

International Group of
Funding Agencies for
Global Change Research

IGFA

National Updates

Hotel Inter-Continental Zürich,
Zürich, Switzerland
October 22 - 26, 2000

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

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Print: GCS as

Copies: 300

Oslo, January 2000

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INTRODUCTION

22-26 October 2000 IGFA had its annual plenary meeting in Zürich, Switzerland.

Presentations on relevant developments in the countries have a prominent place on the agenda of the annual plenary meeting of IGFA. Representatives submit brief written communications and deliver brief oral presentations. The presentations give insight in the position of global change research on the national policy agendas, in the funding structures and trends in the funding of global change research in IGFA member countries.

Following the decision of the plenary meeting in Beijing in 1999 that a 'light' resource assessment should be held, the members were specifically asked to report on i) funding levels in 1999 and ii) national mechanisms for supporting integration and co-ordination of international co-operation in GCR ('glue money mechanisms').



AUSTRIA**Global Change Research**

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1. Funding levels for GCR

A) The total amount of funding global change research in 1999 cannot exactly be quantified, since we do not have an accounting system spanning the range of different funding agencies and different areas of research efforts. Global change research is widespread over institutions and underlies different goals and processes respectively (basic vs. applied research, bottom up vs. top down driven research, see also point B1). We estimate the total national spending on GCR (third-party funds) to be approximately 30 Mio. ATS (2.19 Mio USD). The basic funding of institutions concerned with GCR (mainly indirect, e.g. university institutes) cannot even roughly be quantified, as a clear accountability to GCR is impossible. (1 USD = 13.7044 ATS, as of 31 December 1999).

B1) The following funding agencies are involved in GCR:

Funding agencies	Relevance for GCR	Prevailing type of research
Private principals	Low	Applied research according to requirements
Provincial governments (9)	Medium	Applied research according to requirements
Universities	High	Basic research according to particular interests and subjects
Austrian Academy of Science	High	Basic research according to WCRP, IGBP, IHDP
Ministry of Education, Science and Culture	High	Oriented research (basic and/or applied) according to specific programmes (mainly Austrian landscape research programme)
Ministry of Agriculture, Forestry, Environment and Water Management (including federal research agencies)	High	Applied research according to requirements
Austrian National Bank	Medium	Basic research, bottom up initiated
Austrian Science Fund	Medium	Basic research, bottom up initiated

To indicate some more detailed numbers, the Ministry of Science invested approximately 10 Mio. ATS (730.000 USD) into GC and related research in 1999. The annual research budget for projects in the framework of the IGBP and the WCRP, coordinated by the Austrian Academy of Sciences, amounts to roughly 2.000.000 ATS (146.000 USD).

B2) Overhead costs are partially included. The typical cost of a man-year for a global change scientist is 550.000 ATS (40.000 USD). This includes all personal costs, but no material costs.

C) The main areas of our national research efforts/spending on GCR are in the fields related to the core programmes of IGBP and WCRP; to a lesser extent to IHDP and DIVERSITAS.

D) The amount of glue money as percentage of total national GCR spending is very hard to quantify, since we do not know the total amount of GCR research funding. Nevertheless, we in the Ministry of Science do not know of any further „glue money“ funding than ours (ca. 3,5 Mio

ATS, 255.000 USD), so that this amount can be taken as a first order approximation for the national total.

E) Not possible, see above.

F) The trend in global change research is stable.

2. National mechanisms for supporting integration and co-ordination of international co-operation in GCR („Glue Money“)

„Glue money“ funding is an essential component in the funding strategy of the Ministry of Science. Of particular importance is the Austrian Network of Environmental Research, which is intended to support the internationalization of Austrian environmental research, mainly through coordination and information activities. Particular netnodes are co-financed by other ministries as well, e.g. the Ministry of Agriculture, Forestry, Environment and Water Management. The general orientation and the number of netnodes rest on a strategic setting by the Ministry of Science, whereas individual workpackages are due to individual preferences of the specific research groups. Funding of workshops and conferences as well as sending out experts to GC meetings and bearing their costs are also frequently applied procedures in providing glue money for GCR. This can either be initiated bottom up by request of the scientific community or top down by intervention of the Ministries. As quoted above, glue money funding related to GCR is in an order of 255.000 USD.

3. Recent news and developments

Recently, the Austrian Network of Environmental Research (ANER, <http://nuf.boku.ac.at>) finished a study entitled „Austrian environmental research in the international context“ which concentrates special attention on Austria's global change research efforts in the international framework. The results show, that the Austrian research landscape on GCR and its international vis-a-vis fit very well. However, national emphasis is put on regional aspects and mountainous regions, thereby mainly focusing on the development and implementation of adaptation and mitigation strategies of global change in the regional scale. Strategic concepts for national parks, preservation of endangered landscapes and approaches towards sustainable regional development are examples of main components. Until now of minor importance are investigations on the impact of global change processes on man, health and quality of life as well as on social processes and institutions.

In this context, the netnode Human Dimensions of Global Change has done and will be doing its best to strengthen socio-economic environmental research through a variety of information and coordination activities as well as workshops like Risk and Uncertainty in Human Dimensions Research, Graz, the Conference of the European Society for Ecological Economics (ESEE 2000), Vienna, and the forthcoming workshop on Socio-Economics of Climate Change in the Alps: Impacts and Mitigation in Innsbruck.

The GLORIA initiative (Global Observation Research Initiative in Alpine Environments) is underway and got a push by an FP5 project (GLORIA-EUROPE) being selected for funding by the European Commission. The Austrian-Canadian cooperation „Fish from sensitive ecosystems as bioindicators of climate change“ which has recently been integrated into the IGBP may serve as an example of global change projects funded in the framework of the Austrian Academy of Sciences, who right now is also preparing an interdisciplinary and integrative research programme „Alpine research“ aiming at supporting sustainable development in the Alps. As a prerequisite for a future LTER network Austria a new ANER netnode will set-up a basis by gathering widespread interinstitutional data, organising workshops and developing a research concept for the new research programme „Ecological future research“ which on the one hand will be oriented towards research on ecological processes (including global change) and modelling and on the other be an instrument for further strengthening transdisciplinary research

and stakeholder participation. Finally, the inter/transdisciplinary programme „Austrian landscape research“ (www.klf.at, for details see 1999 updates) as the major GCR relevant programme of the Ministry of Science entered into its second phase.



BELGIUM

Belgian contribution to the IGFA (International Group of Funding Agencies of Global Change Research) plenary meeting in Zurich, 23-26 October 2000.

Funding levels for Global Change Research in Belgium

Apart from the Federal Office for Scientific, Technical and Cultural Affairs, the French and Flemish Community as well as the Fund for Scientific Research (in Wallonia and in Flanders) fund Global Change Research. However, I am not in a position to provide complete and detailed information on the spending on GCR since the research inventory in Belgium is based on the requirements of OECD and the EU and does not include information on the participation in international programmes as IGBP, WCRP and DIVERSITAS. But, I can provide the GCR spending of the Federal Office for Scientific, Technical and Cultural Affairs (OSTC):

The total amount of funding by the OSTC in 1999 : 170 million Belgian Francs (3,9 MEURO) (1EURO: 43 BEF) or 3,544 MUS\$ (1US\$=48BEF)

This amount is calculated from GCR within federal research programmes such as

- Global Change and Sustainable Development (1996-2000);
- Sustainable Management of the North Sea (1997-2001);
- Scientific Research Programme on the Antarctic – Phase IV (1997-2000);
- TELSAT Earth Observation by Satellite),

the 'Glue Money' for Lucc, NDSC, IPCC and "supporting actions" (policy supporting projects with respect to ozone in the troposphere.

Overheads account for **5%** of the personnel and working costs.

The budget does not include relevant space activities, the basic funding of the universities, nor the external funds from e.g. the European Commission.

A typical **cost of a man year** for a global change scientist ranges from **37 500 to 52 865 US\$ / year.** (1US\$: 48 BEF)

Most of the OSTC-funded GCR is relevant for IGBP and WCRP but few projects are formally linked to IGBP or WCRP. The efforts are scattered over different areas: atmospheric processes (SPARC, IGAC), climate modeling (CLIVAR), paleo-climate (PAGES), land-use and land cover change (LUCC) and terrestrial ecosystems (GCTE).

Several scientists are active within IPCC as author or reviewer.

In 1999 the OSTC spent 5,5 MBEF or 114,6kUS\$ to support international integration and co-ordination activities (LUCC support, IPCC participation, NDSC). This is 3,2% of the total amounts that the OSTC spent for GCR.

Trend: Within the OSTC programmes, the funding of GCR remained stable. Compared to previous years the level of "glue money" increased.

National mechanisms for supporting ('Glue Money')

Mechanism 1: valorisation and programme management"

The research program on Global Change was inspired on the international research agenda and as a whole was meant as a financial support for teams integrating in international programs and activities. This programme has a "valorisation and programme management" budget. Part of it is used to fund scientists to participate e.g. in IPCC activities and to fund a scientist helping Prof. Lambin with his task as chair of LUCC. A financial contribution to the IGBP Open Science Conference in Amsterdam in 2001 is under evaluation.

Mechanisme 2: international co-operation

The OSTC has a specific budget for international co-operation. Part of the budget is used for the annual contributions to different organizations such as IGBP, ICSU, ... Part of the budget can be made available for a.o. 'Global Change Glue Money'.

This budget funds at present the LUCC core project office at the University of Louvain-la Neuve and the co-ordination of the Belgian participation to the Network for the Detection of Stratospheric Change (NDSC).

The OSTC considers proposals for 'Glue Money' on an ad-hoc basis. Important selection criteria are the impact/return for Belgium and the involvement of Belgian scientists.

Mechanism 3: Second Multiannual Scientific Support Plan for a Sustainable Development Policy

Proposals in the framework of the Second Multiannual Scientific Support Plan for a Sustainable Development Policy may address, complementary to the main research proposal, activities for integration and co-ordination of international co-operation in global change research. These complementary activities may run for up to two years. Such activities will be financed only if the initial proposal was selected in the SPSD II's call for proposals.

Recent news and developments

The OSTC launched in July 2000 the first call for proposals in the framework of Second Multiannual Scientific Support Plan for a Sustainable Development Policy, part "*Global change, ecosystems and biodiversity*".

This call concerns:

- research related to climate and atmospheric study (including related Antarctic research);
- research related to the study of the terrestrial ecosystems (including wetlands) of the Temperate Regions;
- biodiversity research linked to the functioning and maintenance of the above-mentioned ecosystems.

The budget for this call is **584 MBEF** (12,2 MUS\$). Projects are due to start by the end of 2000. The second call will address sustainable management of the North Sea, hydrological cycles marine biodiversity (North Sea and Antarctica) with a budget of 490 MBEF (10,2MUS\$). The human dimensions of GCR will be addressed later.

The OSTC is considering feasibility studies on the Belgian participation in Global Observing Systems.

BULGARIA

S u m m a r y

During the last 10 years Bulgarian science faced a set of changes, inaugurated by transition processes. At the end 1999 Bulgaria has been included in the group of the preaccession European countries. These countries as a whole and Bulgaria in particular are characterised with the following:

- Collapse of the centralised economy model;
- Loss of markets;
- Brain-drain especially of the young highly qualified generations;
- Social disintegration;
- Lack of reliable structures for co-ordination and management of market-oriented economy and modern scientific activities.

In this socio-economic environment the scientific and educational structures proved to be relatively stable. Evidence for this is the fact the chapters in which Bulgaria first closed the negotiations with the European Commission are Chapter 17 “Science and Research” and Chapter “.

Despite the above mentioned success in the field of scientific researches can be identified a group significant problems that threatens the positive development of science and research activities in Bulgaria:

- 1) Emigration of perspective and highly qualified researchers (international and internal brain-drain).
- 2) Highly negative change of the age profile of the scientific society, lack of young scientists.

Reasons:

- low social prestige of the scientific profession
- low salaries
- outdated and inefficient infrastructure for scientific researches
- disproportion of the production of young researchers within the different field of science
- insufficient professional qualification

Since 1991 have aroused substantial changes both in respect of the structure of scientific potential and in respect of its volume.

At present Bulgaria has 42 universities and 450 scientific organisations, concentrated within the Bulgarian Academy of Sciences and the National Center for Agricultural Sciences. The total number of the scientists is approximately 14 000.

An institutional reform has been carried out at the National Academy for Agrarian Sciences, which resulted in transformation of this institution into a modern scientific center.

A similar reform has been completed at the branch scientific institutes.

A set of initiatives for modernisation of science & education activities were undertaken by the Ministry of Education and Science.

The instruments for implementation of the scientific policy are the Specialised entities for financing of research project on contests' basis. The modern approach for funding of science activities was implemented.

A short review of the country's participation in EU Fifth Framework Program will also be presented.

National Science Fund, Ministry of Education and Science

CANADA

Canada's National Update - 2000

1. Funding levels for GCR

This report contains figures for just one Canadian funding agency - the **Natural Sciences and Engineering Research Council (NSERC)**. Funding for GCR research in Canada is spread amongst many federal departments, such as Environment Canada, Natural Resources Canada, etc., as well as the federal granting councils, who provide support for university research. Support for federal research and research labs is provided through the federal departments. Much global change research in Canada is a collaborative effort involving federal and university scientists, and it is difficult for Canada to provide national spending figures. **The focus of this update is on the support to universities provided through NSERC.** NSERC does not have any programs specifically targeted to GCR. Rather, applications are reviewed on a competitive basis in all disciplines and decisions are made on relative merit. The main programs involved are: Research Grants (supporting individuals in their ongoing programs of basic research); Strategic Projects (group projects with strategic objectives, with non-university partners such as industry and federal departments); Research Networks (larger groups in partnership with non-university partners) and Industrial Research Chairs (salary and research support for new university faculty positions in partnership with industry).

NSERC provides support for the direct costs of research only. Figures provided below do not contain overhead costs or salaries. The exception is the Industrial Research Chairs for which NSERC provides some (not full) salary support, but these figures contain only 6 such positions. Figures are for the fiscal year 1998-99 (however, figures since then have not fluctuated much). Conversion is at the rate of \$1US = \$1.47 Can (Bank of Canada average for December 1999).

	Can k\$	US k\$
Research Grants	7, 548	5,135
Strategic Projects	2,036	1,385
Research Networks*	4,404	2,996
Industrial Research Chairs	978	665
Other	179	122
TOTAL	15,145	10,303

* Includes NSERC's contribution to Canadian GLOBEC, GEWEX and PAGES.

NSERC spending is spread widely over all areas of GCR, with perhaps some focus on climate change research. For Canada as a whole, there is currently a strong focus on climate change (see section 3). NSERC's share of national spending on GCR research is difficult to determine, as the national figures have not been calculated. Funding remains stable at NSERC. However, as new funding mechanisms ramp up, this may result in a decrease in spending at NSERC but a substantial increase from these new sources (see section 3).

The proportion of spending on support for international integration and co-ordination activities is hard to determine. Some of the funding for Research Networks, for example, supports researchers' travel to meetings and for collaboration. NSERC has a relatively new program called the International Opportunity Fund (IOF), which provides funds for Canadian researchers to participate in the planning of new international programs. It is also a potential venue for funding of IPOs.

2. National mechanism for supporting integration and co-ordination of international co-operation in GCR

NSERC has two main mechanisms to support the above activities: the IOF - introduced in 1998 at a level of \$1.5M per year (and described above), and the Collaborative Research Opportunities, introduced last year at the level of \$6M per year. The IOF has been used by groups of Canadian researchers wishing to participate in planning for future activities linked to international programs. One recent example is funding for Canadian participation in the SOLAS workshop. The Collaborative Research Opportunities program (CRO) facilitates the participation of teams of Canadian researchers in major national and international research projects that present a special opportunity for collaboration. In contrast to the IOF, this program will support research costs. While this program is not targeted at any particular research area, there has been a noticeable focus on projects related to the environment among those funded so far, probably because this type of research intrinsically requires an international and interdisciplinary approach.

NSERC and Canada as a whole do not have good mechanisms for considering requests for support of IPOs and the central secretariats. These could be considered under the IOF, but are not always a good fit. They have been treated in an ad-hoc way, and agencies need to be convinced of the benefits back to Canada of supporting these activities. The level of Canadian activity in the core project or international program would then be a major factor in the decision process. NSERC could consider supporting a contribution to an IPO as part of the research support in cases where there is a major Canadian activity. This would have to be requested by the Canadian applicants as part of their initial request for funding, and would be subject to peer review.

3. Recent news and developments

The 2000 Canadian Federal Budget contained good news for Canadian university research. The Government of Canada provided \$900M to support the establishment of 2000 Canada Research Chairs in universities across the country by 2004-05. Its goal is to build a critical mass of world-class researchers who will help Canadian universities achieve research excellence and encourage leading researchers to remain in Canada. The program is managed jointly by the national granting agencies. See http://www.sshrc.ca/english/programinfo/chairs_program.html. The 2000 Budget also contained a number of new climate change and environment-related initiatives, including new funding for climate change research. See http://www.ec.gc.ca/budget/intro_index_e.htm. Of interest to IGFA are:

The creation of a new Canadian Foundation for Climate and Atmospheric Sciences (CFCAS) with a one-time grant of \$60M. The objectives of the Foundation are to undertake scientific research with respect to the climate system, climate change, extreme weather and air quality to:

- strengthen Canada's scientific capacity
- improve scientific understanding of processes and predictions
- provide relevant science to policy makers
- improve understanding of implications of these sciences for human health and for the natural environment
- foster collaboration and interdisciplinary approaches
- encourage participation and support of others, including the private sector

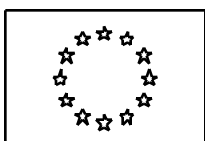
The CFCAS will fund mainly university-based research. Its impact is not yet known, since it has yet to award any funds. For more information, see <http://cfcas.org/contentse.htm>.

The renewal of the Climate Change Action Fund (CCAF) for a further three years, starting in April 2001 at the level of \$5M a year for research into climate change science, impacts and adaptation. Details about this fund were provided in the 1999 Canadian National Update. Examples of projects funded under this initiative can be found at http://www2.climatechange.gc.ca/ccaf/search_e.cfm.

Finally, Canada's Environment minister released a new "Government of Canada Action Plan 2000 on Climate Change" on October 6 this year. This is a \$500M package of initiatives mainly designed to help Canada reduce greenhouse gas emissions, to be confirmed in the 2001 Federal Budget. About 10% of this funding will be focused on climate change science and adaptation, particularly on climate

monitoring, understanding GHG sources and sinks, and on impacts and adaptation to climate change. See http://climatechange.gc.ca/english/html/action_plan.html.

EUROPEAN UNION



EUROPEAN COMMISSION
RESEARCH DIRECTORATE-GENERAL

Directorate D.I - Preserving the Ecosystem I
Biodiversity and global change

IGFA Plenary 2000 – National Updates EC Research on Global Change, Climate and Biodiversity

Funding levels for GCR

A) Total amount of funding of GCR in 1999: DG RTD's Key Action 2 'Global Change, Climate and Biodiversity' of the 'Energy, Environment and Sustainable Development' Programme of EC's Fifth Framework Programme has been attributed a total budget of Euro 287 Mio. The committed amount for 1999 was about Euro 70 Mio. The Joint Research Centre in Ispra (Italy) does also have a budget for GCR which has been Euro 9,6 Mio for 1999.

B1) Funding agencies involved and mechanisms for GCR funding: The figures above describe the budgets provided by DG RTD as well as the Joint Research Centre (JRC). GCR does have its own activity within the Fifth Framework Programme issuing its own calls seeking for proposals in specific research areas of the GC key action which is divided in a number of sub themes. The selection of those sub themes for calls is done according to a 'road map' that has been developed for the whole period of funding but may also be amended according to timely needs of research and/or earlier shortfalls of incoming proposals in specific areas. Policy relevance does play a major role in the evaluation process.

It can be expected that the real spending for EC-GCR is higher than the given figures and may reach at an amount far beyond Euro 300 Mio. Projects of Key Action 1 'Sustainable Management and Quality of Water' and Key Action 3 'Sustainable Marine Ecosystems' as well as projects funded within the so-called Generic Lines on research in the areas of socio-economics and earth observation and also projects from the Thematic Programme IST, 'Promoting user-friendly information society' may fund projects that also could be listed under GCR. But it is hardly impossible to provide reasonable figures without viewing each single project funded under the mentioned research areas and isolate the contributions to the GCR part in those. Such an undertaking would also involve a sharp definition of GCR which is not at hand.

B2) Overhead costs and average cost for a person-year for a GC scientist: Yes, the figures do include overhead costs. The typical cost of a person-year for a global change scientist differs a great lot between the different member states and according to the type of institution, namely governmental or private sector institution. Counting on the basis of an average of 1.680 h / y the range of costs would be for

- Junior scientists : Euro 16.800 – 50.400
- Senior scientists : Euro 50.400 – 117.600

The average figures for some of the pre-accession states may be even below the above given range.

C) Main areas of research efforts/spending on GCR: DG RTD's Key Action (KA) 2 consists of four major areas of research as depicted in the following listing of funds in 1999:

- ca. Euro 32 Mio : Global change processes (KA 2.1)
- ca. Euro 27 Mio : Terrestrial and marine ecosystems (KA 2.2)
- ca. Euro 1 Mio : Scenarios and strategies for responding to global change issues (KA 2.3)
- ca. Euro 10 Mio : Global observing systems (KA 2.4)

Biodiversity - a new research item under the Fifth Framework Programme - is part of KA 2.2 and was committed funds of about Euro 18 Mio in 1999.

The defined areas of GCR of the JRC in Ispra are:

- Euro 5,3 Mio : Atmospheric processes related to GC
- Euro 3,8 Mio : Global monitoring using earth observation
- Euro 0,5 Mio : Energy and GC

D) Support for international integration and co-ordination activities (IPOs and other glue money):

EC's funding structure does not allow funding of IPO's, however, it does support/co-sponsor activities of the International Programmes which counts as funds for accompanying measures.

E) Funding agencies' approximate percentage of total national spending on GCR: Please see answer under A.

F) Trends in the funding levels: Under the Fifth Framework Programme it is foreseen that the committed funds for GCR will grow significantly after 2000. For the latter year the spending will only be around Euro 63 Mio but will then rise to Euro 72 Mio in 2001 and to Euro 81 Mio in 2002. These figures do not include money spent by the JRC and funds for accompanying measures and infrastructure of which the latter also partly includes so-called glue-money funds for GCR. Comparing the figures for GCR of the whole period of the Fourth and Fifth Framework Programme the total budgets are considered more or less equal.

National mechanisms for supporting integration and co-ordination of international co-operation in GCR ('Glue Money')

Funds for co-ordination and integration of GCR is an essential component of the funding schemes of DG RTD. A special activity, ENRICH (European Network of Research into Global Change), has been set up to enhance the effectivity of GCR due to funds for capacity building, training schemes, dissemination, information and communication activities, conferences, workshops, seminars and support for schemes providing information and assistance to research players, including SME's, and including the development of closer international scientific co-operation. In addition there is an 'open call' for accompanying measures of which the incoming proposals are evaluated three times a year. ENRICH, earlier foreseen with two closing dates under the Fifth Framework Programme now has been converted into an 'open call' under accompanying measures. The budget for ENRICH is approximately Euro 5 Mio for the whole period of the Fifth Framework Programme (1999-2002). For the general 'accompanying measures' a budget of up to 4% of the available budget may be spent. Partly also the funds for 'infrastructure' do cover activities that could be seen as accompanying measures activities. There are four calls foreseen on 'infrastructure' under the whole period of the Fifth Framework Programme. The amount spent is depending on the number of proposals that seek funding for infrastructure under KA 2.

Recent news and developments

In 1999 two calls – on 20 March and 18 November - were published on Key Action 2 'Global Change, Climate and Biodiversity'. In reply to the first call 320 proposals were received of which 307 were eligible for evaluation and out of which 158 (49%) passed the evaluation. The second call with a closing on 15 February 2000 yielded 358 proposals of which 331 were eligible for evaluation and 137 (41%) passed the evaluation.

According to the experiences made during the implementation of the sub-programme on 'Environment and Sustainable Development' until mid-2000 the work programme has been revised in three important aspects.

A. Effectiveness of the implementation of the programme:

In order to reduce the number of proposals a better focusing as well as a precise prioritisation of the tasks has been undertaken. Such provisions will reduce overlapping of certain research tasks. They would also take account of the fields for which few proposals have been received so far in relation to those fields in which a higher participation has been observed.

B. Inclusion of new scientific and technical tasks:

In the environmental field often new research needs pop up, frequently addressing urgent needs of the respective policy sector. These may also require scientific and technical support which could not be set out in the initial work programme as needs are developing continuously. Thus e-science aspects and the phenomenon of storms have been explicitly mentioned in the corresponding sub-themes in the GC key action.

In view of the research needs of the implementation of the Kyoto Protocol a timely addition of research items has been specifically undertaken according to carbon cycle research (KA 2, area

disturbance such as fire, pests, land-use change and forestry/agriculture management practice on carbon stocks and emissions'. The inclusion of fire and pests shall lead to better identifying their role in climate variability which goes along with changes in the terrestrial carbon cycle. The inclusion of management aspects – land-use change and forestry/agriculture – is aiming at directly addressing the needs of implementing Art. 3.4 of the Kyoto Protocol.

C. Supporting the realisation of the European Research Area (ERA):

ERA has been created lately only and therefore activities contributing to its successful realisation as regarding infrastructures, networks of excellence of science-society-citizen relations, an in particular the aspects relating to the scientific reference system, to socio-economic research or to support the policies are appearing in the revised text of the work programme. Mentioning just one example for a rapid realisation of ERA the development of the e-Network infrastructures shall be named here.

FINLAND**International Group of Funding Agencies for Global Change Research (IGFA)**

IGFA Plenary Meeting 2000

22-26 October 2000, Zürich, Switzerland

NATIONAL UPDATE 1999/ FINLAND

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1) Funding levels for GCR

A) The total amount of funding for global change research for 1999 in Finland was estimated to be 7-8 million USD.

B)

B1) The funding agencies involved and the special mechanisms in Finland include the following:

Funding Organisations

- The Academy of Finland
- National Technology Agency TEKES
- Various Ministries e.g. Ministry of the Environment, Ministry of Trade and Industry, Ministry of Agriculture and Forestry, Ministry of Transport and Communication
- Private foundations e.g. Maj and Tor Nessling Foundation, Alfred Kordelin Foundation, Wihuri Foundation, Emil Aaltonen Foundation, Finnish Cultural Foundation
- Other organisations e.g. Finnish Forest Industries Federation, Central Union of Agricultural Producers and Forest Owners

Funding Mechanisms

- 'Normal' research funding forms (e.g. research projects, posts, grants)
 - approximately 3-4 million USD for 1999
- Programmes
 - Finnish Global Change Research Programme FIGARE 1999-2002
 - 300,000 USD for 1999 (started in November 1999)
 - 1999-2002 altogether 6.7 million USD, with an average annual input of 2.2 million USD
 - Finnish Biodiversity Research Programme FIBRE 1997-2002
 - ca. 3 million USD for 1999
 - 1997-2002 altogether 20 million USD, with an average annual input 3.3 million USD
 - Technology and Climate Change Programme CLIMTECH 1999-2002
 - ca. 0.5 million USD for 1999
 - 1999-2002 altogether 2.5 million USD

- B2) Overhead costs are generally *not included* in the above numbers. The only exception is National Technology Agency TEKES, who include 15% overhead in their funding. A typical cost of a man-year (including +26% for pension, insurance etc.) for a global change scientist varies between 30,000 USD (post-doc) and 60,000 USD (professor). Foundations allocate grants: the typical cost of a man-year is 12,000 USD.
- C) The main areas of Finnish research efforts in GCR include:
- Biodiversity
 - Atmospheric sciences (incl. GHG, ozone, aerosols etc.)
 - Forest ecosystems
- In addition, following objects/topics are studied:
- Fresh water ecosystems and the Baltic Sea
 - Agriculture and Forestry
 - Developing countries
 - Sustainable energy production and transport, technology development
 - Scenario building
 - Environmental legislation; international agreements and conventions; Kyoto mechanisms
 - Economic globalisation
- D) See 2)
- E) Funding agencies approximate percentages of the total national spending on GCR is as follows:
- The Academy of Finland 50%
 - National Technology Agency TEKES 25%
 - Various Ministries 15%
 - Private foundations 10%
- F) The trend in GCR is growing, mainly due to the new research programmes
- 2) ***National Mechanisms for supporting integration and co-ordination of international co-operation in GCR (“Glue Money”)***
- There are no national mechanisms for integration or co-ordination of international co-operation in GCR. The support for an international organisation or IPO is a special case. However, the funding for individual research projects includes e.g. travel costs, costs of the organising seminars or invitation of foreign researchers. The international GCR integration in the level of EU is supported by the joint EU-projects. In addition, the Academy of Finland grants subsidy for the organising of international scientific conferences in Finland.
- 3) ***Recent news and developments***
- Finnish Global Change Research Programme and Finnish Biodiversity Research Programme are now operative and running until the end of 2002. These multi- and interdisciplinary programmes are hoped to produce integrated, applicable results for the advancement of science, but also for decision making at national and international level.

IGFA, Zürich 23-25 October 2000
Global Change Research 1999- Report from France

1. Funding levels for GCR

A. What was the *total amount of funding (in USD) of global change research (GCR) in 1999 by funding agencies in your country?*

	(M\$)
CEA:	3
CNES: 50	
CNRS: 10	
IFREMER:	3
IFRTP:	2
INRA:	1
IRD:	4
Météo-France: 5	
MATE:	2
MR:	1

TOTAL:	81

Marginal overhead costs are usually included, except for the salaries of staff with permanent position (cost including overheads: k\$ 40 to 65 per year). The total number of scientific, technical and administrative staff in France is about 1000 person, leading to a roughly estimated cost of M\$ 50 per year.

Hence the total amount of funding (including salaries) is about M\$130.

B1. Name the *funding agencies involved* and indicate the *mechanisms* by which GCR is being funded (e.g. special programmes).

GCR is mainly funded through cooperative research programs associating the above agencies:

The main funding agencies for GCR in France are: CEA (French institute for atomic energy), CNES (French space agency), CNRS (National center for scientific research), IFREMER (Institute for research and exploitation of the sea), IFRTP (Institute for polar research), INRA (Institute for agronomic research), IRD (Institute for research in the tropical and mediterranean regions), Météo-France (French weather service), MATE - Ministère de l'Aménagement du Territoire et de l'Environnement (Ministry for national and regional development and environment), MR - Ministère de la Recherche (Ministry for research), SHOM (Hydrographic and oceanic service of the navy).

INSU (National institute for the sciences of the universe) coordinates the programs associating different agencies for GCR, except for those aspects concerning biodiversity and human impacts.

Coordinated specific programs:

Programs to study basic processes including those relevant of GEWEX, SPARC, IGAC, JGOFS, LOICZ, PAGES: PATOM: multiscale oceanic and atmospheric processes, PNCA: atmospheric chemistry, PNEC: coastal environment, PNRH: hydrology, PNTS: remote sensing, PROOF: biogeochemical processes and fluxes in the ocean;
 Programs to study climate variability, French component of CLIVAR: PNEDC: National program for the study of climate dynamics, ACI-Climat: specific action for climate related instrumentation;

Program to study the management and the impacts of Climate Change: GICC: management of the global change impact.

Programs to study biodiversity: ACI-Ecologie Quantitative, PEV: program for environment and life, GIS for biodiversity;

Additional indirect fundings for GCR come from:

Allocation of time on oceanographic vessels (IFREMER, IFRTP, INSU);

Allocation of time on national computing facilities (CNRS, Météo-France);

Preparation and management of satellite programs (CNES);

Permanent observing facilities (INSU, Météo-France)

C. Which are the *main areas of your national research efforts/spending on GCR (e.g. biodiversity, climate, etc.)? (Specification into the areas of the four international programmes WCRP, IGBP, IHDP and Diversitas is not asked for but could be presented if figures are available*

WCRP: GEWEX, CLIVAR, WOCE, SPARC

GCOS

GOOS

DIVERSITAS

IGBP: IGAC, GCTE, LOICZ, JGOFS, PAGES

D. What percentage of the funding agencies' spending on GCR was support for international integration and co-ordination activities (*IPOs and other glue money*)?

There is no specific credit line for that, but funding for international exchanges can be obtained from the above sources.

Medias-France in Toulouse coordinates different regional networks on GCR in the mediterranean and African regions, and hosts different data bases in relation with international programs (e.g. IGAC/IDAF, RICAMARE, ...)

E. If possible, please indicate the funding agencies' approximate percentage of the *total national spending on GCR*.

See A above.

F. Finally, please also indicate *trends in the funding levels (up, down, stable compared to previous years)*?

The funding level should remain stable.

2. National mechanisms for supporting integration and co-ordination of international co-operation in GCR ('Glue Money')

Questions relative to support for the programmes' central secretariats, IPOs or other activities are dealt on case by case. There is no separate budget line for such requests.

France provides funding for the infrastructure of WCRP (k\$ 15) and for IGBP (k\$ 40) and supports two international Project Offices: SPARC in Paris (k\$ 100 /year), Medias-France with a contribution of k\$ 400 /year. A position for a GCTE (RACG) office is being discussed.

3. Recent news and developments

France is involved in the development of operational oceanography in the ARGO framework with three components : the MERCATOR numerical model, the CORIOLIS in-situ observing network with >100 floats to be deployed by 2002 to collect subsurface observations of the ocean, and the JASON-1 and JASON-2 pre-operational altimetry satellites.

There is also a multi-year program to renew the permanent observing facilities.

National Update 2000

1. Funding levels for GCR

Total amount of funding of GCR in 1999 by funding agencies in Germany

The total amount of funding of GCR 1999 in Germany was about 523 Mio DM (268 Mio US-Dollar).

Funding agencies in Germany and mechanisms by which GCR is being funded

The two agencies mainly funding GCR in Germany are the Federal Ministry for Education and Research (BMBF) and the Deutsche Forschungsgemeinschaft (DFG). An overview of the total amounts spent by these agencies is given in Table 1. These figures only partly include overhead costs.

The average costs of a man-year for a researcher in Germany amount to approximately 150,000 DM (including overhead costs) which corresponded to ca. 77,000 US\$ in 1999.

Table 1: Amounts spent for GCR by funding agencies in Germany in 1999 (in Mio US-\$)

Exchange rate from 31.12.99	BMBF		DFG		Sum	
	DM	US-\$	DM	US-\$	DM	US-\$
Glue Money	2.8	1.4	0.8	0.4	3.6	1.8
Research Programs	459.0	235.7	60.0	30.8	519.0	266.5
Total	461.8	237.1	60.8	31.2	522.6	268.3

The mechanisms by which GCR is being funded differ between the agencies: BMBF announces new dedicated research programs and scientists then apply for funds. Proposed projects must match program specifications. DFG on the other hand accepts individual proposals without any programmatic limitations, but also funds programs in a bottom-up-way. In both cases the applications go through an extensive evaluation process.

Main areas of national research efforts/spending on GCR

The main areas of GCR effort in Germany are the following:

- climate and atmosphere
- ocean and polar regions
- biosphere
- pedosphere
- hydrosphere
- climate impact
- human dimensions
- land cover

Percentage of funding agencies' spending on GCR that was Glue Money

The percentage of the total spendings that was Glue Money (figures to be seen in Table 1) was 0.7%. The BMBF spent 0.6% and the DFG 1.2% on support for international integration and coordination. The total amount spent as Glue Money increased by 80% from about 2 Mio DM in 1995 to 3.6 Mio DM in 1999. However, because of varying exchange rates this results in a smaller increase of about 28% in US-\$ from 1.4 Mio US-\$ in 1995 to about 1.8 Mio US-\$ in 1999 (see Figure 1b).

The funding agencies' approximate percentage of the total national spending on GCR

BMBF and DFG covered approximately 88% and 12% respectively of the identified expenses on GCR in 1999. There are additional small sources (e.g. private foundations, state ministries,...) that cover only an insignificant part of GCR-funding.

Trends in funding levels

A comparison between the years 1995 (last IGFA resource assessment) and 1999 shows that in DM there has been an increase of 4% in the total amount spent on GCR. In US-\$, however, the varying exchange rates caused a decrease by 21% (see Figure 1a).

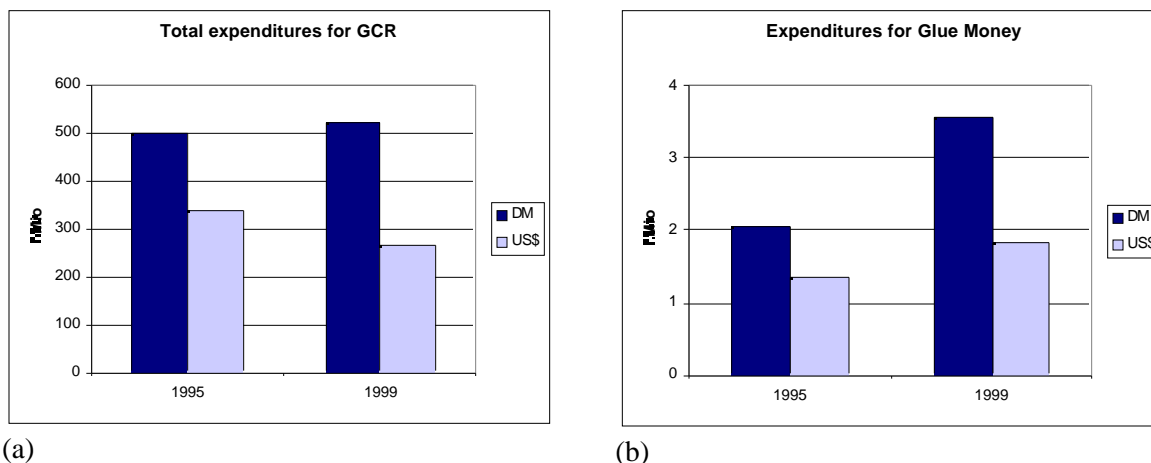


Figure 1: Comparison of expenditures on GCR in Germany between 1995 and 1999 in Mio DM and Mio US-\$ (a: total expenses, b: Glue Money)

2. National mechanisms for supporting integration and coordination of international cooperation in GCR („Glue Money“)

In Germany there is a separate budget line for Glue Money, which is partly administrated by the German National Committee on Global Change Research (further referred to as NKGCF) and partly set aside within the international relations budget as voluntary contributions to ICSU related activities (DFG). In June 1996 the DFG, in close cooperation with the BMBF appointed the NKGCF to act as the national coordinator for the major programs in GCR and to guide research activities in Germany on global environmental change. The NKGCF comprises 15 senior scientists from different disciplines in the sciences and humanities.

As stated above, the amount spent on Glue Money in 1999 was about 3.6 Mio. DM (1.8 Mio US-\$).

3. Recent news and developments

The national programs in the field of GCR recently introduced by BMBF are developing successfully:

- Biodiversity of Global Change (BIOLOG)
This program consists of three parts - biodiversity informatics, terrestrial biodiversity research, and marine biodiversity research. Some initial projects under BIOLOG are already being funded.
- Global Change of the Hydrological Cycle (GLOWA)
Funding under GLOWA for some initial projects has already started.
- German climate research program (DEKLIM)

DEKLIM will cover climate variability, Baltic region studies, climate impact studies, climate model advancement, and promotion of young scientists in the field of climate research. Funding for projects will start in 2001.

- Atmospheric Research (AFO 2000)
This program is focused on the improvement of the understanding of the atmospheric system, the development and provision of instruments for environmental policy, and the support of young talented scientists. Funding for the latter started in July 2000; initial research projects will start in 2001.
- Geotechnologies (joint BMBF/DFG-program)
Funding under this program for some initial projects started in 2000.

The DFG has established two centers of excellence on sustainable land use and land cover changes in SE-Asia and two new graduate colleges in the field of biodiversity.

The Tropospheric Research Program (TFS) that terminated in June 2000, the Aerosol Research

Research Program (OFP) will in future be covered by AFO 2000. Furthermore, two priority programs contributing to PAGES and IHDP are ending in the year 2000.

Iceland

National update on Global Change Research IGFA meeting, Zurich, October, 2000

Background

- Climatic variations on decadal and century time scales are well known to Icelanders and the country and its economy is highly vulnerable to the impact of such variations due to its dependence on natural resources, both of the land and the sea.
- Much proxy data information exists on previous climatic changes and their effects on natural resources and the life of Icelanders.
- In recent years a substantial part of the national efforts in natural (physical and life sciences) and environmental sciences, fisheries and agricultural research has direct and indirect implication for global change research. This effort, however, is divided between a number of sectoral institutions with other objectives and attention to global change issues has depended on the initiative and interest of individual scientists more than concerted national efforts.
- Recognizing the increasing importance of understanding man's impact on and interaction with the environment the Icelandic Research Council took the initiative a few years ago to evaluate the need and formulate an overall strategy in the field of global change research. The recommendations called for a coordinated and cross-disciplinary effort by a number of institutions. However, the limitation of financial resources for R&D in the small economy of Iceland presents a problem in pursuing a concerted strategy. It has taken some time to implement the recommendations.

Recent developments

- In its new vision and strategy for the new millennium the IRC has designated “ the dynamic nature, global change and the co-existence of land and people” as one of its priority areas for research in the future.
- The IRC has taken initiatives to encourage participation of Icelandic scientists in international research cooperation in this field, i.e. through the EU framework program, Nordic Cooperation and recently USA Cooperation.
- In 1999 IRC received earmarked national funds to finance increased research efforts into the area of environmental research. The Government of Iceland has provided a total of 95 MIKR (about 1 M\$) for the year 2001 to fund research into information technology (60%) and environmental research (40%). Important parts of these funds are directed at research themes relevant to global change research. The grants already awarded in the area of information technology included development of comprehensive natural database (GIS) on natural resources and natural phenomena essential to follow long-term changes. Projects in paleoclimatic research were also funded under the environmental part.
- The IRC has recently delivered recommendations to the Government of Iceland regarding ways to increase cooperation and synergies between Icelandic research units. Some of the areas being discussed for such networks would be centered around research themes related to global change and natural variability or its effects on the life and economy of Iceland, such as physical and biological processes of the ocean environment and its interaction with the atmosphere, impact on desertification and ecological changes. The existence of long time series of observations and monitoring form a basis for future research and modeling efforts.
- The IRC and NSF have recently signed a Memorandum of Understanding on closer bilateral cooperation with particular emphasis on environmental variability and global change research. Joint activities between NSF and IRC are expected to be undertaken initially on specific topics within the following broad area of research: 1. Global change; 2. Biological Sciences; 3. Arctic

-
- science and technology; 4. Geosciences; 5. Exchange of information on results of studies on trends in science and technology; 6. Linking of Internet information services.
- The Nordic Science Policy Council (NSPC) was reorganized last year to strength regional cooperation. The Council agreed to give high priority to arctic and ocean climate research programme involving a study of ocean climate interaction by three Nordic institutions. NSPC has set up a working group to review the work in ocean climate research currently ongoing in the Nordic region in order to promote stronger and coordinate Nordic participation in international research cooperation in this field.
 - The Arctic Council in cooperation with the International Arctic Science Committee and IPCC will be undertaking a scientific assessment of consequences of climate variability and change in the Arctic region (Arctic Climate Impact Assessment - ACIA). This major effort is designed to meet the urgent need for regional assessments. It has been decided to prepare a National Implementation Plan (NIP) for ACIA. This plan will specify priority topics from Iceland's perspective, suggest data sources and experts, and identify resources needed to synthesise this information for ACIA. The NIP is planned ready by December 2000.

Funding

While many of the above developments will certainly enhance the possibilities of Icelandic participation in regional and global research efforts for understanding of Earth's physical and biological process, climate variability and interaction with human activity the Icelandic national resources are very small in international terms and in relation to the size of the problem. Iceland has difficulty in directly financing events and research work outside its own borders. It can to some extent finance international scientific workshops and similar events in Iceland and can possibly on a case by case basis find means to fund participants from countries outside Europe in such events. Iceland through IRC and other national institutions is willing to host and co-sponsor such events on a case by case basis when the location in Iceland seems particularly relevant. Iceland hosted a CAPE (Circum-Arctic Paleo Environments) workshop in June 2000, the second IICWG (International Ice Charting Working Group) workshop in October 2000 and the first Northern Research Forum meeting on social and environmental changes, economic globalization and impacts of global change in November 2000.

Japan National Updates for IGFA Meeting

Funding Levels for Global Change Research

A and B total amount of funding, and overhead cost

The Environment Agency of Japan provides the Global Environment Research Fund (about 24.1 million US\$/year) in order to promote global environment researches. The Fund itself includes the overhead cost to prepare the Global Environmental Research Programme that is the basis of research projects to be carried out through the Fund. Agencies in Japan are considering the possibility of including overhead cost for each research project from 2001.

C Main Areas

- Depletion of the Ozone Layer
- Global Warming
- Acid Precipitation
- Marine Pollution
- Tropical Deforestation
- Loss of Biological Diversity
- Desertification
- Human Dimensions of Global Environmental Problems

D Support for international integration and co-ordination activities

(1) Eco-Frontier Fellowship Programme

The Environment Agency of Japan promotes Eco-Frontier Fellowship Programme to invite overseas researchers to Japan in order to facilitate the joint research activities on global environmental issues.

In 2000, 20 young overseas researchers came to Japan from Asian and European countries.

(2) Percentage of the funding agencies' spending on GCR for IPOs and other glue money

Unknown (such spending is included in the budget supporting the specific international research programmes.)

National mechanisms for supporting integration and co-ordination of international cooperation in GCR.

The specific research programmes, eg. IGBP, APN, are supported by the separated budgets by several agencies. The budgets are allocated in accordance with the importance of research on the programme by programme basis.

Recent News:

Ministry of Education, Science, Sport and Culture (Monbusho) has plan to establish a research institution, in the light of contribution to solving environmental problems. This research institution's overarching mission is to develop earth science with comprehensive views beyond the existing academic disciplines, and with particular focus on solving actual problems. Budgetary proposal for this institution's operation was made by the Ministry of Education, Science, Sports and Culture, and it is currently studied by the financial authorities.

The main functions of the institution are ;

- Promotion of interdisciplinary researches,
- Formulation of research network by collaborating with research institutions in and outside Japan,
- Wide dissemination of results of these researches, which invent several measures to cope with environmental problems,
- Enhancement of international research co-operation by joint projects,
- Human resource development by accepting postdoctoral and graduate students.

Location : Kyoto city

Appendix 1

Activities in Ministry of Education, Science, Sports and Culture, JAPAN (MESSC, Monbusho) 1999-2000

MESSC, JAPAN promotes the basic studies relating to the international research programme such as WCRP, IGBP, DIVERSITAS and HDP under the global environmental issue. At present, four research programmes are being undertaken up to the fiscal year of 2001

GAME-MESSC

In 1999 summer, the follow-up experiments to the IOP (GAME Intensive Observing Period) were implemented in GAME-Tropics and HUBEX region. As part of GAME-AAN (Asian AWS Network), the long-term monitoring of the surface radiation and energy fluxes has been continued at about 10 stations covering from the Arctic coast in Siberia down to the tropical monsoon forest in Thailand. In January 2000, we published the GAME News Letter No. 1, to provide an opportunity for introduction of the overall GAME activity.

IGBP-GCTE-MESSC

The question is how do terrestrial ecosystems function as carbon pool under increasing atmospheric carbon dioxide. Two local field stations have been precisely investigated for their carbon budget from forest areas to rivers and finally to lakes. A whole figure of response of carbon budget at a watershed level is now summarized.

DIVERSITAS-MESSC

The evolution and ecology of general flowering in south-east Asian were explained in the light of plant-pollinator interactions. Biodiversity in lake ecosystems was found to be largely affected by the size structure and phenological population dynamics of phytoplankton. The effects of predators on the diversity of prey were found to be different in forest and stream systems. The forest-stream interaction has an important role in the maintenance of each system.

JSPS-FUTURE PROGRAMME

The primary focus of this project concerns the establishment of a sustainable human society that can coexist with natural ecosystems. The final goal is to provide 'Series of Comprehensive Research Manual' through a multi-disciplinary study of a catchment area. The main field is a human dominated river basin of Lake Biwa-Yodo River watershed in Japan. Details of these projects are compiled in the Report of Monbusho 1999.

Appendix 2:**Activities in the Science and Technology Agency**1 Global Environment Science and Technology Fund
Global Environment Research Fund

(Million dollar)

1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
52.2	60.7	31.6	27.6	25.7	39.0	61.6	80.1	81.2	83.2

Main Research Area

- (1) Climate Variations Research
- (2) Hydrological Cycle Research
- (3) Global Warming Research
- (4) Atmospheric Composition Research
- (5) Ecosystem Change Research
- (6) Integrated Modeling Research
- (7) Tropical Ocean Circulation
- (8) Mid-Latitude Ocean Circulation
- (9) High-Latitude and Arctic Ocean Circulation
- (10) Observational Study of the Air-Sea Interaction
- (11) Ocean Material Circulation

2 Number of Foreign Researchers (Frontier Research System) 2000.10.1

	Deep Sea Extremophiles	Subduction Dynamics	Observational Research	Global change	Total
U.S.A		1		3	4
U.K	3				3
Russia			1		1
Korea		1	2	2	5
India				5	5
China	1		4	5	10
Canada				1	1
Bulgaria	2				2
Total	6	2	7	16	31

3 Number of Foreign Researchers (Frontier Research System for Global Change)
Applications

Year	Applications	Details
1997	47	China (12), Japan (10), India (7), Russia (7), U.S.A (2), Bangladesh, Brazil, Germany, U.K., Colombia, Korea, Canada, Egypt, Nepal
1998	68	China (18), India (18), Japan (13), Canada (3), Korea (3), Russia (2), U.S.A (2), Pakistan (2), SriLanka, Bangladesh, U.K., Ecuador, Egypt, Belarus, Australia
1999	48	Japan (18), China (12), India (9), Korea (2), Russia (2), Indonesia, Pakistan, U.K., Philippines, U.S.A

Employment

Year	Employment	Details
1997	14	China (5), Japan (4), India (2), U.S.A, Russia, Canada
1998	16	Japan (8), China (3), India (2), Korea (2), U.K.
1999	19	Japan (10), China (4), India, Korea, Russia, U.K., U.S.A

4 Recent research developments

_Inter-Hemisphere Decadal Variations in SST, surface wind, heat flux, low-level cloud over the Atlantic basin

_The unusual event of 1994 in the Asia-Pacific region

_Detectability of Summer Dryness Caused by Greenhouse Warming

_The Ocean at work during the Indian Ocean Dipole Mode

_The Year 2000 intensified observation in Siberia

_The Effect of Cloud Condensation Nuclei on the Optical Properties of Clouds

_Why is CO₂ gas balance important for the water balance between vegetation and the atmosphere?

_Observations by TRITON buoy array in the western equatorial Pacific Ocean

Further information is available on the homepage - <http://www.frontier.esto.or.jp>

THE NETHERLANDS

National update The Netherlands

*Hans de Boois and John Marks,
Netherlands Organization for Scientific Research NWO, October 2000*

The economy of The Netherlands is blooming. For R&D the benefits have been negligible. After more than 10 years of slowly shrinking research budgets we have arrived below the middle of European spending on R&D. However, in 2001 the trend will change by a minor increase of the budgets for basic research.

Global change research was relatively well off in the past period, and will remain on the top of the agenda of the national science foundation NWO for the next 5 years.

But, though the Dutch Ministry of Environment is hosting the CoP-6 next month, its spending on GCR is planned to decrease by about 30% over the next couple of years.

This does not prevent us from starting up a series of new initiatives.

The Research Council for Earth and Life Sciences is developing a strategic plan for the next four years with core themes which are highly relevant for global change research. At the same time there is a drive to further stimulate international co-operation, both in the planning phase and in the execution of research.

- After termination of the national programme on climate change which had a very wide scope, new programmes will be initiated which will be smaller and more specific.

The specific programme on CLIVAR is to be continued with a second phase.

- The launch by the European Science Foundation of EUROCORES as a new framework of European collaboration is strongly supported. The proposed theme Continental Margins is relevant to various parts of GCR.

The Netherlands take actively part in the Forward Look exercise of ESF.

- The launch of a special Dutch programme on LOICZ has not yet succeeded. Nevertheless, a series of other activities in the scope of LOICZ are continuing. Collaboration in the NW European coastal zones with Germany (State of Bremen) and very recently with Belgium (Flanders) illustrate that. Also, collaboration in SE Asia is planned to be continued, both bilaterally with Indonesia (together with Germany) and Vietnam, and in the framework of SARCS.

- The request to financially support DIVERSITAS was well received in various Dutch agencies. Apart from the financial contribution for the IPO there is a strong commitment to the science agenda as well in among others a national programme. The Netherlands is also actively developing a European node for the Global Biodiversity Information Facility.

Various agencies do efforts to bring contribution to monitoring into the governmental investment scheme for strengthening the economy. At the same time we are bringing the scientific community together to develop a coherent scientific contribution to the G3OS.

In CoP-6, taking place next month in The Hague, attention for science will be low, though monitoring is on the agenda. The Open Science Conference in Amsterdam July 2001 forms another event that offers the opportunity to secure the interest of policy and public in the issue of global change.

Appendix to the national update from The Netherlands

00-966 c

ALL FIGURES ARE ROUGH ESTIMATES

1. Funding levels for GCR

1.A	Total amount 1999 funding by Funding Agencies	NLG k	USD k
	Total	16,225	6,800

1.B.1 Funding agencies involved and mechanisms

Netherlands Organization for Scientific Research NWO:

NWO-ALW Research Council for Earth and Life Sciences

- national programme
- special programmes
- individual projects in annual open competition
- glue money applications

NWO-WOTRO Foundation for the Advancement of Tropical Research

- special programmes

NWO-SRON Foundation for Space Research

- special programme on earth observation

Ministry of Spatial Planning and Environment (via RIVM)

- national programme

Ministry of Education and Science

- incentive funding for NL-Germany collaboration NEBROC and COACH

1.B.2 Overhead, capital assets, shiptime, etc. is not included in the above figures. The net costs of a man-year GC scientist, excluding overhead etc. amount NLG 100 k (USD 42 k).

1.C Main areas of spending

climate, ocean CLIVAR	30%
coastal zone LOICZ	20%
IHDP	20%

1.D	Support for IPOs and other glue money	NLG k	USD k
	IPO LOICZ (1998-2002)	1,100	460 7%
	other glue money	125	50 1%
	Open Science Conference 2001		pm pm
1.E	Total national spending on GCR	48,000	20,000

The total budgets of NWO are slowly declining, but there is the intention to maintain priority for funding GCR.

The budget of the Ministry of Environment for GCR is declining 30% from 2002 on.

The contribution to GCR from own funding of institutes and universities is steadily increasing.

2. National mechanisms for glue money

The NWO Council for Earth and Life Sciences has reserved a budget of USD 40 k per annum. The Executive Directors of WCRP, IGBP, IHDP and DIVERSITAS can apply for funding by submitting proposals to the Council. Funding requests may concern meetings, short postdoc appointments, etc. Preference is given to research areas in which the Dutch science community is actively involved / has a prominent role.

3. Recent news and developments

The second phase of the national programme on GCR is terminating in 2001. Preparations are under way for the establishment of a new programme.

Collaboration with Germany on climate, atmospheric chemistry and coastal research is increasing.

Following previous bilateral coastal zone research programmes in Indonesia and support for the SE-Asian LOICZ research, a new programme has started on the Red River Delta. Continuation of the collaboration with Indonesia is in preparation.

In 2000, Dutch scientist were successful in obtaining EU funding in the Fifth Framework Programme.

New initiatives are undertaken for expanding European collaboration via ESF- EUROCORES.

The GCR Open Science Meeting in 2001 will take place in Amsterdam. From Dutch side organisational support and additional financial support is given.

National Update 2000

1. Funding levels for global change research (GCR)

A Total amount of funding

The total amount of GCR funding through The Research Council of Norway in 1999 is estimated at **NOK 89,8 M** (USD 11,2 M) (exchange rate of 31.12.99: 8,015). The Research Council is the main funding agency for GCR in Norway. The Council's funding is channelled through various research programmes and other research activities. An overview of these is enclosed.

It is difficult to estimate the amount spent by other funding agencies. Overviews of *environmental research* indicate that between 20 – 30 % of the total amount of environmental research conducted in Norway is financed through the Research Council. We have indications that this percentage is higher for GCR – between 40 and 50%. For 1999 we estimate the Council's percentage to be 40 %. Consequently, a rough estimate of the total amount spent on GCR in Norway in 1999 would be **NOK 224,5 M** (USD 28,0 M).

B1 Funding agencies involved and mechanisms by which GCR is funded

The main channels for GCR funding are:

- *The Research Council of Norway*. The Council gets its money from various ministries, of which the Ministry of Environment, Ministry of Education, Science and Church Affairs and Ministry of Petroleum and Energy are the most important contributors to GCR.
- *Other public funding sources*. This is mainly direct funding from the ministries, the main part of which is core funding (universities, other FoU-institutions), but also funding of programs and projects commissioned by the ministries or other public agencies.
- *Other public international sources*, especially EU-funding.
- *Private sources*. This is mainly FoU conducted by industrial firms, some private organisations dedicated to health issues etc.

The mechanisms by which GCR is being funded differ between the agencies. *The Research Council* invites research groups and individual scientists to apply for funding through dedicated research programmes. The Council also accepts individual proposals without any programmatic limitations. In both cases the proposals go through an extensive evaluation process. GCR is also funded through the Council's core funding of independent research institutes.

B 2 Overhead costs and typical cost of a man-year for a global change scientist

The Research Council covers 15 % overhead to the universities, and this is included in the figures above. As for funding through independent research institutes overhead is included in the cost of a man-year.

The cost of a man-year for a global change scientist varies, depending on type of research field/institution. As an average we would estimate around **NOK 1,06 M** (USD 0,132 M). for independent research institutes within the natural science/technology sector and **NOK 0.859 M**

(USD 0,107 M) within the social science sector. We believe that the real cost of a man-year at a university is not too different from this.

C Main areas of Norwegian GCR efforts

- science of climate (regional modelling, processes in ocean and atmosphere, paleoclimate, ozone/UV)
- impacts of climate change on the natural environment
- natural ecosystems/biodiversity
- energy production and consumption
- institutions
- public attitudes, perceptions, behaviour and knowledge
- demographic and social dimensions of resource use
- industrial ecology
- environmental security and sustainable development

D Support for international integration and co-ordination activities (IPOs and other glue money):

Support to the four international global change programmes amounted to **NOK 2,99 M** (USD 0,37 M). This amount was spent as follows:

- IHDP – core funding NOK 100 k (*Research Council*)
- IGBP – core funding NOK 145 k (*Research Council*)
- DIVERSITAS – core funding NOK 100 k (***Research Council***)
- JGOFS - support to the Bergen-secretariat – NOK 1,4 M (***Research Council***)
- CLIC – support to the Tromsø-secretariat – NOK 890 k (***Ministry of Environment***)
- GLOBEC – support to the Danish secretariat NOK 50 k (from 2000 NOK 150 k)
- START – support to START activities in Africa NOK 300 k (***NORAD***)

Support to other global change related activities amounted to NOK 5,69 M (USD 0,71 M):

- IIASA – core funding NOK 5,0 M (*Research Council*)
- IASC – NOK 60 k (*Research Council*)
- The National Global Change committee - NOK 630 k (*Research Council*)

E Funding agencies' percentage of the total national spending on GCR

The Research Council of Norway covered approximately 40 percent of the estimated amount spent on GCR in 1999.

F Trends in the funding levels

The amount allocated to GCR through the Research Council has been relatively stable the last few years included 1999. From 2000 there is a slight increase in the funding of climate and energy research through the Ministry of Environment and through a new governmental fund for long-term research and innovation.

2. National mechanisms for supporting integration and co-ordination activities

Through the Research Council of Norway there are three main mechanisms for such support:

- The Research Council gives core support to IHDP and IGBP out of its ordinary budget allocation

- The Norwegian Global Change Committee has its own budget and is delegated responsibility to support various types of integrating/co-ordinating activities: network support, travel grants, workshops, preparatory work related to GCR, shorter stays at IIASA and other IHDP-related institutions.
- Funding through relevant Norwegian research programmes

3. Recent news and developments

Climate and ozone programme:

- The Research Council recently decided to extend the programme for another 10 year period (2002-2011).
- The budget increased from 18 MNOK in 1999 to 31 MNOK in 2000.
- Some of the new money has been used to initiate a new national project on the thermohaline circulation in the North Atlantic Ocean. The project is expected to have close collaboration with similar UK activities.
- The regional climatmodelling project RegClim recently presented its first scenarios for the climate in the Norwegian region in the period 2000-2050.

Other news:

- A National committee on climate research has presented a report with proposals for future priorities and better and more long-term co-ordination of Norwegian climate research (natural sciences, social sciences and technology).
- It is expected that the Research Council will propose to strengthen the budget for climate impacts research for the coming years.
- The Research Council of Norway has granted support for a four-year period (2000 – 2003) to a project on *Environmental Change, Good Governance and Human Security*. The project will be carried out as a contribution to the IHDP Core project on *Global Environmental Change and Human Security (GECHS)* and serve as a GECHS program office in Norway.
- At the request of the Research Council more than 10 major Norwegian research organisations have commented upon the IDGEC and GECHS' science plans. Their comments and suggestions have been made available to the IHDP scientific committees as part of a more active dialogue between IHDP and the Norwegian research community.

Appendix:

Overview of main GRC-relevant research programmes (Figures represent the GCR-relevant parts)

- Changes in Climate and Ozone Layer (NOK 18,5 M)
- Biological Diversity – Dynamics, Threats and Management (14,85 M)
- Arctic Light and Heat (NOK 7,5 M)
- Changing Landscapes (NOK 3,5 M)
- Norwegian Energy and Environmental Policy: Constraints, Opportunities and Instruments (NOK 6,83 M)
- Sustainable Production and Consumption (NOK M)
- Programme for Research and Documentation for a Sustainable Development (NOK 2,5 M)

- Co-operation Programme for Central and Eastern Europe (NOK 3,1 M)
Independent researcher-initiated projects; other relevant research programmes (NOK 17,0 M)

National Update 2000

1. Funding levels:

A. The estimation of the National Agency for Science, Technology and Innovation concerning the level of R&D expenditures, in 1999, is the following:

- R&D expenditures as percentage in GDP: is about 0,34% in 1999, which represent 107 mil USD. (1600 bilion lei)

Level of GERD				
	1996	1997	1998	1999
GERD (% in GDP)	0,71	0,58	0,47	0,34
GERD (\$/ researcher)	7841	6665	6602	4776

B. Funding agencies in Romania and mechanisms by which are being funded

The two agencies mainly funding GCR in Romania are the National Agency for Science Technology and Innovation and the Ministry of Education

At the present the National Agency for Science Technology and Innovation has in his coordination 34 research institutes which have the statute of national RTD institutes.

There are also institutes, which develop activities of research, but they are not in the coordination of the other ministries. The Ministry of Education financed only the research from universities.

C. Main areas of the national research efforts which correspond to the future programmes from the National Plan

Information/ Life and Health/ Agriculture and food/ Biotechnology/Micro and nano-technology/ New Materials/ Management of risk/ Environment/ energy, resources, infrastructures and transport/ Basic and precompetitive research/ National Programme for Space Research/ Physics

D. Percentage of funding agencies spending on GCR

They are three forms, of strategic reorientation of public financing for RTD and innovation: **a.** the National Plan for RTD and Innovation; **b.** the Programme "HORIZON 2000" and **c.** the systems of grants for scientific research.

The new systems for financing RTD activities, based on the principle of programmes and projects within a National Plan is coordinated by NASTI

In the year 2000, the budget for the National Plan is foreseen to represent about *60% of the total RTD funds.*

The budget for the Programme "HORIZON 2000" was about *35 % of the total RTD funds.*

The systems of the grants for scientific research, represents a small share in the *total of RTD funds (about 5%)*

E. The structure of R&D expenditures by financing sources indicates the still dominant position of public funds, as financing source.**ERD by sources (% in GDP)**

	1996	1997	1998
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GERD	0,71	0,58	0,47
Public funds (GOVERD)	0,39	0,25	0,25
Other sources (BERD + other)	0,32	0,33	0,22

2. National mechanisms for supporting integration and co-ordination of international co-operation in GCR.

The reorientation of the forms of public financing for RTD and innovation, that started during 1999, has the aim to clarify the destination and to correlate the three types of funding that coexist according the current legislation, in order to make them represent complementary forms of investment in RTDI.

The new system was promoting a fully competition-based on financing the projects.

In the year 2000, the budget for the National Plan is foreseen to represent about 60% of the total RTD funds.

Objectives:

- competition –based financing of multiannual programmes
- direct economic effects on short /medium term, responding to concrete economic /social demands
- European and international integration of the Romanian RTD system.

Financing of the projects: partially from public funds, the cofinancing from partner enterprises, interested in the direct application of the results

The national mechanisms mentioned above are finalized through Programmes

Which mean that for the National Plan for RTD and Innovation correspond 4 programmes:

- RELANSIN –relaunch through research and innovation
- CALIST – Quality and standards
- INFRAST –Consolidation of the infrastructures for standardisation
- CORINT International S&T Cooperation and Partnership, which includes:EU-RO, COST-RO, NATO-STI, EUREKA-R, and COPBIL.

(Which represent the cofinanced of the V FP, respective COST; EUREKA; NATO; and bilateral cooperation).

For National Plan in the framework of the Programmes mentioned above, from the public budget in the year 1999 was 2 mil. USD and in the year 2000, 6,4 mil. USD.

We also have financing from private sector, which mean a small part until 10 %.

3. Recent news and developments:

The extension of the Plan will cover the period 1999-2003 and will include the following new programmes: Information Society/ Life and Health/ Agriculture and food/ Biotechnology/ Micro and nanotechnology/ new materials/ Management of risk/ Environment, energy, resources, infrastructures and transport/ Basic and precompetitive research;/ National Programme for Space Research/ Physics.

SOUTH AFRICA

SOUTH AFRICA - NATIONAL UPDATE FOR IGFA: 2000

This report is based on the National Research Foundation (NRF) only. Other South African organisations may be funding in-house global change related research, but as yet this information is difficult to extract.

The objective of the NRF is to support and promote research through funding, human resource development and the provision of the necessary research facilities, in order to facilitate the creation of knowledge, innovation and development in all fields of science and technology. The NRF supports the natural sciences, human sciences, health sciences and environmental and agricultural sciences.

1. Funding levels for Global Change Research (GCR)

- A. The NRF's own investment in GCR in 1999 was ca US\$ 397 000 (ZAR 2.45 million) and the investment in a Country Study on Climate Change on behalf of the USA and Germany amounted to another US\$ 113 000 (ZAR 700 000).
- B. (i) The NRF did not have a special programme for GCR. Funding mechanisms was through research grants and scholarships in a broad Theme called: Sustainable Environment as well as through travel grants for members of international committees to attend meetings abroad. The Country Study on Climate Change was administered by the NRF as an agent of the National Department of Environmental Affairs & Tourism.
(ii) The figures do not include overhead costs such as salaries and infrastructure. The employer concerned covered these.
- C. The main areas of research were on climatic modelling, the status and causes of climate change, the implications of climate change for biodiversity, and the potential to mitigate the effects of economic activity on climate change.
- D. About 1.2 % of the total expenditure on GCR was for integration and co-ordination.
- E. An accurate figure on the total national spending on GCR cannot be provided. It would require an extensive survey amongst South African Science Councils, Universities, Non-Government Organisations and Government Departments to obtain reasonably accurate figures.
- F. Funding levels were stable compared to previous years.

2. National mechanisms for supporting integration and coordination of international co-operation in glue money.

A specific budget line for international travelling exists in the NRF. The available budget is US\$ 40 000 (ZAR 245 000). The procedure for application is simple and the turnover time from when an application is received till when the grant is awarded is less than a month. The application procedure is different from that for normal research grant applications.

3. Recent news and developments

The NRF has developed new Focus Areas to be funded as from 2001 and amongst these are the *Conservation and Management of Ecosystems and Biodiversity*, *Sustainable Livelihoods: the Eradication of Poverty* and the *Socio-political Impact of Globalisation: the Challenge for South Africa* through which support for GCR will be continued. Support for integration and co-ordination will also be continued through a International Science Liaison department in the NRF. The Country Study on Climate Change will be completed in 2000, but this has already stimulated new research directions. An initiative to start a Long-term Ecological Research (LTER) network for South Africa is underway. The SAFARI 2000 collaborative research programme was launched last month. SAFARI 2000 is a joint venture between the USA National Aeronautics and Space Administration (NASA) and scientists from Africa and Europe aimed at developing a better understanding of the southern African earth-atmosphere-human system. The NRF is providing glue money, research funding and in-kind contributions to the Country Study, the LTER initiative and SAFARI 2000.

IGFA Plenary 2000 National update Sweden

1. As the Swedish system is not in an institutional sense designed for a coherent GCR machinery as the assessment about the mobilisation of resources has to be quite vague. Sources that may be associated with RaD in this field could be distributed according to the following scheme:

- A - National research funding agencies
- B - Private or semi-private funds (basically MISTRA)
- C - Basic resources to the Universities and University Colleges (most of which are state entities in Sweden with few exceptions like the Chalmers Technical University)
- D - Specialised agencies (SMHI etc)

With regard to category A we consider the following agencies to be relevant

- NFR (Natural Science)
- FRN (System Science/Human Dimensions)
- SJFR
- NUTEK
- Energy (National Energy Administration)
- Swedish Environmental Protection Agency

- 1:2 Normally there is no specific programme or mechanism for GCR. However, there may be specific "bottom-up" invitations for areas like hydrology, climate etc.
- 1:3 In Sweden if you have to extract a GCR-area of implicate priority concern it would probably be climate change.
- 1:4 The only sole strong international contribution in terms of RaD co-ordination support is the Swedish hosting of the international IGBP office in Stockholm.
- 1: 5 The funding level is fairly stable both in terms of general level as in terms of relative GCR component support (bio-, geo-, hydro-, human dimensions tec).
- 1:6 Gross estimates of Swedish GCR support from national and private fund sources (above basic University /etc/ direct support and overhead costs excluded) could be envisaged in the following way:

Natural Science oriented GCR	100 M SEK
Human Dimensions	<u>20 M SEK</u>
TOTAL	120 M SEK
<i>In Total US\$</i>	<i>15 M SEK</i>

We have taken into account the MISTRA 12 M SEK, the fractions of other agencies contributions to what could be termed GCR. To be observed is also the fact that a very limited part of the entire Swedish sum is core contribution to the major international programmes (at the level of an order of magnitude lower than the total contribution).

2. *Glue money* mechanisms. The Swedish system is not well designed for such contributions.

-
3. *Recent news*: The entire Swedish RaD-system is during the year 2000 finalising in a major re-organisation of its institutions. The key words could be said to be
- concentration to fewer institutions (4 in the governmental sphere)
 - emphasis on basic research
 - "bottom up" procedures.

In the governmental research bill of September 15,2000, to the Swedish parliament, research concerning environmental issues and sustainable development has been highlighted as one of eight priority areas. The annual increase over three years time is 20 M SEK (i.e. around 2.5 M US\$). It is difficult to estimate the fraction of this to fall on the GC domain. More important is probably the selection of the area to be prioritised.

Irène Johansson, NFR
Uno Svedin, FRN
2000-09-18

SWITZERLAND

National Update – Global Change Research in Switzerland

1. *Funding for global change research (GCR)*

1.1. *Research projects and programmes*

Since global change research in Switzerland is classified under environmental research, it is difficult to provide specific data on GCR funding. The following figures are based on projects dealing with GCR, climatic and environmental research, and are therefore to be considered as approximate.

The major funding agency supporting GCR is the **Swiss National Science Foundation (SNSF)**. In 1999, the SNSF supported projects with some relevance to GCR through the following mechanisms:

- ca. **6.18 million Swiss Francs (mio CHF)**, corresponding to **3.87 mio USD** (rate of 31.12.1999) for **basic research projects**,
- ca. **586'000 CHF (367'000 USD)** through its **National Research Programmes (NRP)** (mostly problem-oriented, interdisciplinary research projects),
- ca. **2.6 mio CHF (1.63 mio USD)** within the frame of the **Swiss Priority Programme Environment (SPPE)** (a programme with a strong focus on multidisciplinary and global issues).

In addition, the **Federal Office for Education and Science** supported the participation of Swiss researchers to European GCR projects with approximately **3.71 mio CHF (2.32 mio USD)**.

To a lesser extent, GCR research is also supported by the Federal Office for Environment, Forests and Landscape (BUWAL) and the Swiss Agency for Development and Co-operation (SDC). Detailed figures are, however, not available.

1.2. *International integration and co-ordination activities*

The **SNSF** provides core funding (on an equal basis with the USA) of the **PAGES-IPO** (Past Global Changes - International Project Office), which is located in Berne. The Swiss **annual contribution** amounts to around **245'000 USD**.

The **Swiss Academy of Sciences (SANW)** funds the **European LEMA station for mountain forests** (Long-Term Ecological Modelling Activity, GCTE Focus 2) located in Zurich, with **25'000 USD p.a.**, and supports the **national IGBP committee** with another **8'000 USD p.a.**. In addition the SANW finances **ProClim** (Forum for Climate and Global Change) with **250'000 USD p.a.**. ProClim hosts the **Advisory Body on Climate Change (OcCC)** to the Ministry, which is funded with **125'000 USD p.a.** by the **Federal Office for Environment, Forests and Landscape (BUWAL)**.

The **Swiss Academy of Humanities and Social Sciences (SAGW)** supports the **IHDP-IPO** (Improving Human Dimensions of Global Environmental Change Programme), located in Bonn, with an **annual contribution of 5'000 USD** and the **national IHDP committee** with approx. **2000 USD p.a.**

In comparison, the **average person-year cost** of an experienced scientist in Switzerland lies between **80'000 and 100'000 CHF (50'000-63'000 USD)**.

The general funding trend is stable to slightly increasing.

2. National mechanisms for supporting integration and co-ordination of international co-operation in GCR ('Glue Money')

In Switzerland there is no special budget line allocated to “glue money” for GCR activities. SNSF offers various instruments for supporting international co-operation and co-ordination activities (such as international seminars, exchange of scientists, international programmes), but they are not discipline oriented and subject to application and periodic evaluation. Some of these support mechanisms for international co-operation are subject to periodic calls, others are permanently open. All information is available on the SNSF homepage at: <http://www.snf.ch/>.

In addition most research projects supported by the SNSF (especially the projects of the oriented research programmes, but also several basic research projects) offer the possibility to include so-called “glue money” for overhead costs and co-ordination activities in the project proposal.

Any request for supporting international co-operation which does not fit in the SNSF funding categories should be sent at **minimum 6 months before** to the following address:

Swiss National Science Foundation
International Relations
Wildhainweg 20
CH-3001 Berne

The request should include all information required for evaluation (such as abstract, description, programme, Curriculum vitae of the main applicants, preliminary budget, etc.).

3. Recent news and developments

On June 1999, the Swiss Federal Council has approved a budget of **15 mio CHF for 5 years (9.39 mio USD)** to launch a new *National Research Programme: “Landscapes and Habitats of the Alps”*. The first call for proposals has been opened on 18 October 2000. The programme will analyse and evaluate ecological, economic and cultural processes concerning the dynamics of landscapes and habitats in the Alpine region in inter- and trans-disciplinary research projects.

In early 2001, the SNSF will establish a first series of **National Centres of Competence in Research (NCCR)**. The NCCR will have a particular focus on interdisciplinary approaches and shall promote international co-operation. They consist of a “Leading House” and a network of partners both from academic and non-academic institutions. Their **annual budget will range from 2 to 6 mio CHF (1.25 to 3.75 mio USD), for a duration of ten years**. After formal evaluation, the SNSF has selected 18 proposals and submitted them to the Federal Department of Home Affairs for the final selection. Out of the NCCRs recommended by the SNSF, three focus on GCR or biodiversity:

- *“NCCR North-South: Research partnerships for mitigating syndromes of global change”*
- *“Climate variability, predictability and climate risks”*
- *“Plant survival in natural and agricultural ecosystems”*

In the course of 2000, the Research Council of the SNSF approved to support the core activities of **DIVERSITAS (International programme on biodiversity science)** with an annual contribution of **20'000 USD for 3 years**; and allocated **4'000 USD to IHDP Workshop 2000: “Human Dimensions Issues in the Coastal Zones”**.

THE CONDITION OF SCIENCE IN UKRAINE

In 1998-99 the national science system of Ukraine was functioning in the social-economic conditions, which according to the assessments of the high state power had started obtaining the typical features of the period of economic stabilisation. In the country there had been created the fundamentals of the market economy; the cooperative and private sector had been considerably enlarged. There had taken place the forming of the stock, goods, money and currency markets, as far as the market of state securities.

The market changes and especially their influence on the condition of the domestic economy simultaneously remain still insufficient, and in certain cases they had led to heavy negative results. The structural reconstruction of the economy doesn't have the innovative basis yet. The social economic conditions, in which the new independent national science system is being formed, are generally complicated for creating favourable innovative climate and organisational connection of the scientific-technical progress with the market transformations. From the moment of getting the state independence the process of the transformation of Ukrainian scientific system from regional (which it was in the USSR) into independent national system has been gradually taking place.

At the present moment the development of the scientific technological development in Ukraine is characterised by:

- the low level of budget financing of the scientific-technological sector;
- the fixation of the state's position as of the main customer of R&D works, acting according to the strategy of "surviving" of the science, but not of its "development";
- the low capability of the enterprises to finance own applied investigations and developments;
- inconsiderable share of the innovative products in the general amount of production;
- permanent decreasing of the number of high quality staff at the industrial enterprises.

As the result of all these processes the scientific-technical is realized in Ukraine mainly not due to the present tendencies of the social-economic development, but regardless of them.

Since 1990 the level of science intensity of Ukraine's GNP which is the indicator of the dynamics of the economic transformation has the tendency to stable decreasing, having descended during 1992-1999 almost 1,7 times

The dynamics of the science intensity of the gross domestic product of Ukraine

(according to the provisional data)

	1992	1994	1995	1996	1997	1998	1999
General expenses for science, as a share of GDP, %	1,54	1,35	1,20	1,16	1,43	1,21	0,9

The tendency to the decreasing of the amounts of state budget financing of the scientific researches and developments is present. In the result the share of budget financing of the science

during the last period had been decreasing every year and in 1999 it formed 29% of the general amount of financing comparing to 47% in 1994.

There is also present the negative tendency of decreasing of the amount of the staff, involved into carrying out the scientific-research works (SRW). The average number of the persons, executing SRW after 9 months of 1999 corresponded to 144.500 persons, which was approx. 8% less comparing to the respective period of 1998 and 5% less comparing to the year's beginning.

Other negative tendency at the moment is the fact, that about 40% of the scientists have exceeded the 50-years age, the average age of the candidate of sciences is 50 years, doctor of sciences has on average 59,5 years.

In 1999 more than 70% of the organisations were of the state property, the others were in collective and private property, as far as in the property of international organisations and foreign judicial persons.

Simultaneously there appeared certain evidence for higher independence of the scientific activity from the state budgetary support. For example in 1999 the share of the scientists in non-state organisations was more than 20% of the general amount.

The organisations carrying out the scientific research and developments, the types

Scientific organisations	1992	1994	1995	1996	1997	1998	1999
General amount	1350	1463	1453	1435	1450	1518	1510
	100%	100%	100%	100%	100%	100%	100%
In particular:							
scientific-research	39,6	42,9	46,8	47,5	49,9	51,6	52,0
Design bureaus	25,2%	22,0%	20,6%	20,3%	19,0%	18,0%	17,0%
High schools	10,7%	10,1%	10,3%	10,7%	10,5%	10,4%	10,8%
Scientific-research and design departments at the industrial enterprises	7,5%	8,6%	8,7%	7,6%	6,7%	6,4%	5,5%

In 1999 the Ukrainian science got the reliable legal framework in the form of the Law of Ukraine "for Scientific and Scientific-Technical Activity", which is the basis for the creation of adequate conditions for scientific and scientific-technical activity. The important document is the Concept of the Scientific-Technical and Innovative Development of Ukraine, which was worked out by the Ministry of Education and Science and accepted by the Ukrainian Parliament. It defines the main aims, priority directions and principles of the state scientific-technological policy, mechanisms of the acceleration of the innovative development, the guidelines of structural formation of scientific-technical potential and its provision by the resources.

The main aim of the new education and science policy foreseen by the above mentioned documents lies in the following:

- to provide the correspondence of Ukraine's intellectual and technological resources to the demands of the economic reforms and to the task of the European integration;

- optimal connection of two systems – science and education on the legal, administrative and conceptual levels;
- consequent increase of investing the fundamental sciences and education, as far as the training of the engineer staff;
- to create the favourable climate for attracting the non-state investment into applied scientific-research works.

Participation in the international programs

Ukrainian scientists take part in the realisation of many projects in the frames of INTAS, European Union Program INCO-COPERNICUS, Scientific Program of the NATO, as far as of the special programs of the European Union in the field of education, medicine, environmental protection, power engineering, industrial implementation of the technologies.

In 1996-1998 through the Ukrainian Scientific-research Center by the governments of USA, Canada, Sweden with the aim to support and develop high technologies in the sphere of conversion the scientific-research works to the general sum of about 18,5 mln. USD (USA – 15 mln. \$, Canada – 2 mln.\$, Sweden – 1,5 mln. \$). had been financed All mentioned funds were spent in Ukraine for providing grants for scientists, purchasing and creation of the equipment on the unprofitable and non-returnable basis.

The scientific-technical activity in Ukraine is supported from the following sources: direct from the state funds and branch scientific-technical programs; form off-budget funds, first of all from State innovatory fund; from foreign orders and the grants for carrying out scientific-research and construction works, from the funds of the domestic customers, such as non-state subjects, as far as from the own costs of the scientific-research organisations, which happens, however, quite seldom.

In the frames of these programs there are being financed the following priority directions in the scientific and technical development:

- environmental protection (1*);
- human health (2*);
- production, processing and conservation of agricultural products (3*);
- ecologically clean power engineering and resource-saving technologies;
- new substances and materials;
- scientific problems of state building.

First four directions are realised through:

- the Ministry for education and Science; the Ministry of Ecology and Natural Resources; the Ministry of Health Protection; the Ministry of Economics;
- the State Committee for Industrial Policy; the State Committee for Energy Saving;
- the National Academy of Sciences; the Academy of Agricultural Sciences;
- the State Fund for Fundamental Research.

The financing for the realisation of the State Order Program was (in thousand USD)

Priorities/ Year	1998	1999
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1*.	103,4	58,0
2*.	267,8	106,5
3*.	105,9	48
Total	477,1	212,5

of the State Scientific-Technical Programs:

Priorities/ Year	1998	1999
1*.	359,52	108,3
2*.	293,4	81,2
3*.	95,3	36,5
Total	748,22	226

In the frames of the intersectoral program in 1999 there had been financed 10 projects concerning the ecological purity of the geothermal energy of Ukraine to the sum of 40 thousand USD.

The national program of investigations and use of the resources of the Black sea and the Sea of Azov basin and other regions of the World ocean was financed on the sum of 35,2 th. USD, which is 12,9 % of the amount planned;

- on ecological diagnostics, examination and monitoring on the sum of 20 th. USD;
- on carrying out the control, assessment and prognostication of the situation with the petrochemical pollution of the underground waters of Ukraine – 40 th. USD.

In the frames of the State Fund of the Fundamental Research there had been financed the direction “The Earth and Universe science and the problems of the environment”:

- in 1998 – 125, 78 thd. USD
- in 1999 – 122, 42 thd. USD.

Antarctica

Ukraine is participating in the scientific researches in Antarctic.

Ukraine joined the Antarctic Treaty in 1992.

1996 Ukraine started investigations on its own station “Akademik Vernadsky”, which became one of 17 Antarctic stations (out of 76), being part of the global climate control system.

The yearly financing of the activity of Ukraine in Antarctic is about 1 mln. USD.

Concerning the activity of Ukraine in the field of climate changes there was created the Interdepartmental Commission on Implementing the UN Convention on Climate Changes.

The Ministry of Education and Science is carrying out the preparation work with the aim to create the working group of scientific-technical specialists for the organisation and elaboration of the legal framework and practical solution of the problems connected with the international obligations concerning the climate changes as far as providing the methodological and scientific-technical assistance on the matters concerning the Framework UN Convention on Climate Changes and Kyoto protocol attached to it, first of all concerning the projects of its common implementation. The function of the main scientific-technical coordinator of this work is

proposed to be given to the Scientific-Technical Center of Coal Energetic Technology. The financing is not being carried out.

UNITED KINGDOM

UNITED KINGDOM (UK)

NATIONAL UPDATE

1. Funding levels for GCR

Total funding

The following figures are best estimates and include overheads. The typical cost of UK scientist man-year is £25k (US\$ 41k) staff cost, or £36k (US\$ 60k) including an allowance for overheads.

It is difficult to estimate funding for GCR in universities through the Department of Education (eg for permanent faculty staff) as it is not allocated by specific science area.

GCR is separated from biodiversity as the latter covers local conservation issues as well as global issues.

Agency	1999 Funding of GCR	
	<u>£million</u>	<u>US\$ million</u>
Natural Environment Research Council (NERC)		
GCR	51.1	84.3
Biodiversity	24.0	39.6
Department of Environment		
GCR + Biodiversity	23.0	38.0
Biotechnology and Biological Research Council		
GCR	1.5	2.5
Biodiversity	4.0	6.6
Ministry of Agriculture, Forestry and Food		
GCR	1.7	2.8
Biodiversity	2.3	3.8

TOTAL for UK Funding Agencies (rounded)	108	178
(NERC as % of this TOTAL:	70%)	

A very rough guess of funding for GCR in universities from the Department of Education would be to assume that it approximately matches that from the funding agencies. Whence:

CRUDE ESTIMATE OF TOTAL funding in the UK: **200** **330**
(NERC as % of this TOTAL: 38%)

Breakdown by science area for NERC, plus trends

NERC spend in 1999 on IGBP- and WCRP-related research was

IGBP:	£15.3m	=	US\$ 25.2m
WCRP:	£18.7m	=	US\$ 30.8m

The trend is stable in real terms.

It is difficult to calculate what proportion of our spend on biodiversity could be attributed as DIVERSITAS-related. NERC spend on biodiversity generally has increased in the last few years.

2. Support for glue money

NERC support for glue money in 1999 almost entirely consisted of support for IPOs (WOCE, CLIVAR, GLOBEC, GCTE focus 3), and totalled approximately £0.5m (US\$ 0.8m), which is **1.5%** of our spend on IGBP/WCRP science.

NERC has no special budget or mechanisms for dealing with significant glue money requests. Any such request has to enter our usual grants/proposal systems. Very small requests (eg less than £10k = \$17k) are sometimes funded from a specific 'minor initiatives fund', but this fund has to cover many regular subscriptions (eg ESF, Arctic Science Forum etc).

However, NERC is currently reviewing the way it deals with glue money requests.

3. Recent news and developments

The **Tyndall Centre for Climate Change Research** started operation on 1 October 2000. It is initially a five-year, £10m (\$17m) initiative, looking at climate change impacts, mitigation and adaptation. Its interdisciplinary framework currently covers the social, economic, engineering and technological issues, as well as the climate and environmental science. A particular focus for the centre will be to elucidate sustainable options for dealing with climate change that are relevant to government and business. (<http://www.tyndall.uea.ac.uk/>)

Plus NERC has started four new major thematic programmes in GCR as follows.

Coupled Ocean-Atmosphere Processes and European Climate (COAPEC) aims to determine the impact on climate, especially European climate, of the coupling between the Atlantic Ocean and the atmosphere, including the influence of ENSO on this coupling. Value: £4.85m over 5 years. Details: <http://www.nerc.ac.uk/science/coapec/>

Clouds, Water Vapour and Climate (CWVC) aims to improve our understanding of the physical processes responsible for the distribution of humidity and clouds, and of their influences on climate. Value: £4 million over five years. Details: <http://www.nerc.ac.uk/science/cwvc/>

Palaeoclimate Research and Earth System Modelling for Enhanced Climatic and Environmental Prediction (PRESCIENT) is a new, multi-disciplinary Thematic Programme designed to provide high quality, high resolution palaeoenvironmental data to enable the more rigorous testing of the capabilities and reliability of General Circulation Models (GCMs) with specific focus on increasing the sophistication and versatility of the Hadley Centre's Earth System model. Value: £3.5m from 2000/01 to 20004/5. Details: <http://www.nerc.ac.uk/es/prescient.htm>

Global Nitrogen Enrichment (GANE)

The GANE thematic programme will address the UK interest in the global phenomenon of nitrogen enrichment of soils, vegetation, freshwaters, coastal oceans and the atmosphere. It will tackle key questions concerning:

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- the transformation and pathways of reactive N;
 - quantifying N fluxes at large temporal and spatial scales (from landscapes to the globe);
 - impacts on N-sensitive semi-natural ecosystems and coastal waters.

Value: £6m over 5 years. Details: <http://www.nerc.ac.uk/tfs/progs/gane.htm>

UNITED STATES

National Update for IGFA The United States Global Change Research Program

Funding levels for global change research:

The USGCRP supports a comprehensive program of scientific research on the many issues presented by climate change and other changes in the Earth system. USGCRP-supported research has produced substantial increases in knowledge, predictive understanding, and documented evidence of global change, including major scientific advances in the understanding of strato-spheric ozone depletion, the El Nino-Southern Ocean Oscillation phenomenon, global climate change, and tropical deforestation, among others.

Ten U.S. Federal agencies are involved in the USGCRP. They are the Department of Agriculture (DOA), the Department of Commerce (DOC), the Department of Energy (DOE), the Department of Health and Human Services (HHS), the Department of the Interior (DOI), the Environmental Protection Agency (EPA), the National Aeronautics and Space Administration (NASA), the National Science Foundation (NSF), and the Smithsonian Institution (SI). The DOC activities are centered in the National Oceanic and Atmospheric Administration (NOAA) and HHS activities are centered in the National Institutes of Health (NIH).

The USGCRP was funded for the U.S. Fiscal Year 1999 at a level of \$1,682M. This funding does include support for overhead costs. The funding can be broken out as follows (in millions (M) of dollars):

Scientific research:		Space-based observation programs:	
DOA	\$55	NASA	\$937
DOC/NOAA	63		
DOE	114		
HHS/NIH	40		
DOI	27		
EPA	17		
NASA	240		
NSF	182		
SI	7		
TOTAL	\$745		

The IGFA Resource Assessment of 1995 indicates that approximately 24% of all funding for global change research funding is allocated to the organized international research programs (WCRP, IGBP, IHDP, etc.). Thus, it is estimated that U.S. funding for these was about \$179M in FY1999.

USGCRP-sponsored scientific research in FY1999 focussed on the following:

- Understanding the Earth's climate system;
- Composition and chemistry of the atmosphere;
- The global water cycle;
- Carbon cycle science;
- The biology and biochemistry of ecosystems;
- Human dimensions of global change; and
- Paleoenvironment/paleoclimate.

U.S. funding for integration and coordination activities associated with global change research programs and networks are estimated as follows (in \$100K's):

START	\$750	
IGBP	410	
WCRP		50
IHDP	350	
GAIM	300	
GCTE (Focus 1)	100	
GEWEX	430	
ICSU	175	
IAI	700	
PAGES	300	
IGAC	300	
CLIVAR	160	
WOCE		100
Total direct	\$4,125	

Estimated funds provided for**Scientific workshops,****publications, etc.****\$1,500****Total “glue money” provided \$5,625**

Some of these estimates are based on the USGCRP and research program budgets for U.S. FY2000, rather than FY1999. The largest part of U.S. funding for the WCRP is not included; this is provided through the U.S. annual contribution to the WMO.

The U.S. support for these integration and coordination activities is approximately 3.1% of the funds that the U.S. provides for the organized international global change research programs and is about 0.7% of the overall USGCRP research budget.

Over the three-year period from FY1998 through FY2000 funding for the USGCRP was for all intents and purposes level and funding for FY2001 is likely to remain at a similar level.

National mechanisms for supporting integration and coordination of international cooperation in global change research:

A variety of mechanisms/processes are available to scientists and scientific programs to seek funding for integration and coordination activities through the USGCRP. Those seeking such funding can approach an individual agency directly; they can approach a group of agencies directly; or they can use either of these roads indirectly (e.g., an international research program can work through a “U.S. National Committee” for that program. U.S. scientists and scientific institutions are generally well aware of the various options available to them.

Most requests to U.S. agencies for integration and coordination activities of the organized international programs are handled by these agencies as a group, that is, through the interagency committee that coordinates the USGCRP. Most of these requests are processed through one agency

– the National Science Foundation acting in this area on behalf of the USGCRP – although other agencies, especially NOAA and NASA, provide substantial funds for some specific programs of special interest to them.

Recent news and developments:

The USGCRP is in the process of preparing a long-range strategic plan. This process offers the opportunity to reexamine and redefine the goals of the program based on a decade of research accomplishments and to do so in the light of changing needs for information by decision-makers.

The plan is expected to identify new priorities and expected products. It will offer scientists and science managers the opportunity to reexamine our basic assumptions and understandings and to reinvigorate the mechanisms that coordinate federal global change research efforts. The research community will be asked to review the plan for scientific credibility and vigor. Decision-makers will be asked to review the plan to ensure its relevance to decision support.

It is expected that a key challenge will be to increase attention to the consequences of change at finer spatial scales and in the context of multiple stresses, while continuing to carry out research on the functioning of global systems with which humans interact. Issues which are likely to be considered include forecasting of climate change, vulnerability and resilience; health; water resources; food security; natural heritage; and carbon management.

We look forward to working with our counterpart funding agencies in other IGFA member countries as this long-range planning process develops.

Appendix:

National Updates 2000 - Guidelines for written summaries

Please be brief and focused and structure your summary as follows:

1. Funding levels for GCR

In the 1999 plenary meeting in Beijing options were discussed for continuation of the resource assessment. It turned out that continuation of the comprehensive approach with identification of individual research projects is not realistic. Further discussions in the Staff Group have led to the conclusion that the kind of information which the IGFA members can provide generally is limited to the *funding agencies' spending* on global change research. In line with this conclusion it was decided to include information on the funding levels by funding agencies in the national reports for the plenary meeting. It is desirable that figures presented by the IGFA members are as comparable as possible both between countries and between different years. Therefore we kindly ask you to provide, to the extent possible, the following information:

A. What was the *total amount of funding (in USD) of global change research (GCR) in 1999 by funding agencies in your country?*

B1. Name the *funding agencies involved* and indicate the *mechanisms* by which GCR is being funded (e.g. special programmes).

B2. Indicate whether the figures *include overhead costs or not* and specify the typical *cost of a man-year* for a global change scientist?

C. Which are the *main areas of your national research efforts/spending* on GCR (e.g. biodiversity, climate, etc.)? (Specification into the areas of the four international programmes WCRP, IGBP, IHDP and Diversitas is not asked for but could be presented if figures are available)

D. What percentage of the funding agencies' spending on GCR was support for international integration and co-ordination activities (*IPOs* and other *glue money*)?

E. If possible, please indicate the funding agencies' approximate percentage of the *total national spending* on GCR.

F. Finally, please also indicate *trends in the funding levels* (up, down, stable compared to previous years)?

2. National mechanisms for supporting integration and co-ordination of international cooperation in GCR ('Glue Money')

In Beijing it was agreed that IGFA members should provide information on 'national glue money mechanisms'

Therefore, please specify how requests for support for integration and co-ordination activities (e.g. support for the programmes' central secretariats, IPOs or activities like the Open Science Conference in 2001) are dealt with by your agency:

State whether or not you have separate budget line for such requests.

If so, please indicate its value and the procedures for accessing it;

If not, please say whether your agency accepts such proposals at all, and if so, indicate the approximate total value of this support, and whether these proposals are dealt with like research proposals or handled through a different mechanism.

Any additional comments you might have about support for integration and co-ordination activities are welcome.

3. Recent news and developments

All recent highlights that might be of interest to other IGFA members can be included under this heading (everything from policy issues via organisational/structural issues to interesting new research results), but please be brief.