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BVOC emissions from high-latitude peatlands: Isoprene and monoterpene fluxes in plant communities defined by differences in surface hydrology

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High-latitude peatlands are important sinks of CO_2 and sources of CH_4 but are among the least studied ecosystems with respect to emissions of other reduced volatile organic compounds. Our field site is a subarctic mire in northern Sweden where local differences in permafrost, and therefore surface hydrology, give rise to a distinct pattern of different plant communities. These typical surface features are not static, but could be considered to represent stages in a continuum from areas with flowing water (complete thawing in summer) to those where the watertable never is at the surface (underlain by permafrost). This gives the opportunity to get a snapshot of processes that could occur if the permafrost melts – as current consensus predicts for the Scandinavian subarctic.

Total hydrocarbon emissions (including CH_4) vary between the different plant communities and together they make a substantial contribution to the carbon balance of the mire. In the present study, we specifically investigated emission of non-methane hydrocarbons (NMHC; isoprene and monoterpenes) with two major aims. The first is, to qualitatively evaluate the composition of the NMHC emissions, and second, to investigate environmental controls on the emission of the respective compounds and how the fluxes relate to ecosystem carbon exchange. Earlier measurements have shown

that sedges common to the wetter habitats have the capacity to emit isoprene but the specific composition of emissions from the other plant communities on the mire has not been reported previously. Field measurements were conducted during the growing season 2007 and first results will be presented in this poster.