



University of Saskatchewan

*M.Sc. Opportunities*

## PROJECT SUMMARY

Working in partnership with Kaminak Gold Corporation (KGC) we aim to develop site-specific restoration materials and techniques for the Coffee Gold Project located 130 km south of Dawson City, Yukon. Our project will characterize the rhizosphere (i.e. soil that is influenced by roots and associated soil microorganisms) of northern native plants that are potential candidates for restoration. We will also develop site-specific materials for restoration, including examining the impact of stockpiling on a local peat soil amendment and the interactions of the peat amendment with above and belowground plant-soil systems.

Through this research we seek to understand the linkages between the composition and structure (diversity and abundance) of plant roots, soil bacteria, fungi, and archaea and critical ecosystem functions (soil nitrogen and carbon cycling and storage) as restoration proceeds. By working in collaboration with industry on an active exploration site, students will gain both an understanding of boreal ecosystem dynamics and the challenges faced by companies operating in a northern environment. Furthermore, we will continue to work closely with KGC's Environmental Monitoring team and Tr'ondëk Hwëch'in (TH) citizens to facilitate local community involvement in the on-going restoration process. Through this training, research and outreach we aim to develop innovative restoration techniques that will ensure the long-term ecosystem health of Canada's North.



## **M.Sc. Restoration of Northern Plant-Soil Systems**

The MSc student will be expected to work collaboratively with other university-based project team members and KGC in establishing and monitoring a series of revegetation trials. Various locally available soil amendments, including peat, will be assessed for suitability both in the laboratory and field. While aboveground restoration success of seeding trials and plant-soil plugs will be monitored the focus of the project will be on below-ground systems and recovery of ecosystem processes in these landscapes. Rhizosphere characterization of native boreal species suitable for restoration will be conducted in field and laboratory trials. The student will be expected to work collaboratively with the Kaminak's Environmental Monitoring team, which will include providing background project information and on-site training.

The MSc student will be supervised by Dr. Katherine Stewart at the University of Saskatchewan. The student will be expected to complete field work during the months of June - August in the Yukon. The expected starting date for this 3 year project will be May 1, 2016. The stipend for this position is \$22,695 including benefits per year for 2 years.

Interested candidates should submit a CV, three references and unofficial transcripts to Dr. Katherine Stewart ([katherine.stewart@usask.ca](mailto:katherine.stewart@usask.ca)). For more information please contact Dr. Stewart.

## **M.Sc. Boreal Rhizosphere Dynamics in Peat-Amended Soils**

The MSc student will have the opportunity to conduct field and laboratory studies aimed to evaluate the effectiveness of using on-site peat amendments to restore belowground ecosystem processes in mechanically disturbed soils in subalpine and alpine ecotypes. The student will establish field trials at these sites in the Yukon in close collaboration with other members of the U of S research team and local KGC employees and TH community members. The student will also conduct greenhouse trials to take a focused examination of the mechanisms driving rhizosphere processes in native plant species amended with peat materials. This will involve using <sup>13</sup>C-stable isotope labelling and laboratory techniques in soil biogeochemistry and microbiology.

Qualifications: The student must have a BSc in Environmental Science, Renewable Resource Management, Soil Science, Biochemistry, Microbiology or related disciplines. Students wishing to learn and combine strong laboratory skills with a desire to be outdoors and gain on-site field experience are strongly encouraged to apply.

The MSc student will be supervised by Dr. Melissa Arcand at the University of Saskatchewan. The student will be expected to complete field work during the months of June-August in the Yukon. Greenhouse studies, laboratory analyses, and course requirements will be completed in the Department of Soil Science at the University of Saskatchewan. The expected starting date for this 3 year project will be May 1, 2016. The stipend for this position is \$22,695 including benefits per year for 2 years.

Interested candidates should submit a CV, three references and unofficial transcripts to Dr. Melissa Arcand ([melissa.arcand@usask.ca](mailto:melissa.arcand@usask.ca)). For more information please contact Dr. Arcand.