

A Water Quality Assessment of Representative Trout Streams on Minnesota's North Shore of Lake Superior

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Jesse Anderson is a hydrologist with the Minnesota Pollution Control Agency. He received a B.A. degree in Biology from Gustavus Adolphus College, and a Master's of Science degree in Water Resources Sciences from the University of Minnesota. Together with coauthors Mark Evenson, Tom Estabrooks, and Bruce Wilson, he works on water quality monitoring and watershed planning projects in northeastern Minnesota.

Abstract

The beauty and unique setting of Lake Superior's North Shore have made the region a popular recreation destination. While the impact of tourism on the area's economy is substantial, with tourists spending approximately \$275 million dollars in 2000 along the North Shore area, the impacts of development on the area's sensitive water resources have not been well documented. Water quality and streamflow were monitored on six North Shore streams (Amity, Talmadge, French, Sucker, Poplar, and Brule Rivers) in 2002. Flow weighted mean concentrations of water chemistry parameters typically associated with non-point source pollution (total phosphorus and total suspended solids), were greatest in the southern portion of the Shore, and decreased farther up the Shore. This is likely due to a combination of natural watershed variation (size, soils, storage, slopes) and land use changes such as increased urbanization. Loads of total phosphorus and total suspended solids increased by factors of about two-fold and six-fold, respectively, between two monitoring sites bracketing a developed area on the Poplar River. Total mercury levels in the Poplar River exceeded the state standard, and mercury and suspended solid levels were strongly correlated. Historical data from the 1970's suggests that water quality has declined, except in the Brule River- a watershed that has maintained relatively pristine. Given these findings, it is recommended that long-term monitoring of a representative number of North Shore streams continue in order to track water quality trends and to help provide accurate and up to date information for local decision makers.

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