

Geomatics, Landmanagement and Landscape

Scientific journal founded in 2012 at the University of Agriculture in Krakow



No. 2 • 2016

Editor-in-Chief Prof. dr hab. Józef Bieniek

Scientific Editor Prof. dr hab. Urszula Litwin

Editorial Board

Urszula Litwin (Krakow, Poland) – chair, Jacek M. Pijanowski (Krakow, Poland) – vice-chair,
Henryk Antoni Bryś (Krakow, Poland), Bohdan Cherkes (Lviv, Ukraine), Ryszard Cymerman (Olsztyn, Poland),
Oleksandr Dorozhynskyy (Lviv, Ukraine), Tadeusz Gargula (Krakow, Poland), Krzysztof Gawroński
(Krakow, Poland), Beata Hejmanowska (Krakow, Poland), Józef Hernik (Krakow, Poland), Volodymyr Hlotov
(Lviv, Ukraine), Jarosław Janus (Krakow, Poland), Thomas Kersten (Hamburg, Germany), Marko Komac
(Ljubljana, Slovenia), Wiesław Kosek (Krakow, Poland), Theo Kötter (Bonn, Germany), Eckart Lange
(Sheffield, UK), Hans-Joachim Linke (Darmstadt, Germany), Pingsheng Leng (Beijing, China), Yun Liu (Beijing,
China), Holger Magel (Munich, Germany), Zbigniew Piasek (Krakow, Poland), Weidong Qu (Beijing, China),
Walter Seher (Vienna, Austria), Katarzyna Sobolewska-Mikulska (Warsaw, Poland), Gernot Stöglehner
(Vienna, Austria), Karl-Friedrich Thöne (Dresden, Germany), Walter de Vries (Munich, Germany),
Zofia Więckowicz (Wrocław, Poland), Franciszek Woch (Puławy, Poland)

Topic Editors

Geomatics: Andrzej Kwinta (University of Agriculture in Krakow)
Landmanagement: Jacek M. Pijanowski (University of Agriculture in Krakow)
Landscape: Julia Gorzelany (University of Agriculture in Krakow)
Statistics Editor: Agnieszka Bitner-Fiałkowska (University of Agriculture in Krakow)
Secretary Editor: Halina Stachura
Open Acces Editor: Karol Król

Copy-editing, proof-reading, DTP: Publishing House of the University of Agriculture in Krakow Supported by the Society for Rural Development

The issue contains peer-reviewed papers

Edition of the publications is financed from the fund of the Rector of the University of Agriculture and the fund of the statutory activities of the Faculty of Environmental Engineering and Geodesy (UR) in Krakow

The journal indexed in the databases BazTech, ARIANTA, AGRIS, CABI, AGORA, Index Copernicus, ERIH Plus

Copyright © Publishing House of the University of Agriculture in Krakow, Krakow 2016

ISSN 2300-1496



Publishing House of the University of Agriculture in Krakow
31-425 Krakow, al. 29 Listopada 46
Tel.: (+48) 12 662 51 57 or 12 662 51 59
E-mail: wydawnictwo@ur.krakow.pl
www.wydawnictwo.ur.krakow.pl
E-mail: gll@ur.krakow.pl
www.gll.ur.krakow.pl

Editor sheets 7.5. Printing sheets 7.5. Issue 350 copies

CONTENTS

Foreword	5
Przemysław Baster Studies of historical modifications to the Bernardine monastery garden in Kraków as the basis for its redisign	7
Piotr Bożek, Agnieszka Głowacka, Urszula Litwin, Magda Pluta Using GIS tools to obtain elevation models for the purpose of spatial planning	19
Agnieszka Cupak, Anna Górka, Bogusław Michalec, Andrzej Wałęga Mean annual precipitation in a mountain river catchment area in the period 1984–2012 (the case of Kamienica river)	31
Bogdan Jankowicz Examining the impact of recording long-series images taken from non-metric cameras on optimisation of modelling process and 3D visualisations	41
Jarosław Janus, Mariusz Zygmunt MKSCAL – system for land consolidation project based on CAD platform	49
Ihor Mykolayovych Kovalenko The formation and structure of clones of forest herbs in ecosystems of north-eastern Ukraine	61
Zbigniew Koziara Conditions for the occurrence of selected aquatic plant species in the water bodies of the municipal park in Skawina	77
Karol Król Data presentation on the map in Google Charts and jQuery JavaScript technologies	91
Przemysław Leń, Monika Mika Analysis of the flawed spatial structure of land in selected villages of the south-eastern Poland	107

FOREWORD

It is my pleasure to recommend the next issue of scientific quarterly "Geomatics, Landmanagement and Landscape" to our readers. Representing the neighbouring faculty of Mining Surveying and Environmental Engineering of the AGH University of Science and Technology, I am very glad that the journal managed by our colleagues and friends from the University of Agriculture have been created and is rapidly developing.

The practice shows that the competition in science is a very good thing. It enables exchanges of ideas and enriches research developments. The current issue responds to the good recognition of geodetic science.

The first paper demonstrates how architectural and landscape form of convent gardens can be restored. The authors highlights the need to conduct research on history and rules of compositions regarding such objects. The study and the recomposition project are based on the research carried out in the Bernardine monastery in Krakow.

The following paper presents the application of GIS tools for building spatial models for spatial planning purposes. The various data for building DTM were analysed there. The spatial models (including free ones, e.g. Google Earth) were compared in the study.

In the third paper, the formation of rainfall in the catchment of a mountain river in decades is described.

In the fourth publication the author proposes the use of non-metric cameras for 3D modelling and visualization. The project involves both technical and precision as well as economic optimization of this process.

The use of CAD platform for the consolidation works makes the content of the next article. The authors compare such operations with those based on GIS platform.

In the sixth article, the author proposes the application of original statistical-graphics method to evaluate the accuracy of the formation and the state of clone structure of forest herbs. Research was carried out in the ecosystems situated in the north-east of Ukraine.

Analysis of the conditions of occurrence of selected plant species is the content of the next paper. Research area is artificially created bayou area of the old river basin of Skawinka. The study provides a selection of species and varieties of plants to ensure their proper development and maintaining the recreational values of this place.

6 Foreword

In the eighth article, the selected techniques and programming tools that enable the presentation of maps of statistical data are compared. Their functionality and usability from the point of view of the user is rated there.

Last publication points out to the need of improving the economic conditions of sub-Carpathian villages. The authors suggest how to overcome the difficulties resulting from the faulty village spatial structure, applying the known mutation procedures used in the rural areas.

I am sure that our readers will find in this issue interesting scientific inspirations and encouragement to the joint inter-university research.

Dr hab. Ing. Piotr Parzych, Assoc. Prof. Head of the Department of Geomatics AGH University of Science and Technology in Krakow