

Satellite analysis of toxic algae blooms in Washington State Lakes

By: Joshua Heinlen, Violette Lafferty, Jim Gawel, Emese Hadnagy, Gopal Mulukutla

In order to sense harmful plankton blooms in lakes to avert this danger, we need to be able to detect them. Cyanobacteria blooms are more harmful, so take priority. However since both algae and cyanobacteria contain chlorophyll detecting that will not help, but phycocyanin is distinct to cyanobacteria. Our research aims to establish a remote method for predicting the likelihood of cyanotoxin-producing blooms by correlating field measurements of chlorophyll and phycocyanin with spectral data collected by the Sentinel 2 satellite covering wavelengths ranging from 442.7 to 2202.4 nm. We are examining lakes in Washington State 30-100 acres in size, which is a new application for remote sensing data. We hypothesize that medium-sized lakes with regular occurrences of cyanobacteria blooms detected by resource-intensive in-person methods will also show a proportional spectral signature in satellite data, thus creating a faster, inexpensive way to monitor for harmful algae blooms. We will present initial results of our analysis of a subset of lakes in Snohomish County, WA. These results will be used in an effort to monitor algae blooms more efficiently in order to communicate health risk to lake users to ensure the safety of the many people and animals that use these lakes recreationally throughout the year.