



Enhancing Water Quality

What's controlling the release of dissolved organic carbon to streams?

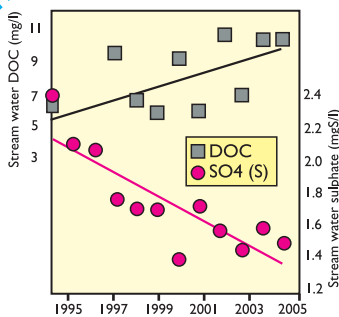
Marc Stutter, David Lumsdon, Martyn Futter and Simon Langan
email: m.stutter@macaulay.ac.uk The Macaulay Institute, Aberdeen



Why is this of concern?

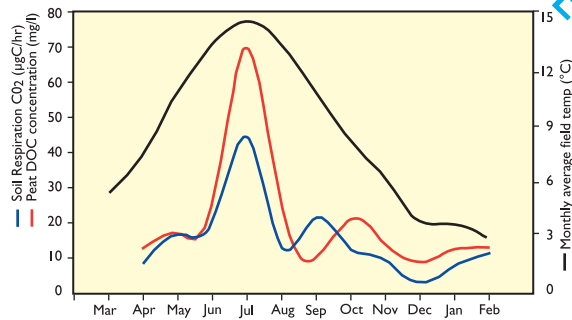
Recent increases in amounts of natural **dissolved organic carbon (DOC)** in surface waters in Scandinavia, central Europe, UK and northeast USA are affecting aquatic biota, associated with contaminant transport and challenging the water treatment industry. In Scotland 83% of drinking water comes from surface waters where contact with soils increases DOC contents and colouration. In 2005 86% of complaints to Scottish Water concerned water colouration.

MONITORING

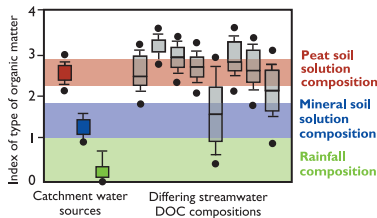


Rising **DOC** concentrations in streamwaters are accompanying declining atmospheric acid inputs. How are they linked?

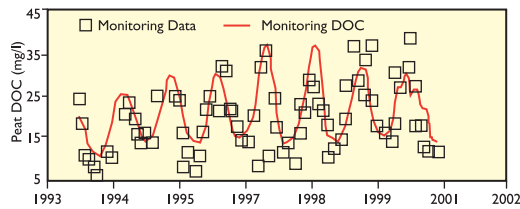
EXPERIMENTS



Temperature drives microbial activity leading to **DOC** and CO₂ release from peat soils. How may climate change affect these seasonal cycles?



DOC properties vary spatially between streams as water flowpaths interact with different soil layers. Will changing patterns of rainfall alter this hydrological control?



We use process – based modelling to increase our understanding of the mechanisms, leading to better predictive capabilities and consideration of options to manage **DOC**.

MODELLING

Looking to the future

A combined monitoring, experimental (field and laboratory) and modelling framework provides a comprehensive methodology to better understand this complex environmental problem and aid predictions under changing environmental conditions.

COMMISSIONED BY



SCOTTISH EXECUTIVE

PARTNER INSTITUTE



research today for land use tomorrow