Geophysical Research Abstracts
Vol. 14, EGU2012-4175, 2012
EGU General Assembly 2012

Variability in the concentration and character of blanket bog pore water dissolved organic carbon

A. Armstrong (1), S. Waldron (1), N. Ostle (2), and J. Whitaker (2)

(1) School of Geographical and Earth Sciences, University of Glasgow, Glasgow, United Kingdom (alona.armstrong@glasgow.ac.uk), (2) Centre of Ecology and Hydrology, Lancaster, United Kingdom

Rising dissolved organic carbon (DOC) concentrations in surface waters have prompted much research to elucidate the cause(s). Given that increases in DOC concentrations, [DOC], may indicate a destabalisation of carbon stores, increase water treatment costs and affect rates of primary production and respiration in aquatic ecosystems, identifying the causes of the increase is important. The majority of studies measure [DOC] but rarely is DOC composition considered contemporaneously - yet this important as it potentially indicates provenance, reprocessing and fate. Moreover, surface water samples are usually collected at a low spatial density within a catchment. For one year we have sampled pore water from 48 piezometers and 48 tension samplers across a 12 km2 area of a Scottish blanket bog hosting a wind farm. The sampling sites are divided into four sites along a hypothesized wind farm-induced microclimatic gradient. At each site twelve sampling plots were established, four each in areas dominated by mosses, sedges and shrubs. From each plot samples were collected from piezometers and tension samplers, representing free-flowing pore water and that held under tension respectively. Dissolved organic carbon concentration and absorbance (190 to 1100 nm), were measured for each sample. Ratios, established to indicate DOC character, were calculated from the absorbance data. We found [DOC] ranged from 2-197 mg l-1 and was significantly associated with sampling location, time of year and the interaction between site and time of year, but not with plant functional type. The water held under tension had a significantly higher [DOC] compared with the free-flowing pore water sampled from the same plot. Preliminary data analysis also indicates variations in the DOC character between sites and with time. These results demonstrate the variable nature of DOC production which is partially obscured when sampling at a catchment scale but needs to be better understood to further understanding of trends in [DOC].