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Modeling of Soil Erosion by IntErO model: The Case Study of the Novsicki Potok Watershed, of the Prokletije high mountains of Montenegro

Velibor Spalevic (1), Ali M. Al-Turki (2), Goran Barovic (3), Marx Leandro Naves Silva (4), Nevenka Djurovic (5), Walisson Soares Souza (6), Pedro Veloso Gomes Batista (7), and Milic Curovic (8)

(1) Department of Geography, Faculty of Philosophy, University of Montenegro, Montenegro (velibor.spalevic@gmail.com), (2) Department of Soil Science, King Saud University, P.O. Box 2460, Riyadh, 11451, Saudi Arabia (aturki@ksu.edu.sa), (3) Department of Geography, Faculty of Philosophy, University of Montenegro, Montenegro (geografija@t-com.me), (4) Federal University of Lavras, Department of Soil Science, Lavras, Brazil (marx@dcs.ufla.br), (5) Faculty of Agriculture, University of Belgrade, Serbia (marasn@agrif.bg.ac.rs), (6) Federal University of Lavras, Department of Soil Science, Lavras, Brazil (walisson.soares@aliancaenergia.com.br), (7) Federal University of Lavras, Department of Soil Science, Lavras, Brazil (pbatista.ufla@gmail.com), (8) Department of Forestry, Biotechnical Faculty, University of Montenegro, Montenegro (curovic@t-com.me)

The application of soil conservation programs to combat erosion and sedimentation are significantly contributing to the protection of the natural resources. Watershed management practices include the assessment of Physical-Geographical, Climate, Geological, Pedological characteristics, including the analysis of Land Use of the regions concerned. The policy makers are increasingly looking for the different land uses and climatic scenarios that can be used for valuable projections for watershed management. To increase knowledge about those processes, use of hydrological and soil erosion models is needed and that is allowing quantification of soil redistribution and sediment productions.
We focused on soil erosion processes in one of Northern Montenegrin mountain watersheds, the Novsicki Potok Watershed of the Polimlje River Basin, using modeling techniques: the IntErO model for calculation of runoff and soil loss. The model outcomes were validated through measurements of lake sediment deposition at the Potpec hydropower plant dam. Our findings indicate a medium potential of soil erosion risk. With 464 m^3 yr^{-1} of annual sediment yield, corresponding to an area-specific sediment yield of 270 m^3km-2 yr^{-1}, the Novsicki Potok drainage basin belongs to the Montenegrin basins with the medium sediment discharge; according to the erosion type, it is surface erosion. The value of the Z coefficient was calculated on 0.403, what indicates that the river basin belongs to 3rd destruction category (of five). Our results suggest that the calculated peak discharge from the river basin was 82 m3s-1 for the incidence of 100 years. According to our analysis there is a possibility for large flood waves to appear in the studied river basin. With this research we, to some extent, improved the knowledge on the status of sediment yield and runoff of the river basins of Montenegro, where the map of Soil erosion is still not prepared. The IntErO model we used in this study is relatively novel concept and is highly recommended for soil erosion modelling in other river basins similar to the studied watershed, because of its simple identification of critical areas affected by the soil loss caused by soil erosion.