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Title: Cycling of peat carbon during estuarine mixing: A Geochemical and I study

Abstract:

OA4 (Biogeochemical Cycling in Estuarine and Coastal Waters) Sessi Rising temperatures and changing rainfall pattern threaten northern b peat, which globally contains 20% of the total soil carbon storage of X1018 g C (Tranvik and Jansson, 2002). The documented increase in carbon in aquatic systems draining peatlands indicate enhance releas carbon from peats (Freeman e al., 2001). The fate of this carbon both particulate and dissolved forms remains uncertain. The efficiency of p carbon cycling in riverine and estuarine systems would ultimately det the proportions of this carbon pool that is oxidized released to the atmosphere as CO2, buried in inland and margin sediments or added large pool of dissolved organic carbon in the ocean. In this study, we evaluate the cycling of peat carbon in estuaries of rivers (Tweed, Tyne Etive) draining peatlands in Northern England and Scotland. We docu the dynamics of peat carbon in dissolved (DOC, DIC) and particulate during estuarine mixing. Stable carbon and nitrogen isotope and elem ratios (d13C, d 15N, C/N, Δ 14C) used to delineate the provenance of organic matter in these pools. Our results suggest large seasonal vari in input of organic carbon into the estuaries with large river flow in w increasing the peat derived carbon loads. Similarly, the fluxes of POC the estuaries into the sea is also increased during high river flow conc This is attributed to the break down of the turbidity maximum, which an important role in increasing the resident time and remineralization organic matter with in these estuaries. This view is supported by Δ 14 changes of the POC indicating that a younger component of the POC preferentially degraded in the turbidity maximum. In contrast, the DC behaves more conservatively during estuarine mixing. References: Fr C, Evans, C.D., Freeman, C., Montieth, D. T (2001) Export of organic from peat soils, Nature, 412, 785 Tranvik, L.J. and Jansson, M. (2002 Terrestrial export of organic carbon, Nature, 415, 861-862.

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