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Annual balance of CH_4 fluxes from subarctic peatland on basis of micrometeorological measurements.

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Natural wetlands in the northern hemisphere are recognized as one of the most important global sources of atmospheric methane (CH_4) and they contribute to approximately 40% of total global wetland emissions. Net emission of CH_4 from those types of ecosystems is a result of several processes including the microbial production, microbial oxidation and vascular plant associated effects such as gas transport. By taking into account that each molecule of CH_4 is 23 times more effective in absorbing heat in the atmosphere than CO_2, CH_4 is one of the most important greenhouse gases contributing to the predicted climate warming.

Among many techniques for studying land-atmosphere gaseous exchange nowadays the most direct micrometeorological method - eddy covariance (EC) technique - plays the leading role. This technique has developed fast during last decades and at the present CO_2 and H_2O fluxes are determined on a routine basic all over the word. However, there is still a limited number of well documented micrometeorological CH_4 flux measurements. In this study intensive high frequency CH_4 measurements were conducted over Stordalen mire northernmost part of sub-Arctic Sweden (68º 20' N, 19º 03' E, alt. 351 m) with special emphasis on thaw/preleaf and autumn/winter seasons. Measurements were conducted with use of cryocooled fast infra red (IR) gas analyser - Tunable Diode Laser Trace Gas Detector (TDL) Aerodyne Research, Inc. The collected data were used to calculate an annual budget of CH_4 fluxes over the area considered. This will be compared with corresponding CO_2 flux measurements to obtain a full budget for exchanges of radiative active trace gases between this mire

and the atmosphere.

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