



Has the composition of fluvial DOC changed? Spatio-temporal patterns in the DOC-colour relationship

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Long term increases in dissolved organic carbon (DOC) concentration and are now a commonly reported phenomenon across the Northern Hemisphere. Hypotheses proposed to explain the observed increases have implications for changes in DOC composition as well as concentration. This study examines the records of colour and DOC from the UK's Harmonised Monitoring Scheme database from 1974 to 2005 and covers 70 rivers over that period. The records were rarely continuous and so in order to assess the controls and the trends over time, the whole dataset was examined. The analysis showed that there was a significant trend over time in the composition of the DOC as measured by the colour:DOC ratio but that this declined to a minimum from 1974 to 1989 and has since risen but not returned to 1974 levels. These changes are not explained by variation in flow or by changes in DOC concentrations at the individual sampling sites. The colour:DOC comparison shows that all data can be separated between two independent components – a “light” and a “dark” component, but variations in these components are driven by increases in DOC concentration and cannot explain the trend in the colour-DOC ratio. A change in the DOC-colour ratio that is independent of DOC and flow that reaches a minimum in 1989 could be explained by changes in soil source water chemistry.