Land Cover Mapping for Subcarpathian Area (Romania) at Different Scales Using Currently Available Data Models

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Abstract

Land cover represents an important factor for different geographic analysis, from physical geography studies to environmental analysis and spatial planning. Land cover is a dynamic variable, because it reflects the interaction between socio-economic activities and regional environmental changes. For this reason it is necessary to update frequently this dataset.

Currently, there are many models of land cover or land use available, produced at global, continental or regional scales, but they are not every time accurate at detailed scales.

Subcarpathian regions are characterized by complex land cover features as an effect of the increasing anthropogenic pressure by settlements, land uses and mining/quarrying during the last 200-300 years. For this reason mapping land cover was a difficult task, and a time consuming one, as the manual classification of land cover classes was for the long time the only one technique.

The study area is located in Prahova County, Romania, between Prahova Valley and Teleajen Valley, and it is characterized of a variety of morphostructures. The typical landscape features include hills superposed on anticlines, depressions on synclines, relief inversions and geomorphic processes (landslides and selective erosion). In this context, the land cover is an important morphodynamic driving factor for a lot of processes.

Our paper proposes a combined GIS, Remote Sensing and cartographic approach in order to produce an accurate land cover data layer for a selected Subcarpathian region where land cover classes are various and com-

ICA European Symposium on CARTOGRAPHY
VIENNA, 10–12 NOVEMBER 2015

Published in "Proceedings of the 1st ICA European Symposium on Cartography", edited by Georg Gartner and Haosheng Huang, EuroCarto 2015, 10-12 November 2015, Vienna, Austria

plicated in configuration. The methodology includes some important steps: data processing, data filtering, landscape analysis, validation and correction and land cover mapping.

This paper focuses on the integration of data from existing land cover models with remotely sensed data (processed by thematic classification, modelling and image interpretation) as well as from thematic maps and research studies.

There are some available land cover models which differ in their spatial or temporal resolution and spatial coverage. Corine Land Cover is one of them, produced by European Environment Agency with a temporal resolution of 6 years (datasets available from 2000, 2006, 2012). Another available land cover model used in this analysis was Global Land Cover 30, produced by National Geomatics Centre of China at 30 m spatial resolution (Yu et al. 2014).

Also, we used some vector data to create masks for the remotely sensed images classifications (such as soil data, extracted from Romania Soil Map 1:200.000).

By integrating the processed satellite data, the available models of land cover and ancillary vector and raster data (Ran et al. 2012), the final results were obtained, which contains various classes, as follows: forest, grassland, orchards, settlements, water, degraded lands and transport network (Farmer et al. 2012). This result was confronted and validated with the latest orthophotos, remote sensing imagery at medium and high spatial resolution and in the terrain. A statistic approach was used in order to test the spatial accuracy of the land cover model.

The final step was to map the land cover for sample areas at different scale, such as for example: 1:25.000 for the entire study area or 1:10.000 for a selected geomorphic unit. This allowed the production of land cover maps for different applications like thematic mapping, natural hazards analysis and spatial planning (examples).

Acknowledgement

This work was supported by the strategic grant POSDRU/187/1.5/S/155559 ***Competitive multidisciplinary doctoral research at European level (CDocMD)*** cofinanced by the European Social Found within the Sectorial Operational Program Human Resources Development 2007-2013.

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