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: January 26, 2022

SUBJECT: Weekly Environmental Conditions for Systems Operations

Summary

Weather Conditions and Forecast

On Wednesday, a stationary front located over the central part of the District drifts south of Lake Okeechobee bringing a good supply of moisture and an unstable atmosphere fueling rains along the front. Heavy rains are likely to occur around and north/east of Lake Okeechobee in the morning. Rains will diminish in the southeastern part of the District during the afternoon, while drying occurs behind the front over northern areas. By Thursday, the drying should overspread much of the District behind the front. However, wrap-around moisture could cause some shower activity north and east of Lake Okeechobee. The cold front over the District will reorganize a bit farther north Friday morning and allow fast-moving, light to moderately heavy rains to form around and north/west of Lake Okeechobee Friday morning, spreading southeastward by Friday afternoon. Low pressure developing along the front Friday morning will usher in very cold and dry air across the District this weekend. Breezy northwesterly winds and daytime maximum temperatures from the high 40's over northern areas and 50's elsewhere across the District on Saturday will generate low wind chills through Saturday, followed by a bitterly cold Saturday night/Sunday morning with the potential for freezing temperatures and possibly frost to extend across much of the District. The well below normal temperatures will continue into Sunday, with a warm-up to follow as dry conditions prevail through the period.

Kissimmee

Flow at S-65A has been reduced to minimum discharge (~300 cfs), and water depth on the Kissimmee River floodplain is declining. Mean depth decreased to 0.17 feet as of January 23, 2022. The concentration of dissolved oxygen in the Kissimmee River has remained well above the region of concern, with an average of 8.8 mg/L for the week ending on January 23, 2022.

Lake Okeechobee

Lake Okeechobee stage was 15.11 feet NGVD on January 23, 2022, and it was 0.55 feet lower than a month ago (**Figure LO-1**). Lake stage fell back to within the ecological envelope on January 1, 2022, after being above the envelope since late September 2021,

and having spent a total of 279 days (79%) in 2021 above the envelope (**Figure LO-2**). Average daily inflows (excluding rainfall) increased from the previous week, going from 476 cfs to 567 cfs. Average daily outflows (excluding evapotranspiration) decreased from the previous week, going from 3,137 cfs to 1,788 cfs. Recent satellite imagery (January 18, 2022) showed continued medium bloom potential along the western shorelines (**Figure LO-6**).

Estuaries

Total inflow to the St. Lucie Estuary averaged 1,245 cfs over the past week, with no flow coming from Lake Okeechobee. Mean salinities decreased at all sites in the estuary over the past week. Salinity at the US1 Bridge was in the good range (10-26) for adult eastern oysters.

Total inflow to the Caloosahatchee Estuary averaged 2,011 cfs over the past week, with 1,201 cfs coming from the Lake. Mean salinities remained the same at S-79 and decreased at the remaining sites in the estuary over the past week. Salinities were in the good range (0-10) for tape grass at Val I-75 and Ft. Myers and in the good range (10-30) for adult eastern oysters at Cape Coral, Shell Point, and Sanibel.

Stormwater Treatment Areas

For the week ending Sunday, January 23, 2022, approximately 2,700 ac-ft of Lake Okeechobee water was delivered to the FEBs/STAs. The total amount of Lake releases sent to the FEBs/STAs in WY2022 (since May 1, 2021) is approximately 77,700 ac-feet. The total amount of inflows to the STAs in WY2022 is approximately 969,000 ac-feet. Most STA cells are at or near target stage, except portions of STA-5/6 cells that are drying out. STA-1E Western Flow-way is offline for the Restoration Strategies project to fill and grade Cells 5 and 7, and STA-1E Eastern Flow-way is offline for rip-rap repairs related to Tropical Storm Eta. Additionally, STA-3/4 Eastern Flow-way is offline for vegetation rehabilitation/drawdown, STA-2 Flow-way 2 is offline for construction activities, and STA-5/6 Flow-way 4 is offline for vegetation management activities. Operational restrictions are in place in STA-1W Western, Eastern, and Northern Flow-ways for construction activities. Operational restrictions are in effect in STA-1E Central Flow-way and STA-2 Flow-ways 3 and 4 for vegetation management activities. This week, if 2008 LORS recommends Lake releases to the WCAs and conditions allow, releases will be sent to STA-2.

Everglades

Recessions at the gauges in WCA-3A continue to be in the good or fair range. Stages are falling below ground in WCA-3A North. Conditions improved In Taylor Slough and Florida Bay last week. Salinities fell back within the regional inner quartile ranges, and stages remain high in northern Taylor slough.

Supporting Information

Kissimmee Basin

Upper Kissimmee

On January 23, 2022, lake stages were 57.8 feet NGVD (0.2 feet below schedule) in East Lake Toho, 54.3 feet NGVD (0.7 feet below schedule) in Lake Toho, and 50.3 feet NGVD (2.2 feet below schedule) in Lakes Kissimmee-Cypress-Hatchineha (KCH) (**Table KB-1**, **Figures KB-1-3**).

Lower Kissimmee

Discharges to the Kissimmee River on January 23, 2022 were 730 cubic feet per second (cfs) at S-65 and 630 cfs at S-65A; discharges from the Kissimmee River were 450 cfs at S-65D and 410 cfs at S-65E (**Table KB-2**). Headwater stages were 46.4 feet NGVD at S-65A and 26.6 feet NGVD at S-65D on January 23, 2022. With lower water temperatures, little rainfall, and reduced discharge at S-65A, the concentration of dissolved oxygen has remained well above the region of concern, with an average of 8.8 mg/L for the week ending on January 23, 2022 (**Table KB-2**, **Figure KB-4**). Flow at S-65A has been reduced to minimum discharge (~300 cfs), and water depth on the Kissimmee River floodplain is declining. Mean depth decreased to 0.17 feet as of January 23, 2022 (**Figure KB-5**).

Water Management Recommendations

Managed stage recessions for snail kite nesting season were started on Lakes Toho and East Toho on January 15, 2022 to gradually reduce lake stages to their low pools by June 1. In Kissimmee-Cypress-Hatchineha, continue to maintain at least 300 cfs at S-65A and follow the IS-14-50 discharge plan (**Figure KB-6**) for S-65 and S-65A for the remainder of dry season.

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)	
							1/23/22	*1/16/22*
Lakes Hart and Mary Jane	S-62	LKMJ	25	61.0	R	61.0	0.0	0.0
Lakes Myrtle, Preston and Joel	S-57	S-57	15	61.4	R	61.4	0.0	0.0
Alligator Chain	S-60	ALLI	0	64.0	R	64.0	0.0	-0.1
Lake Gentry	S-63	LKGT	4	61.5	R	61.5	0.0	0.0
East Lake Toho	S-59	TOHOE	192	57.8	R	58.0	-0.2	-0.1
Lake Toho	S-61	TOHOW S-61	474	54.3	R	55.0	-0.7	-0.5
Lakes Kissimmee, Cypress and Hatchineha	S-65	KUB011 LKIS5B	438	50.3	R	52.5	-2.2	-2.3

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.

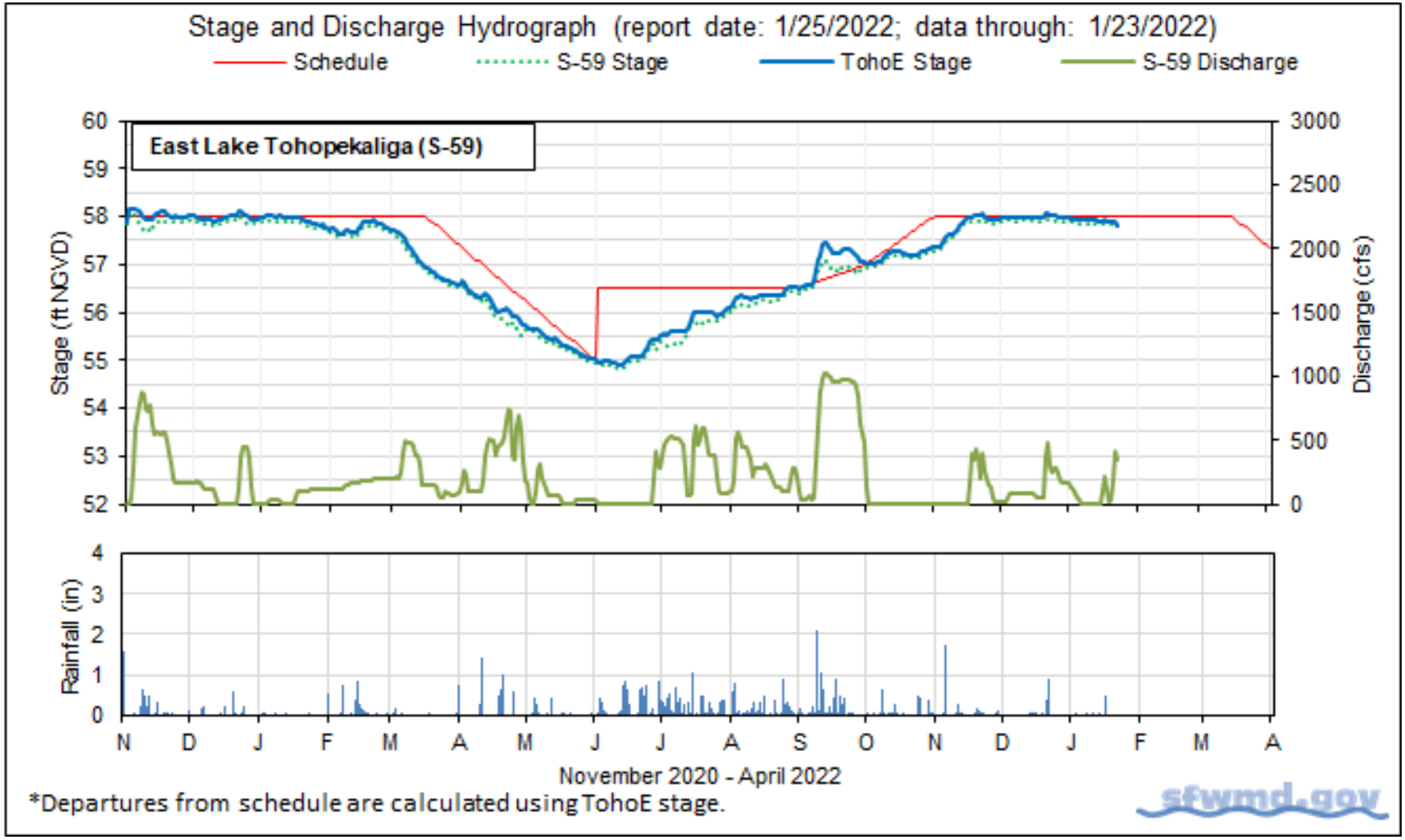


Figure KB-1. East Lake Toho regulation schedule, stage, discharge and rainfall.

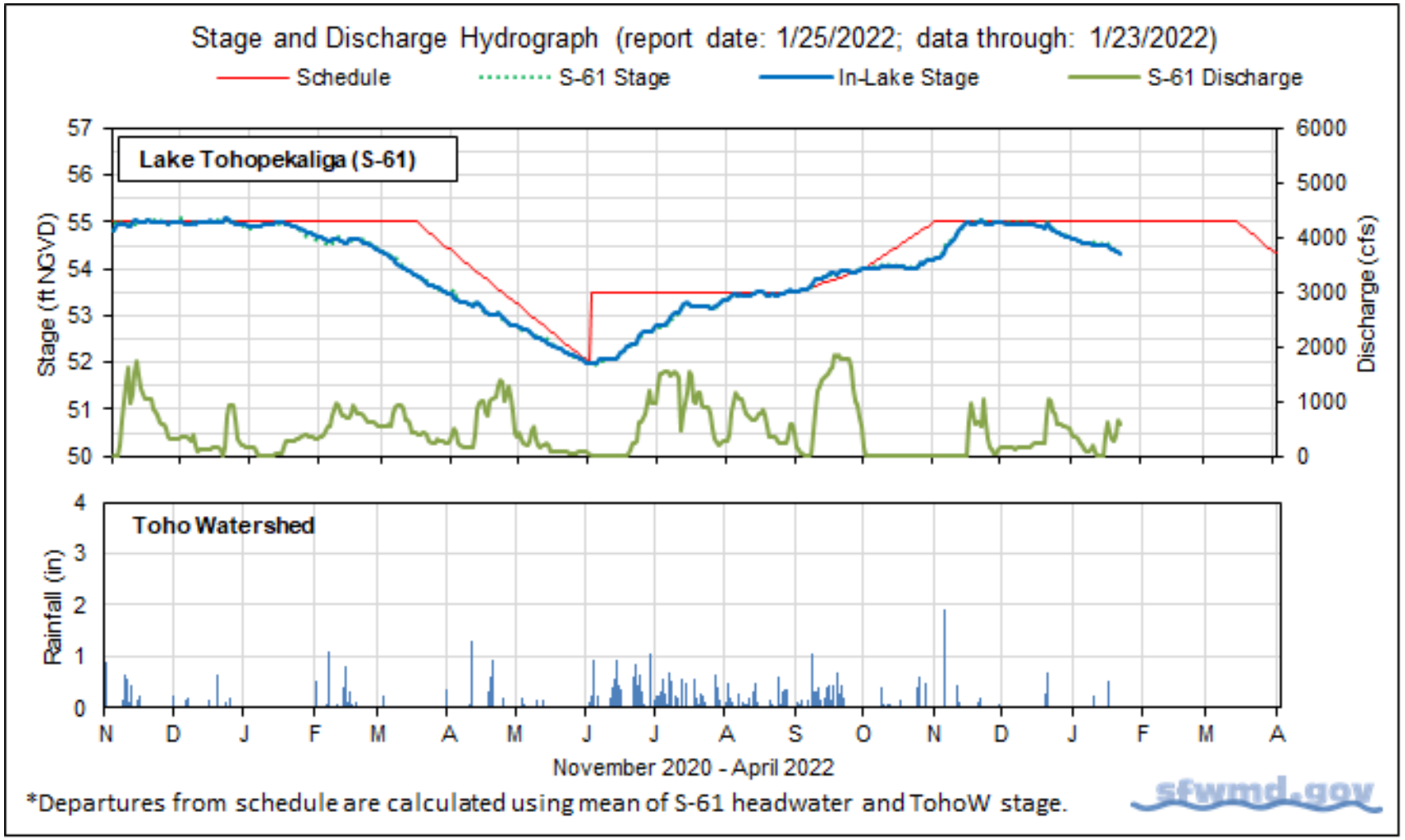


Figure KB-2. Lake Toho regulation schedule, stage, discharge and rainfall.

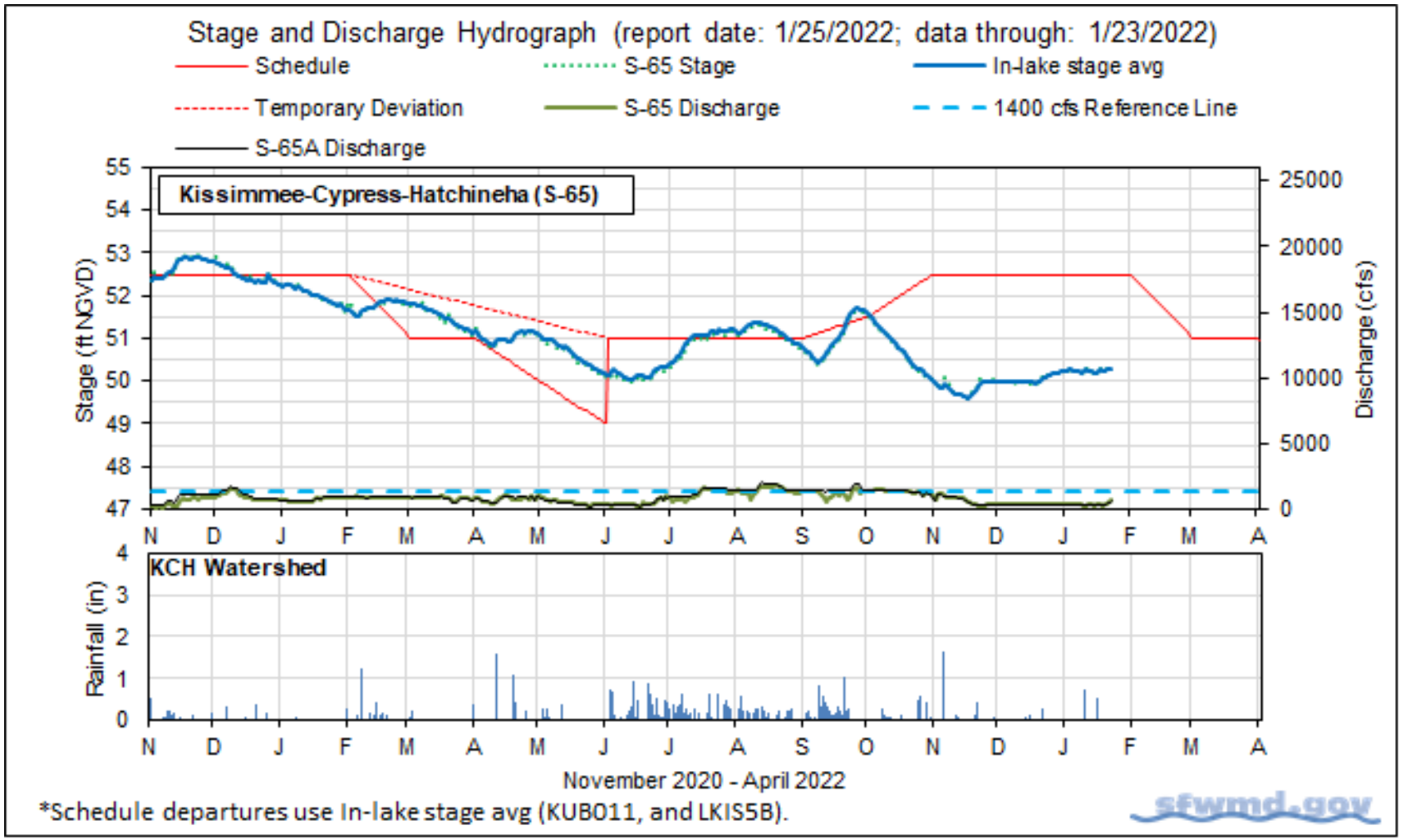


Figure KB-3. Lakes Kissimmee, Cypress and Hatchineha regulation schedule, stage, discharge and rainfall.

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			
		1/23/22	1/23/22	1/16/22	1/9/22	1/2/22
Discharge	S-65	730	440	330	360	380
Discharge	S-65A[a]	630	400	290	290	310
Headwater Stage (feet NGVD)	S-65A	46.4	46.3	46.4	46.3	46.3
Discharge	S-65D[b]	450	360	310	340	370
Headwater Stage (feet NGVD)	S-65D[c]	26.6	26.6	26.5	26.5	26.5
Discharge (cfs)	S-65E[d]	410	380	340	340	380
Discharge (cfs)	S-67	0	0	0	0	0
Dissolved Oxygen (mg/L) [e]	Phase I, II/III river channel	8.7	8.8	8.0	8.0	7.5
Mean depth (feet) [f]	Phase I floodplain	0.17	0.20	0.18	0.20	0.23

a. Combined discharge from main and auxiliary structures.

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

c. Average stage from S-65D and S-65DX1.

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

e. Dissolved oxygen is the average of values from sondes KRBN, PC62, PC33, PD62R and PD42R.

f. One-day spatial average obtained from the South Florida Water Depth Assessment Tool (SFWDAT).

Table KB-3. Discharge rate of change limits for S65/S-65A (revised 1/14/19).

Discharge (cfs)	Maximum Rate of Increase (cfs/day)	Maximum Rate of Decrease (cfs/day)
0-300	100	-50
301-650	150	-75
651-1,400	300	-150
1,401-3,000	600	-600
>3,000	1,000	-2,000

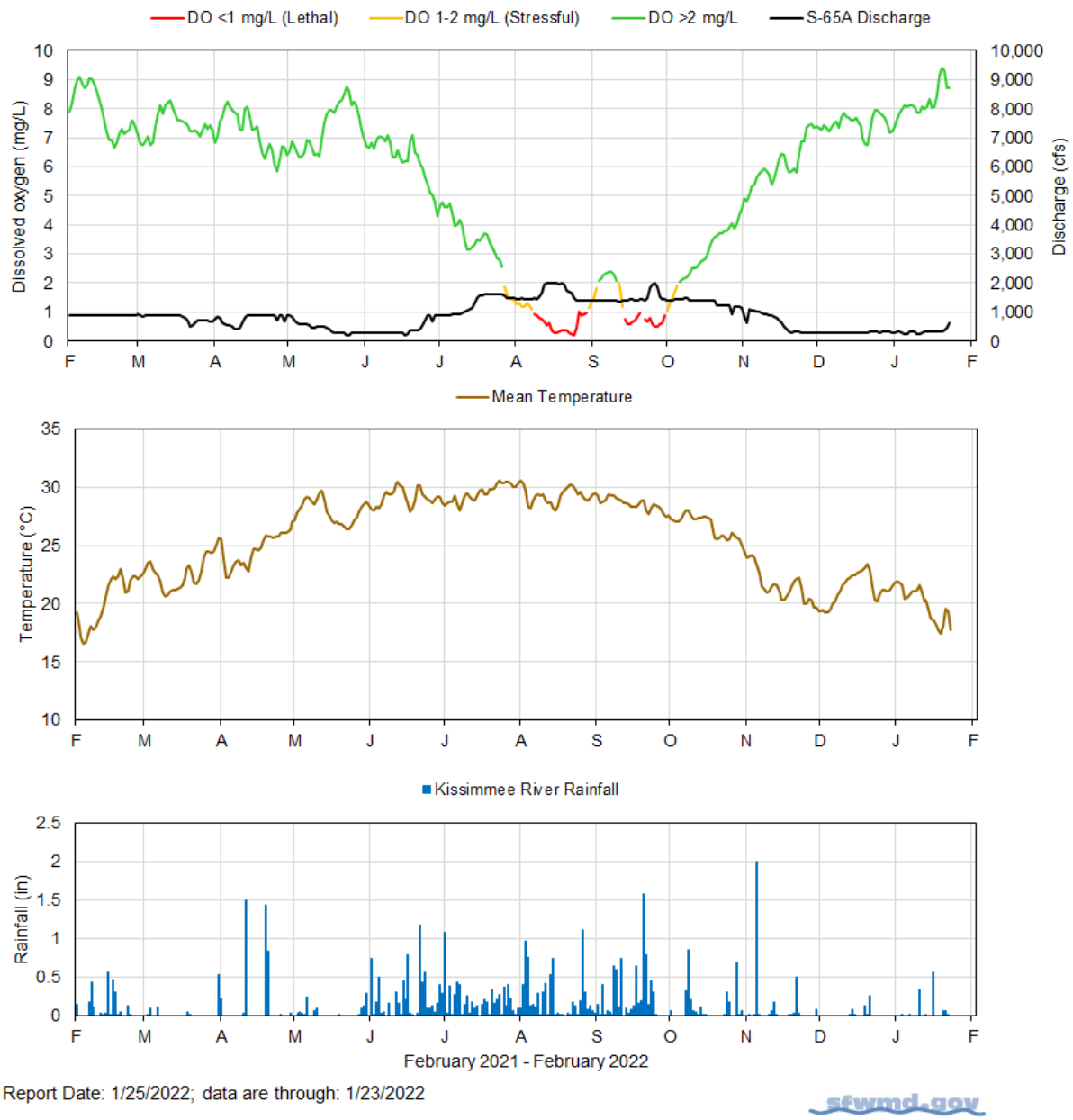


Figure KB-4. Restored Kissimmee river channel mean daily dissolved oxygen concentration (mg/L), S-65A discharge (cfs), temperature (°C) and rainfall (inches). Dissolved oxygen (DO) and temperature are mean daily values averaged for PC62, KRBN, PC33, PD62R, and PD42R with an average of three stations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

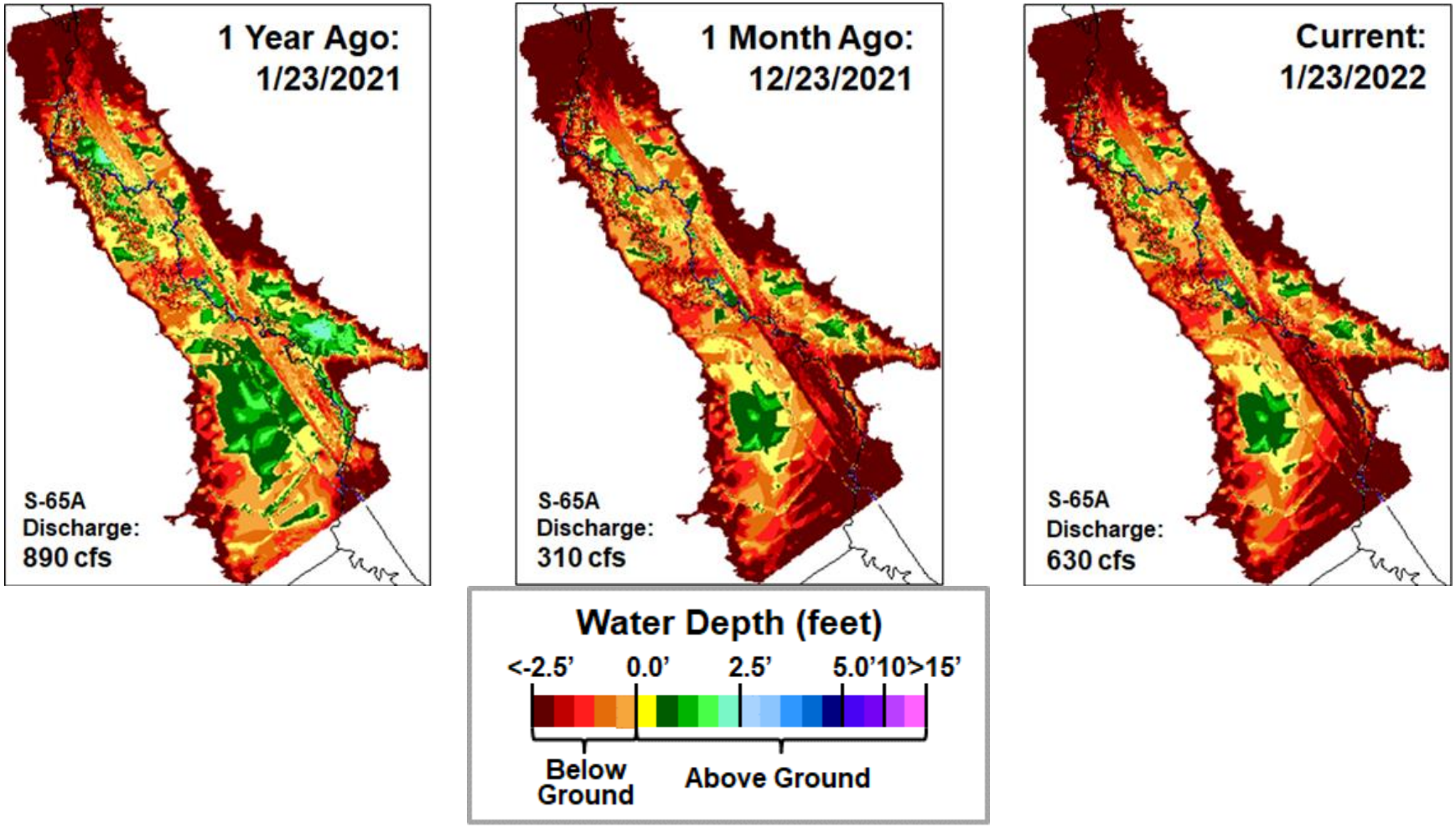


Figure KB-5. Phase I area Kissimmee River floodplain water depths (from left to right) one year ago, one month ago and current.

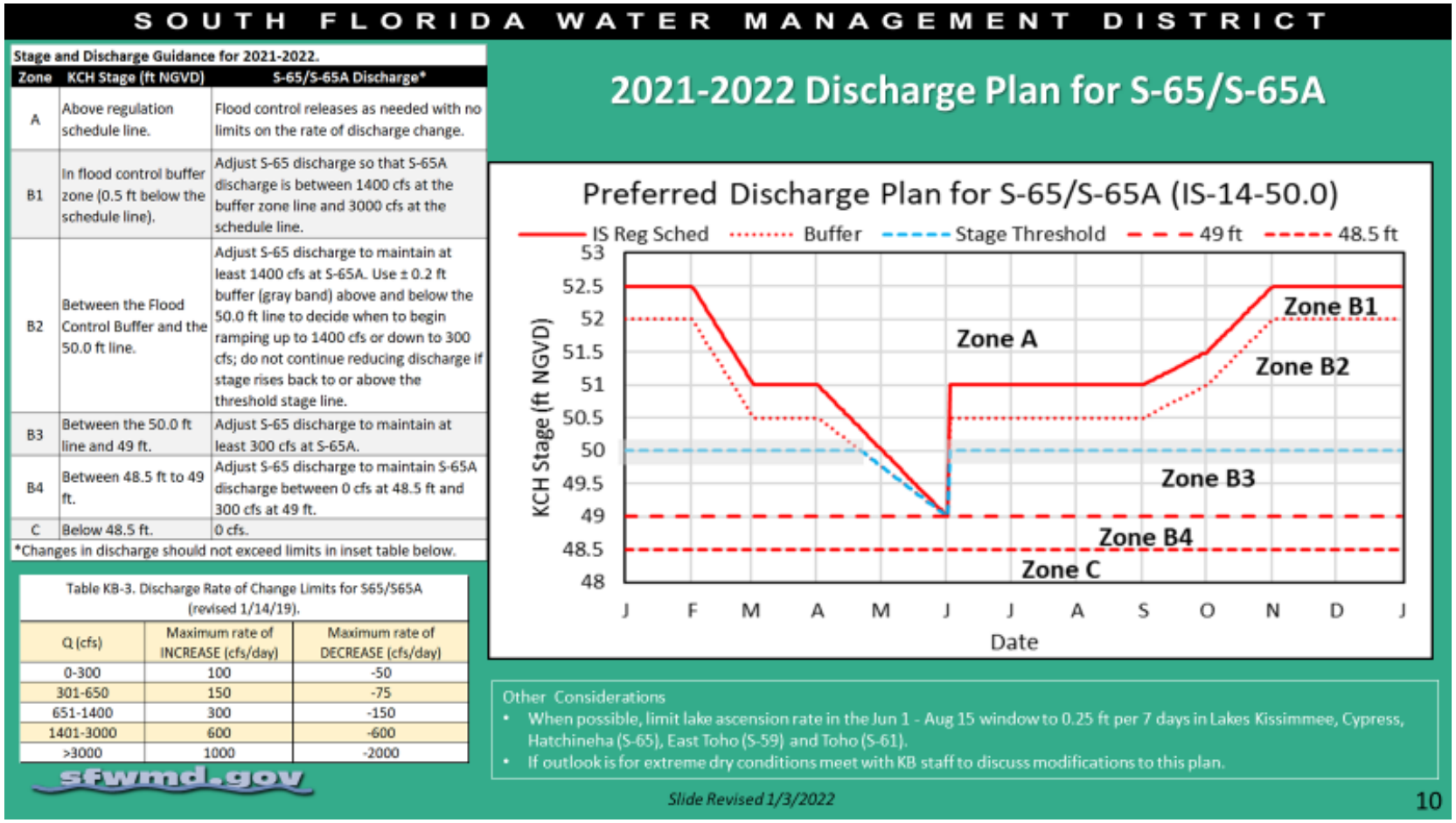


Figure KB-6. IS-14-50 Discharge Plan for S65/S65A with discharge rate of change limits (revised 1/14/19).

Lake Okeechobee

Lake Okeechobee stage was 15.11 feet NGVD on January 23, 2022, with water levels 0.55 feet lower than a month ago (**Figure LO-1**). Lake stage remains in the Low sub-band (**Figure LO-2**) and is still within the ecological envelope, having spent 279 days (79%) of the last year above the envelope (**Figure LO-3**). According to NEXRAD, 0.30 inches of rain fell directly on the Lake last week.

Average daily inflows (excluding rainfall) increased from the previous week from 476 cfs to 567 cfs. Average daily outflows (excluding evapotranspiration) decreased from the previous week from 3,137 cfs to 1,788 cfs. Highest inflows came from the Kissimmee River through the S-65E structure (378 cfs). The highest outflow (1,201 cfs) was to the west via the S-77 structure, while 363 cfs flowed south via the S-350 structures (S-351, 223 cfs; S-352, 90 cfs; S-354, 50 cfs). There was 207 cfs of outflow to the east via the S-308 structure. **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 (January 18, 2022) from the NOAA cyanobacteria monitoring product derived from EUMETSAT's Sentinel 3 OLCI sensor showed continued medium bloom potential along the western shorelines (**Figure LO-6**).

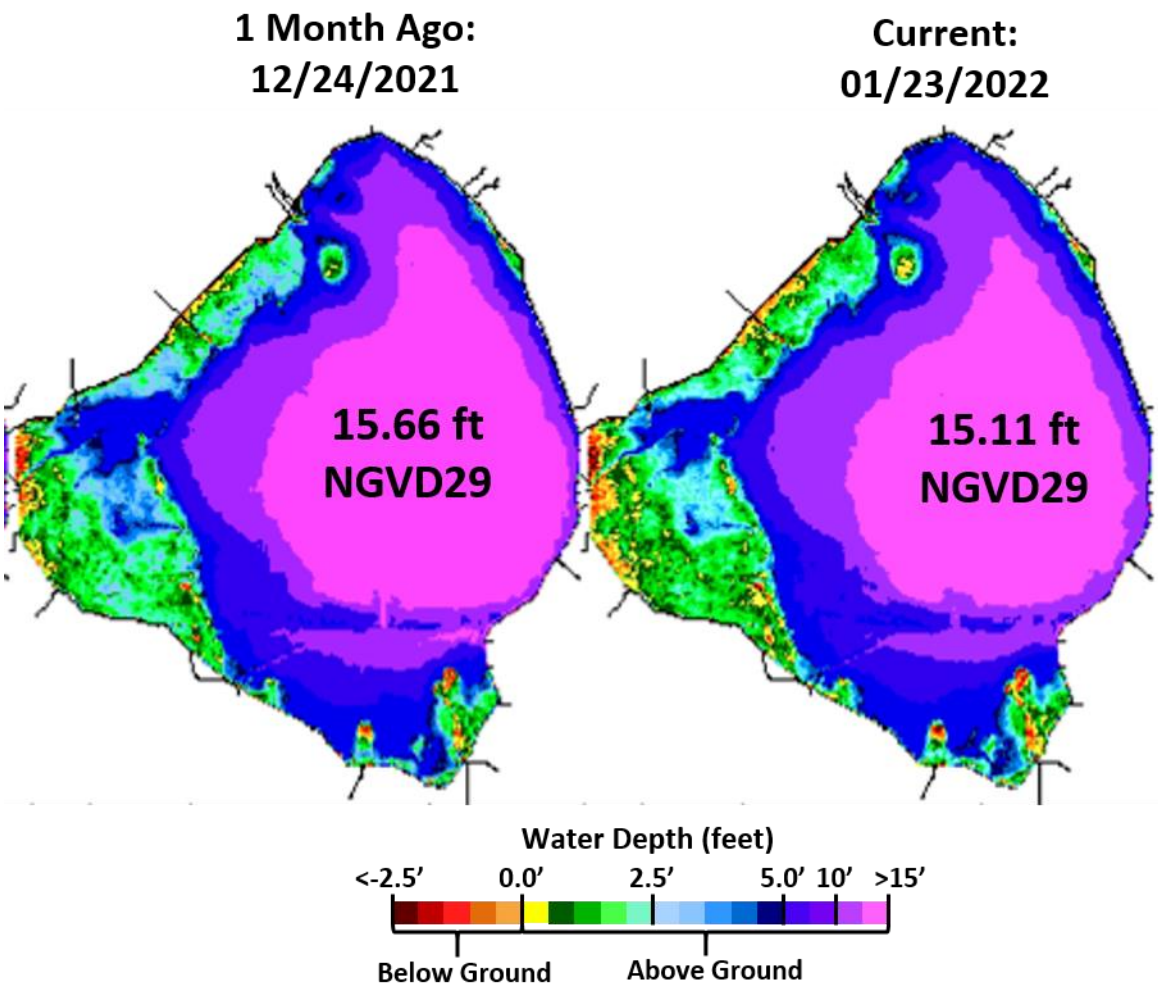


Figure LO-1. Lake Okeechobee water depth estimates based on South Florida Water Depth Assessment Tool (SFWDAT).

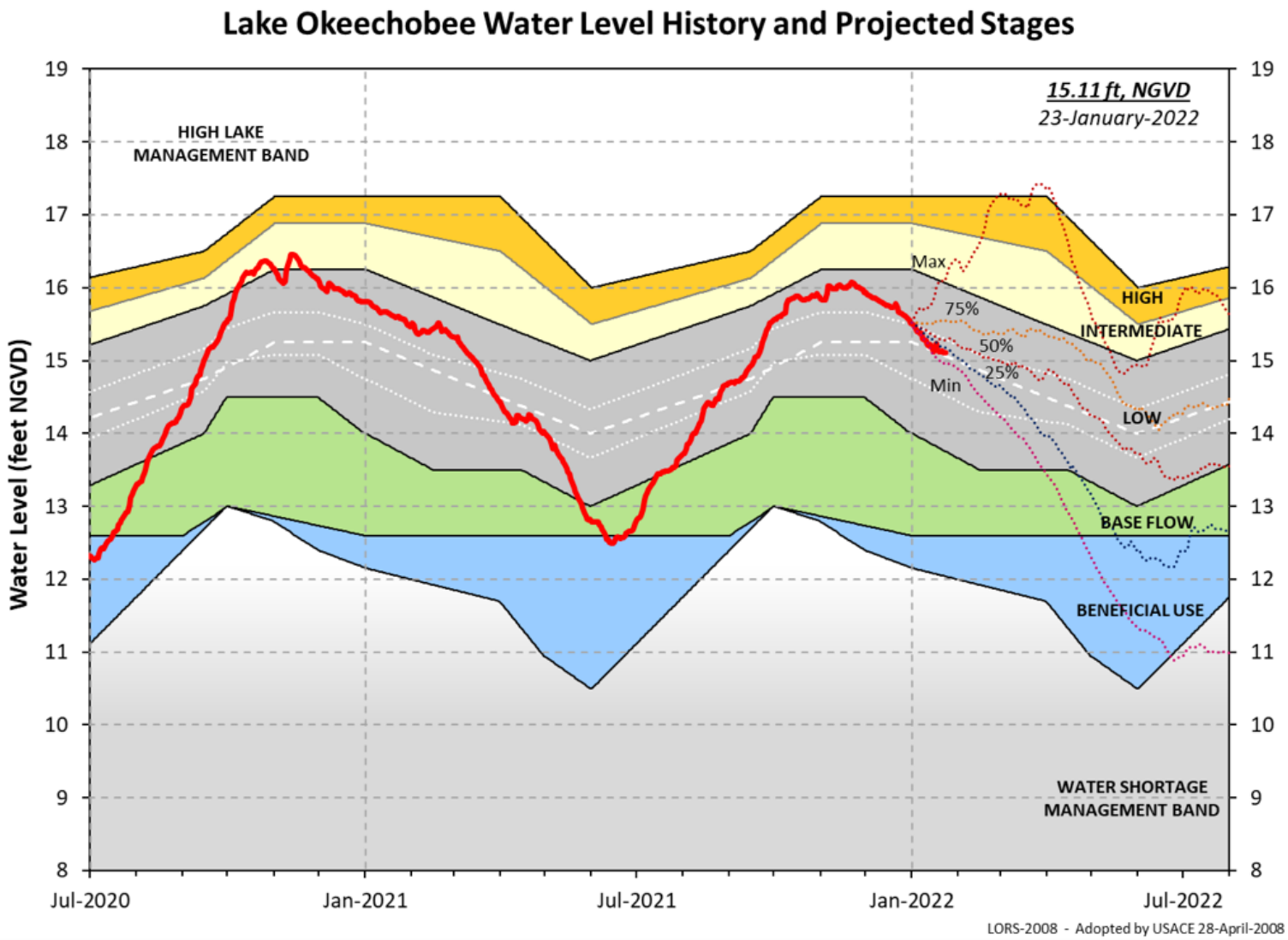


Figure LO-2. Recent Lake Okeechobee stages with projected stages based on a dynamic position analysis.

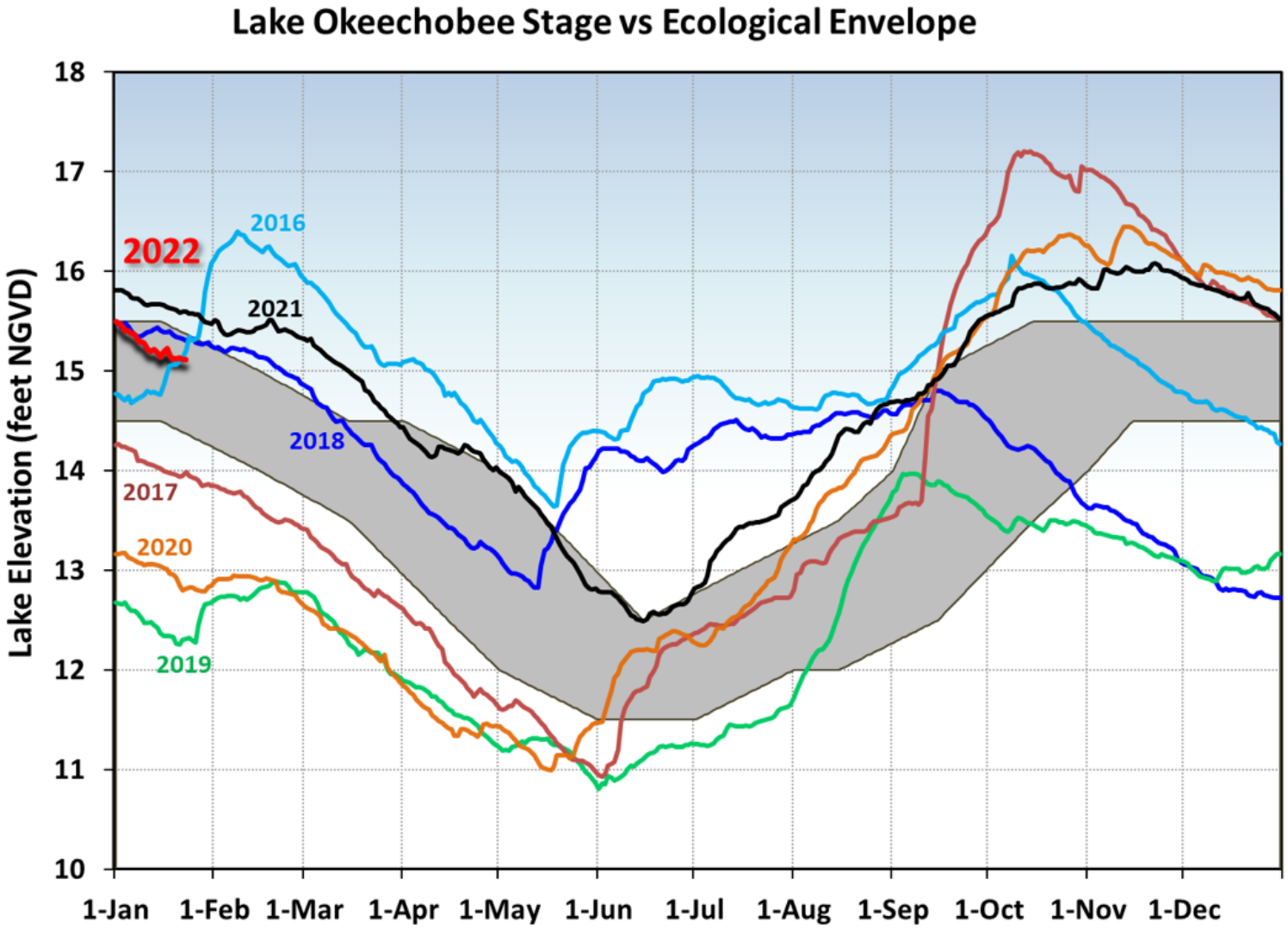


Figure LO-3. The prior six years of annual stage hydrographs for Lake Okeechobee in comparison to the updated ecological envelope.

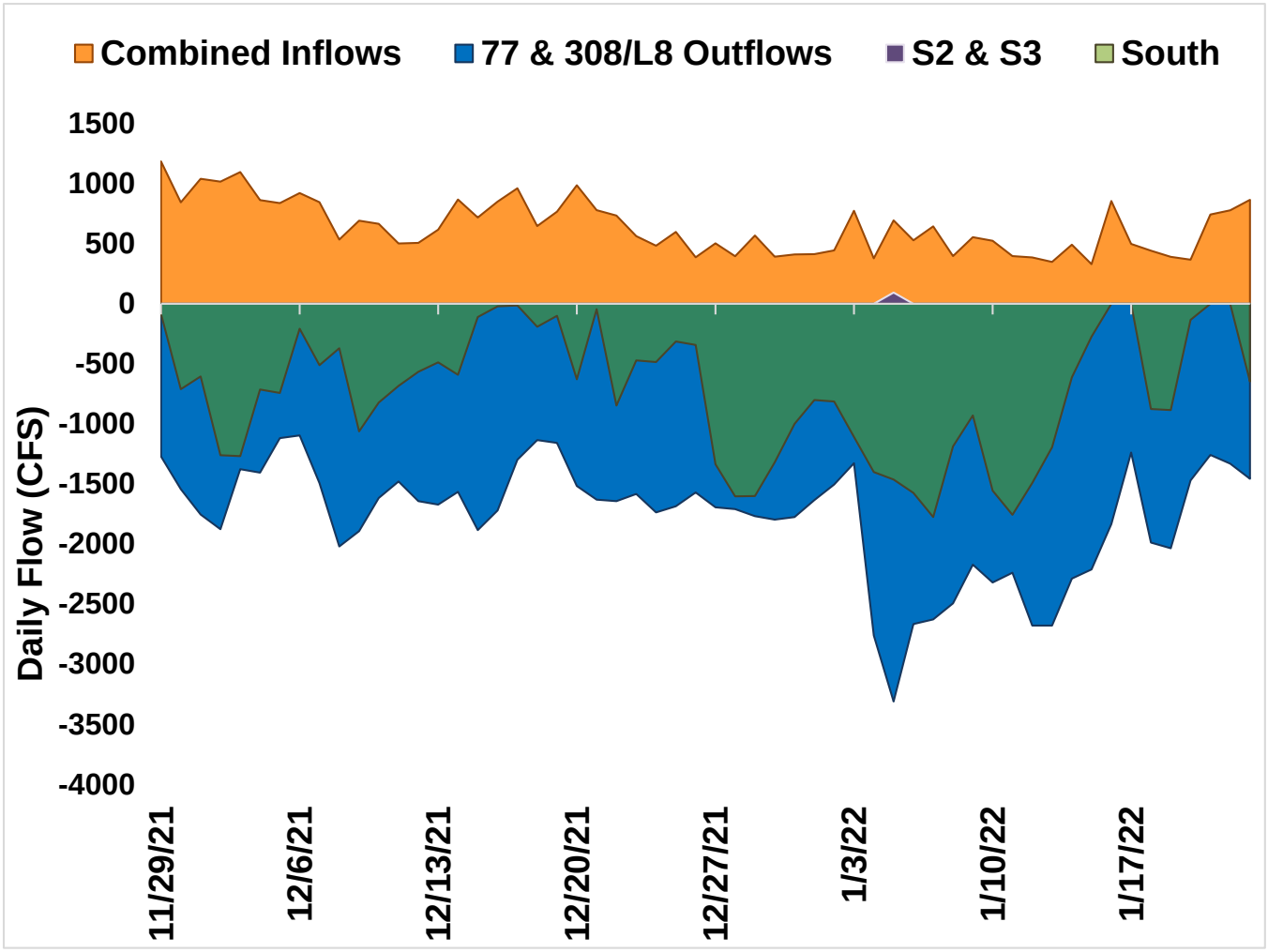


Figure LO-4. Major inflows (orange) to and outflows east and west (blue) from Lake Okeechobee. Outflows south are shown in green. Flows into Lake Okeechobee from the L-8 canal through S-271 (formerly Culvert 10A) or from the C-44 canal through the S-308 are included as inflows. Conversely, flows from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

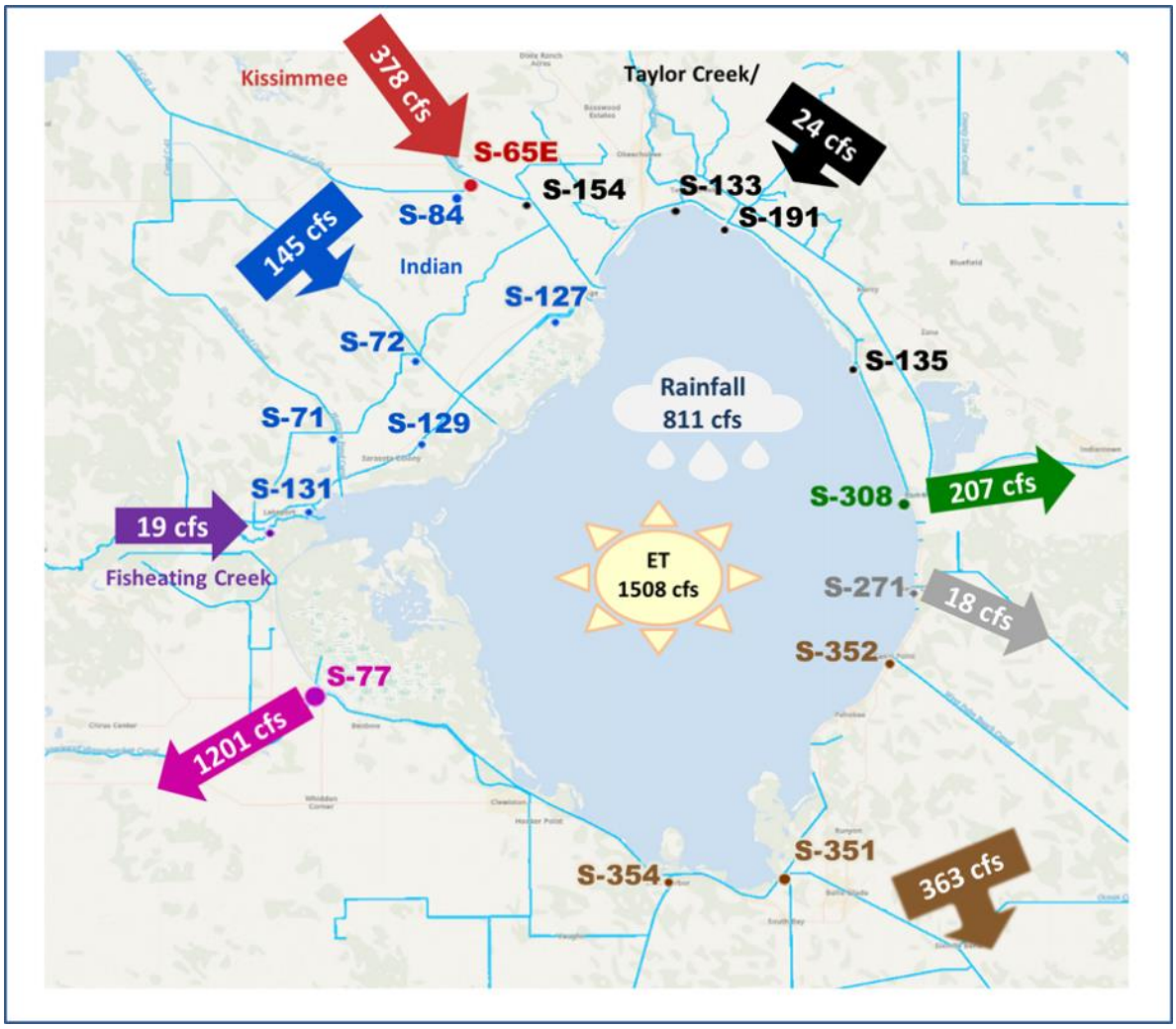


Figure LO-5. Inflows into Lake Okeechobee from Indian Prairie basins, Taylor Creek/Nubbin Slough, Kissimmee River and Fisheating Creek, and outflows to the west via S-77, to the east via S-308, to the south via S-351, S-352, S-354, and to southeast via S-271 (formerly Culvert 10A) for the week of January 17, 2022 – January 23, 2022.

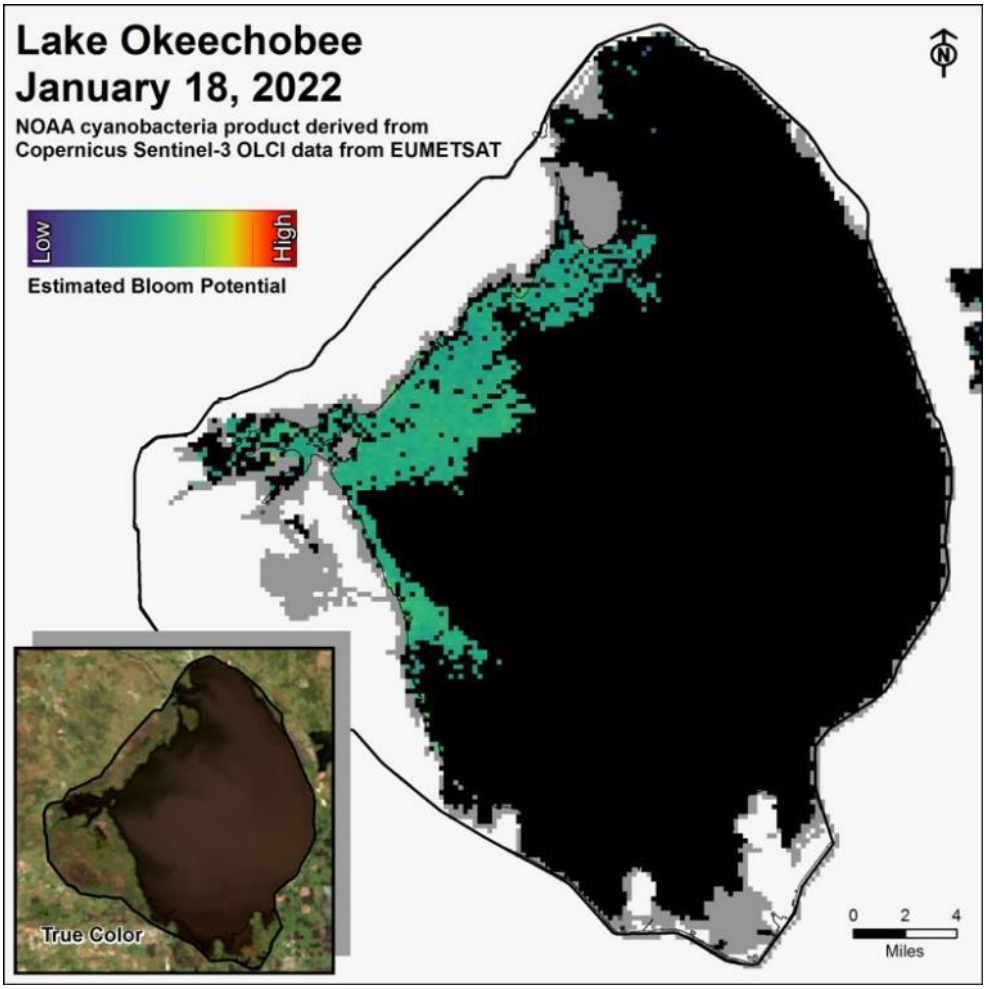


Figure LO-6. Cyanobacteria bloom potential on January 18, 2022 based on NOAA's harmful algal bloom monitoring system. Gray color indicates cloud cover

Estuaries

St. Lucie Estuary

Over the past week, mean total inflow to the St. Lucie Estuary was 1,245 cfs (**Figures ES-1** and **ES-2**), and the previous 30-day mean inflow was 634 cfs. For comparison, the historical provisional mean inflows from the contributing areas are shown in **Figure ES-2**.

Over the past week, salinities decreased at all sites within the estuary (**Table ES-1** and **Figure ES-3**). The seven-day moving average of the surface and bottom salinities at the US1 Bridge was 21.1. Salinity conditions in the middle estuary were estimated to be within the good range for adult eastern oysters (**Figure ES-4**).

Caloosahatchee River Estuary

Over the past week, mean total inflow to the Caloosahatchee River Estuary was 2,111 cfs (**Figures ES-5** and **ES-6**), and the previous 30-day mean inflow was 2,113 cfs. For comparison, the historical provisional mean inflows from the contributing areas are shown in **Figure ES-6**.

Over the past week, salinities remained the same at S-79 and decreased at the remaining sites in the estuary (**Table ES-2** and **Figures ES-7** and **ES-8**). The seven-day mean surface salinities (**Table ES-2**) were in the good range (0-10) for tape grass at Val I-75 and at Ft. Myers. The seven-day mean surface salinity values were within the good range for adult eastern oysters at Cape Coral, Shell Point, and Sanibel (**Figure ES-9**).

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 1,500 cfs and steady releases at 2,000 cfs with estimated tidal basin inflows of 119 cfs. Model results from all scenarios predict daily salinity to be 1.0 or lower, and the 30-day moving average surface salinity to be 0.3 or lower at Val I-75 at the end of the two-week period (**Table ES-3** and **Figure ES-10**). This keeps predicted salinities at Val I-75 within the LORS 2008 salinity range (0.0-5.0).

Red Tide

The Florida Fish and Wildlife Research Institute reported on January 21, 2022, that *Karenia brevis*, the Florida red tide dinoflagellate, was not observed in any samples collected statewide.

[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.

Water Management Recommendations

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

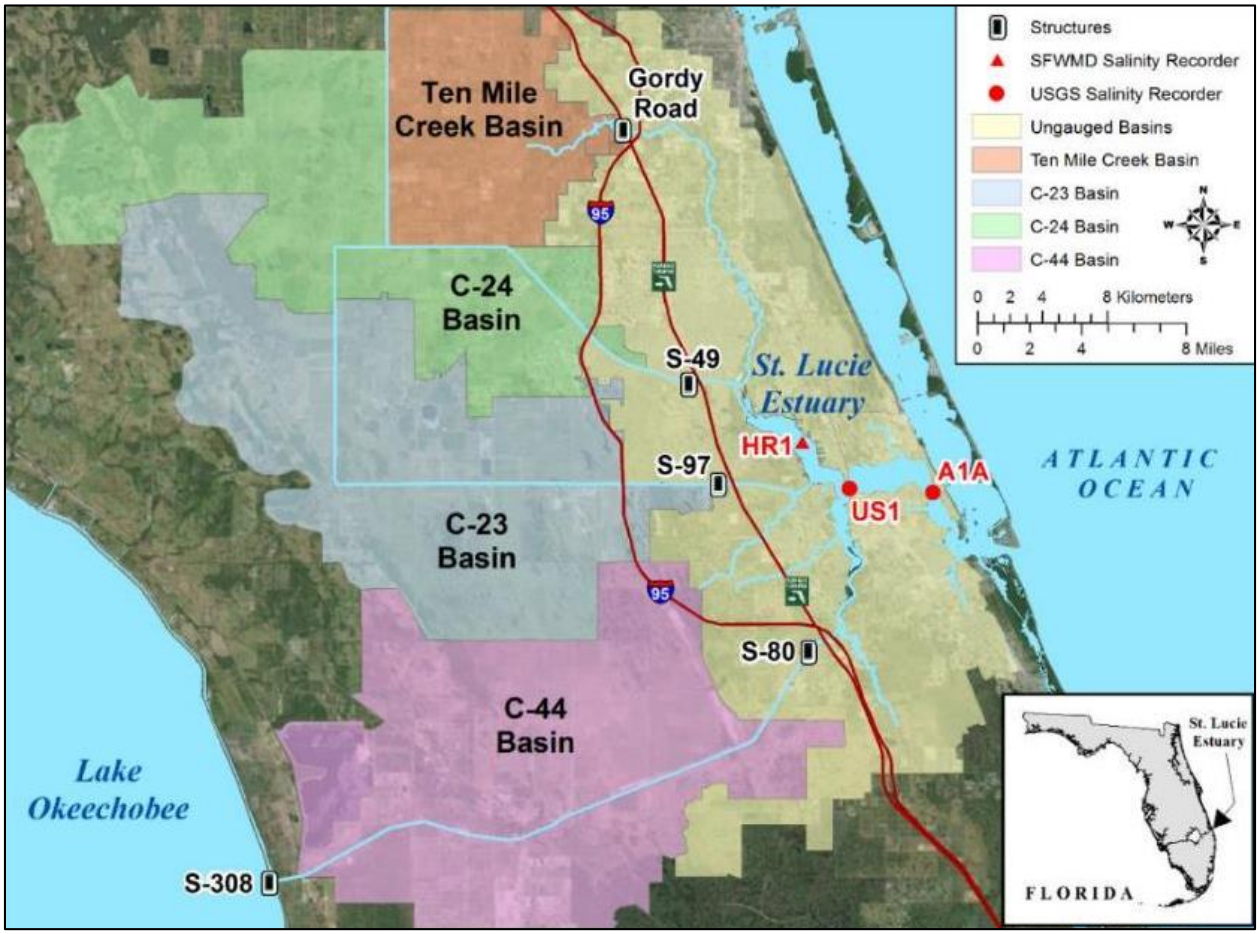


Figure ES-1. Basins, water control structures and salinity monitoring sites in the St. Lucie Estuary.

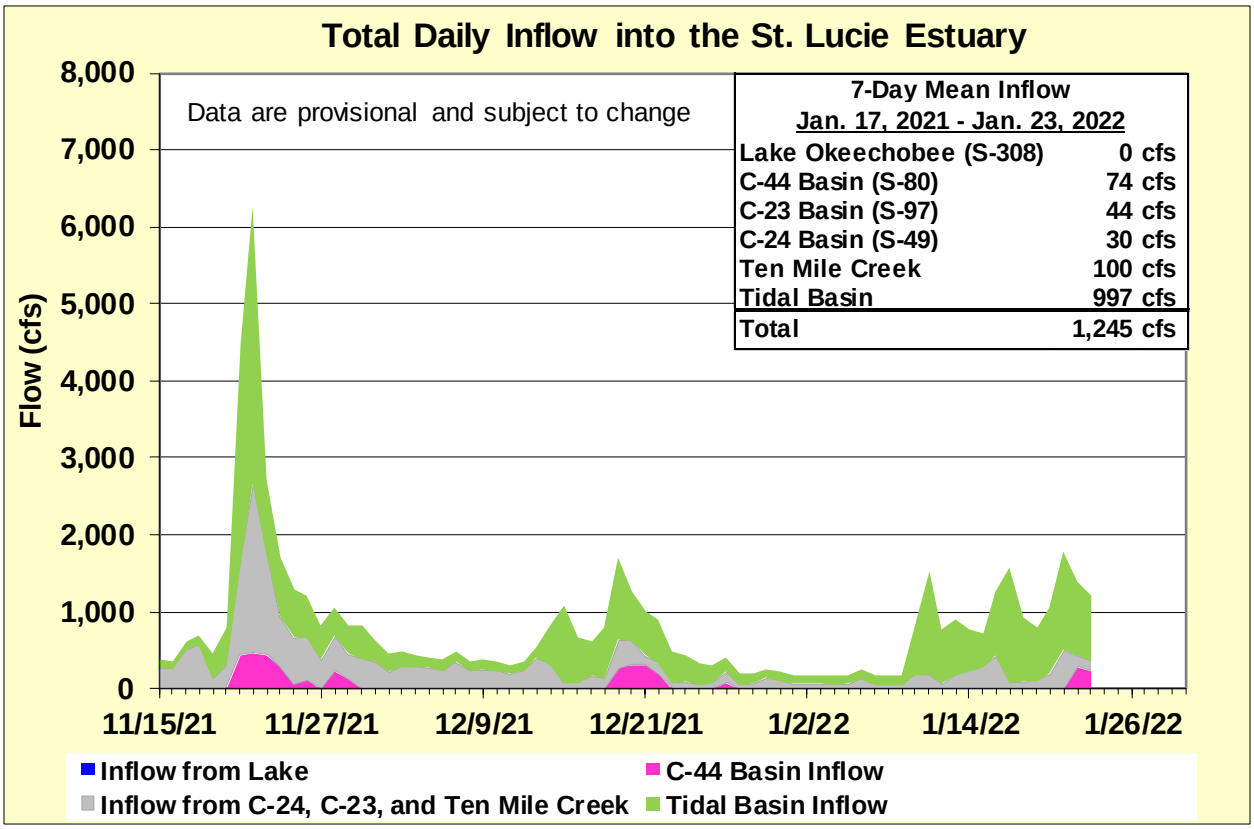


Figure ES-2. Total daily inflows from Lake Okeechobee and runoff from the C-44, C-23, C-24, Ten Mile Creek, and Tidal Basins into the St. Lucie Estuary.

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

Sampling Site	Surface	Bottom	Envelope
HR1 (North Fork)	**16.3** (18.5)	**19.0** (20.4)	NA [a]
US1 Bridge	**20.2** (21.2)	**21.9** (22.8)	10.0 – 26.0
A1A Bridge	**27.3** (29.0)	**29.0** (30.4)	NA [a]

a. The envelope is not applicable.

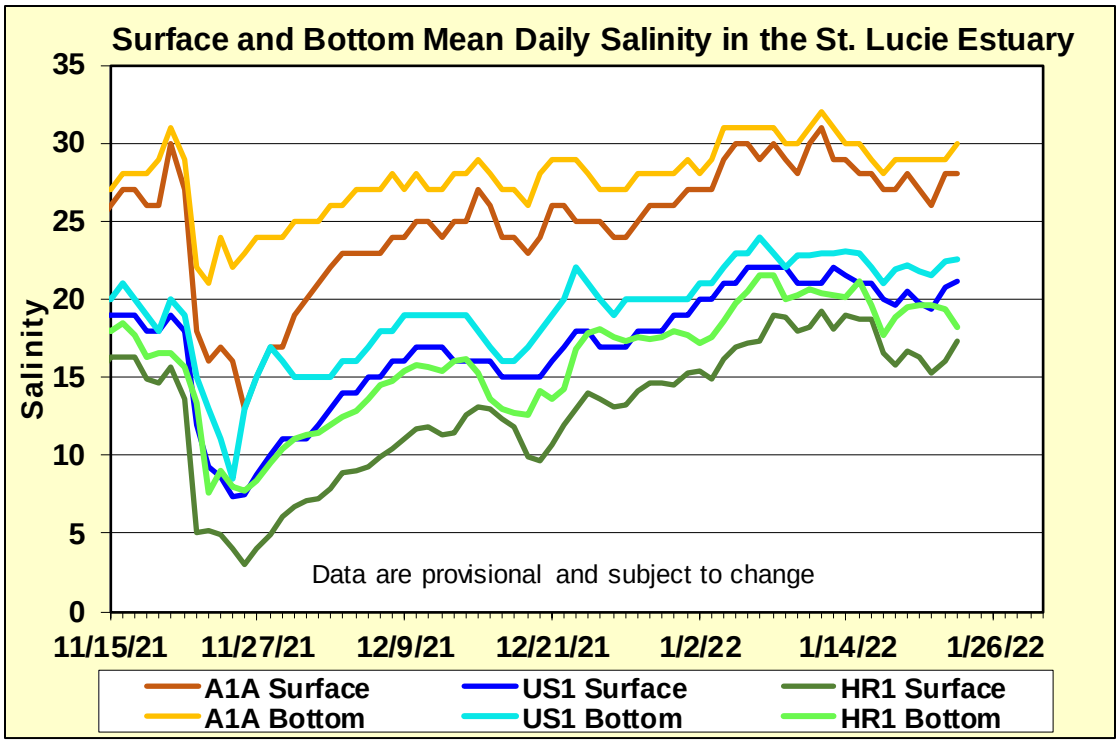


Figure ES-3. Mean daily salinity at the A1A, US1 and HR1 sites in the St. Lucie Estuary.

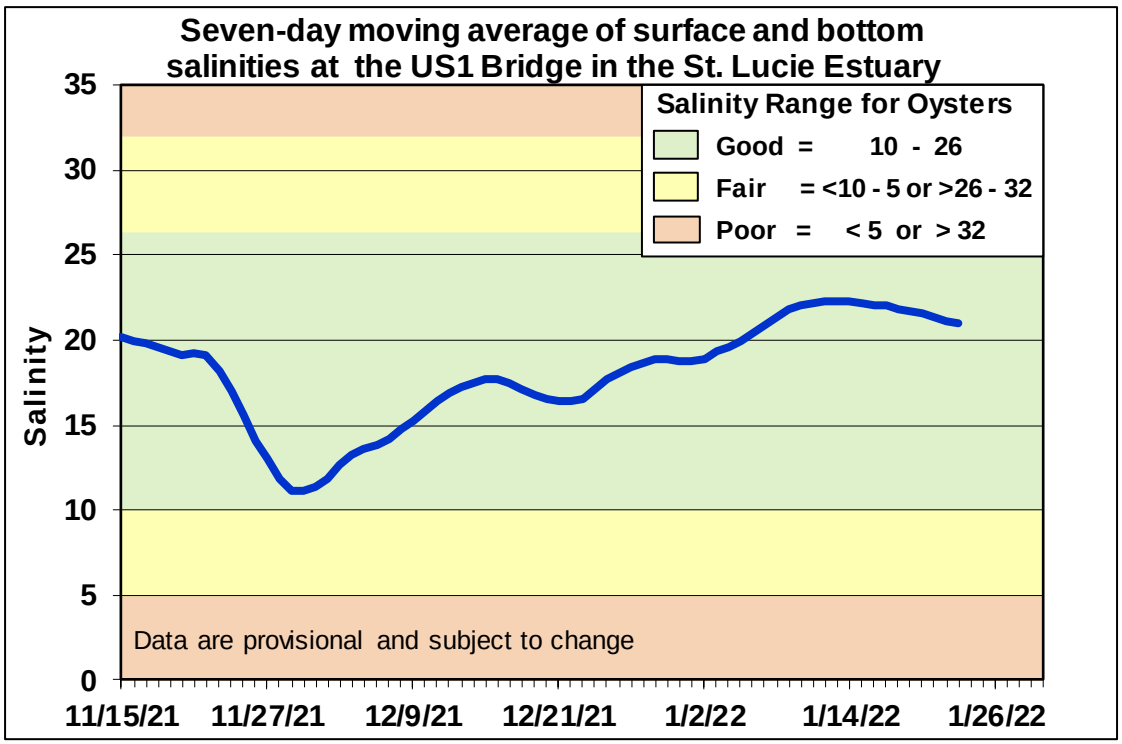


Figure ES-4. Seven-day moving average of the surface and bottom salinities at the US1 Bridge in the St. Lucie Estuary.

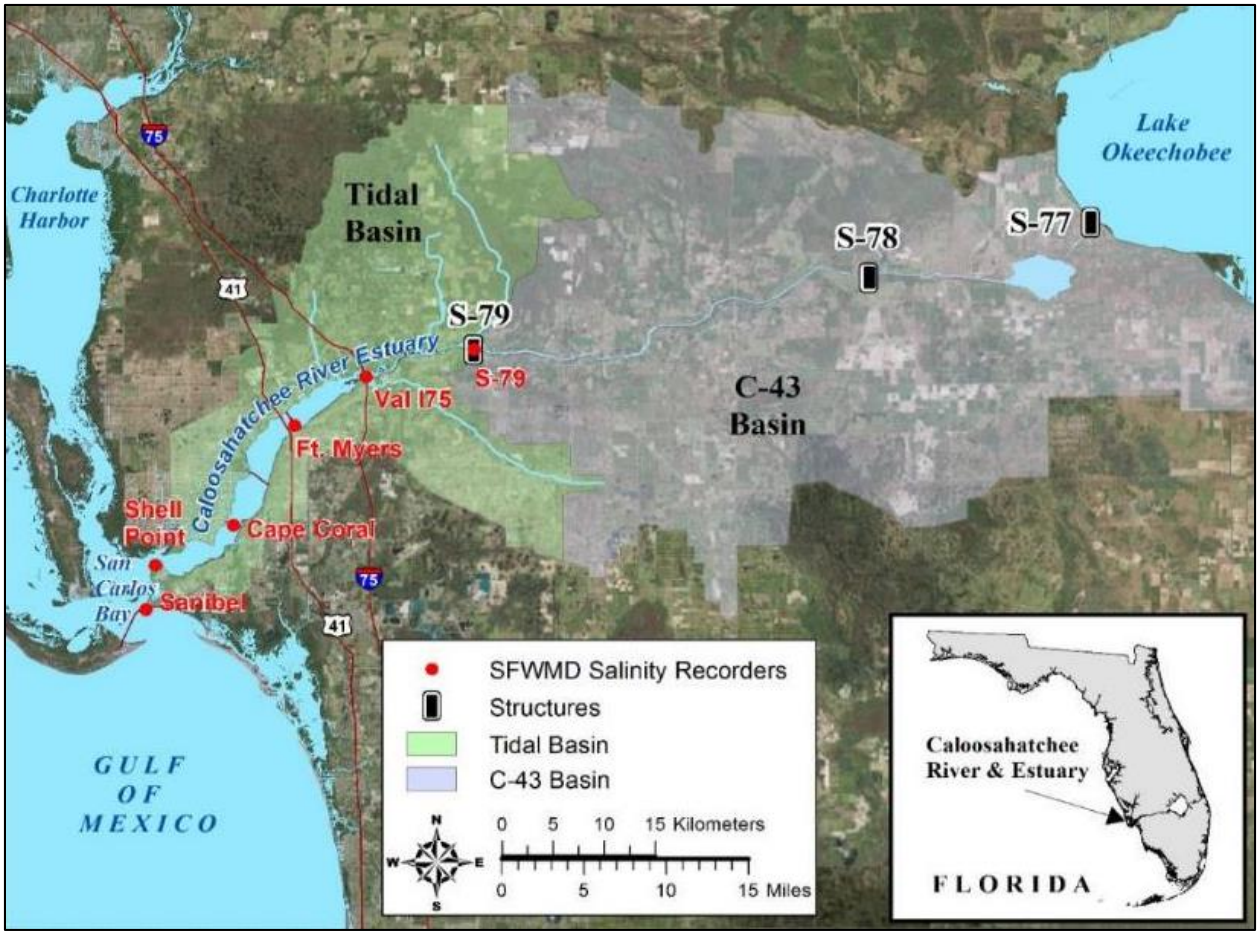


Figure ES-5. Basins, water control structures and salinity monitoring sites in the Caloosahatchee River Estuary.

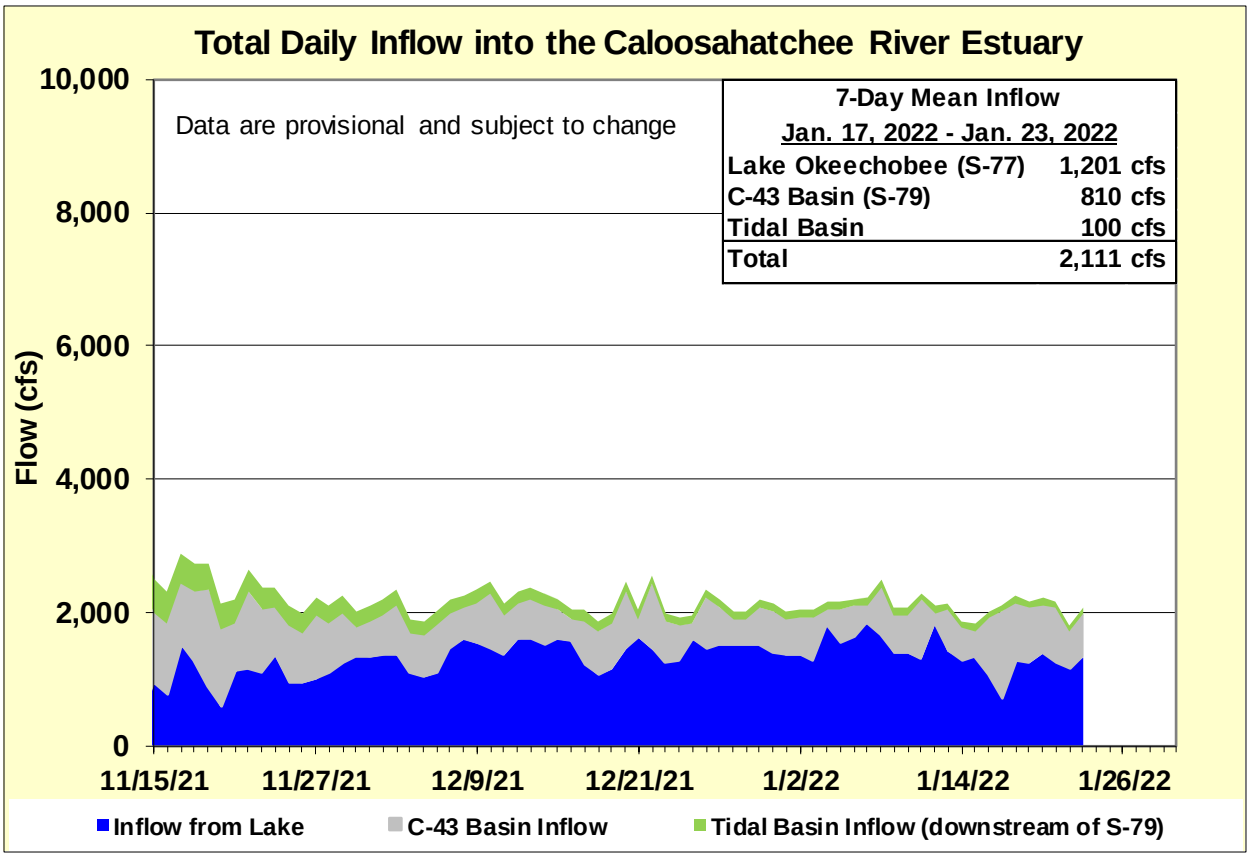


Figure ES-6. Total daily inflows from Lake Okeechobee, and runoff from the C-43 and Tidal basins into the Caloosahatchee River Estuary.

Table ES-2. Seven-day mean salinity at six monitoring sites in the Caloosahatchee River Estuary. Current means are in bold font; previous week's means are in parentheses. The envelope at I-75 is for the protection of tape grass in the upper estuary and the envelope in the lower estuary is the preferred salinity range for adult eastern oysters (*Crassostrea virginica*). Data are provisional.

Sampling Site	Surface	Bottom	Envelope
S-79 (Franklin Lock)	**0.2** (0.2)	**0.2** (0.2)	NA [a]
Val I-75	**0.3** (0.4)	**0.3** (0.6)	0.0 – 5.0 [b]
Fort Myers Yacht Basin	**2.4** (3.3)	**3.6** (5.2)	NA [a]
Cape Coral	**9.1** (10.5)	**10.1** (12.3)	10.0 – 30.0
Shell Point	**20.9** (22.3)	**22.1** (24.3)	10.0 – 30.0
Sanibel	**27.1** (28.5)	**28.8** (29.7)	10.0 – 30.0

a. The envelope is not applicable.
b. The envelope is based on the predicted 30-day mean for the next two weeks.

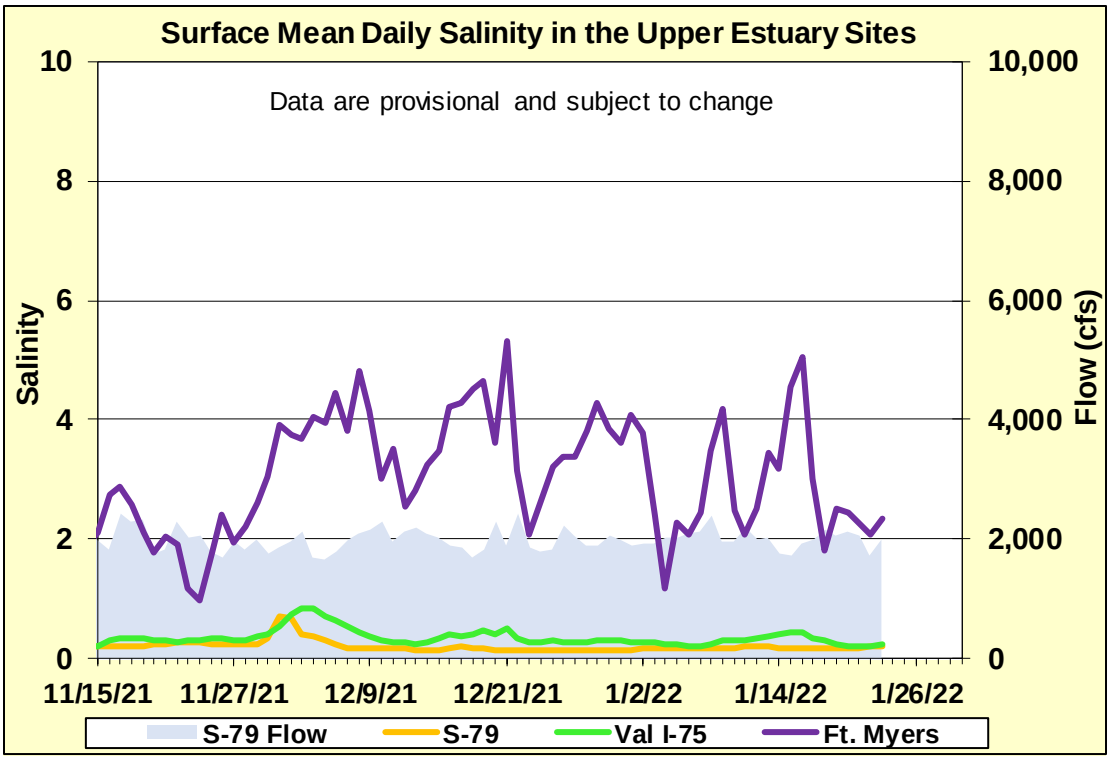


Figure ES-7. Mean daily salinity at upper Caloosahatchee River Estuary monitoring sites and mean daily flow at S-79.

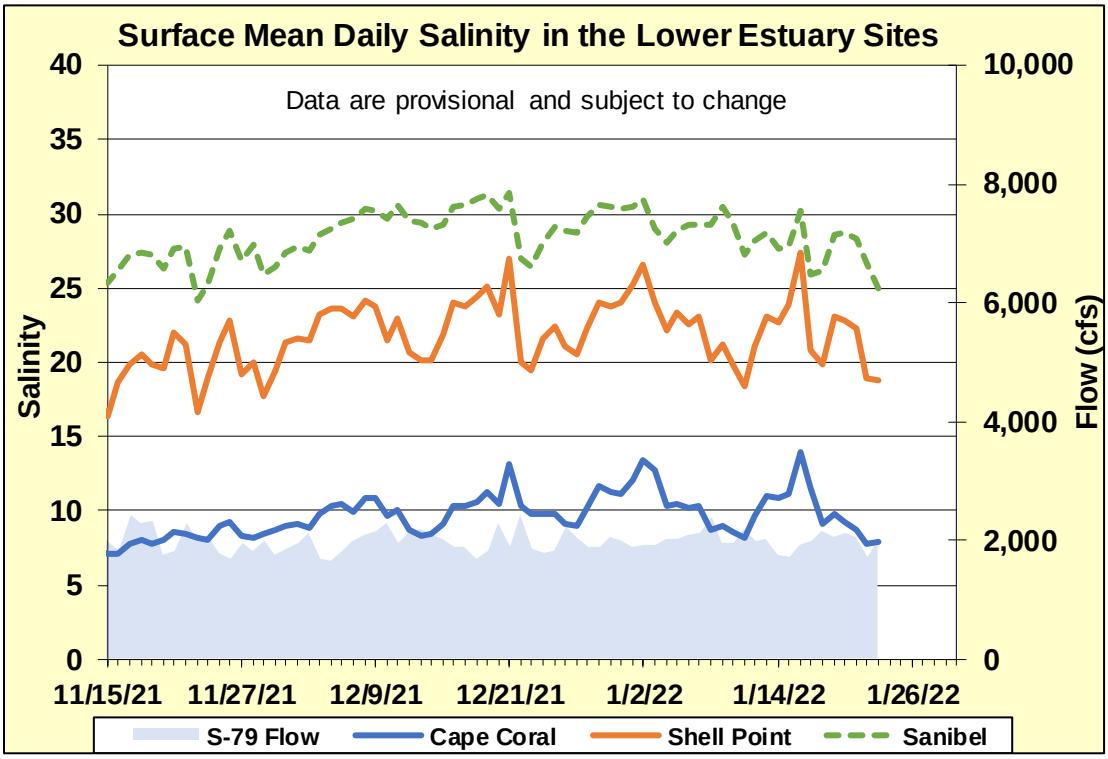


Figure ES-8. Mean daily surface salinity at lower Caloosahatchee River Estuary monitoring sites and mean daily flow at S-79.

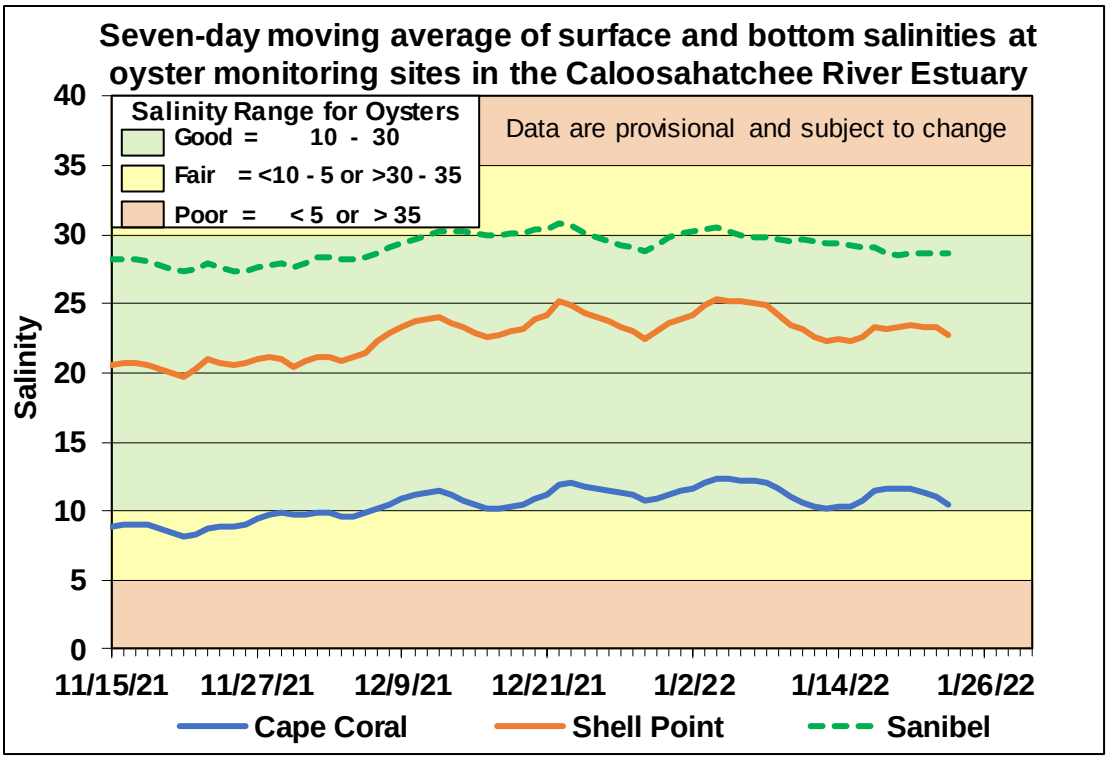


Figure ES-9. Seven-day moving average of surface and bottom salinities at Cape Coral, Shell Point and Sanibel monitoring sites in the Caloosahatchee River Estuary.

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	119	1.0	0.3
B	450	119	0.4	0.3
C	800	119	0.3	0.3
D	1000	119	0.3	0.3
E	1500	119	0.3	0.3
F	2000	119	0.3	0.3

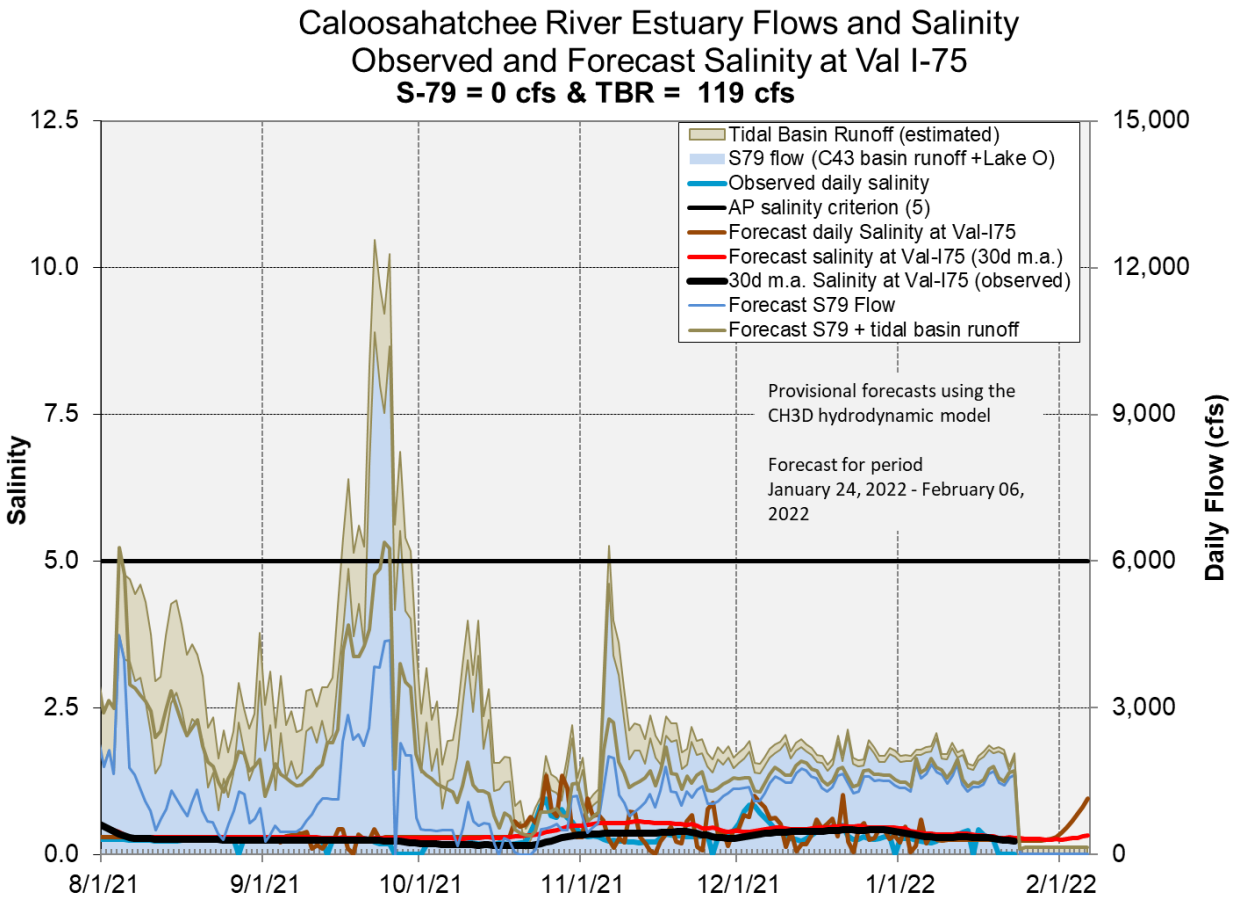


Figure ES-10. Forecasted Val I-75 site surface salinity assuming no pulse release at S-79.

Stormwater Treatment Areas

STA-1E: STA-1E Western Flow-way is offline for the Restoration Strategies project to fill and grade Cells 5 and 7, and the Eastern Flow-way is offline for vegetation management activities including rip-rap repairs related to Tropical Storm Eta. Operational restrictions are in place in STA-1E Central Flow-way for vegetation management activities. Online treatment cells are at or above target stage, and vegetation in these cells is stressed and highly stressed. The 365-day phosphorus loading rates (PLRs) is high for the Central Flow-way (**Figure S-1**).

STA-1W: Operational restrictions are in place in STA-1W Western, Eastern, and Northern Flow-ways due to construction activities. Most treatment cells are at or near target stage. Vegetation in the flow-ways is stressed and highly stressed. The 365-day PLRs for the Northern, Western, and Eastern Flow-ways are below 1.0 g/m^2/year (**Figure S-2**).

STA-2: STA-2 Flow-way 2 is offline for construction activities. Operational restrictions are in place in STA-2 Flow-ways 3 and 4 for vegetation management activities. Online treatment cells are at or near target stage. Vegetation in Flow-ways 1 and 3 is stressed, and in Flow-ways 2, 4 and 5 is highly stressed. The 365-day PLRs for Flow-ways 1, 4 and 5 are below 1.0 g/m^2/year. The 365-day PLR for Flow-way 3 is high (**Figure S-3).**

STA-3/4: STA-3/4 Eastern Flow-way is offline for vegetation rehabilitation/drawdown. Most online treatment cells are at or near target stage. Vegetation in the Eastern and Central Flow-ways is highly stressed and in the Western Flow-way is stressed. The 365-day PLRs for the Central and Western Flow-ways are below 1.0 g/m^2/year (**Figure S-4**).

STA-5/6: STA-5/6 Flow-way 4 is offline for vegetation management activities. Most treatment cells are below target stage. All treatment cells have highly stressed vegetation conditions except Flow-ways 7 and 8, which are healthy. The 365-day PLRs for flow-ways 1, 6, 7, and 8 are below 1.0 g/m^2/year. The 365-day PLRs for flow-ways 4 and 5 are high. (**Figure S-5** and **S-6**).

For definitions on STA operational language see glossary following figures.

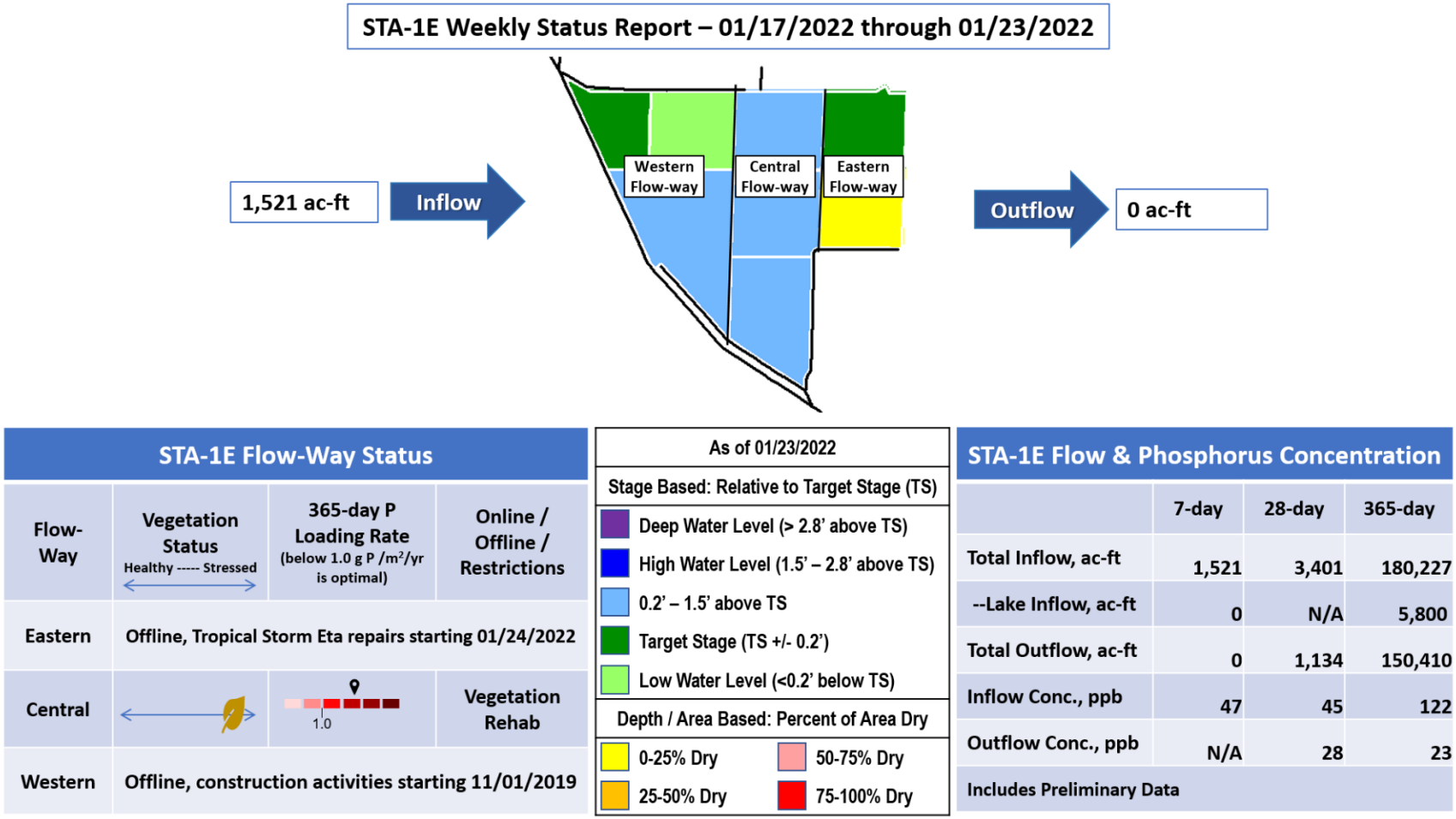


Figure S-1. STA-1E Weekly Status Report

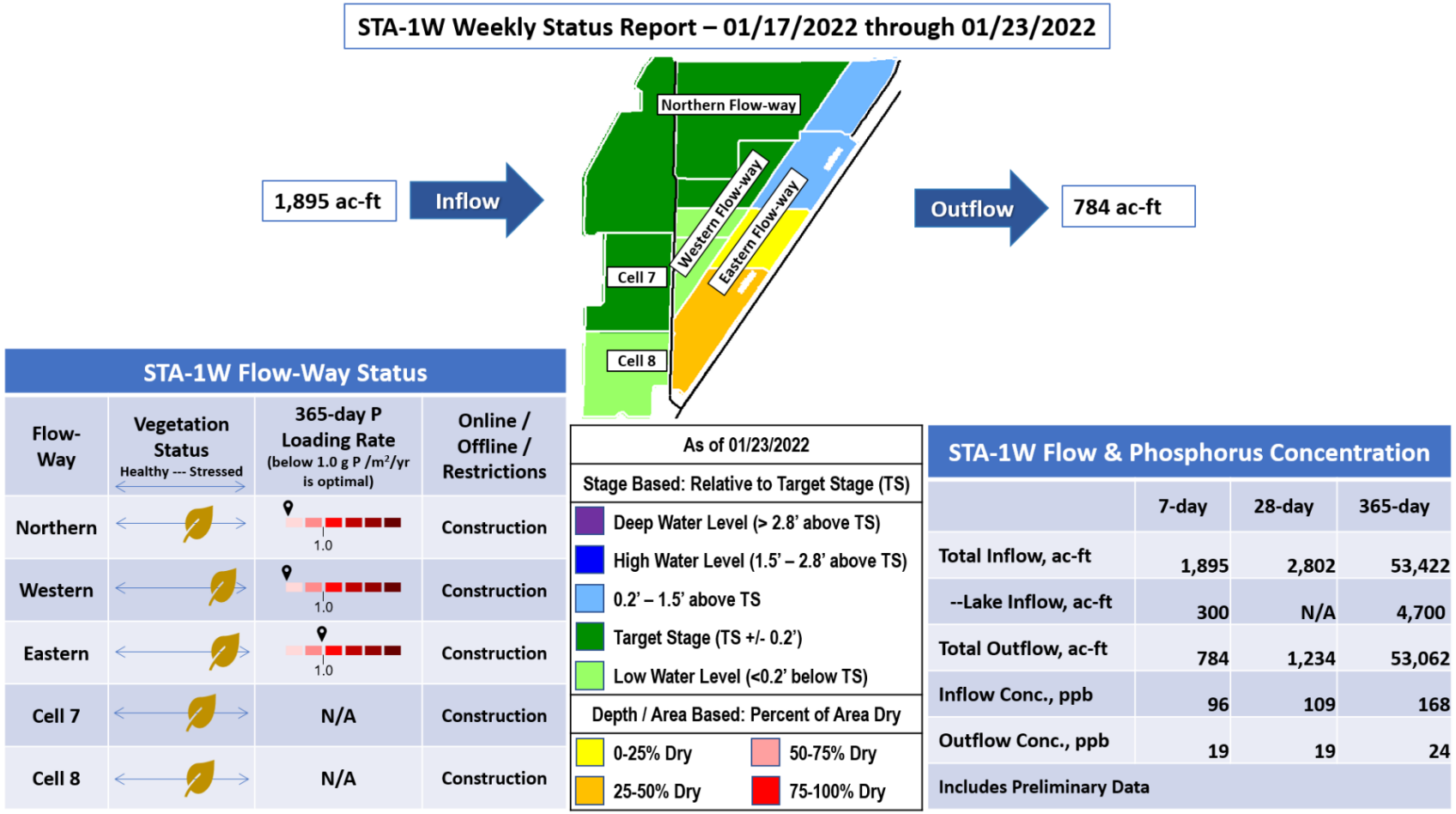


Figure S-2. STA-1W Weekly Status Report

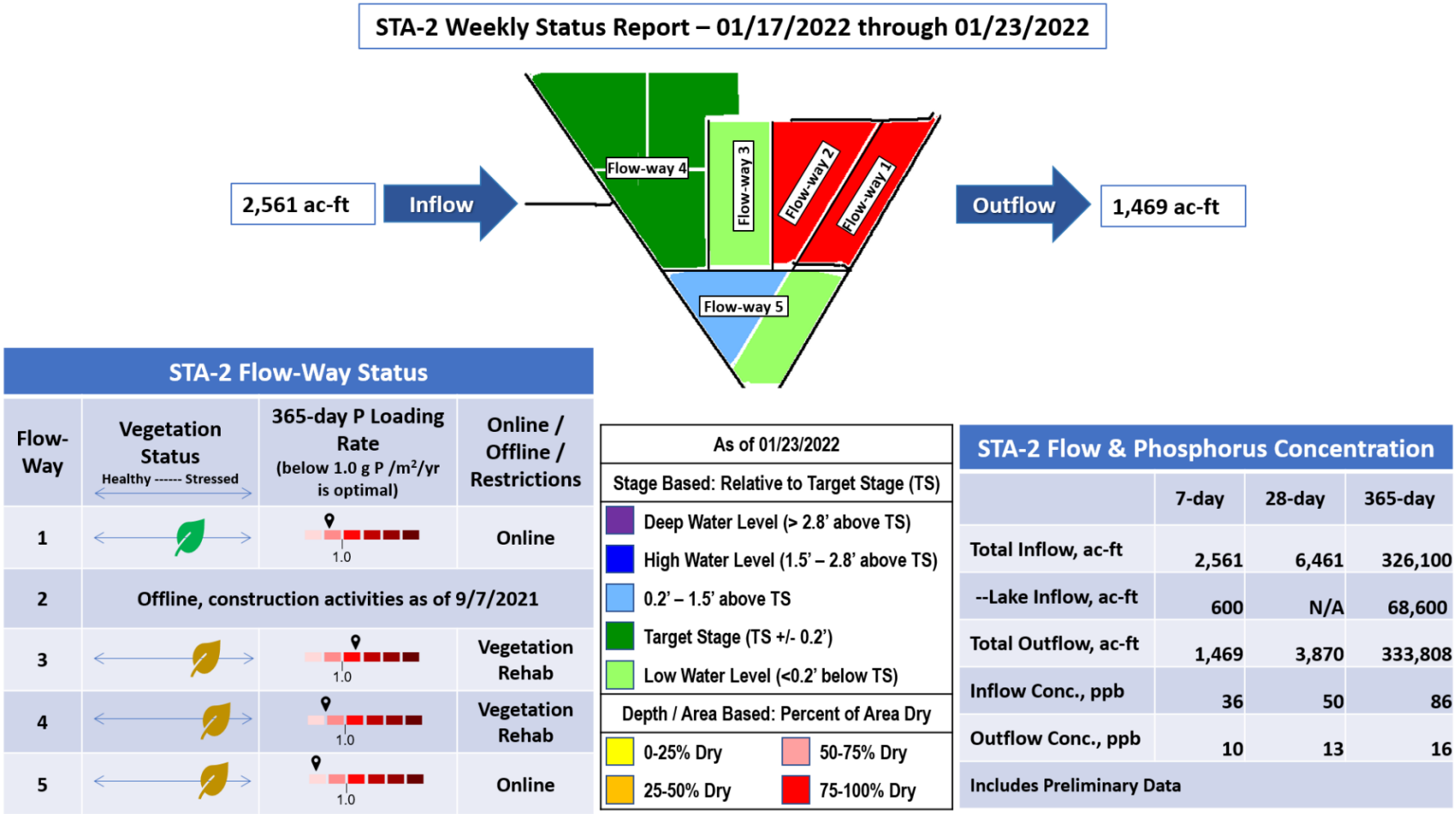
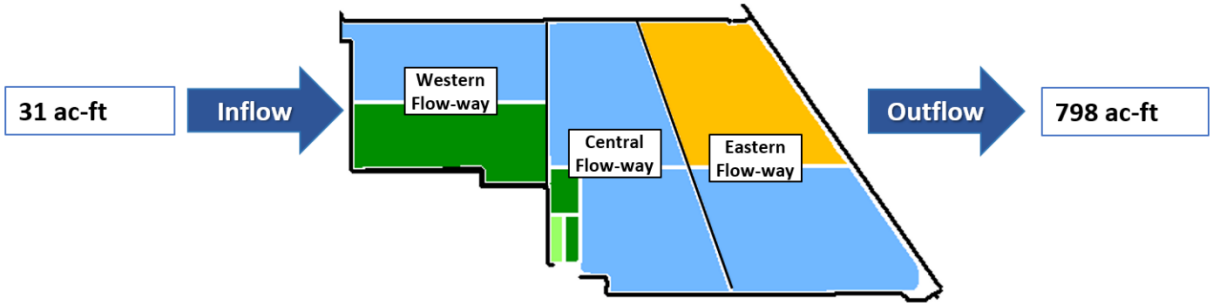


Figure S-3. STA-2 Weekly Status Report

STA-3/4 Weekly Status Report – 01/17/2022 through 01/23/2022



STA-3/4 Flow-Way Status

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

As of 01/23/2022
Stage Based: Relative to Target Stage (TS)
Deep Water Level (> 2.8' above TS)
High Water Level (1.5' – 2.8' above TS)
0.2' – 1.5' above TS
Target Stage (TS +/- 0.2')
Low Water Level (<0.2' below TS)
Depth / Area Based: Percent of Area Dry
0-25% Dry / 50-75% Dry
25-50% Dry / 75-100% Dry

STA-3/4 Flow & Phosphorus Concentration

	7-day	28-day	365-day
Total Inflow, ac-ft	31	125	360,594
--Lake Inflow, ac-ft	0	N/A	39,600
Total Outflow, ac-ft	798	1,061	316,593
Inflow Conc., ppb	46	46	65
Outflow Conc., ppb	16	17	15
Includes Preliminary Data			

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

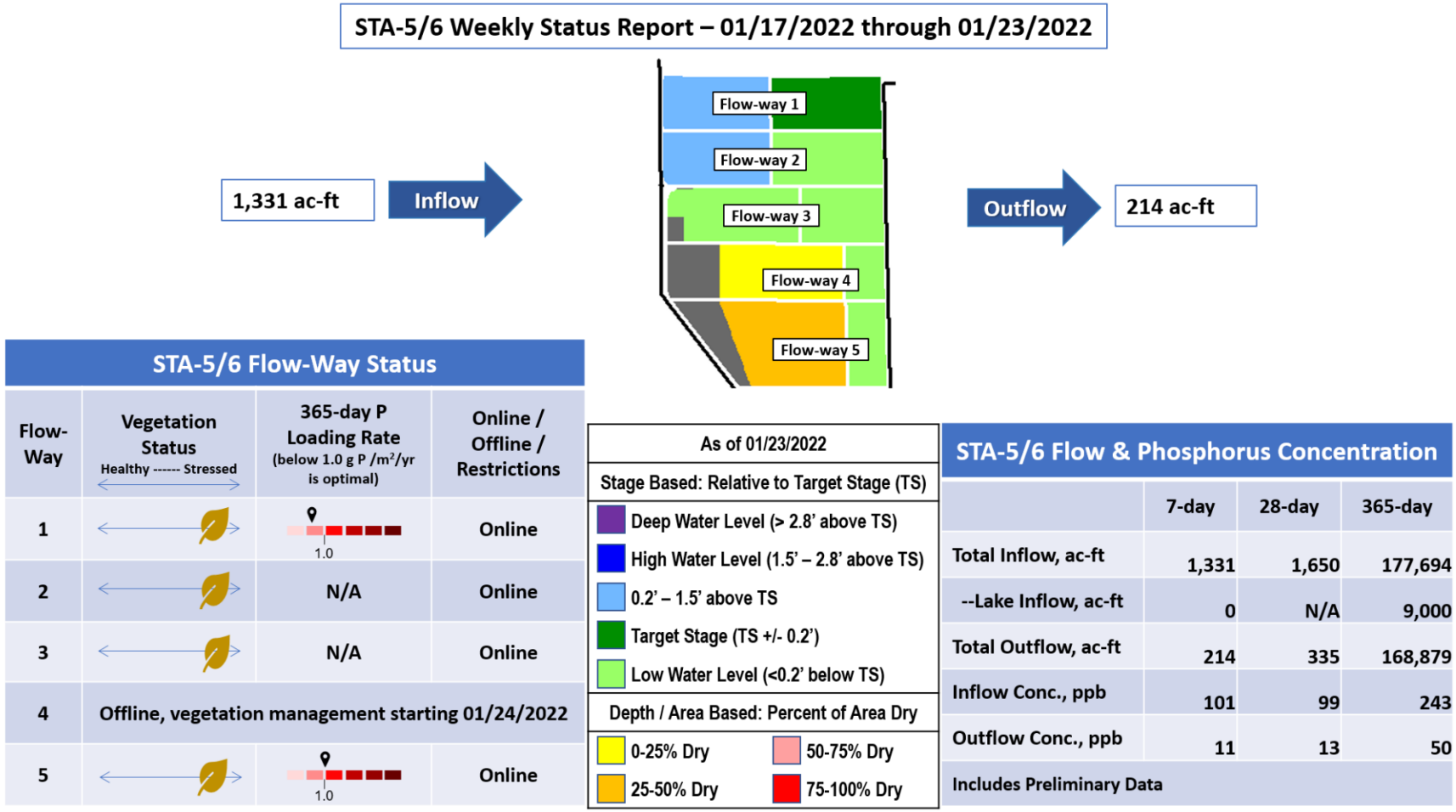
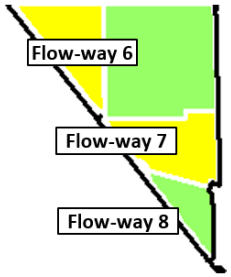
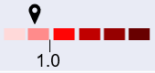
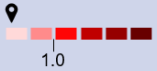
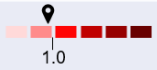


Figure S-5. STA-5/6 Weekly Status Report (Flow-ways 1 – 5)

STA-5/6 Weekly Status Report – 01/17/2022 through 01/23/2022



STA-5/6 Flow-Way Status

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

As of 01/23/2022	
Stage Based: Relative to Target Stage (TS)	
Deep Water Level (> 2.8' above TS)	
High Water Level (1.5' – 2.8' above TS)	
0.2' – 1.5' above TS	
Target Stage (TS +/- 0.2')	
Low Water Level (<0.2' below TS)	
Depth / Area Based: Percent of Area Dry	
0-25% Dry	50-75% Dry
25-50% Dry	75-100% Dry

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

Basic Concepts and Definitions for STA Weekly Status Report

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

Everglades

Recessions at the gauges in WCA-3A continue to be in the good or fair range. Stages are falling below ground in WCA-3A North. Conditions improved In Taylor Slough and Florida Bay last week. Salinities fell back within the regional inner quartile ranges, and stages remain high in northern Taylor slough.

Water Conservation Area (WCA) Regulation Schedules

WCA-1: The 1-8C stage continued to fall slightly slower than the Zone A1 regulation line last week. The average on Monday was 0.33 feet above the regulation line. WCA-2A: Stage change at 2A-17 resumed a faster recession rate last week; the average at that gauge on Monday was 1.22 feet higher than the regulation line. WCA-3A: Last week the Three Gauge Average stage change leveled off; average stage was 0.60 feet below the falling Zone A regulation line on Monday (compared to 0.62 and 0.58 feet the weeks prior). WCA-3A: Stage change at gauge 62 (Northwest corner) was flat last week, the average on Monday was 0.89 feet below the regulation line. (**Figures EV-1** through **EV-4**).

Water Depths

The SFWDAT tool indicates that water depths in the WCAs are the lowest in northeastern WCA-3A, where the spatial extent of the potential for water below the soil surface continues to expand just south of the S-150. North to South hydrologic connectivity has diminished but remains in Everglades National Park (ENP) within Taylor, Lostman's and Shark River sloughs. The western marl prairies in ENP and southern Big Cypress National Preserve (BCNP) are dry as is typical for this time of year. (**Figure EV-5**). Comparing current WDAT water depths to the depth one month ago, stages are decreasing in the WCAs most significantly in southern WCA-2A. Eastern ENP is close to the same stage as one month ago. Looking back one year, most of the Everglades Protection Area is significantly lower in depth (particularly eastern WCA-3A) with only WCA-1 and northeastern ENP close to the same depth as last year. (**Figure EV-6)**. Comparing current depths to the past 20 years, most of WCA-3A is near the 30th percentile, while WCA-1, WCA-3B and northeastern ENP remain above the 90th percentile (**Figure EV-7**).

Taylor Slough and Florida Bay

A spatial average of 0.64 inches of rain fell over Taylor Slough and Florida Bay during the last half of the week ending Sunday, 1/23/2022. Together with the effects of the previous week's rains and increased water deliveries, stages increased an average of 0.11 feet over the week, with increases at all stations and the highest weekly increase at the Taylor Slough Bridge (TSB) station in northern Taylor Slough (**Figure EV-8** and **Figure EV-9**). The Upper Taylor Slough area is 1.3 feet higher than the average from before the Florida Bay Initiative modifications and only 2.5 inches lower than this time last year. Given the expectation of a drier than average dry season, maintaining water deliveries to the area would help to slow the recession in the slough so water movements south can be expedited when the wet season starts.

Salinities in Florida Bay averaged a decrease of 2.7 over the week ending 1/23/2022, with individual station changes ranging from −12.0 to +1.7 (**Figure EV-8**) as the upstream pressure of the previous week relented. The largest changes were decreases in the nearshore area, reversing last week's changes. This allowed the regional averages to decrease back within their respective interquartile ranges (**Figure EV-10**). Bay-wide salinity is now only 1 higher than the historical average as the recent rain pulses have done much to improve the salinity conditions within the Bay. The eastern and central regions remain near their respective 75th percentiles.

Water Management Recommendations

Should conditions warrant the opening of S-10s, the S-10 C structure has historically had the lowest upstream nutrient values, and its use should be prioritized over the other two sister structures. Discharges at the S-10s of more than 500 cfs per structure can have deleterious downstream impacts. Flows directed across the northern perimeter of WCA-3A, that assist in maintaining stage in that sub-basin then move downstream, have an ecological benefit if those discharges can slow the recession rates in that sub-basin. If conditions allow, discharges into both the western (to assist in maintaining current foraging conditions) and the eastern (i.e. S-150 to help maintain stage around the Alley North colony) WCA-3A water control structures has greater benefit than discharges to the west alone. Continued freshwater to the Taylor Slough area, a discharge amount that maintains stage, 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 regions.

Everglades Region	Rainfall (inches)	Stage change (feet)
WCA-1	0.30	−0.02
WCA-2A	0.58	−0.11
WCA-2B	1.10	−0.02
WCA-3A	0.63	−0.03
WCA-3B	2.27	+0.13
ENP	0.87	+0.01

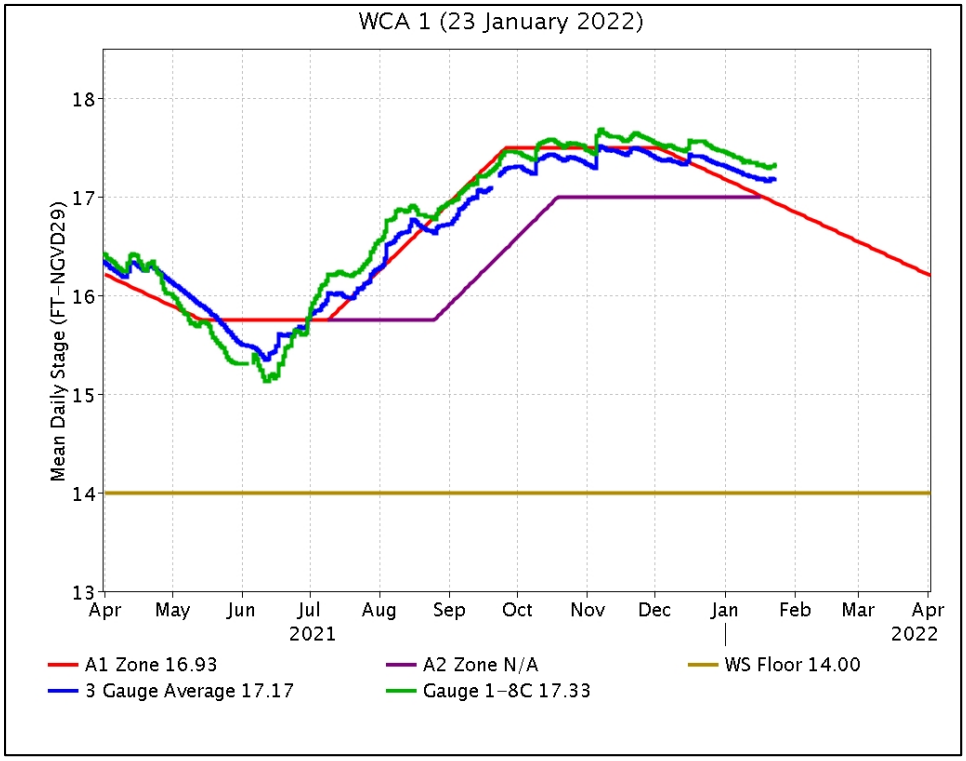


Figure EV-1. WCA-1 stage hydrographs and regulation schedule.

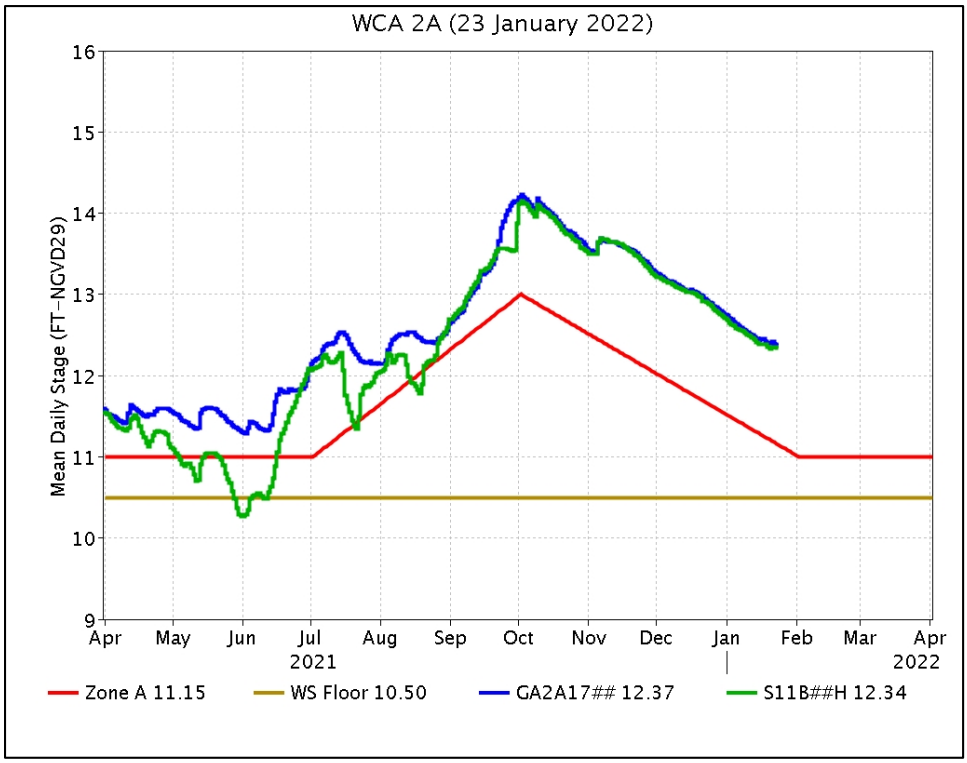


Figure EV-2. WCA-2A stage hydrographs and regulation schedule.

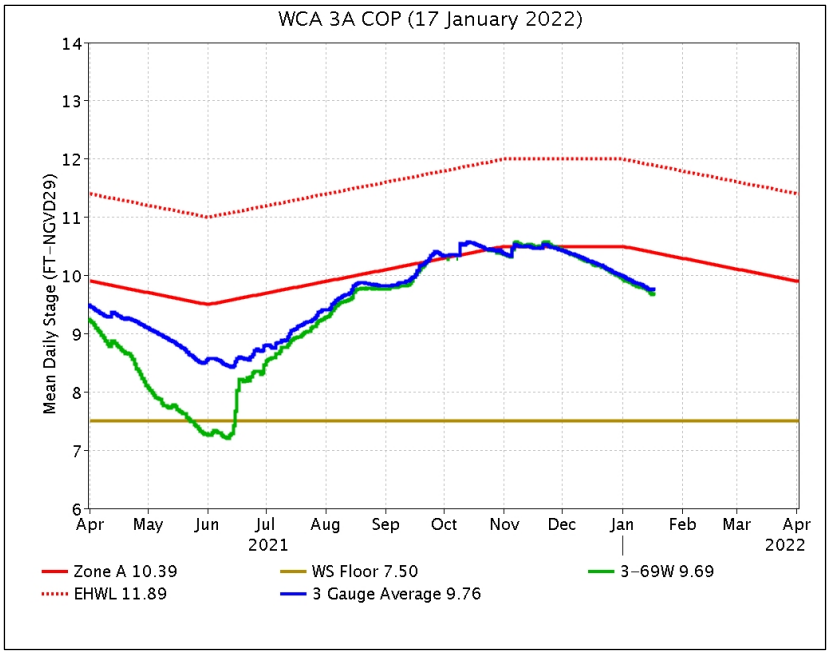


Figure EV-3. WCA-3A stage hydrographs (three-gauge average, S-333 headwater) and regulation schedule.

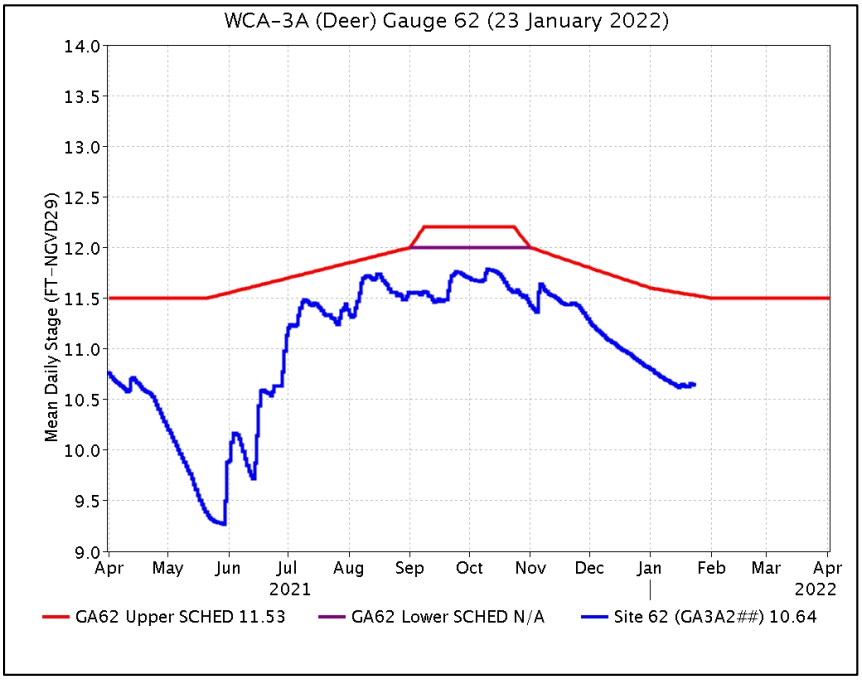


Figure EV-4. WCA-3A stage hydrograph (Deer gauge; Site 62) and CA62 regulation schedule.

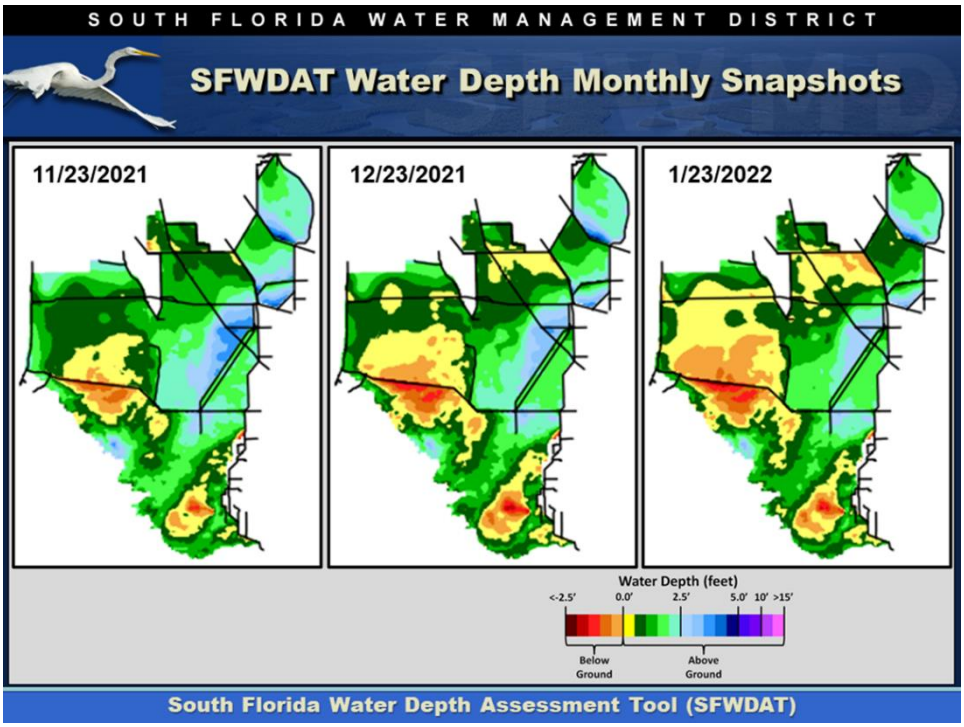


Figure EV-5. Everglades water depths from two months ago (left), one month ago (center) and present (right), based on SFWDAT.

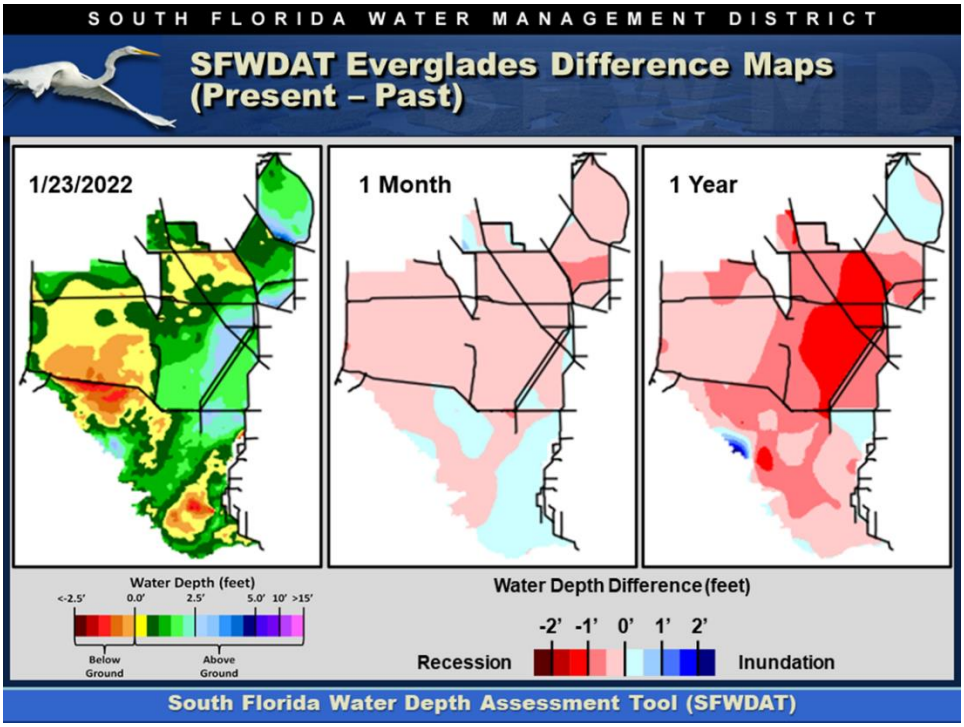


Figure EV-6. Present Everglades water depths (left) and water depth changes from one month (center) and one year (right) ago, based on SFWDAT.

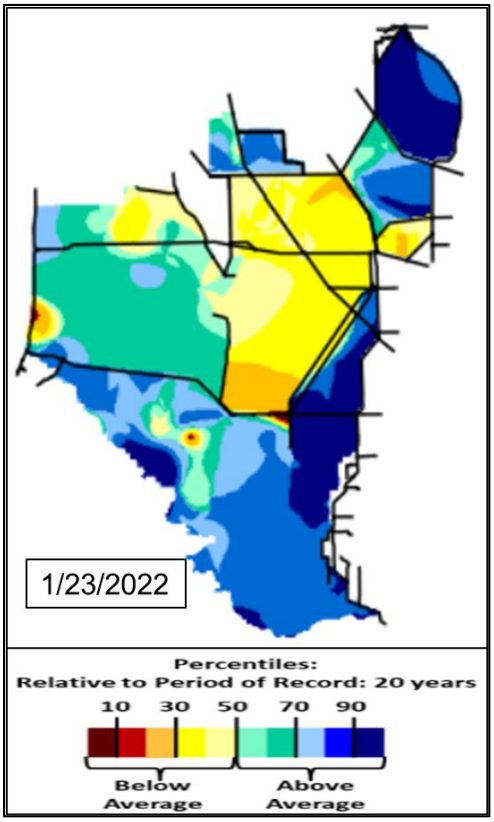


Figure EV-7. Present water depths compared to the day of year median over the previous 20 years.

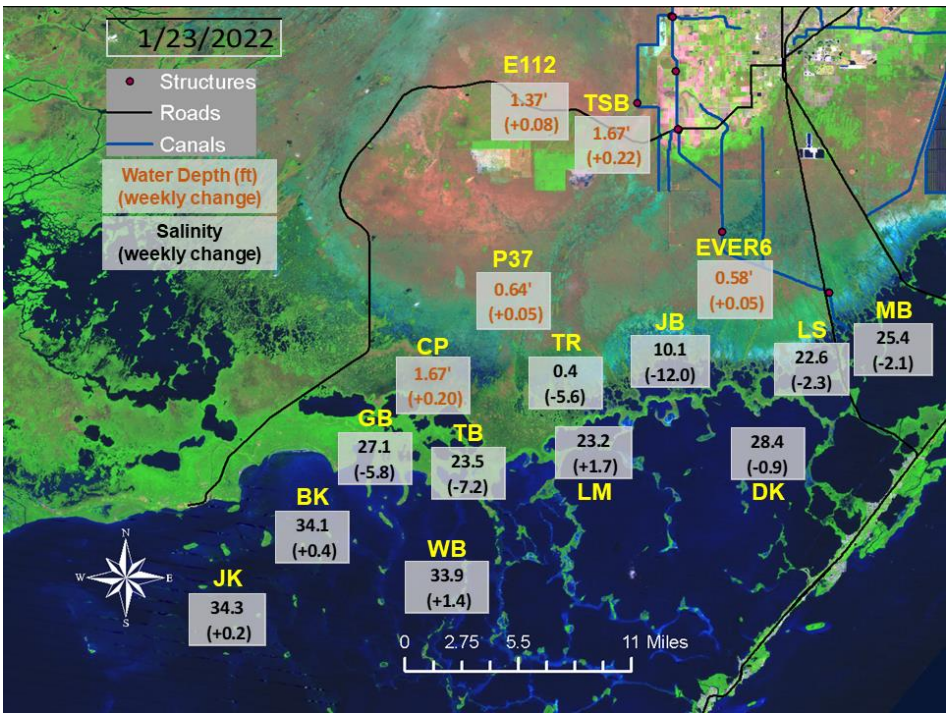


Figure EV-8. Taylor Slough water depths with changes since a week ago and Florida Bay salinities with changes since a week ago.

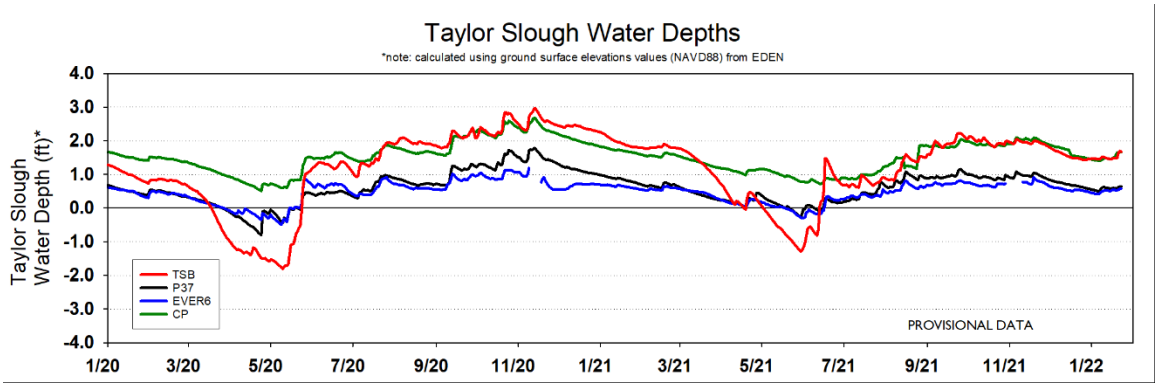


Figure EV-9. Taylor Slough water depth time series.

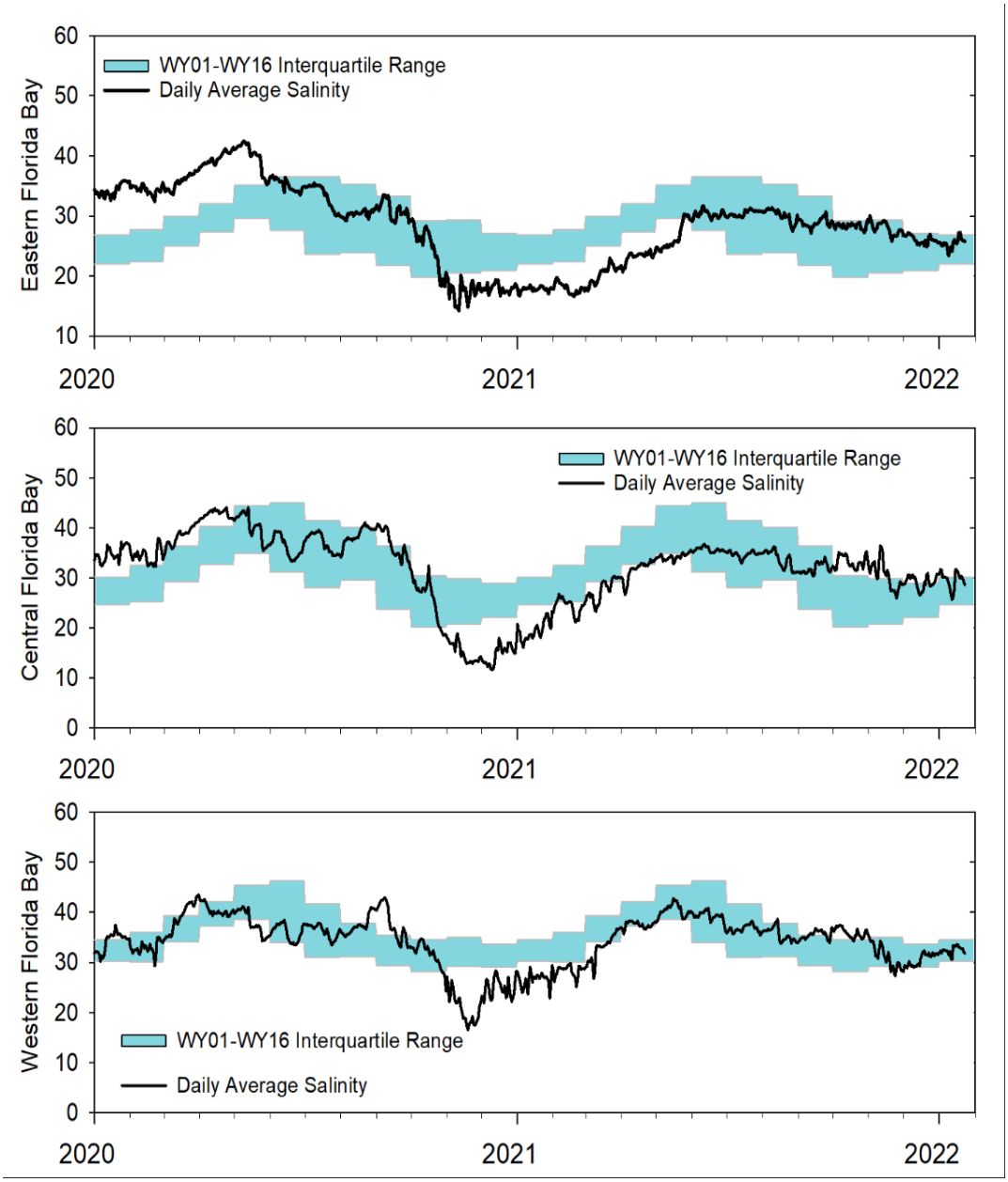


Figure EV-10. Eastern (top panel), Central (middle panel) and Western (bottom panel) Florida Bay daily average salinities with interquartile (25-75 percentile) ranges.

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

SFWMD Everglades Ecological Recommendations, January 25, 2022 (red is new)			
Area	Weekly change	Recommendation	Reasons
WCA-1	Stage decreased by 0.02'	Conserve water in this basin letting the water move south when conditions allow.	Protect within basin and downstream habitat and wildlife. Anticipated La Nina dry season.
WCA-2A	Stage decreased by 0.11'	Conserve water in this basin letting the water move south when conditions allow, with northern WCA-3A as the priority for receiving discharge. Keeping a recession rate less than 0.10 feet per week has an ecological benefit.	Protect within basin and downstream habitat and wildlife. Protect wading bird foraging conditions in WCA-3A North.
WCA-2B	Stage decreased by 0.02'	Conserve water in this basin, maintain a minimum input to maintain stage while moving water south when conditions allow.	Protect within basin and downstream habitat and wildlife.
WCA-3A NE	Stage decreased by 0.08'	Conserve water in this basin, while letting the water move south when conditions allow. Keeping a recession rate less than 0.10 feet per week has an ecological benefit.	Protect within basin peat soils, wading bird foraging and downstream habitat and wildlife. Maintaining stage above 9.5' NGVD at 3A-3 (or gauge 63) prior to March 15 will increase the probability of successful nesting at the Alley North colony.
WCA-3A NW	Stage decreased by 0.03'	Conserve water in this basin letting the water move south when conditions allow. Keeping a recession rate less than 0.10 feet per week has an ecological benefit.	
Central WCA-3A S	Stage decreased by 0.03'	Return to a recession rate that is less than 0.10 feet per week. Allow flows to move south when conditions allow.	Protect within basin and downstream habitat and wildlife.
Southern WCA-3A S	Stage increased by 0.03'		
WCA-3B	Stage increased by 0.13'	Slow ascension rates in this basin letting the water move south when conditions allow.	Protect within basin and downstream habitat and wildlife.
ENP-SRS	Stage increased by 0.01'	Make discharges to the Park according to COP and TTFF protocol while considering upstream and downstream ecological conditions.	Protect within basin and upstream habitat and wildlife.
Taylor Slough	Stage changes ranged from +0.04' to +0.22'	Move water southward as possible.	When available, provide freshwater buffer for downstream conditions.