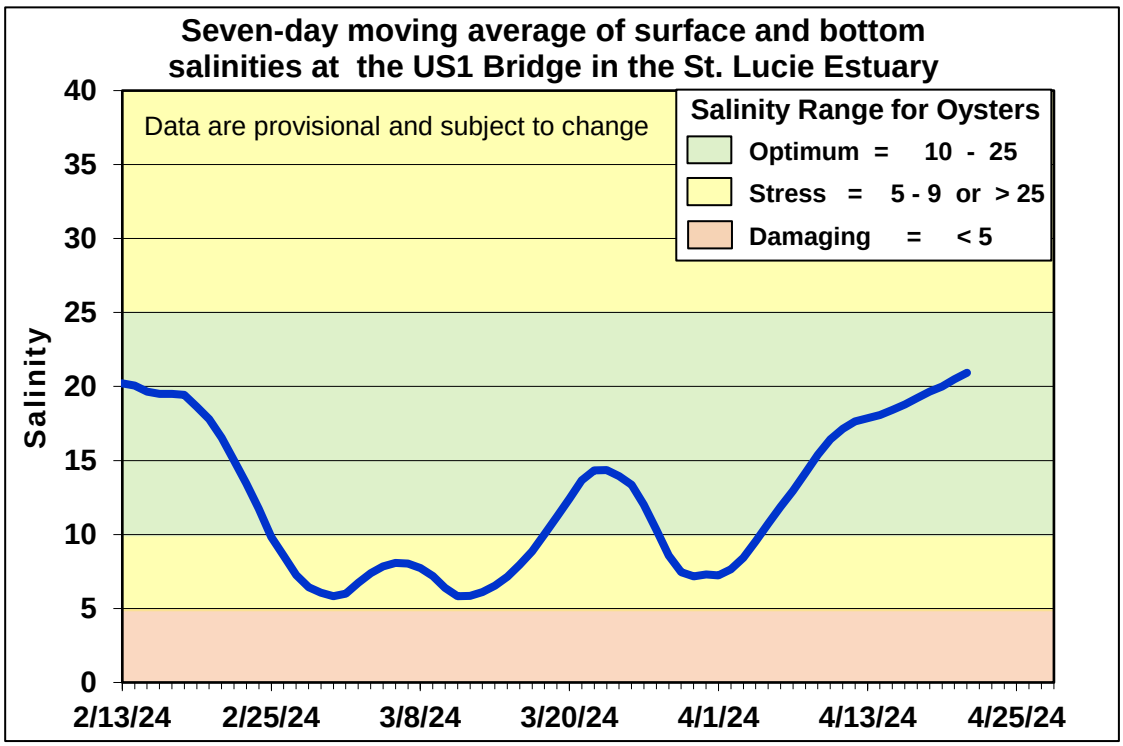


Figure ES-4. Seven-day moving average of the surface and bottom salinities at the US1 Bridge in the St. Lucie Estuary.

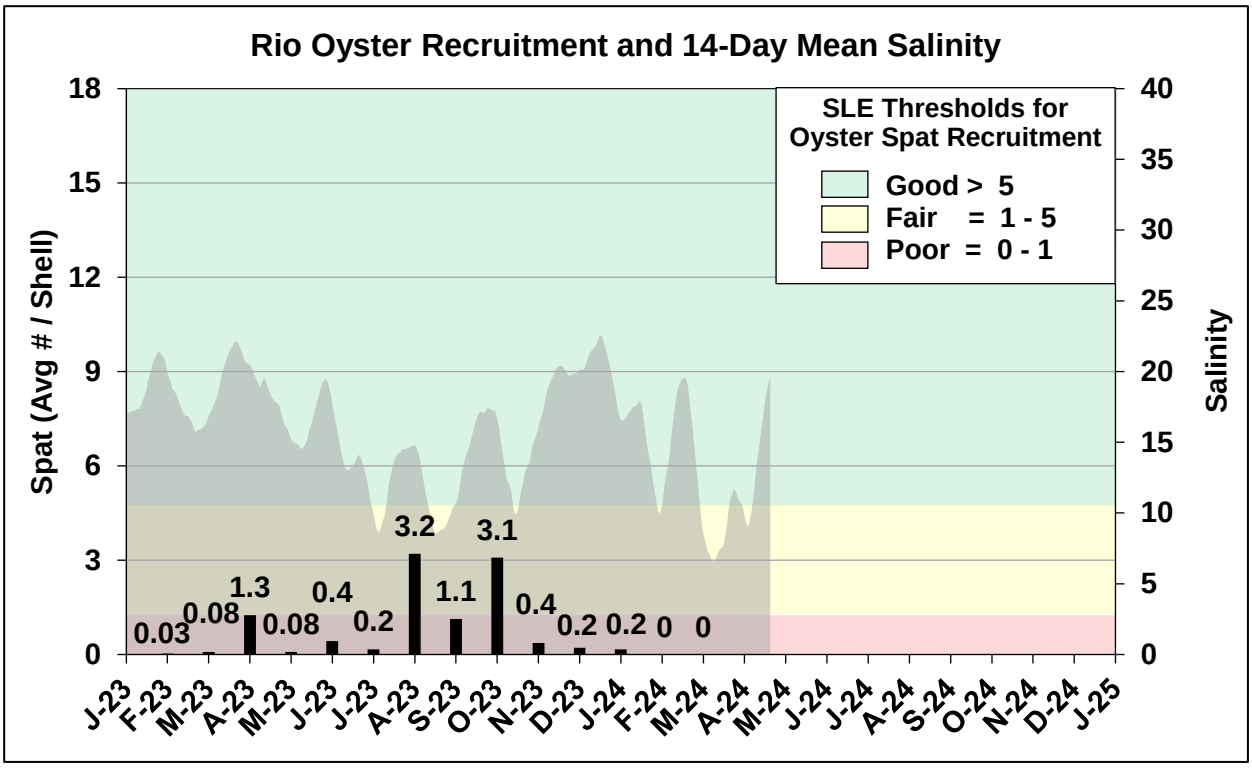


Figure ES-5. Mean oyster recruitment at the Rio oyster monitoring station and 14-day mean salinity at US1 Bridge.

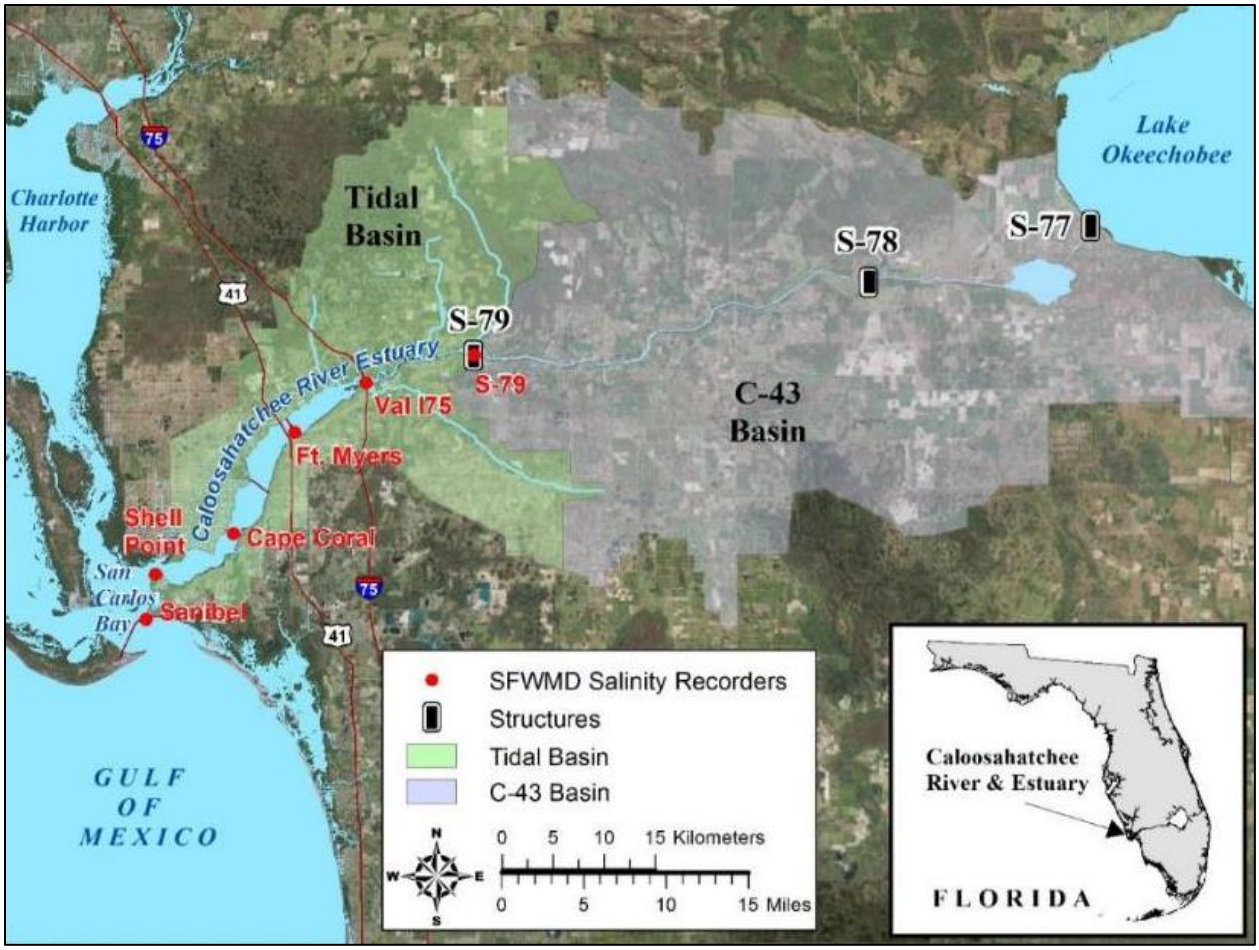


Figure ES-6. Basins, water control structures and salinity monitoring sites in the Caloosahatchee River Estuary.

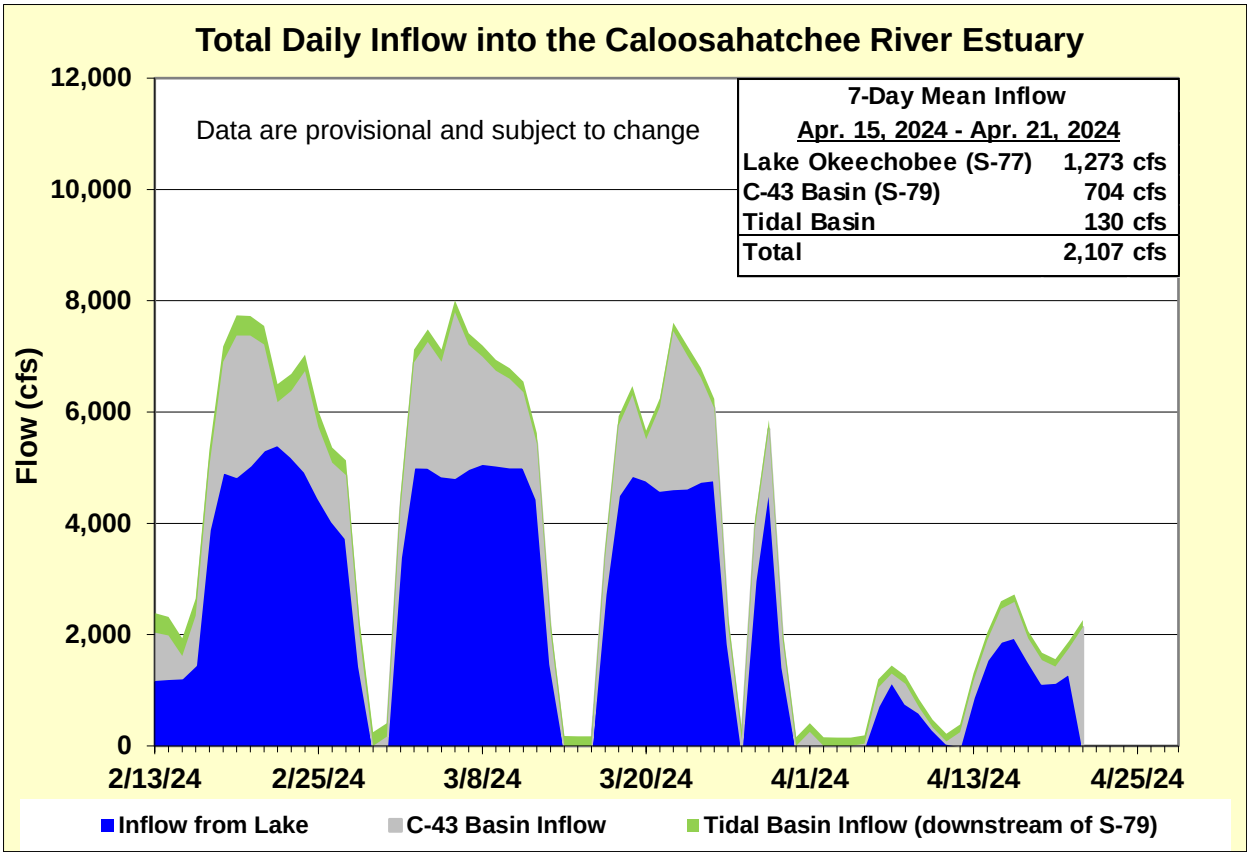


Figure ES-7. Total daily inflows from Lake Okeechobee, and runoff from the C-43 and Tidal basins into the Caloosahatchee River Estuary.

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)	**0.4** (0.2)	**0.4** (0.2)	0.0 – 10.0
Val I-75	**0.4** (0.2)	**0.9** (0.3)	0.0 – 10.0
Fort Myers Yacht Basin	**7.2** (3.7)	**10.2** (5.9)	0.0 – 10.0
Cape Coral	**11.7** (12.5)	**15.8** (14.8)	10.0 – 25.0
Shell Point	**25.4** (26.9)	**26.1** (27.4)	10.0 – 25.0
Sanibel	**30.1** (30.0)	**30.9** (31.1)	10.0 – 25.0

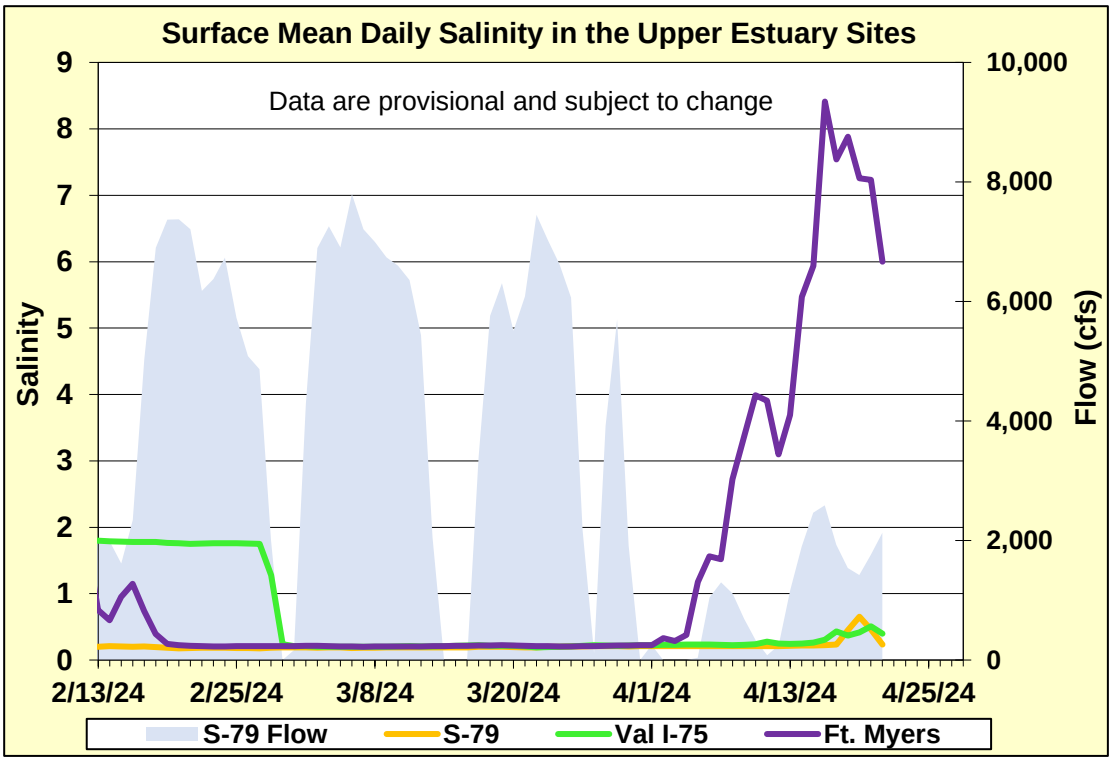


Figure ES-8. Mean daily salinity at upper Caloosahatchee River Estuary monitoring sites and mean daily flow at S-79.

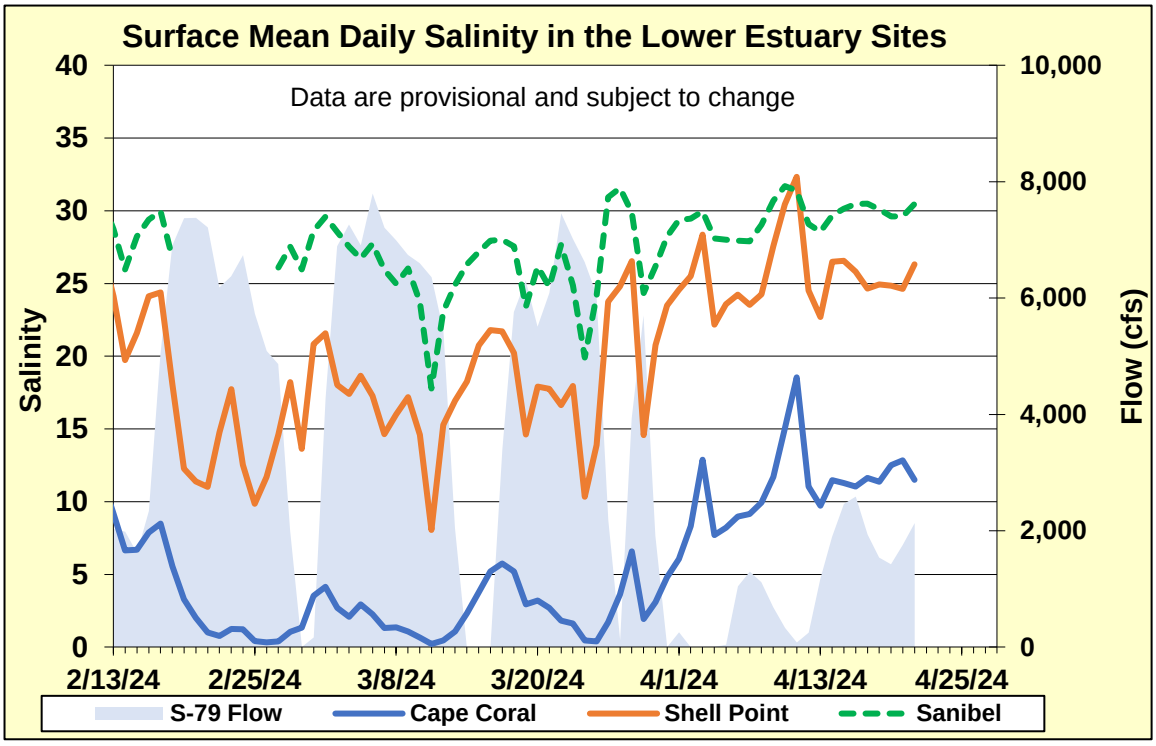


Figure ES-9. Mean daily surface salinity at lower Caloosahatchee River Estuary monitoring sites and mean daily flow at S-79.

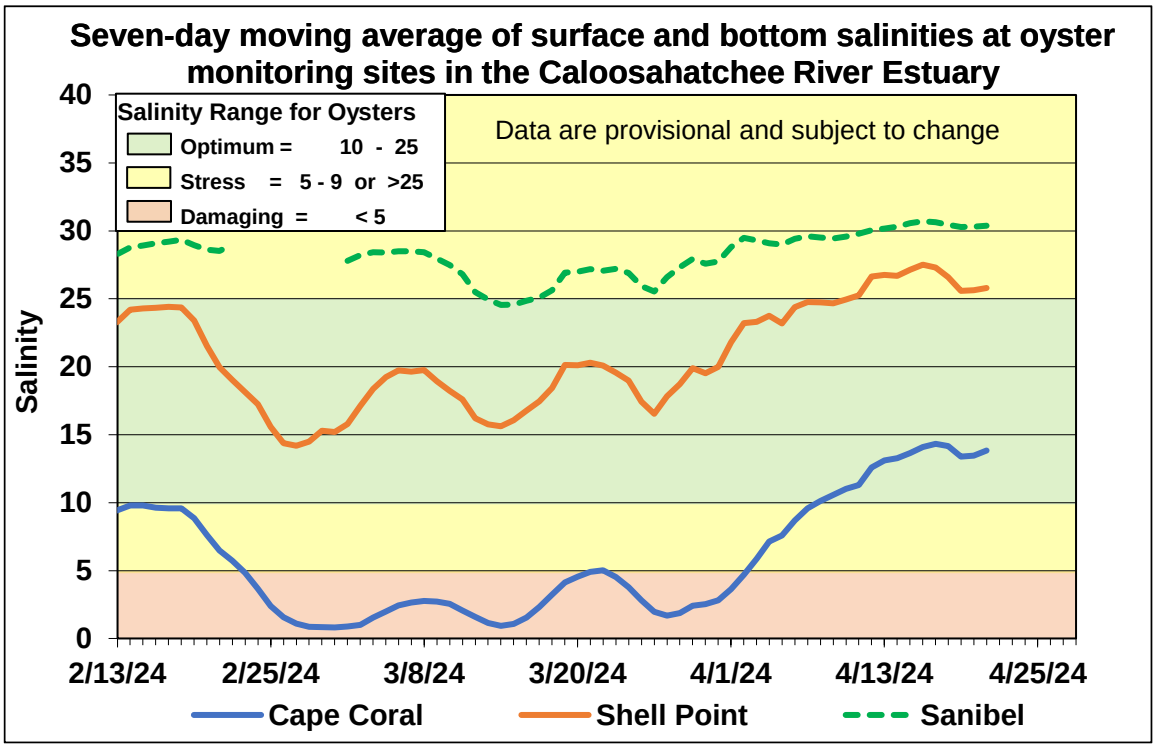


Figure ES-10. Seven-day moving average of surface and bottom salinities at Cape Coral, Shell Point and Sanibel monitoring sites in the Caloosahatchee River Estuary.

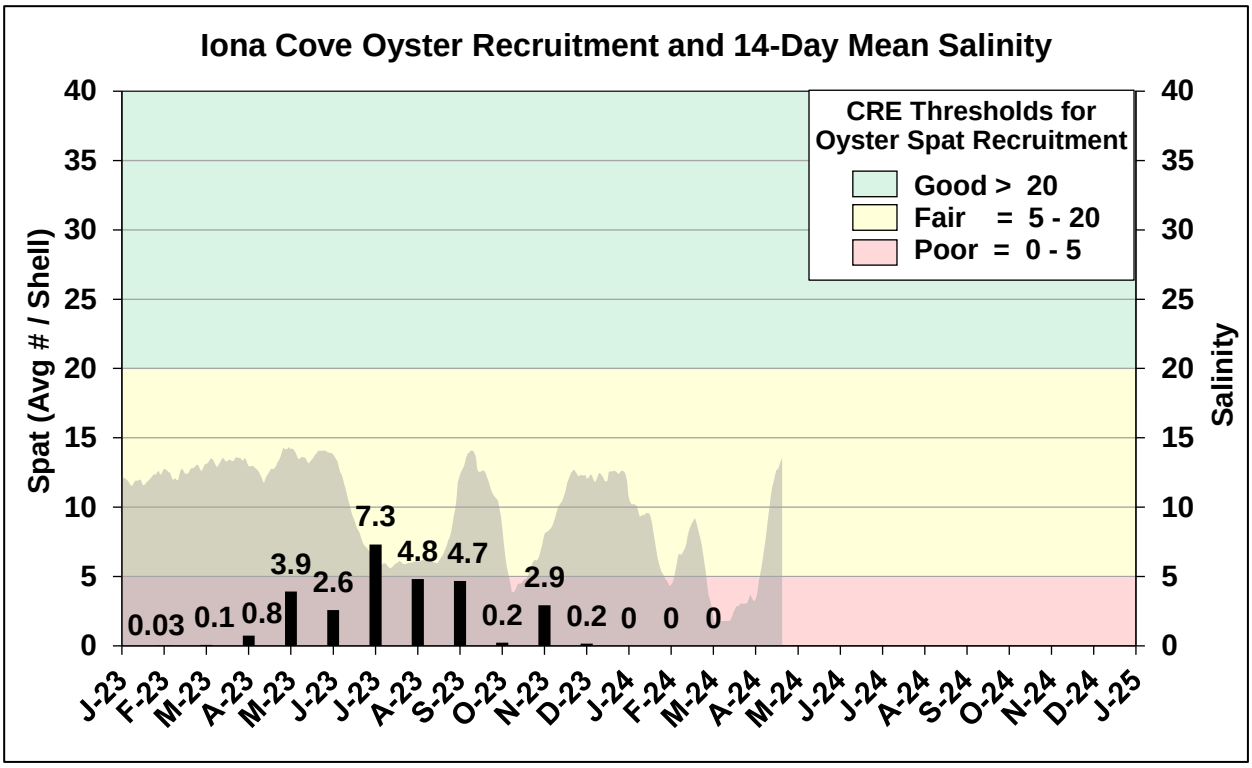


Figure ES-11. Mean oyster recruitment at the Iona Cove oyster monitoring station and 14-day mean salinity at Cape Coral.

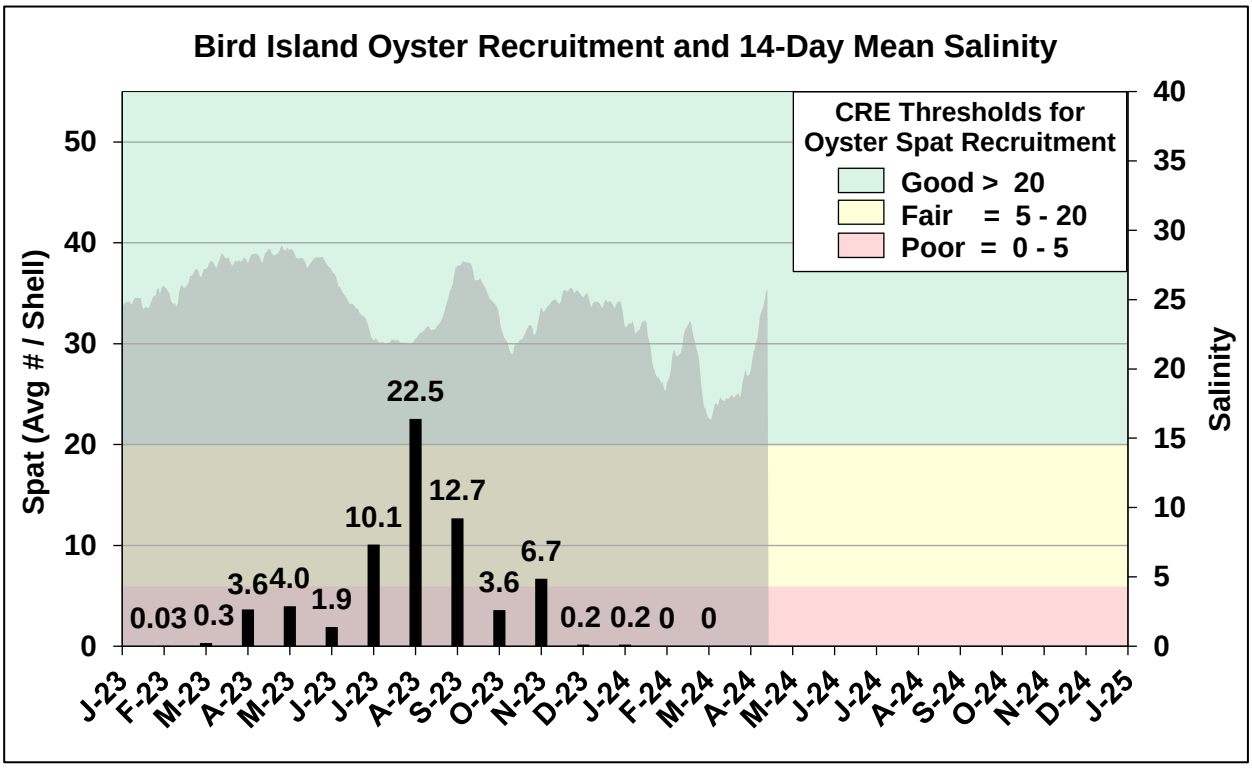


Figure ES-12. Mean oyster recruitment at the Bird Island oyster monitoring station and 14-day mean salinity at Shell Point.

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	111	0.9	0.4
B	750	111	0.5	0.4
C	2,000	111	0.3	0.4

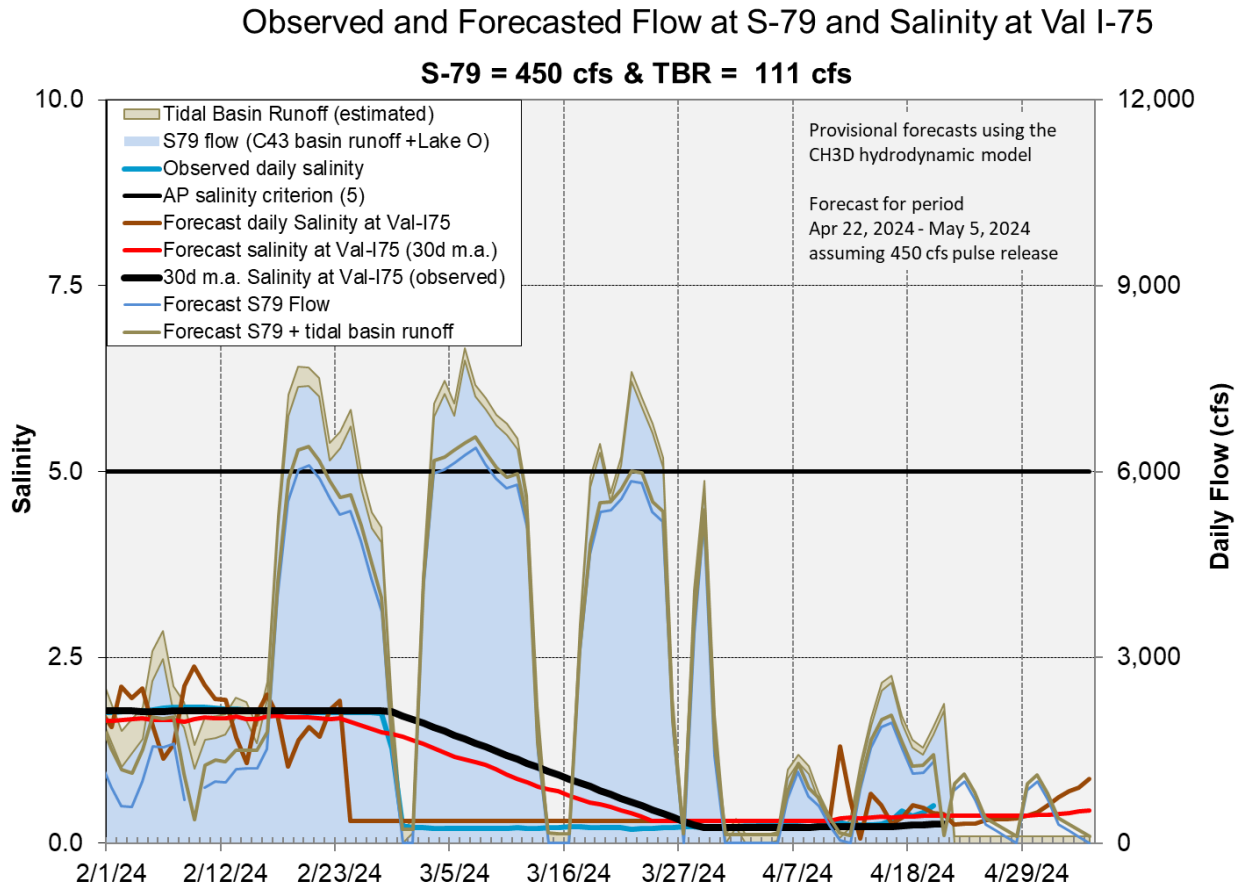


Figure ES-13. Forecasted Val I-75 site surface salinity assuming no pulse release at S-79.

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 at 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**).

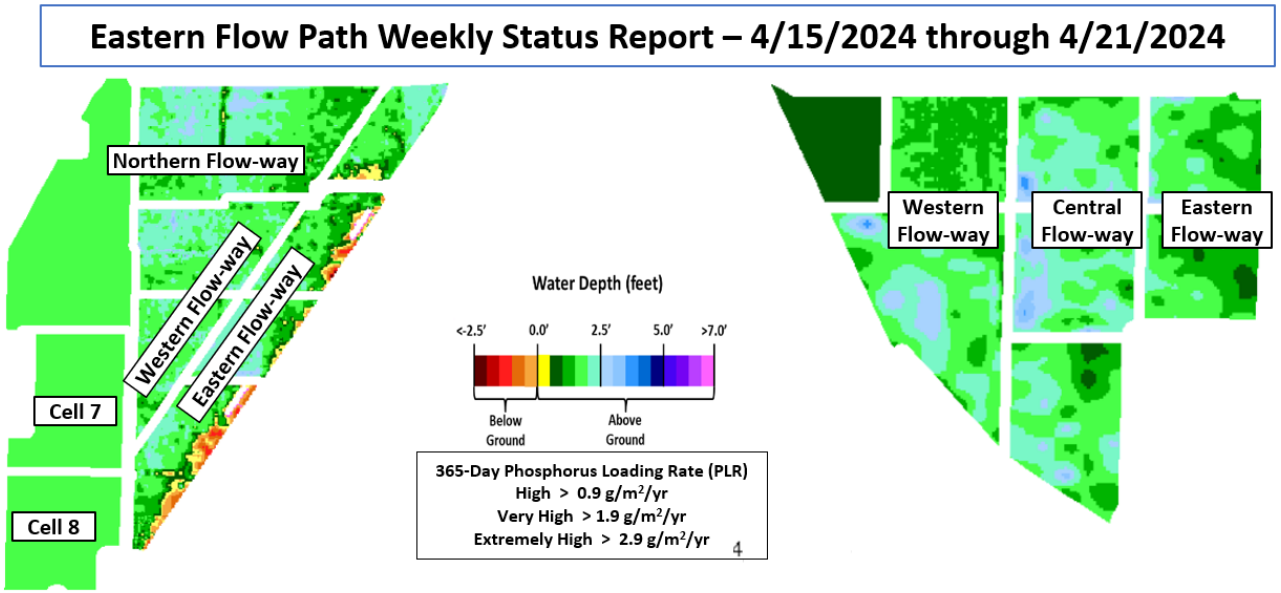
STA-1W: An operational restriction is in place in STA-1W Northern Flow-way for vegetation management activities. Treatment cells are near or above target stage. Vegetation in the flow-ways is highly stressed. The 365-day PLR for the Eastern Flow-way is very high, the 365-day PLR for the Western Flow-way is 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. Online treatment cells are near or above target stage. Vegetation in Flow-ways 2, 3, and 4 is stressed, and in 5 is highly stressed. The 365-day PLRs for Flow-ways 3, 4, and 5 are below 1.0 g/m^2/year. The 365-day PLRs for Flow-way 1 and 2 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 at or above target stage. Vegetation in the Central Flow-way is highly stressed and in the Eastern Flow-way is stressed. The 365-day PLRs for the Central and Western Flow-ways are below 1.0 g/m^2/year (**Figure S-2**).

STA-5/6: An operational restriction is in place in Flow-way 4 for vegetation management (prescribed burn). 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**).

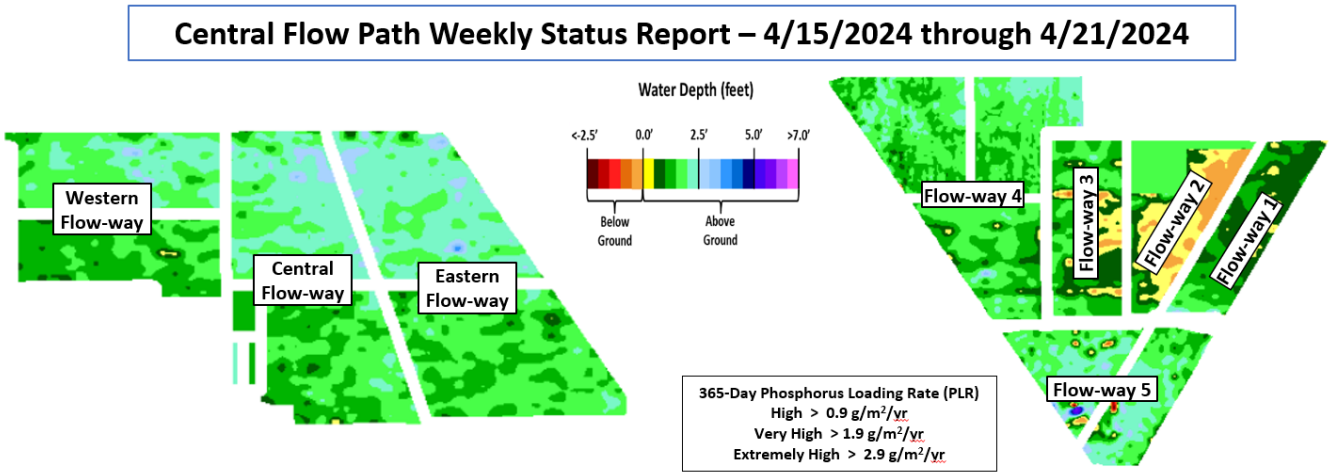
For definitions on STA operational language see glossary following figures.



STA-1W	Flow-way Status
Western	• High 365-day PLR • Highly stressed vegetation conditions
Eastern	• Very High 365-day PLR • Highly stressed vegetation conditions
Northern	• Highly stressed vegetation conditions • Planting emergent vegetation
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

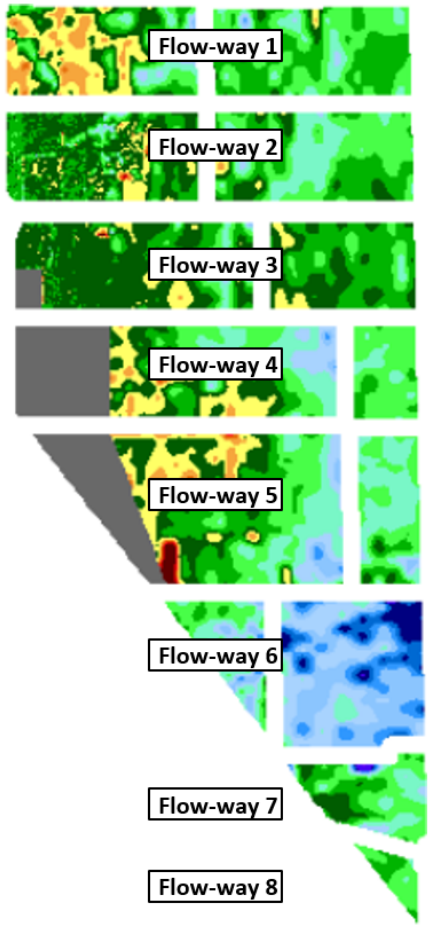


STA-3/4	Flow-way Status
Western	
Central	• Highly stressed vegetation conditions
Eastern	• Post-drawdown vegetation grow-in • Stressed vegetation conditions

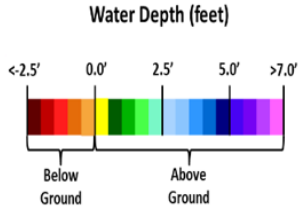
STA-2	Flow-way Status
Flow-way 1	• High 365-day PLR • Upstream nuisance vegetation control
Flow-way 2	• Post-construction vegetation grow-in • Planting emergent vegetation • Stressed vegetation conditions • Upstream nuisance vegetation control
Flow-way 3	• Stressed vegetation conditions • Upstream nuisance vegetation control
Flow-way 4	• Planting emergent vegetation • Stressed vegetation conditions • Upstream nuisance vegetation control
Flow-way 5	• Highly stressed vegetation conditions • Upstream nuisance vegetation control

Figure S-2. Central Flow Path Weekly Status Report

Western Flow Path Weekly Status Report – 4/15/2024 through 4/21/2024



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 • Vegetation management (prescribed burn)
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



365-Day Phosphorus Loading Rate (PLR)
High > 0.9 g/m²/yr
Very High > 1.9 g/m²/yr
Extremely High > 2.9 g/m²/yr

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

Another week of well below average dry season rainfall amounts across the EPA with only the Refuge receiving a significant amountWCA-1: Stage within the Refuge remained below schedule last week, stage on Sunday at the 1-8C gauge was 0.02 feet below the falling Zone A1 regulation line. WCA-2A: Stage at the S-11B_H gauge fell below the schedule line last week. The average on Sunday was 0.07 feet below the flat regulation line. WCA-3A: The 3-Gauge average stage fell into Zone B last week, receding much faster than the slope of the schedule line. The average stage on Sunday was around 0.09 feet below the falling Zone A regulation line. WCA-3A North: Stage at Gauge 62 (NW corner) remained below the Upper schedule last week and recedes quickly, average on Sunday was around 0.57 feet below that schedule line. See figures **EV-1** through **EV-4**.

Water Depths

The SFWDAT model output for 4/14/24 showed stage in WCA-3A North is continuing to dry down from the northeast. Ponded conditions continue to diminish along the northern reaches of the L-67s in WCA-3A. In southern WCA-3A the spatial extent of flooding there continues to contract with depths now around or under 2.0 feet. Hydrologic connectivity remains within all the major sloughs of ENP over the last month but is trending drier. Current WDAT water depth estimates are drier when compared to one month ago across all the EPA, significantly in southwestern BCNP, portions of the Refuge and along the L-67s in WCA-3A. The comparison to modeled conditions a year ago shows wetter conditions across most of the EPA, though slightly drier in the Refuge, WCA-2A and northern WCA-3A (**Figure EV-5 and Figure EV-6)**.

Comparing current conditions to the 20-year average on April 21st: Depth conditions remain above the 90th percentile for this time of the year in WCA-3B and ENP. Depths move below the 90% in WCA-3A especially in the north. Conditions remain above average in WCA-2A and most of the Refuge with drier conditions in the southeast region of that basin (**Figure EV-7**).

Taylor Slough and Florida Bay

Data for stages, salinity and rainfall in Everglades National Park were only available through 4/18 at the time of this report.

All stages decreased across Taylor Slough up through 4/18, with an average decrease of –0.16 feet. Stage changes ranged from –0.32 feet at Taylor Slough Bridge (TSB) in the northern slough, to –0.06 feet at EPSW in the southern 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 14.3 inches compared to before the Florida Bay initiative (starting in 2017), a decrease of 1.2 inches relative to last week's comparison. The stage at Craighead Pond (CP) remains above estimated historical levels by 0.13 feet and the stage at Taylor Slough Bridge (TSB) is now just below historical levels by 0.03 feet.

Average Florida Bay salinity on 4/18 was 22.9, an increase of 0.3 from last week. Salinity increased at most sites, with changes ranging from –2.2 at Terrapin Bay (TB) in the central nearshore region, to +2.4 at Long Sound (LS) in the eastern nearshore region (**Figure EV-8**). Salinity remains below the 25th percentile for all three regions, as well as at or below estimated historical levels (**Figure EV-10**). Average Florida Bay salinity remains below its recent average for this time of year by 9.4, a decrease of 0.7 from last week.

Salinity at the TR station in the mangrove zone on 4/18 (tracked for the Florida Bay MFL) was 0.5. The 30-day moving average was 0.5, with no change from last week (**Figure EV-11**). The 365-day moving sum of flow from the five creeks was 446,853 acre-feet, an increase of 5,633 acre-feet from last week (**Figure EV-11**).

Total weekly rainfall averaged approximately 0.0 inches in Taylor Slough and Florida Bay through 4/18 based on the 18 gauges used for this report. Rainfall was at or near 0.0 inches across all stations (**Figure EV-12**). Wind directions and speeds in Florida Bay ranged from 5.0 mph SE on 4/20 to 21.0 NE on 4/16 (**Figure EV-12**).

Average daily flow from the five major creeks (McCormick, Taylor, Mud, Trout, West Highway) totaled –67 acre-feet last week, with net negative flows for the week. Total daily creek flow ranged from –1,230 acre-feet on 4/21 to 1,110 acre-feet on 4/15 (**Figure EV-13**). Average daily flow for the week was 3,191 acre-feet below estimated historical levels.

Implications for water management

The ecology of WCA-2A will benefit from stage change in the “good” rate range (up to 0.12 feet per week), this type of recession increases foraging opportunities for wading birds and lessen the flooding stress on tree islands and marsh ecology.

Slowing recession rates to less than 0.12 feet per week in WCA-3A would likely discourage more WOST from falling into the “ecological trap” of late nesting.

As conditions remain above the 90th percentile in NESRS, continuing strong positive TS creek flows to avoid salinity swings in the nearshore areas is showing to be ecologically beneficial. 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	0.23	−0.11
WCA-2A	<0.01	−0.15
WCA-2B	0.00	−0.16
WCA-3A	0.02	−0.17
WCA-3B	0.00	−0.13
ENP	<0.01	−0.04

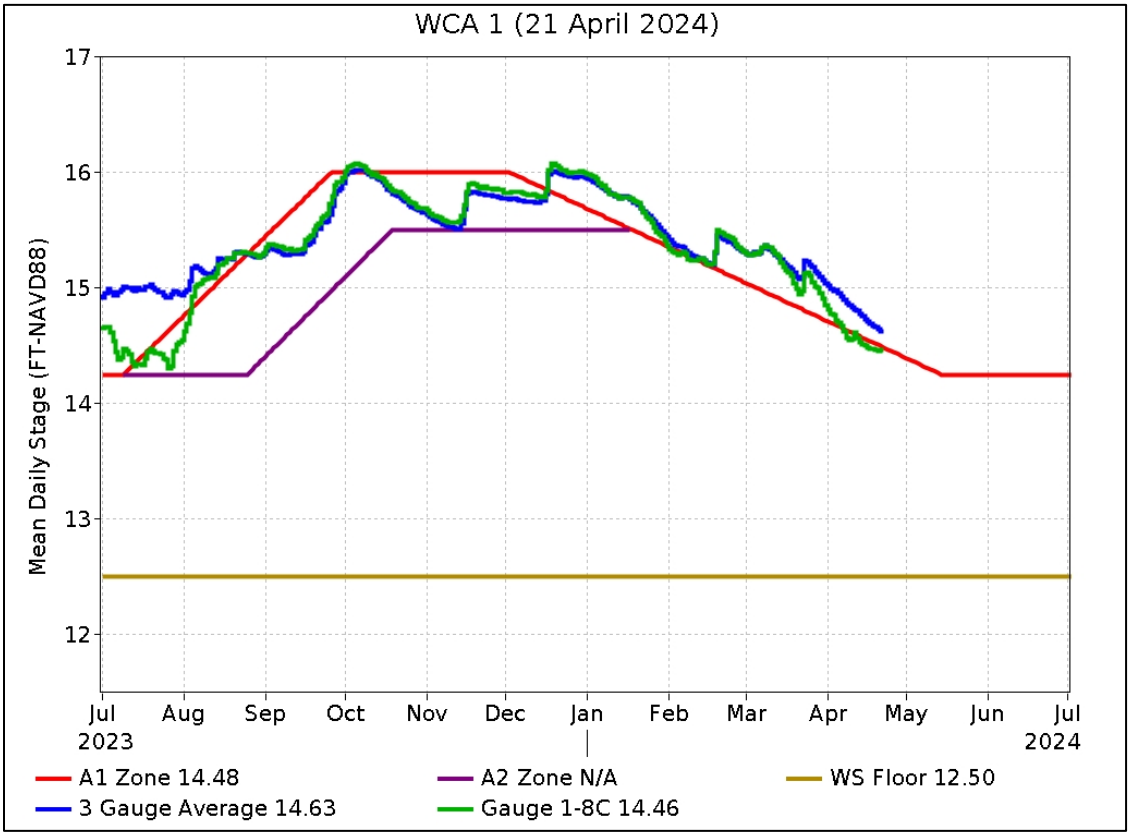


Figure EV-1. WCA-1 stage hydrographs and regulation schedule.

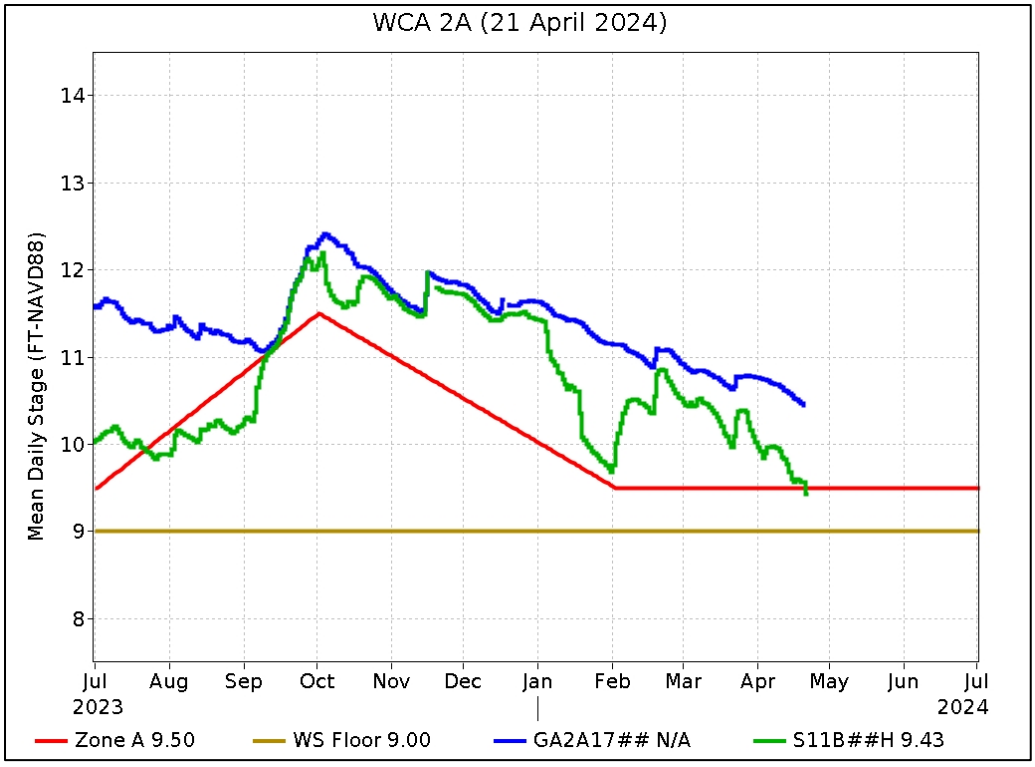


Figure EV-2. WCA-2A stage hydrographs and regulation schedule.

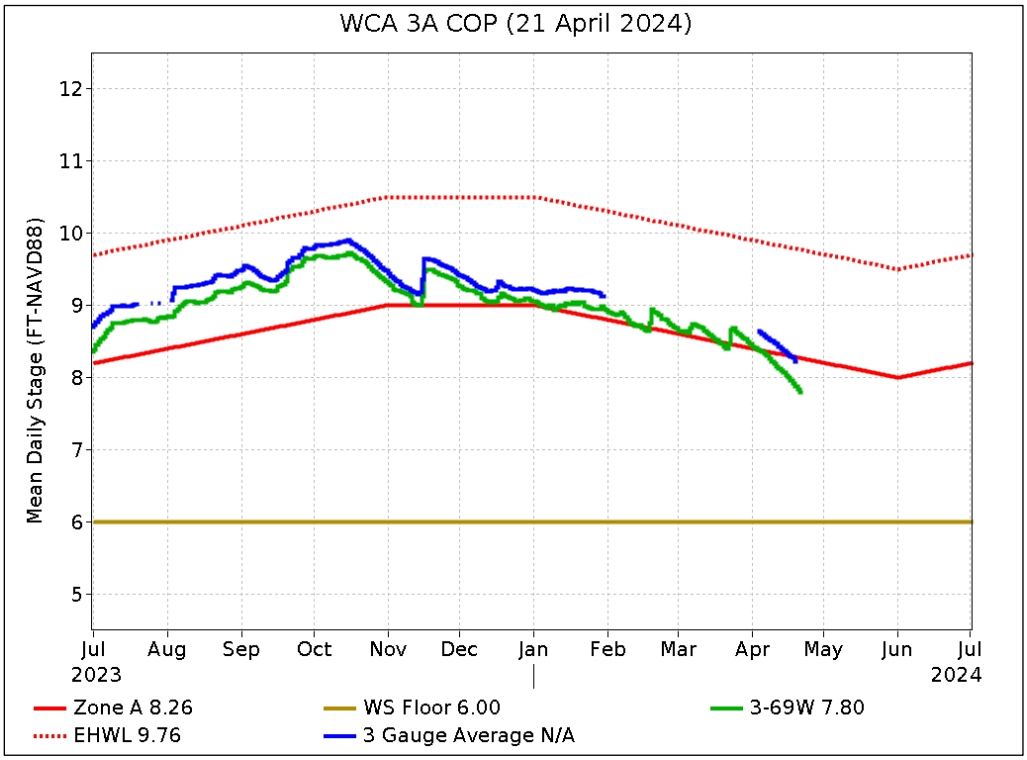


Figure EV-3. WCA-3A stage hydrographs (three-gauge average, 3-69W) and regulation schedule.

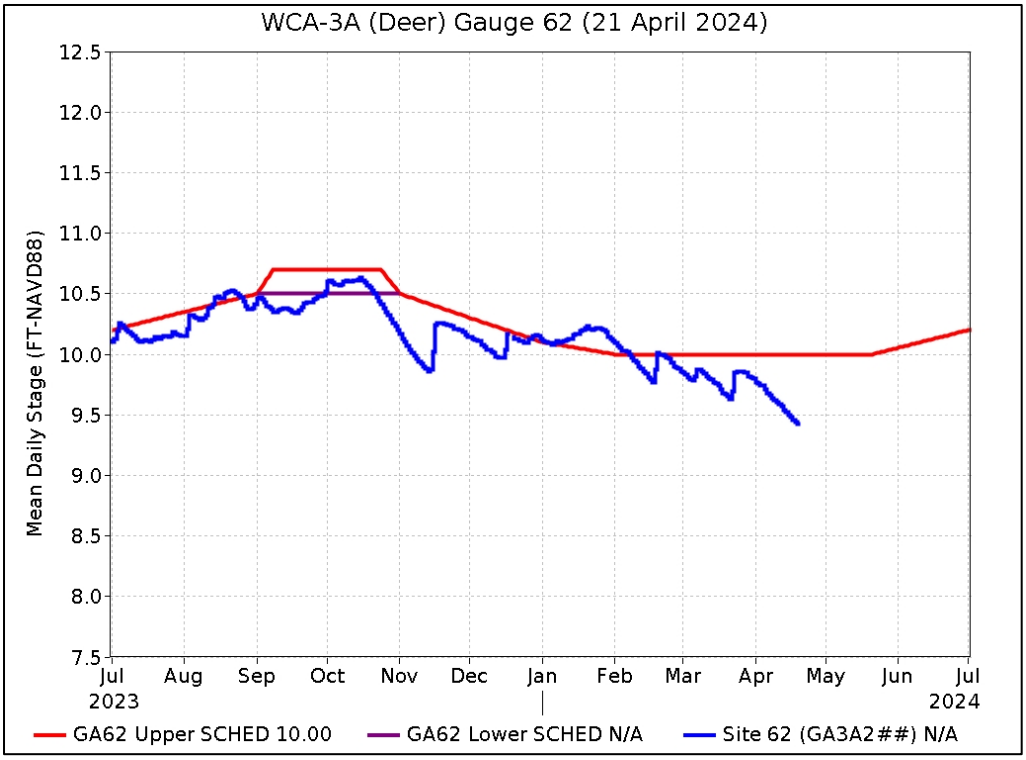


Figure EV-4. WCA-3A stage hydrograph (Deer gauge; Site 62) and GA62 regulation schedule.

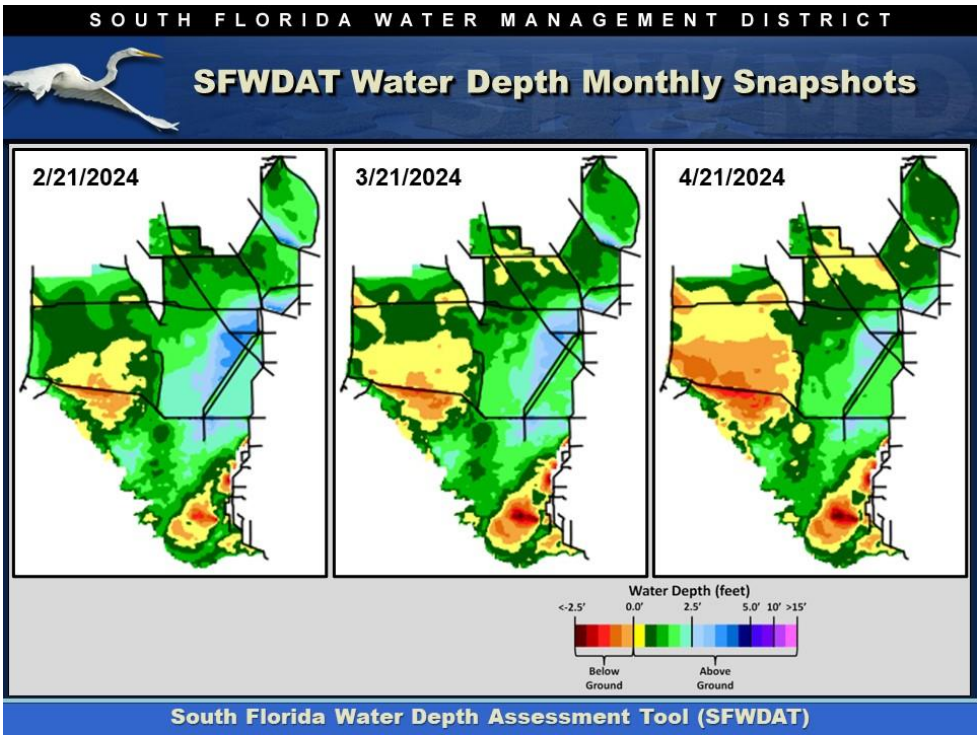


Figure EV-5. Everglades water depths from two months ago (left), one month ago (center) and present (right), based on SFWDAT.

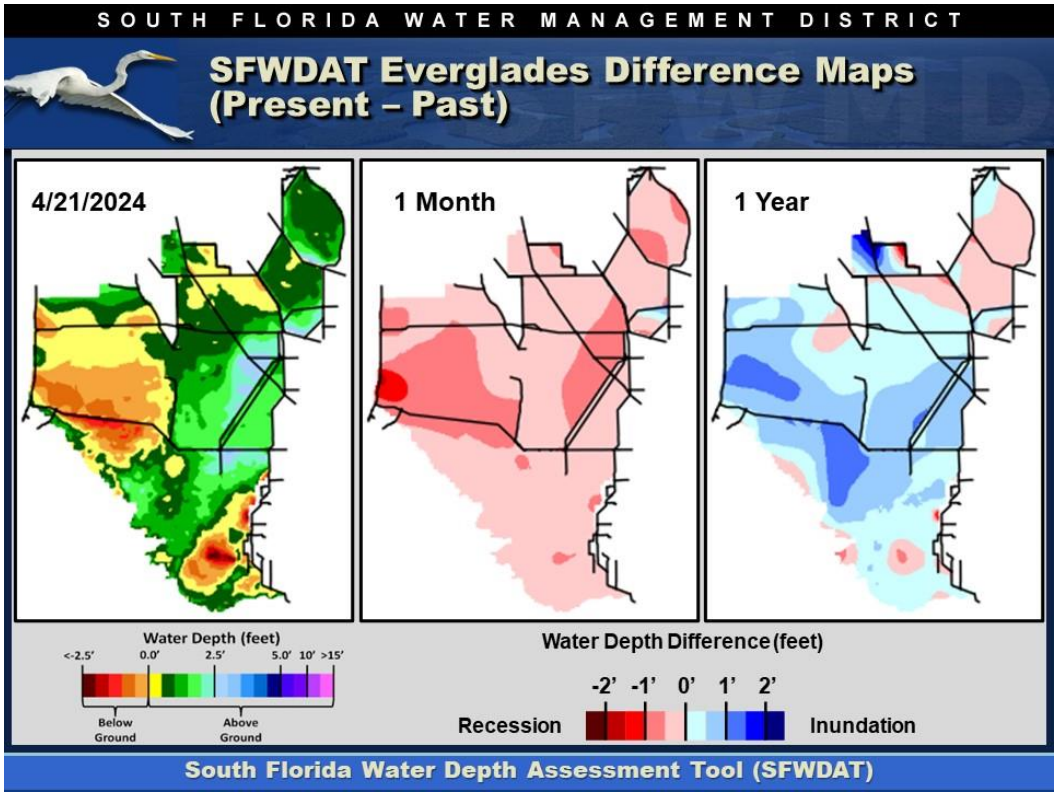


Figure EV-6. Present Everglades water depths (left) and water depth changes from one month (center) and one year (right) ago, based on SFWDAT.

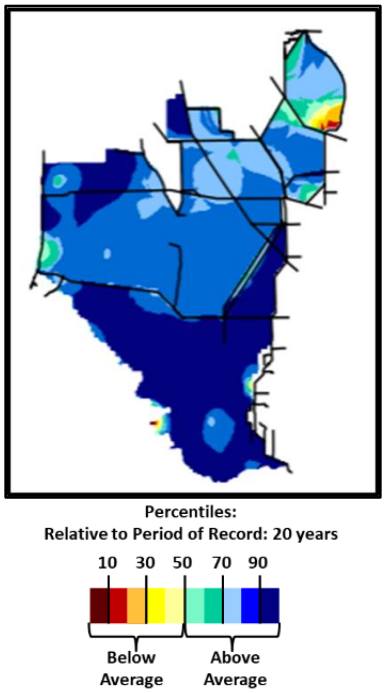


Figure EV-7. Present water depths (4/21/2024) compared to the day of year average over the previous 20 years.

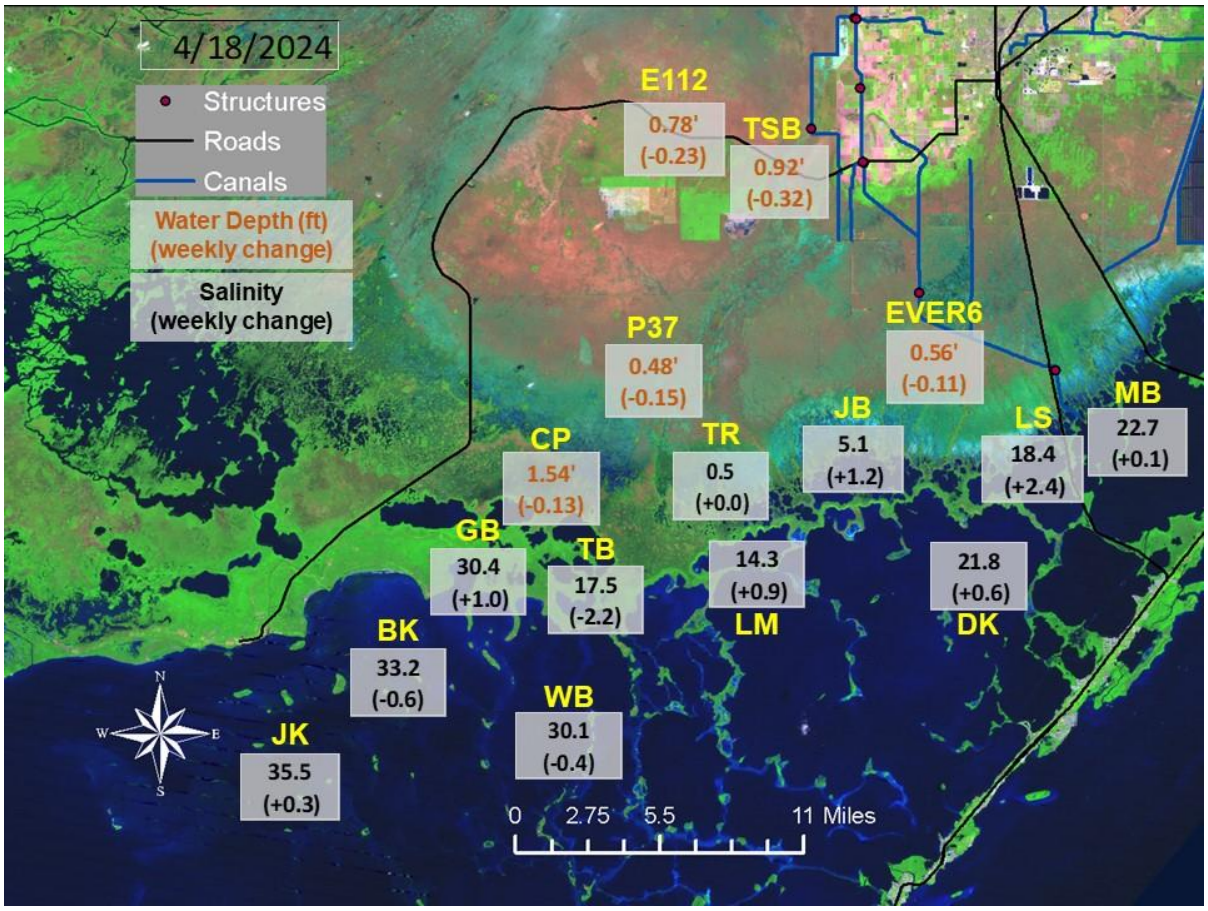


Figure EV-8. Taylor Slough water depths with changes since a week ago and Florida Bay salinities with changes since a week ago.

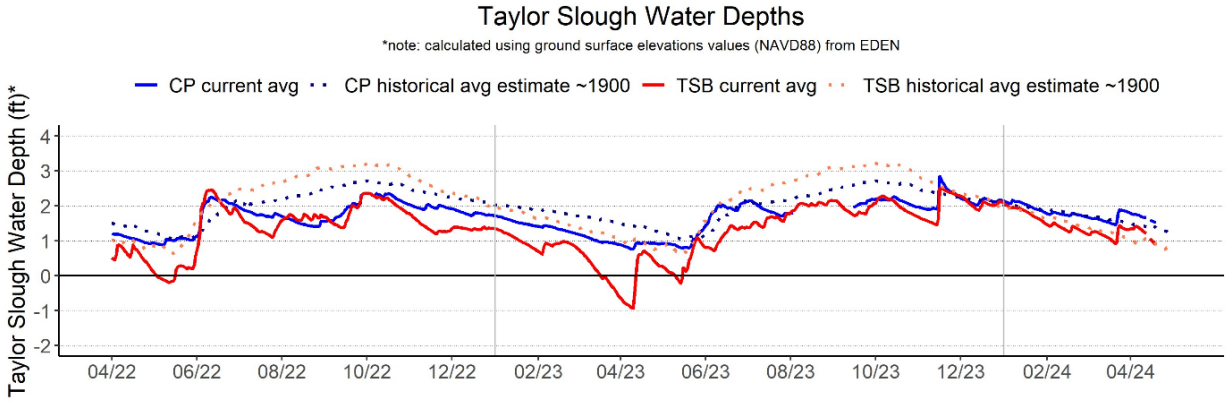


Figure EV-9. Taylor Slough water depth time series for Taylor Slough Bridge (TSB; northern slough) and Craighead Pond (CP; southern slough).

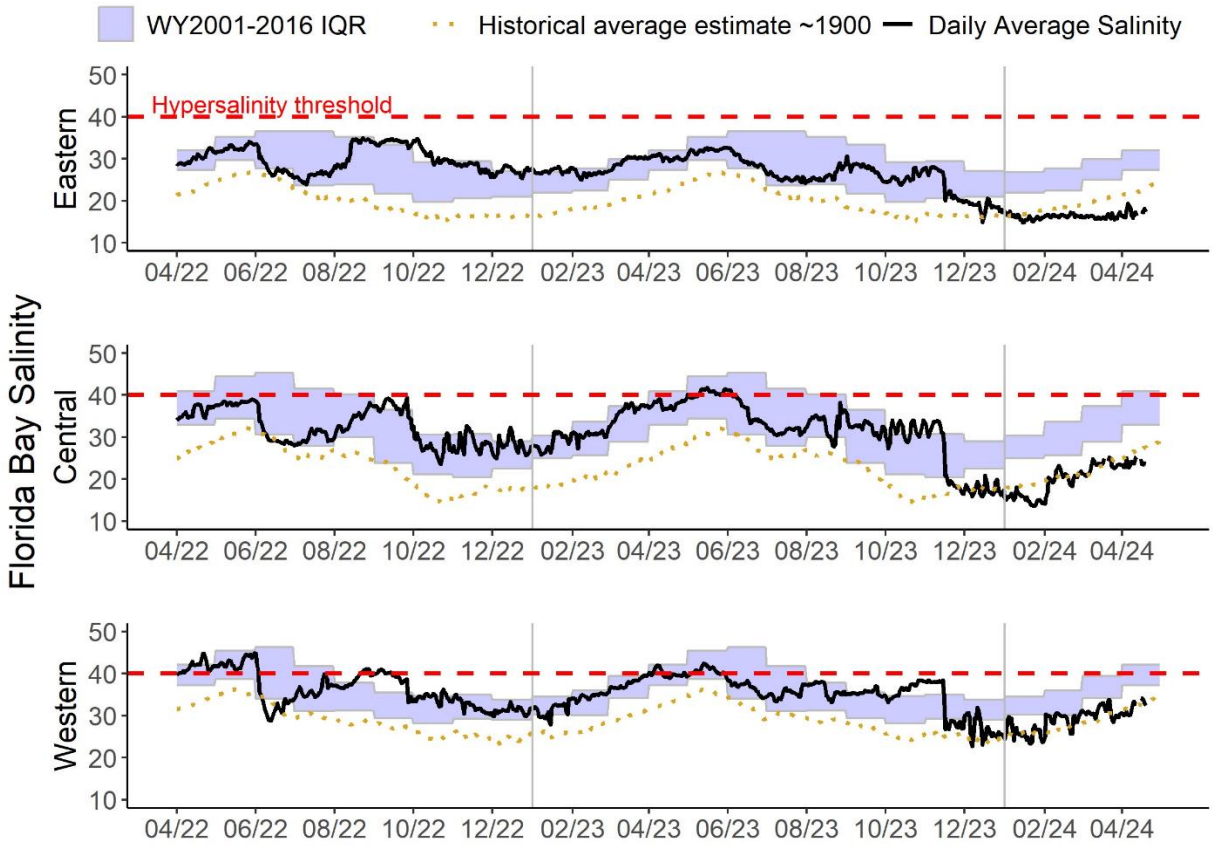


Figure EV-10. Eastern (top panel), Central (middle panel) and Western (bottom panel) Florida Bay daily average salinities with WY2001-2016 interquartile (25-75 percentile) ranges and estimated historical daily average salinities (~1900). The hypersalinity threshold indicates the level at which salinities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

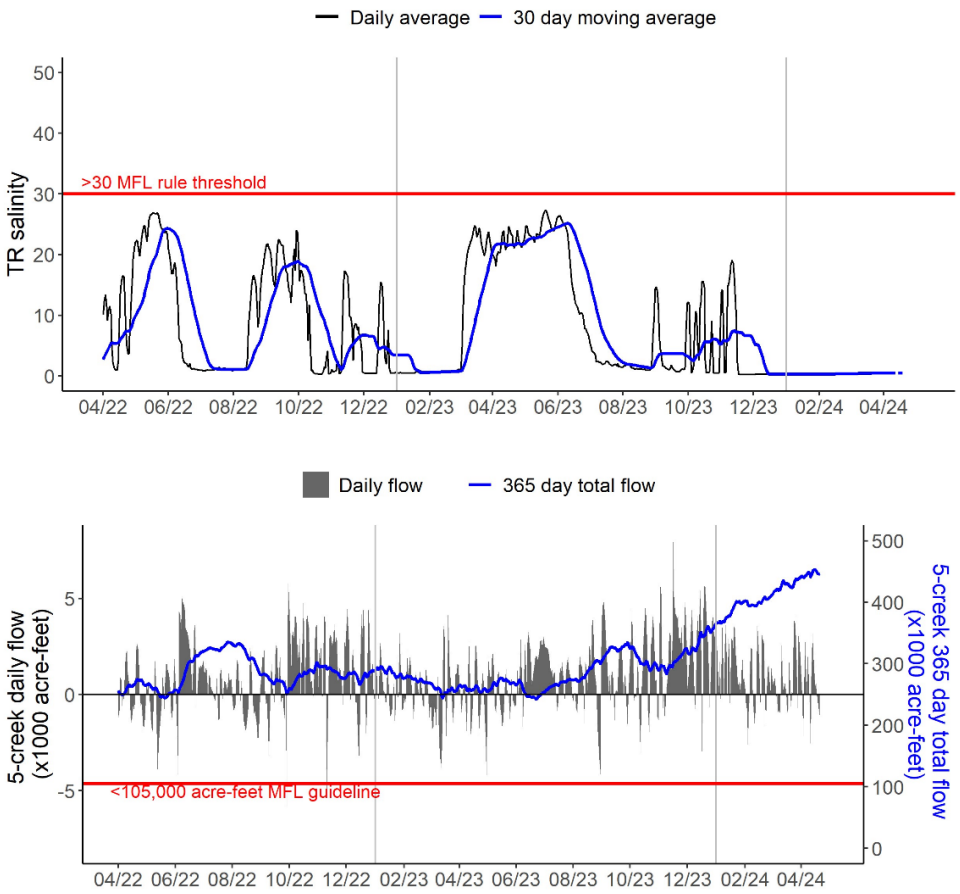


Figure EV-11. Salinity at Taylor River (TR; top) and creek inflow to Florida Bay (bottom) from the five major creeks (McCormick Creek, Taylor River, Mud Creek, Trout Creek, and West Highway Creek). The 30-day moving average salinity and 365-day total creek flow are tracked for the Florida Bay MFL criteria.

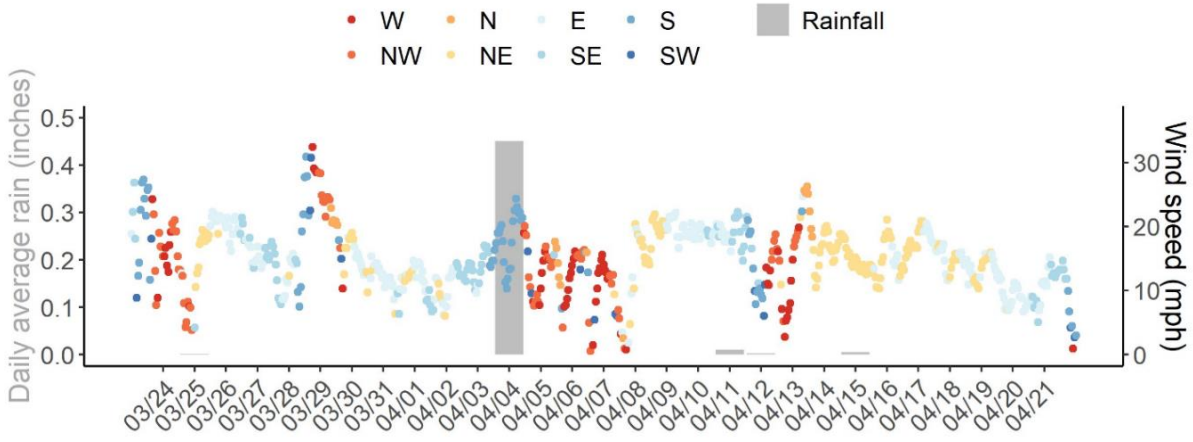


Figure EV-12. Daily average rain across Taylor Slough and Florida Bay, along with hourly average wind speed and direction (measured at Long Key) in Florida Bay over the past four weeks.

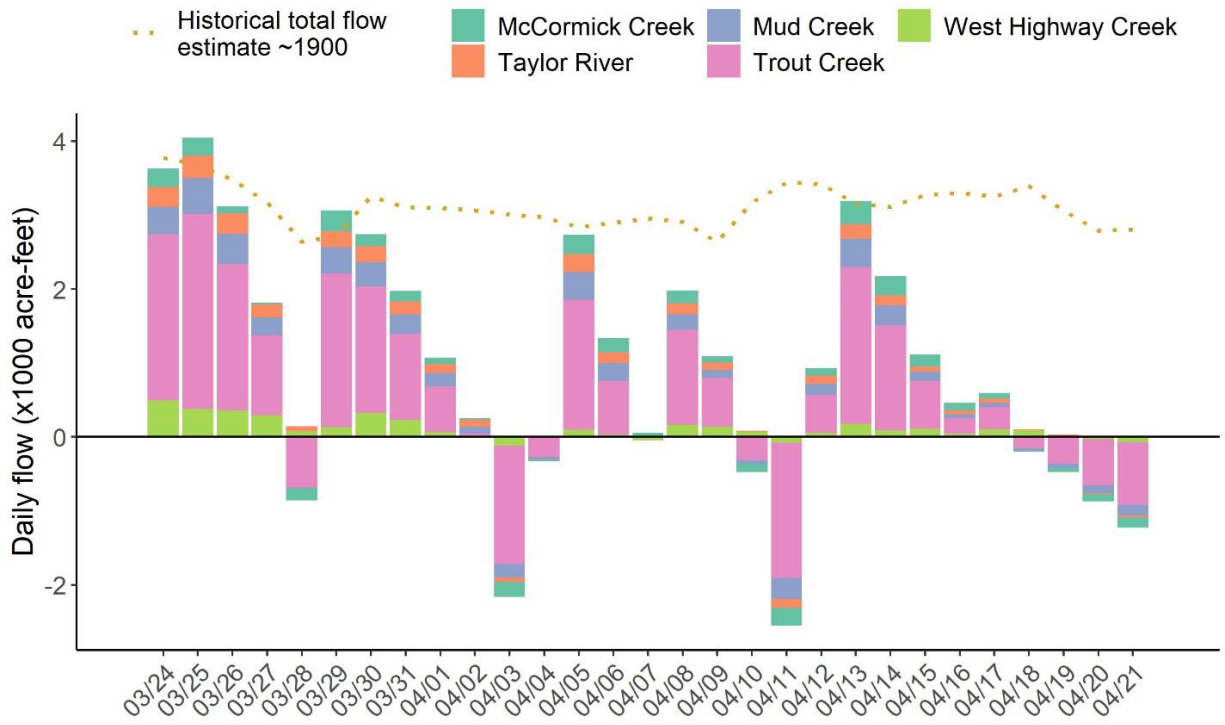


Figure EV-13. Daily average creek flow summed between five creeks with estimated historical daily flow (~1900) over the past four weeks.

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

SFWMD Everglades Ecological Recommendations, April 23, 2024 (red is new)			
	Weekly change	Recommendation	Reasons
WCA-1	Stage decreased by 0.11’	Recession rate of less than 0.12’ per week.	Protect within basin and downstream habitat and wildlife.
WCA-2A	Stage decreased by 0.15’	Recession rate up to 0.12 per week.	Protect within basin and downstream habitat and wildlife from ongoing above average depths.
WCA-2B	Stage decreased by 0.16’	Recession rate of less than 0.12’ per week.	Protect within basin and downstream habitat and wildlife.
WCA-3A NE	Stage decreased by 0.18’	Recession rate of less than 0.12’ per week.	Protect within basin and downstream habitat and wildlife (fish/crayfish reproduction, wading bird foraging and nesting).
WCA-3A NW	Stage decreased by 0.14’	Recession rate of less than 0.12’ per week.	
Central WCA-3A S	Stage decreased by 0.18’	Recession rate of less than 0.12’ per week.	Protect within basin wildlife (fish/crayfish reproduction, wading bird foraging). Slowing the recession rate in this region may prevent late/doomed nesting attempts.
Southern WCA-3A S	Stage decreased by 0.16’		
WCA-3B	Stage decreased by 0.13’	Recession rate of less than 0.12’ per week.	Protect within basin (sensitive tree islands) and downstream habitat and wildlife.
ENP-SRS	Stage decreased by 0.04’	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 (wading bird nesting).
Taylor Slough	Stage changes ranged from −0.32’ to −0.06’	Move water southward as possible.	When available, provide freshwater to promote water movement.
FB- Salinity	Salinity changes ranged from −2.2 to +2.4	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 220 cfs, and the previous 30-day mean inflow was 930 cfs. The seven-day mean salinity was 24.7 at BBCW8 and 15.1 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.

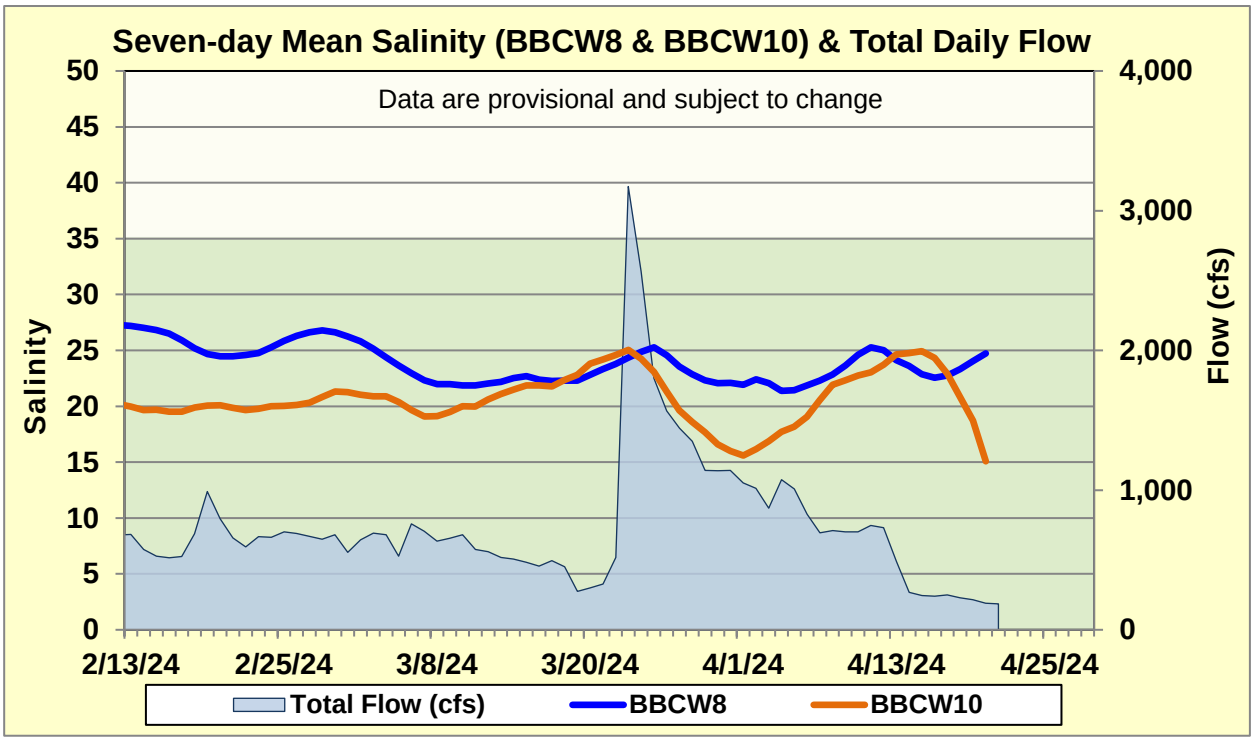


Figure BB-1. Seven-day mean salinity at BBCW8 and BBCW10 and total daily flow in Biscayne Bay. Total daily flow was calculated using flow from structures S20G, S20F, S21, S21A, S123, and S700P.