Geophysical Research Abstracts
Vol. 15, EGU2013-5388-2, 2013
EGU General Assembly 2013

The effects of ecological restoration, on soil-pore water quality and DOC concentrations, on a British upland blanket bog.

Suzane Qassim (1), Simon Dixon (1), James Rowson (2), Fred Worrall (1), and Martin Evans (3)

(1) Durham University, Earth sciences, Durham, United Kingdom (s.m.qassim@durham.ac.uk), (2) Edge Hill University, Department of Geography and Geology, Ormskirk, United Kingdom, (3) University of Manchester, School of Environment and Development, Manchester, United Kingdom

Polluted by past atmospheric deposition, eroded and burnt, the Bleaklow plateau (Peak district National Park, UK) has long been degraded. Peatlands are important carbon reservoirs and can act as sources or sinks of carbon. Dissolved organic carbon (DOC) is carbon lost from peatlands via the fluvial pathway and as the major component of water colour it is costly to remove during water treatment processes. The Bleaklow Summit peatlands, were subjected to a large wildfire in 2003 devegetating 5.5km2. This fire prompted stakeholders to initiate a large-scale programme of restoration of the plateau.

This study considered restoration techniques across four sites: all four sites were seeded with lawn grass, limed and fertilised; to raise the pH and allow establishment of vegetation. In addition to these interventions, one site also had a mulch of Calluna vulgaris applied to the surface to allow soil stabilisation and promote vegetation establishment and another site had biodegradable geojute textile mesh installed, to stabilize the steep gully surfaces. Another site had a gully block installed, to reduce peat desiccation and erosion. This study will compare the four restored sites to two types of comparators: bare soil sites where no restoration was undertaken and a naturally vegetated site unaffected by the 2003 wildfire. Each site had six replicate dipwells, installed in two groups of three. The depth to the water table was monitored and soil water samples collected for analysis, monthly for 5 years, from Nov 2006 – Jan 2012. No significant difference in DOC concentration was found between control and treated sites. There was, however, a significant difference in DOC composition between sites and over the 5 year period of monitoring. UV-vis absorbance of the samples is used to quantify the fulvic to humic components of DOC. The vegetated control was not significantly different to the bare sites; however the vegetated control had a significantly greater humic fraction of than the seeded, limed and fertilised only site, as well as the seeded, limed, C. vulgaris mulched site. This is possibly related to vegetation and litter layer establishment. A suite of water quality data (conductivity, pH and cation data) are now being analysed in combination with DOC to increase understanding of the relationship between bare site re-vegetation and DOC compositional change.