NSERC Canadian Network for Aquatic Ecosystem Services

Theme 3, Project 3.4
Evaluating ecosystem condition by quantifying ecological resilience

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Abstract

Resilience is a term that is commonly used to describe how ecosystems respond to disturbance, but the methods for measuring or quantifying ecological resilience are generally lacking. We are investigating the use of various statistical methods to quantify the ecological resilience of aquatic communities that have experienced various environmental perturbations. The primary objectives of this project are therefore to: 1) review previous methods for quantifying ecological resilience, 2) develop a novel metric of ecological resilience and compare this metric to previously develop metrics using simulations, 3) evaluate the ecological resilience of south-central Ontario freshwater zooplankton communities, and 4) bridge the gap between ecosystem services and ecological resilience theory with a novel aquatic ecosystem management approach. We expect that this research will further the field of ecological resilience, providing a novel tool to evaluate, manage, and enhance the ecological resilience of aquatic ecosystems.

Keywords: Ecological resilience, ecosystem services, multivariate statistics, aquatic ecosystem management

Geographic Location:

Lakes in the District Municipality of Muskoka, Ontario, Canada
Lakes in Haliburton County, Ontario, Canada
Lakes in the Sudbury District, Ontario, Canada

How does your project link to Canadian aquatic ecosystem services?

Understanding and preserving the ecological resilience and ecosystem services of Canadian aquatic ecosystems are two fundamental, interconnected strategies for ecosystem management. In my thesis research, my final chapter looks to bridge the gap between these two disciplines, and will provide a hybrid resilience/ecosystem services management scheme useful for aquatic ecosystem management.