

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: August 7, 2024

SUBJECT: Weekly Environmental Conditions for Systems Operations

Summary

Weather Conditions and Forecast

On Wednesday, drier and stable continental air is expected to overspread the SFWMD. This influx of relatively drier air will likely result in a sharp decrease in total SFWMD rainfall, resulting in below or much below the daily climatological average. However, scattered showers and isolated thunderstorms along and near the west coast of the SFWMD are possible on Wednesday, spreading inland over the western half of the area. By Thursday, scattered showers and isolated thunderstorms will occur mainly over the southern or southeastern third of the SFWMD. As Tropical Storm Debby accelerates northward on Friday, greater moisture could return to portions of the SFWMD, especially east through southeast of Lake Okeechobee. Over the weekend, a subtropical ridge of high pressure is forecast to rebuild into Florida. The change in steering winds and possible increase in moisture are expected to cause typical wet-season rains to resume, focusing over the interior and western parts of the SFWMD. This will likely continue into Monday, with drier air possibly spreading over the SFWMD from the east by the afternoon. For the week ending next Tuesday morning, total SFWMD rainfall is expected to be below normal.

Kissimmee

Lake stage in East Lake Toho and Lake Toho is being allowed to rise with rainfall. Weekly average discharge on August 4, 2024, was 99 cfs and 420 cfs at S-65 and S-65A, respectively. Mean weekly water depth on the Kissimmee River floodplain remained the same as the previous week at 0.10 feet. The weekly average concentration of dissolved oxygen in the Kissimmee River increased from 4.3 mg/L the previous week to 4.6 mg/L, which is above the potentially lethal and stressful levels for largemouth bass and other sensitive species.

Lake Okeechobee

Lake Okeechobee stage was 12.39 feet NAVD88 (13.70 ft NGVD29) on August 4, 2024, which was 0.18 feet lower than the previous week and 0.19 feet higher than a month ago. Average daily inflows (excluding rainfall) increased from 1,390 cfs the previous week to 3,940 cfs. Average daily outflows (excluding evapotranspiration) decreased from 520 cfs

the previous week to 90 cfs. Routine water quality monitoring results showed 11 of 32 sites had detectable levels (>25 µg/L) of microcystin toxins, two of which exceeded the U.S. EPA recreational standard of 8 µg/L. There were no recent satellite images from NOAA's Harmful Algal Bloom Monitoring System that were not obscured by clouds.

Estuaries

Total inflow to the St. Lucie Estuary averaged 2,096 cfs over the past week with no flow coming from Lake Okeechobee. Mean surface salinities decreased at HR1, US1 Bridge, and A1A Bridge 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 4,107 cfs over the past week with 65 cfs coming from Lake Okeechobee. Mean salinities remained the same at S-79, Val I-75, and Ft. Myers sites and increased at the remaining sites in the estuary except for the Sanibel site surface salinity which decreased over the past week. Salinities were in the optimal range (0-10) for tape grass in the upper estuary. Salinities were in the lower stressed range for adult oysters at Cape Coral, in the optimal range at Shell Point, and in the upper stressed range at Sanibel.

Stormwater Treatment Areas

For the week ending Sunday, August 4, 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 68,900 ac-feet. The total amount of inflows to the STAs in WY2025 is approximately 466,000 ac-feet. STA cells are near or above target stage. STA-1E Central Flow-way is offline for construction activities. Operational restrictions are in effect in STA-1E Western and Eastern Flow-ways, STA-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 over the week were fair to good last week providing sufficient conditions for apple snail reproduction except in WCA-2A and southern 2-B, which had poor conditions over the past two weeks. Stages remain above average for this time of year across most of the Everglades Protection Area. Eastern WCA-2B is below average stage for this time of year, WCA-1 has mixed conditions, and Everglades National Park and WCA-3B have above-average water levels in the 90th percentile compared to the 20-year median. Average stage in Taylor Slough increased last week and remains above average for this time of year. Average salinity decreased in Florida Bay last week, the eastern region remains below the inter-quartile range (IQR), while the central and western regions fall within the IQR. Florida Bay MFL metrics remain well outside thresholds of harm.

Biscayne Bay

Total inflow to Biscayne Bay averaged 999 cfs, and the previous 30-day mean inflow averaged 692 cfs. The seven-day mean salinity was 24.4 at BBCW8 and 24.4 at BBCW10, both within the ideal salinity range for estuarine organisms in this region (salinity less than 35). Data were provided by Biscayne National Park.

Supporting Information

Kissimmee Basin

Upper Kissimmee

On August 4, 2024, mean daily lake stages were 55.1 feet NAVD (0.4 feet below schedule) in East Lake Toho, 52.1 feet NAVD (0.2 feet below schedule) in Lake Toho, and 47.9 feet NAVD (1.9 feet below schedule) in Lakes Kissimmee-Cypress-Hatchineha (KCH) (**Table KB-1, Figures KB-1-3**).

Lower Kissimmee

For the week ending August 4, 2024, mean weekly discharge was 99 cfs and 420 cfs at S-65 and S-65A, respectively. Mean weekly discharge from the Kissimmee River was 520 cfs at S-65D and S-65E (**Table KB-2**). Mean weekly headwater stages were 45.3 feet NAVD at S-65A and 24.6 feet NAVD at S-65D. Mean weekly river channel stage increased by 0.1 feet from the previous week to 31.9 feet NAVD (**Figure KB-4**). Mean weekly water depth on the Kissimmee River floodplain remained the same as the previous week at 0.10 feet (**Table KB-2, Figure KB-5**). The weekly average concentration of dissolved oxygen in the Kissimmee River increased from 4.3 mg/L the previous week to 4.6 mg/L (**Table KB-2, Figure KB-6**).

Water Management Recommendations

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

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

Water Body	Structure	Stage Monitoring Site	Weekly (7-Day) Average Discharge (cfs)	Sunday Lake Stage (feet NAVD) ^a	Schedule Type ^b	Sunday Schedule Stage (feet NAVD)	Sunday Departure from Regulation (feet)	
							8/4/24	7/28/24
Lakes Hart and Mary Jane	S-62	LKMJ	100	58.8	R	58.9	-0.1	0.1
Lakes Myrtle, Preston and Joel	S-57	S-57	0	59.4	R	60.0	-0.6	-0.7
Alligator Chain	S-60	ALLI	0	61.4	R	62.2	-0.8	-1.0
Lake Gentry	S-63	LKGT	0	58.9	R	59.9	-1.0	-1.3
East Lake Toho	S-59	TOHOE	120	55.1	R	55.5	-0.4	-0.6
Lake Toho	S-61	TOHOW S-61	260	52.1	R	52.3	-0.2	-0.4
Lakes Kissimmee, Cypress and Hatchineha	S-65	KUB011 LKIS5B	99	47.9	R	49.8	-1.9	-1.9

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.

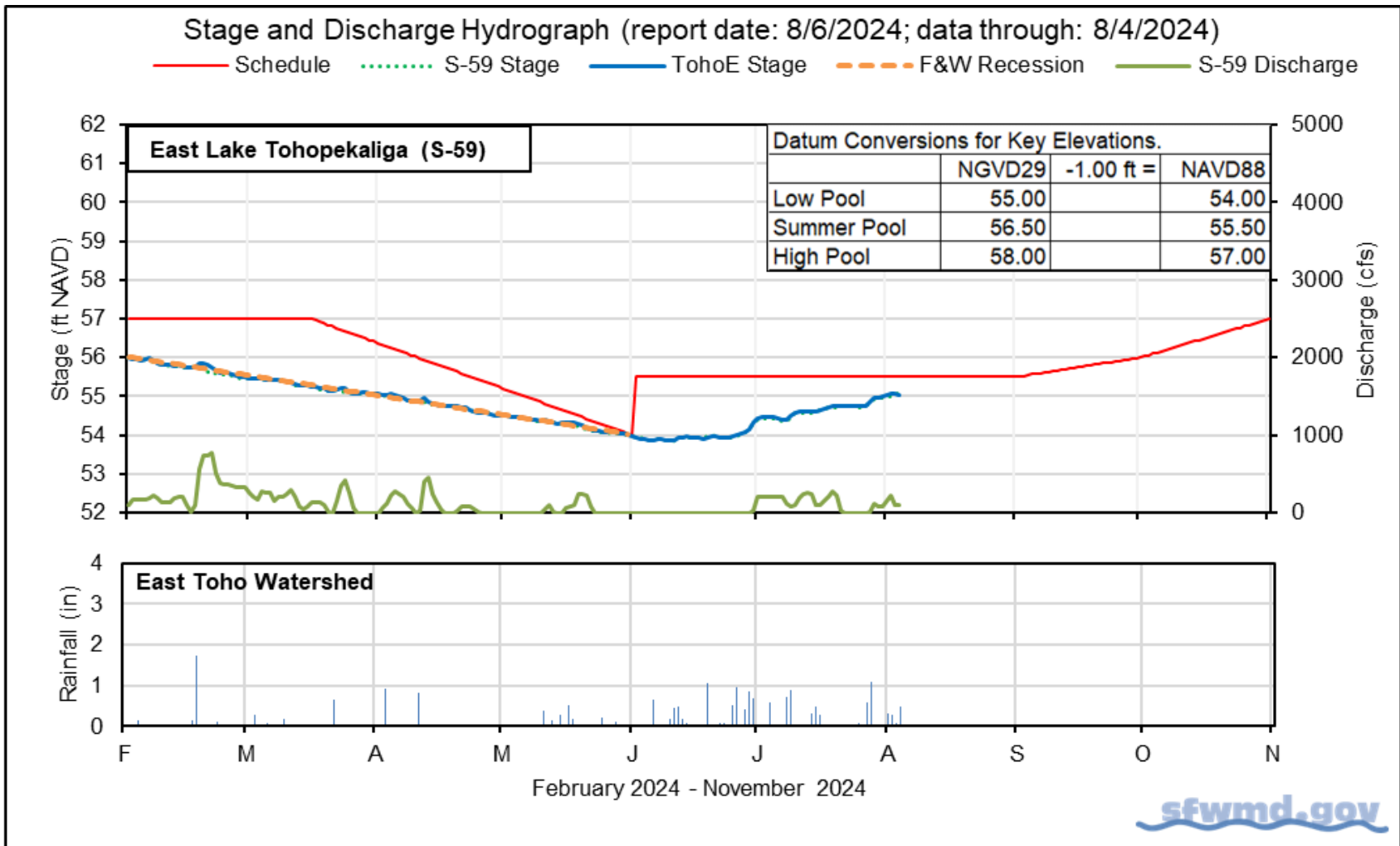


Figure KB-1. East Lake Toho regulation schedule, stage, discharge, and rainfall.

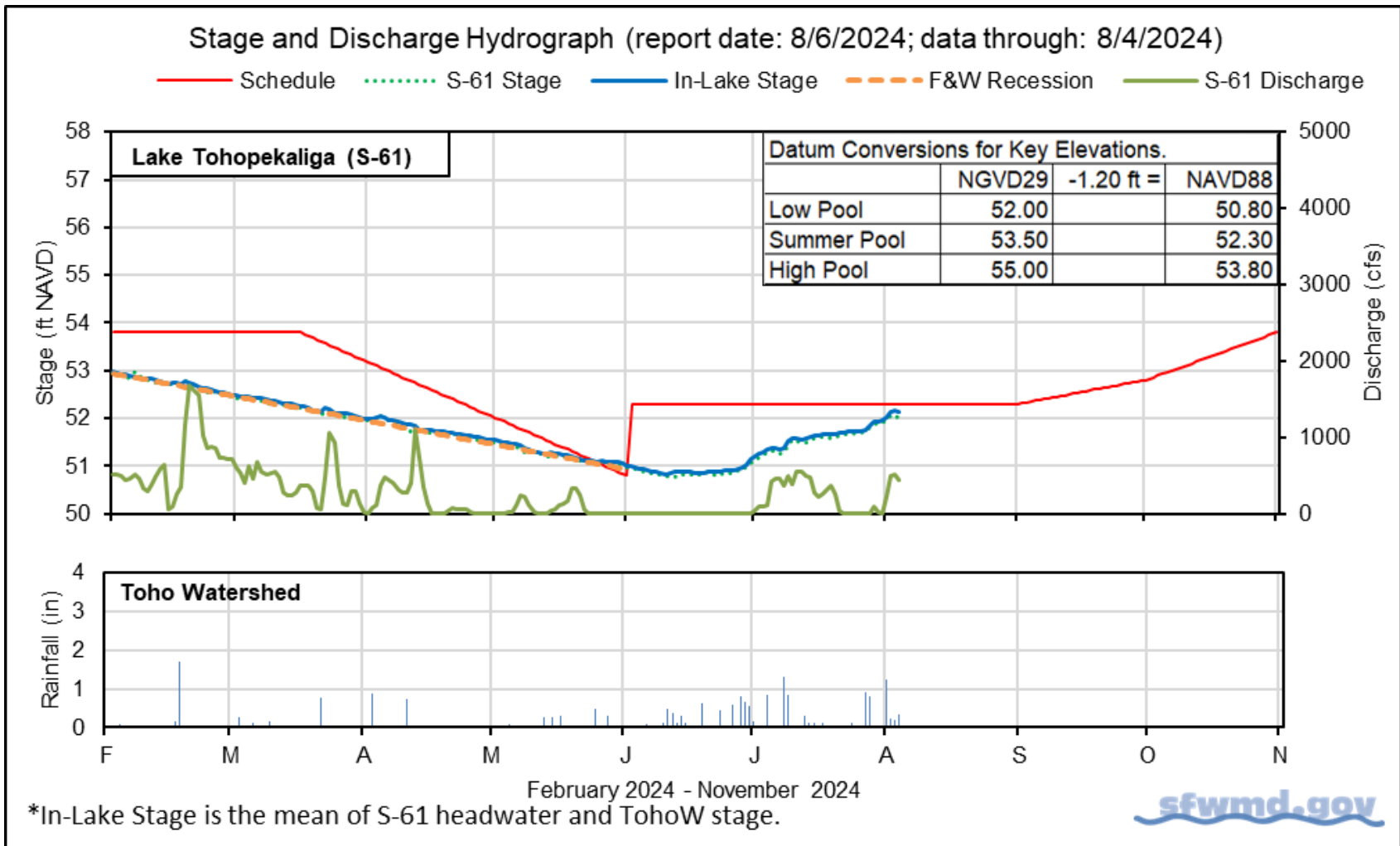


Figure KB-2. Lake Toho regulation schedule, stage, discharge, and rainfall.

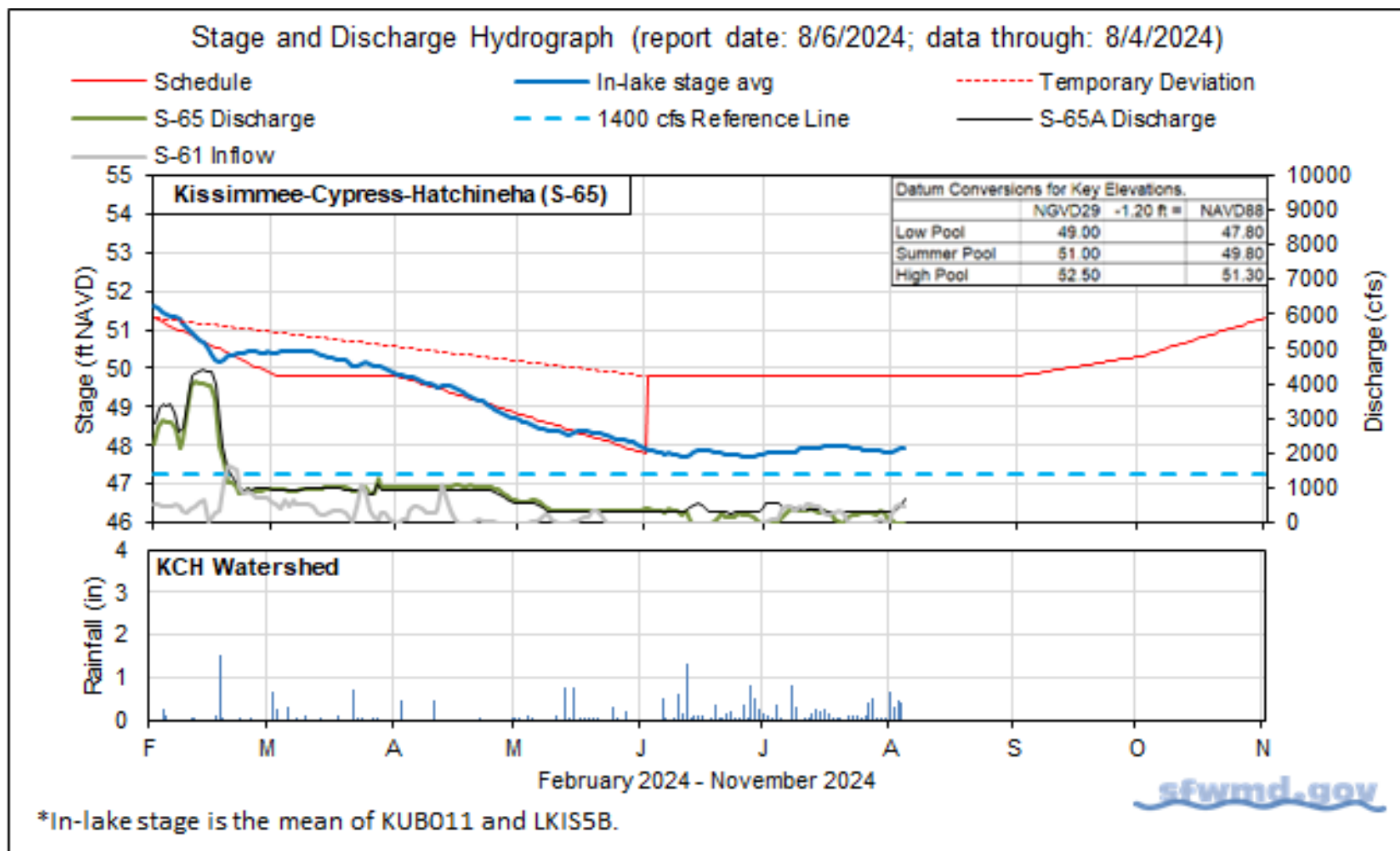


Figure KB-3. Lakes Kissimmee, Cypress and Hatchineha regulation schedule, stage, discharge, and rainfall.

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			
		8/4/24	8/4/24	7/28/24	7/21/24	7/14/24
Discharge	S-65	0	99	260	160	350
Discharge	S-65A ^a	670	420	330	330	390
Headwater Stage (feet NAVD)	S-65A	45.8	45.3	45.1	45.2	45.2
Discharge	S-65D ^b	710	520	450	420	520
Headwater Stage (feet NAVD)	S-65D ^c	24.5	24.6	24.6	24.6	24.6
Discharge (cfs)	S-65E ^d	700	520	440	390	470
Discharge (cfs)	S-67	0	0	0	0	0
Dissolved Oxygen (mg/L) ^e	Phase I, II/III river channel	4.0	4.6	4.3	4.2	3.1
River channel mean stage ^f	Phase I river channel	32.7	31.9	31.8	31.8	32.1
Mean depth (feet) ^g	Phase I floodplain	0.11	0.10	0.10	0.09	0.09

a. Combined discharge from main and auxiliary structures.

b. Combined discharge from S-65D, S-65DX1, and S-65DX2.

c. Average stage from S-65D and S-65DX1.

d. Combined discharge from S-65E and S-65EX1.

e. Dissolved oxygen is the average of values from sondes KRBN, PC62, PC33, PD62R, and PD42R.

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

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

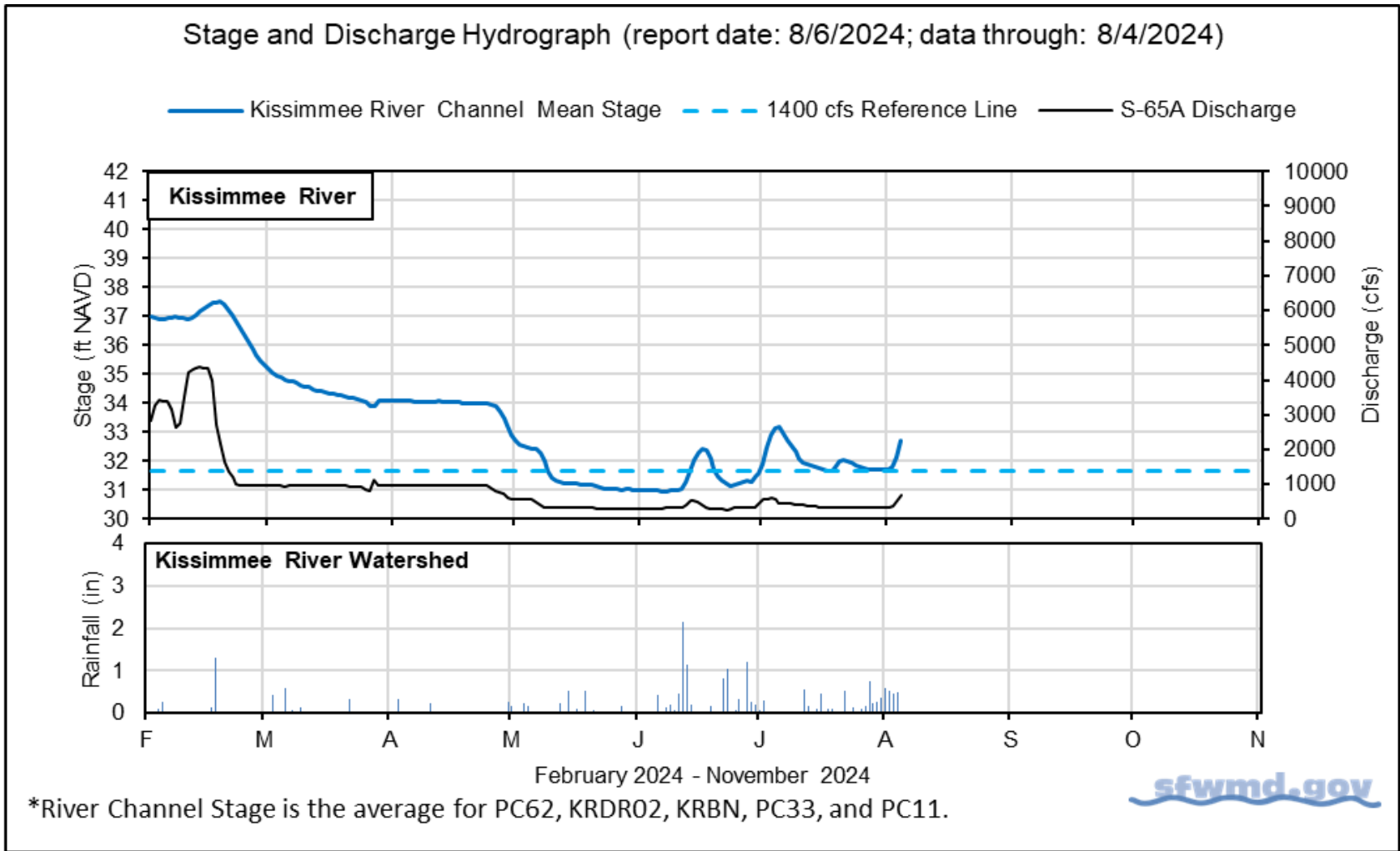


Figure KB-4. Kissimmee River stage, discharge, and rainfall.

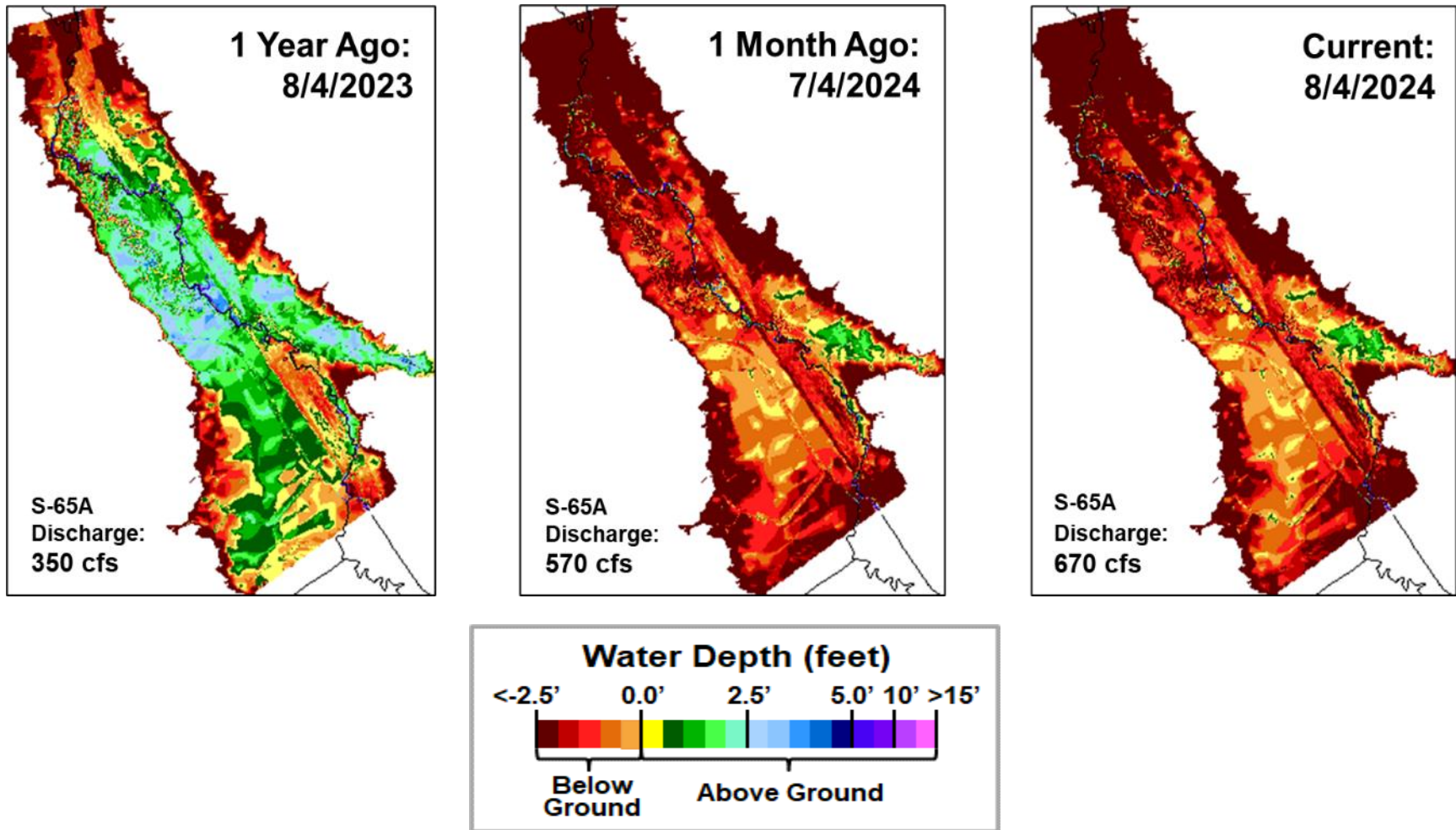
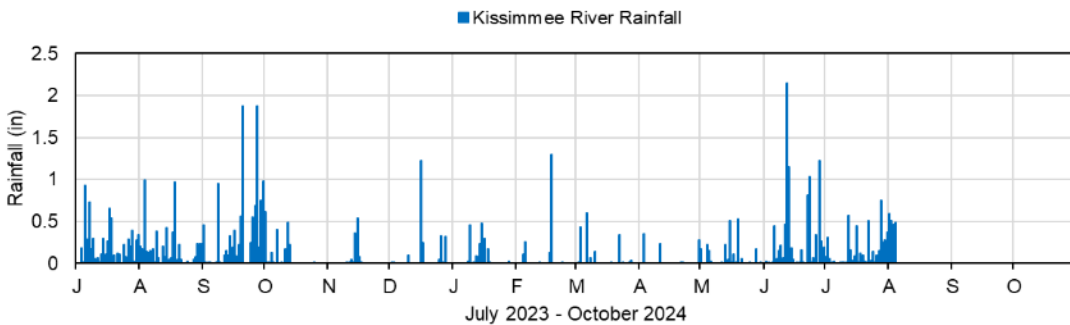
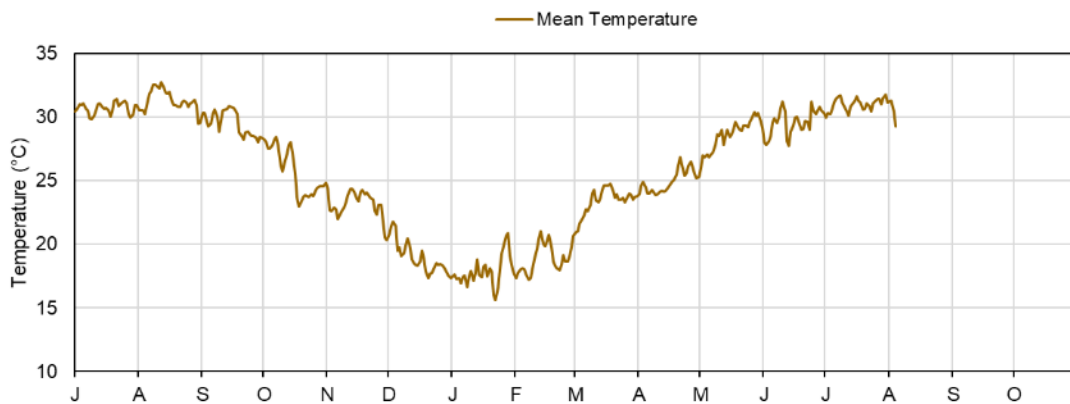
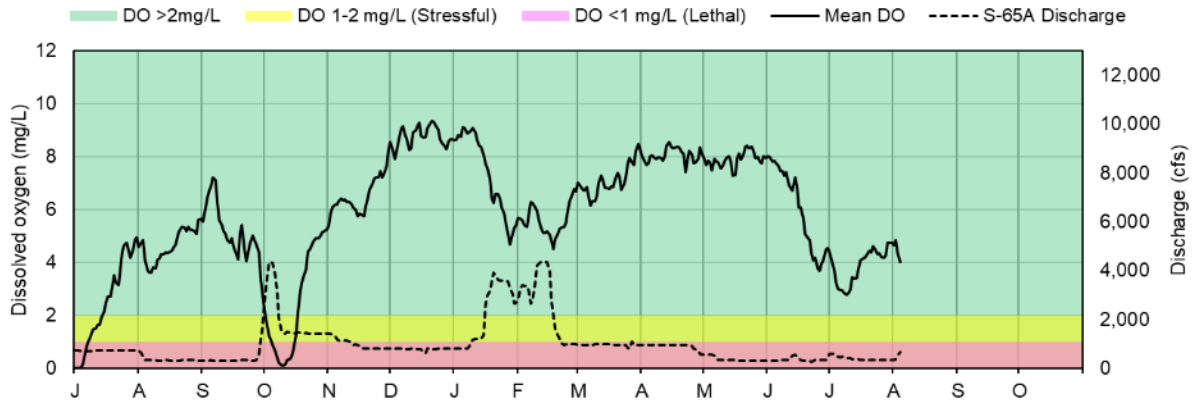


Figure KB-5. Phase I area Kissimmee River floodplain water depths (from left to right) one year ago, one month ago, and current.



Report Date: 8/6/2024; data are through: 8/4/2024



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

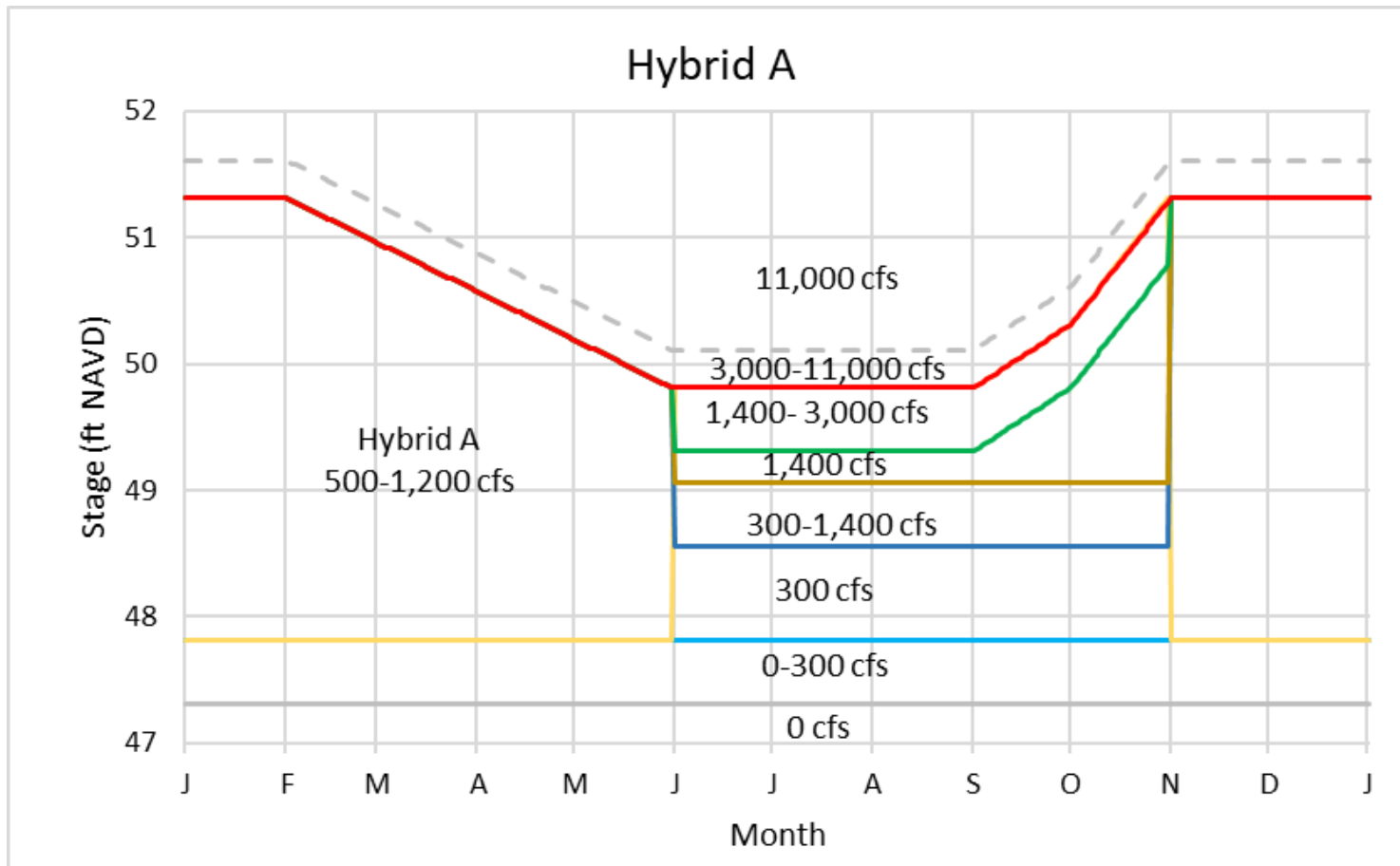


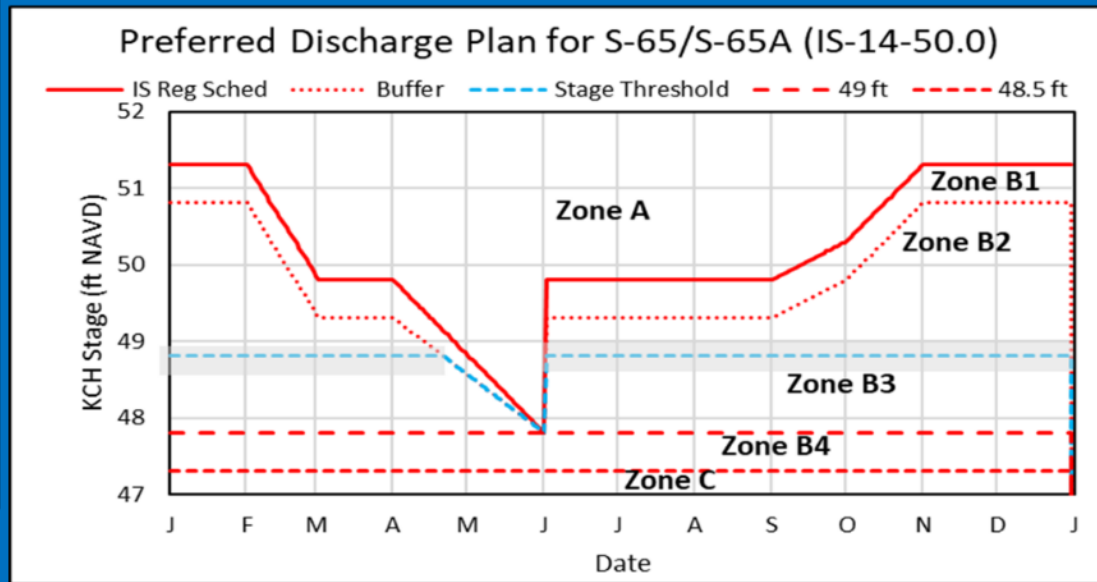
Figure KB-7. Hybrid A Discharge Plan for S-65/S-65A. Use discharge rate of change limits from IS-14-50 (Fig. KB-8).

Stage and Discharge Guidance for 2021-2023.		
Zone	KCH Stage (ft NAVD)	S-65/S-65A Discharge*
A	Above regulation schedule line.	Flood control releases as needed with no limits on the rate of discharge change.
B1	In flood control buffer zone (0.5 ft below the schedule line).	Adjust S-65 discharge so that S-65A discharge is between 1400 cfs at the buffer zone line and 3000 cfs at the schedule line.
B2	Between the Flood Control Buffer and the 48.8 ft line.	Adjust S-65 discharge to maintain at least 1400 cfs at S-65A. Use ± 0.2 ft buffer (gray band) above and below the 48.8 ft line to decide when to begin ramping up to 1400 cfs or down to 300 cfs; do not continue reducing discharge if stage rises back to or above the threshold stage line.
B3	Between the 48.8 ft line and 47.8 ft.	Adjust S-65 discharge to maintain at least 300 cfs at S-65A.
B4	Between 47.3 ft to 47.8 ft.	Adjust S-65 discharge to maintain S-65A discharge between 0 cfs at 47.3 ft and 300 cfs at 47.8 ft.
C	Below 47.3 ft.	0 cfs.

*Changes in discharge should not exceed limits in inset table below.

Table KB-3. Discharge Rate of Change Limits for S65/S65A (revised 1/14/19).		
Q (cfs)	Maximum rate of INCREASE (cfs/day)	Maximum rate of DECREASE (cfs/day)
0-300	100	-50
301-650	150	-75
651-1400	300	-150
1401-3000	600	-600
>3000	1000	-2000

2021-2023 Discharge Plan for S-65/S-65A



Other Considerations

- When possible, limit lake ascension rate in the Jun 1 - Aug 15 window to 0.25 ft per 7 days in Lakes Kissimmee, Cypress, Hatchineha (S-65), East Toho (S-59) and Toho (S-61).
- If outlook is for extreme dry conditions meet with KB staff to discuss modifications to this plan.

Slide Revised 1/3/2022

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 12.39 feet NAVD88 (13.70 ft NGVD29) on August 4, 2024, which was 0.18 feet lower than the previous week and 0.19 feet higher than a month ago (**Figure LO-1**). Lake stage is in the Low sub-band (**Figure LO-2**) and was 1.32 feet above the upper limit of the recovery ecological envelope (**Figure LO-3**). According to NEXRAD, 2.07 inches of rain fell directly over the Lake last week.

Average daily inflows (excluding rainfall) increased from 1,390 cfs the previous week to 3,940 cfs. The largest single structure inflow came from the S-84s (from Lake Istokpoga) at 1,690 cfs, while 870 cfs came from the Indian Prairie watershed via the S-71 and S-72 structures. Average daily outflows (excluding evapotranspiration) decreased from 520 cfs the previous week to 90 cfs, which was released to the C-43 canal through the S-77 structure and south through the S-351 structure. No releases were made to the east through S-308. **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 provisional results from the July 22-24 routine water quality and phytoplankton monitoring sampling trips showed *Microcystis aeruginosa* dominated fewer communities than the early July sample, at just 14 of the 32 sites sampled. Eleven sites had detectable (>0.25 µg/L) microcystin concentrations, with two of those exceeding the U.S. EPA recreational standard of 8 µg/L: station L004 had a concentration of 8.8 µg/L, and LZ40 had 22.0 µg/L (**Figure LO-6**). Chlorophyll *a* concentrations were not available at the time of this report.

There were no unobscured satellite images available after July 28, 2024, the last image from NOAA's Harmful Algal Bloom Monitoring System that was displayed in last week's report.

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

1 Month Ago:
07/04/2024

Current:
08/04/2024

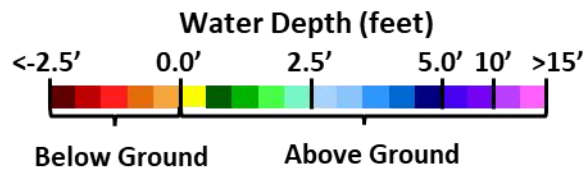
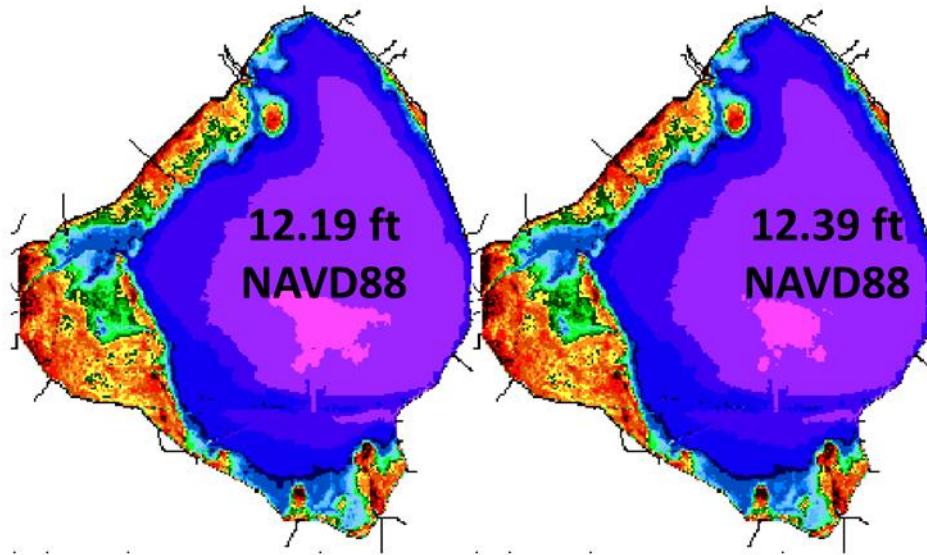
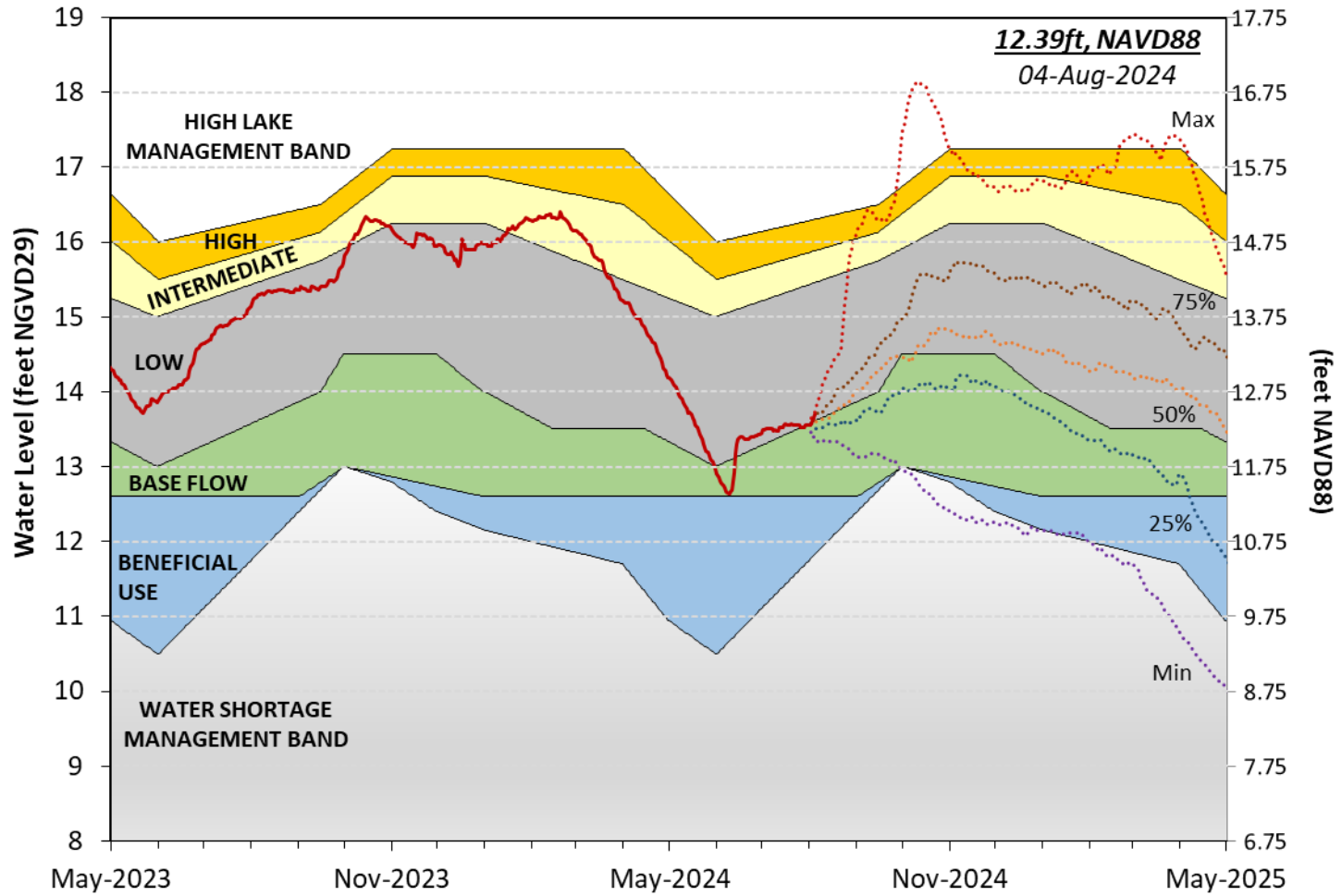


Figure LO-1. Lake Okeechobee water depth estimates based on South Florida Water Depth Assessment Tool (SFWDAT).

Lake Okeechobee Water Level History and Projected Stages



LORS-2008 - Adopted by USACE 28-April-

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

Lake Okeechobee Stage vs Recovery Ecological Envelope

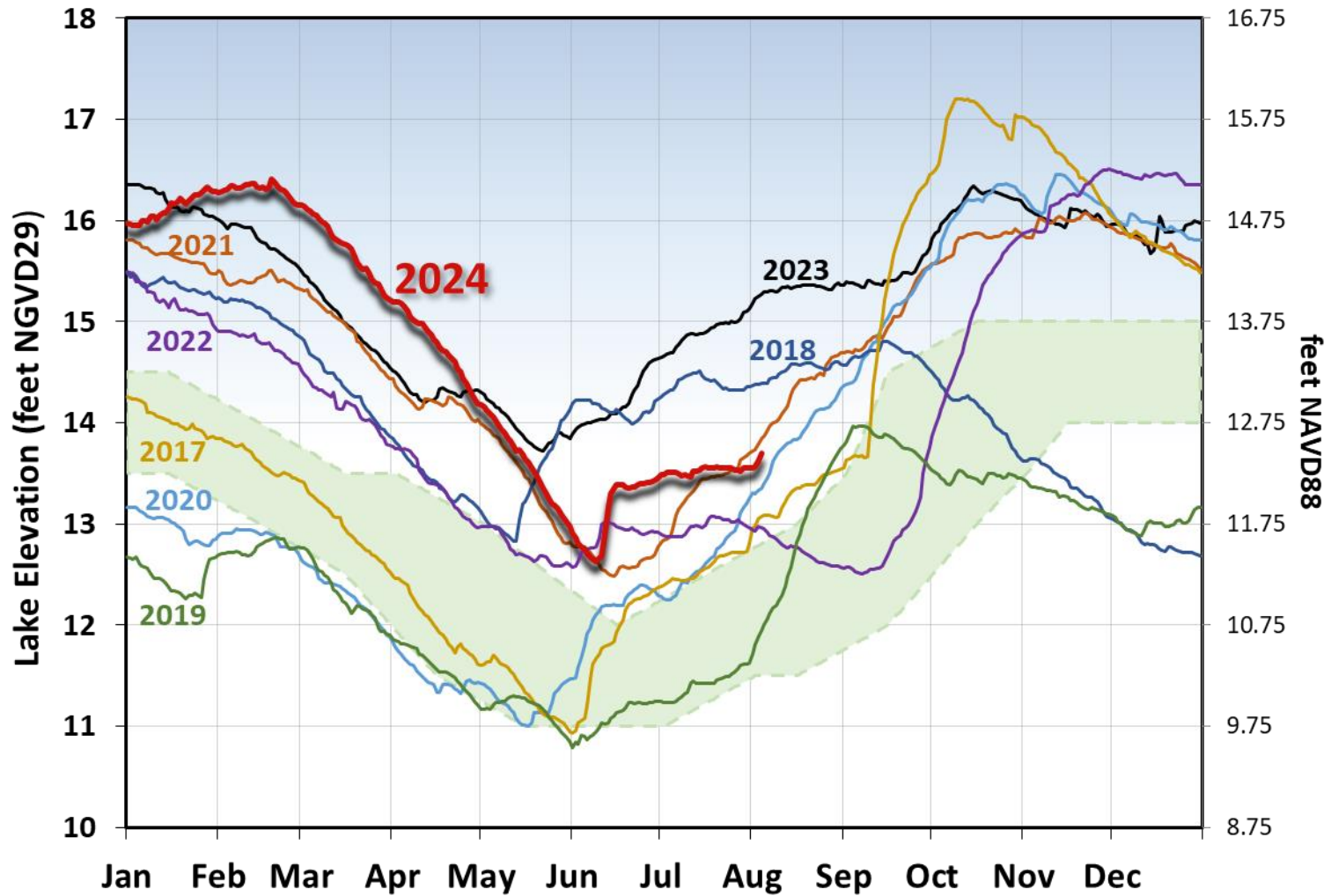


Figure LO-3. The current and seven prior year's annual stage hydrographs for Lake Okeechobee in comparison to the recovery envelope (light green). A shift from the normal ecological envelope to the recovery envelope occurred because the 30-day minimum lake stage (elevations exposed for at least 30 days,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

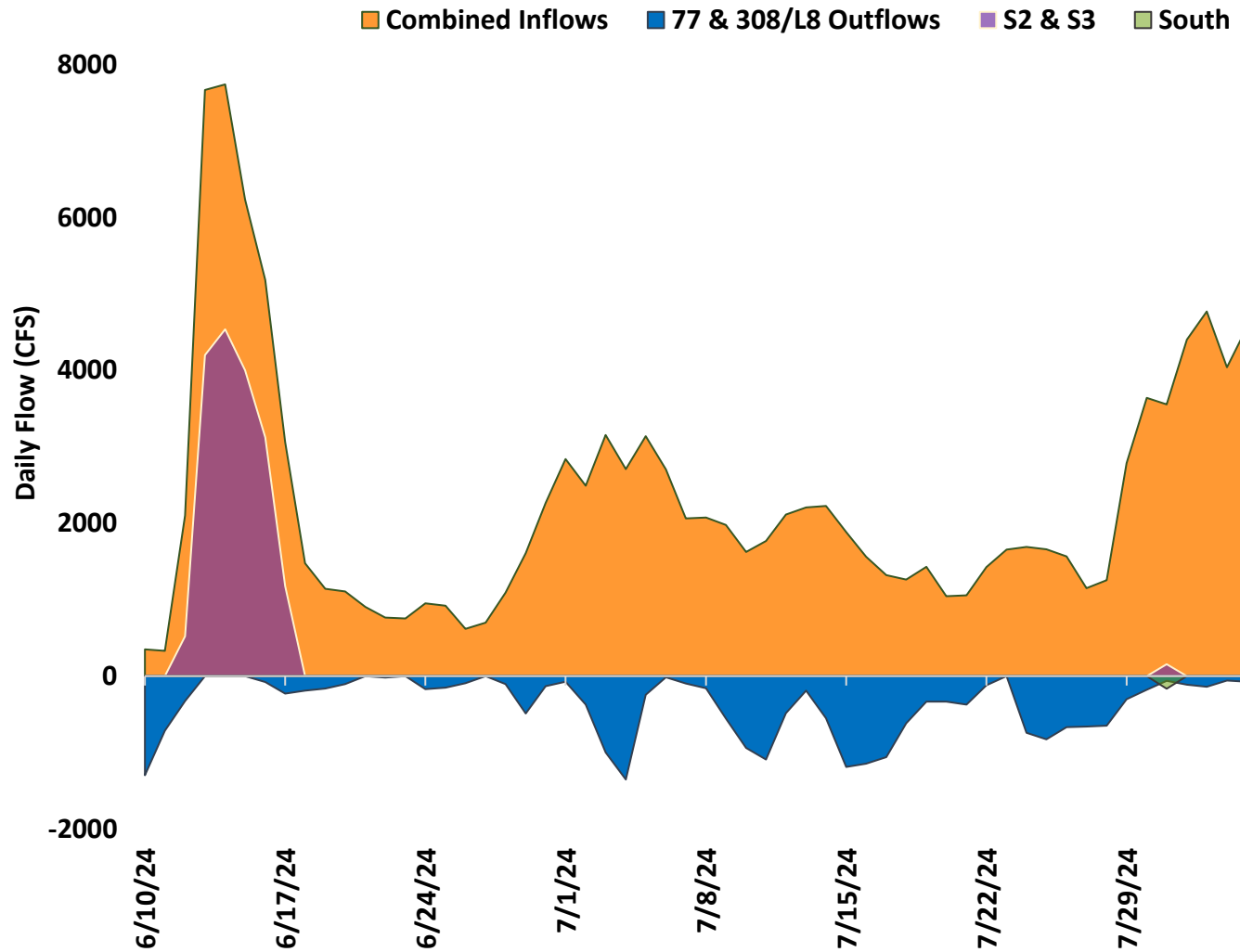


Figure LO-4. Major inflows (orange) to and outflows east and west (blue) from Lake Okeechobee. Outflows south are shown in green. Flows into Lake Okeechobee from the L-8 canal through S-271 (formerly Culvert 10A) or from the C-44 canal through the S-308 are included as inflows. Conversely, flows from Lake Okeechobee into the L-8 or C-44 canals are included with outflows. Inflows are shown as positive values; outflows are negative. Outflows through the S-77 (Caloosahatchee) and S-308 (C-44 Canal) structures are based on downstream gauges to include flows to lock openings for navigation.

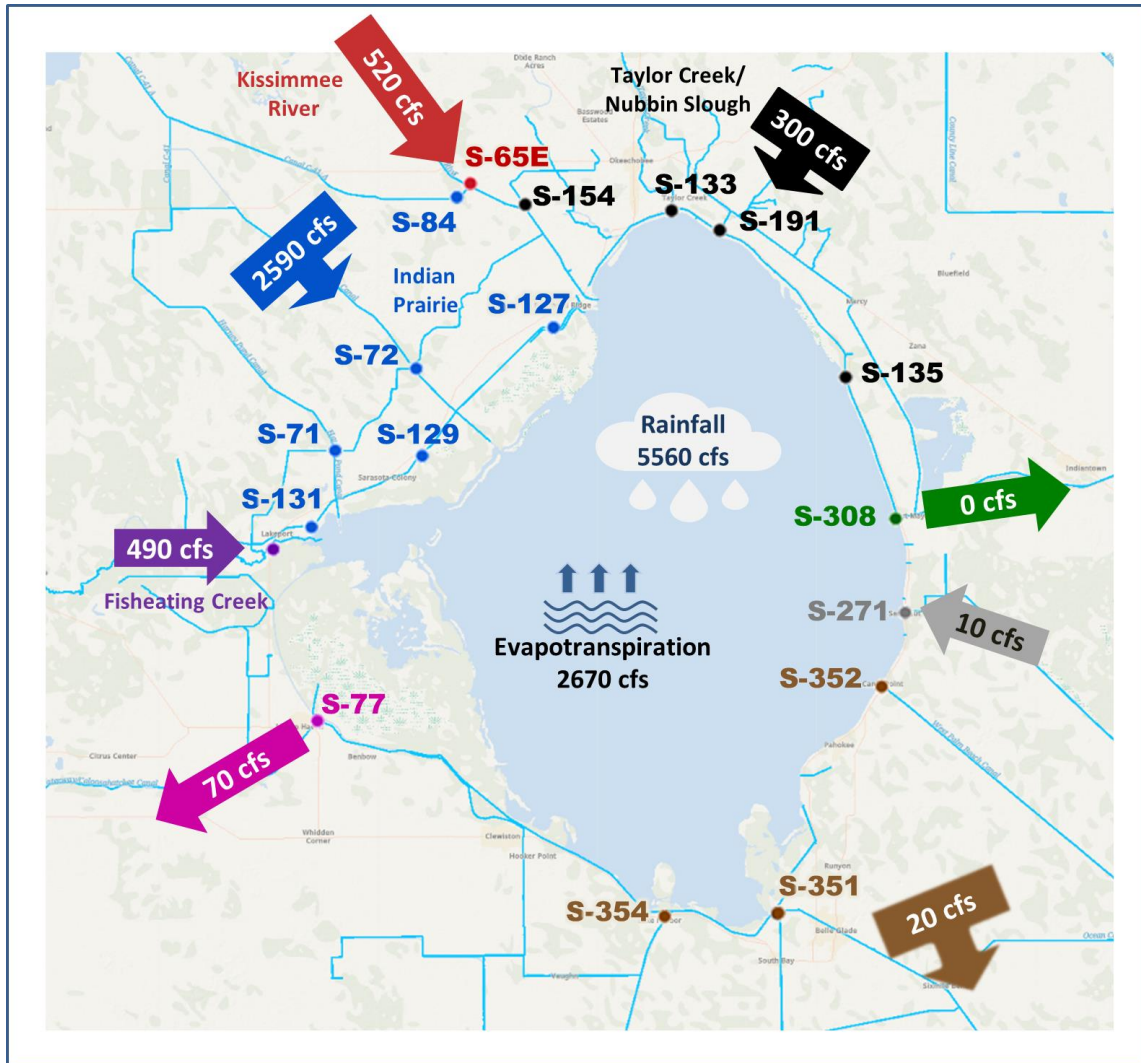


Figure LO-5. Inflows into Lake Okeechobee from Indian Prairie basins, Taylor Creek/Nubbin Slough, Kissimmee River and Fisheating Creek, and outflows to the west via S-77, to the east via S-308, to the south via S-351, S-352, S-354, and to southeast via S-271 (formerly Culvert 10A) for the week of July 29 – August 4, 2024.

Collection Date: July 22-24, 2024

Station	CHL _a (ug/L)	TOXIN (ug/L)	TAXA	Station	CHL _a (ug/L)	TOXIN (ug/L)	TAXA
FEBIN			NS	L001		BDL	<i>mixed</i>
FEBOUT			NS	L004		22.0	<i>Microcys</i>
KISSR0.0	BDL		<i>Raphidio</i>	L006		1.3	<i>Microcys</i>
L005	BDL		<i>Micro/Dolic</i>	L007		BDL	<i>mixed</i>
LZ2	BDL		<i>mixed</i>	L008		3.4	<i>Microcys</i>
KBARSE	BDL		NS	LZ30		BDL	<i>Microcys</i>
RITTAE2	BDL		<i>Microcys</i>	LZ40		8.8	<i>Microcys</i>
PELBAY3	BDL		<i>mixed</i>	CLV10A		1.2	<i>Microcys</i>
POLE3S	BDL		<i>mixed</i>	NCENTER		BDL	<i>Microcys</i>
LZ25A	BDL		<i>Micro/Pseud</i>				
PALMOUT	BDL		<i>Microcys</i>	S308C		0.4	<i>Microcys</i>
PALMOUT1		1.3	<i>Microcys</i>	S77		BDL	<i>mixed</i>
PALMOUT2		3.0	<i>Micro/Pseud</i>				
PALMOUT3		3.1	<i>Microcys</i>				
POLESOUT			NS				
POLESOUT1			NS				
POLESOUT2		BDL	<i>Micro/Dolic</i>				
POLESOUT3		0.3	<i>Microcys</i>				
EASTSHORE		0.5	<i>Microcys</i>				
NES135	BDL		<i>mixed</i>				
NES191	BDL		<i>mixed</i>				

- 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*;
 - Pseud* = *Pseudanabaena*; *Raphi* = *Raphidiopsis*

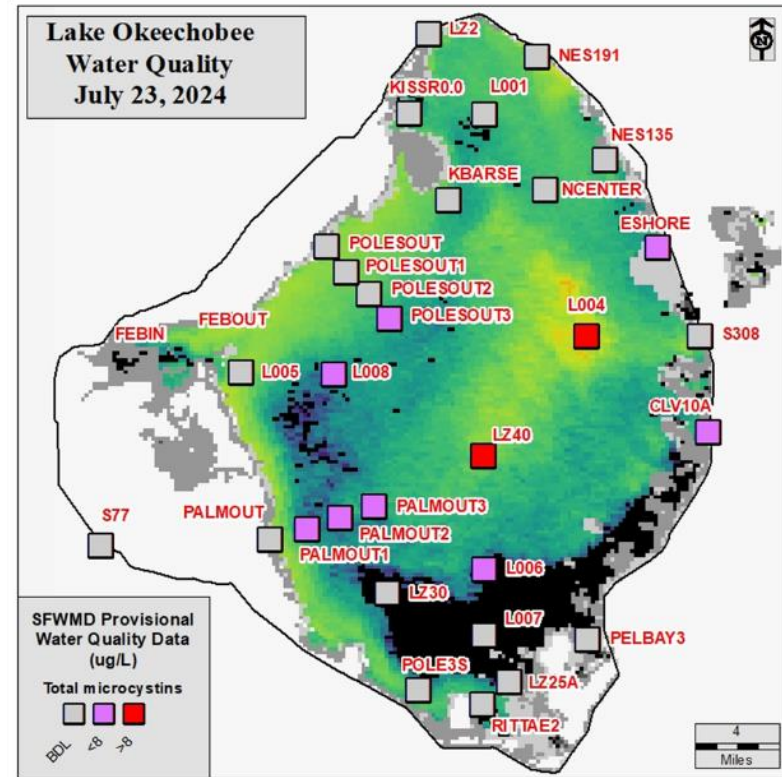


Figure LO-6. Dominant taxa and total microcystin (µg/L) concentration data from July 22-24, 2024. Sampling locations, chlorophyll a, and total microcystin concentrations are overlaid on the July 23, 2024, image from NOAA’s harmful algal bloom monitoring system. Gray color indicates cloud cover.

Estuaries

St. Lucie Estuary

Over the past week, mean total inflow to the St. Lucie Estuary was 2,096 cfs (**Figures ES-1 and ES-2**), and the previous 30-day mean inflow was 1,181 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 12.9. 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 0.9 spat/shell for July, which is a decrease from the previous month (**Figure ES-5**).

Caloosahatchee River Estuary

Over the past week, mean total inflow to the Caloosahatchee River Estuary was 4,107 cfs (**Figures ES-6 and ES-7**), and the previous 30-day mean inflow was 3,621 cfs. For comparison, the historical provisional mean inflows from the contributing areas are shown in **Figure ES-7**.

Over the past week, salinities remained the same at S-79 and Val I-75, all other sites trended downward through the week and increased rapidly on the last day, presumably due to storm surge from Tropical Storm Debby (**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 lower stressed range for adult eastern oysters at Cape Coral, in the optimal range at Shell Point and in the lower stressed range at Sanibel (**Figure ES-10**). The mean larval oyster recruitment rate reported by the FWRI was 1.1 spat/shell at Iona Cove and 36 spat/shell at Bird Island for July, which is a decrease at Iona Cove and an increase at Bird Island from the previous month (**Figures ES-11 and ES-12**).

Surface salinity at Val I-75 was forecast for the next two weeks using an autoregression model (Qiu and Wan, 2013¹) coupled with a linear reservoir model for the tidal basin. Model scenarios included pulse releases at S-79 ranging from 450 to 2,000 cfs with estimated tidal basin inflows of 1,420 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 Qiu, C., and Y. Wan. 2013. Time series modeling and prediction of salinity in the Caloosahatchee River Estuary. *Water Resources Research* 49:5804-5816.

Red Tide

The FWRI reported on August 2, 2023, 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 450 cfs release at S-79 to the Caloosahatchee River Estuary and up to 200 cfs release at S-80 to the St. Lucie Estuary.

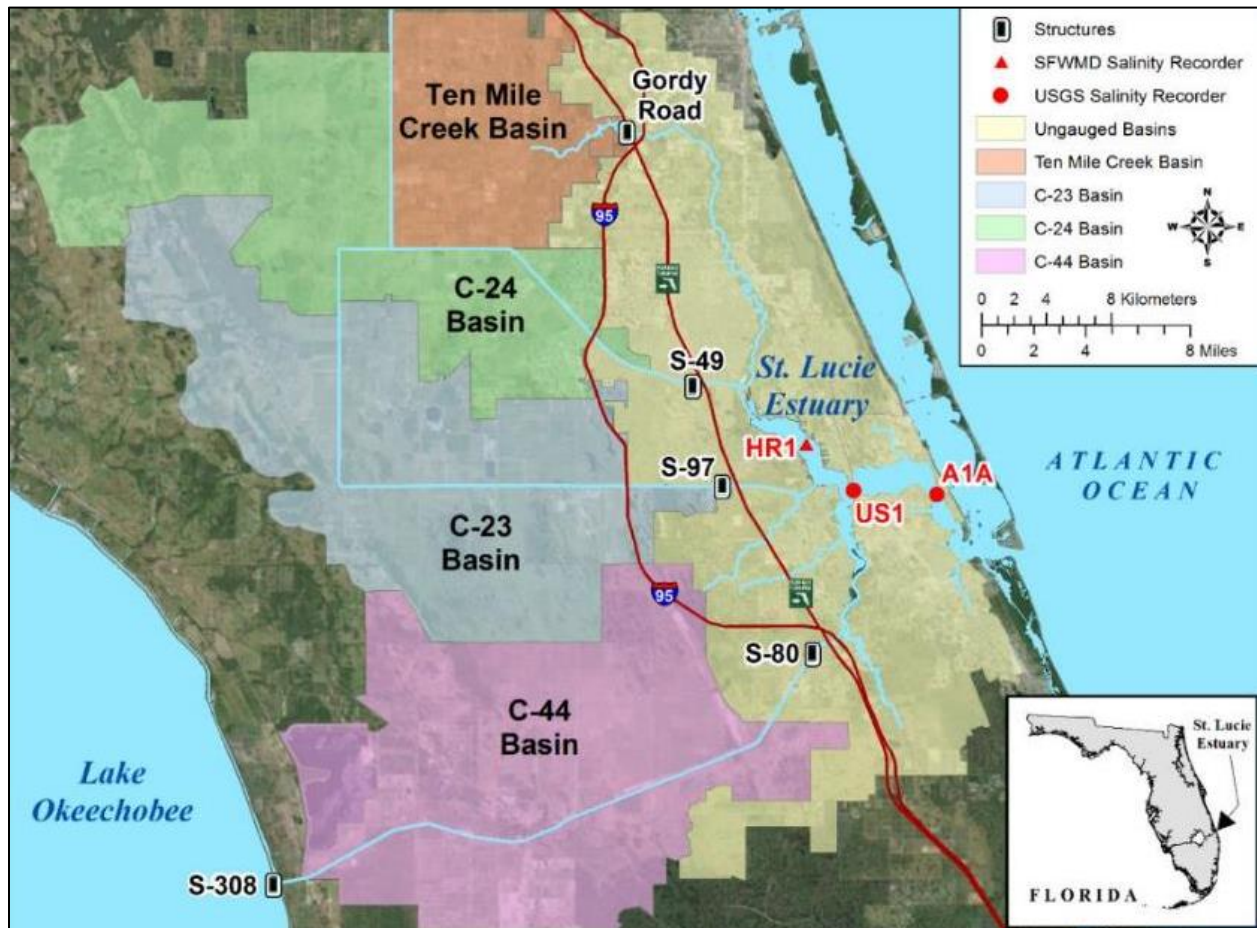


Figure ES-1. Basins, water control structures and salinity monitoring sites in the St. Lucie Estuary.

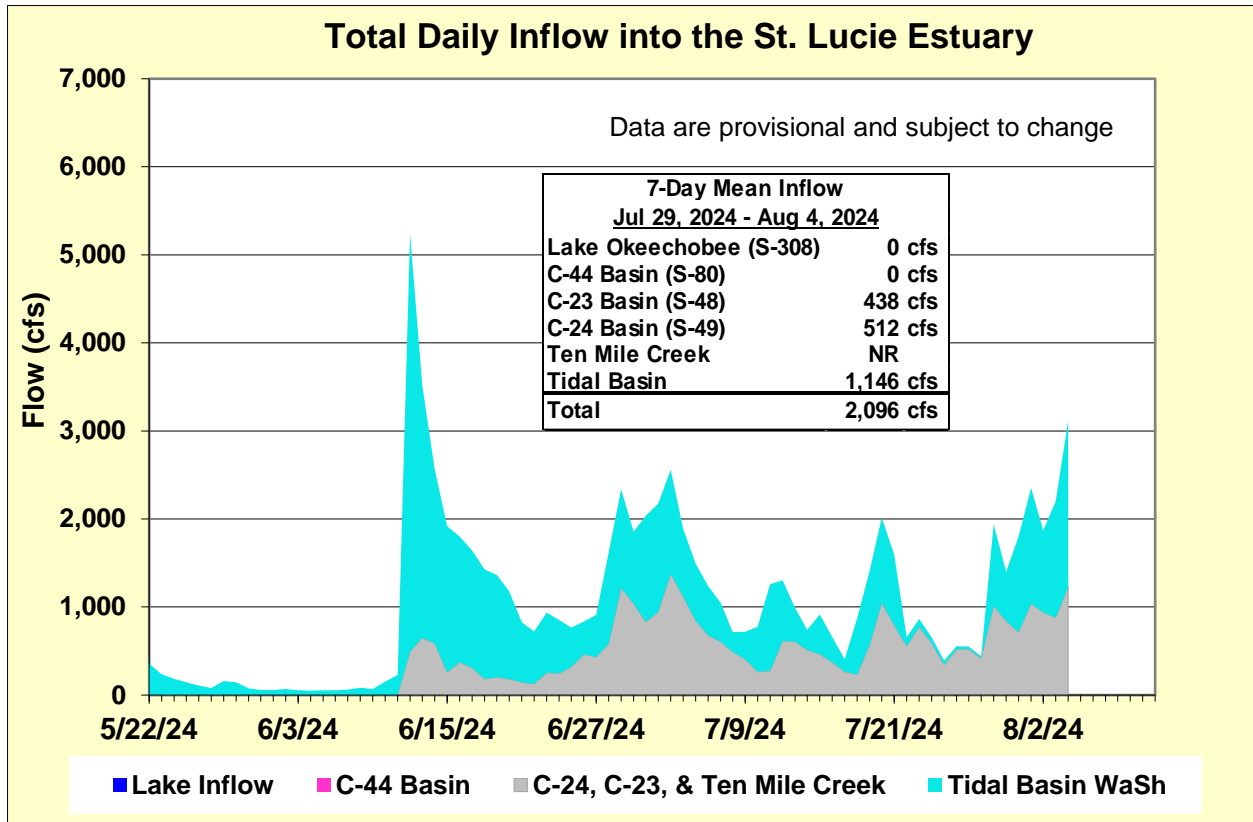


Figure ES-2. Total daily inflows from Lake Okeechobee and runoff from the C-44, C-23, C-24, Ten Mile Creek, and Tidal Basins into the St. Lucie Estuary.

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

Sampling Site	Surface	Bottom	Optimum Envelope
HR1 (North Fork)	5.5 (6.3)	10.3 (12.8)	10.0 – 25.0
US1 Bridge	12.1 (13.9)	13.8 (15.6)	10.0 – 25.0
A1A Bridge	21.0 (23.4)	25.7 (28.0)	10.0 – 25.0

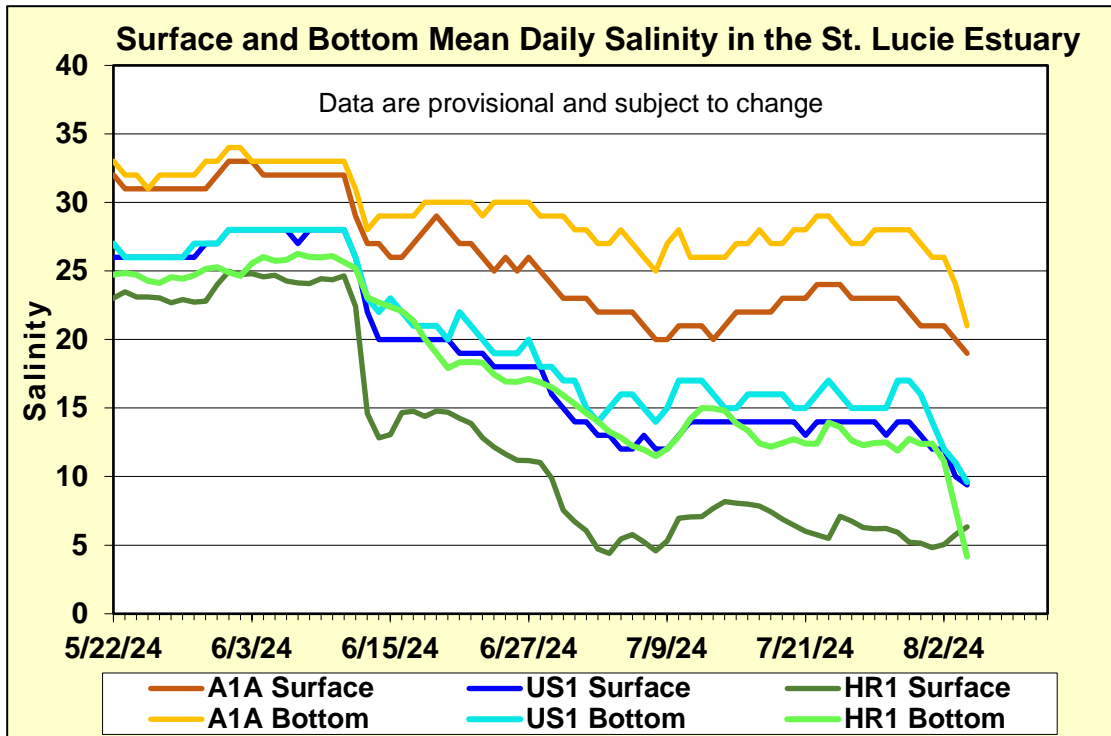


Figure ES-3. Mean daily salinity at the A1A, US1, and HR1 sites in the St. Lucie Estuary.

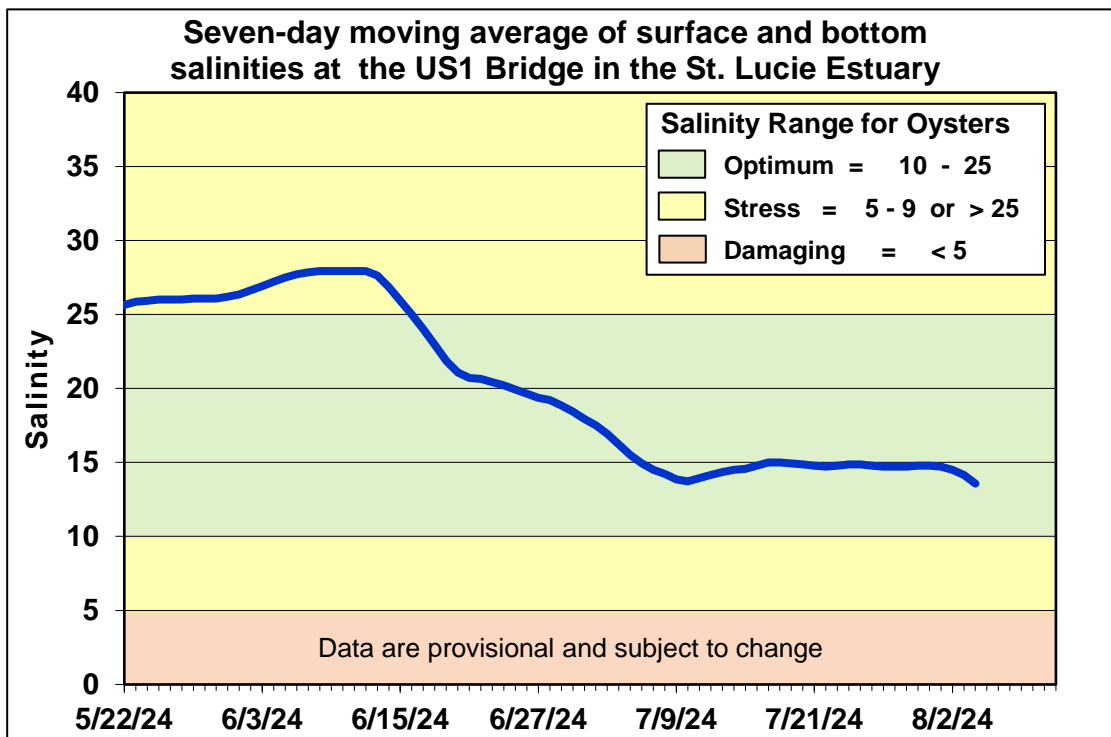


Figure ES-4. Seven-day moving average of the surface and bottom salinities at the US1 Bridge in the St. Lucie Estuary.

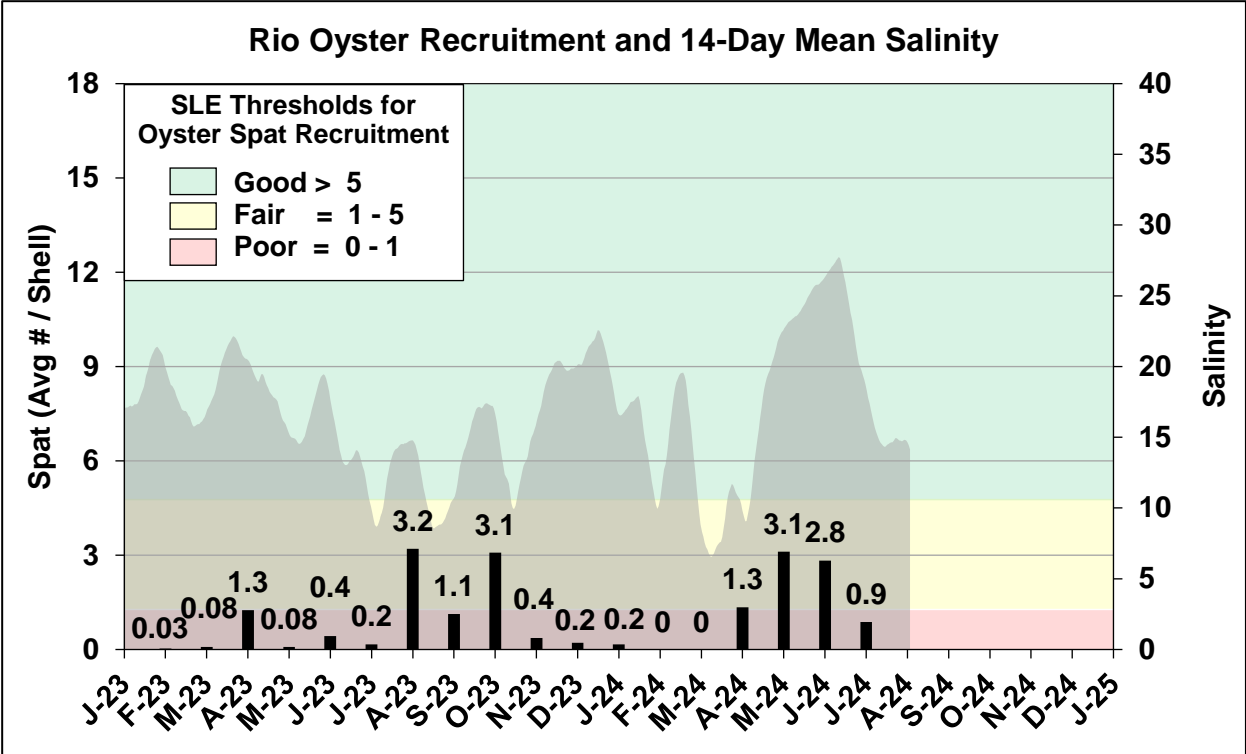


Figure ES-5. Mean oyster recruitment at the Rio oyster monitoring station and 14-day mean salinity at US1 Bridge.

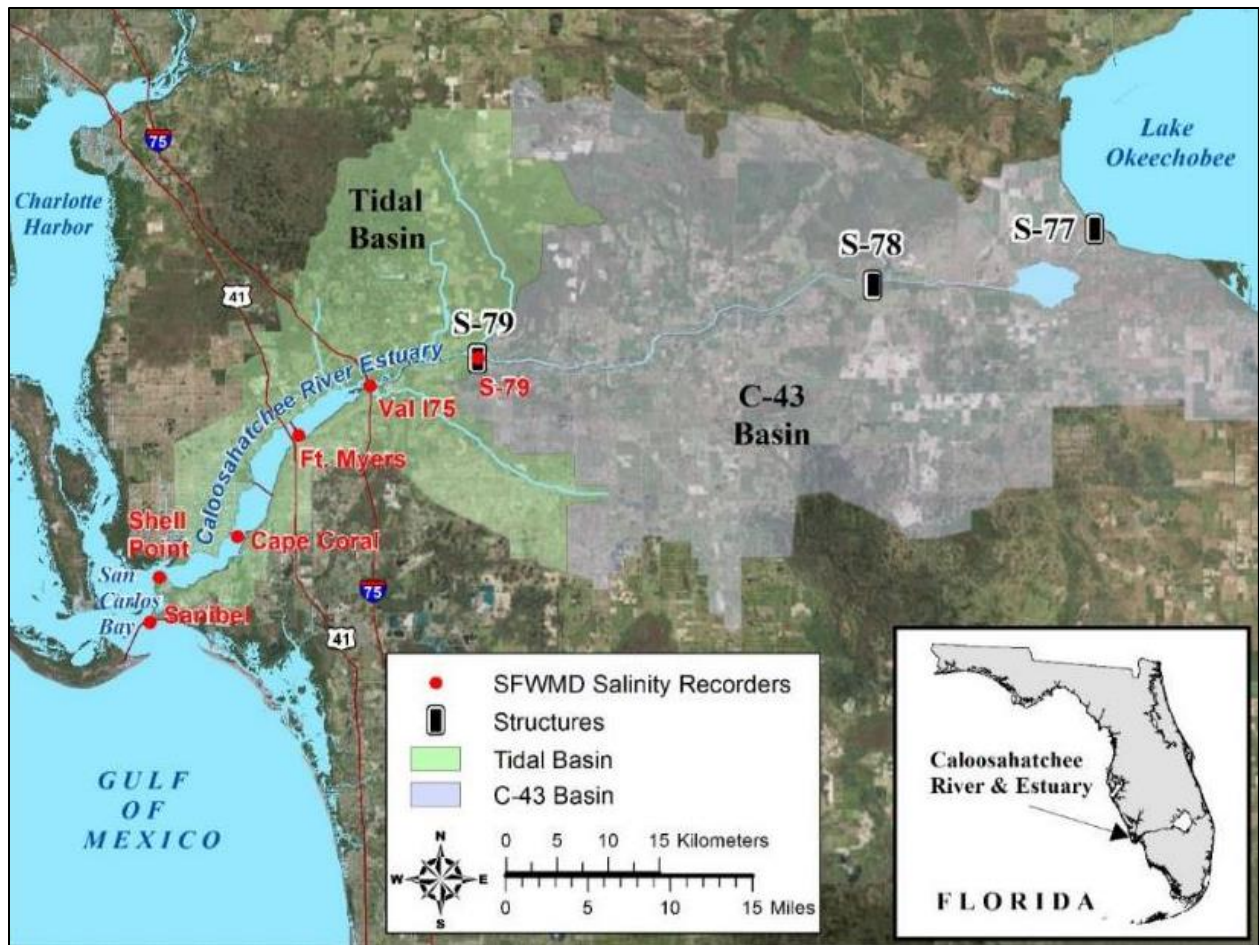


Figure ES-6. Basins, water control structures, and salinity monitoring sites in the Caloosahatchee River Estuary.

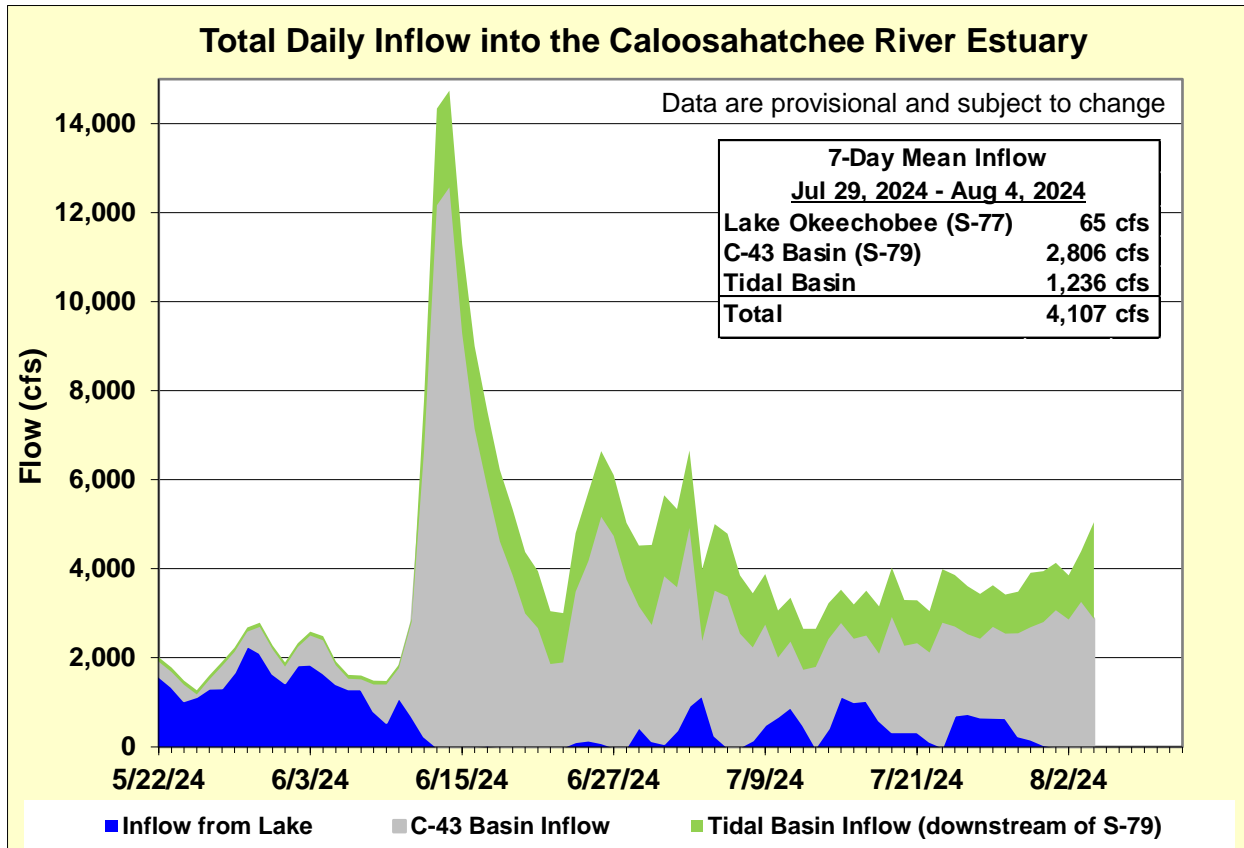


Figure ES-7. Total daily inflows from Lake Okeechobee, and runoff from the C-43 and Tidal basins into the Caloosahatchee River Estuary.

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)	0.2 (0.2)	0.2 (0.2)	0.0 – 10.0
Val I-75	0.2 (0.3)	0.2 (0.2)	0.0 – 10.0
Fort Myers Yacht Basin	0.3 (0.3)	0.4 (0.3)	0.0 – 10.0
Cape Coral	5.8 (5.0)	7.7 (6.7)	10.0 – 25.0
Shell Point	21.4 (20.9)	22.7 (21.9)	10.0 – 25.0
Sanibel	25.2 (26.3)	27.5 (28.6)	10.0 – 25.0

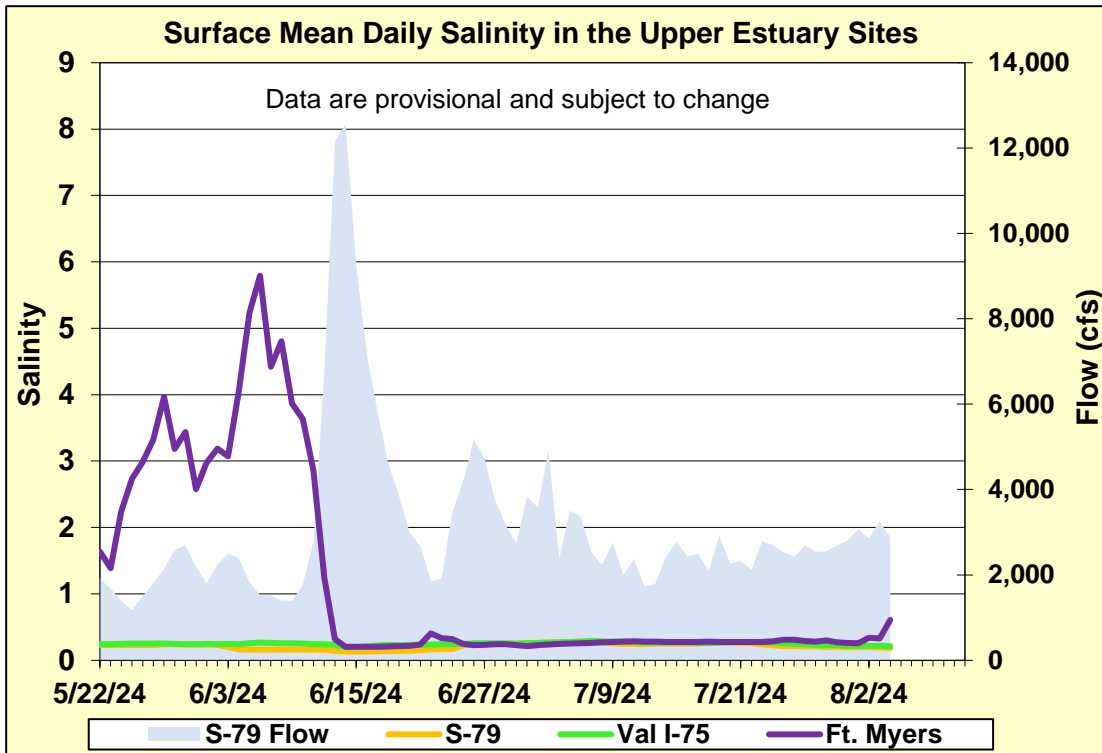


Figure ES-8. Mean daily salinity at upper Caloosahatchee River Estuary monitoring sites and mean daily flow at S-79.

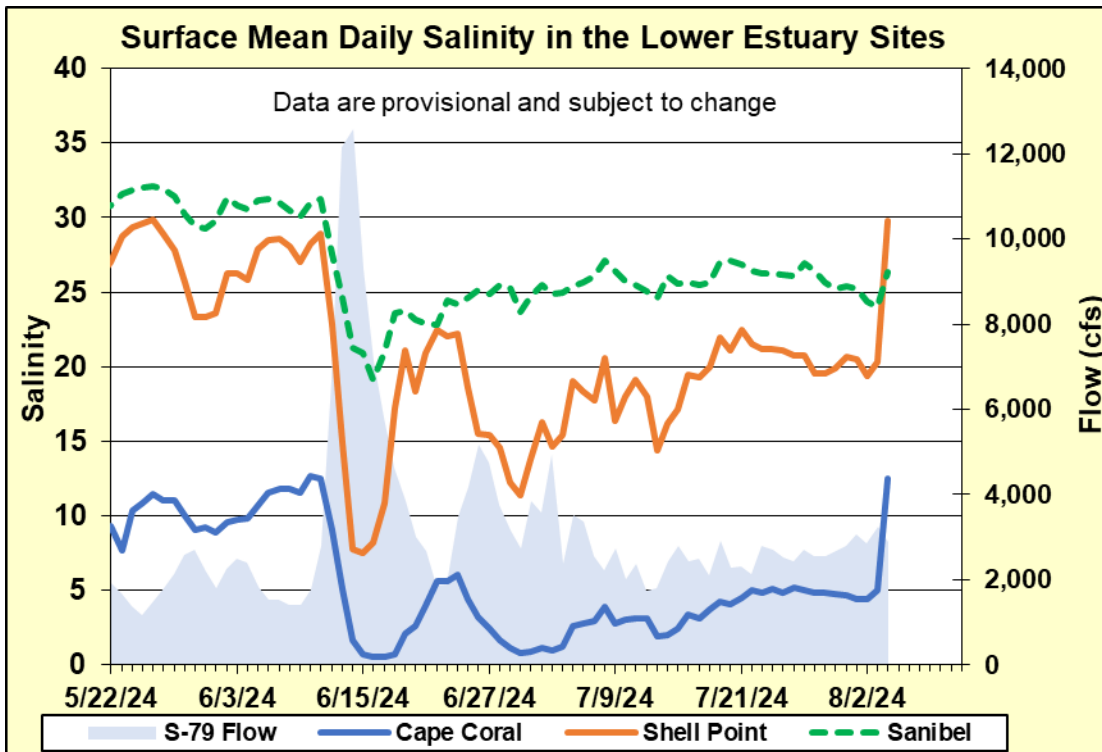


Figure ES-9. Mean daily surface salinity at lower Caloosahatchee River Estuary monitoring sites and mean daily flow at S-79.

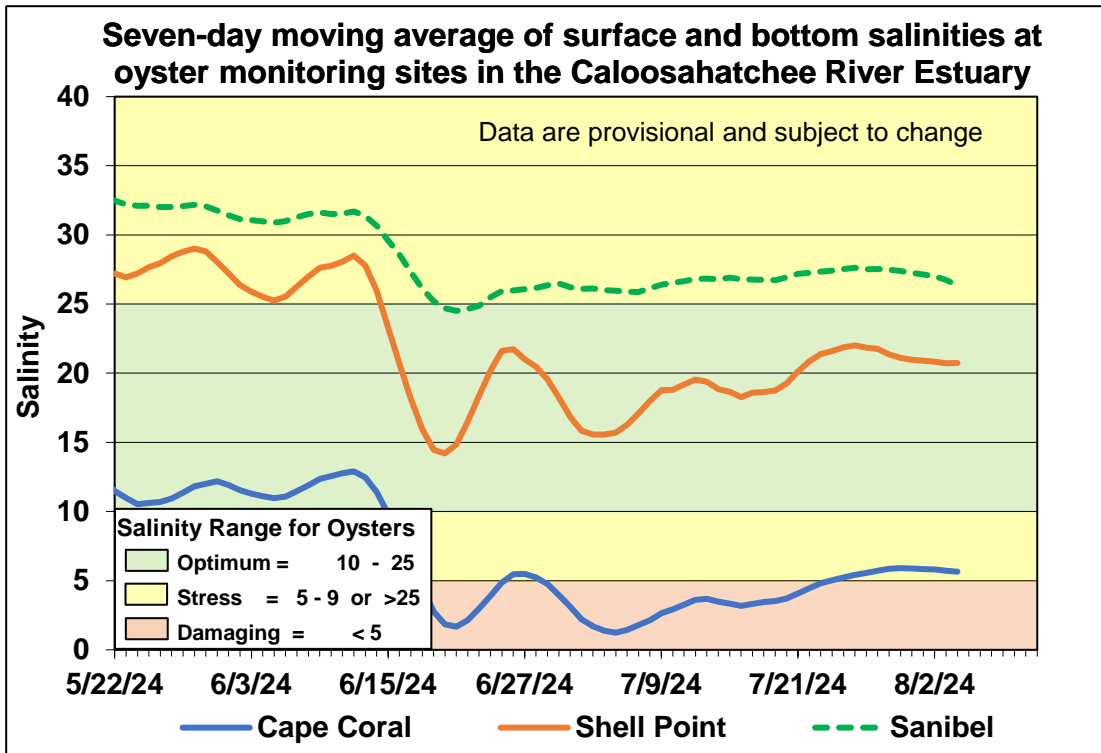


Figure ES-10. Seven-day moving average of surface and bottom salinities at Cape Coral, Shell Point, and Sanibel monitoring sites in the Caloosahatchee River Estuary.

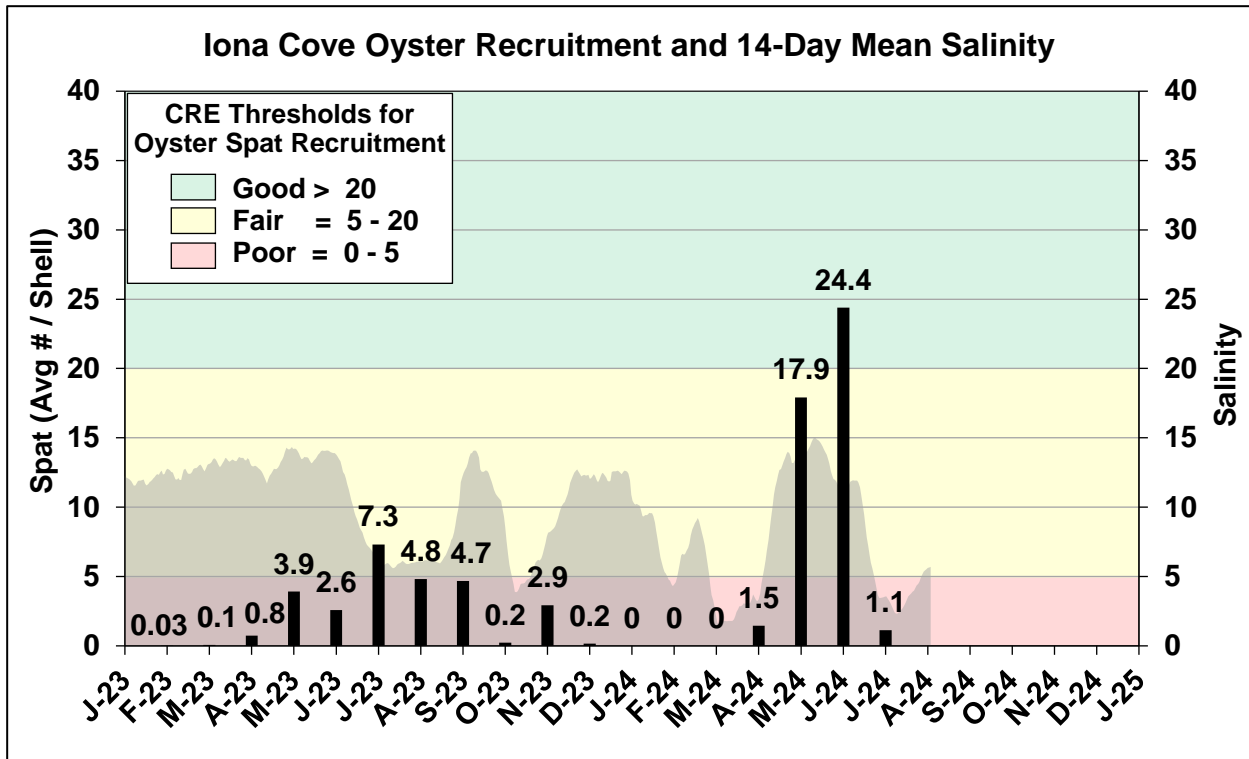


Figure ES-11. Mean oyster recruitment at the Iona Cove oyster monitoring station and 14-day mean salinity at Cape Coral.

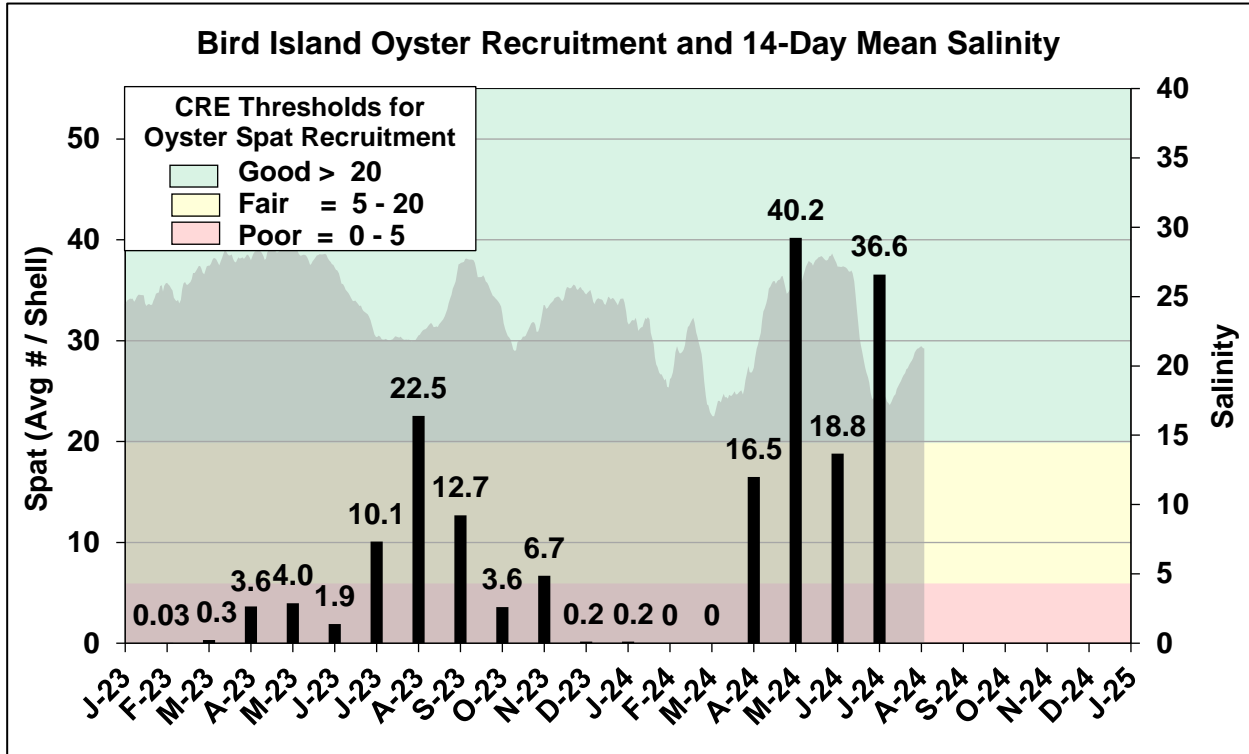


Figure ES-12. Mean oyster recruitment at the Bird Island oyster monitoring station and 14-day mean salinity at Shell Point.

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

Scenario	Simulated S-79 Flow (cfs)	Tidal Basin Runoff (cfs)	Daily Salinity	30-Day Mean Salinity
A	450	1,420	0.3	0.3
B	650	1,420	0.3	0.3
C	1,200	1,420	0.3	0.3
D	2,000	1,420	0.3	0.3

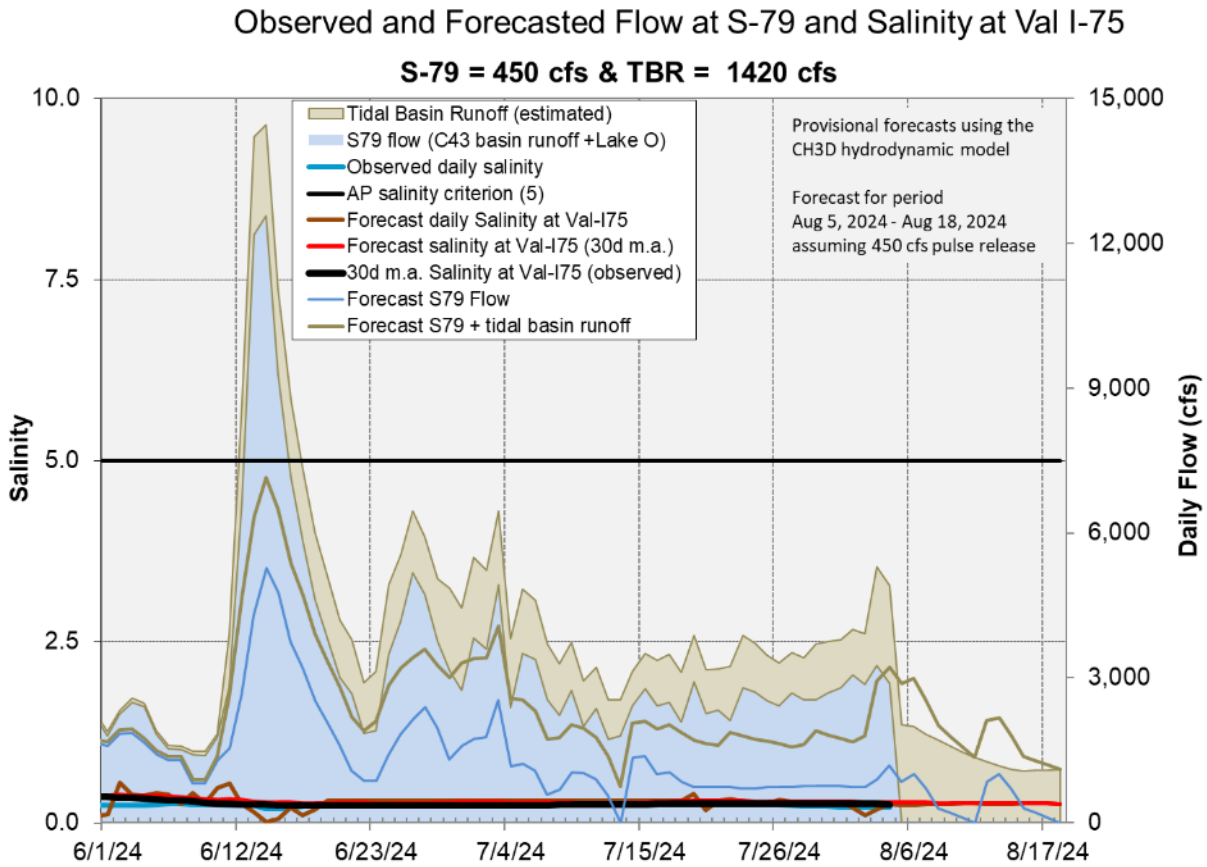


Figure ES-13. Forecasted Val I-75 site surface salinity assuming a 450 cfs pulse release at S-79.

Stormwater Treatment Areas

STA-1E: STA-1E Central Flow-way is offline for construction activities. An operational restriction is in place in the Western Flow-way for post-construction vegetation grow-in, and in the Eastern Flow-way for vegetation establishment following erosion repair. Online treatment cells are near or above target stage. (**Figure S-1**).

STA-1W: Treatment cells are near or above target stage. Vegetation in the flow-ways is highly stressed. The 365-day PLRs for the Eastern and Western Flow-ways are high, and the 365-day PLR for the Northern Flow-ways is below 1.0 g/m²/year (**Figure S-1**).

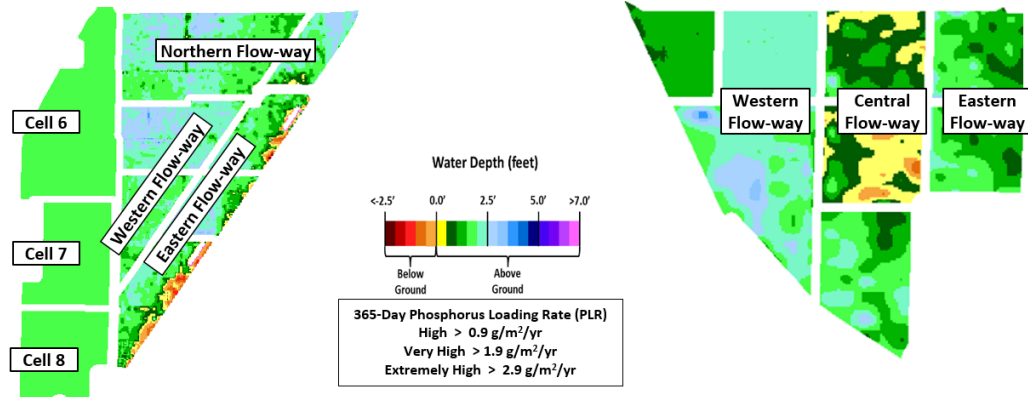
STA-2: Operational restrictions are in place in Flow-ways 2 and 4 for vegetation management activities, and in Flow-way 5 for construction activities. Online treatment cells are near or above target stage. Vegetation in Flow-ways 2, 3, and 4 is stressed, and in 5 is highly stressed. The 365-day PLRs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

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

STA-5/6: Treatment cells are near or above target stage. All treatment cells have highly stressed or stressed vegetation conditions. The 365-day PLRs for Flow-ways 1, 4, 6, 7, and 8 are below 1.0 g/m²/year, and the 365-day PLRs for Flow-ways 2, 3, and 5 are high. (**Figure S-3**).

For definitions on STA operational language see glossary following figures.

Eastern Flow Path Weekly Status Report – 7/29/2024 through 8/4/2024



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

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

Figure S-1. Eastern Flow Path Weekly Status Report

Central Flow Path Weekly Status Report – 7/29/2024 through 8/4/2024

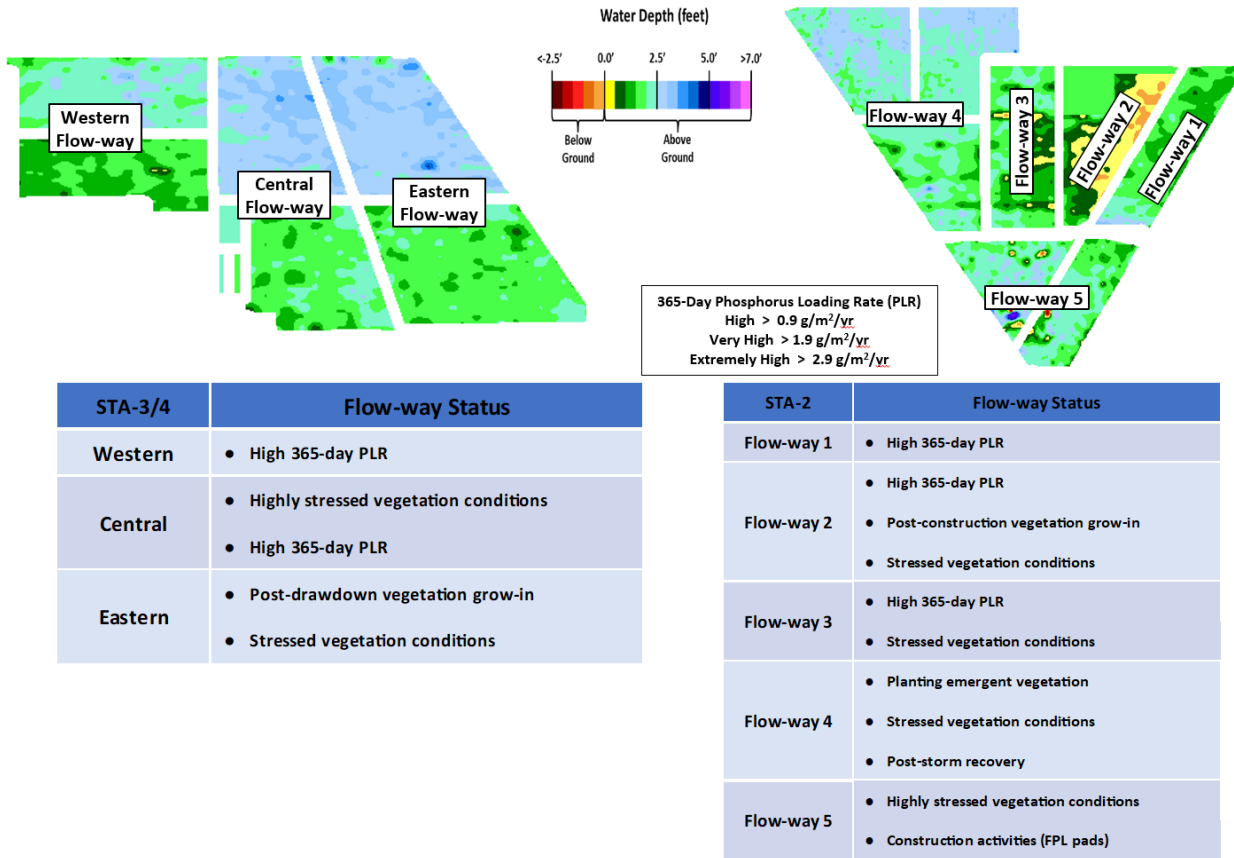


Figure S-2. Central Flow Path Weekly Status Report

Western Flow Path Weekly Status Report – 7/29/2024 through 8/4/2024

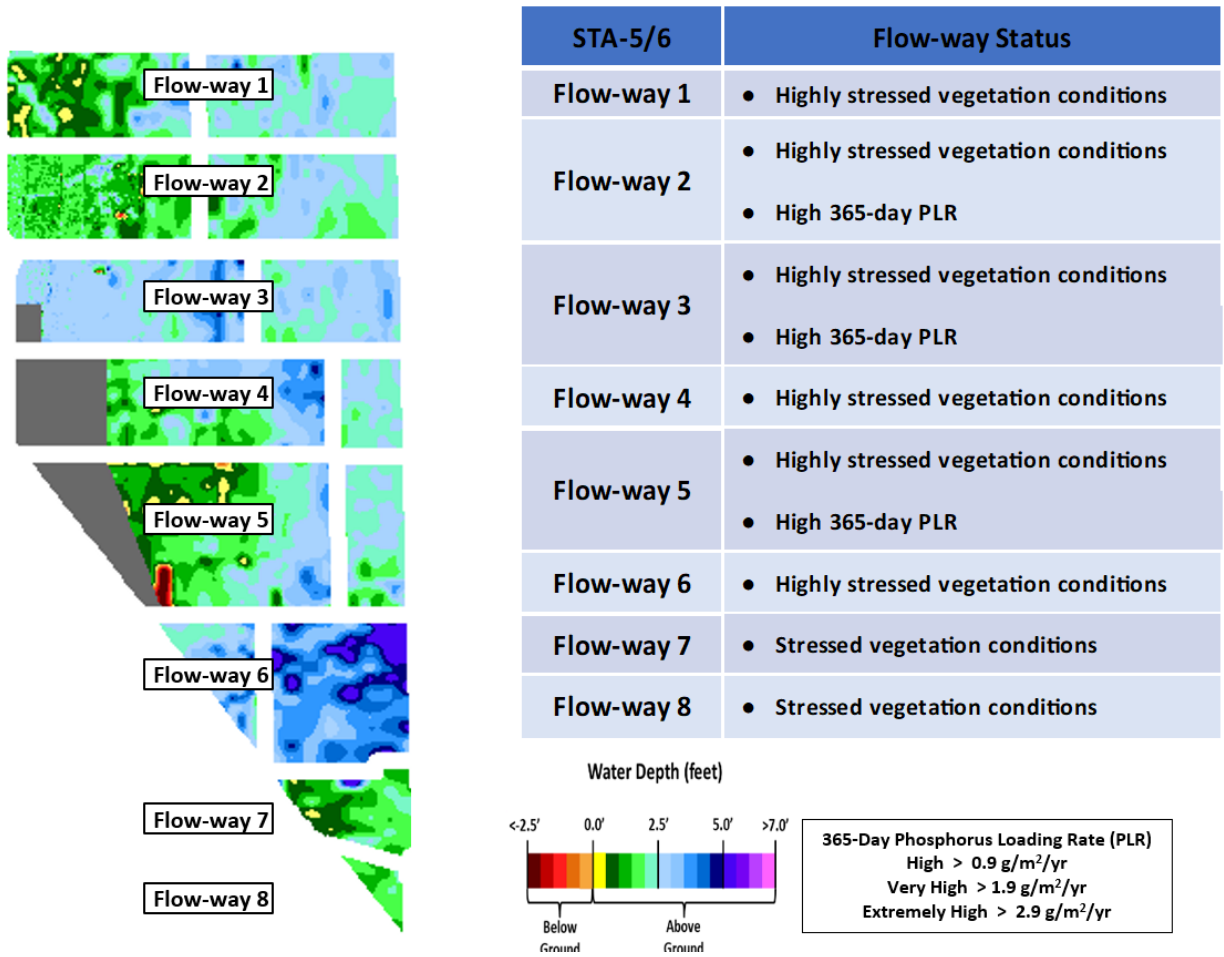


Figure S-3. Western Flow Path Weekly Status Report

Basic Concepts and Definitions for STA Weekly Status Report

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

Everglades

Water Conservation Area Regulation Schedules

More rainfall occurred throughout the Everglades compared to the week prior, especially in Everglades National Park (ENP). WCA-1: Stage within the Refuge remains above schedule but continues to trend towards the regulation line. On Sunday, August 4, 2024, the 3-Gauge average was 0.18 feet above the Zone A1 regulation line. WCA-2A: Stage at gauge 2A-17 is now ascending along the slope of the regulation line. The average on Sunday was 0.9 feet above the Zone A line. WCA-3A: The 3-Gauge average stage increased over the past week, remaining above the Zone A regulation line by 0.88 feet on Sunday. WCA-3A North: the stage at Gauge 62 (NW corner) increased, falling just above the Upper Schedule line last week. The average on Sunday was 0.08 feet above the Upper Schedule. See figures **EV-1** through **EV-4**.

Water Depths

The SFWDAT model output for August 4, 2024, shows a hydropattern that is deeper than two months ago, especially in the west. Pondered conditions continue to expand from the upper reaches of the L-67s south into the historically pondered region of southern WCA-3A and northern ENP. The northern end of the Refuge still has some potential for water at ground surface. Hydrologic connectivity is being well maintained within the major sloughs of ENP. Current WDAT water depth estimates show a mixture of wetter and drier conditions when compared to one month ago across the Everglades Protection Area, with the potential for slightly wetter conditions in WCA-1, WCA-2B, WCA-3B, eastern WCA-3A, and ENP, while Big Cypress National Preserve (BCNP) is shallower throughout. The comparison to modeled conditions a year ago illustrates a mix of deeper and shallower conditions. Central WCA-1, eastern ENP and most of WCA-2A (especially the eastern side) are shallower. Most of WCA-3A, the entirety of BCNP, and western ENP are slightly deeper. Comparing current conditions to the 20-year percentiles for August 4th; depth conditions remain around the 90th percentile for this time of the year in northern Shark River Slough, most of WCA-3A South, and BCNP. Conditions are drier than average in northeast WCA-2A, WCA-2B and mixed in WCA-1.

Taylor Slough and Florida Bay

All stages increased across Taylor Slough over the past week, with an average increase of 0.13 feet. Changes ranged from +0.05 feet at P37 in the southern slough to +0.24 feet at E112 in the northern slough (**Figure EV-8** and **Figure EV-9**). Taylor Slough water levels remain above the recent average for this time of year by 3.3 inches compared to before the Florida Bay initiative (starting in 2017), an increase of 1.0 inch relative to last week. Both the Craighead Pond (CP) and Taylor Slough Bridge (TSB) stages are below estimated historical levels (circa 1900) by 0.54 and 1.31 feet, respectively.

Average Florida Bay salinity was 25.8, a decrease of 1.4 from last week. Salinity decreased at most sites, with changes ranging from -4.7 at Garfield Bight (GB) in the western nearshore region to +0.9 at Duck Key (DK) in the eastern region (**Figure EV-8**). Salinity remains within the WY2001-2016 Interquartile Range (IQR) and above estimated historical levels (circa 1900) in the western and central regions and is below the IQR but above historical levels in the eastern region (**Figure EV-10**). Average Florida Bay salinity

remains below its recent average for this time of year by 2.7, a decrease of 1.5 from last week.

Salinity at the Taylor River (TR) station in the mangrove zone (tracked for the Florida Bay MFL) was 1.2. The 30-day moving average was 1.6, a decrease of 0.2 from last week (**Figure EV-11**). The 365-day moving sum of flow from the five major creeks (McCormick Creek, Taylor River, Mud Creek, Trout Creek, West Highway Creek) was 389,219 acre-feet (**Figure EV-11**)

Average rainfall across Taylor Slough and Florida Bay was 2.40 inches over the past week, based on the 18 gauges used for this report. Rainfall ranged from 1.13 inches at Royal Palm Lake (RPL) in the northern slough to 3.50 inches at Whipray Basin (WB) in the central region (**Figure EV-12**). Wind directions and speeds in Florida Bay ranged from 0.4 mph SW on July 29th to 33.9 mph SE on August 4th (**Figure EV-12**).

Average daily flow from the five major creeks totaled 349 acre-feet last week, with net positive flows for the week. Total daily creek flow ranged from –3,005 acre-feet on August 4th to 1,847 acre-feet on July 30th (**Figure EV-13**). Average daily flow for the week was 3,251 acre-feet below estimated historical levels (circa 1900).

Implications for water management

The ecology of the Everglades benefits from ascension rates of less than 0.18 feet per week. WCA-2A and southern WCA-2B should be monitored and may benefit from reduced ascension rates. The Dynamic Position Analysis modeling for gauge 3-63 in northeast WCA-3A suggests that wetter than average conditions will be required to have the potential of reaching the threshold depths required for nesting to occur at the critical Alley North colony. Maintaining relatively long hydroperiods in northern and central WCA-3A will be critical for a successful 2025 wading bird nesting season. Continued freshwater inputs to the park and into Florida Bay is helping to maintain ecologically desirable salinities, and maintaining inputs of water southward will help to prevent ecologically undesirable salinity swings in Florida Bay nearshore areas. Individual regional recommendations can be found in **Table EV-2**.

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

Everglades Region	Rainfall (inches)	Stage change (feet)
WCA-1	2.32	+0.11
WCA-2A	2.36	+0.31
WCA-2B	2.83	+0.27
WCA-3A	2.58	+0.15
WCA-3B	3.13	+0.22
ENP	3.21	+0.21

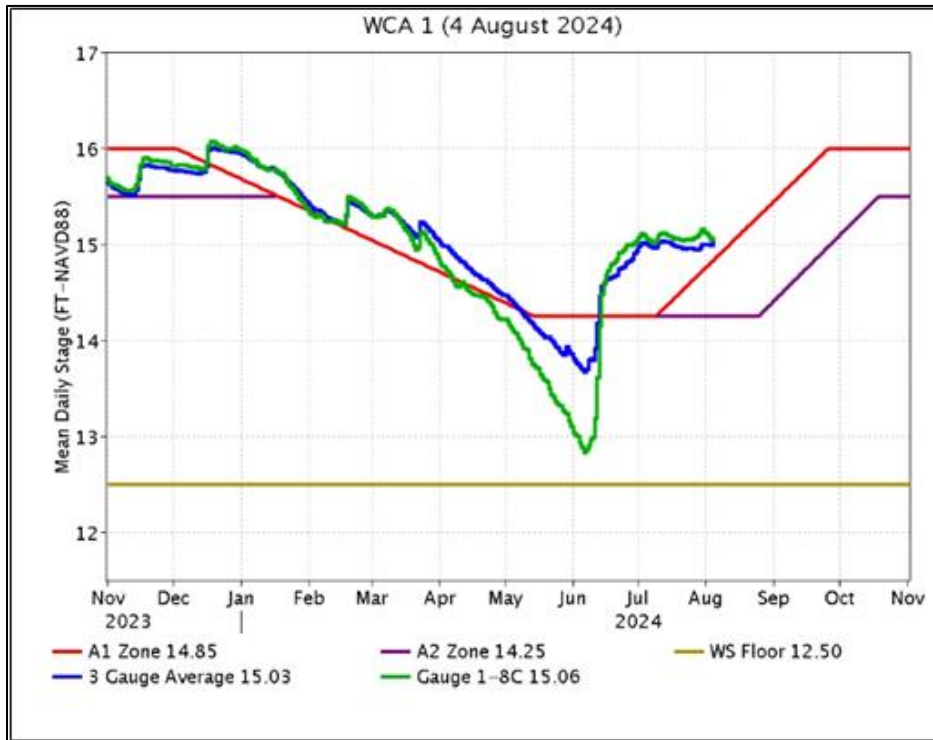


Figure EV-1. WCA-1 stage hydrographs and regulation schedule.

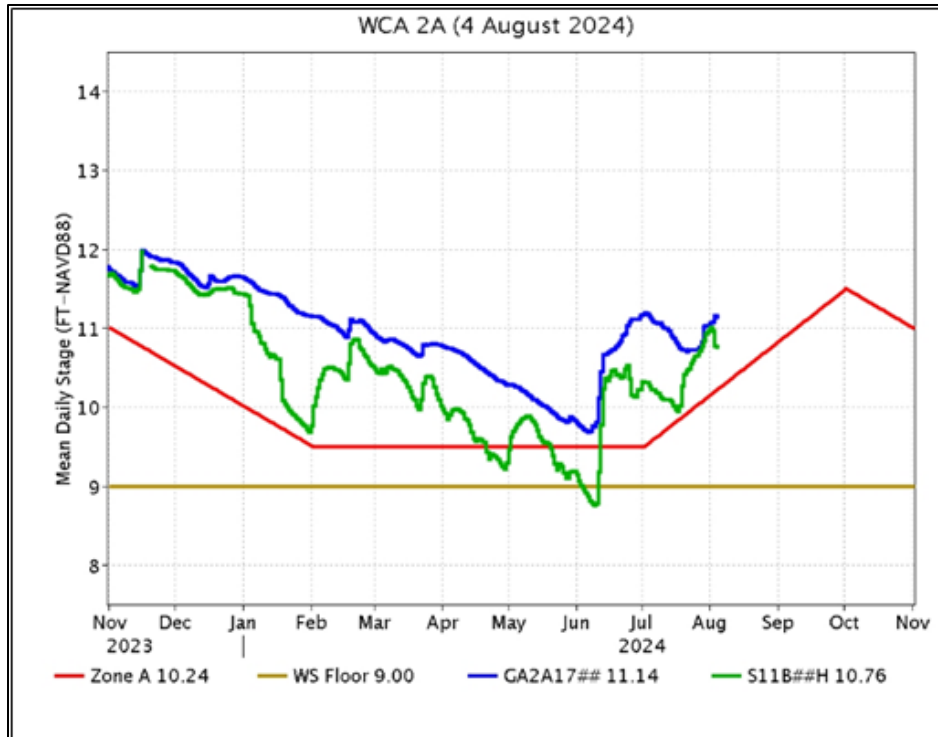


Figure EV-2. WCA-2A stage hydrographs and regulation schedule.

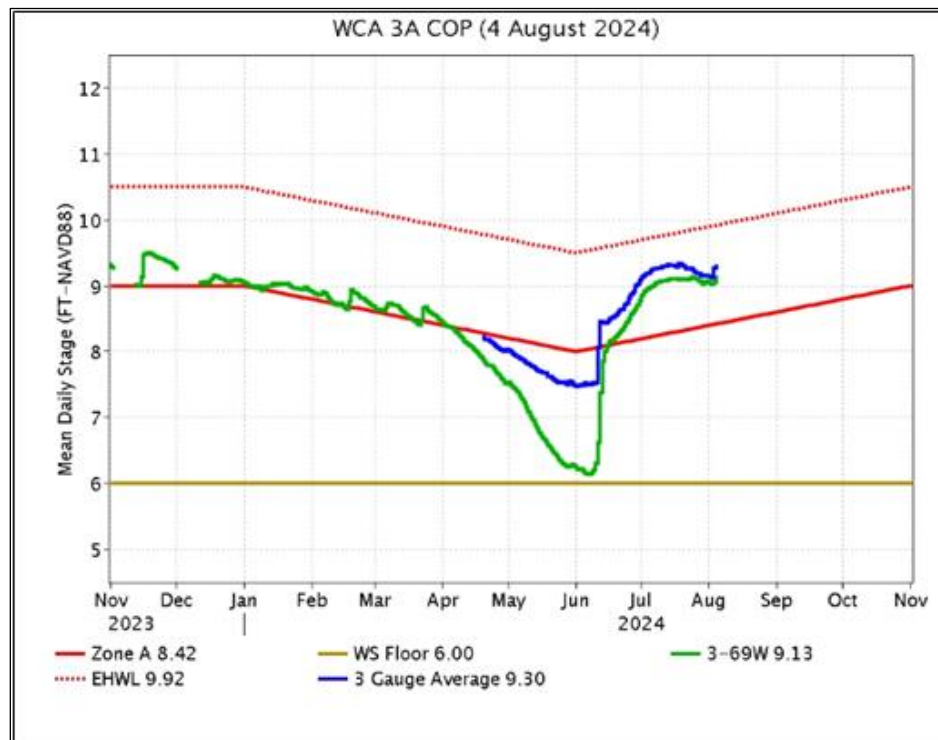


Figure EV-3. WCA-3A stage hydrographs (three-gauge average, 3-69W) and regulation schedule.

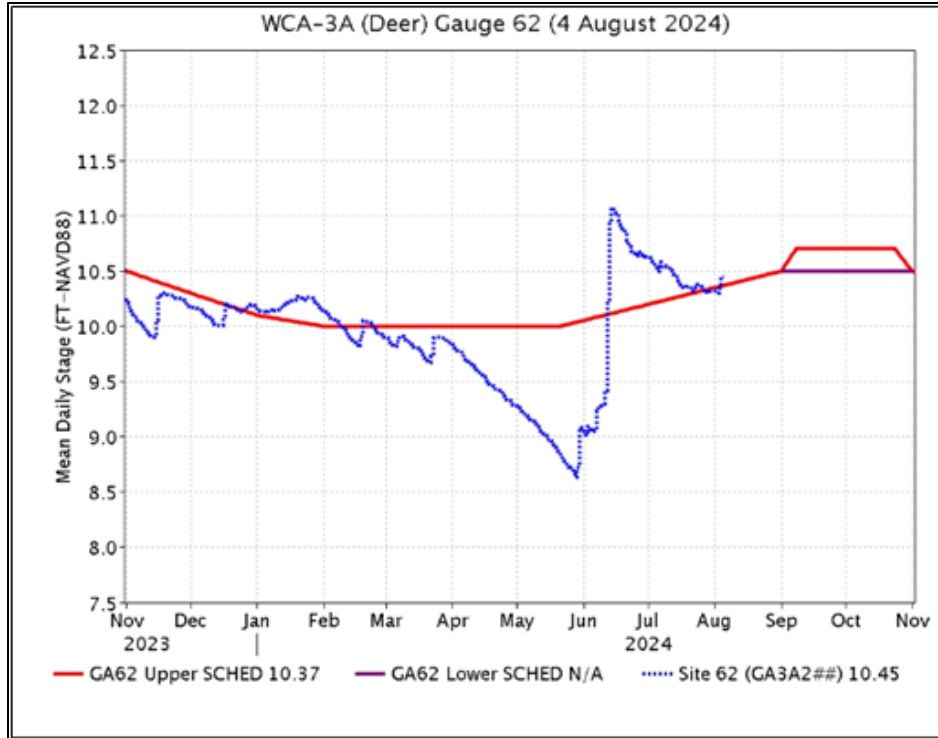


Figure EV-4. WCA-3A stage hydrograph (Deer gauge; Site 62) and GA62 regulation schedule.

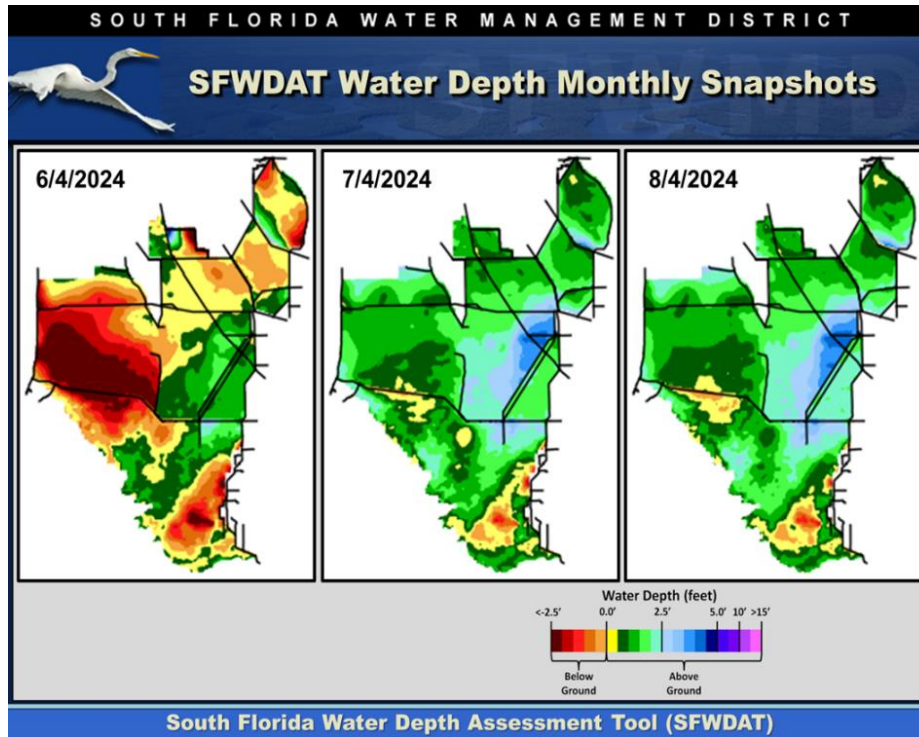


Figure EV-5. Everglades water depths from two months ago (left), one month ago (center) and present (right), based on SFWDAT.

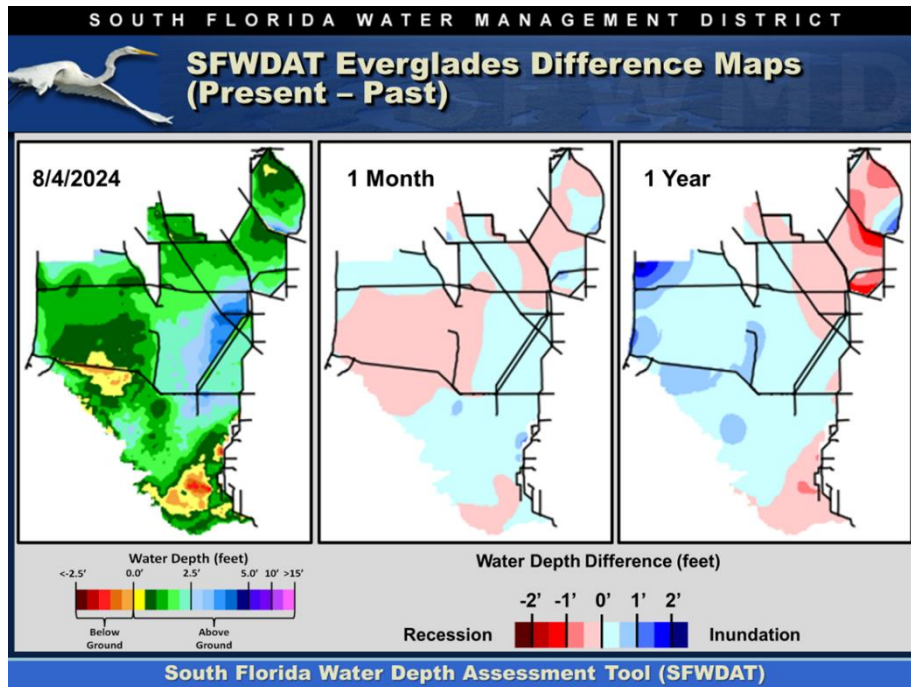


Figure EV-6. Present Everglades water depths (left) and water depth changes from one month (center) and one year (right) ago, based on SFWDAT.

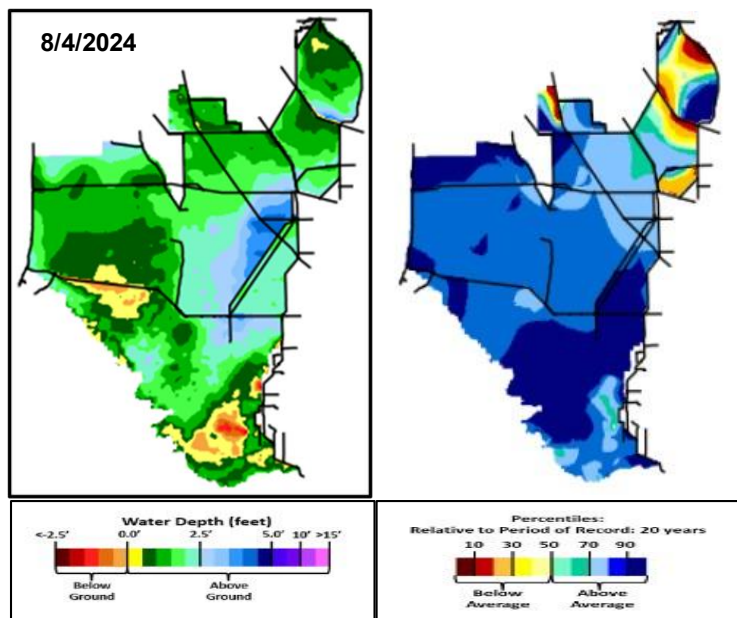


Figure EV-7. Present water depths (July 30, 2024) compared to the day of year average over the previous 20 years.

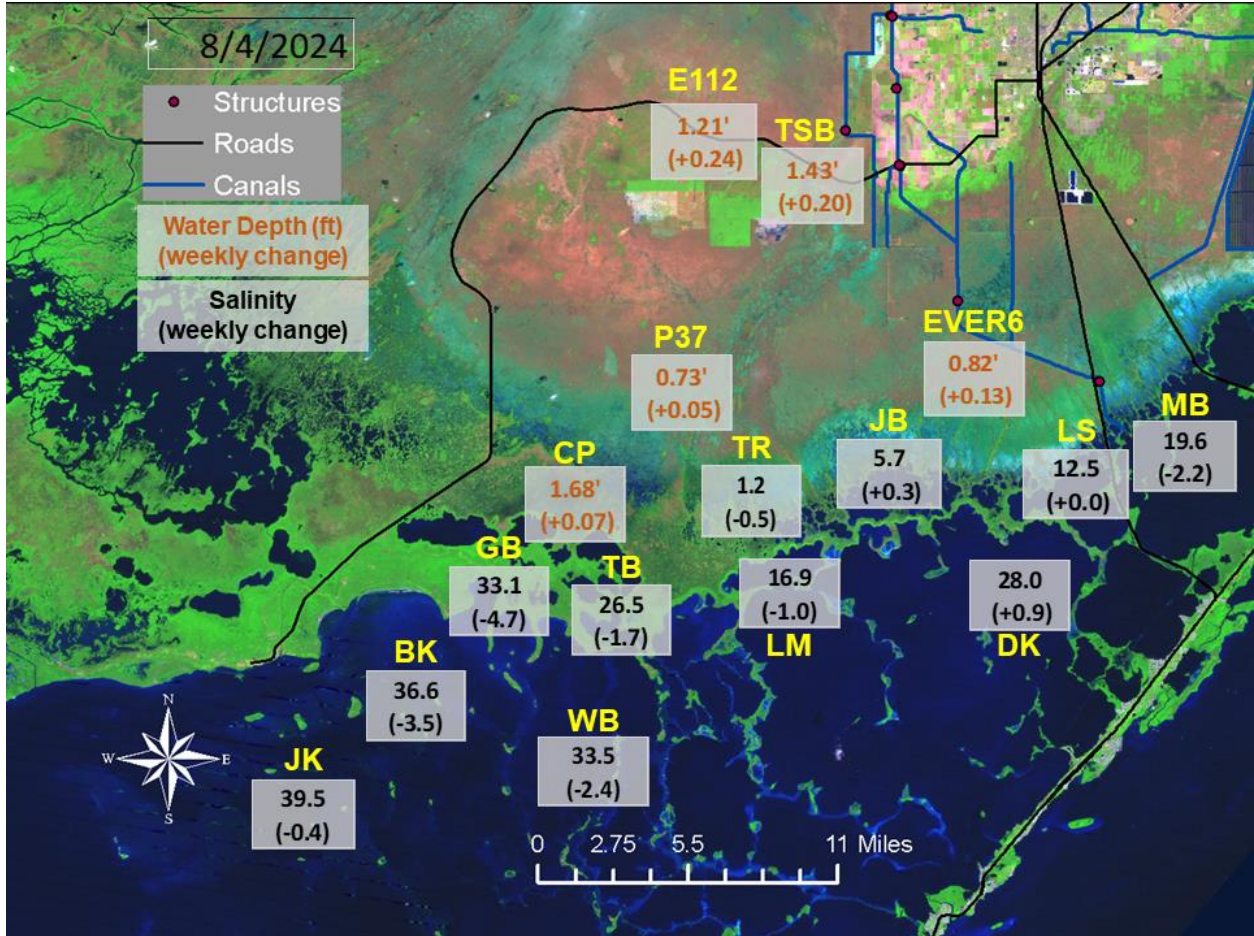


Figure EV-8. Taylor Slough water depths with changes since a week ago and Florida Bay salinities with changes since a week ago.

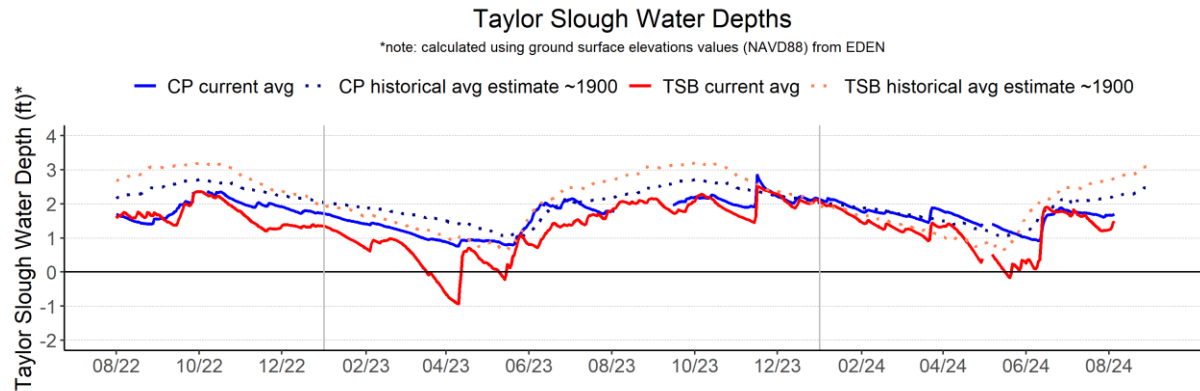


Figure EV-9. Taylor Slough water depth time series for Taylor Slough Bridge (TSB; northern slough) and Craighead Pond (CP; southern slough).

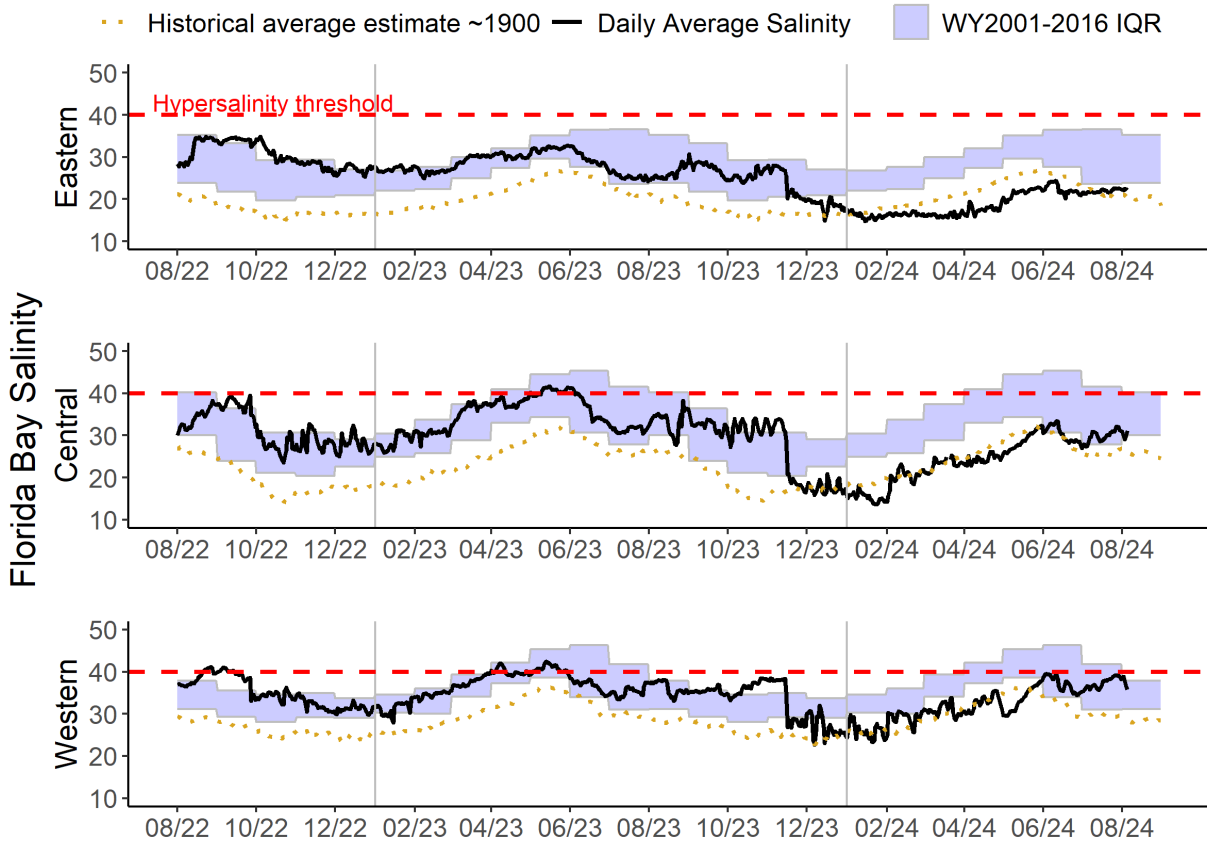


Figure EV-10. Eastern (top panel), Central (middle panel) and Western (bottom panel) Florida Bay daily average salinities with WY2001-2016 interquartile (25-75 percentile) ranges (IQR) and estimated historical daily average salinities. The hypersalinity threshold indicates the level at which salinities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

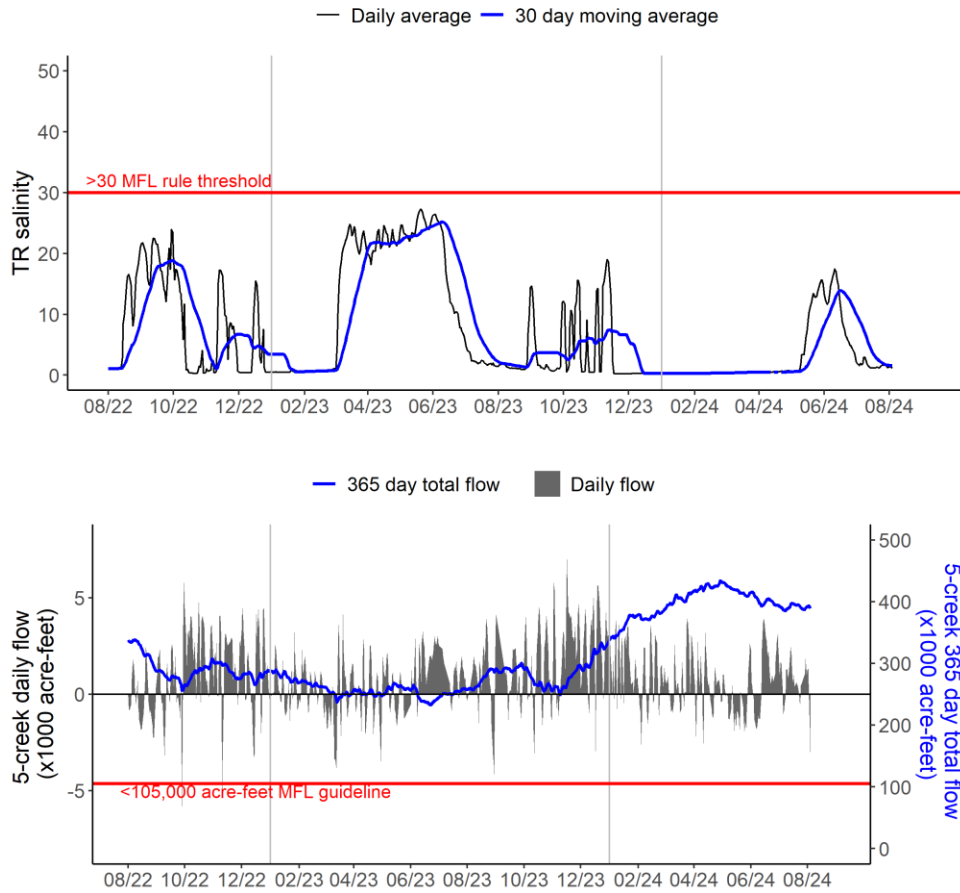


Figure EV-11. Salinity at Taylor River (TR; top) and creek inflow to Florida Bay (bottom) from the five major creeks (McCormick Creek, Taylor River, Mud Creek, Trout Creek, and West Highway Creek). The 30-day moving average salinity and 365-day total creek flow are tracked for the Florida Bay MFL criteria.

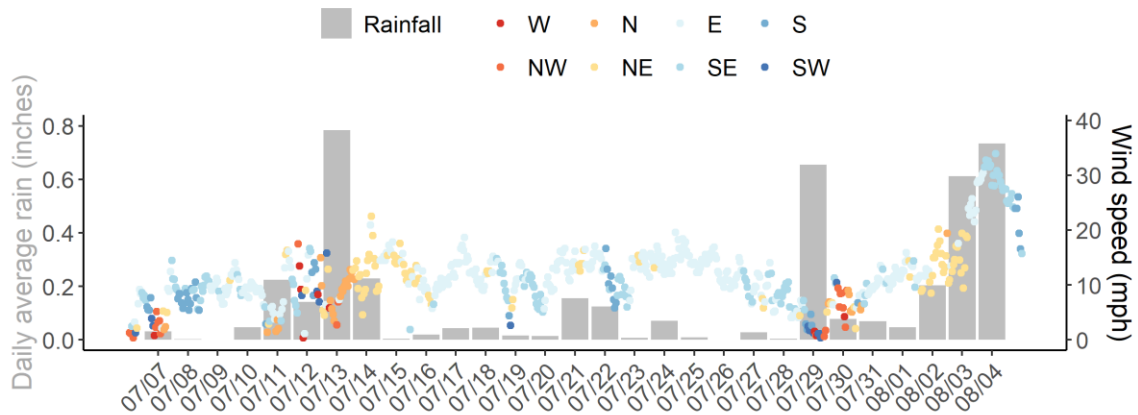


Figure EV-12. Daily average rain across Taylor Slough and Florida Bay, along with hourly average wind speed and direction (measured at Long Key) in Florida Bay over the past four weeks.

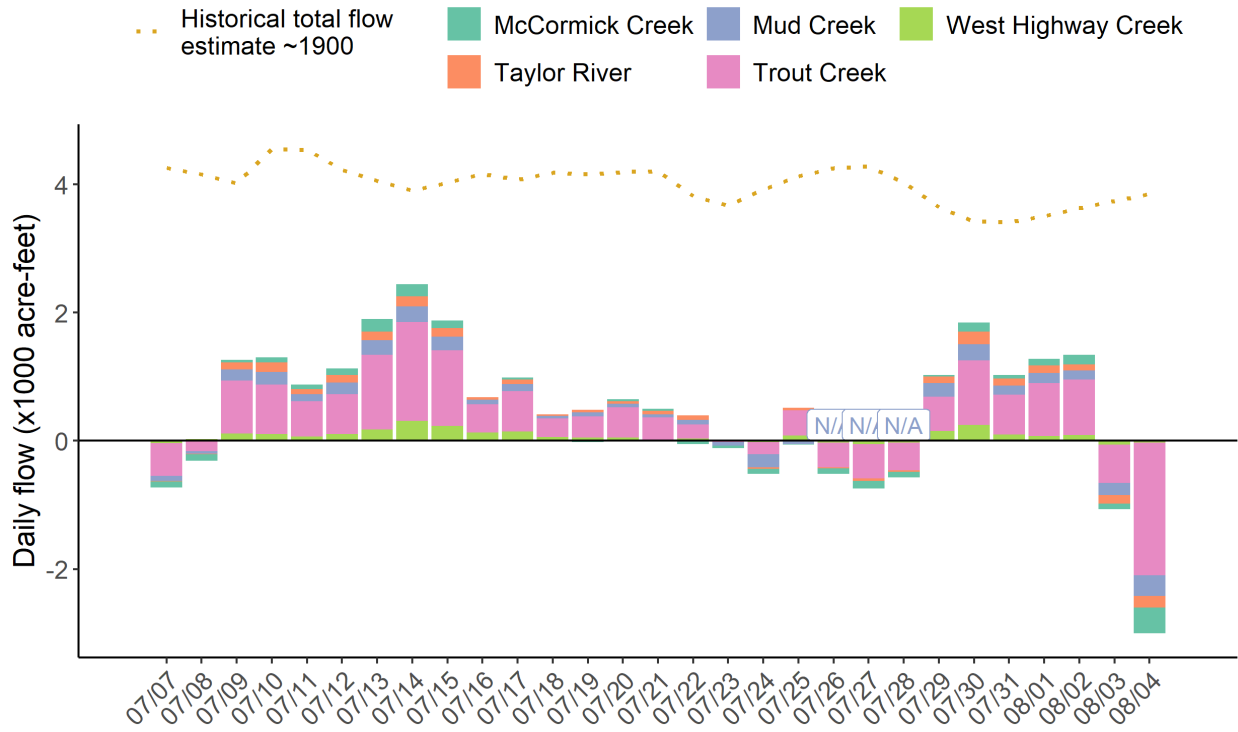


Figure EV-13. Daily average creek flow summed between five creeks with estimated historical daily flow over the past four weeks.

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

SFWMD Everglades Ecological Recommendations, August 5, 2024 (red is new)			
	Weekly change	Recommendation	Reasons
WCA-1	Stage increased by 0.11'	Ascension rate of less than 0.18' per week.	Protect within basin and downstream habitat and wildlife.
WCA-2A	Stage increased by 0.31'	Monitor and reduce ascension rates if possible	Protect within basin and downstream habitat and wildlife.
WCA-2B	Stage increased by 0.27'	Monitor and reduce ascension rates if possible	Protect within basin and downstream habitat and wildlife.
WCA-3A NE	Stage increased by 0.17'	Ascension rate of less than 0.18' per week.	Protect within basin and downstream habitat and wildlife.
WCA-3A NW	Stage increased by 0.17'	Ascension rate of less than 0.18' per week.	
Central WCA-3A S	Stage increased by 0.13'	Ascension rate of less than 0.18' per week.	Protect within basin wildlife.
Southern WCA-3A S	Stage increased by 0.14'	Ascension rate of less than 0.18' per week.	
WCA-3B	Stage increased by 0.22'	Ascension rate of less than 0.18' per week.	Protect within basin and downstream habitat and wildlife.
ENP-SRS	Stage increased by 0.21'	Make discharges to ENP according to COP and TTFB protocol while adaptively considering upstream and downstream ecological conditions.	Protect within basin and upstream habitat and wildlife.
Taylor Slough	Stage changes ranged from +0.05 to +0.24'	Move water southward as possible.	When available, provide freshwater to promote water movement.
FB- Salinity	Salinity changes ranged from -4.7 to +0.9	Move water southward as possible.	When available, provide freshwater to promote water movement.

Biscayne Bay

As shown in **Figure BB-1**, mean total inflow to Biscayne Bay was 999 cfs, and the previous 30-day mean inflow was 692 cfs. The seven-day mean salinity was 24.4 at BBCW8 and 24.4 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.

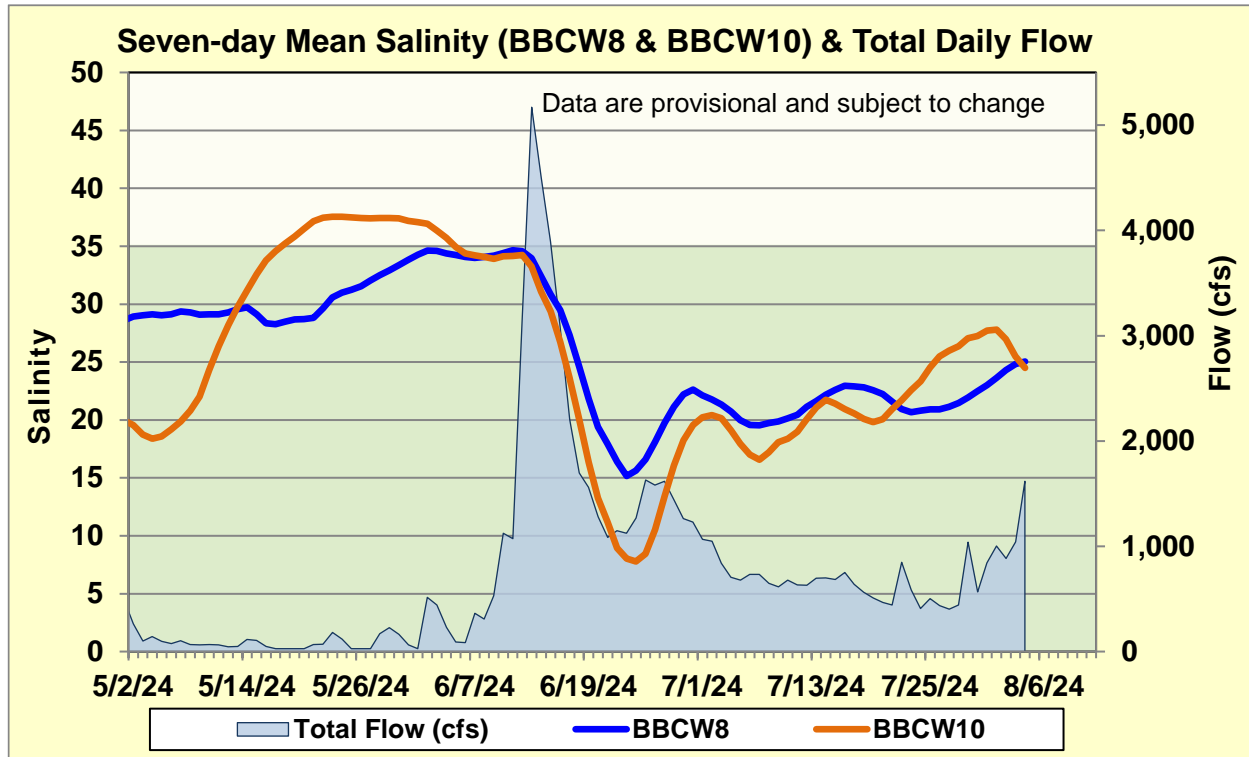


Figure BB-1. Seven-day mean salinity at BBCW8 and BBCW10 and total daily flow in Biscayne Bay. Total daily flow was calculated using flow from structures S20G, S20F, S21, S21A, S123, and S700P.