

Source identification of natural dissolved organic matter by multi-isotope analysis

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Multiple environmental drivers and ecological processes contribute to habitat degradation and fish declines in rivers and estuaries. And while the main focus of habitat remediation studies is usually nutrient loading, the concentrations of N in dissolved and particulate organic matter (DOM & POM) are often higher than nutrient concentrations, and bioavailable C concentrations in DOM and POM pools may be similar. Hence, DOM may be an important but largely overlooked source of energy supplying estuary heterotrophic demand and thus affecting local foodwebs. Multi-isotopic analysis of POM has proved to be a useful tool for investigating organic matter sources and biogeochemical processes in many complex aquatic ecosystems. However, companion multi-isotope investigations of DOM have been limited due to measurement complexities.

To facilitate combined DOM and POM investigations in aquatic ecosystems, we have modified an existing DOM method [1] to develop protocols for the speedy extraction and elution of DOM from sub-liter water samples using pre-packed C18 resin columns, and the analysis of the resulting dried DOM for stable C, N and S isotopes simultaneously. Initial results indicate minimal and correctable isotope fractionation during elution. We have tested this protocol with samples collected from San Francisco Bay and local freshwater ponds. This work was supported by the Indo-US Science and Technology Forum, India.

[1] Louchouart *et al* (2000) *Anal. Chem.* **72**, 2780-2787