



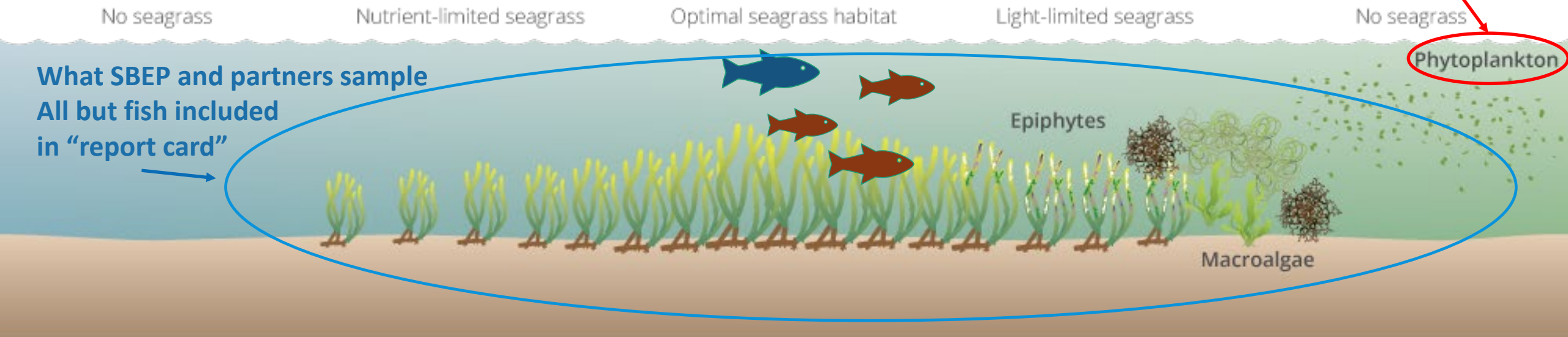
State of the Bay - February 2023

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Managing Sarasota Bay Means Managing Nitrogen

The only thing you're required to sample



What SBEP and partners sample
All but fish included
in "report card"

LIGHT AVAILABILITY

NUTRIENT LOADING

Conceptual diagram illustrating the effect of nutrients of aquatic primary producers

Diagram courtesy of the Integration and Application Network (ian.umces.edu), University of Maryland Center for Environmental Science. Source:

ian.umces.edu



Report card based on four metrics, and a reference period (2006 to 2012)

- Total Nitrogen (TN)
- Chlorophyll-a (Chl-a)
- Macroalgae abundance
- Seagrass acreage



Year	Palma Sola	Upper Bay	Roberts	Little Sarasota	Blackburn
2006	3.67	3.50	3.50	3.75	3.75
2007	3.00	3.25	4.00	3.75	3.75
2008	3.67	3.00	3.00	3.25	3.25
2009	3.67	3.25	3.25	3.50	3.00
2010	3.67	3.75	3.00	2.75	2.75
2011	4.00	3.50	3.00	2.75	2.50
2012	3.00	3.25	3.25	3.00	3.25
2013	3.67	3.00	2.50	2.25	2.25
2014	4.00	3.50	2.50	2.50	2.25
2015	3.67	3.25	2.00	2.25	2.00
2016	3.67	2.75	1.75	2.00	2.25
2017	3.67	2.50	2.00	2.25	2.00
2018	4.00	2.50	2.00	1.50	1.75
2019	3.67	3.00	3.25	1.75	1.75
2020	3.67	3.00	3.00	2.25	2.25
2021	3.75	3.75	3.75	2.75	3.00

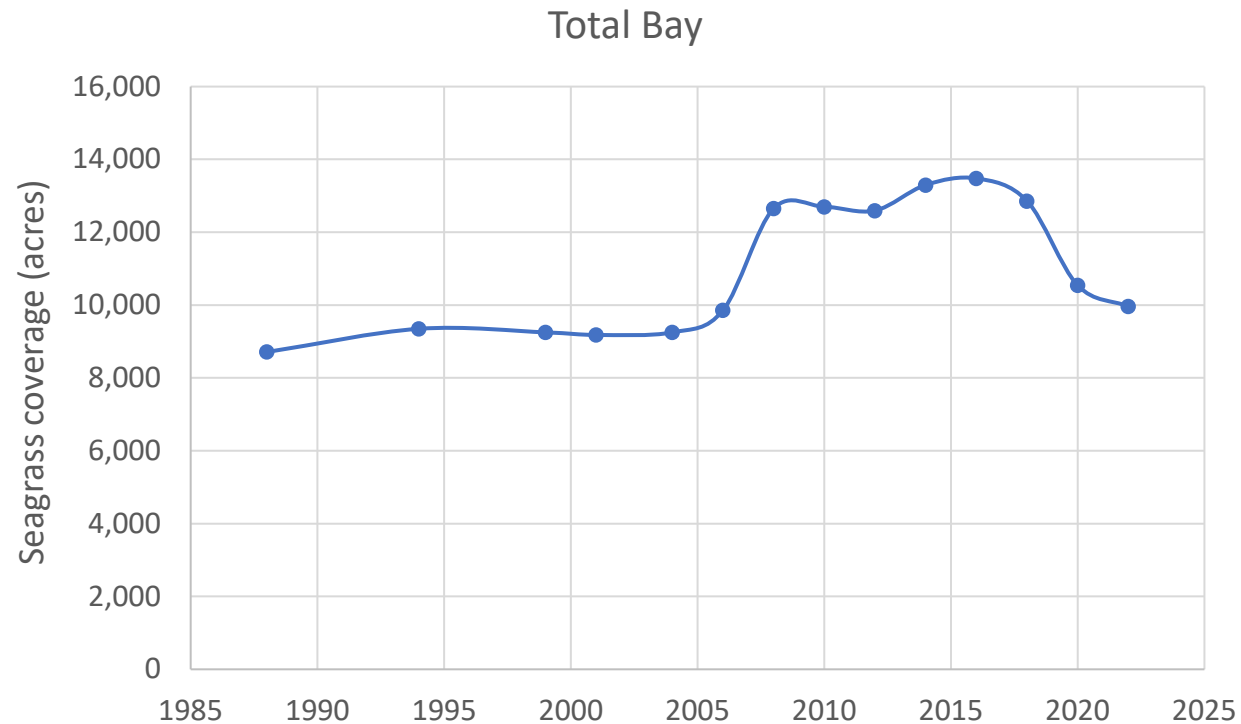
- Palma Sola Bay continues to be a healthy system
- Upper Sarasota Bay shows improvement from 2017 to 2018
- Lower Bay segments show signs of recovery since 2013 to 2018



Seagrass as a biological indicator – mixed news

Down 5% last two years

26% lower than in 2016 – *but still higher than in 1980s and 1990s*



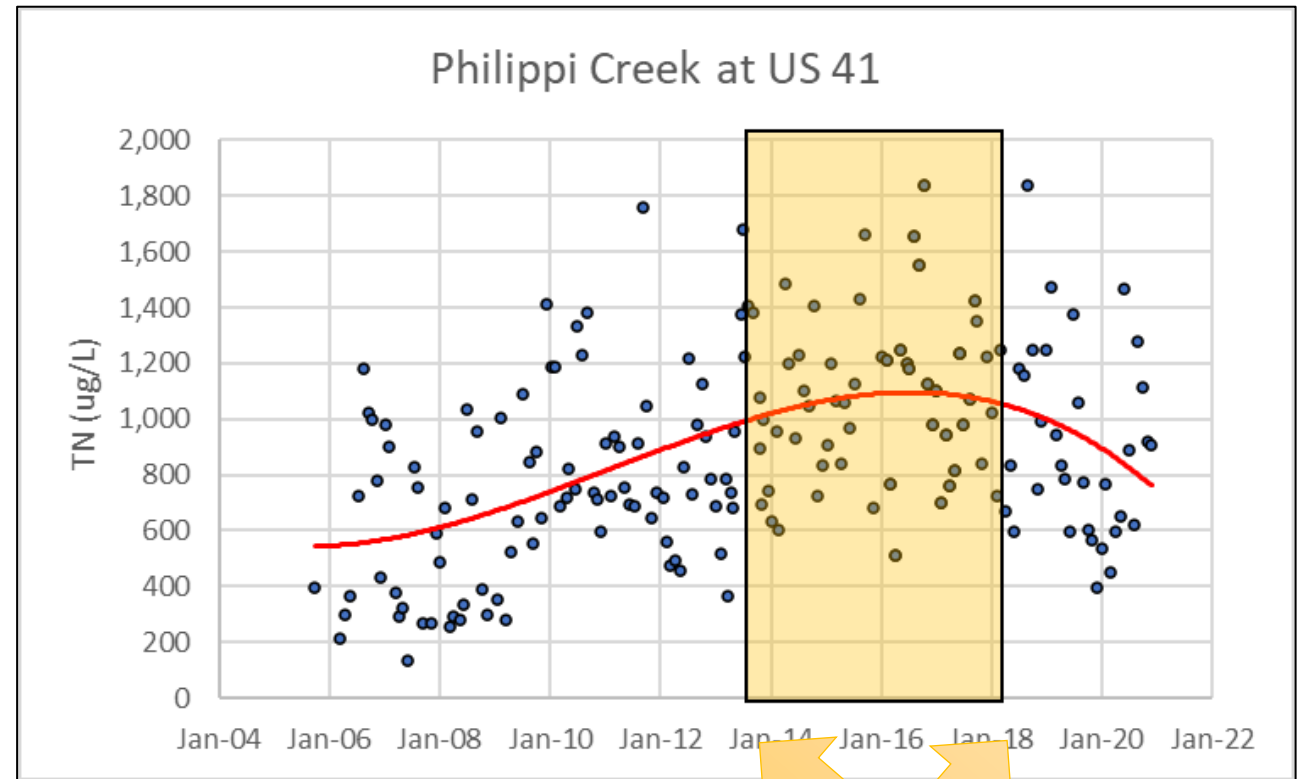
Why the recent bad news?

- Over 750 million gallons of treated, but high-nutrient, WWTP effluent in lower bay (ca. 2013 to 2019)
 - Now mostly under control
- Impacts from Piney Point
 - 200 million gallons of industrial waste
 - 10 times the nitrogen content of our worst performing WWTP
- Hurricane Ian
 - Impacts strongest in lower bay



Evidence of impacts from WWTP effluent overflows –

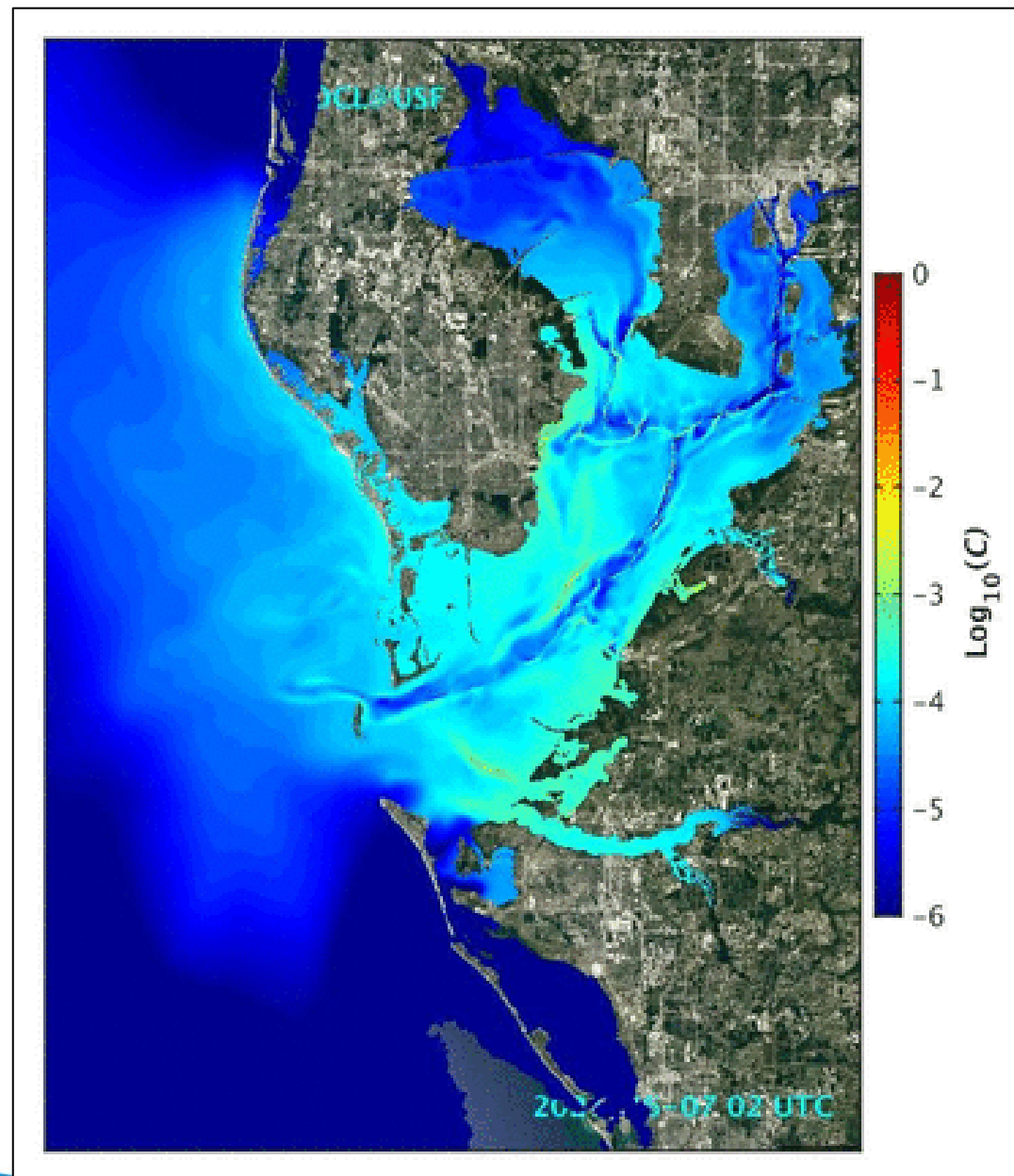
- Nitrogen load increase around 2013
- Peak during 2016 to 2018
- Improvements in water quality since then



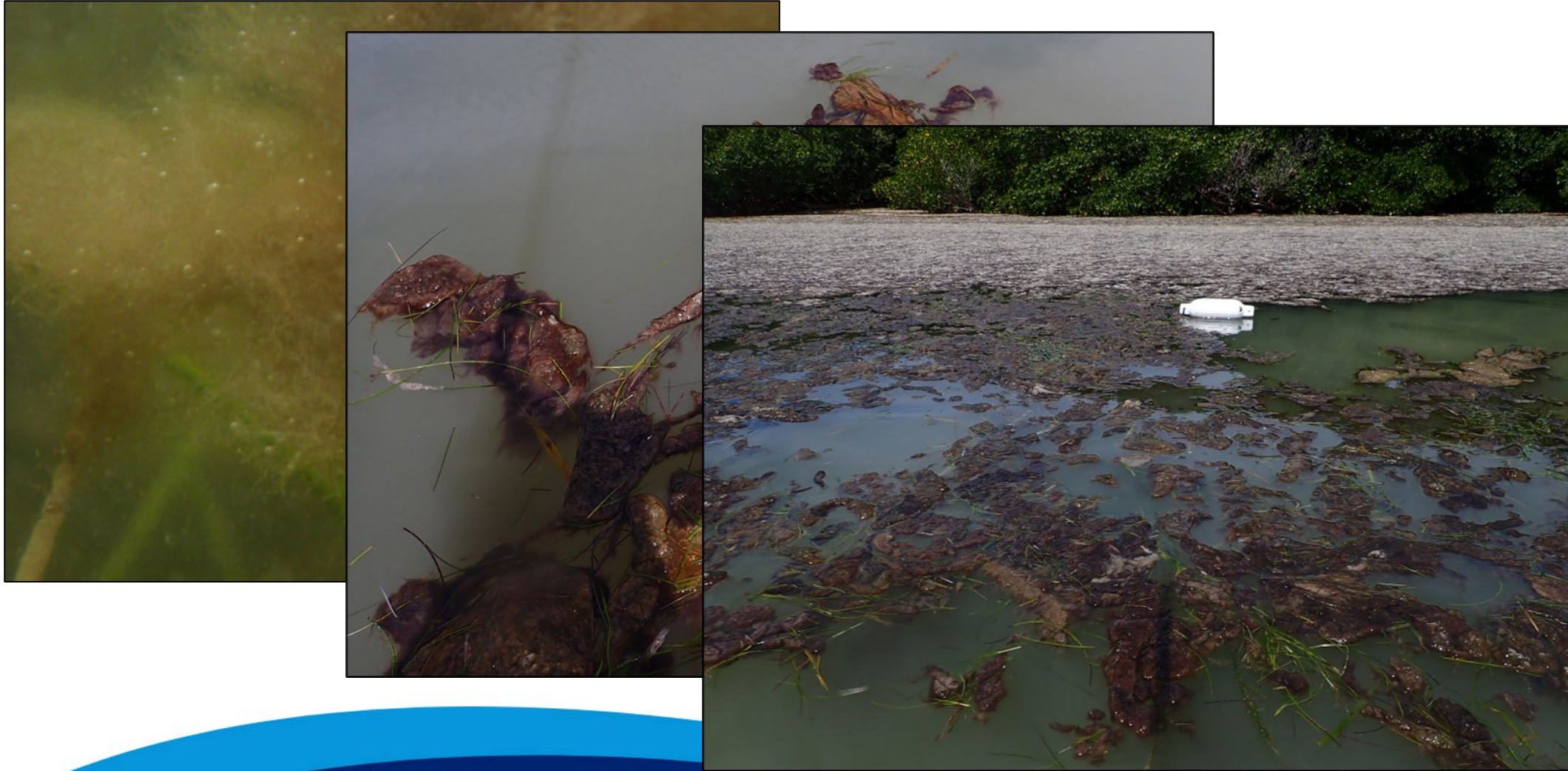
**Onset and then cessation of overflows at Bee Ridge WWTP
(> 750 million gallons of non-AWT effluent discharged)**

What about Piney Point?

- Spring of 2021
- About 200 million gallons
- Just over 200 mg TN/L
- About 200 tons of nitrogen loaded in 10 days



Upper Sarasota Bay after Piney Point



Not just ecological impacts



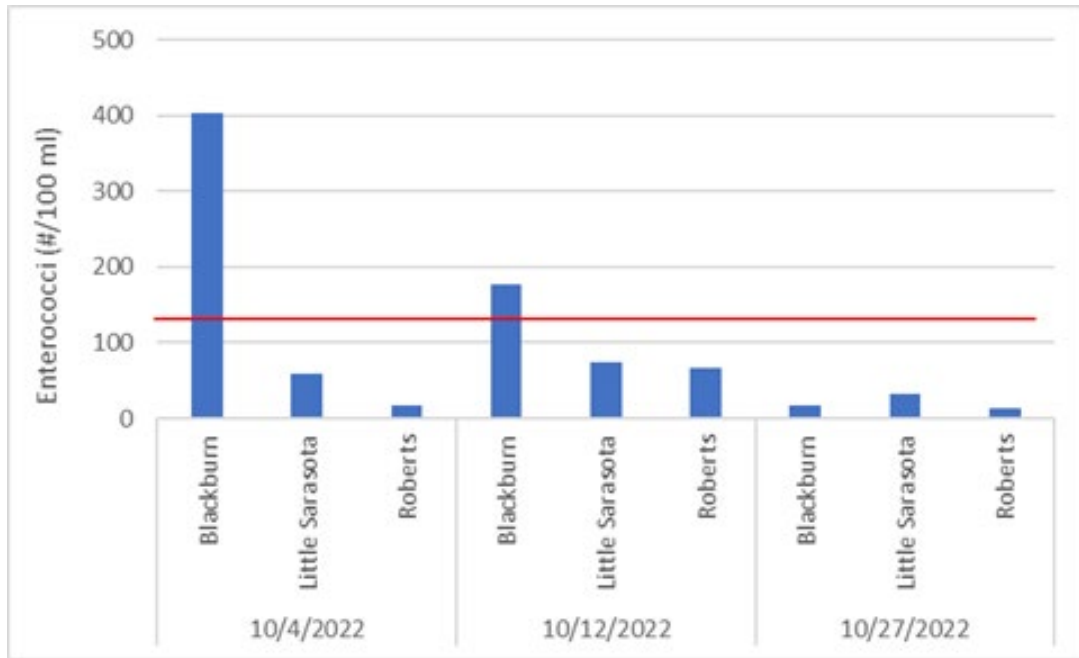
Impacts of Hurricane Ian

- 5 to 15 inches of rainfall
- Up to 85 mph winds
- But...no storm surge

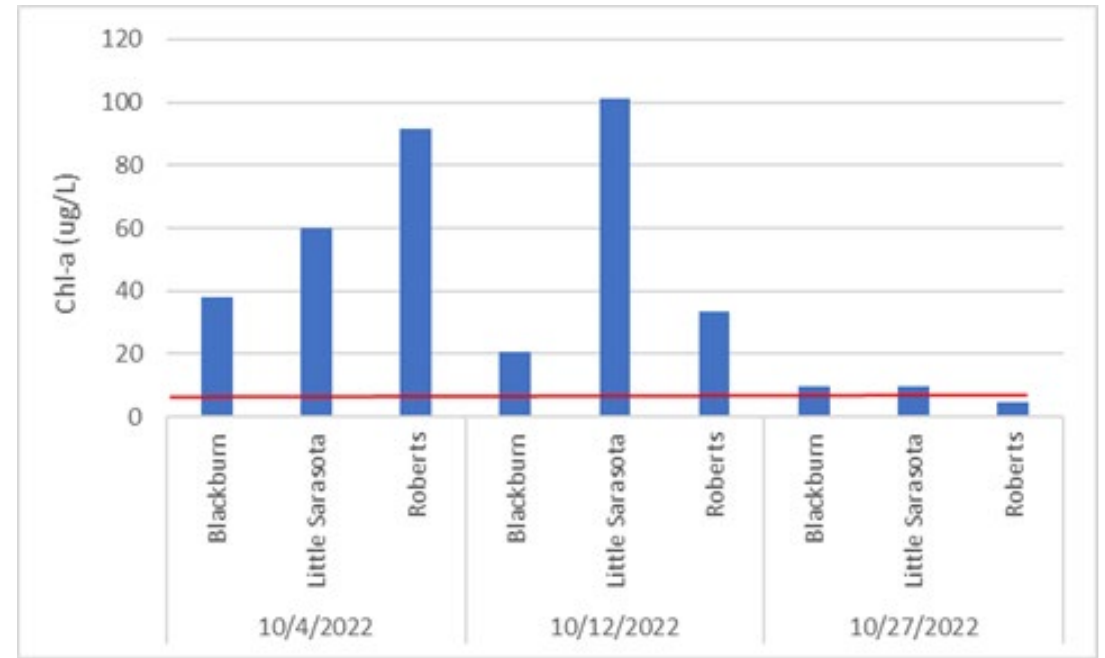


Recovery from Ian – 2 to 4 weeks

Bacteria

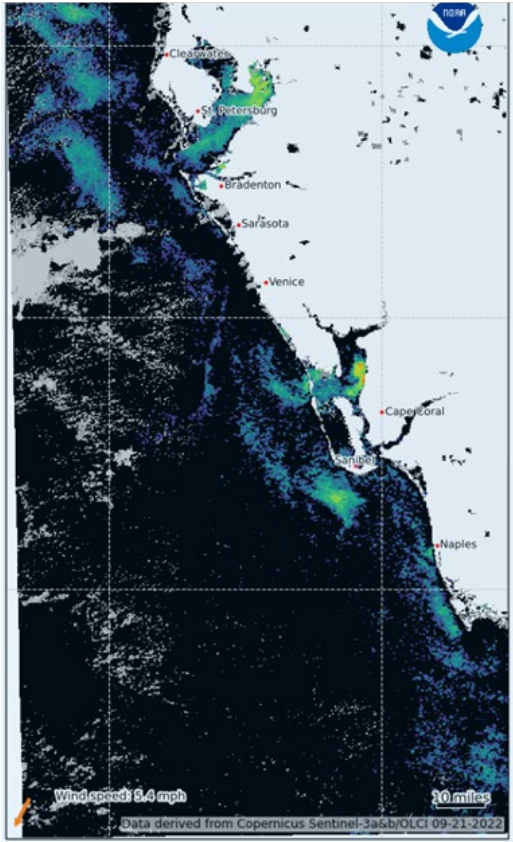


Phytoplankton



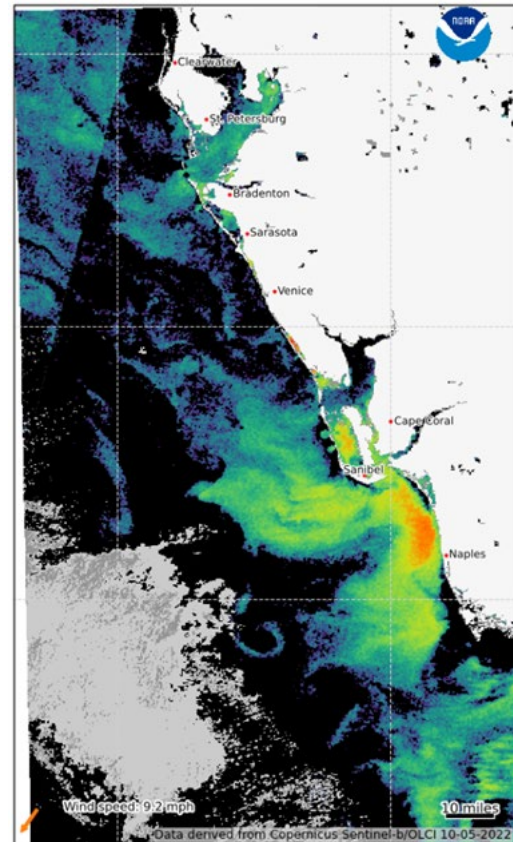
Recovery mostly due to tidal mixing – into the Gulf

One week before Ian



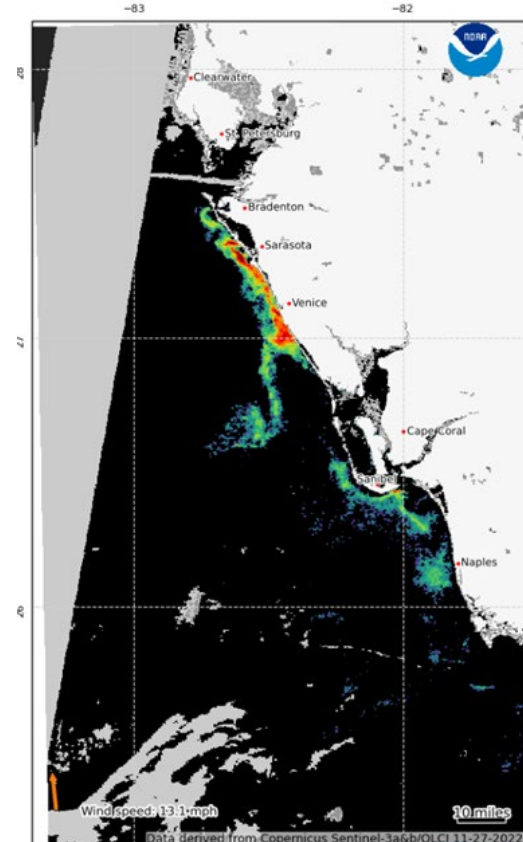
Composited Red Band Difference (RBD) showing relative fluorescence from high (red) to low (violet). A median filter was applied to remove speckle. Average wind for preceding 3 hours of satellite observation from NOAA NDBC station VENF1.

One week after Ian



Red Band Difference (RBD) showing relative fluorescence from high (red) to low (violet). A median filter was applied to remove speckle. Average wind for preceding 3 hours of satellite observation from NOAA NDBC station VENF1.

Eight weeks after Ian



Composited Red Band Difference (RBD) showing relative fluorescence from high (red) to low (violet). A median filter was applied to remove speckle. Average wind for preceding 3 hours of satellite observation from NOAA NDBC station VENF1.

Lots of challenges ahead

- Three-legged stool approach
 - Regulated community
 - Regulators
 - Informed and engaged stakeholders
- All need to play their part

