Geophysical Research Abstracts
Vol. 16, EGU2014-5598, 2014
EGU General Assembly 2014

Validating a topographically driven model of peatland water table: Implications for understanding land cover controls on water table.

Martin Evans (1), Tim Allott (1), Fred Worrall (2), James Rowson (3), and Rachael Maskill (4)

(1) Upland Environments Research Unit, School of Environment, Education and Development, University of Manchester, Oxford Road, Manchester, M13 9PL, United Kingdom martin.evans@manchester.ac.uk, (2) Department of Earth Sciences, University of Durham, DH1 3LE fred.worrall@durham.ac.uk, (3) Department of Geography, Edge Hill University, L39 4QP rowsonj@edgehill.ac.uk, (4) Moors for the Future, Peak District National Park Authority, DE 45 1AE. rachael.maskill@peakdistrict.gov.uk

Water table is arguably the dominant control on biogeochemical cycling in peatland systems. Local water tables are controlled by peat surface water balance and lateral transfer of water driven by slope can be a significant component of this balance. In particular, blanket peatlands typically have relatively high surface slope compared to other peatland types so that there is the potential for water table to be significantly contolled by topographic context. UK blanket peatlands are also significantly eroded so that there is the potential for additional topographic drainage of the peatland surface. This paper presents a topographically driven model of blanket peat water table. An initial model presented in Allott et al. (2009) has been refined and tested against further water table data collected across the Bleaklow and Kinderscout plateaux of the English Peak District. The water table model quantifies the impact of peat erosion on water table throughout this dramatically dissected landscape demonstrating that almost 50% of the landscape has suffered significant water table drawdown. The model calibrates the impact of slope and degree of dissection on local water tables but does not incorporate any effects of surface cover on water table conditions. Consequently significant outliers in the test data are potentially indicative of important impacts of surface cover on water table conditions. In the test data presented here sites associated with regular moorland burning are significant outliers. The data currently available do not allow us to draw conclusions around the impact of land cover but they indicate an important potential application of the validated model in controlling for topographic position in further testing of the impact of land cover on peatland water tables.

Allott, T.E.H. & Evans, M.G., Lindsay, J.B., Agnew, C.T., Freer, J.E., Jones, A. & Parnell, M. Water tables in Peak District blanket peatlands. Moors for the Future Report No. 17. Moors for the Future Partnership, Edale, 47pp.