

Modeling and analysis of Soil Erosion processes by the River Basins model: The Case Study of the Krivacki Potok Watershed, Montenegro

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The objective of this research was to study soil erosion processes in one of Northern Montenegrin watersheds, the Krivacki Potok Watershed of the Polimlje River Basin, using modeling techniques: the River Basins computergraphic model, based on the analytical Erosion Potential Method (EPM) of Gavrilovic for calculation of runoff and soil loss. Our findings indicate a low potential of soil erosion risk, with 554 m³ yr⁻¹ of annual sediment yield; an area-specific sediment yield of 180 m³km-2 yr⁻¹. The calculation outcomes were validated for the entire 57 River Basins of Polimlie, through measurements of lake sediment deposition at the Potpec hydropower plant dam. According to our analysis, the Krivacki Potok drainage basin is with the relatively low sediment discharge; according to the erosion type, it is mixed erosion. The value of the Z coefficient was calculated on 0.297, what indicates that the river basin belongs to 4th destruction category (of five). The calculated peak discharge from the river basin was 73 m3s-1 for the incidence of 100 years and there is a possibility for large flood waves to appear in the studied river basin. Using the adequate computer-graphic and analytical modeling tools, we improved the knowledge on the soil erosion processes of the river basins of this part of Montenegro. The computer-graphic River Basins model of Spalevic, which is based on the EPM analytical method of Gavrilovic, is highly recommended for soil erosion modelling in other river basins of the Southeastern Europe. This is because of its reliable detection and appropriate classification of the areas affected by the soil loss caused by soil erosion, at the same time taking into consideration interactions between the various environmental elements such as Physical-Geographical Features, Climate, Geological, Pedological characteristics, including the analysis of Land Use, all calculated at the catchment scale.