

Publication

A Review of the Radionuclide, Cobalt-60, as a Fine-Sediment Tracer

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The chapter firstly outlines the global crisis concerning accelerated soil erosion, the implications that this could have on longer-term food security and ways that soil loss has been quantified originally through catchment-scale monitoring but with a recent shift toward the use of sediment tracers. It then briefly reviews some of the most commonly used tracers in sedimentation studies, before focusing on artificial, gamma-emitting radionuclides, and in particular, on Cobalt-60 (Co-60). Some historical background information on previous uses of Co-60 are then provided, and the suite of key environmental characteristics that, from the perspective of studies in hydrology and geomorphology, make Co-60 a potentially attractive candidate for fine-sediment tracing. The chapter then outlines and reviews three ways in which Co-60 has been experimentally applied in varying erosion and sedimentation scenarios where most of the more commonly used tracers would be unsuitable or would lack the level of sensitivity needed to return meaningful data. It then outlines some of the notable drawbacks associated with using Co-60, before highlighting refinements and prospects for future work. The chapter finally concludes by evaluating the versatility and efficacy of Co-60 as a fine-sediment tracer.

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