

tology and Palaeoclimatology of the East African Lakes. International Decade for the East African lakes. Dr. Eric Odada, IDEAL International Symposium, c/o Unesco-ROSTA, PO Box 30592, Nairobi, Kenya, Telex: 11175 unesco, Fax: (+254-2) 215 991

Publications:

IGBP Reports

No. 23

Joint Global Ocean Flux Study: Implementation Plan. Jointly published with the Scientific Committee on Oceanic Research (SCOR). (1992). 78 pp.

The Report describes how the aims of JGOFS are being, and will be, achieved through global synthesis, large scale surveys, process studies, time series studies, investigations of the sedimentary record and continental margin boundary fluxes, and the JGOFS data management system.

National Global Change Programmes

Australia

Global Change: A Research Strategy for Australia 1992-1996. Canberra, The Australian Academy of Science (1992). 178 pp.

Canada

Canadian Global Change Program. Ottawa, Royal Society of Canada (1992). 20 pp.

Finland

The Finnish Research Programme on Climate Change. Progress Report. Markku Kanninen and Pia Anttila (eds.). Helsinki, SILMU (1992). 308 pp. (Publications of the Academy of Finland 3/92)

Germany

Das Internationale Geosphären-Biosphären Programm (IGBP). Ergebnisse des zweiten nationalen IGBP-Kolloquiums, Berlin, Oktober 1991, (ed) S. Lütkemeier. Deutsche Forschungsgemeinschaft (1992). 138 pp.

Conceptual Framework for Research on Global Change 1992-1995. Federal Minister for Research and Technology (1992). 77 pp.

Norway

Global Change and Terrestrial Ecosystems (GCTE). Report from the Norwegian Symposium in Oppdal, 26-27 March 1992. Oslo, Norwegian Research Council for Science and the Humanities (1992). 46 pp.

START DIRECTOR

The Standing Committee on START of the International Geosphere-Biosphere Programme invites applications and nominations for the position of Director of the International START Secretariat, currently based in Washington, DC. The position will become available September 1, 1993, for a term of three years and is renewable.

The Global Change System for Analysis, Research and Training (START) is an evolving, global system of research networks focusing on the regional origins and implications of global environmental changes. Special emphasis is being given to the establishment of networks and centres in developing country regions. START is being organized by the major international global environmental change programmes: IGBP, in cooperation with WCRP (World Climate Research Programme), and HDP (Human Dimensions of Global Environmental Change Programme).

The Director of the International START Secretariat will be responsible for implementation of the START effort, including development of research networks and assisting in raising funding for these networks and centres, for linking the research agendas of the international research programmes to the regional research programmes, for organizing inter-regional planning and research activities, and for creating an effective global network of regional research efforts. The Director is responsible for the office and a staff of 6-8 people. The Director will report to the START Standing Committee.

Candidates should be internationally recognized individuals with extensive research and science management background. Necessary factors include:

- Advanced degree, or equivalent experience
- Executive level scientific administrative experience

Global Change (IGBP) Newsletter
Editor: Suzanne Nash
Newsletter requests and change of address information should be sent to the

- Fluency in English: basic knowledge of one or more of the other official UN languages is an advantage.
- Experience in international scientific collaboration
- Willingness to travel

Professional experience in any field of global environmental change research is necessary.

Salary and social benefits will be comparable to similar functions in international research programmes. Those wishing to apply should include detailed curriculum vitae, complete information on past relevant experiences, plus names and addresses of three references.

If you wish to nominate a candidate for the position, please send a letter giving reasons why this person should be considered, giving the nominee's relevant experience and capabilities, with the current address and telephone number.

The START Standing Committee will make an initial assessment of candidates at its meeting in mid-November.

Materials must be posted by 1 November 1992 to:

Dr. Werner Menden, Federal Ministry for Research and Technology (BMFT), Heinemannstrasse 2, D-5300 Bonn 2, Germany
Fax (+49-228) 59 36 01.

For further information, you can also contact:

Prof. Thomas Rosswall, International START Secretariat
1825 K Street, NW, Suite 1101, Washington, DC, 20006, USA
Tel. (+1-202) 457 5840,
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IGBP Secretariat,
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THE INTERNATIONAL GEOSPHERE-BIOSPHERE PROGRAMME: A STUDY OF GLOBAL CHANGE (IGBP)
OF THE INTERNATIONAL COUNCIL OF SCIENTIFIC UNIONS

UNCED and Global Change Science

The United Nations Conference on Environment and Development, held in Rio in June of this year, raised greater expectations than could be satisfied. Agreements were to be reached covering biological diversity, the emissions of greenhouse gases, and the preservation of forests. But it was widely felt that the final texts of these agreements had lost their original vigour due to uncompromising approaches by some nations.

And yet governments agreed on the

Rio Declaration, a set of principles designed to guide Agenda 21, the plan of action prepared for UNCED that should align global economic and social development with the planet's resources. The meeting was a success by its very importance, attracting top world-wide participation and intense world news coverage. And UNCED succeeded in moving the concept of environment linked with sustainable development into public consciousness and on to political agendas.



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The main outputs of UNCED

The Rio Declaration

Twenty seven principles that form a basis for an Earth Charter to be presented at the 50th anniversary of the UN in 1995.

Agenda 21

The major plan of action. It is a comprehensive programme aimed at reshaping human activities in order to minimize environmental damage and ensure sustainability in the development process.

The Framework Convention on Climate Change

Signed by 154 state representatives at Rio, and requires ratification by at least 50 states.

Convention on Biodiversity

Signed by 154 state representatives at Rio, and requires ratification by at least 50 states.



Forest principles

Statement of principles for a global consensus on the management, conservation and sustainable development of all types of forests.

Desertification

A request to the UN General Assembly to prepare a convention to combat desertification, to be finalized by June 1994.

UN Commission on Sustainable Development

Recommendation to establish a Commission to monitor and review implementation of Agenda 21.

UNCED overview

The Conference showed that there is not yet an international consensus to make far-reaching global agreements feasible. Many countries are facing the dilemma posed by addressing both urgent national issues and the global ones.

Formally the results of UNCED constitute no more than recommendations to the General Assembly of the UN which meets later in the year. However, UNCED has provided a practical starting point for the road ahead, the implementation of Agenda 21 by governments and non-governmental organizations (NGOs), to be orchestrated by the "high level Commission on Sustainable Development". The 47th UN General Assembly is charged with the establishment of the Commission, and UN Secretary-General Boutros Ghali has appointed Edouard Saouma, Head of the UN Food and Agricultural Organization in Rome, to head the task force which will advise the General Assembly on the formation of the Commission.

Substantial new funds have not yet been committed for Agenda 21's implementation. This requires the scientific community to continue providing clear presentations of its findings about the status of the globe and the changes occurring in it. In general it can be said that UNCED calls for a stronger role of science in policy making, and better interaction with policy makers and the general public.

The first year after UNCED will be the critical one: will there be a general relaxation of effort and reorientation towards more immediate local issues, or will there be a period of gathering momentum towards implementation of Agenda 21?

The Rio Declaration

This declaration provides principles to help put Agenda 21 into practice. However, it does not contain specific reference to the essential role of scientific research on the Earth system to provide a basis for policies for sustainable development. It is in need of improvement before becoming the Earth Charter in 1995.

Agenda 21

The International Council of Scientific Unions, IGBP's parent organisation, participated in the preparations for UNCED, being asked in 1990 to be its principal scientific adviser, and assisted the preparatory process by providing names of experts, checking the scientific correctness of draft papers, and drawing the attention of its member academies to the importance of science for the national delega-

tions to UNCED. Its largest contribution, however, was to the preparation of the science component of the Agenda 21 document. It was to this end that ICSU held the conference on an Agenda of Science for Environment and Development into the 21st Century: ASCEND 21 in Vienna in November, 1991.

Agenda 21 covers all areas where the environment and the economy intersect. Action-oriented proposals are grouped into 40 chapters and more than 100 programme areas which are described as the basis for action.

Agenda 21's first part addresses the social and economic dimensions of sustainable development and includes programme areas relating to combating poverty, changing consumption patterns, addressing demographic dynamics and human settlement, promoting health, and integrating environ-

"One role of the sciences should be to provide information to better enable formulation and selection of environment and development policies in the decision-making process"

AGENDA 21, CHAPTER 35.

ment and development in decision making and international cooperation. However, it was recognized that it does not sufficiently address population issues.

Its second part, which encompasses 24 chapters, deals with conservation and management of resources for development, and contains recommendations for protecting the atmosphere, the oceans and the quality and supply of freshwater resources; combating deforestation as well as desertification and drought; promoting sustainable rural and mountain development; and conserving biological diversity. Also addressed is the environmentally sound management of biotechnology, of toxic chemicals, and of radioactive and hazardous wastes, including prevention of their illegal international traffic. The most important chapters for the scientific community are the following:

Science for Sustainable Development

The science plan described in Chapter 35 has amongst its objectives the vigorous implementation of the major on-going Earth system research and observation systems, as well as strengthening interdisciplinary cooperation among the natural, social, engineering and health sciences. It further calls for periodic objective scientific assessments of global issues and for clearly explaining scientific findings to the general public and

to policy makers. Strengthening of partnerships with other NGOs, intergovernmental organizations and with industry is also advocated and the need for capacity building in science receives strong emphasis. Of special importance is the proposal for increased interaction between science and decision-making.

Scientific and Technological Community

Chapter 31, in addressing the scientific community, further elaborates the desired collaboration between science, policy-making and public information. It also calls for an examination of the ethical basis for conducting science and technology and the development of codes of practice, where appropriate, in addition to those already in existence.

International Institutional Arrangements

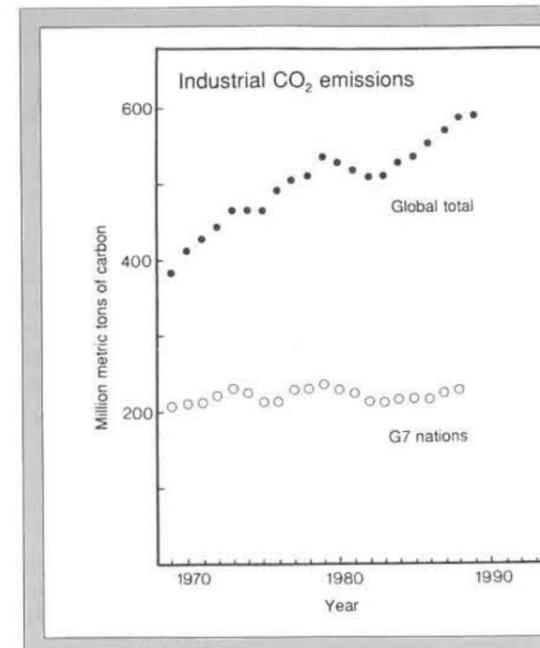
Chapter 38 in general advocates the use of existing mechanisms to ensure implementation of Agenda 21, although some new mechanisms are mentioned—in particular, a new secretariat support structure for the follow-up of the Conference. Emphasis was also included on a strengthened role for the United Nations Environmental Programme (UNEP) in regard to scientific research.

Convention on Biodiversity

The convention on biodiversity was adopted on 22 May after almost four years of deliberations by an Intergovernmental Negotiating Committee under the sponsorship of UNEP. The Convention considers biological diversity to mean all the Earth's species of plants, animals and micro-organisms, and the ecosystems of which they are part. It aroused problems of conflicting interests regarding intellectual property rights on research and products from areas that are rich in biological diversity. The text does not call for drawing up a global list of protected areas. Every country ratifying the Convention will put together its own list, that will eventually become a global one.

Convention on Climate Change

The Convention's aim is to protect the atmosphere from a build-up of anthropogenic gases that trap heat from the sun, causing an enhanced greenhouse effect. The Convention recommends that developed nations return to 1990 levels of greenhouse gas emissions by 2000, but does not indicate what



The UNCED Climate Change Convention aims to hold industrial emissions of carbon dioxide by developed countries at 1990 levels for the next decade. But that measure alone will not slow the global increase – since the CO₂ emissions of many developed countries were near stable in 1970 – 1990, when total emissions rose by nearly 50%. G7 nations: USA, Japan, Germany France, Italy, UK and Canada. (Data source: Trends 91, CO₂ Information Analysis Center, ORNL)

will happen then. It provides for the establishment of machinery, in the form of a Conference of the Parties with appropriate scientific advisory support, as does the Convention on Biodiversity, to take decisions regarding subsequent steps as needed. In the case of international measures to protect the ozone layer, a similar set of mechanisms for incorporating scientific findings into diplomatic negotiations was established in the 1985 Vienna Convention.

It is hoped that existing mechanisms will be relied upon as much as possible. An

indication to this effect is the recent proposal to the Executive Council of the World Meteorological Organization to involve the Intergovernmental Panel on Climate Change as support to the Framework Convention on Climate Change.

Forests and Desertification

The Forest Principles call for a recognition of the vital role of all types of forests in maintaining the ecological processes and balance at the local, national, regional and global levels. These include protecting

fragile ecosystems, watershed and freshwater resources and sources of genetic material for biotechnology products. Equal emphasis is, however, is on sustainable development opportunities for countries undergoing the process of transition to market economies, and an appeal to all countries, notably developed ones, to take action towards reforestation, afforestation and forest conservation. Further elaboration of these principles into conventions or other legal instruments will require firm scientific support.

Follow-up by ICSU and IGBP

ICSU is responsible for the policy-making of its global change programmes, including the IGBP. ICSU's Advisory Committee on the Environment will hold its next meeting in October, immediately followed by a meeting with the Chairmen and Directors of ICSU-sponsored and related global change research programmes and activities, to examine how the leaders of these programmes can contribute to the UNCED follow-up.

The Forum on Earth System Research that will take place on 24 January 1993 in Ensenada, Mexico, the day before the third Scientific Advisory Council for the IGBP, will present and discuss how ICSU's Earth system research activities can be incorporated into the policy-making process that was launched at UNCED.

Compiled from a Report on the Conference by J W M la Rivière and J Marton-Lefèvre, ICSU, the official summary in "Terra Viva" and reports in "Development Forum"

IGBP Activities

System for Analysis, Research and Training

START to Receive GEF Support

At its May meeting, the members of the Global Environment Facility (GEF) of the World Bank, United Nations Development Programme (UNDP) and United Nations Environment Programme (UNEP) decided to support a proposal submitted by the IGBP. Support in the order of US\$8 million will be given to the inter-regional project "Global Change System for Analysis, Research and Training, START". The funds

will be used to support the activities of the Inter-American Institute for Global Change Research (IAI), the early implementation of a Regional Research Network and Centre in Southeast Asia and pilot projects in Northern Africa.

UNDP has concluded that "the project will contribute to the development of human capacity able to deal with scientific issues linked to climate change. Additionally, through research and data collection and exchange, it will increase knowledge about global environmental issues in developing countries, where the need for more information is extremely great. It will help focus more attention on national and regional contributions to climate

change, as well as on the potential consequences. This project will also have many secondary benefits, because climate change will affect practically all other major global and regional environmental issues such as biodiversity, water scarcity, and desertification, and on development issues such as sustainable agriculture".

The International START Secretariat is currently preparing the project document for UNDP, the executing body of GEF support for START. This is being done in close collaboration with the IAI, which is providing specific input for the substantive sections relating to Temperate South America, Tropical South America and the Caribbean. The section for Southeast Asia is be-

ing developed under the guidance of the Southeast Asian Regional Committee for START (SARCS). This recently established committee consists of one representative from each of the ASEAN nations (Brunei, Indonesia, Malaysia, Philippines, Singapore and Thailand) plus representatives of IGBP and Human Dimensions of Global Change Programme (HDP). The first meeting of SARCS was held in Jakarta, Indonesia on 28-29 July, 1992. The second meeting of SARCS will be held in Kuala Lumpur, Malaysia on 9-10 October. SARCS is using these meetings to finalize details of the GEF/UNDP proposal related to Southeast Asia. Details of the Northern Africa component of the proposal will be finalized at the regional workshop "Africa and Global Change" to be held in Niamey, Niger on 23-27 November 1992.

Regional Meeting for Africa

In Africa governments face particularly urgent decisions about whether the risks posed by global change processes warrant potentially costly policy responses. To assist the African scientific community to conduct coordinated research on critical unknowns related to global environmental change, IGBP START is organizing a workshop, "Africa and Global Change."

The first workshop is being arranged by the IGBP, the HDP, and the Joint Research Centre of the Commission of the European Communities in Niamey, Niger from 23 to 27 November 1992. The meeting is arranged in collaboration with the National Meteorological Service of Niger, International Crops Research Institute for Semi-Arid Tropics (IRCISAT) Sahelian Centre, the Agrometeorological-Hydrological Centre (AGRHYMET), the African Centre of Meteorological Applications for Development (ACMAD), the Observatory for the Sahara-Sahel (OSS), and other potential sponsors, including the Toulouse-based MEDIAS (Mediterranée et Afrique Subtropicale) programme, and the US National Science Foundation on behalf of the US Global Change Research Programme. The IGBP has previously conducted a number of regional workshops (Southern Hemisphere, in Swaziland, 1988; South America, in Brazil, 1989; Asia, in India and Singapore, 1991, and Southeast Asia, Thailand, January 1992).

The meeting objectives are to: (i) present current understanding of global change issues in relation to their importance for Africa, (ii) identify key areas of global change research in both natural and socio-economic sciences, (iii) review IGBP and HDP Core Projects and define needs and priorities for African scientific participation in the projects, (iv) discuss global

change research networks as part of the IGBP/WCRP (World Climate Research Programme)/HDP initiative for START in the Mediterranean, Northern African, and Southern African regions, (v) review possibilities for strengthening collaboration with other relevant research and monitoring programmes.

The agenda, earlier presented in Newsletter No. 9, has been further developed and now includes the following components:

I. Overviews on global change research

II. Overviews on the processes of global change in the African context, including:

- Climate change and desertification
- Drought and flood
- Biomass burning as a source of greenhouse gases
- Impacts of global change on savanna ecosystems
- Global change impacts on agriculture:
- The role of tropical forests in the hydrological cycle
- Land-surface processes and the climate system
- Past global changes in Africa
- Population growth and land-use change
- Political and social institutions and environmentally sustainable economic development:
- Energy systems and global change
- The human dimensions of global change in the Sahelian region

III. Developing global change regional research initiatives for Africa

- START
- Observatory for the Sahara-Sahel (OSS)
- Mediterranean and Subtropical African Programme (MEDIAS)
- African Centre of Meteorological Applications for Development (ACMAD)
- European Community initiatives

IV. Working-Group sessions. Working groups will address a number of topics including:

- Desertification and deforestation: impacts on climate and climate-change driven land-cover change
- Impacts of land use and climate change on large river basins and on coastal ecosystems
- Past global changes
- Human dimensions of global environmental change

Each working group will prepare a written report based upon its deliberations.

The reports will address the following: (i) Importance of the topic for Africa, (ii) Ongoing research in Africa, including an update of the draft IGBP/Commonwealth Science Council and OSS surveys of global change research, (iii) Monitoring needs, (iv) Availability of data bases, (v)

Impediments to further regional and international collaboration, and (vi) Recommendations for action.

V. Working groups on the formation of START Regional Research Networks:

- Mediterranean region (MED)
- Northern Africa region (NAF)
- Southern Africa region (SAF)

For further information, please contact:

The International START Secretariat
1825 K Street, NW, Suite 1101 Washington, DC 20006, USA. Tel. (+1-202) 457 5840; Fax. +1-202-457 5859

The International START Secretariat

The International START Secretariat has recently been established in Washington, DC following a decision of the May 1992 meeting of the Standing Committee for START and generous financial support from the Consortium for International Earth Science Information Network. Additional funds for the START Standing Committee are being provided by France, Germany, Japan, Switzerland and the USA.

An announcement regarding the position of Director of the International START Secretariat is included on the back page of this issue. As was already mentioned in Newsletter No. 10, Professor Thomas Ross-wall serves as the interim Director until 1 September 1993. Dr. Hassan Virji is the Deputy Director for Natural Sciences and a similar position for social sciences is expected to be filled by mid-1993.

The address is given above.

International Global Atmospheric Chemistry Project



Global Atmospheric-Biospheric Chemistry is the subject of the first IGAC Scientific Conference that will be held in Eilat, Israel 18 to 22 April 1993.

This conference will review and present new results in the area of global atmospheric chemistry and its interactions with the bio-

sphere, highlighting the early achievements of IGAC. Conference foci include regional studies (marine, tropical, mid-latitude, boreal, and polar), global studies, and fundamental laboratory studies.

It is planned that approximately 12 invited papers (30 minutes each), and 45 contributed papers (15 minutes each) will be presented orally. Contributed poster papers will also be presented in special poster sessions.

The invited papers will be published in a book in the Oholo Conference Series (Plenum Press), which will come out approximately 6 months after the conference. All contributed oral and poster papers will be eligible for submission to a special issue of the *Journal of Geophysical Research*.

To submit a paper for presentation at the conference (specifying whether oral or poster presentation is preferred), a 1 to 1½ page abstract should be sent to: Prof. Ronald Prinn, MIT Room 54-1312, Cambridge, MA 02139, Fax: +1-617-253 0354, E-mail: R.Prinn (Omnet), before 1 December, 1992. Authors will be notified regarding acceptance by 1 January 1993.

The session topics will cover:

- Atmospheric Impacts of Biomass Burning
- Marine Aerosol and Gas Exchange and Global Atmospheric Effects
- Atmospheric Chemistry of the East-Asian/Northwest Pacific Region
- Atmospheric Chemistry of the North Atlantic
- Global Measurements and Cycles for Carbon Dioxide
- Terrestrial Biosphere-Atmosphere Exchange in Middle and High Latitudes
- Polar Atmospheric Chemistry and Deposition
- Rice Cultivation and Trace Gas Exchange
- Global Emissions, Models and Measurements of Photochemically Active Compounds

The Organizing Committee is composed of Ronald Prinn, MIT, USA (Chair), Paul Crutzen, Max-Planck Institute Chemie, Germany, Pamela Matson, NASA-Ames, USA, Amram Golombek, Israel Institute for Biological Research, (Co-Chair for local arrangements), and Henning Rodhe, Stockholm University.

The Conference is the 37th in the Oholo Conference Series. The word "Oholo" means literally "his tent". For the first few years in the 1950s this Israeli conference was held in a large outdoor tent, and the name has remained, even if the venues have changed considerably. The 1993 conference will be in a hotel in Eilat, Israel's most popular resort, located on the shore of the Red Sea.

For further information contact Anne Slinn, IGAC Core Project Office, Massachusetts Institute of Technology Bldg. 54-

1312, Cambridge, Massachusetts 02139 USA. Tel: (+1-617) 253 4902; Fax: (+1-617) 253 0354, E-mail: R.Prinn (Omnet), Telex 921483 mitcam.

Research categories

At its last meeting the IGAC-Scientific Steering Committee decided that IGAC should adopt for inclusion in its research the three-level structure first adopted by the Global Change and Terrestrial Ecosystems (GCTE) Core Project for its research. It is defined as:

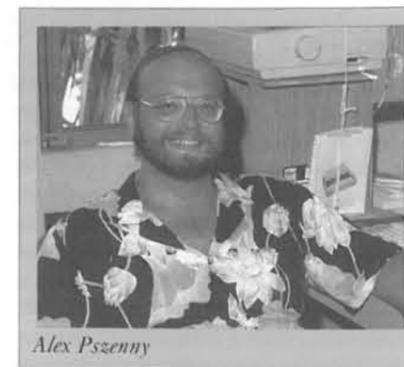
1. Large-scale, integrative projects that are international in scale and global in scope, and designed specifically to meet Core Project objectives.
2. Regional/National Research that arises from national IGBP committees or from other national or regional groups of scientists. This research is designed to meet Core Project objectives at the national or regional level. These are an important part in the overall Project providing critical links between global-scale research and regional-scale activities which are of immediate concern to individual countries and regions.
3. Research relevant to the Core Project that is carried out through many smaller, locally-specific research projects initiated by individual investigators or institutions. Although contributing to the broad knowledge base that underpins the overall effort, their management and funding is the responsibility of the individual investigator(s). Relevant research is referred to the appropriate IGBP national committee for consideration and subsequent action.

The Scientific Steering Committee reviewed the status of the 21 IGAC activities grouped under the main foci: Marine Focus, Tropical Focus, Boreal Focus, Mid-Latitude Focus, Global Focus and the Fundamental Focus. National programmes that include IGAC projects were presented to the IGAC-SSC from Australia, France, Germany, Japan, Sweden, the UK and the USA. In addition to the Oholo Conference in 1993, an IGAC science meeting is also planned for the meeting of the Commission on Atmospheric Chemistry and Global Change (CACGP) in Tokyo in 1994.

Two new members will be joining the IGAC-SSC: Prof. Barry Huebert, of the University of Hawaii, Honolulu, USA, and Prof. Stuart Penkett, of the School of Environmental Sciences, University of East Anglia, Norwich, UK.

New Core Project Officer

As of 1 January 1993 the IGAC Core Project Officer will be Dr. Alex Pszeny. Dr. Pszeny is an American citizen with a M.S. in chemistry from Boston College and a Ph.D.



Alex Pszeny

in oceanography from the University of Rhode Island. Since 1987 he has been a research oceanographer with the U.S. National Oceanic and Atmospheric Administration. His graduate work at Boston College included studies of acid rain, atmospheric deposition of fission products to forest vegetation, and trace metals in respirable aerosols. His doctoral and subsequent research has concerned the biogeochemical cycling of sulphur, nitrogen, and chlorine in the marine atmosphere. He helped to organize and served as chief scientist on several research cruises including, in June of this year, a cruise conducted as part of the IGAC/Marine Aerosol and Gas Exchange (MAGE) complement to the Atlantic Stratocumulus Transition Experiment (ASTEX).

On 1 January the address of the Core Project Office will also change. Still at the Massachusetts Institute of Technology, the address is: Dr. Alex Pszeny, MIT, Building 24-409, Cambridge, MA 02129, USA, Tel: (+1-617) 253 9887, Telex: 921483, Fax: (+1-617) 253 9886, E-mail: A.Pszeny (Omnet).

Global Change and Terrestrial Ecosystems



GCTE is now in its operational phase, and it is encouraging to note the world-wide interest from research groups wishing to become involved in and to contribute to the project. The contributions to category 1 (core research) have, of necessity, to be limited to a well-defined and restricted set of projects. However, the association of many other projects with GCTE in categories 2 (regional/national research) and 3 (other relevant research) make a necessary contribution to the overall global change research goals. The first compendium of GCTE Core

Research projects will be published in a few months.

Given the interest in global change, it is not surprising that there is an increasing number of organizations involved in research that is complementary to GCTE. This is to be welcomed since the magnitude of the problem is such that no one group could tackle it all. Nevertheless, the task now facing the various organisations is to develop programmes that are truly complementary, with a minimum of duplication. Thus far, cooperation has been good and GCTE's plans have developed in concert with those of the Scientific Committee on Problems of the Environment (SCOPE) and the International Union of Biological Sciences (IUBS) in particular; but also with a number of others, including the International Union for the Conservation of Nature (IUCN), the International Union of Forestry Research Organisations (IUFRO), the International Arctic Science Committee (IASC), and Alternatives to Slash and Burn (ASB).

Alternatives to Slash and Burn

The ASB planning workshop in the heart of the Amazon at Porto Velho, Brazil, in February 1992, produced a detailed programme to reduce the rate of tropical deforestation by developing and putting into practice sustainable alternatives to slash-and-burn agriculture. The programme will be a coordinated effort that emphasizes both socio-economic policy and biophysical issues. It will include global-scale components, including the development of common methodologies, the gathering of common data sets, and the GCTE-related research. It also includes regional components related to the specific problems and opportunities in each of the three regions (Africa, Asia and Latin America).

One of the overall objectives of ASB is to quantify the contribution of slash-and-burn practices and their alternatives to global environmental changes, particularly their impact on emission of CO₂ and other greenhouse gases, loss of biodiversity and the associated potential to diminish ecosystem stability, and soil erosion and fertility depletion.

GCTE has identified these issues as important parts of its research effort. More specifically, GCTE Task 1.2.1. (Changes in biogeochemistry in humid forests undergoing land-use change) aims to determine the effects of land clearing and agricultural intensification on quantities and pathways, both atmospheric and hydrological, of carbon and nutrient loss (and their regulation) in the major humid tropical regions of the world. This will contrib-

ute to both the emissions and fertility depletion objectives of ASB. GCTE will provide the scientific expertise for this research, while ASB will provide a framework through well-characterised sites, extant agroecological research, and support facilities, where appropriate.

Arctic/Boreal Research

Two developments have advanced considerably GCTE's research in the Arctic/Boreal region. The first is a proposal for a coordinated Scandinavian contribution to GCTE's Focus 2 on change in ecosystem structure, including a framework for contributions to other GCTE Foci in the future. The proposal first arose from a Norwegian national IGBP/GCTE meeting held at Oppdal in March 1992, and has been carried forward by two Trondheim scientists, one of whom is Dr. Jarle Holten, interim officer for GCTE's Tundra/Boreal Regional Office located at the Norwegian Institute for Nature Research.

The geographical framework for the project is the Scandinavian Terrestrial Ecosystem Profile (STEP), a transect from the tundra and permafrost of Svalbard in the north to the temperate forests in the extreme south of Sweden, with possible extensions to the UK and continental Europe.

Both experiments and modelling will play important roles in the STEP project, whose overall objective is to understand and predict the dynamics of change in ecosystem structure, particularly at the tundra/boreal forest, the boreal forest/alpine and the boreal forest/temperate forest ecotones. At each major site a nested set of sub-sites will provide data for modelling at the patch and landscape scales, in addition to the regional perspective provided by STEP as a whole.

The proposed STEP project may also provide sites for a transect for biogeochemical research that would contribute to GCTE Task 1.2.1. (Changes in biogeochemistry in high latitude systems). A link could be made to the biogeochemical research component of the German contribution to GCTE which suggests an extension to the north.

The second development is the development of a number of arctic interdisciplinary core projects for a regional global change research programme by the International Arctic Science Committee (IASC) at its Workshop in Reykjavik, Iceland. Traditionally the geophysical and oceanographic sciences have been strong in the Arctic, but this workshop gave ecologists/biologists a chance to catch up and develop a strong GCTE-related component in the IASC global change plan. The major objectives of the IASC ecological programme are:

1. To determine the interactive effects of elevated CO₂, changing climate, enhanced UV-B, and altered nutrient availability on the functioning of arctic terrestrial and freshwater ecosystems.
2. To determine the effects of global change on the pools and fluxes of carbon and other elements, including the emission of trace gases to the atmosphere.
3. To determine the impact of global change on the distribution, composition and structure of arctic ecosystems.
4. To determine the impact of global change on the biological diversity of arctic ecosystems, including its relationship to ecosystem function, genetic variability and related issues.

Although much needs to be done to meet these objectives, there are already two large, existing programmes which can make important contributions. The first is the Arctic System Science (ARCSS) programme of the US Global Change Research Programme, which contains a component on Land/Atmosphere/Ice interactions. The second is the International Tundra Experiment (ITEX) which aims to determine the response of selected tundra species to elevated temperature at the network of circumpolar sites. The possibility of doing ecosystem-level elevated CO₂ experiments at selected sites and the potential for modelling change in the composition of tundra ecosystems increase the value of ITEX to the GCTE programme.

Monitoring for terrestrial ecosystems

Of particular concern is the need to rationalize and implement a satisfactory global terrestrial monitoring programme. It is a daunting task that will require a great deal of common will and collaboration; yet a successful monitoring programme is absolutely necessary for the eventual success of the IGBP.

GCTE joined with the UNESCO Man and the Biosphere (MAB) Programme and the Observatory of the Sahara and Sahel (OSS) established by the French Ministry of Foreign Affairs, to organise the workshop that was held in Paris, 27-31 July 1992 to define and initiate a global terrestrial monitoring system for global change research needs.

GCTE requires a global monitoring system for three reasons: (i) to calibrate and validate ecosystem dynamics models at a variety of scales; (ii) to detect global change as evidenced by change in terrestrial ecosystems; and (iii) to record changes in agroecosystems as driven by new land-use practices.

There are already several existing or

proposed terrestrial monitoring networks, and GCTE, MAB and OSS will collaborate so far as possible with these other efforts to avoid duplication. Of particular interest is the Global Climate Observing System (GCOS) which aims to establish a global climate change detection and response monitoring system by adding oceanic and terrestrial observing components to already established atmospheric networks.

The product of the workshop will be an operational plan for the terrestrial monitoring system, including an outline of parameters to be measured, the structure of the system (referenced to a global map), a detailed implementation strategy, management and funding arrangements, and linkages to other monitoring systems. A report of the meeting, incorporating the operational plan, will be available through the GCTE Core Project Office in Canberra.

Compiled from GCTE News, No. 3, August 1992.

Biospheric Aspects of the Hydrological Cycle



The First BAHC Open Meeting will be held 16-18 November 1992 in Toulouse, France. The meeting will be a Scientific Conference, hosted by the Centre National de Recherches Météorologiques.

The Issue

Water is the lifeblood of the terrestrial biosphere. The hydrological cycle, the terrestrial biosphere and human welfare are closely linked - as shown by the devastating effects of droughts and floods. But we know very little about the many other interactions between water, vegetation, soils and atmosphere. Whilst such effects could be critical for global climate models, they are not included, since the relationships are not yet sufficiently well described. The BAHC project is investigating those climate-water interactions with the land biosphere that are likely to be most critical under conditions of changing climate and land use.

Aims

The main aim of BAHC is to coordinate and stimulate related research activities on an international basis, and to develop interdisciplinary collaboration with other research programmes and projects, both within and outside of the IGBP. The research aims of BAHC are:

- to investigate the biospheric controls of the hydrological cycle
- to improve our understanding and capability to model the exchanges of water, carbon and energy transfer at the soil-vegetation-atmosphere interface for different types of landscapes and ecosystems, under the existing and changing conditions, on different temporal and spatial scales
- to quantify the dependencies of the exchanges of water, carbon and energy between land and air on vegetation, land surface and other features
- to describe changes at the continental scale that affect the interactions between the biosphere and the physical Earth system
- to provide improved parameter estimation techniques, which can be applied world wide, and make use of generally available data bases on ecosystems, soils and other related properties derived from conventional sources or remote sensing, in particular from satellites
- to validate model simulations.

The Draft Science and Implementation Plan for BAHC will be presented at the conference for discussion and further development. Conference participants will be invited to express their thoughts about BAHC, make proposals for the Science and Implementation Plan and participate in its finalization.

Scientific Programme

The conference will be organized in four scientific blocks, according to the four BAHC Foci:

Focus 1: Studies of Water, Energy and Carbon Transfer between Soil, Vegetation and the Atmosphere at Patch Scales. Chair: Steven Running, School of Forestry, University of Montana, USA

Focus 2: Regional-Scale Studies of Land-Surface Properties and Fluxes: Experiments, Interpretation and Modelling. Chair: Jean-Claude André, CNRM, Météo-France, Toulouse

Focus 3: Interactions among the Biosphere, Water Resources and Climate - Regional to Continental Scale. Chair: Christopher Field, Department of Plant Biology, Carnegie Institute, Stanford, USA

Focus 4: The Weather Generator Project. Chair: Hans-Jürgen Bolle, Chair of the Scientific Steering Committee for BAHC, Institute of Meteorology, Free University of Berlin, Germany.

Invited key reports and extended contributions on selected research topics will be given, and in addition a number of short contributions and poster presentations. There will be plenary meetings and working group meetings related to the BAHC Foci. The working group meetings will

give the conference participants the opportunity to present their views on the planning of BAHC activities in a more detailed form, and to contribute directly to the finalization of the BAHC Science and Implementation Plan.

The conference will be held at the Centre International de Conférences de Météo-France, Toulouse. The official language will be English. On Sunday, 15 November, one day before the conference, an Informal Preparatory Meeting is foreseen in the afternoon on "Special Regional and National Tasks to be considered in the IGBP Core Project BAHC". Participants who want to present their proposals for discussion, as well as early arriving participants, are kindly invited to attend. Members of the BAHC Scientific Steering Committee and Core Project office will guide the discussion.

It is foreseen to publish a report on the results of the meeting with annexed scientific contributions and/or summaries of contributions to the meeting. Authors are requested to provide at the meeting manuscripts of contributions to be published.

Contacts:

Dr. Alfred Becker, IGBP-BAHC Core Project Office, Institute for Meteorology, Free University Berlin, Dietrich-Schäfer-Weg 6-10, D-1000 Berlin 41, Federal Republic of Germany, Tel: (+49-30) 838 711 84/94, Fax: (+49-30) 838 71185, E-mail: H.Bolle.IGBP (Omnet), Ephrat.Lahmer-Naim@geowiss.fu-berlin.dbp.de (Internet).

Prof. Jean-Claude André, Météo-France, Centre National de Recherches Météorologiques, 42 Avenue Coriolis, F-31057 Toulouse Cedex, France, Tel: (+33) 61 07 93 70, Fax: (+33) 61 07 96 00.

Land Surface Experiments in the Amazon Basin

The Joint Working Group on Land Surface Experiments, chaired by Dr. Jean-Claude André, was established as a collaborative activity between BAHC and the Global Energy and Water Cycle Experiment (GEWEX) of the World Climate Research Programme (WCRP). Field experiments on various spatial scales are needed by both BAHC and GEWEX to improve our understanding of atmospheric boundary-layer processes, soil-vegetation processes, and the effects of mesoscale inhomogeneities on land use and soil properties.

The Third meeting of the Working Group was held in Greenbelt, Maryland, USA, on 18-20 June. The purpose was to develop plans for a large scale land surface

experiment in the Amazon Basin. This region includes a high percentage of the global total of tropical rainforest, and is believed to play an important role in regulating the Earth's climate through feedback effects, operating through the water and carbon cycles.

Around 40 scientists from all over the world participated. The meeting was co-sponsored by IGBP-BAHC, WCRP-GEWEX, the International Hydrological Programme (IHP) of UNESCO, and the International Satellite Land Surface Climatology Project (ISLSCP). NASA also helped as the host organisation.

Participants were briefed on existing large scale meteorological, hydrological and ecological studies in the Amazon region and elsewhere, including the Anglo-Brazilian Climate Observational Study (ABRACOS) programme and the German-Brazilian project on Studies on Human Impact on Forests and Floodplains in the Tropics (SHIFT). Special attention was given to the investigation of large scale water and energy budgets, and to the relationship between evapotranspiration rates and different land use/land cover regimes.

Representatives of the IGBP core project on Global Change and Terrestrial Ecosystems (GCTE) attended the meeting and presented plans for GCTE research in the Amazon region.

The meeting had the challenging task of identifying relevant scientific issues and resource requirements, and deciding on the overall scale for the planned major international land-surface experiment in the Amazon. Better information on the fluxes of energy, water, carbon nutrients was identified as fundamental to the understanding of ecosystem and river-basin behaviour. Hydrological analysis at different scales, including erosion and sediment transport, must form a substantial component in the proposal for large-scale studies. Remote sensing is necessary to assess important land surface characteristics for such work, and as a basis for an improved modelling of land surface processes, in particular at the soil-vegetation-atmosphere interface, and the prediction of changes in case of changing climate or land use.

The planning document will be issued before the end of 1992. It will emphasize the two aspects of the proposed experimental programme: (i) a basin-wide budget experiment, extending over most of the Amazon, based on increased radio-sounding and hydrological measurements; and (ii) a meso-scale intensive land-surface experiment, where various studies aimed at documenting a number of physical and ecological processes will be conducted.

Other points to be addressed in the

experiment plan include the following:

1. Study Area

To achieve greater predictive power for different types of land surfaces, the study area should be extended into the cerrado region of the Amazon. This region represents a considerable land area inside the Amazon region, and cerrado-type vegetation might replace the forest in a possible drying climate. Some attention should be given to the forest-cerrado border.

2. Errors of flux measurements

The ISLSCP field experiment provided some intercomparison of instruments, but the conclusions of that work were not followed-up. For example, it is important to know the absolute accuracy of net radiometers, and to estimate errors on the eddy correlation measurements of CO₂ and H₂O fluxes.

3. Conflicts between disciplines about site characteristics and scale

There are clear differences in the site characteristics required for different sorts of measurements, and these must be taken into account when experiments are designed. For example, small and medium sized catchments are better for hydrology, but larger units are best for aircraft based flux measurements.

4. Data capture and immediate quality checking

Attention should be given to using automatic data transmission from field instruments via a satellite link. This would enable more economical use to be made of researchers' time and a more immediate check to be made on data quality. The ultimate goal would be to run land-surface process and river-basin models in real-time during the main phase of the experiment, at least for one or two selected better-instrumented test basins.

5. Manpower

There is a shortage of trained researchers. Addressing the issue of human resources is necessary at this stage. Assistance to Brazilian and other Amazon countries' universities to train people at MSc/PhD level could be very useful.

6. Use of remote sensing

In addition to the work on forest clearance rates at the Brazilian Institute for Space Research (INPE), it seems desirable to develop the use of radar remote sensing by utilizing the resources of the European Space Agency to examine data from ERS-1. It may be possible to achieve a calibration for biomass at suitable test sites, and hence use this algorithm to monitor carbon accumulation in regrowth areas.

Based on a meeting report by A. Becker (BAHC Core Project Office), B. Brags (Brazil), and J. Grace (UK).

Joint Global Ocean Flux Study

J G O F S

Towards a Model of Ocean Biogeochemical Processes was the title of a meeting held in the framework of the NATO Advanced Research Workshops on Global Change, at Château de Bonas, in Gascony, France, 4-8 May, 1992. The workshop was jointly organized by the JGOFS Core Project Office in Kiel, and Dr. Michael Fasham of the James Rennell Centre for Ocean Circulation at Chilworth, Southampton, UK. The meeting addressed the indispensable but as yet young science of modelling as applied to ocean processes and brought together 45 scientists from 16 countries to discuss this question and to explore the extent to which a common approach is possible.

Events of ocean biogeochemistry that take place in a fraction of a second and a fraction of a cubic centimetre can, in aggregate, affect interannual patterns of element flux over the whole ocean. Models are now under development to incorporate the smallest events into the largest scales. The Workshop explored the possibility of developing consensus on ways to move among scales and parameterize models; to develop satisfactory compromises between detailed accuracy and efficient implementation. It paid special attention to the distinctive role of ocean biology in separating things and creating gradients (whereas physical processes mix things and reduce gradients).

Lectures and working groups were held on four main themes: theoretical aspects of choosing an appropriate level of detail and moving between levels of detail; detailed descriptions of particular components; interactions with local physical processes; extending models and parameterizations to the global scale.

The modelling path should start out from the best physiology and best basic principles we have. But the model itself should not try to incorporate these principles explicitly. Rather, the aim should be to determine and incorporate the "appropriate" level of detail, and to minimize the difference between the detailed model and its efficient approximation - whether we are aggregating species, size classes (for sinking

particles or dissolved organic matter for example), or parameters and functions of a detailed model of internal workings. Parameterizing a model in one region of the ocean based on experimental work in another region is more likely to succeed of the extrapolation uses basic principles rather than empirical summaries.

A model agreed by the scientific community may be, at the moment, a less useful

goal than a community modelling approach. Such an approach might be achieved through a modelling workbench - a set of computer programmes that simplify the construction of models to explore different scientific ideas and different ways to make compromises. As well as methods for simulating the solution of the evolution equations at the largest scale, there must be methods for collapsing the detailed knowledge of physiology into a

set of evolution equations that are efficient enough to be simulated. Work in aggregation theory that has developed in other disciplines needs to be applied here. Even if incorporation into fine resolution general circulation models is the ultimate goal, there is much to be learned from experiments in simpler physical settings, and there is a much wider modelling community with the resources to perform such experiments.

International Group of Funding Agencies

The International Group of Funding Agencies for Global Change Research met for the fifth time in Toulouse, France from 2-4 September. Representatives from 14 countries, the European Community, and ICSU, IGBP, WCRP (World Climate Research Programme) and HDP (Human Dimensions of Global Environmental Change) attended the meeting.

On the first day presentations were made of the different initiatives relating to regional networks, institutes and centres, in particular on the progress of START. A regional meeting in Japan was announced for December for which participation from science and government will be invited. The purpose is to hold a discussion on the setting up of a Southeast Asian Network for global change research. In September the EC will hold a meeting to discuss a possible initiative on its part for a European-African Network.

The director of the Global Change Observing System, Dr. Thomas Spence, briefed IGFA on the progress on the global climate observing system which is now in

its planning phase. Active involvement of the scientific community, cooperating in the internationally coordinated earth science programmes IGBP, WCRP and HDP was considered essential by IGFA. IGFA also drew the attention to the magnitude of the funding needed to set up and operate the system. Operational entities, existing and yet to be created, will have to play an important role especially in the long term, along with science funding agencies.

The second day was devoted to the resource needs of international global change research programmes. A major exercise is ongoing to create an overview of resources allocated in the countries participating in IGFA and compare these with the needs expressed by IGBP, WCRP and HDP. Major progress has been made in collecting the data. It is expected that early next year a first analysis of bottlenecks can be made. With regard to the funding situation of international scientific coordination activities, the funding of the Stockholm office of IGBP was especially noted. Suggestions were made

to address this problem for the longer term, and possible solutions for the short term.

A permanent item on the agenda of IGFA is the discussion on ways to foster the development of programmes for socio-economic and human dimensions research relevant to global change. The working group of IGFA will promote the development of research agenda for areas of common interest to the natural and the social sciences. Furthermore, it will address ways to strengthen the links between the HDP and national activities in these fields.

The next meeting of IGFA will take place in Taipei, Taiwan, from 29 September to 1 October 1993. This meeting will focus on the role of the industrialized Asian Pacific countries in global change research and in IGFA. Further points on the agenda include resource assessment, global observing systems, and socio-economic and human dimension research relevant to global change.

Report by John Marks

Announcements

New Regional Information Centres

The joint project of the International Association of Technological University Libraries (IATUL) and the IGBP on establishing Regional Information Centres has now been increased by five more centres, bringing the total list up to 50. We are particularly pleased to have enlarged

the audience for IGBP Reports by the addition of impressive specialised libraries in several different regions.

Chile

Ana Maria Prat, Librarian for Scientific Information, CONICYT, Casilla 29/V, Santiago. Fax: (56-2) 496 729, e-mail: amprat@uchcecvm (bitnet).

Colombia

Biblioteca Luis López de Mesa, Academia Colombiana de Ciencias Exactas, Físicas y

Naturales, Carrera 3a A No. 17-34, Piso 3, Apartado 44-763, Santafé de Bogotá 1, D.C. Tel: (57-1) 341 4805; Fax: (57-1) 283 8552.

Finland

Prof. Manfred Lange, Arctic Centre, University of Lapland, PO Box 122, SF-96101 Rovaniemi. Tel: (+538-60) 324 271; Fax: (+358-60) 324 270.

Philippines

Mrs. Lourdes T. David, Head Librarian, College of Science Library, University of

the Philippines, Diliman, Quezon City 1101. Tel: (+63-2) 97 12 65.

USA

Robert Conrad, Carbon Dioxide Information Analysis Center, Oak Ridge National Laboratory, Central Research Library, MS 6191, Bldg. 4500N, Post Office Box 2008, Oak Ridge, TN 37831. Tel: (+1-615) 574 6744.

New Member of the Scientific Committee for the IGBP



Professor Eric O. Odada

From October 1992 the Scientific Committee has a new member: Dr. Eric O. Odada. Professor Odada, of the Department of Geology at the University of Nairobi, is a geologist with special interest in the use of African rift lake sediments as palaeorecords. He is a member of the Scientific Steering Committee for the IGBP Core Project on Past Global Changes (PAGES) since 1990.

Call for Proposals for the IIASA Research Programme

The International Institute for Applied Systems Analysis (IIASA) in Laxenburg (near Vienna), Austria, is an interdisciplinary, non-governmental research institution sponsored by scientific organizations from 15 countries. Created in 1972 on the

initiative of the USA and the former USSR, its membership now includes 11 European countries, Canada and Japan. The Institute's overall goal is to provide objective, authoritative, timely and relevant information on environmental and societal change by means of international, interdisciplinary and non-governmental scientific studies for the benefit of the public, the scientific community, and national and international institutions. The programme of substantive and methodological research covers global and regional environmental and demographic issues and their interrelations; technological and economic developments; systems and decision sciences; and international negotiations.

Research theme

Within the Global Environmental Change research theme, IIASA now calls for proposals to carry out research on how global change will affect regions of the globe in distinct ways, depending *inter alia* on ecosystem characteristics, population density, economic activities, and land use. Policies for managing the consequences of global change for environmental quality on the regional level should take these varying characteristics into account. Global changes will aggravate some regional changes, while others could be compensated. Systems analysis can be used for integrated assessment of environmental consequences of global change at the regional level. For this research area the following question should be addressed:

How would environmental quality at a regional level evolve if material flows through society and environment change under various scenarios of socio-economic, population and energy developments?

To answer this question a policy-driven, integrated (air, water, soil, biota) assessment will be needed. The processes that lead to changes in material flows on the regional scale must be considered. These processes include developments of industry, agriculture, population, energy use and land use. The successful proposal will develop tools that can be used to carry out integrated assessment of major environmental problems. The integrated assessment can be used for assisting policy advisors to fully explore the consequences of global change on the regional level using an interesting range of energy-population-economic scenarios (e.g. Intergovernmental Panel on Climate Change, Convention on Long-Range Transboundary Air Pollution, Rhine Commission).

Research Project

A successful proposal would receive significant resources adequate to support an international team of 5-7 senior scientists to

work at IIASA for a period of 2-3 years, starting between September 1993 and September 1994. Individual scientists participating in the team are expected to spend at least one year, but preferably more time, in residence in Laxenburg, Austria.

The proposals should, of course, be of high quality, originality and relevance. They should include both multiple disciplines and multiple nationalities in the composition of the scientific team. Proposals should be submitted to IIASA's Director before December 15, 1992. Review of the proposals will take place in January 1993 by the global Environmental Change Steering Committee. It is planned that unsuccessful applicants will be informed shortly thereafter.

The proposed project should be designed to produce publishable results in 1-3 years. It is anticipated that projects of this size would hold 1-2 conferences and a larger number of workshops during the course of the project.

Applications

Information should include:

1. A short description of the policy issues to which this project responds
2. The scientific issues and questions to be addressed
3. The four major products expected from the project
4. A project time-line
5. For each Principal Investigator (PI): a 2-page CV, a list of five publications relevant to the proposed project, a list of the five most significant publications, and a list of three references (name, address, telephone number).
6. A statement on the applicants' skills in managing projects in an international setting and participating in collaborative projects
7. A budget including: number of person months to be contributed by each PI; person-months for support staff; person-months for short-term visitors; and meetings to be held (including an estimate of the number of people to be invited and the length of the meeting).

Interested persons can obtain more information about IIASA and its Research Programme, as well as details of the application procedure, by contacting the IIASA Director at:

The International Institute for Applied Systems Analysis,
A-2361 Laxenburg, Austria. Tel: (+43-2236) 715210;
Fax: (+43-2236) 73147;
Telex: 079 137 iiasa a;
E-mail: dejanosi@iiasa.ac.at.

IGBP and Related Meetings

IGBP

1992

- 30 Sept-2 October, Durham, NH, USA
5th Meeting of the Scientific Committee for IGBP
- 8-9 October, Silsoe, UK
GCITE/IGBP-DIS Workshop on Global Soils Data Base
- 9-10 October, Kuala Lumpur, Malaysia
Southeast Asia Regional Committee for START
- 19-24 October, Taipei, Taiwan
JGOFIS Scientific Steering Committee
- 24-25 October, Schloss Weidenberg, Bayreuth, Germany
GCITE Scientific Steering Committee, followed by:
- 26-30 October, Schloss Weidenberg
Design and Execution of Experiments on CO₂ Enrichment. Dr. E.-Detlef Schulze, Department of Plant Physiology, University of Bayreuth, Universitätsstrasse 30, D-8580 Bayreuth, Germany. Tel: (+49-921) 55 25 70, Fax: (+49-921) 55 25 64
- 8-10 November, Sioux Falls, South Dakota, USA
IGBP-DIS Land Cover Change Working Group
- 16-18 November, Toulouse, France
BAHC Open Meeting (see page 7)
- 20-22 November, Niamey, Niger
START Standing Committee
- 23-27 November, Niamey, Niger
IGBP-HDP (Human Dimensions of Global Environmental Change Programme) African Regional Workshop (see page 4)
- 1-2 December, Tokyo, Japan
Asian Symposium on Global Environmental Change, in conjunction with the IGBP National Committees in Asia. (see box)
- 16-18 December, Canberra, Australia
IGBP-DIS Standing Committee

1993

- 19-22 January, Charlottesville, Virginia, USA
GCITE Workshop: Use of Functional Types in the Modelling of Global Change. Prof. Herman H. Shugart, Department of Environmental Sciences, University of Virginia, Clark Hall, Charlottesville, VA 22903 USA. Tel: (+1-804) 924 7642, Fax: (+1-804) 982 2137
- 24 January, Ensenada, B.C., Mexico
Scientific Committee for the IGBP
- 25-29 January, Ensenada, B.C., Mexico
SAC III: Third Meeting of the Scientific Advisory Council for the IGBP
- 30 January, Ensenada, B.C., Mexico
Scientific Committee for the IGBP
- 12-15 April, Pack Forest, Washington, USA
GCITE Focus 3 Workshop: Global Change and Forested Ecosystems
- 18-22 April, Eilat, Israel
IGAC Open Meeting
- 23-27 August, Trondheim, Norway
GCITE International Conference: Anticipated Effects

of Global Change on the Structure and Function of Terrestrial and Arctic Ecosystems. Jarle I. Holten, Coordinator, NINA, Norwegian Institute for Nature Research, Tungasletta 2, N-7004 Trondheim, Norway. Tel: (+47-7) 58 05 00, Fax: (+47-7) 91 54 33

Asia-Pacific Global Change Meetings

1-2 December, Tokyo, Japan

Asian Symposium on Global Environmental Change: National and Core Project Reports in the Asia-Pacific Region. The meeting will be chaired by Professor Masatoshi Yoshino, Aichi University. Contact: Secretary General of the Symposium, Dr. Shuzo Nishioka, Center for Global Environmental Research, National Institute for Environmental Studies, 16-2 Onogawa, Tsukuba, Ibaraki 305, Japan. Tel: (+81-298) 516 111, Ext. 380, Fax: (+81-298) 582 645.

3-4 December, Tokyo, Japan

The Government of Japan is organizing a workshop on the "Asia-Pacific Global Change Research Network" for the purpose of finding a way to develop an information network on global change research in the region. The workshop is scheduled to follow immediately the Asia-Pacific Global Environmental Change symposium on December 1-2. Contact: Mr. M. Namba, Scientific Affairs Division, Ministry of Foreign Affairs, Tokyo, Japan. Fax: (+81-3) 3597 7757.

IGBP-related Meetings

1992

- 27 September-11 October, Siena, Italy
Long-term Climatic Variations - Data and Modelling (NATO Advanced Study Institute). Prof. J-C Duplessy, Centre des Faibles Radioactivités, CNRS, Avenue de la Terrasse, F-91198 Gif-sur-Yvette, France
- 28 September-2 October, Kiel, Germany
The State of the Art in Ecological Modelling, Ecosystem Research Project Centre, Christian-Albrechts University, Schauenburger Strasse 112, D-2300 Kiel, Germany. Fax: (+49-431) 880 4083
- 5-8 October, Saint Malo, France
The Role of Regional Organizations in the Context of Climate Change (NATO Advanced Research Workshop). Dr. M. Glantz, National Centre for Atmospheric Research, Environmental & Societal Impacts Group, PO Box 3000, Boulder, CO 80307, USA
- 11-16 October, Davos, Switzerland
International Conference on Mountain Environments in Changing Climates. Martin Beniston, Director, ProClim - National Institute for Climate and Global Change, Box 7613, CH-3001 Bern, Switzerland, Fax: (+41-31) 21 32 91

13-17 October, Tsukuba, Japan
Disturbed Climate, Vegetation and Foods. Mr. S. Isobe, Secretary General, DCVF, National Institute of Agro-Environmental Sciences, 3-1-1 Kannondai, Tsukuba, Ibaraki 305, Japan.

25-29 October, Woods Hole, Massachusetts, USA
International Workshop on Biotic Feedbacks in the Global Climatic System. Working Group 1, Intergovernmental Panel on Climate Change. Shelagh Varney, IPCC WG1 Secretariat, Meteorological Office, Hadley Centre, London Road, Bracknell, RG12 2SY, UK. Tel: (+44-344) 856 888, Telex: 849801 weabka g, Fax: (+44-34) 856 912

26-29 October, Boulder, Colorado, USA
UN World Climate Impacts and Response Strategies, Scientific Advisory Committee

26-30 October, Beijing, China
Contribution to Global Change. Mr. A. Ghazi, Commission of the European Communities, Joint Research Centre, Rue de la Loi 200, B-1049 Brussels, Belgium. Fax: (+32-2) 235 0146.

28-29 October, Paris, France
CEOS Working Group on Data Policy. I. Revah, Centre National d'Etudes Spatiales, 2 pl. Maurice Quentin, 75039 Paris cedex 01, Fax: (+33-1) rt08 78 33.

2-6 November, Accra, Ghana
Toward Sustainable Environmental and Resource Management Futures for Sub-Saharan Africa. Prof. Walther Manshard, Schwarzwaldstr. 24, D-7812 Bad Krozingen, Germany, Tel: (+49) 7633 3488

11-13 November, Harare, Zimbabwe
Eighth Session of the Intergovernmental Panel on Climate Change.

30 November-2 December, Paris, France
Scientific Symposium on the Human Dimensions of Global Environmental Change. Human Dimensions of Global Environmental Change Programme, Pomaret 21, 08034 Barcelona, Spain. Fax: (+34-3) 417 9309.

5-11 December, Nairobi, Kenya
International Conference of the African Meteorological Society. Prof. L. Ogallo, c/o Principal, Meteorological Research and Training, P.O. Box 30259, Nairobi, Kenya

14-17 December, Madras, India
Indian National Symposium on the International Geosphere-Biosphere Programme. Dr. A P Mitra, FRS, National Physical Laboratory, Dr. K. S. Krishnan Road, New Delhi 110 012, Telex: 31-77384 rsd in, Fax: (+91-11) 575 2627

1993

24 January, Ensenada, BC, Mexico
ICSU Global Change Forum on Earth System Science

1-4 March, Taipei, Taiwan
COSTED-Asia Regional Meeting and Workshop on Environment and Sustainable Development. R. R. Daniel, Scientific Secretary, COSTED, 24, Gandhi Mandap Road, Madras 600 025, India, tel: (+91-44) 419 466; 416 614, Fax: (+91-44) 414 543; 411 589

Early 1993 (dates and venue to be announced)
East Africa
International Symposium on the Limnology, Climate