

Two Ph.D. studentships available at Memorial University of Newfoundland (Canada):
Greenhouse gas emissions in boreal peatlands affected by agricultural drainage

The studentships are available fully funded for four years. The expected start date is September 2018, but earlier start date can also be considered.

Ph.D. 1: Examining the impacts of agricultural drainage on greenhouse gas emissions (carbon dioxide, methane and nitrous oxide) in boreal peatlands.

Your research work will include, but not limited to, (1) quantify greenhouse gas emissions from boreal peatlands affected by agricultural drainage; (2) measure the temporal and spatial variability of greenhouse gas emissions; (3) determine the biotic and abiotic regulatory factors and their relationships with greenhouse gas fluxes. You are also welcome to add new components into this project. The data will be collected using the eddy covariance system (LI-7200 and LI-7700) and static chamber measurement (LGR Ultraportable GHG analyzer and/or GC).

You need to have a Master's degree (or equivalent) in appropriate fields, for example, in soil science, ecology, earth system science, physical geography, hydrology, biogeochemistry, and micrometeorology, or other suitable subjects. You are expected to have excellent oral and written skills in English, strong numerical analytical and statistical skill to analyze the large EC data and static chamber measurement data. You are required to regularly visit the sites year-round to collect gas samples from static chambers, and maintain the proper function of EC tower, analyze the sample in the lab, write high-quality manuscripts for publication in the high impact journals, present your work in international/national conferences, and fulfill other requirement for a Ph.D. degree.

Ph.D. 2: Modeling the carbon dynamics in boreal peatlands affected by agricultural drainage.

The research question directing this project is “how can the changes in biogeochemical properties in boreal peatlands affected by agricultural drainage be parameterized in the McGill Wetland Model (MWM) or DeNitrification and DeComposition Model (DNDC)”? Either MWM or DNDC needs to be adapted to incorporate the changes in hydrology and vegetation composition in the agriculturally drained peatlands. The newly developed/adapted model will be evaluated against the continuous eddy-covariance tower measurements (carbon dioxide and methane). Then the model will be applied to the global scale to examine how agricultural drainage affects C dynamics of northern peatlands. If feasible, you are also expected to examine how these agriculturally drained peatlands would be affected in the future projected climate change in terms of carbon dioxide and methane fluxes. You will use our continuous half-hour C flux data (carbon dioxide and methane) from a natural peatland and an agriculturally drained peatland since September 2013 to parameterize and evaluate the model.

You need to have a Master's degree (or equivalent) in appropriate fields, for example, in soil science, ecology, earth system science, physical geography, hydrology, biogeochemistry, and micrometeorology, or other suitable subjects. You are required to have: excellent oral and written skills in English; strong numerical analytical skills; experience with process-based ecosystem

modeling; A good understanding of peatland/wetland C cycling and hydrology, and biophysical drivers of peatland/wetland processes; experience in computer programming (for example, Fortran, or C, C++). You are expected to write high-quality manuscript for publication in the high impact journals, present your work in international/national conferences, and fulfill other requirement for a Ph.D. degree.

If you are interested in either of the two positions, please send a letter of motivation/research statement, evidence of English Proficiency (required for international students), up-to-date curriculum vitae, unofficial transcripts, and a copy of any publication (if available) to Dr. Jianghua Wu at jwu@grenfell.mun.ca with subject **“Ph.D. studentship-Field” for Ph.D. 1 and “Ph.D. studentship-Modeling” for Ph.D. 2**. Reviewing is started immediately after your files are received. Only short-listed applicants will be contacted by email to encourage you to apply formally through the following link: <http://www.mun.ca/become/graduate/programs/environmental.php>, from which you can find the detailed information on the application process.