ASLO, New Orleans, LA. February 2013.

Spencer, R. G. M.

The Utility of CDOM for Improving Land to Ocean Terrigenous Dissolved Organic Carbon Fluxes

One major historical limitation to geochemical studies assessing land to ocean fluxes of dissolved organic matter (DOM) has been the issue of both temporal and spatial scaling. Examples will be presented highlighting how chromophoric dissolved organic matter (CDOM) measurements can be utilized as proxies for more intensive and expensive analytical analyses (e.g. molecular-level organic biomarkers). Utilizing these refined CDOM loads for terrigenous biomarkers results in improved temporal resolution and significant change in flux estimates. Examining CDOM and dissolved organic carbon (DOC) flux data from an assortment of terrestrial biomes we establish a robust relationship between CDOM and DOC loads. The application of this relationship allows future studies to derive DOC loads from CDOM utilizing emerging in-situ or remote sensing technologies and thus refine river-to-ocean DOC fluxes, as well as exploit historic imagery to examine how fluxes may have changed. Calculated CDOM yields from a range of rivers are correlated to watershed percent wetland and highlight the importance of certain regions with respect to CDOM flux to the coastal ocean. This approach indicates that future studies might predict CDOM and DOC yields for different watershed types that could then be readily converted to loads providing for the estimation of CDOM and DOC export from ungauged watersheds. Examination of CDOM yields also highlights important geographical regions for future study with respect to the role of terrigenous CDOM in ocean color budgets and CDOM's role in biogeochemical processes.