Dissolved organic matter composition reflects ecosystem productivity

Yuan Shen

Marine Science Program, University of South Carolina, Columbia, SC 29208 USA

Abstract:

Dissolved organic matter (DOM) in the ocean stores nearly as much carbon (~700×10¹⁵ g) as the atmosphere. The imbalance between its production and remineralization influences carbon sequestration and thereby the global carbon cycle. The fate of DOM is largely controlled by the composition and biological availability of DOM, which is not apparent from the bulk DOM concentrations. The bioavailability of DOM is commonly determined by labor-intensive bioassay experiments. Alternatively, molecular analyses of specific biochemical components of DOM (e.g., amino acids and neutral sugars) can provide qualitative and quantitative insights about the bioavailability of DOM. This approach allows for studies with much broader spatial and temporal coverage and therefore provides great potential to investigate the dynamics of DOM in response to ecosystem and climate changes. In this talk, I will present data from the Arctic Ocean, a vulnerable system affected by the changing climate, to illustrate the linkages between ecosystem productivity, bioavailability of DOM, and shelf-basin interaction.