



### **Cold Regions Eco-Hydrology Field Course**

**Wilfrid Laurier University & the Hoarfrost River Homestead  
10 – 17 February, 2017**

#### ***Course objectives***

This course aims to describe and explain:

- The physical principles and processes that govern cold regions eco-hydrology, with special reference to Canadian winter conditions,
- Mass and energy balance calculations and their application in eco-hydrology,
- Linkages and feedbacks among hydrology, ecology and biogeochemistry.

Students will emerge from the course with a deeper understanding of cold regions eco-hydrological processes and feedbacks. The course is intended for senior undergraduate students with an interest in hydrology and/or ecology who are looking to broaden their understanding of cold regions eco-hydrological systems and processes. This bio-physical science course is quantitative in nature and so a foundation in quantitative methods in the context of hydrology and/or ecology is recommended.

#### ***Course synopsis***

The Cold Regions Research Centre (CRR) at Wilfrid Laurier University ([www.coldregions.ca](http://www.coldregions.ca)) is offering an intensive field-based course on the physical principles of cold regions eco-hydrology and water resources. Factors governing eco-hydrological processes in cold regions landscapes will be discussed including precipitation, interception, energy balance, snow accumulation and redistribution by wind, plant physiology, plant-snow interactions, over-winter moisture redistribution in vegetation, snow and soil properties, and coastal/lake processes. Each will be framed within the context of the subarctic Boreal Shield, a distinctly Canadian landscape. Students will be exposed to an overview of each subject, with recent scientific findings and new cutting edge theories, tools and techniques.

The course will take place at the Hoarfrost River Homestead on the remote, eastern edge of Great Slave Lake in the Northwest Territories. The homestead is just a few kilometres south of the tree-line and as such, offers unparalleled access to boreal forest, taiga and tundra land-covers, in addition to coastal and lake environments. It is also on the shore of the deepest portion of the deepest lake in North America. The immediate area of the homestead was severely burned during the 2014 fire season, with profound effects on local ecosystems and hydrology.

The course will focus on field examinations to expose students to cold regions eco-hydrological phenomenon, state of the art field instrumentation and measurement techniques, including the use of un-manned aerial vehicles (UAVs). Field activities will be complimented by numerical and essay assignments to develop skills in problem solving and in synthesizing eco-hydrological concepts. Each day will start with a condensed lecture on the primary subject, followed by field activities to examine the processes and measurement techniques relevant to the lectures. Points of interest on the land, lake and along the shore will be reached by snowshoe, ski, dogsled, and snowmobile. These scientific activities will be complimented by a traditional knowledge component led by an Elder from the community of Lutsel K'e.

### ***Evaluation***

Students will be evaluated with a literature review on an eco-hydrological process selected in consultation with one of the course instructors (50%), and a quantitative exercise based on collaborative fieldwork by small groups of students while in the field (50%). Both the literature review and the quantitative exercise will be due no later than 4 April, the last day of classes of the 2018 Winter Term.

### ***Preliminary Meeting***

Prior to the field trip, there will be a planning and logistics meeting during the week of 8 January, 2018. Students enrolled in GG499V will receive advanced email notification of the day, time and location of this meeting. The purpose of the meeting is to discuss logistics and to provide course handouts and other reading materials.

### ***Registration***

All students taking this course are required to enroll in GG499V at Wilfrid Laurier University. The registration fee is \$1000. This covers the cost of the use of the facilities, meals and accommodation at the Hoarfrost River Homestead. In addition, students will cover the cost of their airfare to and from Yellowknife, and their hotel accommodation for 1 night in Yellowknife. Students will be able to take advantage of the special rates negotiated by Wilfrid Laurier University for these flights and for the hotel accommodation.

Non-Laurier students must complete a "letter of permission form" provided by their home university. The home university of the non-Laurier students will provide more information on the credit transfer process.

### ***Application***

To apply, please send by email attachment to Bill Quinton ([wquinton@wlu.ca](mailto:wquinton@wlu.ca)) the following:

- a brief (500 word) letter explaining why you are interested in taking this course, and
- a copy of your academic transcript (an unofficial copy is sufficient).

### ***Important Dates***

- 29 September: Last day to submit application.
- 15 October: Successful applicants will be notified.
- 31 October: Last day to submit the course fee (\$1000)

- 15 November: No refunds after this date. Refunds can be made prior to this date, but \$100 will be retained to cover the cost of administration.

**For further information...**

For questions about course content – Bill Quinton ([wquinton@wlu.ca](mailto:wquinton@wlu.ca))

For queries related to registration – Sorina Ciucurita ([sciucurita@wlu.ca](mailto:sciucurita@wlu.ca))

For information related to transferring the GG499V course credit to your home institution, contact your department chair or Dean's office. For further information contact [artsinfo@wlu.ca](mailto:artsinfo@wlu.ca) (519.884.0710 x3891).