

FOREWORD

The European Environment Agency and the European Environment Information and Observation Network (EEA-EIONET) are currently developing a vision and strategy for establishing conditions for sustainable development in Europe for the period 2021–2030. The strategy prioritises knowledge that can be verified and translated into action to ensure informed decision-making on environmental and climate policy. EEA-EIONET for 2030 envisages the application of geoinformation methods (techniques and 4.0 technologies) in various fields of Earth research, building information systems oriented at mass processing of geospatial data for various purposes. The use of digitisation, including new techniques and 4.0 technologies, big data, artificial intelligence and earth satellite observations, 5G, cloud computing, edge computing architecture, and the Internet of Things. The tools used by geoinformaticians and data scientists¹ will complement, and may replace, information sources recognised to date to better support decision-making processes.

Integration of the community of geomaticians working in the field of geodesy, cartography, spatial management, construction, environmental engineering, as well as architecture and spatial planning, which for years has been practiced, among others, by the GLL Editorial Office, is necessary and will result in measurable effects in the form of a solid knowledge base.

The present issue addresses problems from various fields of science concerning geospatial analyses solved with the use of: modern surveying techniques, up-to-date methods of geoinformatic analyses, and also archival knowledge. The scope of studies includes metropolitan areas, which by 2050 will be inhabited by 70% of the world's population, as well as rural areas.

The first paper presents analyses of land consolidation works carried out in rural areas with diversified spatial structures. It assesses the influence of current land consolidation works on the creation of more favourable farming conditions. Forecasts of land consolidation works were also analysed.

¹ GEOINFORMATICS is a set of principles and analytical methods developed to process digital spatial data. DATA SCIENCE – smart processing of data that stream in real-time in large quantities and are likely to be unstructured. Accurate inference from data and extraction of hidden knowledge effectively provides competitive advantage.

The second paper aimed to assess the development of the real estate market, which dynamically imposes constant analyses of the distribution of the number of transactions and the level of real estate transaction prices. The paper presents the spatial distribution of values in real estate transactions in individual registration districts, as well as changes in the distribution of immobility values depending on the distance from the centre of Katowice.

The next paper discusses the methods of spatial analysis of land unsuitable for agriculture in rural areas that could be developed. The possibilities of assigning their specific functions in an alternative development of rural areas are considered.

The fourth paper points out the possibilities of improving the accuracy of plot boundary determination based on archival materials of the National Geodetic and Cartographic Resource.

Remote data acquisition methods, which are nowadays the basic tool of geoinformaticians, are presented in the next two articles. The fifth article concerns the acquisition and updating of data necessary for decision-making in spatial management. It diagnoses trends in land cover changes in selected municipalities of Polish metropolitan areas based on remote sensing data.

In the next one, the already widely used Numerical Terrain Model that is released by the Head Office of Geodesy and Cartography was compared to a satellite measurement. An assessment was made of the accuracy of measurements of selected points of the terrain profile obtained with GNSS observations with coordinates of points identified earlier with the use of a point cloud from the NMT.

The paper concluding this issue of GLL assesses the applicability of developed methods for predicting the rate of siltation in dam reservoirs. The method was developed on the basis of studies on small Polish reservoirs. The presented methods for predicting these processes are important for economic reasons, and can be applied in other geographical conditions.

Every piece of knowledge and every thought that was considered worthy of recording in the past has already been digitised. Every road, every house is already known thanks to current measuring techniques. Each of us leaves a trace that can be found, read and analysed. We do not yet fully understand its value. The time has now come to look to the past and build a future based on proven and actionable knowledge, enabling informed decisions on priorities and solutions that take into account social, economic, or environmental aspects in all areas of life.

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