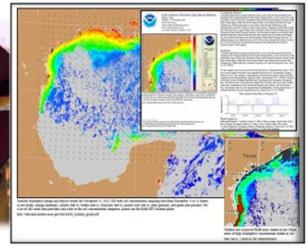


Photo credit: NOAA, TPWD, FWRI, WHOI



Issue 12 June 2015



NOAA HAB-OFS Newsletter

Welcome to the NOAA HAB-OFS Quarterly Newsletter. We are always happy to hear from you so please send your topic suggestions, questions, comments and feedback to hab@noaa.gov.

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NOAA Releases Early Season Predictions for HABs in Lake Erie

In response to increased demand for harmful algal bloom information and data, NOAA's National Centers for Coastal Ocean Science (NCCOS) and their partners at Heidelberg University have begun issuing a new experimental, early season prediction for harmful algal blooms in western Lake Erie. This information is useful in helping the community prepare for the conditions that are most likely to occur this summer.

A bloom of the toxic cyanobacterium, *Microcystis aeruginosa*, peaks annually in late summer, in western Lake Erie. The severity of the bloom depends on the amount of phosphorus that comes into the lake from March 1 through July 31, during what is called the loading season. The early season forecast, released on May 19th, estimates the bloom severity based on the phosphorus loading from the Maumee River combined with historical records. These measurements are also compared with NOAA satellite observations.

Lake Erie has had large blooms three of the last four years. NOAA has issued weekly forecast bulletins for HABs in Lake Erie every summer since 2008. The forecast frequency was increased to twice weekly last summer after toxins produced by the bloom overwhelmed the water treatment facility in Toledo, Ohio, resulting in a two-day ban on drinking and using tap water.

The early seasonal forecast will provide the likely range of severity for the bloom at its peak in August and September. Weekly updates will be compared with the corresponding historical data from the same date, leading to a more accurate final season outlook which will be issued on July 9 at Ohio State University's Stone Lab, on Lake Erie.

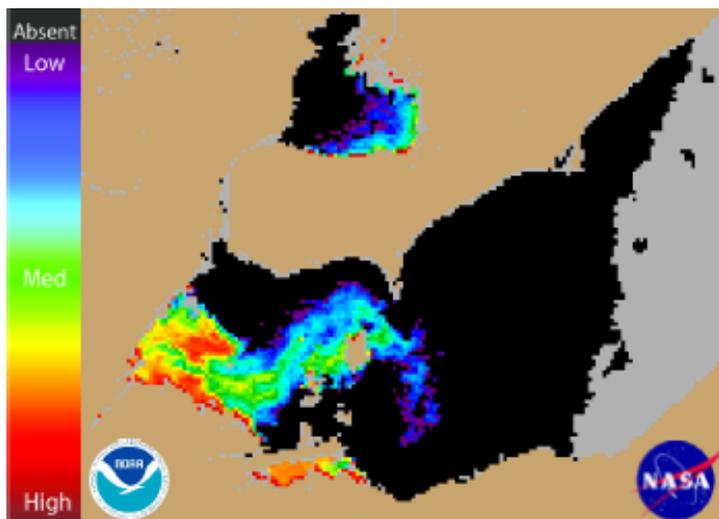


Figure 1: Cyanobacterial Index generated from MODIS Aqua imagery from August 3, 2014. The bloom in Lake Erie's western basin was responsible for a drinking water ban in Toledo from August 2-4.

The advance notice is possible because of the 15 years of data collected by scientists at NCCOS and Heidelberg University's National Center for Water Quality Research. NOAA has assembled data on bloom magnitude from both the European Space Agency's Envisat satellite and NASA's MODIS Aqua and Terra satellites. Heidelberg has been quantifying the loads of nutrients like phosphorus, which are the primary factors promoting cyanobacteria blooms, through daily monitoring of 16 rivers in Ohio and Michigan including the Maumee River since 1974.

While the blooms do not typically start until late July and peak in September, routine monitoring will begin in June. The satellite data will be complemented by field programs from NOAA's Great Lakes Environmental Research Laboratory, Ohio State University's Stone Lab, and the University of Toledo.

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The most recent projection, as of press time, indicates that an extensive severe bloom, similar to 2011, is unlikely to occur this year. The updated early season prediction, as well as the bloom bulletin which begins in July, will be updated weekly and distributed through [NOAA's Experimental Lake Erie HAB Bulletin website](#).

New Satellite Imagery Product for Florida HAB-OFS Bulletins

Following extensive analysis, a new satellite imagery ensemble product will be incorporated into the HAB-OFS bulletins for Florida. The ensemble product, which was detailed in the [June 2014](#) newsletter, helps to further refine *Karenia brevis* detection by combining two additional algorithms with the current chlorophyll anomaly. The additional algorithms help to target specific optical properties of *K. brevis* blooms, including the relative particulate backscatter of blooms and the changes in spectral shape characteristics in the blue wavelengths (at 490 nm). The new ensemble product is in the process of being transitioned to the operational bulletins for Florida and will be available in the near future. When the transition to operations is completed, an updated bulletin guide, including information about how to interpret ensemble imagery, will be sent to all bulletin subscribers.

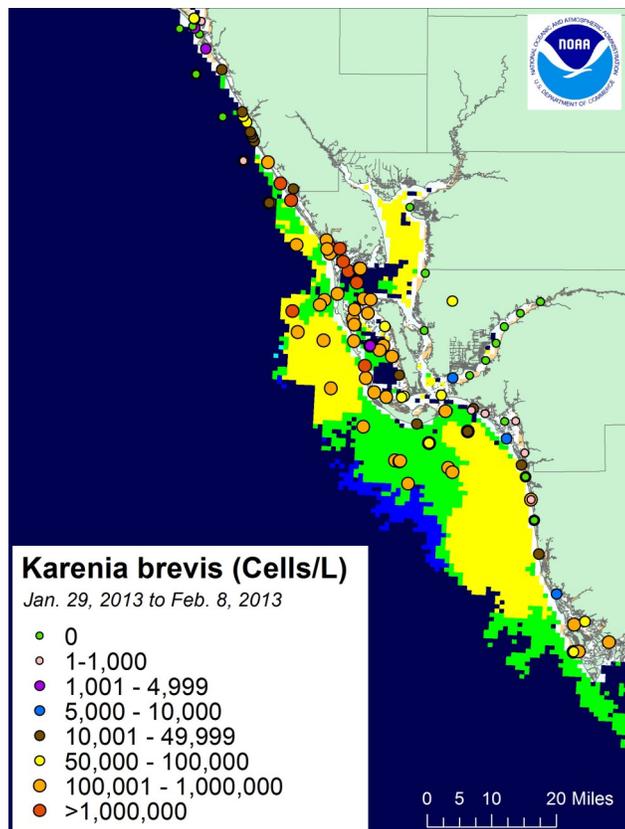


Figure 2: MODIS Aqua imagery of Sarasota, Charlotte, Lee, and Collier counties were processed using the new ensemble imagery product to highlight likely bloom locations. Water sample data provided by the Florida Fish and Wildlife Conservation Commission is overlaid and used to verify the presence of *K. brevis* concentrations in satellite imagery.

Table 1: Explanation of how the different ensemble algorithms are symbolized in the imagery and interpreted by HAB-OFS analysts.

PIXEL COLOR	PRODUCT ALGORITHMS	INTERPRETATION
	Chlorophyll Anomaly only	Less likely to be <i>K. brevis</i>
	Chlorophyll Anomaly + Spectral Shape 490nm	Could be <i>K. brevis</i>
	Chlorophyll Anomaly + Backscatter Ratio b_{bp}	Could be <i>K. brevis</i>
	Chlorophyll Anomaly + Spectral Shape 490nm + Backscatter Ratio b_{bp}	Likely <i>K. brevis</i>

Third Annual Ecological Forecasting Meeting Held in Silver Spring, MD

On May 4th and 5th the HAB-OFS team attended the 3rd Annual Ecological Forecasting Roadmap (EFR) meeting in Silver Spring, MD. The meeting focused on NOAA's continuing commitment to developing ecological forecasts for the EFR's priority areas: harmful algal blooms, hypoxia, marine pathogens, and habitat. The meeting was attended by NOAA, EPA, FDA, IOOS and other government and academic institutions involved in developing ecological forecasting tools and services. The meeting gave members the opportunity to discuss this year's accomplishments and challenges, learn about ecological forecasting efforts being led by NOAA and other federal agencies, and strategize for the coming year.

The first day of the meeting got off to an inspiring start with opening remarks emphasizing the importance of the EFR delivered by the Assistant Administrators of three NOAA line offices: the National Weather Service, National Ocean Service and Oceanic and Atmospheric Research. Progress reports from each of the EFR technical teams were then given. The second day consisted of sessions focused on modeling, strategic planning, data visualization and breakouts for each technical team. The meeting made it clear that, in its three years, the EFR has already improved the coordination of ecological forecasting efforts.

A common difficulty across the EFR portfolio continues to be transitioning experimental ecological forecasts to operations (i.e. sustained, systematic, and reliably products supported with an institutional commitment). NOAA's HAB-OFS sustains the only operational ecological forecasts. However, based on the encouraging discussions in this

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year's meeting, it seems likely that more experimental ecological forecasts will be ready for transition in the future.

The HAB-OFS team will incorporate what was learned over the two-day meeting into its ongoing work to streamline the existing operations in the Gulf of Mexico and plan for expanding operational HAB forecasts nationally. For more information on the Ecological Forecasting Roadmap, and how it applies to forecasting HABs, please visit [NOAA's Ecological Forecasting Services webpage](#).

HAB-OFS Publishes First NOAA Technical Report for Texas, 2010-2014

The HAB team is pleased to announce that a NOAA technical report has been published detailing the results of an evaluation of HAB-OFS bulletins issued for Texas entitled "[Assessment of the Western Gulf of Mexico Harmful Algal Bloom Operational Forecast System \(GOMX HAB-OFS\): October 1, 2010 to April 30, 2014](#)".

You can find a summary of the report in the [March 2015](#) issue of our HAB-OFS newsletter. The results of this assessment will be used to guide enhancements to the operational forecast system with the goal of improving forecast quality through increased scientific understanding and the refinement of current forecast models.

To request a paper copy, please contact us at hab@noaa.gov.

HAB-OFS and NWS Expand Beach Hazards Statement for HABs

On February 4, 2013, the Harmful Algal Bloom Operational Forecast System (HAB-OFS) team began disseminating forecasts of high respiratory irritation associated with *Karenia brevis* through the National Weather Service (NWS) [Beach Hazards Statements](#). The Weather Forecast Office (WFO) Tampa Bay was the first to include these HAB alerts in the Beach Hazards Statements.

Following the success of this product, the HAB-OFS is expanding the coverage of the Beach Hazards Statements to the WFOs Miami and Key West effective June 29, 2015 which will increase HAB Beach Hazards Statement coverage to include Collier, Palm Beach, Broward, Miami-Dade and Monroe counties, including the Florida Keys. The implementation of the expansion was originally scheduled for October 2014, but was rescheduled in order to coincide with a routine update of NWS software, in order to mitigate the risk of unanticipated technical difficulties.

For additional details about the Beach Hazards Statement for HABs, the NWS Service Change Notice announcing the product change is posted at http://www.nws.noaa.gov/om/notification/scn15-33key_mfl_hab.htm.

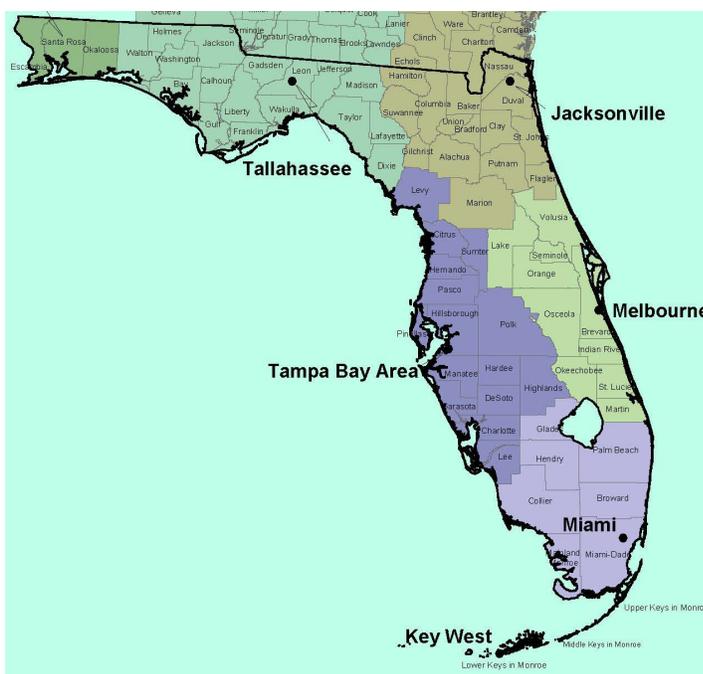


Figure 3: Area of responsibility for each Weather Forecast Office. For a pdf version, visit: <http://www.nws.noaa.gov>.

Many Thanks to our Partners and Data Providers

<http://tidesandcurrents.noaa.gov/hab/contributors.html>

This newsletter was written and designed by:

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