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Interpreting carbon loss from surface recession in peatland gully systems

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Erosion has the potential to shift peatland systems from a carbon sink to a carbon source. Typically eroded systems are densely gullied with considerable bare peat exposed on gully walls. Rates of recession of bare peat are effectively monitored using erosion pins and with knowledge of peat density and carbon content are simply interpreted as a carbon loss from the peatland. It has been recognised (Francis 1990; Evans et al 2006) that these losses have two components; erosional (water and wind erosion) and oxidation losses or 'peat wastage'. However there is no good data on the partitioning of surface loss between these mechanisms. This paper presents a 10 year record of surface recession from gullies in an eroding peat system in the southern Pennines, U.K. The relative importance of erosion and oxidation within the carbon budget are assessed with reference to 2 years of soil CO2 flux data from adjacent sites and existing organic sediment budgets for the catchment.