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Controls on release of DOC from UK peatlands.

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The rise in DOC concentrations in the Northern Hemisphere in recent decades has been taken as indicative of increased turnover of terrestrial carbon and in particular in the vital reserve of peat. Hypotheses for this rise have been hotly debated in the literature. This study proposes that, although trends in concentration have been the main focus of attention, it is trends in DOC flux that need to be examined to understand changes in terrestrial carbon storage. This study uses data from 208 rivers over the period 1975-2003 to calculate the trend of DOC flux from Great Britain. The calculated long-term flux record clearly shows two step changes subsequent to the two most severe droughts during the study period. There is no linear change in flux over the study period which is inconsistent with explanations based upon other linear drivers, i.e. atmospheric CO_2 and air temperature. There are gradual decreases in flux between these step changes which are inconsistent with control by atmospheric deposition. The spatial distribution of trend in flux also discounts changes in land use, atmospheric deposition, atmospheric CO_2 and air temperature. The trend is only consistent with severe drought being the major control on DOC release.