

GLOBAL CHANGE NEWSLETTER

www.igbp.net

No. 67, December 2006

The Global Change NewsLetter is the quarterly newsletter of the International Geosphere-Biosphere Programme (IGBP).

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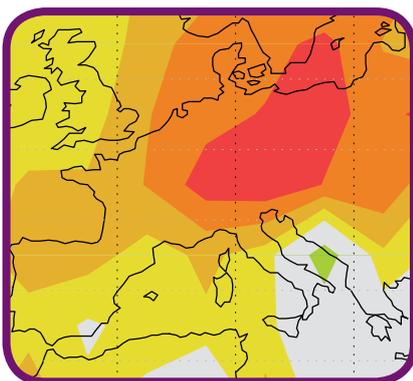
ESSP Theme

The overall theme of this issue of the Newsletter is the Earth System Science Partnership Open Science Conference in Beijing, which attracted 900 scientists from the IGBP, WCRP, IHDP and DIVERSITAS communities. The Guest Editorial, the Science Features, Centrefold, Profile of a Scientist and Pin Board all report on different aspects of this theme.

Pages 2, 4, 6, Centrefold, 22, and 26

Mild Autumn Due to Global Warming?

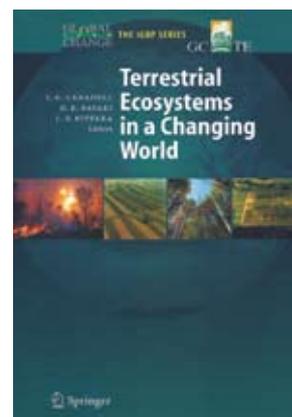
Dutch meteorologists show how the extremely warm autumn in Europe might be coupled to global warming caused by human pollution.



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New IGBP Synthesis Book

The 10th book on IGBP research is now printed. Over 100 authors present 25 contributions on the impacts of global change on terrestrial ecosystems including key processes of the Earth System. Get a 10% discount by ordering through IGBP.

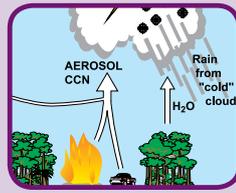


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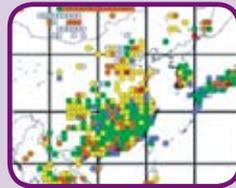
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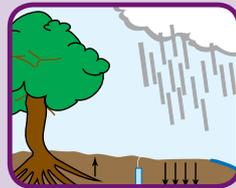


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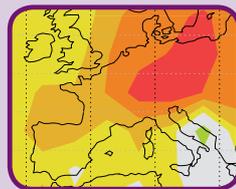
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Guest Editorial

The ESSP: Amsterdam, Beijing and Beyond

The Earth System Science Partnership (ESSP) Open Science Conference "Global Environmental Change: Regional Challenges" attracted over 900 scientists from around the world to Beijing, China 9–12 November 2006. The conference, hosted by the China Meteorological Administration, provided a forum at which results from work done by the ESSP projects as well as in the sponsoring global environmental change Programmes could be discussed in an atmosphere of excitement at what has been done and in anticipation of future accomplishments. Rather than trying to summarize the conference (a very difficult task given the breadth, depth and quality of the contributions), I would like to offer some personal reflections of the future of the ESSP, using this first "truly ESSP" Open Science Conference as a point of departure.

First, a short retrospective. The Amsterdam Declaration that started ESSP is a useful place to start to build a prospective vision for the partnership. There are a few things from the Declaration that stick in my mind as particularly salient. There was a recognition that the Earth System did not behave in a way that was easily understood by "conventional" scientific approaches; from the Declaration: "**A new system of global environmental science is required**". The authors went further to identify a common goal for the four global environmental change research programmes: "The common goal must be to develop the essential knowledge base needed to respond effectively and quickly to the great challenge of global change." There is another citation from the Amsterdam Declaration that is very important, and to which I'll return later – it is: "**An ethical framework for global stewardship and strategies for Earth System management are urgently needed.**"

Since Amsterdam in July 2001, a lot has happened for which those involved can be justifiably proud, and that we all were in the position to celebrate and highlight at this Open Science Conference. The Earth System Science Partnership put into place the structure that enabled our joint projects, START, and now the Monsoon Asia Integrated Regional Study (MAIRS) to be conceived and to develop. In their own ways, these activities actually constructed the first elements of a "system of global environmental science" and the "essential knowledge base needed to respond effectively and quickly to the great challenge of global change". In the short time that they have been in operation, the Global Carbon Project (GCP), Global Water System Project (GWSP) and Global Environmental Change and Food Systems (GECAFS) have each in their own way and with their own different methodologies and approaches gone about building the scientific infrastructure that allows us to take a more integrated

approach to global environmental change science. START has been extremely successful in its capacity building efforts, and we now have the new Global Environmental Change and Human Health project (GECHH) that will address another very important aspect of global environmental change.

At times we tend to be a bit pessimistic about ESSP, because we are not always able to reach the lofty goals that we have collectively set for the partnership, which can be frustrating. On the other hand, from an outside perspective, the progress that has been made in the short five years since 2001, led by the joint projects, START and now MAIRS, has been both substantial and impressive, and we should not be embarrassed about acknowledging that fact. We have not yet reached the end point for ESSP, but we have indeed made substantial progress along the path to get there.

So what is the view forward from the point at which we find ourselves now? Since Amsterdam, a number of developments have occurred that even more clearly illustrate the need to be able to approach the coupled human-environment system in a scientifically rigorous way. The millennium development goals have been articulated: within the next decade we must aim to eradicate extreme poverty and hunger; achieve universal primary education; promote gender equality and empower women; reduce child mortality; improve maternal health; combat deadly diseases; ensure environmental sustainability; and construct a global partnership for development. At the same time, society is faced with other challenges such as global climate change, air pollution, decreases in global biodiversity, food resources and how all of these issues tie into global security. These challenges require us to understand the coupled human-environment system sufficiently well to provide scientifically sound input to support the second of the points from the Amsterdam Declaration, shown in bold in the preceding text – and the one that we have not yet really achieved to the extent that is needed.

What could a vision for the future of ESSP be? To begin with, I think that we must recognise an important reality: the path to achieving “an ethical framework for global stewardship and strategies for Earth System management” is a long and tortuous one. We already know that it can be difficult, and that we will certainly encounter plenty of obstacles as we continue to walk it. We need to resist the desire to reach the end point in a single leap, and avoid setting up unrealistic expectations on ourselves to do so. Having said that, we should not shirk setting up challenging goals.



I would like our vision for the future to have these elements and challenges:

- that the ESSP builds upon the successes we have had of constructing a scientific infrastructure that brings together scientists from many disciplines and backgrounds, from across the natural and social sciences;
- that we use this human and intellectual capital to build the next level of scientific infrastructure that is necessary to understand and predict the behaviour of coupled human-environmental systems;
- that the framework for this scientific infrastructure be built around the ideas of sustainability and ethical global stewardship of the Earth System;
- that we challenge ourselves to use our understanding of these coupled systems as the scientific basis for assessments and communication of the options risks, vulnerabilities and possibilities for future sustainable development of our planet.

Realising this vision will require a renewed commitment on the part of all the members of the Earth System Science Partnership – and my own impression was that this commitment was wholeheartedly reaffirmed at the conference. It is truly exciting to be part of the ESSP at this juncture.

Many people contributed to making the conference a success. While space does not allow everyone who deserves recognition to be mentioned, I would like to thank a number of people for extraordinary contributions: the conference co-chairs Qin Dahe and Gordon McBean; the ESSP coordinator Martin Rice; Li Mingmei from the China Meteorological Administration; the WCRP Secretariat (especially Valery Detemmerman); and finally the ESSP communications team. The Open Science Conference was a fantastic springboard for ESSP – thanks to all of you for making it happen.

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Science Features

ESSP theme: How Can the Amazon Continue as a Sustainable Hot Spot for the Earth System? Contributions from Large-Scale Biosphere-Atmosphere Experiment in Amazonia (LBA) Science.

LBA and the Future of Amazonian Research

M. Batistella and F. Luizão

During the ESSP Open Science Conference held in Beijing in November 2006, a parallel session was organised to present and discuss LBA findings. The session included six invited overview oral presentations covering relevant research components and 54 submitted posters. Three cross-cutting presentations addressed LBA and global environmental change, LBA and sustainability, and the legacy of LBA for Amazonia. The audience contributed with important questions and suggestions in a crucial moment for the Amazonian research, as the programme faces the transition between its first programmatic phase and the future.

The Large-Scale Biosphere-Atmosphere Experiment in Amazonia (LBA) is a major scientific undertaking led by Brazil and involving scientific communities of the Amazonian countries, USA and Europe. It engaged over 1,900 researchers and students working on 155 projects. The main goal of LBA is to address two overarching questions: (i) how Amazonia functions as a regional entity with respect to the cycles of water, energy, carbon, aerosols, and nutrients; and (ii) how regional climate and land-use changes will affect the physical, chemical, and biological functioning of ecosystems in Amazonia, the sustainability of regional development, and the interactions with the Earth system.

LBA studies have been organised in seven broad themes: Physical Climate, Atmospheric Chemistry, Carbon Dynamics,

Biogeochemistry and Nutrient Dynamics, Surface Hydrology and Water Chemistry, Land-Use and Land-Cover Change, and Human Dimensions. LBA research started in 1998 and its first phase will finish in 2007. Over 500 MSc and PhD students have concluded or are doing their research within LBA and most of them are from the Amazonia region.

Scientific progress

LBA has contributed to improving the capability of Amazonian institutions for multidisciplinary research, the training of many young scientists, and the sound understanding of Amazonian ecosystems functioning and their actual importance. New or improved knowledge includes: (i) the recognition that old mature

forests are growing (and thus sequestering atmospheric CO₂) at different rates within the Amazon Basin; (ii) the vital role of the volatile organic compounds (VOCs), emitted by plants, in the production of clouds and raindrops (Figure 1); (iii) the role of the Amazon on South American climate and pluvial regimes; (iv) the lasting and recurrent effects of selective logging and forest fragmentation on residual forests, which become increasingly susceptible to fire events; (v) the importance of robust remote-sensing techniques allowing accurate detection of deforestation, secondary succession or even understory forest damages, as well as structural and functional changes in the forest; (vi) the close coupling of land and water bodies regarding the carbon and water cycles at watersheds and basins; (vii) a better understanding of secondary forests dynamics and their alternative pathways depending on former land uses; and (viii) the evaluation of alternatives for reutilisation or rehabilitation of abandoned or degraded lands through no-burning agriculture and agroforestry systems. These and many other research achievements have allowed better assessments of forest environmental services, improved models, and the creation of new research and development programs.

At this very moment, the LBA community is engaged in a broad and participatory discussion to build its research plan for the next decade. The Brazilian government, through the Ministry of Science and Technology, is coordinating the effort to advance from the recognised success of the program to the new era of

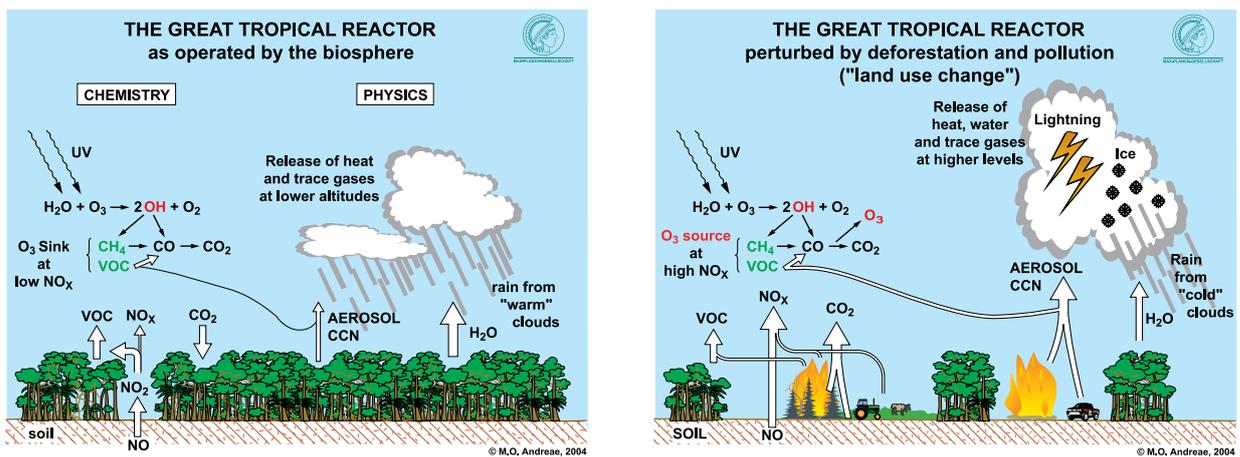


Figure 1: Biosphere-Atmosphere interactions in the Amazon: (a) in pristine conditions (b) as disturbed by deforestation and land use.

LBA, a challenging undertaking on integrative regional studies including complex linkages with global change issues.

The future?

To advance from a previous success that included more than 1200 publications (see text box below) is not an easy task. However, much has to be done for LBA to progress from its multidisciplinary research to interdisciplinary and transdisciplinary integrative questions. In particular, it is vital for the program to link local and regional processes with global change issues through mesoscale integration. Land-use and land-cover changes will still be at the core of the program because of

their role in landscape transformation and consequent impacts on carbon dynamics, biogeochemical cycles, hydrological processes, atmospheric chemistry, and the physical climate. Recent processes in the Amazon, such as urbanisation, agriculture intensification, and forest management will be of particular interest as they drive new changes to the region.

Extension of the scale and cooperation

As LBA progressed, understanding land-use/land-cover changes became a priority, with a particular focus on processes such as deforestation, land abandonment, land degradation, and land-use intensification. Many LBA projects include a land-use/land-cover component and it is now time to take on the challenge of developing cross-scale assessments towards an understanding about the complex human-environment interactions, from the landscape to the region, with particular attention to thresholds and non-linearities. Some LBA investigations have contributed to an integrative research agenda, through dialogues among natural and the social sciences. A major challenge is to capture regional

differences as well as to understand local-scale dynamics. A more complex framework for LBA research then arises, indicating the need for a continuous search for linkages between land-use/land-cover changes and other processes. LBA is initiating a new programmatic effort that will be essential to enhance its interface with other similar research initiatives. The recognition of continuous and creative reviews of the integration of human and natural sciences is among the lessons learned and an incentive for a science of sustainability in Amazonia. Although much has been done since 1998, LBA is still in its infancy and the next decade of LBA research brings challenging but promising tasks for integrative studies on regional and global environmental changes.

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Special Journals on LBA Science

- Journal of Geophysical Research
- Ecological Applications
- Remote Sensing of Environment
- Global Change Biology
- Theoretical and Applied Climatology
- Acta Amazonica
- Earth Interactions
- Hydrological Processes
- Brazilian Journal of Meteorology

Note: the authors wish to thank Drs. Meinrat Andreae, Carlos Nobre, Diógenes Alves, and Paulo Artaxo for their important contributions.

Terrestrial Carbon Budget and Ecosystem Modelling in Asia

Y. Yamagata

To investigate the carbon cycle in East Asia, a group of Japanese researchers used an Integrated System Approach using flux tower measurements, remote sensing, ecosystem- and land use modelling. Successful estimates were made for the region's carbon dynamics.

The Kyoto Protocol was ratified and signatory countries are preparing for the first commitment period, which will start during 2007. Meanwhile, international negotiation has already started on the post 2012 (beyond Kyoto) framework. From now on, the main agenda is long-term atmospheric greenhouse gas (GHG) stabilisation target setting. Scientific knowledge regarding terrestrial carbon sink function and its variability is vitally needed for decision support

Integrated System Approach (ISA)

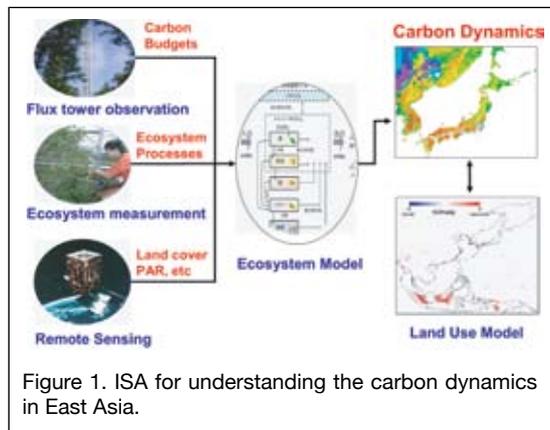
A Japanese research project (Integrated Study for Terrestrial Carbon Management of Asia in the 21st Century Based on Scientific Advancements) related to the "Terrestrial Carbon Cycle Management Project" under Global Carbon Project (GCP), investigated regional carbon dynamics in Asia with a newly developed ISA. This approach combines:

- flux tower measurements and ecosystem measurements at test site network
- remote sensing for scaling

up meteorological measurements and land cover classification

- ecosystem modeling based on the new understanding of ecosystem processes
- land use change modelling for projecting future carbon dynamics.

Figure 1 shows the configuration of the ISA.



Ecosystem model

The Terrestrial ecosystem model (Sim-CYCLE) was developed and improved in collaboration with several flux measurements studies at test sites in East Asia. The improvements were achieved for canopy Gross Primary Productivity (GPP) modelling and seasonal change in leaf properties. The Non-Equilibrium Persistent (NEP) estimate obtained from the model was also compared

with the flux measurements and conventional ecological measurements for validation [1].

Remote sensing

Estimation of carbon dynamics by ecosystem modelling heavily depends on land cover maps. To assess and reduce the uncertainty, Degree Confluence Project information was used as a new method for validating land cover maps. Around 1000 ground truth data for the land cover types were collected and checked for their reliability in the Eurasian region by using this information. Thereby, existing global land cover maps (GLC2000, MOD12, UMD, and GLCC) could be evaluated. The agreement between the derived validation information and the land cover maps was 55% for GLC2000, 58% for MOD12, 54% for UMD, and 50% for GLCC [2].

Carbon dynamics in East Asia

A more accurate cover map is created based on the validation data set and entered to the ecosystem model. Figure 2 shows the model estimate of the carbon budget in East Asia during 2000–2005. (Other input data are for climate: WorldClim and NCEP/NCAR, and for soil: IGBP-DIS). It was implied

that terrestrial ecosystems in this region act as a net carbon sink at the magnitude of about 0.06 Gt carbon per year, corresponding to 11% of fossil-fuel emission from the East Asian region (Figure 2). Interannual variability and spatial heterogeneity in net carbon budget (NEP) was evident and related to meteorological anomalies such as warmth in 2002 and coolness in 2003 around Japan. There remain, however, uncertainties in the effect of

disturbances (such as level of fire damage and timber cutting) on carbon budget accounting.

Future projection with the land-use model

Land-use change between crop and forest land is projected by considering the prices of forestry products and crops with a partial equilibrium economic model. Global forest productivity is calculated by the ecosystem model. Using the land-use model, predictions were made for global land-use changes in the next 30 years. Comparing with FAO Forest Resource Assessment 2005, deforestation pattern is in agreement. This land-use change projection result was entered into the ecosystem model to estimate the carbon dynamics associated with the land-use change (Figure 3). In this estimation amount of biomass above ground and stock change of soil carbon were accounted for [3].

Conclusion and future work

Successful estimates were done for the annual carbon dynamics with our newly developed Integrating System Approach. The carbon sink in the East Asian region (in our analysis) was around 10% of the total carbon emission from the industry sector. However, the carbon budget is estimated without considering the disturbance effect such as fire and harvesting. Geographical distribution of ecosystem disturbances is not well known at the moment. To better understand these, additional research is needed to study more about natural and human disturbance factors, including human land use activities.

This research is supported by GERF (Ministry of the Environ-

ment) as a Japanese GCP (TCCM-P) project, whose description can be found at www.globalcarbonproject.org/activities/tccm-p%20final_3aug2005.pdf

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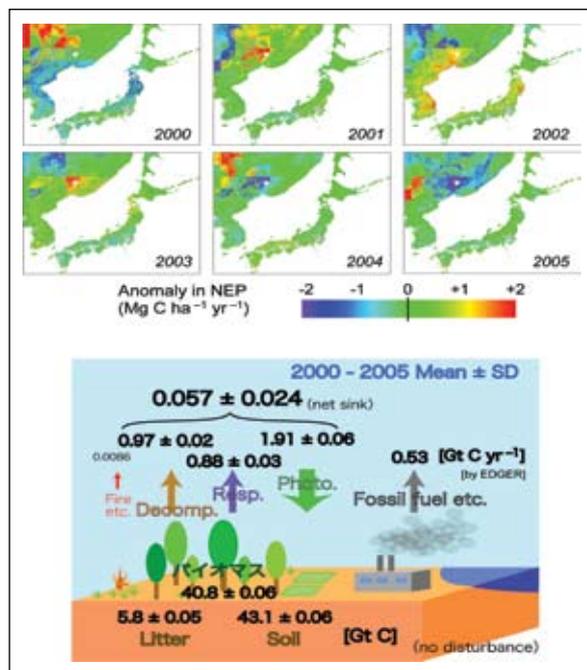


Figure 2. Estimated carbon dynamics (NEP, carbon flux and stock during 2000–2005).

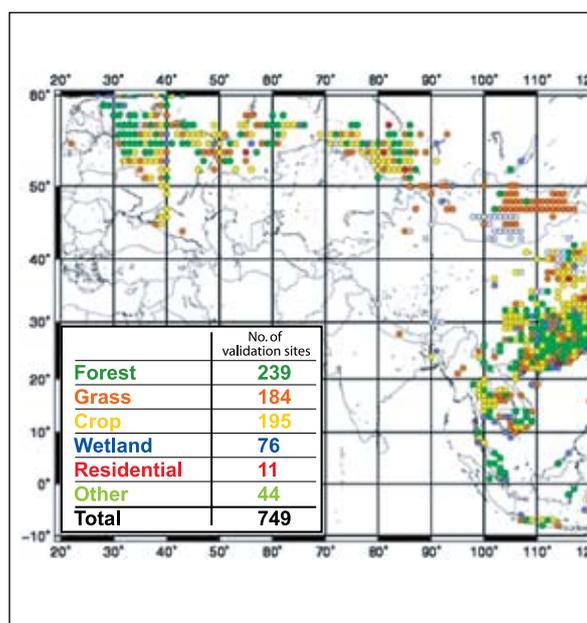


Figure 3. Estimate of carbon dynamics using land use model (2000–2030).

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Biohydrology: How Biological Factors Influence Soil Hydrological Processes

L. Lichner

Biohydrology 2006, held in Prague, Czech Republic 20–22 September 2006, was the first international conference to discuss exclusively the interactions between hydrological and biological processes in soil. Keynote lectures from internationally renowned scientists, combined with volunteered papers and posters, examined the wide range of processes that drive soil biology/hydrology interactions from micro- to regional scale.

To introduce the scientific field, biohydrology deals with an investigation, modelling and mitigation of the impact of biological factors on hydrological processes in the unsaturated zone of soil (vadose zone). This applies, particularly, to the downward and upward movement of water, and the distribution of rainfall to infiltration and runoff at the soil surface (Figure 1).

Acceleration of the upward movement in the vadose zone is caused by the uptake of water by plant roots (Figure 1a). While the slow upward movement of water is driven by evaporation, the rapid upward movement

of water is driven by transpiration of plants. To have sufficient water for transpiration, evaporation and cooling, the roots transport water during hot days from greater depths to the near-surface layer at night (the hydraulic lift).

Acceleration of the downward movement of rainwater in the soil matrix is caused by the surface-vented macropores formed by plant roots and burrowing soil animals (Figure 1b). Covering soil particles, the amphiphilic compounds released from decaying leaves and roots, soil animal (earthworms, ants, etc.) exudates,

as well as root and microbial mucilages can change pore characteristics by influencing the soil-water contact angle. As a result, water repellency (hydrophobicity) or wettability (hydrophilicity) of the topsoil can influence the distribution of rainfall to infiltration and runoff (Figure 1c). Soil water repellency can also reduce agricultural production by the patchy growth and the delay in germination. Cultural practices like core aeration, topdressing with sand, inoculation with wax-degrading bacteria, claying, liming and using wetting agents (surfactants) are used to increase the infiltration rate in the water repellent soils. On the other hand, a shallow ploughing can reduce bypass flow and deeper penetration of solutes via soil macropores.

Conference topics

Biohydrology 2006 was organised by seven national institutions from five countries jointly with one national and three international organisations (see text box), among others IGBP. Over 90 scientists from all continents attended the conference, reflecting the growing international concern of current and future problems with water scarcity and pollution, soil degradation,

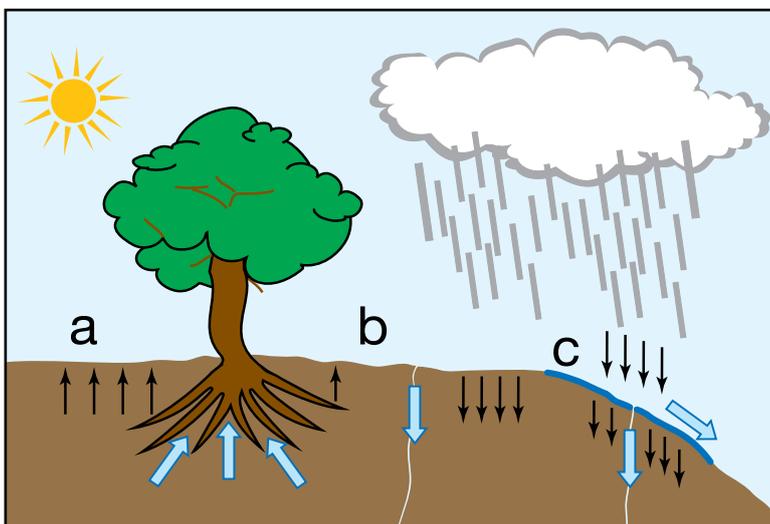


Figure 1: Schematic of the impact of biological factors on hydrological processes in the soil.

a) Acceleration of the upward movement in the soil (*thin arrows* indicate the slow upward movement of water driven by evaporation, while *wide arrows* indicate the rapid upward movement of water driven by transpiration of plants).

b) Acceleration of the downward movement in the soil (*thin arrows* indicate the slow downward movement of water in the soil matrix, while *wide arrows* indicate the rapid downward movement of water in the surface-vented soil macropores).

c) Distribution of rainfall to infiltration (downward movement of water in the soil is illustrated with the same symbols as in Fig. 1b) and runoff at the soil surface.

and the growing demand on our land resources to produce food and provide amenity services. Some of these are severe global threats and they are all driven by the complex interactions between hydrological and biological processes in soil.

The contributions presented at the Biohydrology 2006 conference "Impact of biological factors on soil hydrology" examined the wide range of processes that drive soil biology/hydrology interactions from micro-to regional scale. They were presented in a plenary session (convened by the conference chairman Dr. Louis W. Dekker, Alterra Wageningen, The Netherlands) featuring invited international experts in the field and three thematic sessions:

1. **Biological influence on soil hydrological cycling** (convened by Prof. Coen J. Ritsema, Alterra Wageningen, The Netherlands, and Dr. Miloslav Sir, Institute of Hydrodynamics AS CR, Prague, Czech Republic),
2. **Interactions between microbiology and soil hydrology** (convened by Dr. Paul D. Hallett, Scottish Crop Research Institute, Invergowrie, Dundee, UK, and Dr. Miroslav Tesar, Institute of Hydrodynamics AS CR, Prague, Czech Republic), and
3. **Changing biohydrology for soil sustainability** (convened by Dr. Stefan H. Doerr, University of Wales Swansea, Swansea, UK, and Dr. Lubomir Lichner, Institute of Hydrology SAS, Bratislava, Slovakia).

Scientific outcomes

The scientific impact of the presentations substantiated the

worldwide increasing trend concerning the impact of biological factors on soil hydrology. We would like to conclude by expressing our hope that the result presented both at the conference and in the special issue of *Biologia* will act as a stimulus for initiating new research projects and contribute to finding solutions to the global threats of water scarcity and soil degradation.

As to the conference outcomes, the participants came to an agreement that:

1. Similar conferences should be organised regularly with 2–3-year intervals, and thus, the 2nd Biohydrology conference will be held in Bratislava, Slovakia in September 2009.
2. It should be created an official organisation to promote awareness of and information exchange between interested individuals and groups regarding the occurrence, understanding

and management of water repellency in all soil types. The International Society on Water Repellency in Soil has been registered in the state of Utah, and more information on it can be found at www.waterrepellency.net

3. The efforts of many collectives could be covered by an IGBP core project similar to the former "Biospheric Aspects of the Hydrological Cycle" (BAHC).

Information on the conference as well as the papers published in the special issue of *Biologia* can be found at www.ih.savba.sk/biohydrology2006/ for free downloading.

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Conference Organisers

National institutions

- Institute of Hydrodynamics, Academy of Sciences of the Czech Republic, Prague;
- Czech National Committee for Hydrology UNESCO;
- Institute of Hydrology, Slovak Academy of Sciences, Bratislava, Slovakia;
- Slovak National IGBP Committee;
- ALTERRA Green World Research, Wageningen, The Netherlands;
- Scottish Crop Research Institute, Invergowrie, Dundee, UK; and
- University of Wales Swansea, Swansea, UK.

International and national organisations

- International Commission on Coupled Land-Atmosphere Systems of the International Association of Hydrological Sciences (IAHS, AISH);
- International Geosphere-Biosphere Programme (IGBP);
- International Hydrological Programme of UNESCO; and
- Czech Association of Scientific-Technical Societies.

Climate Change Vulnerability: Challenges and Opportunities in Indochina

N. H. Ninh and L. Q. Huy

Indochina is extremely vulnerable to natural disasters, and will be even more exposed if global changes proceed as projected. New research networks studying regional environmental changes are established to help create preventive policy making mainly in supporting the poorer parts of the region.

The Indochina region has been known to the world as one of the resource-richest and most culturally diverse regions in Southeast Asia. The region's three countries – Vietnam, Lao People's Democratic Republic (Lao PDR) and Cambodia – cover the lower Mekong Basin, and are heavily dependent on their natural resources, particularly agriculture, fisheries and forestry. Though there are potentials in socio-economic development (Table 1), the region is also highly vulnerable to climate impacts, which affect all aspects of social and economic lives, but so far such impacts are poorly understood in Asia.

Vulnerability to natural disasters, climate change and institutional changes

Projected climate changes in the region by the IPCC include strengthening of monsoon circulation, increases in surface temperature, and increases in the magnitude and frequency of extreme rainfall events [1]. The short-term effects from global warming include (i) the spread of diseases, especially vector-borne diseases are expected to increase, (ii) the early arrival of spring which seriously affects rice production, (iii) changes

in the population of plants and animals and shifts in the range of their habitat, (iv) the bleaching of coral reefs in Vietnam and Cambodia, (v) downpours and flooding, and (vi) more frequent droughts and fires. A recent research by Lutfi et al [2] revealed that the deforestation in the Indochina Peninsula causes significant changes in the local atmosphere. Logging activities in this region alter the surface energy and water balance in such a way that the surface becomes drier and warmer. These changes could result in major impacts on the region's ecosystems and biodiversity; hydrology and water resources; agriculture, forestry, and fisheries; mountains and coastal lands; and human settlements and human health [1,3,4,5].

In the long run, climate change may cause serious heat waves and periods of unusually warm weather, subsequently changing the agricultural practices and livelihoods. Ocean warming is also a potential long-term effect, which will result in a massive strike on early-developing fishery, oil refinery and tourism industries of Vietnam and

Table 1. Basic facts about Indochina member countries.

	Vietnam	Lao PDR	Cambodia
Population (millions, 2003)	81.3	5.7	13.4
Urban (%)	24.8	20	18
Rural (%)	75.2	80	82
Annual population growth (%)	1.47	2.4	2.4
Land area (square kilometres)	331,114	236,800	181,035
GDP per capita (US\$, 2003)	485	310	290
Real growth of GDP (% , 2003)	7.3	5.8	5.5

From [9,10,11,12].

Cambodia. Sea level rise is also identified as one of the long-term effects followed by coastal flooding, causing changes in all economic sectors in the coastal areas of the region [1]. In the Indochina region, where the level of vulnerability or susceptibility of the physical and biological system is less understood, it is essential to consider the approach which covers the nature of the political, economic and social changes [6,7,8]. The poor in the Indochina region mostly live in rural, isolated or disaster prone areas, which also have less financial support from the government compared to urban areas [9,10,11,12,13].

Established research projects

The research efforts focus on the main concerns of environmental and climate change in the region [14]. Regional scientists, with support from authorities and international scientific programmes (e.g. IGBP, APN, START, etc.), have been developing advancements in the following issues:

- climate impact and modeling studies
- El Niño, La Niña impacts
- disaster risk management and adaptation
- land-ocean interactions in the coastal zone
- land use and cover change
- biodiversity change
- human dimensions research
- education and training programme.

Several projects have been implemented during past years, including Reducing the Impact of Environmental Emergencies Through Early Warning and Preparedness – The Case of El Niño-Southern Oscillation (ENSO) Vietnam Case Study [15], Train-

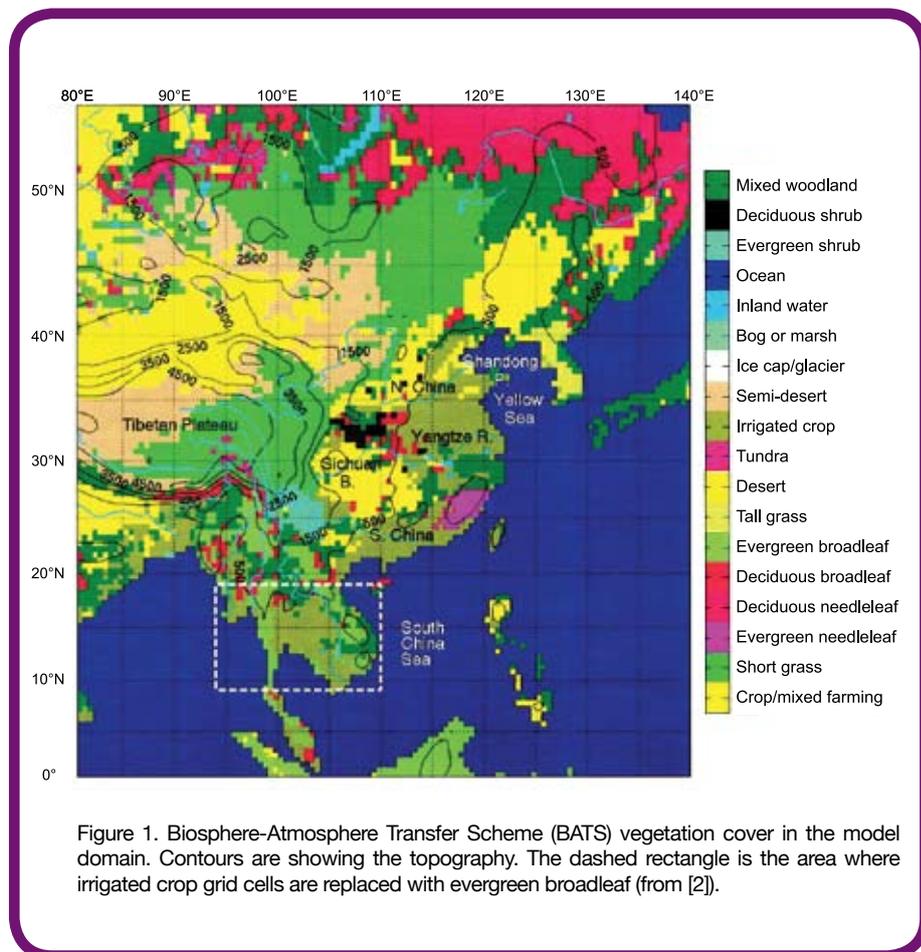


Figure 1. Biosphere-Atmosphere Transfer Scheme (BATS) vegetation cover in the model domain. Contours are showing the topography. The dashed rectangle is the area where irrigated crop grid cells are replaced with evergreen broadleaf (from [2]).

ing Workshop on Forecasting El Niño and La Niña in Indochina [16], Red River Delta/Global Change Programme, 1999–2001, sponsored by the Netherlands Foundation for the Advancement of Tropical Research (WOTRO), First National Communication to the UNFCCC in Cambodia, Lao PDR, Vietnam, 2000–2004, Reversing Environmental Degradation trends in South China Sea and the Gulf of Thailand, 2002–2007 (sponsored by UNEP/GEF) amongst many others, showing a great potential of regional scientists in establishing effective research and capacity building projects in cooperation with international scientists.

Recently, the workshop on “Seasonal Climate Monitoring for Indochina” in Vientiane, Lao PDR was organised to strengthen the capacity of the nations of Indochina to respond to extreme

climate variability associated with El Niño and La Niña events and other processes [17]. Climate monitoring is relevant not only to hazard management, poverty alleviation and sustainable development in the short-term, but also represents a first step in improving the capacity to respond to long-term climate change resulting from human activity. The workshop recognised the pressing importance of seasonal climate monitoring and the production of seasonal climate bulletins for all nations in the Indochina region to assist with the management of natural disasters and longer-term climate disruption. Intergovernmental cooperation at the regional level was essential if each national bulletin was to take full account of the regional context and take advantage of resources available at the regional level, including

the combined expertise of the regional scientific community.

Regional network established

These activities have been organised by the Indochina Global Change Network (IGCN, at www.tiempocyperclimate.org/annex/igcn/).

The IGCN has three main aims:

- to foster and provide support for focused capacity-strengthening projects, directed at specific regional needs;
- to provide training in global change studies through workshops, studentships and fellowships and to promote the development of relevant educational materials for the scientific community, policy makers and the general public;
- to foster and, where appropriate, coordinate regional research on global environmental change, providing

high-level expertise in support of policy development. The IGCN recognises that an effective precautionary response to long-term environmental change must be based on action to reduce present-day vulnerability and that this is, in many cases, a more immediate development priority.

IGCN is coordinated by Dr. Nguyen Huu Ninh of the Center for Environment Research Education and Development, Hanoi, Vietnam, with technical support from Dr. Mick Kelly and Ms. Sarah Granich of the University of East Anglia, UK, and the Tiempo Climate Portal. The network representatives in Cambodia and Lao PDR are Mr. Long Rithirak, Ministry of Environment, and Mr. Phetsavang Sounnalath, National Disaster Management Office, respectively. The IGCN International Support Team, which consists of international scientists, is to establish a number of research programmes on climate-related impacts for Indochina.

In conclusion, regional scientists recognise the pressing need for improved capacity in global environmental change research in the nations of Indochina, in the context of the existing frameworks of the IGBP, WMO and the United Nations Framework Convention on Climate Change, and of the broader science, policy and donor communities. The provision of new and additional financial and technical resources by development partners will be vital if climate research is to support present-day development goals and contribute to the long-term environmental security of the nations of Indochina.

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First Announcement

Joint IMBER / LOICZ
Continental Margins
Open Science
Conference

上海 | Shanghai
2007年9月 | September 17th - 21st
17-21日 | 2007

Impacts of global, local and human
forcings on biogeochemical cycles
and ecosystems

Co-conveners:

Nancy Rabalais (USA): nrabalais@lumcon.edu
and Jack Middelburg (Netherlands): j.middelburg@nioo.knaw.nl

International organizing committee:

Katja Fennel (Canada), Burke Hales (USA), K.K. Liu (Taiwan),
Isabelle Niang Diop (Senegal), Helmuth Thomas (Canada),
Paul Wassman (Norway), Kai Wirtz (Germany)
and Jin Zhang (P.R. China)

Contact:

shanghai.osc@univ-brest.fr


International Council for Science
Scientific Committee on Oceanic Research





Young Scientists' Global Change Conference



Young scientists during sessions



Scientists of the future



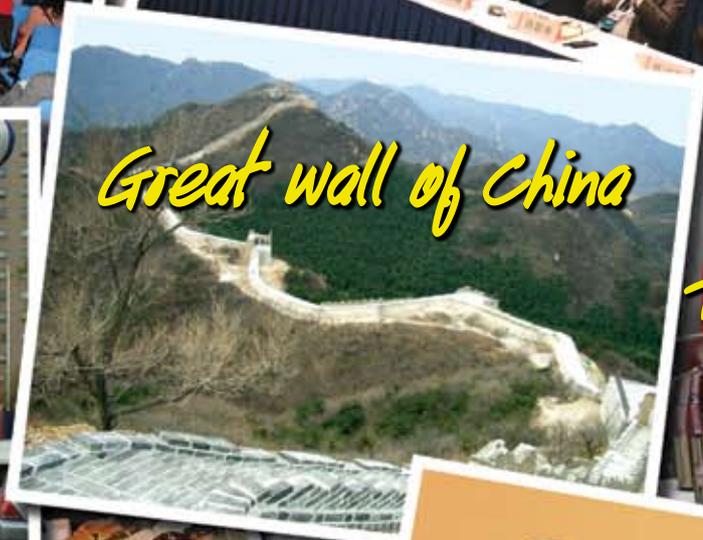
Grand opening!



900 expectant participants



Wonderful entrance!



Great wall of China



Time for



Delicious food!



Chinese theatre

Some Highlights from the ESSP Open Science Conference in Beijing – 9 to 12 November 2006



China's Vice Premier and Dr. Qin Dahe



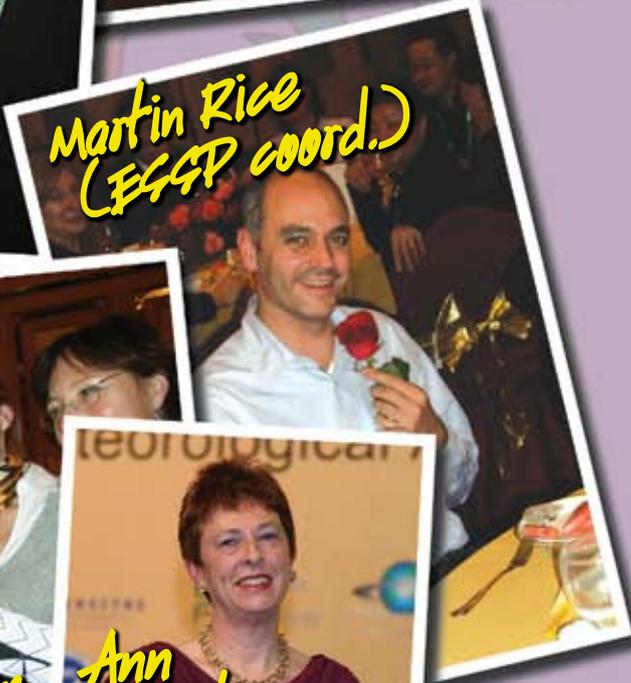
Enjoying pink WCRP ties.



Thomas Rosswall (ICSU) & Qin Dahe (CMA)



Qin Dahe interviewed by Chinese TV



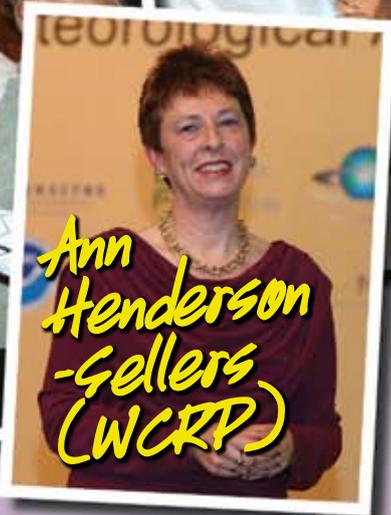
Martin Rice (ESSP coord.)



... a coffee break



Hard working communications team



Ann Henderson-Sellers (WCRP)

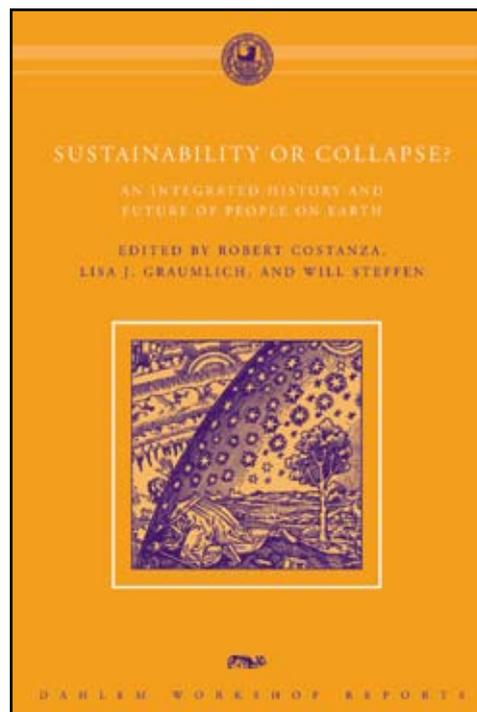
Integration

This article examines a new book that reflects IGBP's system-wide integration, which requires a combined knowledge of human and Earth System history. The book addresses a number of issues debated during a 5-day Dahlem Workshop, such as the impact of the 'Little Ice Age' on societies; the political ecology of the Mayans; the effect of climate on the Roman Empire; past El Niño phenomena; the evolution of socio-ecological systems, namely millennial, centennial and decadal-scale dynamics and human-environmental interactions. The book's future scenarios show how closely linked human societies and the Earth System are.

System-Wide Integration in IGBP

Models, observations and measurements, as well as their scientific integration and synthesis, are fundamentally important activities for IGBP. AIMES, the Analysis, Integration and Modelling of the Earth System project, is concerned with how rapid human development triggers local and regional changes that affect the functioning of the Earth System, including integrating human processes into a new generation of coupled human-in-environment Earth System models (www.aimes.ucar.edu). PAGES, the Past Global Changes project (www.pages.unibe.ch), supports research aimed at understanding the Earth's past environment in order to best make predictions for the future. Human-environment systems, both past and present, are intimately linked in ways that we are only beginning to appreciate and that have been identified as a crucial system-wide integration at the IGBP level.

Human history has traditionally been cast in terms of the rise and fall of great civilisations. This approach leaves out the important ecological, climatic and cultural contexts that shaped and mediated these events. The capability to integrate human history



'Sustainability or Collapse: an Integrated History and Future of People on Earth', MIT Press, 2007 (Costanza, Graumlich, Steffen, eds.), Dahlem Workshop Report Series [ISBN 978-0-262-03366-4].

with the natural history of the Earth now exists. The goal of the *Integrated History and Future Of People on Earth* (IHOPE) initiative (promoted by AIMES and PAGES) is to understand the interactions of the environmental and human processes over the past several ten to hundred millennia, and to determine how human and biophysical changes have contributed to Earth System dynamics. This includes comparing regional-scale reconstructions of ecological and climatic processes, from natural archives, documentary and instrumental data, with evidence on past human activity derived from historical and archaeological records.

The IHOPE Initiative

A first step towards developing the knowledge of humankind's journey as part of a fully integrated system took place at an IHOPE-Dahlem workshop in Berlin, Germany, in 2005. The fields of human history and Earth system history have traditionally been developed independently, with little interaction among the academic communities. Recent recognition that current earth system changes are strongly associated with the

changes in the coupled human-environment system makes the integration of human and Earth System history an important step in understanding the factors leading to global change and in developing coping and adaptation strategies for the future. Ultimately, IHOPE's objective is to produce an integrated history of climate, atmospheric chemistry and composition, material and water cycles, ecosystem distribution, species extinctions, land-use systems, human settlement patterns, technological changes, patterns of disease, patterns of language and institutions, wars and alliances, and other variables on Earth from many new and existing data sources in a spatially and temporally consistent framework.

The IHOPE-Dahlem workshop assembled an interdisciplinary group of 40 top researchers from a range of natural and social science disciplines with the goal of identifying mechanisms and generalisations of how humans have responded to and impacted their environment over millennial, cen-

tennial and decadal scales, as well as providing a glimpse of the future of the human-environment system. The overall conclusion from IHOPE-Dahlem was that human societies respond to environmental (e.g., climate) signals through multiple pathways including coping, adaptation, collapse or failure, migration, and creative invention through discovery. Extreme drought, for instance, has likely triggered both social collapse and ingenious management of water through irrigation. Future responses and feedbacks between the human and environmental components of the Earth System will depend on our understanding of the past and adaptation to future surprises. Results from IHOPE-Dahlem are now available in the newly published MIT volume and provide a useful reference to future work, which will include the publication of the IHOPE Science and Implementation Plan later in 2007.

João MF Morais

IGBP Secretariat

Stockholm, SWEDEN

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PAGES

PAST GLOBAL CHANGES

Co-sponsored International Workshop on Environmental Changes and Sustainable Development in Arid and Semi-arid Regions

10–17 September 2007
Inner Mongolia, China.

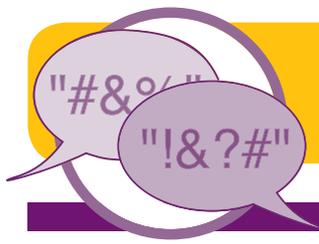
DEADLINES

1 April 2007	Early-bird payment
1 June 2007	Receipt of abstracts. Unless delegates have paid, their papers will not be included in the program
10 August 2007	Final payment for regular registration

Themes of the workshop

- Case studies and theories relating to land degradation and sustainable development in arid and semi-arid as well as sub-humid regions of various continents
- Comparisons of regional-scale reconstruction of Late Quaternary changes in the deserts of various climate zones (monsoon regions, subtropics and westerlies)
- Natural and human impacts on the landscape in various climate zones
- Interactions amongst aeolian, fluvial and lacustrine processes in desert margins

For full details including registration and costs please see the conference website: www.igccas.ac.cn/iw07/



Spotlight: Europe

The extremely warm autumn in Europe has again stressed the discussion of global warming caused by human pollution. Researchers at the Royal Netherlands Meteorological Institute (KNMI) have compiled meteorological data from Europe and present them with some conclusions about global warming.

Extraordinarily mild European autumn 2006 due to global warming?

The temperatures in large parts of Europe have been record high during the meteorological autumn of 2006 (September–November). Compared to the 1971–2000 mean it was more than three degrees Celsius warmer from the north side of the Alps to southern Norway. This made it the warmest autumn on record in the United Kingdom, Belgium, the Netherlands, Denmark, Germany and Switzerland, with the records in central England going back to 1659, in the Netherlands to 1706 and in Denmark to 1768. The autumn was the warmest on record in most of

Austria, southern Sweden, southern Norway and parts of Ireland.

Even with respect to natural climate variations, the observed temperatures for 2006 (Figure 1) would be very unlikely. For the homogenised temperature in De Bilt, the Netherlands (corrected for changes in measurement techniques, environment and urban heat effects), a Gaussian fit (see footnote 1) gives a probability of this temperature occurring of 0.01%, once every 10,000 years, with 95% confidence

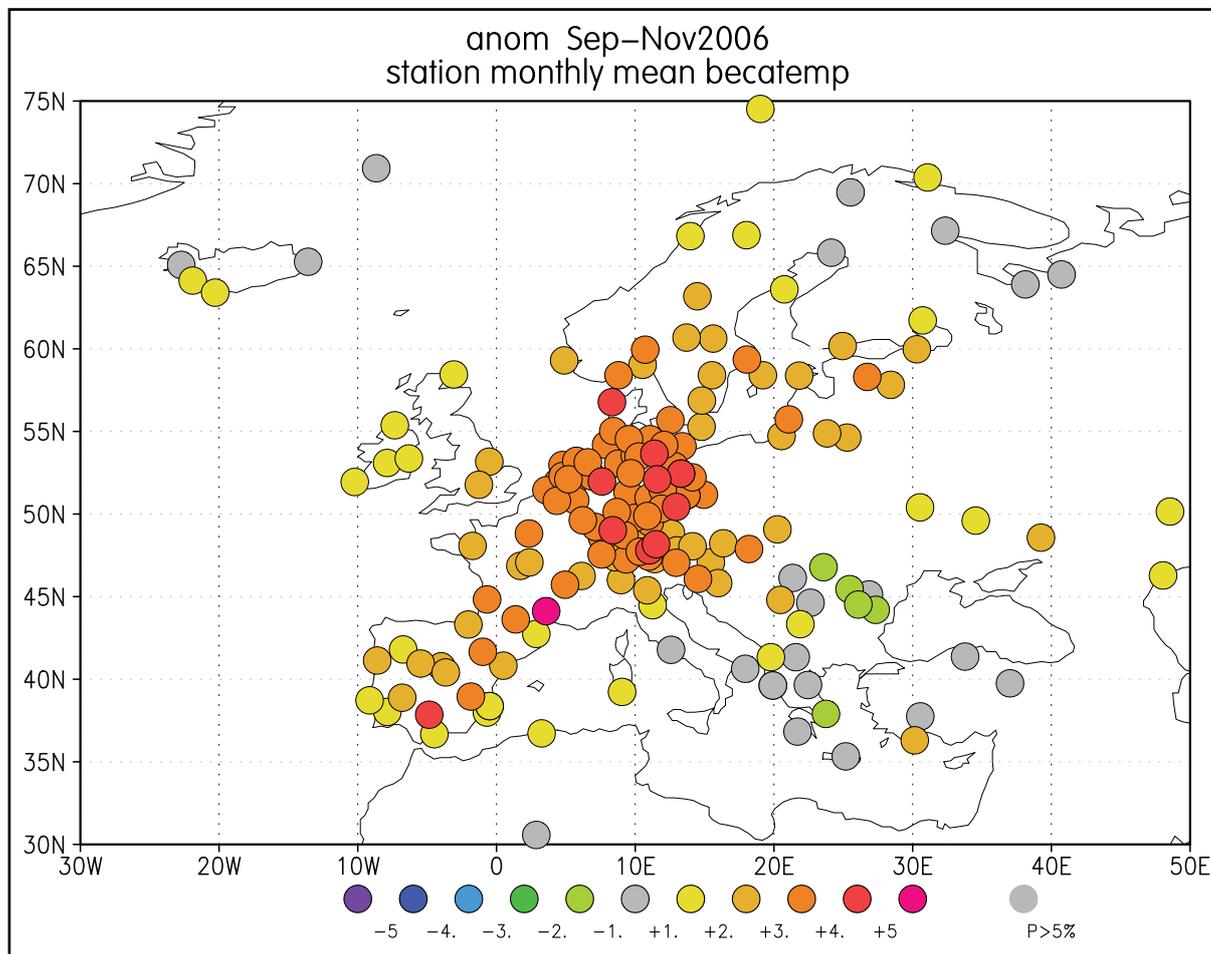


Figure 1. The temperature anomaly of the autumn (September–November) 2006 in ECA&D stations [1] with at least 40 years of data.

interval to once every 2000 years. A GPD (see footnote 1) fit gives even longer return times. If the same Gaussian fit is applied to all European Climate Assessment & Dataset (ECA&D, <http://eca.knmi.nl/>) stations with more than 40 years of data, it appears that the region with return values in excess of 10,000 years covers Belgium, the Netherlands, Germany, Denmark and Switzerland (Figure 2).

Global warming, and hence European warming, therefore must be invoked to explain part of the temperature anomaly this autumn. In a first approximation one can split the temperature anomaly into a part that is linearly proportional to global warming, and the rest, mainly due to the chaotic weather:

$$(1) \quad T = A T_{\text{global}} + T_{\text{weather}}$$

The constant A that describes the relationship between global and local warming in Europe was determined by a linear fit, again not using 2006 itself. The result (Figure 3) shows a strong land-sea contrast along the Atlantic coast, with the Atlantic Ocean warming less than the land. The white area in Eastern Europe is due to a poor

signal/noise ratio in the more variable continental climate there.

The random weather-related temperature anomaly is obtained by subtracting the first term in Equation (1) from the full temperature anomalies (Figure 4). This signal of more than two degrees was mainly due to

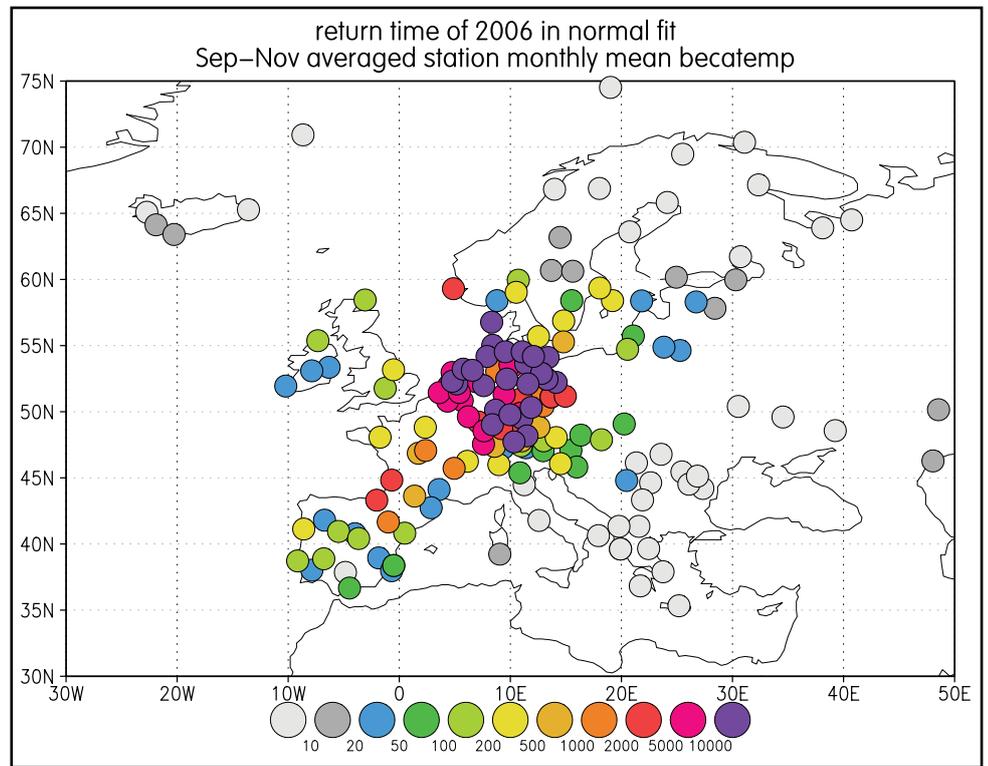


Figure 2. The return period of the autumn of 2006 at De Bilt, the Netherlands, computed from the distribution of the years 1901–2005 for all ECA&D stations with at least 40 years of data, using a Gaussian extrapolation (the GPD gives higher return periods).

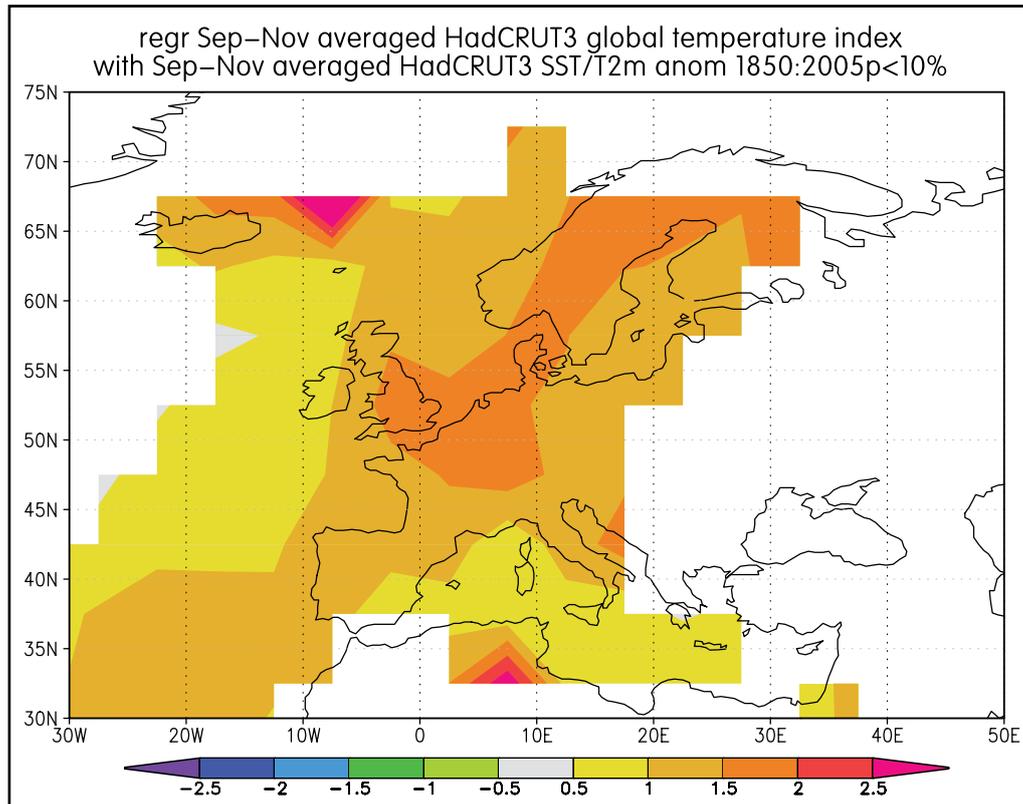


Figure 3. Regression of local temperature with the globally averaged temperature (both from the HadCRUT3 [2] dataset, see footnote 1), which shows a strong land-sea contrast along the Atlantic coast.

southerly winds bringing warm air to the north side of the Alps. Along the shores of the North Sea the lingering effects of the very high temperatures in July raised the temperatures even further.

The occurrence of these weather patterns was still a very unusual event. In the homogenised De Bilt series, the return period of the part not linearly proportional to global warming is 600 years in a Gaussian fit and 2500 years with a GPD fit, with lower boundaries of the 95% confidence interval of 250 years and 700 years respectively. This may still be due to chance, but another possibility is that part of the weather patterns are due to non-linear effects of global warming, which would increase the probability from this upper limit of 0.4%.

The return period of the temperature anomaly corrected for global warming are shown for the conservative Gaussian fit (Figure 5). It appears that the weather played a large part in the unusually warm autumn in Germany and neighbouring countries, with an extension towards the Iberian Peninsula. Investigations are under way to see which factors contributed to the high temperature, and whether these are indeed non-linearly related to global warming or are random variability.

Conclusions

The warm extremes reported in Europe in autumn 2006 cannot be understood without taking global warming into account. The resulting comparatively small shift in the mean temperature implies a large increase in the probability of extreme exceedences. Even so, the return period of the weather patterns that caused the anomaly to be so far above the shifted mean is more than 100 years. One possibility is that this is partly due to unforeseen non-linear effects of global warming.

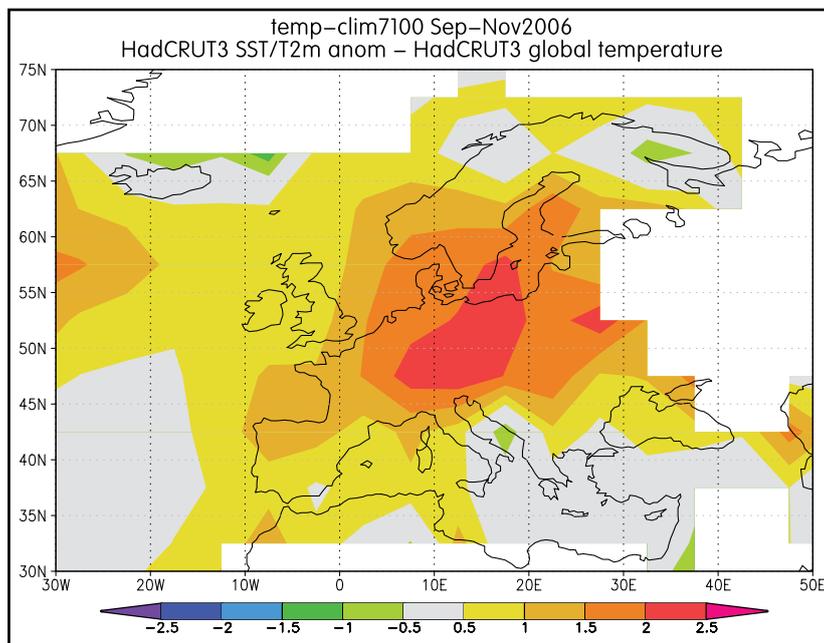


Figure 4. The part of the temperature anomaly in autumn 2006 that is not directly proportional to global warming (HadCRUT3 data).

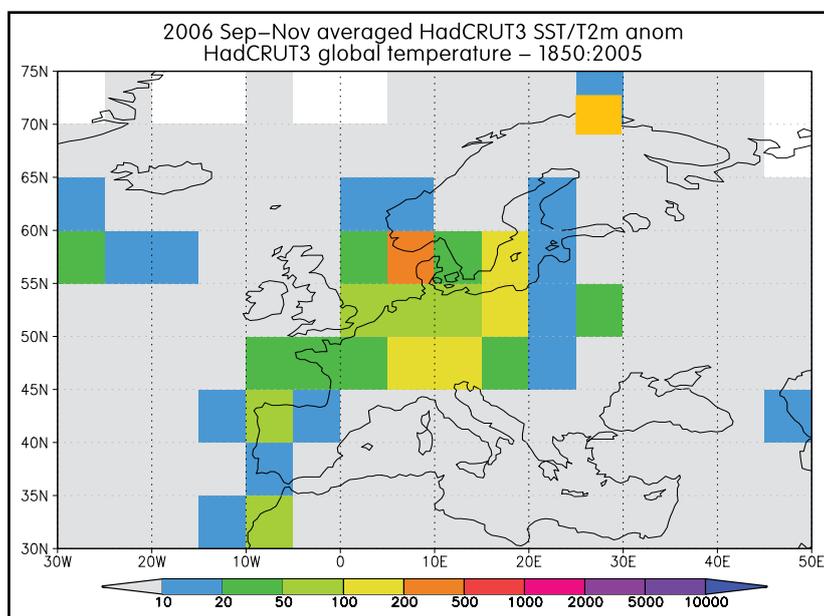


Figure 5. The return period of the anomaly of Figure 4.

Geert Jan van Oldenborgh

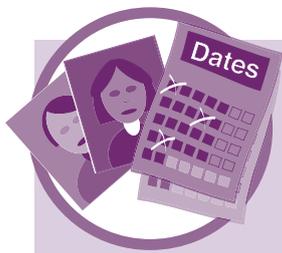
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Footnotes:

1. The *GPD* (Generalized Pareto Distributions) method extrapolates a distribution by fitting a mathematical limiting function to the tail of the distribution, in this case the highest 20%. A *Gaussian fit* considers all points, not only the tail. Autumn temperatures in Europe are often well described by a Gaussian distribution.
2. HadCRUT3 data is combined land and marine (sea surface temperature, SST, anomalies from HadSST2 [3]) temperature anomalies on a 5° by 5° grid-box basis.

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New Roles and Faces

The ESSP Global Water System Project's (GWSP) new Executive Officer



Dr. Lydia Gates took up the position as the GWSP Executive Officer as of December 2006. Dr. Gates is a recognised leader in international global change research (climate and water issues) with a global perspective on water resources. She is very familiar with the global change community in Europe and North America, and has exper-

ience in administering global change programs of the World Climate Research Programme (CLIVAR – Climate Variability and Predictability) and the U.S. National Science Foundation. She has also been involved in GEWEX (Global Energy and Water Cycle Experiment) and other projects related to the GWSP. Dr. Gates' strong science and management background and interdisciplinary interests will be great assets to the GWSP.

E-mail: lydia.dumenilgates@uni-bonn.de

New IGBP Synthesis book:

Terrestrial Ecosystems in a Changing World

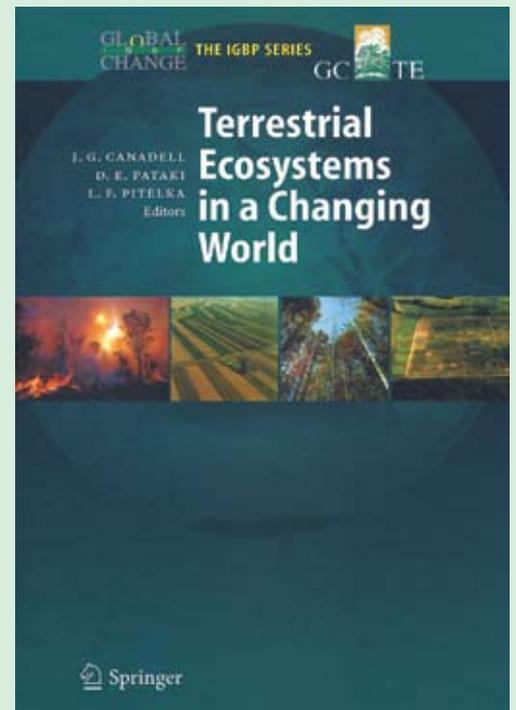
edited by Canadell JG, Pataki DE, Pitelka LF is the latest volume published in the IGBP Book Series. Over 100 authors present 25 contributions on the impacts of global change on terrestrial ecosystems including key processes of the Earth System such as the CO₂ fertilisation effect; the saturation of the terrestrial carbon sink; and ecosystem services such the production of wheat, pest control, and carbon storage in croplands.

The IGBP Series is an excellent resource for those wishing to understand the changing Earth System and the research challenges for the future. The series is especially suited to scientists, educators and students, and many of the volumes – especially Global Change and the Earth System – are also suitable for environmental policy advisors. Find out more about the series at www.igbp.net or order a volume at www.springeronline.com

To order books at a 10% discount, please send your order to Maurer@Springer.de

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GLOBAL
I G B P
CHANGE



Springer

In the Profile of a Scientist section we aim to feature “early-career” scientists who are making important contributions to Earth System science and to IGBP. We strive to achieve gender, discipline and geographical balances. The editor (erik@igbp.kva.se) welcomes suggestions for scientists to profile.

Profile of a Scientist: Colette Heald

Colette Heald, originally from Ottawa, Canada, graduated in 2005 from the Ph.D. program in Earth and Planetary Sciences at Harvard University, focussing on Atmospheric Chemistry. Since 2006 she has been a NOAA Climate and Global Change post-doctoral fellow at the University of California, Berkeley.

At the International Young Scientists’ Global Change Conference that took place 5–8 November 2006 in Beijing, China, she received the honourable Professor Crutzen Prize for best paper. Some 100 participants from 35 countries, selected from over 700 applications by an international review panel, attended the conference.

The conference was endorsed by the Earth System Science Partnership (ESSP) and was co-organised by the global change SysTEM for Analysis, Research and Training (START) initiative (see photos in the centrefold of this Newsletter). Since the conference was followed by the ESSP Open Science Conference in Beijing (see thematic science features in this Newsletter), which was attended by nearly 1000 Earth Science researchers from around the world, Colette received a lot of attention and could profit from new rewarding contacts.

Colette was raised in Montreal and Ottawa in a bilingual family (English and French) and often travelled to England and western Canada with her older sister and parents to visit family. She mentions how her commitment to science all started:

“Trying to keep up with an older sister (now an aerospace engineer) initially fuelled my interest in science and I was fortunate to be in an educational environment that really encouraged women to pursue science,” Colette says.

She earned her undergraduate degree in engineering physics at Queen’s University in Kings-



ton, Ontario, and then moved to Cambridge, Massachusetts, to pursue her PhD. According to her supervisor, Professor Daniel Jacob, her work “pioneered the use of satellite observations of atmospheric composition to quantify the sources and intercontinental transport of pollutants.”

One major component of Colette’s thesis was to combine satellite observations, in situ observations, and a global 3-D model analysis to better understand the trans-Pacific transport of carbon monoxide (CO), ozone, and aerosols. The goal of this study was to test model esti-

mates of Asian pollution enhancements of aerosol concentrations in the United States.

Colette wrote a paper with results suggesting that we might currently be missing a large organic carbon aerosols source in the free troposphere, and showing that the implications for radiative forcing and intercontinental pollution were potentially large, maybe 10 to 100 times higher than previously estimated in models. This paper has received a lot of attention.

Colette held a seminar at Colorado State University on May 22, 2006, where a key statement in her abstract was that:

“Recent observations aboard aircraft off of Asia show a large burden of organic carbon aerosol in the free troposphere. The inability of current models to explain this aerosol suggests an incomplete understanding of secondary organic aerosol (SOA) formation, with significant implications for both air quality and climate forcing.”

A recently published article provides an in depth report on her research on aerosols (Heald CL et al. (2006) Concentrations and sources of organic carbon aerosol in the free troposphere over North America, *Journal of Geophysical Research* 111, D23S47).

After two years of postdoctoral research in Berke-

ley, Colette will start as a tenure-track professor at Colorado State University in January 2008. Her enthusiasm for global change science drives her, and even if, in her free time, she loves to watch black-and-white Hitchcock movies, science and environmental issues provide the real excitement for her.

“Atmospheric science for me is the ideal combination of challenging problem-solving with a society-

relevant motivation. It’s so exciting to feel that as a young scientist in this field there are discoveries to be made which could change our understanding and attitudes towards the environment,” says Colette, who recently started to learn basic Russian in anticipation of a trip later this year. The western world is not enough!

(Sincere acknowledgements to Professor Daniel Jacob for help with information).

IGBP and Related Global Change Meetings

A more extensive meetings list is available on the IGBP web site at www.igbp.net.

7th National Conference on Science, Policy and the Environment: Integrating Environment and Human Health

01–02 February, Washington, DC, United States

Contact: <http://www.ncseonline.org/2007conference/>

ASLO 2007 Aquatic Sciences Meeting

04–09 February, Santa Fe, NM, United States

Contact: <http://aslo.org/santafe2007/>

International Conference on Coastal Zone Environment and Sustainable Development Vulnerability, Adaptation and Beyond

12–15 February, New Dehli, India

Contact: <http://czesd.tripod.com/>

3rd WGNE Workshop on Systematic Errors in climate and NWP Models

12–16 February, San Francisco, CA, United States

Contact: <http://www-pcmdi.llnl.gov/wgne2007/>

UK IGBP National Committee Meeting: Understanding Land-Ocean-Atmosphere Interactions in the Climate System: the Role of Earth Observation from Space

14 February, London, England, United Kingdom

Contact: <http://classic.nerc.ac.uk/IGBP.php>

7th International Conference on Global Change: Connection to the Arctic (GCCA-7)

19–20 February, Fairbanks, AK, United States

Contact: <http://www.iarc.uaf.edu/workshops/GCCA-7/index.php>

International Conference on Environment: Survival and Sustainability

19–24 February, Nicosia, Cyprus

Contact: <http://www.neuconference.org>

The science of climate change: A Royal Society showcase of the IPCC 4th Assessment Working Group 1 report

01–02 March, London, England, United Kingdom

Contact: <http://www.royalsociety.co.uk/event.asp?id=5464> or The Royal Society, discussion.meetings@royalsoc.ac.uk

International Symposium on Polar Research

05–06 March, Brussels, Belgium

Contact: <http://cordis.europa.eu/sustdev/environment/ev20061023.htm>

2nd Alexander von Humboldt International Conference: The role of Geophysics in Natural Disaster Prevention

05–09 March, Lima, Peru

Contact: <http://meetings.copernicus.org/avh2/>

2007 SOLAS Open Science Meeting

06–09 March, Xiamen, China

Contact: <http://www.solas2007.confmanager.com>

Workshop on the Interdisciplinary Science of Climate Changes: Basic Elements

12 March–04 April, Buenos Aires, Argentina

Contact: http://cdsagenda5.ictp.it/full_display.php?email=0&ida=a06284

Conference on Secure and Sustainable Living, Social and Economic Benefits of Weather, Climate and Water Services

19–22 March, Madrid, Spain

Contact: <http://www.wmo.int/Madrid07>

First International Symposium of Marine Sciences & Spanish GLOBEC-IMBER Symposium

28–31 March, Valencia, Spain

Contact: <http://www.ucv.es/isms07/>

8th Swiss Global Change Day

04 April, Bern, Switzerland

Contact: <http://www.proclim.ch/events/8thSGCD.html>

Emerging Issues Along Urban/Rural Interfaces: Linking Land-Use Science and Society

09–12 April, Atlanta, GA, United States

Contact: <http://www.sfw.s.auburn.edu/urbanruralinterfaces/>

Ocean Surface: CO₂ and Vulnerabilities Workshop

11-14 April, UNESCO, Paris, France

http://www.ioc.unesco.org/ioccp/pCO2_2007.htm or Roger Dargaville, r.dargaville@unesco.org

EGU General Assembly

15-20 April, Vienna, Austria

Contact: <http://meetings.copernicus.org/egu2007/>

Annual Meeting: Association of American Geographers

17-21 April, San Francisco, CA, United States

Contact: <http://www.aag.org/>

Framing Land Use Dynamics II

18-20 April, Utrecht University, Netherlands

Contact: <http://www.geo.uu.nl/flud2007>

First National Conference on Global Change by the Spanish Committee of Research on Global Change (ceiCAG)

25-27 April, Madrid, Spain

Contact: <http://www.uc3m.es/uc3m/dpto/CPS/ceicag>

International Conference on Climatic Changes and their impacts on the coastal zone and River Deltas: Vulnerability, Mitigation and Adaptation?

30 April, Alexandria, Egypt

Contact: amhkater@yahoo.com

The EarthCARE Workshop

07-09 May, Noordwijk, Netherlands

Contact: <http://www.congrex.nl/07c08/>

SCOR/IAPSO Working Group 127 on Thermodynamics and Equation of State of Seawater

07-11 May, Reggio Calabria, Italy

Contact: <http://www.scor-int.org/calendar.htm>

Training course: Marie Curie-iLEAPS-MEASUREMENTS. Integrated measurements over land ecosystem atmosphere boundaries

07-12 May, Hyytiälä field station, Finland

<http://www.atm.helsinki.fi/ILEAPS/marie-curie-ileaps/> or Timo Vesala, timo.vesala@helsinki.fi

Conference L2L - Sustainable Neighbourhood: From Lisbon to Leipzig through Research

08-10 May, Leipzig, Germany

Contact: <http://www.fona.de/L2L> or Annette Kirk, annette.kirk@zmaw.de

Workshop: Global Assessments – Bridging Scales and linking to policy

09-11 May, Washington, DC, United States

Contact: <http://www.tias-web.info>

International Conference: Towards Sustainable Global Health

09-11 May, Bonn, Germany

Contact: <http://www.gemini.de/global-health>

IUBS Symposium – Biological Sciences for the 21st Century: Meeting the Challenges of Sustainable Development in an Era of Global Change

09-13 May, Washington, DC, United States

Contact: <http://www7.nationalacademies.org/IUBS> or Katherine Bowman, kbowman@nas.edu

5th GKSS School of Environmental Research: Persistent Pollution: Past, Present and Future

09-18 May, Göhrde near Lüneburg, Germany

Contact: <http://coast.gkss.de/events/5thschool/>

ICES/PICES/IOC symposium on “Effects of climate change on the world’s oceans”

19-23 May, Gijón, Spain

Contact: PICES Secretariat, secretariat@PICES.int

ESF-FWF Conference in Partnership with LFUI: Ocean Controls in Abrupt Climate Change

19-24 May, Obergurgl, Austria

Contact: http://www.esf.org/esf_genericpage.php?section=10&language=0&genericpage=2674&shortcut=1

2007 AGU Joint Assembly

22-25 May, Acapulco, Mexico

Contact: <http://www.agu.org/meetings/ja07/>

Eco Summit 2007 – Ecological Complexity and Sustainability: Challenges and Opportunities for 21st century’s ecology

22-27 May, Beijing, China

Contact: <http://www.ecosummit2007.elsevier.com/index.htm>

Conference on the Human Dimensions of Global Environmental Change: Earth System Governance: Theories and Strategies for Sustainability

24-26 May, Amsterdam, Netherlands

Contact: <http://www.2007amsterdamconference.org/index.htm> or Man-san Sander Chan, sander.chan@ivm.vu.nl or Aysem Mert, aysem.mert@ivm.vu.nl

1st International Summit on Hurricanes and Climate Change

27 May-01 June, Crete, Greece

Contact: <http://www.aegeanconferences.org/HurricanesClimateChange/index.asp>

4th International Zooplankton Production Symposium: Human and Climate Forcing of Zooplankton Populations

28 May-01 June, Hiroshima, Japan

Contact: http://www.pices.int/meetings/international_symposia/2007_symposia/4th_Zooplankton/4th_Zoopl.aspx

Summer School on “Earth System Governance”

28 May-08 June, Amsterdam, Netherlands

Contact: <http://www.2007amsterdamconference.org/summer-school.htm>

International Conference on Climate Change

29-31 May, Hong Kong, China

Contact: <http://www.hkie.org.hk/iccc2007/>

WCRP Workshop on Seasonal Prediction

04-08 June, Barcelona, Spain

Contact: http://wcrp.wmo.int/pdf/Seasonal_Workshop.pdf

5th Study Conference on BALTEX

04-08 June, Kuressaare, Saaremaa, Estonia

Contact: <http://www.baltex-research.eu/conf2007>

IIASA Young Scientists Summer Program 2007

04 June-31 August, Vienna, Austria

Contact: <http://www.iasa.ac.at/Admin/YSF/register/index.html?sb=10>

7th ESEE international conference: Integrating natural and social sciences for sustainability

05-08 June, Leipzig, Germany

Contact: <http://www.esee-leipzig2007.org>

Marie Curie Summer School in Emerging Theories and Methods in Sustainability Research (THEMES)

18-29 June, Vysoke Tatry, Slovakia

Contact: <http://www.umb.no/?viewID=12743>

IPCC-TGICA Regional Meeting: Integrating Analysis of Regional Climate Change and Response Options

20-22 June, Nadi, Fiji

Contact: http://ipcc-wg1.ucar.edu/meeting/TGICA-Regional/TGICA-Regional_public.html

International Sea-Ice Summer School

02-13 July, University Centre in Svalbard, Norway

Contact: <http://www.seaice.info/>

IUGG 24th General Assembly, Union of Geodesy and Geophysics: iLEAPS symposium on "Interactions of Land Cover and Climate"

02-13 July, Perugia, Italy

Contact: http://www.atm.helsinki.fi/ILEAPS/index.php?page=ileaps_meetings

World Congress: International Association for Landscape Ecology

08-12 July, Wageningen, Netherlands

Contact: <http://www.iale2007.com>

Ocean Carbon and Biogeochemistry (OCB) Summer 2007 Science workshop

23-26 July, Woods Hole, MA, United States

Contact: Mary Zawoysky, mzawoysky@whoi.edu

2nd ACCENT Symposium, the European Network of Excellence in Atmospheric Composition Change

23-27 July, Urbino, Italy

Contact: <http://www.accent-network.org/2nd%2Dsymposium/>

17th INQUA Congress

28 July-03 August, Cairns, Australia

Contact: Inqua_secretariat@inqua.org.au

2007 World Water Week in Stockholm

12-18 August, Stockholm, Sweden

Contact: <http://www.worldwaterweek.org/>

17th International Conference on Nucleation and Atmospheric Aerosols

13-17 August, Galway, Ireland

Contact: <http://macehead.nuigalway.ie/icnaa2007>

6th International NCCR Climate Summer School: Land Surface - Atmosphere Interactions in a Changing Climate

26-31 August, Grindelwald, Switzerland

Contact: http://www.nccr-climate.unibe.ch/summer_school/2007/

2nd International Conference on Earth System Modelling

27-31 August, Hamburg, Germany

Contact: <http://www.mpimet.mpg.de/fileadmin/static/icesm/>

3rd Alexander von Humboldt International Conference: East Asian Summer Monsoon – past, present and future

27-31 August, Beijing, China

Contact: https://www.copernicus.org/site/redsys/classicform.php?form=form_avh07_china_circular&site=egu or Zhongli Ding, Zlding@mail.igcas.ac.cn or André Berger, berger@astr.ucl.ac.be

"Monitoring the effectiveness of nature conservation programmes"

03-06 September, Swiss Federal Research Institute WSL, Switzerland

Contact: http://www.wsl.ch/event_07/monitoring/

International Workshop on Environmental Changes and Sustainable Development in Arid and Semi-arid Regions

10-17 September, Inner Mongolia, China

Contact: <http://www.igccas.ac.cn/iw07/index.htm> or Xiaoping Yang, xpyang@263.net.cn, xpyang@mail.igcas.ac.cn

Interdisciplinary Opportunity for Recent PhD Graduates: Dissertations Initiative for the Advancement of Climate Change Research Symposium

10-17 September, Kilauea, Hawaii, United States

Contact: <http://www.solas-int.org/>

2nd Global Conference on Large Marine Ecosystems

11-13 September, Qingdao, China

Contact: http://www.imber.info/jobs-announcements/LMEs_second_announcement.pdf

Joint IMBER/LOICZ Continental Margins Open Science Conference

17-21 September, Shanghai, China

Contact: shanghai.osc@univ-brest.fr

Conference on the Science and Education of Land Use: A transatlantic, multidisciplinary and comparative approach

24-26 September, Washington, DC, United States

Contact: <http://www.nercrd.psu.edu/TALUC/>



Pin Board

The Pin Board is a place for short announcements and letters to the Editor. Announcements may range from major field campaigns, new websites, research centres, collaborative programmes, policy initiatives or political decisions of relevance to global change. Letters to the editor should not exceed 200 words and should be accompanied by name and contact details.

ICSU Consultative Forum

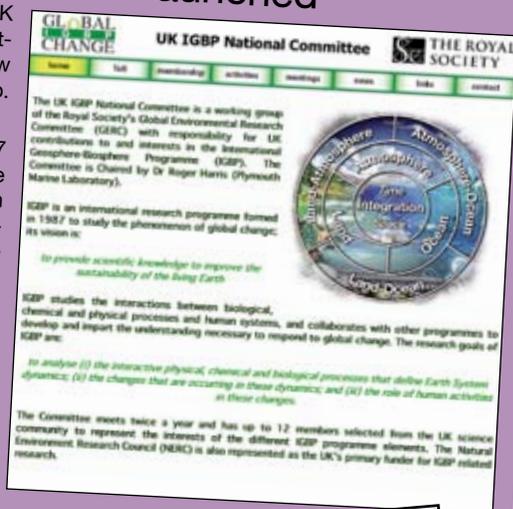
The ICSU Regional Office for Africa held its 2nd Consultative Forum in Pretoria, South Africa during September 2006. In keeping with the ICSU Strategic Plan of 2006–2011, and the needs of Africa, the ICSU Regional Committee for Africa identified four priority areas for its Regional Office. These are: Health and Human Well-being; Sustainable Energy; Natural and Human-induced Hazards and Disasters; and Global Change. Four Scoping Groups, composed of leading African scientists and engineers, are currently preparing science/work plans on each of these priority areas (www.icsu.org; www.icsu-africa.org), and other key stakeholders.



UK IGBP National Committee website launched

In 19 June 2006 the UK IGBP National committee launched its new website at <http://web.pml.ac.uk/uk-igbp/>.

On 14 February 2007 they will organise a one day open meeting on "Understanding Land-Ocean-Atmosphere Interactions in the Climate System – the Role of Earth Observation from Space". Dawn Ashby from the GLOBEC IPO is the contact of the UK IGBP secretariat.



GLP New Website

www.globallandproject.org

The Global Land Project has launched a new website, and a new logo featuring the ESSP visual elements as well as a number of content updates. GLP aims to re-connect researchers active in the GCTE and LUCC, predecessors of the GLP and attract new partners for cooperation. The website features a section devoted to those interested in joining the GLP scientific network.



GLOBEC chooses "Climate Care" for Carbon Offset

To reduce the impact of IGBP project GLOBEC activities on the world's climate, GLOBEC is offsetting the carbon emissions from their flights involving GLOBEC's business through Climate Care. Climate Care is an organisation that reduces greenhouse gas emissions on behalf of companies and individuals by running projects across the world. As well as cutting greenhouse gases, the projects help to improve people's standards of living and protect wildlife habitats.



To find out more about Climate Care and its projects, see www.climatecare.org.



Launch of IPY 1 March 2007!

The first official day of the International Polar Year (IPY) will take place on Thursday 1st March 2007 in Paris, hosted by the International Council for Science (ICSU). The IPY Joint Committee, members of the IPO, and guests will attend this. Read about worldwide IPY events at www.ipy.org

UNESCO-scope Policy Brief on the Carbon Cycle Published

The Scientific Committee on Problems of the Environment (SCOPE) and UNESCO have begun a series of policy briefs, the second of which covers the global carbon cycle. Led by scientists from the Global Carbon Project (GCP, www.globalcarbonproject.org) the brief focuses on the carbon-climate-human interactions and addresses problems such as how to close the 'energy gap' and the potential for the additional release of carbon from vulnerable natural reservoirs. It also considers the inertia of the climate-human system, highlighting the need to act now, as changes will take decades to take effect.



To download the brochure, go to www.unesco.org/mab/publications/pdf/carbonBriefsNo2.pdf

iLEAPS Launch of iLEAPS-China

The official launch of iLEAPS-China took place on 12 November 2006, at the Institute of Atmospheric Physics, Chinese Academy of Sciences, Beijing.

Among other things, the new Asian initiative will deal with research on land-atmosphere exchanges of reactive and long-lived compounds in the Earth System. Read more at <http://ileaps-china.tea.ac.cn/>

Large Environmental Grant to Sweden

The research foundation Mistra has given Stockholm University the largest environmental research grant ever distributed in Sweden – 22 million Euros. These will be invested in a new international transdisciplinary institute for research and policy dialogue on sustainable development. Behind the new institute stands the Centre for Transdisciplinary Environmental Research at Stockholm University, the Stockholm Environment Institute, and the Beijer International Institute of Ecological Economics at the Royal Swedish Academy of Sciences. Professor Carl Folke (IHDP Scientific Committee) will be the head of the new institute.

Congratulations from IGBP!



New Administrative and Finance Officer

Anna Middel started working in January 2007 at Global Water System Project (GWSP). She can be reached at anna.middel@uni-bonn.de.

More thorough information about Anna will be published in the next issue of IGBP's Newsletter.

Welcome to the ESSP community, Anna!

ESSP
news:



Earth System
Science Partnership

Launch of MAIRS and GECHH



During several special sessions at the ESSP Open Science Conference in Beijing, November 2006, the ESSP recently launched the Monsoon Asia Integrated Regional Study (MAIRS). Unlike other monsoon research projects, MAIRS will address the interaction between humans and the environment in Monsoon Asia to support strategies for sustainable development. It attempts to understand to what extent the human activities modulate the Asia monsoon climate and how the changed monsoon climate will impact the social and economic development of Asia. The MAIRS Science Plan can be downloaded at www.mairs-essp.org

GECHH

ESSP has also launched a new research initiative on Global Environmental Change and Human Health (GECHH), together with a Science Plan. The project aims to create an international network of researchers who can identify and quantify health risks posed by global environmental change, and develop adaptation strategies that are cost effective for reducing health risks. Please read our press release "ESSP Launches Project on the effects of global environmental change on human health" and download the GECHH Science Plan at www.essp.org

www.essp.org



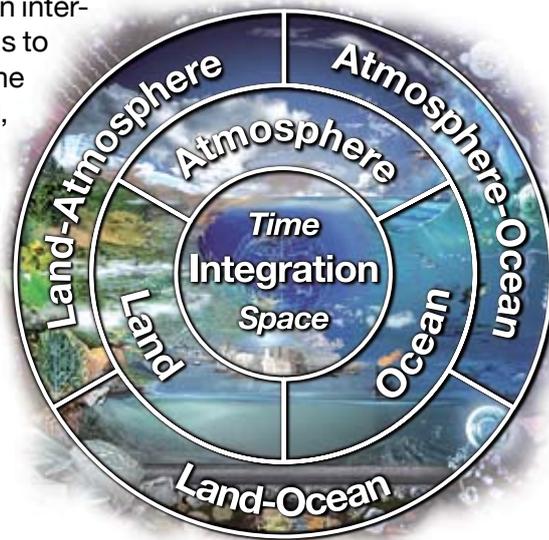
GEIA 2006 Open Science Conference

At the GEIA (Global Emissions Inventory Activity) Open Science Conference in Paris from 29 November – December 2006, topics of discussion included emission trends, aerosols, integration of spatial and temporal scales, terrestrial ecosystems and biomass burning. Also coordination with AIMES and IGAC/IGBP projects, and the ACCENT network were planned. Conference conclusions and GEIA plans for 2007 will be posted soon at the website www.geiacenter.org



The International Geosphere-Biosphere Programme

IGBP is an international scientific research programme built on inter-disciplinarity, networking and integration. The vision of IGBP is to provide scientific knowledge to improve the sustainability of the living Earth. IGBP studies the interactions between biological, chemical and physical processes and human systems, and collaborates with other programmes to develop and impart the understanding necessary to respond to global change. IGBP research is organised around the compartments of the Earth System, the interfaces between these compartments, and integration across these compartments and through time.



IGBP helps to

- develop common international frameworks for collaborative research based on agreed agendas
- form research networks to tackle focused scientific questions and promote standard methods
- guide and facilitate construction of global databases
- undertake model inter-comparisons
- facilitate efficient resource allocation
- undertake analysis, synthesis and integration of broad Earth System themes



IGBP produces

- data, models, research tools
- refereed scientific literature, often as special journal editions, books, or overview and synthesis papers
- syntheses of new understanding on Earth System Science and global sustainability
- policy-relevant information in easily accessible formats



Earth System Science



IGBP works in close collaboration with the International Human Dimensions Programme on Global Environmental Change (IHDP), the World Climate Research Programme (WCRP), and DIVERSITAS, an international programme of biodiversity science. These four international programmes have formed the Earth System Science Partnership (ESSP). The International Council for Science (ICSU) is the common scientific sponsor of the four international global change programmes.

Participate

IGBP welcomes participation in its activities – especially programme or project open meetings (see meetings list on website). To find out more about IGBP and its research networks and integration activities, or to become involved, visit our website (www.igbp.net) or those of our projects, or contact an International Project Office or one of our 78 National Committees.

Contributions

The Global Change NewsLetter primarily publishes articles reporting science undertaken within the extensive IGBP network. However, articles reporting interesting and relevant science undertaken outside the network may also be published. **Science Features** should balance solid scientific content with appeal to a broad global change research and policy readership. **Discussion Forum** articles should stimulate debate and so may be more provocative. Articles should be between 800 and 1500 words in length, and be accompanied by two or three figures or photographs. Articles submitted for publication are reviewed before acceptance for publication. Items for the **Pin Board** may include letters to the editor, short announcements such as new relevant web sites or collaborative ventures, and meeting or field campaign reports. Pin Board items should not exceed 250 words.

Photographs should be provided as TIFF or high resolution JPG files; minimum of 300 dpi. Other images (graphs,

diagrams, maps and logos) should be provided as vector-based EPS files to allow editorial improvements at the IGBP Secretariat. All figures should be original and unpublished, or be accompanied by written permission for re-use from the original publishers.

The Global Change NewsLetter is published quarterly – February, May, August and November. The deadline for contributions is two weeks before the start of the month of publication. Contributions should be emailed to the editor.



ISSN 0284-5865

Publication Details

Circulation: 11,200 copies

Published by:

IGBP Secretariat
Box 50005
SE-104 05, Stockholm
SWEDEN

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The current and past issues of the Global Change NewsLetter are available for download from www.igbp.net. Requests for reproduction of articles appearing in the NewsLetter should be emailed to the editor. Changes to address information for receipt of the NewsLetter should be emailed to charlottew@igbp.kva.se. The IGBP Report Series is published in annex to the Global Change NewsLetter.

Printed by Bergs Grafiska, Sweden.