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Thursday, October 11
Poster Session 4
10:30–12:00

Poster 144

HYPERSPECTRAL REMOTE SENSING OF HARMFUL ALGAL BLOOMS IN LAKES (GREAT AND SMALL) AND RIVERS

In the Great Lakes region, despite the diversity of toxic cyanobacteria that have been historically present, there has been a recent proliferation and dominance of cyanobacteria blooms by the genus Microcystis. In many cases, these blooms have been associated with high concentrations of the toxin microcystin, which is particularly troubling given the impact to wildlife and the usage of these fresh water resources for drinking water and recreational activities. There is significant need for improved remote sensing capabilities to both monitor and study these blooms. A multi-year research activity to develop remote sensing algorithms that will improve the capability to remotely sense water quality from space began in 2015. The algorithms are focused on improving the capability to assess harmful algal blooms across North America, including the Laurentian Great Lakes, rivers, and small inland lakes, all of which are impacted by eutrophication and changes to their ecology. The research team has utilized water sampling data, airborne hyperspectral data, and satellite observations to develop remote sensing algorithms that delineate algal types and other water constituents important to algal bloom development, such as phytoplankton competitors and sediment plumes. Algorithms being developed and assessed include: Spectral Decompostion by Varimax-Rotated Principal Component Analysis (VPCA), Adaptive Cyanobacterial Index (CI), Scum Index, Ensemble Machine Learning and Atmospheric Correction for Adjacency Effect for Rivers and Small Lakes and bio-optical model based approaches. The algorithms are being developed utilizing both hyperspectral and multispectral data and the efficacy of the algorithms to the different operational platforms is assessed.

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