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

Raymond, Peter A., James E. Bauer

Limnol. Oceanogr., 46(3), 2001, 655-667 | DOI: 10.4319/lo.2001.46.3.0655

ABSTRACT: We measured dissolved organic carbon (DOC), dissolved inorganic carbon (DIC), and their corresponding del^{14}C and del^{13}C values in order to study the sources and fates of DOC in the York River Estuary (Virginia, U.S.A.). The del^{14}C and del^{13}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 mM L^{-1} d^{-1}.