



Characterizing the quality of DOM with spectroscopic approaches to monitor response to climate change

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Dissolved organic material (DOM) is a major pool of organic carbon in aquatic ecosystems, representing a substrate for microbial growth and regulating light penetration in lakes and streams and the bioavailability of trace metals and organic contaminants. In lakes and streams, DOM can originate from the surrounding watershed (allochthonous sources) and from production and decomposition of DOM within the aquatic ecosystem (autochthonous sources). One important step towards understanding the biogeochemical processes controlling DOM reactivity is increasing the application of advanced analytical methods for chemical characterization of DOM. Towards this goal, we compared the chemical properties of DOM samples collected by scientists from the LTER participating in a workshop based on spectroscopic and elemental analyses. The dataset includes results from 140 samples representing the full diversity of DOM sources and aquatic and soil environments. The results show that substantial variations on DOM properties occur across the terrestrial- aquatic continuum, and the extent of these variations can be quantified using methods that can be incorporated into monitoring studies. These methods have the potential to provide greater understanding of changes in DOM associated with climate and land use change.