

Further investigation of the relationship between ^{137}Cs and $^{210}\text{Pb}_{\text{ex}}$ flux and sediment output from two small experimental catchments in Calabria, southern Italy

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Abstract Information on rates of soil loss and associated rates of soil redistribution are seen as an important requirement for effective environmental management. The use of the fallout radionuclides caesium-137 (^{137}Cs) and excess lead-210 ($^{210}\text{Pb}_{\text{ex}}$) to document rates of soil and sediment redistribution in the landscape has attracted increasing attention in recent years. A detailed investigation of sediment and sediment-associated ^{137}Cs and $^{210}\text{Pb}_{\text{ex}}$ fluxes has been initiated in two experimental catchments (approx. 1.5 ha in size) located in southern Italy. For both catchments, information on the sediment and radionuclide fluxes associated with 50 individual storm events has been assembled for the period 2005–2011. This measurement programme has identified a number of differences in the erosional response on the two catchments and provides a useful demonstration of the further potential for using ^{137}Cs and $^{210}\text{Pb}_{\text{ex}}$ measurements to shed light on the internal functioning of a catchment, in terms of sediment mobilization and delivery.

Key words caesium-137; lead-210; soil erosion; suspended sediment; sediment dynamics, sediment delivery, Italy