

## ORAL PRESENTATION

### A 30 LAKE DIATOM TP CALIBRATION SET FROM THE ERIE / ONTARIO DRIFT PLAIN ECOREGION

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Nutrient enrichment in the form of anthropogenic phosphorous and nitrogen inputs has occurred in lakes worldwide. In the absence of historical water chemistry data, the extent to which human activity has impacted lakes in the Erie/Ontario drift and lake plain and Western Allegheny Plateau ecoregions is unknown. The objective of this study was to develop a surface sediment diatom calibration set from 30 lakes spanning a phosphorous and nitrogen gradient in the glaciated regions of northeast Ohio and northwest Pennsylvania with an additional lake in New York. No current training set exists for this geographic region. Surface sediment samples and water chemistry data were collected from selected lakes in fall 2006. Sediment samples were processed and analyzed for diatom species composition using a minimum count of 500 valves. The relationship between diatom species, environmental variables and water chemistry was determined using canonical correspondence analysis (CCA). Total phosphorus, ammonia, and magnesium were the three most statistically significant environmental variables, although maximum depth and nickel concentrations were also found to be important. The relationship between diatom species and environmental variables was established using weighted-averaging and the ecological indicator values (optima and tolerances) of 40 abundant diatom species were defined using C<sup>2</sup> software. The root mean squared error associated with prediction of the TP inference model was 17 ug/L, and the R<sup>2</sup> linear coefficient of correlation between observed and diatom-inferred TP values was 0.77. The optima developed in this research compare with other calibration studies of similar TP gradient lengths (12 ug/L-153 ug/L TP). Optima determined from other nearby regional studies are much lower than those from this project, illustrating the need for more regional calibration research.