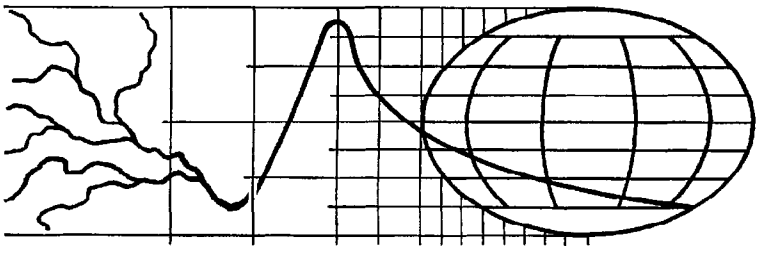
Weltdatenbank Abfluß
Bundesanstalt für Gewässerkunde
Koblenz, Deutschland

Global Runoff Data Centre
Federal Institute of Hydrology
Koblenz, Germany

REPORT No. 9

Report of the Second Meeting of the GRDC Steering Committee, Koblenz, Germany 27 - 28 June 1995



GRDC

August 1995

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Annexes to the Report

1. Opening of the meeting

1.1 The Steering Committee (SC) of the Global Runoff Data Centre (GRDC) convened in the Conference Room of the Federal Institute of Hydrology in Koblenz on Tuesday, 27 June 1995.

1.2 The President of the Federal Institute of Hydrology (FIH), Mr. Wetzel, welcomed the participants of the SC and outlined the institutional progress made in identifying the GRDC as an entity in the FIH (Annex 2) and the increase of the personnel resources of the GRDC that had been provided from the own resources of the FIH (Annex 3). He expressed, that these developments should give sufficient indication of the strong support the GRDC can count on from the side of the FIH.

1.3 On behalf of WMO, Dr. Askew thanked the Federal Institute of Hydrology for its kindness in hosting the Second Meeting of the GRDC-SC and for the firm committment of the FIH towards the development of the GRDC. Dr. Askew expressed his pleasure at the progress made so far. He pointed out that the Secretary-General of WMO has written letters to the relevant Ministries of the Federal Republic of Germany. While appreciating the commendable efforts towards the increase of the institutional capacity of the GRC, the Secretary-General had invited the Ministries to consider strengthening their support of the GRDC. Dr. Askew assured the SC that WMO would provide all feasible support to the GRDC.

1.4 The Chairman of the SC, Professor Liebscher gave a brief outline of the history of the GRDC and its recent progress. Since its auguration in 1988, the Centre has expanded its scope of operation from a tool for climatological research to operational hydrology and the support of regional projects. Commenting on the recent progress, Prof. Liebscher noted the growing international recognition of the GRDC due to its improved user services and the manifold linkages with programmes and projects of WMO, UNESCO, UNEP and other organizations. He especially highlighted the increasing acceptance of the GRDC by the international scientific community and its role in the World Climate Research Programme (WCRP) as well as as in the uses of the database for operational hydrology and water resources management.

1.5 The meeting was then formally opened by the chairman of the Steering Committee.

2. Organization of the work and adoption of the agenda

2.1 The meeting was attended by 16 participants representing 10 organizations. The list of participants is given in Annex 1 to this report. The World Bank was unable to attend but sent a letter (Annex 4) indicating its support for the activities and objectives of the GRDC. The World Bank would like to see the GRDC continue its committment for the development of the World Hydrological Climate Observing System (WHYCOS).

2.2 The agenda was discussed and adopted. It forms the table of contents of this report.

3. Report of WMO-Congress (Cg-XII) resolutions relevant to the GRDC

3.1 Dr. Askew reported on the relevant issues and resolutions of the Twelfth Congress (Cg-XII) of WMO for the strategy and activities of the GRDC. The budgets of all the Departments were cut, including that of the Hydrology and Water Resources Department (HWRD). The most important outcome was that information on the GRDC was presented to Congress with a specific resolution which was fully endorsed. The Hydrology and Water Resources Department of WMO is recognized as the parent body for the overall guidance of the GRDC with a specific mention of its value to the World Climate Research Programme (WCP). The GRDC is also mentioned in a Congress resolution concerning the World Hydrological Cycle Observing System (WHYCOS), where it is identified as a principal central database for selected regional WHYCOS data.

3.2 The President of the Commission for Hydrology (CHy) of WMO, Professor Hofius, pointed out that the resolution recognizes the GRDC's belonging to the HWRD as its parent body. In the light of the resolution, Professor Hofius expressed his committment to undertake the necessary administrative and scientific steps in CHy to implement the recommendations made in the resolution and to coordinate the activities of the CHy so that the GRDC operates under the same principles as adopted during Congress with regard to the exchange of data and data products in meteorology.

3.3 The Resolutions of Cg-XII with regard to the Hydrology and Water Resources Department are documented in Annex 5.

4. Comments on the World Climate Research Programme (WCRP) of WMO

4.1 The Director of the WCRP, Professor Graßl, informed the participants of the view of the WCRP with regard to the GRDC-activities. He outlined the principal interest of the climate research community in quality-controlled hydrological data sets with maximum possible global coverage to model, forecast and assess impacts of climate change. For the validation of climate models, hydrological data are indispensible. In this respect, river flows from the continents into the oceans are of prime interest as the freshwater flux into the oceans contributes significantly to the ocean-atmosphere energy transport and thus has a powerful impact on the formation of climate patterns and changes of climate.

4.2 Professor Graßl and Professor Raschke welcomed the contribution of the GRDC to various projects of the Global Energy and Water Cycle Experiment (GEWEX).

5. Presentation of the draft GRDC Status Report 1994

5.1 The Head of the GRDC, Dr. Grabs explained the principal activities of the Centre in 1994. Priorities were assigned to substantive works for GEWEX in the context of the Arctic Climate System Study (ACSYS), the assembly of a database of gauging stations close to the mouths of rivers and support for the Global Environment Monitoring System - Water (GEMS/WATER) of UNEP. The database was substantially updated and new software products included to enhance the updating capacity of the GRDC. The GRDC has been keen to strengthen its ties with national hydrological services and other data providers such as the Mekong Secretariat and the Zambesi River Basin Development Authority in close collaboration with WMO, UNEP/WHO and the World Bank. The participants acknowledged and expressed their satisfaction with the work concluded. The report was duly adopted and is separately attached as Annex 6 to this report.

6. Strategy and activities of the GRDC in co-operation with the Global Freshwater Assessment (WMO), WHYCOS (WMO/World Bank) GEMS/Water (UNEP/WHO/UNESCO/WMO), and FRIEND

6.1 Global Freshwater Assessment

The GRDC is prepared to participate actively in the global freshwater assement which is being undertaken at the request of the United Nations Commission for Sustainable Development (CSD), especially with regard to chapter 2 of the planned report: Assessment of the resource itself. On a global scale, the GRDC has already computed the continental runoff of rivers into the oceans and compared it with continental runoff estimates of various researchers. The specific tasks of the GRDC will be defined during a meeting in Geneva in July 1995.

6.2 GEMS/Water

The representative for GEMS/Water, Dr. Helmer explained that the GRDC has entered a contract agreement with GEMS/Water under which the GRDC links country missions with GEMS/Water missions and delivers data support to the GEMS/Water Collaborating Centre for Water Quality in Burlington, Canada. The GRDC participates in the Freshwater Programme of UNEP and contributes to the implementation of regional freshwater programmes of UNEP. Operating funds are allocated to the GRDC, dedicated mainly for country missions, data acquisition and production of primary data products. This respect, GRDC and GEMS/Water join forces in country missions to strengthen water quantity and quality data exchange arrangements and exchange information about planned and current activities.

6.2.1 The database of continental runoff into the oceans is of particular interest with regard to the Global Register of Rivers (GLORI) project of GEMS/Water. The GEMS/Water Steering Committee recommended during its session on 23rd June, that the two databases should liaise closely in future and necessary actions should be initiated. Dr. Ongley, Director of the GEMS/WATER Collaborating Centre for Water Quality, outlined the cooperation between the Centre and the GRDC and the common use of the RAISON software for visualization and graphical interpretation of both quantity and quality data.

6.3 WHYCOS

Resolution 3.5/3 (Cg-XII) - World Hydrological Cycle Observing System (WHYCOS) outlines the role of the GRDC in this important joint project of WMO and the World Bank. The World Bank expressed its view that the collaboration will facilitate the implementation of the Bank's Water Resources Management policy and the CSD's Global Freshwater Assessment. The GRDC is in a position to react in short-term to anticipated requests for receiving and processing of near real-time hydrological data. WMO is actively publicising the capacity and potential of the GRDC to play a vital role in the further development of WHYCOS.

6.4 FRIEND

The representative of UNESCO, Dr. Habib Zebidi, explained the aims and objectives of this important UNESCO project under IHP-IV and IHP-V and emphasized the common links between the WMO and UNESCO with regard to the development of both the FRIEND project and the GRDC.

6.4.1 The representative of FRIEND - Northern Europe, Dr. Gustard, outlined the strategy of FRIEND, especially that to increase the number of FRIEND projects in different regions. In his view, there is no prospect of a competition between FRIEND and the GRDC. In his response, Dr. Grabs informed the participants of a Memorandum of Understanding between the GRDC and FRIEND (Annex 7), in which ways of cooperation between FRIEND and the GRDC are outlined. He expressed his concern for possible competition and confusion in those cases where FRIEND and GRDC are seeking the same set of data. These cases occur especially in developing countries where there are no small experimental basins and FRIEND will incorporate data from the regular hydrological network of the respective country.

6.4.2 As the FRIEND data policy is more restrictive than the data policy of the GRDC (see item 11) this issue must be solved. First steps in this direction are the mututal invitations to the Steering Committee meetings of FRIEND and GRDC.

6.4.3 The SC recommended that the GRDC and FRIEND should collaborate in the field of quality control of data.

7. Cooperation of the GRDC with regard to GEWEX, GCOS, GPCC

7.1 GEWEX

Professor Raschke informed the SC of the outcome of the Seventh Session of the GEWEX Scientific Steering Group in Melbourne, January 1995 with regard to the GRDC (Annex 8). While the efforts and results of the GRDC are highly acclaimed, the principal request for a quality controlled set of hydrological data remains the first priority for GEWEX. Dr. Raschke invited the GRDC to participate in the meeting of the Working Group on Hydrometeorology in Visby (August 31 and September 1, 1995. He explained to the SC that this group brings together the Regional Projects of GEWEX.

7.1.1 Dr. Grabs presented the following outputs produced in 1994 relevant to the interests of GEWEX:

- Provision of the Arctic River Data Base for ACSYS
- Provision of all GRDC-station close to mouth of rivers for the estimation of freshwater flows from continents to the oceans
- Report on the database of the 20 largest rivers of the world.

With regard to the acquisition and exchange of hydrological data, the GRDC welcomes a closer cooperation with planned and on-going GEWEX projects such as BALTEX, GAME and LAMBADA, especially regarding a better feed-back from regional projects to the GRDC.

7.1.2 Prof. Graßl recommended that trend stations for further work on WCP-Water Project A.2 - "Long-Term Analysis of Hydrological Time Series" should be identified in conjunction with GCOS.

7.2 GCOS

The SC acknowledged the contacts between the GRDC and GCOS. There are no operational tasks for the GRDC at present to serve the data and information requirements of GCOS. The SC recommended that the GRDC continues to monitor developments concerning GCOS.

7.3 GPCC

The cooperation between the GRDC and the GPCC is expected to bear results in the contribution of the GRDC to the WCP-Water Project B.7. Due to the resignation of the responsible scientist at the FIH, however, further progress of the project will slow down considerably. The GRDC and the GPCC are extending the common time series where runoff and precipitation data are available. The Head of the GPCC, Mr. Rudolf, expressed his view that by autumn 1995 data sets of seven years (1986-1992) and by mid-1996 time series going back to 1980 will be available.

7.3.1 Mr. Rudolf then presented the work of the GPCC, especially with regard to the compilation of global time-series of precipitation and the quality control of precipitation data.

8. Scope and priorities for data acquisition of the GRDC

8.1 The SC re-iterated the present criteria for data collection, namely: Data should be collected for rivers with mean annual discharge greater than 100 m^3/s, from rivers with catchment areas greater than 1.000.000 km^2 and from river basins with more than 1.000.000 inhabitants. It should be expanded if a catchment size of 100.000 km^2 would be more appropriate.

8.2 The SC recommended that, as a general policy, the aim should be to collect daily discharge data. Data suppliers should therefore be requested to supply daily data. However, the SC is aware of the fact that many data suppliers at present supply only mean monthly discharge data to the GRDC.

8.3 The SC felt that the GRDC should be selective in what data it requests and accepts from programmes such as GEWEX and WHYCOS so that the received data are matching with the actual data requirements for the tasks of the GRDC. Dr. Helmer pointed out that the GRDC has to follow a definite data acquisition policy in order to develop an institutional profile of its own. Some members noted that the GRDC should not put too strict conditions on the data acquisition and also collect data from rivers even if the discharge is less than $100m^3/s$, if these rivers have an important role regionally.

8.4. The representative of the Government of Japan, Dr. Kinosita, noted that in no case estimated or interpolated data should be stored in the GRDC. Where data have been interpolated, they must be flagged to distinguish these data from the original data in the GRDC. The SC made it clear that the GRDC should stick to its present practice to collect only gauge observed data which are not statistically altered. Any missing data that have been filled in the database should be identified as such so as to allow users always to distinguish between originally observed and derived data.

8.5 In compliance with major data programmes such as GEWEX, additional requirements to be met include:

- Collection of discharge data from closed basins and from continents to oceans.

- Information to verify the runoff produced by coupled models in areas of 10^3 - 10^5 km^2.

8.6 For GEMS/Water, the GRDC-stations should as much as possible be linked with GEMS/Water "Trend-stations". For GEWEX and GEMS, discharge information from river stations close to the mouth and draining into the oceans bear special importance.

8.7 Selected data generated through the WHYCOS project data will also be incorporated in the GRDC database.

8.8 In general, the GRDC should take the lead for data collection programmes for regionally important rivers (e.g. within the WHYCOS project) and the global coverage of runoff; the GRDC should cooperate in data collection programmes of programmes such as GEMS/Water, GEWEX, FRIEND, etc.

8.9 Dr. Askew offered that the WMO Secretariat would write directly to data providers in those cases where necessary data are not accessible to the GRDC.

8.10 The SC felt that the GRDC should start to compile a meta-data catalog on hydrological databases. In this context, Dr. Zebidi informed the SC that UNESCO had recently published technical information on hydrological databases. The establishment of a modest library at the GRDC which contains inter alia hydrological yearbooks, river basin reports and relevant research papers is a first step.

8.11 The SC also discussed the requirement for the GRDC to keep records of sediment data for flux stations as hydrological services usually also collect sediment samples, and these are not available through other services. The SC discussed also in some depth the necessity for the GRDC to obtain not only surface water discharge data but also information about soil moisture and groundwater. This issue has been brought up in discussions at various occasions but a solution has not been found as of now.

9. Participation of the GRDC in regional working groups, cooperation with regional centres and other information networks

9.1 Dr. Grabs reported on the participation of the GRDC in regional working groups and its links with regional centres, especially the Mekong Secretariat.

9.2 The SC discussed this item and concluded that, as a general strategy, the GRDC should combine regional working group attendance by GRDC with country missions for contacts to national Hydrological Services to advertise the GRDC and stimulate the data collection.

9.3 The SC felt that it is extremely difficult to operate a regionalized or distributed data centre. The GRDC should therefore continue its practice of centralizing the holding of discharge data vital for the support of global and regional projects. However, the GRDC should liaise with existing or emerging data centres and assist in capacity building in terms of assistance in methodologies, techniques, and invitation of guest researchers or databank managers. Active liaison should only be sought when the data centres are established and founded and do not require extensive inputs from the GRDC.

9.4 The GRDC should monitor the creation of regional Centres which follow their own dynamics: methodological support by the GRDC being offered to such emerging Regional Centres based on the regional context and the support of leading countries.

10. Considerations for quality control of GRDC data

10.1 The quality of hydrological data is a key issue for all applications, the solution of this issue can only be approximated. The GRDC will use a specially programmed plausibility tool to check the plausibility of data. In-depth quality control can only be undertaken for selected cases with the active collaboration with the data providers. In the case of governmental or parastatal agencies, the final responsibility for the correctness of the data rests solely with these agencies. If the plausibility check shows errors or the data seem doubtful, the providing agency should be contacted for correction of the data. Where possible, the data quality assurance procedures from data providers should be communicated to the GRDC.

10.2 Additional data screening software should be adapted from existing software, including software in HOMS, research groups and international river basin authorities.

10.3 Dr. Gustard mentioned that FRIEND has data quality problems similar to those of the GRDC and proposed the extension of cooperation between FRIEND and the GRDC in the field of quality control.

10.4 The participants also suggested that the Centre should look for Ph.D students to do studies on quality control to supplement the manpower resources of the GRDC.

10.5 The participants acknowledged that quality control in hydrology is more complex and difficult to accomplish than for many meteorological parameters. One factor for this is the different set of instruments in meteorology and hydrology which make it difficult for the GRDC to use the same quality control procedures used in meteorology.

10.6 To find practical solutions to the data quality issue, the participants agreed that a small group of scientists should be established to advise and develop a quality control programme for GRDC data. In this respect, the offer for collaboration with FRIEND (item 10.3 above) and the recommendation of the SC to cooperate with FRIEND (item 6.4.2) was noted.

11. GRDC Policy Guidelines for the Dissemination of Data and Costing of Services

11.1 Following a recommendation of the SC in 1994, the GRDC prepared a draft: "Policy guidelines for the dissemination of Data and costing of services" in close cooperation with the WMO secretariat. Dr. Askew pointed out the necessity to harmonize the GRDC policy with the mainstream developments in WMO with regard to data transfer and dissemination. Dr. Kinosita remarked that the military use of discharge data must be prevented. The SC confimed that repeated misuse of the GRDC database or non-compliance with the data policy should result in the data user concerned being denied GRDC services.

11.2 After thorough deliberations, the members of the SC adopted the Policy Guidelines that are contained in Annex 9 to this report. The SC noted that the Policy Guidelines are subject to review at future meetings of the Steering Committee in the light of experience with its use and any developments in the WMO policy.

12. Allocation of resources to the GRDC; status and requirements

12.1 The SC welcomed the efforts of the Federal Republic of Germany, and in particular the Federal Institute of Hydrology, to augment the personal resources of the GRDC to the current number of five members (Annex 3).

12.2 The SC expressed its satisfaction that WMO and UNEP allocated operating funds for the GRDC, these being dedicated mainly for country missions, data acquisition and production of primary data products. The SC expressed clearly, that these funds were to be used to supplement the budget which the Federal Republic of Germany allocates to the Centre, especially for those activities where the allocated budget is insufficient to carry out the necessary activities of the GRDC.

12.3 Together with funds provided by WMO and by UNEP through its GEMS/Water programme, the SC noted that the GRDC is now in a good position to expand its activities.

The SC however also noted that additional financial and manpower resources are necessary to take the lead in the scientific exploitation of the database and to effectively coordinate research activities with global data sets. The latter is important, because the GRDC keeps to its practice not to disseminate the entire database or large parts thereof. The SC recognized that, under these circumstances, it would be appropriate for the GRDC to undertake, lead and coordinate global hydrological research based on the GRDC database.

12.5 The SC recommended that the GRDC actively attract funds from third sources to finance invitations to researchers at the GRDC and technical assistance to hydrological services in the the context of GRDC data requirements.

13. Review of membership of the Steering Committee

13.1 The SC reviewed its membership and recommended, that the number of persons in the SC should remain constant. It noted that up until now, a representative of ICSU has not been nominated.

13.2. The SC, recognizing the importance of ICSU representation recommended that the WMO Secretariat write a letter to this regard to ICSU. ICSU might then nominate a person from the climate community, in collaboration with WCRP and taking into account the national balance of the SC members. The review of membership of the SC should be retained as a topic for discussion at the next SC meeting.

13.3 The SC recommended that the Head of the GRDC should invite to Meetings of Steering Committee observers and/or representatives of bodies whose needs or potential value to the GRDC are not represented by Committee membership.

14. Research issues of the GRDC in collaboration with existing and planned programmes of WMO and other organizations, including the possible establishment of a Science Team

14.1 A poster presentation of two nationally funded projects was given by Dr. T. Lüllwitz (FIH): Transformation of measured flow data to grid points and R. Winnegge (FIH): Comparison study of areal mean monthly precipitation and streamflow for selected basins: The Niger River. These projects are contributions to the WCP-projects WCP-Water Project B.3 "Development of grid related estimates of hydrological variables" and WCP-Water Project B.7 "Comparison study of time series of areal mean monthly precipitation and streamflow of selected catchment areas".

14.2 The progress of both projects was acknowledged by the SC. The contribution of the B.3 project will likely end at the end of 1995. Since the principal researcher for the B.7 project has left the FIH, further progress will be slowed down significantly.

14.3 With regard to WCP-Water Project A.9 "Monitoring changes in the characteristics of extreme hydrological events (floods and droughts)", the recommendation of the SC from June 1994 to publish the highest and lowest recorded discharges from GRDC files as a contribution to this project had to be deferred into 1996 due to a shift of the working priorities of the Centre. Dr. Zebidi informed the SC that the IHP project H-2-3 on "Extraordinary rainfall and snowmelt floods in rivers of the world" was not implemented due to a lack of funds.

14.4 Prof. Graßl remarked that every effort should be made to make scientific use of the GRDC database. In this respect, the GRDC should intensify its efforts to cooperate with research institutions to conduct research. He pointed out that high quality research would also facilitate funding from national and international sources.

14.5 The WMO Rapporteur on Hydrological Data for Observing Climate and Environmental Change, Prof. Kaczmarek, encouraged the GRDC to follow current research developments and to review the results with a view to the strategic planning of GRDC activities.

14.6 The GRDC is prepared to invite/accept guest researchers to work with

the GRDC database at the GRDC in Koblenz. Results of such publications should be published under the GRDC as host institution with the collaboration of the guest institution, where appropriate.

14.7 The issue of the establishment of a Science Team was discussed at some length. The SC then recommended that a science team meeting could be convened on an ad-hoc basis to discuss specific research issues. The SC requested Dr. Grabs to contact members of the Steering Committee when need for scientific clarification/guidance is required and convene ad hoc scientific groups for this purpose.

15. Miscellaneous

15.1 Public Relations

The GRDC expressed its intention to publish a color leaflet by the end of 1995. This leaflet is intended to give general information about the GRDC, its mandate, objectives and services. In 1996, a more detailed leaflet will be produced.

15.2 Information Transfer

The transfer of data and on-line information makes it necessary that the GRDC is linked to the World Wide Web (WWW) and INTERNET. Technically, the GRDC could be "on-line" by the end of 1995 and will take every step possible to achieve this objective after many requests by agencies, data providers and users. However, the on-line access to the data base itself is not foreseen, because it would contradict the GRDC policy on the dissemination of data and costing of services (see topic 11 above).

16. Next meeting of the Steering Committee

16.1 The SC discussed the necessary frequency of SC meetings and decided that its next meeting should take place in Koblenz tentatively in **June 1997**.

17. Summary of results and closure of the meeting

17.1 The Secretary of the SC reviewed the work of the Steering Committee and the major conclusions and recommendations. The SC agreed, that the final report should be made available to all participants and the abridged version published by the GRDC in its GRDC Status Report 1995.

17.2 In the closing session, the participants thanked the President of the Federal Institute of Hydrology for his hospitality and genuine interest in the progress of the GRDC. Likewise, the participants expressed their satisfaction about the professional preparation and conduct of the meeting.

17.3 In his closing remarks, Prof. Liebscher thanked the participants for their valuable advice and inputs towards the operation of the GRDC. He then wished the participants a safe journey home. The meeting was closed on Wednesday, 28 June 1994.

Annex 1

Participants of the meeting

Annex 1

Participants of the 2nd GRDC-Steering Committee Meeting 27 - 28 June 1995 at the Federal Institute of Hydrology, Koblenz, Germany

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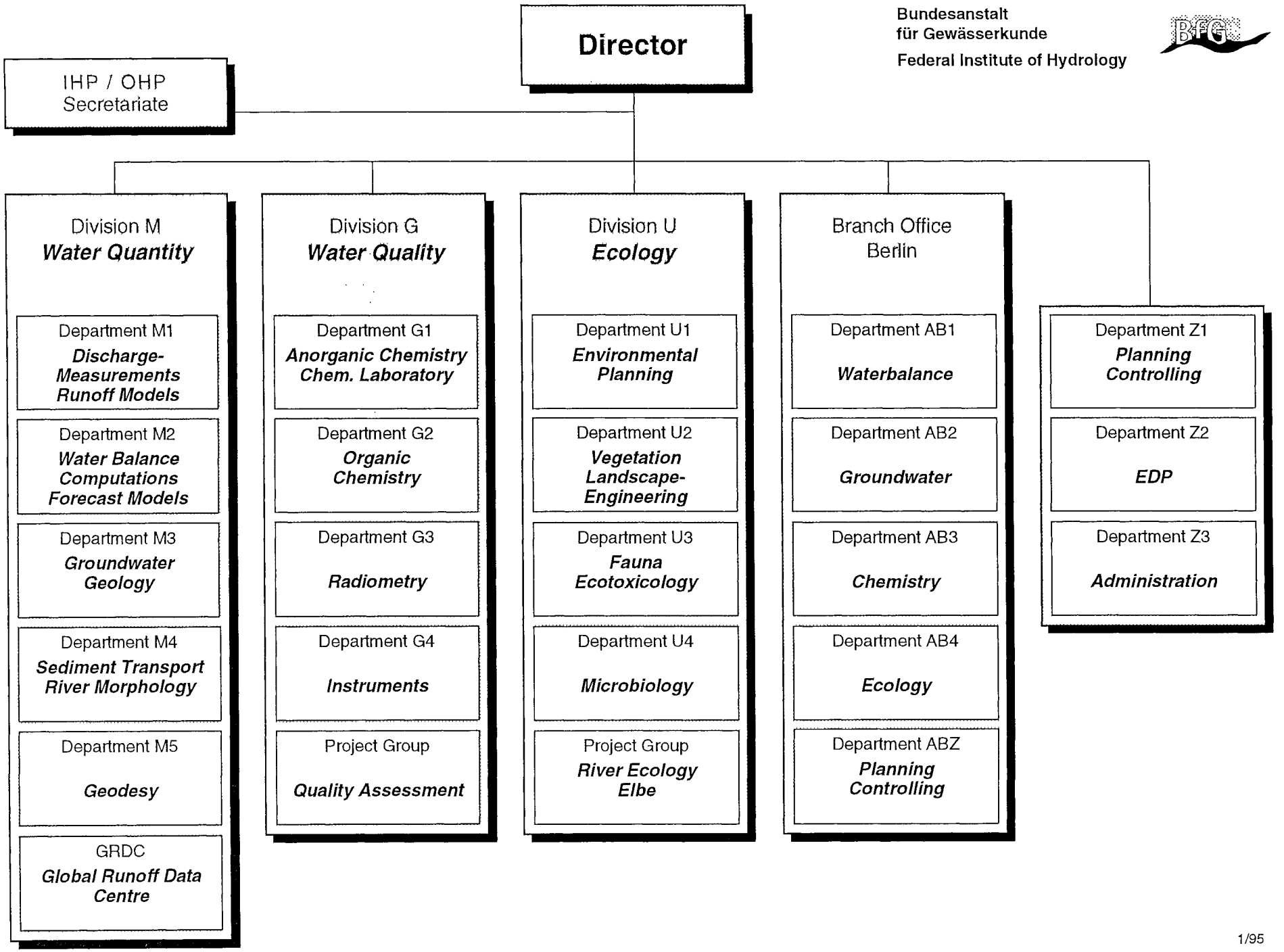
Annex 2

Organization diagram of the Federal Institute of Hydrology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Department M1
Discharge-
Measurements
Runoff Models
Department M2
Water Balance
Computations
Forecast Models
Department M3
Groundwater
Geology
Department M4
Sediment Transport
River Morphology
Department M5
Geodesy
GRDC
Global Runoff Data
Centre
Division G
Water Quality
Department G1
Anorganic Chemistry
Chem. Laboratory
Department G2
Organic
Chemistry
Department G3
Radiometry
Department G4
Instruments
Project Group
Quality Assessment
Division U
Ecology
Department U1
Environmental
Planning
Department U2
Vegetation
Landscape-
Engineering
Department U3
Fauna
Ecotoxicology
Department U4
Microbiology
Project Group
River Ecology
Elbe
Branch Office
Berlin
Department AB1
Waterbalance
Department AB2
Groundwater
Department AB3
Chemistry
Department AB4
Ecology
Department ABZ
Planning
Controlling
Department Z1
Planning
Controlling
Department Z2
EDP
Department Z3
Administration
1/95

Annex 3

Organization of the GRDC

Bundesanstalt für Gewässerkunde
Federal Institute of Hydrology

Staff of the Global Runoff Data Centre

Name	Function	Principal Task
Dr. Wolfgang Grabs	Head of the GRDC	Overall operation of the Centre, international contacts, policy matters, programme planning and implementation, data acquisition and data product development
Dr. Thomas Lülllwitz	Deputy	Scientific data processing, quality control, geographic information systems support, statistical analysis of time-series
Mr. T. de Couet	Task Manager	Compilation of project databases and use of GIS-based software, response to data requests and data queries from users, generation of data products
Mr. J. Pauler	Databank Administration	Administration and development of the Databank System, development of databank tools, update of database, development of programme interfaces
Mrs. A. Markert	Administration	Archiving services, public relations, general support

Postal Address:
Global Runoff Data Centre
Federal Institute of Hydrology
Bundesanstalt für Gewässerkunde
P.O.B. 309, 56003 Koblenz, Germany

Phone: +49-261-1306-224/265
Fax: +49-261-1306-280

Annex 4

Letter from The World Bank

THE WORLD BANK/IFC/M.I.G.A.

Headquarters: Washington, D.C. 20433 U.S.A.
Tel. No. (202) 477-1234 // Fax Tel. No. (202) 477-6391 // Telex No. RCA 248423

FACSIMILE COVER SHEET AND MESSAGE

DATE: June 22, 1995 NO. OF PAGES: 1 (including this sheet) MESSAGE NUMBER: \

TO
Name: Dr. Wolfgang Grabs
Organization: \
Fax Tel. No. 49 6542 1284
City: Bullay/Mosel
Country: Germany

FROM
Name: Geoffrey J. Matthews
Dept./Div. \
Room No. \
Fax Tel. No. 1 202 334 0568
Dept/Div No. \
Tel. No. 1 202 473 0354

SUBJECT: Global Runoff Data Centre (GRDC) - 2nd. Steering Committee - 27 to 28 June 1995

MESSAGE:

Dear Dr. Grabs,

I regret to inform you that neither I nor Mr. Guy Le Moigne will be able to attend the 2nd. GRDC Steering Committee due to mission committments. However we wish that you record in the Minutes of your deliberations that the World Bank fully supports the activities and objectives of the GRDC.

With regard to future activities, the Bank would like the GRDC to continue its committment to the development of the World Hydrological Cycle Observing System (WHYCOS) in partnership with the Bank and all other interested parties. The strategy of the Bank, the GRDC and others should be mutual support and the marketing of each others services.

The result of this collaboration will facilitate the implementation of the Bank's Water Resources Management policy, Agenda 21 and the CSD's Global Freshwater Assessment.

Please send a copy of the Minutes to the Bank..

We wish you a very successful meeting.

Kindest regards,

Geoffrey J. Matthews
Senior Water Resources Engineer

Transmission authorized by: _____

If you experience any problem in receiving this transmission, inform the sender at the telephone or fax number listed above.

Annex 5

Resolutions of Cg-XII with regard to GRDC

Draft resolution

Res. 3.5/1 (Cg-XII) - HYDROLOGY AND WATER RESOURCES PROGRAMME

THE CONGRESS,

NOTING:

(1) Resolution 22 (Cg-XI) - Hydrology and Water Resources Programme;

(2) Resolution 11 (EC-XLV) - Report of the ninth session of the Commission for Hydrology;

(3) The report of the president of the Commission for Hydrology and the Statement of the ninth session of the Commission for Hydrology;

(4) WMO's Plan of Action for the International Decade for Natural Disaster Reduction (IDNDR);

(5) The review of national capacities presented in the WMO/UNESCO Report on Water Resource Assessment, prepared in 1990-91;

(6) The issues of importance to hydrology and water resources, raised at the International Conference on Water and the Environment (Dublin, January 1992) and at the United Nations Conference on Environment and Development (Rio de Janeiro, June 1992);

(7) The Paris Statement of the UNESCO/WMO/ICSU International Conference on Hydrology (March 1993);

(8) The call by the second session of the UN Commission for Sustainable Development for an assessment of global water resources;

NOTING FURTHER:

(1) That there is a common recognition that scarcity and misuse of fresh water pose a serious and growing threat to sustainable development and the protection of the environment;

(2) That there is a deteriorating capability in many countries to determine accurately the status and trend of both the quantity and quality of their water resources;

(3) That improved operational techniques are required for the more effective assessment and prediction of future water conditions;

(4) That broader commitment and concerted action are required by international agencies, including WMO, to enable the effective and world-wide assessment, development and management of fresh waters;

CONSIDERING:

(1) That the Operational Hydrology Programme (OHP) provides the framework for all scientific and technical aspects of WMO's activities in the field of hydrology and water resources;

(2) That the Hydrological Operational Multipurpose System (HOMS) successfully continues to meet the differing needs of Members for technology transfer in the field of operational hydrology;

(3) The importance to Members of the adequate assessment and the rational management of their water resources;

(4) That Hydrological Services are essential to the management of water resources for human consumption, agriculture, energy production and industrial purposes, while avoiding irreversible degradation of water quality and of the environment;

(5) That such services are also essential to activities aimed at mitigating the effects of droughts, floods, desertification and tropical cyclones, while at the same time these phenomena pose special problems for the collection, analysis and use of hydrological data;

(6) The need for an increase in activities on the interfaces between operational hydrology and meteorology, in climate studies and, in particular, in environmental management;

(7) The need for maintaining the co-ordination of international activities and programmes in hydrology and water resources, so as to enhance their impact at the national level and provide for more economic and rational management of available resources;

DECIDES:

(1) That the substance of the Hydrology and Water Resources Programme, and hence the Operational Hydrology Programme - Basic Systems, the Operational Hydrology Programme - Applications and Environment and the Programme on Water-related Issues be as indicated in Part II, Volume 5 of the WMO Fourth Long-term Plan adopted under Resolution ... (Cg-XII);

(2) To endorse the Implementation Plan for HOMS adopted by CHy-IX;

(3) That WMO should continue to take the lead, jointly with the United Nations Education, Scientific and Cultural Organization (UNESCO), in the follow-up to the UN Conference on Environment and Development (UNCED) to promote and implement on water-resource assessment;

(4) That WMO should continue its efforts, with the support of other agencies, to develop the World Hydrological Cycle Observing System (WHYCOS) as a component of the HWRP;

(5) That WMO should continue to contribute towards the comprehensive assessment of water resources requested by the UN Commission on Sustainable Development (CSD), and take an active part in the 1997 session of the CSD when fresh water is considered;

(6) That WMO should contribute actively to the follow-up to UNCED in respect to other areas of fresh water dealt with in Agenda 21;

(7) That WMO should seek to further improve co-ordination of the OHP with the International Hydrological Programme (IHP) of UNESCO at the national and international levels;

INVITES MEMBERS:

(1) To take all possible measures to continue full support to the implementation of the three component programmes of the Hydrology and Water Resources Programme;

(2) To arrange for their Hydrological, Hydrometeorological and Meteorological Services to continue to co-operate in the implementation of national and international plans for the assessment and management of their water resources and to participate in the implementation of WHYCOS;

(3) To continue their close co-ordination in the planing and implementation of national inputs to international programmes in the field of hydrology and water resources;

(4) To institute or continue the co-operation between Hydrological, Hydrometeorological and Meteorological Services within shared river basins;

(5) To participate in the component of the Voluntary Co-operation Programme directed towards hydrology and water resources;

(6) To support the process leading to the assessment of global water resources requested by CSD;

REQUESTS the Secretary-General to invite the United Nations and its subsidiary bodies, all specialized agencies concerned and the International Atomic Energy Agency (IAEA) to take account of the activities of WMO, and in particular those of the Hydrology and Water Resources Programme, in the planning and execution of their programmes in water resources and to note the contributions that WMO can make to these programmes;

REQUESTS the president of CHy:

(1) To arrange for the implementation by CHy of relevant parts of the Hydrology and Water Resources Programme;

(2) To continue the co-ordination of CHy activities with the regional inputs to the Hydrology and Water Resources Programme including the possible implementation of joint projects;

(3) To arrange for appropriate contributions from CHy to WMO's efforts in support of the IDNDR;

REQUESTS the Executive Council and the Secretary General, as appropriate and within the available budgetary resources:

(1) To strengthen support to the Hydrology and Water Resources Programme in view of the increasing need of its enhanced participation in the resolution of the world water issues;

(2) To take all necessary action to assist the Commission for Hydrology and all bodies concerned in implementing the Hydrology and Water Resources Programme, in accordance with DECIDES (1);

(3) To continue to provide assistance in support of training events for Members in the fields of hydrology and water resources, particularly those in developing countries and other countries-in-need;

(4) To continue to co-operate with other governmental and non-governmental organizations in the field of hydrology and water resources and with existing international river basin commissions;

(5) To continue to take account of the contribution that hydrological science can make through the Hydrology and Water Resources Programme to current and future programmes of WMO, including future arrangements that will follow from adoption of the Climate Agenda.

Note: This resolution replaces Resolution 22 (Cg-XI) which is no longer in force.

Draft resolution

Res. 3.5/3 (Cg-XII) - WORLD HYDROLOGICAL CYCLE OBSERVING SYSTEM (WHYCOS)

THE CONGRESS,

NOTING:

(1) That WHYCOS has already been endorsed by the Commission for Hydrology at its ninth session (1993);

(2) That the Executive Council of WMO, at its forty-sixth session (1994), expressed the view that WHYCOS was potentially of great importance to water resources assessment on the global, regional and national scales;

(3) That the Eleventh Session (1995) of the Intergovernmental Council of the International Hydrological Programme of UNESCO adopted a resolution which called upon the Director General of UNESCO to arrange, in co-operation with WMO, for the planning and implementation of WHYCOS;

(4) That the World Bank as part of its water resources strategies has specifically recommended the establishment of Hydrological Cycle Observing System (HYCOS);

(5) The financial support already given by the World Bank for the implementation of the Mediterranean Hydrological Cycle Observing System (MED-HYCOS), a sub-regional component of WHYCOS, and the interest shown by other donors for similar sub-regional components;

CONSIDERING:

(1) That WHYCOS is one of the basic WMO responses to the recommendation of the UN Commission on Sustainable Development (CSD) to strengthen efforts towards a comprehensive assessment of freshwater resources, notably by providing timely, reliable and consistent data to regional data centres. Certain of these data could then be made available at the international level through centres such as GRDC for runoff data;

(2) That WHYCOS has a vital role to play in several new programmes such as the Global Climate Observing System (GCOS), the Global Terrestrial Observing System (GTOS) and in the Global Ocean Observing System (GOOS);

(3) That the concept of WHYCOS is in line with the spirit of international co-operation in which the World Weather Watch (WWW) was established and has since operated;

ENCOURAGES Members:

(1) To participate in the development of a global conceptual basis for providing a framework and general guidance for the establishment of WHYCOS;

(2) To facilitate the establishment of WHYCOS through the implementation of national, sub-regional and regional components of the system;

REQUESTS the president of CHy to ensure that the Commission provides WHYCOS with the technical advice that it requires;

REQUESTS the Secretary-General:

(1) To invite other international organizations to co-operate with WMO to establish WHYCOS, contribute to its implementation and make use of it;

(2) To provide all possible support to WHYCOS from available resources and to seek additional resources for this purpose from external sources.

Draft resolution

Res. 3.5/4 (Cg-XII) - GLOBAL RUNOFF DATA CENTRE (GRDC)

THE CONGRESS,

NOTING:

(1) That the GRDC has its origins in support to the World Climate Research Programme (WCRP) and to studies of large-scale hydrological processes;

(2) The generous support that has been provided by Germany over many years for the establishment and maintenance of the Centre;

(3) That the GRDC is now widely-recognized as the principal source of global data on river flows, providing an effective service to an increasing range of users;

(4) That the Centre already co-operates in a number of major international projects;

(5) That the Executive Council, at its forty-fifth session, had approved Recommendation 2 (CHy-IX) - Support to global data centres;

CONSIDERING:

(1) That new and increased demands are now being put on the Centre, in particular in relation to the global assessment of the world's water resources requested by the second session of CSD (1994), the need for a global data centre in relation to the World Hydrological Cycle Observing System (WHYCOS) and for various climate studies;

(2) That the Centre will need considerably more resources if it is to meet these new demands effectively;

RECOGNIZING that the GRDC is a major component of WMO's Hydrology and Water Resources Programme (HWRP), serving also the WCRP and other programmes of the Organization;

ENCOURAGES Members:

(1) To support the GRDC through the provision of the hydrological data and related information that it needs, including through the regional components of WHYCOS;

(2) To consider also providing support to the Centre in the form of staff, funding and other resources;

REQUESTS the president of CHy to ensure that the Commission provides the GRDC with the scientific and technical advice that it requires;

REQUESTS the Secretary-General:

(1) To invite other international organizations to co-operate with the GRDC, to make use of the services that it offers and to contribute both data and other resources in support of its operations;

(2) To provide all possible support to the GRDC from available resources and to seek additional resources for this purpose from external sources.

Annex 6

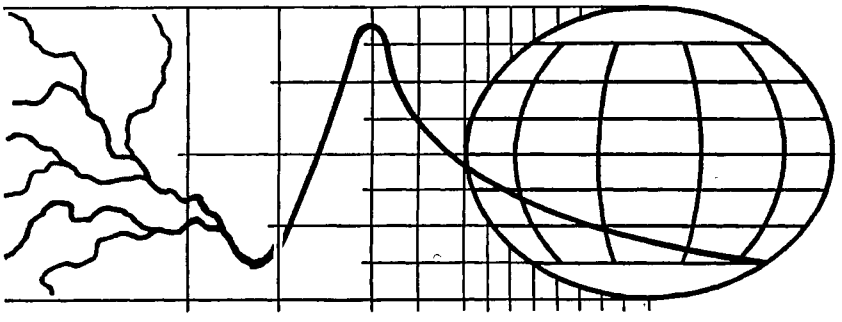
GRDC Status Report 1994

(attached seperately)

Bundesanstalt für Gewässerkunde
Federal Institute of Hydrology

Report No. 7

GRDC - Status Report 1994



GRDC

GRDC operates with the support of the Federal Republic of Germany under the auspices of the World Meteorological Organization (WMO)

56068 Koblenz, Kaiserin-Augusta-Anlagen 15-17, Phone (0261) 1306-0, Fax (0261) 1306-302
Germany

Annex 7

Memorandum of Understanding between FRIEND and the GRDC

Common views of the representative of FRIEND and the GRDC on the relationship between FRIEND and GRDC

Results of a meeting at the Federal Institute of Hydrology
Koblenz, 25 January 1995

Participants:

A. Gustard, represenative FRIEND
K. Hofius, President of CHy
H. Liebscher, Chairman, GRDC Steering Committee
W. Grabs, Head of GRDC
U. Schröder, IHP/OHP Secretariat
T. Lüllwitz, Federal Institute of Hydrology

Results

The group agreed on the following points:

1. To prepare a draft brochure to outline the objectives and present and future activities of FRIEND and the GRDC and ways of co-operation between FRIEND and GRDC primarily in the fields of data

    - acquisition
    - archiving
    - processing
    - dissemination

2. To develop operational links between the GRDC and FRIEND on the basis of the GRDC Steering Committee and the individual Steering Committees of FRIEND.

3. To exchange meta-data between GRDC and FRIEND with regular up-dates

4. During country missions, representatives of FRIEND and GRDC should inform the data providing agencies about the different programmes and activities of GRDC and FRIEND and ask for active contributions to each other's programme.

5. In regions, where FRIEND is established, FRIEND could act as an agent for GRDC in order to implement previous agreements between the relevant partners.

6. In new FRIEND regions, GRDC could act as an agent for FRIEND with respect to time-series database development.

7. UNESCO should inform WMO prior to the establishment of new FRIEND activities.

8. It is recommended, that participation by WMO in FRIEND activities should be strenghtened and that UNESCO should continue to support activities of GRDC.

9. Define the roles of GRDC and FRIEND in the respective programmes of WMO and UNESCO more clearly.

10. To invite Mr. Alan Gustard as FRIEND representative to the next Steering Comittee meeting of the GRDC (Koblenz, June 27-28, 1995).

11. To invite Mr. W. Grabs of the GRDC to the regional Steering Committee meetings of FRIEND.

Annex 8

Report of the 7th Session of the GEWEX Scientific Steering Group, Melbourne 1995 with regard to GRDC

INTERNATIONAL COUNCIL OF SCIENTIFIC UNIONS

WORLD METEOROLOGICAL ORGANIZATION

INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION

WORLD CLIMATE RESEARCH PROGRAMME

GLOBAL ENERGY AND WATER CYCLE EXPERIMENT

(GEWEX)

REPORT OF THE SEVENTH SESSION OF

THE GEWEX SCIENTIFIC STEERING GROUP

(Melbourne, Australia, 30 January-3 February 1995)

June 1995

5/1995

13.2 Global Runoff Data Centre (GRDC) Operations

Since GEWEX is interested in quantitative estimates of water discharge from the continents to the oceans or from one large land area to another, the SSG reaffirmed that a quality controlled climatologic runoff data set remains its primary requirement from GRDC. The Group acknowledged the preparation and distribution on diskette of a new GRDC data catalog of 115 stations as an important first step in achievement of this goal. Other operational improvements and technical progress were also acknowledged. The SSG recommended, however, further development of a scientific programme to define and implement a quality control element in the GRDC data scheme with the objective of coupling an error budget definition with each dataset. Dr. W. Grabs, representing GRDC at the meeting, was invited by the SSG to participate in the ISLSCP/IAHS joint development of hydrological requirements (noted above) and the newly formed Hydrometeorological Working Group (Item 8.2) to enhance acquisition of discharge data.

Dr. E. Raschke was asked by the SSG to consolidate the GEWEX runoff data requirements (in concert with the ISLSCP/IAHS action group) and to convey these to the GRDC in a formal report by mid-1995. The SSG also asked WCRP to coordinate with the WMO Hydrology and Water Resources Department to:

a) have Dr. Raschke added, as a GEWEX representative, to thew recently organized GRDC Advisory Panel,

b) recommend that a small science team be established to assist the Centre with development and publication of a GRDC Science and Implementation Plan and

c) make the appropriate German National Offices aware of the SSG recommendations with the suggestion that consideration be given to augmentation of the GRDC's resources, as required, to expedite development of the runoff datasets necessary to meet the needs of the climate research community.

Annex 9

Policy Guidelines for the Dissemination of Data and Costing of Services

Global Runoff Data Centre
Federal Institute of Hydrology
Bundesanstalt für Gewässerkunde
Kaiserin-Augusta-Anlagen 15-17
56068 Koblenz
Federal Republic of Germany

Tel. National	(0261)1306-0
International	+49 261 1306-0
Telex	8-62499
Telefax	+49 261 1306280

GRDC operates with the support of the Federal Republic of Germany under the auspices of WMO

POLICY GUIDELINES FOR THE DISSEMINATION OF DATA AND COSTING OF SERVICES

Preamble

The Global Runoff Data Centre (GRDC) operates under the auspices of the World Meteorological Organization (WMO) on the advice of its international Steering Committee and in cooperation with organizations such as UNESCO, UNEP, WHO and ICSU. This Guideline regulates the acquisition and dissemination of hydrological data and costing of services in the Global Runoff Data Centre under the Terms of Reference stipulated during the First Session of the Steering Committee of the GRDC and the committments of WMO at its Twelfth Congress in 1995.

The Guideline does not infringe on the ownership rights on the data transmitted to the GRDC by data providers. In particular, the GRDC does not usually provide value-added and costed services to data users which fall in the domain of national hydrological services.

At its Twelfth Congress in 1995, the World Meteorological Organisation (WMO) adopted Resolution 40 (Cg-XII) and thus committed itself, as a fundamental principal, "to broadening and enhancing the free and unrestricted international exchange of meteorological and related data and products." In this context, "free and unrestricted" means non-discriminatory and without charge, the latter with the meaning "at no more than the cost of reproduction and delivery, without charge for the data and products themselves." With regard to the Global Runoff Data Centre, Congress also adopted Resolution 21 (Cg-XII) which encourages Members "to support the GRDC through the provision of the hydrological data and related information that it needs".

WMO Congress also adopted the practice that countries "should provide to the research and education communities, for their non-commercial activities, free and unrestricted access to all data and products exchanged under the auspices of WMO "with the understanding that the commercial use of these data may be subject to conditions."

1. Principles of data acquisition and access

1.1 The GRDC operates on the WMO principal mentioned above with the aim of encouraging the widespread use of the data for national, regional and global studies.

1.2 Contributing countries are encouraged to transfer unrestricted, quality controlled, selected hydrological data together with station history information to the GRDC. The transfer of daily discharge data is preferred.

1.3 When requested by a contributing agency, the GRDC also accepts and stores restricted data. In such cases, the agency concerned specifies the relevant restrictions and the GRDC flags the restricted data and uses them under the conditions specified by the contributing agency.

2. Dissemination of GRDC-Data

2.1 GRDC data are available to users under the conditions specified in 2.2. to 2.6 below.

2.2 Requests for data must reach the GRDC in written form: letter, facsimile, telex or email. A proforma is attached for use in this respect (annex 1).

2.3 The data user agrees in writing that the data received are not transferred to third parties without the written consent of the GRDC (proforma in annex 2).

2.4 GRDC data shall not be used for commercial purposes without the prior consent of the national hydrological service(s) and/or other contributors of the data to the GRDC. The GRDC will request such consent on behalf of a potential user.

2.5 The data user agrees that the GRDC may inform the national hydrological service(s) supplying the data about the use to which their data have been put and will transfer the name and address of the data user to the hydrological service(s) concerned.

2.6 The GRDC makes available subsets of the GRDC database on request, as stated above. Requests for the entire database or substantial parts of it cannot be entertained.

3. Cost of services

3.1 Information about the GRDC, including the yearly status reports and the database contents (catalogue), are provided free of charge upon request.

3.2 To enhance the services of the GRDC, the GRDC charges data users on a non-profit base for the time used for carrying out services and for costs of material, handling and mailing.

3.3 Standard GRDC services (annex 3) are free for agencies and institutions which contribute data to the GRDC, as well as for the Secretariats of international organizations which are the principal clients of the GRDC, such as WMO, UNESCO, UNEP and WHO.

3.4 For all other users, the cost for databank queries, diskettes, mail and all other overheads is based on the current price for services charged by the Federal Institute of Hydrology, Koblenz staff time being based on a per hour rate which in June 1995 was set at DM 75,--.

3.5 Services for projects which require extensive work at the GRDC or the establishment of an own database are agreed upon in a Memorandum of Unterstanding (MoU) between the project partners. In these cases, the financial contribution for the services of the GRDC are costed and incorporated in the MoU.

3.6 To give an indication of the approximate costs of databank services, the following can serve as a guide:

a) Simple queries, such as a search for all stations of three major rivers and the extraction of mean daily discharge data:

Estimated time for completion:	1.5 hours
Approximate cost (June 1995) :	DM 112,50

b) Complex queries, such as the selection of daily discharge time series of at least 20 years for 20 stations from three major rivers, with maximum overlap of time series:

Estimated time for completion:	5 hours
Approximate cost (June 1995) :	DM 375,--

For complex tasks where data products (statistical evaluations, graphics etc.) are also requested, a cost estimate is made and agreed upon in advance.

3.7 Payment for services is by bank transfer to the credit of the GRDC:

BUNDESKASSE KOBLENZ, LANDESZENTRALBANK KOBLENZ
BLZ: 570 000 00, ACCOUNT: 570 010 01, credit: 1207/11902 GRDC

Cheques sent by registered mail are also acceptable.

4. Disclaimer

4.1 While the GRDC makes every effort to eliminate errors from the data base, there may be errors in the data unknown to the GRDC. Neither the GRDC nor its sponsors can be held responsible for the consequences of the use of GRDC data, error free or otherwise.

Annex 1

Format for Data Request from GRDC

Any request for data should provide the following information:

a) Origin of the request including name, postal, e-mail address, phone and fax number of the individual person or institute making the request; where an institute, the name and the position of the responsible officer should also be provided.

b) Specification of request (e.g. which rivers, stations or regions, monthly or mean daily data, time series).

c) Rational for the data request.

d) Detailed description of the use to be made of the data. A summary of the research or study project should be added to the request.

e) Signature of the person or responsible officer referred to in a) above.

Annex 2

Declaration of the Data User

The undersigned declares that he/she is responsible for the use of the data provided by the GRDC and agrees to use the data under the following conditions:

1. The GRDC data are not transferred either in part or total to third parties or to the general public (e.g. by electronic media), without the written consent of the GRDC.

2. The data will not be used for commercial purposes without the written consent of the GRDC. The GRDC itself will obtain clearance from the respective national hydrological service(s) and/or other data contributors.

3. The dataset will be not accessible to unauthorized persons and after completion of the specified studies, the dataset will be kept seperate from the general data processing facilities on diskette, tape or CD.

4. After completion of the studies and parts thereof, two copies of the results will be made available for the GRDC, as well as publications arising from the use of the data set or parts thereof.

5. In all publications, the source of the data will be fully cited as: "The Global Runoff Data Centre, D - 56068 Koblenz, Germany".

6. The GRDC operates on a non-profit basis. In certain cases, however, the GRDC may charge the data user a nominal amount for data queries and handling or an amount which has been agreed upon between the requesting agency and the GRDC prior to data delivery. The undersigned confirms his/her capacity to pay bills presented by the GRDC for services.

7. Disclaimer

While the GRDC makes every effort to eliminate errors from the data base, there may be errors in the data unknown to the GRDC. Neither the GRDC nor its sponsors can be held responsible for the consequences of the use of GRDC data, error free or otherwise.

I, as principal researcher/representative of the requesting organization agree to the conditions stated above.

Place and date : _____

Signature : _____

Annex 3

Standard Services of GRDC

The following standard services are rendered on a routine basis and are distinguished from specialized services to data users:

- Production and dissemination of catalogs and yearly status reports
- Database queries and response to data requests
- Compilation of project/programme related sub - databases
- Production of tables and graphs to illustrate and enhance the understanding of the content of the database
- Monitoring of global/regional runoff on a comparative basis
- Production of reports in the GRDC - Report series on global/regional hydrological issues on demand from projects/programmes of, inter alia, WMO, UNEP and UNESCO

The GRDC holds the right to change the extend and scope of standard services without notice.

An example for specialized services would be the detailed statistical analysis of regional time-series for specific studies.

Reference of GRDC-Reports

Report No. 1 Second Workshop on the Global Runoff Data Centre, Koblenz, Germany, 15 - 17 June 1992; May 1993

Report No. 2 Dokumentation bestehender Algorithmen zur Übertragung von Abflußwerten auf Gitternetze. (Incl. abstract in English by GRDC: Documentation of existing algorithms for transformation of runoff data to grid cells). G. C. Wollenweber, May 1993

Report No. 3 GRDC - Status Report 1992, June 1993

Report No. 4 GRDC - Status Report 1993, June 1994

Report No. 5 Hydrological Regimes of the Largest Rivers of the World - A Compilation of the GRDC Database, November 1994

Report No. 6 Report of the first meeting of the GRDC Steering Committee, Koblenz, Germany, 20 - 21 June 1994

Report No. 7 GRDC - Status Report 1994, June 1995

Report No. 8 First Interim Report on the Arctic River Database for the Arctic Climate System Study (ACSYS), July 1995

Report No. 9 Report of the Second Meeting of the GRDC Steering Committee, Koblenz, Germany, 27 - 28 June 1995