Geophysical Research Abstracts,
Vol. 10, EGU2008-A-09005, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-09005
EGU General Assembly 2008

Effects of rain episodes on the quality and quantity of dissolved organic matter (DOM) in streamwater from a blanket peat in Wales

K. Austnes (1), C.D. Evans (2), P. Naden (3) and G. Old (3)

(1) Department of Plant and Environmental Sciences, Norwegian University of Life Sciences, Norway, (2) Centre for Ecology and Hydrology Bangor, Environment Centre Wales, UK, (3) Centre for Ecology and Hydrology Wallingford, UK (kari.austnes@umb.no / Fax: +47 64965601 / Phone: +47 64965576)

Episodes of heavy rainfall have a strong impact on hydrological pathways in peat soils, which may affect the transport of dissolved organic matter (DOM) from soils to streams. The impact of rain episodes is important in a climate change perspective, as increased frequency of such episodes is predicted in many regions of northern Europe, including the UK.

High frequency water sampling was conducted in a peat stream (Afon Ddu) in north Wales during three autumn rain episodes. The samples were analysed for pH, conductivity, dissolved organic carbon (DOC) and nitrogen (DON), NO_3-N, NH_4-N, UV/VIS-absorbance and fluorescence. The results showed a marked increase in DOC during the episodes, with a much less clear trend for DON. The increased DOC can be related to a change of flow paths, with increased sub-surface flow through upper parts of the peat. pH decreased in response to the increased discharge. This may reflect a dilution of the far less acidic base flow, and probably more importantly the increased DOC concentration.

The sUVa levels (absorbance at 254 nm/DOC concentration) decreased markedly during the episodes. This indicates that the released material is less aromatic, more bioavailable and of lower molecular weight. In combination with an increase in DOC/DON this indicates that the DOM released during episodes can be less pro-

cessed humic material. Fluorescence scanning data will also be discussed to evaluate changes in the quality of DOM in more detail.

The episode studies revealed a strong delay in the peat hydrology. The decrease in DOC concentration was much slower than the decrease in discharge. Likewise, the decrease in pH at peak discharge was abrupt, while the subsequent increase was slow. Thus, rain episodes have a marked impact on quantity and quality of DOM transported from the soil to the stream, and the effect lasts for far longer than the rain event itself.