



Snow hydrology research opportunities in the Canadian Rocky Mountains



The University of Saskatchewan Centre for Hydrology www.usask.ca/hydrology with funding from the Global Institute for Water Security and NSERC has appointments open for

1) PhD – Ecohydrology of Canadian Rockies treelines (Pomeroy). This studentship will examine the interaction of snow redistribution and melt, water supply and tree growth to determine the hydrological role of mountain treelines and the stability of treelines under a warming climate.

2) PhD - Snow-Atmosphere Interactions in Complex Terrain (Helgason). This studentship will examine the spatial variability of convective energy fluxes to/from snow surfaces within headwater basins of the Canadian Rocky Mountains. The student will examine the nature of the turbulent exchange at the snow air interface and develop a refined understanding of the driving processes in these complex environments.

3) PhD – Meltwater Flow through Mountain Snow (Pomeroy & Marsh). This studentship will examine meltwater storage and flow through deep snowpacks on slopes in the Canadian Rocky Mountains. The student will examine coupled energy and mass transport in snow and the development of preferential flowpaths and the effect on routing meltwater runoff using field studies in high mountain environments and physically based modelling..

4) PDF – Spatially distributed modelling of the dynamics of mountain snow hydrology (Pomeroy). The fellowship will focus on using experimental mountain basin data to develop and drive sophisticated, fully distributed snow hydrology models to better understand headwaters basin response to changing climate and land use.

The University maintains the Coldwater Centre offices and laboratories in the Kananaskis Valley of the Canadian Rockies and instrumented basins at Marmot Creek, and Peyto Glacier, Alberta along with a suite of hydrological models and a wide range of collaborations.

Ecohydrology of Canadian Rockies Treelines - PhD Student

Qualifications:

Applicants must have or be near completion of a Master's degree in a natural resources or engineering field (preferably with an emphasis on hydrology), and must meet all of the requirements for acceptance into the PhD program in the Department of Geography and Planning at the University of Saskatchewan. The successful applicant will have an interest in the intersection of physical and ecological science, be highly motivated, have excellent oral and written communication skills, and have previous wilderness fieldwork experience in cold environments (please clearly outline previous field experience in cover letter). A successful application to the College of Graduate Studies and Research at the University of Saskatchewan will be required (see below).

Venue:

Research will be conducted in the Centre for Hydrology www.usask.ca/hydrology with offices on campus in Saskatoon and on the campus of the Biogeoscience Institute in the Kananaskis Valley, Alberta <http://bgs.ucalgary.ca/>. The Centre for Hydrology offers superb facilities for training in hydrological processes and modelling and related ecological, climatological and hydrochemical phenomena. Marmot Creek Research Basin in the Kananaskis Valley of the Canadian Rockies is one of the most comprehensively instrumented mountain research basins in Canada and has a 50 year history of research. Fieldwork technicians and computer modellers are available to help with this research.

Stipend:

A three-year scholarship is available to aid in the completion of the Ph.D. program. Base support is \$19,129 per year with a notable supplement for good performance. Normal starting dates are September 2012.

How to Apply:

General admission requirements and an on-line application form can be found at the College of Graduate Studies and Research (CGSR) website: www.usask.ca/cgsr/admission/index.php .

In addition to completing the CGSR application, please send a statement describing your research interests and field experience to the Graduate Chair, Department of Geography and Planning following the procedure outlined at <http://www.arts.usask.ca/geography/graduate/> .

Deadline for applications to the Department of Geography and Planning is 15 Feb 2012.

You are strongly encouraged to contact Dr. John Pomeroy, Director, Centre for Hydrology (john.pomeroy@usask.ca.) before applying.

Snow-Atmosphere Interactions in Complex Terrain - PhD Student

Qualifications:

Applicants must have or be near completion of a Master's degree in a natural resources or engineering field (preferably with an emphasis on hydrology). The successful applicant should have interests in hydrology, meteorology, and modeling. In addition to having good analytical skills, applicants should have an aptitude for conducting field work in a challenging environment while deploying and maintaining hydrological and meteorological instrumentation. A successful application to the College of Graduate Studies and Research at the University of Saskatchewan will be required (see below). All candidates must demonstrate that they have excellent oral and written communication skills, and international candidates should ensure that they meet the language requirements at the time of application (see <http://www.usask.ca/cgsr/admission/language.php> for more information).

Venue:

Research will be conducted in the Centre for Hydrology www.usask.ca/hydrology with offices on campus in Saskatoon and on the campus of the Biogeoscience Institute in the Kananaskis Valley, Alberta <http://bgs.ucalgary.ca/>. Marmot Creek Research Basin in the Kananaskis Valley of the Canadian Rockies is one of the most comprehensively instrumented mountain research basins in Canada and has a 50 year history of research. Fieldwork technicians and computer modellers are available to help with this research.

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How to Apply:

General admission requirements and an on-line application form can be found at the College of Graduate Studies and Research (CGSR) website: www.usask.ca/cgsr/admission/index.php .

In addition to completing the CGSR application, please send a statement describing your research interests and field experience to the Graduate Chair, Department of Chemical and Biological Engineering (http://www.usask.ca/cgsr/grad_programs/programs/ABE.php)

For more details, applicants are invited to contact Dr. Warren Helgason (warren.helgason@usask.ca) before applying.

Meltwater Flow through Mountain Snow – PhD Student

Qualifications:

Applicants must have or be near completion of a Master's degree in hydrology or a related field, and must meet all of the requirements for acceptance into the PhD program in the Department of Geography and Planning at the University of Saskatchewan. The successful applicant will have an interest in flow through frozen porous media, be highly motivated, have excellent oral and written communication skills, and have previous wilderness fieldwork experience in cold environments (please clearly outline previous field experience in cover letter). A successful application to the College of Graduate Studies and Research at the University of Saskatchewan will be required (see below).

Venue:

Research will be conducted in the Centre for Hydrology www.usask.ca/hydrology with offices on campus in Saskatoon and the Coldwater Centre on the campus of the Biogeoscience Institute in the Kananaskis Valley, Alberta <http://bgs.ucalgary.ca/>. The Centre for Hydrology offers superb facilities for training in hydrological processes and modelling. Marmot Creek Research Basin and Peyto Glacier in the Canadian Rockies are two of the most comprehensively instrumented mountain hydrology research sites in Canada and have a 50 year history of research. Fieldwork technicians and computer modellers are available to help with this research.

Stipend:

A three-year scholarship is available to aid in the completion of the Ph.D. program. Base support is \$19,129 per year with a notable supplement for good performance. Normal starting dates are September 2012.

How to Apply:

General admission requirements and an on-line application form can be found at the College of Graduate Studies and Research (CGSR) website: www.usask.ca/cgsr/admission/index.php .

In addition to completing the CGSR application, please send a statement describing your research interests and field experience to the Graduate Chair, Department of Geography and Planning following the procedure outlined at <http://www.arts.usask.ca/geography/graduate/> .

Deadline for applications to the Department of Geography and Planning is 15 Feb 2012.

You are strongly encouraged to contact Dr. John Pomeroy, Director, Centre for Hydrology (john.pomeroy@usask.ca.) or Dr. Phillip Marsh, Project Chief, Environment Canada (phillip.marsh@ec.gc.ca) before applying.

Spatially distributed modelling of the dynamics of mountain snow hydrology - Post-doctoral Fellow

Qualifications

The successful applicant must have completed within five years or be near completion of a PhD that involves some aspect of snow hydrology or climatology or mountain ecology and be fully conversant with snow physics, micrometeorology, hydrology, and physically based modelling of complex systems. Required qualifications include: ability to code in C or C++, ability to operate complex computer models, ability to operate GIS, ability to participate in high altitude mountain fieldwork in wilderness locations and ability to write scientific papers. Evidence of successful publication in high quality international science journals is a requirement for this PDF.

Fellowship

The Fellow will work with Dr. Pomeroy and national and international collaborators to develop and apply fully distributed models of snow hydrology to high mountain environments in order to determine scale relationships, climate sensitivity, and landscape ecological sensitivity of snow hydrological processes. Models will include a full suite of wind and canopy snow redistribution processes, open and sub-canopy snow energy balance processes, snowmelt hydrology and soil/glacier interactions. Models will be tested using observations from a suite of high altitude snow micrometeorology observation stations in currently instrumented stations and using archival data from the IP3 Network www.usask.ca/ip3.

Venue:

Research will be conducted in the Centre for Hydrology www.usask.ca/hydrology with offices on campus in Saskatoon and on the campus of the Biogeoscience Institute in the Kananaskis Valley, Alberta <http://bgs.ucalgary.ca/>. This position will be based at the Coldwater Centre @ Biogeoscience Institute, Kananaskis, Alberta – the nearest full service residential town is Canmore, Alberta <http://www.tourismcanmore.com/>. The Centre for Hydrology offers superb facilities for training in hydrological processes and modelling and related ecological, climatological and hydrochemical phenomena, and its Coldwater Centre is a unique mountain snow hydrology and climatology laboratory situated in the Canadian Rockies. Nearby Marmot Creek Research Basin and Peyto Glacier in the Canadian Rockies are two of the most comprehensively instrumented mountain research basins in Canada and have a 50 year history of research. Fieldwork technicians and computer modellers are available to help with this research.

Stipend:

A two-year fellowship at \$45,000/year is available to support this post.

How to Apply:

Contact Dr. Pomeroy john.pomeroy@usask.ca with a cover letter explaining your motivation, complete CV, examples of at least three top papers either in press or published, and contact details for three academic references.