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 1, 2022

SUBJECT: Weekly Environmental Conditions for Systems Operations

Summary

Weather Conditions and Forecast

On Wednesday, there could be widespread coverage of afternoon thunderstorms across the interior of the District. The greatest coverage of storms could occur over the south during the late afternoon. Additional afternoon thunderstorms are likely on Thursday. Beginning late Thursday night, rain coverage over the south is expected to increase in association with a broad area of low pressure located over the southern Gulf of Mexico, Yucatan Peninsula and/or northwestern Caribbean. There is a good chance that the low could become a tropical or subtropical cyclone as it quickly moves toward Florida. It seems likely that heavy rainfall could occur all day on Friday as the tropical system approaches, and then end by late in the day on Saturday after the storm passes. The amount of rainfall that will occur across the District is highly dependent on the future track and evolution of this system. Because this area of low pressure has not yet formed but is expected to form over the next few days, the uncertainty regarding the future location of this potential tropical cyclone is greater-than-normal. For example, a track that takes the storm over central Florida would favor widespread rainfall across the entire District, while a path into northwestern Cuba would favor drier conditions with the heavy rainfall limited to the south. After the storm passes east of Florida, drier weather is likely on Sunday and Monday. For the week ending next Tuesday morning, the total average District rainfall is likely to be much above normal due to the influence of this tropical disturbance.

Kissimmee

Flow at S-59 and S-61 is being adjusted to keep East Toho and Toho on their respective recession lines. With stage in KCH declining, flow at S-65/S-65A is being reduced. Water depth on the Kissimmee River floodplain has decreased, with a mean depth of 0.30 feet as of May 29, 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 6.9 mg/L for the week ending on May 29, 2022.

Lake Okeechobee

Lake Okeechobee stage was 12.59 feet NGVD on May 29, 2022, with water levels 0.39 feet lower than a month ago (**Figure LO-1**). Lake stage switched from Base Flow sub-band to Beneficial Use sub-band between May 27-29, 2022 (Figure LO-2) and has been within the ecological envelope for 21 weeks (**Figure LO-3**). Average daily inflows (excluding rainfall) decreased from the previous week, going from 1,111 cfs to 790 cfs. Average daily outflows (excluding evapotranspiration) increased, going from 1,834 cfs to 2,701 cfs. The most recent satellite image (May 29, 2022) from the NOAA cyanobacteria monitoring product derived from EUMETSAT's Sentinel 3 OLCI sensor showed that bloom potential was high in Fisheating Bay (western part of the Lake) and the northwestern part of the Lake, and medium to high in the northern region. Bloom potential increased in the northern region compared to the previous week (**Figure LO-6**). Approximately 28% of the sites (or 9 sites) had total phytoplankton biomass (chlorophyll a) above the Lake-wide bloom threshold (>40 µg/L). The highest chlorophyll *a* (112 µg/L) was recorded at site NES135 in the northeastern part of the Lake **(Figure LO-7).**

Estuaries

Total inflow to the St. Lucie Estuary averaged 341 cfs over the past week with no flow coming from Lake Okeechobee. Mean surface salinities decreased slightly at HR and US1, and increased slightly at A1A. Salinity in the middle estuary was just within the stressed range (10-25) for adult eastern oysters.

Total inflow to the Caloosahatchee Estuary averaged 1,047 cfs over the past week with 518 cfs coming from the Lake. Mean salinities increased at all 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 Cape Coral and in the stressed range at Shell Point and Sanibel.

Stormwater Treatment Areas

For the week ending Sunday, May 29, 2022, approximately 1,300 ac-ft of 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 40,000 ac-feet. Most STA cells are above or near target stage, except STA-5/6 cells that are drying out. STA-1E Western Flow-way is offline for post-construction vegetation grow in. Additionally, STA-3/4 Eastern Flow-way is offline for vegetation rehabilitation/drawdown, STA-2 Flow-way 2 is offline for construction activities, and STA-5/6 Flow-way 4 is offline for vegetation management activities. Operational restrictions are in place in STA-1E Central Flow-way, STA-1W Eastern and Northern Flow-ways for nesting by Migratory Bird Treaty Act protected species. 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 dry-out conditions. This week, if 2008 LORS recommends Lake releases to the WCAs and conditions allow, releases will be sent to STA-2.

Everglades

Many regions of the Everglades experienced a reversal in stage last week in response to rainfall, favorable in areas where stage is below the soil surface. Conditions remain dry in WCA-3A. As wading birds continue to forage and nest prolonging a recession (even a slight reversal) in areas where birds are foraging will increase nesting success. Expectations for wading bird nesting success remain low. CSSS subpopulation regions remain within the % dry targets and consecutive dry nesting days will continue to accumulate as long as the “dry” season lasts. Stages decreased in Taylor slough last week but remain above average. Salinities also increased on average in Florida Bay last week and remains above average, but conditions are ideal to move water south once the wet season begins in earnest.

Biscayne Bay

Total inflow to Biscayne Bay averaged 174 cfs and the previous 30-day mean inflow averaged 196 cfs. The seven-day mean salinity was 32.6 at BBCW8 and 34.9 at BBCW10, both below the preferred maximum salinity of 35 for these sites. Salinity data provided as a courtesy by Biscayne National Park.

Supporting Information

Kissimmee Basin

Upper Kissimmee

On May 29, 2022, lake stages were 55.1 feet NGVD (at schedule) in East Lake Toho, 52.0 feet NGVD (0.1 feet below schedule) in Lake Toho, and 48.7 feet NGVD (0.4 feet below schedule) in Lakes Kissimmee-Cypress-Hatchineha (KCH) (**Table KB-1**, **Figures KB-1-3**).

Lower Kissimmee

Discharges to the Kissimmee River on May 29, 2022 were 760 cfs at S-65 and 660 cfs at S-65A; discharges from the Kissimmee River were 760 cfs at S-65D and 660 cfs at S-65E (**Table KB-2**). Headwater stages were 46.3 feet NGVD at S-65A and 26.8 feet NGVD at S-65D on May 29, 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 6.9 mg/L for the week ending on May 29, 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 0.30 feet as of May 29, 2022 (**Figure KB-6**).

Water Management Recommendations

Continue following the stage recession lines in Lakes East Toho and Toho through Wednesday June 1, then begin allowing stages to rise slowly (preferred maximum rate is 0.5 ft/14 days) to the extent possible. In KCH, continue the slow rampdown in flow at S-65/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)	
							5/29/22	*5/22/22*
Lakes Hart and Mary Jane	S-62	LKMJ	11	59.5	R	59.6	-0.1	-0.1
Lakes Myrtle, Preston and Joel	S-57	S-57	1	60.0	R	60.0	0.0	0.0
Alligator Chain	S-60	ALLI	32	62.1	R	62.1	0.0	-0.1
Lake Gentry	S-63	LKGT	47	59.6	R	59.6	0.0	0.0
East Lake Toho	S-59	TOHOE	153	55.1	R	55.1	0.0	-0.2
Lake Toho	S-61	TOHOW S-61	509	52.0	R	52.1	-0.1	-0.2
Lakes Kissimmee, Cypress and Hatchineha	S-65	KUB011 LKIS5B	853	48.7	R	49.1	-0.4	-0.5

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.

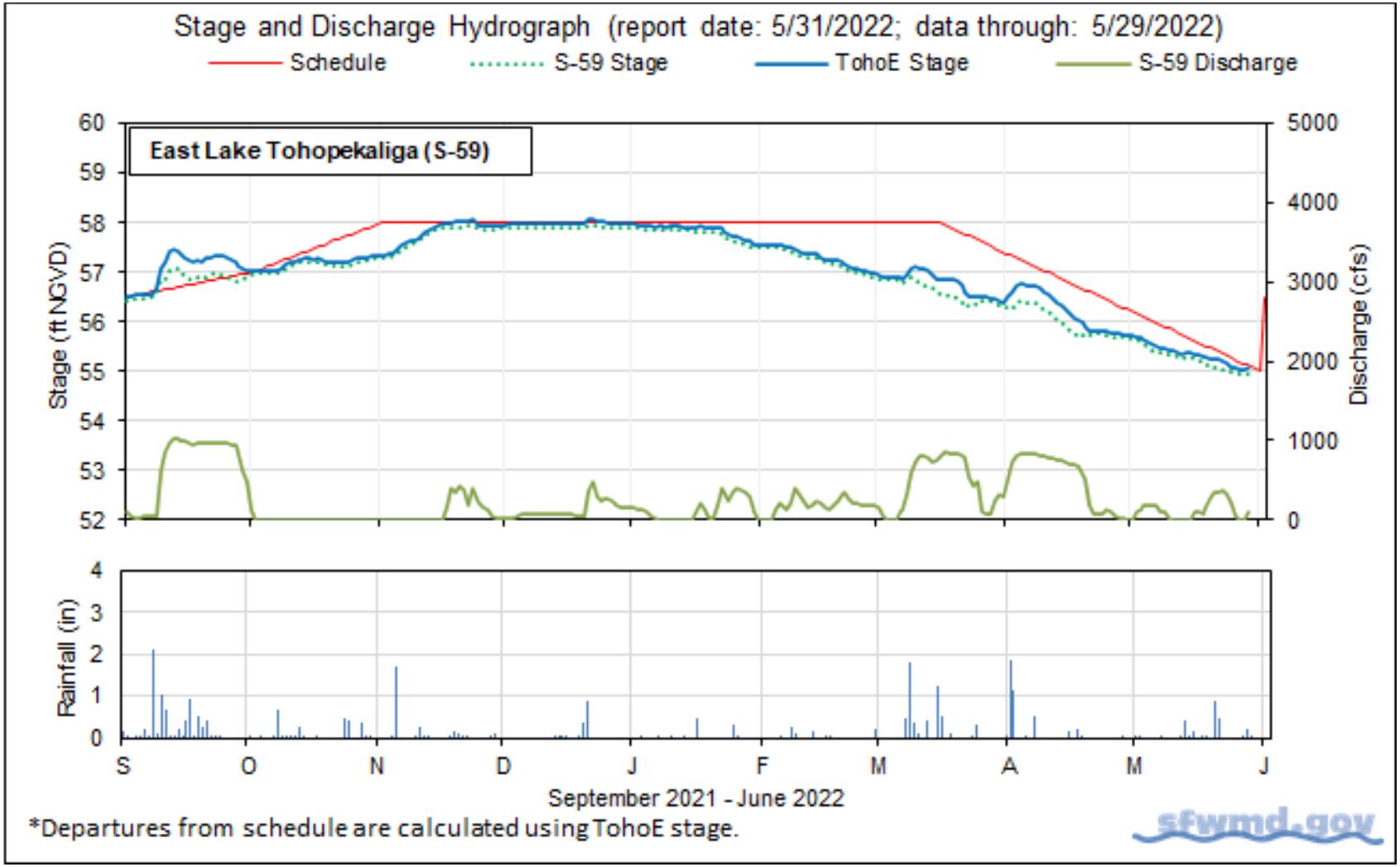


Figure KB-1. East Lake Toho regulation schedule, stage, discharge and rainfall.

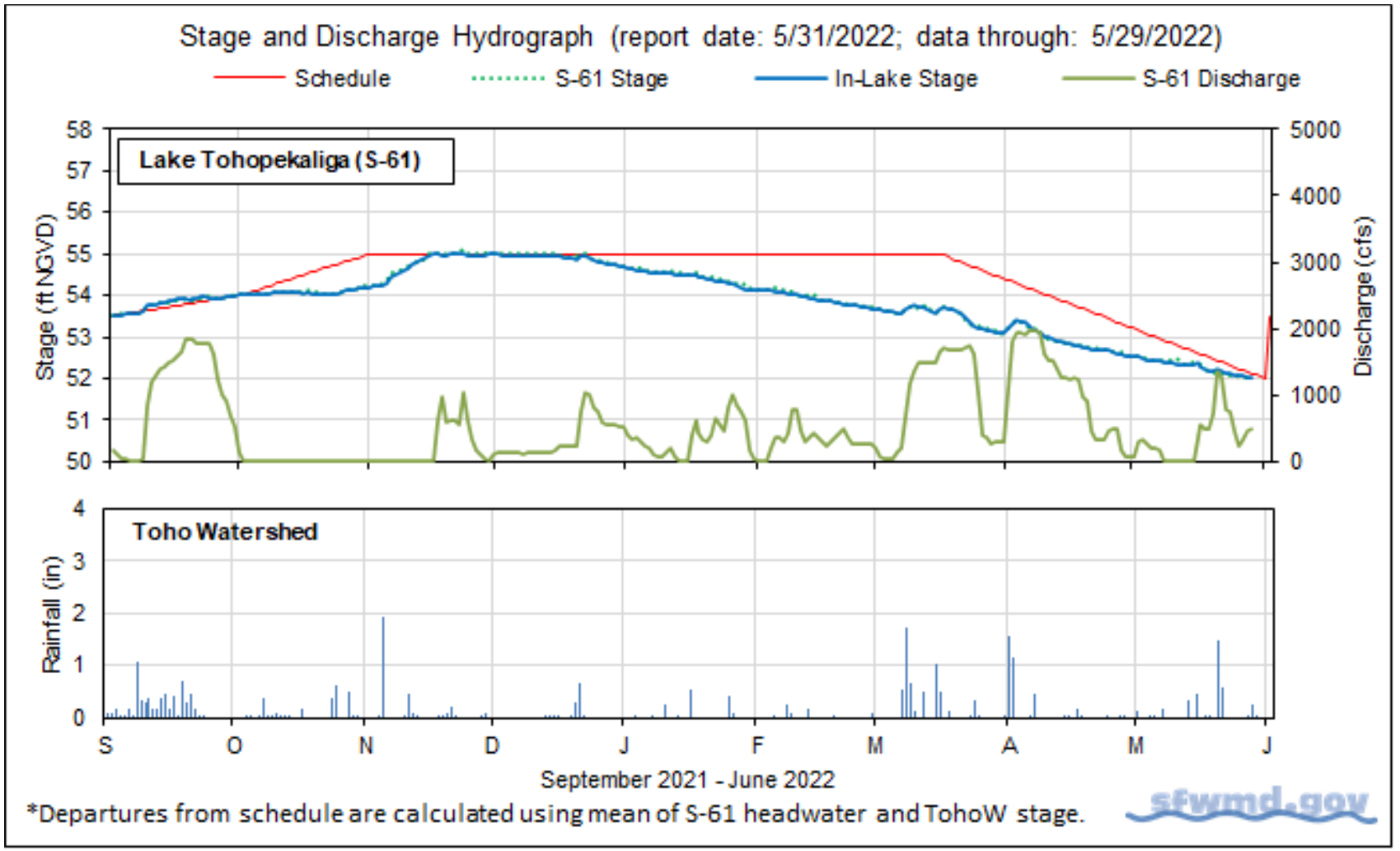


Figure KB-2. Lake Toho regulation schedule, stage, discharge and rainfall.

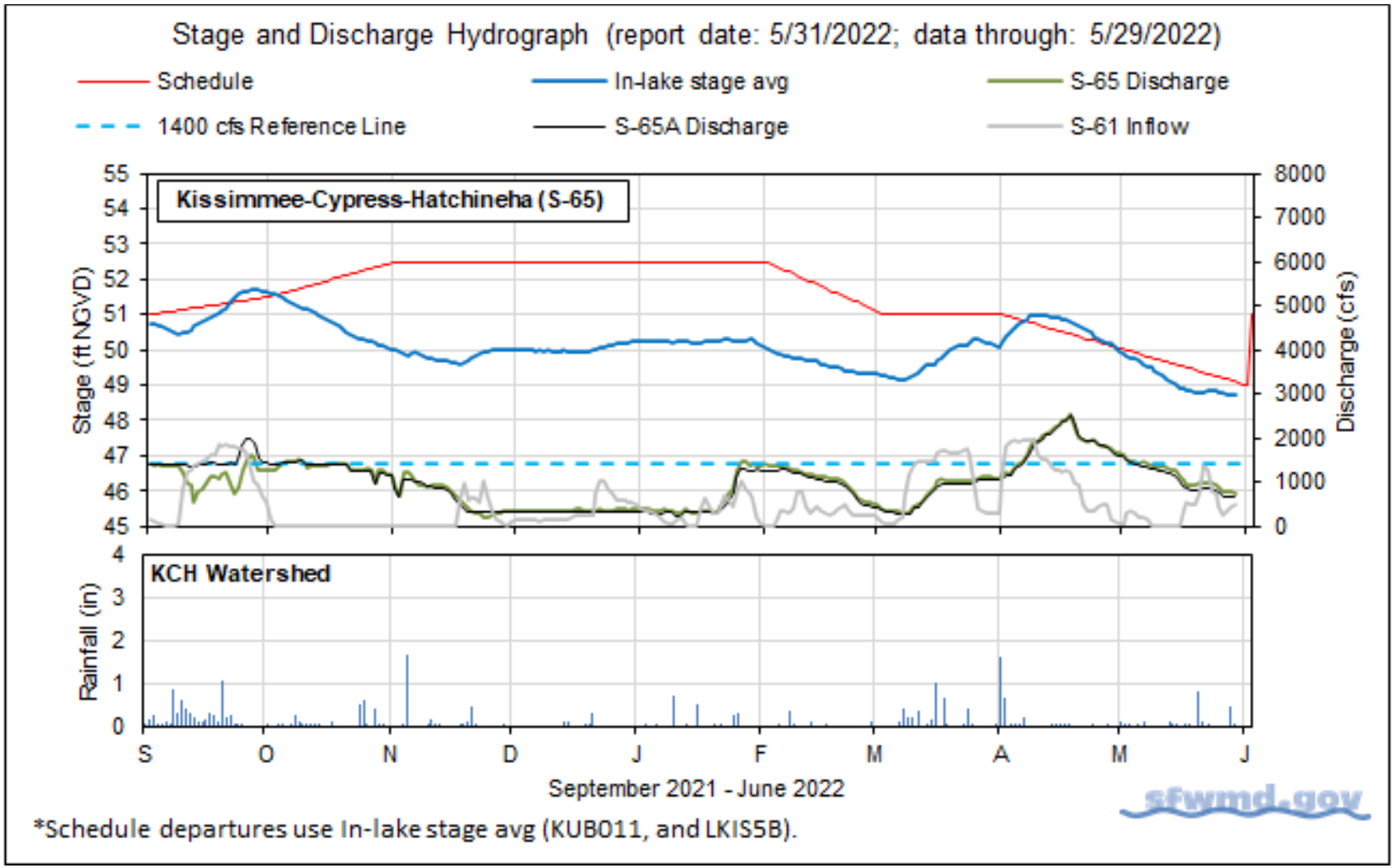


Figure KB-3. Lakes Kissimmee, Cypress and Hatchineha regulation schedule, stage, discharge and rainfall.

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			
		5/29/22	5/29/22	5/22/22	5/15/22	5/8/22
Discharge	S-65	760	850	970	1,300	1,460
Discharge	S-65A[a]	660	730	850	1,200	1,400
Headwater Stage (feet NGVD)	S-65A	46.3	46.3	46.2	46.2	46.2
Discharge	S-65D[b]	760	870	1,240	1,540	1,770
Headwater Stage (feet NGVD)	S-65D[c]	26.8	26.8	26.9	27.1	27.1
Discharge (cfs)	S-65E[d]	660	770	1,100	1,360	1,570
Discharge (cfs)	S-67	0	0	0	0	0
Dissolved Oxygen (mg/L) [e]	Phase I, II/III river channel	7.3	6.9	5.7	4.9	3.6
Mean depth (feet) [f]	Phase I floodplain	0.30	0.33	0.48	0.68	0.84

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).

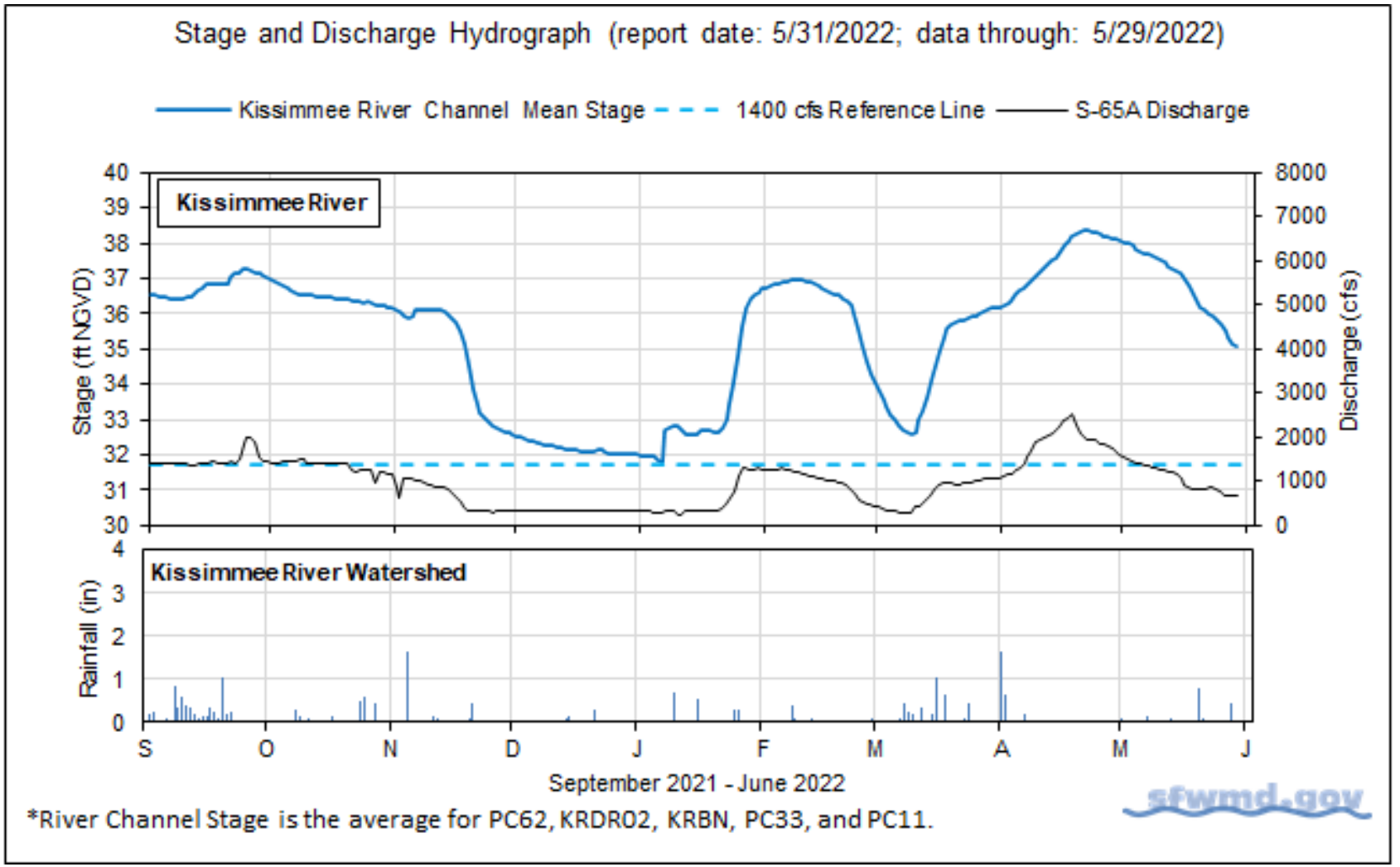


Figure KB-4. Kissimmee River stage, discharge and rainfall.

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

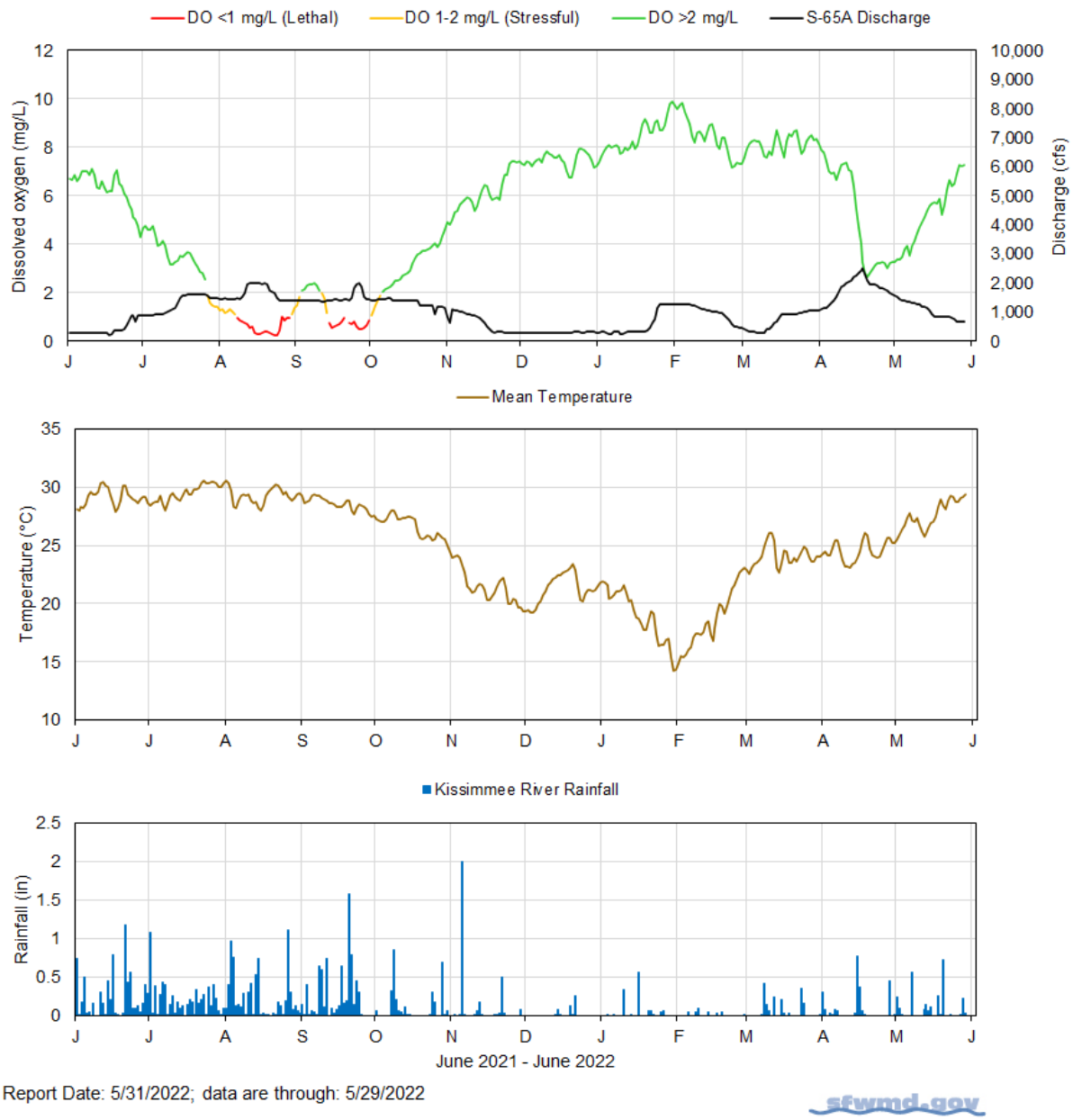


Figure KB-5. Restored Kissimmee river channel mean daily dissolved oxygen concentration (mg/L), S-65A discharge (cfs), temperature (°C) and rainfall (inches). Dissolved oxygen (DO) and temperature are mean daily values averaged for PC62, KRBN, PC33, PD62R, and PD42R with an average of four stations reporting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

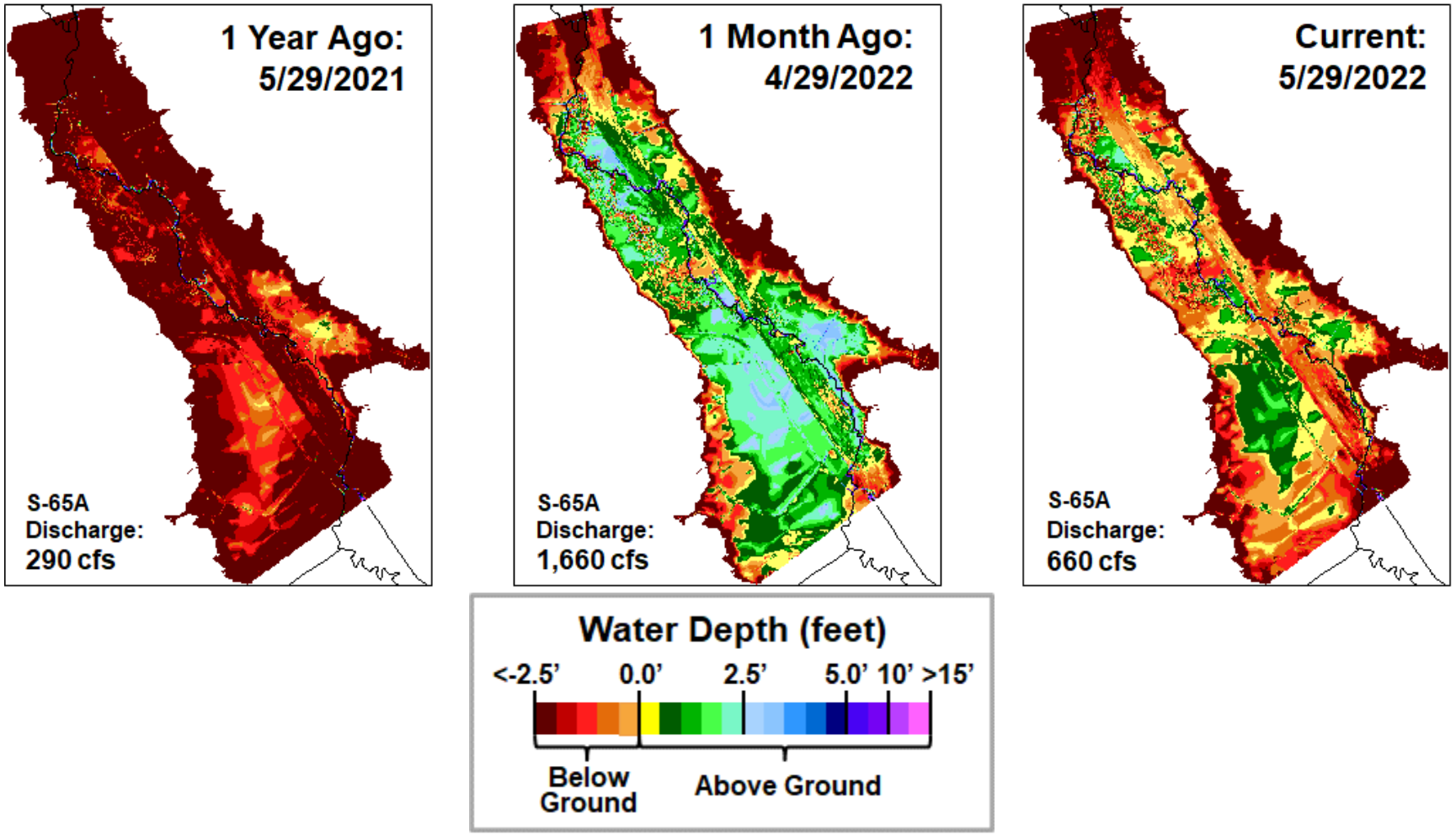


Figure KB-6. Phase I area Kissimmee River floodplain water depths (from left to right) one year ago, one month ago and current.

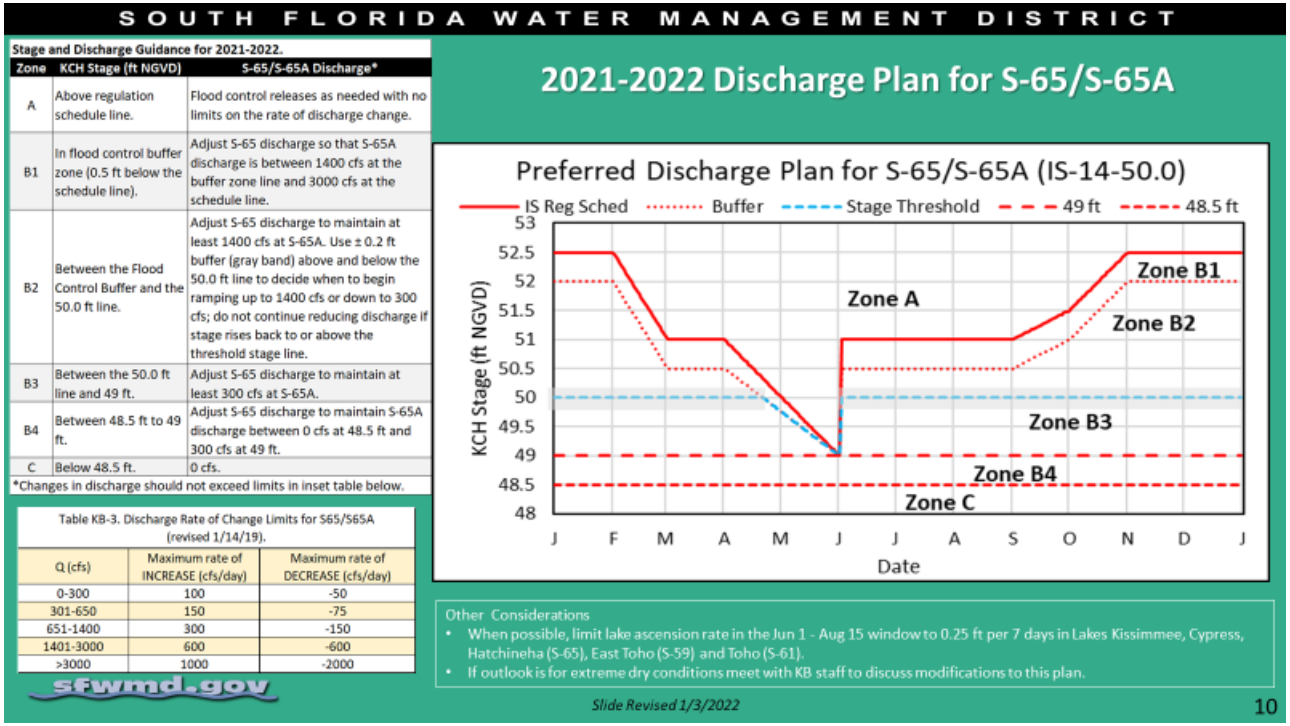


Figure KB-7. IS-14-50 Discharge Plan for S65/S65A with discharge rate of change limits (revised 1/14/19).

Lake Okeechobee

Lake Okeechobee stage was 12.59 feet NGVD on May 29, 2022, with water levels 0.39 feet lower than a month ago (**Figure LO-1**). Lake stage switched from Base Flow sub-band to Beneficial Use sub-band between May 27-29, 2022 (**Figure LO-2**) and has been within the ecological envelope for 21 weeks (**Figure LO-3**). According to NEXRAD, 1.60 inches of rain fell directly on the Lake last week.

Average daily inflows (excluding rainfall) decreased from the previous week, going from 1,111 cfs to 790 cfs. Average daily outflows (excluding evapotranspiration) increased, going from 1,834 cfs to 2,701 cfs. Highest inflows came from the Kissimmee River through the S-65E structure (765 cfs). The outflow to the east via S-308 structure into C-44 Canal was 1,142 cfs and outflows to the west via the S-77 structure into the C-43 Canal was 994 cfs. Outflows south via the S-350 structures totaled 509 cfs. Outflow via the S-271 was 56 cfs 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 (May 29, 2022) from the NOAA cyanobacteria monitoring product derived from EUMETSAT's Sentinel 3 OLCI sensor showed that bloom potential was high in Fisheating Bay (western part of the Lake) and northwestern part of the Lake, and medium to high in northern region. Bloom potential increased in the northern region compared to the previous week (**Figure LO-6**). The May 16-18, 2022 routine water quality monitoring surveys on the Lake revealed that 63% of the sites had concentrations of total microcystins below detection level, and 72% of the sites had mixed phytoplankton communities and only 19% of the sites had communities dominated by *Microcystis aeruginosa* (**Figure LO-7**). Approximately 28% of the sites (or 9 sites) had total phytoplankton biomass (chlorophyll *a*) above Lake-wide bloom threshold (>40 µg/L). The highest chlorophyll *a* (112 µg/L) was recorded at site NES135 in the northeastern part of the Lake (**Figure LO-7**).

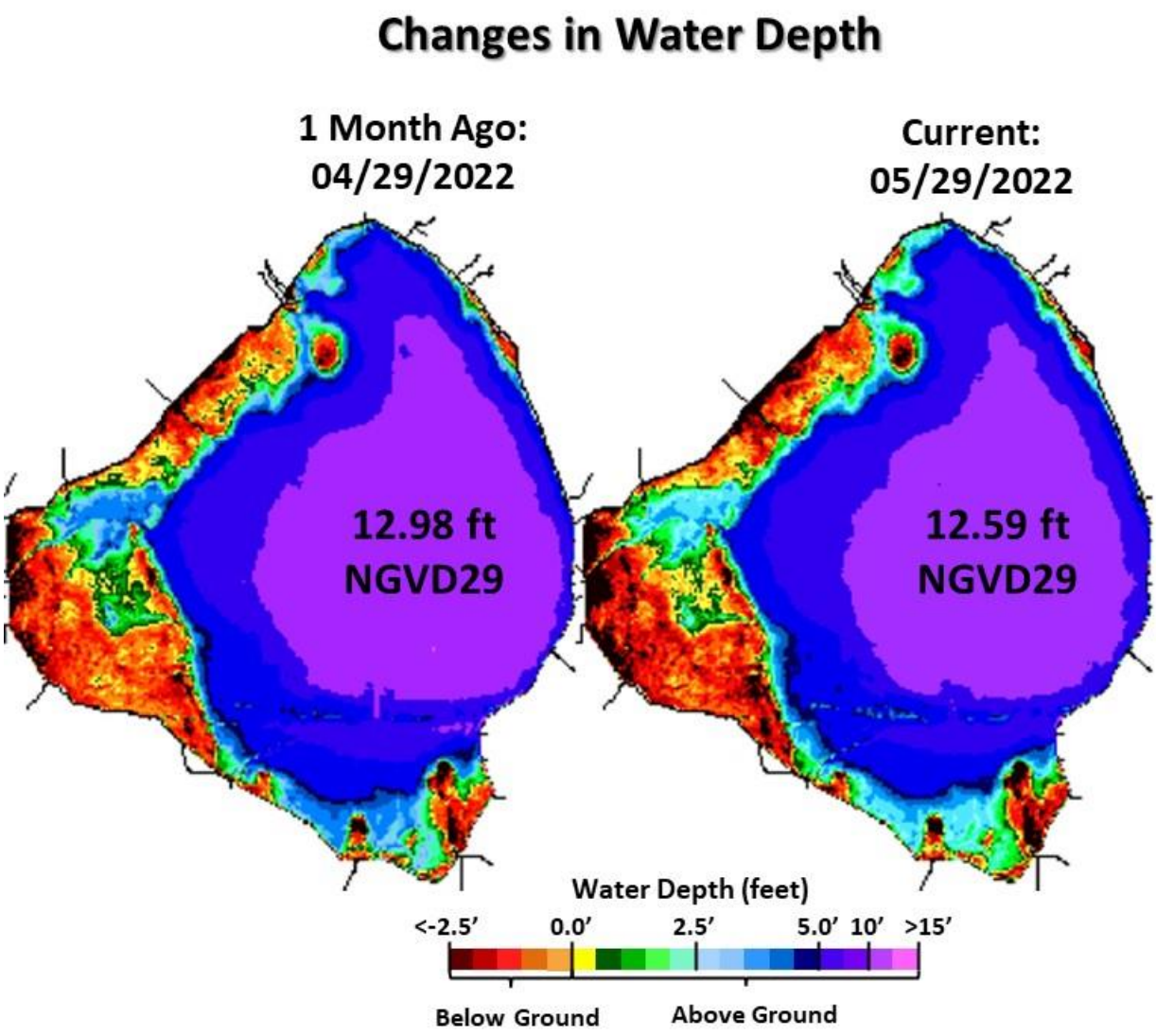


Figure LO-1. Lake Okeechobee water depth estimates based on South Florida Water Depth Assessment Tool (SFWDAT).

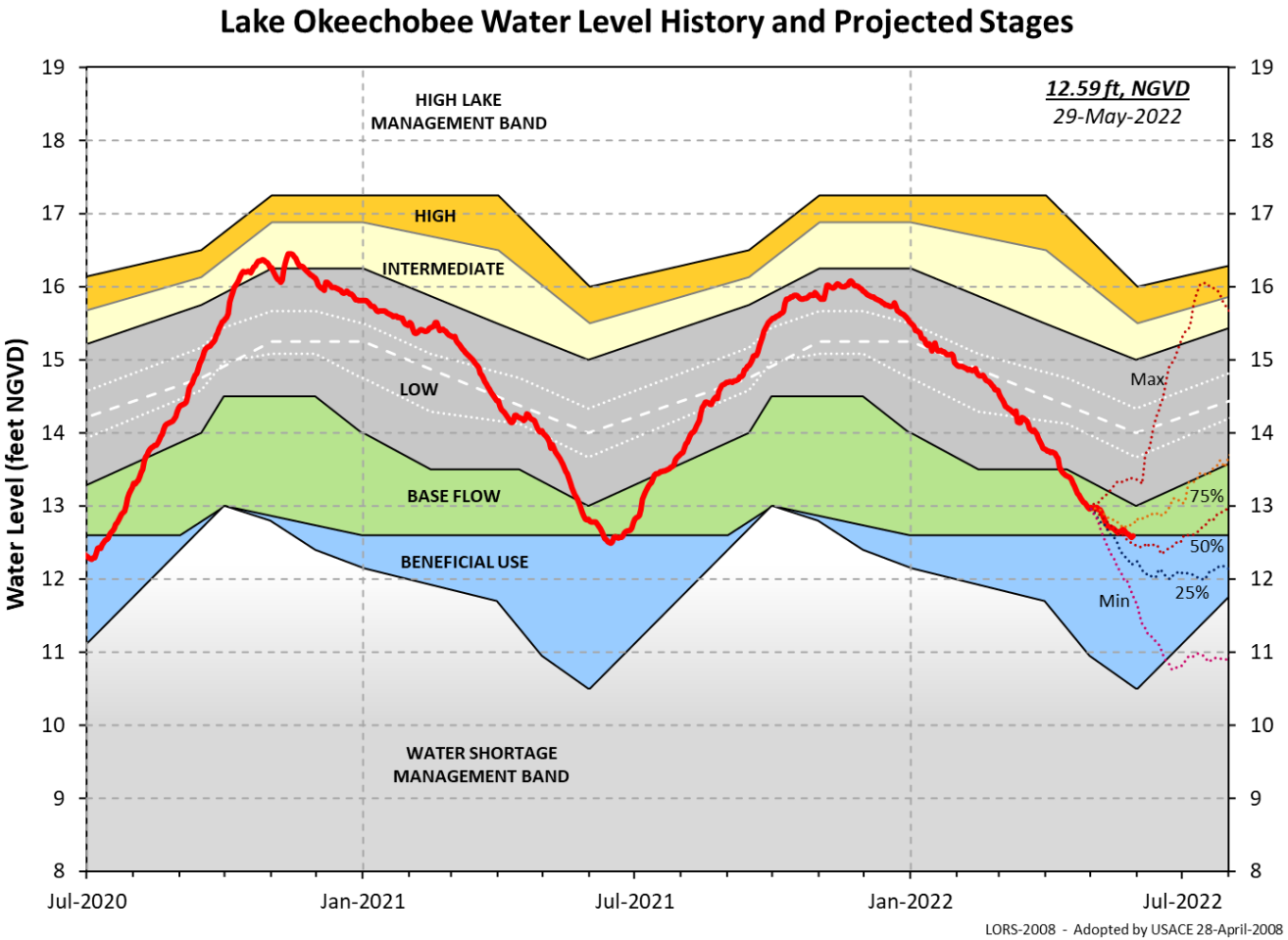


Figure LO-2. Recent Lake Okeechobee stages with projected stages based on a dynamic position analysis.

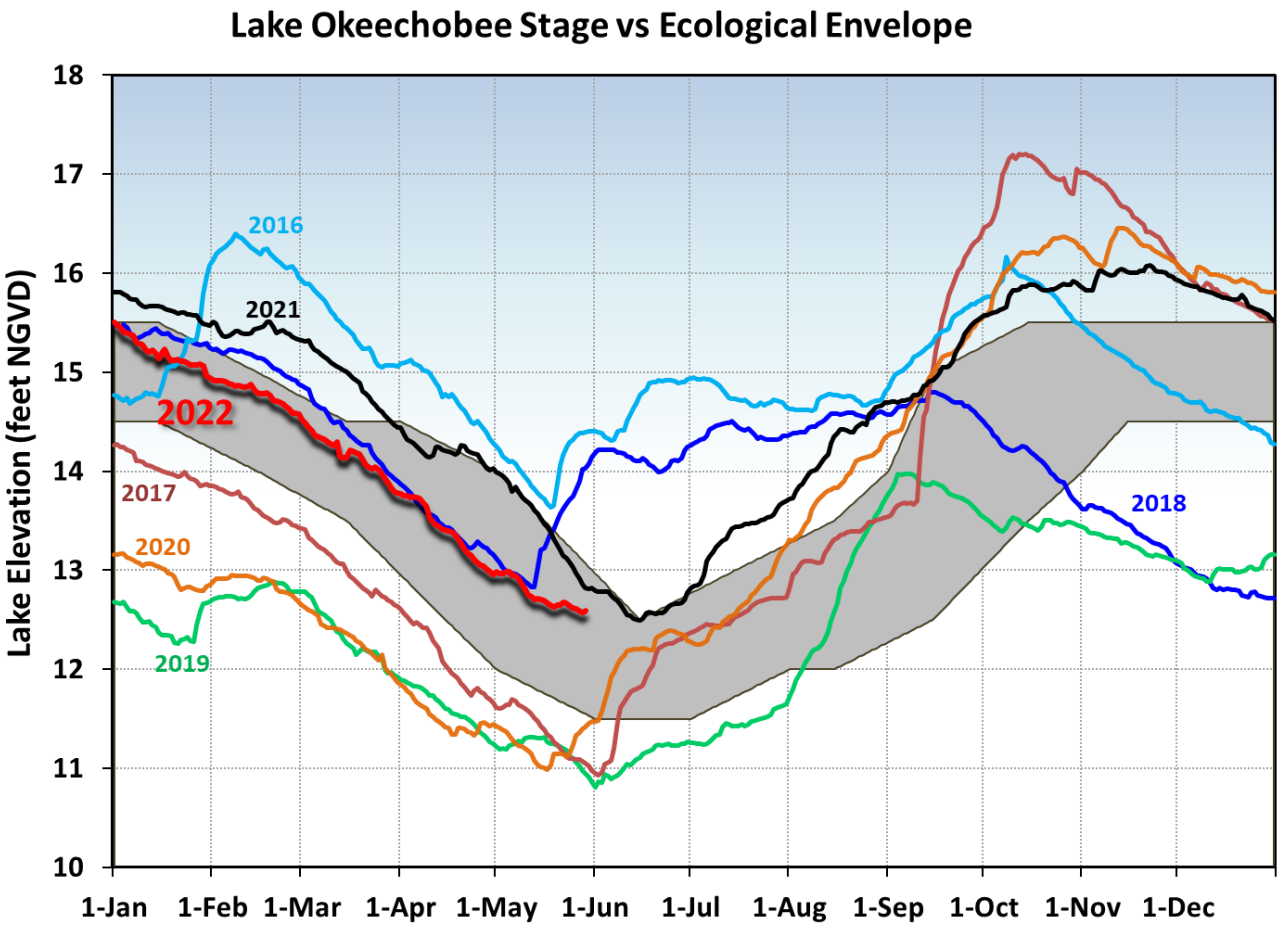


Figure LO-3. The prior six years of annual stage hydrographs for Lake Okeechobee in comparison to the ecological envelope.

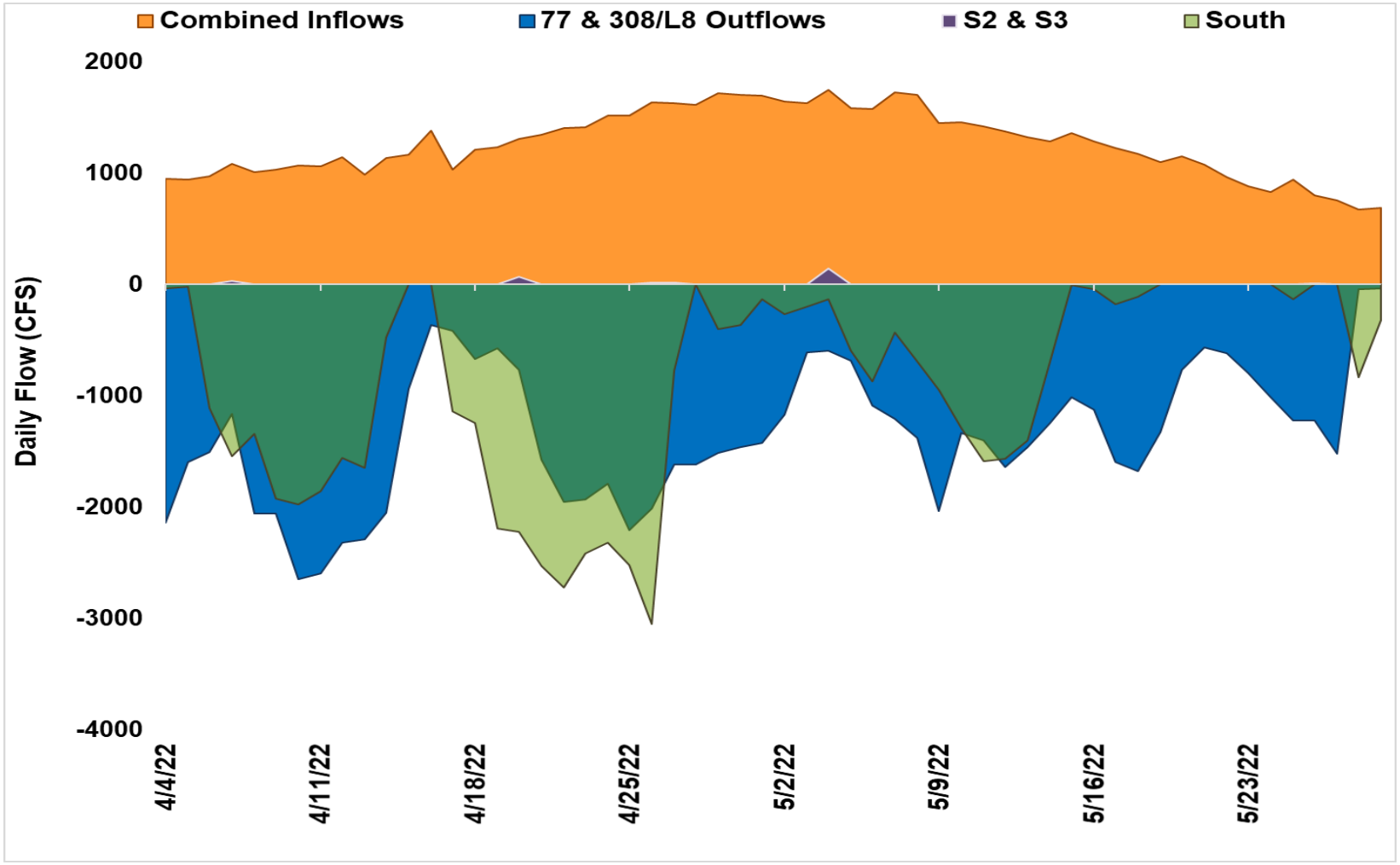


Figure LO-4. Major inflows (orange) to and outflows east and west (blue) from Lake Okeechobee. Outflows south are shown in green. Flows into Lake Okeechobee from the L-8 canal through S-271 (formerly Culvert 10A) or from the C-44 canal through the S-308 are included as inflows. Conversely, flows from 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 23-29, 2022 are based on limited data points and should be interpreted with caution.

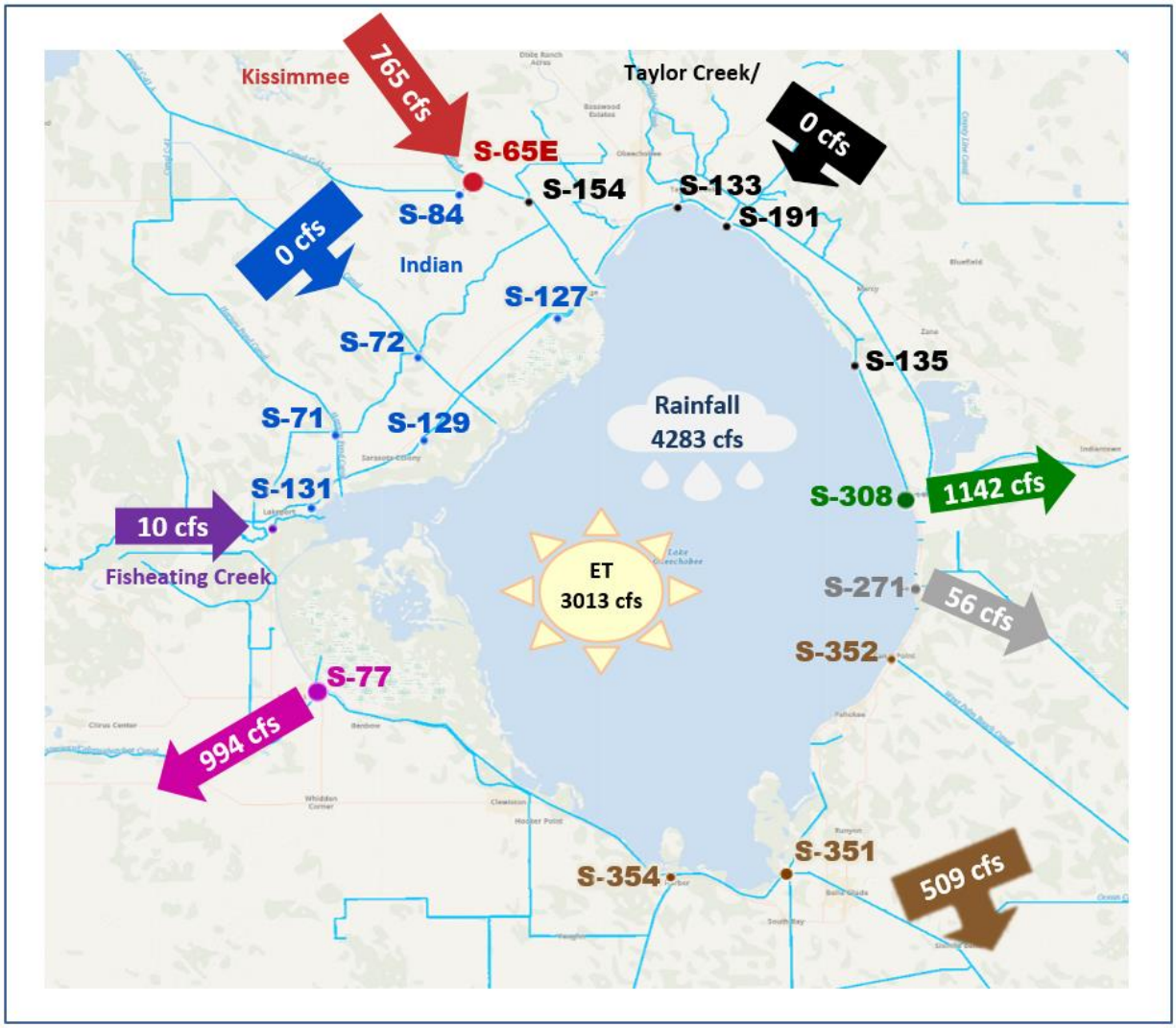


Figure LO-5. Inflows into Lake Okeechobee from Indian Prairie basins, Taylor Creek/Nubbin Slough, Kissimmee River and Fisheating Creek, and outflows to the west via S-77, to the east via S-308, to the south via S-351, S-352, S-354, and to southeast via S-271 (formerly Culvert 10A) for the week of May 23-29, 2022.

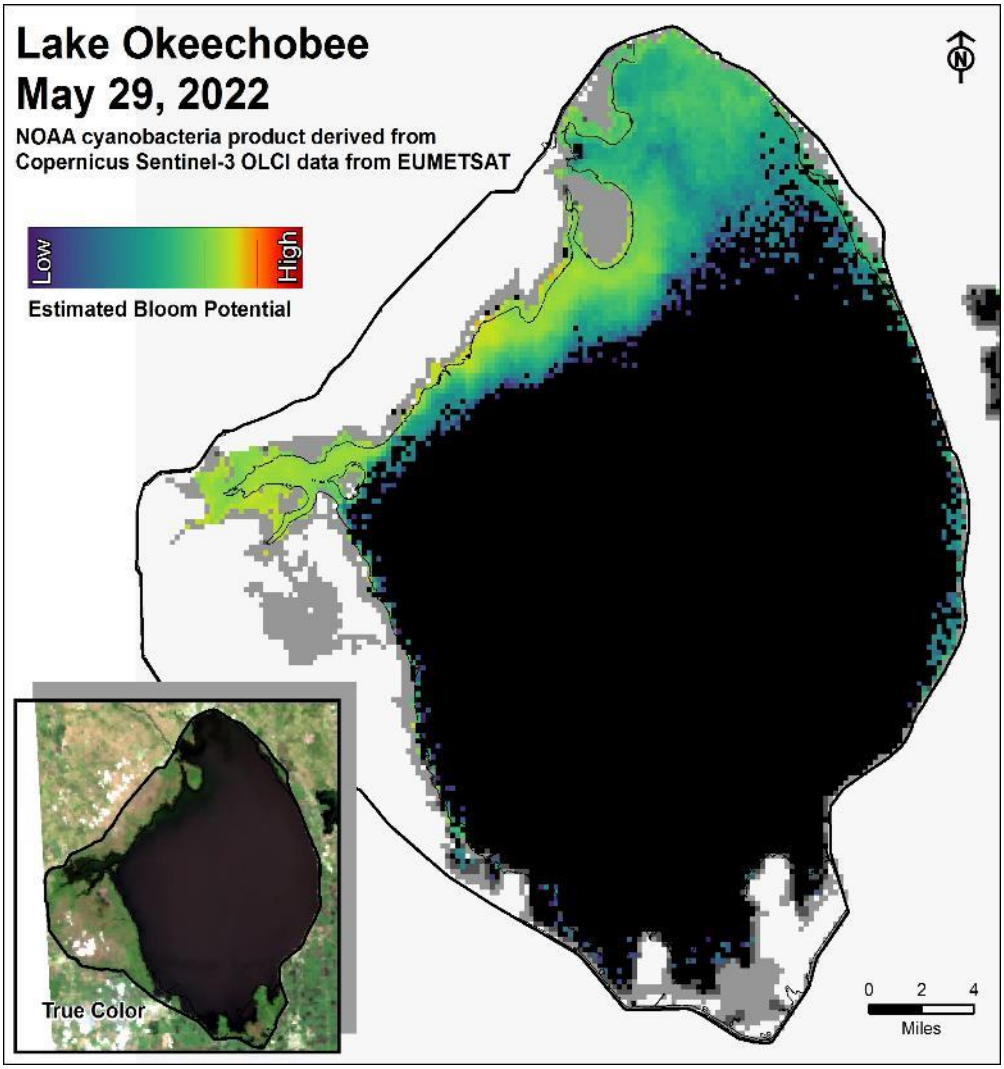


Figure LO-6. Cyanobacteria bloom potential on May 29, 2022 based on NOAA's harmful algal bloom monitoring system. Gray color indicates cloud cover.

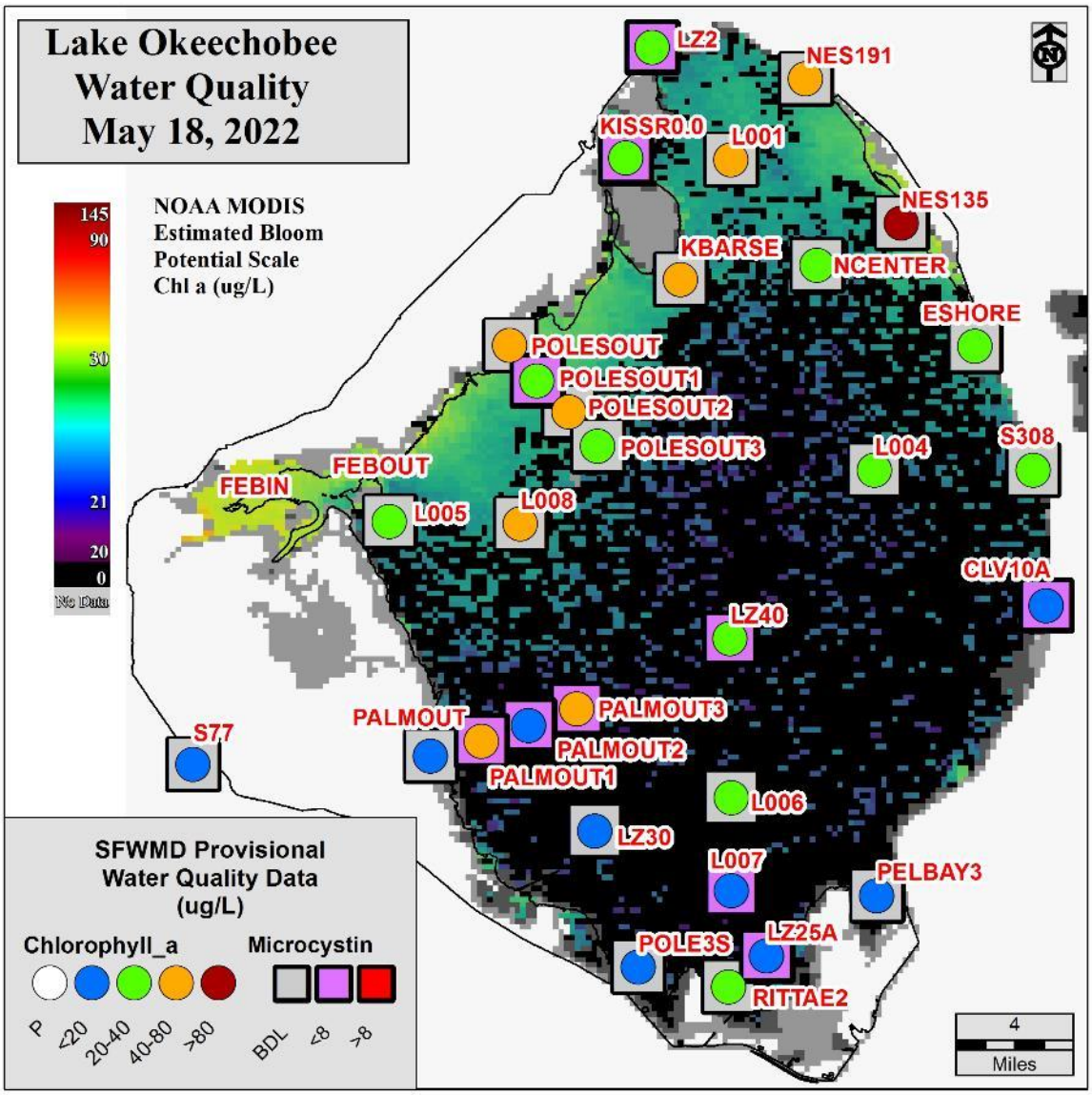


Figure LO-7. Expanded monitoring network and provisional chlorophyll *a* (µg/L) and total microcystins (µg/L) concentrations results from samples collected May 16-18, 2022.

Estuaries

St. Lucie Estuary

Over the past week, mean total inflow to the St. Lucie Estuary was 341 cfs (**Figures ES-1** and **ES-2**) and the previous 30-day mean inflow was 342 cfs. For comparison, the historical provisional mean inflows from the contributing areas are shown in **Figure ES-2**.

Over the past week, surface salinity decreased slightly at HR1 while bottom salinity increased, and salinities decreased at US1 Bridge and increased at the A1A Bridge sites (**Table ES-1** and **Figure ES-3**). The seven-day moving average of the surface and bottom salinities at the US1 Bridge was 25.4. Salinity conditions in the middle estuary were estimated to be within the stressed range for adult eastern oysters (**Figure ES-4**). The mean larval oyster recruitment rate reported by the Fish and Wildlife Research Institute was 13.8 spat/shell for April and was higher than any recruitment rate reported in the past two years (**Figure ES-5**).

Caloosahatchee River Estuary

Over the past week, mean total inflow to the Caloosahatchee River Estuary was 1,047 cfs (**Figures ES-6** and **ES-7**) and the previous 30-day mean inflow was 1,068 cfs. For comparison, the historical provisional mean inflows from the contributing areas are shown in **Figure ES-7**.

Over the past week, salinities increased 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 was 1.2 spat/shell at Iona Cove in April. Recruitment rates remained low at Bird Island (**Figures ES-11 and ES-12**).

Surface salinity at Val I-75 was forecasted for the next two weeks, using an autoregression model (Qiu and Wan, 2013[1]) coupled with a linear reservoir model for the tidal basin. Model scenarios included pulse releases at S-79 ranging from 0 to 1500 cfs, and steady releases at 2,000 cfs with estimated tidal basin inflows of 60 cfs. Model results from all scenarios predict daily salinity to be 5.9 or lower and the 30-day moving average surface salinity to be 2.2 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 May 27, 2022, that *Karenia brevis*, the Florida red tide dinoflagellate, was not observed in any samples collected statewide. On the east coast, red tide was not observed in samples from St. Lucie, Martin, or Miami-Dade counties.

Water Management Recommendations

Lake stage is in the Beneficial Use Sub-Band. Tributary conditions are dry. The LORS2008 release guidance suggests no releases to the Caloosahatchee River Estuary or the St. Lucie Estuary.

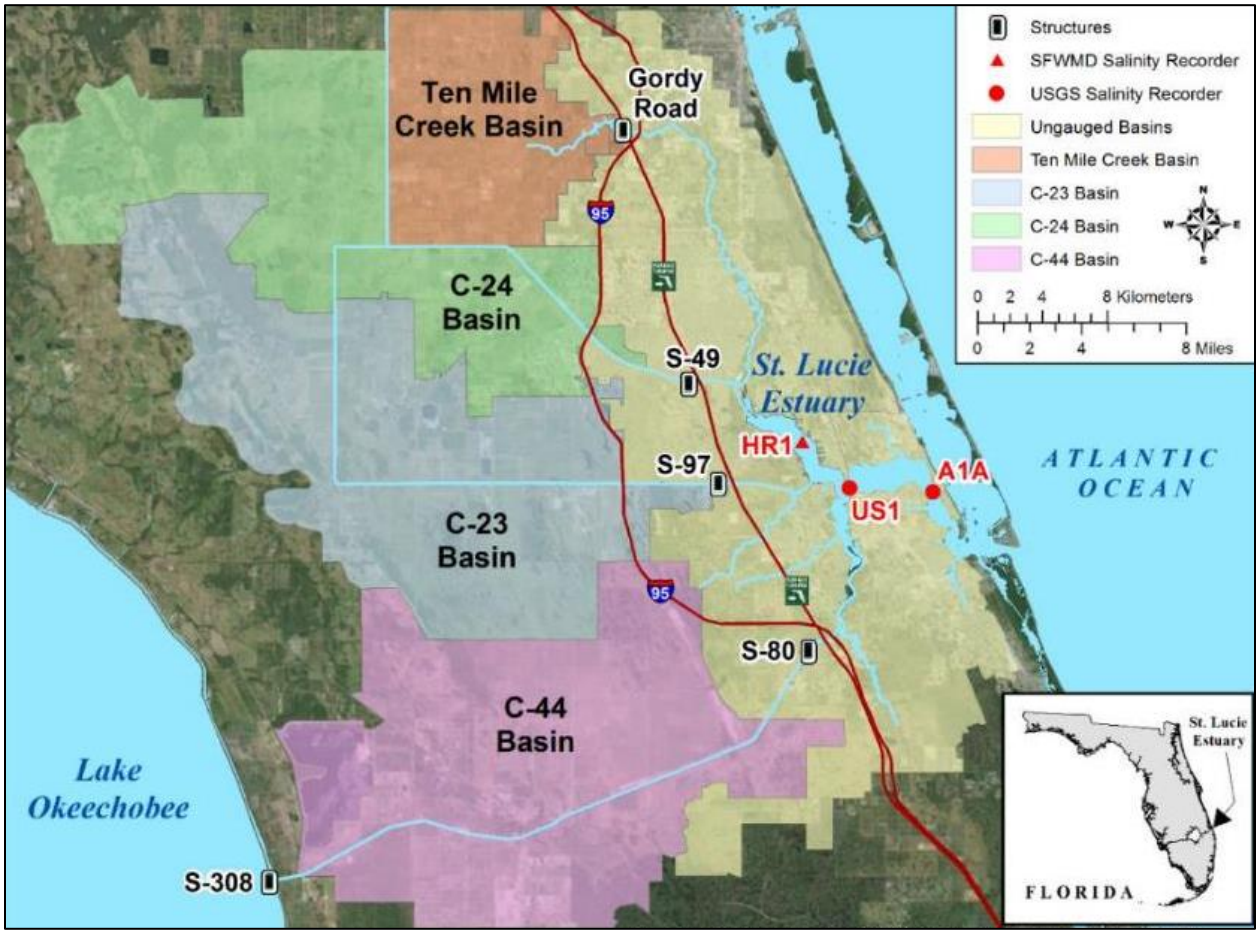


Figure ES-1. Basins, water control structures and salinity monitoring sites in the St. Lucie Estuary.

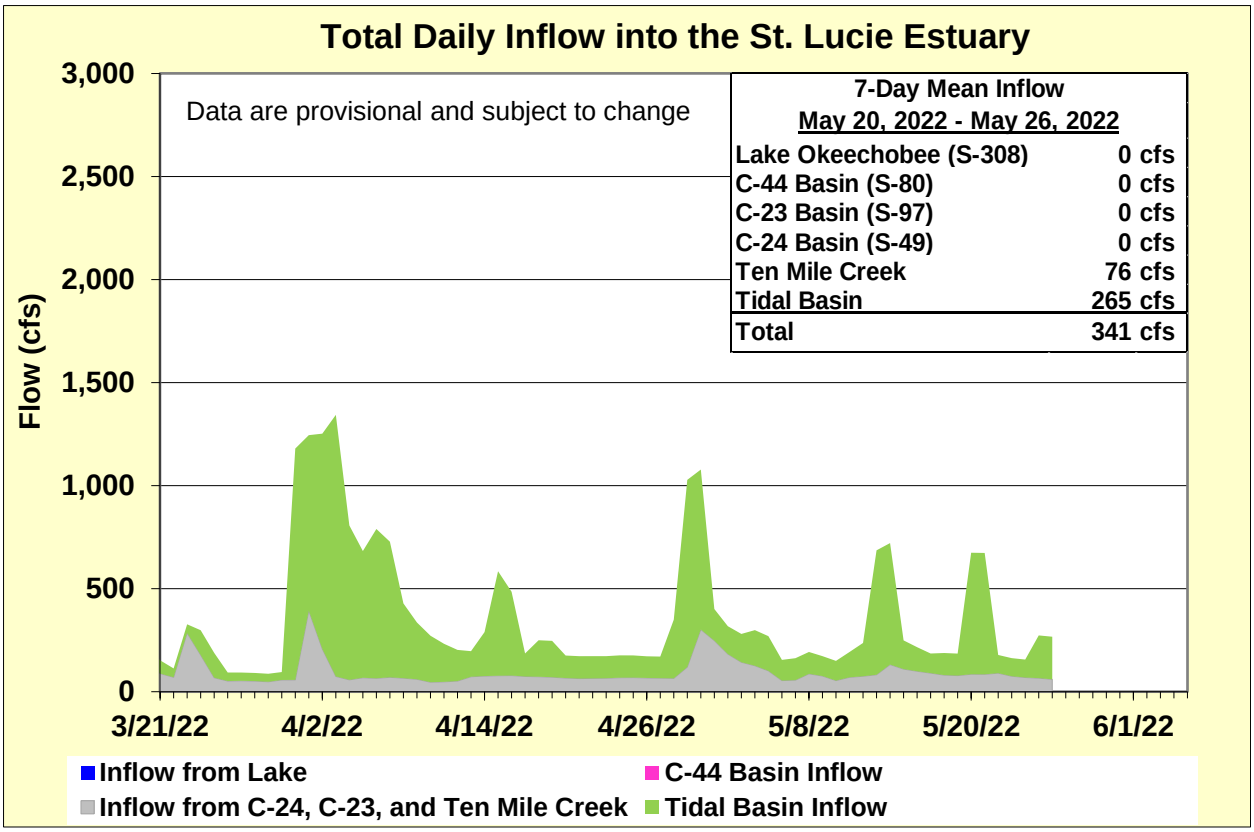


Figure ES-2. Total daily inflows from Lake Okeechobee and runoff from the C-44, C-23, C-24, Ten Mile Creek, and Tidal Basins into the St. Lucie Estuary.

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)	**22.0** (22.3)	**22.8** (21.9)	10.0 – 25.0
US1 Bridge	**25.1** (25.4)	**25.7** (26.1)	10.0 – 25.0
A1A Bridge	**31.0** (30.6)	**32.0** (31.7)	10.0 – 25.0

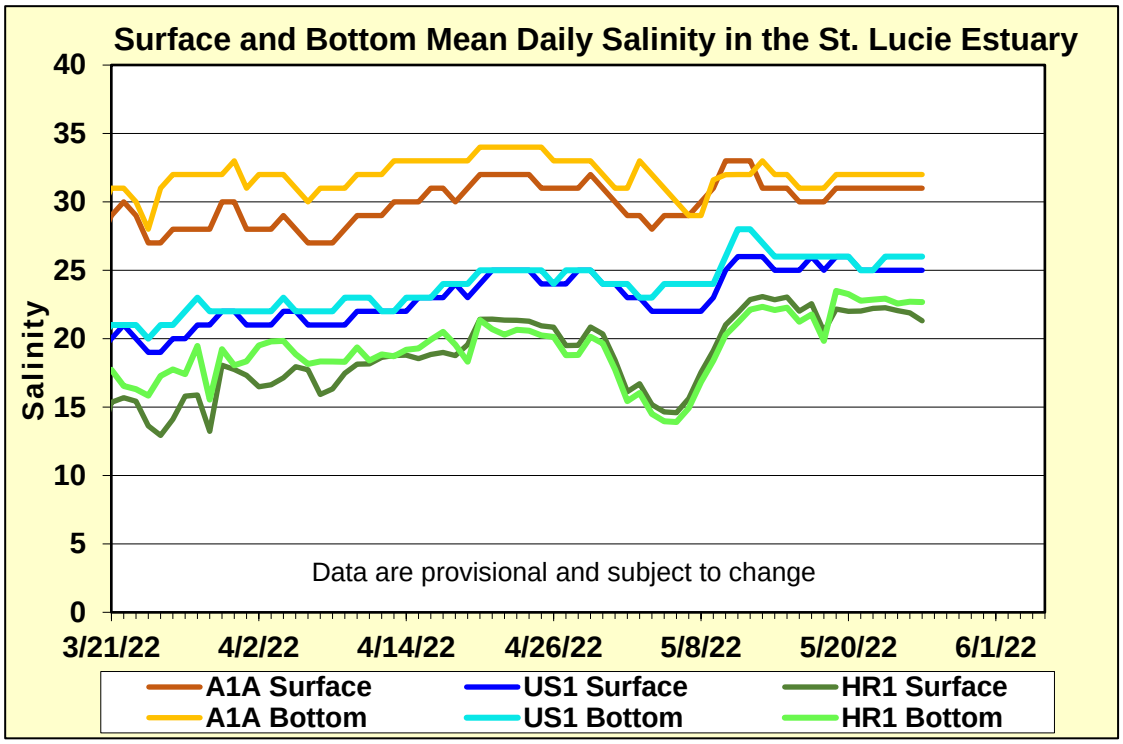


Figure ES-3. Mean daily salinity at the A1A, US1 and HR1 sites in the St. Lucie Estuary.

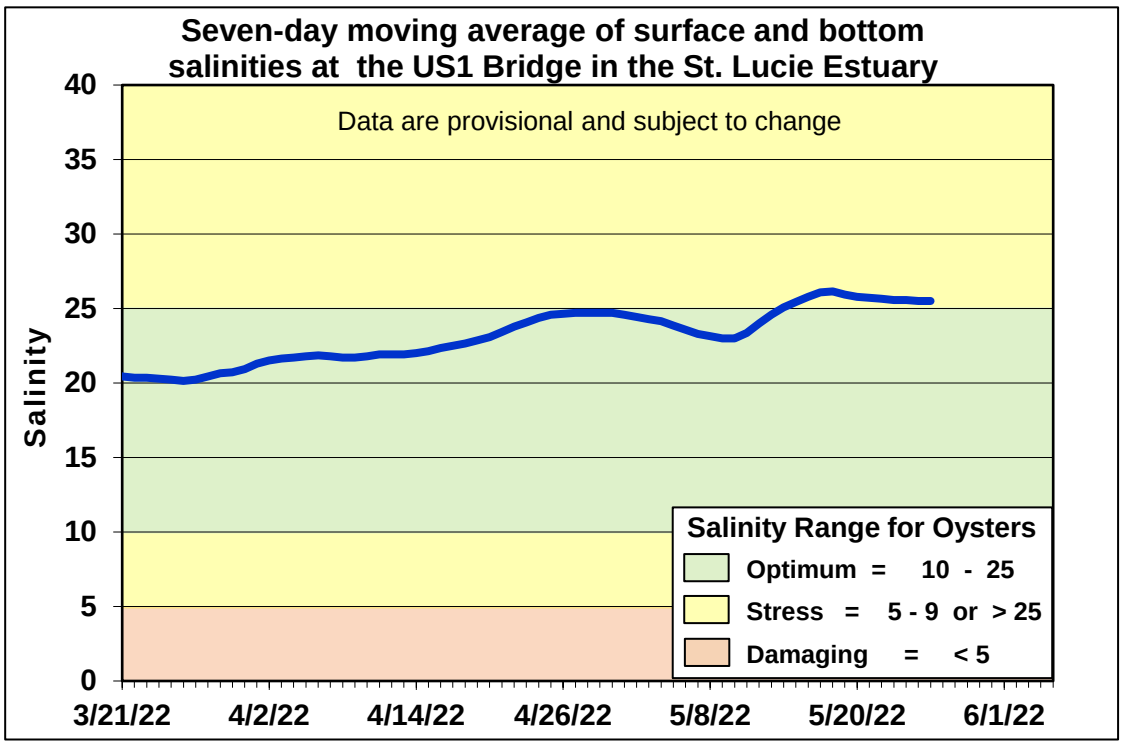


Figure ES-4. Seven-day moving average of the surface and bottom salinities at the US1 Bridge in the St. Lucie Estuary.

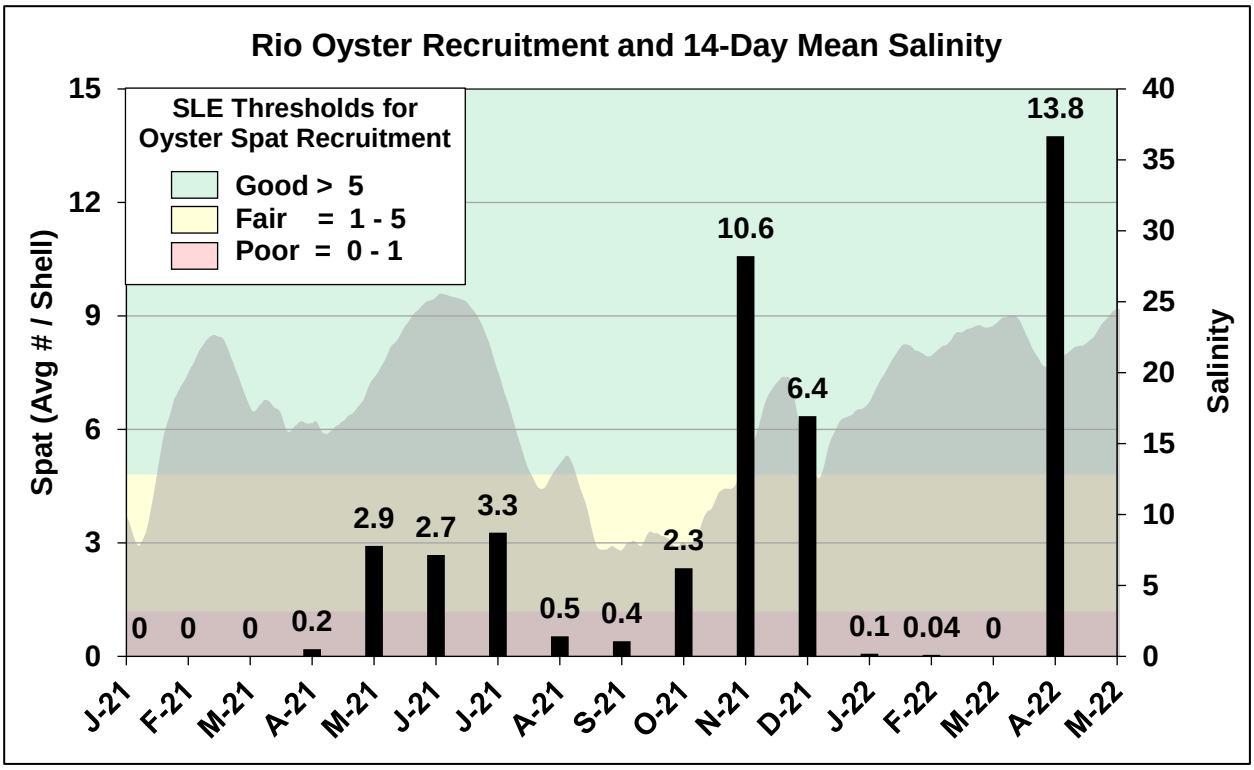


Figure ES-5. Mean oyster recruitment at the Rio oyster monitoring station and 14-day mean salinity at US1 Bridge.

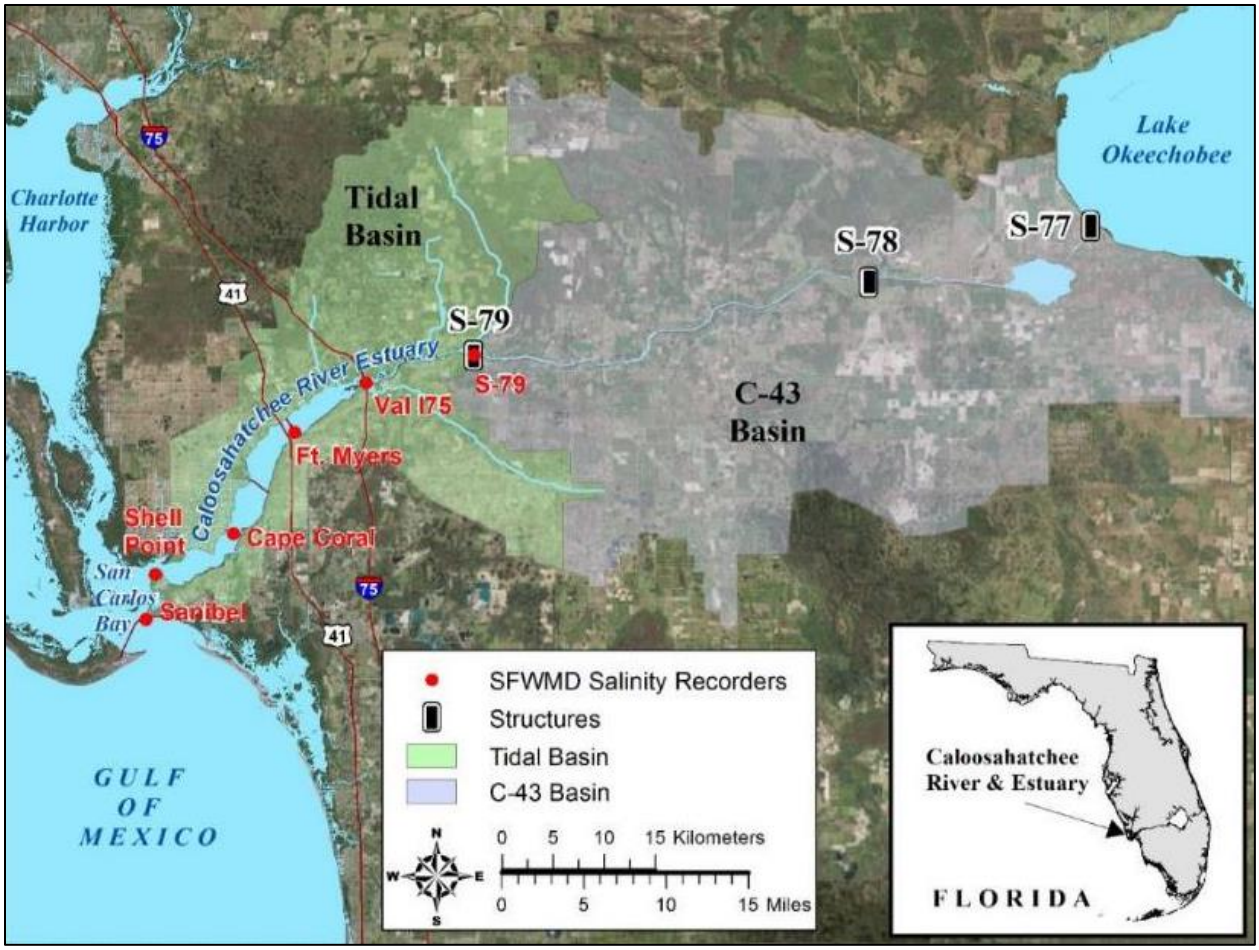


Figure ES-6. Basins, water control structures and salinity monitoring sites in the Caloosahatchee River Estuary.

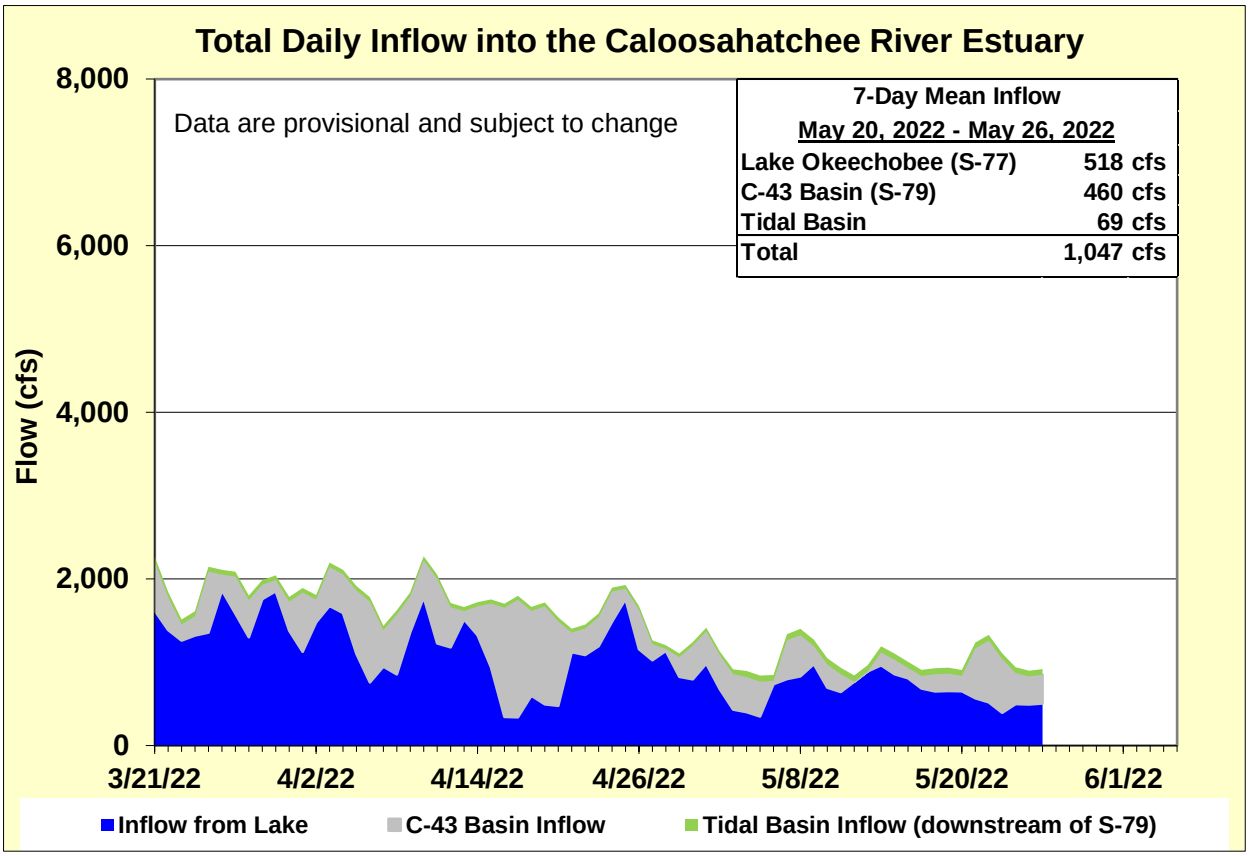


Figure ES-7. Total daily inflows from Lake Okeechobee, and runoff from the C-43 and Tidal basins into the Caloosahatchee River Estuary.

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

Sampling Site	Surface	Bottom	Optimum Envelope
S-79 (Franklin Lock)	**0.4** (0.2)	**0.4** (0.2)	0.0 – 10.0
Val I-75	**0.7** (0.6)	**1.2** (0.8)	0.0 – 10.0
Fort Myers Yacht Basin	**6.0** (5.7)	**7.3** (6.6)	0.0 – 10.0
Cape Coral	**14.4** (13.6)	**15.9** (14.9)	10.0 – 25.0
Shell Point	**28.4** (27.0)	**28.8** (27.3)	10.0 – 25.0
Sanibel	**31.8** (30.3)	**33.5** (32.1)	10.0 – 25.0

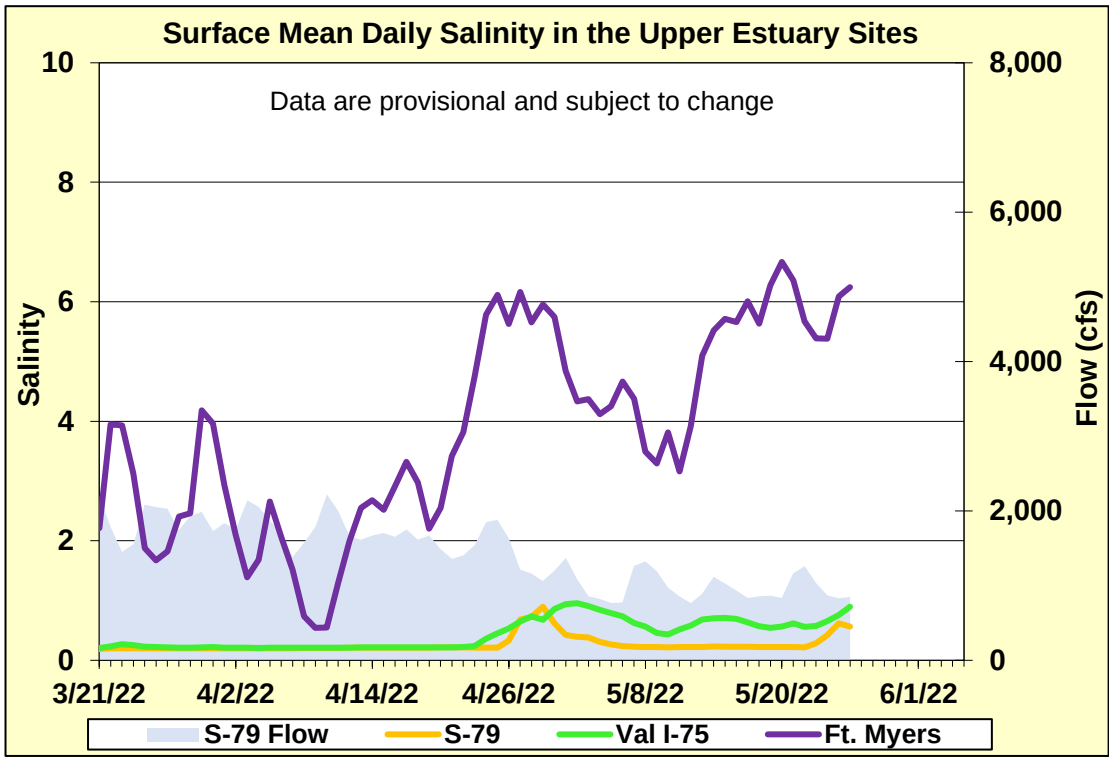


Figure ES-8. Mean daily salinity at upper Caloosahatchee River Estuary monitoring sites and mean daily flow at S-79.

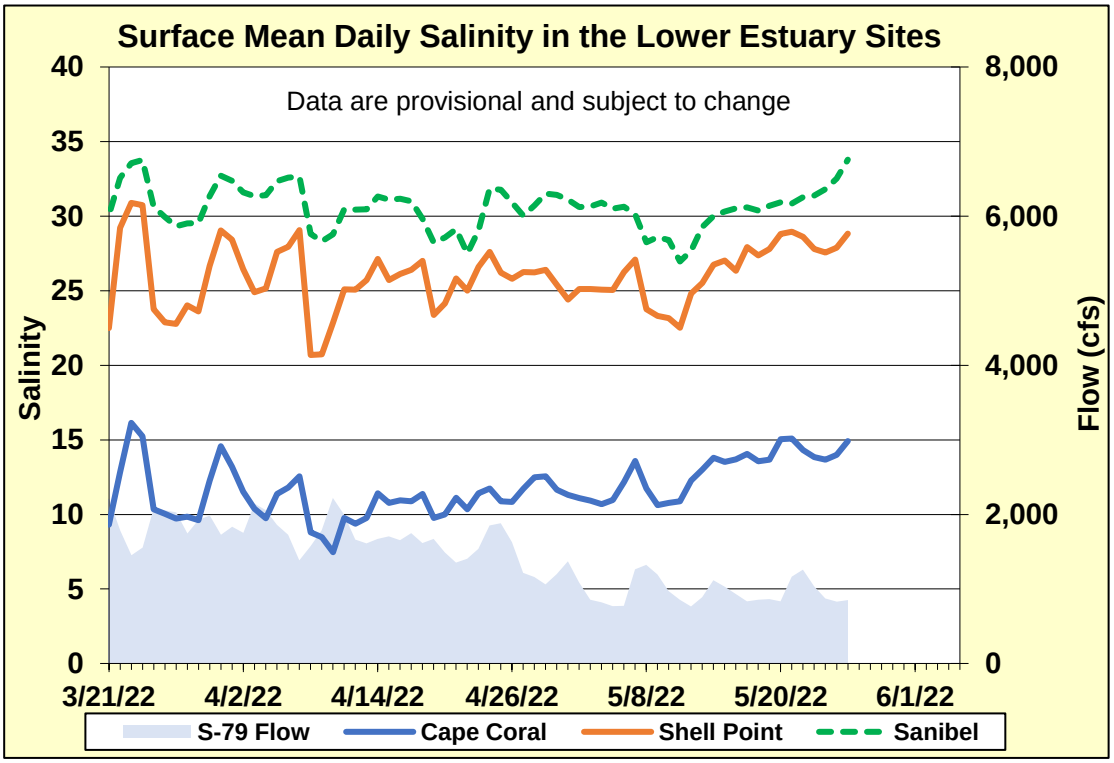


Figure ES-9. Mean daily surface salinity at lower Caloosahatchee River Estuary monitoring sites and mean daily flow at S-79.

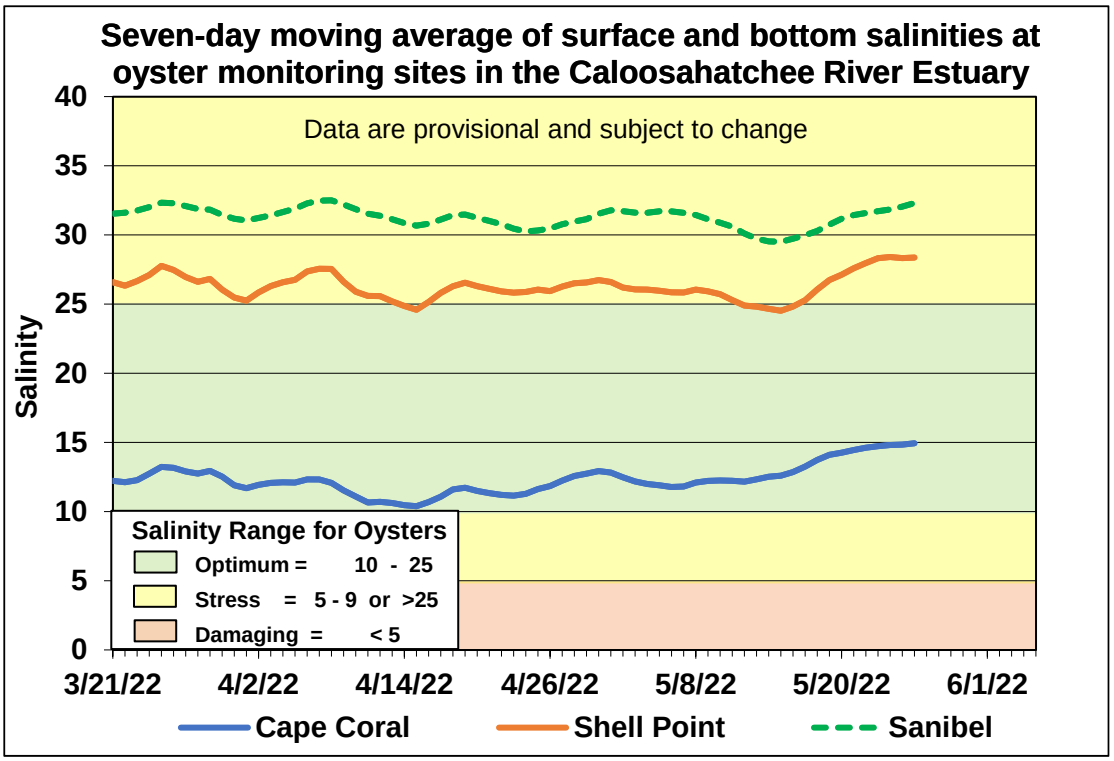


Figure ES-10. Seven-day moving average of surface and bottom salinities at Cape Coral, Shell Point and Sanibel monitoring sites in the Caloosahatchee River Estuary.

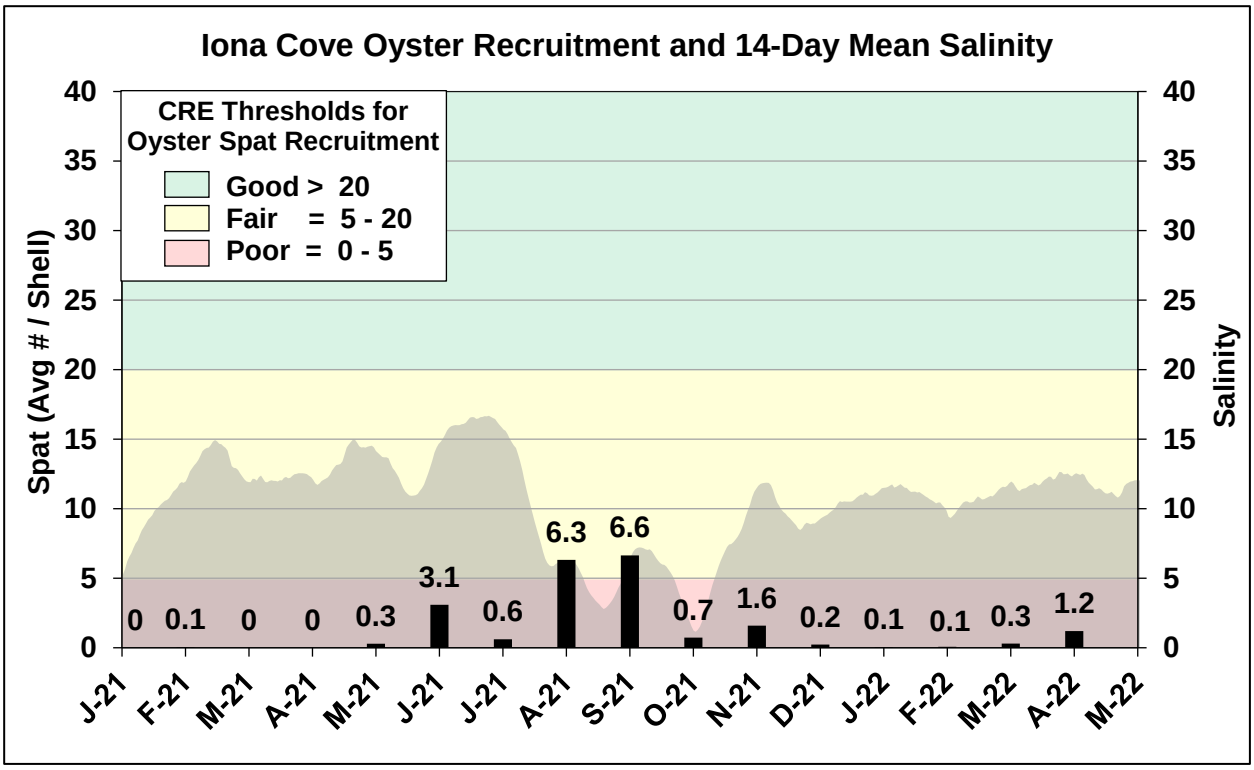


Figure ES-11. Mean oyster recruitment at the Iona Cove oyster monitoring station and 14-day mean salinity at Cape Coral.

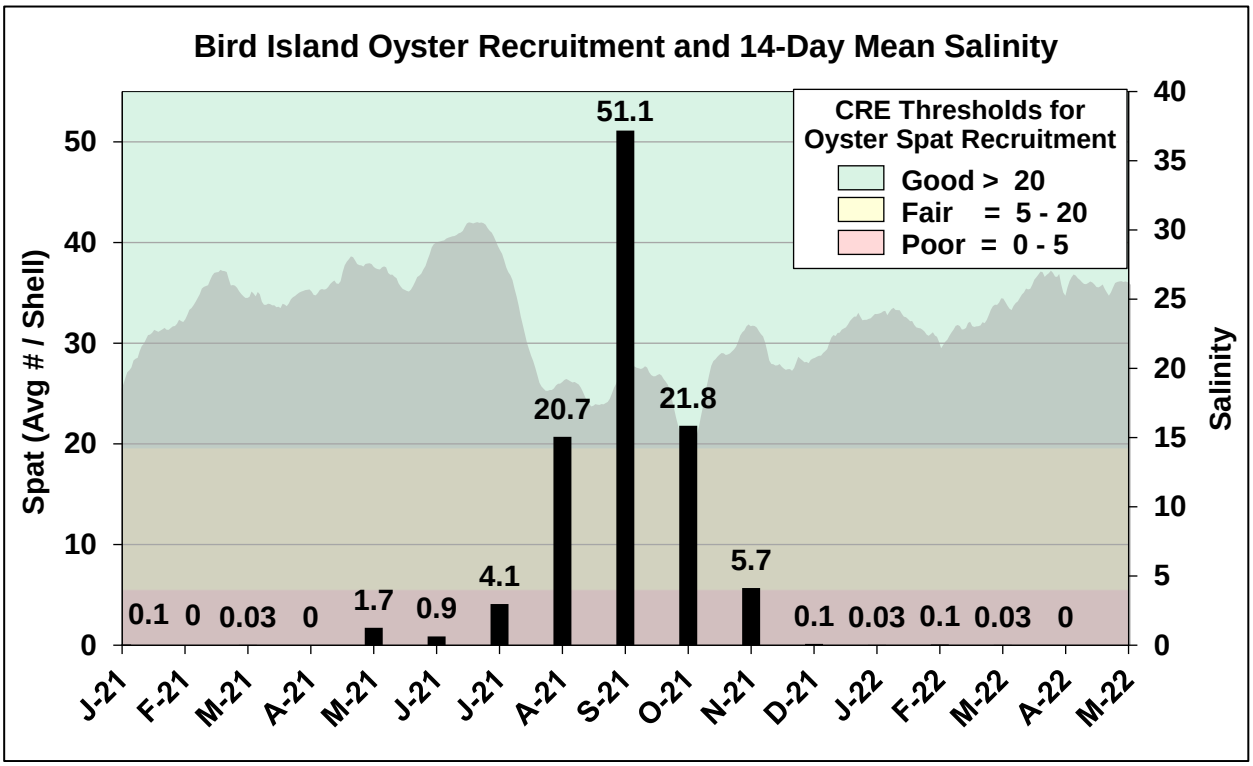


Figure ES-12. Mean oyster recruitment at the Bird Island oyster monitoring station and 14-day mean salinity at Shell Point.

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	60	5.9	2.2
B	450	60	4.3	1.8
C	800	60	3.1	1.6
D	1000	60	2.2	1.4
E	1500	60	1.2	1.2
F	2000	60	0.5	1.0

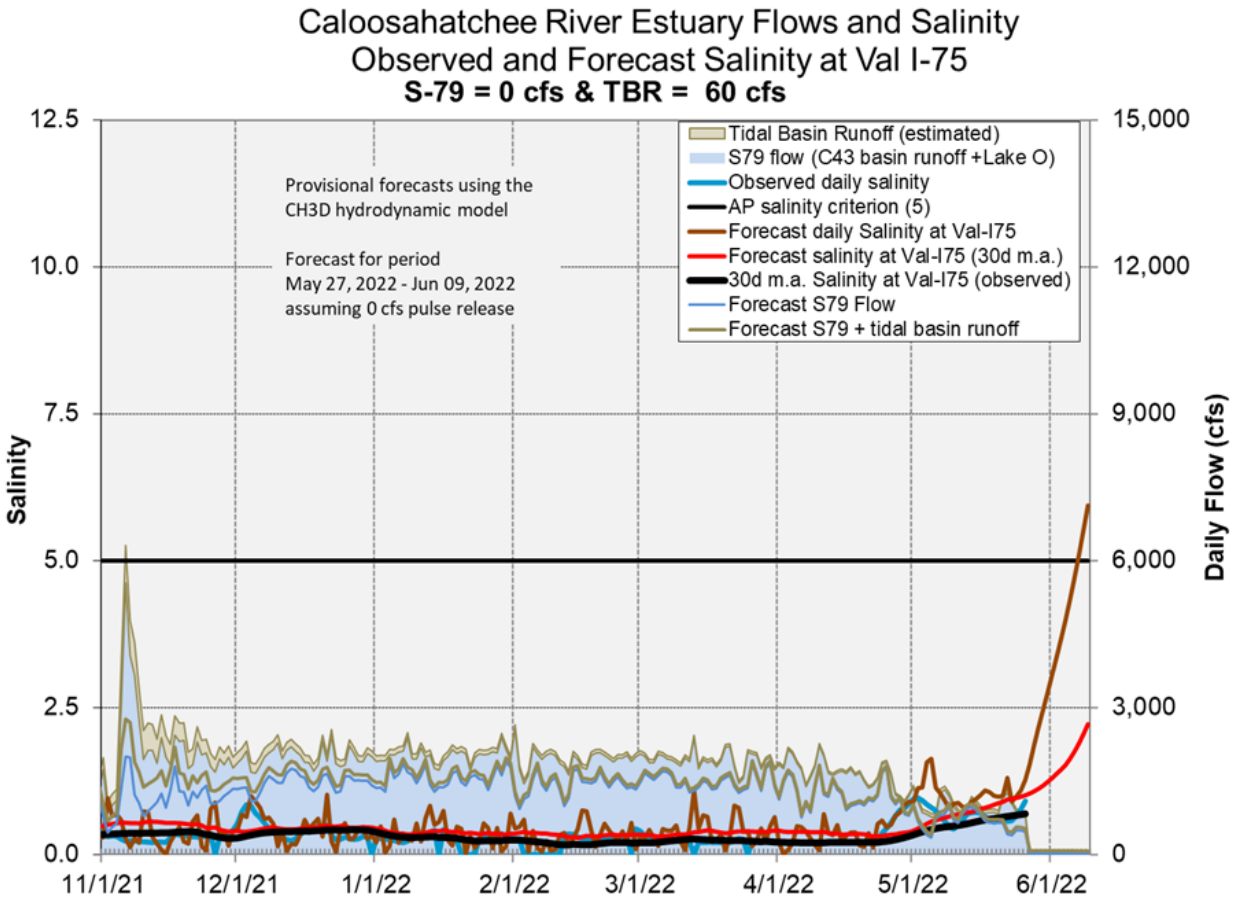


Figure ES-13. Forecasted Val I-75 site surface salinity assuming no pulse release at S-79.

Stormwater Treatment Areas

STA-1E: STA-1E Western Flow-way is offline for post-construction vegetation grow in. The Central Flow-way contains nests of Migratory Bird Treaty Act protected species. Operational restrictions are in place in STA-1E Central and Eastern Flow-ways for vegetation management activities. Online treatment cells are at or near target stage and vegetation in the flow-ways is stressed and highly stressed. The 365-day phosphorus loading rates (PLRs) is high for the Central Flow-way (**Figure S-1**).

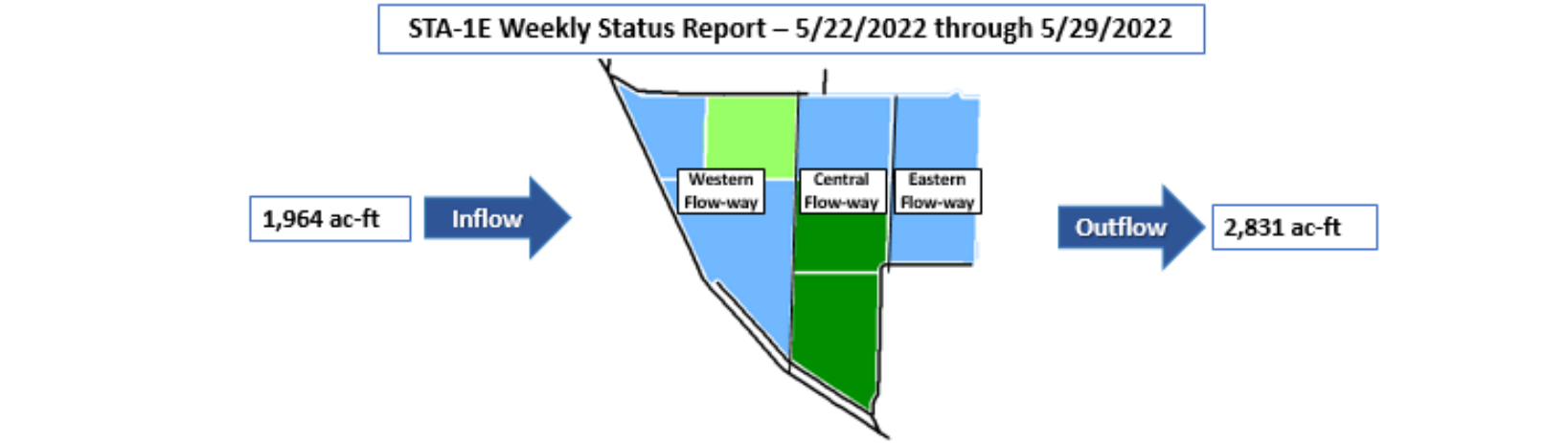
STA-1W: Operational restrictions are in place in STA-1W Western, Eastern, and Northern Flow-ways for vegetation management activities. The Eastern and Northern Flow-ways contain nests of Migratory Bird Treaty Act protected species. Most treatment cells are at or near target stage. Vegetation in the flow-ways is stressed and highly stressed. The 365-day PLRs for the Northern and Western, and Eastern Flow-ways are below 1.0 g/m^2/year (**Figure S-2**).

STA-2: STA-2 Flow-way 2 is offline for construction activities. Flow-way 3 contains nests of Migratory Bird Treaty Act protected species. 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. The Central Flow-way contains nests of Migratory Bird Treaty Act protected species. 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. All treatment cells are below target stage. All treatment cells have highly stressed vegetation conditions except Flow-ways 7 and 8 which are healthy. The 365-day PLRs for 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.



STA-1E Flow-Way Status

Flow-Way	Vegetation Status (Healthy ⟷ Stressed)	365-day P Loading Rate (below 1.0 g P /m²/yr is optimal)	Online / Offline / Restrictions
Eastern	⟷	N/A	Vegetation management
Central	⟷	1.0	Veg Rehab / Nesting
Western	Offline, post-construction grow in starting 3/28/2022		

As of 5/29/2022

Stage Based: Relative to Target Stage (TS)

- Deep Water Level (> 2.8' above TS)
- High Water Level (1.5' – 2.8' above TS)
- 0.2' – 1.5' above TS
- Target Stage (TS +/- 0.2')
- Low Water Level (<0.2' below TS)

Depth / Area Based: Percent of Area Dry

- 0-25% Dry
- 25-50% Dry
- 50-75% Dry
- 75-100% Dry

STA-1E Flow & Phosphorus Concentration

	7-day	28-day	365-day
Total Inflow, ac-ft	1,964	6,736	178,133
--Lake Inflow, ac-ft	0	N/A	2,900
Total Outflow, ac-ft	2,831	4,032	146,114
Inflow Conc., ppb	131	128	118
Outflow Conc., ppb	24	25	22

Includes Preliminary Data

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

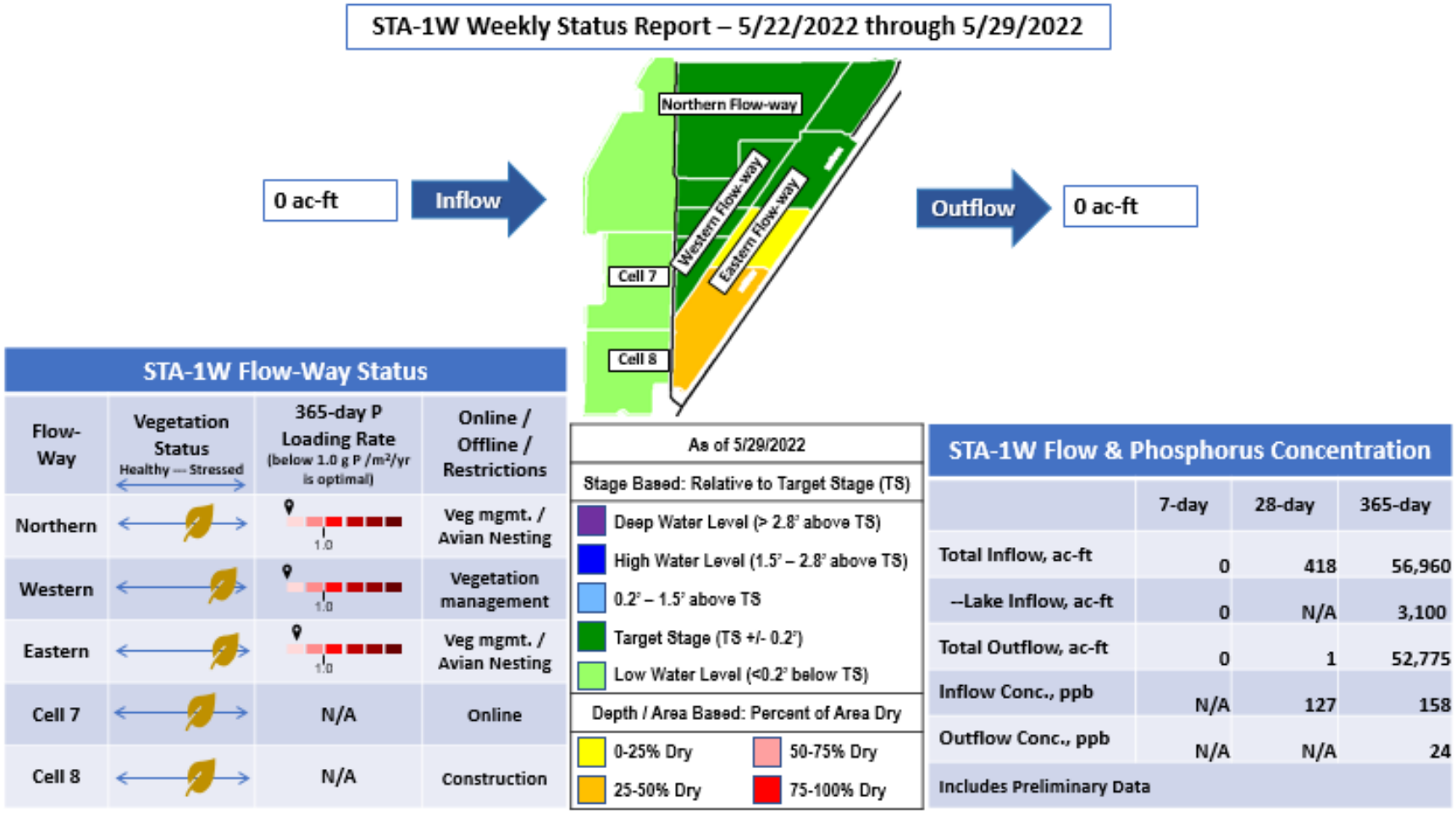


Figure S-2. STA-1W Weekly Status Report

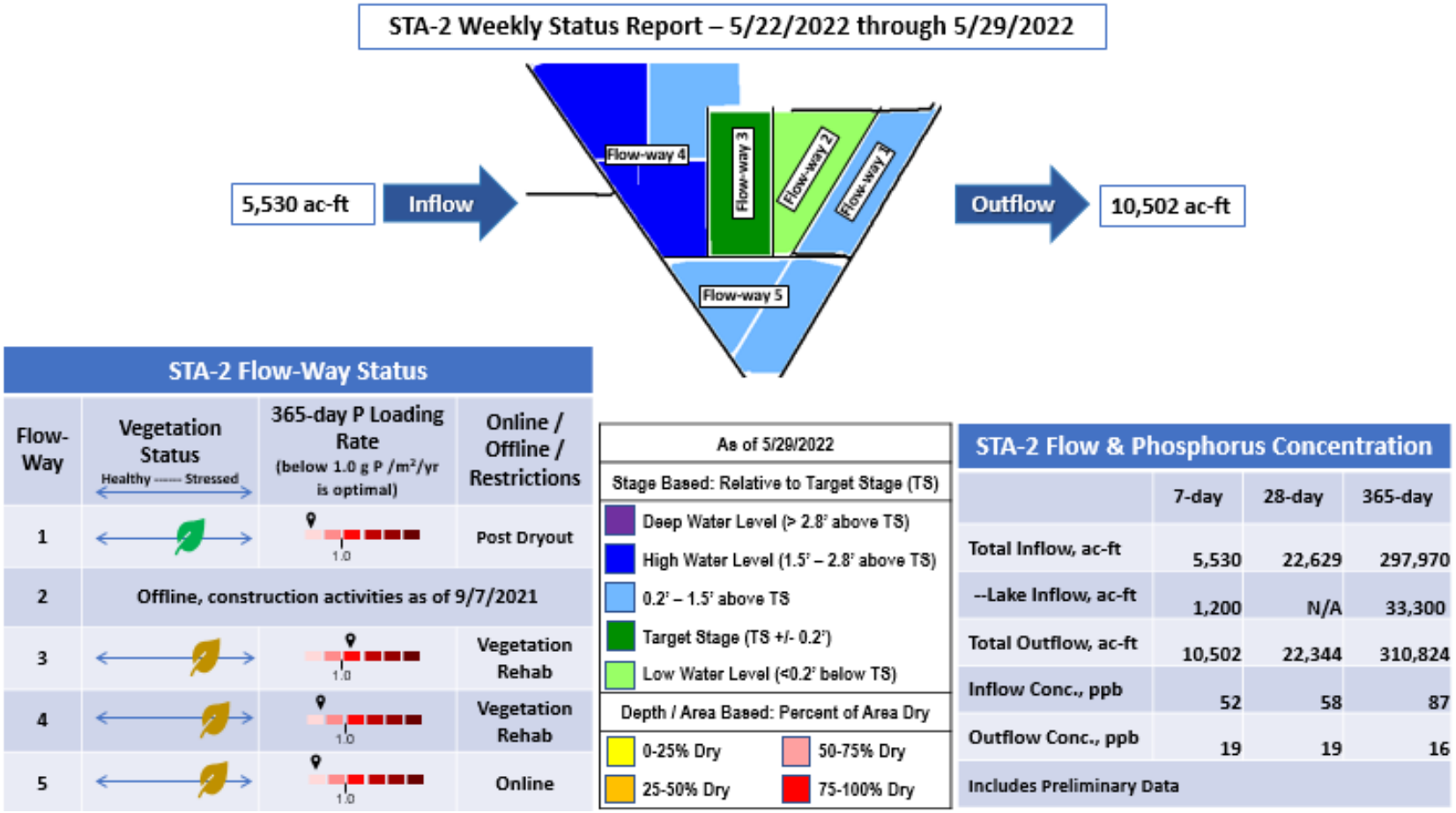


Figure S-3. STA-2 Weekly Status Report

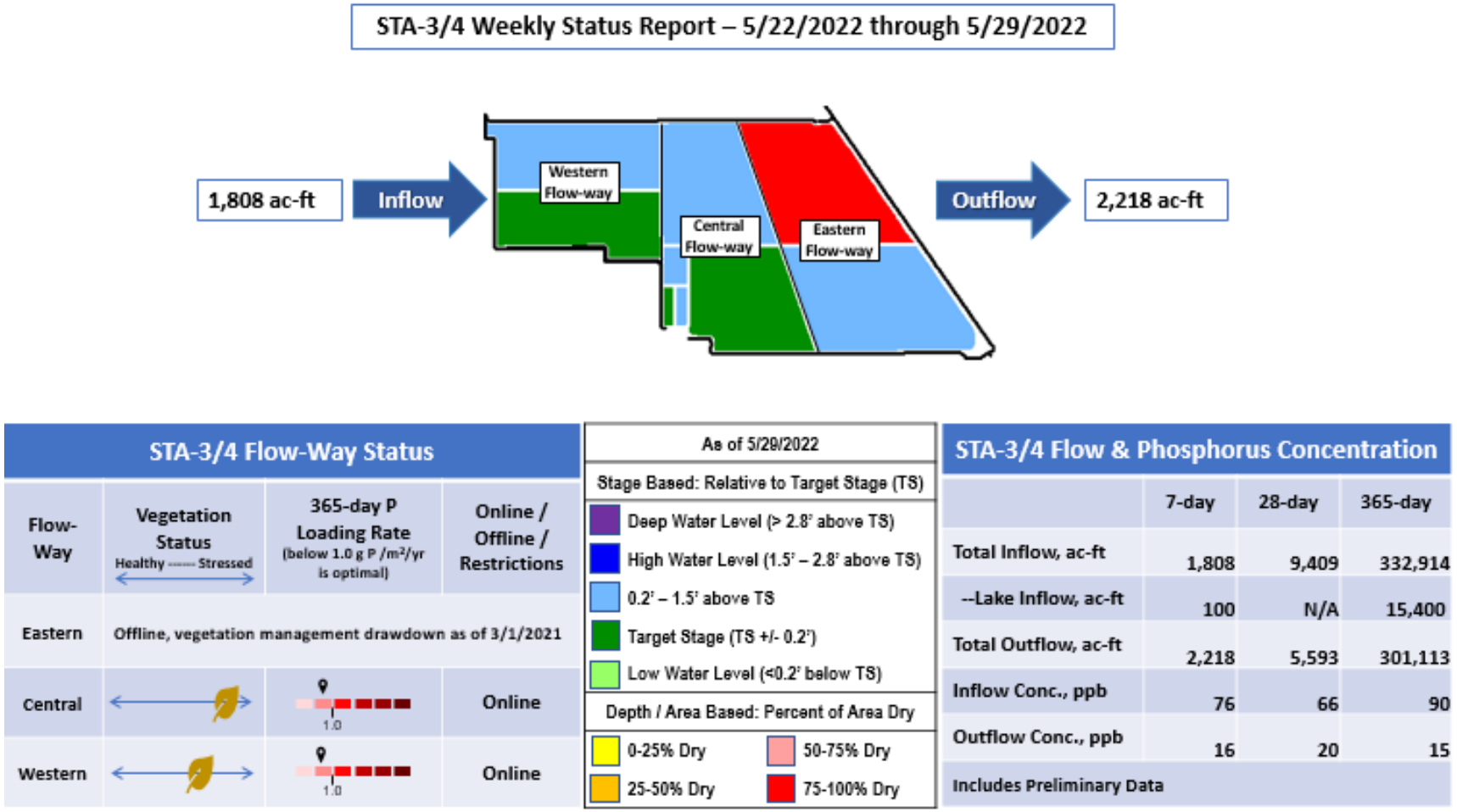


Figure S-4. STA-3/4 Weekly Status Report

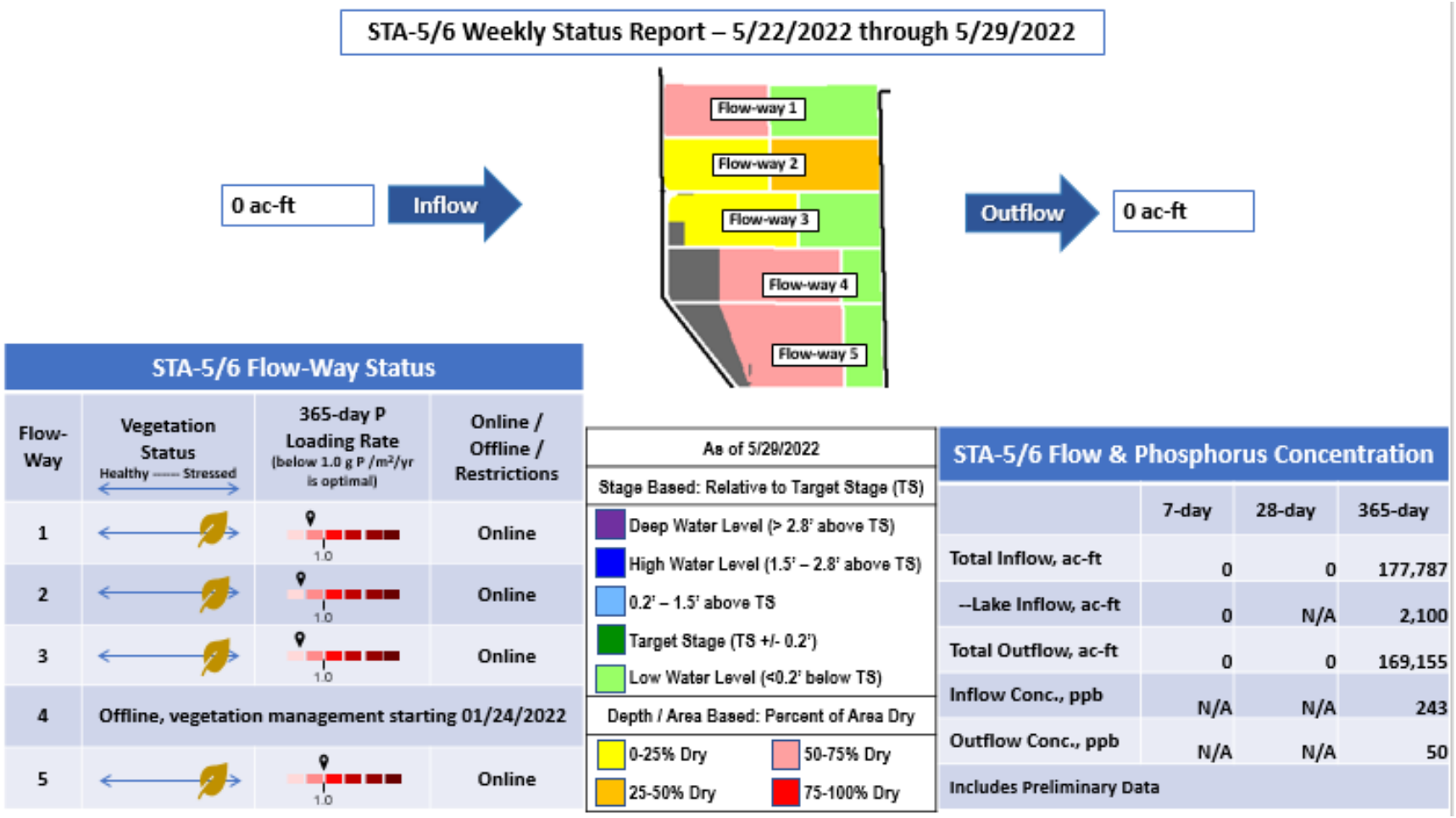


Figure S-5. STA-5/6 Weekly Status Report (Flow-ways 1 – 5)

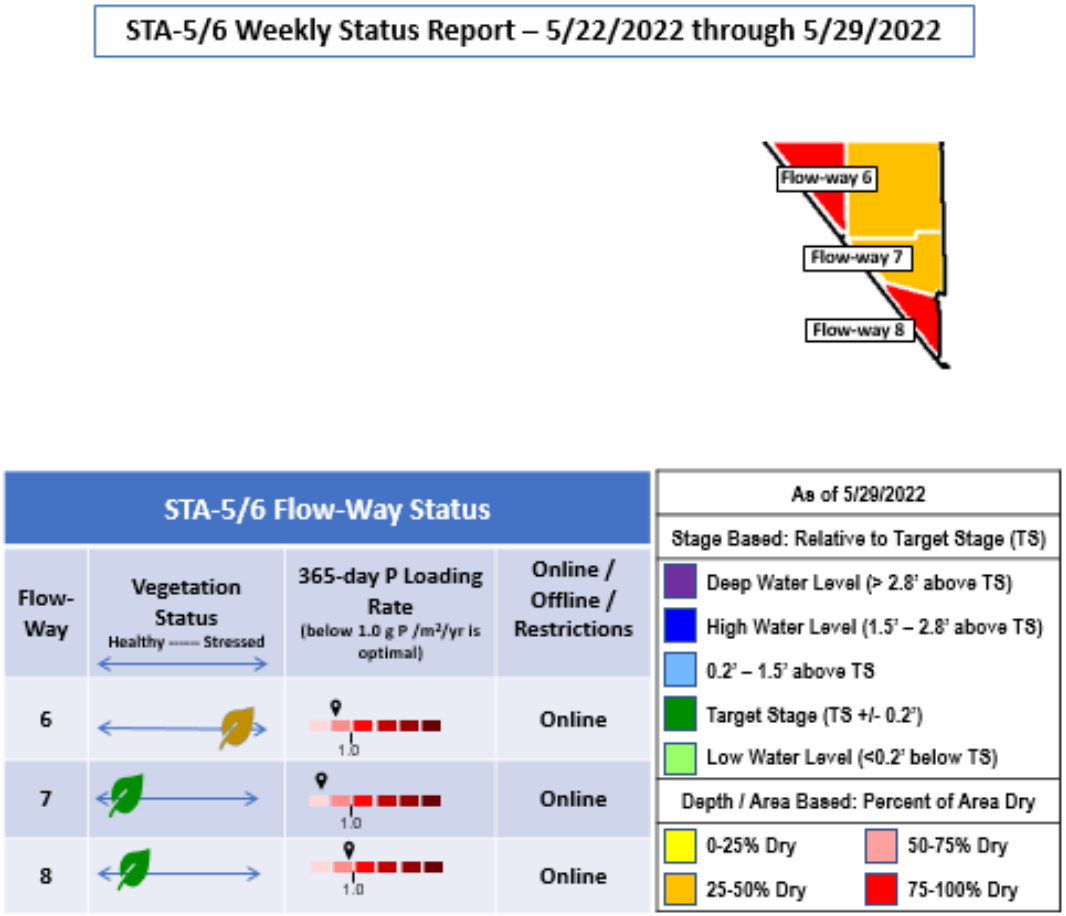


Figure S-6. STA-5/6 Weekly Status Report (Flow-ways 6 – 8)

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 then leveled last week. The average on Friday was only 0.03 feet below the flat Zone A1 regulation line. WCA-2A: Stage leveled at the S11B headwater last week. The average at that gauge on Friday was 0.28 feet above the flat regulation line. WCA-3A: Last week the Three Gauge Average stages receded steadily; average stage was 1.14 feet below the falling regulation line on Friday. WCA-3A: Stage receded quickly at gauge 62 (Northwest corner) last week, the average on Sunday was 1.29 feet below the rising Upper schedule line. (**Figures EV-1** through **EV-4**).

Water Depths

The SFWDAT tool indicates that stages are recovering to soil surface east of the Miami Canal in WCA-3A North. WCA-1 stages remain steady while WCA-2A stages are higher. Southern WCA-3A potentially drying down to soil surface is a rare event, these dry conditions have the potential for ecological harm if they remain too long. North to South hydrologic connectivity is diminishing within Everglades National Park's Shark River Slough. (**Figure EV-5**). Comparing current WDAT water depths to the depth one month ago, stages decreased across southern WCA-3A South, while deeper in central BCNP, northwestern WCA-3A and northern WCA-2A. Looking back one year, most of the EPA is wetter while south-eastern WCA-3A, -3B and NESRS are lower in depth compared to one year ago. (**Figure EV-6)**. Comparing current depths to the past 20 years, the eastern half WCA-3A North continues to move towards the median. BCNP is above the 50th percentile but below the soil surface a condition typical for this time of year but not favorable. WCA-3A South is within the 10 to 20th percentile. Everglades National Park's Shark River Slough remains around the 70th percentile. (**Figure EV-7**).

Taylor Slough and Florida Bay

Stages in Taylor Slough decreased an average of 0.10 feet over this past week, and the northern area of the Slough is remains above ground despite the recession. Individual stage gauge changes ranged from −0.05 feet in the southwestern area of the Slough to −0.16 feet in the central Slough area (**Figure EV-8** and **Figure EV-9**). The Slough is now 6 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. Some positive flows have been seeping out of the 5 main creeks feeding Florida Bay this week with 4 of the last seven days having positive flow into the Bay similar to last week. Weekly net flow volume increased from around 1,000 acre-feet for the week to almost 2,000 acre-feet this past week.

Salinities in Florida Bay averaged an increase of 0.5 over the week ending 5/29, with individual station changes ranging from −2.9 to +3.1 (**Figure EV-8**). The largest changes (both positive and negative) occurred in the western area with the decrease at the shoreline and the increase a little further into the Bay. The eastern and western areas of the Bay are ending May near their 75th percentiles and are decreasing, while the central

Bay is near the middle of its interquartile range (**Figure EV-10**). The Bay, as a whole, is only 2 higher than its historical average for this time of year.

Water Management Recommendations

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 assist recession rates in that sub-basin have an ecological benefit by protecting particularly fragile peat soils from oxidation and lowering the risk of muck fires as we move into the driest part of the year. When conditions allow discharge via S-150 would benefit the downstream ecology as conditions are very 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	1.94	N/A
WCA-2A	2.94	+0.06
WCA-2B	3.26	+0.33
WCA-3A	1.50	+0.07
WCA-3B	1.94	+0.04
ENP	0.71	−0.04

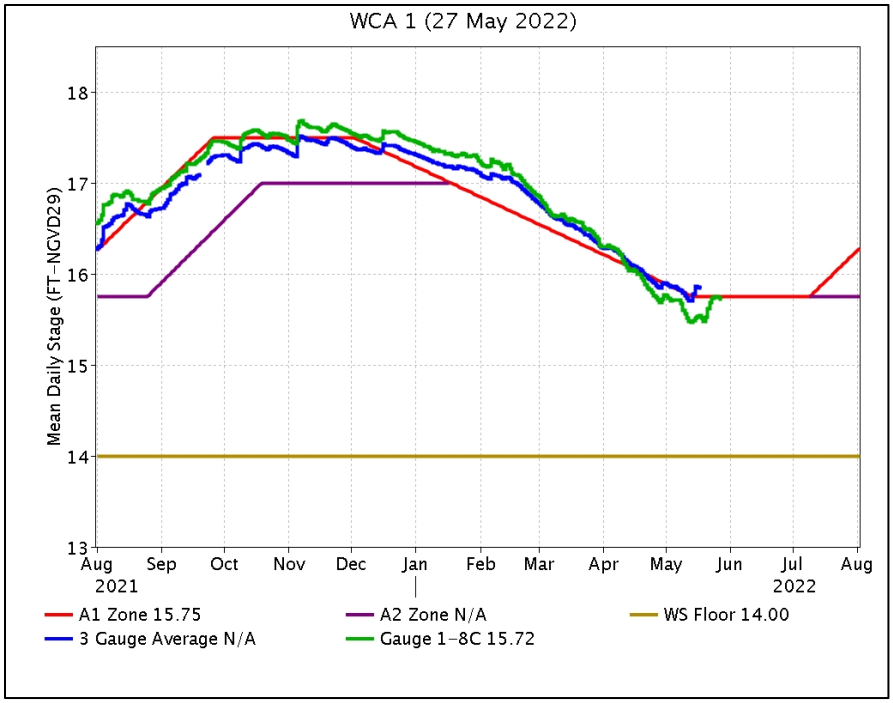


Figure EV-1. WCA-1 stage hydrographs and regulation schedule.

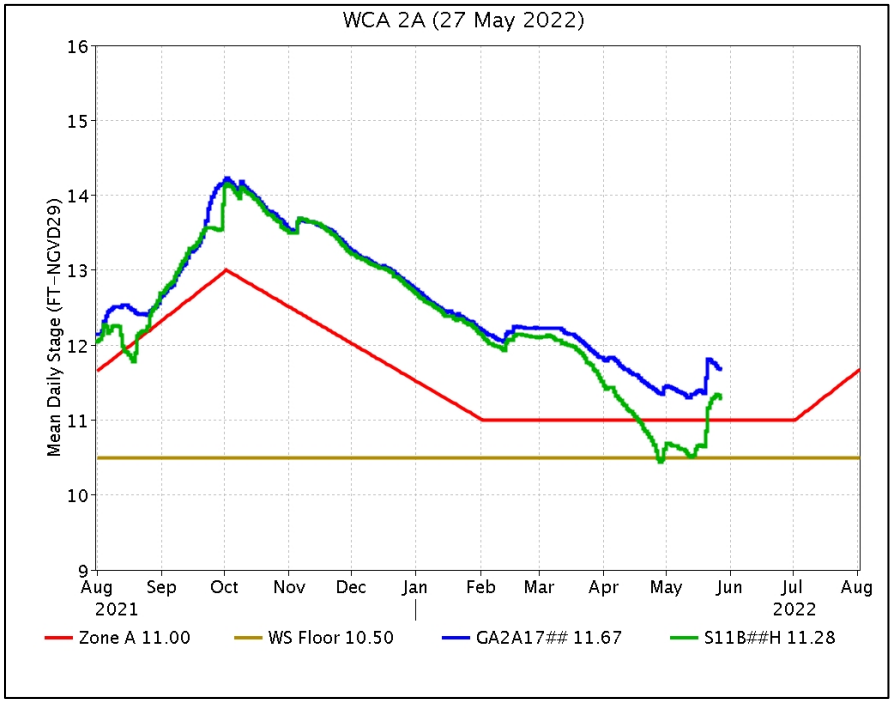


Figure EV-2. WCA-2A stage hydrographs and regulation schedule.

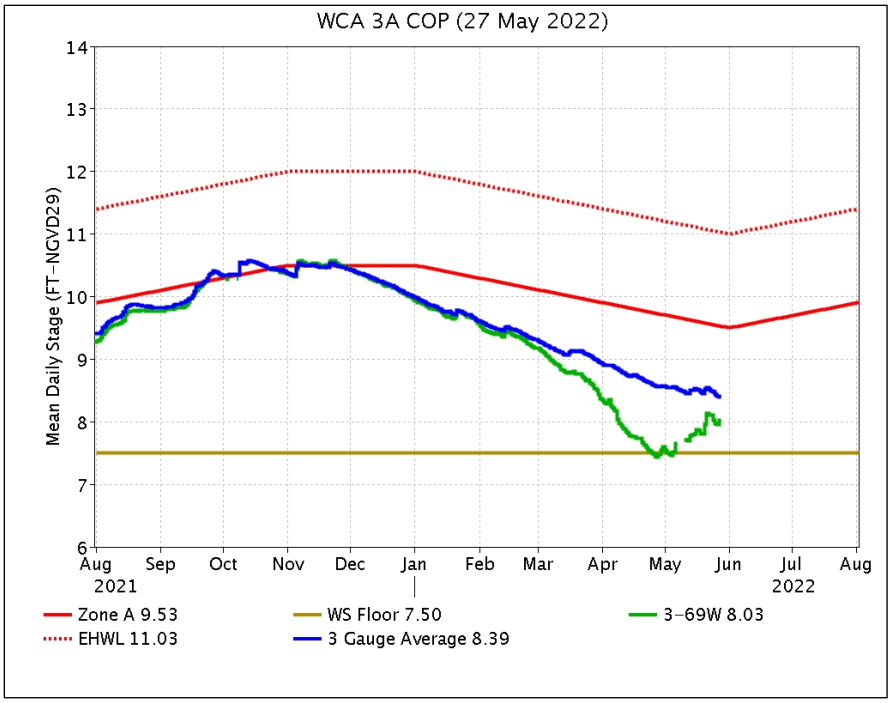


Figure EV-3. WCA-3A stage hydrographs (three-gauge average, S-333 headwater) and regulation schedule.

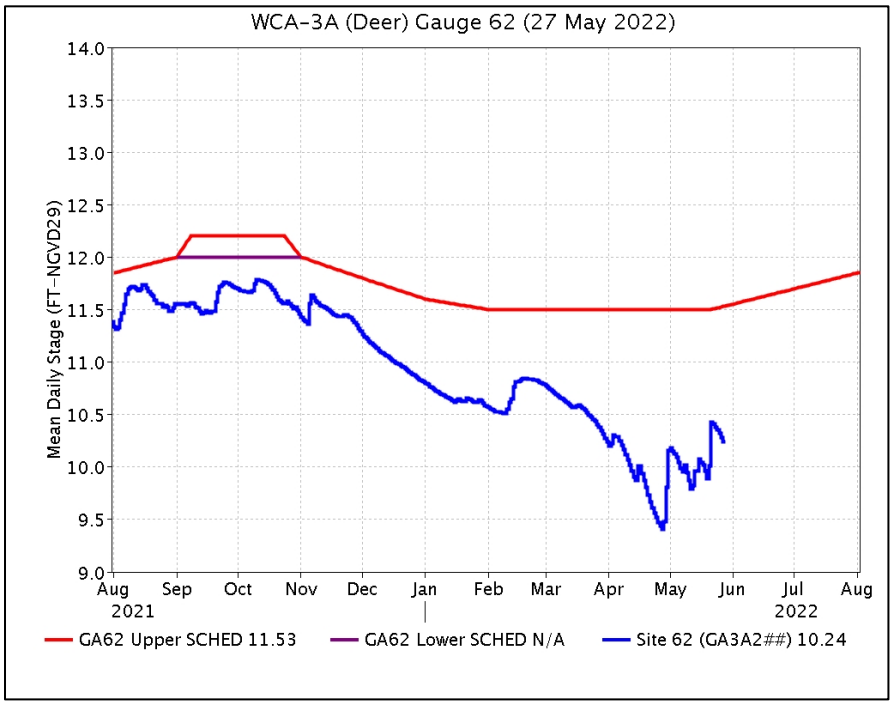


Figure EV-4. WCA-3A stage hydrograph (Deer gauge; Site 62) and CA62 regulation schedule.

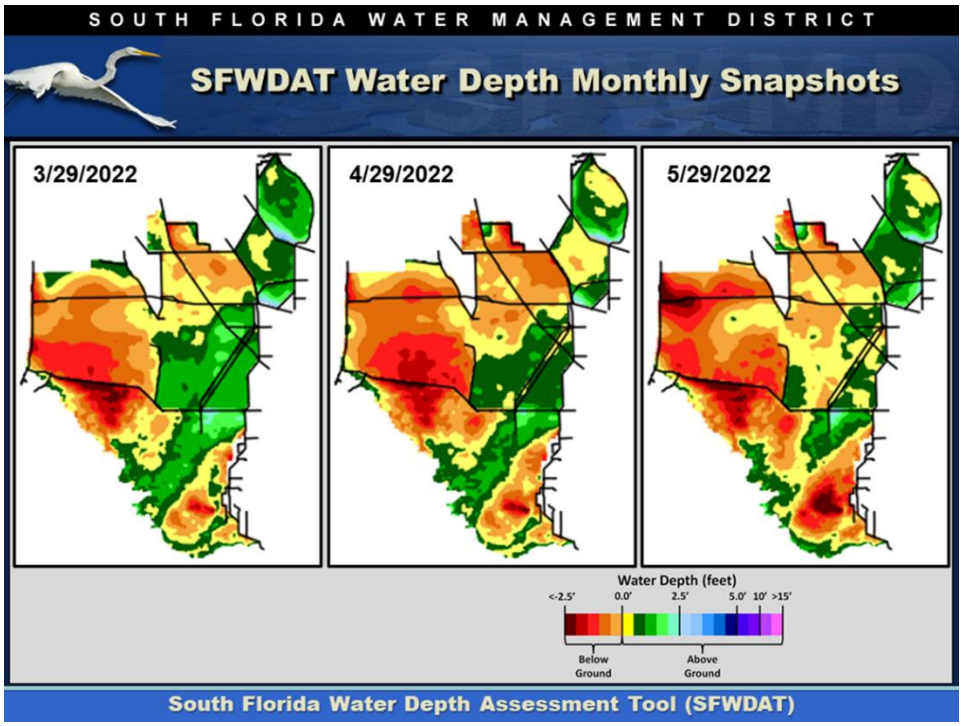


Figure EV-5. Everglades water depths from two months ago (left), one month ago (center) and present (right), based on SFWDAT.

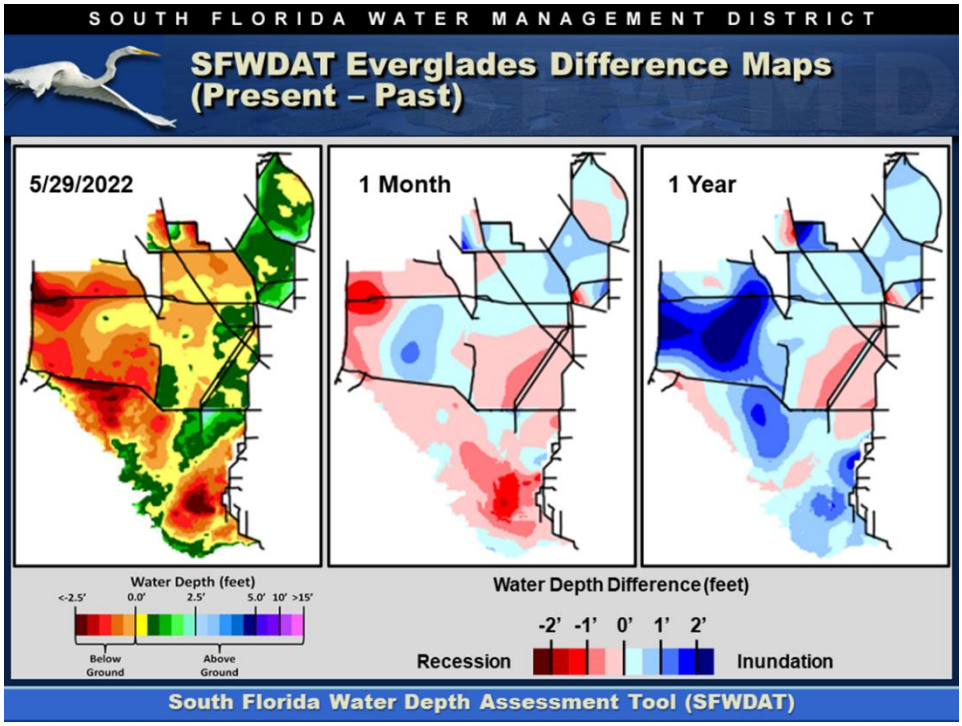


Figure EV-6. Present Everglades water depths (left) and water depth changes from one month (center) and one year (right) ago, based on SFWDAT.

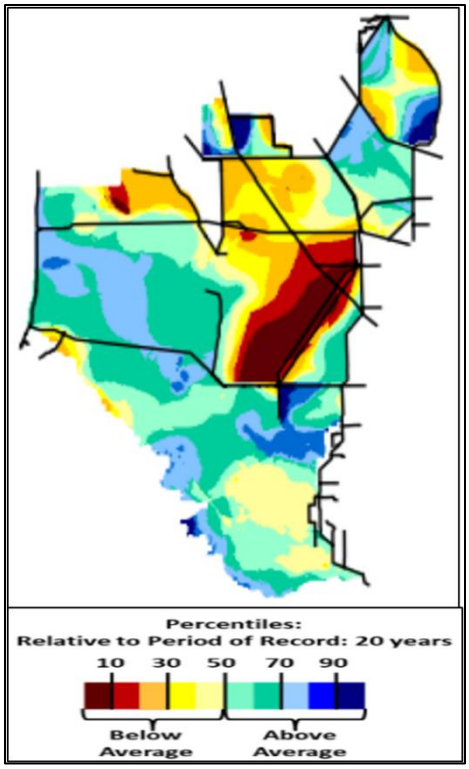


Figure EV-7. Present water depths (5/29/2022) compared to the day of year median over the previous 20 years.

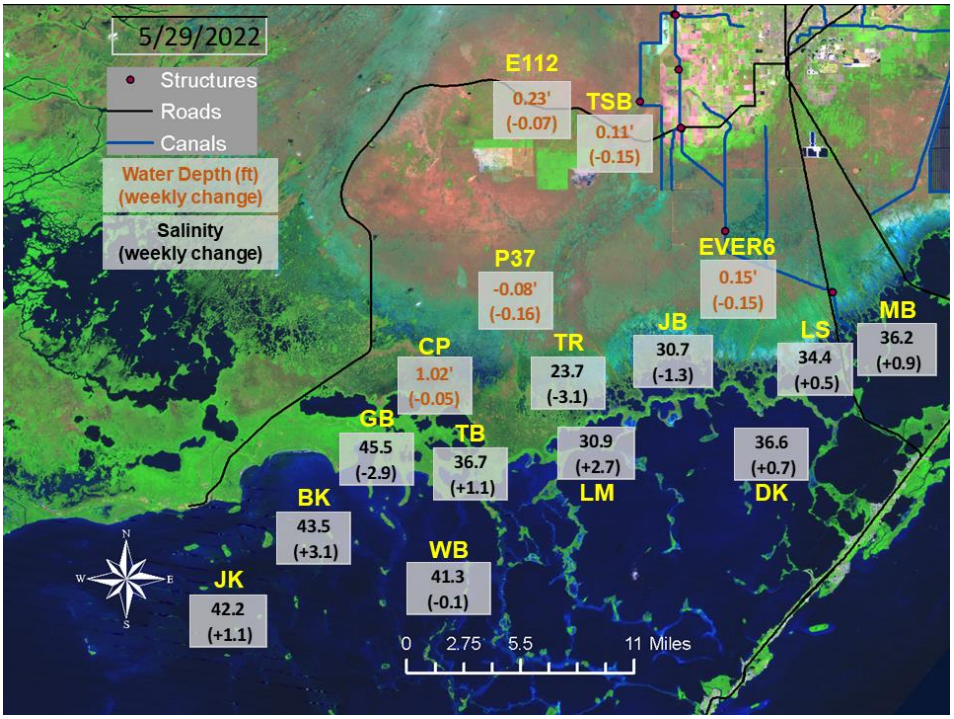


Figure EV-8. Taylor Slough water depths with changes since a week ago and Florida Bay salinities with changes since a week ago.

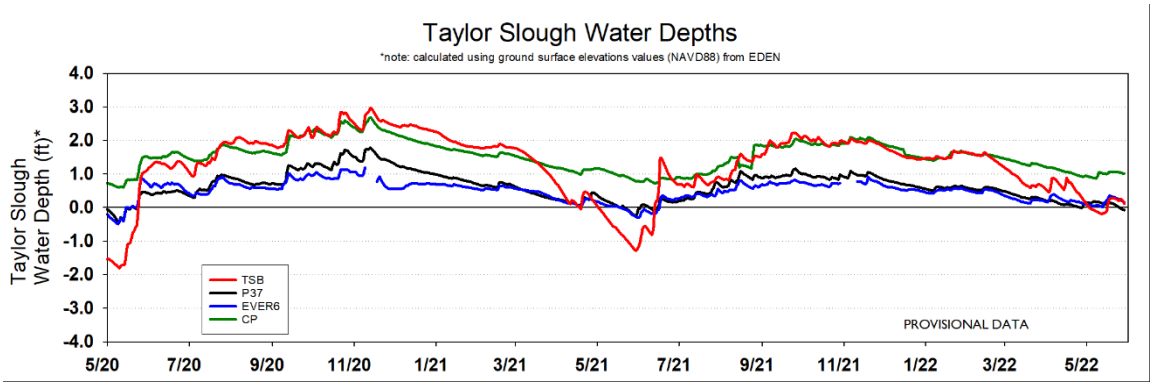


Figure EV-9. Taylor Slough water depth time series.

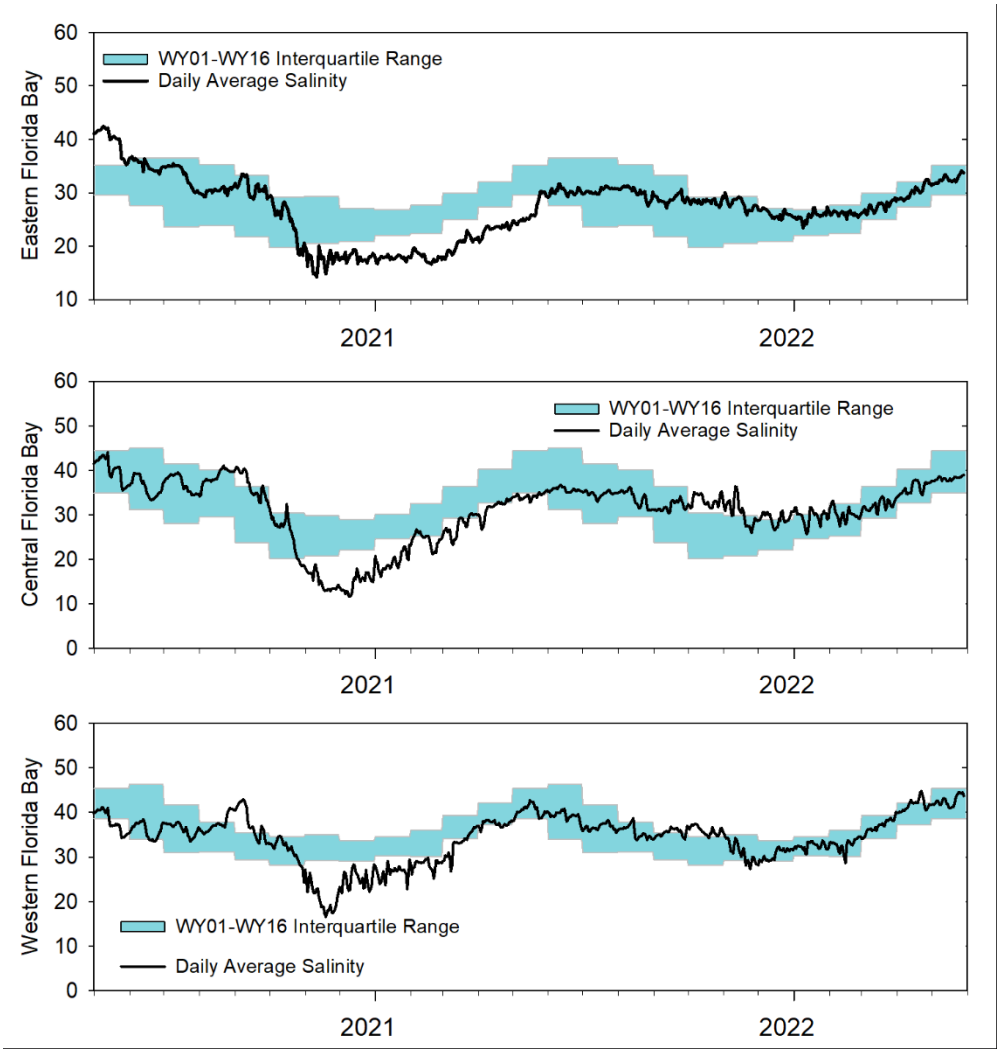


Figure EV-10. Eastern (top panel), Central (middle panel) and Western (bottom panel) Florida Bay daily average salinities with interquartile (25-75 percentile) ranges.

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

SFWMD Everglades Ecological Recommendations, May 31, 2022 (red is new)			
Area	Weekly change	Recommendation	Reasons
WCA-1	Stage increased by 0.06'	Resume a recession rate at less than 0.10 feet per week.	Protect within basin and downstream habitat and wildlife. Foraging and nesting wading birds.
WCA-2A	Stage increased by 0.06'	Conserve water in this basin letting the water move south when conditions allow.	Protect within basin and downstream habitat and wildlife.
WCA-2B	Stage increased by 0.33'	Conserve water in this basin, maintain a minimum input to maintain stage while moving water south when conditions allow.	Protect within basin and downstream habitat and wildlife.
WCA-3A NE	Stage increased by 0.40'	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. Lower fire risk.
WCA-3A NW	Stage decreased by 0.15'	Conserve water in this basin letting the water move south when conditions allow.	
Central WCA-3A S	Stage decreased by 0.05'	Resuming a recession rate of less than 0.10 feet per week has an ecological benefit.	Protect within basin and downstream habitat and wildlife. Lower fire risk. Foraging and nesting wading birds.
Southern WCA-3A S	Stage increased by 0.07'		
WCA-3B	Stage increased by 0.o4'	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 0.04'	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 −0.01' to −0.16'	Move water southward as possible.	When available, provide freshwater buffer for downstream conditions.
FB- Salinity	Salinity changes ranged −2.9 to +3.1	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 174 cfs and the previous 30-day mean inflow was 196 cfs. The seven-day mean salinity was 32.6 at BBCW8 and 34.9 at BBCW10, both below the preferred maximum salinity of 35 for these sites. Data provided by Biscayne National Park.

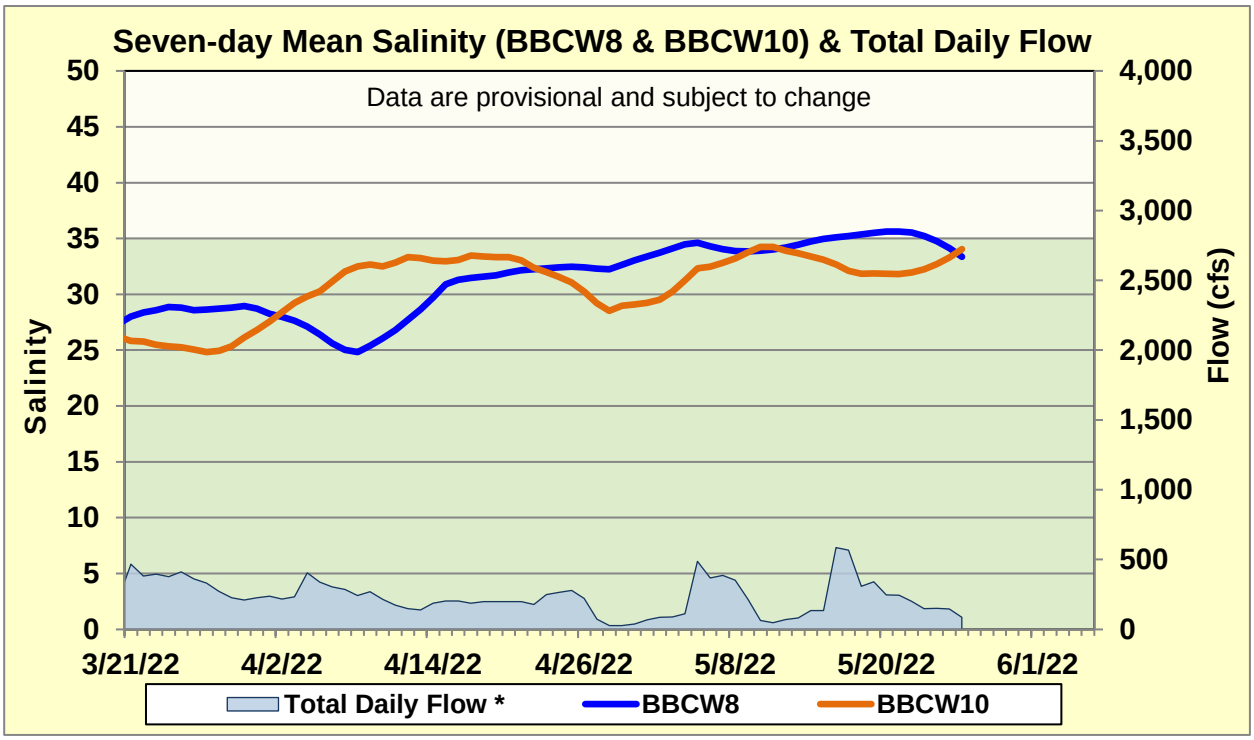


Figure BB-1. Seven-day mean salinity at BBCW8 and BBCW10 and total daily flow in Biscayne Bay. Total daily flow was calculated using flow from structures S20G, S20F, S21, S21A, S123, and S700P.