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Black carbon in UK upland peat soils: a consequence of management fire?

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Peatlands are very sensitive environments for both their role as a carbon sink and their vulnerability to fire. Although they represent a large area, there is currently a lack of knowledge on black carbon (BC) stocks and fate in these environments. British Uplands have been managed by fire for centuries. This practice is still currently used, although burning frequencies are very low (around 15 years).

This research concentrates on the effects of vegetation fires on peat soils. We seek to investigate (1) the BC content in peat soils in British Upland environments as a consequence of fire used as a management practice, (2) the fate of BC in peat soils.

The work was carried out in the *Peak District National Park* (UK). The area is mainly characterised by low vegetation (e.g. *Calluna vulgaris, Sphagnum* spp.) and blanket peat soils of about 2 m deep. Samples were taken at 0-2.5 cm and 2.5-5 cm depth intervals from three different plots: (A) a plot burned the day previous to sampling, (B) a plot burned 5 years prior sampling and (C) a plot unburned for 20 years. Soil samples were incubated for 10 weeks with various proportions of charcoal artificially produced from heather plants (burnt at 350˚C for 1 h). The soil was not ground prior to incubation in order to mimic field conditions. Samples were kept at 25ºC and 70% of the water holding capacity. Black carbon quantification on field and incubation samples is currently done using the benzene polycarboxylic acids (BPCAs) as markers for BC (Brodowski *et al*., 2005). The results presented here give some information on what can be expected in peat soils that are managed by fire.

0.0.1 References

Brodowski, S, Rodionov, A., Haumaier, L., Glaser, B. & Amelung, W. 2005. Revised black carbon assessment using benzene polycarboxylic acids. *Organic Geochemistry* 36:1299-1310.