



Ecosystem scale methane emission from a boreal fen measured by eddy covariance method

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Northern wetlands are important for the global climate system not only because they store vast amounts of carbon, but also because they emit high amounts of methane into the atmosphere. However, continuous long term measurements of methane emissions from these ecosystems are sparse. We have conducted measurements of methane emissions from a boreal wetland ecosystem by eddy covariance technique since 2005. These continuous measurements enable us to study the methane emission dynamics in different timescales from changes occurring in hourly timescales via seasonal cycles to interannual variations. The measurement site, Siikaneva, is a minerotrophic fen located in Southern Finland. First results show that methane emission is important not only to the radiative forcing caused by the gas exchange between the fen and the atmosphere, but also to the carbon balance of the fen. The snow free period contributes most to the annual emission, but there is also detectable emission during winter. There is an emission pulse during the snow melting period, but this is of minor importance. Of the environmental parameters, peat temperature correlates best with the methane emission while water table depth may have a more complex influence, which will be discussed. The measurements will be continued for the foreseeable future as a part of ICOS project.