

CAN NEW TRACING TECHNOLOGIES UNLOCK THE MYSTERIES OF SEDIMENT TRANSPORT?

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The last decade has seen the increasing development of new technologies for tracing the movement of sediment across landscapes. These new tracers allow us to tag soil particles using a chemical marker or introduce particles to the soil that mimic its behaviour. Once applied to the soil the particles can be recovered from the landscape or fluvial system and the concentration of tagged particles present quantified. Therefore there is the potential to use different tracers or different 'species' of the same tracer to collect data on temporal and spatial patterns of soil redistribution on hillsides and sediment delivery to fluvial systems, with a better resolving power than existing tracers, such as Cs137. Such data could help us in many ways, for example: improving our process understanding of soil erosion processes; understanding rates deposition and their links to biogeochemical cycling; providing spatial data for the validation of erosion models; and getting a better understanding of sediment residence times in catchments. In this paper I will address whether the potential of tag and trace technologies to unlock some of the mysteries of sediment transport can be fulfilled and present a vision for the future development and application of these new additions to the erosion scientist's toolbox.