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: April 27, 2022

SUBJECT: Weekly Environmental Conditions for Systems Operations

Summary

Weather Conditions and Forecast

A cold front will push into the far northern part of the SFWMD by Wednesday evening and then arrive as a 'backdoor' cold front over central Florida by Thursday morning. Ahead of the front on Wednesday, scattered afternoon rains over the southern interior and eastern half of the SFWMD are forecast, with the main concentration of rains from the southern interior to the southeast coast of Florida. The weak 'backdoor' cold front should slip southwestward from around Lake Okeechobee on Thursday afternoon to the southern part of the SFWMD on Friday. A large increase of rains is expected through the period with widespread coverage likely around and south of Lake Okeechobee. The heaviest and possibly significant rains are most likely to occur along and near the east coast with some possible extension into the eastern interior. Rains could also form across the southern and western interior to the west coast, some of which could be heavy. By Saturday, rains around and south of Lake Okeechobee could develop, but less than what is expected Thursday and Friday. By Sunday, rain in the east is the forecast for the morning, followed by wet-season-like rains over the southwestern/western interior through the west coast in the afternoon. The eastern part of the SFWMD will dry out. The same rainfall pattern is likely to repeat on Monday, but with much less total rainfall than over the weekend. However, the Monday forecast is of lower confidence since some model solutions still show the possibility of greater rain continuing Monday afternoon over the southwestern / western interior through the west coast.

Kissimmee

Flow at S-59 and S-61 is being reduced as stages in East Toho and Toho return to their respective recession lines. With stage in lakes Kissimmee, Cypress, and Hatchineha (KCH) now declining, flow at S-65 and S-65A is being reduced. Water depth on the Kissimmee River floodplain has increased, with a mean depth of 1.02 feet as of April 24, 2022. With the S65 and S-65A discharge reductions, the concentration of dissolved oxygen in the Kissimmee River has started to rise slowly, with an average of 3.0 mg/L for the week ending on April 24, 2022.

Lake Okeechobee

Lake Okeechobee stage was 13.11 feet NGVD on April 24, 2022, with water levels 0.90 feet lower than a month ago (**Figure LO-1**). Lake stage remains in the Baseflow sub-band and has been within the ecological envelope for 16 weeks (**Figure LO-3**). Average daily inflows (excluding rainfall) increased from the previous week, going from 1,110 cfs to 1,320 cfs. Average daily outflows (excluding evapotranspiration) increased, going from 2,950 cfs to 4,050 cfs. There have been 39 snail kite nests recorded on the Lake thus far. Recent satellite imagery (April 21, 2022) showed moderate bloom potential in Fisheating Bay and along the western and northern shorelines (**Figure LO-6**).

Estuaries

Total inflow to the St. Lucie Estuary averaged 195 cfs over the past week with no flow coming from Lake Okeechobee. Mean salinities increased at all sites within the estuary over the past week. Salinity at the US1 Bridge was in the optimal range (10-25) for adult eastern oysters.

Total inflow to the Caloosahatchee Estuary averaged 1,608 cfs over the past week with 920 cfs coming from Lake Okeechobee. Mean surface salinities remained the same at S-79 and Val I-75, increased at Ft. Myers and Cape Coral, and decreased at Shell Point and Sanibel over the past week. Salinities were in the optimal range (0-10) for tape grass in the upper estuary. Salinities were in the optimal range (10-25) for adult eastern oysters at Cape Coral and in the stressed range at Shell Point and Sanibel.

Stormwater Treatment Areas

For the week ending Sunday, April 24, 2022, approximately 200 ac-ft of Lake Okeechobee water was delivered to the FEBs and STAs. The total amount of Lake releases sent to the FEBs and STAs in WY2022 (since May 1, 2021) is approximately 107,900 ac-ft. The total amount of inflows to the STAs in WY2022 is approximately 1,025,000 ac-ft. Most STA cells are at or near target stage, except STA-5/6 cells that are drying out. The STA-1E western flow-way is offline for post-construction vegetation grow in, and the STA-1E eastern flow-way is offline for vegetation management activities related to Tropical Storm Eta. Additionally, the STA-3/4 eastern flow-way is offline for vegetation rehabilitation and 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 the STA-1E central flow-way and STA-2 flow-ways 3 and 4 for vegetation management activities, and in STA-2 Flow-way 1 following dry-out conditions. This week, if the Lake Okeechobee regulation schedule (2008 LORS) recommends Lake releases to the WCAs and conditions allow, releases would be sent to STA-2.

Everglades

Stage changes within most of the WCAs remain in the “poor” rate-of-change category. Average wading bird nesting expectations continue to fall with widespread nest

abandonment and heavy predation evident at the Alley North colony; overall the nesting effort is low for this time of year (within the bottom five of last twenty years within WCAs) but the coastal colonies in ENP remain the lone productive location. All the CSSS subpopulation conditions have reached the target of 40% dry, except sub population E where recessions remain slow to reach the percentage dry and the dry nesting days target. Stages receded last week but remain high in Taylor Slough especially in the north. Salinities fell on average within Florida Bay and while the western region is above its 75th percentile, salinities dropped in that region late in the week. This is the time of year that salinities rise rapidly due to increased evaporation and the lack of precipitation and flow.

Biscayne Bay

Total inflow to Biscayne Bay averaged 200 cfs and the previous 30-day mean inflow averaged 250 cfs. The seven-day mean salinity was 32.5 at BBCW8 and 31.1 at BBCW10, both below the preferred maximum salinity of 35 for these sites. Salinity data was provided as a courtesy by Biscayne National Park.

Supporting Information

Kissimmee Basin

Upper Kissimmee

On April 24, 2022, lake stages were 55.8 feet NGVD (0.7 feet below schedule) in East Lake Toho, 52.7 feet NGVD (0.8 feet below schedule) in Lake Toho, and 50.4 feet NGVD (0.1 feet above schedule) in Lakes Kissimmee-Cypress-Hatchineha (KCH) (**Table KB-1**, **Figures KB-1-3**).

Lower Kissimmee

Discharges to the Kissimmee River on April 24, 2022 were 1,950 cfs at S-65 and 1,930 cfs at S-65A; discharges from the Kissimmee River were 1,650 cfs at S-65D and 1,500 cfs at S-65E (**Table KB-2**). Headwater stages were 46.3 feet NGVD at S-65A and 27.1 feet NGVD at S-65D on April 24, 2022. With the S65/S-65A discharge reductions, the concentration of dissolved oxygen in the Kissimmee River has started to rise slowly, with an average of 3.0 mg/L for the week ending on April 24, 2022 (**Table KB-2**, **Figure KB-4**). Water depth on the Kissimmee River floodplain has increased with a mean depth of 1.02 feet as of April 24, 2022 (**Figure KB-5**).

Water Management Recommendations

Continue following the stage recession lines in Lakes East Toho and Toho. In KCH, continue the slow decrease in flow at 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)	
							4/24/22	*4/17/22*
Lakes Hart and Mary Jane	S-62	LKMJ	86	60.0	R	60.2	-0.2	-0.3
Lakes Myrtle, Preston and Joel	S-57	S-57	32	60.4	R	60.4	0.0	0.0
Alligator Chain	S-60	ALLI	64	63.0	R	63.0	0.0	-0.1
Lake Gentry	S-63	LKGT	93	60.5	R	60.5	0.0	-0.1
East Lake Toho	S-59	TOHOE	312	55.8	R	56.5	-0.7	-0.7
Lake Toho	S-61	TOHOW S-61	662	52.7	R	53.5	-0.8	-0.9
Lakes Kissimmee, Cypress and Hatchineha	S-65	KUB011 LKIS5B	2,087	50.4	R	50.3	0.1	0.4

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

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

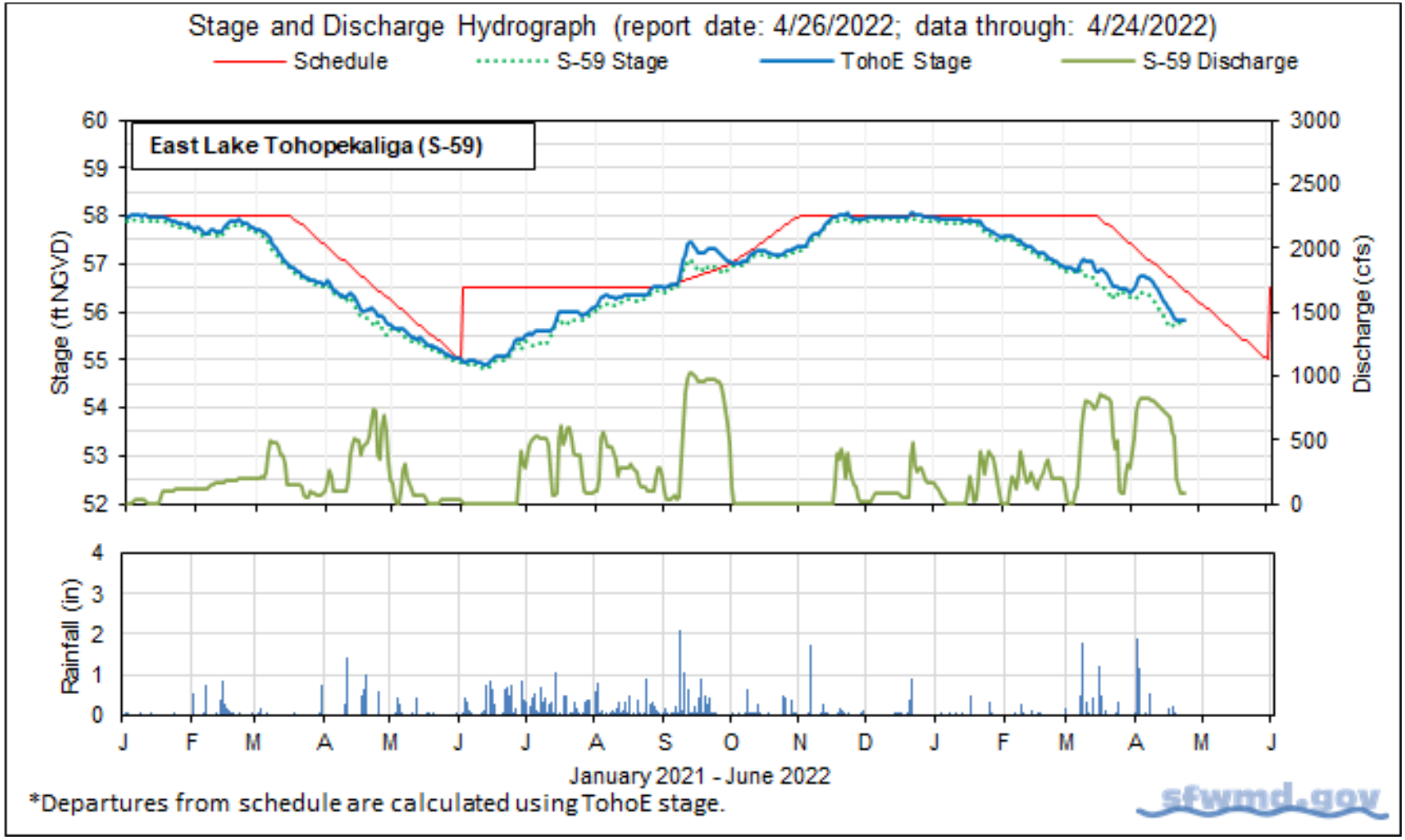


Figure KB-1. East Lake Toho regulation schedule, stage, discharge and rainfall.

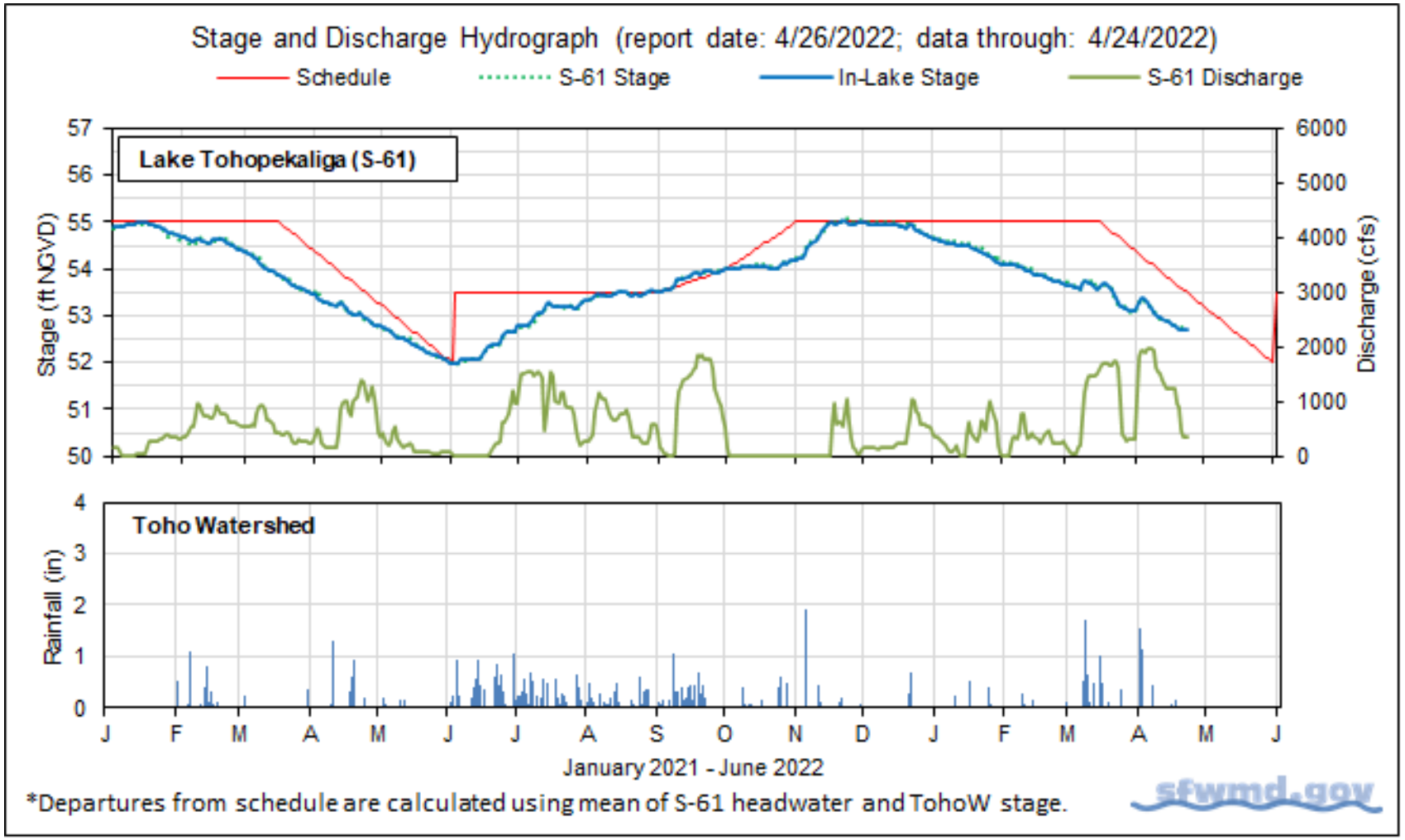


Figure KB-2. Lake Toho regulation schedule, stage, discharge and rainfall.

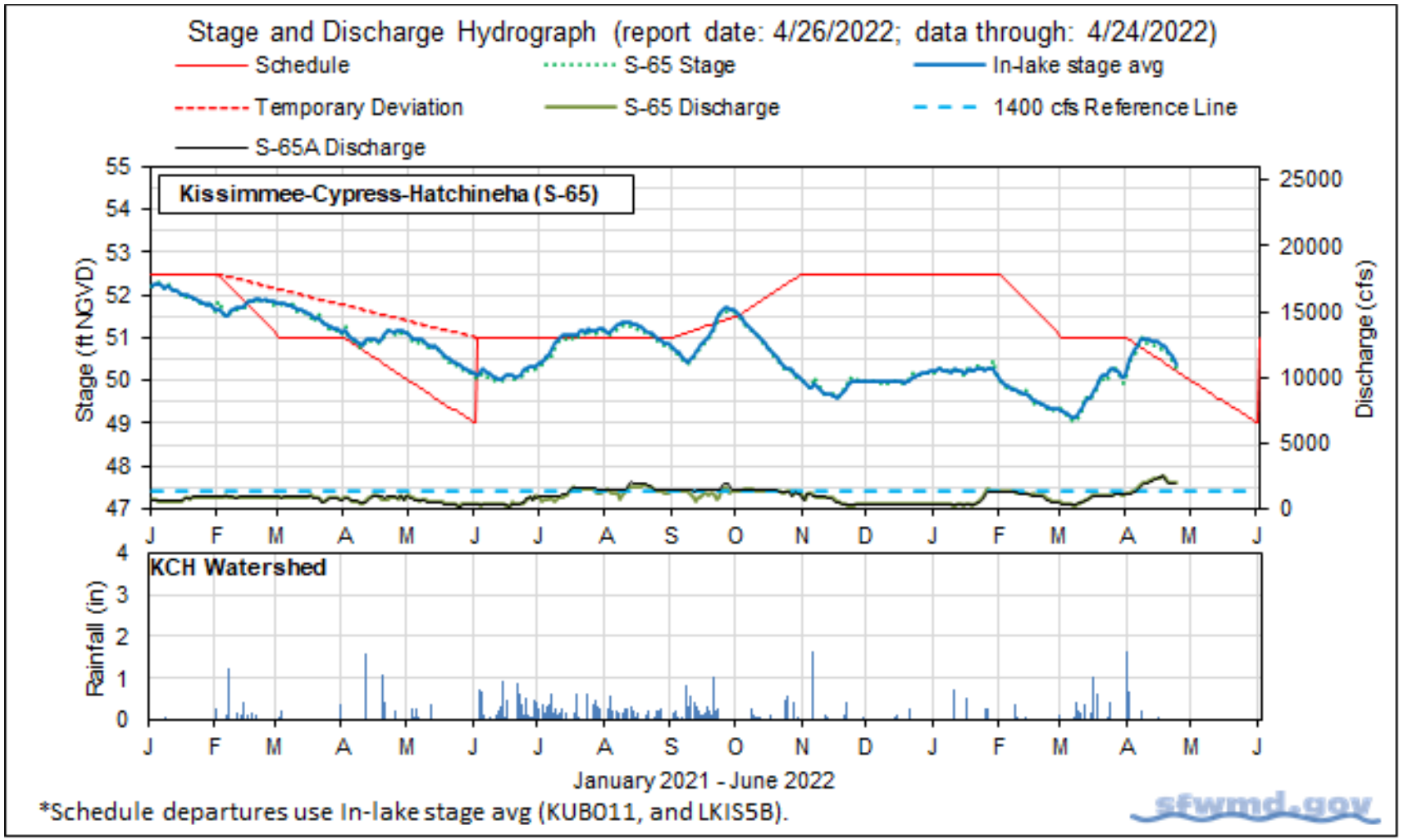


Figure KB-3. Lakes Kissimmee, Cypress and Hatchineha regulation schedule, stage, discharge and rainfall.

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

Metric	Location	Daily Average	Average for Previous Seven Day Periods			
		4/24/22	4/24/22	4/17/22	4/10/22	4/3/22
Discharge	S-65	1,950	2,090	2,240	1,640	1,140
Discharge	S-65A[a]	1,930	2,100	2,200	1,570	1,080
Headwater Stage (feet NGVD)	S-65A	46.3	46.4	46.5	46.5	46.3
Discharge	S-65D[b]	1,650	1,500	1,220	1,090	980
Headwater Stage (feet NGVD)	S-65D[c]	27.1	27.0	26.8	26.8	26.8
Discharge (cfs)	S-65E[d]	1,500	1,310	1,090	970	860
Discharge (cfs)	S-67	0	0	0	0	0
Dissolved Oxygen (mg/L) [e]	Phase I, II/III river channel	3.2	3.0	6.0	7.0	8.1
Mean depth (feet) [f]	Phase I floodplain	1.02	0.97	0.47	0.23	0.24

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

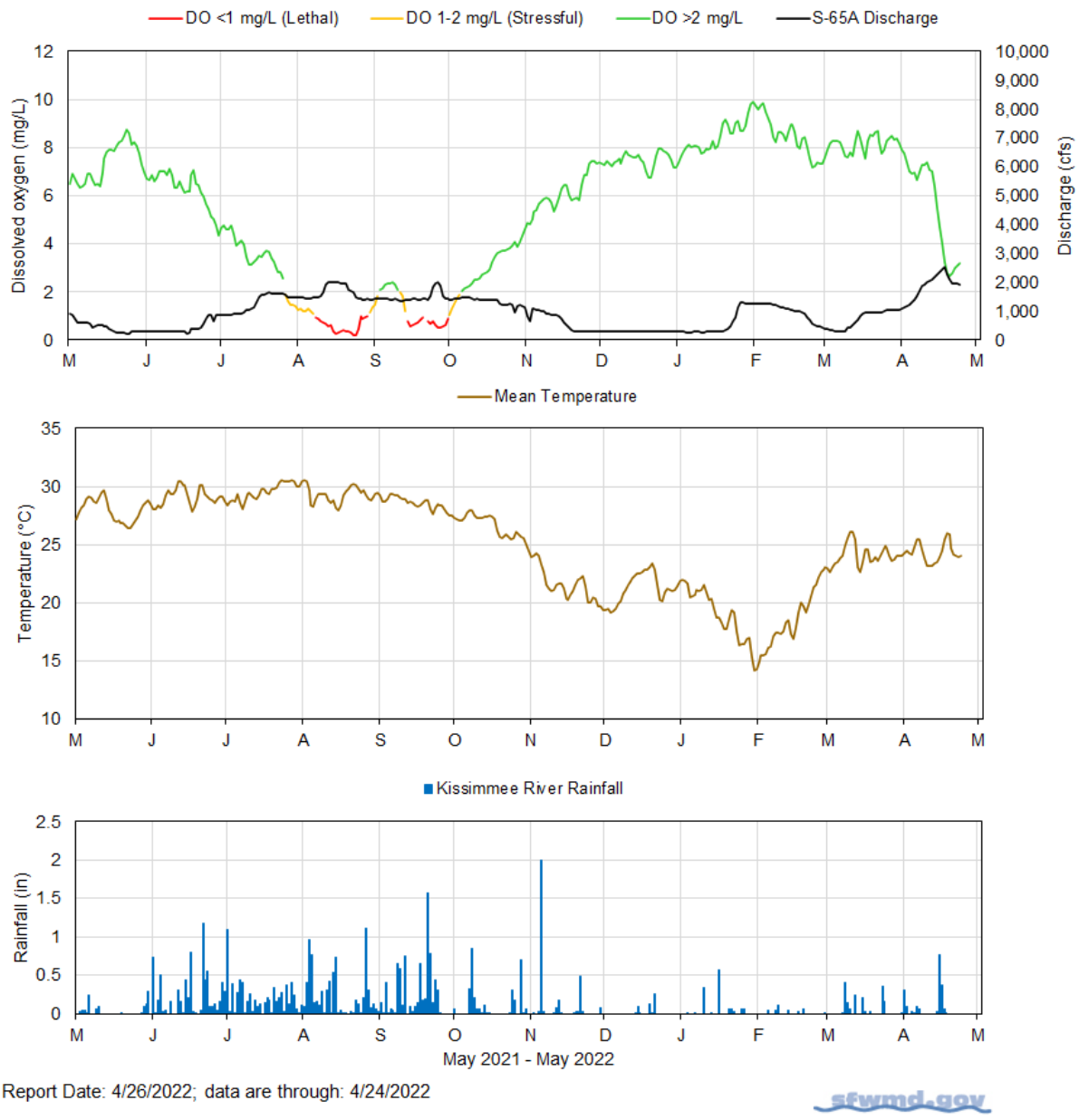


Figure KB-4. Restored Kissimmee river channel mean daily dissolved oxygen concentration (mg/L), S-65A discharge (cfs), temperature (°C) and rainfall (inches). Dissolved oxygen (DO) and temperature are mean daily values averaged for PC62, KRBN, PC33, PD62R, and PD42R with an average of four stations reporting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

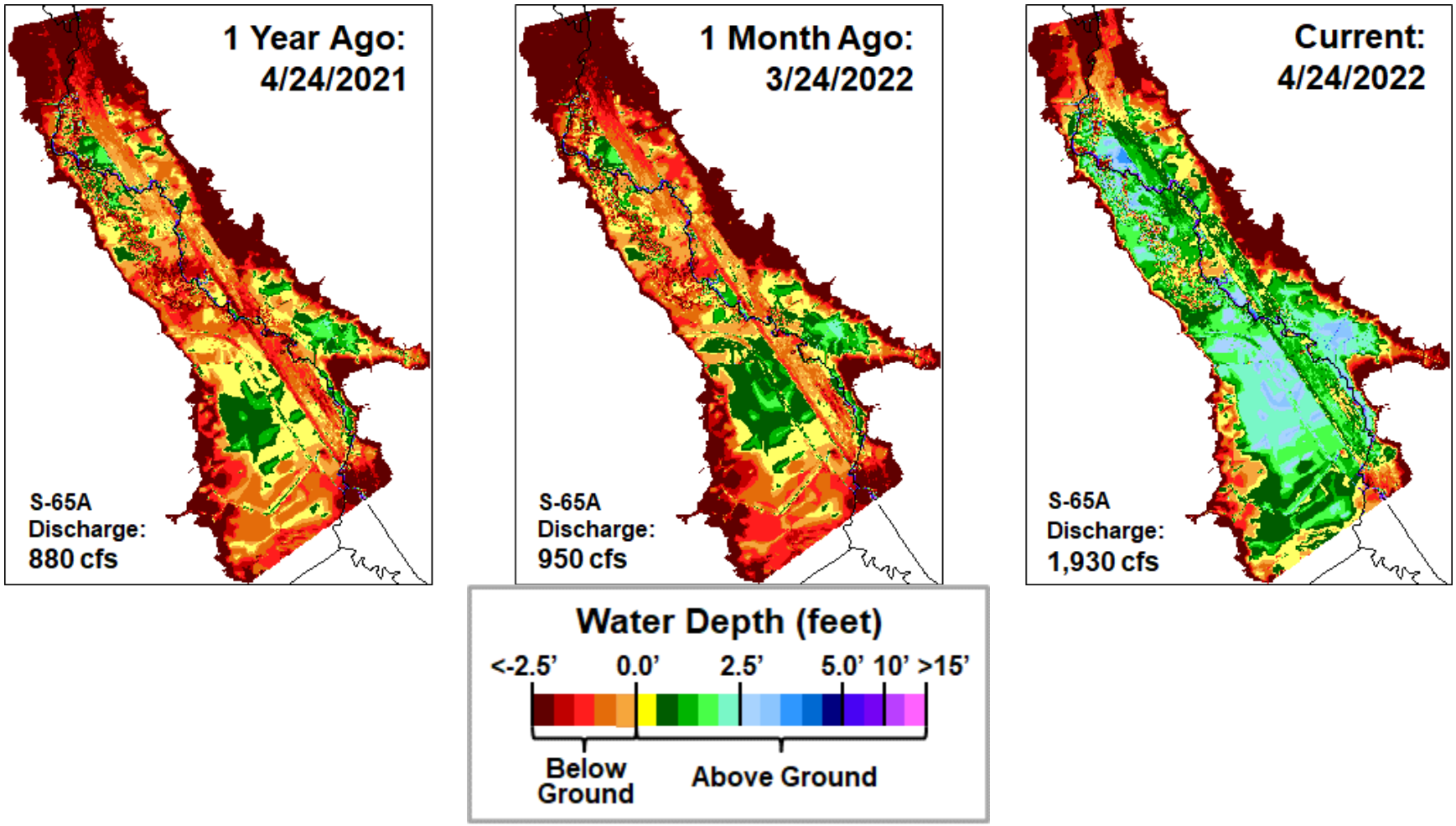


Figure KB-5. Phase I area Kissimmee River floodplain water depths (from left to right) one year ago, one month ago and current.

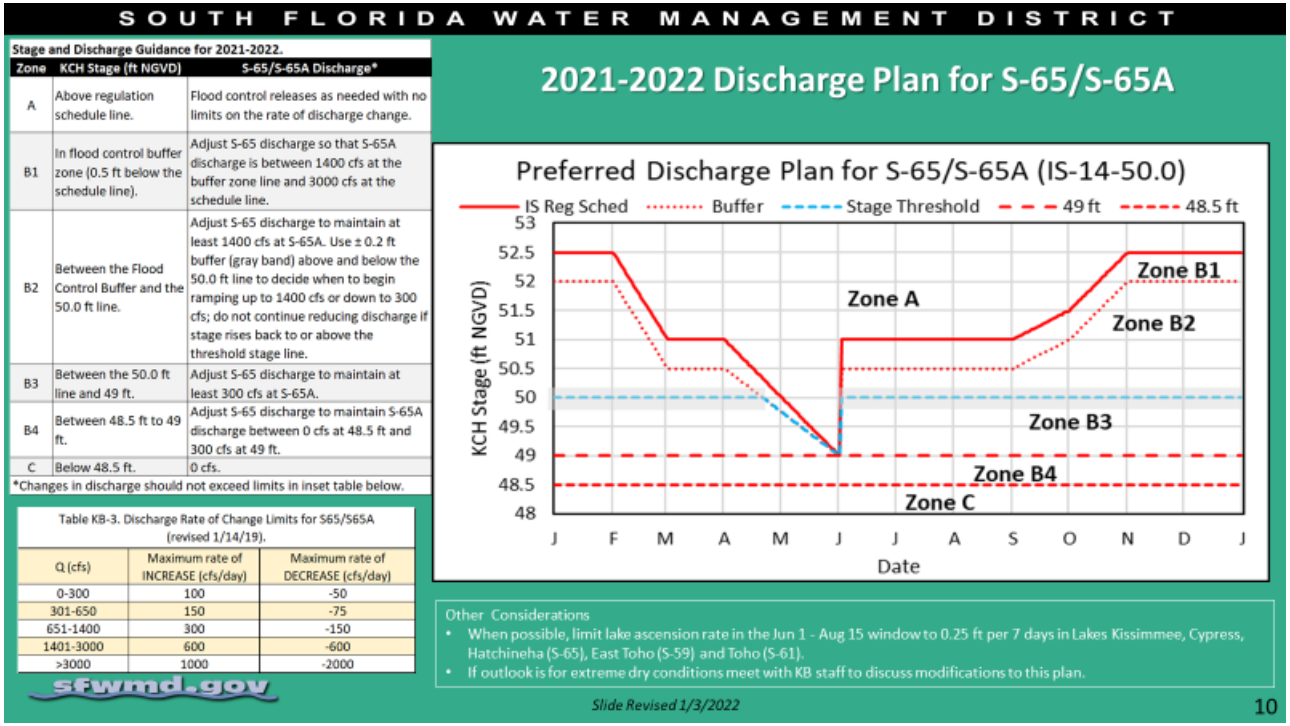


Figure KB-6. IS-14-50 Discharge Plan for S65/S65A with discharge rate of change limits (revised 1/14/19).

Lake Okeechobee

Lake Okeechobee stage was 13.11 feet NGVD on April 24, 2022, with water levels 0.90 feet lower than a month ago (**Figure LO-1**). Lake stage remains in the Baseflow sub-band (**Figure LO-2**) and has been within the ecological envelope for 16 weeks (**Figure LO-3**). According to NEXRAD, 0.05 inches of rain fell directly on the Lake last week.

Average daily inflows (excluding rainfall) increased from the previous week, going from 1,110 cfs to 1,320 cfs. Average daily outflows (excluding evapotranspiration) also increased, going from 2,950 cfs to 4,050 cfs. Highest inflows came from the Kissimmee River through the S-65E structure (1,311 cfs). The outflow to the west via the S-77 structure was 1,090 cfs and flows south via the S-350 structures totaled 2,240 cfs (S-351 1,090 cfs; S-352 690 cfs; S-354 460 cfs). Flows east were 690 cfs and 40 cfs via the S-308 structure and the L-8 canal through the S-271 structure (formerly Culvert 10A), respectively. **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 snail kite nesting survey recorded two more nests on Lake Okeechobee, for a total of thirty-nine nests thus far, including twenty failures. Nests are spread across Indian Prairie marsh, Moonshine Bay and Observation Island. Nests have also been recorded on Lake Hicpochee impoundments (24 nests; 19 active), the C-44 canal impoundments (9 nests; all active), and in Nubbin Slough impoundment (1 active).

The most recent satellite image (April 21, 2022) from the NOAA cyanobacteria monitoring product derived from EUMETSAT's Sentinel 3 OLCI sensor showed areas of increasing bloom potential in Fisheating Bay and along the northern and western shorelines (**Figure LO-6**).

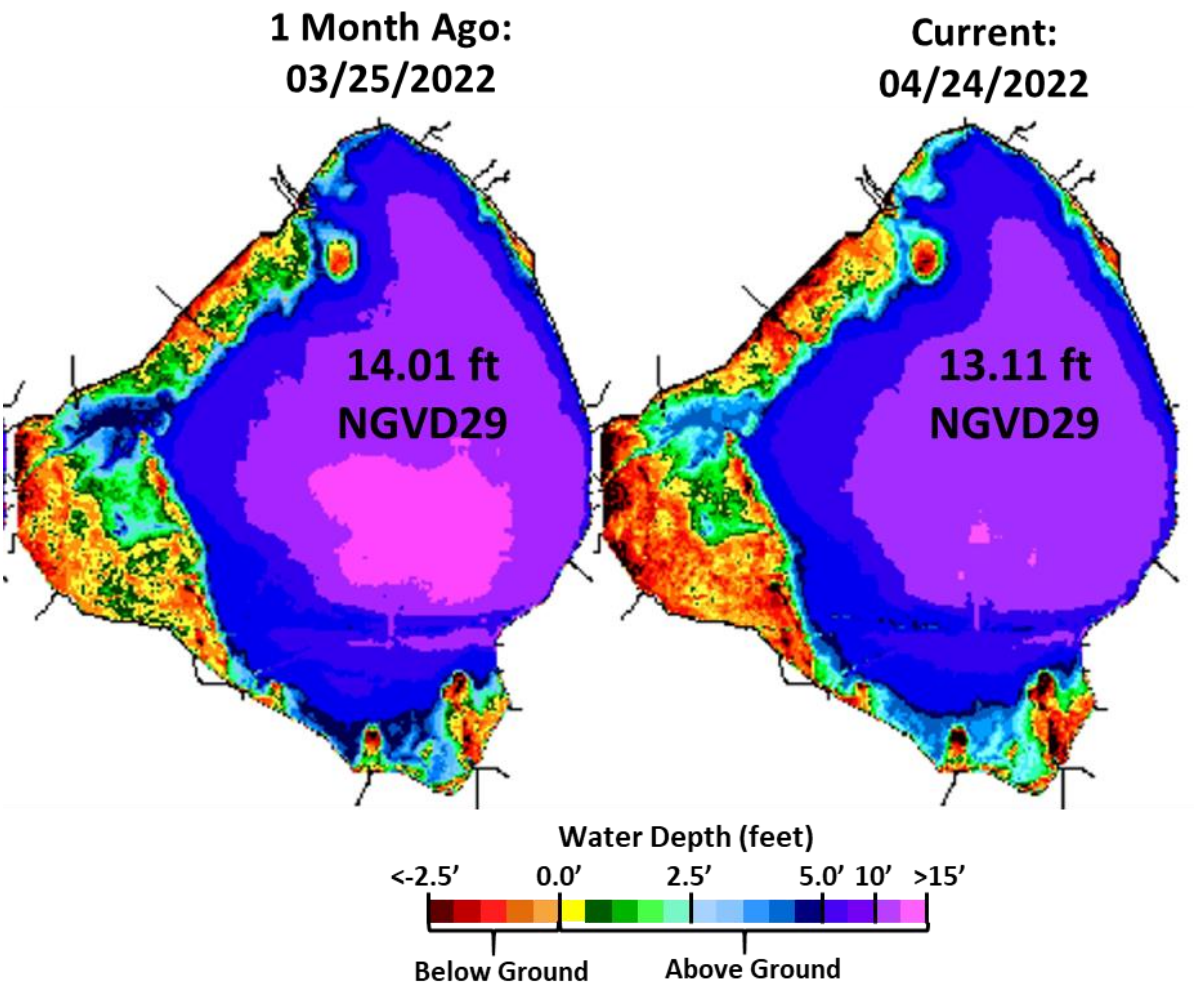


Figure LO-1. Lake Okeechobee water depth estimates based on South Florida Water Depth Assessment Tool (SFWDAT).

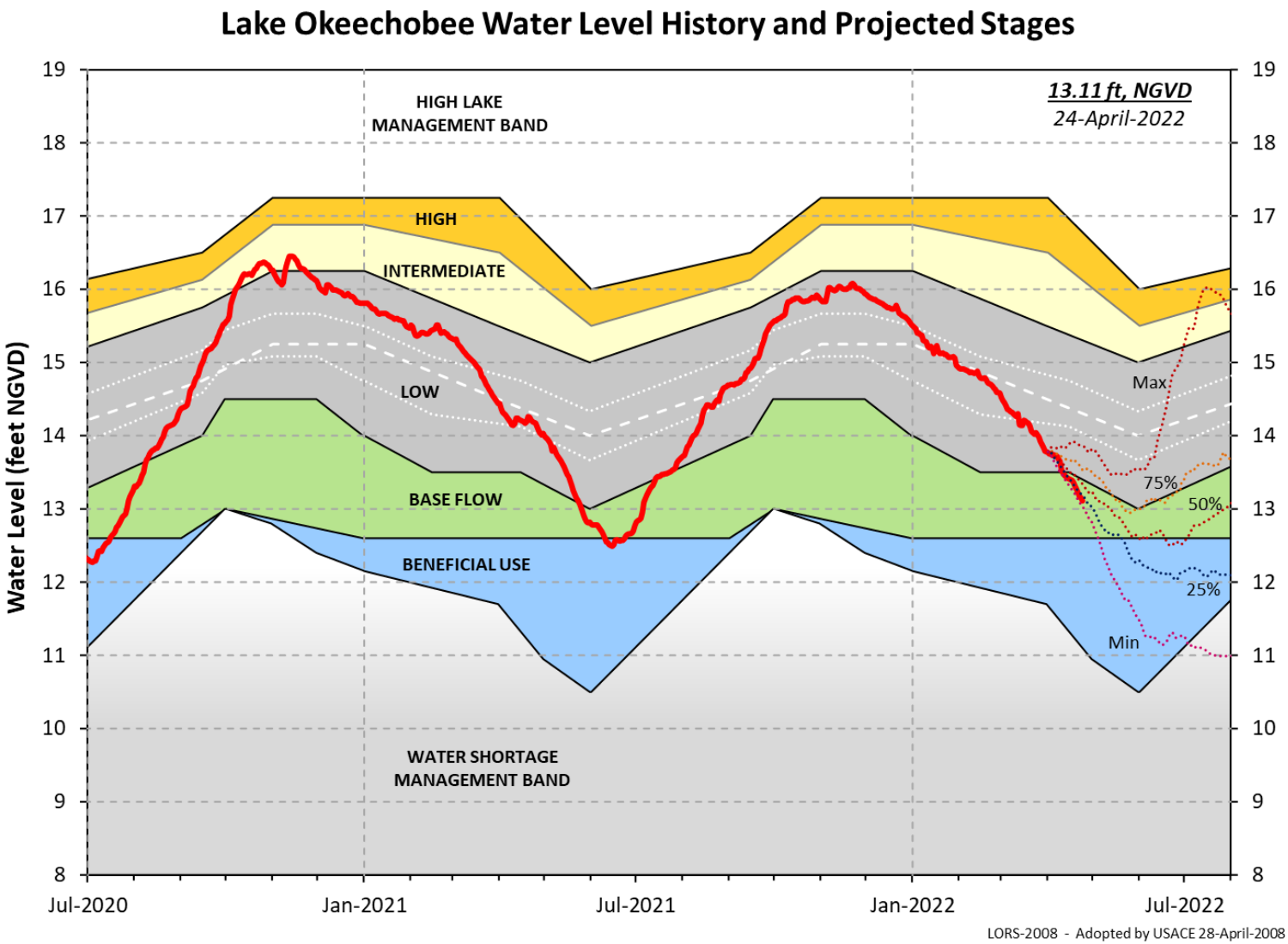


Figure LO-2. Recent Lake Okeechobee stages with projected stages based on a dynamic position analysis.

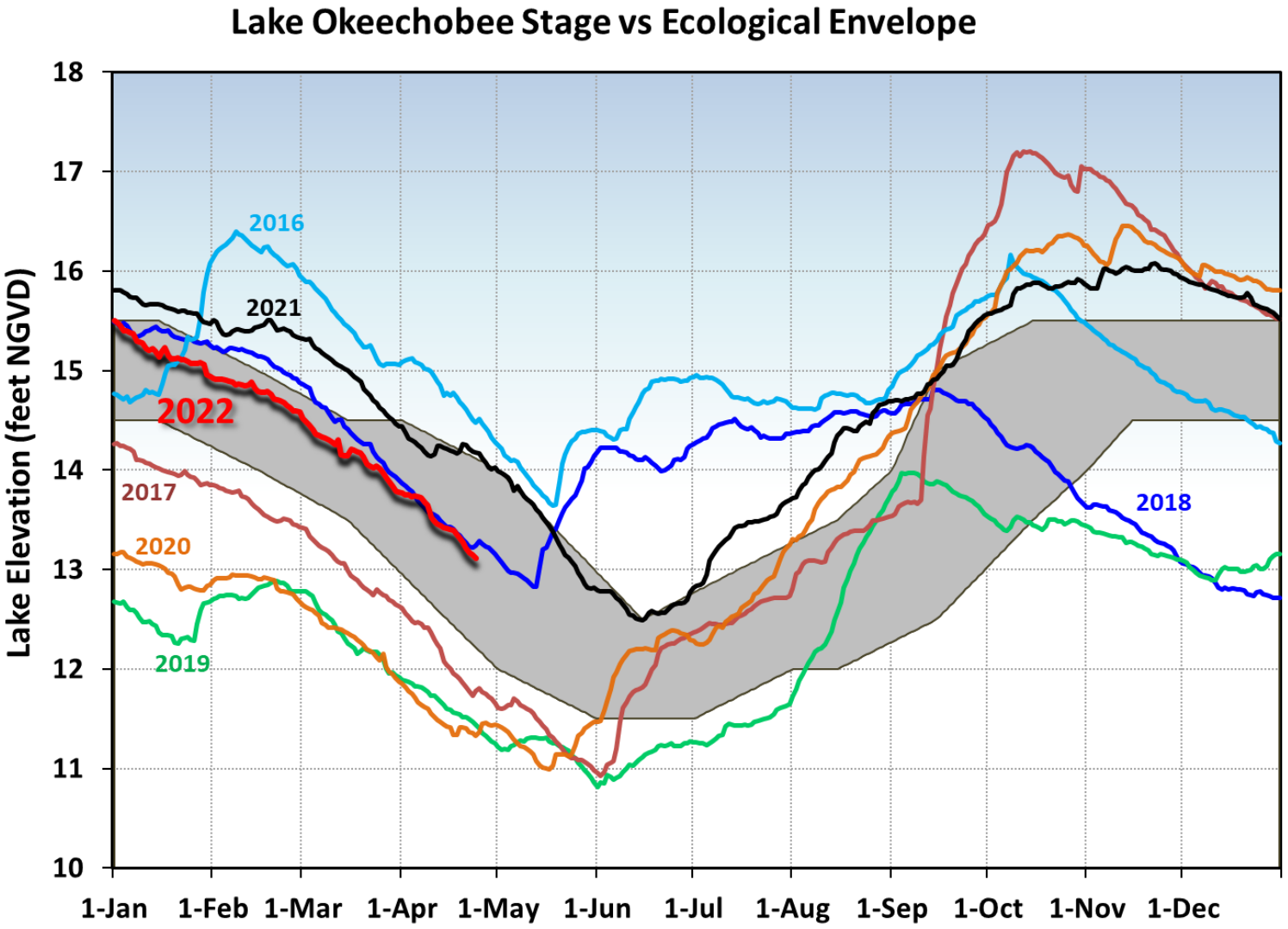


Figure LO-3. The prior six years of annual stage hydrographs for Lake Okeechobee in comparison to the ecological envelope.

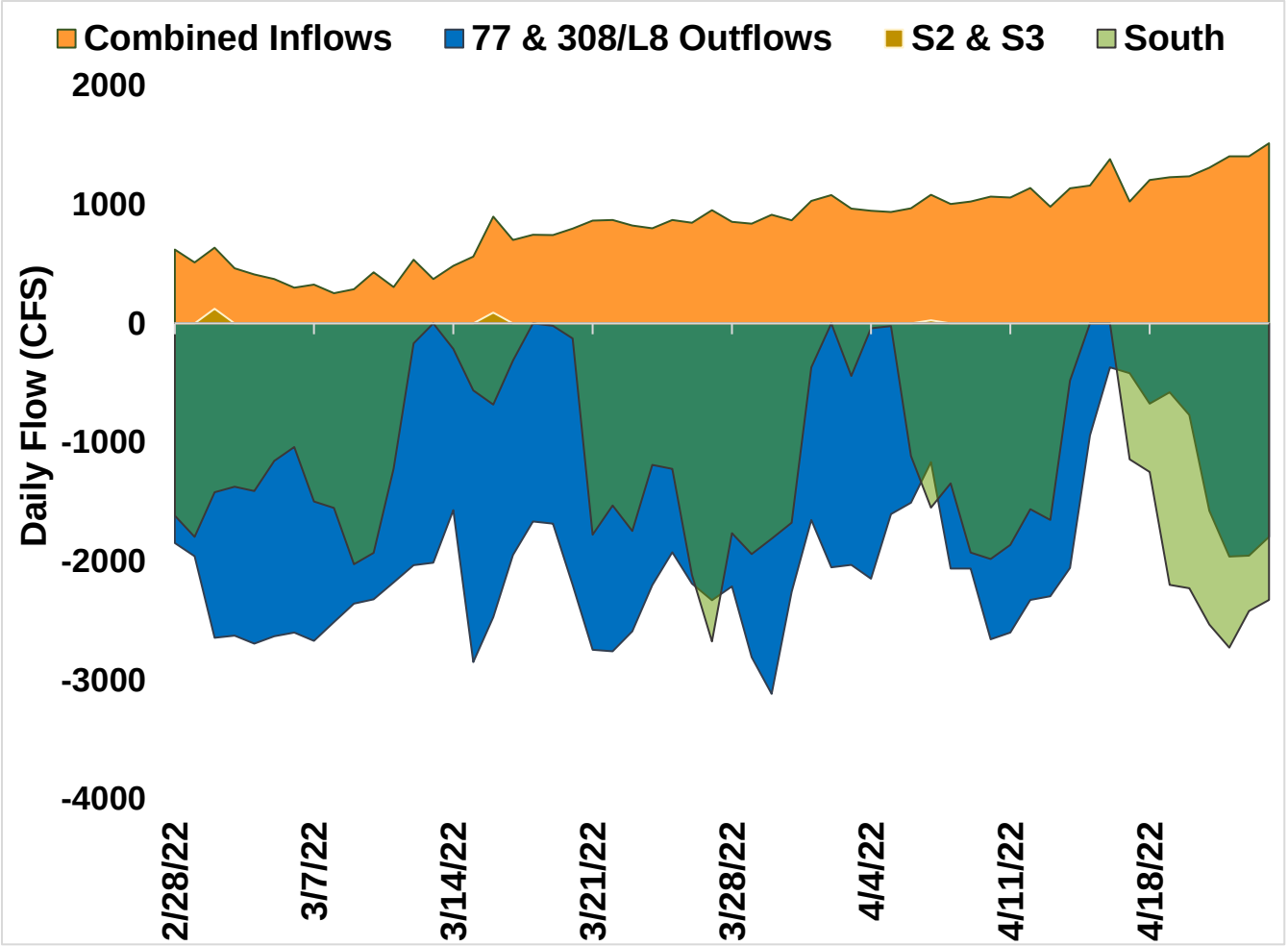


Figure LO-4. Major inflows (orange) to and outflows east and west (blue) from Lake Okeechobee. Outflows south are shown in green. Flows into Lake Okeechobee from the L-8 canal through S-271 (formerly Culvert 10A) or from the C-44 canal through the S-308 are included as inflows. Conversely, flows from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

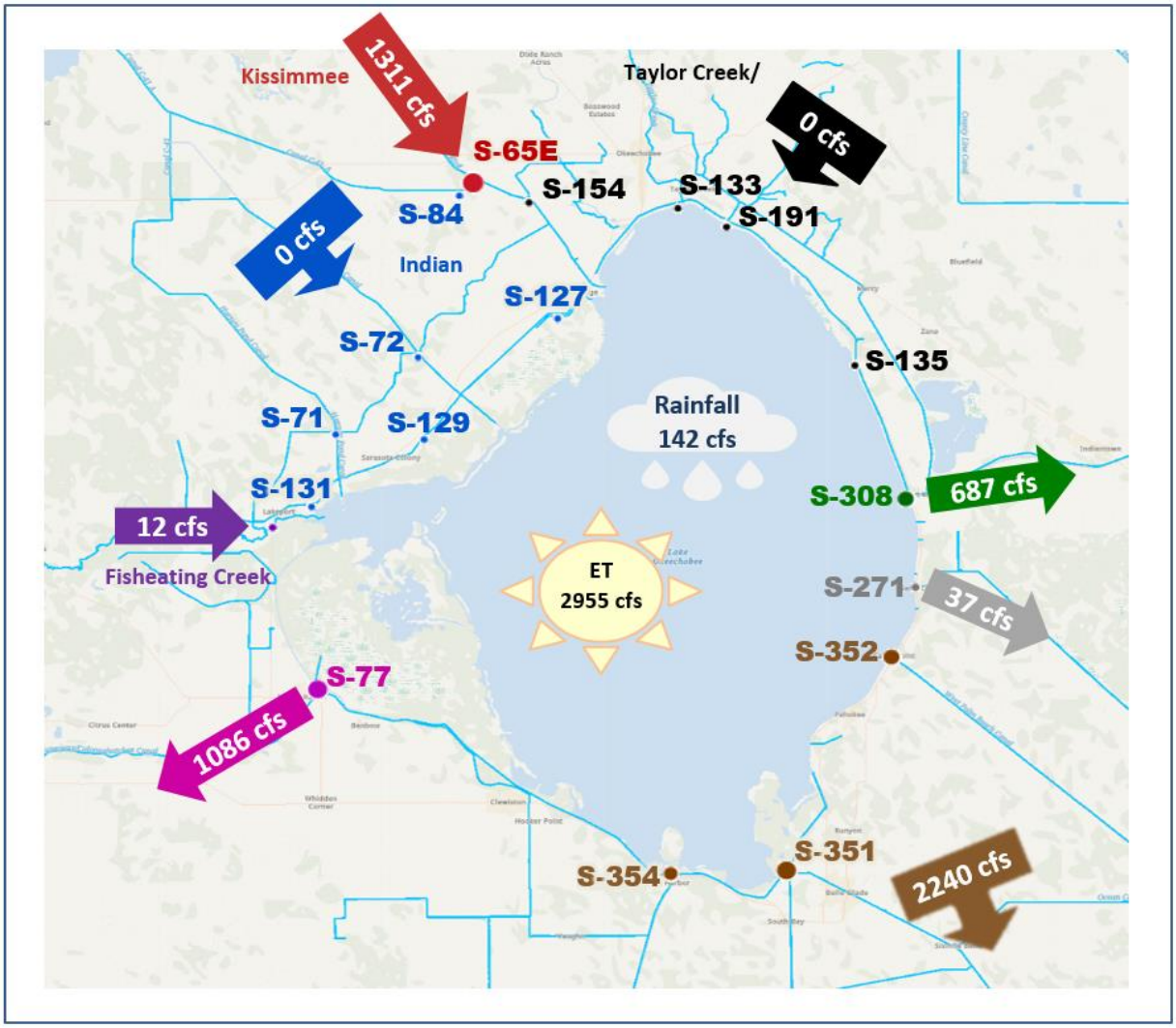


Figure LO-5. Inflows into Lake Okeechobee from Indian Prairie basins, Taylor Creek/Nubbin Slough, Kissimmee River and Fisheating Creek, and outflows to the west via S-77, to the east via S-308, to the south via S-351, S-352, S-354, and to southeast via S-271 (formerly Culvert 10A) for the week of April 18, 2022 – April 24, 2022.

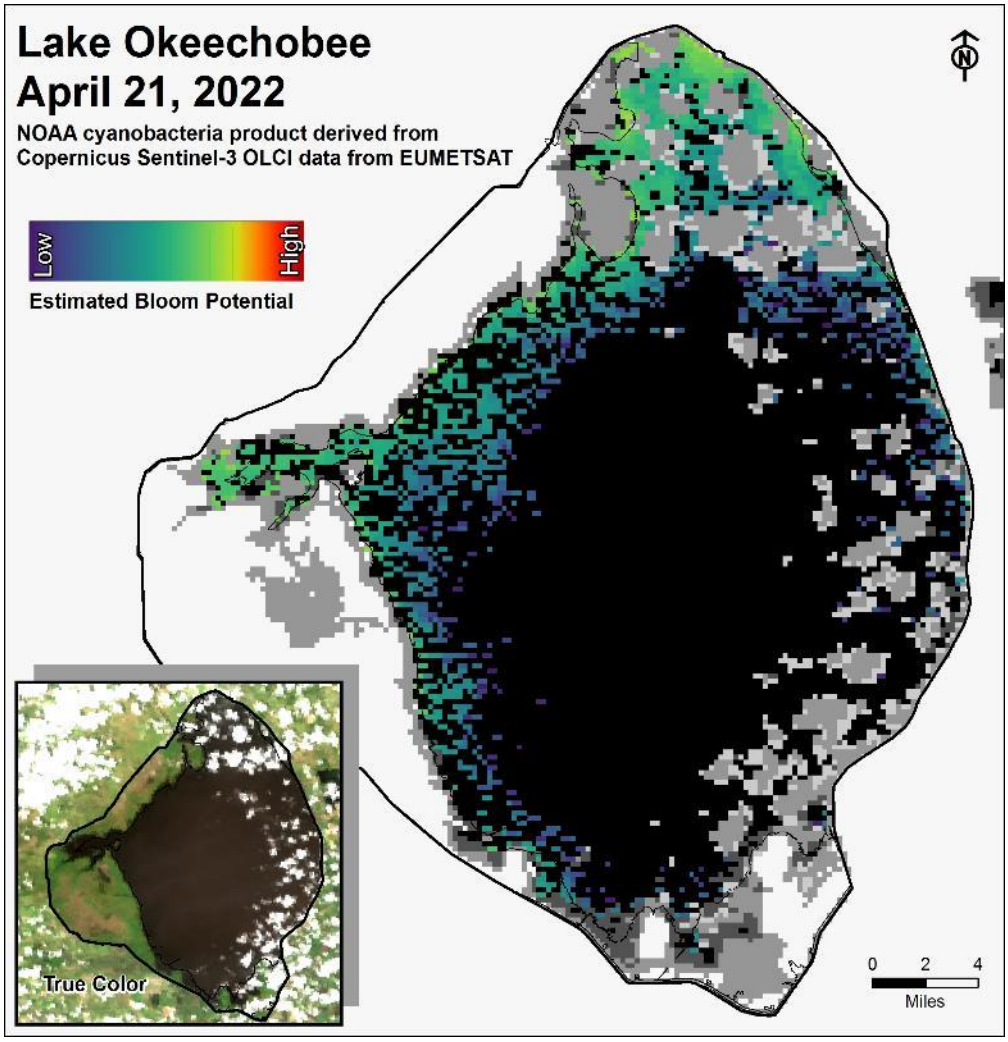


Figure LO-6. Cyanobacteria bloom potential on April 21, 2022 based on NOAA's harmful algal bloom monitoring system. Gray color indicates cloud cover.

Estuaries

St. Lucie Estuary

Over the past week, mean total inflow to the St. Lucie Estuary was 195 cfs (**Figures ES-1** and **ES-2**) and the previous 30-day mean inflow was 435 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 24.6. Salinity conditions in the middle estuary were estimated to be within the optimal range for adult eastern oysters (**Figure ES-4**). Larval oyster recruitment rates reported by the Fish and Wildlife Research Institute were low in March, as expected during the cooler months when most oysters are not spawning (**Figure ES-5**).

Caloosahatchee River Estuary

Over the past week, mean total inflow to the Caloosahatchee River Estuary was 1,610 cfs (**Figures ES-6** and **ES-7**) and the previous 30-day mean inflow was 1,810 cfs. For comparison, the historical provisional mean inflows from the contributing areas are shown in **Figure ES-7**.

Over the past week, surface salinities remained the same at S-79 and Val I-75, increased at Ft. Myers and Cape Coral, and decreased at Shell Point and Sanibel (**Table ES-2** and **Figures ES-8** and **ES-9**). The seven-day mean salinities (**Table ES-2**) were in the optimal range (0-10) for tape grass in the upper estuary. The seven-day mean salinity values were within the optimal range for adult eastern oysters at Cape Coral, and in the stressed range at Shell Point and Sanibel (**Figure ES-10**). Larval oyster recruitment rates reported by the Fish and Wildlife Research Institute were low at Iona Cove and Bird Island in March, as expected during the cooler months when most oysters are not spawning (**Figures ES-11 and ES-12**).

Surface salinity at Val I-75 was forecasted for the next two weeks, using an autoregression model (Qiu and Wan, 2013[1]) coupled with a linear reservoir model for the tidal basin. Model scenarios included pulse releases at S-79 ranging from 0 to 1500 cfs and steady releases at 2,000 cfs with estimated tidal basin inflows of 40 cfs. Model results from all scenarios predict daily salinity to be 2.5 or lower and the 30-day moving average surface salinity to be 0.6 or lower at Val I-75 at the end of the two-week period (**Table ES-3** and **Figure ES-13**). This keeps predicted salinities in the upper estuary within the optimal salinity range (0-10) for tape grass.

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

Red Tide

The Florida Fish and Wildlife Research Institute reported on April 22, 2022, that *Karenia brevis*, the Florida red tide dinoflagellate, was not observed in any samples collected within the District region. On the east coast, red tide was not observed in samples from St. Lucie, Martin, Palm Beach or Miami-Dade counties.

Water Management Recommendations

Lake stage is in the Base Flow Sub-Band. Tributary conditions are dry. The LORS 2008 release guidance suggests up to 450 cfs release at S-79 to the Caloosahatchee River Estuary and up to 200 cfs release at S-80 to the St. Lucie Estuary.

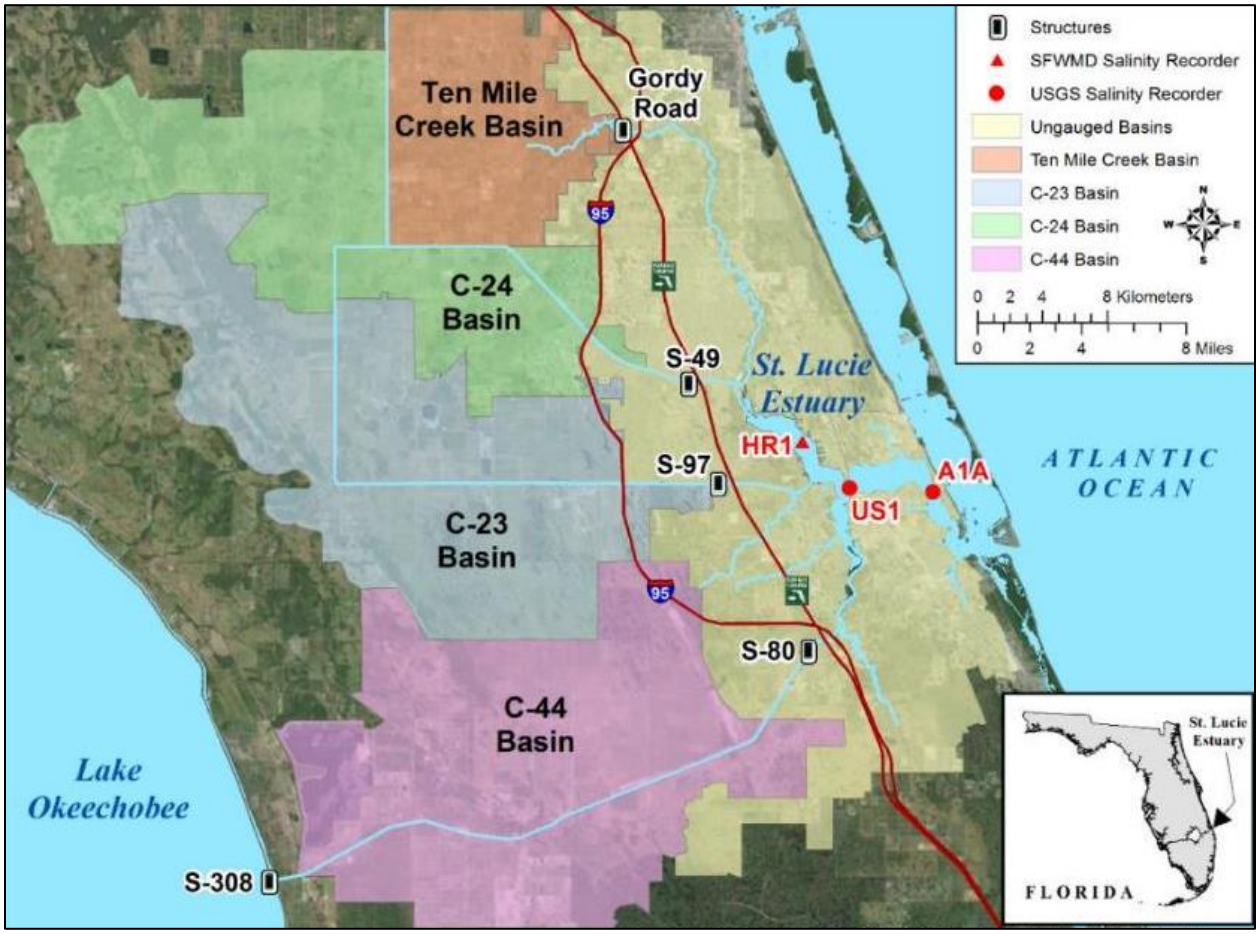


Figure ES-1. Basins, water control structures and salinity monitoring sites in the St. Lucie Estuary.

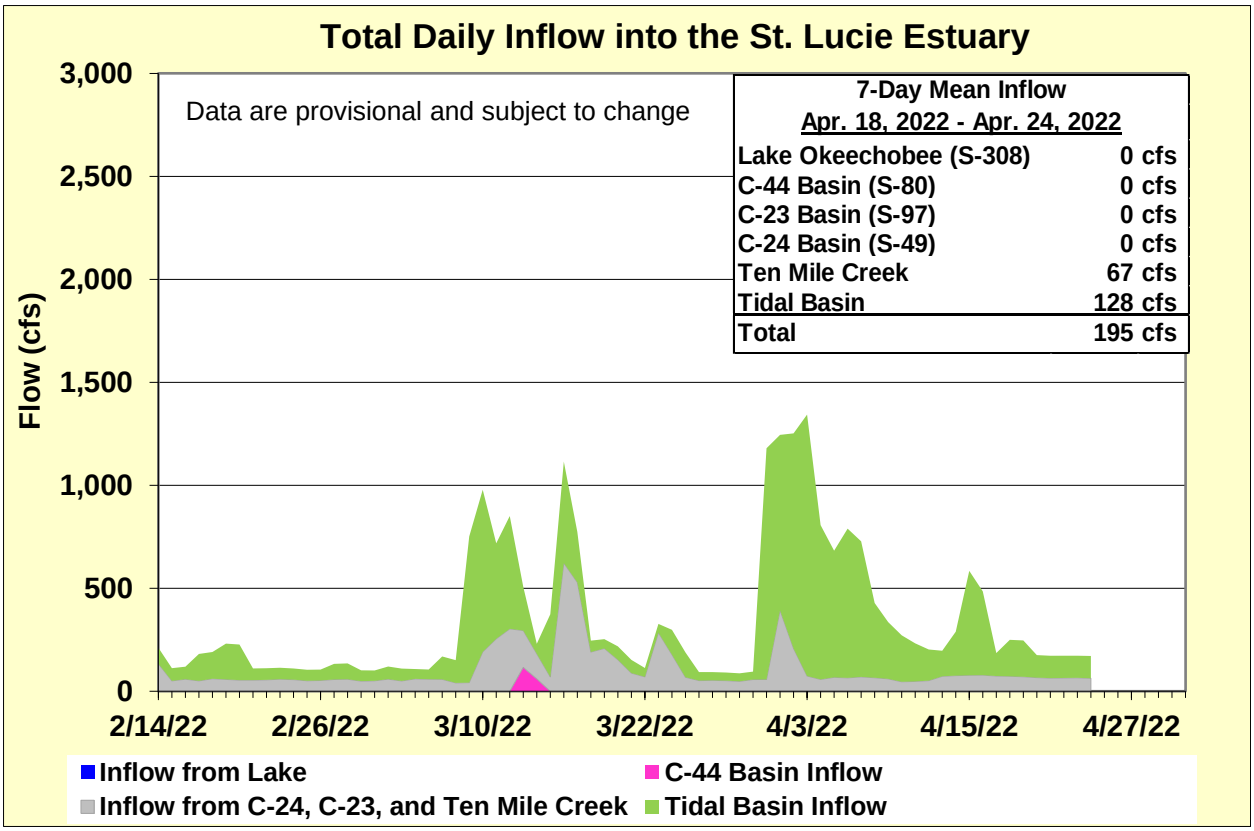


Figure ES-2. Total daily inflows from Lake Okeechobee and runoff from the C-44, C-23, C-24, Ten Mile Creek, and Tidal Basins into the St. Lucie Estuary.

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

Sampling Site	Surface	Bottom	Optimal Envelope
HR1 (North Fork)	**20.7** (18.7)	**20.1** (19.3)	10.0 – 25.0
US1 Bridge	**24.4** (22.4)	**24.7** (22.9)	10.0 – 25.0
A1A Bridge	**31.6** (30.0)	**33.7** (32.7)	10.0 – 25.0

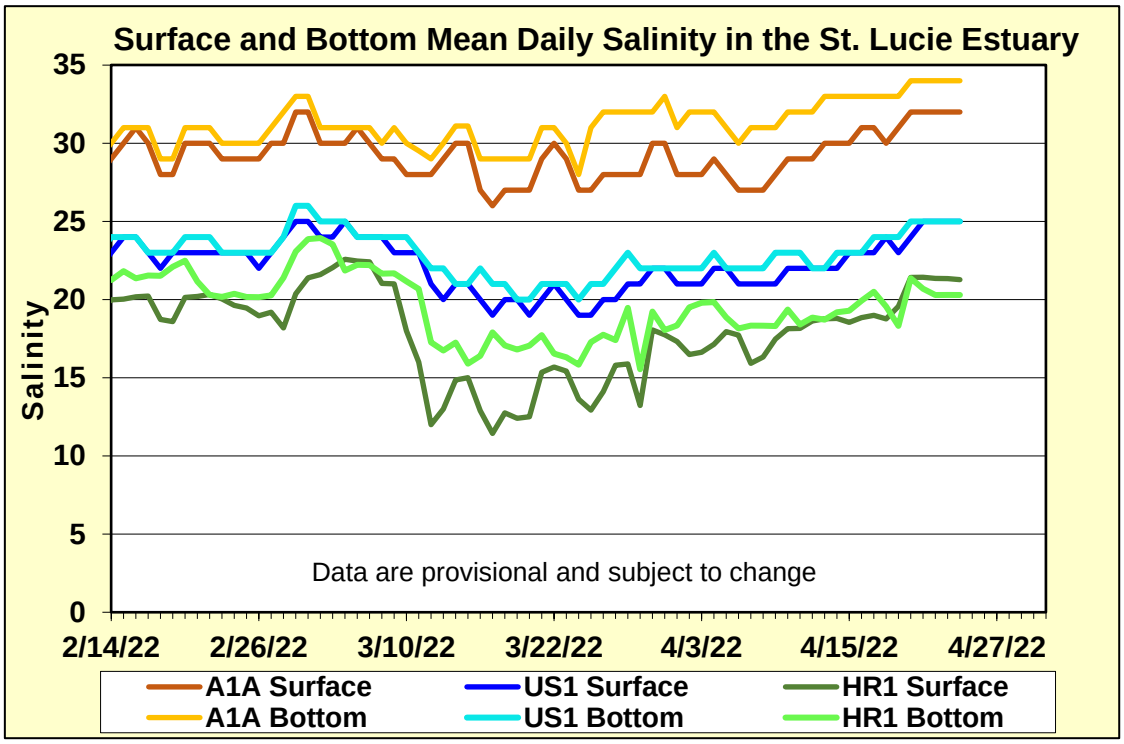


Figure ES-3. Mean daily salinity at the A1A, US1 and HR1 sites in the St. Lucie Estuary.

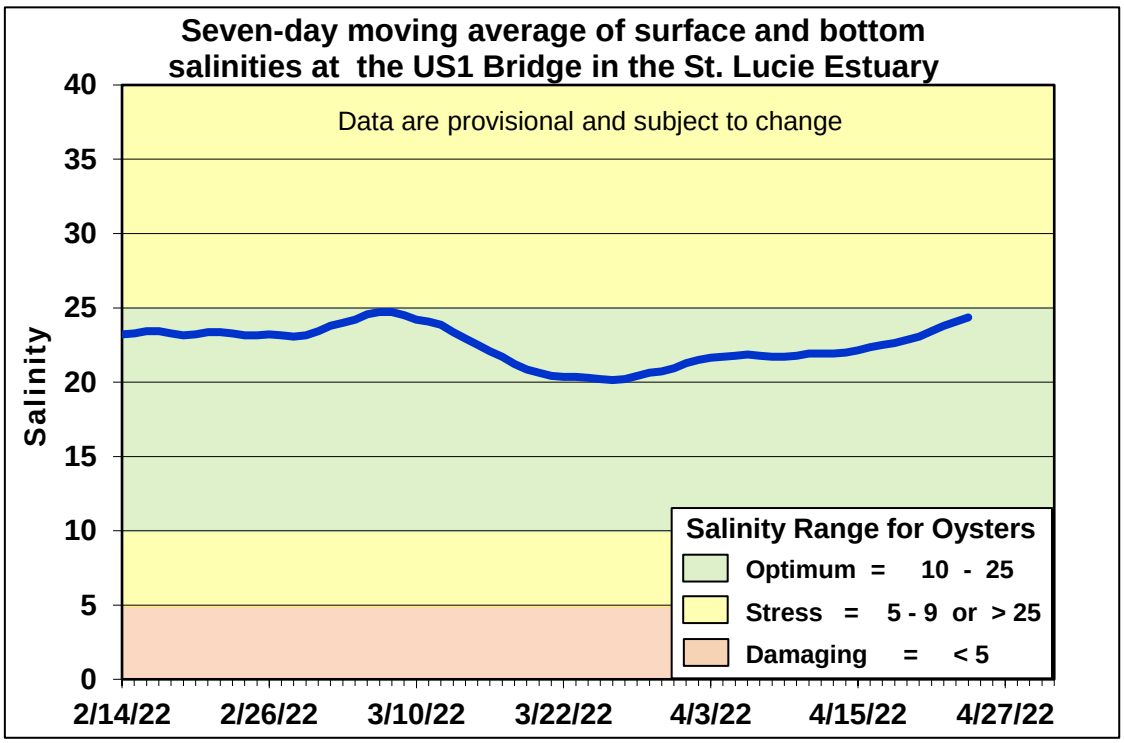


Figure ES-4. Seven-day moving average of the surface and bottom salinities at the US1 Bridge in the St. Lucie Estuary.

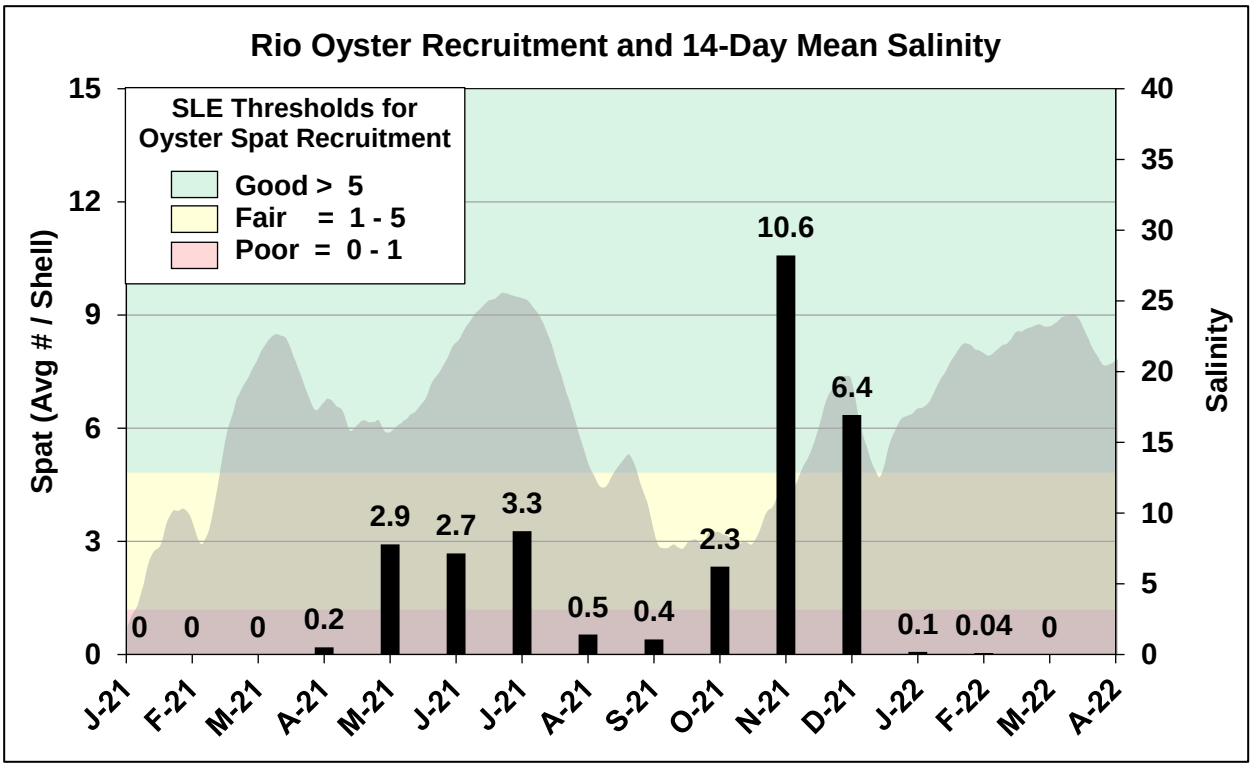


Figure ES-5. Mean oyster recruitment at the Rio oyster monitoring station and 14-day mean salinity at US1 Bridge.

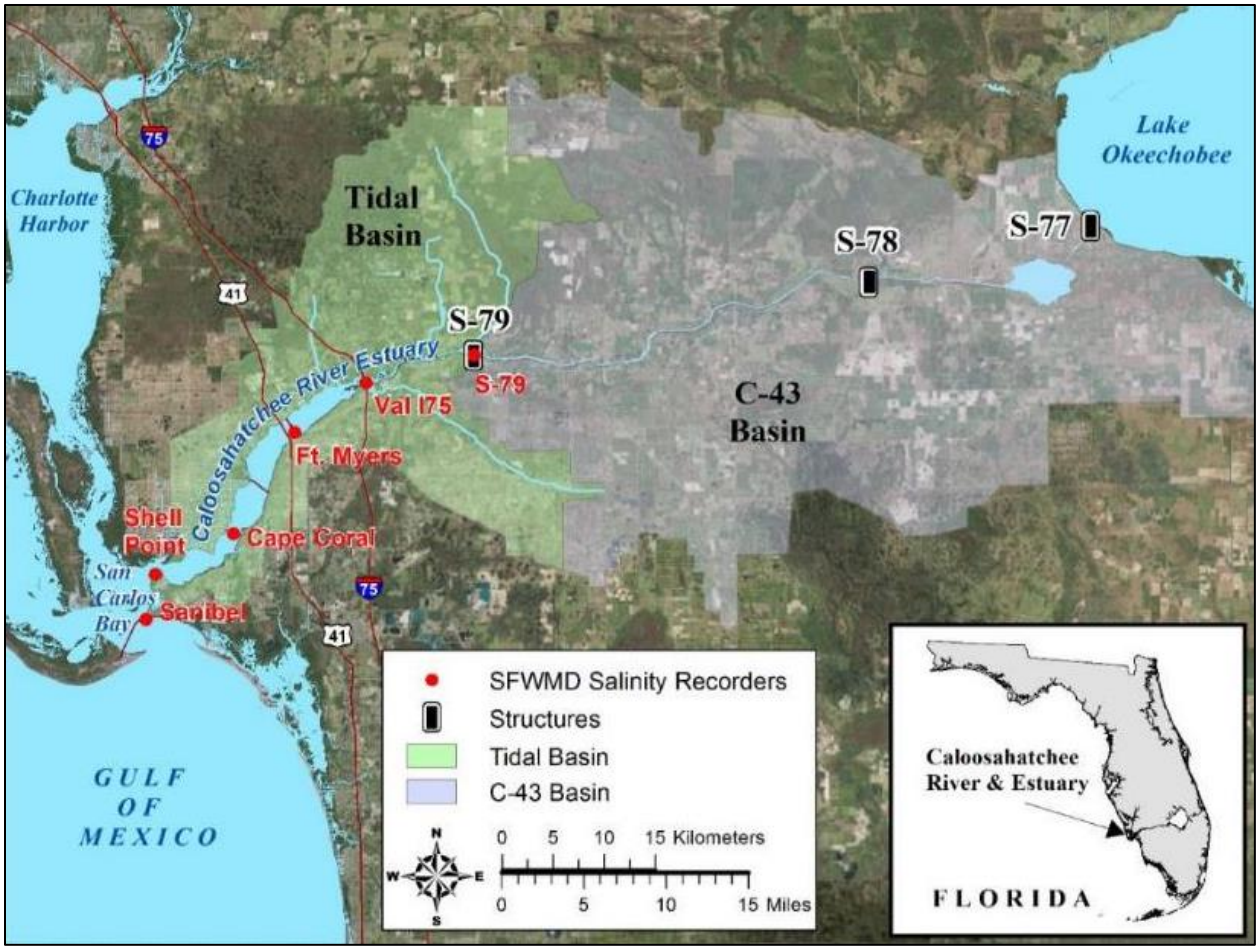


Figure ES-6. Basins, water control structures and salinity monitoring sites in the Caloosahatchee River Estuary.

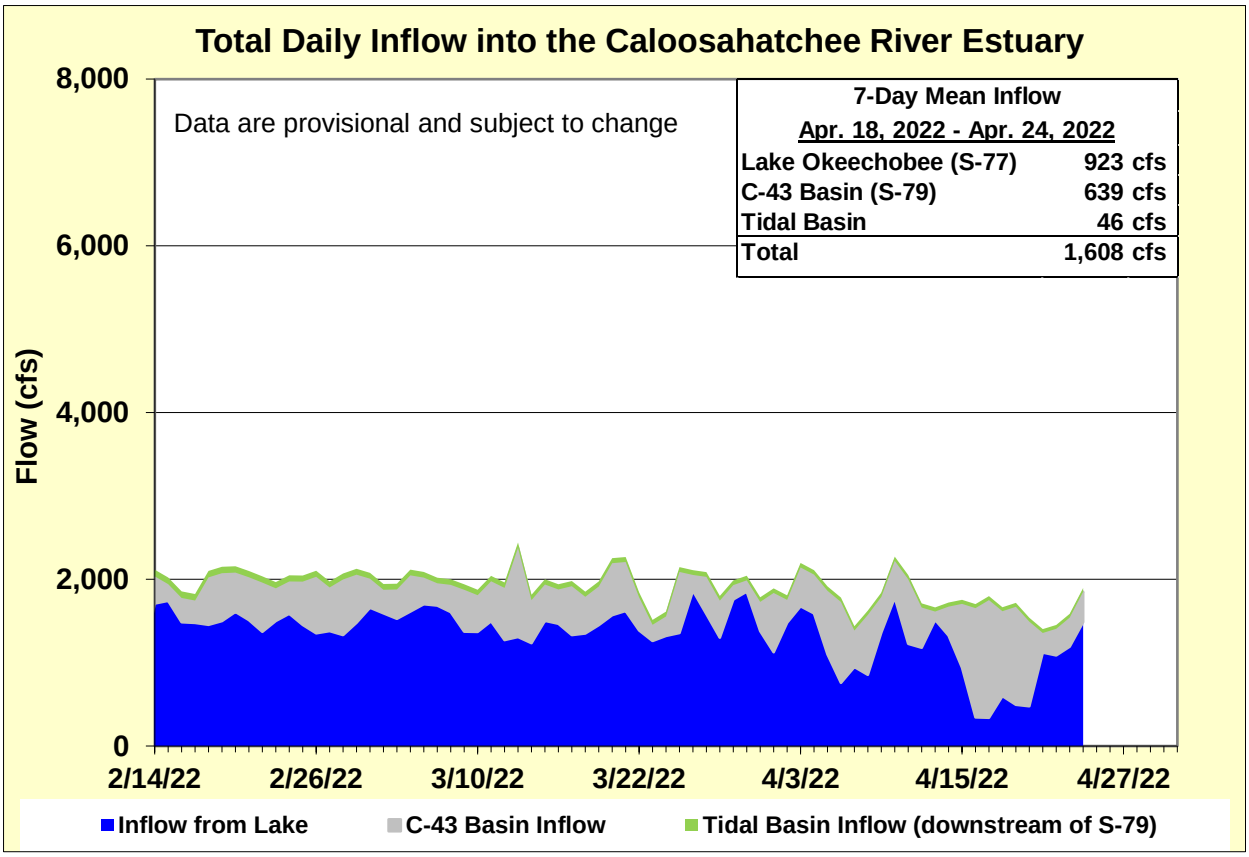


Figure ES-7. Total daily inflows from Lake Okeechobee, and runoff from the C-43 and Tidal basins into the Caloosahatchee River Estuary.

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

Sampling Site	Surface	Bottom	Optimal Envelope
S-79 (Franklin Lock)	**0.2** (0.2)	**0.2** (0.2)	0.0 – 10.0
Val I-75	**0.2** (0.2)	**0.3** (0.2)	0.0 – 10.0
Fort Myers Yacht Basin	**3.6** (2.5)	**4.8** (3.9)	0.0 – 10.0
Cape Coral	**10.8** (10.4)	**12.4** (12.8)	10.0 – 25.0
Shell Point	**25.7** (25.9)	**26.4** (26.7)	10.0 – 25.0
Sanibel	**29.2** (30.8)	**31.5** (32.0)	10.0 – 25.0

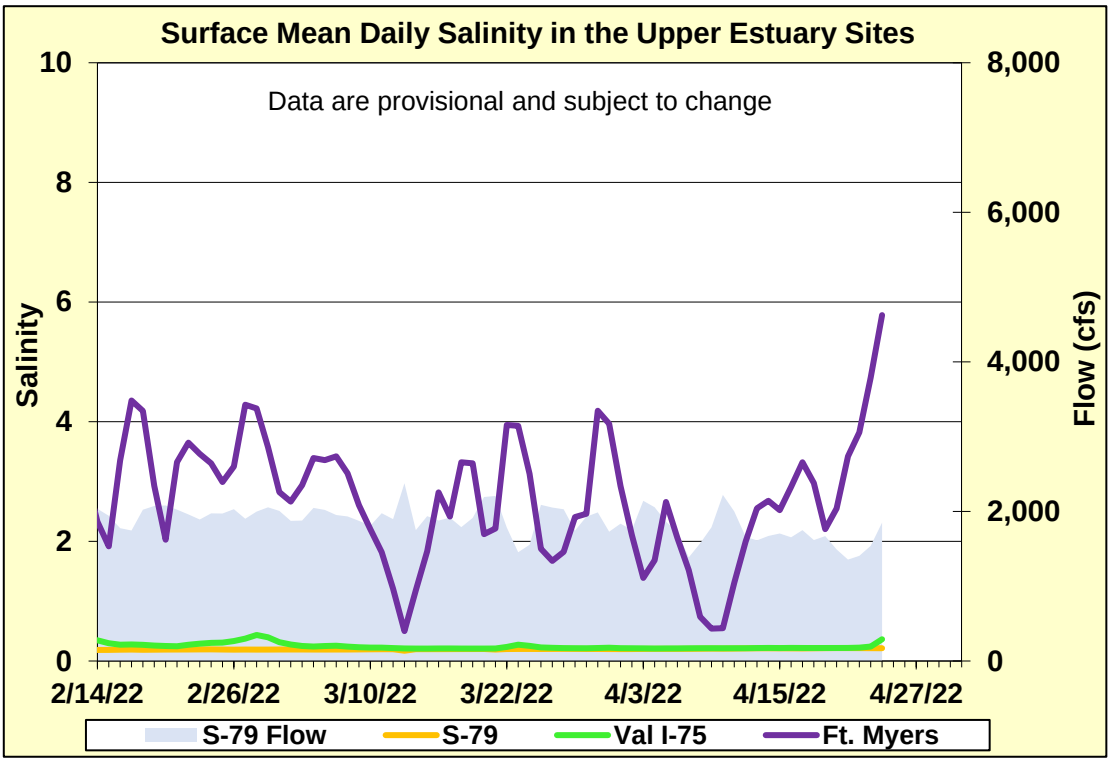


Figure ES-8. Mean daily salinity at upper Caloosahatchee River Estuary monitoring sites and mean daily flow at S-79.

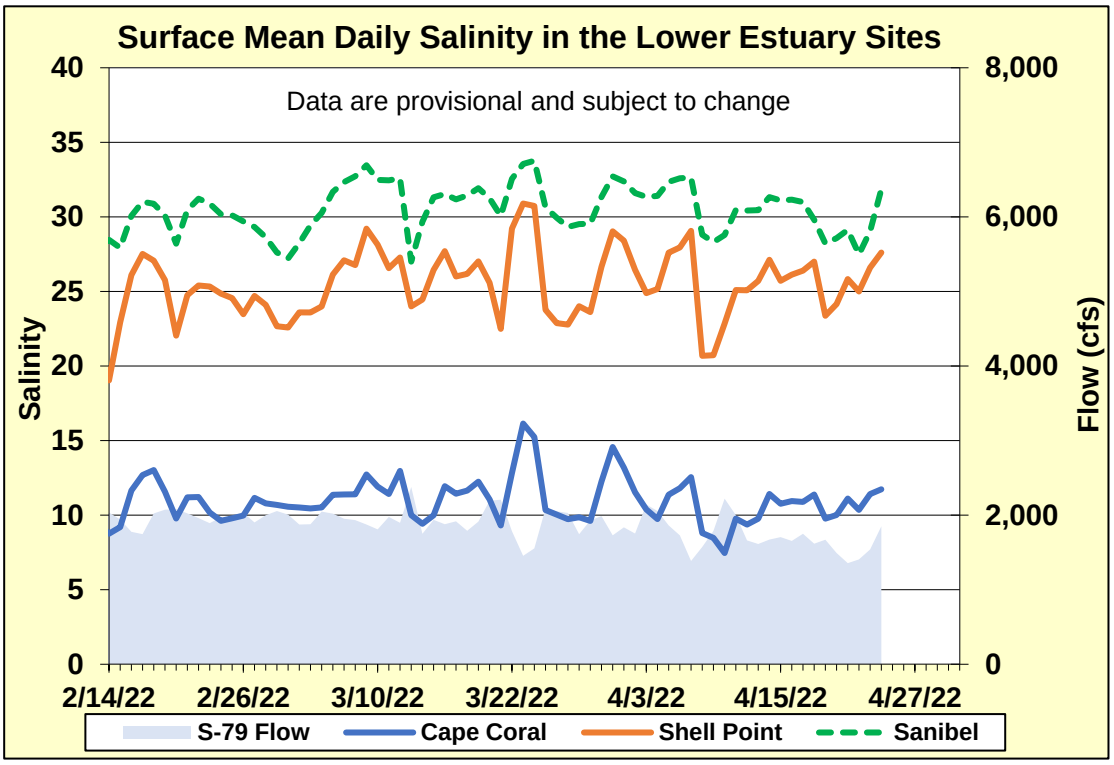


Figure ES-9. Mean daily surface salinity at lower Caloosahatchee River Estuary monitoring sites and mean daily flow at S-79.

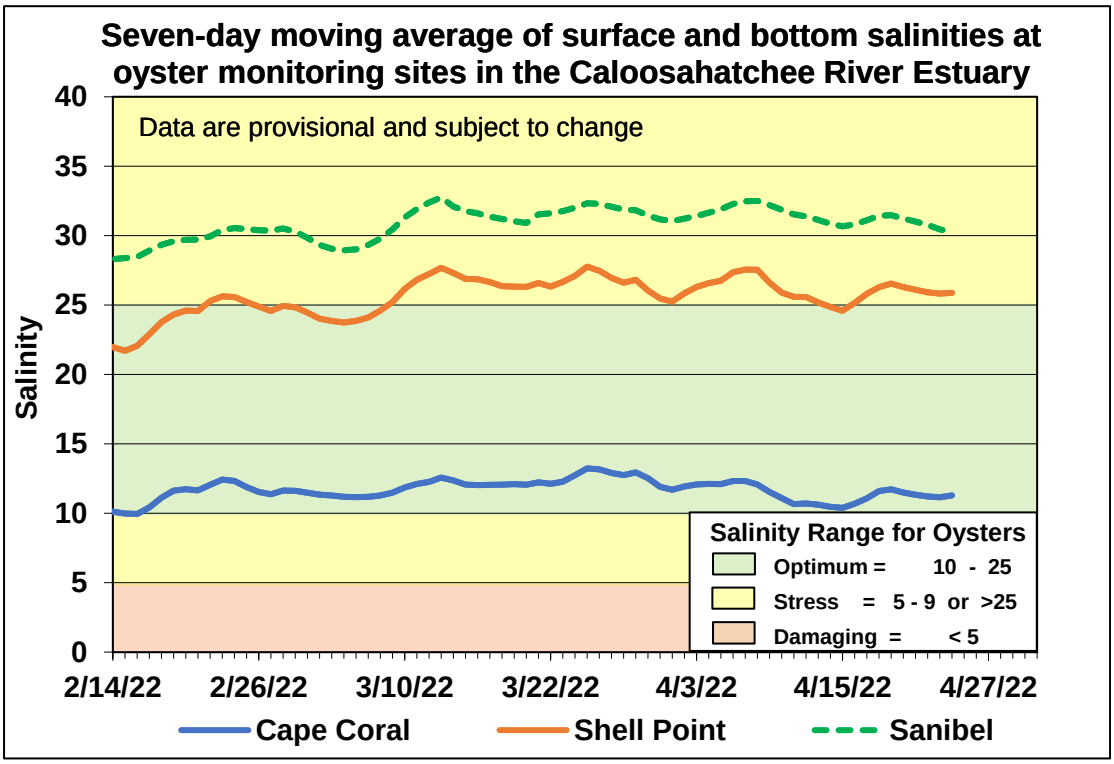


Figure ES-10. Seven-day moving average of surface and bottom salinities at Cape Coral, Shell Point and Sanibel monitoring sites in the Caloosahatchee River Estuary.

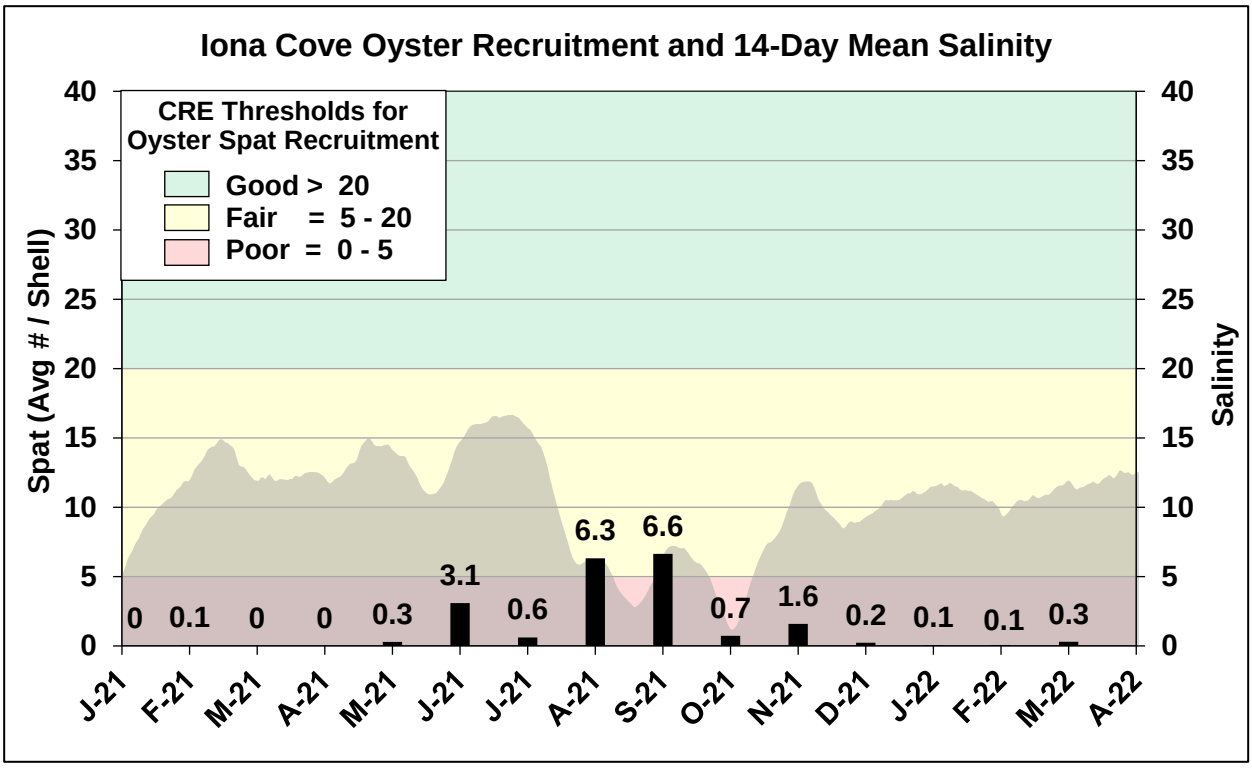


Figure ES-11. Mean oyster recruitment at the Iona Cove oyster monitoring station and 14-day mean salinity at Cape Coral.

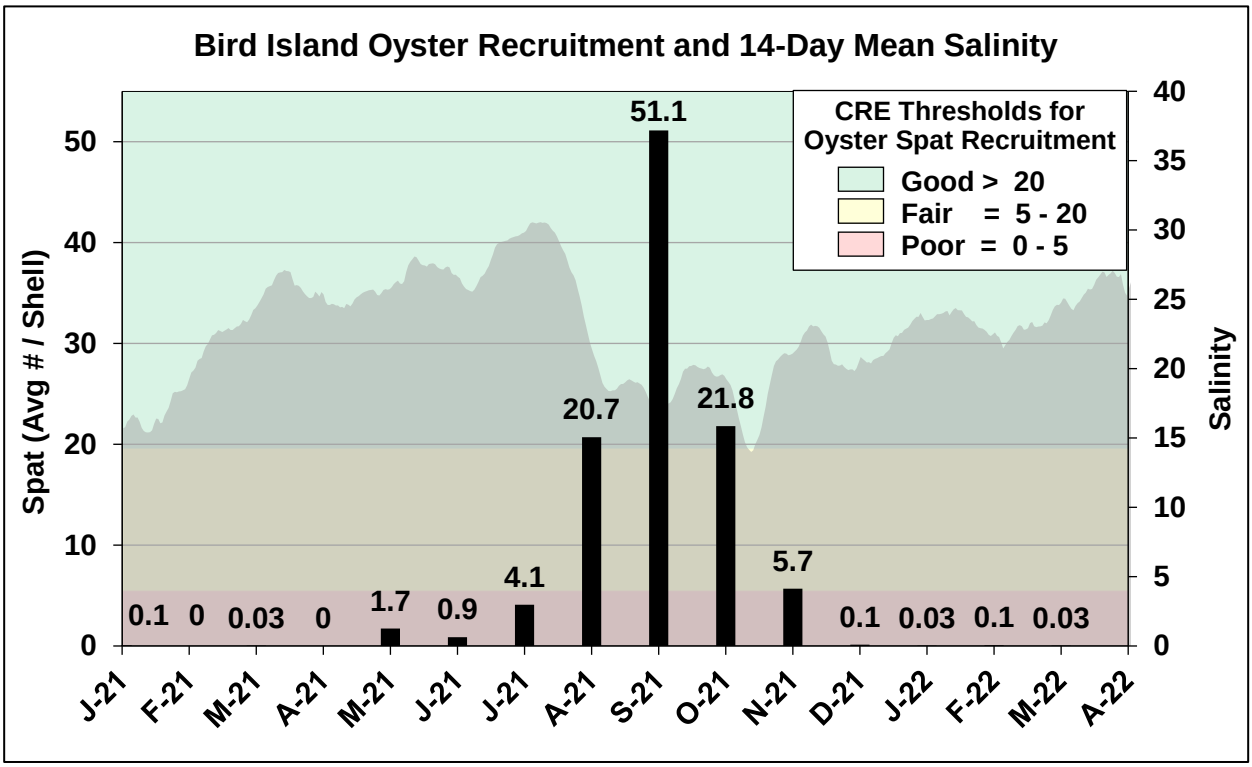


Figure ES-12. Mean oyster recruitment at the Bird Island oyster monitoring station and 14-day mean salinity at Shell Point.

Table ES-3. Predicted salinity at Val I-75 in the Caloosahatchee River Estuary at the end of the forecast period for various S-79 flow release scenarios.

Scenario	Simulated S-79 Flow (cfs)	Tidal Basin Runoff (cfs)	Daily Salinity	30-Day Mean Salinity
A	0	40	2.5	0.6
B	450	40	1.5	0.5
C	800	40	0.8	0.4
D	1000	40	0.5	0.4
E	1500	40	0.3	0.3
F	2000	40	0.3	0.3

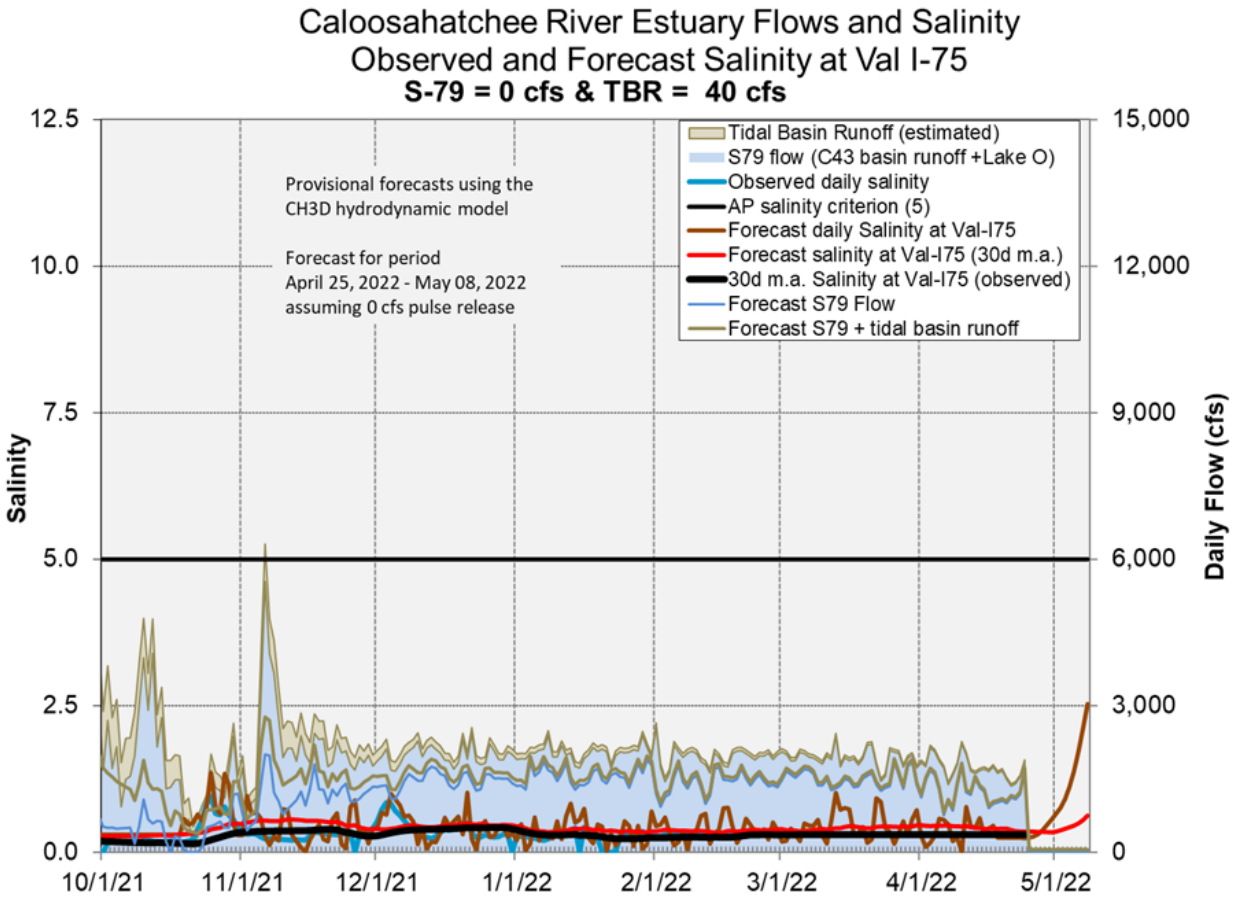


Figure ES-13. Forecasted Val I-75 site surface salinity assuming no pulse release at S-79.

Stormwater Treatment Areas

STA-1E: STA-1E Western Flow-way is offline for post-construction vegetation grow in, and the Eastern Flow-way is offline for vegetation management activities 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 near target stage and vegetation in the flow-ways is stressed and highly stressed. The 365-day phosphorus loading rates (PLR) is high for the Central Flow-way (**Figure S-1**).

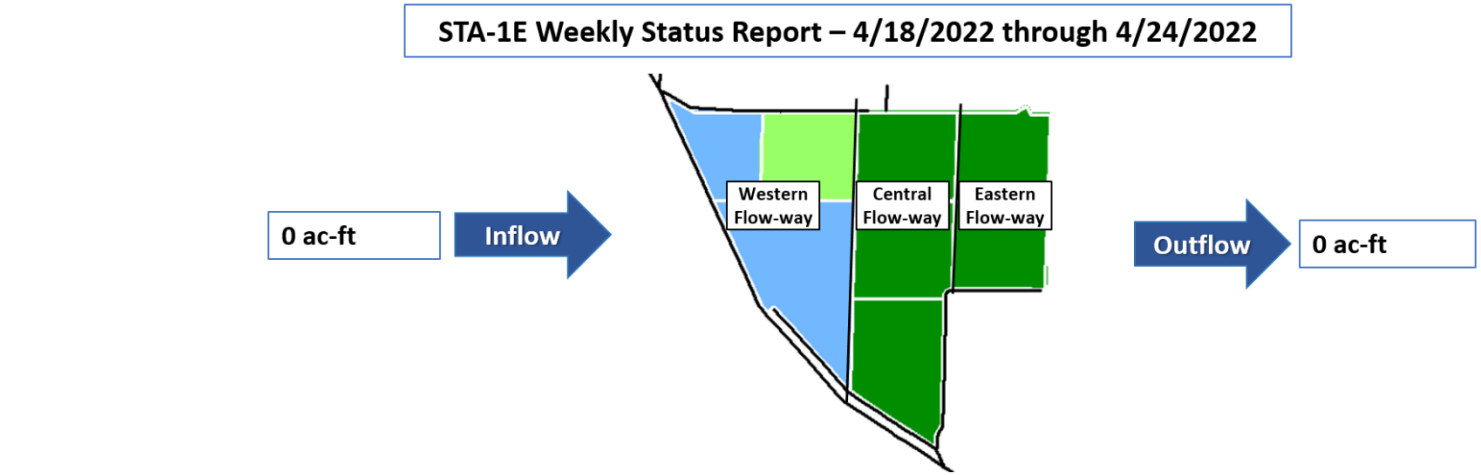
STA-1W: Operational restrictions are in place in STA-1W Western, Eastern, and Northern Flow-ways due to construction activities. Most treatment cells are at or near target stage. Vegetation in the flow-ways is stressed and highly stressed. The 365-day PLRs for the Northern and Western, and Eastern Flow-ways 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, and in Flow-way 1 following dry-out conditions. Online treatment cells are near or below 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. All 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, post-construction grow in starting 3/28/2022		

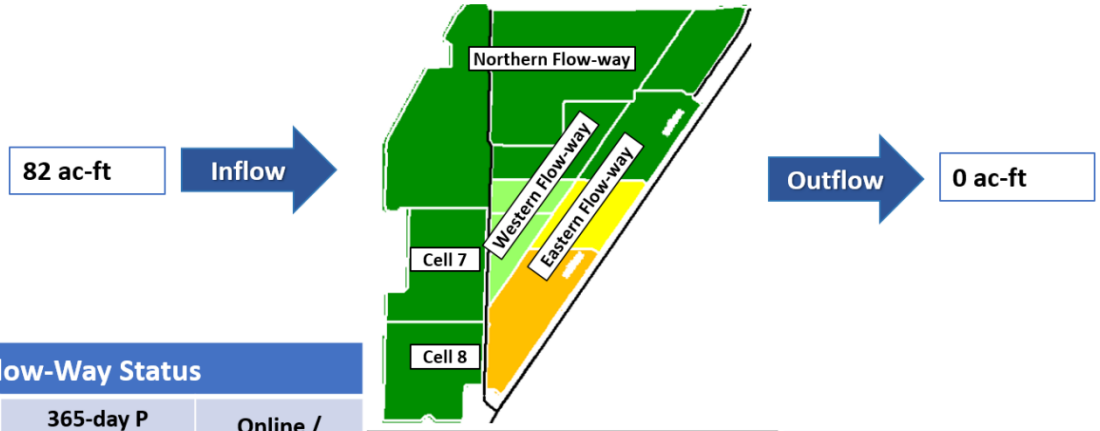
As of 4/24/2022	
Stage Based: Relative to Target Stage (TS)	
Deep Water Level (> 2.8' above TS)	
High Water Level (1.5' – 2.8' above TS)	
0.2' – 1.5' above TS	
Target Stage (TS +/- 0.2')	
Low Water Level (<0.2' below TS)	
Depth / Area Based: Percent of Area Dry	
0-25% Dry	50-75% Dry
25-50% Dry	75-100% Dry

STA-1E Flow & Phosphorus Concentration

	7-day	28-day	365-day
Total Inflow, ac-ft	0	3,818	173,041
--Lake Inflow, ac-ft	0	N/A	4,300
Total Outflow, ac-ft	0	14	143,038
Inflow Conc., ppb	N/A	101	119
Outflow Conc., ppb	N/A	23	22
Includes Preliminary Data			

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

STA-1W Weekly Status Report – 4/18/2022 through 4/24/2022



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	Online
Cell 8		N/A	Construction

As of 4/24/2022	
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	82	2,908	56,746
--Lake Inflow, ac-ft	0	N/A	3,300
Total Outflow, ac-ft	0	0	52,971
Inflow Conc., ppb	60	94	158
Outflow Conc., ppb	N/A	N/A	24
Includes Preliminary Data			

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

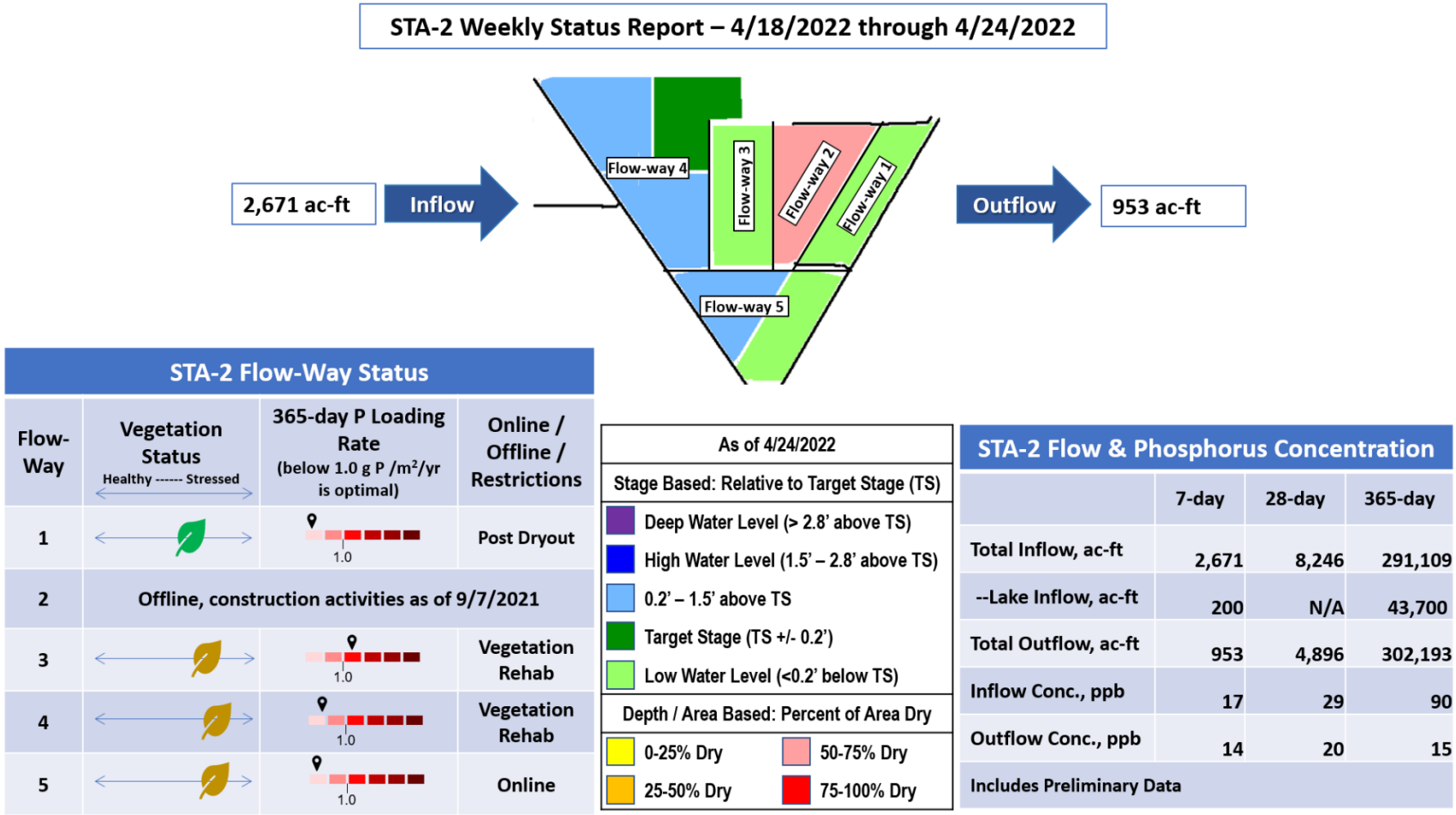
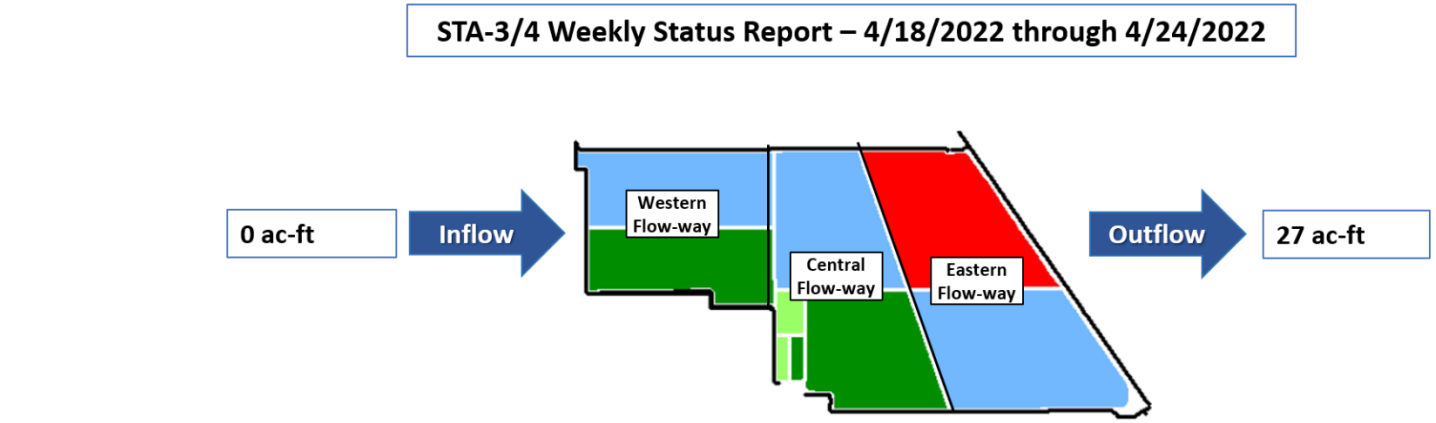


Figure S-3. STA-2 Weekly Status Report



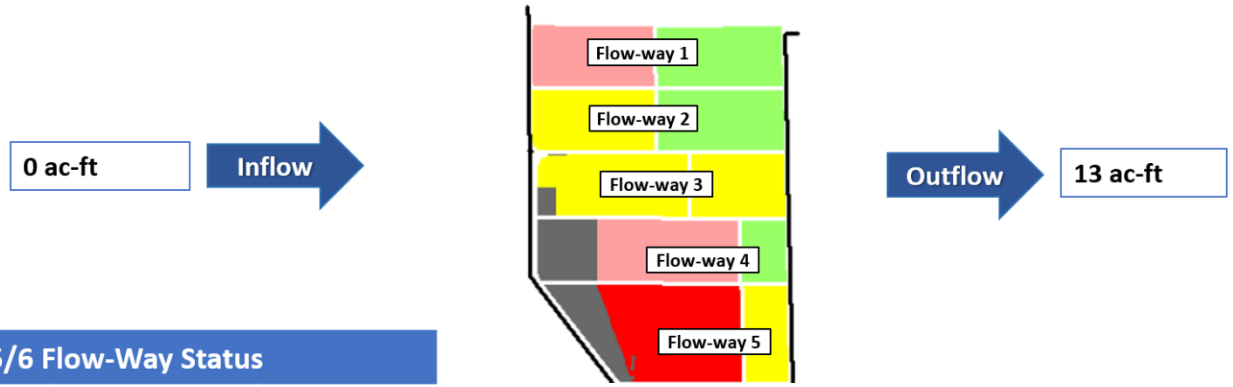
STA-3/4 Flow-Way Status			
Flow-Way	Vegetation Status (Healthy ------ Stressed)	365-day P Loading Rate (below 1.0 g P /m²/yr is optimal)	Online / Offline / Restrictions
Eastern	Offline, vegetation management drawdown as of 3/1/2021		
Central		1.0	Online
Western		1.0	Online

As of 4/24/2022	
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	58	347,346
--Lake Inflow, ac-ft	0	N/A	35,800
Total Outflow, ac-ft	27	192	312,690
Inflow Conc., ppb	N/A	31	66
Outflow Conc., ppb	10	29	15
Includes Preliminary Data			

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

STA-5/6 Weekly Status Report – 4/18/2022 through 4/24/2022



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

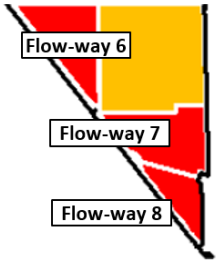
As of 4/24/2022	
Stage Based: Relative to Target Stage (TS)	
Deep Water Level (> 2.8' above TS)	
High Water Level (1.5' – 2.8' above TS)	
0.2' – 1.5' above TS	
Target Stage (TS +/- 0.2')	
Low Water Level (<0.2' below TS)	
Depth / Area Based: Percent of Area Dry	
0-25% Dry	50-75% Dry
25-50% Dry	75-100% Dry

STA-5/6 Flow & Phosphorus Concentration

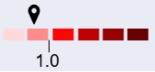
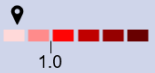
	7-day	28-day	365-day
Total Inflow, ac-ft	0	0	177,784
--Lake Inflow, ac-ft	0	N/A	8,000
Total Outflow, ac-ft	13	13	169,181
Inflow Conc., ppb	N/A	N/A	243
Outflow Conc., ppb	37	37	50
Includes Preliminary Data			

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

STA-5/6 Weekly Status Report – 4/18/2022 through 4/24/2022



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			Online
7			Online
8			Online

As of 4/24/2022

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

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 fell with the slope of the regulation line last week. The average on Sunday remained 0.03 feet below the falling Zone A1 regulation line. WCA-2A: Stage continues to drop quickly at the S11B headwater. The average at that gauge on Sunday was 0.28 feet below than the flat regulation line (0.01' above last week). WCA-3A: Last week the Three Gauge Average stages declined faster than the previous week; average stage was 1.14 feet below the falling regulation line on Sunday. (3-69W is +0.01'). WCA-3A: Stage fell dramatically at gauge 62 (Northwest corner), the average on Sunday was 1.98 feet below the flat Upper schedule line. (**Figures EV-1** through **EV-4**).

Water Depths

The SFWDAT tool indicates that water depths over the last two months have fallen significantly below the soil surface across most of BCNP especially in the south and WCA-3A North (west of the Miami canal) as is typical but not favorable for this time of year. Ponding in the upper reaches of the L-67 is no longer present. North to South hydrologic connectivity remains within Everglades National Park's Shark River Slough and has greatly diminished in Taylor slough. (**Figure EV-5**). Comparing current WDAT water depths to the depth one month ago, stages decreased across the EPA, very significantly so in central BCNP as water falls below soil surface within that basin. Looking back one year, eastern WCA-3A is significantly lower in depth compared to one year ago, while the northern perimeter is slightly wetter. (**Figure EV-6)**. Comparing current depths to the past 20 years, portions of the eastern half WCA-3A North remain in the 10th percentile. BCNP is between the 30th and 50th percentile but below the soil surface. Western WCA-3A is within the 10 to 20th percentile, a good thing for that historically ponded region. The eastern side of ENP and WCA-3B remains above the 70th percentile. (**Figure EV-7**).

Taylor Slough and Florida Bay

Stages in Taylor Slough decreased an average of 0.15 feet over this past week with individual stage gauges decreasing from near zero to 0.37 feet (**Figure EV-8**). The Slough is now 8.7 inches higher than average driven in large part by the northern areas which are 14 inches higher than the historical average for this time of year (pre-Florida Bay initiative which started in 2017). If current recession rates continue, the Slough will be mostly dry next week. Water depths in the northern area of the Slough remain higher than in the central and southern areas which is unusual for this time of year especially since the northern parts of the Slough would have typically been dry for more than 2 months (**Figure EV-9**).

Salinities in Florida Bay averaged a decrease of 0.7 over the week ending April 24, with individual station changes ranging from −3.8 to +1.6 (**Figure EV-8**). Central Bay salinities decreased the most over this past week and are now in the lower half of their historical interquartile range (**Figure EV-10**).Western Bay salinities are above their 75th percentile but have been decreasing over the last few days.This is the time of year that salinities rise rapidly due to increased evaporation and the lack of precipitation and flow.

Water Management Recommendations

Conserving water in the northern basins, then allowing that water to move downstream as we transition further into the dry season maximizes the ecological benefit of freshwater on the landscape. Flows if possible into the northern WCA-3A that assist recession rates in that sub-basin have an ecological benefit by protecting particularly fragile peat soils from oxidation and lowering the risk of muck fires as we move into the driest part of the year. Continued rain and freshwater flows to the Taylor Slough area have prolonged the hydroperiod there, if stage can be maintained it 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	0.08	−0.14
WCA-2A	0.01	−0.15
WCA-2B	0.03	−0.25
WCA-3A	0.07	−0.20
WCA-3B	0.12	−0.07
ENP	0.60	−0.15

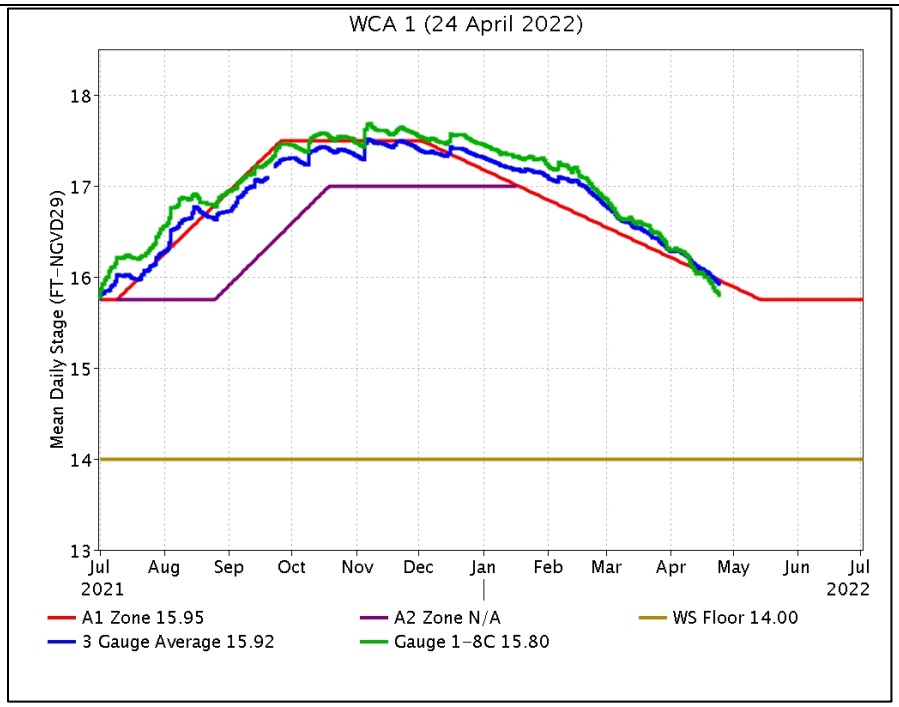


Figure EV-1. WCA-1 stage hydrographs and regulation schedule.

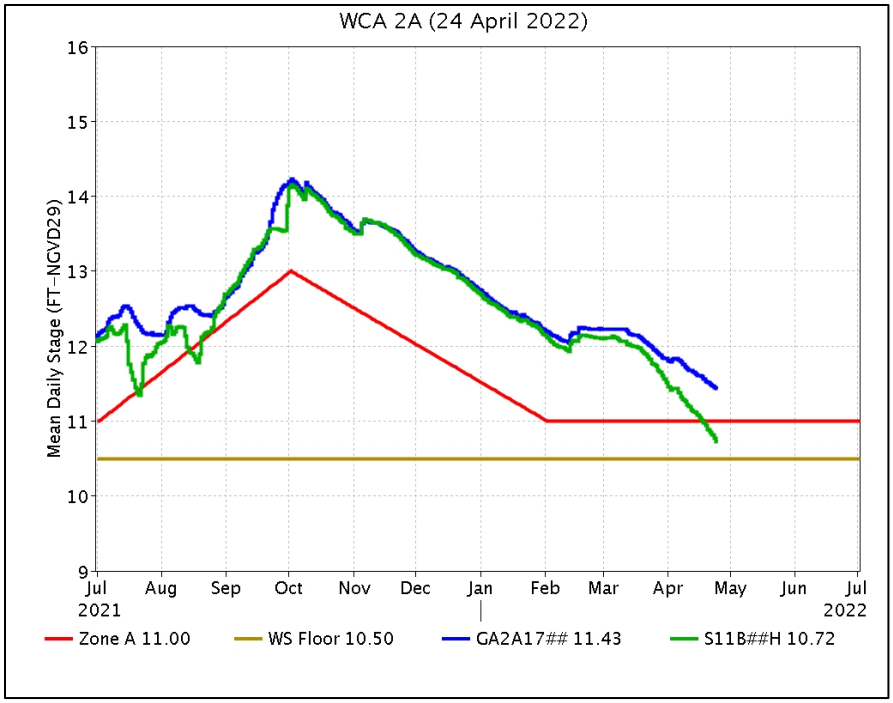


Figure EV-2. WCA-2A stage hydrographs and regulation schedule.

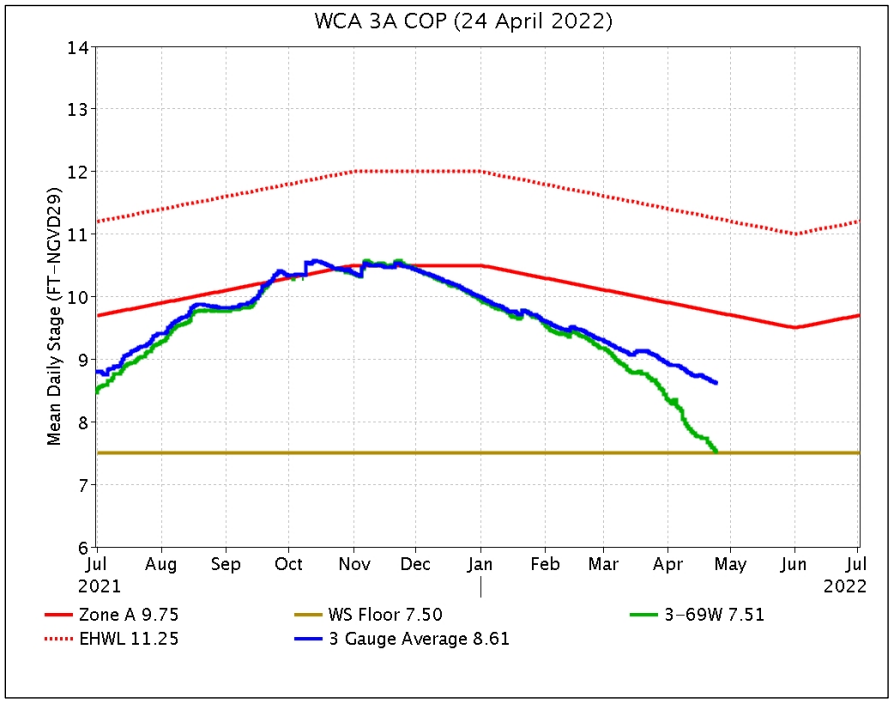


Figure EV-3. WCA-3A stage hydrographs (three-gauge average, S-333 headwater) and regulation schedule.

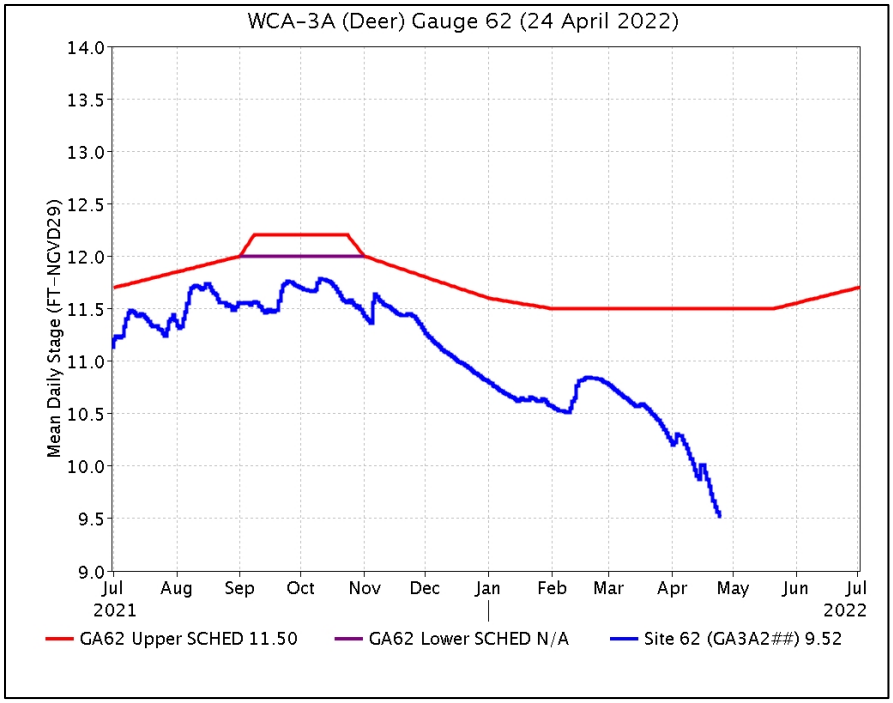


Figure EV-4. WCA-3A stage hydrograph (Deer gauge; Site 62) and CA62 regulation schedule.

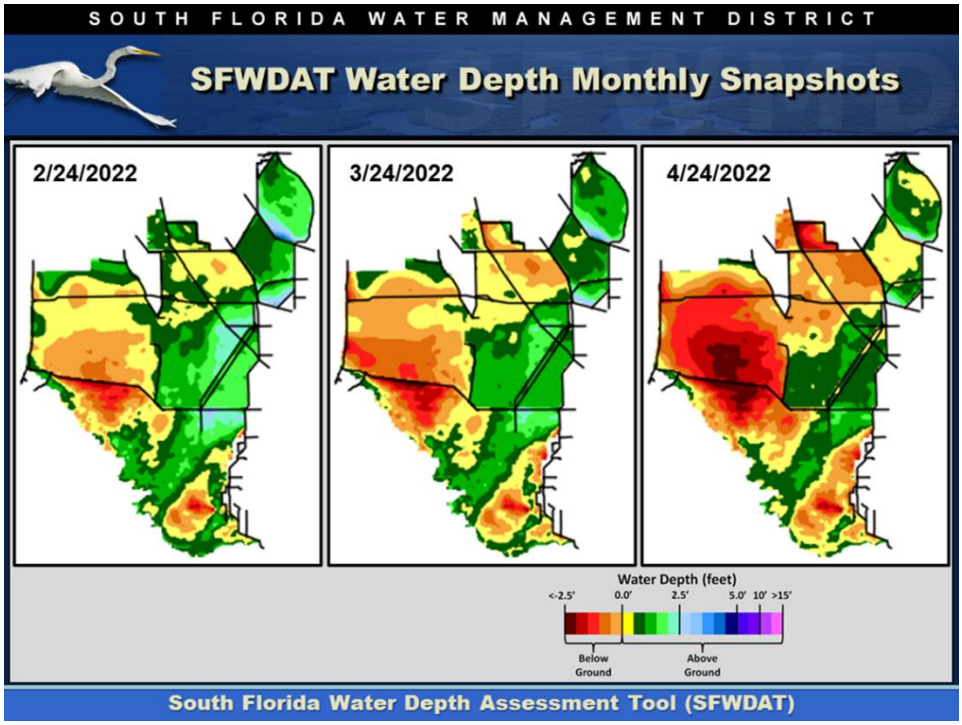


Figure EV-5. Everglades water depths from two months ago (left), one month ago (center) and present (right), based on SFWDAT.

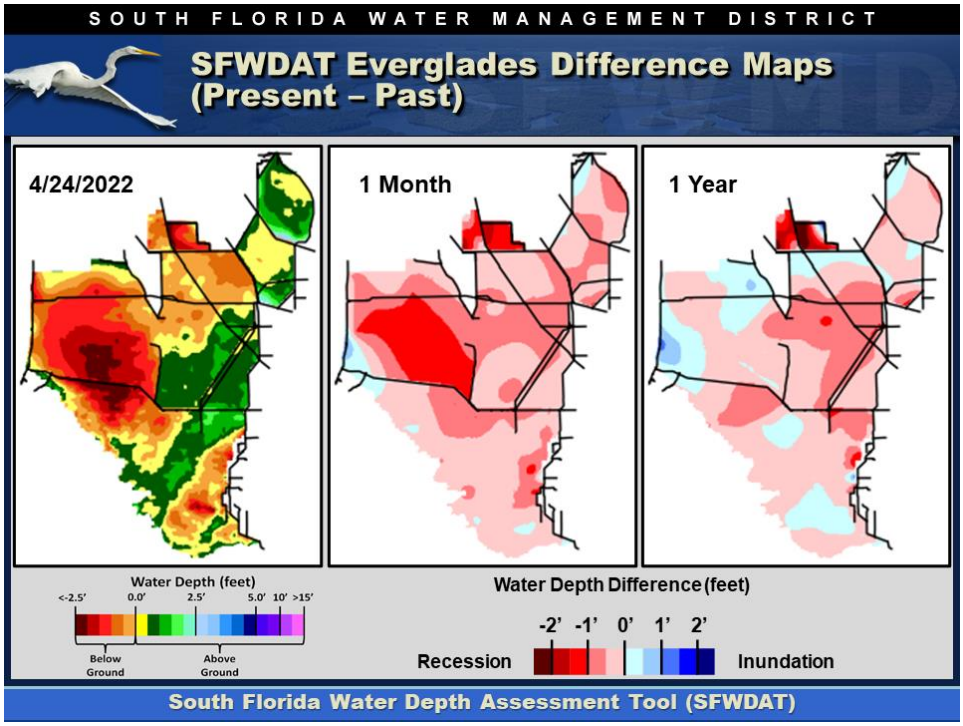


Figure EV-6. Present Everglades water depths (left) and water depth changes from one month (center) and one year (right) ago, based on SFWDAT.

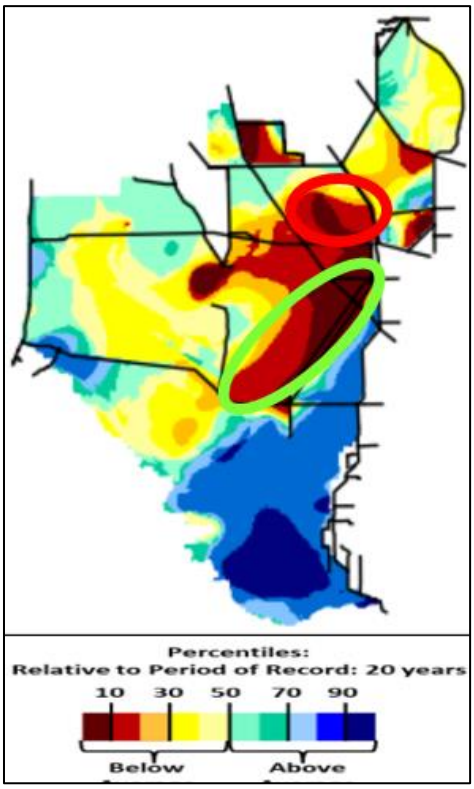


Figure EV-7. Present water depths (4/24/2022) compared to the day of year median over the previous 20 years.

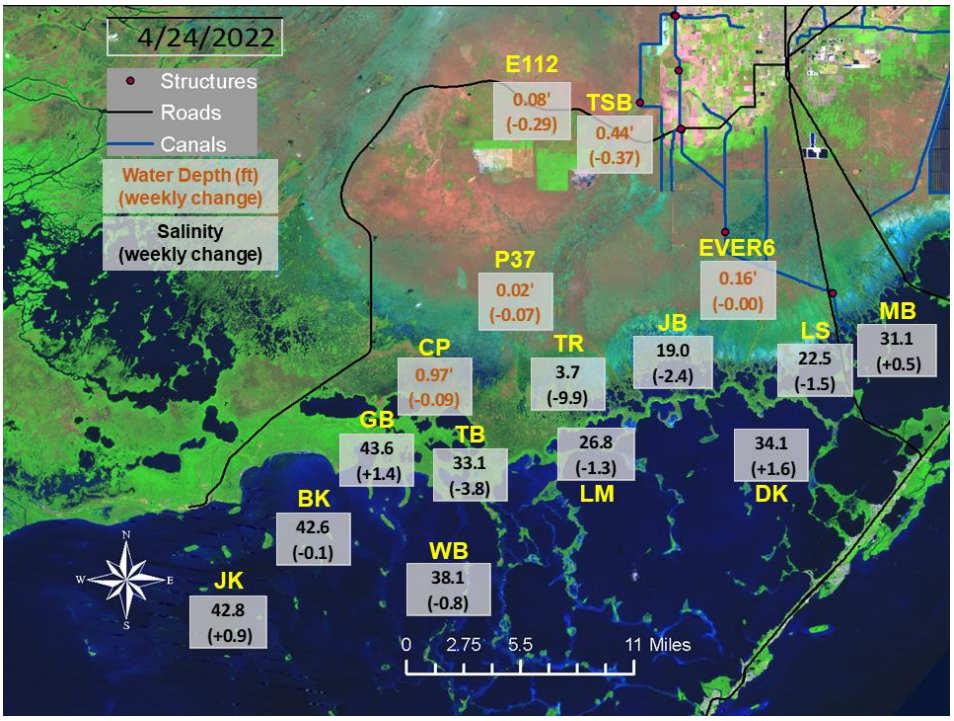


Figure EV-8. Taylor Slough water depths with changes since a week ago and Florida Bay salinities with changes since a week ago.

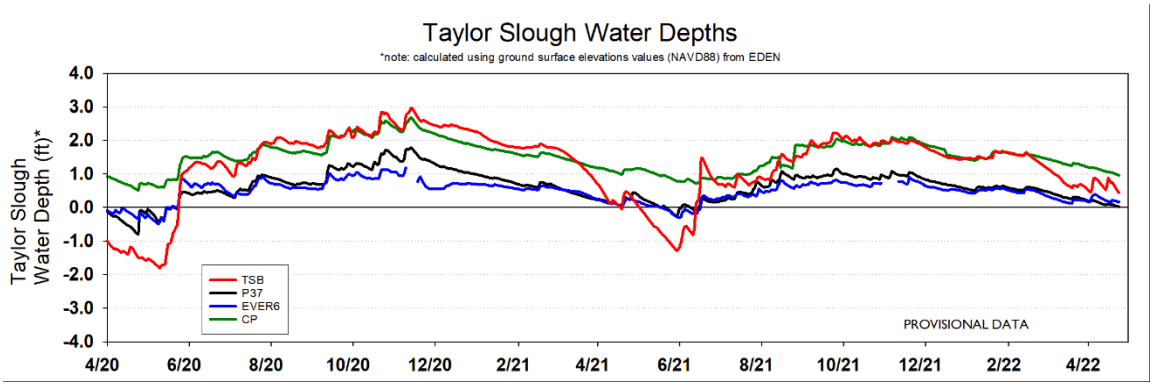


Figure EV-9. Taylor Slough water depth time series.

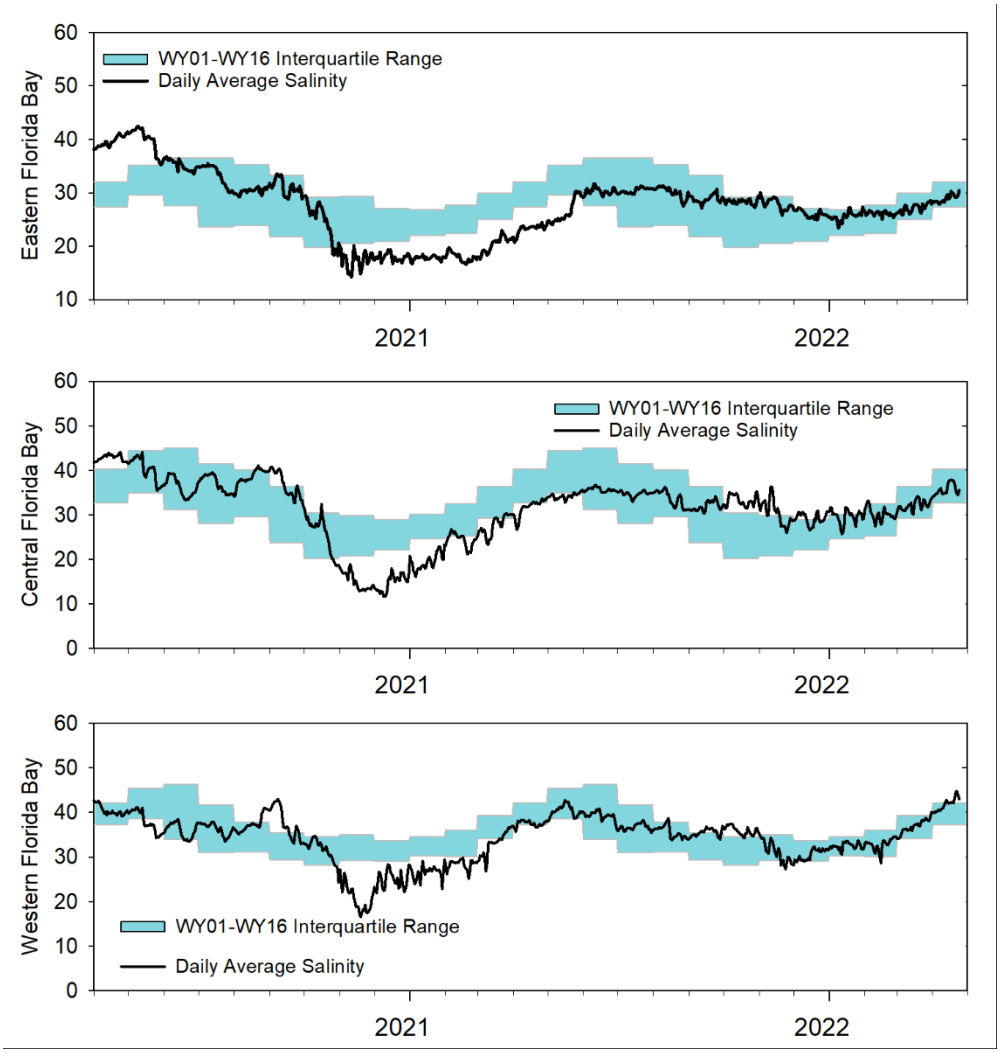


Figure EV-10. Eastern (top panel), Central (middle panel) and Western (bottom panel) Florida Bay daily average salinities with interquartile (25-75 percentile) ranges.

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

SFWMD Everglades Ecological Recommendations, April 19, 2022 (red is new)			
Area	Weekly change	Recommendation	Reasons
WCA-1	Stage decreased by 0.14'	Allow water to move south from this basin until stages reach the regulation schedule. Moderate the recession rate to 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 0.15'	Conserve water in this basin letting the water move south when conditions allow, with northern WCA-3A as the priority for receiving discharge. Moderate the recession rate to less than 0.10 feet per week.	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 0.25'	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 0.06'	Conserve water in this basin, while letting the water move south when conditions allow. Maintaining 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. Lower fire risk.
WCA-3A NW	Stage decreased by 0.41'	Conserve water in this basin letting the water move south when conditions allow. Returning to a recession rate less than 0.10 feet per week has an ecological benefit.	
Central WCA-3A S	Stage decreased by 0.16'	Returning to a recession rate less than 0.10 feet per week has an ecological benefit.	Protect within basin and downstream habitat and wildlife. Lower fire risk.
Southern WCA-3A S	Stage decreased by 0.15'		
WCA-3B	Stage decreased by 0.07'	Maintaining 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. Lower fire risk.
ENP-SRS	Stage decreased by 0.15'	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 −0.37' to -0.01'	Move water southward as possible.	When available, provide freshwater buffer for downstream conditions.
FB- Salinity	Salinity changes ranged −3.8 to +1.6	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 210 cfs and the previous 30-day mean inflow was 250 cfs. The seven-day mean salinity was 32.5 at BBCW8 and 31.1 at BBCW10, both below the preferred maximum salinity of 35 for these sites. Data provided by Biscayne National Park.

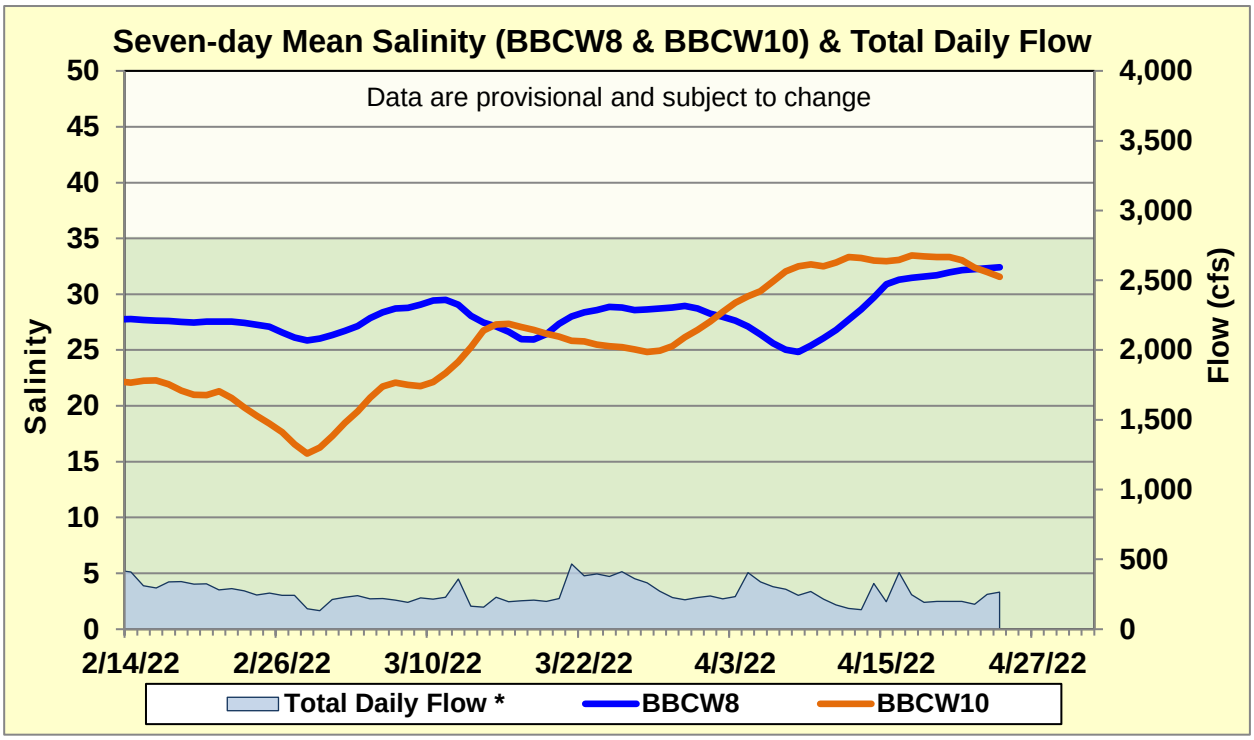


Figure BB-1. Seven-day mean salinity at BBCW8 and BBCW10 and total daily flow in Biscayne Bay. Total daily flow was calculated using flow from structures S20G, S20F, S21, S21A, S123, and S700P.