

DRAFT

Ecological Conditions Update

Governing Board Meeting
March 11, 2021



Lawrence Glenn
Division Director
Water Resources

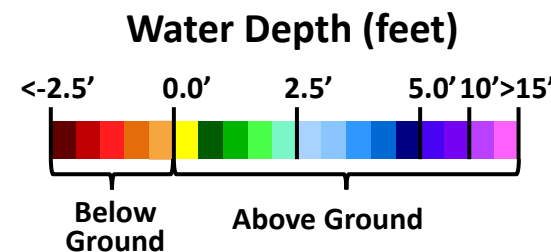
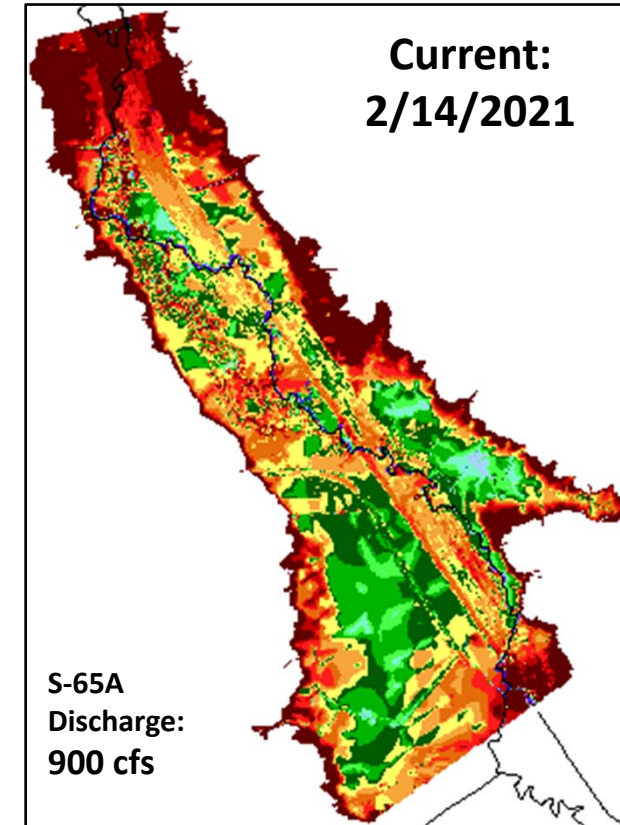
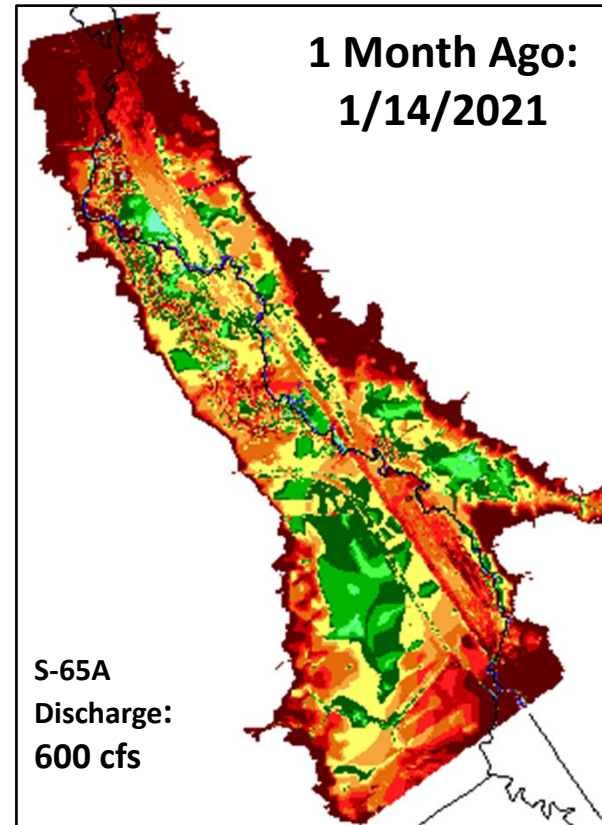
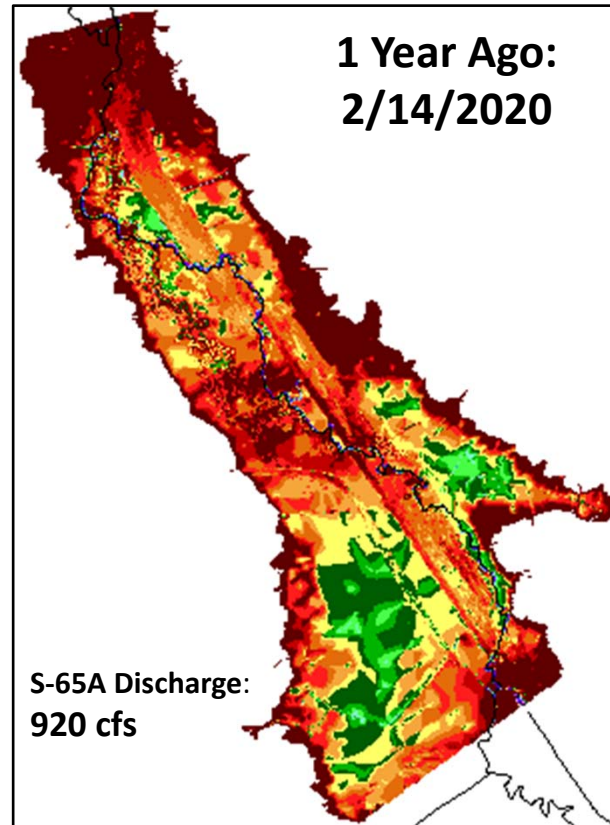
*Indian River Lagoon
Coastal Ecosystem Section
February 9, 2021*

Kissimmee River Phase I Restoration Area

Water Depth Maps

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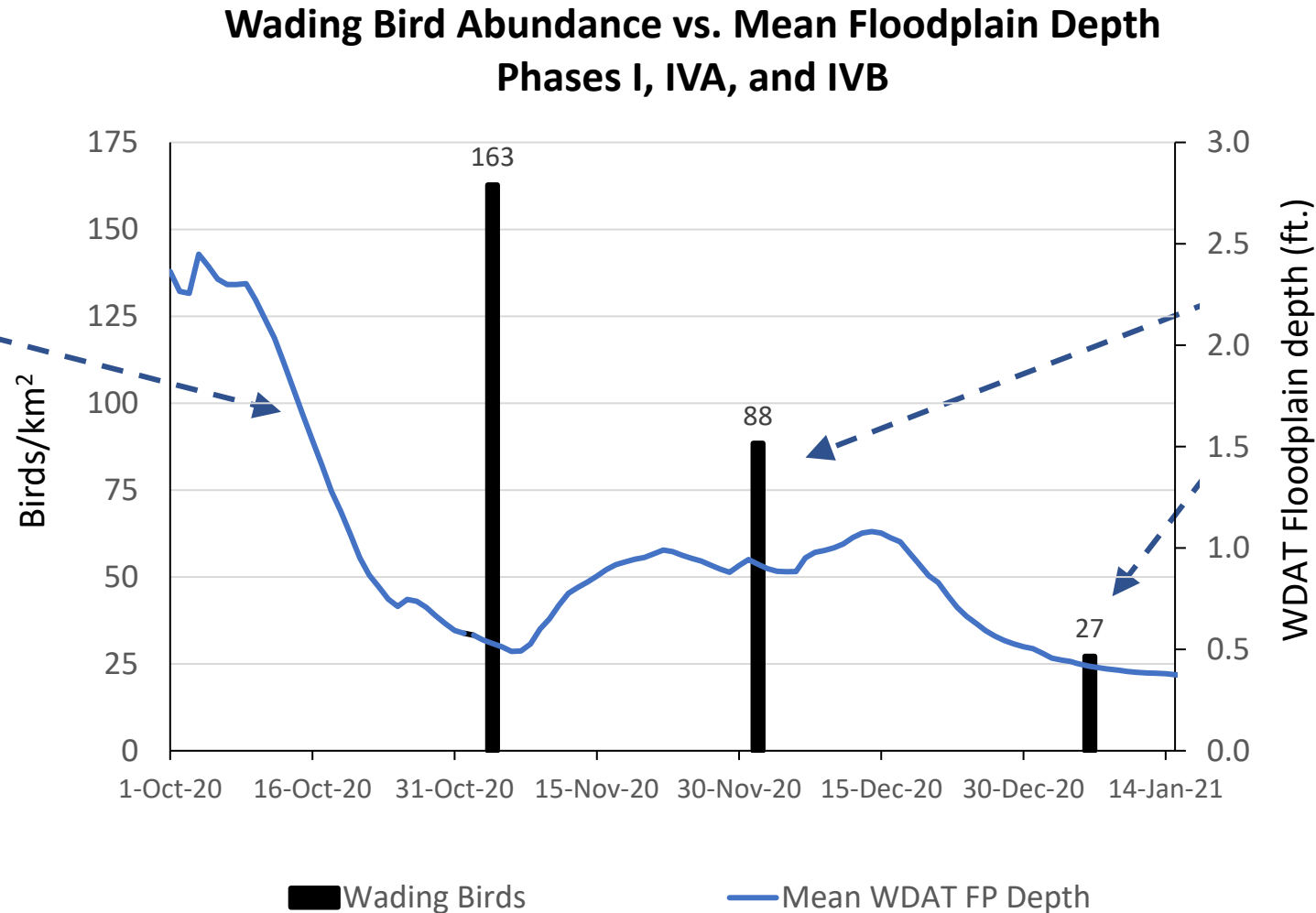
Data to be updated



Kissimmee River Floodplain Wading Bird Foraging Surveys

DRAFT**Data to be updated**

Rapid discharge reductions in Oct 2020 quickly reduced depths on the KR floodplain, which concentrated prey and resulted in a sudden “boom” in wading bird foraging, as seen in the Nov 2020 bird survey

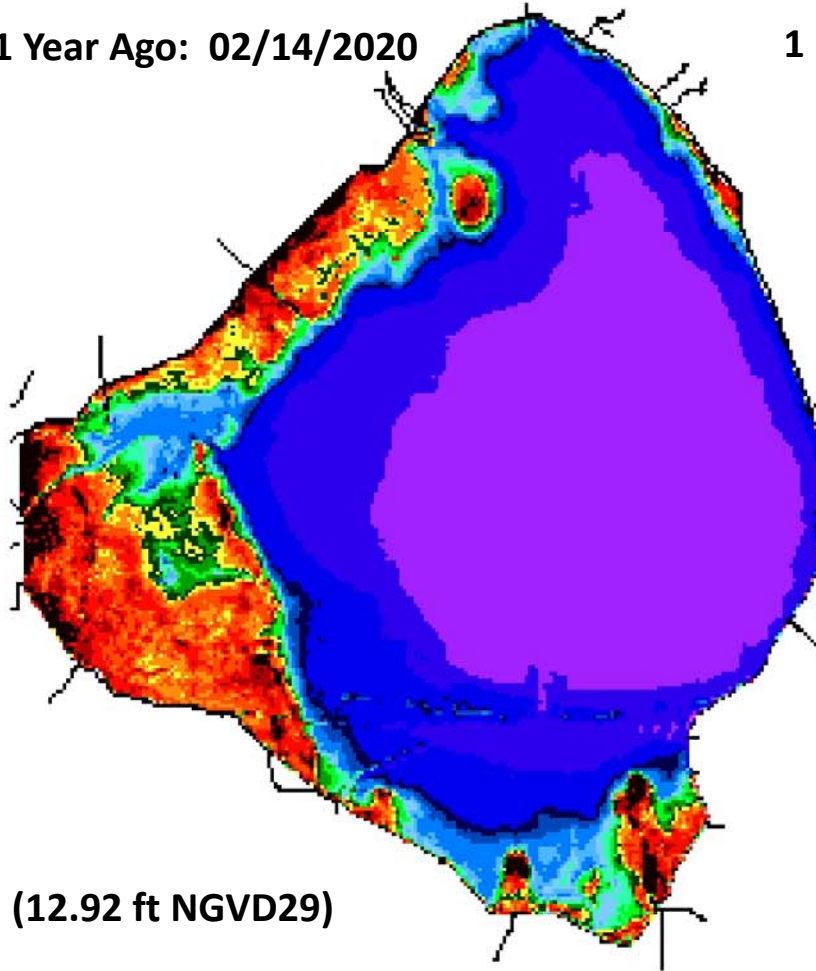


Reduction in prey and temporary increase in water depth was reflected in declining bird abundance in the Dec 2020 and Jan 2021 surveys

Lake Okeechobee Water Depth Maps

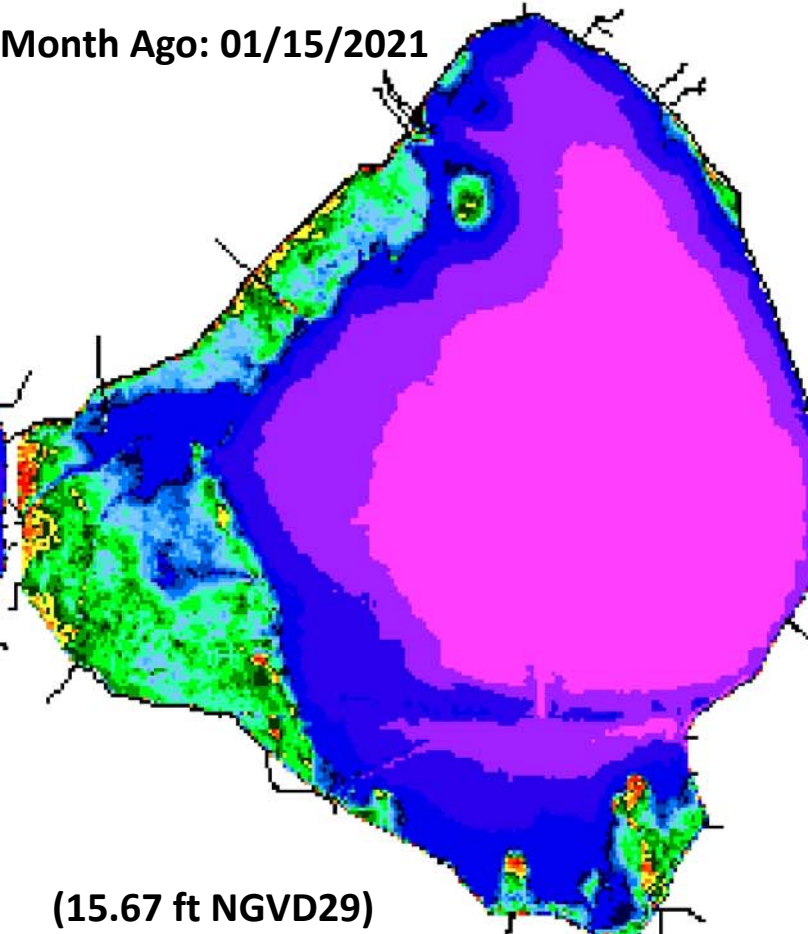
DRAFT
Data to be updated

1 Year Ago: 02/14/2020



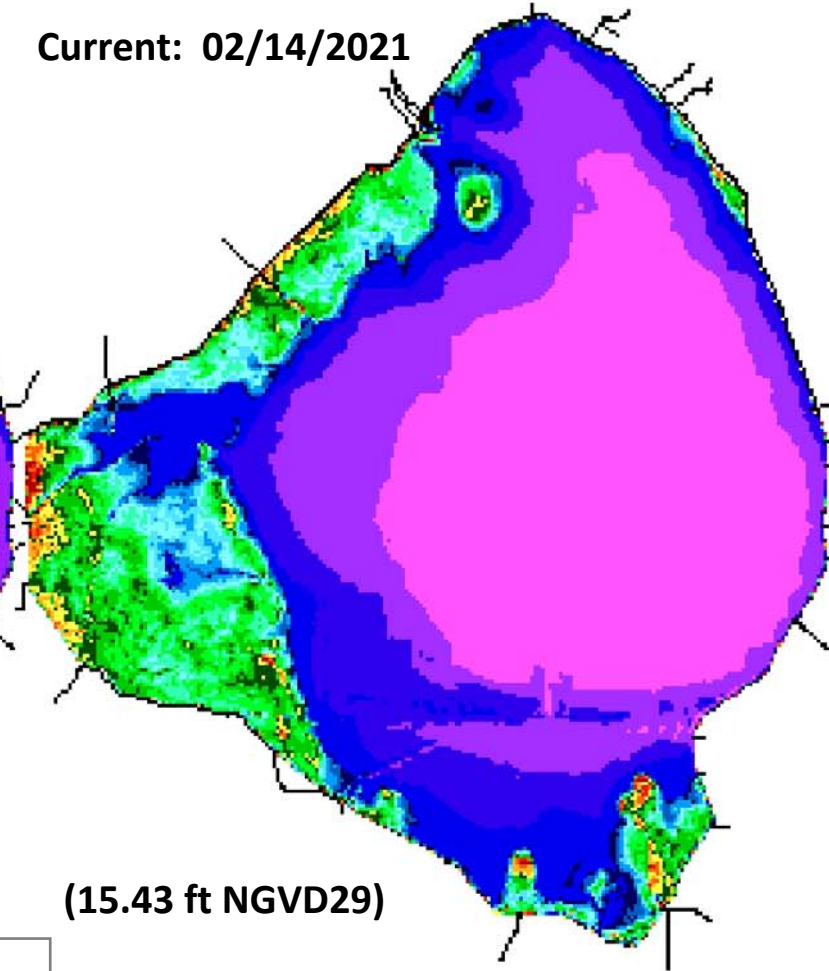
(12.92 ft NGVD29)

1 Month Ago: 01/15/2021

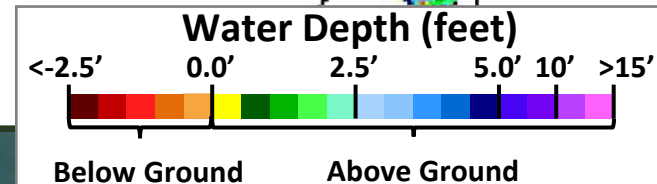


(15.67 ft NGVD29)

Current: 02/14/2021



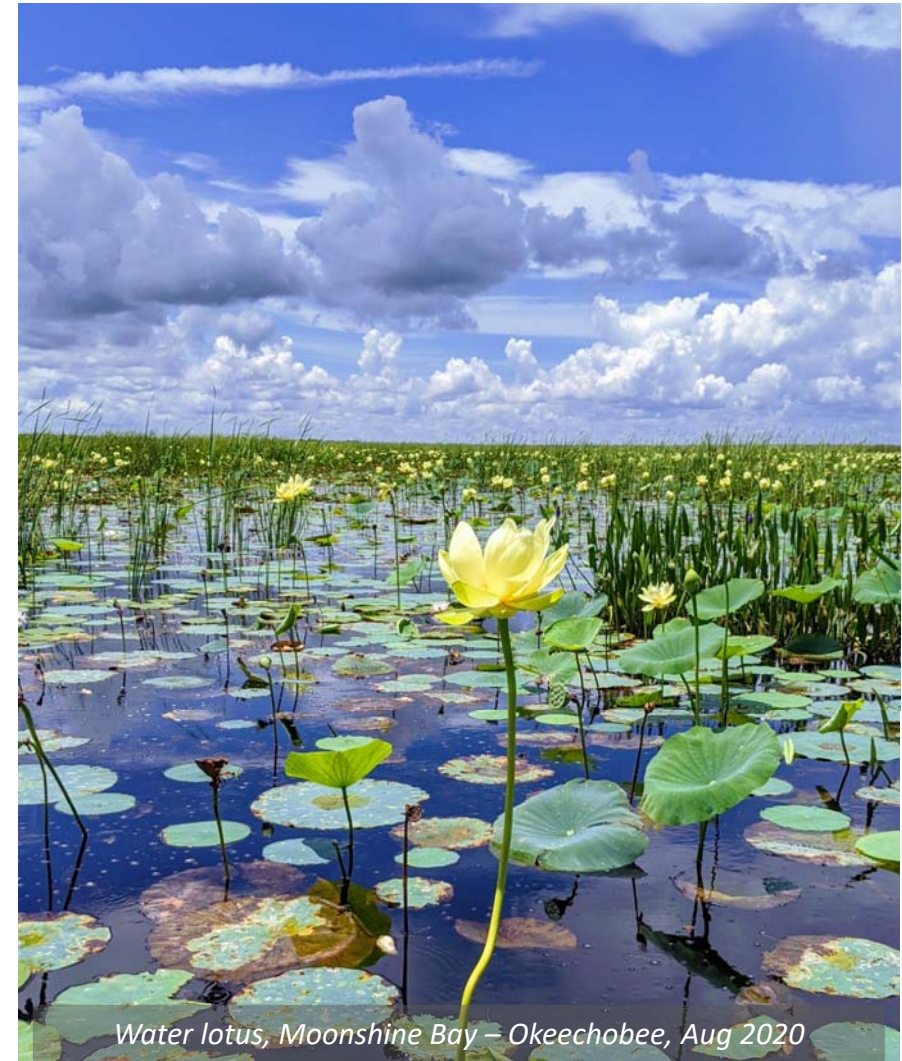
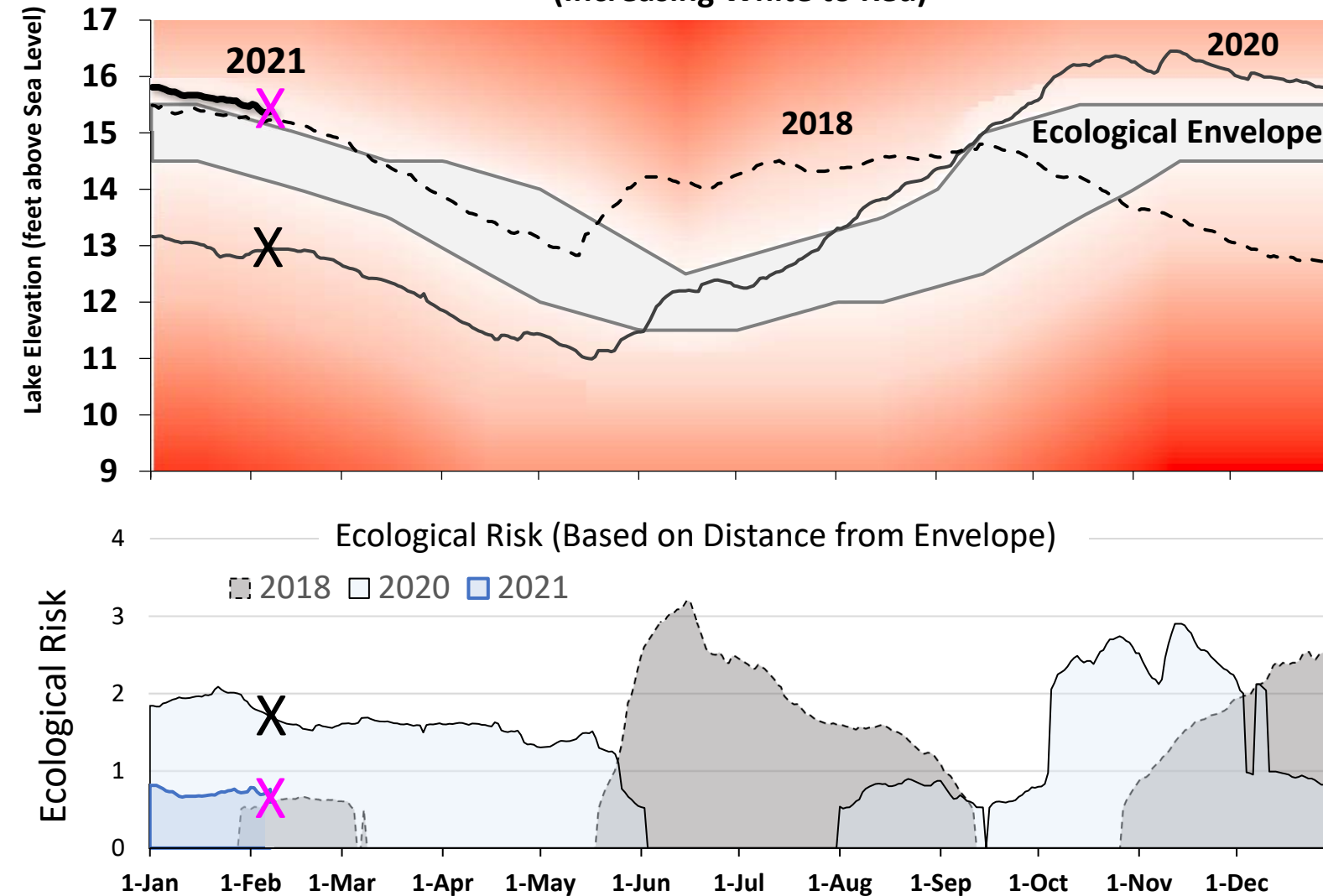
(15.43 ft NGVD29)



Lake Okeechobee Stages and Ecological Envelope

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Data to be updated

Lake Okeechobee Stage vs Ecological Envelope and Environmental Risk
(Increasing White to Red)

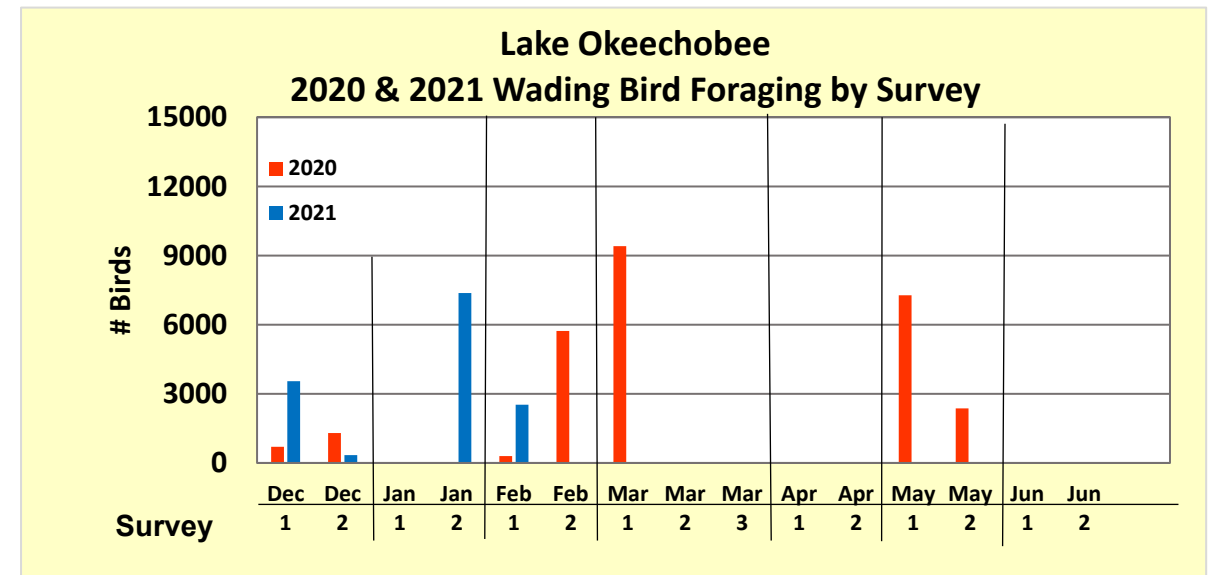
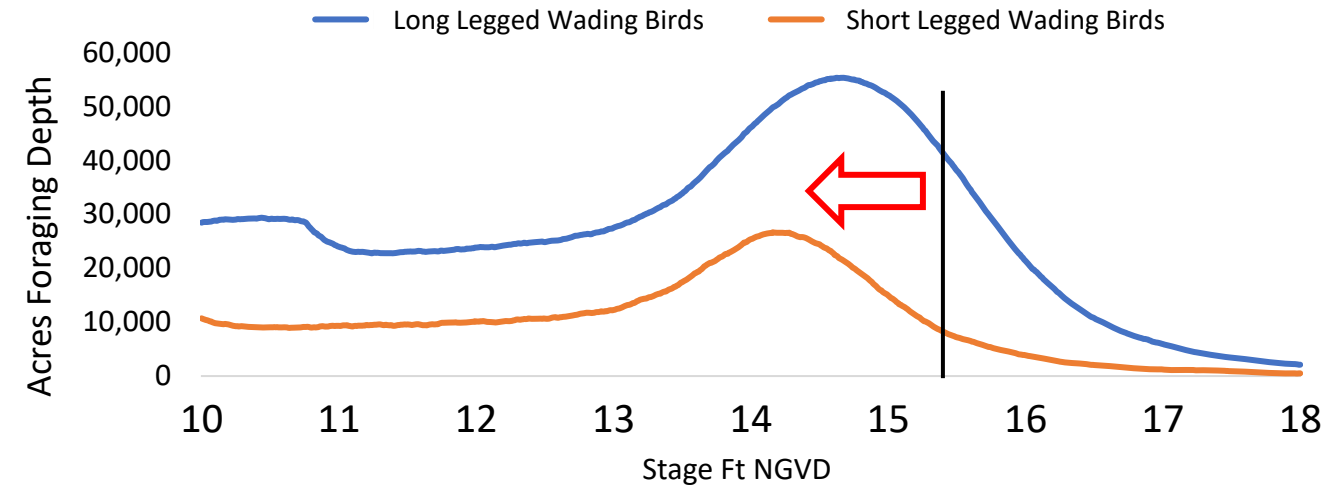
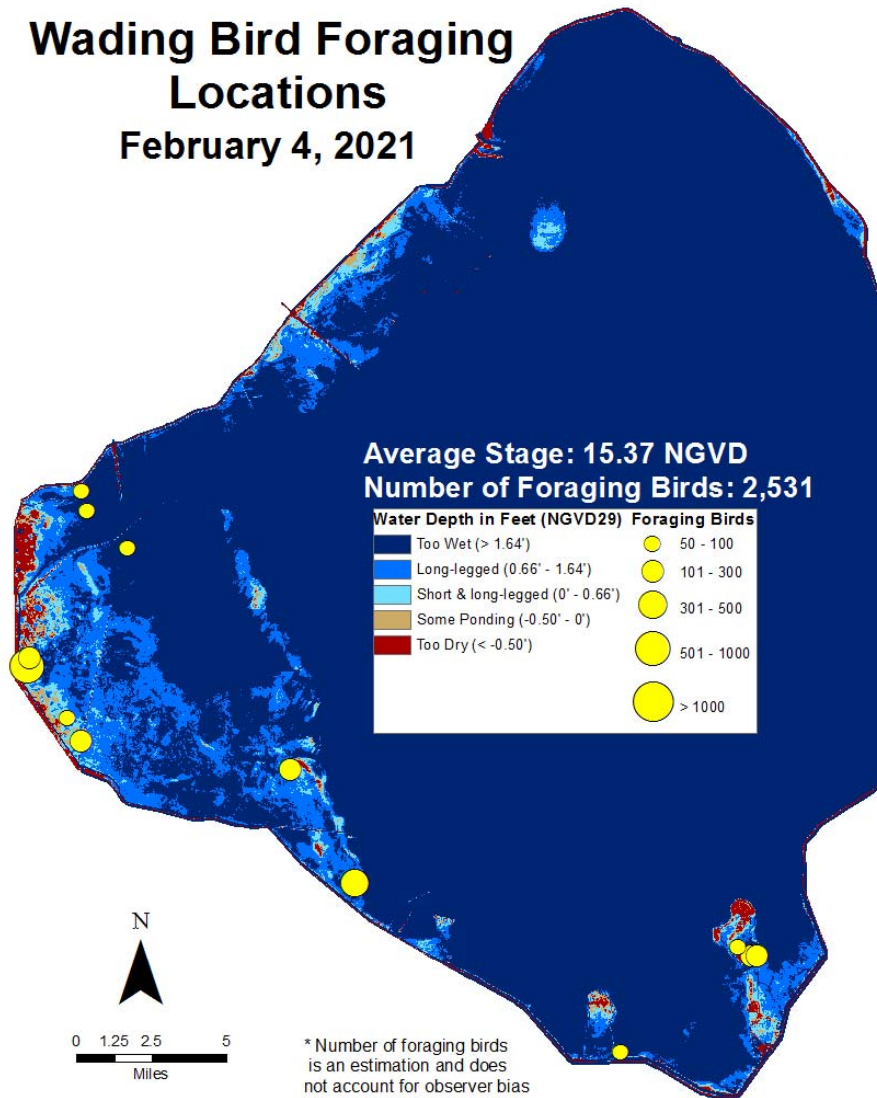


Lake Okeechobee Foraging Wading Birds

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Data to be updated

Wading Bird Foraging Locations February 4, 2021



Snail Kite Nest Monitoring

Data to be updated



- 12 nests in Hicpochee Impoundment area
- 7 nest in C-44 STA
- 90 snail kites observed on Lake Okeechobee, one nest

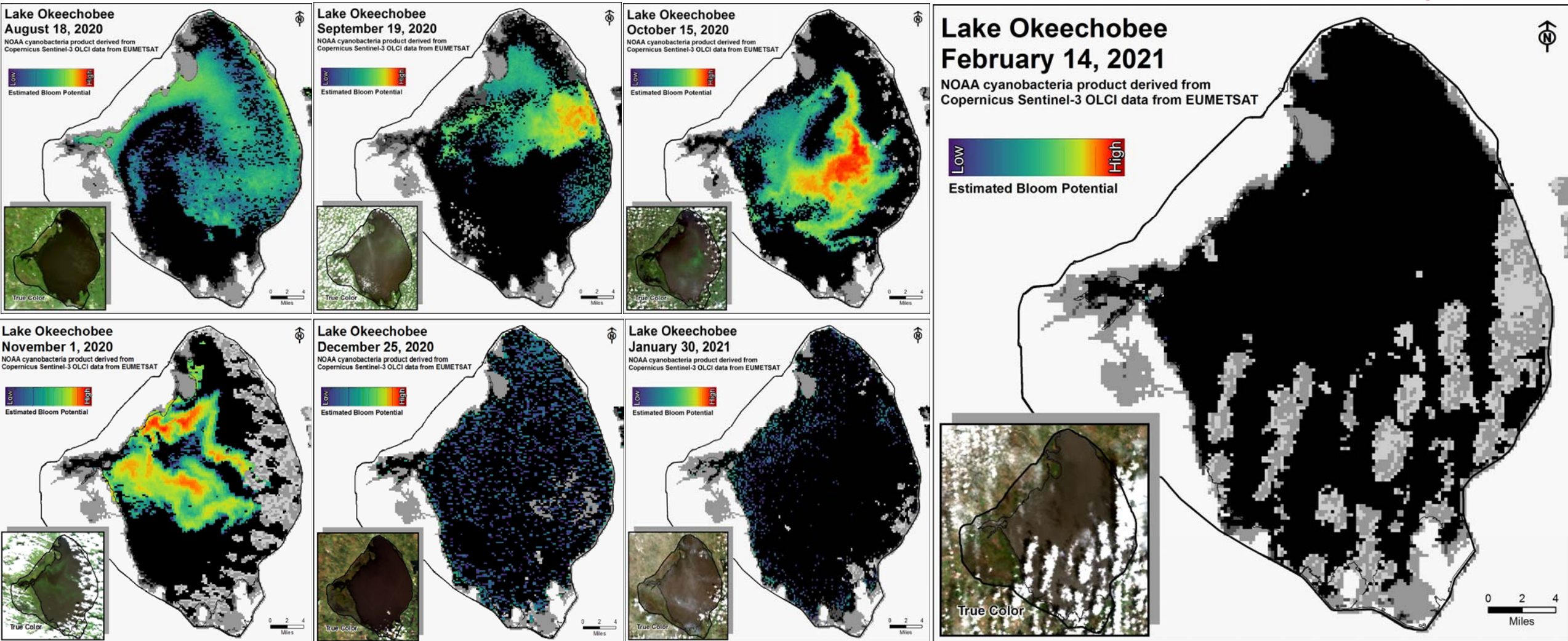


Snail Kite Nestlings
Credit: Jean Olbert



Snail Kite – Credit: Mike Tracy

Lake Okeechobee Cyanobacteria Bloom Potential

DRAFT**Data to be updated**

NOAA cyanobacteria product derived from Copernicus Sentinel-3 OLCI data from EUMETSAT

Lake Okeechobee Water Quality

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Provisional Data

Data to be updated

Collection Date: January 5-6, 2021

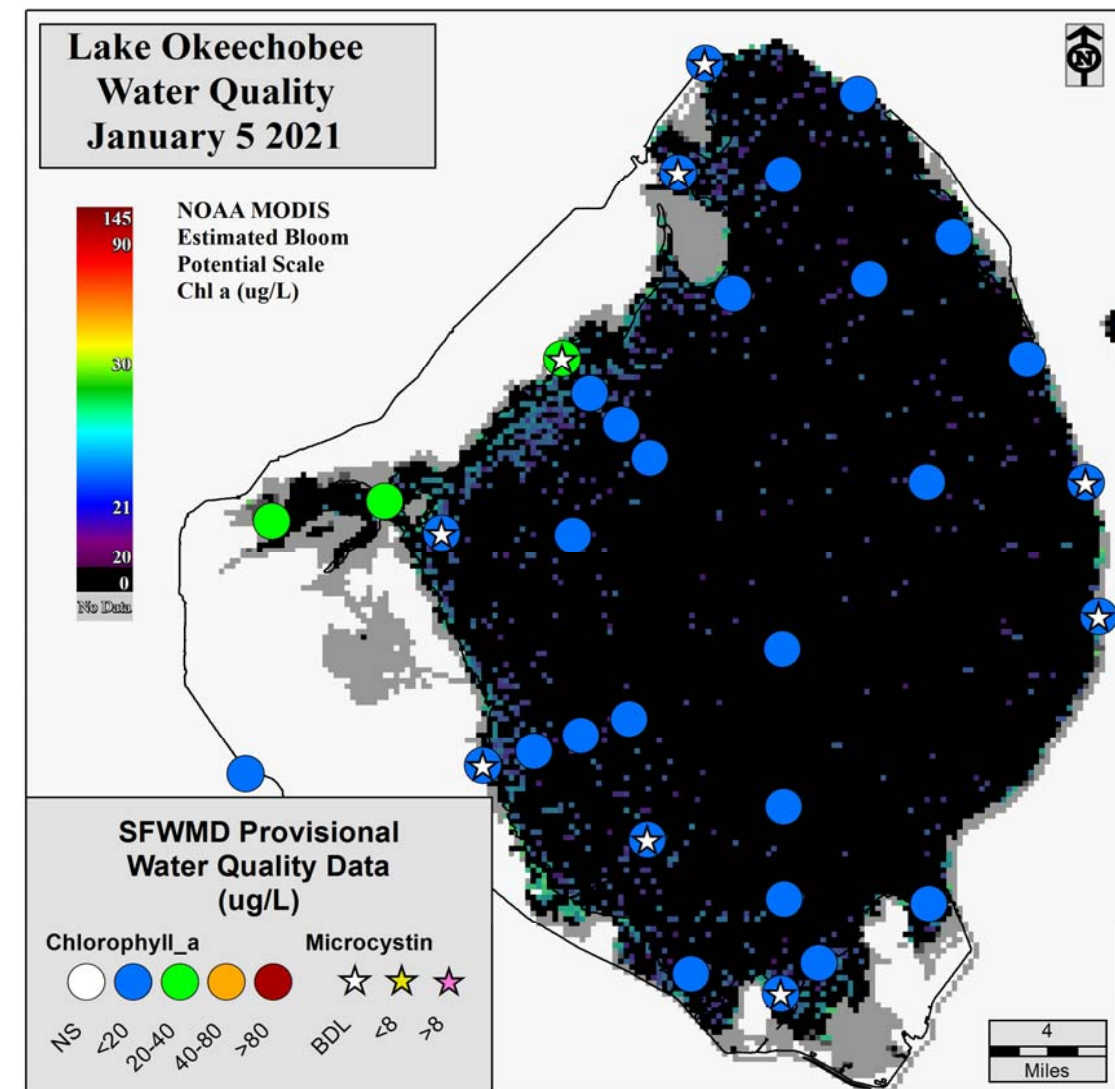
Station	CHL α (ug/L)	TOXIN (ug/L)	TAXA
FEBIN ^(1/4)	29.9		
FEBOUT ^(1/4)	27.4		
KISSR0.0	17.8	BDL	mixed
L005	5.9	BDL	mixed
LZ2	11.0	BDL	mixed
KBARSE	8.6		
RITTAE2	7.8	BDL	mixed
PELBAY3	5.5		
POLE3S	6.6		
LZ25A	6.7		
PALMOUT	19.5	BDL	mixed
PALMOUT1	7.0		
PALMOUT2	5.7		
PALMOUT3	5.3		
POLESOUT	30.5	BDL	mixed
POLESOUT1	15.8		
POLESOUT2	9.4		
POLESOUT3	8.4		
EASTSHORE	3.9		
NES135	4.1		
NES191	6.0		

Station	CHL α (ug/L)	TOXIN (ug/L)	TAXA
L001	5.2		
L004	6.2		
L006	4.4		
L007	7.8		
L008	9.2		
LZ30	7.0	BDL	mixed
LZ40	4.5		
CLV10A	4.0	BDL	mixed
NCENTER	4.8		

Sampled 1/11

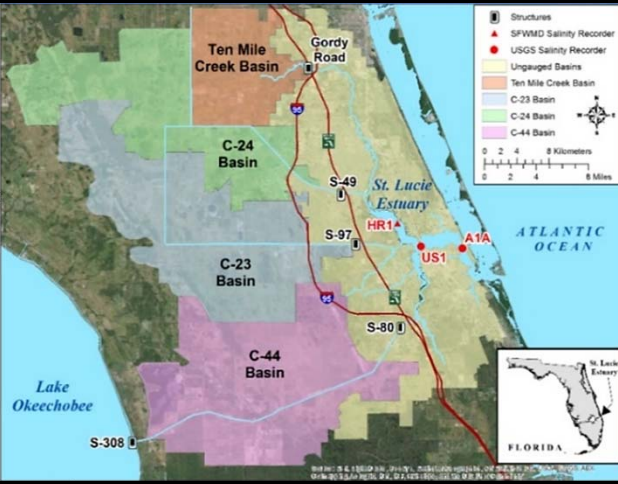
S308C	6.5	BDL	mixed
S77	5.2		

- SFWMD considers >40 $\mu\text{g/L}$ Chlorophyll a (Chl α) an algal bloom
- BDL – Below Detectable Limit of **0.25** $\mu\text{g/L}$
- ND – No Dominant taxa
- P – Pending
- NS – Not Sampled
- Bold – crew observed possible BGA
- Chlorophyll a analyzed by SFWMD
- Toxin and Taxa analyzed by FDEP

Cylindro = *Cylindrospermopsis**Planktol* = *Planktolyngbya**Dolicho* = *Dolichospermum*

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St. Lucie Inflows and Salinity Conditions



Total Daily Inflow into the St. Lucie Estuary

Data provisional and subject to change

Data to be updated

Weekly Average Inflow Feb. 8, 2021 - Feb. 14, 2021

Inflow from Lake	0 cfs
C-44 Basin	0 cfs
C-23 Basin	73 cfs
C-24 Basin	178 cfs
Ten Mile Creek	N/A
Tidal Basin Inflow	300 cfs
Total:	551 cfs

12,500

10,000

7,500

5,000

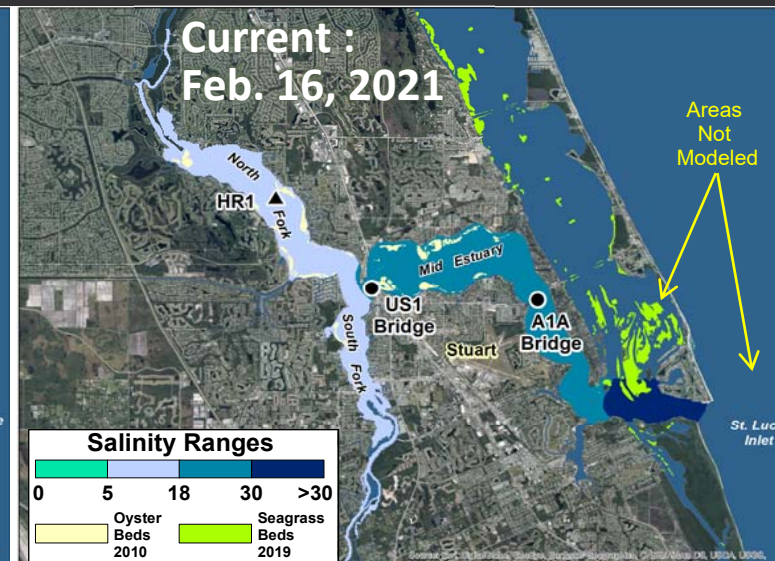
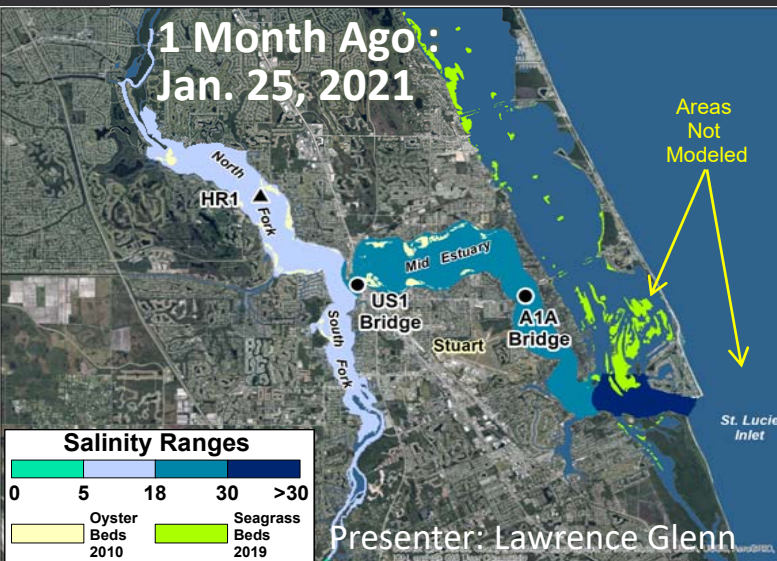
2,500

0

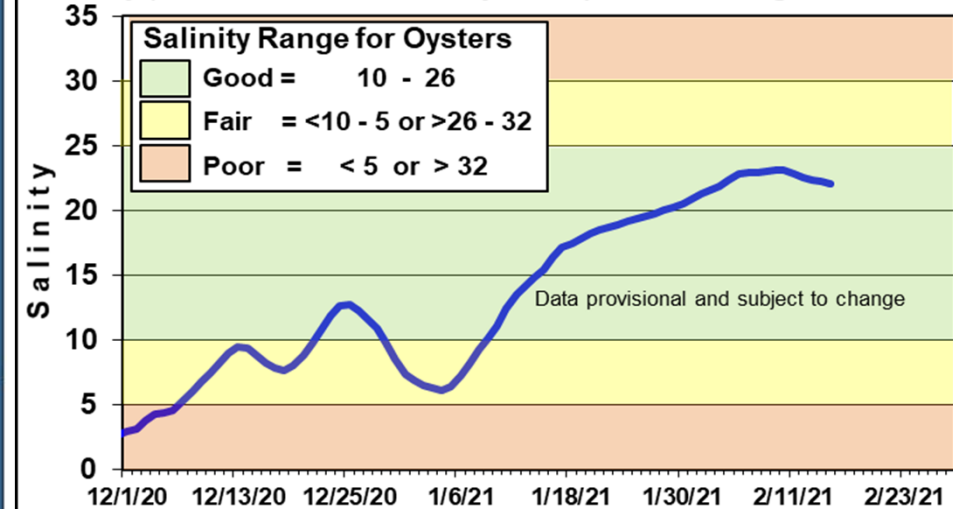
Total Flow (cfs)

Feb-20 Mar-20 Apr-20 May-20 Jun-20 Jul-20 Aug-20 Sep-20 Oct-20 Nov-20 Dec-20 Jan-21 Feb-21

■ Inflow from Lake ■ C-44 Basin Runoff ■ Inflow from C-24, C23, and Ten Mile Creek ■ Tidal Basin Inflow



Salinity (water column seven day mean) at US1 Bridge in the SLE



Southern IRL Seagrass Species

- Six seagrass species in the lagoon system:

Halodule wrightii

Syringodium filiforme

Thalassia testudinum

Halophila decipiens

Halophila johnsonii

Halophila engelmannii

- In December, showed cover and abundance index of SAV within each Segment (22-27)
- Current data analysis combines all Segments to look at trends for the two most abundant species in 2018 and 2019:

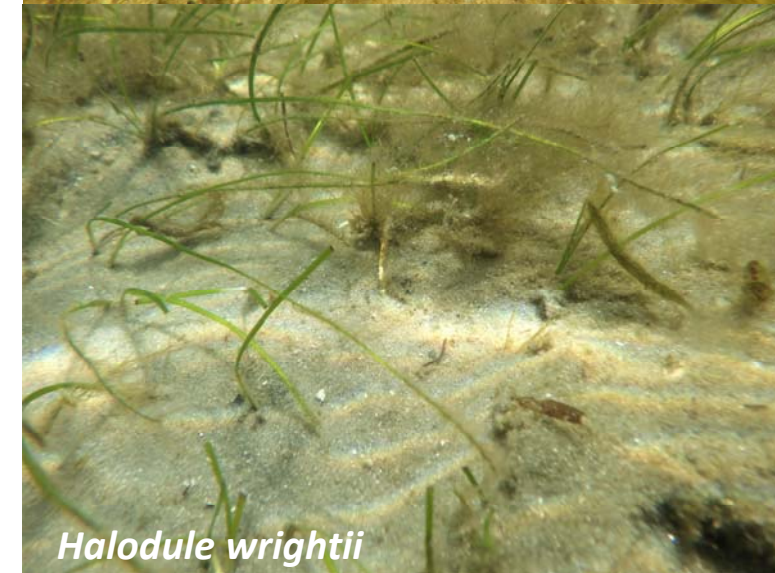
What factors drive changes in seagrass cover?

- Temperature, salinity, and light availability are three major influences

- Work is collaboration with partners at SJRWMD – Dr. Charles Jacoby

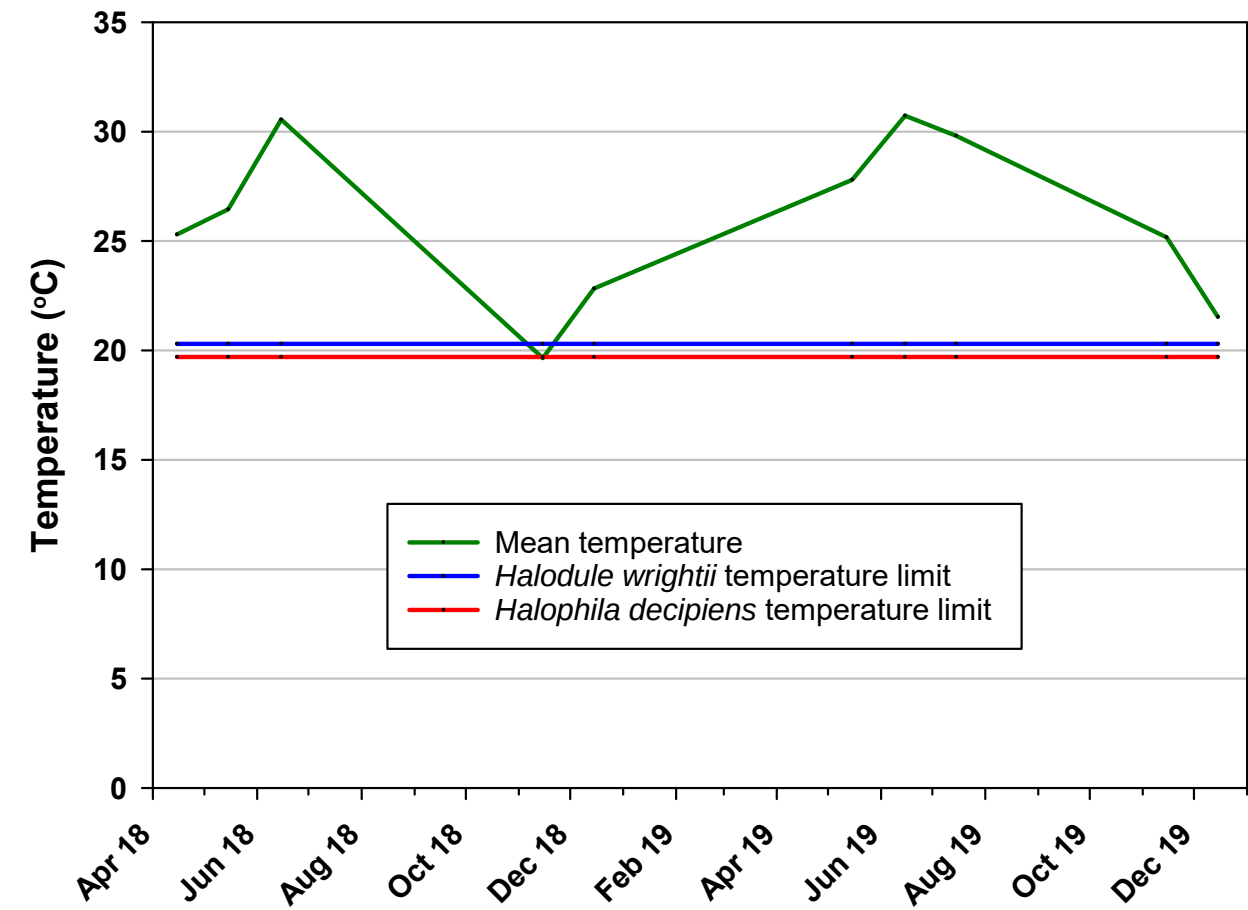
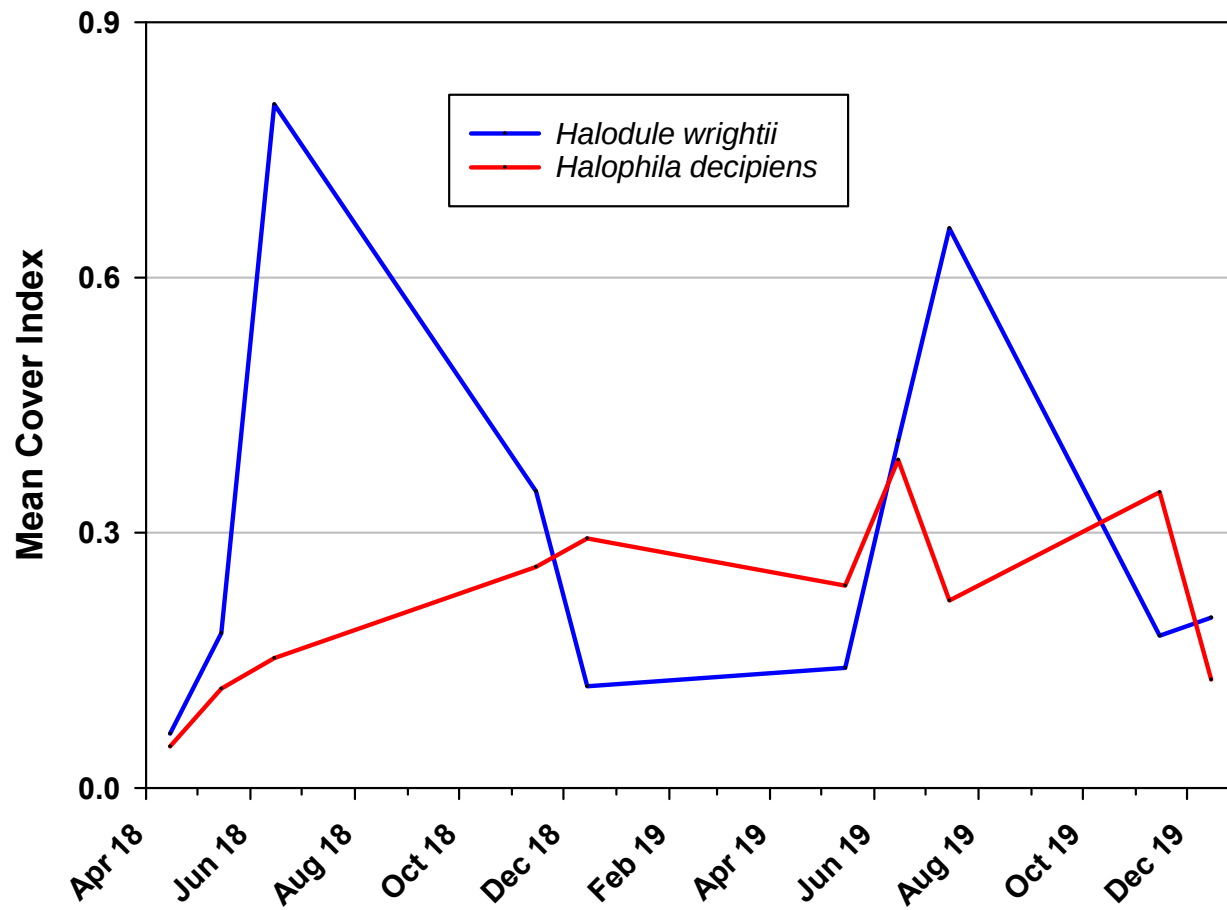


Halophila decipiens

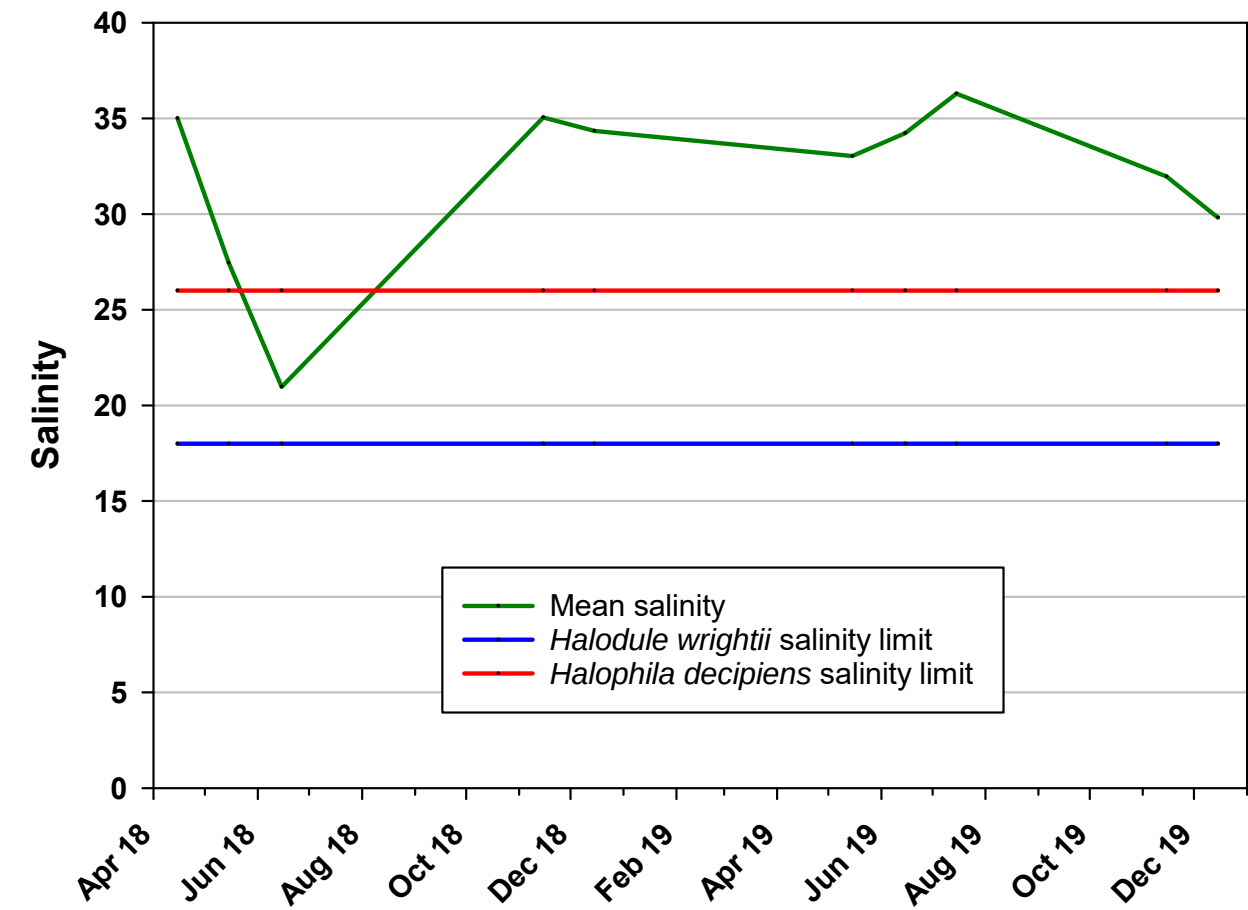
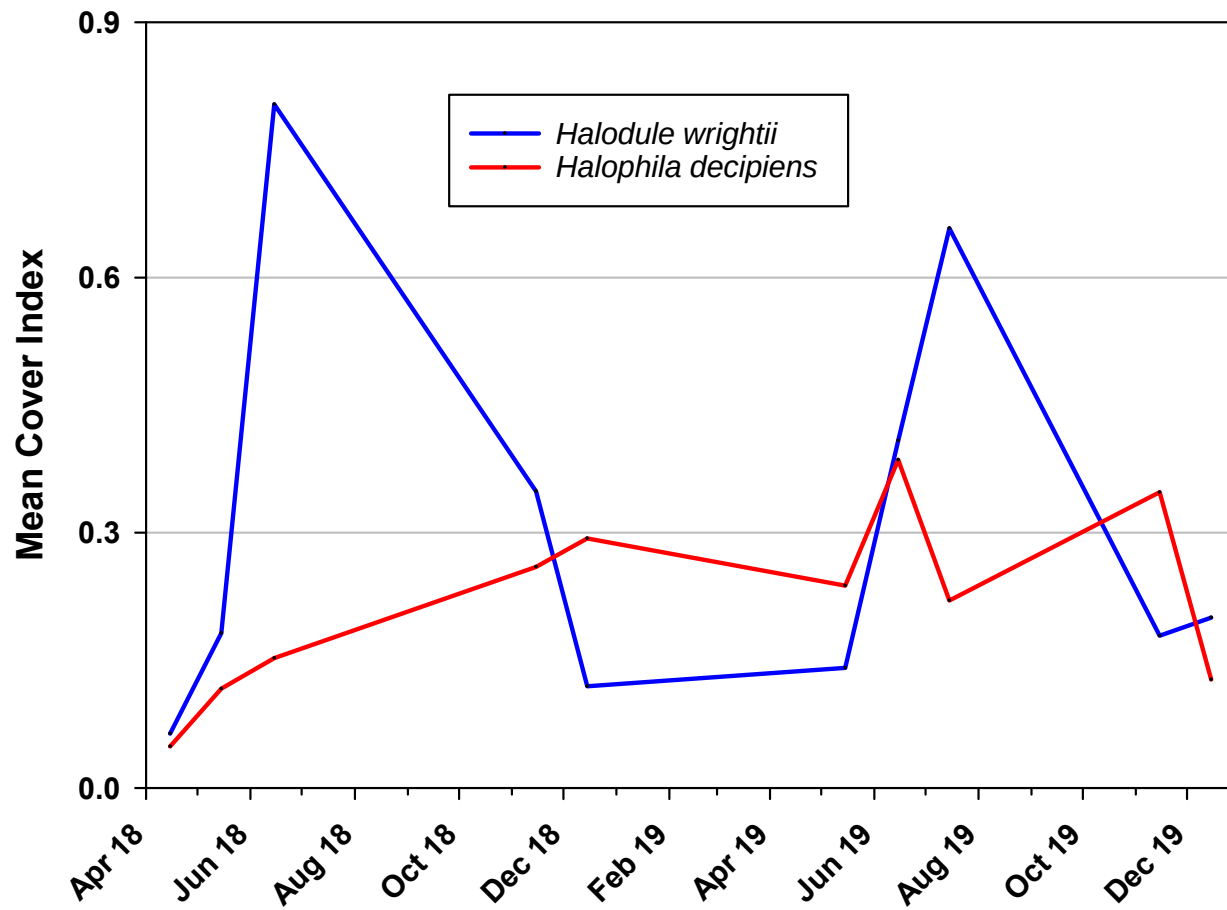


Halodule wrightii

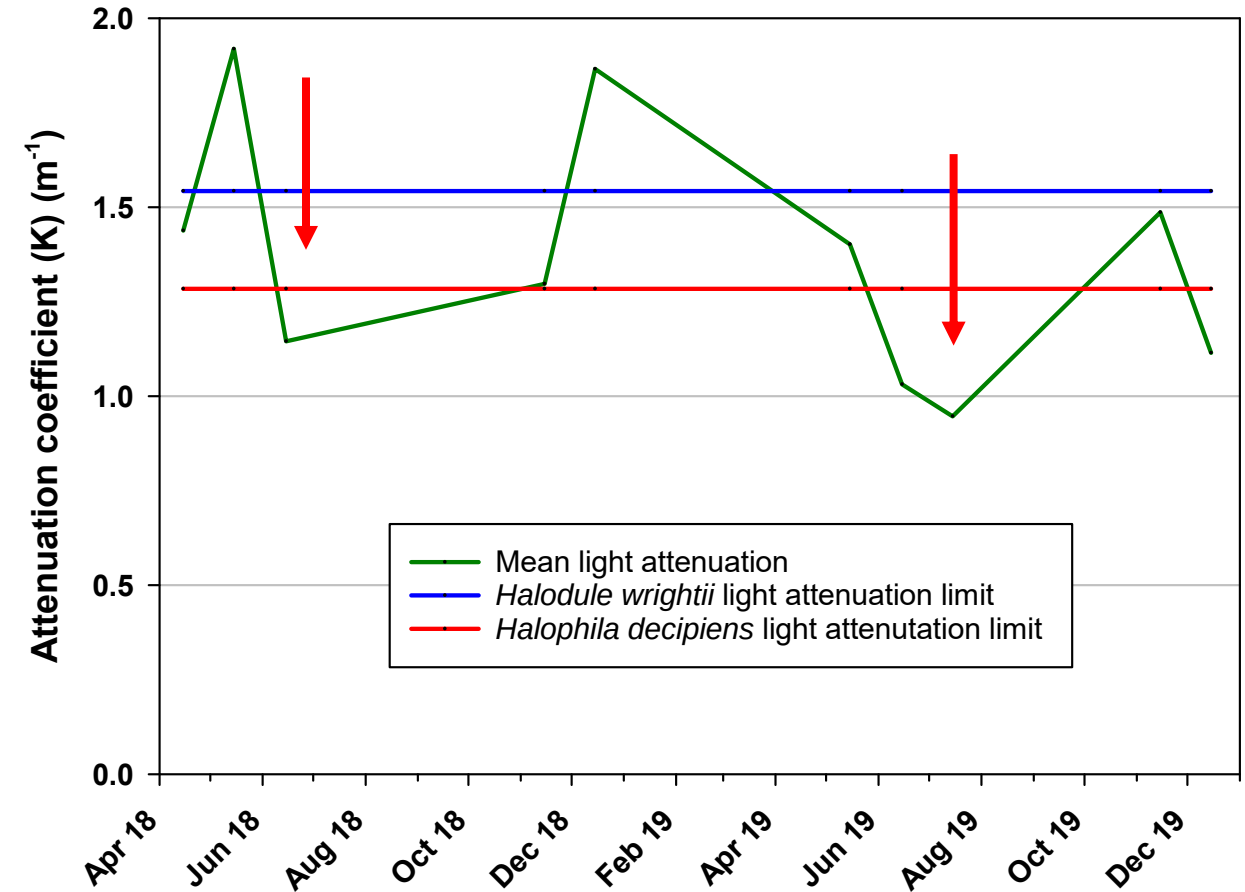
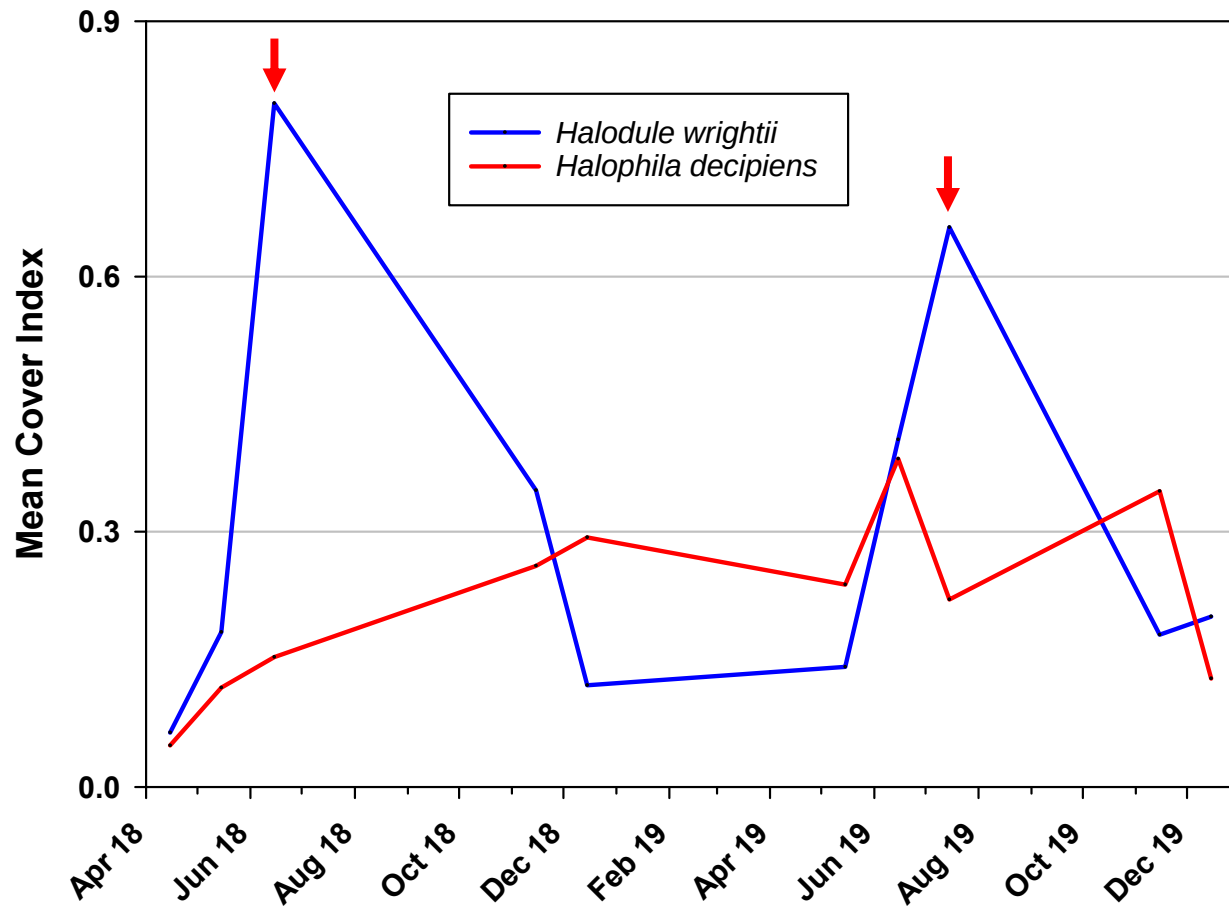
Seagrass and Temperature



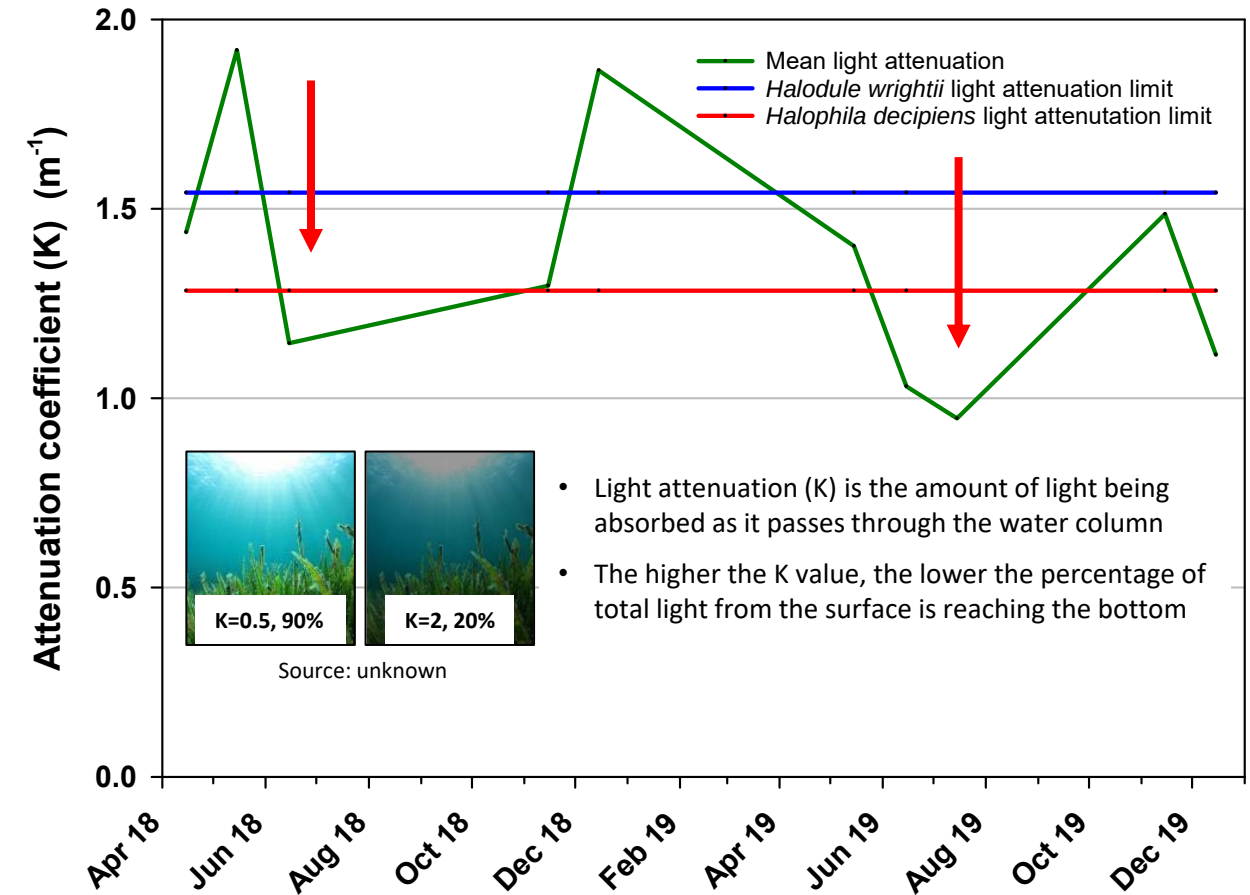
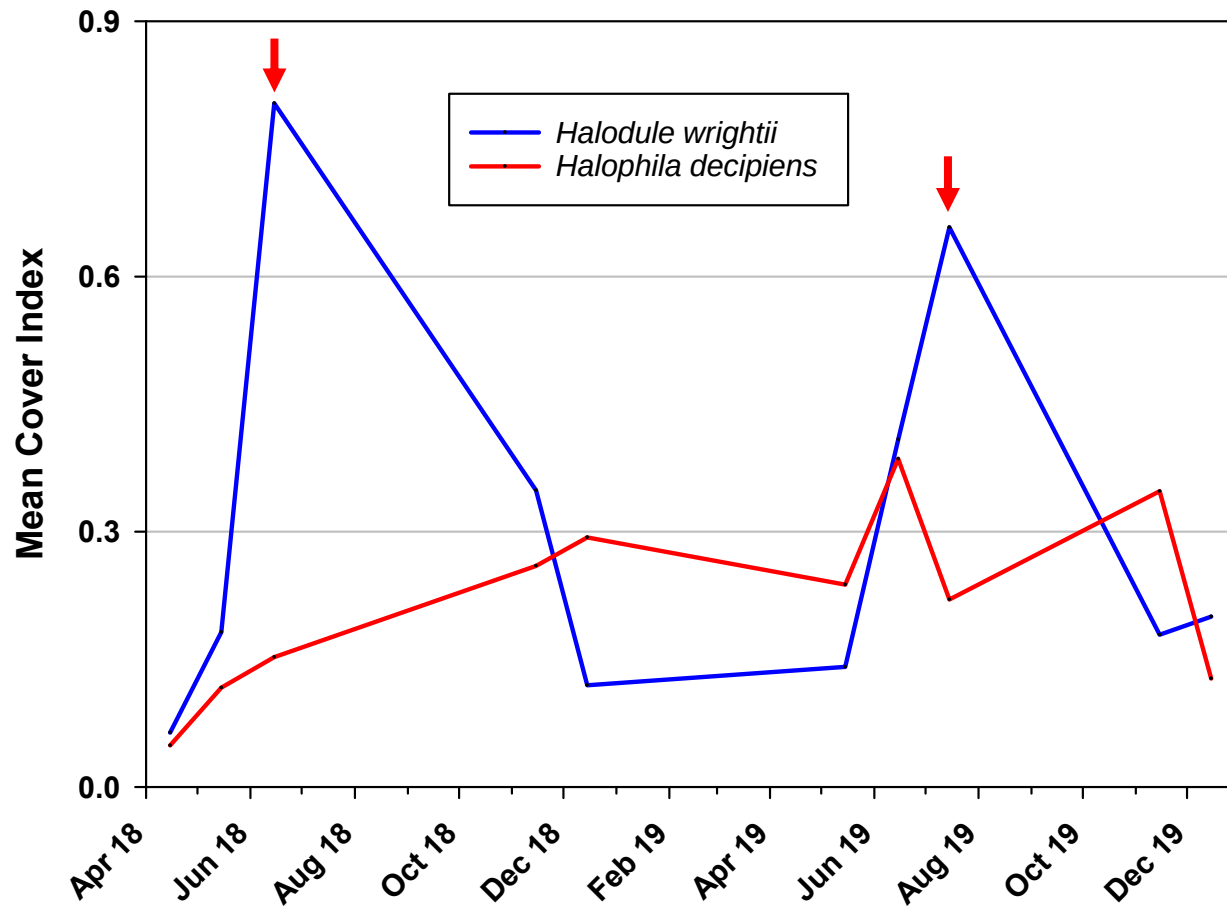
Seagrass and Salinity



Seagrass and Light Availability



Seagrass and Light Availability



Next Steps...

- Continue SFWMD collaboration with Dr. Jacoby at SJRWMD
- Complete similar analyses for SAV in the Caloosahatchee River
- Look more closely at potential drivers for SAV cover, such as water quality and hydrologic conditions



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Caloosahatchee Inflows and Salinity Conditions

Total Daily Inflow into the Caloosahatchee Estuary

Data are provisional and subject to change

Data to be updated

Weekly Average Inflow

Feb. 8, 2021 - Feb. 14, 2021

Inflow from Lake: 877 cfs

C-43 Basin Inflow: 751 cfs

Tidal Basin Inflow: 92 cfs

Total: 1720 cfs

16,000

14,000

12,000

10,000

8,000

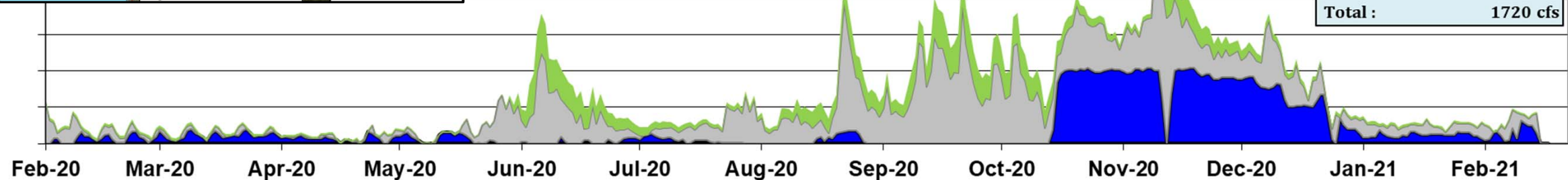
6,000

4,000

2,000

0

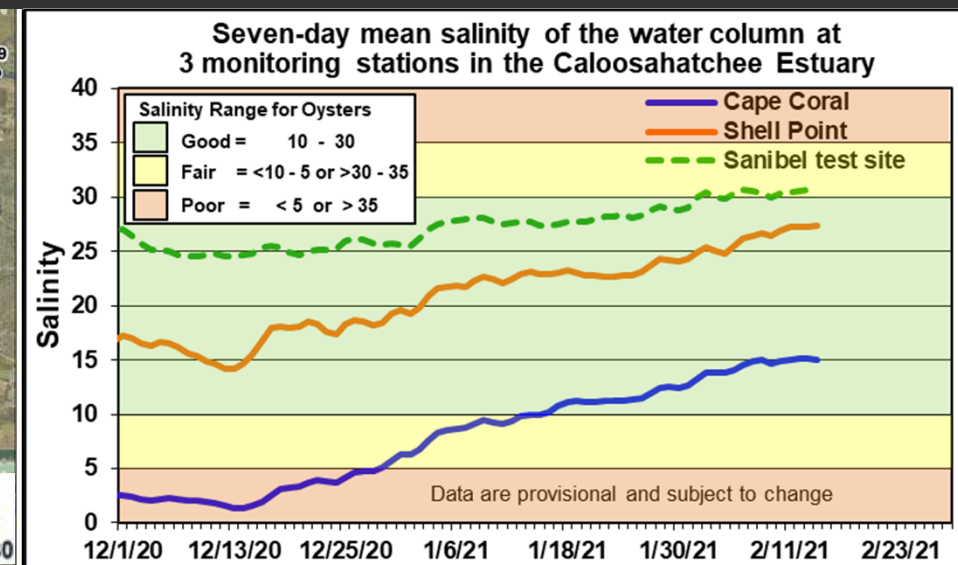
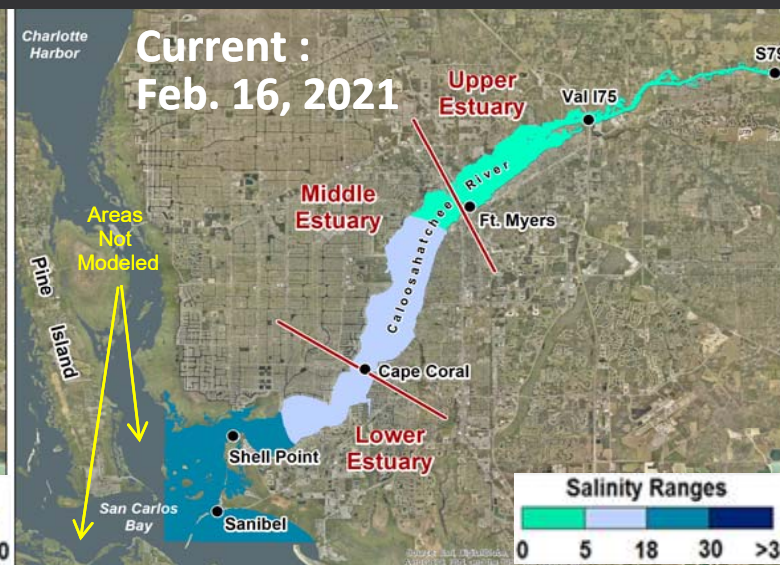
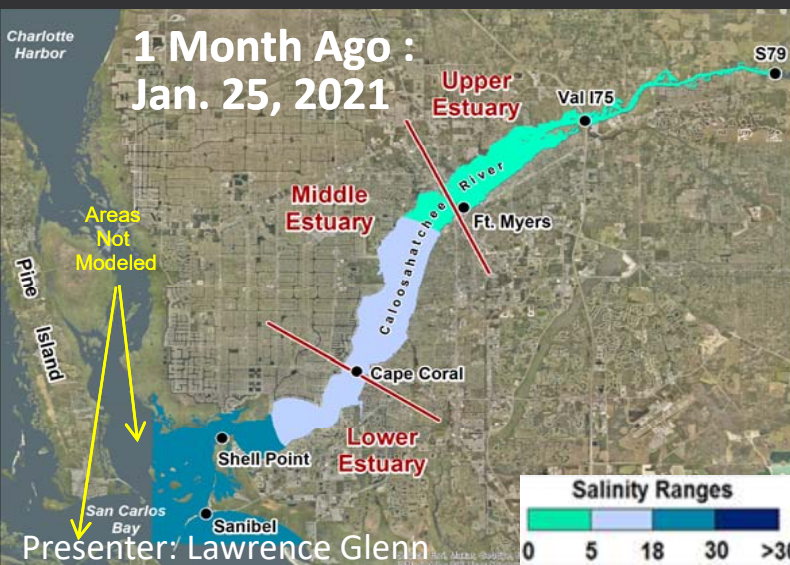
Total Flow (cfs)



■ Inflow from Lake

■ C-43 Basin Inflow

■ Tidal Basin Inflow (downstream of S79)



Data are provisional and subject to change

Everglades Stormwater Treatment Areas (STAs)

DRAFT
Data to be updated

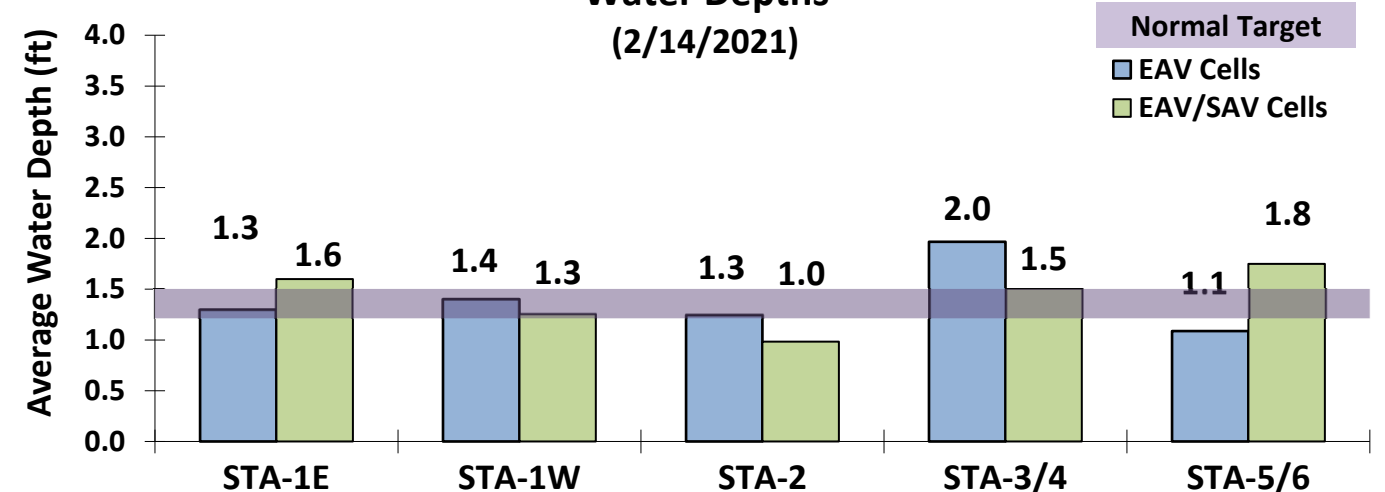
- STAs treated basin runoff and Lake releases in February
- Total Inflows to STAs in WY2021 ~1,543,000 ac-ft
- Lake Okeechobee releases to STAs in WY2021 ~99,300 ac-ft (6% of total)
- Extensive vegetation management activities underway to address stressed and highly stressed vegetation especially in EAV cells
- Most treatment cells are near target depth

Water Year 2021
5/1/2020 to 2/14/2021

	STA-1E	STA-1W	STA-2	STA-3/4	STA-5/6
Inflow TP Concentration (ppb)	137	257	108	57	281
Outflow TP Concentration (ppb)	37	38	21	12	80
365-day Phosphorus Loading Rate (g/m ² /yr)	4.4	2.3	0.9	0.7	0.8
Inflow Volume (ac-ft)	309,700	186,300	372,700	544,400	129,800

Includes preliminary data; all concentrations are flow-weighted means

Water Depths
(2/14/2021)



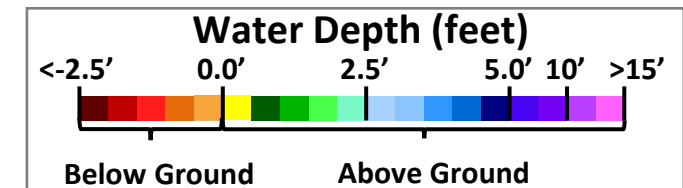
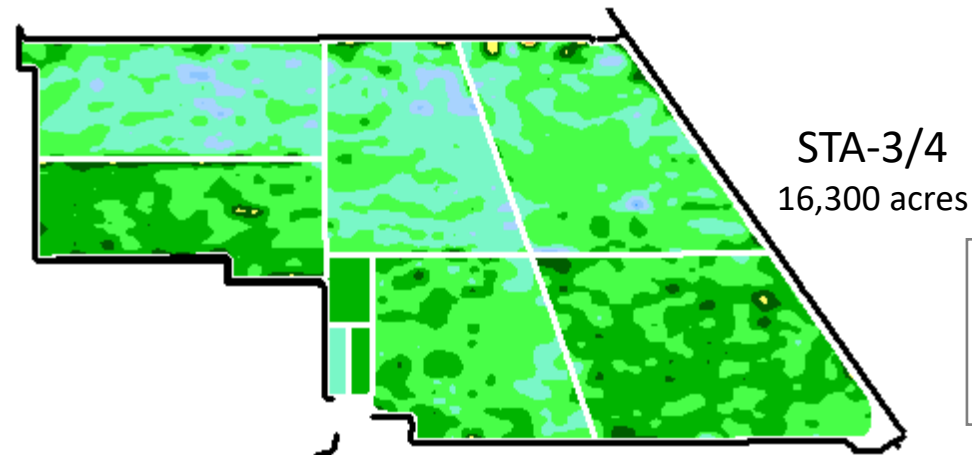
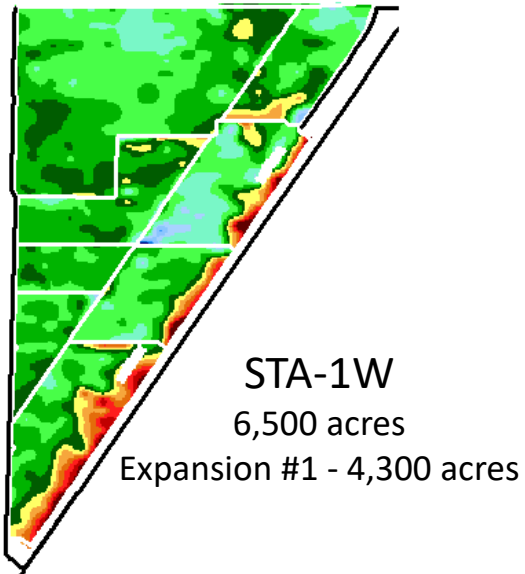
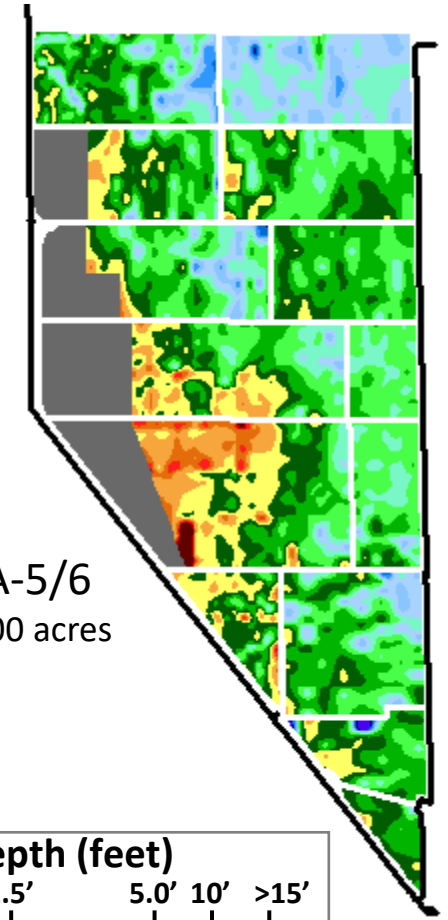
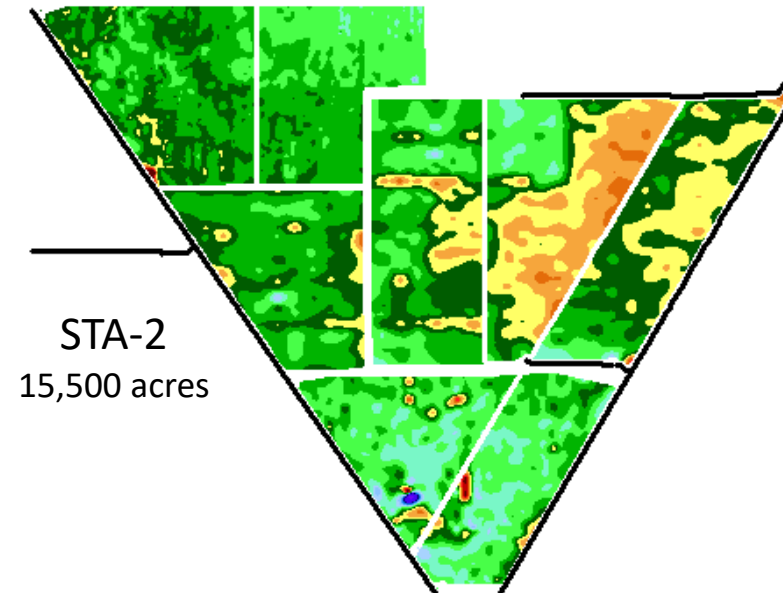
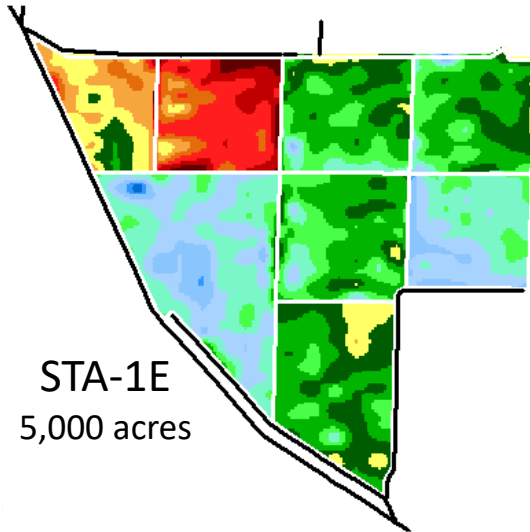
Includes preliminary data; Emergent Aquatic Vegetation (EAV); Submerged Aquatic Vegetation (SAV)

Everglades Stormwater Treatment Areas

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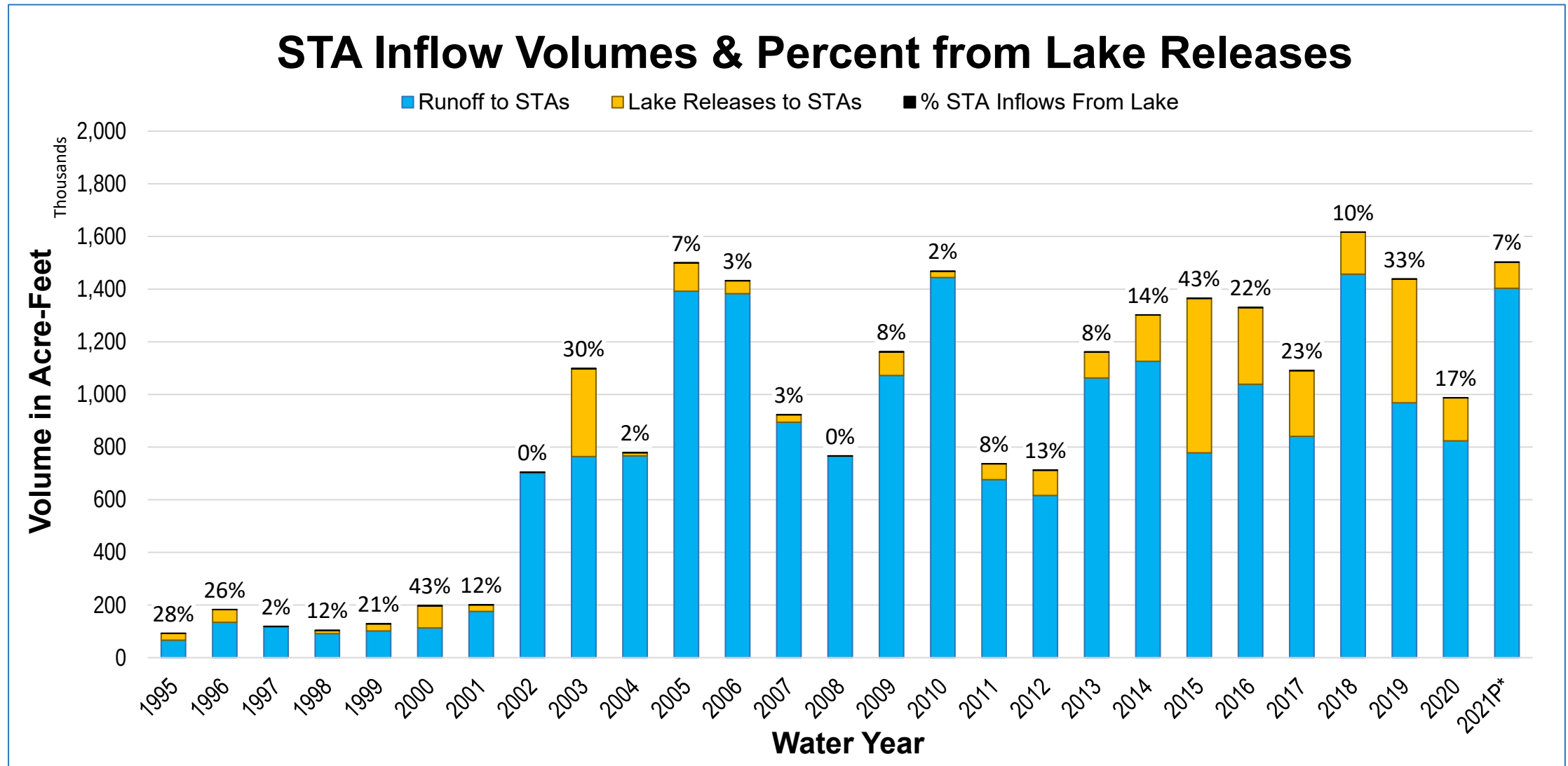
Daily Average Water Depths on 2/14/2021

Data to be updated



STA Inflow Volumes

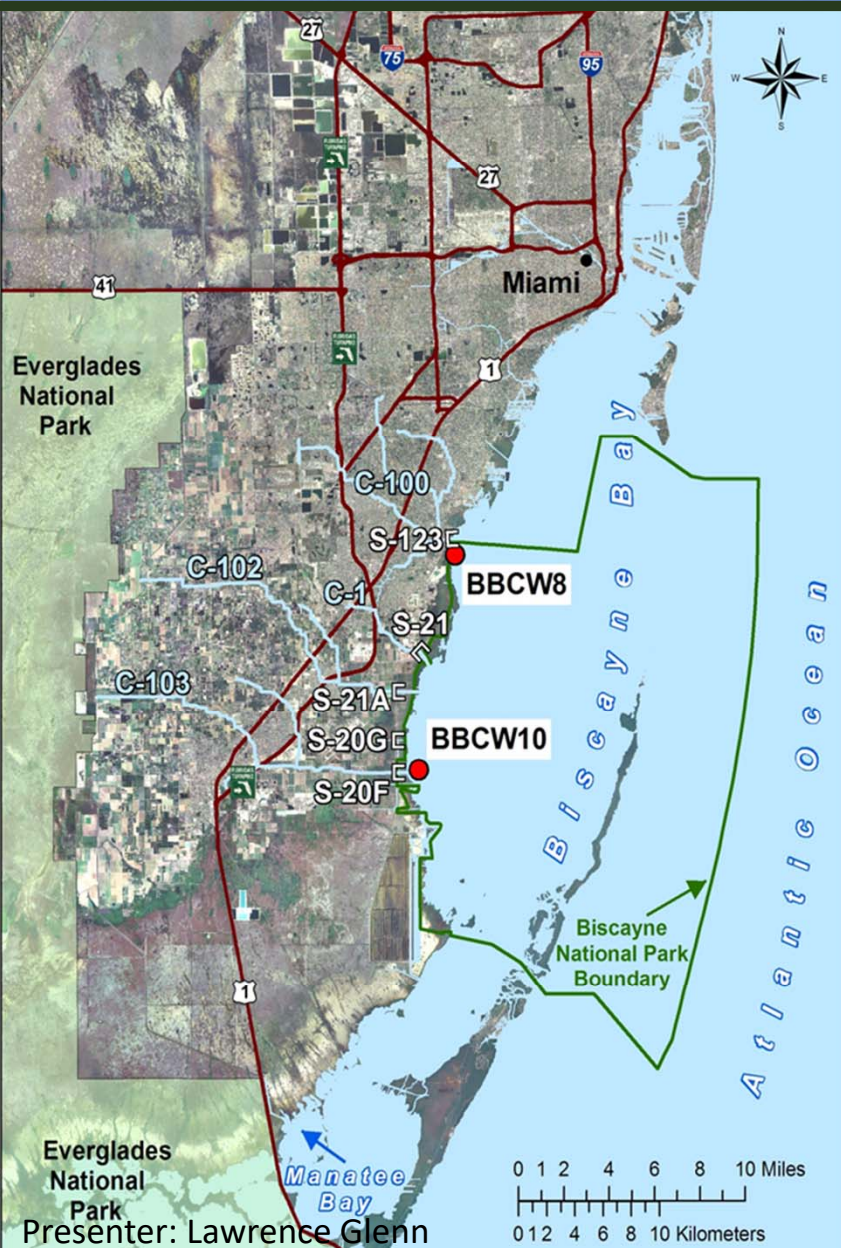
Data to be updated



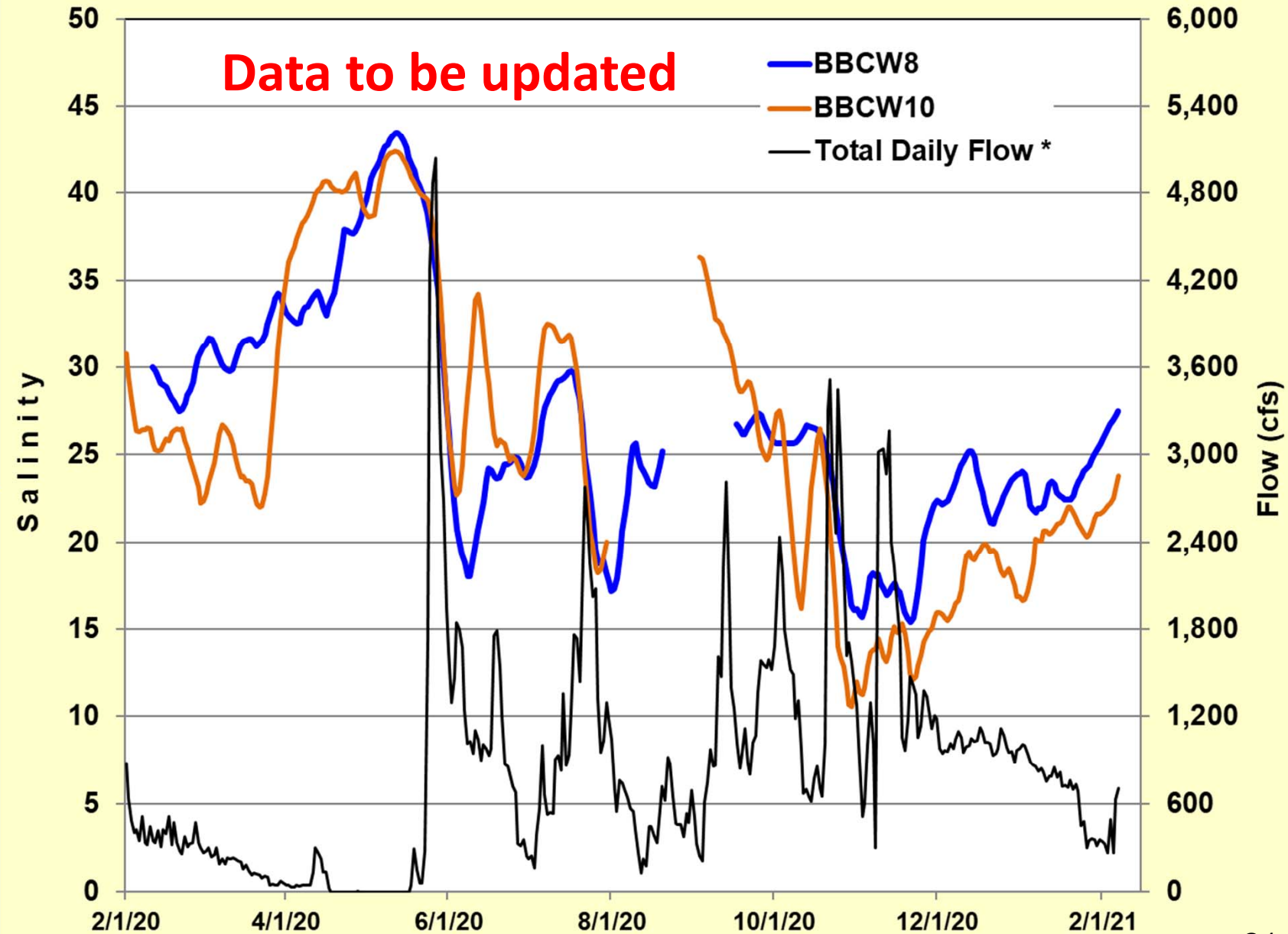
Includes preliminary data

Presenter: Lawrence Glenn

Biscayne Bay



Seven Day Mean Salinity (BBCW8 & BBCW10) & Total Daily Flow



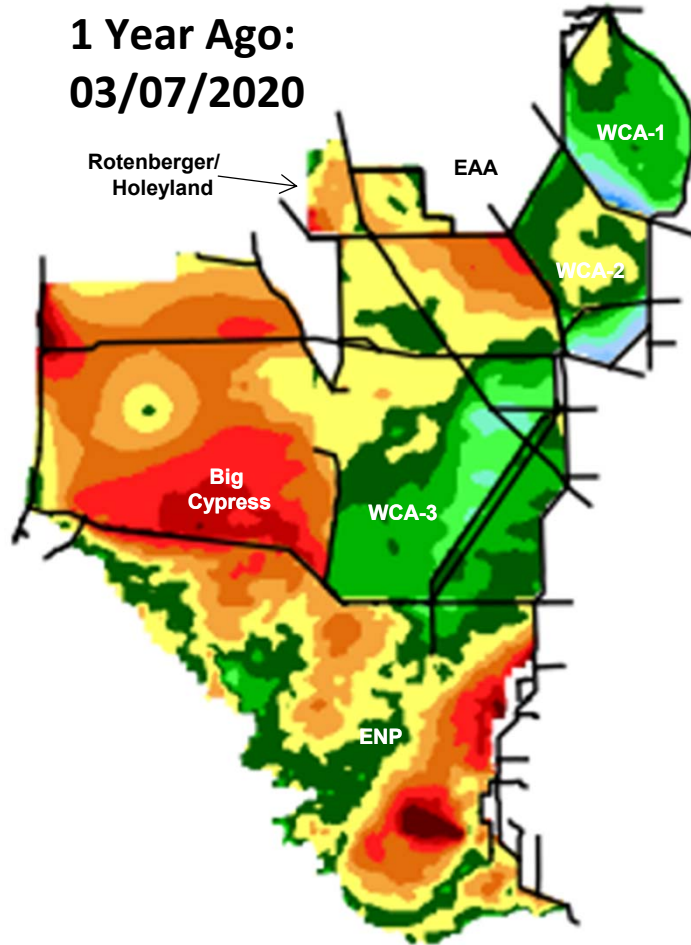
* Total flow from S20G, S20F, S21, S21A, S123, S700P

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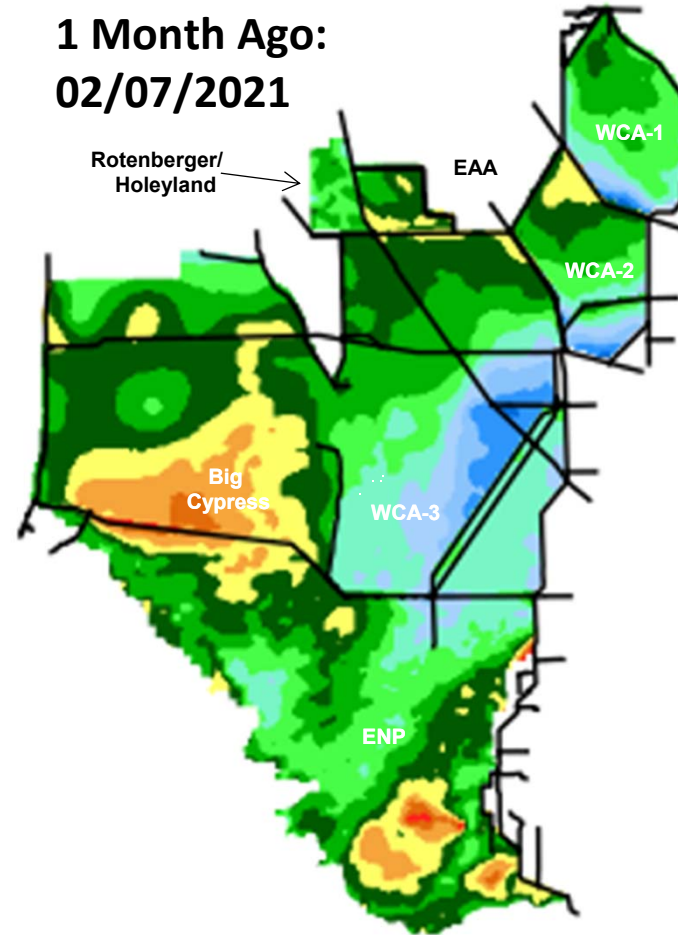
Everglades Water Depth Maps

Data to be updated

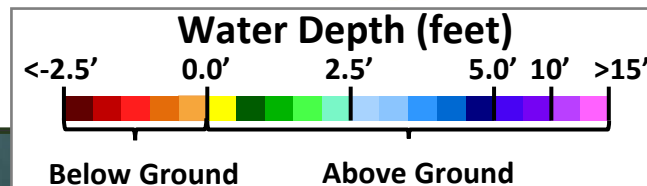
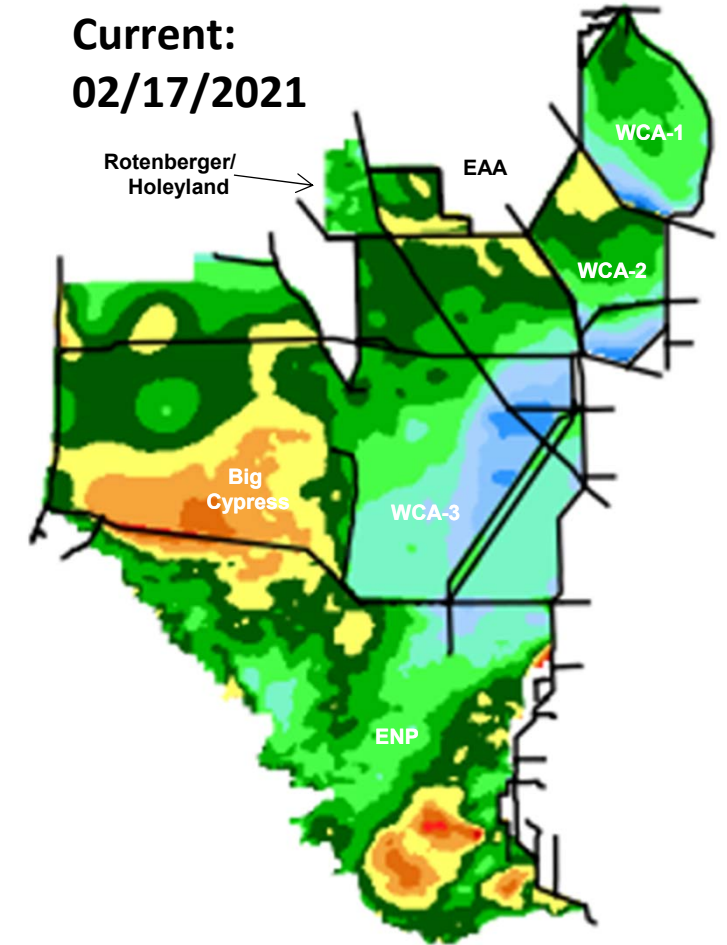
1 Year Ago:
03/07/2020



1 Month Ago:
02/07/2021

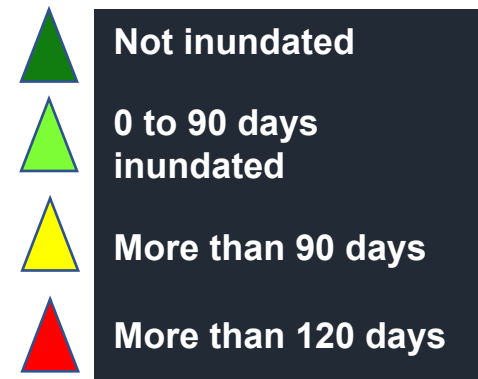
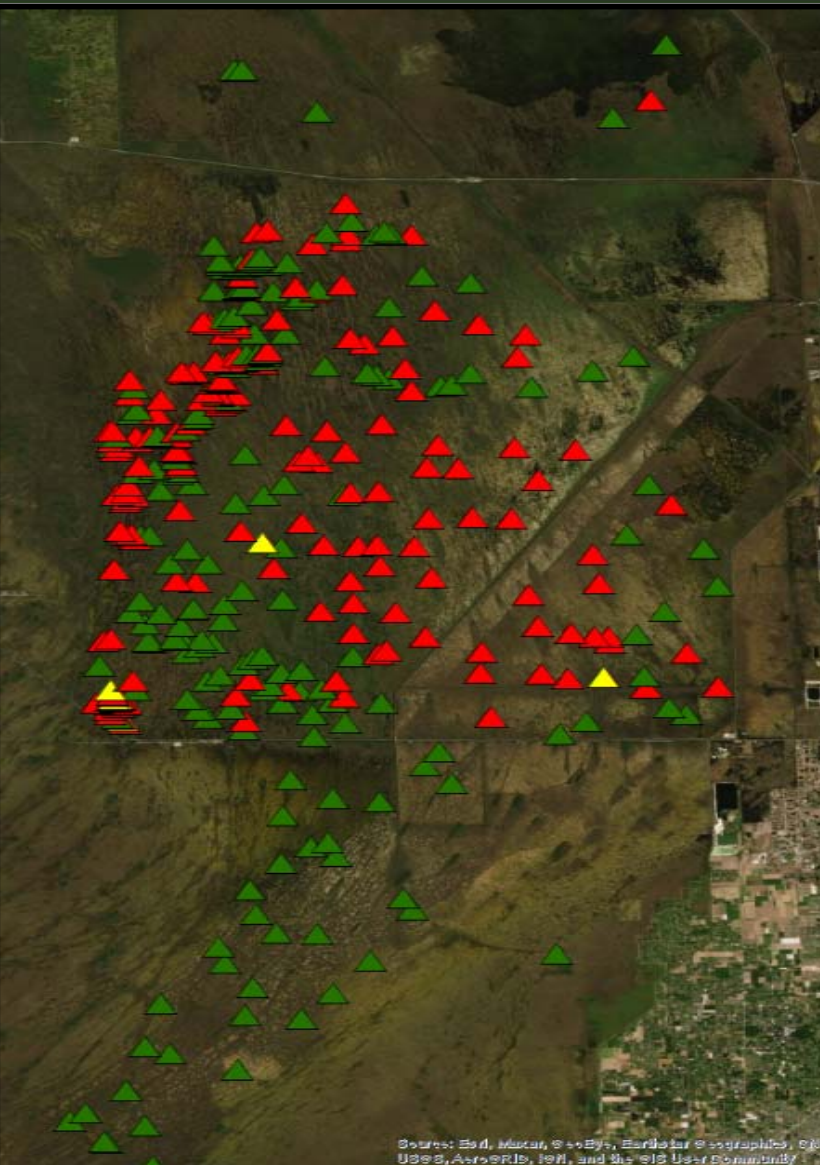


Current:
02/17/2021



Tree Island Inundation (days)

Data to be updated



- Current preliminary estimates using WDAT indicate that **46% or 173** of the tree islands are currently inundated, down from 56% the week prior.
- Initial islands inundated beginning 5/24/20, longest duration of continuous inundation is **240** days. Inundation for more than 90 days has the potential for ecological harm. Inundation for more than 120 days will cause ecological harm to sensitive islands (now **45%** of islands).
- In comparison on 1/25/18: 94 islands, 242 days, 13%.

Everglades Wading Bird Foraging & Nesting (Feb 2021)

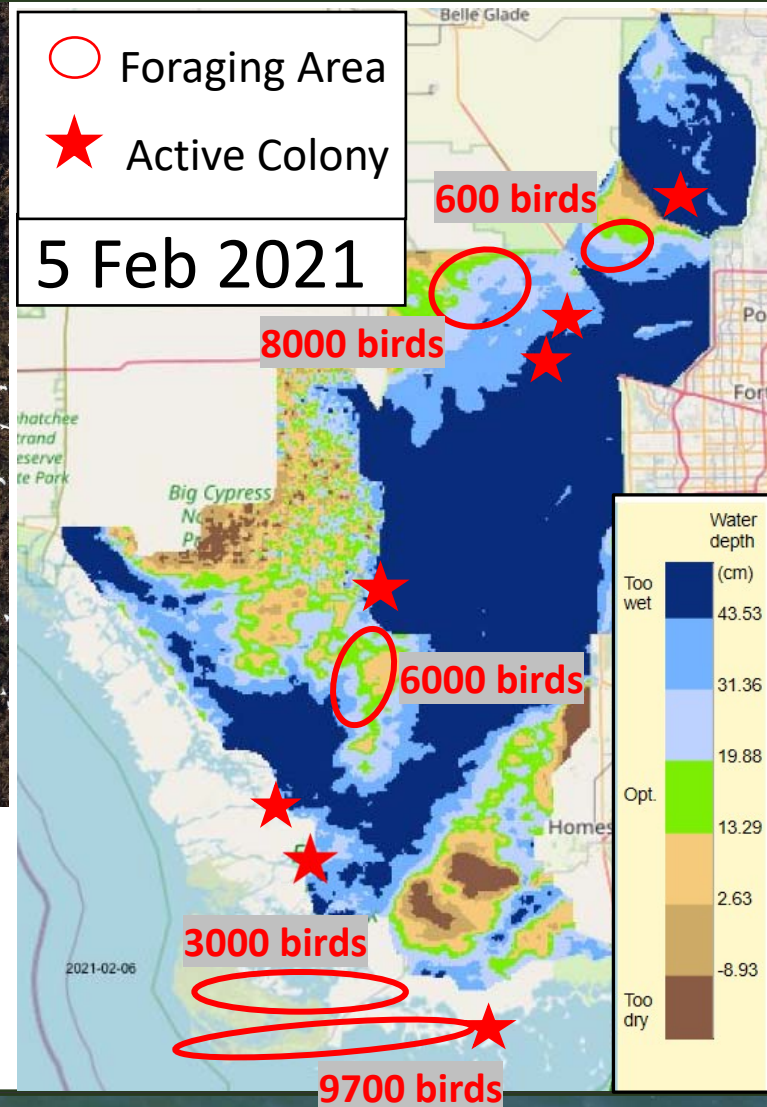
DRAFT

Data to be updated



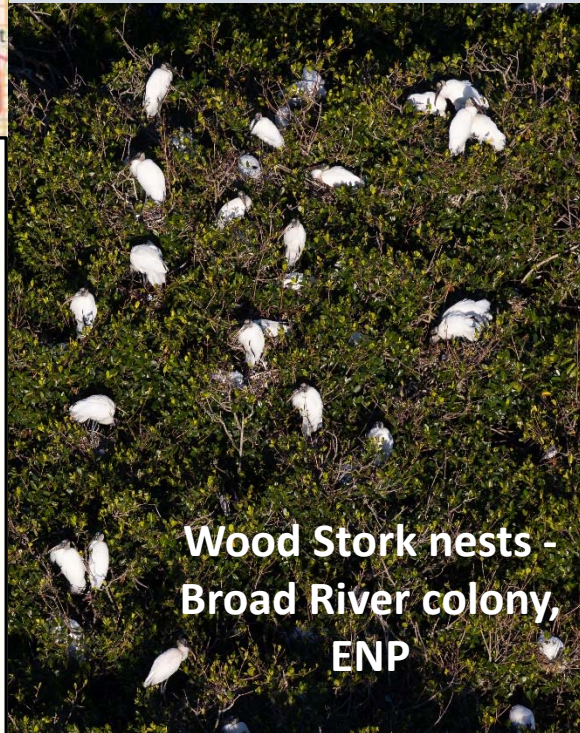
Foraging: Large numbers in coastal habitats, western marl prairies & the northern marshes of the WCAs.

Nesting: Recently started at multiple colonies (wood storks, roseate spoonbills and great egrets).



Habitat Suitability Map

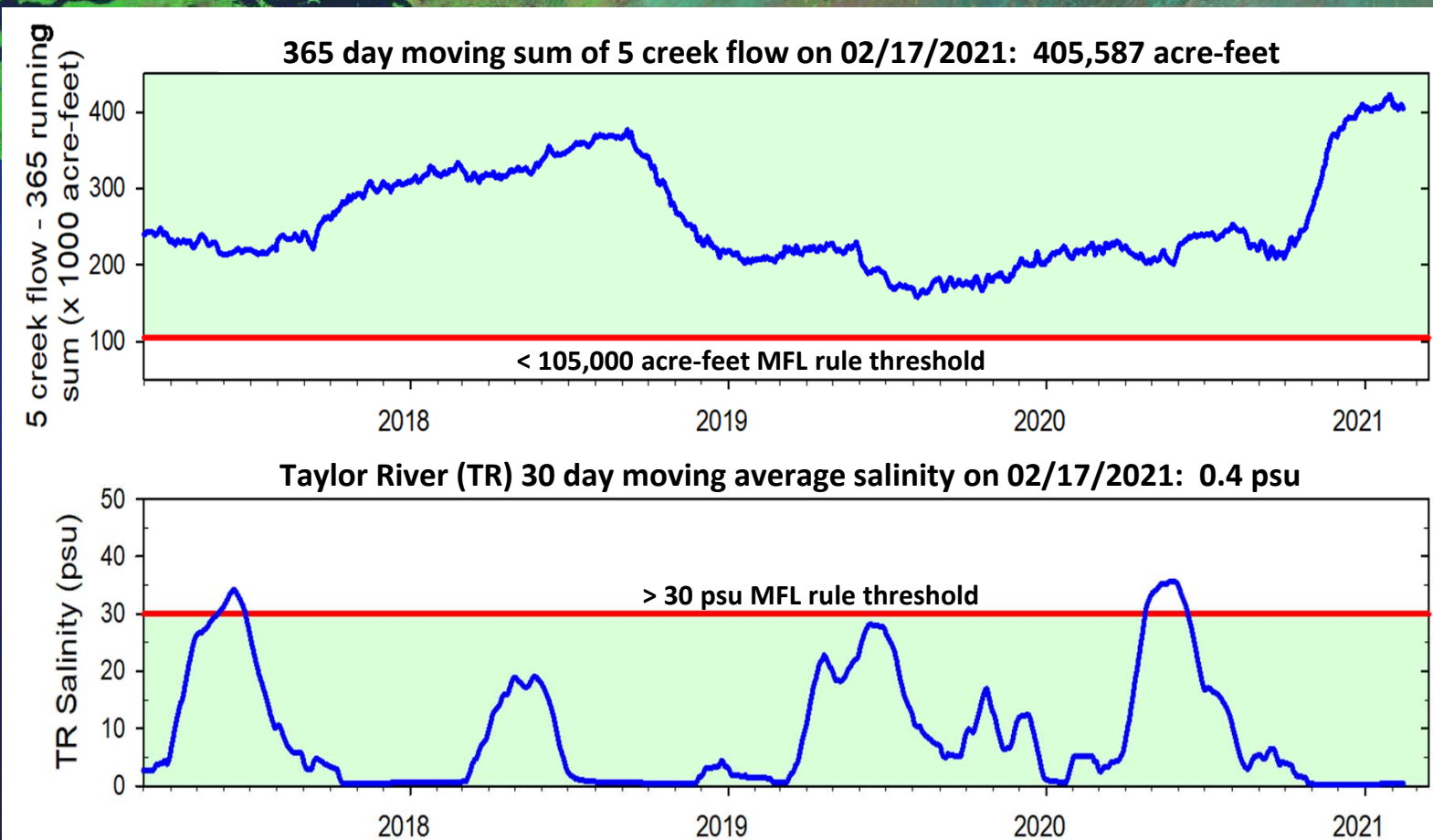
Optimal foraging depths for birds are shown as green or pale blue.



Northeast Florida Bay MFL

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Data to be updated

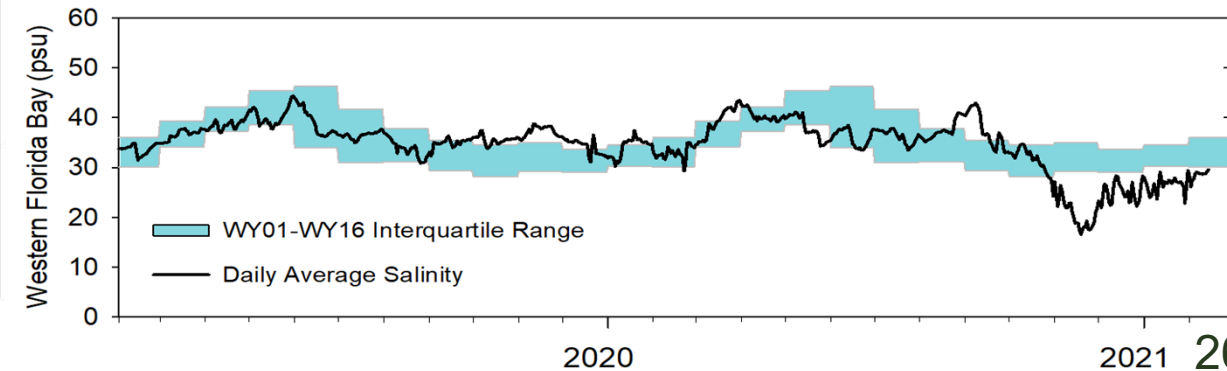
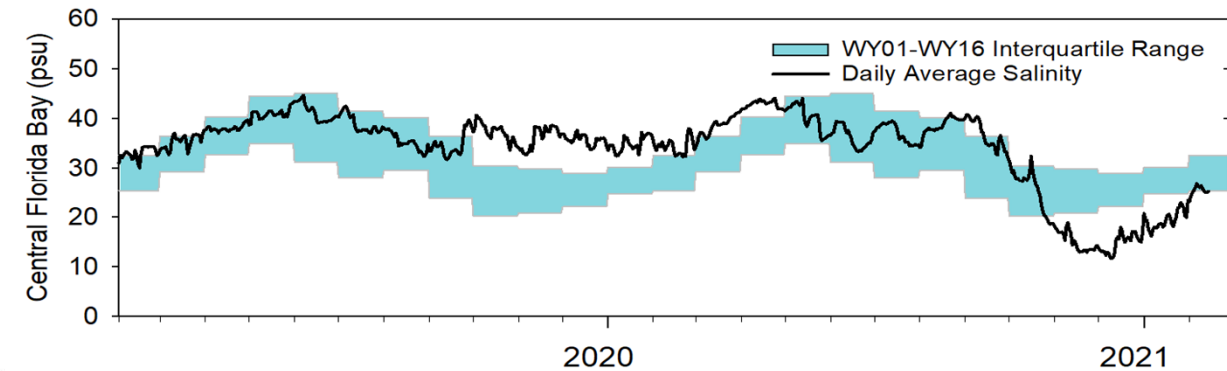
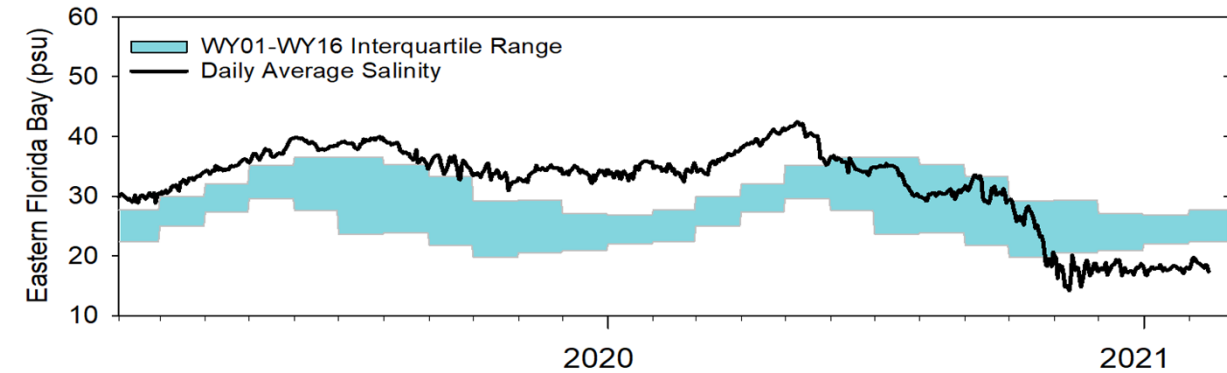
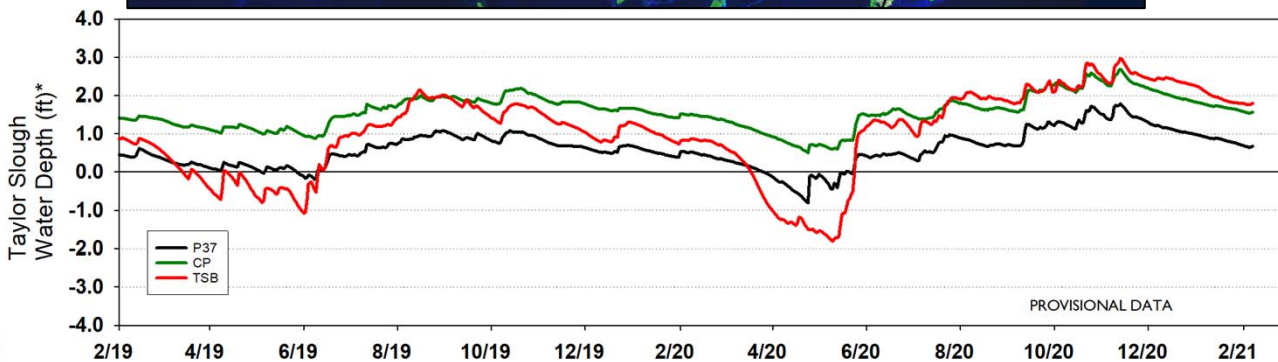
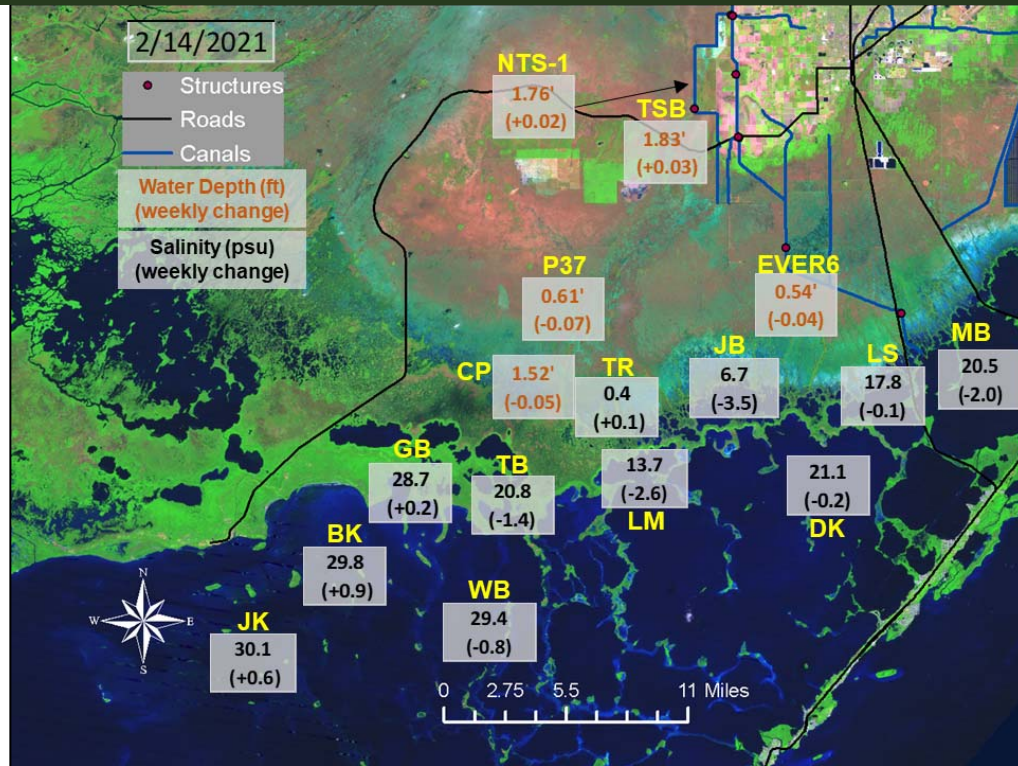


- ★ Salinity gauge
- ★ Creek flow gauge

TR

Taylor Slough Stages and Florida Bay Salinity

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Data to be updated

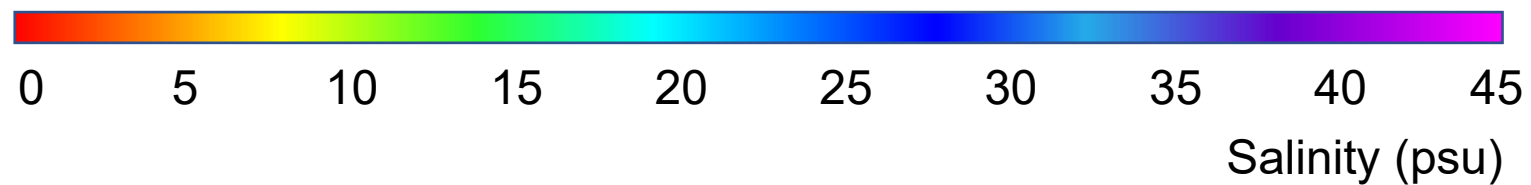
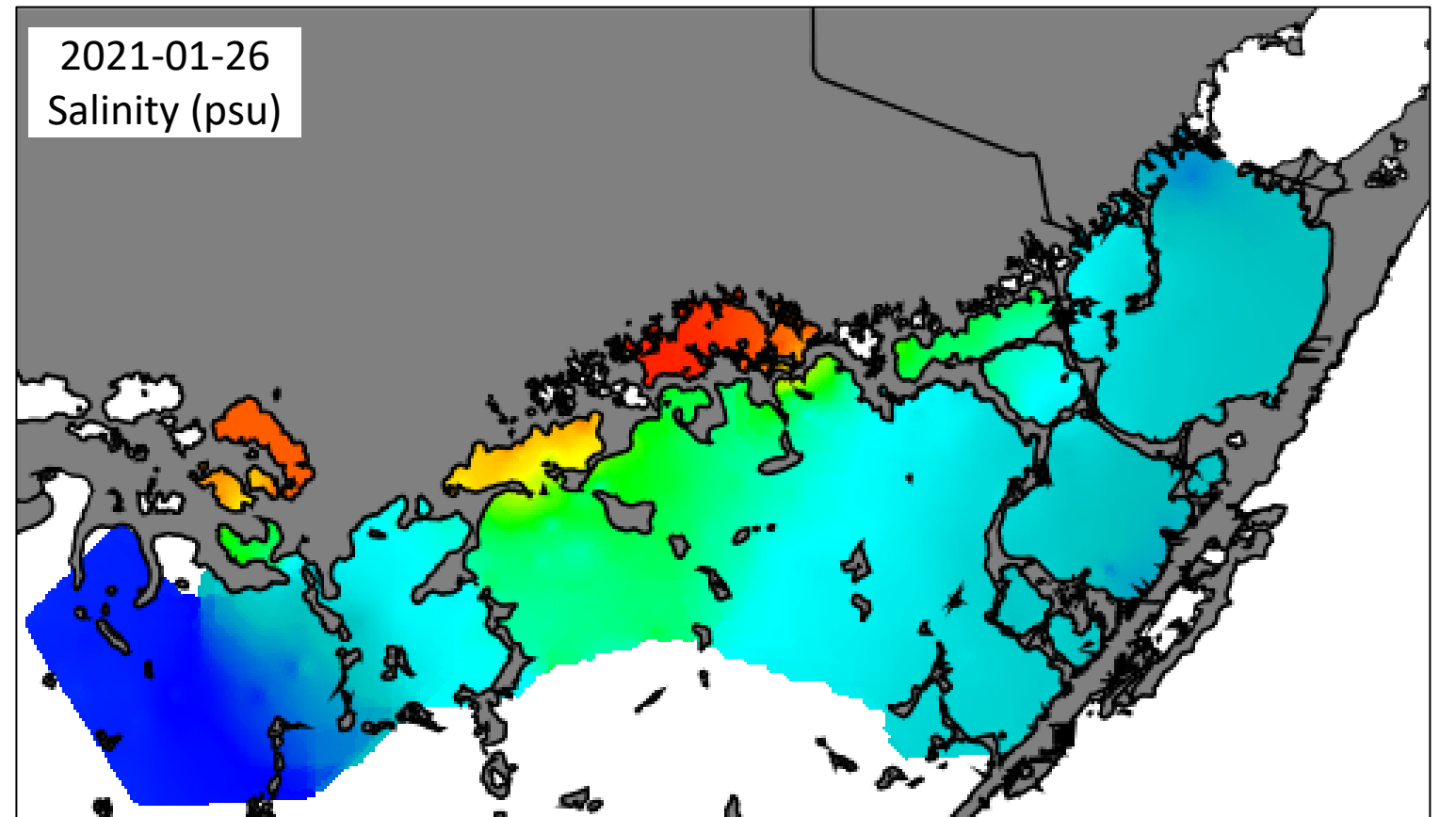
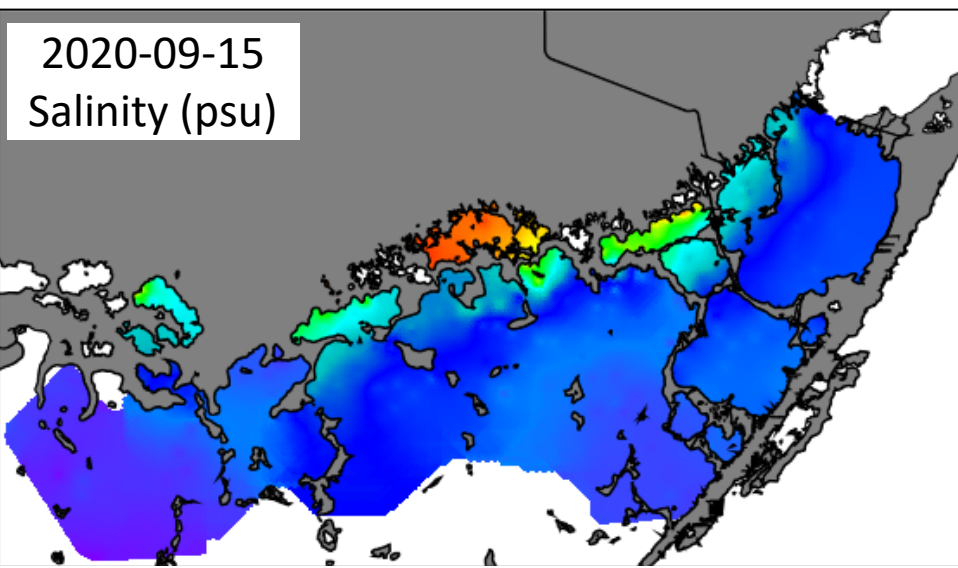
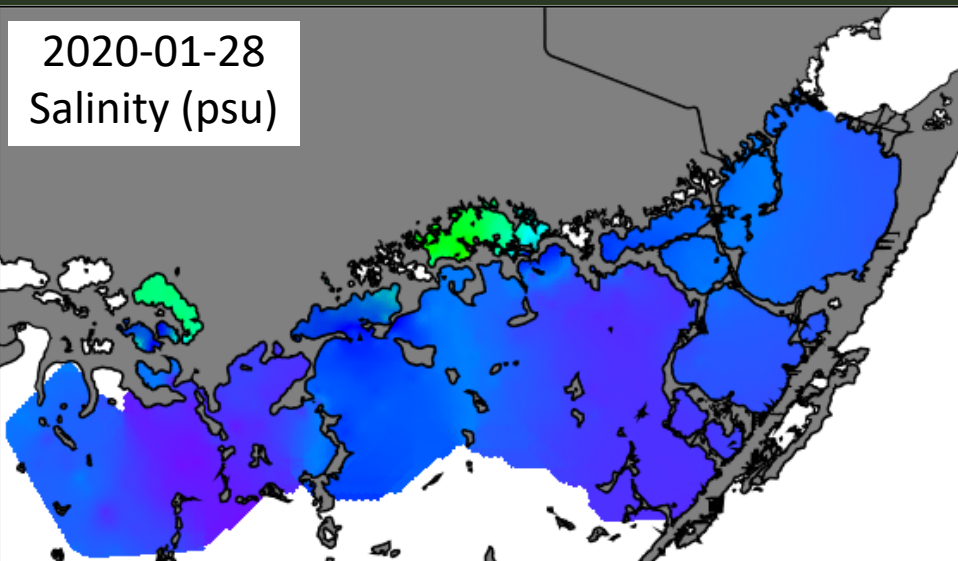


Florida Bay Mapping

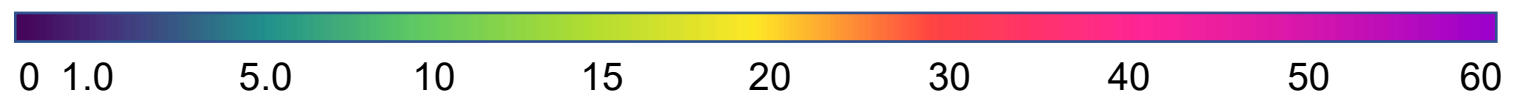
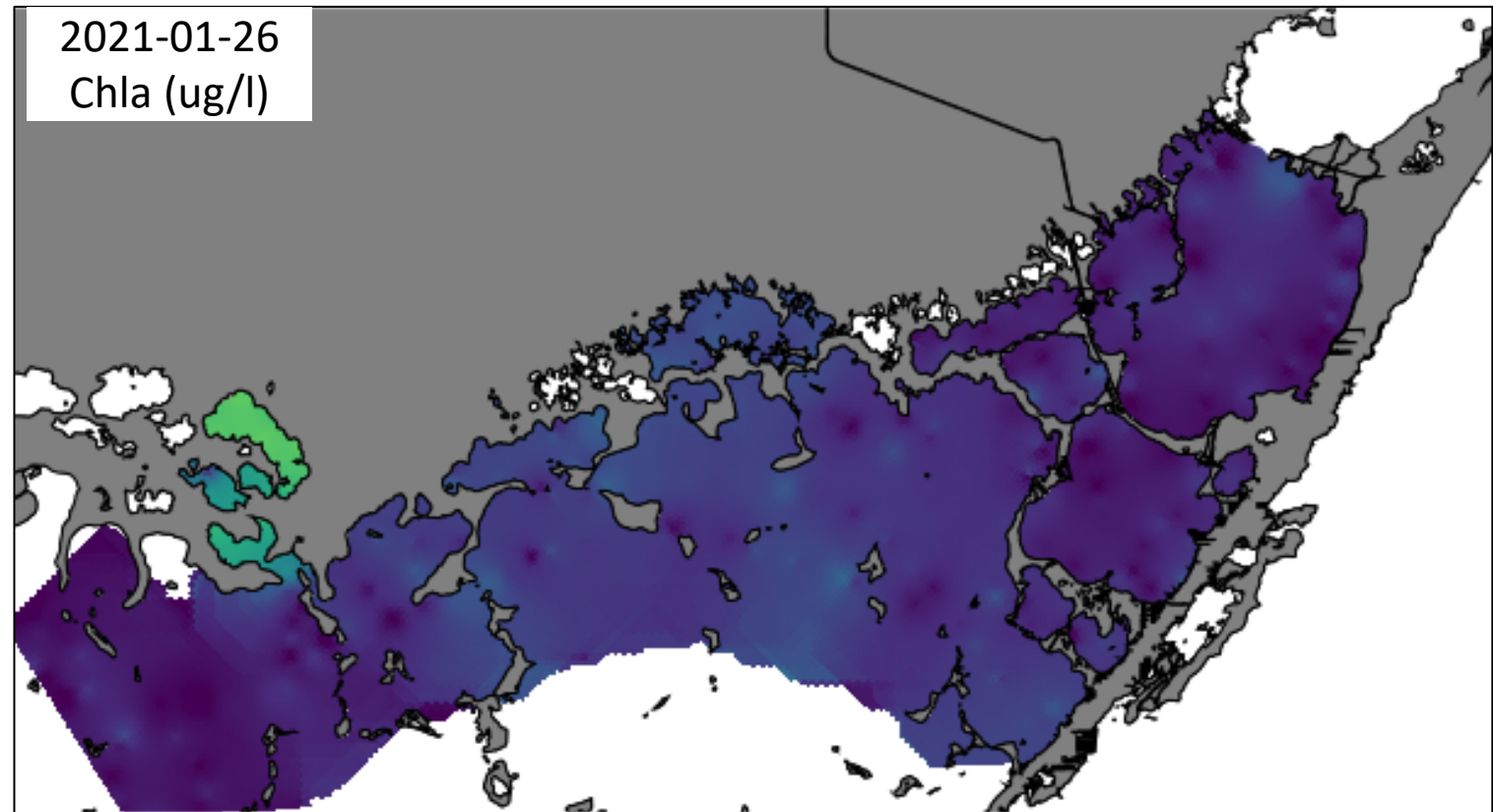
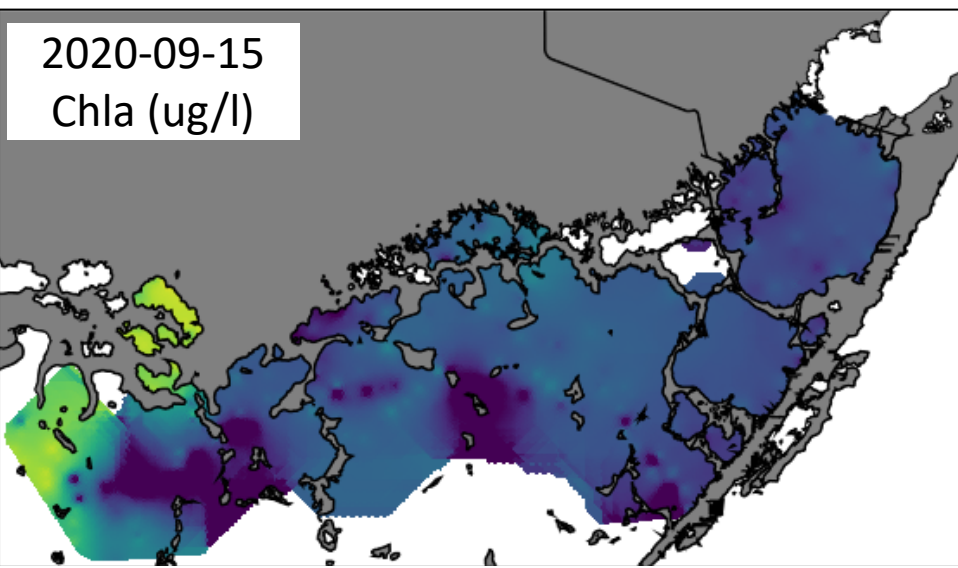
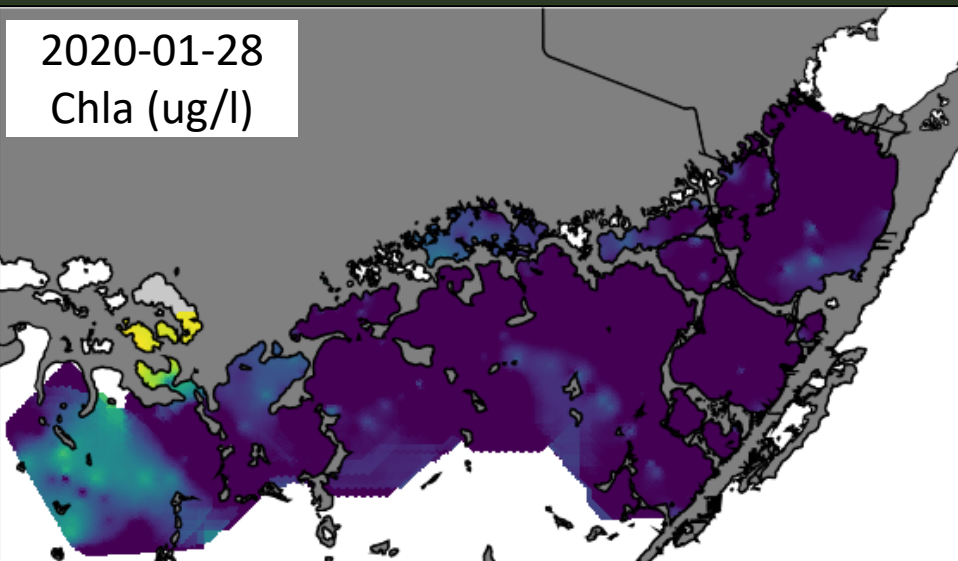


The flow-through mapping system used by the Florida Bay Science team (maps on the next 2 slides) is currently limited to the Bay area within the yellow box.

Florida Bay: Salinity



Florida Bay: Chlorophyll



Chlorophyll a (ug/L)

DRAFT

Placeholder

Florida Bay: Freshwater flows and water clarity



MARK COOK

Florida Bay: Wading bird foraging

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Placeholder



Foraging wading birds,
WCA-3AN, on 3 Feb



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Florida Bay: Shorebirds

Placeholder



Florida Bay: Seabirds & Waterfowl

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Florida Bay: Predators

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Questions

Curious raccoon
Photograph courtesy of SFWMD staff