



## **Pyrogenic Carbon redistribution from hillslopes to stream corridors following a large montane wildfire**

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Pyrogenic Carbon (PyC) is a ubiquitous, important and often neglected form of organic carbon, which forms from incomplete combustion of biomass during fire. Following the large High Park wildfire in the Cache la Poudre watershed of the Rocky Mountains (CO, USA), we tracked PyC from the litter layer and soil, through eroded, suspended, and dissolved sediments to alluvial deposits along river sides. Additionally, we separated deposited sediment in a high- and a low-density fraction to identify preferential forms of PyC later transport, and used  $^{14}\text{C}$  dating to estimate the age of alluvial deposits. A few months after the fire, PyC had yet to move vertically into the mineral soil and remained in the organic layer or had been transported off site by rainfall driven overland flow. During major storm events PyC was associated with suspended sediments in the water column, and later identified in low-density riverbank deposits. Flows from an unusually long-duration and high magnitude rain storm either removed or buried the riverbank sediments approximately one year after their deposition. Buried alluvial deposits contained significant amounts of PyC, dating back over a thousand years. We conclude that PyC redistributes after wildfire in patterns that are consistent with erosion and deposition of low-density sediments. A more complete understanding of PyC dynamics requires attention to the interaction of post-fire precipitation patterns and geomorphological features that control surface erosion and deposition throughout the watershed.