

**Ph.D. and M.Sc. Opportunities- Land/Water Linkages and the Recovery of Severely Damaged Systems  
Vale Living with Lakes Centre, Laurentian University, Sudbury, Ontario**

We are seeking Ph.D. and M.Sc. students to lead projects on the effects of forest disturbances on the recovery dynamics of aquatic ecosystems in mining impacted landscapes. The principal study site is Sudbury, Ontario - historically the home to one of the largest point sources of sulphur dioxide and metal particulates. These studies will build on more than 40 years of intensive environmental research in an area internationally-renowned for its dramatic recovery following a 95% reduction in airborne pollutants, as well as extensive land reclamation efforts (4000 ha limed. 13 M trees planted). This study area, with its wealth of high quality monitoring data, vast arrays of available experimental systems, and sharp spatial gradients of disturbance has long been used to study multiple stressor interactions, the mechanism and drivers of recovery and the potential use of remedial techniques. However, there are still several intriguing observations and questions that Ph.D. and M.Sc. students could tackle. These include:

1. Role of invasive herbivorous insects, such as gypsy moth, in speeding the soil building process (in heavily eroded, metal contaminated soils) and in triggering increased production of invertebrates and fish in downstream streams and lakes ( Observation: a wide variety of insects repeatedly cause extensive defoliation of the early successional forest associated with recovering lakes)
2. Effects of watershed disturbance on nutrient inputs, including DOM (of differing quality), hydrology and physical changes (e.g. surface wind speeds) that may trigger cyanobacteria blooms. (Observation: there is a high frequency of cyanobacteria blooms in lakes within the mining disturbance region)
3. Effects of sublethal exposure to metals on potentially sensitive biomarkers in fish (e.g. gut microbiomes) in lakes with persistent but relatively low levels of multiple metal mixtures (Observation: metagenomics and metabolomics are proving to be very useful tools for detecting the effects of such low level exposures in other biota).

Location and Research Team: The students (s) will be based at the Vale Living with Lakes Centre ([www.livingwithlakes.ca](http://www.livingwithlakes.ca)) and be supported within the Cooperative Freshwater Ecology Unit with its broad partnership of university, government and industry collaborators. The microbial components of the studies involve collaboration with Drs. Nathan Basiliko (<http://www3.laurentian.ca/livingwithlakes/about/staff/nathan-basiliko/>) and Dr. Nadia Mykytczuk (<http://www3.laurentian.ca/livingwithlakes/about/staff/nadia-mykytczuk/>).

Starting Date: When Filled

An excellent academic record, proven publishing ability, strong ecology and statistical training are necessary for these positions. Competitive financial support will be provided. Applications with 80% average are eligible for \$5000 entrance scholarship. Send a letter of interest, CV, copy of recent transcripts and the names of three potential referees to:

Dr. John Gunn  
Canada Research Chair in Stressed Aquatic Systems  
Vale Living with Lakes Centre  
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