



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

**NEWSLETTER**

No 18

February 2016

---

**IGU LUCC STEERING COMMITTEE 2012-2016**

**Prof. Ivan Bičík (chair)**

Department of Social Geography and Regional Development  
Faculty of Science, Charles University in Prague  
Albertov 6, 128 43 Prague 2  
Czech Republic  
Tel: +420-221951380  
Fax: +420-2-24919778  
bicik@natur.cuni.cz

**Prof. Ján Feranec (vice-chair)**

Institute of Geography  
Slovak Academy of Sciences  
Stefanikova 49, 814 73 Bratislava  
Slovakia  
Tel: +421-2-57510219  
Fax: +421-2-5249 1340  
feranec@savba.sk

**Prof. Dan Balteanu**

Institute of Geography  
D. Racovita 12, 023993  
Sector 2, Bucharest  
Romania  
Tel: +4 021 313 59 90

Fax: +4 021 311 12 42  
dancbalteanu@gmail.com

**Dr. G.S.Chauhan**

University Grants Commission  
Central Regional Office  
Tawa Complex, Bittan Market  
E-5 Arera Colony, Bhopal-462016  
India  
Tel: (+91)0755- 2467418, (+91)0755- 2467892  
Fax:(+91)0755- 2467893  
chauhanugc@gmail.com

**Prof. Matej Gabrovec**

Anton Melik Geographical Institute  
Department of Geographic Information Systems  
P. B. 306, SI-1001 Ljubljana  
Slovenia  
Tel: +386 1 470 63 60  
matej@zrc-sazu.si

**Prof. Ernan Rustiadi**

Center for Regional Systems Analysis, Planning and Development (CrestPent)  
Bogor Agricultural University  
Damarga Campus 16001 Bogor  
Indonesia  
Tel: +62 251 374 055  
Fax: +62 251 374 055  
ernan@indo.net.id

**Prof. Helmut Geist**

School of Geosciences  
University of Aberdeen  
Elphinstone Road, Aberdeen, AB24 3UF  
Scotland, UK  
Tel: +44 (0) 1224 272 342  
h.geist@abdn.ac.uk

**Prof. Chandra P. Giri**

U.S. Geological Survey Earth Resources Observation and Science Center  
Sioux Falls, SD 57198  
USA  
Tel: (605) 594-6903  
Fax: (605) 594-6529  
cgiri@usgs.gov

**Prof. U. A. Chandrasena**

Department of Geography, Faculty of Social Sciences  
University of Kelaniya  
Sri Lanka  
uac\_c@yahoo.com

**Prof. Koichi Kimoto**

Department of Liberal Arts  
Hiroshima Jogakuin University  
Japan  
kx.7.koichi@gmail.com

**Dr. Luca S. Rizzo**

Department DISSGeA - section: Geography  
University of Padua  
Via del Santo 26, Padova, 35123  
Italy  
Tel: 0039 348 30 39 718  
lucasimone\_rizzo@libero.it, lucasimone.rizzo@unipd.it

---

**IGU LUCC WEBSITE**

Because of problems with re-registration our domain luccprague.cz has not been prolonged and does not belong to us anymore. Thus, commission does not have own website right now. But we presume that after vote of new commission's chair in IGC Beijing 2016 brand new IGU LUCC website will come into being. Nevertheless, e-mail address of IGU LUCC secretariat still remains the same – [igu.landuse@gmail.com](mailto:igu.landuse@gmail.com) (at least until the vote of the new chair).

*Jiří Stockmann, IGU LUCC office*

---

## NEWS

### **Future changes in IGU LUCC steering committee and vote of the chair of the commission during IGC Beijing 2016**

As you probably know, election period of actual IGU LUCC steering committee slowly comes to the end. During 33<sup>rd</sup> International Geographical Congress in Beijing, China (August 2016) the changes in steering committee will be done. Our commission will continue in its mission, but steering committee for period 2016–2020 will be partly modified, included vote of the new chair – prof. Bičík is in this function 10 years and according to the IGU rules he can't be re-elected.

Therefore, if you want to continue as a member of steering committee (or become a new committee's member), please send us your brief CV (maximum of 4000 characters), or please send this information to your colleagues who are interested in IGU LUCC activities. Also send us summary of at least 7 your publications which you value most and which have been published since 2007. Please send it to Ivan Bičík ([bicik@natur.cuni.cz](mailto:bicik@natur.cuni.cz)) and Ján Feranec ([feranec@savba.sk](mailto:feranec@savba.sk)).

Thank you for your cooperation.

*Jiří Stockmann, Ivan Bičík*

---

## FORTHCOMING MEETINGS

### **2ND EARSEL SIG LU/LC AND NASA LCLUC WORKSHOP “ADVANCING HORIZONS FOR LAND COVER SERVICES ENTERING THE BIG DATA ERA”, PRAGUE, CZECH REPUBLIC, 2016, MAY 6-7**

IGU Commission on Land Use and Land Cover Change will join workshop “Advancing horizons for land cover services entering the big data era” organized in Prague, Czech Republic in May 6–7th 2016. This workshop is a chance to involve IGU/LUCC into wider scientific network.

The 2nd EARSEL SIG LU/LC and NASA LCLUC joint Workshop is considered supportive to the objectives of the imminent following ESA Living Planet Symposium 2016 on 9–13 May 2016, as a brainstorming preparation and chance for specialists to formulate a common understanding and language prior to entering the wider discussions of the more diverse audience; in matters of background and expectations from land-cover products and the scientific community.

The Workshop is organized around four representative sessions, covering the latest advances; trending activities and future challenges in land-cover services in the big data era. Eight (8) renowned keynote speakers will guide a vivid discussion, while contributions are attracted among the key enabling actors of Earth Observation in Europe (e.g. EEA and ESA), USA (e.g. NASA) and the World (e.g. GEO). The four sessions are:

1. Harmonization of Sentinel-2 and Landsat products
2. Mapping Land Cover and Land Use with cross-scale and cross-sensors approaches
3. Challenges of Land Cover and Land Use Monitoring with Dense Time Series of EO Data
4. EO benefits for ecosystem services and human wellbeing

IGU/LUCC commission will organize a special **thematic excursion** to Prague surrounding after this workshop on Sunday **8th May 2016** (from 8:30 till 17:00) named "25 years of transitional changes of the LUCC around Prague". The excursion fee is EUR 25 (it will be paid at the opening of the conference and covers travel and excursion lunch). Please send your registration for the excursion to professor Ivan Bičík ([ivan.bicik@natur.cuni.cz](mailto:ivan.bicik@natur.cuni.cz)).

More info at <https://web.natur.cuni.cz/gis/lucc/>.

*Ivan Bičík, Přemysl Štych*

## **INTERNATIONAL GEOGRAPHICAL CONGRESS, BEIJING, CHINA, 2016, AUGUST 21-25**

The theme of the 2016 Congress is Shaping Our Harmonious Worlds, which highlights today's common pursuit for harmony between humankind and nature, between environment and society, and for harmonious approaches to the world's hazards and conflicts. Under this theme, five Congress key topics will be focused, parallel to the quadrennial meeting of the IGU commissions and task forces. In addition, a rich variety of field excursions will be organized so as to provide participants a chance to appreciate some of the unique natural features and cultural traditions of this ancient and modern country (*source: [www.igc2016.org](http://www.igc2016.org)*).

There will be **5 thematic sessions** organized by Land Use and Cover Change Commission during IGC in Beijing:

- 1) Comparative Study on Land Cover and Land Use Change (LCLUC) and Their Driving Forces in Different Regions

- 2) Evaluation of Dominant Trends of Human Impact On Land Use/Land Cover (LU/LC) Changes as in Multi-Levels (/State as Regional and Local Levels)
- 3) Policies and Economic Conditions Impact on Urban, Agricultural and Forestry Landscapes Change
- 4) Land Use/Land cover (LU/LC) Change Mapping in Multi-Scales: Data and Methodology
- 5) Land Cover/Land Use Databases and Data Sharing

The organizer of IGU/LUCC sessions is prof. Ivan Bičík, Charles University in Prague.

Important dates:

**31 March 2016 – deadline for abstract submission**

30 April 2016 – notification of acceptance

15 May 2016 – deadline for early registration

15 July 2016 – deadline for regular registration

After 15 July 2016 – late registration

More info at official website: [www.igc2016.org](http://www.igc2016.org).

*Jiří Stockmann*

## **CLIMATE CHANGE AND ANTHROPOGENIC IMPACTS ON ECOSYSTEMS IN SCERIN SCERIN-4 CAPACITY BUILDING WORKSHOP**

**Date** SCERIN-4 Workshop: July 18-22, 2016, Trans-Atlantic Training (TAT): July 23-25, 2016

**Location** SCERIN-4 will take place 18-22 of July in Zvolen, Slovakia and will be hosted in collaboration by a partnership among three Slovakian institutions. The Slovakian National Forest Centre (where the meeting will be hosted), the Slovak Academy of Sciences and the Technical University in Zvolen

The capacity building workshop SCERIN-4 will focus on the current LCLUC challenges in the SCERIN region connected with climate change and anthropogenic influence on ecosystems, addressing their significance and influence on ecological and social processes and ecosystem functioning. The meeting will have capacity building focus and will be held in coordination with a Trans-Atlantic Training (TAT4), jointly organized by NASA, ESA and START for graduate students and young professionals usually together with SCERIN meetings.

### **SCERIN-4 Goals and objectives**

Through working sessions and discussions during the four days' workshop, the SCERIN-4 participants will review the recent research accomplishments in the LCLUC research area, GOFC-GOLD and GEOSS, and will:

- outline progress on the peer review papers initiated in SCERIN-3, and foster new ideas for joint manuscripts by participants, and
- address in the working sessions specific issues/needs in LCC characterization in the region of South, Central and Eastern Europe (SCE).

The objectives of the SCERIN-4 workshop include:

- 1) Inform about ongoing major scientific efforts and projects with possible contribution and follow-up activities of the SCERIN participants.
- 2) Outline the specific land-cover and land-use change research, applications and development needs in the SCE region.
- 3) Address SCE priority topics, with focus on '*Remote sensing in forest management and administration*', '*Monitoring of protected areas*', and '*Assessment of forest disturbance*'.
- 4) Review the requirements and availability of satellite data, products, and approaches for land cover monitoring in SCE.
- 5) Provide forum and opportunity for the SCERIN Focus Groups (FGs) oriented to the above defined topics to resolve specific issues to enhance capacity building in the region.

*Lucie Kupková*

---

## **LAST MEETINGS**

### **ANNUAL MEETING OF THE IGU LUCC STEERING COMMITTEE DURING IGU REGIONAL CONFERENCE, MOSCOW, RUSSIA, 2015, JULY 17-22**

During the IGU regional conference there was held also the meeting of the IGU LUCC steering committee. Four members of the committee were present (I. Bicik, Czechia, J. Feranec, Slovakia, D. Balteanu, Romania, M. Gabrovec, Slovenia) and they discussed results of IGU LUCC commission in the last years; but very important part of the meeting also consisted of discussions on the future work of the commission.

When we look at the **commission's activities in the last years**, they can be summarized into five main groups:

- Regular participation and coordination of LUCC topics in regional conferences and world congresses
- Organizing LUCC seminars (almost) each year – last one was realized in Bucharest (Romania) in 2014, previously in Prague (Czechia) in 2013, 2012 etc.
- Preparation of eleven volumes of atlases “Land use/Cover Changes in Selected Regions in the World” in cooperation with prof. Himiyama (from 2001 till 2015)
- Reviewing of books, articles for scientific journals
- Some members of the commission were very active in (inter)national seminars caring topics oriented on the LUCC.

But there is always way how to intensify and improve commission’s activities. It will be the main task for renewed steering committee with a new chair, because topics of the LUCC are very important from a scientific point of view as well as from application reasons. Long-term interest in LUCC topics in contemporary research is clearly depicted in the table below:

*Tab. 1: Chosen terms in abstracts and key words in articles in Web of Science and Scopus databases (1970- 2010)*

Database	Key words	1970	1980	1990	2000	2005	2010
Web of Science	Landscape ecology			21	114	119	177
	Landscape metrics				15	57	74
	Land use	65	132	228	1350	2563	4335
	Land cover		3	28	361	810	1267
Scopus	Landscape ecology			15	159	174	408
	Landscape metrics				13	60	73
	Land use	19	48	256	1456	2373	4102
	Land cover		1	9	295	603	1119

*Source: Balej, 2012*

As a base for discussion about activities of the IGU LUCC commission in the future, prof. Bicik and prof. Feranec prepared **scheme of activities in 2016-2020** (to be discussed during IGC Beijing 2016), which can be focused on six main aims:

- 1) More intensive cooperation
  - a. Collaboration must be more intensive at universities and research institutes as well;



- b. It is necessary to strengthen international contacts for preparing international research project, supported by sources from the EU and others;
  - c. Besides IGU Conferences there should be organized special LUCC seminar annually zoomed on actual topics;
- 2) Evaluation of trends and comparison of different parts of world
  - a. Evaluation of dominant trends of human impact on land use/land cover (LU/LC) changes should be studied at different levels (state/regional/local);
  - b. In the whole world LU/LC is strongly affected by political and economic conditions with particularly visible outcomes in urban, agricultural and forestry landscapes;
  - c. Presentations from different parts of the world may help to detect the relevant human impacts on LU/LC changes.
- 3) Using of databases
  - a. There is need to use LC databases (e.g. CORINE Land Cover – CLC, National Land Cover Dataset – NLCD, etc.) derived of satellite images for identification, analysis and assessment of LU/LC changes;
  - b. The data derived from satellite images provide information about LU/LC and its changes for substantial parts of the world. Availability of these data may contribute to new approaches to the assessment of the landscape, for instance in the context of environmental and economic accounting, diversity, modelling of its properties, etc. Presentation may provide an overview of examples with used databases obtained by application of satellite images.
- 4) Publishing in general
  - a. Map presentation of LU/LC changes. The effort of LU/LC change mapping in different regions of the world and different scales has been also documented by atlases published under the umbrella of the IGU LUCC;
  - b. In particular, this initiative aims to promote studies on LC/LU changes all over the world as a geographical research focus;
  - c. There is need to stimulate the production and the use of LC/LU information acquired from datasets with temporal resolution;
  - d. It is good to coordinate the comparative studies of LC/LU and their driving forces in different regions. Papers may show map presentations of LC/LU changes in different parts of the world.

- 5) Publishing of Atlases
  - a. It is crucial to collect, review and prepare next Volumes of the IGU/LUCC Atlas;
  - b. These Atlases (each of them in ca 200 – 250 pieces) gave a chance in last 15 years to publish ca 50 chapters about dynamic land use/land cover in different parts of the world;
  - c. It is necessary to find external sources for the next Volumes of Atlas IGU/LUCC publications and their dissemination around the world;
  - d. New Volumes could be “monothematic”, concerned e.g. on suburbanization, preserved areas, urban landscape, new wilderness, abandoned military areas etc.
- 6) Dissemination of publications
  - a. We discussed about possibility to obtain agreements from all authors for another form of publication. We plan after these agreements to realize other form – publish all chapters also in IGU/LUCC website;
  - b. This second form of publication will bring a better chance to disseminate our works in other lands and continents and will bring better chance to inform about our methods and investigational results;
  - c. We believe this form of publishing influence investigators of the LUCC topics towards higher activity and collaboration.

*Ivan Bičík, Ján Feranec*

## **9TH EARSEL SIG IMAGING SPECTROSCOPY WORKSHOP, LUXEMBOURG, 2015**

The 9<sup>th</sup> meeting, jointly organized by Trier University and the Luxembourg Institute of Science and Technology (LIST, former CRP - Gabriel Lippmann), built on the 8 previous successful workshops and was hold in Luxembourg in April 2015.

EARSEL's Special Interest Group on Imaging Spectroscopy aimed to encourage international discussions among specialists working with innovative Earth Observation technologies.

Contributions dealt in general with recent advances in and applications of the different techniques and research methods used in imaging spectroscopy and or hyperspectral remote sensing. The following topics were covered:

## **Research and applications of imaging spectroscopy**

- Agriculture, forestry, rangeland and wetland management
- Vegetation biophysical properties, processes and functions, as well as plant species, plant stress and disease
- Minerals, rocks, soils, and artificial materials
- Urban studies
- Coastal and inland waters
- Land use change

## **Advances in hyperspectral remote sensing data processing**

- Hyperspectral data processing algorithms, data mining and data assimilation
- Sensor calibration, atmospheric correction and product validation
- Synergies of hyperspectral data with the Sentinels, i.e. with advanced multi-spectral and microwave sensors

## **New and innovative hyperspectral sensor systems**

- Visible, near-, mid- and thermal infrared spectral and multi-angular measurements including fluorescence
- Hyperspectral images from ground, drone, airborne and satellite platforms

*Lucie Kupková*

## **SCERIN-3 CAPACITY BUILDING WORKSHOP, BRASOW, ROMANIA, 2015, JULY 13-18**

Over 40 participants from 13 countries were present at the 3<sup>rd</sup> workshop “SCERIN” (South Central and Eastern European Regional Information Network) focused on Earth observation and land cover/land use changes with emphasis on forests. The meeting was organized by GOFC-GOLD (Global Observations of Forest and Land Cover Dynamics), NASA Land-Cover and Land-Use Change Program, START initiative together with Transylvania University of Brasov. The main coordinators of SCERIN network are Petya Campbell from NASA Goddard Space Flight Center, Jana Albrechtova and Lucie Kupkova from Charles University in Prague.

The topics were presented and discussed from different and inspirational points of view. Some presentations summarized current research results from a general point of view (e.g. Overview of EARSEL activities as relevant to SCERIN by I. Manakos; Overview of NASA Land-Cover and Land-Use Change Program activities by G. Gutman or Overview of LCLU changes in Central and Eastern Europe by P. Stych), meanwhile some papers were much more specialized (e.g. Hyperspectral data based monitoring of forest health status by J. Albrechtova; or Utilizing SAR data for land monitoring by L. Ronczyk). Also the names of two poster sessions make it clear, what topics are in the focus of contemporary research: Forest LCLUC and biomass production; Anthropogenic LCC: agricultural land abandonment, urban expansion and climate change.

The integral part of the meeting was also a training – series of long sessions (ca 1-1,5 hours) which were focused on some specific topics (e.g. Land cover change analysis and social aspects by G. Taff).

*Přemysl Štych, Jiří Stockmann*



Photo 1: Participants of SCERIN-3 workshop during excursion.

---

## PUBLICATIONS

BICIK, I., KUPKOVA, L., JELEČEK, L., KABRDA, J., ŠTYCH, P., JANOUŠEK, Z., WINKLEROVÁ, J. (2015): **Land Use Changes in the Czech Republic 1845-2010 – Socio-Economic Driving Forces**, Springer International Publishing, Switzerland.

Summary:

The Czech landscape has changed considerably during the last two centuries. Due to modernisation of farming, industrialisation and urbanisation, a fifth of agricultural land has been lost – developed, afforested or abandoned. In the course of socialist collectivisation after WW2, landscape structure was radically simplified, fields amalgamated and semi-natural elements removed from them. The pre-industrial agricultural landscape with a mix of fields, meadows, pastures and woodlands has been gradually disappearing. Instead, spatial differentiation started to prevail and larger regions with homogenous land use to appear: artificial areas increasingly cluster in urban zones, whereas intensively farmed arable land concentrates in fertile lowlands and grasslands and forests in naturally less favoured areas.

The objective of this book is to analyse changes in the Czech landscape since the first half of the 19th century. The text focuses not only on describing these changes with statistical and spatial data, but also on explaining processes behind them, and their societal, economic, political and institutional driving forces. The authors – all from the Faculty of Science, Charles University in Prague – build on more than two decades of their experiences with land use research. They utilise the unique “Database of long-term land use changes in Czechia (1845–2010)” and combine methods and approaches of human geography, cartography, landscape ecology, historical geography and environmental history. The authors understand land use research as a way of analysing the nature–society interaction, its development, spatial aspects, causes and impacts. Czechia then serves as an example combining general processes occurring in landscapes of developed countries with the results of regionally specific driving forces, mostly political (e.g., communism).

\* \* \* \* \*

Since the last newsletter there have been published **two new volumes of atlases** “Land Use / Cover Changes in Selected Regions in the World:

## **Land Use/Cover Changes in Selected Regions in the World, Vol. X**

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

Contents:

Preface: *Yukio Himiyama*

- I. Land Use/Land/Cover Change in Peripheral National Capital Region: A Case Study of Almar Distrikt, Rajasthan  
*Ajay Kumar*
- II. Oncoming Aridization of the Main Grain-Producing Region in Central Eurasia  
*N.M.Dronin, N.O.Telnova, A.P.Kirilenko, E.V.Milanova, N.N.Kalutskova*
- III. Land Use Change in the Plain Areas in Eastern China since the 1980s  
*Yukio Himiyama, Tsubasa Ono, Yutaro Nakai*

## **Land Use/Cover Changes in Selected Regions in the World, Vol. XI**

BICIK, I., HIMIYAMA, Y., FERANEC, J., KUPKOVA, L. (eds.) (2015): Land Use / Cover Changes in Selected Regions in the world: Volume XI. IGU/LUCC, Faculty of Science, Charles University in Prague and Hokkaido University of Education, Asahikawa

Contents:

Preface: *Ivan Bičík*

- I. Land use/cover changes slony the Romanian Danuše Valleys  
*Gheorghe Kucsicsa, Dan Balteanu, Elena-Ana Popovici, Nicoleta Daman*
- II. Accessing spatio-temporal dynamics of urban sprawl in the Bucharest Metropolitan Area over the last century  
*Ines Grigorescu, Gheorghe Kucsicsa, Bianca Mitrica*
- III. Impact of transitional dynamics induced by socio-economic changes in post-communist Romania on land cover and use  
*Alexandru-Ionut Petrisor*

IV. Changes of artificial surfaces of Bratislava in 2006–2012 identified by the Urban Atlas data

*Róbert Pazúr, Monika Kopecká, Ján Feranec*

V. Land use/cover changes to transition from communist system to free market economy in The Górcze Mts., Polish Carpathians, Poland

*Anna Bucala*

VI. Land use/cover changes in the Prague metropolis in years 1989, 1999 and 2006

*Přemysl Štych, Ondřej Míček, Jan Kříž*

VII. Changes of agricultural land use in Czechia 1990–2010

*Ivan Bičík, Lucie Kupková, Jan Kabrda*

### 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 XII and XIII (to be published in 2016, 2017). In case of your interest please contact chair of IGU LUCC commission Ivan Bičík ([bicik@natur.cuni.cz](mailto:bicik@natur.cuni.cz)) until May 1, 2016 (deadline for papers' submission).**

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.

---

## **RESEARCH AND RESULTS**

### **IGU-LUCC investigations 2015 in Moscow State M. V. Lomonosov University, Faculty of Geography**

IGU-LUCC researches in Russia concern problems associated with transition from state-command to market driven economy. The laboratory of Global and Regional Geoecology at the Faculty of Geography, Moscow State University named after M.V. Lomonosov focuses on land use changes in the main grain-producing region of the Eastern Europe and Central Asia (Kazakhstan).

The main goal of our research in 2015 was assessment of contributions of agricultural policy and climate change in observed dynamic of biological productivity of agroecosystems in Eastern Europe and Kazakhstan in 1980-2010. The grain-growing belt of forest-steppes and steppes in Central Eurasia, shared by Russia, Ukraine and Kazakhstan, spreading from the Carpathians to the Altay Mountains offers significant but underutilized grain-production potential. For the last two decades the entire post-Soviet region saw a fundamental transformation of the land-use structure on no easy way out socialism to a market economy. These three countries of the former Soviet Union only recently reemerged as the leading grain exporters. However, several studies based on coupling climate and crop models indicate that agro-ecological potential of the grain-producing zone may decrease because of higher growth of temperature as compared with modest increase of precipitation and more frequent of droughts.

Time series of NDVI GIMMS values, obtained from NOAA AVHRR and Terra MODIS low-resolution data, were used as the input data in analyzing productivity changes for agroecosystems. Analysis shows an unambiguous positive trend for the steppe and forest-steppe zones for the period of the 1980s caused by stable weather conditions and large state investments in the agrarian sector. An unambiguous negative trend was revealed for the 1990s when all Soviet republics were experiencing a profound economic crisis, combined with extremely unfavorable weather conditions. For the 2000s, remote sensing data show no clear biological



productivity trends, and this finding does not support a popular view of rapid recovery of production potentials in agriculture in countries of Eastern Europe at that period. Moreover, spatial pattern comparable analysis of some climate variables and NDVI time series proves projections of aridization of the forests-steppe and steppe zones for the whole region with some exclusion for the territories (Northern Caucasus) experienced local increase of precipitation or better land management.

Main publications:

*Dronin N., Telnova N., Kirilenko A., Milanova E., Kalutskova N.* Observed and projected climate change and its impact on ecosystems' productivity in forest-steppe and steppe zones of Russia and neighboring (FSU) countries / // *Revue Roumaine de Géographie / Romanian Journal of Geography*. — 2015. — Vol. 59, no. 2. — P. 91–100.

*Dronin N., Telnova N., Kirilenko A., Milanova E., Kalutskova N.* Oncoming aridization of the main grain-producing region in Central Eurasia / // *Land Use/Cover Change in Selected Regions in the World*. — Vol. 10. — Hokkaido University of Education, Japan, 2015. — P. 8–22.

*Dronin N., Telnova N., Kalutskova N.* Changes in productivity of agrolandscapes in the south of eastern Europe during 1982–2006 // *Geography and Natural Resources*. — 2015. — Vol. 36, no. 3. — P. 300–304.

*Elena V. Milanova,*

## **Ecosystem services and its trade-off derived by land use change on vertical spectrum and spatial heterogeneity**

**Foundation:** National Science Foundation of China

**Principle Investigator:** Prof. Dai Erfu

**Abstract:** This project major focuses on ecosystem services and its trade-off derived by land use change, especially on vertical spectrum. Xiaojiang basin of Hengduan Mountains, where the vertical characteristics on land use and ecosystem are very typical at South-west China, was selected as study area (**figure 1**). Modelling approaches used in this project includes, Agent Based Modelling for land use change, InVEST for ecosystem services assessment, and statistical method for trade-off analysis on ecosystem services. Following contents will be investigated: (1) Characteristics on vertical heterogeneity as well as its driving mechanism, including spatial pattern of land use on vertical spectrum, driving factors to land use change as well as ABM based land use change modelling. (2) Assessment and trade-off on

ecosystem services, including InVEST method based approach on ecosystem services assessment, and statistical method based approach on trade-off on ecosystem services. And (3) Optimization recommendation on land use and ecosystem services at Xiaojiang basin, including scenarios analysis on land use and ecosystem services, considering eco-protection oriented, economic development oriented and business as normal. On scientific dimension, this project strives for establishing the method land use change derived ecosystem services and its trade-off derived on vertical spectrum. And on practical dimension, results from this project will give scientific support for land use pattern optimization and ecosystem services promotion.

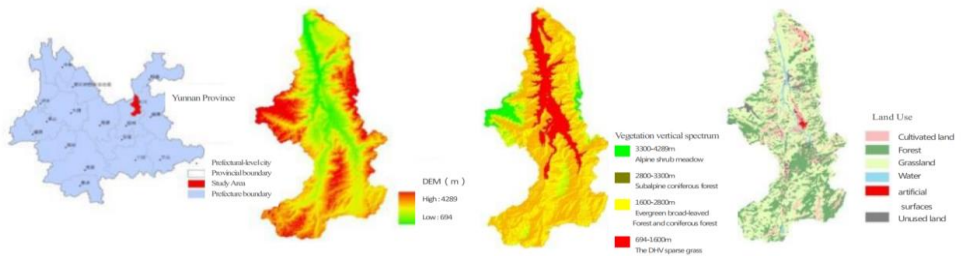


Figure1: Location and land use types of Xiaojiang basin at South-west China

Dai Erfu

**Selected results of the Institute of Geography, Slovak Academy of Sciences in Bratislava obtained in the framework of land cover/use change activities:**

**Feranec J., Soukup T., Hazeu G., Jaffrain G. (eds): *European Landscape Dynamics: CORINE Land Cover Data*** (forthcoming book by CRC Press, Taylor & Francis; available from June 21, 2016)

Four unique all-European sets of CORINE Land Cover, that is, CLC1990, CLC2000, CLC2006, and CLC2012, offer the opportunity to observe the European landscape by means of land cover and its change. It is precisely what this book contains: methodology of identification, analyses and assessment of land cover of Europe and its changes over four time horizons. Also examples are presented in which CLC data plays a role in offering solutions to European environmental problems such as the monitoring of urban dynamics, land fragmentation, ecosystems mapping and assessment, high nature value farmland characteristic, etc. As the existing environmental problems require new approaches, the authors of the book made a

point of outlooks for the CLC data generation with more detailed levels (for scales larger than 1:100 000), bottom-up approaches and the relationship of CLC data to the Infrastructure for Spatial Information in Europe (INSPIRE).

*Ján Feranec*

### **Monitoring of the Dynamics of Built-up Areas**

Due to the continuously increasing share of population living in cities and related concentration of consumption of resources, the urbanisation process is generally considered as one of the driving forces of global environmental change.

The aim of the monograph recently published by the Institute of Geography of Slovak Academy of Sciences is to present topical trends in the monitoring of built-up areas on various levels of spatial and thematic resolution using remote sensing data. Identification and quantification of recent changes in urbanised landscape, possibilities of their visualisation, and comparison of the available data sources in the assessment of the dynamics of built-up areas is demonstrated on study areas selected with special focus on Slovakia.

One of the main objectives of this monograph was to point out the different nature of the datasets about built-up areas. Characteristics of CORINE Land Cover, Urban Atlas, HRL Imperviousness, ZB GIS data base, and cadastre databases were described in detail. Results presented in individual chapters and accompanied by examples

indeed document different outputs, although obtained for identical time horizons.



Kopecká, M., Rosina, K., Oťahel, J., Feranec, J., Pazúr, R., Nováček, J. (2015). Monitoring dynamiky zastavaných areálov. Geographia Slovaca, 30. Bratislava, Geografický ústav SAV, 98 s. ISBN 978-80-89580-11-8

Available at:

[http://www.geography.sav.sk/journals/  
WEB\\_Geographia\\_Slovaca\\_30.pdf](http://www.geography.sav.sk/journals/WEB_Geographia_Slovaca_30.pdf)

*Monika Kopecká*

## **Newsletter Appendix No. 1**

This newsletter includes one Appendix – a detailed table of contents of all volumes of atlas Land Use/Cover Changes in Selected Regions in the World, Vol. I-XI