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Preliminary results of long-term methane exchange measurements at SMEAR II

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Mineral soils in the boreal region are currently an important sink for atmospheric methane (CH_4). As methanotrophy is dependent on oxygen availability, projected changes in weather patterns, such as more rain during summertime, can affect soil aeration and hence the sink strength. In some cases, boreal forest soils have also been observed to act as a strong source of CH_4 during short periods of time. Long-term data sets of CH_4 exchange combined with a wide variety of measurements of meteorological and soil conditions, such as precipitation, soil moisture, temperature and irradiation, offer an opportunity to estimate the effects of changing climate on the soil CH_4 sink.

Here we present preliminary results of 9 years (2006–2015) of forest floor CH_4 exchange measurements from a pine-dominated upland forest at Hyytiälä SMEAR II station in the mid-boreal region where a wide variety of supporting observations are available. Our results indicate a persistent and potentially slowly increasing small sink for CH_4 over the 9 years. In the presentation we will show links between the observed meteorological conditions and the magnitude of the sink.