

Thawing permafrost increases fertility in subarctic peatlands

June 19 2012

(Phys.org) -- A group of ecologists from Umea University's Climate Impact Research Centre (CIRC) and VU University Amsterdam have shown that thawing permafrost increases fertility in subarctic peatlands in northern Sweden. This increased fertility may have impacts on plant productivity and species composition. These findings were recently published in the journal *Global Change Biology*.

Frida Keuper, from the Department of Ecological Science, VU University Amsterdam, The Netherlands, and co-workers compared plant-available nitrogen pools and fluxes in near-surface permafrost (0–10 cm below the thawfront) with those taken from the current-rooting-zone layer (5–15 cm depth) across five representative peatlands in subarctic Sweden.

Results consistently showed up to seven times more plant-available nitrogen in near-surface permafrost soil compared with the current-rooting-zone layer. Furthermore, a supplementary experiment showed an eightfold larger plant nitrogen uptake from permafrost soil than from other nitrogen sources, such as current-rooting-zone soil or fresh litter substrates. These results demonstrate that near-surface permafrost soil of subarctic peatlands can release a biologically relevant amount of plant-available nitrogen, which may have impacts on [plant productivity](#) and species composition.

Lead researcher Frida Keuper is now a postdoctoral researcher at Climate Impact Research Centre (CIRC), a part of the Department of

Ecology and Environmental Science, Umeå University. Ellen Dorrepaal, a research assistant at CIRC, is one of the article co-authors.

The article titled ‘A frozen feast: thawing permafrost increases plant-available nitrogen in subarctic [peatlands](#)’ is [highlighted](#) in *Nature Climate Change*.

More information: Keuper, F., van Bodegom, P. M., Dorrepaal, E., Weedon, J. T., van Hal, J., van Logtestijn, R. S. P. and Aerts, R. (2012), A frozen feast: thawing permafrost increases plant-available nitrogen in subarctic peatlands. *Global Change Biology*, 18: 1998–2007. [doi: 10.1111/j.1365-2486.2012.02663.x](#)

Provided by Umea University

Citation: Thawing permafrost increases fertility in subarctic peatlands (2012, June 19) retrieved 27 April 2024 from <https://phys.org/news/2012-06-permafrost-fertility-subarctic-peatlands.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.