THE CYCLING OF OCEAN CARBON THROUGH DISSOLVED ORGANIC MATTER

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Marine dissolved organic matter (DOM), holding 660 Pg of carbon or 200 times the amount of carbon residing as biomass in the ocean, has been targeted in our efforts to understand the global ocean carbon cycle. Attention toward the pool increased 2 decades ago, and has included both global ocean surveys and studies of processes controlling its dynamics. The marine analog to soil organic matter, it is produced by photoautotrophs in the surface ocean and includes fractions with very long lifetimes (centennial to millennial). The DOM that resists microbial consumption while at the surface is transported across ocean basins with surface currents, whereupon it is exported to great ocean depths with the deep overturning circulation. Once at depth, removal is slow and likely due to both biotic and abiotic processes. In this presentation the production and fate of DOM will be considered in the context of the ocean carbon cycle. Evolving features and directions of study will be highlighted.