SOUTH FLORIDA WATER MANAGEMENT DISTRICT

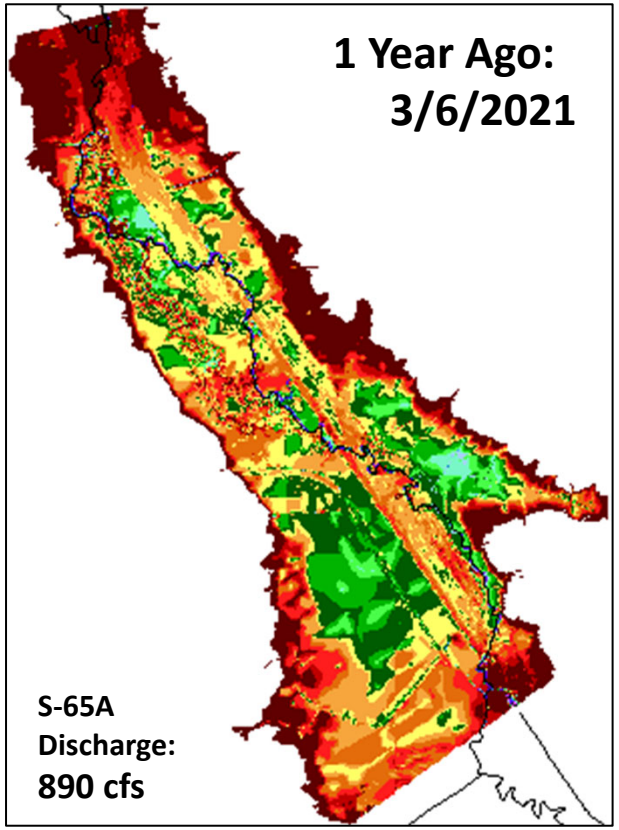
Ecological Conditions Update

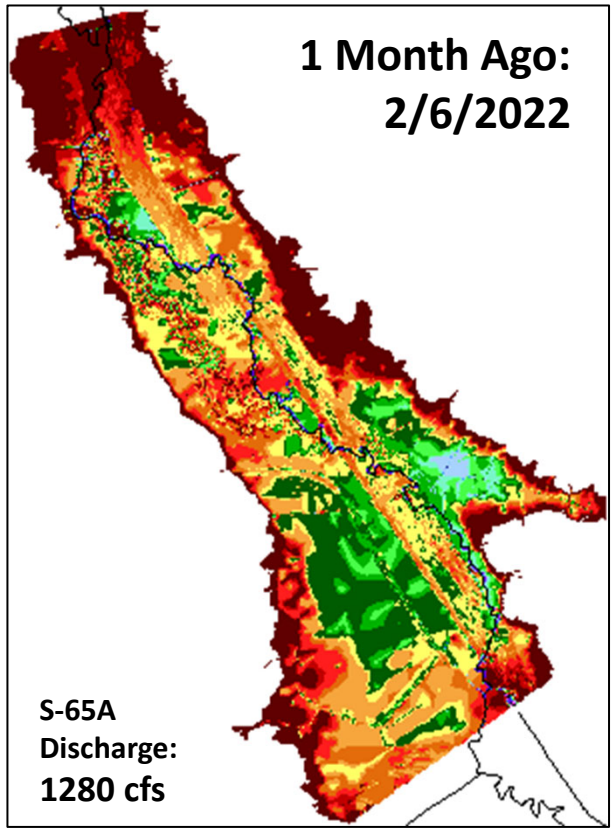
Governing Board Meeting
March 10, 2022

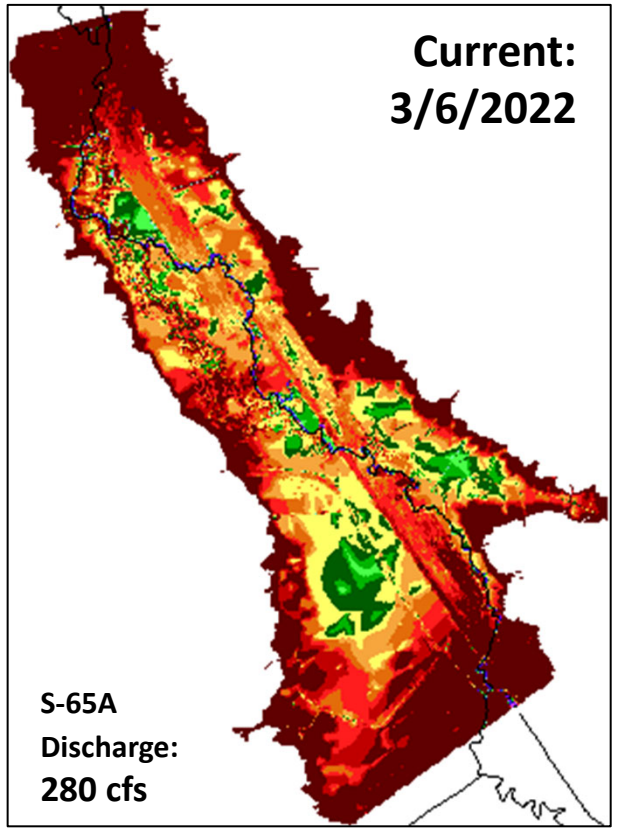
Seán Sculley, PE
Chief, Applied Sciences Bureau
Water Resources Division

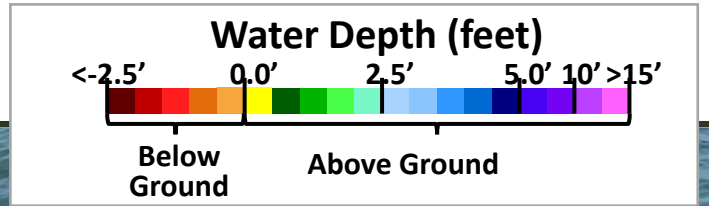
Caloosahatchee River Estuary by the Sanibel Causeway
Photograph courtesy of SFWMD staff

Kissimmee River (Phase I) Floodplain Water Depth Maps



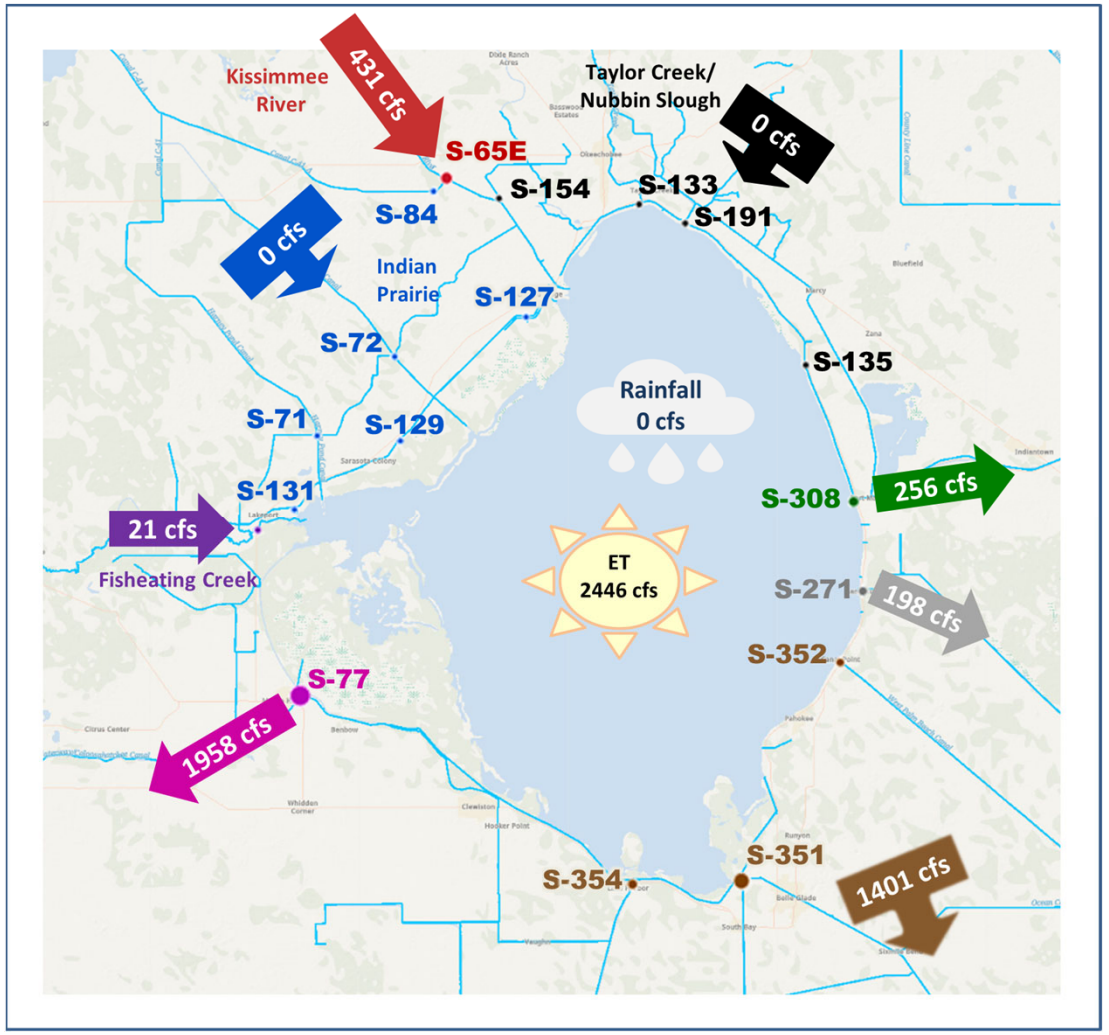




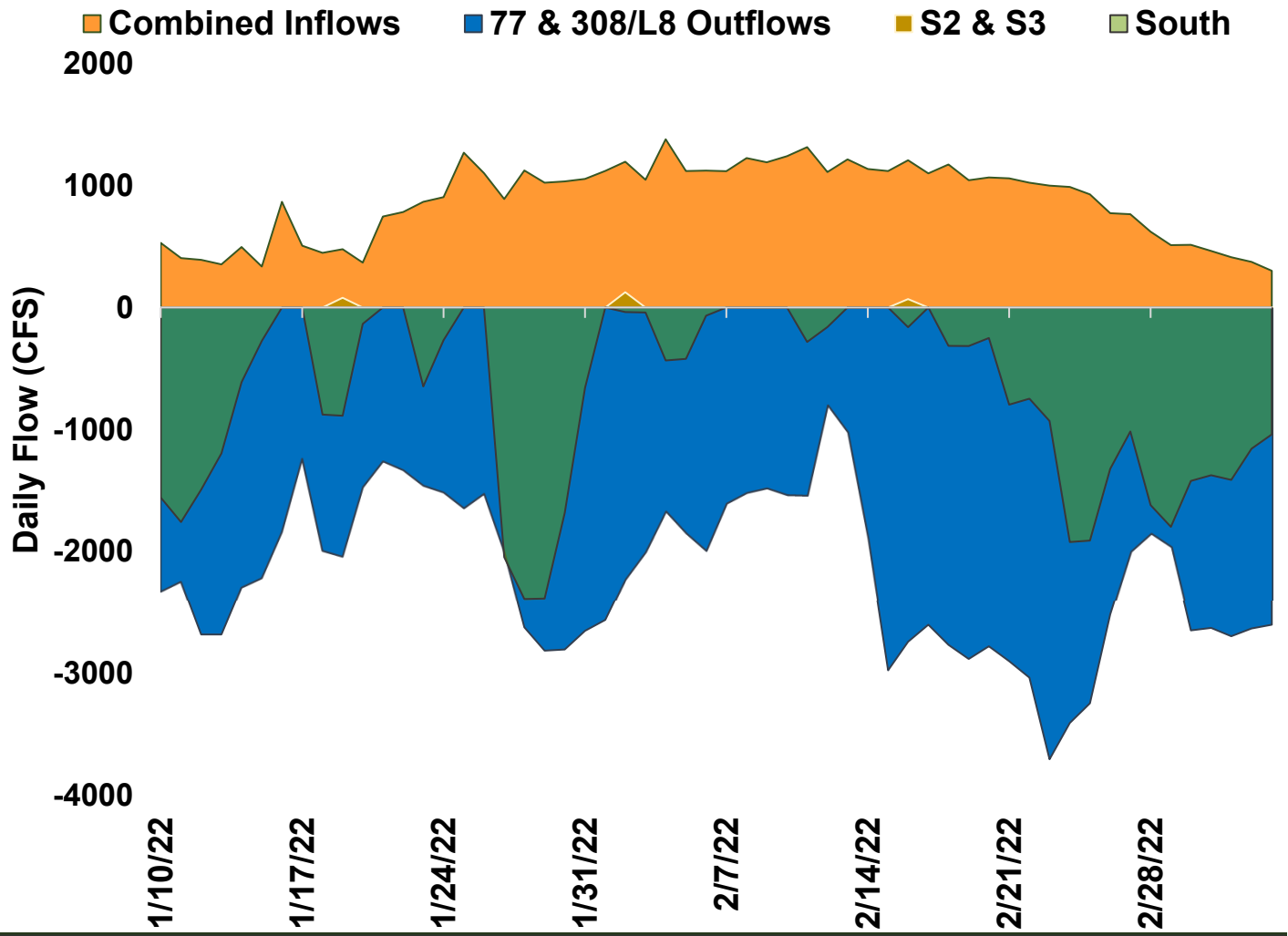


Lake Okeechobee Hydrology
(*Provisional Data)

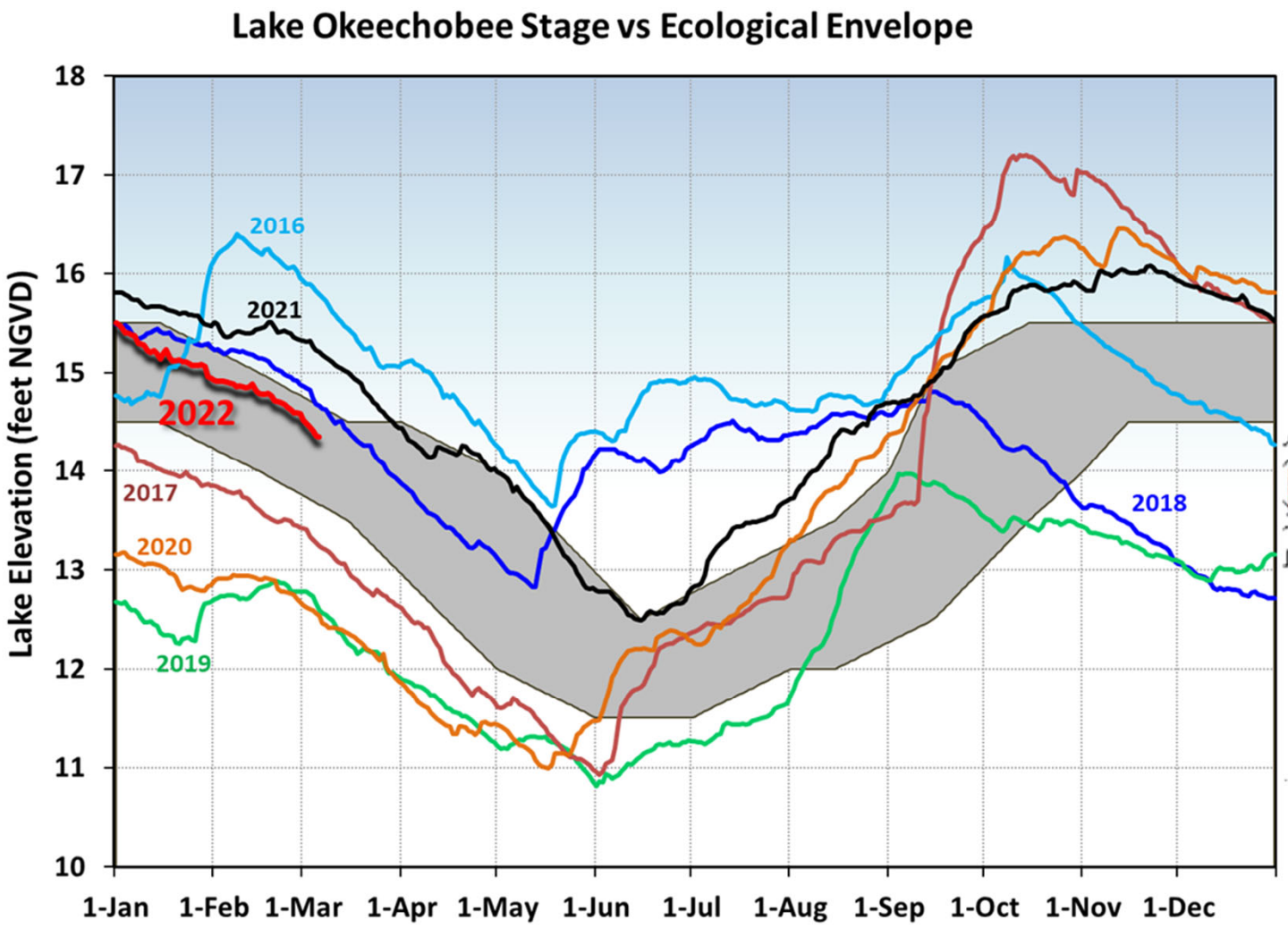
Feb. 28 – Mar. 06 Inflows and Outflows

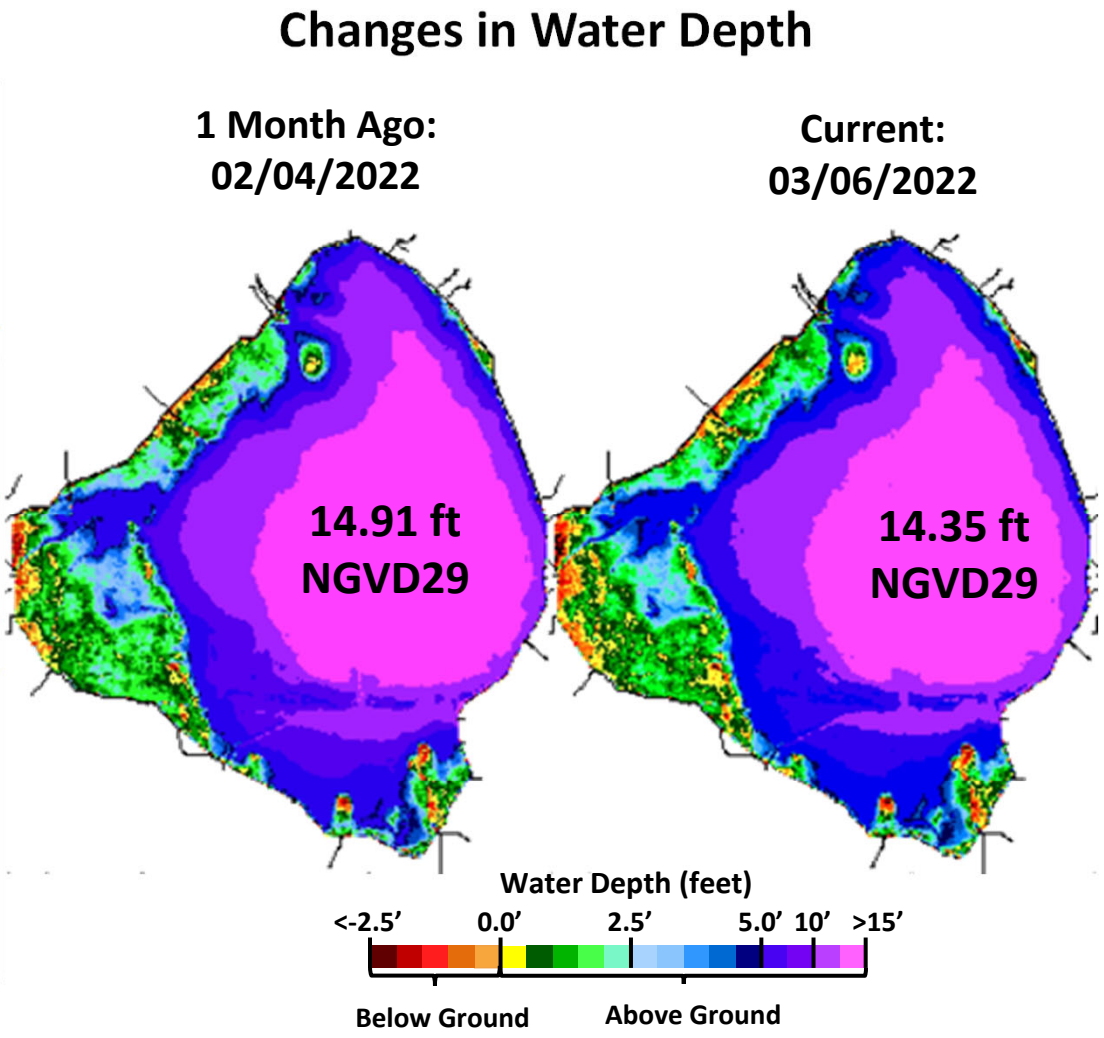


Prior 8 Weeks Inflows and Outflows

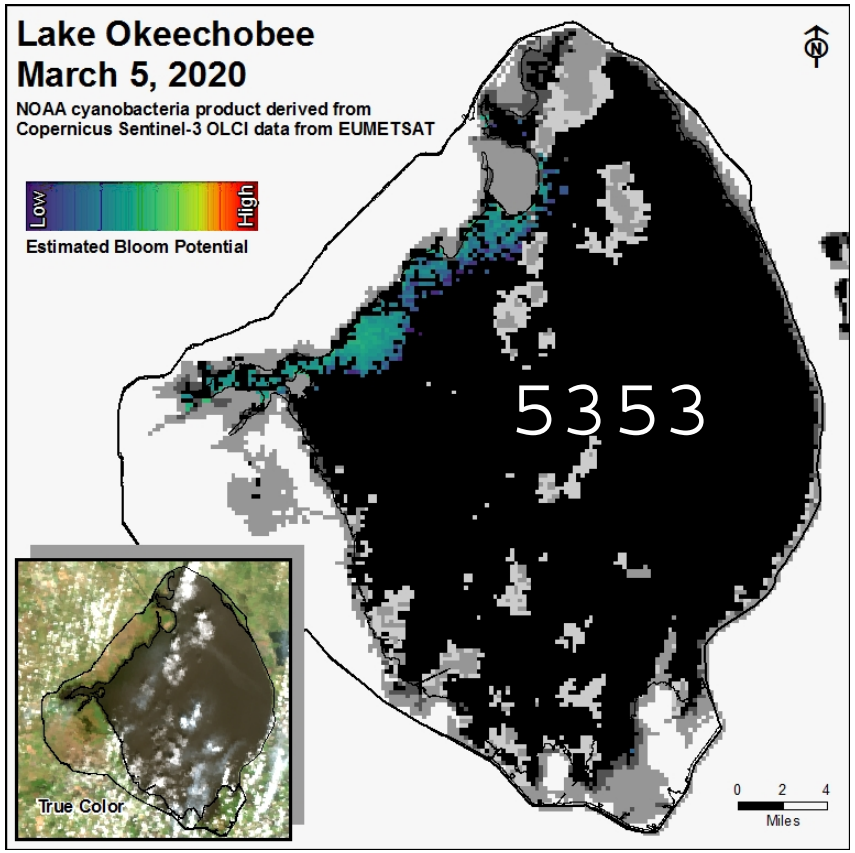


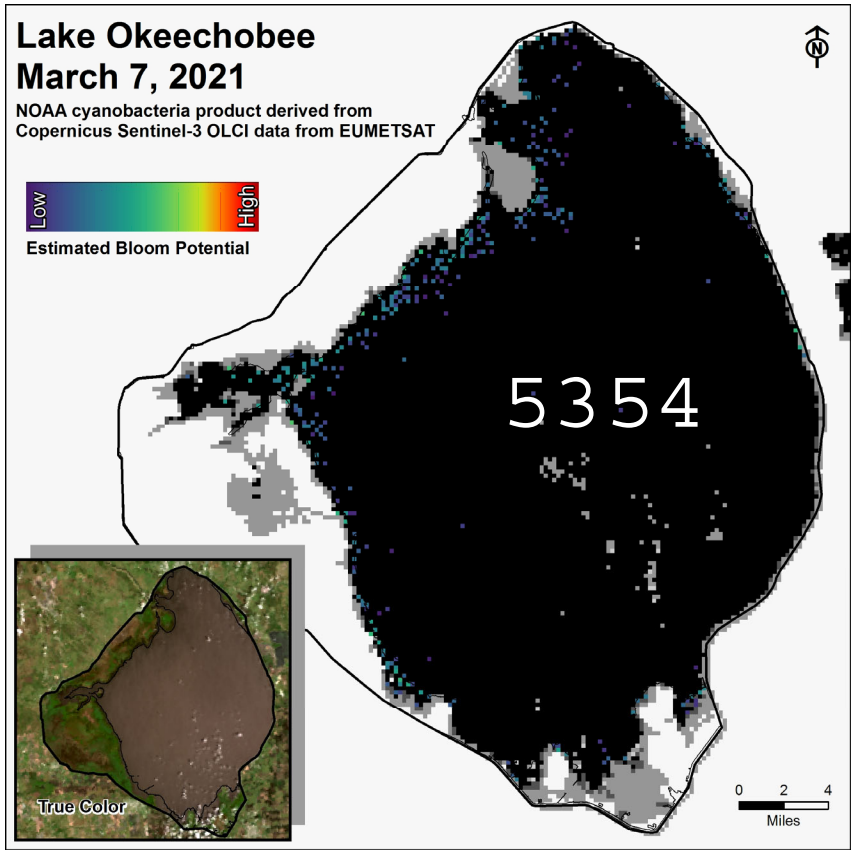
Ecological Envelope and Water Depths

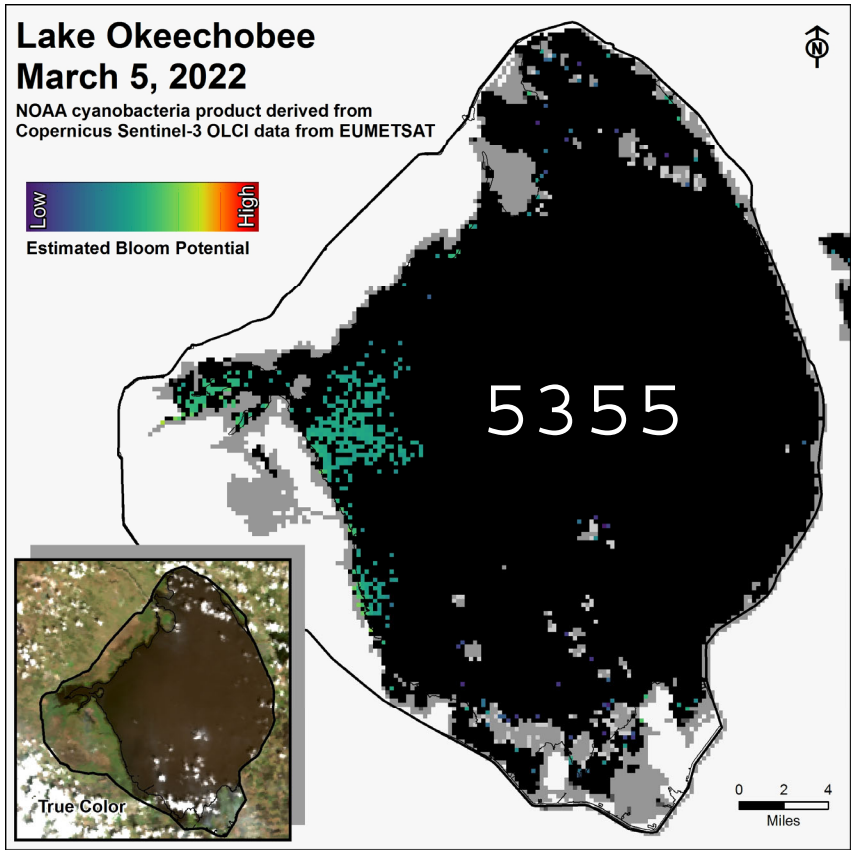




Lake Okeechobee
Cyanobacteria Bloom Potential







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Lake Okeechobee January Water Quality

Provisional Data

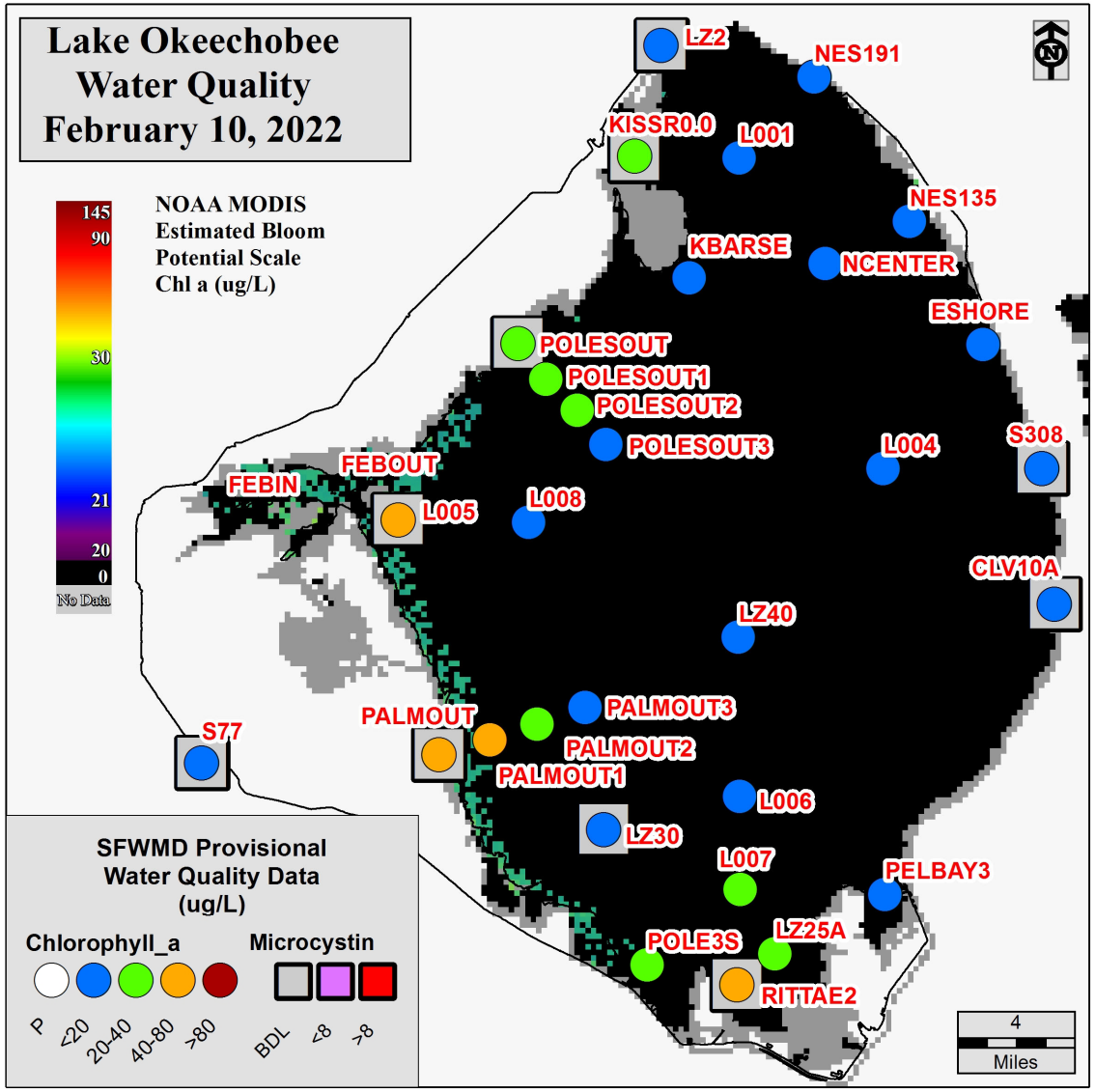
Collection Date: Feb 7-9, 2022

Station	CHL*a* (ug/L)	TOXIN (ug/L)	TAXA
FEBIN	NS		
FEBOUT	NS		
KISSR0.0	**27.9**	BDL	*mixed*
L005	**42.7**	BDL	*Cylindro*
LZ2	12.9	BDL	*mixed*
KBARSE	19.4		
RITTAE2	**40.0**	BDL	*mixed*
PELBAY3	6.0		
POLE3S	**33.6**		
LZ25A	**29.0**		
PALMOUT	**50.1**	BDL	*Cylin/Pseud*
PALMOUT1	**52.6**		
PALMOUT2	**27.9**		
PALMOUT3	11.4		
POLESOUT	**36.1**	BDL	*mixed*
POLESOUT1	**35.2**		
POLESOUT2	**24.2**		
POLESOUT3	18.4		
EASTSHORE	6.5		
NES135	7.3		
NES191	13.0		

Station	CHL*a* (ug/L)	TOXIN (ug/L)	TAXA
L001	9.6		
L004	10.3		
L006	7.1		
L007	**36.8**		
L008	9.2		
LZ30	13.8	BDL	*mixed*
LZ40	9.8		
CLV10A	8.8	BDL	*mixed*
NCENTER	11.4		

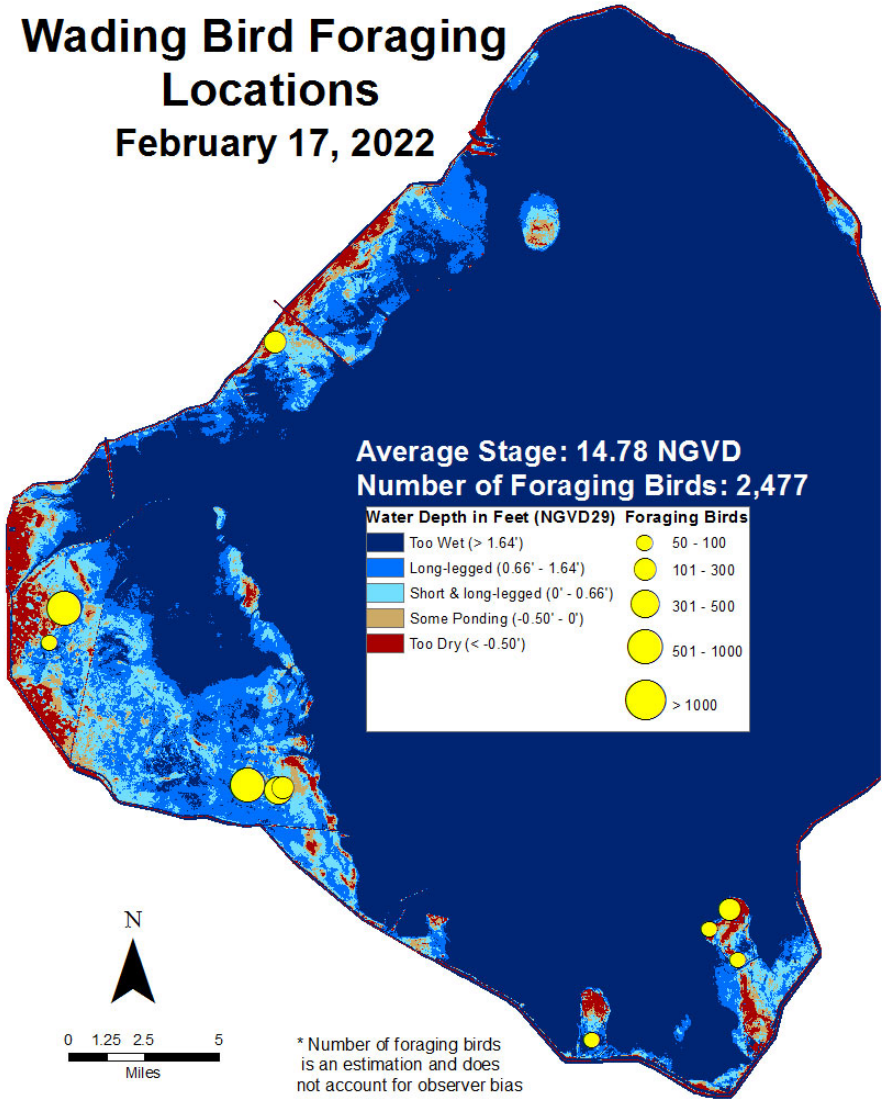
S308C	6.2	BDL	*mixed*
S77	19.2	BDL	*Microcys*

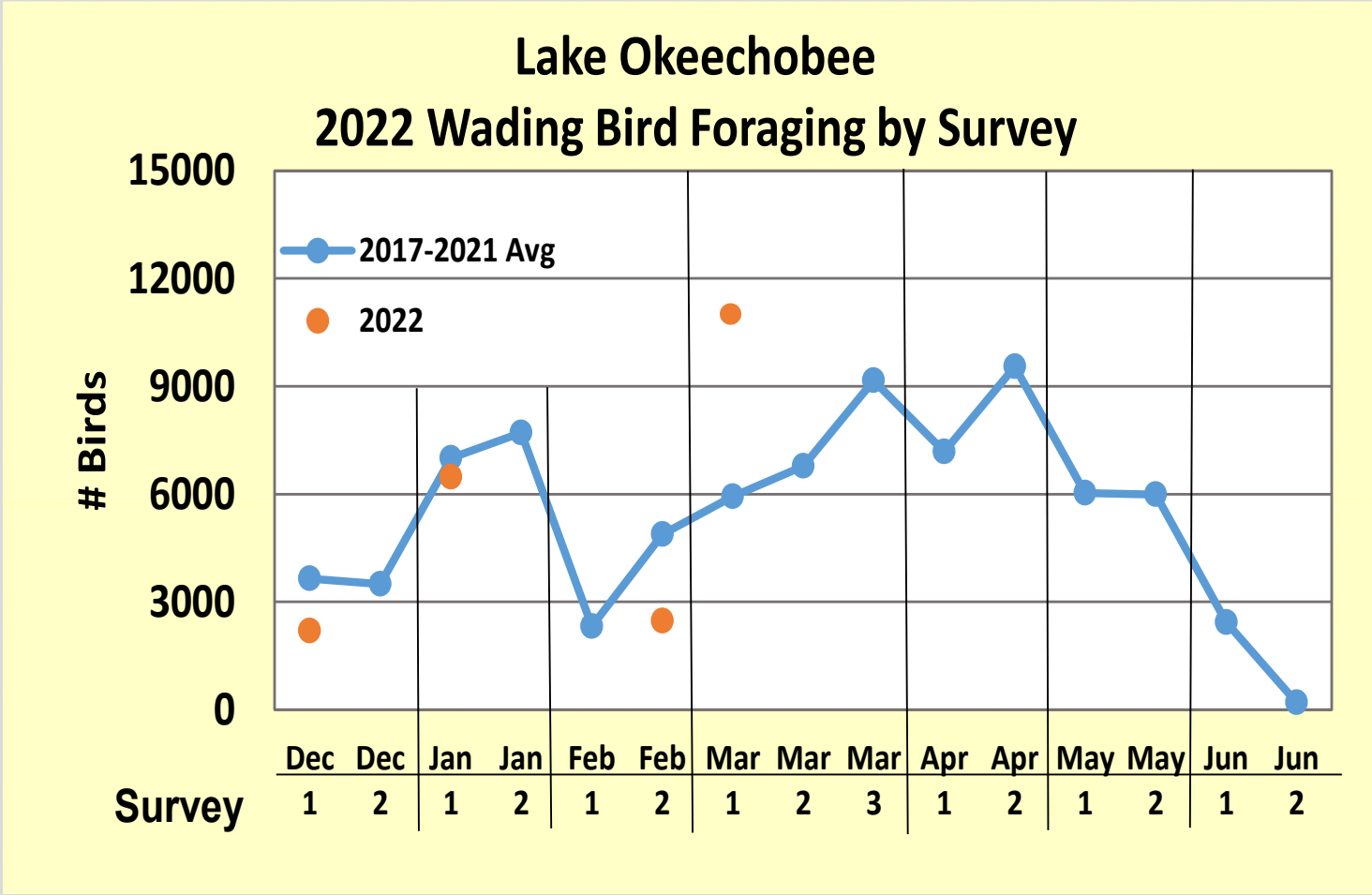
- SFWMD considers >40 µg/L Chlorophyll *a* (Chl*a*) an algal bloom
- BDL – Below Detectable Limit of **0.25** µg/L
- ND – No Dominant taxa
- P – Pending
- NS – Not Sampled
- Station bold font – crew observed possible BGA
- Chlorophyll *a* analyzed by SFWMD
- Toxin and Taxa analyzed by FDEP: *Microcys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



Presenter: Seán Sculley

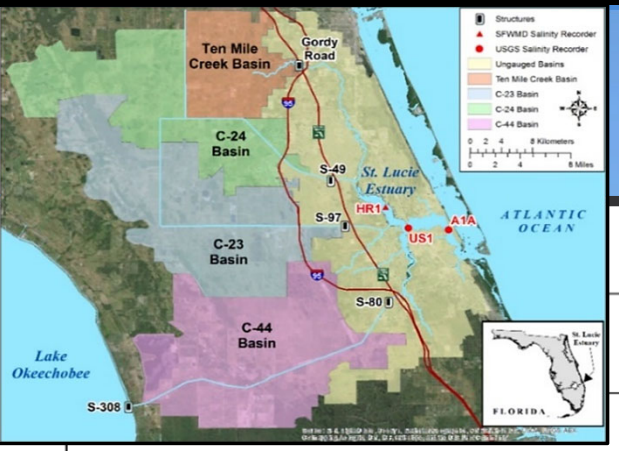
Lake Okeechobee Wading Bird Foraging



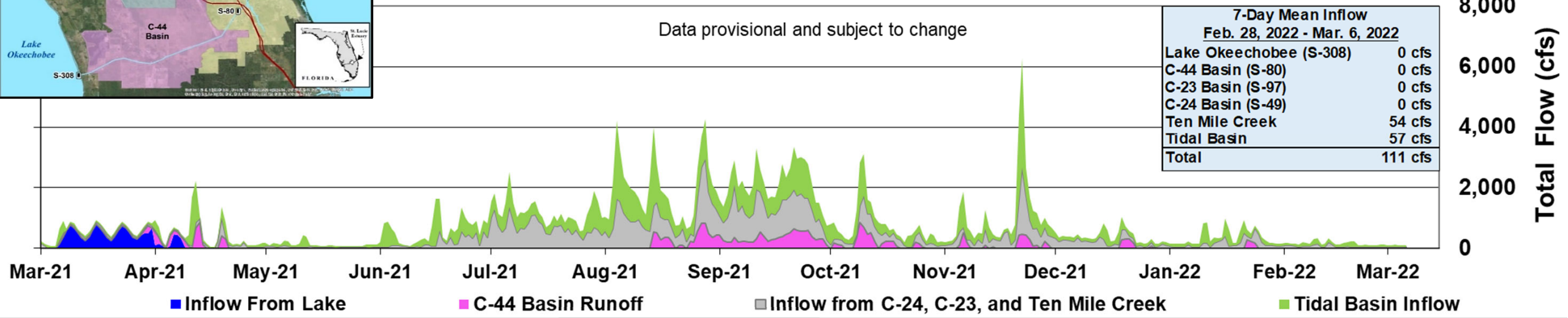


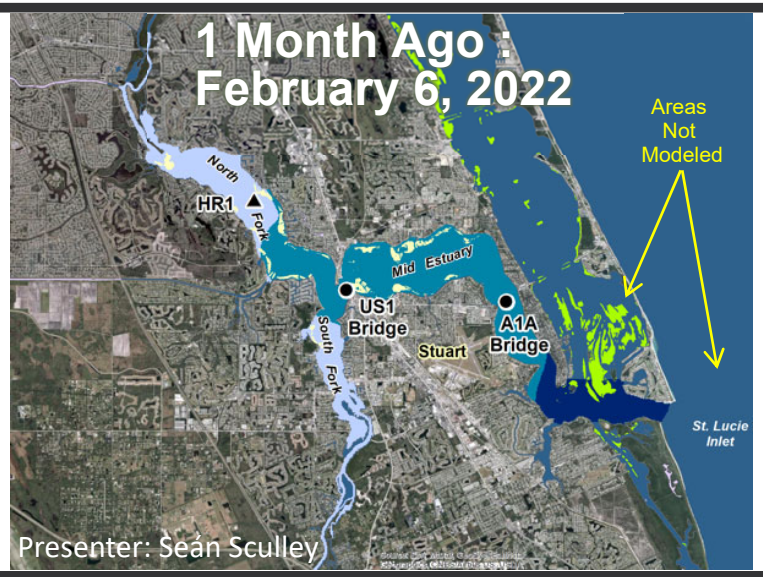
Presenter: Seán Sculley

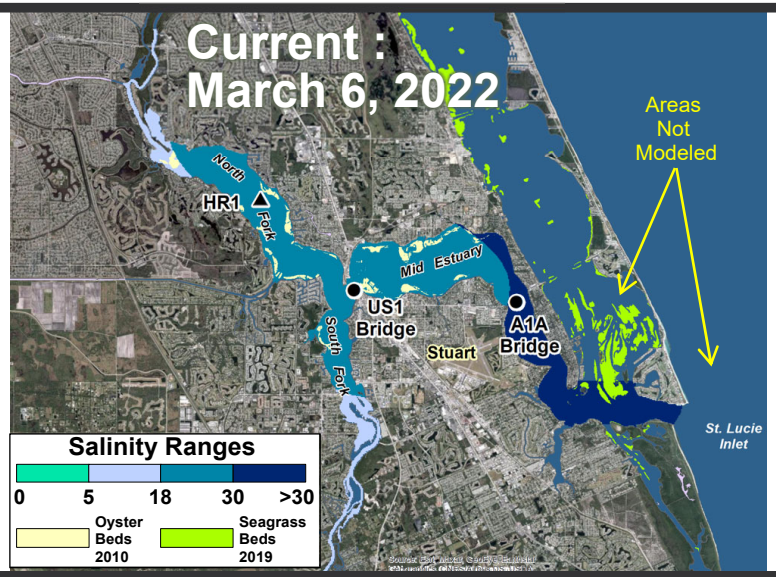
St. Lucie Inflows and Salinity Conditions

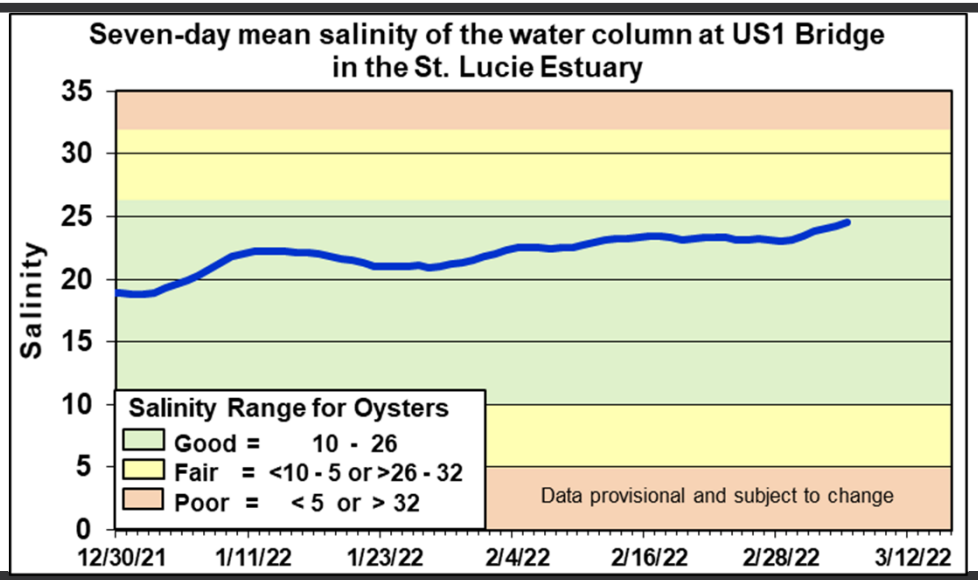


Total Daily Inflow into the St. Lucie Estuary



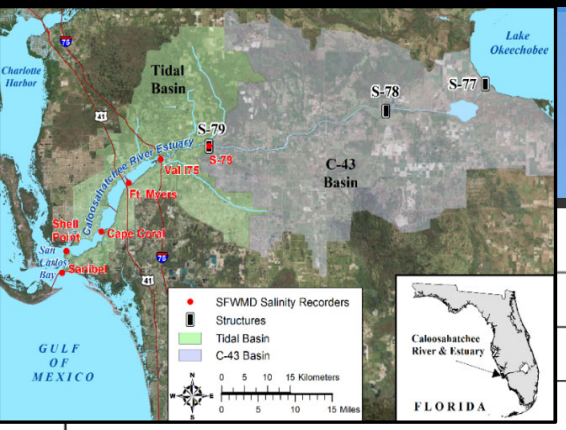


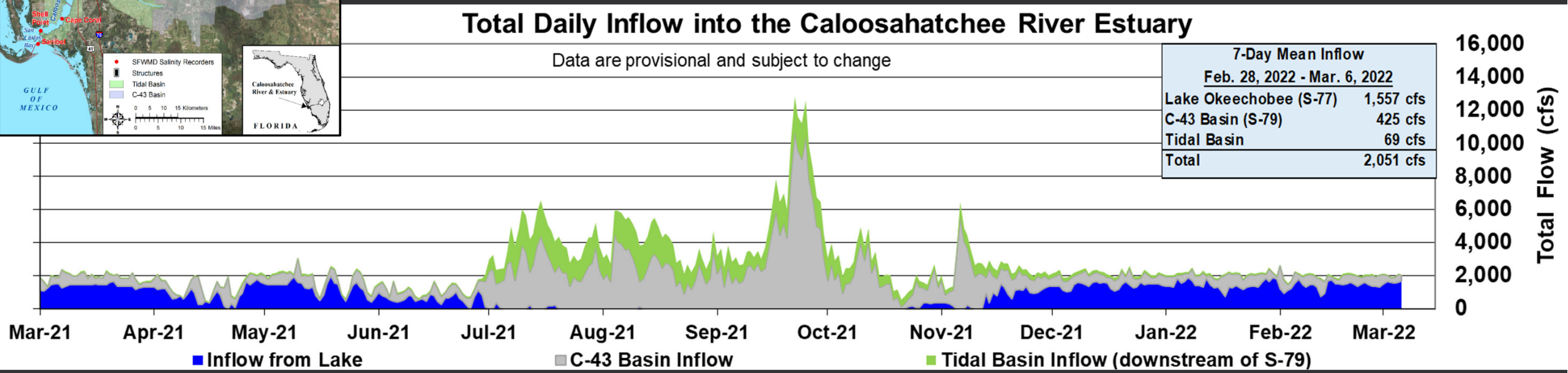


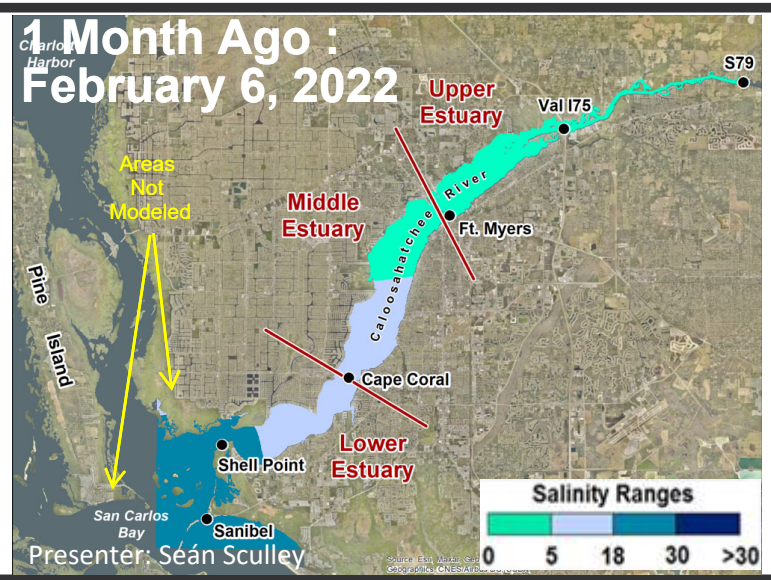


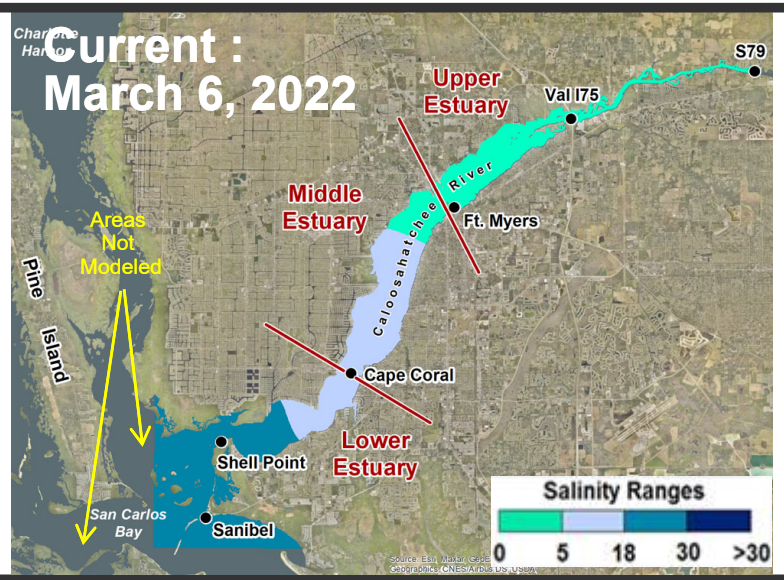
Presenter: Seán Sculley

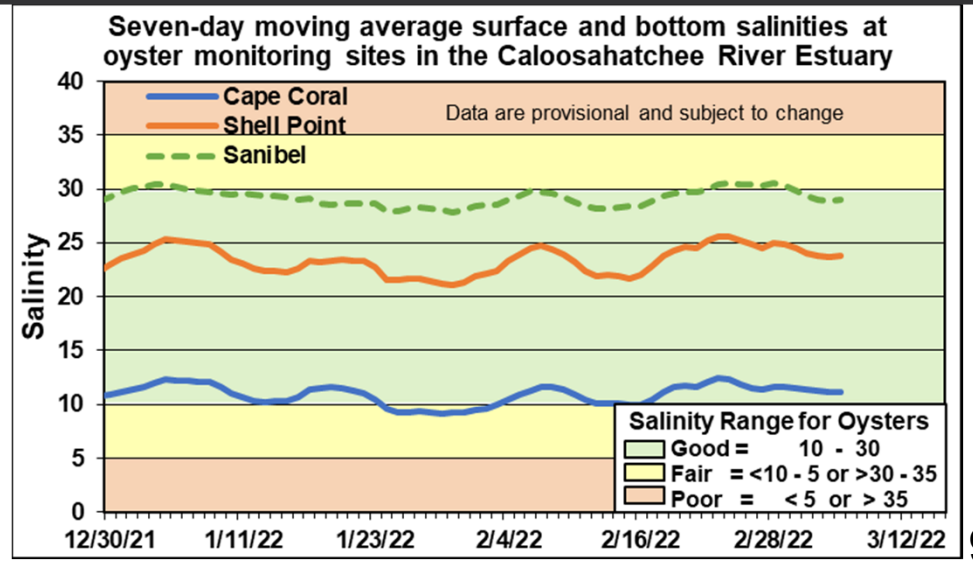
Caloosahatchee Inflows and Salinity Conditions



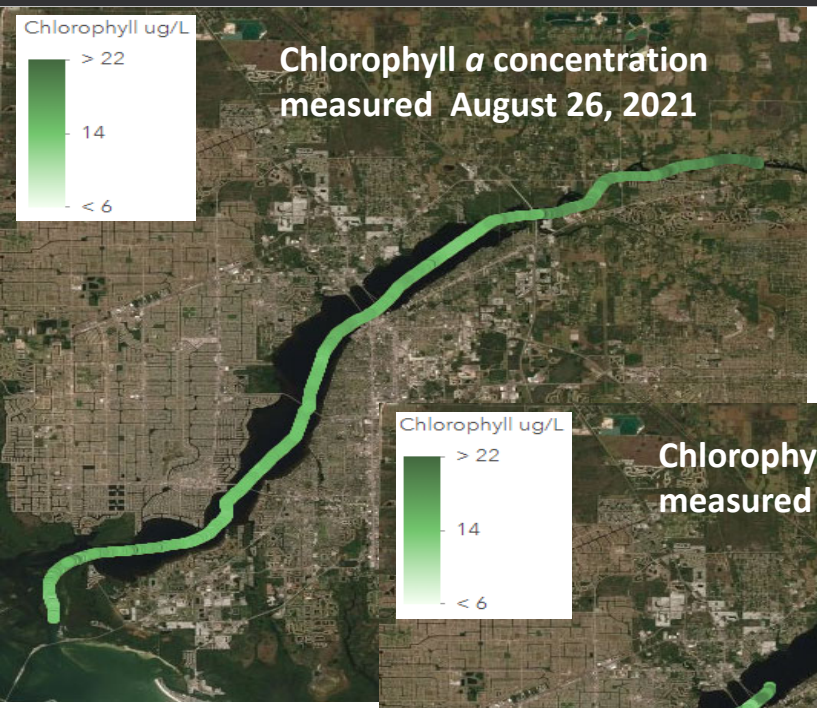




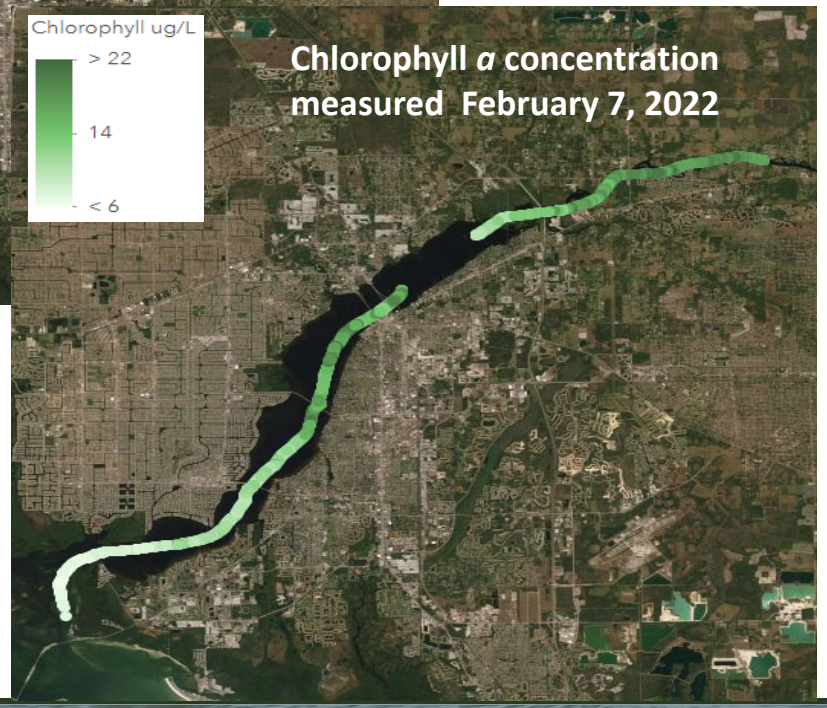




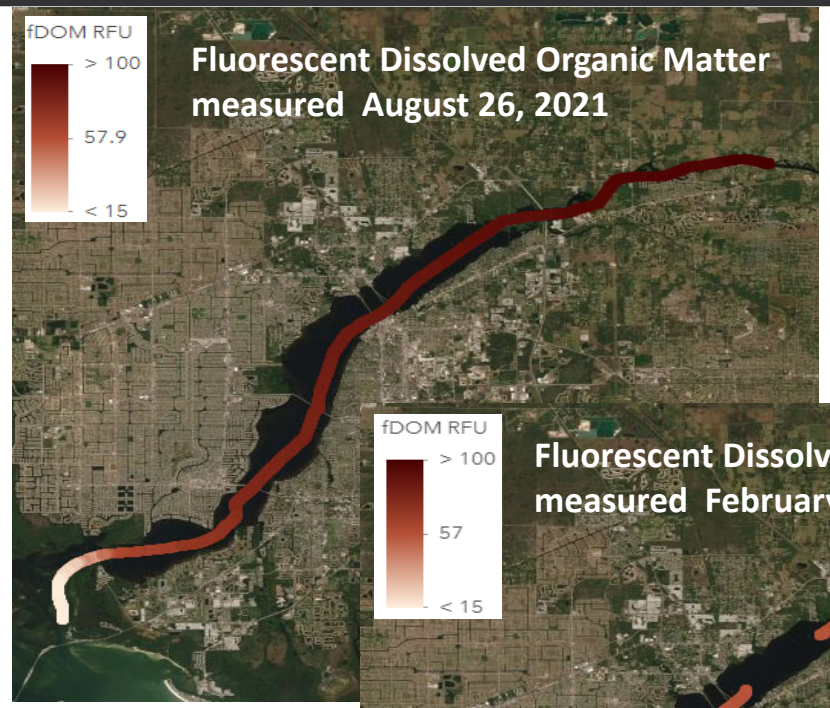
Caloosahatchee Estuary – SERFIS WQ



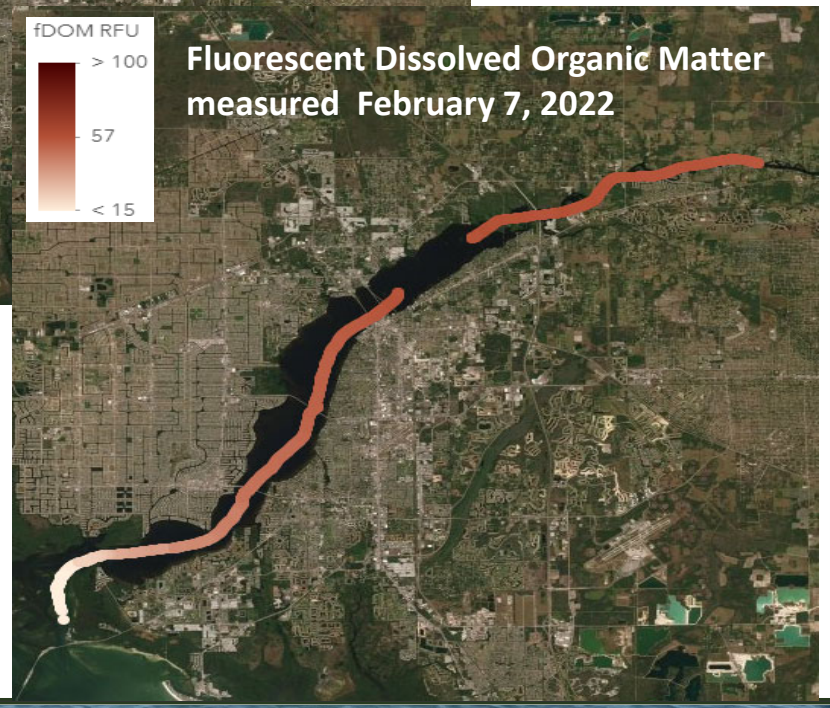
Chlorophyll *a* concentration measured August 26, 2021



Chlorophyll *a* concentration measured February 7, 2022

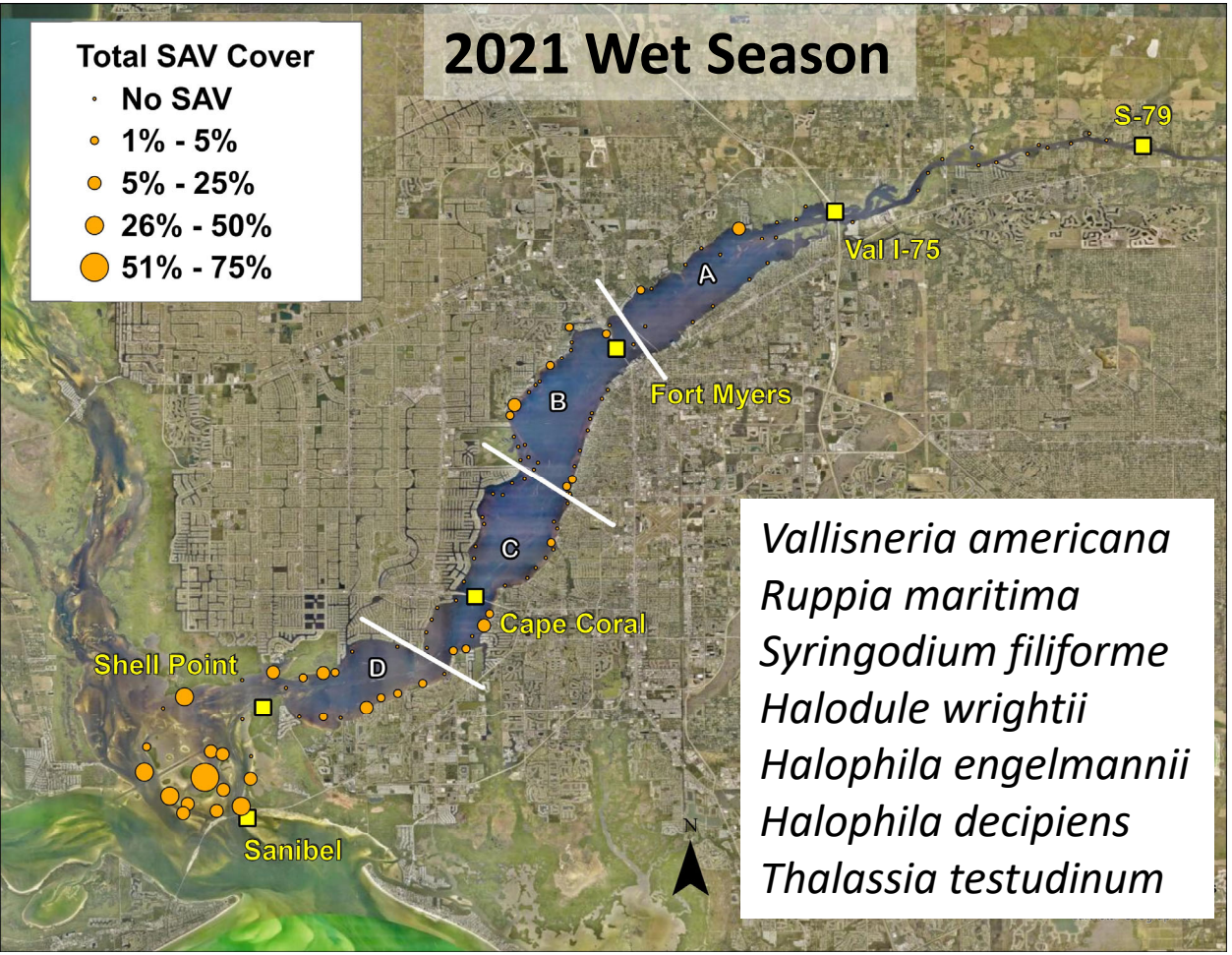


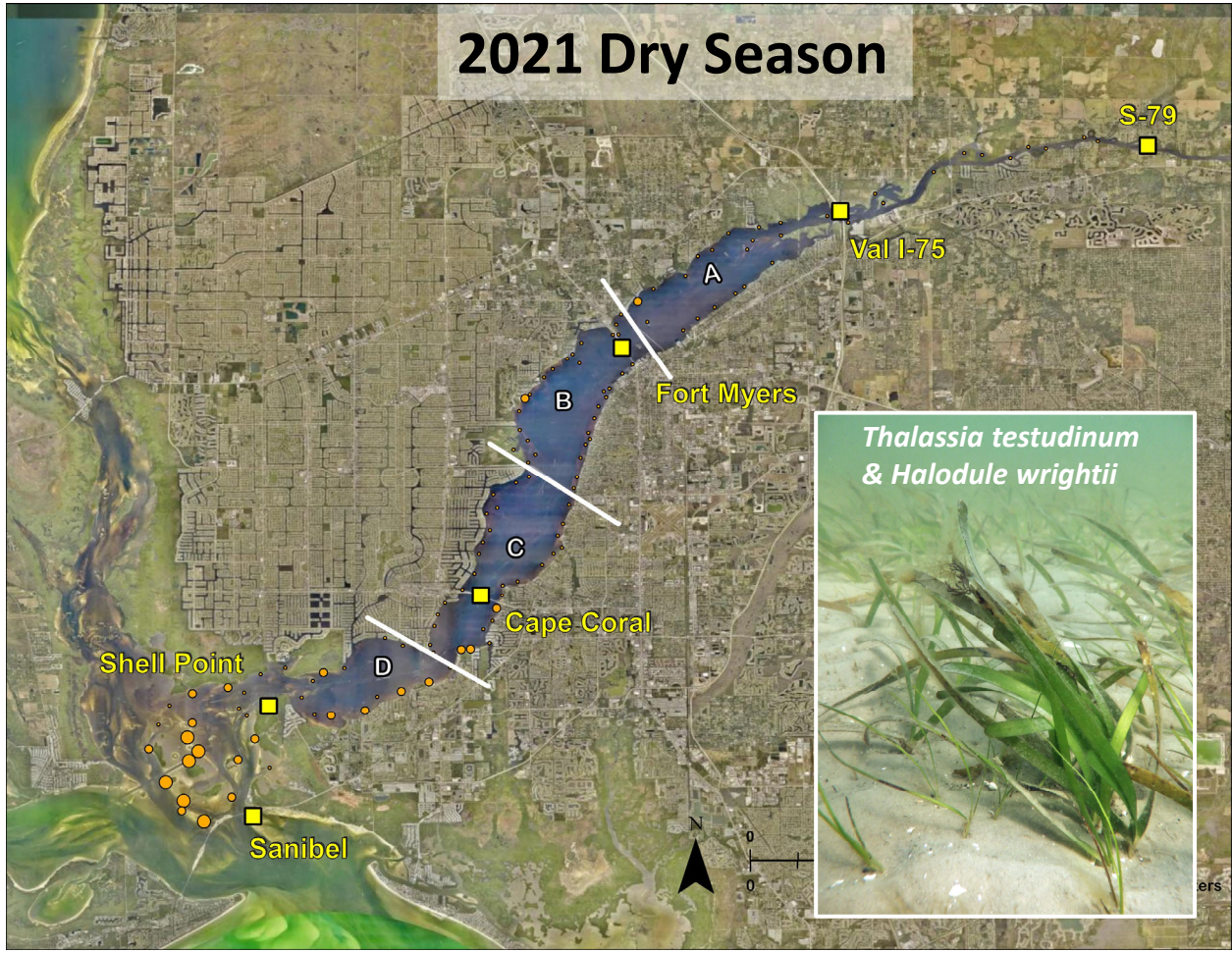
Fluorescent Dissolved Organic Matter measured August 26, 2021



Fluorescent Dissolved Organic Matter measured February 7, 2022

Caloosahatchee Estuary – SAV Distribution





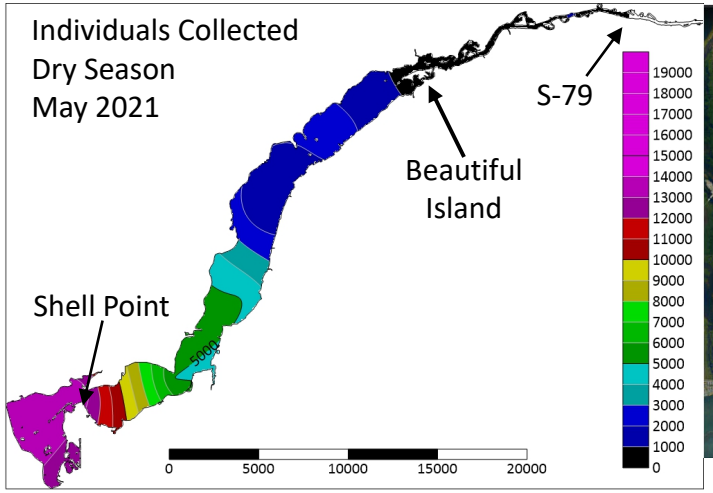
Caloosahatchee Estuary – Zooplankton

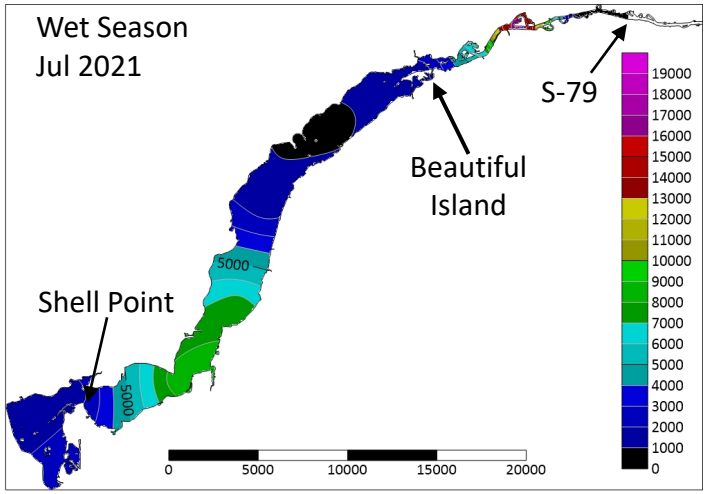
Dry Season

- Most zooplankton at the mouth of estuary
- Species number ranged from 8 at S-79 to 56 at Shell Point
- Estuarine species located mid-estuary to mouth

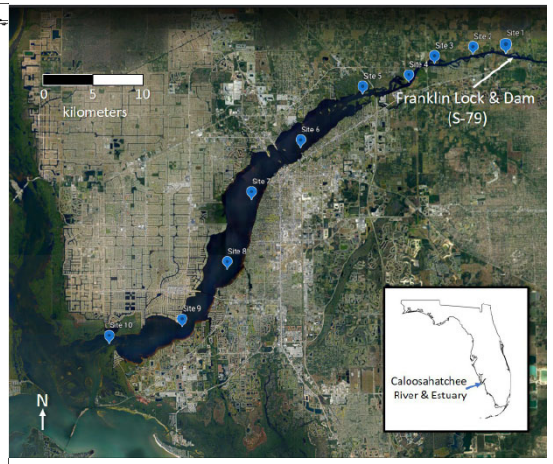
Wet Season

- Most zooplankton at head of estuary
- Species number ranged from 29 at S-79 to 25 at Shell Point
- Estuarine species located at mouth of estuary

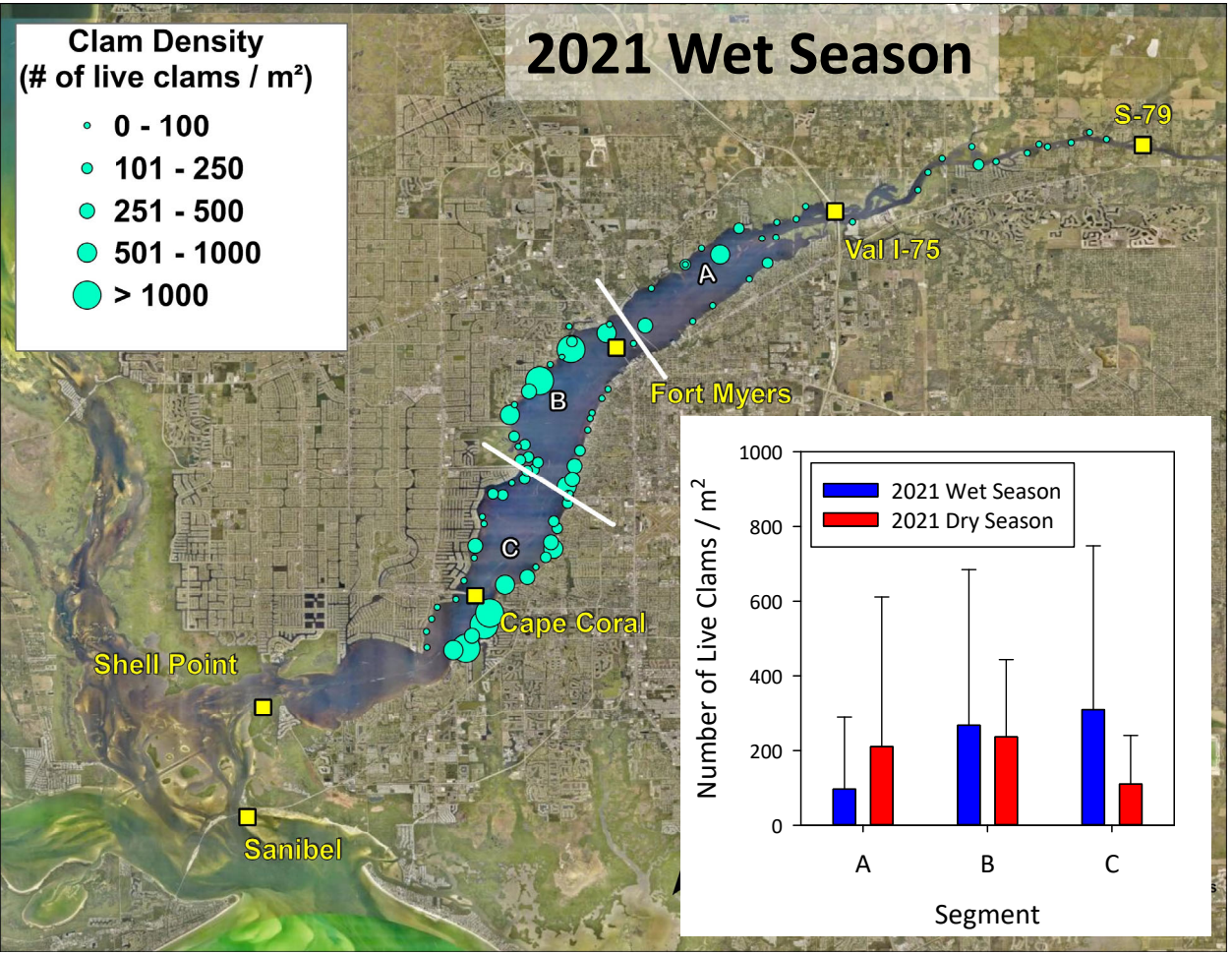


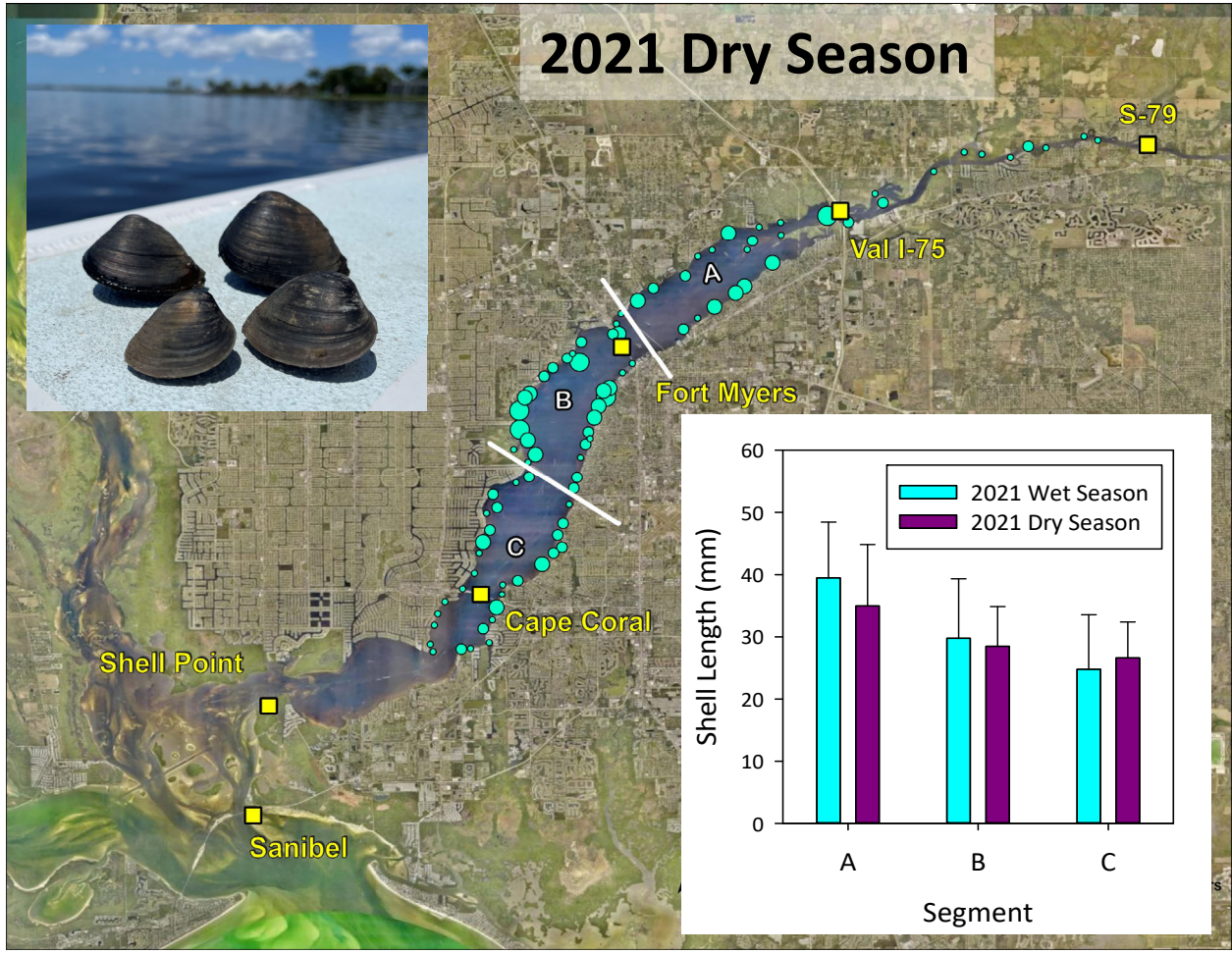


From Tolley et al, 2022

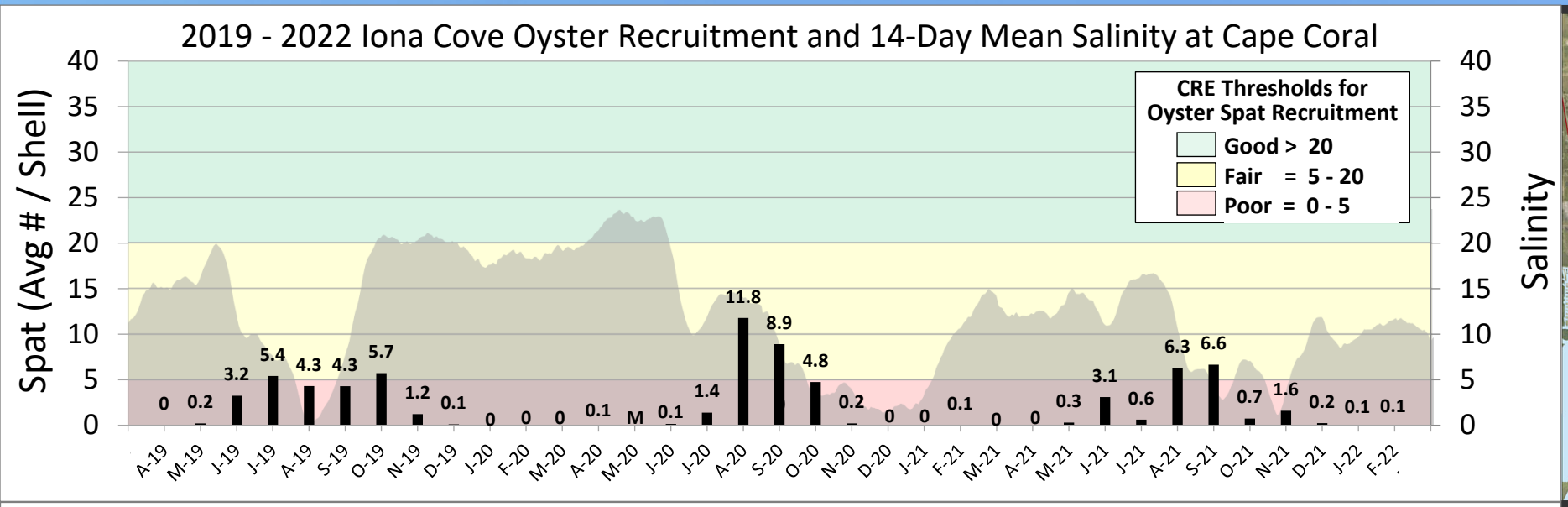


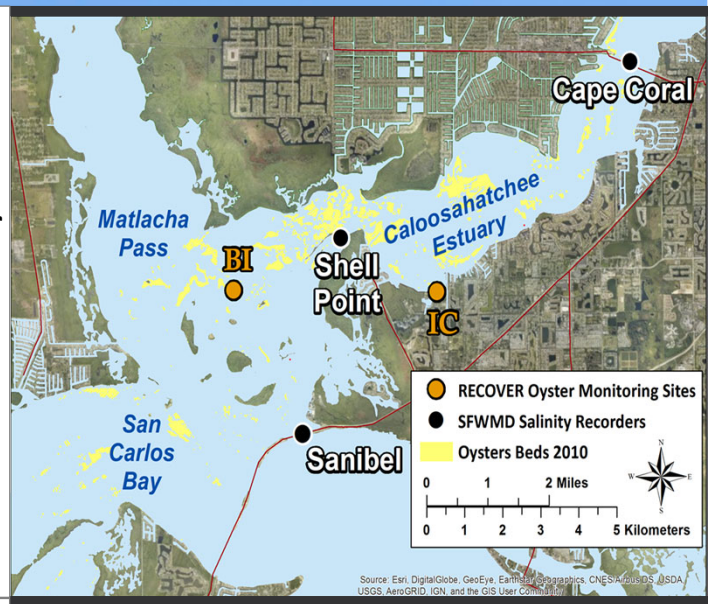
Caloosahatchee Estuary – Clam Distribution

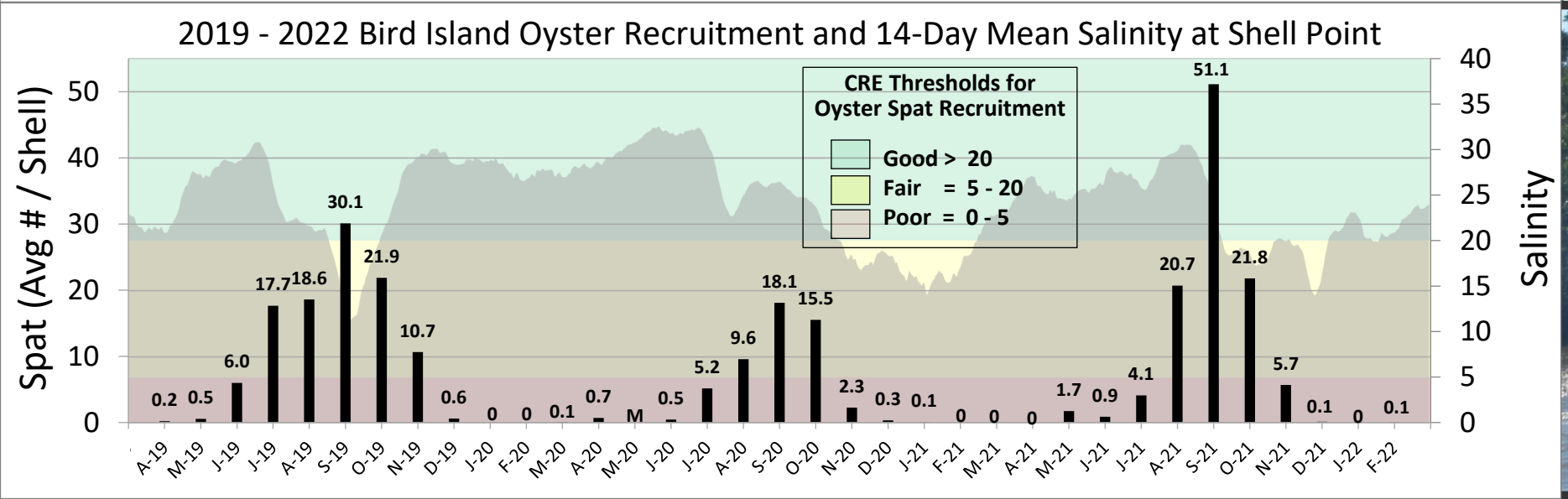




Caloosahatchee Estuary – Oyster Recruitment



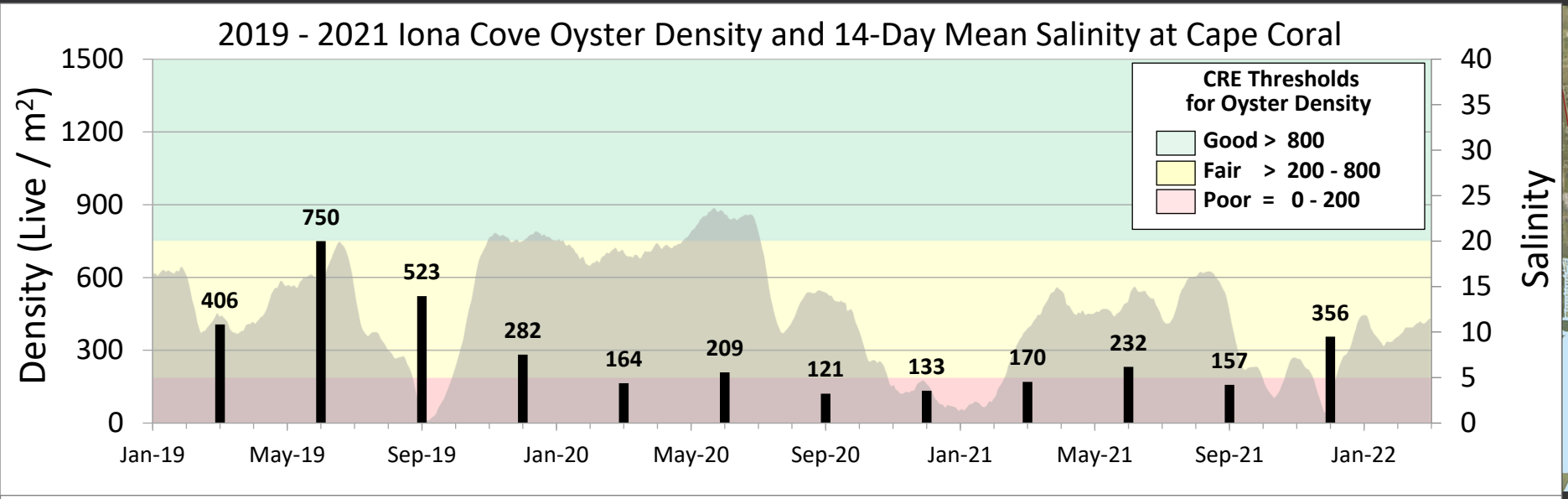


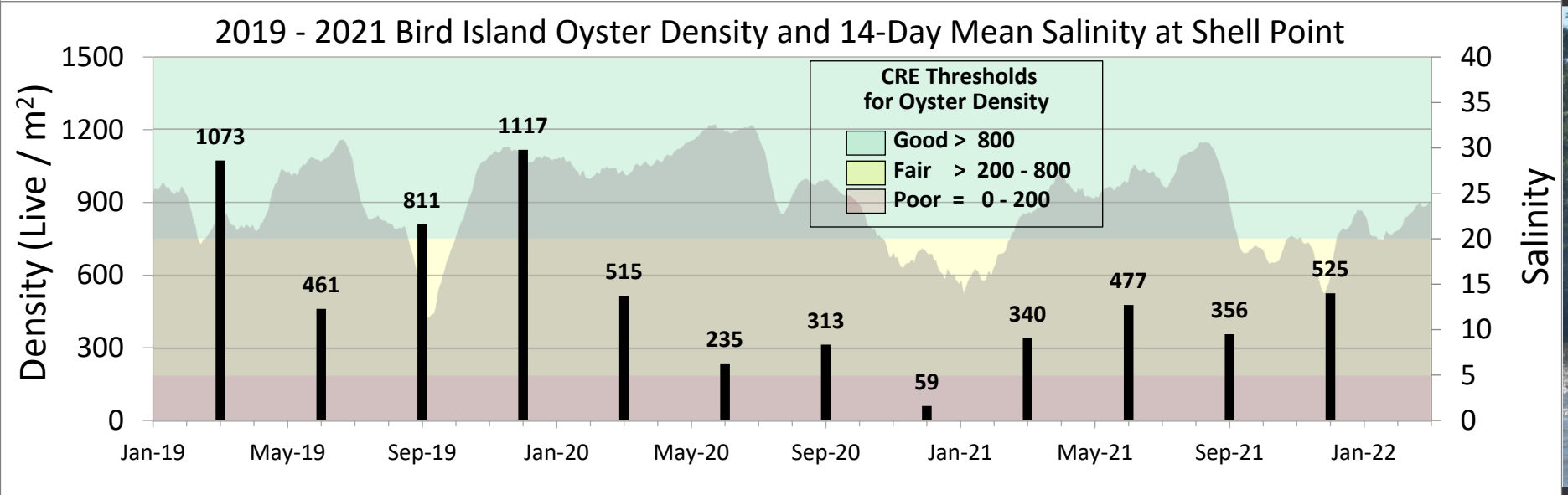


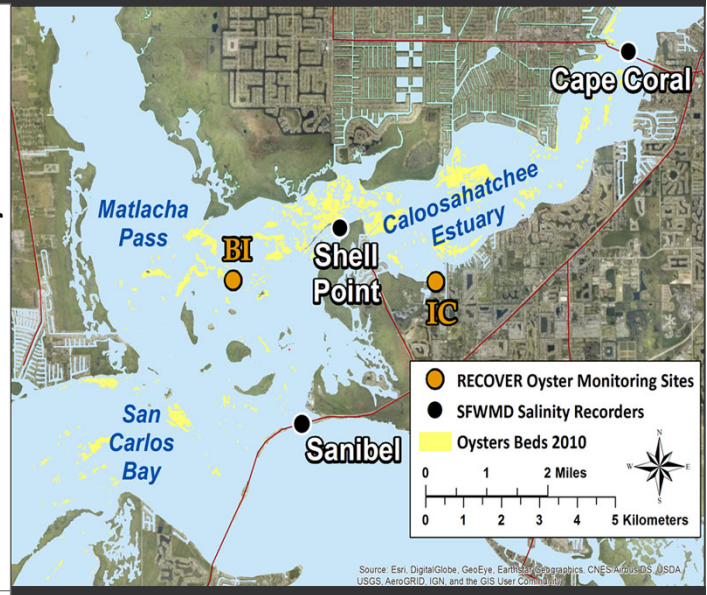
Exposed oyster bed at Iona Cove

Presenter: Seán Sculley

Caloosahatchee Estuary – Oyster Density







Exposed oyster bed at Iona Cove

Presenter: Seán Sculley

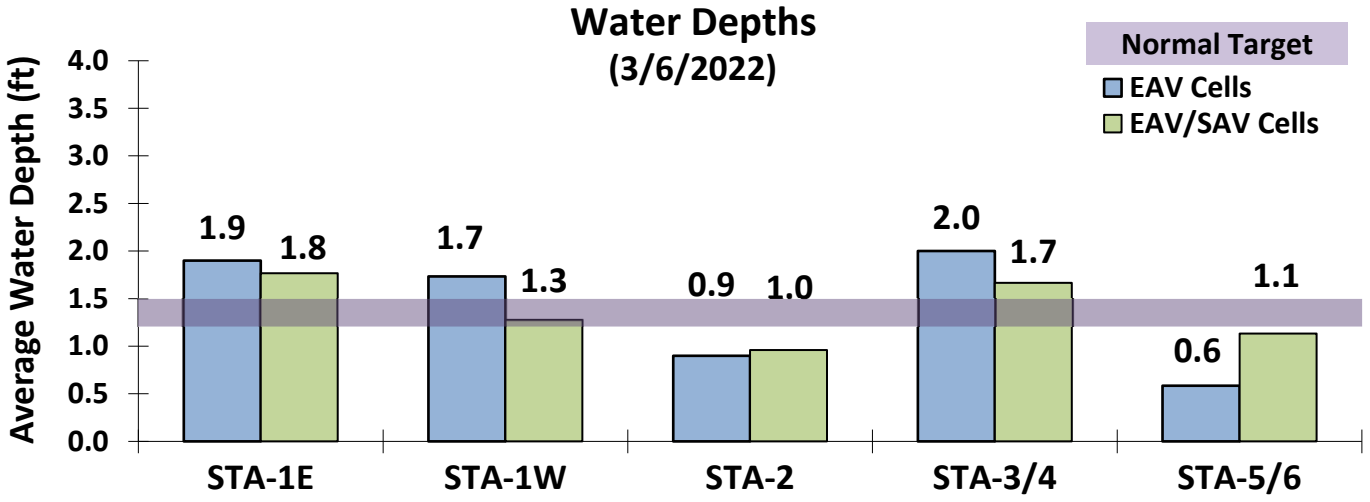
Everglades Stormwater Treatment Areas (STAs)

- STAs treated basin runoff and Lake Okeechobee releases in February
  - Total inflows to STAs since 5/1/2021 (WY2022): ~990,000 ac-ft
  - Lake Okeechobee releases to FEB/ STAs in WY2022: ~89,700 ac-ft
- Extensive vegetation management activities underway to address stressed and highly stressed vegetation especially in EAV cells
- Most treatment cells are at or near target depth except STA-5/6 EAV cells starting to dry out

Water Year 2022 To Date
5/1/2021 to 3/6/2022

	STA-1E	STA-1W	STA-2	STA-3/4	STA-5/6
Inflow TP Concentration (ppb)	119	167	93	66	243
Outflow TP Concentration (ppb)	22	24	15	15	50
365-day Phosphorus Loading Rate ($g/m^2/yr$)	2.3	0.3	0.6	0.7	0.9
Inflow Volume (ac-ft)	167,300	50,700	266,900	342,800	177,800

Includes preliminary data; all concentrations are flow-weighted means



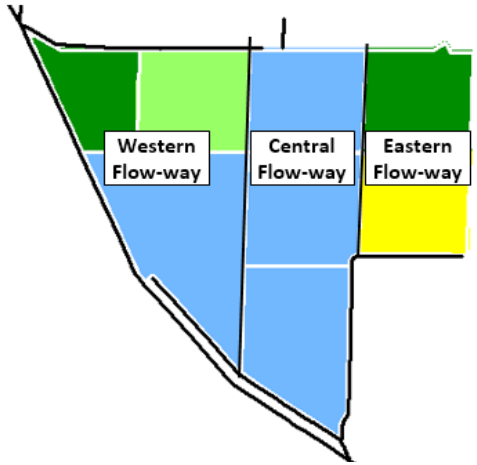
Includes preliminary data; Emergent Aquatic Vegetation (EAV); Submerged Aquatic Vegetation (SAV)

Presenter: Seán Sculley

STA-1E

STA-1E Weekly Status Report – 2/28/2022 through 3/6/2022

168 ac-ft → Inflow



Outflow → 0 ac-ft

STA-1E Flow-Way Status

Flow-Way	Vegetation Status (Healthy ----- Stressed)	365-day P Loading Rate (below 1.0 g P /m²/yr is optimal)	Online / Offline / Restrictions
Eastern	Offline, Tropical Storm Eta repairs starting 01/24/2022		
Central		1.0	Vegetation Rehab
Western	Offline, construction activities starting 11/01/2019		

As of 3/6/2022

Stage Based: Relative to Target Stage (TS)

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

Depth / Area Based: Percent of Area Dry

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

STA-1E Flow & Phosphorus Concentration

	7-day	28-day	365-day
Total Inflow, ac-ft	168	2,781	179,190
--Lake Inflow, ac-ft	0	N/A	5,800
Total Outflow, ac-ft	0	373	150,519
Inflow Conc., ppb	34	55	122
Outflow Conc., ppb	N/A	23	23

Includes Preliminary Data

STA-1W

STA-1W Weekly Status Report – 2/28/2022 through 3/6/2022

124 ac-ft → Inflow

Outflow → 0 ac-ft

STA-1W 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
Northern		1.0	Construction
Western		1.0	Construction
Eastern		1.0	Construction
Cell 7		N/A	Construction
Cell 8		N/A	Construction

As of 3/6/2022

Stage Based: Relative to Target Stage (TS)

- Deep Water Level (> 2.8' above TS)
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- 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

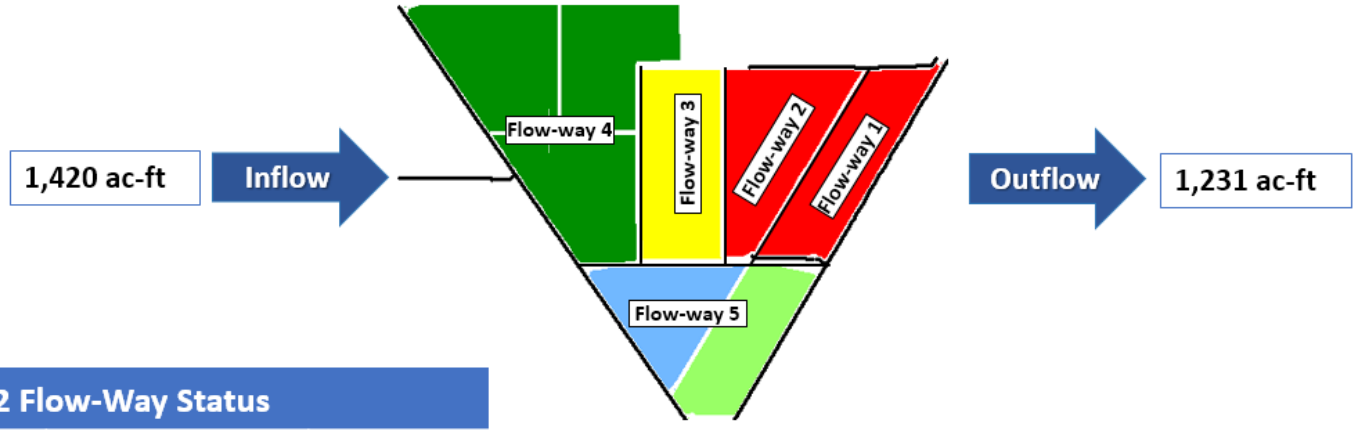
STA-1W Flow & Phosphorus Concentration

	7-day	28-day	365-day
Total Inflow, ac-ft	124	2,718	56,139
--Lake Inflow, ac-ft	0	N/A	5,400
Total Outflow, ac-ft	0	0	52,974
Inflow Conc., ppb	83	85	165
Outflow Conc., ppb	N/A	N/A	24

Includes Preliminary Data

STA-2

STA-2 Weekly Status Report – 2/28/2022 through 3/6/2022



STA-2 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
1		1.0	Vegetation Management
2	Offline, construction activities as of 9/7/2021		
3		1.0	Vegetation Rehab
4		1.0	Vegetation Rehab
5		1.0	Online

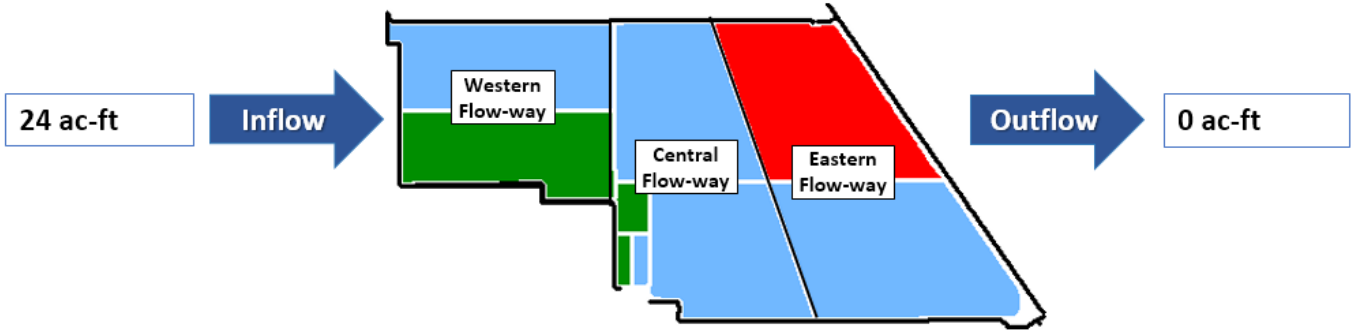
As of 3/6/2022	
Stage Based: Relative to Target Stage (TS)	
Deep Water Level (> 2.8' above TS)	
High Water Level (1.5' – 2.8' above TS)	
0.2' – 1.5' above TS	
Target Stage (TS +/- 0.2')	
Low Water Level (<0.2' below TS)	
Depth / Area Based: Percent of Area Dry	
0-25% Dry	50-75% Dry
25-50% Dry	75-100% Dry

STA-2 Flow & Phosphorus Concentration

	7-day	28-day	365-day
Total Inflow, ac-ft	1,420	6,464	321,393
--Lake Inflow, ac-ft	1,400	N/A	63,500
Total Outflow, ac-ft	1,231	5,524	336,161
Inflow Conc., ppb	48	42	88
Outflow Conc., ppb	13	13	15
Includes Preliminary Data			

STA-3/4

STA-3/4 Weekly Status Report – 2/28/2022 through 3/6/2022



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 3/6/2022

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-3/4 Flow & Phosphorus Concentration

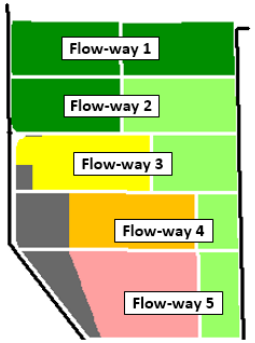
	7-day	28-day	365-day
Total Inflow, ac-ft	24	26	358,560
--Lake Inflow, ac-ft	0	N/A	38,200
Total Outflow, ac-ft	0	1,007	316,294
Inflow Conc., ppb	30	29	65
Outflow Conc., ppb	N/A	20	15

Includes Preliminary Data

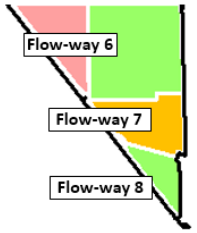
STA-5/6

STA-5/6 Weekly Status Report – 2/28/2022 through 3/6/2022

28 ac-ft → Inflow



Outflow → 0 ac-ft



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
1		1.0	Online
2		N/A	Online
3		N/A	Online
4	Offline, vegetation management starting 01/24/2022		
5		1.0	Online

As of 3/6/2022

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	28	678	177,796
--Lake Inflow, ac-ft	0	N/A	9,000
Total Outflow, ac-ft	0	260	169,265
Inflow Conc., ppb	67	80	243
Outflow Conc., ppb	N/A	17	50

Includes Preliminary Data

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		1.0	Online
7		1.0	Online
8		1.0	Online

As of 3/6/2022

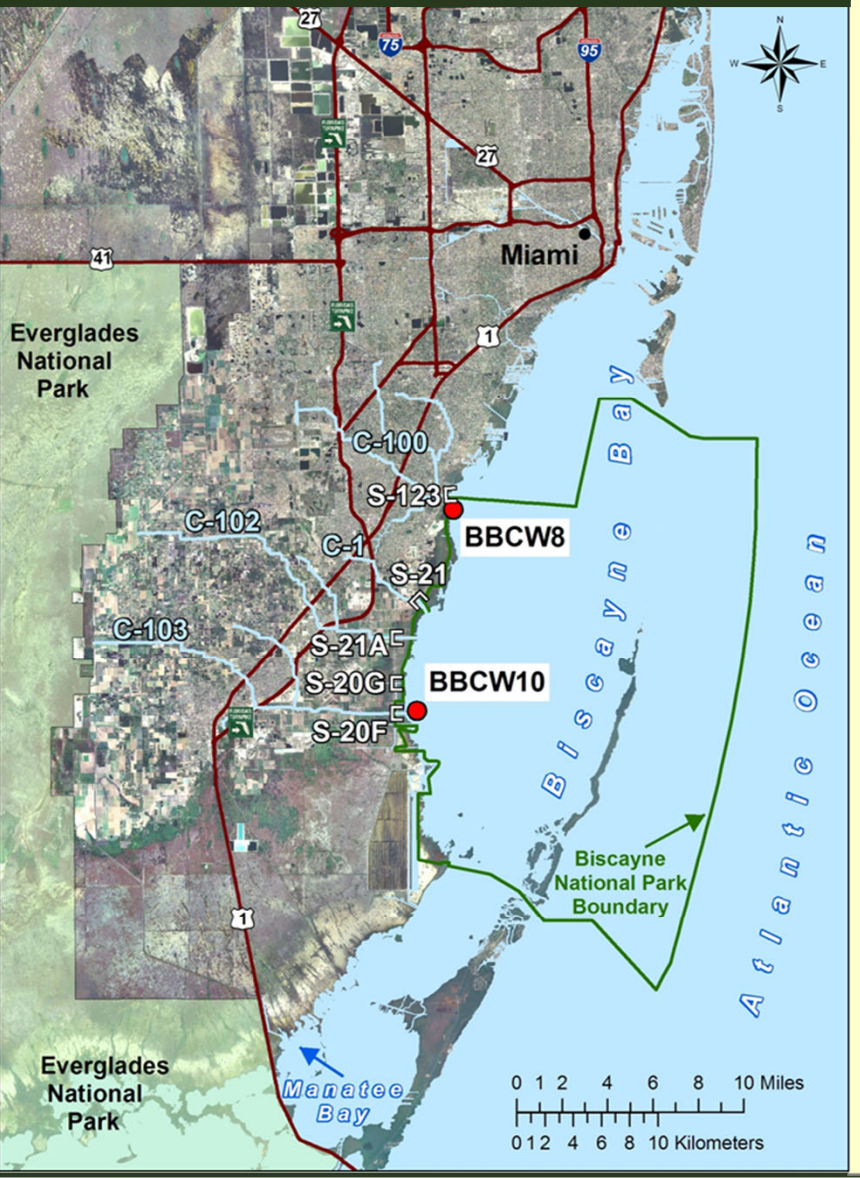
Stage Based: Relative to Target Stage (TS)

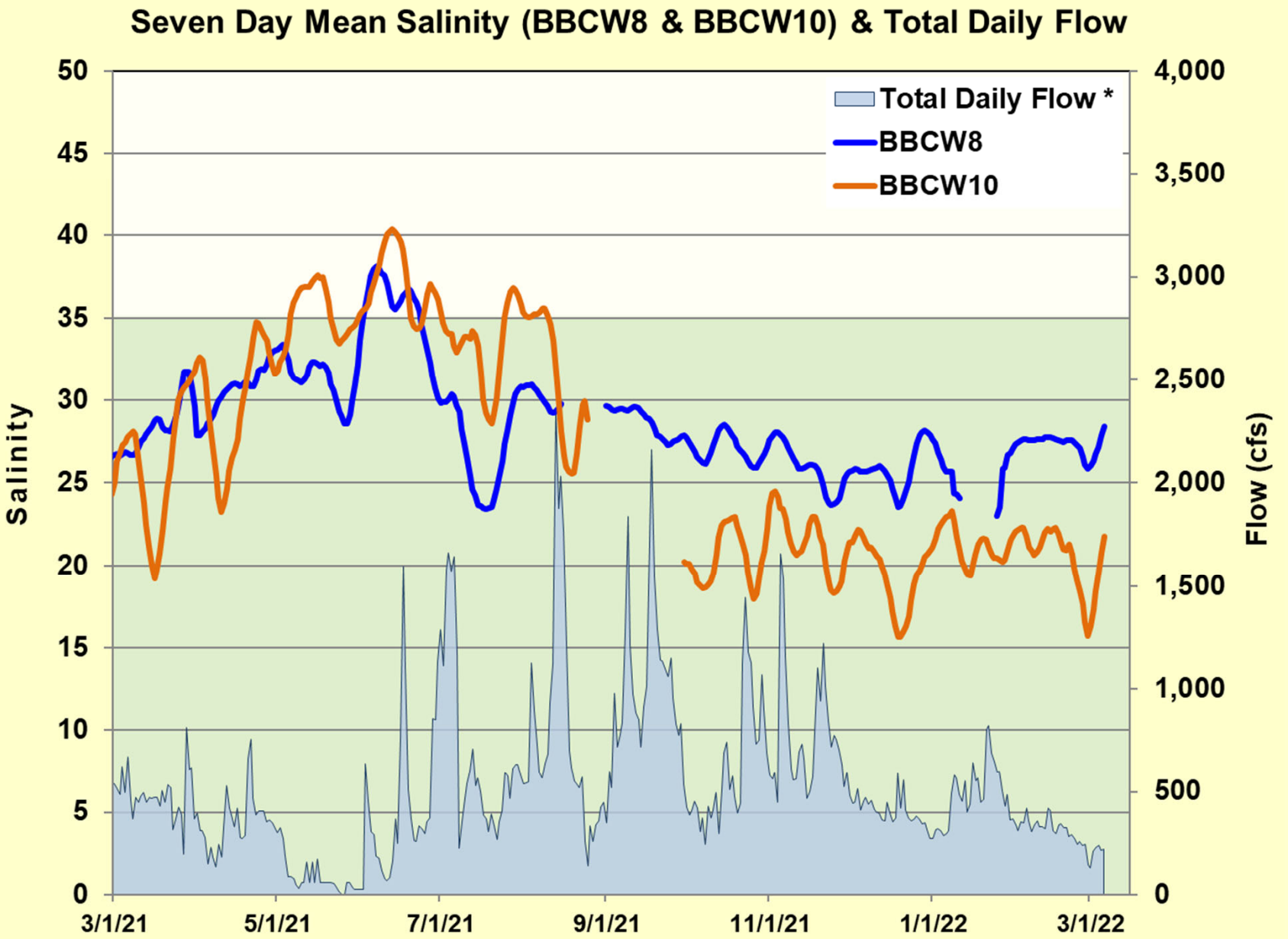
- Deep Water Level (> 2.8' above TS)
- High Water Level (1.5' – 2.8' above TS)
- 0.2' – 1.5' above TS
- Target Stage (TS +/- 0.2')
- Low Water Level (<0.2' below TS)

Depth / Area Based: Percent of Area Dry

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

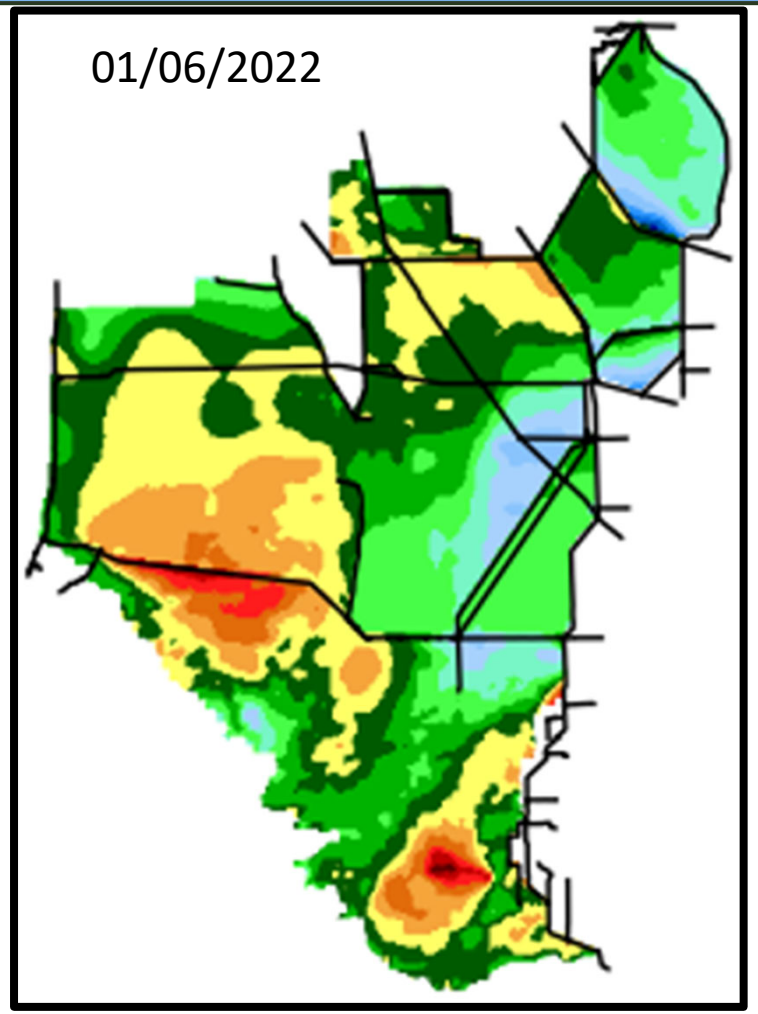
Biscayne Bay

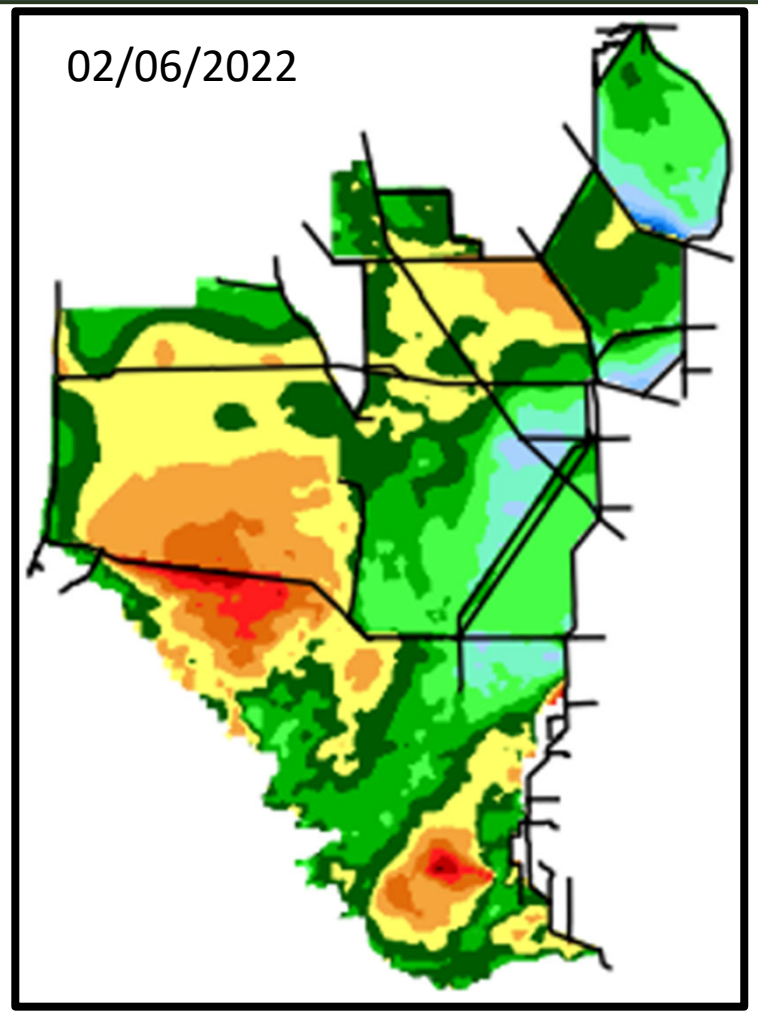


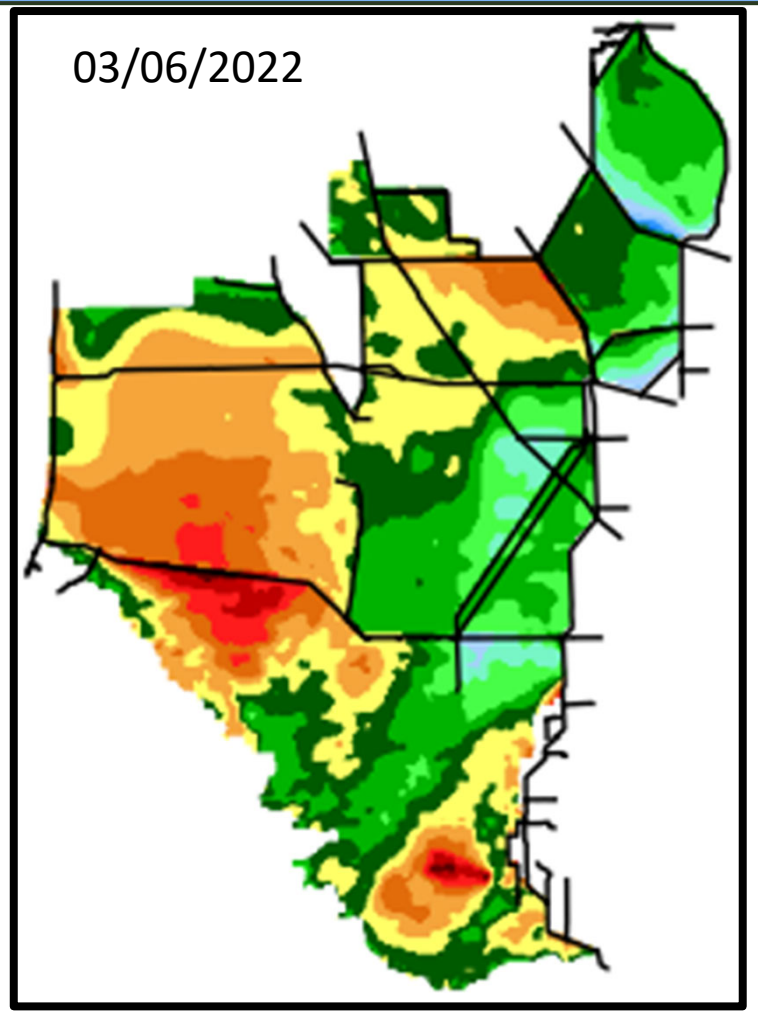


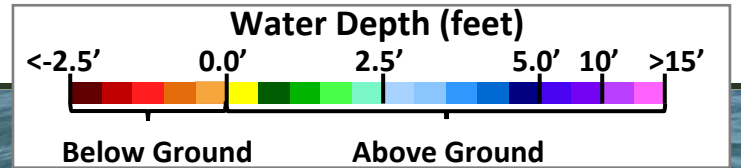
* Total flow from S20G, S20F, S21, S21A, S123, S700P

Everglades Water Depth Maps

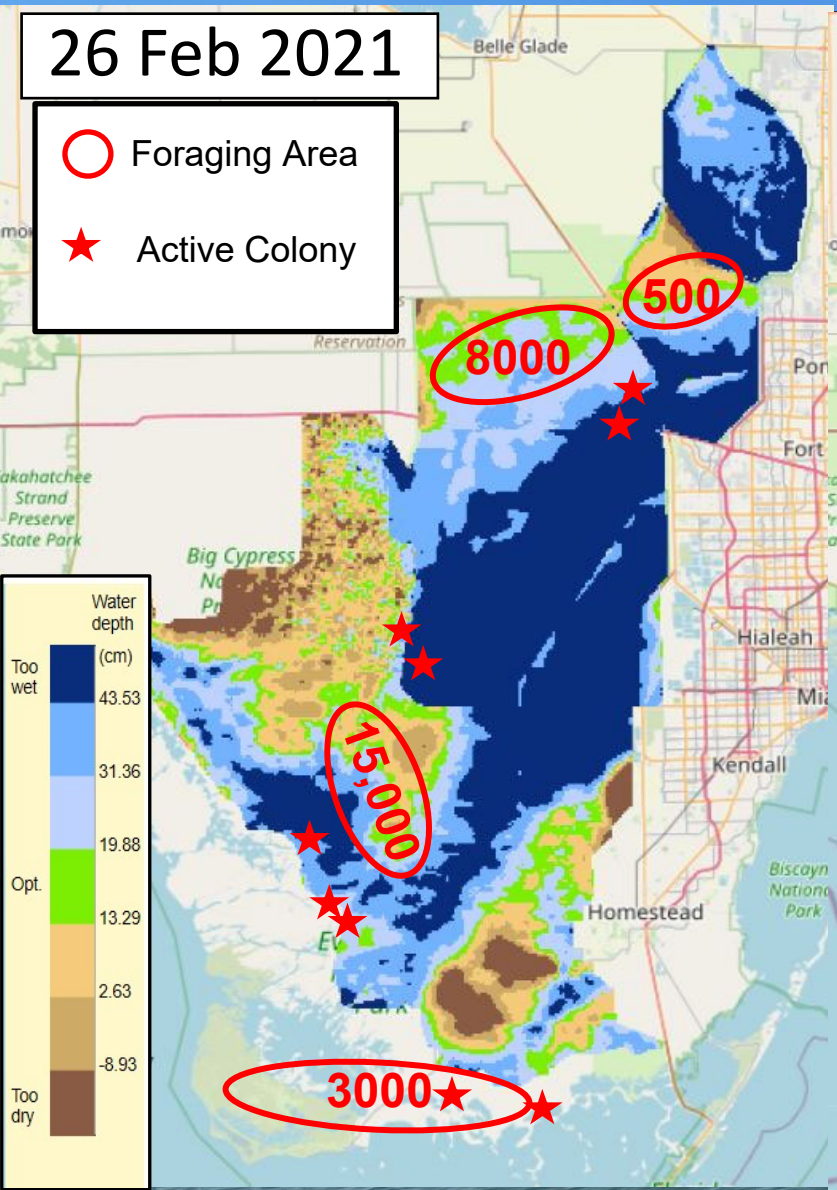


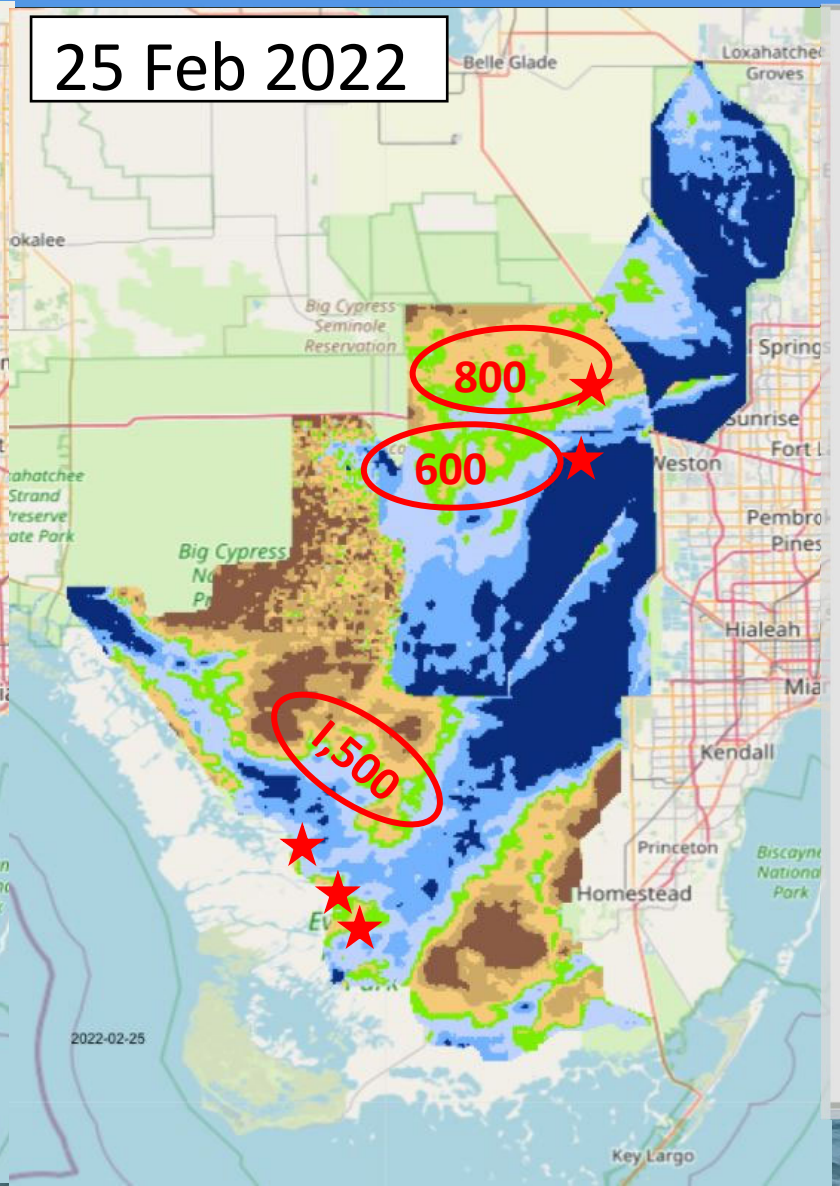






Current Wading bird foraging & nesting compared to February 2021

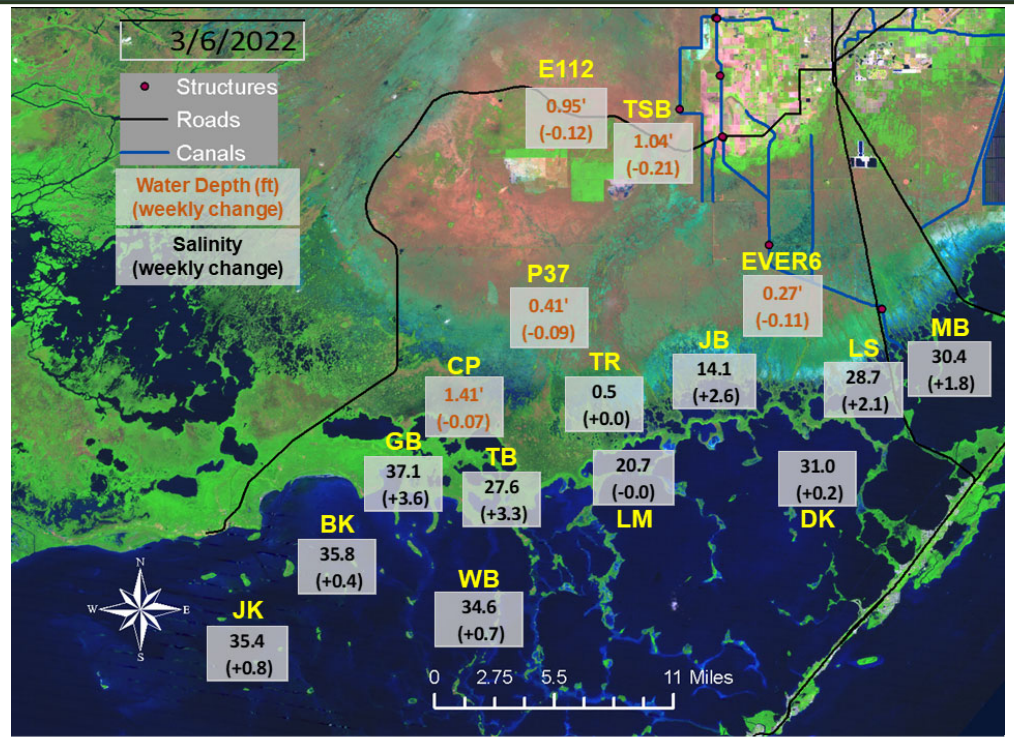


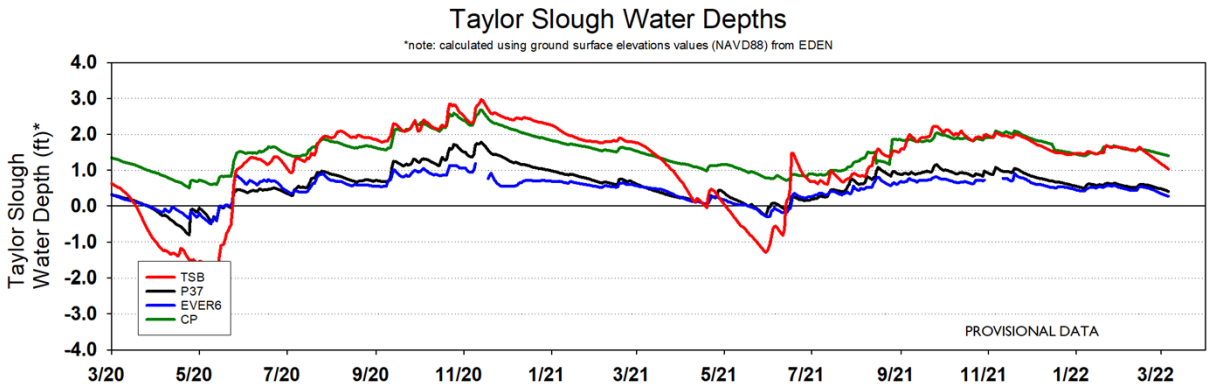


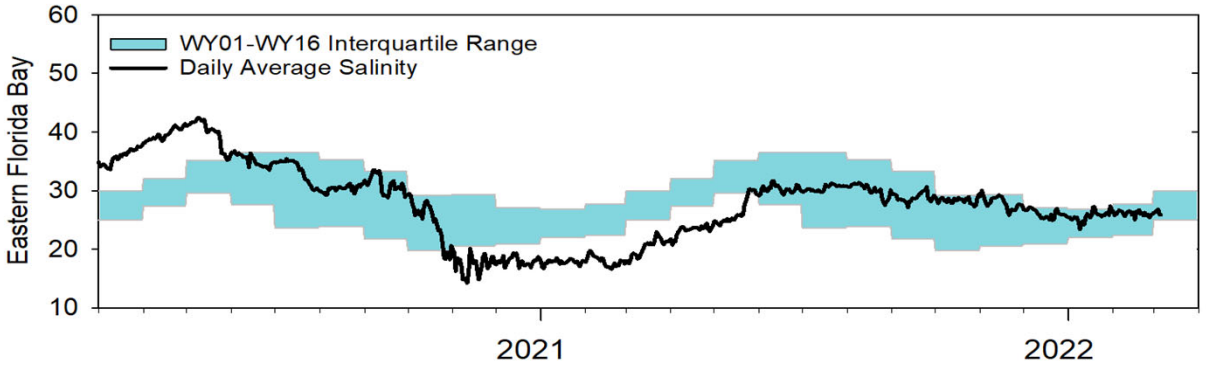
	Feb 2021	Feb 2022
Foraging birds:	~19,000	~2,900
All nests:	2769	930
Stork nests:	406	0

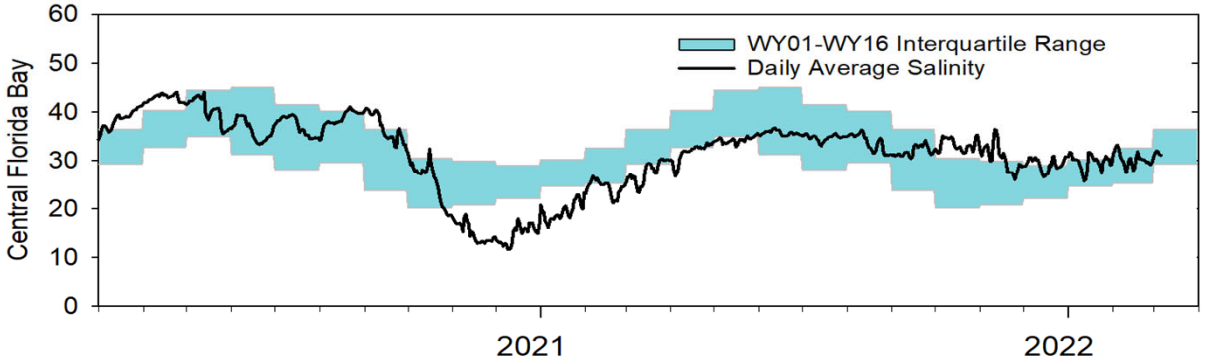
Drier conditions in 2022 have resulted in shorter hydroperiods in core foraging habitats, reduced prey production, fewer foraging birds and later nesting compared to 2021.

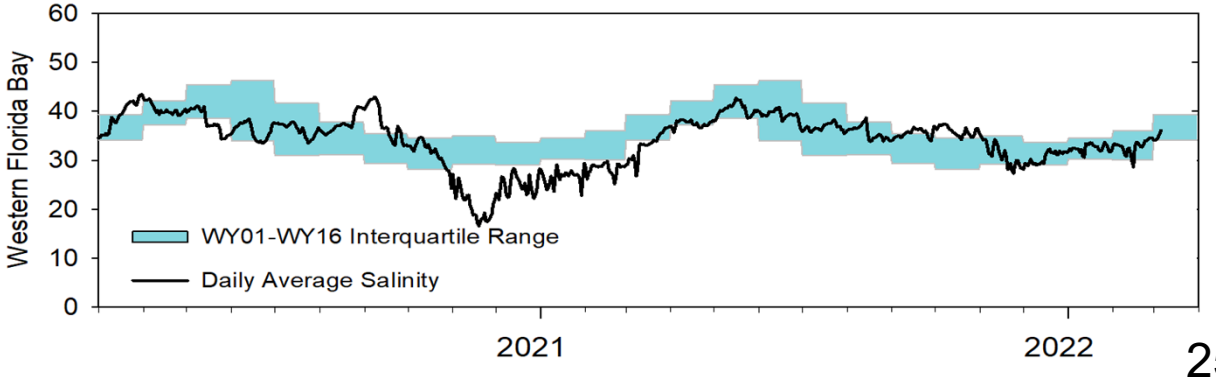
Taylor Slough Stages and Florida Bay Salinity











Questions

Brown Pelican
Photograph courtesy of SFWMD staff