



## **A methodological procedure for the application and validation of a physically-based erosion model in the Slovak catchment**

Zuzana Némětová, Silvia Kohnová, and Viera Rattayová

Slovak University of Technology, Faculty of Civil Engineering, Dept. of Land and Water Resources Management, Bratislava, Slovakia (zuzana.nemetova@stuba.sk)

Although the development of methods and assessments for the evaluation of soil water erosion has been investigated by a large number of authors, it is still significantly under-researched and unclear. The main aim of the study is a validation of the physically-based EROSION-3D model together with an investigation of the complex structural equations in the Slovak catchment. The model has been validated based on the continuous rainfall series. The fundamental concept of the physically-based model is the description and quantitative evaluation of soil erosion (soil detachment, transport and deposition) using physically-based equations. Physically-based models consider an understanding of the physics of the hydrological processes and therefore present a powerful and innovative technique for the determination of complicated runoff-erosion processes. The study characterizes a model system in a complex way by a set of equations that establish relationships between the variables. The methodical application procedure created presents explanations of the relationships between the individual equations and provides an essential tool for the application of the EROSION-3D model. At the end of the study, the modelled sediment yields were compared with the measured data obtained by the bathymetry measurement using the AUV (Autonomous Underwater Vehicle) device EcoMapper.