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: June 7, 2023

SUBJECT: Weekly Environmental Conditions for Systems Operations

Summary

Weather Conditions and Forecast

On Tuesday, a low-pressure trough over the Gulf of Mexico will draw moisture northward from the western Caribbean Sea that will largely be shunted to the east of Florida. The moisture increase area-wide will support widespread rainfall, largely during the afternoon to the evening, and above-normal total SFWMD rainfall. Locally significant rainfall is likely, especially south of Lake Okeechobee. By Thursday, the approaching southern jet trough, then located over the eastern Gulf of Mexico, will have pushed the moisture from the western Caribbean Sea well to the east of Florida, with some residual moisture favoring afternoon rains over the eastern and far southern parts of the SFWMD. Far less area-averaged rainfall is predicted north and west of Lake Okeechobee. The passage of the southern stream upper-air trough and the arrival of a potent northern one over the western Atlantic will have a suppressing effect on rainfall. Shallow moisture and daytime surface heating will result in some afternoon rains each day from Friday through the weekend but mainly over the eastern part of the SFWMD. An abnormally strong upper-air trough of low pressure will likely form over the Midwest/Ohio Valley early next week, which will help to introduce a very late-season cold front into north Florida or southern Georgia/Alabama, where it will likely stall. Below-normal moisture will continue to favor unusually low rainfall, with some chance of a minor increase over the Florida Keys and southeast coast of the SFWMD. For the week ending next Tuesday morning, total SFWMD rainfall is likely to be below normal, with the greatest weekly rainfall predicted to be over the southeastern part of the SFWMD. For the week-2 period (*13-19 June*) the model runs support a continuation of below or even much below normal rainfall.

Kissimmee

Releases were reduced to zero from East Lake Toho and Lake Toho after they both reached their respective low pools on June 1. Weekly average discharges on June 4, 2023 at S-65 and S-65A were 240 cfs and 310 cfs, respectively. Mean weekly water depth on the Kissimmee River floodplain of 0.13 ft was essentially unchanged from the previous week. The weekly average concentration of dissolved oxygen in the Kissimmee River increased from 7.1 mg/L last week to 7.5 mg/L for the week ending June 4, 2023, above

both the potentially lethal level and the physiologically stressful range for largemouth bass and other sensitive species.

Lake Okeechobee

Lake Okeechobee stage was 13.98 feet NGVD on June 4, 2023, which is 0.08 feet higher than the previous week and 0.21 feet lower than a month ago. Average daily inflows (excluding rainfall) increased from the previous week, going from 1,091 cfs to 1,239 cfs. Average daily outflows (excluding evapotranspiration) decreased from the previous week, going from 1,133 cfs to 575 cfs.

The most recent satellite image (June 4, 2023) from NOAA's Harmful Algal Bloom Monitoring System showed medium to high bloom potential in Fisheating Bay, southwestern and southeastern nearshore areas, and central region of the Lake. Overall, bloom potential increased compared to the previous week, especially in the central and southeastern parts of the Lake.

Estuaries

Total inflow to the St. Lucie Estuary averaged 1,683 cfs over the past week with no flow coming from Lake Okeechobee. Mean salinities decreased at all sites 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 2,808 cfs over the past week with 575 cfs coming from Lake Okeechobee. Mean surface salinities surface salinities remained the same at S-79 and Val I-75 and decreased at the remaining sites in the estuary over the past week. Salinities were in the optimal range (0-10) for tape grass in the upper estuary. Salinities were in the optimal range for adult eastern oysters at Cape Coral (10-25) and in the stressed range at Shell Point and Sanibel.

Stormwater Treatment Areas

For the week ending Sunday, June 4, 2023, 0 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 2,000 ac-feet. The total amount of inflows to the STAs in WY2024 is approximately 84,000 ac-feet. Most STA cells are at or above target stage. STA-1E Western Flow-way is offline for post-construction vegetation grow in, STA-1E Central Flow-way is offline for a Refurbishments project survey, STA-3/4 Eastern Flow-way is offline for vegetation rehabilitation/drawdown, and STA-2 Flow-way 2 is offline for post-construction vegetation grow in. Operational restrictions are in effect in STA-1E Eastern Flow-way, STA-1W Eastern, Western, and Northern Flow-ways, and STA-2 Flow-ways 3 and 4 for vegetation management activities. STA-1E Central Flow-way, STA-1W Northern Flow-way, Cell 7 and Cell 8, and STA-2 Flow-way 3 contain nests of Migratory Bird Treaty Act protected species. This week, if 2008 LORS recommends Lake releases to the WCAs and conditions allow, releases will be sent to STA-2.

Everglades

Stage across the EPA increased last week as rainfall increased in every basin except WCA-1, most regions ascension rates were elevated into the “fair” range based on apple snail reproduction. White Ibis continue to nest in eastern WCA-1, and the Cabbage Bay colony in ENP remains active. Last week depths again increased across Taylor Slough and remain well above historical average. Average salinity fell again last week in Florida Bay and continues to trend towards a fresher than average condition for this time of year.

Biscayne Bay

Total inflow to Biscayne Bay averaged 1,242 cfs and the previous 30-day mean inflow averaged 676 cfs. The seven-day mean salinity was 28.8 at BBCW8 and 28.8 at BBCW10, both within the ideal salinity range for estuarine organisms in this region (salinity less than 35). Data provided by Biscayne National Park.

Supporting Information

Kissimmee Basin

Upper Kissimmee

On June 4, 2023, mean daily lake stages were 55.0 feet NGVD (1.5 feet below schedule) in East Lake Toho, 52.1 feet NGVD (1.4 feet below schedule) in Lake Toho, and 50.4 feet NGVD (0.6 feet below schedule) in Lakes Kissimmee-Cypress-Hatchineha (KCH) (**Table KB-1**, **Figures KB-1-3**).

Lower Kissimmee

For the week ending June 4, 2023, mean weekly discharge was 240 cfs at S-65 and 310 cfs at S-65A. Mean weekly discharge from the Kissimmee River was 360 cfs at S-65D and 380 cfs at S-65E (**Table KB-2**). Mean weekly headwater stages were 46.4 feet NGVD at S-65A and 28.1 feet NGVD at S-65D on June 4, 2023. Mean weekly river channel stage of 33.1 ft NGVD on June 4, 2023 was essentially unchanged from the previous week (**Figure KB-4**). Mean weekly water depth on the Kissimmee River floodplain of 0.13 ft for the week ending June 4, 2023 was essentially unchanged from the previous week (**Table KB-2**, **Figure KB-5**). The weekly average concentration of dissolved oxygen in the Kissimmee River increased from 7.1 mg/L the previous week to 7.5 mg/L for the week ending June 4, 2023 (**Table KB-2**, **Figure KB-6**).

Water Management Recommendations

Follow the IS-14-50 discharge plan for S-65/S-65A, including limiting lake stage ascension rates to 0.25 ft/week to the extent possible in East Lake Toho, Lake Toho and KCH.

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 NGVD)[a]	Schedule Type[b]	Sunday Schedule Stage (feet NGVD)	Sunday Departure from Regulation (feet)	
							6/4/23	*5/28/23*
Lakes Hart and Mary Jane	S-62	LKMJ	15	59.6	R	60.0	-0.4	0.0
Lakes Myrtle, Preston and Joel	S-57	S-57	0	60.0	R	61.0	-1.0	-0.1
Alligator Chain	S-60	ALLI	0	62.1	R	63.2	-1.1	-0.1
Lake Gentry	S-63	LKGT	21	59.6	R	61.0	-1.4	0.0
East Lake Toho	S-59	TOHOE	97	55.0	R	56.5	-1.5	-0.1
Lake Toho	S-61	TOHOW S-61	260	52.1	R	53.5	-1.4	-0.1
Lakes Kissimmee, Cypress and Hatchineha	S-65	KUB011 LKIS5B	230	50.4	R	51.0	-0.6	0.6

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

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

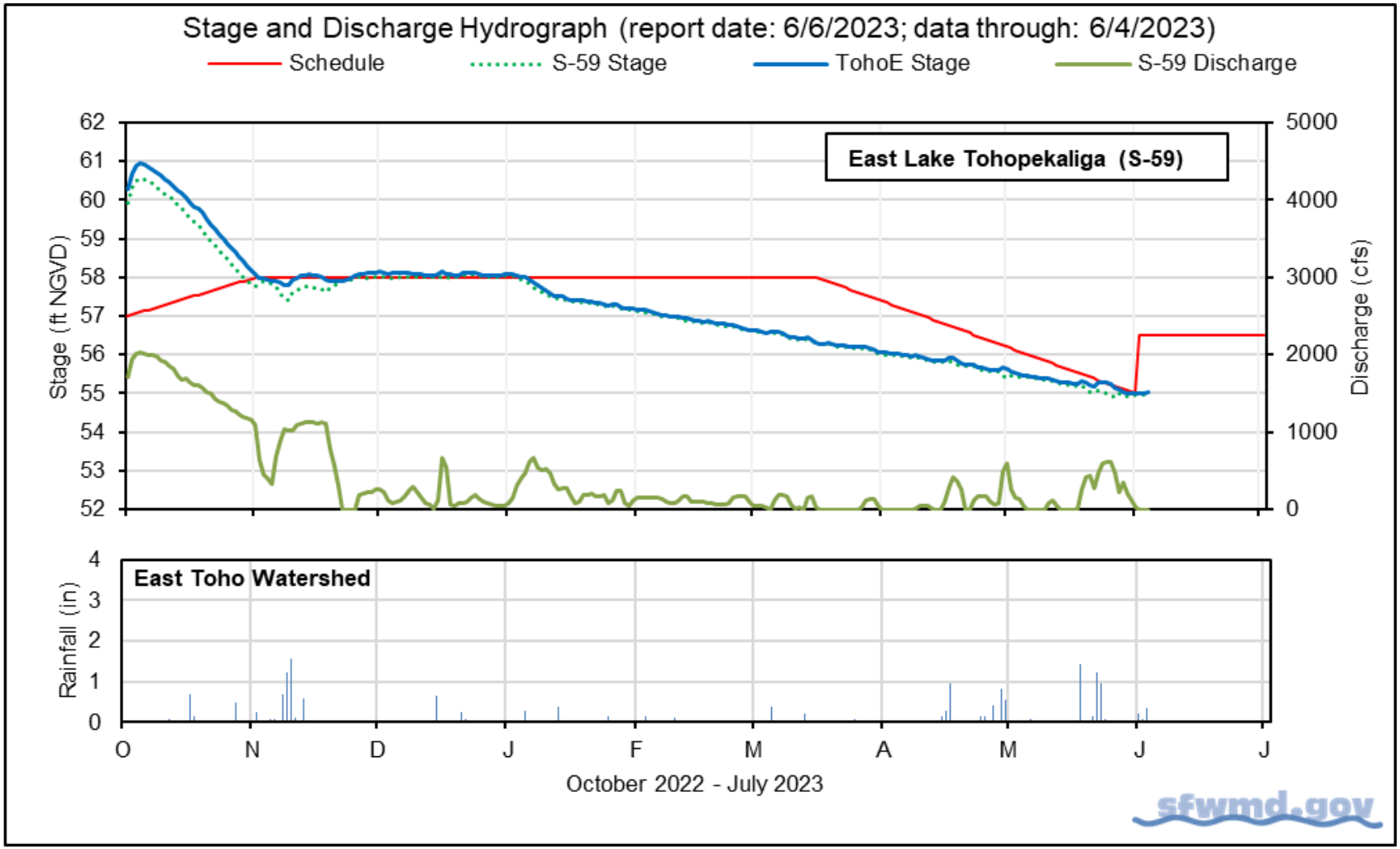


Figure KB-1. East Lake Toho regulation schedule, stage, discharge and rainfall.

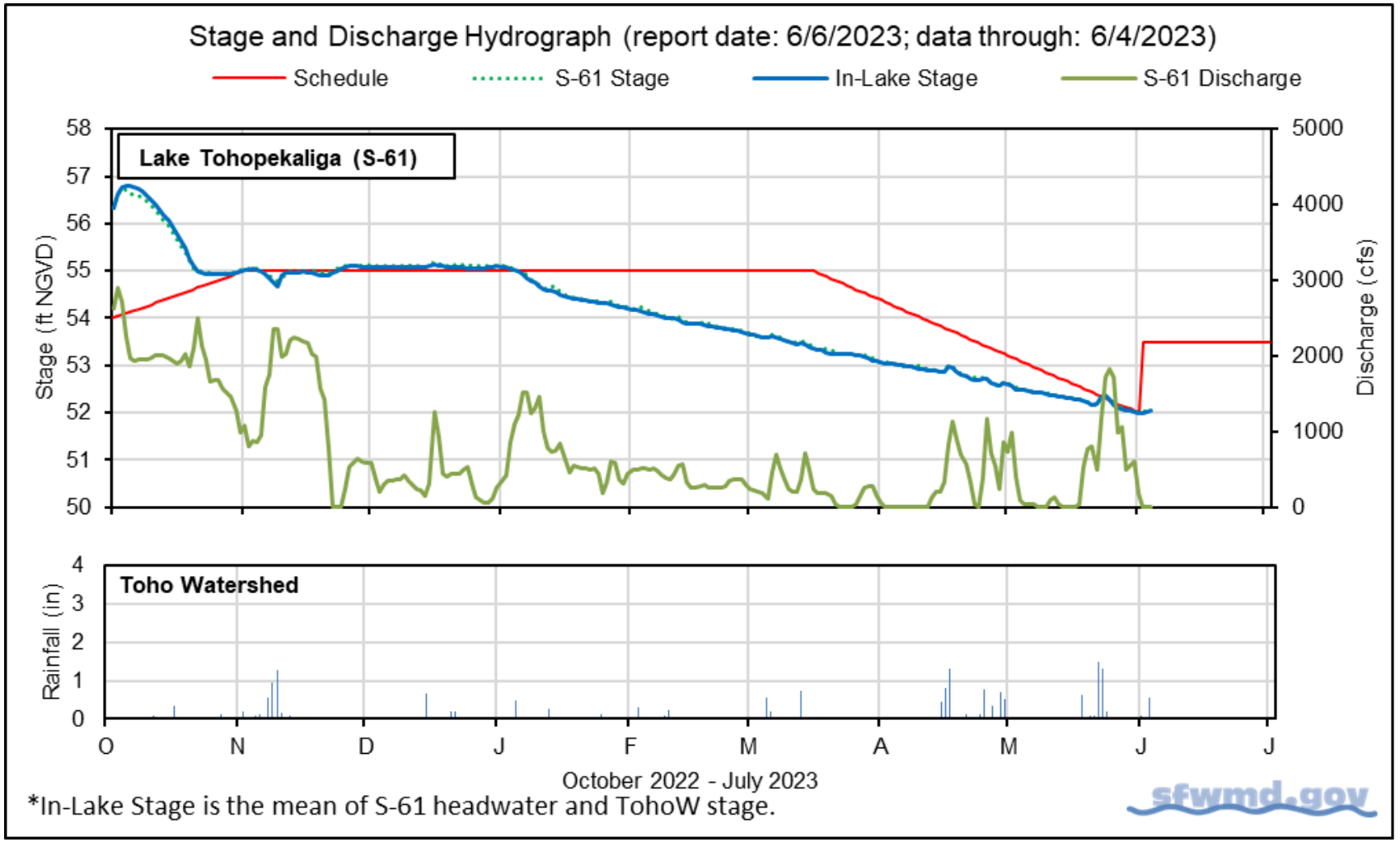


Figure KB-2. Lake Toho regulation schedule, stage, discharge and rainfall.

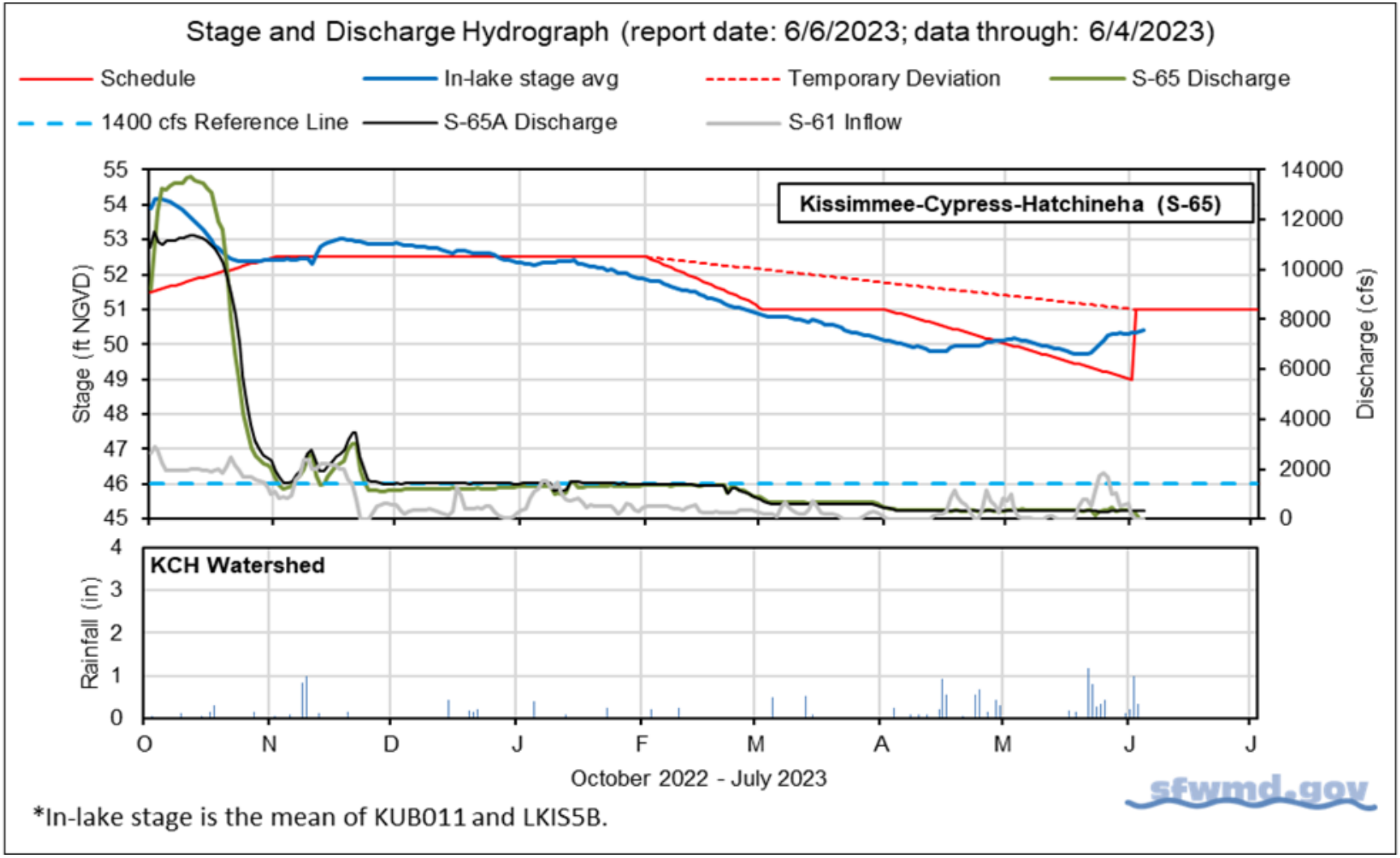


Figure KB-3. Lakes Kissimmee, Cypress and Hatchineha regulation schedule, stage, discharge and rainfall.

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

Metric	Location	Sunday Daily Average	Weekly Average for Previous Seven Day Periods			
		6/4/23	6/4/23	5/28/23	5/21/23	5/14/23
Discharge	S-65	0	240	330	350	350
Discharge	S-65A[a]	310	310	310	310	310
Headwater Stage (feet NGVD)	S-65A	46.6	46.4	46.1	46.4	46.3
Discharge	S-65D[b]	430	360	430	300	280
Headwater Stage (feet NGVD)	S-65D[c]	27.9	28.1	28.2	28.3	28.3
Discharge (cfs)	S-65E[d]	460	380	430	260	260
Discharge (cfs)	S-67	0	0	0	0	0
Dissolved Oxygen (mg/L) [e]	Phase I, II/III river channel	6.4	7.5	7.1	7.4	7.9
River channel mean stage[f]	Phase I river channel	33.7	33.1	33.0	32.8	32.8
Mean depth (feet) [g]	Phase I floodplain	0.17	0.13	0.13	0.08	0.07

a. Combined discharge from main and auxiliary structures.

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

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

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

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

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

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

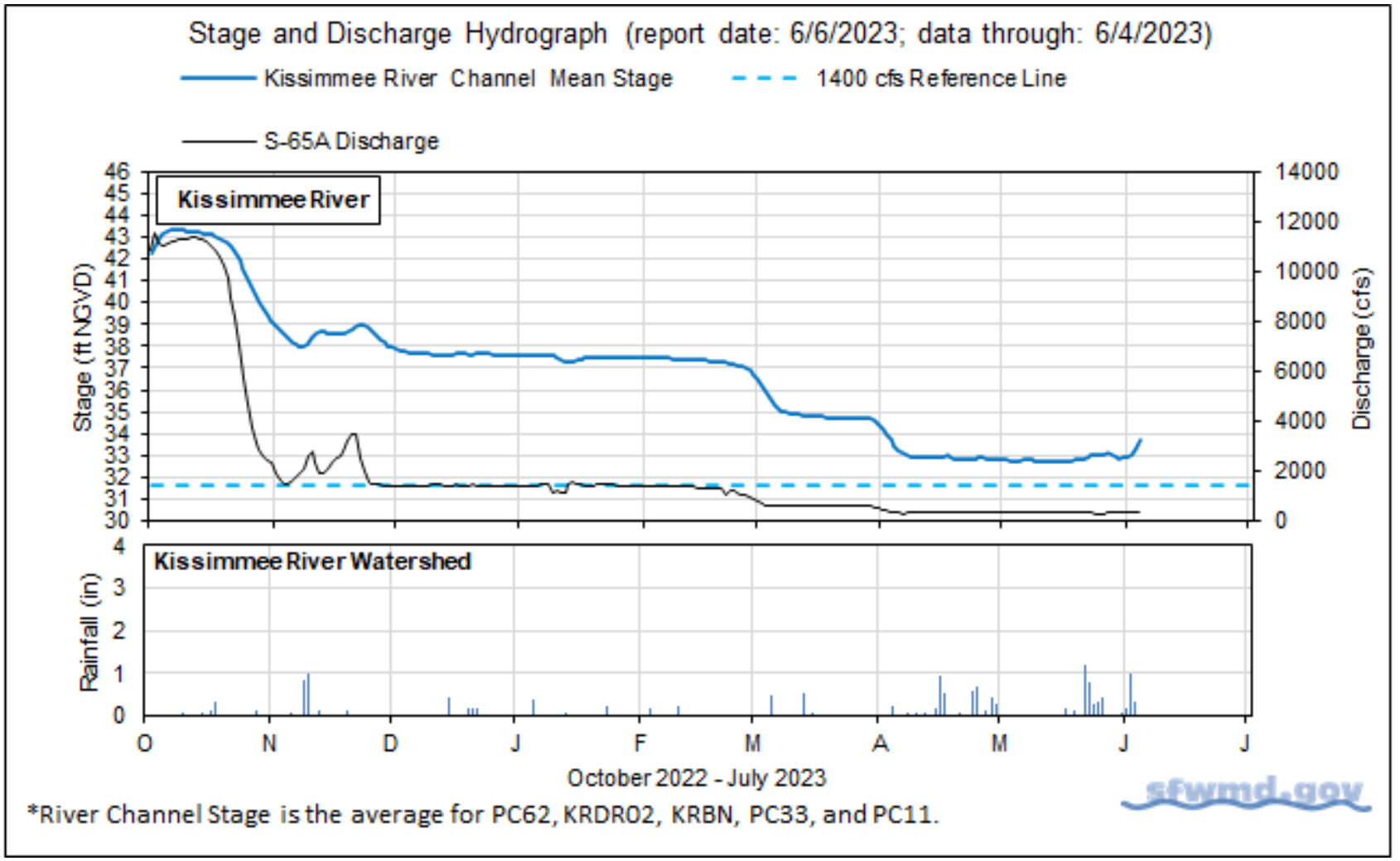


Figure KB-4. Kissimmee River stage, discharge and rainfall.

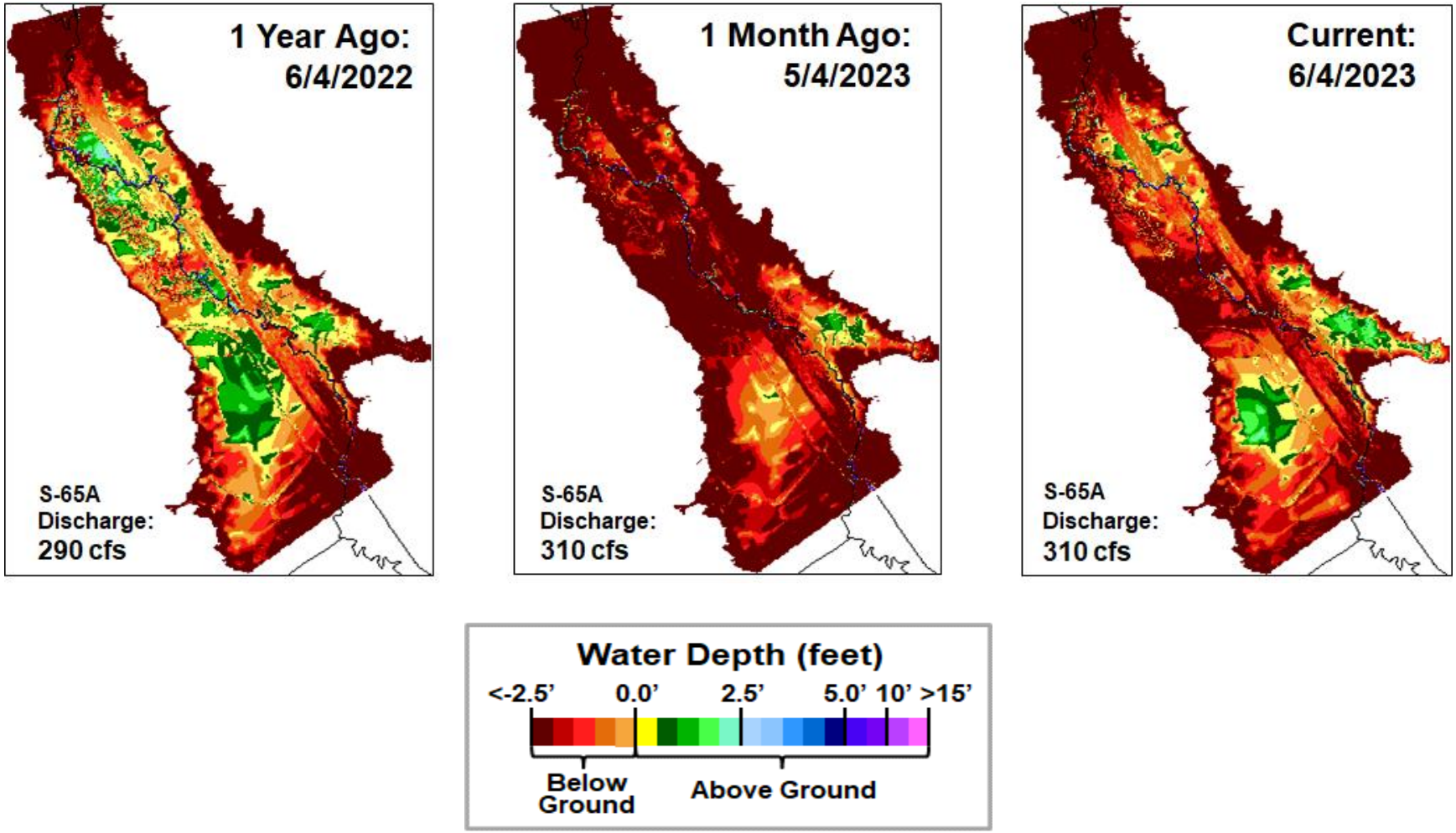


Figure KB-5. Phase I area Kissimmee River floodplain water depths (from left to right) one year ago, one month ago and current.

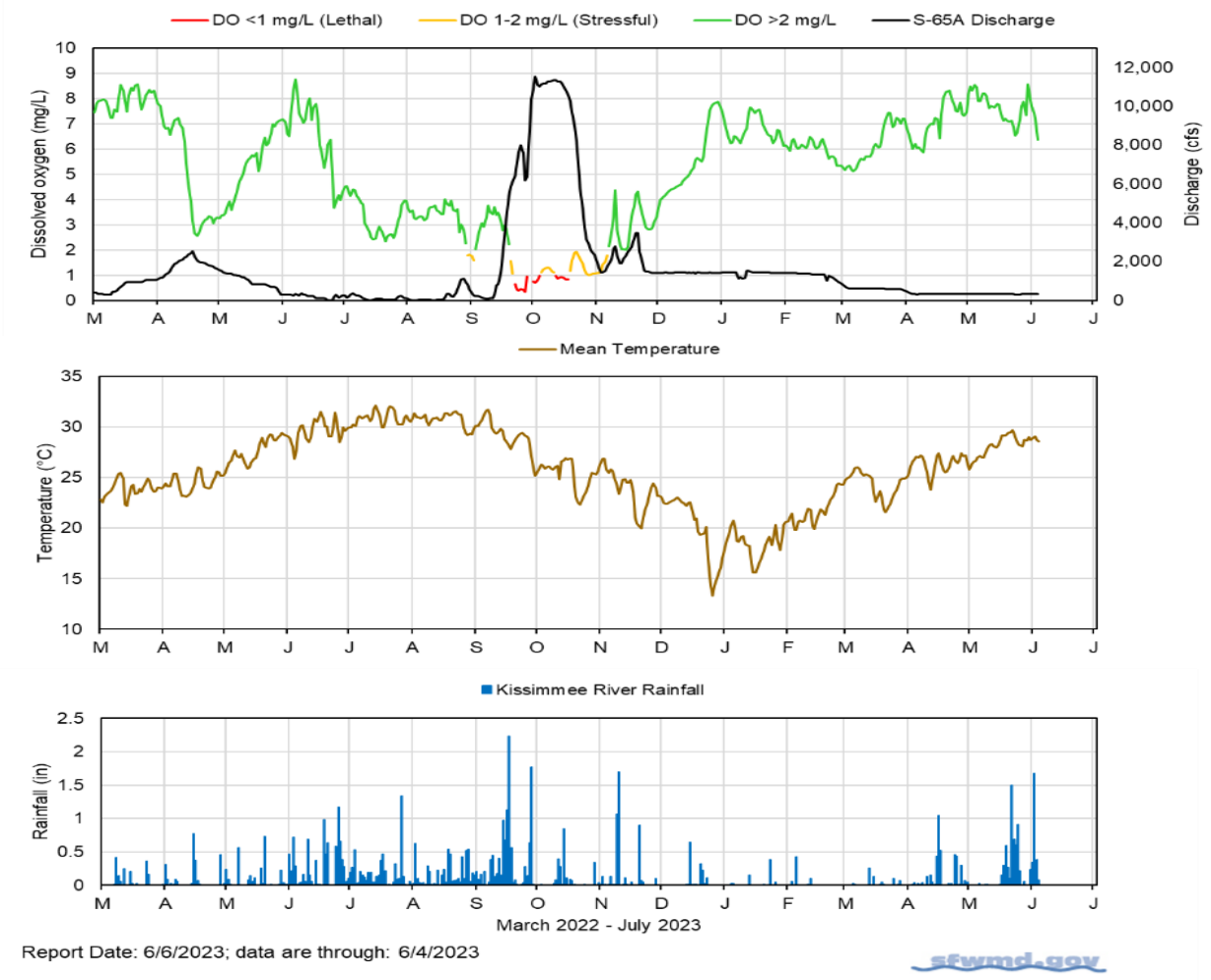


Figure KB-6. Restored Kissimmee river channel mean daily dissolved oxygen concentration (mg/L), S-65A discharge (cfs), temperature (°C) and rainfall (inches). Dissolved oxygen (DO) and temperature are mean daily values averaged for PC62, KRDR02, KRBN, PC33, PC11, PD62R, and PD42R with an average of four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

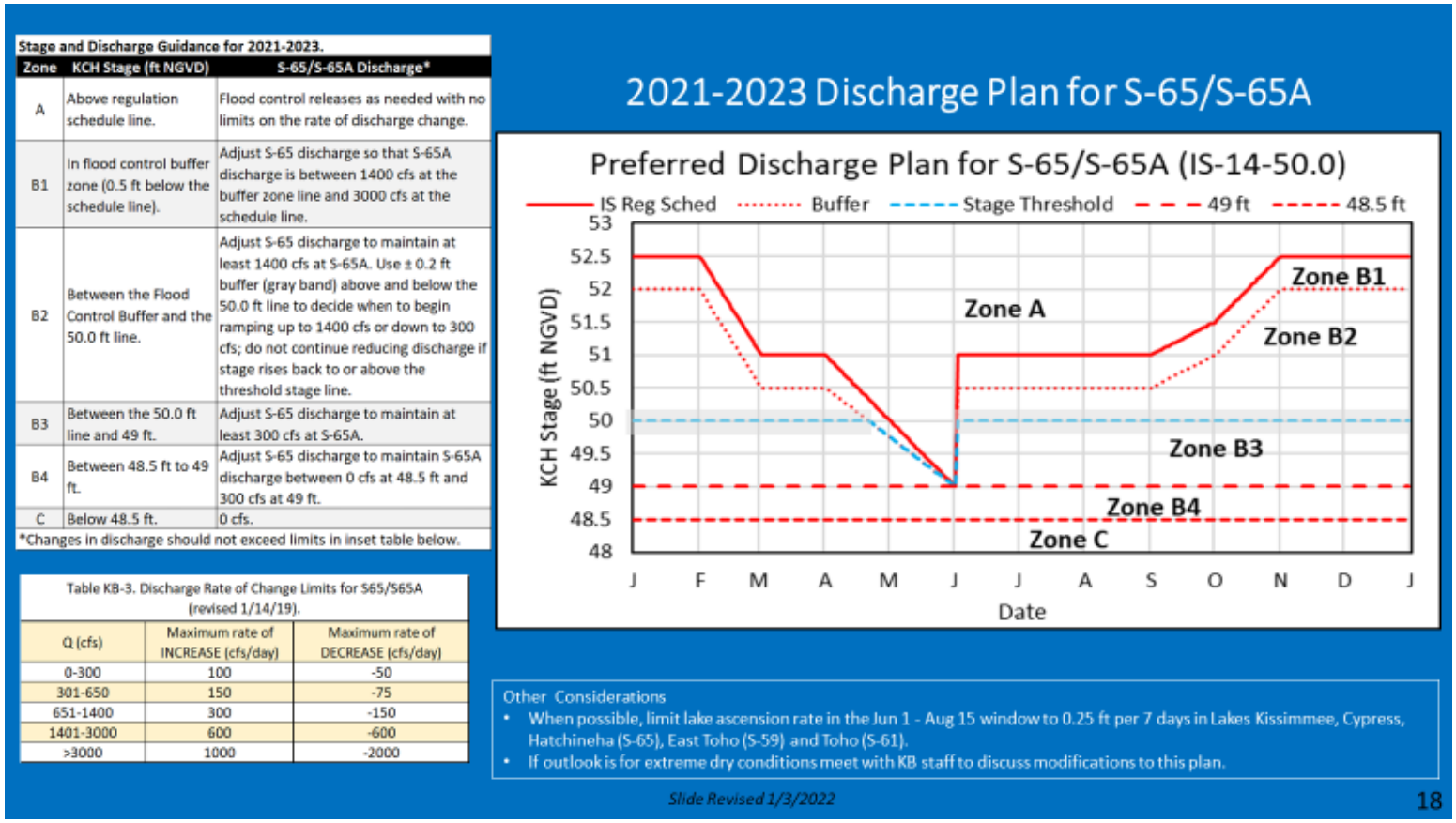


Figure KB-7. IS-14-50 Discharge Plan for S65/S65A with discharge rate of change limits (revised 1/14/19).

Lake Okeechobee

Lake Okeechobee stage was 13.98 feet NGVD on June 4, 2023, which is 0.08 feet higher than the previous week and 0.21 feet lower than a month ago (**Figure LO-1**). Lake stage remained in the Low sub-band (**Figure LO-2**) and was 1.1 feet above the upper limit of the ecological envelope (**Figure LO-3**). According to NEXRAD, 2.0 inches of rain fell directly on the Lake last week.

Average daily inflows (excluding rainfall) increased from the previous week, going from 1,091 cfs to 1,239 cfs. Average daily outflows (excluding evapotranspiration) decreased from the previous week, going from 1,133 cfs to 575 cfs. Most of the combined inflows came from the Indian Prairie Canals (473 cfs; highest inflow via S-84/84X (267 cfs)). The highest average single structure inflow came from the S-65E/EX1 structure (382 cfs). Outflows to the west via the S-77 structure averaged 575 cfs for the week. There were no outflows to the east via the S-308 structure or to the south via the S-350 structures. Backflows via the S-271 were at average rate of 87 cfs. **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. These data are provisional and are subject to change.

The most recent satellite image (June 4, 2023) from NOAA's Harmful Algal Bloom Monitoring System showed medium to high bloom potential in Fisheating Bay, southwestern and southeastern nearshore areas, and central region of the Lake. Overall, bloom potential increased compared to the previous week, especially in the central and southeastern parts of the Lake (**Figure LO-6**).

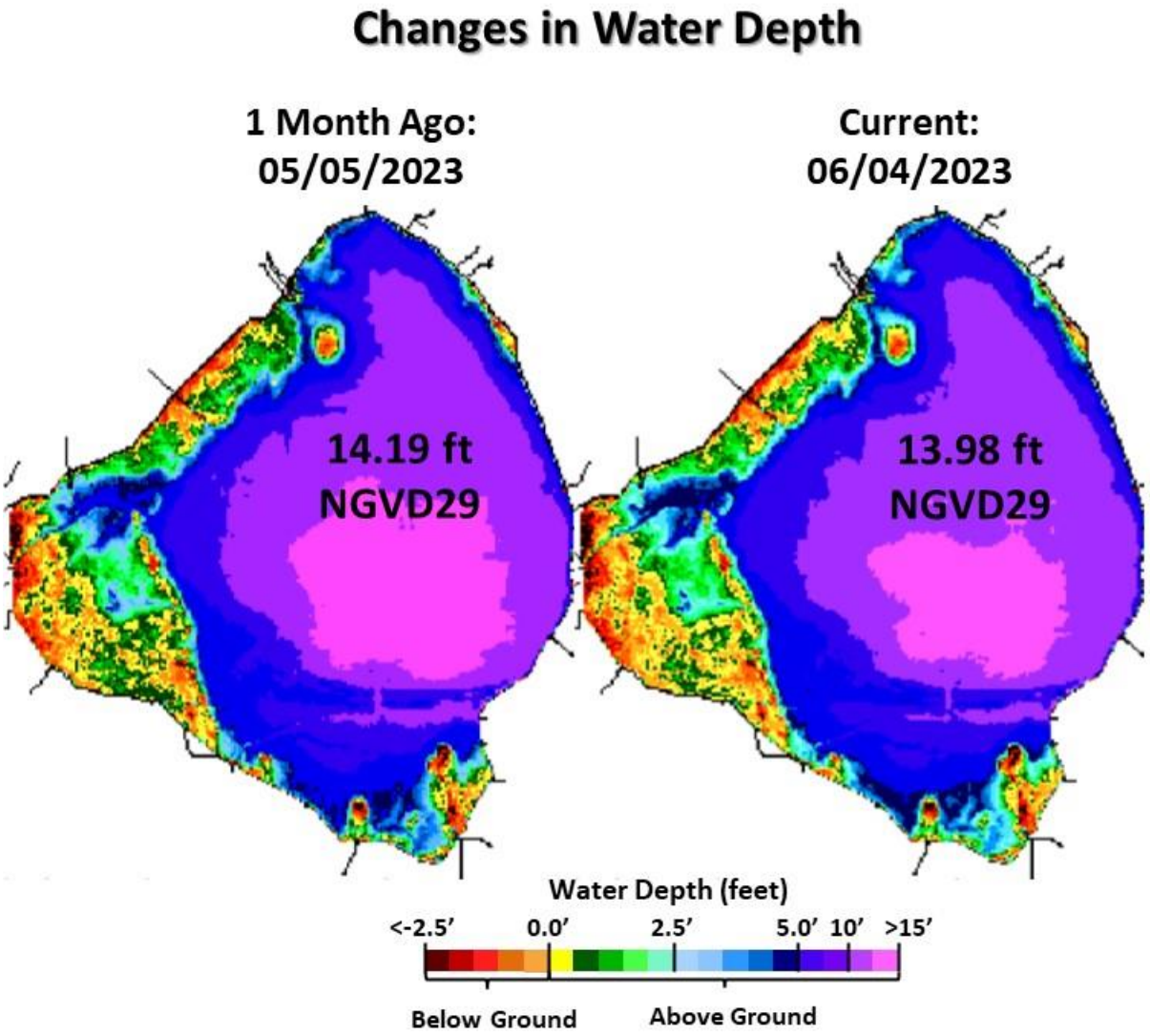


Figure LO-1. Lake Okeechobee water depth estimates based on South Florida Water Depth Assessment Tool (SFWDAT).

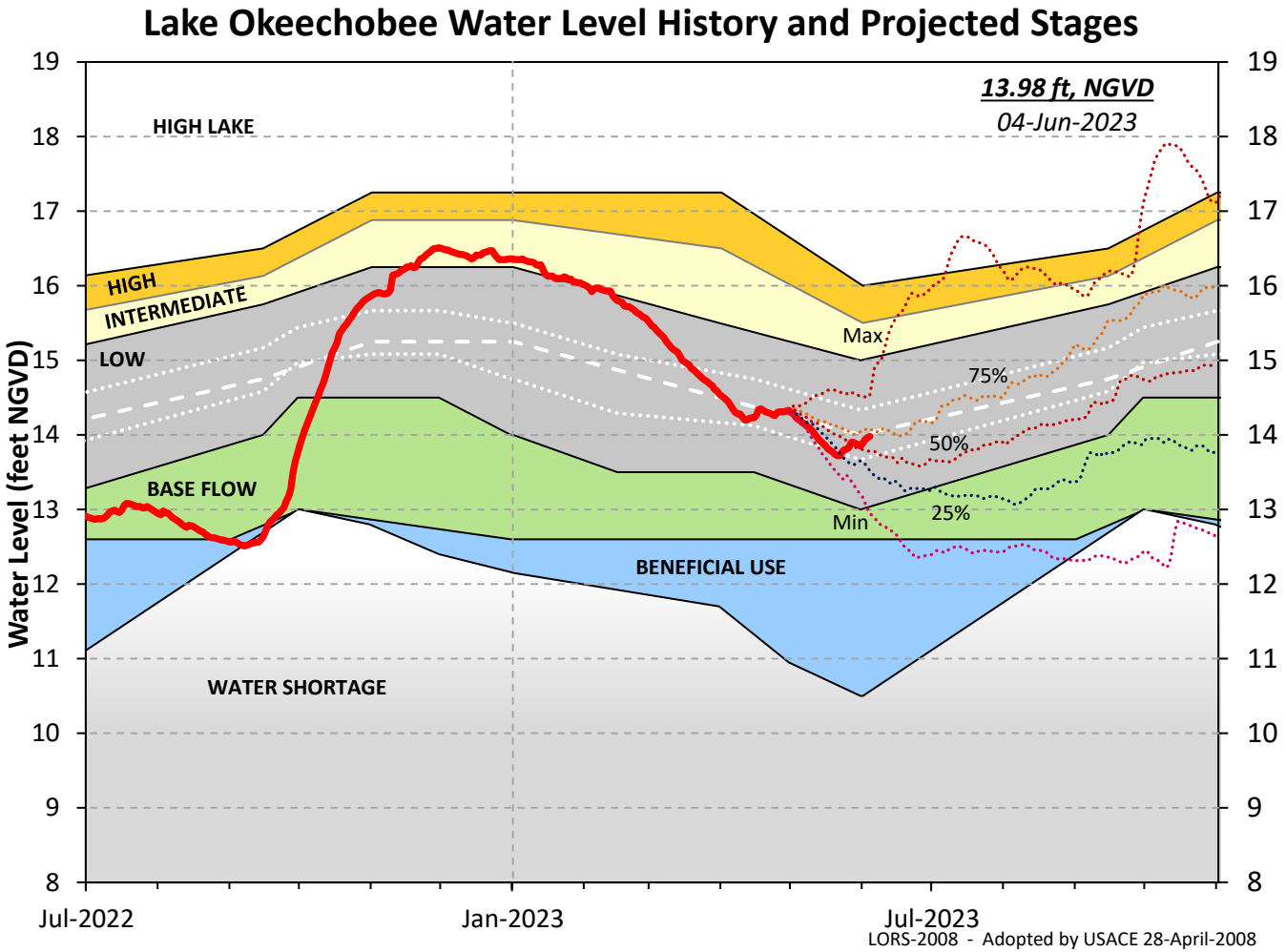


Figure LO-2. Recent Lake Okeechobee stages with projected stages based on a dynamic position analysis.

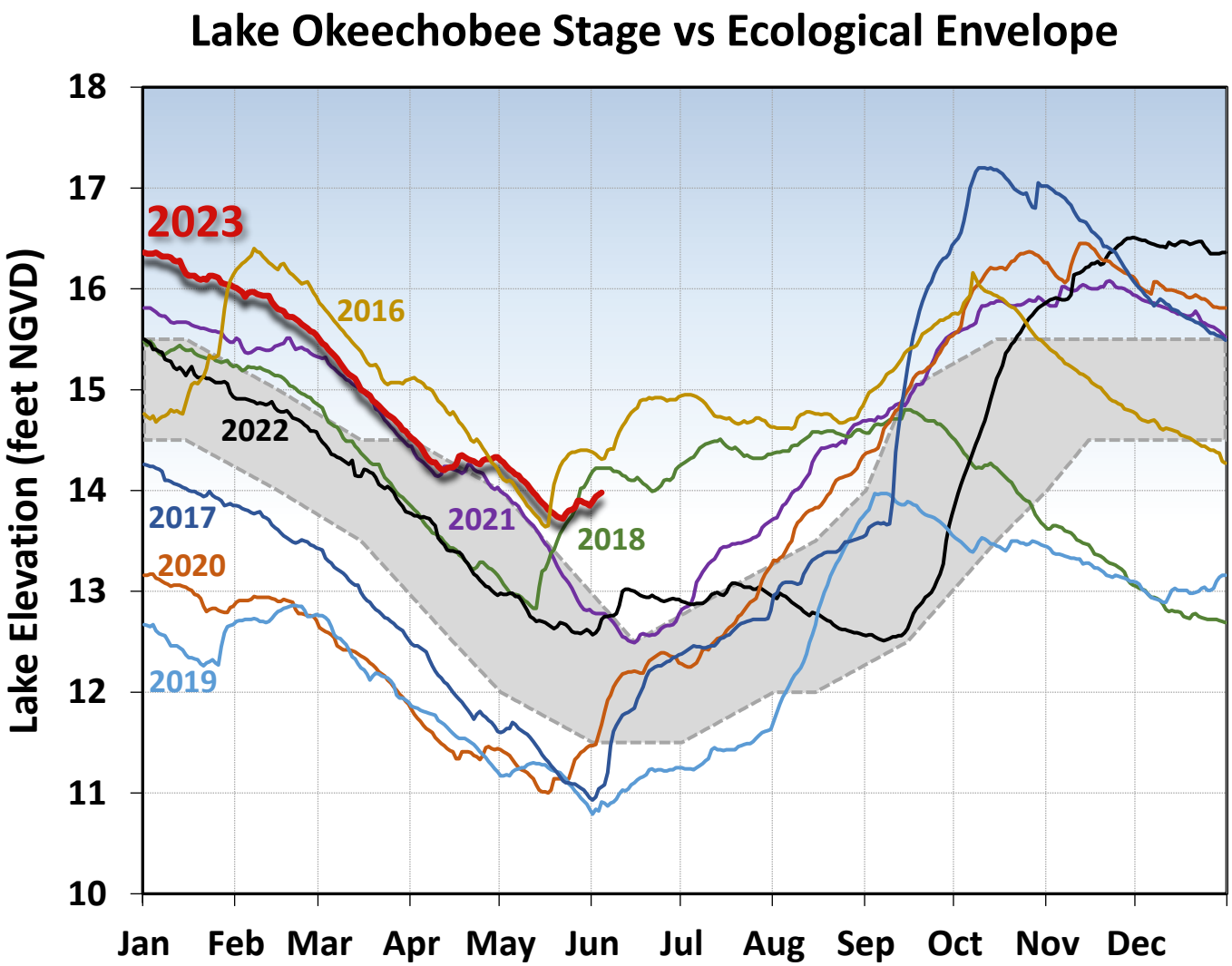


Figure LO-3. The prior seven years of annual stage hydrographs for Lake Okeechobee in comparison to the ecological envelope.

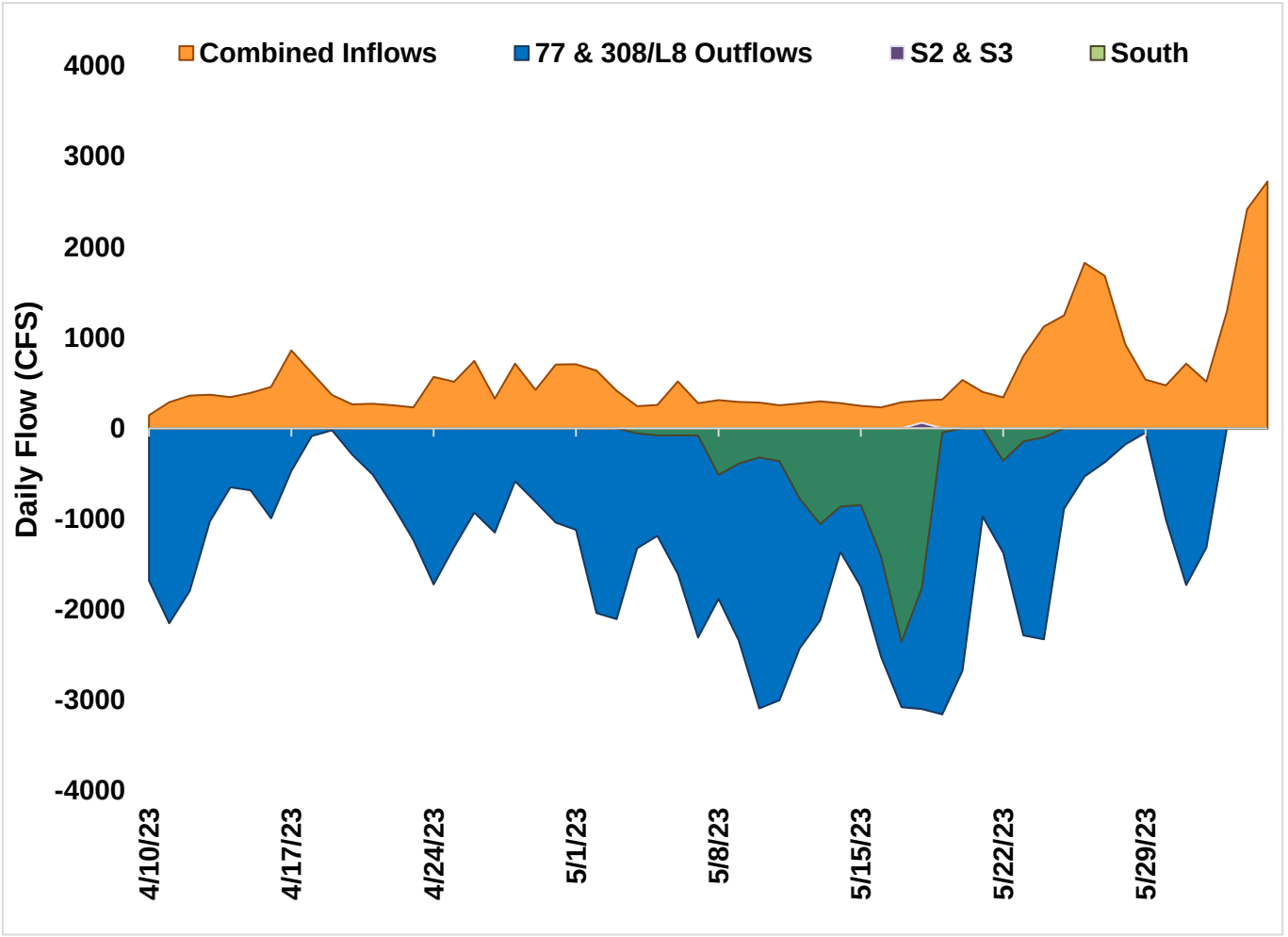


Figure LO-4. Major inflows (orange) to and outflows east and west (blue) from Lake Okeechobee. Outflows south are shown in green. Flows into Lake Okeechobee from the L-8 canal through S-271 (formerly Culvert 10A) or from the C-44 canal through the S-308 are included as inflows. Conversely, flows from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

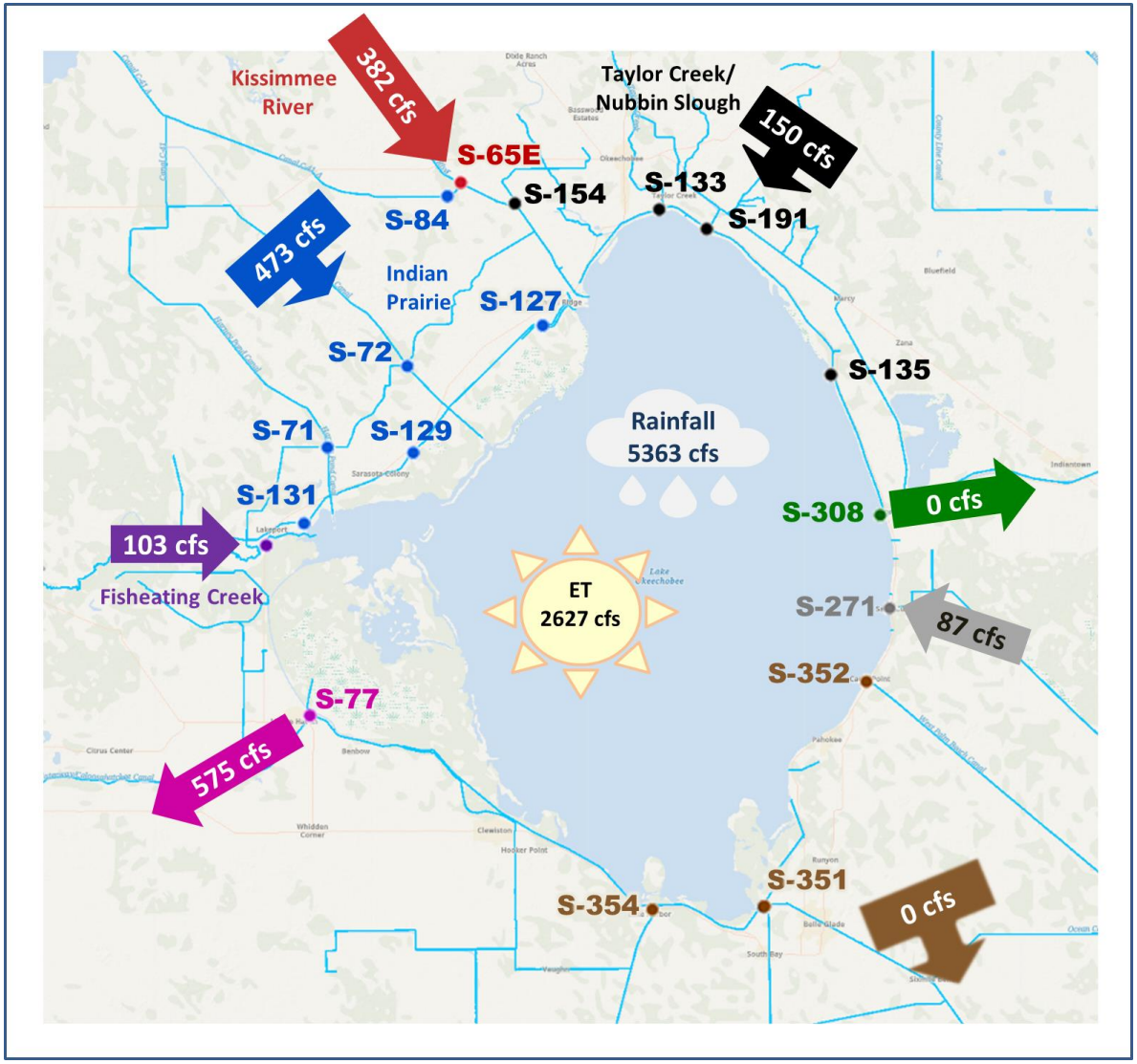


Figure LO-5. Inflows into Lake Okeechobee from Indian Prairie basins, Taylor Creek/Nubbin Slough, Kissimmee River and Fisheating Creek, and outflows to the west via S-77, to the east via S-308, to the south via S-351, S-352, S-354, and to southeast via S-271 (formerly Culvert 10A) for the week of May 29 – June 4, 2023.

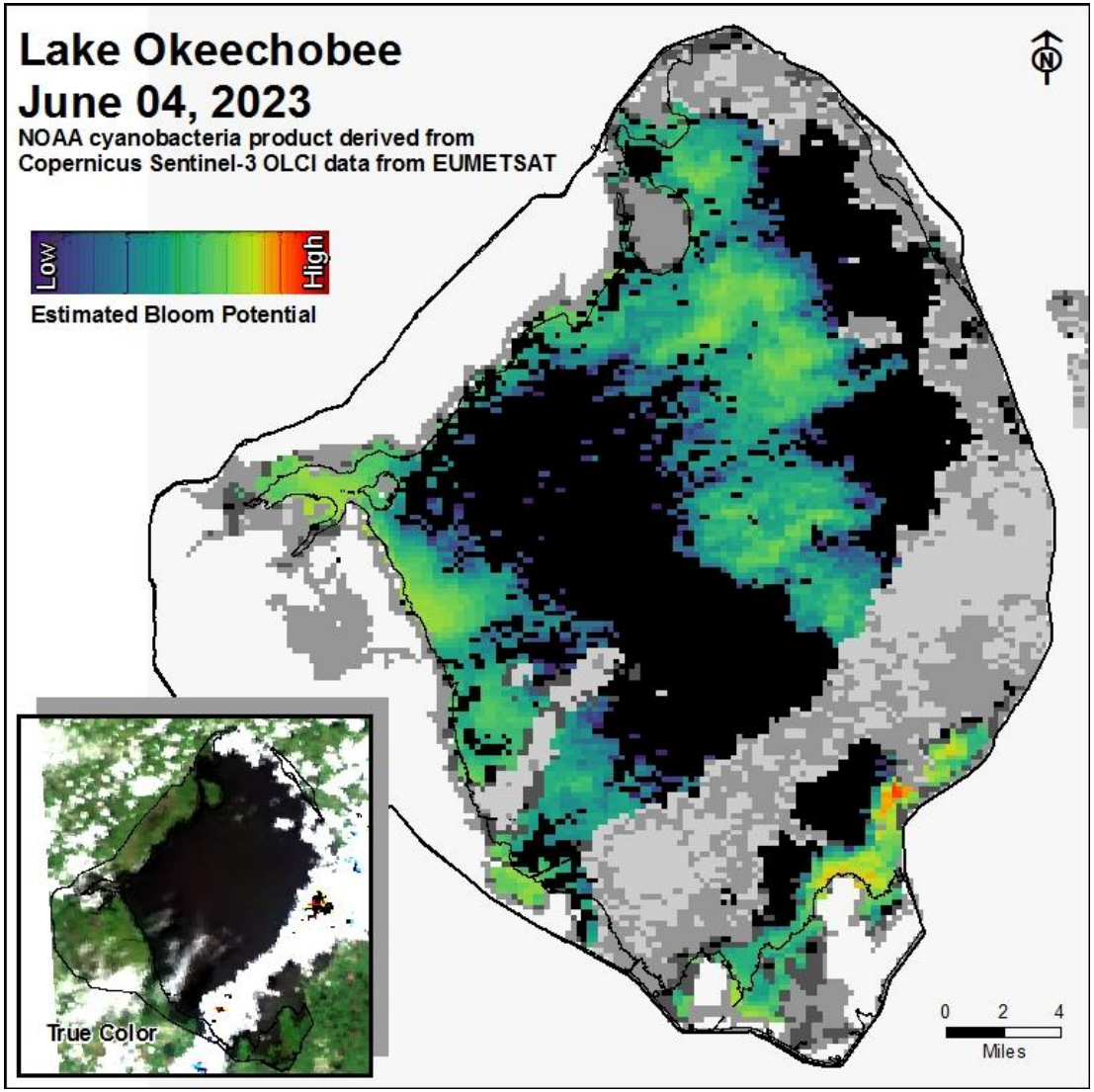


Figure LO-6. Cyanobacteria bloom potential on, June 4, 2023, based on NOAA's harmful algal bloom monitoring system. Gray color indicates cloud cover.

Estuaries

St. Lucie Estuary

Over the past week, mean total inflow to the St. Lucie Estuary was 1,683 cfs (**Figures ES-1** and **ES-2**), and the previous 30-day mean inflow was 812 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 0.08 spat/shell for May, which is a decrease from the recruitment rate recorded in April (**Figure ES-5**).

Caloosahatchee River Estuary

Over the past week, mean total inflow to the Caloosahatchee River Estuary was 2,808 cfs (**Figures ES-6** and **ES-7**), and the previous 30-day mean inflow was 2,037 cfs. For comparison, the historical provisional mean inflows from the contributing areas are shown in **Figure ES-7**.

Over the past week, surface salinities remained the same at S-79 and Val I-75 but decreased at the remaining sites in the estuary (**Table ES-2** and **Figures ES-8** and **ES-9**). The seven-day mean salinities (**Table ES-2**) were in the optimal range (0-10) for tape grass in the upper estuary. The seven-day mean salinity values were within the optimal range for adult eastern oysters at Cape Coral and in the stressed range at Shell Point and Sanibel (**Figure ES-10**). The mean larval oyster recruitment rates reported by the Fish and Wildlife Research Institute were 3.9 spat/shell at Iona Cove and 4.0 spat/shell at Bird Island for May, both of which are an increase from April recruitment rates (**Figures ES-11 and ES-12**).

Surface salinity at Val I-75 was forecasted for the next two weeks using an autoregression model (Qiu and Wan, 2013[1]) coupled with a linear reservoir model for the tidal basin. Model scenarios included pulse releases at S-79 ranging from 0 to 1,500 cfs, and a steady release at 2,000 cfs with estimated tidal basin inflows of 255 cfs. Model results from all scenarios predict daily salinity to be 1.4 or lower and the 30-day moving average surface salinity to be 0.6 or lower at Val I-75 at the end of the two-week period (**Table ES-3** and **Figure ES-13**). This keeps predicted salinities in the upper estuary within the optimal salinity range (0-10) for tape grass.

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

Red Tide

The Florida Fish and Wildlife Research Institute reported on June 2, 2023, that *Karenia brevis*, the Florida red tide dinoflagellate, was not observed at bloom concentrations in any samples collected from within the District region. On the east coast, red tide was not observed in samples from Palm Beach or Broward counties.

Water Management Recommendations

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

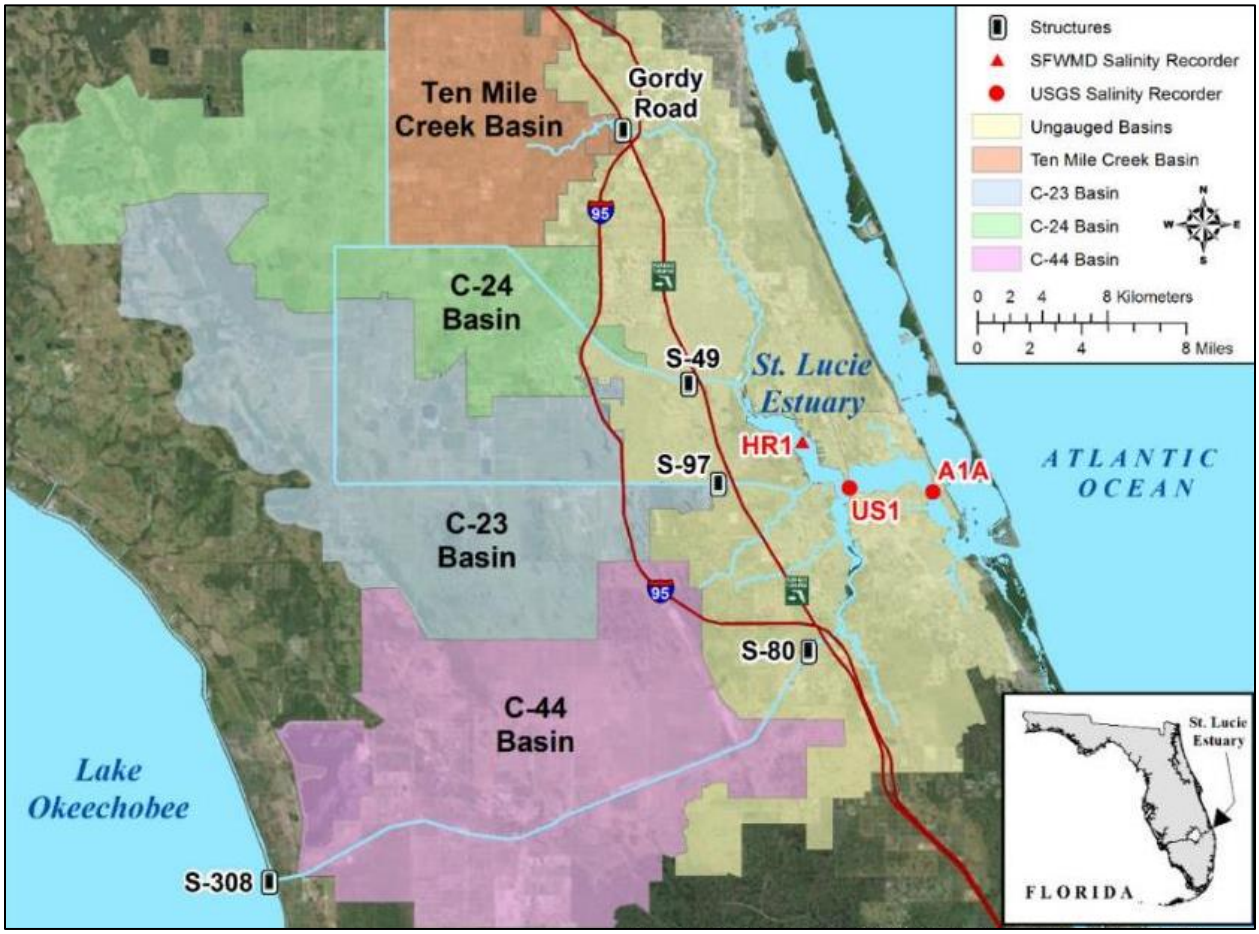


Figure ES-1. Basins, water control structures and salinity monitoring sites in the St. Lucie Estuary.

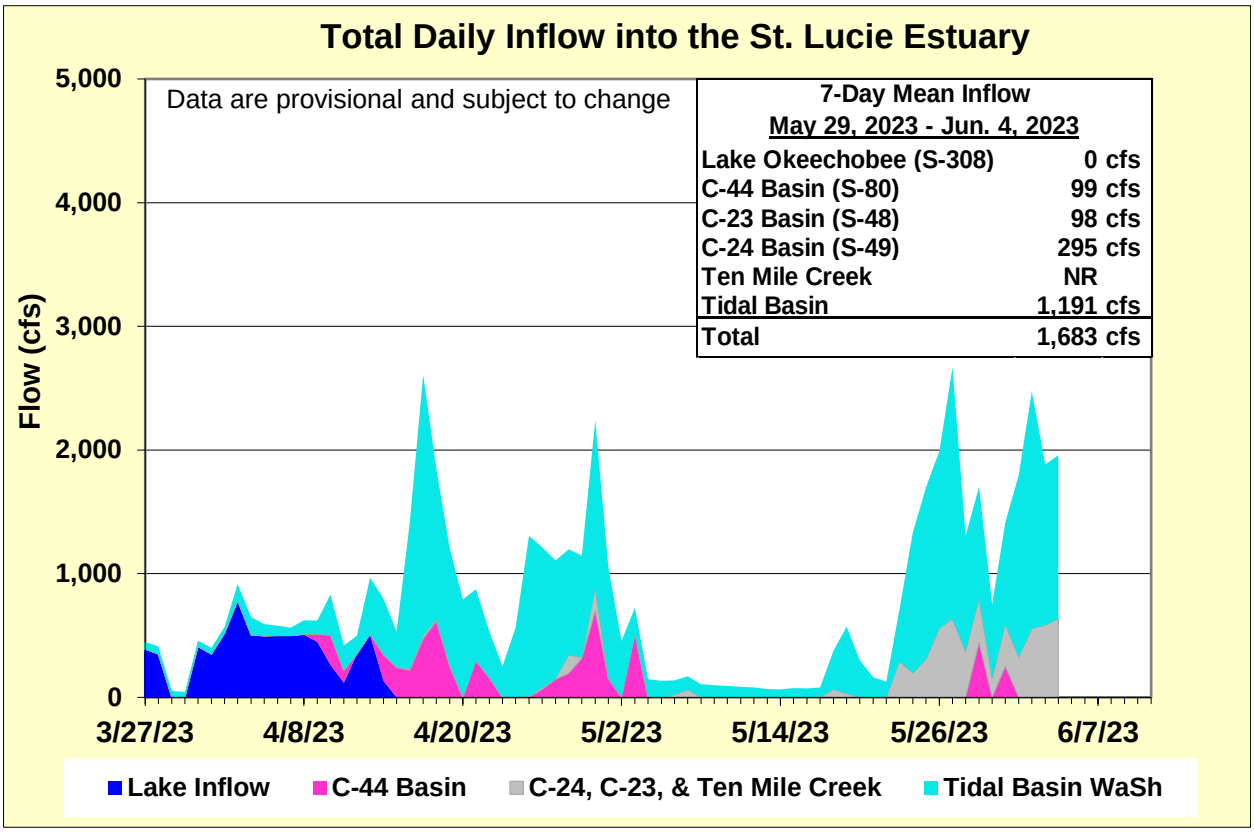


Figure ES-2. Total daily inflows from Lake Okeechobee and runoff from the C-44, C-23, C-24, Ten Mile Creek, and Tidal Basins into the St. Lucie Estuary.

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

Sampling Site	Surface	Bottom	Optimum Envelope
HR1 (North Fork)	**6.8** (12.0)	**12.9** (18.2)	10.0 – 25.0
US1 Bridge	**11.6** (17.7)	**14.1** (21.1)	10.0 – 25.0
A1A Bridge	**20.3** (25.9)	**25.7** (29.0)	10.0 – 25.0

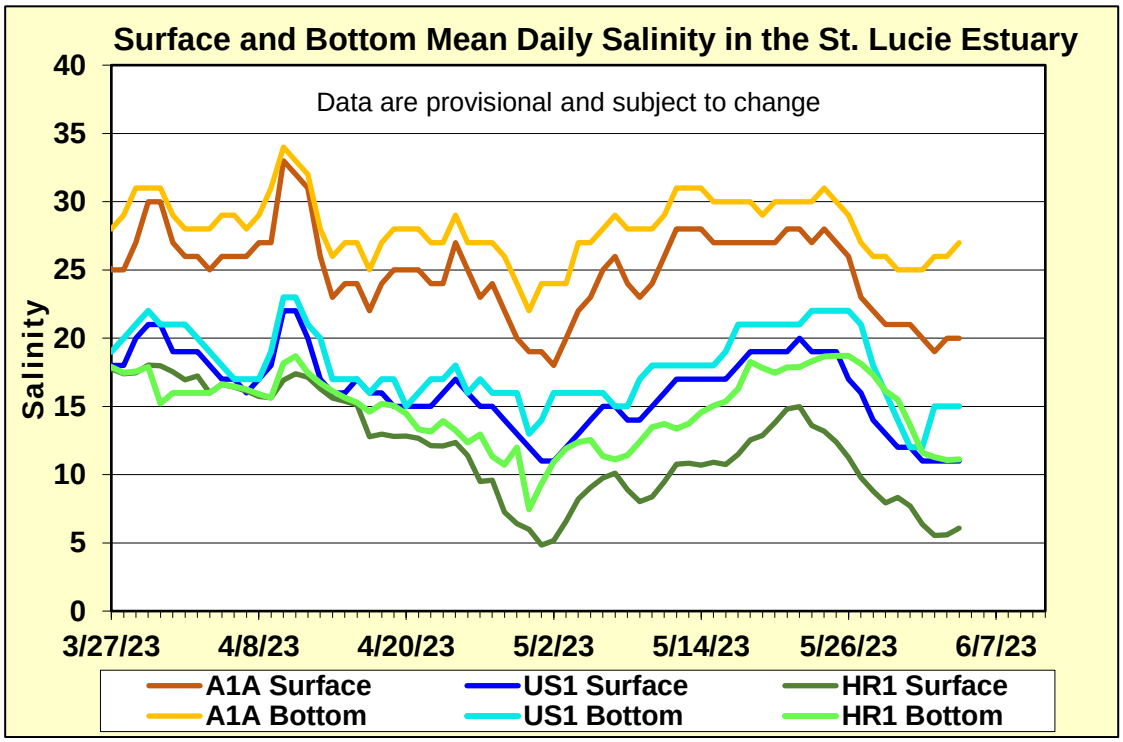


Figure ES-3. Mean daily salinity at the A1A, US1 and HR1 sites in the St. Lucie Estuary.

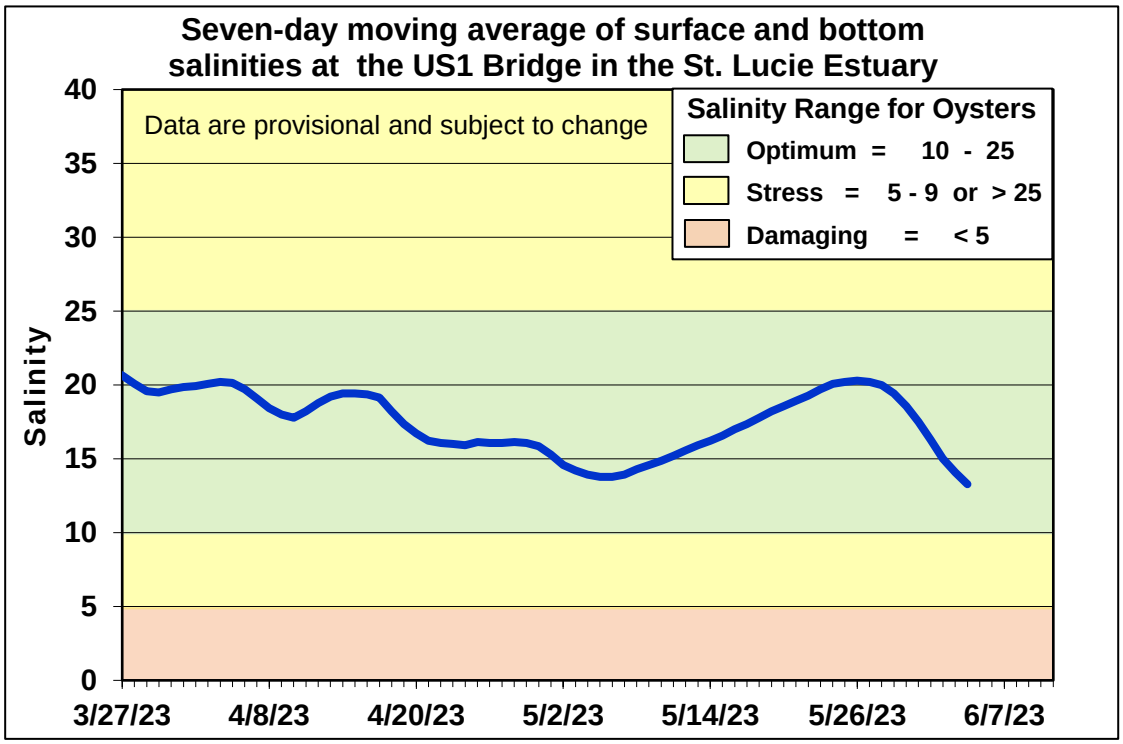


Figure ES-4. Seven-day moving average of the surface and bottom salinities at the US1 Bridge in the St. Lucie Estuary.

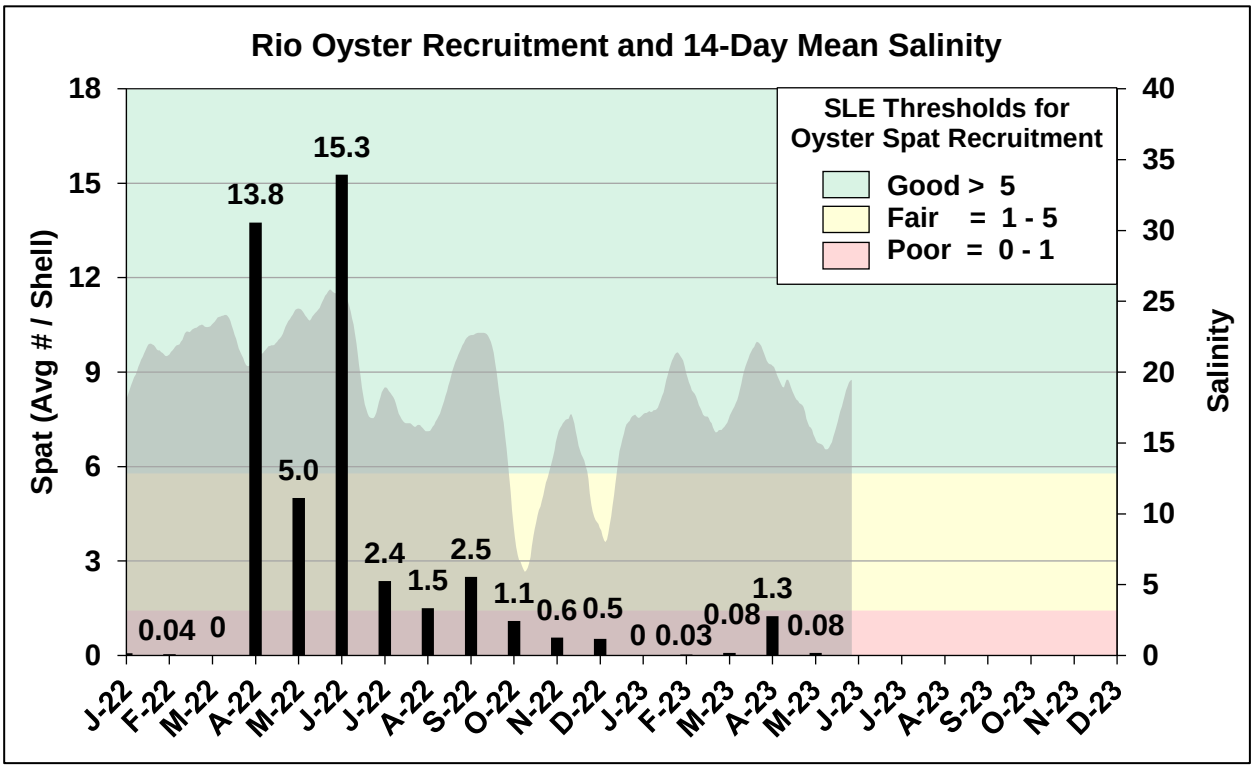


Figure ES-5. Mean oyster recruitment at the Rio oyster monitoring station and 14-day mean salinity at US1 Bridge.

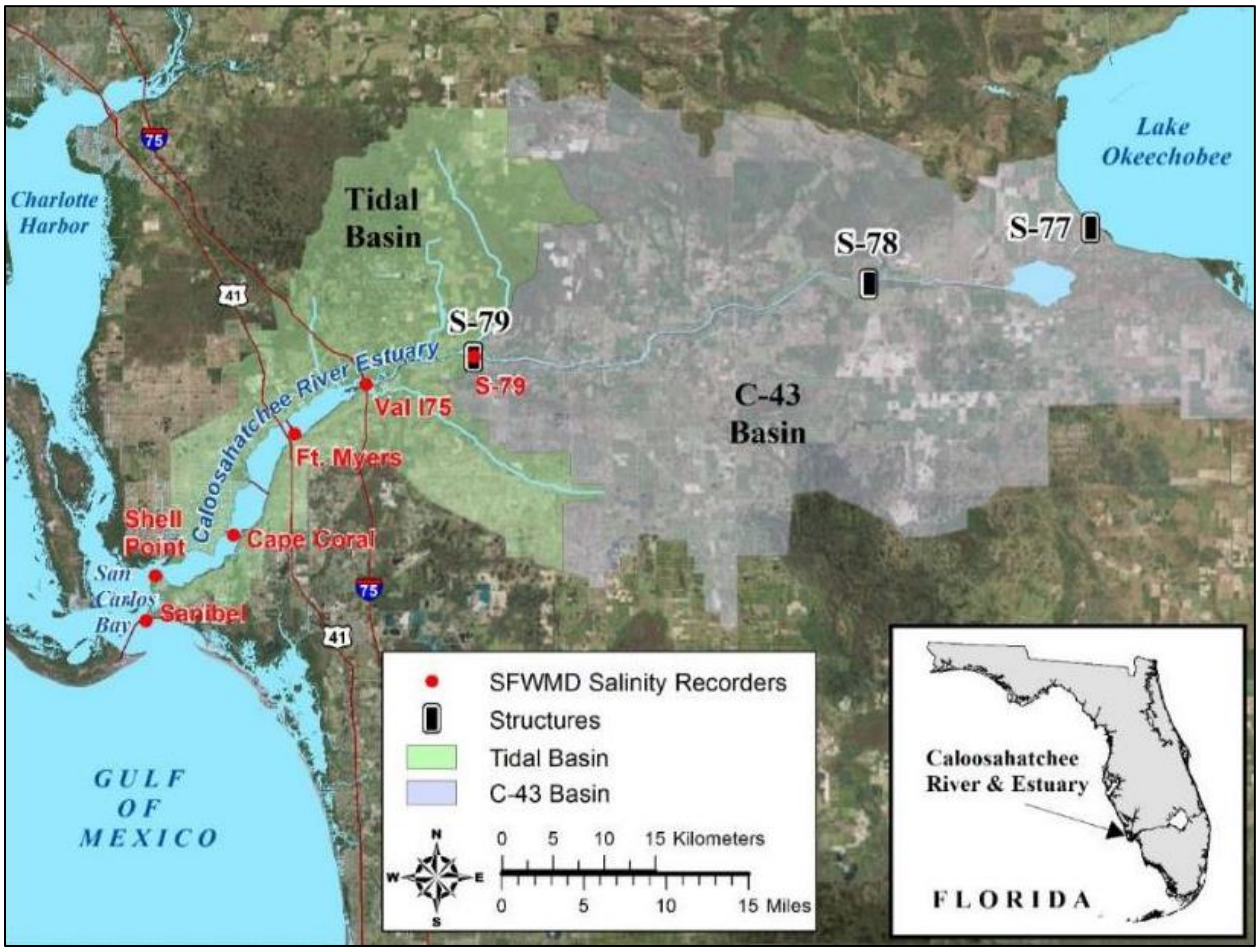


Figure ES-6. Basins, water control structures and salinity monitoring sites in the Caloosahatchee River Estuary.

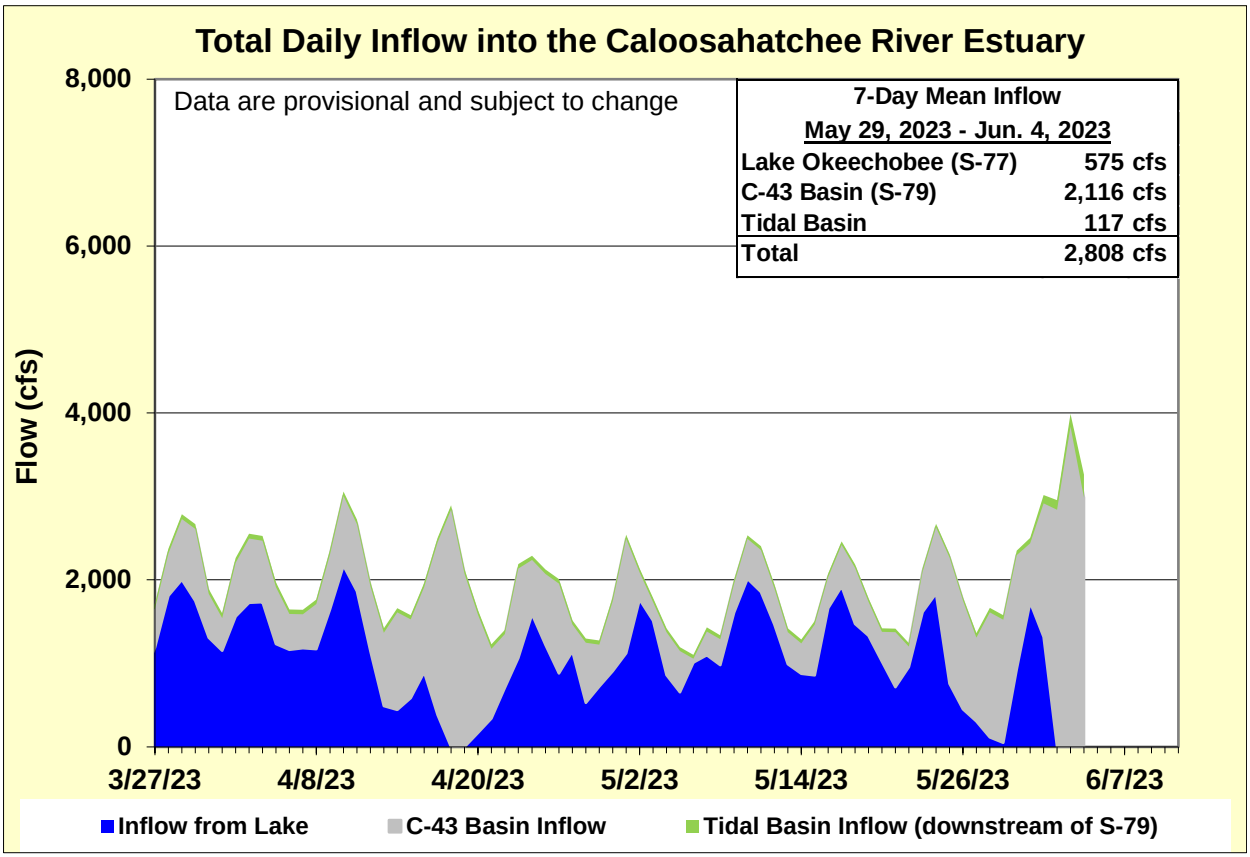


Figure ES-7. Total daily inflows from Lake Okeechobee, and runoff from the C-43 and Tidal basins into the Caloosahatchee River Estuary.

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)	**0.5** (0.5)	**0.5** (0.4)	0.0 – 10.0
Val I-75	**0.8** (0.8)	**0.9** (1.2)	0.0 – 10.0
Fort Myers Yacht Basin	**5.4** (6.9)	**6.8** (10.3)	0.0 – 10.0
Cape Coral	**11.1** (12.9)	**13.4** (15.6)	10.0 – 25.0
Shell Point	**25.4** (26.8)	**26.4** (27.6)	10.0 – 25.0
Sanibel	**31.1** (32.2)	**32.0** (32.7)	10.0 – 25.0

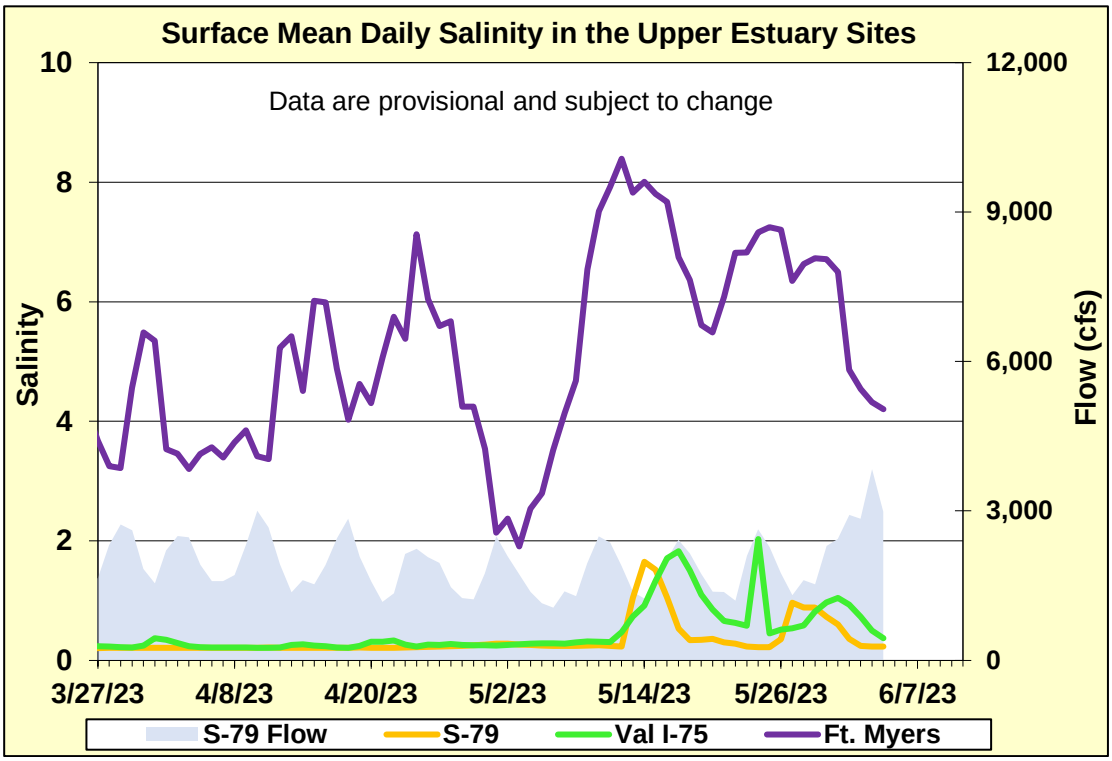


Figure ES-8. Mean daily salinity at upper Caloosahatchee River Estuary monitoring sites and mean daily flow at S-79.

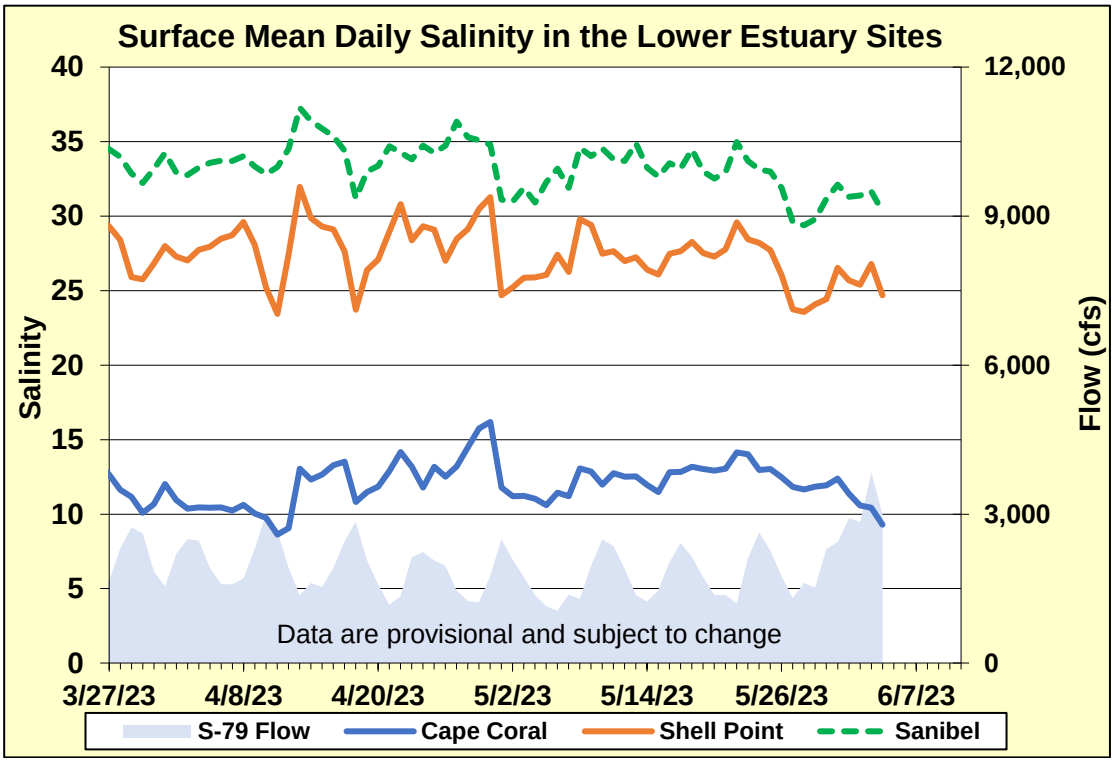


Figure ES-9. Mean daily surface salinity at lower Caloosahatchee River Estuary monitoring sites and mean daily flow at S-79.

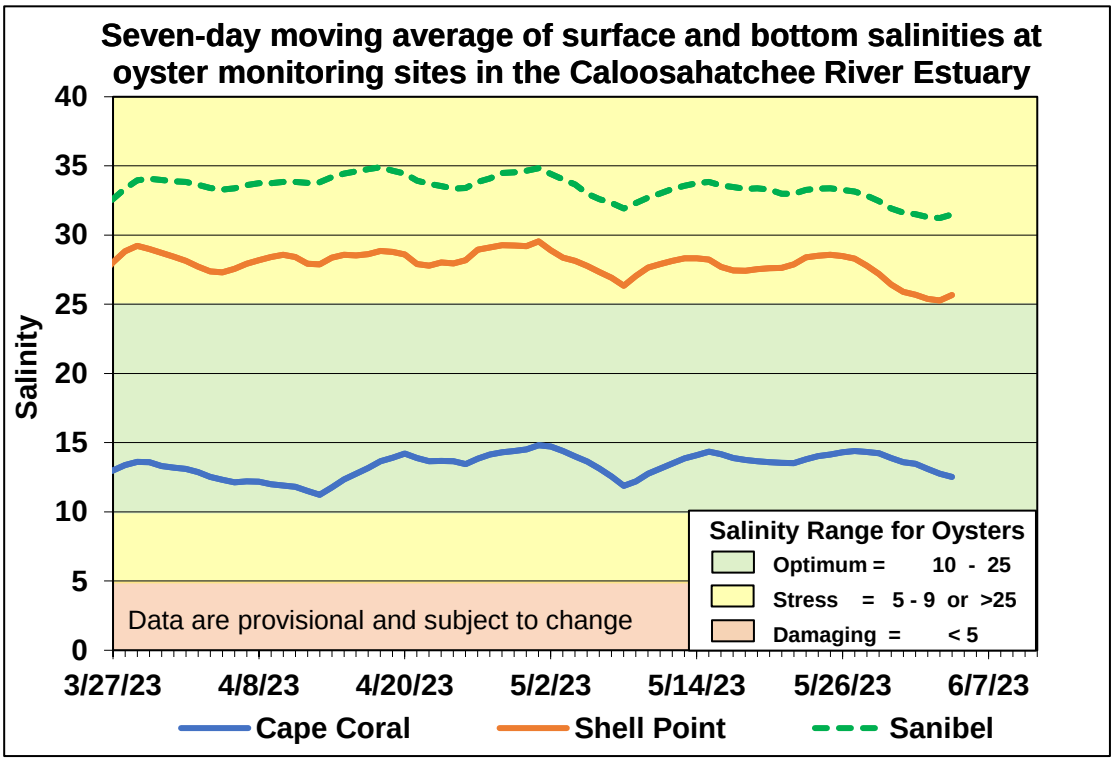


Figure ES-10. Seven-day moving average of surface and bottom salinities at Cape Coral, Shell Point and Sanibel monitoring sites in the Caloosahatchee River Estuary.

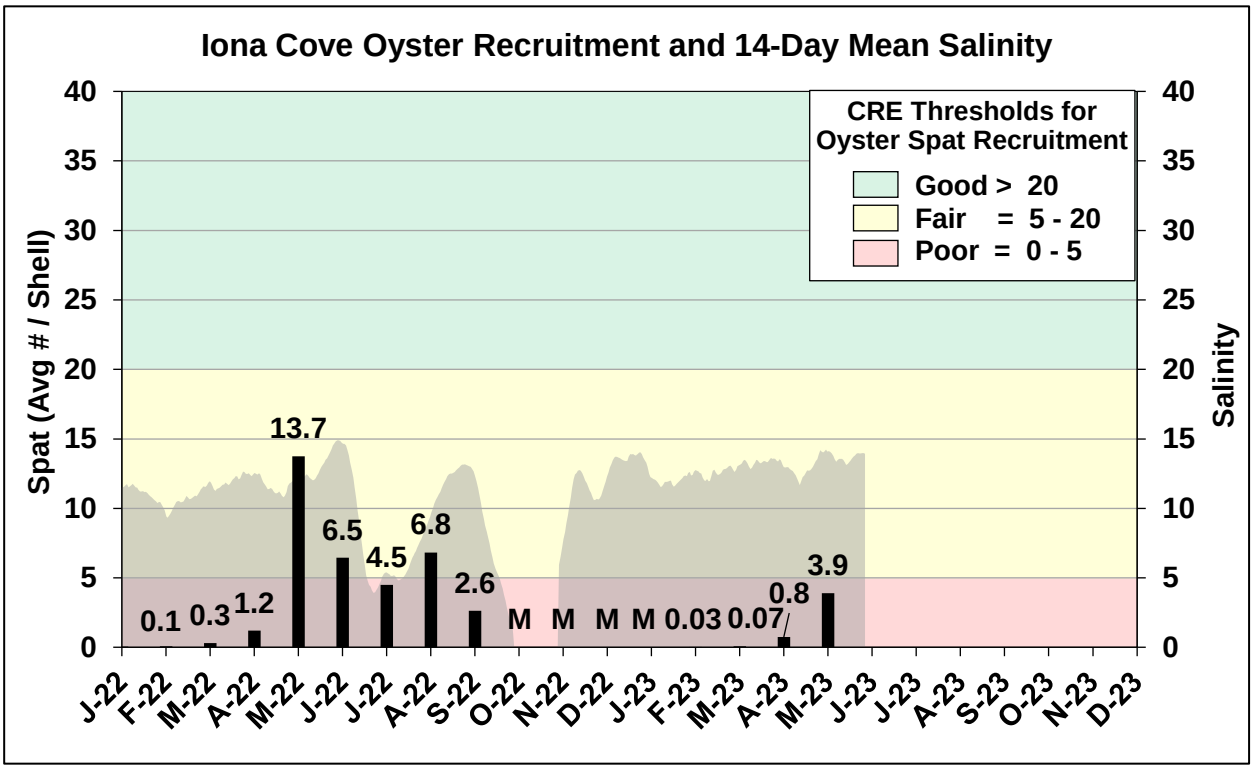


Figure ES-11. Mean oyster recruitment at the Iona Cove oyster monitoring station and 14-day mean salinity at Cape Coral.

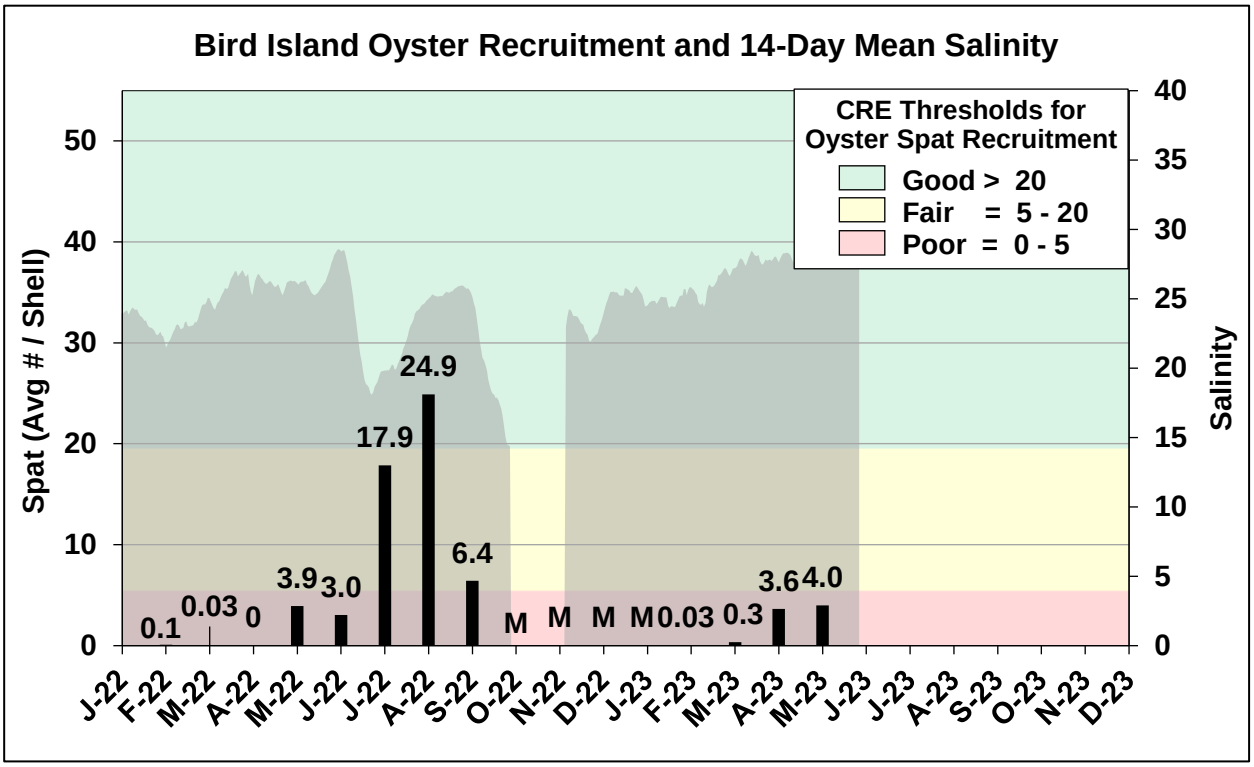


Figure ES-12. Mean oyster recruitment at the Bird Island oyster monitoring station and 14-day mean salinity at Shell Point.

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	0	255	1.4	0.6
B	450	255	0.7	0.6
C	750	255	0.4	0.5
D	1,000	255	0.3	0.5
E	1,500	255	0.3	0.5
F	2,000	255	0.3	0.5

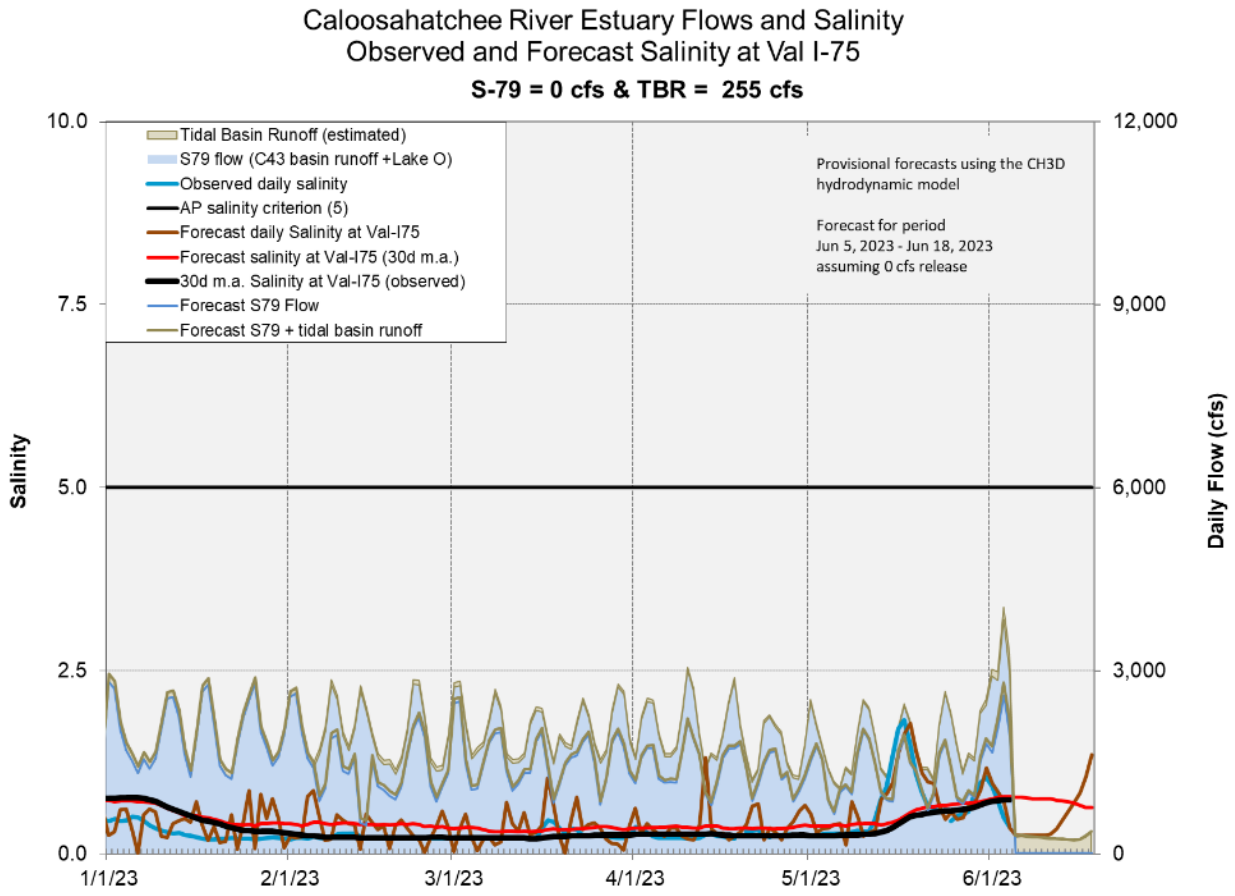


Figure ES-13. Forecasted Val I-75 site surface salinity assuming no pulse release at S-79.

Stormwater Treatment Areas

STA-1E: STA-1E Western Flow-way is offline for post-construction vegetation grow in and the Central Flow-way is offline for a Refurbishments project survey. Operational restrictions are in place in STA-1E Eastern Flow-way for vegetation management activities. The Central Flow-way contains nests of Migratory Bird Treaty Act protected species. Online treatment cells are above target stage. Vegetation in the flow-ways is stressed and highly stressed. The 365-day phosphorus loading rate (PLR) for the Eastern Flow-way is below 1.0 g/m^2/year. The 365-day PLR for the Central Flow-way is high (**Figure S-1**).

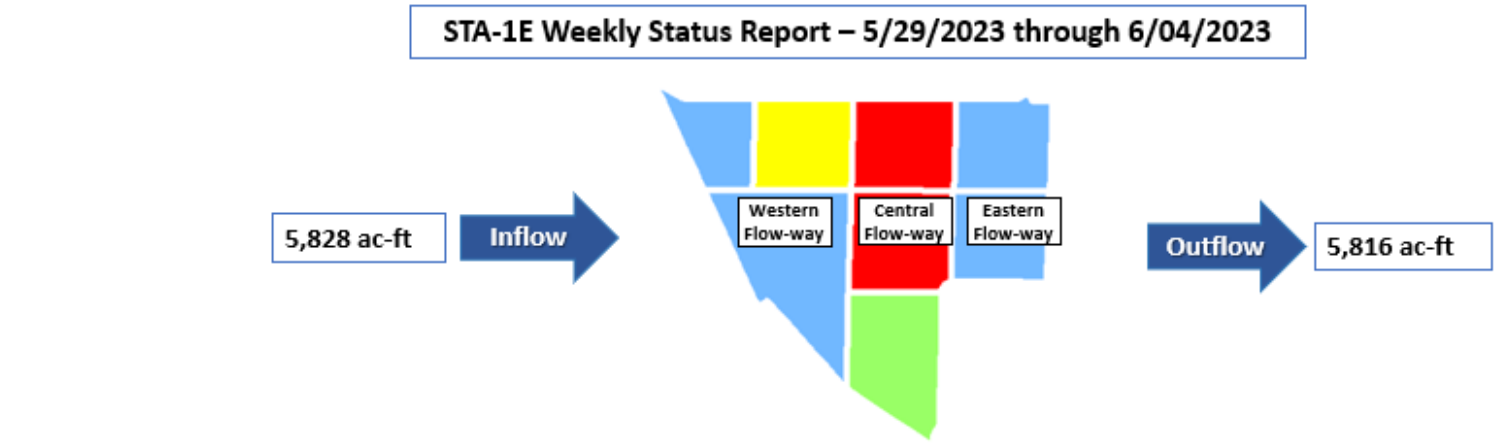
STA-1W: Operational restrictions are in place in STA-1W Western, Eastern, and Northern Flow-ways for vegetation management activities. The Northern Flow-way, Cell 7 and Cell 8, contain nests of Migratory Bird Treaty Act protected species. Most treatment cells are above target stage. Vegetation in the flow-ways is stressed and highly stressed. The 365-day PLR for the Eastern Flow-way is below 1.0 g/m^2/year. The 365-day PLRs for the Northern and Western Flow-way are high (**Figure S-2**).

STA-2: STA-2 Flow-way 2 is offline for post-construction vegetation grow in. Operational restrictions are in place in STA-2 Flow-ways 3 and 4 for vegetation management activities. Flow-way 3 contains nests of Migratory Bird Treaty Act protected species. Most online treatment cells are above target stage. Vegetation in Flow-ways 1 and 3 is stressed, and in Flow-ways 2, 4 and 5 is highly stressed. The 365-day PLRs for Flow-ways 4 and 5 are below 1.0 g/m^2/year. The 365-day PLR for Flow-ways 1 and 3 are high (**Figure S-3).**

STA-3/4: STA-3/4 Eastern Flow-way is offline for vegetation rehabilitation/drawdown. Most online treatment cells are above target stage. Vegetation in the Eastern and Central Flow-ways is highly stressed and in the Western 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-4**).

STA-5/6: All flow-ways in STA-5/6 are online. Most treatment cells are at or near target stage. All treatment cells have highly stressed vegetation conditions except Flow-ways 7 and 8 which are healthy. The 365-day PLRs for most flow-ways are at or below 1.0 g/m^2/year, except Flow-way 3 which is high (**Figure S-5** and **S-6**).

For definitions on STA operational language see glossary following figures.



STA-1E Flow-Way Status

Flow-Way	Vegetation Status (Healthy ----- Stressed)	365-day P Loading Rate (below 1.0 g P /m²/yr is optimal)	Online / Offline / Restrictions
Eastern		1.0	Vegetation management
Central	Offline, refurbishments project survey starting 4/26/2023		
Western	Offline, post-construction grow in starting 3/28/2022		

As of 6/04/2023
Stage Based: Relative to Target Stage (TS)
Deep Water Level (> 2.8' above TS)
High Water Level (1.5' – 2.8' above TS)
0.2' – 1.5' above TS
Target Stage (TS +/- 0.2')
0.2' – 0.5' below TS
0.5' – 1.0' below TS
Low Water Level (1.0' – 1.2' below TS)
Extreme Low Water (> 1.2' below TS)

STA-1E Flow & Phosphorus Concentration

	7-day	28-day	365-day
Total Inflow, ac-ft	5,828	15,342	121,651
--Lake Inflow, ac-ft	0	N/A	1,500
Total Outflow, ac-ft	5,816	8,480	97,305
Inflow Conc., ppb	60	66	111
Outflow Conc., ppb	22	25	26
Includes Preliminary Data			

Figure S-1. STA-1E Weekly Status Report

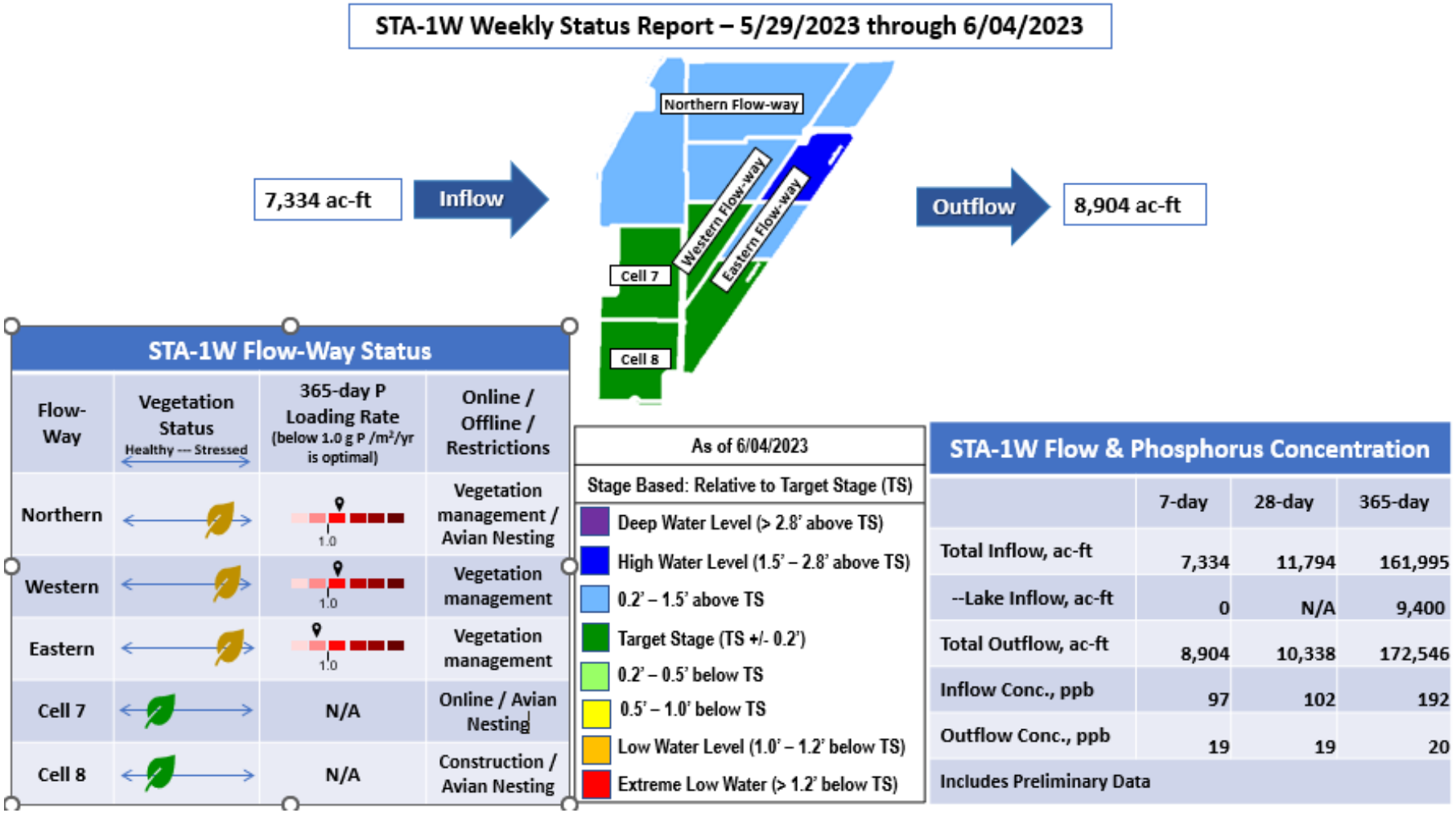


Figure S-2. STA-1W Weekly Status Report

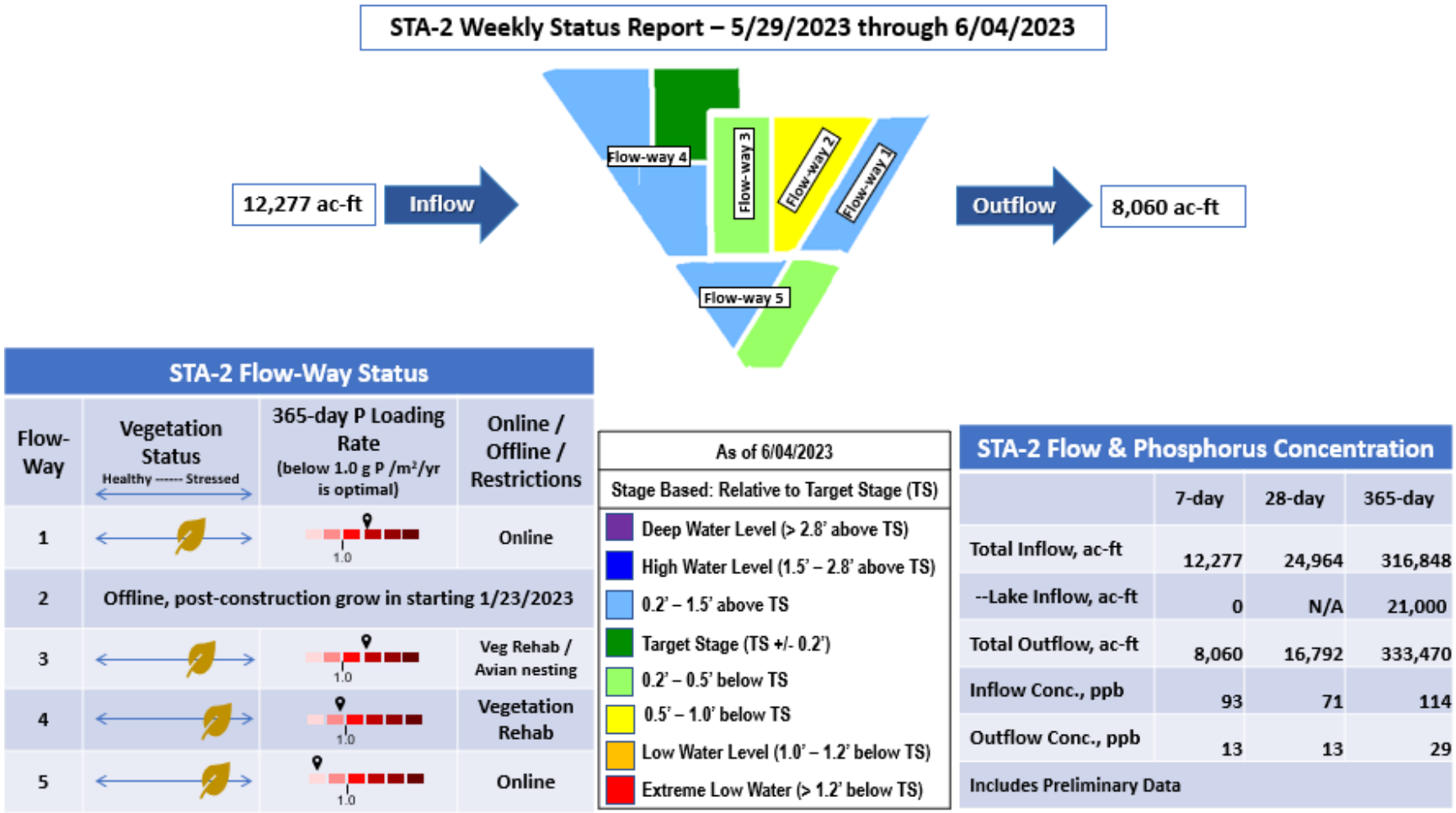
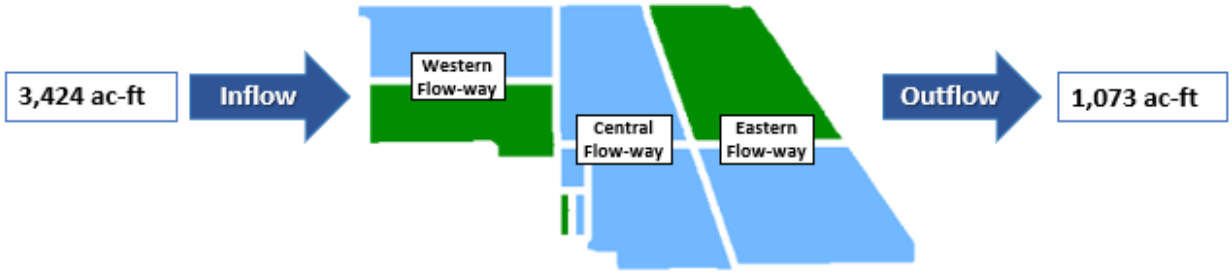


Figure S-3. STA-2 Weekly Status Report

STA-3/4 Weekly Status Report – 5/29/2023 through 6/04/2023



STA-3/4 Flow-Way Status

Flow-Way	Vegetation Status (Healthy ------ Stressed)	365-day P Loading Rate (below 1.0 g P /m²/yr is optimal)	Online / Offline / Restrictions
Eastern	Offline, vegetation management drawdown as of 3/1/2021		
Central		1.0	Online
Western		1.0	Online

As of 6/04/2023
Stage Based: Relative to Target Stage (TS)
Deep Water Level (> 2.8' above TS)
High Water Level (1.5' – 2.8' above TS)
0.2' – 1.5' above TS
Target Stage (TS +/- 0.2')
0.2' – 0.5' below TS
0.5' – 1.0' below TS
Low Water Level (1.0' – 1.2' below TS)
Extreme Low Water (> 1.2' below TS)

STA-3/4 Flow & Phosphorus Concentration

	7-day	28-day	365-day
Total Inflow, ac-ft	3,424	8,638	327,239
--Lake Inflow, ac-ft	0	N/A	1,400
Total Outflow, ac-ft	1,073	8,899	318,468
Inflow Conc., ppb	44	49	94
Outflow Conc., ppb	16	16	16
Includes Preliminary Data			

Figure S-4. STA-3/4 Weekly Status Report

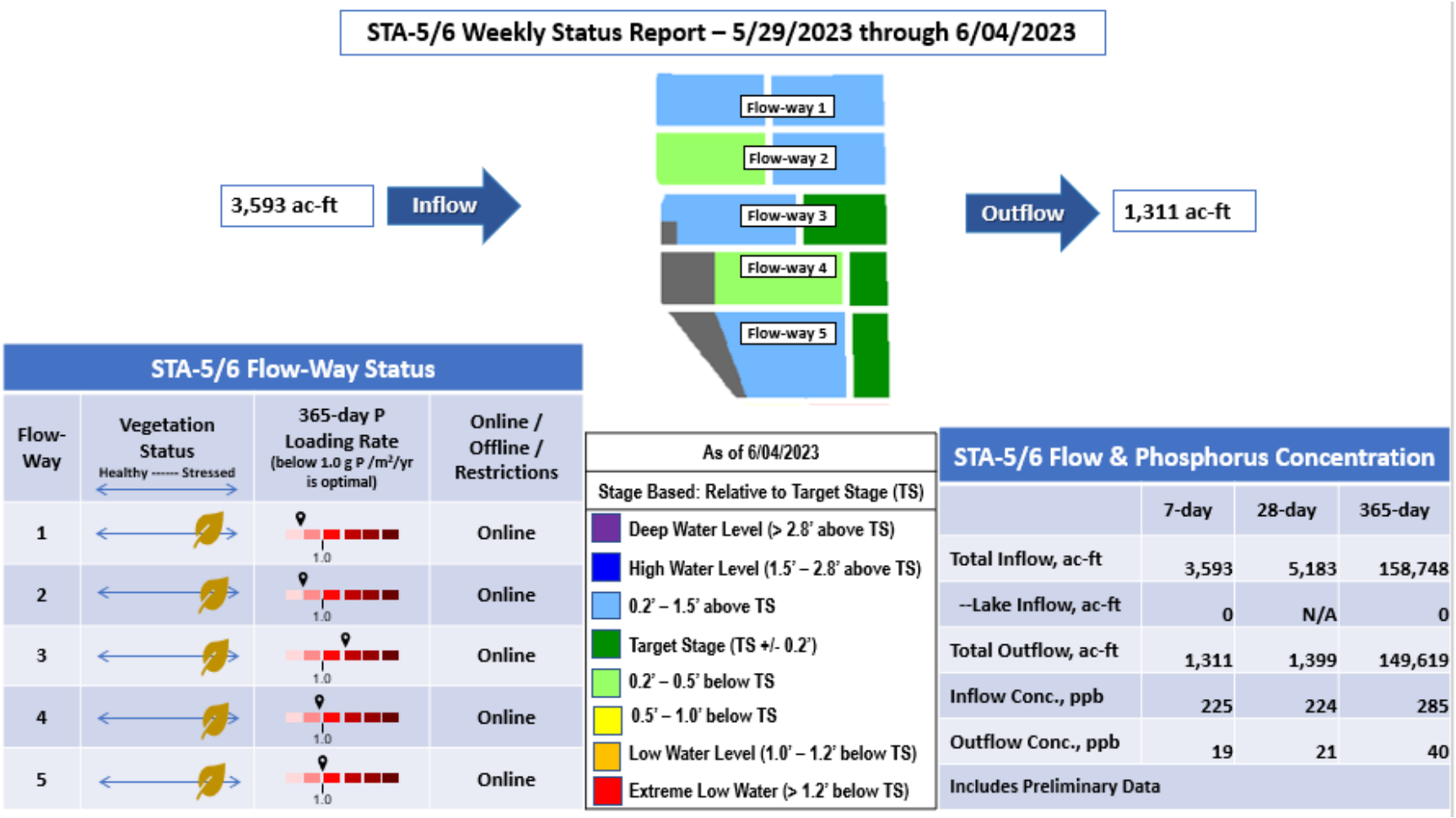
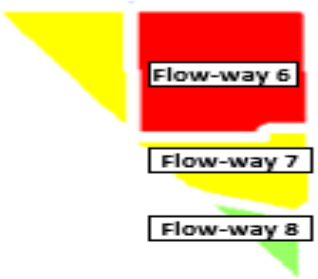


Figure S-5. STA-5/6 Weekly Status Report (Flow-ways 1 – 5)

STA-5/6 Weekly Status Report – 5/29/2023 through 6/04/2023



STA-5/6 Flow-Way Status

Flow-Way	Vegetation Status Healthy ------ Stressed	365-day P Loading Rate (below 1.0 g P /m²/yr is optimal)	Online / Offline / Restrictions
6		1.0	Online
7		1.0	Online
8		1.0	Online

As of 6/04/2023
Stage Based: Relative to Target Stage (TS)
Deep Water Level (> 2.8' above TS)
High Water Level (1.5' – 2.8' above TS)
0.2' – 1.5' above TS
Target Stage (TS +/- 0.2')
0.2' – 0.5' below TS
0.5' – 1.0' below TS
Low Water Level (1.0' – 1.2' below TS)
Extreme Low Water (> 1.2' below TS)

Figure S-6. STA-5/6 Weekly Status Report (Flow-ways 6 – 8)

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 significant rainfall with more to the south, especially in southern WCA-3A and northern ENP. WCA-1: Last week stage at the 1-8C continued to rise away from schedule. The average on Sunday was 0.52 feet above the flat Zone A1 regulation line. WCA-2A: Stage fell at the S11B–HW gauge last week. The average on Sunday was 0.53 feet above the flat regulation line. WCA-3A: The Three Gauge Average stage rose and then steadied last week. The average stage was 0.30 feet below the now rising regulation line on Sunday. WCA-3A North: At gauge 62 (Northwest corner) stage ascended quickly, the average on Sunday was 0.30 feet below the rising Upper schedule line (**Figures EV-1** through **EV-4**).

Water Depths

The SFWDAT tool illustrates current stages in the EPA remain low in the far west but have risen dramatically over the last two months. Stage has risen in northwestern WCA-3A with only a small area remaining significantly below ground. Central WCA-3A depths are rising with less potential for stage below ground. Hydrologic connectivity continues to strengthen within the main sloughs of ENP. Comparing current WDAT water depths to one month ago conditions within the WCAs are similar but significantly wetter in central BCNP and parts of ENP. Looking back a year ago, conditions are also similar in WCAs; significantly drier in far western BCNP (**Figure EV-5 and Figure EV-6)**. Comparing current conditions to the 20-year average on June 4th: Depths are now above average across the EPA with the exception being the historically ponded southern WCA-3A and historically over-dried northwestern WCA-3A (**Figure EV-7**).

Taylor Slough and Florida Bay

Total weekly rainfall averaged 1.7 inches in Taylor Slough and Florida Bay over the past week (Monday-Sunday) based on the 18 gauges used for this report. Rainfall ranged from 0.2 inches at Whipray Basin (WB) in the central Bay to 5.2 inches at Taylor Slough Bridge (TSB) in the northern slough. Stages across most of Taylor Slough increased, averaging an increase of +0.3 feet and ranging from a decrease of −0.02 feet at EPSW in the southern C-111 area to +0.71 feet at Taylor Slough Bridge (TSB) (**Figure EV-8 and Figure EV-9**). Water levels at many sites are now aboveground, a reversal of the decreasing pattern over the past several weeks. Taylor Slough water levels are above the historical average for this time of year by +8.9 inches compared to before the Florida Bay initiative (starting in 2017), an increase of +3.1 inches from last week.

Average Florida Bay salinity was 36.5, +0.1 higher than the previous week. Salinity remained similar to the previous week at many sites and ranged from a decrease of −0.23 in Long Sound to an increase of +4.6 in Joe Bay (JB), both in the eastern nearshore region (**Figure EV-8**). Salinities remain within the IQR for the Eastern, Central and Western regions of the bay (**Figure EV-10**). Florida Bay salinity is +0.3 above its historical average for this time of year, down −0.8 from last week.

Water Management Recommendations

Balancing basin inflows and outflows, allowing for a natural rate of stage change has ecological benefit as we the wet season progresses. Operations that elevate the ascension rates above 0.18 feet per week would have detrimental ecological impacts in sensitive regions of the EPA. The ecology of WCA-2A would benefit from a more moderate ascension rate or even a slow recession in the marsh. If necessary, in order to meet that goal, an increase in discharge from the S-11 structures would not have detrimental impacts downstream. As conditions remain at the 90th percentile in NESRS, when water is available flow through Taylor slough has ecological benefit downstream. Individual regional recommendations can be found in **Table EV-2**.

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

Everglades Region	Rainfall (inches)	Stage change (feet)
WCA-1	1.92	+0.13
WCA-2A	2.41	+0.19
WCA-2B	3.07	+0.16
WCA-3A	3.15	+0.29
WCA-3B	3.92	+0.25
ENP	2.89	+0.34

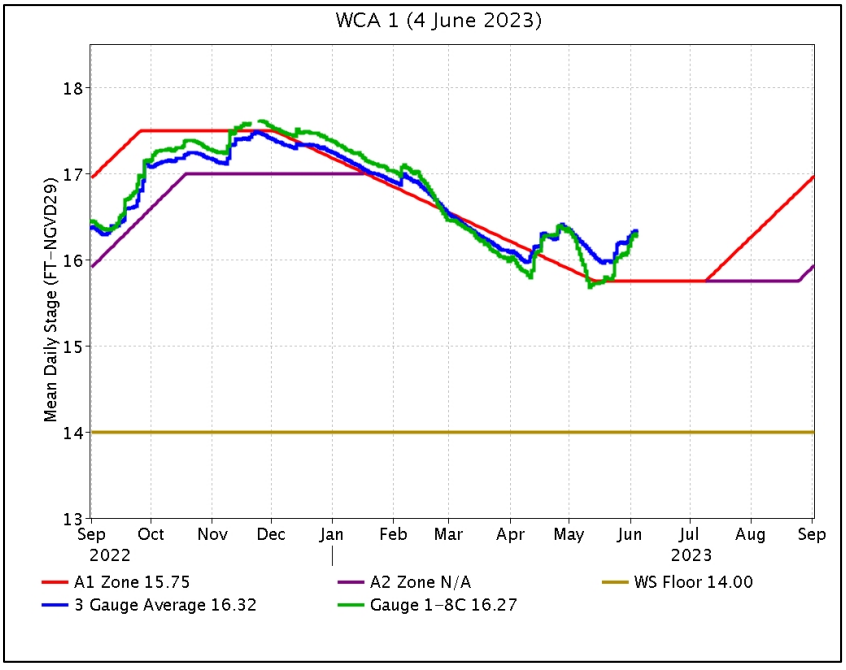


Figure EV-1. WCA-1 stage hydrographs and regulation schedule.

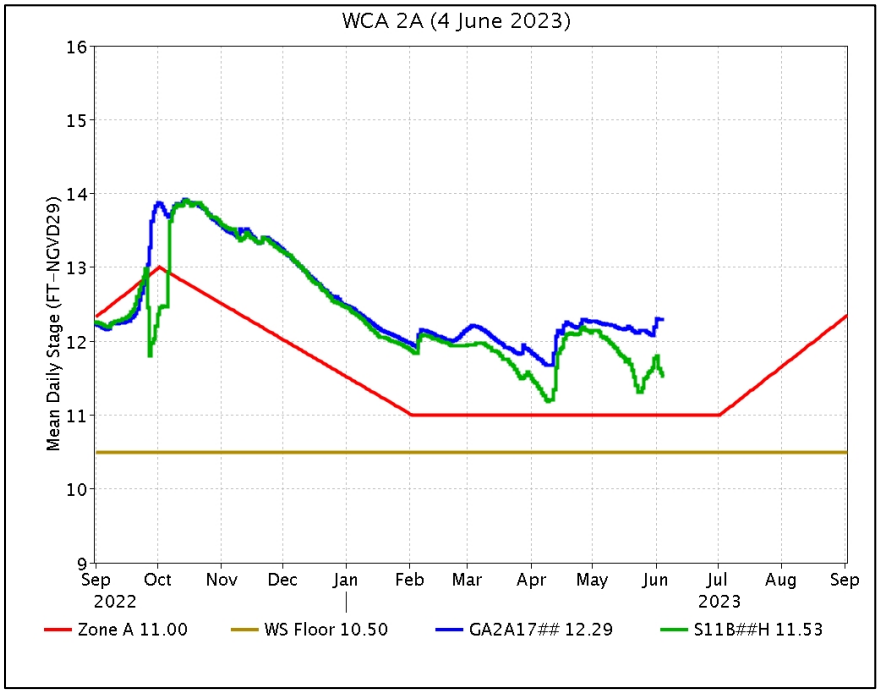


Figure EV-2. WCA-2A stage hydrographs and regulation schedule.

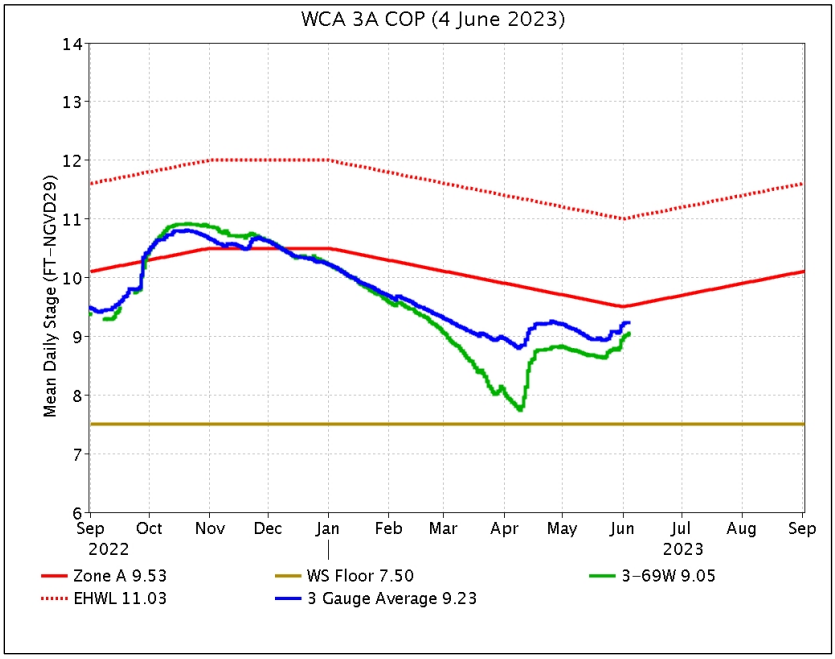


Figure EV-3. WCA-3A stage hydrographs (three-gauge average, 3-69W) and regulation schedule.

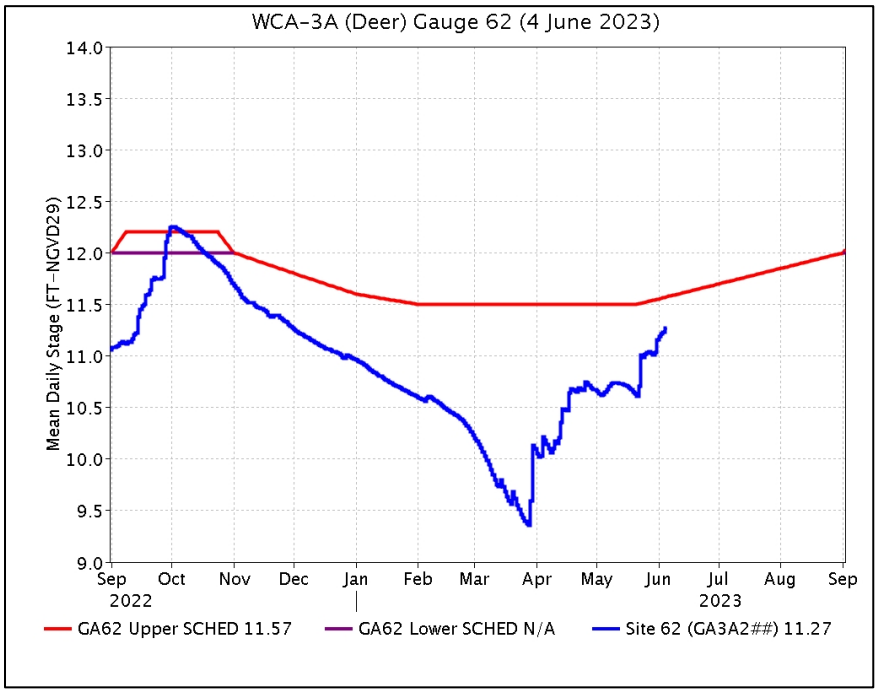


Figure EV-4. WCA-3A stage hydrograph (Deer gauge; Site 62) and CA62 regulation schedule.

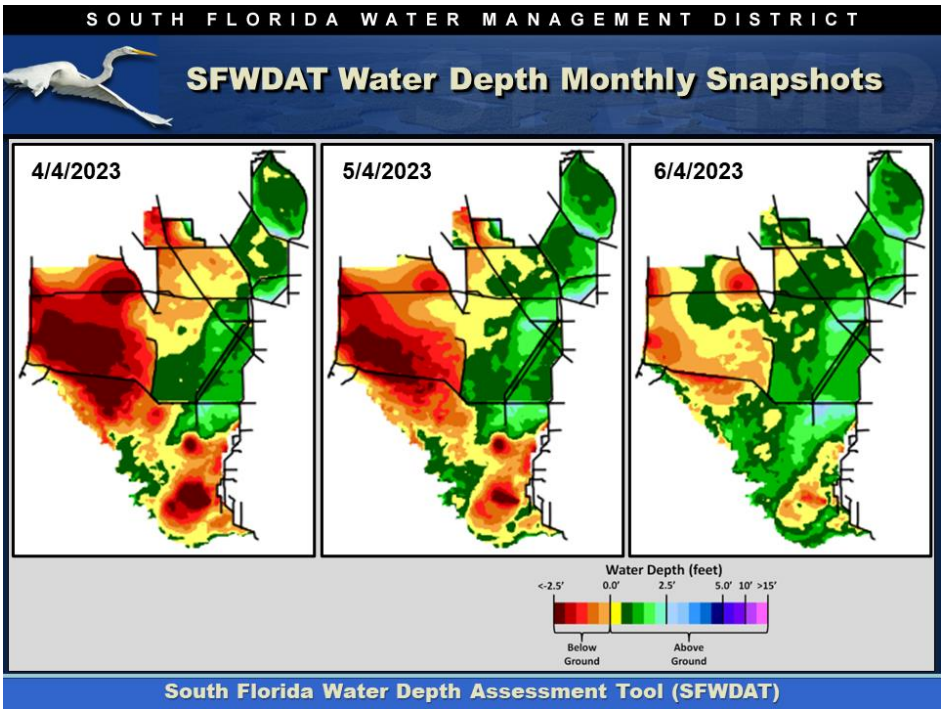


Figure EV-5. Everglades water depths from two months ago (left), one month ago (center) and present (right), based on SFWDAT.

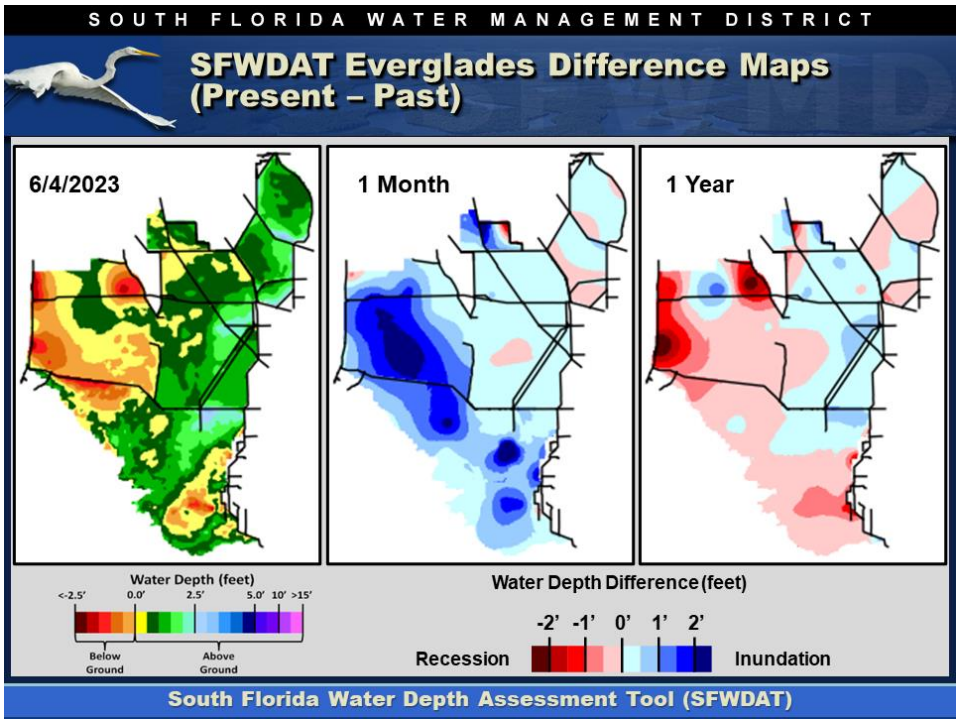


Figure EV-6. Present Everglades water depths (left) and water depth changes from one month (center) and one year (right) ago, based on SFWDAT.

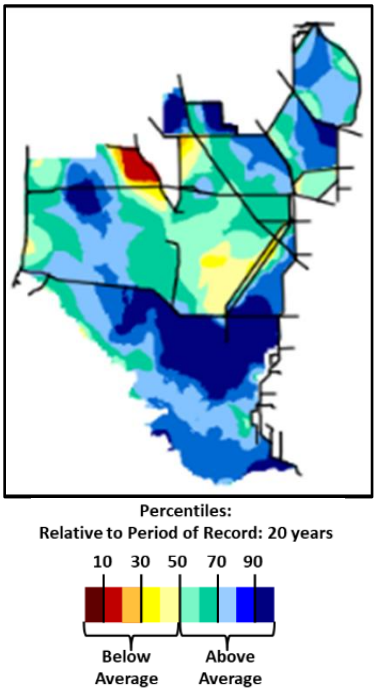


Figure EV-7. Present water depths (6/4/2023) compared to the day of year average over the previous 20 years.

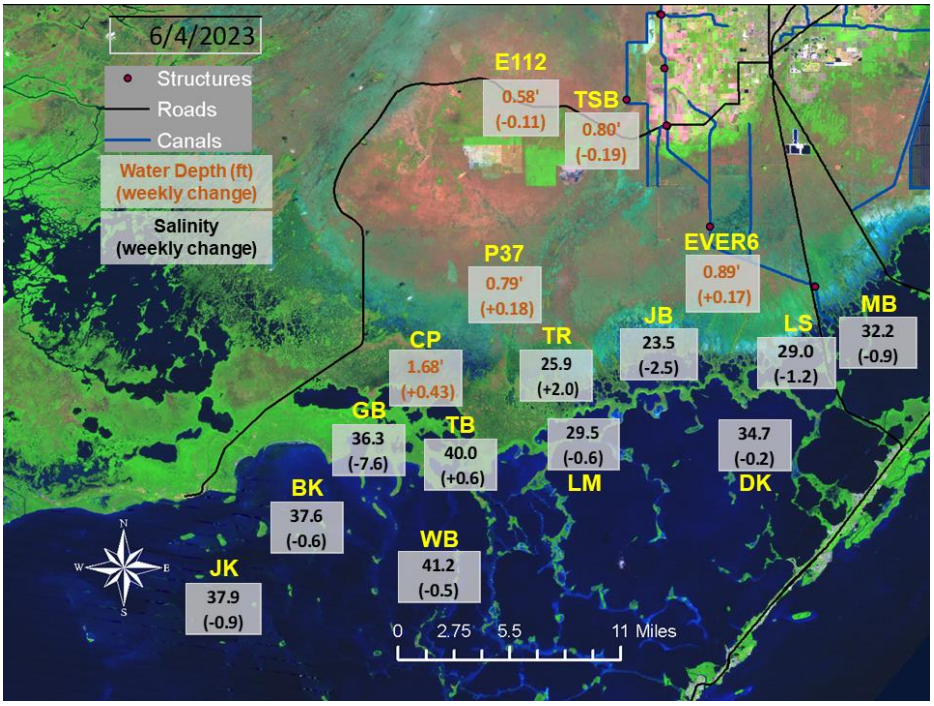


Figure EV-8. Taylor Slough water depths with changes since a week ago and Florida Bay salinities with changes since a week ago.

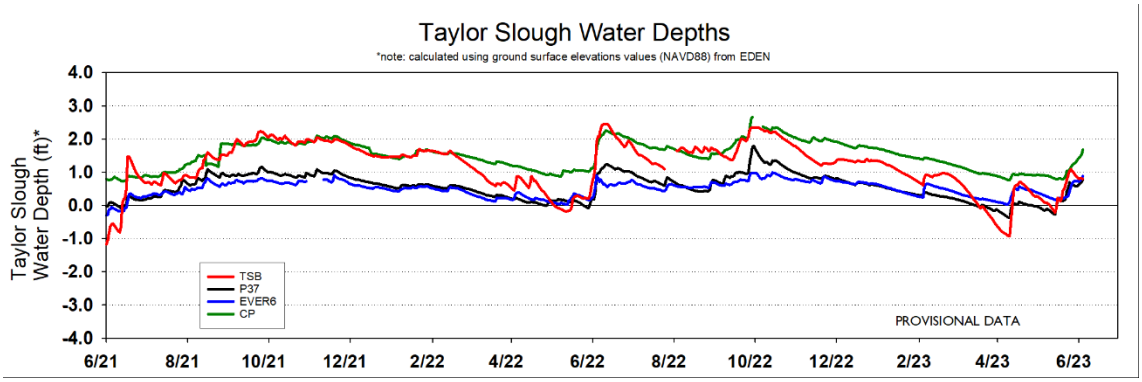


Figure EV-9. Taylor Slough water depth time series.

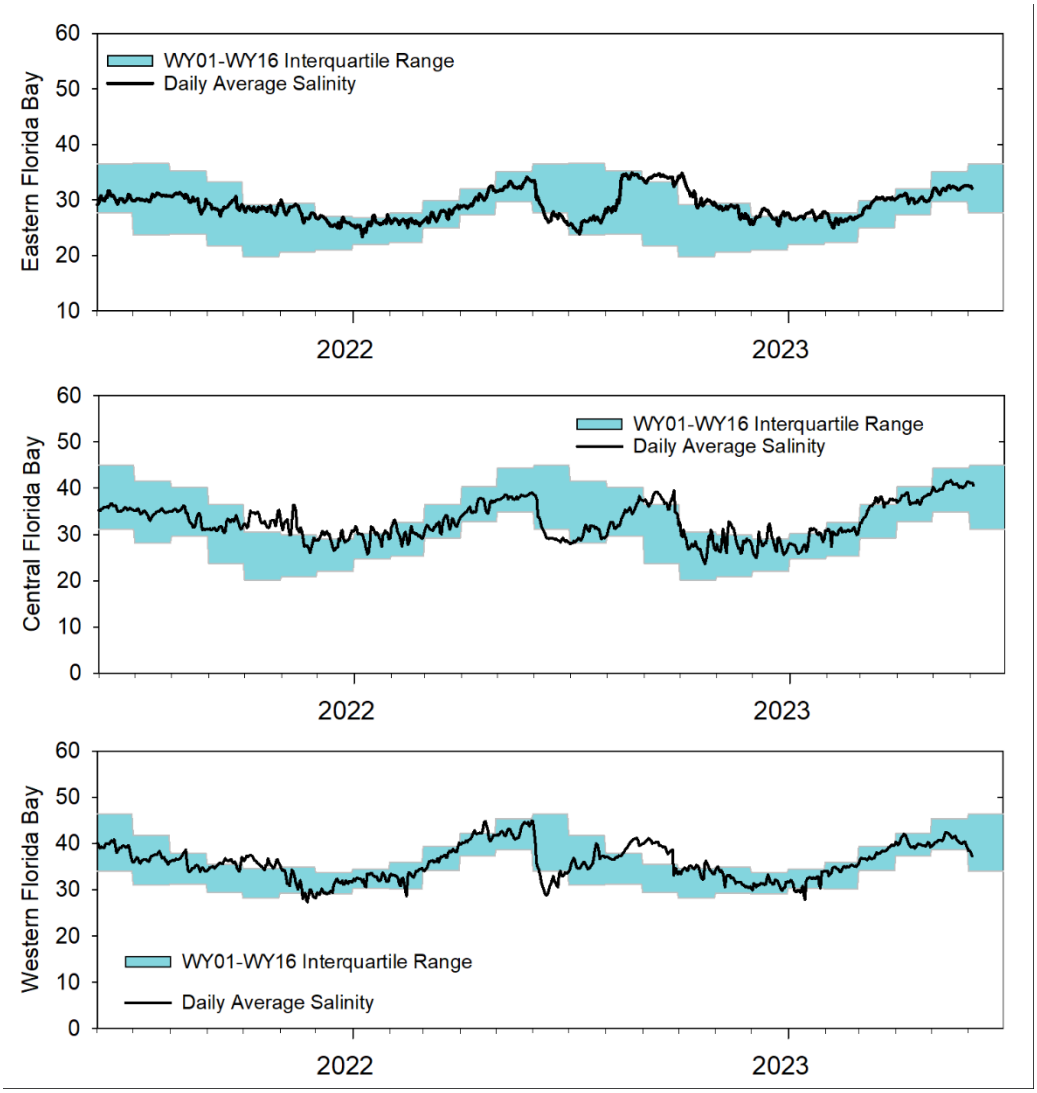


Figure EV-10. Eastern (top panel), Central (middle panel) and Western (bottom panel) Florida Bay daily average salinities with interquartile (25-75 percentile) ranges.

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

SFWMD Everglades Ecological Recommendations, June 6, 2023 (red is new)			
	Weekly change	Recommendation	Reasons
WCA-1	Stage increased by 0.13’	Recession rate of less than 0.10’ per week.	Protect within basin and downstream habitat and wildlife. Assist in creating conditions acceptable for Rx burn.
WCA-2A	Stage increased by 0.19’	Allow water to flow south from this basin until 11.6 NGVD at the 2-17 gauge. Recession rate of less than 0.10’ per week.	Protect within basin and downstream habitat and wildlife.
WCA-2B	Stage increased by 0.16’	Conserve water in this basin as possible Ascension rate of less than +0.18’ per week.	Protect within basin and downstream habitat and wildlife.
WCA-3A NE	Stage increased by 0.07’	Conserve water in this basin as possible. Ascension rate of less than +0.18’ per week.	Protect within basin and downstream habitat and wildlife.
WCA-3A NW	Stage increased by 0.46	Conserve water in this basin as possible. Ascension rate of less than +0.18’ per week.	
Central WCA-3A S	Stage increased by 0.20	Ascension rate of less than +0.18’ per week.	Protect within basin and downstream habitat and wildlife.
Southern WCA-3A S	Stage increased by 0.44’		
WCA-3B	Stage increased by 0.25’	Ascension rate of less than +0.18’ per week.	Protect within basin and downstream habitat and wildlife.
ENP-SRS	Stage increased by 0.34’	Make discharges to ENP according to COP and TTFF protocol while adaptively considering upstream and downstream ecological conditions.	Protect within basin and upstream habitat and wildlife.
Taylor Slough	Stage changes ranged from −0.19’ to +0.43’	Move water southward as possible.	When available, provide freshwater buffer for downstream conditions.
FB- Salinity	Salinity changes ranged from −7.6 to +0.6	Move water southward as possible.	When available, provide freshwater to maintain low salinity buffer and promote water movement.

Biscayne Bay

As shown in **Figure BB-1**, mean total inflow to Biscayne Bay was 1,242 cfs and the previous 30-day mean inflow was 676 cfs. The seven-day mean salinity was 28.8 at BBCW8 and 28.8 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.

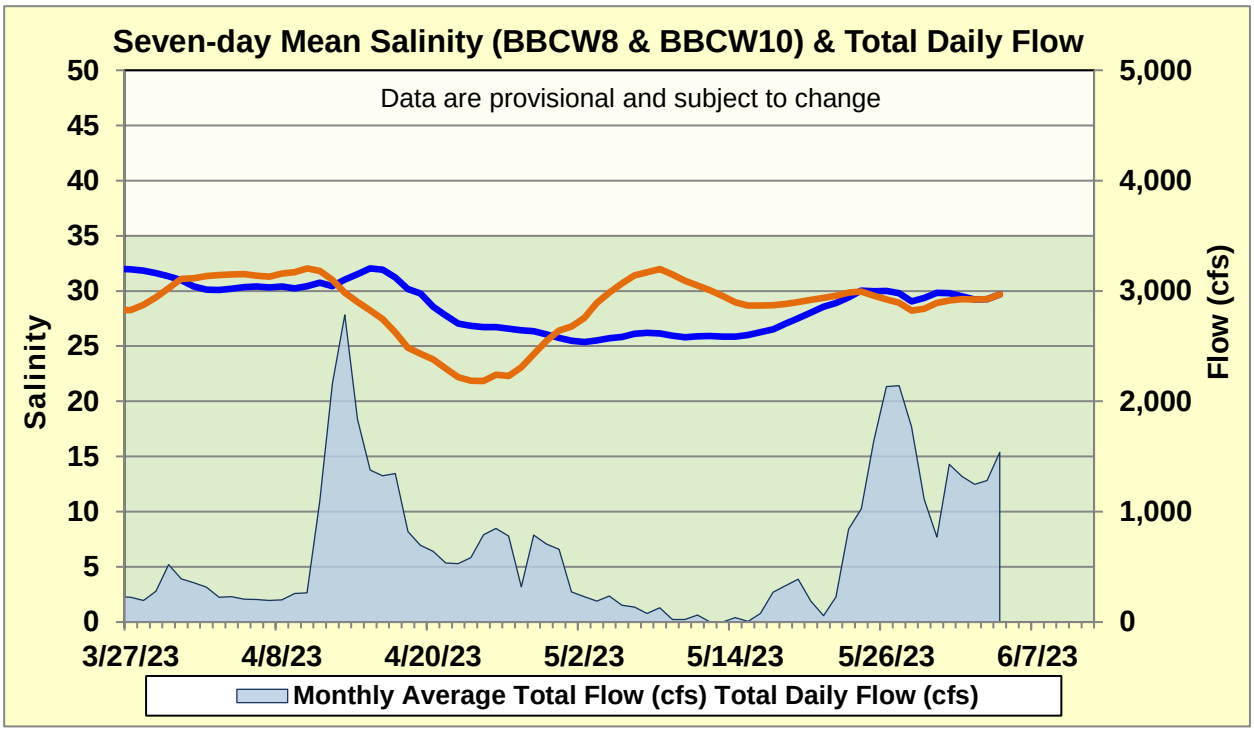


Figure BB-1. Seven-day mean salinity at BBCW8 and BBCW10 and total daily flow in Biscayne Bay. Total daily flow was calculated using flow from structures S20G, S20F, S21, S21A, S123, and S700P.