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: February 9, 2022

SUBJECT: Weekly Environmental Conditions for Systems Operations

Summary

Weather Conditions and Forecast

Light rains will shift southeastward with a front early on Wednesday, with the last of the rains diminishing or exiting the southeastern half of the District Wednesday morning or afternoon. A dry, cool and stable air mass will then settle across the District behind the front later on Wednesday as the fronts shifts eastward Thursday morning. The dry and cool weather should last through Saturday across the District. However, the front could move northward if a weak frontal wave forms along it, causing some shower activity in the east Friday and early Saturday before diminishing, but confidence is not very high on this scenario at this time. The late-week weather forecast is of even lower confidence, with some model solutions showing low pressure forming over the Gulf of Mexico and rains developing ahead of it with another frontal passage on Sunday. However, the majority of the more reliable solutions show a mild and dry weather pattern persisting from Saturday through Sunday, with a “dry” frontal passage on Sunday, ushering in a breezy, much colder, and dry weather early next week.

Kissimmee

Flow at S-65 was maintained at ~1400 cfs to stop the stage rise in KCH, and water depth on the Kissimmee River floodplain was steady with a mean depth of 0.21 feet as of February 6, 2022. The concentration of dissolved oxygen in the Kissimmee River has remained well above levels of concern, with an average of 9.4 mg/L for the week ending on February 6, 2022.

Lake Okeechobee

Lake Okeechobee stage was 14.79 feet NGVD on February 06, 2022 and it was 0.58 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) increased from the previous week, going from 1,040 cfs to 1,124 cfs. Average daily outflows (excluding evapotranspiration) decreased from the previous week, going from 3,307 cfs to 2,306 cfs. Recent satellite imagery

(February 05, 2022) showed scattered areas of low to moderate bloom potential along the western shorelines (**Figure LO-6**).

Estuaries

Total inflow to the St. Lucie Estuary averaged approximately 161 cfs over the past week with no flow coming from Lake Okeechobee. Mean salinities increased at all sites in the estuary 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 2,022 cfs over the past week with 1,368 cfs coming from the Lake. Mean salinities remained the same at S-79, decreased slightly at Val I-75, and increased 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, February 6, 2022, approximately 900 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 80,000 ac-feet. The total amount of inflows to the STAs in WY2022 is approximately 975,000 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 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

WCA-1, WCA-2A, WCA-3B and eastern ENP depths remain above average. Elevated recessions at the gauges in WCA-3A meant every region within that basin had poor recession rates except the northwest. Depths are lower in WCA-3A North than any other gauge locations and stages are likely too low to support much nesting at the Alley North colony. Conditions remained fair in Taylor Slough and Florida Bay last week. Salinities rose only slightly, and stages remain high in northern Taylor slough, aided by sustained discharges. Conditions are looking favorable for CSSS habitat and nesting this year.

SUPPORTING INFORMATION

Kissimmee Basin

Upper Kissimmee

On February 6, 2022, lake stages were 57.5 feet NGVD (0.5 feet below schedule) in East Lake Toho, 54.1 feet NGVD (0.9 feet below schedule) in Lake Toho, and 49.9 feet NGVD (2.3 feet below schedule) in Lakes Kissimmee-Cypress-Hatchineha (KCH) (**Table KB-1**, **Figures KB-1-3**).

Lower Kissimmee

Discharges to the Kissimmee River on February 6, 2022 were 1,330 cfs at S-65 and 1,280 cfs at S-65A; discharges from the Kissimmee River were 1,150 cfs at S-65D and 1,070 cfs at S-65E (**Table KB-2**). Headwater stages were 46.4 feet NGVD at S-65A and 26.7 feet NGVD at S-65D on February 6, 2022. With lower water temperatures, the concentration of dissolved oxygen is well above the region of concern, with an average of 9.4 mg/L for the week ending on February 6, 2022 (**Table KB-2**, **Figure KB-4**). Flow at S-65 was maintained at ~1,400 cfs to stop a stage rise in KCH, and water depth on the Kissimmee River floodplain was steady with a mean depth of 0.21 feet as of February 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 flat or 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)	
							2/6/22	*1/30/22*
Lakes Hart and Mary Jane	S-62	LKMJ	0	N/A	R	61.0	N/A	-0.1
Lakes Myrtle, Preston and Joel	S-57	S-57	15	61.3	R	61.3	0.0	0.0
Alligator Chain	S-60	ALLI	0	64.0	R	64.0	0.0	0.0
Lake Gentry	S-63	LKGT	0	N/A	R	61.5	N/A	-0.1
East Lake Toho	S-59	TOHOE	74	57.5	R	58.0	-0.5	-0.4
Lake Toho	S-61	TOHOW S-61	142	54.1	R	55.0	-0.9	-0.9
Lakes Kissimmee, Cypress and Hatchineha	S-65	KUB011 LKIS5B	1,378	49.9	R	52.2	-2.3	-2.3

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.

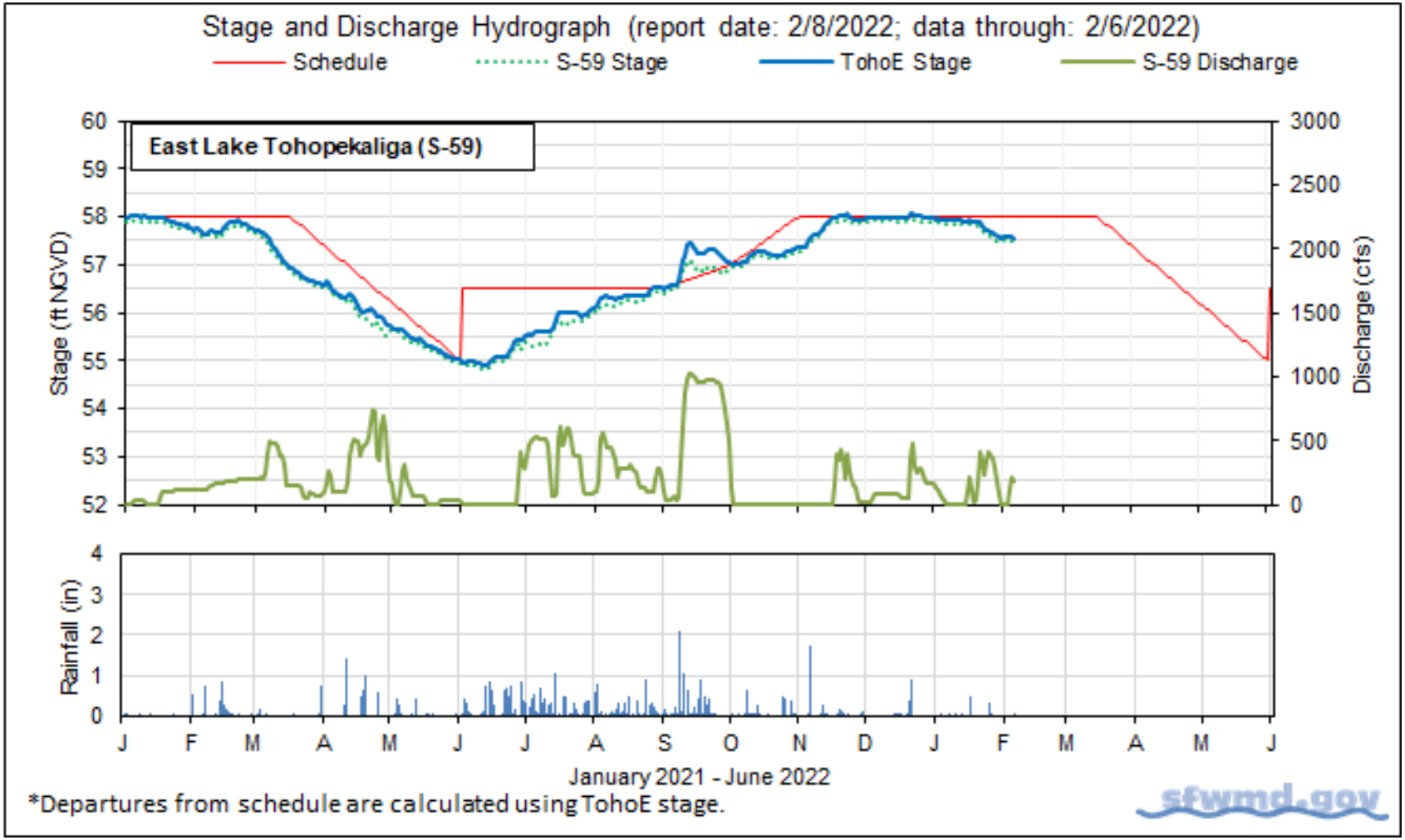


Figure KB-1. East Lake Toho regulation schedule, stage, discharge and rainfall.

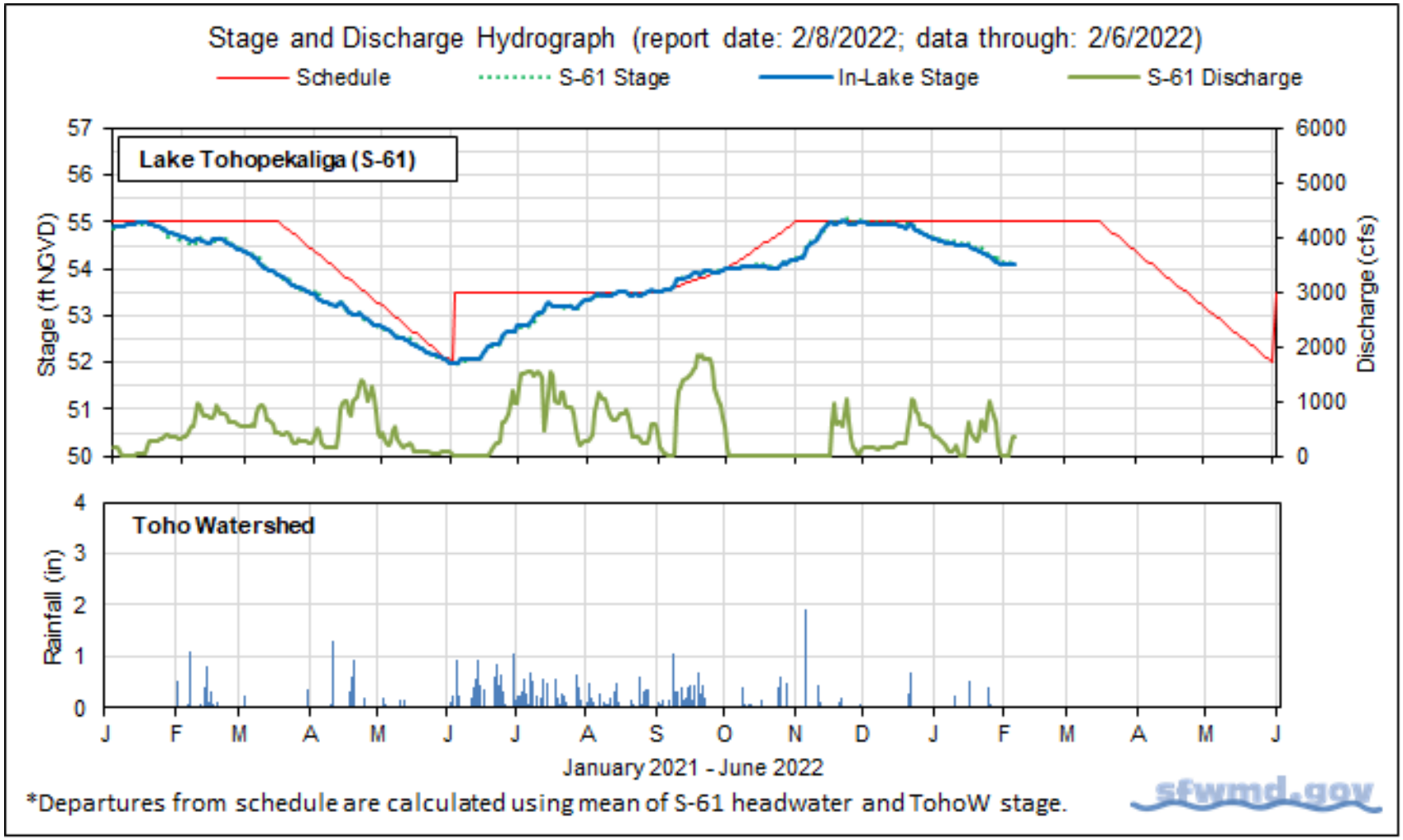


Figure KB-2. Lake Toho regulation schedule, stage, discharge and rainfall.

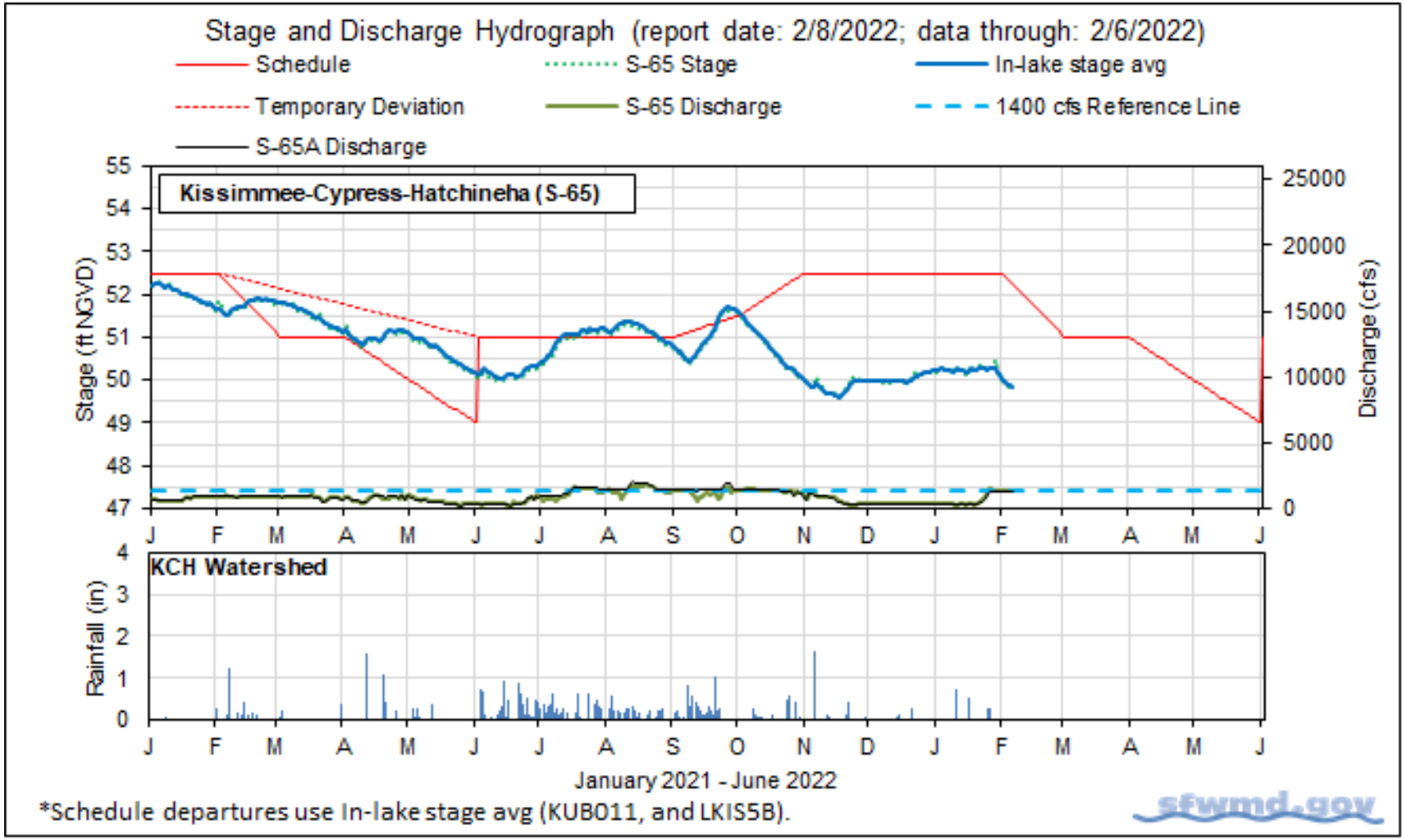


Figure KB-3. Lakes Kissimmee, Cypress and Hatchineha regulation schedule, stage, discharge and rainfall.

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			
		2/6/22	2/6/22	1/30/22	1/23/22	1/16/22
Discharge	S-65	1,330	1,380	1,310	440	330
Discharge	S-65A[a]	1,280	1,270	1,190	400	290
Headwater Stage (feet NGVD)	S-65A	46.4	46.3	46.4	46.3	46.4
Discharge	S-65D[b]	1,150	1,110	840	360	310
Headwater Stage (feet NGVD)	S-65D[c]	26.7	26.7	26.6	26.6	26.5
Discharge (cfs)	S-65E[d]	1,070	1,060	820	380	340
Discharge (cfs)	S-67	0	0	0	0	0
Dissolved Oxygen (mg/L) [e]	Phase I, II/III river channel	8.9	9.4	9.0	8.7	7.9
Mean depth (feet) [f]	Phase I floodplain	0.21	0.21	0.18	0.20	0.18

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

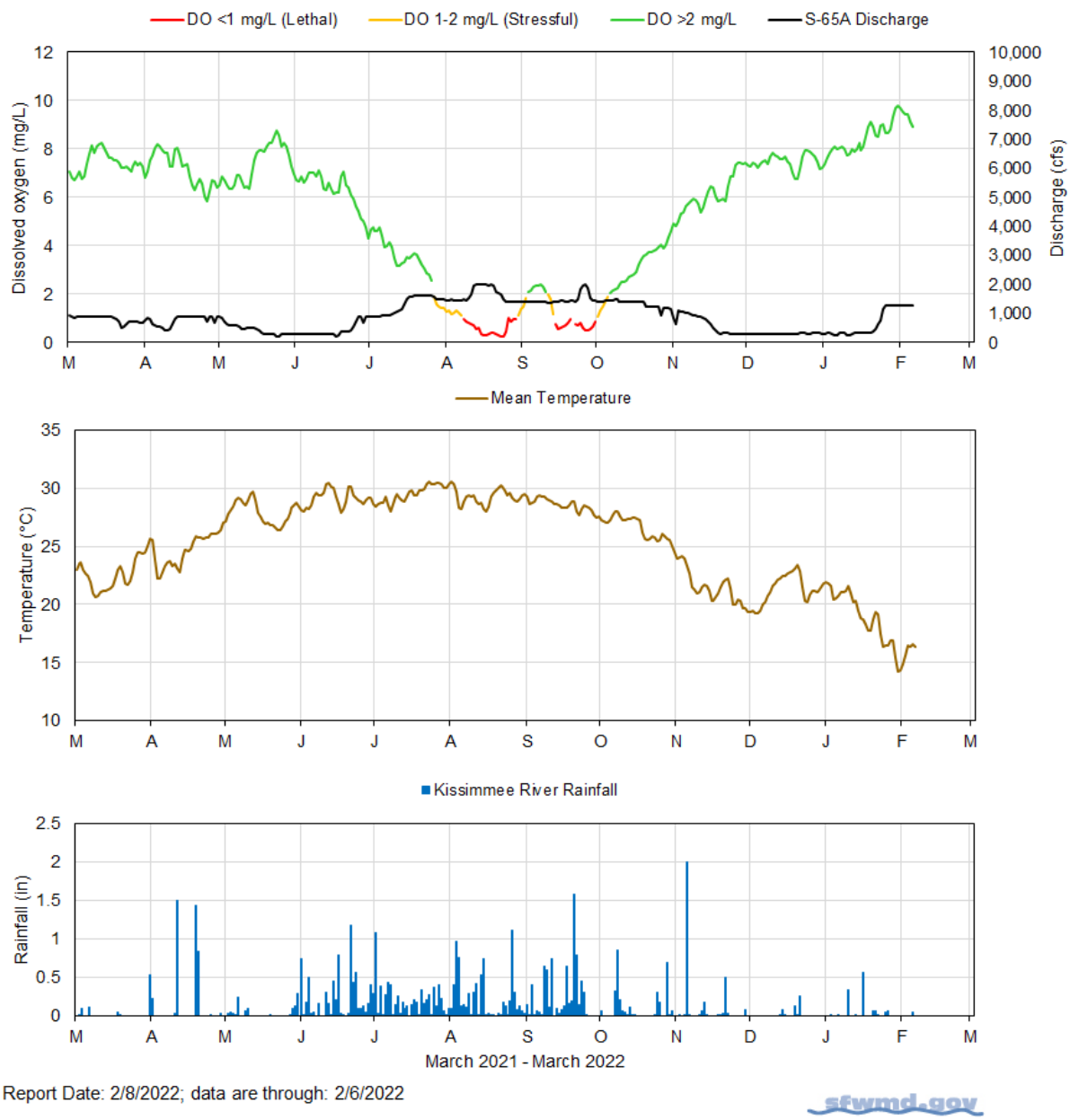


Figure KB-4. Restored Kissimmee river channel mean daily dissolved oxygen concentration (mg/L), S-65A discharge (cfs), temperature (°C) and rainfall (inches). Dissolved oxygen (DO) and temperature are mean daily values averaged for PC62, KRBN, PC33, PD62R, and PD42R with an average of three stations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

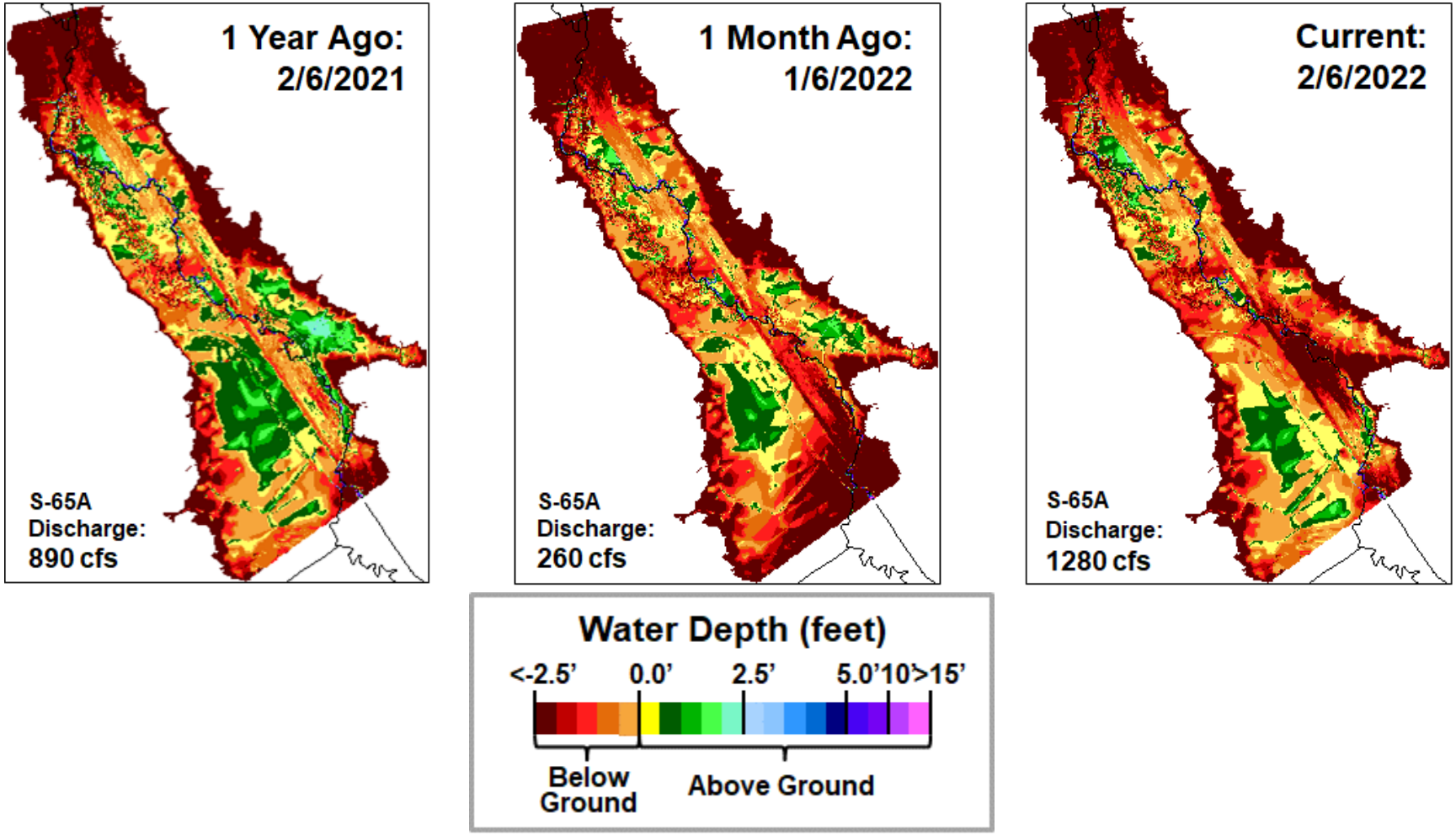
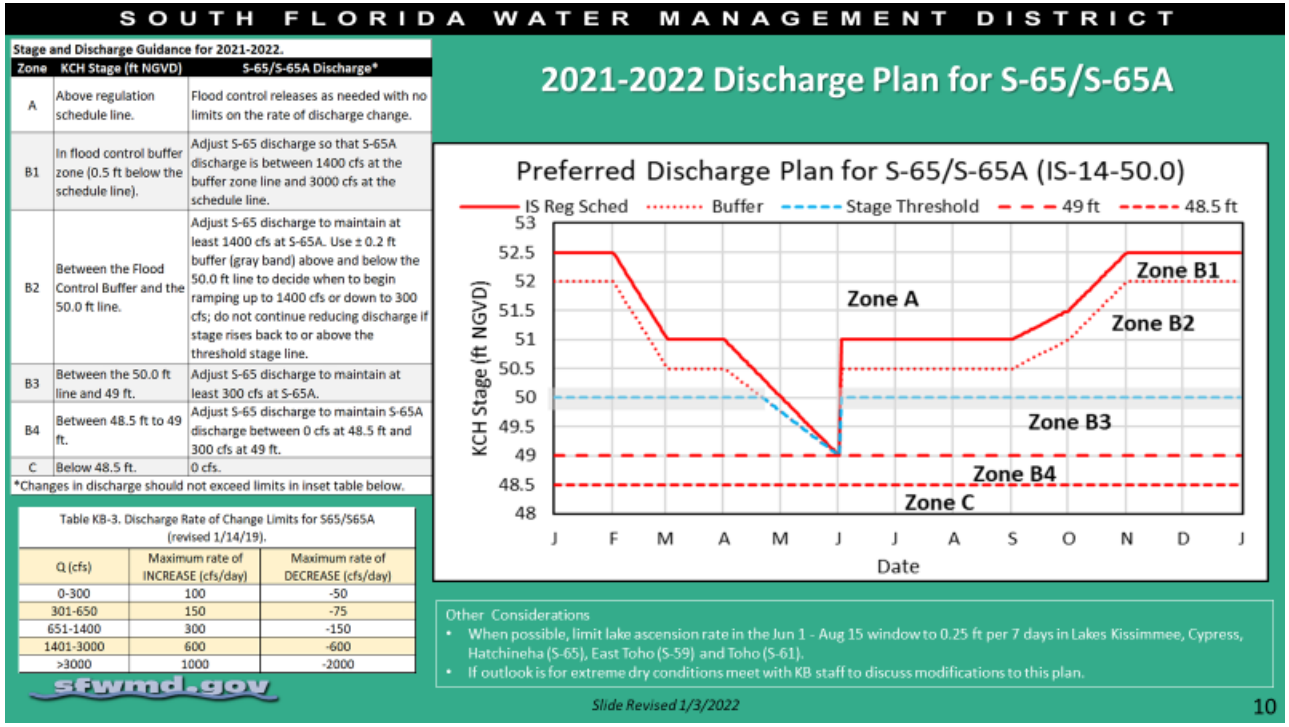


Figure KB-5. Phase I area Kissimmee River floodplain water depths (from left to right) one year ago, one month ago and current.



Stage and Discharge Guidance for 2021-2022.

Zone	KCH Stage (ft NGVD)	S-65/S-65A Discharge*
A	Above regulation schedule line.	Flood control releases as needed with no limits on the rate of discharge change.
B1	In flood control buffer zone (0.5 ft below the schedule line).	Adjust S-65 discharge so that S-65A discharge is between 1400 cfs at the buffer zone line and 3000 cfs at the schedule line.
B2	Between the Flood Control Buffer and the 50.0 ft line.	Adjust S-65 discharge to maintain at least 1400 cfs at S-65A. Use ± 0.2 ft buffer (gray band) above and below the 50.0 ft line to decide when to begin ramping up to 1400 cfs or down to 300 cfs; do not continue reducing discharge if stage rises back to or above the threshold stage line.
B3	Between the 50.0 ft line and 49 ft.	Adjust S-65 discharge to maintain at least 300 cfs at S-65A.
B4	Between 48.5 ft to 49 ft.	Adjust S-65 discharge to maintain S-65A discharge between 0 cfs at 48.5 ft and 300 cfs at 49 ft.
C	Below 48.5 ft.	0 cfs.

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

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

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

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 14.79 feet NGVD on February 06, 2022, with water levels 0.58 feet lower than a month ago (**Figure LO-1**). Lake stage remains in the Low sub-band (**Figure LO-2**) and has been within the ecological envelope since January 1, 2022, after spending 279 days (79%) of the last year above the envelope (**Figure LO-3**). According to NEXRAD, 0.01 inches of rain fell directly on the Lake last week.

Average daily inflows (excluding rainfall) increased from the previous week, going from 1,040 cfs to 1,124 cfs. Average daily outflows (excluding evapotranspiration) decreased from the previous week, going from 3,307 cfs to 2,306 cfs. Highest inflows came from the Kissimmee River through the S-65E structure (1,062 cfs). The highest outflow (1,848 cfs) was to the west via the S-77 structure, while 236 cfs flowed south via the S-350 structures (S-351, 164 cfs; S-352, 10 cfs; S-354, 64 cfs). There was 36 cfs of outflow to the east via the S-308 structure and 189 cfs of outflow to 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 most recent satellite image (February 05, 2022) from the NOAA cyanobacteria monitoring product derived from EUMETSAT's Sentinel 3 OLCI sensor showed scattered areas of low to moderate bloom potential along the western shorelines (**Figure LO-6**).

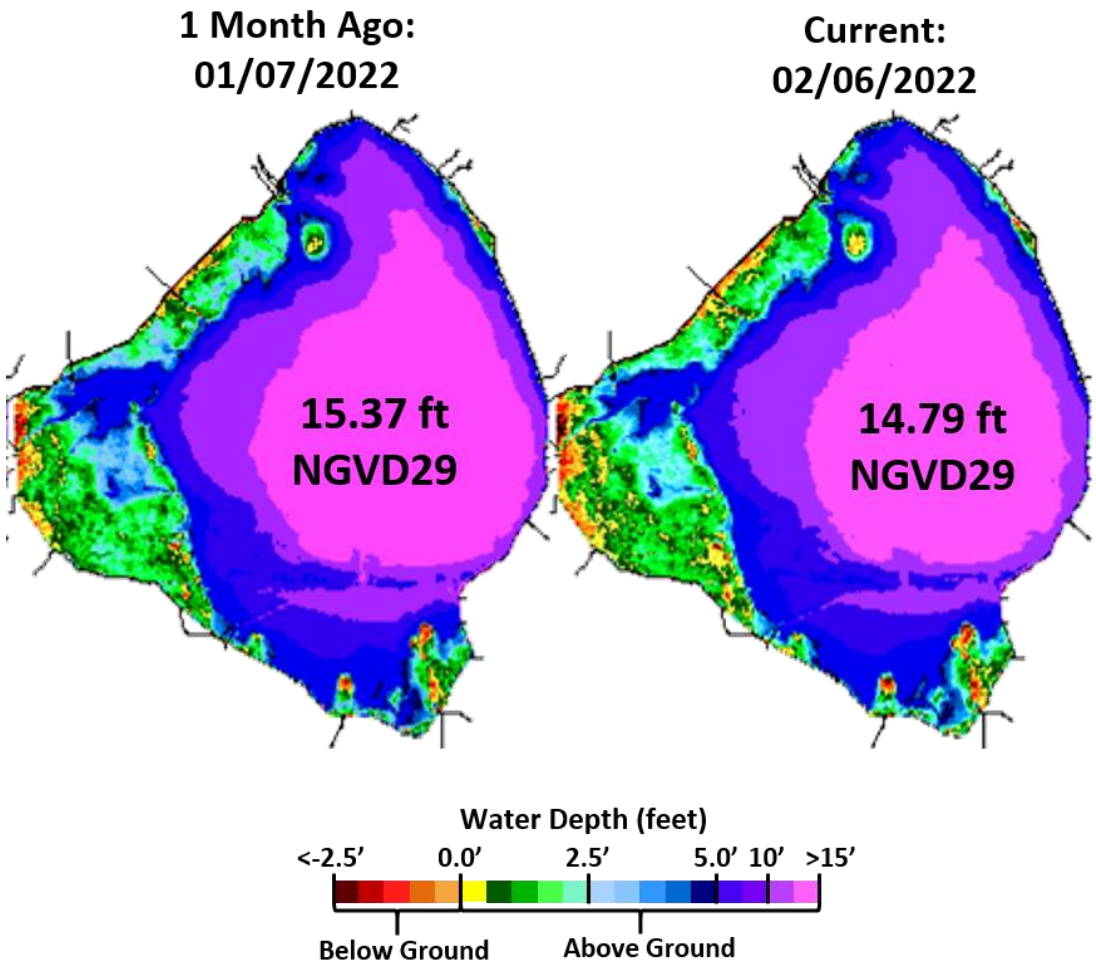


Figure LO-1. Lake Okeechobee water depth estimates based on South Florida Water Depth Assessment Tool (SFWDAT).

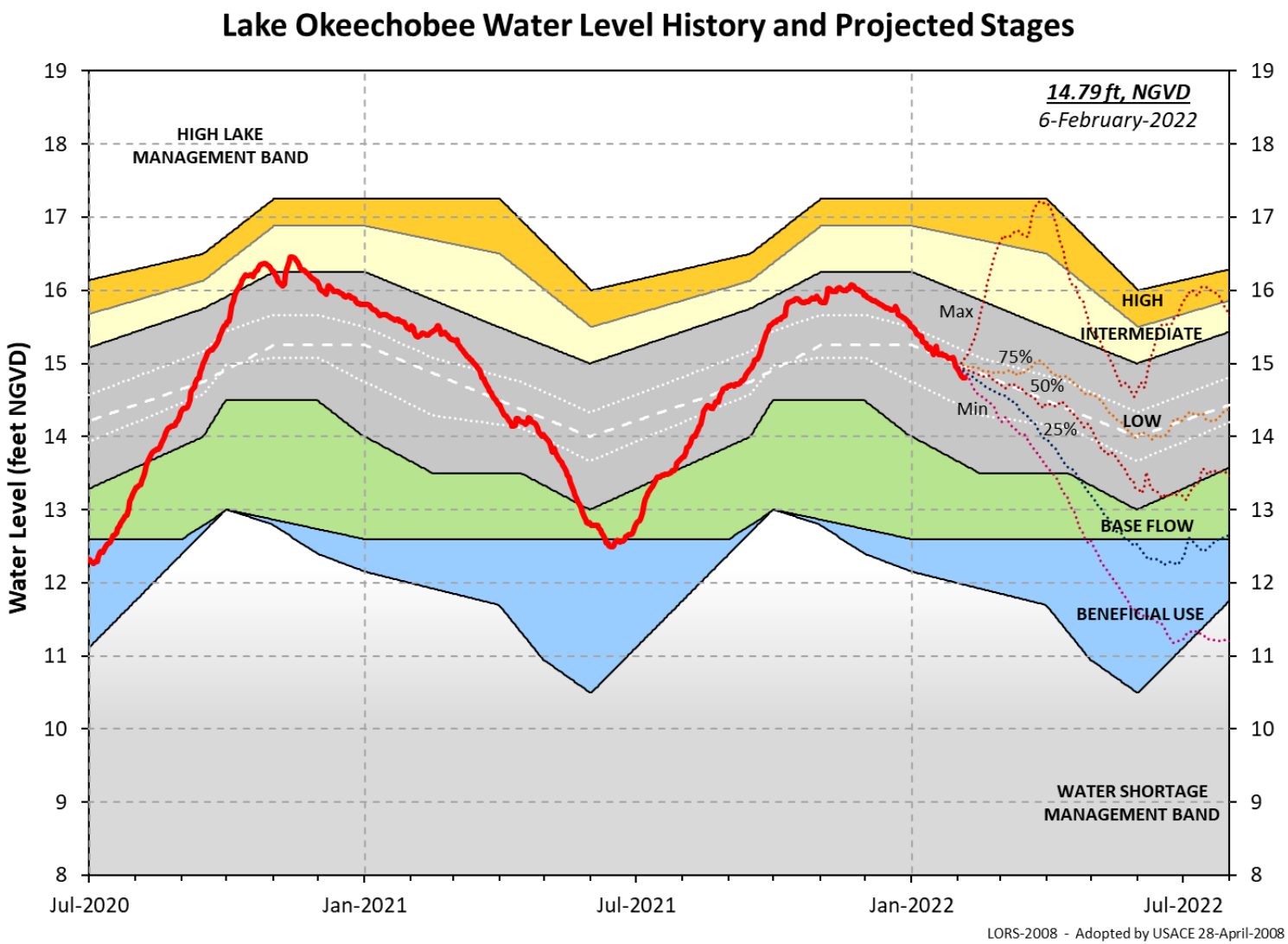


Figure LO-2. Recent Lake Okeechobee stages with projected stages based on a dynamic position analysis.

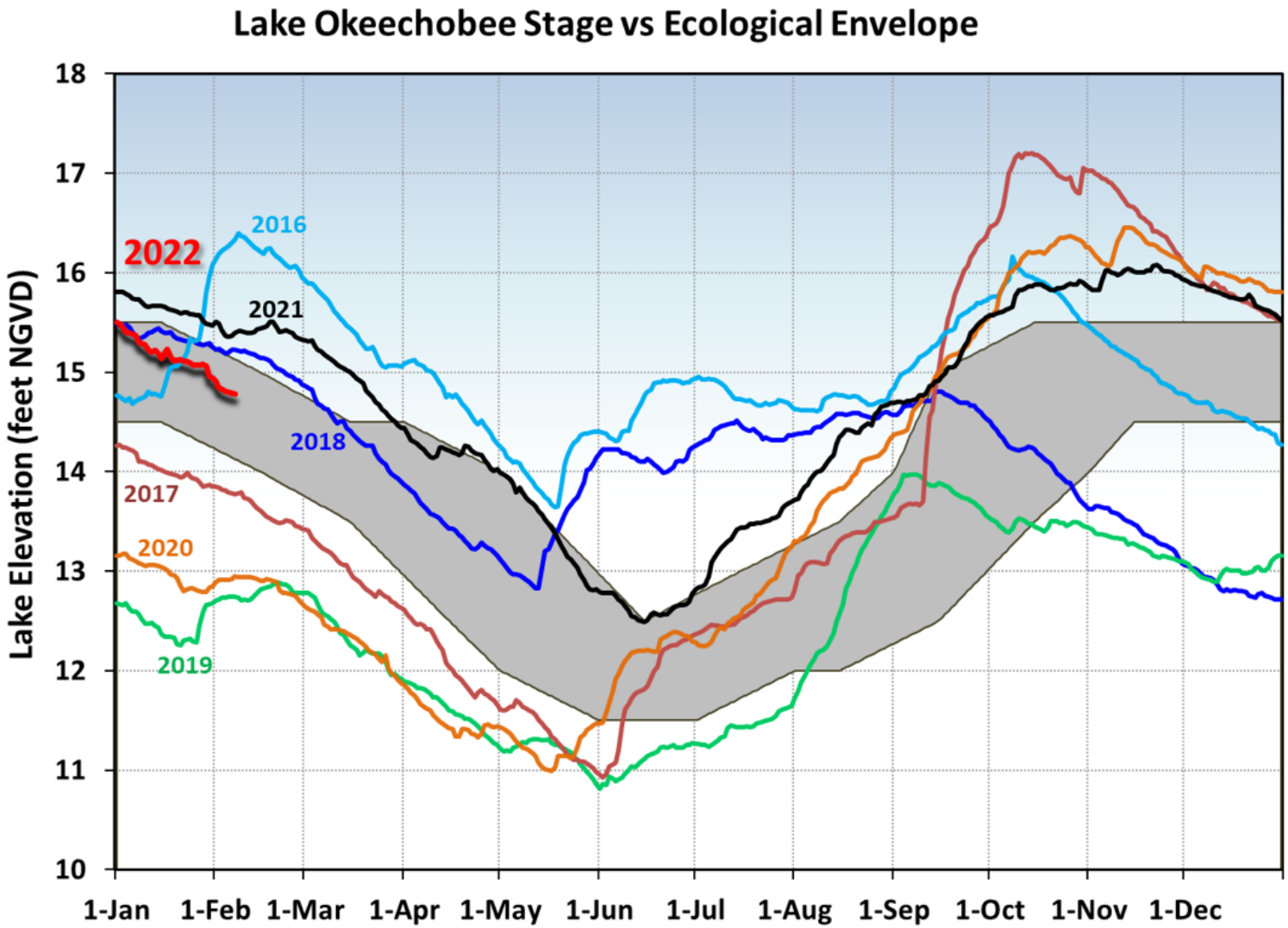


Figure LO-3. The prior six years of annual stage hydrographs for Lake Okeechobee in comparison to the ecological envelope.

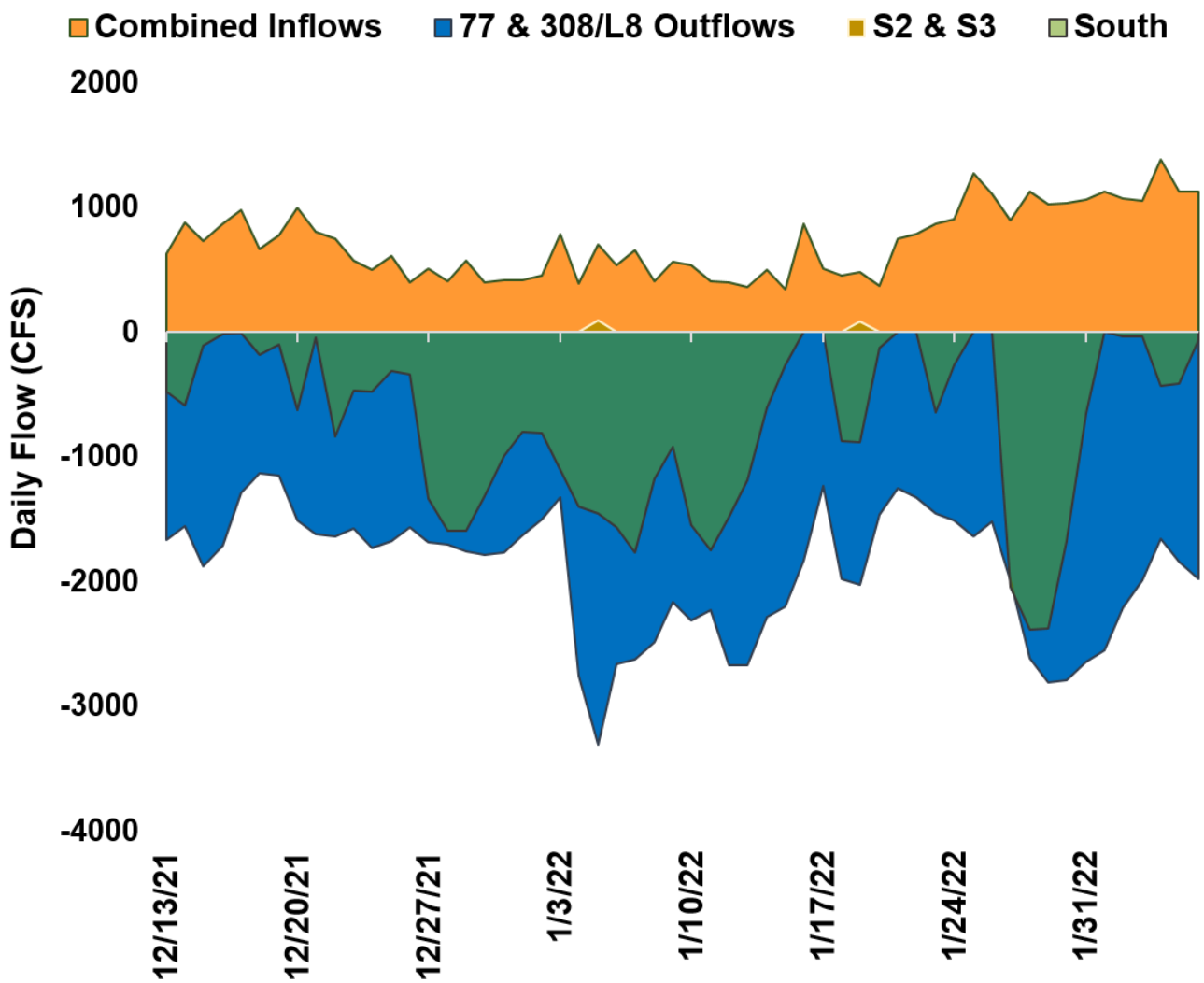


Figure LO-4. Major inflows (orange) to and outflows east and west (blue) from Lake Okeechobee. Outflows south are shown in green. Flows into Lake Okeechobee from the L-8 canal through S-271 (formerly Culvert 10A) or from the C-44 canal through the S-308 are included as inflows. Conversely, flows from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

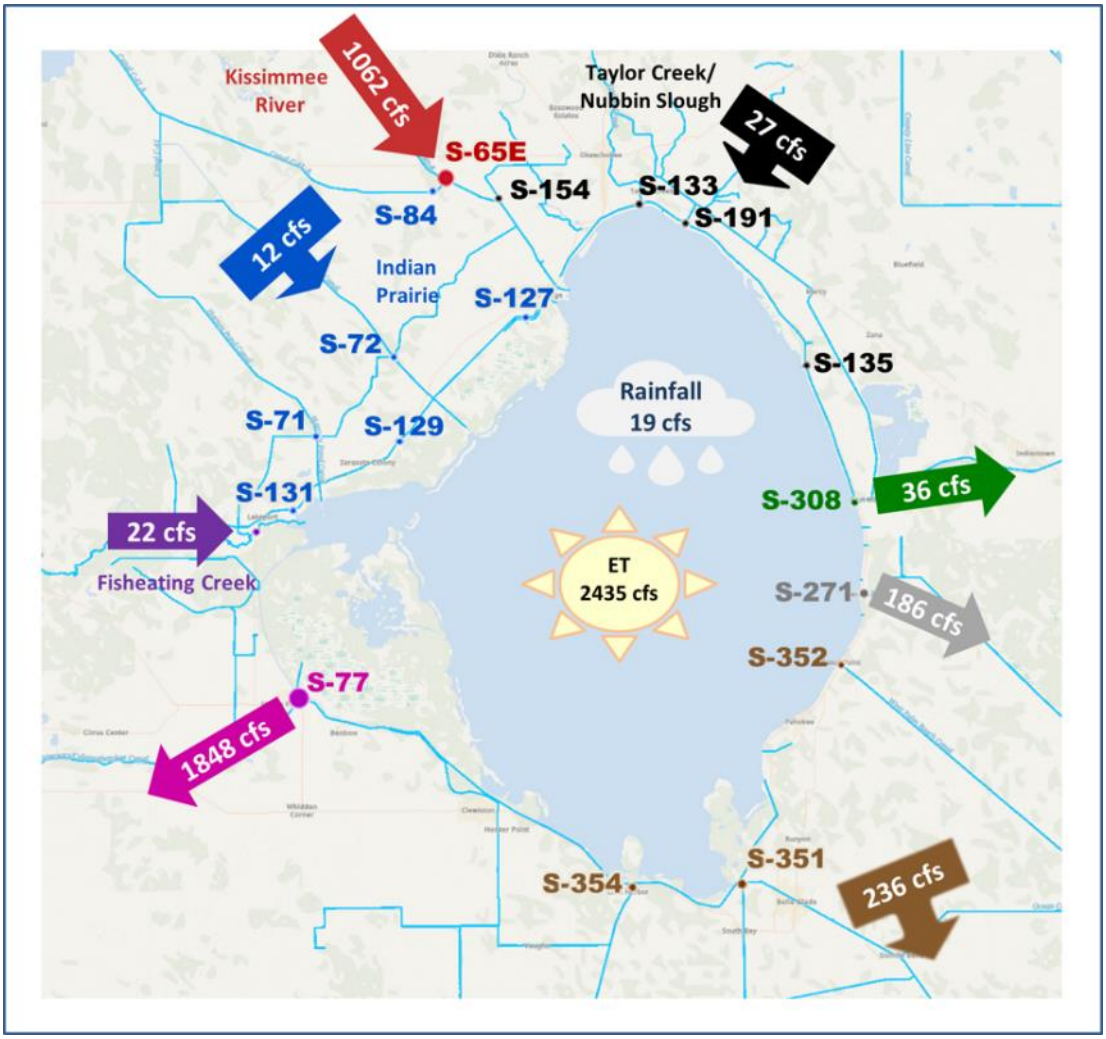


Figure LO-5. Inflows into Lake Okeechobee from Indian Prairie basins, Taylor Creek/Nubbin Slough, Kissimmee River and Fisheating Creek, and outflows to the west via S-77, to the east via S-308, to the south via S-351, S-352, S-354, and to southeast via S-271 (formerly Culvert 10A) for the week of January 31, 2022 – February 06, 2022.

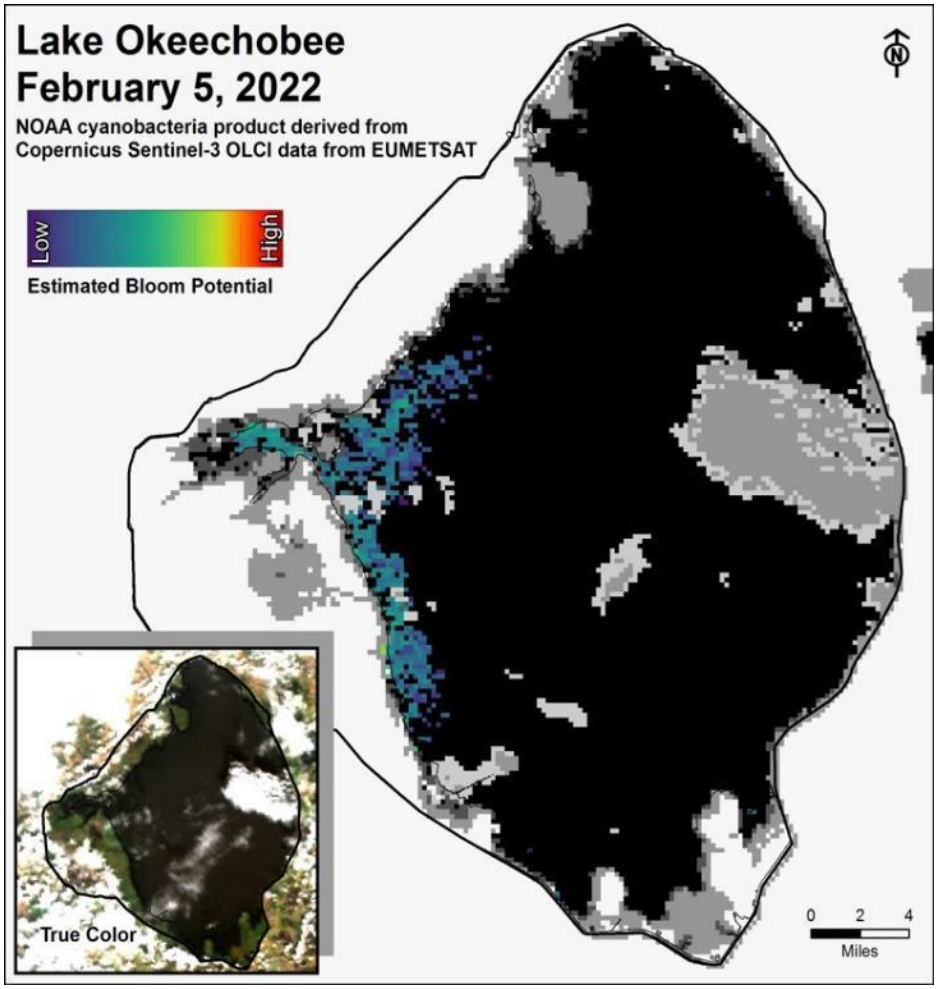


Figure LO-6. Cyanobacteria bloom potential on February 05, 2022 based on NOAA's harmful algal bloom monitoring system. Gray color indicates cloud cover

Estuaries

St. Lucie Estuary

Over the past week, mean total inflow to the St. Lucie Estuary was approximately 161 cfs (**Figures ES-1** and **ES-2**) and the previous 30-day mean inflow was approximately 380 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 22.4. 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 approximately 2,022 cfs (**Figures ES-5** and **ES-6**) and the previous 30-day mean inflow was approximately 2,111 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, bottom salinity decreased slightly at Val I-75, and salinities increased 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 1,500 cfs and a steady release at 2,000 cfs with estimated tidal basin inflows of 75 cfs. Model results from all scenarios predict daily salinity to be 1.1 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 February 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 or Miami-Dade counties.

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[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.

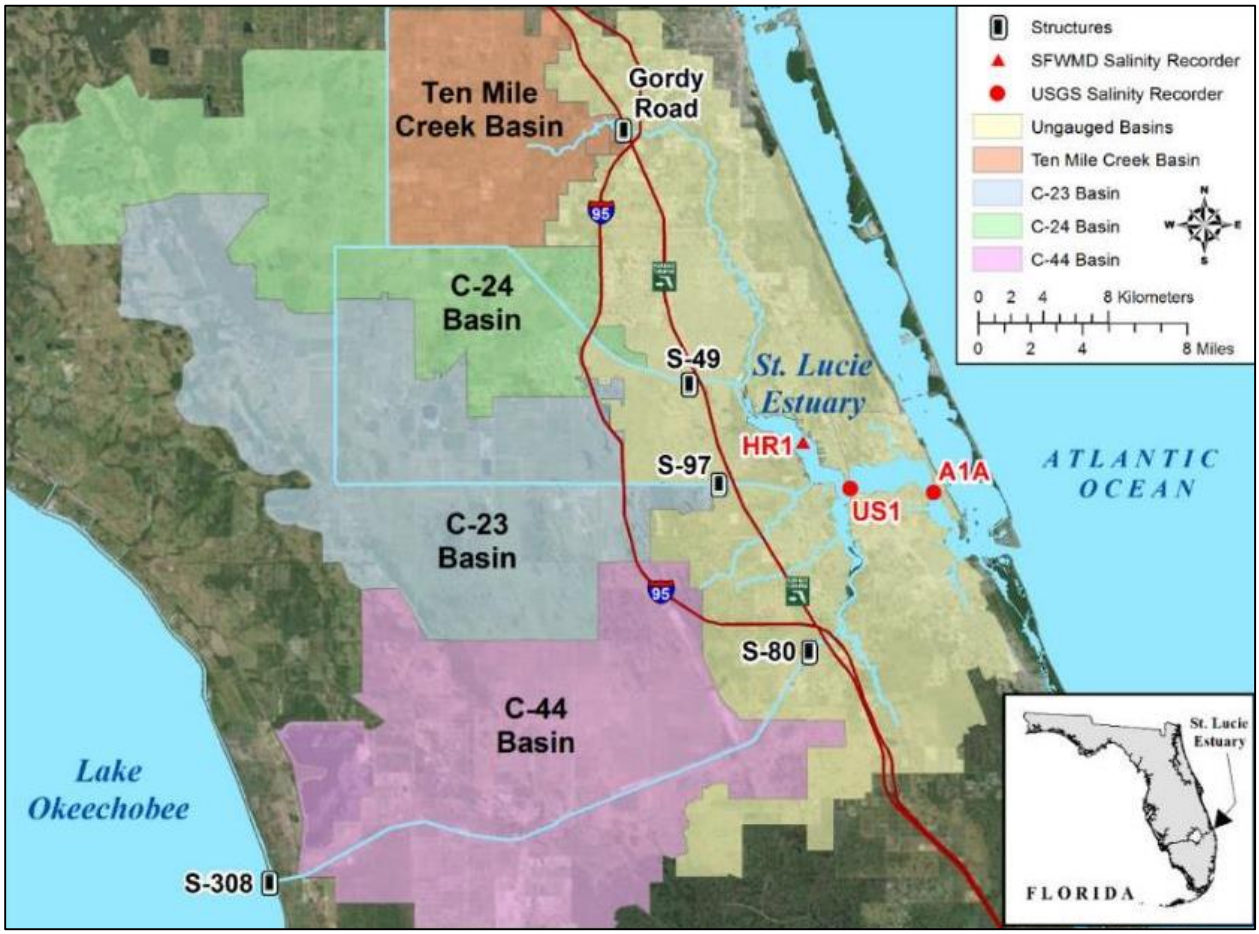


Figure ES-1. Basins, water control structures and salinity monitoring sites in the St. Lucie Estuary.

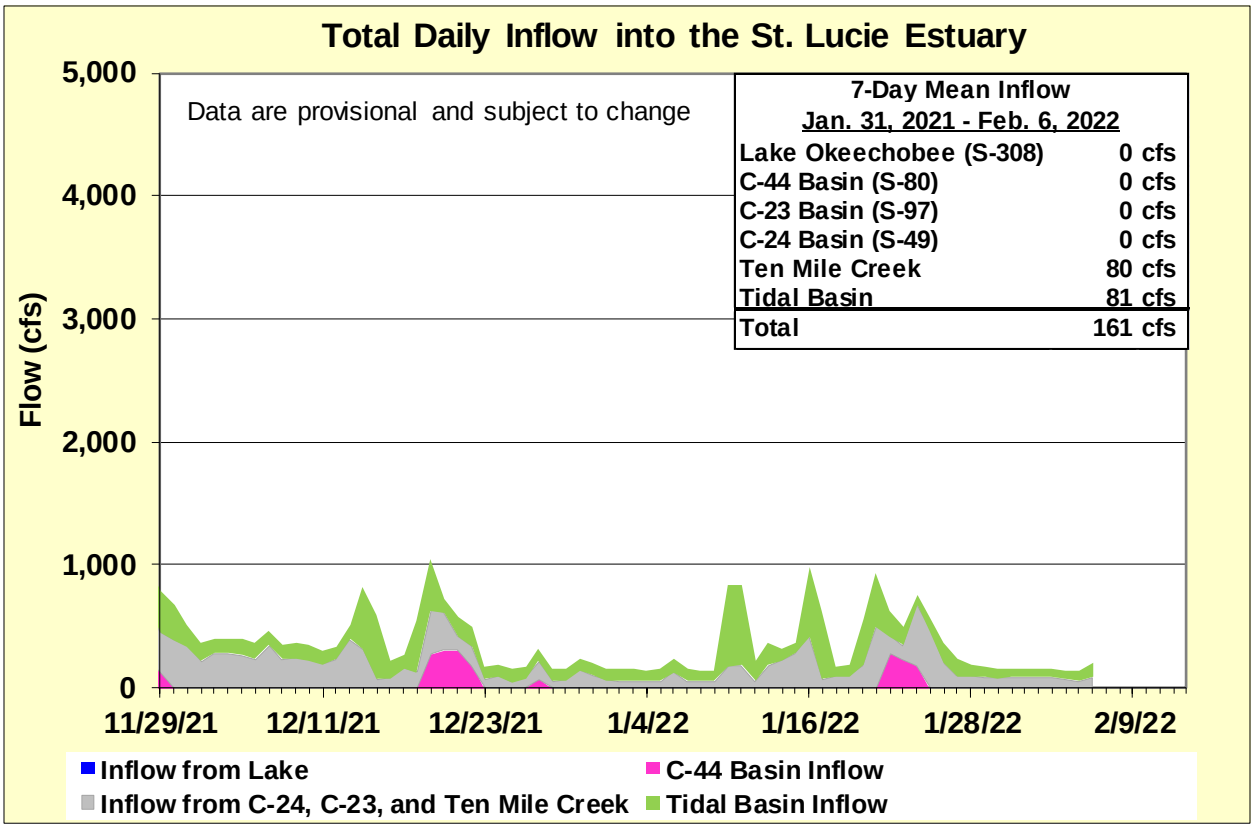


Figure ES-2. Total daily inflows from Lake Okeechobee and runoff from the C-44, C-23, C-24, Ten Mile Creek, and Tidal Basins into the St. Lucie Estuary.

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)	**18.7** (17.4)	**20.9** (20.0)	NA [a]
US1 Bridge	**22.1** (20.9)	**22.7** (22.1)	10.0 – 26.0
A1A Bridge	**29.0** (27.6)	**30.0** (29.1)	NA [a]

a. The envelope is not applicable.

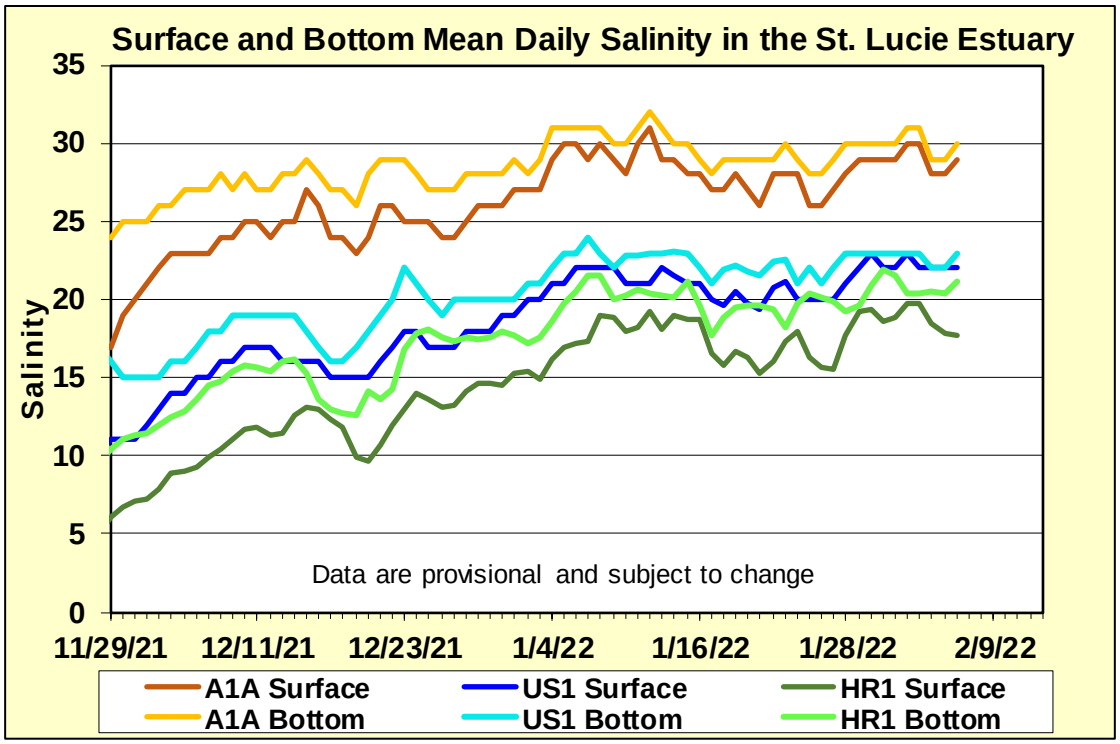


Figure ES-3. Mean daily salinity at the A1A, US1 and HR1 sites in the St. Lucie Estuary.

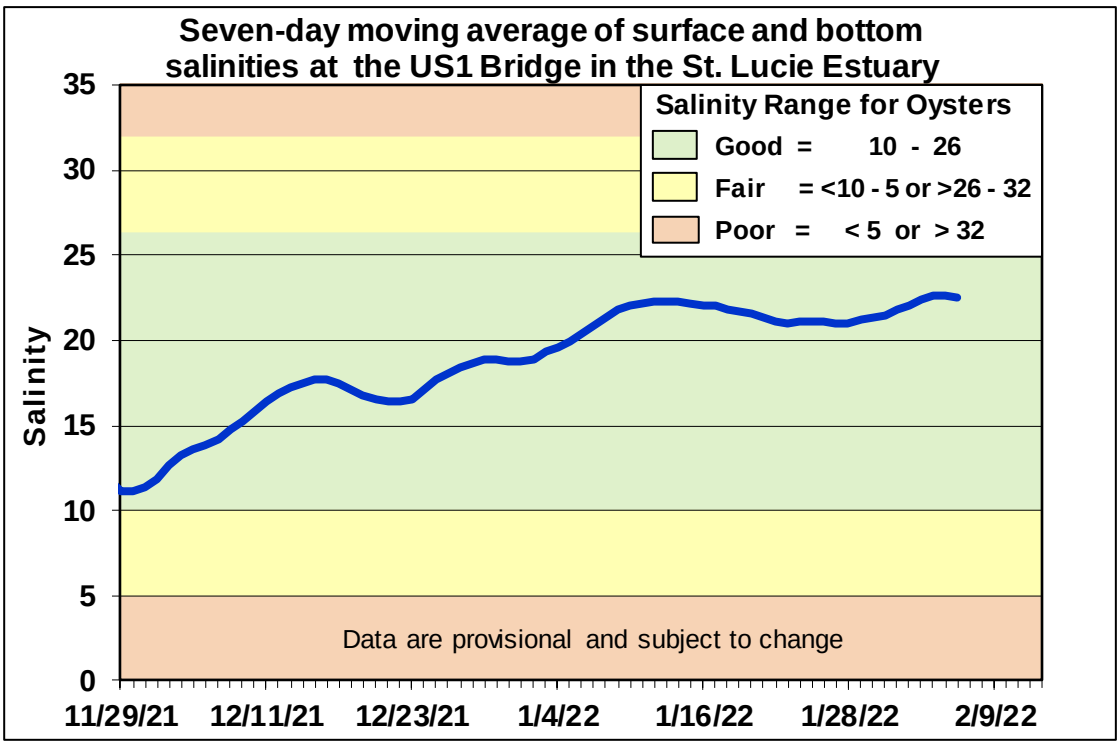


Figure ES-4. Seven-day moving average of the surface and bottom salinities at the US1 Bridge in the St. Lucie Estuary.

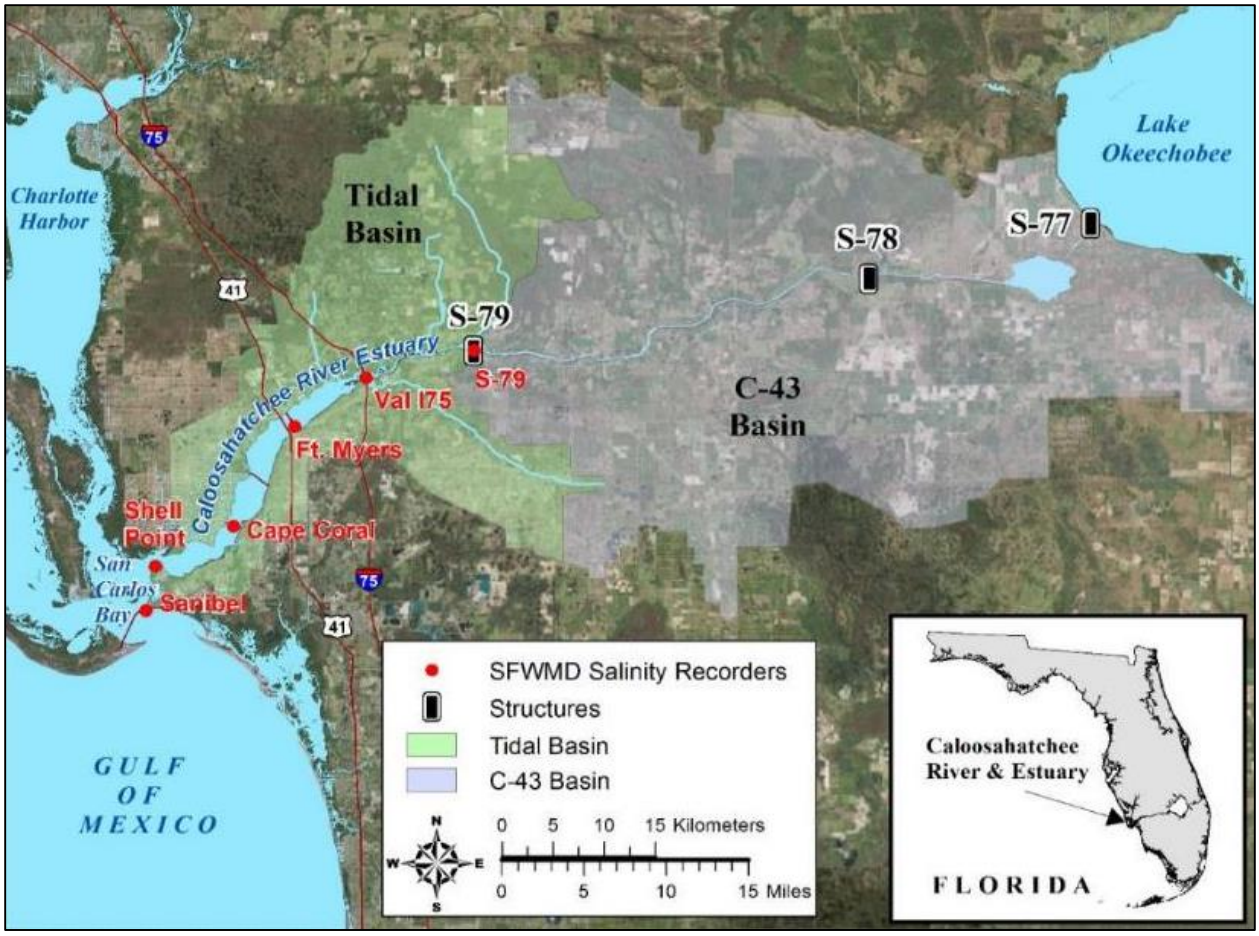


Figure ES-5. Basins, water control structures and salinity monitoring sites in the Caloosahatchee River Estuary.

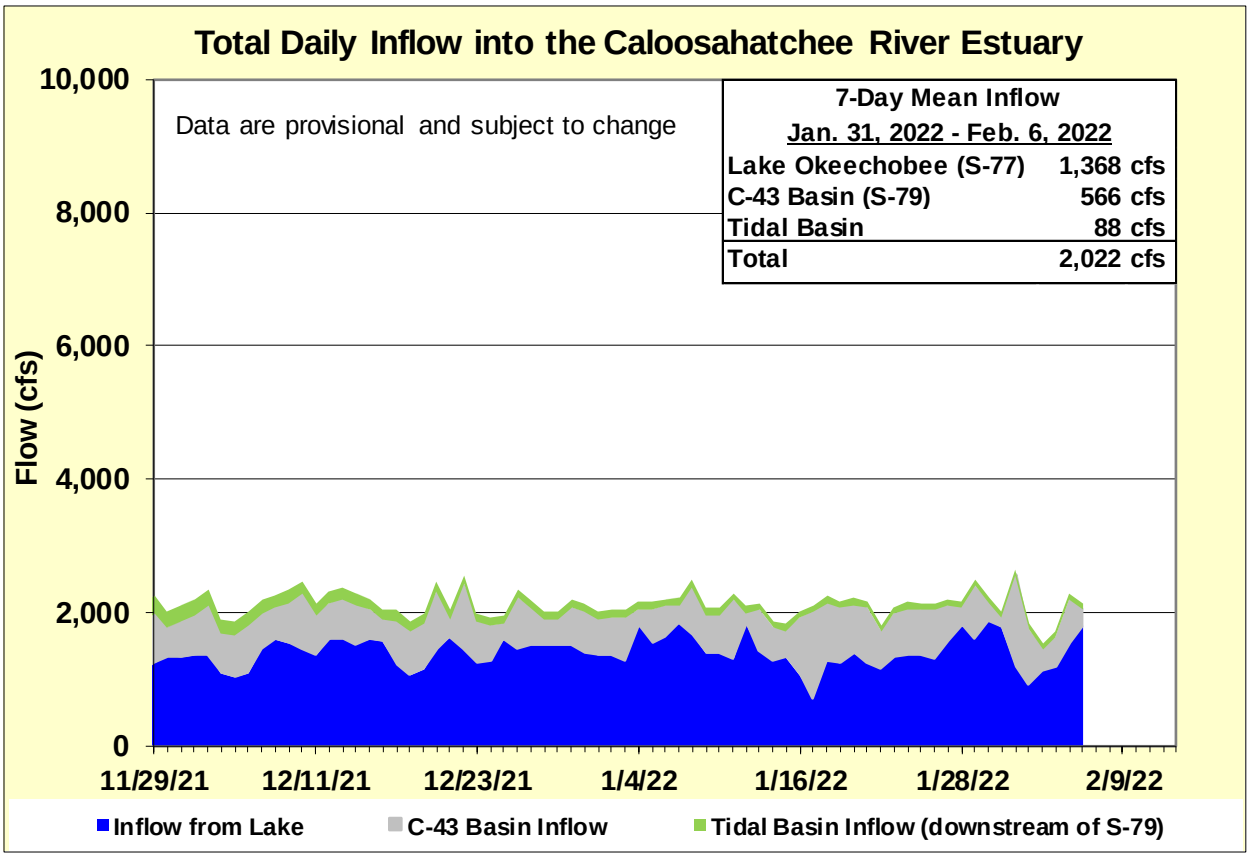


Figure ES-6. Total daily inflows from Lake Okeechobee, and runoff from the C-43 and Tidal basins into the Caloosahatchee River Estuary.

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** (0.5)	0.0 – 5.0 [b]
Fort Myers Yacht Basin	**3.7** (2.5)	**5.5** (4.4)	NA [a]
Cape Coral	**10.8** (8.6)	**12.6** (9.8)	10.0 – 30.0
Shell Point	**24.5** (20.6)	**25.0** (22.1)	10.0 – 30.0
Sanibel	**29.4** (27.2)	**30.1** (29.0)	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.

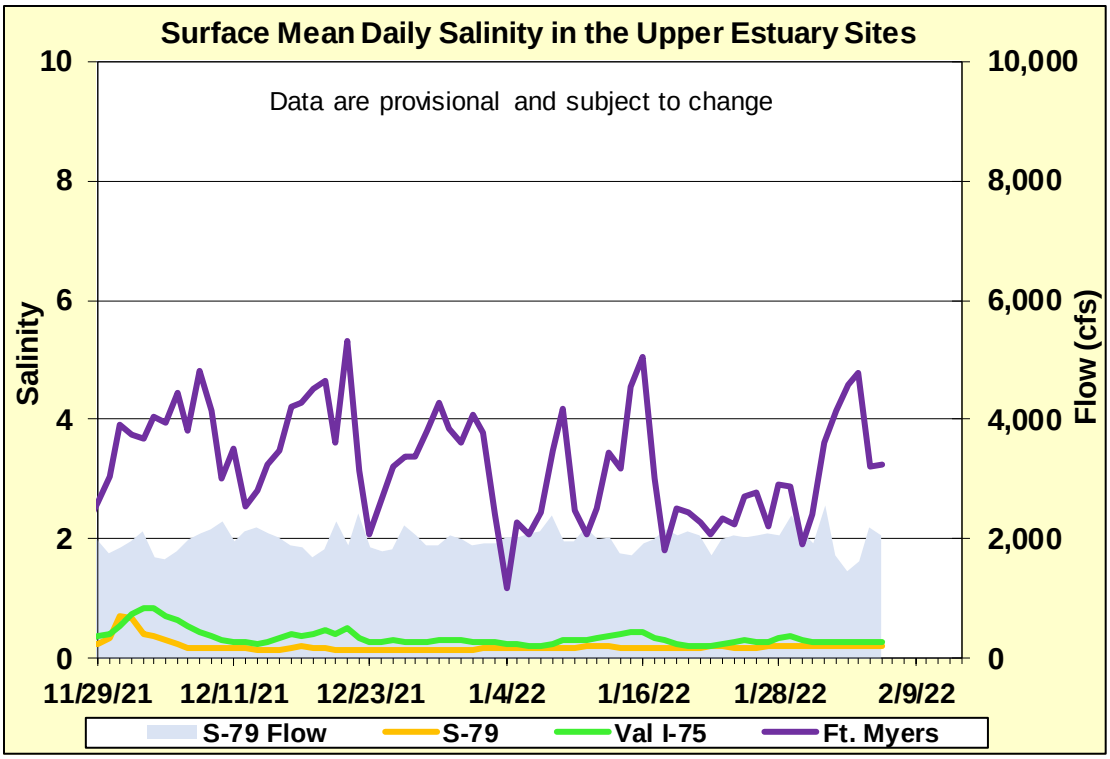


Figure ES-7. Mean daily salinity at upper Caloosahatchee River Estuary monitoring sites and mean daily flow at S-79.

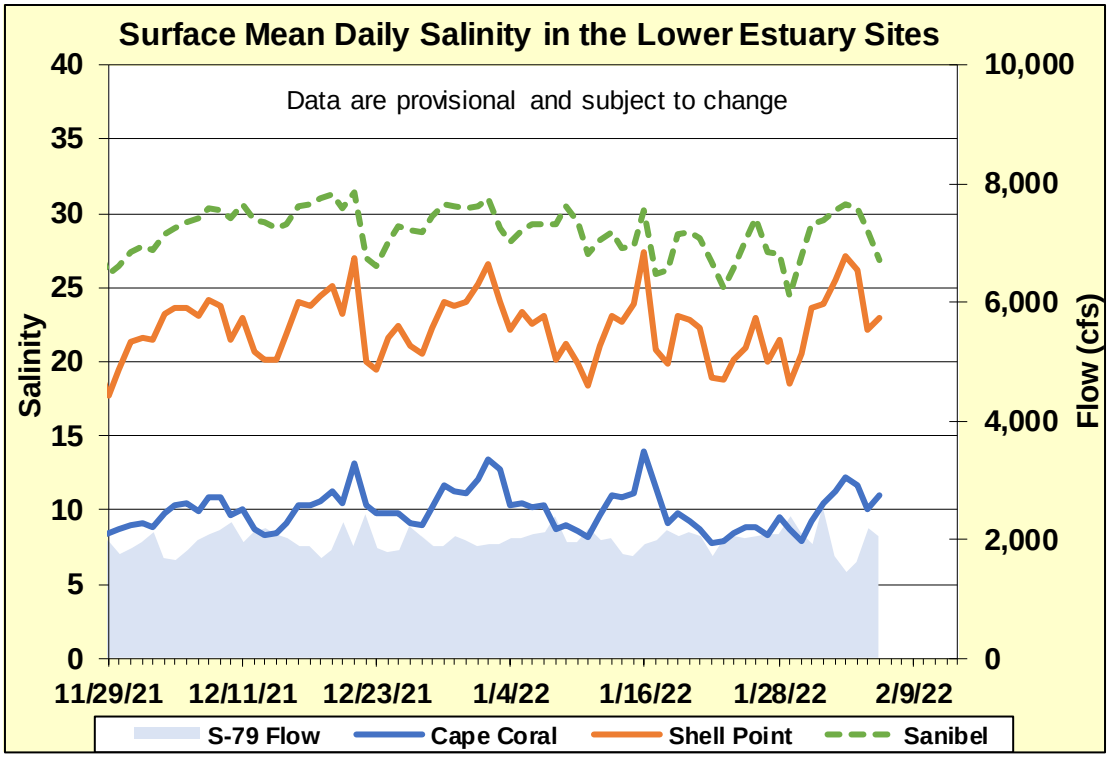


Figure ES-8. Mean daily surface salinity at lower Caloosahatchee River Estuary monitoring sites and mean daily flow at S-79.

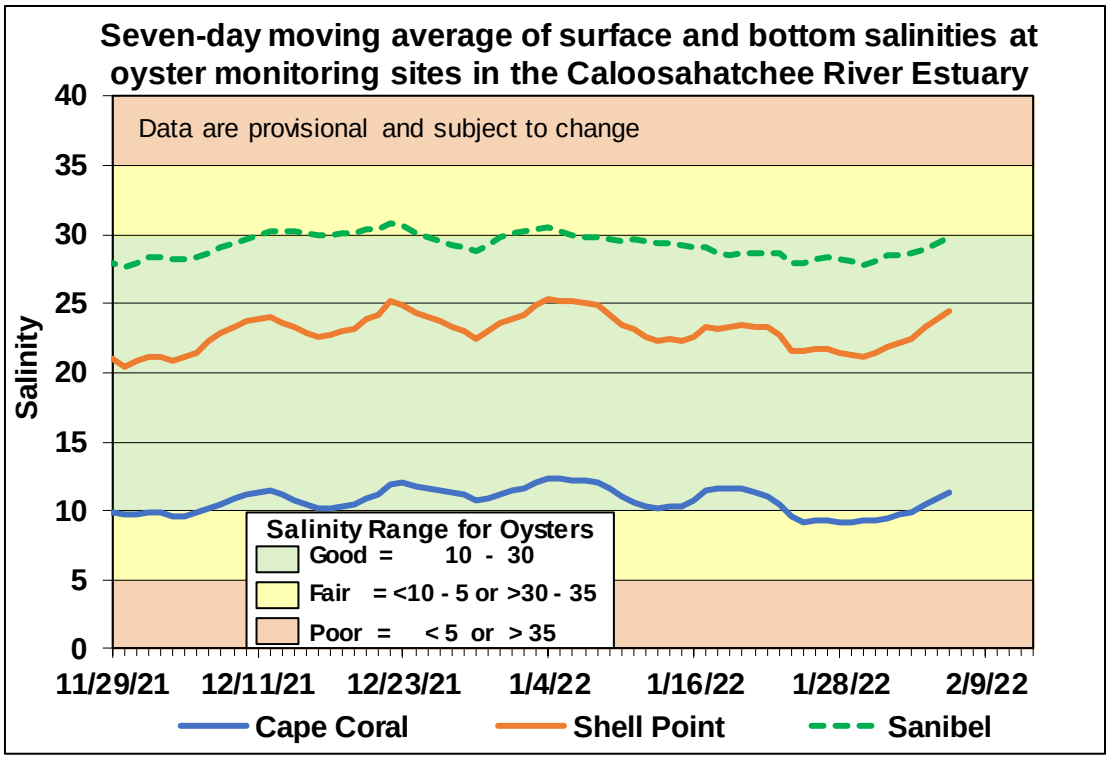


Figure ES-9. Seven-day moving average of surface and bottom salinities at Cape Coral, Shell Point and Sanibel monitoring sites in the Caloosahatchee River Estuary.

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	75	1.1	0.4
B	450	75	0.6	0.3
C	800	75	0.4	0.3
D	1000	75	0.3	0.3
E	1500	75	0.3	0.3
F	2000	75	0.3	0.3

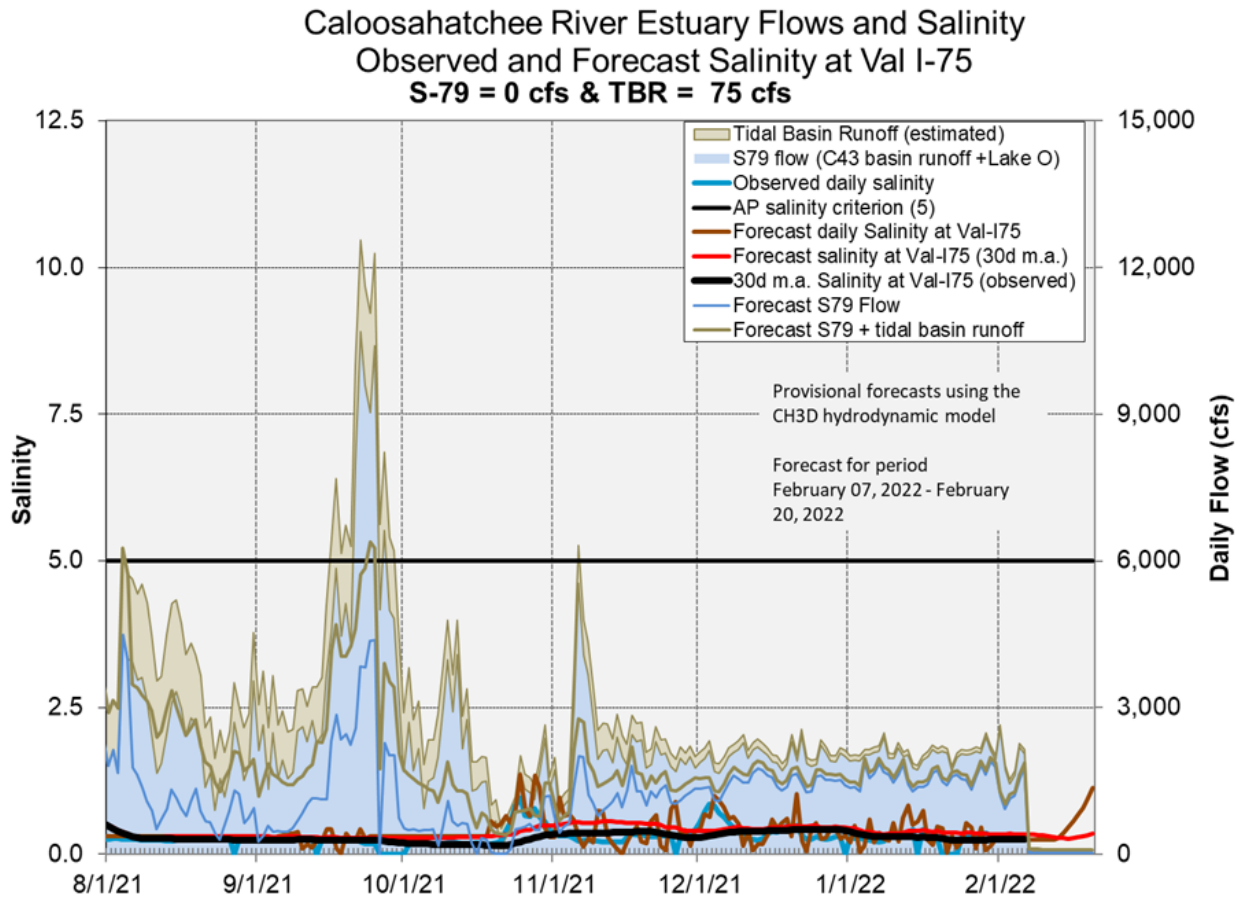


Figure ES-10. Forecasted Val I-75 site surface salinity assuming no pulse release at S-79.

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 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).**

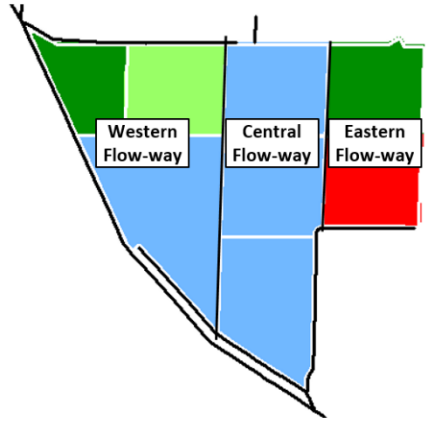
STA-3/4: STA-3/4 Eastern Flow-way is offline for vegetation rehabilitation/drawdown. Most online treatment cells are at or near target stage. Vegetation in the Eastern and Central Flow-ways is highly stressed and in the Western Flow-way is stressed. The 365-day PLRs for the Central and Western Flow-ways 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 Weekly Status Report – 1/31/2022 through 2/6/2022

277 ac-ft → Inflow



Outflow → 0 ac-ft

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 2/6/2022

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
- 25-50% Dry
- 50-75% Dry
- 75-100% Dry

STA-1E Flow & Phosphorus Concentration

	7-day	28-day	365-day
Total Inflow, ac-ft	277	2,842	179,322
--Lake Inflow, ac-ft	0	N/A	5,800
Total Outflow, ac-ft	0	1,234	151,327
Inflow Conc., ppb	49	67	122
Outflow Conc., ppb	N/A	27	23

Includes Preliminary Data

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

STA-1W Weekly Status Report – 1/31/2022 through 2/6/2022

0 ac-ft → Inflow

Outflow → 0 ac-ft

STA-1W 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
Northern		1.0	Construction
Western		1.0	Construction
Eastern		1.0	Construction
Cell 7		N/A	Construction
Cell 8		N/A	Construction

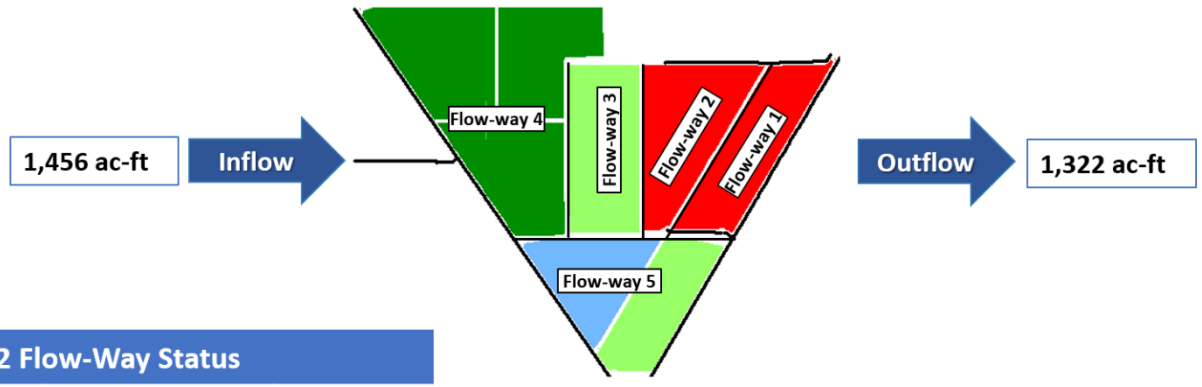
As of 2/6/2022	
Stage Based: Relative to Target Stage (TS)	
Deep Water Level (> 2.8' above TS)	
High Water Level (1.5' – 2.8' above TS)	
0.2' – 1.5' above TS	
Target Stage (TS +/- 0.2')	
Low Water Level (<0.2' below TS)	
Depth / Area Based: Percent of Area Dry	
0-25% Dry	50-75% Dry
25-50% Dry	75-100% Dry

STA-1W Flow & Phosphorus Concentration

	7-day	28-day	365-day
Total Inflow, ac-ft	0	1,894	53,421
--Lake Inflow, ac-ft	0	N/A	4,700
Total Outflow, ac-ft	0	781	53,060
Inflow Conc., ppb	N/A	99	169
Outflow Conc., ppb	N/A	26	24
Includes Preliminary Data			

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

STA-2 Weekly Status Report – 1/31/2022 through 2/6/2022



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

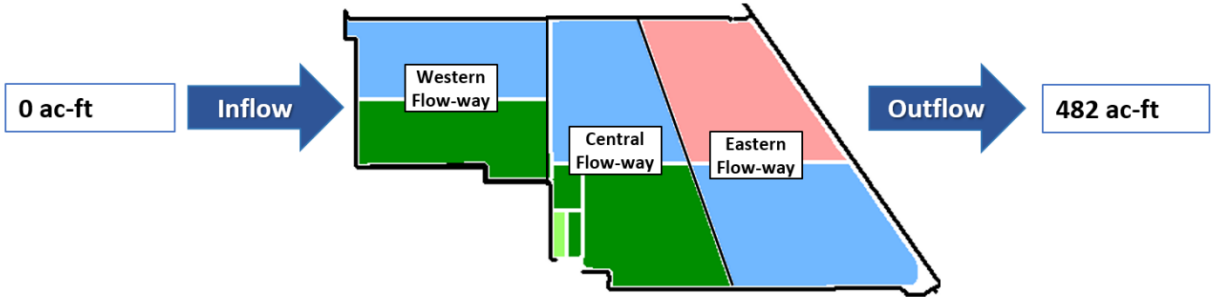
As of 2/6/2022	
Stage Based: Relative to Target Stage (TS)	
Deep Water Level (> 2.8' above TS)	
High Water Level (1.5' – 2.8' above TS)	
0.2' – 1.5' above TS	
Target Stage (TS +/- 0.2')	
Low Water Level (<0.2' below TS)	
Depth / Area Based: Percent of Area Dry	
0-25% Dry	50-75% Dry
25-50% Dry	75-100% Dry

STA-2 Flow & Phosphorus Concentration

	7-day	28-day	365-day
Total Inflow, ac-ft	1,456	7,385	329,309
--Lake Inflow, ac-ft	800	N/A	70,000
Total Outflow, ac-ft	1,322	5,433	336,145
Inflow Conc., ppb	58	47	86
Outflow Conc., ppb	9	11	15
Includes Preliminary Data			

Figure S-3. STA-2 Weekly Status Report

STA-3/4 Weekly Status Report – 1/31/2022 through 2/6/2022



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 2/6/2022	
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

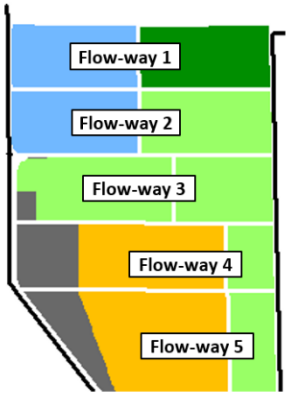
STA-3/4 Flow & Phosphorus Concentration

	7-day	28-day	365-day
Total Inflow, ac-ft	0	122	359,189
--Lake Inflow, ac-ft	0	N/A	39,600
Total Outflow, ac-ft	482	1,662	316,414
Inflow Conc., ppb	N/A	46	65
Outflow Conc., ppb	17	18	15
Includes Preliminary Data			

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

STA-5/6 Weekly Status Report – 1/31/2022 through 2/6/2022

313 ac-ft → Inflow



Outflow → 72 ac-ft

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 2/6/2022

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
- 25-50% Dry
- 50-75% Dry
- 75-100% Dry

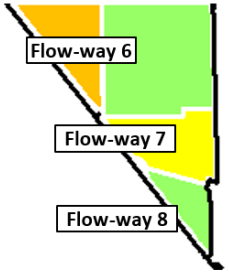
STA-5/6 Flow & Phosphorus Concentration

	7-day	28-day	365-day
Total Inflow, ac-ft	313	2,478	177,926
--Lake Inflow, ac-ft	0	N/A	9,000
Total Outflow, ac-ft	72	905	169,517
Inflow Conc., ppb	88	94	243
Outflow Conc., ppb	7	11	50

Includes Preliminary Data

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

STA-5/6 Weekly Status Report – 1/31/2022 through 2/6/2022



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 2/6/2022	
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 stage at the 1-8C gauge continues to fall slightly slower than the Zone A1 regulation line last week, averaging 0.48 feet above that line on Sunday. WCA-2A: Stage recession at 2A-17 slowed slightly last week; the average at that gauge on Sunday was 1.13 feet higher than the regulation line. WCA-3A: Last week at the Three Gauge Average stages continued to fall faster than the slope of the Zone A regulation line; average stage was 0.73 feet below that line on Sunday. WCA-3A: Stages at gauge 62 (Northwest corner) began receding again last week, with the average on Sunday 0.97 feet below the regulation line (**Figures EV-1** through **EV-4**).

Water Depths

Water depths and hydropatterns have been relatively stable in WCA-1 over the last month, based on the SFWDAT. Within the WCAs water depths are the lowest in northeastern WCA-3A, where the area with stage below the soil surface continues to expand. North to South hydrologic connectivity has diminished but remains within Everglades National Park sloughs. The western marl prairies and southern BCNP are dry as is typical but not favorable for this time of year (**Figure EV-5**). Comparing current SFWDAT water depths to the depth one month ago, stages are decreasing in the WCAs, most significantly in southern WCA-2A. Eastern ENP is close to the same stage as one month ago. Looking back one year, most of the Everglades Protection Area is significantly lower in depth (particularly eastern WCA-3A) with only WCA-1 and extreme northeastern ENP close to the same depth as last year (**Figure EV-6)**. Comparing current depths to the past 20 years, most of WCA-3A is now below the 30th percentile while WCA-1 and northeastern ENP remain above the 90th percentile (**Figure EV-7**).

Taylor Slough and Florida Bay

Very little rain fell over Taylor Slough and Florida Bay during the week ending Sunday, February 6, with only 2 stations in the Upper Taylor Slough area recording any rain. The maximum was 0.23 inches for the week. Water deliveries to Taylor Slough have remained relatively high for this time of year with S-332C and S-332D but are slowing down. Water levels in Taylor Slough decreased an average of 0.06 feet over this past week (**Figure EV-8**). The Slough, as a whole, is 6 inches higher than average while the northern parts are 16 inches higher than the historical average for this time of year. After the modifications to the management system in the Upper Taylor Slough area in 2017, TSB has been at least 0.6 feet higher than the pre-2017 average for this time of year every year (**Figure EV-9**). Given the forecast for a drier than average 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 0.8 over the past week, with individual station changes ranging from −1.0 to +3.6 (**Figure EV-8**). Weekly creek flow has slowed but is still more than twice the historical median for this time of year. These flows have helped to stabilize salinities within Florida Bay. Bay-wide salinities are just under 2 higher than the historical average now, but negative flows during the middle of last week allowed

increases in the central and western Bay shoreline area. Positive flows have since resumed and the salinities in the central and western shoreline area have decreased by 5 and 1, respectively, over the weekend (**Figure EV-10**).

Water Management Recommendations

Should conditions warrant the opening of the S-10s, the S-10 Charlie structure has historically had the lowest upstream nutrient values and its use should be prioritized over the others. Discharges at the S-10s of more than 500 cfs per structure can have deleterious downstream impacts. Flows directed across the northern perimeter of WCA-3A that assist in maintaining stage in that sub-basin and then move downstream have an ecological benefit if those discharges can slow the recession rates in that sub-basin. If conditions allow, discharges into both western (to assist in maintaining current foraging conditions) and the eastern (i.e. S-150 to help maintain stage around the Alley North colony) WCA-3A has greater 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 regions.

Everglades Region	Rainfall (inches)	Stage change (feet)
WCA-1	0.54	−0.03
WCA-2A	0.27	−0.11
WCA-2B	0.15	−0.11
WCA-3A	0.07	−0.10
WCA-3B	0.01	−0.09
ENP	0.09	−0.06

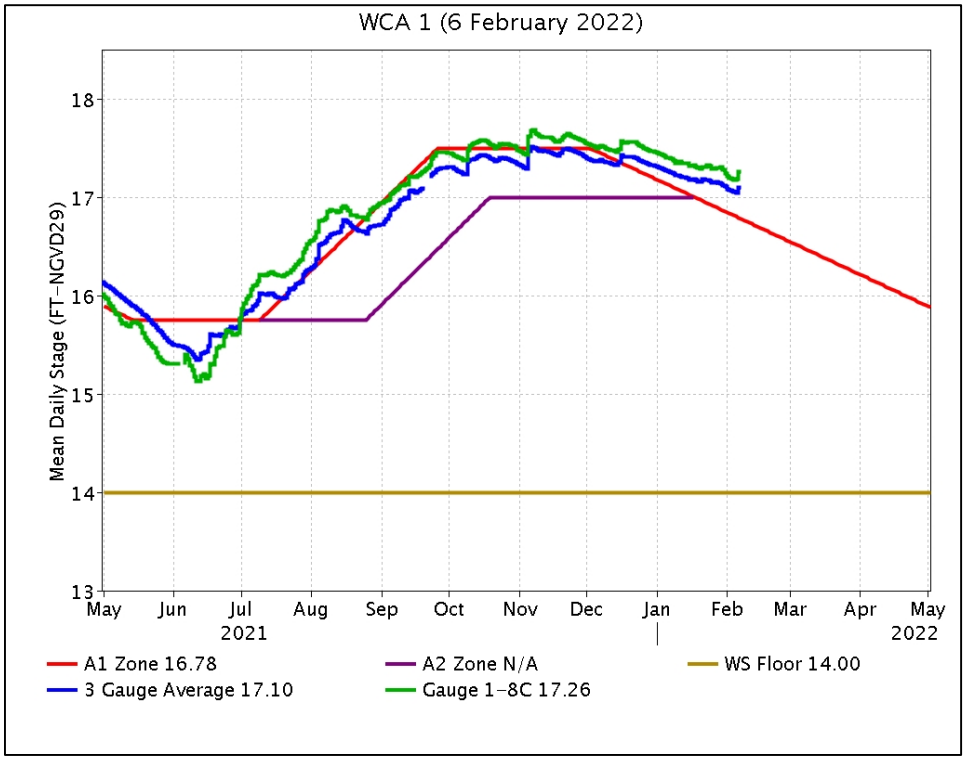


Figure EV-1. WCA-1 stage hydrographs and regulation schedule.

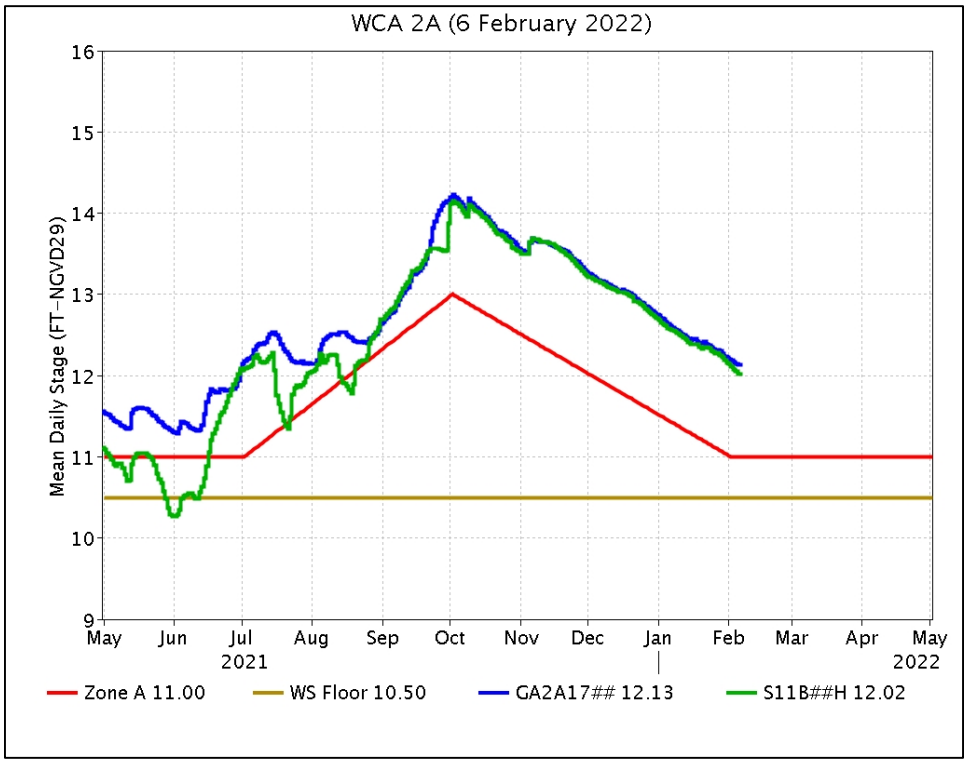


Figure EV-2. WCA-2A stage hydrographs and regulation schedule.

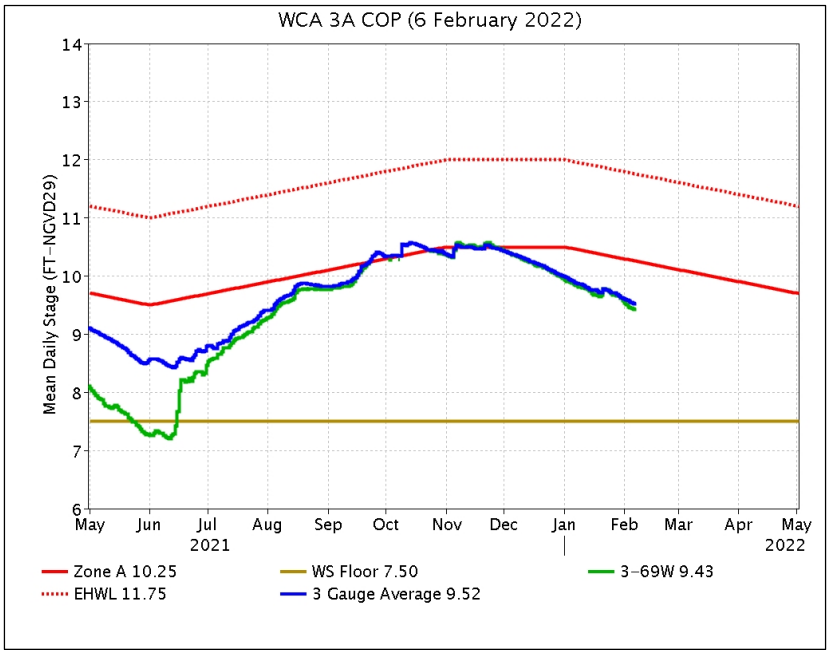


Figure EV-3. WCA-3A stage hydrographs (three-gauge average, S-333 headwater) and regulation schedule.

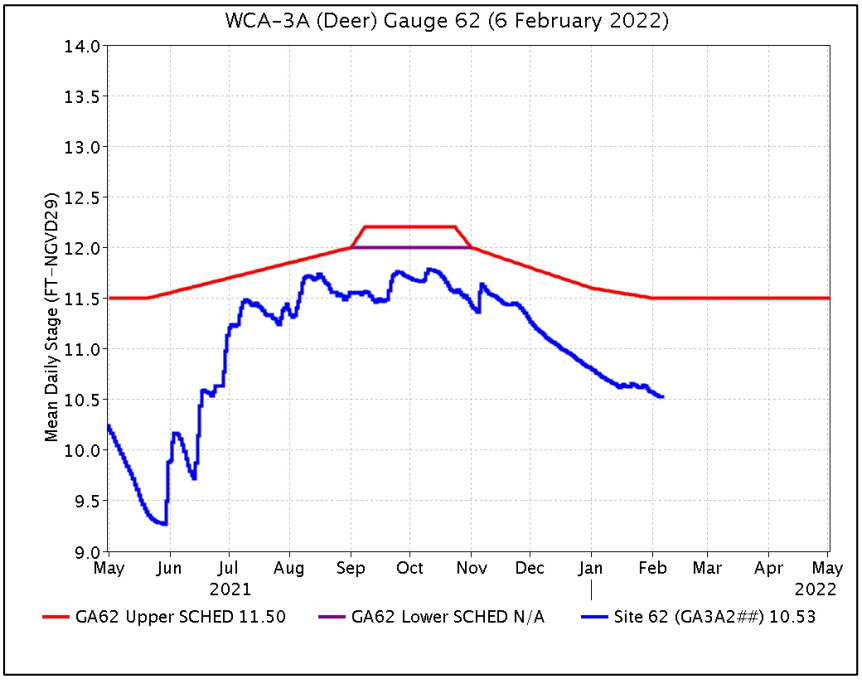


Figure EV-4. WCA-3A stage hydrograph (Deer gauge; Site 62) and CA62 regulation schedule.

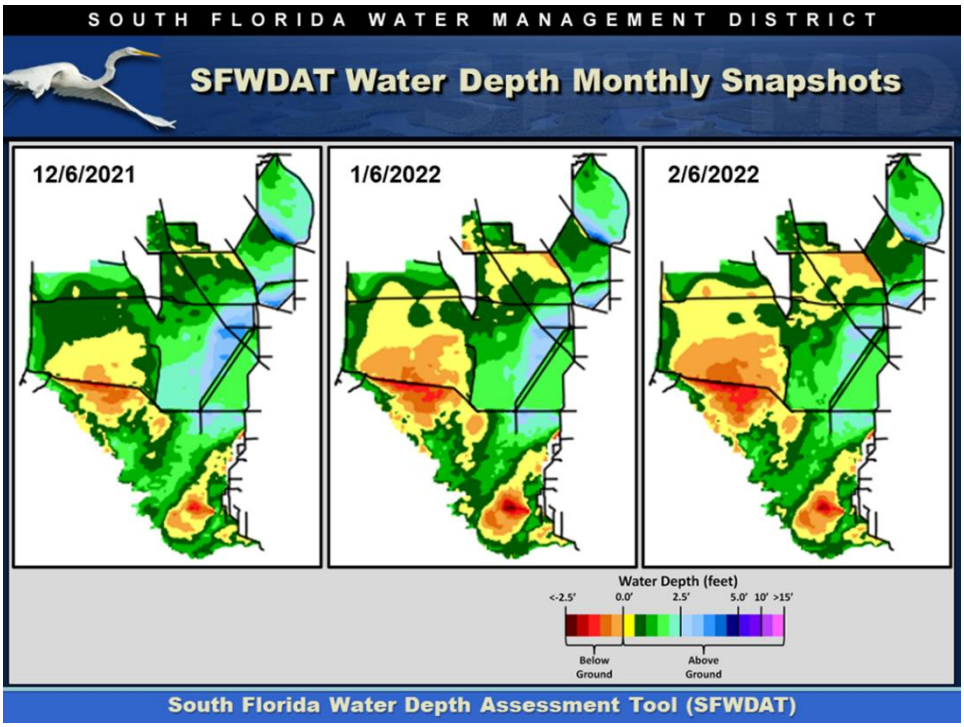


Figure EV-5. Everglades water depths from two months ago (left), one month ago (center) and present (right), based on SFWDAT.

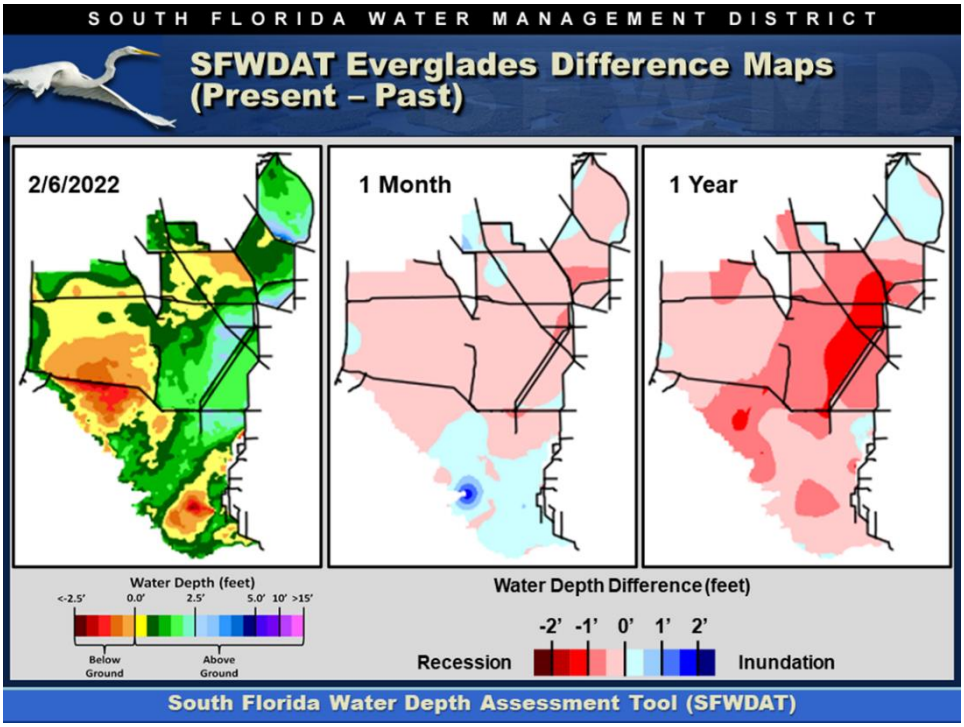


Figure EV-6. Present Everglades water depths (left) and water depth changes from one month (center) and one year (right) ago, based on SFWDAT.

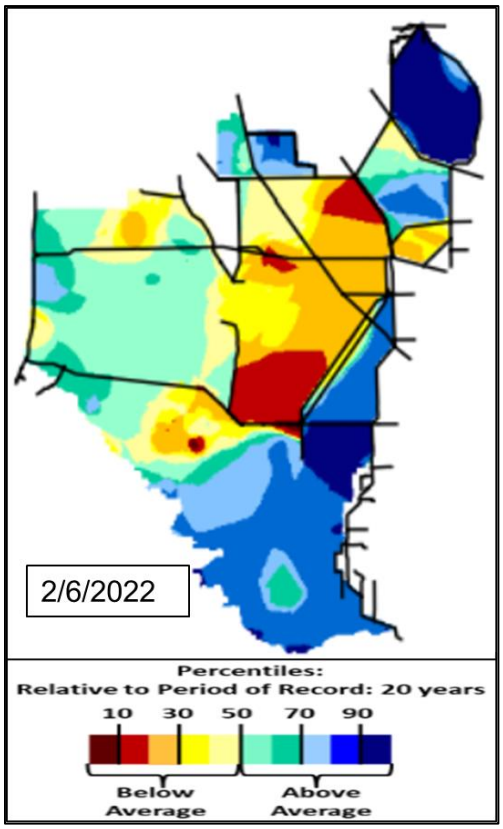


Figure EV-7. Present water depths compared to the day of year median over the previous 20 years.

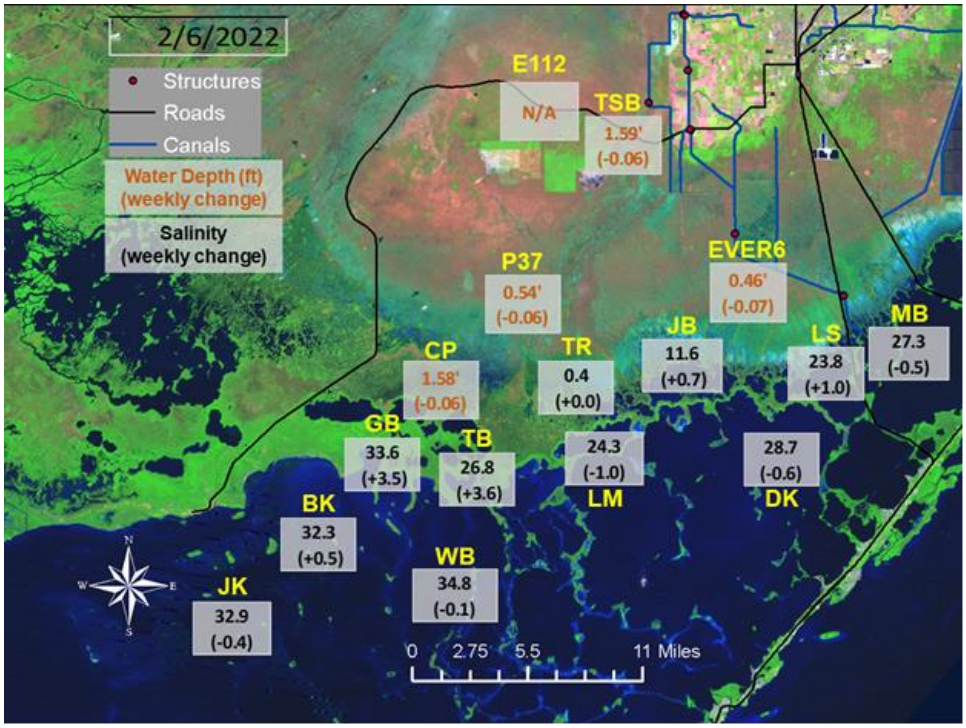


Figure EV-8. Taylor Slough water depths with changes since a week ago and Florida Bay salinities with changes since a week ago (parentheses).

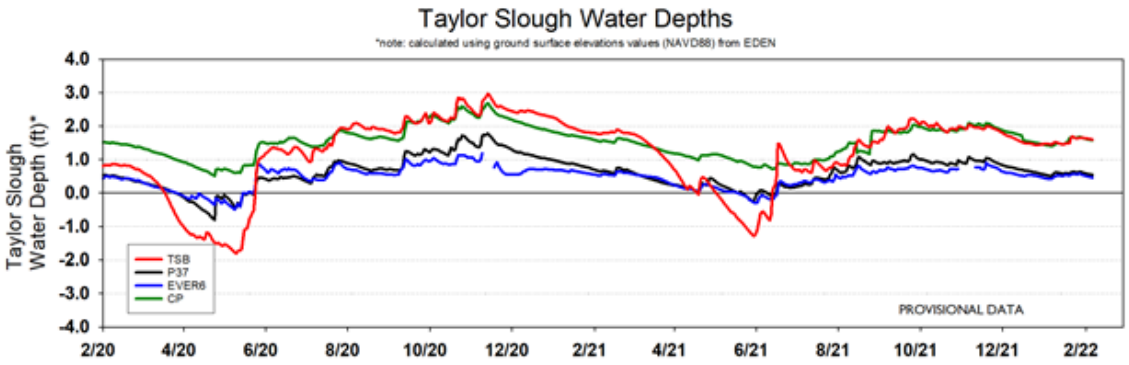


Figure EV-9. Taylor Slough water depth time series.

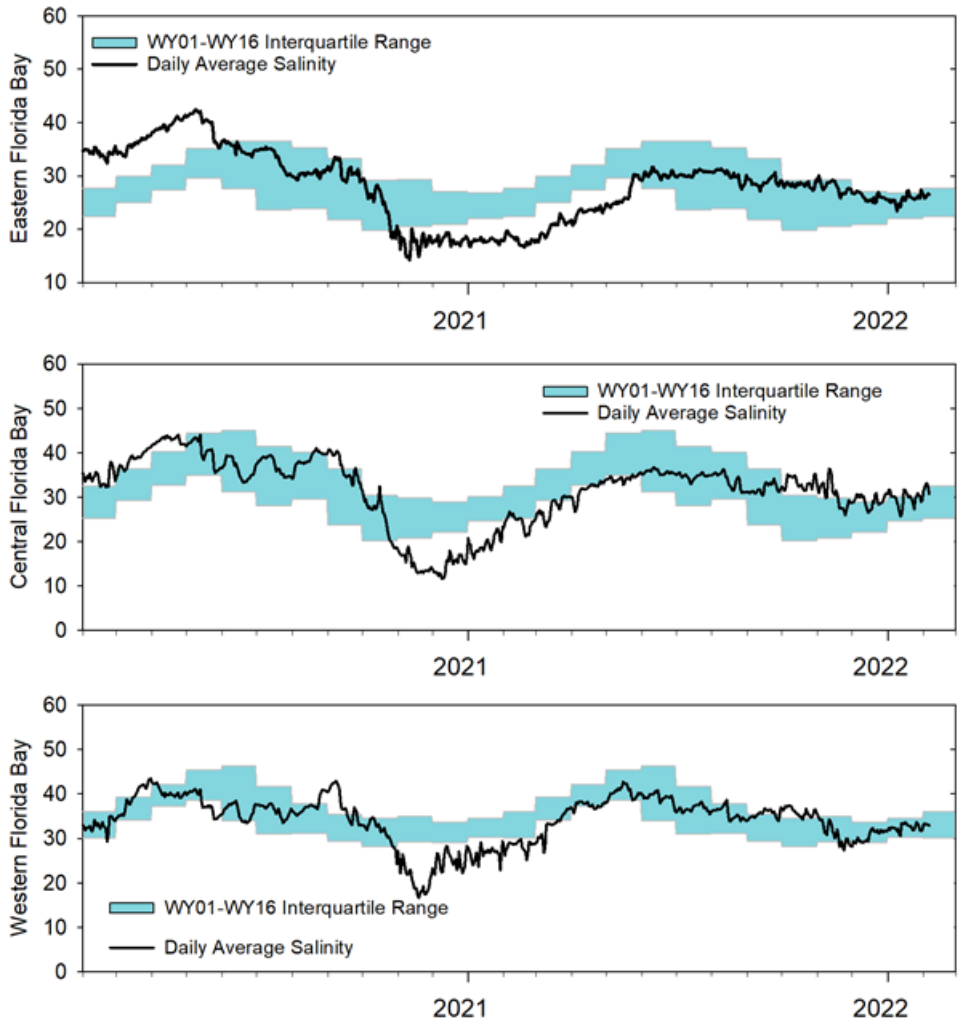


Figure EV-10. Eastern (top panel), Central (middle panel), and Western (bottom panel) Florida Bay daily average salinities with interquartile (25-75 percentile) ranges.

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

SFWMD Everglades Ecological Recommendations, January 25, 2022 (red is new)			
Area	Weekly change	Recommendation	Reasons
WCA-1	Stage decreased by 0.03'	Allow water to move south from this basin until stages reach the regulation schedule.	Protect within basin and downstream habitat and wildlife. Stages are above the 90th percentile.
WCA-2A	Stage decreased by 0.11'	Conserve water in this basin letting the water move south when conditions allow, with northern WCA-3A as the priority for receiving discharge. Keeping a recession rate less than 0.10 feet per week has an ecological benefit.	Protect within basin and downstream habitat and wildlife. Protect peat soils.
WCA-2B	Stage decreased by 0.10'	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 0.13'	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, wading bird foraging and downstream habitat and wildlife. Maintaining stage above 9.5' NGVD at 3A-3 (or gauge 63) prior to March 15 will increase the probability of successful nesting at the Alley North colony.
WCA-3A NW	Stage decreased by 0.06'	Conserve water in this basin letting the water move south when conditions allow. Keeping a recession rate less than 0.10 feet per week has an ecological benefit.	
Central WCA-3A S	Stage decreased by 0.10'	Return to a recession rate that is less than 0.10 feet per week. Allow flows to move south when conditions allow.	Protect within basin and downstream habitat and wildlife.
Southern WCA-3A S	Stage increased by 0.11'		
WCA-3B	Stage increased by 0.08'	Maintain recession rates 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 0.06'	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 −0.04' to +0.02'	Move water southward as possible.	When available, provide freshwater buffer for downstream conditions.
FB- Salinity	Salinity changes ranged −2.3 to +2.9	Move water southward as possible.	When available, provide freshwater to maintain low salinity buffer and promote water movement.