UNBC UNIVERSITY OF NORTHERN BRITISH COLUMBIA
School of Planning and Sustainability
University of Northern British Columbia
3333 University Way, Prince George, BC, Canada, V2N 4Z9

Graduate Student Opportunity in Watershed Disturbance

Project Description

The goal of the project is to improve the understanding of appropriate baseline land cover conditions from which to measure hydrological disturbance in British Columbia watersheds. This Mitacs-funded project is part of a larger research initiative focused on hydrological model development being undertaken through a collaboration between Selkirk College (Selkirk Innovates) UNBC, UBC, and forest industry partners.

The project will require a multidisciplinary approach that includes integrating concepts and principles from the fields of hydrology, geomorphology, landscape and forest ecology and BC Provincial land management policy. Study outcomes will be used to inform the broader hydrological modeling research project and as well, provide valuable information for watershed managers and planners throughout the study area.

Position

The position is a master's level research project in the Masters of Natural Resources and Environmental Studies program, that will be jointly supervised by Dr Tara Clapp (UNBC Faculty) and Dr. Kim Green (Selkirk Innovates Faculty), with an Internship at Selkirk Innovates. The graduate student will be be based at University of Northern British Columbia in Prince George; the internship will be done remotely. The successful applicant will be enrolled in the Selkirk Innovates applied research internship training program, which does not have a fee.

RESEARCH APPROACHES

- Use historical imagery and landcover data bases within the GIS environment to characterize temporal and spatial patterns of landcover disturbance,
- Apply concepts of landscape ecology across hydroclimatic regions to delineate regional disturbance zones.
- Apply machine learning methods to estimate long-term landcover disturbance levels across spatial scales.
- Contrast research outcome with Provincial land management policy applicable to the natural resource sectors.

MAIN DUTIES AND RESPONSIBILITIES

- Undertake a literature review to identify the current state of knowledge and determine scope and methods of research project
- Conduct geospatial analysis that is facilitated by machine learning methods to map landcover disturbance across scales and over time in Boundary and Kootenay region watersheds.
- Compare/contrast outcomes with Provincial policy related to watershed management in the resource sector
- Present results in publishable reports
- Share outcomes of study at workshops and conferences

The internship is currently funded for 420 hours, over 18 months (Sept 3 2024 – April 30, 2026), although the start date can be adjusted to coincide with graduate program start. The rate of pay is $22.41/hr.

Supervisors

Dr. Tara L Clapp, Associate Professor, School of Planning and Sustainability, UNBC, and Dr. Kim Green, Researcher, Selkirk Innovates, Selkirk College BC.

Qualifications

Prospective students must meet the academic requirements to admission to the graduate program in MNRES at UNBC, should have (or will have) an undergraduate degree in geoscience/earth science, physical geography, environmental science, environmental planning or a related discipline, practical knowledge and competency in the use of GIS and geospatial analysis methods, and solid grounding in at least one assessment policy context in the British Columbia context (or similar) – watershed assessment, cumulative impacts assessment or environmental impact assessment. Priority will be given to Canadian applicants.

ADDITIONAL RELEVANT QUALIFICATIONS

- Well-developed GIS research skills. Please note that this position requires an in-depth understanding of GIS techniques and is therefore not a good fit for candidates who have completed a single GIS course with no additional skill development through work experience.
- Interest in and knowledge of mountain watershed systems
- Experience collecting and working with BC Provincial and Federal landcover datasets
- Experience with GIS-based data analysis using the latest GIS software.
- Experience programming in R, as well as Python or similar language
- Familiarity with the application of machine learning approaches
- Practical knowledge of Provincial policies related to at least one watershed assessment approach
- Strong communication skills with the ability to communicate research outcomes in English language written documents and conference events.
- Excellent interpersonal, time management, and task management skills
- Ability to work independently
- Access to a personal computer with Microsoft Office programs, geospatial analysis/GIS software, and sufficient processing power to manage large datasets.

Application

Expressions of interest should be prepared as a single PDF file emailed to tara.clapp@unbc.ca and kgreen@selkirk.ca with the email title: **Baseline Watershed Disturbance Internship**. For more information contact Dr. Tara Clapp by email (tara.clapp@unbc.ca) or Dr. Kim Green by email (kgreen@selkirk.ca). Applications received by March 29, 2024 will be given full consideration, but applications will be accepted and reviewed until the position is filled. UNBC encourages applications from all qualified individuals, including women, Indigenous people, visible minorities, and persons with disabilities.