

Sediment Fingerprinting in the Southern Piedmont

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Fingerprinting suspended sediment was used to determine the source of high stream sediment concentrations in a typical southern Piedmont watershed. Nuclear fallout radionuclide ^{137}Cs and three other tracers were used to determine the relative contribution of banks vs. upland sources. Tracer concentrations were determined in potential sediment sources and suspended sediment samples collected from the stream and analyzed using mixing models. Results indicated that about 60-65% of the sediment originated from eroding stream banks, 27-29% from upland subsurface sources such as construction sites and unpaved roads and about 8-11% from pastures. This is the first study that has found a way to distinguish bank sediment from construction/unpaved road sources. The results may be applicable to other watersheds in the Piedmont depending on the extent of urbanization occurring in these watersheds. Better understanding on the sources of fine sediment has practical implications on the type of sediment control measures to be adopted. Investment of resources in improving water quality should consider the contribution of bank erosion and unpaved roads/construction sites to water quality impairment.

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