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DIGITAL SOIL MAPPING IN A MOUNTAINOUS AREA WITH MIXED LAND USE (HUMOR CATCHMENT - EASTEARN CARPATHIANS, ROMANIA) USING SOIL-LANDSCAPE SYSTEMS, FUZZY LOGIC AND ENVIRONMENTAL COVARIATES

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Abstract

The proper evaluation of soil resources, especially in mountainous areas, is very important for the suitable development of the local communities, which host traditional sustainable agriculture. Nonetheless, regarding the preservation of traditional sustainable agriculture and the introduction of a modern development plan to the area, an actualized and detailed distribution of soil cover is crucial. Soil legacy data is not always available at the right scale and spatial cover. To overcome such obstacles, the most suitable approach is the use of digital soil mapping for supplementing soil information. Sparse soil information is available for the Humor catchment, Eastern Carpathians, Romania, therefore we used a soil-landscape system approach, which when coupled with a fuzzy logic-based assignment of soil to landscape system and a raster GIS representation model of the landscape environmental layers (SoLIM model), allow the continuous spatial modelling of the soil classes. The result was validated against available soil maps and soil profiles and it was shown to better represent spatial distribution of the soil cover, although further work is needed to better sample soils representing local conditions which because weren't predictable in the applied model, were included as punctual occurrences.

Key words: digital soil mapping, soil-landscape systems, fuzzy logic, environmental covariates, SoLIM

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