

Lake Erie HAB-OFS Bulletin Guide

Created: May 1, 2017

Harmful algal blooms (HABs) of the cyanobacteria *Microcystis* sp. (commonly called “blue-green algae”) occur nearly every year in Lake Erie and cause potential public health, economic and ecological impacts. The National Oceanic and Atmospheric Administration (NOAA) provides the HAB Operational Forecast System (HAB-OFS) Bulletin as a decision support tool. HAB-OFS Bulletins are emailed to subscribers during the Lake Erie HAB season and are viewable as georeferenced pdfs (see [GeoPDF Viewing Instructions](#)). To subscribe, click [here](#). Please send your questions to hab@noaa.gov.

A) Bloom Analysis

This section provides the current and predicted *Microcystis* conditions as follows:

- **Bloom location, density, and toxicity:** The bloom location is described based on satellite imagery. NOAA partner observations are used to determine toxicity of the bloom.
- **Transport forecast:** Potential bloom transport is forecast using satellite imagery that is incorporated with modeled surface currents using a 2D particle trajectory model.
- **Mixing nowcast/forecast:** Vertical mixing of cyanobacterial cells through the water column reduces the visibility of the bloom at the surface. Forecasts of mixing and surface scum formation for three days following the bulletin date, are based on predicted winds. Nowcasts from imagery date to bulletin date are based on observed winds. Forecasts for mixing and surface scum formation for the seventy-two hours following the bulletin are based on predicted winds.
- **Potential decline:** The potential for bloom decline is forecast when temperatures decrease below 15°C.

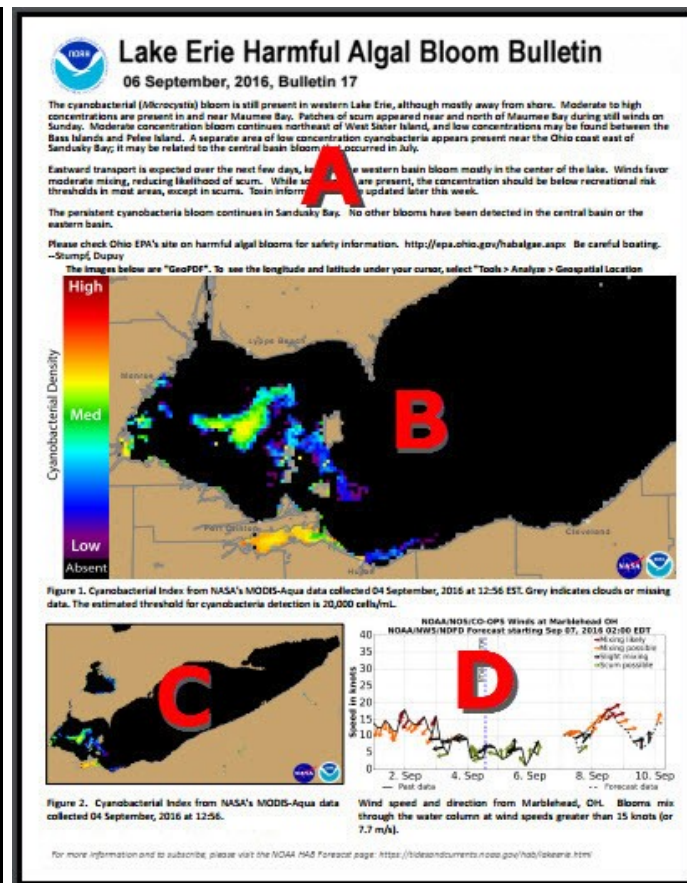
B) and C) Lake Erie Satellite Imagery

Georeferenced satellite images come from the Moderate Resolution Imaging Spectroradiometer (MODIS) sensors aboard the Terra and Aqua satellites and the Ocean and Land Color Instrument (OLCI) sensor aboard the Sentinel-3 satellite (click [here](#) for the Sentinel data usage legal notice).

Bloom density is processed using a cyanobacterial index represented on a color spectrum where purple represents the lowest density of cyanobacteria and red represents the highest. Black pixels indicate a bloom was not detected and gray indicates the presence of clouds.

Image B Western/central basins of Lake Erie where blooms tend to originate.

Image C Full extent of Lake Erie.



D) Mixing Forecast

A graphical representation of the potential for mixing based on wind speed.

- ➡ <5 knots winds — Potential for scum formation
- ➡ 5-10 knots winds —Slight potential for mixing
- ➡ 10-15 knots—Increased potential for mixing
- ➡ 15+ knots winds —Mixing is likely

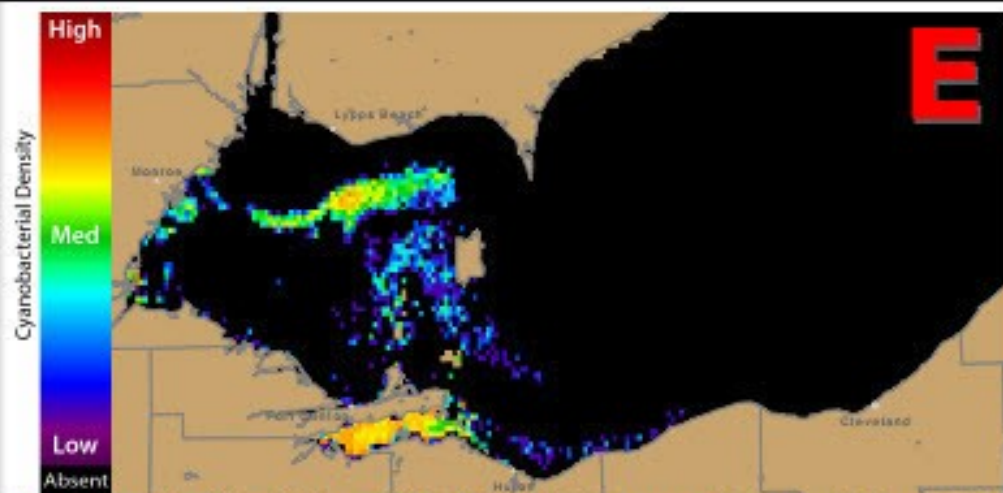


Figure 3. Nowcast position of bloom for 06 September, 2016 using GLFS modelled currents to move the bloom from the 04 September, 2016

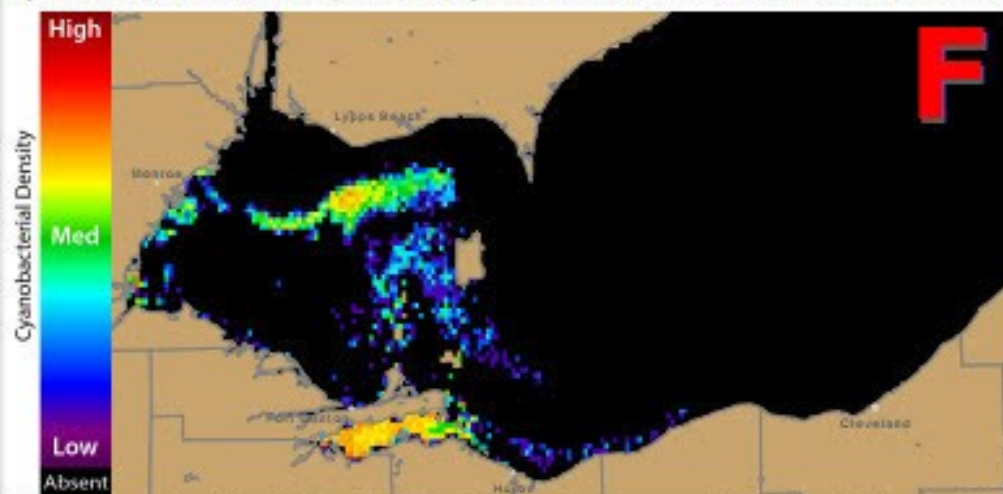
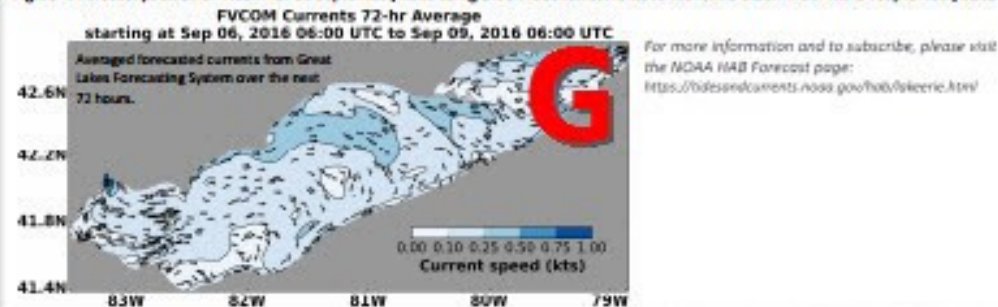


Figure 4. Forecast position of bloom for 06 September, 2016 using GLFS modelled currents to move the bloom from the 04 September, 2016



For more information and to subscribe, please visit the NOAA HAB Forecast page: <https://hiresandocuments.noaa.gov/hab/forecasts.html>

E) Transport Nowcast and F) Transport Forecast

Transport is predicted by incorporating satellite imagery and surface currents from the Great Lakes Operational Forecast System (GL-OFS) into the General NOAA Operational Modeling Environment (GNOME) particle trajectory model.

- A transport nowcast predicts bloom movement from the date of satellite imagery to date of the bulletin, and is based on wind and current forecasts from the GL-OFS.
- A transport forecast predicts bloom movement over 72 hours from the bulletin date, and is based on wind and current forecasts from the GL-OFS.

G) Currents

Image depicts the average forecasted currents data over 72 hours from the date of the bulletin, and is based on winds data from the GL-OFS.



NOAA/National Ocean Service

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