GIS-based RUSLE modelling of Leça River Basin, Northern Portugal, in two different grid scales

S. Petan (1), J.L.P. Barbosa (2), M. Mikoš (1), and F.T. Pinto (2)

(1) University of Ljubljana, Faculty of Civil and Geodetic Engineering, Chair of Hydrology and Hydraulic Engineering, Jamova 2, 1000 Ljubljana, Slovenia (spetan@fgg.uni-lj.si), (2) University of Porto, Faculty of Engineering, Department of Civil Engineering, Hydraulics, Water Resources and Environment Division, Rua Dr. Roberto Frias, s/n 4200-465 Porto, Portugal (fpinto@fe.up.pt)

Soil erosion is the mechanical degradation caused by the natural forces and it is also influenced by human activities. The biggest threats are the related loss of fertile soil for food production and disturbances of aquatic ecosystems which could unbalance the environment in a wider range. Thus, precise predictions of the soil erosion processes are of a major importance for preventing any kind of environmental degradations. Spatial GIS modelling and erosion maps greatly support the policymaking for land planning and environmental management. Leça River Basin, with a surface of 187 km2, is located in the Northern part of Portugal and it was chosen for testing RUSLE methodology for soil loss prediction and identifying areas with high potential erosion. The model involves daily rainfall data for rainfall erosivity estimation, topographic data for slope length and steepness factor calculation, soil type data, CORINE land cover and land use data. The raster layer model was structured in two different scales: with a grid cell size of 10 and 30 meters. The similarities and differences between the model results of both scales were evaluated.