

## **Opportunities for Graduate Research and Training: Climate Change Impacts on Arctic Land and Water Surface Processes**

Several exciting and challenging opportunities are available for graduate and post-doctoral training in a new suite of collaborative projects funded by the NSF Arctic System Science program, on *Spatial and Temporal Influences of Thermokarst Failures on Surface Processes in Arctic Landscapes*. The various components of this collaborative effort focus on how a widespread and long-term increase in the incidence of thermokarst failures impacts the structure and function of arctic landscapes. Specific components focus on the composition of vegetation, the distribution and processing of soil nutrients, and exports of sediments and nutrients to stream and lake ecosystems. The projects are designed to address how changing land surface processes and formation of thermokarst failures feedback to the climate system through energy, albedo, water, and trace gas exchange. Additional information about this program of research can be found at <http://thermokarst.psu.edu>.

We seek motivated graduate students and post-doctoral fellows who have excellent quantitative and communication skills. Successful candidates for these positions will be able to work well independently and as a part of a larger, diverse team of scientists and fellow students. Potential applicants should realize that these projects entail field research at remote sites in the arctic – the western Brooks Range and the North Slope of Alaska – under conditions that can be physically challenging. Participants in these projects will be integrally involved in incorporating their research into several education and outreach activities as part of the overall effort. Professional mentoring opportunities exist within the group and through the Association of Polar Early Career Scientists (APECS).

The following specific graduate and post-doctoral opportunities are currently available:

*Mechanisms of thermokarst Failure:* A graduate student position is available in the Department of Civil & Environmental Engineering at Pennsylvania State University to work on a research project that is focused on localized permafrost degradation that results in development of thermokarst failure features. The successful candidate will investigate the temporal and spatial variability in surface energy and hydrological conditions on hillslopes that promote formation of thermokarst failures. For additional information see <http://water.engr.psu.edu/gooseff> and please contact Dr. Michael Gooseff at [mng2@psu.edu](mailto:mng2@psu.edu) or 814-867-0044.

*Soil carbon and trace gas dynamics:* A graduate student position is available at the University of Alaska Fairbanks to study carbon and nutrient cycling, and trace gas emissions from thermokarst features in Arctic Alaska. Preference will be given for a Ph.D. student, although M.S. applicants will be considered. Please contact Dr. Jeremy (Jay) Jones in the Institute of Arctic Biology and Department of Biology and Wildlife at the University of Alaska Fairbanks at [ffbj@uaf.edu](mailto:ffbj@uaf.edu) or 907-474-7972.

*Plant community dynamics:* MS and PhD student assistantships are available at the University of Florida, Department of Biology, to study the effects of climate change on arctic ecosystems. The project will focus on the consequences of thermokarst--catastrophic ground subsidence due to thaw of permanently frozen soil--for plant communities and ecosystem processes such as productivity and nutrient cycling. This position will be located at the University of Florida in Gainesville, FL, during the winter and will require extensive field work in arctic Alaska during the summer. The candidate student has the choice of entering through either a Botany (<http://web.botany.ufl.edu/>) or Interdisciplinary Ecology (<http://snre.ufl.edu/>) degree program. Please contact Dr. Michelle Mack ([mcmack@ufl.edu](mailto:mcmack@ufl.edu)) for more information.

*Impacts on stream ecosystems:* An opportunity is available at The Rubenstein School of Environment and Natural Resources at the University of Vermont, to study how sediment and nutrient export from thermokarst failures affect stream ecosystem communities and dynamics. Preference will be given to PhD students, but well-prepared and experienced MS students will be considered. For additional

information please contact Dr. Breck Bowden at [breck.bowden@uvm.edu](mailto:breck.bowden@uvm.edu) or 802-656-2513 and see <http://www.uvm.edu/~wbowden>).

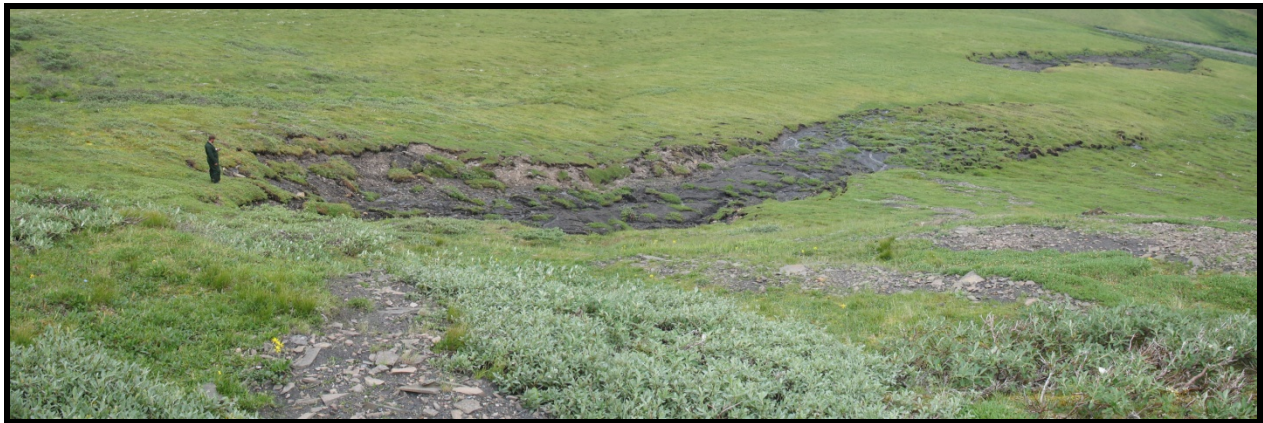
*Impacts on lake ecosystems:* An opportunity exists for a Ph.D. or Masters student to explore how thermokarst failures affect lake ecosystems. Fully funded 5-yr program for Ph.D. students (details at <http://www.eeb.lsa.umich.edu/eeb/graduates/index.html>). Please contact Dr. George Kling at [gwk@umich.edu](mailto:gwk@umich.edu) for more information..

*Geomorphic processes:* An opportunity exists at Idaho State University for an MSc or PhD student interested in arctic river processes including sediment transport, bed and bank stability and network response to changes in the volume and timing of water and sediment delivery to channels. Applicants with strengths in field observation, computational and mapping tools (Matlab, GIS, GPS, Total Station etc.), river processes and numerical modeling are especially encouraged to apply. Please contact Dr. Benjamin Crosby at [crosbenj@isu.edu](mailto:crosbenj@isu.edu) or 208-282-2949 for further details and see <http://geology.isu.edu/~crosbenj>.

*Simulation of long-term landscape dynamics:* A position is available at The Rubenstein School of Environment and Natural Resources at the University of Vermont to further develop existing models of long-term landscape change to incorporate the influences of thermokarst failures. This position may be filled at the Post-Doctoral level or at the PhD level. A firm grasp of mathematical representations of complex systems is essential and some background in programming and systems modeling is expected, though the experience could be in areas different from ecosystem or landscape ecology. The successful candidate will be housed at the University of Vermont but will collaborate closely with Dr. Ed Rastetter at the Ecosystems Center, Marine Biological Laboratory in Woods Hole, MA. Please contact Dr. Ed Rastetter at [erastett@mbl.edu](mailto:erastett@mbl.edu) (508-289-7483) or Dr. Breck Bowden at [breck.bowden@uvm.edu](mailto:breck.bowden@uvm.edu) (802-656-2513) for further details.

*Human community dynamics:* Funding is available to support an MS student at the University of Alaska – Fairbanks to study climate change effects on rural villages of Alaska, with a particular focus on the implications of permafrost melting. The research will require spending considerable time in villages and using qualitative and quantitative methods to examine the social-ecological dynamics. For more information contact Dr. Gary Kofinas at [ffgpk@uaf.edu](mailto:ffgpk@uaf.edu).

*The partners in this collaborative effort are Equal Opportunity/Affirmative Action Employers. Applications from women and people from diverse racial, ethnic, and cultural backgrounds are encouraged.*



*A failure feature in the Western Brooks Range, Alaska, 2006.*