

# Atmosphere-soil-stream greenhouse gas fluxes from peatlands

Kerry Dinsmore, Mike Billett and Ute Skiba

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*Centre for Ecology and Hydrology (Edinburgh), Bush Estate, Penicuik, Midlothian EH26 0QB*  
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The project aims to produce a complete inventory of greenhouse gas fluxes and emissions from a Scottish peatland. Carbon dioxide, methane and nitrous oxide emissions from the land surface (soil and vegetation) to the atmosphere, losses to streamwater and degassing will all be considered. The study is carried out at Auchencorth Moss, Midlothian, with intensive monitoring and measurements being made over a 2-year period, starting March 2006. The site consists of a patchwork of different vegetation communities including areas dominated by *Calluna* or *Juncus*, grassy hummocks and hollows and a narrow riparian zone again dominated by *Juncus*. GHG flux measurements will be made using chambers covering each vegetation type allowing for both a comparison between vegetation types and the subsequent scaling up to catchment level emissions. A flux tower on site provides further data on CO<sub>2</sub> net exchange. In addition the concentrations of GHG in the soil are measured using gas permeable tubing. Other land based measurements will include water table depth, soil moisture, soil temperature and soil NO<sub>3</sub>, NH<sub>4</sub> and DOC content. A datalogger is in place adjacent to the stream allowing for almost continuous measurements of stream temperature, conductivity and height; this data along with regular measurements of stream solute and dissolved gas concentrations will be used to estimate both stream gaseous emissions and lateral outputs. Routine measurements of carbon (DOC, DIC, POC, CO<sub>2</sub> and CH<sub>4</sub>) and nitrogen (NO<sub>3</sub>, NH<sub>4</sub>, DON, N<sub>2</sub>O) will also be made along the stream length to measure spatial variability.

An introduction to the project will be presented.