

Impacts of drain blocking on the aquatic carbon export from a UK peatland

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Drainage ditches, which have historically been used across UK peatlands, provide a rapid pathway for carbon export between terrestrial and aquatic systems, potentially reducing or reversing the net uptake of carbon by peatlands. Currently, considerable investment is being made in Scotland to restore drained peatlands with the aim of raising water tables, restoring active vegetation cover, enhancing carbon uptake and reducing carbon losses via the aquatic pathway. However, monitoring of restoration and its impact is often restricted by a lack of pre-restoration data and typically does not cover the full range of fluvial carbon species.

Drain blocking was carried out in March 2015 at the Auchencorth Moss peatland, SE Scotland, which has an extensive record of fluvial carbon measurements (from 2007 to present day). This study combines an intensive 12 month field monitoring campaign, during and after drain blocking works, with the long-term record to investigate the impacts of drain blocking on the dissolved and gaseous carbon export via the aquatic pathway.

Post-restoration, concentrations and fluxes of all stream water dissolved and gaseous carbon species were in the range of values measured over the period 2007 to present; with no significant change in the 12 months post-restoration. The results from this study indicate that the drain blocking works did not have a significant impact on the concentration or speciation of carbon exported via the aquatic pathway which can be attributed to the largely overgrown nature of the drains and the large inter- and intra-annual variability in the system. This study raises questions on the suitability of some peatlands for drain blocking and the pre- and post-restoration monitoring required to accurately assess the impacts of peatland restoration activities.