



## DIVERSITAS at a GLANCE - Special ESSP OSC2

This electronic newsletter is meant as a way to inform the community on all aspects of DIVERSITAS. This volume is a special issue on the ESSP OSC2.

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DIVERSITAS is a member of the [ESSP](#), which includes: [DIVERSITAS](#), [IGBP](#), [IHDP](#) and [WCRP](#)

### Earth System Science Partnership (ESSP) 2<sup>d</sup> OPEN SCIENCE CONFERENCE



Global Environmental Change:  
Regional Challenges

**Global Environmental Change, Regional Challenges: An Earth System Science Partnership Global Environmental Change Open Science Conference**  
*9-12 November 2006 - Beijing, China*

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#### **Audience and outreach**

Five years after the first Global Change Open Science Conference in Amsterdam (NL, 2001), the ESSP brought together the worldwide global environmental change research community to assess progress since that meeting and to lay plans for the future.

The ESSP OSC2 convened in Beijing, China, was opened by Q Dahe (China Meteorological Administration) and G McBean (University of Western Ontario, Canada), Co-Chairs of the Conference.

900 experts specialising in various Earth System science disciplines attended, including young scientists, funding agency representatives, exhibitors, members of the broader global environmental change science and development communities such as policy makers, practitioners, media representatives, members of the private sector and government officials from China and elsewhere.

Plenary and parallel sessions allowed practitioners from the many different disciplines that focus on the integrated Earth System approach to global environmental change research, to present up-to-date results and research themes. Topics included: 1) integrated regional studies with emphasis on Monsoon Asia; 2) integrative modelling of the water, 3) carbon and other cycles; 4) role of science in informing public policy development; 5) role of science in development, including food security, health and water management; and 6) characteristics, impacts and responses to extreme events.

In his closing speech, J Church, WCRP Chair, highlighted the many opportunities that evolve from building on the success of the GEC Programmes and the ESSP partnership. Highlights of the Conference included an impressive variety of keynote presentations on advances in Global Environmental Change to Earth System Science and the way forward. There were 44 parallel sessions ranging from Monsoon Asia to the future of Earth System Modelling to the governance of water, food, and carbon and over 500 poster presentations. Major outcomes of the Conference included the launch of the new ESSP Joint Project on GEC and Human Health and the Monsoon Asia Integrated Regional Study (MAIRS) initial Science Plan. The ESSP Open Science Conference delivered a message of urgency to governments to take action on issues of global environmental change and sustainable development.

Of the expected outcome of the conference, input into the future evolution of major initiatives includes the International Conventions on Biological Diversity, Climate Change, Desertification and others and national and international policies on these topics.

### **Media coverage**

About 50 Chinese and foreign correspondents from various news agencies from around the world provided science updates and discussions on global environmental change at the ESSP Open Science Conference. Leading experts in the diverse fields of Earth System science gave interviews. The China Meteorological Administration's Weather Channel devoted a news programme about the ESSP Conference including live broadcasts and interviews with experts attending the Conference.

Conference web pages at <http://www.essp.org/ESSP2006/> and <http://www.essp.org/>

### **ESSP OSC2 Declaration**

#### **The Statement of the Beijing Conference on Global Environmental Change**

The global environmental change scientists gathered in Beijing for the Open Science Conference on Global Environmental Changes - Regional Challenges, note:

- The Earth System Science Partnership (ESSP), created by four global environmental change programmes (DIVERSITAS, IGBP, IHDP, WCRP) through the 2001 Amsterdam Declaration to bridge the disciplinary gaps across environmental science, is now dramatically improving our understanding of the complex Earth system
- In this era of human activities modifying the planet on a global scale, we are concerned for the continuing adverse affects on the global environment and the resulting serious threats to sustainable development of human society

In view of the importance of the impacts on human health, the Beijing Conference launched the Global Environmental Change and Human Health Project.

Recognising that there are issues special to regions, the Beijing Conference initiated the Monsoon Asia Integrated Regional Study to examine the threats posed to populations and ecosystems in Monsoon Asia.

We affirm that the ESSP, its regionalized activities together with START, on-going joint projects on Food Security, Carbon and Water Systems and the four parent Global Environmental Change Programmes will:

- Create new understanding of key components of the earth system and their dynamic interactions, and address uncertainties and risks
- Take responsibility to mobilise knowledge for action, and provide society with the scientific information to better meet present and future needs within the context of sustainable development

The Earth System Science Partnership urges governments to work with us on these initiatives while also undertaking actions to reduce the impact of human activities on the environment in order to ensure sustainable development.

## Sessions related to DIVERSITAS

During the **Opening Plenary Session Welcome Remarks** were offered by the four ESSP Chairs: [M Loreau](#)/DIVERSITAS, C Nobre/IGBP, O Young/IHDP and J Church/WCRP.

[C Körner](#)/GMBA gave a talk entitled "[Beyond counting: Biodiversity drives the Earth System](#)", followed by [R Leemans](#) who spoke about "[Earth System Science: Progress and challenges](#)".

DIVERSITAS organised or co-organised 8 parallel sessions:

- *Climate Change and Rising CO2: How Serious is the Future Threat to Biodiversity?* Convened by [P Leadley](#)/ bioDISCOVERY p4
- *Towards a Global Observation System of Biodiversity and Land Cover Changes: Solutions for Sustainable Development* chaired by [N Jürgens](#)/bioDISCOVERY p4
- *Biodiversity, Ecosystem Functioning and Carbon Sequestration* chaired by [K Ma](#)/DIWPA/ecoSERVICES p5
- *Environmental Change and Disease Emergence: Predictive Approaches to a Global Problem* co-organised by [P Daszak](#)/DIVERSITAS and M Cesario/IHDP p5
- *Interdisciplinary and Implementation-oriented Approaches in Research on Conservation and Use of Biodiversity: What are the Lessons (to be) Learned?* Organised by [M Denich](#)/bioSUSTAINABILITY p5
- *Improving the Interface between Global Change Science and Policy Makers* convened by [D Raffaelli](#) and [A Holt](#) /bioSUSTAINABILITY p6
- *Mountains Under Change* chaired by [C Körner](#) and [E Spehn](#) /GMBA, and G Greenwood/MRI p7
- *Environmental Water Allocations: Conserving Ecological Goods and Services* convened by [R Naiman](#)/freshwaterBIODIVERSITY and S Bunn/GWSP p8

DIVERSITAS Scientists gave presentations at two other sessions and co-chaired three more:

- *GEC Science Links with Policy and Development Agendas*, plenary session day 3 to which [MJ Williams](#)/SC-DIVERSITAS contributed with "GEC Science in Relation to Development Agencies" p8
- *Collaborative Regional GEC Networks in the Americas: Opportunities for Stakeholders and governance*, convened by G Breulmann and M Brklacich, where [ME McClain](#)/freshwaterBIODIVERSITY presented "Linking Global Change Research to Improved Policies and Management for Rivers in the Andean Amazon" p9

- [P Leadley](#)/bioDISCOVERY convened two more parallel sessions: p9
  - *Biodiversity, Land Management and Ecosystem Responses* with S Diaz and D Ojima
  - *Future Directions in Earth System Modelling* with G Brasseur, G Gallopin, B Hoskins and S Van der Leeuw
- [E Crasswell](#)/freshwaterBIODIVERSITY co-chaired with FP Lansigan, J Alcamo and H Kremer, the GWSP session: *How do Coastal and Freshwater Systems Interact Under the Global Water System?* P10

## **Climate Change and Rising CO<sub>2</sub>: How Serious is the Future Threat to Biodiversity?**

**P Leadley/bioDISCOVERY**

Please, find the details about the 5 talks and 31 posters [here](#)

There is good empirical evidence that terrestrial plants and animals have moved pole-ward and up in altitude in response to global warming in the 20th century. Mathematical models suggest that these trends will be accentuated in the 21st century and could lead to large scale changes in biodiversity. Experimental manipulations also suggest that plant community structure is substantially modified by warming, changes in precipitation and elevated CO<sub>2</sub>. Thus, there is a strong consensus that predicted future changes in precipitation patterns and rising temperature and CO<sub>2</sub> concentrations could fundamentally alter the abundance and distribution of plants and animals and that this could have strong feedbacks on regional and global biogeochemical cycles. There is, however, considerable disagreement within the scientific community over the speed at which these changes will occur, the degree that this will contribute to the erosion of biodiversity and the best means of developing management strategies for limiting the negative impacts of climate change. This symposium brought together researchers working on observational data, experiments and various types of mathematical models. The symposium directly contributed to the goals of DIVERSITAS and the Global Land Projects of the IGBP and IHDP programmes and thus represented an emerging initiative of ESSP.

### Oral presentations

- [P Leadley](#): Integrating multiple approaches to predicting the effects of climate change on biodiversity
- J Henning Sommer: Implications of climate change on Africa's plant diversity
- M Loeffler: Effects of elevated CO<sub>2</sub> and an extreme drought event on the biodiversity of a grazed temperate grassland
- M Benito Garzón: Modelling the effects of climate change in the Iberian forests under past (PMIP) and future (IPCC) climate scenarios
- [S Lavorel](#): Modelling species response to global change: recent advances and future directions

## **Towards a Global Observation System of Biodiversity and Land Cover Changes: Solutions for Sustainable Development**

**N Jürgens/bioDISCOVERY**

Please, find the details about the 6 talks and 12 posters [here](#)

This session aimed to discuss how to design, finance, implement and sustain a feasible global observation system of biodiversity and land cover changes, which is meaningful for science and for users and which supports sustainable development.

Keywords: biodiversity, monitoring, observation system, land cover, earth observation, ecosystem, degradation, migration, conservation, sustainable management.

### Oral presentations

- J Mutke: Continental to global plant diversity maps and datasets as a basis for future monitoring
- A Fenech: Using the Smithsonian Institution's forest observing plots as a platform for monitoring global change and biodiversity

- AN Gillison: A cost-effective method of acquiring standardized data for a global observation system of biodiversity and land cover
- M Brady: GTOS/GOFC-GOLD activities to improve land cover and forest observations in the context of GEO
- J Townshend: GOFC-GOLD activities towards operational land cover and fire observations
- [N Jürgens](#): Towards a global observation system for biodiversity

## **Biodiversity, Ecosystem Functioning and Carbon Sequestration**

**K-P Ma/DIWPA/ecoSERVICES**

Please, find the details about the 5 talks and 56 posters [here](#)

Biodiversity in all terrestrial biomes is sensitive to global environment and land use change. This session aimed to improve our understanding of the response, sensitivity and adaptation of biodiversity to global change, to project the future scenarios of terrestrial biodiversity, to identify biodiversity conservation gaps, and to examine the impacts of biodiversity change on ecosystem processes in the Earth system.

### Oral presentations

- L Aribo: Modelling spatial distribution of tree species diversity in semi-arid savannah using high resolution, multi-spectral air born images
- L Zhang: Ecophysiological controls on the ecosystem carbon exchange of the typical forests along the north-south transect in eastern China
- DH Urrego: Biodiversity changes in an Amazonian cloud forest
- H Luo: Long-term observation of carbon exchange between a chaparral shrub ecosystem and atmosphere using Eddy covariance techniques
- G Gleixner: Biodiversity increases carbon storage in experimental grasslands

## **Environmental Change and Disease Emergence: Predictive Approaches to a Global Problem**

**P Daszak/DIVERSITAS and M Cesario/IHDP**

Please, find the details about the 5 talks and 13 posters [here](#)

Key words: Environmental change, emerging diseases, deforestation, SARS, Avian influenza, malaria  
The causes of almost all emerging diseases are a series of changes to demography, human behaviour, socio-economic and environmental factors. Speakers in this session gave an overview of research that monitors and maps these interactions, from land use change, to changes in the global trade in wildlife. The ultimate goal of this research is to provide a solid base for predicting the spread or future emergence of known and as-yet undiscovered pathogens.

### Oral presentations

- [P Daszak](#): The links among biodiversity, anthropogenic environmental change, and emerging diseases
- [S Zhang](#): From civets to bats, researches on the natural reservoir of SARS CoV
- DM Tompkins: Predicting disease risk from climate influences on vector distributions
- L Changrong: The temporal-spatial variability and vulnerability analysis of the global avian influenza
- JA Patz: Deforestation and Malaria Risk in the Peruvian Amazon

## **Interdisciplinary and Implementation-oriented Approaches in Research on Conservation and Use of Biodiversity: What are the Lessons (to be) Learned?**

**M Denich/bioSUSTAINABILITY**

Please, find the details about the 6 talks and 32 posters [here](#)

Conservation and use of biodiversity are two different, mostly conflicting management goals. Taking into consideration the manifold facets of biodiversity conservation and use as well as the need for research based advice in biodiversity management, it is of major importance to discuss research approaches which focus on resolving this conflict. Not only the natural sciences but also socio-economic determinants as well as political and legal factors have to be taken into account. The 1st DIVERSITAS Open Meeting in Mexico clearly showed that policy and decision makers urgently need research-based advice on (1) how to harmonize the goals of conservation and use of biodiversity and (2) how to bridge the gap between science and practice in the field of biodiversity management.

#### Oral presentations

- [M Denich](#): Interdisciplinary and implementation-oriented approaches in research on conservation and use of biodiversity
- S Liu: Mapping biodiversity and ecosystem service—analyses for global conservation prioritization
- BK Becker: Harmonizing conservation and use of biodiversity in Brazilian Amazonia
- A Wieckhorst: Interdisciplinary approaches towards the conservation of medicinal plants and traditional knowledge in sub-Saharan Africa
- EE Bertke: An efficient political instrument for the provision of agro-biodiversity - A German case study
- T Woldemariam Gole: Conservation and use of wild *Coffea arabica* populations in the montane rainforests of Ethiopia

The session gathered approximately 70 participants whose discussions were very lively and interested. Over the time it became clear for M Denich that, although we expected "interdisciplinary approaches", the audience and presenters usually referred to "multidisciplinary approaches".

BK Becker noted that inside each parallel session the general subject was dealt with quite different approaches and in different geographic scales, giving their own colour to the session. However, for instance in M Denich's parallel session, local experiences in Africa and Germany and analysis of the huge and complex Amazon Region were presented, but without laying any basis for comparison. While lessons learned for the Amazon were the need of a scientific - technological revolution, institutional change and regionalization, for Africa, on the contrary the maintenance of existing local patterns of land uses was suggested.

### **Improving the Interface Between Global Change Science and Policy Makers**

#### **D Raffaelli and A Holt / bioSUSTAINABILITY**

Please, find the details about the 6 talks [here](#)

A recurring issue for the biodiversity community is the difficulty that both natural and social scientists often have in effectively communicating their findings and their advice to those who can make a real difference to the conservation and sustainable use of biodiversity. In turn, policy makers and managers are often frustrated by the seeming inability of scientists to get their message across. There may also be institutional barriers which mean that some groups feel disenfranchised by the decision-making process so that resulting policy may not be fully informed. Improving the communication and dialogue between scientists and those responsible for making decisions and developing policy is a major goal of, and challenge for, science organisations such as DIVERSITAS, for processes such as the Millennium Ecosystem Assessment and IMoSEB, the (International Mechanism of Scientific Expertise on Biodiversity), as well as for those charged with biodiversity decisions at the local level. This session explored a range of experiences of those involved with the science-policy interface, the tools available for managing this interface and the needs of emerging initiatives such as IMoSEB.

#### Oral presentations

- [DG Raffaelli](#): Session introduction: Improving the interface between biodiversity science and policy

- [A Larigauderie](#): Improving the interface between biodiversity science and policy: Towards an International Mechanism of Scientific Expertise on Biodiversity (IMoSEB)
- C Görg: Making scientific assessments policy relevant - challenges and experiences from the Millennium Ecosystem Assessment
- AH Gesche: Environmental change and food production: Improving the effectiveness of the science-policy interface using a collaborative, integrated and holistic framework
- W WANG: More than observers, what scientists can do - New roles of scientists in the global change
- M del Mar Otero-Villanueva: Tools and practices for decision making in Yancheng Coastal Wetlands, Jiangsu Province, China

At the issue of the session, it came forward that the global change issue can hardly be resolved with good will only - more than thoughts are needed - techniques, instruments... to help provide for information at local level (by creating local information systems for example) and give the tools to protect the existing ecosystems and avoid further degradation. As in the final session was said, top-down and bottom-up approaches would be more effective. (W WANG, M del Mar Otero Villanueva)

D Raffaelli acknowledged that, along with T Elmqvist and A Holt of the bioSUSTAINABILITY IPO, he organized and chaired the symposium building on the science-policy interface workshops held by DIVERSITAS (Montreal 2004; Stockholm 2006) and with the IMoSEB consultation process in mind. It was the first time that many of the participants had been able to meet and exchange ideas and views, and D Raffaelli is hopefully that new collaborations between DIVERSITAS and other initiatives will emerge.

Nonetheless, bioSUSTAINABILITY is planning to build on this session's topic and organise a related panel at the big Sustainability conference to be held in Leipzig in May 2007 which is connected with the German EU presidency. (C Görg)

## Mountains Under Change

**C Körner and E Spehn /GMBA, and G Greenwood/MRI**

Please, find the details about the 6 talks and 44 posters [here](#)

A webcast of the talks is available online at <http://mri.scnatweb.ch/content/view/90/43/>

Mountains, with their 25% share of global land area and hosting half of all global biodiversity hot spots, are particularly sensitive to environmental change and human perturbation. 50% of humanity depends on goods and services provided by mountains, such as the provision of water. The session addressed mountain conservation issues, questions related to sustainable upland management, impacts of amenity-led mountain urbanization, global change impacts on ecosystem services, climatic feedback of deforestation, and the need for future freshwater management in light of glacier retreat. These themes were addressed by regional examples from New Zealand, Tibet, the Alps and the Andes.

### Oral presentations

- [KJM Dickinson](#)/GMBA: Ecology of New Zealand's Alpine ecosystems: Research applied to sustainable management and biodiversity conservation
- X Cui: Climate impact of deforestation on the Tibetan Plateau
- G Kaser: Future runoff from differently glacier covered basins in the Tropical Andes
- H Bugmann: Global change impacts on selected ecosystem goods and services from the European Alps: A simulation study with stakeholder involvement
- L Graumlich: Mountains, climate variability, and the vulnerability of ecosystem services
- H Ricardo Grau: Globalization, agriculture adjustment, rural emigration, climate change and ecological transition in Neotropical montane ecosystems

## **Environmental Water Allocations: Conserving Ecological Goods and Services**

**R Naiman / freshwaterBIODIVERSITY and S Bunn / GWSP**

Please, find the details about the 4 talks and 38 posters [here](#)

Major world-wide anthropogenic disturbances in freshwater ecosystems are the abstraction or interception of water, including modification of seasonal flows or water levels. Environmental Water Allocations (EWA) aim to minimise the environmental effects of changed water volumes (increased or decreased) and alterations to the temporal patterns of flow by mimicking the natural hydrologic variability of the system. Over 200 methods exist for assessing EWA but few have ever been implemented. EWA seldom have been applied in countries harbouring most of the world's large dams. However, interest in the concept of maintaining flow environmental regimes is growing as issues related to maintaining biodiversity, abating pollution, and controlling the spread of water-borne disease are increasing. Unfortunately, of those EWA that have been implemented, few have been monitored well enough to evaluate their ecological benefits, although progress is being made in developing scientifically sound monitoring designs and identification of the most suitable indicators of biodiversity response to flow restoration. The objectives of this symposium were to:

- Assess the ecological consequences of implementing EWA
- Determine what can and cannot be conserved by EWA
- Identify strategies for combining EWA with other rehabilitation and restoration actions and the monitoring required to determine success or otherwise

### Oral presentations

- [RJ Naiman](#): The rationale for establishing environmental flows for rivers
- NL Poff: Using the natural flow regime concept to guide regional environmental flow management
- [BD Richter](#): Modifying dam operations to restore environmental flows
- SE Bunn: Influence of flow on aquatic biodiversity and ecosystem health in rivers

The session had an enthusiast audience; its success and the fact that the conference coincided with the opening of the GWSP Asia Office within the Chinese Academy of Sciences, leads B Naiman to believe that China is a region where the freshwaterBIODIVERSITY Committee can have a strong and positive impact, especially as China develops its water resources. B Naiman expects to see important ties emerging over the next few years.

## **GEC Science Links with Policy and Development Agendas**

**T Rosswall / ICSU      Plenary session Day 3**

The ESSP OSC plenary session on Global Environmental Change Science links with Policy and Development Agendas, focused on GEC science in relation to international environmental assessments and conventions; policy formulation at the regional level; sustainable development in Asia; industrial transformation in Africa; and GEC science in relation to development agencies. "Science for Sustainability" is one of the Conference's central themes and this was an important session addressing key sustainability issues from a regional and global perspective.

Please read [MJ Williams](#)/SC-DIVERSITAS' presentation [GEC Science in Relation to Development Agencies](#)

## **Collaborative Regional GEC Networks in the Americas: Opportunities for Stakeholders and Governance**

**G Breulmann and M Brklacich**

This session provided a forum for discussing expected GEC science changes throughout the Americas, focusing on the changing context of GEC science funding and governance; new partnerships required to enhance GEC science relevance within the policy, resource management and education communities; and mechanisms to establish and maintain engagement with diverse stakeholders.

Please, read the details about [ME McClain/freshwaterBIODIVERSITY: Linking Global Change Research to Improved Policies and Management for Rivers in the Andean Amazon](#)

## **Biodiversity, Land Management and Ecosystem Responses**

**S Diaz, P Leadley / [bioDISCOVERY](#) and D Ojima**

Please, find the details about the 4 talks and 59 posters [here](#)

Human activities directly or indirectly affect terrestrial and freshwater ecosystems worldwide, resulting in changes in biogeochemical dynamics, biophysical processes and biodiversity. These in turn interact in complex, often non-linear ways, modifying ecosystems, ecosystem services derived from them, and future land management options. Research studies in this session focused on the interactions among these complex processes, with emphasis on an integrated, multidisciplinary approach.

### Oral presentations

- S Diaz: Biodiversity and global land use change: Piecing together the broad picture
- D Ojima: Human impacts on the interaction of ecosystem dynamics and biodiversity: A research approach
- [S Lavorel](#): Feedbacks between climate and land use change, and ecosystems: Plant functional traits as linkages
- H Haberl: Global human appropriation of net primary production: spatial patterns, trends during the 20<sup>th</sup> century, and implications for biodiversity

## **Future Directions in Earth System Modelling**

**G Brasseur, G Gallopin, B Hoskins, P Leadley / [bioDISCOVERY](#) and S Van der Leeuw**

Please, find the details about the 6 talks and 26 posters [here](#)

The session, featuring an inter-disciplinary focus on Earth System modelling, explored the four drivers for increased computational power and understanding, the needs to represent the breadth of the coupled Earth System (including socio-economic conditions), to employ higher resolution, to perform large ensembles and to evaluate the ability to simulate environmental change phenomena, and also the data and data assimilation requirements for predictions and the links with applications.

### Oral presentations

- SC Kerr: Simple Integrated Models (SIMs): Integrating economics into Earth System models
- S Emori: Japan's progress in Earth System modelling catalyzed by the Earth simulator and its future prospect
- KC Krishna Bahadur: Combining socioeconomic and Earth System information in rural environmental change studies: Example from mountains of Nepal
- MB Endejan: Using object-oriented analysis and the unified modelling language to facilitate inter-disciplinarity in Earth System science
- AD Nobre: Is the Amazon forest a sitting duck for climate change? Models need yet to capture the delicate and complex mutual conditioning between vegetation and rainfall
- RA Betts: Climate change impacts and mitigation: The need to look beyond greenhouse forcing

## How do Coastal and Freshwater Systems Interact Under the Global Water System?

FP Lansigan, E Crasswell / [freshwaterBIODIVERSITY](#), H Kremer and J Alcamo

Please, find the details about the 5 talks and 18 posters [here](#)

The session covered issues common to freshwater and coastal systems, and the global water system such as effective and efficient governance, environmental flows, freshwater and coastal nutrient fluxes and the global nutrient cycles, impacts of river diversions, land use change, and climate change, etc. in order to develop a framework for linking science and resource management, and to define a strategy for collaboration and network for research.

### Oral presentations

- A. Ducharne: Evolution of water and nutrient fluxes from a human impacted river under plausible changes of anthropogenic pressures during the 21<sup>st</sup> century
- S. Haida: Geomorphological response of regulated rivers and climate change In the Sebou coastal zone (Morocco)
- T. R. Healy: Climate change impact on sedimentation in New Zealand estuaries
- J. Alcamo: New scenarios of future freshwater inflows to major world estuaries under climate change,
- M. B. Endejan: Providing a holistic view of the global water system through a digital water atlas

## Global Environmental Changes and Human Health (GEC-HH): a new ESSP Joint Project

The new ESSP Joint Project on Global Environmental Change and Human Health was successfully launched at the ESSP Open Science Conference in Beijing (09-12 November 2006). The "[Science Plan and Implementation Strategy](#)" of this ESSP joint project was presented in Beijing and a series of consultations to provide input to this document is on-going.

The intent of the science plan is to build a large international community around this agenda, and engage people in contributing to it. Hence, the ESSP coordinator [M Rice](#) welcomes all views about how your work or the projects you are involved in could contribute to this ESSP project on Global Environmental Change and Human Health. M Rice will readily receive all expressions of interest, ideas for workshops or new collaborative research, too.

## **Global Environmental Change and Human Health: Issues and Research Needs, a Strategy for International Research and Capacity-Building**

**T McMichael /GEC HH (co-chair) plenary session day 2**

This session marked the launch of the new ESSP Joint Project on Global Environmental Change and Human Health. The project will provide a focus of convergence for the three ongoing ESSP Joint Projects on the Global Carbon Cycle (GCP), the Global Water System (GWSP), and Global Environmental Change and Food Systems (GECAFS), each of which systems directly influences human wellbeing and health. The GEC and Human Health Project Planning Team have identified a set of key types of global environmental change that are known or suspected to have significant consequences for human health. The evolving Science Plan explores priorities and settings for the future coordinated international study of these relationships, taking into account the complexities of concurrently acting environmental changes and the importance of socioeconomic and cultural contexts as modifiers of community vulnerability. This planned ESSP Joint Project, therefore, seeks to identify and quantify current health impacts of GEC and to forecast the future health impacts. These scenarios of future health impacts will form a new, dynamic and integrative

node in the developing domain of Earth System Science. They will help focus on policy options that ensure a healthier and more sustainable future.

You can download T McMichael's [Global Environmental Change and Human Health: Issues and Research Needs](#) presentation

### **How Does Global Environmental Change Affect Health and How Can We Measure it?**

**T McMichael and U Confalonieri /GEC HH (co-chairs)**

The session addressed issues related to the identification, methods for the measurement and costs of the human population health impacts of global environmental changes. Problems in both developed and developing countries were discussed, including infectious diseases, pollinosis, malnutrition and effects of air pollution; environmental changes to be covered are climate variability and change; land use and land cover changes and chemical pollution.