

EASTERN MICHIGAN UNIVERSITY

Chemistry Department

Seminar by Prof. Rose Cory,

University of Michigan Department of Earth and Environmental Sciences

Monday, Jan. 27th 4:00-5:00 pm Science Complex 156

Dissolved organic matter degradation and chemical composition: implications for carbon cycling

All water on Earth contains thousands of naturally occurring dissolved organic molecules (DOM) from the breakdown of once-living organic matter. DOM is a critical intermediate in the global carbon cycle because one fate is its conversion to greenhouse gases such as CO₂ and CH₄. In surface or subsurface waters, conversion of DOM to greenhouse gases occurs on a continuum of timescales from seconds to thousands of years, depending on its chemical composition. Using a range of analytical tools and techniques, we relate the chemical composition of DOM to its conversion to greenhouse gases by biological, chemical, and photochemical processes. Much of our work is conducted in the Arctic where tremendous stores of organic carbon frozen in permafrost soils have the potential to double the amount of carbon in the atmosphere on a timescale similar to human inputs because as soils warm and thaw the DOM they contain is susceptible to conversion to CO₂.



Arctic lake (near Toolik Field Station) impacted by a thermokarst failure on shore adding sediment and DOM to the lake ("glacial flour" blue color compared to surrounding undisturbed lakes).