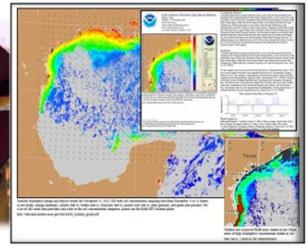


Photo credit: NOAA, TPWD, FWRI, WHOI



# Issue 13 September 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](mailto:hab@noaa.gov).

### In this issue:

- *Coming Soon: Florida HAB-OFS Technical Report*
- *Lake Erie HAB Demonstration Forecast Update*

## Coming Soon: Technical Report Assessing the Florida HAB-OFS '08-14

In order to continually improve the HAB-OFS, bulletin utilization and forecast quality (i.e. forecast accuracy, reliability, and skill) are evaluated regularly. The HAB team will soon publish the results of the evaluation of HAB-OFS bulletins issued for Florida from May 1, 2008 to April 30, 2014 (BY2008-2014).

### Key Results from the Assessment:

- From May 1, 2008 to April 30, 2014 the HAB-OFS issued a total of: 468 bulletins, 5 supplemental bulletins, and 28 conditions updates.

### Utilization:

- Although probably underreported, confirmed product utilization increased from a range of 66.3-83.9% during BY2008-2012 to greater than 93.8% during BY2012-2014, in part due to the [HAB-OFS Facebook Page](#) launched in the fall of 2012.
- *Next step:* Develop procedures to better evaluate product utilization. Increase utility with the next-generation GIS-based infrastructure being developed.

### Bloom Detection:

- During BY2008-2009, all three of the *Karenia brevis* features were detected first by the HAB-OFS using satellite imagery.
- However, bloom detection capabilities declined as the SeaWiFS sensor experienced a series of outages before its mission was terminated in 2011.
- MODIS Aqua has not performed as well as the SeaWiFS sensor. During BY2009-2014, all *K. brevis* features were detected by *in situ* sampling prior to being identified by the HAB-OFS in satellite imagery.
- *Next step:* As of this August, HAB-OFS analysts began consulting a newly operational ensemble satellite imagery product, which refines bloom detection (available on bulletin as of 9/8/15). The HAB-OFS is also in the process of evaluating higher resolution chlorophyll products from the Visible Infrared Imaging Radiometer Suite (VIIRS).

### Respiratory Irritation Forecasts:

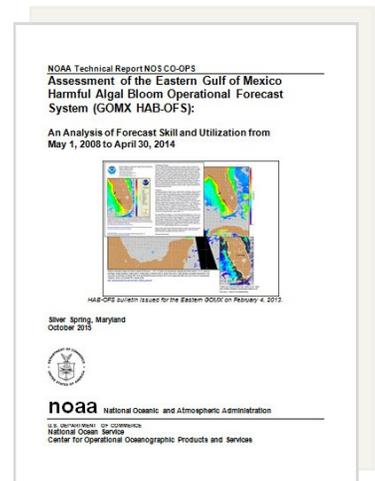
- Improvements to the model implemented in August 2009 resulted in better forecast performance overall, especially for the “very low” and “low” level respiratory irritation forecasts.
- Forecast performance was variable, improving with increasing bloom severity.
- *Next step:* Evaluate and integrate new data sets into analysis as they become available, including methods to cost-effectively measure the concentration of *brevetoxin* in the air and water.

### Transport Direction Forecasts:

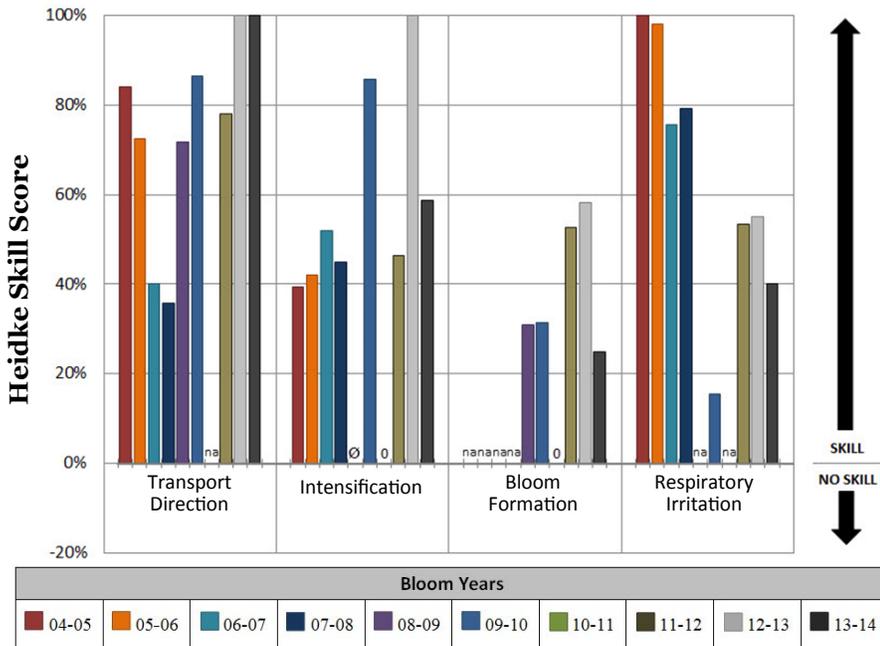
- Performed better during BY2012-2014 than during BY2004-2012 even though there were no changes to the model.
- The forecast performed well at predicting the general direction of bloom movement.
- *Next step:* Explore hydrodynamic models in order to predict both the direction and distance of bloom movement.

### Bloom Formation at the Coast Forecasts :

- Better than chance at predicting whether or not a bloom might form at the coast, but prone to false alarms.
- *Next step:* Evaluate new research findings regarding bloom development to establish a more comprehensive model.



**Figure 1:** Upcoming technical report for Eastern Gulf of Mexico HAB-OFS assessment 5/1/08 to 4/30/14.



**Intensification Forecasts:**

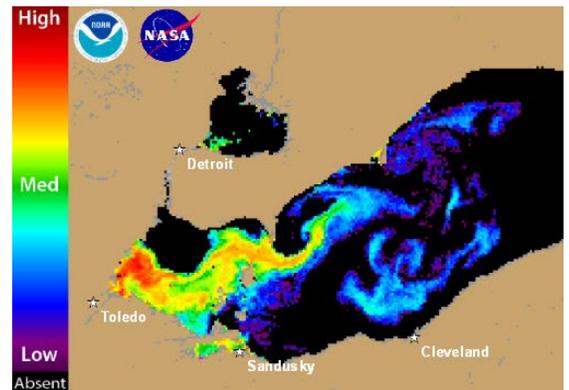
- Model improvements in 2008 resulted in better forecast performance during BY2008-2014 vs. By2004-2008.
- *Next step:* Improvements to bloom detection would also enhance the evaluation of the intensification forecasts.

The HAB-OFS continues to rely on data from our [Bulletin Contributors](#) and the expertise of a full team of 7 analysts, specially trained to utilize established standard operating procedures and analytical methods. The results of this assessment will be used to guide enhancements to the operational forecast system with the goals of improving forecast quality through increased scientific understanding and the refinement of current forecast models. To read through our findings when the report is published, visit the HAB-OFS [Publications](#) webpage.

**Figure 2.** The Heidke skill score for each component of the Florida HAB-OFS from BY2004-2014. The Heidke skill score is a skill corrected verification measure of categorical forecast performance.

## Lake Erie HAB Demonstration Forecast Update

In our [June 2015](#) newsletter, we highlighted the beginning of the bloom season in western Lake Erie, where blooms of the toxic cyanobacterium, *Microcystis aeruginosa* typically peak in late summer. A key factor in determining the amount or severity of the bloom each year is the phosphorus loads that enter the lake from March 1 to July 31. Based on measurements of this year's phosphorus loads, the National Center for Coastal Ocean Sciences (NCCOS) released an experimental early season projection on May 19<sup>th</sup> which was updated weekly through July in order to incorporate environmental changes and refine the predictions. Unseasonably high amounts of rain early in the summer led to large amounts of phosphorus entering Lake Erie in June and July. Unfortunately, to-date, the bloom appears consistent with NCCOS' latest projection that the bloom, which has been expanding since mid-July, may be second in extent only to that of 2011 (the largest documented). The bacteria is producing the toxin, *microcystin*, which means that water treatment plants have had to add treatments to the water to assure that the toxin is eliminated from drinking water successfully. The bloom has been monitored using a combination of satellite imagery, water samples, and sensors. Bulletins providing updates on the current and forecast location and *Microcystis* quantity will continue twice weekly until the bloom ends, potentially in October. When the bloom dissipates, scientists will be able to analyze this year's bloom duration, extent, and toxicity and apply lessons learned to next year's forecast. To get the bulletin and find more information, go to: <http://coastalscience.noaa.gov/research/habs/forecasting>.



**Figure 3.** The Cyanobacterial Index highlighting a *Microcystis aeruginosa* bloom in the western basin of Lake Erie. (NASA's MODIS Terra 9/6).

**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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