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Lake Superior: Nearshore variability and a landscape driver concept

High spatial variation is well known to exist in water quality parameters of the Great Lakes nearshore, however strong patterns for extended reaches are also observed and found to be robust across a seasonal time frame. Less is known about robustness of inter-annual variation within parameters for water quality in the nearshore. We conducted high-resolution surveys with towed electronic instrumentation in nearshore areas of Lake Superior and have combined several seasons (2001-2005) of measurements from multiple research programs to investigate how spatial variation correlates across years. The combined survey tows ranged across approximately 1200 km of the south shore. In addition to the survey tracks we also sampled fixed stations to collect calibration data and other parameters not observed by the in situ electronic sensors. The towed sensor data illustrate the spatial and temporal variability of water quality in the nearshore.

Correlation of the nearshore measurements with respect to landscape characteristics of the adjacent coastal watersheds (US only) was analyzed using multivariate stepwise regressions. We found a consistent pattern along the south shore of Lake Superior that related to landscape characterization.