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Typologically-differentiated landslide susceptibility assessment for Romania.

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Alongside floods and earthquakes, landslides are representing one of the main geomorphic hazards in Romania, a country with more then 2/3 of its territory consisting of mountains, hills and tablelands prone to such slope processes. Diversity of morphostructural and lithological features are imposing a large variety in landslide typology, dominated by mud and debris-slides and mud-debris-flows and rockfalls. The purpose of this paper is to propose the first national inventory-based landslide susceptibility assessment. By compiling literature data, personal or institutional landslide inventories, a database of more that 27,900 cases (split in three main categories, i.e. slide, flow, fall) was set up as the basis for a multi-criteria modelling approach.
For this assessment, a restricted number of spatial predictors is used (lithology, land-cover, slope). The assessment is based on a DEM of 90×90 m derived from ASTERGDEM v2; a classification of different topographic regions is proposed. Following classification and weighting procedures, a pairwise comparison was performed in order to rank the importance of each conditioning factor. The results (consisting in three nation-wide maps; slides, flows and falls) outline very well the correlation between the major morphostructural units and different susceptibility classes. The medium and high Carpathians, built mainly on metamorphic and igneous rock formations (sometimes on limestone and dolostones), present the highest susceptibility to (rock/debris) falls and (debris) flows. The low Carpathians, consisting of more or less cohesive flysch formations are very prone to (mud/debris) slides. The Subcarpathian hills and the extended homocline or hilly tablelands shows high susceptibility to (mud/debris) slides and (mud) flows. Further steps will include the integration of dynamic factors (climate maps, peak ground acceleration map) in the analysis.
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