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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: February 22, 2023

SUBJECT: Weekly Environmental Conditions for Systems Operations

Summary

Weather Conditions and Forecast

Strong mid-level high pressure will suppress all rainfall across the SFWMD this week. The high-pressure region is currently located over Cuba and will recenter itself over south Florida on Thursday and strengthen in response to an amplifying upper trough over the western US. Strong sinking air associated with the area of high pressure will dry out and stabilize the mid-layers of the atmosphere; no rainfall is expected anywhere across the SFWMD during the week 1 period. In addition, very warm temperatures, potentially record-breaking in some locations and summer-like for this time of the year, will accompany this very dry period. On Sunday, the high-pressure area will breakdown and shift eastward over the Bahamas, which will allow a mostly dry cold front to sweep southward into the northern interior during the week 2 period. For the week 1 period ending next Tuesday morning, much, much below average rainfall is expected.

Kissimmee

Releases were made from East Lake Toho and Lake Toho to continue their recessions to their respective low pools on June 1. Discharge at S-65A has been reduced by approximately 25 cfs/week since February 6, 2023. Weekly average discharges on February 19, 2023, at S-65 and S-65A were 1,400 cfs and 1,300 cfs, respectively. Mean weekly water depth on the Kissimmee River floodplain of 0.41 feet was approximately 0.02 feet lower than last week. The weekly average concentration of dissolved oxygen in the Kissimmee River increased from 6.1 mg/L the last week to 6.3 mg/L for the week ending February 19, 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 15.72 feet NGVD on February 19, 2023, which is 0.21 feet lower than the previous week and 0.37 feet lower than a month ago. Lake stage dropped into the Low sub-band and is 0.88 feet above the upper limit of the ecological envelope.

Lake stage was above 16 feet for 3 months and is the highest for this time of year since 2016. According to NEXRAD, no rain fell directly on the Lake last week. Average daily inflows (excluding rainfall) decreased from 1,553 cfs the previous week 1,349 cfs this week. Average daily outflows (excluding evapotranspiration) increased from 2,751 cfs the previous week to 3,524 cfs this week. The most recent satellite image (February 15, 2023) from NOAA's Harmful Algal Bloom Monitoring System showed moderate bloom potential for many nearshore regions of the Lake.

Estuaries

Total inflow to the St. Lucie Estuary averaged 534 cfs over the past week with 387 cfs coming from the Lake. Mean salinities decreased at HR1, remained the same at the US1 Bridge, and increased at the 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 1,896 cfs over the past week with 930 cfs coming from the Lake. Mean salinities remained the same at S-79 and Val I-75 and decreased at the remaining sites within 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 upper stressed range at Shell Point and Sanibel (>25).

Stormwater Treatment Areas

For the week ending February 19, 2023, 1,500 ac-ft of Lake Okeechobee water was delivered to the FEBs/STAs. The total amount of Lake releases sent to the FEBs/STAs in WY2023 (since May 1, 2022) is approximately 26,900 ac-feet. The total amount of inflows to the STAs in WY2023 is approximately 1,002,000 ac-feet. Most STA cells are at or near target stage, except STA-5/6 where most cells are below target. STA-1E Western Flow-way is offline for post-construction vegetation grow in, 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 Central and Eastern Flow-ways, STA-1W Eastern, Western, and Northern Flow-ways, and STA-2 Flow-ways 3 and 4 for vegetation management activities. This week, if 2008 LORS recommends Lake releases to the WCAs and conditions allow, releases will be sent to STA-2.

Everglades

Last week rates of stage change within most of the Everglades Protection Area remained elevated, with most regions in the "fair" range. Depths remain above average in WCA-3A northeast (but also remain one of the shallowest regions in the WCAs). Maintaining above average conditions could be important for wading bird nesting in that region. Very few wading birds are foraging in WCA-3A North compared to one month ago as conditions have dried down quickly in that region. The large flocks that were feeding along the coastal margins of eastern Everglades National Park have left that region. Helicopter issues prevented a system-wide reconnaissance of wading birds last week. Taylor slough stages fell last week but remain above the pre-Florida Bay initiative average. Average

salinity increased again last week in Florida Bay, but all the regions remain within the inter-quartile range.

Biscayne Bay

Total inflow to Biscayne Bay averaged 539 cfs, and the previous 30-day mean inflow averaged 525 cfs. The seven-day mean salinity was 24.1 at BBCW8 and 21.7 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 February 19, 2023, mean daily lake stages were 56.8 feet NGVD (1.2 feet below schedule) in East Lake Toho, 53.8 feet NGVD (1.2 feet below schedule) in Lake Toho, and 51.2 feet NGVD (0.4 feet below schedule) in Lakes Kissimmee-Cypress-Hatchineha (KCH) (**Table KB-1, Figures KB-1-3**).

Lower Kissimmee

For the week ending February 19, 2023, mean weekly discharge was 1,400 cfs at S-65 and 1,300 cfs at S-65A. Mean weekly discharge from the Kissimmee River was 1,300 cfs at S-65D and 1,300 cfs at S-65E (**Table KB-2**). Mean weekly headwater stages were 46.3 feet NGVD at S-65A and 28.4 feet NGVD at S-65D on February 19, 2023. Mean weekly river channel stage was 37.3 feet NGVD on February 19, 2023, 0.01 feet lower than the previous week's mean (**Figure KB-4**). Mean weekly water depth on the Kissimmee River floodplain was 0.41 feet for the week ending February 19, 2023, approximately 0.02 feet lower than the previous week's mean (**Table KB-2, Figure KB-5**). The weekly average dissolved oxygen concentration in the Kissimmee River increased from 6.1 mg/L the previous week to 6.3 mg/L this week (**Table KB-2, Figure KB-6**).

Water Management Recommendations

Continue stage recessions in Lake Toho and East Lake Toho to their June 1 low pools. Beginning Wednesday 02/22/2023, reduce discharge at S-65/S-65A by 75 cfs/day until discharge is decreased to 650 cfs, then reduce to 38 cfs/day until discharge is decreased to 300 cfs.

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)	
							2/19/23	2/12/23
Lakes Hart and Mary Jane	S-62	LKMJ	30	60.9	R	61.0	-0.1	0.1
Lakes Myrtle, Preston and Joel	S-57	S-57	6	61.1	R	61.1	0.0	0.0
Alligator Chain	S-60	ALLI	0	64.0	R	64.0	0.0	0.1
Lake Gentry	S-63	LKGT	0	61.5	R	61.5	0.0	0.1
East Lake Toho	S-59	TOHOE	100	56.8	R	58.0	-1.2	-1.1
Lake Toho	S-61	TOHOW S-61	320	53.8	R	55.0	-1.2	-1.0
Lakes Kissimmee, Cypress and Hatchineha	S-65	KUB011 LKIS5B	1400	51.2	R	51.6	-0.4	-0.4

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.

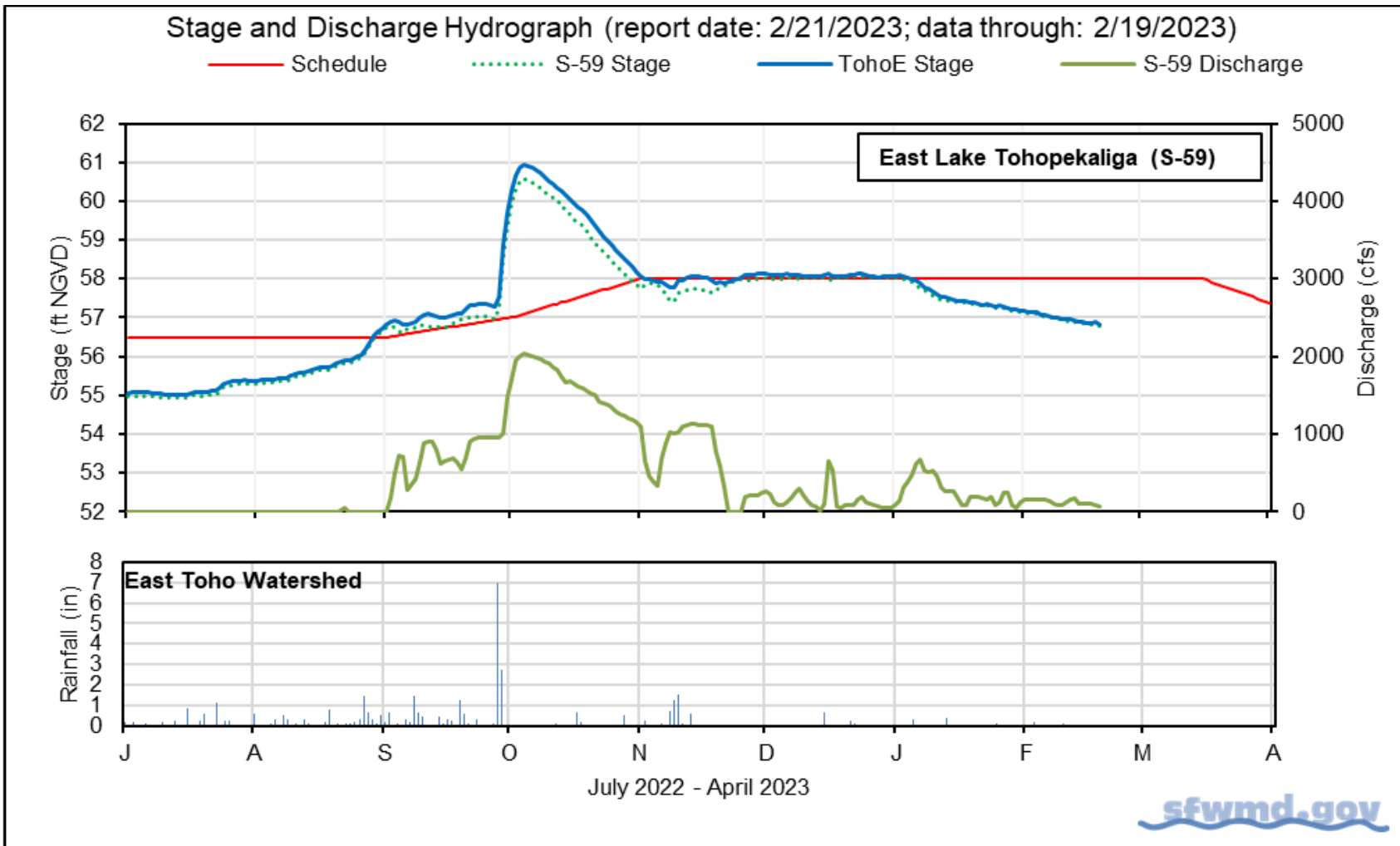


Figure KB-1. East Lake Toho regulation schedule, stage, discharge, and rainfall.

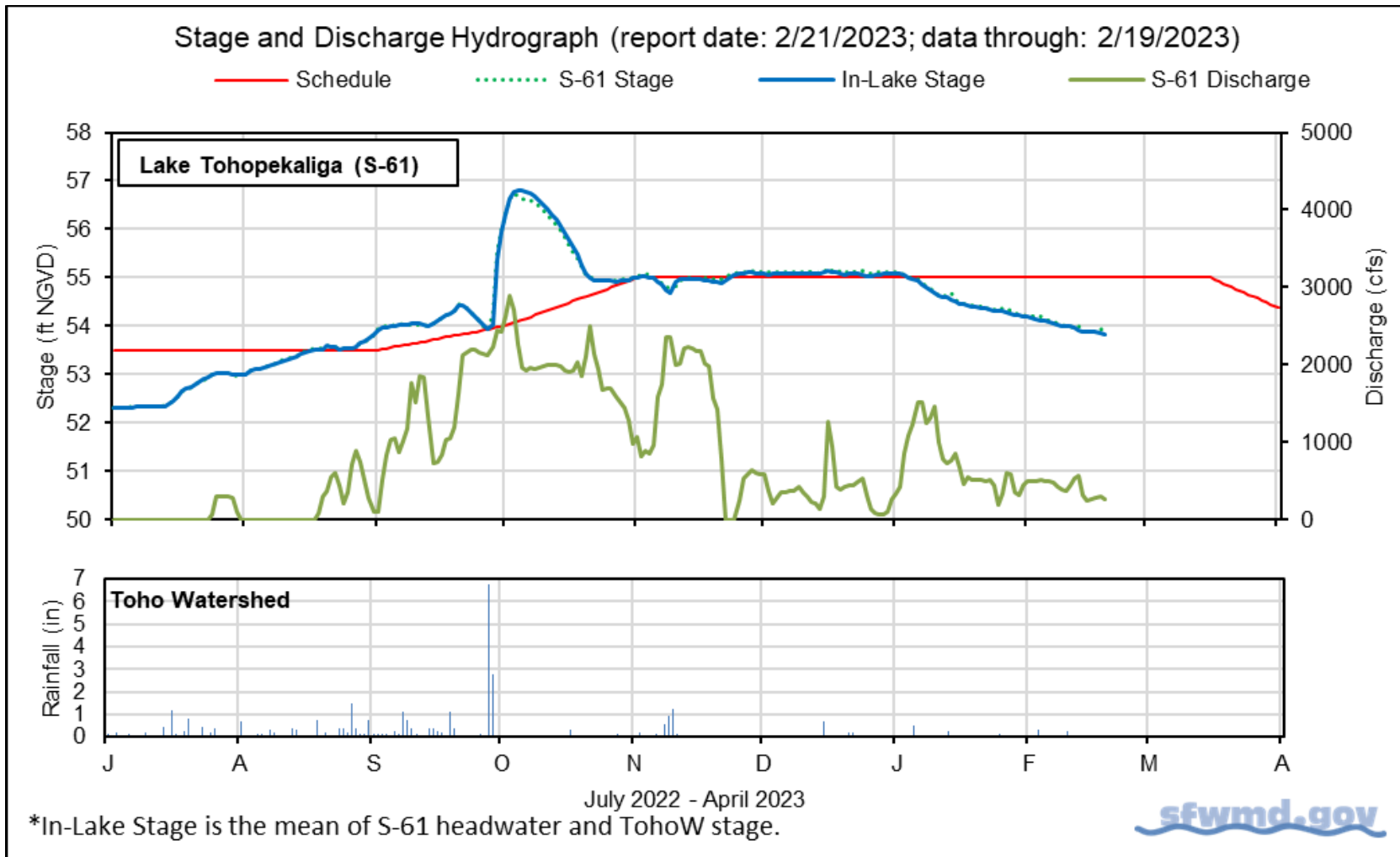


Figure KB-2. Lake Toho regulation schedule, stage, discharge, and rainfall.

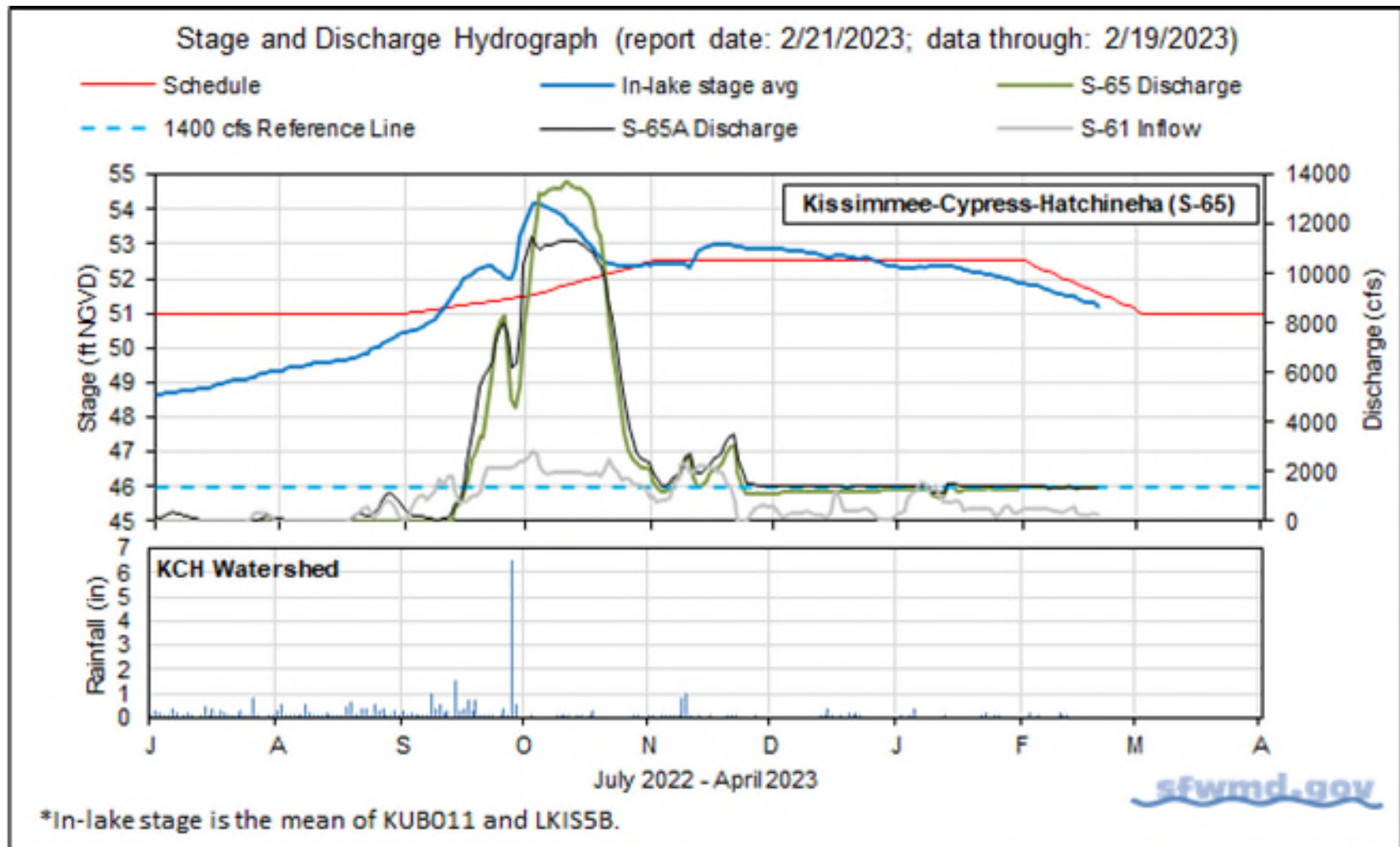


Figure KB-3. Lakes Kissimmee, Cypress and Hatchineha regulation schedule, stage, discharge, and rainfall.

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			
		2/19/23	2/19/23	2/12/23	2/5/23	1/29/23
Discharge	S-65	1,400	1,400	1,400	1,400	1,300
Discharge	S-65A ^a	1,300	1,300	1,400	1,400	1,400
Headwater Stage (feet NGVD)	S-65A	46.3	46.3	46.3	46.3	46.3
Discharge	S-65D ^b	1,200	1,300	1,300	1,400	1,400
Headwater Stage (feet NGVD)	S-65D ^c	28.4	28.4	28.4	28.4	28.4
Discharge (cfs)	S-65E ^d	1,300	1,300	1,400	1,400	1,400
Discharge (cfs)	S-67	0	0	0	0	0
Dissolved Oxygen (mg/L) ^e	Phase I, II/III river channel	6.4	6.3	6.1	6.2	6.5
River channel mean stage ^f	Phase I river channel	37.3	37.3	37.4	37.5	37.5
Mean depth (feet) ^g	Phase I floodplain	0.40	0.41	0.43	0.44	0.46

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).

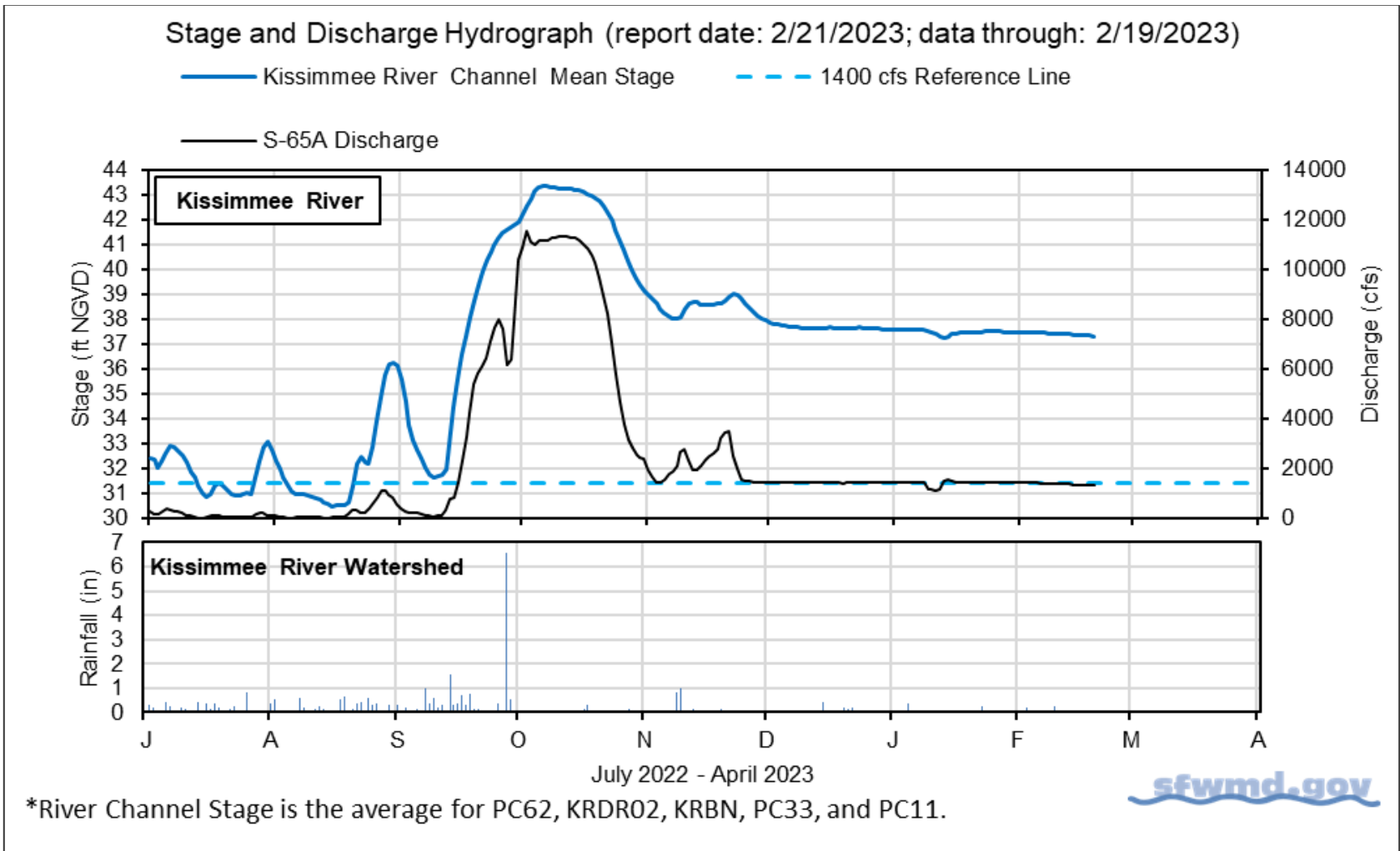


Figure KB-4. Kissimmee River stage, discharge, and rainfall.

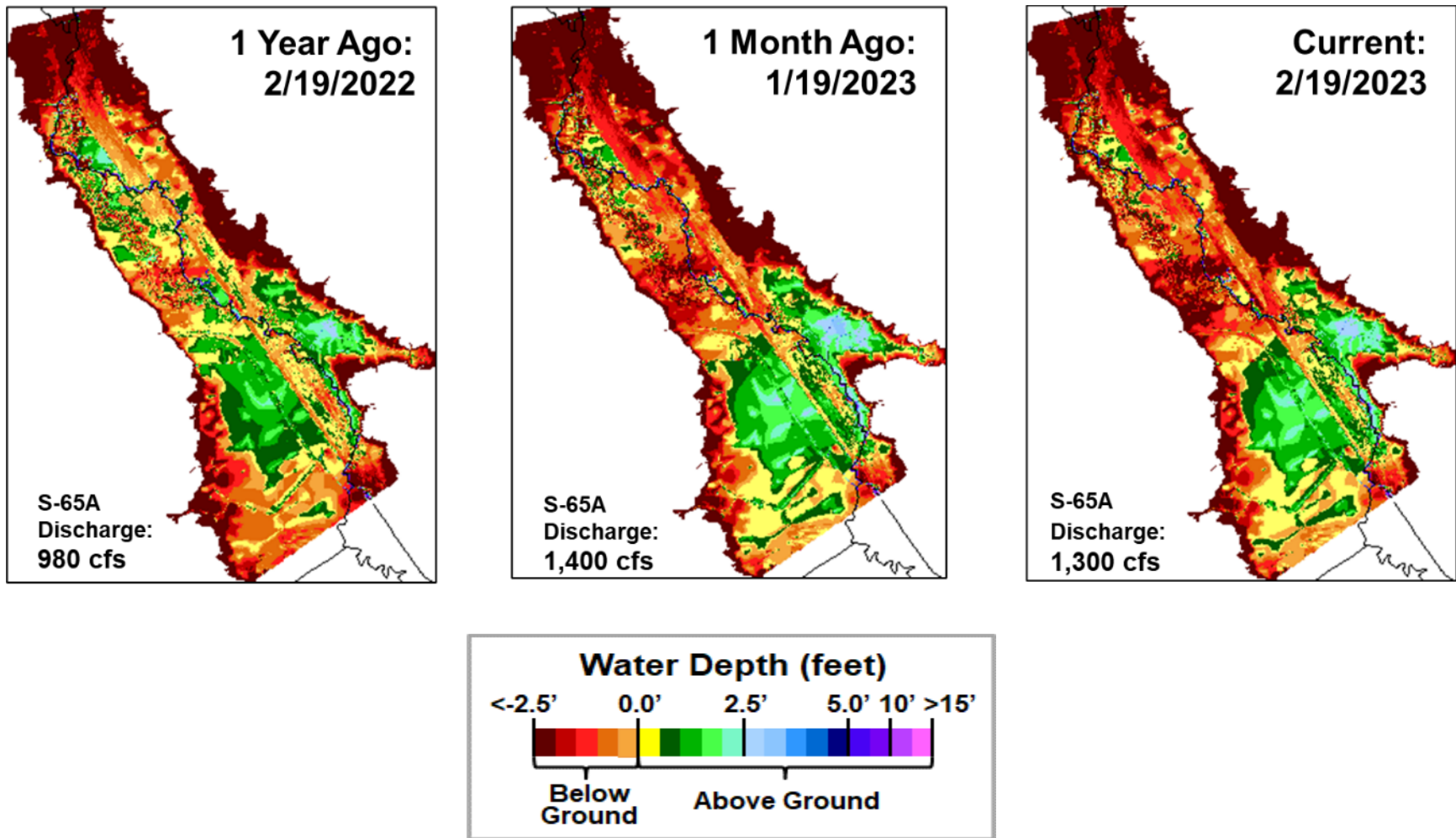
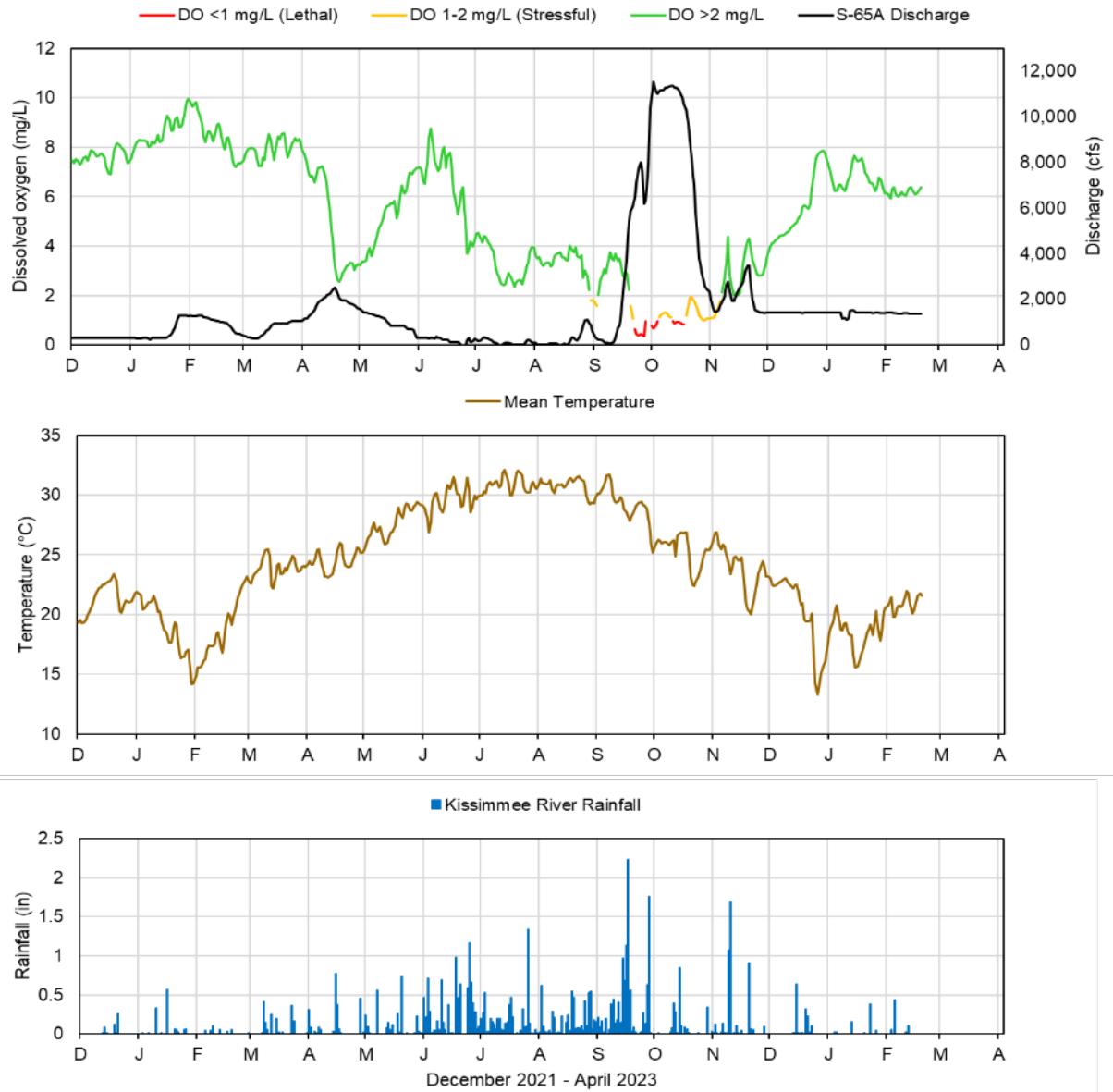


Figure KB-5. Phase I area Kissimmee River floodplain water depths (from left to right) one year ago, one month ago, and current.



Report Date: 2/21/2023; data are through: 2/19/2023



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 six stations reporting this week. Rainfall values are daily totals for Kissimmee River (Pool BCD) AHED watershed.

Stage and Discharge Guidance for 2021-2022.

Zone	KCH Stage (ft NGVD)	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 50.0 ft line.	Adjust S-65 discharge to maintain at least 1400 cfs at S-65A. If the KCH stage is above the 50.0 ft line to decide when to begin ramping up to 1400 cfs or lower. Do not continue reducing discharge until the stage has returned to or above the threshold stage line.
B3	Between the 50.0 ft line and 49 ft.	Adjust S-65 discharge to maintain at least 700 cfs at S-65A.
B4	Between 48.5 ft to 49 ft.	Adjust S-65 discharge to maintain a constant discharge between 0 cfs at 48.5 ft and 300 cfs at 49 ft.
C	Below 48.5 ft.	0 cfs.

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

Table KB-3. Discharge Rate of Change Limits for S65/S65A (revised 1/14/19).

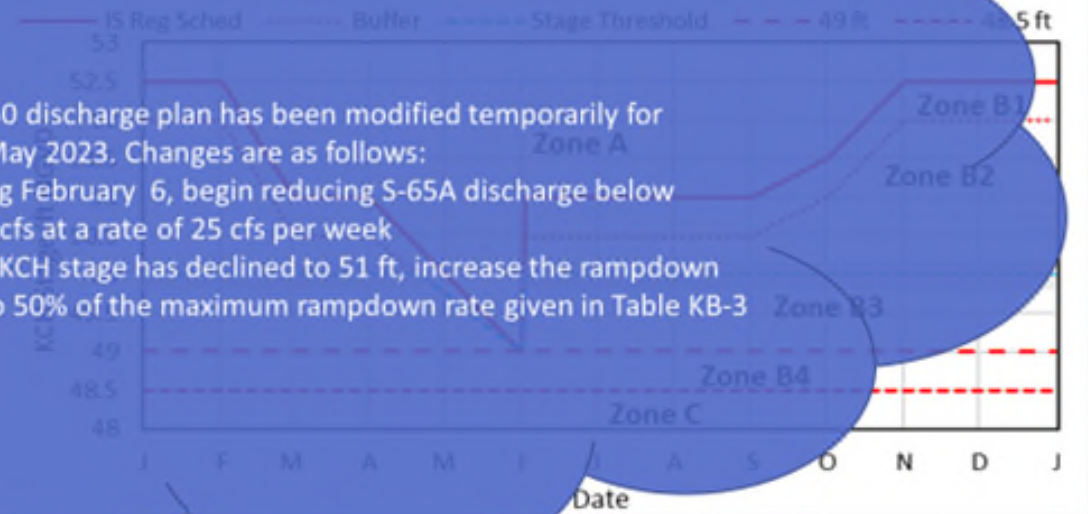
Q (cfs)	Maximum rate of INCREASE (cfs/day)	Maximum rate of DECREASE (cfs/day)
0-300	100	-50
301-650	150	-75
651-1400	300	-150
1401-3000	600	-600
>3000	1000	-2000

2021-2022 Discharge Plan for S-65/S-65A

Preferred Discharge Plan for S-65/S-65A (IS-14-50.0)

The IS-14-50 discharge plan has been modified temporarily for February-May 2023. Changes are as follows:

- Starting February 6, begin reducing S-65A discharge below 1,400 cfs at a rate of 25 cfs per week
- When KCH stage has declined to 51 ft, increase the rampdown rate to 50% of the maximum rampdown rate given in Table KB-3



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.

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 15.72 feet NGVD on February 19, 2023, which is 0.21 feet lower than the previous week and 0.37 feet lower than a month ago (**Figure LO-1**). Lake stage dropped into the Low sub-band (**Figure LO-2**) and is 0.79 feet above the upper limit of the ecological envelope (**Figure LO-3**). According to NEXRAD, no rain fell directly on the Lake last week.

Average daily inflows (excluding rainfall) decreased from 1,553 cfs the previous week to 1,349 cfs this week. Average daily outflows (excluding evapotranspiration) increased from 2,751 cfs the previous week to 3,524 cfs this week. The highest inflow came from the Kissimmee River (C-38 Canal; 1,316 cfs). Outflows to the west via the S-77 structure averaged 1,645 cfs for the week. Outflows to the east via the S-308 structure averaged 462 cfs, and outflows south via the S-350 structures averaged 1,116 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 (February 15, 2023) from NOAA's Harmful Algal Bloom Monitoring System showed moderate bloom potential for many nearshore regions of the Lake (**Figure LO-6**).

**1 Month Ago:
01/19/2023**

**Current:
02/19/2023**

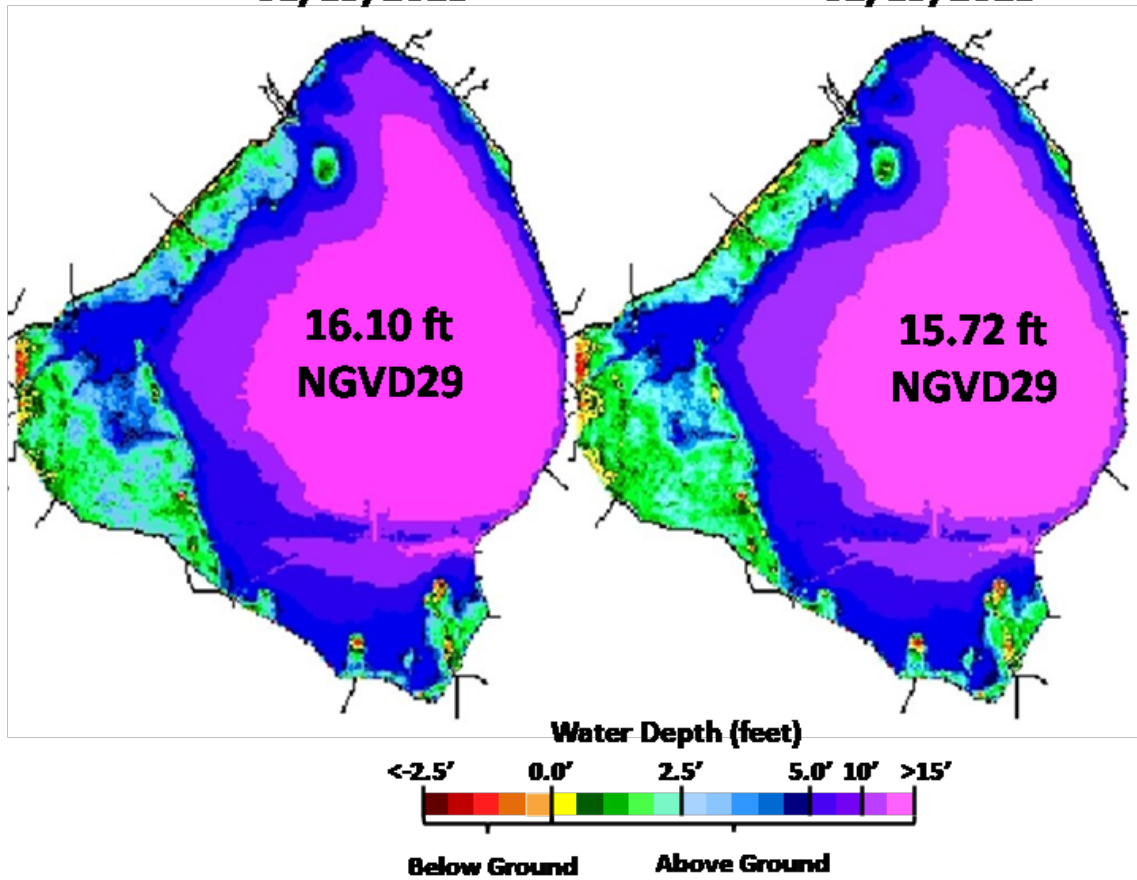


Figure LO-1. Lake Okeechobee water depth estimates based on South Florida Water Depth Assessment Tool (SFWDAT).

Lake Okeechobee Water Level History and Projected Stages

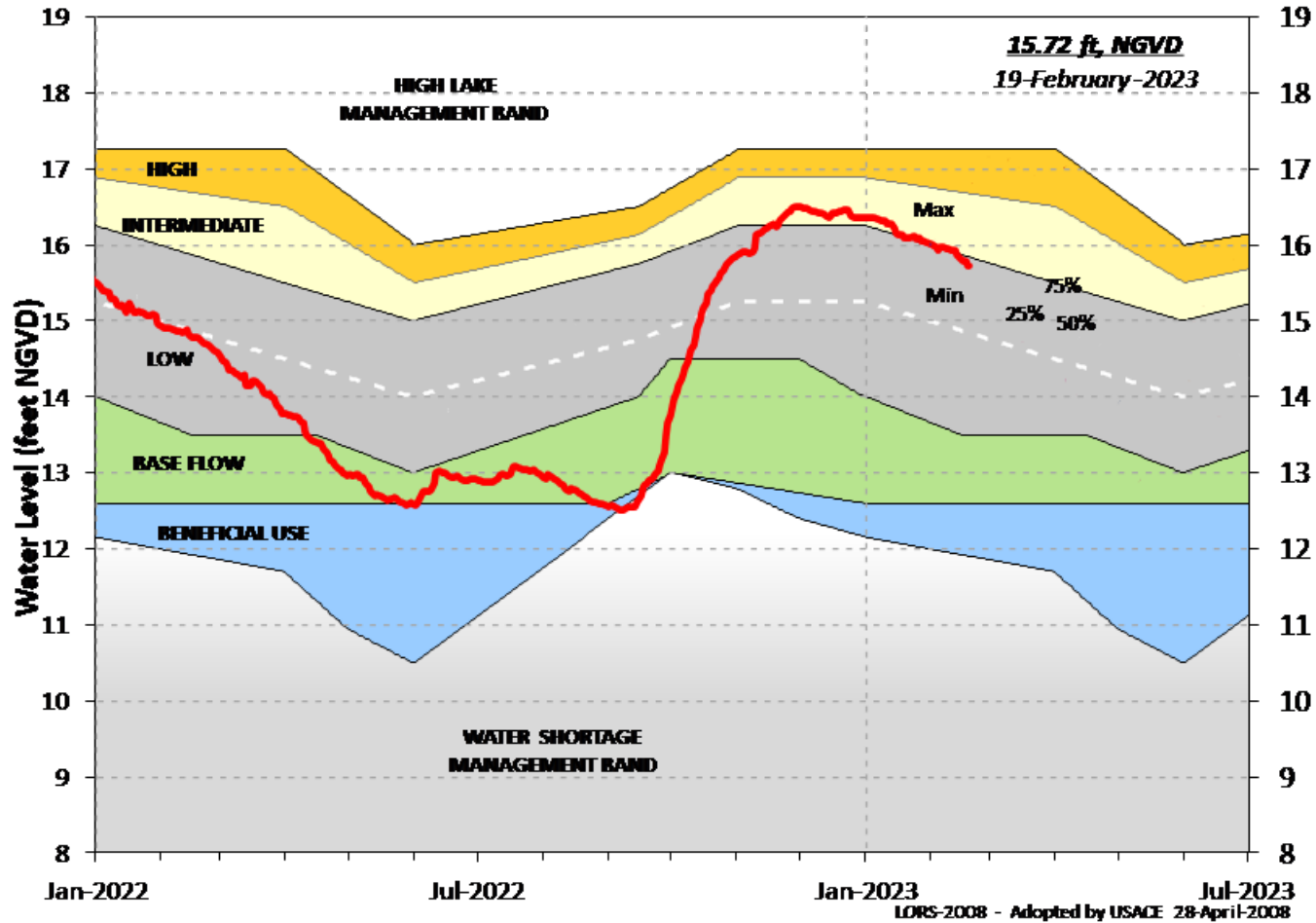


Figure LO-2. Recent Lake Okeechobee stages with projected stages based on a dynamic position analysis.

Lake Okeechobee Stage vs Ecological Envelope

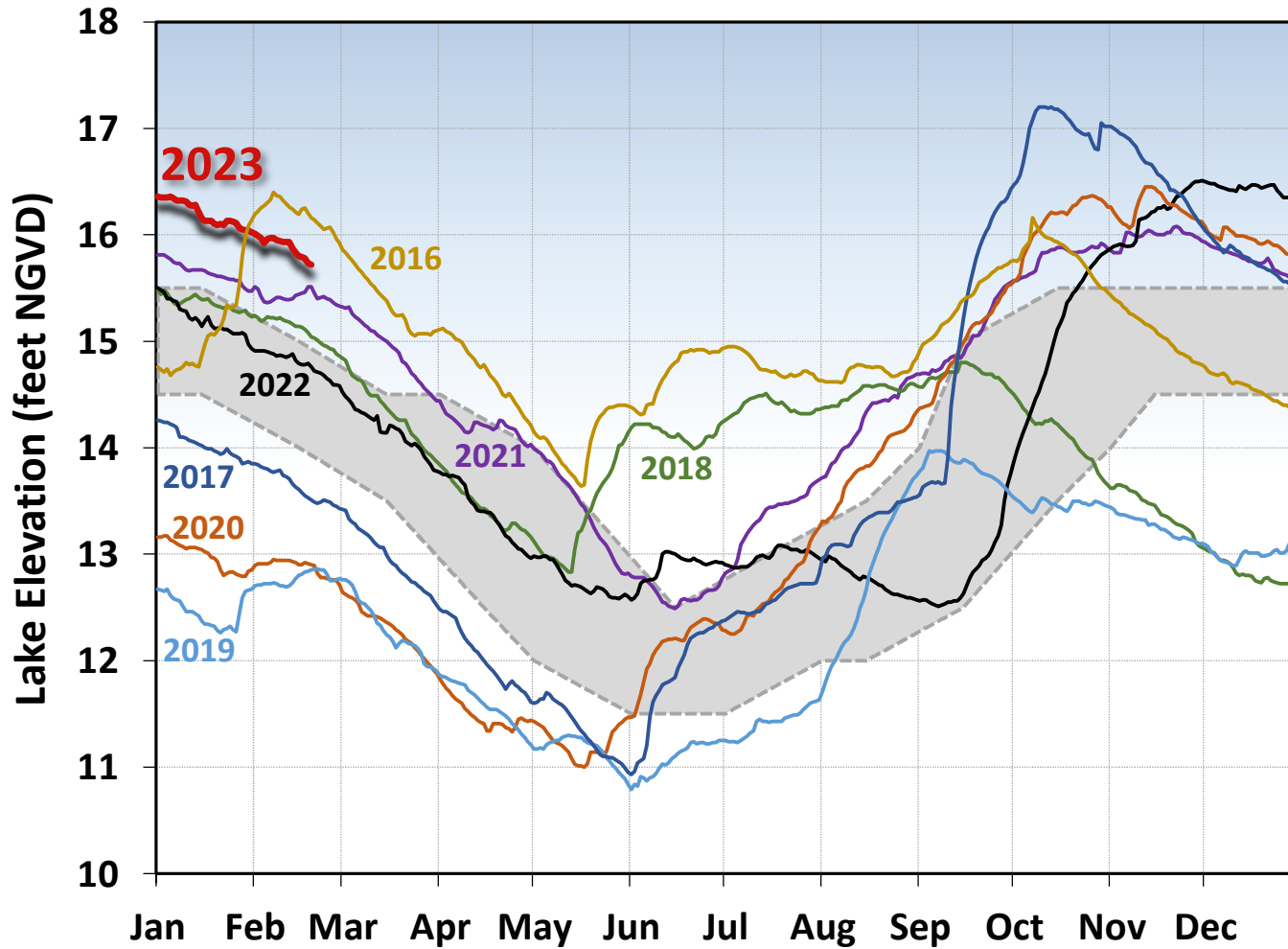


Figure LO-3. The prior seven years of annual stage hydrographs for Lake Okeechobee in comparison to the ecological envelope.

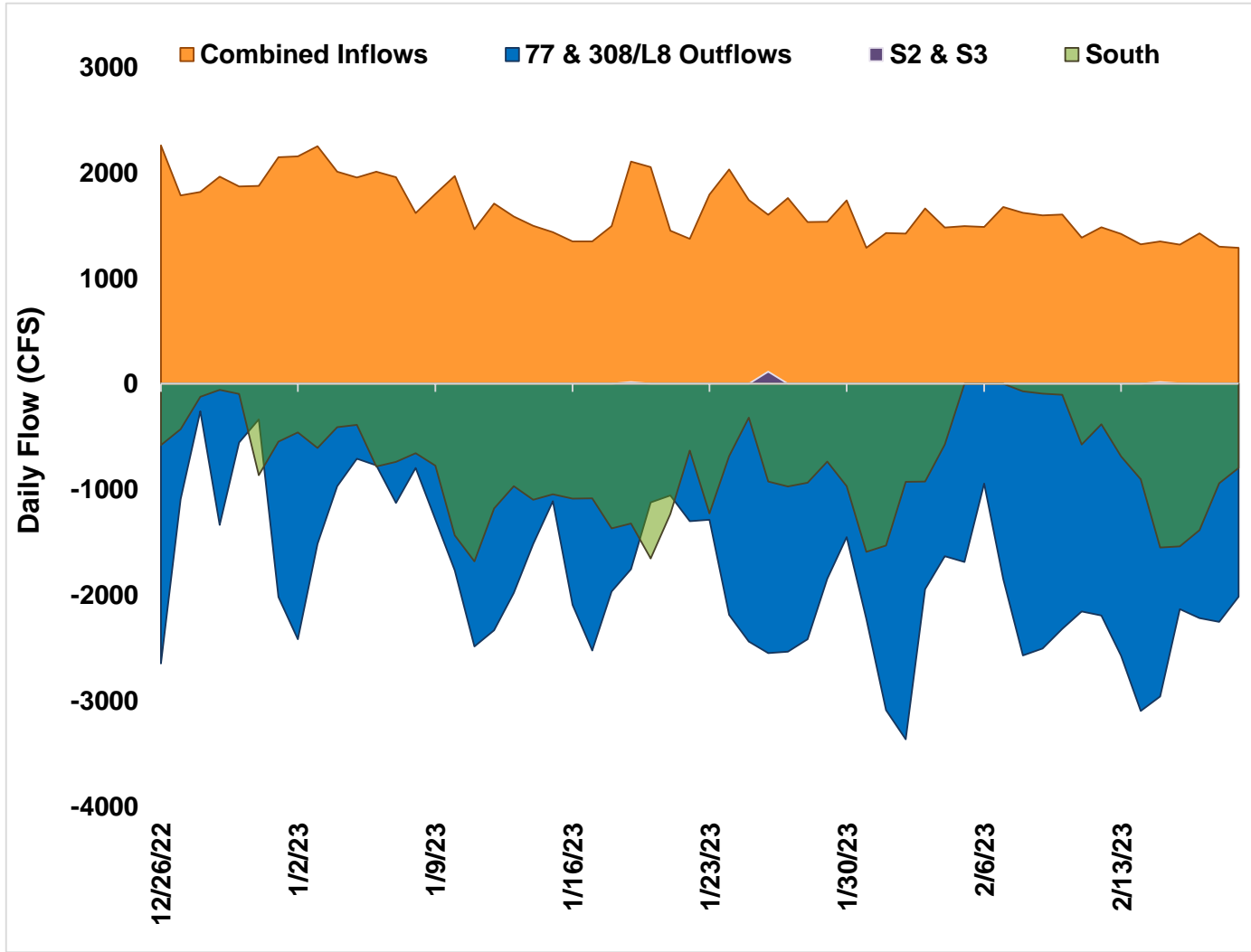


Figure LO-4. Major inflows (orange) to and outflows east and west (blue) from Lake Okeechobee. Outflows south are shown in green. Flows into Lake Okeechobee from the L-8 canal through S-271 (formerly Culvert 10A) or from the C-44 canal through the S-308 are included as inflows. Conversely, flows from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

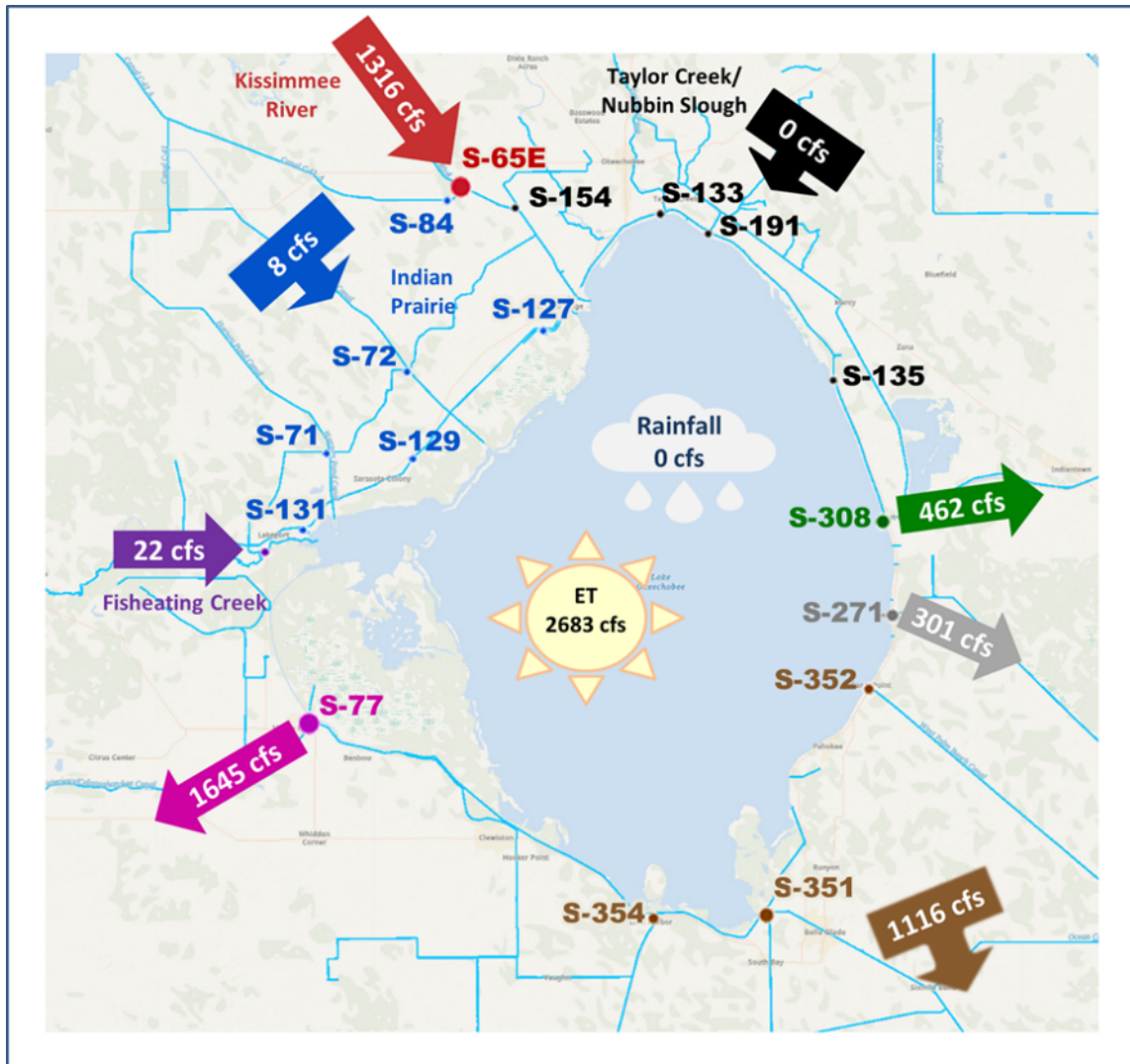


Figure LO-5. Inflows into Lake Okeechobee from Indian Prairie basins, Taylor Creek/Nubbin Slough, Kissimmee River and Fisheating Creek, and outflows to the west via S-77, to the east via S-308, to the south via S-351, S-352, S-354, and to southeast via S-271 (formerly Culvert 10A) for the week of February 13 - 19, 2023.

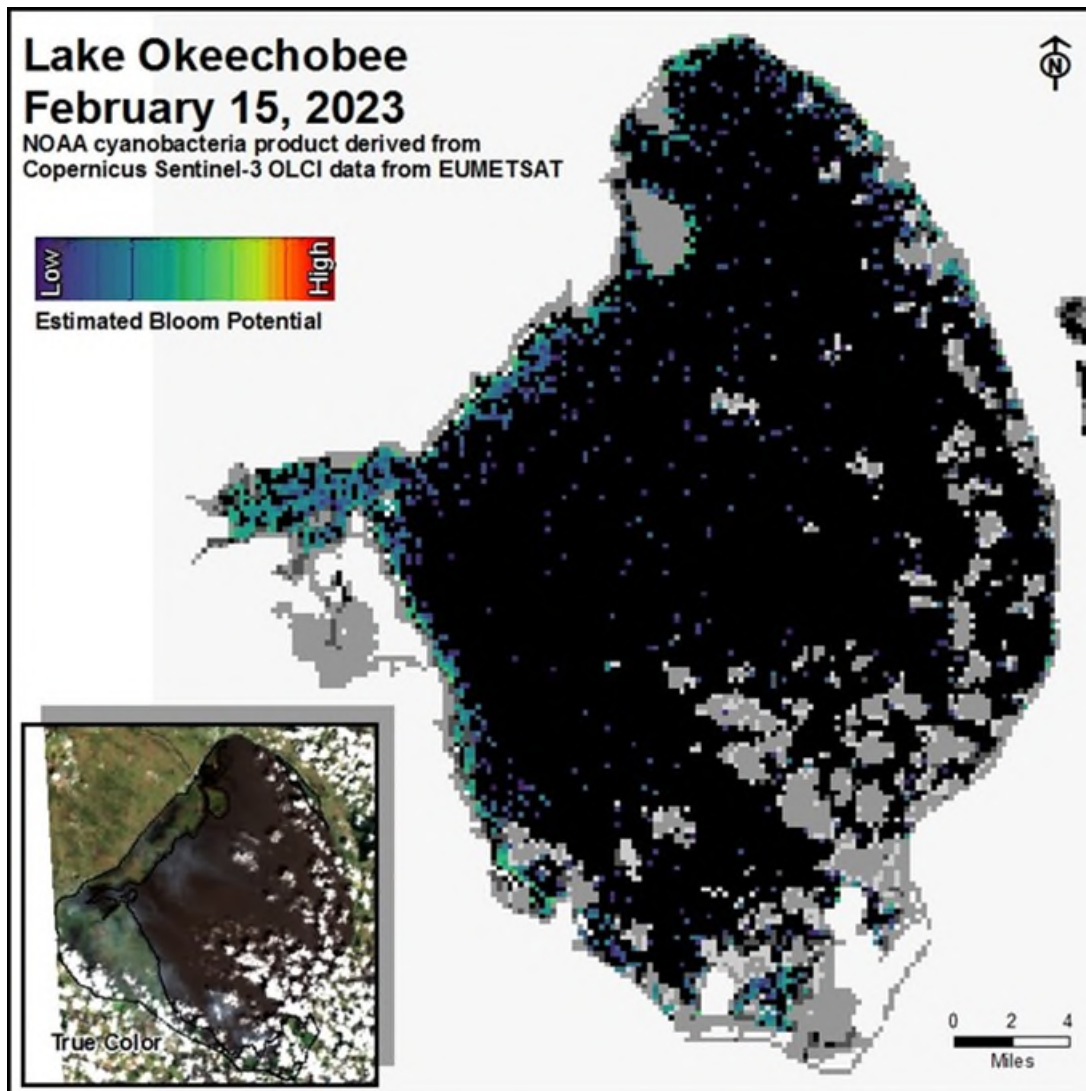


Figure LO-6. Cyanobacteria bloom potential on February 15, 2023, based on NOAA's harmful algal bloom monitoring system. Gray color indicates cloud cover.

Estuaries

St. Lucie Estuary

Over the past week, mean total inflow to the St. Lucie Estuary was 534 cfs (**Figures ES-1 and ES-2**), and the previous 30-day mean inflow was 217 cfs. For comparison, provisional mean inflows over the past several months are shown in **Figure ES-2**.

Over the past week, salinities decreased at HR1, remained the same at the US1 bridge, and increased at the A1A bridge (**Table ES-1 and Figure ES-3**). The seven-day moving average of the surface and bottom salinities at the US1 Bridge was 15.9. Salinity conditions in the middle estuary were 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 spat/shell for January, which is normal for this time of the year (**Figure ES-5**).

Caloosahatchee River Estuary

Over the past week, mean total inflow to the Caloosahatchee River Estuary was 1,896 cfs (**Figures ES-6 and ES-7**), and the previous 30-day mean inflow was 2,027 cfs. For comparison, provisional mean inflows over the past several months are shown in **Figure ES-7**.

Over the past week, salinities remained the same at S-79 and Val I-75 and decreased at the remaining sites in the estuary (**Table ES-2 and Figures ES-8 and ES-9**). The seven-day mean salinities (**Table ES-2**) were in the optimal range (0-10) for tape grass in the upper estuary. The seven-day mean salinity values were within the optimal range for adult eastern oysters at Cape Coral, and in the stressed range at Shell Point and Sanibel (**Figure ES-10**). Oyster recruitment data in the CRE are not available at this time; FWRI will redeploy recruitment collectors once water quality conditions improve.

Surface salinity at Val I-75 was forecasted 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 0 to 1,500 cfs, and a steady release at 2,000 cfs with estimated tidal basin inflows of 70 cfs. Model results from all scenarios predict daily salinity to be 1.6 or lower, and the 30-day moving average surface salinity to be 0.5 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 February 17, 2023, that *Karenia brevis*, the Florida red tide dinoflagellate, was observed at bloom concentrations in eight samples collected from Charlotte County and 22 samples collected from Lee County over the past week. On the east coast, red tide was not observed in samples from Miami-Dade County.

Water Management Recommendations

Lake stage is in the Low Sub-Band. Tributary conditions are normal. The LORS2008 release guidance suggests up to 450 cfs release at S-79 to the Caloosahatchee River Estuary and up to 200 cfs release at S-80 to the St. Lucie Estuary.

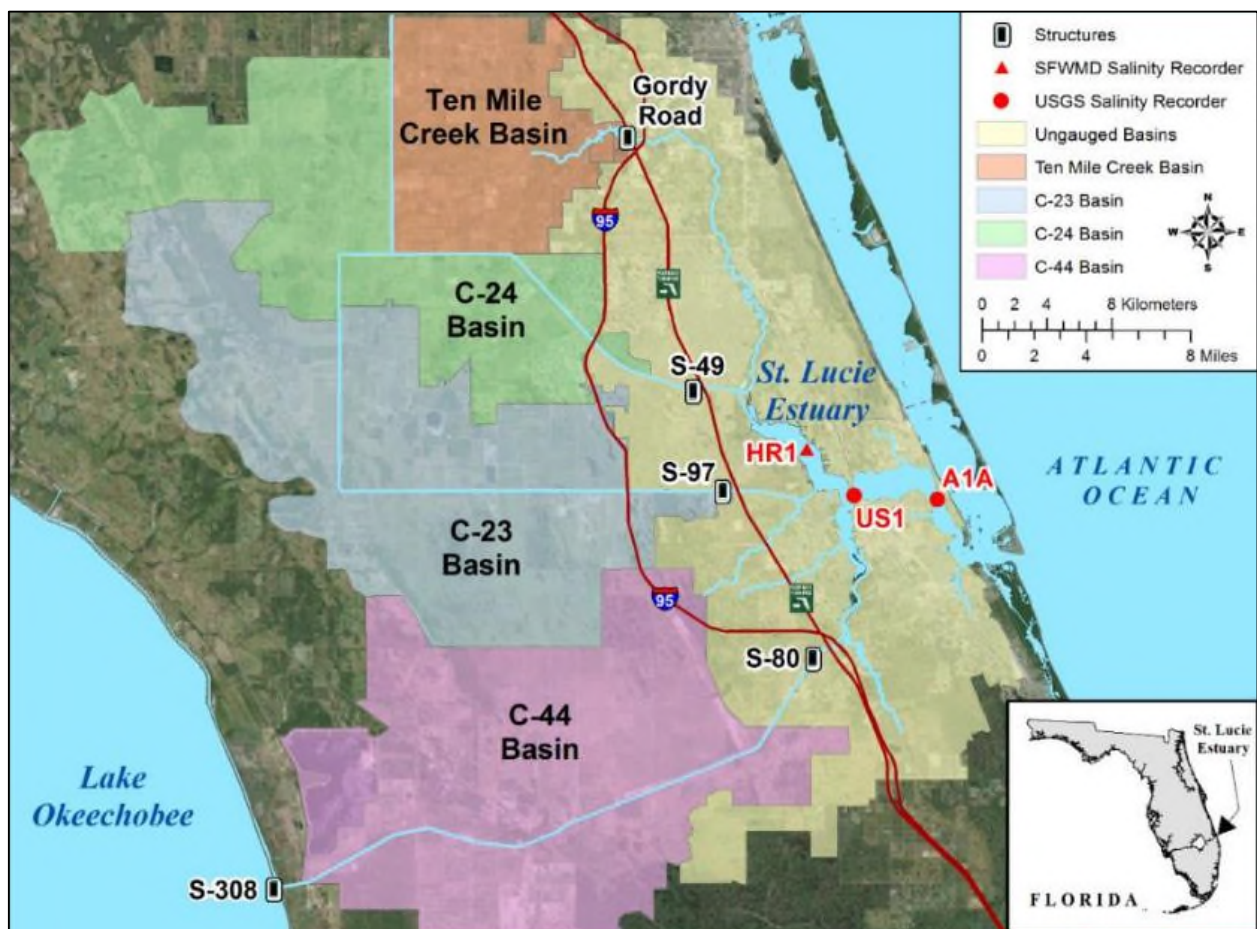


Figure ES-1. Basins, water control structures, and salinity monitoring sites in the St. Lucie Estuary.

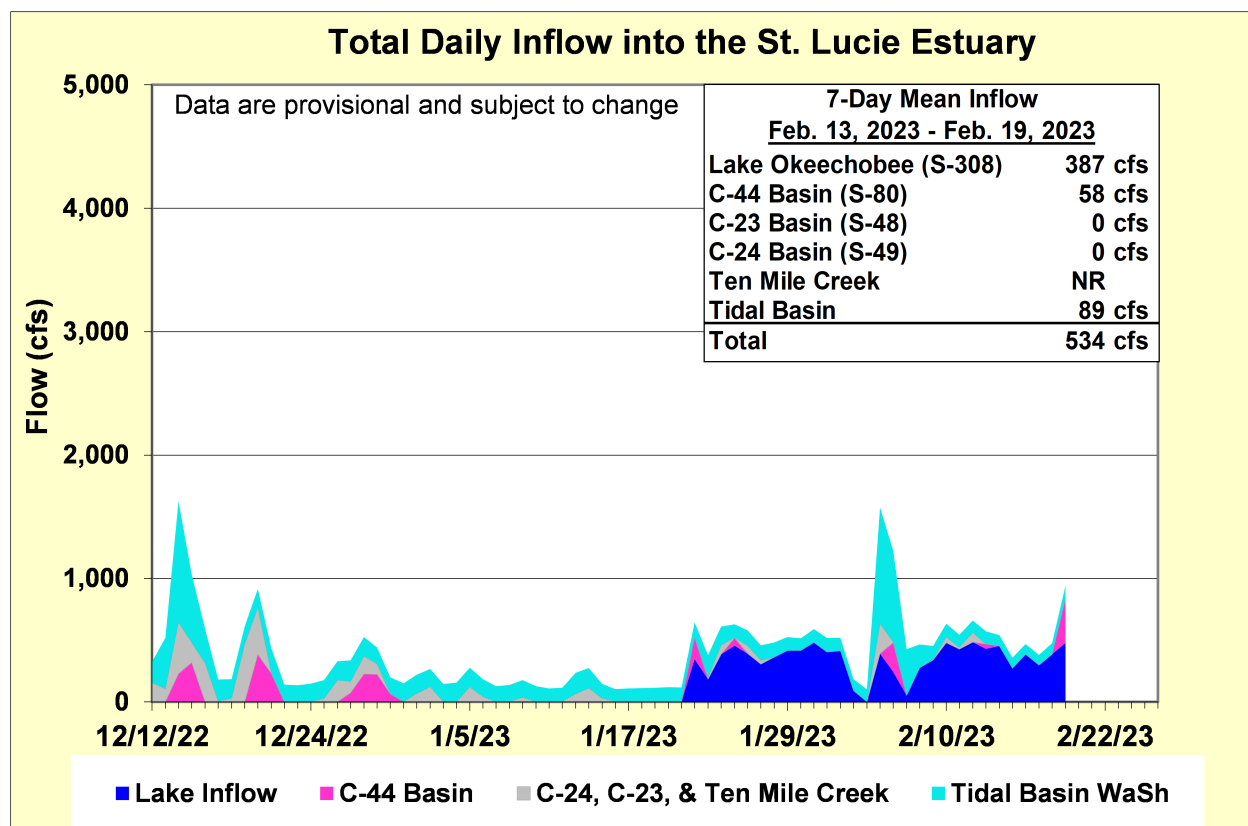


Figure ES-2. Total daily inflows from Lake Okeechobee and runoff from the C-44, C-23, C-24, Ten Mile Creek, and Tidal Basins into the St. Lucie Estuary.

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

Sampling Site	Surface	Bottom	Optimum Envelope
HR1 (North Fork)	11.0 (12.9)	12.7 (13.7)	10.0 – 25.0
US1 Bridge	15.1 (15.1)	16.6 (16.6)	10.0 – 25.0
A1A Bridge	24.3 (23.4)	27.6 (26.7)	10.0 – 25.0

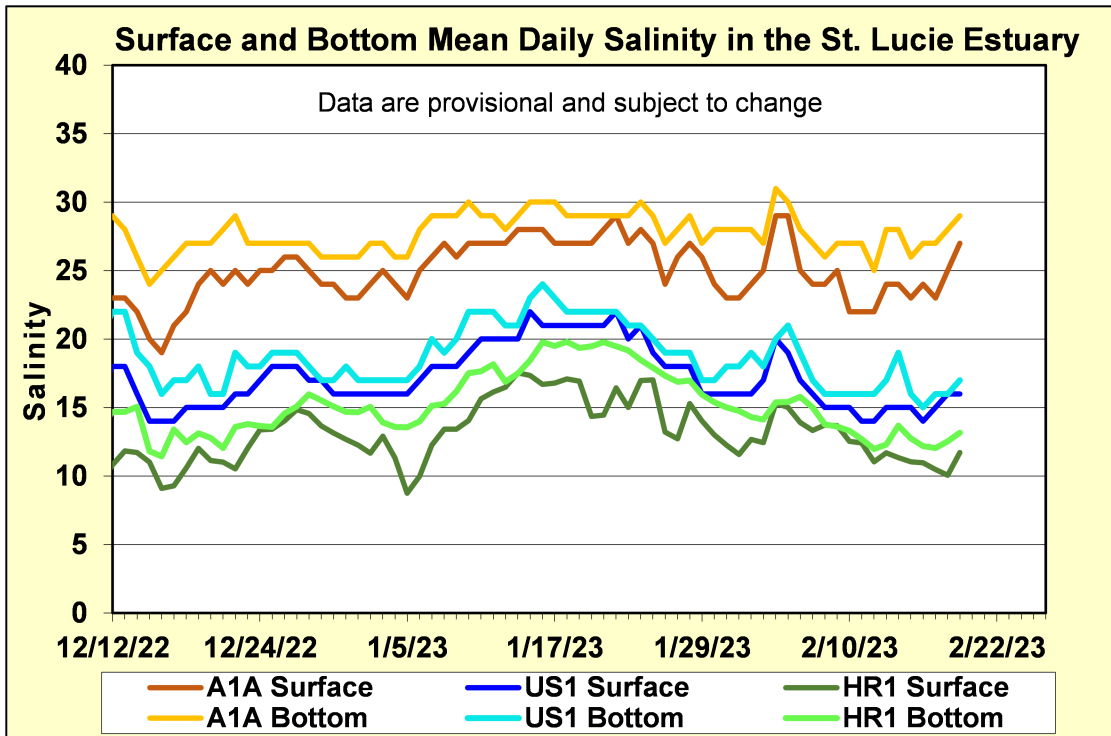


Figure ES-3. Mean daily salinity at the A1A, US1, and HR1 sites in the St. Lucie Estuary.

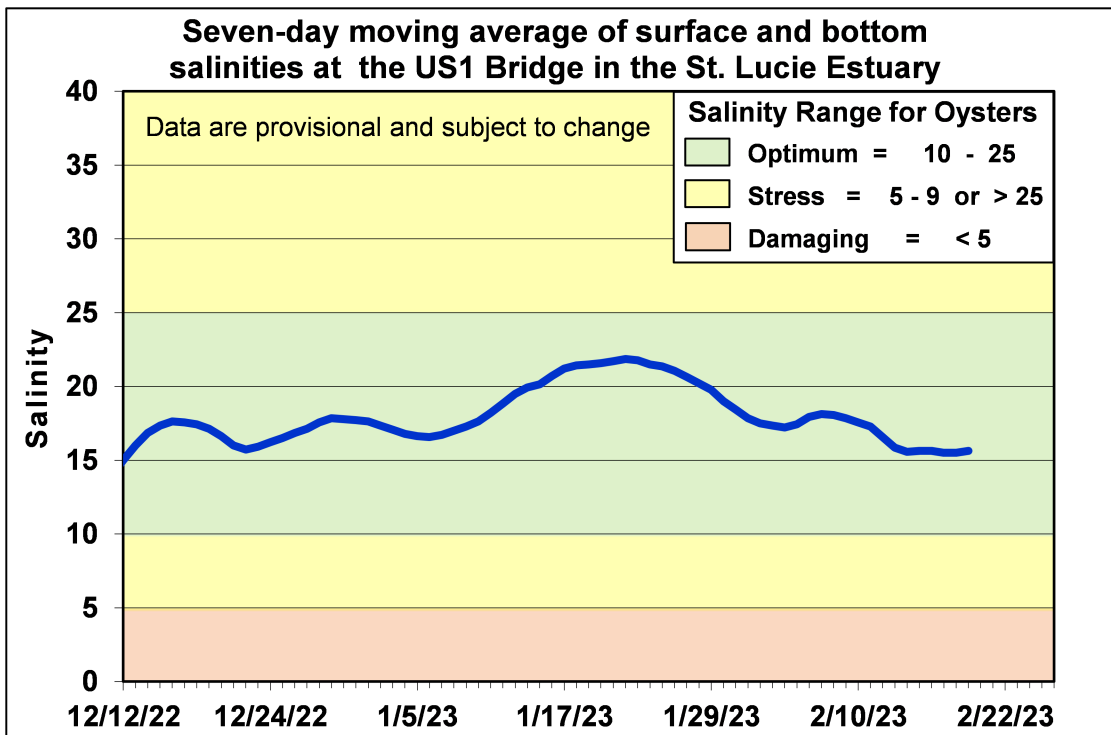


Figure ES-4. Seven-day moving average of the surface and bottom salinities at the US1 Bridge in the St. Lucie Estuary.

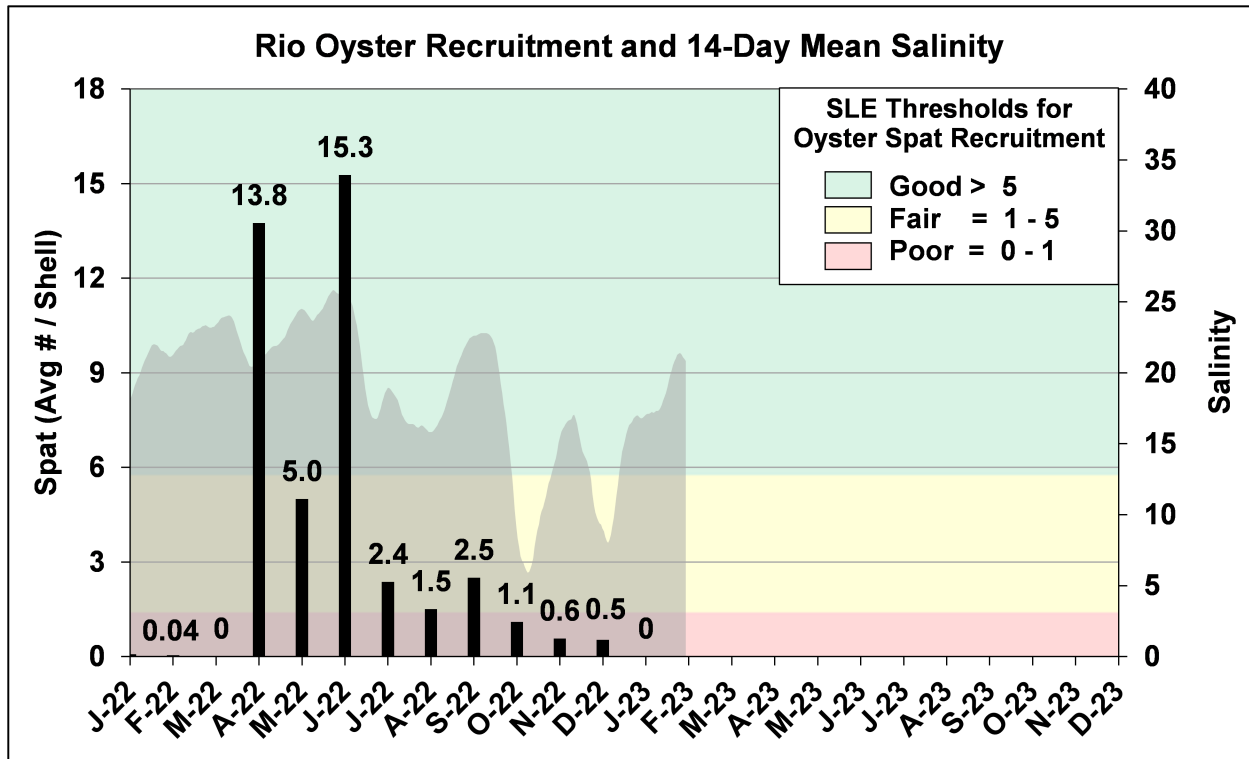


Figure ES-5. Mean oyster recruitment at the Rio oyster monitoring station and 14-day mean salinity at US1 Bridge.

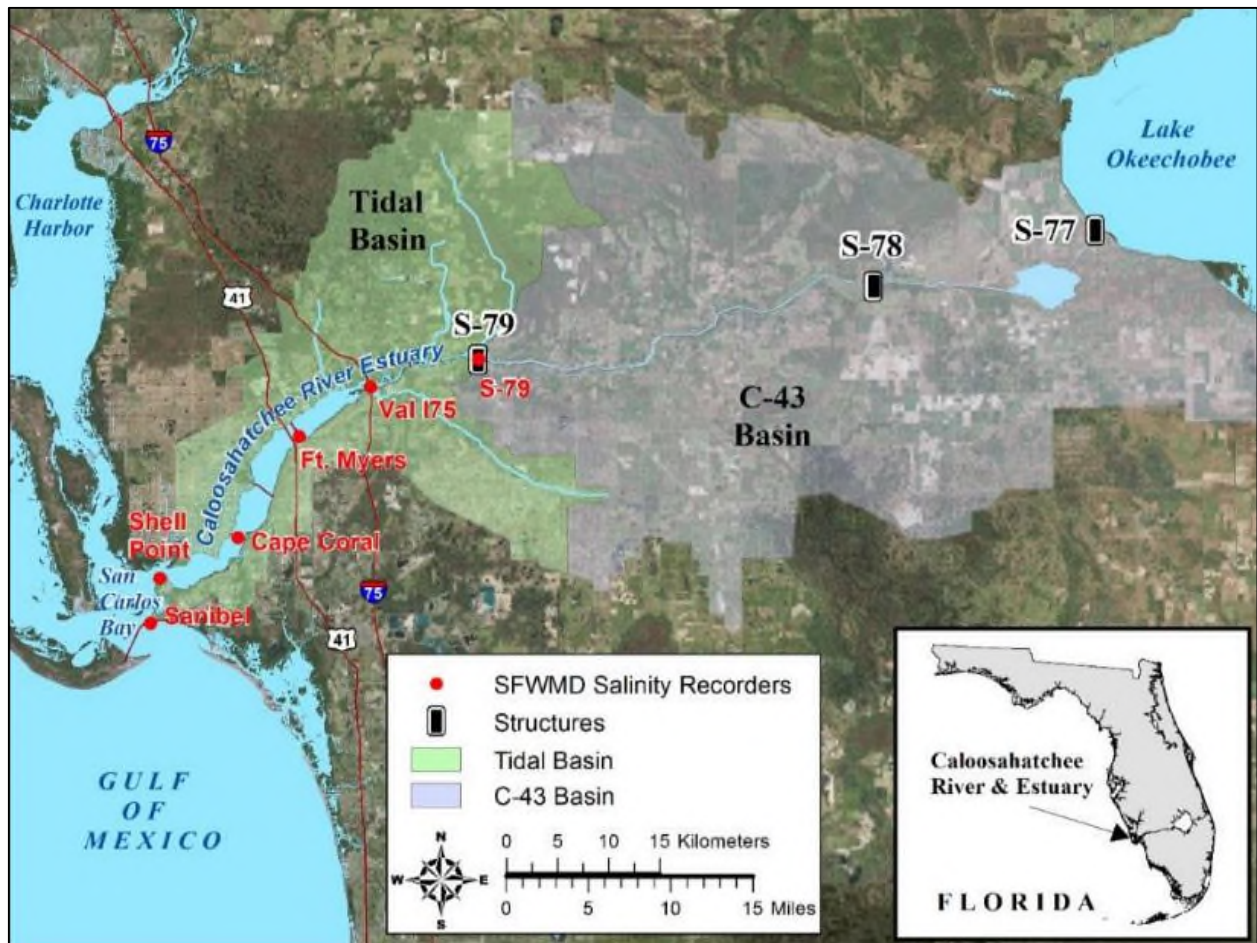


Figure ES-6. Basins, water control structures, and salinity monitoring sites in the Caloosahatchee River Estuary.

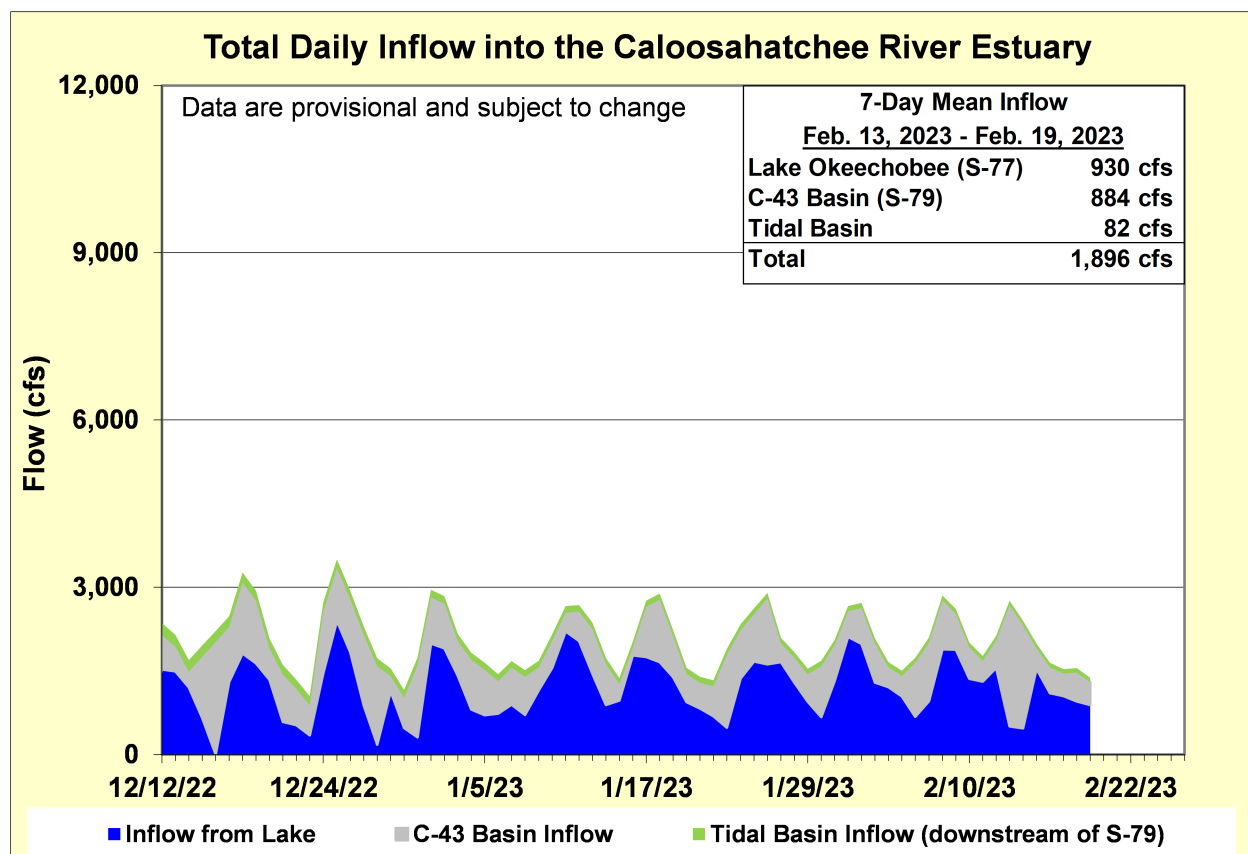


Figure ES-7. Total daily inflows from Lake Okeechobee, and runoff from the C-43 and Tidal basins into the Caloosahatchee River Estuary.

Table ES-2. Seven-day mean salinity at six monitoring sites in the Caloosahatchee River Estuary. Current means are in bold font; previous week's means are in parentheses. The envelope in the upper estuary sites is for the protection of tape grass, and the envelope in the lower estuary is the optimum salinity range for adult eastern oysters (*Crassostrea virginica*). Data are provisional.

Sampling Site	Surface	Bottom	Optimum Envelope
S-79 (Franklin Lock)	0.2 (0.2)	0.2 (0.2)	0.0 – 10.0
Val I-75	0.2 (0.2)	0.2 (0.3)	0.0 – 10.0
Fort Myers Yacht Basin	2.8 (5.2)	4.2 (6.6)	0.0 – 10.0
Cape Coral	11.0 (12.4)	13.4 (14.5)	10.0 – 25.0
Shell Point	25.6 (27.1)	26.5 (27.7)	10.0 – 25.0
Sanibel	30.6 (32.2)	31.2 (32.2)	10.0 – 25.0

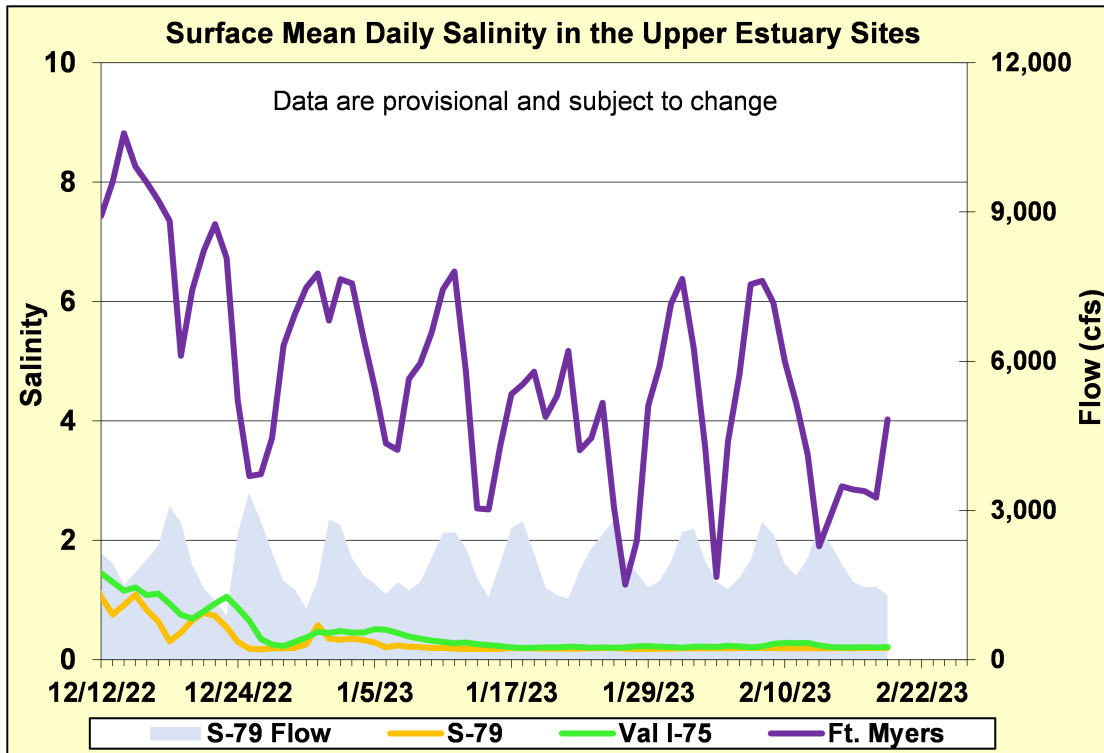


Figure ES-8. Mean daily salinity at upper Caloosahatchee River Estuary monitoring sites and mean daily flow at S-79.

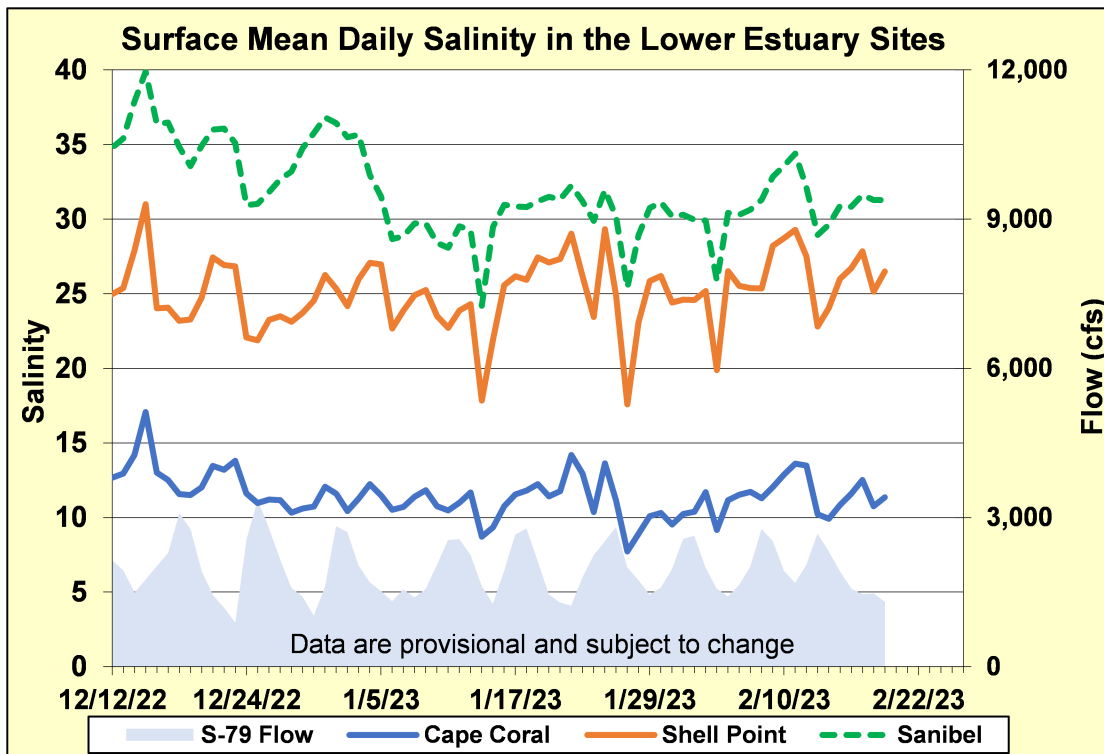


Figure ES-9. Mean daily surface salinity at lower Caloosahatchee River Estuary monitoring sites and mean daily flow at S-79.

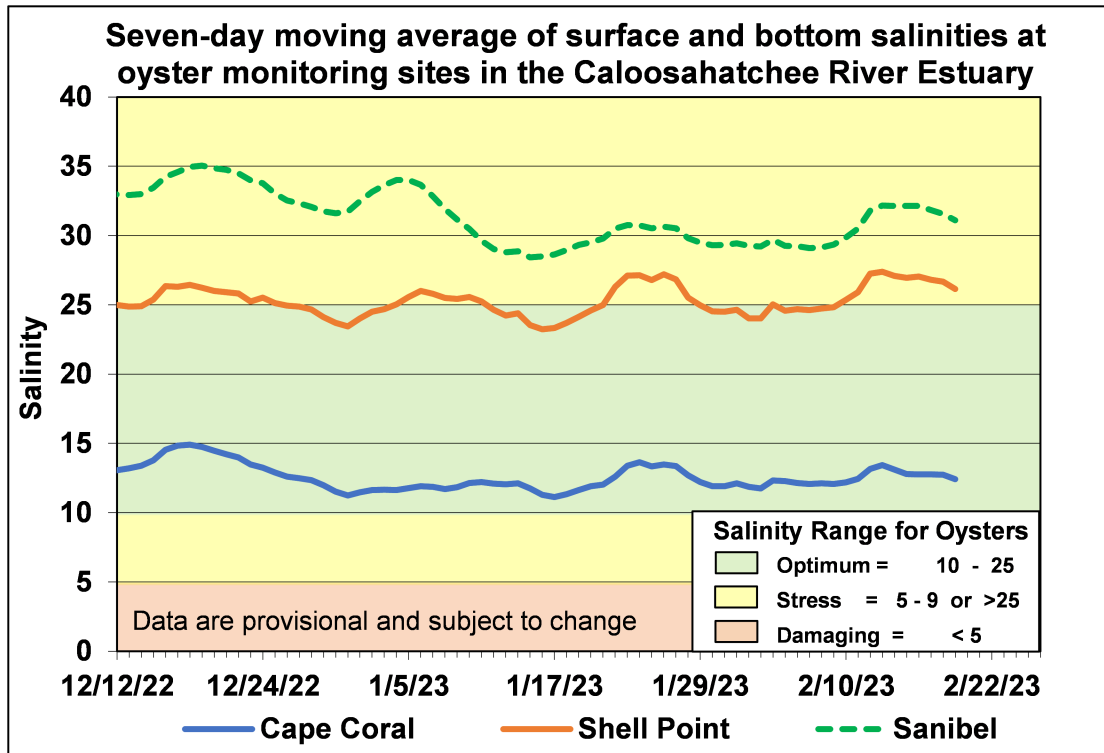


Figure ES-10. Seven-day moving average of surface and bottom salinities at Cape Coral, Shell Point and Sanibel monitoring sites in the Caloosahatchee River Estuary.

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	70	1.6	0.5
B	450	70	0.8	0.4
C	750	70	0.5	0.4
D	1000	70	0.3	0.3
E	1500	70	0.3	0.3
F	2000	70	0.3	0.3

Caloosahatchee River Estuary Flows and Salinity
Observed and Forecast Salinity at Val I-75
S-79 = 0 cfs & TBR = 70 cfs

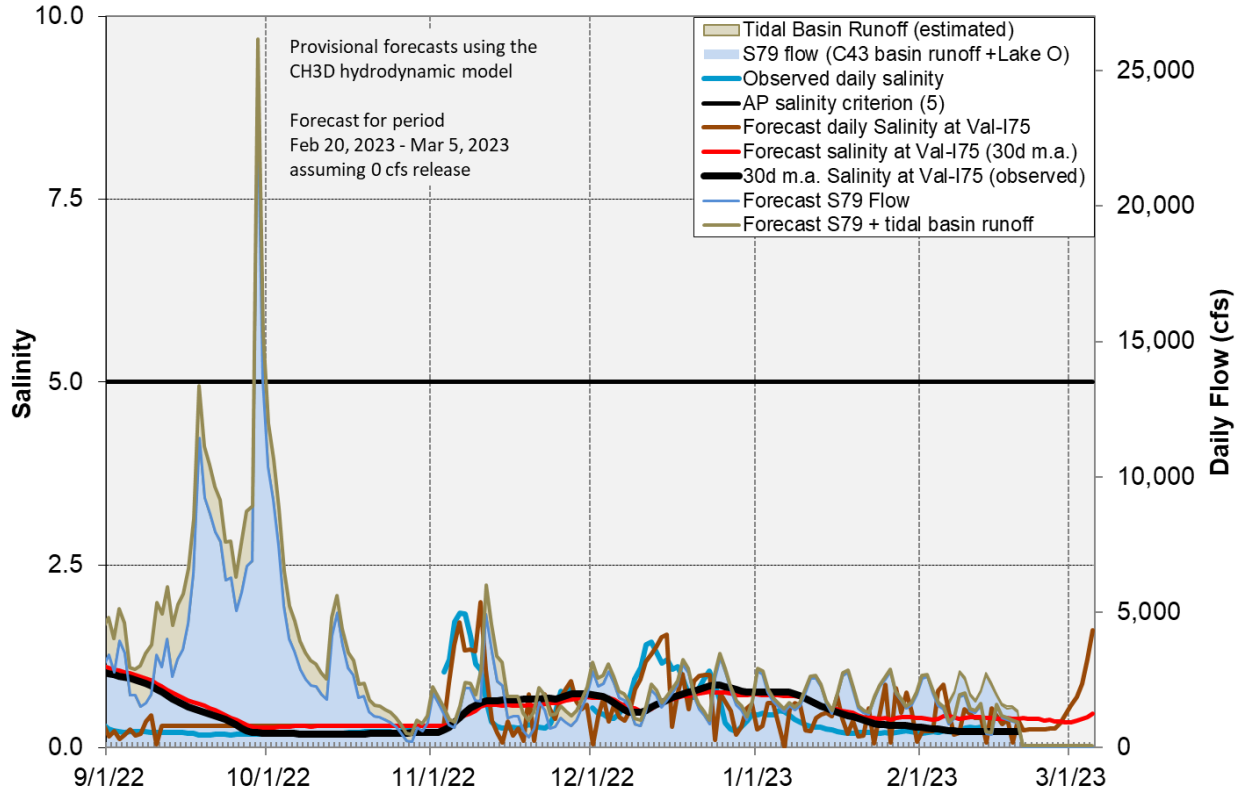


Figure ES-11. Forecasted Val I-75 site surface salinity assuming no pulse release at S-79.

Stormwater Treatment Areas

STA-1E: STA-1E Western Flow-way is offline for post-construction vegetation grow in. Operational restrictions are in place in STA-1E Central and Eastern Flow-ways for vegetation management activities. Online treatment cells are at or near target stage and 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/m²/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. Treatment cells are at 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/m²/year. The 365-day PLRs for the Northern and Western Flow-way are high (**Figure S-2**).

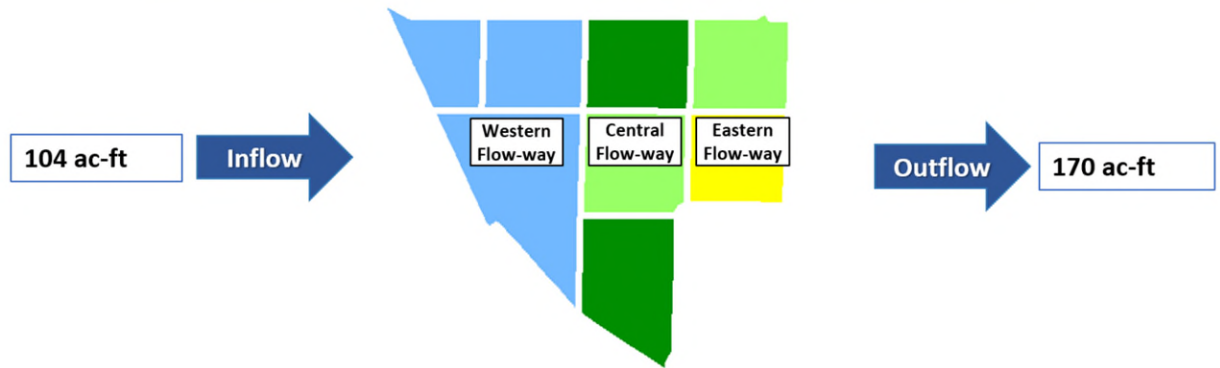
STA-2: STA-2 Flow-way 2 is offline for post-construction vegetation grow in. Operational restrictions are in place in STA-2 Flow-ways 3 and 4 for vegetation management activities. Online treatment cells are at or near target stage. Vegetation in Flow-ways 1 and 3 is stressed, and in Flow-ways 2, 4, and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

STA-5/6: All flow-ways in STA-5/6 are online. Most treatment cells are below 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/m²/year, except Flow-ways 3 and 4, which are high (**Figure S-5 and S-6**).

For definitions on STA operational language see glossary following figures.

STA-1E Weekly Status Report – 2/13/2023 through 2/19/2023



STA-1E Flow-Way Status				As of 2/19/2023		STA-1E Flow & Phosphorus Concentration			
Flow-Way	Vegetation Status Healthy ----- Stressed ←-----→	365-day P Loading Rate (below 1.0 g P /m ² /yr is optimal)	Online / Offline / Restrictions	Stage Based: Relative to Target Stage (TS)		7-day	28-day	365-day	
				<ul style="list-style-type: none"> ■ 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) 					
Eastern	← →		Vegetation management	■		Total Inflow, ac-ft	104	1,607	127,753
Central	← →		Vegetation rehabilitation	■		--Lake Inflow, ac-ft	0	N/A	3,200
Western	Offline, post-construction grow in starting 3/28/2022			■		Total Outflow, ac-ft	170	327	100,409
				■		Inflow Conc., ppb	102	136	114
				■		Outflow Conc., ppb	18	18	25
Includes Preliminary Data									

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

STA-1W Weekly Status Report – 2/13/2023 through 2/19/2023



STA-1W Flow-Way Status

Flow-Way	Vegetation Status Healthy --- Stressed	365-day P Loading Rate (below 1.0 g P /m ² /yr is optimal)	Online / Offline / Restrictions
Northern	← →		Vegetation management
Western	← →		Vegetation management
Eastern	← →		Vegetation management
Cell 7	← →	N/A	Online
Cell 8	← →	N/A	Construction

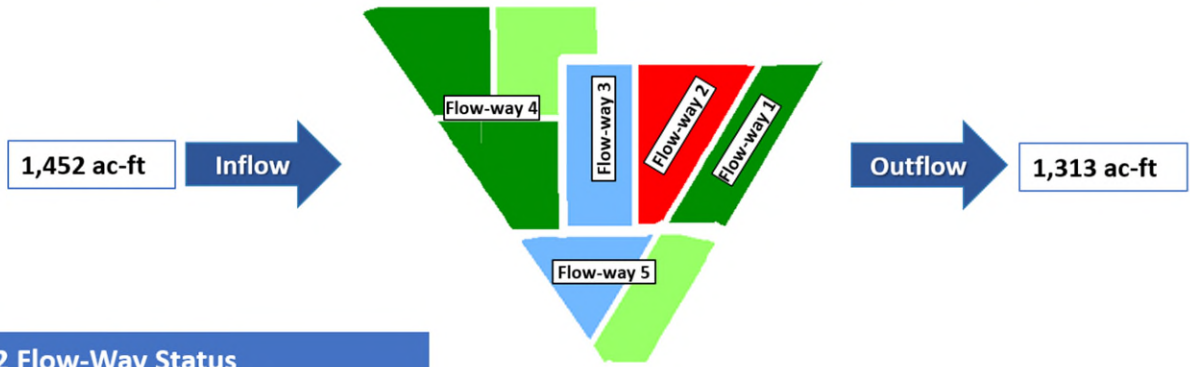
As of 2/19/2023	
Stage Based: Relative to Target Stage (TS)	
	Deep Water Level (> 2.8' above TS)
	High Water Level (1.5' – 2.8' above TS)
	0.2' – 1.5' above TS
	Target Stage (TS +/- 0.2')
	0.2' – 0.5' below TS
	0.5' – 1.0' below TS
	Low Water Level (1.0' – 1.2' below TS)
	Extreme Low Water (> 1.2' below TS)

STA-1W Flow & Phosphorus Concentration

	7-day	28-day	365-day
Total Inflow, ac-ft	0	1,417	144,239
--Lake Inflow, ac-ft	0	N/A	3,600
Total Outflow, ac-ft	310	1,446	147,436
Inflow Conc., ppb	N/A	162	198
Outflow Conc., ppb	18	18	20
Includes Preliminary Data			

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

STA-2 Weekly Status Report – 2/13/2023 through 2/19/2023



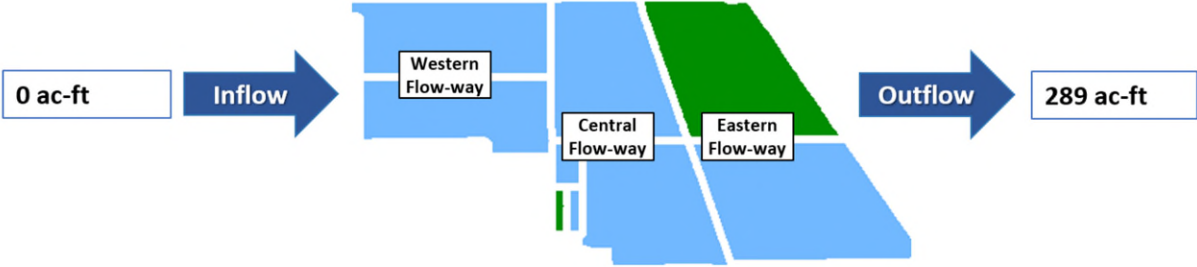
STA-2 Flow-Way Status			
Flow-Way	Vegetation Status Healthy ----- Stressed	365-day P Loading Rate (below 1.0 g P /m ² /yr is optimal)	Online / Offline / Restrictions
1			Online
2	Offline, post-construction grow in starting 1/23/2023		
3			Vegetation Rehab
4			Vegetation Rehab
5			Online

As of 2/19/2023	
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-2 Flow & Phosphorus Concentration			
	7-day	28-day	365-day
Total Inflow, ac-ft	1,452	12,033	317,703
--Lake Inflow, ac-ft	1,500	N/A	32,400
Total Outflow, ac-ft	1,313	7,032	332,412
Inflow Conc., ppb	84	76	114
Outflow Conc., ppb	16	13	30
Includes Preliminary Data			

Figure S-3. STA-2 Weekly Status Report

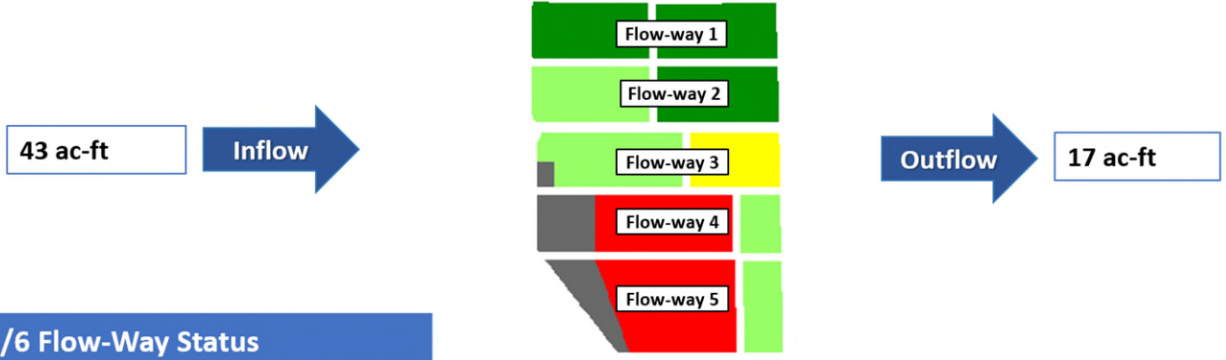
STA-3/4 Weekly Status Report – 2/13/2023 through 2/19/2023



STA-3/4 Flow-Way Status				As of 2/19/2023	STA-3/4 Flow & Phosphorus Concentration			
Flow-Way	Vegetation Status Healthy ----- Stressed	365-day P Loading Rate (below 1.0 g P /m ² /yr is optimal)	Online / Offline / Restrictions	Stage Based: Relative to Target Stage (TS)		7-day	28-day	365-day
Eastern	Offline, vegetation management drawdown as of 3/1/2021			<ul style="list-style-type: none"> 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) 	Total Inflow, ac-ft	0	43	299,698
Central			Online		--Lake Inflow, ac-ft	0	N/A	4,200
Western			Online		Total Outflow, ac-ft	289	124	291,528
					Inflow Conc., ppb	N/A	N/A	93
					Outflow Conc., ppb	19	58	16
					Includes Preliminary Data			

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

STA-5/6 Weekly Status Report – 2/13/2023 through 2/19/2023



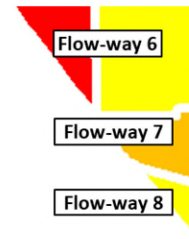
STA-5/6 Flow-Way Status			
Flow-Way	Vegetation Status Healthy ----- Stressed	365-day P Loading Rate (below 1.0 g P /m ² /yr is optimal)	Online / Offline / Restrictions
1	← →		Online
2	← →		Online
3	← →		Online
4	← →		Online
5	← →		Online

As of 2/19/2023
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-5/6 Flow & Phosphorus Concentration			
	7-day	28-day	365-day
Total Inflow, ac-ft	43	50	152,545
--Lake Inflow, ac-ft	0	N/A	0
Total Outflow, ac-ft	17	34	148,200
Inflow Conc., ppb	256	235	288
Outflow Conc., ppb	33	30	40
Includes Preliminary Data			

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

STA-5/6 Weekly Status Report – 2/13/2023 through 2/19/2023



STA-5/6 Flow-Way Status				As of 2/19/2023	
Flow-Way	Vegetation Status Healthy ----- Stressed ←-----→	365-day P Loading Rate (below 1.0 g P /m ² /yr is optimal)	Online / Offline / Restrictions	Stage Based: Relative to Target Stage (TS)	
				Color	Range
6	←-----→	1.0	Online		Extreme Low Water (> 1.2' below TS)
7	←-----→	1.0	Online		0.5' – 1.0' below TS
8	←-----→	1.0	Online		Low Water Level (1.0' – 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, $\mu\text{g/L}$ 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

WCA-1: Last week stage at the 1-8C gauge receded towards schedule. The average on Sunday was 0.17 feet above the falling Zone A1 regulation line. **WCA-2A:** Stage receded at the 2-17 gauge last week. The average on Sunday was 1.02 feet above the flat regulation line. **WCA-3A:** The Three Gauge Average stage receded faster than the slope of the schedule line again last week. The average stage was 0.70 feet below the falling regulation line on Sunday. **WCA-3A North:** At gauge 62 (Northwest corner), stage continues a steady recession. The average on Sunday was 1.07 feet below the flat Upper schedule line (**Figures EV-1** through **EV-4**).

Water Depths

The SFWDAT illustrates current stages in the Everglades Protection Area (EPA) are falling within the major basins; with very dry conditions in southern Big Cypress National Preserve (BCNP). WCA-3A continues to dry down from the northwest to the southeast, with only a small pocket in the southeast corner (which contains the Alley North colony) having apparent surface water present. Connectivity remains in Shark River Slough (SRS) and Taylor Slough of the Everglades National Park (ENP), while to the west it is diminishing. Comparing current WDAT water depths to one month ago, conditions within the EPA are shallower with eastern WCA-3A and western BCNP significantly so. Looking back a year ago, western WCA-3A and western BCNP are shallower in depth, while northeastern WCA-3A and northern ENP are slightly deeper (**Figure EV-5** and **Figure EV-6**). Comparing current conditions to the 20-year average on February 19, conditions are above average in northeastern WCA-3A, below average in central and southern WCA-3A, and above the 90th percentile in northeastern SRS and portions of WCA-1 (**Figure EV-7**).

Taylor Slough and Florida Bay

Taylor Slough and Florida Bay recorded an average of 0.05 inches of rainfall over the past week (Monday-Sunday) based on the 18 gauges used in this report. Total weekly rainfall ranged from 0.0 inches at multiple sites to 0.26 inches at Taylor Slough Bridge (TSB) and Taylor River (TR). Taylor Slough stage changes averaged a decrease of 0.02 feet and ranged from a decrease of 0.07 feet at both Craighead Pond in the southwestern slough and EVER6 in the southern C-111 area to an increase of 0.08 feet at Taylor Slough Bridge in the northern slough (**Figure EV-8** and **Figure EV-9**). Taylor Slough water levels remain above the historical average for this time of year by 7.0 inches compared to before the Florida Bay initiative (starting in 2017), an increase of 0.1 inch from last week.

Average Florida Bay salinity was 28.0, an increase of 0.2 from last week. Salinity changes ranged from a decrease of 2.4 in Joe Bay (JB) to 1.5 in Long Sound (LS), both in the eastern nearshore (**Figure EV-8**). As of 2/19, salinity remains within the inter-quartile range (IQR) in the Eastern, Central, and Western regions (**Figure EV-10**). Florida Bay salinity is 1.8 above its historical average for this time of year, up 0.5 from last week.

Water Management Recommendations

Conserving water in WCA3A North will most likely prove critical for the upcoming wading bird nesting season. As water levels go belowground in the northwest of that sub-basin, inflows that slow the recession are ecologically beneficial, especially if some flow could still be maintained into the northeast. Maintaining a moderate rate of stage change within the marshes of WCAs despite reversals, avoiding abrupt changes in water depth, and conserving water north in the system has an ecological benefit. When water is available, discharge downstream through Taylor Slough. Individual regional recommendations can be found in **Table EV-2**.

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

Everglades Region	Rainfall (inches)	Stage change (feet)
WCA-1	<0.01	-0.15
WCA-2A	<0.01	-0.08
WCA-2B	<0.01	-0.15
WCA-3A	0.03	-0.11
WCA-3B	0.09	-0.10
ENP	0.20	-0.06

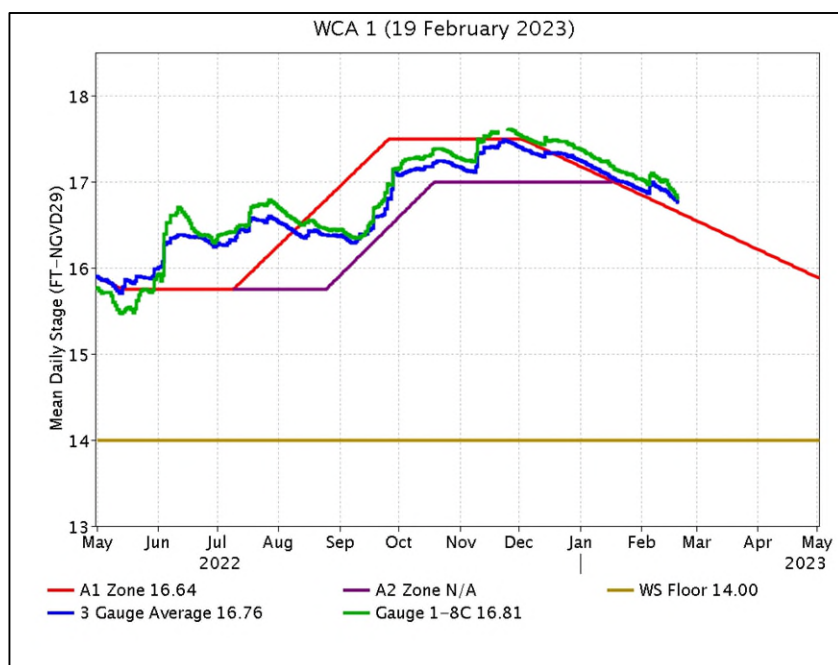


Figure EV-1. WCA-1 stage hydrographs and regulation schedule.

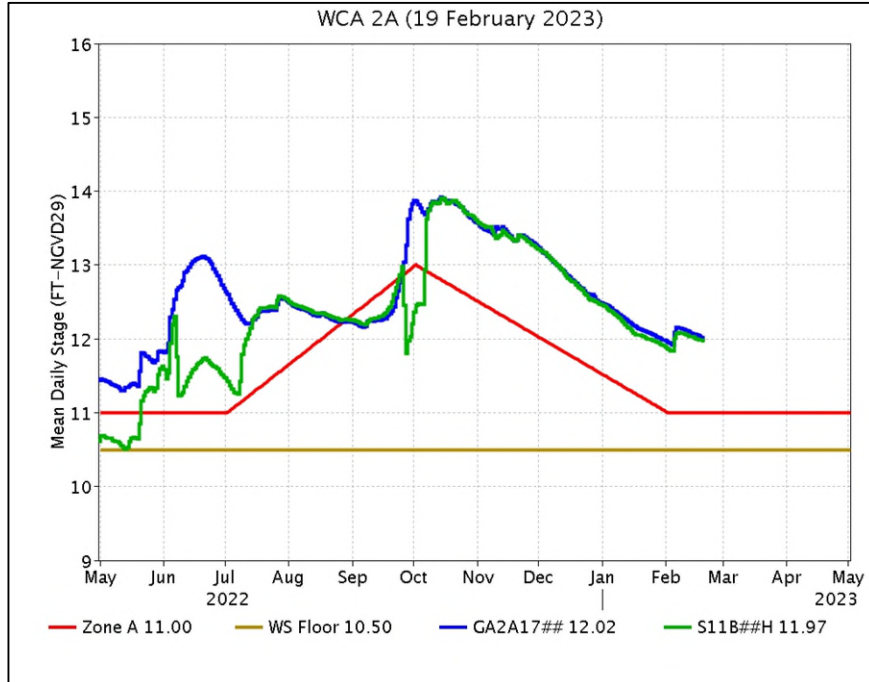


Figure EV-2. WCA-2A stage hydrographs and regulation schedule.

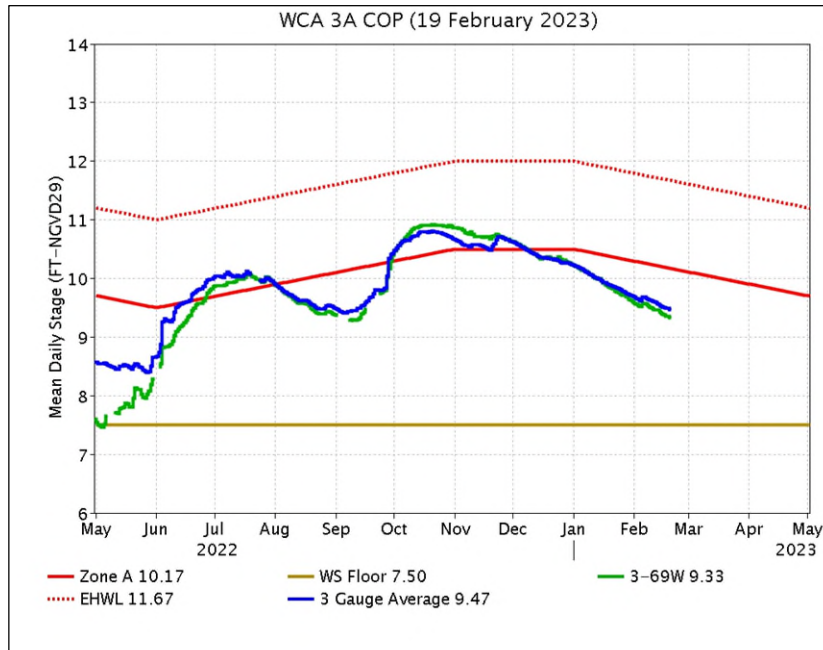


Figure EV-3. WCA-3A stage hydrographs (three-gauge average, S-333 headwater) and regulation schedule.

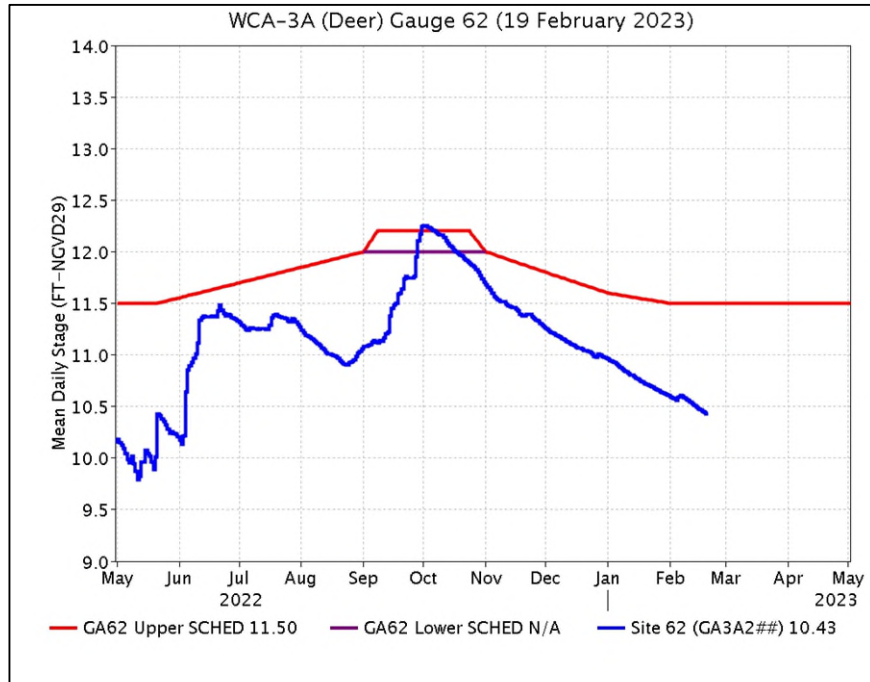


Figure EV-4. WCA-3A stage hydrograph (Deer gauge; Site 62) and CA62 regulation schedule.

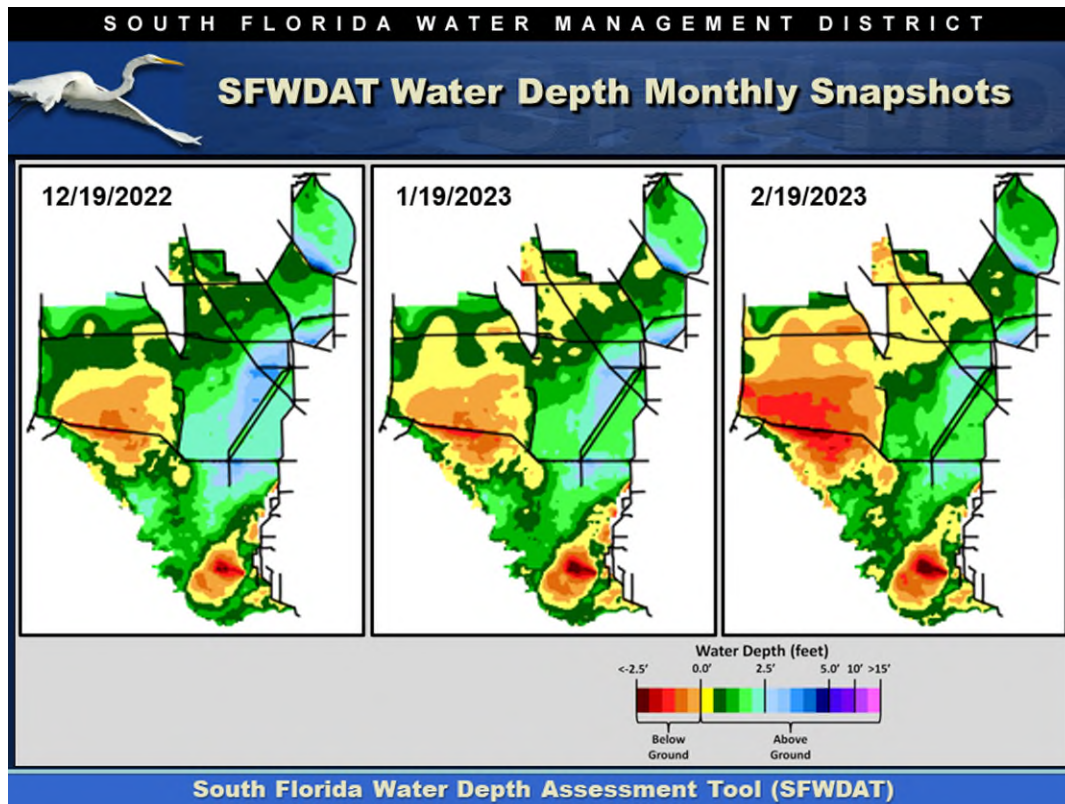


Figure EV-5. Everglades water depths from two months ago (left), one month ago (center) and present (right), based on SFWDAT.

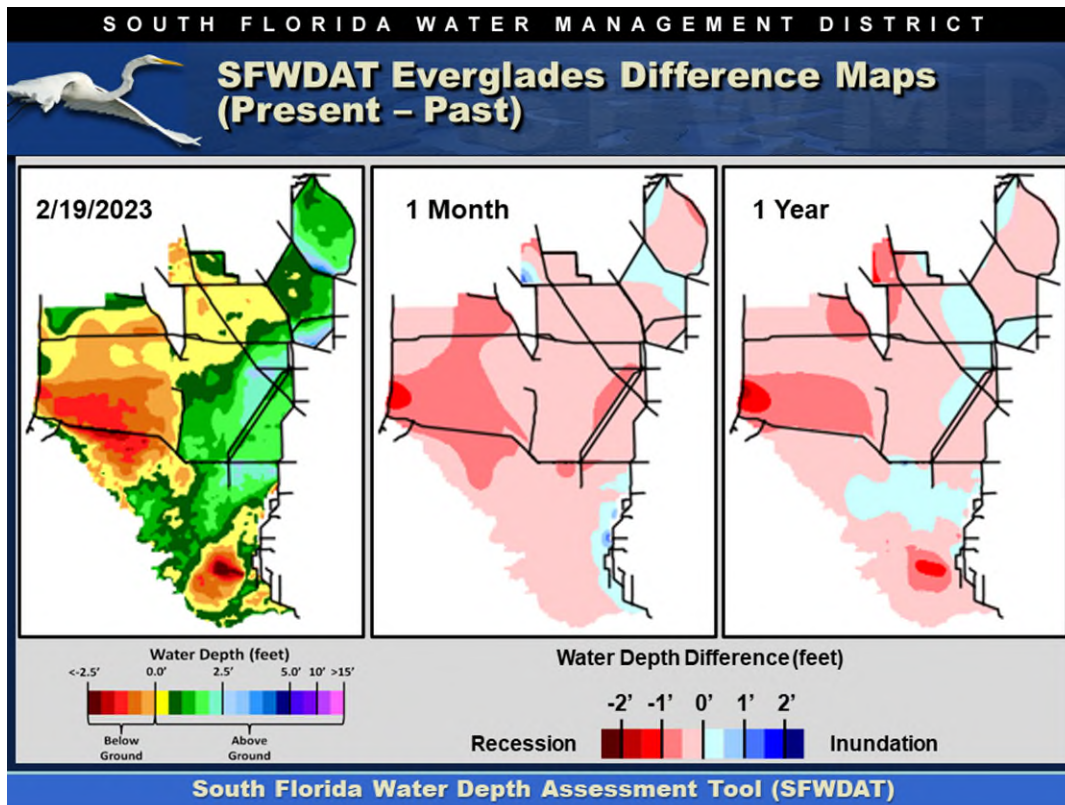


Figure EV-6. Present Everglades water depths (left) and water depth changes from one month (center) and one year (right) ago, based on SFWDAT.

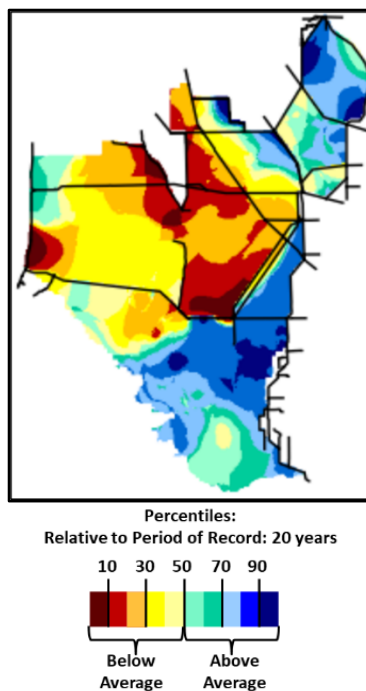


Figure EV-7. Present water depths (2/19/2023) compared to the day of year average over the previous 20 years.

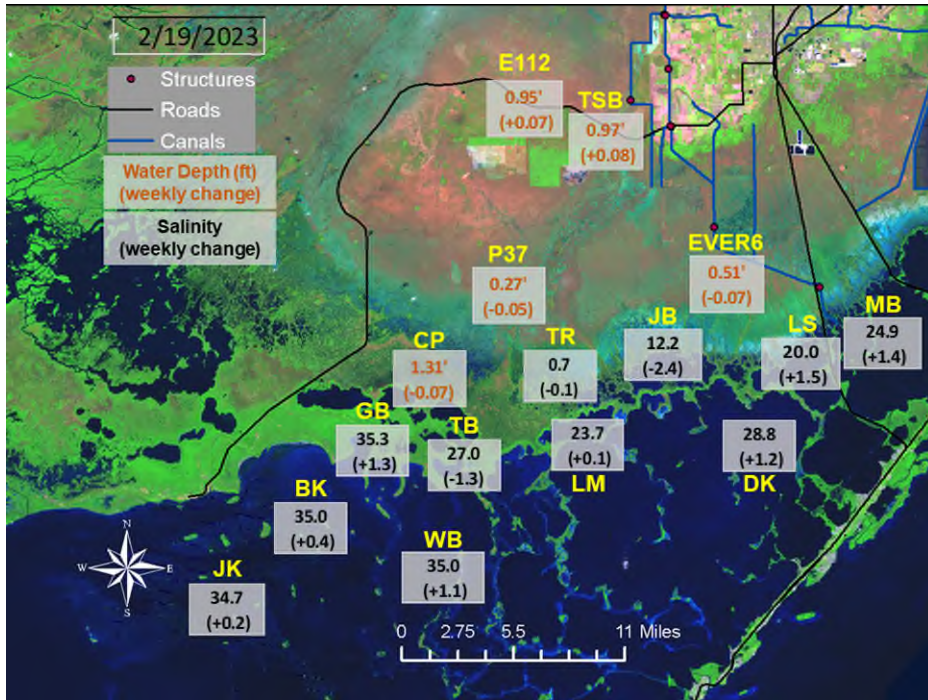


Figure EV-8. Taylor Slough water depths with changes since a week ago and Florida Bay salinities with changes since a week ago.

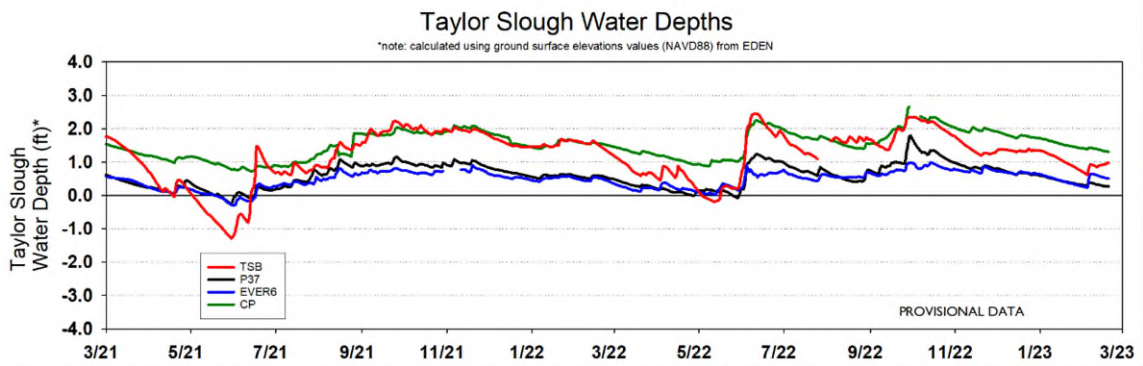


Figure EV-9. Taylor Slough water depth time series.

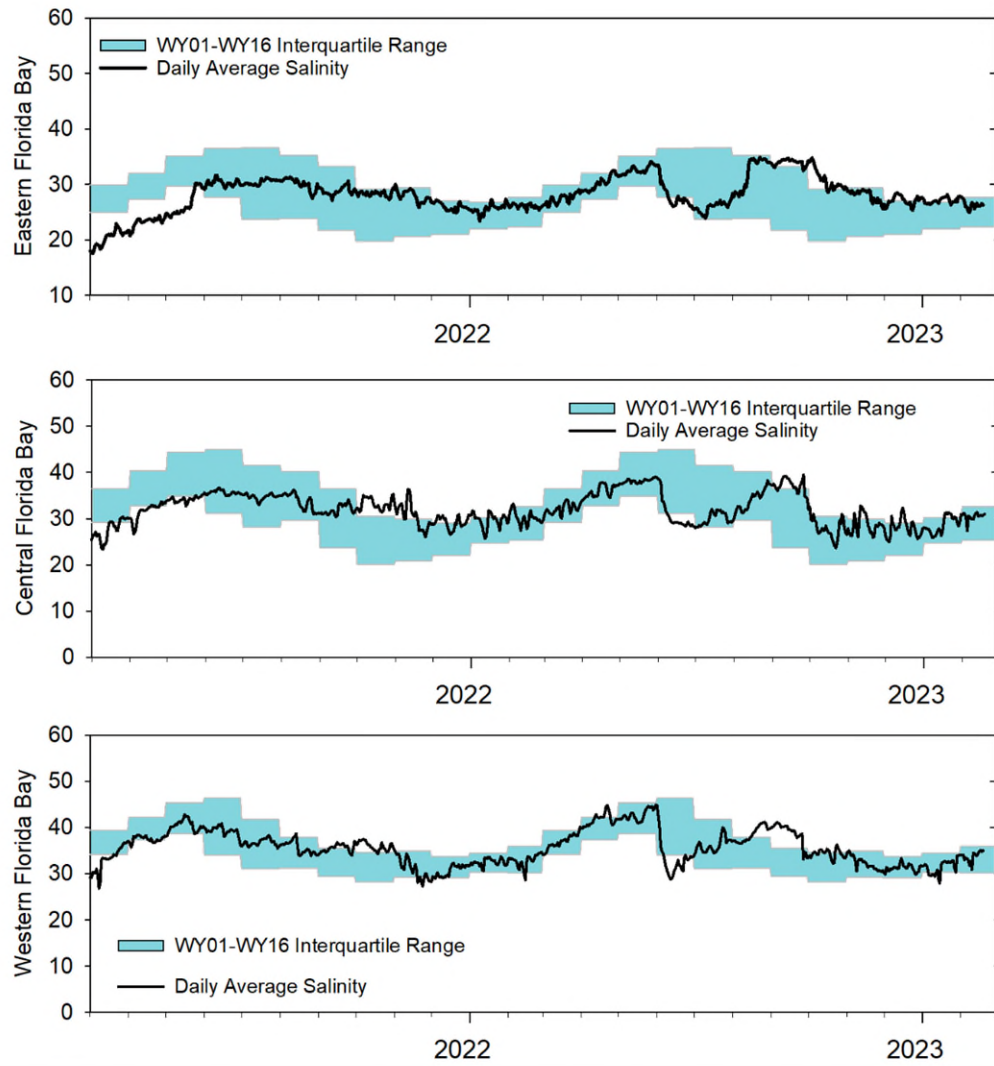


Figure EV-10. Eastern (top panel), Central (middle panel) and Western (bottom panel) Florida Bay daily average salinities with interquartile (25-75 percentile) ranges.

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

SFWMD Everglades Ecological Recommendations, February 21, 2023 (red is new)			
	Weekly change	Recommendation	Reasons
WCA-1	Stage decreased by 0.15'	Conserve water in this basin as possible. Recession rate of less than 0.05' per week.	Protect within basin and downstream habitat and wildlife.
WCA-2A	Stage decreased by 0.08'	Conserve water in this basin as possible. Recession rate of less than 0.05' per week.	Protect within basin and downstream habitat and wildlife. Protect conditions conducive to wading bird foraging later in the season.
WCA-2B	Stage decreased by 0.15'	Conserve water in this basin as possible. Recession rate of less than 0.05' per week.	Protect within basin and downstream habitat and wildlife.
WCA-3A NE	Stage decreased by 0.13'	Conserve water in this basin as possible. Recession rate of less than 0.05' per week	Protect within basin and downstream habitat and wildlife. Protect conditions conducive to wading bird foraging later in the season. Lower fire risk and protect peat soils.
WCA-3A NW	Stage decreased by 0.09'	Conserve water in this basin as possible. Recession rate of less than 0.05' per week	
Central WCA-3A S	Stage decreased by 0.11'	Conserve water in this basin as possible. Recession rate of less than 0.10' per week	Protect within basin and downstream habitat and wildlife.
Southern WCA-3A S	Stage decreased by 0.11'		
WCA-3B	Stage decreased by 0.10'	Recession rate of less than 0.10' per week.	Protect within basin and downstream habitat and wildlife.
ENP-SRS	Stage decreased by 0.06'	Make discharges to ENP according to COP and TTFF protocol while adaptively considering upstream and downstream ecological conditions. Discussions on water management within the system should be continued.	Protect within basin and upstream habitat and wildlife.
Taylor Slough	Stage changes ranged from -0.06' to +0.06'	Move water southward as possible.	When available, provide freshwater buffer for downstream conditions.
FB- Salinity	Salinity changes ranged from -4.3 to +7.0	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 539 cfs, and the previous 30-day mean inflow was 525 cfs. The seven-day mean salinity was 24.1 at BBCW8 and 21.7 at BBCW10, both within the ideal salinity range for estuarine organisms in this region (salinity less than 35). Data provided by Biscayne National Park.

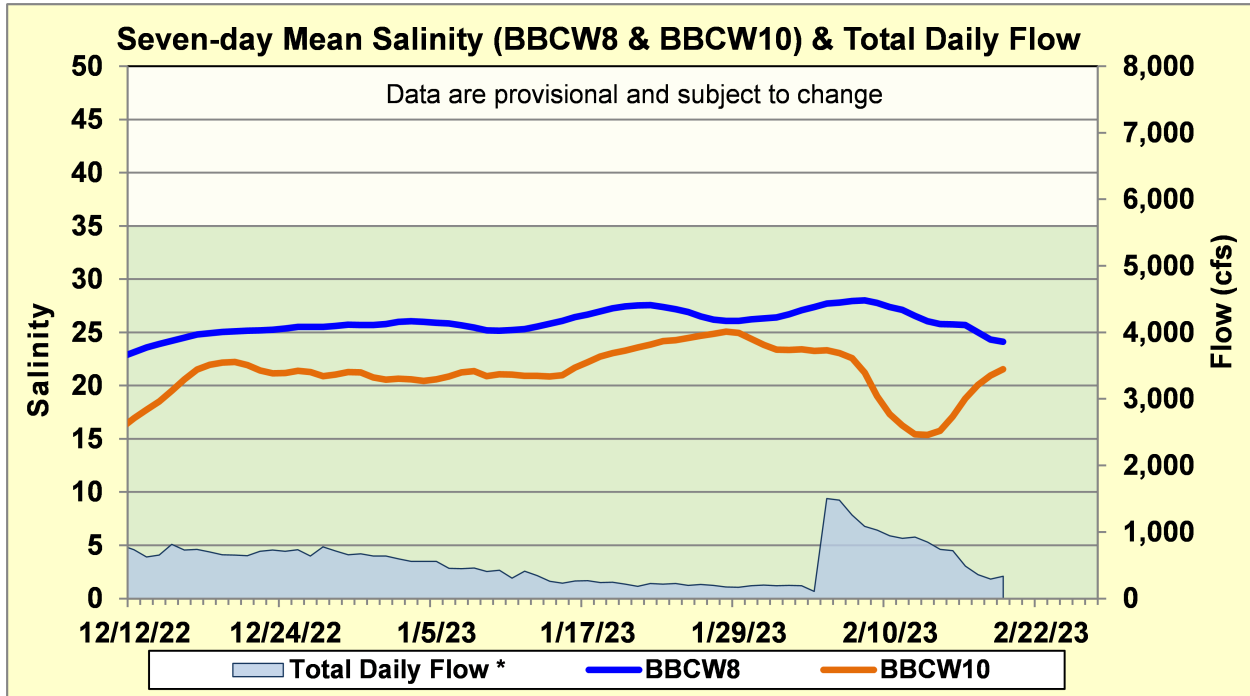


Figure BB-1. Seven-day mean salinity at BBCW8 and BBCW10 and total daily flow in Biscayne Bay. Total daily flow was calculated using flow from structures S20G, S20F, S21, S21A, S123, and S700P.