Sediment yield assessment at basin scale using geospatial technique

Abstract

Soil erosion and sediment yield from catchments are key limitations to achieving sustainable land use and maintaining water quality in nature. One of the important aspects in protecting the watershed is evaluation of sediment produced by statistical methods. Controlling sediment loading in protecting the watershed requires knowledge of soil erosion and sedimentation. Sediment yield is usually not available as a direct measurement but is estimated using geospatial models. One of the geospatial models for estimating sediment yield at the basin scale is sediment delivery ratio (SDR). The present study investigates the spatial SDR model in determining the sediment yield rate considering climate and physical factors of basin in geographic information system environment. This new approach was developed and tested on the Amammeh catchments in Iran. The validation of the model was evaluated using the Nash Sutcliffe efficiency coefficient. The developed model is not only conceptually easy and well suited to the local data needs but also requires less parameter, which offers less uncertainty in its application while meeting the intended purpose. The model is developed based on local data. The results predict strong variations in SDR from 0 in to 70 % in the uplands of the Basin.