METHODS FOR NATURAL LAND MAPPING UNITS DELINEATION FOR AGRICULTURAL LAND EVALUATION

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Abstract

Agricultural land evaluation has a key role in the sustainable agriculture. The agricultural land evaluation methodolog y is applied to land mapping units fo r computing a suitability index, based on the value of several soil and environment indicators, which characterize these land mapping units. The natural land mapping units, are delineated using various criteria and thematic layers, but most times the approach is subjective. GIS, geomorphometry, remote sensing and geostatistics bring the possibility to objectively delineate most suitable natural land mapping units for applying the agri cultural land evaluat ion methodology. The methods for natural land mapping units delineation can be divided in two classes of methods: supervised and unsupervised. The first, require some knowledge about the area, and can be used to carry the results for a specific purpose of the land evaluation. The last, related especially to cluster analysis and image segmentation, depend on the input data and the number of specified classes or the seed points, so require first the analysis of the input data, to reveal the clusters/seed sampling. Both approaches were used to delineate the natural lan d mapping units for a DEM covering a test area, and were used to extrapolate the method settings for a DEM covering 15 villages from Iasi county agricultural area. Because reference data concerning the natural land mapping units is almos t impossible to derive, we analyzed statistically and conceptually the results along a topographic transect, in order to try to find the most suitable method. Generally, unsupervised segmentation methods gave the best results, and from them the segmentation procedures, although very intensive from a computational point of view, can depict interesting patterns of natural aggreg ation of natural land mapping units.

Key words: land mapping unit, agricultural land evaluation, GIS