CORINE LAND COVER DATA BASE AT THE SCALE 1:100 000 IN THE SLOVAK REPUBLIC AND CZECH REPUBLIC

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ABSTRACT

The paper provides information of the results obtained by the finalization of the CORINE Land Cover Project in the Slovak and Czech Republics. Interpretation experience of technical nature and experience connected with identification of some land cover classes are characterized. The main possibilities of application of the created land cover data base in the Slovak and Czech Republics were analysed.

1 INTRODUCTION

The Slovak Republic and the Czech Republic are another European countries that have finished interpretation of satellite photographs with the aim to identify land cover classes within the CORINE programme. The work on the projects was coordinated in both Republics by the company GISAT from Praha. Team of interpreters consisted of two research workers of the Institute of Geography of the S.A.S., Bratislava, who guaranteed interpretation of satellite photographs of the Slovak territory and 11 research workers, who have interpreted photographs from the territory of the Czech Republic. Besides of GISAT's experts the interpretation has been accomplished by geographers and surveyors of the Ecological Institute of České Budějovice, Surveying Institute in Praha, Czech Technical University and the Institute of Geonics in Brno. Interpretation of satellite photographs of both Republics took approx. 12 months.

The aim of the paper is to provide brief information of results obtained especially by interpretation of satellite photographs within CORINE Land Cover Project and to point at the significance of the obtained data base for geoscientific analyses and environmental management and planning.

2 METHODOLOGY OF THE CORINE LAND COVER PROJECT

As the project must achieve compatible results, its methodology is uniform. It consists of five parts [1,3,4], characterized within the Slovak and Czech Republics by the following specific features:

Preparatory work and selection of data:

This work consists of selection of the most suitable LANDSAT TM scenes covering the Slovak and Czech territory, as well as topographic maps in scales 1:100 000 (53 map sheets of this scale cover the territory of the Slovak Republic, and 75 sheets of the territory of the Czech Republic and 8 sheets cover boundary area between both countries) and 1:50 000 in Gauss-Krüger map projection, aerial photographs and thematic maps (for instance on the real vegetation, protected areas, etc.).

Production of false-colour images at scale 1:100 000:

National Aerospace Laboratory (NLR), Space Division, Remote Sensing Department, in Noordoostpolder (the Netherlands) produced geometrically transformed satellite images to the Gauss-Krüger map projection in the scale 1:100 000.

Visual interpretation:

It was based on analysis of textures forming the land cover patterns. Land cover is determined by significant appearence characteristics manifesting themselves in satellite images by means of characteristic patterns (acceptably homogeneous) which are formed at least by two textures [2]. Result of interpretation is represented by 133 interpretation schemes for the Czech Republic and 53 for the Slovak Republic, formed by areas of identified land cover and marked by corresponding number of 32 classes occuring in both Republics (44 land cover classes are defined for the whole Europe in this project).

Digitising of interpretation schemes and depositing of the interpretation results in data base of GIS:

It is carried out by the GISAT company in co-operation with the technical team of the project in Brussels.

3 OUR INTERPRETATION EXPERIENCE

Our interpretation experience could be characterized as:

Experience of technical nature:

- It is very important to understand the content of every land cover classe (from point of views of interpretation and application).

- Simultaneous interpretation of the same satellite image by two interpreters is very convenient.

- Identification of the land cover patterns requires to take into account visual image interpretation element *association* (correct classification of the textures to the patterns is very important).

- Application of the aerial photographs helps to identify correctly land cover classes on the satellite images (aerial photographs should be of the closest possible date to the satellite image acquiring date).

Experience connected with identification of some land cover classes:

112 - Discontinuous urban fabric:
Often contains the area of production "buildings of agricultural farm," that is not always directly connected with the settlement, especially of rural type (area of production can be several tens of meters far from the settlement area), if the area of the farm does no have more that 5x5 mm of size and is not too distant from the settlement area, it is classified into this class.

221 - Vineyards:
Without topical aerial photographs of the topographic maps and often also without knowledge obtained by field mapping it is very difficult to identify, especially young vineyards have spectral characteristics similar to ploughed soil without vegetation.

222 - Fruit trees and berry plantations:
For precise identification mainly of the young orchards topical aerial photographs, topographical maps and often also the results of field mapping are necessary: spectral characteristics of young orchards are similar to the ones of ploughed soil without vegetation.

231 - Pastures:
Pastures are spectrally similar to cereals, eventually feedstuff (e.g. clover), especially in lowland landscape during spring and autumn acquisition date of satellite data; topical aerial photographs and above all results of field mapping are necessary for exact identification.

243 - Land principally occupied by agriculture with significant areas of natural vegetation:
A consequent observation of the areas of single texture classified into them (must not be larger than 5x5 mm) is necessary at identification of this class.

321 - Natural grassland:
This class is very difficult to identify without aerial photographs and maps of the protected areas.

322 - Moors and heathland:
As the areas of this class (on the territory of both Republics represented above all by dwarf pine) occur most frequently on differently oriented slopes over the upper timber line (often shadowed), exact identification was possible only by means of topographic or vegetation maps, for instance in scale 1:100 000.

324 - Transitional woodland scrub:
This class is in the territory of the Slovak and Czech Republics formed above all by the areas of cut down forests with young trees and scrub, bush and herbaceous understories, textures of which are very well identifiable, in lesser extent it is represented by areas with formation of naturally developing forest (for instance abandoned pastures overgrown by trees and scrub), topical aerial photographs are needed for exact identification.

332 - Bare rocks:
Identifiability of this class represented mostly by klippen relief is negatively affected by exposition. That is why also aerial photographs and especially topographic maps had to be used for interpretation.

4 POSSIBILITIES OF APPLICATION OF THE LAND COVER DATA BASE

One of the important areas, where it is possible to apply the information on land cover is creation of thematic maps in the scale 1:100 000 and smaller.

Data on land cover can be directly used in creation of all-national information system data base of environment or in creation of partial geographical information systems.

The quoted data base will be a helpfull requisite in the area of the basic geo-scientific research, at the geo-recognizing and exploring purposes, as it will be able to provide up-dated information on spatial characteristics of land cover.

Land cover can also represent a valuable source of information for the modelling of various processes in landscape and generation of new synthetic information based in comparison - combination with other landscape data, e.g. morphometric characteristics of terrain, demographic characteristics, natural landscape types map (to identify of changes of landscape development).

Land cover data provide introductory source of environmental assessments, indispensable for social decision making and landscape planning.

This data base represents an interactive tool for the environmental management and education (explanation of environmental concepts and visualization of environmental data on global, regional and local scale).

5 CONCLUSION

Finalization of the mentioned project has provided analogue and digital information on land cover of the Slovak Republic and Czech Republic in the scale of 1:100 000 compatible with the ones processed by other European countries, for the knowledge and management of landscape.

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