



**International Geographical Union
STUDY GROUP ON LAND USE/COVER CHANGE**

NEWSLETTER

No 1

April 1997

THE BIRTH OF IGU-LUCC

A message from the Chair

The International Geographical Union (IGU) established a new Study Group on Land Use and Land Cover Change (IGU-LUCC) in November 1996. The major aim of the Study Group is the enhancement of research on land use/cover change in general, and in particular to contribute to the Land Use/Cover Change Programme (LUCC) jointly initiated by the International Geosphere-Biosphere Programme (IGBP) of the International Council of Scientific Unions (ICSU) and the International Human Dimensions Programme (IHDP) of the International Social Science Council (ISSC). The birth of the new Study Group is the result of the growing awareness among the world geographical community of the urgent need to include land use/cover change in global environmental research.

The establishment of IGU-LUCC is a notable milestone not only for LUCC, but also for IGU. For IGU, the new Study Group is probably the first of its commissions and groups that seeks direct involvement in a major international environmental programme. For LUCC, it is perhaps the first research body belonging to an international scientific union that proposes a close co-operative relation with it. I believe that the new Study Group has a great potential for contributing to both IGU and LUCC.

The success of the Study Group depends on a number of important factors. The first is the strength of support it receives from specialists and institutions concerned with land use/cover change, especially those in the international geographical community. The second is co-operation with LUCC, UNU (United Nations University), IGBP (International Geosphere-Biosphere Programme), IHDP (Human Dimensions Programme), APN (Asia Pacific Network for Global Change Research), LUTEA (Land Use Change in Temperate East Asia), and other related organisations. The Study Group is willing to send its representatives to these organisations whenever possible.

Geographers can make a variety of contributions to Lucc from both natural science and socio-economic perspectives. The Study Group will use not only its own network and symposia but also its expertise for the promotion and advancement of the Lucc Program. I hope many join the activities of IGU-Lucc. Anyone interested in the activities of IGU-Lucc is welcome to apply to join the Study Group as a corresponding member. A corresponding member will enjoy the privilege of involvement in the Study Group's activities, as well as receiving the Group's newsletter and other information. Those who wish to apply for corresponding membership are invited to write to me. I also welcome any suggestions you have about IGU-Lucc. I look forward to hearing from you.

Yukio Himiyama

Chair of IGU-Lucc

IGU Study Group 96.SG06 LAND USE AND LAND COVER CHANGE

Objectives:

- To promote the study of land-use change throughout the world as a geographical research focus
- To stimulate the production and the use of land-use databases and maps of both the present and the past
- To co-ordinate the comparative study of land-use changes and their driving forces in different regions
- To contribute to the Lucc Program

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IGU-LUCC HOMEPAGE

The Study Group is grateful to Dr Toshiaki Ichinose for establishing an IGU-LUCC home page at:

<http://www.urban.rcast.u-tokyo.ac.jp/igulucc.html>

News on group activities and other relevant information will be posted here. Please check the home page regularly, and if you have suggestions for the website please contact Dr. Toshiaki Ichinose, Chief Research Engineer, Center for Global Environmental Research (CGER), National Institute for Environmental Studies (NIES), 16-2 Onogawa, Tsukuba 305, Japan; tel: +81-298-50-2598; fax: +81-298-58-2645, e-mail: toshiaki@nies.go.jp.

Items for the *IGU-LUCC Newsletter* should be sent to Professor Alexander Mather
e-mail a.mather@abdn.ac.uk

The LUCC Project: a new interdisciplinary, international program

David L Skole

Chair of LUCC
Institute for the Study of Earth, Oceans and Space,
University of New Hampshire, USA

In 1996 the International Geosphere-Biosphere Programme (IGBP) and the International Human Dimensions Programme for Global Environmental Change (IHDP) jointly initiated a new Core Project on Land Use and Cover Change (LUCC). This is an interdisciplinary project and is actively involving scientists and scholars from the physical and social science communities. It was initiated after several years of planning, and the Science Plan for the project appeared as IGBP Report 35 and IHDP Report 7.

The overall objective of this new international project is to foster and expand basic research into the causes and consequences of land use and cover change worldwide. This activity is important for several reasons. Firstly, the area of science is a vital one. Human alterations in land cover as a result of the use of land-based natural resources not only have local and regional impacts, but can also have important effects at the global level. For example, human-made changes in land use over the last 150 years have contributed about as much carbon dioxide to the atmosphere as has come from fossil fuel combustion. Many other examples are given in the aforementioned report.

Secondly, this is the first time that the IGBP and IHDP have mounted a combined initiative in which responsibility is equally shared between the two bodies. This is a significant achievement because the task is intrinsically large, and particularly considering the difficulties of developing productive partnerships, on an equal basis, between natural and social scientists. These two groups come from different traditions but, despite this, the joint IGBP/HDP Core Project Planning Committee has produced a well balanced report.

The Science Plan presents the subject of land-use and land-cover change and ties it to the overarching themes of global change. It briefly outlines what is currently known and what knowledge will be necessary to address the problem in the context of the broad agendas of IGBP and HDP. Drawing on the expertise of specialists in various disciplines within the natural and social sciences, the authors have developed specific research questions and suggested methodologies for addressing them.

The next stage is putting this into practice, with the involvement of the widest scientific community possible. The LUCC Open Science meeting (Amsterdam, 29-31 January 1996) provided an important opportunity for discussions on how this will be achieved. This consultation with a wide scientific community will provide input for the next stage, which will be the elaboration of an implementation plan that will specify in greater detail the activities and projects that will fulfil the mandate outlined in this document. Not only new projects but ongoing activities by individual scientists and other agencies will be potential partners for this path-breaking endeavour to address the interactions between natural and social processes in the use of one of humankind's crucial resources.

Improved understanding through improved data and information

As much as 40% of the global net primary productivity has been utilised or appropriated by human activity. This human activity is directly related to land use. Humans have expanded their activities into all corners of the biosphere, and today land-use and land-cover change is a significant driving agent of global change. Yet, we know so very little about this important topic. The basic observational datasets are lacking and there is an even poorer understanding of the complex factors and processes which control land-use change globally. Although some of the more important consequences of land-use and cover change can be identified, we do not yet have a sound diagnostic and prognostic modelling capability upon which to build a strong foundation for policy.

Indeed new satellite observation programmes are being developed which are already providing critically needed data on land-cover change. These observational systems are vastly improving the direct measurement of change, alleviating the heretofore use of proxy data on land-cover change, such as from population projections or economic statistics. Yet direct observation of patterns of land-cover change alone cannot provide insight into the processes which drive land-use change. The coupling of direct observations with process-level analyses will be an important and necessary endeavour if we are to improve our understanding of land-use and cover change. This 'pattern-to-process' approach will require the development of a whole new interdisciplinary genre of global change research.

To begin this effort it will be necessary to 'socialise the pixel'. That is, it will be necessary to begin developing new and novel ways to link satellite and other observational data to social, economic, and demographic data and analyses. There has not been much experience in the social sciences with satellite data. Nor do the users of remote-sensing technologies have a long history of transdisciplinary work with the social sciences. This merging of heretofore disciplinary methods into new interdisciplinary methodologies will be fundamental to advancing LUCC research.

Although land-use and cover change are manifested at local scales, it is a complex global phenomenon. Large-scale external factors which operate at regional or global scales often drive or 'push' local land use changes, and in turn the collective actions of local changes have profound global impacts. If we are to understand the forces of change at the global scale it will be necessary to develop an integrated modelling framework for LUCC research and policy. Moreover, it will be central to this aim that we understand more completely the nature of processes across the various scales – from the household or farm level all the way up to the level of external markets and institutions.

These requirements imply the development of a new approach to research coupled to new efforts to improve LUCC databases. It is through partnerships with initiatives such as the IGU-LUCC effort that such data and information can be developed and coupled to new research. The IGBP/IHDP LUCC project extends a congratulatory hand to the new IGU-

LUCC effort, and sees its success as vital to our own success. Over the coming years, we hope to collaborate on a number of joint projects and workshops, many of which will focus on improving datasets.

For further information

The LUCC International Project Office has been established at the Institut Cartografic de Catalunya in Barcelona, Spain under the direction of Dr Xavier Baulies. The project's data efforts are also being co-ordinated directly at the International Project Office. For further information on LUCC, please contact our office in Barcelona by e-mail (lucc@icc.es), website (www.icc.es/lucc) or fax (34-3-426 74 42).

LUCC research at the Faculty of Geography, Moscow State University, Russia

Elena Milanova

Since the end of 1980s, and especially since 1991, the land-use systems of Russia have experienced rapid and dramatic changes. The latest political and socio-economic changes in Russia have had a considerable impact on the land-use structure due to increasing rate of land conversion. Analyses, mapping and modelling of these new trends in land-use change are needed for their understanding, forecasting and efficient land-use management.

A research project on 'Land use/ cover mapping and monitoring of Russia' is currently underway at the Geography Faculty of Moscow State University in the frame of VEGETATION International Preparatory Programme and INTAS Programme of EC (International Association for Promotion of Cooperation with Scientists from New Independent States of the former Soviet Union).

It aims to assess and map land use /cover of Russia using remote-sensing data. The area of study roughly corresponds to the Russian plains within European Russia, where particular attention will be given to the five provinces: Upper Volga, Smolensko-Moscovskaja, Mecherskaja, Middle Russia and Oka-Don, which form a wide axis across European Russia from north to south.

Coarse, medium and high-resolution imagery from several satellite systems (NOAA-AVHRR, Resource and SPOT) is used as principal source of data about land cover. The methodology of landscape classification based on AVHRR coarse resolution and RESURS-01-3 medium resolution data has been developed for landscape analysis at the regional level for Central Russia. Ancillary data, such as topographic, climatic and ecological parameters are stored as a reference spatial database and used for satellite-data interpretation. Software basis for the GIS includes tools for both vector and raster analysis.

Geographical research on land use in (South) Korea

Manik Hwang

Land-use studies in geography in Korea have been largely concerned with two broad topics. One is the land-use effects of rapid urbanisation and industrialisation in recent decades, and the resulting environmental impacts. The other is land-use policy, particularly in relation to the Capital Region where one-half of the nation's population and industrial establishments are concentrated. In and around Seoul, the capital city, valuable agricultural and forest land has been and is being converted into urban and industrial uses. Since 1971, green belts have been established to limit previously uncontrolled urban sprawl, and to preserve the natural environment around the capital and the other major metropolitan centres. Remote-sensing data and land-value data have been used in the analyses of land-use change over a period of some decades.

National land-use policies aim to provide a balanced pattern of development between regions, and particularly between the capital region and other regions. There are, however, numerous problems. These include conflicts between efficiency in land uses, equity among regions, and environmental issues. Other conflicts include those between central and local government. Land-use authority rests with the central government, but recent policies have introduced some delegation of this authority to local governments. Land-use research focuses on these conflicts, and particularly on policy alternatives to problem-solving in relation to industrial uses in the Capital Region.

Research in land use and land cover can contribute effectively in developing comprehensive land-use management skills for a sustainable environment in Korea, a country which has faced mounting environmental problems in recent years.

IGU-LUCC '97 OPEN INTERNATIONAL SYMPOSIUM

INFORMATION BASES FOR LAND USE AND LAND COVER CHANGE RESEARCH

Inaugural IGU-LUCC Study Group Symposium

Griffith University, Brisbane, Australia

July 3-4, 1997

The first International Symposium organised by the new IGU-LUCC Study Group will be held in early July at Griffith University, Brisbane, Australia. The schedule will allow participants to attend the following IGU'97 Conference of the Commission on Sustainability of Rural Systems organised by the University of New England, Armidale, NSW, where there will be joint sessions for the IGU-LUCC Study Group.

The principal issues to be addressed at the IGU-LUCC Symposium in Brisbane pertain to land-use and land-cover data sources, standards for classification, appropriate scales for national and regional databases, and the utility/compatibility of various technologies and software. Sessions on the processes and forces producing land-use and land-cover changes and their relation to agricultural sustainability will be held in Armidale.

Attendance at the IGU-LUCC'97 Open International Symposium in Brisbane is open to all interested persons who provide timely notification of their intention to attend. Requests for additional information, along with abstracts of papers proposed for inclusion in Symposium or for the IGU-LUCC joint sessions at the CSRS Conference in Armidale, should be sent as soon as possible to:

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Developing Skills for Land Use/Cover Change Research

Financial support from APN and LUTEA may be available for young researchers from the Asia-Pacific region wishing to attend the Australian symposia. Intending applicants should contact Professor Crissman by 30 April 1997.
