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A Spatially Distributed Event- Based Model to Predict Sediment Yield

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Abstract

A study has been conducted in three sub-watersheds to model the spatial distribution of runoff and sediment yield. The basic structure of the model includes generation of runoff using SCS curve number (CN) method and soil detachment by RUSLE, MUSS and MUST equations, which is in turn delimited by Kirkby's transport capacity equation. The input parameter grids – cover, practice and soil erodibility grids were generated from satellite data with adequate field check. Routing of runoff and sediment was done in ARC/INFO's GRID module. Predicted results

were validated with field-measured values. Results show that the runoff from CN method was better estimated after accounting for depression storage. Results from two hilly watersheds show that the standard error of sediment yield prediction of RUSLE < MUSS < MUST equations. In a relatively flat watershed, sediment yields were underestimated, due to underestimation of transport capacity. Hence, there is a need to address the transport capacity in plains and moderately sloping areas.

Keywords

Runoff; sediment yield; Geographic Information System; GIS; remote sensing; watershed; event-based

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