Geophysical Research Abstracts
Vol. 17, EGU2015-4170-1, 2015
EGU General Assembly 2015

Sensitivity of the boreal forest-mire ecotone CO$_2$, CH$_4$, and N$_2$O global warming potential to rainy and dry weather

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In a mosaic of well drained forests and poorly drained mires of boreal landscape the weather events such as drought and rainy control greenhouse gas dynamics and ecosystem global warming potential (GWP). In forest-mire ecotone especially in ecosystems where CO_2 sink is nearly balanced with CO_2 source, it's fairly unknown whether the net warming effect of emissions of gases with strong radiative forcing (CH_4 and N_2O) could offset the net cooling effect of CO_2 sequestration.
We compared the net ecosystem CO_2 exchange (NEE) estimated from the carbon sequestrations of forest stands and forest floor CO_2 fluxes against CH_4 and N_2O fluxes of nine forest/mire site types along the soil moisture gradient in Finland. The ground water of nine sites changed between 10 m in upland forests and 0.1 m in mires, and weather during three years ranged between exceptionally wet and dry for the local climate.
The NEE of upland forests was typically a sink of CO_2, regardless the weather. Though, xeric pine forest was estimated to be a source of CO_2 during wet and intermediate year and became a weak sink only in dry year. The NEE of forest-mire transitions ranged between a sink in dry year, while increased stand carbon sequestration could offset the reduced forest floor CO_2 emission, and a source in wet year. The NEE of two sparsely forested mires strongly differed. The lawn type mire was balanced around zero and the hummock type mire was relatively strong NEE sink, regardless the weather. Generally, nearly zero N_2O emission could not offset the cooling effect of net CH_4 sink and net CO_2 sink of upland forest and forest-mire transitions. However in sparsely forested mires, with N_2O emission also nearly zero, the CH_4 emission during wet and intermediate year played important role in turning the net cooling effect of NEE into a net warming. When evaluating GWP of boreal landscapes, undisturbed forest-mire transitions should be regarded as net cooling ecosystems instead of hotspots of net warming.