

COULD CONTINUOUS-COVER FORESTRY REPRESENT PALUDICULTURE IN BOREAL PEATLAND FORESTS?

*Sakari Sarkkola, Hannu Hökkä, Raisa Mäkipää, Päivi Mäkiranta, Mika Nieminen, Meeri Pearson, Timo Penttilä, Markku Saarinen, Raija Laiho

Natural Resources Institute Finland, Finland

sakari.sarkkola@luke.fi

Drainage for forestry, agriculture and peat extraction threatens the ecosystem services that peatlands provide in their pristine state. Land management increases the radiative forcing of peatlands, as the decreases in CH₄ emissions are more than offset by the increases in CO₂ and N₂O emissions. Forestry results in less drastic changes in ecosystem greenhouse gas balance than other peatland use. For instance, in Finland, about 0.25 million hectares of drained peatland in agricultural use and 4.6 million hectares in forestry use are estimated to produce similar emissions. Soil emissions usually increase with more effective drainage, thus maintaining high water-table levels is considered the best way to protect the peat C stores. Since peatlands are in many regions important providers of livelihood, often through production of different biomasses, combining raised water-table levels with sustained sources of income is critical for successful mitigation. Different forms of paludiculture, production of crops that can be grown under high water-table levels, are gaining increasing interest. In northern Europe, e.g., Finland, Estonia and Latvia, forestry is a more important land use form of peatlands than agriculture, in contrast to the rest of Europe. Consequently, paludicultural or paludiculture-like options for peatland forests would be useful in this region. Boreal peatlands host several site types that are densely forested even without drainage. Such peatland forests could serve as a model for developing paludiculture-like management for peatland forests. In this presentation we explore the prospects for developing paludiculture-like forest management for boreal peatland forests, and the environmental benefits such management might provide. For this purpose, we first review the relationships between the tree stand and water-table level and the idea and feasibility of continuous cover forestry (CCF) as a paludiculture-like forest management in boreal peatland forests, and then present first results on the water-table levels and soil greenhouse gas exchange obtained under CCF.