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Remote Sensing of Blue-Green Algae for Water Quality Management

Vallely, L.A.[1], Wilson J.S.[1], Tedesco, L.P.[2,3], Pascual, D.L.[2], Randolph K.L.[4], Li L.[3], Cigana J.[5]

[1] Department of Geography, IUPUI
[2] Center for Earth and Environmental Science, IUPUI
[3] Department of Earth Science, IUPUI
[4] Department of Marine Sciences, University of Connecticut
[5] Veolia Water Company

Blue-green algal blooms cause aesthetic and ecological degradation to water reservoirs; in addition, these blooms can pose threat to human health. Monitoring bloom occurrence is a priority for water managers, though current monitoring methods rely on time intensive and costly field sampling. Remote sensing can provide timely synoptic coverage of a feature of interest, making it an appealing alternative to current monitoring methods. Phycocyanin, a pigment unique to blue-green algae in inland water systems, makes the remote detection of blue-green algae possible. This project examines the feasibility of remotely sensing concentration and distribution of phycocyanin in three Indiana drinking water reservoirs. Data were collected from June to November 2006 over a wide range of bloom conditions. Reflectance spectra were collected with an ASD spectrometer; *in situ* water measurements were collected with an YSI multi-parameter probe; and surface water samples were analyzed for phycocyanin. Previously published spectral algorithms for the detection of phycocyanin were evaluated against analytically measured pigment concentrations. Preliminary results indicate that algorithm predictions are affected by multiple water constituents. Partial least squares models incorporating *in situ* water measurements along with spectral algorithms have improved prediction power (R^2 values from 0.70 – 0.90).