

International Group of
Funding Agencies for
Global Change Research
IGFA

Meeting Report No. 10

EC Joint Research Center
Ispra, Italy
October 26 - 29, 1998

The International Group of Funding Agencies for Global Change Research (IGFA) is an informal group of representatives of agencies and ministries of 21 countries and the EU, responsible for the funding of global change research. The purpose of the Group is to facilitate international global change research in the natural, social and economic sciences by bringing the perspective of these national funding agencies to strategic planning and implementation of such research.

IGFA's goals are:

- (i) internal communication about funding issues;
 - (ii) communication with the international organizations dealing with global research issues;
 - (iii) addressing specific issues related to global change research and its funding.
- Once a year IGFA has a plenary meeting

Additional copies of this report may be obtained upon request from:

The IGFA secretariat, c/o The Research Council of Norway

P.O. Box 2700, St. Hanshaugen

OSLO N-0131

Norway

tel.: +4722037207

fax: +4722037278

E-mail: igfa@forskningsradet.no

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Table of Contents

Executive summary.....	1
1. Opening session.....	2
2. National presentations.....	2
3. The state of WCRP.....	3
4. The state of IGBP.....	4
5. IHDP and human dimensions.....	5
6. Science-policy interaction.....	8
7. Biodiversity.....	9
8. Global change and health.....	11
9. Data and observations.....	12
10. Regional perspectives and collaboration with Aid Agencies.....	14
11. Funding issues.....	15
12. Resource assessment.....	16
13. Organizational matters.....	17
14. Tour-de-table.....	17
Appendices:	
a. Agenda.....	19
b. List of participants.....	21
c. Review of IHDP.....	27

EXECUTIVE SUMMARY

In its 1998 plenary meeting representatives of 20 IGFA members and the international global change programmes WCRP, IGBP and IHDP exchanged information on the funding of global change research and discussed the state and developments in the international GC research programmes. Throughout the meeting research on biodiversity and human health impacts were addressed as 'horizontal' themes. Representatives from DIVERSITAS and of the GC and health community attended the meeting.

From national presentations it emerged that the overall funding level of global change research looks stable. A tendency was noted that the interest in regional issues is increasing. Also, there is a trend towards an integrated approach to global change issues.

The programmes WCRP, IGBP and IHDP are well under way. WCRP is about halfway through and faces the start of the major new project CLIVAR. IGBP is moving into a new phase with emphasis on synthesis and integration to be carried out by new crosscutting activities. The progress of IHDP has been reviewed. It was concluded that IHDP has developed very well and is fulfilling an important role by integrating national and regional research.

IGFA was briefed on the status of research on biodiversity and human health impacts of global change. DIVERSITAS was recognized as a major international global change research programme and was invited to interact with IGFA. IGFA decided to assist in activities aimed at international coordination of research on human health impacts of global change.

Considerable progress was noted in the collaboration with CEOS, WCRP and IGBP to develop the Integrated Global Observing Strategy IGOS and its pilot projects. IGFA will continue its involvement in the IGOS process.

IGFA discussed with representatives of the regional networks IAI, APN, ENRICH and START the situation of regional research in particular in developing countries. The three networks are developing well. IGFA members will keep looking for options to collaborate with aid agencies.

The report on the second Resource Assessment on funding levels in 1995 was discussed. The report indicates that overall funding levels match the total requirements, but funding is not yet sufficiently aimed at 'core' research of the international programmes despite a considerable shift from 'relevant' to 'core' research. The Resource Assessment is considered to be an essential activity of IGFA. It was decided to continue this activity aiming at funding levels in the year 2000.

1. OPENING SESSION

On behalf of the host of the meeting *Dr. Christian Patermann* welcomed the participants. He regretted that the arrivals on the previous day were in severe disorder due to the chaotic situation at the new airport Milan Malpensa.

(Note of the secretariat: and this chaos lasted at least during the rest of the week.)

The Director of the EC Joint Research Centre, *Dr. Winter*, welcomed the participants and gave an overview of the research programme at the JRC. The EC-JRC centres in Belgium, The Netherlands, Spain and Italy together have a staff of 3,000 people. The JRC at Ispra deals among other issues with environmental research contributing to the frameworks of IGAC, GCOS and LUCC. He extended an invitation to the participants to consider collaboration with the JRC.

The chair of IGFA, *Dr. John Marks*, remarked that this was the 10th plenary meeting of IGFA. He welcomed in particular the new representatives of Australia, Indonesia and New Zealand. The chair expressed the gratitude of IGFA to the EC Joint Research Centre for the preparedness to host this meeting of IGFA.

With regard to the agenda the chair noted that throughout this plenary meeting special attention would be paid to the issues of biodiversity and human health as 'horizontal issues'. In particular he welcomed the representatives of DIVERSITAS, *Prof. Michel Loreau* and *Dr. Colleen Skule Adam*, and *Prof. Tony McMichael* as representative from the GC & human health research community.

Michel Loreau and *Colleen Adam* gave a key note lecture on the status and mode of operation of the SCOPE programme DIVERSITAS. *Tony McMichael* first informed the meeting of his disastrous midnight experiences at Malpensa airport and then delivered a key note lecture on research on global change and health. The lectures are summarized in sections 7 and 8 of this report.

2. NATIONAL PRESENTATIONS

Members of IGFA were invited to present written communications on national developments with regard to the funding of global change research. These written communications are printed as a separate IGFA report.

The participants made short statements highlighting issues from the written national communications. Recent developments on national global change policy and GC research were reported. Information was presented on trends in funding policies on global change research. Special attention was paid to the position of research on biodiversity, on global change and human health and on data and observations.

The chair *Dr. Patermann* concluded that the national presentations were extremely useful and formed important sources of input to the further discussions.

In general the funding situation is quite stable with few reductions and some (sometimes considerable) increases. It is evident that the interests are moving towards regional issues, in particular mitigation and adaptation. This is not without risk for the basic global scale issues. A common trend towards integrated approach of different items was discerned. In many member countries biodiversity is recognized as a policy relevant research issue. The position of research on GC and human health was less clear. *Dr. Patermann* noted two weak points: (i) what about agriculture; and (ii) only a few countries referred to industrial involvement.

3. THE STATE OF THE WORLD CLIMATE RESEARCH PROGRAMME WCRP

The Director of WCRP, *Hartmut Grassl*, gave an overview of recent results, the state and the future of WCRP. In September 1997, the WCRP conference statement was presented to the Subsidiary Body for Scientific and Technical Advice of the UN- Framework Convention on Climate Change (FCCC), leading to the decision of the Third Conference of Parties in Kyoto on the development of observational networks for the climate system. In May 1998 a major conference on WOCE was held. The field phase was concluded with 90% of all planned sections completed through 8 years. The findings showed that in all basins the variability was stronger than expected.

The TOGA array of buoys and floats continued after TOGA and is now operational, which enabled prediction of the 1997/98 El Niño. Funding for arrays in the Indian Ocean and the Atlantic Ocean is thus easier. The Climate and Cryosphere (CLIC) Task Group is planning to enlarge ACSYS to a global scale project, considering that the cryosphere is an early indicator of and global player in climate change.

The START project CLIMAG aims to link IGBP and WCRP projects with users in order to improve the output of agriculture at strong climate variability. In December 1998 the start conference on CLIVAR will be held. The goals of the conference are (i) to ask national contributions to the implementation of CLIVAR, (ii) to identify gaps in knowledge, and (iii) to ask for efforts to fill the gaps. In the framework of GEWEX successful continental scale experiments were executed in America, Asia and Europe. Coupled hydrometeorological models are being developed. SPARC focuses also on the attribution of global change to causes. It was found that lower stratospheric cooling is rather a consequence of ozone depletion and only above 15-20 km altitude part of the cooling can be attributed to increased concentration of greenhouse gases.

Grassl mentioned the lack of glue money as a general problem in global change research, especially serious for IHDP and DIVERSITAS. Also for GCOS and the Climate Agenda there is lack of commitments by real sponsors. Specific problems for WCRP are that a global ocean observing system doesn't yet exist. The continued funding of the GEWEX office is endangered. *Grassl* expressed the wish that all funding agencies of countries are included in IGFA, also space agencies.

In the discussion it was considered that the intergovernmental structure of WMO is a benefit for WCRP. This would not work for the other programmes with low-budget sponsors like ICSU, UNESCO and UNEP.

CONCLUSIONS

WCRP is in very mature stage, producing very relevant scientific results and critical inputs to the work of IPCC and in the development of operational monitoring. IGFA members should support this work and assist in resolving funding problems that may arise.

4. THE STATE OF THE INTERNATIONAL GEOSPHERE-BIOSPHERE PROGRAMME IGBP

The executive director of IGBP, *Dr. Will Steffen* summarized the position of IGBP. The implementation started in 1990. The scope of IGBP is wider than just CO₂ driven climate change; it also includes change in biogeochemical cycles, land cover change and species extinctions (ecological complexity).

IGBP's implementation strategy is to integrate and synthesize research on these issues, to identify gaps, to prioritize research, to standardize methodologies, to organize model intercomparisons, to foster resource allocations (e.g. ship time distribution). IGBP's products are data, research tools, and integrated and synthesized results. As an example of the latter, in March 1998 a publication in *Science* was devoted to the global carbon cycle, underpinning the Kyoto protocol.

In the period 1998-2000 IGBP moves into a process of synthesis and restructuring. Phase II of IGBP will be aimed at "sustainability science" and a stronger regional perspective. *Steffen* illustrated the value of IGBP's synthesis by recent findings on different aspects of the carbon cycle. A series of workshops has been planned to execute the synthesis phase ending in 2000. In 2001 the open science meeting will present the results of the synthesis and will point towards the new challenges of Phase II of IGBP: the robustness of biogeochemical cycles, the nature of biodiversity and its interaction with Earth system functioning, and ways in which human activities can harmonize with the earth system.

Special items

At present all core projects are heavily involved in the synthesis. DIS is being reviewed. The International Project Offices are in reasonably good shape, in terms of both financial and human resources. The partnership with START concentrates on regional coordination, which will be of increasing importance. This needs further development.

Science-policy interaction

The results transfer project has been initiated to improve interaction between IGBP and the policy community. IGBP will develop policy-relevant papers and, in particular, will continue to expand the IGBP science series. The results transfer project will be based on a questionnaire approach (in cooperation with IGFA).

CONCLUSIONS

IGFA members expressed their appreciation for the development and the ambitions of IGBP. IGBP has entered an exciting new phase of synthesis and integration. IGBP is organizationally and even financially in a rather healthy state, although the long-term stability of funding and the special needs of the synthesis project remain a concern. IGFA members should assist in maintaining this situation by addressing problems at an early stage. IGFA is prepared to cooperate with IGBP on the issue of science-policy interface, in particular the results transfer project.

5. THE INTERNATIONAL HUMAN DIMENSIONS PROGRAMME IHDP

Review of IHDP

According to the decision of the IGFA plenary in Tucson *Prof. Uno Svedin and Dr. Andrew Sors* have undertaken a review of the IHDP in the light of the expectations IGFA had formulated in Kyoto in 1995. The report of this review was tabled, together with a letter of *Uno Svedin* and the chair of IGFA. The overriding conclusion of the report is that the IHDP is now developing along a promising line which has the potential to allow human dimensions research to play its legitimate role in global change research efforts. IHDP needs support *now* in order to be able to further develop its potential. The current inadequate level of funding from IGFA members and others may put at risk IHDP's continuing development and utility to the global and national research communities.

The IGFA working group on Human Dimensions

Uno Svedin, chair of the working group on Human Dimensions, explained that last year the focus was on the review document. Now other issues need to be addressed, in particular the development of a document on the changes in the field of human dimensions topics. This requires the input of other IGFA members. IGFA members are invited to propose members who will work intersessionally with the Chair to complete the above tasks. The group will preferably work by e-mail *).

The state of IHDP

The chair of the SSC of IHDP, *Prof. Eckhart Ehlers*, summarized the goals of IHDP: to coordinate human dimensions research on a globally comparative basis, based upon national programmes.

IHDP needs a great number of strong national HD research communities. The IHDP wants to promote synergy among national programmes; is developing new research priorities; and is linking researchers, policymakers and stakeholders. The programme is creating footholds in the national research systems through a network of national committees (at present there 28 NC).

*) The Staff Group recommends that such a group is called 'Contact Group'.

LUCC is a mature project which IHDP is now really co-managing with the IGBP. The COP in Kyoto has pushed LUCC in new directions: carbon cycles, sources and sinks.

There is strong support for the IPO, but focus offices are still a problem. The Institutional Dimensions of GEC project is completing its science plan. The Human Security project is dealing with health, food, livelihood, addressing such issues as vulnerability, resources, population and migration. Links exist with institutions.

The Industrial Transformation project deals with macro systems and incentive structures; production systems; and the consumption system. The IT project has held 8 regional workshops to scope the issue in different regions. In February 1999 there will be an open science meeting in Amsterdam.

The main challenges for the IHDP are:

- to develop links with national committees;
- to develop links to developing countries through START;
- to respond to the ICSU request to address the issue of health;
- to develop a directory of funding opportunities for developing country scientists.

The funding position of IHDP is a matter of great concern. So far, there are two main sponsors: the German Ministry of Education and Science BMBF and US-NSF. The University of Bonn provides in-kind support. The core funding from BMBF is coming to an end in 1999. IHDP has the moral support of 120 countries, so it cannot be that continuation of the existence of IHDP depends on only 3 sponsors. *Ehlers* emphasized that support can be given in various forms, such as seconding staff members in the IPO, sponsoring workshops and publications, etc.

Ehlers asked IGFA members:

- whether they approved IHDP's directions, activities and approach;
- to support IHDP, in particular with financial commitments;
- to view IHDP as an equal partner like WCRP and IGBP.

Ehlers thanked *Larry Kohler* for all his efforts during his two years term as executive director, and *Hartmut Grassl* for his support for IHDP.

In the discussion the executive director of IHDP, *Larry Kohler*, explained that the target funding level for all three core projects of IHDP is at 1 M USD. The present funding level is 500 k USD. There are strong commitments from Sweden, Canada and the Netherlands. At present 48 countries are providing contributions.

Kohler thought it unrealistic to aim at regular membership fees according to UN rules; rather, effort should be aimed at expansion of the current system of voluntary membership fees.

The chair *Johannes Karte* noted that IGFA's central role is at stake.

The German representative of BMBF, *mrs. Annelise Bohn* informed IGFA that another 3 years funding of the office was in preparation.

The US representative *mrs. Hilleary Everist* judged the progress of IHDP as considerable and called upon other IGFA members to increase support.

Several members of IGFA and the representatives of WCRP and IGBP expressed that IHDP has achieved outstanding results in only 2,5 years. It was noted that the feeling of IGFA was more positive than was expressed in the review. Several members expressed their intention to continue or increase their funding efforts for IHDP.

A break-out session on Human Dimensions resulted in the following recommendations:

1. *On the review of IHDP*

IGFA should adopt the conclusions and recommendations of the review.

On the basis of the presentation of the director of IHDP and the reaction to the review by the chair of the SSC, there is consensus in IGFA that::

- IHDP is developing fast and is addressing important questions in HD research;
- The potential of the IHDP to achieve interesting scientific results which are relevant to society is very high;
- IGFA fully supports the strategy of IHDP to (i) integrate national/regional HD research, and (ii) to develop a limited set of core programmes;
- In the light of this it is urgent that IGFA members take action on the funding of HD research and of the coordination tasks of IHDP.

2. *On the funding situation*

- The chair should send a letter to IGFA members reporting on the discussion in Ispra and urging agencies to respond on their funding possibilities and intentions in multi-annual perspective before 1 December; also small contributions are valuable;
- The staff group should make an inventory of the funding possibilities;
- IHDP is invited to develop a 3 or 4 level indicative contribution scale for voluntary contributions.

3. *On the HD Working Group agenda*

The working group is invited:

- to develop the IGFA presentation in the IHDP conference in Shonan Village (Japan) in June 1999;
- to prepare the document on changes in the field of human dimensions on the basis of the material presented in Shonan Village and to report to the IGFA 1999 plenary.

IGFA members should offer their assistance in setting up national IHDP committees.

National presentations in 1999 should focus on particular national strengths in HD research.

CONCLUSIONS

IGFA agreed upon the review, the recommendations of the review and upon the above recommendations resulting from the break out session. The positive judgment of IHDP's performance should be translated into adequate funding levels. Initial reactions were given to the question of funding levels. It was decided to aim at completing the consolidated IGFA response on funding levels by the end of the year. The review report is attached as appendix d.

6. SCIENCE-POLICY INTERACTION

In Tucson 1997 IGFA members informed the plenary meeting about national strategies and activities aimed at bringing results of science and their implications for policy to the attention of the policy sector and the public at large. A wide variety of mechanisms for interfacing were identified.

The scientific basis for providing the information needed by policy makers is developed in the international global change research programmes. In addition more focused research for policy is needed, in which integrated assessments are a valuable tool. In participating in interactions with policy makers and the public it is important that scientists explain limitations and uncertainties. Examples of problems in the interface were mentioned: the unsound initial scientific basis of the Biodiversity Convention; lacking coordination between ministries; and the time lag between steering by science policy and the production of policy relevant results.

A number of developments were noted.

- Traditionally SCOPE has played a prominent role in synthesizing scientific results;
- IGBP has now embarked on a programme of synthesis and integration of the research results. In a pilot project IGBP/GCTE is actively transferring the science results to the policy community, soliciting feedback on policy needs in the process;
- At the initiative of Japan an OECD workshop took place on 4-6 March 1998 in Stockholm on the interface between science and policy in global scale issues. The OECD Megascience Forum is considering what follow up it will give to the workshop. In particular it intends to bring recommendations to the OECD ministerial meeting in 1999.

In the light of the recommendations from the workshop, both with regard to the cases and the general recommendations, IGFA reflected on the possible role of IGFA agencies.

As concrete areas for action of science funding agencies were identified:

- to provide glue money to support synthesis and integration of scientific results of global change research;
- to establish links at the national level with ministries and agencies with policy responsibility in these areas.

CONCLUSIONS

IGFA members should explore the feasibility in their country of the mechanisms that were highlighted in Ispra (e.g. briefing sessions for the political level by high level scientists; regional meetings with stakeholders: involving “clients” in steering groups for research programmes).

IGFA welcomes the ‘results transfer project’ as a concrete experiment in science-policy interactions. IGFA members should, at the request of IGBP, help in distributing and obtaining responses to the questionnaire which will be distributed.

IGBP’s offer to provide briefing material for IGFA members is welcomed.

7. BIODIVERSITY

IGFA has decided that biodiversity and the international programme DIVERSITAS should be a major theme in this meeting. Representatives of this area of research were invited. Members of IGFA were invited to highlight this area in their national presentations.

In her key note lecture, the director of DIVERSITAS, *Dr. Colleen Skule Adam* explained that DIVERSITAS acts as an umbrella over national activities with the goal to stimulate ongoing activities, to eliminate duplication, to foster coherence and to synthesize results. DIVERSITAS was founded in 1991 and is sponsored by IUBS, SCOPE, UNESCO, IUMS (Microbiological Sciences), ICSU and IGBP. The programme contains five Core Elements plus five Special Target Areas of Research (STAR). National committees should be established, linking policy, science and industry. An International Biodiversity Observation Year IBOY will be in 2001, focusing on the questions:

- what do we have;
- what have we lost;
- why are we losing global biodiversity;
- what implications do these losses of biodiversity have.

Prof. Michel Loreau discussed the (potential) interactions between global change and biodiversity and human societies. He argued that simple model experiments already show that under global change unexpected interactions between diversity and vegetation and soil/ decomposers may occur (influencing the C-fluxes and land use).

Loreau mentioned potential links between GC-research and biodiversity research.

In the discussion IGFA noted that the definition of biodiversity varies.

It was also noted that the degree of integration varies, but this appears to be due to definitions rather than substance.

It is acknowledged that biodiversity is important at the policy level (national and international) and at the science level.

From both funding agency and programme perspective the trend is towards integration:

- “environment as a habitat”;
- focus on:
 - . ecosystem functioning
 - . trends in change
 - . driving forces
 - . vulnerability
 - . socio-economic implications.

Loreau expressed concern about the unstable year-to-year funding of the secretariat of DIVERSITAS.

A break-out session was held on Biodiversity, concluding that DIVERSITAS should be adopted by IGFA.

The plenary discussion resulted in the following conclusions and recommendations:

Biodiversity and developing countries

Ecosystems and biodiversity preservation/use in developing countries is a theme of several countries.

Biodiversity and observing systems

It is difficult to count species by satellite, but much work on habitat and land use/cover change is relevant, e.g. the IGBP land cover map and vegetation map.

Biodiversity and policy

- The statement of the Megascience Forum was endorsed:
“Ecosystem goods and services provide the life support for all life on Earth. As species are lost and ecosystems degraded, the functioning of all systems is changed and the delivery of ecosystem services and goods is impaired”;
- Climate change and ozone problems are related to ecosystems and biodiversity in an ‘Integrated Earth and Human System’.

CONCLUSIONS

IGFA recognizes DIVERSITAS as a major international global change research programme and considers its role important. IGFA invited DIVERSITAS to interact with IGFA similar to WCRP, IGBP and IHDP. IGFA invites DIVERSITAS’ presence at IGFA meetings for information on programme progress and specific issues.

It was noted with interest that DIVERSITAS plans to approach (inter)national industries for (inter)national involvement in the programme.

8. GLOBAL CHANGE AND HEALTH

IGFA had decided that research on global change and health should be a major theme in the meeting. A representative of this area was therefore invited to participate. Members of IGFA were invited to highlight this theme in the national presentations.

In his key note lecture, *Prof. Tony McMichael* noted that the traditional view on environment and health focuses on toxic chemicals and radiation. However, globally environmental stress on life support systems has greater impact. Relevant issues are systematic environmental changes: climate, ozone, geochemical cycle and loss of biodiversity. Research on Environment and Health is still in its infancy and a major international research programme does not yet exist.

Forward-looking science is needed on the direct impacts of physical environmental change, of ecological changes, of demographic displacement and social disruption. The interactions and synergies between these issues are complicated and may reinforce the impacts of changes.

McMichael illustrated the relevance of such issues by noting the increase of cholera by consumption of sea food during El Niño, outbreaks of malaria the year after El Niño, and the model on skin cancer incidence. The funding mechanisms offer ample opportunity for the type of research needed in the area of GC and Human Health. Currently, initiatives on GC and human health are on the agendas of the EC Fifth Framework Programme, WHP Rome, IAI and the Canadian GC Programme. Additionally, linkages are possible with UNEP, the World Bank and the CoP.

Optional relations with IHDP may exist in links by humans as cause, modifier and victim of GC. *McMichael* suggested to expand the EU FP-5 item Environmental Hazards to Environment as Habitat.

In the plenary discussion several IGFA members noted that the issues of health are closely related to their national priorities. To foster the creation of an international programme other (parts of) funding agencies should be involved.

It was noted that both for biodiversity and human health, the funding of research in developing countries is an important issue.

Last year IGFA knew very little about the issue, apart from ad-hoc activities. Now we realize that there is a dynamic ongoing development. Clusters of interest are emerging at regional and international level.

Health and developing countries

Health is often a major focus and of great relevance in developing countries, but this may not yet be regarded as related to global change impacts. Maybe awareness is still insufficient.

Health and observations

Information is crucial. It has been demonstrated that there may be a link between cholera outbreaks and sea surface temperature.

International scientific networks

IPCC has health impact review panels.

IHDP/ICSU project on global change and health.

Europe:	Climate change and health network in WHO (Rome) and ENRICH group;
Americas:	an IAI network (5 countries) is proposed. NAS made an assessment on climate change and health;
Asia Pacific Network:	the situation is unknown;
Australia-New Zealand:	informal network on climate change and health;
Africa:	informal network (e.g. Highland Malaria Project).

An international coordination centre is possible. Currently there is coordination of 20 scientists in a Pan-European Working Group on global change, ozone depletion and health impacts in Europe.

A break-out session on GC and human health was held.

A summary of the discussion was presented to the plenary which contributed to the conclusions.

CONCLUSIONS

IGFA members recognize the relevance of the health issue in global change research.

IGFA takes note of plans to develop an agenda through the ICSU/IHDP project and various other initiatives (WHO, IAI, ENRICH).

IGFA members could assist by helping to identify researchers in their countries and by investigating the position of national funding bodies on this issue (e.g. Medical Research Councils) and report back.

9. DATA AND OBSERVATIONS

The main interests of IGFA in the area of Data and Observations are (i) data availability and accessibility and (ii) the interaction with CEOS and the G3OS sponsors in the development of an Integrated Global Observation Strategy (IGOS). IGFA is concerned about the deterioration of the existing observation networks and data sets.

IGFA members informed the meeting of ongoing activities in their countries with regard to data availability and access.

- IGFA recognizes the need for a strategic framework for global observing systems for decisions and resource allocation;
- IGFA encourages the development of mechanisms for the transition of capacity from research to operational;
- IGFA underlines the importance of in situ observations in their own right.

The initiative taken by CEOS to develop an integrated observing strategy IGOS is considered extremely important. IGFA is committed to work together with CEOS and the G3OS sponsors on IGOS.

In order to achieve the objectives of an IGOS, actions are necessary at three levels:

- create a strategic partnership of senior representatives of G3OS sponsors, CEOS, IGFA and others;
- develop IGOS and pilot projects;
- bring together at the national level agencies and ministries with (partial) responsibility for observations;

The G3OS should build upon the results from the programme elements of the international global change research programmes: e.g. CLIVAR, JGOFS, WOCE. The pilot projects should primarily bring together existing elements in the G3OS. The present set of pilot projects comprises:

- global ocean data assimilation experiment;
- upper air measurements;
- long-term continuity of ozone measurements;
- global observation of forest cover;
- long-term ocean biology measurements;
- disaster management.

The pilot projects are a mechanism to develop and illustrate the coherence of what already exists and to demonstrate the usefulness of data, rather than obtain money for new developments. This should lead to awareness of governments, (in particular of those parts with responsibility for the Conventions) of the importance of global observations for Global Change research and policy; it will facilitate the planning of funding agency support for integrated space and in situ observations.

Progress in the development of the pilots is very mixed. One concern is that the pilots should not develop into new projects in their own right, competing for funding with existing activities. The role of the pilots in demonstrating the added value of IGOS should be closely watched.

In Tucson IGFA decided that its working group on data and observations should take a proactive role in:

- working jointly with CEOS and the sponsors of G3OS on the development of an IGOS;
- bringing to the attention of governments the importance of global observations for research and policy;
- assisting in the transfer of observational capacity from research to the operational domain.

The Chairs of the working group and of IGFA have participated in several meetings of CEOS and of the partners for the global observing systems. It has not been possible to put in place an active working group, though some offers for participation were received. The Chair of the working group needs more support. Given the commitment to participate in the IGOS development which IGFA made in its last meeting IGFA must put in place an active working group *).

A break-out session on data and observations was held.

A summary of the discussion was presented to the plenary.

CONCLUSIONS

In the past year considerable progress has been made in developing the partnership between the sponsors of the global observing systems, CEOS, IGFA, IGBP and WCRP. It is strongly encouraged that IGFA continues to participate and to cooperate with CEOS and others on both IGOS and the Pilot Projects. It is encouraged that continued work be supported by strong leadership by IGFA: the chair or a senior point of contact to work with interested parties from member countries. It was decided to exchange letters of commitment between the partners in order to confirm the mutual intentions. IGFA reconfirmed the agenda for the Data and Observations working group. The working group should be reinforced.

10. REGIONAL PERSPECTIVES AND COLLABORATION WITH AID AGENCIES

A focused round table discussion was held on the participation of developing countries in the international global change programmes, and the roles in this respect of the regional networks, START, IGFA member agencies and Aid Agencies.

The regional networks aim to develop regional collaboration, usually between developed and less developed countries, supporting regional research and capacity building. Development Aid agencies are more interested in capacity building in the framework of the Conventions than in the global scale research on global change issues (particularly those issues with long-term perspectives). Aid agencies usually require that research addresses policy needs in the developing countries and that the developing country identifies the research as a priority in its development relation with the donor country.

An example of the role of Aid agencies is the multi-donor initiative of the Danish and Dutch Aid agencies in response to a proposal by START. The Kyoto protocol of the Climate Convention provides a strong justification for aid agency involvement. IGFA member agencies sometimes fund research projects in developing countries, but usually have no specific mandate to fund capacity building. The Dutch WOTRO foundation provides an example of science funding agency involvement in research in developing countries.

Brief introductions were given by APN, IAI, ENRICH and START. Issues relevant for contribution from IGFA members were:

- Fund raising ((science) funding and aid agencies);
- Spreading information, including information about opportunities;
- Facilitating the involvement of aid agencies;
- Facilitating co-operation with other organizations/programmes;
- Multidonor effort.

Both funders of science and aid agencies should contribute to the regional networks

The national presentations reveal that the level of co-operation between the two types of agencies varies from country to country. *Lou Brown* has continued his effort to improve the collaboration with the aid agencies.

Conclusions

It is a necessity to support global change science in developing countries.

IGFA concluded that the three regional networks and START were developing well.

IGFA members are encouraged to continue exploring the possibilities for synergistic cooperation with the aid agencies in support of capacity building. In particular they could assist in the follow-up to the START Multi-Development Aid Agencies donor proposal. IGFA should explore the potential for interaction with the working party for the environment of the OECD development assistance committee and if useful, invite its chair to a next IGFA meeting.

Lou Brown is asked to continue his effort. The staff group is asked to assist him. Members of the contact group may be used as reference persons via e-mail etc.

11. FUNDING ISSUES

As background material for this item served the statement on IPO funding, agreed upon in Oslo 1996 and the concept of Glue Money, adopted in Tucson 1997 and described in Annex III to the Tucson report. In the introduction of this item the statements on this matter in the National Presentations were summarized.

The Directors and Chairs of the international Global Change research programmes prepared a discussion note for consideration. As a further background information IGBP has prepared an overview of the funding situation of its IPO's.

The following issues were discussed:

- Should IGFA extend the IPO funding procedure, i.e. with an initiative role for a principle funding agency, to the funding of the central secretariats? What are the implications of such an extension?
- IHDP (and DIVERSITAS) at present have no system of national contributions. Is this mechanism, which works for IGBP, feasible for the IHDP and DIVERSITAS? What alternatives do IGFA members see?

It was remarked that contributions could increase a feeling of 'ownership'. As an example the ESF mechanism was mentioned, which requires contribution (in general about 20 k USD/year) for participation in an ESF science programme.

Johannes Karte considered that the glue funding is low compared to other overheads. The benefits should be recognized. He proposed to investigate all existing funding options of its members and the agencies they represent; both the mechanisms and limitations;

- As described in the note of the directors and chairs, approaches for centralized funding contributions are being made by IGBP, IHDP, START, as well as increasingly by APN and IAI. How can funding agencies deal with these multiple approaches for the same sort of centralized funding?

CONCLUSIONS:

Generally, the funding position of WCRP and IGBP is in good shape. A major problem now is the funding of IHDP and DIVERSITAS. IHDP is moving onto full deployment and that requires more extensive and stable funding. IGFA members were urged to respond to the letter on the funding of IHDP. DIVERSITAS is operating in a different mode, but also suffers from lack of long term funding commitments. IGFA needs to think fundamentally about mechanisms for funding international science collaboration in the 21st century. IGFA agreed upon the proposal to investigate all existing funding options of its members and the agencies they represent, both mechanisms and limitations. It was reiterated that IGFA should be a platform for communication between funding agencies, and on problems which might be solved by co-funding with other agencies. The ICSU/UNESCO world science conference is a venue for a more philosophical discussion. The outcome may be useful for IGFA's further discussions and actions.

12. RESOURCE ASSESSMENT

The Resource Assessment is a core activity of IGFA, with the goal to quantify the funding level for global change research and trends in funding. The first resource assessment was focused at funding levels in 1992. The second focused on 1995 levels.

The assessment deals on one hand with the funding levels for research and on the other hand with the funding requirements for research according to the international project offices. A 'harmonization' meeting was held in Potsdam, Germany, August 1997. The final report on the second Resource Assessment was published shortly before the meeting. This report is the result of a comprehensive activity which was funded and coordinated by Germany (BMBF and DLR). In the plenary meeting in 1997 IGFA discussed the preliminary results and the process to finalize this exercise. Several members expressed the opinion that the 2nd resource assessment has been too labor intensive at the national level.

Now this assessment has been finished it was discussed how to proceed with the Resource Assessment. The Steering Committee suggested that a new Resource Assessment should be considered, focusing at the funding levels in 2000. That would mean that by early 2000 the process should be re-started. It was proposed that the IGFA Staff Group should take responsibility for the process, supported by a full time coordinator. With regard to the coordination it was suggested to ask the Swiss ProClim office to take the lead.

After the considerable efforts Germany has spent for the now finished Resource Assessment a new commitment is needed. It is considered that it would be possible to have a new exercise co-funded by several IGFA members. The costs of coordination of a new Resource Assessment were estimated to be 2 man-years (100 kUSD/my) and 2 workshops (50 kUSD each).

CONCLUSIONS

The report on the Resource Assessment was considered an essential base activity of IGFA and useful, though misinterpretations by outsiders may still be possible. It was decided that a continuation will be focused at the funding levels in the year 2000.

IGFA agreed that the Staff Group should explore the options for a next assessment with assistance from the Swiss office ProClim.

13. ORGANIZATIONAL MATTERS

Chair and secretariat

The search committee nominated the Norwegian member from the Forskningsradet as the new chair and secretariat of IGFA. The nomination was fully endorsed by the meeting. *Kirsten Broch Mathisen* was appointed chair. *Terje Morland* will act as secretary and chair of the staff group with *Sissel Berger* as administrative assistant.

It was decided that the staff group will continue to assist the Steering Group and assume the responsibility for the resource assessment. *Ian Dwyer* (UK-NERC) will join the staff group. Members are invited to reinforce the contact group on Data and Observations.

Next meetings

IGFA accepted the offer from NAS (China) to host the next plenary meeting in Beijing, 25-29 October 1999.

The Swiss representative indicated that SNSF might be prepared to work with the chair to explore the possibility of hosting the 2000 meeting.

The members are invited to suggest options to host the 2001 plenary meeting.

14. TOUR-DE-TABLE

Before concluding the meeting a tour-de-table was held in which IGFA members commented on the meeting.

Almost all participants stressed the value of IGFA as a forum for the exchange of information. The national presentations fulfil a valuable role in this. Concrete questions to be addressed in these presentations should be sent out well in advance, so that proper preparation can take place. Health and biodiversity are important issues on the global change agenda. IGFA should keep them on its agenda. Several members stressed the importance of human dimensions issues. With regard to the meeting structure and schedule, there was a consensus that the meeting was extremely dense. Most participants preferred more parallel sessions on specific issues, with plenary reporting of their outcome, rather than extending the meeting. The importance of intersessional work was stressed by several members, as well as the need to disseminate the information from IGFA meetings nationally.

Appendix A
**Agenda plenary meeting of IGFA, 26-29 October 1998,
at the EU Joint Research Centre, Ispra, Italy**

Sunday 25th:

17:00 Joint Steering/Staff group meeting
18:00 *reception, buffet at hotel*

Monday 26th:

Session chair: **Patermann**

Rapporteur: **Morgan**

09:30 Opening / logistics / host
10:00 Introductions to new GC related issues (policy, science, funding):
- Global Change and Biodiversity (45 min) (Michel Loreau, Colleen Skule Adams, DIVERSITAS)
- Global Change and Health (30 min.) (Prof.dr. Tony McMichael)
11:15 *break*
11:45 National presentations (oral presentations by IGFA members, forward looking for IGFA general. 10 minutes per country)
12:30 *Lunch break*
14:00 National presentations
16:00 *break*
16:30 National presentations
18:00 *adjourn*
Dinner hosted by EU

Tuesday 27th:

Session chair: **Karte (Ge)**

Rapporteur: **@**

09:00 Summary of national presentations
09:30 Human Dimensions issues
10:30 *break*
11.00 WCRP science / organisation and infrastructure /
12:00 IGBP regional perspectives
13:00 *lunch break*

15:00 EU-presentation
18:00 *adjourn*
No evening programme will be arranged

Wednesday 28th:**Chair:** Corell**Rapporteur:** Brown

09:00 IHDP science / organisation and infrastructure /
regional perspectives

10:00 science policy interface (Marks, Corell)

10:45 *coffee break*

11:15 Data and observations

12:30 *Lunch break*

Chair: Broch Mathisen**Rapporteur:** Morland

14:00 Funding issues:

- glue money
- IPO funding
- issues to be raised by IHDP/IGBP/WCRP/DIVERSITAS

15:00 Aid agencies working group and introduction on regional perspectives

15:30 *break*

16:00 Regional perspectives and collaboration with aid agencies

18:00 *adjourn*

buffet in hotel

21:00 Meetings of Staff group & Ad Hoc Drafting Groups (IGOS ad hoc
Group)

Thursday 29th:**Chair:** Marks**Rapporteur:** de Boois

09:00 The future of the Resource assessment

09:30 Biodiversity (Patermann/Morgan)

10:00 Health (Patermann/Morgan)

10:30 *Coffee break*

11:00 Reports from break-out groups
conclusions of the meeting

11:45 Tour de Table

12:45 New chair and secretariat / next meeting

13:00 *End of plenary meeting / adjourn*

Lunch

14:00 Steering Committee / Informal meetings

15:00 End

Appendix B
List of Participants**AUSTRALIA**

Robyn Graham
 Director, Science Coordination
 Office of the Chief Science Adviser
 Environment Australia, 3rd floor, IBM
 House
 8, Brisbane Avenue,
 BARTON ACT 2600
 Australia
 Tel.: 0067262172045
 Fax: 0067262172028
 E-mail: robyn.graham@ea.gov.au

AUSTRIA

Irene Gabriel
 Dept. of Ecosyst. Research
 International Research Cooperation
 Ministry of Science and Transport
 Rosengasse 4
 VIENNA A-1010
 Austria
 Tel.: +431531207153
 Fax: +431531206480
 E-mail: irene.gabriel@bmf.gv.at

Günter Köck
 Institute of Zoology and Limnology
 University of Innsbruck
 Technikerstrasse 25
 INNSBRUCK A-6020
 Austria
 Tel.: +435125076196
 Fax: +435125072930
 E-mail: guenter.koeck@vibk.ac.at

BELGIUM

Martine Vanderstraeten
 Advisor for Scientific Affairs
 Federal Office for Scientific,
 Technical and Cultural Affairs
 Rue de la Science 8
 BRUSSELS B-1000
 Belgium
 Tel.: +3222383411
 Fax: +3222305912
 E-mail: vdst@belspo.be

CANADA

Elizabeth Boston
 Natural Sciences and Engineering
 Research Council of Canada

Constitution Square, Tower II
 35, Albert Street
 OTTAWA ON K1A 1H5
 Canada
 Tel.: +16139955695
 Fax: +16139925337
 E-mail: erb@nserc.ca

France Landriault
 Director Division of Policy, Planning &
 International Relations
 Social Sciences and Humanities
 Research
 Council Canada
 P.O. Box 1610
 OTTAWA, Ontario K1P 6G4
 Canada
 Tel.: +16139925125
 Fax: +16139921787
 E-mail: fla@sshrc.ca

CHINA, TAIPEI

Chin-Hong Sun
 National Science Council
 #200, 106, Sec. 2 Heping E.Rd.
 TAIPEI
 China
 Tel.: +886227377339
 Fax: +886227377071
 E-mail: chsun@ccms.ntu.edu.tw

GERMANY

Anneliese Bohn

Johannes Karte
 Programme Director for Earth Sciences,
 Environment Research Coordinator
 Deutsche Forschungsgemeinschaft
 Kennedyallee 40
 BONN D-53175
 Germany
 Tel.: +492288852319

Fax: +492288852777

ICELAND

Halldor Thorgeirsson
Head of Division
International Affairs
Vonarstraeti 4
REYKJAVIK IS 150
Iceland
Tel.: +3545609600
Fax: +3545624566
E-mail: halldor.thorgeirsson@umh.stjr.is

INDONESIA

Indroyono Soesilo
Agency for the Assessment and
Application of Technology - BPPT
Deputy Chairman for
Natural Resources and Development
2nd building, 19th floor
Jl. M.H. Thamrin no. 8
JAKARTA 10340
Indonesia
Tel.: +62213168830
Fax: +6221396225
E-mail: tien@nimbus.upthb.bppt.go.id

Tien Sribimawati
Agency for the Assessment and
Application of Technology - BPPT
BPPT Main bld. 19th fl.
Jl. MH Thamrin no. 8
JAKARTA 10340
Indonesia
Tel.: +62213168830
Fax: +62213906225
E-mail: tien@cumulus.upthb.bppt.go.id

Sri Woro Budiati Harijono
Agency for the Assessment and
Application of Technology - BPPT
2nd bld., 19th floor
Jl.M.H. Thamrin no. 8
JAKARTA 10340
Indonesia
Tel.: +62213168816
Fax: +62213906225
E-mail: sriworo@bppt.go.id

JAPAN

Hiroshi Kanzawa

Center for Global Environment Research
National Institute for Environmental
Studies
16/2, Onogawa, Tsubuka
IBARAKI 305
Japan
Tel.: +81298502431
Fax: +81298582645
E-mail: kanzawa@nies.go.jp

Kazuhiro Kitazawa
Special Staff
Division of Ocean and Earth
Science and Technology Agency
2-1-1 Kasumigaseki
TOKYO 100 Chiyoda-Ku
Japan
Tel.: +81335806561
Fax: +81335817442
E-mail: kitazawa@jamstec.go.jp

Eitaro Wada
Center for Ecological Research
Kyoto University
Shimosakamoto 4-1-23
OTSU 520-01
Japan
Tel.: +81775788055
Fax: +81775781436
E-mail: wadaei@ecology.kyoto-u.ac.jp

Osamu Mizuno
Environment Agency of Japan
1-2-2 Kasumigaseki, Chiyoda-ku
TOKYO
Japan
Tel.: +81335813422
Fax: +81335813423
E-mail: psamu-mizuno@eanet.go.jp

Funato Teruhisa
Ministry of Education, Science, Sport
and Culture (Monbusha)
3-2-2-, Kasumigaseki Chiyoda-ku
TOKYO 100-0013
Japan
Tel.: +81335812754
Fax: +81335037048
E-mail: teruhisa@monbu.go.jp

Takemasa Minemoto
Ocean & Earth Division
Research and Development Bureau
Science and Technology Agency
2-2-1, Kasumigaseki, Chiyoda-ku
TOKYO
Japan

Tel.: +81335806561
Fax: +81335817442
E-mail: tminemo@sta.go.jp

THE NETHERLANDS

Hans de Boois
Netherlands Organization for
Scientific Research, NWO
P.O. Box 93138
2509 AC THE HAGUE
The Netherlands
Tel.: +31703440752
Fax: +31703832173
E-mail: igfa@nwo.nl or boois@nwo.nl

Astrid van Esch
Netherlands Organization for
Scientific Research, NWO
P.O. Box 93138
2509 AC THE HAGUE
The Netherlands
Tel.: +31703440763
Fax: +31703819874
E-mail: igfa@nwo.nl or esch@nwo.nl

John Marks
Director, Research Council for
Earth and Life Sciences
Netherlands Organization for
Scientific Research (NWO)
P.O. Box 93138
2509 AC THE HAGUE
The Netherlands
Tel.: +3370440708
Fax: +33703832173
E-mail: marks@nwo.nl

Fred Eybergen
Ministry of Education, Culture and
Science
P.O. Box 25000
2700 LZ ZOETERMEER
The Netherlands
Tel.: +33793233409
Fax: +31793232080
E-mail: f.a.eybergen@minocw.nl

NEW ZEALAND

Colin Webb
Foundation for Research, Science
& Technology
P.O. Box 12240
Wellington
New Zealand
Tel.: +6444951800
Fax: +6444992568
E-mail: colin@frst.govt.nz

NORWAY

Kirsten Broch Mathisen
Chair of IGFA
Division of Environment and
Development
The Research Council of Norway
P.O. Box 2700
St. Hansaugen
OSLO 0131
Norway
Tel.: +4722037225
Fax: +4722037278
E-mail: kirsten.broch-mathisen@nfr.no

Sissel Berger
IGFA-secretariat
The Research Council of Norway
P.O. box 2700
St. Hansaugen
OSLO N-0131
Norway
Tel.: +4722037207
Fax: +4722037278
E-mail: sissel@berger@forskningsradet.no

Terje Morland
The Research Council of Norway
P.O. Box 2700
St. Hansaugen
OSLO N-0131
Norway
Tel.: +4722037280
Fax: +4722037278
E-mail: terje.morland@forskningsradet.no

SPAIN

Esteban Manrique
Departamento de Biología Vegetal II
Facultad de Farmacia
Universidad Complutense
Ciudad Universitaria s/n
28040 MADRID
Spain
Tel.: 34 91 394 1771
Fax: 34 91 394 1771
E-mail: emanri@eucmax.sim.ucm.es

SWEDEN

Uno Svedin
Director of Research
Swedish Council for Planning and
Coordination of Research (FRN)
Box 7101
STOCKHOLM 10387
Sweden
Tel.: +4684544123
Fax: +4684544144
E-mail: uno.svedin@frn.se

SWITZERLAND

Katja Remane
Swiss National Science Foundation
Wildhainweg 20
BERNE CH-2001
Switzerland
Tel.: +41313082222
Fax: +41313013009
E-mail: kremane@snf.ch

UNITED KINGDOM

Anthony J. McMichael
Dept. of Epidemiology and Population
Health
London School of Hygiene and
Tropical Medicine
Keppel Street
LONDON WC1E 7HT
United Kingdom

Ian Dwyer
Natural Environment Research Council
Global Change Coordinator
Polaris House
North Star Avenue
SWINDON SN2 1EU
United Kingdom
Tel.: +44793411511
Fax: +44793411584
E-mail: i.dwyer@nerc.ac.uk
Chris West
Natural Environment Research Council
Polaris House
North Start Avenue
SWINDON SN2 1EU
United Kingdom
Tel.: +441796411740
Fax: +441793411756
E-mail: c.west@nerc.ac.uk

UNITED STATES

Lou Brown
Directorate of Geosciences
CNRS
Daniel Vidal-Madjar
Deputy Director of Ocean and
Atmosphere
CNRS/INSU
3, Rue Michel-Ange
PARIS F-75116
France
Tel.: +33144964380
Fax: +33144965005
E-mail: daniel.vidal-madjar@cns-dir.fr

DIVERSITAS

Colleen Skule Adam
Executive Director of DIVERSITAS
c/o UNESCO MAB
1, Rue Miollis

National Science Foundation
4201 Wilson Blvd. Room 1070
ARLINGTON VA 22230
United States
Tel.: +17033061516
Fax: +17033060091
E-mail: lbrown@nsf.gov

Robert Corell
Assistant Director
Directorate for Geosciences
National Science Foundation
4201 Wilson Blvd., room 705
ARLINGTON VA 22230
United States
Tel.: +17033061500
Fax: +17033060372
E-mail: rcorell@nsf.gov

Hilleary Everist
Deputy Director
Division of Social, Behavioral and
Economic Research
National Science Foundation
5201 Wilson Blvd., room 995
ARLINGTON VA 22230
United States
Tel.: +17033061760
Fax: +17033060485
E-mail: heverist@nsf.gov

Cara Sucher
Global Change Research Program
400, Virginia Ave Sw, Suite 750
WASHINGTON DV 20024
United States
Tel.: +2023142221
Fax: +2024888681
E-mail: csucher@usgcrp.gov

PARIS 75015
France
Tel.: +33145684054
Fax: +33145686832
E-mail: c.adam@unesco.org or
diversitas@unesco.org

Michel Loreau
SSC DIVERSITAS
c/o Ecole Normale Supérieure - CNRS
CNRS-URA 258
46, Rue d'Ulm
PARIS Cedex 05 75230
France
Tel.: +33144323709
Fax: +33144323885
E-mail: loreau@ens.fr

European Commission

Steve Morgan
ENRICH secretariat
DG XII-d, SDME 7/23
8, Square de Meeus
B-1050 BRUSSELS
Belgium
Tel.: +3222994184
Fax: +3222963024
E-mail: steven.morgan@dg12.cec.be

Christian Patermann
Director Environment Programme
DG XII/D SDME 7/62
European Commission
Rue de la Loi 200
BRUSSELS 1049
Belgium
Tel.: +3222951815
Fax: +3222963024
E-mail:
christian.patermann@dg12.cec.be

IAI

Armando Rabuffetti
IAI Director
c/o INPE
Av. dos Astronautas, 1758 - Jd. da Granja
SAO JOSE DOS CAMPOS 12227-010
Brazil
Tel.: +551234566855
Fax: +55123414410

ICSU

Jean-Francois Stuyck-Taillandier
Executive Director of ICSU
51, Bd. de Montmorency
PARIS 750165
France
Tel.: +33145250329
Fax: +33142889431
E-mail: jfst.icsu@lmcp.jussieu.fr

Anne Larigauderie
ICSU
51, Boulevard de Montmorency
PARIS 75016
France
Tel.: 0033145250329
Fax: 0033142889431
E-mail: airies@airies.or.jp

IGBP

Will Steffen
Executive Director of the
International Geosphere-Biosphere
Programma
The Royal Swedish Academy of
Sciences
Box 50005

Lilla Frescativagen 4
STOCKHOLM S-104 05
Sweden
Tel.: +468166448
Fax: +468166405
E-mail: wst@igbp.kva.se (?)

IHDP

Eckart Ehlers
IHDP Chair
Univeristy of Bonn
Nussallee 15a
BONN D-53115
Germany
Tel.: +49228739050
Fax: +49228739054
E-mail: ihdp@uni-bonn.de

Larry Kohler
IHDP
Nussallee 15a
BONN D-53115
Germany
Tel.: +49228739050
Fax: +49228739054
E-mail: kohler.ihdp@uni.bonn.de

START

Roland Fuchs
Director of the International
START secretariat
2000, Florida Avenue, Suite 200
WASHINGTON DC 20009
United States
Tel.: +12024622213
Fax: +12024575859
E-mail: rfuchs@kosmos.agu.org

WCRP

Hartmut Grassl
Executive Director WCRP
CP 2300
41, Avenue Giuseppe Motta
GENEVA 2 CH-1211
Switzerland
Tel.: +41227308246
Fax: +41227340357
E-mail: grassl_h@gateway.wmo.ch

APPENDIX C

REVIEW OF IHDP

