



Cesium-137 – Its applications for understanding soil redistribution and deposition patterns on the landscape

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In the 1960s research began on the application of fallout radionuclides to determine sediment deposition and soil redistribution rates and patterns in agricultural and natural ecosystems. This research was based on the use of fallout Cesium-137 (Cs-137) from nuclear weapon tests deposited worldwide during the 1950's and 1960's. Once Cs-137 reaches the soil surface, it is strongly and quickly adsorbed on soil particles and is essentially nonexchangeable. Thus the movement of Cs-137 across the landscape is associated with the physical processes of soil movement (i.e., water, wind, tillage erosion) making it an effective tracer of the movement and redeposition of soil particles. Over the past 40 years, research has shown that Cs-137 can be used effectively and efficiently to estimate soil erosion rates, soil deposition rates, and potential sediment sources to providing site specific information on soil redistribution rates and patterns. This paper provides examples of the unique capability of the Cs-137 methodology for understanding soil movement rates and patterns, sediment sources, and sediment deposition rates on the landscape to assist in developing management plans to conserve our agricultural and natural resources.