Tracking long term reactivity of dissolved organic carbon exported from terrestrial to aquatic systems

Panneer Selvam, Balathandayuthabani; Karlsson, Jan; Berggren, Martin

2014

Panneer Selvam B (oral), J Karlsson and M Berggren. 2014. Tracking long term reactivity of dissolved organic carbon exported from terrestrial to aquatic systems. *AGU/ASLO 2014 Ocean Sciences Meeting*, presented on February 23-28, 2014, in Honolulu, Hawaii, USA

ABSTRACT

Terrestrial export of dissolved organic carbon (DOC) is one of the major sources of organic carbon to coastal marine ecosystems. It is often assumed that much of the reactive DOC is being lost during transit from freshwaters to sea, due to bacterial and photochemical degradation, but the magnitude of this decrease is largely unknown. We assessed bio- and photo-reactivity of DOC as functions of natural water residence times within a river catchment, and as functions of artificial water residence times during long-term (365 d) laboratory degradation experiments; in both cases we found strong indications of decreasing bio-reactivity of the DOC. The photochemical reactivity, on the other hand, only decreased slightly and the percentage of DOC that was photo-reactive actually increased with increases in the residence time of the water, even in the 365 d incubation experiment. This pattern was further coupled to increases in $SUVA_{254}$ values. Our findings suggest that in river systems which have a water residence time in the order of a year, most of the bio-reactive DOC is degraded whereas photo-reactive DOC eventually reaches the sea.