

Małgorzata Buśko, Anna Przewięźlikowska • **Application of the GEO-INFO System for Modernization of the Cadastre** • Geomatics and Environmental Engineering 2013, Vol. 7, No. 4

The aim of this article is to present the possibilities of making use of the GEO-INFO Geographic Information System database for the purpose of modernization of the cadastre, with reference to establishing records of buildings.

The subject of the study on which this article was based was the implementation of the project called *The capture and distribution of information on the buildings in the West Pomerania province* conducted for all cadastral units of the West Pomerania counties which do not have established records of buildings and dwellings. Administrative and technical operations have been discussed on the example of the conducted modernization of the buildings register in the district of Choszczno.

The paper presents stages of the procedure leading to the creation of the graphic and descriptive database of buildings using the GEO- INFO GIS:

- capturing data to modernize the register of buildings,
- analysis of the materials and preparation of the data in the GEO-INFO GIS for field inspection,
- field inspection and follow-up surveys of buildings,
- technology for creating a database for records of buildings in the GEO-INFO GIS,
- importing data to the numerical map database of cartographic documentation centers,
- importing data to the descriptive part of the cartographic documentation center base.

GEO-INFO Geographic Information System provides an opportunity to quickly update the resource and offers effective possibilities to control the quality and consistency of the descriptive and geometric data. Summarizing the description of the works associated with the modernization of the cadastre in terms of creating the database of buildings, it can be concluded that the computerization of the geodetic and cartographic resource improves

considerably record keeping and upgrades the quality of the record data.

**Keywords:** GEO-INFO Geographic Information System, modernization of the cadastre, record database of buildings

Ewa Głowienka-Mikrut, Krystyna Michałowska, Sławomir Mikrut, Tomasz Nałęcz, Tomasz Mroczka • **Modelling of Flood Hazard Zone for the Łęg River** • Geomatics and Environmental Engineering 2013, Vol. 7, No. 4

This article presents an update of flood hazard map for the 4 km strip of land along the Łęg River below the water reservoir dam in the village of Wilcza Wola, in the district of Kolbuszowa (the Podkarpackie Province), Poland. To produce the map, the hydrological model for a hypothetical flood caused by construction disaster of the water reservoir dam in Wilcza Wola was used. Based on the DTM and cross-sections of known flood wave profiles, flood zone for the examined river section was outlined. Also, the impact of the possible flood on inhabitants of the area concerned, and on selected land surface objects, was examined.

**Keywords:** GIS, DEM, hydrological model, flood zone, GRASS

Katarzyna Grzesik • **Application of the IWM-PL Model for the Life Cycle Assessment (LCA) of Municipal Waste Management in Krakow. Part 2** • Geomatics and Environmental Engineering 2013, Vol. 7, No. 4

The goal of this study is the quantification of the environmental impacts from the municipal waste management system in Krakow, state in 2010, and the identification of processes that significantly affect the environmental performance, applying the IWM-PL model, first Polish language application for LCA of waste management systems.

In the first part of the study, in the paper entitled *Application of IWM-PL Model for Life Cycle Assessment (LCA) of Municipal Waste Management in Krakow. Part 1* the detailed life cycle inventory of the municipal waste management system in Krakow was shown. The life cycle inventory results are input for the next phase of life cycle assessment (LCA), that is the life cycle impact assessment (LCIA). This paper presents and discusses the results of the third

(life cycle impact assessment) and fourth (interpretation) phase of LCA for the municipal waste management system in Krakow.

The final result of the evaluation of the municipal waste management system in Krakow is expressed in ecopoints (Pt) in two damage categories: human health and ecosystem quality. For human health, the environmental impact of waste management system is negative and amounts 16,726.26 Pt, which is comparable to the annual environmental load of 16 average European inhabitants. While for ecosystem quality the environmental impact is positive (value below zero), and equals -7,422.14 Pt.

The results obtained with the application of the IWM-PL model, shown in this paper, need to be verified in further research, employing other models for LCA, developed for evaluating waste management systems.

**Keywords:** life cycle impact assessment (LCIA), life cycle assessment (LCA), municipal waste management system, models for LCA

Maciej Michałowski, Paulina Ciągło, Aleksandra Wagner • **An Attempt to Assess the Water Quality in the Dunajec River According to the Requirements for Waters as Fish Habitat** • Geomatics and Environmental Engineering 2013, Vol. 7, No. 4

The mean annual results of 2005–2010 (by the Provincial Inspectorate of Environmental Protection in Krakow) showed that the waters of the Dunajec River, in most cases, do not meet the requirements for a fish habitat. The author's field analyses, conducted in the measuring points of Kurów, Świniarsko and Czerwony Klasztor confirmed an unsatisfactory water quality status of the Dunajec as a favourable environment for fish, but still some species live there, which was confirmed by the anglers.

**Keywords:** Dunajec River, water quality, fish, pollution

Sławomir Mikrut, Ewa Głowienka-Mikrut, Krystyna Michałowska • **The UAV Technology as a Future-Oriented Direction in the Development of Low-Ceiling Aerial Photogrammetry** • Geomatics and Environmental Engineering 2013, Vol. 7, No. 4

The paper reviews current issues related to UAV flights. The relevant research has been conducted all over the world for

a dozen or so years in various scientific research centres. The paper presents results of research obtained by various agencies, and shows the concept of research on aerial vehicles completed with the cooperation of the AGH University of Science and Technology in Krakow, Poland. Research issues focus mainly on geometry and radiometry of recorded images. That technology seems to be highly future-oriented due to its low costs as compared to traditional aerial photogrammetry.

**Keywords:** UAV, photogrammetry, geometric resolution, radiometric resolution, remote sensing, recognition

Tomasz Owerko • **Variations of Frequency Responses of a Cable-Stayed Bridge and Calculation of the Damping Coefficient of Selected Vibration Modes Based on the Data Recorded with Radar Systems** • Geomatics and Environmental Engineering 2013, Vol. 7, No. 4

The use of ground-based radar interferometry to measure bridge structures allows to obtain accurate information on the dynamic response of a structure to the applied excitation, even in the case of observing spans located above the water level. Under the current regulations, the acceptance process for new bridges includes dynamic testing. The study design most often includes loads of diverse forced vibrations. The presented publication shows how frequency responses of the tested span changes with respect to varied excitations, and how to gain information on the value of the damping coefficient on the basis of radar data.

**Keywords:** radar interferometry, signal processing, damping decrement

Magda Pluta, Pelagia Biłka • **Selected Aspects of the Application of Terrestrial Laser Scanning as a Tool to Support the Development of Rural Areas** • Geomatics and Environmental Engineering 2013, Vol. 7, No. 4

This paper discusses the selected aspects of the application of terrestrial laser scanning as a tool to support the development of rural areas. This paper presents an overview of the current state of knowledge, which is shown in horizontal way. The possibilities

of using terrestrial laser scanning in agriculture, forestry and architecture have been discussed as a factors to have an impact to well-organized spatial order as the foundation of optimal use of the existing resources.

**Key words:** rural development, terrestrial laser scanning, agriculture, forestry, architecture