

M.Sc. Opportunity in Northern Hydrometeorology

Project Summary:

This project will focus on cold region processes related to storms and their precipitation at the top of the western Cordillera. The precipitation in this region provides the primary source of water for North American rivers going to the Pacific, Atlantic and Arctic Oceans, can trigger catastrophic flooding and it maintains the perilous existence of glaciers. Despite its essential role, very few observations that link surface features, precipitation and atmospheric conditions are available in this region. This project will start addressing this gap by using a combination of sophisticated weather instruments, instrumented mountain basins and modelling tools to study storms and precipitation across the continental divide between Alberta and British Columbia (BC). A key issue is how much of the moisture flux crosses the barrier from either the Pacific in eastward moving storms or from the Prairies and Gulf of Mexico in leeward (upslope) storms. For this project, a M.Sc. student will quantify the orographic enhancement of precipitation occurring in storms impacting the continental divide between Alberta and BC using a combination of field measurements and numerical model output. To do so, both sides of the divide will be instrumented to measure precipitation aloft to study particle evolution and then its spatial distribution at the surface. This will fill in the gaps of efforts to characterize the precipitation at the surface and snowline, in drought periods and impacts on hydrology. A critical outcome will be to deliver a system to diagnose and predict precipitation amounts, patterns and types across the divide using a combination of very high-resolution modelling and sophisticated instrumentation.

We invite applications for a potential M.Sc. student having a comprehensive knowledge of cold regions hydrometeorology, excellent computational and programming skills, and experience conducting field work in remote terrain. The student will participate in a two-month field campaign (provisionally scheduled for May and June 2019) in southeastern BC along the continental divide. This research will involve the collection and analysis of precipitation data along an elevation gradient, so experience with state-of-the-art weather instrumentation (especially from Campbell Scientific) and efficient data and statistical analyses are assets.

Interested applicants are encouraged to contact Stephen Déry at sdery@unbc.ca with a cover letter highlighting research interest and experience, an up-to-date curriculum vitae, unofficial transcripts, and the names of two potential references. The deadline for submitting these documents is Friday 12 January 2018 (or until the position is filled). The successful candidate will then be required to submit an application for entry to the Natural Resources and Environmental Studies (NRES) graduate program at the University of Northern British Columbia (UNBC) situated in Prince George, British Columbia, Canada. The successful candidate will receive 2-year of financial support starting with the UNBC academic session in September 2018.