2014 Lake Erie Harmful Algal Bloom (HAB)

Experimental Forecast: This product represents the first year of an experimental forecast relating bloom size to total phosphorus load.

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Forecast summary:

This year's forecast is for a western basin Lake Erie cyanobacteria bloom of 22,000 metric tons dry weight (MT), with a 95% predictive interval of 11,000 to 33,000 MT. The bloom size over the last decade (2004-2013) has averaged 14,000 MT, such that this year's bloom will likely be above-average. However, the 2014 bloom is expected to be less than the record bloom of 40,000 MT, which occurred in 2011.

Forecast details:

The experimental forecast is based on a probabilistic model relating bloom size to spring total phosphorus load. The model also reflects the lake's apparent increasing susceptibility to HABs (i.e., less load is required to generate large blooms than a decade ago), possibly due to invasive species and climate change. The model has been calibrated to 12 years of bloom observations developed by NOAA from satellite imagery (Stumpf et al., 2012) and by the University of Toledo from in-lake measurements (Bridgeman et al., 2013). The 2014 bloom forecast can be compared to the historical bloom record and TP load, as shown below:

Forecast motivation:

HABs, which are stimulated by nutrient loading from agricultural and urban sources, may produce toxins that are harmful to humans and other animals. HABs are also often responsible for taste, odor, and/or aesthetic problems, which discourage outdoor recreation and tourism. In Lake Erie, the magnitude of HABs has been increasing in recently years (Michalak et al., 2013; IJC, 2014), raising concerns among water resources managers and the public. Large algal blooms also contribute to hypoxia (low dissolved oxygen) in Lake Erie, which negatively impacts the habitat of many fish species. The purpose of this forecast is to alert water resources managers and the public to the potential severity of the annual HAB bloom, which typically peaks in August to September.

Additional Lake Erie HAB resources:

Throughout the summer, high-resolution HAB tracking and forecasting information is available through the NOAA *Experimental HAB Bulletin*. This bulletin includes the present location of any HAB and its likely future movement, as well as the results of in-lake cyanobacteria sampling:

http://www.glerl.noaa.gov/res/Centers/HABS/lake_erie_hab/lake_erie_hab.html

More general information on HABs, including advice for individuals affected by HABs, may be found in the following Ohio Sea Grant publication:

http://www.ohioseagrant.osu.edu/_documents/publications/FS/FS-091-2011%20Harmful%20Algal%20Blooms%20In%20Ohio%20Waters.pdf

References:

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