CO-150

STUDY OF STANDARDISATION OF THE CARTOGRAPHIC MODELLING PROCESS IN OFFICIAL REFERENCE DATA BASES IN POLAND

OLSZEWSKI R.(1), ANDRZEJEWSKA M.(2), BIELAWSKI B.(3), GłAżEWSKI A.(1), GOTLIB D.(1), KOWALSKI P.(1), OSTROWSKI W.(4)

(1) Warsaw University of Technology, WARSAW, POLAND ; (2) UNEP/GRID, WARSAW, POLAND ; (3) Intergraph Polska, WARSAW, POLAND ; (4) Warsaw University, WARSAW, POLAND

Development and utilisation of MRDB technology to create multi-resolution reference data bases has become a world trend recently. Those trends are also considered by the executive regulation to the act on the Spatial Data Infrastructure, aiming at implementation of the INSPIRE Directive in Poland. The topographic Geo-reference Data Base (BDG), created basing on that executive regulation, will be developed as a MRDB type data base, consisting of two topographic components: TOPO10 and TOPO250 and a series of cartographic components: KARTO10, KARTO25, KARTO50, KARTO100, KARTO250, KARTO500 and KARTO1000.

Therefore, it is particularly important to develop the methodology of creation of a two-level structure of the BDG data base, as well as cartographic visualisation of reference data and its multiscale analysis.

The objective of creation of the TOPO10 (as well as TOPO250) component is to utilize acquired data for various analyses based on spatial information, for integration with other thematic GIS data bases and for location of objects. The objective of creation of KARTO components is to utilize them for printing topographic maps and to use them as cartographic background for production of thematic maps.

The main idea of BDG database is based on several important assumptions:

- Common database structures
- Common definitions of spatial features
- Aggregated data types
- Two categories of geometry accuracy
- Separate rules for data acquisition for each component
- Features for TOPO250 are derived solely from TOPO10
- GML as a data interchange format
- Ability to integrate components TOPO10 and TOPO250 in DBMS
- No data redundancy
- Continuous data base in the country

In the data model, we have about 270 feature classes on lowest level; 70 feature classes on medium level and 9 feature classes of highest level. Highest level feature classes are listed below:

• Hydrography networks
• Road and rail networks
• Facility networks
• Land cover (classified on the basis of visual appearance), i.e. forests, open waters, grass, buils areas, etc.
• Land use (classified on the basis of use, or management or property) i.e. factory, railway station, airports complex, school complex, etc.
• Buildings and built structures
• Environmental protection
• Administration units
• Others (swamps, small topographical objects like monuments, fountains, bus/tram stops, some trees, bushes, etc.)

In the MDRB database structure are implemented some aggregated data types. Some values (detailed) are allowed to use in TOPO10 component and others (aggregated) in TOPO250 component. For example we have several detailed values for road surface type: “asphalt”, “concrete tiles”, “concrete cubes”, “rocks”. All of these values can be use in TOPO10, in TOPO250 only one aggregated value “paved” can be used.

For each TOPO component the different level of geometric accuracy is defined. For TOPO10, indicatively, minimal distance between two vertexes shouldn’t be closer than about 0.5 meter (terrain units). For TOPO250 the same value should be about 50 meters.

Each component (TOPO10 and TOPO250) has its own set of data acquisition rules. Instructions describe, deal with dimension criteria, data consistence and topology instructions, special rules for some exceptions. It's important that features in TOPO250 component are derived solely from TOPO10. It means that the process of model generalization should be defined and implemented. The only way to build TOPO250 data is to generalize data from TOPO10 component. An important issue is the ability to integrate components TOPO10 and TOPO250 in one, MRDB database structure. Through unique data identifiers it is possible to make relation between corresponding objects in TOPO10 and TOPO250. Component integration will be implemented in dedicated Data Base Management System.