Digital cartography serving flood control purposes on the territory of the Czech Republic

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Experience gained in extensive devastating floods that hit the Czech Republic in 1997 have shown that in the future such natural disasters can be effectively tackled only through the application of a sophisticated system of protective measures. These measures have to be accompanied by appropriate information support. The local and regional activities in preparing the documentation of inundation areas lacked nationwide coordination. As a consequence of this fact, mutual incoherence and limited compatibility of the resulting geographic information on flooding lines in the neighboring localities, which had been acquired in different periods of time, were shown. The Oracle 9.2 (RDBMS) and technology ArcSDE 9.2 (Spatial Database Engine) are the base system technology components for development of the Map of Flood Areas of the Czech Republic at a scale of 1:10 000.

The cartographic work with a title “Map of Flood Areas of the Czech Republic at the scale 1:10 000 (MZÚČR10)”has become, in accordance with the valid legislation, the core element of the governmental information support and basic measure for floods maintenance.

Source information for the Map of Flood Areas of the Czech Republic at the scale 1:10 000.

The groundwork for the creation of the basic layer of the Map of Flood Areas of the Czech Republic at the scale 1:10000 is a vector digital landscape model (DTMÚ), which is represented by the Fundamental Base of Geographical Data of the Czech Republic (ZABAGED®). This DTMÚ represents the settlements and individual objects, communications, waters, vegetation cover, land surface and use, borders, land relief and positional components - points of control. The compilation and administration of the ZABAGED® fall within the competence of the Czech National Mapping and Surveying Agency. It is maintained in the national reference system of coordinates S-JTSK and in the national Baltic altitude system, at a level of detail corresponding to the scale of 1:10 000. It covers the entire territory of the state, being regularly updated in a three-year cycle.

The starting data source for the creation of the thematic layer of the MZÚČR10 is the local or regional paper documentation identifying the flood area of each relevant watercourse on the territory of the state. Flooding lines identifying 5-year, 20-year and 100-year floods on each watercourse, which is focused, represent the main components of the content of the given documentation.

The documentation of the flood area containing such elements is subjected to the raster digitizing and the subsequent vectorizing, with the DTMÚ of the theme concerned produced as output. Through an automated process complemented by the interaction finalization then the produced DTMÚ is transformed, using the respective catalogue of the cartographic symbols, to the digital cartographic model of the territory (DKMÚ) of the considered flood theme, which represents the latter, the thematic layer of the resulting digital Map of Flood Areas of the Czech Republic at the scale 1:10 000 (MZÚČR10). The complete digital MZÚČR10, produced by the compilation of both of its layers, through an automated process is further transformed into the raster form, in which it can be distributed to the user field.

The mentioned digital cartographic works are produced in the technological environment of the ESRI system. Together with their map par in the raster form, they are made available to the users either in electronic form within the framework of web services on the Internet address http://mapy.vuv.cz/website/isp http://www.vuv.cz/oddeleni-gis/22/mapa-zaplavovych-uzemi-1:10-000.html. So far, this product has been available for more than 40 of the Czech rivers and its preparation for the next 10 is under way in 2008-2009.