Climate change and predicting soil loss from rainfall

Peter Kinnell

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

Conceptually, rainfall has a certain capacity to cause soil loss from an eroding area while soil surfaces have a certain resistance to being eroded by rainfall. The terms "rainfall erosivity' and "soil erodibility" are frequently used to encapsulate the concept and in the Revised Universal Soil Loss Equation (RUSLE), the most widely used soil loss prediction equation in the world, average annual values of the R "erosivity" factor and the K "erodibility" factor provide a basis for accounting for variation in rainfall erosion associated with geographic variations of climate and soils. In many applications of RUSLE, R and K are considered to be independent but in reality they are not. In RUSLE2, provision has been made to take account of the fact that K values determined using soil physical factors have to be adjusted for variations in climate because runoff is not directly included as a factor in determining R. Also, the USLE event erosivity index EI30 is better related to accounting for event sediment concentration than event soil loss. While the USLE-M, a modification of the USLE which includes runoff as a factor in determining the event erosivity index provides better estimates of event soil loss when event runoff is known, runoff prediction provides a challenge to modelling event soil loss as climate changes