Geophysical Research Abstracts
Vol. 16, EGU2014-4001, 2014
EGU General Assembly 2014

The effect of drain blocking on dissolved organic carbon under the peak flow conditions

zhuoli zhang
United Kingdom (zhuoli.zhang@dur.ac.uk)

There are numerous studies that have shown increasing dissolved organic carbon (DOC) concentration down stream of upland peat catchments (eg. Worrall et al., 2007; Clark et al., 2007; Gibson et al., 200). In the UK, upland peat soils are both an important water source and an important carbon store, therefore, the transportation of DOC from soil to the aquatic system remains a critical part of the impact that upland peat environments have on wider society. The majority of the DOC is delivered from the peat soil during the peak flow events (Clark et al., 2008), however, most of the storm events analysis has been developed for organo-mineral soil rather than for peat soil catchments.
Worrall et al., (2007) suggested that drain blocking as a potential method for controlling DOC release from peat soil. An events analysis was conducted on the drain blocking data collected from 2008 to 2010 from Cronkley Fell (UK National grid reference NY 83800 26996). A total of 756 peak flow events were chosen to access the impact of drain blocking on DOC concentration and flux during the events. The data was analysed by the combination of principal components analysis (PCA) and end member mixing analysis (EMMA). The results showed that during the peak flow events, the effects of drain blocking was minimised by the rapid flushing of the event water: the DOC concentration on storm events increased after blocking rather than decreased; DOC flux did decrease after blocking but rather as a result of the increased volume of the event water.

Worrall, F., Armstrong, A., Holden, J., 2007. Short term impact of peat drain blocking on water color, dissolved organic carbon concentration and water table depth. Journal of Hydrology 337,315-325
Clark, J.M., Lane, S.N., Chapman, P.J., Adamson, J.K., 2007. Export of dissolved organic carbon from an upland peat during storm events: Implication for flux estimates. Journal of Hydrology 347, 438-447.
Aitkenhead, J.A., McDowell, W. H., 2000. Soil C: N ratio as a predictor of annual riverine DOC flux at ;ocal and global scale. Global biogeochemical Cycles 14 (1), 127-138.
Clark, J.M., Lane, S.N., Chapman, P.J., Adamson, J.K., 2008. Link between DOC in near surface peat and stream water in an up land catchment. Sci Total Environ 404 (2-3): 308-315