



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*



No. 4 • 2019
Krakow

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), Oleg Iwanczuk (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),
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 2019

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 17.0. Printing sheets 16.0. Issue 150 copies

CONTENTS

Foreword.....	5
<i>Henryk Bryś, Kazimierz Ćmielewski, Marek Trojanowicz</i> Precise integrated hybrid networks in 21st-century tunnel surveying	7
<i>Grażyna Gawrońska, Krzysztof Gawroński, Karol Król, Sebastian Ciesielka</i> Environmental impact assessment of the Waksmund–Ostrowsko–Łopuszna bypass construction, with particular reference to the results of public consultation process	23
<i>Józefa Gniewek</i> Attempted assessment of the collaboration between cooperative banking sector and the state administration and local self-government institutions in Poland	41
<i>Marta Gross</i> Public Real Estate Management Index – a case study of European states	51
<i>Dawid Kudas, Agnieszka Wnęk</i> Operation of ASG-EUPOS POZGEO sub-service in the event of failure of reference stations used in the standard solution – case study	59
<i>Bogusława Kwoczyńska, Wojciech Sroka, Kamila Sikora</i> Analysis of the changes to land use in selected municipalities of Lublin metropolitan area, based on remote sensing data	73
<i>Barbara Prus, Arkadiusz Nowak</i> Historical land use conversion in Kraków’s metropolitan zone	93
<i>Dawid Kudas, Agnieszka Wnęk</i> Validation of NRTK measurements with MAC solution in NadowskiNet active geodetic network	109
<i>Aneta Dacko, Mariusz Dacko</i> Size structure of individual farms in Poland between 1918–2018	123

<i>Magdalena Wilkosz-Mamcarczyk, Barbara Olczak</i> Parsonage gardens – attempted recreation of historic functional and spatial layouts	137
<i>Volodymyr Hlotov, Alla Hunina</i> Study of the method for focal length determination in digital cameras	145
<i>Bogusława Kwoczyńska</i> Modelling of a heritage property using a variety of photogrammetric methods	155
<i>Karol Król</i> Map charts: visualisation of statistical data on a background map – case study	171
<i>Krzysztof Gawroński, Karol Król, Grażyna Gawrońska, Bartosz Kubicki</i> Analysis of the development of Lublin City Bike Stations versus the economic and spatial conditions in that city	183
<i>Robert Gradka, Roksana Majdańska, Andrzej Kwinta</i> Example of historic building inventory with an application of UAV photogrammetry	201
<i>Bogusław Michalec, Mateusz Strutyński</i> Silting forecast of the planned retention reservoirs within the drainage system in Łączany	219
<i>Bartłomiej Mikołajczyk, Bogusław Michalec, Mateusz Strutyński</i> Preliminary assessment of the impact of Wrocławski Bridge in Gliwice on flood flow in Kłodnica River	231
<i>Volodymyr Mikołajowicz Hlotov, Yulia Pariichuk</i> 3D modelling of the territory of the Ukrainian Antarctic Station “Academician Vernadsky” based on large-scale topographical research	243
Instructions to authors	251
Reviewers (year 2019)	255