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M E M O R A N D U M

TO: John Mitnik, Assistant Executive Director, Executive Office Staff

FROM: SFWMD Staff Environmental Advisory Team

DATE: April 13, 2022

SUBJECT: Weekly Environmental Conditions for Systems Operations

Summary

Weather Conditions and Forecast

An easterly steering wind Wednesday will help the formerly cool and stable air mass to warm and moisten with rainfall along the immediate east coast and Florida Keys. Atmospheric moisture is forecast to substantially increase Thursday and Friday causing summer-like rains to form during the afternoon, with a primary focus on the interior of the SFWMD on Thursday and potentially over a broader area on Friday. Isolated areas are likely to see significant rainfall on Thursday over the southern interior to around Lake Okeechobee, while Friday could see an elevated risk of significant rainfall over a wider area. However, Friday's forecast is of profoundly low confidence due to large model differences that cannot be reconciled with current data. Over the weekend above-normal moisture and enhanced instability should result in a continuation of wet-season-like rains each day, most likely with a widely scattered or scattered coverage each afternoon. On Monday next week, steering winds are forecast to change to westerly direction as a new cold front arrives over north Florida resulting in a good coverage of rain Monday afternoon and evening across the interior to eastern parts of the SFWMD (and away from the west). A frontal passage will probably occur on Tuesday, with diminishing rains by mid-week next week. For the week ending next Tuesday morning, total SFWMD rainfall is forecast to be near normal, although areal average rainfall over parts of the interior could be above normal.

Kissimmee

Flow at S-59 and S-61 was increased to stop the rise in stage in East Toho and Toho and return to their respective recession lines. Flow at S-65/S-65A is being increased slowly to manage the stage reversals on lakes Kissimmee, Cypress, and Hatchineha (KCH), and the Kissimmee River; water depth on the Kissimmee River floodplain remained steady, with a mean depth of 0.23 feet as of April 10, 2022. The concentration of dissolved oxygen in the Kissimmee River has remained well above the region of concern, with an average of 7.0 mg/L for the week ending on April 10, 2022.

Lake Okeechobee

Lake Okeechobee stage was 13.53 feet NGVD on April 10, 2022, with water levels 0.73 feet lower than a month ago (**Figure LO-1**). Lake stage has been within the ecological envelope for 14 weeks (**Figure LO-3**). Average daily inflows (excluding rainfall) increased slightly from the previous week, going from 881 cfs to 987 cfs. Average daily outflows (excluding evapotranspiration) decreased slightly, going from 3,848 cfs to 3,550 cfs. There have been thirty-four snail kite nests recorded on the Lake thus far. Approximately 3,570 wading birds were seen actively foraging on the Lake on April 7, 2022, well below average for this time of year, though many nesting colonies are active (**Figure LO-6**). Recent satellite imagery (April 11, 2022) showed a moderate bloom potential in Fisheating Bay and along the northern shoreline (**Figure LO-7**).

Estuaries

Total inflow to the St. Lucie Estuary averaged 580 cfs over the past week with no flow coming from Lake Okeechobee. Mean salinities increased at the HR1 and US1 Bridge sites and decreased at the A1A Bridge site 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 1,854 cfs over the past week with 1,223 cfs coming from the Lake. Mean surface salinities remained the same at S-79 and Val I-75 and decreased at the remaining sites in the estuary over the past week. Salinities were in the good range (0-10) for tape grass at Val I-75 and Ft. Myers. Salinities were in the good range (10-30) for adult eastern oysters at Cape Coral and Shell Point, and in the fair range at Sanibel.

Stormwater Treatment Areas

For the week ending Sunday, April 10, 2022, approximately 1,600 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 105,700 ac-feet. The total amount of inflows to the STAs in WY2022 is approximately 1,019,000 ac-feet. Most STA cells are at or near target stage, except STA-5/6 cells that are drying out. STA-1E Western Flow-way is offline for post-construction vegetation grow in, and STA-1E Eastern Flow-way is offline for vegetation management activities 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, and in STA-2 Flow-way 1 following dryout conditions. This week, if 2008 LORS recommends Lake releases to the WCAs and conditions allow, releases will be sent to STA-2.

Everglades

Rate of stage changes within most of the WCAs increased into the “poor” category. Depths in WCA-2A have fallen to schedule and continued (but declining) discharge from that basin into WCA-3A North via the northern perimeter of that basin are benefitting the ecology of that particularly sensitive region; but those discharges are expected to cease as stages decline. FWC reports the WCA-3B wildfire extinguished, with about 10,000 acres burned but no negative impacts detected so far. Wading bird nesting expectations are falling; currently conditions are becoming appropriate for foraging in WCA-1 and WCA-2, but the overall nesting effort is relatively low for this time of year and Wood Storks have initiated nesting very late. The eastern CSSS subpopulation percent dry conditions have reached the target of 40% dry, but recessions in sub population E remain slow. Stages remain high in Taylor Slough especially in the north and the salinities fell on average within Florida Bay with positive creek flow, but the western Bay salinity is nearing the 75th percentile.

Biscayne Bay

Total inflow to Biscayne Bay averaged 294 cfs and the previous 30-day mean inflow averaged 278 cfs. The seven-day mean salinity was 26.8 at BBCW8 and 32.9 at BBCW10, both below the preferred maximum salinity of 35 for these sites. Salinity data provided as a courtesy by Biscayne National Park.

Supporting Information

Kissimmee Basin

Upper Kissimmee

On April 10, 2022, lake stages were 56.6 feet NGVD (0.4 feet below schedule) in East Lake Toho, 53.0 feet NGVD (1.0 feet below schedule) in Lake Toho, and 51.0 feet NGVD (0.3 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 10, 2022 were 1,920 cfs at S-65 and 1,920 cfs at S-65A; discharges from the Kissimmee River were 1,180 cfs at S-65D and 1,020 cfs at S-65E (**Table KB-2**). Headwater stages were 46.5 feet NGVD at S-65A and 26.6 feet NGVD at S-65D on April 10, 2022. Although water temperature has begun to rise, the concentration of dissolved oxygen remains well above the region of concern, with an average of 7.0 mg/L for the week ending on April 10, 2022 (**Table KB-2, Figure KB-4**). Flow at S-65/S-65A is being increased slowly to manage the stage reversals on KCH and the Kissimmee River, and water depth on the Kissimmee River floodplain has remained steady with a mean depth of 0.23 feet as of April 10, 2022 (**Figure KB-5**).

Water Management Recommendations

Following the most recent rainfall, flow was increased at S-59 and S-61 and is still being increased at S-65 to address the resulting stage reversals.

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)	
							4/10/22	4/3/22
Lakes Hart and Mary Jane	S-62	LKMJ	334	60.3	R	60.5	-0.2	0.0
Lakes Myrtle, Preston and Joel	S-57	S-57	79	60.7	R	60.6	0.1	0.3
Alligator Chain	S-60	ALLI	406	63.3	R	63.4	-0.1	0.3
Lake Gentry	S-63	LKGT	692	60.8	R	60.9	-0.1	0.5
East Lake Toho	S-59	TOHOE	824	56.6	R	57.0	-0.4	-0.6
Lake Toho	S-61	TOHOW S-61	1,903	53.0	R	54.0	-1.0	-0.9
Lakes Kissimmee, Cypress and Hatchineha	S-65	KUB011 LKIS5B	1,639	51.0	R	50.7	0.3	-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.

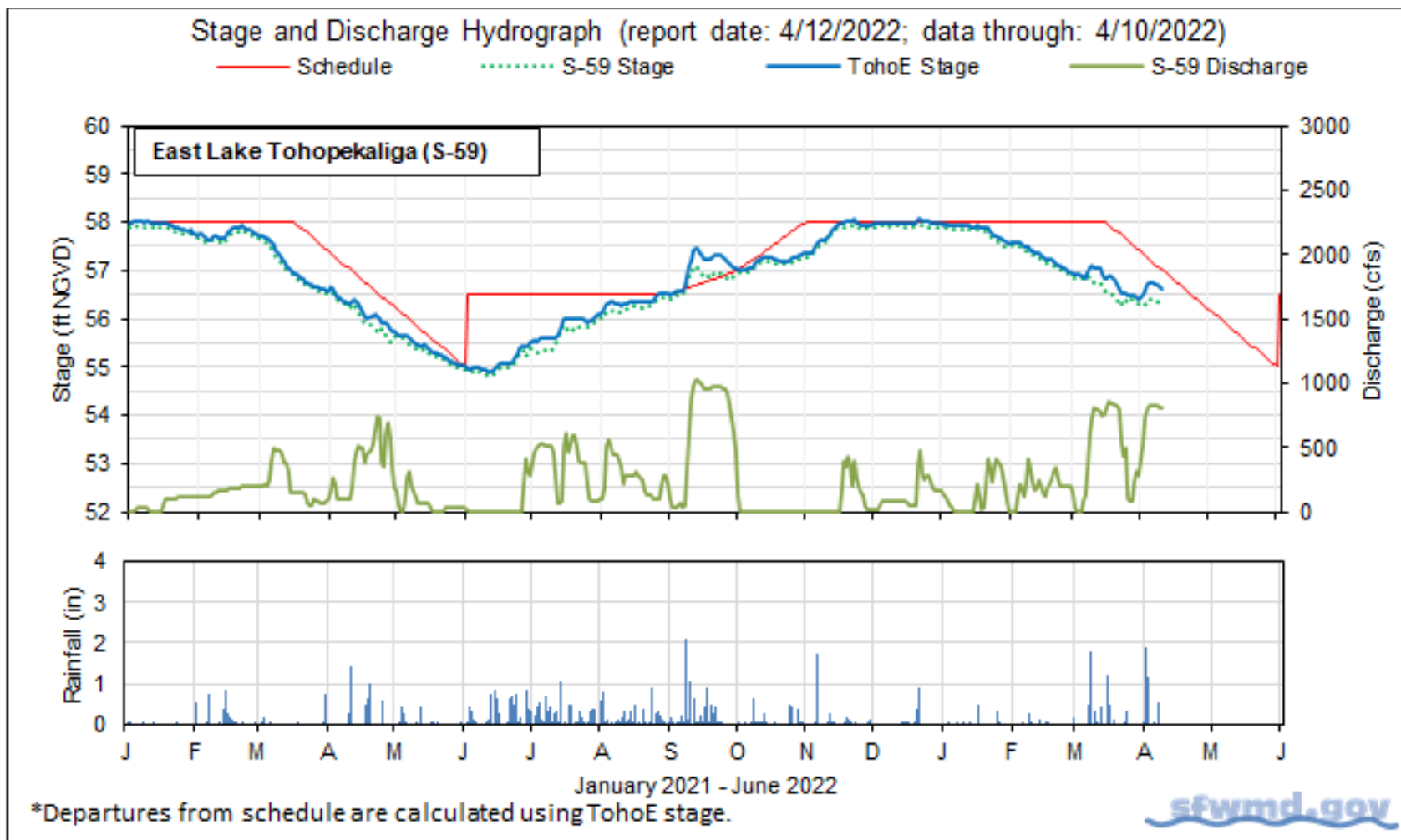


Figure KB-1. East Lake Toho regulation schedule, stage, discharge and rainfall.

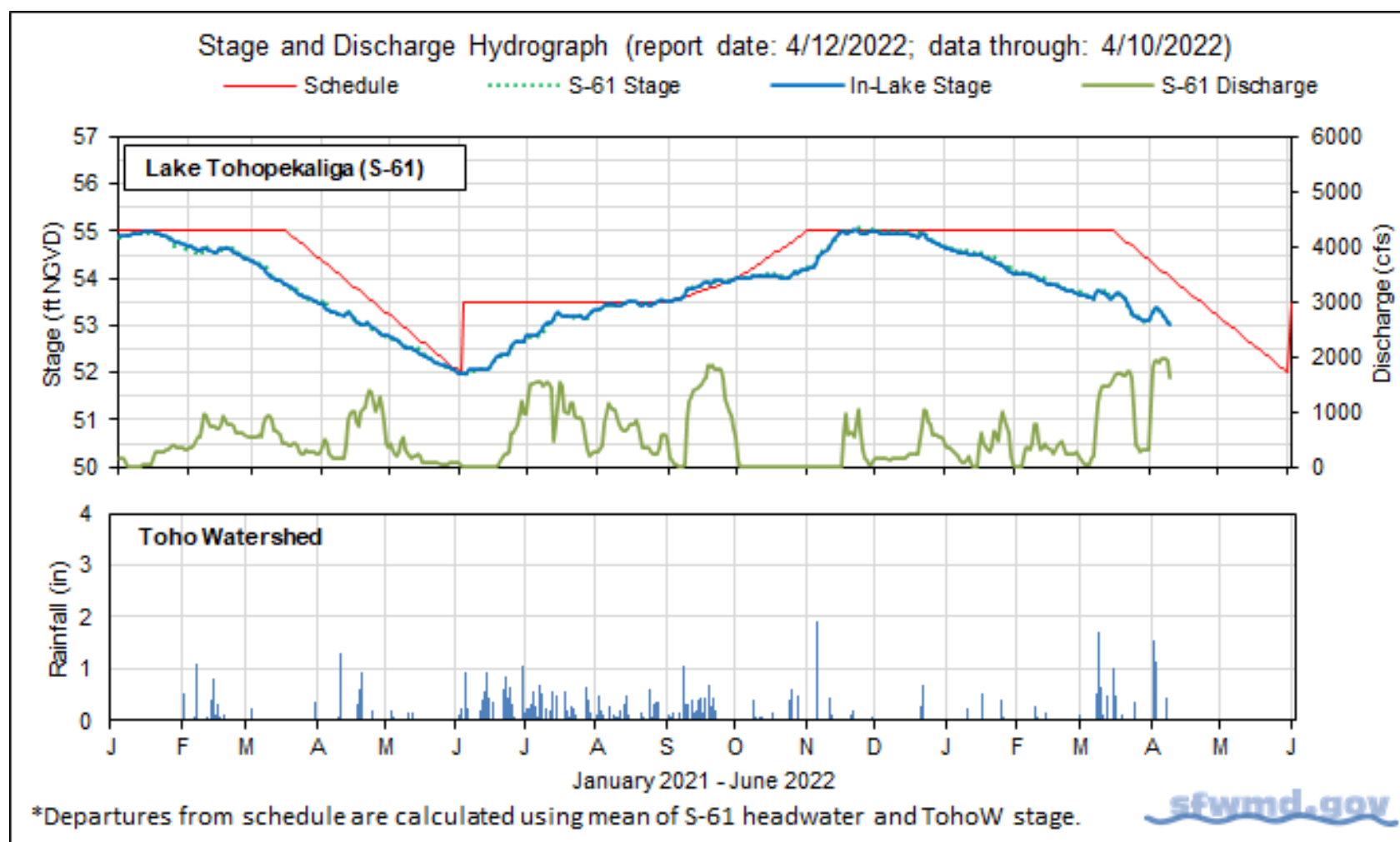


Figure KB-2. Lake Toho regulation schedule, stage, discharge and rainfall.

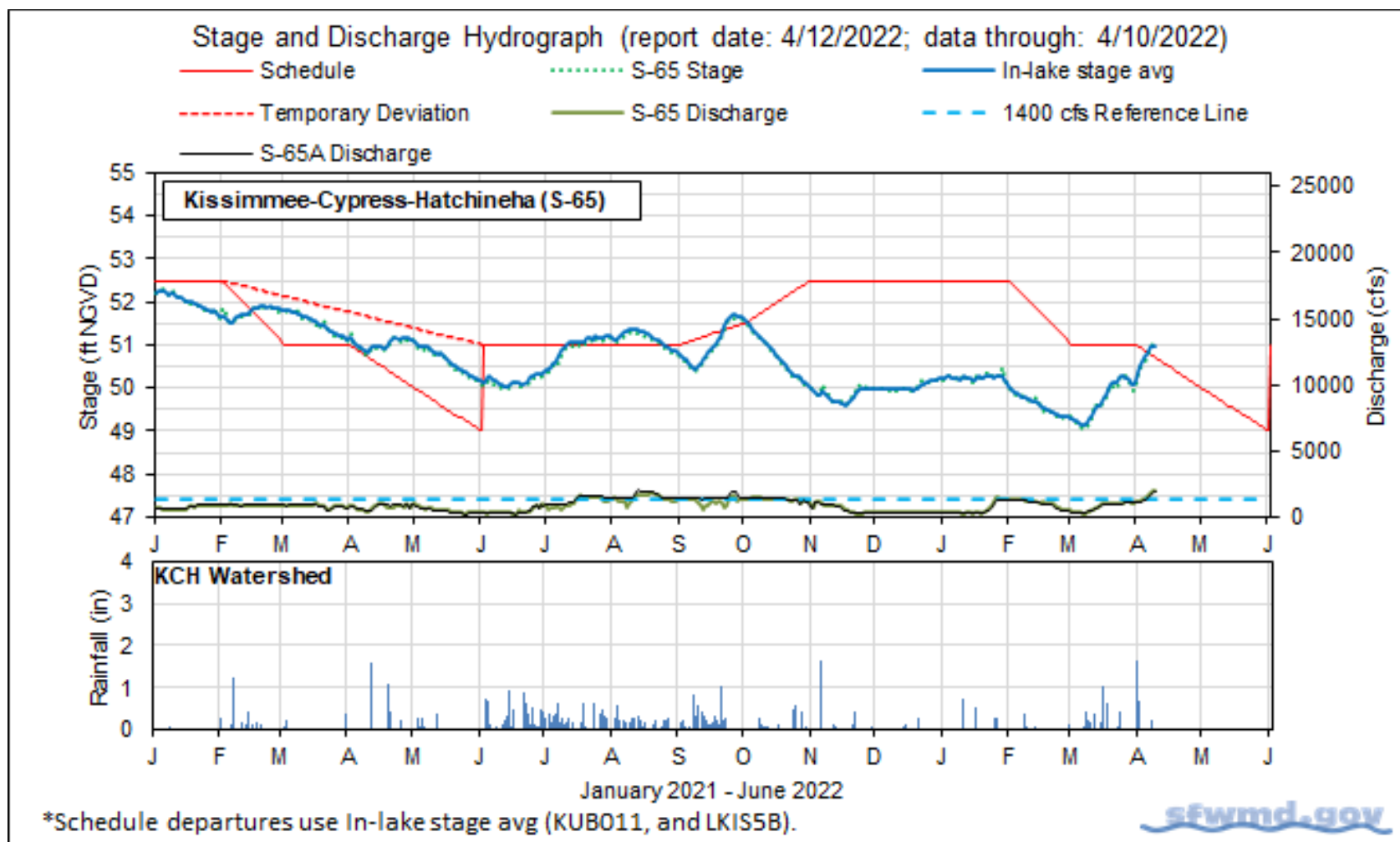


Figure KB-3. Lakes Kissimmee, Cypress and Hatchineha regulation schedule, stage, discharge and rainfall.

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 4/10/22	Average for Previous Seven Day Periods			
			4/10/22	4/3/22	3/27/22	3/20/22
Discharge	S-65	1,920	1,640	1,140	1,050	980
Discharge	S-65A ^a	1,920	1,570	1,080	980	880
Headwater Stage (feet NGVD)	S-65A	46.5	46.5	46.3	46.4	46.4
Discharge	S-65D ^b	1,180	1,090	980	950	770
Headwater Stage (feet NGVD)	S-65D ^c	26.6	26.8	26.8	26.6	26.6
Discharge (cfs)	S-65E ^d	1,020	970	860	830	660
Discharge (cfs)	S-67	0	0	0	0	0
Dissolved Oxygen (mg/L) ^e	Phase I, II/III river channel	7.3	7.0	8.1	8.3	8.3
Mean depth (feet) ^f	Phase I floodplain	0.23	0.23	0.24	0.28	0.28

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.

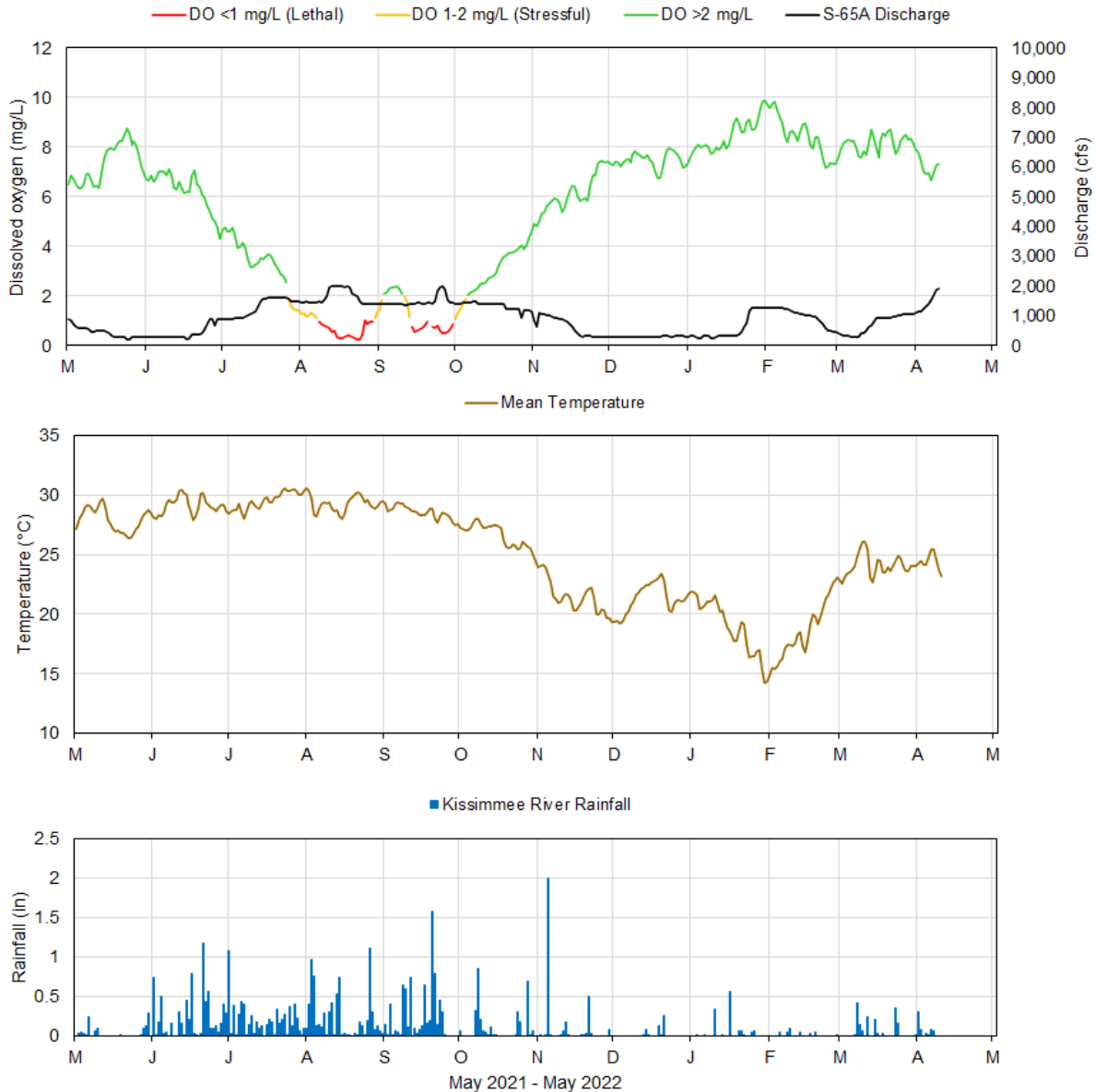
d. Combined discharge from S-65E and S-65EX1.

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



Report Date: 4/12/2022; data are through: 4/10/2022



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.

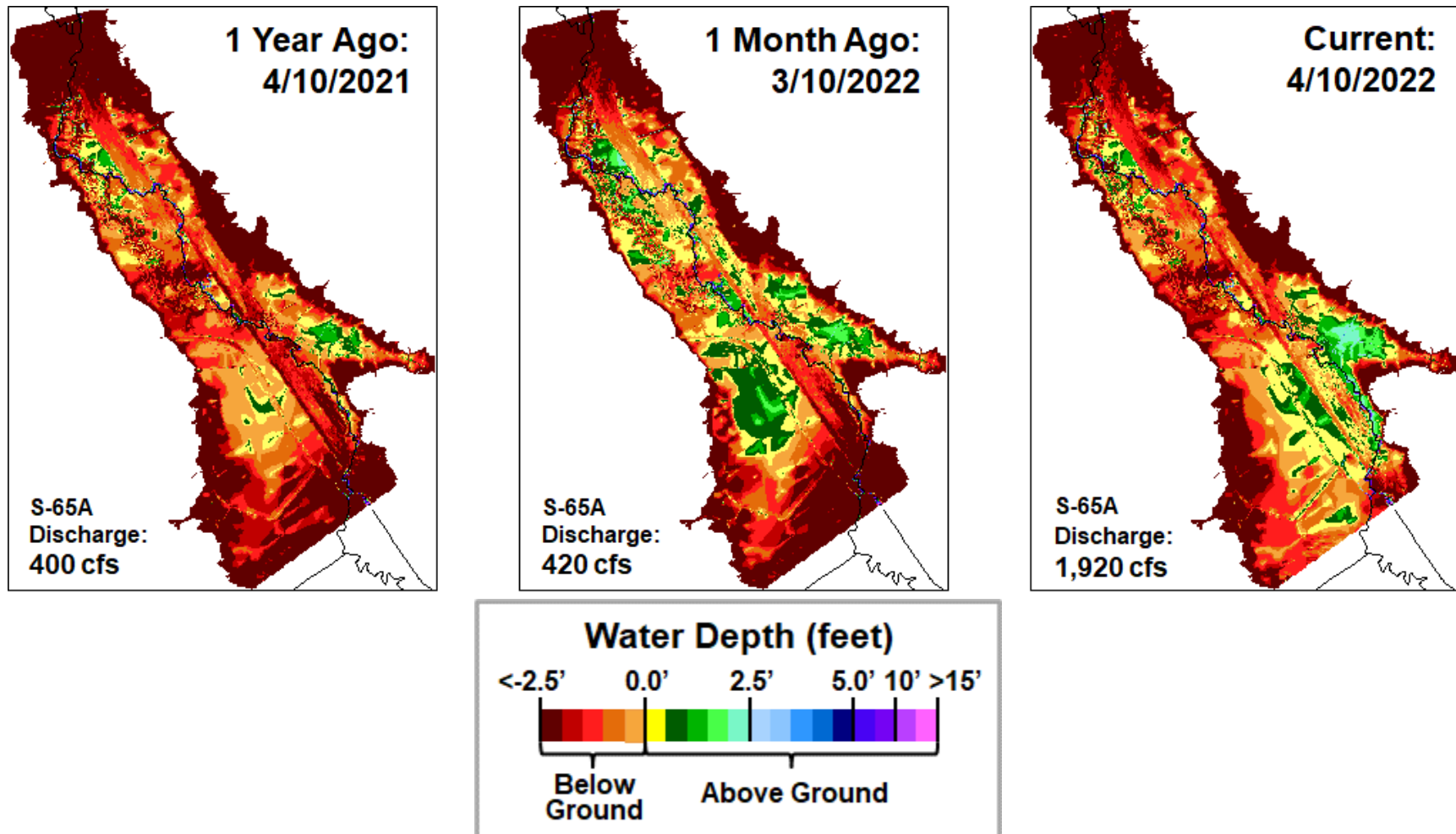


Figure KB-5. Phase I area Kissimmee River floodplain water depths (from left to right) one year ago, one month ago and current.

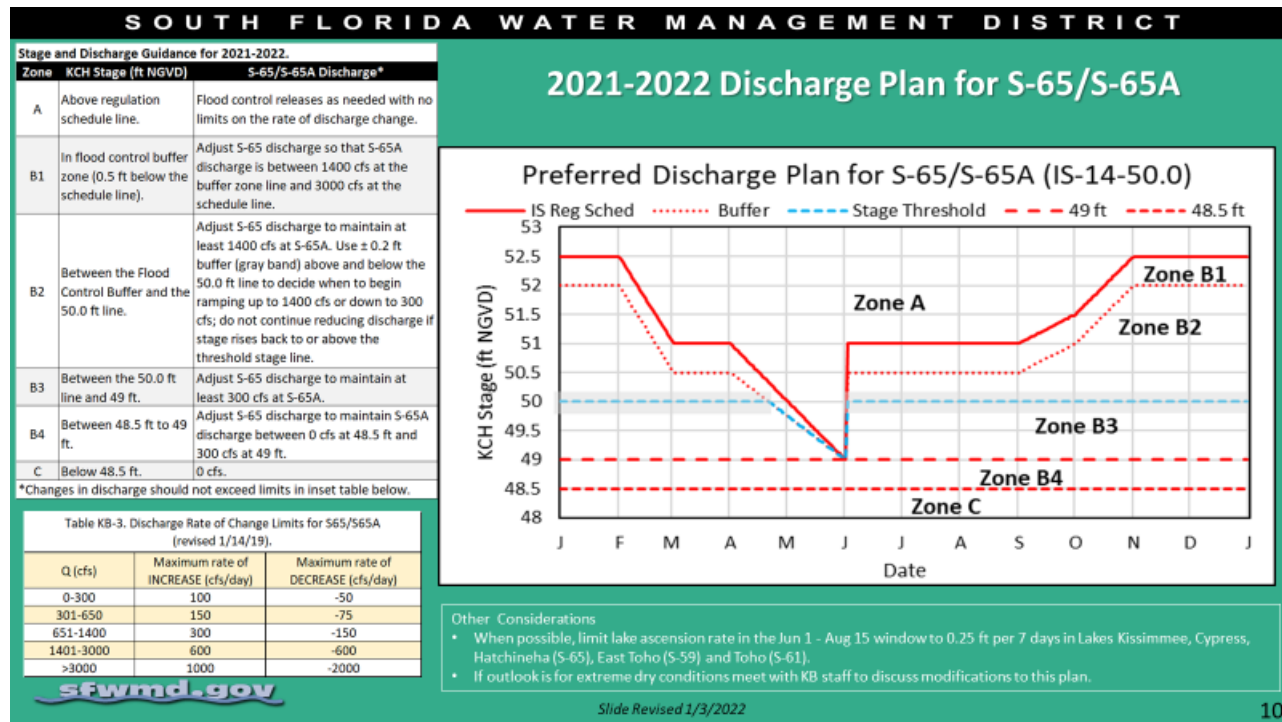


Figure KB-6. IS-14-50 Discharge Plan for S65/S65A with discharge rate of change limits (revised 1/14/19).

Lake Okeechobee

Lake Okeechobee stage was 13.53 feet NGVD on April 10, 2022, with water levels 0.73 feet lower than a month ago (**Figure LO-1**). Lake stage was 0.03 feet above the Baseflow sub-band (**Figure LO-2**) and has been within the ecological envelope for 14 weeks (**Figure LO-3**). According to NEXRAD, 0.16 inches of rain fell directly on the Lake last week.

Average daily inflows (excluding rainfall) increased slightly from the previous week, going from 881 cfs to 987 cfs. Average daily outflows (excluding evapotranspiration) decreased slightly, going from 3,858 cfs to 3,550 cfs. Highest inflows came from the Kissimmee River through the S-65E structure (975 cfs). The highest outflow (1,681 cfs) was to the west via the S-77 structure, while flows south via the S-350 structures remained around 1,140 cfs (S-351 288 cfs; S-352 434 cfs; S-354 418 cfs). Flows east were 565 cfs and 164 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 three more nests on Lake Okeechobee, for a total of thirty-four nests thus far, including thirteen failures. Nests are spread across Indian Prairie marsh, Moonshine Bay and Observation Island.

The most recent wading bird survey (April 7, 2022) reported approximately 3,570 actively foraging wading birds on the Lake, spread across 13 flocks. This total is lower than the 5-year average and is possibly because many of the previously counted wading birds were focused in nesting colonies around the Lake, and were not tallied in the foraging surveys (**Figure LO-6**).

The most recent satellite image (April 11, 2022) from the NOAA cyanobacteria monitoring product derived from EUMETSAT's Sentinel 3 OLCI sensor showed scattered areas of low to moderate bloom potential in Fisheating Bay and along the northern shoreline (**Figure LO-7**).

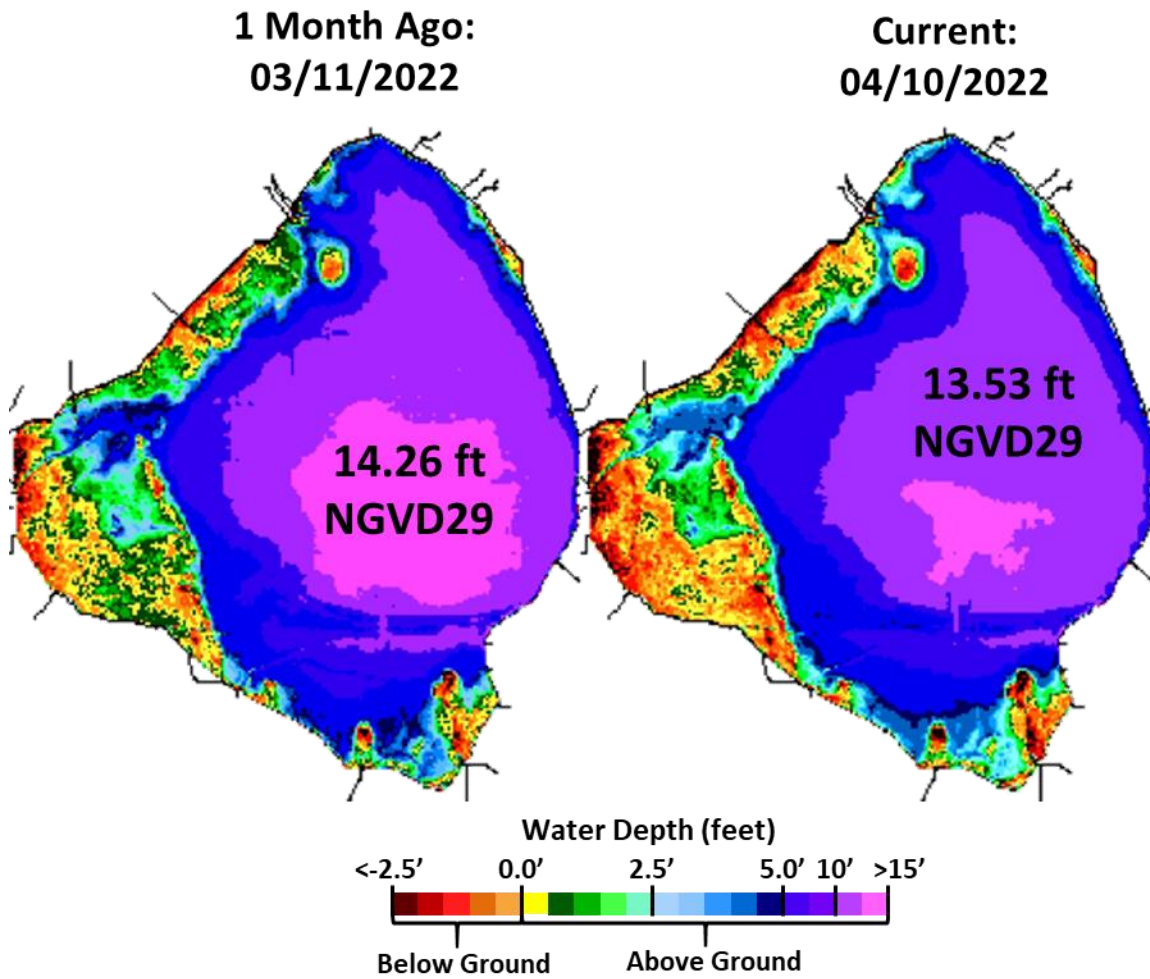


Figure LO-1. Lake Okeechobee water depth estimates based on South Florida Water Depth Assessment Tool (SFWDAT).

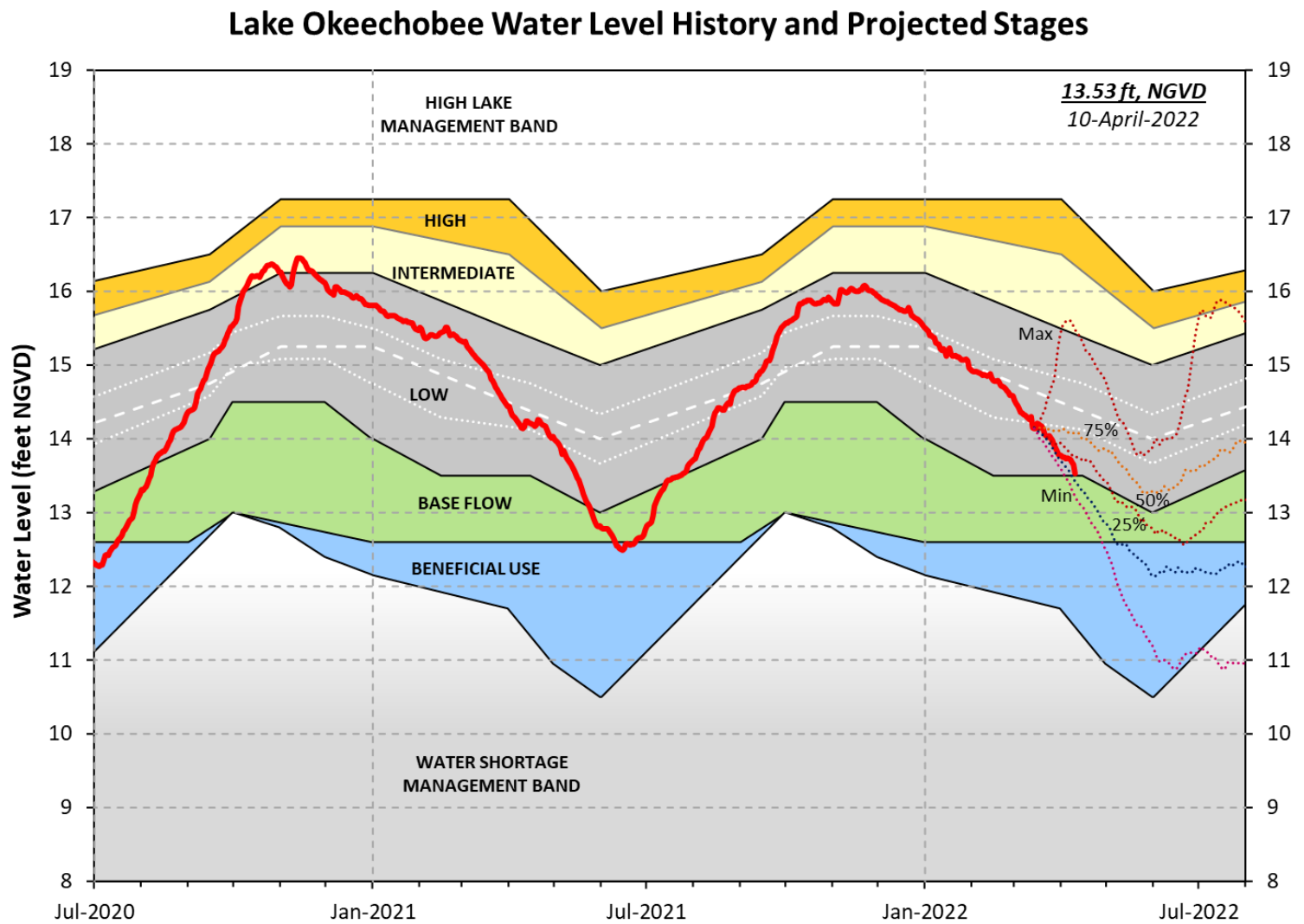


Figure LO-2. Recent Lake Okeechobee stages with projected stages based on a dynamic position analysis.

LORS-2008 - Adopted by USACE 28-April-2008

Lake Okeechobee Stage vs Ecological Envelope

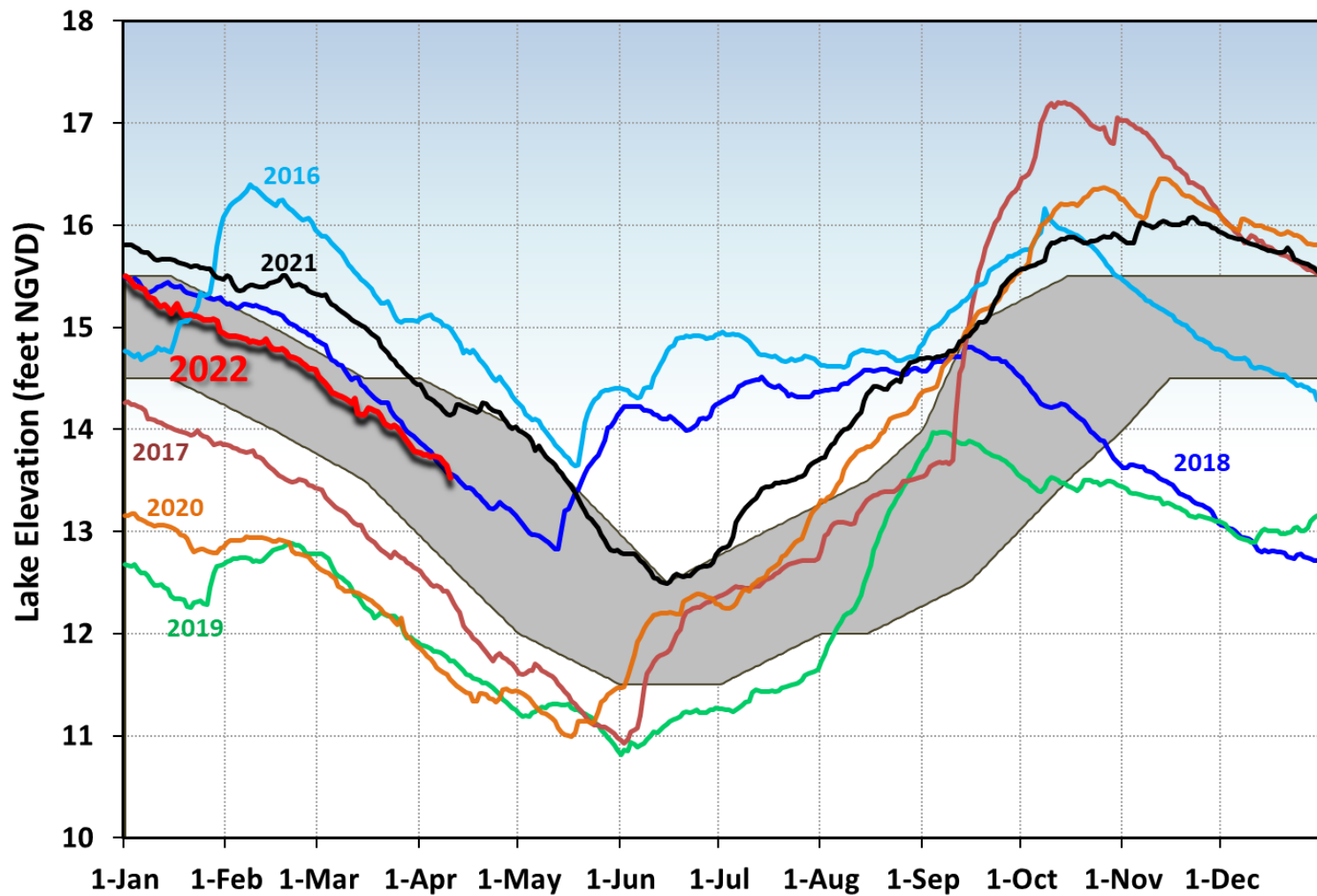


Figure LO-3. The prior six years of annual stage hydrographs for Lake Okeechobee in comparison to the ecological envelope.

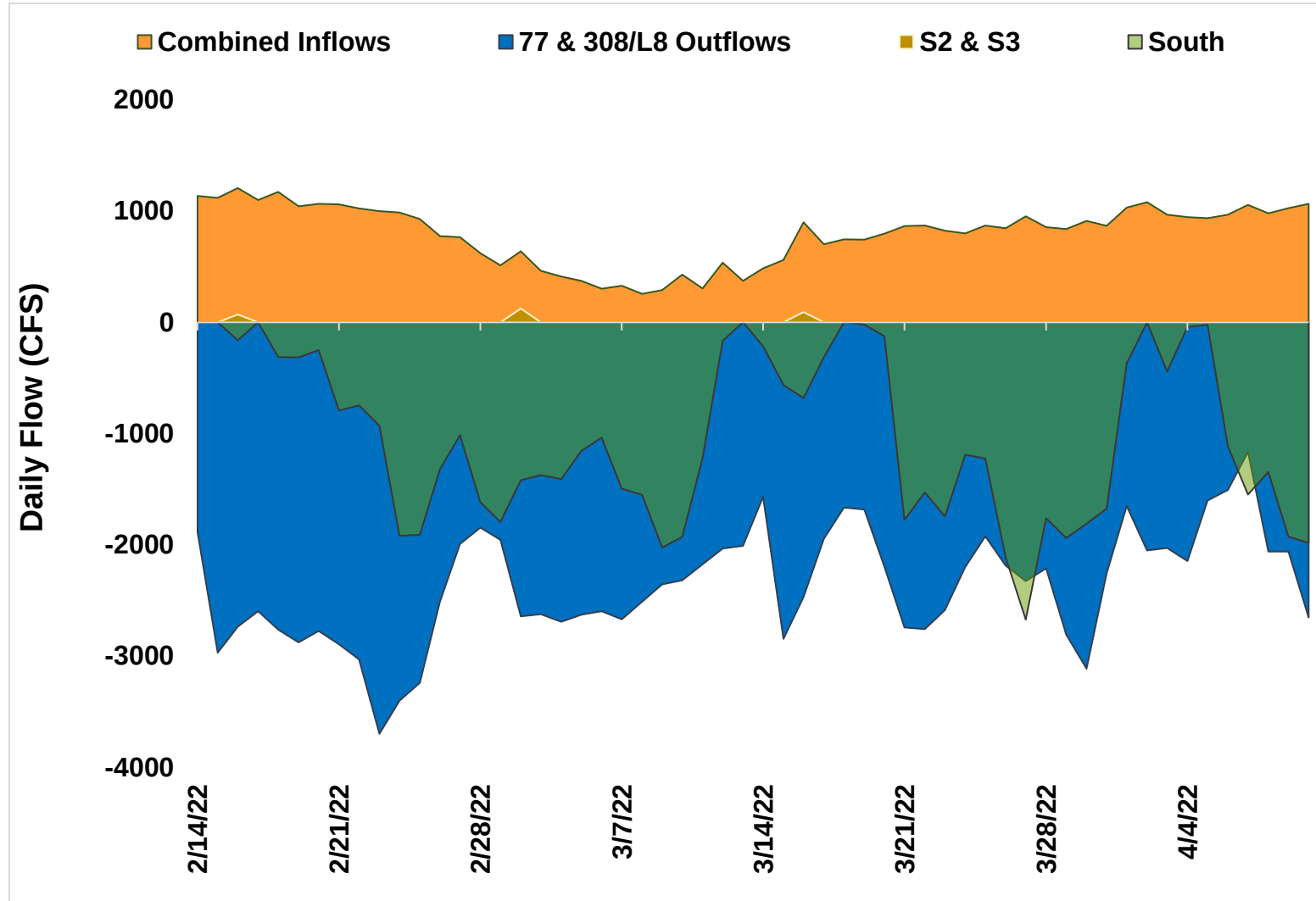


Figure LO-4. Major inflows (orange) to and outflows east and west (blue) from Lake Okeechobee. Outflows south are shown in green. Flows into Lake Okeechobee from the L-8 canal through S-271 (formerly Culvert 10A) or from the C-44 canal through the S-308 are included as inflows. Conversely, flows from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

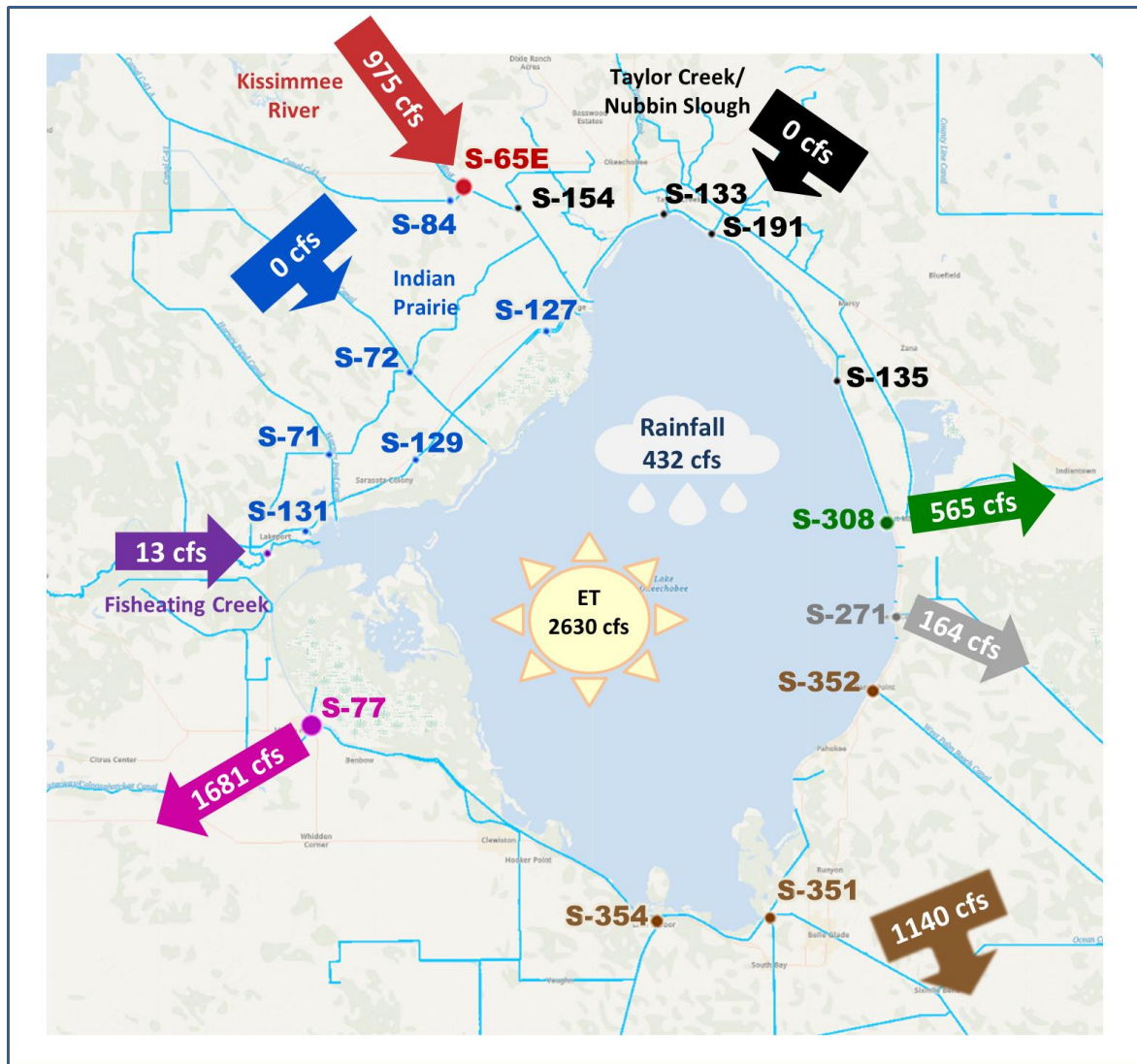


Figure LO-5. Inflows into Lake Okeechobee from Indian Prairie basins, Taylor Creek/Nubbin Slough, Kissimmee River and Fisheating Creek, and outflows to the west via S-77, to the east via S-308, to the south via S-351, S-352, S-354, and to southeast via S-271 (formerly Culvert 10A) for the week of April 4, 2022 – April 10, 2022.

Wading Bird Foraging and Nesting Locations April 7, 2022

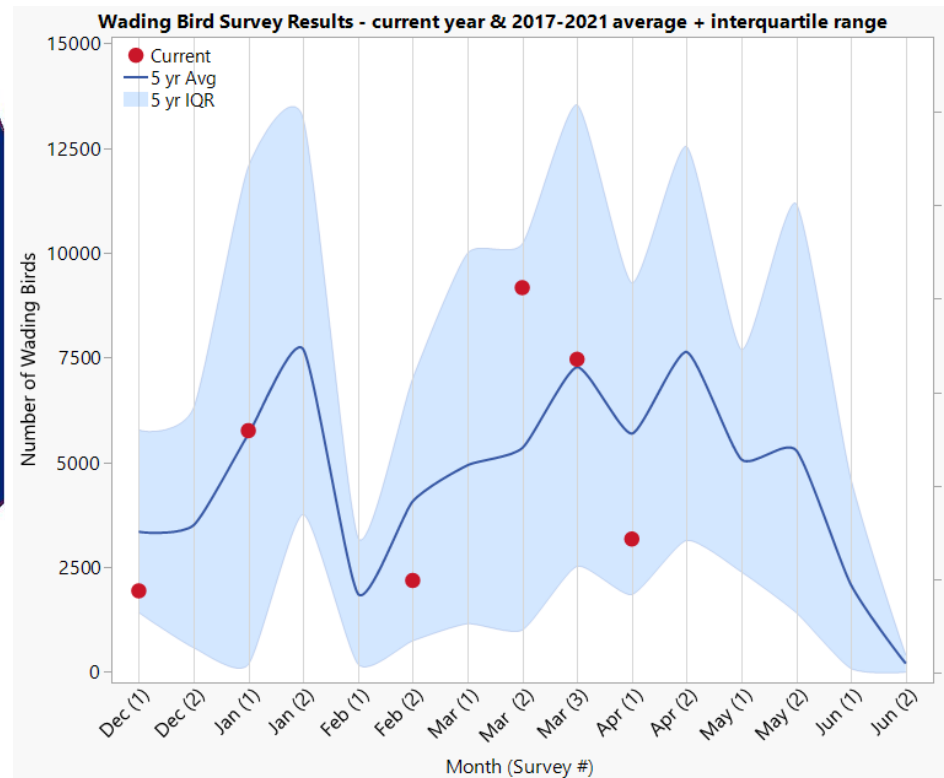
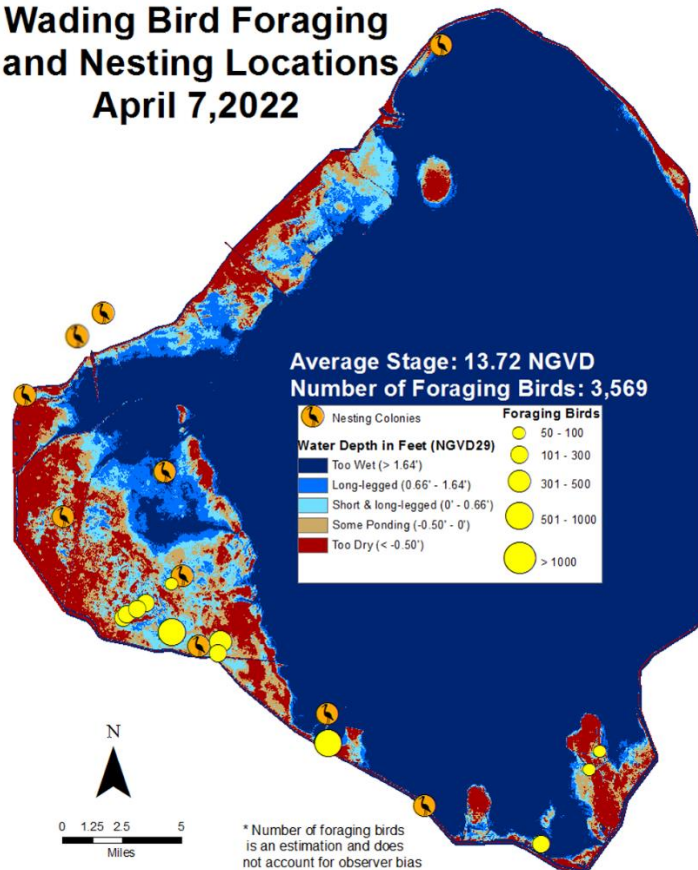


Figure LO-6. Locations of foraging flocks of wading birds observed during a monitoring flight on April 7, 2022 (map on left) are shown in yellow (circle sizes represents the flock size). Previous survey averages from the last five breeding seasons (blue line) compared to the 2022 breeding season (red dots) thus far is seen in the graph on the right. Light blue area represents the interquartile range for the previous five breeding seasons.

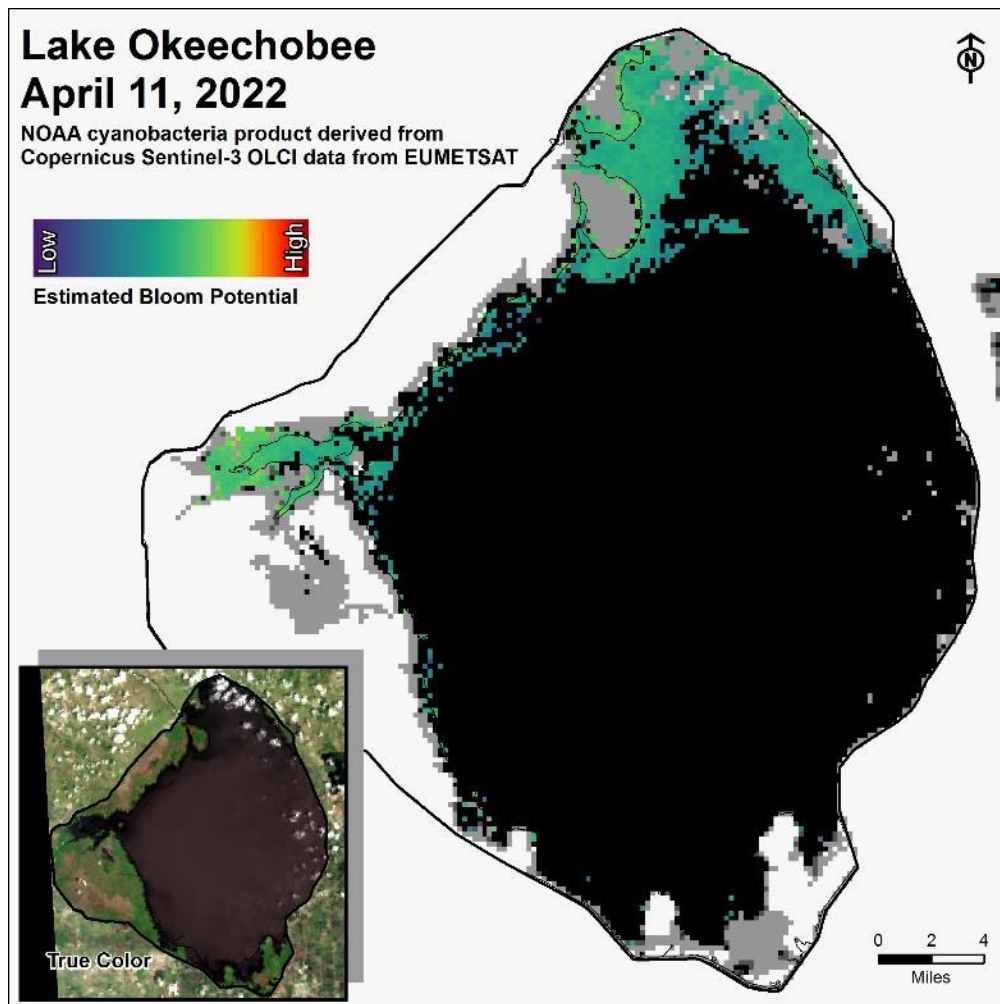


Figure LO-7. Cyanobacteria bloom potential on April 11, 2022 based on NOAA's harmful algal bloom monitoring system. Gray color indicates cloud cover.

Estuaries

St. Lucie Estuary

Over the past week, mean total inflow to the St. Lucie Estuary was 580 cfs (**Figures ES-1 and ES-2**) and the previous 30-day mean inflow was 506 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 the HR1 and US1 Bridge sites and decreased at the A1A Bridge site (**Table ES-1 and Figure ES-3**). The seven-day moving average of the surface and bottom salinities at the US1 Bridge was 21.9. Salinity conditions in the middle estuary were estimated to be within the good range for adult eastern oysters (**Figure ES-4**). Larval oyster recruitment rates reported by the Fish and Wildlife Research Institute remained 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 1,854 cfs (**Figures ES-6 and ES-7**) and the previous 30-day mean inflow was 1,942 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 and decreased at the remaining sites in the estuary (**Table ES-2 and Figures ES-8 and ES-9**). 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 and Shell Point, and in the fair range at Sanibel (**Figure ES-10**). Larval oyster recruitment rates reported by the Fish and Wildlife Research Institute remained 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, 2013¹) coupled with a linear reservoir model for the tidal basin. Model scenarios included pulse releases at S-79 ranging from 0 to 1,500 cfs and a steady release at 2,000 cfs with estimated tidal basin inflows of 45 cfs. Model results from all scenarios predict daily salinity to be 1.8 or lower and the 30-day moving average surface salinity to be 0.5 or lower at Val I-75 at the end of the two-week period (**Table ES-3 and Figure ES-13**). This keeps predicted salinities at Val I-75 within the LORS 2008 salinity range (0.0-5.0).

Red Tide

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

The Florida Fish and Wildlife Research Institute reported on April 8, 2022, that *Karenia brevis*, the Florida red tide dinoflagellate, was not observed within the District region. On the east coast, red tide was not observed in samples from St. Lucie, Martin, or Palm Beach counties.

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.

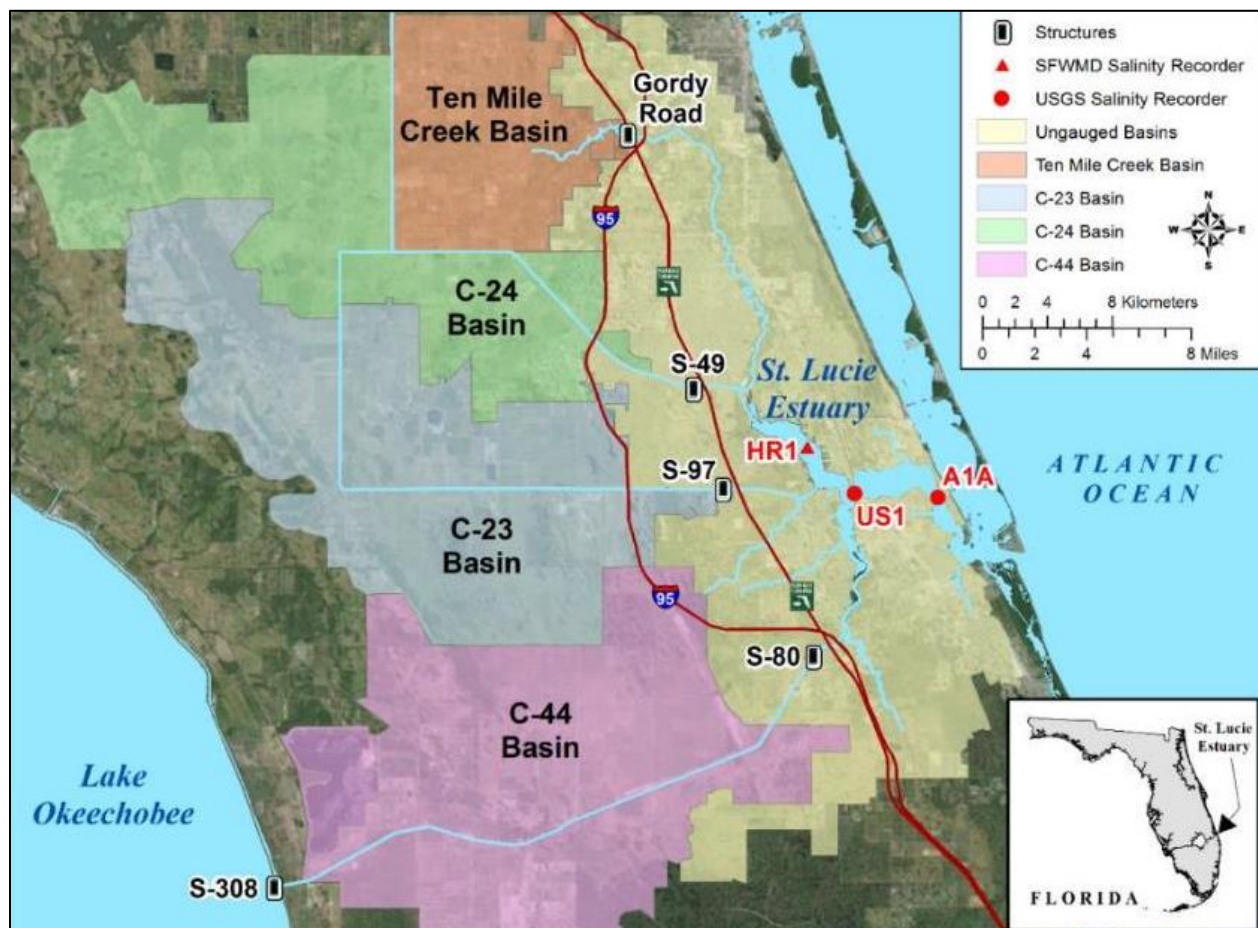


Figure ES-1. Basins, water control structures and salinity monitoring sites in the St. Lucie Estuary.

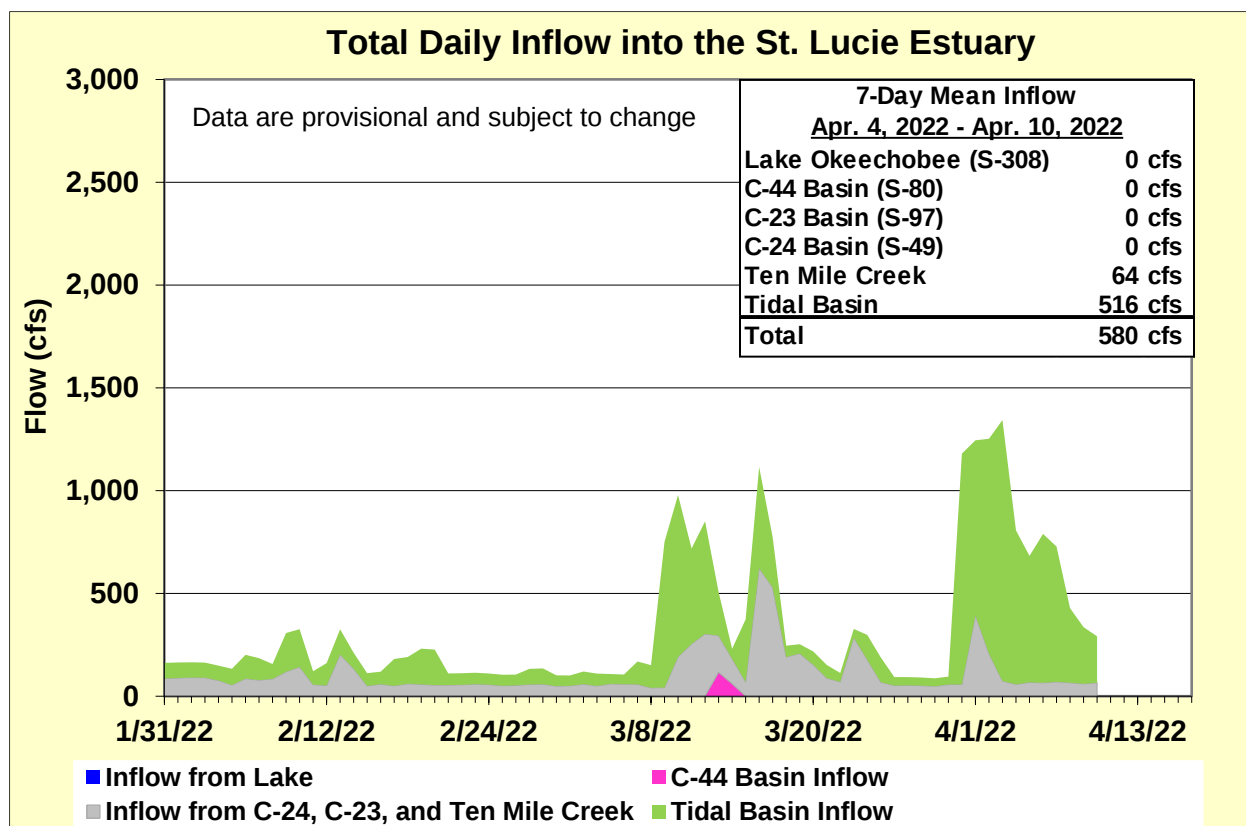


Figure ES-2. Total daily inflows from Lake Okeechobee and runoff from the C-44, C-23, C-24, Ten Mile Creek, and Tidal Basins into the St. Lucie Estuary.

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)	17.2 (16.5)	18.7 (18.6)	NA ^a
US1 Bridge	21.4 (21.3)	22.4 (22.1)	10.0 – 26.0
A1A Bridge	27.9 (28.6)	31.1 (32.0)	NA ^a

a. The envelope is not applicable.

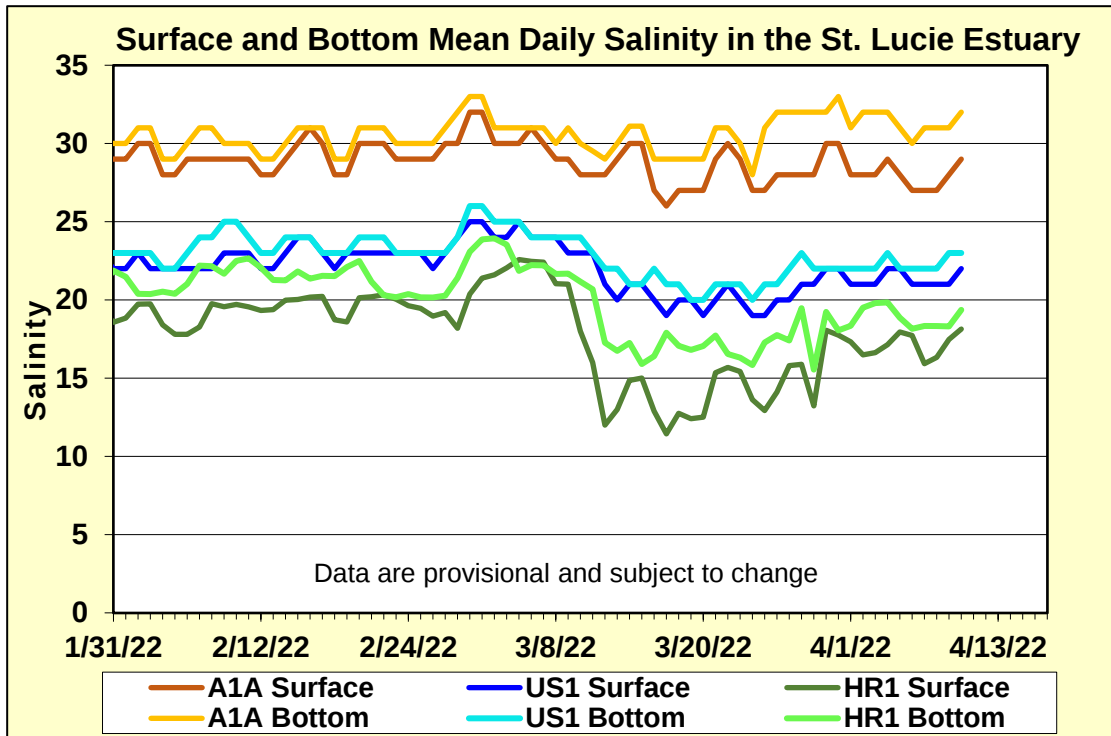


Figure ES-3. Mean daily salinity at the A1A, US1 and HR1 sites in the St. Lucie Estuary.

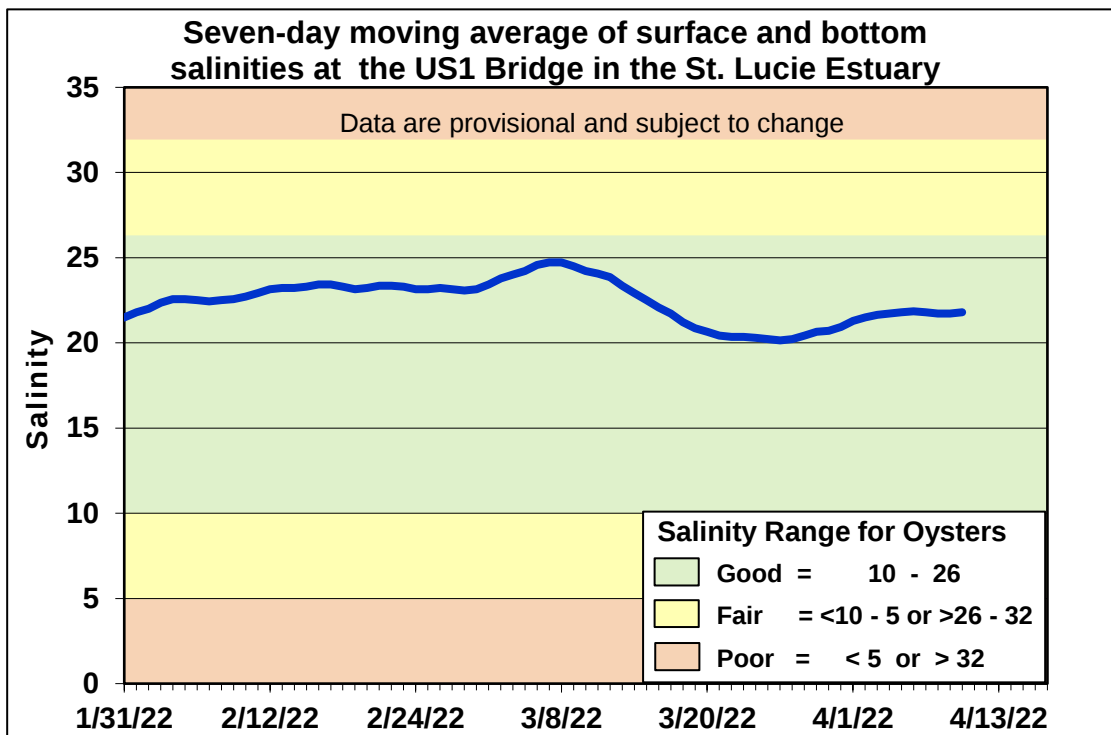


Figure ES-4. Seven-day moving average of the surface and bottom salinities at the US1 Bridge in the St. Lucie Estuary.

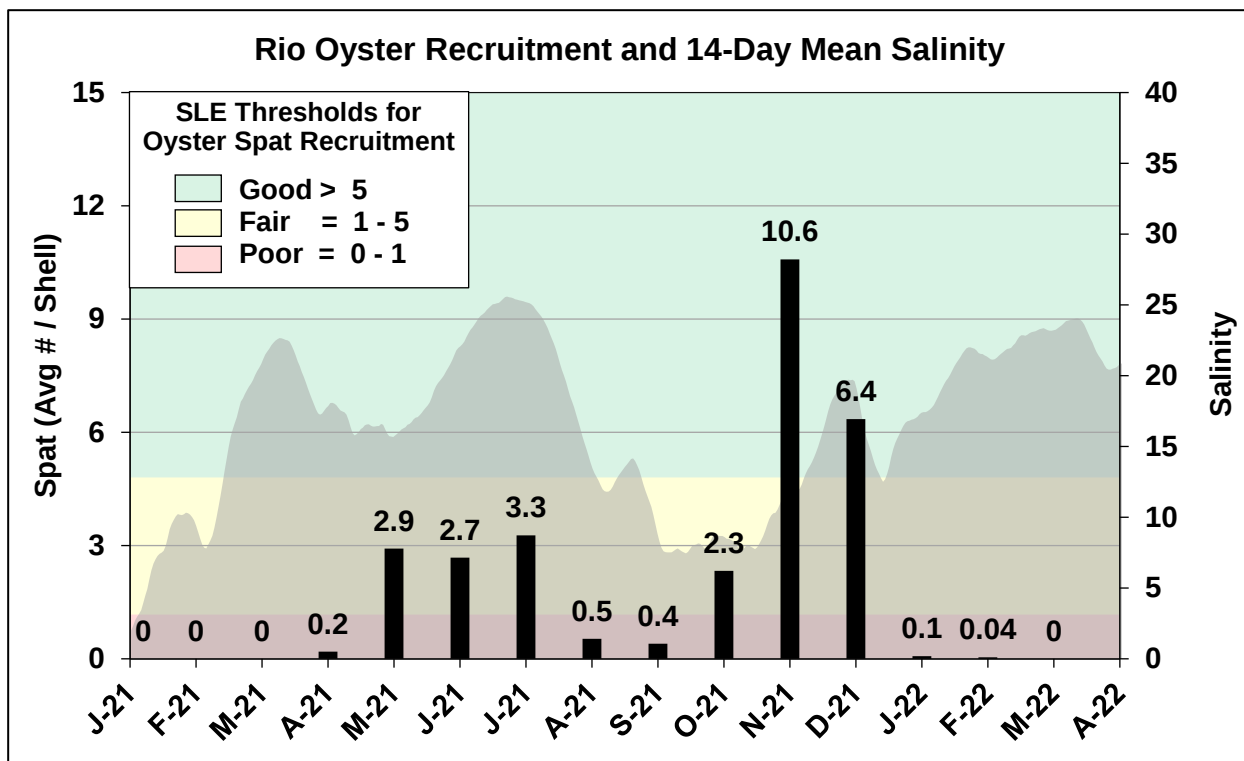


Figure ES-5. Mean oyster recruitment at the Rio oyster monitoring station and 14-day mean salinity at US1 Bridge.

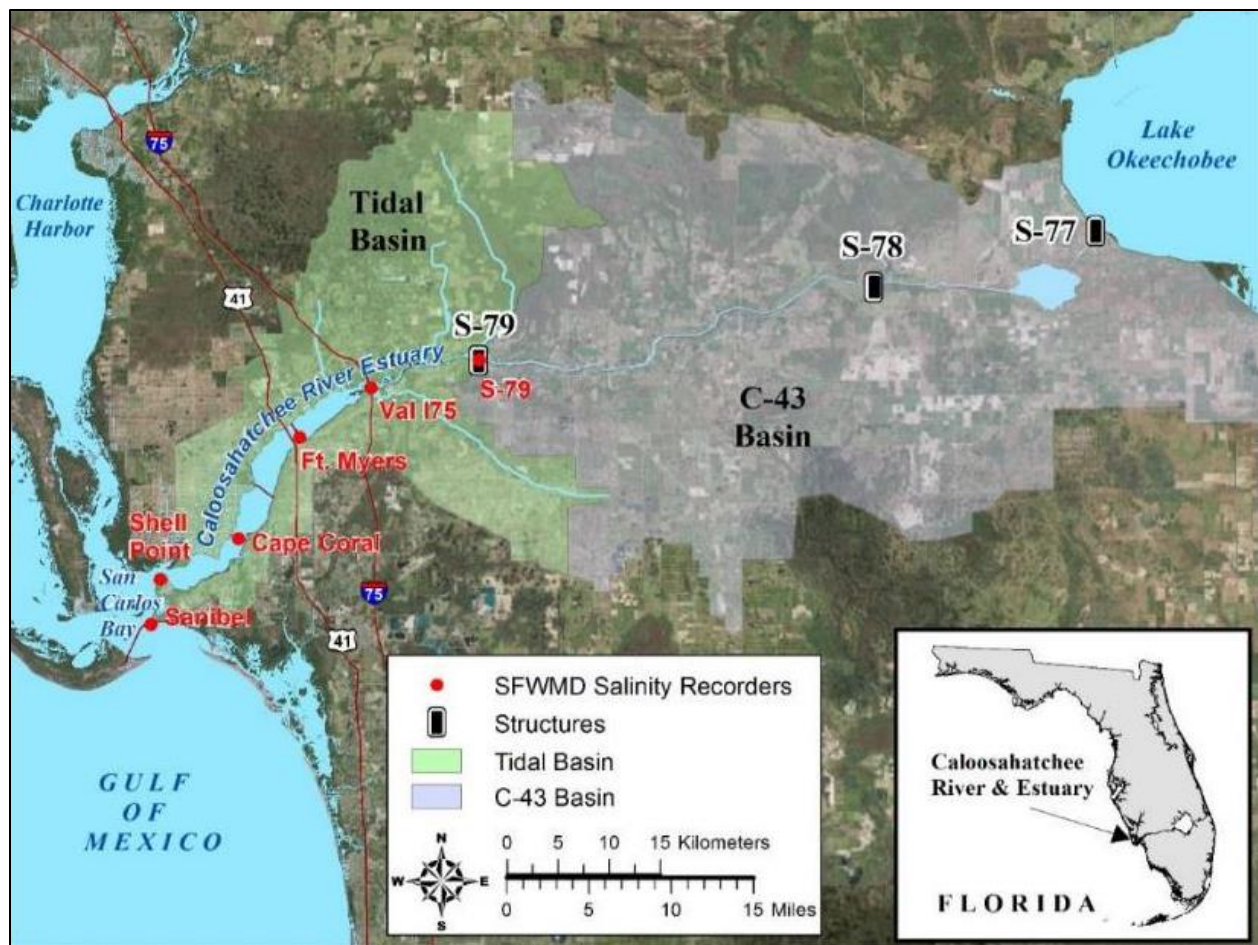


Figure ES-6. Basins, water control structures and salinity monitoring sites in the Caloosahatchee River Estuary.

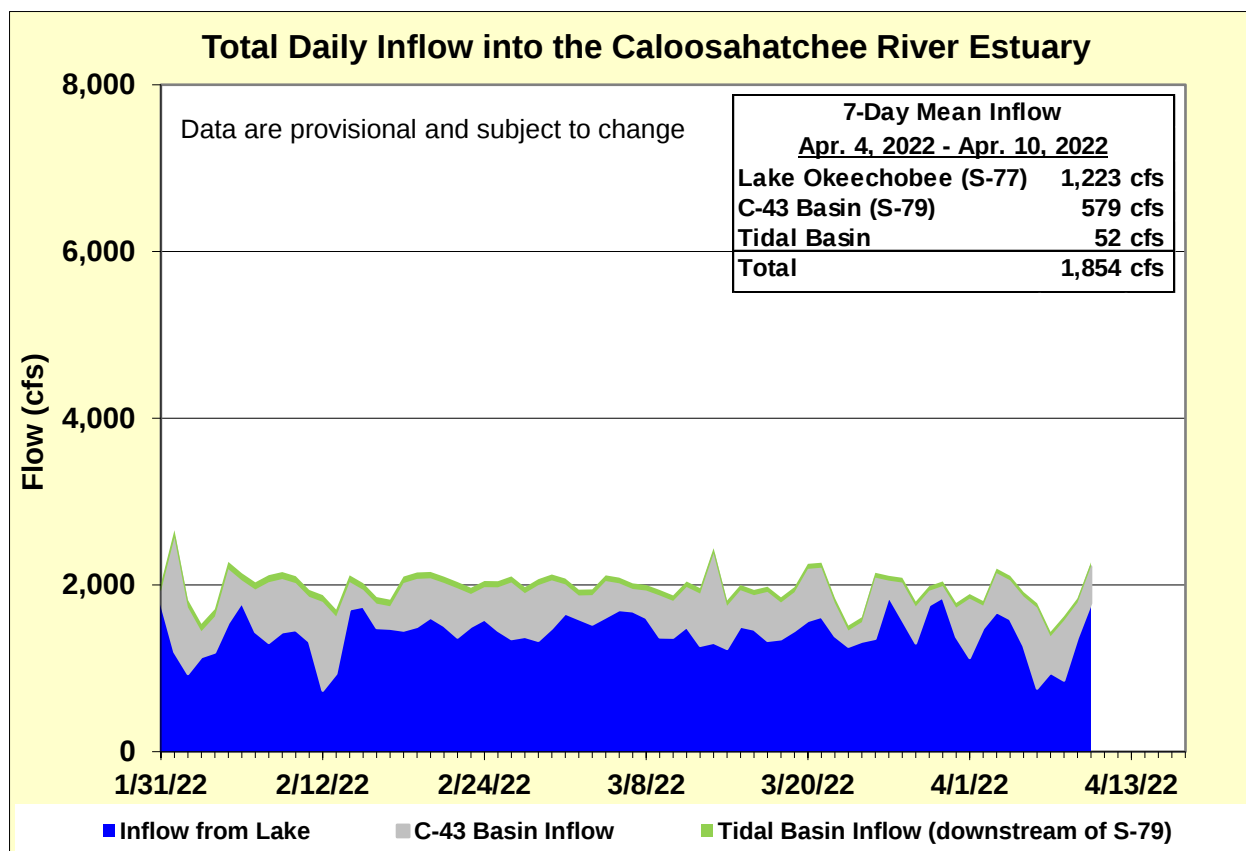


Figure ES-7. Total daily inflows from Lake Okeechobee, and runoff from the C-43 and Tidal basins into the Caloosahatchee River Estuary.

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 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	0.2 (0.2)	0.2 (0.2)	0.0 – 5.0 ^b
Fort Myers Yacht Basin	1.4 (2.8)	2.1 (3.5)	NA ^a
Cape Coral	10.0 (11.6)	11.3 (12.6)	10.0 – 30.0
Shell Point	24.9 (26.2)	26.3 (27.0)	10.0 – 30.0
Sanibel	30.7 (31.2)	32.4 (32.1)	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.

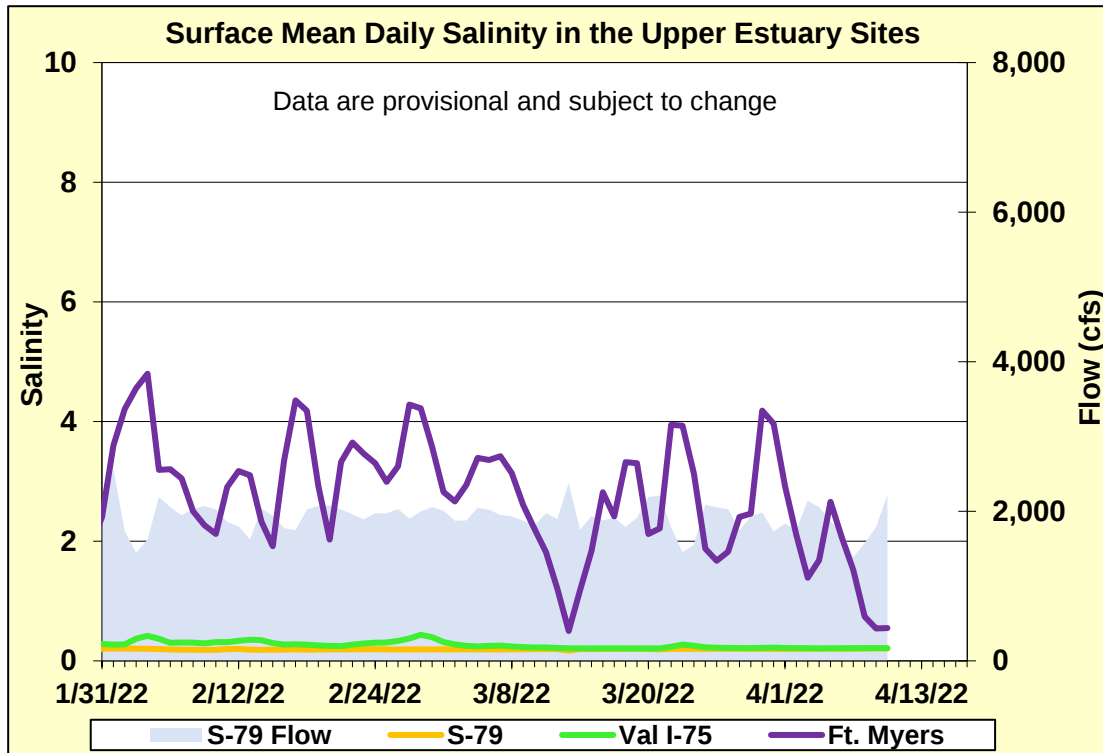


Figure ES-8. Mean daily salinity at upper Caloosahatchee River Estuary monitoring sites and mean daily flow at S-79.

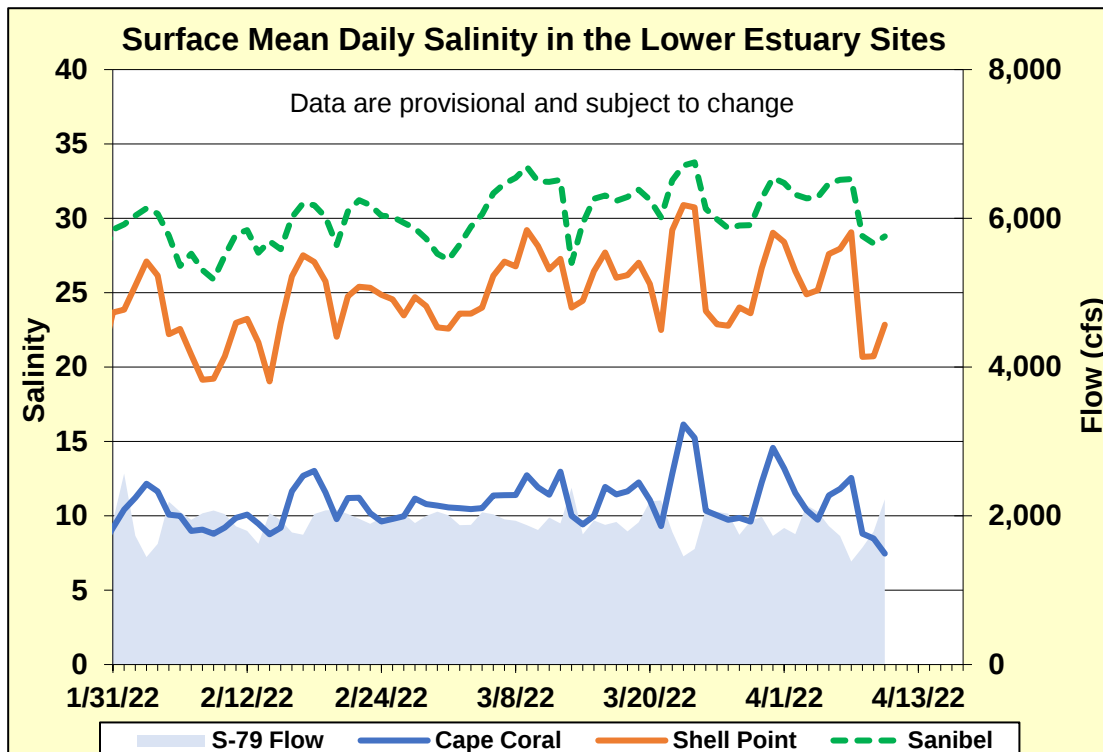


Figure ES-9. Mean daily surface salinity at lower Caloosahatchee River Estuary monitoring sites and mean daily flow at S-79.

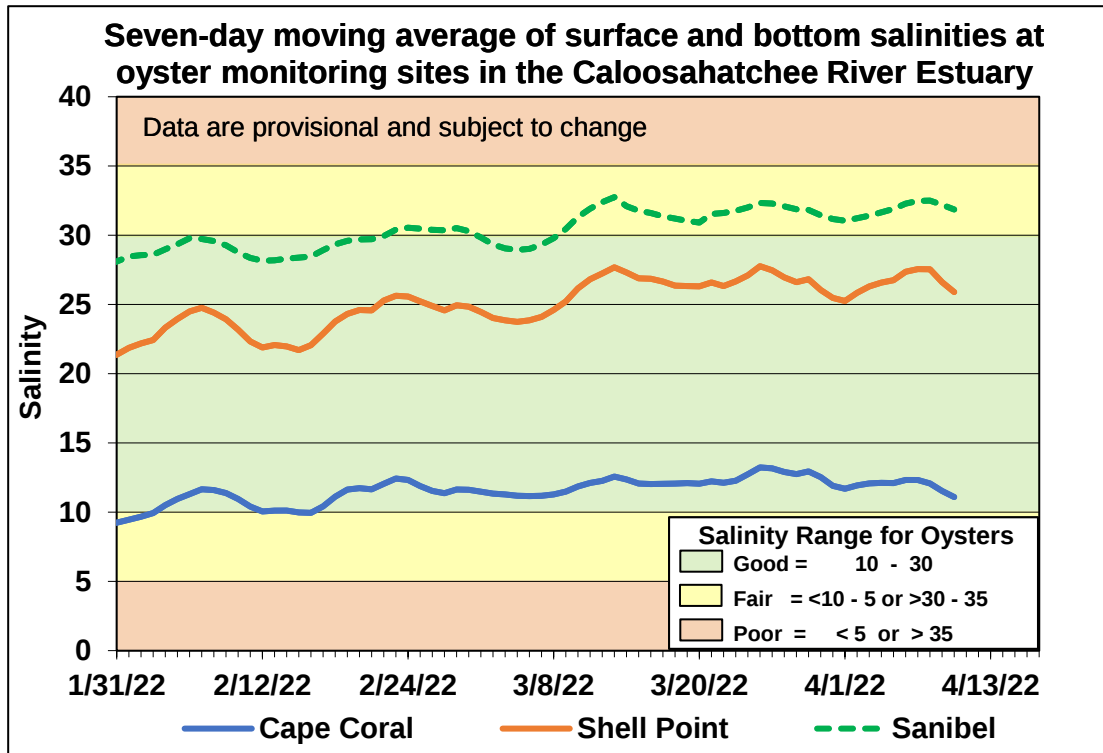


Figure ES-10. Seven-day moving average of surface and bottom salinities at Cape Coral, Shell Point and Sanibel monitoring sites in the Caloosahatchee River Estuary.

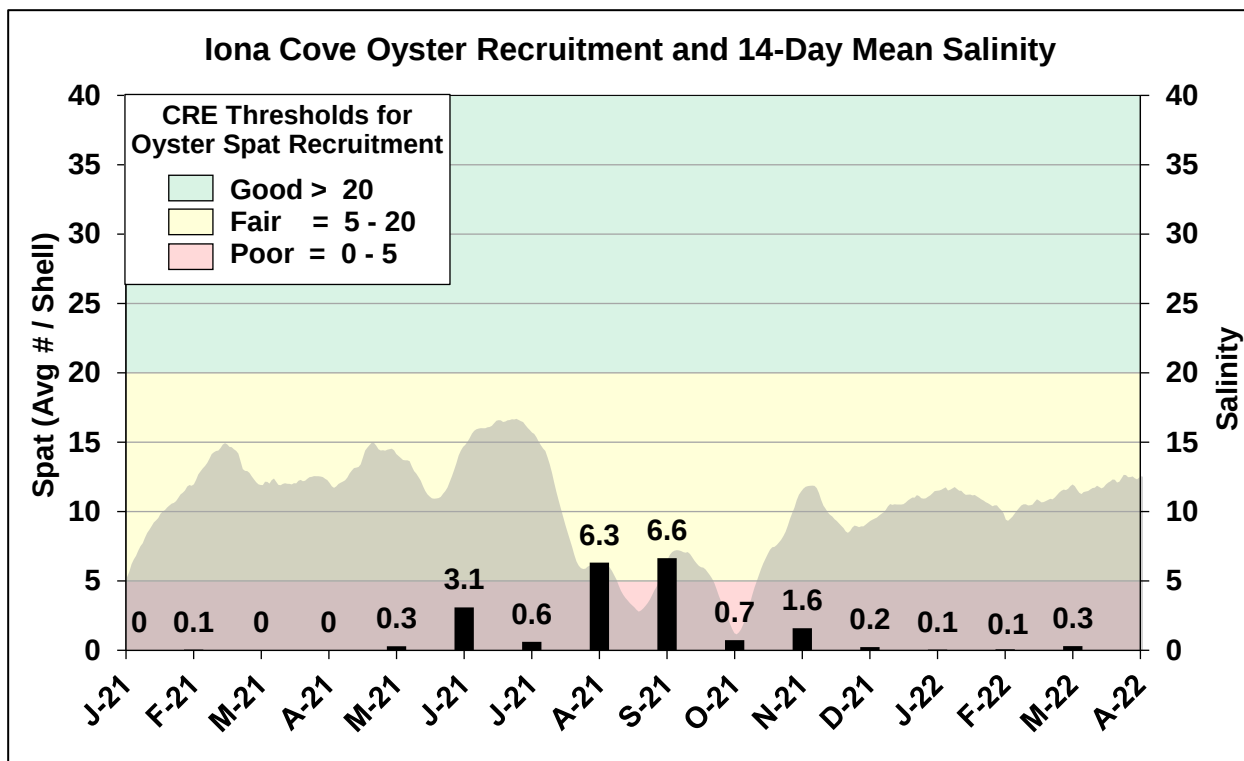


Figure ES-11. Mean oyster recruitment at the Iona Cove oyster monitoring station and 14-day mean salinity at Cape Coral.

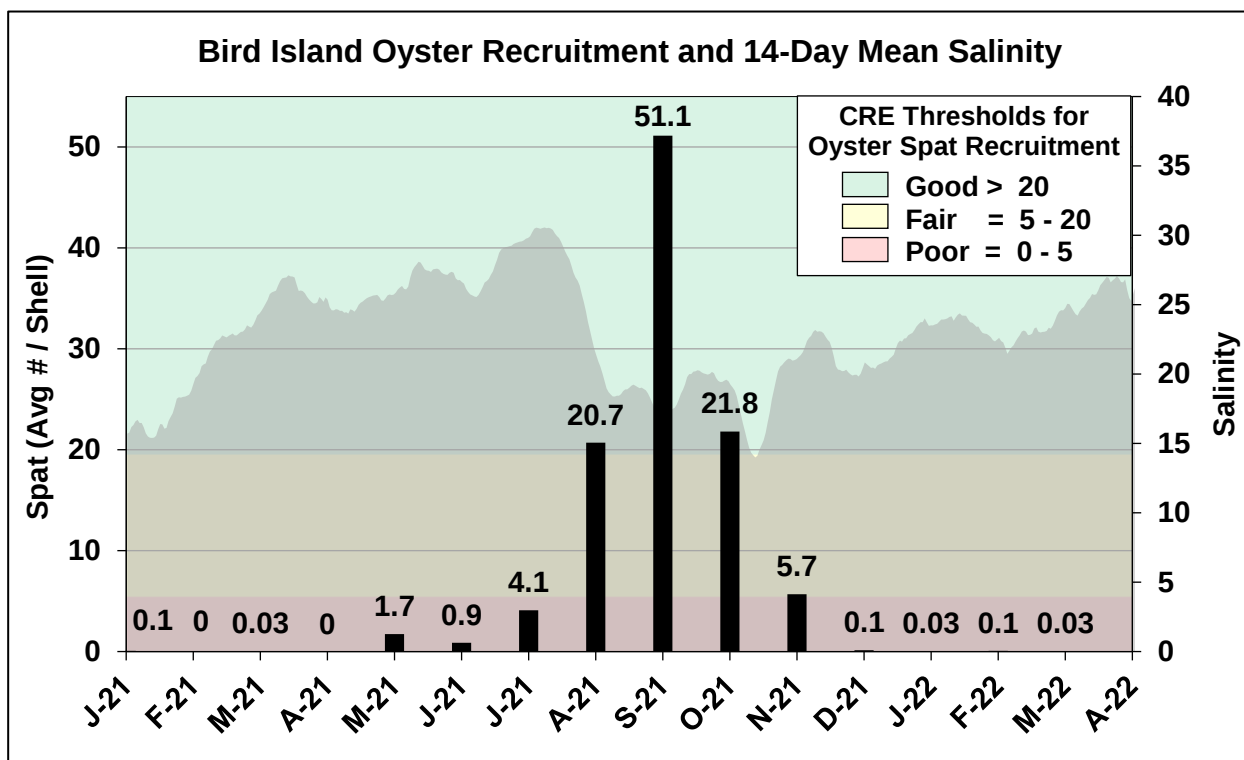


Figure ES-12. Mean oyster recruitment at the Bird Island oyster monitoring station and 14-day mean salinity at Shell Point.

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	45	1.8	0.5
B	450	45	0.9	0.4
C	800	45	0.5	0.3
D	1000	45	0.4	0.3
E	1500	45	0.3	0.3
F	2000	45	0.3	0.3

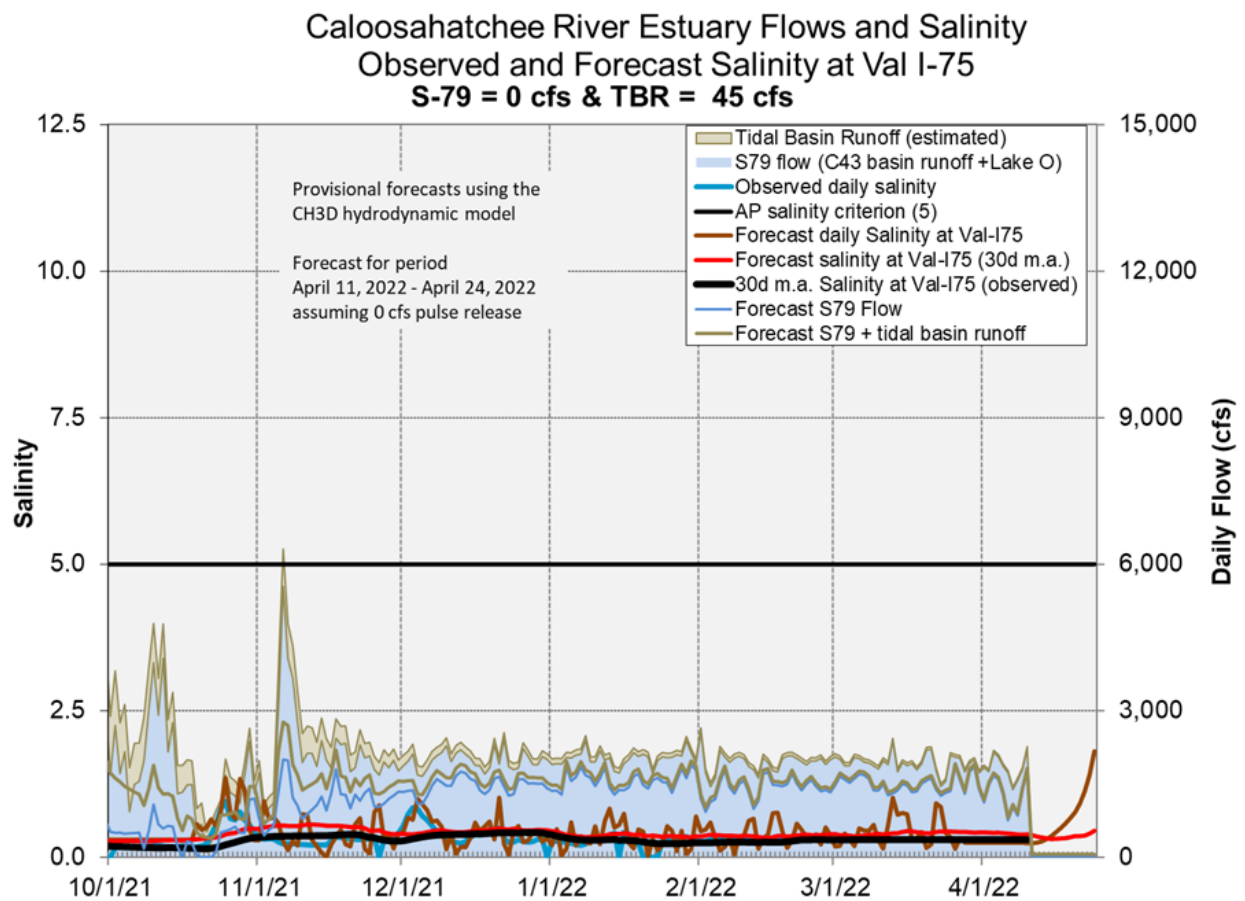


Figure ES-13. Forecasted Val I-75 site surface salinity assuming no pulse release at S-79.

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 (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 and Western, and Eastern Flow-ways are $1.0 \text{ g/m}^2/\text{year}$ or lower (**Figure S-2**).

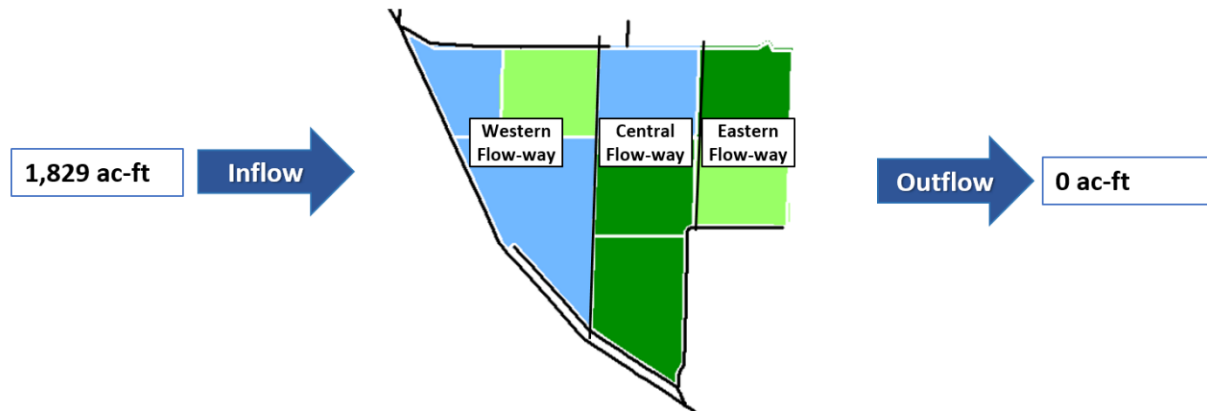
STA-2: STA-2 Flow-way 2 is offline for construction activities. Operational restrictions are in place in STA-2 Flow-ways 3 and 4 for vegetation management activities, and in Flow-way 1 following dryout conditions. Online treatment cells are near or below target stage. Vegetation in Flow-ways 1 and 3 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 $1.0 \text{ g/m}^2/\text{year}$. 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 $1.0 \text{ g/m}^2/\text{year}$ (**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 $1.0 \text{ g/m}^2/\text{year}$. 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.

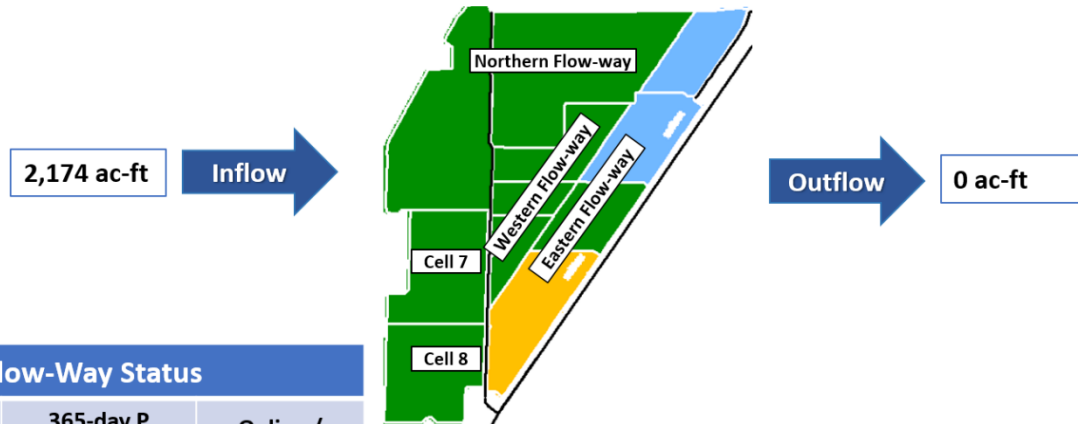
STA-1E Weekly Status Report – 4/4/2022 through 4/10/2022



STA-1E Flow-Way Status				As of 4/10/2022		STA-1E Flow & Phosphorus Concentration				
Flow-Way	Vegetation Status Healthy ----- Stressed 	365-day P Loading Rate (below 1.0 g P /m²/yr is optimal)	Online / Offline / Restrictions	Stage Based: Relative to Target Stage (TS)			7-day	28-day	365-day	
				 Deep Water Level (> 2.8' above TS)	 High Water Level (1.5' – 2.8' above TS)					
Eastern			Vegetation Rehab	 0.2' – 1.5' above TS	 Target Stage (TS +/- 0.2')		Total Inflow, ac-ft	1,829	2,789	178,882
				 Low Water Level (<0.2' below TS)						
Central				Depth / Area Based: Percent of Area Dry						
Western			Vegetation Rehab	 0-25% Dry	 50-75% Dry		Total Outflow, ac-ft	0	691	148,751
				 25-50% Dry	 75-100% Dry					
							Inflow Conc., ppb	84	79	121
							Outflow Conc., ppb	N/A	32	23
Includes Preliminary Data										

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

STA-1W Weekly Status Report – 4/4/2022 through 4/10/2022



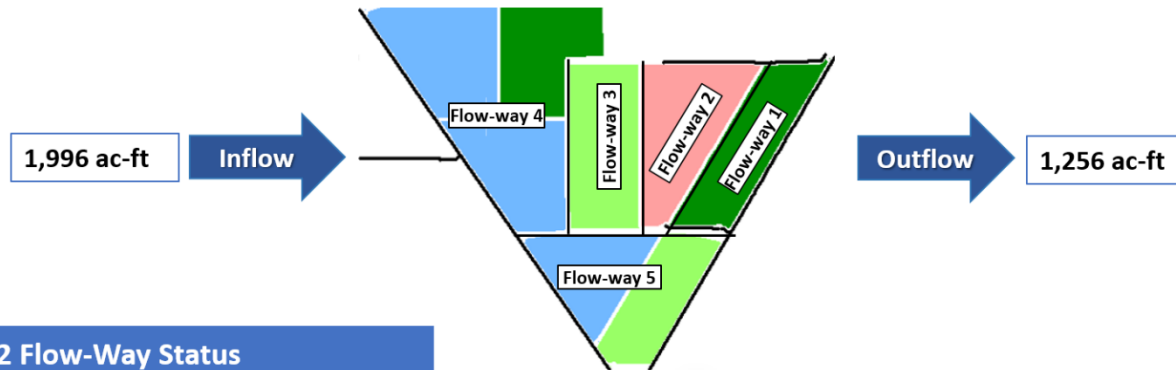
STA-1W Flow-Way Status			
Flow-Way	Vegetation Status Healthy --- Stressed	365-day P Loading Rate (below 1.0 g P /m ² /yr is optimal)	Online / Offline / Restrictions
Northern			Construction
Western			Construction
Eastern			Construction
Cell 7		N/A	Online
Cell 8		N/A	Construction

As of 4/10/2022	
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-1W Flow & Phosphorus Concentration			
	7-day	28-day	365-day
Total Inflow, ac-ft	2,174	5,264	60,541
--Lake Inflow, ac-ft	600	N/A	6,000
Total Outflow, ac-ft	0	0	52,971
Inflow Conc., ppb	75	75	156
Outflow Conc., ppb	N/A	N/A	24
Includes Preliminary Data			

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

STA-2 Weekly Status Report – 4/4/2022 through 4/10/2022



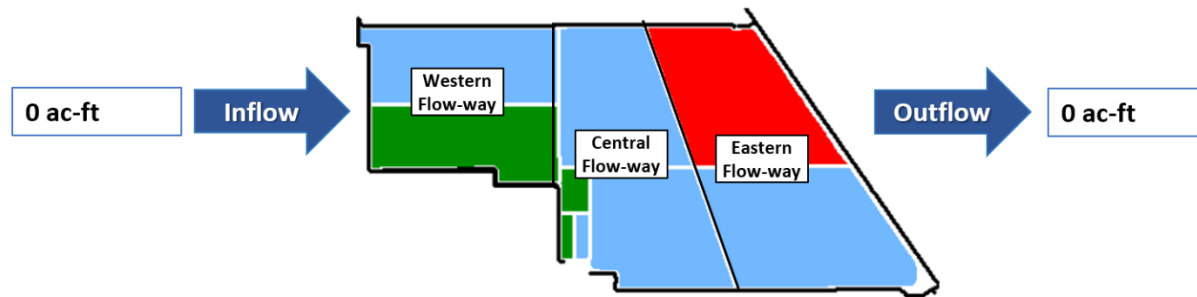
STA-2 Flow-Way Status			
Flow-Way	Vegetation Status Healthy ----- Stressed	365-day P Loading Rate (below 1.0 g P /m ² /yr is optimal)	Online / Offline / Restrictions
1			Post Dryout
2	Offline, construction activities as of 9/7/2021		
3			Vegetation Rehab
4			Vegetation Rehab
5			Online

As of 4/10/2022	
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-2 Flow & Phosphorus Concentration			
	7-day	28-day	365-day
Total Inflow, ac-ft	1,996	13,451	307,824
--Lake Inflow, ac-ft	0	N/A	51,700
Total Outflow, ac-ft	1,256	4,941	315,422
Inflow Conc., ppb	20	49	89
Outflow Conc., ppb	22	20	15
Includes Preliminary Data			

Figure S-3. STA-2 Weekly Status Report

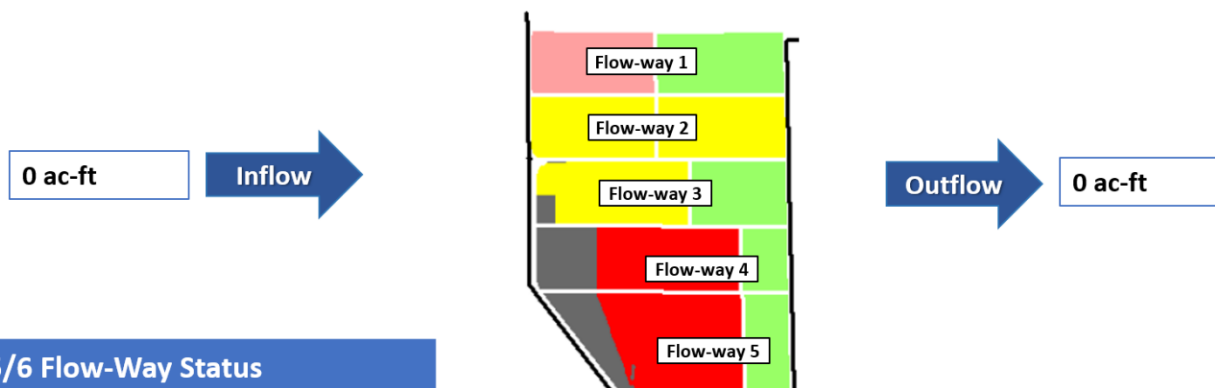
STA-3/4 Weekly Status Report – 4/4/2022 through 4/10/2022



STA-3/4 Flow-Way Status				As of 4/10/2022		STA-3/4 Flow & Phosphorus Concentration											
Flow-Way	Vegetation Status Healthy ----- Stressed	365-day P Loading Rate (below 1.0 g P /m²/yr is optimal)	Online / Offline / Restrictions	Stage Based: Relative to Target Stage (TS)			7-day	28-day	365-day								
				Deep Water Level (> 2.8' above TS)		Total Inflow, ac-ft	0	61	358,597								
				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													
Eastern	Offline, vegetation management drawdown as of 3/1/2021			0-25% Dry	50-75% Dry	Total Outflow, ac-ft	0	0	316,277								
Central		1.0	Online	25-50% Dry	75-100% Dry					Inflow Conc., ppb	N/A	30	65				
Western		1.0	Online											Outflow Conc., ppb	N/A	N/A	15
Includes Preliminary Data																	

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

STA-5/6 Weekly Status Report – 4/4/2022 through 4/10/2022



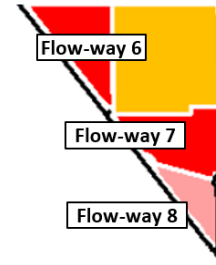
STA-5/6 Flow-Way Status			
Flow-Way	Vegetation Status Healthy ----- Stressed	365-day P Loading Rate (below 1.0 g P / m ² /yr is optimal)	Online / Offline / Restrictions
1			Online
2		N/A	Online
3		N/A	Online
4	Offline, vegetation management starting 01/24/2022		
5			Online

As of 4/10/2022	
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	0	0	177,793
--Lake Inflow, ac-ft	0	N/A	8,800
Total Outflow, ac-ft	0	0	168,885
Inflow Conc., ppb	N/A	N/A	243
Outflow Conc., ppb	N/A	N/A	50
Includes Preliminary Data			

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

STA-5/6 Weekly Status Report – 4/4/2022 through 4/10/2022



STA-5/6 Flow-Way Status				As of 4/10/2022	
Flow-Way	Vegetation Status Healthy ----- Stressed ←-----→	365-day P Loading Rate (below 1.0 g P /m ² /yr is optimal)	Online / Offline / Restrictions	Stage Based: Relative to Target Stage (TS)	
				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)	
6	←-----→	1.0	Online		
7	←-----→	1.0	Online		
8	←-----→	1.0	Online		
				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, $\mu\text{g/L}$ or ppb. Inflow concentration refers to the flow-weighted mean TP from all inflow structures over a period of time.
- **Outflow Concentration:** The flow-weighted mean TP from all outflow structures over a period of time. The outflow concentration represents the reduction of inflow TP achieved by STA treatment of the inflow water.
- **WQBEL:** The STA outflow concentration that is required upon completion of the Restoration Strategies projects by December 2025. The outflow concentration shall not exceed 13 ppb as an annual flow weighted mean in more than 3 out of 5 water years on a rolling basis and shall not exceed 19 ppb as an annual flow weighted in any water year.
- **Flow-Way (FW):** One or more treatment cells connected in series. Cells typically have emergent aquatic vegetation (EAV) in the front portion of the flow-way followed by a mix of EAV and submerged aquatic vegetation (SAV)
- **Vegetation Status:** Healthy means the vegetation condition is good and will allow the STA to perform as designed. Stressed means the vegetation is showing signs of poor health, such as browning or areas of vegetation die-off, or the cell contains undesirable vegetation such as floating exotic vegetation requiring treatment. The TP reduction capability of the STA is affected when the vegetation condition is poor.
- **Phosphorus Loading Rate (PLR):** Mass of inflow TP in grams, divided by total treatment area of STA in square meters, per year. In general, a 365-day value of less than 1.0 is needed for an STA to perform optimally. A PLR of 2.0 is considered very high and a PLR of 3.0 is considered extremely high. The TP reduction capability of the STA is affected when the PLR is high, very high and extremely high.
- **Online:** Online status means the FW can receive and treat inflow.
- **Online with Restriction:** The FW can receive and treat inflow, but the amount of flow or water level may be limited temporarily. For example, a vegetation rehabilitation effort may require reduced flows through an area while the new plants are establishing, or nesting by protected species may require a certain water level not to be exceeded.
- **Offline:** The FW is unable to receive and treat inflow due to repairs, construction, or other prohibitive reasons.
- **Depth:** Difference between the average surface water level in a cell and the average ground elevation in that cell. Target depths, or depths between flow events, are between 1.25 ft to 1.5 ft. As depth approaches or drops below zero, an increasing percentage of the cell is considered dry and STA conditions deteriorate. An increase in depth above target depth is expected with increasing flow. However, as depth increases much above the target depth and is sustained over a period of time, it can be detrimental to vegetation health and overall STA treatment performance.
- **Note:** The data provided in this summary report were developed using a combination of provisional and quality-assured flow and water quality data. In some cases, best professional judgment was used to estimate missing data and revise questionable data. Values provided are not considered final but are appropriate for use in STA operational decision-making.

Everglades

Water Conservation Area Regulation Schedules

WCA-1: Stages at the 1-8C gauge fell faster than the slope of the regulation line last week, with Sunday's average reaching 0.05 feet above the regulation line. WCA-2A: Stage continued to drop quickly at the S11B headwater gauge last week. The average on Sunday was 0.44 feet higher than the flat regulation line. WCA-3A: Last week the Three Gauge Average stages declined faster than the slope of the Zone A line; average stage was 0.97 feet below the falling regulation line on Sunday. (3-69W is +0.43'). WCA-3A: Stage continued to recede at gauge 62 (Northwest corner), falling quickly late in the week. Sunday's average was 1.43 feet below the flat Upper schedule line.

(Figures EV-1 through EV-4).

Water Depths

The WDAT indicates that water depths are below the soil surface across most of BCNP (especially in the south) and WCA-3A North as is typical but not favorable for this time of year. Central WCA-2A and northern WCA-1 are drying down providing wading bird foraging habitat. North to south hydrologic connectivity continues to diminish but remains within Everglades National Park's Shark River Slough. (Figure EV-5). Comparing current estimated water depths to the depth one month ago, stages decreased across the EPA, significantly so in western BCNP. Looking back one-year, western WCA-3A is significantly lower in depth compared to one year ago. WCA-2A, western WCA-1, central BCNP and eastern ENP are slightly wetter than a year ago. (Figure EV-6). Comparing current depths to the past 20 years, portions of the eastern half of WCA-3A remain in the 10th percentile. BCNP remains above the median but below the soil surface. Discharges into northern WCA-3A remain evident. (Figure EV-7).

Taylor Slough and Florida Bay

A spatial average of 0.81 inches of rain fell over Taylor Slough and Florida Bay on Monday, 4/4 and the rest of the week saw no rain. Stages in Taylor Slough increased an average of 0.09 feet over this past week with the largest weekly change of +0.29 feet in the northern Taylor Slough area (Figure EV-8). The Slough, as a whole, is now 10 inches higher than average driven in large part by the northern areas which are 17 inches higher than the historical average for this time of year (pre-Florida Bay initiative which started in 2017). If the previous recession rates resume, the Slough would be mostly dry after 2 weeks. Water depths in the northern area of the Slough are higher than in the central and southern areas which is unusual for this time of year (Figure EV-9).

Salinities in Florida Bay averaged a decrease of 0.7 over the week, with individual station changes ranging from -5.6 to +2.8 (Figure EV-8). The central and western Bay stations are at 39 while the western nearshore station of Garfield Bight (GB) remains above 40 for the second week. After negative flows to start the week, the final weekly total from the 5 creeks feeding the Bay was 5,600 acre-feet. The eastern and central Bay areas are still in the lower half of their historical interquartile range of salinities, but the western Bay is approaching its 75th percentile (Figure EV-10).

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. This recommendation is currently being epitomized with STA2 discharges hydrating northern WCA-2A, being picked up by S7 which then supplies NE and NW WCA-3A North; continued flows via this route are recommended as long as feasible.

Continued inflows via the S-150 seem to be having a positive result on stages in northeastern WCA-3A as seen from the air and in recent modeling results. If conditions allow, continued flow through S-150 is recommended due to its potentially having great ecological benefit by slowing recessions near the Alley North colony and the 7,000 White Ibis nesting there. If conditions allow operational discharges into both the western and the eastern WCA-3A water control structures, this operation has greater benefit than discharges to the west alone. 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	0.16	-0.12
WCA-2A	0.66	-0.12
WCA-2B	0.64	-0.13
WCA-3A	0.29	-0.15
WCA-3B	0.60	-0.05
ENP	0.40	-0.07

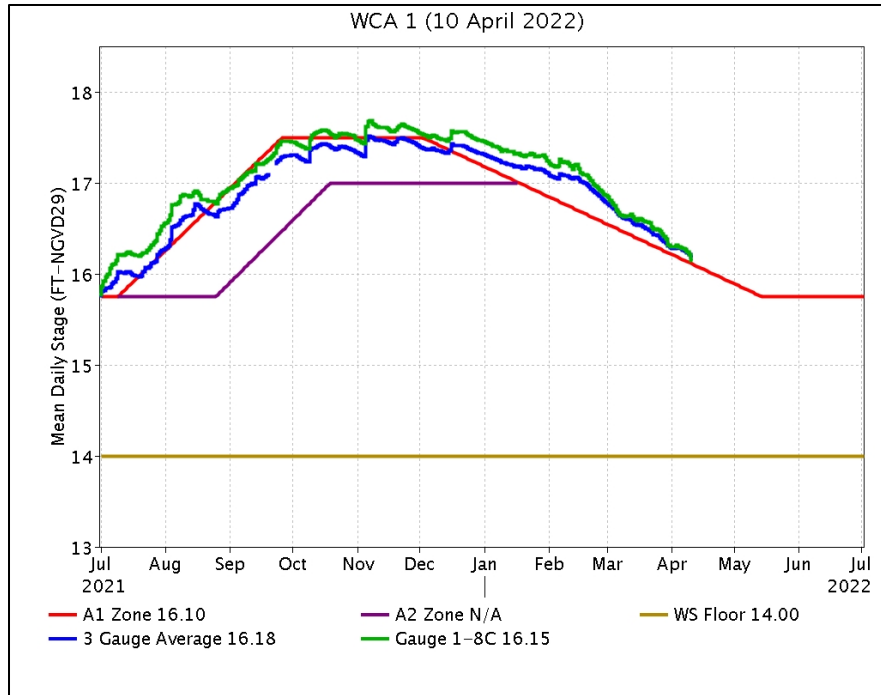


Figure EV-1. WCA-1 stage hydrographs and regulation schedule.

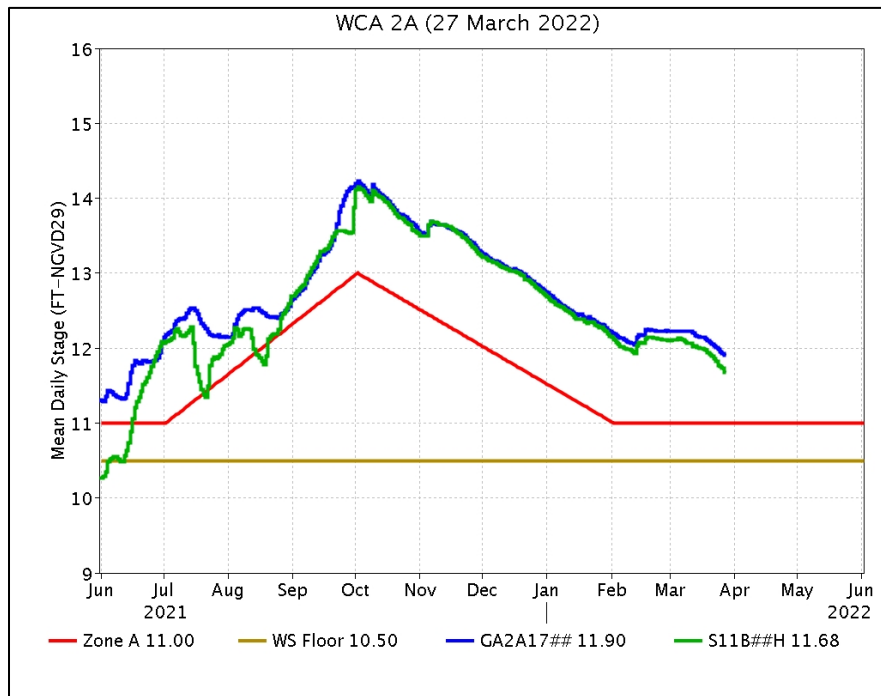


Figure EV-2. WCA-2A stage hydrographs and regulation schedule.

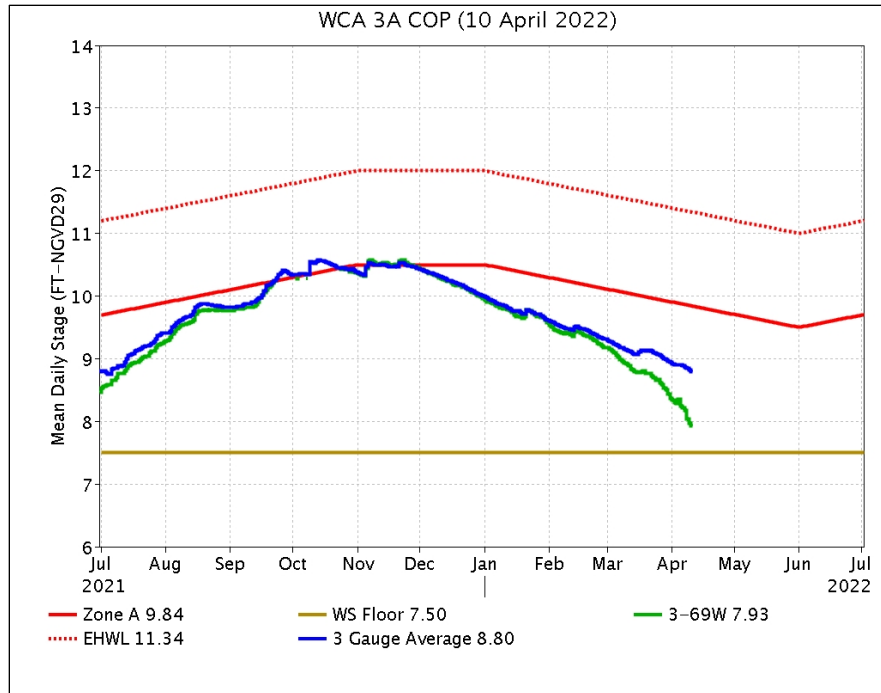


Figure EV-3. WCA-3A stage hydrographs (three-gauge average, S-333 headwater) and regulation schedule.

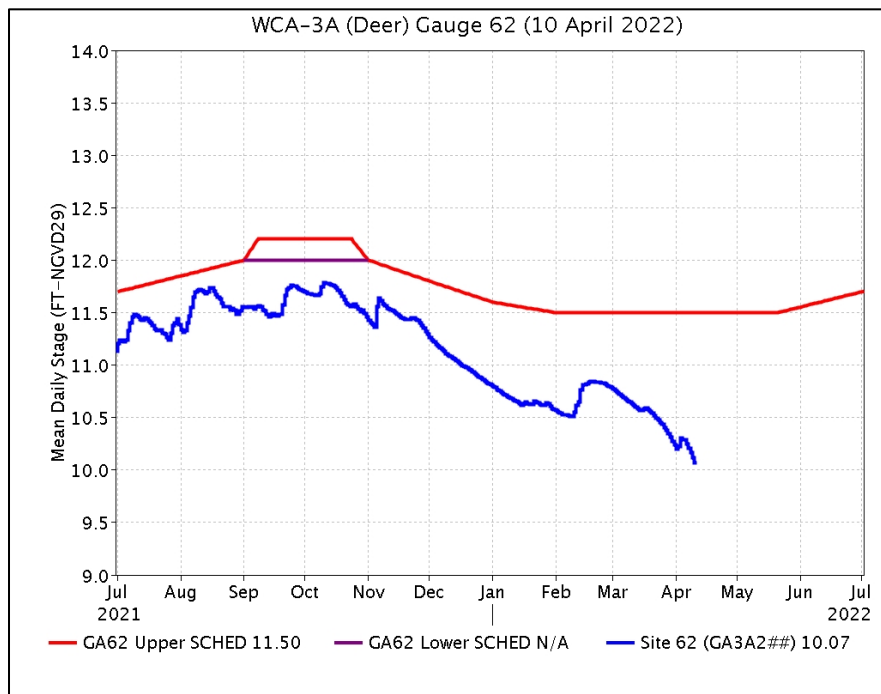


Figure EV-4. WCA-3A stage hydrograph (Deer gauge; Site 62) and CA62 regulation schedule.

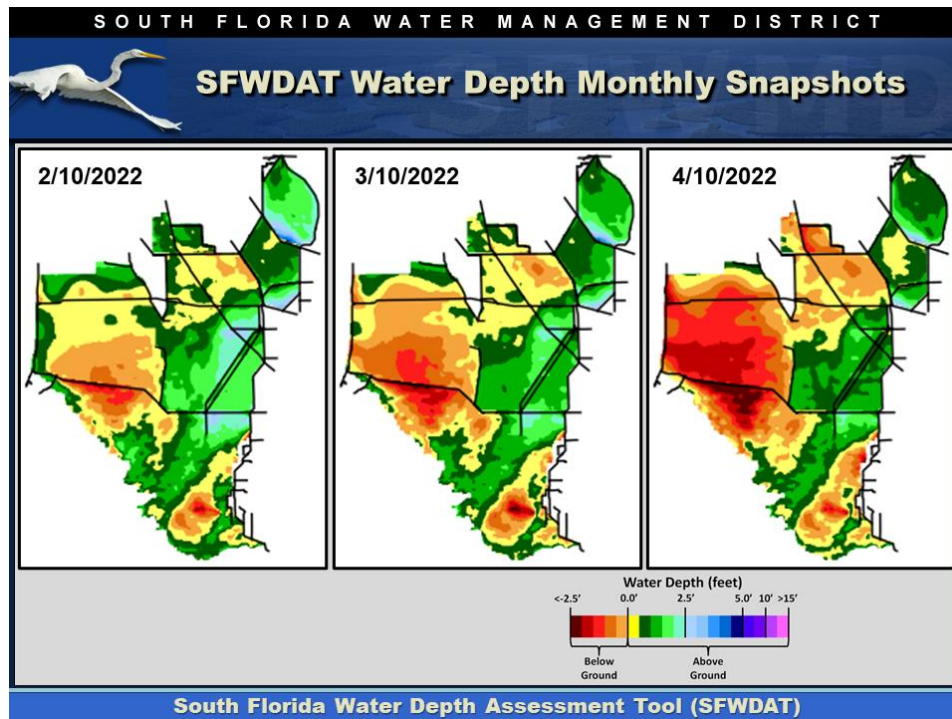


Figure EV-5. Everglades water depths from two months ago (left), one month ago (center) and present (right), based on SFWDAT.

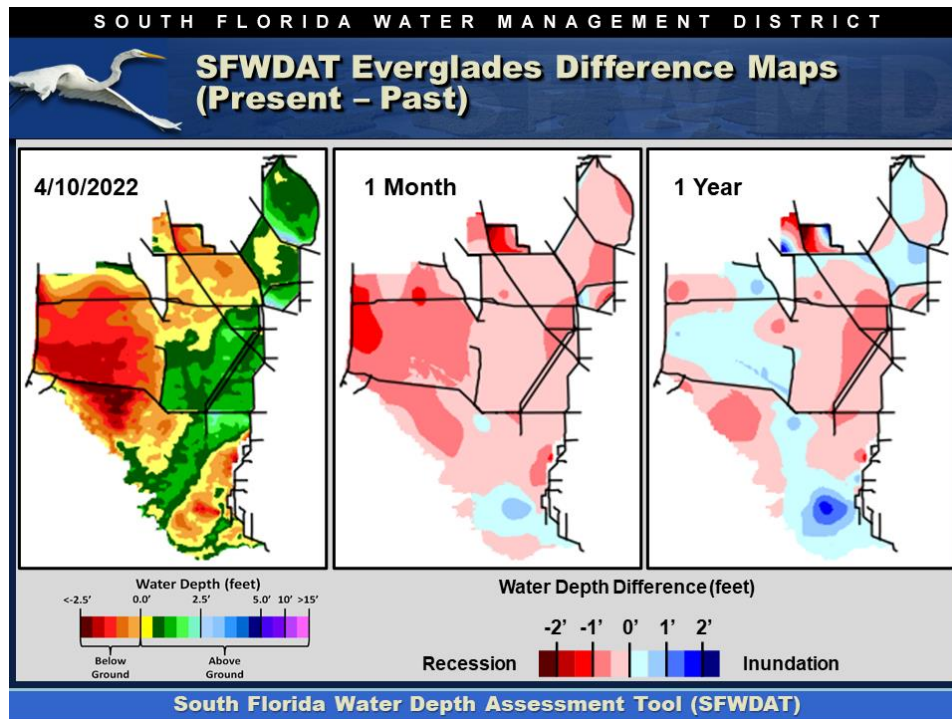


Figure EV-6. Present Everglades water depths (left) and water depth changes from one month (center) and one year (right) ago, based on SFWDAT.

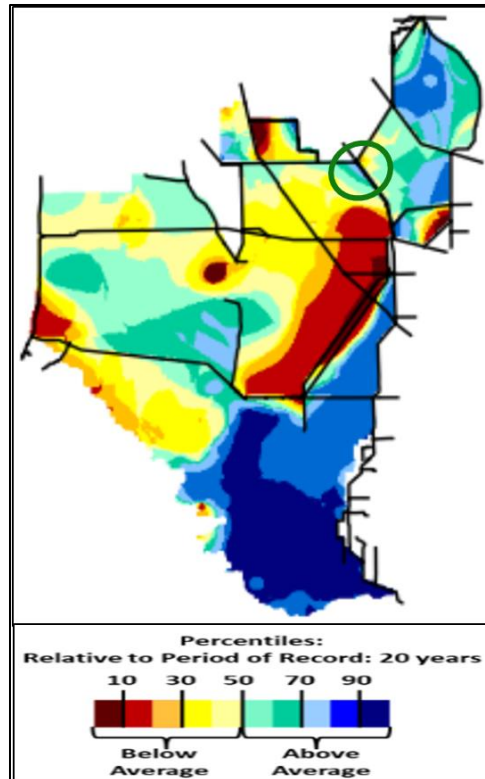


Figure EV-7. Present water depths (4/10/2022) compared to the day of year median over the previous 20 years.

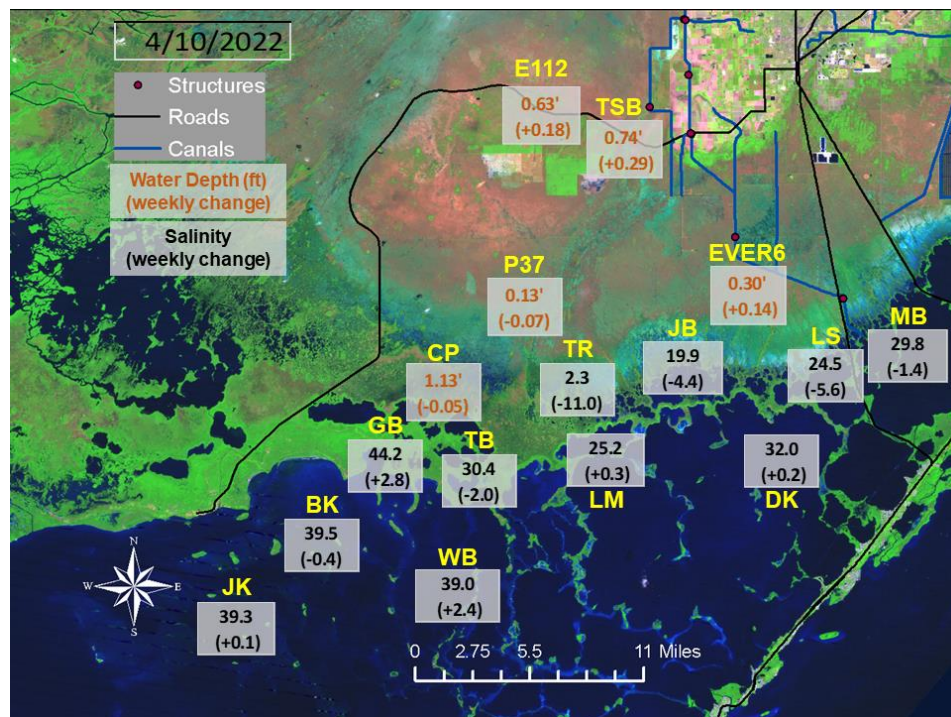


Figure EV-8. Taylor Slough water depths with changes since a week ago and Florida Bay salinities with changes since a week ago.

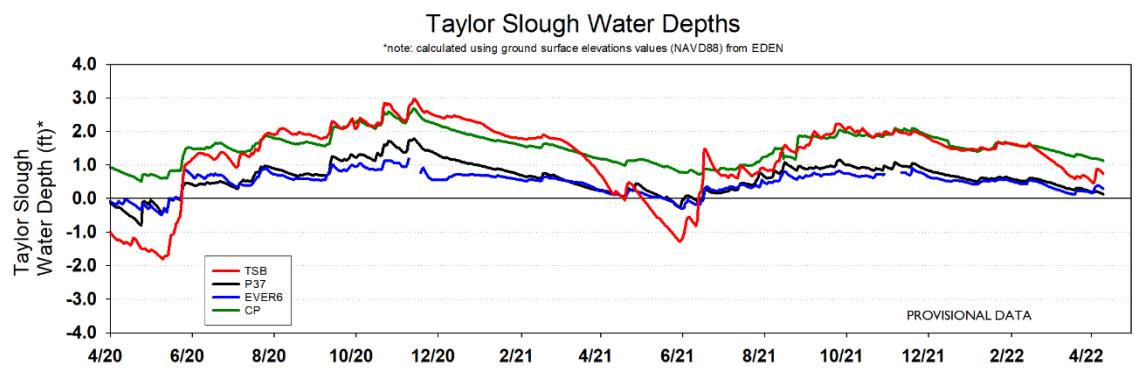


Figure EV-9. Taylor Slough water depth time series.

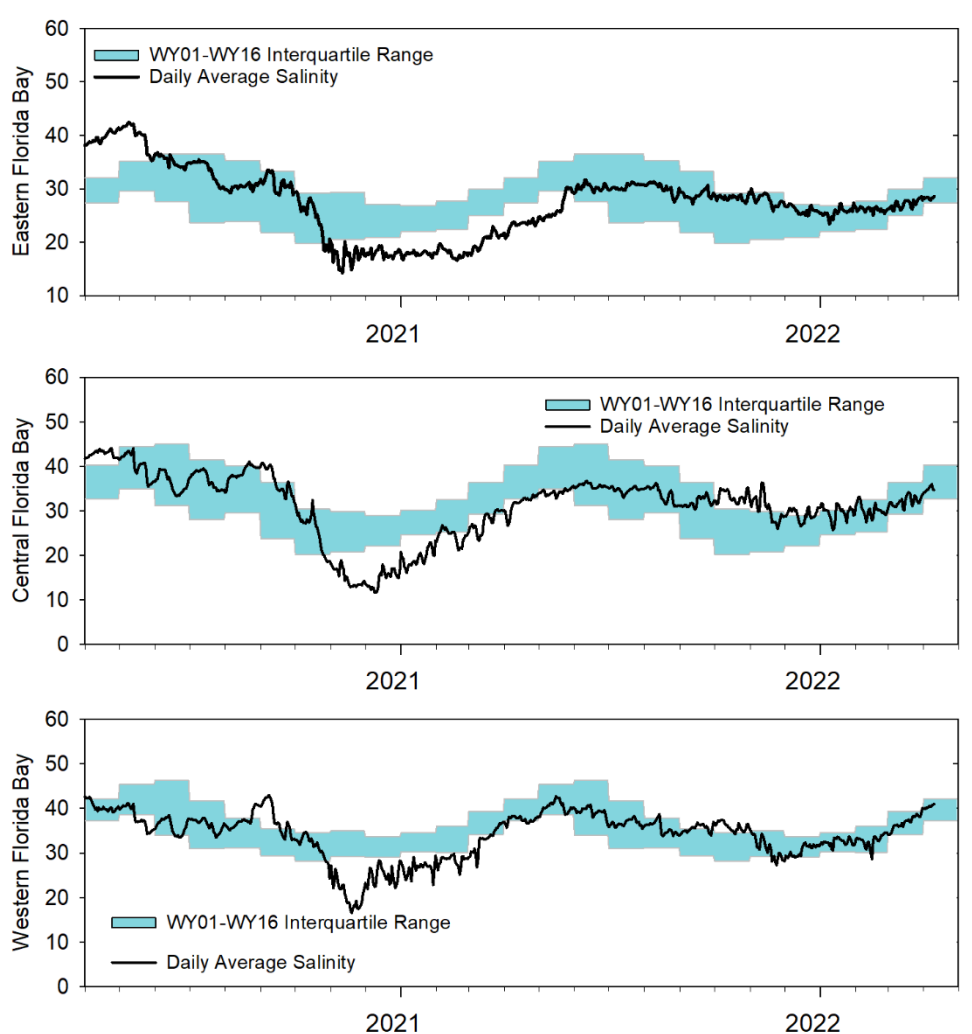


Figure EV-10. Eastern (top panel), Central (middle panel) and Western (bottom panel) Florida Bay daily average salinities with interquartile (25-75 percentile) ranges.

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

SFWMD Everglades Ecological Recommendations, April 12, 2022 (red is new)			
Area	Weekly change	Recommendation	Reasons
WCA-1	Stage decreased by 0.12'	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 90 th percentile.
WCA-2A	Stage decreased by 0.12'	Conserve water in this basin letting the water move south when conditions allow, with northern WCA-3A as the priority for receiving discharge. Maintain 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 0.13'	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 0.11'	Conserve water in this basin, while letting the water move south when conditions allow. Returning to 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 0.25'	Conserve water in this basin letting the water move south when conditions allow. Returning a recession rate less than 0.10 feet per week has an ecological benefit.	
Central WCA-3A S	Stage decreased by 0.11'	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 0.13'		
WCA-3B	Stage decreased by 0.05'	Maintaining a recession rate of around 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 0.07'	Make discharges to ENP according to COP and TTFF protocol while adaptively considering upstream and downstream ecological conditions.	Protect within basin and upstream habitat and wildlife.
Taylor Slough	Stage changes ranged from -0.07' to +0.29'	Move water southward as possible.	When available, provide freshwater buffer for downstream conditions.
FB- Salinity	Salinity changes ranged -5.6 to +2.8	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 294 cfs and the previous 30-day mean inflow was 278 cfs. The seven-day mean salinity was 26.8 at BBCW8 and 32.9 at BBCW10, both below the preferred maximum salinity of 35 for these sites. Data provided by Biscayne National Park.

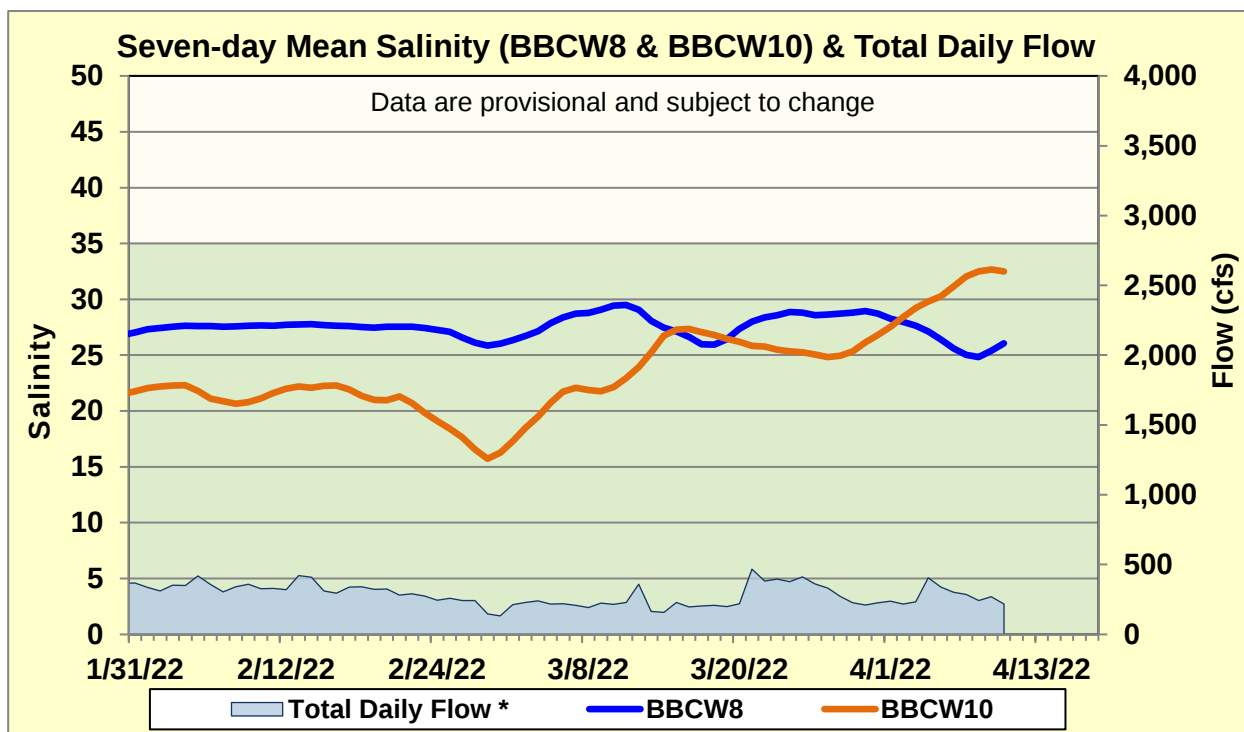


Figure BB-1. Seven-day mean salinity at BBCW8 and BBCW10 and total daily flow in Biscayne Bay. Total daily flow was calculated using flow from structures S20G, S20F, S21, S21A, S123, and S700P.