



## **Methane fluxes on pristine, drained and restored boreal spruce swamps**

Markku Koskinen (1), Kari Minkkinen (1), Mika Nieminen (2), Liisa Maanavilja (1), and Eeva-Stiina Tuittila (3)

(1) University of Helsinki, Department of Forest sciences, Finland (@helsinki.fi), (2) Finnish Forest Research Institute, Vantaa, Finland (@metla.fi), (3) University of Eastern Finland, School of Forest sciences, Joensuu, Finland (@uef.fi)

Successful restoration of peatlands drained for forestry means that all the processes of pristine mires are present in the restored peatlands. Methanogen communities are usually disturbed by the lowering of water table by drainage and previous studies have found only slow recovery of methane emissions on restored peatlands.

We made methane flux measurements on pristine, drained and restored conditions boreal spruce swamps. Restoration measures had taken place approximately 10 years before our measurement campaign. The measurement plots on the drained and restored sites included drainage ditches and the disturbed soil beside the ditch as well as the undisturbed mid-strip area. Water table was measured from wells near the flux measurement plots. Seven sites were sampled twice per month for one growing season with eight sampling plots grouped in four locations per site in total. The locations were placed on a line perpendicular to the mire edge on the pristine sites and a drainage ditch on the drained and restored sites.

The highest mean water level was recorded on the restored sites, and the lowest on the drained sites.

The restored sites showed high fluxes from all measurement plots. The fluxes from the pristine and drained sites were much smaller and did not differ significantly from each other. The highest fluxes were measured from the drainage ditches on both the drained and restored sites. The pristine sites showed high relative spatio-temporal variation in the flux, partly explained by changes in the water table level. No effect of measurement plot distance from the mire edge was discernible on the pristine sites.