



Understanding dissolved organic matter reactivity in a global context: tribute to Dr. George Aiken's many contributions

Diane McKnight

University of Colorado, INSTAAR, Boulder, Colorado, United States (diane.mcknight@colorado.edu)

As Dr. George Aiken emphasized throughout his distinguished research career, the diversity of sources of dissolved organic material (DOM) is associated with a diversity of dissolved organic compounds with a range of chemistries and reactivities that are present in the natural environment. From a limnological perspective, dissolved organic matter (DOM) can originate from allochthonous sources on the landscape which drains into a lake, river, wetland, coastal region, or other aquatic ecosystem, or from autochthonous sources within the given aquatic ecosystem. In many landscapes, the precursor organic materials that contribute to the DOM of the associated aquatic ecosystem can be derived from diverse sources, e.g. terrestrial plants, plant litter, organic material in different soil horizons, and the products of microbial growth and decay. Yet, through his focus on the underlying chemical processes a clear, chemically robust foundation for understanding DOM reactivity has emerged from Aiken's research. These processes include the enhancement in solubility due to ionized carboxylic acid functional groups and the reactions of organic sulfur groups with mercury. This approach has advanced understand of carbon cycling in the lakes of the Mars-like barren landscapes of the McMurdo Dry Valleys in Antarctica and the rivers draining the warming tundra of the Arctic.