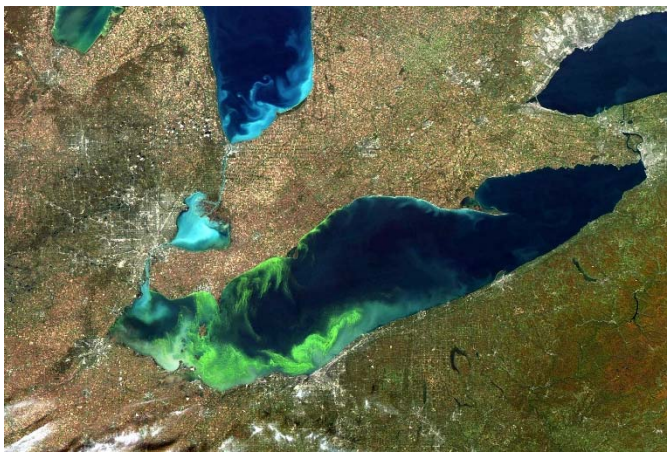
NOAA, Research Partners Predict Severe 2015 Harmful Algal Bloom for Lake Erie (July 2015)



LimnoTech's Western Lake Erie Ecosystem Model (WLEEM) is one of three models being used in an ensemble modeling approach by the National Oceanic and Atmospheric Administration (NOAA) and its research partners to forecast the severity of the 2015 Harmful Algal Bloom (HAB) in the Western Basin of Lake Erie. WLEEM is a fine-scale, three-dimensional, process-based model developed by LimnoTech with funding from several sources (USACE, U.S. EPA, and NSF). The other two models were developed by scientists at NOAA's National Centers for Coastal Ocean Science (NCCOS) and a collaborative of the University of Michigan, the University of Michigan Cooperative Institute for Limnology and Ecosystems Research, and the NOAA Great Lakes Environmental Research Laboratory (GLERL). All three models use nutrient load data collected by Heidelberg University's National Center for Water Quality Research. The models predict that the 2015 western Lake Erie harmful algal bloom season will be among the most severe in recent years as a result of heavy June rains causing substantial nutrient runoff. The effects of the cyanobacterial blooms can include higher costs for local governments to treat drinking water, risks to swimmers in high-concentration areas, aesthetic nuisance to boaters, and disruption of the health and integrity of the ecosystem's food web that supports its world-class sport fishery.

While a severe bloom developing from west to east is forecast to begin in mid-July, its exact track and resulting local impacts will depend on winds and temperature over the remainder of the summer. Therefore, as the summer progresses, field observations on water quality, algal biomass, and toxicity will be collected by NOAA GLERL and CILER, the Ohio State University's Sea Grant Program and Stone Laboratory, Heidelberg University, the University of Toledo, Ohio EPA, and LimnoTech. To support monitoring activity, LimnoTech placed and will maintain several real-time sensors in the waters of western Lake Erie. These sensors will provide information at water intakes to treatment plant operators to help them anticipate HABs and to adjust treatment processes to avoid a situation like the water alerts in Toledo in 2014.

LimnoTech is also assisting on other efforts related to HABs in Lake Erie.

- **Beefing up real-time monitoring of in-situ observations of water quality including HABs related parameters:** We have contracts with five water treatment plants including Toledo, Oregon, Avon Lake, Marblehead, and Ottawa County (Port Clinton). We are anticipating contracts with five more (Elyria, Put-In-Bay, Ashtabula, and Cleveland) in the near future. The

contracts cover the installation and maintenance of YSI EXO2 sondes to measure temperature, conductivity, pH, ORP, turbidity, DO, chlorophyll, and blue-green algae. This work is written up in a recent article here: http://www.fondriest.com/news/lake-erie-algal-bloom-monitoring-network-shaping-up-after-toledo-water-crisis.htm. This network will ensure operators of water treatment plants are aware of changing lake conditions and can either ramp up or decrease treatment levels to remove microcystin from the water. Researchers can also use the new observations to understand bloom dynamics.

- **Rolling out a new HABs Data Viewer through GLOS:** In addition to helping individual water treatment plants, we are working through our contract with the Great Lakes Observing System (GLOS) to develop a new data viewer to handle new real-time data that will be available from these new stations. We are also directly coordinating participation in this collaborative data-sharing tool with other researchers deploying similar sensors on buoys throughout the Western Basin including NOAA GLERL, the University of Toledo, Bowling Green State University, and Ohio State University. GLOS is sending out an announcement of the availability of this tool. Here is a link to the announcement http://glos.us/news-events/news/2015-07/algal-bloom-data-viewer-online-now . This type of unilateral collaboration between researchers and the drinking water treatment industry is a good example of how a good data management system can benefit all involved. Typically, water treatment plants are hesitant to share raw water data with researchers and the public, but GLOS and LimnoTech have done a good job at navigating this partnership and trust. Check out the new viewer here http://habs.glos.us .