

Effects of wildfire on source-water quality and aquatic ecosystems, Colorado Front Range

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Abstract Watershed erosion can dramatically increase after wildfire, but limited research has evaluated the corresponding influence on source-water quality. This study evaluated the effects of the Fourmile Canyon wildfire (Colorado Front Range, USA) on source-water quality and aquatic ecosystems using high-frequency sampling. Dissolved organic carbon (DOC) and nutrient loads in stream water were evaluated for a one-year period during different types of runoff events, including spring snowmelt, and both frontal and summer convective storms. DOC export from the burned watershed did not increase relative to the unburned watershed during spring snowmelt, but substantial increases in DOC export were observed during summer convective storms. Elevated nutrient export from the burned watershed was observed during spring snowmelt and summer convective storms, which increased the primary productivity of stream biofilms. Wildfire effects on source-water quality were shown to be substantial following high-intensity storms, with the potential to affect drinking-water treatment processes.

Key words wildfire; Colorado Front Range; source-water quality; dissolved organic carbon; sediment; stream biofilms
