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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: July 6, 2022

SUBJECT: Weekly Environmental Conditions for Systems Operations

Summary

Weather Conditions and Forecast

A tropical wave will emerge over the southeastern Gulf of Mexico on Wednesday. Deep moisture will envelop SFWMD, with available moisture likely above the 90th percentile for early July over western areas. The prime ingredients of considerable moisture and instability will result in scattered morning rains in the east, some of which could be heavy, followed by a widespread coverage of rain around and south through west of Lake Okeechobee when the steering winds become southeasterly. The large-scale conditions appear so ideal on Wednesday that some locations over the western half of the SFWMD could see excessive rainfall. A drier air mass with less instability should begin arriving over the eastern half or third of the SFWMD on Thursday and Friday while western areas continue to see above-normal moisture levels trailing the tropical wave. The southeasterly steering wind flow and the abundant moisture will continue to favor enhanced rains from around Lake Okeechobee westward both days with little rain over the east and far north. On Saturday, southerly steering winds will favor rains over the southern interior to around Lake Okeechobee. Meanwhile, the Kissimmee Valley, especially the far north, should still see much less rainfall relative to areas south of the Lake. For the period Thursday through Saturday, the total SFWMD area most likely will be below the daily climatological average. A reversal of the steering winds to the southwest or west will cause afternoon rains to preferentially form over the interior and the east on Sunday, with a particular focus north of Lake Okeechobee. A better coverage of rain is anticipated by Monday ahead of a weakening front, again with areas north and west of Lake Okeechobee seeing the greatest areal average rainfall. For the week ending next Tuesday morning, total SFWMD area is forecast to be below normal, with the greatest weekly rains over the southern and western interior to the west coast. However, for week 2, environmental conditions should favor above normal total rainfall, with the greatest weekly rains north and west of Lake Okeechobee.

Kissimmee

Flow at S-59 and S-61 is being adjusted to allow stage to rise gradually in East Toho and Toho, respectively. Flow at S-65/S-65A was reduced to 0 cfs to slow the stage decline in KCH, although some releases were made from S-65A to control the rainfall-driven stage rise in Pool A. Water depth on the Kissimmee River floodplain declined over the week, with a mean depth of 0.35 feet as of July 3, 2022. The concentration of dissolved oxygen in the Kissimmee River is rising, with an average of 4.4 mg/L for the week ending on July 3, 2022.

Lake Okeechobee

Lake Okeechobee stage was 12.88 feet NGVD on July 3, 2022, with water levels 0.25 feet higher than a month ago (**Figure LO-1**). Lake stage on July 3, 2022 was in the Base Flow sub-band (**Figure LO-2**) and 0.08 feet above the ecological envelope (**Figure LO-3**). This was the fourth week Lake stage has been above ecological envelope, after 22 weeks within it. Average daily inflows (excluding rainfall) increased from the previous week, going from 670 cfs to 1,040 cfs. Average daily outflows (excluding evapotranspiration) decreased, going from 190 cfs to 90 cfs. The most recent satellite image (July 3, 2022) from the NOAA Harmful Algal Bloom Monitoring System showed that bloom potential is moderate in the western and northern regions of the lake. The bloom potential decreased slightly along the western, southern, and northern nearshore areas of the Lake compared to the previous two weeks but increased in the central pelagic region.

Estuaries

Total inflow to the St. Lucie Estuary averaged 720 cfs over the past week with no flow coming from Lake Okeechobee. Mean salinities increased at HR1 and US1 Bridge sites and decreased at the A1A Bridge site over the past week. Salinity in the middle estuary was within the optimal range (10-25) for adult eastern oysters.

Total inflow to the Caloosahatchee Estuary averaged 2,900 cfs over the past week with 60 cfs coming from the Lake. Mean surface salinities remained the same at S-79, Val I-75, and Ft. Myers and increased at the remaining sites within 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 Shell Point and in the stressed range at Cape Coral (5-9) and Sanibel (>25).

Stormwater Treatment Areas

For the week ending Sunday, July 3, 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 328,000 ac-feet. Most STA cells are near or above target stage. 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. This week, there is no capacity for Lake releases in the STAs.

Everglades

Ascension rates decreased in the south (3A/B and Everglades National Park) this week, with most of the Everglades Protection Area (EPA) falling within the good or fair range. Descension rates decreased or held steady in the north end of the EPA this week, a good thing as higher than average rates stress flora and fauna. Florida Bay and environs stages fell slightly last week but remain well above average. Salinities on average were mixed last week in Florida Bay but remain below the 25th percentile for this time of year, conditions remain ideal to move water south as rains continue.

Biscayne Bay

Total inflow to Biscayne Bay averaged 690 cfs and the previous 30-day mean inflow averaged 2,370 cfs. The seven-day mean salinity was 22 at BBCW8 and 21 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 July 3, 2022, lake stages were 55.1 feet NGVD (1.4 feet below schedule) in East Lake Toho, 52.3 feet NGVD (1.2 feet below schedule) in Lake Toho, and 48.7 feet NGVD (2.3 feet below schedule) in Lakes Kissimmee-Cypress-Hatchineha (KCH) (**Table KB-1, Figures KB-1-3**).

Lower Kissimmee

Discharges to the Kissimmee River were reduced to 0 cfs at S-65 and 65A on Wednesday June 22, 2022 to slow the rate of stage decline in KCH. Discharges on July 3, 2022 were 0 cfs at S-65 and 180 cfs at S-65A; the increase in discharge at S-65A was to control the rise in S-65A headwater stage. Discharges from the Kissimmee River were 370 cfs at S-65D and 260 cfs at S-65E (**Table KB-2**). Headwater stages were 46.6 feet NGVD at S-65A and 26.2 feet NGVD at S-65D on July 3, 2022. The concentration of dissolved oxygen in the Kissimmee River rose over the last week from a low of 3.8 mg/L on June 26, 2022, with an average of 4.4 mg/L for the week ending on July 3, 2022 (**Table KB-2, Figure KB-5**). Over the week ending July 3, 2022, Kissimmee River mean river channel stage varied with S-65A discharge but declined overall (**Figure KB-4**); water depth on the Kissimmee River floodplain also declined over the week, with a mean depth of 0.35 feet on July 3, 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. Encourage stage in KCH to rise by continuing 0 cfs discharge at S-65 and S-65A except when S-65A flow can be increased to manage stage in Pool A.

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)	
							7/3/22	6/26/22
Lakes Hart and Mary Jane	S-62	LKMJ	0	59.5	R	60.0	-0.5	-0.7
Lakes Myrtle, Preston and Joel	S-57	S-57	0	60.1	R	61.0	-0.9	-1.1
Alligator Chain	S-60	ALLI	0	62.1	R	63.2	-1.1	-1.1
Lake Gentry	S-63	LKGT	1	59.6	R	61.0	-1.4	-1.6
East Lake Toho	S-59	TOHOE	0	55.1	R	56.5	-1.4	-1.6
Lake Toho	S-61	TOHOW S-61	0	52.3	R	53.5	-1.2	-1.3
Lakes Kissimmee, Cypress and Hatchineha	S-65	KUB011 LKIS5B	0	48.7	R	51.0	-2.3	-2.5

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.

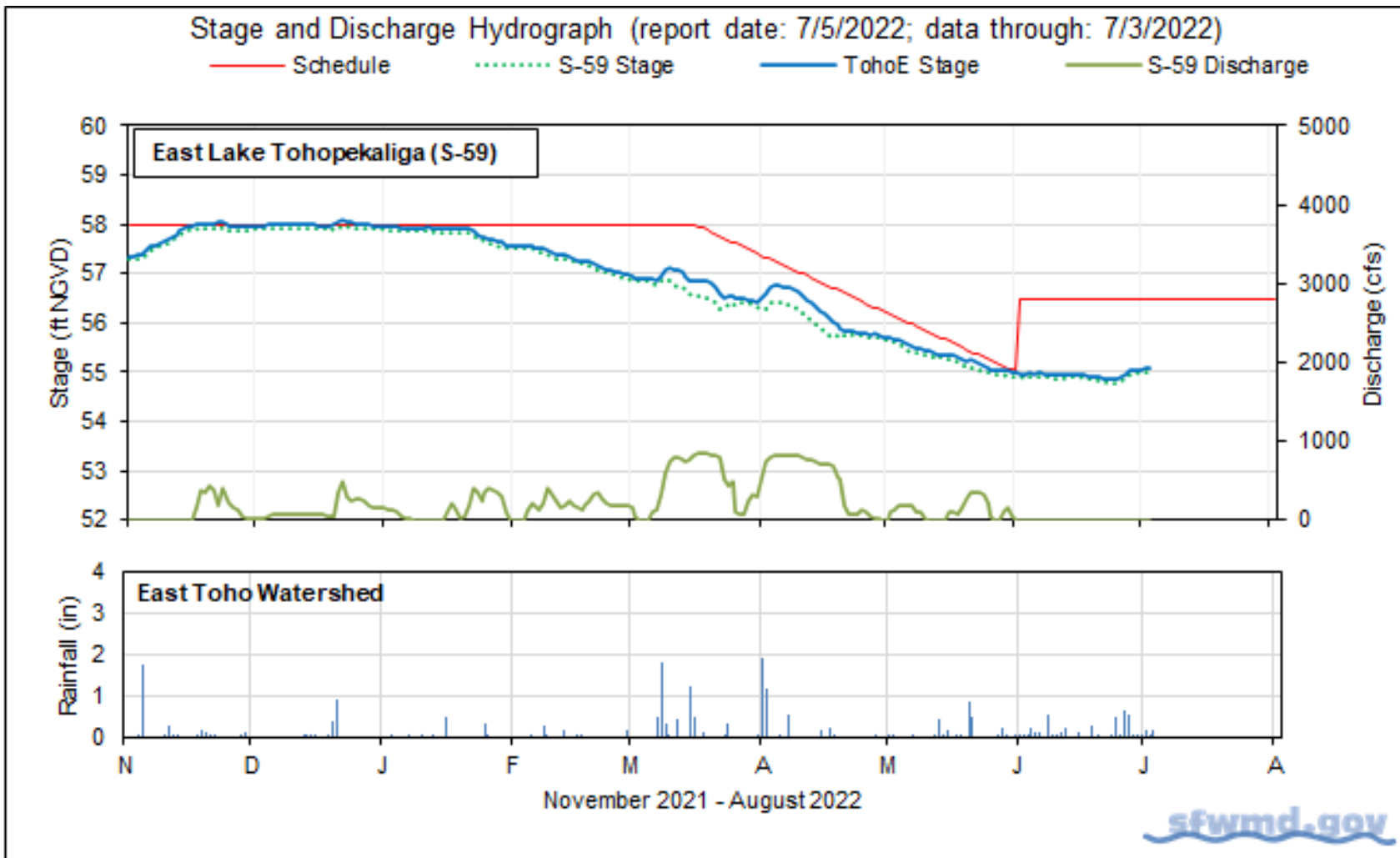


Figure KB-1. East Lake Toho regulation schedule, stage, discharge and rainfall.

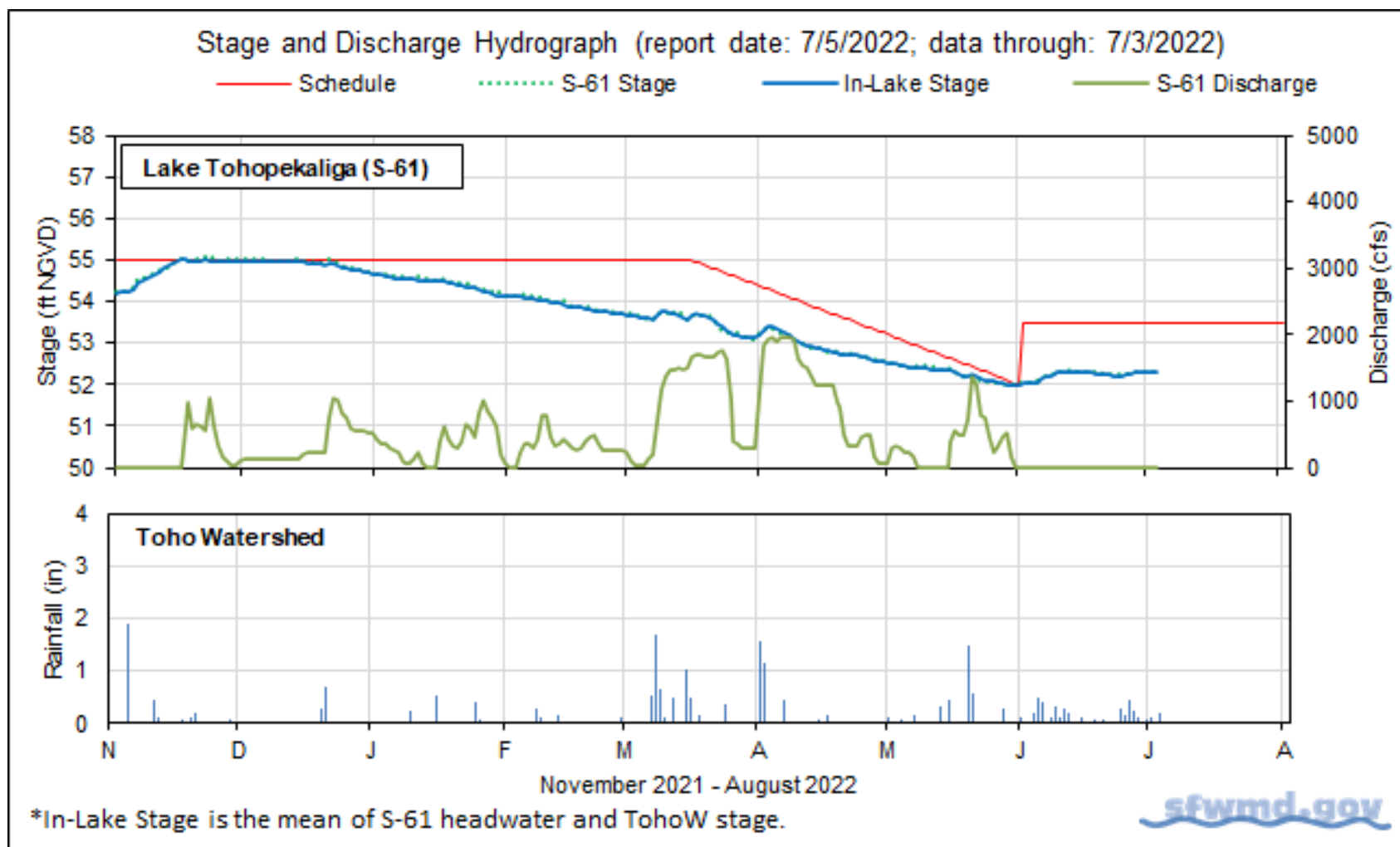


Figure KB-2. Lake Toho regulation schedule, stage, discharge and rainfall.

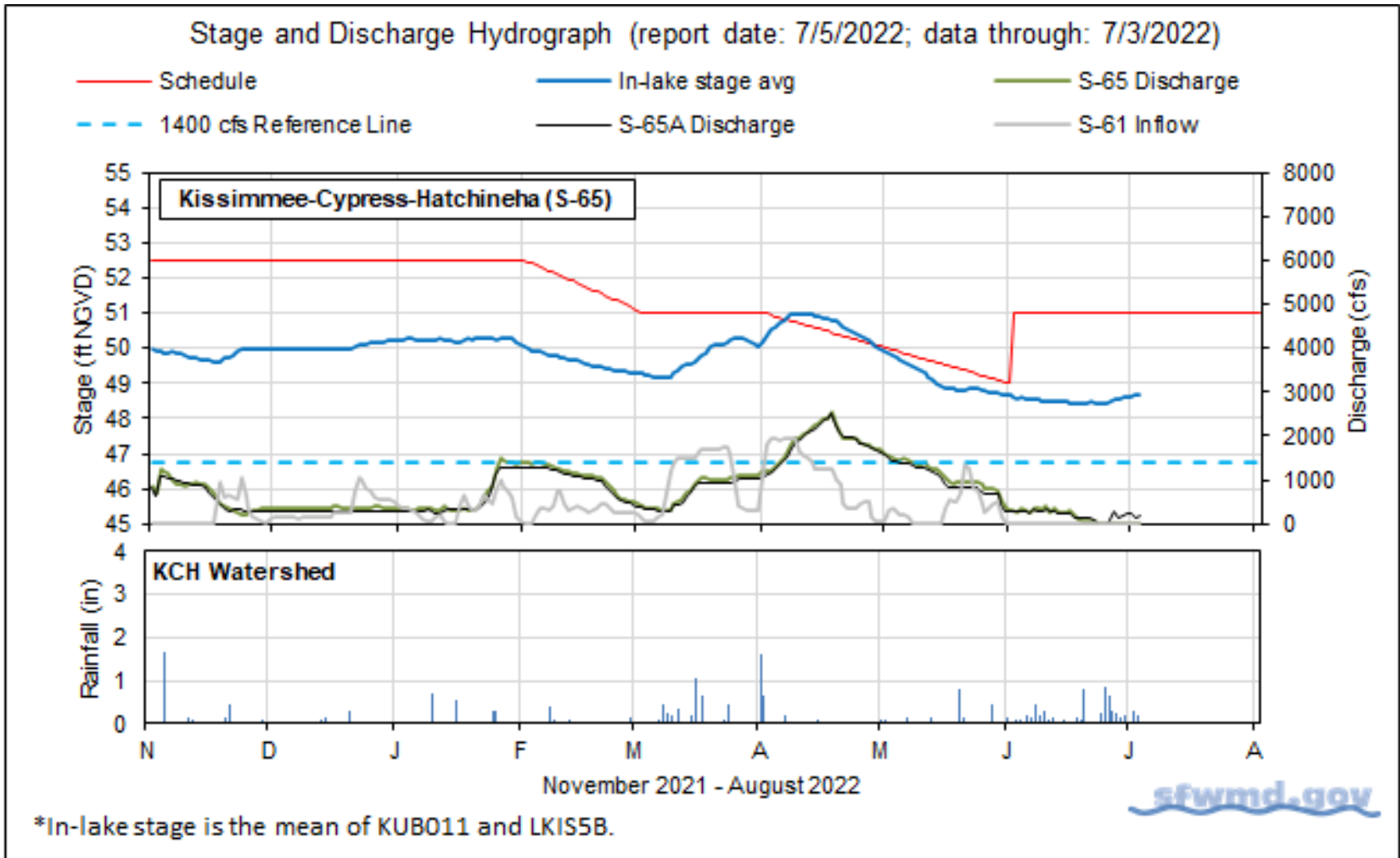


Figure KB-3. Lakes Kissimmee, Cypress and Hatchineha regulation schedule, stage, discharge and rainfall.

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			
		7/3/22	7/3/22	6/26/22	6/19/22	6/12/22
Discharge	S-65	0	0	30	210	340
Discharge	S-65A ^a	180	200	70	190	300
Headwater Stage (feet NGVD)	S-65A	46.6	46.5	46.5	46.4	46.3
Discharge	S-65D ^b	370	470	310	310	330
Headwater Stage (feet NGVD)	S-65D ^c	26.2	26.2	26.2	26.6	26.8
Discharge (cfs)	S-65E ^d	260	380	230	300	330
Discharge (cfs)	S-67	0	0	0	0	0
Dissolved Oxygen (mg/L) ^e	Phase I, II/III river channel	4.4	4.4	5.5	7.4	7.9
Mean depth (feet) ^f	Phase I floodplain	0.35	0.40	0.41	0.28	0.27

a. Combined discharge from main and auxiliary structures.

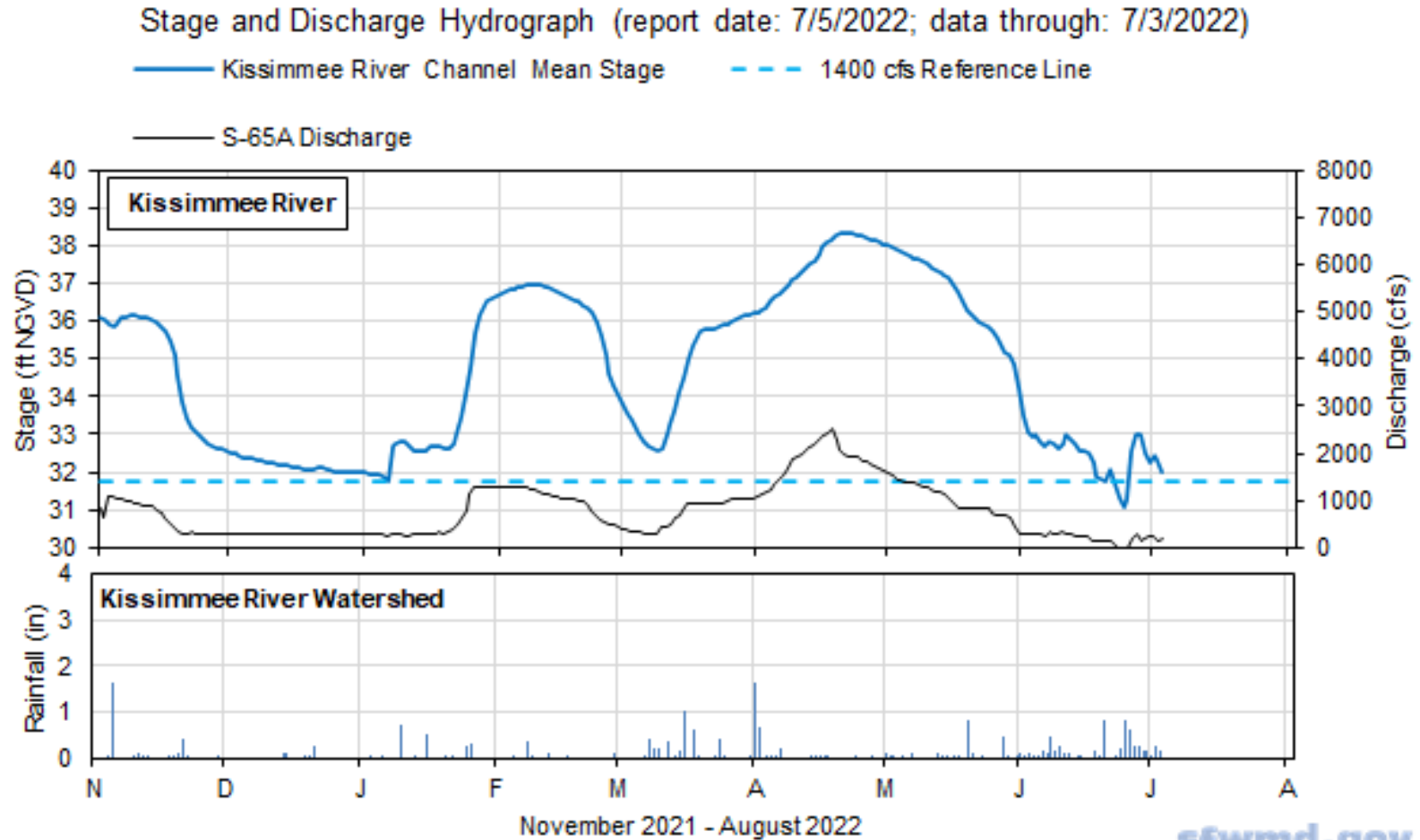
b. Combined discharge from S-65D, S-65DX1 and S-65DX2.

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).



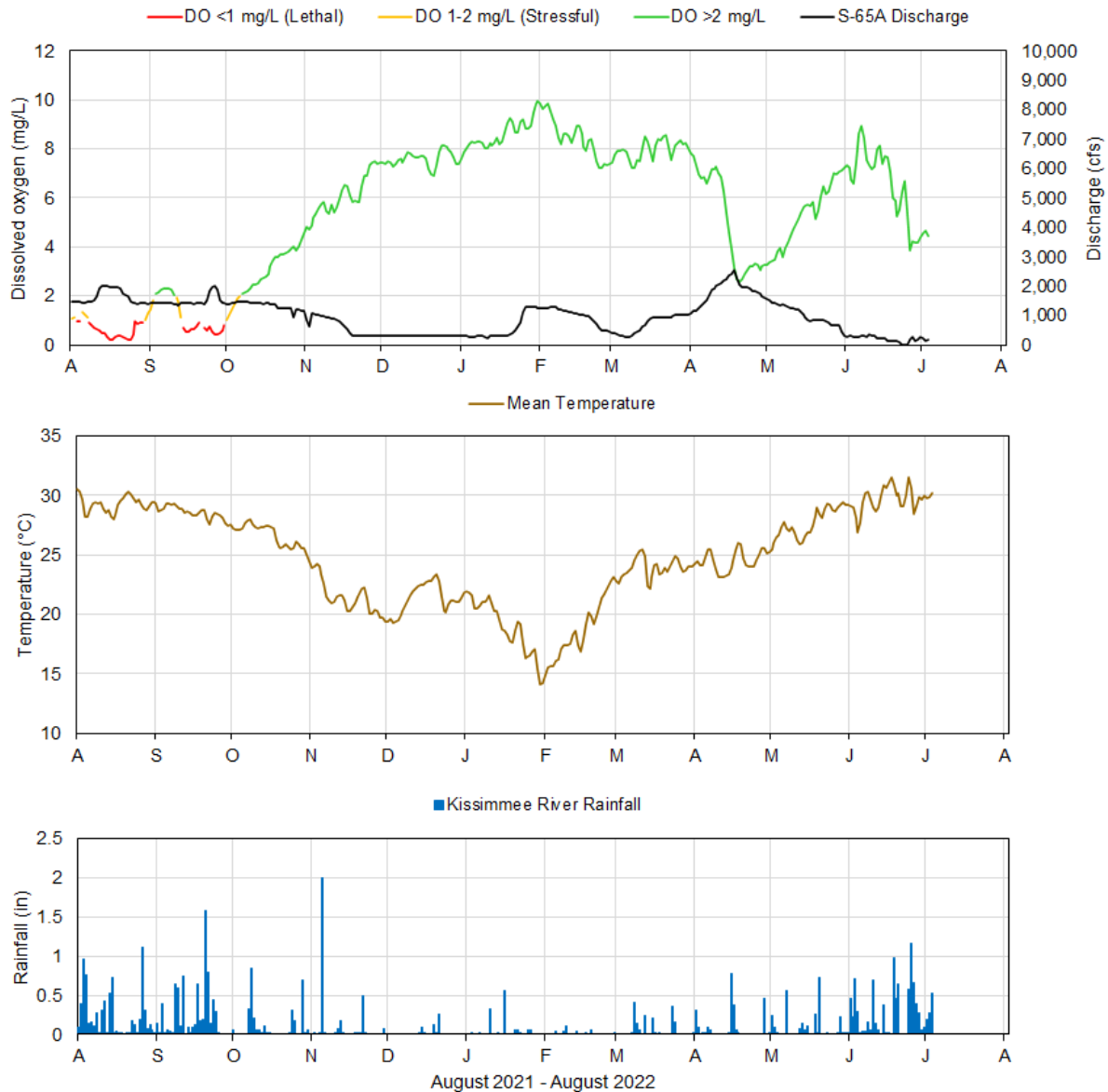
*River Channel Stage is the average for PC62, KRDR02, KRBN, PC33, and PC11.

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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



Report Date: 7/5/2022; data are through: 7/3/2022

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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 three stations reporting this week. Rainfall values are daily totals for Kissimmee River (Pool BCD) AHED watershed.

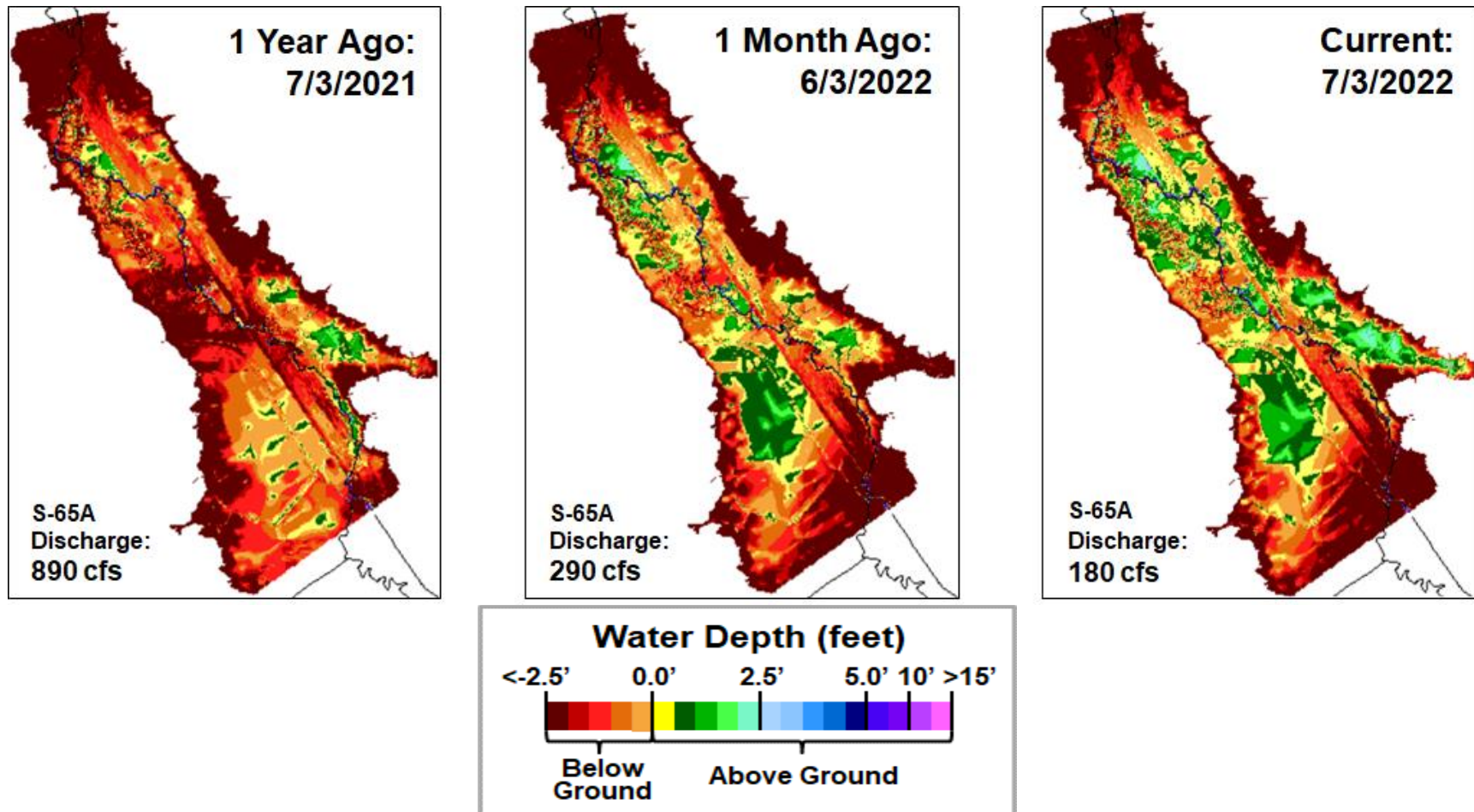


Figure KB-6. Phase I area Kissimmee River floodplain water depths (from left to right) one year ago, one month ago and current.

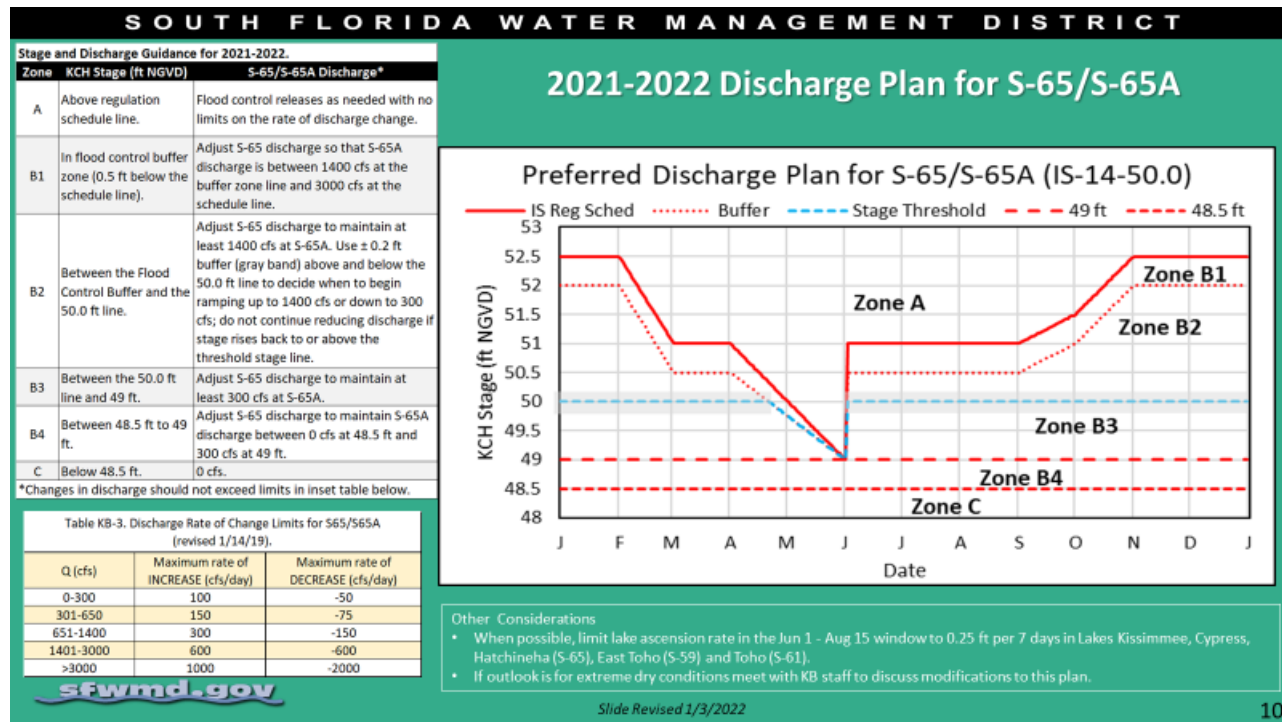


Figure KB-7. IS-14-50 Discharge Plan for S65/S65A with discharge rate of change limits (revised 1/14/19).

Lake Okeechobee

Lake Okeechobee stage was 12.88 feet NGVD on July 3, 2022, with water levels 0.25 feet higher than a month ago (**Figure LO-1**). Lake stage was in the Base Flow sub-band (**Figure LO-2**) and 0.08 feet above the ecological envelope last week (**Figure LO-3**). Lake stage rose above the ecological envelope on June 8, 2022, after spending 22 weeks within it. According to NEXRAD, 0.45 inches of rain fell directly on the Lake last week.

Average daily inflows (excluding rainfall) increased from the previous week, going from 670 cfs to 1,040 cfs. Average daily outflows (excluding evapotranspiration) decreased, going from 190 cfs to 90 cfs. Highest inflow came from the Kissimmee River/C-38 Canal through the S-65E structure (360 cfs). There was 22 cfs of outflow to the west via S-77, 35 cfs of outflow south through the S-350 structures and 40 cfs of outflow east through S-271. There was a total of 390 cfs of backflow from the east via S-308 last week. **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 (July 3, 2022) from NOAA's Harmful Algal Bloom Monitoring System showed that bloom potential is moderate in the western and northern regions of the lake. The bloom potential decreased slightly along the western, southern, and northern nearshore areas of the Lake compared to the previous two weeks but increased in the central pelagic region. (**Figure LO-6**).

1 Month Ago:
06/03/2022

Current:
07/03/2022

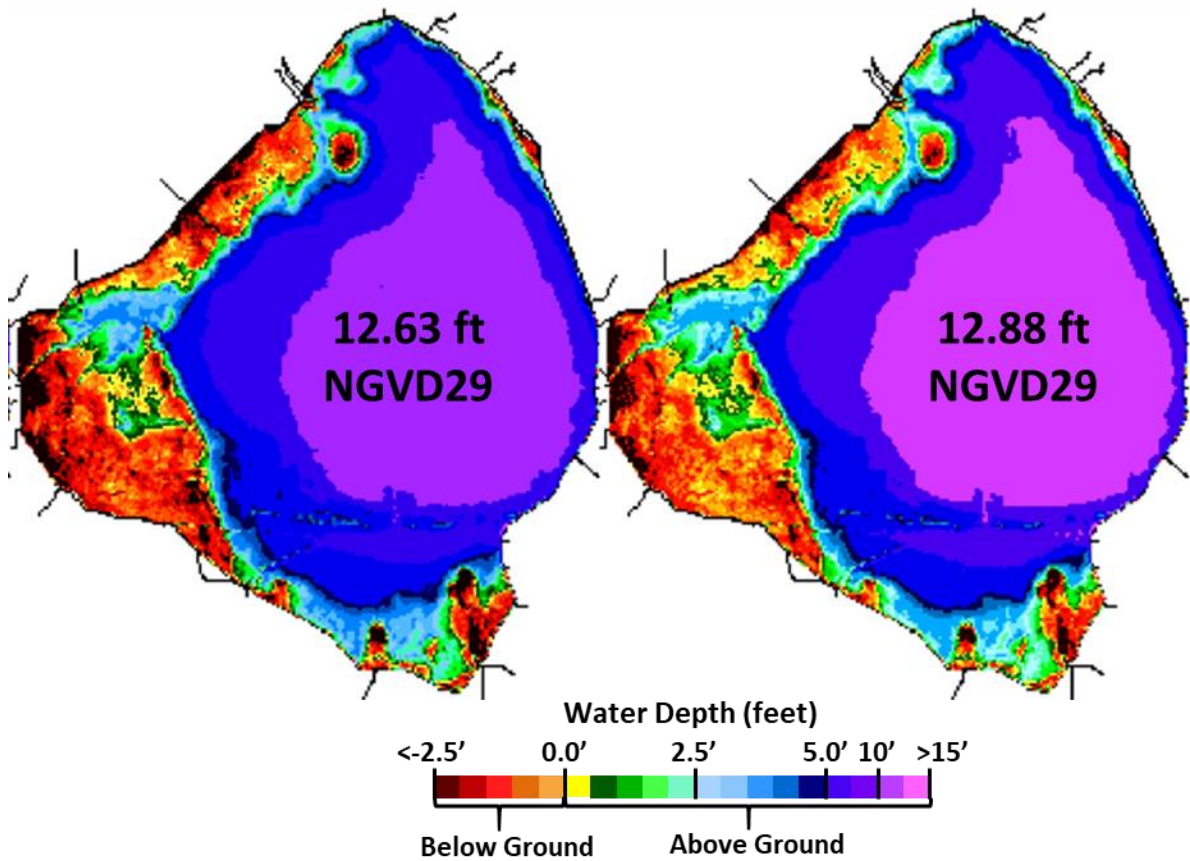
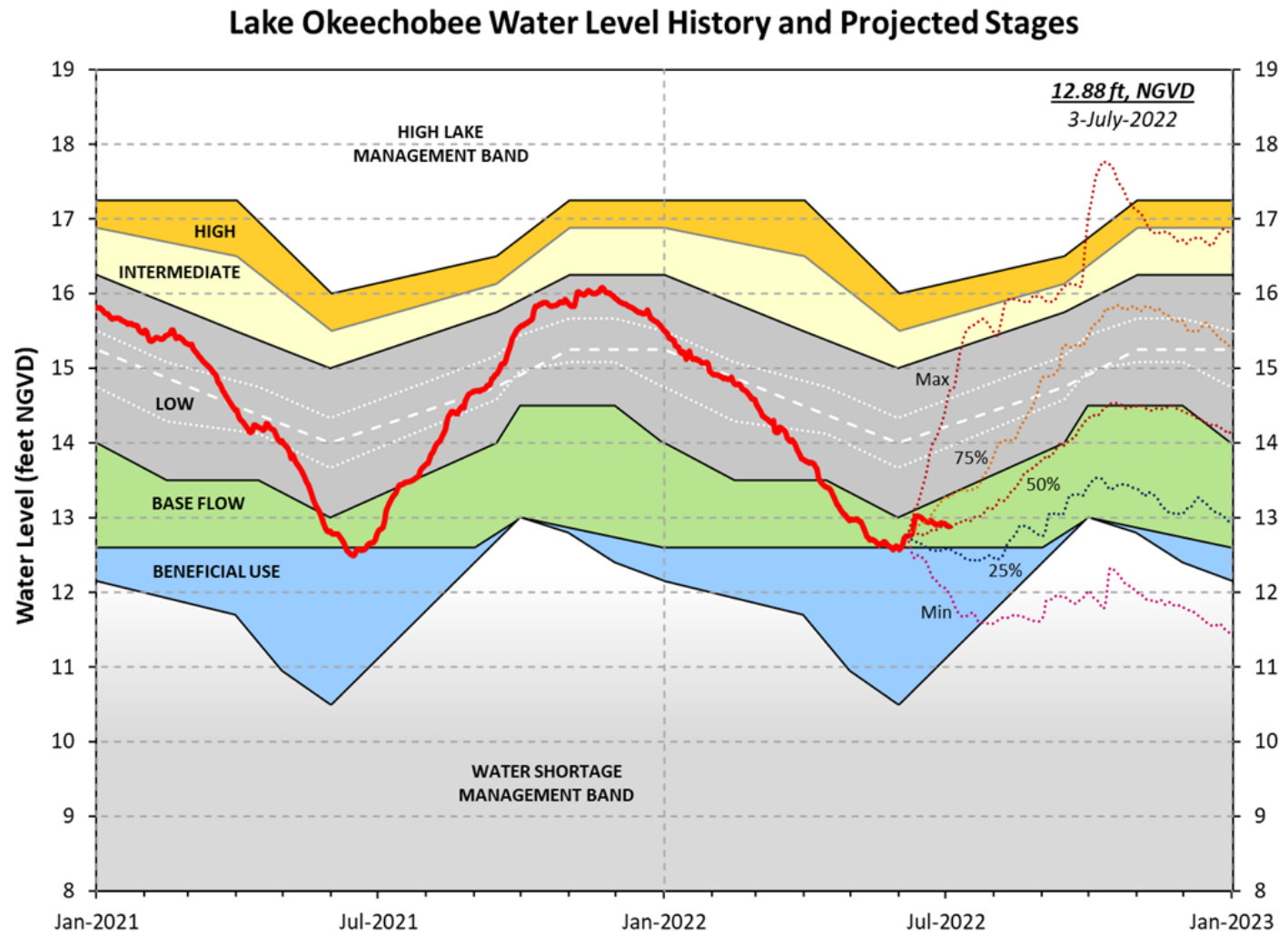


Figure LO-1. Lake Okeechobee water depth estimates based on South Florida Water Depth Assessment Tool (SFWDAT).



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

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

Lake Okeechobee Stage vs Ecological Envelope

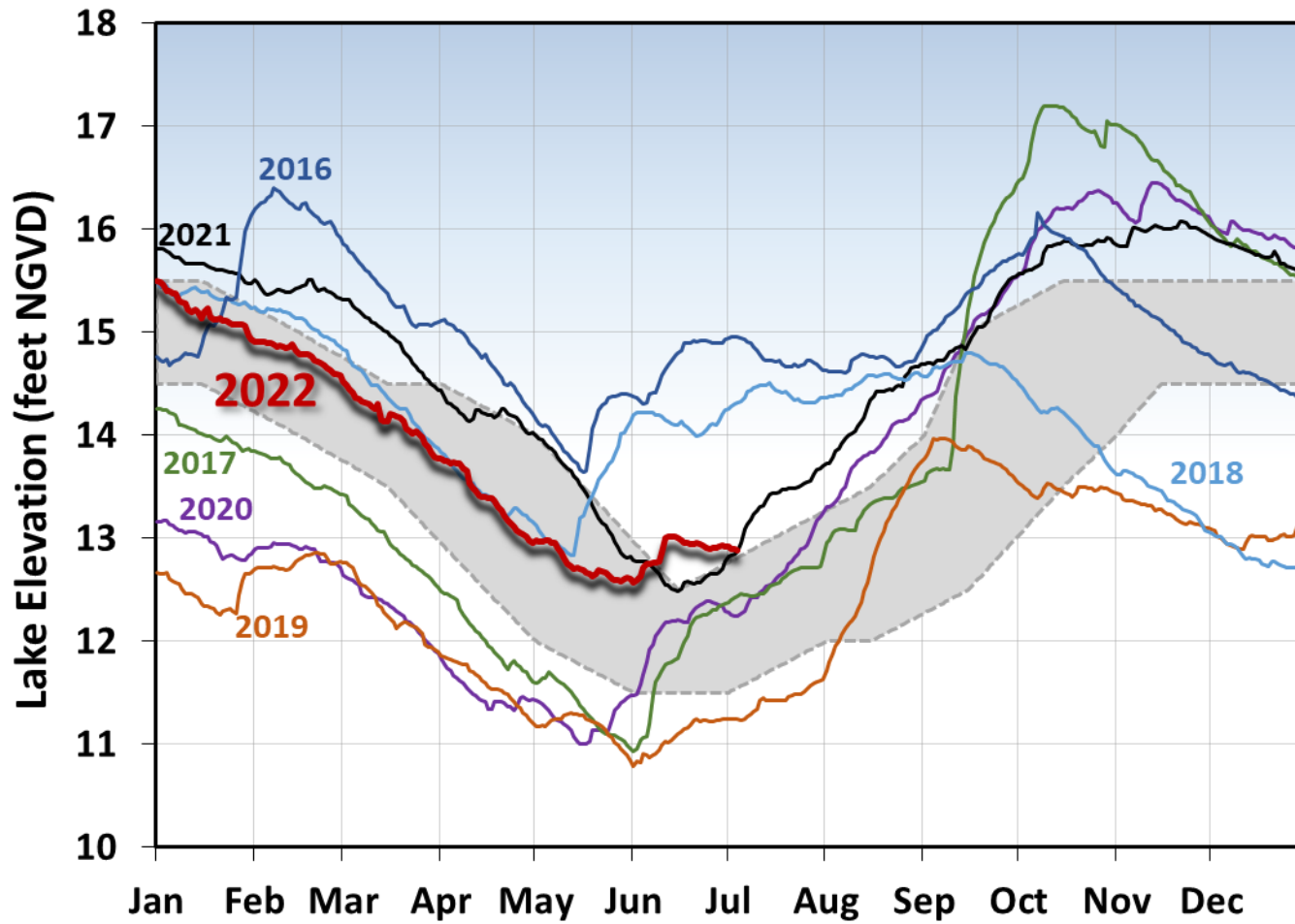


Figure LO-3. The prior six years of annual stage hydrographs for Lake Okeechobee in comparison to the ecological envelope.

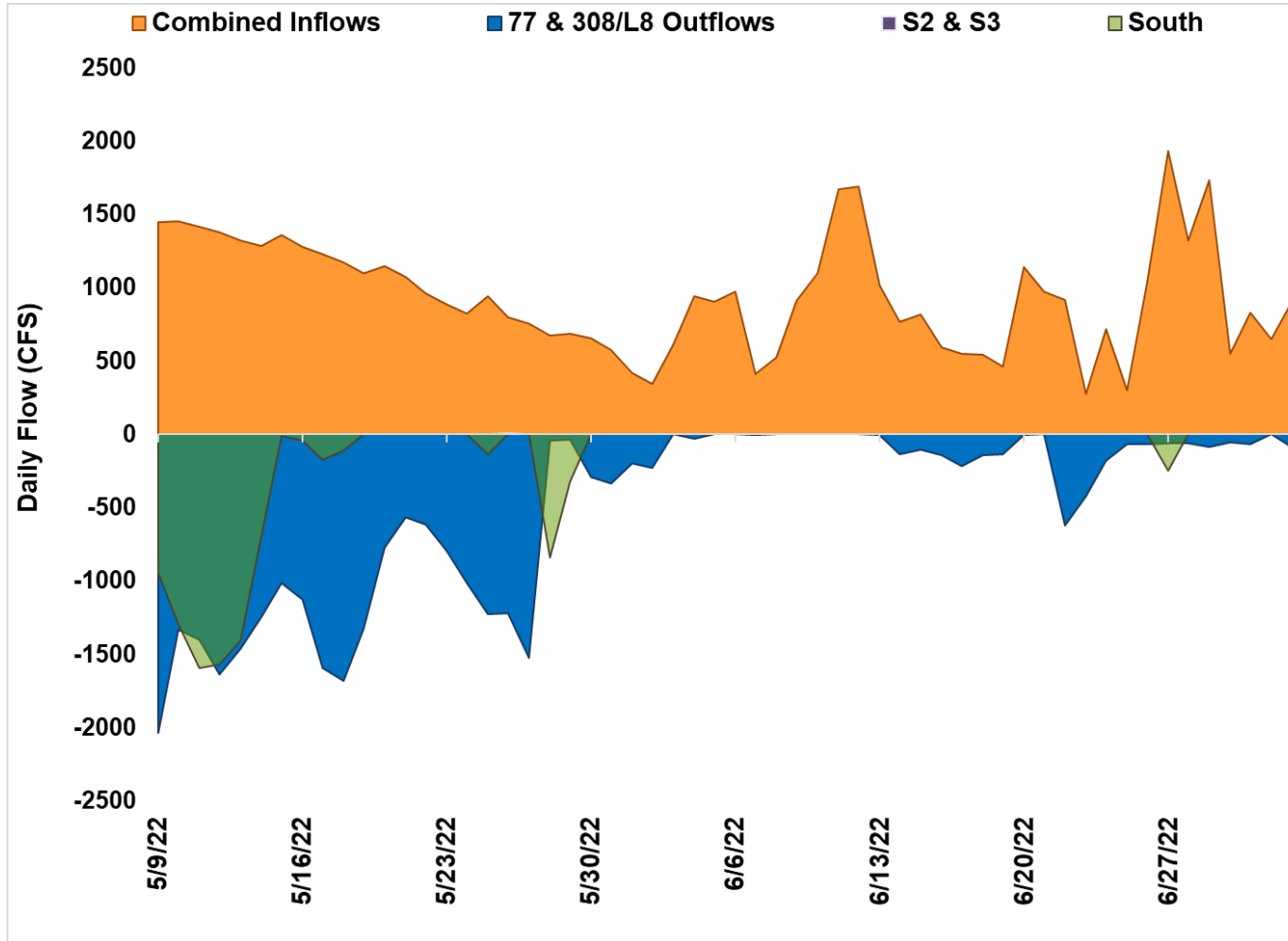


Figure LO-4. Major inflows (orange) to and outflows east and west (blue) from Lake Okeechobee. Outflows south are shown in green. Flows into Lake Okeechobee from the L-8 canal through S-271 (formerly Culvert 10A) or from the C-44 canal through the S-308 are included as inflows. Conversely, flows from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

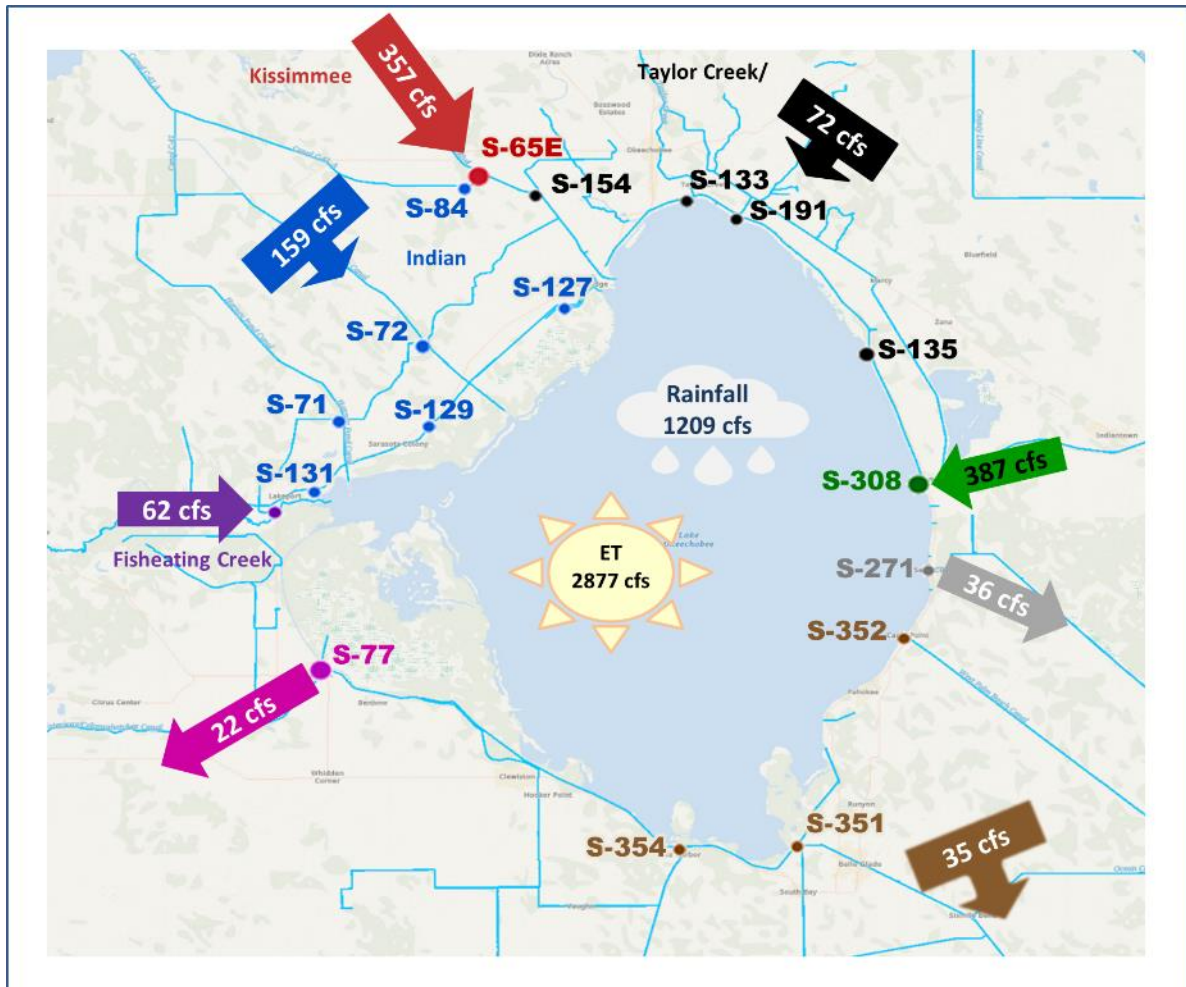


Figure LO-5. Inflows into Lake Okeechobee from Indian Prairie basins, Taylor Creek/Nubbin Slough, Kissimmee River and Fisheating Creek, and outflows to the west via S-77, to the east via S-308, to the south via S-351, S-352, S-354, and to southeast via S-271 (formerly Culvert 10A) for the week of June 27 – July 3, 2022.

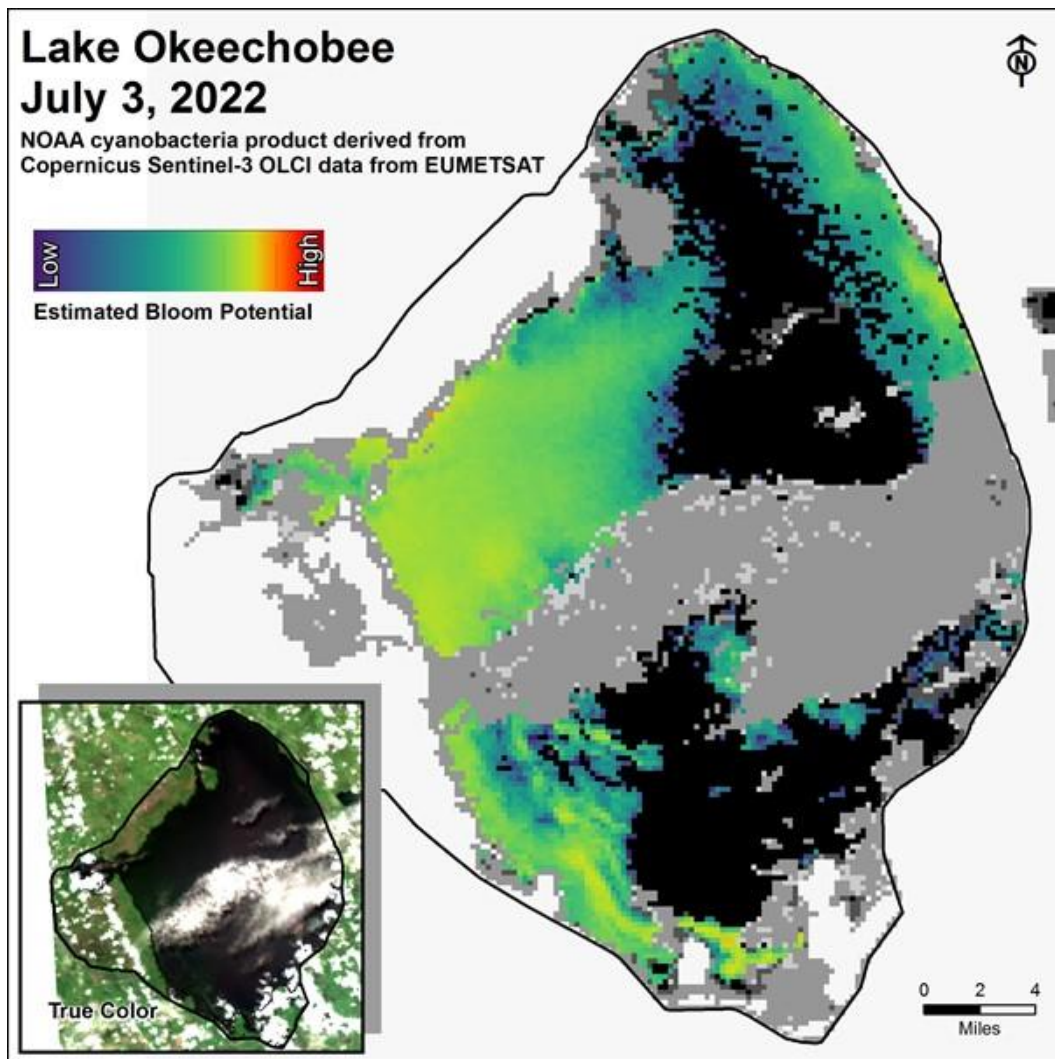


Figure LO-6. Cyanobacteria bloom potential on July 3, 2022 based on NOAA's harmful algal bloom monitoring system. Gray color indicates cloud cover.

Estuaries

St. Lucie Estuary

Over the past week, mean total inflow to the St. Lucie Estuary was 720 cfs (**Figures ES-1 and ES-2**) and the previous 30-day mean inflow was 910 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 19.5. 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 15.3 spat/shell in June (**Figure ES-5**).

Caloosahatchee River Estuary

Over the past week, mean total inflow to the Caloosahatchee River Estuary was 2,899 cfs (**Figures ES-6 and ES-7**) and the previous 30-day mean inflow was 3,918 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, Val I-75 and Ft. Myers, and increased at the remaining 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 Shell Point, and in the stressed range at Cape Coral and Sanibel (**Figure ES-10**). The mean larval oyster recruitment rate reported by the Fish and Wildlife Research Institute was 6.5 spat/shell at Iona Cove and 3.0 spat/shell at Bird Island in June (**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 1500 cfs, and a steady release at 2,000 cfs with estimated tidal basin inflows of 1,600 cfs. Model results from all scenarios predict daily salinity to be 0.6 or lower and the 30-day moving average surface salinity to be 0.3 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 Qiu, 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 24, 2022, that *Karenia brevis*, the Florida red tide dinoflagellate, was observed at background concentrations in three samples from Lee and Collier counties last week. On the east coast, red tide was not observed in samples from Martin, Palm Beach or Miami-Dade counties.

Water Management Recommendations

Lake stage is in the Base Flow 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.

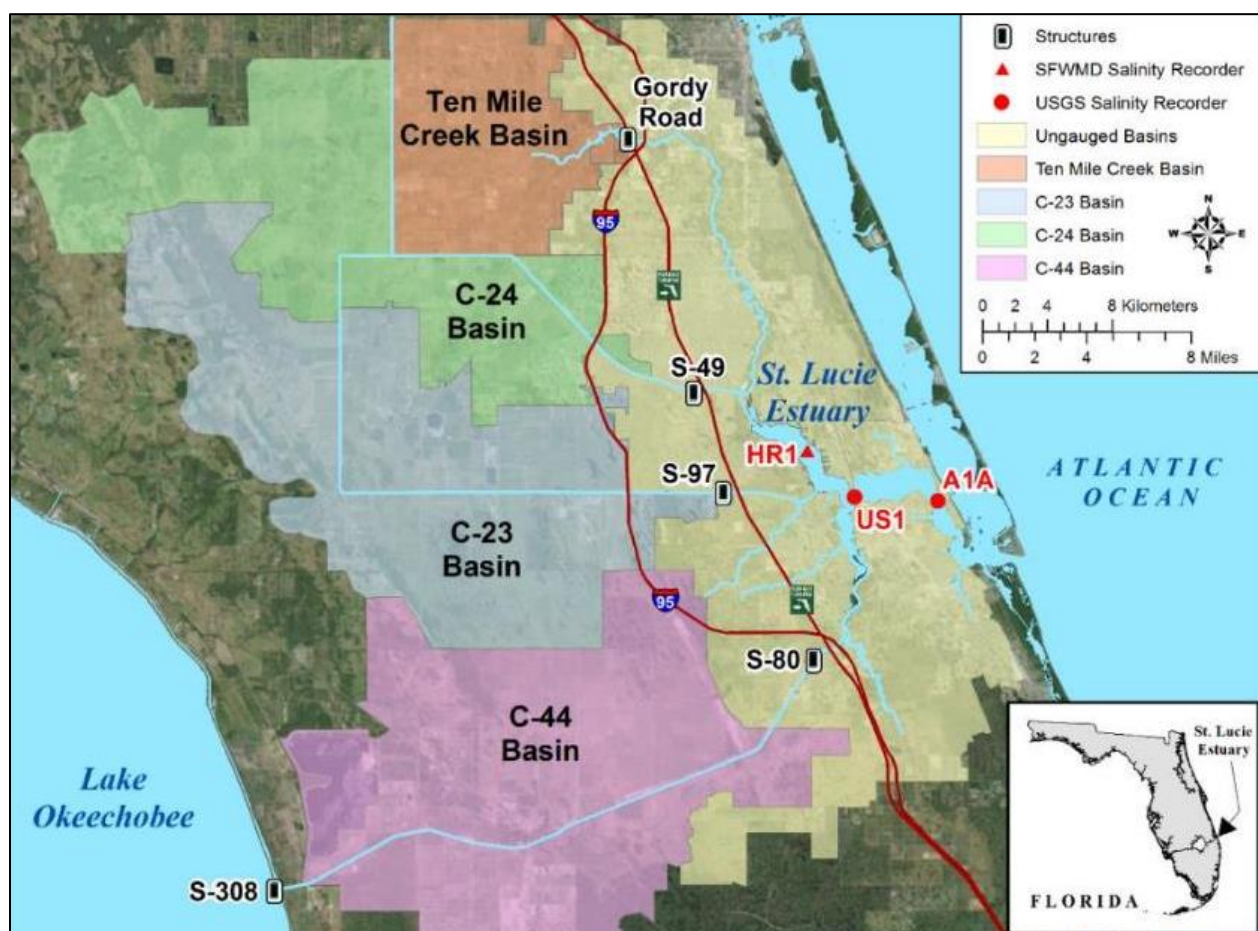


Figure ES-1. Basins, water control structures and salinity monitoring sites in the St. Lucie Estuary.

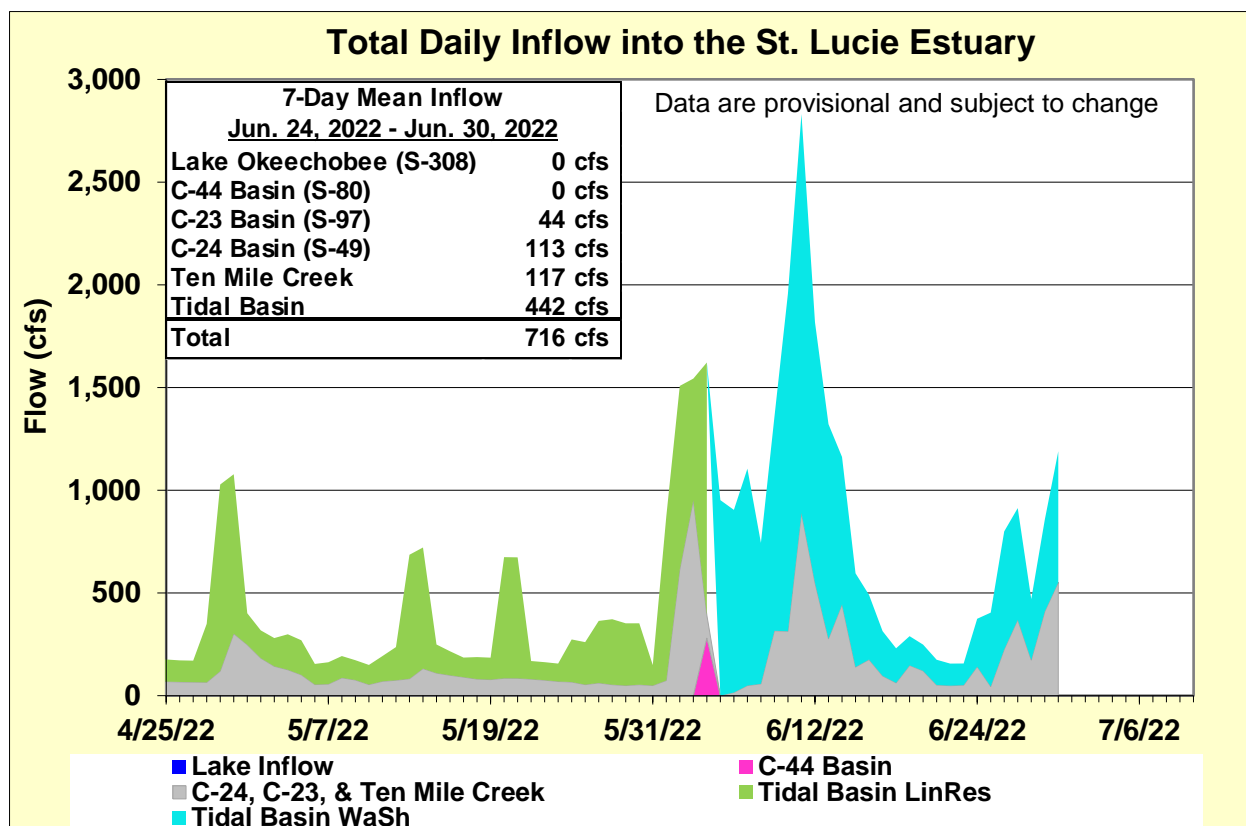


Figure ES-2. Total daily inflows from Lake Okeechobee and runoff from the C-44, C-23, C-24, Ten Mile Creek, and Tidal Basins into the St. Lucie Estuary.

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

Sampling Site	Surface	Bottom	Optimum Envelope
HR1 (North Fork)	12.7 (10.8)	16.5 (15.0)	10.0 – 25.0
US1 Bridge	18.6 (17.3)	20.4 (18.9)	10.0 – 25.0
A1A Bridge	26.1 (26.6)	28.7 (29.1)	10.0 – 25.0

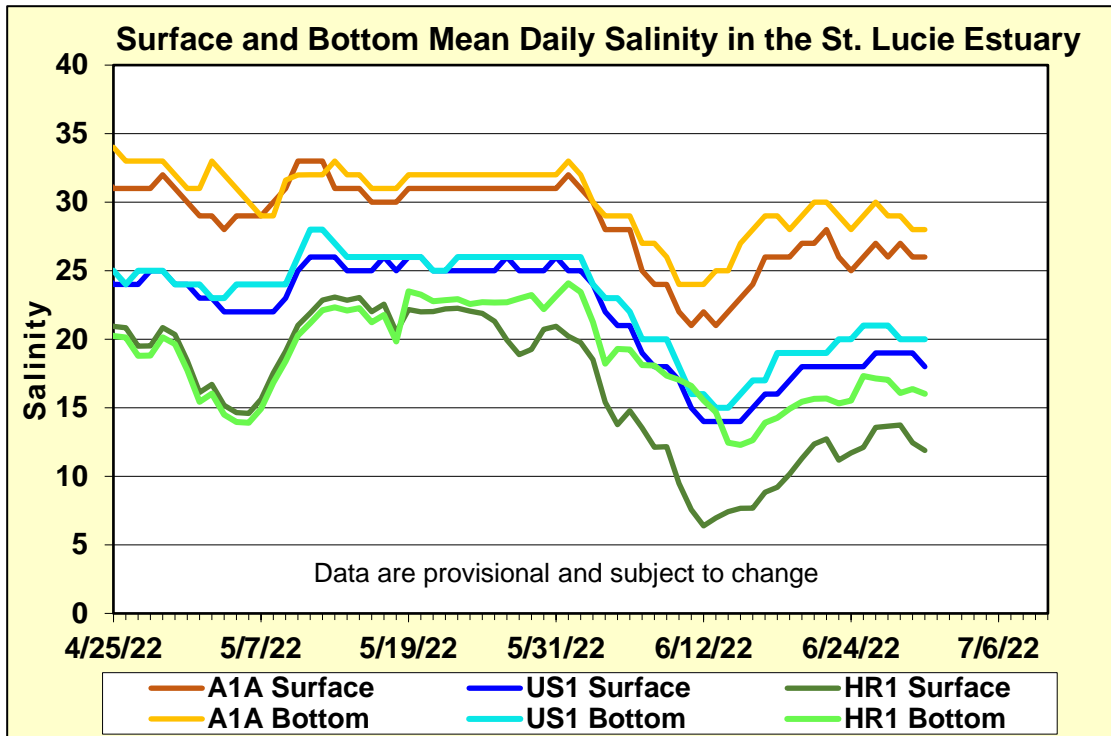


Figure ES-3. Mean daily salinity at the A1A, US1 and HR1 sites in the St. Lucie Estuary.

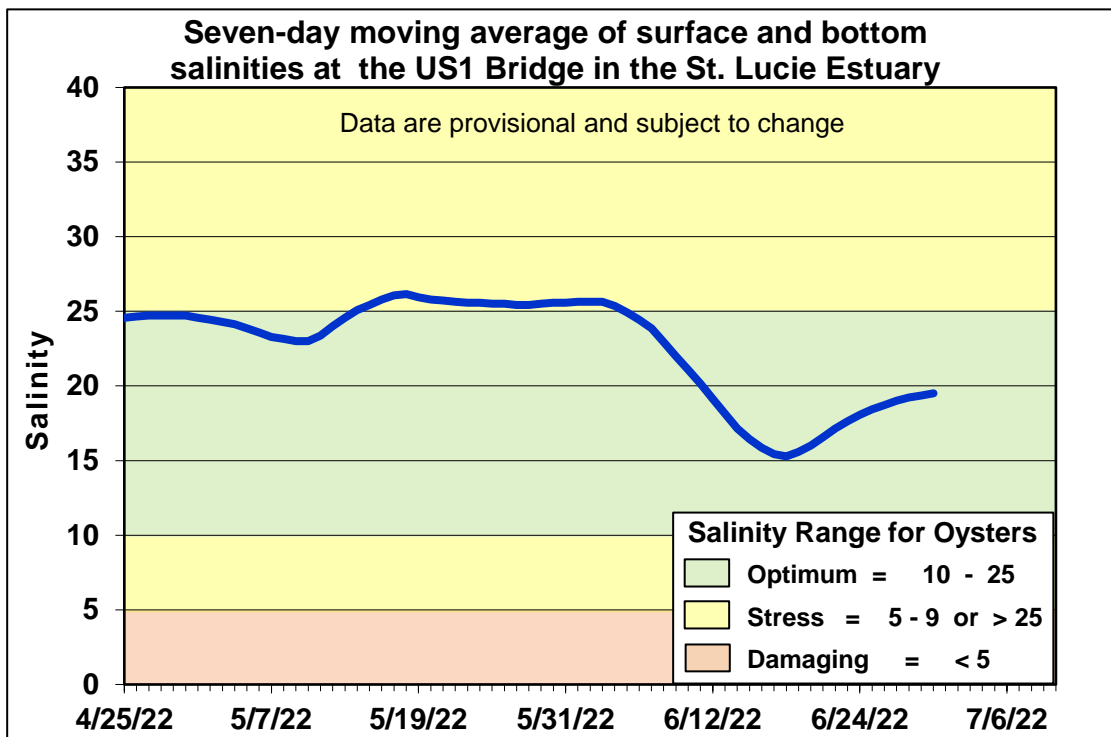


Figure ES-4. Seven-day moving average of the surface and bottom salinities at the US1 Bridge in the St. Lucie Estuary.

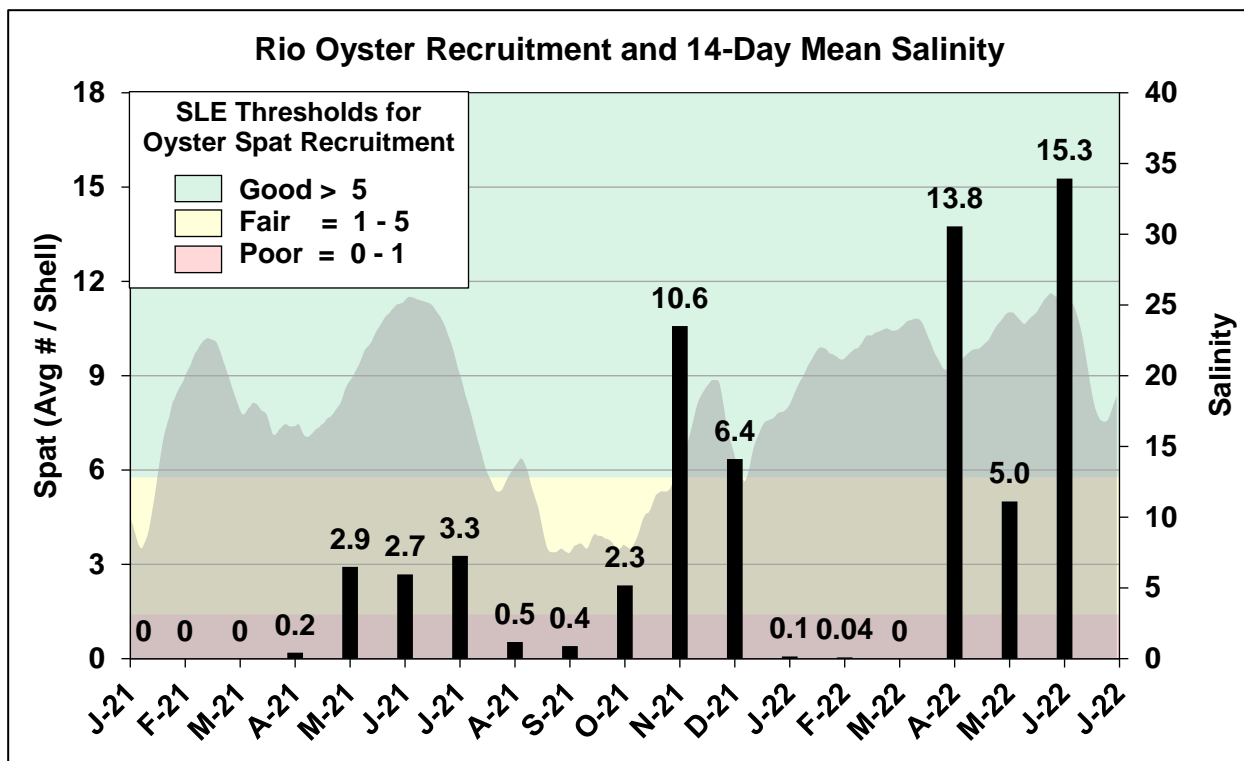


Figure ES-5. Mean oyster recruitment at the Rio oyster monitoring station and 14-day mean salinity at US1 Bridge.

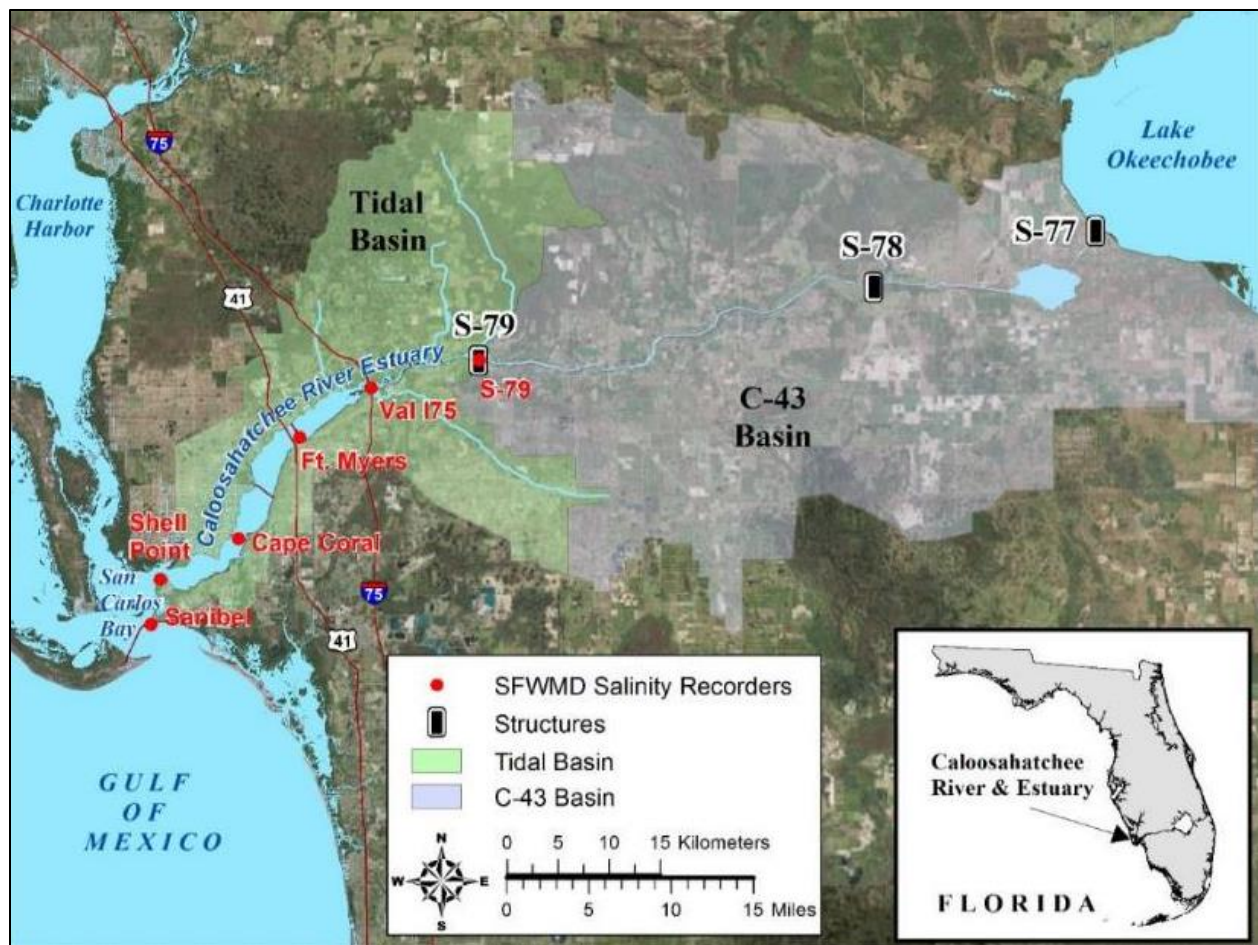


Figure ES-6. Basins, water control structures and salinity monitoring sites in the Caloosahatchee River Estuary.

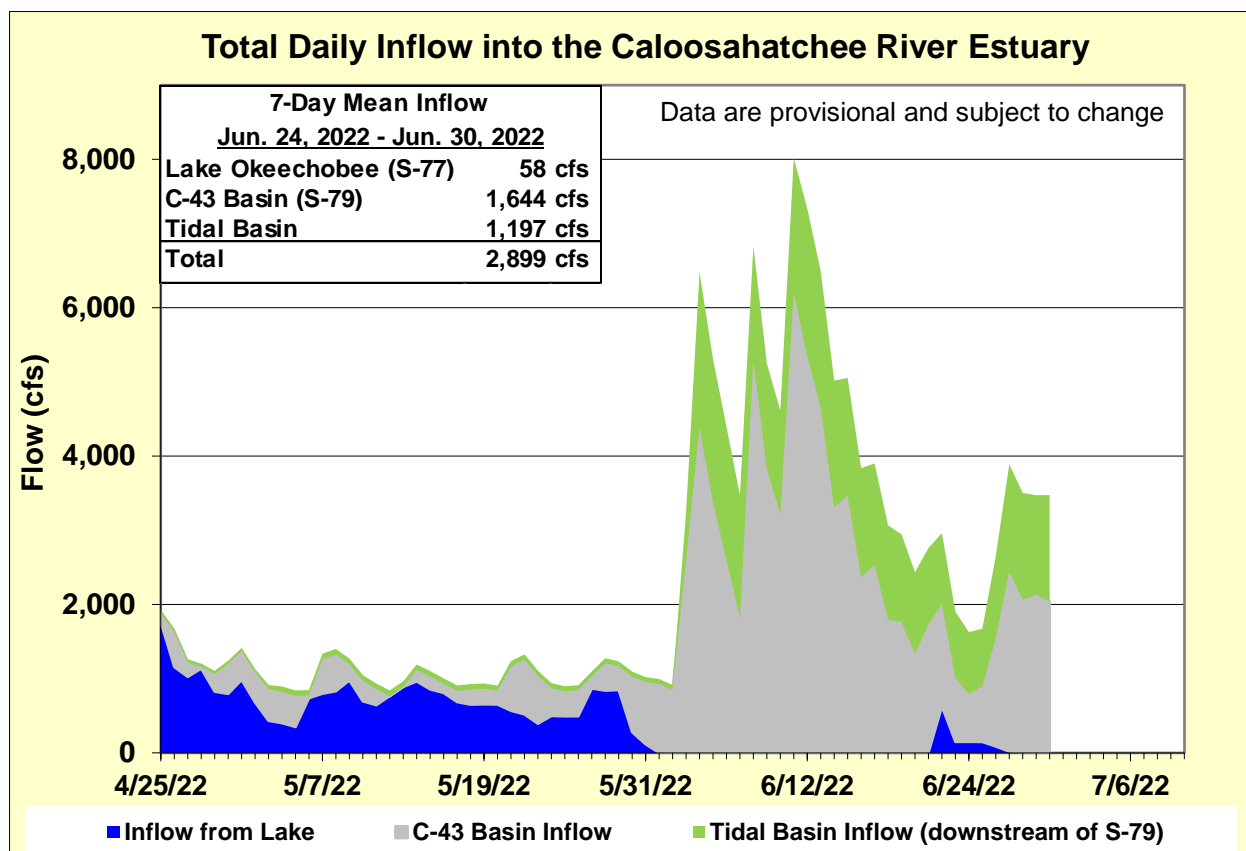


Figure ES-7. Total daily inflows from Lake Okeechobee, and runoff from the C-43 and Tidal basins into the Caloosahatchee River Estuary.

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)	0.3 (0.3)	0.3 (0.2)	0.0 – 10.0
Val I-75	0.3 (0.3)	0.3 (0.3)	0.0 – 10.0
Fort Myers Yacht Basin	0.4 (0.4)	0.5 (0.4)	0.0 – 10.0
Cape Coral	5.2 (4.2)	6.4 (5.7)	10.0 – 25.0
Shell Point	19.7 (17.9)	21.6 (20.0)	10.0 – 25.0
Sanibel	26.8 (26.2)	29.1 (27.6)	10.0 – 25.0

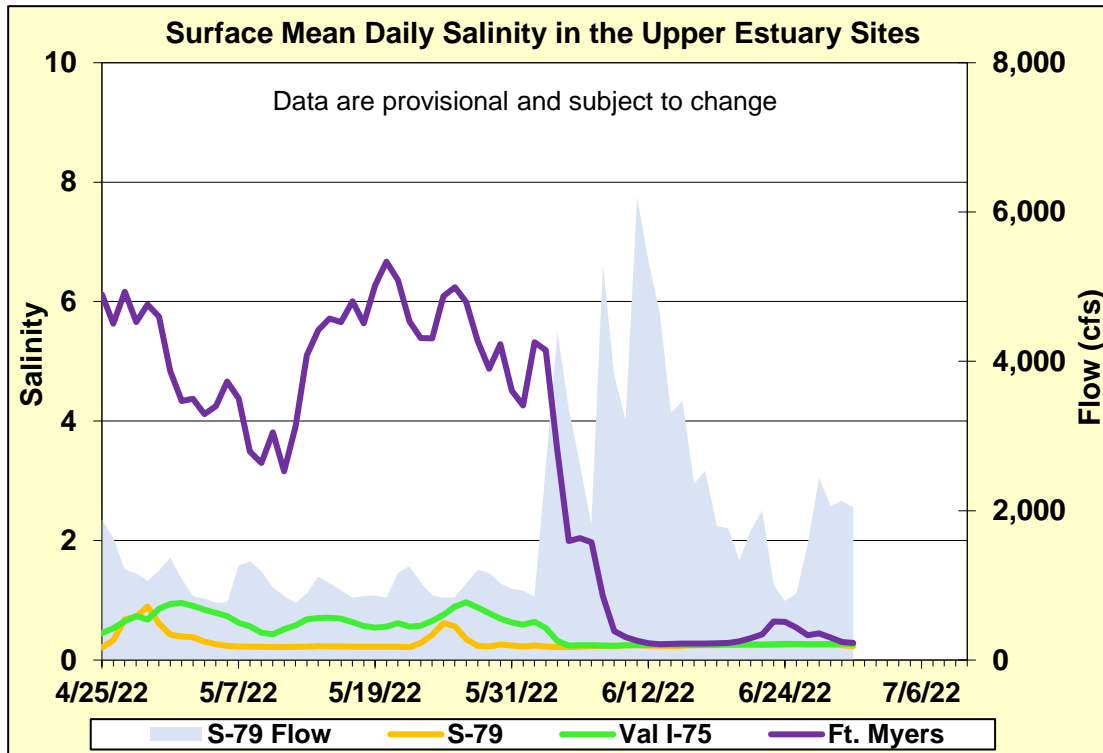


Figure ES-8. Mean daily salinity at upper Caloosahatchee River Estuary monitoring sites and mean daily flow at S-79.

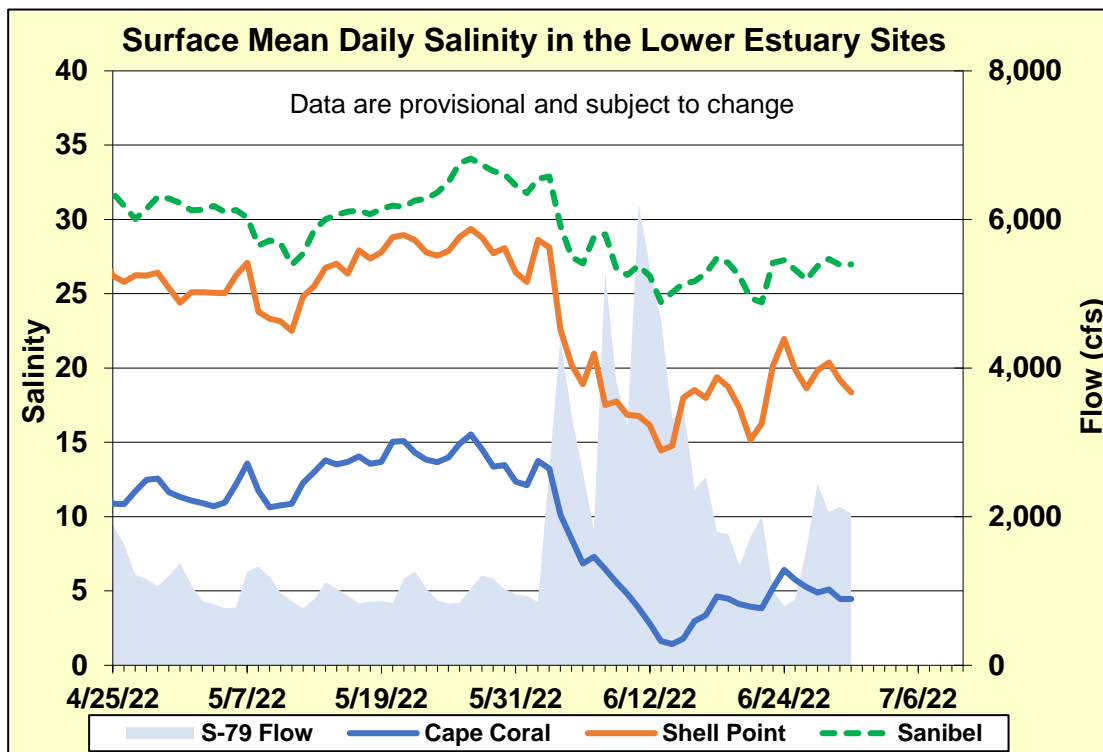


Figure ES-9. Mean daily surface salinity at lower Caloosahatchee River Estuary monitoring sites and mean daily flow at S-79.

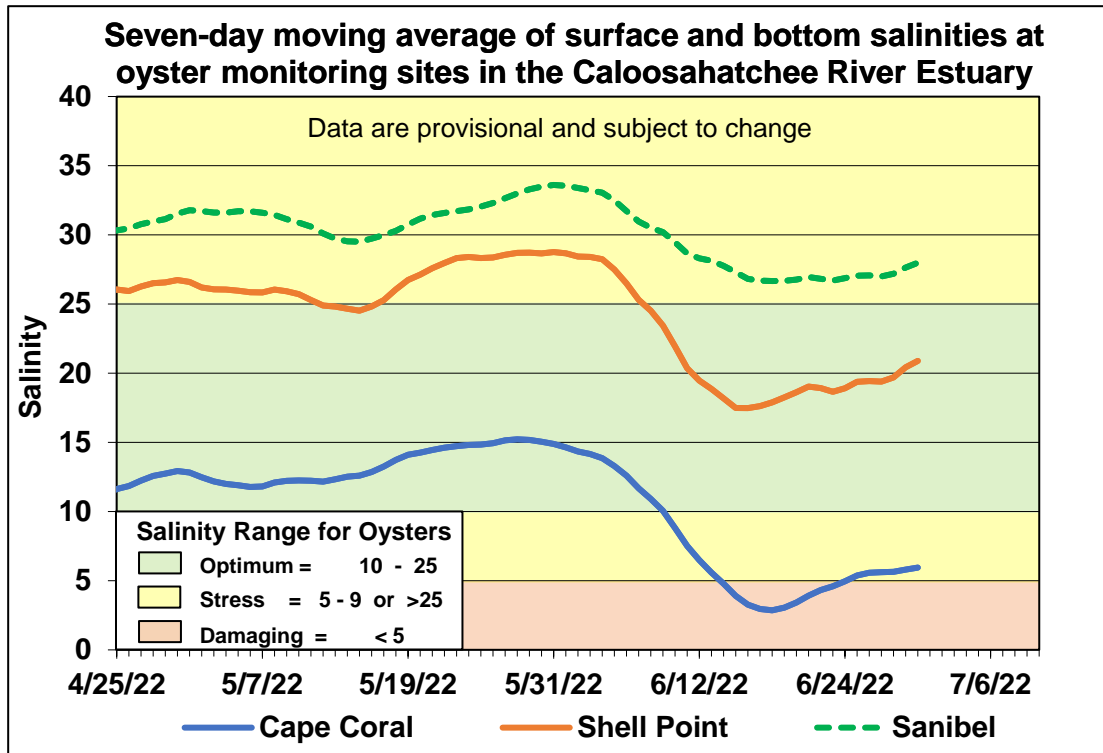


Figure ES-10. Seven-day moving average of surface and bottom salinities at Cape Coral, Shell Point and Sanibel monitoring sites in the Caloosahatchee River Estuary.

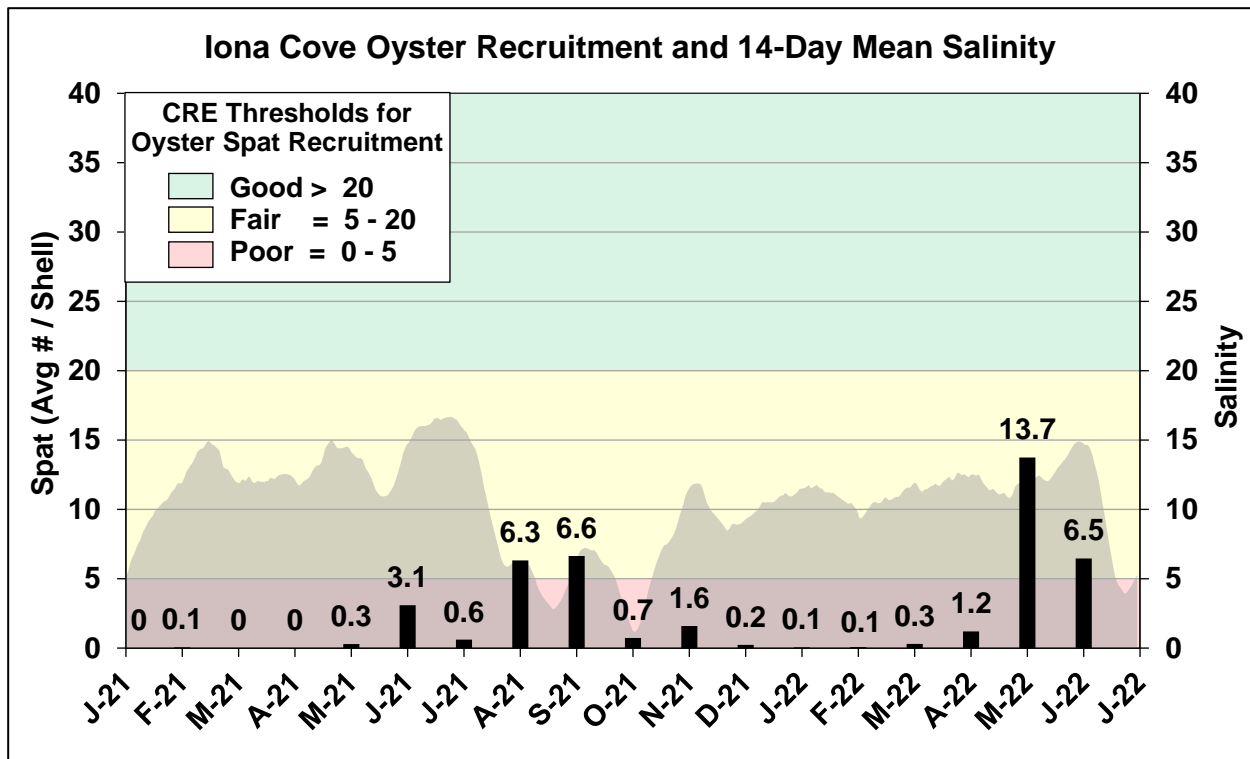


Figure ES-11. Mean oyster recruitment at the Iona Cove oyster monitoring station and 14-day mean salinity at Cape Coral.

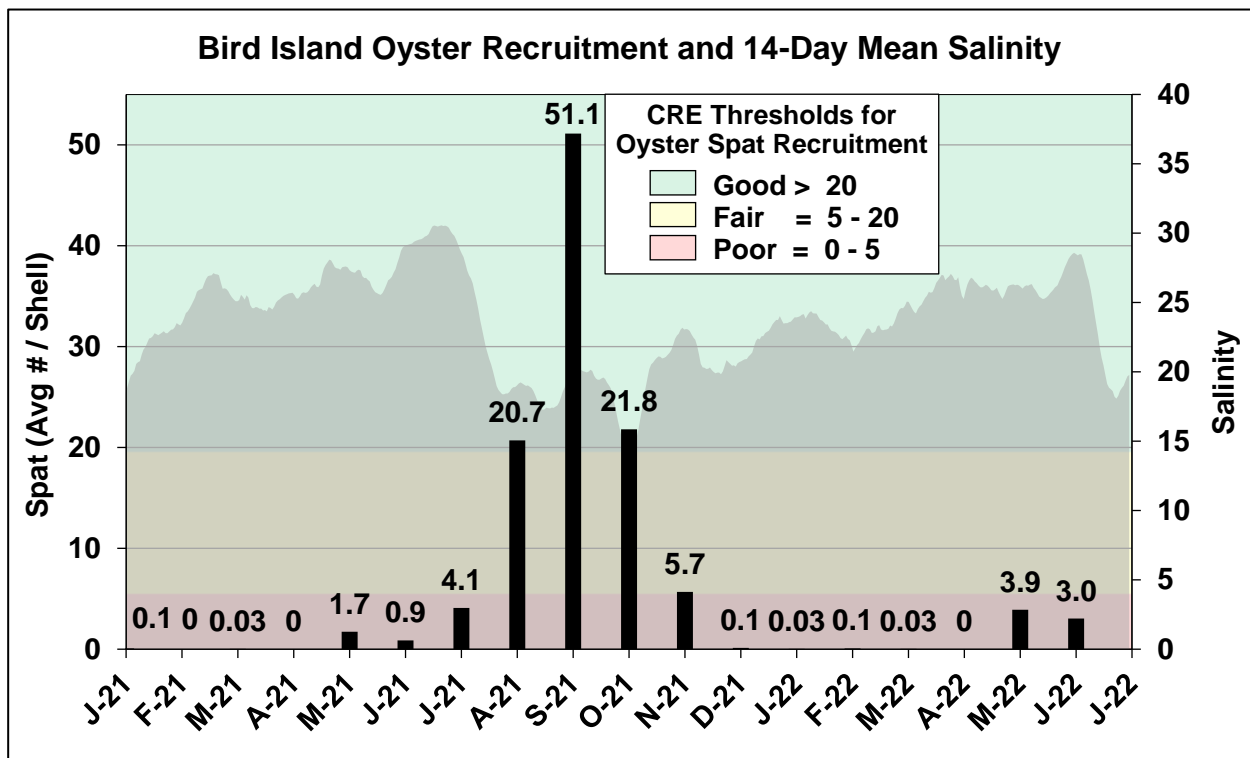


Figure ES-12. Mean oyster recruitment at the Bird Island oyster monitoring station and 14-day mean salinity at Shell Point.

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	1601	0.6	0.3
B	450	1601	0.3	0.3
C	800	1601	0.3	0.3
D	1000	1601	0.3	0.3
E	1500	1601	0.3	0.3
F	2000	1601	0.3	0.3

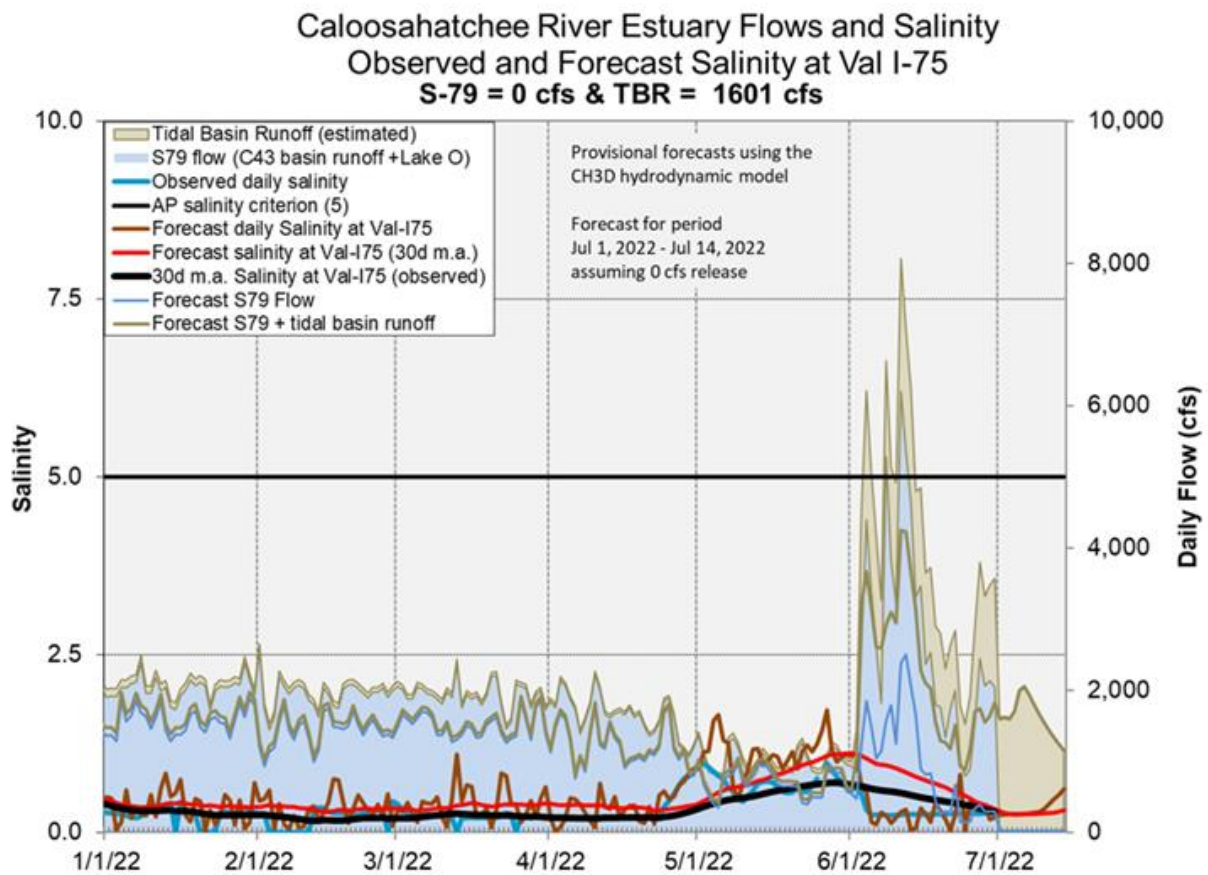


Figure ES-13. Forecasted Val I-75 site surface salinity assuming no pulse release at S-79.

Stormwater Treatment Areas

STA-1E: STA-1E Western Flow-way is offline for post-construction vegetation grow in. Operational restrictions are in place in STA-1E Central and Eastern Flow-ways for vegetation management activities. Online treatment cells are near or above target stage and vegetation in the flow-ways is stressed and highly stressed. The 365-day phosphorus loading rates (PLRs) are high for the Eastern Flow-way and very 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 for vegetation management activities. Most treatment cells are 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 at or below 1.0 g/m²/year (**Figure S-2**).

STA-2: STA-2 Flow-way 2 is offline for construction activities. Operational restrictions are in place in STA-2 Flow-ways 3 and 4 for vegetation management activities. Online treatment cells are 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/m²/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. 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/m²/year (**Figure S-4**).

STA-5/6: STA-5/6 Flow-way 4 is offline for vegetation management activities. Treatment cells are near or 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/m²/year, except Flow-way 5 which is high. (**Figure S-5** and **S-6**).

For definitions on STA operational language see glossary following figures.

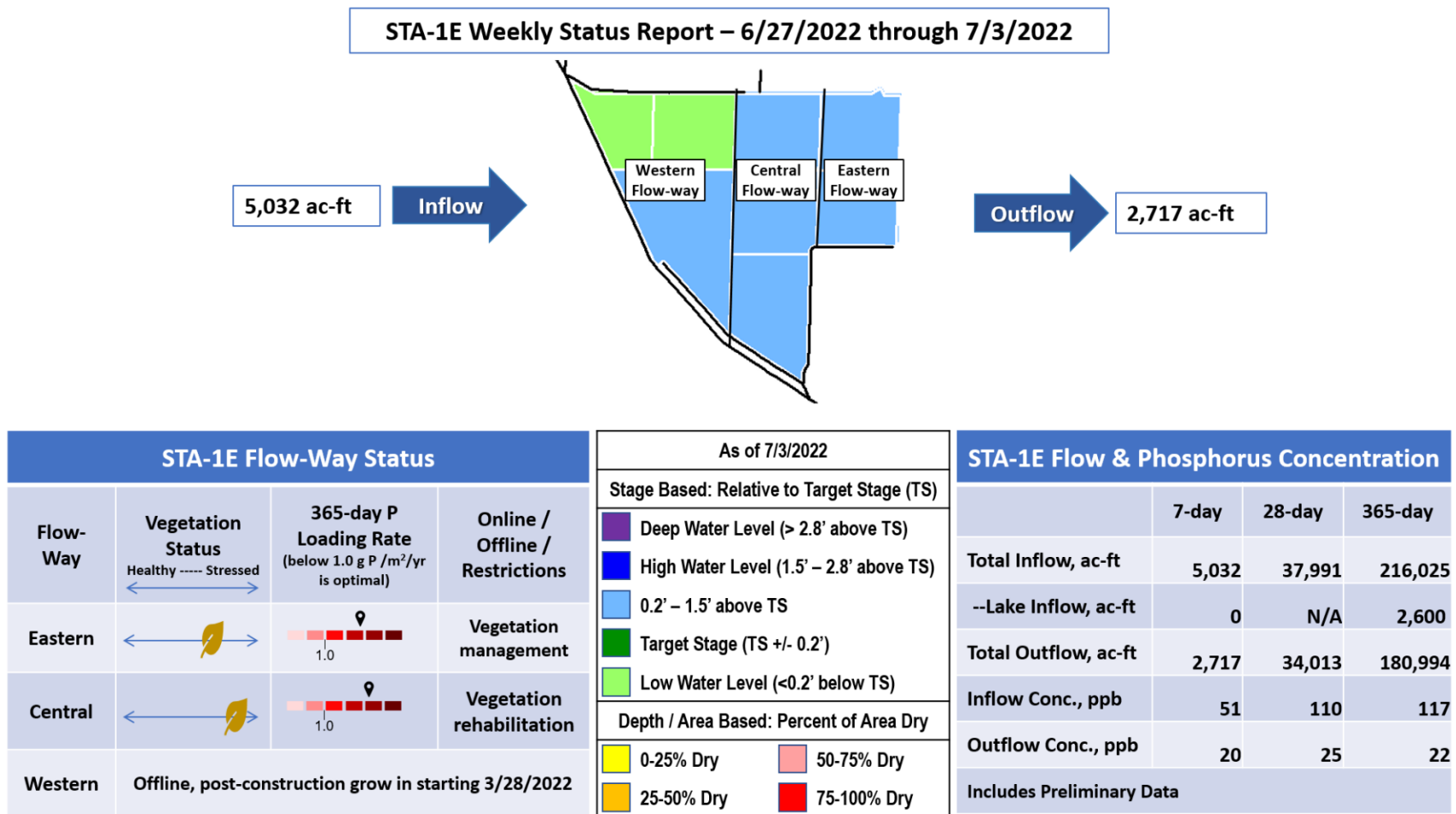
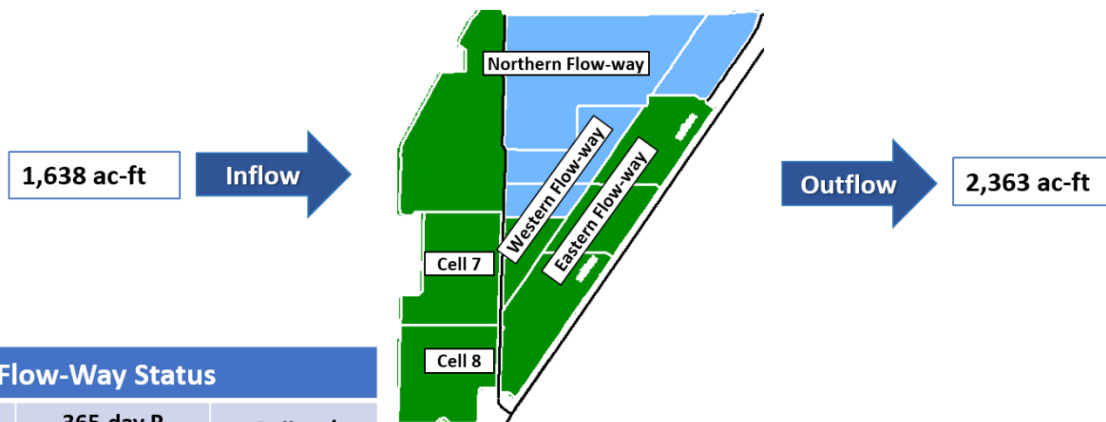


Figure S-1. STA-1E Weekly Status Report

STA-1W Weekly Status Report – 6/27/2022 through 7/3/2022



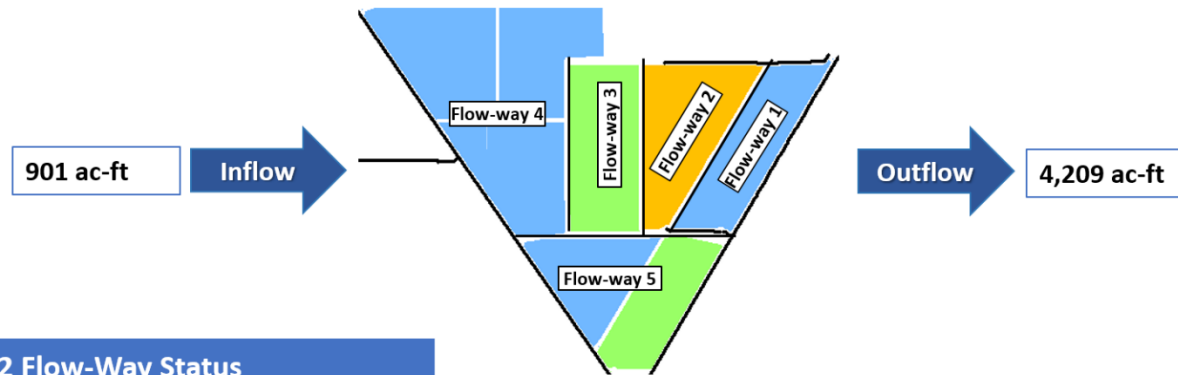
STA-1W Flow-Way Status			
Flow-Way	Vegetation Status Healthy --- Stressed	365-day P Loading Rate (below 1.0 g P /m ² /yr is optimal)	Online / Offline / Restrictions
Northern	← →	1.0	Vegetation management
Western	← →	1.0	Vegetation management
Eastern	← →	1.0	Vegetation management
Cell 7	← →	N/A	Online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

As of 7/3/2022	
Stage Based: Relative to Target Stage (TS)	
Deep Water Level (> 2.8' above TS)	
High Water Level (1.5' – 2.8' above TS)	
0.2' – 1.5' above TS	
Target Stage (TS +/- 0.2')	
Low Water Level (<0.2' below TS)	
Depth / Area Based: Percent of Area Dry	
0-25% Dry	50-75% Dry
25-50% Dry	75-100% Dry

STA-1W Flow & Phosphorus Concentration			
	7-day	28-day	365-day
Total Inflow, ac-ft	1,638	27,117	79,652
--Lake Inflow, ac-ft	0	N/A	3,000
Total Outflow, ac-ft	2,363	35,204	84,898
Inflow Conc., ppb	120	213	176
Outflow Conc., ppb	21	25	24
Includes Preliminary Data			

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

STA-2 Weekly Status Report – 6/27/2022 through 7/3/2022



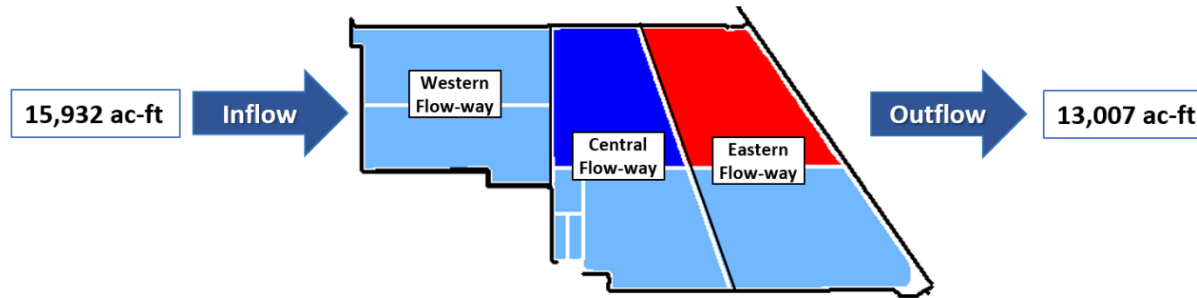
STA-2 Flow-Way Status			
Flow-Way	Vegetation Status Healthy ----- Stressed	365-day P Loading Rate (below 1.0 g P /m ² /yr is optimal)	Online / Offline / Restrictions
1			Online
2	Offline, construction activities as of 9/7/2021		
3			Vegetation Rehab
4			Vegetation Rehab
5			Online

As of 7/3/2022	
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	901	69,433	344,473
--Lake Inflow, ac-ft	0	N/A	28,100
Total Outflow, ac-ft	4,209	90,665	374,960
Inflow Conc., ppb	68	175	104
Outflow Conc., ppb	31	37	21
Includes Preliminary Data			

Figure S-3. STA-2 Weekly Status Report

STA-3/4 Weekly Status Report – 6/27/2022 through 7/3/2022









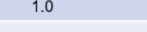


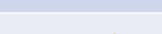


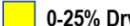
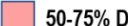
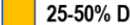
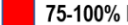
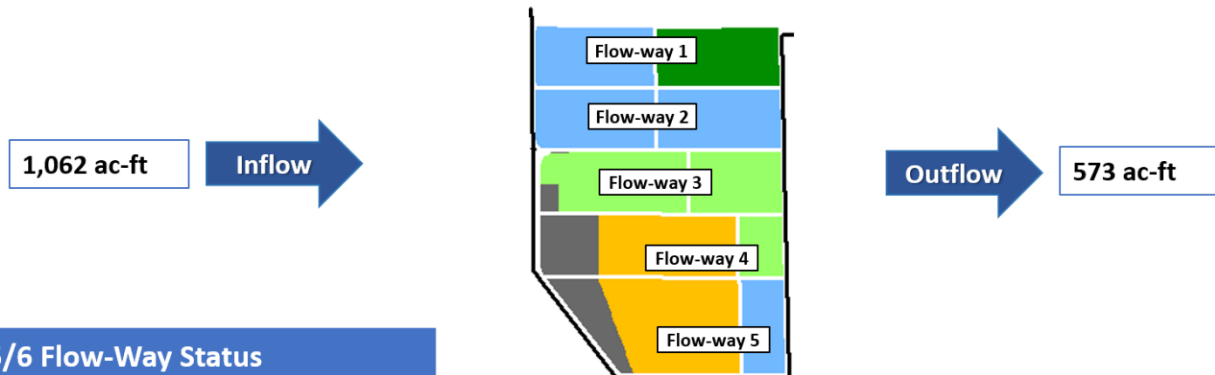
STA-3/4 Flow-Way Status				STA-3/4 Flow & Phosphorus Concentration			
Flow-Way	Vegetation Status <small>Healthy ----- Stressed</small> 	365-day P Loading Rate <small>(below 1.0 g P /m²/yr is optimal)</small>	Online / Offline / Restrictions	As of 7/3/2022			
				Stage Based: Relative to Target Stage (TS)			
Eastern				 Deep Water Level (> 2.8' above TS)			
				 High Water Level (1.5' – 2.8' above TS)			
Central			Online	 0.2' – 1.5' above TS			
				 Target Stage (TS +/- 0.2')			
Western			Online	 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		
				Total Inflow, ac-ft			
				--Lake Inflow, ac-ft			
				Total Outflow, ac-ft			
				Inflow Conc., ppb			
				Outflow Conc., ppb			
				Includes Preliminary Data			
				7-day			
				28-day			
				365-day			

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

STA-5/6 Weekly Status Report – 6/27/2022 through 7/3/2022



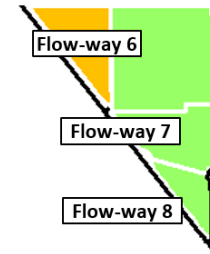
STA-5/6 Flow-Way Status			
Flow-Way	Vegetation Status Healthy ----- Stressed	365-day P Loading Rate (below 1.0 g P /m ² /yr is optimal)	Online / Offline / Restrictions
1			Online
2			Online
3			Online
4	Offline, vegetation management starting 01/24/2022		
5			Online

As of 7/3/2022	
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	1,062	5,866	183,659
--Lake Inflow, ac-ft	0	N/A	0
Total Outflow, ac-ft	573	2,031	171,179
Inflow Conc., ppb	139	167	241
Outflow Conc., ppb	28	24	49
Includes Preliminary Data			

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

STA-5/6 Weekly Status Report – 6/27/2022 through 7/3/2022



STA-5/6 Flow-Way Status				As of 7/3/2022	
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)	
				Depth / Area Based: Percent of Area Dry	
				0-25% Dry	50-75% Dry
				25-50% Dry	75-100% Dry
6	←-----→	1.0	Online		
7	←-----→	1.0	Online		
8	←-----→	1.0	Online		

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: Stage at the 1-8C gauge increased over the week by 0.02 ft. The average on Sunday was 0.52 feet above the Zone A1 regulation line. Stage decreased in WCA-2A; as of July 1 the regulation gauge switches to 2-17. It is now 1.5 ft. above schedule. IN WCA-3A last week the stages continued to ascend, and the three-gauge average was 0.34 feet above the rising Zone A regulation line. At gauge 62 (Northwest corner) the stage slightly decreased last week, averaging 0.44 ft. below the rising upper schedule line. (**Figures EV-1 through EV-4**).

Water Depths

Comparing current Water Depth Assessment Tool (WDAT) depths to depths one month ago, stages are significantly deeper across South Florida (**Figure EV-5**). Looking back one year, the EPA is deeper including southeast of Shark River Slough; eastern WCA-3A and BCNP are significantly so. (**Figure EV-6**). Comparing current depths to the past 20-year average depths, Eastern WCA-3A North is now above the 50th percentile. The typically flooded area in eastern WCA-3A South along the L-67s is now above the 50th percentile. Eastern ENP is above the 90th percentile. (**Figure EV-7**)

Taylor Slough and Florida Bay

Taylor Slough and Florida Bay received a total of 4.53 inches of rain in the past week, less than half that recorded for the previous week. Stages in Taylor Slough have remained relatively stable, with an average change of -0.09 feet (**Figure EV-8 and Figure EV-9**). Individual stage gauge changes ranged from -0.158 at E112 in the northern slough to +0.032 feet in the southeastern region (EPSW). The Slough is now 9.72 inches higher than its historical average for this time of year (pre-Florida Bay initiative which started in 2017). Conditions continue to be highly favorable for moving water downstream through the Slough this year as the rains continue.

Overall, Florida Bay salinity average increased only +0.1 over the week ending in 7/3. Salinities continued to decrease in the central and eastern nearshore areas. Individual station changes throughout the bay ranged from -2.90 in Little Madeira Bay (LM), which receives inputs from Taylor River, to +3.30 in Garfield Bight (GB) in the western nearshore area (**Figure EV-8**). Despite small salinity increases in the western region, regional salinities across the bay continue to remain around the 25th percentile (**Figure EV-10**). Florida Bay salinity is 4.24 lower than its historical average for this time of year.

Water Management Recommendations

Balancing inflows with outflows in WCA-2A to slow descension rates below last week's rate in that basin would have ecological benefit. If conditions allow, distributing flows both into the northern perimeter of WCA-3A and making use of the S-150 is ecologically better

than using the northwestern structures alone. Flows into northern WCA-3A continue to have an ecological benefit. 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	1.03	-0.04
WCA-2A	0.76	-0.36
WCA-2B	0.70	-0.14
WCA-3A	1.38	+0.01
WCA-3B	0.95	+0.01
ENP	0.82	+0.00

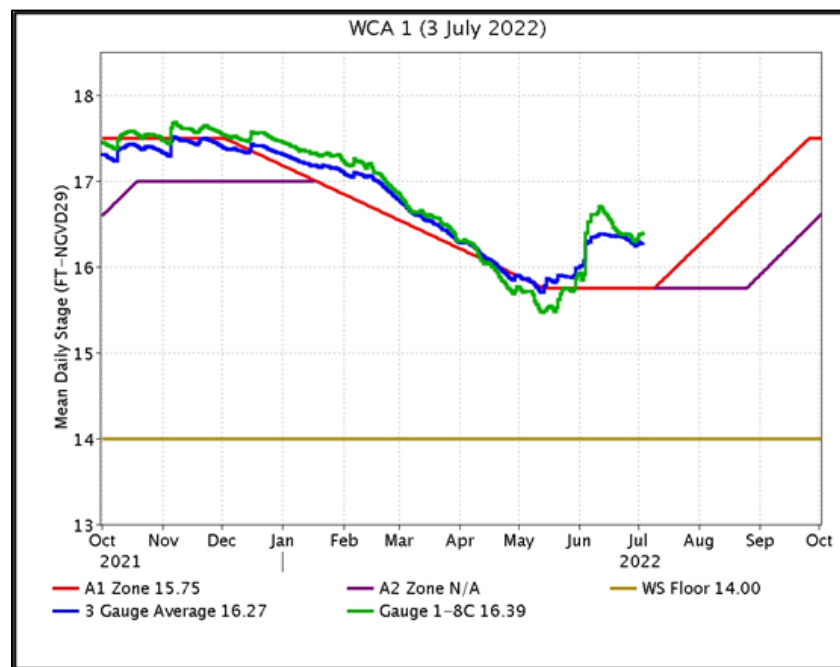


Figure EV-1. WCA-1 stage hydrographs and regulation schedule.

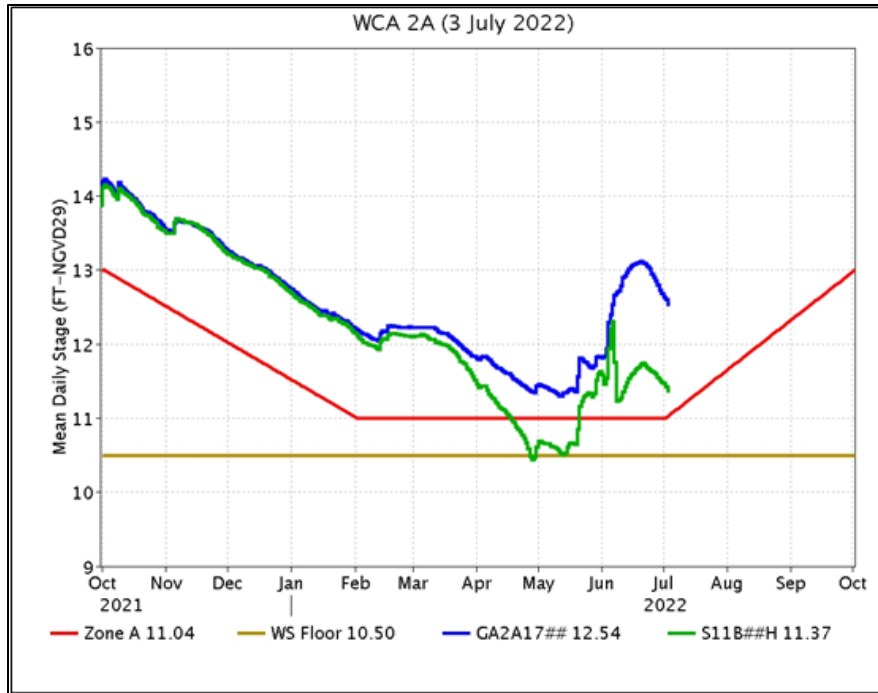


Figure EV-2. WCA-2A stage hydrographs and regulation schedule.

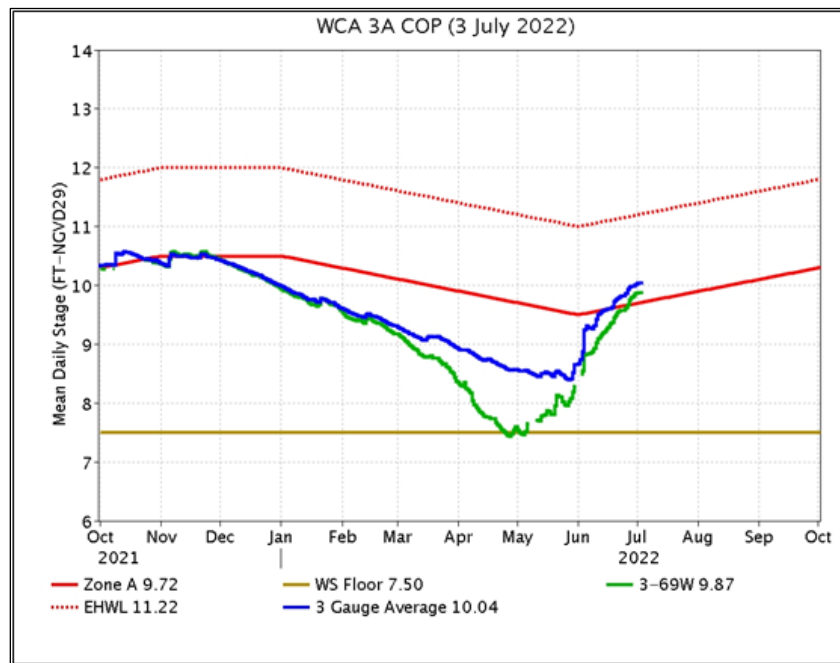


Figure EV-3. WCA-3A stage hydrographs (three-gauge average, S-333 headwater) and regulation schedule.

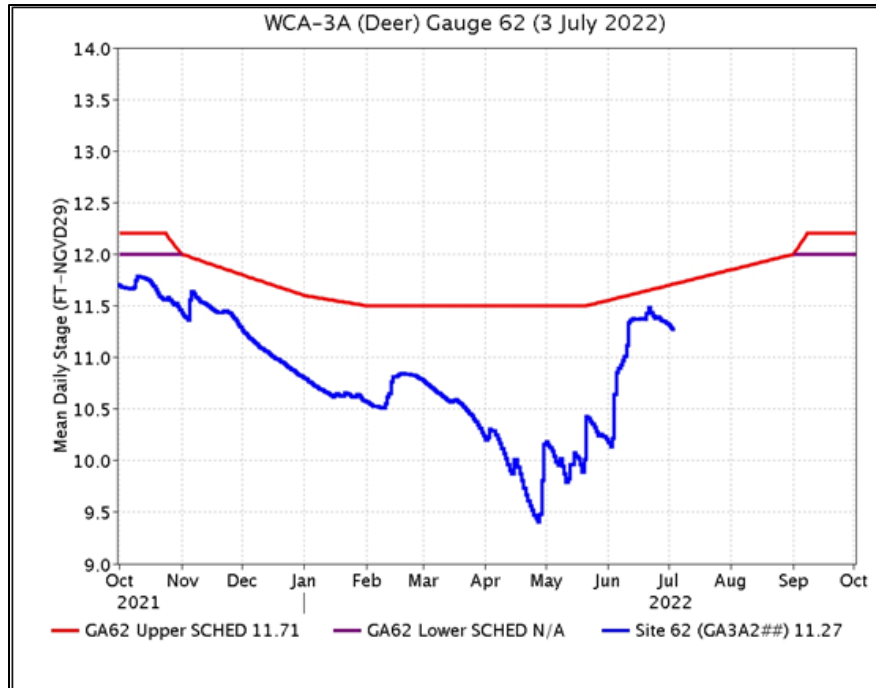


Figure EV-4. WCA-3A stage hydrograph (Deer gauge; Site 62) and CA62 regulation schedule.

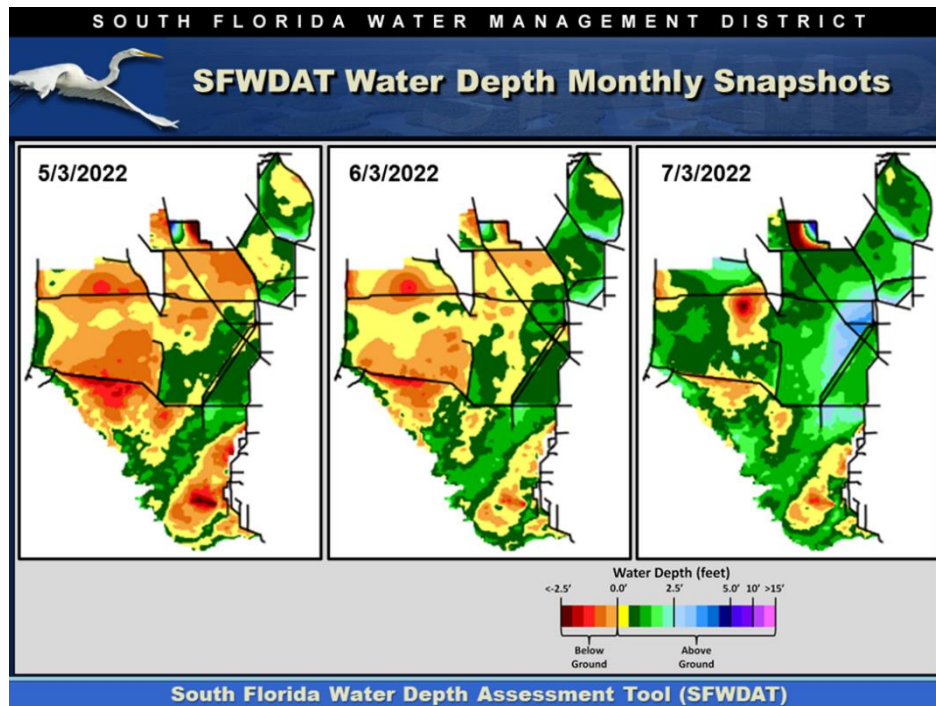


Figure EV-5. Everglades water depths from two months ago (left), one month ago (center) and present (right), based on SFWDAT.

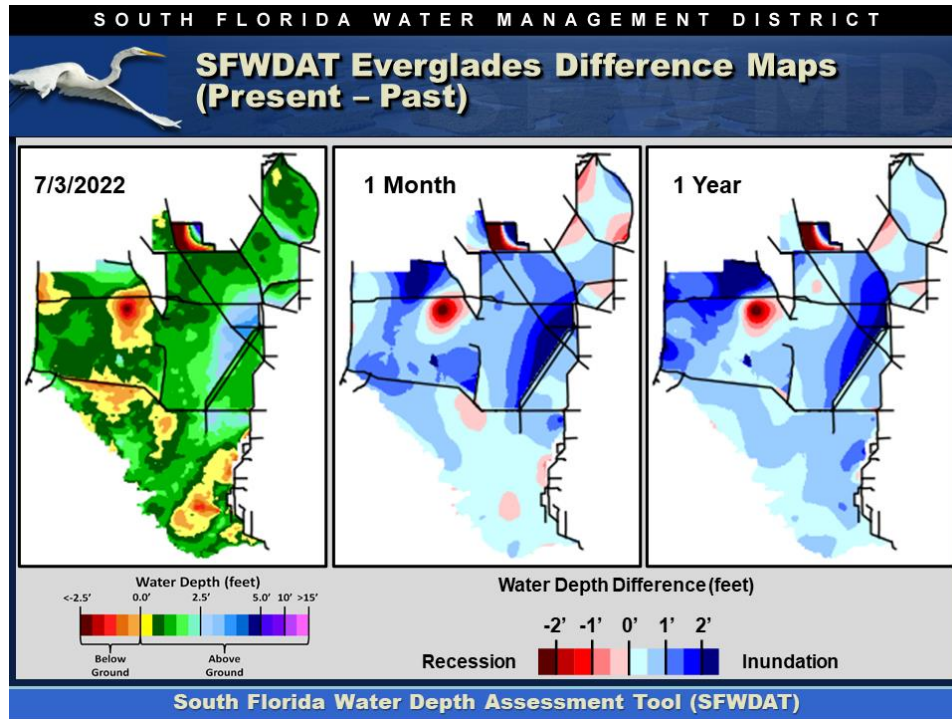


Figure EV-6. Present Everglades water depths (left) and water depth changes from one month (center) and one year (right) ago, based on SFWDAT.

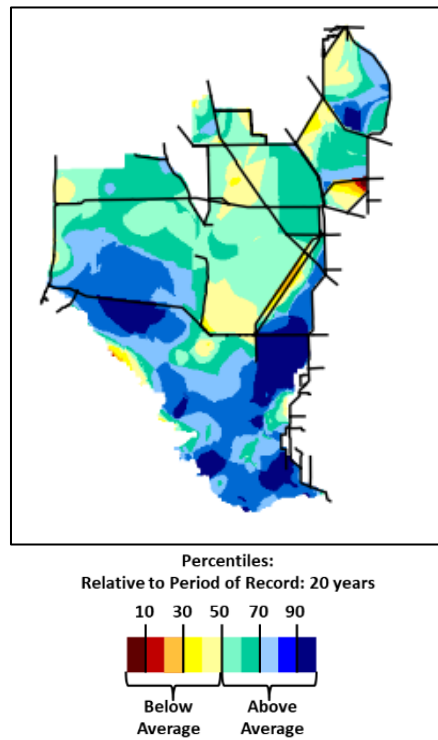


Figure EV-7. Present water depths (7/04/2022) compared to the day of year median over the previous 20 years.

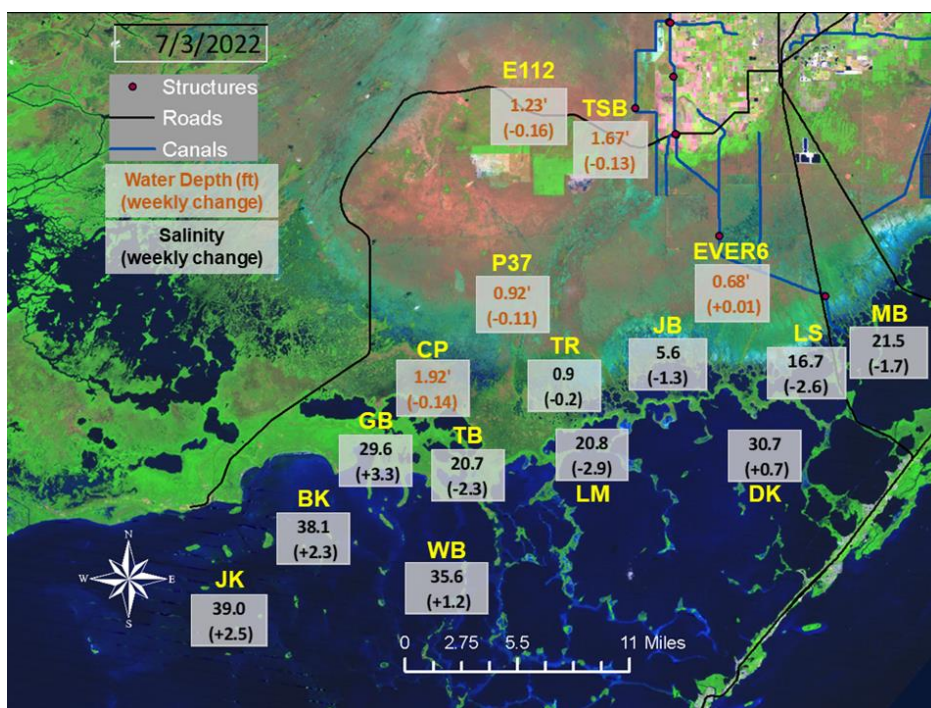


Figure EV-8. Taylor Slough water depths with changes since a week ago and Florida Bay salinities with changes since a week ago.

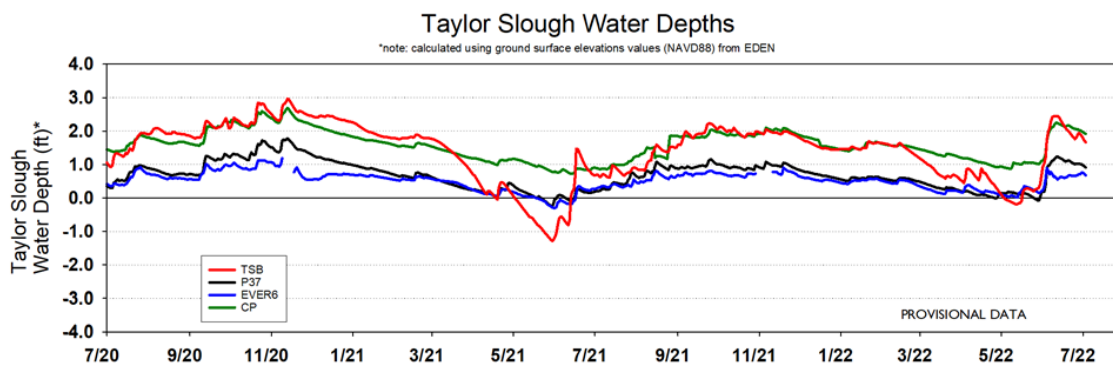


Figure EV-9. Taylor Slough water depth time series.

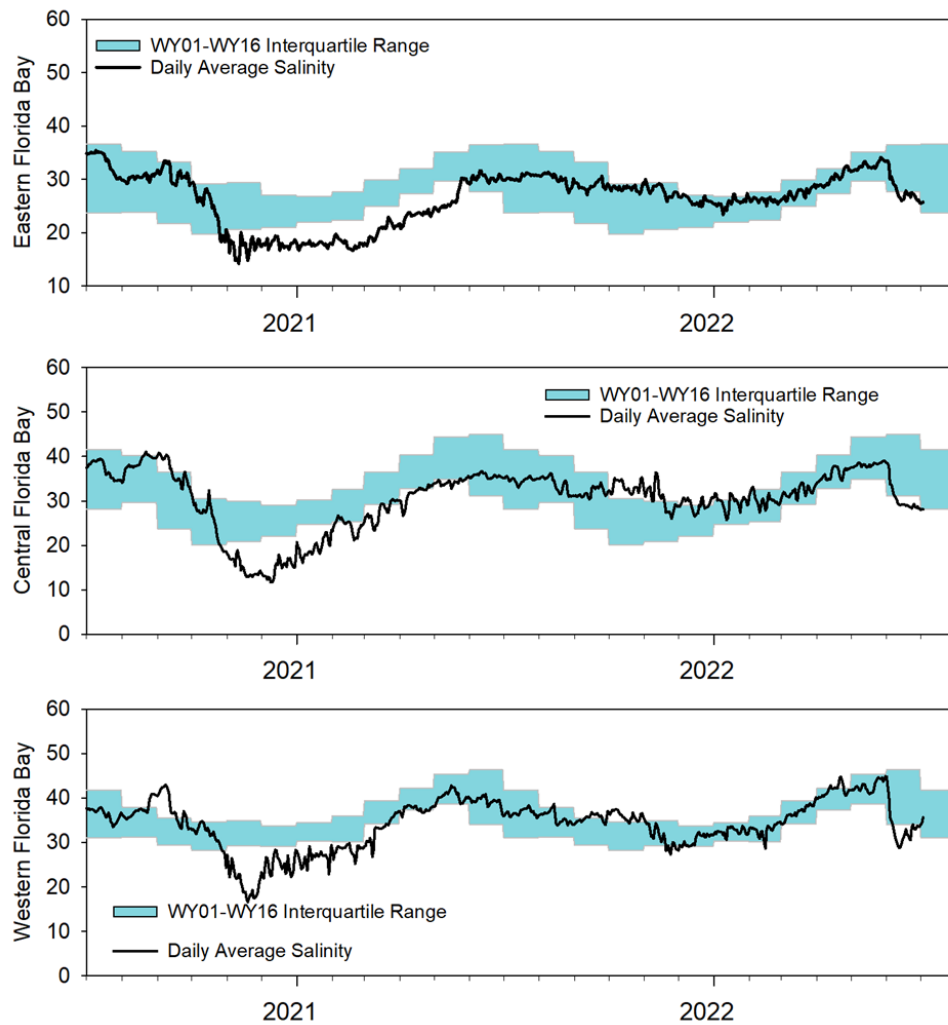


Figure EV-10. Eastern (top panel), Central (middle panel) and Western (bottom panel) Florida Bay daily average salinities with interquartile (25-75 percentile) ranges.

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

SFWMD Everglades Ecological Recommendations, July 5th, 2022 (red is new)			
Area	Weekly change	Recommendation	Reasons
WCA-1	Stage decreased by 0.04'	Moderate rate changes 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 and downstream habitat and wildlife.
WCA-2A	Stage decreased by 0.36'	Reduce descension rate to about .20 per week.	Protect within basin and downstream habitat and wildlife.
WCA-2B	Stage decreased by 0.14'	Maintain rate changes of less than 0.5 feet per two weeks.	Protect within basin and downstream habitat and wildlife.
WCA-3A NE	Stage decreased by 0.04'	Moderate rate changes to less than 0.5 feet per two weeks.	Protect within basin peat soils, and downstream habitat and wildlife.
WCA-3A NW	Stage decreased by 0.11'	Maintain rate changes of less than 0.5 feet per two weeks.	
Central WCA-3A S	Stage increased by 0.23'	Maintain rate changes of less than 0.5 feet per two weeks, letting the water move south when conditions allow.	Protect within basin and downstream habitat, Tree islands and wildlife.
Southern WCA-3A S	Stage decreased by 0.03'		
WCA-3B	Stage increased by 0.01'	Maintain rate changes of 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 was similar- 0.00'	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 -0.158' to +0.032'	Move water southward as possible.	When available, provide freshwater buffer for downstream conditions.
FB- Salinity	Salinity changes ranged -2.9 to +3.3	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 687 cfs and the previous 30-day mean inflow was 2,368 cfs. The seven-day mean salinity was 22.0 at BBCW8 and 21.0 at BBCW10, both below the preferred maximum salinity of 35 for these sites. Data provided by Biscayne National Park.

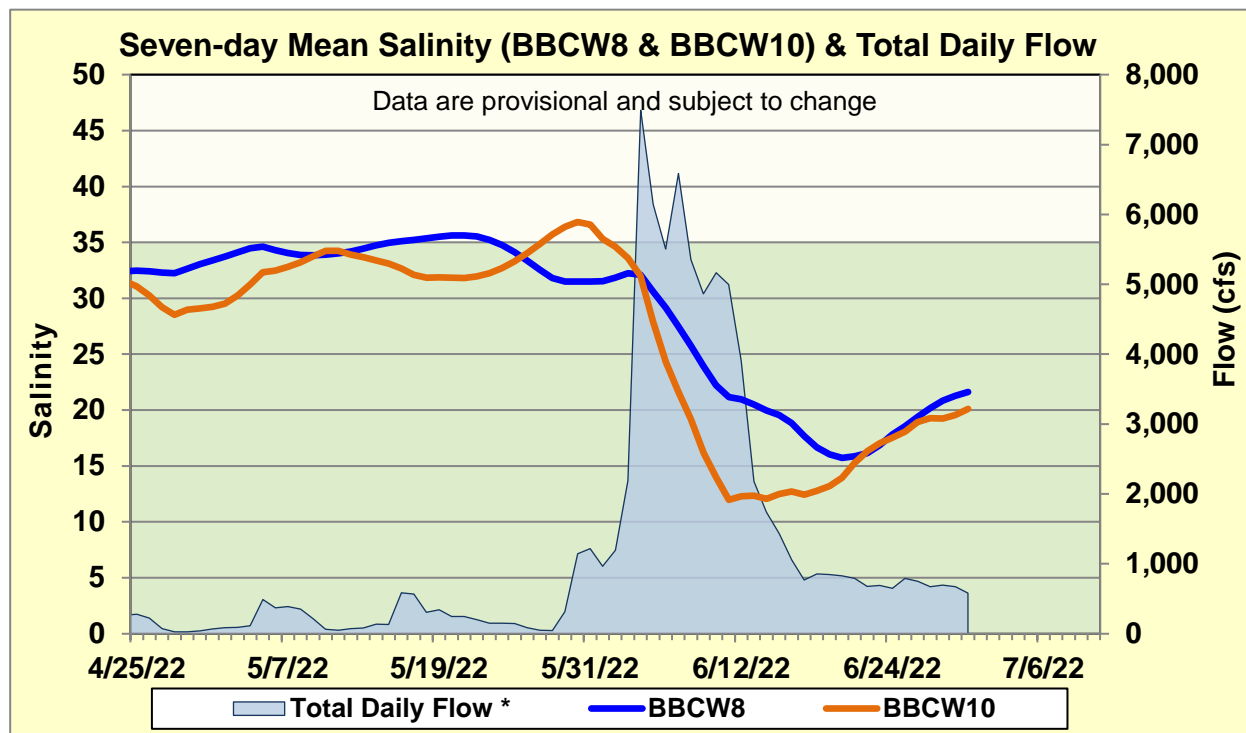


Figure BB-1. Seven-day mean salinity at BBCW8 and BBCW10 and total daily flow in Biscayne Bay. Total daily flow was calculated using flow from structures S20G, S20F, S21, S21A, S123, and S700P.