Piotr Benduch: **The Assessment of the Influence of Cadastral Parcel Boundary Points Location Errors on the Accuracy of Analytical Determination of Their Surface Area** • Geomatics and Environmental Engineering 2016, Vol. 10, No. 1

A parcel constitutes a leading object in the register of land and buildings. The main spatial attribute of a parcel are its boundaries, which determine the range of proprietary right. The surface area of a parcel is a derivative of its boundaries and in accordance with the regulations in force it is calculated on the basis of boundary points coordinates.

Based on derived formulas and on the materials obtained from the centres of geodetic and cartographic documentation, the basic factors influencing the value of average error of parcel surface area have been analyzed. The results of examination have confirmed unambiguously that the errors in boundary points' location have a significant influence on lowering the accuracy of surface area analytical determination. The parcel geometry, which is strictly connected with the number of boundary bend points, plays also an important role in this respect. In practice, all the considered factors affect the final value of surface area average error. Their total influence can cause very negative effects in a great number of fields related to real estate management. It proves the fact that data on parcels' boundaries should be obtained with the highest accuracy, particularly on urbanized areas. The fulfilment of this postulate will contribute to a significant improvement of broadly-understood functioning of the register of land and buildings.

Keywords: cadastral parcel, boundary point, boundary, surface area, accuracy

Krzysztof Butryn, Edward Preweda: **Selected Issues of Establishing and Functioning of the Transmission Easement** • Geomatics and Environmental Engineering 2016, Vol. 10, No. 1

The institution of transmission easements, introduced from 3 August 2008 by an amending the Civil Code, is currently the most widely used legal form that allows entrepreneurs by

transmission for the use of someone else's property. The practical application of this institution faces a number of legal problems. The purpose of this paper is to bring certain aspects of a provider's complexity solution for this issue.

Transmission easement is established on the property, which, under the Civil Code, is a kind of thing immobility. The establishment of easements causes in practice limitation, to some extent, ownership of real estate. A large part of the property, however, is devoted to perpetual usufruct, which is kind of the law. It is therefore questionable whether the transmission easement can be charged as the right, not the thing. The paper reviews the case law, pointing to the possibility of establishing transmission easement on the property donated in perpetual usufruct, unless the contract makes the property the lease provides otherwise. Rarely mentioned, but very important issue is to establish a transmission easement for devices which do not go physically by the property to be charged and only affect the right of ownership. Case law indicates there is no basis to establish the transmission easement in this case. In practice, however foundation of transmission equipment on the neighboring property causing significant limitations in exercise of the right to property, for which, in the case of not establishing transmission easement, the owner does not receive due compensation.

Keywords: transmission easement, easement, perpetual usufruct

Mateusz Jakubiak, Ewa Panek: **Small Water Bodies in the Valley of the River Rudawa in Krakow – the Environmental Value** • Geomatics and Environmental Engineering 2016, Vol. 10, No. 1

Small water bodies (SWB) are an important element influencing considerably environmental biodiversity. Such water reservoirs are a common part of the landscape of northern Poland. While in southern Poland small natural water bodies are very rare. Many similar ponds were liquidated forever in Krakow in recent decades – mostly due to an urban pressure and lack of conservation actions. The complex of ponds associated with the valley of the River Rudawa is one of discreditable examples.

The aim of the study is the environmental inventory, assessment of the conservation status and environmental condition as well as identification of opportunities for legal protecting of SWB in the valley of the River Rudawa in the area of the Krakow. Small ponds are especially vulnerable to various forms of anthropogenic pressure hence only 3 of 10 water bodies in the studied

area still exist. These SWB are perennial: pond in Mydlniki and two oxbow lakes of Rudawa. The others, no longer exist, 7 water bodies on the study area were shallowed, dried out and some of them were backfilled. The following parameters of environmental assessment of SWB have been applied: terrain morphology and land use around the reservoir, origin and morphometry of water bodies, the stability of the water table, insolation conditions, and coastal and water vegetation. This information would facilitate and help to undertake some nature protection actions.

The studied small water bodies are not legally protected. Two of them are the only existing fragments the Rudawa oxbow in Krakow. Therefore it should be considered to preserve them by establishing an ecological site form of protection.

Keywords: oxbow lake, anthropopression, environment conservation, Poland

Przemysław Leń, Natalia Winiarska: **The Analysis of the Network of Roads Servicing Fields as Illustrated by the Village of Piątkowa** • Geomatics and Environmental Engineering 2016, Vol. 10, No. 1

At the time when a horse-drawn carriage was used for field works and transport, navigating narrow unpaved roads did not present any significant difficulty. The problems related to the use of these roads emerged together with the rapid technological progress. The use of big modern agricultural machinery required the expanding and paving of these roads, which could be made possible thanks to the land consolidation. The existing condition of roads providing direct access to the fields of Piątkowa is, to a certain degree, the result of the consolidation.

Roads used by agricultural transport are part of the land infrastructure determining the development of a given area. It is therefore essential to shape these road networks in a proper manner ensuring the access to individual fields, plots as well as to individual farmers' households. The analysis of the road network has been carried out with the use of the QGIS programme, distance measuring tools and a spatial query plugin which facilitates the spatial analysis. The employment of this method as well as the preparation of photographic documentation enabled the comprehensive analysis of road networks.

Keywords: roads used in agricultural transport, plot patchwork, land consolidation

Oleh M. Mandryk, Yuliya D. Mykhayliuk: **The Development of Mathematical Model of Gas-Turbine Unit Combustion for Chamber Functioning** • Geomatics and Environmental Engineering 2016, Vol. 10, No. 1

This article presents the basic issues of ecological safety improvement of present-day steady-state gas-turbine units. It has been developed the mathematical model diagnostics of combustion chamber considering the basic parameters of gas-turbine unit (GTU) operation under different technological modes including the intake air temperature of the axial-flow compressor, the intake temperature of the actuating medium of the directing set of the high pressure turbine as well as the temperature of the environment.

Keywords: combustion chamber, mathematical model, gas-turbine engine, ecological characteristics, actuating medium

Monika Mika, Monika Siejka: **The Use of Handheld Navigation Receivers GARMIN GPSmap62st for the Unambiguous Identification of the Cadastral Plots in the Field** • Geomatics and Environmental Engineering 2016, Vol. 10, No. 1

The issue of this study relates to investigation of the suitability of the handheld navigation receivers GARMIN GPSmap62st for the unambiguous identification of the position in the field of cadastral plots.

The study consisted of two stages. In the first one data in the form of approximate coordinates (N, E) of the cursor inside the cadastral plot, have been read from the service Geoportal 2 and stored in a text file in the memory of the receiver GPSmap62st. The next step was field measurement consisting in the use of navigation functions of the receiver and navigation to the indicated points. Positioning took place in optimal measurement conditions, characteristic for the group of handheld receivers and was aimed at achieving the indicated points and saving (N1, E1) in the WAYPOINT mode. The second stage consisted in registration in the GPSmap62st receiver's memory the actual coordinates of the points inside cadastral plots, based on field inquiry, and then re-performing the navigation to the indicated points to identify the position of the plot based on coordinates (N2, E2).

The experimental results showed a satisfactory level of unambiguous identification of cadastral plots using GPSmap62st

both based on the coordinates from Geoportal and WAYPOINTS registered in the field.

Keywords: navigation, cadastral plot, property valuation, GPSmap62st handheld receiver

Tomasz Salata, Katarzyna Cegielska, Krzysztof Gawroński: **Application Geoprocessing Tools for Investment Background Analysis and Evaluation at the Commune's Level** • Geomatics and Environmental Engineering 2016, Vol. 10, No. 1

A commune is the primary authority that creates the spatial policy. In terms of administrative borders and indirectly in the adjacent areas, it can influence the direction and rate of economic, social and investment changes. The changes' direction depends mainly on spatial policy but the rate is also determined by the ability to handle specific areas by technical and communication infrastructure. The degree of technical investment significantly increases the rate of investment growth while good quality communication system availability advances the land attractiveness on a par with landscape values.

Methods of spatial data processing stored in vector and raster formats were used in the paper. Multiple format conversion was performed using geoprocessing tools. At the source data obtaining stage, the analysis based on the metadata collections availability was conducted. It includes three-tier hierarchy of the administrative competence of authorities maintaining adequate metadata and data sets. The character of the performed tasks at the lowest administration level is oriented towards obtaining highly detailed spatial and descriptive data. The results indicate a strong correlation between mentioned investment, communication and building features as well as their influence on the development rate and the attractiveness of the municipalities' spatial policy proposals and accuracy assessment of the planning solutions. Linking investment areas qualitative data with the rate of their development has allowed us to evaluate used indicators' accuracy.

Keywords: spatial planning, building areas, GIS, technical infrastructure