Funded PhD level graduate position in the Natural Resources and Environmental Studies Graduate Program at the University of Northern British Columbia (UNBC) on modeling snowcover in regional climate models

The Natural Resources and Environmental Studies Graduate Program at UNBC, in collaboration with the Canadian Network for Regional Climate and Weather Processes (CNRCWP; http://www.cnrcwp.uqam.ca/) based at the Université du Québec à Montréal (UQAM), is offering three years of funding in support of a Ph.D. on improving the simulation of snowwithin the Canadian Regional Climate Model.

Project Overview:

To better resolve the changing snowmelt and glacier hydrology of western North America, improved representations of surface heterogeneity and snowpack processes are needed in the current generation of regional climate models. Multiple factors control mountain snowpack accumulation and ablation, including elevation, slope, aspect, wind, and vegetation. Snow melt is also affected by the evolution of the snowpack through the melt season, e.g. the influences of impurities, water content, and recrystallization on snow albedo; the effects of internal and overnight refreezing; the development of surface features that influence snowpack roughness (hence, turbulent exchanges). This project will therefore involve the development of a subgrid-scale snow (SSS) parameterization to consider land surface heterogeneities on snowpack conditions within regional climate models (e.g., Liston 2004; Déry et al. 2004). Use of elevation bands, consideration of slope and aspect, and exposure to wind will be factored in the SSS parameterization. The aim of this work is to improve the depiction of snowpack evolution in western North America and impacts on the regional hydrology in climate models. Simulations will focus on the Columbia, Fraser, Mackenzie and Nelson river basins (and some of their major tributaries) for which observed hydrometric and snow data (snow cover, depth and water equivalent) are available (e.g., Déry et al. 2012).

Application Process:

The successful candidate will have a strong science background (Master's degree) with previous focus on the hydrological sciences, climate change, snow, statistics, andnumerical modeling. Previous experience with climate models and programming in Fortranwill be an asset.Funding is available for three years. Course work andsupervision will be at UNBC and will be in conjunction with our research partners. For more information, please contact Dr. Stephen Déry at: sdery@unbc.ca or consult the group's website (http://nhg.unbc.ca).

Candidates must submit electronically a one-page letter of intent describing interests in the project and their qualifications to undertake this work, along with an unofficial transcript and CV to Dr. Déry by January 15th, 2015. Deadline for application to graduate programs at UNBC isFebruary 15th, 2015 for a Fall 2015 admission.