

Summertime in the Rocky Mountains: A Biogeochemical Perspective on Climate Change and Water Quality.

In the Rocky Mountains, changes in the duration and intensity of summertime conditions are drivers for current substantial changes in biogeochemistry of terrestrial and aquatic ecosystems that are influencing water quality. Approaching questions of aquatic biogeochemistry from the perspective of “hotspots” and/or “hot moments” allows for integration of these results within the broad concepts of aquatic ecosystem function and responses to climate change. One example is the role of sunlight in determining the structure of lake and stream ecosystems, not only by controlling photosynthesis, but also by driving diverse biogeochemical and photochemical processes. Further, photochemical processes in receiving streams can chemically transform nutrients, dissolved organic material and many trace constituents. Incorporating these dynamic processes into monitoring approaches may be useful in understanding the climate-driven changes in water quality. Examples will be presented of changes in water quality involving increasing concentrations of dissolved organic material in lakes and trace metals in streams draining mineralized watersheds.