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From field to stream: Tracing streambed organic carbon origins at a catchment scale

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Quantifying organic carbon (OC) levels and the processes altering them is key in unlocking soils potential as a mediator of climate change through sequestration of atmospheric CO_2. In areas of high soil erosion increased fluxes of OC across the terrestrial-aquatic interface are likely and understanding these fluxes is crucial in integrating lateral OC fluxes within the carbon cycle. For this study of a small UK catchment, OC mapping and Revised Universal Soil Loss Equation (RUSLE) based erosion modelling provided estimates of proportional soil OC loss coming from each land use. Sediment fingerprinting using *n*-alkane biomarkers and a Bayesian unmixing model provided a comparison of streambed OC proportions by land use to assess which processes were dominating OC input to streams. Results showed that RUSLE-based soil OC loss proportions exhibited disconnect with sediment fingerprinting OC composition and the river corridor and riparian environment were key zones in regulating terrestrial to aquatic fluxes of OC.