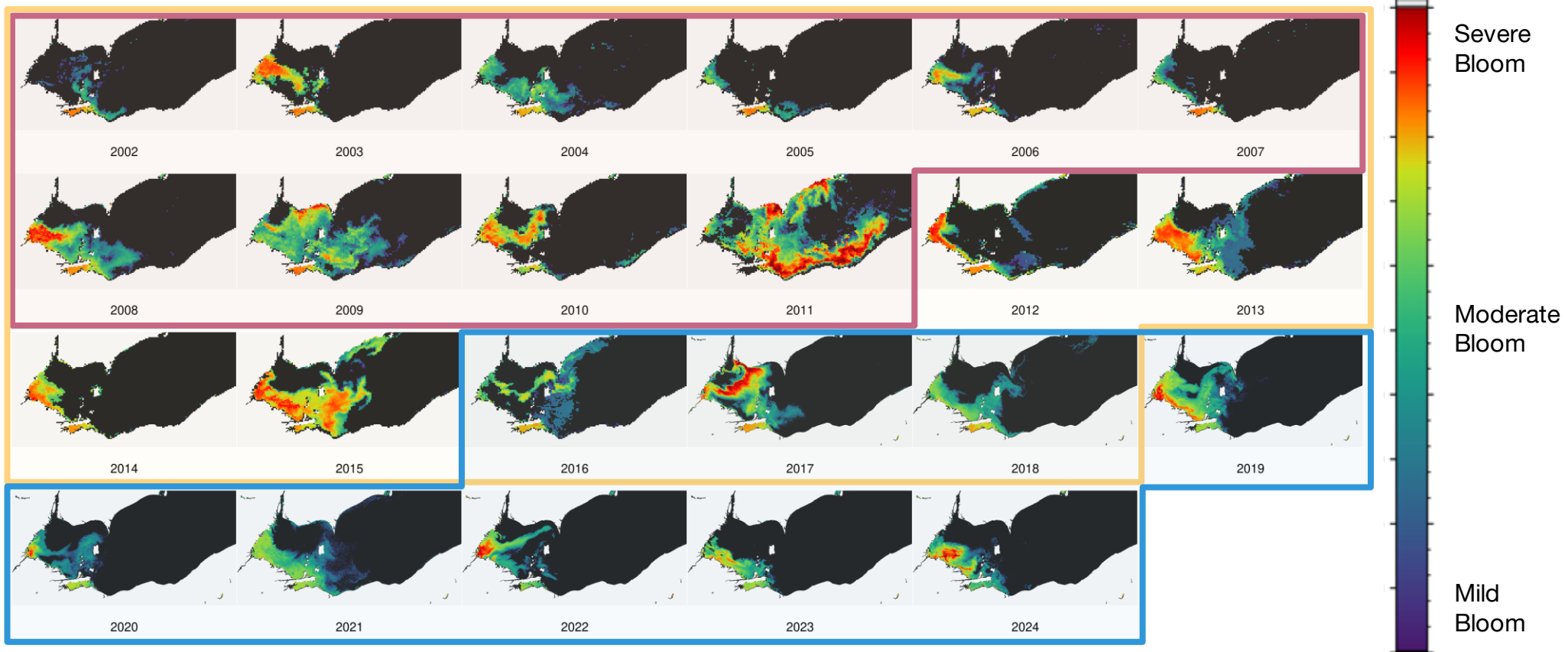


# Lake Erie Historical Time Series: 2025 Update

## Providing continuous cyanobacteria Harmful Algal Bloom (cyanoHAB) monitoring

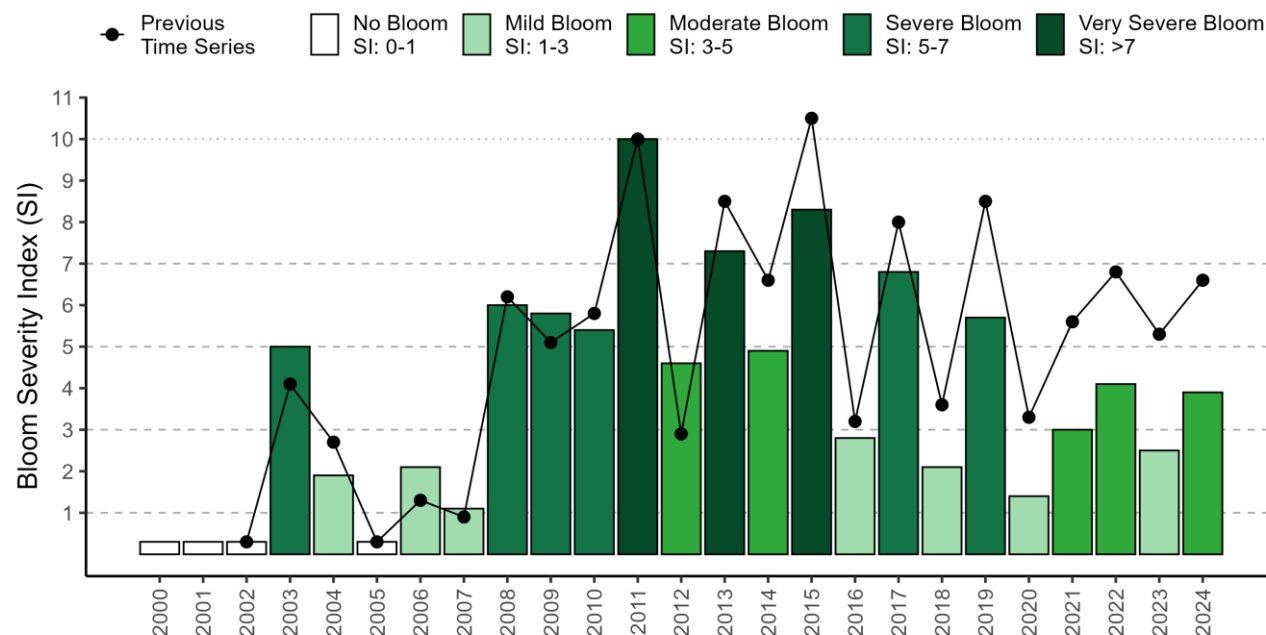
Since 2009, NOAA's National Centers for Coastal Ocean Science (NCCOS) has been using satellite data to monitor the severity and impacts of annually occurring cyanoHABs in Lake Erie. The time series was originally developed using the European Space Agency's (ESA) Medium Resolution Imaging Spectrometer (MERIS, pink box), which collected images from 2002-2011. Following the untimely end of MERIS, NASA's Moderate Resolution Imaging Spectrometer (MODIS, yellow box) was inter-calibrated to MERIS and used to continue monitoring from 2012-2016. In 2016, ESA launched the first of the Ocean Land Colour Instruments (OLCI, blue box; Sentinel-3a), followed by a second OLCI sensor in 2018 (Sentinel-3b). By inter-calibrating between the various satellite missions, NOAA's NCCOS has developed an updated continuous time series of cyanoHAB satellite remote sensing monitoring from 2000-2024. The maximum bloom extent for selected years (2002-2024) is shown below.





## Improved Satellite Based Time Series Better Captures Historical Bloom Patterns

Following the 2024 bloom, we reprocessed the full time series with new calibrations and improved algorithms, generating a more consistent data set for cyanobloom monitoring. The reprocessing also incorporated more data, especially for the MODIS and MERIS satellite sensors (Mishra et al. 2023), and extended the time series from 2000 to present. These updates resulted in the most consistent satellite imagery time series for Lake Erie across all three satellite sensors.



## Reassessing Bloom Severity

With the new data set, we reassessed historical bloom severity. We determined that 2011 was the most severe bloom followed by 2015 and 2013. The reanalysis also increased the relative severity of earlier blooms that were measured using MERIS and MODIS, which underestimated bloom severity relative to OLCI from more recent years. This revised pattern of bloom severity is more aligned with on-the-ground observations of bloom impacts. Blooms from 2021-2024 were generally perceived as less intense with fewer “scum” events as compared to 2008-2010 and 2014. Finally, we have also added categorical descriptors to the previously used bloom severity (CI Severity) scale to better designate overall severity.

### More Information:

[NOAA NCCOS HAB Science](#)  
[NOAA NCCOS Hypoxia Forecasting](#)  
[NOAA NCCOS HAB Monitoring](#)  
[NOAA NCCOS HAB Forecasting](#)

