Tomasz Adamczyk, Jan Ruchel: **Analysis of Comparative Approach and Cost Approach in the Aspect of Real Property Market Value** • Geomatics and Environmental Engineering 2015, Vol. 9, No. 4

The market value of real property, as the most frequently determined value category, can be defined according to one of three approaches: comparative, income or mixed approach. According to the International Valuation Standards cost approach may also be applied to estimate the market value.

The article contains an analysis of the results of the market values obtained from two valuation approaches – comparative and cost approach. The use of cost approach came down to applying the algorithms presented by the authors in their previous papers and publications.

Apart from the analysis of the obtained market values for several real properties, an analysis of variances was also conducted, illustrating the confidence level of the obtained results.

Keywords: market value, comparative approach, cost approach

Agnieszka Bieda, Jan Ruchel: **Legal Bases of Decisions Subdividing Real Property – Case Study** • Geomatics and Environmental Engineering 2015, Vol. 9, No. 4

The subdivision of real property is performed according to defined laws. One of the them is the Act of 21 August 1997 on real property management which imposes on the executive branch of municipalities an obligation to perform subdivision procedures. According to this Act, if the division of real property is performed by a municipality commune head (mayor or president of a city), such a procedure must end in an administrative decision. The subdivision can be shown in the cadastre and in land register only when this decision comes into force.

The Act indicates a few methods to subdivide real property. They are included in art. 92–95 and are the basis of a decision approving the subdivision. There are also other references to the Act in the subdivision documents (art. 96–99). The authors

intended to check the legal basis of decisions subdividing real property based on the Act on real property management in 1998–2014, in two municipalities.

Keywords: administrative decision, legal basis, subdivision of real property, Act on real property management

Karol Firek, Rajmund Oruba, Aleksander Wodyński: **Problems Associated with Qualifying Selected Industrial Structures in Terms of Charging Property Tax** • Geomatics and Environmental Engineering 2015, Vol. 9, No. 4

This article presents a criteria for qualifying selected industrial structures: warehouses, storage tanks, reservoirs, foundations and supporting structures, in terms of charging property tax. This issue is particularly complicated due to the number of the above-mentioned structures located at large industrial plants, as well as because of their diversification in terms of structure and function. Qualifying assets used for running a business activity to the category "structures", within the meaning of the Construction Law, results in them being subject to property tax. The categories of objects, specified on the basis of the adopted criteria, have been illustrated with examples from large industrial plants.

Keywords: construction law, property tax, industrial structures

Ewa Głowienka, Justyna Wójcik-Leń: **Application of GIS Analyses to Identify the Problematic Agricultural Areas in the Course of Land Consolidation** • Geomatics and Environmental Engineering 2015, Vol. 9, No. 4

Defectivenesses occurring in agricultural production space can be eliminated through the performance of comprehensive land consolidation and exchange works. An essential issue in Poland when proceeding with land consolidation works is that of agricultural problem areas (OPR). In the paper the authors proposed conducting a number of GIS analyses for a properly selected set of criteria connected with landform features of the village of Hłudno, based on which agricultural problem areas were isolated and visualized. As part of that research, on the basis of SRTM digital terrain model, maps of slopes, aspects and susceptibility to erosion were developed. Using relevant

re-classification procedures, proper weights (criteria) were assigned to those maps, thus providing grounds for producing a final map of types of suitability/defectiveness of agricultural space within the examined area of interest.

Keywords: GIS analyses, digital terrain model, slopes, aspects, erosion, agricultural problem areas

Krzysztof Kopciowski, Tomasz Pirowski: **Determination of Geological Linear Structures of the Low Beskids – Assessment of Suitability of Landsat 8 Satellite Images and Products of the Image Processing** • Geomatics and Environmental Engineering 2015, Vol. 9, No. 4

The paper presents the results of validity of multi-dimensional photointerpretation assignation of linear geological structures, the so-called lineaments on the area of the Low Beskids on the basis of Landsat 8 satellite data.

The methods of lineament determination on satellite images requires the re-evaluation of their suitability, due to the development of Earth image systems and the wider variety of technical possibilities to strengthen the content images. Both of these indicators may potentially influence the improvement of visual data interpretation. This paper raises an attempt to assess if, and if it is correct, which of the selected strengthening techniques of image make it possible to increase the number of lineament assignations, able to detect their progress more precisely and confirm their credibility in current geological studies.

The introduction contains an explanation of lineaments and controversies which are related to them. It contains a brief presentation of geological photointerpretation in the aspect of lithology and tectonics and a description of the research area in terms of photomorphics and geology.

The research part sets images which are used for geological photointerpretation. The following operations were conducted with the Landsat data: thresholds, quantization, filtration, selection of the coloured compositions (KB 123, KB 234, KB 247 were selected – numbering according to Landsat 5 and 7 channels systems) as well as inter-channel weighting. The course of the lineaments was determined independently on each of the datasets. Linear features of the surface were verified on the basis of current geological knowledge included in the detailed studies. On the basis of these results, the original evaluation method was prepared which connects the obtained quantitative and qualitative

parameters of assignations and the ease of interpretation. The ranking of the methods which strengthen the content images in terms of their suitability in the geological interpretation was established. The results of inter-channel weighting were acknowledged as the best complementary set of interpretative materials and were presented in the form of B coloured composition: 2/4, G: 2/5, R: 3/5, KB 247 and quantization of the close infrared channel.

Keywords: lineaments, Landsat 8, photointerpretation, validity method.

Robert Krzyżek: **Innovative Algorithm of Vector Translation Method for the Measurements of Corners of Building Structures Using RTN GNSS Technology** • Geomatics and Environmental Engineering 2015, Vol. 9, No. 4

The paper presents the results of a research experiment which involved measuring the corners of building structures in the RTN GNSS mode. The base points were determined in real time, and in order to determine the coordinates of the corners of building structures, the method of *line-line intersection* was used. The obtained values of the coordinates were modified using the algorithm developed by the author, called the method of *vector translation*. These activities yielded the Cartesian coordinates *X* and *Y* of corners of building structures, which ensured high reliability of the position of an object in the field.

Keywords: RTN-RTK GNSS, base points, measurement control, corner of a building, vector translation, line-line intersection

Zbigniew Szczerbowski, Anna Piątkowska: **Towards Data Integration and Analysis in the Detection of Terrain Surface Deformation in the Case of the Inowrocław Salt Dome** • Geomatics and Environmental Engineering 2015, Vol. 9, No. 4

Long-term geodetic observations of the terrain surface displacements show local trends in uplifts and subsidence as effects of mining and geological processes related to the salt structure of Inowrocław. Surveys have been carried out on a number of control points of the geodetic network, thus, observations provide detailed data, but limited to a small area. The application of the Synthetic Aperture Radar Interferometry (InSAR) data extending a spatial range of displacements depicted by levelling can provide a regional context of the process. The presented

combination of the levelling and InSAR (Persistent Scatterer Interferometry – PSI) data in modelling of displacements can be a good option on the condition that some of the peculiarities of the methods are considered.

Keywords: levelling method, InSAR methods, salt diapir

Michał Witkowski, Aleksander Wodyński: **Analysis of Mining Damage Notifications in Single-Family Buildings after the Occurrence of Intensive Mining Tremors**

This article analyzes the cases of notifications of mining damage to buildings in housing estates in Polkowice. They occurred after three high-energy mining tremors on 20 February 2002, 16 May 2004, and 21 May 2006. The study was carried out taking into account the differences in structural and building materials, with emphasis on damage to structural and non-structural elements.

Keywords: mining damage, mining tremors, damage to buildings