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: June 8, 2022

SUBJECT: Weekly Environmental Conditions for Systems Operations

Summary

Weather Conditions and Forecast

The moisture associated with the tropical wave will be exiting to the west on Wednesday, but an upper-air disturbance is forecast to drift southward and will cut off over southern Florida, enhancing instability across the area. The result should be enhanced rains mainly around Lake Okeechobee southward with westerly steering winds favoring the greatest rains over the interior and the east. When the upper-air trough shifts southeastward on Thursday, total District rains should be below the daily climatological average. Thursday afternoon and evening rains will be in the southern interior and east coast of Florida. Widespread coverage of rainfall on Friday and Saturday are expected, with the heavier rains focused over the northern two-thirds of the area. A very wet Sunday over the northeastern half to two-thirds of the area is possible, with the potential for significant rainfall on a broad scale north and east of Lake Okeechobee. Either Saturday or Sunday could be significant SFWMD rain events, with total rainfall of half an inch or greater. A large decrease of total SFWMD rainfall is likely early next week. Strong mid-level high pressure building across the southern United States around this time will begin to extend eastward toward Florida, likely dominating the week-2 period and resulting in below or much below normal total SFWMD rainfall. For current week-long period ending next Tuesday morning, total SFWMD rainfall is predicted to be near to above normal, with the greatest rains the interior and the east.

Kissimmee

Flow at S-59 and S-61 is being adjusted to allow stage to rise slowly in East Toho and Toho, respectively. Flow at S-65/S-65A has been reduced to the minimum for the Kissimmee River to slow the stage decline in KCH. Water depth on the Kissimmee River floodplain has decreased, with a mean depth of 0.29 feet as of June 5, 2022. With the S-65/S-65A discharge reductions, the concentration of dissolved oxygen in the Kissimmee River has continued to rise, with an average of 7.1 mg/L for the week ending on June 5, 2022.

Lake Okeechobee

Lake Okeechobee stage was 12.75 feet NGVD on June 5, 2022, with water levels 0.20 feet lower than a month ago (**Figure LO-1**). Lake stage was in the Base Flow sub-band (**Figure LO-2**) and has been within the ecological envelope for 22 weeks (**Figure LO-3**). Average daily inflows (excluding rainfall) decreased from the previous week, going from 789 cfs to 587 cfs. Average daily outflows (excluding evapotranspiration) decreased, going from 1,944 cfs to 103 cfs. The most recent satellite image (June 5, 2022) from the NOAA cyanobacteria monitoring product derived from EUMETSAT's Sentinel 3 OLCI sensor showed that bloom potential remains highest in Fisheating Bay (western part of the Lake) and the northwestern part of the Lake. The bloom potential was medium to high in northern region (Figure LO-6). Late-May 2022 snail kite nest monitoring on the Lake revealed 44 nests, 14 of which were successful, 1 was still active, and 29 were failures. The May 26, 2022 wading bird survey revealed 8 flocks with 5735 actively foraging wading birds on the Lake, 75% of which were in Moonshine Bay.

Estuaries

Total inflow to the St. Lucie Estuary averaged 1,022 cfs over the past week with no flow coming from Lake Okeechobee. Mean salinities decreased at all sites in the estuary over the past week. Salinity in the middle estuary was just within the optimal range (10-25) for adult eastern oysters.

Total inflow to the Caloosahatchee Estuary averaged 2,722 cfs over the past week with 54 cfs coming from Lake Okeechobee. Mean salinities decreased at all sites in the estuary over the past week. Salinities were in the optimal range (0-10) for tape grass in the upper estuary. Salinities were in the optimal range (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, June 6, 2022, no Lake Okeechobee water was delivered to the FEBs/STAs. The total amount of Lake releases sent to the FEBs/STAs in WY2023 (since May 1, 2022) is approximately 12,400 ac-feet. The total amount of inflows to the STAs in WY2023 is approximately 98,000 ac-feet. Most STA cells are above target stage, except STA-5/6 cells that are drying out. STA-1E Western Flow-way is offline for post-construction vegetation grow in. 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 effect in STA-1E Central and Eastern Flow-ways, STA-1W Eastern, Western, and Northern Flow-ways, and STA-2 Flow-ways 3 and 4 for vegetation management activities, as well as STA-2 Flow-way 1 following dryout conditions. This week, there is no capacity for Lake releases in the STAs.

Everglades

Wet season conditions now dominate, and most regions of the Everglades experienced a rapid ascension last week. The very dry conditions WCA-3A prior to the rain probably limited the aquatic prey production for next season. Wading bird nesting numbers were moderate to low in the WCAs this year also due to dry conditions, and nesting success is expected to be lower than average. CSSS subpopulation regions are no longer within the 40% dry target, but consecutive dry nesting days continued to accumulate, which is important for providing sparrows an opportunity to hatch multiple broods per season. Stages increased in Taylor slough last week and remain above average. Salinities decreased on average in Florida Bay last week especially in the western bay and fell below average. Conditions remain ideal to move water south as rains continue.

Biscayne Bay

Total inflow to Biscayne Bay averaged 2,903 cfs, and the previous 30-day mean inflow averaged 841 cfs. The seven-day mean salinity was 29.1 at BBCW8 and 24.3 at BBCW10, both below the maximum salinity of 35 for these sites. Salinity data are provided as a courtesy by Biscayne National Park.

Supporting Information

Kissimmee Basin

Upper Kissimmee

On June 5, 2022, lake stages were 55.0 feet NGVD (1.5 feet below schedule) in East Lake Toho, 52.1 feet NGVD (1.4 feet below schedule) in Lake Toho, and 48.6 feet NGVD (2.4 feet below schedule) in Lakes Kissimmee-Cypress-Hatchineha (KCH) (**Table KB-1**, **Figures KB-1-3**).

Lower Kissimmee

Discharges to the Kissimmee River on June 5, 2022 were 300 cfs at S-65 and 290 cfs at S-65A; discharges from the Kissimmee River were 400 cfs at S-65D and 340 cfs at S-65E (**Table KB-2**). Headwater stages were 46.3 feet NGVD at S-65A and 27.0 feet NGVD at S-65D on June 5, 2022. With the S-65/S-65A discharge reductions, the concentration of dissolved oxygen in the Kissimmee River has continued to rise, with an average of 7.1 mg/L for the week ending on June 5, 2022 (**Table KB-2**, **Figure KB-5**). Kissimmee River mean stage has continued to decline (**Figure KB-5)** and water depth on the Kissimmee River floodplain has decreased with a mean depth of 0.29 feet as of June 5, 2022 (**Figure KB-6**).

Water Management Recommendations

When possible, limit stage ascension rates in Lakes East Toho, Toho and KCH to a preferred maximum of 0.5 ft/14 days. Continue at least minimum flow (~300 cfs) at 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)	
							6/5/22	*5/29/22*
Lakes Hart and Mary Jane	S-62	LKMJ	0	59.4	R	60.0	-0.6	-0.1
Lakes Myrtle, Preston and Joel	S-57	S-57	0	60.0	R	61.0	-1.0	-0.1
Alligator Chain	S-60	ALLI	16	62.0	R	63.2	-1.2	0.0
Lake Gentry	S-63	LKGT	23	59.4	R	61.0	-1.6	0.0
East Lake Toho	S-59	TOHOE	28	55.0	R	56.5	-1.5	-0.1
Lake Toho	S-61	TOHOW S-61	25	52.1	R	53.5	-1.4	-0.1
Lakes Kissimmee, Cypress and Hatchineha	S-65	KUB011 LKIS5B	344	48.6	R	51.0	-2.4	-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.

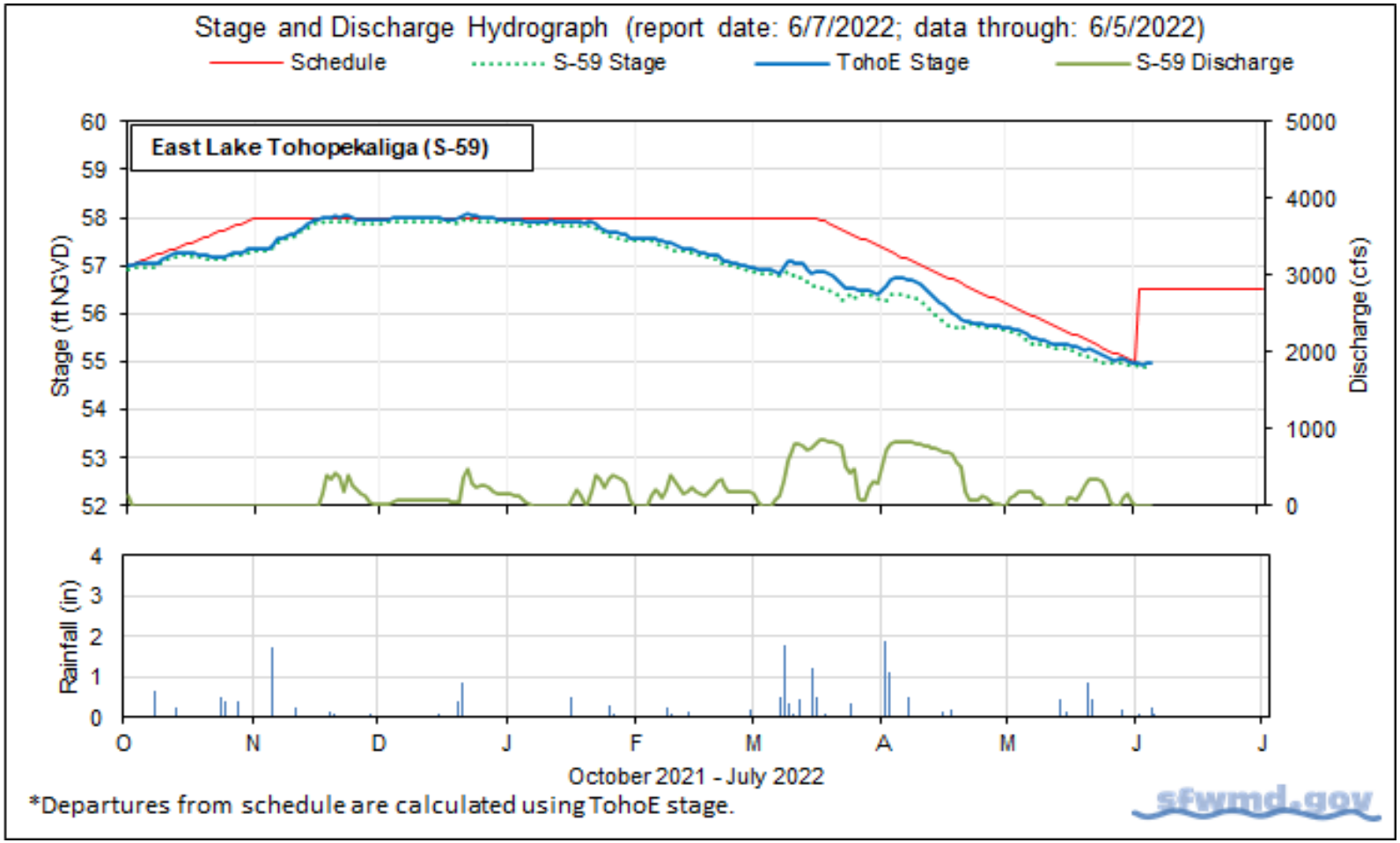


Figure KB-1. East Lake Toho regulation schedule, stage, discharge and rainfall.

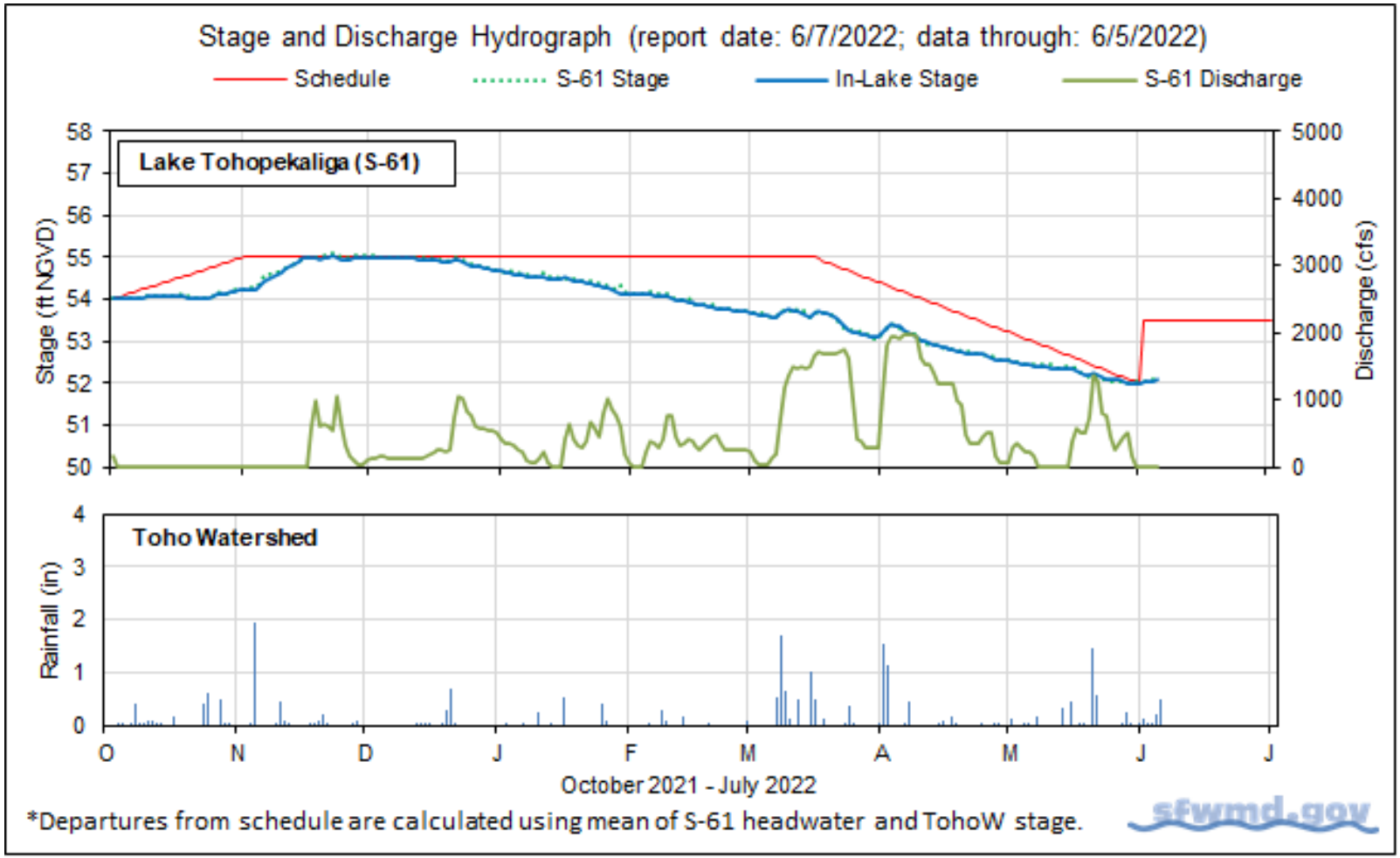


Figure KB-2. Lake Toho regulation schedule, stage, discharge and rainfall.

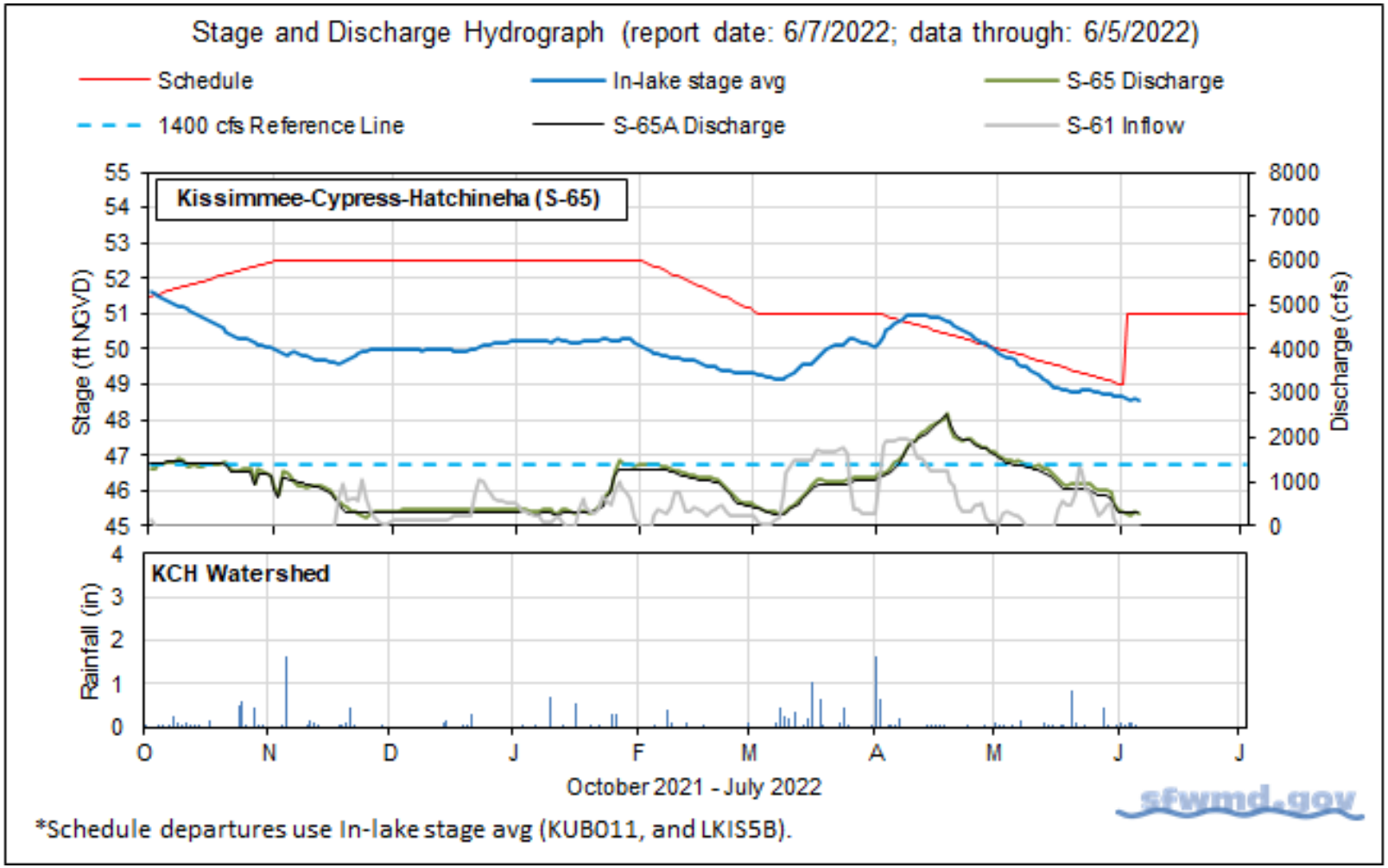


Figure KB-3. Lakes Kissimmee, Cypress and Hatchineha regulation schedule, stage, discharge and rainfall.

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			
		6/5/22	6/5/22	5/29/22	5/22/22	5/15/22
Discharge	S-65	300	340	850	970	1,300
Discharge	S-65A[a]	290	310	730	850	1,200
Headwater Stage (feet NGVD)	S-65A	46.3	46.3	46.3	46.2	46.2
Discharge	S-65D[b]	400	480	870	1,240	1,540
Headwater Stage (feet NGVD)	S-65D[c]	27.0	26.8	26.8	26.9	27.1
Discharge (cfs)	S-65E[d]	340	420	770	1,100	1,360
Discharge (cfs)	S-67	0	0	0	0	0
Dissolved Oxygen (mg/L) [e]	Phase I, II/III river channel	7.4	7.1	6.7	5.6	4.9
Mean depth (feet) [f]	Phase I floodplain	0.29	0.26	0.33	0.48	0.68

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).

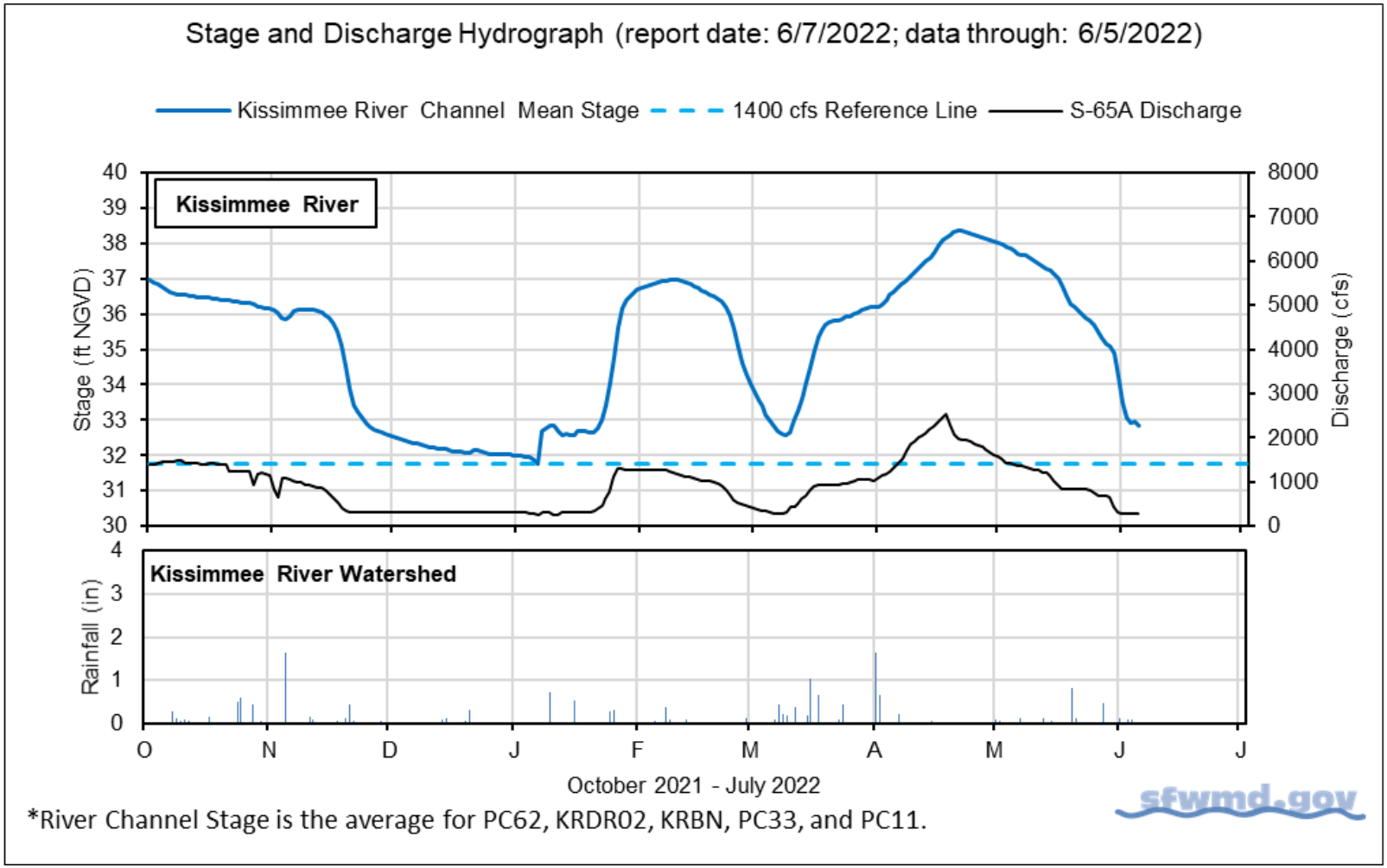


Figure KB-4. Kissimmee River stage, discharge and rainfall.

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

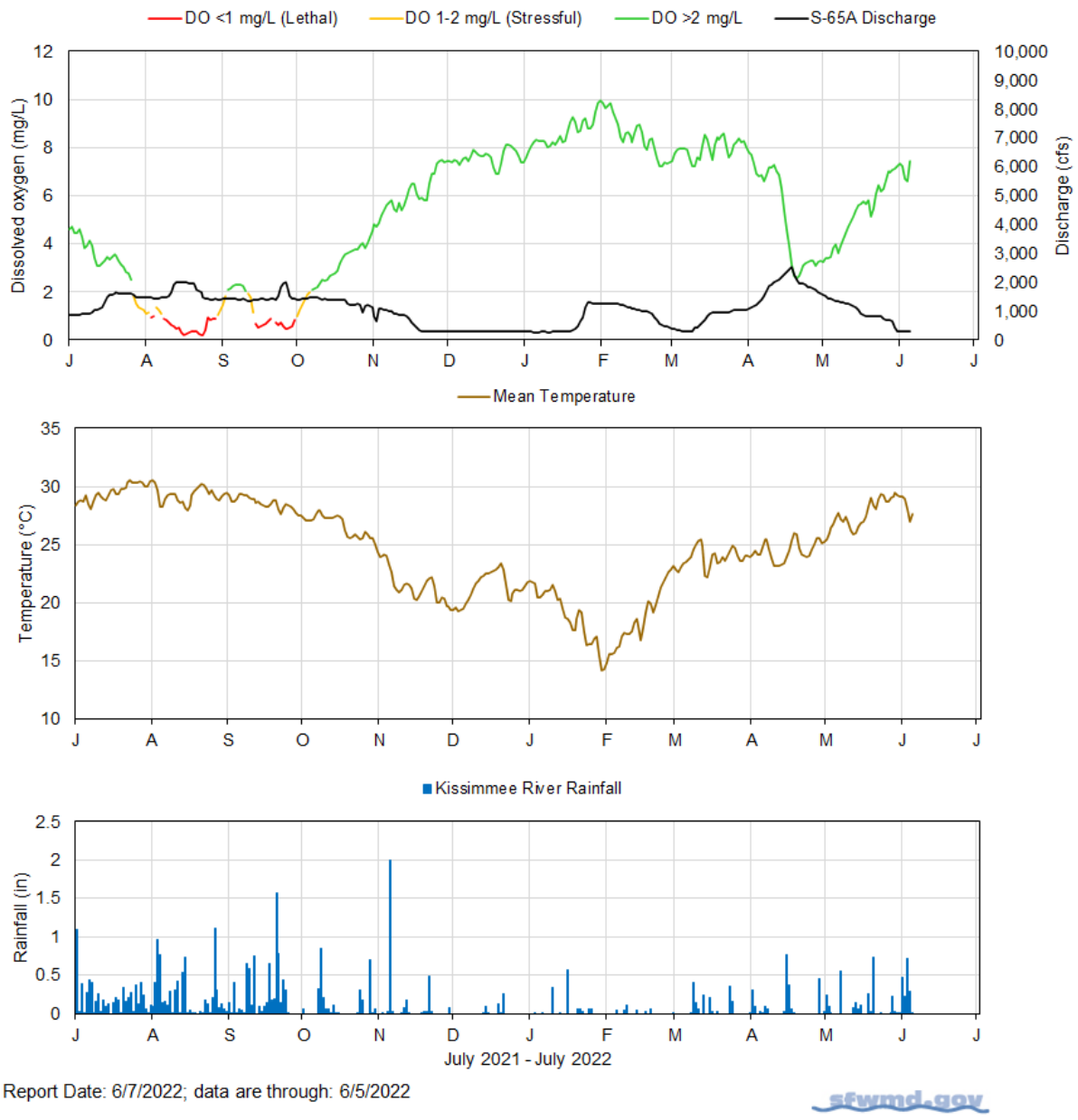


Figure KB-5. Restored Kissimmee river channel mean daily dissolved oxygen concentration (mg/L), S-65A discharge (cfs), temperature (°C) and rainfall (inches). Dissolved oxygen (DO) and temperature are mean daily values averaged for PC62, KRDR02, KRBN, PC33, PC11, PD62R, and PD42R with an average of five stations reporting this week. Rainfall values are daily totals for Kissimmee River (Pool BCD) AHED watershed.

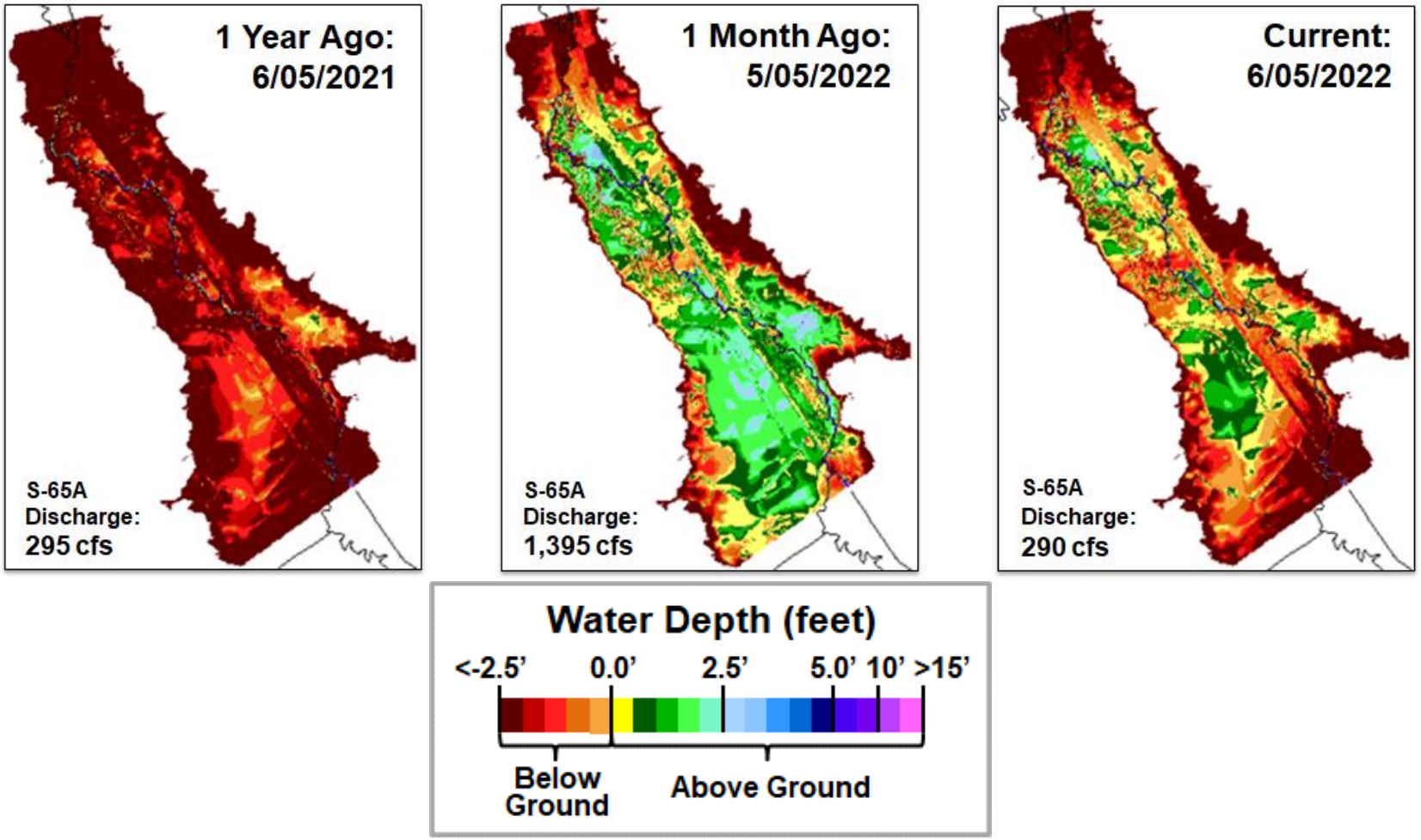


Figure KB-6. Phase I area Kissimmee River floodplain water depths (from left to right) one year ago, one month ago and current.

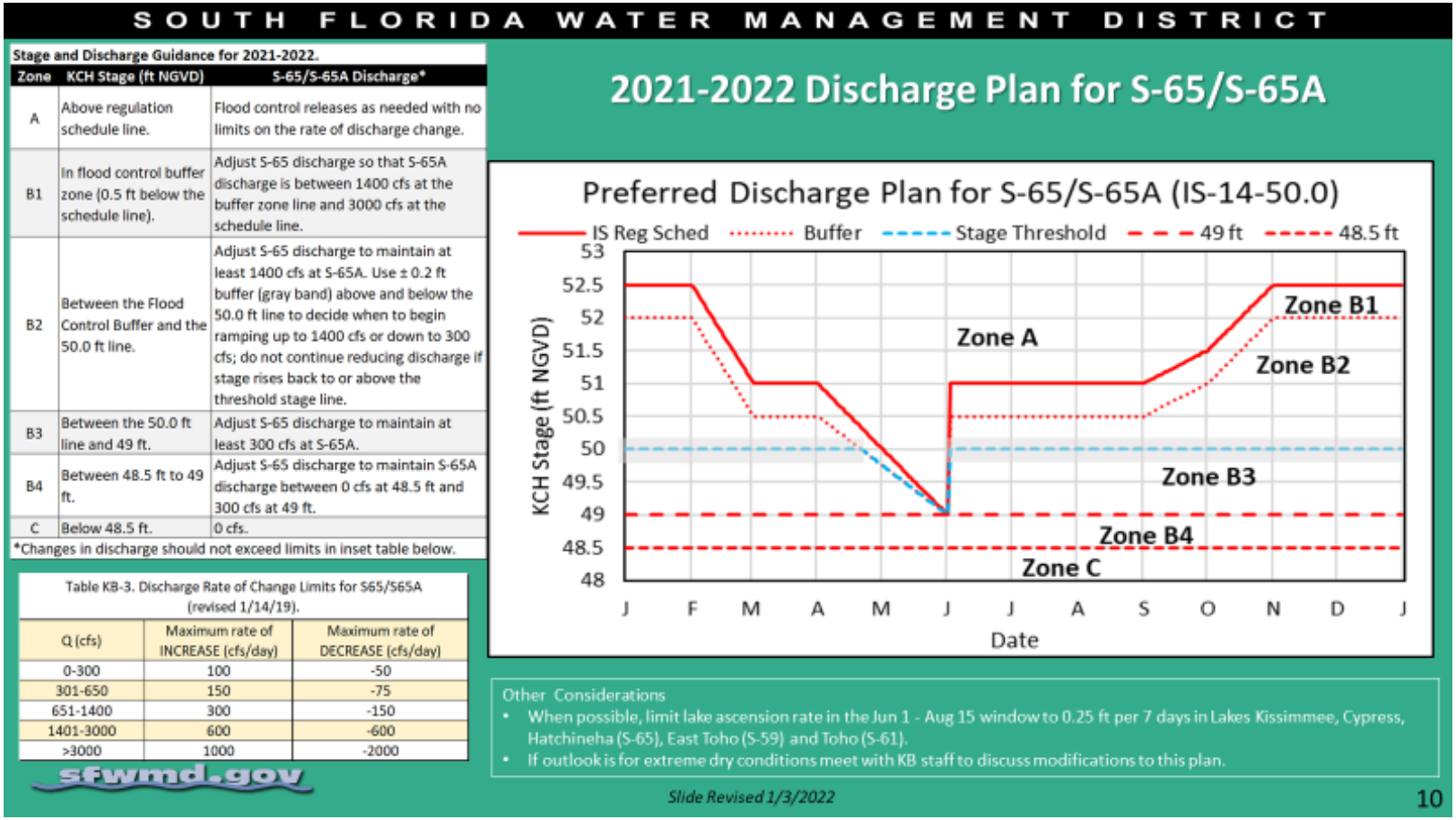


Figure KB-7. IS-14-50 Discharge Plan for S65/S65A with discharge rate of change limits (revised 1/14/19).

Lake Okeechobee

Lake Okeechobee stage was 12.75 feet NGVD on June 5, 2022, with water levels 0.20 feet lower than a month ago (**Figure LO-1**). Lake stage was in the Base Flow sub-band (**Figure LO-2**) and has been within the ecological envelope for 22 weeks (**Figure LO-3**). According to NEXRAD, 1.88 inches of rain fell directly on the Lake last week.

Average daily inflows (excluding rainfall) decreased from the previous week, going from 789 cfs to 587 cfs. Average daily outflows (excluding evapotranspiration) decreased, going from 1,944 cfs to 103 cfs. Highest inflows came from the Kissimmee River/C-38 Canal through the S-65E structure (421 cfs). The daily outflows to the east via the S-308 structure into the C-44 Canal averaged 50 cfs, and outflow to the west via the S-77 structure into the C-43 Canal was 54 cfs. There were no outflows south via the S-350 structures, and there was a back flow into the Lake from the L-8 Canal via S-271. **Figures LO-4 and LO-5** show the combined average daily inflows and outflows for the Lake over the past eight weeks, and average inflows and outflows last week, respectively. These data are provisional and are subject to change.

The most recent satellite image (June 5, 2022) from the NOAA cyanobacteria monitoring product derived from EUMETSAT's Sentinel 3 OLCI sensor showed that bloom potential remains highest in Fisheating Bay (western part of the Lake) and the northwestern part of the Lake. The bloom potential was medium to high in the northern region of the Lake, which was a slight decrease compared to the previous week (**Figure LO-6**).

The late-May 2022 snail kite nest monitoring on the Lake revealed 44 nests, 14 of which were successful, 1 was still active, and 29 were failures. The May 26, 2022 wading bird survey revealed 8 flocks with 5,735 actively foraging wading birds on the Lake, 75% of which were found in Moonshine Bay.

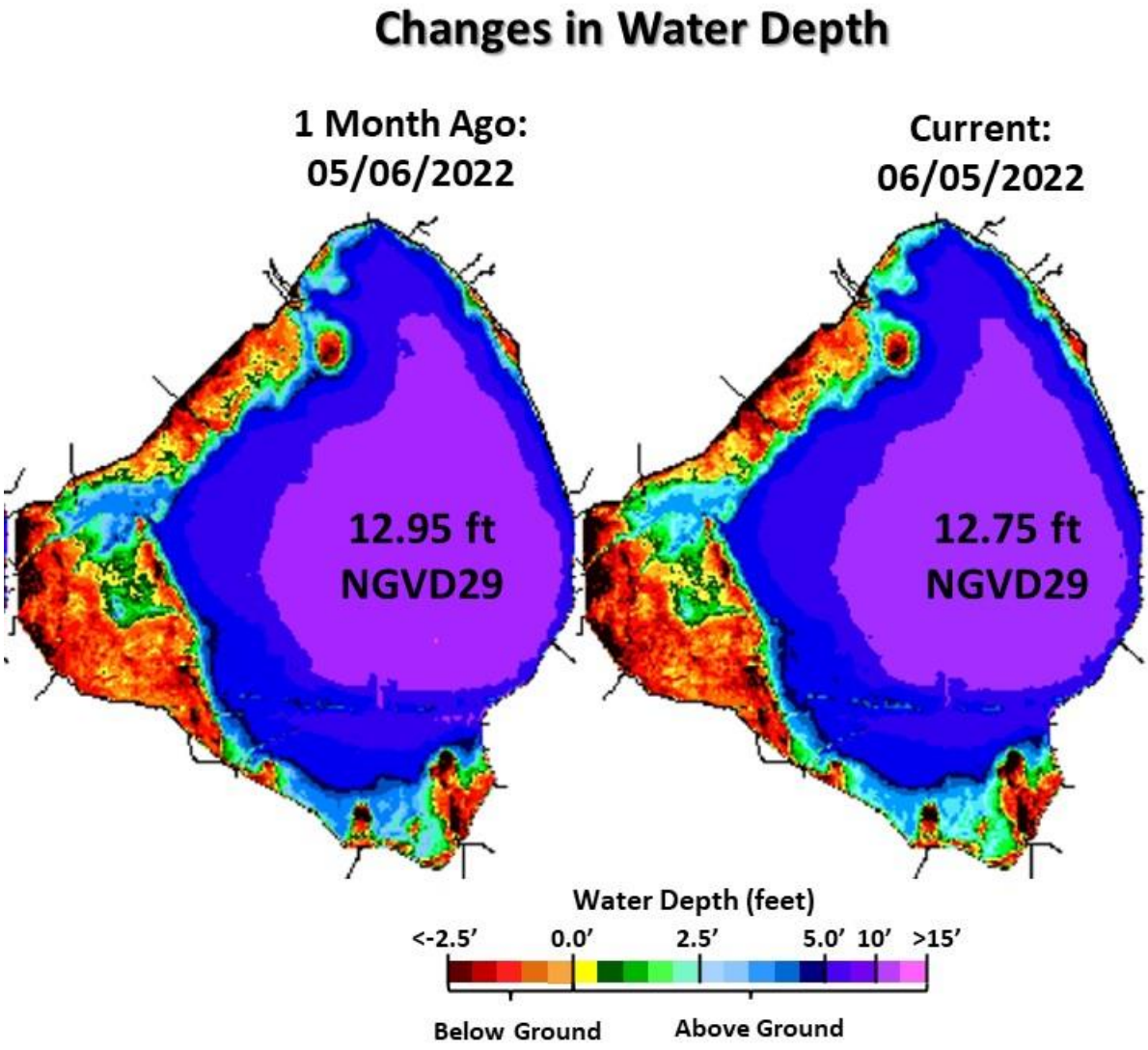


Figure LO-1. Lake Okeechobee water depth estimates based on South Florida Water Depth Assessment Tool (SFWDAT).

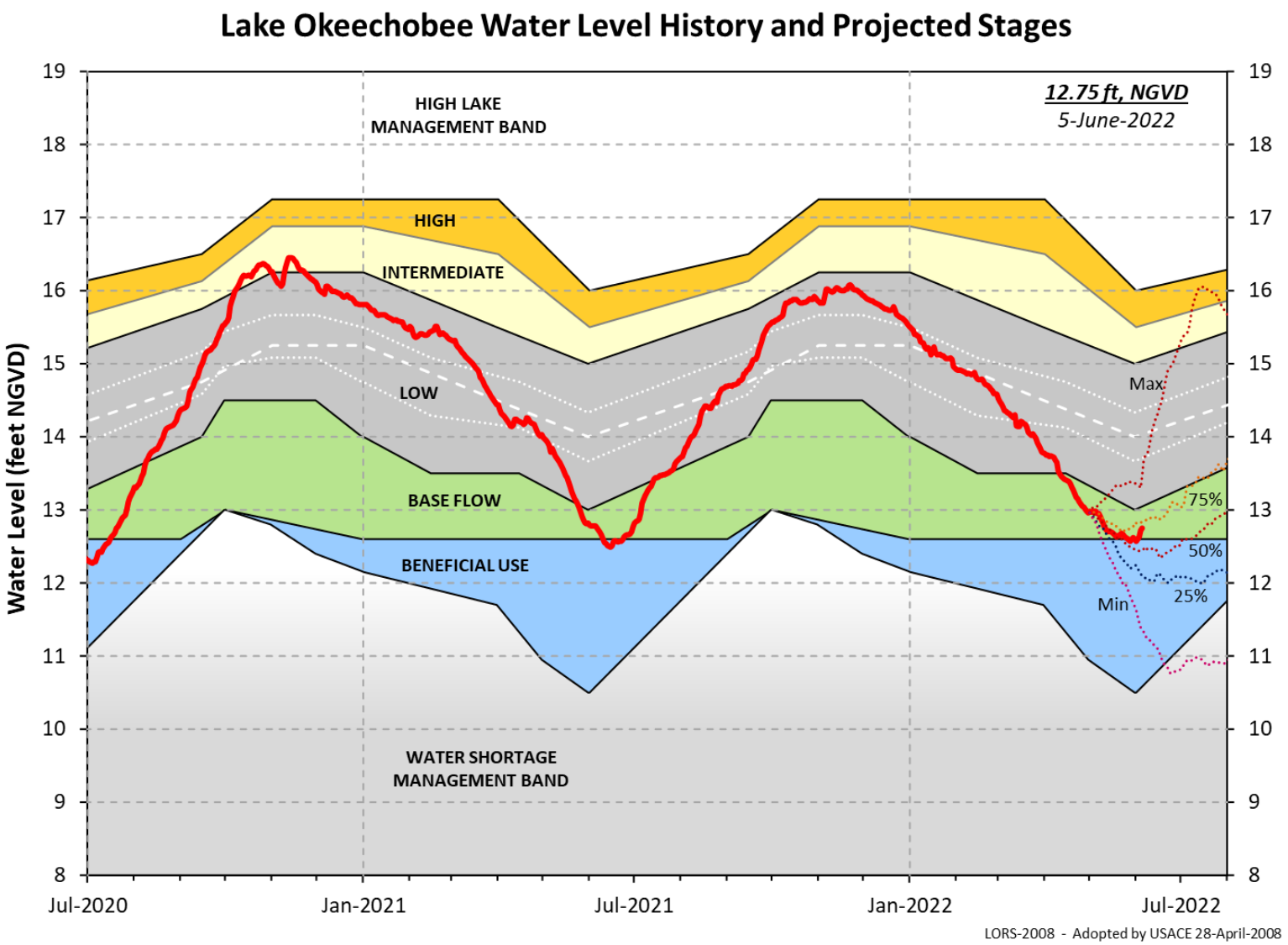


Figure LO-2. Recent Lake Okeechobee stages with projected stages based on a dynamic position analysis.

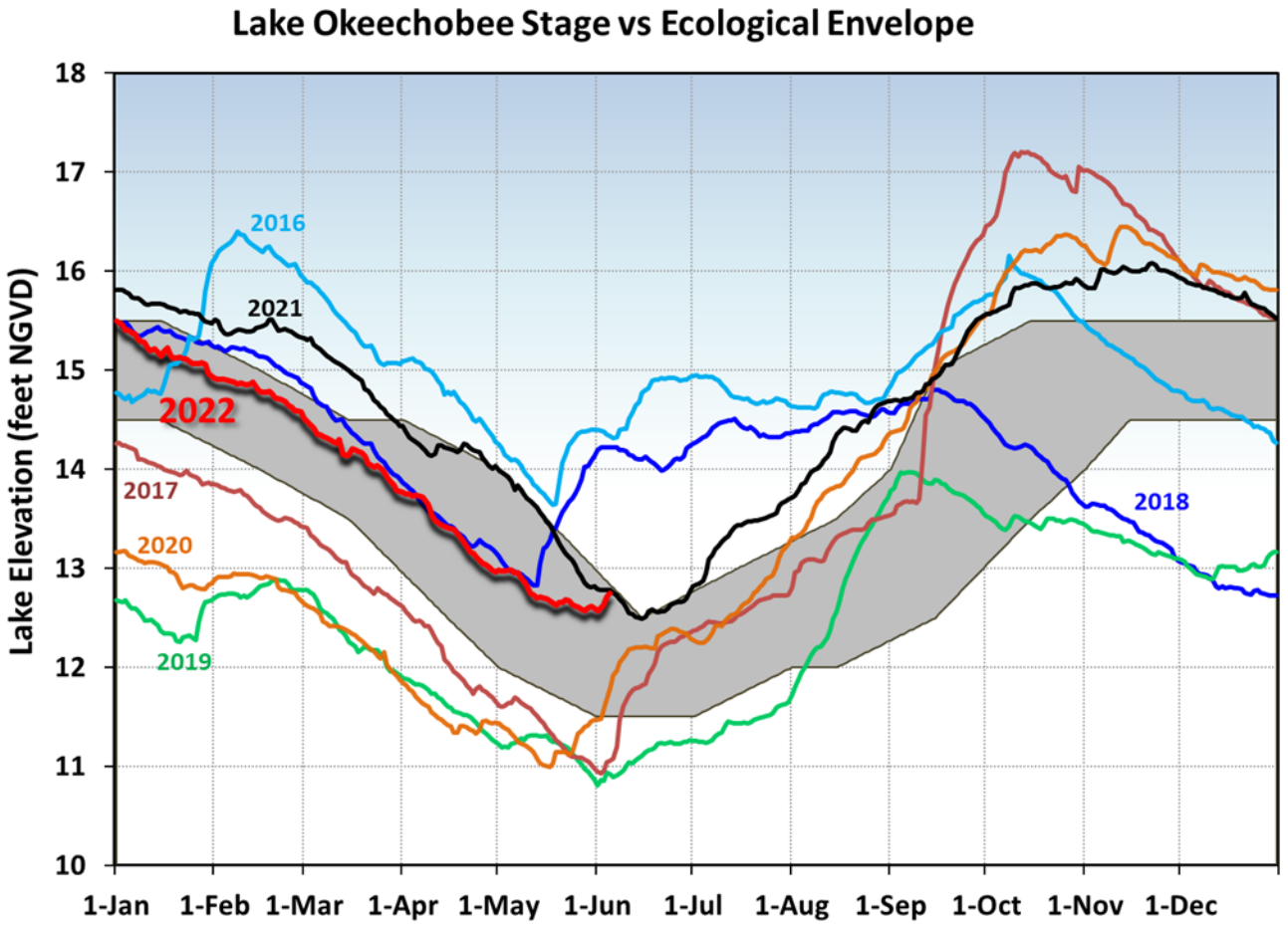


Figure LO-3. The prior six years of annual stage hydrographs for Lake Okeechobee in comparison to the ecological envelope.

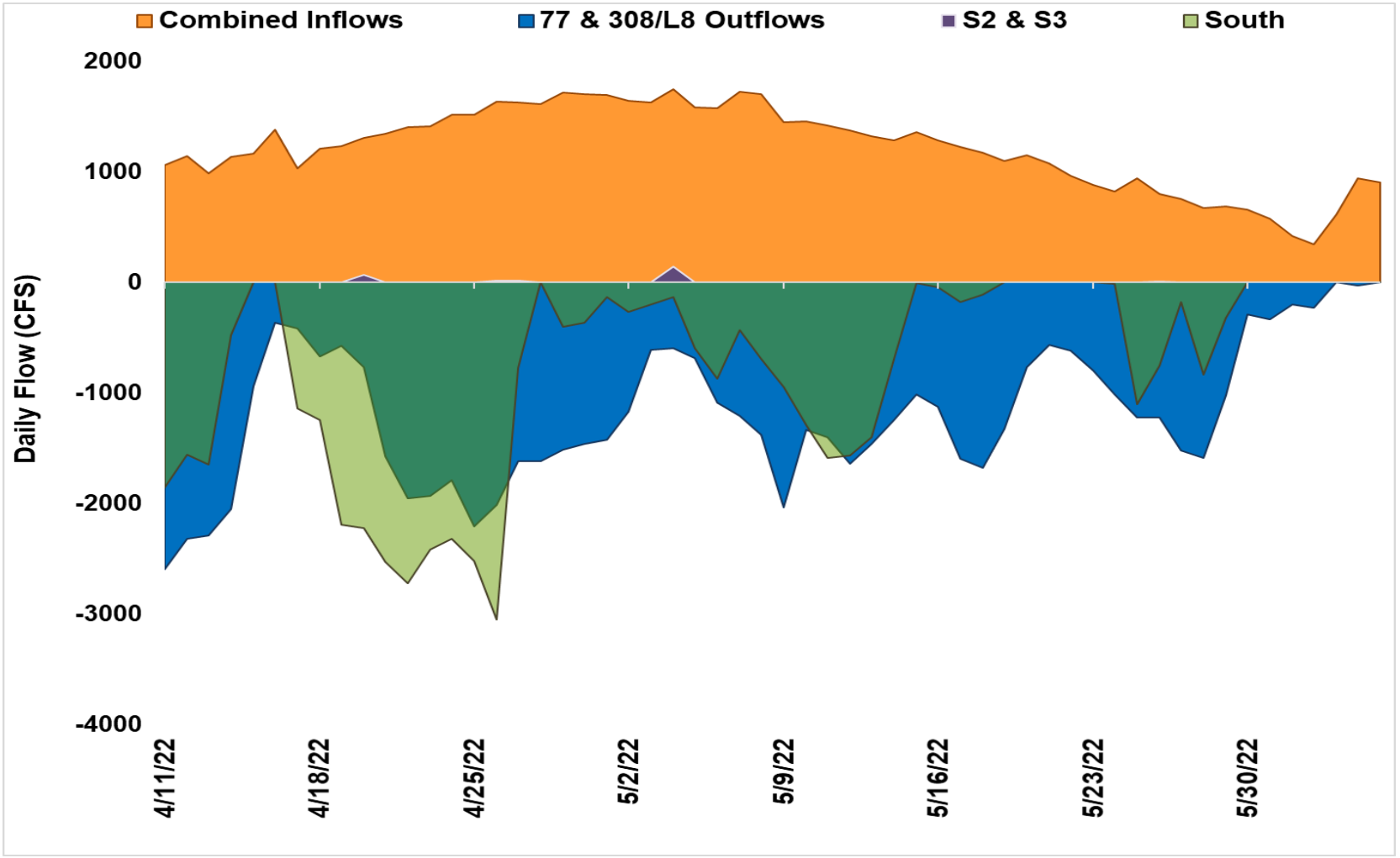


Figure LO-4. Major inflows (orange) to and outflows east and west (blue) from Lake Okeechobee. Outflows south are shown in green. Flows into Lake Okeechobee from the L-8 canal through S-271 (formerly Culvert 10A) or from the C-44 canal through the S-308 are included as inflows. Conversely, flows from 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. Flow calculation for the period between May 30 – June 5, 2022 are based on limited data points and should be interpreted with caution.

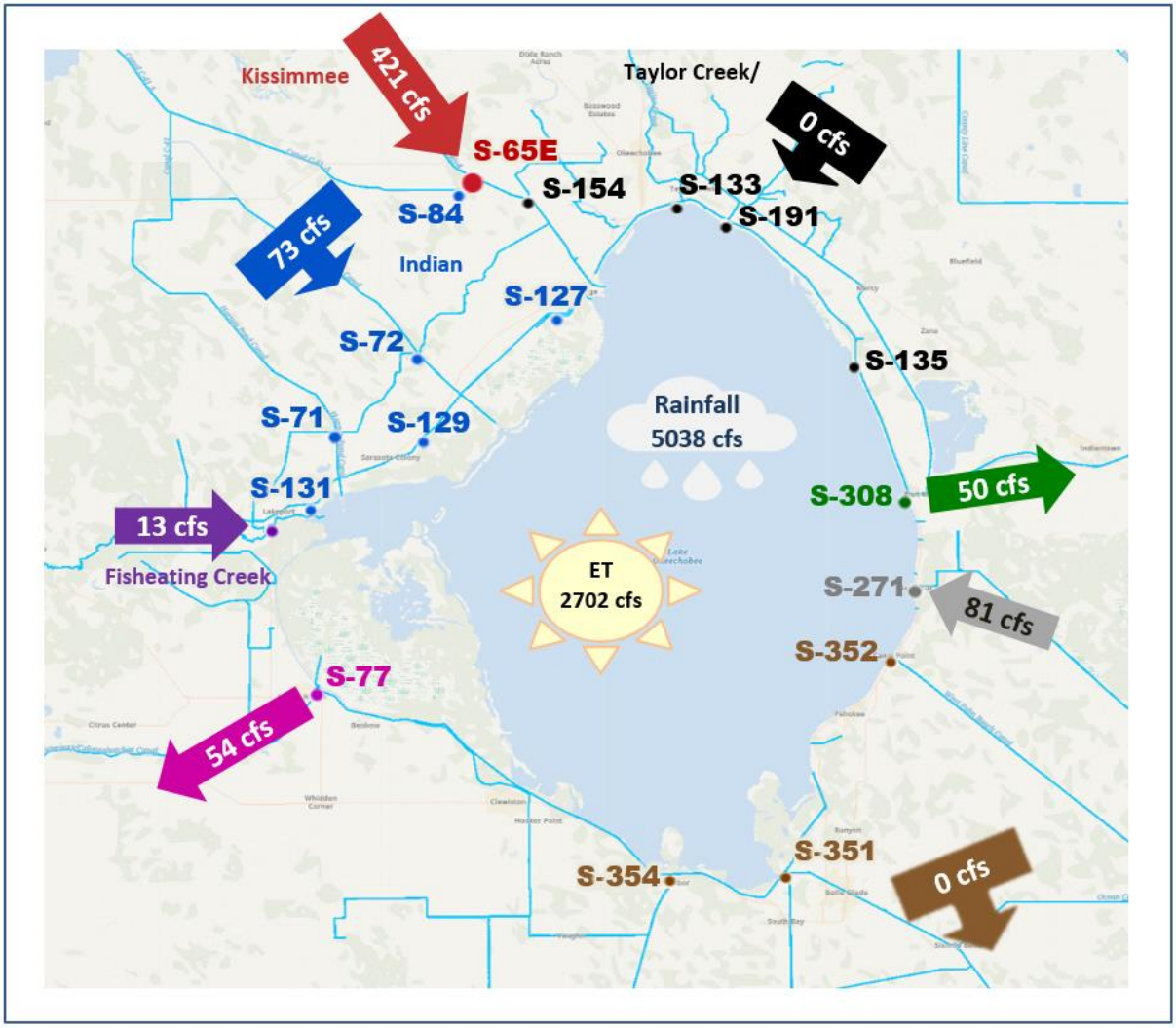


Figure LO-5. Inflows into Lake Okeechobee from Indian Prairie basins, Taylor Creek/Nubbin Slough, Kissimmee River and Fisheating Creek, and outflows to the west via S-77, to the east via S-308, to the south via S-351, S-352, S-354, and to southeast via S-271 (formerly Culvert 10A) for the week of May 30 – June 5, 2022.

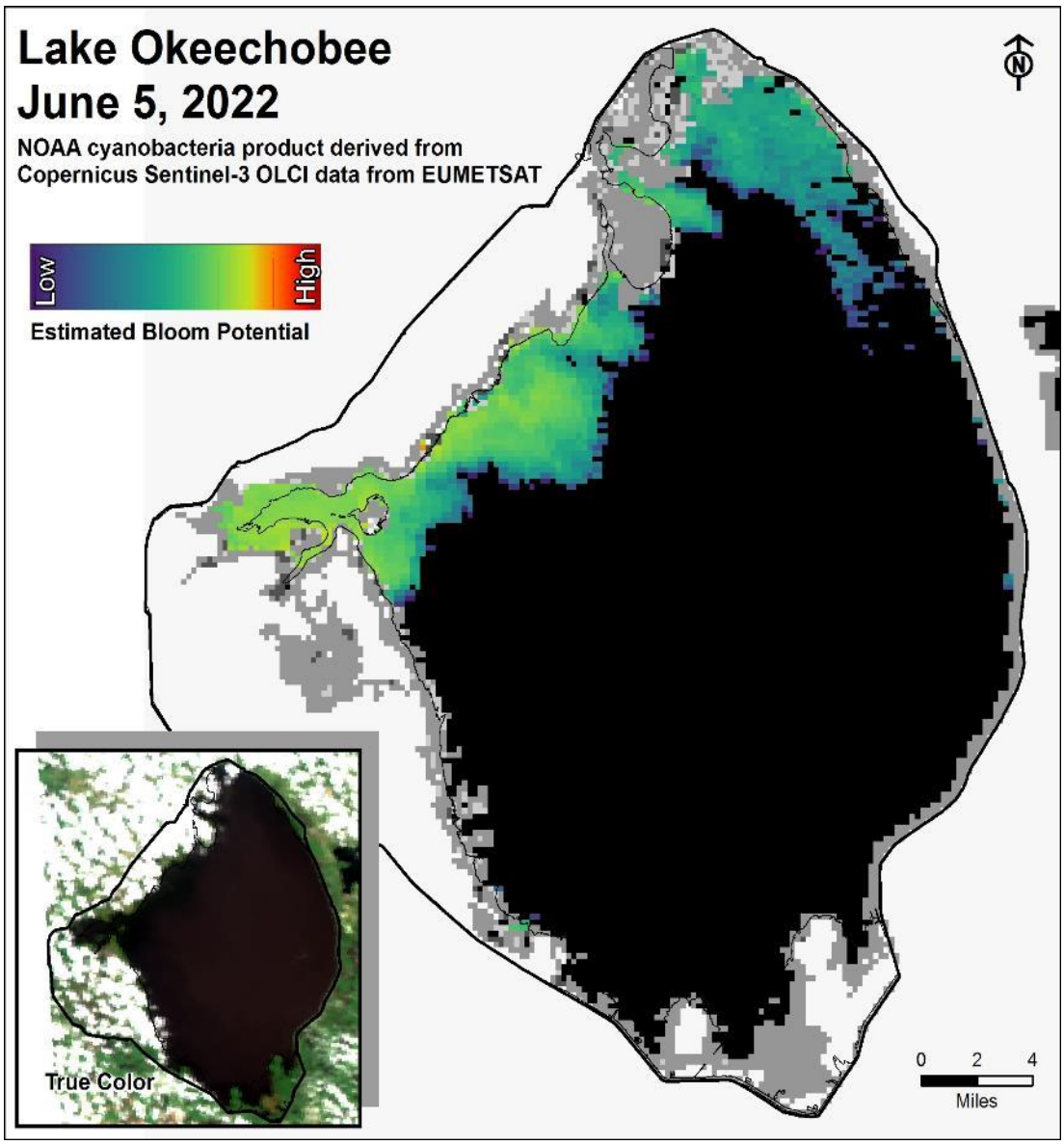


Figure LO-6. Cyanobacteria bloom potential on June 5, 2022 based on NOAA's harmful algal bloom monitoring system. Gray color indicates cloud cover.

Estuaries

St. Lucie Estuary

Over the past week, mean total inflow to the St. Lucie Estuary was 1,022 cfs (**Figures ES-1** and **ES-2**), and the previous 30-day mean inflow was 472 cfs. For comparison, the historical provisional mean inflows from the contributing areas are shown in **Figure ES-2**.

Over the past week, salinities decreased at all sites in 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 24.4. Salinity conditions in the middle estuary were estimated to be within the optimal range for adult eastern oysters (**Figure ES-4**). The mean larval oyster recruitment rate reported by the Fish and Wildlife Research Institute was 5.0 spat/shell for May (**Figure ES-5**).

Caloosahatchee River Estuary

Over the past week, mean total inflow to the Caloosahatchee River Estuary was 2,722 cfs (**Figures ES-6** and **ES-7**), and the previous 30-day mean inflow was 1,462 cfs. For comparison, the historical provisional mean inflows from the contributing areas are shown in **Figure ES-7**.

Over the past week, salinities decreased at all sites in the estuary (**Table ES-2** and **Figures ES-8** and **ES-9**). The seven-day mean salinities (**Table ES-2**) were in the optimal range (0-10) for tape grass in the upper estuary. The seven-day mean salinity values were within the optimal range for adult eastern oysters at Cape Coral, and in the stressed range at Shell Point and Sanibel (**Figure ES-10**). The mean larval oyster recruitment rate reported by the Fish and Wildlife Research Institute increased to 13.2 spat/shell at Iona Cove and 3.9 spat/shell at Bird Island in May (**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 a steady release at 2,000 cfs with estimated tidal basin inflows of 1020 cfs. Model results from all scenarios predict daily salinity to be 2.7 or lower and the 30-day moving average surface salinity to be 1.3 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 June 3, 2022, that *Karenia brevis*, the Florida red tide dinoflagellate, was not observed above background concentrations in any samples collected statewide. On the east coast, red tide was not observed in any samples from Palm Beach or Broward counties.

Water Management Recommendations

Lake stage is in the Base Flow Sub-Band. Tributary conditions are near normal. 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.

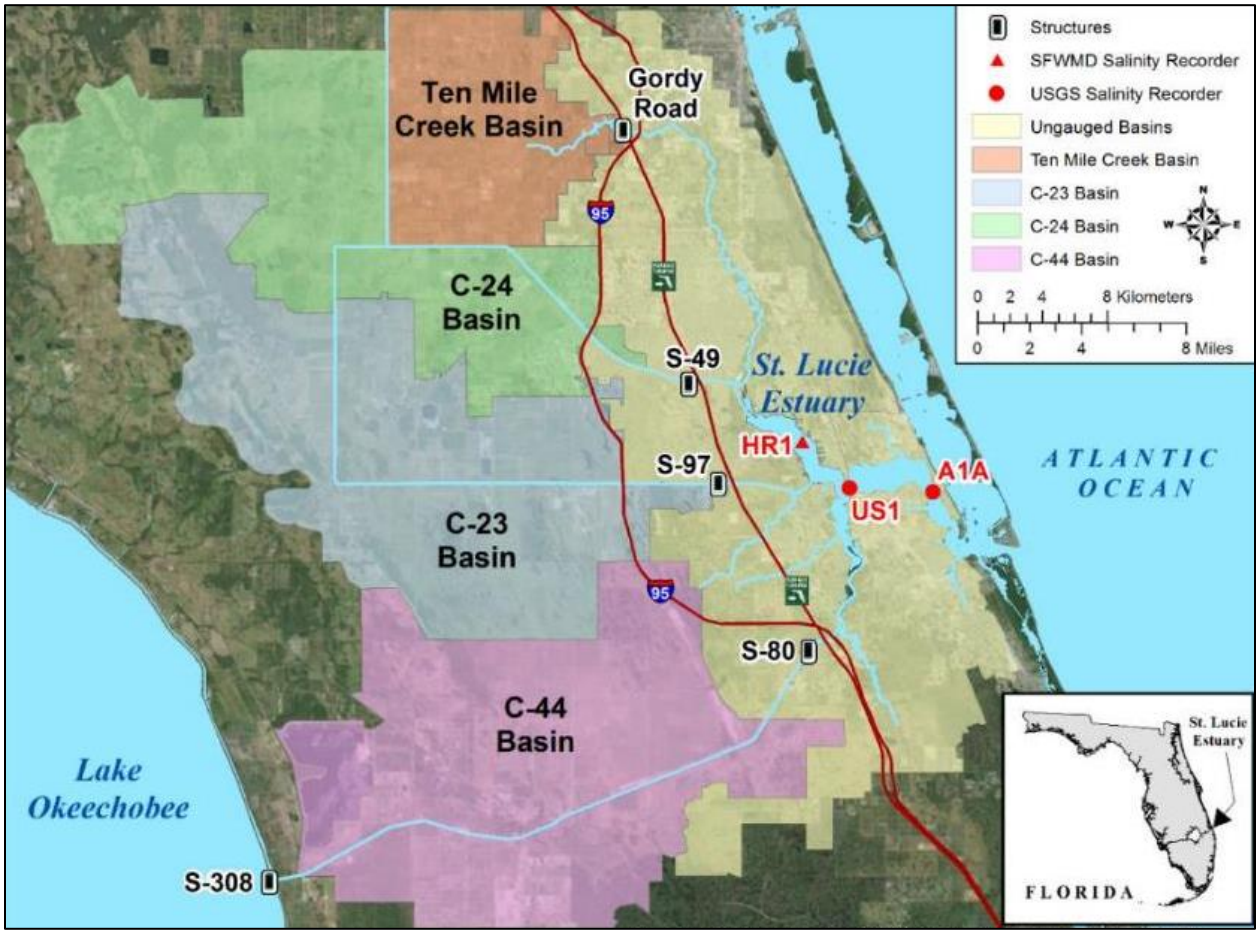


Figure ES-1. Basins, water control structures and salinity monitoring sites in the St. Lucie Estuary.

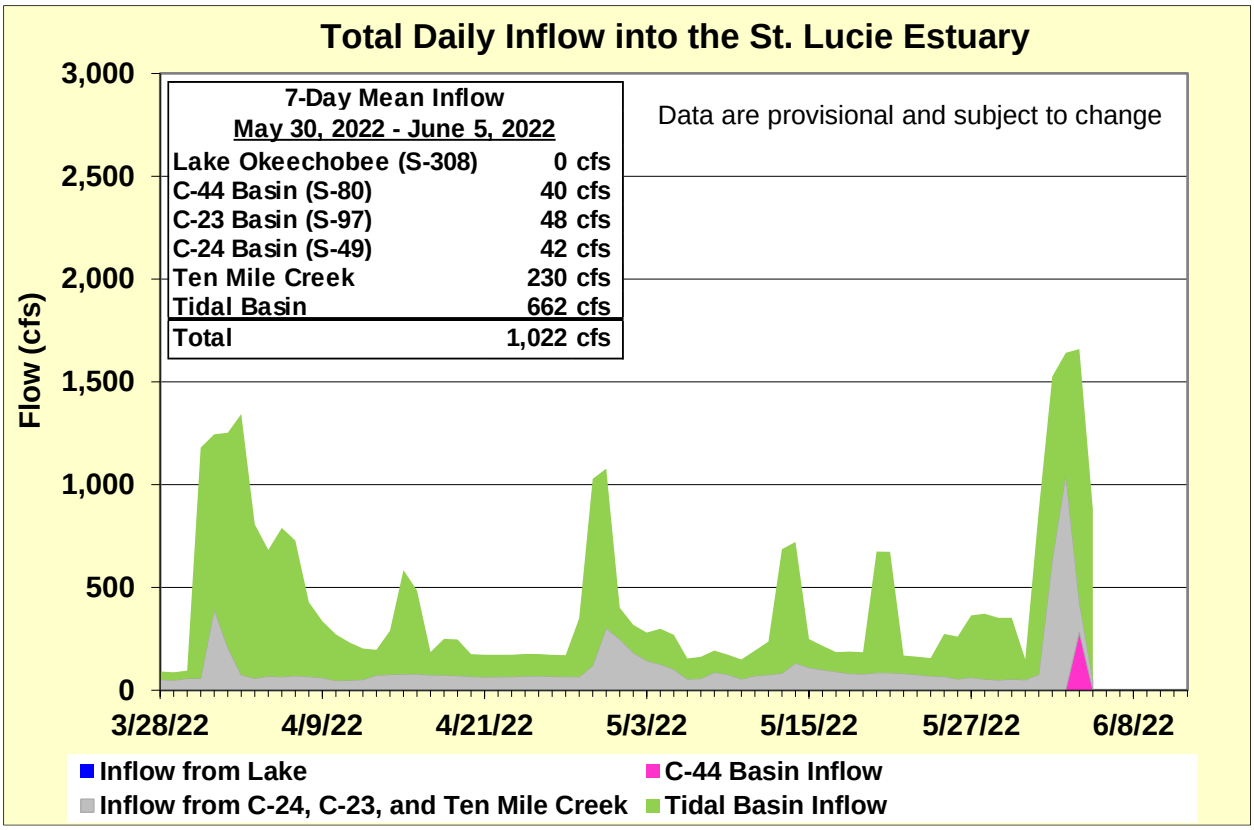


Figure ES-2. Total daily inflows from Lake Okeechobee and runoff from the C-44, C-23, C-24, Ten Mile Creek, and Tidal Basins into the St. Lucie Estuary.

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

Sampling Site	Surface	Bottom	Optimum Envelope
HR1 (North Fork)	**18.5** (20.8)	**21.7** (22.8)	10.0 – 25.0
US1 Bridge	**24.0** (25.1)	**24.9** (26.0)	10.0 – 25.0
A1A Bridge	**30.1** (31.0)	**31.0** (32.0)	10.0 – 25.0

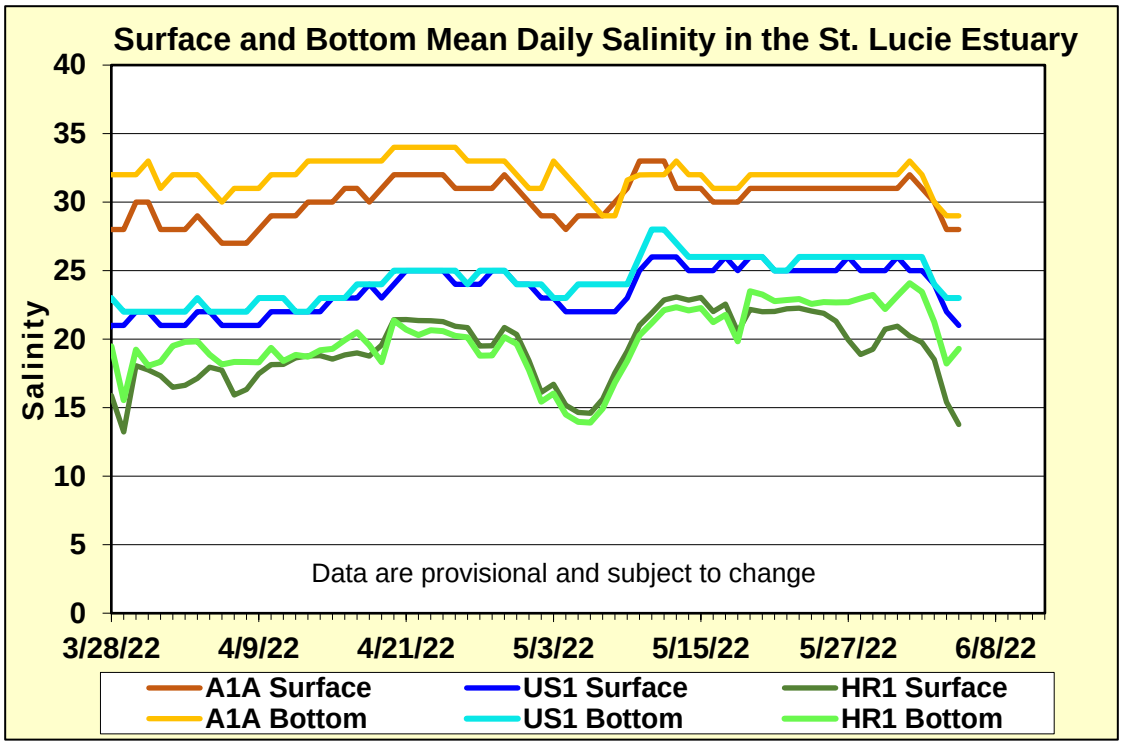


Figure ES-3. Mean daily salinity at the A1A, US1 and HR1 sites in the St. Lucie Estuary.

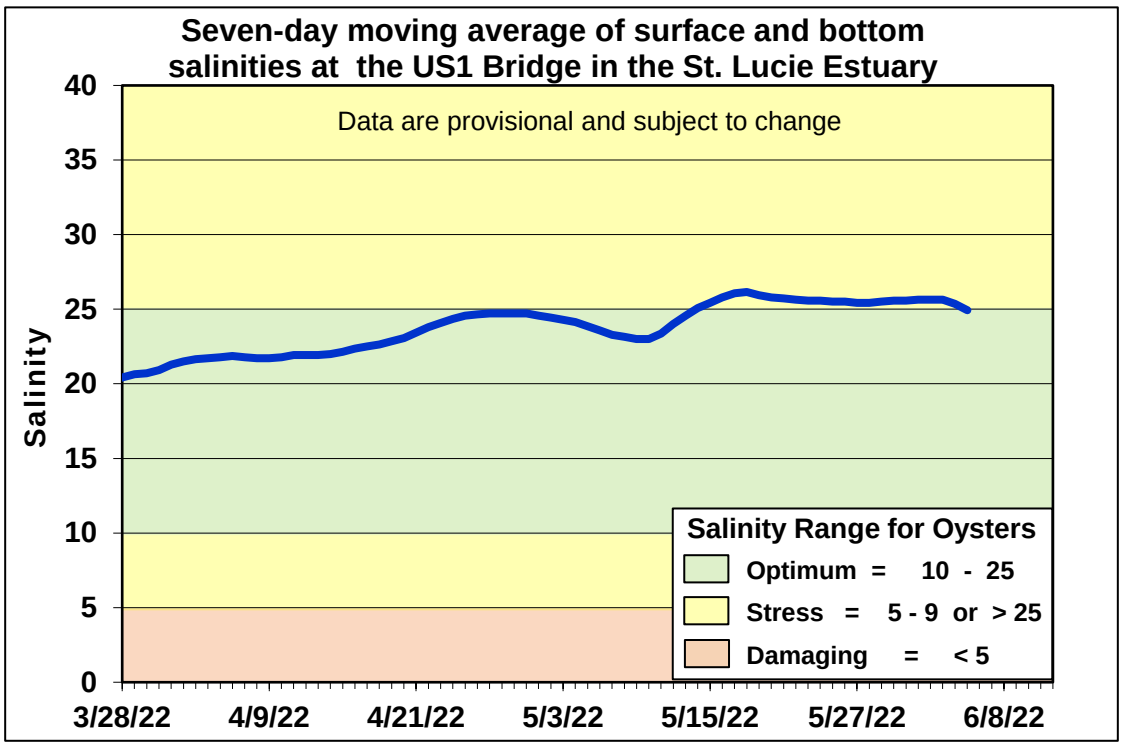


Figure ES-4. Seven-day moving average of the surface and bottom salinities at the US1 Bridge in the St. Lucie Estuary.

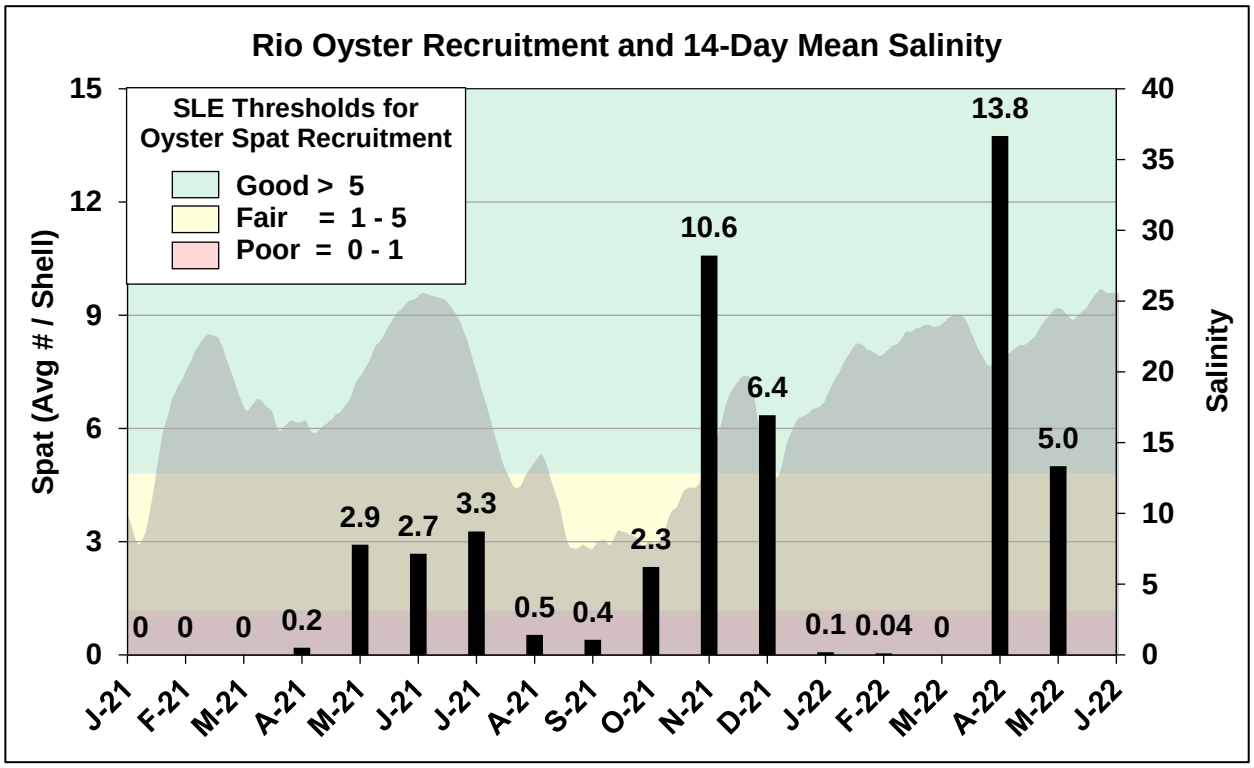


Figure ES-5. Mean oyster recruitment at the Rio oyster monitoring station and 14-day mean salinity at US1 Bridge.

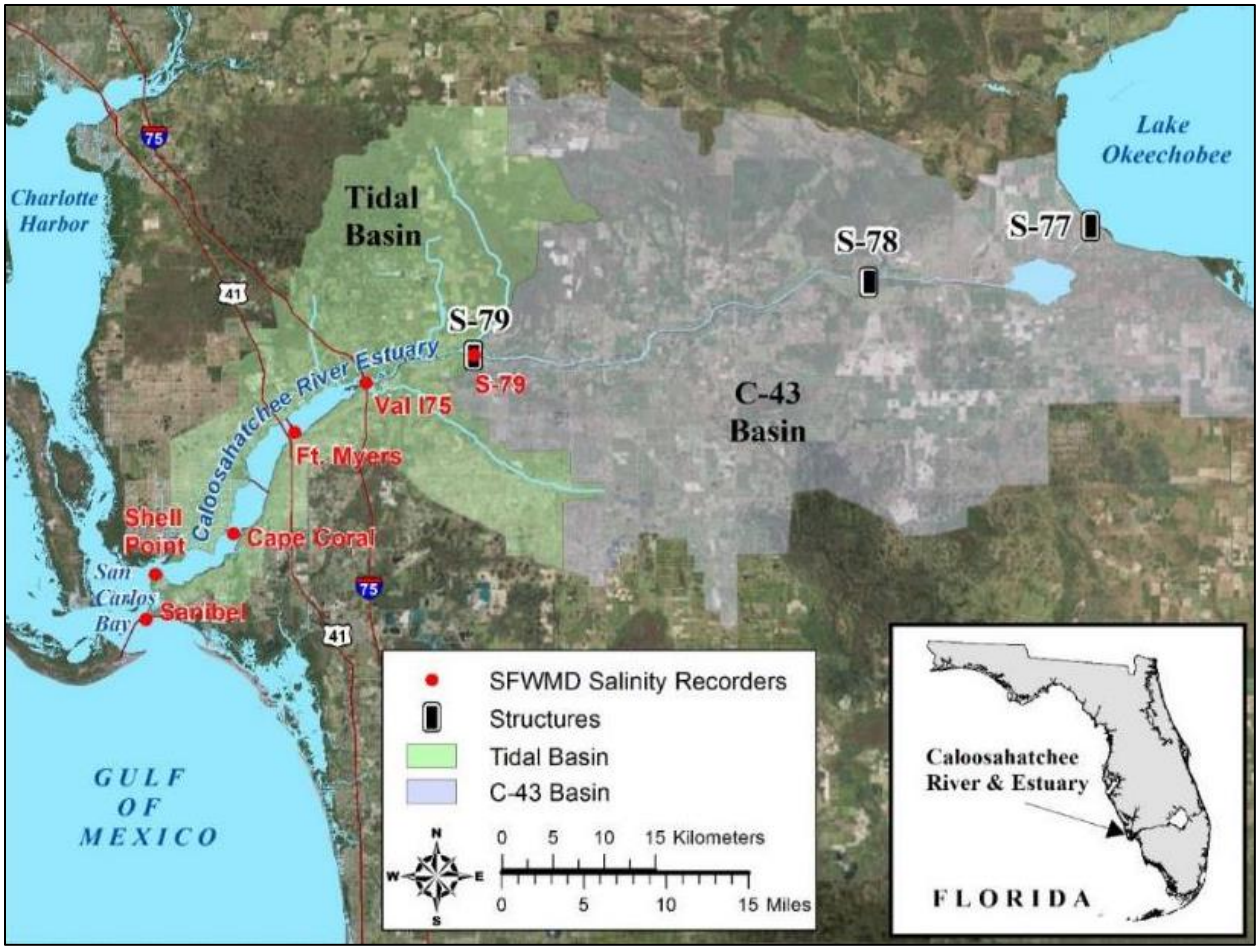


Figure ES-6. Basins, water control structures and salinity monitoring sites in the Caloosahatchee River Estuary.

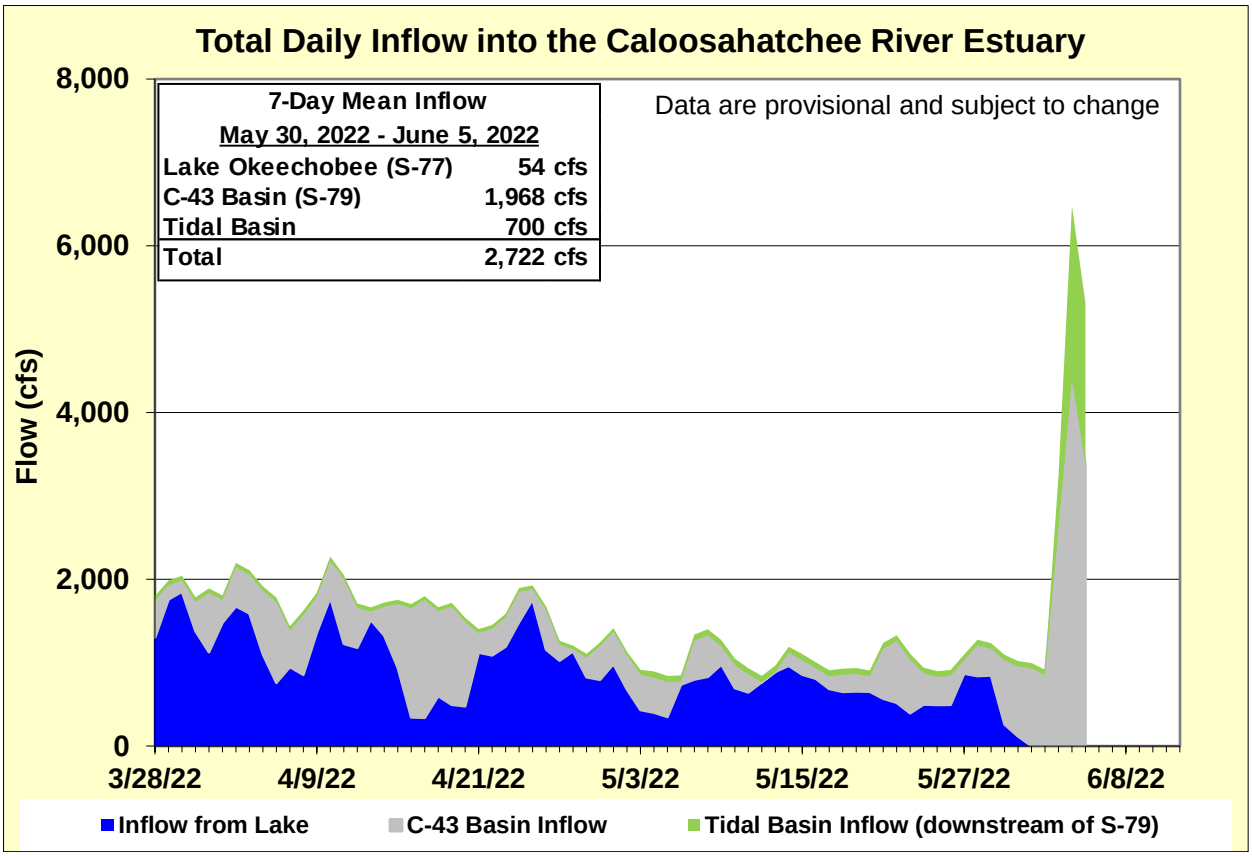


Figure ES-7. Total daily inflows from Lake Okeechobee, and runoff from the C-43 and Tidal basins into the Caloosahatchee River Estuary.

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

Sampling Site	Surface	Bottom	Optimum Envelope
S-79 (Franklin Lock)	**0.2** (0.4)	**0.3** (0.4)	0.0 – 10.0
Val I-75	**0.5** (0.8)	**0.6** (1.2)	0.0 – 10.0
Fort Myers Yacht Basin	**4.3** (5.6)	**6.3** (6.8)	0.0 – 10.0
Cape Coral	**11.9** (14.3)	**13.3** (15.8)	10.0 – 25.0
Shell Point	**25.7** (28.3)	**27.3** (29.0)	10.0 – 25.0
Sanibel	**31.4** (32.9)	**32.1** (34.0)	10.0 – 25.0

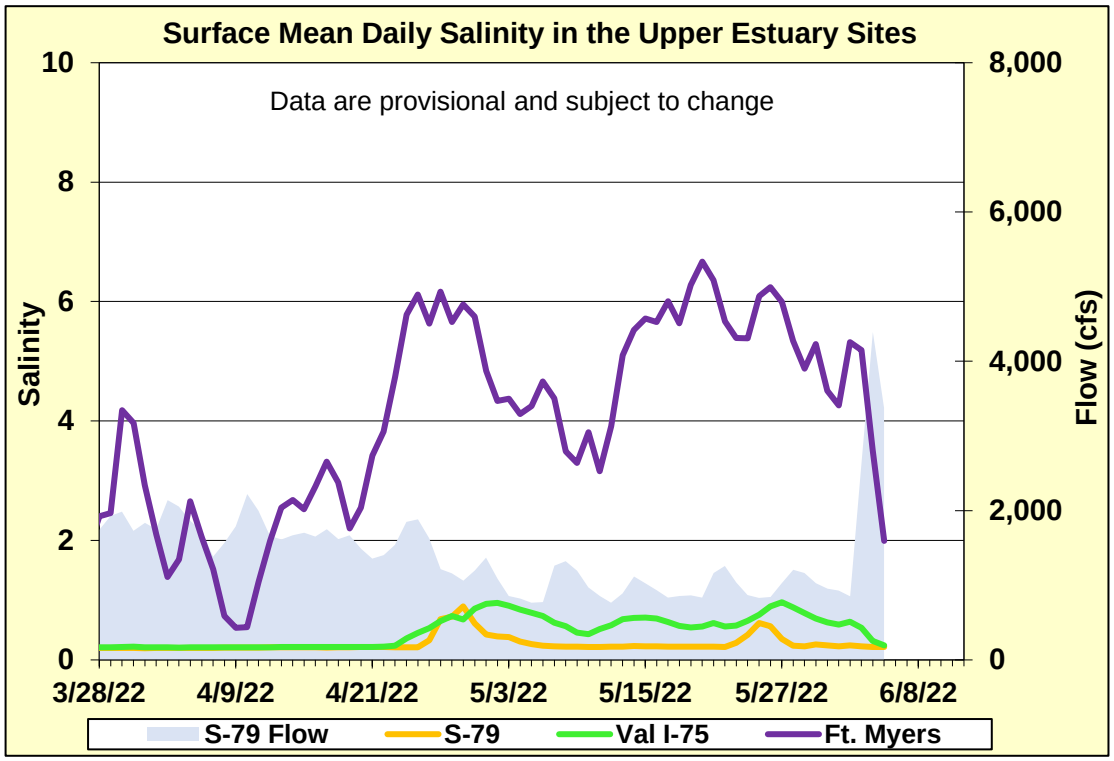


Figure ES-8. Mean daily salinity at upper Caloosahatchee River Estuary monitoring sites and mean daily flow at S-79.

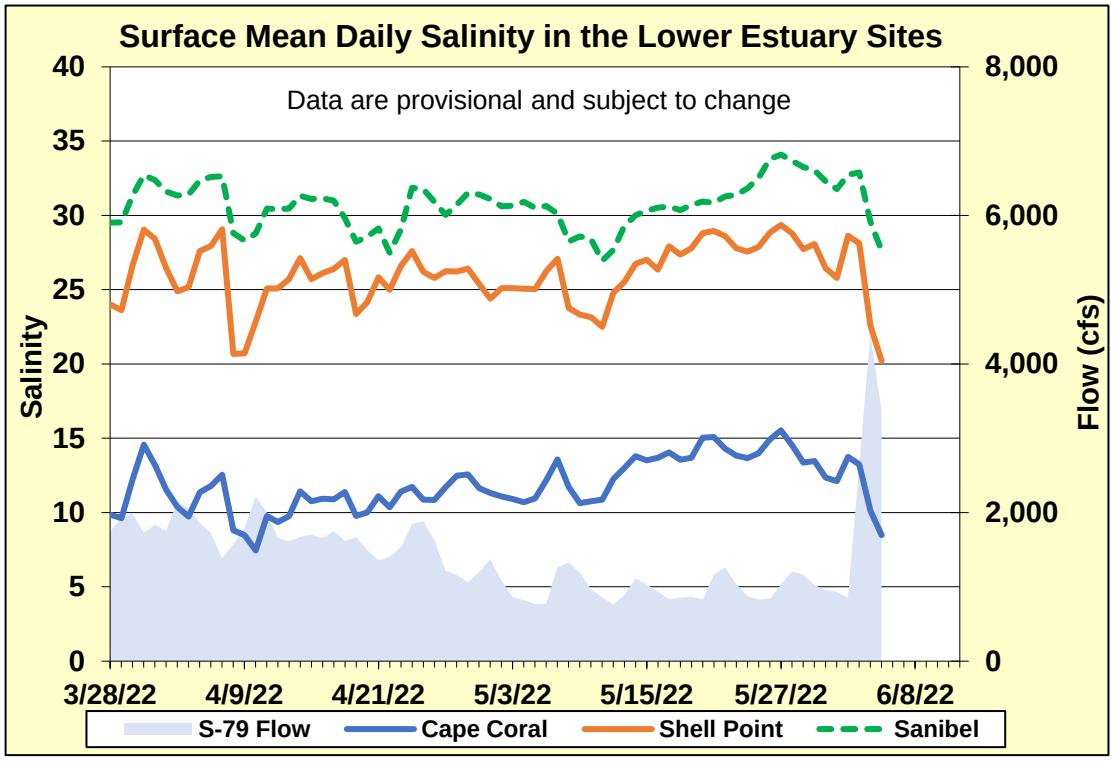


Figure ES-9. Mean daily surface salinity at lower Caloosahatchee River Estuary monitoring sites and mean daily flow at S-79.

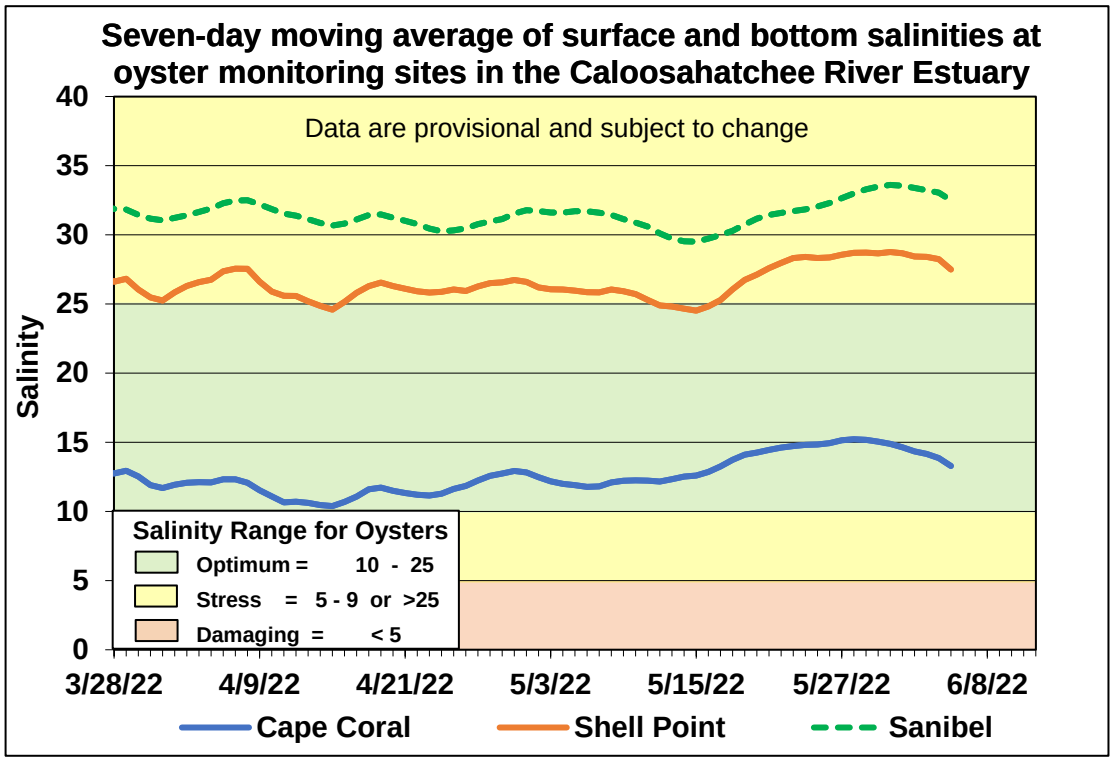


Figure ES-10. Seven-day moving average of surface and bottom salinities at Cape Coral, Shell Point and Sanibel monitoring sites in the Caloosahatchee River Estuary.

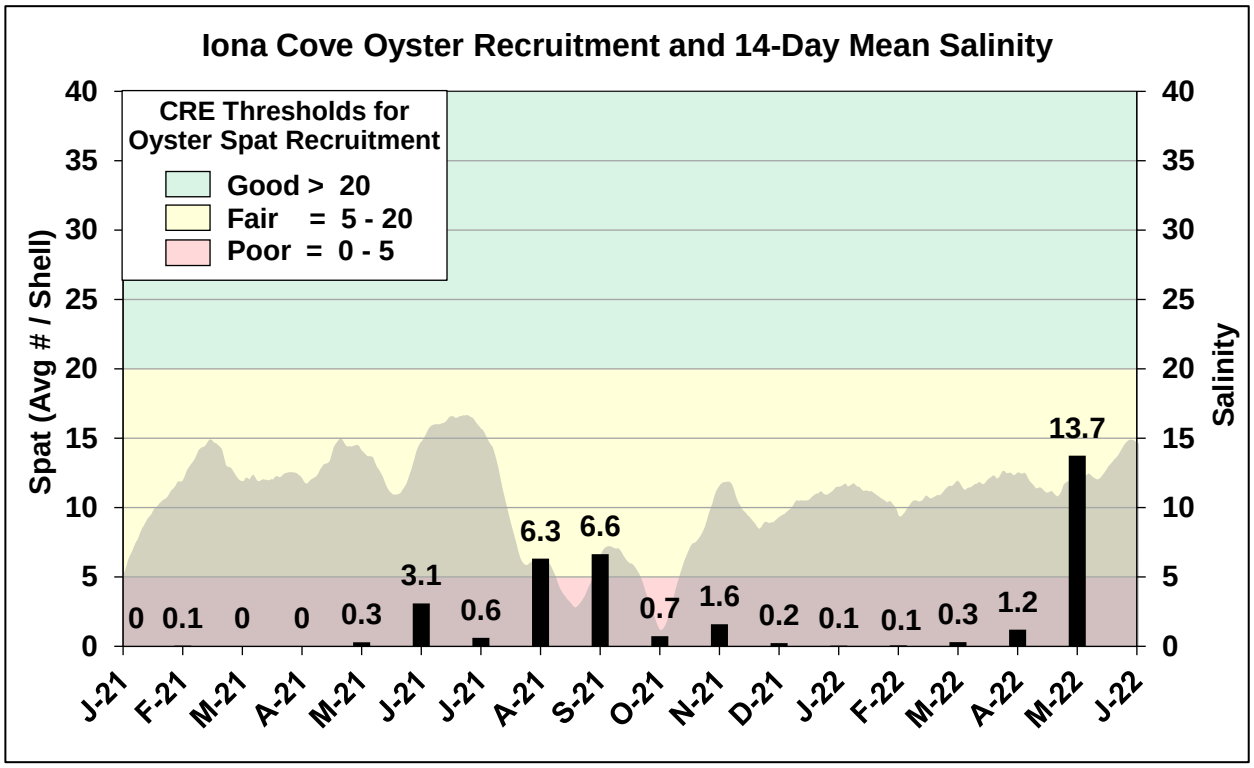


Figure ES-11. Mean oyster recruitment at the Iona Cove oyster monitoring station and 14-day mean salinity at Cape Coral.

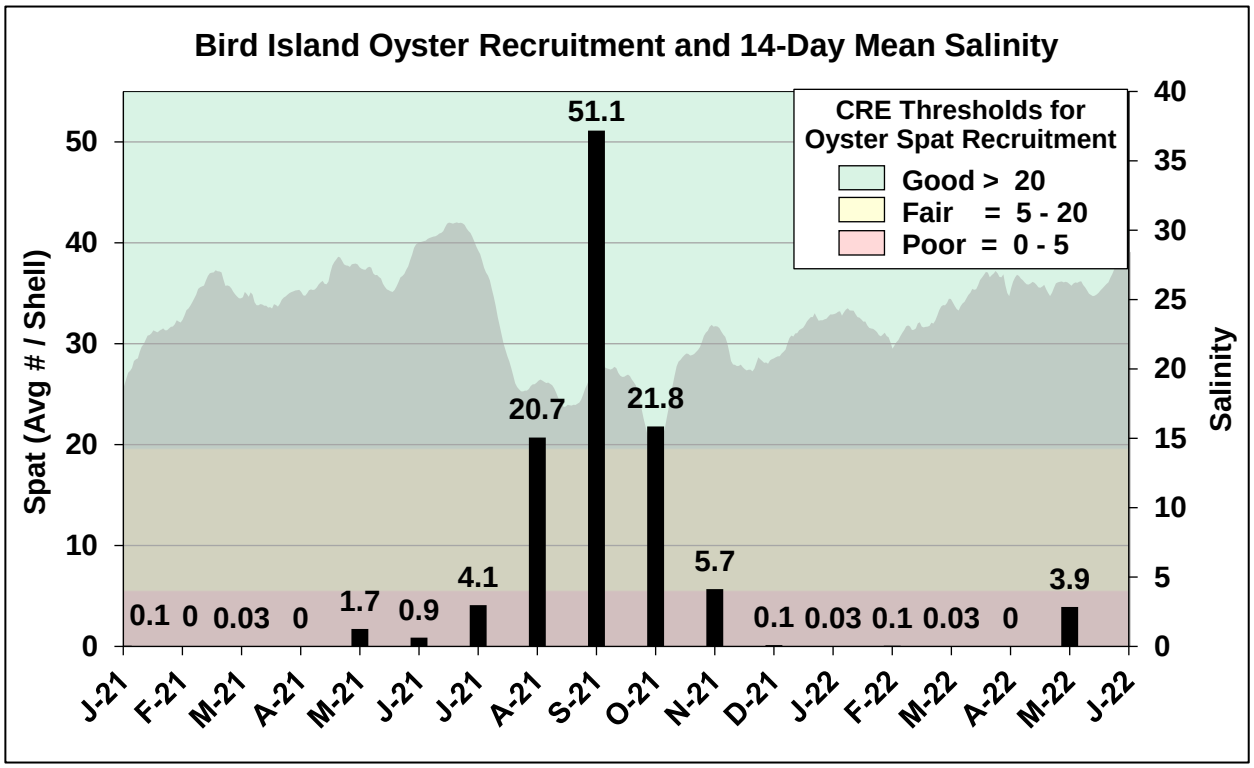


Figure ES-12. Mean oyster recruitment at the Bird Island oyster monitoring station and 14-day mean salinity at Shell Point.

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	1020	2.7	1.3
B	450	1020	1.7	1.1
C	800	1020	1.1	1.0
D	1000	1020	0.7	0.9
E	1500	1020	0.4	0.8
F	2000	1020	0.3	0.7

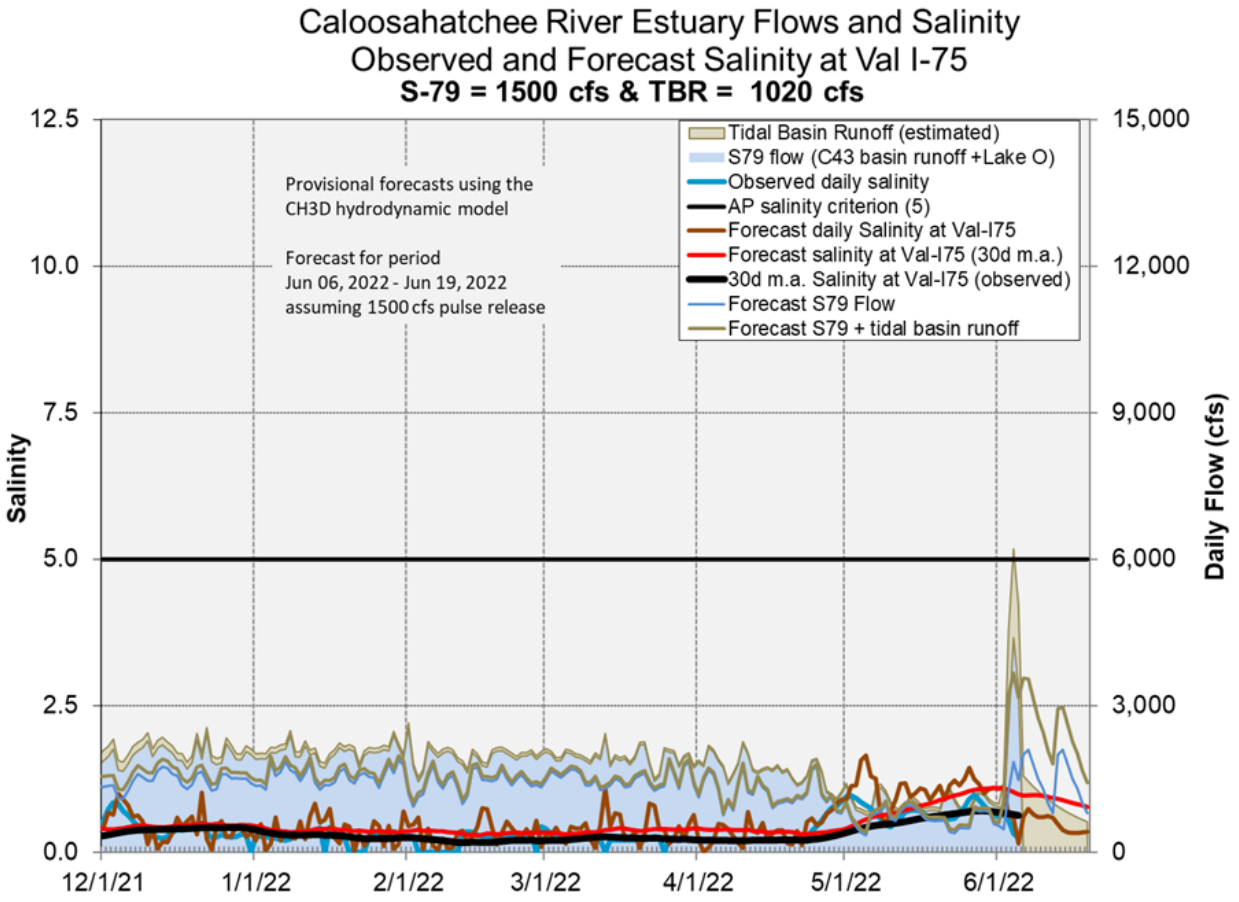


Figure ES-13. Forecasted Val I-75 site surface salinity assuming no pulse release at S-79.

Stormwater Treatment Areas

STA-1E: STA-1E Western Flow-way is offline for post-construction vegetation grow in. Operational restrictions are in place in STA-1E Central and Eastern Flow-ways for vegetation management activities. Online treatment cells are above target stage and vegetation in the flow-ways is stressed and highly stressed. The 365-day phosphorus loading rate (PLR) is below 1.0 g/m^2/year for the Central Flow-way (**Figure S-1**).

STA-1W: Operational restrictions are in place in STA-1W Western, Eastern, and Northern Flow-ways for vegetation management activities. Most treatment cells are near or above 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 dryout conditions. Online treatment cells are above 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 above target stage. Vegetation in the Eastern and Central Flow-ways is highly stressed and in the Western Flow-way is stressed. The 365-day PLRs for the Central and Western Flow-ways are below 1.0 g/m^2/year (**Figure S-4**).

STA-5/6: 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 most flow-ways are below 1.0 g/m^2/year, except Flow-way 5 which is high. (**Figure S-5** and **S-6**).

For definitions on STA operational language see glossary following figures.

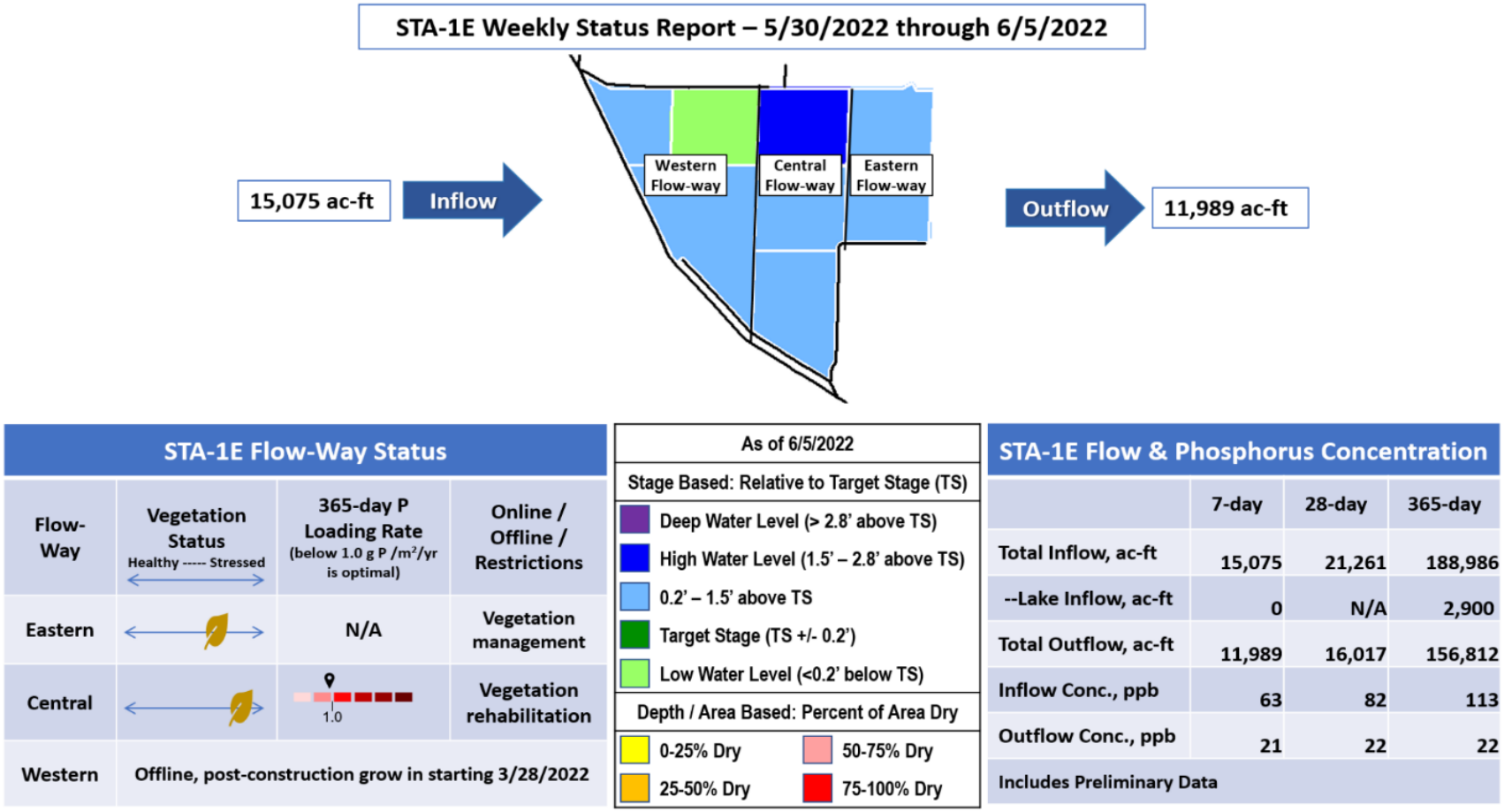


Figure S-1. STA-1E Weekly Status Report

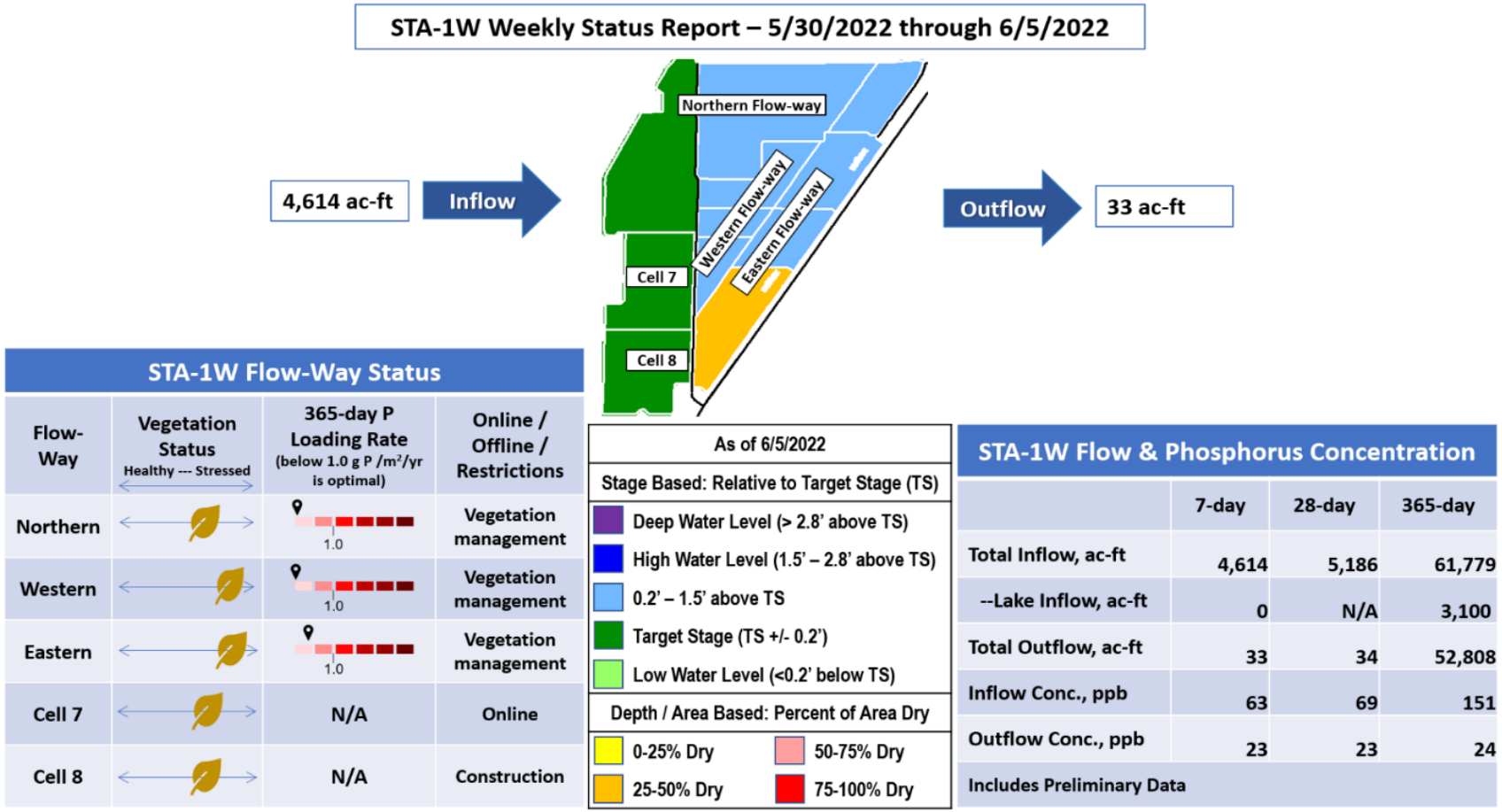
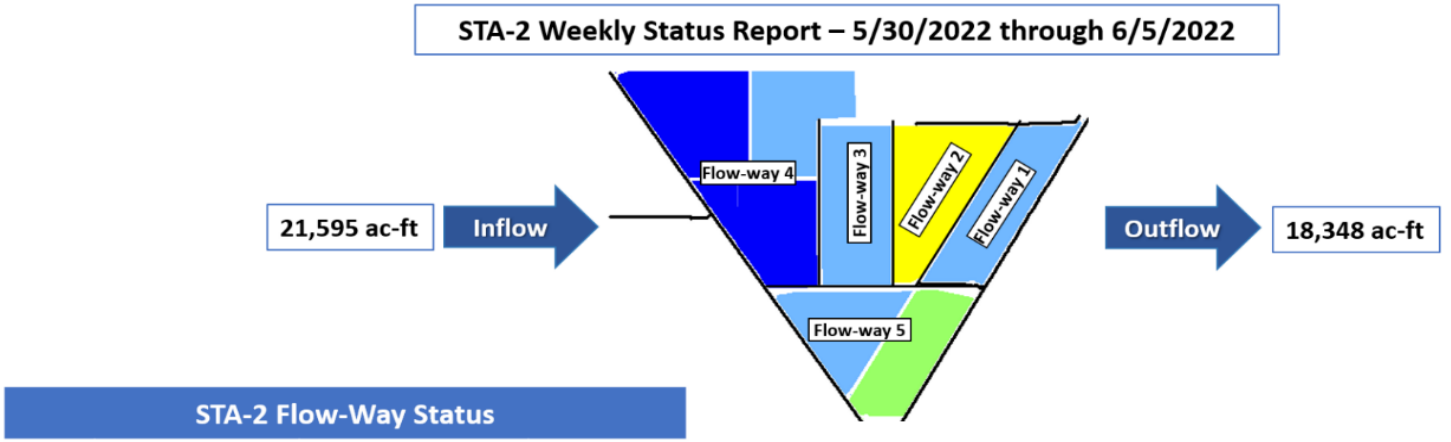


Figure S-2. STA-1W Weekly Status Report



STA-2 Flow-Way Status

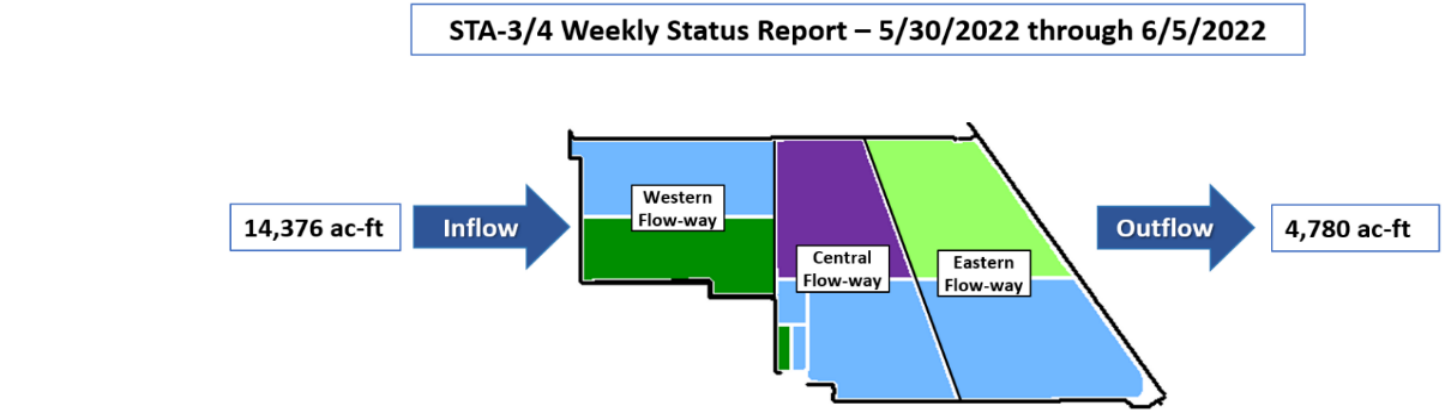
Flow-Way	Vegetation Status (Healthy ------ Stressed)	365-day P Loading Rate (below 1.0 g P /m²/yr is optimal)	Online / Offline / Restrictions
1		1.0	Post Dryout
2	Offline, construction activities as of 9/7/2021		
3		1.0	Vegetation Rehab
4		1.0	Vegetation Rehab
5		1.0	Online

As of 6/5/2022	
Stage Based: Relative to Target Stage (TS)	
Deep Water Level (> 2.8' above TS)	
High Water Level (1.5' – 2.8' above TS)	
0.2' – 1.5' above TS	
Target Stage (TS +/- 0.2')	
Low Water Level (<0.2' below TS)	
Depth / Area Based: Percent of Area Dry	
0-25% Dry	50-75% Dry
25-50% Dry	75-100% Dry

STA-2 Flow & Phosphorus Concentration

	7-day	28-day	365-day
Total Inflow, ac-ft	21,595	42,121	316,175
--Lake Inflow, ac-ft	0	N/A	33,300
Total Outflow, ac-ft	18,348	37,857	326,508
Inflow Conc., ppb	94	76	87
Outflow Conc., ppb	15	18	16
Includes Preliminary Data			

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 6/5/2022	
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	14,376	19,975	343,688
--Lake Inflow, ac-ft	0	N/A	15,400
Total Outflow, ac-ft	4,780	10,388	301,667
Inflow Conc., ppb	56	57	87
Outflow Conc., ppb	14	17	15
Includes Preliminary Data			

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

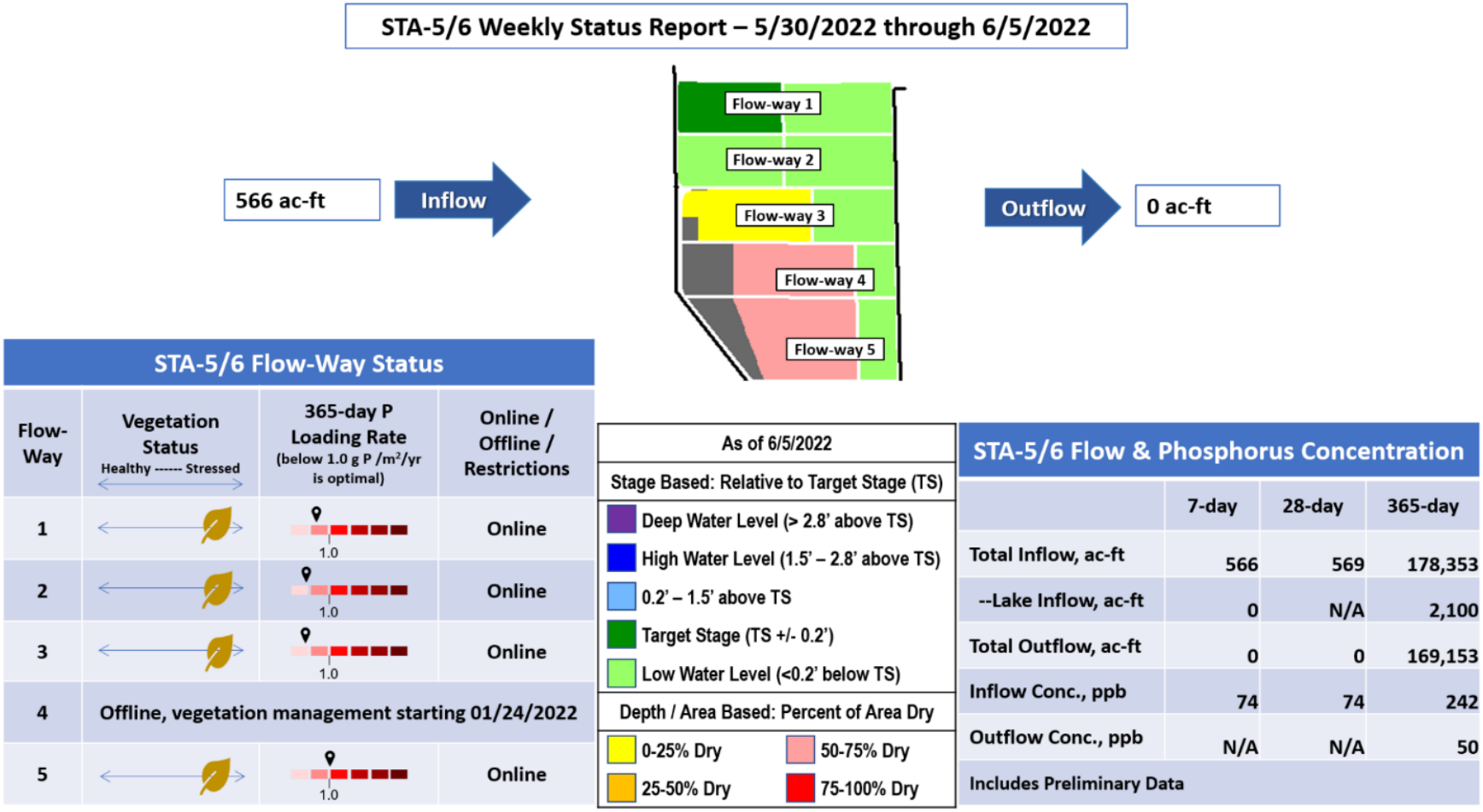
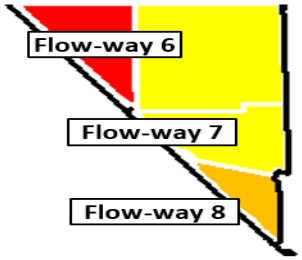


Figure S-5. STA-5/6 Weekly Status Report (Flow-ways 1 – 5)

STA-5/6 Weekly Status Report – 5/30/2022 through 6/5/2022



STA-5/6 Flow-Way Status

Flow-Way	Vegetation Status Healthy ------ Stressed	365-day P Loading Rate (below 1.0 g P /m²/yr is optimal)	Online / Offline / Restrictions
6		1.0	Online
7		1.0	Online
8		1.0	Online

As of 6/5/2022	
Stage Based: Relative to Target Stage (TS)	
Deep Water Level (> 2.8' above TS)	
High Water Level (1.5' – 2.8' above TS)	
0.2' – 1.5' above TS	
Target Stage (TS +/- 0.2')	
Low Water Level (<0.2' below TS)	
Depth / Area Based: Percent of Area Dry	
0-25% Dry	50-75% Dry
25-50% Dry	75-100% Dry

Figure S-6. STA-5/6 Weekly Status Report (Flow-ways 6 – 8)

Basic Concepts and Definitions for STA Weekly Status Report

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

Everglades

Water Conservation Area Regulation Schedules

WCA-1: Stage at the 1-8C ascended quickly late last week. The average on Sunday was 0.77 feet above the flat Zone A1 regulation line. WCA-2A: Stage also ascended quickly at the S11B headwater last week. The average at that gauge on Sunday was 1.19 feet above the flat regulation line. WCA-3A: Last week the Three Gauge Average stages ascended quickly then leveled late; average stage was 0.21 feet below the rising regulation line on Friday. WCA-3A: Stage ascended quickly at gauge 62 (Northwest corner) last week, the average on Sunday was 0.73 feet below the rising Upper schedule line. (**Figures EV-1** through **EV-4**).

Water Depths

The SFWDAT tool indicates that stages are recovering east of the Miami Canal in WCA-3A North but still remain the shallowest in the WCAs. Northern WCA-1 and southern WCA-2A stages got significantly deeper. WCA-3A along the L-67s potentially drying down to soil surface is a rare event, and conditions are likely drier than model output indicates. North to South hydrologic connectivity rebounded quickly within the sloughs of Everglades National Park. (**Figure EV-5**). Comparing current WDAT water depths to the depth one month ago, stages are significantly deeper across South Florida. Looking back one year, the EPA is deeper, significantly so in BCNP and to the east and west of Shark River Slough in ENP. (**Figure EV-6)**. Comparing current depths to the past 20 years, most of WCA-3A North continues to move towards the median. BCNP and ENP are around the 90th percentile. The area of the historically ponded region in WCA-3A South in the 10th percentile is shrinking as that region once again begins to recover depth and begins to pond. (**Figure EV-7**).

Taylor Slough and Florida Bay

Based off tropical activity, Taylor Slough received just over 9 inches of rain in the past week. Stages in Taylor Slough increased an average of 0.75 feet over this past week (**Figure EV-8** and **Figure EV-9**). We are following up on TSB stages. Individual stage gauge changes reached up to +1.31 feet in the northern Slough area. The Slough is now 12 inches higher than its historical average for this time of year (pre-Florida Bay initiative which started in 2017). Conditions are highly favorable for moving water downstream through the Slough this year as the rains continue.

Salinities in Florida Bay averaged a decrease of almost 6 over the week ending 6/5, with individual station changes ranging from −12.0 to −1.8 (**Figure EV-8**). The largest changes occurred in the western area where salinities were highest. All 3 regions show a distinct drop in salinity with the western region almost to the 25th percentile (**Figure EV-10**). The salinity in the Bay, as a whole, is about lower than its historical average by 4 for this time of year.

Water Management Recommendations

Balancing inflows with outflows in WCA-2A in a way that moderates the recent ascension in that basin would have ecological benefit in particular to the area most recently impacted by wildfire. Distributing WCA-2A outflows both into the northern perimeter of WCA-3A and making use of the S-11s is ecologically better than using one or the other. Flows as long as possible into the northern WCA-3A that safely build depth in that sub-basin have an ecological benefit. When conditions allow, discharge via S-150 would benefit the downstream ecology as conditions remain dry in northeastern WCA-3A. 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	5.31	NA
WCA-2A	6.61	+0.64
WCA-2B	9.74	+0.99
WCA-3A	5.84	+0.65
WCA-3B	7.03	+0.53
ENP	7.85	+0.69

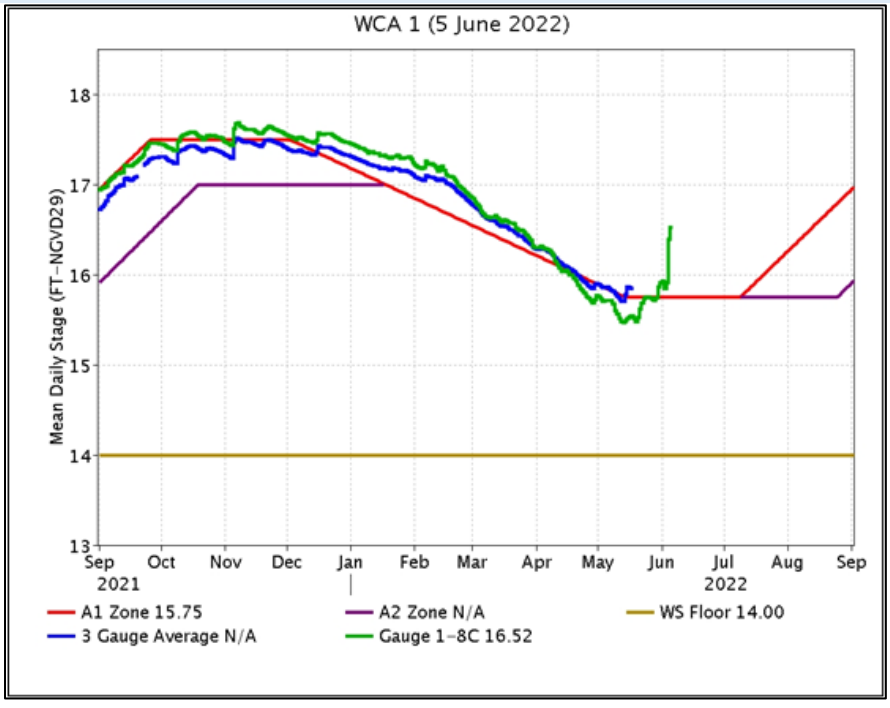


Figure EV-1. WCA-1 stage hydrographs and regulation schedule.

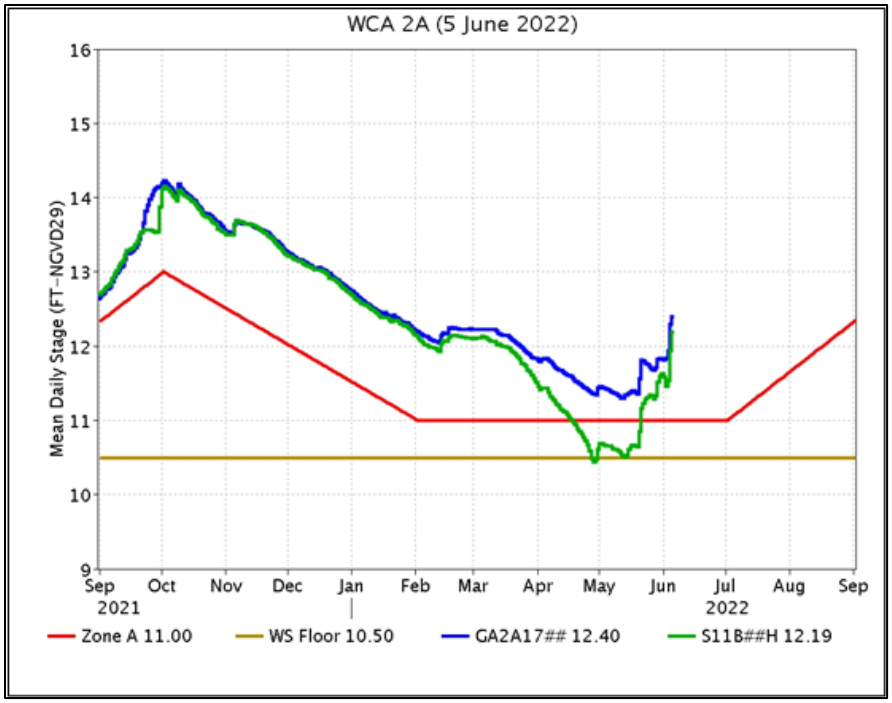


Figure EV-2. WCA-2A stage hydrographs and regulation schedule.

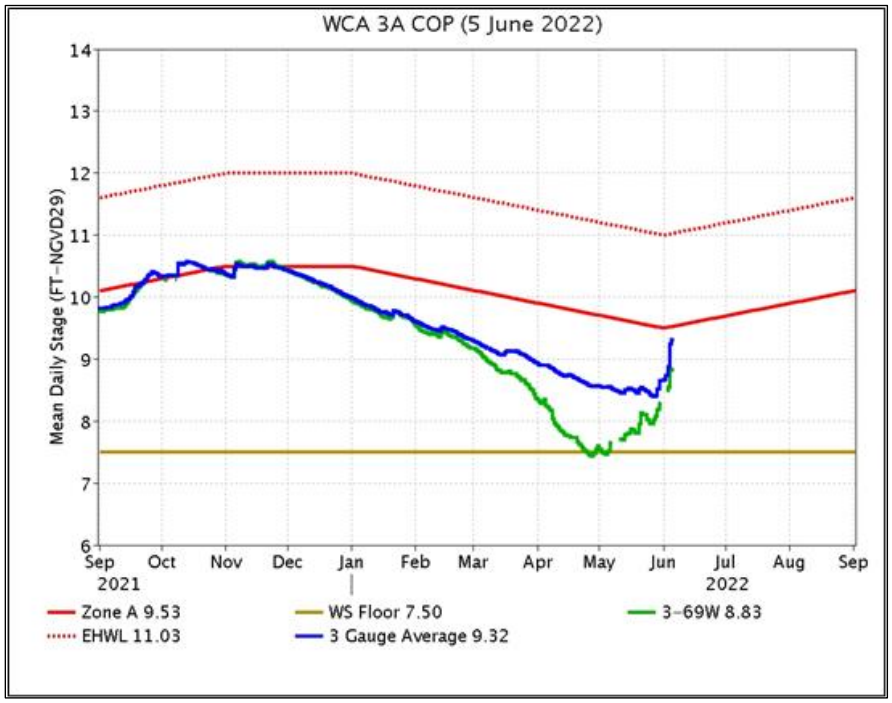


Figure EV-3. WCA-3A stage hydrographs (three-gauge average, S-333 headwater) and regulation schedule.

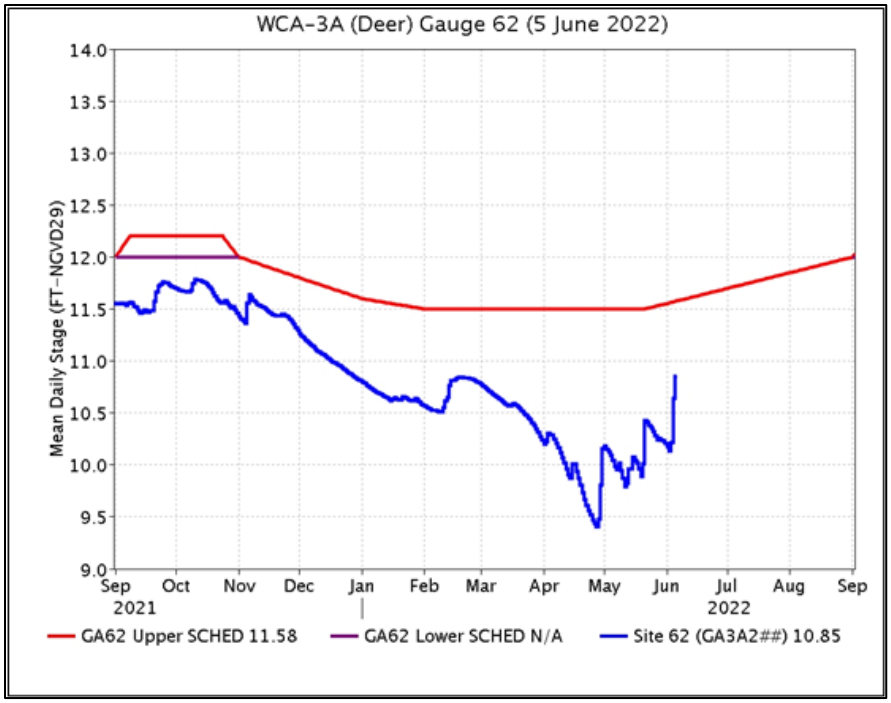


Figure EV-4. WCA-3A stage hydrograph (Deer gauge; Site 62) and CA62 regulation schedule.

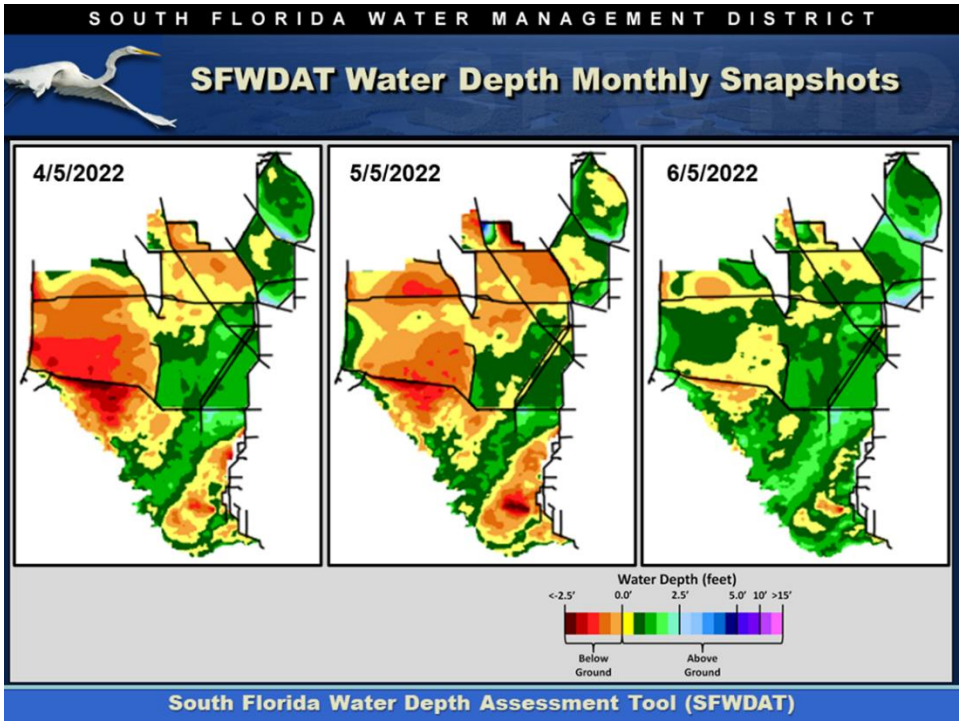


Figure EV-5. Everglades water depths from two months ago (left), one month ago (center) and present (right), based on SFWDAT.

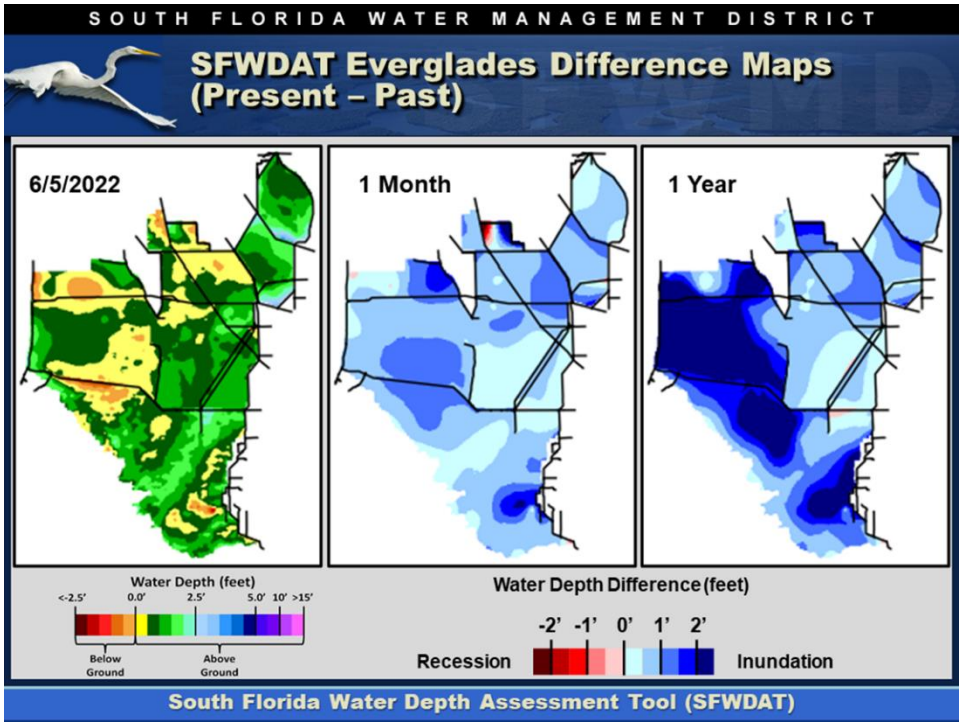


Figure EV-6. Present Everglades water depths (left) and water depth changes from one month (center) and one year (right) ago, based on SFWDAT.

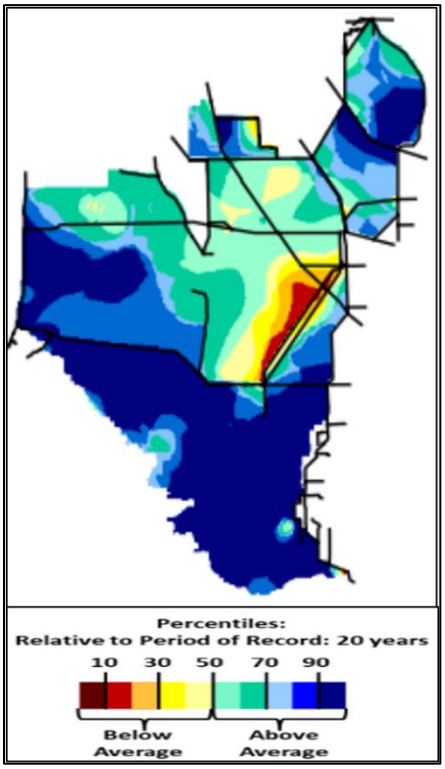


Figure EV-7. Present water depths (5/29/2022) compared to the day of year median over the previous 20 years.

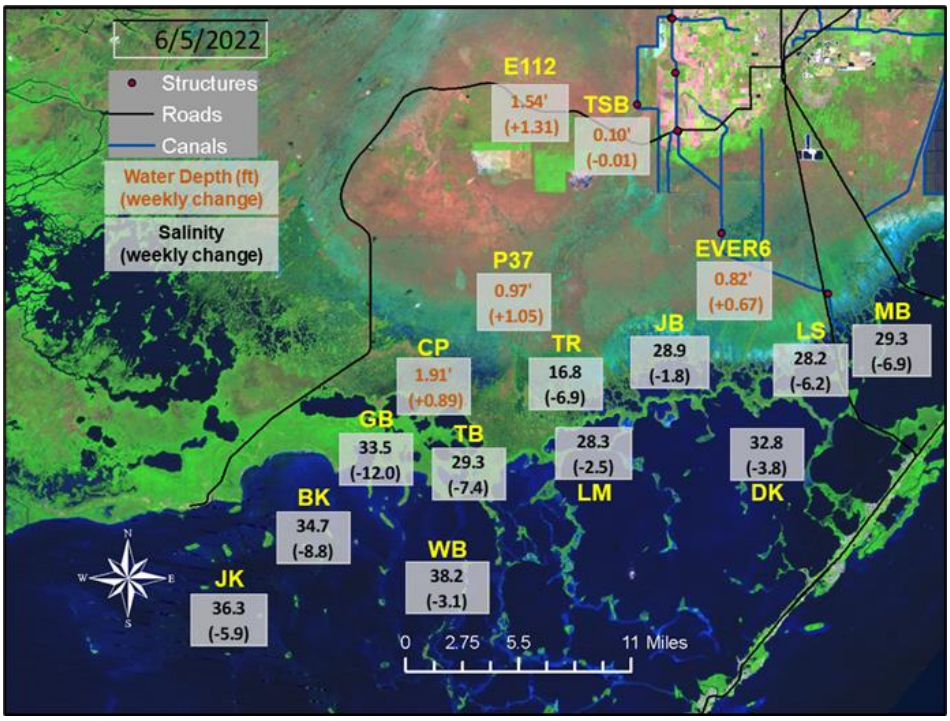


Figure EV-8. Taylor Slough water depths with changes since a week ago and Florida Bay salinities with changes since a week ago.

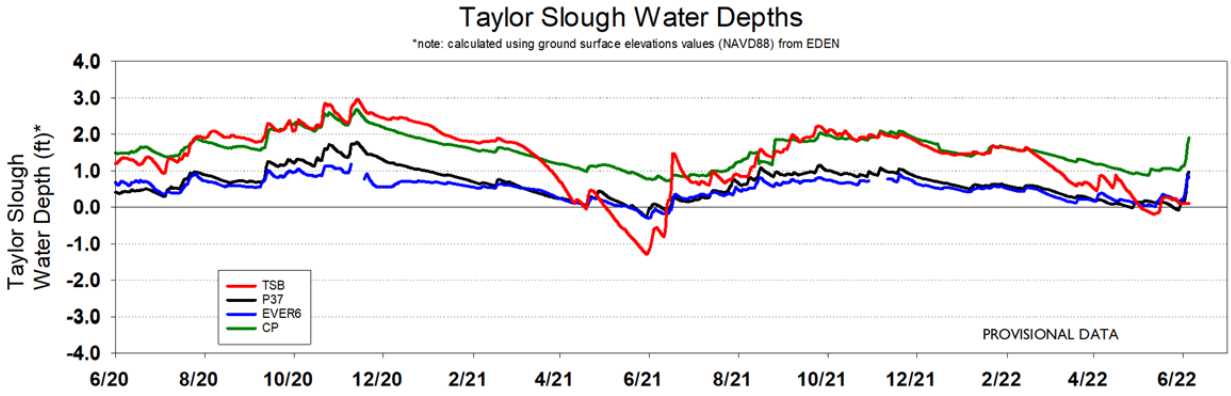


Figure EV-9. Taylor Slough water depth time series.

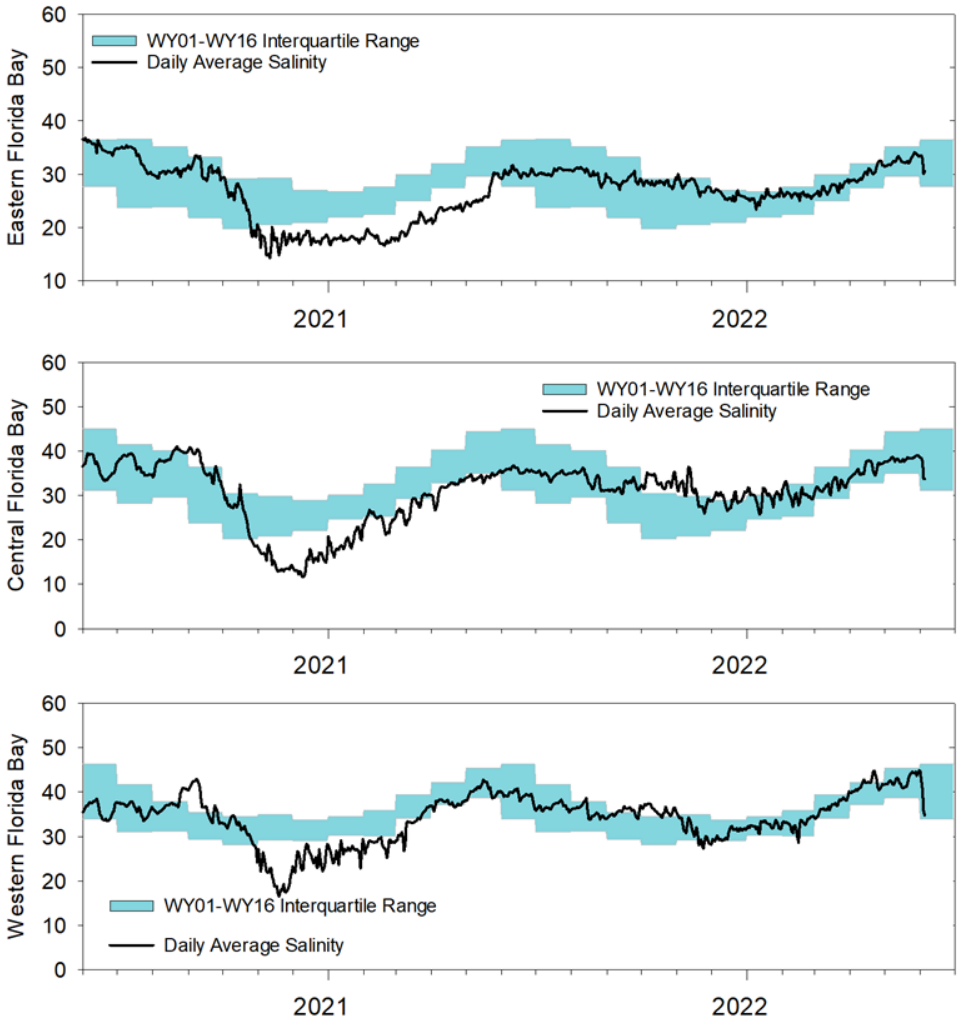


Figure EV-10. Eastern (top panel), Central (middle panel) and Western (bottom panel) Florida Bay daily average salinities with interquartile (25-75 percentile) ranges.

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

SFWMD Everglades Ecological Recommendations, June 7, 2022 (red is new)			
Area	Weekly change	Recommendation	Reasons
WCA-1	Stage increased by 0.39'	Moderate ascension to less than 0.5 feet per two weeks.	Protect within basin and downstream habitat and wildlife.
WCA-2A	Stage increased by 0.64'	Moderate ascension to less than 0.5 feet per two weeks.	Protect within basin and downstream habitat and wildlife.
WCA-2B	Stage increased by 0.99'	Moderate ascension to less than 0.5 feet per two weeks.	Protect within basin and downstream habitat and wildlife.
WCA-3A NE	Stage increased by 0.57'	Moderate ascension to less than 0.5 feet per two weeks. Conserve water in this basin, while letting the water move south when conditions allow.	Protect within basin peat soils, and downstream habitat and wildlife.
WCA-3A NW	Stage decreased by 0.64'	Moderate ascension to less than 0.5 feet per two weeks. Conserve water in this basin letting the water move south when conditions allow.	
Central WCA-3A S	Stage decreased by 0.63'	Moderate ascension to less than 0.5 feet per two weeks, letting the water move south when conditions allow.	Protect within basin and downstream habitat and wildlife. Foraging and nesting wading birds.
Southern WCA-3A S	Stage increased by 0.76'		
WCA-3B	Stage increased by 0.53'	Moderate ascension to less than 0.5 feet per two weeks 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 0.69'	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 −0.012' to +1.313'	Move water southward as possible.	When available, provide freshwater buffer for downstream conditions.
FB- Salinity	Salinity changes ranged −12.0 to −1.8	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 2903 cfs, and the previous 30-day mean inflow was 841 cfs. The seven-day mean salinity was 29.1 at BBCW8 and 24.3 at BBCW10, both below the preferred maximum salinity of 35 for these sites. Data provided by Biscayne National Park.

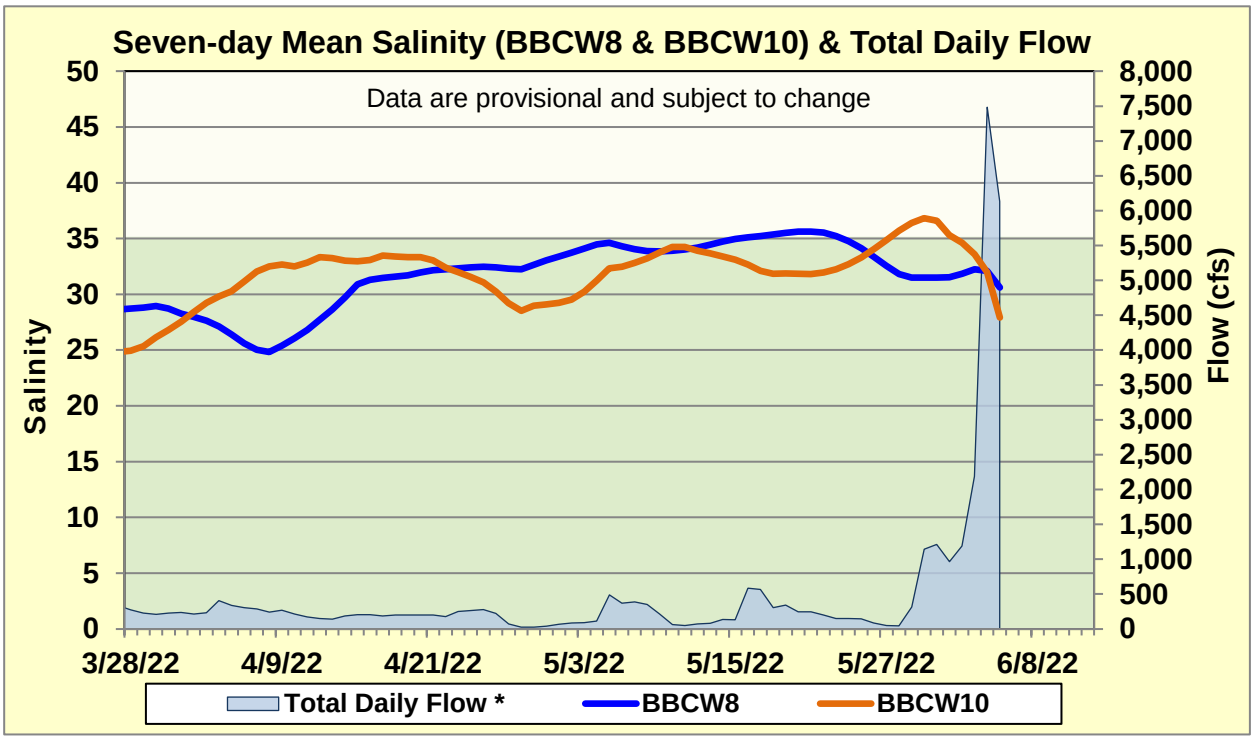


Figure BB-1. Seven-day mean salinity at BBCW8 and BBCW10 and total daily flow in Biscayne Bay. Total daily flow was calculated using flow from structures S20G, S20F, S21, S21A, S123, and S700P.