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# Differences in redox potential in peatlands under different drainage regimes

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Reduction-oxidation (redox) reactions are central to the adsorption and release of carbon and nutrients in all soils. Different electron acceptors are used by microbes to gain energy according to their availability and ease of use. The presence and status of different electron acceptors and donors affects the availability of electrons in the soil. The redox conditions in soils can be described by the electric potential compared to a standard hydrogen electrode.

Recent developments in measurement methods have enabled continuous field measurements of redox potential. As redox reactions are key to carbon dioxide ($CO_2$) and methane ($CH_4$) emissions and the release of phosphorus (P) and dissolved organic carbon (DOC) from peat soils, the redox state of peatlands could be used to improve models that predict the functioning of these ecosystems under different water table regimes.

We present results from a redox measurement campaign of two years at the Lakkasuo mire in southern Finland. The measurements were conducted at a mesotrophic site with three different drainage regimes: pristine, short-term drainage and long-term drainage. At the site, also WTL, rainfall, air and soil temperature and other environmental variables are measured.

Initial analysis shows that short- and long term drainage results in a more stable redox regime in the surface layer (5 cm depth) and that long-term drainage results in a higher redox potential at 15 cm depth. In the pristime state, conditions are highly reducing most of the time already at 15 cm depth.