Updating Rainfall Erosivity Map of the Mediterranean Region in Turkey by RUSLE-R and GIS

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To understand and analyze rainfall variability is a need for evaluating the erosive potential of rainfall in terms of space and time. In this study of revising rainfall erosivity index by RUSLE-R equation and recent data set, we focus in particular on the semi-arid areas of the Mediterranean Region, Turkey, where soil erosion is one of the major threats to soil and water resources and where soil erosion is as acute as or more severe than those in other Mediterranean countries. The primary data set included electronically stored daily rainfall records of the Turkish State Meteorological Service for the years from 1993 to 2004 at the 38 climate stations located in the Mediterranean Region. After analyzing the time-depth records of each independent erosive rainfall, RUSLE-R was calculated as the product of average rainfall energy and a 30-min maximum intensity of rainfall. Point RUSLE-R values as long-term averages obtained for each climate station were interpolated using tri-variate functions of longitude, latitude, and elevation to have a map. Summarily, by integrating Digital Elevation Model (DEM) of the region and Geographic Information Systems (GIS), the rainfall erosivity map of the Mediterranean Region in Turkey was updated. Doubtlessly, this study would provide data not only for climate studies but also opportunities for integration of climate data with properties of soil, topography and land use to understand complicated hydrologic processes at watershed and regional scales and would be effectively employed to take soil and water conservation measures.

Key words: rainfall erosivity index, RUSLE prediction technology, soil erosion, GIS.