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: March 9, 2022

SUBJECT: Weekly Environmental Conditions for Systems Operations

Summary

Weather Conditions and Forecast

Afternoon thunderstorms are expected each day over the District when the maximum daytime temperatures are reached and when instability is at its highest. On Wednesday, afternoon showers are expected to initiate east/southeast of Lake Okeechobee, with most of the rainfall confined over the Upper Kissimmee. Thursday, afternoon thunderstorms are likely over areas east/southeast of Lake Okeechobee, while the Upper Kissimmee will likely receive higher rainfall amounts from a frontal disturbance that will not cross the District. Friday looks to be drier, but some scattered afternoon showers could occur east/southeast of Lake Okeechobee. Rainfall will be more widespread over the Upper Kissimmee as a strong frontal system approach. Saturday will begin mostly dry, but fast-moving thunderstorms will quickly enter the Upper Kissimmee and northern part of the District by the afternoon. As these thunderstorms move southeastward across the District, they will likely weaken, lowering rainfall totals over the southern part of the District. It is likely that the entire District will see some rainfall from this frontal passage, with the heaviest totals confined to the Upper Kissimmee. Temperatures and humidity will drop quickly after the frontal passage, with no rain expected at all on Sunday. Some light showers could occur along the east coast on Monday as the winds become more easterly and shallow moisture returns. Week 1 will feature slightly above average rainfall, while Week 2 will feature normal to slightly above average rainfall as well.

Kissimmee

Flow at S-65/S-65A is being reduced to allow for slow stage recessions on KCH and the Kissimmee River, and water depth on the Kissimmee River floodplain decreased with a mean depth of 0.19 feet as of March 6, 2022. The concentration of dissolved oxygen in the Kissimmee River has remained well above the region of concern, with an average of 8.0 mg/L for the week ending on March 6, 2022.

Lake Okeechobee

Lake Okeechobee stage was 14.35 feet NGVD on March 6, 2022, with water levels 0.56 feet lower than a month ago (**Figure LO-1**). Lake stage fell back to within the ecological envelope on January 1, 2022, after being above the envelope since late September 2021, and having spent a total of 279 days (79%) in 2021 above the envelope (**Figure LO-2**). Average daily inflows (excluding rainfall) decreased from the previous week, going from 915 cfs to 452 cfs. Average daily outflows (excluding evapotranspiration) also decreased from the previous week, going from 4,181 cfs to 3,813 cfs. The first Snail Kite nests of the breeding season were observed on Lake Okeechobee during the most recent survey with three nests found in the Indian Prairie marsh. Recent satellite imagery (March 5, 2022) showed a few scattered areas of low to moderate bloom potential in the western bay and along the southwestern shoreline (**Figure LO-6**).

Estuaries

Total inflow to the St. Lucie Estuary averaged 110 cfs over the past week with no flow coming from Lake Okeechobee. Mean surface salinities increased at HR1, A1A and US1 Bridge sites over the past week. Salinity at the US1 Bridge was in the good range (10-26) for adult eastern oysters.

Total inflow to the Caloosahatchee Estuary averaged 2,000 cfs over the past week with 1,600 cfs coming from the Lake. Mean surface salinities remained the same at S-79 and Val I-75, increased slightly at Cape Coral, and decreased at the remaining sites in the estuary over the past week. Salinities were in the good range (0-10) for tape grass at Val I-75 and Ft. Myers. Salinities were in the good range (10-30) for adult eastern oysters at Cape Coral, Shell Point, and Sanibel.

Stormwater Treatment Areas

For the week ending Sunday, March 6, 2022, approximately 4,500 ac-ft of Lake Okeechobee water was delivered to the FEBs/STAs. The total amount of Lake releases sent to the FEBs/STAs in WY2022 (since May 1, 2021) is approximately 89,700 ac-feet. The total amount of inflows to the STAs in WY2022 is approximately 990,000 ac-feet. Most STA cells are at or near target stage, except portions of STA-5/6 cells that are drying out. STA-1E Western Flow-way is offline for the Restoration Strategies project to fill and grade Cells 5 and 7, and STA-1E Eastern Flow-way is offline for rip-rap repairs related to Tropical Storm Eta. Additionally, STA-3/4 Eastern Flow-way is offline for vegetation rehabilitation/drawdown, STA-2 Flow-way 2 is offline for construction activities, and STA-5/6 Flow-way 4 is offline for vegetation management activities. Operational restrictions are in place in STA-1W Western, Eastern, and Northern Flow-ways for construction activities. Operational restrictions are in effect in STA-1E Central Flow-way and STA-2 Flow-ways 1, 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

Hydrologic recession rates within most of the WCAs were high and were above the optimal except in a few locations where total outflows (ET & discharge) were equal to inflows. While depths at the 2-17 gauge in WCA-2A remain above schedule, foraging has yet to begin in WCA-2A. Continued discharges from WCA-2A to WCA-3A are benefitting the ecology of the sensitive regions in the Northern regions of WCA-3A. Wading bird foraging and nesting, across all the WCA's, bounced back from the reversal of a few weeks ago, but expectations are for average wading bird nesting success this year. CSSS subpopulation percent dry conditions improved towards the target over the last week. The rapid decrease typical for this time of year has begun in northern Taylor slough, but the conditions remain fair with Florida Bay with salinities near the 25th percentile and continued flow into the bay.

Biscayne Bay

Total inflow to Biscayne Bay averaged 199 cfs and the previous 30-day mean inflow averaged 291 cfs. The seven-day mean salinity was 28.7 at BBCW8 and 22.1 at BBCW 10, both below the preferred maximum salinity of 35 for these sites. Salinity data are provided as a courtesy by Biscayne National Park.

Supporting Information

Kissimmee Basin

Upper Kissimmee

On March 6, 2022, lake stages were 56.9 feet NGVD (1.1 feet below schedule) in East Lake Toho, 53.6 feet NGVD (1.4 feet below schedule) in Lake Toho, and 49.2 feet NGVD (1.8 feet below schedule) in Lakes Kissimmee-Cypress-Hatchineha (KCH) (**Table KB-1**, **Figures KB-1-3**).

Lower Kissimmee

Discharges to the Kissimmee River on March 6, 2022 were 340 cfs at S-65 and 280 cfs at S-65A; discharges from the Kissimmee River were 370 cfs at S-65D and 270 cfs at S-65E (**Table KB-2**). Headwater stages were 46.4 feet NGVD at S-65A and 26.5 feet NGVD at S-65D on March 6, 2022. With lower water temperatures, the concentration of dissolved oxygen is well above the region of concern, with an average of 8.0 mg/L for the week ending on March 6, 2022 (**Table KB-2**, **Figure KB-4**). Flow at S-65/S-65A is being reduced to allow for slow stage recessions on KCH and the Kissimmee River, and water depth on the Kissimmee River floodplain decreased with a mean depth of 0.19 feet as of March 6, 2022 (**Figure KB-5**).

Water Management Recommendations

Managed stage recessions for snail kite nesting season were started on Lakes Toho and East Toho on January 15, 2022 to gradually reduce lake stages to their low pools by June 1. In Kissimmee-Cypress-Hatchineha, continue to keep stage slowly declining while maintaining at least 300 cfs at S-65A and following the IS-14-50 discharge plan (**Figure KB-6**) for S-65 and S-65A.

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

Water Body	Structure	Stage Monitoring Site	7-Day Average Discharge (cfs)	Lake Stage (feet NGVD)[a]	Schedule Type[b]	Schedule Stage (feet NGVD)	Departure from Regulation (feet)	
							3/6/22	*2/27/22*
Lakes Hart and Mary Jane	S-62	LKMJ	12	60.7	R	61.0	-0.3	-0.2
Lakes Myrtle, Preston and Joel	S-57	S-57	3	60.9	R	61.0	-0.1	0.0
Alligator Chain	S-60	ALLI	0	63.9	R	64.0	-0.1	0.0
Lake Gentry	S-63	LKGT	0	61.5	R	61.5	0.0	0.0
East Lake Toho	S-59	TOHOE	68	56.9	R	58.0	-1.1	-1.0
Lake Toho	S-61	TOHOW S-61	123	53.6	R	55.0	-1.4	-1.3
Lakes Kissimmee, Cypress and Hatchineha	S-65	KUB011 LKIS5B	397	49.2	R	51.0	-1.8	-1.9

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

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

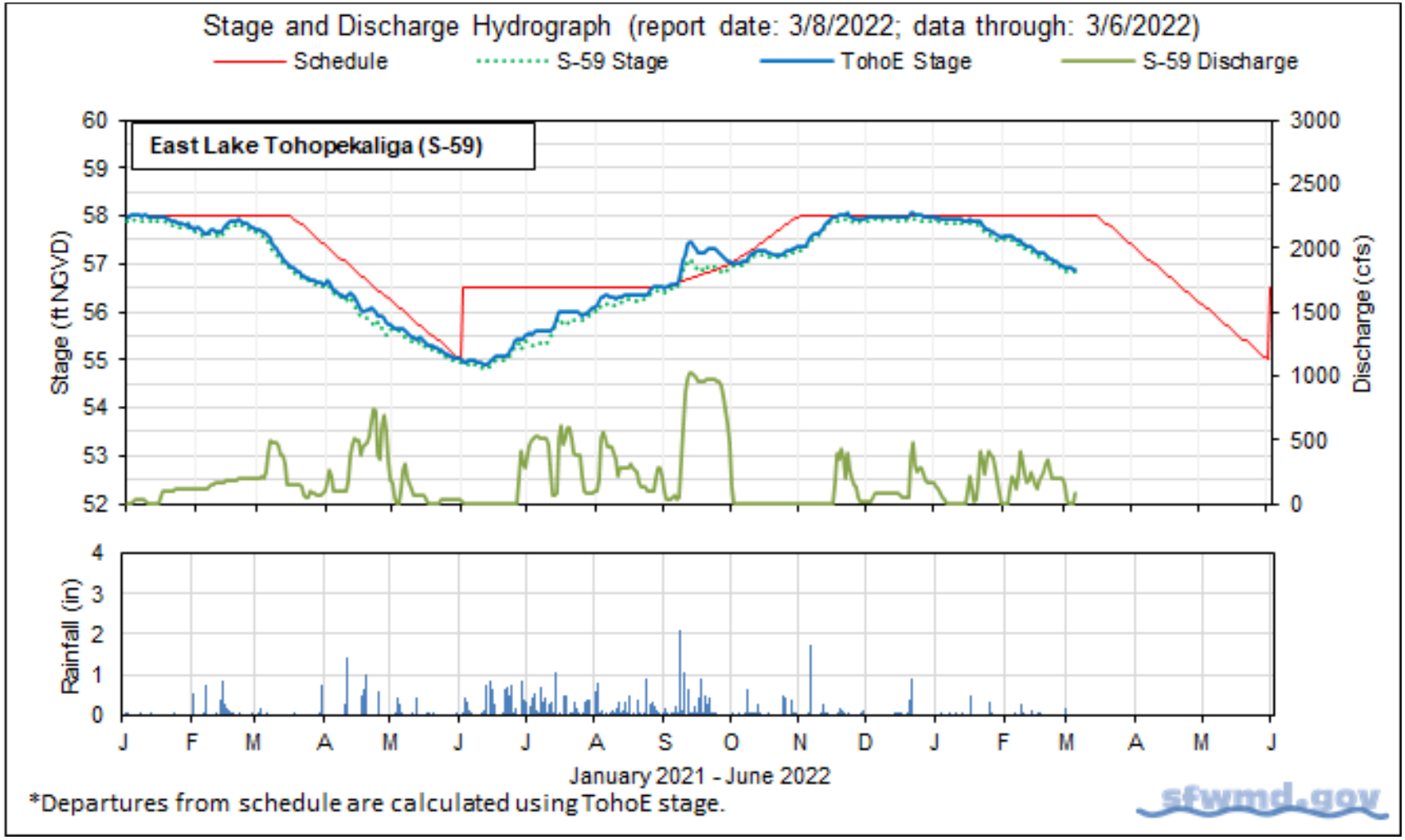


Figure KB-1. East Lake Toho regulation schedule, stage, discharge and rainfall.

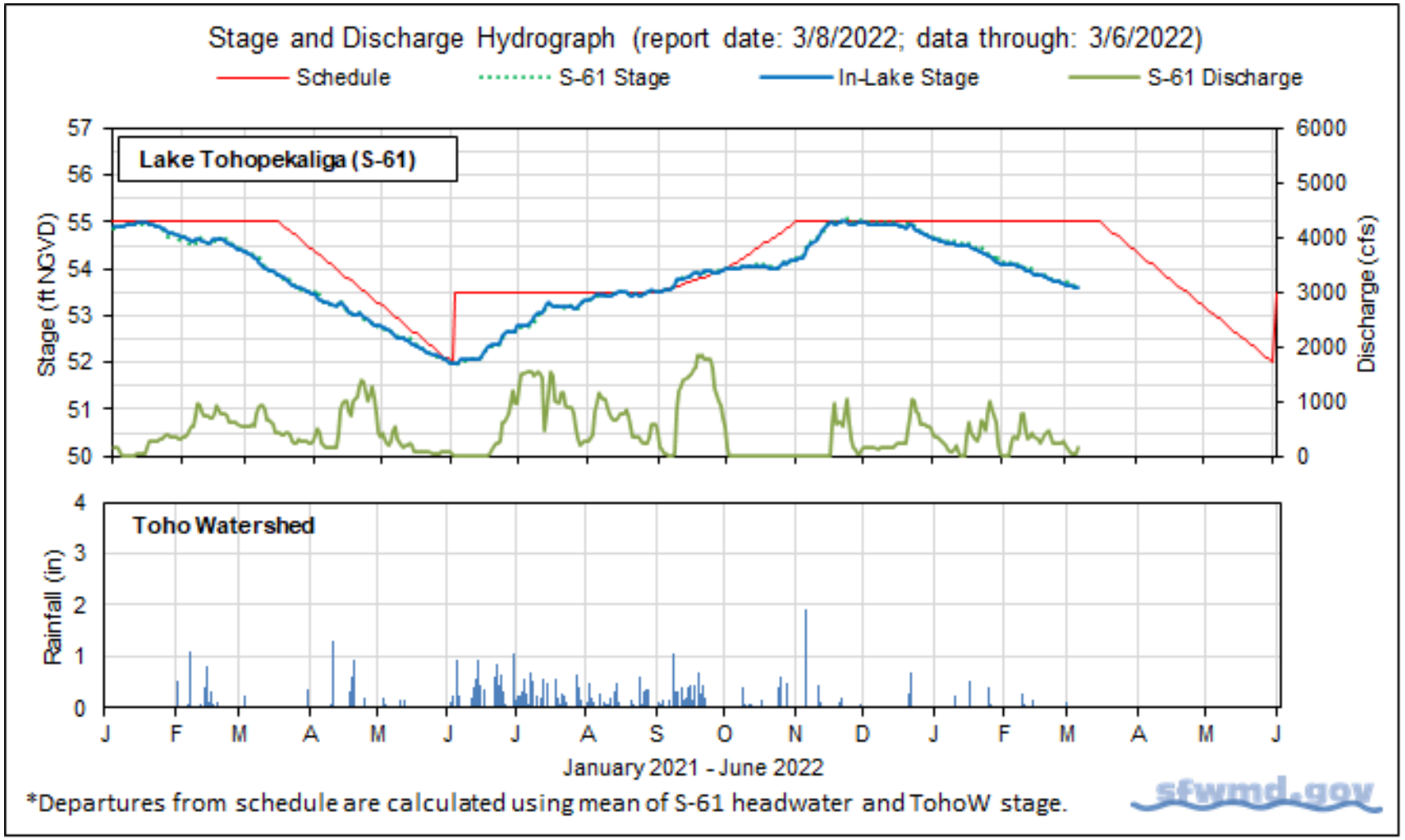


Figure KB-2. Lake Toho regulation schedule, stage, discharge and rainfall.

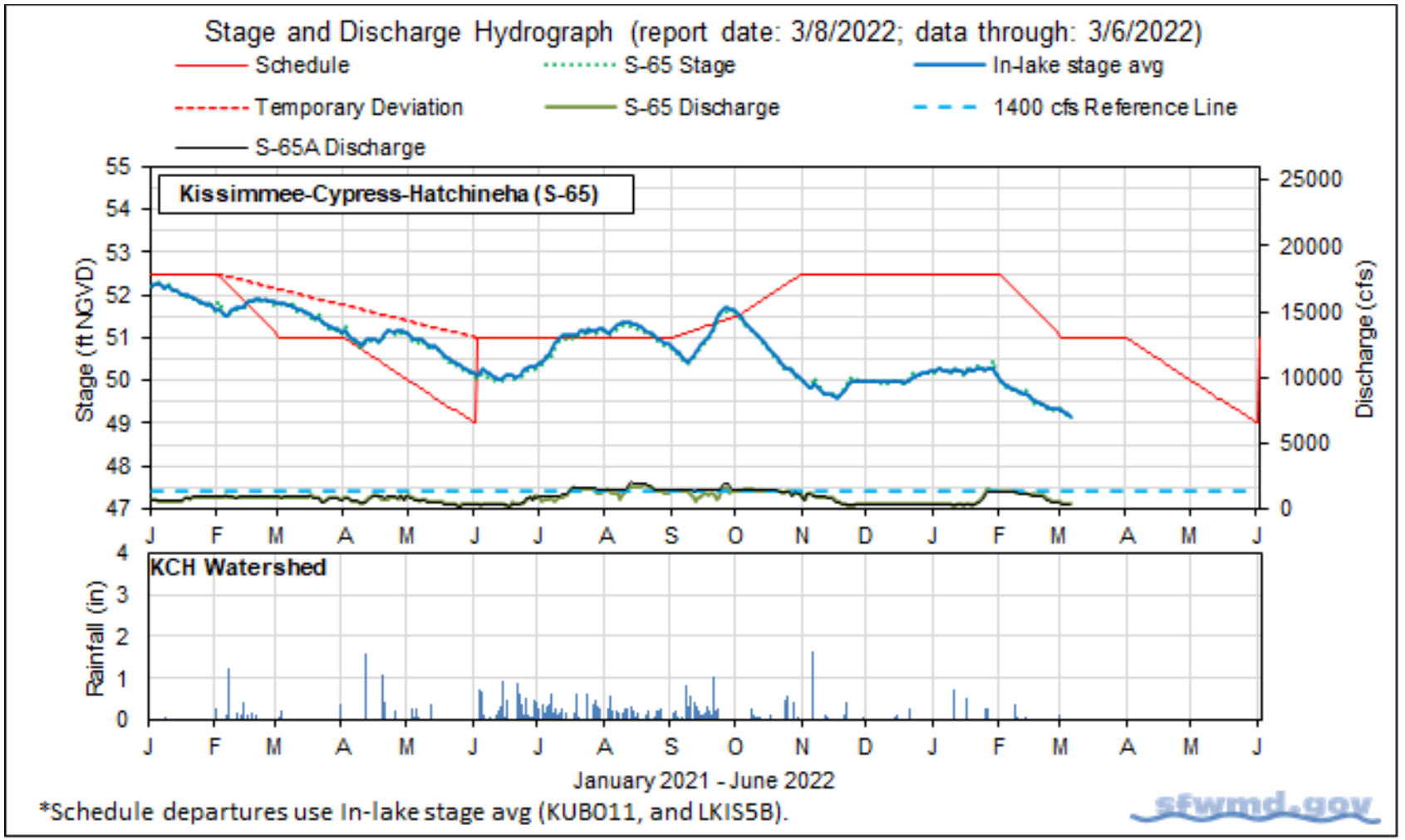


Figure KB-3. Lakes Kissimmee, Cypress and Hatchineha regulation schedule, stage, discharge and rainfall.

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

Metric	Location	Daily Average	Average for Previous Seven Day Periods			
		3/6/22	3/6/22	2/27/22	2/20/22	2/13/22
Discharge	S-65	340	400	710	1,100	1,240
Discharge	S-65A[a]	280	360	630	1,020	1,180
Headwater Stage (feet NGVD)	S-65A	46.4	46.4	46.3	46.3	46.3
Discharge	S-65D[b]	370	470	950	1,570	1,170
Headwater Stage (feet NGVD)	S-65D[c]	26.5	26.5	26.5	26.6	26.7
Discharge (cfs)	S-65E[d]	270	430	870	1,070	1,100
Discharge (cfs)	S-67	0	0	0	0	0
Dissolved Oxygen (mg/L) [e]	Phase I, II/III river channel	8.3	8.0	7.6	8.5	8.5
Mean depth (feet) [f]	Phase I floodplain	0.19	0.21	0.30	0.40	0.43

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

Table KB-3. Discharge rate of change limits for S65/S-65A (revised 1/14/19).

Discharge (cfs)	Maximum Rate of Increase (cfs/day)	Maximum Rate of Decrease (cfs/day)
0-300	100	-50
301-650	150	-75
651-1,400	300	-150
1,401-3,000	600	-600
>3,000	1,000	-2,000

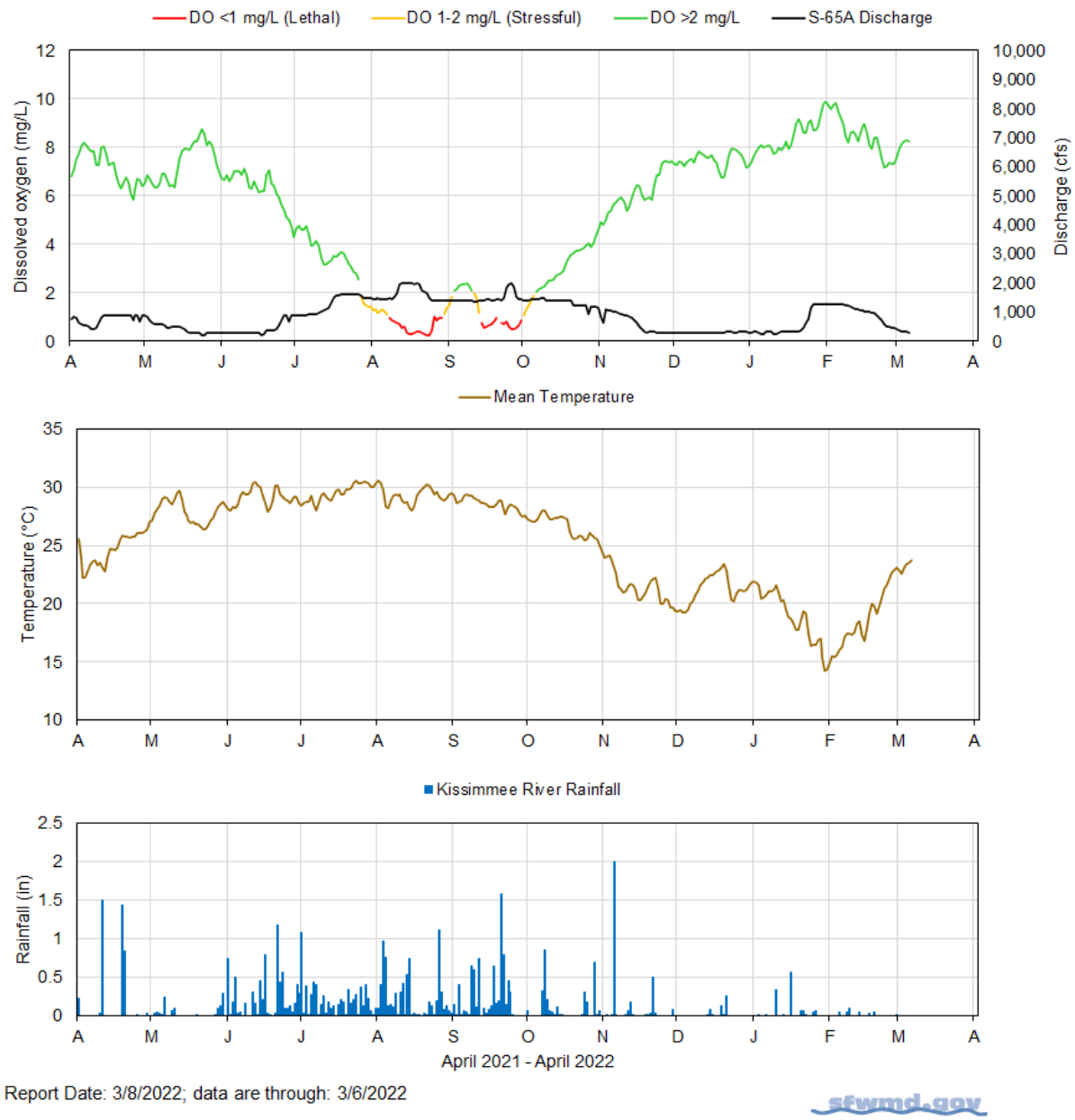


Figure KB-4. Restored Kissimmee river channel mean daily dissolved oxygen concentration (mg/L), S-65A discharge (cfs), temperature (°C) and rainfall (inches). Dissolved oxygen (DO) and temperature are mean daily values averaged for PC62, KRBN, PC33, PD62R, and PD42R with an average of three stations reporting this week. Rainfall values are daily totals for Kissimmee River (Pool BCD) AHED watershed.

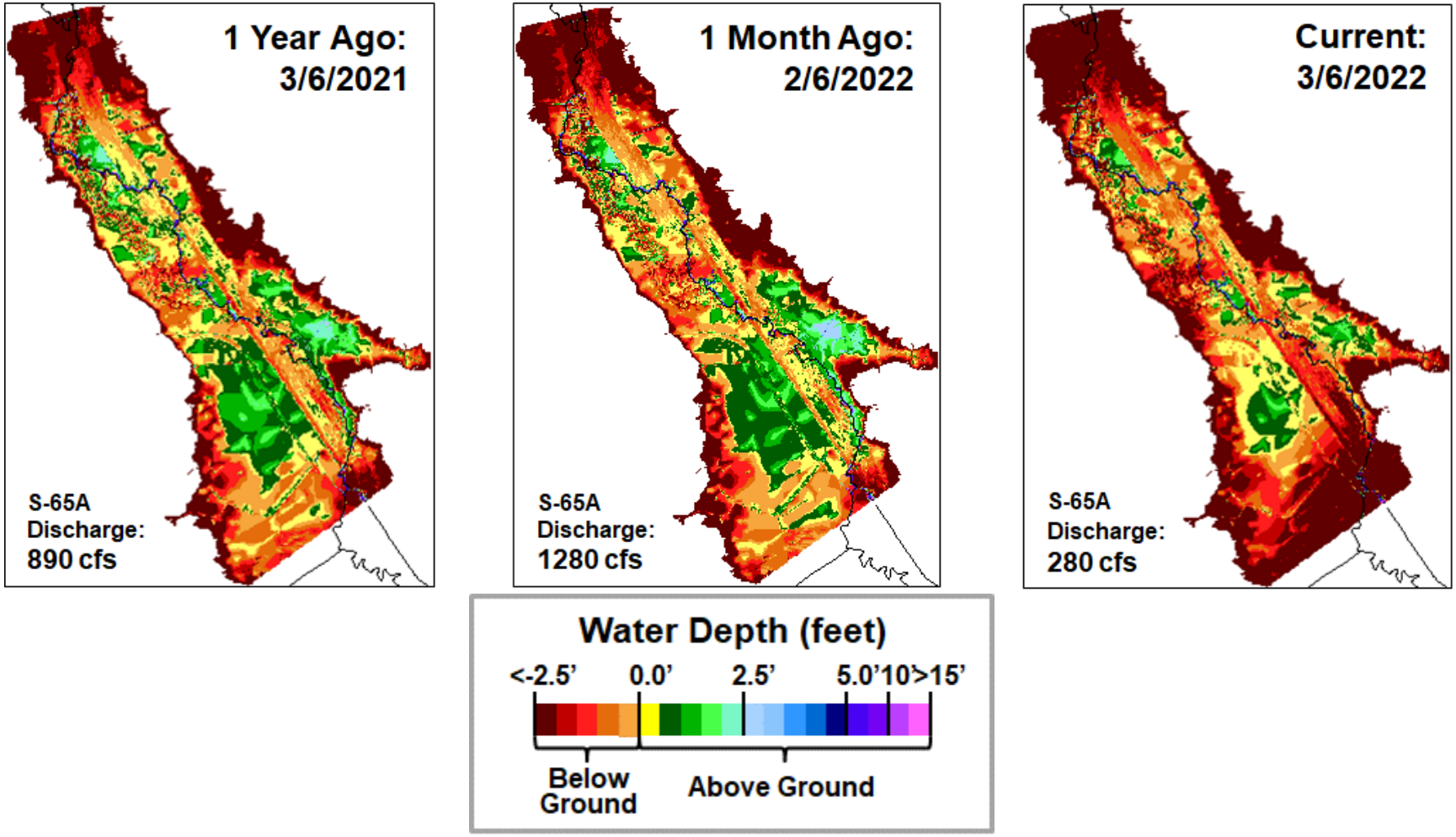


Figure KB-5. Phase I area Kissimmee River floodplain water depths (from left to right) one year ago, one month ago and current.

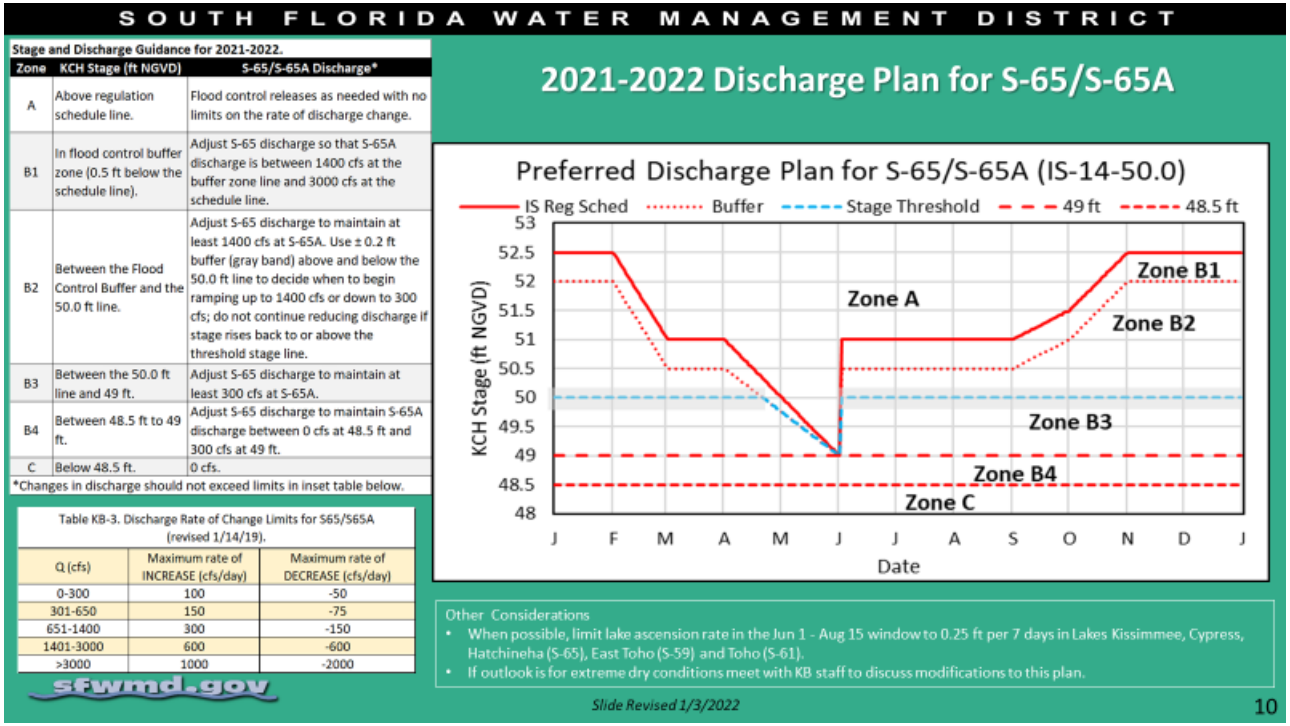


Figure KB-6. IS-14-50 Discharge Plan for S65/S65A with discharge rate of change limits (revised 1/14/19).

Lake Okeechobee

Lake Okeechobee stage was 14.35 feet NGVD on March 6, 2022, with water levels 0.56 feet lower than a month ago (**Figure LO-1**). Lake stage remains in the Low sub-band (**Figure LO-2**) and is still within the ecological envelope, having spent 279 days (79%) of the last year above the envelope (**Figure LO-3**). The first Snail Kite nests of the breeding season were observed on Lake Okeechobee during the most recent survey with three nests found in the Indian Prairie marsh. According to NEXRAD, no rain fell directly on the Lake last week.

Average daily inflows (excluding rainfall) decreased from the previous week, going from 915 cfs to 452 cfs. Average daily outflows (excluding evapotranspiration) also decreased from the previous week, going from 4,181 cfs to 3,813 cfs. Highest inflows came from the Kissimmee River through the S-65E structure (431 cfs). The highest outflow (1,958 cfs) was to the west via the S-77 structure, while 1,401 cfs flowed south via the S-350 structures (S-351, 1,025 cfs; S-352, 117 cfs; S-354, 260 cfs), 256 cfs flowed east via the S-308 structure and 198 cfs flowed out of the L-8 canal through the S-271 structure (formerly Culvert 10A). **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 first Snail Kite nests of the breeding season were observed on Lake Okeechobee during the most recent survey with three nests found in the Indian Prairie marsh.

The most recent satellite image (March 5, 2022) from the NOAA cyanobacteria monitoring product derived from EUMETSAT's Sentinel 3 OLCI sensor showed a few scattered areas of low to moderate bloom potential in the western bay and along the southwestern shoreline (**Figure LO-6**).

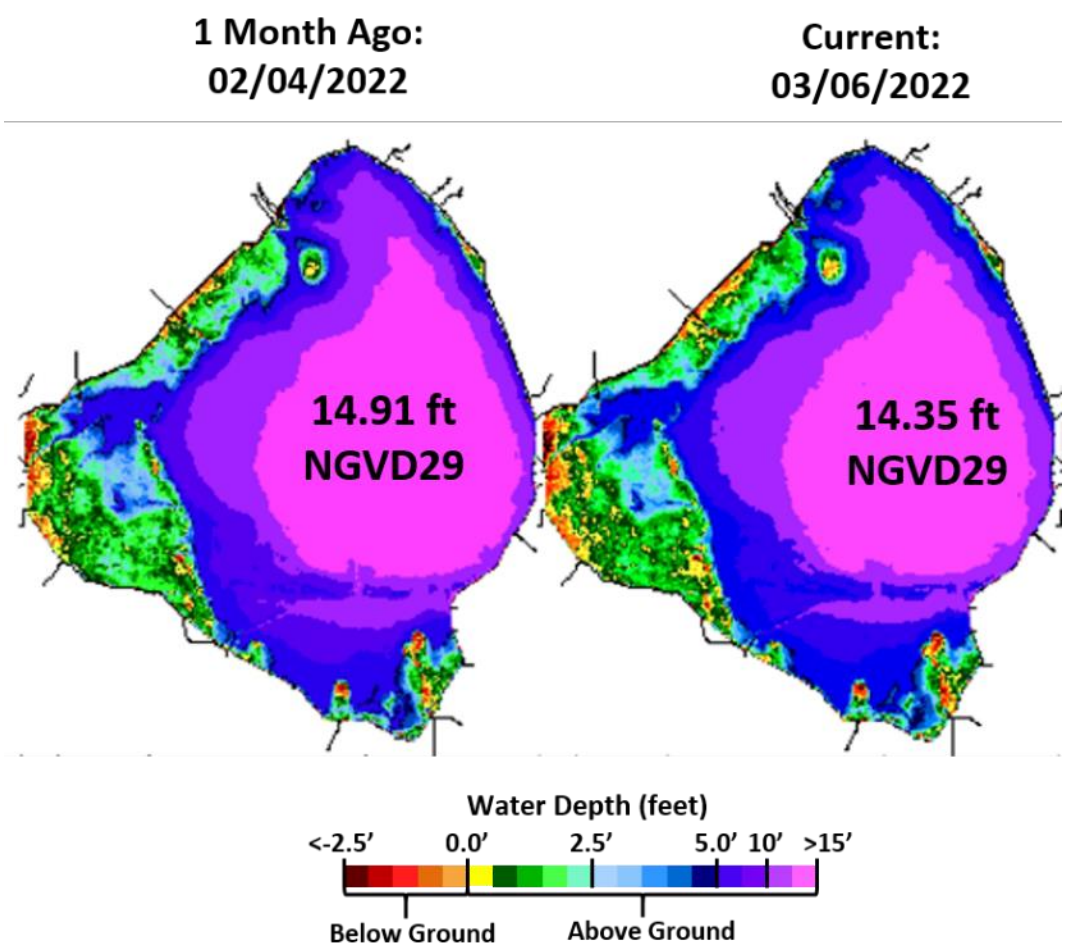


Figure LO-1. Lake Okeechobee water depth estimates based on South Florida Water Depth Assessment Tool (SFWDAT).

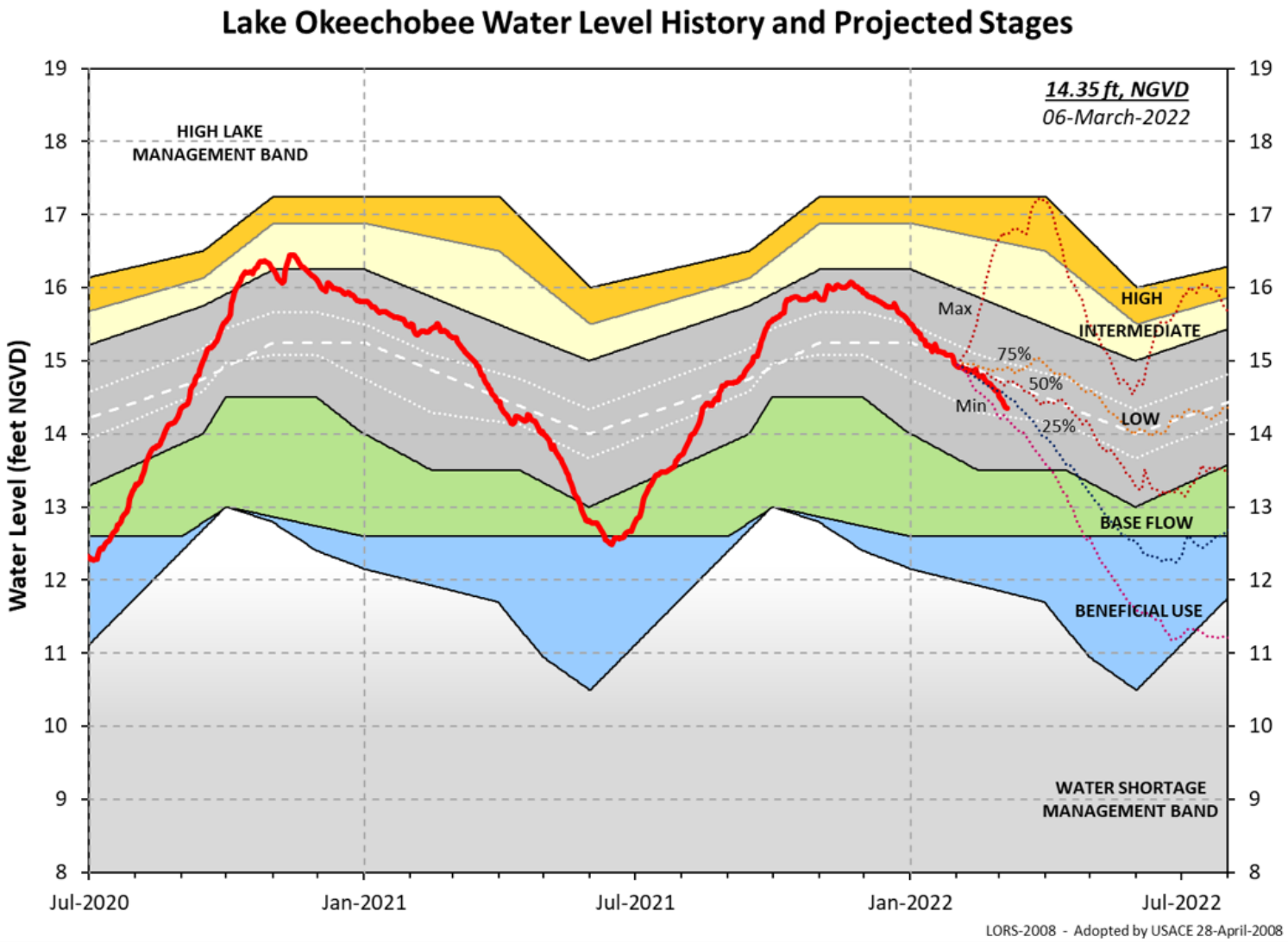


Figure LO-2. Recent Lake Okeechobee stages with projected stages based on a dynamic position analysis.

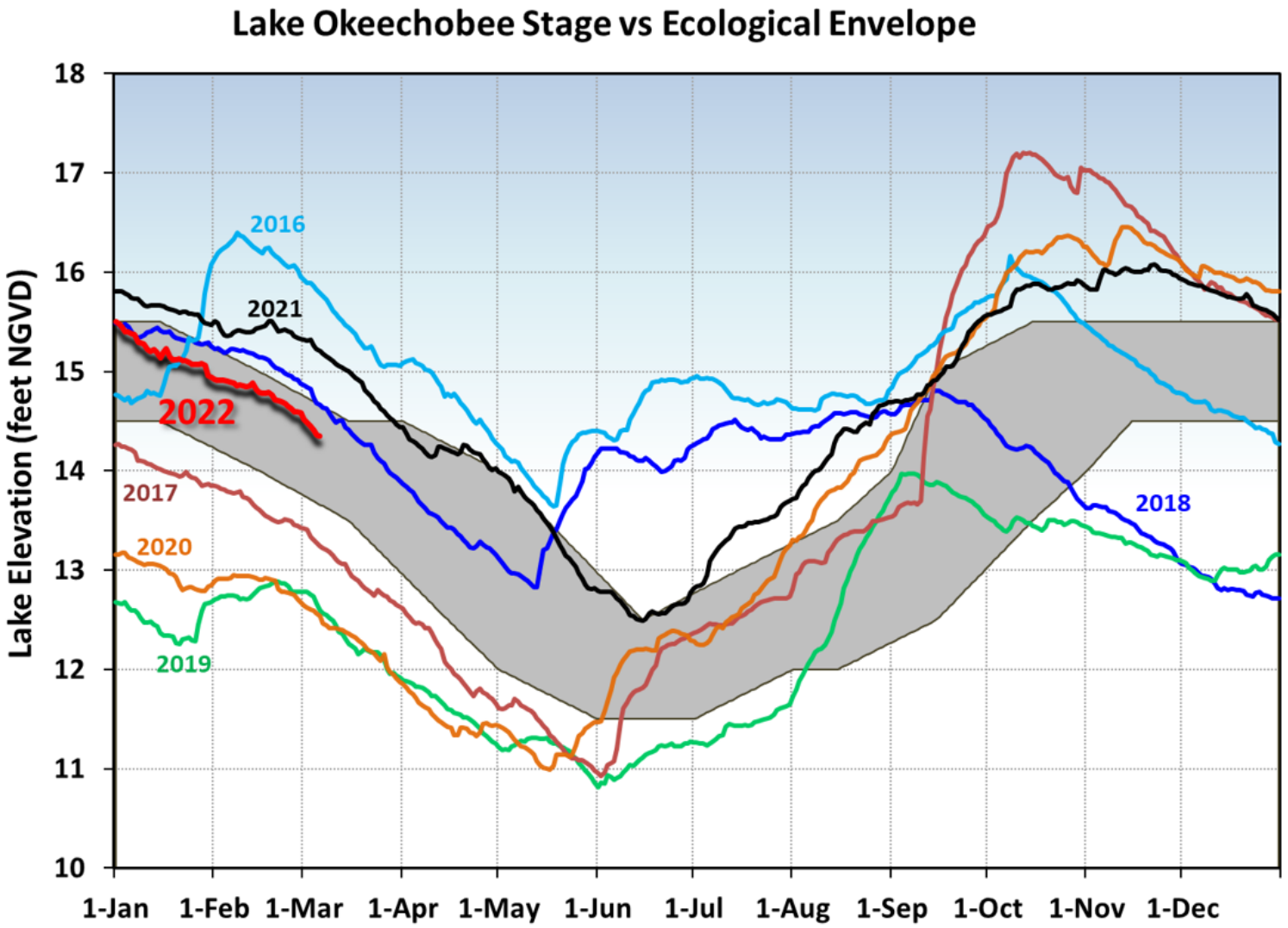


Figure LO-3. The prior six years of annual stage hydrographs for Lake Okeechobee in comparison to the ecological envelope.

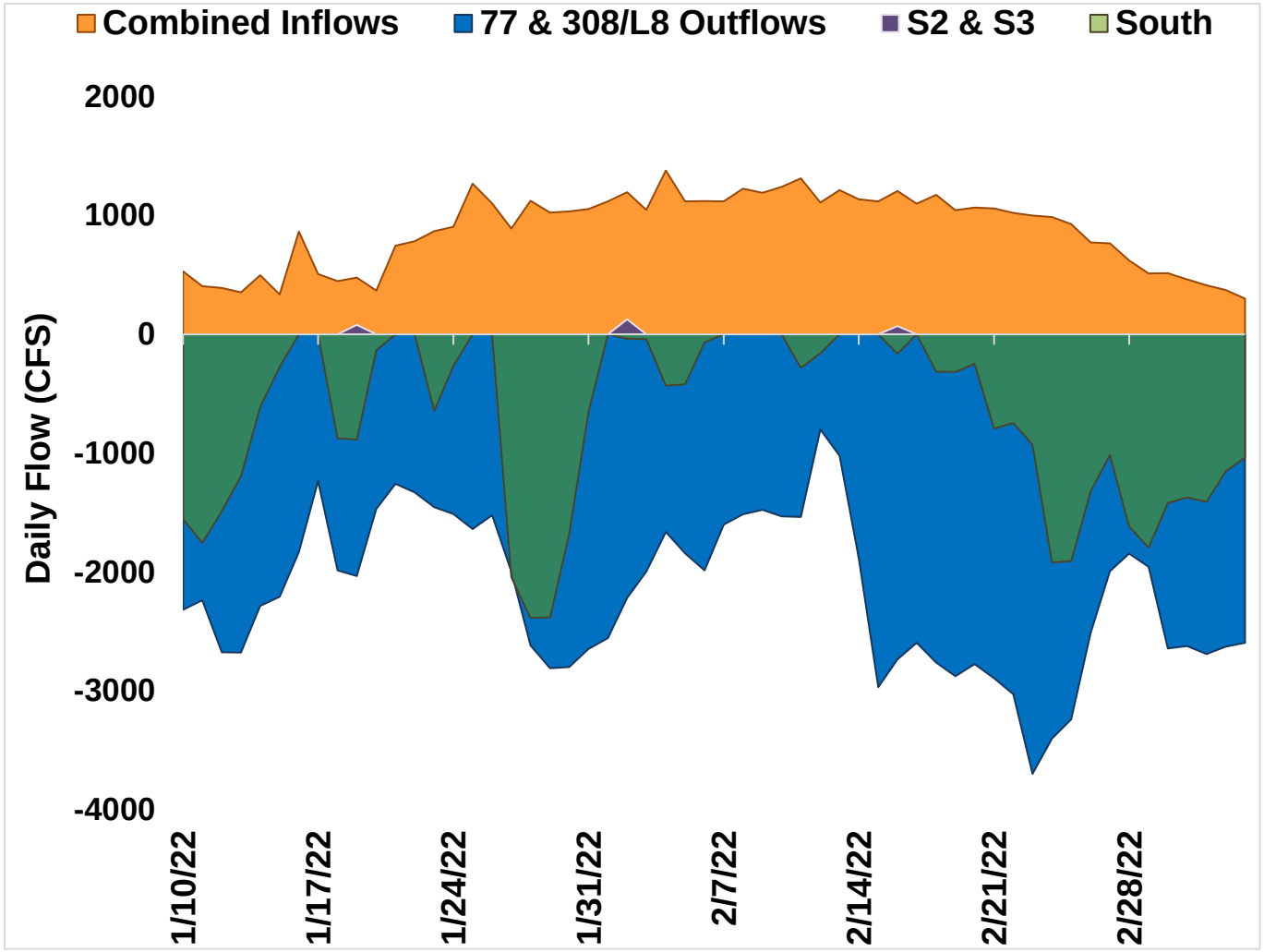


Figure LO-4. Major inflows (orange) to and outflows east and west (blue) from Lake Okeechobee. Outflows south are shown in green. Flows into Lake Okeechobee from the L-8 canal through S-271 (formerly Culvert 10A) or from the C-44 canal through the S-308 are included as inflows. Conversely, flows from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

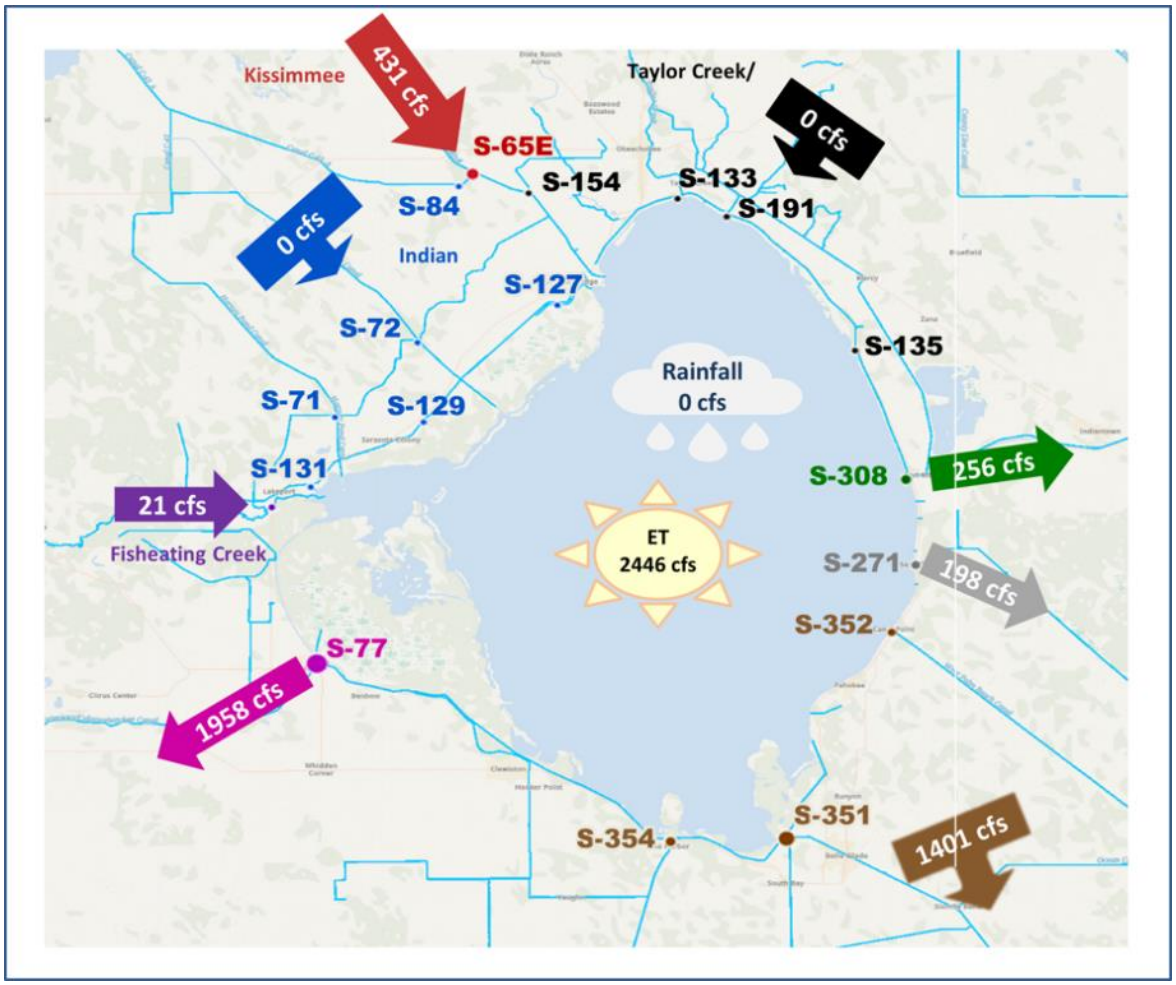


Figure LO-5. Inflows into Lake Okeechobee from Indian Prairie basins, Taylor Creek/Nubbin Slough, Kissimmee River and Fisheating Creek, and outflows to the west via S-77, to the east via S-308, to the south via S-351, S-352, S-354, and to southeast via S-271 (formerly Culvert 10A) for the week of February 28, 2022 – March 06, 2022.

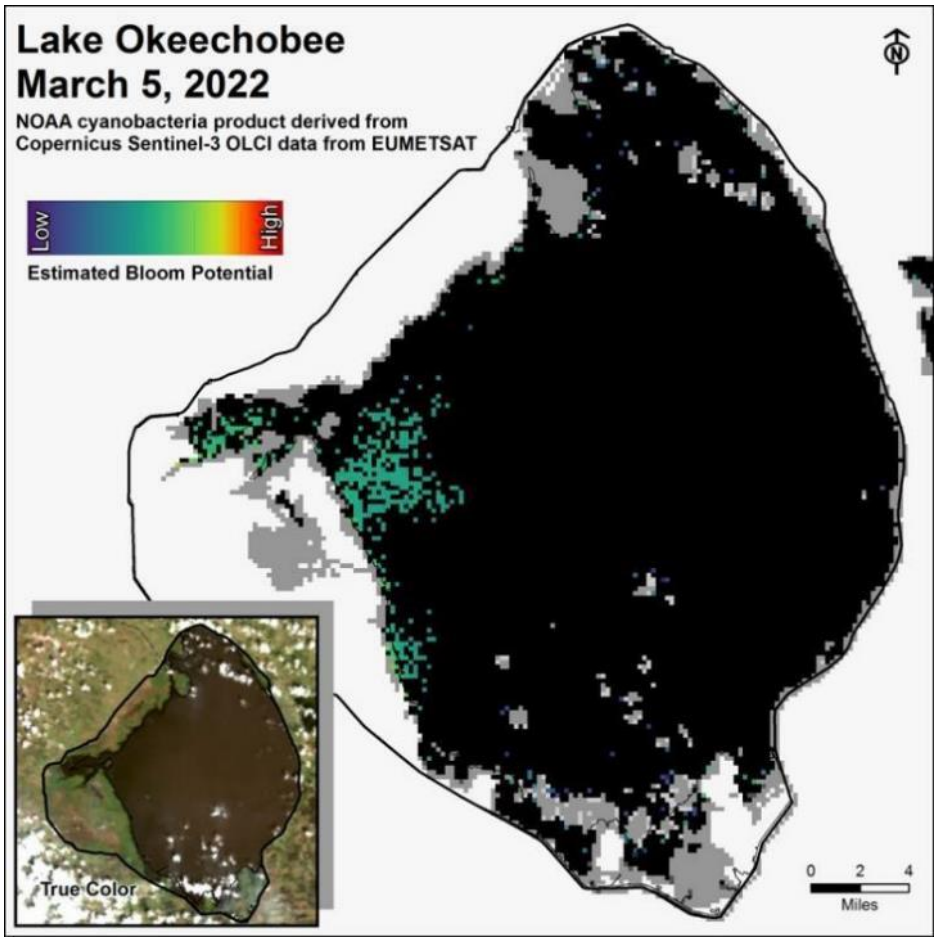


Figure LO-6. Cyanobacteria bloom potential on March 5, 2022 based on NOAA's harmful algal bloom monitoring system. Gray color indicates cloud cover.

Estuaries

St. Lucie Estuary

Over the past week, mean total inflow to the St. Lucie Estuary was 111 cfs (**Figures ES-1** and **ES-2**) and the previous 30-day mean inflow was 158 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 24.7. Salinity conditions in the middle estuary were estimated to be within the good range for adult eastern oysters (**Figure ES-4**).

Caloosahatchee River Estuary

Over the past week, mean total inflow to the Caloosahatchee River Estuary was 2,051 cfs (**Figures ES-5** and **ES-6**) and the previous 30-day mean inflow was 2,040 cfs. For comparison, the historical provisional mean inflows from the contributing areas are shown in **Figure ES-6**.

Over the past week, salinities remained the same at S-79, surface salinity increased slightly at Cape Coral, and salinities decreased at the remaining sites in the estuary (**Table ES-2** and **Figures ES-7** and **ES-8**). The seven-day mean surface salinities (**Table ES-2**) were in the good range (0-10) for tape grass at Val I-75 and at Ft. Myers. The seven-day mean surface salinity values were within the good range for adult eastern oysters at Cape Coral, Shell Point, and Sanibel (**Figure ES-9**).

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 steady releases at 2,000 cfs with estimated tidal basin inflows of 60 cfs. Model results from all scenarios predict daily salinity to be 1.5 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-10**). This keeps predicted salinities at Val I-75 within the LORS 2008 salinity range (0.0-5.0).

Red Tide

The Florida Fish and Wildlife Research Institute reported on March 4, 2022, that *Karenia brevis*, the Florida red tide dinoflagellate, was not observed in any samples collected statewide. On the east coast, red tide was not observed in samples from Palm Beach, Broward, or Miami-Dade counties.

[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.

Water Management Recommendations

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

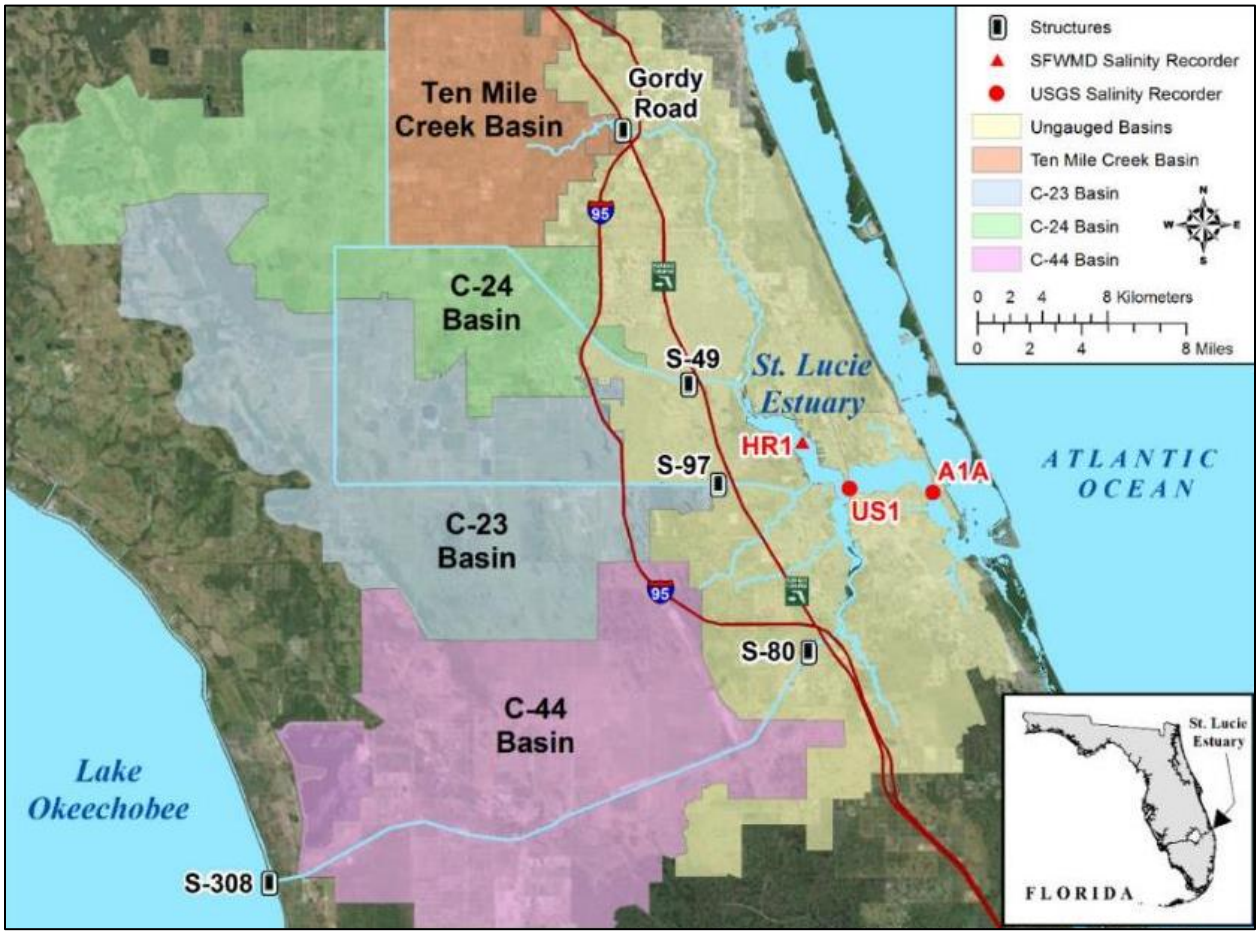


Figure ES-1. Basins, water control structures and salinity monitoring sites in the St. Lucie Estuary.

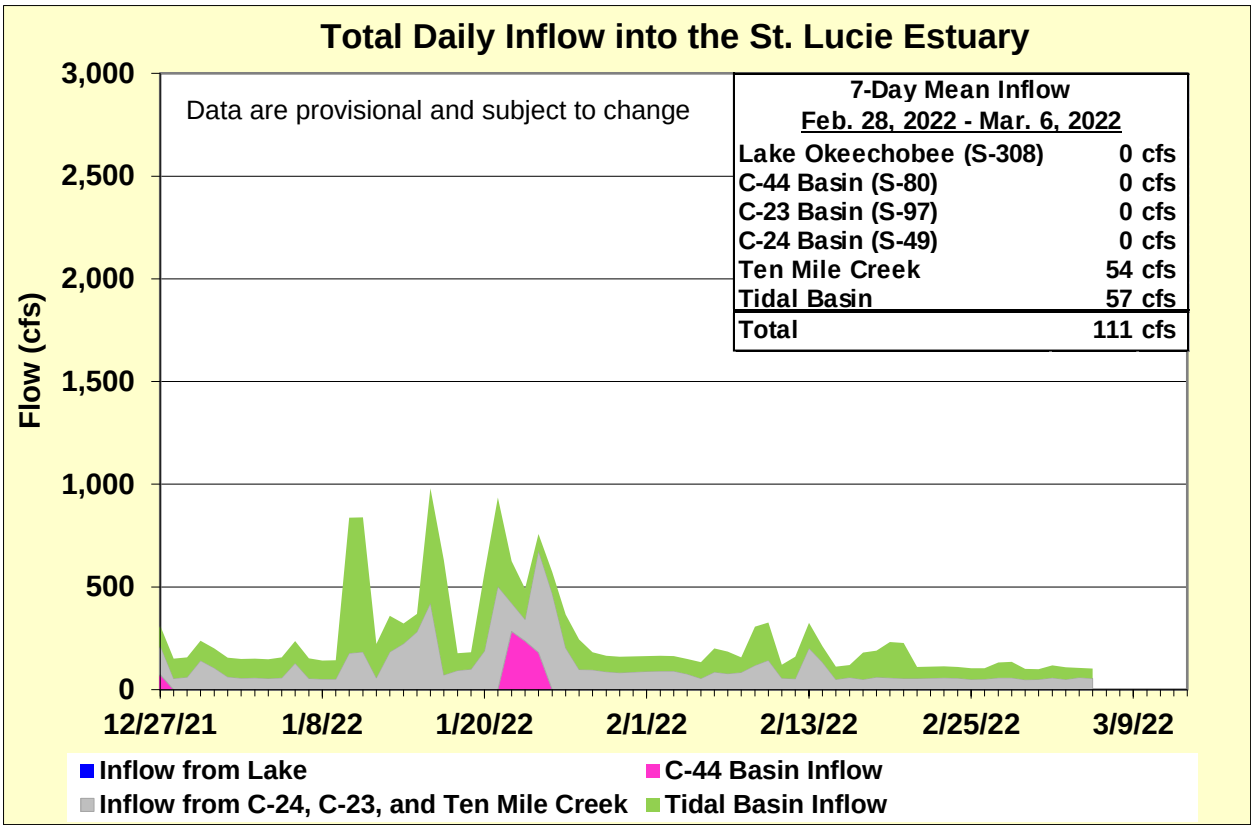


Figure ES-2. Total daily inflows from Lake Okeechobee and runoff from the C-44, C-23, C-24, Ten Mile Creek, and Tidal Basins into the St. Lucie Estuary.

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 preferred salinity range for adult eastern oysters (*Crassostrea virginica*) in the middle estuary. Data are provisional.

Sampling Site	Surface	Bottom	Envelope
HR1 (North Fork)	**21.2** (19.7)	**22.8** (20.4)	NA [a]
US1 Bridge	**24.4** (22.9)	**25.0** (23.3)	10.0 – 26.0
A1A Bridge	**30.7** (29.4)	**31.7** (30.4)	NA [a]

a. The envelope is not applicable.

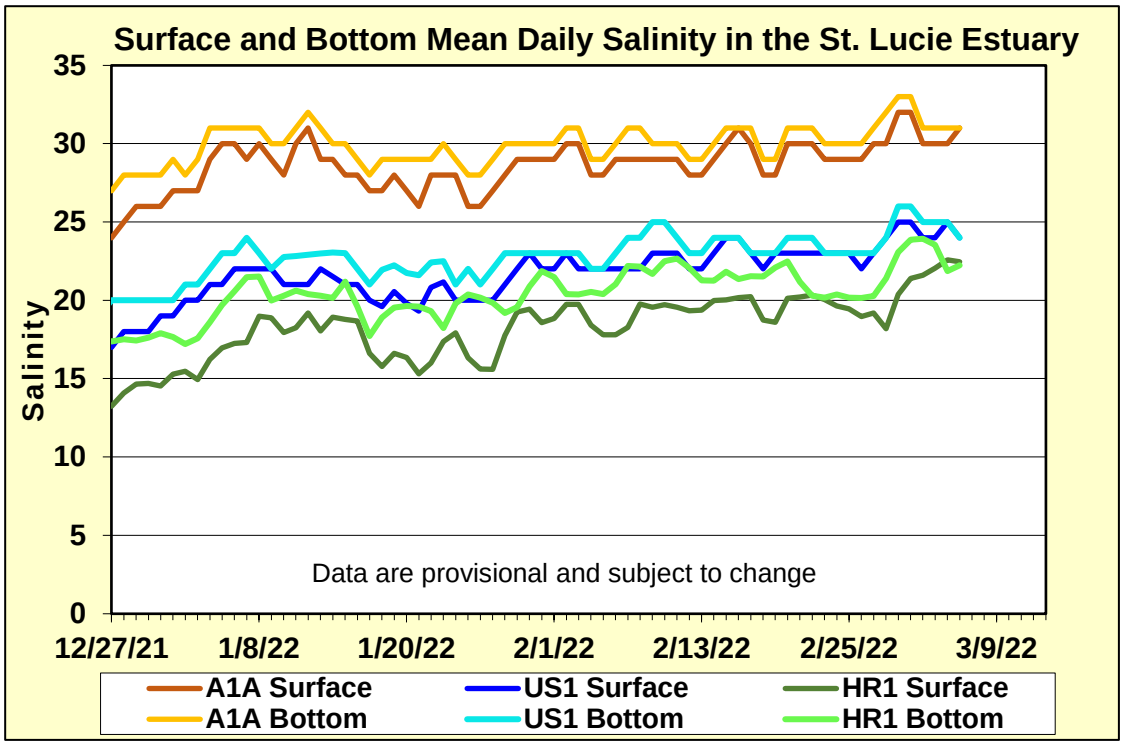


Figure ES-3. Mean daily salinity at the A1A, US1 and HR1 sites in the St. Lucie Estuary.

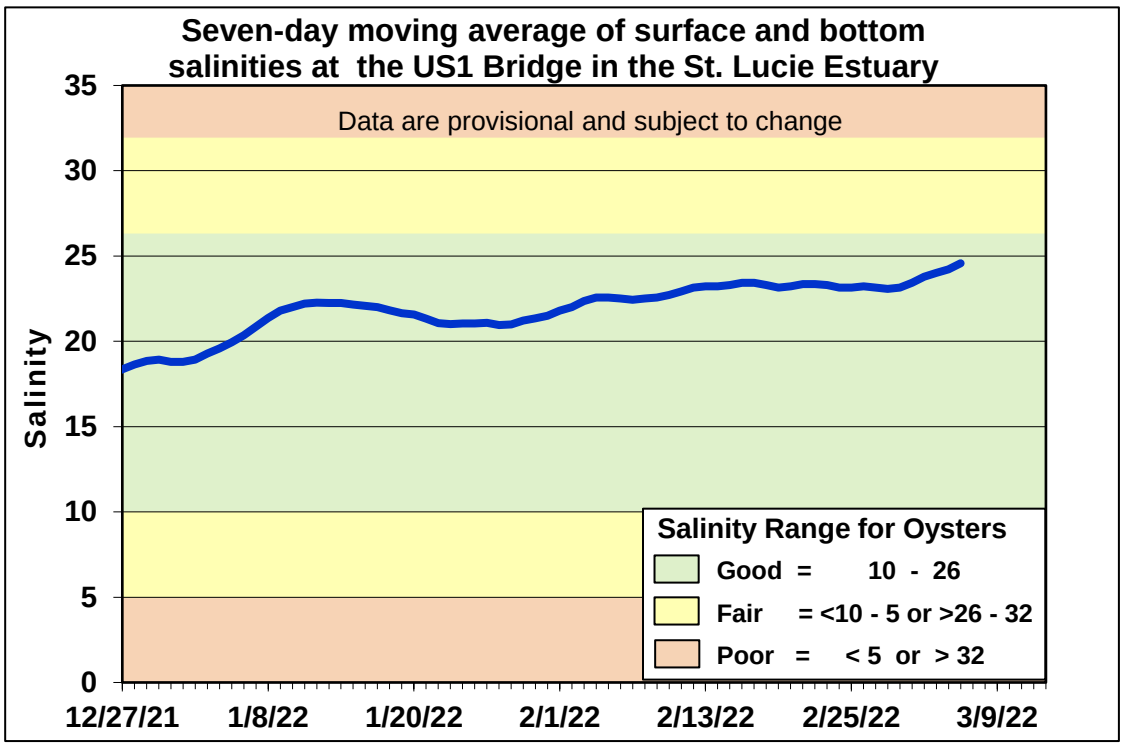


Figure ES-4. Seven-day moving average of the surface and bottom salinities at the US1 Bridge in the St. Lucie Estuary.

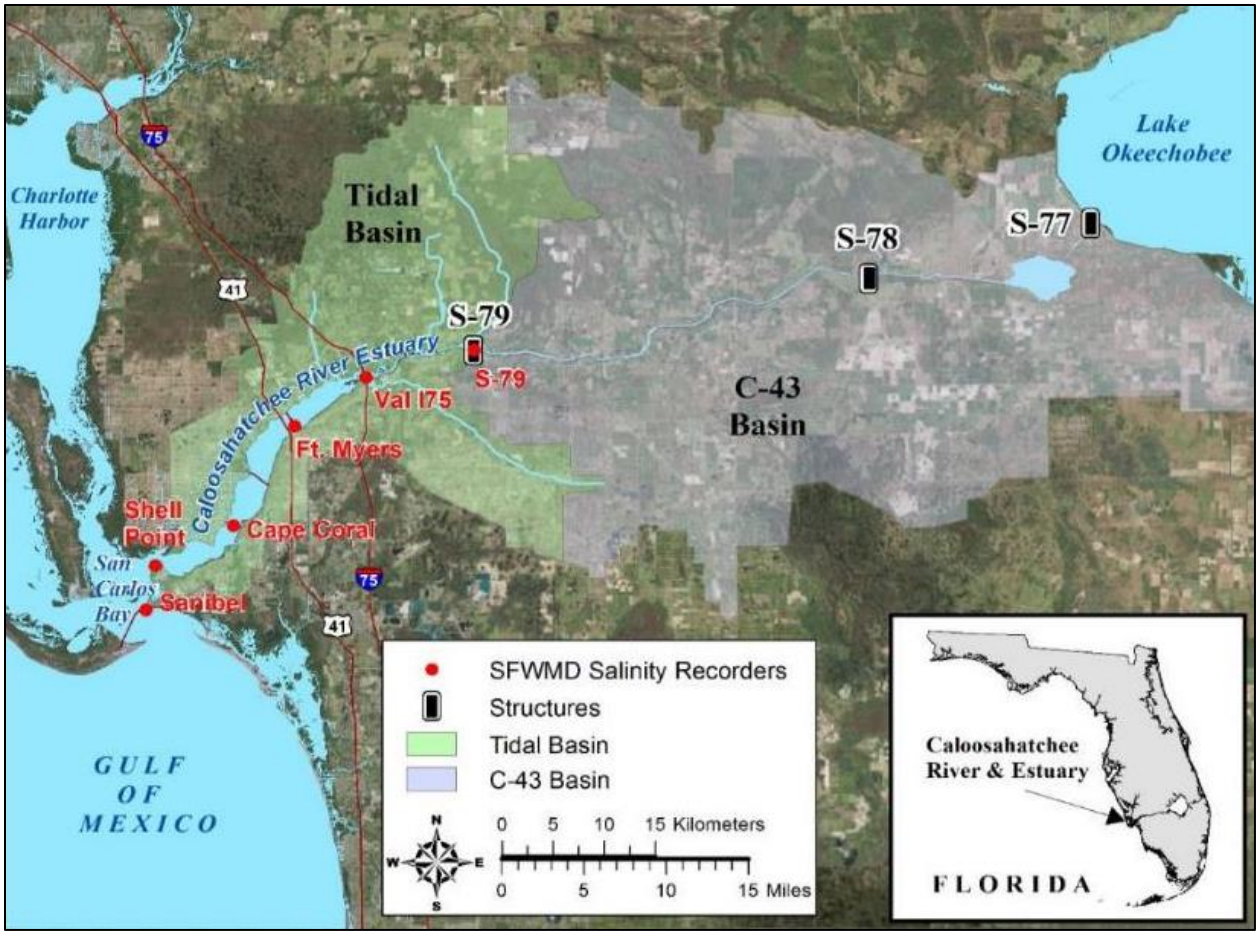


Figure ES-5. Basins, water control structures and salinity monitoring sites in the Caloosahatchee River Estuary.

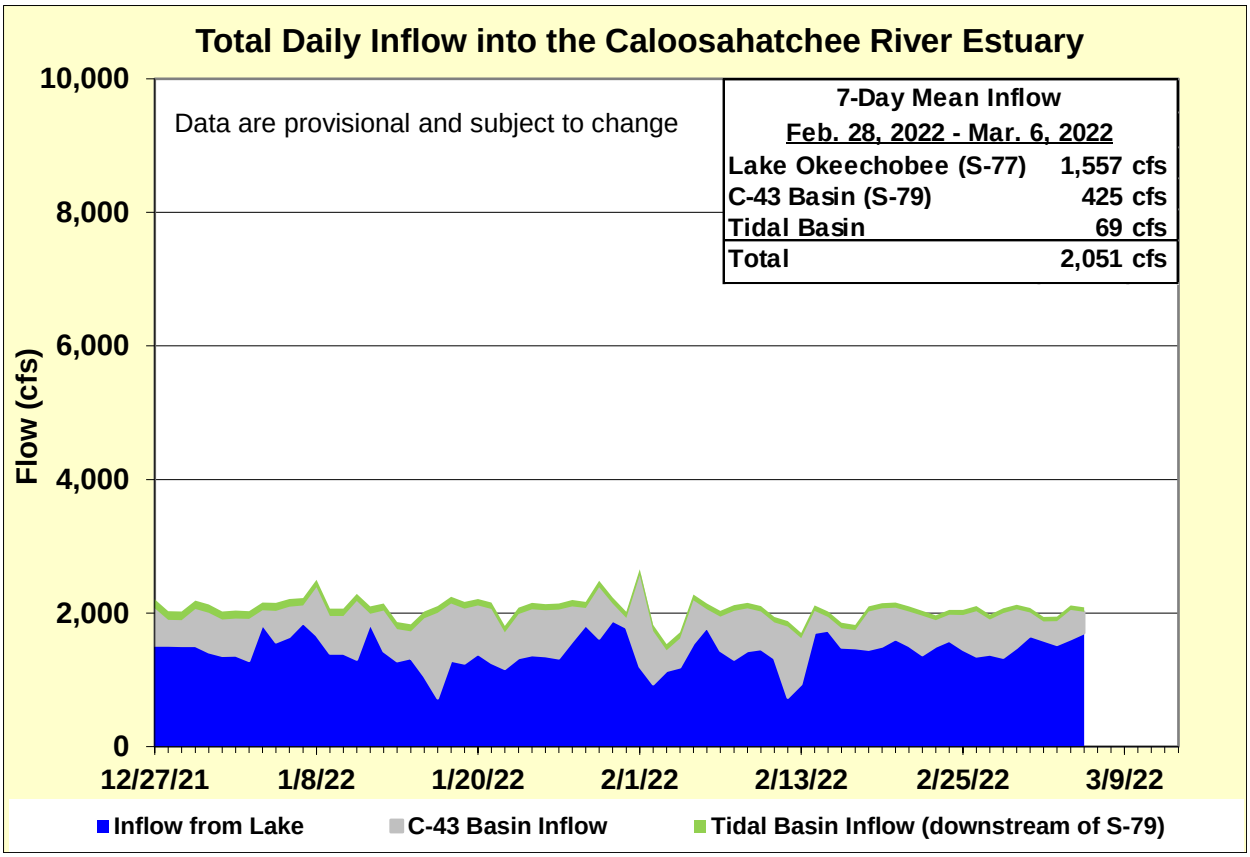


Figure ES-6. Total daily inflows from Lake Okeechobee, and runoff from the C-43 and Tidal basins into the Caloosahatchee River Estuary.

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 at I-75 is for the protection of tape grass in the upper estuary and the envelope in the lower estuary is the preferred salinity range for adult eastern oysters (*Crassostrea virginica*). Data are provisional.

Sampling Site	Surface	Bottom	Envelope
S-79 (Franklin Lock)	**0.2** (0.2)	**0.2** (0.2)	NA [a]
Val I-75	**0.3** (0.3)	**0.3** (0.6)	0.0 – 5.0 [b]
Fort Myers Yacht Basin	**3.3** (3.5)	**3.9** (6.8)	NA [a]
Cape Coral	**10.7** (10.4)	**11.7** (12.8)	10.0 – 30.0
Shell Point	**23.8** (24.7)	**24.4** (25.2)	10.0 – 30.0
Sanibel	**29.0** (30.3)	**29.6** (30.8)	10.0 – 30.0

a. The envelope is not applicable.
b. The envelope is based on the predicted 30-day mean for the next two weeks.

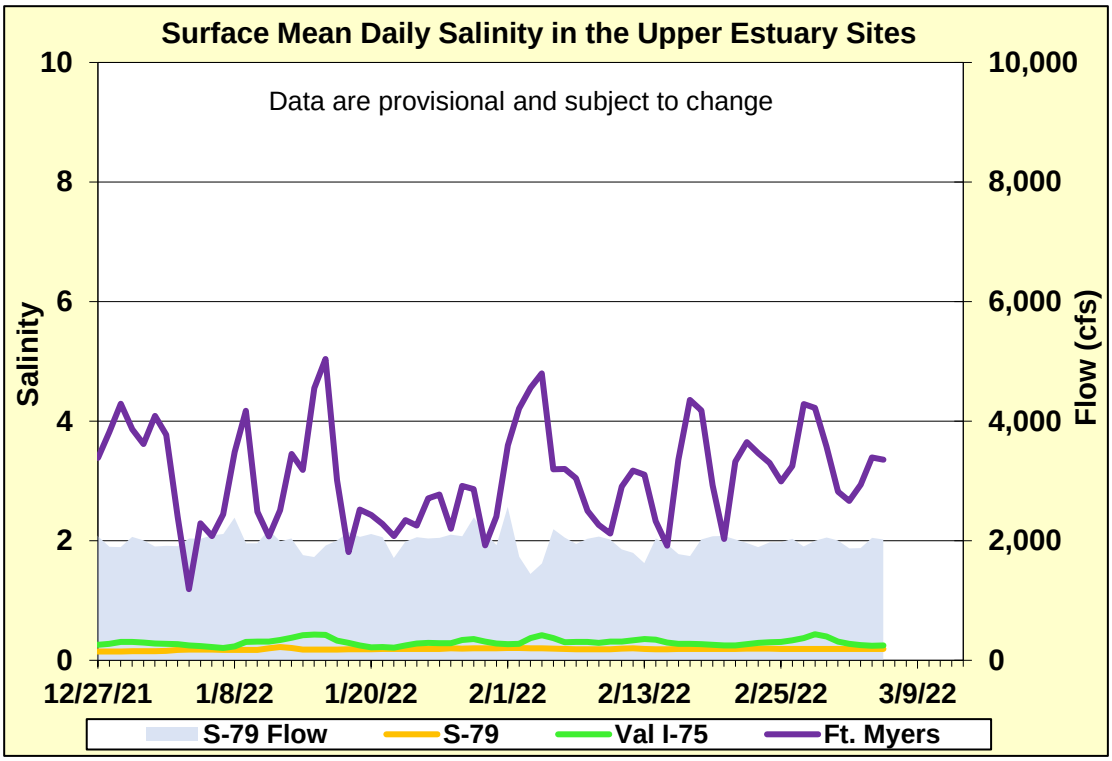


Figure ES-7. Mean daily salinity at upper Caloosahatchee River Estuary monitoring sites and mean daily flow at S-79.

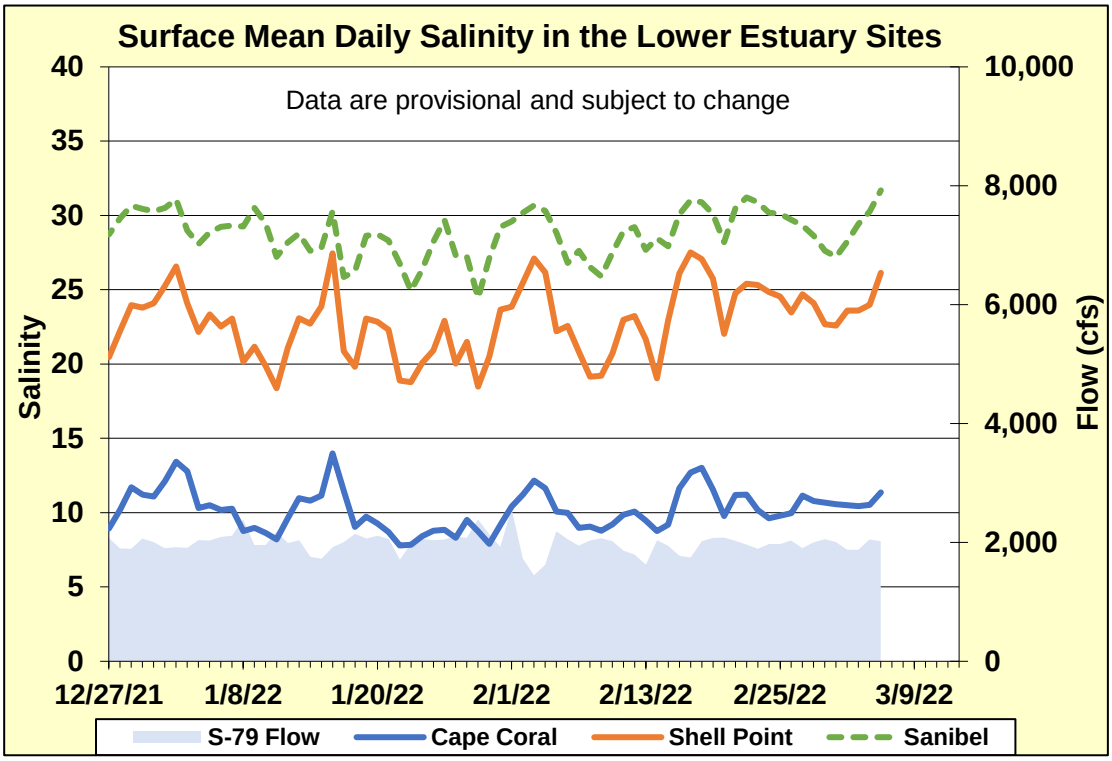


Figure ES-8. Mean daily surface salinity at lower Caloosahatchee River Estuary monitoring sites and mean daily flow at S-79.

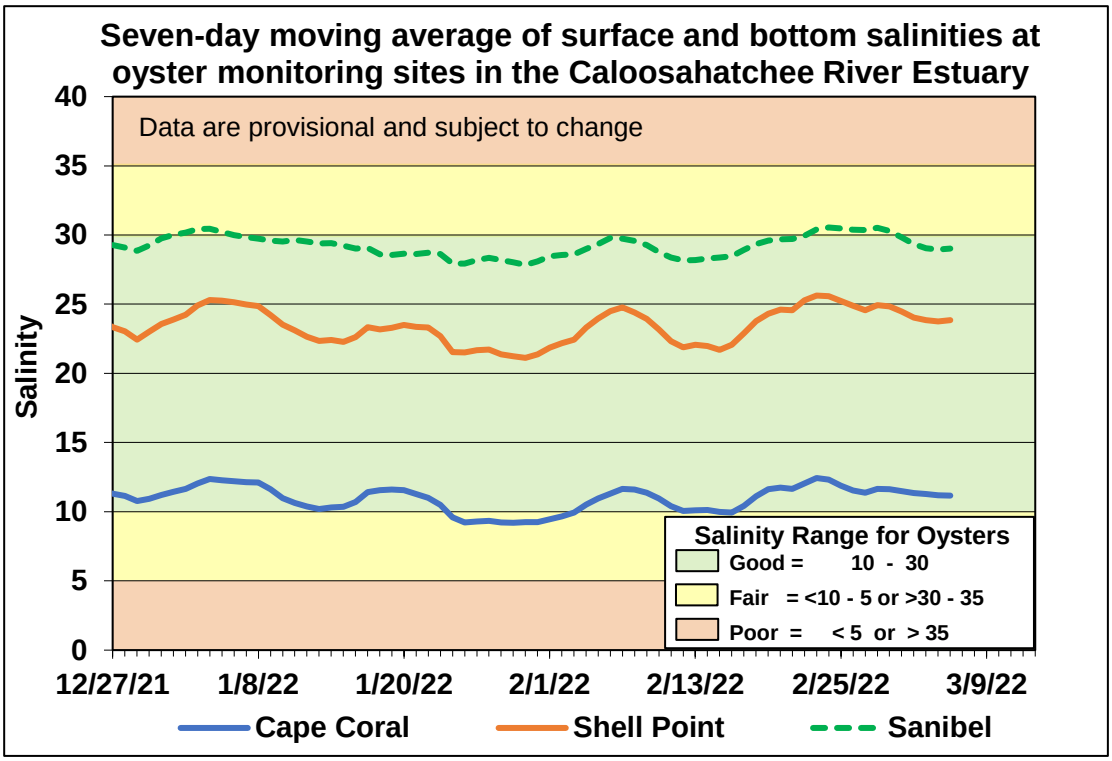


Figure ES-9. Seven-day moving average of surface and bottom salinities at Cape Coral, Shell Point and Sanibel monitoring sites in the Caloosahatchee River Estuary.

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	60	1.5	0.4
B	450	60	0.7	0.3
C	800	60	0.4	0.3
D	1000	60	0.3	0.3
E	1500	60	0.3	0.3
F	2000	60	0.3	0.3

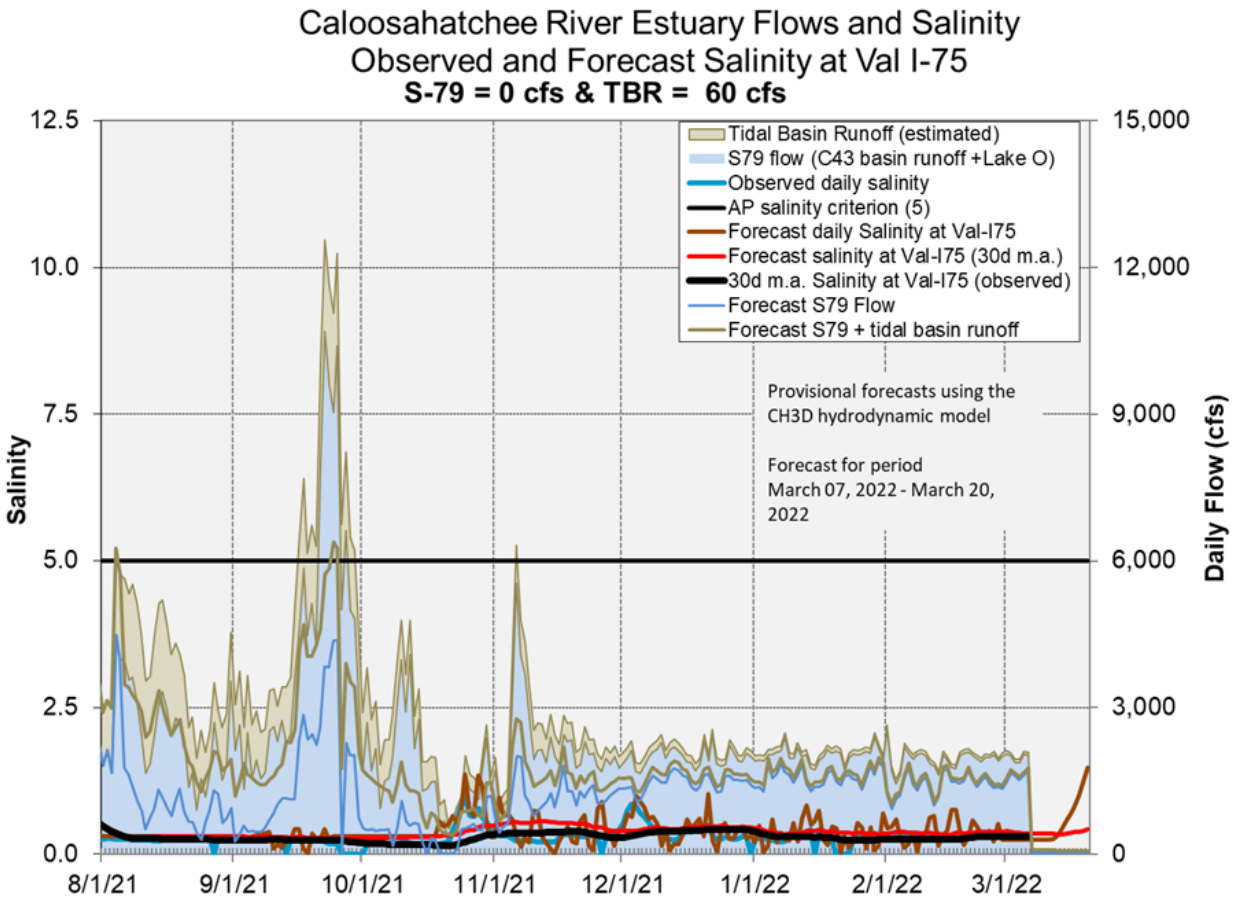


Figure ES-10. Forecasted Val I-75 site surface salinity assuming no pulse release at S-79.

Stormwater Treatment Areas

STA-1E: STA-1E Western Flow-way is offline for the Restoration Strategies project to fill and grade Cells 5 and 7, and the Eastern Flow-way is offline for vegetation management activities including rip-rap repairs related to Tropical Storm Eta. Operational restrictions are in place in STA-1E Central Flow-way for vegetation management activities. Online treatment cells are at or above target stage and vegetation in the flow-ways is stressed and highly stressed. The 365-day phosphorus loading rates (PLRs) is high for the Central Flow-way (**Figure S-1**).

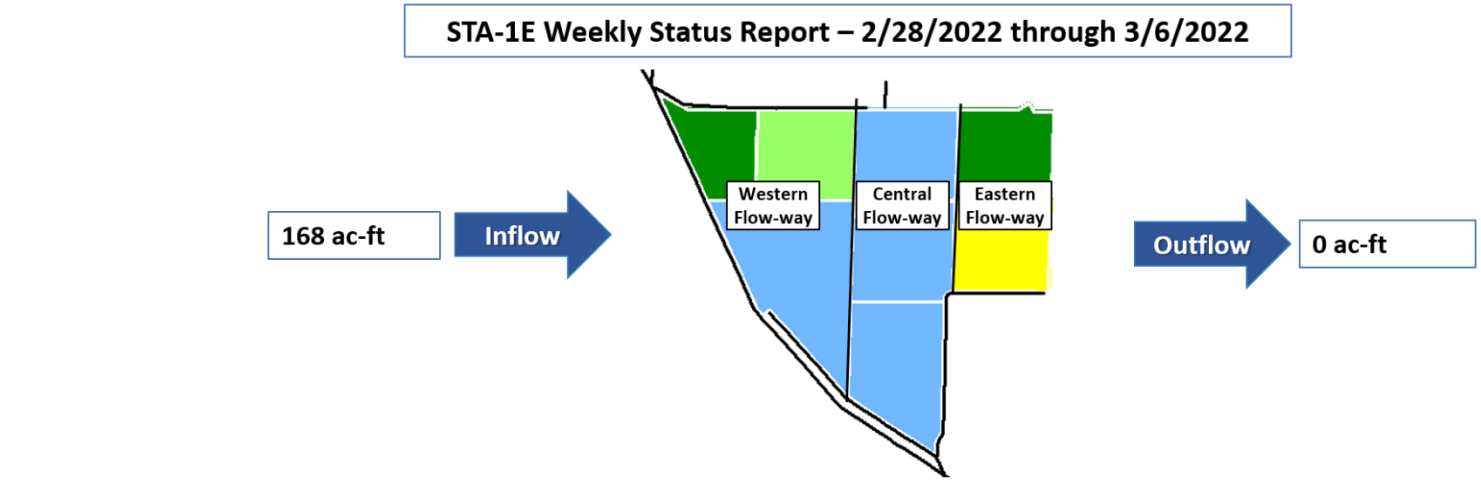
STA-1W: Operational restrictions are in place in STA-1W Western, Eastern, and Northern Flow-ways due to construction activities. Most treatment cells are at or near target stage. Vegetation in the flow-ways is stressed and highly stressed. The 365-day PLRs for the Northern, Western, and Eastern Flow-ways are below 1.0 g/m^2/year (**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 1, 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 1, 4 and 5 are below 1.0 g/m^2/year. The 365-day PLR for Flow-way 3 is high (**Figure S-3).**

STA-3/4: STA-3/4 Eastern Flow-way is offline for vegetation rehabilitation/drawdown. Most 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/m^2/year (**Figure S-4**).

STA-5/6: STA-5/6 Flow-way 4 is offline for vegetation management activities. 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 flow-ways 1, 6, 7, and 8 are below 1.0 g/m^2/year. The 365-day PLRs for flow-ways 4 and 5 are high. (**Figure S-5** and **S-6**).

For definitions on STA operational language see glossary following figures.



STA-1E Flow-Way Status			
Flow-Way	Vegetation Status (Healthy ----- Stressed)	365-day P Loading Rate (below 1.0 g P /m²/yr is optimal)	Online / Offline / Restrictions
Eastern	Offline, Tropical Storm Eta repairs starting 01/24/2022		
Central		1.0	Vegetation Rehab
Western	Offline, construction activities starting 11/01/2019		

As of 3/6/2022	
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')	
Low Water Level (<0.2' below TS)	
Depth / Area Based: Percent of Area Dry	
0-25% Dry	50-75% Dry
25-50% Dry	75-100% Dry

STA-1E Flow & Phosphorus Concentration			
	7-day	28-day	365-day
Total Inflow, ac-ft	168	2,781	179,190
--Lake Inflow, ac-ft	0	N/A	5,800
Total Outflow, ac-ft	0	373	150,519
Inflow Conc., ppb	34	55	122
Outflow Conc., ppb	N/A	23	23
Includes Preliminary Data			

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

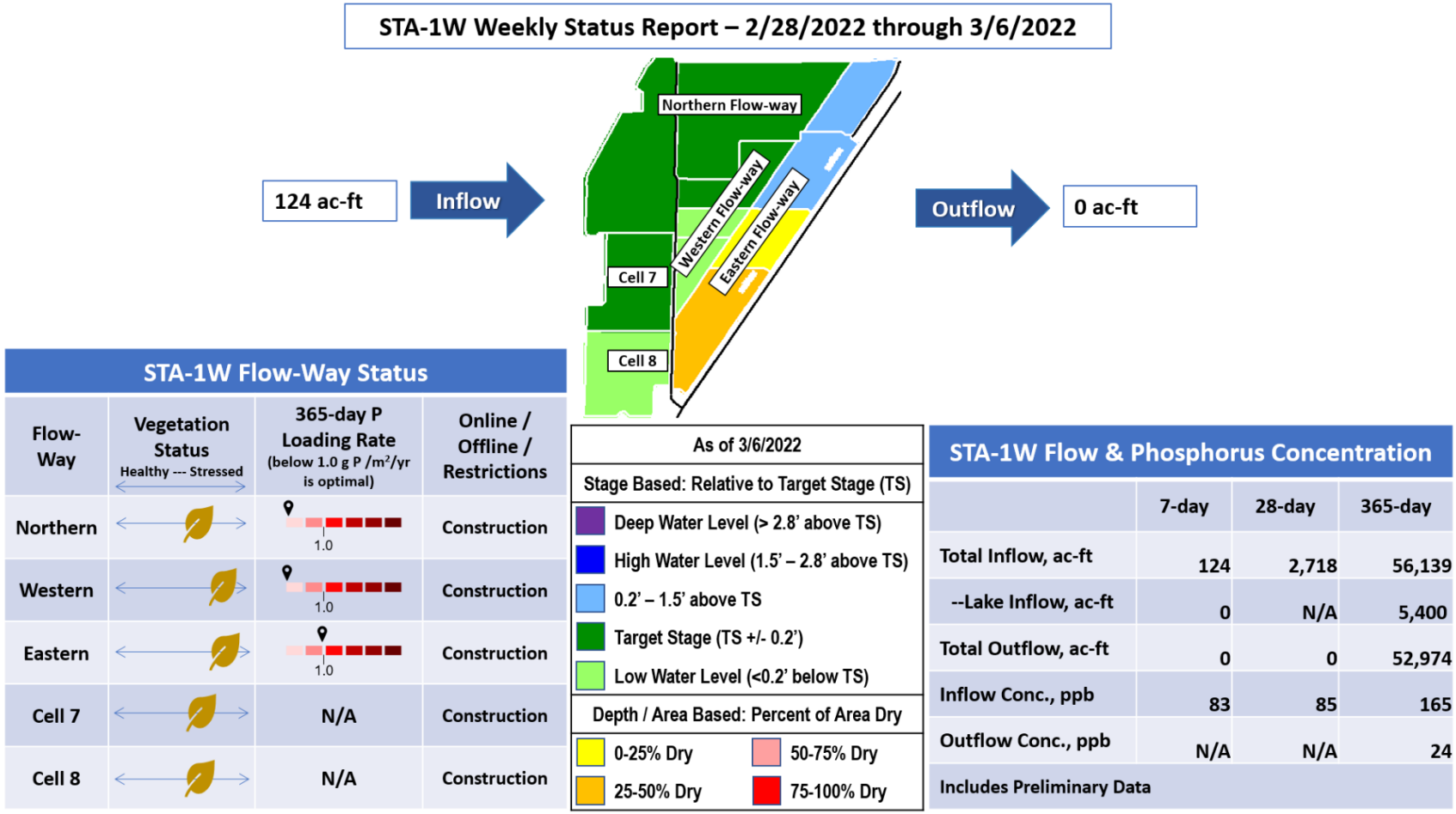
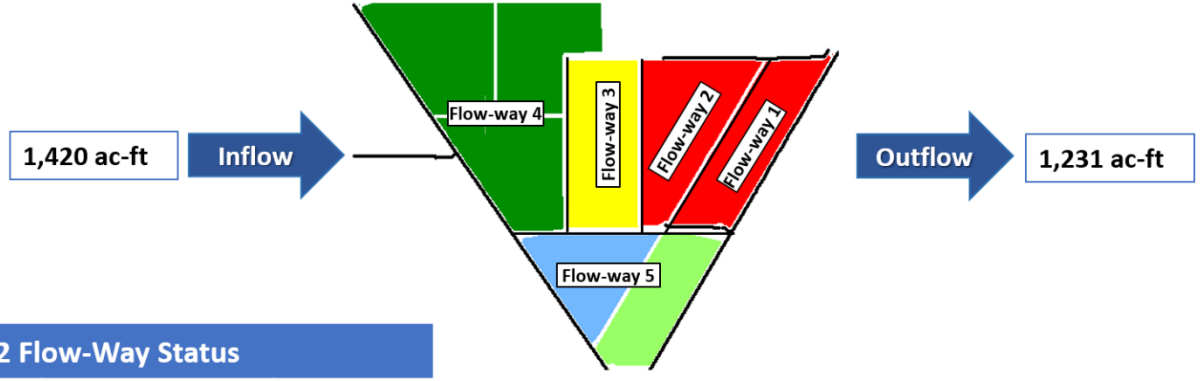


Figure S-2. STA-1W Weekly Status Report

STA-2 Weekly Status Report – 2/28/2022 through 3/6/2022



STA-2 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
1		1.0	Vegetation Management
2	Offline, construction activities as of 9/7/2021		
3		1.0	Vegetation Rehab
4		1.0	Vegetation Rehab
5		1.0	Online

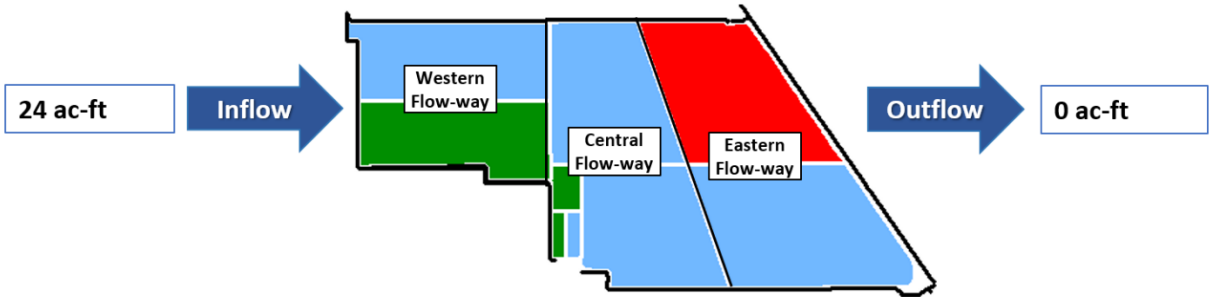
As of 3/6/2022	
Stage Based: Relative to Target Stage (TS)	
Deep Water Level (> 2.8' above TS)	
High Water Level (1.5' – 2.8' above TS)	
0.2' – 1.5' above TS	
Target Stage (TS +/- 0.2')	
Low Water Level (<0.2' below TS)	
Depth / Area Based: Percent of Area Dry	
0-25% Dry	50-75% Dry
25-50% Dry	75-100% Dry

STA-2 Flow & Phosphorus Concentration

	7-day	28-day	365-day
Total Inflow, ac-ft	1,420	6,464	321,393
--Lake Inflow, ac-ft	1,400	N/A	63,500
Total Outflow, ac-ft	1,231	5,524	336,161
Inflow Conc., ppb	48	42	88
Outflow Conc., ppb	13	13	15
Includes Preliminary Data			

Figure S-3. STA-2 Weekly Status Report

STA-3/4 Weekly Status Report – 2/28/2022 through 3/6/2022



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

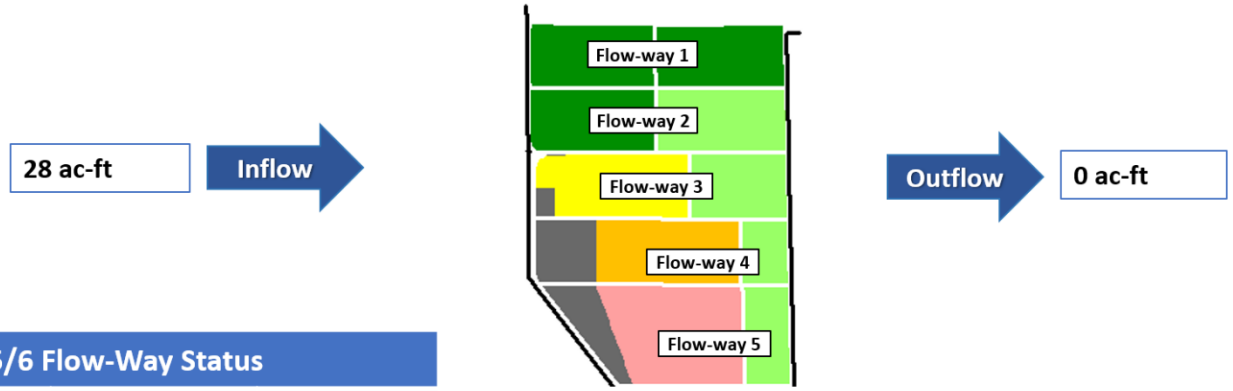
As of 3/6/2022	
Stage Based: Relative to Target Stage (TS)	
Deep Water Level (> 2.8' above TS)	
High Water Level (1.5' – 2.8' above TS)	
0.2' – 1.5' above TS	
Target Stage (TS +/- 0.2')	
Low Water Level (<0.2' below TS)	
Depth / Area Based: Percent of Area Dry	
0-25% Dry	50-75% Dry
25-50% Dry	75-100% Dry

STA-3/4 Flow & Phosphorus Concentration

	7-day	28-day	365-day
Total Inflow, ac-ft	24	26	358,560
--Lake Inflow, ac-ft	0	N/A	38,200
Total Outflow, ac-ft	0	1,007	316,294
Inflow Conc., ppb	30	29	65
Outflow Conc., ppb	N/A	20	15
Includes Preliminary Data			

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

STA-5/6 Weekly Status Report – 2/28/2022 through 3/6/2022



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
1		1.0	Online
2		N/A	Online
3		N/A	Online
4	Offline, vegetation management starting 01/24/2022		
5		1.0	Online

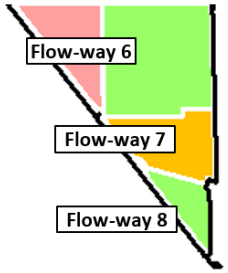
As of 3/6/2022	
Stage Based: Relative to Target Stage (TS)	
Deep Water Level (> 2.8' above TS)	
High Water Level (1.5' – 2.8' above TS)	
0.2' – 1.5' above TS	
Target Stage (TS +/- 0.2')	
Low Water Level (<0.2' below TS)	
Depth / Area Based: Percent of Area Dry	
0-25% Dry	50-75% Dry
25-50% Dry	75-100% Dry

STA-5/6 Flow & Phosphorus Concentration

	7-day	28-day	365-day
Total Inflow, ac-ft	28	678	177,796
--Lake Inflow, ac-ft	0	N/A	9,000
Total Outflow, ac-ft	0	260	169,265
Inflow Conc., ppb	67	80	243
Outflow Conc., ppb	N/A	17	50
Includes Preliminary Data			

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

STA-5/6 Weekly Status Report – 2/28/2022 through 3/6/2022



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 3/6/2022	
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')	
Low Water Level (<0.2' below TS)	
Depth / Area Based: Percent of Area Dry	
0-25% Dry	50-75% Dry
25-50% Dry	75-100% Dry

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: The 1-8C stage fell faster than the slope of the falling Zone A1 regulation line last week. The average on Sunday was 0.18 feet above that line. WCA-2A: Stage change at S11B headwater was once again flat. The average at that gauge on Sunday remained 1.10 feet higher than the regulation line. WCA-3A: Last week the Three Gauge Average stages continued to fall faster than the slope of the Zone A regulation line; average stage was 0.87 feet below the falling regulation line on Sunday. WCA-3A: Stage returned to a normal recession at gauge 62 (Northwest corner) last week, the average on Sunday was 0.81 feet below the Upper schedule line. (**Figures EV-1** through **EV-4**).

Water Depths

The SFWDAT tool indicates that water depths and hydro-patterns have been relatively stable in WCAs 1 and 2 over the last two months. To the south the spatial extent of regions with below-ground stages are expanding quickly in northeastern WCA-3A. North to South hydrologic connectivity continues to diminish but remains within Everglades National Park's Shark River and Taylor sloughs. Stages fell below ground across much of southern BCNP as is typical but not favorable for this time of year. (**Figure EV-5**). Comparing current WDAT water depths to the depth one month ago, stages are decreasing slowly across most of the EPA with only WCA-2A unchanged or even gaining in water depth on the eastern side. Looking back one year, most of the EPA south of WCA-2A is lower in depth than one year ago, eastern WCA-3A significantly so. (**Figure EV-6)**. Comparing current depths to the past 20 years, the eastern half WCA-3A is below the 20th percentile. Portions of WCA-1 and northeastern SRS remain above the 90th percentile but are trending dryer than previous weeks model output (**Figure EV-7**).

Taylor Slough and Florida Bay

Only 0.02 inches of rain fell over Taylor Slough and Florida Bay during the week ending Sunday, 3/6. Stages in Taylor Slough decreased an average of 0.11 feet over this past week with the largest weekly change of -0.21 feet in the northern Taylor Slough area similar to last week (**Figure EV-8**). The Slough, as a whole, is still 9.4 inches higher than average while the northern parts are 17 inches higher than the historical average for this time of year (pre-Florida Bay initiative which started in 2017). The rapid decrease in the northern parts of the Slough expected in the late dry season have begun (**Figure EV-9**). Given the expectation of a continued dry dry-season, maintaining water deliveries to the area would slow the recession in the slough so water movements south can be expedited once the wet season starts.

Salinities in Florida Bay averaged an increase of 1.5 over the week ending 3/6, with individual station changes ranging from −0.0 to +3.6 (**Figure EV-8**). Weekly flow from the 5 main creeks feeding the Bay decreased to 1,400 acre-feet because of some wind-driven upstream flows during the week but relatively strong positive flows for this time of year returned by the weekend. The average salinities in the eastern and central areas increased slightly to start the week and then decreased again over the weekend (**Figure**

EV-10). Current condition across the Bay is 1.5 psu higher than the long term mean and in the lower half of the interquartile ranges.

Water Management Recommendations

Conserving water in the northern basins, then allowing that water to move downstream as we transition into the dry season maximizes the ecological benefit of freshwater on the landscape. This recommendation is currently being epitomized with WCA-1 and STA2 discharges hydrating northern WCA-2A, being picked up by S7 which then supplies NE and NW WCA-3A North. This operation is more ecologically advantageous than outflow from the S-11 structures as long as a normal recession rate can be returned to WCA-2A. However, if conditions warrant (i.e. reversal imminent), the opening of the S-11s may serve to keep wading birds foraging within that basin, supporting the Alley North colony as there is very little available foraging habitat in WCA-3A North.

Stage conditions in northeastern WCA-3AN continue to warrant further consideration as aerial observation confirms WDAT model output indicating very dry, below average levels. However recent inflows via the S-150 were anecdotally confirmed once again this week from the air as having a positive result on stages in northeastern WCA-3A. When possible, control structure discharges into both the western and eastern areas of WCA-3A, will greater ecological benefit than discharges to the west alone. Continued freshwater to the Taylor Slough area, a discharge amount that maintains stage will help expedite deliveries to the south when the wet season begins. 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	0.04	−0.15
WCA-2A	0.03	−0.02
WCA-2B	0.02	−0.16
WCA-3A	<0.01	−0.14
WCA-3B	0.01	−0.12
ENP	0.02	−0.14

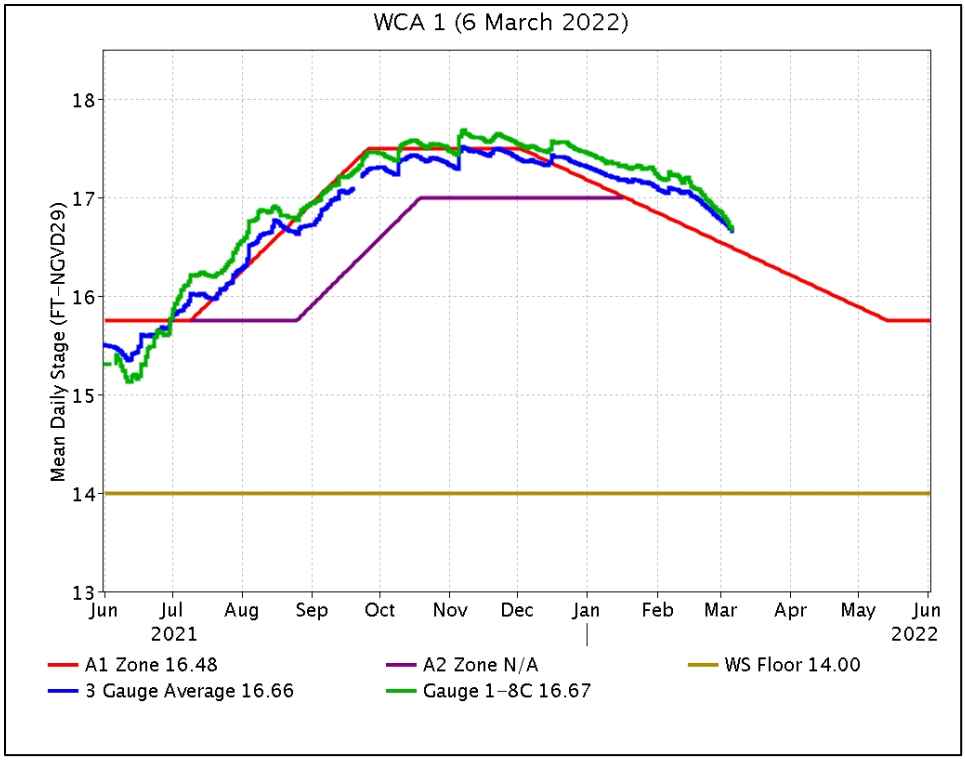


Figure EV-1. WCA-1 stage hydrographs and regulation schedule.

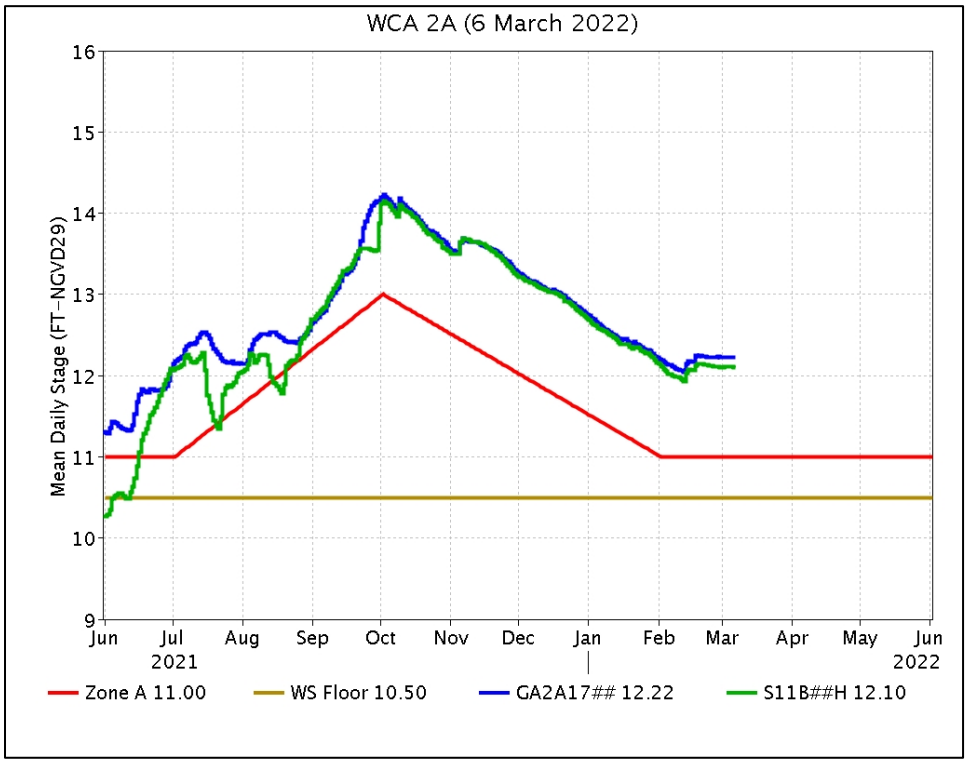


Figure EV-2. WCA-2A stage hydrographs and regulation schedule.

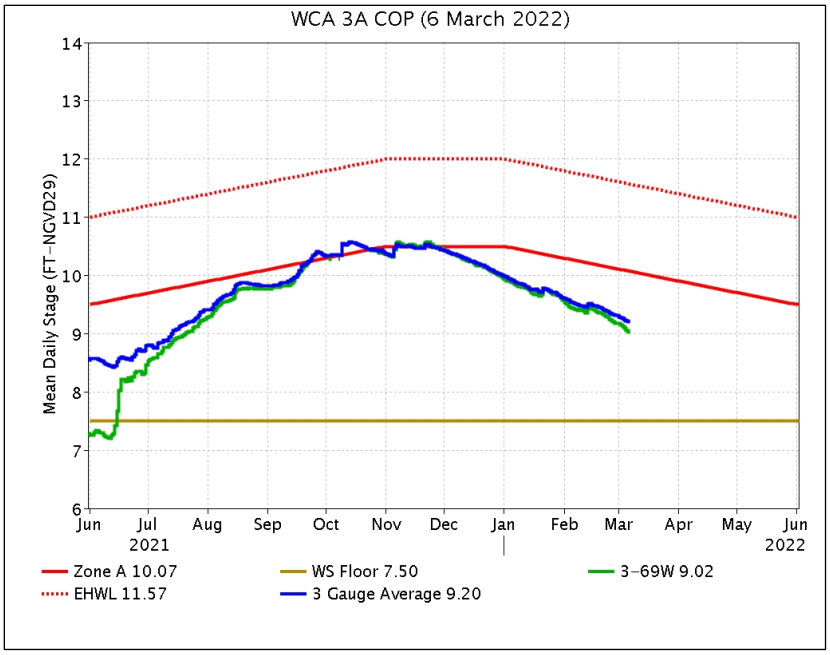


Figure EV-3. WCA-3A stage hydrographs (three-gauge average, S-333 headwater) and regulation schedule.

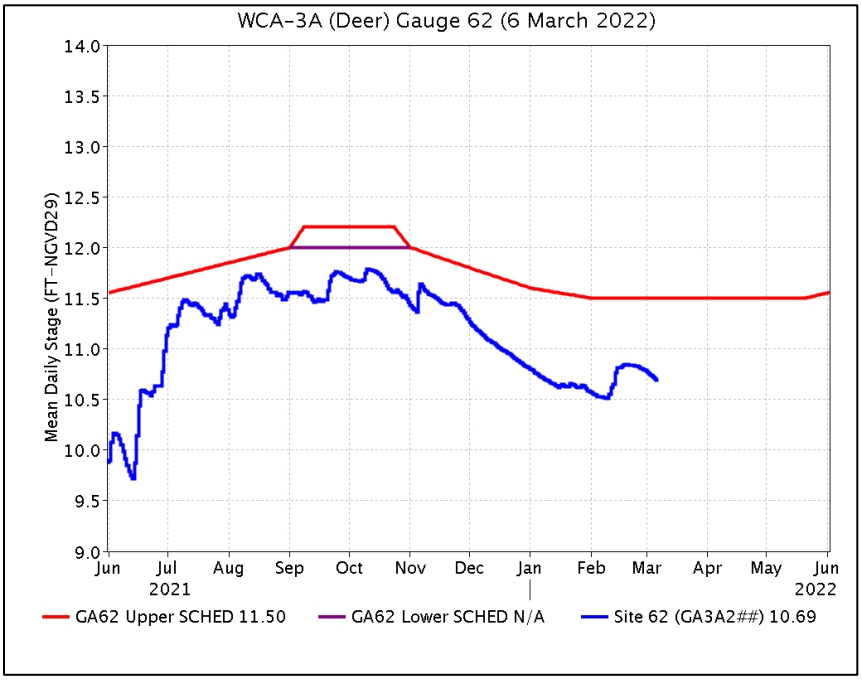


Figure EV-4. WCA-3A stage hydrograph (Deer gauge; Site 62) and CA62 regulation schedule.

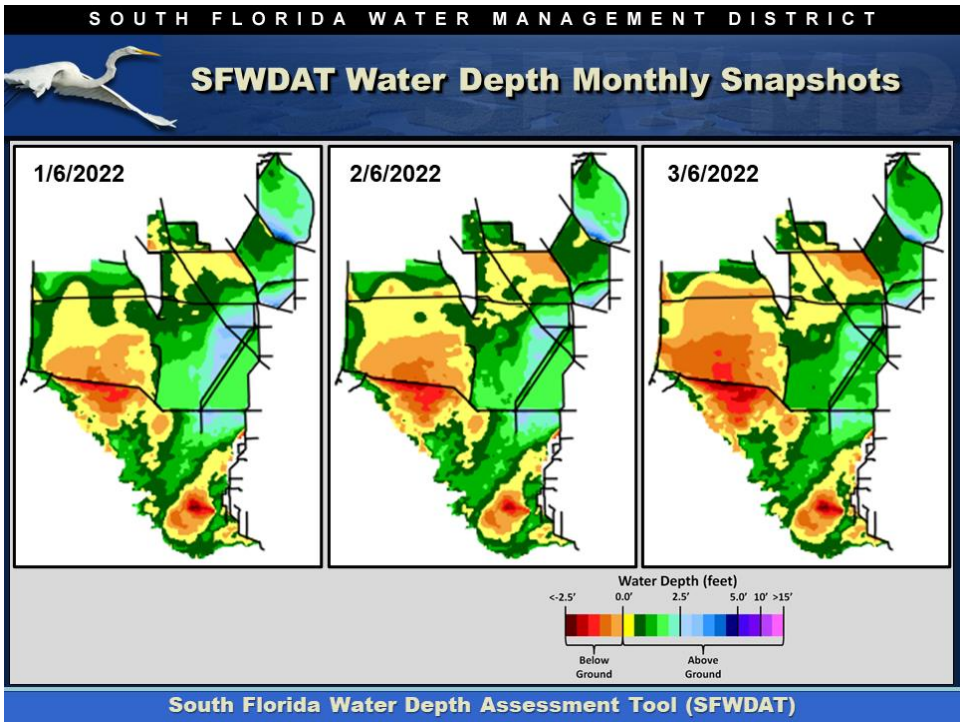


Figure EV-5. Everglades water depths from two months ago (left), one month ago (center) and present (right), based on SFWDAT.

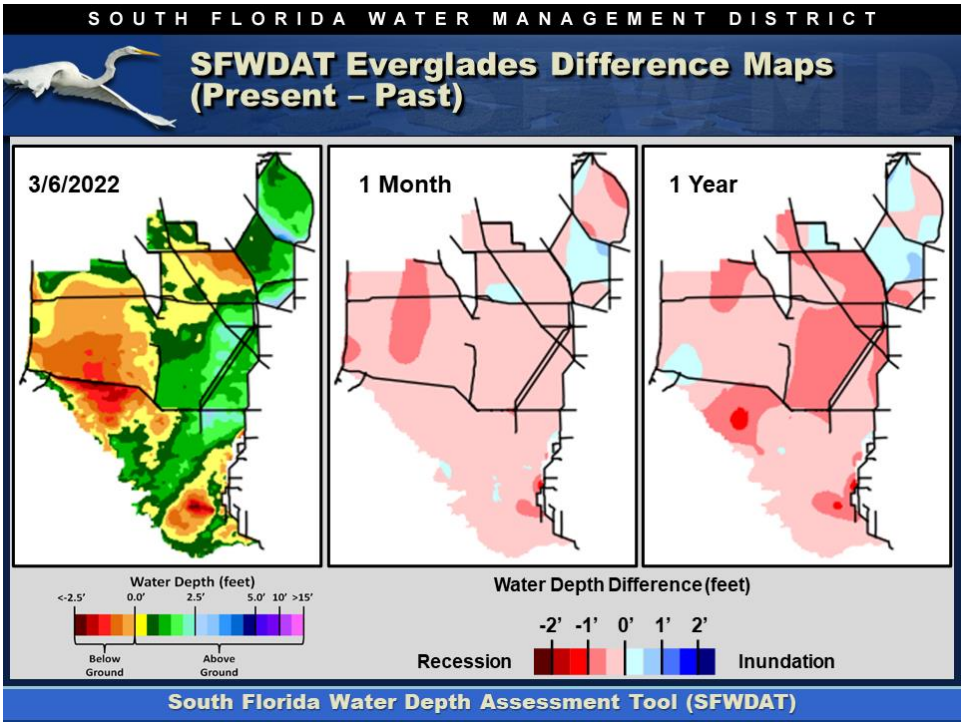


Figure EV-6. Present Everglades water depths (left) and water depth changes from one month (center) and one year (right) ago, based on SFWDAT.

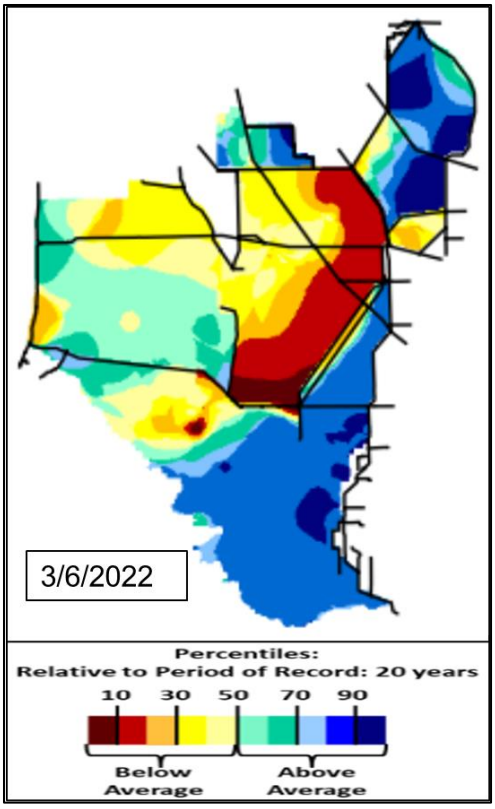


Figure EV-7. Present water depths compared to the day of year median over the previous 20 years.

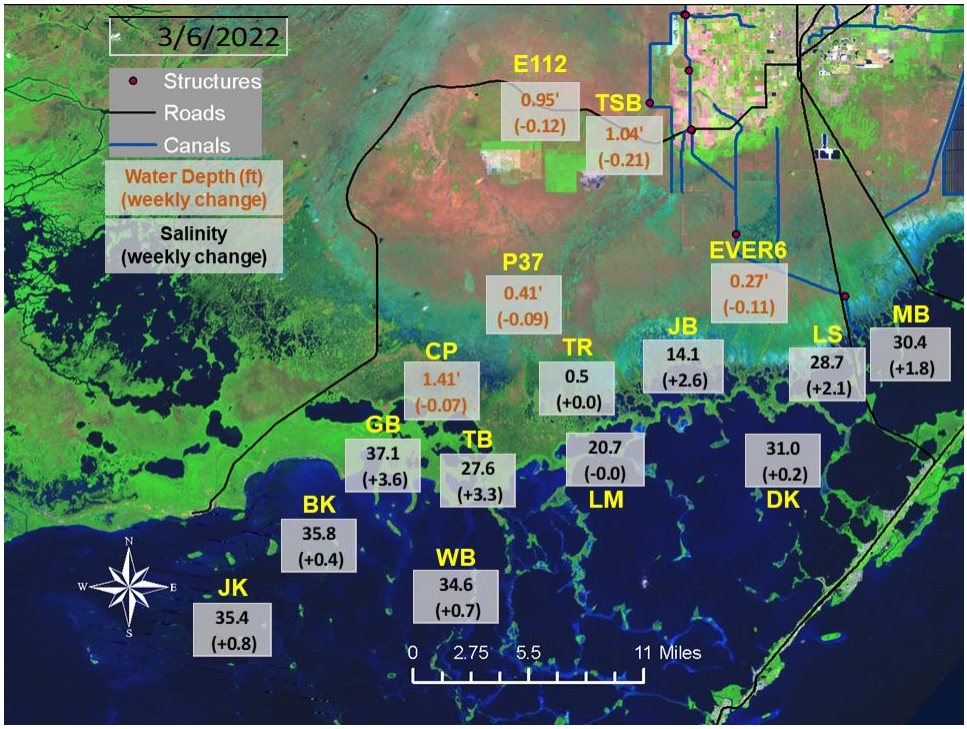


Figure EV-8. Taylor Slough water depths with changes since a week ago and Florida Bay salinities with changes since a week ago.

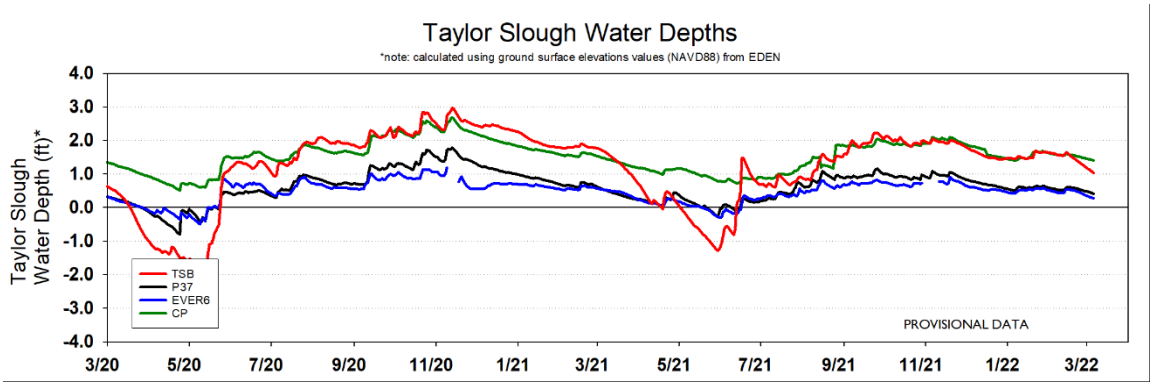


Figure EV-9. Taylor Slough water depth time series.

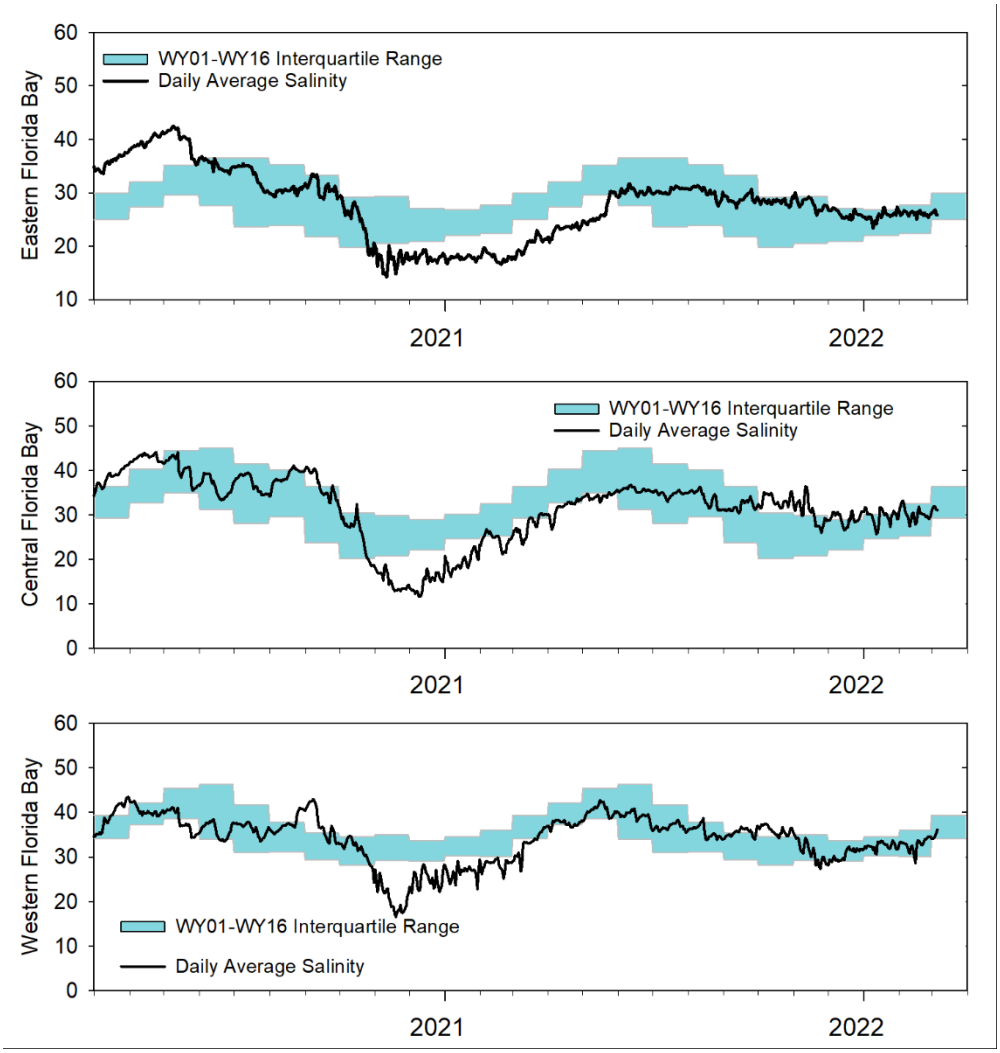


Figure EV-10. Eastern (top panel), Central (middle panel) and Western (bottom panel) Florida Bay daily average salinities with interquartile (25-75 percentile) ranges.

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

SFWMD Everglades Ecological Recommendations, February 22, 2022 (red is new)			
Area	Weekly change	Recommendation	Reasons
WCA-1	Stage decreased by 0.15'	Allow water to move south from this basin until stages reach the regulation schedule. Return to a recession rate of less than 0.10 feet per week.	Protect within basin and downstream habitat and wildlife. Stages are above the 90th percentile.
WCA-2A	Stage decreased by 0.02'	Conserve water in this basin letting the water move south when conditions allow, with northern WCA-3A as the priority for receiving discharge. A recession rate less than 0.10 feet per week has an ecological benefit.	Protect within basin and downstream habitat and wildlife. Protect peat soil and future wading bird forage as the dry season progresses.
WCA-2B	Stage decreased by 0.16'	Conserve water in this basin, maintain a minimum input to maintain stage while moving water south when conditions allow.	Protect within basin and downstream habitat and wildlife.
WCA-3A NE	Stage decreased by 0.14'	Conserve water in this basin, while letting the water move south when conditions allow. Keeping a recession rate less than 0.10 feet per week has an ecological benefit.	Protect within basin peat soils, and downstream habitat and wildlife. Inflows via the S-150 are anecdotally observed to be positively impacting stages in NE WCA-3A North.
WCA-3A NW	Stage decreased by 0.12'	Conserve water in this basin letting the water move south when conditions allow.	
Central WCA-3A S	Stage decreased by 0.12'	Return to a recession rate that is less than 0.10 feet per week. Allow flows to move south as conditions allow.	Protect within basin and downstream habitat and wildlife.
Southern WCA-3A S	Stage decreased by 0.16'		
WCA-3B	Stage decreased by 0.12'	Return to a recession rate of less than 0.10 feet per week in this basin, letting the water move south when conditions allow.	Protect within basin and downstream habitat and wildlife.
ENP-SRS	Stage decreased by 0.14'	Make discharges to ENP according to COP and TTFF protocol while adaptively considering upstream and downstream ecological conditions.	Protect within basin and upstream habitat and wildlife.
Taylor Slough	Stage changes ranged from −0.07' to −0.21'	Move water southward as possible.	When available, provide freshwater buffer for downstream conditions.
FB- Salinity	Salinity changes ranged −0.0 to +3.6	Move water southward as possible.	When available, provide freshwater to maintain low salinity buffer and promote water movement.

Biscayne Bay

As shown in **Figure BB-1**, mean total inflow to Biscayne Bay was 199 cfs and the previous 30-day mean inflow was 291 cfs. The seven-day mean salinity was 28.7 at BBCW8 and 22.1 at BBCW10, both below the preferred maximum salinity of 35 for these sites. Data provided by Biscayne National Park.

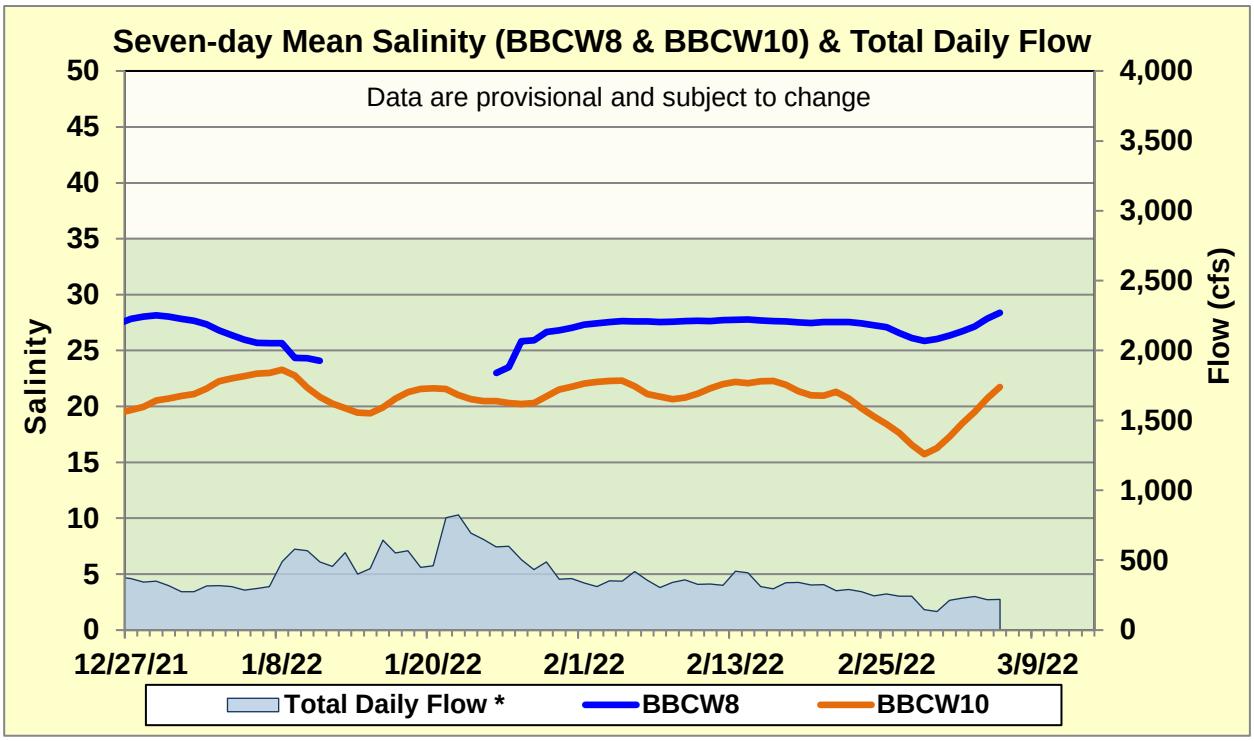


Figure BB-1. Seven-day mean salinity at BBCW8 and BBCW10 and total daily flow in Biscayne Bay. Total daily flow was calculated using flow from structures S20G, S20F, S21, S21A, S123, and S700P.