PERIODIC SCIENTISTS CALL FOR LAKE OKEECHOBEE AND THE ESTUARIES

Savannah Lacy, P.E.

Chief, Operations Unit
Water Management Section
Jacksonville District
14 March 2023

US Army Corps of Engineers®

STATEMENT OF INTENT

The intent of this forum is to exchange views, information or advice between federal, state and local agency technical scientists regarding Lake Okeechobee, C&SF operations and the relationship of impacts to the surrounding areas. This is not intended to be a forum for official policy discussion. The opinions shared in this forum do not represent any official position from any agency at any time unless otherwise specifically indicated.

Non-technical local government staff or elected officials are kindly asked to make their comments in the public comment portion of the call.

Thank you all for your continued engagement.

USACE DATA RESOURCES

Jacksonville Water Management Page
https://www.saj.usace.army.mil/WaterManagement/

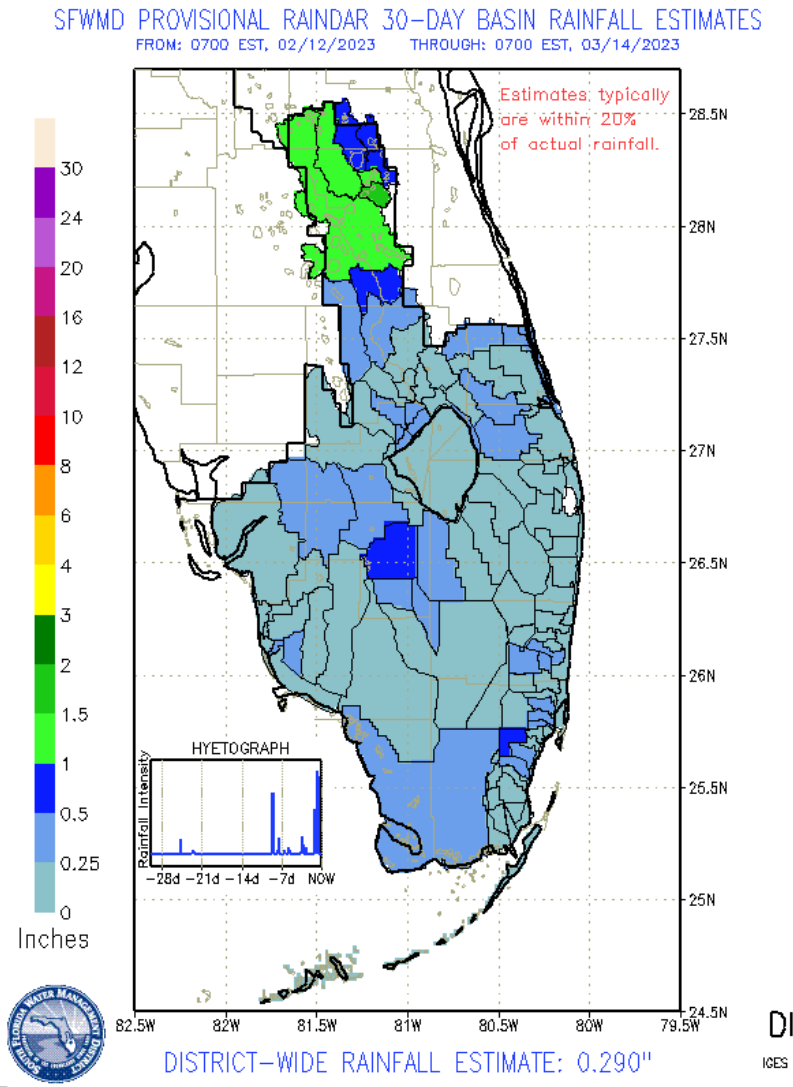
- Reports
- Plots
- Water Control Plans
- Navigation information

System Status Map
https://w3.saj.usace.army.mil/h2o/reports/StatusDaily.htm

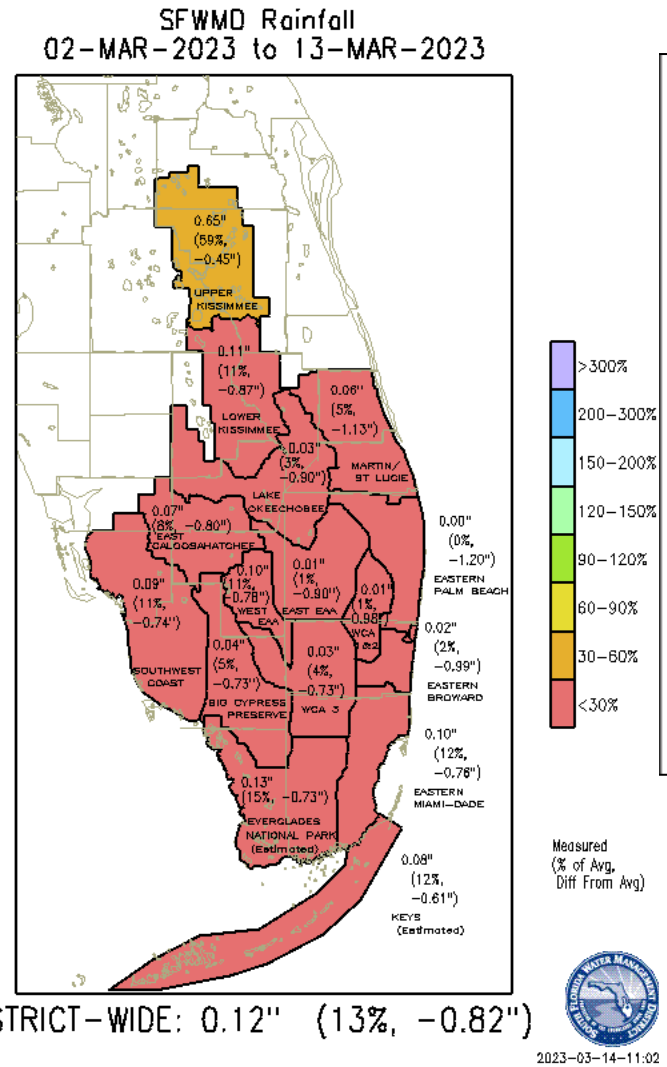
Algae Information
https://www.saj.usace.army.mil/Algae/

RAINFALL

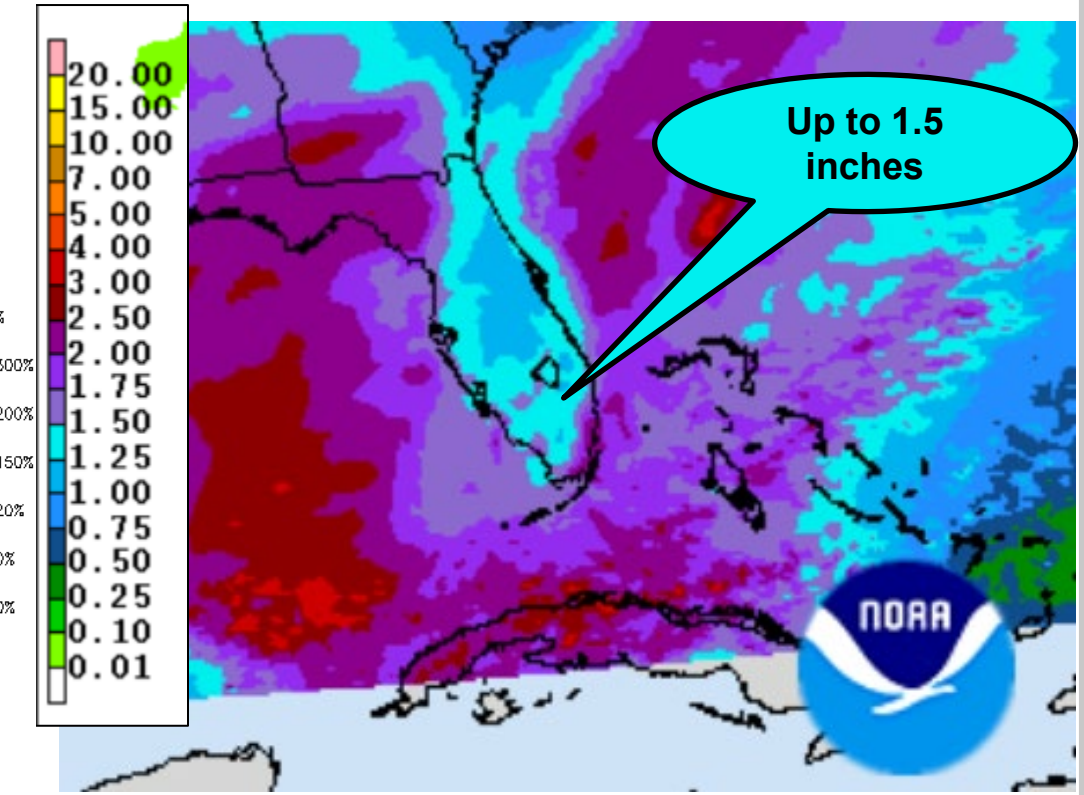
Last 30 days



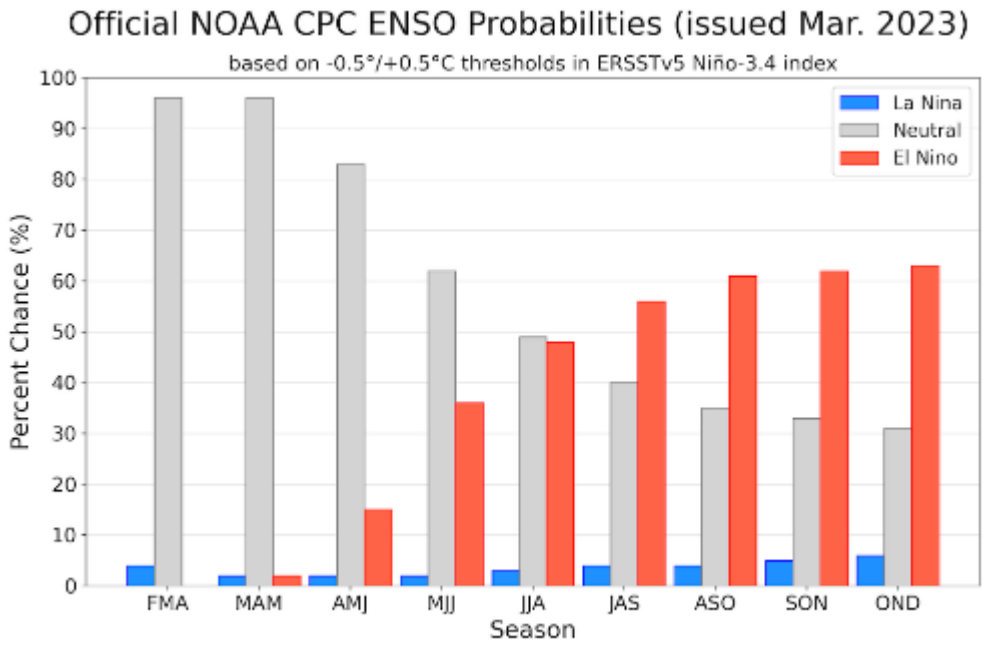
March

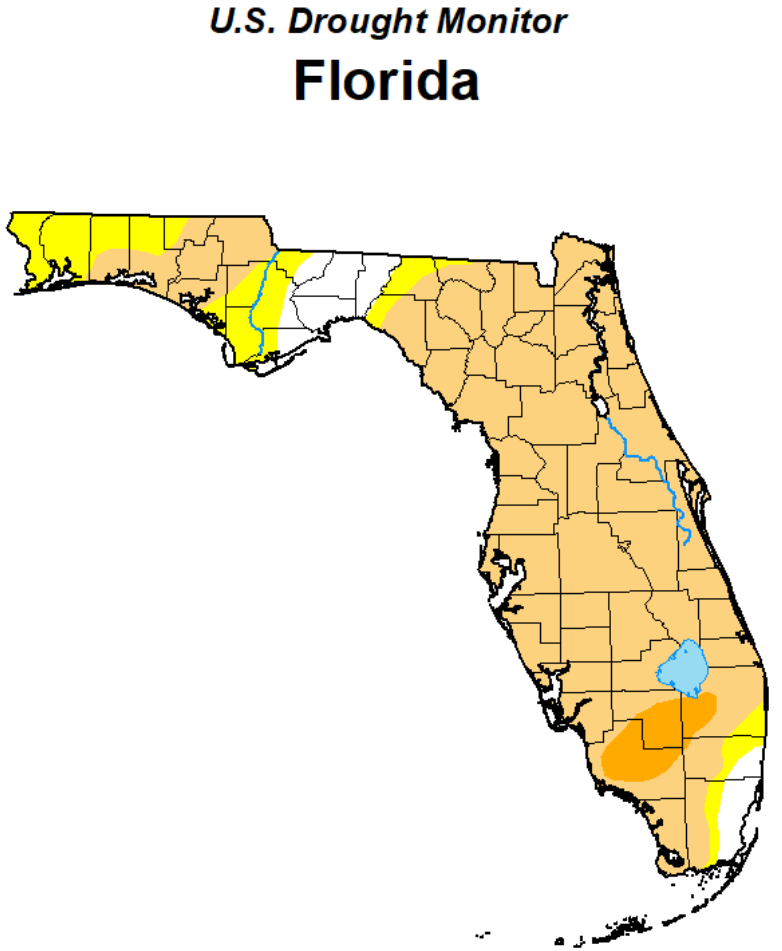


7-day QPF



CLIMATE





March 7, 2023

(Released Thursday, Mar. 9, 2023)

Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	7.06	92.94	80.29	3.90	0.00	0.00
Last Week *02-28-2023*	12.04	87.96	64.54	0.00	0.00	0.00
3 Months Ago *12-06-2022*	66.72	33.28	29.86	21.88	0.00	0.00
Start of Calendar Year *01-03-2023*	56.61	43.39	30.80	19.77	0.00	0.00
Start of Water Year *09-27-2022*	91.16	8.84	0.00	0.00	0.00	0.00
One Year Ago *03-08-2022*	11.38	88.62	52.27	2.21	0.00	0.00

Intensity:

- None
- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to https://droughtmonitor.unl.edu/About.aspx

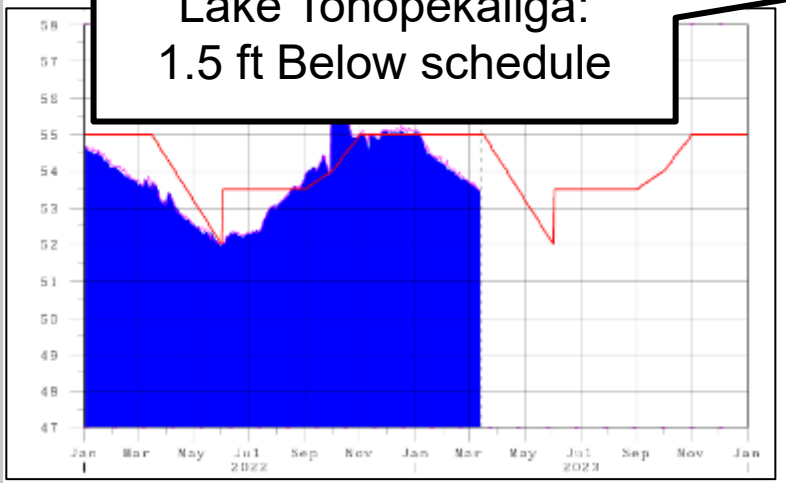
Author:

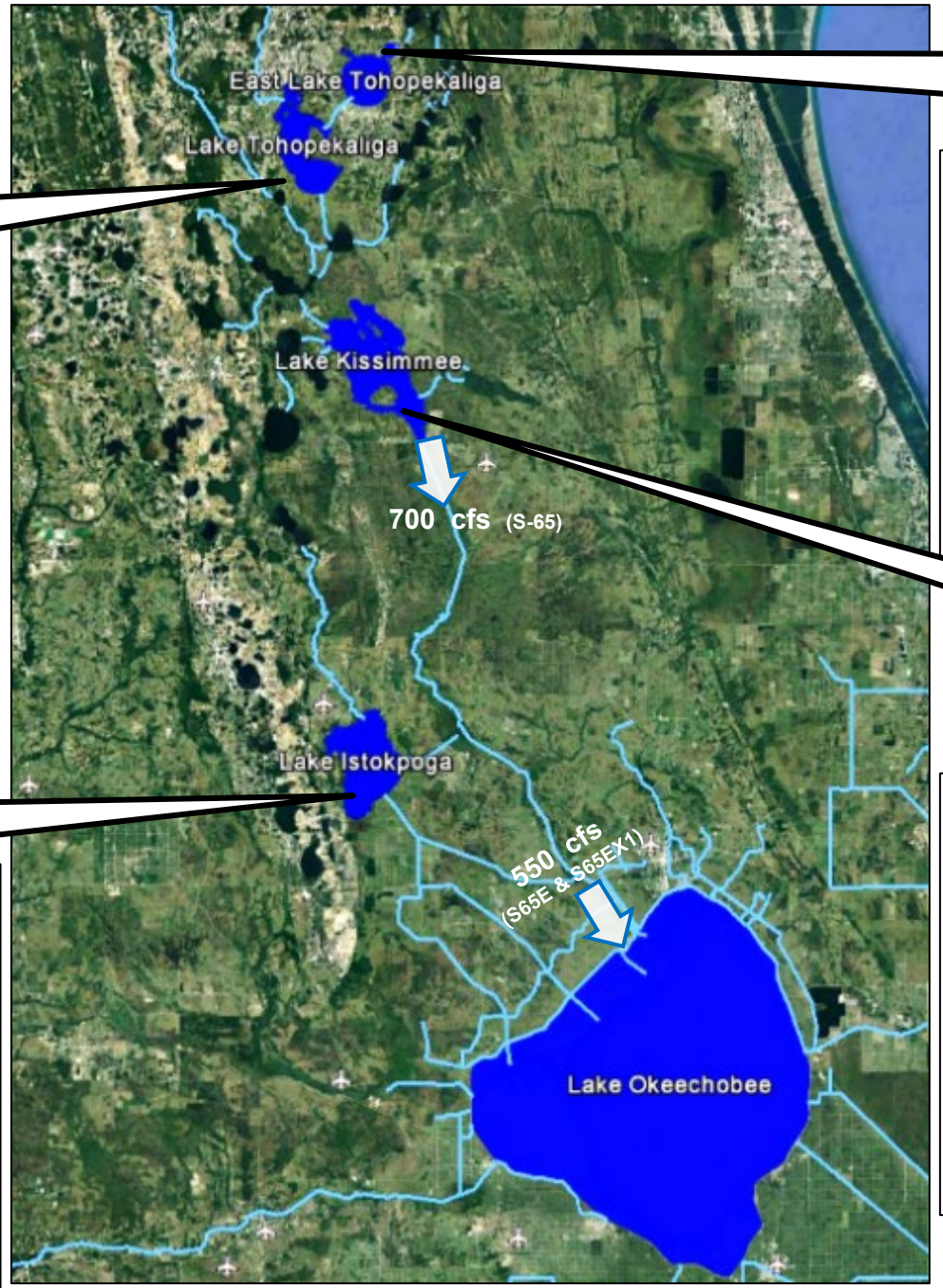
Deborah Bathke
National Drought Mitigation Center

droughtmonitor.unl.edu

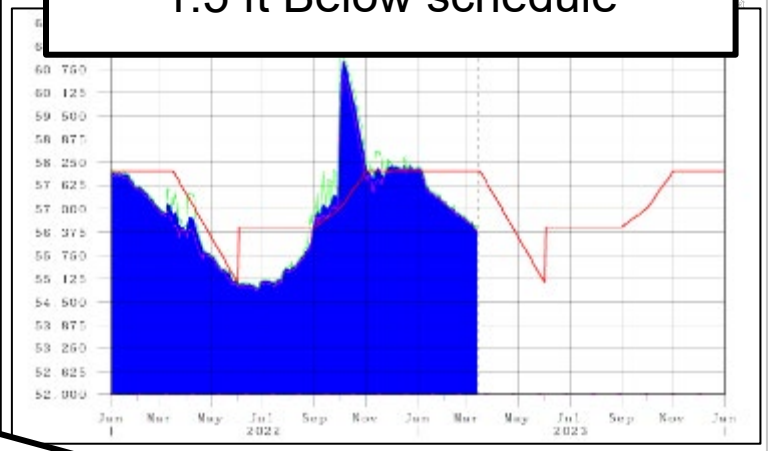
KISSIMMEE CHAIN OF LAKES

East Lake Tohopekaliga:
1.5 ft Below schedule

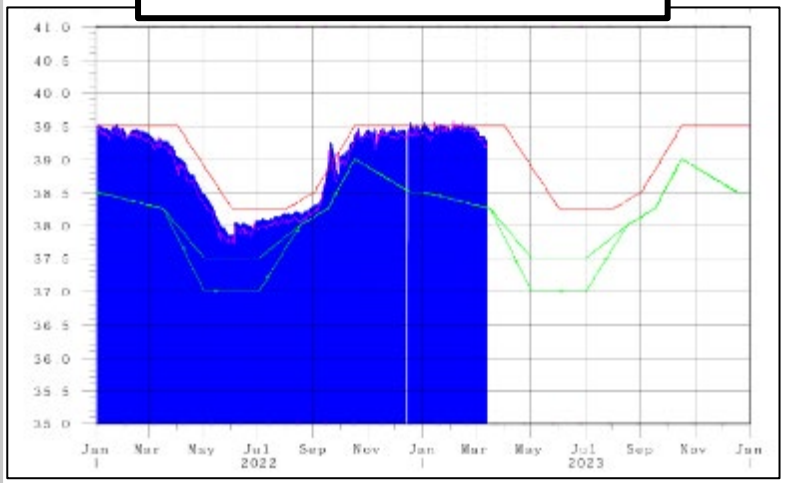




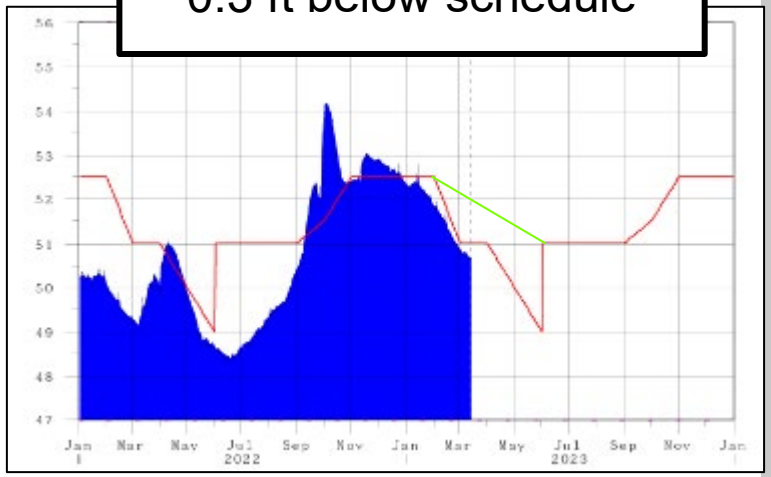
Lake Tohopekaliga:
1.5 ft Below schedule

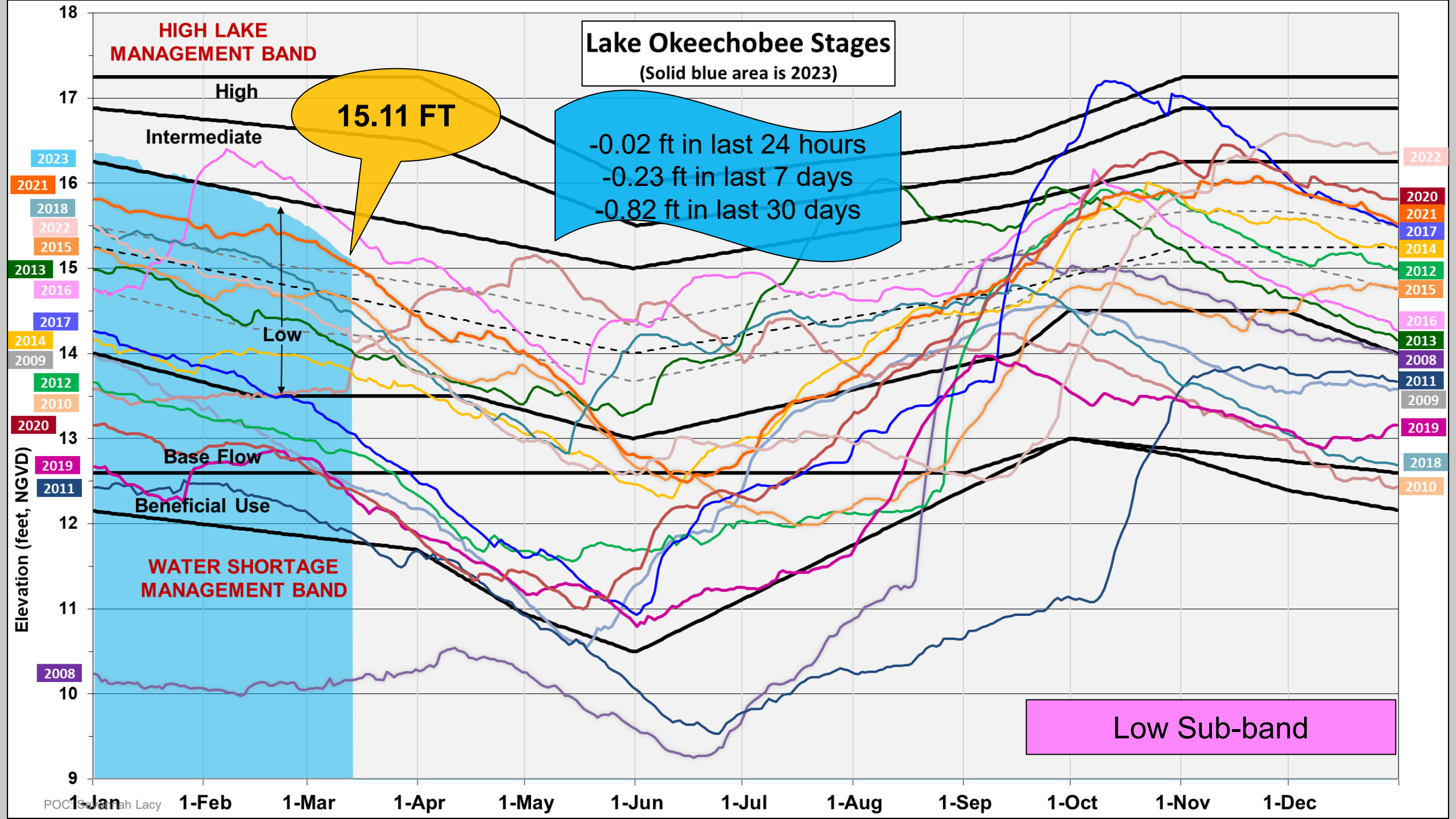


Lake Istokpoga:
0.3 ft Below schedule



Lake Kissimmee:
0.3 ft below schedule




Lake Okeechobee Stages
(Solid blue area is 2023)
HIGH LAKE MANAGEMENT BAND
High
Intermediate
Low
Base Flow
Beneficial Use
WATER SHORTAGE MANAGEMENT BAND
15.11 FT
-0.02 ft in last 24 hours
-0.23 ft in last 7 days
-0.82 ft in last 30 days
Low Sub-band
Elevation (feet, NGVD)
18
17
16
15
14
13
12
11
10
9
1-Jan
1-Feb
1-Mar
1-Apr
1-May
1-Jun
1-Jul
1-Aug
1-Sep
1-Oct
1-Nov
1-Dec
2023
2021
2018
2022
2015
2013
2016
2017
2014
2009
2012
2010
2020
2019
2011
2008
2022
2020
2021
2017
2014
2012
2015
2016
2013
2008
2011
2009
2019
2018
2010
POC: Jonathan Lacy

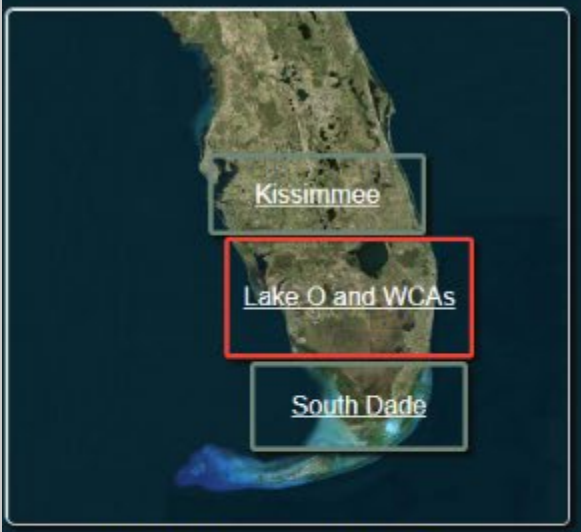
Lake Okeechobee and WCAs

Daily averages for 14 March 2023

Lake Okeechobee stage: 15.11 ft
Previous day: 15.13 ft
One week ago: 15.34 ft
(1965-2007 avg for today): 14.46 ft

Total Structure/Creek Inflows: 675 cfs
Total Structure Outflow: 3753 cfs
Quick Reference for Map Flows

Area	Stages (hover for notes)	Schedule
WCA-1	Site 1-8C: 16.30 ft 3-Station: 16.32 ft	16.39 ft
WCA-2A	Site 2-17: 12.04 ft S-11B HW: 11.86 ft	11.00 ft
WCA-3A	3-Station: 9.10 ft	10.03 ft



Water Management Main Page
Status Update Archives WRDA Archives
Elevations are ft-NGVD.
Flows are average daily CFS...
Data is provisional and subject to revision.
Report generated: 14 MAR 2023 @ 11:05

Current Lake Release Schedule*		
West (S-79)	2000 cfs	Pulse
East (S-80)	500 cfs	Constant

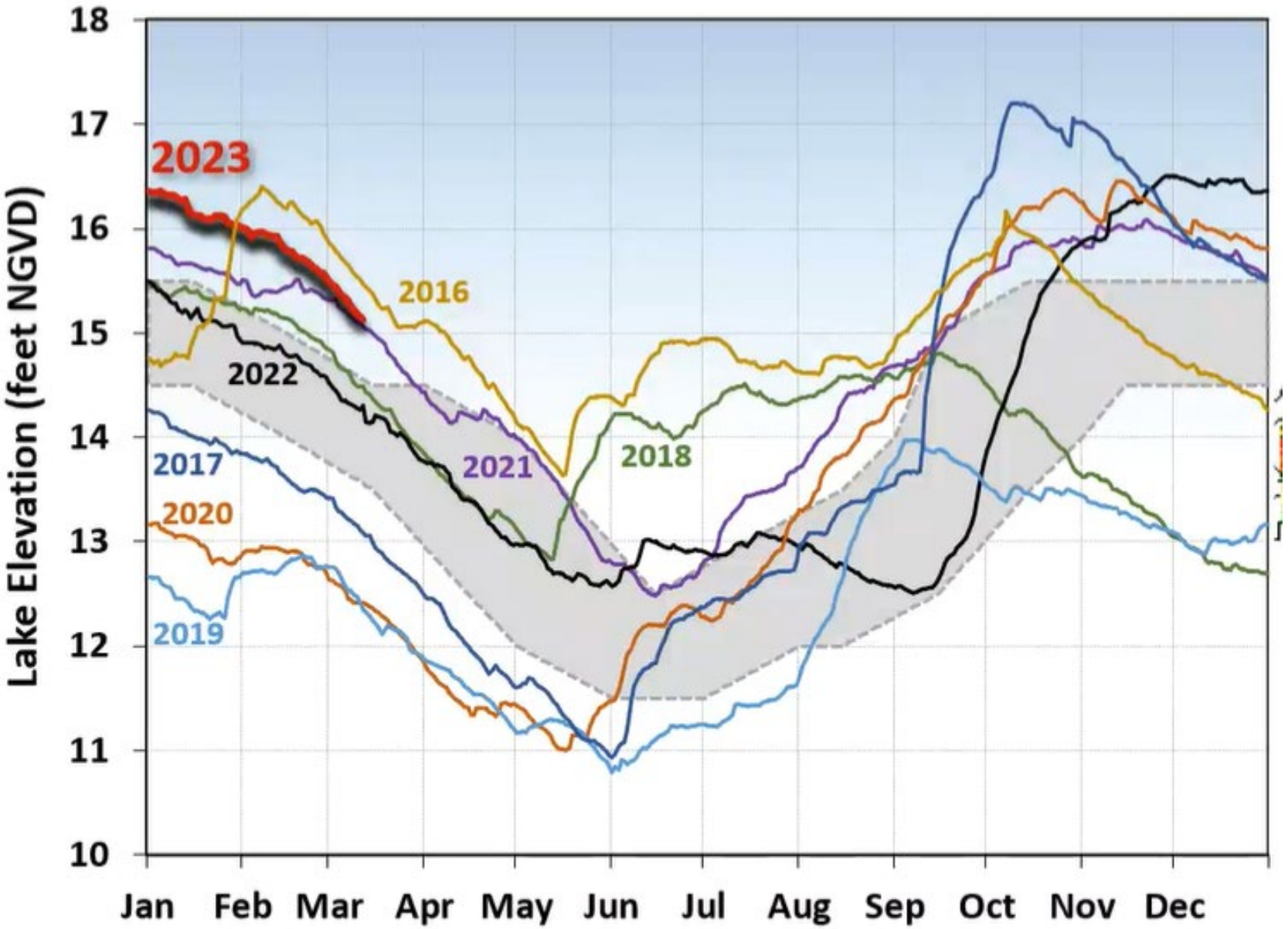
*Updates are generally made on Fridays

7 Day Average Outflows and % of total		
Total	4317 cfs	
West (S-77)	1781 cfs	41%
West (S-79)	1898 cfs	
East (S-308)	280 cfs	6%
East (S-80)	128 cfs	
South	2257 cfs	52%
Other	0 cfs	0%

S-65E: 553
S-65EX1: 0
Pump inflows: 83
Other inflows: 38
Other outflows: 0
Istokpoga: 0
S-80: 253
Fisheating Creek: 0
Lake Okeechobee 15.11 ft
S-308: 279
S-271: 397
S-352: 595
S-77: 1509
S-78: 1322
S-79: 1595
S-354: 183
S-351: 789
STAs to WCA-1: 0
S-155A: 369
WCA1
STAs to WCA-3A: 73
STAs to WCA-2A: 52
S-10s: 0
S-39: 66
S-190: 0
WCA2A
S-11s: 0
S-38: 124
S-140: 38
S-34E: 0
S-151: 0
BCNP
S-344: 0
WCA3A
S-31: 0
S-337: 0
S-333: 293
S-333N: 316
S-343s: 0
S-356: 121
S-334: 0
ENP
S-12s: 244

U.S. Army Corps of Engineers

Lake Okeechobee Stage vs Ecological Envelope



Lake Okeechobee

Chlorophyll *a*, Total Microcystins, and Dominant Taxa

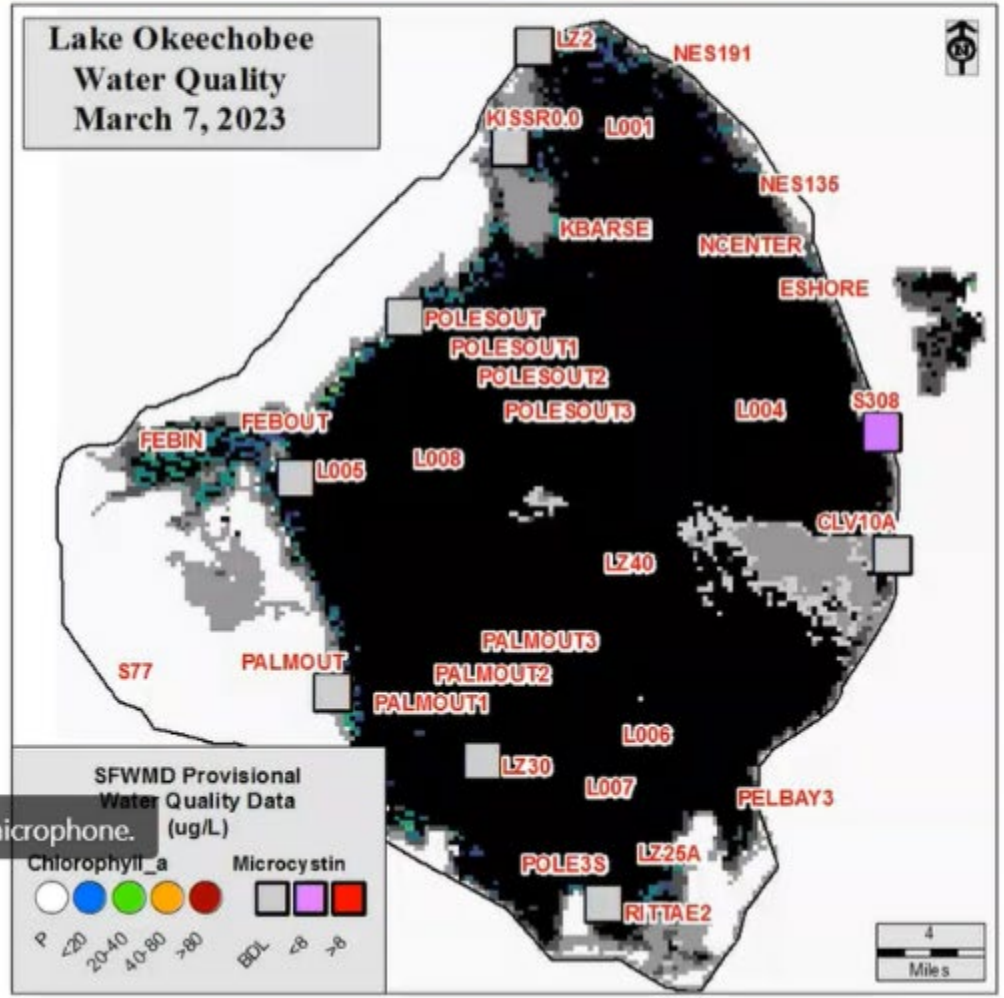
*Provisional Data

Collection Date: March 6-8, 2023

Station	CHL*a* (ug/L)	TOXIN (ug/L)	TAXA
FEBIN	P		
FEBOUT	P		
KISSR0.0	P	BDL	*mixed*
L005	P	BDL	*Microcys*
LZ2	P	BDL	*mixed*
KBARSE	P		
RITTAE2	P	BDL	*mixed*
PELBAY3	P		
POLE3S	P		
LZ25A	P		
PALMOUT	P	BDL	*Microcys*
PALMOUT1	P		
PALMOUT2	P		
PALMOUT3	P		
POLESOUT	P	BDL	*mixed*
POLESOUT1	P		
POLESOUT2	P		
POLESOUT3	P		
EASTSHORE	P		
NES135	P		
NES191	P		

Station	CHL*a* (ug/L)	TOXIN (ug/L)	TAXA
L001	P		
L004	P		
L006	P		
L007	P		
L008	P		
LZ30	P	BDL	*mixed*
LZ40	P		
CLV10A	P	BDL	*Microcys*
NCENTER	P		
S308C	P	**0.5**	*Microcys*
S77	P		

- SFWMD considers >40 µg/L Chlorophyll *a* (Chl*a*) an algal bloom
- BDL – Below Detectable Limit of **0.25** µg/L
- ND – No Dominant taxa
- P – Pending
- NS – Not Sampled
- Station bold – Chlorophyll *a* analyzed by SFWMD
- Toxin and Taxa analyzed by FDEP:
  Microcys = Microcystis; Cylindro = Cylindrospermopsis; Planktol = Planktolyngbya; Dolicho = Dolichospermum



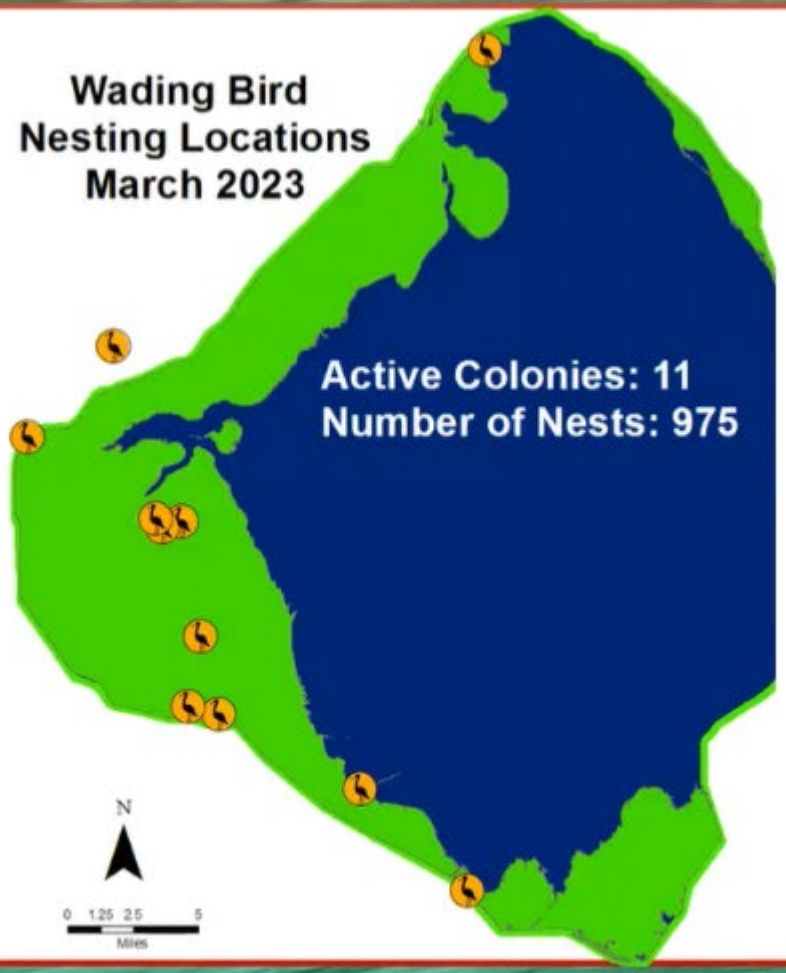
BLUE GREEN ALGAE AT S-308

https://www.saj.usace.army.mil/Media/News-Releases/Article/3313221/usace-monitors-blue-green-algae-conditions-and-adjusts-releases-at-port-mayaca/

https://www.saj.usace.army.mil/Media/News-Releases/Article/3316819/usace-resumes-releases-to-st-lucie-estuary/

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Lake Okeechobee Nesting Colonies



SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Lake Okeechobee Snail kite Nesting

2008 LORS

Part D: Establish Allowable Lake Okeechobee Releases to Tide (Estuaries)

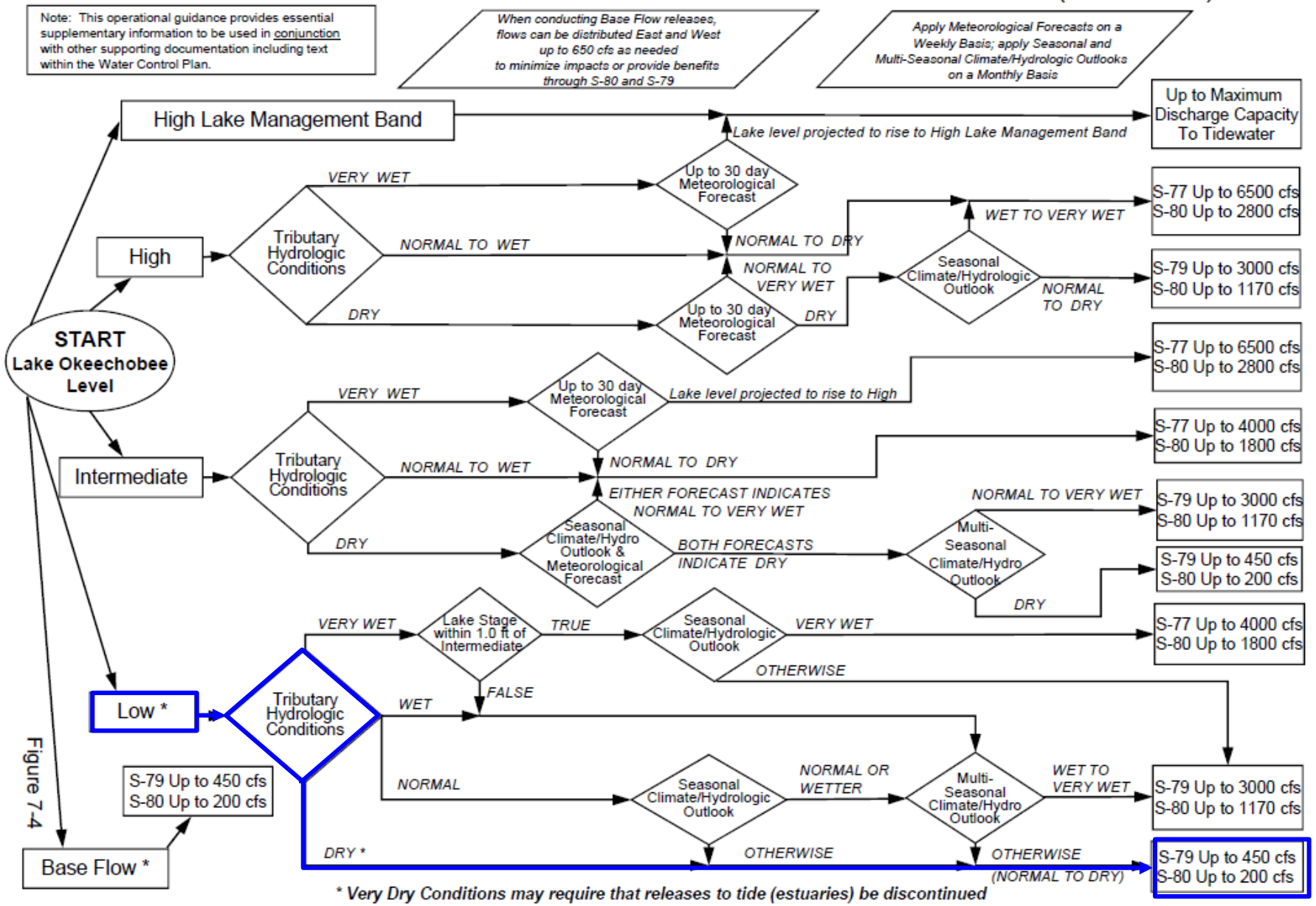


Figure 7-4

2008 LORS

Part C: Establish Allowable Lake Okeechobee Releases to the Water Conservation Areas

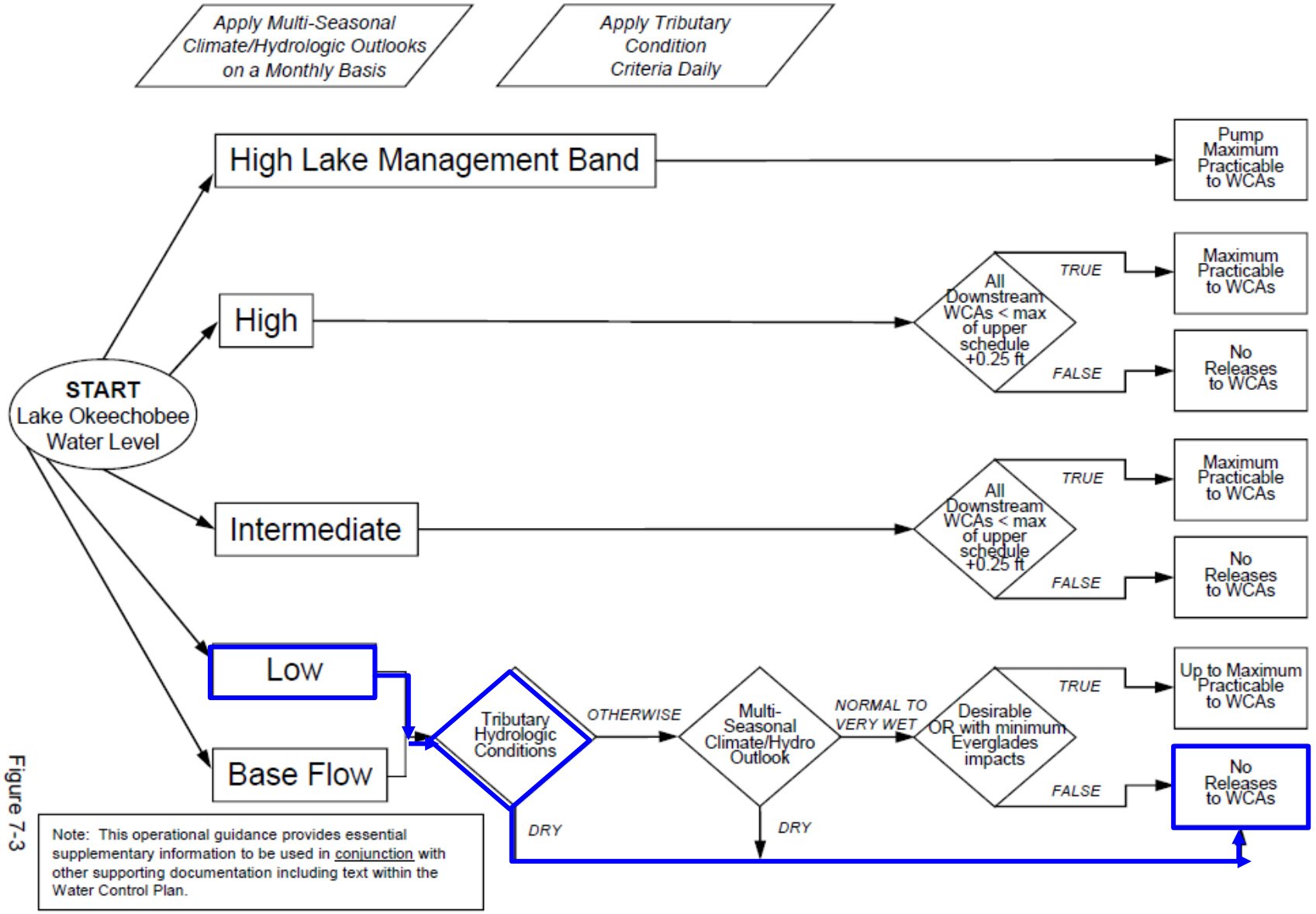
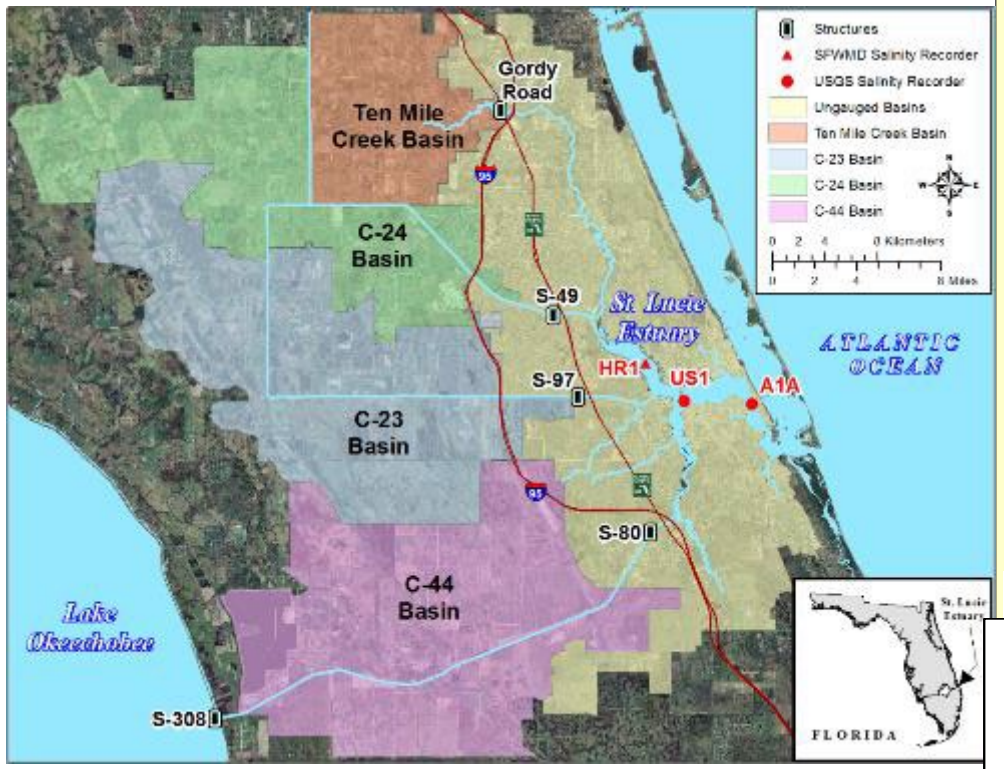
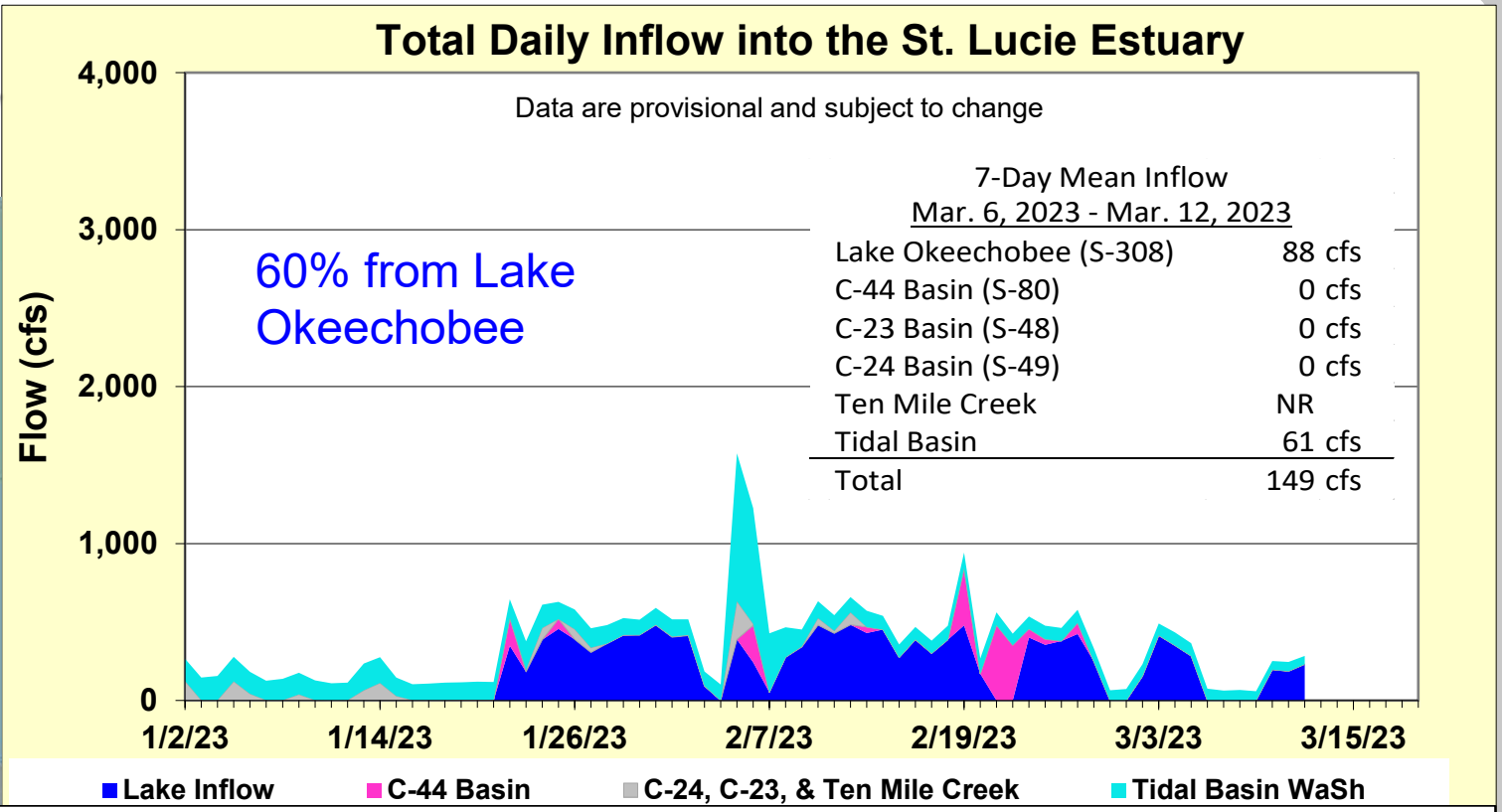
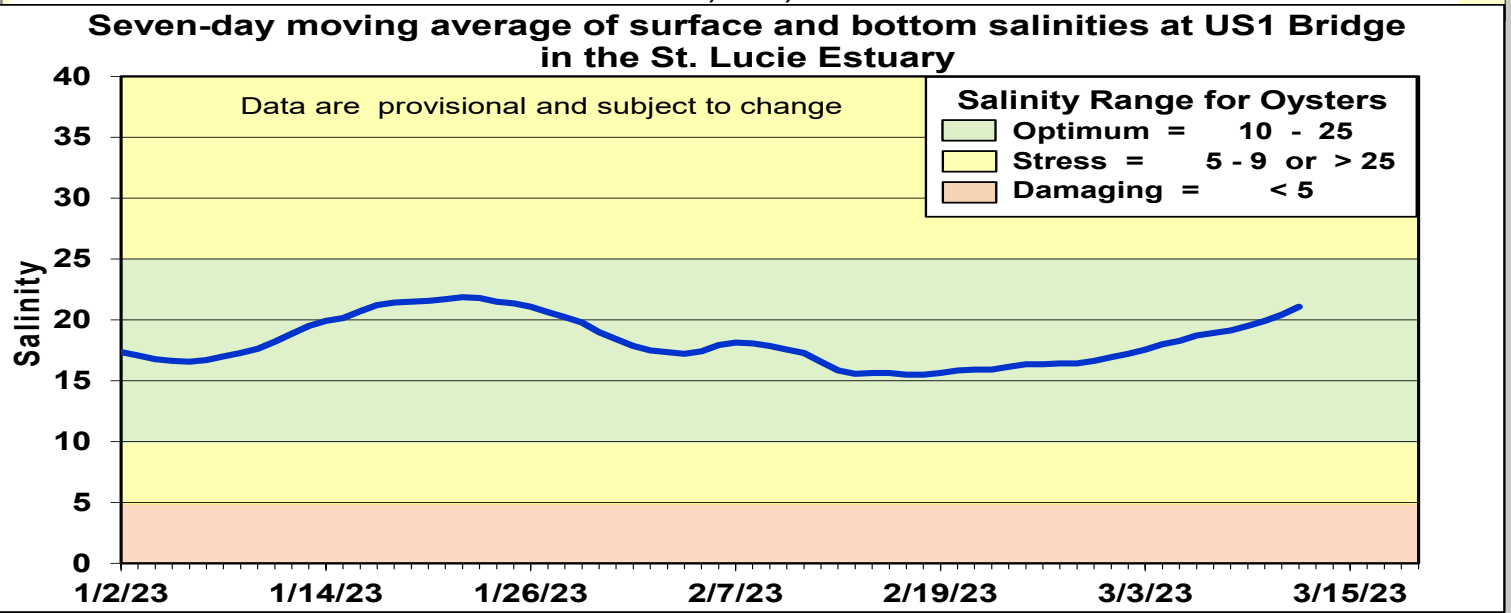


Figure 7-3

St. Lucie Estuary

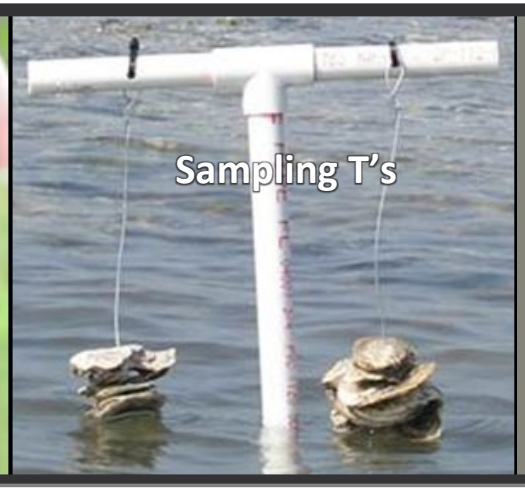


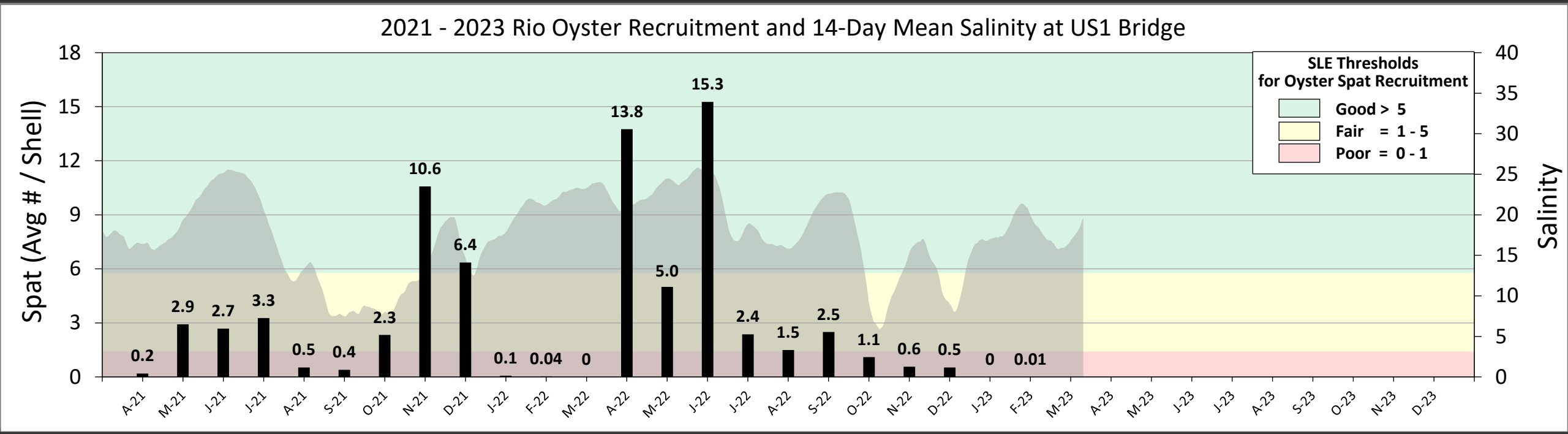




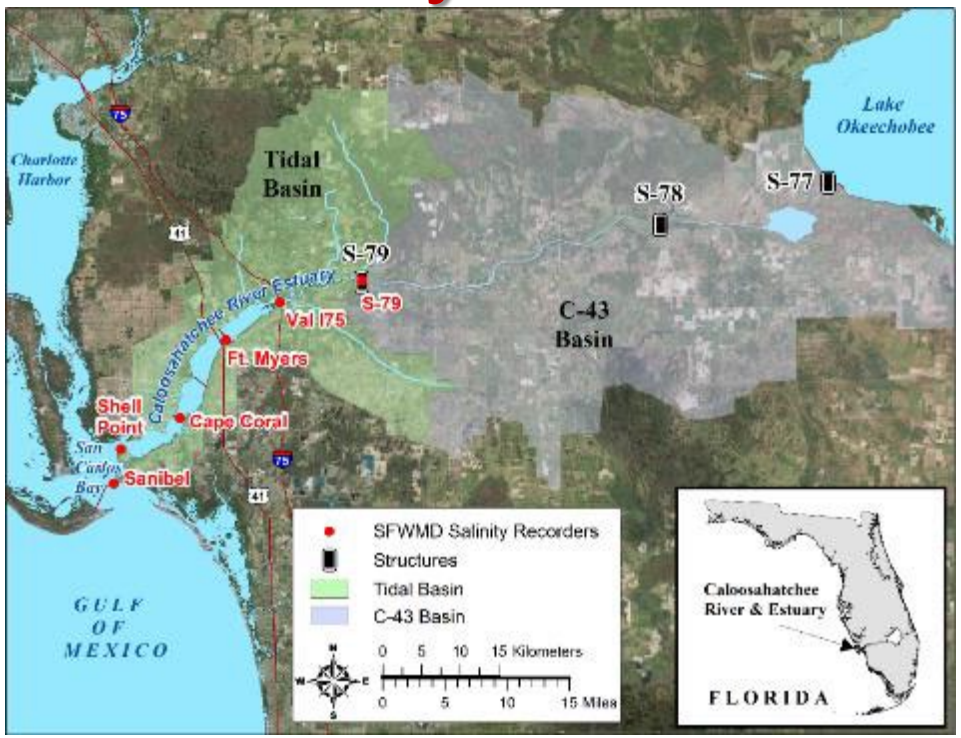
Information provided by the
South Florida Water Management District

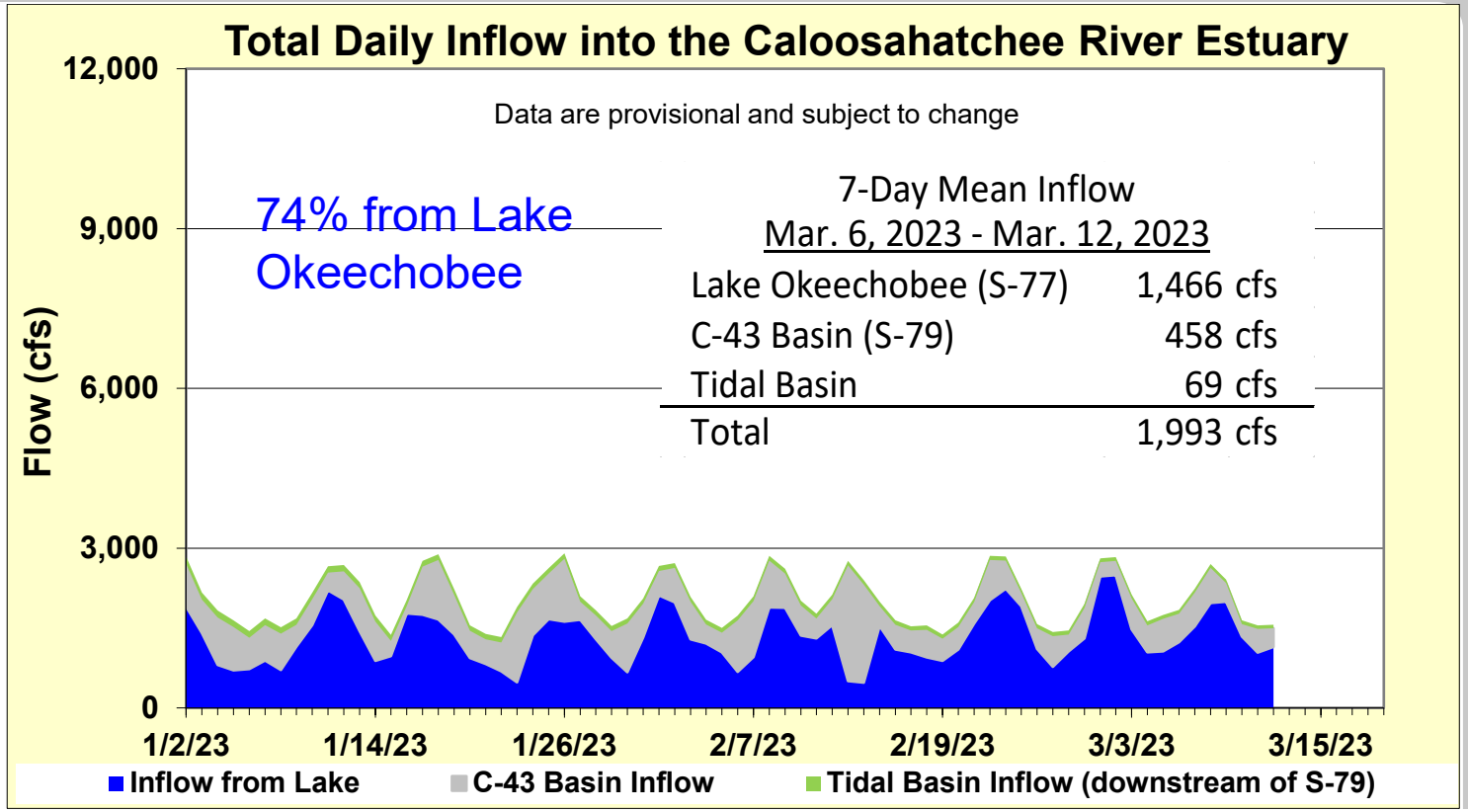
ST. LUCIE ESTUARY – OYSTER RECRUITMENT

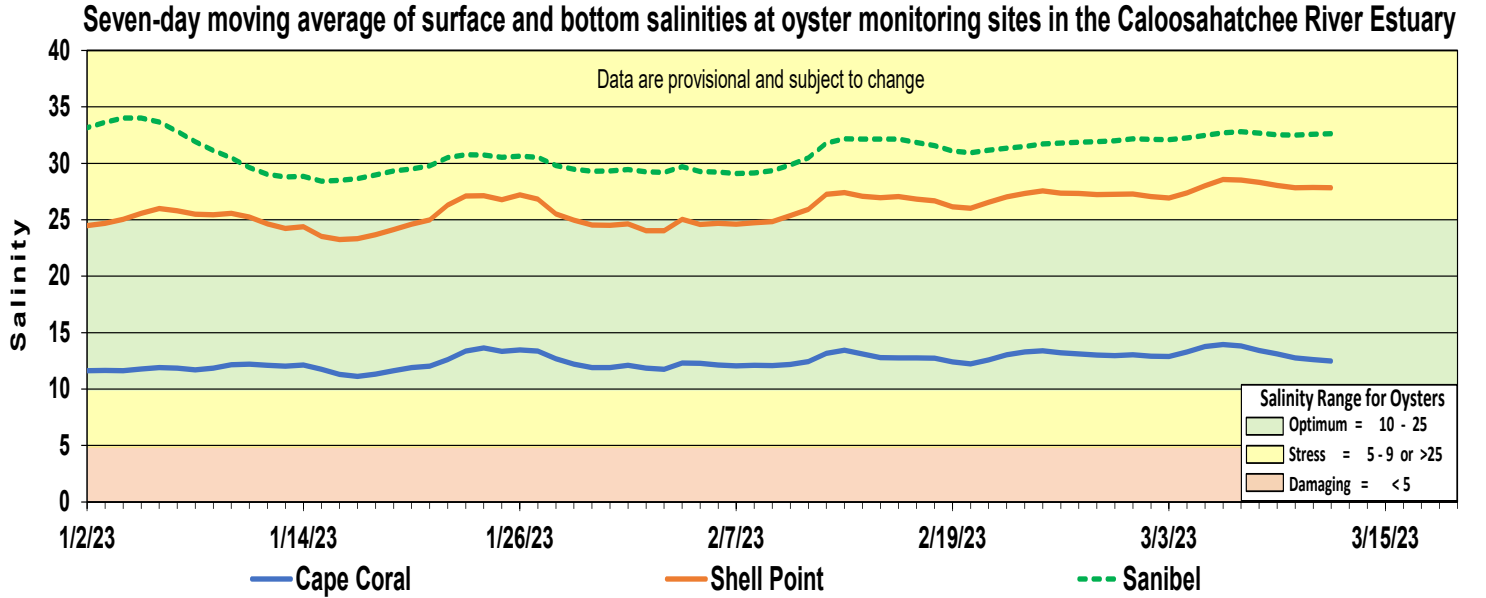




Caloosahatchee Estuary

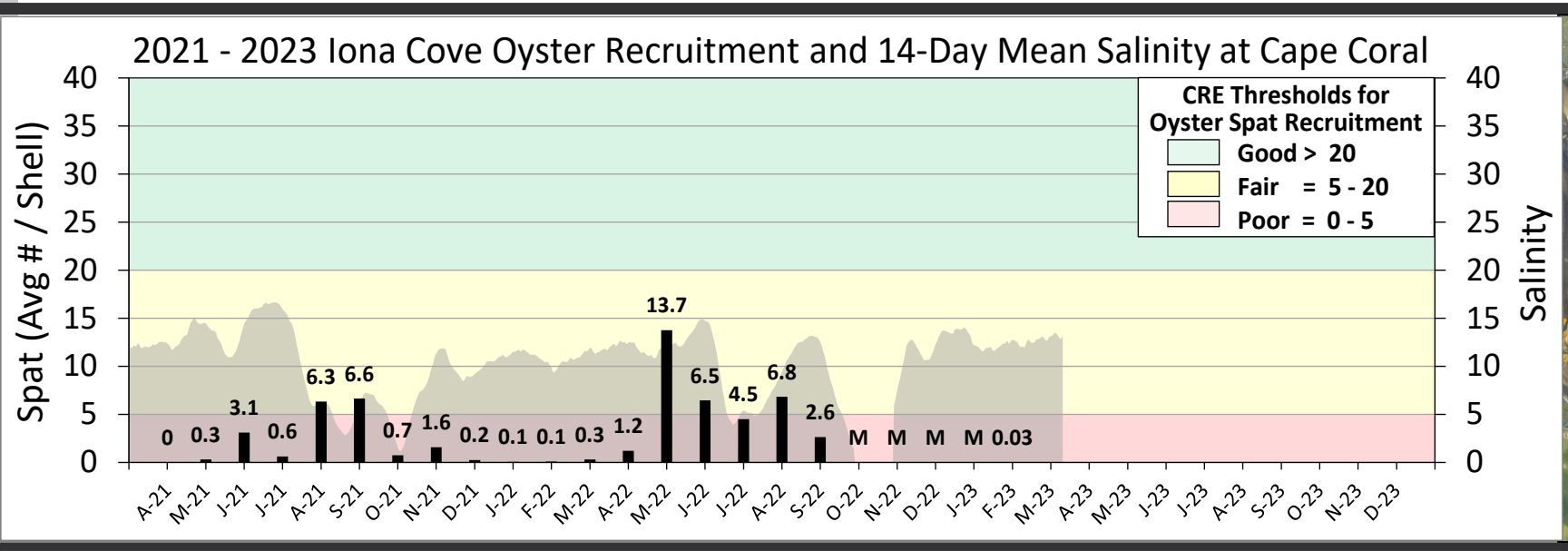


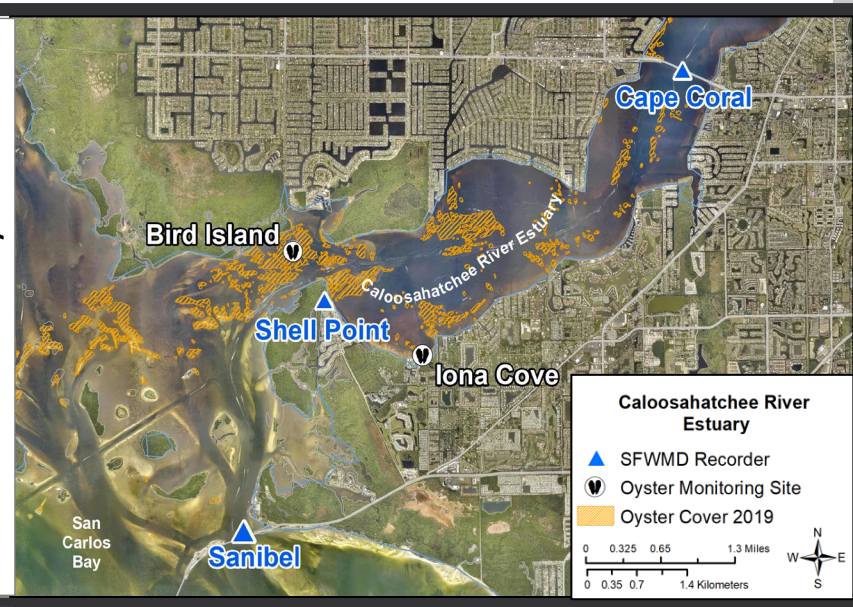


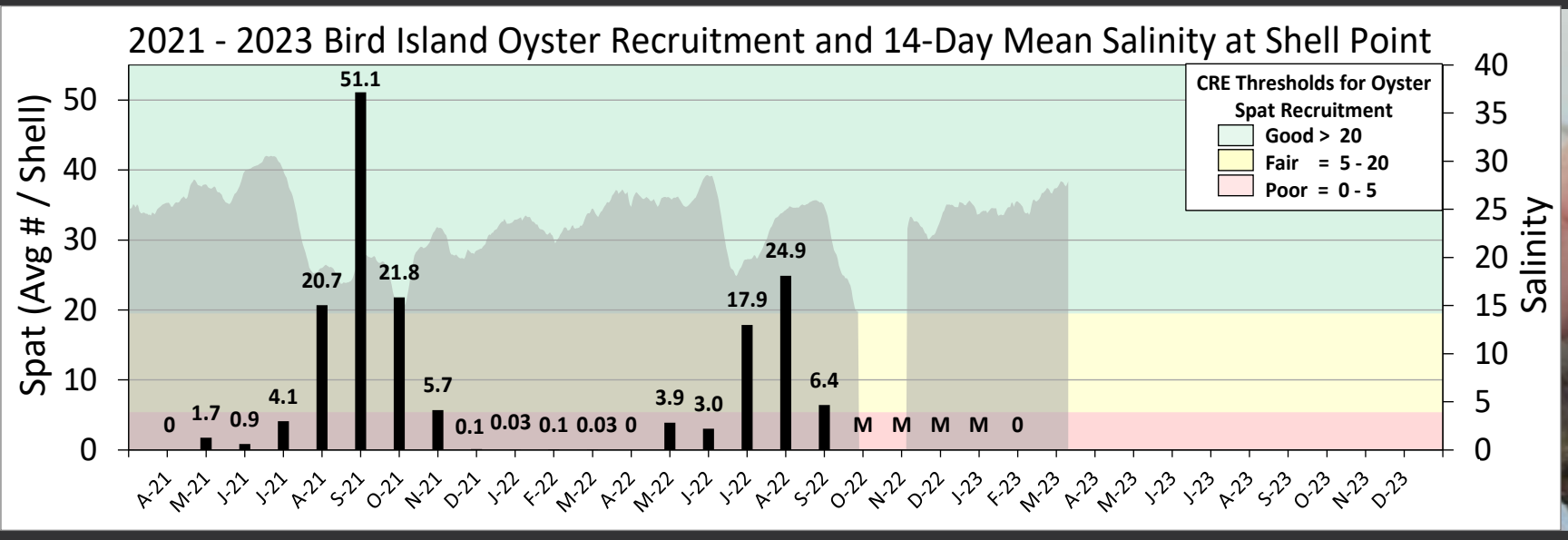


Information provided by the South Florida Water Management District

CALOOSAHATCHEE RIVER ESTUARY – OYSTER RECRUITMENT







MAKE-UP RELEASE BANKING

"Historically, the planned Lake Okeechobee releases to tide (estuaries) have been subject to reduction or prevention by downstream conditions such as downstream local basin runoff, the tidal cycle, tidal storm surge and spawning in the estuaries."

- Make-up releases can be made below Intermediate sub-band and should be done as soon as possible once Part D do not allow for releases or prescribe a lower volume release
- Banked higher releases can be made later at a rate not exceeding:
  - 2,800 cfs at S-79
  - 2,000 cfs into SLE (considering all surface water inflows in addition to S-80)
- Water bank will be used before the wet season begins

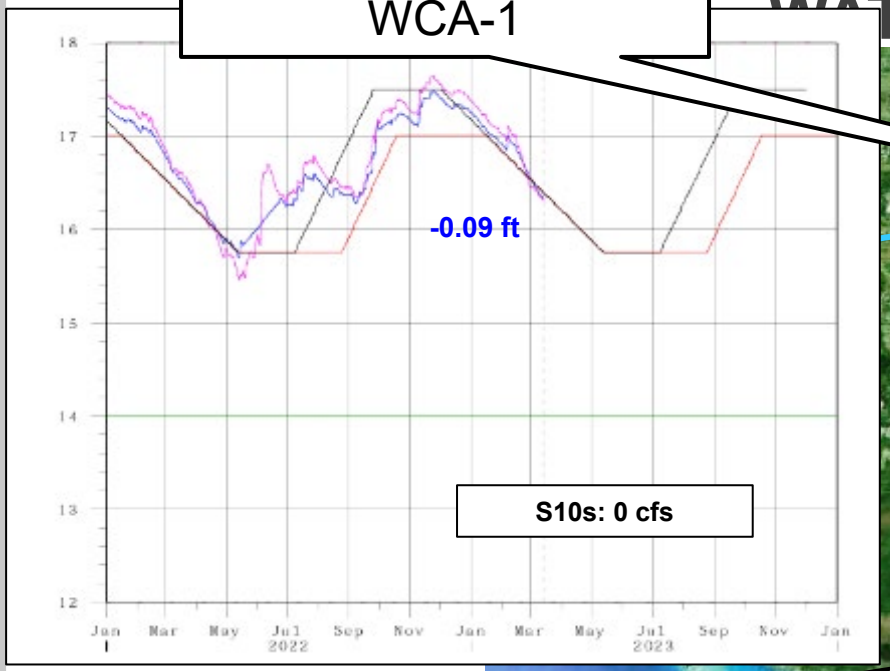
LORS guidance recommends up to 450/200 cfs at S-79/S-80
USACE is targeting 2,000/500 cfs at S-79/S-80

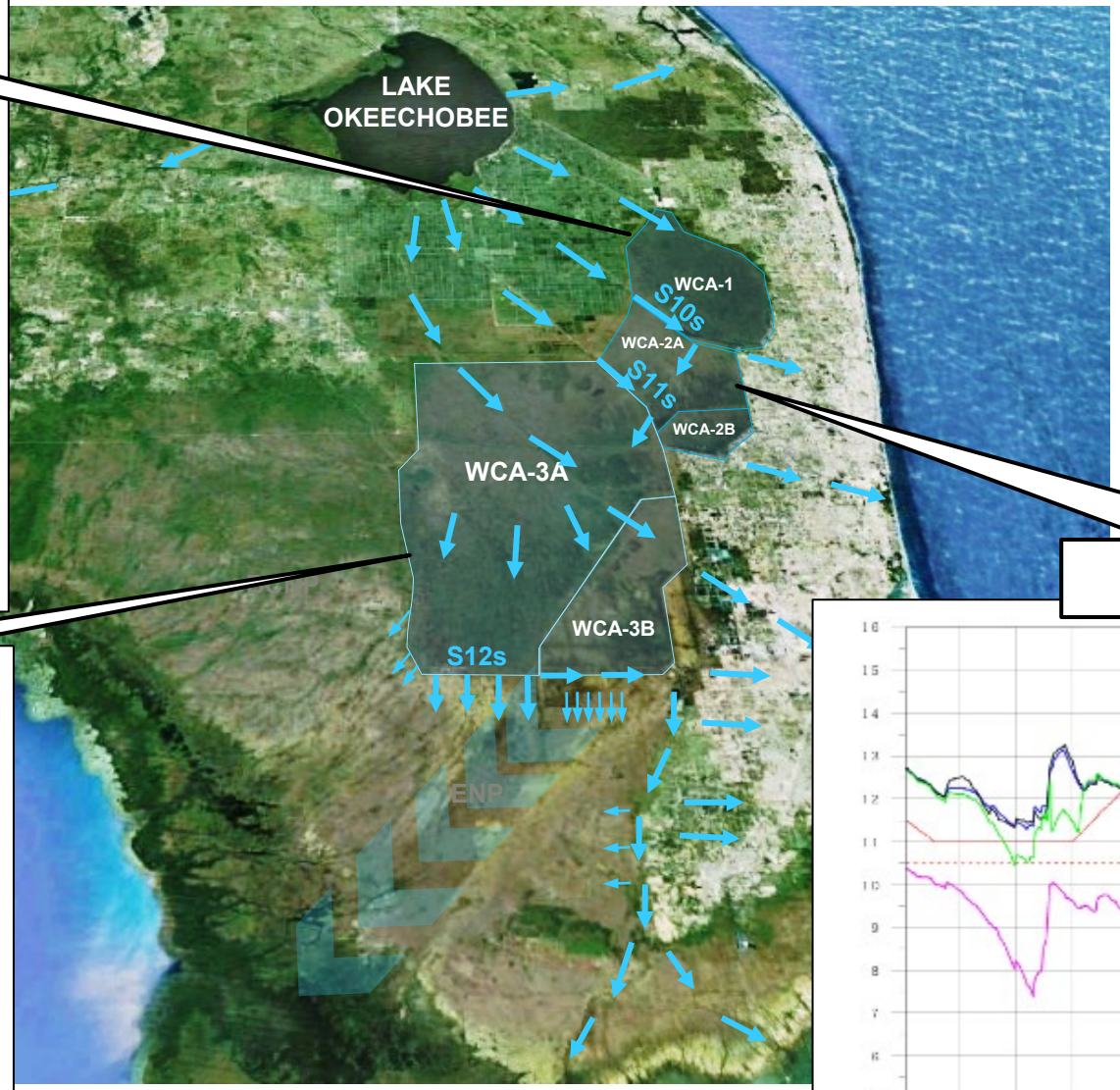
Difference between actual releases and targets (accounting for basin runoff and any water supply deliveries) is using the banked water to make releases over LORS Part D

845,000 ac-ft in water bank now

WATER CONSERVATION AREAS

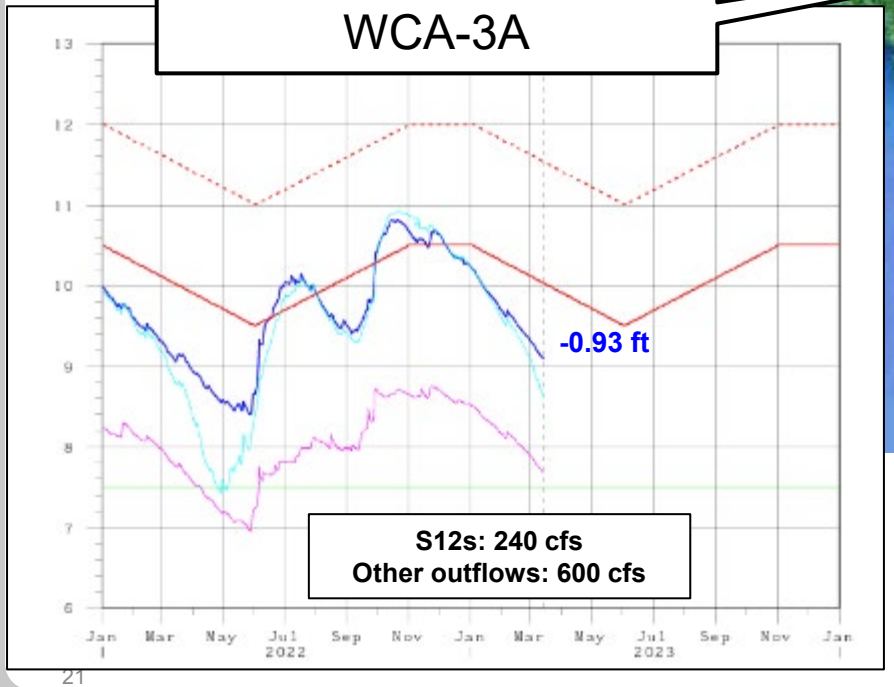
WCA-1





WCA-2A

WCA-3A



LAKE OKEECHOBEE DRY SEASON STRATEGY

- Our goal is to reduce water levels, to the extent possible, before the onset of the wet season by making beneficial releases to downstream users and environments. We hope to get lake levels down into the ecological stage envelope soon and look for opportunities to send water south in concert with our state partners. This also allows us to remain within the RECOVER flow envelope for releases to the Caloosahatchee.
- We will use the banked water to sustain releases longer into the dry season, which will help manage stages over the long term and help maintain optimum salinity levels in the Caloosahatchee Estuary.
- We have an increased risk of below normal rainfall this dry season with the current La Niña condition and will be running projections out through June to help adjust our plan along the way and minimize the risk of entering the Water Shortage Management Band.
- We will continue to evaluate conditions throughout the dry season and will adjust releases as necessary.
- We expect an increased risk of algal blooms this summer due to the hurricanes, so we believe making releases now will reduce the potential for needing to release water next year when algae risk is higher.
- Lowering lake water levels while protecting ecosystems on the lake, the estuaries, and throughout the Everglades, while also ensuring enough water is available for beneficial uses, is a delicate balance.
- Achieving this balance given the extraordinary circumstances of this year may be tough, but we are committed to transparency and open communication throughout this dry season and during whatever adversity mother nature may throw at us.

Team Input

Thank you for participating

SEMINOLE TRIBE OF FLORIDA - INPUT

SEVEN CURRENT REPORTS OF BLUE-GREEN ALGAE ON LAKE OKEECHOBEE

All blue green algae reports are current (3/6/2023 – 3/8/2023).
Example of a report:

Close

MARKER:	LAT/LONG:
Lake Okeechobee - CLV10A	26.91607806, -80.6246625

HEALTH NOTIFICATION:

3/8/2023
CAUTION
Blue-Green Algae

Blue-green algal bloom conditions were observed or cyanobacteria was found to be the dominant species of algae in the sample. Not all blue-green algae contains toxins. However, adults, children and pets should avoid swimming in or drinking water from these waters while blue-green algal blooms are present.

More on Health Notifications

EFFECTS REPORTED:

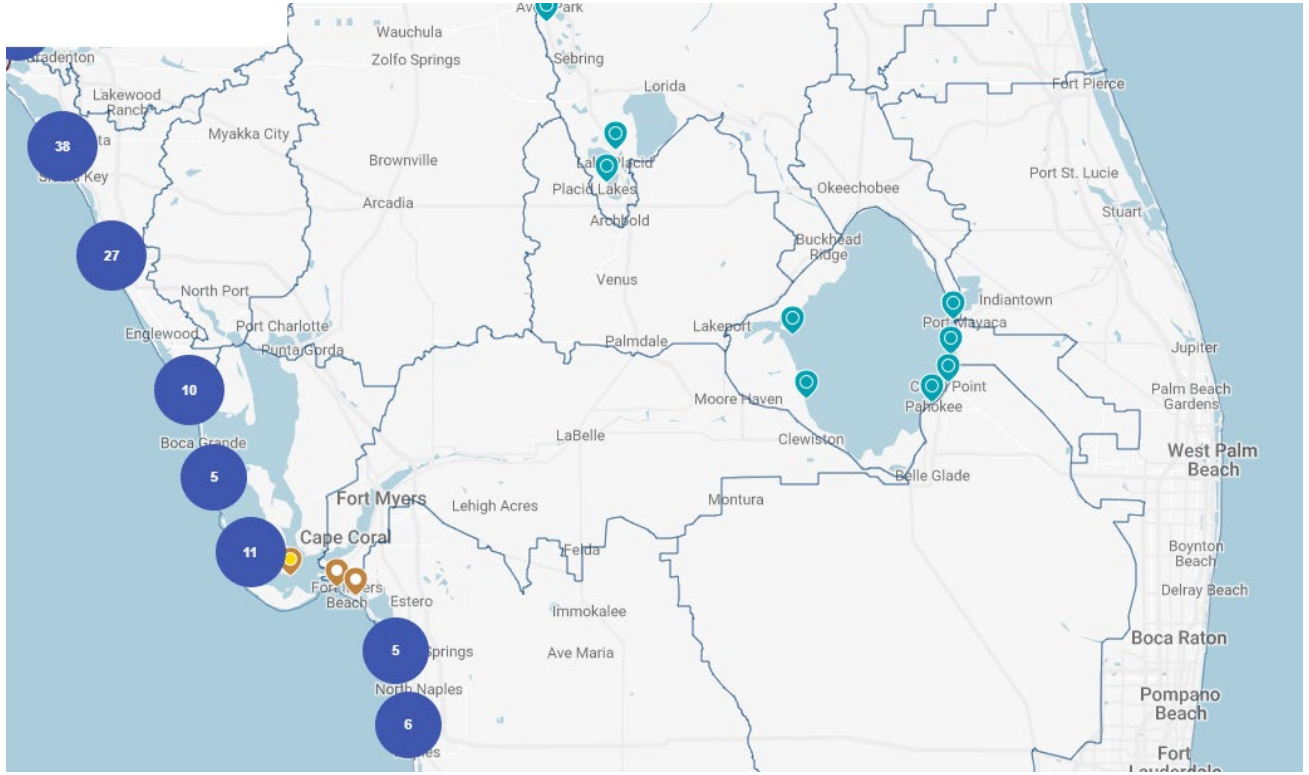
3/8/2023
BLUE-GREEN ALGAE
DEP
Bloom Observed: No
Cyanobacteria Dominant: Yes
Toxin Detected: No

Bloom conditions were not observed at the time the sample was collected.

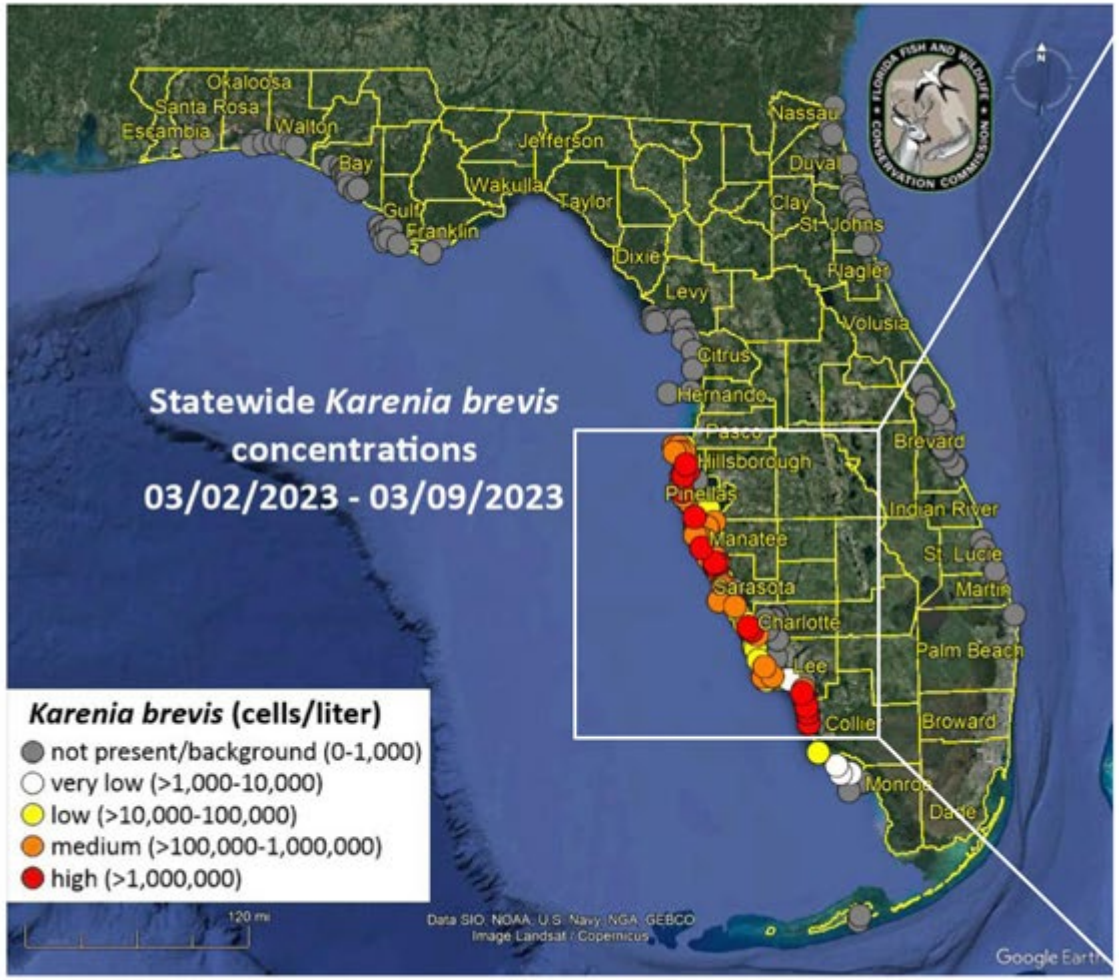
Blue-green algae, or cyanobacteria, are an important part of Florida's aquatic ecosystems, but they can sometimes form large blooms that may be harmful to humans and aquatic life. A sample was taken at this location on the date noted.

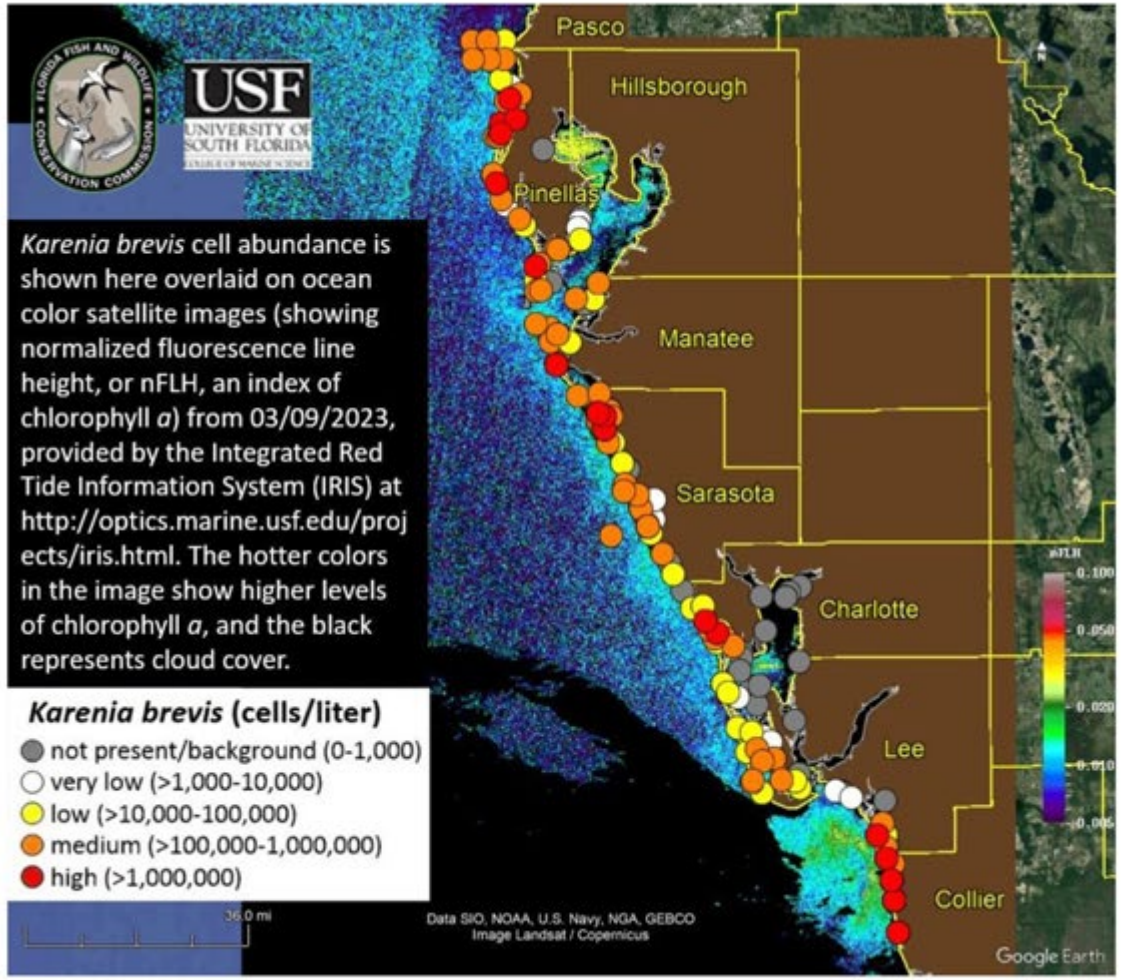
Bloom conditions were not observed at the time the sample was collected. However, bloom conditions can change quickly. There is no way to tell if a blue-green algal bloom is toxic just by looking at it. Adults, children, and animals should avoid contact with water when algal blooms are present. Toxins can persist in the water after a bloom; watch for signs of recent blooms, such as green scum on the shoreline.

To report a bloom, please visit DEP's Algal Bloom Dashboard.



https://protectingfloridatogether.gov/water-quality-status-dashboard



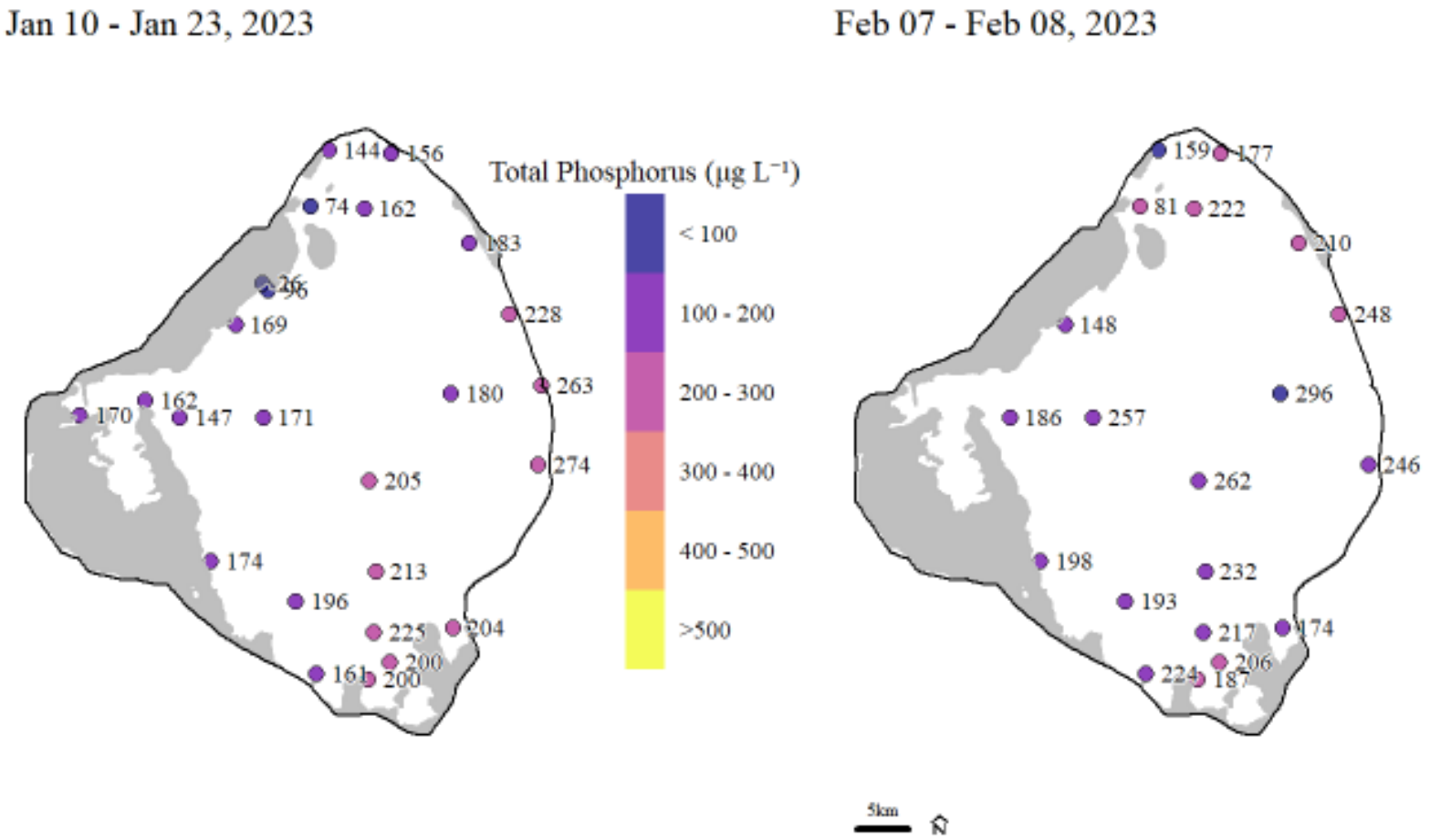


https://myfwc.com/research/redtide/statewide/

Spatial

Total Phosphorus

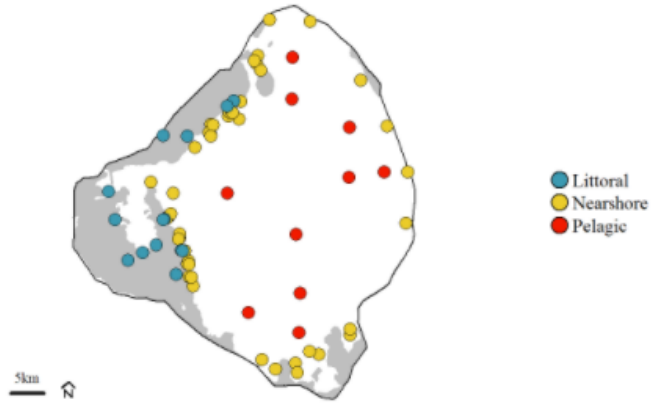
Disclaimer: The data provided here should be considered preliminary and are subject to change. The data used here is from the South Florida Water Management District and available on DBHYDRO.



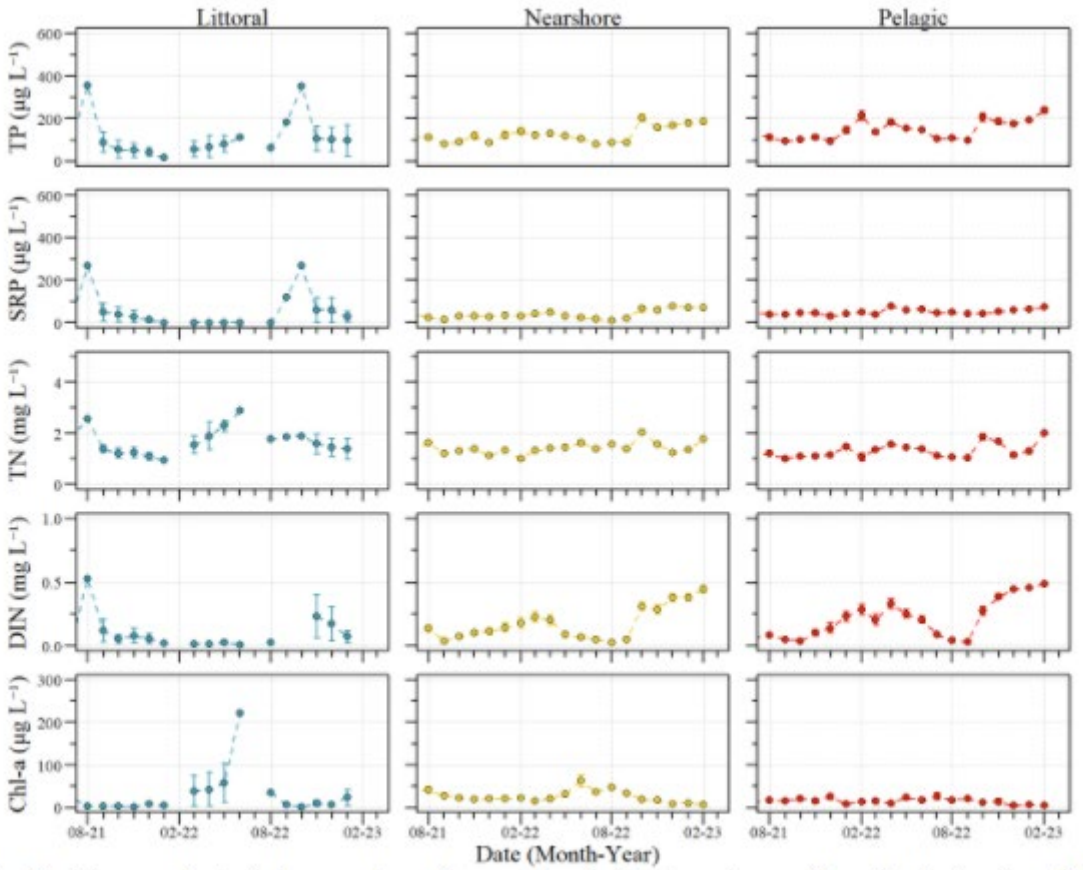
Total Phosphorus Concentrations across the lake for the last two months.

https://swampthingecology.org/LakeO_WQ/currentWQStatus/index

Time Series



Monitoring location with littoral, nearshore and pelagic/limnetic zones identified across Lake Okeechobee. Includes active and inactive (historical) monitoring locations.



Monthly arithmetic mean with standard error water quality parameters for littoral, nearshore and limnetic/pelagic regions of the lake.

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STOF SUMMARY

Total Phosphorus and Total Nitrogen levels have been increasing in Lake Okeechobee since August 2022, and current levels are among the highest reported in the past 12 months.

Red Tide is widespread along Gulf coast and has persisted for more than 30 days.

Blue-green algae reports becoming more frequent from Lake Okeechobee. Initial reports started in January and have become more frequent in March.

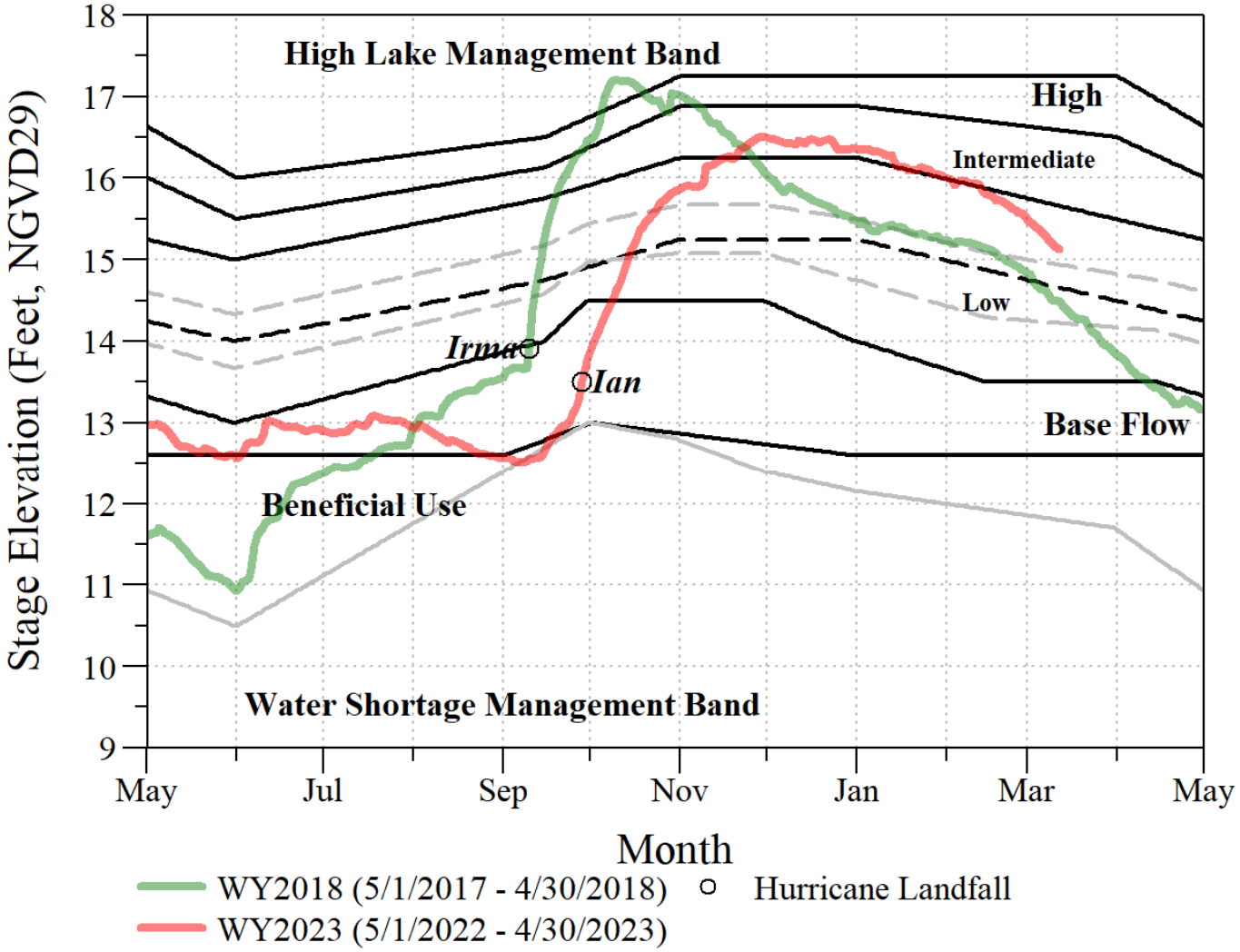
Comparing 2018 and 2023 with respect to:

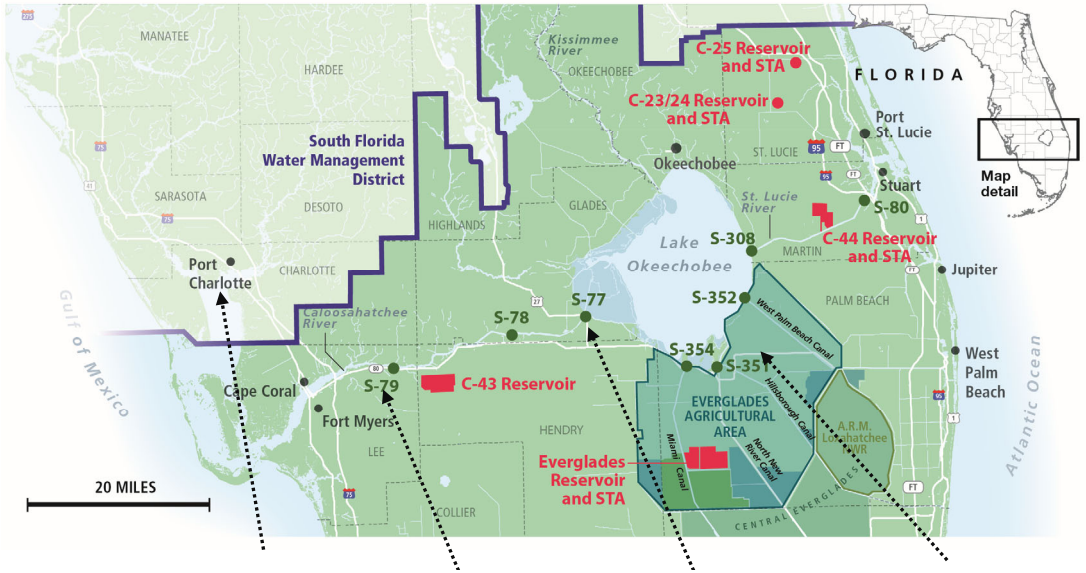
Lake Okeechobee position & discharge

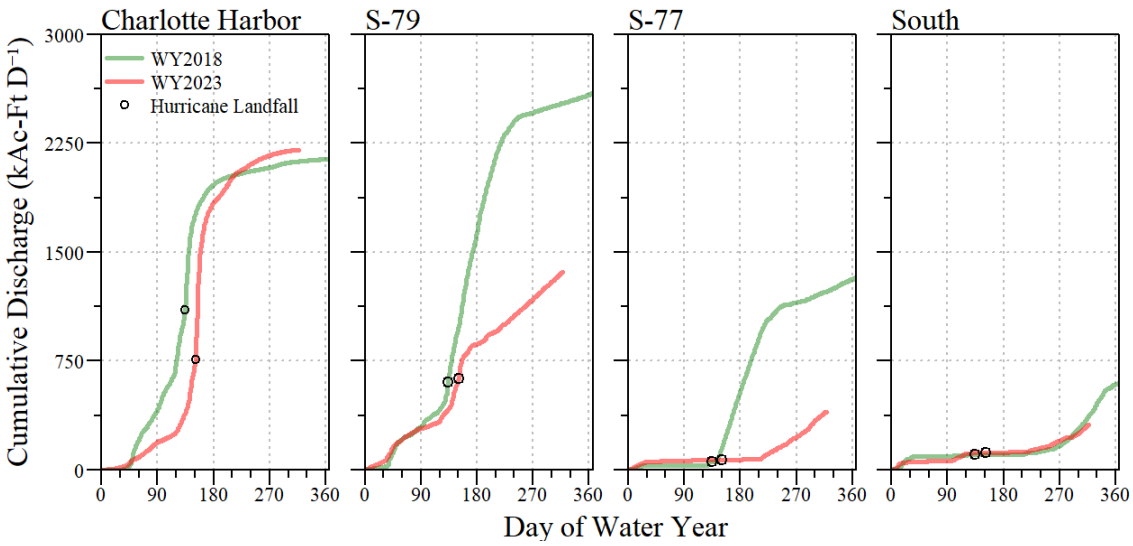
Red Tide distribution & intensity

Paul Julian PhD

Lake Okeechobee stages in Water Year (WY) 2018 and 2023





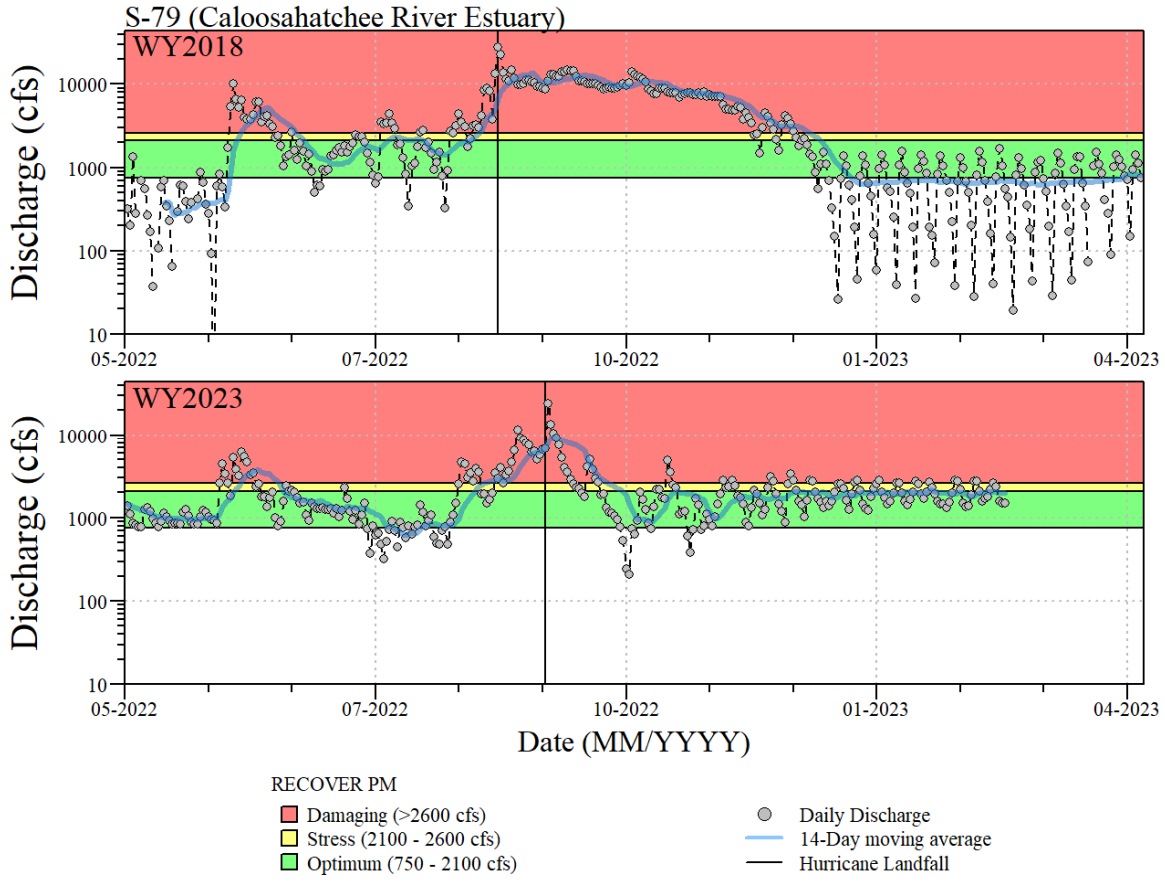


Freshwater Discharges

- Lake discharges following Hurricane Irma were more aggressive to the Caloosahatchee estuary, beginning on September 18, 2017, one week after the storm's landfall.

  Discharges to Caloosahatchee following Ian were more measured (due greater capacity in the lake and the storm coming later in the wet season) and began on November 28, 2022, two months after the storm's landfall.

Water Year (WY) begins May 1 and concludes April 30.



- Pre-Irma, 3 consecutive Stress and Damaging events (including 8 days prior to landfall).
- Post-Irma, 117 consecutive days with 14-day moving average in Stress and Damaging.

- Pre-Ian, 2 consecutive Stress and Damaging events (including 25 days prior to landfall).
- Post-Ian, 27 consecutive days with 14-day moving average in Stress and Damaging.

Red Tide data near Charlotte Harbor in Water Years 2018 and 2023