



DOC cycling in a temperate estuary: A mass balance approach using natural ^{14}C and ^{13}C isotopes

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ABSTRACT: We measured dissolved organic carbon (DOC), dissolved inorganic carbon (DIC), and their corresponding $\delta^{14}\text{C}$ and $\delta^{13}\text{C}$ values in order to study the sources and fates of DOC in the York River Estuary (Virginia, U.S.A.). The $\delta^{14}\text{C}$ and $\delta^{13}\text{C}$ values of DOC and DIC at the freshwater end-member indicate that during periods of moderate to high flow, riverine DOC entering the York was composed of decadal-aged terrestrially organic matter. In nearly all cases, DOC concentrations exceeded conservative mixing lines and were therefore indicative of a net DOC input flux from within the estuary that averaged $1.2 \text{ mM L}^{-1} \text{ d}^{-1}$.

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