

16 January, Lilongwe, Malawi
3rd START Southern African Committee Meeting (SAFCOM)

17-21 January, Lilongwe, Malawi
First Regional South African Workshop for START. Lilongwe, Malawi. Z. M. Kasomekera, University of Malawi, Bunda College of Agriculture, PO Box 219, Lilongwe, Malawi. Tel: (+265) 277 222, Fax: (+265) 277 251, or 277 364

27-29 January, Brunei
Fourth Meeting of the Southeast Asia Regional Committee for START

4-5 February, Boulder, CO, USA
PAGES/PALE Principal Investigators. John Andrews, Boulder, CO, USA. Tel: (+1-303) 492-8347; Fax: (+1-303) 492 6388

7-11 February 1994, Nairobi, Kenya
GCTE/ISSS/TSBF/UNDP/ICRAF/US-SMS Workshop on the management of carbon in tropical soils under global change. John Ingram, GCTE Focus 3 Project Officer, Department of Plant Sciences, University of Oxford, South Parks Road, Oxford, OX1 3RB, UK. Tel: (+44-865) 275 079; Fax: (+44-865) 275 060

10-14 March, Bonn, Germany
8th Meeting of the Scientific Committee for the IGBP

13-16 March, Bonn, Germany
Fourth Meeting of the IGBP National Committees. Sabine Lütkecieier, IGBP-Sekretariat, Institut für Meteorologie, Freie Universität Berlin, Dietrich Schäfer-Weg 6-10, D-12165 Berlin, Germany. Tel: (+49-30) 838 71117, Fax: (+49-30) 838 71160, E-mail: H.Bolle.IGBP (Omnet)

21-22 March, Manila, Philippines
GCTE Rice Network Planning Workshop, with the International Rice Research Institute. John Ingram, GCTE Focus 3 Project Officer, Department of Plant Sciences, University of Oxford, South Parks Road, Oxford, OX1 3RB, UK. Tel: (+44-865) 275 079; Fax: (+44-865) 275 060

6-7 April, Belgium
International Open Symposium on Freshwater Ecosystems. Oscar Vanderborcht, Royal Belgian Academies of Sciences, Palais des Académies, 1, rue Ducale, B-1000 Bruxelles. Tel: (+32-2) 511 2629; Fax: (+32-2) 511 01430, or at the University of Antwerp, Department of Biology: Fax: (+32-3) 328 0497

25-26 April, Washington, DC
IGBP-DIS Soils Working Group

23-27 May, Woods Hole, Massachusetts, USA
First GCTE Science Conference. Will Steffen, GCTE Core Project Officer, CSIRO, Division of Wildlife & Ecology, PO Box 84, Lyncham ACT

2602, Australia. Tel: (+61-6) 242 1748; Fax: (+61-6) 241 2362; E-Mail: wls@cbr.dwc.csiro.au

1-3 June, Nantes, France
PAGESSymposium on palaeo-processes in the sub-polar oceans, in connection with the symposium on sub-polar oceans: Role in World Ocean and Climate. Laurent Labeyrie, Laboratoire Mixte CNRS-CEA, Centre de Faibles Radioactivités, Parc du CNRS, Gif-sur-Yvette, F-91198, France. Tel: (+33-1) 6982 3536, Fax: (+33-1) 6982 3568, E-mail: labeyrie@eole.cfr.cnrs-gif.fr

8-11 August, Beijing, China
International Symposium on Global Change in Asia and the Pacific Regions. c/o LASG, Institute of Atmospheric Physics, Chinese Academy of Sciences, PO Box 2718, Beijing 100 080, China. Tel: (+86-1) 256 0172, 257 1939; Fax: (+86-1) 256 2347.

14 August, Glasgow, UK
PAGES Workshop on comparison of chronologies, in connection with the 15th International Radiocarbon Conference. Willem Mook, Centre for Isotope Research, University of Groningen, Westersingel 34, NL-9718 GM Groningen, The Netherlands. Tel: (+31) 2220 693 66; Fax: (+31) 2220 19 674

5-9 September, Fuji-Yoshida, Japan
International Symposium on Global Atmospheric Chemistry: Human impact on the global troposphere. 2nd Scientific Conference of the International Global Atmospheric Chemistry Project (IGAC) and 8th Symposium of the IAMAP Commission on Atmospheric Chemistry and Global Pollution. Toshihiro Ogawa, CACGP/IGAC Symposium, Dept. of Earth and Planetary Physics, Faculty of Science, University of Tokyo, Bunkyo-ku, Tokyo 113, Japan, or IGAC Core Project Office, MIT, Room 24-409, Cambridge, MA 02139, USA. Tel: (+1-617) 253 9887, Telex: 921473 mitcam; Fax: (+1-617) 253 9886

Publications

Joint UNESCO/IGBP Report

Towards a Global Terrestrial Observing System (GTOS): detecting and monitoring change in terrestrial ecosystems (1993). Report of Fontainebleau Workshop, Ed O.W.Heal, J.-C. Menaut and W.L. Steffen. UNESCO Man and Biosphere Digest 14; IGBP Report 26. 71p. *Limited number of copies available from UNESCO, 7 place de Fontenoy, 75352 Paris 07, France.*



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National Activities

India

Geosphere-Biosphere programme. Activities and Plans of the Department of Science and Technology (1993). New Delhi, Ministry of Science & Technology Delhi, Earth System Science Division. 83 p. (DST Programme on Geosphere-Biosphere, Document 3)

France

Evolution of the climate and the global environment. The French contribution in 1992 (1993). Paris, Ministry for Higher Education and Research. 62 p.

A new research newsletter

SPARC Newsletter, No. 1, July 1993 (twice yearly). Stratospheric Processes and their Role in Climate.

SPARC is a research project of the World Climate Research Programme, an IGBP sister organization. Write to M.-L. Chanin, Service d'Aéronomie, CNRS, BP 3, 91371 Verrières-le-Buisson, France, if you wish to be put on the mailing list.

GLOBAL CHANGE NEWSLETTER

Edited by Suzanne Nash and Phillip Williamson
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GLOBAL CHANGE NEWSLETTER

No. 15

SEPTEMBER 1993

THE INTERNATIONAL GEOSPHERE-BIOSPHERE PROGRAMME: A STUDY OF GLOBAL CHANGE (IGBP)
OF THE INTERNATIONAL COUNCIL OF SCIENTIFIC UNIONS

Global outlook for European science

“Environmental research requires a coherent vision, committed funding and an outward-looking, global approach. The European Community recognizes the role of the major international programmes, such as IGBP, in providing the scientific framework for research on global change – and hence helping to maximise the effectiveness and impact of the European research effort”. Those important developments in European Community (EC) science policy were recently outlined to the IGBP Scientific Committee by Professor Antonio Ruberti, Commission Member with top responsibility for EC research.

Discussion of the relationship between IGBP and the EC was one of the main agenda items at the 7th meeting of the IGBP Scientific Committee, held at Ispra, Italy, 30 June – 1 July. Ispra is the largest site of the EC Joint Research Centre, and was originally developed as a nuclear research establishment. However, during the past decade, research groups at Ispra have become increasingly involved in environmental and global change studies, with around 300 staff (plus research students and visiting scientists) now working there within the JRC's Environment Institute and Institute for Remote Sensing Applications.

Organization of EC research

Dr Jean-Pierre Contzen (JRC Director General and Deputy Director General for CEC DG XII) provided the IGBP Scientific Committee with further information on EC research structure and funding plans relevant to global change. Despite the economic recession, a substantial increase in EC research expenditure is envisaged for its 4th Framework Programme, 1994-98. Most of that budget will provide shared-



Jean-Pierre Contzen and Antonio Ruberti at the IGBP Scientific Committee meeting

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cost funding of cooperative projects between universities, research centres and industry in member states, with a simplified procedure for obtaining support. The remainder will be used to support in-house research at the JRC, and funding for coordination and training activities. Applying the concept of 'subsidiarity', the EC gives special emphasis to large-scale projects and activities, that are of high scientific or applied importance yet might not otherwise be carried out by individual member states.

Scientific collaboration is encouraged not only between EC research groups, but between the EC and elsewhere. That approach has already resulted in the establishment of a European Project Office for the IGBP International Global Atmospheric Chemistry project (IGAC), and plans for a more comprehensive European Network for Research in Global Change (ENRICH, see box) are well advanced, with the aim of achieving greater coherence for European global change research as a whole. In addition, a (de-centralized) Centre for Earth Observations (CEO) is being developed, in collaboration with the European Space Agency (ESA), to promote user access and exploitation of remote sensing data within a global network.

JRC research

Presentations and demonstrations by JRC researchers illustrated the global scope of current studies at Ispra. For example, work on multiphase atmospheric chemistry, investigating the importance of natural and anthropogenic sulphur aerosols in counteracting greenhouse forcing. This research is closely linked to the IGAC Marine Aerosol Characterization Experiment, with fieldwork in the Southwest Pacific (near Tasmania) in 1995.

Both marine and terrestrial remote sensing studies are carried out at Ispra. The marine research group is developing a bio-optical model for the estimation of primary production in the Northeast Atlantic. It also has interests in the production and cycling of dimethylsulphide (DMS), and in the development of hydrodynamic and heat transfer models. The Ocean Colour European Archive Network (OCEAN) project, a joint initiative with ESA, is now nearing completion; however, follow-up work is planned (on the processing of SeaWiF's data), with scope for major contributions to both the Joint Global Ocean Flux Study (JGOFS) and Land-Ocean Interactions in the Coastal Zone (LOICZ).

On the terrestrial side, JRC remote sensing studies include the quantification

of biomass burning in Africa; hydrological analyses for large watersheds; and the monitoring of agricultural production, in Europe and the Sahel. Extensive collaborations have been developed in the TREES project (Tropical Ecosystem Environment Observations by Satellites).

The SC-IGBP agenda

Much of the remainder of the IGBP Scientific Committee meeting was spent in reviewing the progress of IGBP Core Projects, with scientific presentations by IGAC and PAGES (see p 3). In addition, the implications of the SCOPE Report "Effects of Increased Ultraviolet Radiation on Biological Systems" were discussed (with a presentation by Professor Edward de Fabo) as well as the IGBP input to the 1995 IPCC Assessments. The decisions of the SC-IGBP on the role of National IGBP Committees in the development and implementation of IGBP research are reported on p 5-9 of this Newsletter.

Following the SC-IGBP meeting, the IGBP Officers held a very productive day of discussions with the Italian National IGBP Committee, under the chairmanship of Dr Angelo Guerrini.

The support provided by the CEC for the 7th meeting of the IGBP Scientific Committee is gratefully acknowledged.



Analysis of vegetation types in Southeast Asia: part of the baseline inventory for the TREES study, a joint project between JRC and ESA, in collaboration with NASA, the ISY World Forest Watch, IGBP-DIS and other agencies and institutes. The illustration is a mosaic of six AVHRR images (Feb 1991) at 1 km resolution, which has been used to derive a digital forest/non-forest classification, validated with high resolution Landsat TM and SPOT data.

ENRICH: European Network for Research in Global Change

Several European countries have well-developed national programmes for global change research, and there are many effective collaborations between individual research laboratories. However, until now, there has been minimal effort directed at achieving their overall coordination or promoting wider international research links, and thereby ensuring complementarity at the regional (and global) scale.

To investigate how those issues might best be addressed, a Group of Senior Experts was designated by Research Ministers of the European Community. The Group has recently presented its recommendations to the Commission of the European Communities, proposing that a European Network for Research in Global Change (ENRICH) should be established. Its purpose will be to encourage global change research within the European Community, through scientific cooperation; the collection, analysis and dissemination of relevant information; and by training and education. ENRICH will also support initiatives that promote relevant research capabilities in Central and Eastern European nations, and developing countries, mainly, but not exclusively, in Africa.

ENRICH will largely be built on the facilities of existing institutions and operational mechanisms, in close liaison with the Global Change System for Analysis, Research and Training (START). Thus it is intended that ENRICH should give particular encouragement to research collaborations that contribute to the scientific agendas of IGBP, the World Climate Research Programme (WCRP) and the Human Dimensions of Global Environmental Change Programme (HDP).

For further information on ENRICH, contact: Dr Anver Ghazi, Joint Research Centre/Commission of the European Communities, 200 Rue de la Loi, B-1049 Brussels, Belgium.

Scientific Highlights

The Ispra meeting of the IGBP Scientific Committee gave special attention to the plans and progress of the projects International Global Atmospheric Chemistry (IGAC) and Past Global Changes (PAGES). Examples of recent results from these projects were presented by Ron Prinn and Alex Pszenny (IGAC SSC Chair and Core Project Manager, respectively) and by Hans Oeschger (PAGES SSC Chair).

Variability in methane fluxes

Wetland tundra in the Northern Hemisphere is an important net source of methane (CH_4), emitting around 35 Tg per year. This value compares to the 1992 IPCC emission estimates of 155 Tg per year from all natural sources, and an atmospheric increase of 32 Tg per year. However, there are still uncertainties regarding (i) the total amount of CH_4 released from high latitude wetlands; (ii) whether there is a net uptake by boreal forest ecosystems; and (iii) how those fluxes would respond to changing environmental conditions.

Vegetation, soil temperature, and water table depth all affect the balance between the production and consumption of CH_4 in tundra ecosystems: these relationships are being examined by the HESS Activity (High Latitude Ecosystems as Sources and Sinks of Trace Gases; convenor, William Reeburgh) of the IGAC Boreal Focus.

Recent field results have confirmed that there is considerable spatial and temporal (daily to interannual) variability in CH_4 fluxes at tundra sites. Laboratory experiments show some of the reasons, with complex interactions between time, temperature and hydrological conditions. For example: a falling water table enhances, but a rising water table inhibits, CH_4 release. Models of large-scale flux processes are being developed from these studies, and compared with an inverse application of atmospheric transport models. High latitude biosphere-atmosphere studies within IGAC have, to date, had a strong North American bias: collaborations are now being developed to integrate that work with studies at European and Siberian sites.

Tracking ozone over the Atlantic

Tropospheric ozone has important oxidising properties, and contributes to the greenhouse effect in the lower atmosphere. It

has both natural and anthropogenic sources; improved estimates of their relative importance in northern temperate latitudes have been obtained through the NARE Activity (North Atlantic Regional Experiment; convenors, Fred Fehsenfeld and Stuart Penkett) of the IGAC Marine Focus.

Measurements were made of both tropospheric ozone and carbon monoxide at

sites on the Atlantic coast of Canada, and in north west Ireland: changes in the relative abundance of these gases (and knowledge of their atmospheric lifetimes) were then used to estimate the export of anthropogenic ozone from North America. That amount was greater than the calculated input of ozone from the stratosphere, showing that pollution sources have very wide effects in the northern hemisphere.

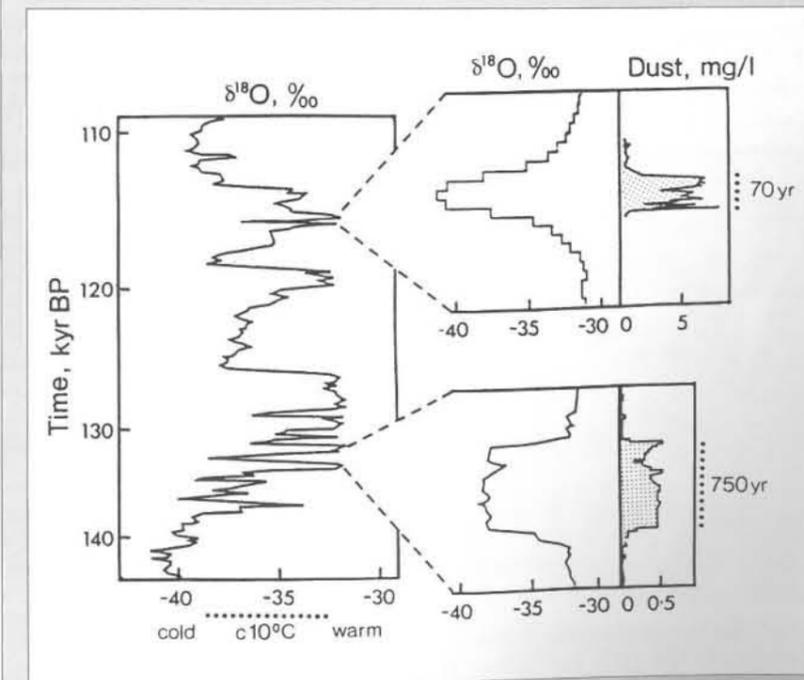
New ice core data show climate instability

During the previous (Eemian) interglacial, the Earth's climate was, on average, slightly warmer than it is today. But it was also much more unstable – as shown by new data from the PAGES Greenland Ice Core Project (GRIP). The temperature changes that occurred then, inferred from oxygen isotope data, were dramatic and very rapid, with regional changes of more than 10°C over 10-30 years.

Changes in dust deposition rates, and in the ionic composition of the ice, occurred at the same time, indicating that there were regional (and probably global) reorganizations of ocean circulation and atmospheric transport processes.

Four main modes of climate are apparent in the full glacial/interglacial data set: the current climate; warmer than present; cool glacial; and cold glacial. For the past 10,000 yr (Holocene), the climate has been anomalously stable in comparison to its fluctuations during the previous 250,000 yr. The implication of these findings is that current GCMs may be unreliable guides to future climate changes: abrupt switches in climate may be triggered, rather than gradual global warming.

For further information on these studies, see Nature 364, pp. 203-7 and 218-220; 15 July 1993.



GRIP/PAGES results indicating rapid climate changes during the last interglacial, as shown by oxygen isotope and dust analyses of the new Greenland ice core.

Changes at the Top

The IGBP Scientific Committee and its Officers, appointed by the ICSU Executive Board, have the responsibility for planning the programme as a whole, guiding its implementation and coordination, liaison with other international bodies, and making known its results.

Several important changes in that leadership of IGBP occur on 1 October 1993. By coincidence, all the individuals involved have oceanographic research interests; however, their disciplinary backgrounds are balanced by the strong expertise in terrestrial (and other) fields elsewhere in the membership of the Scientific Committee.

Being a successful chairman of the IGBP Scientific Committee not only requires a perceptive understanding of many scientific fields, but also vision, determination and diplomacy. James J. McCarthy has those skills in abundance, and, in spite of his many other professional responsibilities and interests, has always managed 'to put IGBP first' - from at least 1987 when, temporarily based at UCAR Boulder, Colorado, he was appointed Chair of the newly-founded Special Committee for IGBP, that had the task of designing the programme.

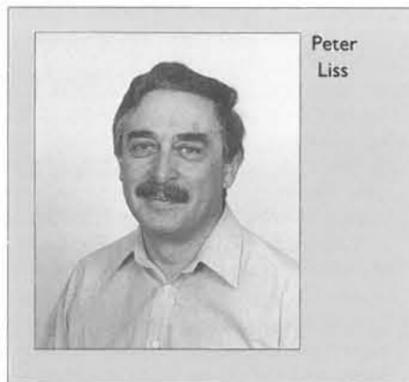
In 1990, as IGBP became operational, the Special Committee was replaced by the IGBP Scientific Committee, again under Jim McCarthy's capable leadership.



Jim McCarthy being presented by Thomas Rosswall with a unique CZCS globe, as a 'retirement' gift from SC-IGBP members. Thomas has now resumed his position as IGBP Executive Director

By then he had returned to his faculty posts at Harvard University, with academic appointments there including the Directorship of the Museum of Comparative Zoology and the Alexander Agassiz Chair of Biological Oceanography.

Jim's research interests focus on nutrient cycling by phytoplankton, both at the



Peter Liss

physiological scale and with regard to global implications. He remains a highly active field worker, each year spending several weeks (or even months) at sea, most recently with the JGOFS Equatorial Pacific Process Study. He will continue on the Scientific Committee for the IGBP for another year as Past Chair. Jim's successor at the helm of the IGBP Scientific Committee is Peter Liss, who became closely involved in the programme as the SC-IGBP Treasurer (and Officer) in 1990, at the same time being a member of the IGAC Scientific Steering Committee and Chair of the UK National Committee. The credibility, and creditability, of IGBP owes much to Peter's enthusiastic dedication to those tasks: whilst the ambitions for IGBP activities will, undoubtedly, always exceed the resources available, the programme's

A personal appreciation of Jim McCarthy

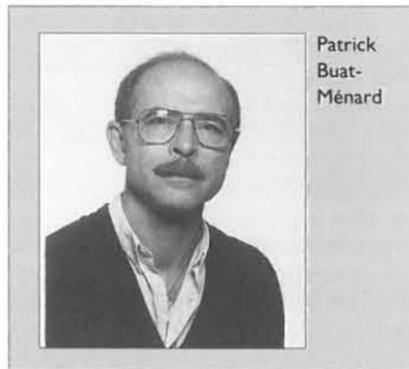
To launch an international research programme with the magnitude and interdisciplinary complexity of the IGBP is no easy task. Extraordinary intellectual leadership was needed to guide the IGBP Special Committee in deciding on initial priorities, and in convincing the science community, funding agencies and policy makers that the IGBP was both scientifically challenging and an essential component of the research effort addressing global change. If one person can be singled out as responsible for the success of the IGBP by ensuring intellectual integrity and leadership throughout the planning and implementation processes, it is Jim. He has a remarkable breadth of knowledge, vision and strength. He always took responsibility for addressing the most difficult issues and never bothered with micromanagement. It has been a rare privilege to work with and for him, which has not only shaped the IGBP but me as well.

Thomas Rosswall

financial state and outlook are now much-improved.

Peter Liss has, since 1985, been Professor in the School of Environmental Sciences, University of East Anglia, UK. His many research interests include the geochemical behaviour of pollutants in coastal waters, marine aerosols, and the processes of gas exchange across the air-sea interface - investigated in mid-ocean as well as in the laboratory.

Patrick Buat-Ménard joins the IGBP Scientific Committee as its Treasurer in October, completing the current suite of personnel changes. Patrick has recently moved from Gif-sur-Yvette to the University of Bordeaux, France, where he now



Patrick Buat-Ménard

heads the Department of Geology and Oceanography.

Patrick has been a very active member of both the JGOFS and IGAC Scientific Steering Committees, and of the French National IGBP Committee. His specific expertise covers the atmospheric cycling of trace metals and particulate carbon; and the marine biogeochemistry of trace metals, natural radionuclides and sulphur compounds.

Defining IGBP research

Much effort has been expended by the research community and IGBP Committees in defining and describing what IGBP research ought to be. The outcome includes the overview Science Plan (Report 12, 1990), and the separate Science Plans, Operational Plans and strategy documents of the IGBP Core Projects and Framework Activities. Most projects are now in their implementation phase: the research is underway, supported at the national level. But that raises other questions regarding the definition of IGBP research. Who is doing what and where? (and with whom?) Are there critical gaps that, if unfilled, could jeopardize a particular project and the programme as a whole? How serious are the funding problems?

These issues are being raised with increasing frequency at meetings of the IGBP Scientific Committee and the Core Project Scientific Steering Committees. To answer them not only requires up-to-date and comprehensive listings of the 'IGBP research' that is planned and in progress, but, more importantly, information on its relationship to the ideal world of the Science Plans.

The evolution of IGBP and its information needs

The following underlying and related principles have guided the development of IGBP: that it should be science-driven, on a truly international basis, with clearly defined priorities, yet with the flexibility to evolve, and with a minimum amount of administration. Some organization is of course necessary, and that has been established with the primary purpose of ensuring effective planning and structural coordination at the national, regional and global level.

The programme is now operational, with its component scientific objectives, and the approaches needed, having been defined in some detail within the context of IGBP's overall, long-term goal. In response, many individual scientists and research groups have re-directed their efforts "to advance our understanding of the dynamic and transdisciplinary nature of the Earth system, its past changes and uncertain future".

This current interest in global change research is highly welcome. However, it presents definition and information problems of a different kind: those responsible for the coordination and integration of IGBP need to know how many of the studies being carried out under the heading of 'global change' are directly addressing the programme's priorities. With that information, effort can be focused on increasing the amount, and also the effectiveness, of Core Project research, both by better liaison with researchers and through discussions with funding agencies, at the national and international level.

Research classification

A three-way classification of IGBP research has been adopted by the programme to facilitate this process of definition and recognition. The three categories (Core, Regional/National and Relevant) were originally developed by the Global Change and Terrestrial Ecosystems (GCTE) project, and discussions were held at the

Characteristics of the Categories for IGBP Research

Aspect:	Core Research	Regional/National Research	Relevant Research
Overall research aims	Addresses global-scale objectives, matching IGBP Core Project science plan	Addresses regional or national priorities, closely linked to Core Project science plan	Research objectives include aspects relevant to the IGBP science agenda
Methodologies	Follows internationally agreed methods (may need to be developed by the SSC)	Standard sampling and experimental procedures highly desirable; proper documentation required	Procedures employed to be properly documented (new methods may be developed)
Data management and data access	Follows Core Project data protocols; international data access (e.g. in World Data Centres)	Core Project protocols desirable; national or regional data centres used for archiving, with data available on request	Data archival strongly encouraged
Planning	Planned at international level by the Core Project SSC (but may be initially developed at national/regional level)	Planned at the regional or national level, by a committee or collaborating institutes	Planning may be at the level of a single institute, research group or individual scientist
Approval, coordination and progress review	Responsibility of the Core Project SSC, based on project descriptions and reports	Responsibility of the relevant National Committee(s), in liaison with SSC (and START for regional work)	No requirement for formal approval or progress review; however liaison with National Committee is highly desirable
Collaborations	At international level	At regional or national level	Collaboration with other research groups encouraged
IGBP acknowledgement in publications	Considered essential	Considered desirable	Probably not appropriate

3rd Scientific Advisory Council meeting (SAC III) at Ensenada on their wider applicability and usefulness (see Newsletter No 13, March 1993; p 11-12). Subsequently, the IGBP Scientific Committee has given further attention to the category definitions, and their application within the IGBP organizational structure.

Revised descriptions of the three categories are given here (see Table "Characteristics of the Categories for IGBP Research"). New aspects include the reference to standard methodologies, and data management and access. But the main features are as before: Core Research directly addresses the Science Plan goals of IGBP projects, being part of their formal structure and coordinated by the relevant Scientific Steering Committee; Regional/National research is closely linked to Science Plan objectives (but may have other overall aims), and is coordinated at a national or regional level; whilst Relevant Research makes an indirect contribution to the project, without formal affiliation.

Even with the additional criteria, the classification of national programmes (and individual studies) may not always be clear-cut. That was recognised at SAC III: "the category allocation of a research activity may change according to its own development and the evolving priorities of the IGBP Core Projects".

Since such changes are unavoidable, it is worth re-emphasising that the categories are not based on scientific merit *per se*: they relate to research objectives, implementation procedures, and the 'coordination capacity' within the Core Projects and at regional and national levels. Core Research is expected to be of high scientific quality; however, work of equally high scientific importance may be found in the other categories.

The role of SSCs, Core Project Offices and National IGBP Committees

For this conceptual structure to be functionally useful, the Core Project Scientific Steering Committees (SSCs) must know what Core Research is being carried out. In addition, the National IGBP Committees (NCs) must be aware of research at the Regional/National level (with the involvement of regional START Committees, where appropriate). Since there could be inconsistencies if research groups decided on the category of their own work, the Core Project SSCs and the NCs must take on that task.

The procedures recommended by the IGBP Scientific Committee are as follows:

1. The NCs have responsibility for assem-

Contact information for IGBP Core Projects and Activities

Biospheric Aspects of the Hydrological Cycle (BAHC)
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Internet: bahc.cpo@geowiss.fu-berlin.d400.de

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Fax: (+49-431) 565 876
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Omnet: JGOFS.Kiel

Land-Ocean Interactions in the Coastal Zone (LOICZ)
John Pernetta (from 1 Nov 1993)
LOICZ Core Project Officer
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Texel, The Netherlands
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Fax: (+31-2220) 69430

Past Global Changes (PAGES)
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Bärenplatz 2, CH-3011 Berne
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Fax: (+41-31) 312 31 68
Internet: pages@ubeclu.unibe.ch

Land-Use/Cover Change (LUCC) Core Project Planning Committee
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Global Analysis, Interpretation and Modelling (GAIM) Task Force
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Data and Information System (IGBP-DIS)
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IGBP-DIS Office
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4 Place Jussieu
F-75230 Paris Cedex 05, France
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Omnet: I.Rasool

bling descriptions of national projects, planned or underway, that they consider to be within the Core and Regional/National categories. The information needs to be more than just the project title; its relationship to Core Project objectives and data synthesis must be made clear. A format for project descriptions already exists for GCTE, and similar guidance will be made available by the other Core Projects. To assist in this information review, NCs are encouraged to set up Working Groups

or sub-Committees matching the Core Projects that are of greatest national interest.

2. The NCs submit descriptions of projects considered to be within the Core Research category to the SSCs, via the relevant Core Project Office; preferably as a packaged 'national contribution' to each project. Following the review of such material by the SSCs, formal recognition of its current category status, or other feedback, will be provided. In cases where the NCs are un-

able to carry out preliminary assessments, research groups may need to make their submissions directly to the SSCs/Core Project Offices; however, the NC should be kept fully informed of any such actions.

3. The SSCs will use the information on Core Research to guide the further development of their projects, encouraging collaborations, and, where necessary, taking action to attract effort and resources to 'neglected' areas.

Addresses of Core Project Offices are given here, and those of NC Chairs (or other contacts) on p 16-18 of this Newsletter. The Scientific Conferences, Symposia and other open meetings of Core Projects provide the opportunity for direct discussion of project development by IGBP researchers, and national participation in such meetings is therefore strongly encouraged.

Publication of research compendia

Following the category-allocation exercise, information on the component studies of each Core Project will be published, either as a listing within the IGBP Newsletter (or a Core Project Newsletter), or, in more detail, as a Core Project Research Compendium. NCs are also encouraged to publish national compendia of information on projects, that could combine a listing of studies within both Core and Regional/National categories. Information on Relevant Research may also be included, but its different status should be indicated.

At SAC III it was proposed that a complete international listing of IGBP research,

in all categories, should be published. That would be a very ambitious task, with difficulty in up-dating and ensuring consistency between different national entries. The feasibility of preparing such a listing on a regional scale is currently being examined by European NCs.

Timescale of actions

Several countries have already published national compendia of IGBP or global change research. Those initiatives are extremely useful; however, as the NCs were not in all cases closely involved in preparing such listings, and the criteria for the different categories are now more exactly defined, some further review may be needed before forwarding existing information to SSCs for formal consideration.

The GCTE SSC has already applied the three-way classification to projects that have been submitted for that purpose. A compendium of GCTE Core Research is in preparation, with publication as a GCTE Report expected in late 1993. Three other Core Projects have published Implementation Plans or similar documents (PAGES, Report No 19; JGOFS, Report No 23; IGAC, 1993 booklet series) and publication of the BAHC Operational Plan (Report No 27) is imminent. For those projects, an initial definition of their Core Research should be completed within the next two years.

The 1994 meeting of NC Chairs (Bonn, 13 - 16 March) provides the opportunity for setting more exact timetables with Core

Project SSC Chairs and the IGBP Scientific Committee, and for further review of the proposed procedures.

IGBP acknowledgement policy: giving credit where it's due

Acknowledgement of IGBP in scientific publications is of considerable benefit to the programme. It also benefits individual researchers to be associated with an activity whose importance is being increasingly recognized by the scientific community, funding agencies and at the political level.

All IGBP researchers are therefore strongly urged to include in publications the following credit: "This research is part of the project of the International Geosphere-Biosphere Programme (IGBP)". Such acknowledgement is particularly desirable for 'high profile' papers, involving international collaboration, and in the lead articles for conference proceedings and similar special volumes.

The relevant Core Project Office should be sent a reprint of IGBP-related papers on their publication, and can be contacted if (prior to formal recognition of Core Research) there is uncertainty regarding the appropriateness of IGBP acknowledgement.

Formation and Function of National Committees

There are now 66 National IGBP Committees, with ten new ones formed so far this year. Yet there are still 'gaps in the map' (see p 15), where researchers do not yet have the opportunity to participate fully in the excitement of IGBP science - and many of these areas are also of particular importance to the programme. A study of the Earth system in its entirety requires global coverage of observations and studies, on the ground (and at sea) as well as from satellites.

As may be expected, National Committees have been now established in nearly all industrialized countries, and recent members are mostly developing nations. The Global Change System for Analysis, Research and

Training (START) gives special attention to their needs, promoting the regional development of networks for scientific collaboration, capacity building, assessments and application of global change research.

For countries that do not yet have a National Committee, the following notes have been prepared for their guidance. Much of the information will be familiar to many readers here; nevertheless, it is provided in full, as a timely reminder of the important role of National IGBP Committees in assisting in the implementation of the programme.

Background

The International Geosphere-Biosphere Programme (IGBP) is the largest, most comprehensive and ambitious multidisciplinary research effort ever undertaken. Its objective is "to describe and understand the interactive physical, chemical, and biological processes that regulate the total Earth system, the unique environment that it provides for life, the changes that are occurring in this system, and the manner in which they are influenced by human activities".

Seven Core Projects address the main research questions related to this objective. The IGBP is sharply focused on well-

defined scientific priorities, with a major emphasis on integration of results, modelling, and, ultimately, improving predictive capacity – to reduce uncertainties in global change. This knowledge is vital for policy development and for society as a whole. Core Project research is supported by a data and information system, a global analysis and modelling Task Team, and a global network of regional research and training sites and centres.

IGBP is a body of the independent International Council of Scientific Unions (ICSU) and has been endorsed by the UN General Assembly. Together with the World Climate Research Programme (WCRP) and the Human Dimensions of Global Environmental Change Programme (HDP), it provides international coherence to the scientific effort addressing the challenge of understanding global change. National IGBP Committees have a key function in the programme: their role is to represent, and bring together, the intellectual capacity and scientific vigour of researchers in participating countries; to provide the formal interface with the international structure; to contribute to the conceptual and practical development of IGBP as a whole; and to assist in promoting the international collaborations that are needed for global change research.

Establishment

1. Since IGBP is an ICSU body, it is generally the responsibility of the organization providing ICSU National Membership to convene the constitutive meeting for a National IGBP Committee and decide on its membership. If the nation or territory is not an ICSU National Member, persons or institutions are free to establish the National Committee through their own structures.

2. Support for the Committee's activities by an institution is necessary. Depending on how national research is organized, the institutional framework can be provided by a scientific academy, research council, scientific institution or association of such institutions, that effectively represents the scientific activities relevant to IGBP in a country or definite territory.

3. Members of a National Committee should be scientists active in global change research relevant to IGBP, whilst also having interdisciplinary experience and providing a broad representation of the sciences involved. The inclusion of scientists with an active interest in the human dimensions of global environmental change, and also the physical climate system, is of great benefit, to ensure that the Commit-

tee provides a national link to HDP and WCRP. In addition, representation of relevant national funding agencies, and other bodies involved in setting national science priorities, is encouraged. Membership rotation is highly desirable, to bring in new expertise and extend contacts with the research community.

4. National Committees are strongly advised to set up working groups or sub-committees that match the IGBP Core Projects of greatest interest to them, thereby assisting in liaison with the relevant national research communities, and information exchange with the international Core Project Offices and Scientific Steering Committees.

Role and function

5. National IGBP Committees are expected to follow closely the development of the IGBP research agenda and to actively encourage their scientific communities to participate in Core Project research and other IGBP activities. Further details of the practical aspects that are involved are provided in "Defining IGBP Research" and "Benefits and responsibilities of participation in IGBP" (the preceding and following articles in this Newsletter).

6. The overall scientific strategy of IGBP is described in IGBP Report 12, *The Initial Core Projects* (1990) and *Global Change: Reducing Uncertainties* (1992). For most Core Projects more detailed science and implementation plans have been published in the IGBP Report series, and others are in preparation.

7. To a major extent IGBP research is implemented through nationally funded projects. Whilst the National Committee may not necessarily be involved in the funding process, it is expected to be aware of the relevant national research effort, and thereby assist Core Projects in identifying planned and on-going research that addresses IGBP priorities.

8. In addition to their role in stimulating and coordinating the national research effort, National Committees should also take a lead in initiating regional collaboration within the Global Change System for Analysis, Research and Training (START), as outlined in IGBP Report 15 (1991). The Committees should define suitable regional frameworks in collaboration with the START Standing Committee.

9. The Chairs of National IGBP Committees meet at regular intervals to discuss common concerns. National Committees also participate in the IGBP Scientific Advisory Council (SAC), which meets eve-

ry 2-3 years. In addition to delegations from National Committees, the Council brings together representatives from other ICSU bodies, funding agencies, and other international organizations involved in global change research.

10. Further opportunities for National Committees to contribute to the development of IGBP as a whole include participation in the scientific conferences and open meetings of the Core Projects, where results are discussed and plans for new work are developed on a fully international basis.

Financial issues

11. National participation in IGBP requires the payment of an annual contribution towards the cost of the central scientific coordination and integration of the programme. Together with income from other sources, these contributions support meetings of the IGBP Scientific Committee and the Core Project Scientific Steering Committees, as well as other planning and coordination meetings, the operation of the Stockholm Secretariat, and IGBP publications.

12. The payment of that annual contribution entitles National Committee members, and others within the country, to receive copies of IGBP publications (Reports and the Global Change Newsletter) at no further charge. In addition, national representatives will be invited to attend the major IGBP science meetings, with the possibility of financial assistance for such participation from the developing countries.

13. The IGBP budget is prepared by the IGBP Scientific Committee with National Committee involvement. The level of each nation's contribution to that budget is derived from the IGBP budget by applying a scale reviewed by the Scientific Advisory Council (further details available on request). Payment of the national contribution may be made by any agency or institution in the country.

14. The IGBP Secretariat should receive formal notification of the establishment of the National Committee, of its membership (including full contact information) and of the name and address of the body that will pay the national contribution.

Enquiries regarding the establishment of a new National IGBP Committee should be addressed to: IGBP Secretariat, Royal Swedish Academy of Sciences, Box 50005, S-10405, Stockholm, Sweden; tel (+46-8) 16 64 48, fax (+46-8) 16 64 05, telex 17509 igbp s.

Benefits and Responsibilities of Participation in IGBP

A statement of what can be gained from participation in an IGBP Core Project, and the commitments that are required, was originally developed by the Joint Global Ocean Flux Study (JGOFS). A more general version has since been prepared, with the following text endorsed by the IGBP Scientific Committee at its Ispra meeting.

Benefits

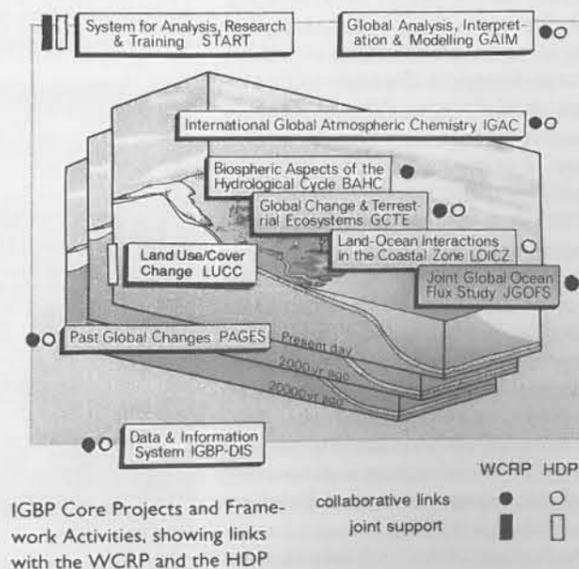
The IGBP Core Projects and other programme activities benefit component national studies and individual researchers in many ways. In particular, IGBP:

- facilitates the planning of national global change research programmes, by providing a soundly-based intellectual and organizational framework for focused research, with overall aims, approach and implementation developed and endorsed by the international science community
- adds to the scientific value of component studies, and assists in their interpretation, by providing complementary information; for example, by widening the range of studies and extending their temporal and spatial coverage
- promotes the rapid communication of scientific ideas and results at the frontiers of knowledge, through meetings and publications, and by encouraging interdisciplinary liaison at the national, regional and international level between individuals and research groups
- develops, and tests the applicability of, standard methods and protocols for measuring key environmental variables, thereby facilitating national and international quality control, intercalibration studies, and subsequent data exchange, synthesis and interpretation
- assists in the cost-effective deployment of major capital equipment and facilities, by encouraging their collaborative use and efficient scheduling, and promoting the international transfer of technological expertise
- makes available the data sets collected by its component projects and studies, and assists in developing common data management strategies, in liaison with national and international data centres
- encourages the full involvement of developing countries in global change research, by promoting the establishment of regional research networks, capacity building through training, and by providing, wherever possible, financial assistance for developing country participation at open IGBP meetings
- keeps the research community informed of developments within the programme through IGBP Reports, the Global Change Newsletter and other publications
- ensures that close working links are developed with other relevant international programmes and projects, particularly those of the World Climate Research Programme (WCRP) and the Human Dimensions of Global Environmental Change Programme (HDP), and with international assessment exercises, such as those of the Intergovernmental Panel on Climate Change (IPCC)
- promotes the concept of IGBP science, the results obtained from the programme, and their application, to decision-makers, funding agencies and inter-governmental organizations, thereby indirectly assisting in the further financial support of its component studies.

Responsibilities

Participation in IGBP Core Projects and other activities requires a commitment to work within both a national and international structure. At the national level, leadership is provided by the National IGBP Committee. It has the responsibility, shared by the research community of the country and collaborating national ICSU bodies, to:

- facilitate the planning and implementation of a national research programme that addresses the scientific aims of some or all of the IGBP Core Projects (as described in their Science Plans and Implementation Plans), accepting guidance from, and reporting progress to, their Scientific Steering Committees
- assist in the development and coordination of IGBP as a whole, through information exchange with IGBP Core Project Offices and the IGBP Secretariat, and participation in regional and international IGBP meetings
- ensure that the national science community, and funding bodies, are aware of the importance of IGBP research and its development
- make nationally-collected IGBP data available to the international research community, in accordance to the protocols developed for data exchange within the Core Projects and for IGBP as a whole
- acknowledge participation in IGBP in scientific publications arising from involvement in the programme
- provide, through the National Committee or other bodies, an annual financial contribution to the cost of the international scientific coordination and integration of the programme (in accordance with budgets and payment scales prepared by the IGBP Scientific Committee, and reviewed by the IGBP Scientific Advisory Council)
- where possible, make a further contribution to the international effort; for example, by hosting regional or international IGBP meetings, or obtaining support for a Core Project Office, or other facilities that assist in the international planning, implementation and data management for IGBP.



Regional Round-up

Trace Gas Fluxes, Land Use and Climate Change in African Savannas

Report of the Workshop at Victoria Falls (Zimbabwe) 2-5 June 1993

This joint IGBP Core Project Workshop was convened to bring together scientists involved in studying various aspects of the savannas of Africa. The objectives were to discuss mutual research interests and to outline a regional research agenda. The workshop focused on land-atmosphere interactions, with particular emphasis on sources and sinks of trace gases. Sixty-five international delegates attended the meeting, including representatives from IGAC, GCTE, START, GAIM and IGBP-DIS.

Interest in African trace gas emissions has been boosted by the recent discovery of a seasonal maximum of tropospheric ozone over the southern tropical Atlantic. This anomaly has been linked to land use practices in African savannas resulting in the production and transport of O₃ and OH. Preliminary estimates suggest that biogenic (ruminants, soils and termites) and pyrogenic sources dominate the emissions. The development of a dynamic model of trace gas fluxes which is responsive to interannual variability as well as long term changes in climate is an important interdisciplinary goal for the research community. Such a model needs to take account of primary production, emission characteristics, fire behaviour, land use, herbivory and other aspects of savanna ecosystem function.

The workshop was opened by the Deputy Minister for Environment and Tourism for Zimbabwe, Mrs. O. Rushe-sha. Representatives from the organising committee then presented the background to the workshop and its objectives. Professor Rosswall outlined the relevance of regional START initiatives, and the activities of the Intergovernmental Panel on Climate Change (IPCC).

The first part of the Workshop consisted of a series of review presentations on

the major processes and factors affecting regional emissions. In the second part, discussion groups examined the areas of major uncertainty (namely primary production and land use), focusing on key processes, available data, new data and experimental needs. Another group discussed the design and content of a data and information system for regional emissions.

Subsequent discussion groups addressed specific questions associated with land-atmosphere interactions, and identified key questions, hypotheses and associated experiments under four categories: pyrogenic emissions, biogenic emissions, herbivory and land use. In the final session of the meeting, presentations were made on START activities, and the major field experiments already planned for Africa in the area of land-atmosphere interactions. A proposed research strategy was then outlined based on known proposals and perceived needs.

The meeting was unanimous on the need for a regional effort to compile the existing data and results pertinent to African savannas. This information is currently scattered throughout the region in the grey literature and in national holdings, with additional relevant data collected by the international projects DECAFE (Dynamique et Chimie Atmosphérique en Forêt Equatoriale) and SAFARI (Southern African Fire-Atmosphere Research Initiative). Quantification of the distribution and timing of fires is now possible through the use of daily coarse-resolution satellite

data. Our knowledge of the distribution and rates of land use change in Africa can also be much improved using the 20 yr record of high resolution satellite data. The human dimensions of the research questions were identified, including the need to locate and compile up-to-date data on population, fuel wood consumption and charcoal production within the region.

The meeting promoted the necessary interdisciplinary dialogue between the atmospheric, ecological and social science communities, and between field researchers and modellers. It exposed individual research efforts to a broader community; in addition, several new experiments were proposed, and ways to strengthen planned studies were discussed. The meeting laid the foundation for a regional research programme that would also have national relevance, assisting in national assessments of greenhouse gas emissions for the IPCC.

The advantages of an African research initiative were apparent from the meeting, as was the need for the increased involvement of regional scientists at all levels within such a programme. There may be difficulties in obtaining funding for interdisciplinary and regional scale studies; nevertheless, the regional nature of the research questions, the requirement for regionally applicable methodologies and the limited human resources to conduct the research are very strong arguments for such an approach.

Chris Justice,
Goddard Space Flight Center



Participants at the Victoria Falls Workshop

Global Change Research in the Arctic

A new Global Change Programme Office has been opened by the International Arctic Science Committee (IASC) at Rovaniemi, Finland.

The Arctic is a region where the consequences of global environmental changes, notably climate changes, are likely to be particularly severe. Current global climate models all share the common feature of significantly larger rise in mean surface temperatures at high northern latitudes than elsewhere. This is particularly disturbing since a number of feedback processes, involving a shrinking sea ice cover or the release of greenhouse gases from thawing permafrost, could enhance any initial warming. The importance of high latitude processes for the state of the global system has been recognized by both the IGBP, through its START initiative, and the World Climate Research Programme (WCRP) through its recently launched Arctic Climate System Study.

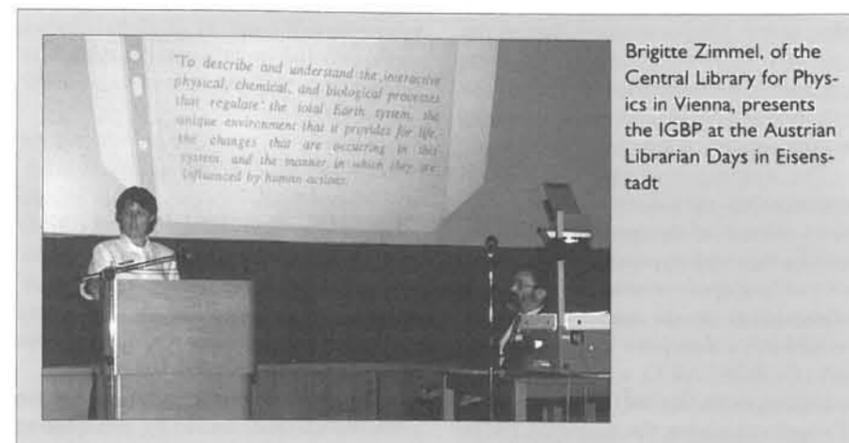
One of the first groups initiated by the IASC is the Global Change Working Group, under the chairmanship of Gunter Weller (University of Alaska). Finland offered to host the IASC Global Change Programme Office at the Arctic Centre of the University of Lapland in Rovaniemi. Headed by Manfred Lange, the Office will primarily support and implement the scientific initiatives and decisions of the Global Change Working Group. It will also be a contact point between the Group and other international global change research programmes with an interest in the Arctic.

Contact: Global Change Programme Office at the Arctic Centre, PO Box 122, Rovaniemi, SF-96101, Finland. Tel: (+358-60) 324 771, Fax: (+358-60) 324 760.

Manfred Lange,
Head, Arctic Centre

Regional Information Centres

Over 50 university libraries and documentation centres throughout the world have now agreed to act as Regional Information Centres for IGBP, to ensure that IGBP publications are widely accessible. The RICs make the literature available in many ways – e.g. by loan, copying, free access to the library, and announcements in acquisition lists and bibliographies. The Arctic Centre (above) is one of these RICs.



Brigitte Zimmel, of the Central Library for Physics in Vienna, presents the IGBP at the Austrian Librarian Days in Eisenstadt

The Central Library for Physics in Vienna, another RIC, gave a presentation on IGBP at the 22nd Austrian Librarian Days in Eisenstadt in October 1992. This event was attended by 400 people, and represents the most important meeting of librarians in Austria.

Europe

Two back-to-back meetings of representatives of European National IGBP Committees were held in June, one in Brussels and one in Amsterdam.

Commission of European Communities

On 4 June, eighteen Chairs of National IGBP Committees in eastern and western Europe met in Brussels at the invitation of Jean-Pierre Contzen, Director-General of the CEC's Joint Research Centre. The meeting was organized to inform the European IGBP Committees about the CEC global change research efforts, including the funding possibilities for this type of research offered by the Framework Programme. In particular, the Chairs were informed about a large number of CEC funded global change research projects that were now open for participation by researchers from eastern Europe. Dr. Contzen also gave a presentation of the plans for the European Network for Research in Global Change (ENRICH, see box on p. 2). After an animated discussion the following conclusions were drawn:

- the ENRICH initiative was welcomed as an attractive mechanism for developing east-west collaboration in Europe
- it would be desirable if the CEC played a role at the European level in fostering the development of communication between the government level and research scientists

- the CEC activities should be truly interdisciplinary, linking to the full set of international global change research programmes (i.e. including WCRP and HDP)
- in addition to paying attention to the regional impact of global change, it is also important to consider the possible global impact of local or regional problems
- thus CEC support should not only be given to regional aspects of global change: the global implications of this research must not be forgotten
- it would benefit regional collaboration in Europe in the IGBP framework if further meetings were held of European National IGBP Committees.

START in Europe

The Netherlands IGBP Committee, in collaboration with the Dutch National Institute for Public Health and Environmental Protection, organized a meeting on START in Europe on 7-8 June 1993 in Amsterdam, in consultation with the National IGBP Committees of Germany, Poland and the Russian Federation. The meeting was attended by representatives of 14 other National Committees, the International Institute for Applied System Analysis (IIASA) and the CEC.

This initiative is being developed in close contact with the European Communities, and in particular the ENRICH activities (see p. 2). START in Europe encompasses all of Europe, from the Atlantic to the Urals.

Hans-Jürgen Bolle (Germany) presented the workshop objectives and discussion themes. Whilst Europe can be considered as a single region, it is likely that an increasing greenhouse effect will have very different consequences in the Mediterranean and in Scandinavia—possibly giving rise to increasing gradients across Europe. This calls for research initiatives addressing specific themes or areas (such as the

Baltic or the Mediterranean), but at the same time larger collaborative efforts are necessary. The workshop discussed the goals of a possible European network, its structure and the scientific priorities.

The meeting concluded that a European network should develop stepwise, taking account of the special characteristics of Europe with respect to global change, and building upon existing networks and collaborations. It was agreed that before establishing a European START framework (EUROSTART), a study should be carried out, exploring the feasibility of that idea and examining the scientific priorities in more detail. The proposed terms of reference for such a study are:

- to review the extent of global change research and its structures in European countries, and participation in IGBP projects
- to identify the major requirements for EUROSTART that are necessary to fulfil the goals of IGBP and its Core Projects, such as the development of large scale projects as a contribution to Core research; integration and synthesis of scientific results; establishing data bases and site networks; and social and policy-related initiatives
- to develop a draft Mission Statement for EUROSTART, including relations to IGBP, HDP, WCRP, and other initiatives, such as ENRICH

- to identify mechanisms for implementation
- to examine ways of enhancing links between Eastern and Western Europe, and with Africa
- to identify the needs of consultation with relevant communities and organizations
- to identify the necessity of a larger follow-up conference on the feasibility and goals of EUROSTART.

It is intended to present the outcome of this study at the March 1994 meeting of National IGBP Committees in Bonn, Germany.

*Extract from a report by
Hans van Emden and R. J. Swart*

dian researchers to formulate the Canadian programme. The Canadian LOICZ Committee includes physical and natural scientists, social scientists and representatives of northern native organizations.

*Brian D. Bornhold, Director,
Canadian Global Change Program*

China (Beijing)

Beijing had the good fortune to welcome several members of the IGBP Scientific Committee this summer. The SC-IGBP Officers met in Beijing from 8 - 10 May, giving them the opportunity to meet with the Chinese National Committee and with scientists from various institutes in the country. Following presentations given by Chinese scientists, the Officers discussed ways to improve links between China's IGBP activities and IGBP Core Projects. Brian Walker, Chair of GCTE, visited Beijing from 17-23 July. He gave a lecture at the Institute of Botany, Chinese Academy of Sciences, followed by discussions with Chinese scientists from several research institutes.

The Committee is organizing, with the Chinese Academy of Sciences, an International Symposium on Global Change in Asia and the Pacific Regions, to be held in Beijing, 8-10 August 1994. The central themes of this symposium will cover: past global change; global change impact and terrestrial ecosystems; variability of the climate system; biogeochemical cycle and greenhouse gases; and Earth observations for global change. For more information, contact Prof Panqin Chen, Chinese National Committee for the IGBP, c/o Chinese Academy of Sciences 52, Sanlihe Road, Beijing 100864, China Tel: (+86-1) 859 7531 Telex: 22474 aschi, cn Fax: (+86-1) 851 1095 E-mail: chenpq%bepc2@slacvx.bitnet

*Panqin Chen, Secretary General,
IGBP China (Beijing)*

Colombia

Ongoing research projects in Colombia include the study "Colombian high mountain areas in the framework of global change". A Workshop is planned in October to review this programme, and to establish common methodologies for the eight institutional projects that are already part of this Colombian contribution to the IGBP.

Colombia also has a research programme "Effects of Climate Change in Colombia" as a contribution to IGBP. This includes coastal studies on the Magdalena river basin, and the estuarine and lagoonal systems of the Colombian Pacific Coast - as pre-

sented at the LOICZ Open Meeting in the USA this spring.

José Lozano, Chair, IGBP Colombia

Denmark

During the past two years the Danish National Committee has collected data on Danish IGBP-related activities. A summary of this survey in English is planned, but due to lack of funds, it cannot yet be published.

IGBP-related projects in Denmark are not supported by a special Danish IGBP programme, but seek funding in many ways, e.g., from National Research Councils and their strategic programmes, Nordic Ministry Council funds, the EC, and private foundations.

The major Danish interests in IGBP relate to IGAC, PAGES, and BAHC, which cover some 70% of the projects. A National Research Programme on the Environment has been launched, but the global perspective only plays a minor role in this programme.

In the framework of IGBP and WCRP, Danish institutions are participating in several research fields; for example, ice core studies (Greenland Ice-core Project), parameterisation of the hydrological cycle over land (NOPEX), ocean circulation (WOCE), ozone measurements in the Arctic, land use in Africa, and climate modelling. Attempts are also made to secure a region in north-east Greenland as an IGBP biological monitoring area (e.g. the project Zackenberg station and the Zero project).

During the last meeting of the Committee, it was decided to make a new effort to strengthen its own financial background, as well as making the importance of the IGBP better known to the Danish public. The Committee also discussed funding possibilities within the European Community, and the relevance of research networks in Europe.

Claus Hammer, Chair, IGBP Denmark

Estonia

The Estonian National Committee was established in June 1993. It is now developing its national programme, and identifying ongoing activities related to IGBP Core Projects. The Chair attended the START in Europe meeting in Amsterdam in June, to involve Estonia actively in international global change research.

Rein Vaikmäe, Chair, IGBP Estonia

Ireland

Irish researchers are participating in several international projects of IGBP interest,

and many have been forging contacts concerning research applications for the next European Community environment programme. A number of current EC-funded projects relating to IGBP (mostly to IGAC and LOICZ) reach their completion dates at the end of the year. The National Committee has been represented at the recent START in Europe meeting in Amsterdam and the IGAC meeting in Eilat, Israel.

John Sweeney, Member, IGBP Ireland

Japan

For several years the Japanese National Committee has organized sub-committees on IGBP Core Projects to address IGBP-related research. On 8-9 February 1993, the Science Council of Japan held an IGBP Symposium in Tokyo, devoted to the annual assessment of IGBP-related studies, where each sub-committee reported on its advances.

The IGAC group presented results from APARE (East-Asian North-Pacific Regional Experiment); from studies on atmospheric trace gases and terrestrial ecosystems; and on the generation of sulphur compounds from the oceans.

The JGOFs group addressed marine ecosystems, the biogeochemical circulation of carbon and other elements in the oceans, and other results of Japanese JGOFs research.

For GCTE, the main theme was CO₂ budgets for terrestrial ecosystems; for BAHC, the estimation of evapotranspiration at the mesoscale. The National Committee strongly promotes GCTE projects, especially "Global Change Impacts on Terrestrial Ecosystems in Monsoon Asia" (TEMA), lead by Prof. Tadaki Hirose, of the Biological Institute of Tohoku University in Sendai.

The group on climate modelling and atmospheric chemistry reported on model developments, particularly the effects of hydrological processes at the continental surface on the general atmospheric circulation, and the modelling of forest dynamics. Monitoring of environmental change addressed the calibration of data from the satellite Himawari. Among the PAGES projects are cooperative studies on deep sea sediments and the studies in Monsoon Asia and West Pacific.

The sub-committee on PAGES in Japan met in June. Reports were given by Prof. Y. Ono on the reconstruction of palaeo-environment of East Asia during the last glacial period; by Prof. K. Endo on the palaeo-environment of Taklimakan Desert; by Prof. K. Urushibara-Yoshino on the palaeo-environment of Java, Indone-

News from the Nations

The work of National IGBP Committees is presented in every issue of the Global Change Newsletter: a particularly comprehensive set of reports is given here. Several National Committees have recently strengthened their membership with scientists actively involved in IGBP research, and have increased their contacts with the IGBP Core Projects. These developments are most welcome.

Botswana

As a follow-up to the regional IGBP workshop in Niamey on "Africa and Global Change", an IGBP Committee for Botswana was formed in May 1993. The National Institute of Development Research and Documentation hosts the committee at the University of Botswana. It is constituted by an executive committee with nine members, and a reference committee drawn from various sectors in the country that can contribute to global change research. A plan of action is in preparation, which includes: initiating global change research, identifying ways of disseminating information, and lobbying policy makers in the country regarding global change issues.

One of the immediate tasks of the committee is to support the establishment of the regional research project "Kalahari Ecosystem Functioning and Human Impact" (KEFHI), based at the University of Botswana. The KEFHI project, designed in line with GCTE objectives, is planned to cover five countries in Southern Africa.

The Committee is also involved in the Desertification Pilot Study carried out in Botswana, in preparation for the UN Desertification Convention.

Ansu Data, Chair, IGBP Botswana

Brazil

The Brazilian Committee met on 16 July to discuss its structure and programme. The Committee is now composed of 19 members, of which six are newcomers, specifically invited in order to ensure better coverage of all the subjects dealt with by the IGBP Core Projects. The Committee Board includes the Brazilian Minister for Science and Technology, Prof. José Israel Vargas, and the Deputy Minister for Science and Technology, Prof. Luiz Beviláqua, is also a Committee member.

The Committee has organized a data bank at the Brazilian Academy of Sciences: this contains information on global change activities carried out in Brazil, for the benefit of researchers and for the preparation of the Committee's annual report.

*Haroldo Mattos de Lemos,
Executive Secretary, IGBP Brazil*

Canada

The Canadian IGBP Committee has recently directed its attention to two IGBP initiatives: Biospheric Aspects of the Hydrological Cycle (BAHC) and Land-Ocean Interactions in the Coastal Zone (LOICZ).

A small *ad hoc* BAHC committee, chaired by Brad Bass of the Canadian Cli-

mate Centre, met for the first time in May to formulate BAHC-Canada goals, to discuss links with other related research activities in Canada (such as GEWEX), and to begin planning a workshop to be held within the coming year - to define more specifically the objectives of a BAHC-Canada programme. The committee has proposed that the Canadian BAHC initiative pursue two major goals:

1. To understand better how plant communities, together with the topographic structure of the land surface, interact with the hydrologic cycle at northern latitudes in order to: a) develop improved land-surface parameterizations for the third-generation Canadian Climate Centre GCM; and b) improve operational hydrology models
2. To develop a set of algorithms, models and techniques (the weather generator) for the production of high-resolution climate information as required for ecological and hydrological research.

The first meeting of a small *ad hoc* committee to begin planning a Canadian contribution to LOICZ was held in early June. The Canadian programme will focus on northern and arctic regions. Under the chairmanship of Grant Ingram of McGill University, the *ad-hoc* group identified potential members for the Canadian National LOICZ Committee that has now been created, established terms of reference, and began planning a workshop, to be held in April 1994, to bring together Cana-

sia; and by Prof. M. Yoshimura on the reconstruction of dry/wet conditions in the second half of the Edo era using the historical weather data base.

Studies on the human dimensions of global environmental change include projects on the global effects of agriculture and forestry, and the emission and absorption of greenhouse gases by food production. An new and active sub-committee related to the HDP and addressing land use/cover change is chaired by Prof. Teitaro Kitamura, Faculty of Agriculture, Kyoto University.

*Masatoshi Yoshino,
Chair, IGBP Japan*

Netherlands

The Netherlands National Committee will hold a national BAHC planning symposium on 10 November, as part of a suite of Core Project symposia. GCTE and PAGES were reported on in the June Newsletter. A national sub-committee for a Dutch contribution to the LOICZ project has now been established, as a result of the publication of the LOICZ Science Plan.

*Hans van Emden, Secretary,
IGBP Netherlands*

New Zealand

We are at present reorganising our Committee membership, and are hoping that some of the scientists actively involved in studies adopted by IGBP Core Projects (notably GCTE) will become members, thereby improving our contacts both within the New Zealand scientific community and internationally.

We are also trying to develop co-operation with Australia in a START initiative for the Southwest Pacific, and at the same time to support the development of the International Centre for Antarctic Information and Research. Both of these activities mean that we need the support of our Ministry of Foreign Affairs and Trade – and we are working on this!

*Jane Soons, Convener,
IGBP New Zealand*

Norway

At our last national meeting, the major topic of discussion was the funding of Norwegian IGBP activities. The Committee has minimal influence on the allocation of research funds, and thereby lacks a major incentive for researchers to familiarise themselves with the IGBP, as well as to direct their work towards IGBP objectives. Various mechanisms to gain influence on funding authorities have been considered.

We plan to initiate cooperation with the Steering Committee of the National Climate and Ozone Research Programme at the Research Council of Norway. The Norwegian National Committee has stated very clearly that proposals for IGBP-related projects should be judged on their quality, like any other project which is granted money by the Research Council. However, we have asked that whenever project applications are otherwise equal, an expressed orientation towards the objectives of IGBP Core Projects should be most beneficial.

In order to inform our researchers about IGBP objectives, and to improve coordination of national research activities, we have arranged national seminars on IGBP Core Projects. The next seminar, scheduled for early 1994, will focus on Land Ocean Interactions in the Coastal Zone (LOICZ). An overview of the Norwegian IGBP activities is ongoing, and a report is planned for publication later this year.

Our research council system is undergoing comprehensive organisation and structural changes, the main result being that our five councils will merge into one: the Research Council of Norway. The National IGBP Secretariat and general administration will be at the Division of Environment and Development (see list p. 17).

*Gørill Kristiansen,
Secretary, IGBP Norway*

Philippines

The National IGBP Committee became operational in July 1992 upon the recommendation of the National Research Council of the Philippines and the National Academy of Science and Technology. It was approved by the Department of Sciences and Technology, who provided initial funding for its support.

The Committee serves as the coordinating body and feedback mechanism of the IGBP to national researchers working within IGBP Core Projects and other implementation activities.

To date, the Committee has mapped out the responsibilities, plans and course of action in relation to the establishment of an IGBP Philippines Research Network. An inventory of the institutions, scientists and research on global change is being undertaken.

The National Committee has been active in introducing itself in the local scientific community through participation in several meetings: Response to the Earth Summit – implementing the Philippine Agenda 21 for Sustainable Development (Sept 1992); Symposium on coping with national disasters (Oct 1992); and involv-

ing national global change scientists in the 3rd meeting of the Southeast Asian Regional Committee for START.

*Filomena Campos,
Chair, IGBP Philippines*

Slovakia

After the division of the Czechoslovak Federal Republic on 1 January 1993 into the Czech and Slovak Republics, the Czechoslovak National IGBP Committee divided into two separate national ones. We are pleased to inform you about the new committee for Slovakia, and ask you to note the new address (p. 18).

IGBP-related activities in Slovakia include the following:

- The project "Changes of the hydrological regime of rivers and of the soil moisture regime influenced by global changes in the atmosphere, and by anthropogenic activity in catchments". This study will assess the impact of climate change upon the hydrological regime of the upper Váh river catchment and upon the soil water regime of the Zitny Ostrov lowland region, and has been approved for funding by the Slovak Academy of Sciences.

- A Commission for the Environment was established at the Presidium of the Slovak Academy of Sciences, and within it a Sub-commission for global change.

- A system for the collection, transfer and processing of environmental data for Slovakia has been established, to monitor global change impact.

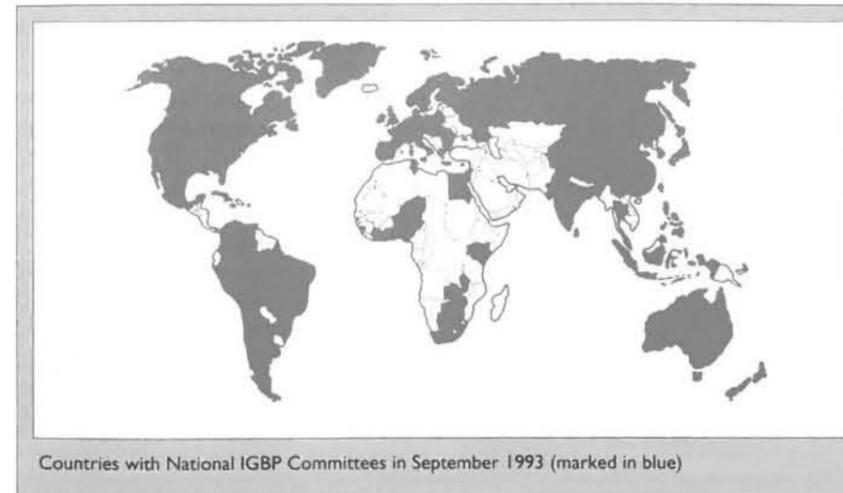
- The Academy has established a national committee for the International Climate Programme of the WMO that will work in close co-operation with the Slovak National IGBP Committee. Its main objective is to implement the UN convention on reducing greenhouse gas emissions and to encourage research on climate change impacts on the social and economic sectors of the country.

Július Šátor, Chair, IGBP Slovakia

South Africa

The South African National IGBP Committee established the goal: "Understanding global environmental change in order to devise effective strategies for assessing and managing its impact on the natural resources of Southern Africa, its people and their welfare" at its meeting on 8 June 1993. A regional IGBP symposium is planned for the second half of 1994 and a Task Group has been appointed to plan this event.

The Committee reviewed the draft white paper on the government's proposed policy on global environmental change. It



Countries with National IGBP Committees in September 1993 (marked in blue)

considered the document to be very good, and sent detailed comments on several points to the Department of Environmental Affairs.

A draft document "Climate change scenarios for Southern Africa: 1993", compiled by Prof. R. E. Schulze and Dr. R. P. Kunz of the University of Natal, in response to the white paper, was circulated for comment, and endorsed by the Committee.

The Steering Committee of the Southern African Fire-Atmosphere Research Initiative (SAFARI), a component of the IGAC activity on biomass burning, will serve as a task group under the South African IGBP Committee, and a further experiment has been proposed for May 1994.

Several South African scientists will attend the first START meeting for southern, central and eastern Africa, to be held at Lilongwe in January 1994.

Louise Botten, IGBP South Africa

Thailand

The functions of the Thai National Committee, under the auspices of the National Research Council of Thailand, are to coordinate existing IGBP-related research projects, and to initiate and prepare new national studies.

A survey of planned, ongoing or completed IGBP-related research found that more than 13 institutes and 39 Thai scientific teams are involved in various aspects of the IGBP Core Projects. As a follow-up we organized our second workshop on the role of Thailand in the study of global change on 2-3 July 1993. Participants discussed international collaborative research under the objectives of the Global Change System for Analysis, Research and Training (START) developed by the Southeast Asian Regional Committee (SARC). They

presented progress reports of their activities, according to the defined regional global change research priorities: (1) to improve estimates of greenhouse gas fluxes, especially in relation to changes in land-use and land-cover; (2) to integrate natural and social science assessments of the impacts of sea-level rise on terrestrial and marine resources in the coastal zone; (3) to develop regional databases for use in global warming studies; and (4) to establish a Regional Research Network for global change research, and lay the foundation for the creation of a Regional Research Centre.

The working group on greenhouse gas emissions in relation to land-use changes reported on methane studies being conducted on wetland, urban and industrial areas. Methane flux from paddy fields is estimated by the closed chamber method, under different soil types, rice cultivars, and fertilization regimes. Emissions from animal husbandry and organic waste burning have been estimated according to IPCC and OECD guidelines.

Estimates of CO₂ emission and sequestration in tropical forests, and CO₂ emission from fossil fuel consumption by transport, have been conducted by the Thai Environment Institute.

The working group on LOICZ noted the lack of data to assess the impact of sea-level rise, and identified the need for more information—with proper methodology and trained personnel in physical oceanography, terrestrial ecology and social economy. Additional research is required to improve information on tidal predictions, coastal morphological processes (erosion, deposition and subsidence) and meteorological events.

The participants unanimously recognized the importance of developing regional databases, and other START activities for fruitful collaboration in the region,

and expressed their willingness to support these initiatives.

*Twesukdi Piyakarnchana,
Chair, IGBP Thailand*

Togo

The most recent meeting of the Togolese Committee for Global Change discussed research results and new research projects to be financed. The following activities have been carried out by its five subcommittees:

1. The sub-committee on Atmospheric Sciences has published research reports on rainfall trends in Togo; the El-Niño phenomenon on the Togolese coastal zone; observations on August-September abnormal rainfalls in Lomé; the role of Togo in global change; and the rainfall regime of the Ghana, Togo, Bénin and Nigerian coastal zone. The sub-committee initiated a new project to study the biospheric environment in Togo. Contact: Dr. Kodjovi Edjame, Dept of Physics, Faculty of Sciences, Univ of Bénin, Lomé.

2. The sub-committee on the Hydrosphere undertook various studies in Togo, Ghana, Bénin and Nigeria in the framework of a coastal erosion project, and initiated a research project to control and monitor land-ocean exchanges. Contact: Dr. Adoté Bliivi, Dept of Geography, Faculty of Letters and the Humanities, Univ of Bénin, Lomé.

3. The sub-committee on Human Dimensions of Global Change presented its research findings on "Threats of livestock and human carrying capacity", a component of the coastal erosion project in Togo. It designed a research project on production and farm management decisions of rural households as a result of general atmospheric warming. Contact: Ayechoro Akibode, Dept of Geography, Faculty of Letters and the Humanities, Univ of Bénin, Lomé.

4. The sub-committee on Biosphere Evolution has planned two projects: The natural transformation of the savanna into humid tropical forest zone in south-west Togo, and a study of the biodiversity of flora and the control of national grazing lands. Contact: Dr. Koffi Akpagana, Dept of Botany, Faculty of Sciences, Univ of Bénin, Lomé.

5. The sub-committee on Palaeo-ecosystems has prepared a project on human impacts on vegetation, as part of the recent history of the Togo forest and savanna. Contact: Thérèse Edoth, Dept of Botany, Faculty of Sciences, Univ of Bénin, Lomé.

A. K. Akibode, Secretary, IGBP Togo

Tunisia

The newly-created IGBP National Committee in Tunisia, born in 1993, comprises a multidisciplinary group belonging to different national institutions dealing with specific aspects of global change. The position of Tunisia as both an African and a Mediterranean country provides it with special opportunities to contribute to the IGBP Core Projects, and to the START network. The address of the Chair is given in the list of National IGBP committees (p. 18).

Mohamed Brini, IGBP Tunisia

USA

The National Research Council's Board on Global Change, which serves as the US National Committee for the IGBP, will hold a major workshop from 8-10 November 1993. The workshop will review the planning and implementation of the US Global Change Research Program, with special attention on improving its relevance and links to environmental and development policy issues. A preparatory meeting for the workshop was held in Woods Hole, Massachusetts, 30 August - 1 September.

Meanwhile, a number of NRC units are conducting studies closely related to IGBP Core Projects. For example, the Committee on Atmospheric Chemistry of the Board on Atmospheric Sciences and Climate has just published a report, "Understanding and Predicting Atmospheric Chemical Change: An Imperative for the U.S. Global Change Research Program." The report strongly supports participation in IGAC. Two other reports of the Board, dealing with terrestrial ecosystems and solar influences are approaching publication.

John Perry,
Executive Secretary, IGBP USA

Contact Information for National Committees

with year of establishment; current total, 66

Chairs and Secretaries

Argentina (1990)

Chair Dr. Mario N. Nuñez, Departamento de Meteorología, Universidad de Buenos Aires, Pabellón 2 - Ciudad Universitaria, Buenos Aires 1428. Tel: (+54-1) 782 65 28; Telex: 18694 ibuba ar; Fax: (+54-1) 311 05 16; E-mail: rtnunez@criba.edu.ar

Co-Chair Dr. Osvaldo E. Sala, Departamento de Ecología, Universidad de Buenos Aires, Facultad de Agronomía, Av. San Martín 4453, Buenos Aires 1417. Tel: (+54-1) 52 09 03 or 51 15 89; Fax: (+54-1) 334 89 64; E-mail: sala@criba.edu.ar

Australia (1986)

Prof. Bruce G. Thom, Department of Geography, Institute Building HO 3, University of Sydney, Sydney, New South Wales. Tel: (+61-2) 692 2886; Fax: (+61-2) 692 3644; E-mail: thom@estro.ucc.su.oz.au

Austria (1990)

Prof. Siegfried J. Bauer, Institut für Meteorologie und Geophysik, Universität Graz, Halbhäthgasse 1, A-8010 Graz. Tel: (+43-316) 380 52 56/55/61; Telex: 31662 ubgraza; Fax: (+43-316) 384 091.

Bangladesh (1988)

Dr. S. D. Chaudhuri, Bangladesh Academy of Sciences, 3/8 Asad Avenue, Muhammadpur, Dhaka 1207. Tel: (+880-2) 31 04 25/60 68 68; Telex: 64 22144 srsbj; Fax: (+880-2) 310 237.

Belgium (1988)

Dr. Oscar Vanderborcht, Royal Belgian Academies of Sciences, Palais des Académies, 1, rue Ducale, B-1000 Bruxelles. Tel: (+32-2) 511 2629; Fax: (+32-2) 511 0143, or at the University of Antwerp, Department of Biology, Fax: (+32-3) 328 0497.

Bénin (1992)

Prof. K. S. Adam, Laboratoire de Cartographie Géographique, Université Nationale du Bénin, B.P. 7060, Cotonou. Tel: (+229) 33 19 17; 30 14 05. Tlx: 5010 unb ctnou. Fax: (+229) 33 19 81
Secretary Dr. Séverin Assé, Directeur de l'Aménagement du Territoire, Ministère de l'Environnement, de l'Habitat et de l'Urbanisme, Cotonou.

Bolivia (1988)

Dr. Jaime Argollo, Facultad de Ciencias Geológicas, Universidad Mayor de San Andrés, Casilla de Correo 355, La Paz. Tel: (+591-2) 37 44 64; Telex: 3438 umsa bu; 3514 orstom bu, Telefax: (+591-2) 35 94 91.

Botswana (1993)

Prof. Ansu Datta, National Institute of Development, Research and Documentation, University of Botswana, Private Bag 0022, Gaborone. Tel: (+267) 356 364/5; Telex: 2429 bo; Fax: (+267) 357 573

Secretary Dr. Pauline Opha Dube, Department of Environmental Sciences, University of Botswana, Private Bag 0022, Gaborone. Tel: (+267) 351 151, 352 510; Telex: 2429 bo; Fax: (+267) 356 591.

Brazil (1988)

Prof. A. Azevedo Pacheco Leão, Academia Brasileira de Ciências, Cx. Postal 229, Rua Alfilófilo de Carvalho 29, 3º, Rio de Janeiro 20.001-970. Tel: (+55-21) 220 4794; Telex: 2123087 daac br; Fax: (+55-21) 240 4695.

Secretary Dr. Haroldo Mattos de Lemos, Rua Paulo Pereira da Câmara, no. 30, 22.631-090 Barra da Tijuca, Rio de Janeiro, RJ. Tel: (+55-21) 493 5336; Fax: (+55-21) 493 8995.

Bulgaria (1990)

Prof. Nadezda Petrova, Bulgarian Academy of Science, I "7 Noemvri" St., Sofia. Tel: (+359-2) 87 77 31; Telex: 22424 ban sf bg.

Canada (1988)

Dr. John W. B. Stewart, Dean, College of Agriculture, University of Saskatchewan, Saskatoon, Saskatchewan S7N 0W0. Tel: (+1-306) 966 4055; Fax: (+1-306) 966 8894.
Secretariat Canadian Global Change Programme, The Royal Society of Canada, P. O. Box 9734, Ottawa, Ontario K1G 5J4. Fax: (+1-613) 991 6996

Chile (1987)

Prof. Humberto A. Fuenzalida, Departamento de Geofísica, Universidad de Chile, Casilla 2777, Santiago de Chile. Tel:

(+56-2) 696 87 90; Telex: 243302 ingen cl; Fax: (+56-2) 71 27 99.

China (CAST) (1988)

Prof. Duzheng Ye, Chinese Academy of Sciences, 52, Sanlihe Road, Beijing. Telex: 22474 aschi cn; Fax: (+86-1) 851 1095.
Secretary General Prof. Panqin Chen, Chinese Academy of Sciences, Bureau of Resources & Environment, 52 Sanlihe Road, Beijing. Tel: (+86-1) 859 7531; Telex: 22474 aschi cn; Fax: (+86-1) 851 1095. E-mail: chenpq@bepc2@slacvx.bitnet

China (Academy of Sciences, Taipei) (1988)

Prof. Chen-Tung A. Chen, National Sun Yat-Sen University, Kaoshiung, Taiwan 80424. Tel: (+886-7) 532 1408; Fax: (+886-7) 521 4623; 561 4455.

Secretary Dr. Typhoon Lee, Institute of Earth Sciences, Academia Sinica, PO Box 23-59, Taipei, Taiwan 115. Tel: (+886-2) 363 0214, x 364; Fax: (+886-2) 362 9563

Colombia (1987)

Dr. José A. Lozano, Academia Colombiana de Ciencias Exactas, Físicas y Naturales, Carrera 3a, No. 17-34 pº 3, Apartado 44.763 Santafé de Bogotá. Tel: (+57-1) 341 48 05; Fax: (+57-1) 283 85 52.

Côte d'Ivoire (1992)

Dr. Annabelle Amoin Konan, Centre de Recherches Océanologiques, Laboratoire d'Ecologie Benthique, 29, rue des pêcheurs BP V 18 Abidjan. Tel: (+225) 35 50 14; Fax: (+225) 24 65 04.



Representatives of IGBP China (CAST) attending SAC III at Ensenada in January 1993.
From left to right: Zhang Lansheng, Fu Congbin, Ye Duzheng (Chair), Lin Hai, Zhang Xinshi, and Chen Panquin (Secretary General)

Cuba (1989)

Prof. Carlos Gómez Gutiérrez, Academia de Ciencias de la República de Cuba, Capitolio Nacional, Industria y San José, La Habana. Tel: (+53-7) 68914; Telex: 51 1290 acdcp cu.

Czech Republic (1993; formerly Czechoslovakia, 1987)

Dr. I. Nemešová, Institute of Physics of the Atmosphere CSAV, Bocni II, Box 1401, CS-141 31 Praha 4. Tel: (+42-2) 76 25 48; Telex: 121546 inop e; Fax: (+42-2) 76 15 49.
Secretary Dr. Jan Laštovička, Geophysical Institute, Bocni II, 141-31 Prague 4. Tel: (+42-2) 762 548; Fax: (+42-2) 762 528; E-mail: jlast@cspgig11 (earn/bitnet)

Denmark (1990)

Dr. Claus Hammer, Geofysisk Institut, Haraldsgade 6, DK-2200 Copenhagen. Tel: (+45) 31 83 85 00; Fax: (+45) 35 82 25 65; E-mail: glac@osiris.gfy.kk.dk

Egypt (1988)

Prof. Mohamed A. Ayyad, Faculty of Science, University of Alexandria, Alexandria. Telex 54467 univ un; Fax: (+20-3) 496 0720, 422 7805

Executive Prof. Mohamed El-Raey, Vice Dean of the Institute of Graduate Studies, University of Alexandria, Alexandria. Tel: (+20-3) 421 5792; Fax: (+20-3) 421 5793

Estonia (1993)

Dr. Rein Vaikmäe, Institute of Geology, Estonian Academy of Sciences, Estonia pst. 7, Tallinn EE-0105, Estonia. Tel: (+372-2) 454 120; Fax: (+372-6) 312 074

Finland (1989)

Dr. Per-Edvin Persson, Director, Heureka, The Finnish Science Centre, PO Box 166, SF-01301 Vantaa. Tel: (+358-0) 85 799; Fax: (+358-0) 873 4142.

Secretary Marku Kanninen, The Finnish Research Programme on Climate Change, Academy of Finland, P O Box 57, SF-00551, Helsinki. Tel: (+358-0) 775 8336; Fax: (+358-0) 775 8299; E-mail: silmu@aka.fi

France (1988)

Dr. Jean-Claude Duplessy, CNRS Centre des Faibles Radioactivités, Av. de la Terrasse, F-91190 Gif-sur-Yvette. Tel: (+33-1) 69 82 35 86; Telex: 214627 f; Fax: (+33-1) 69 82 35 68; E-mail: CFR.GIF (Omnet)

Executive Director Jean Labrousse, Dept Earth, Oceans, Space and Environment, Ministry of Higher Education and Research, 1 rue Descartes, 75005 Paris. Tel: (+33-1) 46 34 38 79; Fax: (+33-1) 46 34 37 06

Germany (BRD - 1987; DDR - 1988)

Prof. Hans-Jürgen Bolle, Institut für Meteorologie, Freie Universität Berlin, Carl-Heinrich-Becker-Weg 6-10, D-12165 Berlin 41. Tel: (+49-30) 838 711 59, 838 711 17; Telex: (41) 17 308740 fusat; Fax: (+49-30) 838 711 60; E-mail: H.Bolle.IGBP (Omnet).

Executive Secretary Dr. Sabine Lütkemeier, IGBP-Sekretariat, Institut für Meteorologie, Freie Universität Berlin, Carl-Heinrich-Becker-Weg 6-10, D-12165 Berlin 41. Tel: (+49-30) 838 711 17; Fax: (+49-30) 838 71217; E-mail: H.Bolle.IGBP (Omnet)

Ghana (1993) (ICSU Committee)

Dr. E. N. W. Oppong, Ghana Academy of Arts and Sciences, off Agostino Neto Road, Airport Residential Area, P.O. Box M.32, Accra. Tel: (+233-21) 77 7651 (to 4); Fax: (233-21) 77 7655; Telex: 071289
Secretary Prof. K. Gyekye, F.G.A. (at above address)

Greece (1988)

Prof. John Xanthakis, Research Center for Astronomy and Applied Mathematics, Academy of Athens, 14, Anagnostopoulou Street, GR-10673 Athens. Tel: (+30-1) 361 35 89.

Hungary (1987)

Prof. Joseph Tigyi, Biophysical Institute of the Medical University, PO Box 99, H-7643 Pécs. Tel: (+36-72) 140 17; Telex: 12500 pote h; Fax: (+36-72) 262 44.

Secretary Prof. Attila Borhidi, Faculty of Human and Natural Sciences, Janus Pannonius University, Kulich Gy. u. 22, H-7601 Pécs. Tel: (+36-72) 12 988; Fax: (+36-72) 26 886.

India (1988)

Dr. A. P. Mitra, National Physical Laboratory, Hillside Road, New Delhi 110 012. Tel: (+91-11) 683 5480; Telex: 31-77384; Fax: (+91-11) 575 2678.

Secretary Dr. S. C. Majumdar, Secretary, National Committee for the IGBP, Council Scientific & Industrial Research, C.S.I.R. Complex, N.P.L. Campus Pusa 990092, New Delhi.



Some of the members of the Italian IGBP Committee at JRC Ispra in July.

From left to right: Angelo Guerrini (Chair), Gennaro Ferrara, Roberto Frassetto, Vincenzo Damiani

Indonesia (1992)

Prof. Dr. Harsono Wiryosumarto, Chairman, Agency of National Aeronautic and Aerospace LAPAN, Jl. Permuda Persil No 1, PO Box 20/JAT, Jakarta 13220. Tel: (+62-21) 489 2802; 489 4941; Fax: (+62-21) 489 4815.

Ireland (1988)

Prof. R. P. Kernan, Science Secretary, Royal Irish Academy, 19 Dawson Street, Dublin 2. Tel: (+353-91) 244 11; Fax: (+353-91) 241 76.

Israel (1988)

Prof. Dan H. Yaalon, Institute of Earth Sciences, Hebrew University of Jerusalem, Givat Ram Campus, Jerusalem 91904. Tel: (+972-2) 58 42 48/58 46 86; Telex: 25391 hu il; Fax: (+972-2) 662 581, 666 804.

Italy (1990)

Dr. Angelo Guerrini, President, National Committee for Science and Technology of the Environment, National Council for Research, Piazzale Aldo Moro, 7, I-00185 Roma. Tel: (+39-6) 49 93 33 49; Telex: 610076 cnr rm it; Fax: (+39-6) 446 98 33.

Jamaica (1988)

Dr. Gladstone V. Taylor, Scientific Research Council, PO Box 350, Kingston. Tel: (+1-809) 927 1771/4 or 927 1912; Telex: 3631 srctstin ja; Fax: (+1-809) 927 5437.

Japan (1987)

Prof. Masatoshi Yoshino, 15-18 Nakaarakawaoki-machi, Tsuchiura-City, 300-11. Tel and Fax: (+81-298) 41 3309.

Kenya (1990)

Prof. Shem O. Wandiga, Deputy Vice Chancellor (A&F), University of Nairobi, PO Box 30197, Nairobi. Tel: (+254-2) 33 42 44; Telex: 22095 varsity ke; Fax: (+254-2) 33 68 85.
Secretary Prof. W. Ogan, Honorary Secretary, Kenya National Academy of Sciences, PO Box 39450, Kenya. Tel: (+254-2) 721 138/721 345.

Korea, Republic of (1993)

Dr. E-Hyock Kwon, ICSU Committee, National Academy of Sciences of the Republic of Korea, San 94, Panpog-dong, Seocho-gu, Seoul 137-042. Tel: (+82-2) 534 0737; Fax: (+82-2) 537 3183.

Malaysia (1992)

Mr. V. Danabalan, Secretary General, Ministry of Science, Technology and the Environment, 14th Floor, Sime Darby Building, Jalan Raja Laut, 50662 Kuala Lumpur. Tel: (+60-3) 293 8917; Fax: (+60-3) 293 6006; Cable: KEMSAINS.

Mexico (1991)

Dr. Mario Martínez García, Director General, CICESE, Av. Espinoza No. 843, Ensenada, Baja California. Tel: (+52-667) 44 501 to 44 506; Fax: (+52-667) 4 48 80; E-mail: mmartinez@cicese.mx (Internet)

Mongolia (1993)

Dr. T. S. Shirevdamba, First Deputy Minister, Ministry for Nature and the Environment, Khuldalaany Gudaing 5, Ulaan Baatar 11. Fax: (+976-1) 32 401; Telex: 79343.

Netherlands (1987)

Prof. Henk Postma, Dutch MAB/SCOPE/IGBP Committee, K.N.A.W., Kloveniersburgwal 29, NL-1011 JV Amsterdam. Tel: (+31-20) 622 29 02; Fax: (+31-20) 620 49 41; E-mail: noiz.Texel.Bitnet

Secretary Dr. Hans van Emden, KNAW, Royal Netherlands Academy of Sciences, PO Box 19121, NL-1000 GC Amsterdam. Tel: (+31-20) 551 07 32; Fax: (+31-20) 620 49 41.

New Zealand (1988)

Prof. Jane Soons, Royal Society of New Zealand, PO Box 598, Wellington. Tel: (+64-4) 72 74 21, Cable: Royal Soc.; Fax: (+64-4) 73 18 41, (+64-3) 364 2907; E-mail: geog188 csc.canterbury.oc.nz

Secretary Mrs Sue Usher, Assistant Executive Officer, The Royal Society of New Zealand, PO Box 598, Wellington. Tel: (+64-4) 473 1841; Fax: (+64-4) 472 7421.

Niger (1991)

Dr. Mohamed Boulama, Direction de la Météorologie Nationale, BP 218, Niamey. Tel: (+227) 73 21 60; Telex: 5527; Fax: (+227) 73 38 37.

Nigeria (1992)

Prof. A. U. Ogan, The Nigerian Academy of Science, P. M. B. 1004, University of Lagos Post Office, University of Lagos, Akoka-Yaba.

Norway (1989)

Prof. Ivar S. A. Isaksen, Institute of Geophysics, University of Oslo, PO Box 1022 Blindern, N-0315 Oslo 3. Tel: (+47-2) 85 58 22; Fax: (+47-2) 85 52 69.

Secretary Gerill Kristiansen, The Research Council of Norway, Division of Environment and Development, PO Box 2700, St. Hanshaugen, 0131 Oslo. Tel: (+47-22) 03 70 00; Fax: (+47-22) 03 70 01.

Peru (1989)

Dr. Alberto A. Giesecke M., Centro Regional de Sismología, Apartado 14-0363, Lima. Tel: (+51-14) 33 67 50; Telex: 20053 pe pb limt; Fax: (+51-14) 33 67 50, 33 89 34.

Philippines (1992)

Dr. Filomena F. Campos, National Research Council of the Philippines, General Santos Avenue, Bicutan, Taguig, 1604 Metro Manila. Tel: (+63-2) 822 0409; 822 0962/67; Fax: (+63-2) 823 8937.

Poland (1989)

Academician Prof. Leszek Starkel, Polish Academy of Sciences, Institute of Geography, Ul. Sw. Jana 22, PL-31-018 Kraków. Tel: (+48-22) 22 40 85; Telex: 825414 olpan pl; Fax: (+48-22) 26 72 67.

Portugal (1993) (ICSU Committee)

Dr. F. R. Dias Agudo, Academia das Ciências de Lisboa, rua Academia das Ciências, 19, P-1200 Lisboa.

Romania (1991)

Prof. Liviu Constantinescu, Romanian Academy of Sciences, Department of Geonomical Sciences, Calea Victoriei 125, 71 102 Bucarest 22. Tel: (+40-0) 50 76 80, ext. 175; Telex: 11470 acad r; Fax: (+40-0) 50 47 94.

Russia (formerly USSR Committee, 1988)

Prof. Vladimir M. Kotlyakov, Institute of Geography, Russian Academy of Sciences, Staromonety per. 29, Moscow 109017. Tel: (+7-095) 238 8610, Tlx: (64) 411781 globe, Telefax: (+7-095) 230 2090.

Secretary Dr. Yuri A. Starikov, Deputy Director, International Scientific Environmental Center, Russian Academy of Sciences, Ulianovskaya 51, 109 004 Moscow. Tel: (+7-095) 237 8062, 954 5243, Telex: 411964 ans su, Fax: (+7-095) 137 3622.

Sierra Leone (1993)

Dr. N. H. Ayodele Cole, Fourah Bay College, University of Sierra Leone, Freetown. Tel: (+232-22) 23 26 48; Fax: (+232-22) 22 49 04.

Slovakia (1993; formerly Czechoslovakia, 1987)

Dr. Július Šutor, Institute of Hydrology, Slovak Academy of Sciences, Trnavská 32, CS-826 51 Bratislava. Tel: (+42-7) 684 97, Fax: (+42-7) 624 19.

Secretary Ing. Lubomir Lichner (at above address)

South Africa (1987)

Dr. P. van Eldik, Foundation for Research Development, P O Box 2600, Pretoria. Tel: (+27-12) 841 2426; Fax: (+27-12) 804 2679.

Secretary Dr. D. Walmsley (at above address)

Spain (1993)

Dr. José Manuel Moreno, Secretaria General del Plan Nacional de I+D, Comisión Interministerial de Ciencia y Tecnología, Rosario Pino, 14-16, E-18020 Madrid. Tel: (+34-1) 572 0098, Telex: 49692 cicyt e, Fax: (+34-1) 571 8998.

Secretary Dr. Julio Montes (at above address)

Sri Lanka (1990)

Dr. K. D. Amarantunga, Central Environmental Authority, PO Box 2205, Parisara Mawatha, Maligawate New Town, Colombo 10. Tel: (+94-1) 54 67 50; Fax: (+94-1) 54 67 49.

Sweden (1987)

Prof. Nils Malmer, Department of Plant Ecology, Östravallgatan 14, University of Lund, 223 61 Lund. Tel: (+46-46) 10 92 99, 10 92 95; Telex: 33533 luniv s; Fax: (+46-46) 10 44 23.

Secretary Ms. Irène Johansson, Swedish Natural Science Research Council, Box 6711, S-113 85 Stockholm, Sweden.

Switzerland (1987)

Prof. Hans R. Thierstein, Geologisches Institut, ETH-Zentrum, CH-8092 Zürich. Tel: (+41-1) 256 36 66; Telex: 817379 ehg ch, Fax: (+41-1) 252 70 08.

Secretariat Ms. Anne-Christine Clottu Vogel, Swiss Academy of Sciences, Bärenplatz 2, CH-3011 Berne. Tel: (+41-31) 21 21 14, Fax: (+41-31) 21 32 91.

Thailand (1989)

Dr. Twesukdi Piyakanchana, Department of Marine Science, Faculty of Sciences, Chulalongkorn University, Bangkok 10330. Tel: (+66-2) 251 6968, 251 1951; Telex: 20217 unichul; Fax: (+66-2) 252 5929.

Togo (1992)

Prof. Komlavi Seddoh, Vice-Chancellor of the University of Bénin, B P 1515 Lomé. Tel: (+228) 21 35 00; Telex: 5258 ub tg, Fax: (+228) 21 85 95; 21 87 84.

Secretary Dr. Ayéchoro Koffi Akibode, Ecole Supérieure d'Agronomie, University of Benin, B.P. 999, Lomé. Tel: (+228) 26 48 95, Fax: (+228) 21 85 95; 21 87 84.

Tunisia (1993)

Prof. Mohamed Brini, Directeur du Département de Mathématiques, Physique et Chimie, Institut National Agronomique de Tunis, 43, Avenue Charles Nicolle, 1082 Tunis Mahrajène. Tel: (+216-1) 780 950, Fax: (+216-1) 799 391.

Uganda (1990)

Dr. S.P. Kagoda, Commissioner for Technology, Ministry of Industry and Technology, PO Box 7125, Kampala. Secretary Dr. W. A. Majugu, Eastern & Southern African Drought Monitoring Centre, PO Box 3025, Nairobi, Kenya. Tel: (+254-2) 567 888.

United Kingdom (1987)

Dr. Bernard Tinker, GCTE Associate Project Office, Department of Plant Sciences, University of Oxford, South Parks Road, Oxford OX1 3RB. Tel: (+44 865) 275 079; Fax: (+44 865) 275 060.

Secretary Mr. Len Mole, The Royal Society, 6 Carlton House Terrace, London, SW1Y 5AG. Tel: (+44-71) 839 5561, Telex 917876, Fax: (+44-71) 930 2179.

United States (1987)

Dr. Ralph J. Cicerone, Geosciences Department, 220 Physical Sciences Building, University of California, Irvine, CA 92717. Tel: (+1-714) 725 2157; Fax: (+1-714) 725 2261; E-mail: R.Cicerone (Omnet).

Secretary Dr. John S. Perry, Staff Director, Atmospheric Sciences & Climate, National Research Council, 2101 Constitution Avenue, NW, Washington, DC 20418. Tel: (+1-202) 334 35 17, Fax: (+1-202) 334 25 30, E-mail: J.Perry (Omnet)

Venezuela (1988)

Prof. Federico Pannier, Academia de Ciencias Físicas, Matemáticas y Naturales, Apartado 1421, Caracas 1010A. Tel: (+58-2) 41 66 11, 483 41 33; Telex: 25205 cmit vc; Fax: (+58-2) 41 66 11.

Zambia (1990)

Interim Convener Prof. Prom C. Jain, Physics Department, University of Zambia, PB 32379, Lusaka. Tel: (+260-1) 293 343/293 809; Telex: 44370 unza lu za; Fax: (+260-1) 253 052, E-mail: Pjain@fl.n761.zs.fidonet.org

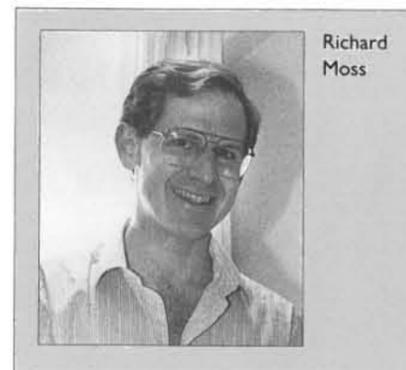
Zimbabwe (1989)

Dr. G. R. Chimonyo, Department of Geography, University of Zimbabwe, PO Box MP 167, Mount Pleasant, Harare. Tel: (+263-4) 30 32 11, ext. 1265; Telex: 26580 univ zw; Fax: (+263-4) 30 32 92.

management, impact assessment and monitoring, with a particular interest in global change impacts on coastal zones and small islands. He has recently carried out consultancy work on these topics for several international organizations, including the United Nations Environment Programme (UNEP), the Intergovernmental Oceanographic Commission (IOC), the World Conservation Union (IUCN), the Food and Agriculture Organization (FAO), and the World Wide Fund for Nature (WWF).

Currently living in the UK, where he obtained his PhD, John has held teaching and research posts at the University of the South Pacific, Fiji; the Universities of Manitoba and Winnipeg, Canada; and the University of Papua New Guinea.

Richard Moss, who joined the IGBP Secretariat in Stockholm in September 1991, returned to the USA this July. He is now with the US Global Change Research Program, at the National Science Foundation, Washington DC, as Head of the Technical Support Unit for the Impact Assessment Working Group of the IPCC.



Richard Moss

As well as supporting that international assessment exercise, his work there includes developing integrated assessments within the US GCRP, and addressing a wide range of global environmental issues that bring together social, economic and policy sciences with the natural sciences.

Richard's background is in political science. As IGBP Programme Officer, he was responsible for promoting collaborations between relevant social science studies and those of the IGBP.

The post was established jointly between the Human Dimensions of Global Environmental Change Programme (HDP) and the IGBP; while in Stockholm, Richard was also Deputy Director and Research Associate for HDP. In addition to his role in developing the HDP research agenda, he put the 'human dimension' into many parts of IGBP, with particularly valuable contributions to the planning of START and the Land Use/Cover Change project.

IGBP Meetings

28 September - 1 October, Greenbelt, MD; Washington DC

Diversity of Biosphere-Hydrosphere Interactions: temporal and spatial variability (BAHC Focus 3), in conjunction with the International Satellite Land Surface Climatology Project (ISLSCP) Scientific Steering Committee Meeting

30 Sept-2 Oct, Panama City, Panama

PAGES Workshop on late quaternary palaeoclimates in the Americas, pole-equator-pole. Vera Markgraf, INSTAAR, University of Colorado, Boulder CO 80309, USA. Tel: (+1-303) 492 5117; Fax: (+1-303) 492 6388

13-15 October, Washington, DC, USA

Annual Meeting of the PAGES Core Project Scientific Steering Committee. Herman Zimmerman, PAGES Core Project Office, Bärenplatz 2, CH-3011 Bern, Switzerland. Tel: (+41-31) 21 31 33; Fax: (+41-31) 21 31 68; E-mail: PAGES@ubeclu.unibe.ch

14-16 October, Pisa, Italy

GCTE Workshop: CO₂ springs and their use in biological research. George Koch, GCTE Focus 1 Officer, Department of Biological Sciences, Stanford University, Stanford, CA 94305, USA. Tel: (+1-415) 723 1179, Fax: (+1-415) 723 9253, E-mail: gwksu@leland.stanford.edu

18-20 October, Pisa, Italy

GCTE State of the Science Symposium: Terrestrial ecosystem response to elevated CO₂. George Koch (see above)

19-21 October, Stockholm, Sweden

Meeting of Officers of the IGBP Scientific Committee

20-22 October, Canberra, Australia

Land use and land cover in Australia: living with global change. Joint Australian Academies' Symposium. Bruce Thom, Chairman, Australian National Committee for the IGBP, Department of Geography, Institute Building HO 3, University of Sydney, Sydney, New South Wales. Tel: (+61-2) 692 2886; Fax: (+61-2) 692 3644; E-mail: thom@astro.ucc.su.oz.au

22-26 October, Aussois, France

Strategies for the use of palaeoclimate data sets in climate model intercomparison and Evaluation (NATO ARW and PAGES). J. Guiot, CNRS, UA 1152, Laboratoire de Botanique Historique et Palynologie, Faculté St. Jérôme, F-13397 Marseilles Cédex 13, France

24 October, Goa, India

1st START Bureau Meeting

25-27 October, Goa, India

7th START Standing Committee Meeting

1-9 November, Santiago, Chile

The Quaternary of Chile, Project IGCP 281, Quaternary Climates of South America. Juan Carlos Aravena, Santiago. Tel: (+56-2) 271 2865, ext. 459; Fax: (+56-2) 271 2983

2-4 November, Lunteren, Netherlands

GCTE Focus 3 Workshop: Wheat model sensitivity analysis experimental programme. John Ingram, GCTE Focus 3 Project Officer, Department of Plant Sciences, University of Oxford, South Parks Road, Oxford, OX1 3RB, UK. Tel: (+44-865) 275 079; Fax: (+44-865) 275 060

8-11 November, Kyoto, Japan

International Symposium on the Sino-Japanese Co-operative Programme on Atmosphere-Land Surface Processes in the Heihe River Basin (HEIFE)/BAHC Focus 2 on Land-Surface Experiments. Yasushi Mitsuta, Disaster Prevention Research Institute, Kyoto University, Gokasho Uji, Kyoto 611, Japan. Tel: (+81) 774 32 3111, ext. 3200; Fax: (+81) 774 33 0026

10-12 November, Sevilla, Spain

European Community ENRICH Workshop

15-18 November, Toledo, Spain

GCTE/IGBP Spain Workshop: Global change and landscape dynamics in Mediterranean systems. Will Steffen, GCTE Core Project Office, CSIRO Division of Wildlife & Ecology, POB 84, Lyncham, ACT 2602, Australia. Tel: (+61-6) 242 1755, Fax: (+61-6) 241 2362, E-mail: B. Walker (Omnet); wls@cbr.dwe.csiro.au (Internet)

15-27 November, Mombasa, Kenya

JGOFIS Indian Ocean Training Course and JGOFIS Indian Ocean Planning Group (20-21 Nov). Aida Starke, JGOFIS Project Office, Institut für Meereskunde, Universität Kiel, Düsternbrooker Weg 20, D-24105 Kiel, Germany. Tel: (+49-431) 597 4019; Fax: (+49-431) 565 876; E-mail: JGOFIS.Kiel (Omnet)

17-20 November, Oxford, UK

Land Use/Land Cover Change Project Modelling Working Group

30 Nov-1 Dec, Espoo, Finland

PAGES Workshop, in association with the Finnish Climate Programme (SILMU): The impact of climate on lake and peatland environments during the holocene. V. Salonen, Naantali, Finland. Tel: (+358-21) 633 5490; Fax: (+358-21) 633 6580

30 Nov-3 Dec, Taipei, Taiwan

APARE/IGAC International conference on regional environment and climate changes in East Asia. Chung Ming Liu, Dept. of Atmospheric Sciences, National Taiwan University, Taipei, Taiwan. Tel: (+886-2) 362 3112, Fax: (+886-2) 363 3642, E-mail: liu@asc120.as.nut.edu.tw

1-3 December, Tucson, Arizona, USA

PAGES Workshop: Extracting climatic and other environmental signals from millennial-aged tree-ring chronologies. D. Graybill, University of Arizona, Tucson, Arizona 85721, USA. Tel: (+1-602) 621 6469; Fax: (+1-602) 621 8229

2-5 December, St. Moritz, Switzerland

BAHC Workshop on climate-hydrology-ecology interrelations in mountain areas

7-10 December, Texel, Netherlands

LOICZ Scientific Steering Committee

20-22 December, Mombasa, Kenya

INQUA-PAGES Palaeomonsoon Workshop and Planning Group. Stefan Kropelin, Freie Universität Berlin, Geomorphologisches Laboratorium, Altensteinerstr. 19, Berlin 33, Germany. Tel: (+49-30) 838 4887, Fax: (+49-30) 838 4842

1994**10-12 January, Taipei, Taiwan**

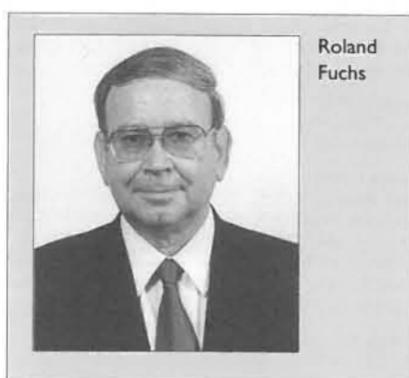
International Group of Funding Agencies for Global Change Research (IGFA). Ho Lin, Dept. of Atmospheric Sciences, National Taiwan University, Taipei, Taiwan. Tel: (+886-2) 363 6775, Fax: (+886-2) 363 3642

People in (and out of) the IGBP

Two 'citizens of the world' are here welcomed to the IGBP family - both with impressive research records and with high-level experience in scientific management. It is gratifying that IGBP is able to attract personnel of such calibre to its secretariats and Core Project Offices. We also take this opportunity to express appreciation for the proven skills of Richard Moss, who has done so much to develop links between IGBP and HDP in the past two years.

Roland J. Fuchs has been appointed Director of the International START Secretariat, based in Washington DC, for a three year period from 1 November 1993. Thomas Rosswall will continue to be Interim Director until that time.

Roland Fuch's extensive and distinguished research career has included studies of land use, soil erosion, regional development, population distribution and socio-economic structures. That background is highly appropriate to the integration of natural and social science aspects of the Global Change System for Analysis, Research and Training, now for-



Roland Fuchs

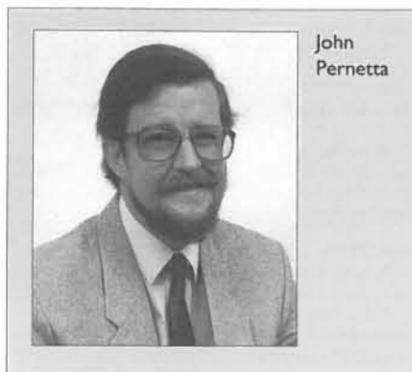
mally supported by HDP and WCRP as well as by IGBP.

He also has considerable international experience: over the past 35 years, Roland has studied, taught and worked in the USA, the former USSR, Nepal, Taiwan, Hawaii, and, most recently Japan - where he is currently the Vice-Rector of the United Nations University in Tokyo. His responsibilities as Head of the Academic Division of the UNU include the development of centres and networks for research

and training. Roland is Professor Emeritus of the Department of Geography, University of Hawaii, and Past-President of IGU.

John Pernetta has been appointed Core Project Manager and international secretary for the IGBP Land Ocean Interactions in the Coastal Zone (LOICZ) project. From November he will be based at the Netherlands Institute of Sea Research (NOIZ) in Texel, where the newly-established LOICZ Core Project Office is located.

John's expertise is in environmental



John Pernetta