



UNIVERSITY OF AGRICULTURE
IN KRAKOW

Geomatics, Landmanagement and Landscape

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

GLL *Geomatics,
Landmanagement
and Landscape*

A stylized graphic element consisting of a horizontal line with a decorative flourish at the right end, positioned below the 'GLL' text.

No. 3 • 2015

Krakow

Editor-in-Chief

Prof. dr hab. Józef Bieniek

Scientific Editor

Prof. dr hab. Urszula Litwin

Scientific Board

Urszula Litwin (Krakow, Poland) – chair, Jacek M. Pijanowski (Krakow, Poland) – vice-chair,
Henryk 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), Jozef 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), Walter Seher (Vienna, Austria), Katarzyna Sobolewska-Mikulska (Warsaw,
Poland), Gernot Stöglehner (Vienna, Austria), Karl-Friedrich Thöne (Drezno, 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-Plesińska (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 2015

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. Printing sheets 6.75. Issue 350 copies

CONTENTS

Foreword.....	5
<i>Rang Abdallah</i> Geometric characteristics of iraq's raster topographic maps used for automatic updating the road network	7
<i>Bartłomiej Ćmielewski, Kazimierz Ćmielewski, Piotr Gołuch, Janusz Kuchmister, Izabela Wilczyńska</i> Measuring devices set for determining height differences in construction works ...	19
<i>Oleksandr Dorozhynskyy, Radomir Obrosłak, Yurii Stusyak</i> Research methods for improving satellite images based on pan-sharpening	29
<i>Marcin Feltynowski</i> The change in the forest land share in communes threatened by suburbanisation and the sustainable development principle	45
<i>Pelagia Gawronek, Bartosz Mitka</i> The use of terrestrial laser scanning in monitoring of the residential barracks at the site of the former concentration camp auschwitz ii-birkenau	53
<i>Anna Gontarska</i> Financial instruments of the cohesion policy in the development of regional spatial information systems in poland – the experiences of the first ten years of poland's membership in the eu	61
<i>Bogdan Jankowicz</i> The influence of recording of long-series images taken from non-metric cameras on increasing the quality of modelling objects with their surroundings	77
<i>Karol Król</i> The description and comparative analysis of chosen tools automatizing the process of creating interactive maps of spatial objects	91
<i>Alexander B. Shandyba, Dmitry M. Shpetny</i> Pollution migration forecast for soil-geochemistry mapping	101

FOREWORD

Warsaw and Krakow are very actively cooperating academic centres. A good example of this cooperation is long-term relationship between the Faculty of Geodesy and Cartography of The Warsaw University of Technology and the Faculty of Environmental Engineering and Land Surveying of the University of Agriculture in Krakow. These relations include, for some years now, co-organisation of conferences and seminars, publishing scientific monographs, articles and collaboration in various institutions, such as Międzynarodowe Forum Górskie (International Mountain Forum) or Towarzystwo Rozwoju Obszarów Wiejskich (Organisation for Development of Rural Areas). I am convinced that this Journal will also become a platform of exchange of scientific ideas and experiences between the researchers of both faculties.

This number of the GLL is devoted to broadly understood geodesy and some of its problems. The first article treats about the issue of road network extraction from raster image for automatic updating the road network. The second paper is about the measuring devices for determining height differences in construction works. The third of the presented articles elaborates on the research methods for improving satellite images based on pan-sharpening. The next one focuses on changes in the forest land areas in communes threatened by suburbanisation and the sustainable development principle. The authors of the fifth paper write about the use of terrestrial laser scanning in monitoring of residential barracks at the site of the former Auschwitz II – Birkenau Concentration Camp. The next paper is devoted to the issue of the role of financial instruments in cohesion policy of the European Union in the development of regional systems of spatial information in Poland, in the context of first ten years of Poland's membership in the EU. The seventh paper concerns the influence of recording of long-series images taken from a digital camera on the increase of the quality of modeling objects for the purposes of spatial analyses. The author of the eight paper focuses on the topic of creating interactive maps of spatial objects with embedded web resources technique. And the last article is devoted to the issue of pollution migration forecast for soil-geochemistry mapping.

I hope that this issue of Geomatics, Landmanagement and Landscape will intensify the cooperation and exchange of ideas, especially on modern geodesy, between our academic centres and will contribute to common scientific achievements.

*Prof. dr hab. Alina Maciejewska
Dean of the Faculty of Geodesy and Cartography
of the Warsaw University of Technology*