New YorkView 2023 – 2024

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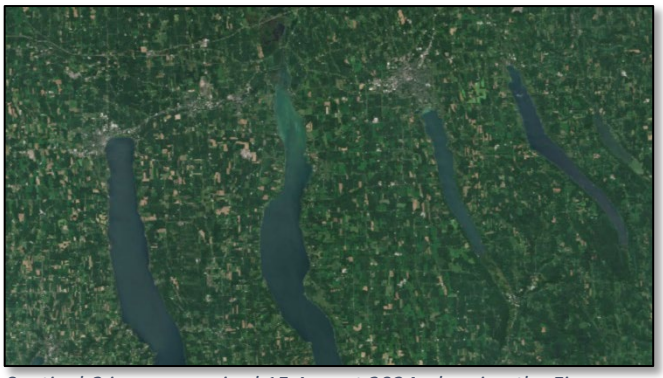
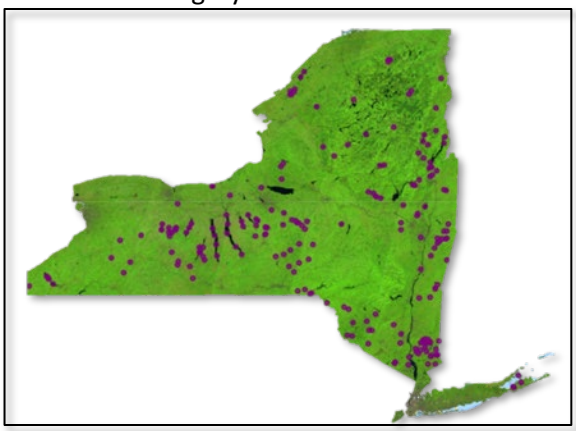
New YorkView 2023 – 2024 Activities

Harmful algae blooms (HABs) have been reported with greater frequency in lakes across New York State (NYS) in recent years. While field-based sampling is important to assess water quality, such observations cannot be used to evaluate the thousands of lakes spread across the state. NYView worked with the NYS Department of Environmental Conservation (DEC) to develop a remote sensing-based method to estimate cyanobacteria concentrations at high temporal (5 days) and spatial (10–20 m) resolution. Our research modeled the relationship between field observations of chlorophyll-a and phycocyanin collected through the NYS Citizens Statewide Lake Assessment Program (CSLAP) program and data derived from Sentinel-2 imagery. CSLAP is a volunteer lake monitoring program run by the NYS DEC and the NYS Federation of Lake Associations. Citizen volunteers collect biweekly water quality data and samples from June through September on approximately 180 sites across NYS.



Sentinel-2 image acquired 15 August 2024, showing the Finger Lakes region of Central New York State, with algal blooms visible in the north of Cayuga Lake.



Field sample locations collected through the Citizens Statewide Lake Assessment Program (CSLAP) program.

We tested seven remote-sensing-derived indices, two field measurements, two cloud mitigation approaches, and three temporal sampling windows. The models developed provide a means to identify lakes across NYS that have not had field sampling but are at a significant risk of algal blooms. Future work will focus on exploring alternative algorithms that can incorporate diverse data sources and lake characteristics, contributing to a deeper understanding of the relationship between remote sensing data and water quality parameters.

Faculty, staff, and graduate students from the SUNY College of Environmental Science and Forestry (ESF) have also supported NYView's remote sensing outreach efforts. NYView teamed with the ESF Department of Environmental Resources Engineering and the ESF Open Academy to develop a Landsat-based floor puzzle highlighting portions of the Lake Ontario Watershed. This puzzle was used as part of a display at the New York State Fair and will be used in a variety of geospatial training efforts.

ESF graduate student with children at the New York State Fair using the Landsat-based puzzle.

New YorkView is a member of the AmericaView Consortium, a nationally coordinated network of academic, agency, non-profit, and industry partners and cooperators that share the vision of promoting and supporting the use of remote sensing data and technology within each state. AmericaView is funded by USGS grant agreement G23AP00683.

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Benefits to New York

As part of the AmericaView Consortium, NYView has supported the application of remote sensing data and products to solve challenges in New York State (NYS) since 2009. Remotely sensed imagery provides a unique viewpoint and supports a wide range of applications in NYS including analyzing land use and land cover change to monitor critical resources, quantifying water quality, characterizing vegetation dynamics, planning or monitoring urban growth, and supporting emergency response.

Rich Lake from Goodnow Mountain at the Adirondack Ecological Center in Newcomb, NY.

NYView initially focused on facilitating access to diverse remote sensing data and products, and supporting collaborative research, teaching, and outreach among consortium members. Since becoming a full member of AmericaView in 2014, NYView has supported training of high school teachers, undergraduate and graduate students, and demonstrated applications of remote sensing data for visitors at the New York State Fair using Landsat change pairs from sites across the state and using a handheld spectrometer to perform observations. NYView has also developed video modules and lab exercises to support development of skills in the cloud-based Google Earth Engine platform.

The reservoir of the Mount Morris Dam in the Genesee River in Letchworth State Park.

In addition to the activities described above, NYView has explored integration of airborne lidar and Landsat data for quantifying forest aboveground biomass and investigated remote sensing and spatial analysis for assessing vegetation trends along riparian corridors and monitoring wetlands. Ongoing research focuses on using remote sensing data to support assessment of water quality in lakes to support state agencies charged with monitoring this vast resource.

New YorkView Consortium Membership

Current NYView consortium members include the State University of New York (SUNY) College of Environmental Science and Forestry (ESF), the Institute for Resource Information Sciences (IRIS) at Cornell University, and SUNY Fredonia. NYView also has collaborators at other institutions of higher education and agencies within NYS as we seek to encourage collaboration and enhance remote sensing activities across the state. Interested researchers and users of remote sensing data should visit the NYView webpage (www.esf.edu/nyview) or contact the NYView Principal Investigator for more information.

ESF

Cornell University

IRIS

Institute for Resource Information Sciences

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