

Application of sediment tracers to discriminate sediment sources following wildfire

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Abstract Wildfire can cause the main sources of fine sediment transported within burned basins to change. Sediment tracing techniques offer an approach to quantify this sediment source response to burning. In this paper, we review the application of various sediment tracers to discriminate sediment sources following wildfire. This includes studies examining changes in fallout radionuclide, geochemical and mineral magnetic properties of burned soil to identify possible fire-related effects on tracer properties and behaviour. Previous work suggests that fallout radionuclides (^{137}Cs , excess ^{210}Pb , ^7Be , $^{239,240}\text{Pu}$) may provide the most effective tracers for post-fire sediment source and budgeting studies. Other tracer properties seem to be overly susceptible to burn effects and might provide a less consistent basis for post-fire source discrimination. The final selection of tracer properties for use in sediment tracing applications should reflect the likely controls of individual tracer concentrations in different sources and their potential response to burning.

Key words wildfire; sediment tracing; sediment sources; fallout radionuclides; river basins