



Runoff as a factor in USLE/RUSLE technology

Peter Kinnell

University of Canberra, Institute of Applied Ecology, School of Applied Science, Canberra, Australia
(peter.kinnell@canberra.edu.au)

Modelling erosion for prediction purposes started with the development of the Universal Soil Loss Equation the focus of which was the prediction of long term (~ 20) average annual soil loss from field sized areas. That purpose has been maintained in the subsequent revision RUSLE, the most widely used erosion prediction model in the world. The lack of ability to predict short term soil loss saw the development of so-called process based models like WEPP and EUROSEM which focussed on predicting event erosion but failed to improve the prediction of long term erosion where the RUSLE worked well. One of the features of erosion recognised in the so-called process based modes is the fact that runoff is a primary factor in rainfall erosion and some modifications of USLE/RUSLE model have been proposed have included runoff as an independent factor in determining event erosivity. However, these models have ignored fundamental mathematical rules. The USLE-M which replaces the EI_{30} index by the product of the runoff ratio and EI_{30} was developed from the concept that soil loss is the product of runoff and sediment concentration and operates in a way that obeys the mathematical rules upon which the USLE/RUSLE model was based. It accounts for event soil loss better than the EI_{30} index where runoff values are known or predicted adequately. RUSLE2 now includes a capacity to model runoff driven erosion.