EGU21-11449
https://doi.org/10.5194/egusphere-egu21-11449
EGU General Assembly 2021

Depth-dependent decomposition of root litter in drained and rewetted fen ecosystems

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Peatlands cover only 3% of the lands surface, but store roughly a third of the global soil carbon due to inhibited decomposition rates. Over a third of the peatland area in Europe are fens, in which the peat is primarily formed by roots and rhizomes of vascular plants. These fens have been subjected to widespread drainage and conversion into agricultural areas. As a result, they continuously emit large amount of greenhouse gases. One strategy of mitigating the emissions, and ideally restoring the original sink function, is to rewet fen peatlands. However, it remains uncertain how rewetting changes decomposition rates compared to the drained state, and what the underlying biogeochemical processes and organic matter transformations during litter decomposition and peat formation are. We here present decomposition rates of root material in different depth, over 6 months, a year, and two years in different drained and rewetted fen ecosystems (percolation fen, coastal fen, alder forest). In addition to mass loss, we also assessed the composition of carbon compounds over time.