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M E M O R A N D U M

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

FROM: SFWMD Staff Environmental Advisory Team

DATE: January 5, 2022

SUBJECT: Weekly Environmental Conditions for Systems Operations

Summary

Weather Conditions and Forecast

Dry conditions remain over most of the District. Moisture should spread northward over the District and allow daytime heating to generate some scattered light showers Wednesday and Thursday. A weak cold front is forecast to push into the District from the northwest Friday morning and then stall across south Florida Friday night. Light rain and showers from the west may proceed the front Thursday night and then scattered shower activity will follow as the front moves southward into the District Friday. Once the front stalls, some moderate shower activity will persist along the east coast Saturday. The most likely areas for rains Saturday are Broward and Miami-Dade Counties. The boundary is forecast to lift back north on Sunday producing scattered showers east and north. A second cold front is then forecast to push in from the northwest Monday producing scattered showers and thunderstorms as it moves through the area. Total rainfall is forecast to be near the historical average during the first 7-day period (Week 1) and then near the historical average again during the second 7-day period (Week 2).

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 0.22 feet as of January 2, 2022. The concentration of dissolved oxygen in the Kissimmee River has remained well above the region of concern, with an average of 7.7 mg/L for the week ending on January 2, 2022.

Lake Okeechobee

Lake Okeechobee stage was 15.48 feet NGVD on January 2, 2022 and it was 0.41 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) decreased from the previous week, going from 610 cfs to 440 cfs. Average daily outflows (excluding evapotranspiration) increased from the previous week, going from 1,990 cfs to 2,890 cfs. Recent satellite imagery (January

2, 2022) showed low to medium bloom potential along the northwestern and western shorelines (**Figure LO-6**).

Estuaries

Total inflow to the St. Lucie Estuary averaged approximately 230 cfs over the past week with no flow coming from Lake Okeechobee. Mean salinities increased 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 2,090 cfs over the past week with 1,460 cfs coming from the Lake. Mean salinities remained the same at S-79 and increased at the remaining sites in the estuary over the past week. Salinities were in the good range (0-10) for tape grass at Val I-75 and Ft. Myers. Salinities were also in the good range (10-30) for adult eastern oysters at Cape Coral and Shell Point, and just within the fair range at Sanibel.

Stormwater Treatment Areas

For the week ending Sunday, January 2, 2022, approximately 3,500 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 66,000 ac-feet. The total amount of inflows to the STAs in WY2022 is approximately 954,000 ac-feet. Most STA cells are at or near target stage, except STA-5/6 cells that are starting to dry out. STA-1E Western Flow-way is offline for the Restoration Strategies project to fill and grade Cells 5 and 7, STA-3/4 Eastern Flow-way is offline for vegetation rehabilitation / drawdown, and STA-2 Flow-way 2 is offline for construction 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

Rates of stage change across the Everglades went from mostly fair the previous week to fair and poor last week with elevated recessions in WCA-2A and northeastern and central WCA-3A. Recession rate predictions for WCA-2A indicate a more extensive dry down in WY2022 compared to WY2021. Depths are low in northern WCA-3A and stages are below the median in the central and southern regions of that conservation area. Florida Bay salinities increased again over the last week and stages fell slightly on average in Taylor Slough. Salinities in the central regions exceeded its 75th percentile once again and conditions remain less than ideal to tolerate a drier than average dry season.

Supporting Information

Kissimmee Basin

Upper Kissimmee

On January 2, 2022, lake stages were 58.0 feet NGVD (at schedule) in East Lake Toho, 54.7 feet NGVD (0.3 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 2, 2022 were 380 cfs at S-65 and 310 cfs at S-65A; discharges from the Kissimmee River were 380 cfs at S-65D and 370 cfs at S-65E (**Table KB-2**). Headwater stages were 46.3 feet NGVD at S-65A and 26.5 feet NGVD at S-65D on January 2, 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 7.7 mg/L for the week ending on January 2, 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 0.22 feet as of January 2, 2022 (**Figure KB-5**).

Water Management Recommendations

Managed stage recessions for snail kite nesting season are currently planned to begin in Lakes Toho and East Toho on January 15, 2022. In preparation, stage is being reduced in Lake Toho to 54.5 ft by January 14, 2022; this operation was started on December 17. 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)	
							1/2/22	12/26/21
Lakes Hart and Mary Jane	S-62	LKMJ	72	61.0	R	61.0	0.0	0.0
Lakes Myrtle, Preston and Joel	S-57	S-57	28	61.6	R	61.7	-0.1	0.0
Alligator Chain	S-60	ALLI	25	64.0	R	64.0	0.0	0.0
Lake Gentry	S-63	LKGT	52	61.5	R	61.5	0.0	0.0
East Lake Toho	S-59	TOHOE	168	58.0	R	58.0	0.0	0.0
Lake Toho	S-61	TOHOW S-61	501	54.7	R	55.0	-0.3	-0.2
Lakes Kissimmee, Cypress and Hatchineha	S-65	KUB011 LKIS5B	379	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.

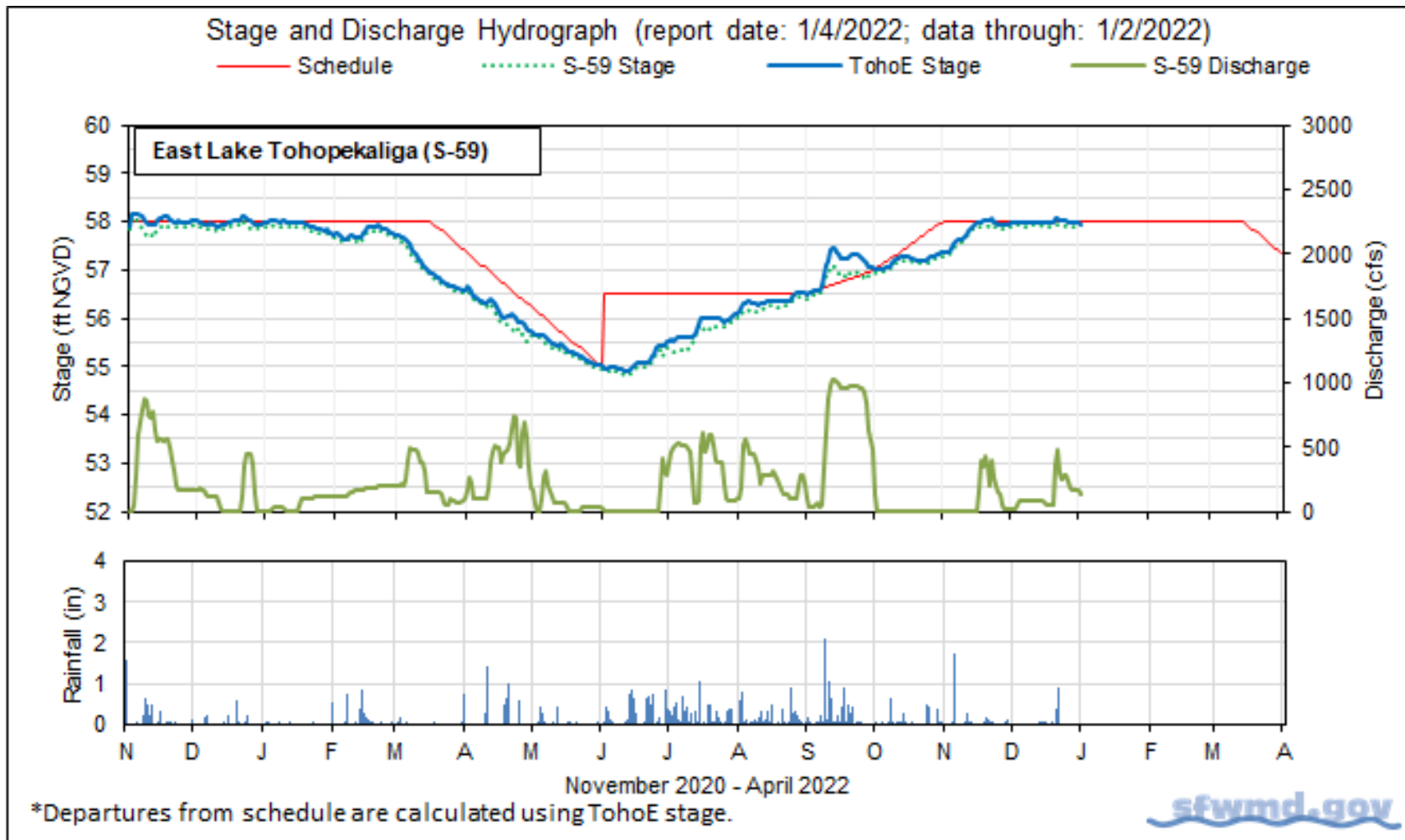


Figure KB-1. East Lake Toho regulation schedule, stage, discharge and rainfall.

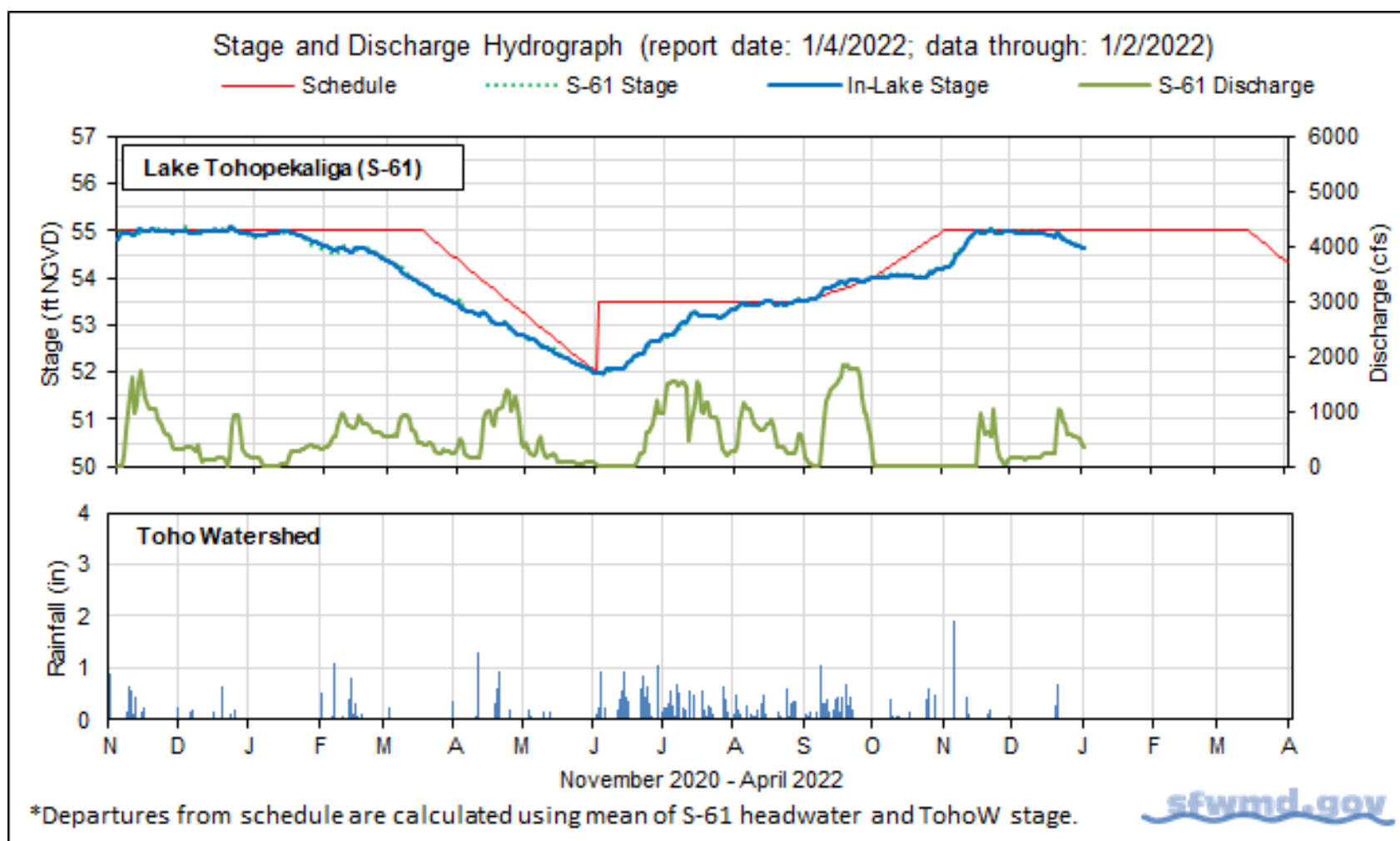


Figure KB-2. Lake Toho regulation schedule, stage, discharge and rainfall.

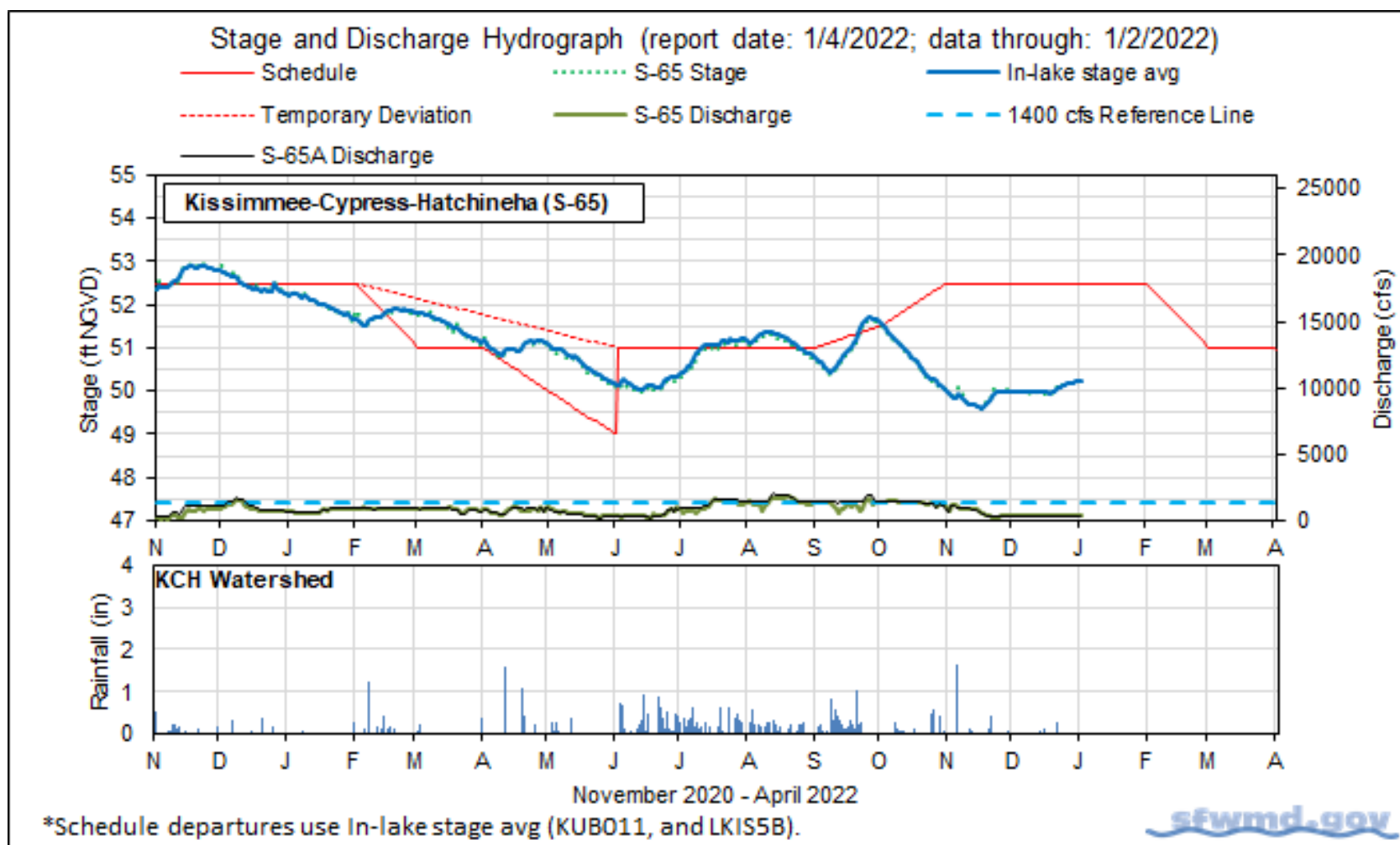


Figure KB-3. Lakes Kissimmee, Cypress and Hatchineha regulation schedule, stage, discharge and rainfall.

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 1/2/22	Average for Previous Seven Day Periods			
			1/2/22	12/26/21	12/19/21	12/12/21
Discharge	S-65	380	380	370	370	360
Discharge	S-65A ^a	310	310	310	310	310
Headwater Stage (feet NGVD)	S-65A	46.3	46.3	46.3	46.3	46.3
Discharge	S-65D ^b	380	370	380	410	470
Headwater Stage (feet NGVD)	S-65D ^c	26.5	26.5	26.4	26.5	26.7
Discharge (cfs)	S-65E ^d	370	380	380	400	420
Discharge (cfs)	S-67	0	0	0	0	0
Dissolved Oxygen (mg/L) ^e	Phase I, II/III river channel	7.7	7.7	7.5	7.5	7.6
Mean depth (feet) ^f	Phase I floodplain	0.22	0.23	0.26	0.26	0.29

a. Combined discharge from main and auxiliary structures.

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

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

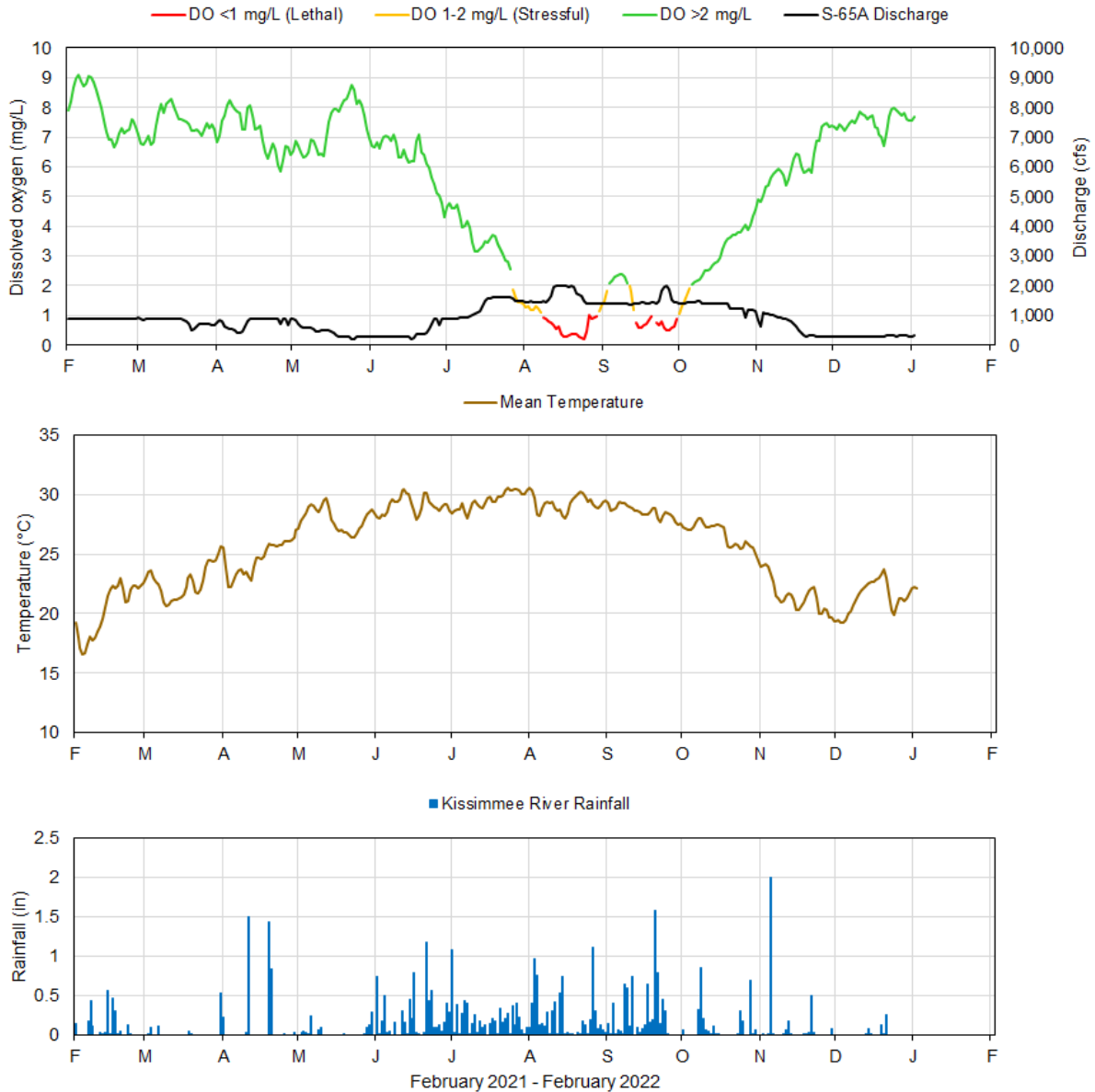
d. Combined discharge from S-65E and S-65EX1.

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

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

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

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



Report Date: 1/4/2022; data are through: 1/2/2022



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

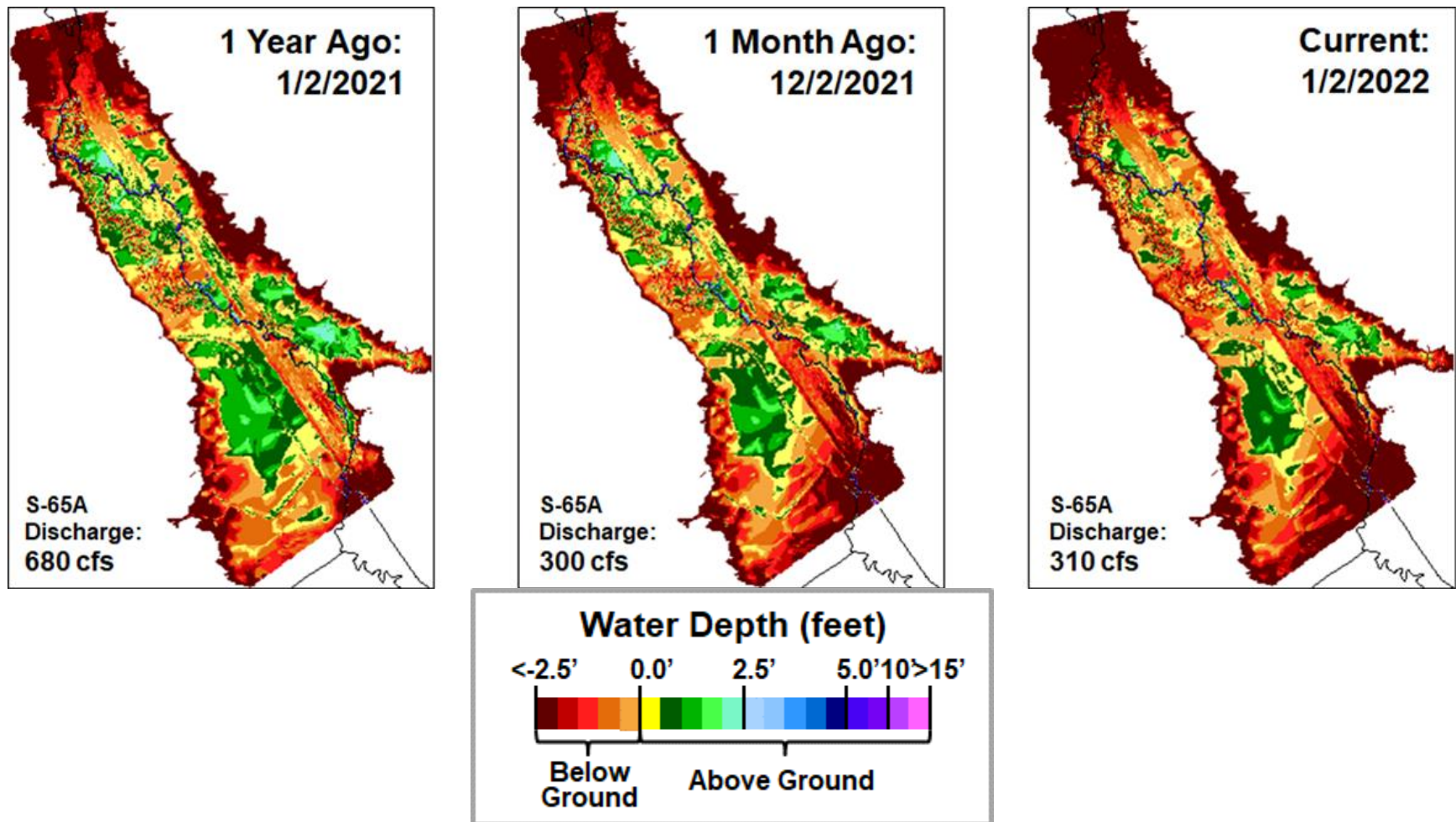


Figure KB-5. Phase I area Kissimmee River floodplain water depths (from left to right) one year ago, one month ago and current.

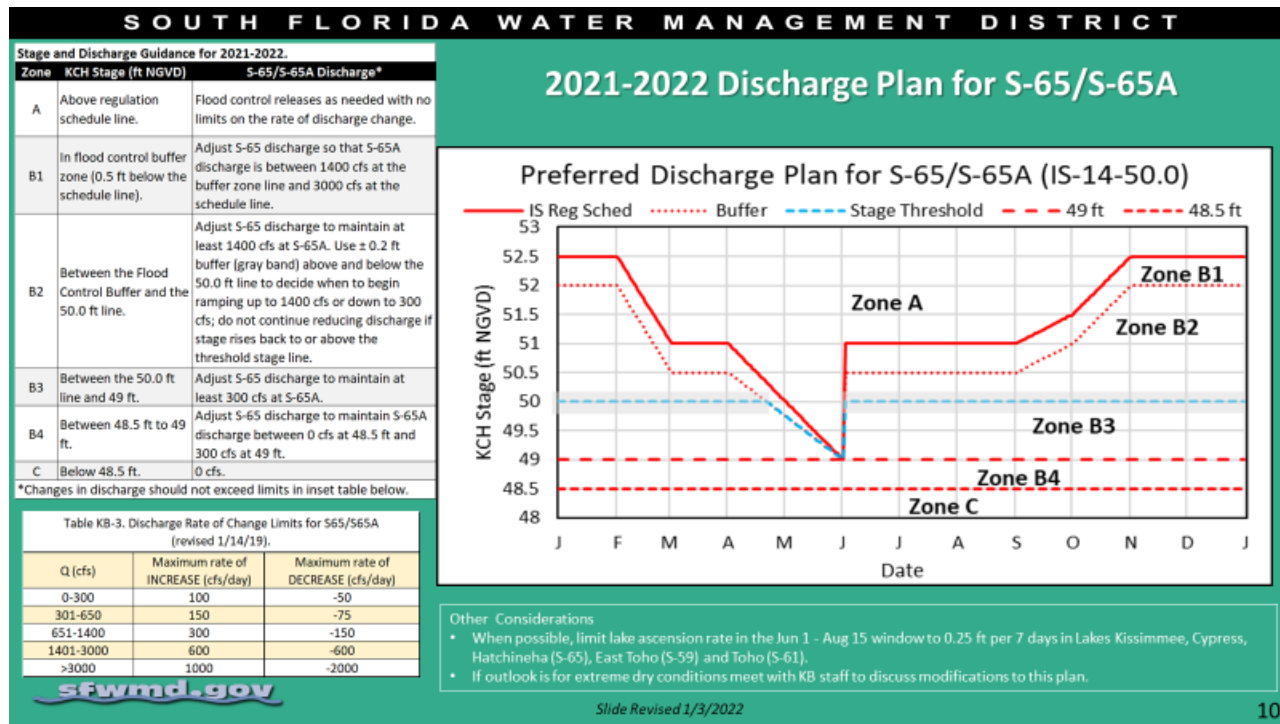


Figure KB-6. IS-14-50 Discharge Plan for S65/S65A with discharge rate of change limits (revised 1/14/19).

Lake Okeechobee

Lake Okeechobee stage was 15.48 feet NGVD on January 2, 2022, with water levels 0.41 feet lower than a month ago (**Figure LO-1**). Lake stage remains in the Low sub-band and is now back within the ecological envelope (**Figure LO-2**), having spent 279 days (79%) of the last year above the envelope (**Figure LO-3**). According to NEXRAD, no rain fell directly on the Lake last week.

Average daily inflows (excluding rainfall) decreased from the previous week, dropping from 610 cfs to 440 cfs. Average daily outflows (excluding evapotranspiration) increased from the previous week, going from 1,992 cfs to 2,885 cfs. Highest inflows came from the Kissimmee River through the S-65E structure (378 cfs). The highest outflow (1,604 cfs) was to the west via the S-77 structure, while 1,212 cfs flowed south via the S-350 structures (S-351, 768 cfs; S-352, 66 cfs; S-354, 379 cfs). After an extended period of backflow into the Lake from the L-8 canal, an average of 69 cfs flowed out through the S-271 structure. There was no flow 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 2, 2022) from the NOAA cyanobacteria monitoring product derived from EUMETSAT's Sentinel 3 OLCI sensor showed low to medium bloom potential along the northwestern and western shorelines (**Figure LO-6**).

1 Month Ago:
12/03/2021

Current:
01/02/2022

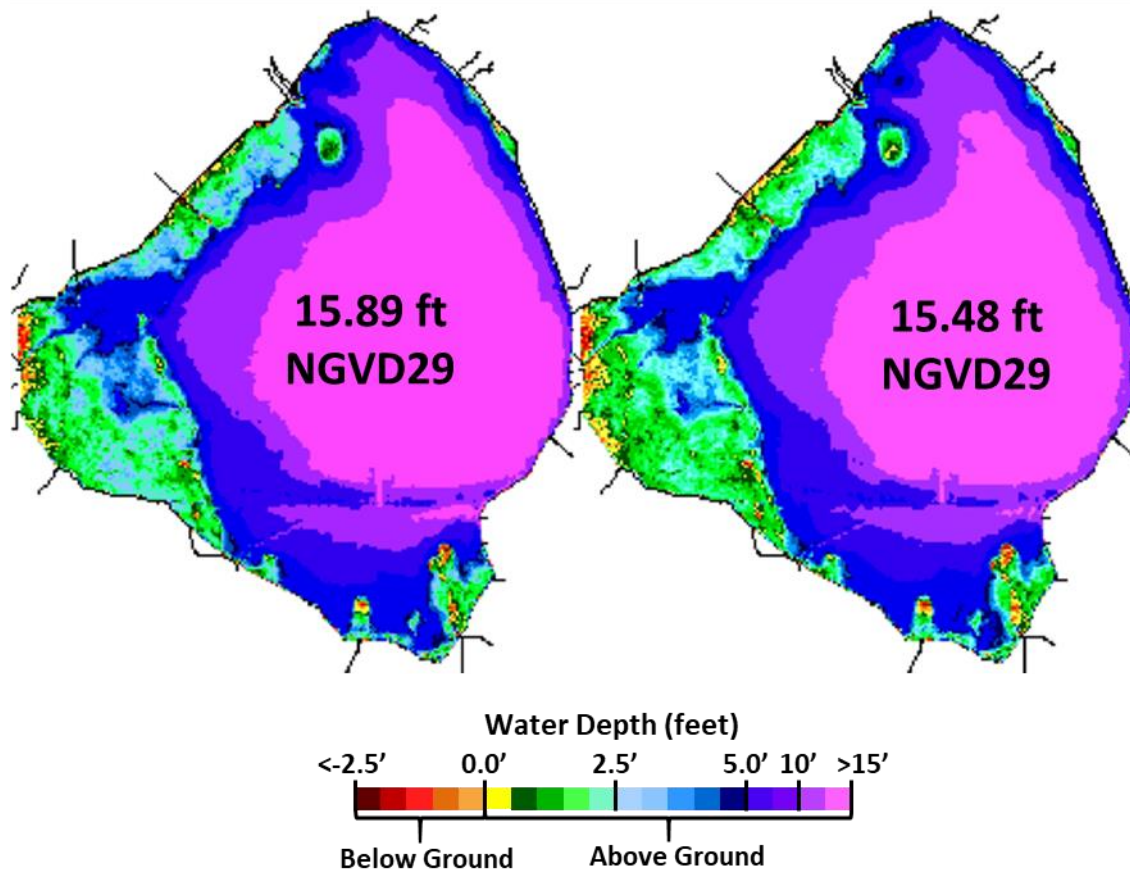


Figure LO-1. Lake Okeechobee water depth estimates based on South Florida Water Depth Assessment Tool (SFWDAT).

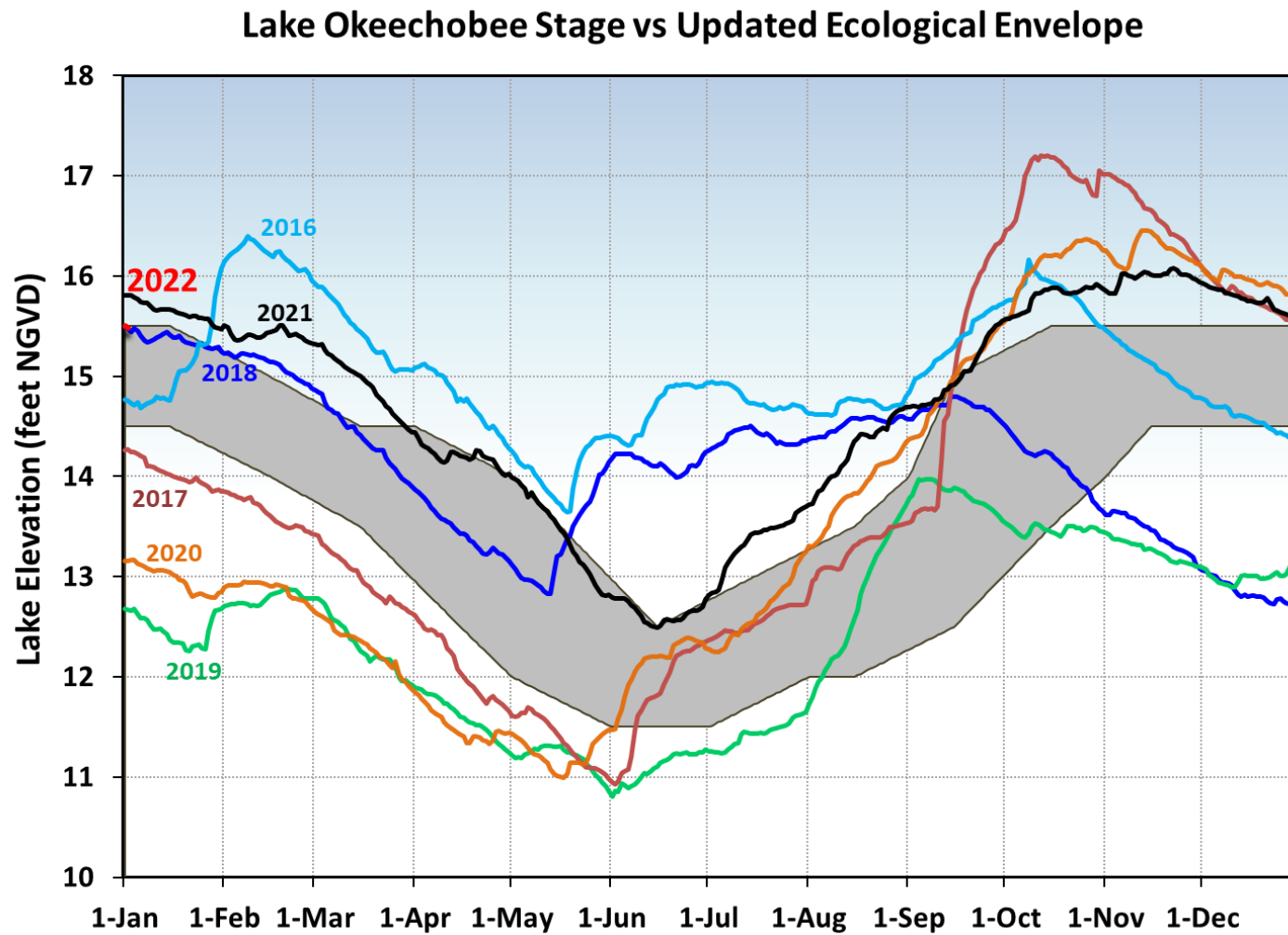


Figure LO-2. The prior six years of annual stage hydrographs for Lake Okeechobee in comparison to the updated ecological envelope.

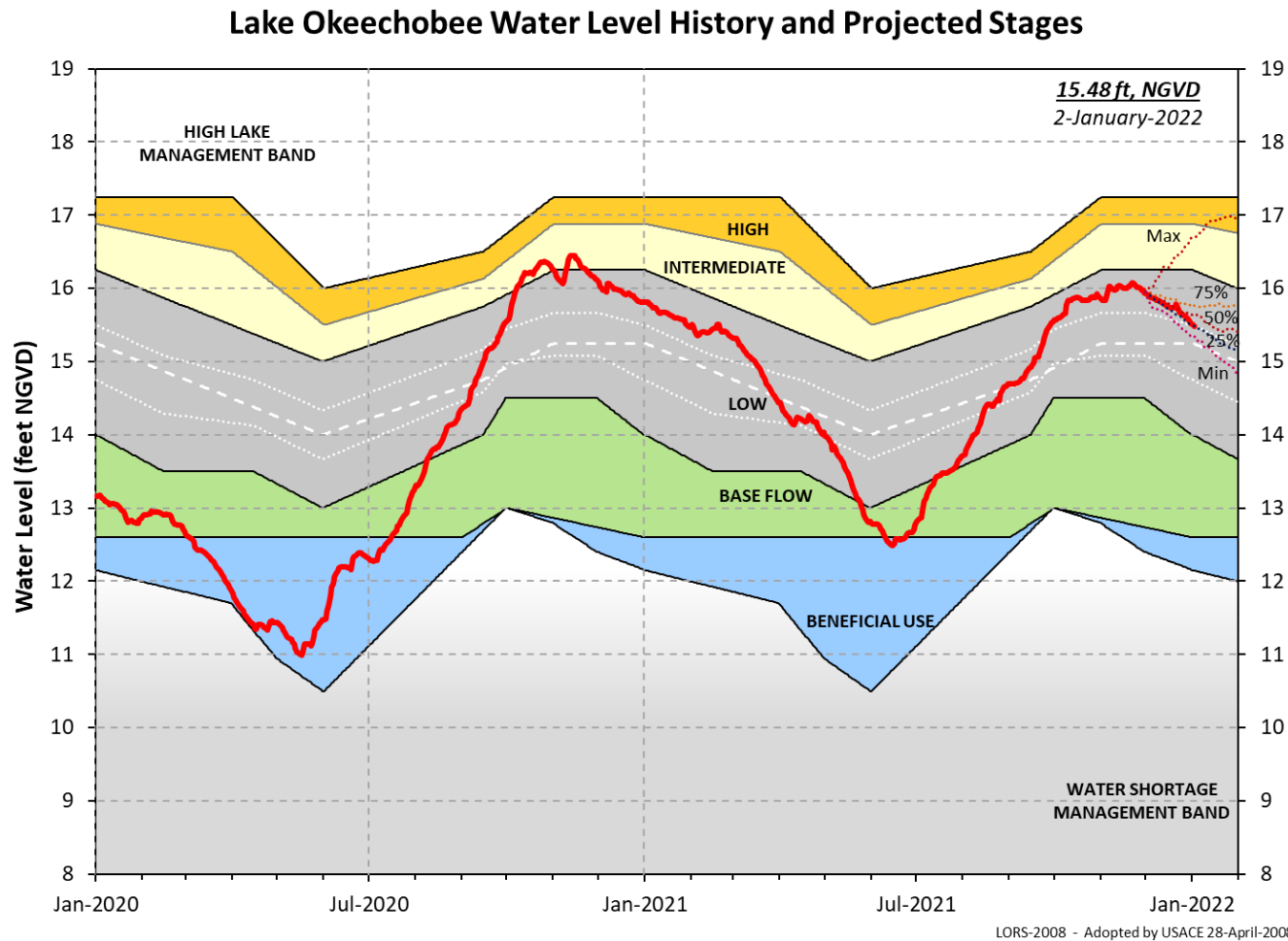


Figure LO-3. Recent Lake Okeechobee stages and releases, with projected stages based on a dynamic position analysis.

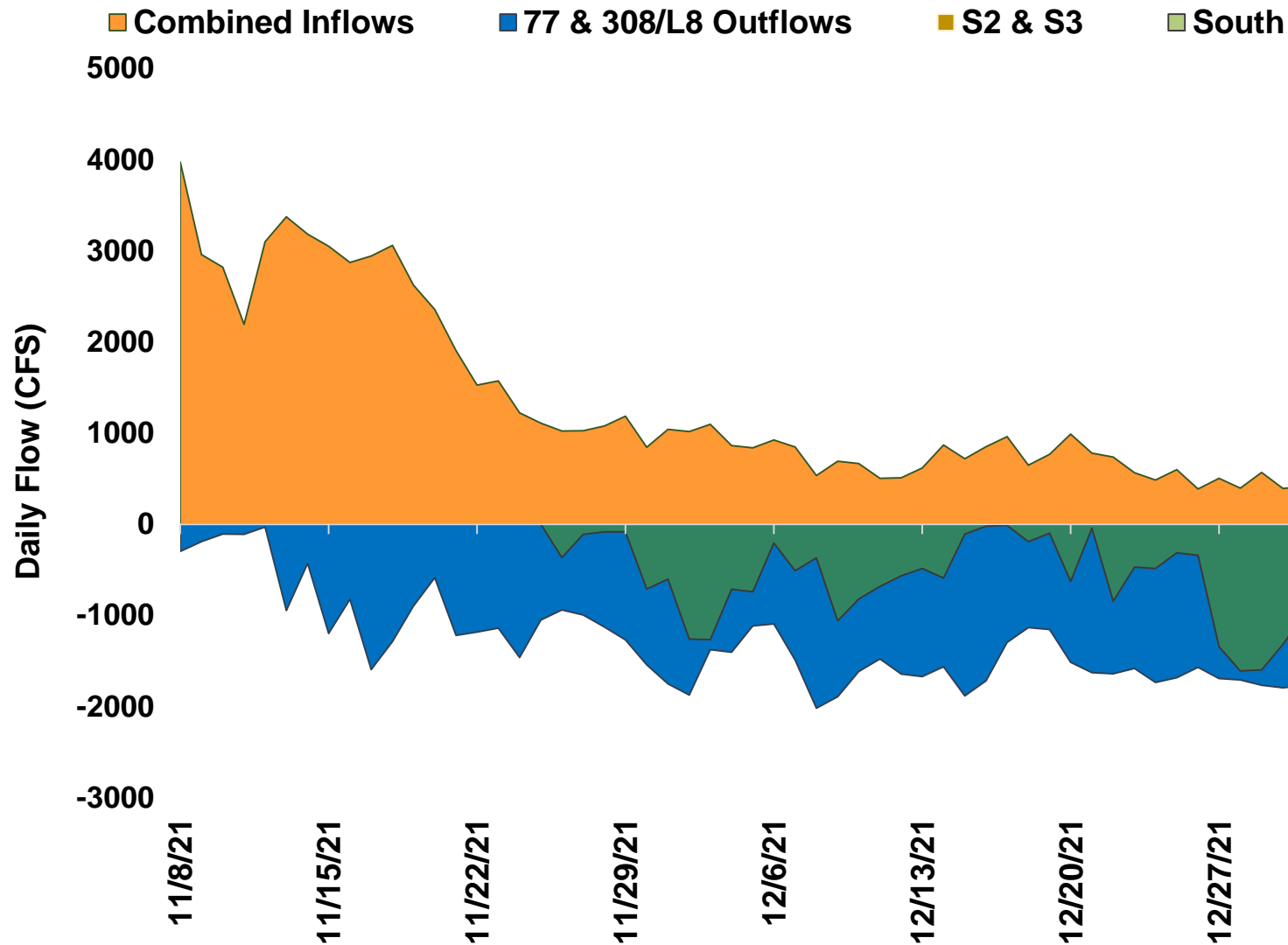


Figure LO-4. Major inflows (orange) to and outflows east and west (blue) from Lake Okeechobee. Outflows south are shown in green. Flows into Lake Okeechobee from the L-8 canal through S-271 (formerly Culvert 10A) or from the C-44 canal through the S-308 are included as inflows. Conversely, flows from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

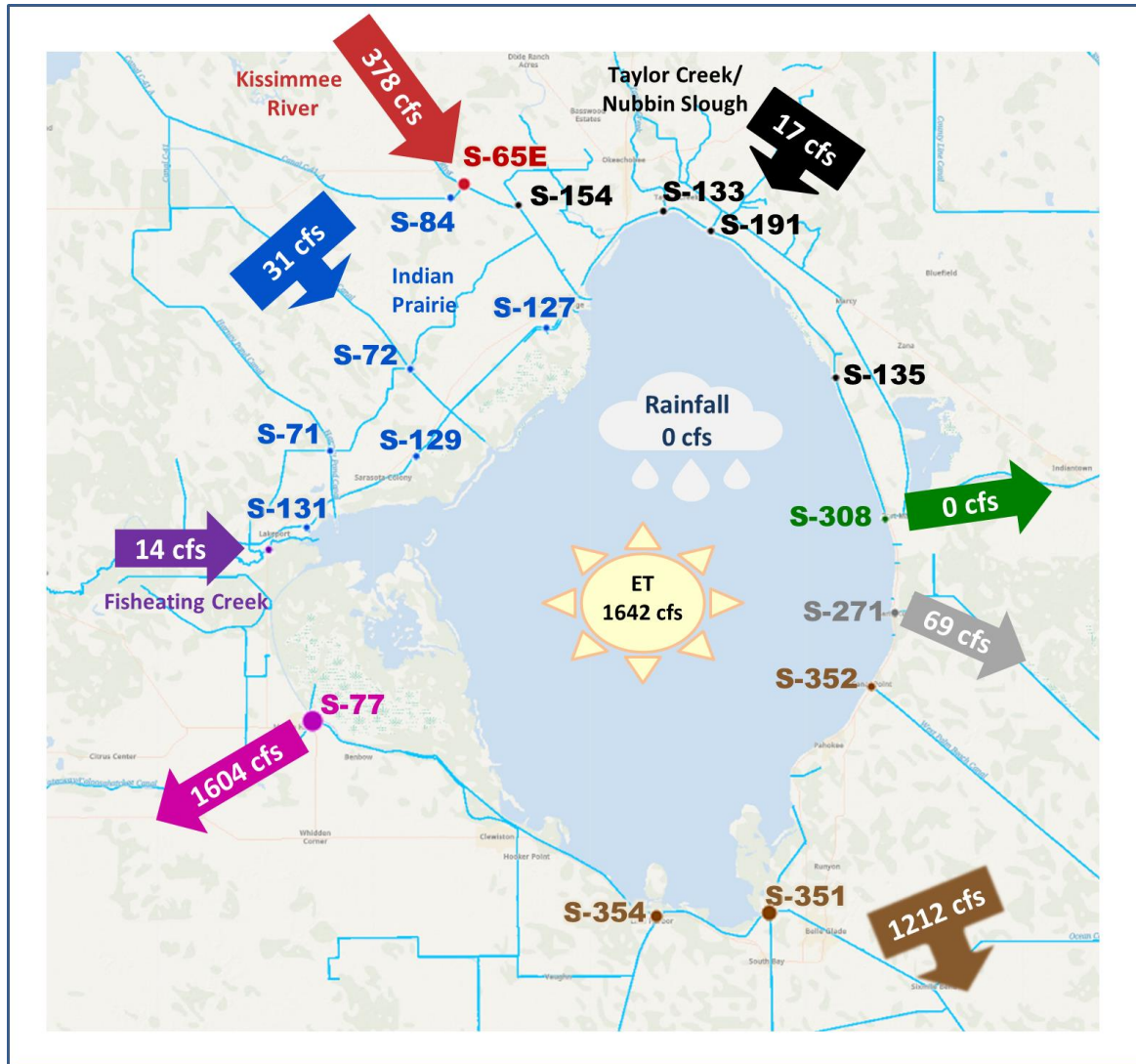


Figure LO-5. Inflows into Lake Okeechobee from Indian Prairie basins, Taylor Creek/Nubbin Slough, Kissimmee River and Fisheating Creek, and outflows to the west via S-77, to the east via S-308, to the south via S-351, S-352, S-354, and to southeast via S-271 (formerly Culvert 10A) for the week of December 27, 2021 – January 2, 2022.

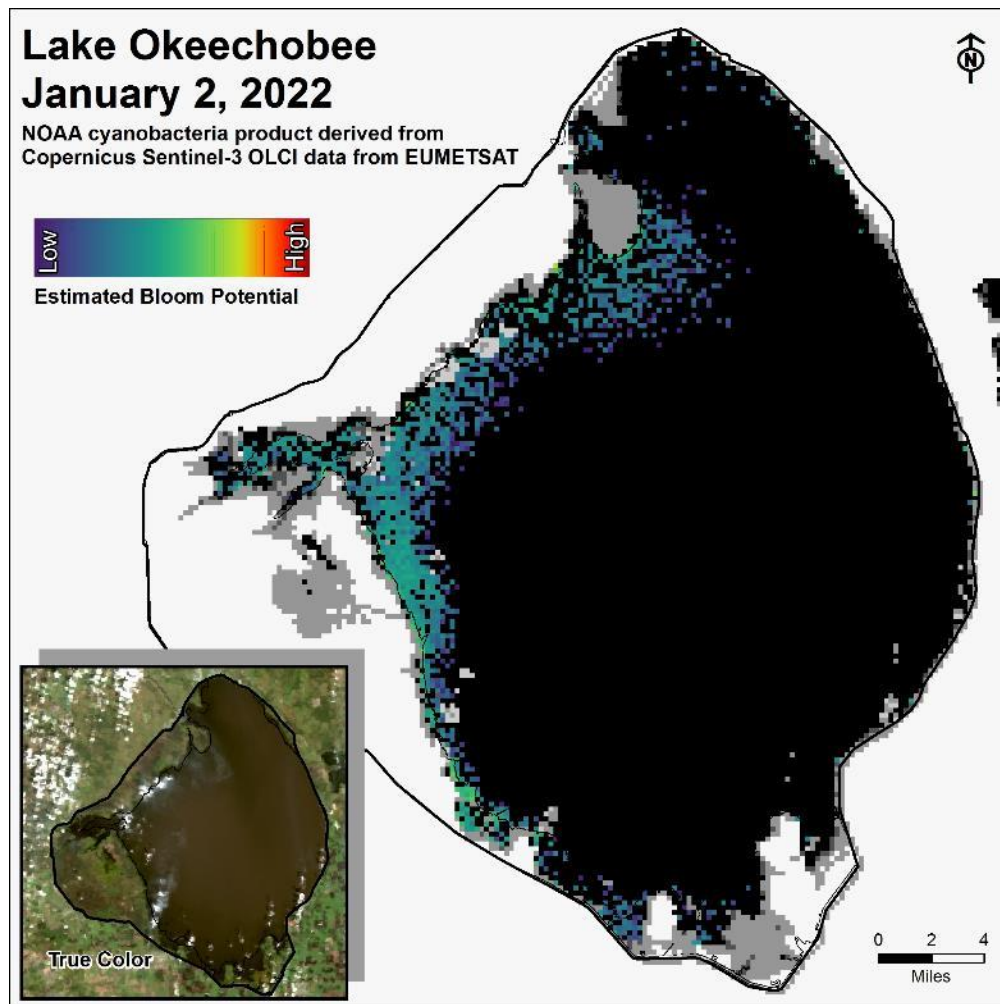


Figure LO-6. Cyanobacteria bloom potential on January 2, 2022 based on NOAA's harmful algal bloom monitoring system. Gray color indicates cloud cover.

Estuaries

St. Lucie Estuary

Over the past week, mean total inflow to the St. Lucie Estuary was approximately 230 cfs (**Figures ES-1 and ES-2**) and the previous 30-day mean inflow was approximately 530 cfs. For comparison, the historical provisional mean inflows from the contributing areas are shown in **Figure ES-2**.

Over the past week, salinities increased at 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 19.3. 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 approximately 2,090 cfs (**Figures ES-5 and ES-6**) and the previous 30-day mean inflow was approximately 2,140 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 increased 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 and Shell Point, and in the fair range at Sanibel (**Figure ES-9**).

Surface salinity at Val I-75 was forecasted for the next two weeks, using an autoregression model (Qiu and Wan, 2013¹) coupled with a linear reservoir model for the tidal basin. Model scenarios included pulse releases at S-79 ranging from 0 to 1500 cfs and steady releases at 2,000 cfs with estimated tidal basin inflows of 103 cfs. Model results from all scenarios predict daily salinity to be 1.3 or lower and the 30-day moving average surface salinity to be 0.4 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 December 29, 2021, that *Karenia brevis*, the Florida red tide dinoflagellate, was observed at very low concentrations in one sample offshore of Charlotte County. On the east coast, red tide was not observed in samples from Palm Beach County.

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

Water Management Recommendations

Lake stage is in the Low Sub-Band. Tributary conditions are near normal. The LORS2008 release guidance suggests up to 450 cfs release at S-79 to the Caloosahatchee River Estuary and up to 200 cfs release at S-80 to the St. Lucie Estuary.

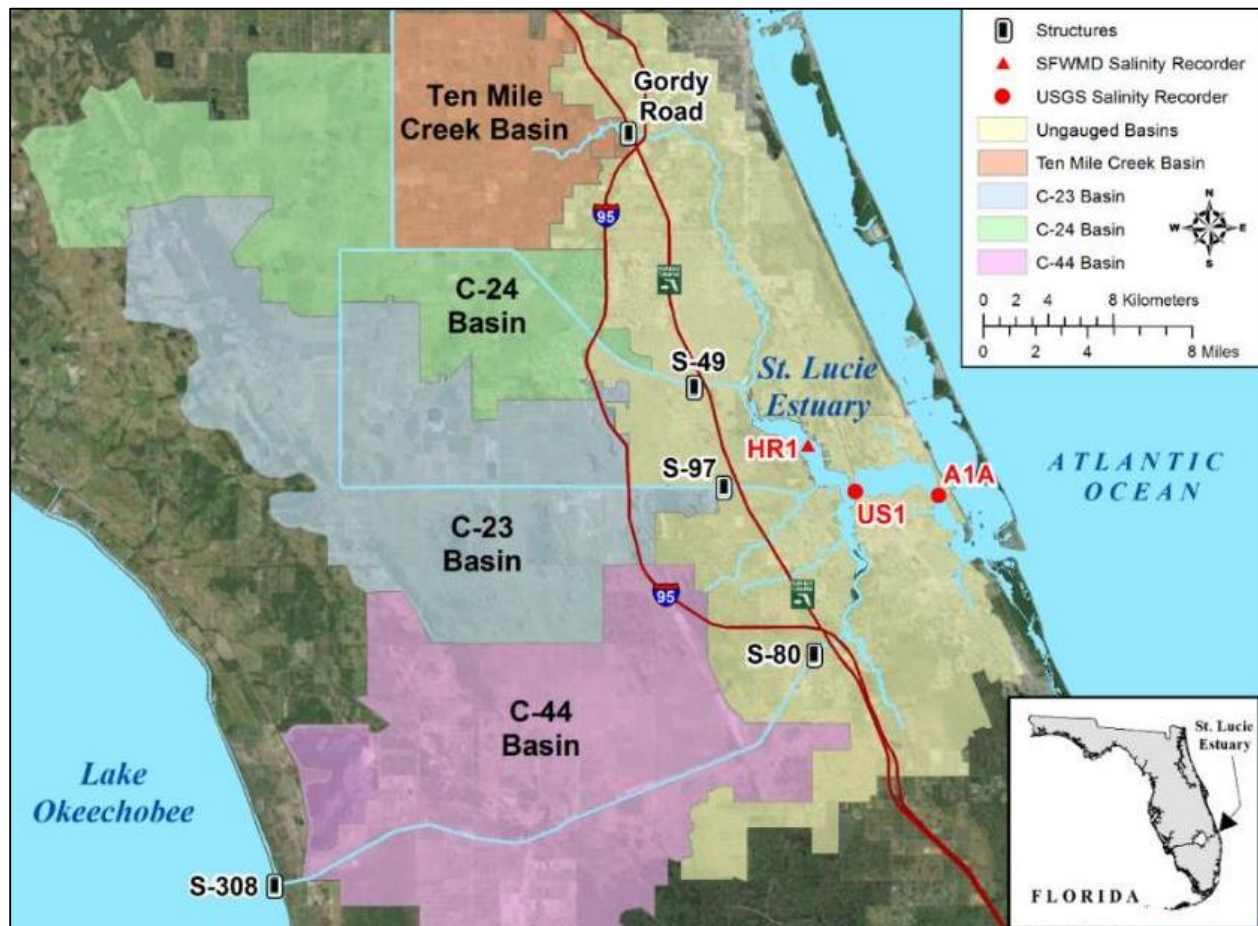


Figure ES-1. Basins, water control structures and salinity monitoring sites in the St. Lucie Estuary.

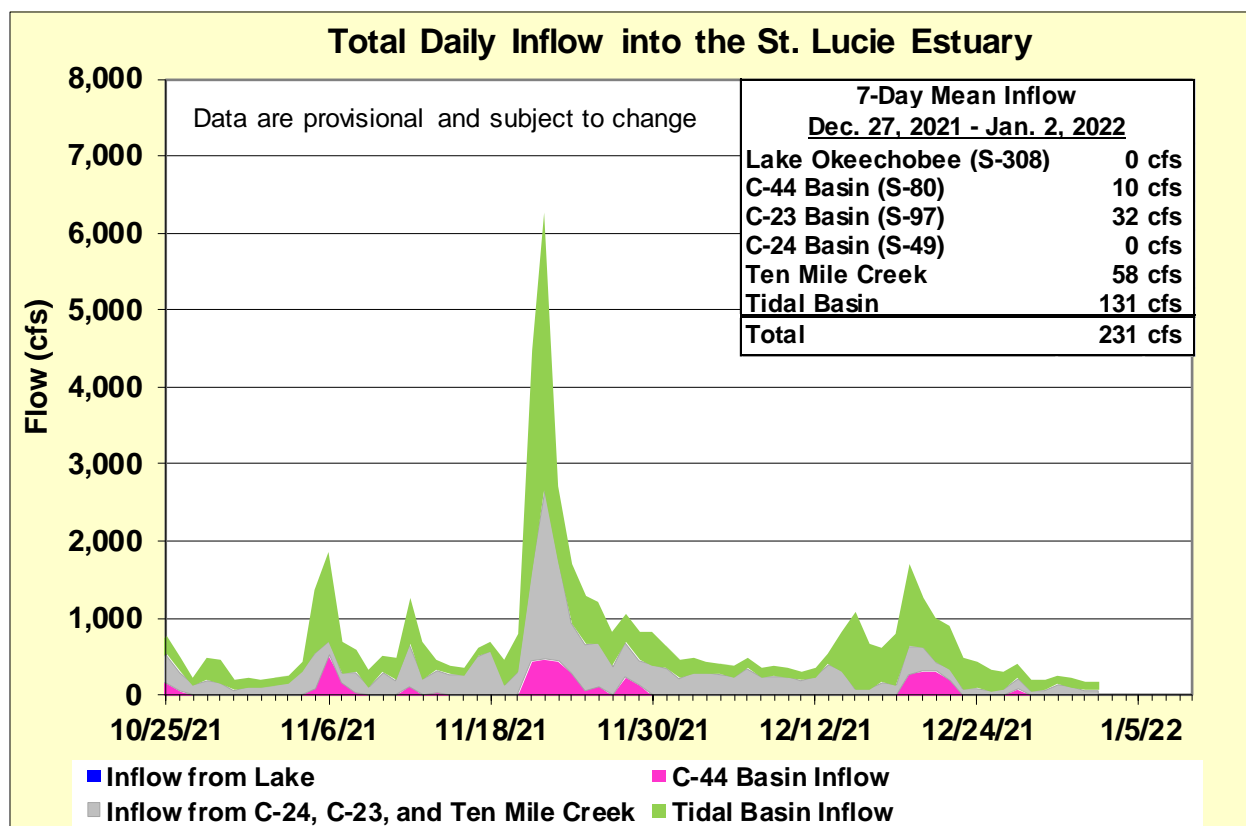


Figure ES-2. Total daily inflows from Lake Okeechobee and runoff from the C-44, C-23, C-24, Ten Mile Creek, and Tidal Basins into the St. Lucie Estuary.

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

Sampling Site	Surface	Bottom	Envelope
HR1 (North Fork)	14.6 (12.3)	17.5 (16.1)	NA ^a
US1 Bridge	18.4 (16.9)	20.1 (19.9)	10.0 – 26.0
A1A Bridge	25.9 (25.0)	28.0 (28.1)	NA ^a

a. The envelope is not applicable.

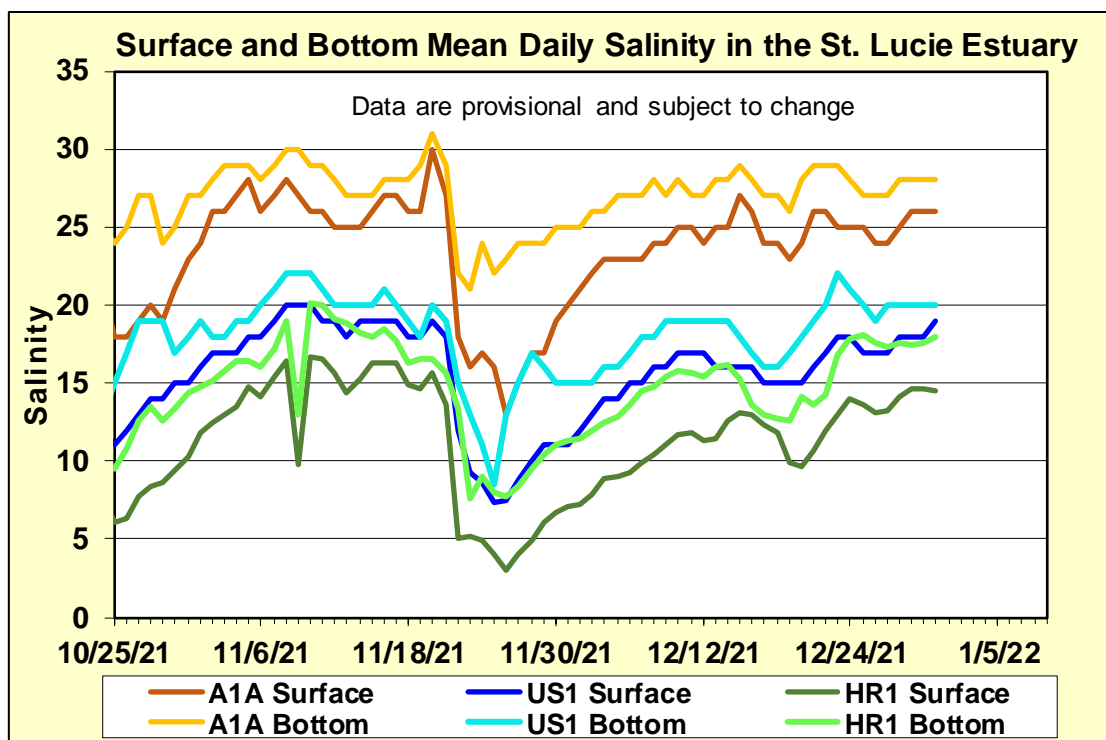


Figure ES-3. Mean daily salinity at the A1A, US1 and HR1 sites in the St. Lucie Estuary.

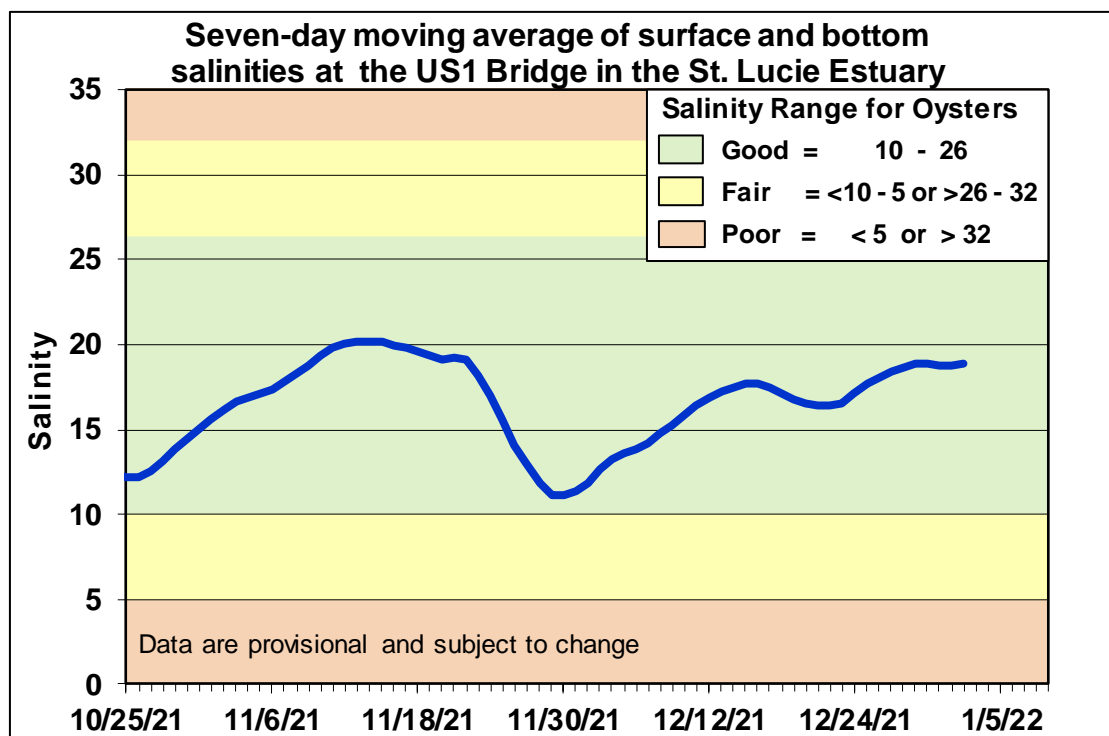


Figure ES-4. Seven-day moving average of the surface and bottom salinities at the US1 Bridge in the St. Lucie Estuary.

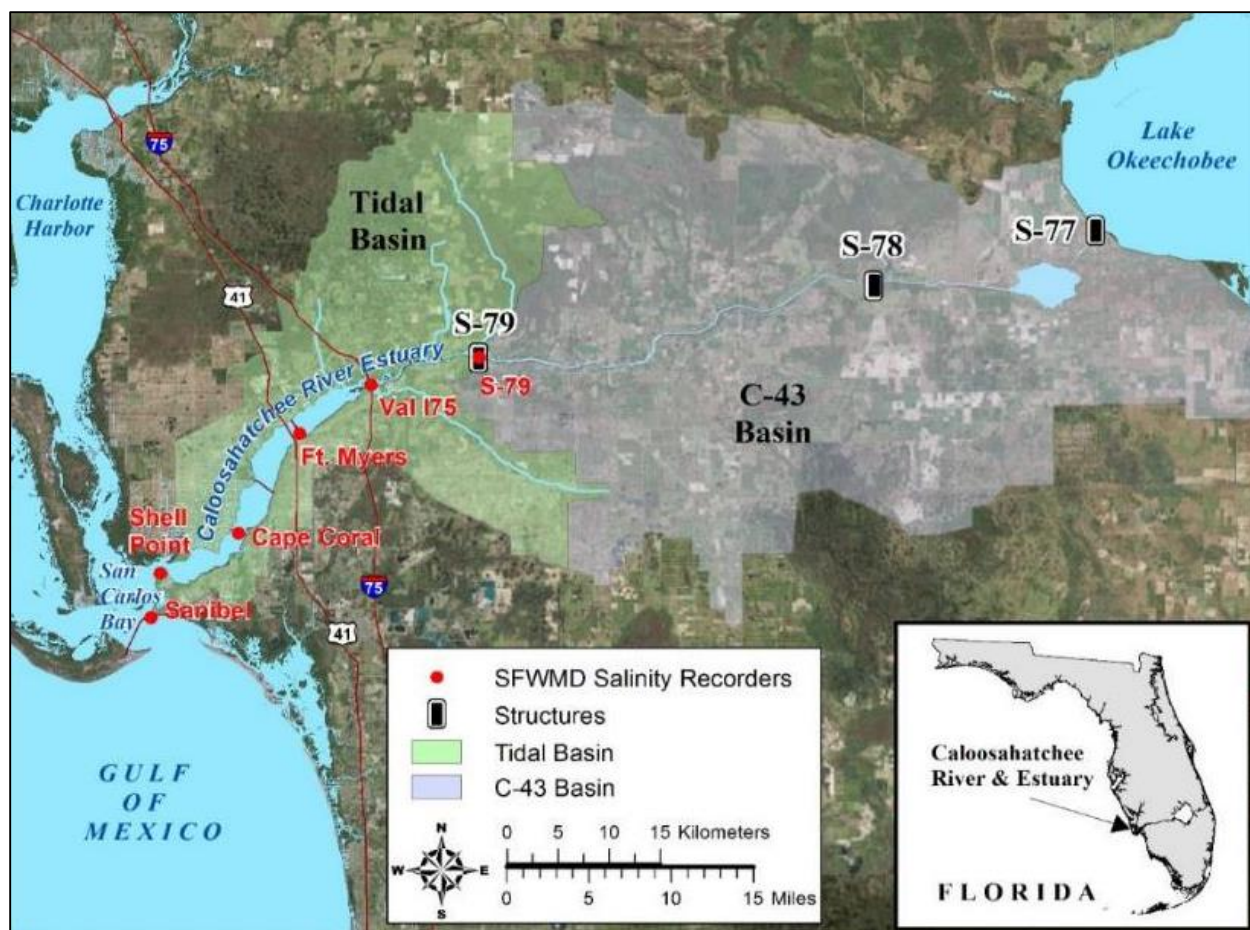


Figure ES-5. Basins, water control structures and salinity monitoring sites in the Caloosahatchee River Estuary.

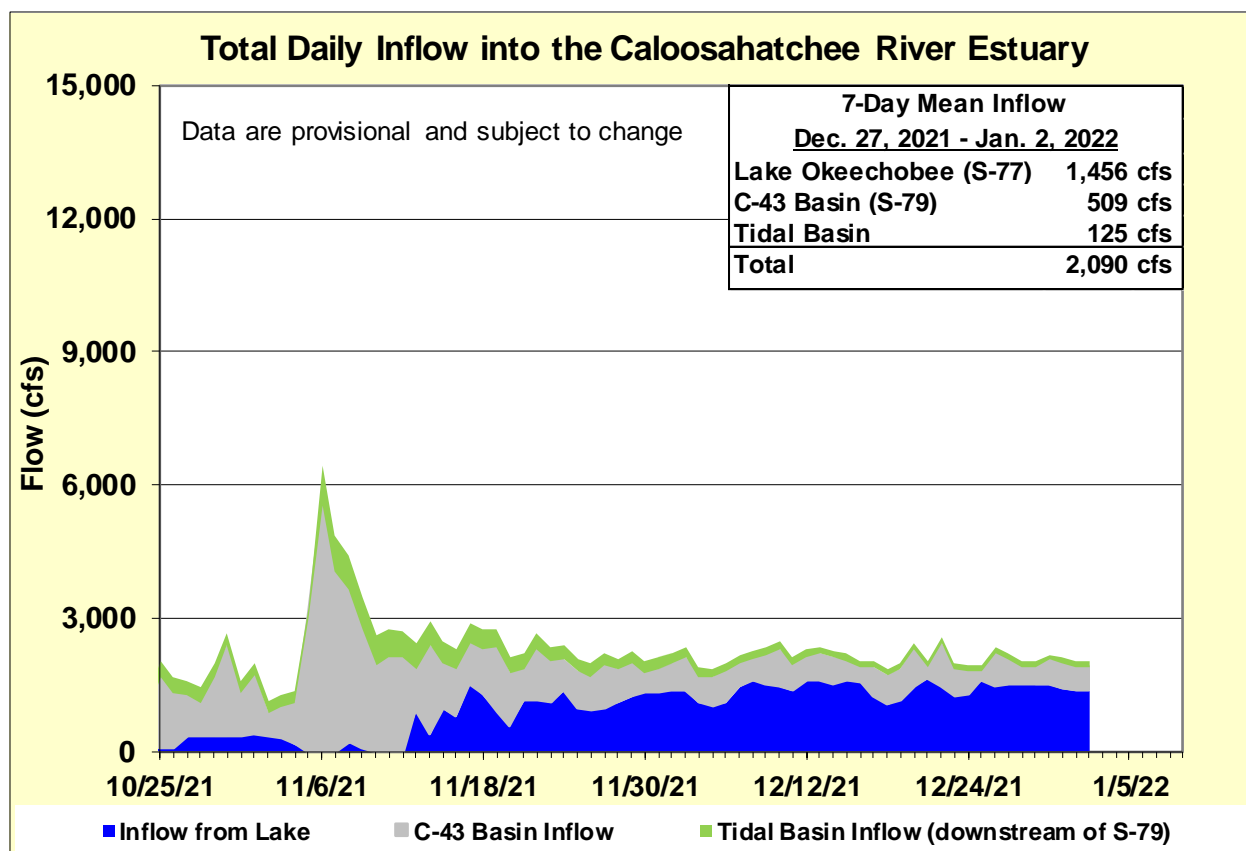


Figure ES-6. Total daily inflows from Lake Okeechobee, and runoff from the C-43 and Tidal basins into the Caloosahatchee River Estuary.

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 (0.3)	0.4 (0.5)	0.0 – 5.0 ^b
Fort Myers Yacht Basin	3.8 (3.3)	5.4 (5.3)	NA ^a
Cape Coral	11.2 (10.3)	12.8 (12.3)	10.0 – 30.0
Shell Point	23.8 (22.1)	26.0 (24.6)	10.0 – 30.0
Sanibel	30.2 (28.7)	30.6 (29.8)	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.

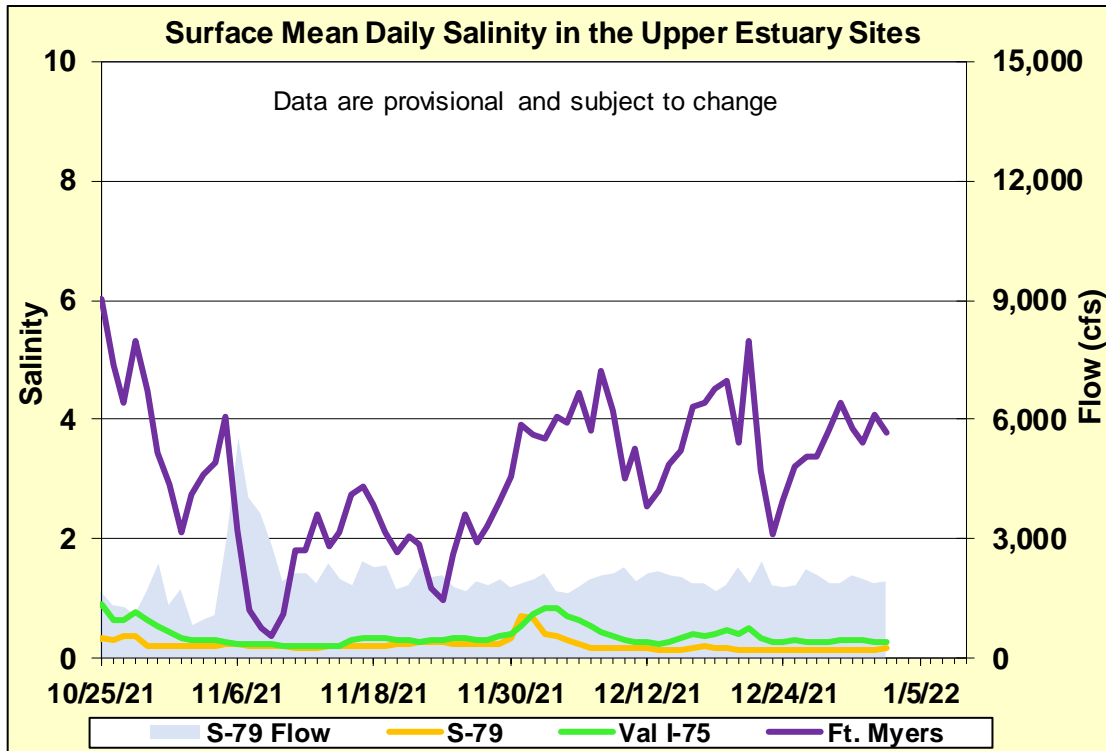


Figure ES-7. Mean daily salinity at upper Caloosahatchee River Estuary monitoring sites and mean daily flow at S-79.

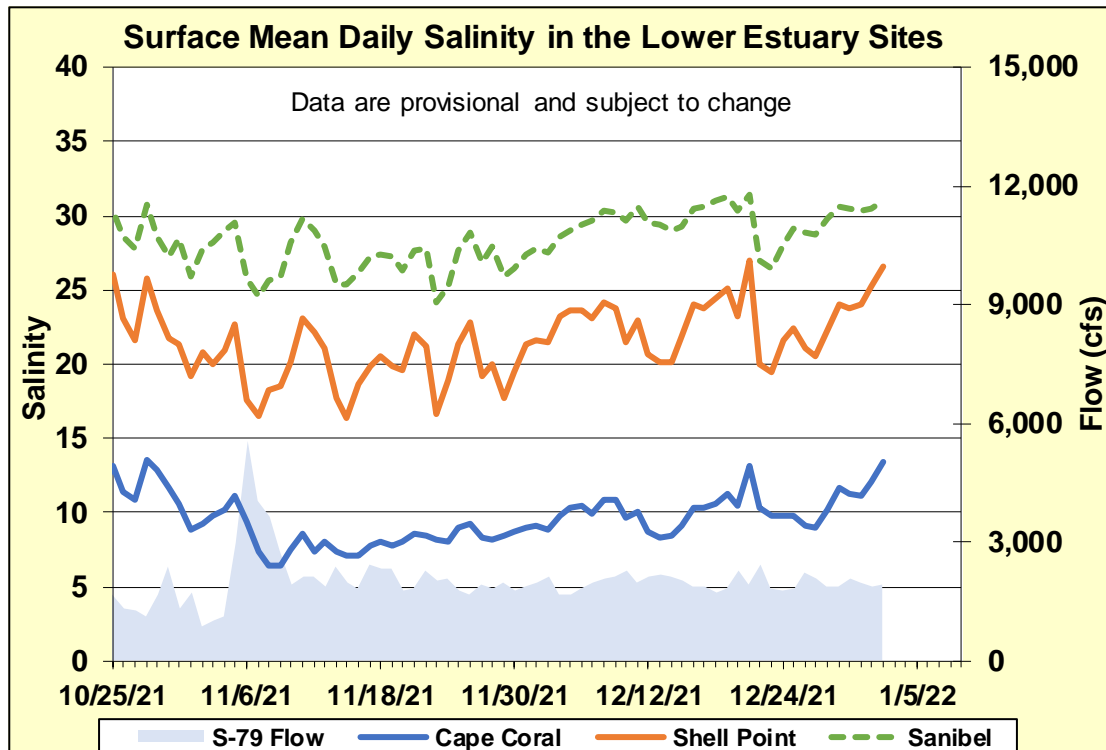


Figure ES-8. Mean daily surface salinity at lower Caloosahatchee River Estuary monitoring sites and mean daily flow at S-79.

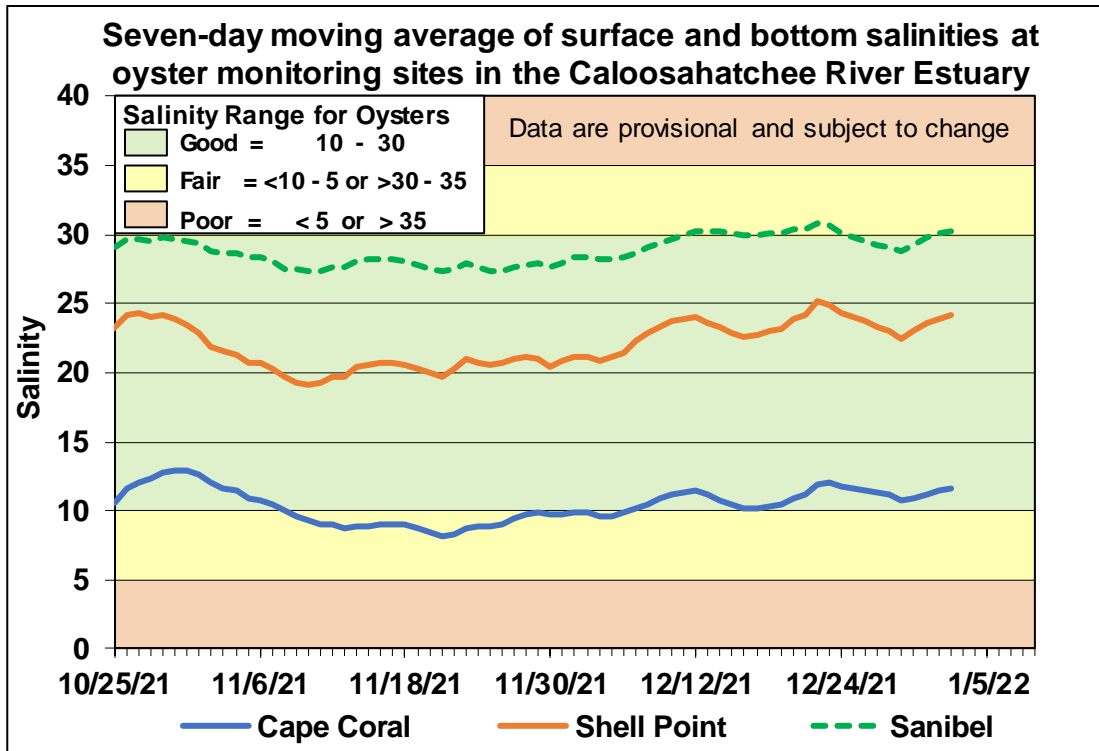


Figure ES-9. Seven-day moving average of surface and bottom salinities at Cape Coral, Shell Point and Sanibel monitoring sites in the Caloosahatchee River Estuary.

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	103	1.3	0.4
B	450	103	0.5	0.4
C	800	103	0.3	0.3
D	1000	103	0.3	0.3
E	1500	103	0.3	0.3
F	2000	103	0.3	0.3

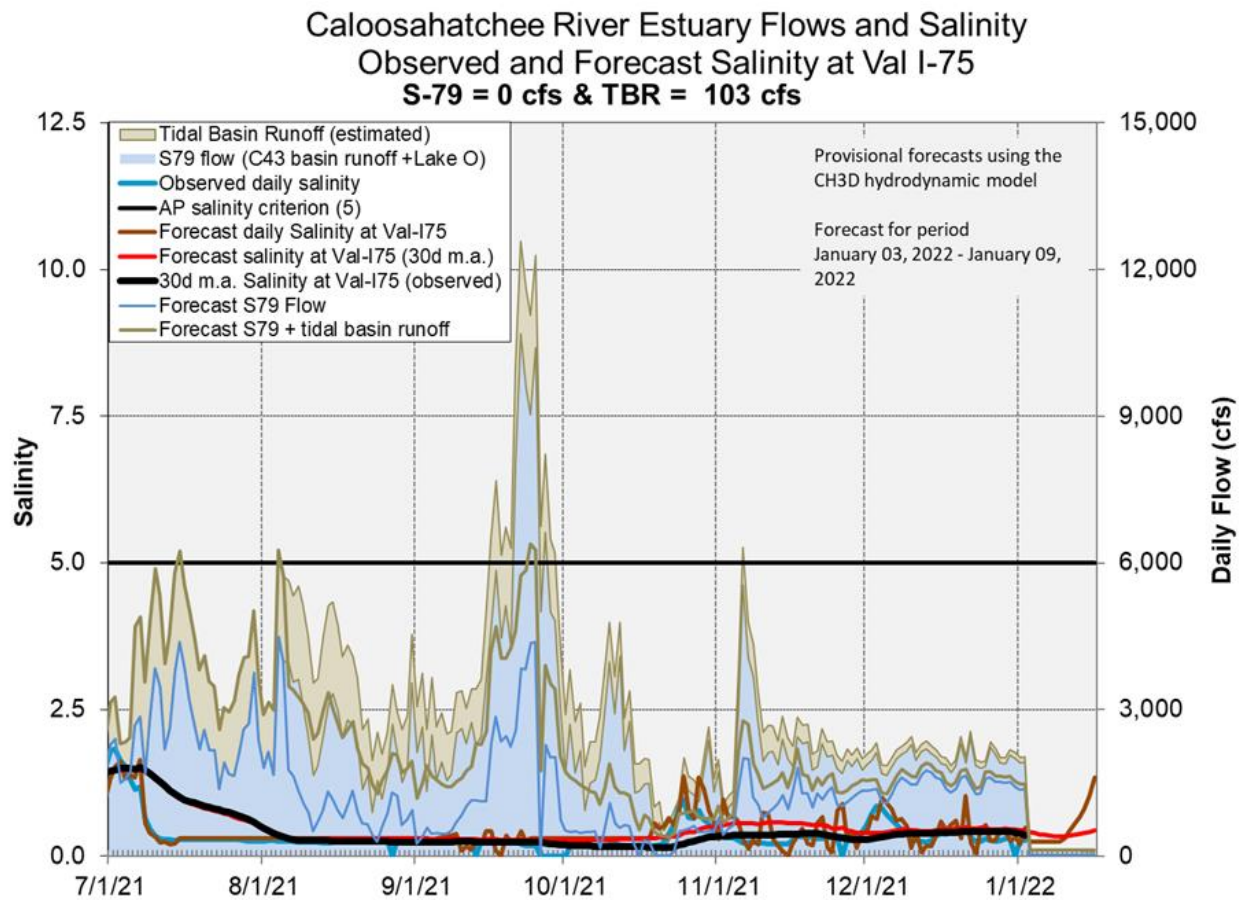


Figure ES-10. Forecasted Val I-75 site surface salinity assuming no pulse release at S-79.

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. 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) are high for the Eastern and Central Flow-ways (**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/m²/year (**Figure S-2**).

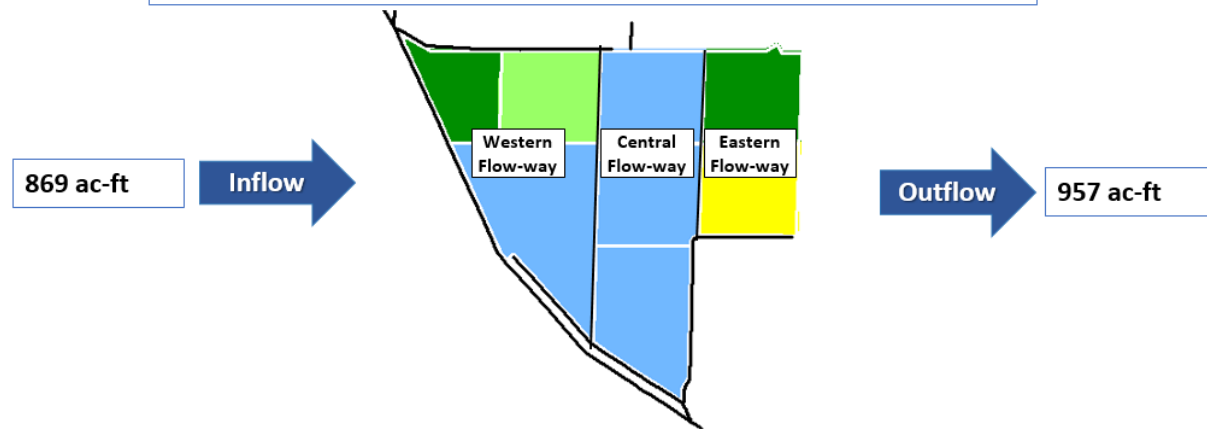
STA-2: STA-2 Flow-way 2 is offline for construction activities. Operational restrictions are in place in STA-2 Flow-ways 3 and 4 for vegetation management activities. Online treatment cells are at or near target stage. Vegetation in Flow-ways 1 and 3 is stressed, and in Flow-ways 2, 4 and 5 is highly stressed. The 365-day PLRs for Flow-ways 1, 4 and 5 are below 1.0 g/m²/year. The 365-day PLR for Flow-way 3 is high (**Figure S-3**).

STA-3/4: STA-3/4 Eastern Flow-way is offline for vegetation rehabilitation/drawdown. 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/m²/year (**Figure S-4**).

STA-5/6: All Flow-ways are online. 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/m²/year. The 365-day PLRs for flow-ways 4 and 5 are high. (**Figure S-5** and **S-6**).

For definitions on STA operational language see glossary following figures.

STA-1E Weekly Status Report – 12/27/2021 through 01/02/2022


















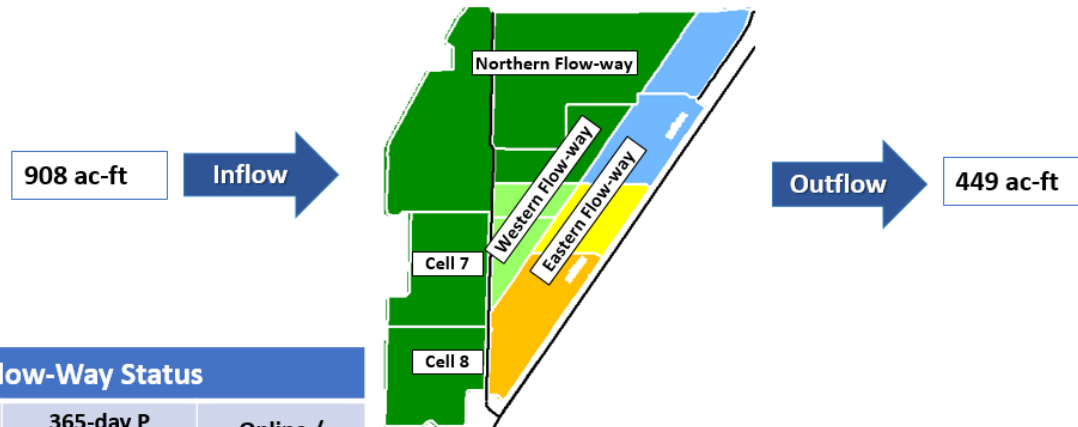
STA-1E Flow-Way Status				As of 01/02/2022		STA-1E Flow & Phosphorus Concentration			
Flow-Way	Vegetation Status <small>Healthy ----- Stressed</small> 	365-day P Loading Rate <small>(below 1.0 g P /m²/yr is optimal)</small> 	Online / Offline / Restrictions	Stage Based: Relative to Target Stage (TS)		Total Inflow, ac-ft	7-day	28-day	365-day
				 Deep Water Level (> 2.8' above TS)	 High Water Level (1.5' – 2.8' above TS)				
Eastern			Online	 0.2' – 1.5' above TS		--Lake Inflow, ac-ft	0	N/A	5,900
				 Target Stage (TS +/- 0.2')	 Low Water Level (<0.2' below TS)				
Central			Vegetation Rehab	Depth / Area Based: Percent of Area Dry		Inflow Conc., ppb	41	62	122
Western	Offline, construction activities starting 11/01/2019			 0-25% Dry	 50-75% Dry				
				 25-50% Dry	 75-100% Dry				
Includes Preliminary Data									

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

STA-1W Weekly Status Report – 12/27/2021 through 01/02/2022



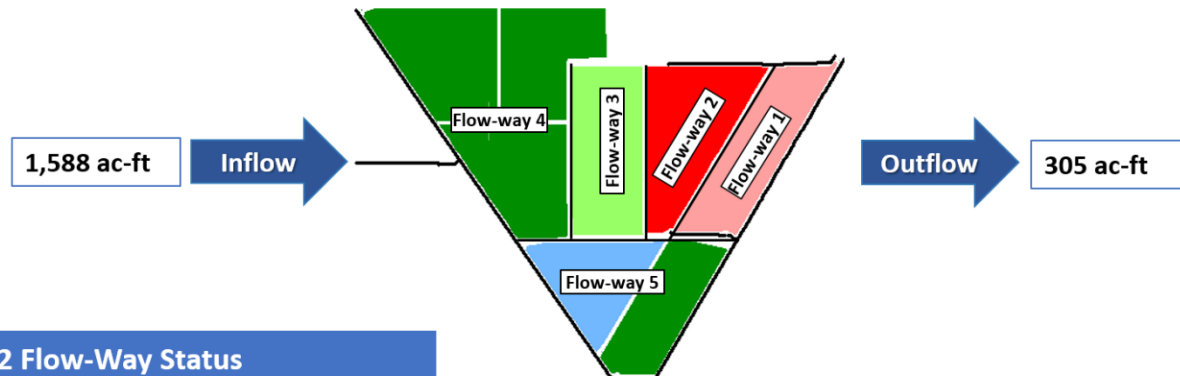
STA-1W Flow-Way Status			
Flow-Way	Vegetation Status Healthy — Stressed	365-day P Loading Rate (below 1.0 g P / m ² /yr is optimal)	Online / Offline / Restrictions
Northern			Construction
Western			Construction
Eastern			Construction
Cell 7		N/A	Construction
Cell 8		N/A	Construction

As of 01/02/2022	
Stage Based: Relative to Target Stage (TS)	
	Deep Water Level (> 2.8' above TS)
	High Water Level (1.5' – 2.8' above TS)
	0.2' – 1.5' above TS
	Target Stage (TS +/- 0.2')
	Low Water Level (<0.2' below TS)
Depth / Area Based: Percent of Area Dry	
	0-25% Dry
	25-50% Dry
	50-75% Dry
	75-100% Dry

STA-1W Flow & Phosphorus Concentration			
	7-day	28-day	365-day
Total Inflow, ac-ft	908	1,345	51,531
--Lake Inflow, ac-ft	400	N/A	4,500
Total Outflow, ac-ft	449	1,259	52,277
Inflow Conc., ppb	145	145	171
Outflow Conc., ppb	24	20	24
Includes Preliminary Data			

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

STA-2 Weekly Status Report – 12/27/2021 through 01/02/2022



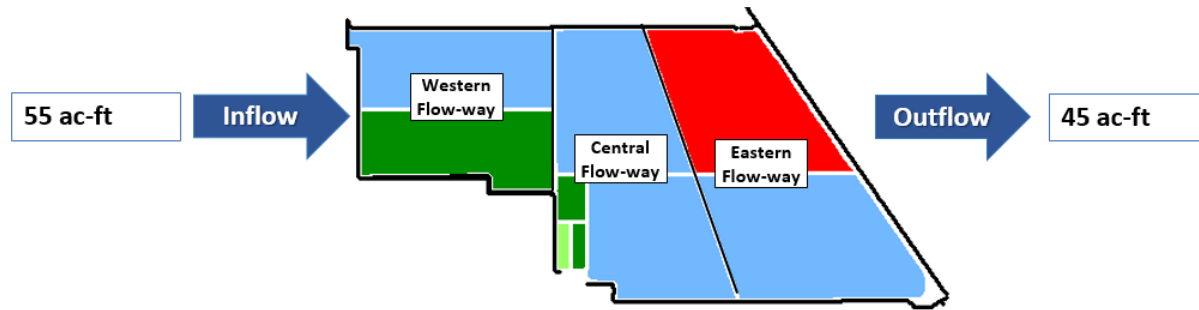
STA-2 Flow-Way Status			
Flow-Way	Vegetation Status Healthy ----- Stressed	365-day P Loading Rate (below 1.0 g P /m ² /yr is optimal)	Online / Offline / Restrictions
1			Online
2	Offline, construction activities as of 9/7/2021		
3			Vegetation Rehab
4			Vegetation Rehab
5			Online

As of 01/02/2022	
Stage Based: Relative to Target Stage (TS)	
	Deep Water Level (> 2.8' above TS)
	High Water Level (1.5' – 2.8' above TS)
	0.2' – 1.5' above TS
	Target Stage (TS +/- 0.2')
	Low Water Level (<0.2' below TS)
Depth / Area Based: Percent of Area Dry	
	0-25% Dry
	25-50% Dry
	50-75% Dry
	75-100% Dry

STA-2 Flow & Phosphorus Concentration			
	7-day	28-day	365-day
Total Inflow, ac-ft	1,588	2,956	322,355
--Lake Inflow, ac-ft	1,600	N/A	66,600
Total Outflow, ac-ft	305	2,452	331,564
Inflow Conc., ppb	48	35	87
Outflow Conc., ppb	20	20	16
Includes Preliminary Data			

Figure S-3. STA-2 Weekly Status Report

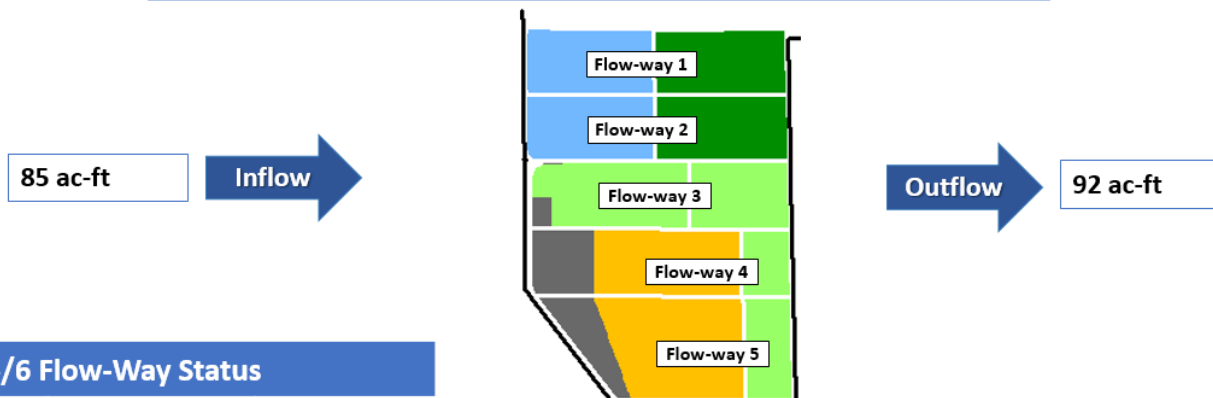
STA-3/4 Weekly Status Report – 12/27/2021 through 01/02/2022



STA-3/4 Flow-Way Status				STA-3/4 Flow & Phosphorus Concentration			
Flow-Way	Vegetation Status <div>Healthy-----Stressed</div> <div></div>	365-day P Loading Rate (below 1.0 g P / m²/yr is optimal)	Online / Offline / Restrictions	As of 01/02/2022			
				Stage Based: Relative to Target Stage (TS)			
Eastern	Offline, vegetation management drawdown as of 3/1/2021			<div></div> Deep Water Level (> 2.8' above TS)			
				<div></div> High Water Level (1.5' – 2.8' above TS)			
				<div></div> 0.2' – 1.5' above TS			
				<div></div> Target Stage (TS +/- 0.2')			
Central	<div></div>	<div></div>	Online	<div></div> Low Water Level (<0.2' below TS)			
				Depth / Area Based: Percent of Area Dry			
Western	<div></div>	<div></div>	Online	<div></div> 0-25% Dry	<div></div> 50-75% Dry		
				<div></div> 25-50% Dry	<div></div> 75-100% Dry		
					7-day	28-day	365-day
Total Inflow, ac-ft					55	87	363,093
--Lake Inflow, ac-ft					0	N/A	40,200
Total Outflow, ac-ft					45	525	319,385
Inflow Conc., ppb					31	33	65
Outflow Conc., ppb					19	20	15
				Includes Preliminary Data			

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

STA-5/6 Weekly Status Report – 12/27/2021 through 01/02/2022



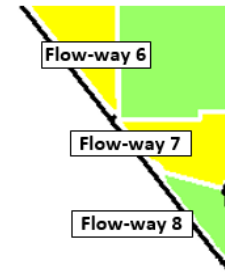
STA-5/6 Flow-Way Status			
Flow-Way	Vegetation Status Healthy ----- Stressed	365-day P Loading Rate (below 1.0 g P / m ² /yr is optimal)	Online / Offline / Restrictions
1			Online
2		N/A	Online
3		N/A	Online
4			Online
5			Online

As of 01/02/2022	
Stage Based: Relative to Target Stage (TS)	
	Deep Water Level (> 2.8' above TS)
	High Water Level (1.5' – 2.8' above TS)
	0.2' – 1.5' above TS
	Target Stage (TS +/- 0.2')
	Low Water Level (<0.2' below TS)
Depth / Area Based: Percent of Area Dry	
	0-25% Dry
	25-50% Dry
	50-75% Dry
	75-100% Dry

STA-5/6 Flow & Phosphorus Concentration			
	7-day	28-day	365-day
Total Inflow, ac-ft	85	3,149	179,651
--Lake Inflow, ac-ft	0	N/A	9,000
Total Outflow, ac-ft	92	2,111	171,815
Inflow Conc., ppb	104	93	242
Outflow Conc., ppb	16	20	50
Includes Preliminary Data			

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

STA-5/6 Weekly Status Report – 12/27/2021 through 01/02/2022



STA-5/6 Flow-Way Status				As of 01/02/2022	
Flow-Way	Vegetation Status Healthy ----- Stressed ←-----→	365-day P Loading Rate (below 1.0 g P /m ² /yr is optimal)	Online / Offline / Restrictions	Stage Based: Relative to Target Stage (TS)	
				<div>Deep Water Level (> 2.8' above TS)</div> <div>High Water Level (1.5' – 2.8' above TS)</div> <div>0.2' – 1.5' above TS</div> <div>Target Stage (TS +/- 0.2')</div> <div>Low Water Level (<0.2' below TS)</div>	
6	←-----→	1.0	Online		
7	←-----→	1.0	Online		
8	←-----→	1.0	Online		
				Depth / Area Based: Percent of Area Dry	
				<div>0-25% Dry</div> <div>25-50% Dry</div>	<div>50-75% Dry</div> <div>75-100% Dry</div>

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

Basic Concepts and Definitions for STA Weekly Status Report

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

Everglades

Water Conservation Area Regulation Schedules

WCA-1: The 1-8C stage fell in parallel with the Zone A1 regulation line last week. The average on Sunday was 0.28 feet above. WCA-2A: Stage at 2A-17 fell faster than the slope of the Zone A regulation line last week; the average on Sunday was 1.22 feet higher than that line. WCA-3A: Last week the Three Gauge Average stages continued to fall away from the stable Zone A regulation line; average stage was 0.52 feet below that line on Sunday. (compared to 0.42 and 0.31 feet the two weeks prior). WCA-3A: Stage at gauge 62 (Northwest corner) continues to fall faster than the slope of the falling Upper Schedule, the average on Sunday was 0.80 feet below the regulation line. (**Figures EV-1 through EV-4**).

Water Depths

The SFWDAT tool indicates that water depths in the WCAs remain the lowest in northeastern WCA-3A, where the spatial extent of the potential for water below the soil surface is expanding. North to South hydrologic connectivity has significantly diminished in Taylor Slough in Everglades National Park and areas significantly below ground in western ENP and southern BCNP continue to increase in spatial extent. (**Figure EV-5**). Comparing current WDAT water depths to the depth one month ago, stages are decreasing in most areas. Looking back one year, most of the EPA is significantly lower in depth, with only WCA-1 and northeastern ENP close to the same depth as last year. (**Figure EV-6**). Comparing depths over the past 20 years, most of WCA-3A is now at or below the 50th percentile while WCA-1, southern WCA-2A, and eastern ENP remain well above. Portions of western ENP/southern BCNP have fallen below the 20th percentile. (**Figure EV-7**).

Taylor Slough and Florida Bay

Next to no rain fell over Taylor Slough and Florida Bay over the week ending Sunday, 1/2, which allowed stages to decrease an average of 0.03 feet again (**Figure EV-8** and **Figure EV-9**). Recent increases in water deliveries through S-332C likely aided increases in northern Taylor Slough stages. The Slough average is 6 inches above its historical average for this time of year while the northern parts of the Slough are 11 inches above its historical average from before the modifications to levies and structures in Upper Taylor Slough. Compared to this time last year after Tropical Storm Eta, stages now are still 5 inches lower suggesting less water available to buffer downstream conditions. 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 an increase of 1.6 over the week ending 1/2, with individual station changes ranging from -0.7 to +7.5 (**Figure EV-8**). The largest changes were increases in the northeastern and central shoreline area. The central Bay average is again above its 75th percentile (**Figure EV-10**), but the eastern Bay has been decreasing away from its 75th percentile. Conditions are not ideal for enduring a drier than average dry season. Bay-wide salinity is averaging 2.5 higher than the historical average while there is less water in the upstream Slough compared to last year.

Water Management Recommendations

Flows into northern WCA-3A that assist recession rates in that sub-basin then move downstream have an ecological benefit if those discharges can slow the elevated 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, enough 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	0.00	-0.06
WCA-2A	0.00	-0.15
WCA-2B	0.00	-0.11
WCA-3A	0.01	-0.11
WCA-3B	0.00	ERROR*
ENP	<0.01	-0.02

* sensor not reporting (other two gauges report -0.05)

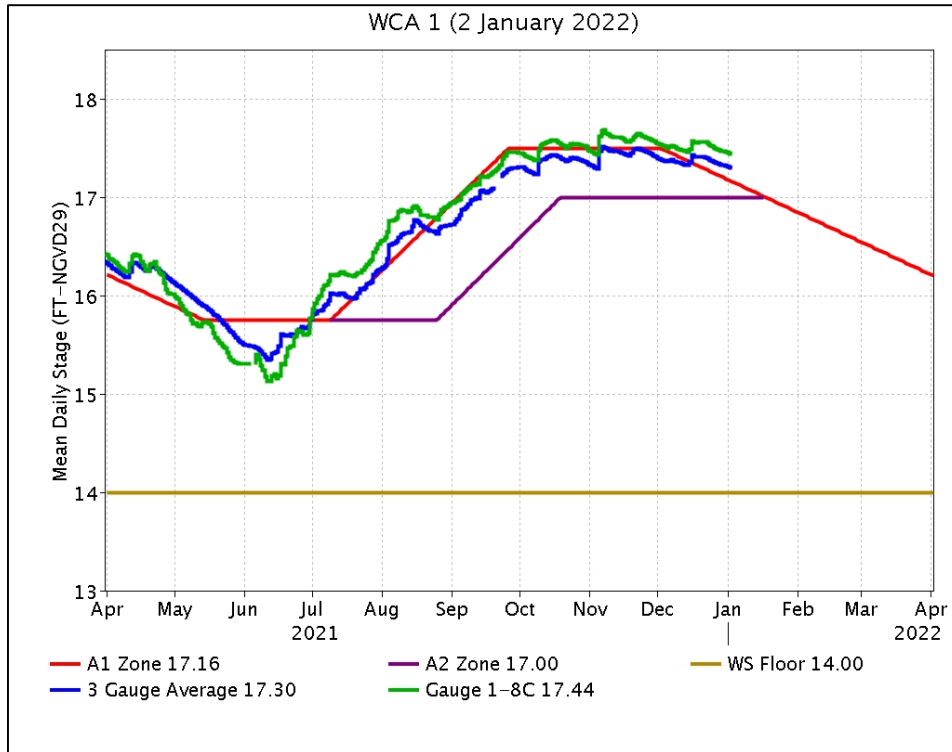


Figure EV-1. WCA-1 stage hydrographs and regulation schedule.

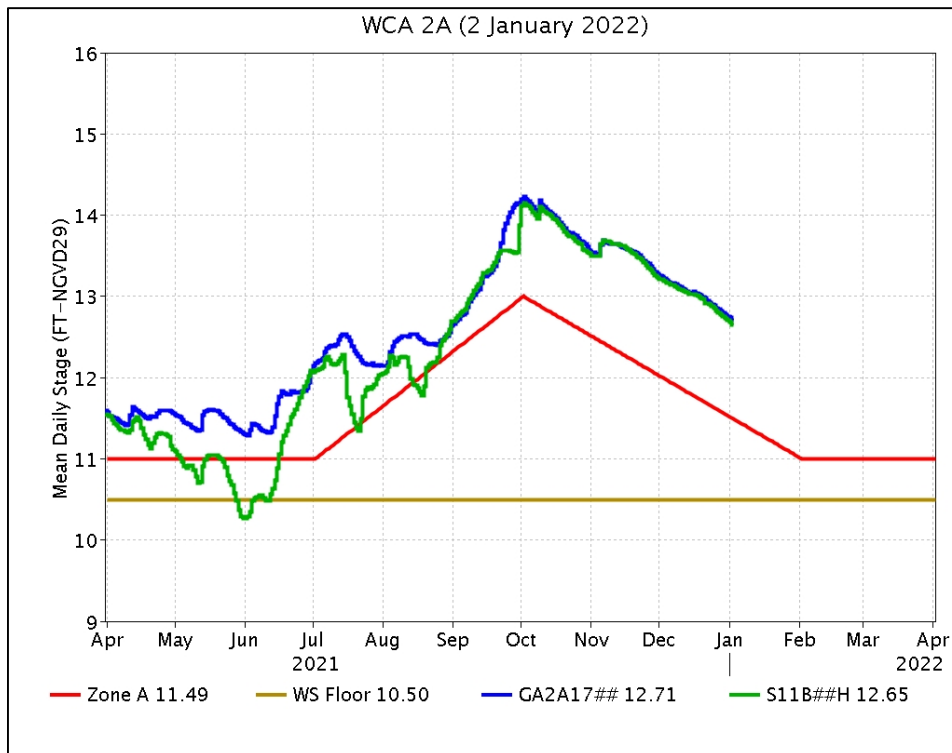


Figure EV-2. WCA-2A stage hydrographs and regulation schedule.

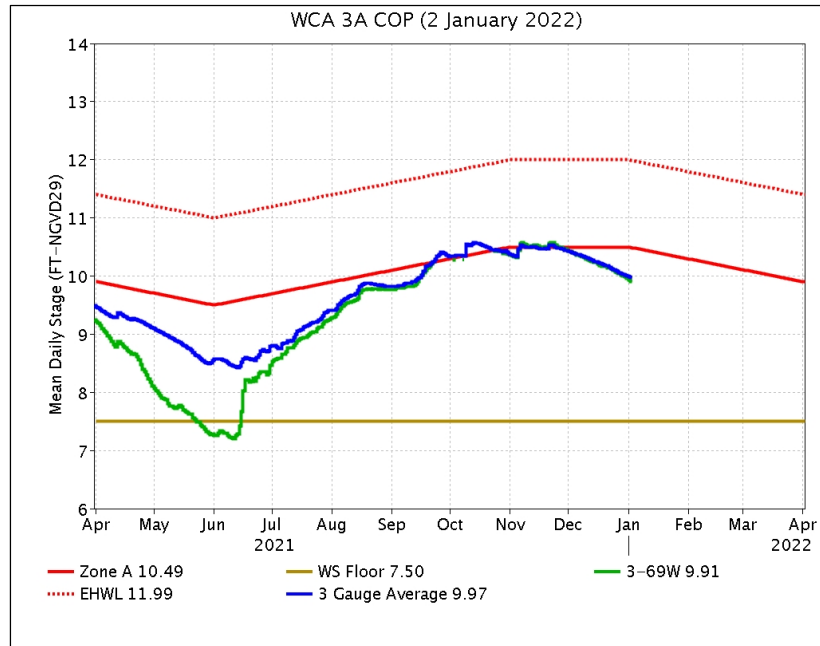


Figure EV-3. WCA-3A stage hydrographs (three-gauge average, S-333 headwater) and regulation schedule.

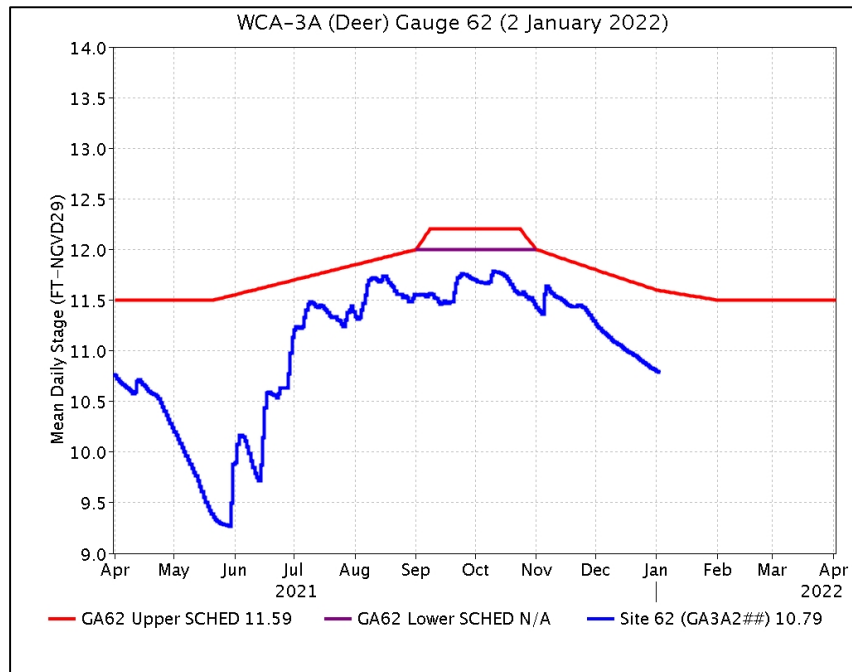


Figure EV-4. WCA-3A stage hydrograph (Deer gauge; Site 62) and CA62 regulation schedule.

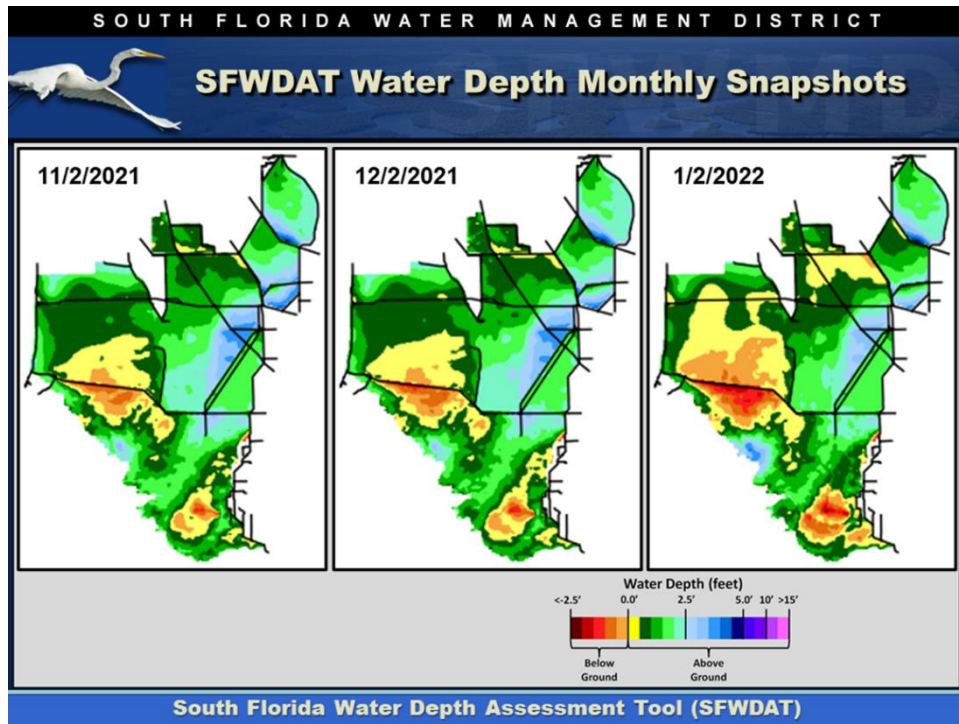


Figure EV-5. Everglades water depths from two months ago (left), one month ago (center) and present (right), based on SFWDAT.

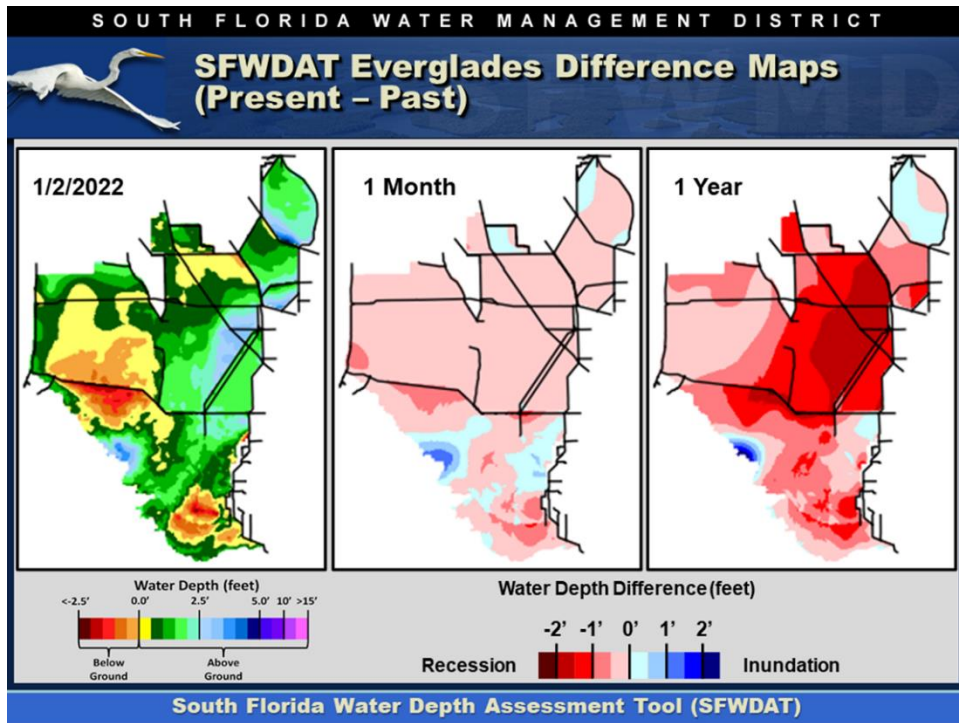


Figure EV-6. Present Everglades water depths (left) and water depth changes from one month (center) and one year (right) ago, based on SFWDAT.

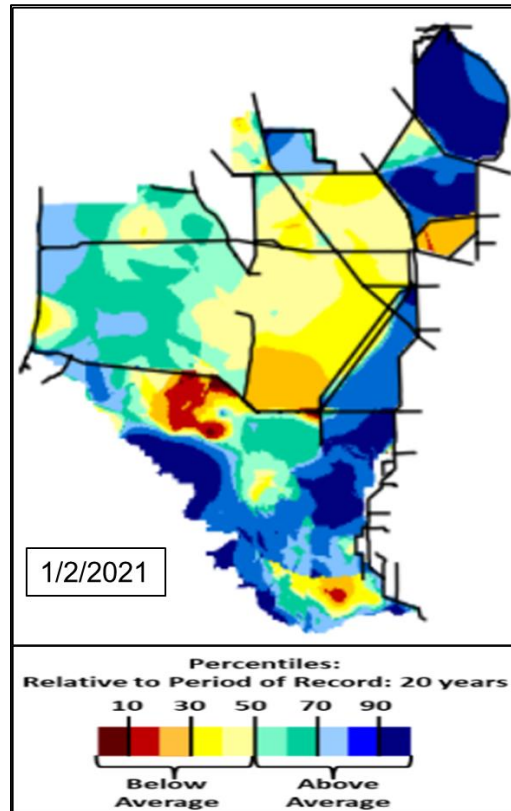


Figure EV-7. Present water depths compared to the day of year median over the previous 20 years.

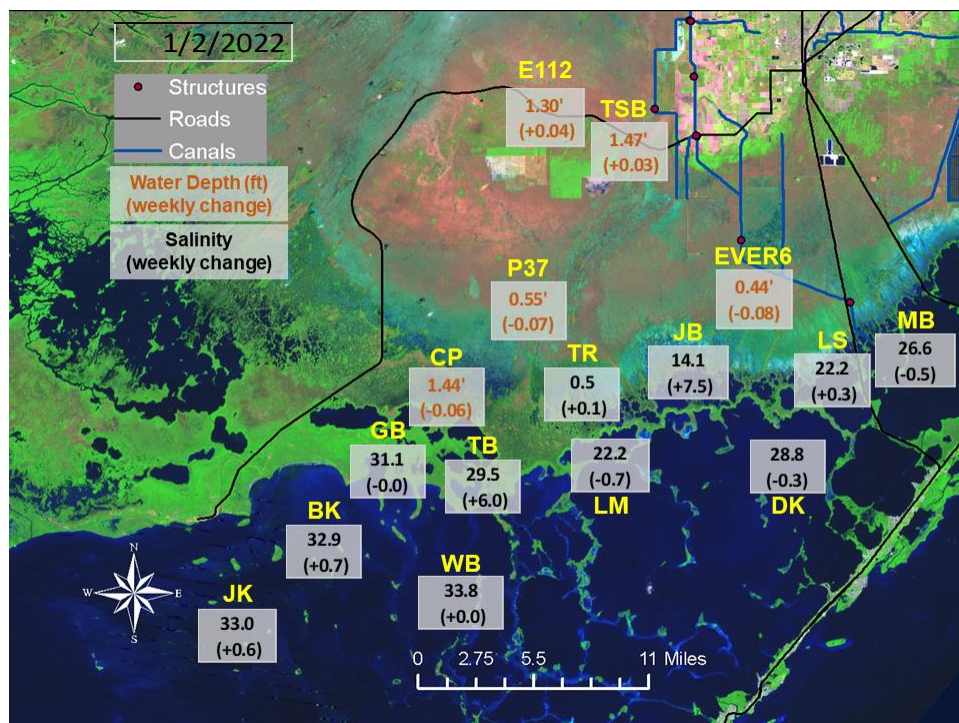


Figure EV-8. Taylor Slough water depths with changes since a week ago and Florida Bay salinities with changes since a week ago.

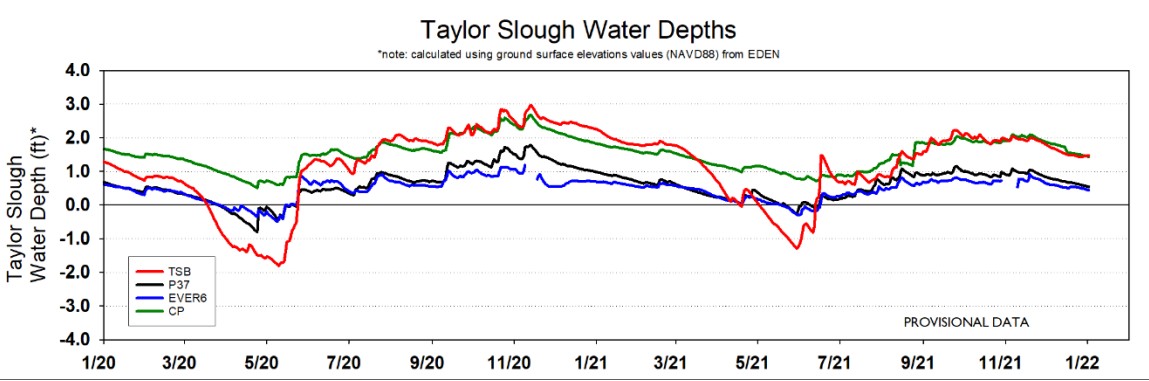


Figure EV-9. Taylor Slough water depth time series.

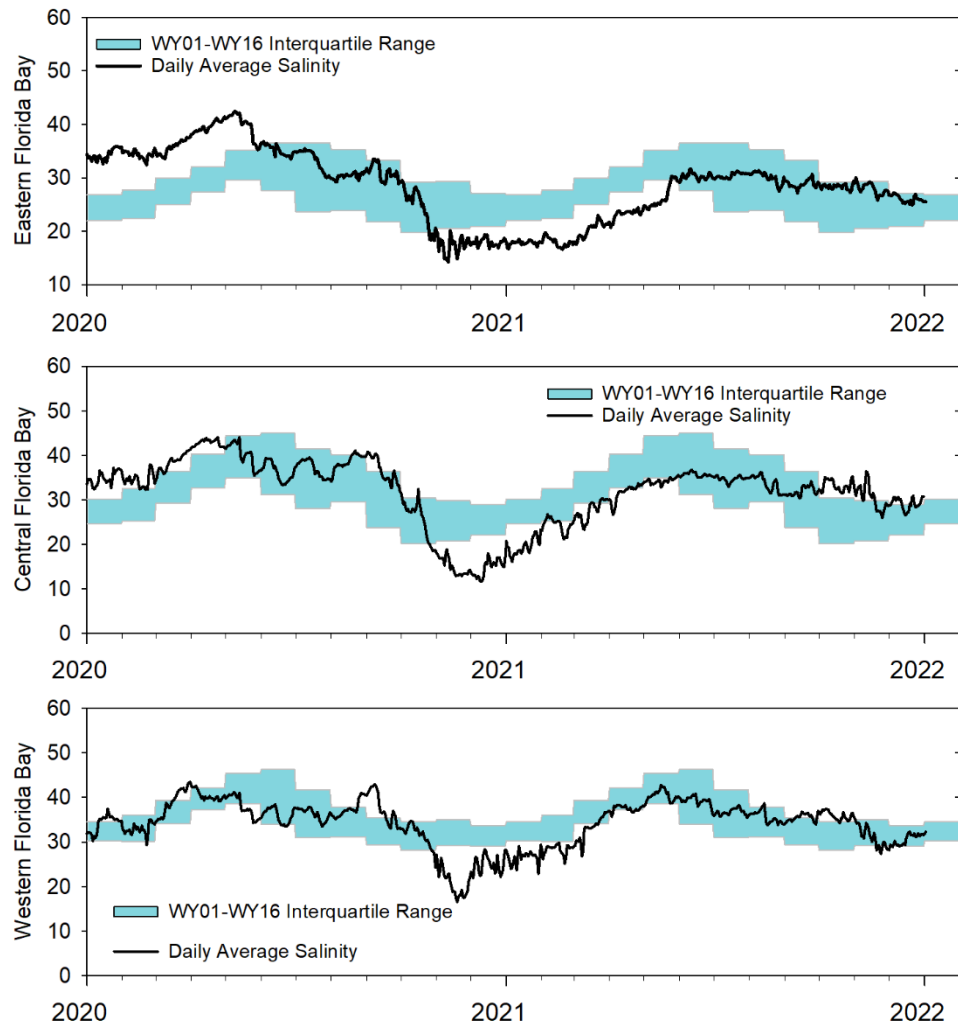


Figure EV-10. Eastern (top panel), Central (middle panel) and Western (bottom panel) Florida Bay daily average salinities with interquartile (25-75 percentile) ranges.

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

SFWMD Everglades Ecological Recommendations, December 28, 2021 (red is new)			
Area	Weekly change	Recommendation	Reasons
WCA-1	Stage decreased by 0.06'	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 0.15'	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 0.11'	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. Depths in excess of 4.0 feet.
WCA-3A NE	Stage decreased by 0.10'	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.	Protect within basin peat soils, wading bird foraging and downstream habitat and wildlife.
WCA-3A NW	Stage decreased by 0.09'	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 0.11'	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.	Protect within basin and downstream habitat and wildlife.
Southern WCA-3A S	Stage decreased by 0.12'		
WCA-3B	Stage decreased by 0.05'	Conserve water in this basin letting the water move south when conditions allow.	Protect within basin and downstream habitat and wildlife.
ENP-SRS	Stage decreased by 0.02 feet	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 -0.08' to +0.04'	Move water southward as possible.	When available, provide freshwater buffer for downstream conditions.
FB- Salinity	Salinity changes ranged -0.7 to +7.5	Move water southward as possible.	When available, provide freshwater to maintain low salinity buffer and promote water movement.