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Canadian Forest Service | Service canadien des forêts
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Nov 10, 2010

Norwegian Institute for Air Research
Cathrine Lund Myhre
Department of Atmospheric and Climate Research
P.O. Box 100
N-2027 KJELLER

Dear Catherine,

Partnership in the project THAW: "Trends and Hazards in Arctic Warming: Climate change and greenhouse gas emissions from Arctic permafrost regions"

Thank you for the invitation to participate as a partner in the proposed project THAW coordinated by Norwegian Institute for Air Research. I gladly accept this invitation and I am looking forward to collaboration.

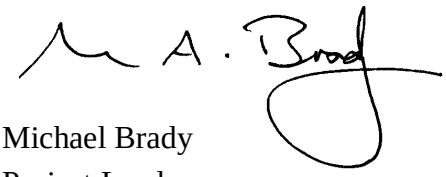
The Canadian Forest Service (CFS), Natural Resources Canada is the country's premier agency for forest information and research. A key objective of our research programs is to characterize northern forests and how they are changing, and to explain why these changes are occurring. As part of the International Polar Year (IPY) research program, in 2006 we commenced a study to improve our understanding of the potential impacts of recent climate change, as well as anthropogenic and natural disturbances, on the total C storage and source-sink relationships of forest and peat ecosystems of the Mackenzie Valley in Northwestern Canada. Because of the vast carbon (C) reserves present in peatlands, thawing of peatland permafrost can potentially mobilize this C, leading to enhanced emissions of greenhouse gasses (GHGs) to the atmosphere, substantially augmenting the global atmospheric C cycle. The study is linked nationally to IPY Climate Change Impacts on Canadian Arctic Tundra Ecosystems Project, and internationally to the Global Carbon Project (GCP), the International Permafrost Association's Soil Carbon Project (CAPP) and The North American Carbon Budget and Implications for the Global Carbon Cycle Project (SOCCR).

The study documents local C cycling processes and GHG emissions as associated with vegetation, soil and permafrost environments along a climatic gradient from the Isolated Patches Permafrost Zone, in northern Alberta, to the Continuous Permafrost Zone at Inuvik, NWT. In order to understand variation in vegetation, soils, and permafrost, an extensive network of 26 sites was established over the summers of 2007 and 2008, with four of these sites intensively monitored, from 2007 to the present, for C cycling and GHG exchange (attachment 1). Each NWT site encompasses a gradient from upland to peatland, including areas of permafrost-affected peatlands (peat plateau), areas of permafrost thaw within the peat plateau matrix (collapse scars), and nearby forests occurring on mineral soils (upland forests). The northern Alberta site is entirely permafrost free, containing peatland plots in a bog, an internal lawn (area of permafrost thaw within an unfrozen bog matrix), and an adjacent upland forest. Preliminary results of the study suggest that climate warming, causing permafrost thaw and an increase in collapse scar areas, will result in drastic

vegetation change. Additionally, GHG emissions of CO_2 and CH_4 from soil are likely to increase under a warming climate with changing hydrology and enhanced active layers. Further modeling work will extrapolate these results to a landscape scale with changes in plant communities and permafrost zones, and hence our interest in partnership with the THAW project.

We confirm that we will participate as a partner in the THAW project without being a contractor. Our participation will involve provision of vegetation, soils, GHG emissions and permafrost thermal data and expertise, with respect to northern Canadian forest and peatlands conditions. I wish you success with your application and look forward to contributing to this project.

Best regards,



Michael Brady
Project Leader

Cc Jagtar Bhatti, CFS

Attachment

Attachment 1: Locations of extensive and intensive study sites established in 2007 and 2008 relative to permafrost zones, major lakes and rivers, as well as key communities along the Mackenzie River Valley, NWT, Canada.