

ABSTRACT NO: 302

Decomposition rates of coarse root systems
on forestry-drained peatlands

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We investigated the carbon dynamics of coarse root systems (CRS) by estimating their decomposition rates and carbon contents in different stages of decomposition in two forestry-drained peatland sites. Our aim was to study the poorly known role of CRS in the drained peatland carbon cycle. Our hypotheses were: i) the decomposition of coarse root systems is slow in peat even in drained sites, ii) coarse root systems form an important part of the whole peatland carbon pool and act as a long-term C sink after harvesting the aboveground tree biomass. Both study sites were in southern Finland: Kalevansuo is a drained nutrient poor dwarfshrub-pine bog and Lettosuo is a drained nutrient rich pine-birch fen with a spruce understorey. For decomposition dynamics of CRS we excavated Scots pine stumps and roots (diameter down to one cm) of both live trees and those of trees that had been cut earlier. We tested different biomass models against the measured CRS dry mass of the newly cut trees and then predicted the initial CRS biomass for the trees cut earlier. The old stumps were analysed with dendrochronological methods and with radiocarbon dating to determine the time of death. Mass loss was then estimated as the difference of the measured necromass of old CRS and the predicted CRS biomass of a similar live tree. Preliminary results show that the decomposition rate of coarse root systems was markedly low.