NASA DEVELOP National Program  
Ames Research Center

**LAKE ERIE WATER RESOURCES:**

*Utilizing NASA Satellite Data to Detect Harmful Algal Blooms in the Western Basin of Lake Erie*

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Harmful algal bloom events, or HABs, have increased in Lake Erie and are negatively impacting drinking water supplies, as well as fisheries and property values. HAB events also pose a risk to water resources around the world, drawing various stakeholders to take steps toward mitigation efforts and to better understand its effects on nearby communities.  Remote sensing is proving to be a useful tool for HAB detection, and can be applied in areas of the world where *in-situ* data is either inaccessible or extremely costly. To validate the precision of remote sensing in detecting HAB events, the NASA DEVELOP team at the Ames Research Center applied two indices to satellite imagery obtained over Lake Erie. The indices were compared against *in-situ* data to assess satellite accuracy statistics.  These indices included Floating Algal Index (FAI) and Normalized Difference Turbidity Index (NDTI). Both indices were applied to remotely-sensed products from NASA Earth Observing System’s Landsat 5 Thematic Mapper, Landsat 8 Operational Land Imager, and Terra Moderate-Resolution Imaging Spectrometer (MODIS), as well as data from the Hyperspectral Imager for the Coastal Ocean (HICO) aboard the International Space Station (ISS).  The National Geospatial-Intelligence Agency (NGA), National Center of Water Quality Research (NCWQR), the University of Toledo, and the Great Lakes and St. Lawrence Cities Initiative (GLSLCI) utilize these methods and end-results to evaluate the potential of applying these indices within Lake Erie and other regions of the world.

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