



Wood ash fertilization of a forested drained bog did not affect soil CO₂ flux, but slightly increased CH₄ emissions

M. Gustafsson (1), L. Klemedtsson (1), M. Nilsson (2), U. Sikström (3)

(1) Department of Plant and Environmental Sciences, Göteborg University, Sweden, (2) Department of Forest Ecology, SLU, Sweden, (3) Skogforsk Institute, Sweden

(maria.gustafsson@botany.gu.se / Phone: +46317732614)

Two bogs in southern Sweden, drained in 1986 and 1996, respectively, were fertilized with wood ash in 2003. During the following two and a half years the soil emissions of the greenhouse gases CO₂, CH₄ and N₂O were measured using static manual chambers. At the bog drained in 1986, measurements were made at two watersheds, one treated and one untreated. On the bog drained in 1996, a replicated plot design was laid out, with four replicates and three different treatments: 4 tons/ha of wood ash, 8 tons/ha of wood ash and control. The addition of wood ash did not change the CO₂ flux from the soil at any of the sites during these first years. The CH₄ emissions showed a general tendency to be higher on the fertilized plots, and in the late summers and autumns of both 2004 and 2005 the differences were significant. N₂O fluxes were generally below the detection limit. Recalculated into CO₂ equivalents, the increased CH₄ flux is small compared to the expected accumulation of carbon in the tree biomass induced by the fertilization. At this early stage, no increase in biomass could be measured directly, but a lowered groundwater level at the fertilized plots indicates an increased growth.