



**International Geographical Union  
COMMISSION ON LAND USE/COVER CHANGE**

**NEWSLETTER**

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**IGU LUCC WEBSITE**

All important information about IGU LUCC commission's activities you can find at IGU LUCC website – <http://www.luccprague.cz/>. There you can find up-to-date information about IGU LUCC commission activities, planned conferences and meetings, etc. E-mail address of IGU LUCC secretariat remains the same – [igu.landuse@gmail.com](mailto:igu.landuse@gmail.com).

*Jiří Stockmann, IGU LUCC office*

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## NEWS

Chair of the IGU LUCC Commission Prof. Ivan Bicik applies to all geographers provide information about activities in the framework of land use/cover change (LU/CC) identification, analysis and assessment by responding to these items:

*Title of the now solved project: ... /national – international*

*Role of geographers in concerned project (2-3 sentences):*

*Results and their presentation (2-3 sentences):*

Your answers will be used for summarization of LU/LC change activities of geographers in the context of IGU LU/CC and for the proposal of new activities of the IGU LUCC Commission. The **deadline** for your answers is **31<sup>st</sup> May 2015**. Please send them to Ivan Bicik ([bicik@natur.cuni.cz](mailto:bicik@natur.cuni.cz)) and Jan Feranec ([feranec@savba.sk](mailto:feranec@savba.sk)).

Thank you for your cooperation.

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## FORTHCOMING MEETINGS

### INTERNATIONAL GEOGRAPHICAL UNION REGIONAL CONFERENCE, MOSCOW, RUSSIA, 2015, AUGUST 17-21

The 2015 IGU Regional Conference will focus on five main themes:

1. Urban ecology
2. Polar studies
3. Climate change
4. Global conflict
5. Regional sustainability

The program of the 2015 IGU Regional Conference is focused on diversity and interdisciplinary dialogue. It will include the following meeting formats:

- Sessions organized by IGU commissions,
- Sessions on relevant interdisciplinary themes proposed by groups of scholars,
- Thematic sessions devoted to IGU projects and to the role of geography in international programs such as Future Earth,

- Plenary sessions and lectures by leading geographers as well as specialists from other earth sciences and the humanities, lectures by practitioners from a wide variety of fields.

The main deadlines for the International Geographical Union Regional Conference in Moscow are the following:

15 October 2014 – Deadline for submitting session proposals

01 November 2014 – Early registration begins

31 January 2015 – **Deadline** for submitting abstracts for papers and posters – **Prolongation till 28<sup>th</sup> February!!**

01 March 2015 – Notification of the results of the abstract review

20 March 2015 – Publication of the provisional conference program

10 April 2015 – Deadline for early registration fee payment

10 June 2015 – Deadline for regular fee payment

17-21 August 2015 – IGU Regional Conference in Moscow

**The IGU/LUCC Commission C12.26** submitted the proposal of a session during the Regional Conference of IGU, Moscow, Russia, 17-21.08.2015 under title “Problems and consequences of land use/land cover changes”.

The Organizers of IGU/LUCC sessions are: Professor Ivan Bičík, Charles University in Prague Ivan Bičík, Head of the IGU/LUCC Commission, and Dr. Elena V. Milanova, Moscow State University, Faculty of Geography.

The aims of IGU/LUCC Commission sessions will allow:

- to promote geographical research on land use/cover changes, at scales ranging from the local to the global;
- to stimulate the production and the use of land-use information bases of both the present and the past;
- to coordinate the comparative study and the model study of land use/cover changes and their driving forces in different regions.

The welcome **topics of presentations** are:

- Evaluation of the LUCC data, accuracy assessment
- GIS as a tool for the LUCC evaluation
- Participation on the next Atlas of LUCC development from different parts of the world
- Progress in remote sensing technics and methodology

- Driving forces in the LUCC changes in different periods of societal development
- Care for agricultural and arable land for the future
- Agricultural abandonment and increase of unproductive land – problem of developed countries
- Unproductive lands – their structure and development
- New wilderness – why, where, when

More information at <http://www.igu2015.ru/>.

*Elena Milanova*

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## **LAST MEETINGS**

### **LAND USE-COVER CHANGE COMMISSION REGIONAL MEETING, BUCHAREST, ROMANIA, 2014, JUNE 23-26**

The 2014 IGU LUCC Regional Meeting “*LAND USE-LAND COVER CHANGES AND LAND DEGRADATION (LUCC&LD)*” was held in Bucharest, Romania on June 23-26. The event was organized by the Romanian Academy’s Institute of Geography, the Romanian Space Agency – ROSA, and the University of Agronomic Science and Veterinary Medicine Bucharest. The Symposium focused on land use and land degradation related to soil erosion, landslides, desertification and climate change. The topics also included land-use transformations connected with economic, social and political changes.

The Symposium gathered nearly 40 researchers from the European countries (the Czech Republic, Bulgaria, Romania, Austria, Italy, and Russia) and Australia and the following institutions: *Al. I. Cuza* University of Iași, Department of Geography, Romania; *Charles* University, Faculty of Science, Czech Republic; Danube Delta National Institute for Research & Development, Romania; Esri Romania, Bucharest; Help Service Remote Sensing, Czech Republic; National Agricultural Research and Development Institute, Romania; the Romanian’s Academy Institute of Geography, Romania; International Institute for Applied Systems Analysis (IIASA), Austria; Moscow State University, Faculty of Geography, Russia; National Institute of Geophysics, Geodesy and Geography, Bulgaria; Remote Sensing Application Center - ReSAC and Agency for Sustainable Development and Eurointegration – ASDE, Bulgaria; Romanian Space Agency – ROSA, Romania; Transilvania University of Brașov; University of Agronomic Science and Veterinary Medicine Bucharest,

Romania; University of Bucharest, Faculty of Geography, Romania; University of New England, Australia.

The symposium was organized into a plenary session and three paper sessions. The two plenary session papers were presented by Prof. Ivan Bičík (Chair of IGU Commission on Land Use and Cover Changes) and by Prof. Dan Bălteanu (member of the steering committee of IGU Commission on Land Use and Cover Changes).

The participants discussed problems of land use-land cover changes in Czechia, as well as along the Romanian Danube Valley, in the Oltenia Plain, in the Buzău County, in the Subcarpathian Watershed of the Argeșel River, in Regional Australia, and in the steppe region of Russia; agrolandscape methodology of LUCC study; assessment of the agricultural spatial-temporal patterns in the Romanian Flood Plain; land degradation in a salt mining area, the Curvature of the Central Moldavian Plateau, the Curvature of the Subcarpathian region; the dynamics of built-up areas in Bucharest Metropolitan Area.



Photo. 1. Plenary Session, Institute of Geography, Romanian Academy



Photo. 2. Institute of Geography, Romanian Academy

After the Conference, a field trip was organized on June 23-26. The field trip represented a transect through the Romanian Plain, the Hilly Region of the Subcarpathians and the Carpathian Mountains. In the post-communist period these regions have registered transformations such as land use-land fragmentation, land abandonment, land degradation and deforestation. The field trip followed Land-use changes in the Bucharest Metropolitan Area, Agricultural land use in the Bărăgan

Plain, Land use and soil erosion in the outer Subcarpathian area, Land use and cover changes in the Curvature Carpathians and Subcarpathians, Land use in the mountain area and mudflows, impacts on infrastructure, Land use and land degradation in the Buzău mountain area, Land use and deforestation/afforestation in the Braşov Depression.

### Field trip, June, 23-26



Photo. 3. *Moara Domnească* Didactic Farm, University of Agronomic Science and Veterinary Medicine Bucharest



Photo. 4. Land degradation in the Bend Subcarpathians

*Dan Balteanu*

### IGU REGIONAL CONFERENCE IN KRAKÓW, POLAND, 2014

IGU Regional Conference was held in Kraków in August 18-22, 2014. Preparing of programme had started of course long time before the start of conference – each IGU commission should decide about its content. The key was decision which participants should be speakers in each land-use/cover changes commission's sessions, what will be recommended in poster section and which papers are not suitable to commission's activities. In the very first round it was necessary to take decision on about 50 papers; our commission also had to decide (according to wishes of organizers) on several papers, which were "lost" or incorrectly submitted in other IGU commissions.

Land use/land cover topics under the heading of LUCC commission were finally presented in five thematic sessions:

1. Land Use Changes in Metropolitan Areas
2. Historical/Dynamic Changes of Land Use
3. Landscape (re)Construction
4. Land Use of Towns and Villages
5. Natural Changes by Human Activity I, II, III

According to their abstracts finally ca 55 papers were divided into these sessions. Another 23 applications we recommended to present as posters. Unfortunately we also had to refuse 7 applications. Because of high number of planned papers some sessions were divided into several separate parts. Therefore commission meetings organized in the new and beautiful Campus of Jagiellonian University (in Central Europe the second oldest after Charles University) were realized in 7 separate sessions.

Moreover land-use theme was presented in another thematic sessions focused on local and regional development, natural hazards, sustainable development of rural regions etc. We can summarize that land-use matters analyzed by different methods and technics is one of the very supporting tendency of contemporary geographical research.

The quality of papers was comparatively very good. There were presented papers from about 20 countries, focused mainly on small regions; topics focused on large territories were presented rarely. Main part of papers deals with description and land-use development rather than searching of driving forces. About one third of papers took advantage of opportunities to link with other research from physical and social geography or from history to make a synthesis about researched regions with impact in theoretical and application level.

The host university provided not only good weather, field trips, but also great culinary experience for all participants in beautiful Jagiellonian University and magical city of Kraków.

Apart from thematic sessions IGU LUCC steering committee had organized a business meeting to review its activity and to discuss its plans for 2015 and 2016. Discussion of 10 participants (thereof 5 contemporary or former committee members) realized into several recommendations:

1. As an IGU LUCC commission vice-chair was named prof. Jan Feranec (Institute of Geography of Slovak Academy of Sciences, Bratislava, Slovakia) with the aim of deeper connection of LUCC commission with IGU commissions focused on Earth observation and regional development.
2. Another commission's meeting will be during Regional Geographic Conference in Moscow 2015. Also it is discussed possibility to organize the second seminar during autumn 2015 (Sofia – Bulgaria?)
3. There was also discussion about possible common project focused on LUCC and supported by international funds ICSU.
4. Atlas LUCC Volume IX was prepared in Prague again and its distribution started in September 2014, partly in Kraków.
5. Preparation of further Atlas of World Land Use. Volume X, XI will be published by IGU/LUCC commission in Japan (Asahikawa) and in Czechia (Prague) under supervision of prof. Hymiyama and prof. Bičík.
6. Continuation of collaboration with SCERIN activity (= NASA and ESA seminar and training of young scientists from Central and East Europe; 2012 – Sofia, 2013 – Prague, 2014? 2015?).
7. Preparation of IGU Newsletter 2013/2014.
8. Actualization and filling of website IGU/LUCC <http://www.luccprague.cz/igu.landuse@gmail.com> - address for corresponding.
9. Creation of networks with other group of scientists engaged on LUCC state and changes (ESEH, PECSRL, IALE etc.).
10. Organizing and support of macro-regional and national meetings oriented on LUCC activity.

*Ivan Bičík*

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## **PUBLICATIONS**

### **Land use/Cover Changes in Selected Regions in the World**

BICIK, I., HIMIYAMA, Y., FERANEC, J., KUPKOVA, L. (eds.)(2014): Land Use / Cover Changes in Selected Regions in the world: Volume IX. IGU/LUCC, Faculty of Science, Charles University in Prague and Hokkaido University of Education, Asahikawa

## **Preface of Atlas, Volume IX**

Thanks to Professor Himiyama's effort, the first Volume of the LUCC Atlas was created 14 years ago. It was a special publication by the land use/cover commission of the IGU (Land Use/Cover Changes in Selected Regions in the World. Volume I, IGU/LUCC Research Reports, Asahikawa, Japan, 2001). I consider this act of momentous importance as in the following years, it made possible to follow up the effort. Until now, thanks to the editing work of members of the IGU/LUCC commission nine Volumes have been published. You have just opened the latest one. In the course of the past 14 years, we have several times discussed whether this activity, ensured by several projects in Japan and Czechia, has a meaning in the form of a printed atlas with a large format or whether it might be better to only provide the work in electronic form. So far, the view has always prevailed in the discussions of the IGU/LUCC commission that it is better to keep a large atlas in a paper form. As you just have in your hands its Volume IX, the concept seems to have both its authors and subscribers. In fact, about 200 copies of each Volume have been published that have reached virtually the whole world. The presented Volume IX was created during 2013 when we received the contributions agreed on at the meeting of the LUCC congress in Cologne in 2012. It was also thanks to subsequent appeals that appeared in the Newsletter published by the IGU/LUCC commission and also on the commission's website ([www.lucc.prague.cz](http://www.lucc.prague.cz)). We managed to gather 11 contributions from six countries in the form consistent with the editors' demands. After an agreement with authors, another three contributions on which the work still continues will be finished in 2014 and they will serve as a basis for another Volume prepared in Japan by Yukio Himiyama (Volume X) or chairman of the IGU/LUCC commission Ivan Bičik in Prague (Volume XI). With these opening words, we call on, among others, everyone interested in publishing in some of the next Volumes of this Atlas to turn directly to IGU/LUCC Vice-President Yukio Himiyama to Japan ([himiyama.yukio@a.hokkyodai.ac.jp](mailto:himiyama.yukio@a.hokkyodai.ac.jp)) or the commission's chairman Ivan Bičik to Czechia ([bicik@natur.cuni.cz](mailto:bicik@natur.cuni.cz)).

Similarly to the previous ones, this atlas, too, was created in the form of a monograph analysing landscape changes evaluated by various methods and in different time spans. The landscape changes document a continuing diversification of land use. On the one hand, sprawling areas of a significantly transformed landscape with specific functions of a modernising industrial and postindustrial society are in the making. On the other hand, a large portion of a previously economically used landscape is being returned to its natural functions in advanced countries. This is manifested both by a growing area of woodland on less fertile areas that were

formerly used for agriculture and by the abandonment of small sections of landscape used by man where human society stopped farming it and where a “new wilderness” is being formed. Some studies of landscape changes have highlighted the new various functions demanded from landscape by the development of human society. These are manifested gradually, by a change in the structure of use of a landscape with a specific function.

*Ivan Bičik*  
*Head of the IGU-LUCC Commission*

## **Content of Atlas, Volume IX**

### **Sebastian Eiter, Wendy Fjellstad, Grete Stokstad (Norway): Agricultural landscapes of Norway: Farmland continuity and change, and their driving forces**

In their contribution, the authors evaluate changes in farming, using seven small territorial units in the country’s peripheral zones between the mid-1960s and mid-1980s, and the current state. They used the method of a comparison of available aerial photos from the former years and the current state based on a field and questionnaire survey. The authors divided about 60 established driving forces into six main groups: economy, rules and regulations, technology, society, natural conditions and personal situation. In the end, they document patterns of land use changes, losses of farmland, newly cultivated land, non-agricultural land use and driving forces.

### **Luca Simone Rizzo, Raffaella Gabriella Rizzo, Paolo Tizzani (Italy): The impact of anthropogenic land use changes on the ecological quality of (selected) areas in Northern Italy**

Similarly to other European countries, in Italy, too, one can observe large-scale changes in the structure of land use. This is mainly caused by an economic pressure causing the abandonment of arable and agricultural land in less suitable, primarily natural conditions for farming, followed by technological changes in the agriculture itself and of course by a pressure of society on new functions of certain parts of landscape (housing, stores, technological infrastructure, etc.). A part of the abandoned agricultural land is being turned into woodland (+ 6% and + 9% in both CLC periods) in the Veneto region that one can see in most European countries (Mather’s theory of forest transition). The Italian authors focused on the Veneto region (the Verona and Vicenza provinces) with which they document the processes of landscape transformation between 1990 and 2006, as analysed by means of remote sensing of the Earth, with the use of Corine Land Cover.

**Lucija Ažman Momirski, Matej Gabrovec (Slovenia): Changes in land use in the Mediterranean terraced landscapes between 1819 and 2012: The case of two selected villages in Slovenia**

The Slovenian authors present an analysis of the Slovenian areas adjacent to the Mediterranean Sea that always in the past distinguished themselves with a specific type of agriculture, primarily focused on the production of fruit, wine and olives. For their study, they used the example of two villages in terraced slopes of varying altitudes, based on analyses gained by LIDAR, which enabled a very accurate positioning of terrain regulations. They also made use of detailed maps of the Franciscan Cadastre (1:2,880). The two model regions provided data for similar conclusions with regard to the longterm land use changes in 1829/1835 and 2012. These were abandonment of agricultural land (both arable and permanent grassland), a growth in woodland and, in general, considerably lower intensity of land use. This trend is typical of a majority of European countries and is one of the preconditions of the continuing differentiation of landscape. In this case, it is a sort of return of the model regions to rather natural functions of their landscape.

**Samuel Babatunde Agbola, Oluwasinaayomi Faith Kasim, Mosunmola Olufunmilayo Coker (Nigeria): Dynamics of land use and land cover change in Ibadan region, Nigeria**

This is the only contribution to this Volume coming from outside Europe. It documents momentous and accelerated changes in land use/cover in the countries with belated social and economic development, using the example of Ibadan, a metropolis of Nigeria. The authors chose the comparison of three key categories of land use: built-up areas, vegetation cover and water bodies of the town in 1984, 2002 and 2013, with which they describe characteristic trends of land use/cover changes. The contribution documents an obvious need of information on the state and development of land use for the implementation of acceptable development of such a large city as Ibadan. Increasing population number, growth in economic importance and political status are the driving forces of its development.

**Monika Kopecka, Rumiana Vatseva, Jan Feranec, Jan Ořáhel, Konštantin Rosina: Urban land cover changes: Case studies Trnava (Slovakia) and Burgas (Bulgaria)**

A comparison of the development of land cover between two towns in Slovakia and Bulgaria (Trnava and Burgas) in the first decade of the 21st century was made by researchers from the institutes of geography of the Slovak and Bulgarian academies of science. The authors tried to analyse the three processes that are most characteristic in the urbanized areas. These are as follows: increase in the extent of a built-up area (urban extension), transformation of the structure of the town itself

with regard to the relations between the grassland and built-up areas (urban infill), and, finally, other changes that are not covered by the former two processes (other urban changes).

**Dušan Šebo, Jozef Novaček (Slovakia): Case study areas Pruske, Bohunice, Vršatske Podhradie and Krivoklat: Land cover changes 1949–2009**

The authors targeted their research into landscape changes by means of a land cover analysis at three important data: 1949, 1986 and 2009. The former two are based on aerial photographs, the third on LCL data. The small territorial units under observation distinguish themselves with quite a differing altitude that is, along with slope inclination, fertility and distance of an area from a municipality, one of the main “driving forces”. The authors document an important influence of changes in landscape functions on the basis of natural conditions that provide various economic results in landscape use.

**Branislav Olah, Igor Gallay, Zuzana Gallayova, Martin Boltžiari (Slovakia): Recent transformation of the Slovak cultural landscape**

This contribution aims to describe changes in Slovakia’s cultural landscape that underwent three stages of different social and economic development in its history. These were the transformation of a feudal society into a market society in the 19th century and the first half of the 20th century. After 1948, the capitalist system gave way to a central planning system that was replaced again with a market system after 1990. These vital changes have been translated into a varying development of landscape structures and land cover also when the years 1990, 2000 and 2006 are evaluated by means of CLC. The authors deal with the assessment of these changes in Slovakia’s very diversified landscape in four landscape types: the lowlands (27% of Slovakia’s area), basins (14%), valleys between mountains (7%), and mountains (52%). A detailed analysis of three model areas of different locations and development of landscape is added to this general look at landscape changes in the whole of Slovakia.

**Marian Žabensky, Michala Dubska (Slovakia): Land use development in Slovakia from the 17th to the 20th century: Case study area of Bojnice**

The author concentrated on the landscape changes in the vicinity of one of the most visited castles of Slovakia. He analyses the details of landscape changes, including construction interventions in the castle compound in various eras. He also assesses the main “driving forces” which contributed to the changes.

**Marketa Šantrůčková, Lucia Bendikova (Czechia): Assessment of land use changes in landscape conservation areas based on LUCC database**

Another two authors from Czechia devote their interest to land conservation areas (LCA). They present unusual sections of the landscape as these are mainly the areas associated with their historical and cultural importance, protected by the Czech Culture Ministry. Their analysis of the time extent of landscape changes is quite large as they monitor it in 1845, 1948, 1990 up to 2000, making use of the databases prepared at the Faculty of Science of Charles University in Prague ([www.lucc.ic.cz](http://www.lucc.ic.cz)). They consist of seven categories registered by the Czech Office for Surveying, Mapping and Cadastre. They work with five newly formed LCAs that have a smaller dimension than territorial units of the LUCC database.

**Jaromir Kolejka, Martin Klimanek (Czechia): The process of transition from industrial to post-industrial society identified in land use and land cover data: Case of the Czech Republic**

In the first contribution focusing on northwestern Bohemia, the authors examined recent transformations of its landscape associated with the transformation of an industrial society into a postindustrial one. Czechia's lagging behind the "normal" development of Western European countries, that was due to the influence of centrally commanded society from 1948 to 1990, brought about a very dynamic change in the landscape in the past quarter of a century. The chapter focuses on the case of Czechia and in it, on the area most affected by large-scale mining and industrialisation and subsequently dynamically changed: the Usti Region in northwestern Bohemia.

**Jan Pacina, Kamil Novak (Czechia): Lake Most – how can a royal town be turned into a lake: Georelief analysis 1938–2012**

The paper focusing on northwestern Bohemia examines the transformation of the Most region landscape. In Czech history, Most was an important royal town, a natural centre of a fertile agricultural area alongside the Bilina River. After brown-coal mining was started here, it became a natural centre of a rapidly developing industry and it provided housing to thousands of miners. The transition from underground to open-cast mining put an end to the historic town and its hinterland. The new Most was built about two kilometres to the south, on the opposite side of the town symbol: the Hněvín Hill. At present, a part of the zone of former open-cast mines is being reclaimed. It has been transformed into a dry polder, a lake, a motor racing track, a recreational zone with a horse racing stadium and even into agricultural land (vineyards).

*The Volume IX was prepared in cooperation with the P3K publishers (www.p3k.cz) to which we thank for wonderful cooperation and an excellent result as in the case of previous atlases published in Prague (V, VII).*

### **Land use/Cover Changes in Selected Regions in the World – Next Volumes**

**!** *We kindly ask all researchers, who are interested in LUCC problematic, to contribute with their papers to next Volumes (X, XI...). In case of your interest please contact chair of IGU LUCC commission Ivan Bičík (bicik@natur.cuni.cz). Next Volumes are planned to be published in 2015.*

Articles requirements:

- a) The article has to be focused on Land Use/Cover Changes topics analysed by remote sensing or by statistical data; text and figures/maps should be in the equal extent.
- b) Theme of the paper should not cover only some landscape detail, but it could be analysed in larger consequences and considering larger area (administrative region, state, river basin etc.).
- c) We accept papers from all countries in the case they fulfil scientific and technical requirements (high resolution of figures/maps).
- d) Editors send papers for review and after that the papers are accepted for publishing; or they are sent to authors for adjustments according to review.
- e) The extent of text in English language is 10 – 12 pages (font Times New Roman, line spacing 1,5), graphical supplements (maps, figures, photos, diagrams etc.) are in the same extent.

### **LUCC Commission activities at the Institute of Geography, Slovak Academy of Sciences for the latter part of 2013 and 2014**

#### Identification and assessment of landscape changes in Central Europe

Results are published by: Feranec, J., Soukup, T., Taff, N. G., Stych, P., Biciik, I.: *Overview of changes in land use and land cover in Central Europe* (the text and seven general maps: Spatial distribution of URBANISATION; INTENSIFICATION of agriculture; EXTENSIFICATION of agriculture; AFFORESTATION; DEFORESTATION;

WATER BODIES CONSTRUCTION; OTHER CHANGES in Central Europe for the periods 1990-2000 and 2000-2006); the chapter prepared for the book: Gutman, G. (Editor): *Land cover and land use change in Eastern Europe 1990-2010: Impacts of the breakup of the Soviet Union*. The book would be published by Springer.

The chapter presents an overview of landscape changes (spatial distribution and intensity) in Central Europe (17 countries: Albania, Bosnia/Herzegovina, Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Kosovo, Latvia, Lithuania, Macedonia FYR, Monte Negro, Poland, Romania, Serbia, Slovakia, and Slovenia) during the periods 1990-2000 and 2000-2006, as well as a mapping methodology useful for presenting landscape changes on a macro-scale. The area of identified land use/cover change (LUCC) in 1990-2000 was approximately 2,197 km<sup>2</sup>, and in 2000-2006 it was approximately 1,386 km<sup>2</sup>, out of the study area comprises 17 Central European countries with a total area of approximately 1,340,000 km<sup>2</sup>. Most prevalent changes occurred as afforestation and deforestation, totalling 54.5% of the whole LUCC area in 1990-2000 and 72.0% of the whole LUCC area in 2000-2006. More comprehensive analyses of territorial differentiation and evaluation of driving forces could be developed based on obtained results and LUCC maps.

#### Semantic similarity between land cover classes

Results are published by: Feranec, J., Solin, L., Kopecka, M., Otahel, J., Kupkova, L., Stych, P., Biciak, I., Kolar, J., Cerba, O., Soukup, T., Brodsky, L. (2014). Analysis and expert assessment of the semantic similarity between land cover classes. *Progress in Physical Geography*, 38 (3), 301-327.

Assuming that data of various databases are often used in search for solutions to environmental problems, it is necessary to know what classes of different databases and to what extent are similar, in other words, their possible compatibility and interchangeability. The study demonstrates an expert assessment of the potential similarity between the CLC and NLCD nomenclatures. The results obtained there transmit the similarity assessment accomplished by four experts who marked the degree of similarity between the compared LC classes by 1 (almost similar classes), 0.5 (partially similar classes) and 0 (not similar classes).

#### Spatial determinants of abandoned arable lands and grasslands in Slovakia

Results are published by: Pazur, R., Lieskovsky J., Feranec, J., Otahel, J. (2014). Spatial determinants of abandonment of large-scale arable lands and managed grasslands in

Slovakia during the periods of post-socialist transition and European Union accession. *Applied geography*, 54, 118-128.

Agricultural land abandonment is particularly wide-spread in the post-socialist Central and Eastern European countries, where the adoption of a market-oriented economy after the era of socialism and the implementation of EU policies during and after the EU accession process were the greatest challenges of recent decades. In this study was performed the first nation-wide analysis of abandonment of large-scale arable land and grassland in post-socialistic countries. On country-wide and region-based level was identified locations that assessed the abandoned in the transition period (1990-2000) and in the EU accession period (2000-2006) by specific conversions of CORINE land cover classes. Areas of stable and abandoned agricultural fields were integrated with biophysical, distance and demographic determinants that hypothetically influence the agricultural land change. Performed logistic regression estimations on national-wide and region-based samples showed high probabilities of abandonment occurrence on fields with lower soil quality located on less accessible areas closed to non-farmed land. During the transition period the abandonment in rural areas was also largely influenced by the migration and changes of population structure.

#### More detailed mapping of urban areas using high-resolution remote sensing data

Results are published by: Vátseva, R., Kopecka, M., Feranec, J., Rosina, K. (2014). Classification of urban areas by geographic object-based analysis of very high resolution remote sensing data. *South-Eastern European Journal of Earth Observation and Geomatics*, 3(25), 671-675 (e-journal).

Proposed extended classification of urban land cover is compatible with CORINE Land Cover. It is demonstrated through the case studies of Trnava (Slovakia) and Burgas (Bulgaria) that are quite representative areas for a wide range of urban land cover at multiple scales. The advantage of the developed nomenclature is that it can be easily generalized and it is easy to adapt to appropriate scales. The object-based image analysis is an effective approach for generating highly detailed urban land cover maps. The main guidelines of criteria for evaluation of urban geographic objects are accepted and presented in the paper. The obtained results provide a reliable spatial data for the urban environment at regional and local level.

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