

# GLOBAL CHANGE NEWSLETTER

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GLOBAL  
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Source: Terra MODIS, NASA/GSFC

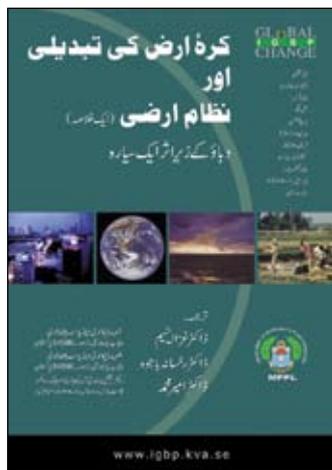
## Continued Global Ocean Productivity Surveys Threatened by Lack of Satellite Sensor Development

For a decade satellite sensors SeaWiFS and MODIS have produced excellent information on climate-ocean biology interconnections, but the time is ripe for a new generation of sensors capable of exploring the fast changes in the world's oceans.

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## Urdu Translation Printed

The Executive Summary of the IGBP synthesis book *Global Change and the Earth System – A Planet Under Pressure* has been translated into Pakistan's major language, Urdu.



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## UK National Committee Promotes Earth System Science Dialogue

As a working group of the Royal Society's Global Environmental Research Committee in London, the UK IGBP National Committee invites scientists to discuss topics on Earth System Science such as ocean biodynamics, satellite observations and palaeo sciences.

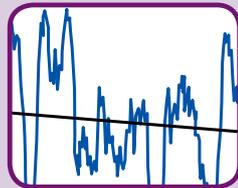


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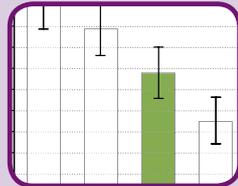
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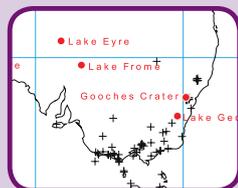


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# Guest Editorial

## Communicating at the Science/Policy Interface

Climate change continues to heat up the headlines thanks in no small part to the recent Intergovernmental Panel on Climate Change (IPCC) Assessment



Report. Policy makers, in particular, are chief among those who are finally paying heed to the mounting evidence that anthropogenic influences are affecting the Earth's environment.

The challenge now is to maintain this level of political attention. As IGBP scientist Paulo Artaxo of the University of São Paulo, Brazil, and an IPCC Lead Author explained, "Earth Science will have to work together with policy makers to mitigate and help the adaptation to the effects of climate change."

Increasingly, scientists and policy makers are recognising the need to strengthen the integration of science and policy making. A November 2006 workshop held in Brussels on that topic, titled "Communicating Interests, Attitudes and Expectations at the Science/Policy Interface: Setting Environmental Research Agendas to Support Policy" outlined the difficulties inherent in scientists and policy makers coming together, but also offered successful examples of achieving a better dialogue between the two.

The workshop highlighted challenges to the successful integration of science and policy. These included scientists unaware of policy priorities or harbouring misperceptions as to the importance of the research on the policy agenda. Policy makers, for their part, may not be aware of a rising scientific issue, and may have priorities that are not in line with the latest findings. Just as researchers often approach research challenges with their own conceptual and disciplinary frameworks, policy makers often have strong commitments to particular ways of acting and thinking about socio-political issues. To compound the problem, according to the workshop, scientific output is often not "policy-maker friendly".

Clearly both sides need to improve communicating their interests, perceptions and expectations.

One solution presented at the workshop is the joint setting of research agendas, where researchers interact with policy makers and others to identify research topics and questions of interest.

The workshop also stressed the importance of regular dialogue between researchers and policy makers. As this newsletter goes to press, IGBP's regional office in Brazil, along with the Brazilian Academy of Sciences, is hosting

the First Brazilian Symposium on Global Environmental Change in Rio de Janeiro, opening a dialogue between Brazilian scientists and policy makers. In early March 2007, IGBP Chair Carlos Nobre participated in a panel discussion on the science of climate change hosted by the Royal Society in London in response to the recent IPCC report. Later this year in Stockholm IGBP will celebrate its 20<sup>th</sup> anniversary by convening scientists, policy makers and business sector representatives to discuss the importance of Earth System Science.

Case studies presented at the workshop in Brussels, along with the many roundtable discussions, made it clear that successful communication at the science-policy interface requires a mix of techniques, from face-to-face roundtables to well-targeted publications. Most impor-

tantly, both sides must maintain a sustained dialogue and jointly launch initiatives of far-sighted scientific and policy visions. IGBP and its network scientists should take full advantage of the current media popularity of 'global warming' to seek further dialogues with policy makers and promote the importance of dealing with broader issues such as global environmental change. IGBP describes its work as "policy relevant, not policy prescriptive"; with the right mix of policy interface, IGBP can uphold its policy relevance while maintaining its objective approach to global research.

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# Nitrogen 4<sup>th</sup> Conference

**Costa do Sauípe – Bahia, Brazil**  
**1–5 October 2007**



**Agriculture, Development and Nitrogen**  
**A problem of too little or too much**

The last 40 years have seen an extraordinary change in the global nitrogen cycle. As recently as the 1960s, nitrogen availability on Earth was controlled by natural processes, but the human creation of synthetic nitrogen fertilizer and the release of nitrogen from fossil-fuel combustion now match the natural rate of formation of reactive nitrogen on the planet's landscape.

The use of nitrogen is imbalanced, with industrialised countries suffering pollution problems from too much nitrogen and low-income countries having a shortage of nitrogen that constrains food production. The goal of the N2007 Symposium is to address these two challenges in an integrated manner.

The meeting will bring together some of the world's best nitrogen scientists with development experts to build a new agenda towards a sustainable use of nitrogen in our planet.

**For further details: [www.nitrogen2007.com](http://www.nitrogen2007.com)**



# Science Features

## Ocean Productivity – Climate Linkages Imprinted in Satellite Observations

M. J. Behrenfeld and D. A. Siegel

Ocean productivity and climate are intimately linked. Processes involved in this relationship can be observed using global satellite measurements of key ocean ecosystem properties. Analysis of satellite data reveals strong evidence of seasonal and El Niño Southern Oscillation influences on the distribution and magnitude of ocean photosynthesis and attests to the vital importance of sustained remote sensing observations. Limitations of the data, however, also emphasise the urgent need for advanced satellite sensor capabilities that will enable resolution of outstanding questions regarding the functioning of our Earth system.

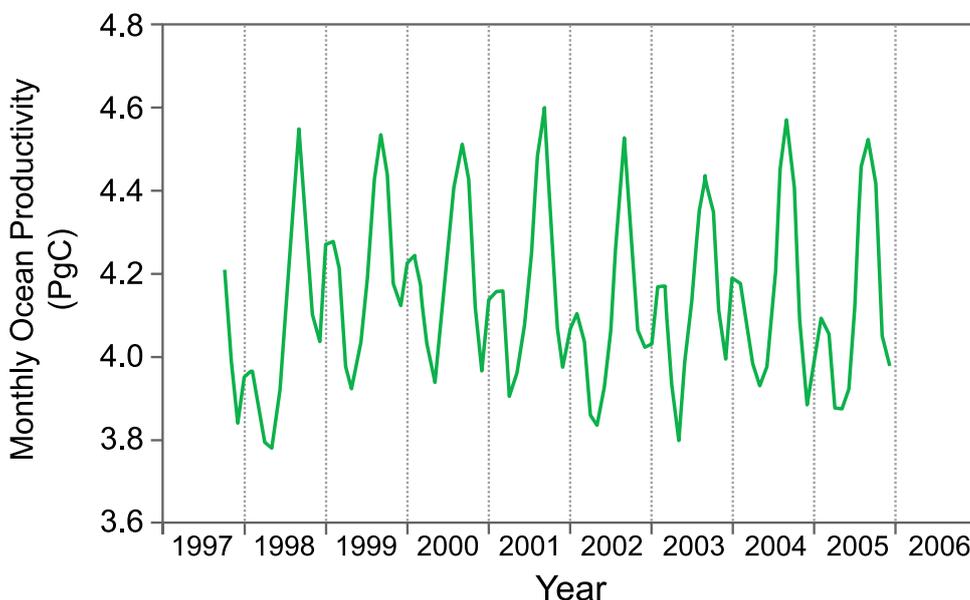
IGBP has had an ongoing interest in ocean productivity, starting with its former JGOFS project (1988–2003) and continuing with its IMBER (2004–) and SOLAS (2003–) projects. This article explains how the examination of changes in ocean productivity can be surveyed through the development of new remote sensing methods.

Terrestrial plant photosynthesis greatly exceeds gross photosynthesis in the oceans, but this difference is roughly equivalent to the respiratory demands of the non-photosynthetic tissues in terrestrial plants (i.e., stems, roots). Consequently, annually-integrated net primary production (NPP), that fraction of newly formed organic material

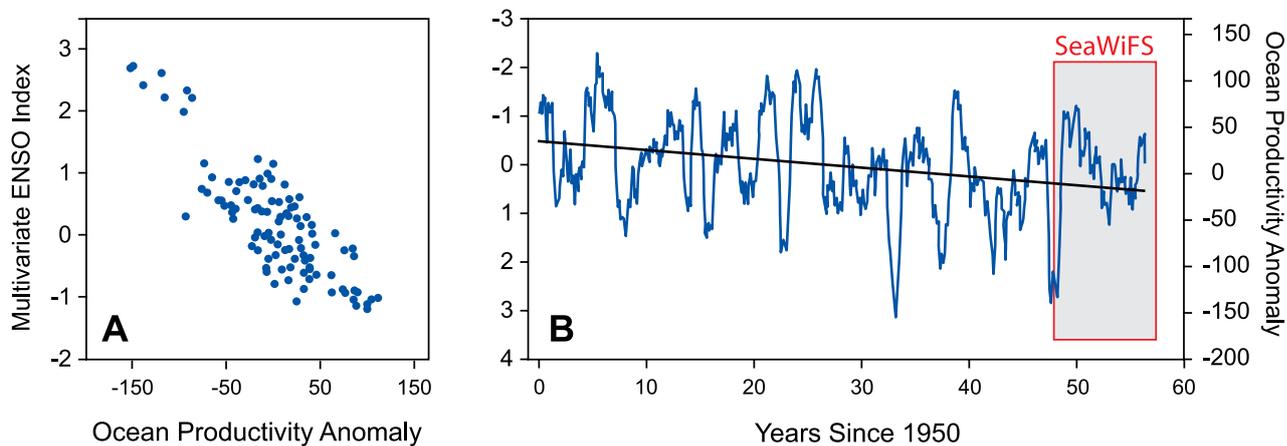
available for consumption by heterotrophic communities, or net accumulation of plant material, is of similar magnitude for Earth's land and oceans systems – of the order of 50 billion tons of carbon per year ( $\text{Pg y}^{-1}$ ) [1,2]. The ubiquitous, free-floating, single-celled phytoplankton of the upper ocean are responsible for a vast majority of aquatic primary productivity.

## Challenges and Solutions

Achieving an accurate estimate of global ocean NPP has been a notoriously difficult task (for a very nice review of estimates dating back to 1919 see [3]). One major issue is that the oceans are enormous and research ships travel only at about the speed of a bicycle. Thus, it is impossible for all practical purposes to assemble a globally representative ocean NPP data set by ship alone, much less the necessary temporal coverage to detect interannual trends. For ocean productivity modellers, therefore, the advent of satel-



**Figure 1.** Monthly global ocean net primary production (NPP) between September 1997 and December 2005 based on SeaWiFS satellite data and illustrating the pronounced, repeated seasonal cycles. The strongest peak during each annual cycle corresponds to enhanced production in northern latitudes during the boreal summer. The peak each austral summer is notably lower, largely reflecting widespread iron limitation of phytoplankton growth in the Southern Ocean.



**Figure 2. (A)** Over the SeaWiFS record, ocean productivity in the global permanently stratified oceans varied with the strength of the ENSO cycle (assessed by the Multivariate ENSO Index, MEI). Monthly productivity anomalies represent deviations from the ‘average’ monthly value calculated for the 9-year record.

**(B)** MEI variability within the SeaWiFS era (red box) is within the range of variability observed since 1950 (left axis, note in this panel, MEI is low at the top and high at the bottom). Application of the relationship shown in (A) to the full MEI record may provide a sense of how ocean productivity varied over the same period (right axis; units =  $10^{12}$  g C month<sup>-1</sup>). Regression analysis of the full data set suggests a decreasing trend of  $9 \times 10^{12}$  g C per decade ( $p < 0.001$ ).

lite global ocean colour sensors marked a true revolution. Presently, the high-quality ocean satellite data record extends back nearly a decade.

Conditions necessary to support phytoplankton net photosynthesis and growth exist only in the thin upper veneer of the ocean. This zone, referred to as the ‘photic layer’, is in intimate contact with the overlying atmosphere and exhibits particularly pronounced temporal variability. Environmentally-driven fluctuations in ocean NPP are dominated by the seasonal cycle (Figure 1), followed by influences of the El Niño Southern Oscillation (ENSO) cycle. Superimposed on these two higher-amplitude signals are the more subtle changes associated with basin-scale oscillations (e.g., the Pacific Decadal Oscillation) and longer-term climate trends. A decade’s worth of satellite data is not sufficient to clearly resolve the impact of these later climate forcings, but it is sufficient to probe into the underlying climate-ocean biology relationships.

## Phytoplankton Variability

While the satellite sensor Coastal Zone Color Scanner (CZCS: 1978–1985) provided the proof-of-concept that biologically relevant ocean data could be retrieved from space, it wasn’t until the launch of the Sea-viewing Wide Field-of-view Sensor (SeaWiFS) in 1997 that a science-quality ocean colour record truly began. Recently, we investigated the SeaWiFS record for quantitative links between global changes in ocean biology and fluctuations in climate [4].

Our analysis began by first removing the dominant seasonal cycle (Figure 1) from nine years of SeaWiFS-based chlorophyll and NPP estimates. We then compared the resultant chlorophyll- and NPP-anomalies to coincident changes in (i) the Multivariate ENSO Index (MEI) [5], (ii) a measure of surface stratification based on density differences between 10 and 200 meters, and (iii) spatial patterns in Sea Surface Temperature (SST) changes [4]. Our first finding was that global ocean NPP anomalies, and particularly

anomalies in the permanently stratified oceans, were highly correlated with the MEI. Specifically, we found that tropical Pacific warming periods (i.e., higher MEI values) corresponded to net global decreases in NPP and chlorophyll, while cooling periods had the opposite effect (Figure 2A). When viewed in the context of the 50-year MEI record (Figure 2B, left axis), it is clear that fluctuations during the SeaWiFS era (red box in Figure 2B) are well within the normal range of ENSO variability for the past half century. We then compared global NPP anomalies with changes in stratification intensity and again found a very strong correspondence [4]. This result provides observational confirmation of a relationship between global stratification and NPP commonly featured in ocean circulation-ecosystem models [6] and long observed on local and regional scales. Finally, comparison of NPP and SST changes between 1999 and 2004 revealed a general inverse relationship that was stronger in the Pacific and Atlantic oceans than in the Indian Ocean [4]. This comparison illus-

trated well how overall net warming periods are actually composed of both warming and cooling events at the regional scale, with coherent impacts on NPP.

## What Next?

NPP is not something that can be measured from space, but instead is derived from observed changes in ocean optical properties. Each step in this derivation adds uncertainty, so quantifying and reducing this uncertainty remains an on-going challenge. The temporal trends and spatial patterns in chlorophyll and NPP we describe [4] can be traced directly to changes in measured optical properties. The tight coupling between this variability and independent, coincident changes in surface

stratification, the MEI, and SST lend confidence to the satellite results. But are there alternative ecosystem-level explanations for the observed patterns which are equally consistent with the climate indices? In fact there are, and resolving the significance of these represents another great challenge for future satellite ocean biology and biogeochemistry research.

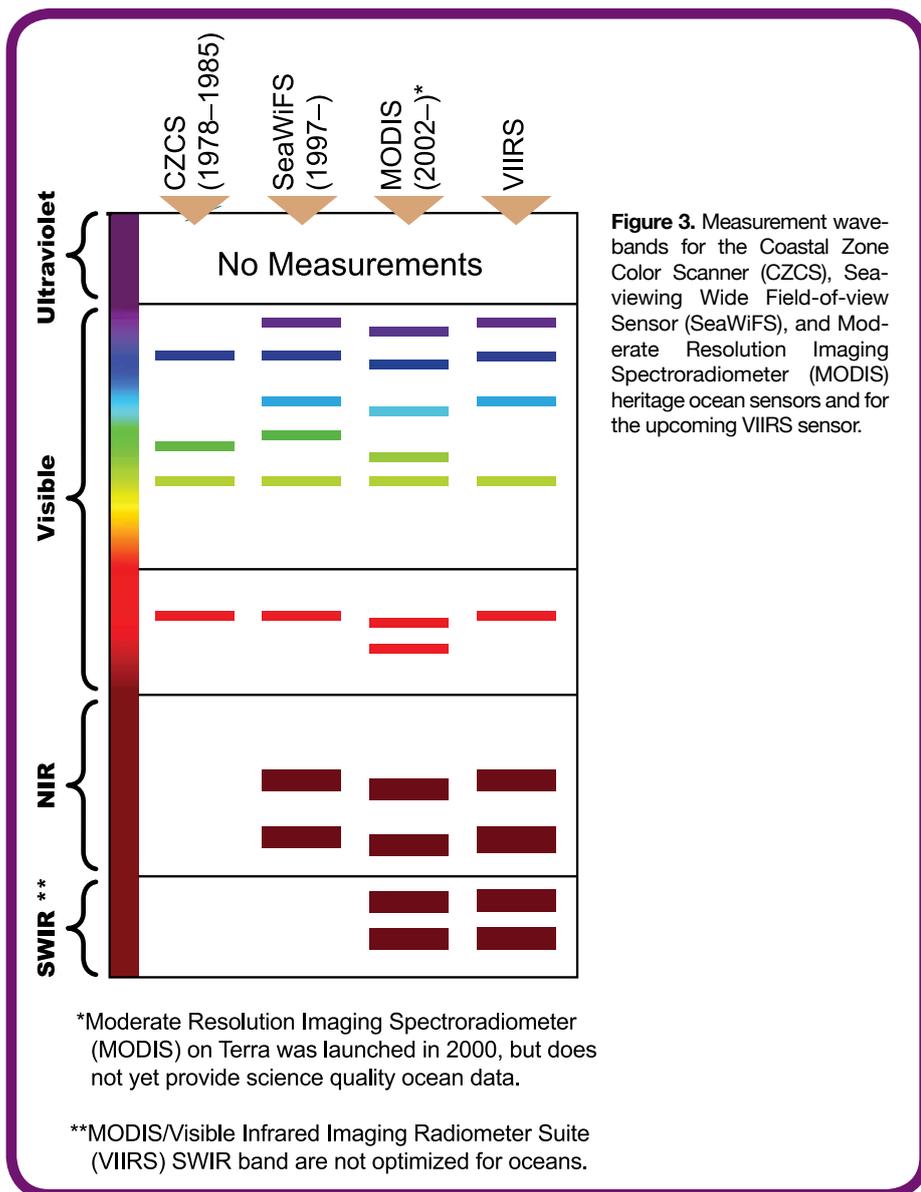
The question is simply: “What ecosystem properties could have changed over the SeaWiFS record such that mixed layer light absorption decreases (i.e., the water gets clearer) when stratification increases?” Three potential answers come to mind: (i) a decrease in phytoplankton abundance due to reduced nutrient flux, (ii) a shift to higher carbon: chlorophyll ratios reflect-

ing enhanced nutrient stress and/or elevated light levels with shallower mixing, and (iii) a reduction in light absorption by coloured dissolved organic material (cDOM) due to enhanced photobleaching. The first of these is consistent with changes in NPP. The second represents physiological adjustments to changing mixed layer growth conditions that may (due to nutrient stress) or may not (due to higher light levels) be associated with changes in NPP. The third does not necessitate a change in NPP.

## Satellite Sensors Past, Present and Future

So which of the above interpretations is correct? Or did they all contribute? Are there yet other explanations for the SeaWiFS observations? Answers to these questions reside in our ability to accurately separate optically-active constituents (in other words, ‘What’s in the water and how much of it is there?’).

From the first sensor, CZCS, to the upcoming Visible Infrared Imaging Radiometer Suite (VIIRS), the basic satellite ocean colour waveband set has changed very little (Figure 3). This measurement set traces to the conventional wisdom regarding ocean optics at the time when CZCS was designed, specifically that all light-absorbing components in the water column co-vary in a globally consistent manner with chlorophyll – a concept referred to as the ‘*bio-optical assumption*’ [7,8,9]. This essential assumption underlies all waveband-ratio algorithms applied to, or planned for past, present, and future satellite data. However, in the decades since CZCS, it has become abundantly clear that the bio-optical assumption is *incorrect*. We now understand



that optically active ecosystems constituents do, in fact, exhibit significant independent behaviour [e.g., 9] and new spectral matching algorithms are being developed to accommodate this independence [e.g., 10,11]. The full potential of this powerful new approach, however, can not be realised with the heritage satellite waveband set (Figure 3).

The time is ripe for a new era in satellite observations enabling the maturation of global ocean biology and biogeochemistry research. Of foremost importance is an expansion of sensor capabilities allowing optical features of key ecosystem components and characteristics to be readily distinguished. Such measurements should provide regular global coverage of high spectral resolution (~5 nm resolution) data extending from the Near Infrared (NIR) down to the information-rich near-ultraviolet region (350–400 nm), and include specific Short Wave Infrared (SWIR) bands for atmospheric corrections over turbid coastal waters. Future sensor designs should also reflect 'lessons learned' from heritage missions, such as the importance of regular lunar observations and tilting capabilities to avoid data loss from sun glint, and include rigorous pre-launch sensor characterisation and post-launch field calibration and validation.

The SeaWiFS sensor has been a remarkable success story, but it has already entered its fifth lifetime extension and will, perhaps soon, come to an end. The follow-on MODIS (Moderate Resolution Imaging Spectroradiometer) sensor on EOS AQUA is likewise providing high-quality ocean colour data, but it too is now in its first lifetime extension. With these two sensors, the oceanography community has enjoyed a decade of high-quality ocean colour data, but we have erroneously come to expect that

such data will continue into the future and be freely available to all. In truth, upcoming planned sensors are unlikely to provide ocean colour data of equivalent quality as SeaWiFS, and may not be launched in time for significant data overlap with SeaWiFS or MODIS. None of them provide the new measurements needed to resolve questions regarding the true nature of detected trends in global ocean properties. Given the long lead-time for launching a satellite (*minimum* 4 years), urgency is upon us to secure support for a new advanced sensor and begin its development.

SeaWiFS has given us a glimpse into climate-ocean biology interconnections of our Earth system and demonstrates the vital importance of sustained satellite measurements. But with what confidence can we forecast the relationships resolved? Does the correspondence between ocean NPP and the MEI (Figure 2A) allow a 50 year hindcast of

NPP changes (Figure 2B, right axis) or was this relationship different before SeaWiFS? If the mechanisms have remained consistent, then what is driving the apparent 50-year downward trend in NPP of roughly  $10^{13}$  g C decade<sup>-1</sup> (Figure 2B, black line)? With so many unanswered questions remaining, now is certainly not the time for an interrupted or degraded data record, but rather a time to expand our global ocean observing capabilities as outlined in a recent community report for NASA's Ocean Biology and Biogeochemistry Program [12].

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## References

1. Field CB, Behrenfeld MJ, Randerson JT and Falkowski PG (1998) Primary production of the biosphere: Integrating terrestrial and oceanic components. *Science* 281(5,374): 237–240. doi: 10.1126/science.281.5374.237.
2. Behrenfeld MJ, Randerson J, McClain C, Feldman G, Los S, Tucker C, Falkowski P, Field C, Frouin R, Esaias W, Kolber D and Pollack N (2001) Biospheric primary production during an ENSO transition. *Science* 291: 2594–2597.
3. Barber RT and Hiltling AK (2002) History of the study of plankton productivity. In: Williams PJ, Thomas DN & Reynolds CS (Ed.s), *Phytoplankton Productivity: Carbon Assimilation in Marine and Freshwater Ecosystems*. Blackwell. pp16–43.
4. Behrenfeld MJ, O'Malley R, Siegel D, McClain C, Sarmiento J, Feldman G, Milligan A, Falkowski P, Letelier R and Boss E (2006) Climate-driven trends in contemporary ocean productivity. *Nature* 444: 752–755. doi:10.1038/nature05317.
5. Wolter K, Timlin MS (1993) Monitoring ENSO in COADS with a seasonally adjusted principal component index. Proc. 17<sup>th</sup> Climate Diagnostics Workshop, NOAA. pp52–57.
6. Sarmiento JL, et al. (2004) Response of ocean ecosystems to climate warming. *Global Biogeochemical Cycles* 18(GB3003), doi:10.1029/2003GB002134.
7. Smith RC and Baker KS (1978a) The bio-optical state of ocean waters and remote sensing. *Limnology and Oceanography* 23: 247–259.
8. Smith RC and Baker KS (1978b) Optical classification of natural waters. *Limnology and Oceanography* 23: 260–267.
9. Siegel DA, Maritorena S, Nelson NB and Behrenfeld MJ (2005) Independence and interdependences among global ocean color properties: Reassessing the bio-optical assumption. *Journal of Geophysical Research* 110(C07011), doi:10.1029/2004JC002527.
10. Maritorena S, Siegel DA and Peterson AR (2002) Optimization of a semianalytical ocean color model for global-scale applications, *Applied Optics* 41(15):2705–2714.
11. IOCCG (2006) Remote sensing of inherent optical properties: Fundamentals, tests of algorithms, and applications. Lee ZP (Ed.) Reports of the International Ocean-Colour Coordinating Group. No. 5 IOCCG, Dartmouth, Canada.
12. NASA (2007) Earth's Living Ocean: The Unseen World – A community advanced planning report for the NASA Ocean Biology and Biogeochemistry Program, NASA. 71pp. (in review, will be available at the NASA Ocean Color Web site).

## National Committee Science

Articles in this section highlight global change science conducted by IGBP National Committees around the globe. The Austrian National Committee, established at the Austrian Academy of Sciences, contributed this item.

### Global Change Research in Austria

G. Köck

The Austrian Academy of Sciences (ÖAW) research programme on Global Change aims to promote high-quality research in the field of global change and the transfer of scientific results into practice and to the public. The Global Change Programme is administered by a national committee (Chair: G. Grabherr, University of Vienna), established at the ÖAW, and is financed by the Federal Ministry for Science and Research. Established in 1990, this research programme covers three international research networks, including IGBP, IHDP (International Human Dimensions Programme on Global Environmental Change) and WCRP (World Climate Research Programme). This article describes some of the global change science efforts made by ÖAW.

The Global Change Programme supports projects dedicated to the study of the causes and effects of global environmental

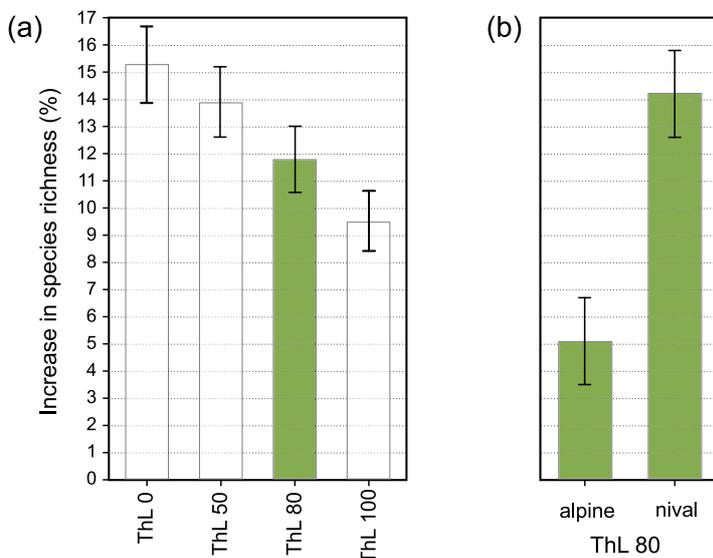
change (e.g., climate, biodiversity). Currently 10 research projects are carried out within the framework of this pro-

gramme, showing a wide range of basic and applied research topics within the natural, social and economical sciences. Details about the projects can be found at the website [www.oeaw.ac.at/deutsch/forschung/programme/change.html](http://www.oeaw.ac.at/deutsch/forschung/programme/change.html).

Three projects contribute to the IGBP programme:

1. One study led by H. Haberl analyses driving forces for global environmental change in an Austrian case study. The project studies interrelations between socio-economic dynamics and the country's household carbon from 1830–2000 on the basis of an integrated approach.

2. The IGBP project led by K. Reiter is focussed on the effects of global warming on plant biodiversity in the Austrian Alps and is part of the GLORIA (Global Observation Research Initiative in Alpine Environments) network. Species richness in high mountain ecosystems has increased during the past century mainly due to higher temperatures [1]. Responding to the fact that alpine plants are obviously excellent indicators for climate change impacts the research team established in 1994 an extensive setup of nearly



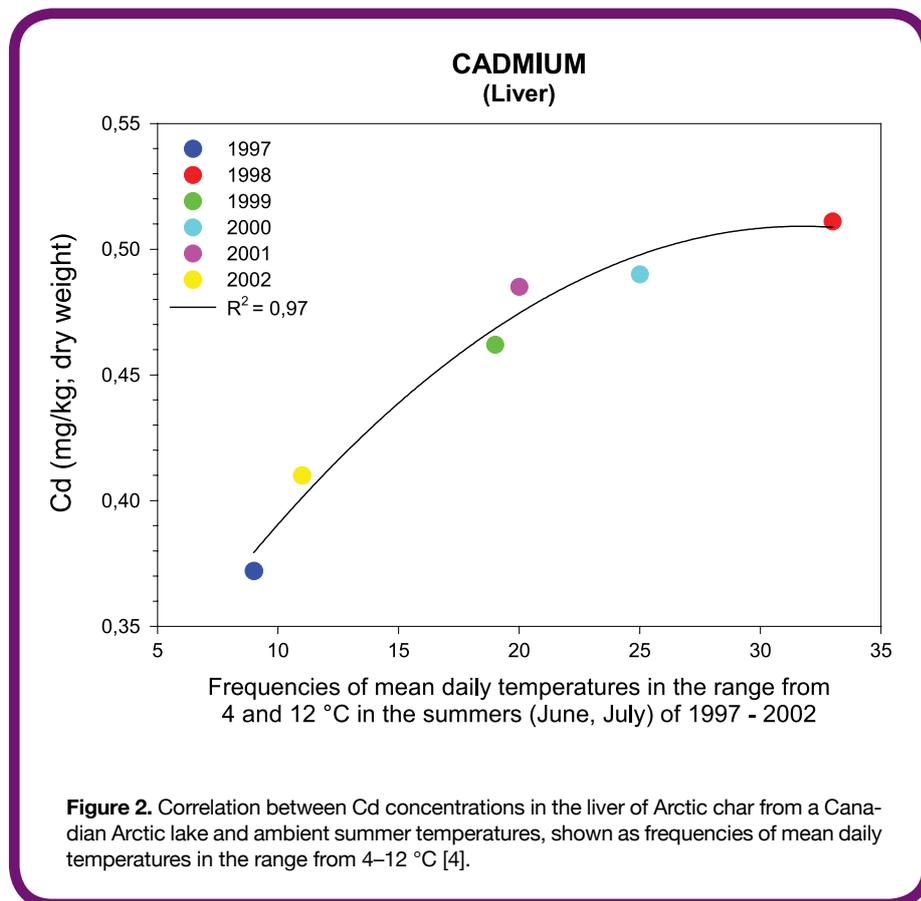
**Figure 1.** Mean percentage increase in species richness in the Tyrolean Alps, Austria, between 1994 and 2004:

(a) all plots (N = 362) calculated for the four threshold levels (ThL) and

(b) comparison of plots with alpine grassland communities (alpine; N = 79) and plots with subnival and nival plant assemblages (nival; N = 282). 95% confidence intervals are shown. ThL-values are levels of certainty, where ThL100 shows only species considered whose disappearance or appearance was absolutely certain, and ThL0 shows all species considered recorded in 1994 and/or 2004, including those which might have been ill-identified or overlooked in the new or old records [3].

1200 (1m x 1m) permanent plots at the alpine-nival ecotone (between 2900 and 3450 m) on Mount Schrankogel, a GLORIA master site ([www.gloria.ac.at](http://www.gloria.ac.at)) in the Tyrolean Alps, Austria. Ten years after the first recording the authors observed an average change in vascular plant species richness from 11.4 to 12.7 species per plot, an increase of 11.8%, based on a representative selection of 362 permanent plots (Figure 1). The cover for nival and subnival species (i.e., species restricted to the upper limits of vascular plant life) showed a significant decline, whereas the cover of alpine species whose optimum is lower down, increased. The results demonstrate an ongoing range contraction of subnival to nival species at their rear edge and a concurrent expansion of alpine pioneer species at their leading edge, which indicates that warming, as predicted, will have a significant effect on the biodiversity in high mountains. A considerable part of the ca. 2500 vascular plant species restricted to the high grounds of Europe might become critically endangered [2].

3. HIGH-ARCTIC, an ongoing multi-year study coordinated by G. Köck and D. Muir, and carried out in cooperation with various Canadian research facilities, is investigating the effects of short-term and long-term climate change on freshwater ecosystems in the Canadian High Arctic and in the Austrian Alps. The study illustrates that global warming may endanger fish populations from Arctic and alpine lakes by leading to an increase of both metal accumulation and stress. Comparison of metal levels (e.g., cadmium; Figure 2) and biochemical stress indicators in Arctic char (*Salvelinus alpinus*) collected from Canadian Arctic lakes revealed



**Figure 2.** Correlation between Cd concentrations in the liver of Arctic char from a Canadian Arctic lake and ambient summer temperatures, shown as frequencies of mean daily temperatures in the range from 4–12 °C [4].

marked seasonal and inter-annual trends in the turnover of metals, as well as stress responses in the liver. Results indicate metal accumulation and level of stress to be higher the warmer the summers in the Canadian Arctic [4,5,6]. Predictive relationships between lake temperature and metal uptake were similar for high Arctic lakes and previously studied Austrian high mountain lakes, thus confirming water temperature to be a driving force of metal accumulation in char from these sensitive ecosystems. The observed effects provide clues as to what would happen to the extremely vulnerable land-locked char populations in the event of a longer-term, synoptic warming trend associated with global climate change. The authors speculate that the steep increase of temperatures within the next decades as predicted by various

GCMs (Global Climate Models) as well as higher frequencies of atypically warm summers in the Arctic could be a serious threat to the stability of Arctic char populations in high latitude and high altitude lakes. HIGH-ARCTIC illustrates that fish from high latitude and high altitude lakes appear to be sensitive bioindicators of the interactive effects of pollution and global climate change [7].

The seven other projects show a wide range of scientific aspects of global change research. The study EHGC Water, coordinated by M. Steiner, is an Austrian contribution to the IHDP programme and is focussed on the development of economic methods for assessing hydrological changes in water supply. Interdisciplinary scientific collaboration, in particular between economics, hydrology and climatology, yield estima-

tions of expected exposure and adaptive strategies to global change impacts on water supply in Austria. A neobiota study led by S. Dullinger deals with the distribution of the invasive alien plant species black locust (*Robinia pseudoacacia* L.) in Austria. The project has two main objectives: (i) It shall provide a spatially explicit assessment of black locust invasion risk in Austria under scenarios of forthcoming climate change by means of predictive habitat modelling, and (ii) it will experimentally evaluate the effects of interacting global change components (climate change and nitrogen deposition) on black locust's ability to colonise new habitats. The results will indicate if ongoing environmental changes are likely to promote further expansion of an aggressive alien tree in Austria and shall guide the formulation of regionalised management directives.

The aim of CLIMPHEN, led by H. Scheifinger, is a comprehensive statistical description of the spatial and temporal behaviour of the Austrian plant and insect phenological observations. Of specific concern is the influence of the complex topography of the Alps on the phenological entry dates. The effect of temperature as the dominant atmospheric factor governing phenological events is evaluated, and trends of temperature and phenological time series are compared.

Two projects are dealing with meteorological phenomena. A project led by P. Seibert investigates the relationship between climate change and heavy precipitation weather patterns in Austria. The project is focussed on the development of a method suitable to model the past and future climate scenarios to study how the frequency and intensity

of synoptic patterns, which are responsible for heavy precipitation in Austria, have developed in the past 25 years.

F. Prettenhaler studies the effects of global change on winter and summer tourism in Austria and evaluates the sectoral economic vulnerability of the Austrian communities. This research project aims to assess new parameters for a quantitative evaluation of socio-economic vulnerability on a regional scale. The research outcomes should give communities and policy makers valuable information for decision making. The methodology developed in this pilot project aims at enabling interested communities to carry out further sectoral vulnerability studies in the future.

SPACON+, led by B. Friedl, describes the complex interactions between mobility consumption patterns, land use and fossil fuel emissions by means of a spatial computable general equilibrium model to evaluate the scope by which respective technological options and, more fundamentally, spatial restructuring can reduce mobility-related fossil fuel emissions.

Additional global change-related scientific projects are also funded by the interdisciplinary oriented ÖAW Alpine Research programme. At present three projects dealing with aspects of global change in the Alps are funded: (i) CLIM-LAND, led by R. Schmidt, is a multi-disciplinary approach study dedicated to reconstruct seasonal climate variables in relation to Alpine land-use in the Austrian Alps during the last 4,000 years. For the quantitative inference of seasonal climatic variables they use diatom, chrysophyte-cyst and chironomid-based transfer functions, established from a lake calibration data set

of the Austrian Central Alps; (ii) The multi-disciplinary study AUSTRO\*ICE\*CAVES\*2100, coordinated by C. Spötl, is aimed to gain a better physical understanding of underground ice dynamics, to develop constraints on the fate of alpine ice caves, and to assess the unexplored potential of this ice as a paleoclimate archive in the Alps; (iii) The project CRYO.RAD, by B. Sattler, investigates the role of microbial communities of cryoconites (now seen as micro ecosystems with high ecological relevance for glaciers) as sensitive indicators for radioactive impact on alpine glaciers. The project aims at a better understanding of the ecological relevance of cryoconites, their role in radionuclide accumulation and their impact on glacial retreat worldwide. Further details of all projects can be found at the ÖAW webpage [www.oeaw.ac.at/english/forschung/programme/alpen.html](http://www.oeaw.ac.at/english/forschung/programme/alpen.html).

For the period of 2007–2009 the Austrian national committee for global change has decided to focus theme-supported funding for future research, predominantly on the following research topics: global change impacts on species composition of mountain biota; the impact of neobiota; land use change (the impact of agroindustrial practices on traditional mountain farming/ "Almnutzungen"); global change effects in Arctic and alpine areas (as contribution to the International Polar Year); and effects of climate warming on alpine permafrost. These projects are co-funded by the ÖAW Programme for International Strategy for Disaster Reduction (ISDR).

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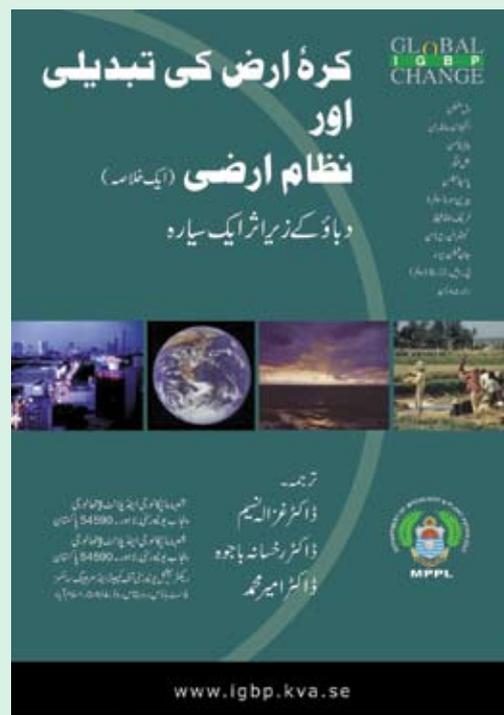
E-mail: [guenter.koeck@oeaw.ac.at](mailto:guenter.koeck@oeaw.ac.at)

## References

1. Grabherr G, Gottfried M and Pauli H (1994) Climate effects on mountain plants. *Nature* 369: 448.
2. Väre H, Lampinen R, Humphries C and Williams P (2003) Taxonomic diversity of vascular plants in the European alpine areas. In: Nagy L, Grabherr G, Körner C and Thompson DBA (Ed.s.) *Alpine biodiversity in Europe – A Europe-wide Assessment of Biological Richness and Change*. *Ecological studies* 167, Springer, Berlin. pp133–149.
3. Pauli H, Gottfried M, Reiter K, Klettner C and Grabherr G (2006). Signals of range expansions and contractions of vascular plants in the high Alps: observations (1994–2004) at the GLORIA master site Schrankogel, Tyrol, Austria. *Global Change Biology* 13(1):147–156.
4. Köck G, Babaluk J, Berger B, Bright D, Doblander C, Flannigan M, Kalra Y, Loseto L, Miesbauer H, Muir D, Niederstätter H, Reist J and Telmer K (2004) Fish from sensitive ecosystems as bioindicators of global climate change – High-Arctic 1997–2003. G. Köck (Ed.) In German with summaries in English and Inuktitut. *Veröffentlichungen der Universität Innsbruck (VUI)* 245, ISBN-3-901249-68-0. 120pp.
5. Wrona FJ, Prowse TD and Reist JD et al. (lead authors) and Köck G et al. (contributing authors) (2004) Chapter 8: Freshwater Ecosystems and Fisheries. In: *ACIA Impacts of a Warming Arctic. Synthesis of the Arctic Climate Impact Assessment*. Cambridge University Press. ISBN-13 978-0-521-61778-9. 139pp.
6. Köck G, Niederstätter H, Muir D, Talbot C, Doblander C, Berger B., Miesbauer H, Bright D, Reist J, Babaluk J, Kalra Y, Flannigan M (2006) Fish from sensitive ecosystems as bioindicators of global climate change (High-Arctic 1997–2004). In: Brancelj A, Köck G and Muri G (Ed.s.) *The Alps of the next generation. Proceedings of the AlpWeek 2004, 22–25 September, Kranjska Gora, Slovenia*. Austrian Academy of Sciences Press 2006, Vienna. Digital Edition; ISBN-10: 3-7001-3750-8, ISBN-13:978-3-7001-3750-4, doi: 10.1553/alp-week2004.7

# A new translation of the IGBP Executive Summary

The executive summary of the IGBP Synthesis book *Global Change and the Earth System – A Planet Under Pressure* by Steffen W et al. (Ed.s., 2004) has been translated into Urdu, the national language of Pakistan.



The main authors of the translated work are:

Dr. Ghazala Nasim and Dr. Rukhsana Bajwa (both at the Department of Mycology and Plant Pathology, University of the Punjab, Lahore, Pakistan), and Dr. Amir Muhammed (President, ASIANICS International, Islamabad; Rector, National University of Computer & Emerging Sciences, Pakistan; and Chair, IGBP National Committee, Pakistan).

The IGBP National Committee in Pakistan generously supported the translation and printing of the document.

A digital copy will soon be downloadable from the IGBP website, [www.igbp.net](http://www.igbp.net)

To receive paper copies of the Urdu translation, please contact Dr. Amir Muhammed at [amir.muhammed@nu.edu.pk](mailto:amir.muhammed@nu.edu.pk)

## IGBP activities by the UK National Committee

R. Harris and D. Ashby

A series of meetings organised by the UK National Committee highlight the involvement of UK scientists within IGBP. The meetings are held in central London at the Royal Society, one of the world's oldest scientific societies.

The UK National Committee (<http://web.pml.ac.uk/uk-igbp/index.htm>) is a working group of the Royal Society's Global Environmental Research Committee (GERC), which has a responsibility for UK contributions to and interests in IGBP. The Committee meets twice a year with members selected from the UK science community to represent the interests of the different IGBP programme elements.

The responsibilities of the committee include ensuring that the UK science community, funding agencies, and other relevant bodies are aware of the objectives, activities and results of the IGBP. The committee organises opportunities for the UK community to discuss the IGBP and actively encourages UK participation in IGBP research activities and related data exchange. London meetings supporting these objectives have included four specific Earth System Science topics, as follows.

### Ecosystem Dynamics in the Ocean

This Royal Society Discussion Meeting was held in February 2004 and presented the concluding results of the UK GLOBEC (Global Ocean Ecosystem

Dynamics) programme "Marine Productivity".

The meeting included a talk titled "GLOBEC international: What's new and what does it all

mean? New initiatives, synthesis and integration". Speakers then addressed population dynamics of the copepod *Calanus finmarchicus* in the North Atlantic, in addition to plankton responses to hydroclimatic variability around the UK and Southern Ocean ecosystem dynamics. Other topics included 3D ecosystem modelling for shelf seas; zooplankton genes as useful targets for marine ecosystem research; and the importance of microzooplankton in marine food webs.

The wider societal relevance of the UK programme was considered in a presentation on "The ultimate top-down

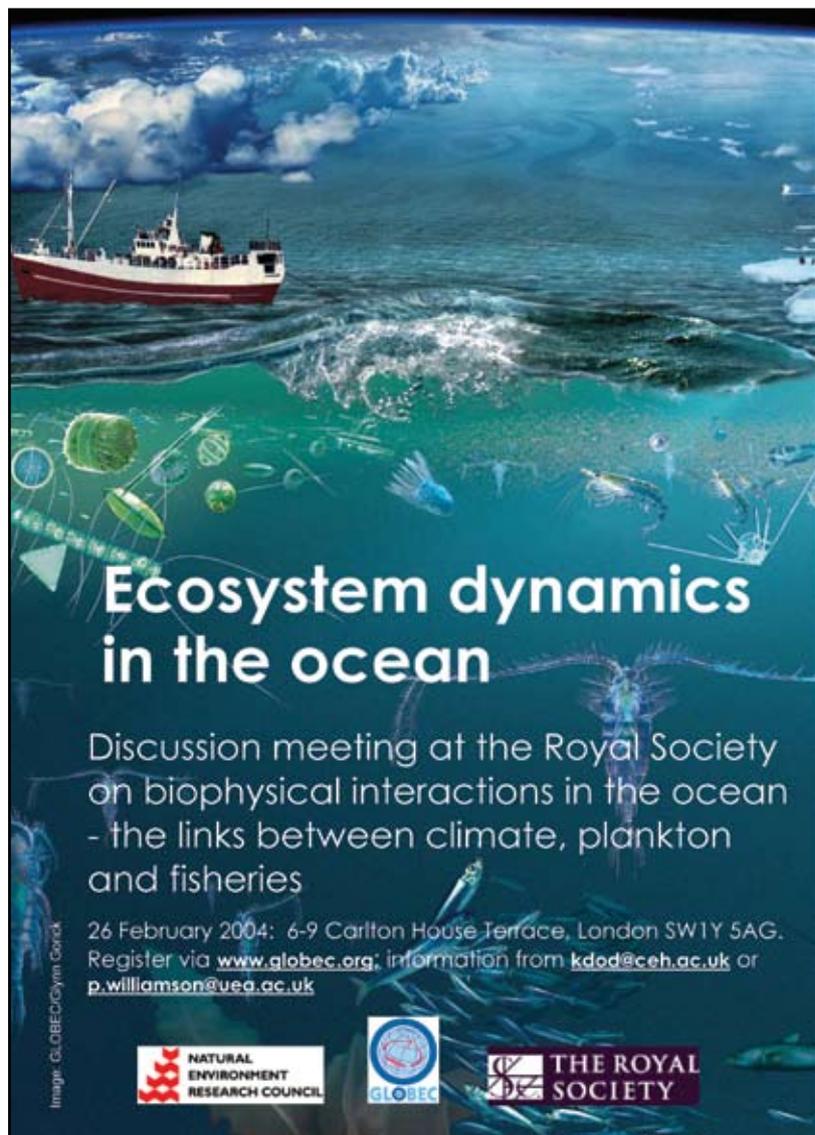


Figure 1. GLOBEC's Glynn Gorick illustration was used to advertise the Marine Productivity meeting.

control on marine systems: What factors determine human predation pressures?”. The meeting concluded with a discussion on how information on marine ecosystem processes can be integrated with fishery management. This discussion focussed on the wider relevance of marine productivity research, the science priorities for UK GLOBEC and future initiatives.

## Atlantic Ocean Biogeochemistry and Biodiversity

The Atlantic Meridional Transect (AMT) programme undertakes biological, chemical and physical oceanographic research during the annual return passage of the RRS James Clark Ross between the UK and the Falkland Islands or the RRS Discovery between the UK and Cape Town, a distance of up to 13,500 km. This

transect crosses a range of ecosystems, from sub-polar to tropical and from euphotic (sunlit zone) shelf seas and upwelling systems to oligotrophic mid-ocean gyres. The Atlantic Ocean Biogeochemistry and Biodiversity meeting, held at the Royal Society in July 2006, reviewed the outcomes of AMT, particularly in the context of the IGBP projects SOLAS and IMBER, and considered exploitation of AMT science in the context of Earth System Science and natural resource management.

Presentations considered the structure and functional properties of planktonic ecosystems associated with equatorial upwelling in the Atlantic Ocean; the role of physical processes in supplying nutrients to the surface ocean; sustaining biological production; and the structure and functioning of the planktonic community in the Atlantic. Other aspects reviewed

during the meeting comprised atmosphere/ocean interactions: an AMT perspective; the metabolic significance of the surface layer of the subtropical Atlantic Ocean; province-specific bio-optical functional traits; and the determination of phytoplankton functional types from remotely sensed data.

A particular aim was to set the AMT in the wider international context and in this light a concluding talk addressed “Temporal variability of carbon and nitrogen at the Bermuda Atlantic Time-Series (BATS) site in the North Atlantic Ocean”. Discussion centred on exploring scientific priorities for future UK effort in this area of ocean biogeochemistry and linking with other relevant European initiatives. Further details about data from the transects are presented at the website [www.amt-uk.org](http://www.amt-uk.org).

continued on page 16



**Figure 2.** There were almost 80 participants at the AMT meeting 20 July 2006 at the Royal Society in London.



# The Global Change NewsLetter Survey 2006–2007: Feedback from Readers

In November 2006 IGBP surveyed its readers to gather their thoughts about the Global Change NewsLetter. Although only just over 2% of the 12,000 subscribers answered, the overall survey results reflect a satisfied readership: a broad majority likes the content in the articles. Newsletter readers may recall a similar survey undertaken four years ago; IGBP used those results to improve the look and content of the newsletter. The 2006 survey results will help us fine-tune the newsletter even further in order to most effectively meet our readers' needs.

## Electronic Newsletter

Almost half of the respondents (42%) would prefer to receive the newsletter in electronic format only, up from 28% four years ago. This is a trend also seen among several larger journals worldwide, because of escalating postage and printing costs and delivery that requires global, environmentally

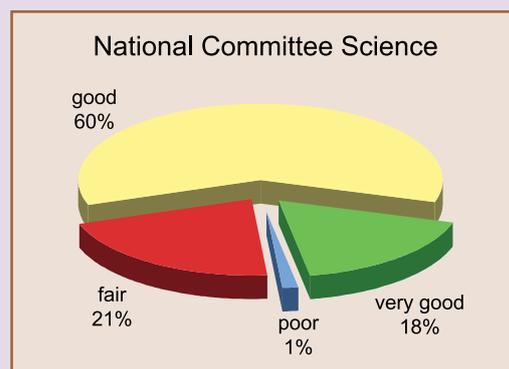
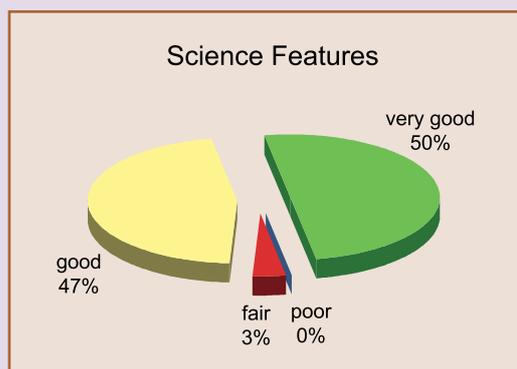
unfriendly transportation. We are trying to follow these developments as an up-to-date journal, while at the same time pleasing our readers. IGBP encourages its readers to “go electronic” by emailing us at [info@igbp.kva.se](mailto:info@igbp.kva.se) and telling us your preference.

## Science Features

The most popular section was the ‘Science Features’ (97% rated it as ‘good’ or ‘very good’). Common comments included ‘very informative’, ‘well-balanced topics’, ‘up-to-date’, and many of you said that you used the articles in teaching. Some readers thought that the articles could be shorter and include more human-dimensions- related science.

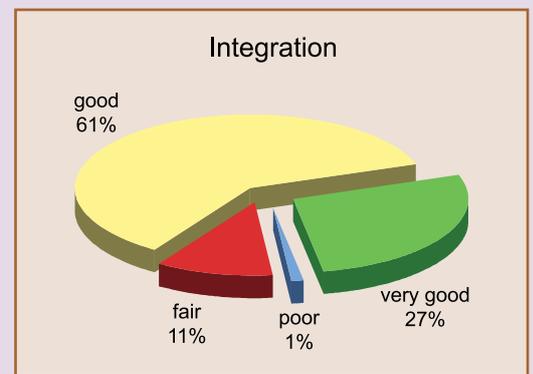
## National Committee Science

This section is rather new and includes research initiatives on Earth System Science (ESS) at a national level, and accordingly has a more varied content and perspective than the other sections. Still, just over three quarters of the readers valued this section to be ‘good’ or ‘very good’, but nearly one quarter had little interest in reading those items, making this the least popular section of the newsletter.



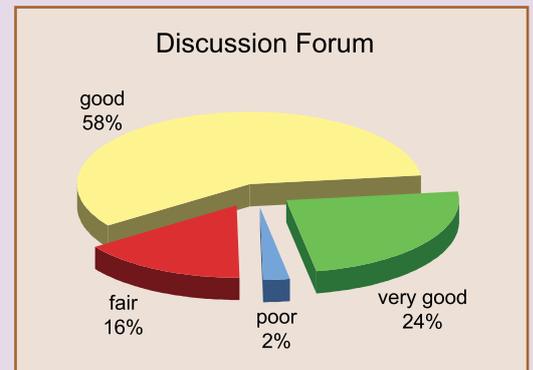
## Integration

In spite of its diverse topics, the Integration articles were well appreciated, as 88% rated this section 'good' or 'very good'. Still, several readers thought some of these articles were too 'politically correct' or more like PR-material for the authors' own projects. As many initiatives on creating new networks and scientific collaborations to inspire ESS are described with enthusiasm from the authors, an Integration article might be regarded as too angled, and written with less objectivity than a Science feature. This is, however, inevitable to a certain extent. Articles that describe new IGBP initiatives should inspire researchers to contact each other and benefit from new collaborations.



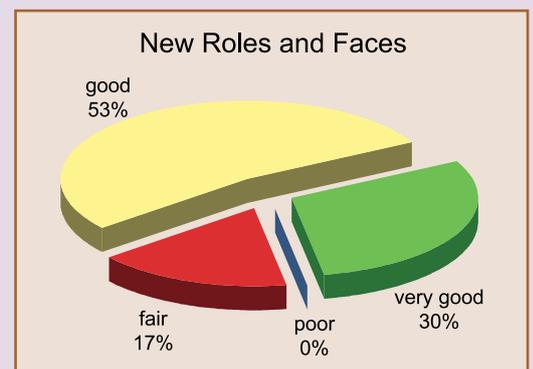
## Discussion Forum

The Discussion Forum was initiated to facilitate debate on ESS topics with a more subjective style and stimulate somewhat provocative issues. Some readers thought this was fulfilled and rated this section as 'Very Good', while some wanted to see more critical or controversial opinions. As a whole, many of you want this section to develop and to be stimulating for a broader audience.



## New Roles and Faces

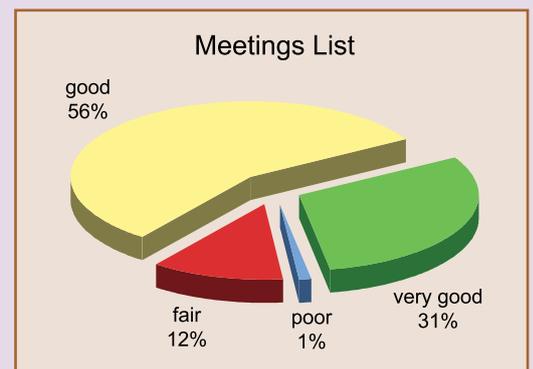
The majority (83%) appreciate this section, but some thought it was only for insiders. Since new roles often concern changes in International Project Office staff or the IGBP Scientific Committee, this might be seen as a bit too internally focussed. But at the same time this section helps introduce important people in the IGBP network.



## Meetings List

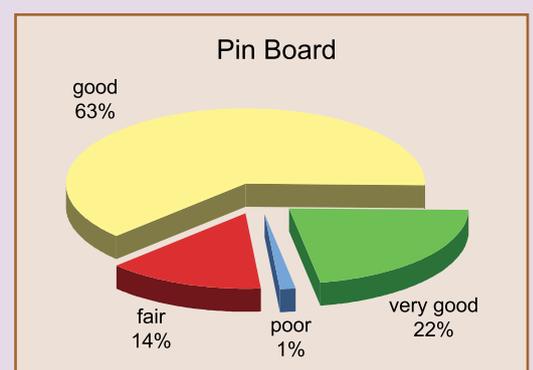
The list of IGBP-related meetings and conferences was highly rated by 87% of the respondents, as compared with 75% in 2002. For the past few years we have narrowed the list to scientific meetings that are directly relevant to IGBP, or with a broad 'global change' appeal. As space in the newsletter limits us to publish meetings in the far future, the full (and searchable) list is always available on our website: [www.igbp.net](http://www.igbp.net).

Several readers commented that some of the meetings were out of date by the time they receive the newsletter. This inconvenience is due to the fact that newsletter delivery is delayed by several months in some remote countries. The problem is very country specific, suggesting that the problem lies with particular countries' postal systems rather than our distribution company in Sweden. The quickest way to get around this is to visit our website to access the complete database of meetings related to global change science.



## Pin Board

The majority (85%) thought the Pin Board was useful or even should be extended to more pages. This last section in the newsletter gives short updates from the vast IGBP global change network, e.g., announcements from major field campaigns, new websites, as well as letters to the editor. More letters to the editor are strongly encouraged.



## Understanding Land-Ocean- Atmosphere Interactions in the Climate System – the Role of Earth Observation from Space

A one-day open meeting was held at the Royal Society on 14 February 2007, organised jointly by CLASSIC (Climate and Land Surface Systems Interaction Centre), CASIX (Centre for observation of Air-Sea Interactions and fluxes) and ESSC (Environmental Systems Science Centre) on behalf of the IGBP UK National Committee. The meeting was expected to build links between UK research communities working to understand and model aspects of the whole Earth system and to foster a more integrated view of the Earth climate system, a topic of high relevance for IGBP. It exposed the UK scientific community to relevant international initiatives and expertise, particularly within IGBP, and reviewed the contribution that Earth observation is now making to the development of coupled Earth system models and their application to increase understanding of global-scale

processes. Read more on the CLASSIC website <http://classic.nerc.ac.uk/IGBP.php>.

## Palaeo and Modern Perspectives on Global Change

The next Royal Society meeting sponsored by the UK National Committee will be held on 27 June 2007. This will examine the key challenges posed by the palaeo-record from the perspective of each of the IGBP projects and hopes to build a dialogue between these projects and the PAGES community to ensure that these challenges are addressed in a realistic way. The aims of the meeting are to inform the UK science community of the major challenges of understanding medium and long-term dynamics of key aspects of the Earth system as currently perceived by the IGBP community. These aim to inform the UK science community about the availability of resources (e.g., process studies, data syntheses and modelling tools) for tackling such challenges over the next 5–10 years; to strengthen the links between the IGBP projects at a critical phase in the planning and implementation of new projects, including their link with the ESSP integrated projects on water, food, carbon

and human health; to explore differences in perspective and in our understanding of key aspects of the Earth system that stem from the timescale at which these phenomena are studied; to explore approaches based on analysis of observations at different temporal and spatial scales; to use modelling tools and to develop ideas for improving the integration of palaeo-studies within the other core IGBP projects; and to provide feedback to the international IGBP.

The meeting will be structured around a series of paired talks plus a chair-moderated discussion. Suggested topics are: biodiversity, ecosystem structure and functioning; the regulation of ocean productivity; ocean fertilisation and the biological pump; fluxes to the coastal ocean – changing land-surface conditions and human interactions; and natural regulation of atmospheric oxidising capacity. For further details, please contact Katie Pellicci, [katie.pellicci@bristol.ac.uk](mailto:katie.pellicci@bristol.ac.uk)

**Roger Harris**

*Chairman*

*UK National Committee for IGBP*

*E-mail: [rph@pml.ac.uk](mailto:rph@pml.ac.uk)*

**Dawn Ashby**

*Secretary*

*UK National Committee for IGBP*

*E-mail: [daas@pml.ac.uk](mailto:daas@pml.ac.uk)*

*Both at Plymouth Marine Laboratory*

*Plymouth*

*UNITED KINGDOM*



### Deadline for Contributions! 4th IGBP Congress 2008

Send your contributions to Joao Morais  
(IGBP Secretariat) by 1 May 2007

The IGBP and ESSP communities are encouraged to contribute to the IGBP Congress:

### Sustainable Livelihood in a Changing Earth System

A PDF file with more info on the Congress is downloadable from [www.igbp.net](http://www.igbp.net)  
(direct link: [www.igbp.net/documents/Congress-Call.pdf](http://www.igbp.net/documents/Congress-Call.pdf))

*Note that Congress attendance is by invitation only*

The challenge of anthropogenic climate change has stimulated a broad range of research and review activities in the past several decades to assess our understanding of the scientific basis of climate change and opportunities for adaptation and mitigation. In the past decade, this work has expanded to include the detection and attribution of changes already occurring, but such endeavours, particularly on a regional scale, require excellent data on long time scales. Unfortunately, relatively widespread instrumental measurements only extend back to the mid-19<sup>th</sup> century, and even then in only a minority of sites.

## Integrating High-resolution Past Climate Records for Future Predictions in the Australasian Region

However, there exists an abundance of indicators that can be used to characterise natural and anthropogenic climate variability on a range of timescales. Climate indicators with annual resolution, such as tree-rings, corals and annually laminated lake sediments, often combined with historical climate datasets, have made important contributions. Considerable potential exists for extending reconstructions further into the past, providing a longer-term perspective of natural climate variability. Only by reconstructing regional climate in a quantitative manner can we determine the natural level of variability and the roles of atmospheric, terrestrial and oceanic controls. Such a regional reconstruction would allow studies of the effects of past human populations and provide a tool to guide interpretation of future scenarios.

### Scarce data sets

The Australasian region experiences inter- and intra-annual modes of climate variability that have the potential to be highly sensitive under a variety of anthropogenic climate change scenarios (these include the Australian Monsoon, the Interdecadal Pacific Oscillation, and the El Niño-Southern Oscillation). Importantly, in the few comparisons of proxy-generated climate reconstructions between the hemispheres, differences in the timing and magni-

tude of variations have been noted. For example, the Southern Hemisphere shows little evidence of the Little Ice Age (AD 1350 to 1880). The extent to which these differences are real is uncertain owing to scarce and ambiguous data.

On 27 and 28 June 2005, over 100 palaeo and contemporary climatologists attended a workshop entitled “Reconstructing past climates for future prediction: integrating high-resolution palaeo data for meaningful prediction in the Australasian region” at the Australian Academy of Sciences, Canberra. This workshop was funded by the Australian Greenhouse Office, the Australian Academy of Sciences, and the Australian Research Council Earth System Science and Environmental Futures Networks. The workshop was also supported by Climate Variability and Predictability (CLIVAR), the GeoQuEST Research Centre, the International Union for Quaternary Research (INQUA) and the IGBP project Past Global Changes (PAGES). Many of the papers presented at the workshop were also published in a special issue of the *Journal of Quaternary Science* [1].

### Role of Fires

An important issue highlighted at the workshop was the role of fire in present and past climates of Australasia. There are a number of methods that allow the detection of past fire activity. The most direct are

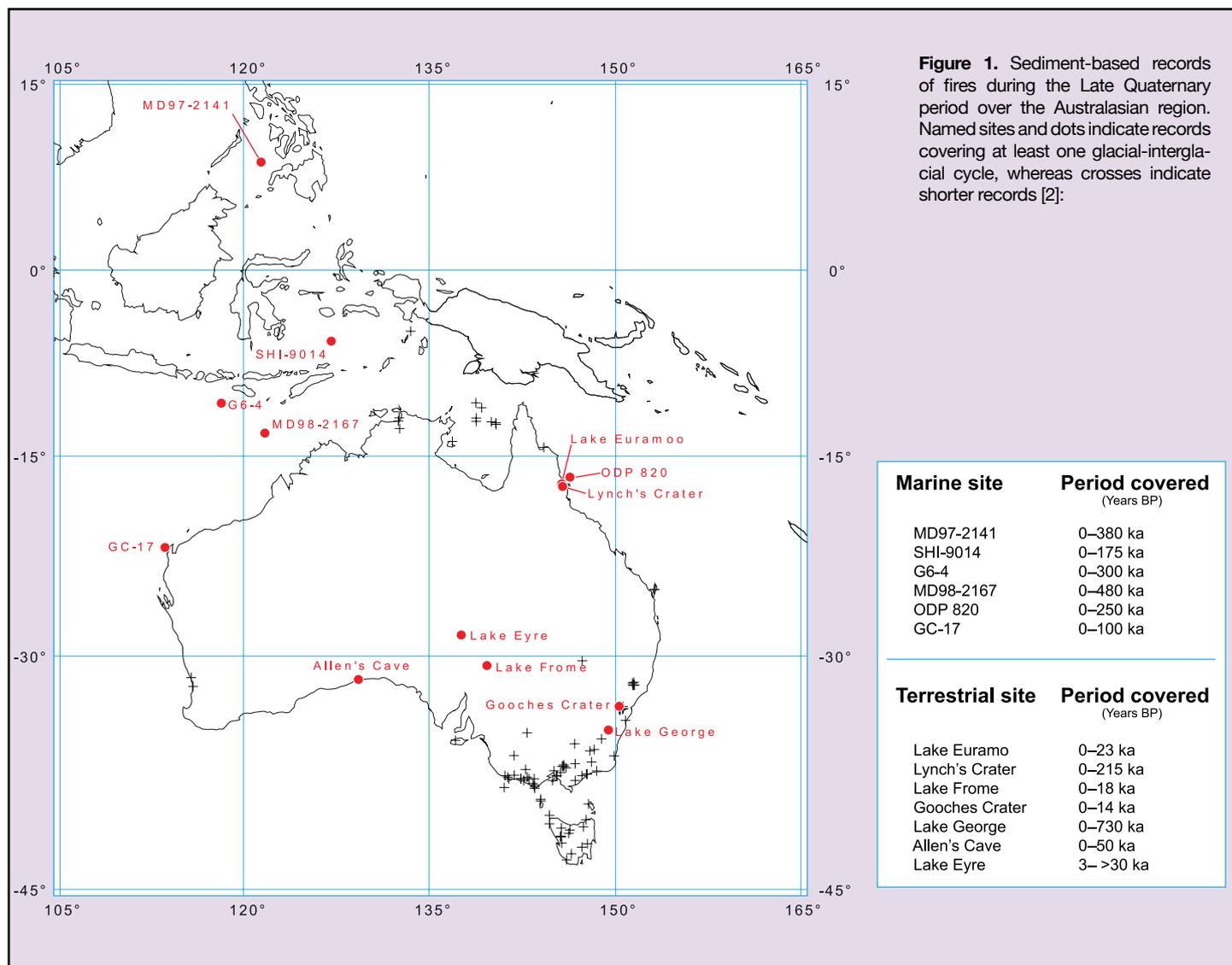
those that measure the incomplete products of combustion (soot, microcharcoal, macrocharcoal and fire scars), usually from biomass burning, preserved in lake, swamp, and marine sedimentary sequences. Indirect methods include the use of pollen records of fire-sensitive species and models of climate-vegetation-fire relationships.

Burning has been a significant feature of the Australian environment but has become progressively more important since the mid-Tertiary, associated with the development of the characteristic sclerophyll (hard leaves) vegetation. In the Quaternary, the extent of burning has varied temporally and regionally with glacial cycles. Evidence suggests that the occurrence of fire during glacial periods was reduced in drier areas, presumably due to a lack of available fuel, but increased in relatively wetter areas where fuel levels were high. Peaks in evidence of burning often accompany transitions between fire-insensitive vegetation types, and hence it has been suggested that burning is facilitated during periods of rapid climate change and/or environmental instability. This contention is supported by relationships that have been elucidated between fire and El Niño activity.

## Human impact

The frequency of fire has also been subject to major accelerations around the time of first human settlement of the continent (roughly 45 ka BP) and with the arrival of Europeans (1788). However, the evidence for a direct and detectable influence of human habitation on past fire regimes is ambiguous. Some studies have found that the decline of fire-sensitive vegetation types correspond with archaeological evidence of increased human habitation. Other studies suggest that the presence of increased charcoal can be explained by the loss of stability in resource availability due to increased climatic variation. And to date, no Australian study has obtained sufficient temporal resolution to fully characterise the relationship between fire, climate and human activities in the historic period.

The workshop participants concluded that there exists a paucity of data at high temporal resolution, and of data from sites in the interior of the continent (Figure 1). Nevertheless, the extent to which climate has changed in the past provides a critical baseline against which to compare present and future variability and change. A robust quantified multi-



proxy reconstruction of temperature change for the Australasian region over at least the last 2000 years requires attention, and this was considered the most urgent of the 10 recommendations developed at the workshop. Among the other recommendations, listed in the final report (location noted below) included developing improved calibration of proxy indicators, deriving better chronologies for inter-proxy comparisons, and building a national capacity for palaeodata analysis and palaeoclimate modelling. In addition, the free availability of data through the development of a national meta-database was considered to be an important vehicle for improving collaboration.

The exciting ongoing research presented in this workshop has provided an important foundation on which future studies of the region's climate history can build.

**Amanda H. Lynch**

*Geography and Environmental Science, Climate Programme  
Monash University, Melbourne  
AUSTRALIA*

Note: The workshop report can be obtained at [http://www.uow.edu.au/conferences/canberra/final\\_report.pdf](http://www.uow.edu.au/conferences/canberra/final_report.pdf)

## References

1. Turney CSM, Kershaw AP and Lynch AH (2006) Introduction: Integrating high-resolution past climate records for future prediction in the Australasian region. *Journal of Quaternary Science* 21:679–680, doi: 10.1002/jqs.1072 and accompanying research articles.
2. Lynch AH, Beringer J, Kershaw P, Marshall A, Mooney S, Tapper N, Turney C, and Van Der Kaars S (2007) Using the paleorecord to evaluate climate and fire interactions in Australia. *Annual Review of Earth and Planetary Sciences* 35:215–239, doi:10.1146/annurev.earth.35.092006.145055.

# FIRST CALL FOR A JOINT EUR-OCEANS, IRD, GLOBEC AND IMBER INTERNATIONAL SYMPOSIUM

## EASTERN BOUNDARY UPWELLING ECOSYSTEMS: INTEGRATIVE AND COMPARATIVE APPROACHES

**2–6 June 2008**

**Las Palmas de Gran Canaria, Canary Islands, Spain**

### Types of submissions

Full and Short Papers,  
Posters/Demonstrations

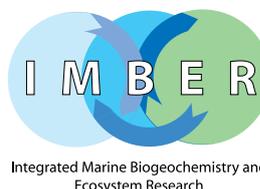
### Time table (dead lines)

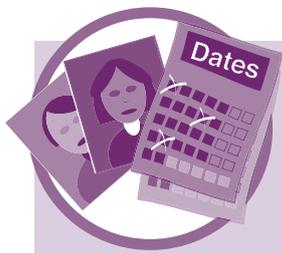
Abstract submission: 1 Jan 2008  
Early registration: 15 February 2008  
Final paper submission: 2 June 2008

[www.upwelling-symposium.org](http://www.upwelling-symposium.org)  
(soon to be activated)

### Symposium Scope

The symposium will consider most aspects of the dynamics, structure and functioning of the four major eastern boundary upwelling ecosystems. These aspects include climate and ocean dynamics, climate change, physics of the ocean and atmosphere, biogeochemistry, ecosystem production, ecology (including behavioural ecology), food-web structure and dynamics, trophic interactions, fisheries assessment and management.





## New Roles and Faces

### New IGBP SC members since 1 January 2007



**Mercedes Bustamante** is a biologist and since 1994 professor at the Department of Ecology of the University of Brasília (Brazil). She is engaged in different disciplines for undergraduate and graduate courses and is a member of the coordination committee of the Graduate Program in

Ecology of the University of Brasília. Her interest is in Ecosystem Ecology, especially Biogeochemistry.

Currently she is co-project investigator of several international collaborative projects on land use changes in the Amazon and in the Brazilian savannas (cerrado), including the impacts on nutrient cycling, trace gas emissions from soil to the atmosphere and water resources. Mercedes is also a member of the Scientific Steering Committee of the Large-scale Experiment of the Biosphere-Atmosphere in the Amazon (LBA) and former coordinator of the LBA Training and Education Committee.

E-mail: [mercedes@unb.br](mailto:mercedes@unb.br)



**Qin Dahe** is a specialist in Glaciology, Climatology and Geography. In the 1980's Qin studied glaciology in western China and began to study the snow/firn ice densification process and glaciochemistry in Antarctica. After that he initiated and extended the research to mountain glaciers

in China. In recent years, he led the assessments on climate change and environment evolution in China and the study on the meteorological development strategy in China. Qin led the establishment of the

Key Laboratory for the Ice Core and Cold Region's Environment in the Chinese Academy of Sciences (CAS) in 1992. Since 2000 he is the administrator of the China Meteorological Administration and permanent representative of China with WMO. In 2002 he was elected as co-chair and co-author of the IPCC WG I (AR4). Qin is an academician of the Chinese Academy of Sciences and a member of the Academy of Sciences for the Developing World (TWAS). He serves as the chair of the IGBP China committee.

E-mail: [qdh@cma.gov.cn](mailto:qdh@cma.gov.cn)

### New GWSP Administrative and Finance Officer



**Anna Middel** has taken up the position of GWSP administrative and finance officer as of January 2007, replacing **Lara Wever** after three years of highly appreciated duty. Anna possesses diplomas in language studies, many years of experience in worldwide

shipping and also in administration and office management. Within the ESSP community Anna is known from her former position as the administrative officer at the International Human Dimensions Programme on Global Environmental Change (IHDP) Secretariat, also located at the University of Bonn.

E-mail: [anna.middel@uni-bonn.de](mailto:anna.middel@uni-bonn.de)

## New staff at the IHDP Secretariat



**Laura Siklossy** is certainly remembered by some of you, since she already worked with IHDP from 1997 to 2001 under Larry Kohler (executive director) and Eckart Ehlers (chair). Laura is a US national who has been a resident of Germany for more than 35

years. She brings skills as a personal assistant and vast experience in office management from both the NGO and private sectors. In addition, she provides some IHDP corporate memory! As IHDP's office manager, she will assist the executive director and generally be responsible for the organisation and administration of the Secretariat and its workflows. She started 1 February 2007.

E-mail: siklossy.ihdp@uni-bonn.de



**Nina G. Müller** is a German national and a PhD student, who was with the IHDP Office for an internship last summer. She is now joining as a special assistant in charge of national committees, especially those in Latin America and the Caribbean, as well as Spain,

Portugal and Italy. Nina will also be involved in fundraising strategies, seed grants and other capacity development activities.

E-mail: mueller.ihdp@uni-bonn.de

## New Office and Communications Manager at LOICZ IPO



**Ellen-Barbe Goldberg** is since 1 December 2006 employed as office and communications manager at the LOICZ IPO in Geesthacht, Germany. She has been working as an assistant to senior management as well as to project managers, mostly in companies in close cooperation with

universities, but most of her experience is gained in the competency centre for broadband network

in Bremen. Her most recent job was to work for the University and Academies of Hamburg to establish the so called "Bologna Process", which is aimed to harmonise graduation procedures across European universities; to make European higher education more competitive and attractive; and to promote international links and cooperation with European academic institutions. Barbe's emphasis was on project management, marketing and public communication.

E-mail: loicz.ip@loicz.org

## Staff changes at the IGBP Secretariat



Wendy Broadgate



Beatriz Balino

**Wendy Broadgate** (Deputy Director, Natural Sciences) is now back from maternity leave and **Beatriz Balino**, who has been replacing her, left IGBP on 15 February. The Secretariat would like to thank Beatriz for the excellent job she has done over the past 11 months. Her efficiency, enthusiasm, sense of humour – and of course the salsa lessons – will be missed! Beatriz returns to Bergen to a new position as advisor at the Department of Research Management at the University of Bergen.

E-mail: wendy@igbp.kva.se

# 3<sup>rd</sup> SOLAS International Summer School

22 Oct – 3 Nov 2007

Cargèse, Corsica, France



## Scientific Committee

Phil Boyd  
Minhan Dai  
Véronique Garçon  
Corinne Le Quéré  
Maurice Levasseur  
Peter Liss  
Natalie Mahowald  
Uli Platt  
Eric Saltzman  
Mitsuo Uematsu

## Lecturers

Laurent Bopp  
Phil Boyd  
Véronique Garçon  
Alison Green  
Dave Karl  
Karen Kohfeld  
Corinne Le Quéré  
Margaret Leinen  
Peter Liss  
Hubert Loisel  
Wajih Naqvi  
Phil Nightingale  
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## Objective

To expose graduate students and young scientists to recent developments and methodologies in the study of biogeochemical and physical feedbacks between the ocean and atmosphere in a changing environment.

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<http://www.uea.ac.uk/env/solas/summerschool/>

**Application deadline: 13 April 2007**

Institut d'Etudes Scientifiques de Cargèse  
<http://www.iesc.univ-corse.fr>

# IGBP and Related Global Change Meetings

A more extensive meetings list is available on the IGBP web site at [www.igbp.net](http://www.igbp.net).

## The International Polar Year 2007–2008

**1 January 2007–31 December 2008,**

**Various countries**

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

## 1<sup>st</sup> International Symposium of Marine Sciences & Spanish GLOBEC-IMBER Symposium

**28–31 March, Valencia, Spain**

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

## April

### 8<sup>th</sup> Swiss Global Change Day

**4 April, Bern, Switzerland**

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

### Global Scientific Challenges: Perspectives from Young Scientists: An international conference celebrating 75 years of ICSU

**4–6 April, Lindau, Germany**

Contact: [http://www.icsu.org/10\\_icsu75/75ANNIV\\_Events.html](http://www.icsu.org/10_icsu75/75ANNIV_Events.html)

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

**9–12 April, Atlanta, GA, United States**

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

### GEO Training Workshop on Numerical Weather Prediction

**9–13 April, Seoul, Republic of Korea,**

Contact: <http://www.earthobservations.org/meetings/meetings.html>

### Ocean Surface: CO<sub>2</sub> and Vulnerabilities Workshop

**11–14 April, UNESCO, Paris, France**

Contact: Roger Dargaville, [r.dargaville@unesco.org](mailto:r.dargaville@unesco.org) or [http://www.ioc.unesco.org/ioccp/pCO2\\_2007.htm](http://www.ioc.unesco.org/ioccp/pCO2_2007.htm)

### From Anthropocentrism to Ecocentrism: Making the Shift

**14–30 April, Online E-Conference**

Contact: <http://www.eco-res.org/register.html>

### EGU General Assembly

**15–20 April, Vienna, Austria**

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

### EGU General Assembly: Session OS13 – Sensitivity of marine ecosystems and biogeochemical cycles to climate change

**15–20 April, Vienna, Austria**

Contact: [http://www.cosis.net/members/meetings/programme/view.php?p\\_id=249](http://www.cosis.net/members/meetings/programme/view.php?p_id=249)

### EGU General Assembly: Session OS6 – IMBER/SOLAS Special Session

**15 April, Vienna, Austria**

Contact: Temel Oguz, [oguz@ims.metu.edu.tr](mailto:oguz@ims.metu.edu.tr) or Veronique Garcon, [Veronique.Garcon@cnes.fr](mailto:Veronique.Garcon@cnes.fr)

### 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>

### Atmospheric CO<sub>2</sub> Inversions

**24–27 April, Purdue University, Indiana, USA**

Contact: Rachel Law, [rachel.law@csiro.au](mailto:rachel.law@csiro.au) or Kevin Gurney, [kgurney@purdue.edu](mailto:kgurney@purdue.edu) or [http://www.purdue.edu/transcom/meetings\\_purdue.php](http://www.purdue.edu/transcom/meetings_purdue.php)

### 1<sup>st</sup> 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: [amhkhater@yahoo.com](mailto:amhkhater@yahoo.com)

## May

### The EarthCARE Workshop

**7–9 May, Noordwijk, Netherlands**

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

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

**7–11 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

**7–12 May, Hyytiälä field station, Finland**

Contact: Timo Vesala, [timo.vesala@helsinki.fi](mailto:timo.vesala@helsinki.fi) or <http://www.atm.helsinki.fi/ILEAPS/marie-curie-ileaps/>

### Conference L2L – Sustainable Neighbourhood: From Lisbon to Leipzig through Research

**8–10 May, Leipzig, Germany**

Contact: Annette Kirk, [annette.kirk@zmaw.de](mailto:annette.kirk@zmaw.de) or <http://www.fona.de/L2L>

### Global Assessments: Bridging Scales & Linking to Policy

**9–11 May, Washington, DC, United States**

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

**International Conference: Towards Sustainable Global Health**

**9–11 May, Bonn, Germany**

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

**Workshop: Global Assessments – Bridging Scales and linking to policy**

**9–11 May, Washington, DC, United States**

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

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

**9–13 May, Washington, DC, United States**

Contact: Katherine Bowman, [Kbowman@nas.edu](mailto:Kbowman@nas.edu) or <http://www7.nationalacademies.org/IUBS>

**5<sup>th</sup> GKSS School of Environmental Research: Persistent Pollution: Past, Present and Future**

**9–18 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](mailto:secretariat@PICES.int)

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

**19–24 May, Obergurgel, Austria**

Contact: [http://www.esf.org/esf\\_genericpage.php?section=10&language=0&genericpage=2674&shortcut=1](http://www.esf.org/esf_genericpage.php?section=10&language=0&genericpage=2674&shortcut=1)

**2007 Belgian Biodiversity Platform Conference – Biodiversity and Climate Change**

**21–22 May, E-Conference**

Contact: <http://rivendell.vub.ac.be/changes>

**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 21<sup>st</sup> century’s ecology**

**22–27 May, Beijing, China**

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

**Special Session on Human Dimensions of Climate Variability and Change in the Americas at the joint meeting of the American Geophysical Union and the Mexican Geophysical Union in Acapulco**

**22–25 May, Acapulco, Mexico**

Contact: <http://www.agu.org/meetings/ja07/?content=home>

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

**24–26 May, Amsterdam, Netherlands**

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

**1<sup>st</sup> International Summit on Hurricanes and Climate Change**

**27 May–1 June, Crete, Greece**

Contact: <http://www.aegeanconferences.org/HurricanesClimate-Change/index.asp>

**4<sup>th</sup> International Zooplankton Production Symposium: Human and Climate Forcing of Zooplankton Populations**

**28 May–1 June, Hiroshima, Japan**

Contact: [http://www.pices.int/meetings/international\\_symposia/2007\\_symposia/4th\\_Zooplankton/4th\\_Zoopl.aspx](http://www.pices.int/meetings/international_symposia/2007_symposia/4th_Zooplankton/4th_Zoopl.aspx)

**Summer School on “Earth System Governance”**

**28 May–8 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/>

## June

**WCRP Workshop on Seasonal Prediction**

**4–8 June, Barcelona, Spain**

Contact: [http://wcrp.wmo.int/pdf/Seasonal\\_Workshop.pdf](http://wcrp.wmo.int/pdf/Seasonal_Workshop.pdf)

**5<sup>th</sup> Study Conference on BALTEX**

**4–8 June, Kuressaare, Saaremaa, Estonia**

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

**IIASA Young Scientists Summer Program 2007**

**4 June–31 August, Vienna, Austria**

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

**7<sup>th</sup> ESEE international conference: Integrating natural and social sciences for sustainability**

**5–8 June, Leipzig, Germany**

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

**Marie Curie Summer School in Emerging Theories and Methods in Sustainability Research (THEMES): Institutional Analyses of Sustainability Problems**

**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](http://ipcc-wg1.ucar.edu/meeting/TGICA-Regional/TGICA-Regional_public.html)

**Creating Sustainability Within Our Midst: Challenge for the 21<sup>st</sup> Century**

**23–27 June, New York, United States**

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

**Palaeo and Modern Perspectives on Global Change**

**27 June, Royal Society, London, United Kingdom**

Contact: Katie Pellicci, [Katie.Pellicci@bristol.ac.uk](mailto:Katie.Pellicci@bristol.ac.uk) or Sandy Harrison, [sandy.harrison@bristol.ac.uk](mailto:sandy.harrison@bristol.ac.uk) or Rick Battarbee, [r.battarbee@geog.ucl.ac.uk](mailto:r.battarbee@geog.ucl.ac.uk) or <http://www.bridge.bris.ac.uk/palmope>

## July

### **International Sea-Ice Summer School**

**2–13 July, University Centre in Svalbard, Norway**

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

### **IUGG 24<sup>th</sup> General Assembly, Union of Geodesy and Geophysics: iLEAPS symposium on Interactions of Land Cover and Climate**

**2–13 July, Perugia, Italy**

Contact: [http://www.atm.helsinki.fi/ILEAPS/index.php?page=ileaps\\_meetings](http://www.atm.helsinki.fi/ILEAPS/index.php?page=ileaps_meetings)

### **World Congress: International Association for Landscape Ecology**

**8–12 July, Wageningen, Netherlands**

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

### **Radiocarbon in Ecology and Earth System Science**

**9–14 July, Irvine, CA, United States**

Contact: Ted Schuur, [tschuur@ufl.edu](mailto:tschuur@ufl.edu) or Susan Trumbore, [setrumbo@uci.edu](mailto:setrumbo@uci.edu) or <http://ecology.botany.ufl.edu/radiocarbon07/>

### **Workshop on A Global Change Research Network in African Mountains**

**23–25 July, Kampala, Uganda**

Contact: Gregory B. Greenwood, [greenwood@scnat.ch](mailto:greenwood@scnat.ch)

### **Ocean Carbon and Biogeochemistry (OCB) Summer 2007 Science workshop**

**23–26 July, Woods Hole, MA, United States**

Contact: Mary Zawoysky, [mzawoysky@whoi.edu](mailto:mzawoysky@whoi.edu)

### **2<sup>nd</sup> ACCENT Symposium, the European Network of Excellence in Atmospheric Composition Change**

**23–27 July, Urbino, Italy**

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

### **17<sup>th</sup> INQUA Congress**

**28 July–3 August, Cairns, Australia**

Contact: [Inqua\\_secretariat@inqua.org.au](mailto:Inqua_secretariat@inqua.org.au)

## August

### **2007 World Water Week in Stockholm**

**12–18 August, Stockholm, Sweden**

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

### **The 17<sup>th</sup> International Conference on Nucleation and Atmospheric Aerosols**

**13–17 August, Galway, Ireland**

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

### **6<sup>th</sup> 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/](http://www.nccr-climate.unibe.ch/summer_school/2007/)

### **3<sup>rd</sup> Alexander von Humboldt International Conference: East Asian Summer Monsoon, past, present and future**

**27–31 August, Beijing, China**

Contact: Zhongli Ding, [Zlding@mail.igcas.ac.cn](mailto:Zlding@mail.igcas.ac.cn) or Andre Berger, [berger@astr.ucl.ac.be](mailto:berger@astr.ucl.ac.be) or [https://www.copernicus.org/site/redsyst/classicform.php?form=form\\_avh07\\_china\\_circular&site=egu](https://www.copernicus.org/site/redsyst/classicform.php?form=form_avh07_china_circular&site=egu)

### **CLIVAR/WCRP 2<sup>nd</sup> International Conference on Earth System Modelling**

**27–31 August, Hamburg, Germany**

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

### **2<sup>nd</sup> International Conference on Earth System Modelling**

**27–31 August, Hamburg, Germany**

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

## September

### **2<sup>nd</sup> ALTER-Net Summer School “Trends in Biodiversity: European Ecosystems and Policy”**

**1–13 September, Peyresq, Alpes de Haute-Provence, France**

Contact: Sabine Lutkemeier, [Sabine.Lutkemeier@pik-potsdam.de](mailto:Sabine.Lutkemeier@pik-potsdam.de) or <http://www.pik-potsdam.de/alter-net/>

### **10<sup>th</sup> Symposium on Aquatic Microbial Ecology**

**2–7 September, Universidade do Algarve, Faro, Portugal**

Contact: <http://www.ualg.pt/fcma/same10/>

### **International conference: Monitoring the effectiveness of nature conservation programmes**

**3–6 September, Swiss Federal Research Institute WSL, Birmensdorf, Switzerland**

Contact: [http://www.wsl.ch/event\\_07/monitoring/](http://www.wsl.ch/event_07/monitoring/)

### **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://aslo.org/phd.html>

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

**10–17 September, Inner Mongolia, China**

Contact: Xiaoping Yang, [xpyang@263.net.cn](mailto:xpyang@263.net.cn), [xpyang@mail.igcas.ac.cn](mailto:xpyang@mail.igcas.ac.cn) or <http://www.igggcas.ac.cn/iw07/index.htm>

### **2<sup>nd</sup> Global Conference on Large Marine Ecosystems**

**11–13 September, Qingdao, China**

Contact: [http://www.imber.info/jobs-announcements/LMEs\\_second\\_announcement.pdf](http://www.imber.info/jobs-announcements/LMEs_second_announcement.pdf)

### **12<sup>th</sup> International Workshop on Transport Phenomena in Two-Phase Flows**

**12–17 September, Sunny Beach Resort, Bulgaria**

Contact: [chboyadj@bas.bg](mailto:chboyadj@bas.bg) or [jordan.hristov@mail.bg](mailto:jordan.hristov@mail.bg) or [hristovmeister@gmail.com](mailto:hristovmeister@gmail.com)

**Joint IMBER/LOICZ Continental Margins Open Science Conference: Impacts of global, local and human forcings on biogeochemical cycles and ecosystems**

**17–21 September, Shanghai, China**

Contact: [shanghai.osc@univ-brest.fr](mailto:shanghai.osc@univ-brest.fr) or [http://www.imber.info/images/photos/IMBER\\_LOICZ\\_CM\\_OSC\\_1st\\_Flyer.gif](http://www.imber.info/images/photos/IMBER_LOICZ_CM_OSC_1st_Flyer.gif)

**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/>

## October

**Conference Marie Curie-iLEAPS-MODELS. Towards a process-based description of trace gas emissions in land surface models (dates to be finalised)**

**1 October, Lund, Sweden**

Contact: Almut Arneth, [almut.arneth@nateko.lu.se](mailto:almut.arneth@nateko.lu.se)

**7<sup>th</sup> European Meteorological Society Annual Meeting and 8<sup>th</sup> European Conference on Applications of Meteorology**

**1–5 October, Madrid/San Lorenzo de El Escorial, Spain.**

Contact: <http://meetings.copernicus.org/ems2007>

**Greenhouse 2007**

**2–5 October, Sydney, Australia**

Contact: <http://www.greenhouse2007.com/>

**Long Time-Series Observations in Coastal Ecosystems: Comparative Analyses of Phytoplankton Dynamics on Regional to Global Scales**

**8–12 October, Rovinj, Croatia**

Contact: <http://www.agu.org/meetings/chapman/2007/bcall/>

**SOLAS Summer School 2007**

**22 October–3 November, Corsica, France**

Contact: SOLAS IPO, [jeff.hare@uea.ac.uk](mailto:jeff.hare@uea.ac.uk) or <http://www.uea.ac.uk/env/solas/summerschool/>

**Danish Network for Land System**

**25–26 October, Copenhagen, Denmark**

Contact: <http://www.lasys.dk/index.shtml>

## November

**1<sup>st</sup> International Conference on Adaptive & Integrated Water Management: Coping with complexity and uncertainty (CAIWA 2007)**

**12–15 November, Basel, Switzerland**

Contact: <http://www.usf.uos.de/projects/caiwa/index.htm>

**Asia-Pacific EcoHealth Conference: Sustaining People and Places in a Changing World**

**26–29 November, Basel, Switzerland**

Contact: Marika Thomson, [marika.thomson@deakin.edu.au](mailto:marika.thomson@deakin.edu.au) or <http://www.deakin.edu.au/events/ecohealth2007/>

## 2008

### May

**4<sup>th</sup> IGBP Congress 2008**

**May, Cape Town, South Africa (dates TBA)**

Contact: <http://www.igbp.net>

**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](mailto:secretariat@PICES.int)

### June

**5<sup>th</sup> international conference on Climate Change: The Karst Records Conference**

**2–5 June, Chongqing, China**

Contact: <http://www.climatechangeokr5.org>

**Eastern boundary upwelling ecosystems: Integrative and comparative approaches**

**2–6 June, Canary Islands, Spain**

Contact: <http://www.upwelling-symposium.org>

### July

**SCAR/IASC Open Science Conference 2008**

**8–11 July, St. Petersburg, Russia**

Contact: <http://www.scar.org/events/#2008>

**37<sup>th</sup> Scientific Assembly of the Committee on Space Research and Associated Events – COSPAR 2008: “50<sup>th</sup> Anniversary Assembly”**

**13–20 July, Montreal, Canada**

Contact: COSPAR, [cospar@cosparhq.cnes.fr](mailto:cospar@cosparhq.cnes.fr) or <http://www.cospar2008.org/> or <http://www.cospar-assembly.org>

### August

**33<sup>rd</sup> International Geological Congress: Earth System Science: Foundation for Sustainable Development**

**5–14 August, Oslo, Norway**

Contact: <http://www.pages.unibe.ch/calendar/calendar08.html>

### September

**13<sup>th</sup> World Water Congress**

**1–4 September, Montpellier, France**

Contact: <http://www.worldwatercongress2008.org>



# 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.

## SCOR Announces Fellowship Programme for 2007

The announcement for the 2007 POGO-SCOR Visiting Fellowships for Oceanographic Observations is available now on the Partnership for Observation of the Global Oceans (POGO) website, see below. The fellowship programme is open to scientists, technicians, graduate students (PhD) and post doctoral fellows involved in oceanographic work at centres in developing countries and countries with economies in transition. The fellowship provides airfare and a stipend for living expenses for up to three months.

[www.ocean-partners.org/POGO\\_SCOR\\_Fellowships.htm](http://www.ocean-partners.org/POGO_SCOR_Fellowships.htm)

International Council for Science

Scientific Committee on Oceanic Research



## New GECAFS IPO address

The ESSP joint project Global Environmental Change and Food Systems' (GECAFS) International Project Office has relocated to the OUCE-Environmental Change Institute ([www.eci.ox.ac.uk](http://www.eci.ox.ac.uk)), of which Diana Liverman is director. The new GECAFS IPO contact details are:

GECAFS International Project Office (IPO),  
Environmental Change Institute, Oxford University  
Centre for the Environment, South Parks Road, Oxford OX1 3QY, UK  
Phone: +44 1865 285 176 and Fax: +44 1865 285 534  
Website, as before: [www.gecafs.org](http://www.gecafs.org)

## Climate Change only one Symptom of a Stressed Planet Earth

In a press release recently published by IGBP, **Corinne Le Quééré** (IGBP researcher and IPCC WGI Chapter 5 Lead Author) says: "Evidence presented in the IPCC clearly shows that climate is changing. We also need to look more closely at what else is changing in addition to climate. For instance, the oceans and the terrestrial biosphere slow down climate change by absorbing half of the CO<sub>2</sub> emitted to the atmosphere, but how long will this continue? We have evidence that these natural CO<sub>2</sub> sinks are weakening in many regions of the world. We need to look at the Earth as a whole, and include the full interactions between climate, the biosphere, and humans".

Read the whole press release at the IGBP website [www.igbp.net](http://www.igbp.net) under Resource room/Media/Press releases.



## ICSU's 75<sup>th</sup> Anniversary Celebrations Continue!

WCRP is supporting young climate modellers Dr. Molly Hellmuth and Dr. Kei Yoshimura to present their climate-related research at the ICSU Conference *Global Scientific Challenges: Perspectives from Young Scientists*.

The conference, which will take place in Lindau, Germany from 4-6 April 2007, will bring together about 200 young scientists to address the following topics:

- International cooperation
- Transdisciplinary collaboration
- Public engagement
- Science for policy
- Scientific freedom and responsibilities
- Science and the private sector.

Read more at [www.icsu.org](http://www.icsu.org)



## Africa is Losing Forest Faster than any Other Continent

Africa lost over 9% of its trees between 1990 and 2005, according to a UN survey of the world's forests. This represents over half of global forest loss, despite the fact that the continent accounts for only 16% of global forests. The UN Food and Agriculture Organization released the report 13 March. The highest losses were found in countries with high forest cover: Angola, Cameroon, Congo, Nigeria, Sudan, Tanzania, Zambia and Zimbabwe.

Source: [www.SciDev.net](http://www.SciDev.net)

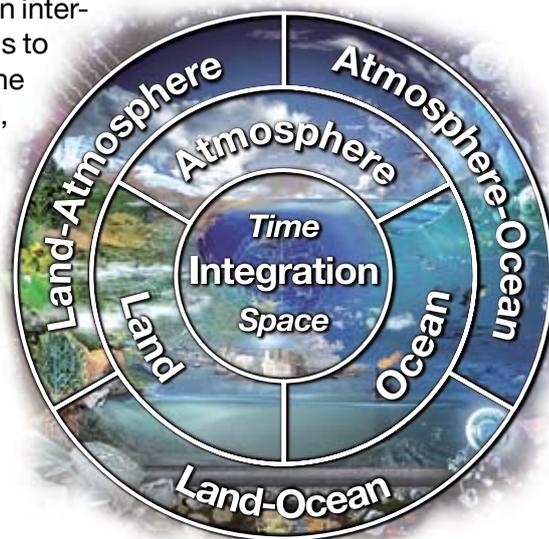
## Reconstructing Brazil's Atlantic Rainforest

An ambitious project in Brazil's most populous state, São Paulo, is trying to create a real working ecosystem through the reforestation of 1 million hectares (2.47 million acres) of riparian rainforest. Because of decades of deforestation the local farmers are struggling with a fairly new problem: the groundwater they have relied on for years is disappearing. Riparian rainforest once covered 80% of the São Paulo state, but today only 13% remains, which has led to severe land degradation problems and a huge loss of biodiversity. To restore the forest the first seedling was planted in December last year, but the plan is to increase the forested area to 25% in the following 20-30 years. The project is called Riparian Forest Restoration Project (RRP) and is mainly funded by the Global Environment Facility (GEF). Source: Science 315(5815):1070-1072.



# 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](http://www.igbp.net)) or those of our projects, or contact an International Project Office or one of our 74 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.



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