



FALL 2013 SEMINAR SERIES

DEPARTMENT OF OCEAN, EARTH, AND ATMOSPHERIC SCIENCES
3PM – ROOM 200 IN THE OCEANOGRAPHY/PHYSICS BUILDING
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“WHAT HAPPENS TO THE TERRESTRIAL DISSOLVED ORGANIC MATTER AS IT MOVES TO THE OPEN OCEAN?”

Hussain Abdulla

Old Dominion University

ABSTRACT

Despite the fact that the global annual discharge of riverine dissolved organic carbon (tDOC) could sustain the amount of DOC in the marine pool, evidence from carbon isotopes, elemental analysis and molecular biomarkers shows that only a small portion of identifiable terrestrial dissolved organic matter (tDOM) reaches the open ocean. The fate of tDOM as it moves to open ocean has been the focus of many studies over the last three decades; most of these studies focused on three major removal processes (photochemical mineralization, microbial oxidation and mixing-induced flocculation). The combination of these removal processes appears to be far from closing the gap between the riverine fluxes of tDOM and the amount of tDOM detected in the open ocean; the latter appears to account for less than 2.5% of total DOM in open ocean. This leads to hypothesize that either a significant component of tDOM is escaping the detection windows of the tDOM tracers that have been used to date (forgotten components) and/or there are other important unexplored processes responsible for removing a significant portion of tDOM before it reaches the open ocean. In this talk, I will explore these two possibilities by taking a closer look at the fate of terrestrial polycarboxylic compounds as a forgotten terrestrial component and the photo-flocculation as a significant sinking process for terrestrial dissolved organic matter. Geochemical implications of these two observations will be discussed.

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