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: January 18, 2023

SUBJECT: Weekly Environmental Conditions for Systems Operations

Summary

Weather Conditions and Forecast

The temperatures will continue to warm through the week with a relative lack of moisture and strong stability of the atmosphere through at least Thursday evening. A cold front will arrive over the Florida Panhandle late Thursday and north Florida by daybreak on Friday, ahead of which isolated showers could reach the Kissimmee Valley during the early morning hours on Friday. The cold front will then gradually sink southward into the northern part of the SFWMD by late Friday and to Lake Okeechobee on Saturday. Although moisture ahead of the cold front will increase, limited shower activity is expected from around Lake Okeechobee northward on Friday. Well above-normal moisture across the SFWMD should result in an increase of rains, mainly north and west of Lake Okeechobee on Saturday. Dry conditions and very warm temperatures will prevail across the southern third of the SFWMD and then spread District-wide through Sunday evening. A cold front should begin moving southeastward by late Monday or early Tuesday, although how far southeastward is uncertain. A stream of moisture ahead of the front could cause an increase of rains during this time, again mainly north and west of Lake Okeechobee, with the best chance for increased rain chances by the early morning on Tuesday. For the week ending next Tuesday morning, total SFWMD rainfall is forecast to be much below or below normal. However, while rainfall south of Lake Okeechobee should be below normal, particularly over the southeastern part of the SFWMD where much-below normal should occur, rainfall over the far north and west is most likely to near to above normal.

Kissimmee

Releases were made from East Lake Toho and Lake Toho to lower lake stages to 0.5 ft below their respective regulation schedules by January 15 and begin their recessions to their respective low pools on June 1. Weekly average discharges on January 15, 2023 at S-65 and S-65A were 1,200 cfs and 1,300 cfs, respectively. Mean weekly water depth on the Kissimmee River floodplain decreased slightly from the previous week, from 0.0.64

feet to 0.58 feet. The weekly average concentration of dissolved oxygen in the Kissimmee River increased from 6.6 mg/L the previous week to 6.8 mg/L for the week ending January 15, 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 16.15 feet NGVD on January 15, 2023, which is 0.17 feet lower than the previous week and 0.32 feet lower than a month ago. Lake stage remained in the Intermediate sub-band and was 0.65 feet above the upper limit of the ecological envelope. This is the third year in a row Lake stages have exceeded 16 feet NGVD at the beginning of the dry season and is the highest lake stage at this time of year for more than two decades. According to NEXRAD, 0.11 inches of rain fell directly on the Lake last week. Average daily inflows (excluding rainfall) decreased from the previous week, going from 1,983 cfs to 1,648 cfs. Average daily outflows (excluding evapotranspiration) increased from the previous week going from 1,702 cfs to 2,908 cfs. The most recent satellite image (January 15, 2023) from NOAA's Harmful Algal Bloom Monitoring System showed low-moderate bloom potential across much of the Lake.

Estuaries

Total inflow to the St. Lucie Estuary averaged 138 cfs over the past week with no flow coming from Lake Okeechobee. Mean salinities increased 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 1,975 cfs over the past week with 1,329 cfs coming from Lake Okeechobee. Mean surface salinities decreased at all 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 and Shell Point (10-25) and in the upper stressed range at Sanibel (>25).

Stormwater Treatment Areas

For the week ending Sunday, January 15, 2023, 1,700 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 14,200 ac-feet. The total amount of inflows to the STAs in WY2023 is approximately 982,000 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 construction activities. 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 in WCA-3A and – 2A remained in the “fair” or “poor” category. Depths in WCA-3A northeast remain one of the shallowest regions in the WCAs. Maintaining wet conditions and preventing a complete dry-down is important for wading bird nesting in that region. Wading birds are likely foraging in WCA-3A North and conditions there remain similar to last year, which was a poor to moderate wading bird nesting season. Taylor slough stages fell last week but remain well above the pre-Florida Bay initiative average. Average salinity decreased again last week in Florida Bay. Salinities in the eastern bay are above the IQR and below in the western bay.

Biscayne Bay

Total inflow to Biscayne Bay averaged 427 cfs and the previous 30-day mean inflow averaged 616 cfs. The seven-day mean salinity was 25.5 at BBCW8 and 20.9 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 January 15, 2023, mean daily lake stages were 57.5 feet NGVD (0.5 feet below schedule) in East Lake Toho, 54.5 feet NGVD (0.5 feet below schedule) in Lake Toho, and 52.3 feet NGVD (0.2 below schedule) in Lakes Kissimmee-Cypress-Hatchineha (KCH) (**Table KB-1**, **Figures KB-1-3**).

Lower Kissimmee

For the week ending January 15, 2023, mean weekly discharge was 1,200 cfs at S-65 and 1,300 cfs at S-65A. Mean weekly discharge from the Kissimmee River was 1,400 cfs at S-65D and 1,500 cfs at S-65E (**Table KB-2**). Mean weekly headwater stages were 46.5 feet NGVD at S-65A and 28.3 feet NGVD at S-65D on January 15, 2023. Mean weekly river channel stage stayed approximately the same as the previous week's mean of 37.4 feet (**Figure KB-4**). Mean weekly water depth on the Kissimmee River floodplain for the week ending January 15, 2023 decreased slightly from the previous week, from 0.64 feet to 0.58 feet (**Table KB-2**, **Figure KB-5**). The weekly average concentration of dissolved oxygen in the Kissimmee River increased from 6.6 mg/L the previous week to 6.8 mg/L for the week ending January 15, 2023 (**Table KB-2**, **Figure KB-6**).

Water Management Recommendations

Lower stages in Lake Toho and East Lake Toho to 0.5 ft below their respective regulation schedules by January 15, then begin stage recessions to their June 1 low pools. Per the IS-14-50.0 discharge plan, adjust S-65 discharge to maintain a minimum flow of at least 1,400 cfs at S-65A to the Kissimmee River while stage in KCH is at or above 50 ft. (**Figure KB-7**).

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)	
							1/15/23	*1/8/23*
Lakes Hart and Mary Jane	S-62	LKMJ	36	61.1	R	61.0	0.1	0.1
Lakes Myrtle, Preston and Joel	S-57	S-57	24	61.6	R	61.5	0.1	0.1
Alligator Chain	S-60	ALLI	26	64.0	R	64.0	0.0	0.1
Lake Gentry	S-63	LKGT	30	61.5	R	61.5	0.0	0.1
East Lake Toho	S-59	TOHOE	380	57.5	R	58.0	-0.5	-0.2
Lake Toho	S-61	TOHOW S-61	990	54.5	R	55.0	-0.5	-0.2
Lakes Kissimmee, Cypress and Hatchineha	S-65	KUB011 LKIS5B	1200	52.3	R	52.5	-0.2	-0.2

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

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

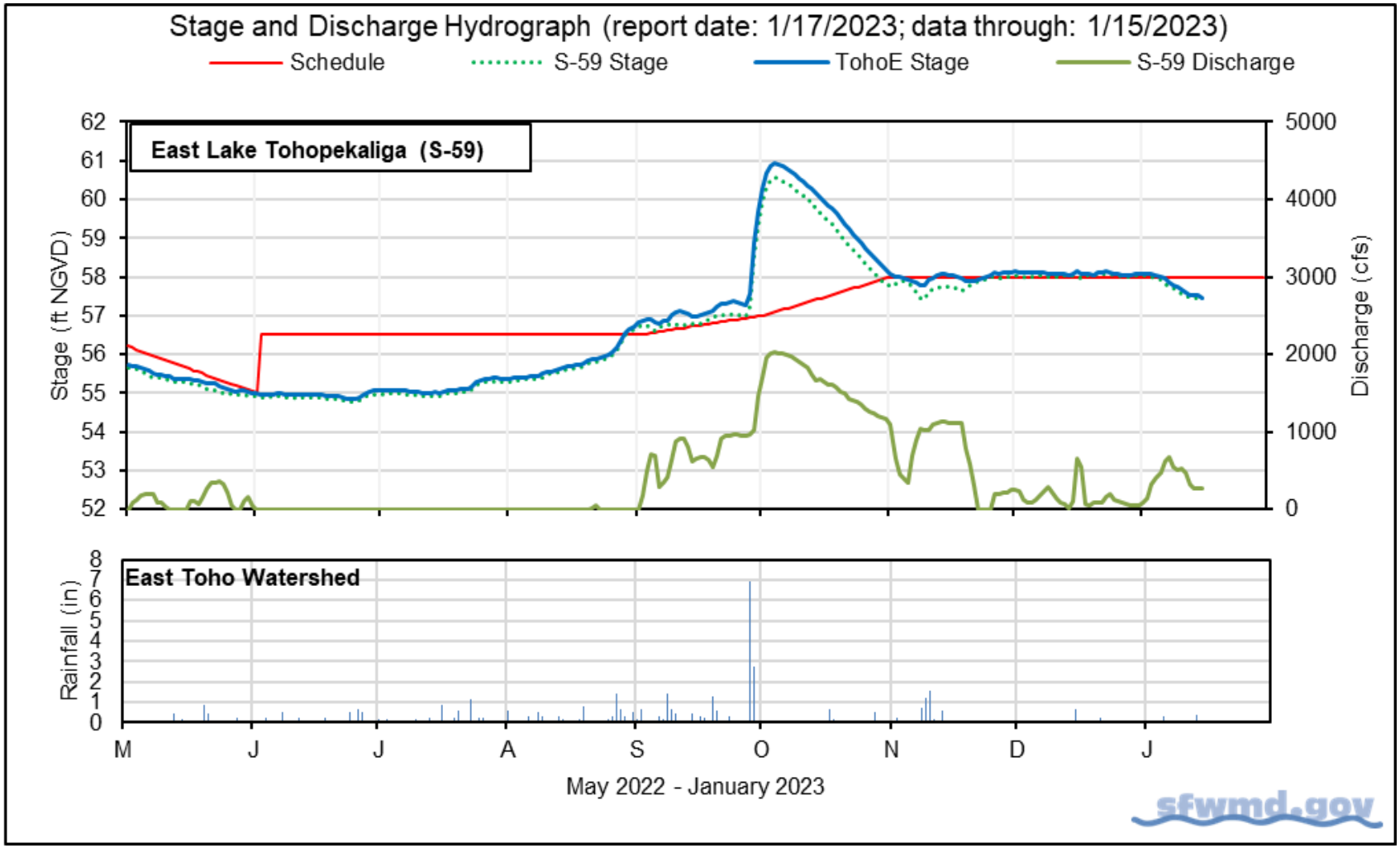


Figure KB-1. East Lake Toho regulation schedule, stage, discharge and rainfall.

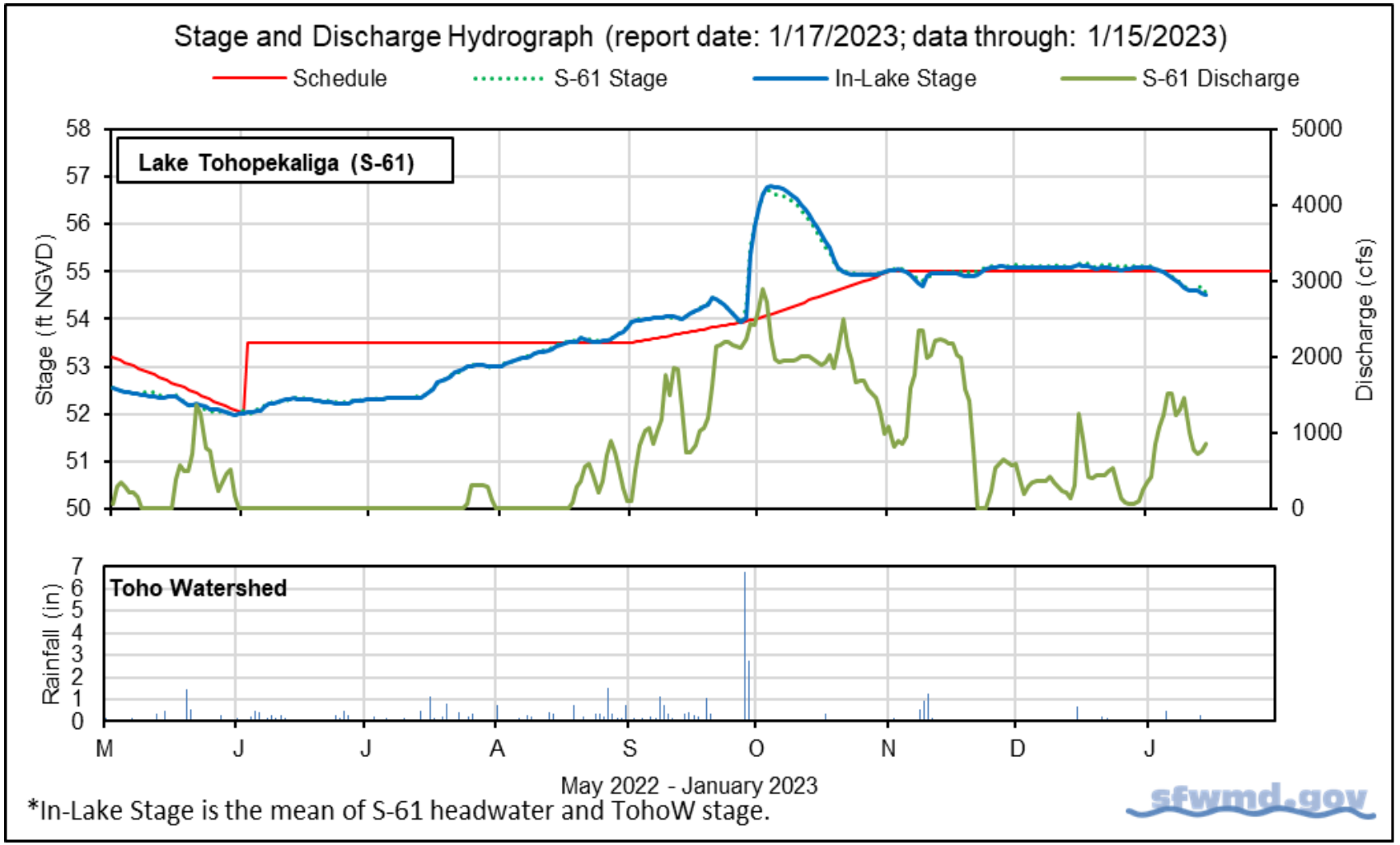


Figure KB-2. Lake Toho regulation schedule, stage, discharge and rainfall.

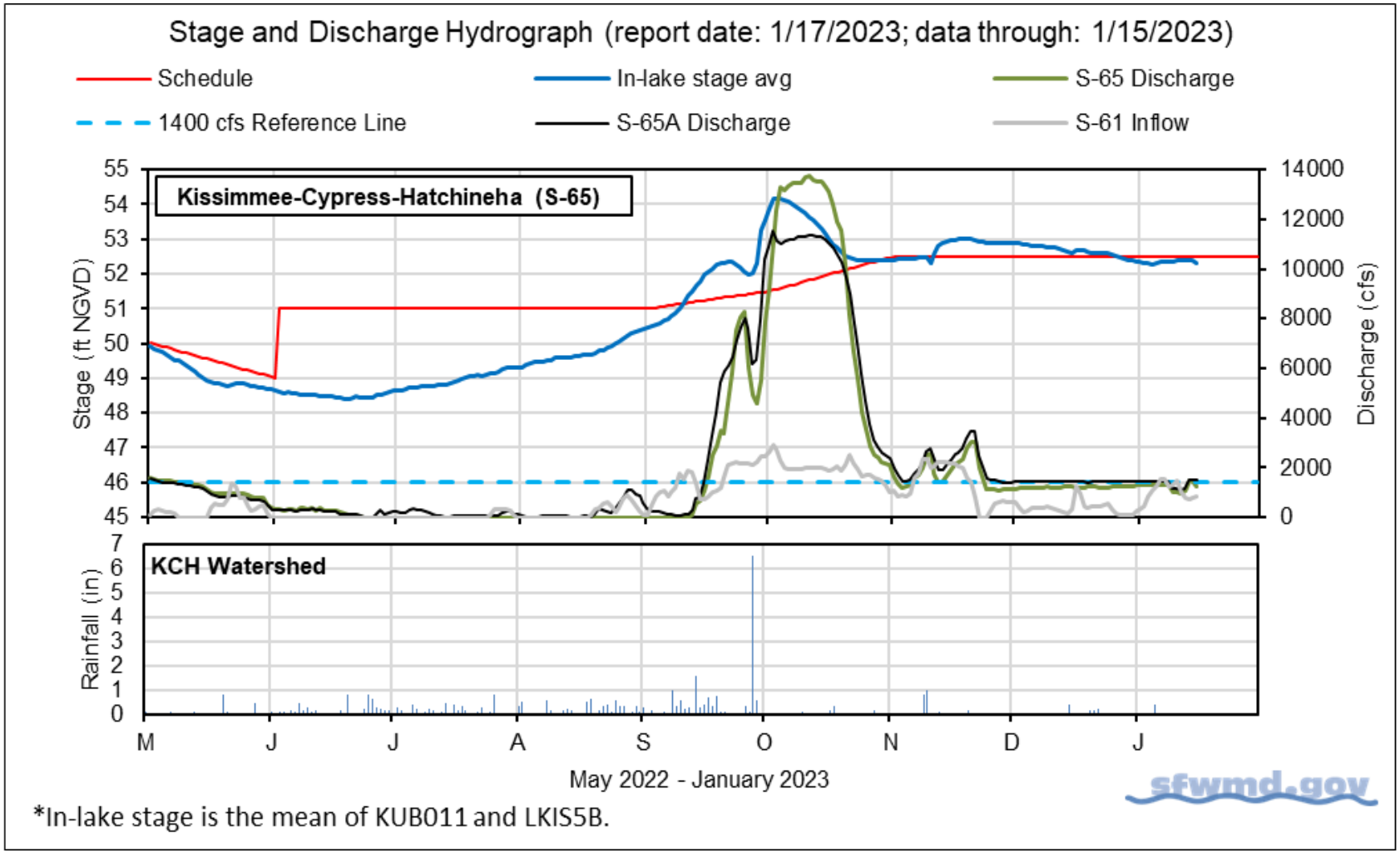


Figure KB-3. Lakes Kissimmee, Cypress and Hatchineha regulation schedule, stage, discharge and rainfall.

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

Metric	Location	Sunday Daily Average	Weekly Average for Previous Seven Day Periods			
		1/15/23	1/15/23	1/8/23	1/1/23	12/25/22
Discharge	S-65	1,200	1,200	1,300	1,300	1,200
Discharge	S-65A[a]	1,500	1,300	1,400	1,400	1,400
Headwater Stage (feet NGVD)	S-65A	46.7	46.5	46.4	46.3	46.4
Discharge	S-65D[b]	1,300	1,400	1,400	1,500	1,600
Headwater Stage (feet NGVD)	S-65D[c]	28.3	28.3	28.4	28.3	28.3
Discharge (cfs)	S-65E[d]	1,400	1,500	1,500	1,500	1,600
Discharge (cfs)	S-67	0	0	0	0	0
Dissolved Oxygen (mg/L) [e]	Phase I, II/III river channel	7.6	6.8	6.6	7.7	5.9
River channel mean stage[f]	Phase I river channel	37.4	37.4	37.6	37.6	37.6
Mean depth (feet) [g]	Phase I floodplain	0.54	0.58	0.64	0.66	0.57

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).

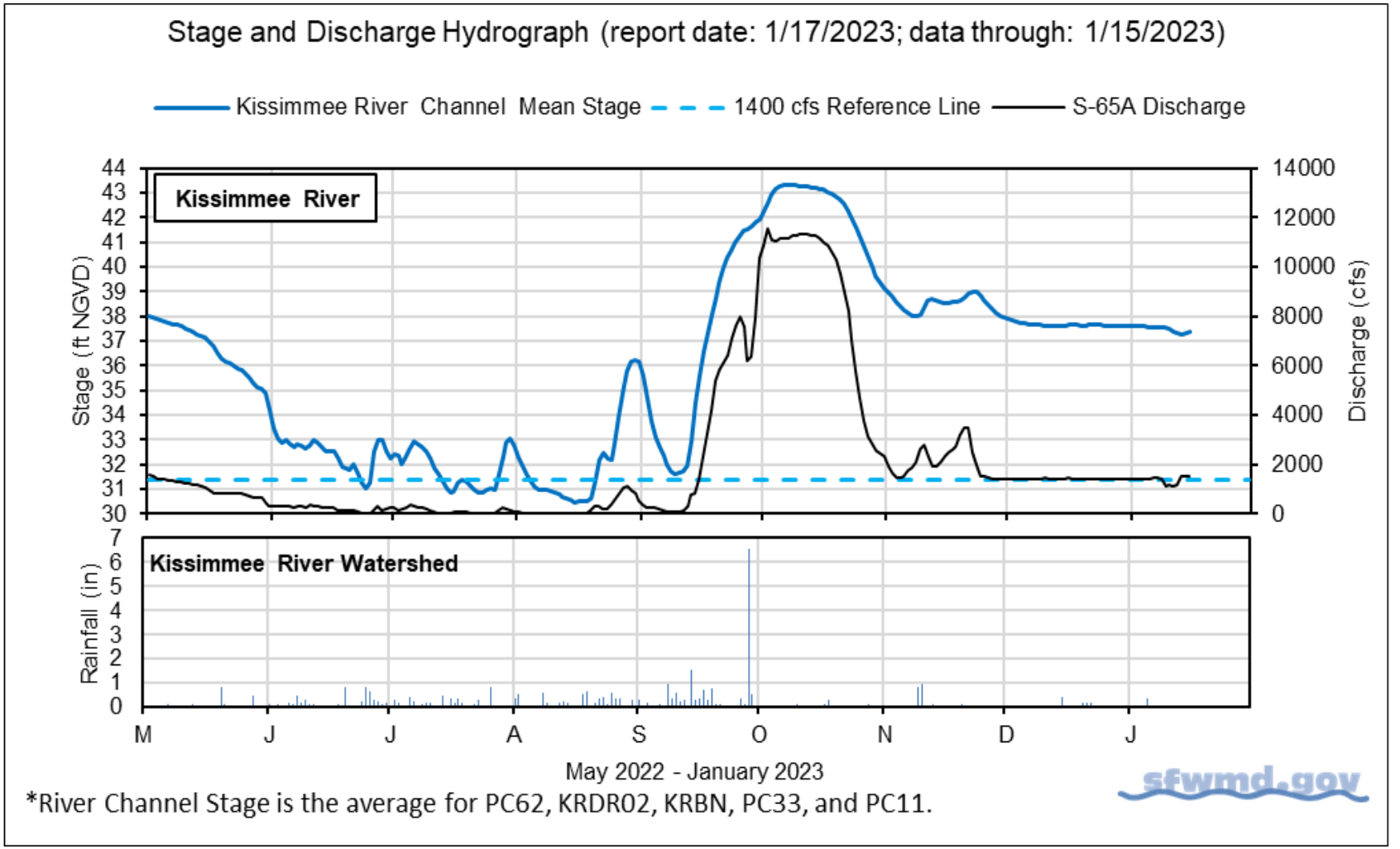


Figure KB-4. Kissimmee River stage, discharge and rainfall.

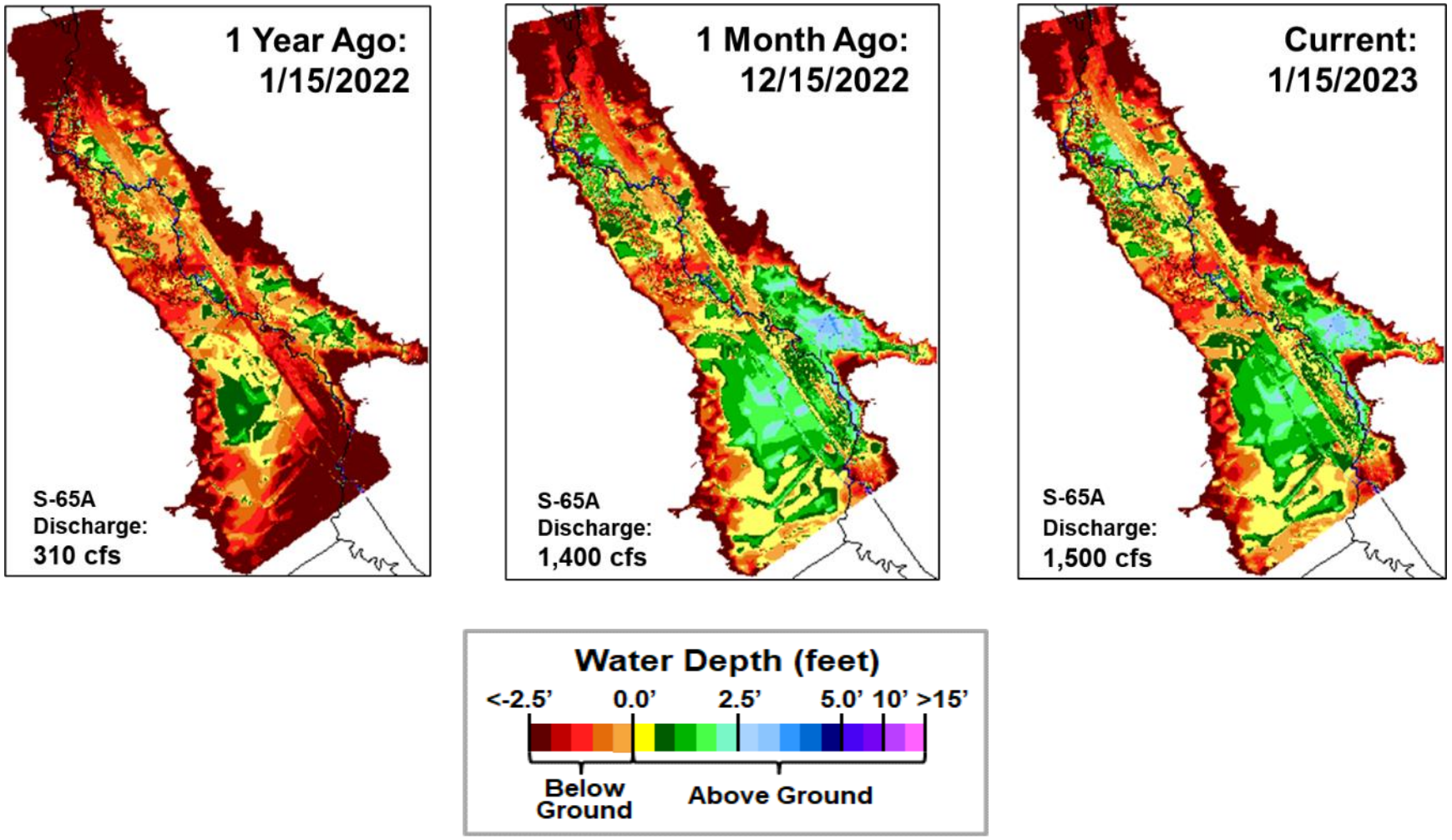


Figure KB-5. Phase I area Kissimmee River floodplain water depths (from left to right) one year ago, one month ago and current.

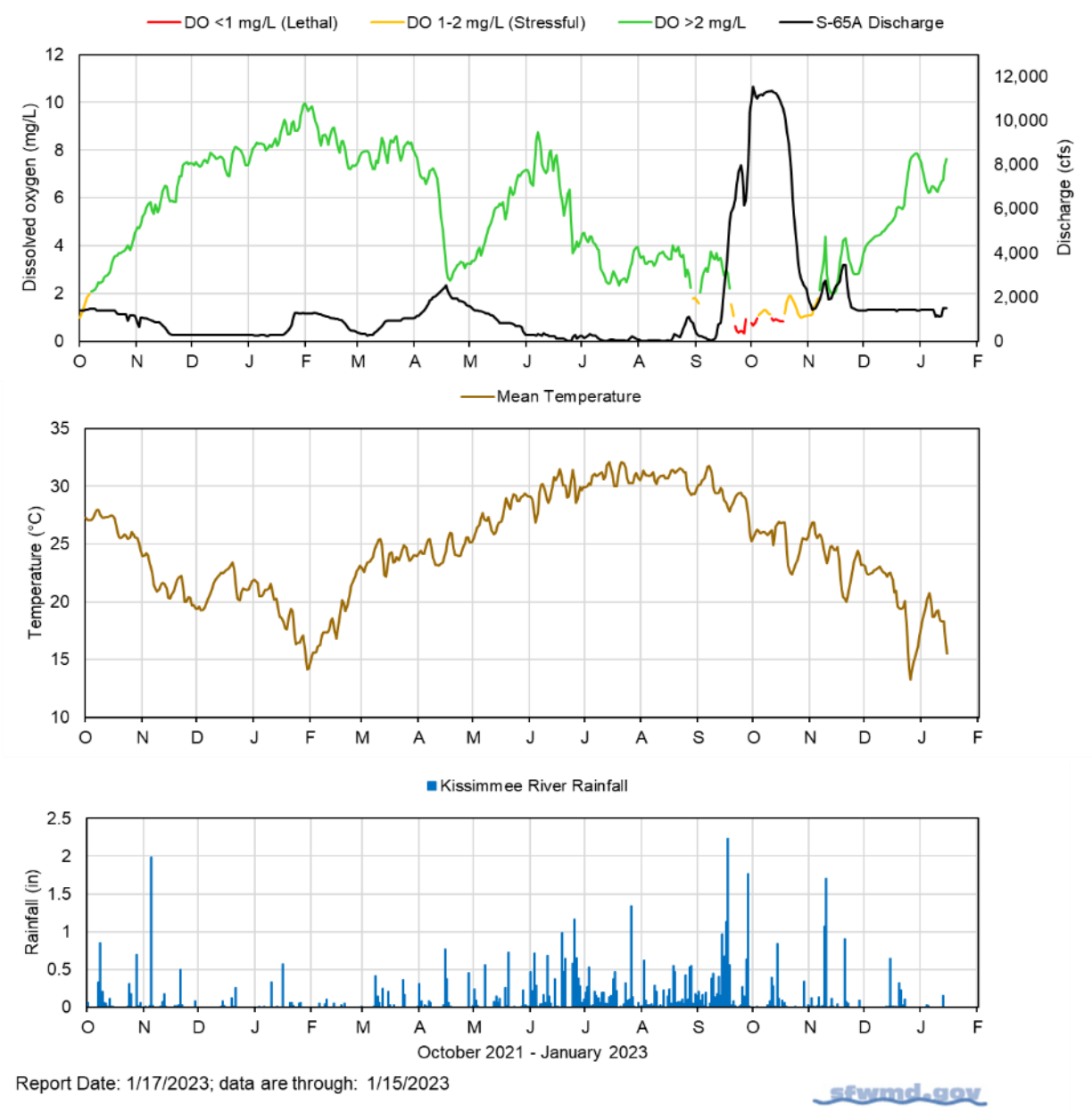


Figure KB-6. Restored Kissimmee river channel mean daily dissolved oxygen concentration (mg/L), S-65A discharge (cfs), temperature (°C) and rainfall (inches). Dissolved oxygen (DO) and temperature are mean daily values averaged for PC62, KRDR02, KRBN, PC33, PC11, PD62R, and PD42R with an average of five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

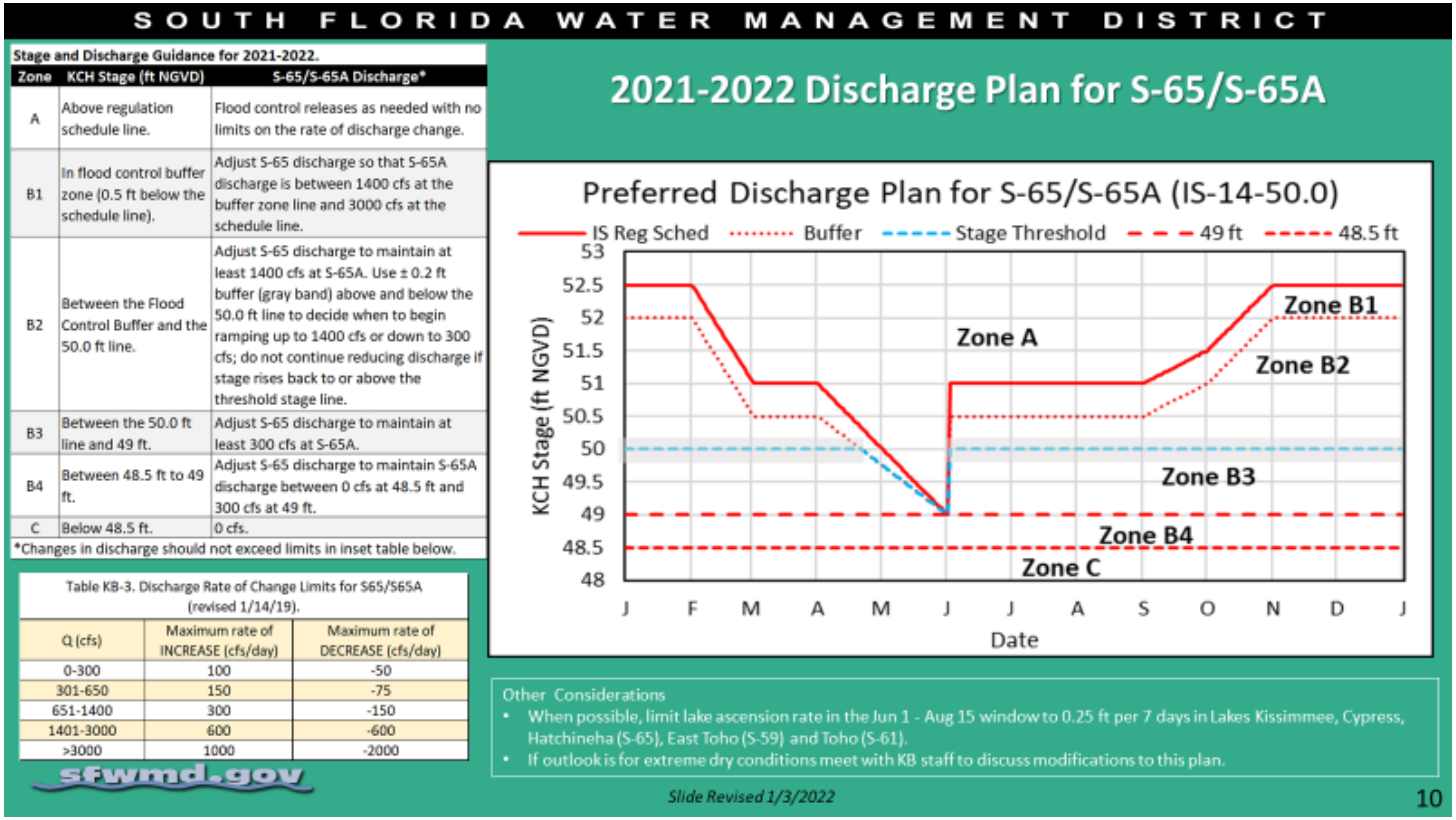


Figure KB-7. IS-14-50 Discharge Plan for S65/S65A with discharge rate of change limits (revised 1/14/19).

Lake Okeechobee

Lake Okeechobee stage was 16.15 feet NGVD on January 15, 2023, which is 0.17 feet lower than the previous week and 0.32 feet lower than a month ago (**Figure LO-1**). Lake stage remained in the Intermediate sub-band (**Figure LO-2**) and was 0.65 feet above the upper limit of the ecological envelope (**Figure LO-3**). According to NEXRAD, 0.11 inches of rain fell directly on the Lake last week.

Average daily inflows (excluding rainfall) decreased from the previous week, going from 1,983 cfs to 1,648 cfs. Average daily outflows (excluding evapotranspiration) increased from the previous week going from 1,702 cfs to 2,908 cfs. The highest inflow came from the Kissimmee River (C-38 Canal; 1,470 cfs). Outflows to the west via the S-77 structure averaged 1,624 cfs for the week. Outflows to the south via the S-350 structures averaged 1,174 cfs, and there was no flow to the east via the S-308 structure. **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 (January 15, 2023) from NOAA's Harmful Algal Bloom Monitoring System showed low-moderate bloom potential across much of the Lake, which is an increase in bloom risk from the previous week (**Figure LO-6**).

The most recent wading bird survey was conducted on January 12, 2023. Two flocks, with an estimated total of 740 birds were seen actively foraging on the Lake (**Figure LO-7**). Water levels remain too high to provide suitable foraging habitat across much of the Lake.

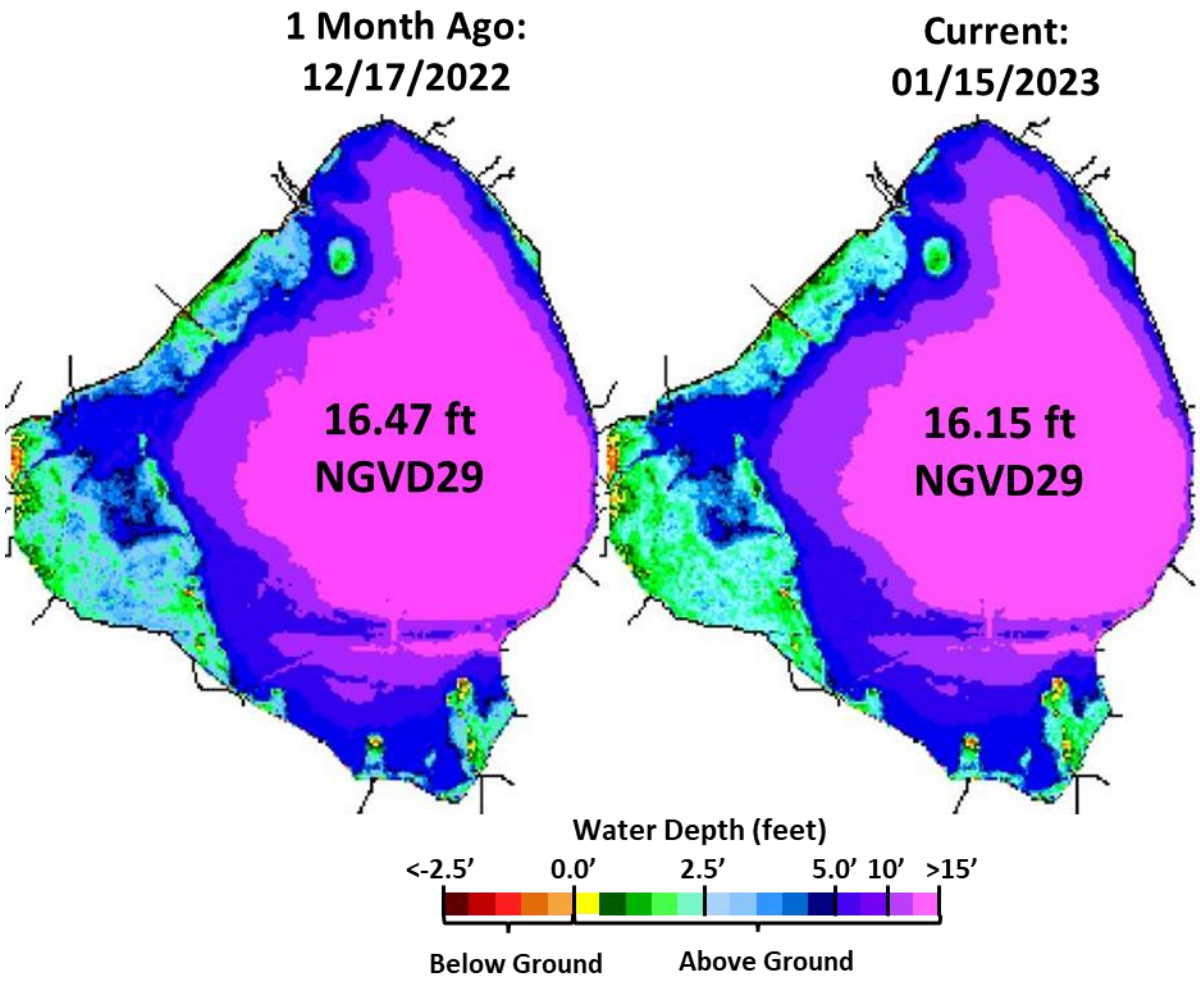


Figure LO-1. Lake Okeechobee water depth estimates based on South Florida Water Depth Assessment Tool (SFWDAT).

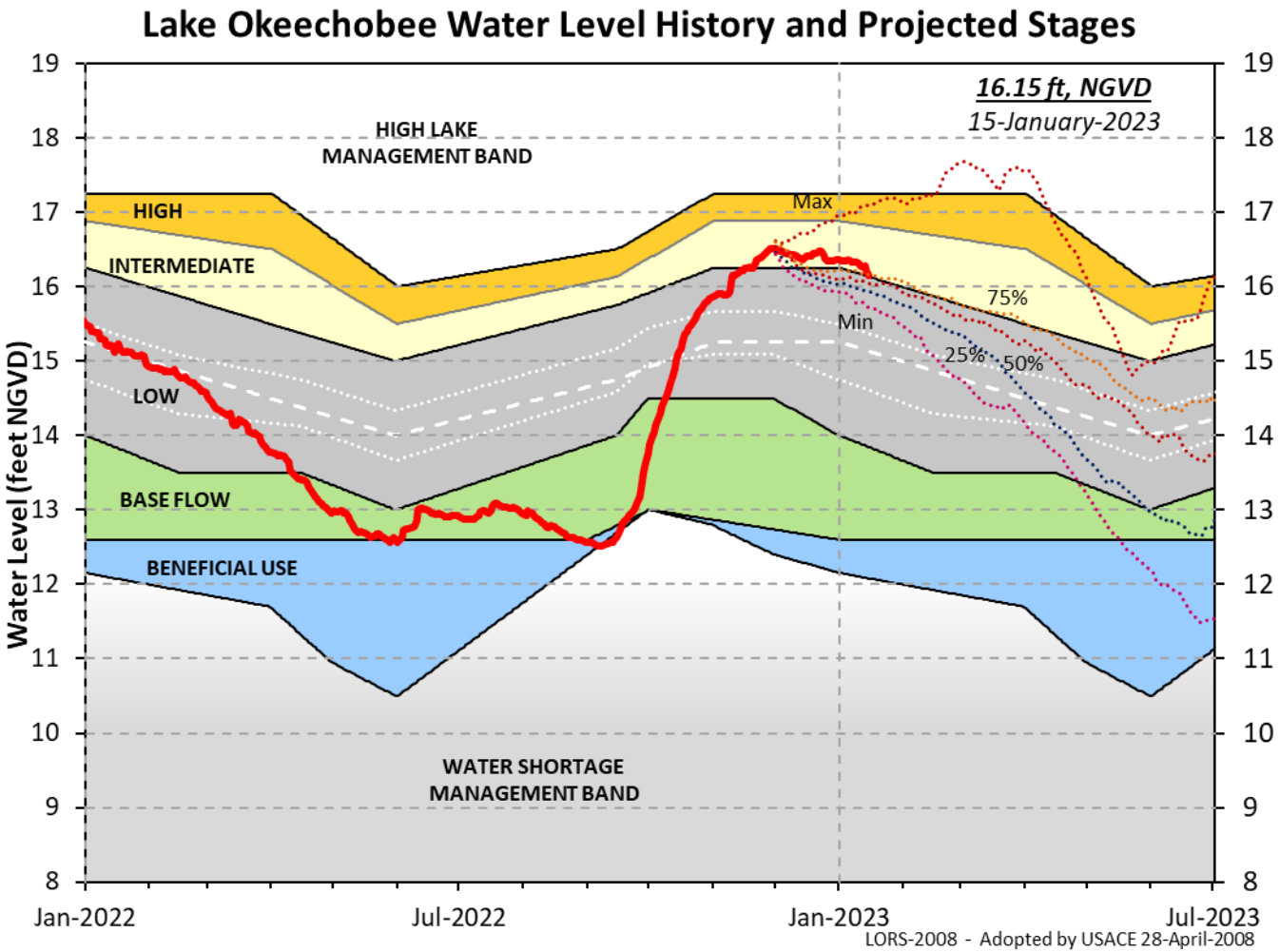


Figure LO-2. Recent Lake Okeechobee stages with projected stages based on a dynamic position analysis.

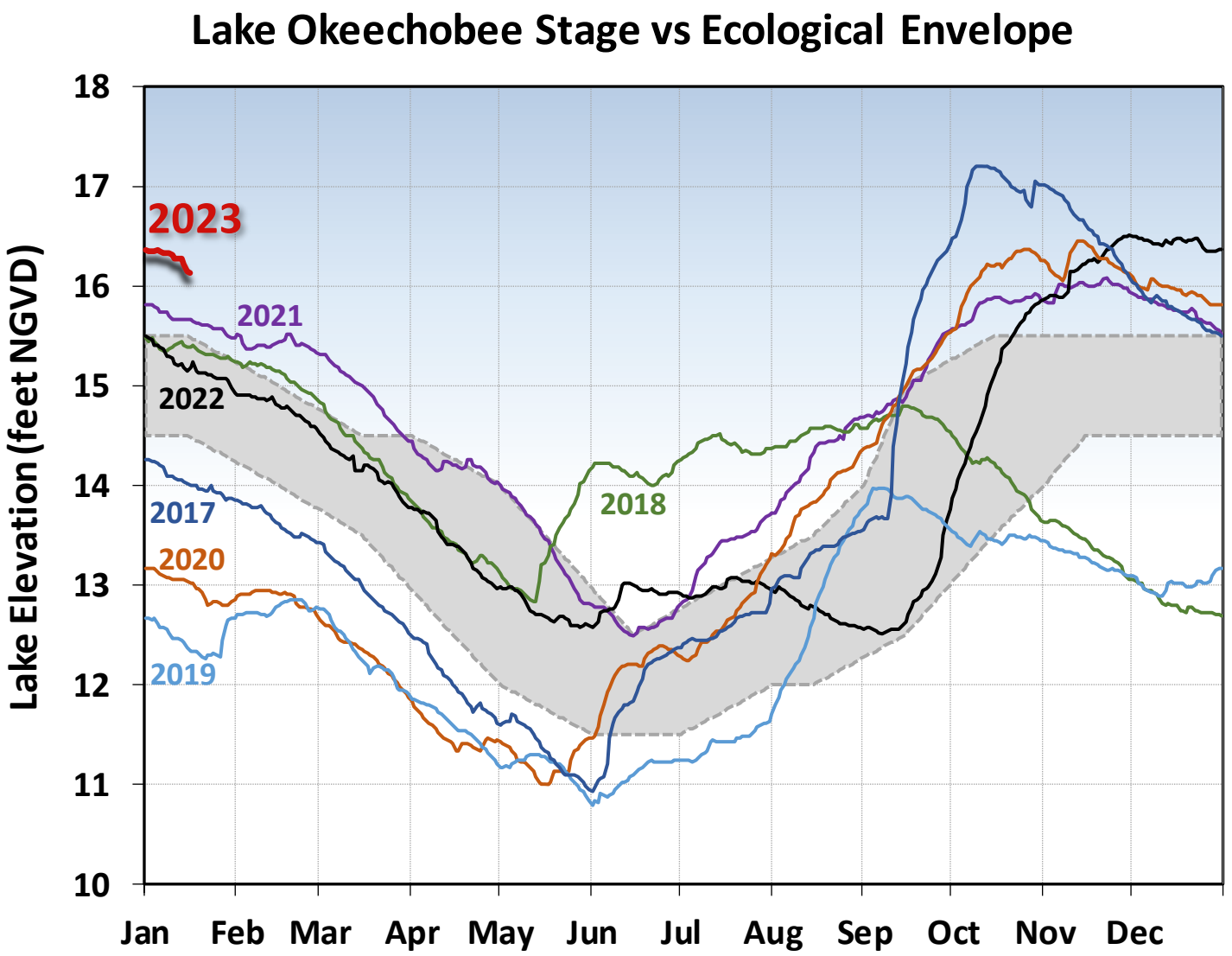


Figure LO-3. The prior seven years of annual stage hydrographs for Lake Okeechobee in comparison to the ecological envelope.

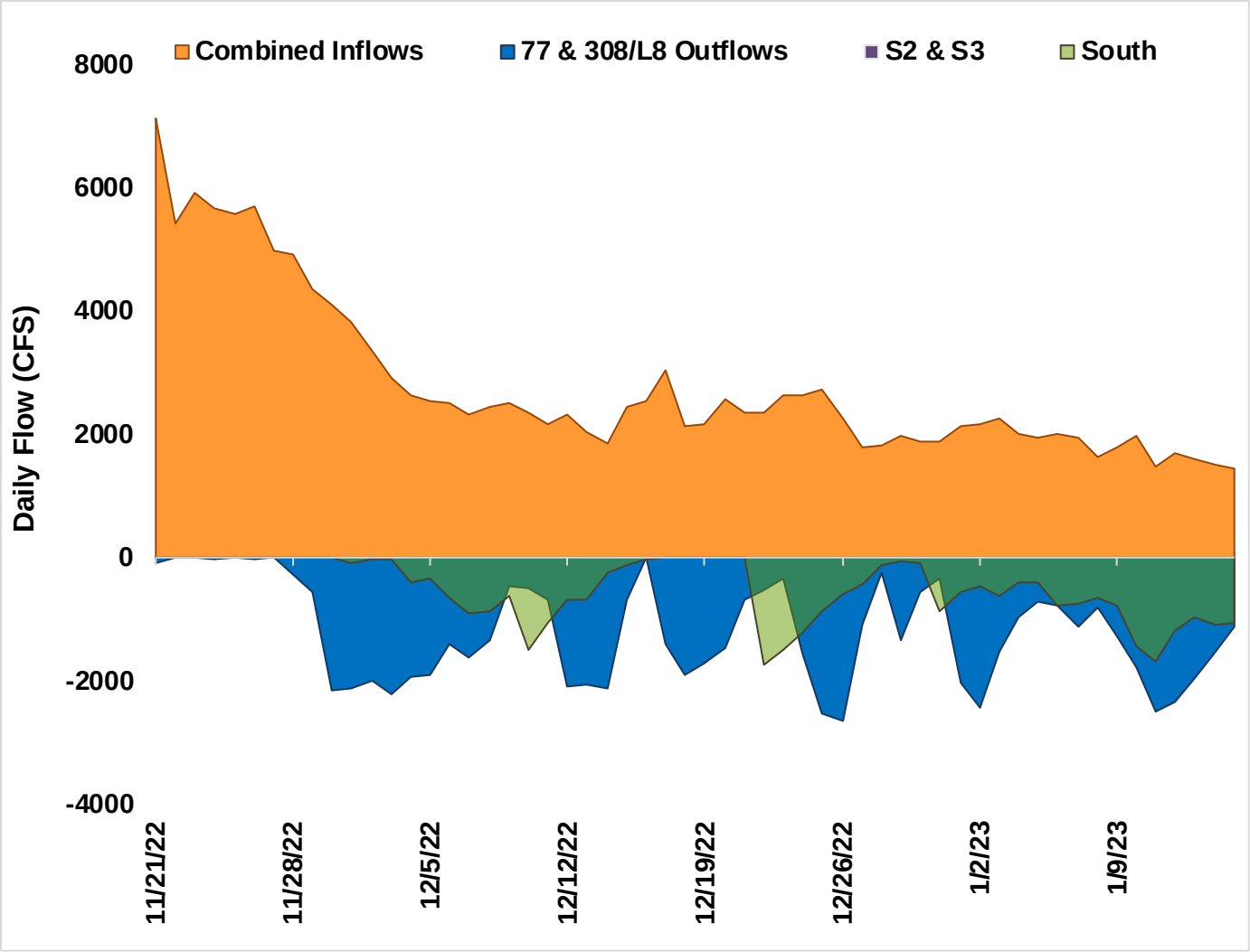


Figure LO-4. Major inflows (orange) to and outflows east and west (blue) from Lake Okeechobee. Outflows south are shown in green. Flows into Lake Okeechobee from the L-8 canal through S-271 (formerly Culvert 10A) or from the C-44 canal through the S-308 are included as inflows. Conversely, flows from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

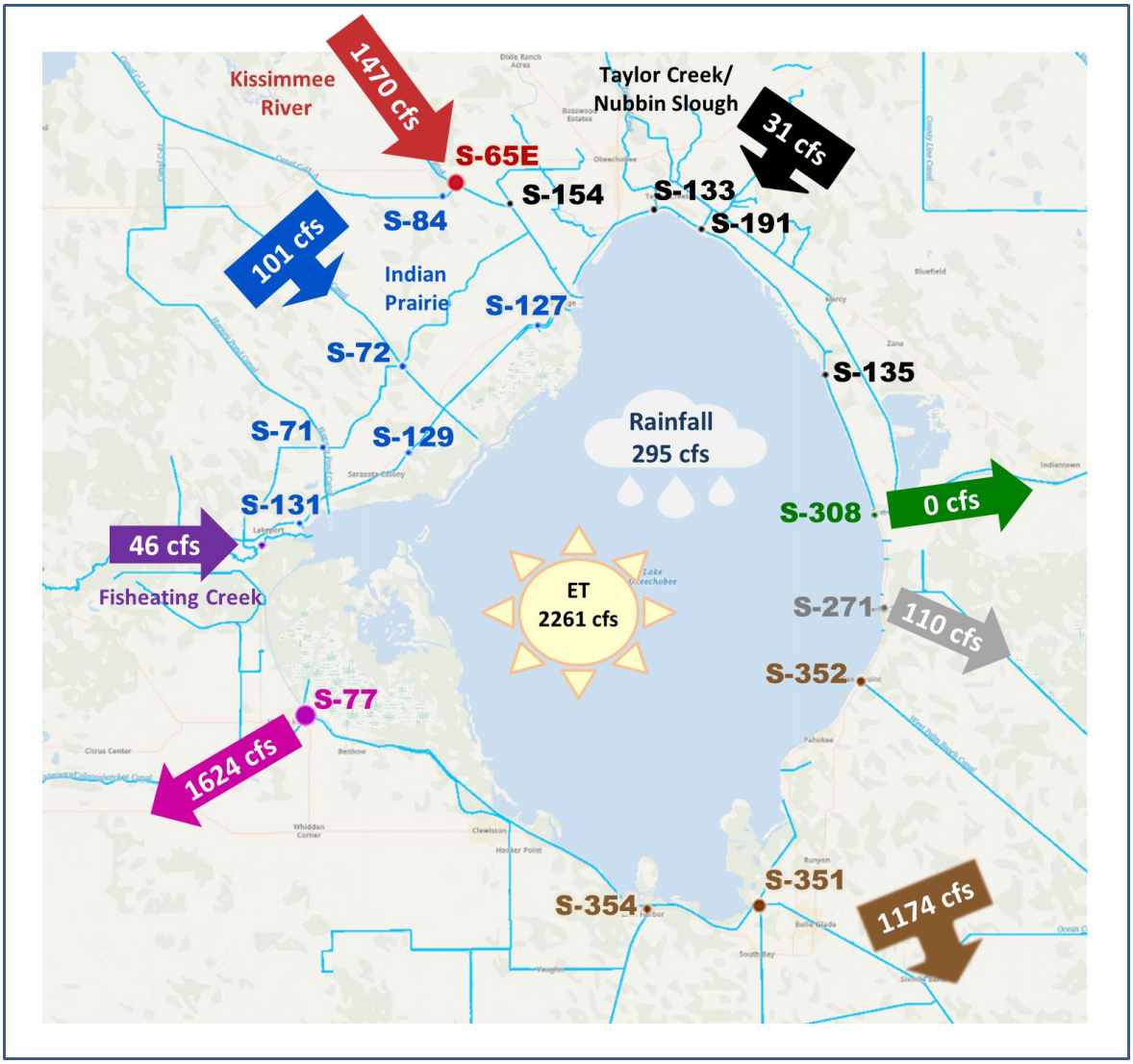


Figure LO-5. Inflows into Lake Okeechobee from Indian Prairie basins, Taylor Creek/Nubbin Slough, Kissimmee River and Fisheating Creek, and outflows to the west via S-77, to the east via S-308, to the south via S-351, S-352, S-354, and to southeast via S-271 (formerly Culvert 10A) for the week of January 09 - 15, 2023.

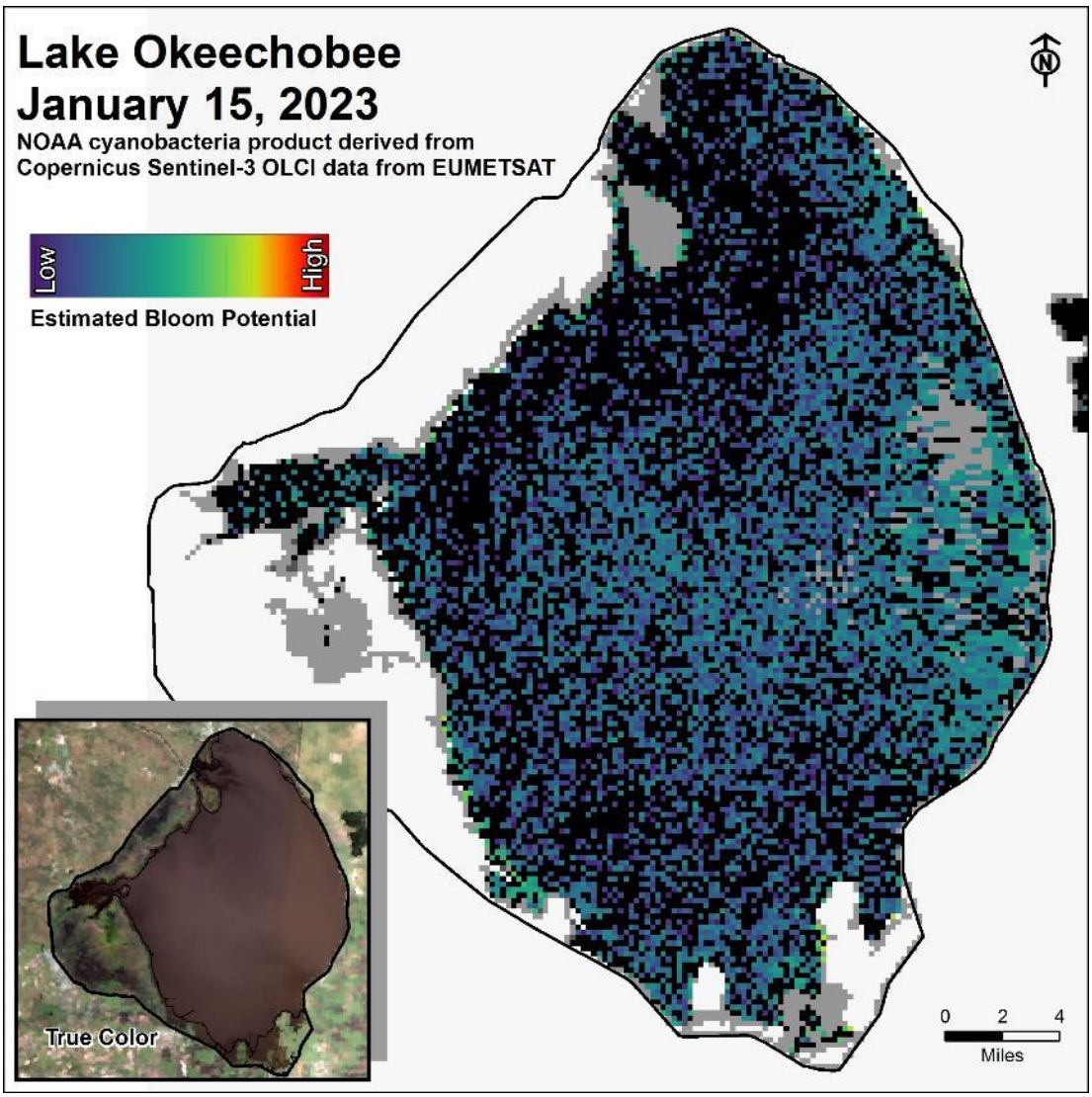
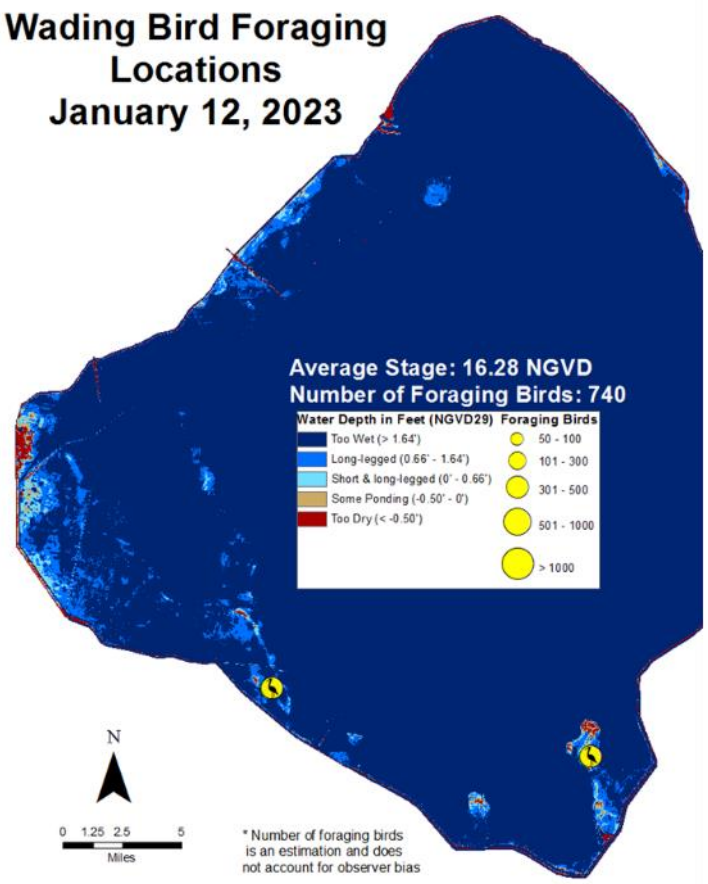


Figure LO-6. Cyanobacteria bloom potential on January 15, 2023, based on NOAA's harmful algal bloom monitoring system. Gray color indicates cloud cover.



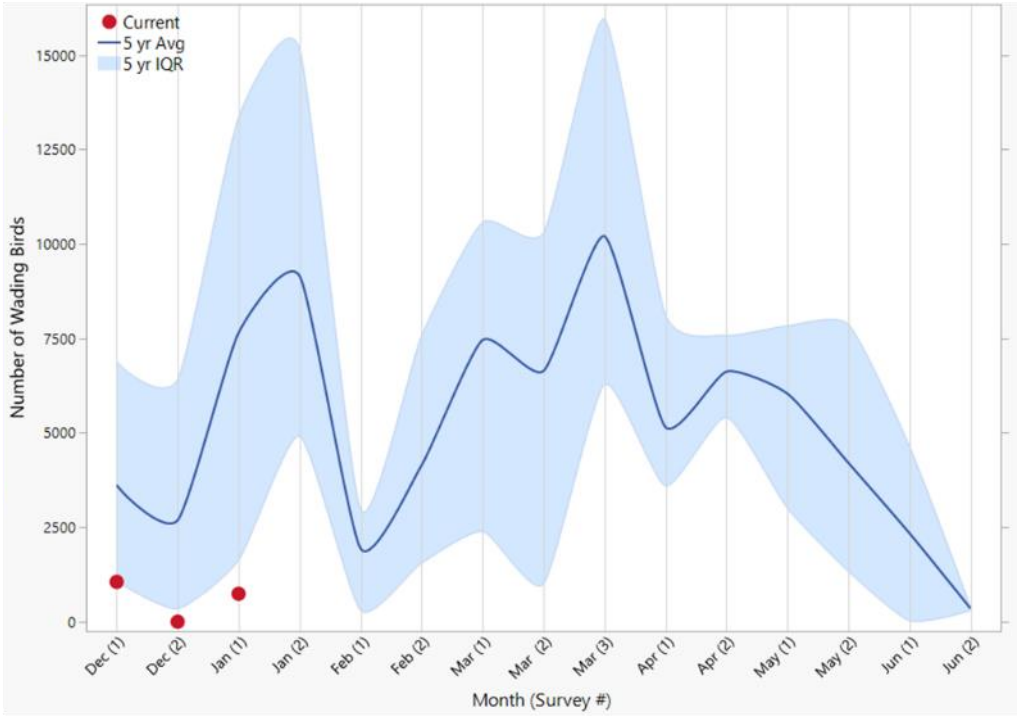


Figure LO-7. Results from the Wading Bird survey conducted on January 12, 2023. Image shows the location of flocks and the estimated total number of birds seen actively foraging on Lake Okeechobee. Graph compares the 2023 totals (red dots) to the interquartile range of the surveys from 2018-2022.

Estuaries

St. Lucie Estuary

Over the past week, mean total inflow to the St. Lucie Estuary was 138 cfs (**Figures ES-1** and **ES-2**) and the previous 30-day mean inflow was 335 cfs. For comparison, the historical provisional mean inflows from the contributing areas are shown in **Figure ES-2**.

Over the past week, salinities increased at all sites within 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 19.5. 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 0.5 spat/shell for December (**Figure ES-5**).

Caloosahatchee River Estuary

Over the past week, mean total inflow to the Caloosahatchee River Estuary was 1,975 cfs (**Figures ES-6** and **ES-7**) and the previous 30-day mean inflow was 2,118 cfs. For comparison, the historical provisional mean inflows from the contributing areas are shown in **Figure ES-7**.

Over the past week, surface salinities decreased at all sites within 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 Shell Point, and in the stressed range at 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, 2013[1]) coupled with a linear reservoir model for the tidal basin. Model scenarios included pulse releases at S-79 ranging from 0 to 1500 cfs, and a steady release at 2,000 cfs with estimated tidal basin inflows of 99 cfs. Model results from all scenarios predict daily salinity to be 1.0 or lower and the 30-day moving average surface salinity to be 0.4 or lower at Val I-75 at the end of the two-week period (**Table ES-3** and **Figure ES-11**). 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 January 11, 2023, that *Karenia brevis*, the Florida red tide dinoflagellate, was observed at bloom concentrations in two samples collected from Charlotte, Collier, and Monroe counties over the past week. On the east coast, red tide was not observed in any samples collected.

Water Management Recommendations

Lake stage is in the Intermediate Sub-Band. Tributary conditions are normal. The LORS2008 release guidance suggests up to 4,000 cfs release at S-77 to the Caloosahatchee River Estuary and up to 1,800 cfs release at S-80 to the St. Lucie Estuary.

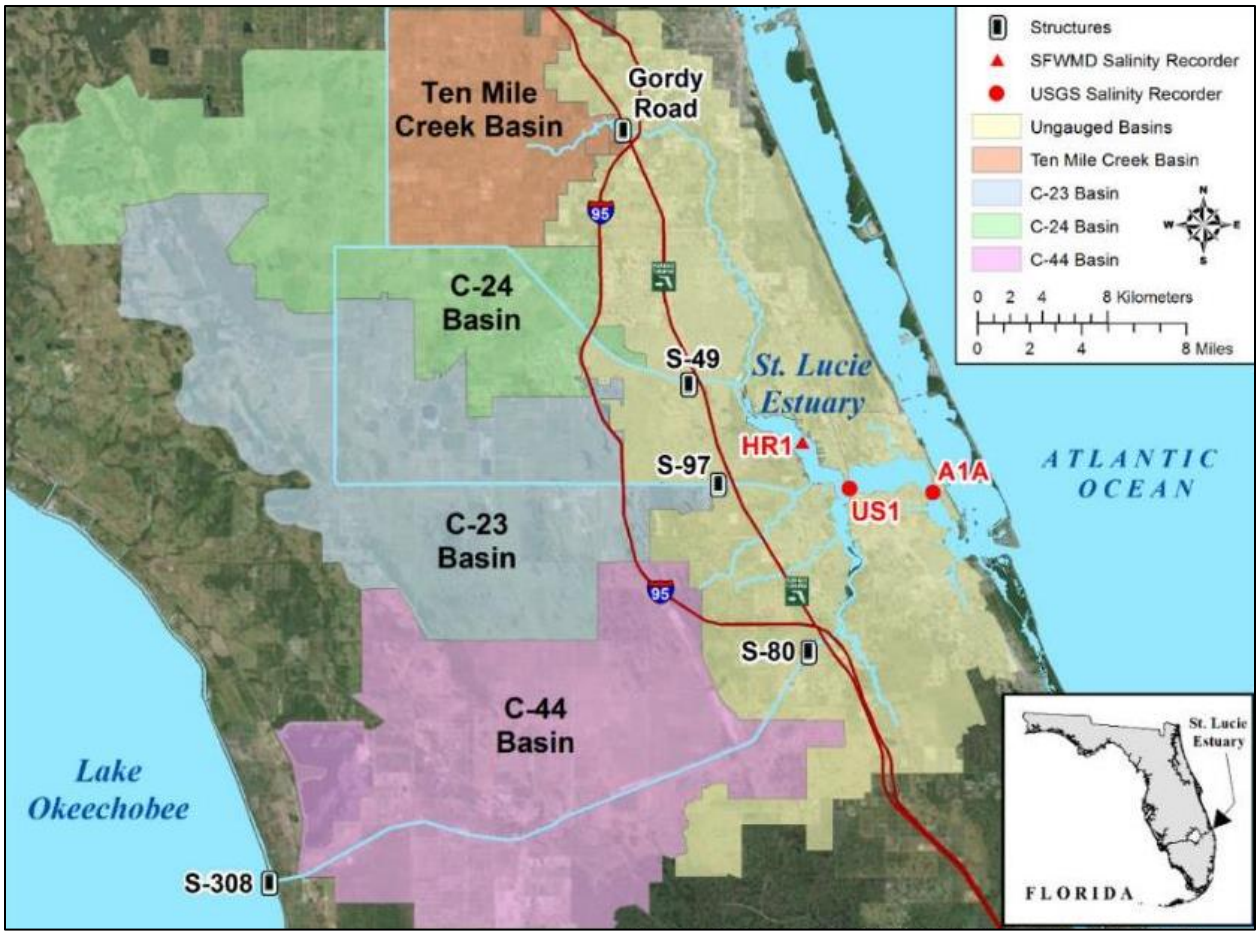


Figure ES-1. Basins, water control structures and salinity monitoring sites in the St. Lucie Estuary.

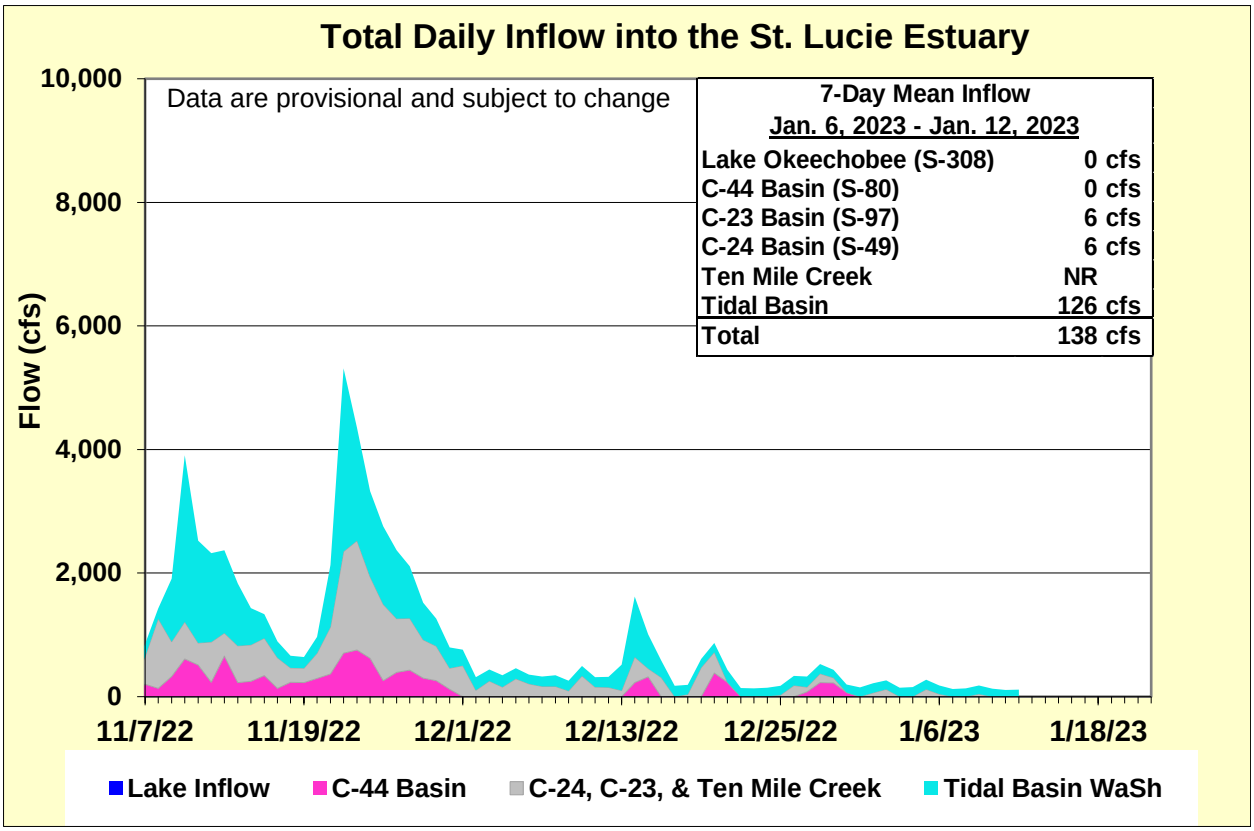


Figure ES-2. Total daily inflows from Lake Okeechobee and runoff from the C-44, C-23, C-24, Ten Mile Creek, and Tidal Basins into the St. Lucie Estuary.

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)	**13.6** (11.8)	**16.3** (14.4)	10.0 – 25.0
US1 Bridge	**18.6** (16.0)	**20.4** (17.1)	10.0 – 25.0
A1A Bridge	**26.4** (23.7)	**29.0** (26.3)	10.0 – 25.0

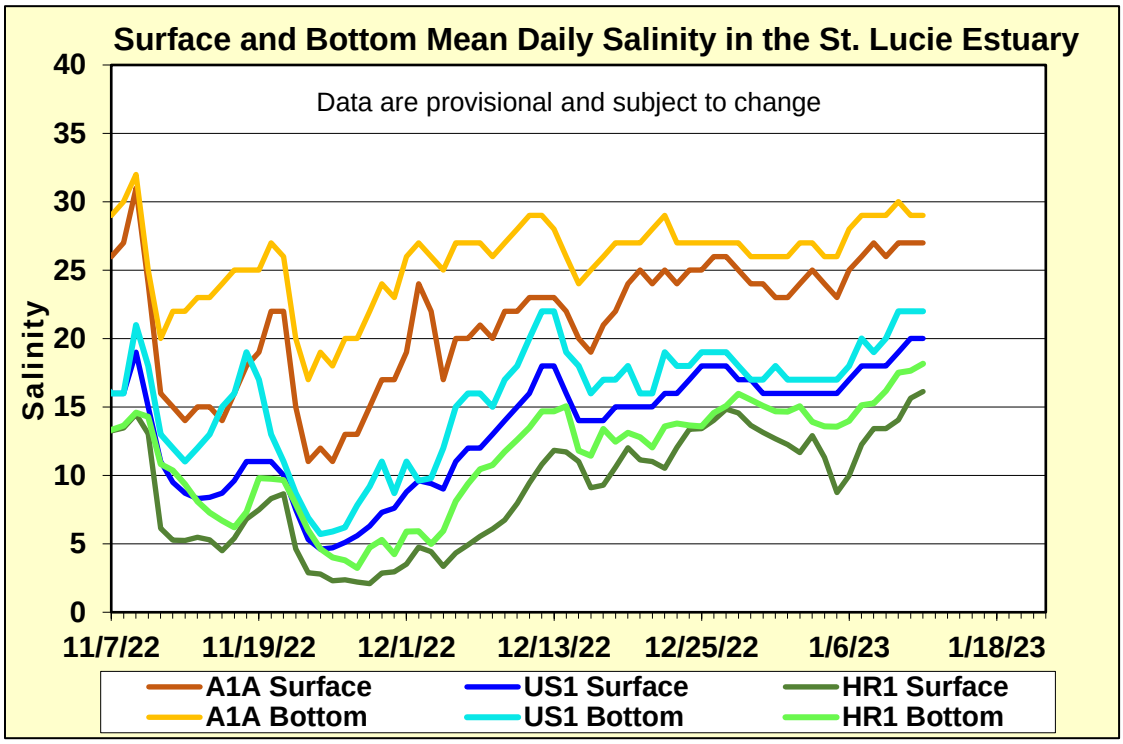


Figure ES-3. Mean daily salinity at the A1A, US1 and HR1 sites in the St. Lucie Estuary.

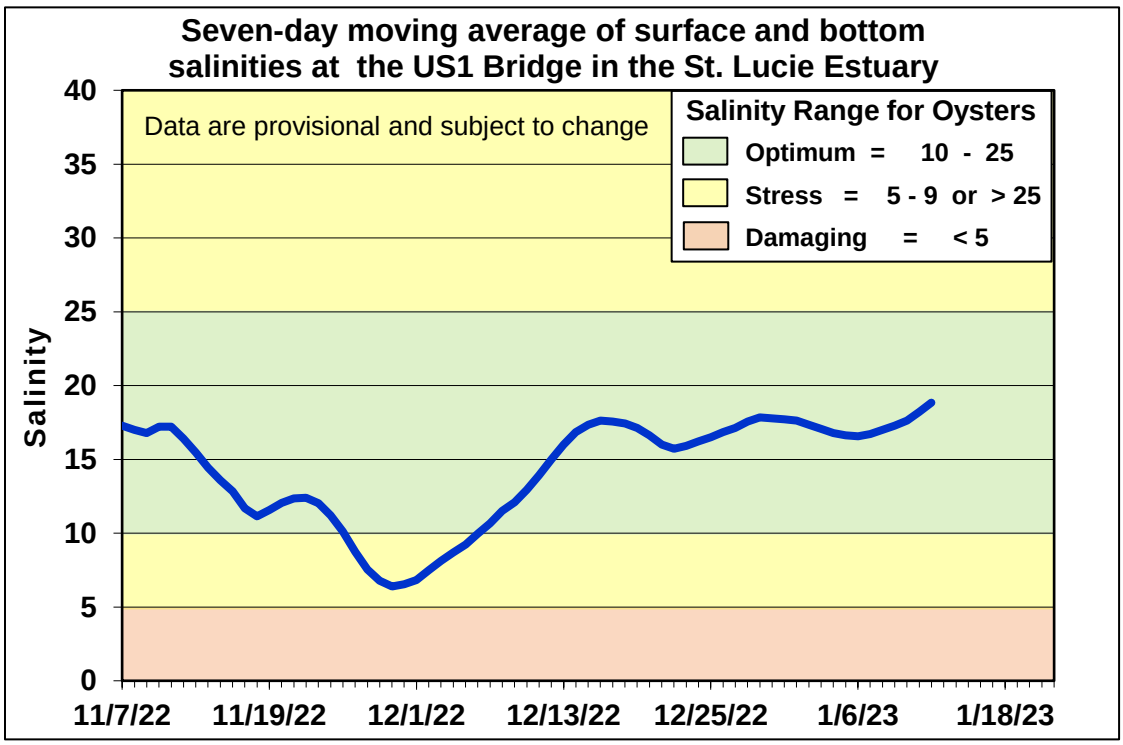


Figure ES-4. Seven-day moving average of the surface and bottom salinities at the US1 Bridge in the St. Lucie Estuary.

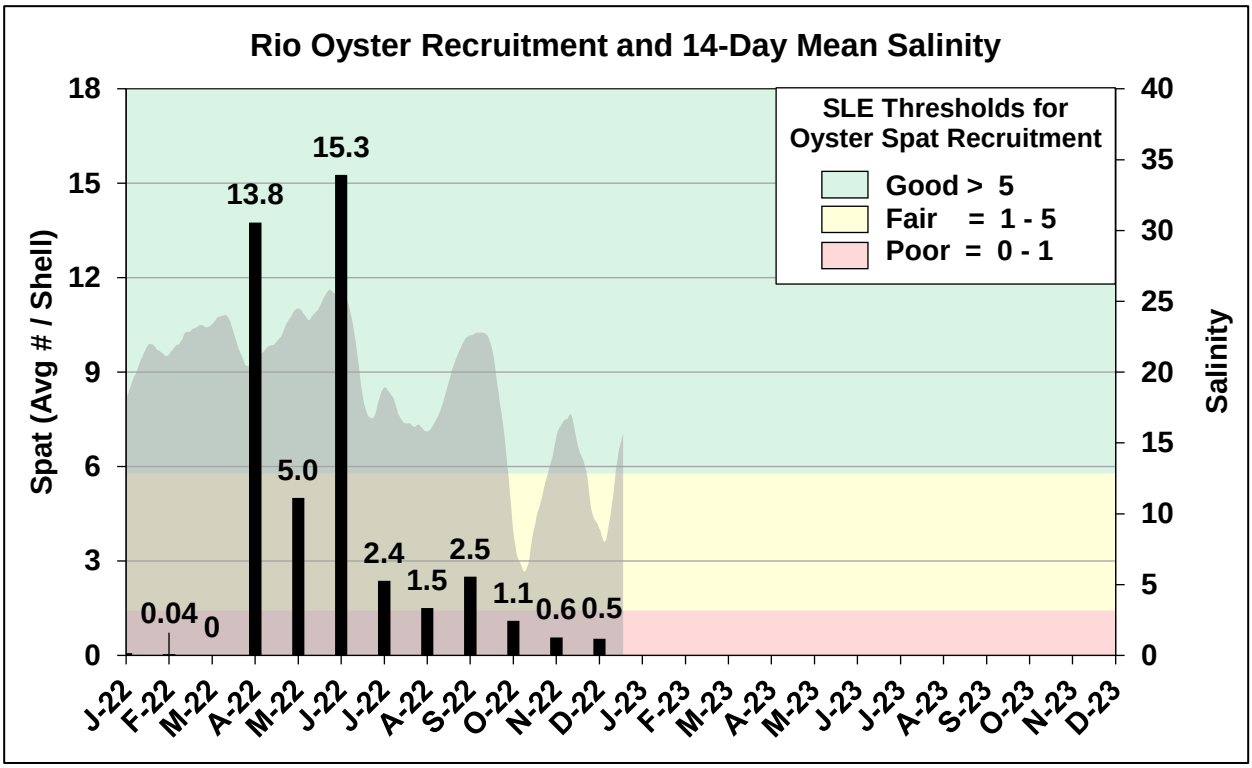


Figure ES-5. Mean oyster recruitment at the Rio oyster monitoring station and 14-day mean salinity at US1 Bridge.

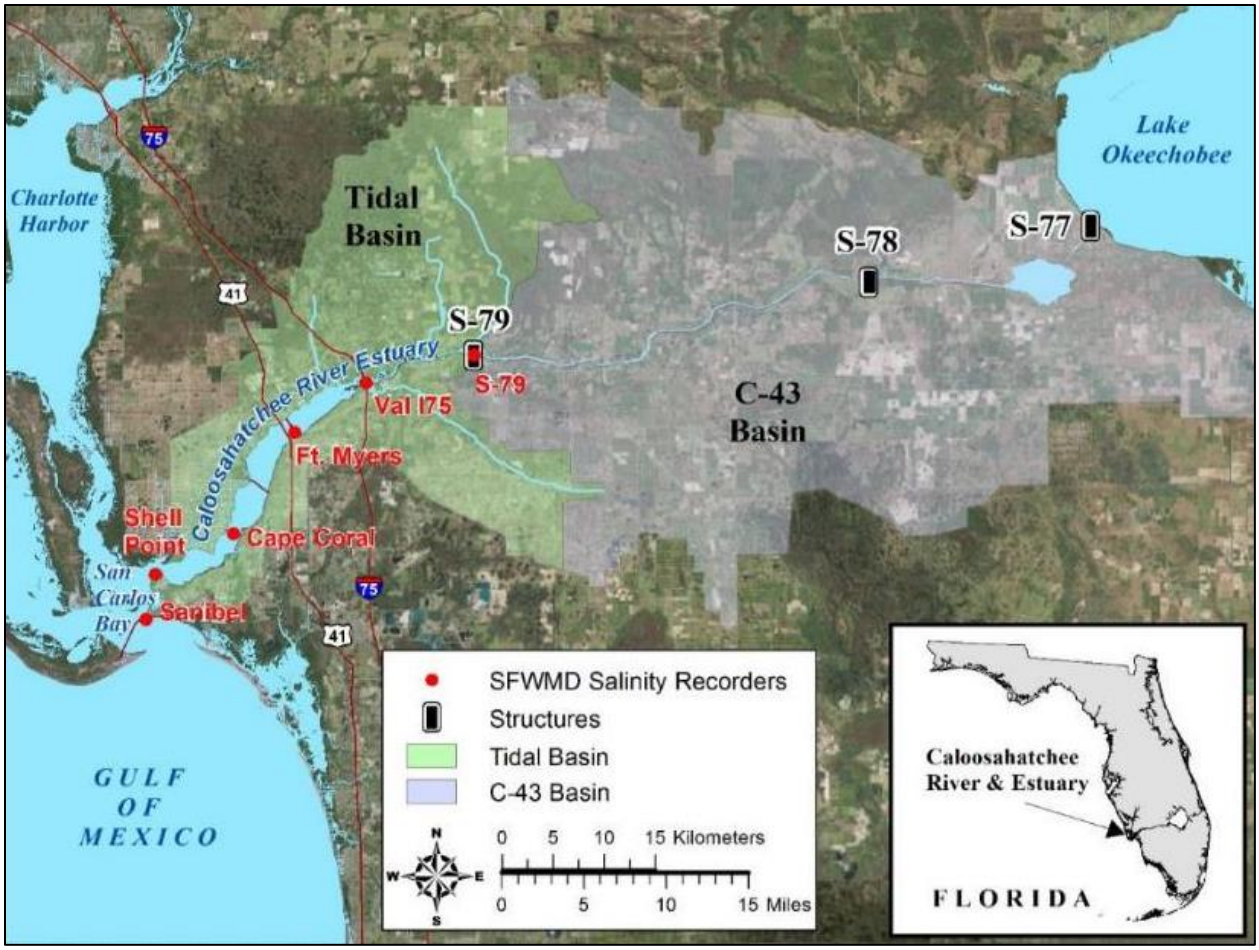


Figure ES-6. Basins, water control structures and salinity monitoring sites in the Caloosahatchee River Estuary.

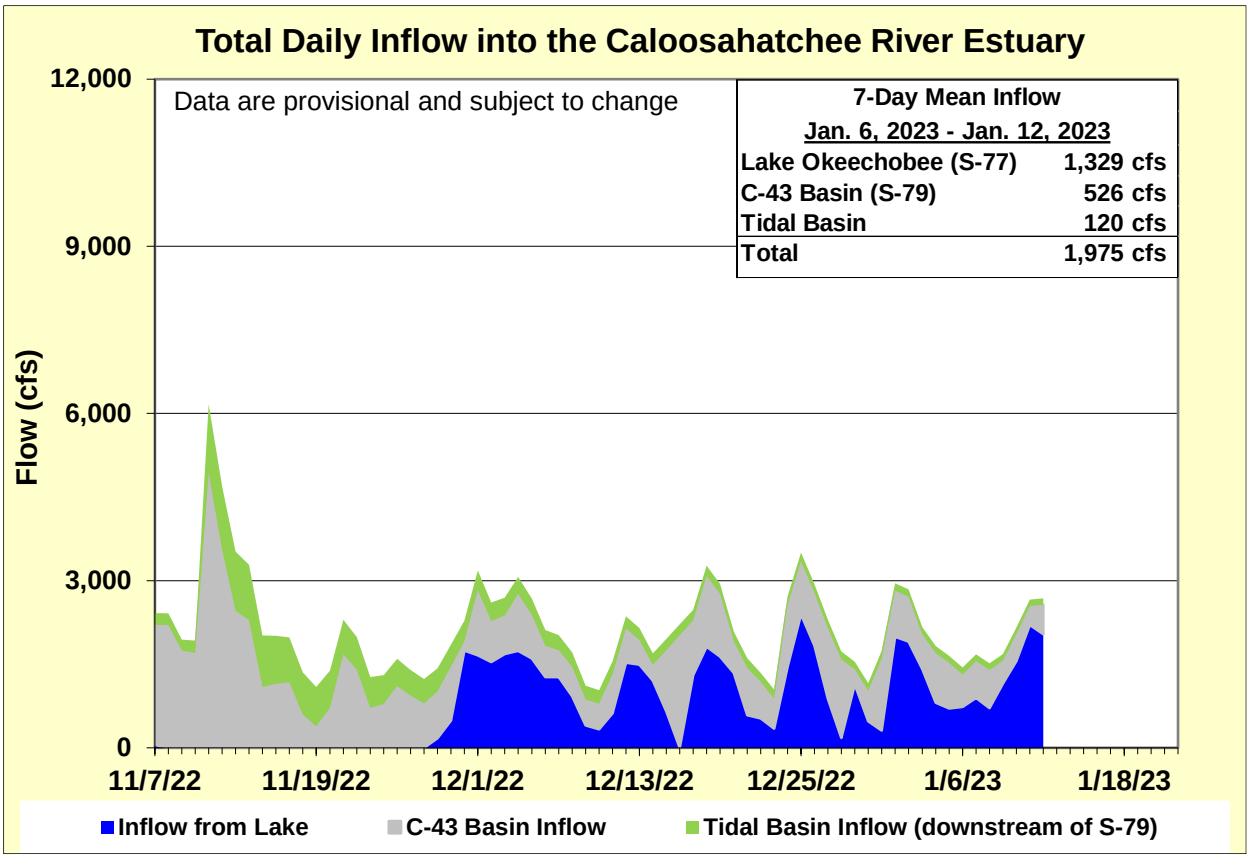


Figure ES-7. Total daily inflows from Lake Okeechobee, and runoff from the C-43 and Tidal basins into the Caloosahatchee River Estuary.

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** (0.4)	**0.2** (0.4)	0.0 – 10.0
Val I-75	**0.4** (0.5)	**0.4** (1.0)	0.0 – 10.0
Fort Myers Yacht Basin	**5.0** (5.9)	**7.4** (6.3)	0.0 – 10.0
Cape Coral	**11.0** (11.4)	**13.1** (12.4)	10.0 – 25.0
Shell Point	**23.8** (25.8)	**24.6** (26.3)	10.0 – 25.0
Sanibel	**29.0** (34.9)	**28.6** (32.4)	10.0 – 25.0

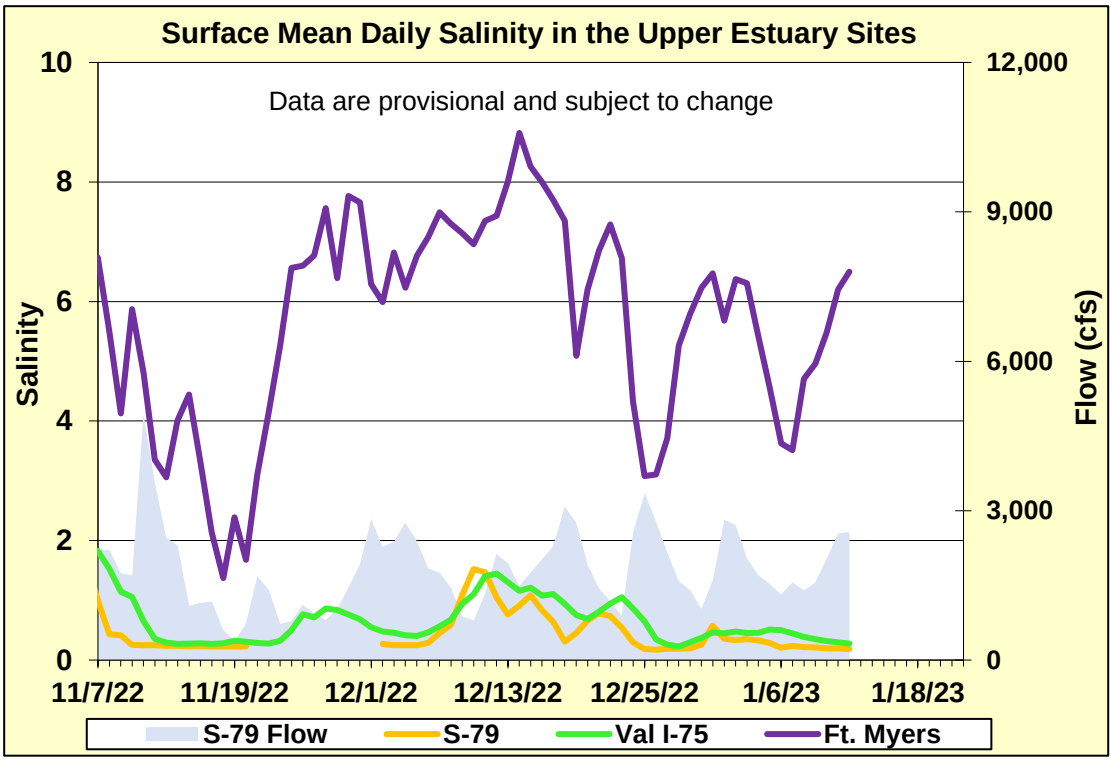


Figure ES-8. Mean daily salinity at upper Caloosahatchee River Estuary monitoring sites and mean daily flow at S-79.

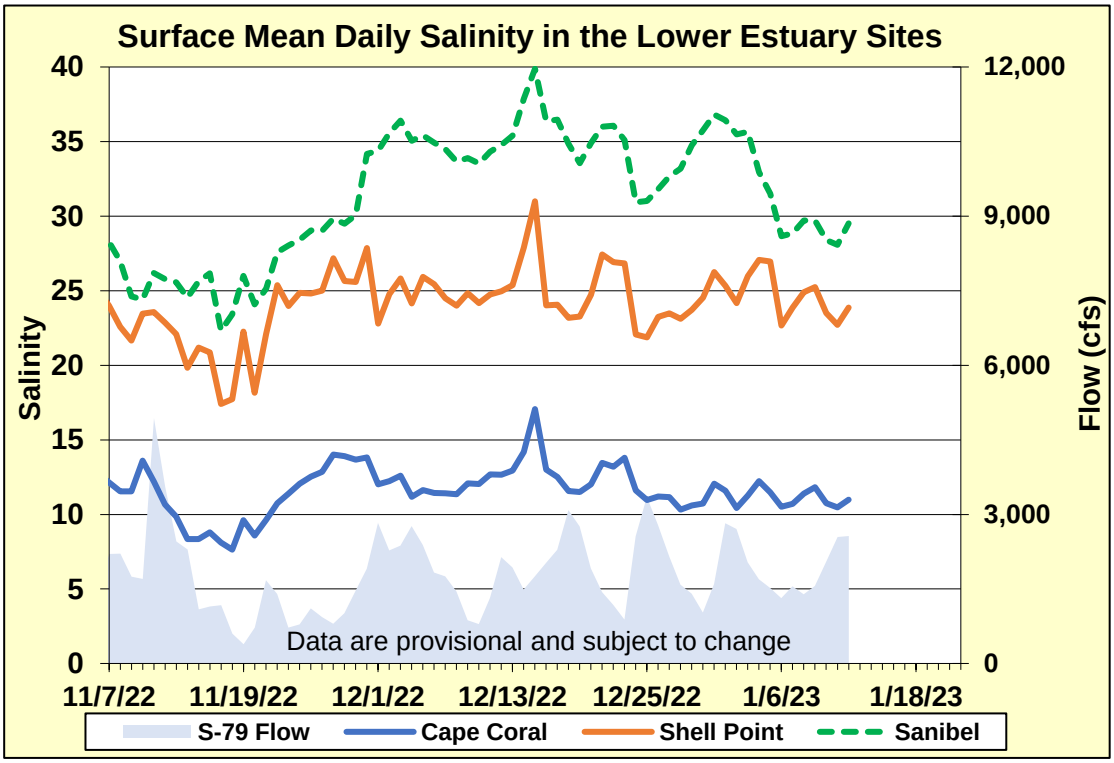


Figure ES-9. Mean daily surface salinity at lower Caloosahatchee River Estuary monitoring sites and mean daily flow at S-79.

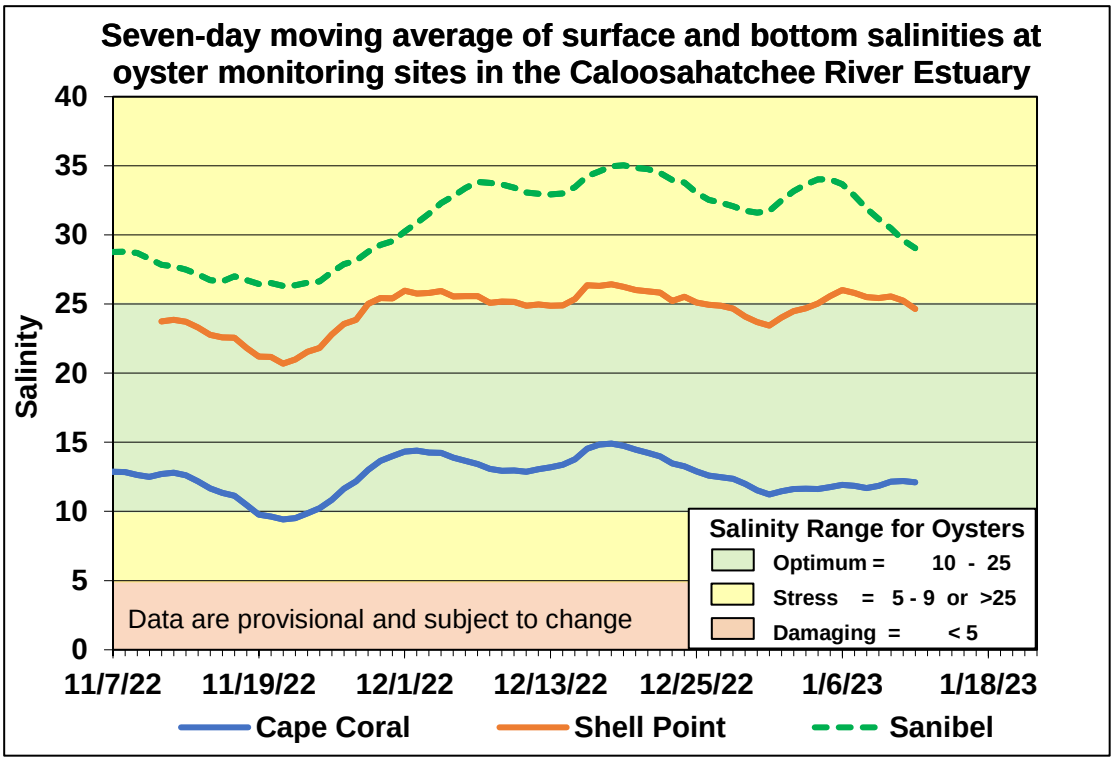


Figure ES-10. Seven-day moving average of surface and bottom salinities at Cape Coral, Shell Point and Sanibel monitoring sites in the Caloosahatchee River Estuary.

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	99	1.0	0.4
B	450	99	0.5	0.4
C	750	99	0.3	0.4
D	1000	99	0.3	0.4
E	1500	99	0.3	0.4
F	2000	99	0.3	0.4

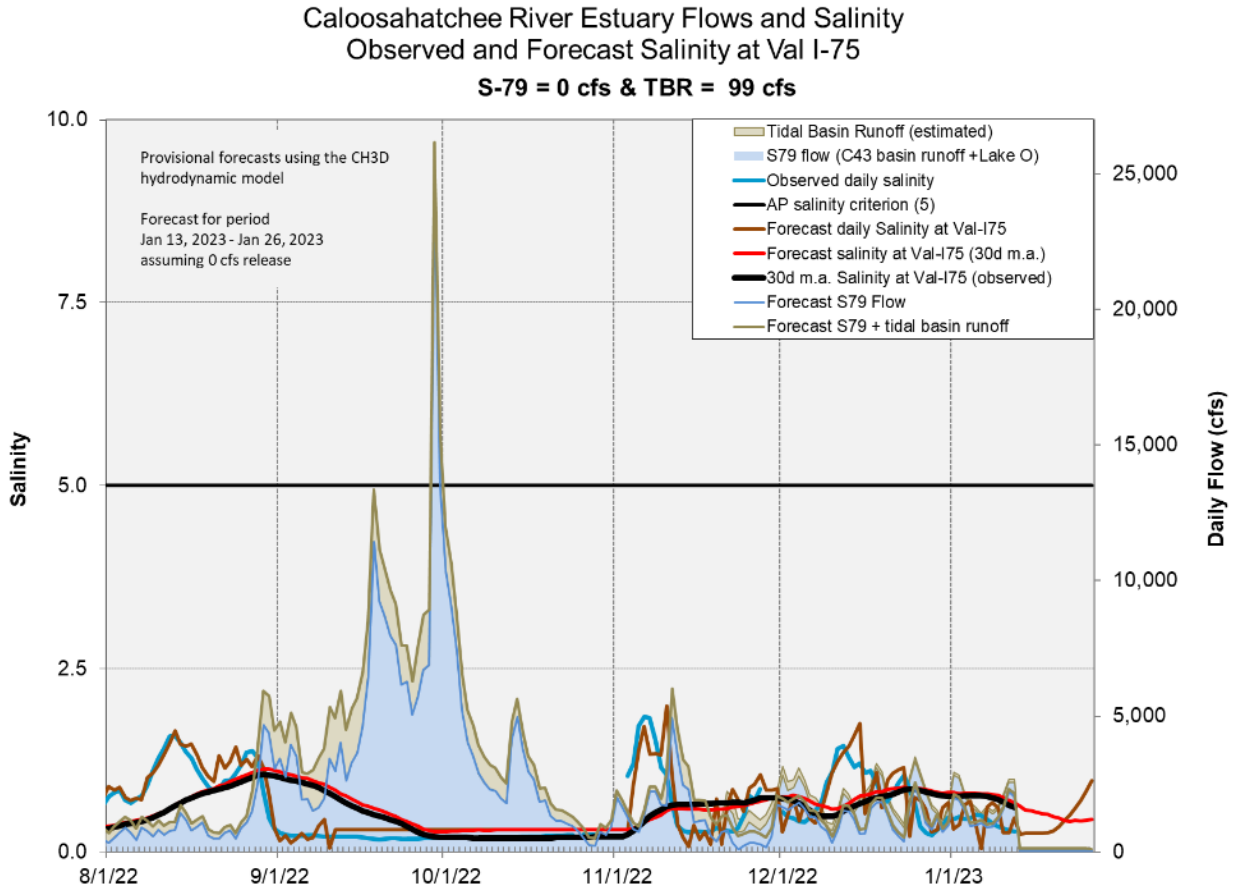


Figure ES-13. Forecasted Val I-75 site surface salinity assuming no pulse release at S-79.

Stormwater Treatment Areas

STA-1E: STA-1E 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 rates (PLRs) are high for the Eastern and Central Flow-way (**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/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 construction activities. 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/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. Online treatment cells are at or near 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 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/m^2/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.

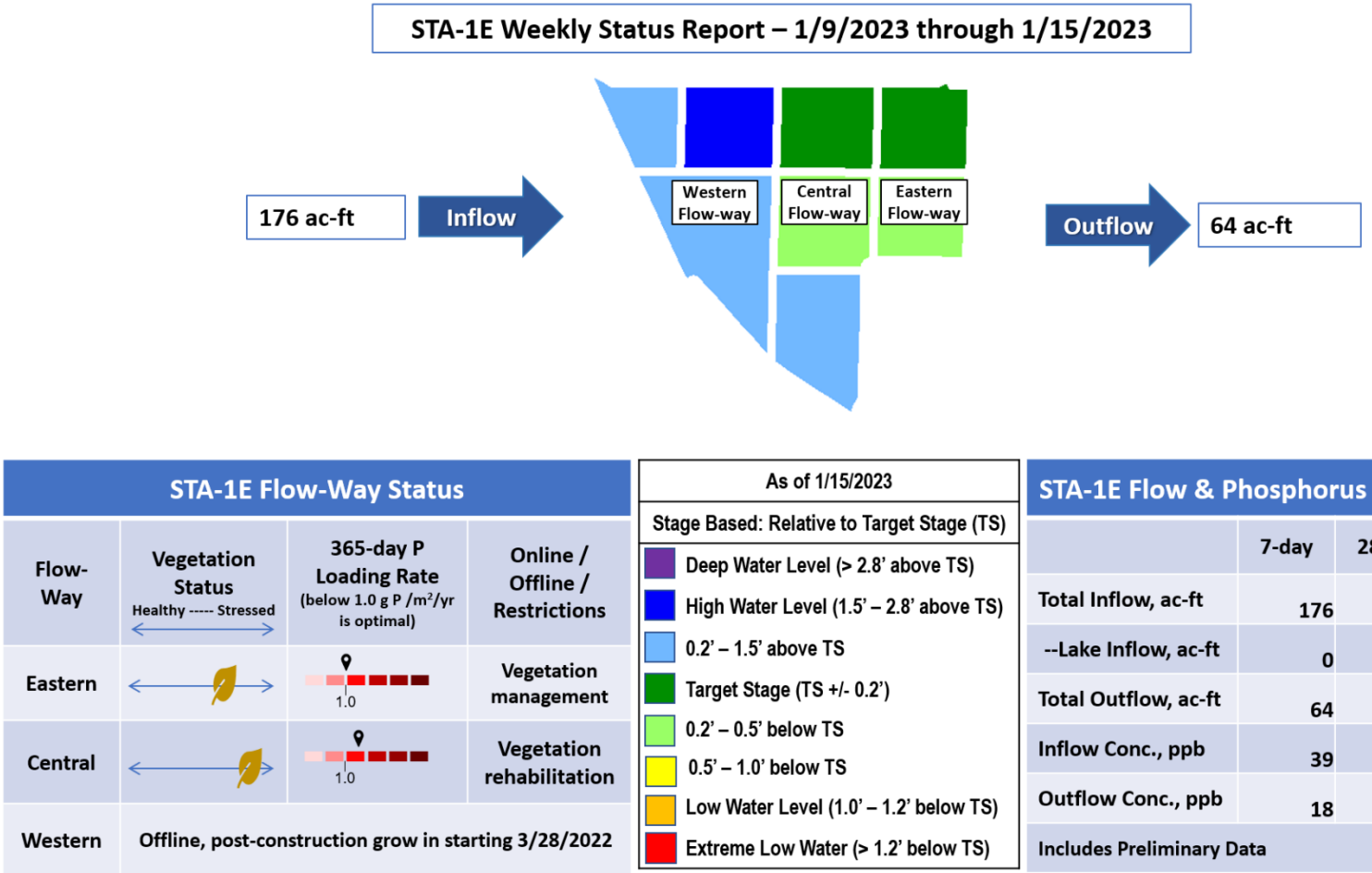


Figure S-1. STA-1E Weekly Status Report

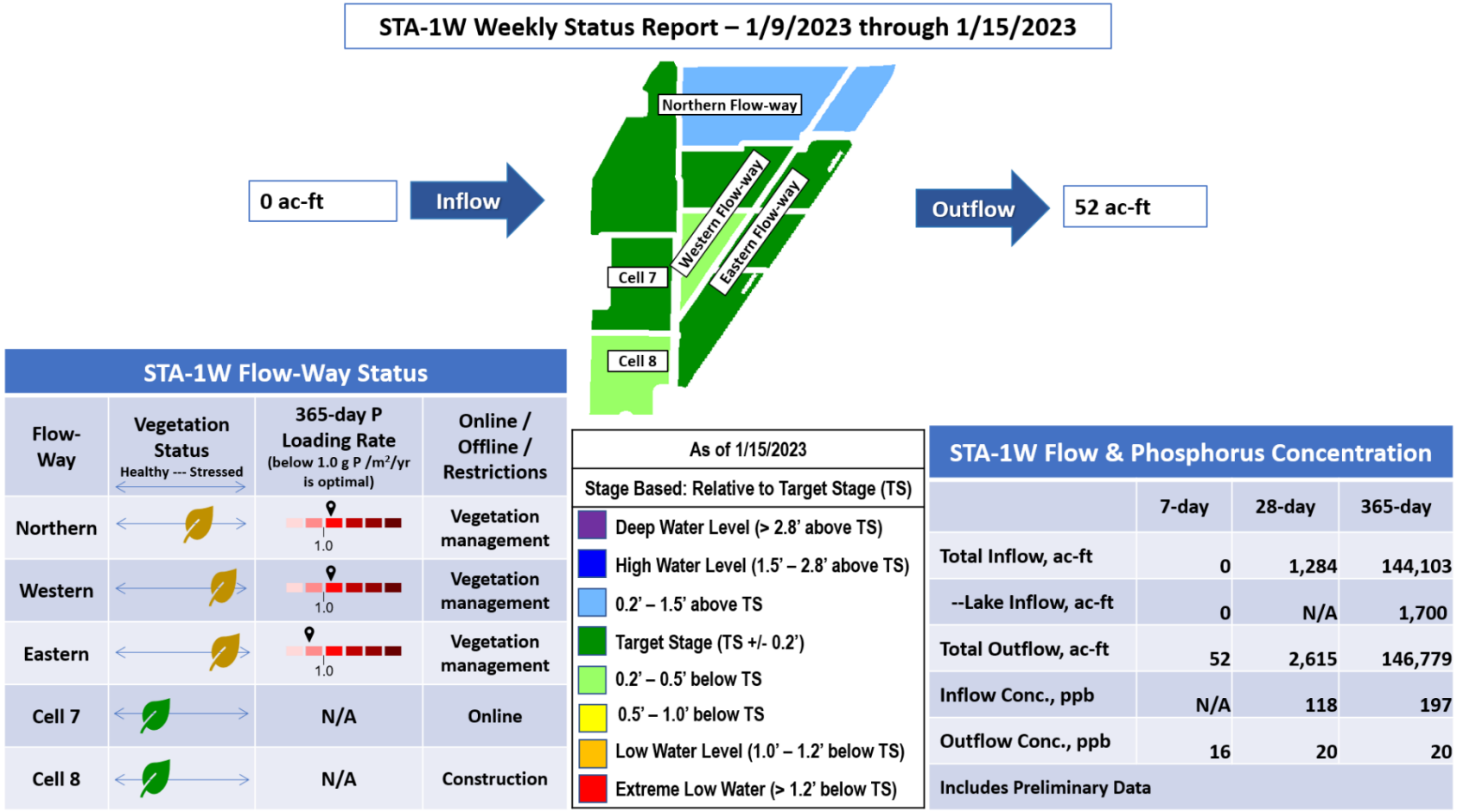


Figure S-2. STA-1W Weekly Status Report

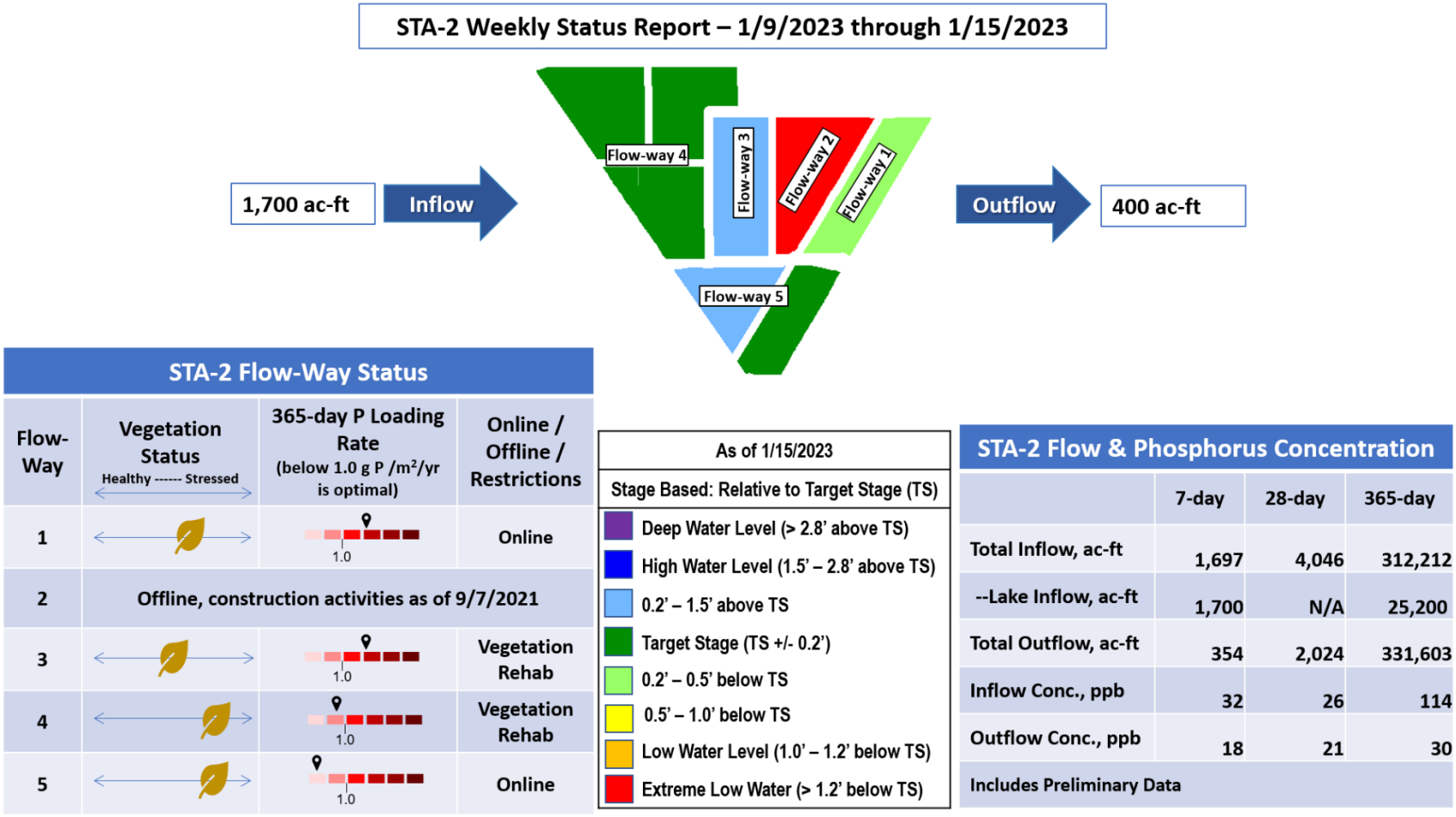
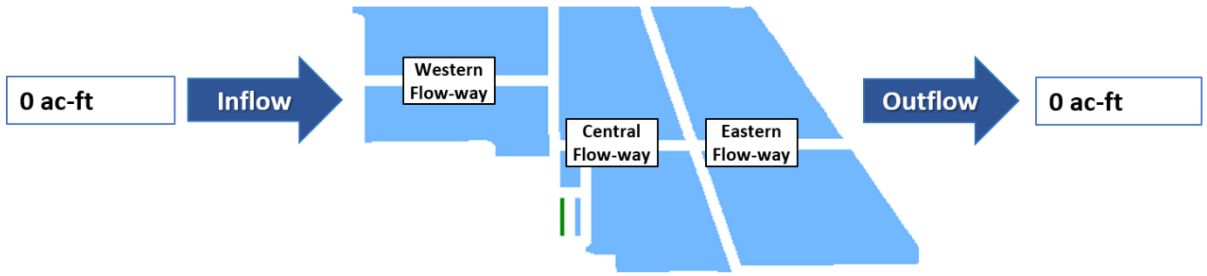


Figure S-3. STA-2 Weekly Status Report

STA-3/4 Weekly Status Report – 1/9/2023 through 1/15/2023



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 1/15/2023
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	0	20	299,714
--Lake Inflow, ac-ft	0	N/A	4,300
Total Outflow, ac-ft	0	0	293,992
Inflow Conc., ppb	N/A	71	93
Outflow Conc., ppb	N/A	N/A	16
Includes Preliminary Data			

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

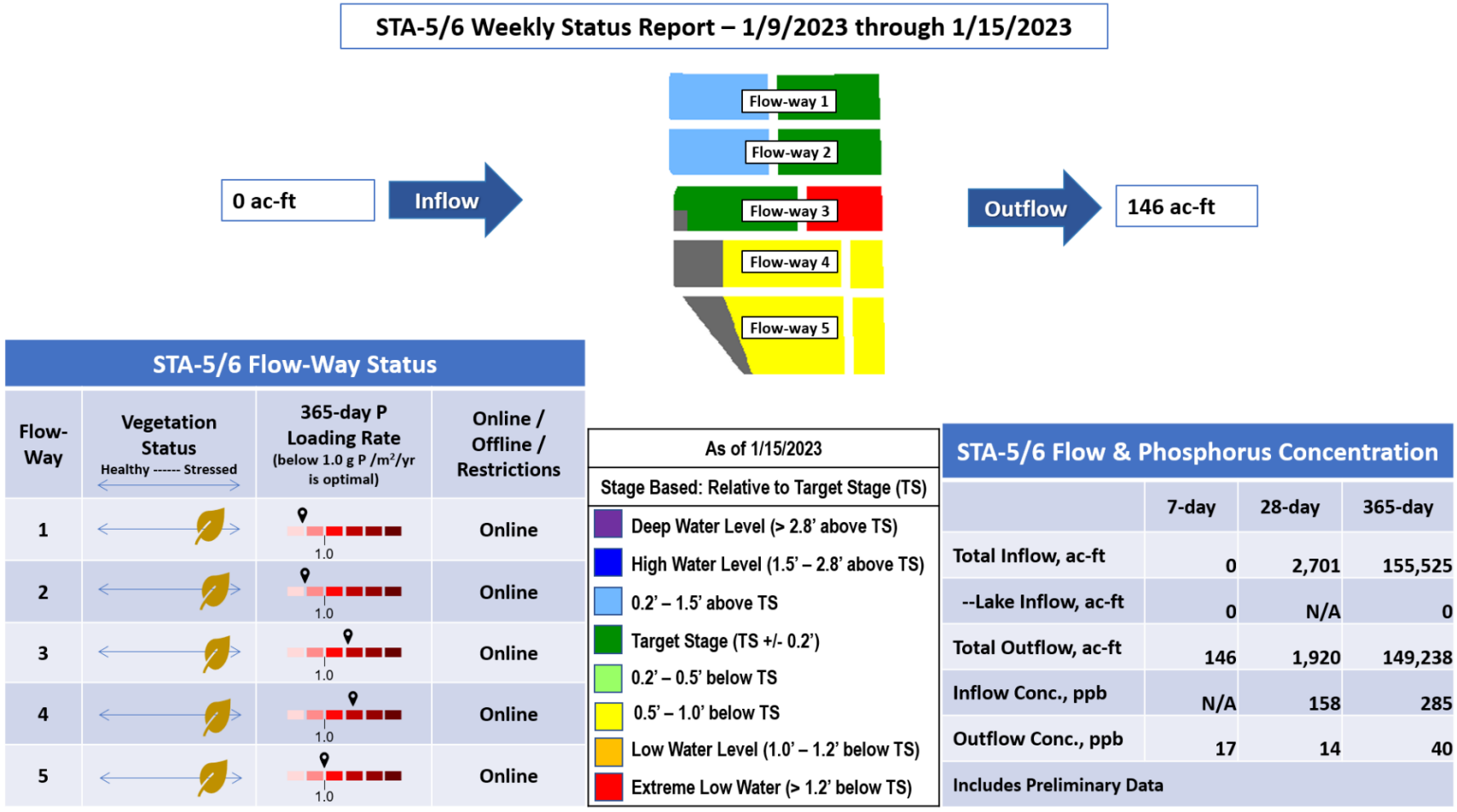
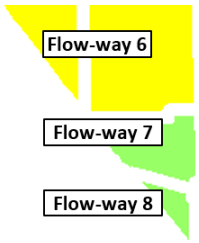


Figure S-5. STA-5/6 Weekly Status Report (Flow-ways 1 – 5)

STA-5/6 Weekly Status Report – 1/9/2023 through 1/15/2023



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 1/15/2023
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

WCA-1: Stage at the 1-8C receded over the week in parallel with schedule. The average on Monday was 0.17 feet above the falling Zone A1 regulation line. WCA-2A: Stage recession at the 2-17 gauge increased again and continues to fall faster than the slope of the regulation line. The average on Monday was 0.92 feet above the falling regulation line. WCA-3A: Over the last week the Three Gauge Average stage continues to recede faster than the slope of the regulation line. The average stage was 0.45 feet below the falling regulation line on Monday. WCA-3A North: At gauge 62 (Northwest corner) stage continued a recession that is falling faster than the slope of the Upper schedule line, the average on Monday was 0.79 feet below. (**Figures EV-1** through **EV-4**).

Water Depths

The SFWDAT tool illustrates current stages in the EPA are falling in most of the major basins; with NESRS, southern WCA-1 and the upper reaches of the L-67s retaining stage. WCA-3A continues to dry down from the northwest to the southeast. There is an expansion in extent for areas with the potential for stages to have moved to ground surface in the headwaters of the Miami Canal and in northern WCA-2A. Connectivity in the sloughs of ENP remains but is diminishing in the west. Comparing current WDAT water depths to one month ago conditions within the EPA are generally shallower with southern WCA-2A and downstream of the S-11s in WCA-3A significantly so. Looking back a year ago, most of WCA-3A and western ENP is slightly deeper; significantly deeper in the extreme northeast of WCA-3A, and northwestern ENP (**Figure EV-5 and Figure EV-6)**. Comparing current conditions to the 20-year average on January 16: Conditions are above average in northeastern WCA-3A and below in the southeastern WCA-3A; significantly above average in WCA-3B, northeastern SRS and portions of WCA-1 (**Figure EV-7**).

Taylor Slough and Florida Bay

Taylor Slough and Florida Bay received an average of 0.05 inches of total rain over the past week (Monday-Sunday) based on the 18 gauges used in this report. Stations received little rain, ranging from 0 inches at three stations to a maximum of 0.29 at Garfield Bight (GB) in the western nearshore. Taylor Slough stage changes ranged from decreases of −0.65 feet to −0.08 feet (**Figure EV-8 and Figure EV-9**). Taylor Slough water levels remain above the historical average for this time of year by +5.5 inches compared to before the Florida Bay initiative (starting in 2017), a decrease of −0.5 inches from last week.

Average Florida Bay salinity was 25.3, a decrease of −0.5 from last week. Salinity changes ranged from a decrease of −5.7 in Garfield Bight (GB) in the western nearshore to an increase of +2.3 in Joe Bay (JB) in the eastern nearshore region (**Figure EV-8**). This corresponded with mostly east to northwest winds and positive flows in the central and western creeks. As of 1/15, salinities are below the IQR in the Western Bay, within the IQR in the Central Bay, and just above the IQR in the East (**Figure EV-10**). As a

whole, Florida Bay salinity is −1.4 below its historical average for this time of year, down −1.6 from last week.

Water Management Recommendations

We recommend continuing discussion and the utilization of strategies that prevent further degradation of WCA3A North. Conserving water in this region will most likely prove critical for the upcoming wading bird nesting season. Optimizing the volume of water currently available to be discharged into the northern perimeter of WCA-3A will benefit the ecology of that region as conditions transition to a dry season predicted to be drier than average. Maintaining a moderate rate of stage change within the marshes of WCAs, 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	0.07	−0.09
WCA-2A	0.08	−0.16
WCA-2B	0.12	+0.03
WCA-3A	0.08	−0.13
WCA-3B	0.03	−0.11
ENP	0.05	−0.06

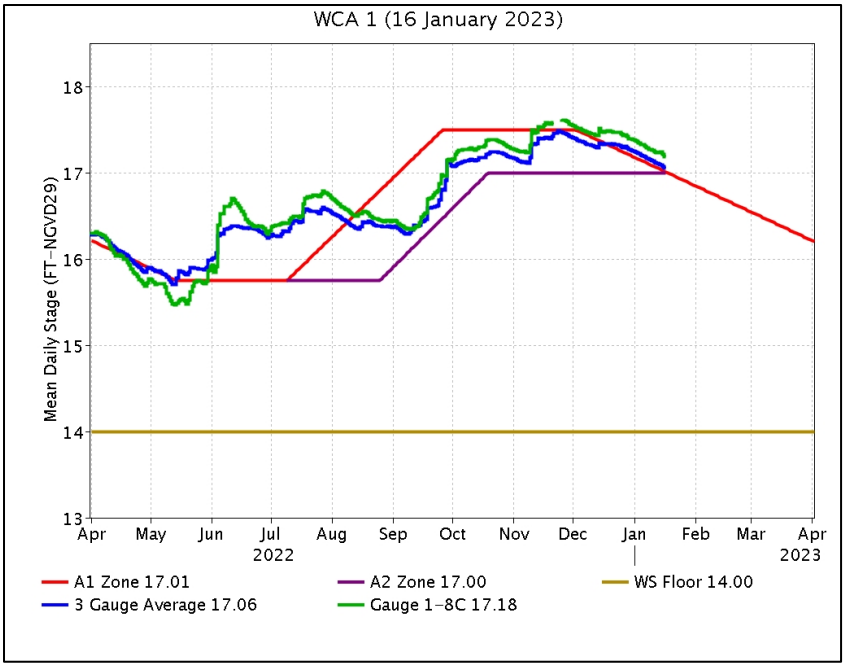


Figure EV-1. WCA-1 stage hydrographs and regulation schedule.

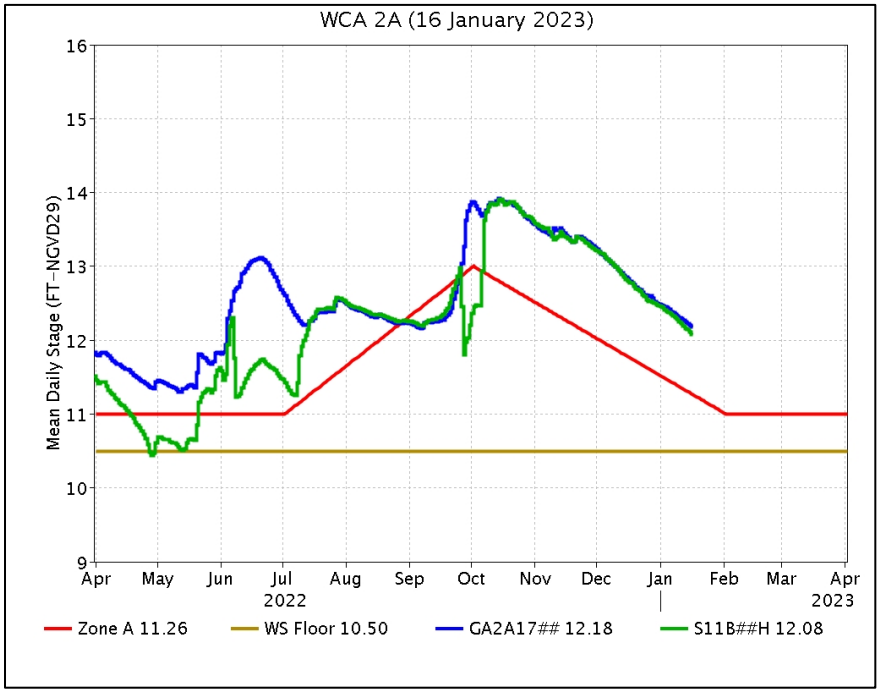


Figure EV-2. WCA-2A stage hydrographs and regulation schedule.

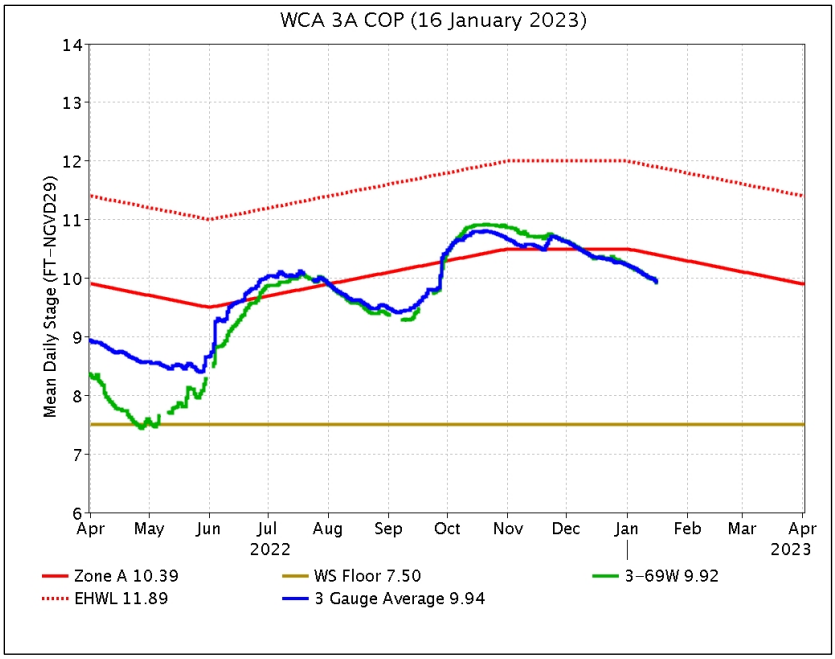


Figure EV-3. WCA-3A stage hydrographs (three-gauge average, S-333 headwater) and regulation schedule.

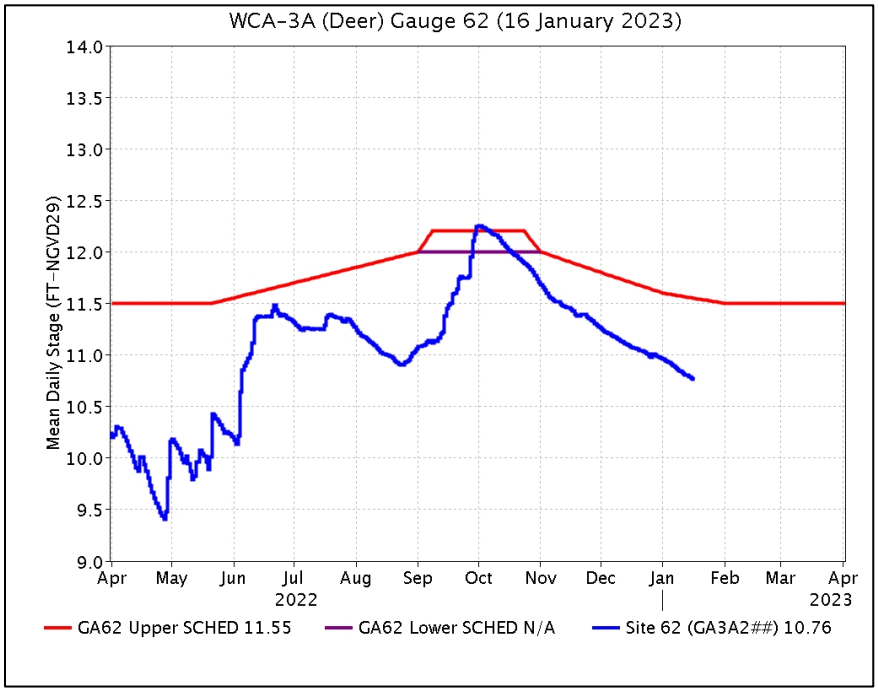


Figure EV-4. WCA-3A stage hydrograph (Deer gauge; Site 62) and CA62 regulation schedule.

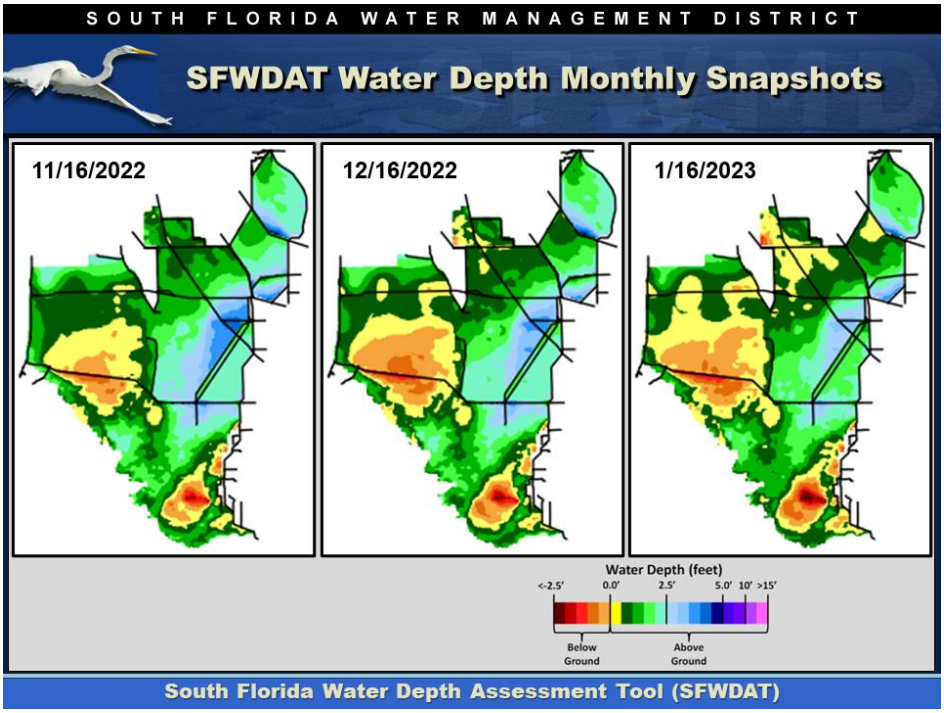


Figure EV-5. Everglades water depths from two months ago (left), one month ago (center) and present (right), based on SFWDAT.

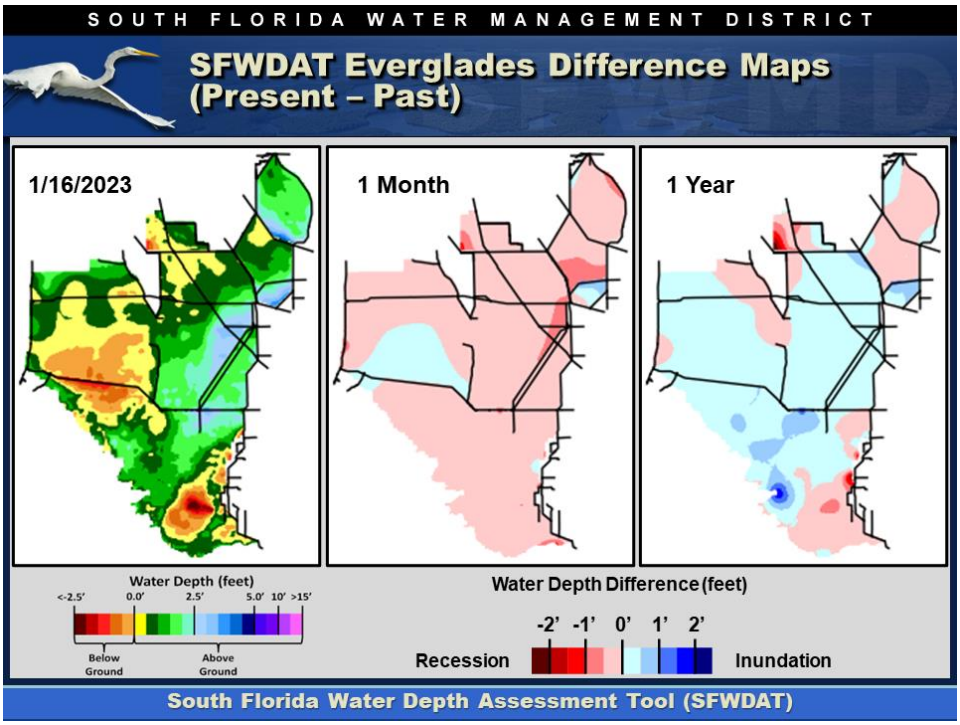


Figure EV-6. Present Everglades water depths (left) and water depth changes from one month (center) and one year (right) ago, based on SFWDAT.

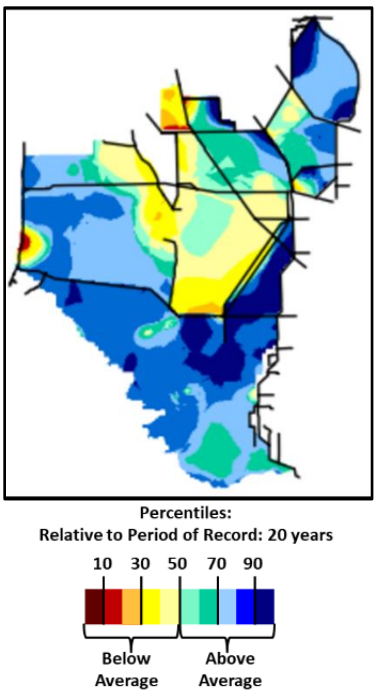


Figure EV-7. Present water depths (1/16/2023) compared to the day of year average over the previous 20 years.

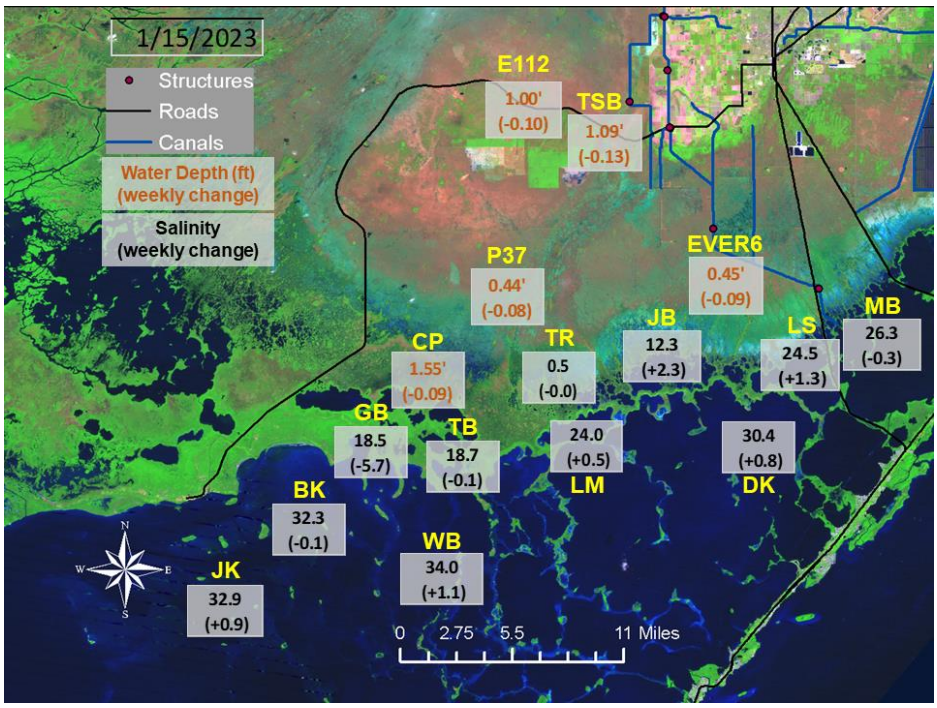


Figure EV-8. Taylor Slough water depths with changes since a week ago and Florida Bay salinities with changes since a week ago.

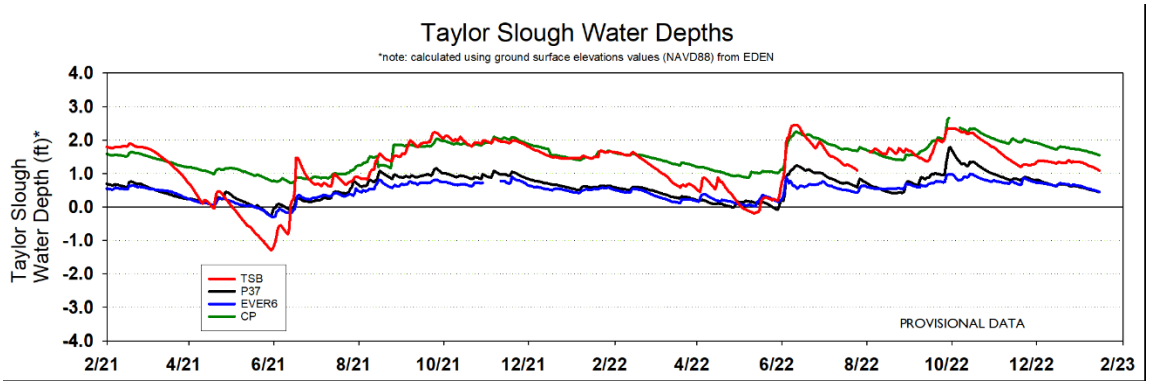


Figure EV-9. Taylor Slough water depth time series.

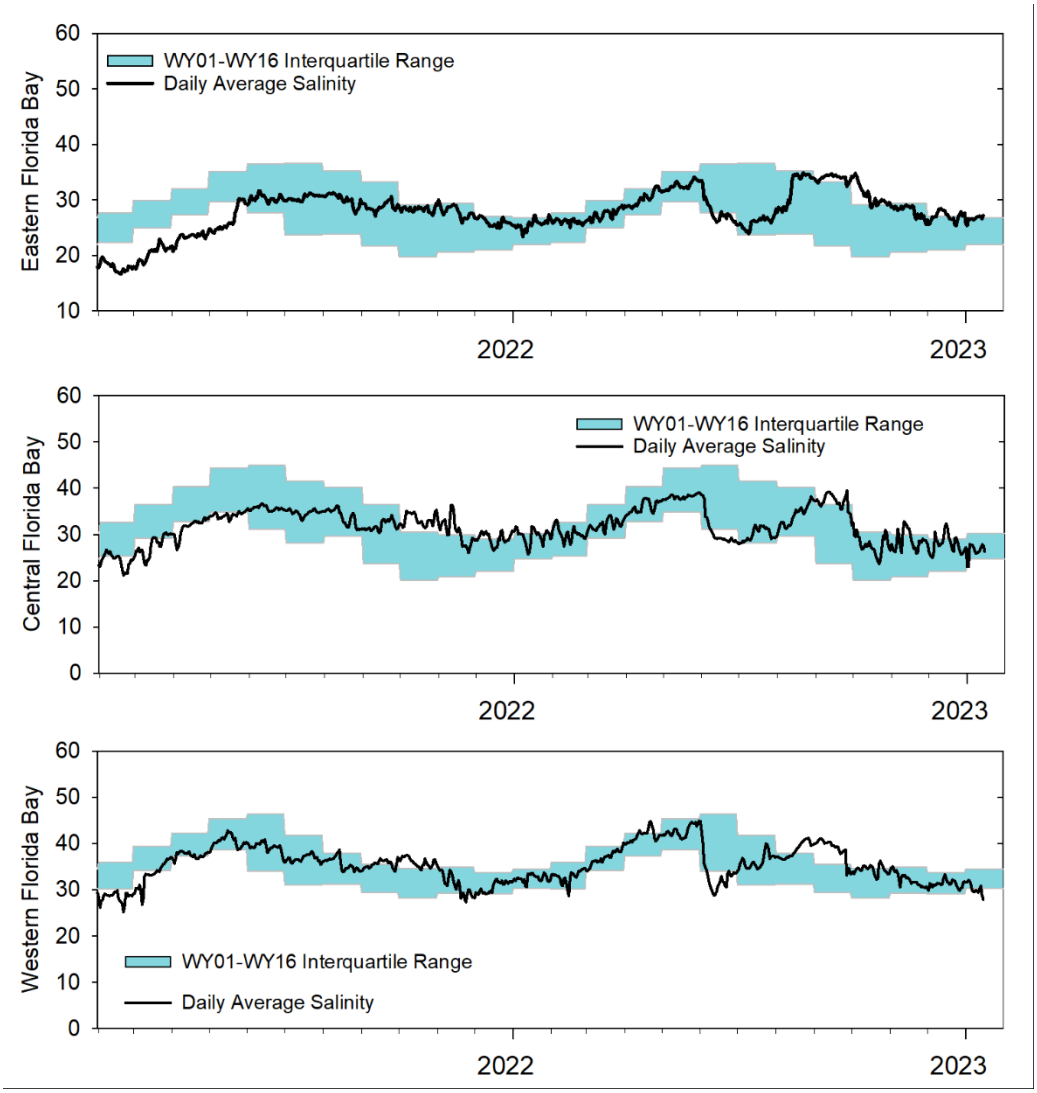


Figure EV-10. Eastern (top panel), Central (middle panel) and Western (bottom panel) Florida Bay daily average salinities with interquartile (25-75 percentile) ranges.

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

SFWMD Everglades Ecological Recommendations, January 17th 2023 (red is new)			
Area	Weekly change	Recommendation	Reasons
WCA-1	Stage decreased by 0.09'	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 0.16'	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 increased by 0.03'	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 0.17'	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 0.15'		
WCA-3B	Stage decreased by 0.11'	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 −0.65' to −0.08'	Move water southward as possible.	When available, provide freshwater buffer for downstream conditions.
FB- Salinity	Salinity changes ranged from −5.7" to +2.3"	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 427 cfs and the previous 30-day mean inflow was 616 cfs. The seven-day mean salinity was 25.5 at BBCW8 and 20.9 at BBCW10, both within the ideal salinity range for estuarine organisms in this region (salinity less than 35). Data provided by Biscayne National Park.

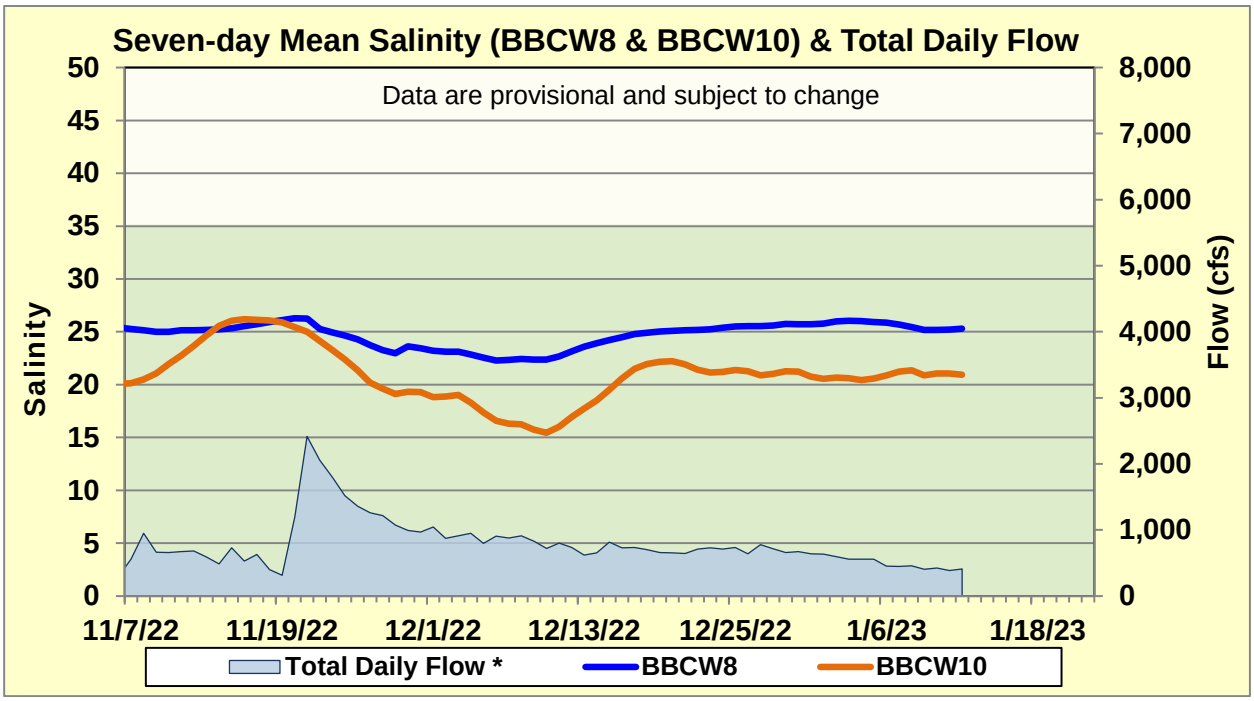


Figure BB-1. Seven-day mean salinity at BBCW8 and BBCW10 and total daily flow in Biscayne Bay. Total daily flow was calculated using flow from structures S20G, S20F, S21, S21A, S123, and S700P.