GLERL researchers use an integrated approach to understand and predict HABs throughout the Great Lakes, particularly in the western basin of Lake Erie. This true color satellite image captures an extensive harmful algal bloom in Lake Erie, on September 5, 2015.

Photo Credit: NASA

Harmful Algal Blooms (HABs)

The August 2014 shutdown of Toledo Ohio's drinking water treatment facility propelled the Lake Erie algae issue to the national spotlight. This major toxic bloom event served as a wake up call that harmful algal blooms pose serious health risks to humans and animals, and threaten the Great Lake region's ability to maintain safe drinking water and to retain and attract water-dependent businesses and activities.

What causes the blooms? When will there be a bloom? Where is the bloom located?
How long will a bloom last? How toxic is the bloom?

Understanding harmful algal blooms requires coordination among researchers and collaboration between different research disciplines. Using cutting-edge research, NOAA is making significant contributions towards understanding and resolving the issue of HABs, particularly in the Great Lakes Region. NOAA's Great Lakes Environmental Research Laboratory (GLERL) and its partners are developing forecast tools and warning systems to assist drinking water system managers, health officials, and the public to provide them with the information they need, when they need it. Through twice-weekly HAB Bulletins, experimental HAB Tracker forecasts, and informative websites with maps displaying bloom locations, NOAA GLERL and its partners help facilitate the continued use and enjoyment of the Great Lakes.
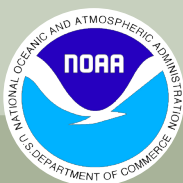
For additional information, please contact:
NOAA Great Lakes Environmental Research Laboratory
Information Services
info-services.glerl@noaa.gov
734-741-2210
www.glerl.noaa.gov

NOAA GLERL contributes to HABs research through:

The GLERL HABs Research Program

The NOAA Great Lakes Harmful Algal Blooms (HABs) program is a collaborative effort to understand and predict HABs by integrating monitoring and real-time observations, forecasting and 3-D modeling, and hyperspectral and remote sensing. NOAA GLERL research on the formation, duration and toxicity of HABs is used to create products for stakeholders, coastal communities, and the public for making important decisions, such as managing drinking water treatment plants. For more, visit NOAA GLERL's Harmful Algal Blooms research homepage at www.glerl.noaa.gov/res/HABs_and_Hypoxia.

Monitoring and Real-time Observations

Field monitoring, buoy, and sensor data assist in the development of tools that predict the magnitude and movement of algal blooms. These tools help us quantify the influence of nutrients on HAB growth and toxicity, and provide critical information to regional stakeholders. NOAA research and models support monitoring and forecasting of these harmful blooms. During the HAB season, the current status of the bloom in western Lake Erie as well as short-term forecasts are published twice a week in the Experimental Lake Erie Harmful Algal Bloom Bulletin. This bulletin is disseminated to stakeholders and available on the web. The data also assist in the development of the experimental Lake Erie HAB Tracker tool. For more, visit NOAA GLERL's Harmful Algal Blooms Water Quality and Monitoring webpage at www.glerl.noaa.gov/res/HABs_and_Hypoxia/habsMon.html.

Forecasting & 3-D Modeling (Experimental Lake Erie HAB Tracker Tool)

The Lake Erie HAB Tracker is a tool that combines remote sensing, monitoring, and modeling to produce daily 5-day forecasts of bloom transport and concentration. This product uses daily satellite imagery and real-time monitoring data to estimate the current expanse and intensity of the bloom. It then incorporates forecasted meteorology and hydrodynamic modeling to predict where the bloom will travel, both horizontally (how far) and vertically (how deep), and what concentrations are likely to be seen. This information is used by drinking water managers to ensure harmful algae is not introduced to potable water supplies. For more, visit NOAA GLERL's Lake Erie HAB Tracker webpage (www.glerl.noaa.gov/res/HABs_and_Hypoxia/habTracker.html).

Hyperspectral & Remote Sensing Research

Cutting-edge hyperspectral technology will take HAB forecasting capabilities to the next level. NOAA GLERL conducts weekly airborne hyperspectral campaigns to capture images of harmful algal blooms in the Great Lakes. Hyperspectral sensors provide color detail much greater than what the human eye, or even satellites, can detect. Because the flyovers are done at low altitude, cloud cover interference, as often seen in satellite images, is minimized. The resulting greater resolution and detail helps scientists evaluate the types of algae present within a bloom. This data will advance research to develop predictions of bloom toxicity and help municipal drinking water managers and other water users know when a HAB has the potential to become a concern. For more, visit NOAA GLERL's HABs-Hyperspectral and Satellite Algorithm Development webpage (www.glerl.noaa.gov/res/HABs_and_Hypoxia/airSatelliteMon.html).

Environmental Sample Processor

In 2016, NOAA GLERL deployed the world's first freshwater Environmental Sample Processor (ESP) near the Toledo, Ohio water intake in Lake Erie. The ESP will advance NOAA GLERL's current weekly monitoring program and provide the most accurate HAB and toxin detection and forecasting tools possible. Sometimes referred to as a "lab in a can," the ESP is an autonomous robotic instrument that provides near real-time detection of HABs and their toxins. The ESP can provide local and municipal managers earlier warning of blooms and toxicity. For more, visit NOAA GLERL's ESP webpage (www.glerl.noaa.gov/res/HABs_and_Hypoxia/esp.html).

Connect with us!