

Benthic fluxes of total dissolved amino acids to the ocean: Results from the East/Japan Sea

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We measured the distributions of total dissolved amino acids (TDAAs) in the water column and sediment porewater of the East/Japan Sea. In general, the distribution patterns of TDAAs were similar to those in the global oceans, with relatively higher concentrations in the surface and benthic boundary layers of the ocean. The concentrations of L- and D-amino acids (L- and D-AAs) were 46- and 31-fold greater in porewater than in the overlying water column, respectively. Similarly higher values of C-normalized TDAAs (TDAA-C%), aspartic acid/ β -Alanine (Asx/ β -Ala), and reactivity index (RI) were observed in the surface and benthic boundary layers, indicating that dissolved organic matter (DOM) in both layers is fresh and largely bioavailable. The benthic fluxes of L- and D-AAs across the sediment-water interface were calculated to be 64 ± 36 and 13 ± 5 $\mu\text{mol m}^{-2} \text{d}^{-1}$, respectively, which was about 3-fold greater than the downward fluxes from the euphotic zone. Our results suggest that the benthic flux of DOM from organic-rich bottom sediments supplies a significant amount of bioavailable TDAAs to the water column.