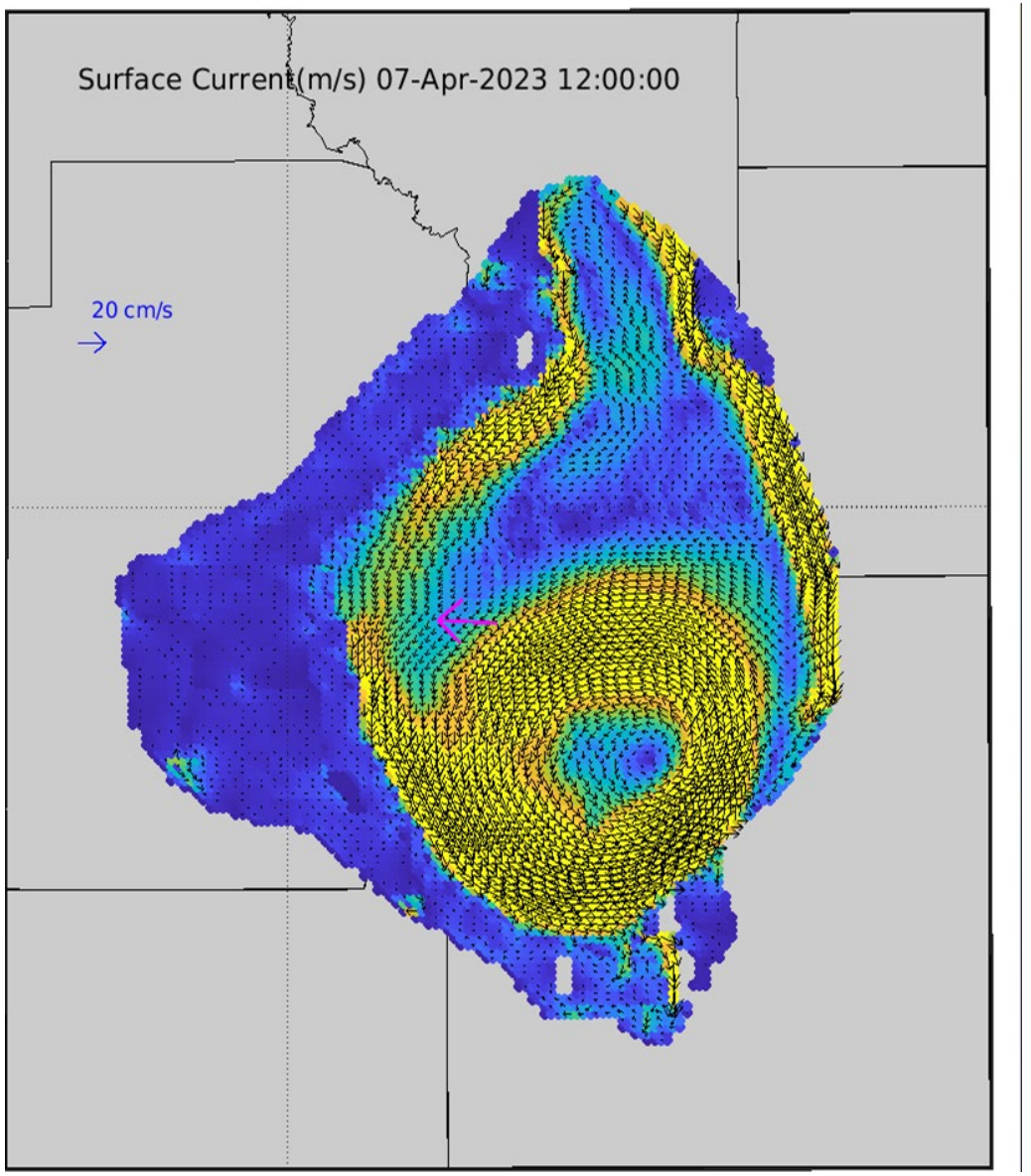
PREDICTION and MODELING Forecasting Cyanobacteria Blooms in Lake Okeechobee



Rick Stumpf

NOAA NOS, National Centers for Coastal Ocean Science (NOAA-NCCOS)

FL BGASOS May 2023

Summary:

Management of Lake Okeechobee (and other large lakes in Florida) is complicated by large, toxic cyanobacteria blooms.

More information on bloom intensity, distribution, frequency:

Satellite imagery as a resource
from daily monitoring to multi-decade time series.

Forecast blooms

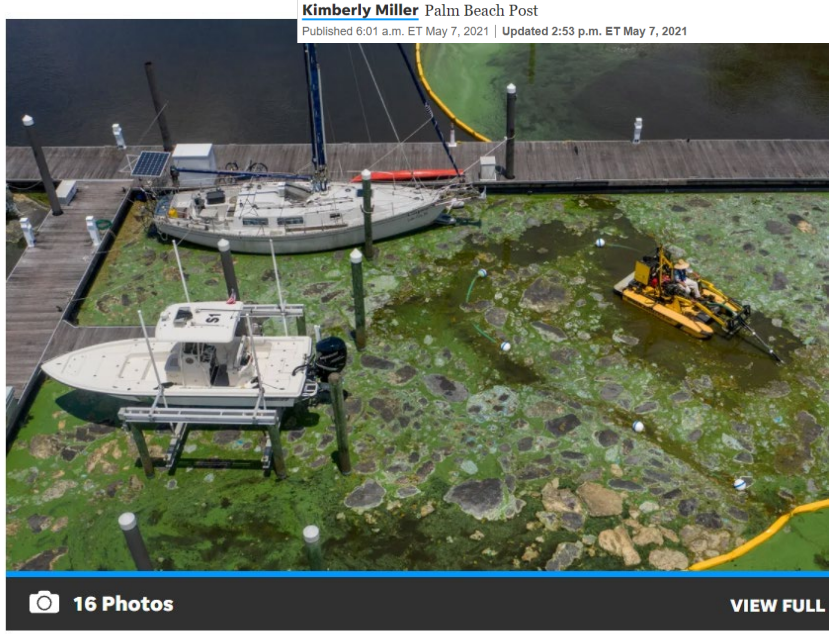
short-term: next several days
long-term: weeks to months (likelihood of severe bloom)

Make these routine

These require detailed data sets on blooms, combined with existing monitoring systems (SFWMD/USACE/USGS, DBHydro data system).

West Palm shuts down canal to protect drinking water

Kimberly Miller Palm Beach Post
Published 6:01 a.m. ET May 7, 2021 | Updated 2:53 p.m. ET May 7, 2021



Photos: Toxic blue-green algea invades the Pahokee Marina

Will it work? Experts hope Lake O water releases now will help avoid toxic summer algae

Kimberly Miller Palm Beach Post
Published 6:00 a.m. ET March 11, 2021 | Updated 8:58 a.m. ET March 11, 2021

Takeaway: Satellite monitoring daily to feed forecast (pending)

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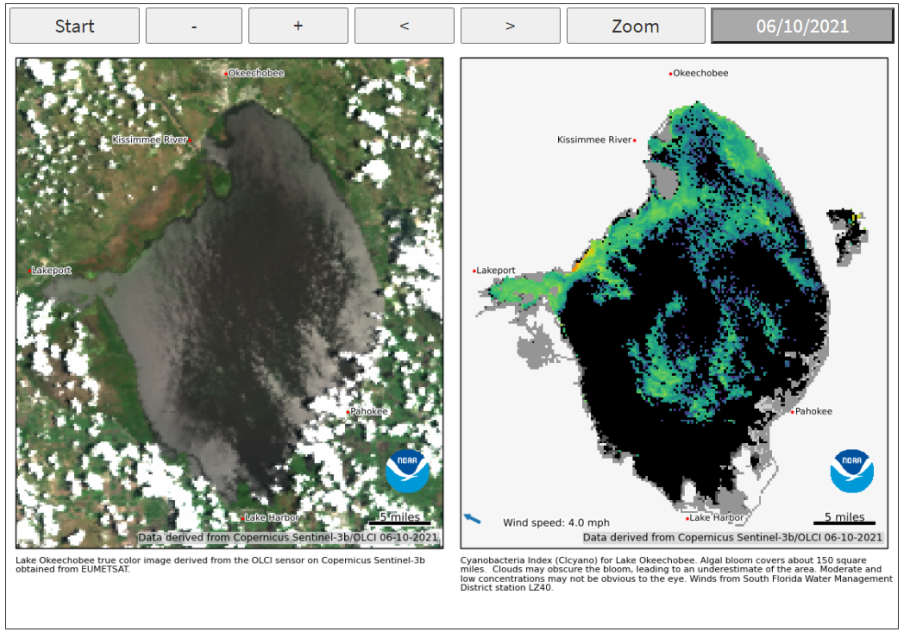
HARMFUL ALGAL BLOOM MONITORING SYSTEM

Cyanobacteria Algal Bloom from Satellite in Lake Okeechobee, FL

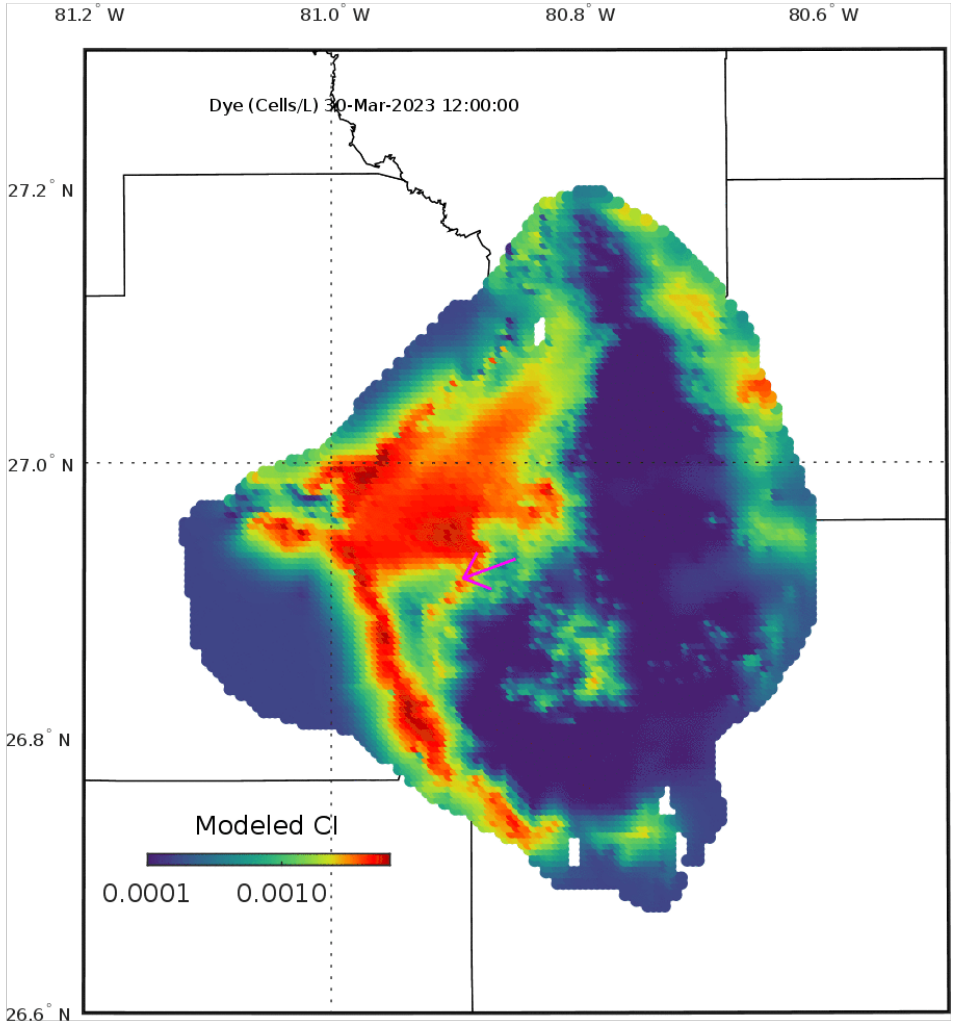
Images last updated: 06/14/2021

Click the next and previous arrows to view the most recent 13 usable images from the last 14 days.
(You may need to refresh your browser or clear your browsing data to see the latest forecast.)



Lake Okeechobee true color image derived from the OLCI sensor on Copernicus Sentinel-3b obtained from EUMETSAT.

Cyanobacteria Index (CIcyano) for Lake Okeechobee. Algal bloom covers about 150 square miles. Clouds may obscure the bloom, leading to an underestimate of the area. Moderate and low concentrations may not be obvious to the eye. Winds from South Florida Water Management District station LZ40.



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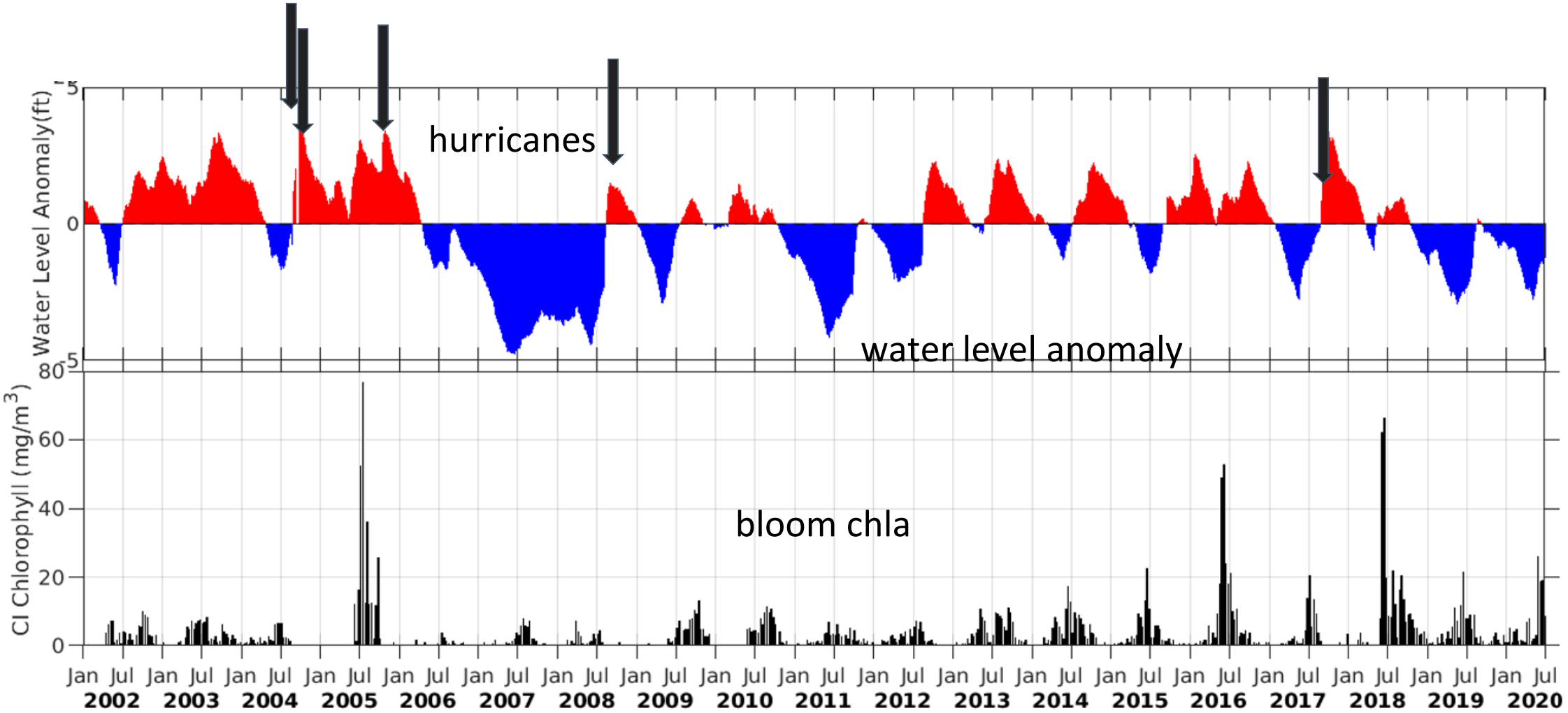
Takeaway: Long-term evaluation (with satellite) of environmental factors



Research Priorities

Nutrient load data: While external loads are important, we likely need better data on internal load. And more analysis of load (variability, etc.)

Improved BGA prediction. Predictions are an improvement, coming shortly.

Circulation models now exist: evaluation--and what that means (we are evaluating specifically for our applications)

Accuracy of satellite imagery: the question is more making a "translation" to water samples. (We are working on that now).

Explanation of satellite imagery: Depends on source. (We are doing ok; lay audiences are using our pages & products.) More problematic if there are multiple products looking at same problem.

New data gaps

- DBHydro is a great resource; keep it working
- Bi-weekly water sampling continue as practical
- Is there a good nutrient budget for Caloosahatchee River and estuary, and St Lucie estuary? (including groundwater and local runoff). This matters for what is done in Lake O.

Acknowledgements

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15 Jan 2023
NOAA, derived from Copernicus Sentinel-3 data

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