

Calculation of Sediment yield at the S 7-4 catchment of the Shirindareh Watershed of Iran using the River Basins model

Velibor Spalevic (1), Goran Barovic (2), Dusko Vujacic (3), Dragica Mijanovic (4), Milic Curovic (5), Vjekoslav Tanaskovic (6), and Morteza Behzadfar (7)

(1) Department of Geography, Faculty of Philosophy, University of Montenegro, Montenegro (velibor.spalevic@gmail.com), (2) Department of Geography, Faculty of Philosophy, University of Montenegro, Montenegro (geografija@t-com.me), (3) Department of Geography, Faculty of Philosophy, University of Montenegro, Montenegro (dule.v@t-com.me), (4) Department of Geography, Faculty of Philosophy, University of Montenegro, Montenegro (mdragica@t-com.me), (5) Forestry Department, University of Montenegro, Montenegro (curovic@t-com.me), (6) University St. Cyril and Methodius, Faculty of Agricultural Sciences and Food, Skopje, Macedonia (vjekoslavtanaskovic@yahoo.com), (7) Natural Resources and Watershed Management Office, North Khorasan, Iran (mbehzadfar@gmail.com)

Soil erosion is driven by complex processes involving detachment of material caused by raindrops and flow tractions, which is further transported by the wind or by the water flow. The region of Shirindareh Watershed of Iran is particularly prone to erosion because it is subject to long dry periods followed by heavy erosive rainfalls, falling on steep slopes with soils prone to erosion. The identification of areas that are vulnerable to those processes is needed for improving our knowledge about the extent of the areas affected and for developing measures to control the problem. In our opinion, models can be very supportive tools for understanding of the soil erosion and sediment transport at the watershed scale. This study aims to illustrate the possibility in computing the runoff and sediment yield at the catchment scale using the River Basins model of Spalevic, which is based on the Erosion Potential Method of Garilovic. We apply the model in the S 7-4 catchment of the Shirindareh Watershed of Iran using the computer graphic model, which allowed the quantification of the environmental effects of erosion and the land use measures applied at the studied area. Model calculations showed that the calculated peak discharge from the river basin was 61 m³ s⁻¹ for the incidence of 100 years and the net soil loss was 5806 m³ per year, specific 159 m³km⁻² per year. According to Gavrilovic this amount of soil loss indicates very weak erosion category. The method we used in this study can also be of interest for soil erosion modelling in other basins. The proper implementation of best management practices and control measures are crucial for protecting land resources in the Shirindareh Watershed and the other river basins with similar physical - geographical conditions.