



Exploring the potential for using artificial radionuclides to assess the selective erosion of sediment particles and soil organic matter

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This communication presents the preliminary results of experimental work to assess the potential for using the artificial gamma-emitting radionuclides, Caesium-134 (134Cs) and Cobalt-60 (60Co), to simulate the particle-size selective sediment redistribution, and hence, of soil organic carbon, on a range of different cultivated hillslope soils from southern England. The concentration of artificial radionuclides and soil organic matter (SOM) in sediment are both subject to a differentiation as a consequence of selective detachment and depositional processes caused by surface-runoff during erosion events on hillslope environments. Unlike soil organic matter, the radionuclides Cs and Co remain stable in sediment, i.e. they remain attached to particles and are not subject to mineralization during transport or after deposition. A priori reasoning suggests, therefore, that artificial radionuclides represent a faithful analogue that can be effectively used to study the movement of particulate soil organic matter through a range of mobilization and transport processes.