

Greenhouse gas balances in low-productive drained boreal peatlands – is climate-friendly management possible?

Paavo Ojanen (1), Kari Minkkinen (2), Tiina Heikkinen (2), and Timo Penttilä (1)

(1) Natural Resources Institute Finland, Vantaa, Finland (paavo.ojanen@helsinki.fi), (2) Department of Forest Sciences, University of Helsinki, Finland

Five million hectares of peatland has been drained for forestry in Finland. About 20% of that, i.e. one million hectares, has been estimated to be so low-productive that the profitability of keeping them in forestry is questionable. At the same time, drainage has introduced changes in the ecosystem functions of these peatlands, including fluxes of greenhouse gases. Options to manage such peatlands include for example 1) no measures, i.e. leaving the drained peatlands as they are 2) increasing intensity by e.g. repetitive fertilisations and 3) restoration back to functional peatlands. Here we estimate the greenhouse gas impacts of these three management options.

We collected GHG and organic carbon flux data from 50 low-productive peatlands under these management options over two years 2014-2015. Gas fluxes (CO₂, CH₄, N₂O) were measured with closed chambers. Litter production rates of different plants above and below ground were estimated using litter traps (trees), biomass sampling (roots), through-grow nets (mosses), allometric biomass models (other vasculars) and published turnover rates (roots, other vasculars). Characteristics for estimating tree stand biomass increment were measured at each site from circular sample plots.

In this presentation we will estimate the GHG impacts for the different management options, and aim to find the most climate-friendly options for the management of low-productive peatlands in the short and long term. This work was funded by Life+ LIFE12/ENV/FI/150.