



“Gheorghe Asachi” Technical University of Iasi, Romania



APPLICATION OF GIS TECHNIQUES FOR THE QUANTIFICATION OF LAND DEGRADATION CAUSED BY WATER EROSION

Gabriela Biali^{1*}, Cristian Valeriu Patriche², Vasile Lucian Pavel¹

¹*“Gheorghe Asachi” Technical University of Iasi, Faculty of Hydrotechnical Engineering, Geodesy and Environmental Protection, Iasi, Romania*

²*Romanian Academy, Department of Iasi, Geography Group, Iasi, Romania*

Abstract

Land decay processes caused by erosion are very serious by their long term impact on the quality of soils, surface waters, environment and living standards. This article presents the results of a spatial erosion modelling. A new methodology is hereby proposed to estimate the soil losses caused by water erosion. The method is based on using GIS techniques, and its novelty consists in applying the mathematic calculation model on the pixel/ cell level, by using the “overlay” technique, which grants a high level of accuracy for the results. The input data used are four site plans (topographical survey, land use layout, soils layout, and erosion control plan map). Upon processing, seven information layers resulted, which are included in the calculation model, representing actually the factors triggering and maintaining the erosion process. The scope of erosion modeling is to determine the actual and potential erosion in the hydrographical basin considered for the study. Results show an average annual soil loss much above the tolerable limit in our country. In-house developed software application for erosion simulation (in Fortran language) was run under Geo-Graph software, that was used for the entire project development. At the end of the work it is shown that erosion modeling suggested by this software is balanced (through comparison / test) by the erosion measurements and tests performed by researchers from the Research and Development Center for Soil Erosion Control, Perieni, Romania.

Key words: Geographic Information Systems (GIS), land degradation, layer, water erosion

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* Author to whom all correspondence should be addressed: e-mail: gbiali@yahoo.com