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Monitoring carbon export from upland peat catchments in the North Pennines, UK.

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It is estimated that globally, peatlands contain up to one third of the total terrestrial carbon pool. Given that peatlands are such a significant carbon store, it is important to determine whether they are net sinks or sources of C and how this may change in response to changes in climate and rising atmospheric CO_2. The terrestrial-riverine carbon flux is the largest net export pathway for carbon from peatland systems. Recent work shows that in response to climate and land use change this flux pathway is likely to offer an increasingly significant contribution to the sink-source function of peatlands. Currently the mechanisms that control the mobilisation and release of organic carbon from the terrestrial environment to watercourses are poorly understood. This research attempts to improve the understanding of the physical and biological controls on organic carbon release from upland peat catchments. In particular, the impact of peat erosion and the exposure of bare peat surfaces on these fluxes, given the increased likelihood of changing peat stability in response to climate and land use change.

Measurements of dissolved (DOC) and particulate organic carbon (POC) in stream water draining upland blanket peat catchments are presented. Data covers a six-month continuous monitoring period (July-December 2005) consisting of daily point samples. Early results show that DOC flux is considerably larger in magnitude than POC flux. DOC concentrations in stream water also follow a strongly seasonal pattern, evident in both stable and eroding peat catchments. In addition, over shorter event based time-scales, both DOC and POC concentration increase in response to the occurrence of precipitation events. In terms of the influence of peat erosion, the magnitude of POC export from the eroded sub-catchment is larger in comparison to the stable sub-catchment.