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Two PhD opportunities:

Quantifying carbon-wildlife ecosystem service bundles where Ontario's James Bay Lowlands meet the Boreal Shield

Frances Stewart (Wilfrid Laurier University) & **Catherine Dieleman** (University of Guelph)

We invite applications for two PhD positions that will advance our understanding of boreal wildlife-habitat relationships. This work will focus on an ecologically important region of growing industrial development interest in Northern Ontario, Canada.

The goals of this project are to build on co-located sampling of peatland carbon stores, vegetation community composition, and wildlife populations to quantify spatial associations among these measures. Wildlife and vegetation data collection has begun, with future field work focusing on co-located carbon sampling, with some flexibility. This multi-agency collaboration will provide important baseline data while asking questions regarding the drivers of wildlife-habitat relationships and ecosystem processes within a remote landscape and prior to anticipated disturbance (natural and anthropogenic).

The successful candidates will benefit from the scientific input of an advisory committee composed of wildlife, vegetation, peatland, and systems researchers from governments, eNGO, and academic partners. Both positions are fully funded for 4 years of full-time work and provide scope for interest driven and interdisciplinary questions.

PhD 1: Soil and vegetation position in the NorthCore (Dieleman) lab
Linkages between vegetation community assemblages and below-ground carbon stock size in Ontario's Far North.

- Assess the current state of knowledge on carbon and vegetation community structure across Ontario's Far North to identify spatial gaps in ongoing research and prioritize future data collection.
- Opportunities to help organize, lead, and participate in highly remote helicopter-based fieldwork to collect primary soil and vegetation data.
- Lead data analysis to identify spatial drivers of organic carbon stocks and their stability in regions of Ontario's Far North.
- Conduct laboratory incubations to quantify the vulnerability of peatland carbon stocks to cumulative disturbances.

Remuneration: A minimum stipend of $28k/year plus support for external funding opportunities, workshops, conferences, and travel.

PhD 2: Wildlife position in the WILD (Stewart) lab
Quantifying, and integrating, spatial predictors of wildlife abundance and diversity in Ontario's Far North.

- Assess the current state of knowledge on the relative abundance and diversity of mammal occurrence across Northern Ontario.
- Consolidate, summarize, and map the distribution of wildlife species from existing camera trap photos, quantifying species occurrence, abundance, and diversity from an existing camera trapping array.
- Lead data analysis to generate multivariate spatial models of relationships among carbon stocks, vegetation (see PhD1) and wildlife occurrences.
- Produce maps and predicted changes in wildlife-carbon abundance.

Remuneration: A minimum stipend of $28k/year plus support for external funding opportunities, workshops, conferences, and travel.

The ideal candidates should have a MSc in a relevant discipline (e.g. ecology, forestry, environmental science, computer science) and an understanding of northern boreal ecology. The candidates should possess aptitude and enthusiasm for applied quantitative ecology, critical thinking, independent research, and writing. Field experience in remote settings is an asset.

Start dates: PhD 1 will start in January 2024, and PhD 2 in either January or May 2024.

How to Apply:
Please submit a single PDF that includes:
(i) a cover letter highlighting relevant experience and your interest in the position;
(ii) a curriculum vitae with names and contact information for two referees;
(iii) your unofficial academic transcript.

Email Vegetation position inquiries to Catherine Dieleman (cdielema@uoguelph.ca), and Wildlife position inquiries to Frances Stewart (fstewart@wlu.ca), with the subject line "Northern Ontario PhD application". Applications are due September 30th, 2023.

Diversity and Inclusion:
The impact of leaves (e.g. parental leave, extended leaves due to illness, etc.) will be carefully considered when reviewing candidates' eligibility and record of research achievement. Candidates are encouraged to explain in their cover letter how career interruptions may have impacted them. Diversity and creating a culture of inclusion is a key pillar of both Wilfrid Laurier University and the University of Guelph's Strategic Academic Plans. Both universities are committed to increasing the diversity of students and postdocs and welcomes applications from candidates who identify as Indigenous, racialized, having disabilities, and from persons of any sexual identities and gender identities. Indigenous candidates who would like to learn more about equity and inclusive programming are welcomed to contact the Office of Indigenous Initiatives at mireland@wlu.ca at Laurier and indigenous@uoguelph.ca at Guelph . Candidates from other equity seeking groups who would like to learn more about equity and inclusive programming are welcomed to contact Equity and Accessibility at equity@wlu.ca at Laurier and Diversity and Human Rights at dhrinfo@uoguelph.ca at Guelph.

References:
Environment Canada. 2011. Scientific Assessment to Inform the Identification of Critical Habitat for Woodland Caribou (Rangifer tarandus caribou), Boreal Population, in Canada:2011 Update. Page 102 pp. plus appendices. Ottawa, Ontario.

Dyson, M.E., S. Endicott, C. Simpkins, J.W. Turner, S. Avery-Gomm, C.A. Johnson, M. Leblond, E.W. Neilson, R.S. Rempel, P. Wiebe, J.L. Baltzer, F.E.C. Stewart, J. Hughes. Existing caribou habitat and demographic models need improvement for Ring of Fire impact assessment: A roadmap for improving the usefulness, transparency, and availability of models for conservation. In review. https://www.biorxiv.org/content/10.1101/2022.06.01.494350v1

Lucet, V., S. McFarlane, J. Baltzer, C. A. Johnson, M. Leblonde, E. Neilson, P. Wiebe, F.E.C. Stewart, J. Hughes. 2023. *Using camera traps and computer vision to quantify wildlife diversity and co-occurrence across Ontario's Far North.* The Ontario Chapter of The Wildlife Society, Peterborough, Ontario. March 24th – 26th.
https://drive.google.com/file/d/1GOpPPCzf-iE0AFq7NnUICSgr6nzURcAe/view?usp=sharing