



The surface Arctic Ocean: A dynamic reservoir of terrigenous dissolved organic carbon

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The upper mixed layer of the Arctic Ocean is a globally important sink for dissolved organic matter mobilized from adjacent continents, which in turn are subject to substantial changes with warming of the Arctic system. Understanding the dynamics and fate of this terrigenous material has become critical for our understanding the contributions of the Arctic to the global carbon cycle. Terrigenous dissolved organic carbon (tDOC) had long been viewed as highly conserved within the Arctic Ocean, yet only a fraction of that entering from the rivers survived for export to the North Atlantic. Extensive surveys of tDOC and other tracers between the shelves and the waters overlying the deep basins indicate that a large fraction of the tDOC is subject to slow mineralization. The extent of removal within the Arctic system depends then on the time scale for water mass retention; the longer the retention, the greater the remineralization within the Arctic. Remineralization of tDOC adds to the inorganic carbon inventory and seawater $p\text{CO}_2$, thus impacting exchange of CO_2 with the atmosphere. This talk will begin with a global view of marine dissolved organic carbon (DOC), from which the context for tDOC in the Arctic Ocean will be established. The surface Arctic Ocean distribution of tDOC will be presented, along with consideration of its dynamics and export to the North Atlantic.