

USDA - WATER EROSION PREDICTION PROJECT
HILLSLOPE PROFILE AND WATERSHED MODEL DOCUMENTATION

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ABSTRACT

The objective of the Water Erosion Prediction Project is to develop new generation prediction technology for use by the USDA-Natural Resources Conservation Service, USDA-Forest Service, USDI-Bureau of Land Management, and others involved in soil and water conservation and environmental planning and assessment. This improved erosion prediction technology is based on modern hydrologic and erosion science, is process-oriented, and is computer-implemented. This document is a detailed description of the WEPP erosion model as developed for application to small watersheds and hillslope profiles within those watersheds.

The WEPP erosion model is a continuous simulation computer program which predicts soil loss and sediment deposition from overland flow on hillslopes, soil loss and sediment deposition from concentrated flow in small channels, and sediment deposition in impoundments. In addition to the erosion components, it also includes a climate component which uses a stochastic generator to provide daily weather information, a hydrology component which is based on a modified Green-Ampt infiltration equation and solutions of the kinematic wave equations, a daily water balance component, a plant growth and residue decomposition component, and an irrigation component. The WEPP model computes spatial and temporal distributions of soil loss and deposition, and provides explicit estimates of when and where in a watershed or on a hillslope that erosion is occurring so that conservation measures can be selected to most effectively control soil loss and sediment yield.

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