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WORLD METEOROLOGICAL ORGANIZATION

INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION

REPORT OF THE GCOS

DATA AND INFORMATION MANAGEMENT PANEL

Second Session

(Ottawa, Ontario, Canada, 14-17 May,1996)

July 1996

GCOS - 25

WMO/TD No. 765
UNEP/DEIA/MR.96-5

UNITED NATIONS ENVIRONMENT PROGRAMME

INTERNATIONAL COUNCIL OF SCIENTIFIC UNIONS

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1. OPENING OF THE SESSION

The Global Climate Observing System (GCOS) Data and Information Management Panel (DIMP) held its second session 14-17 May 1996 in Ottawa, Ontario, Canada. The meeting was hosted by the Marine Environmental Data Service (MEDS) and chaired by Mr G. Withee.

1.1 Welcome

The Chairman welcomed the participants, expressed his gratitude for their attendance (Annex I), and invited each participant to describe their roles and responsibilities related to GCOS. Mr Withee then introduced Dr G. Holland, President of the Intergovernmental Oceanographic Commission (IOC).

Dr Holland greeted the participants on behalf of Environment Canada. As Chair of the IOC, Dr Holland noted that the IOC has established the Global Ocean Observing System (GOOS) with the intention that its climate module would supply the ocean element of GCOS and noted that the ocean community has long established expertise in data management and exchange. He pointed out that in the current challenging fiscal climate it is imperative to cooperate and coordinate data management activities to make the best use of the resources available. He also noted the enormous economic impact of climate on Canada's economy and described how a very small increase in the efficiency of these activities through better understanding and use of climate data would provide savings far in excess of the cost of Canada's contribution to GCOS.

1.2 Annroval of the agenda

The agenda as given in Annex II was adopted.

2. GCOS STATUS AND UPDATE

The Chairman invited Dr T. Spence, Director of the Joint Planning Office, to provide an update on GCOS activities since the first meeting of the Panel. Dr Spence reviewed overall programme issues including the JSTC-V meeting, subsequent panel meetings and publications. Since the last meeting, plans for the overall programme, the space-based observations, the ocean observations, the terrestrial observations as well as for data and information management have been published and widely distributed.

He noted that implementation of some elements of the Initial Operational System (IOS) bad begun, in particular with the selection of *inter alia* upper-air stations, the designation of a surface network, and with increases in the data buoys in the southern hemisphere. He further noted the close interactions among existing operational programmes and the developing

GOOS and GTOS programmes which, for climate issues, will be coordinated by the GCOS programme.

He illustrated the structures of the three observing systems as they currently exist and proposed that the Panel consider during its session if it would be advisable to broaden the Panel to support the data and information management activities of GOOS and GTOS. He observed that both programmes had indicated their willingness to participate in combined planning activities to the degree possible.

3. PANEL CHAIRMAN STATEMENT

Mr Withee summarized the relationship between GCOS, GTOS and GOOS and noted that the climate components of GTOS and GOOS should provide the terrestrial and ocean components of GCOS. He also discussed the terms of reference of the Data and Information Management Panel as agreed by the JSTC and noted specific aspects pertinent to this meeting of the Panel. He described the Virtual GCOS Data and Information System outlined in the GCOS Data and Information Management Plan and noted the progress made to date towards its implementation. Mr Withee also briefly summarized the JSTC discussions and decisions pertinent to data management.

4. INVITED PROGRESS REPORTS

The Chairman invited progress reports from the GCOS design panels, the Global Ocean and Terrestrial Observing Systems and WMO World Weather Watch.

4.1 GCOS Atmospheric Observation Panel

Dr D. Whelpdale described recent activities pertinent to the GCOS Atmospheric Observation Panel. He summarized data management plans of the Global Atmosphere Watch and noted that there are a number of GAW World Data Centres that should be invited to participate in GCOS. He informed the session that the GAW has agreed to implement an Internet-based distributed data base system using the principles outlined in the GCOS Data and Information Management Plan. He described a proposed system of "data passports". The passports would be issued only to centres that demonstrate suitable quality control/assurance procedures and would be needed in order to submit data to a GAW World Data Centre.

Dr Whelpdale summarized the work of the Commission for Climatology (CCl) / Commission for Basic Systems (CBS) expert meeting on the GCOS surface network held in March 1996. The experts agreed on a plan and schedule for developing the GCOS Surface Network (GSN) according to a specific set of selection criteria such as at least 30 years of continuous record, currently operational, etc. The plan calls for a network of approximately 800 stations for the globe to be identified by June 1997.

4.2 GCOS/GOOS/WCRP Ocean Observation Panel

On behalf of the Chairman, Dr N. Smith, the Director of the JPO reported on the first session of the Ocean Observation Panel for Climate (OOPC) which met in Miami. The Panel is a follow-on activity to the Ocean Observation System Development Panel and will provide the scientific and technical guidance on ocean topics for both GCOS and GOOS. At the first meeting, the focus was on the strategy to advance the key recommendations of the OOSDP. Particularly significant observational elements were reviewed, and a plan to develop information packages on them was agreed. While the Panel did not make specific input to the DIMP, they did agree that the OOSDP discussion of data issues should provide initial guidance for ocean data for climate.

4.3 GCOS/GTOS Terrestrial Observation Panel

Dr Josef Cihlar, Chairman of the Terrestrial Observation Panel for Climate (TOPC) reported on the third session held in Cape Town, South Africa'. The TOPC discussed many key issues including: (1) prioritization of variables needed to characterize the land surface; (2) development of a sampling scheme for the biosphere, hydrosphere and cryosphere; (3) data and information management needs for terrestrial environments; (4) the development of a pilot project; and (5) suggested revisions to the GCOS/GTOS Plan for Terrestrial Climate-related Observations.

Two activities of the TOPC were noted to be particularly relevant to the DIMP. First, a pilot project was discussed. It would assemble and harmonize datasets and improve the ability of developing countries to predict seasonal to interannual climate and assess impacts of long-term climate change. Second, the TOPC discussed data issues of relevance for the terrestrial environment. As a result of these topics, the TOPC requested that the DIMP assist them in:

- Determining the best way to consolidate disparate datasets from scattered locations around the world;
- The best way to assure all individuals access to GCOS/GTOS datasets;
- Identification and evaluation of data centres that hold relevant land surface data.

4.4 GCOS Space-based Observation Panel

Dr J. Morgan provided a brief summary of the history of the Space-based Observation Panel (SOP) and described recent developments. He noted that the SOP is now co-sponsored by GCOS and J-GOOS and that GCOS requirements were being reviewed by a task force of the Committee on Earth Observation Satellites (CEOS). He outlined the progress made to date

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[1] See GCOS-23

and noted that the SOP had developed Version 1 .O of the GCOS Space Plan and the JPO had developed the Guide to Satellite Instruments for Climate.

4.5 GOOS Linkage

Mr J. Withrow described the linkages between GCOS and GOOS and reminded the Panel that some components of GOOS, such as IGOSS and IODE, were operational and could contribute to the implementation of GCOS. He noted the close relationship between GCOS and GOOS and expressed his support for inviting GOOS to join GCOS in establishment of a joint data management panel. The Panel noted this with interest and developed a recommendation on this issue that is described in section 9 of this report.

4.6 GTOS Linkage

Dr M. Baumgardner described the linkages between GCOS and GTOS and noted the close relationship between GCOS and GTOS data management activities. He stated that the ad *hoc* Scientific and Technical Planning Group for GTOS has recommended that the GTOS and GCOS Data and Information Management Panels be combined into a joint Panel.

4.7 WWW Linkage

Mr P. Chen summarized the status of WWW data management activities pertinent to GCOS. The strong linkage is represented by the membership of the Chairman of the CBS Working Group on Data Management on this Panel. Mr Chen reported briefly on the recently held Expert Meeting on WWW Data Management (29 April - 2 May 1996) and informed the Panel on progress of the CBS Distributed Databases trial. The trial began in October 1995 with several World Wide Web and/or FTP server centres participating. Server centres are to provide reports every 6 months on a number of questions related to services and users' feedback. Based on these reports, criteria for evaluating the trial will be established.

The WWW is to lead in the development of an integrated WMO-wide Data Management Plan (see reference in the Inter-programme Data Management Coordination Meetings). The experts at the recent WWW Data Management meeting considered the GCOS DIM Plan as a start, and found it a useful reference but noted that a WMO-wide plan would have to be much broader. A draft work plan was developed for this initiative, which includes, for example, close consultation with data management components of other WMO commissions.

5. REVIEW OF RECOMMENDATIONS AND ACTIONS

The Panel Chair briefly reviewed the recommendations and actions resulting from meetings of the JSTC and the first DIMP meeting as provided in excerpts from the reports of the two meetings. As outlined in the documents provided for the DIMP-II, several actions had been completed, but there were elements of some recommendations which required further

input from the Panel. In particular, a number of actions associated with the links to data centres and with the establishment of guidelines were to be considered on the agenda.

6. DATA SYSTEM CONCEPTS

6.1 Status of Data Systems

Mr D. McGuirk described the current status of the GCOS Data System and performed a brief demonstration of its functions via the Internet. He noted that the prototype that has been operated by the JPO for more than one year was a very simple system that provided pointers to existing data centres but did not provide any capability to support distributed searches for data. He stepped through many of the pages in the current World Wide Web-based system and also showed how documents can be retrieved via the FTP server.

6.2 GCOS Data System Functional Guidelines

Mr McGuirk introduced a set of draft functional guidelines for the GCOS data system that have been developed via correspondence over the past year in response to a request from the first session of the Data Panel. He also described a set of recommendations on the guidelines from a recent CBS expert meeting on WWW data management. The Panel expressed general satisfaction with the draft guidelines but noted that they described competing notions for a data system: a true distributed data system versus a distributed directory system. The Panel decided to refer the guidelines to a working group for further discussion and analysis.

6.3 IGOSS/IODE Data Management Strategy in Support of GCOS

Mr B. Searle noted that the traditional boundaries between IGOSS and IODE data management strategies have begun to blur over the past few years. He pointed out that in the future, governments will want to have access to a variety of data that has not traditionally been part of IGOSS and IODE, such as coastal zone data. He explained that the objective of the strategy is to create an integrated, technologically advanced data and information management, processing and distribution system that will meet the evolving needs of the oceanographic and meteorological communities while maintaining compatibility with the GCOS data and information management system.

7. DATA SYSTEM LINKAGES

7.1 GCOS Data Centre Implementation/Coordination Meeting

Dr F. Webster informed the meeting of the results of the GCOS Data Centre Implementation/Coordination Meeting held in Offenbach 27-29 June 1995. (The report of the meeting is available as GCOS-19.) The Data Centre meeting agreed on the following recommendations:

i) GCOS should establish a GCOS Data Support Network (GDSN) modelled on the European Climate Support Network (ECSN);

ii) As participating centres must have a commitment from their agencies for long-term funds to perform GCOS-related functions, the JPO should request data centre participation in the GDSN through letters to the policy-level administrators of each centre's parent agency;

iii) The Chairman of the DIMP should form a GCOS Data and Information System Technical Advisory Group (TAG) with members selected from the GDSN.

7.2 Snace-based Observations

Mr H. Kikuchi outlined recent CEOS activities pertinent to GCOS. The item most directly related to data and information management concerned the decision of the CEOS Plenary to establish a Working Group on Information System and Services (WGISS) by consolidating the Working Groups on Data and International Network Services. The overall objective of WGISS is to facilitate data and information management services for users and data providers in dealing with global, regional and local issues. In particular, it will address issues to enable improved interoperability and interconnectivity of information systems and services.

Mr Kikuchi also discussed current NASDA activities. He outlined recent organizational changes within NASDA and explained plans for the Japanese Data and Information System, noting eight particular projects that are currently underway or planned for the near future. The Panel expressed satisfaction that Japan has demonstrated a continuing and active commitment to GCOS.

Mr A.S. Montasser informed the meeting of the current plans for the Earth Observation System Data and Information System (EOSDIS). He noted that it is based upon a hierarchy of data priorities with preservation of the data at the top. He discussed the concept of an Environmental Information Economy which is one step towards implementation of an Environmental Information System Federation. He pointed out that a number of such federations already exist and should be linked into an "inter-federation" or federation of federations, much like the internet is a network of networks. He also explained how EOSDIS will be based upon Earth Science Information Partners, summarized their responsibilities and discussed current implementation plans.

7.3 Euronean Union Activities

Dr J. Aschbacher described the Centre for Earth Observation (CEO) that is an initiative of the European Commission to facilitate access to Earth Observation data, information and services. He explained the current programme of activities and noted that their primary goal is to bring customers and service providers together. He described the European Wide Service Exchange (EWSE) and provided a live demonstration of its implementation with World Wide Web technology. The Panel found the demonstration very interesting and noted that it might be able to contribute to implementation of the GCOS Data and Information System.

7.4 Developing Countries

Dr A.M. Jose made a presentation on approaches to linkages between developing countries and data and information centres. She pointed out that the design of linkages must consider the national priority of the countries, existing communications and information technology and the type of data and information products that are needed. She noted that many developing countries are vulnerable to natural disasters and need enhancement of operational weather analysis and forecasting systems, climate information and prediction services and other early warning systems.

7.5 World Data Centres

Dr Webster described the World Data Centre (WDC) system and summarized the results of the Conference of World Data Centre Directors held in October 1995 in the Netherlands. The Directors agreed that the WDC should evolve by:

- Pursuing a more global environmental data and information system,
- Taking advantage of new technology,
- Establishing new procedures for system coordination and direction, and
- Emphasizing quality.

He noted that the WDC system is embarking on a period of significant change and suggested that a closer relationship with IGBP-DIS could have positive benefits.

8. IMPLEMENTATION

8.1 Assignment to Discussion Groups

The Chairman proposed that three working groups be formed to address GCOS implementation: (1) a group to focus on specific projects that will contribute to implementation (the Pilot - next steps subgroup chaired by Mr Karl); (2) a group to focus on data centre and data policy issues (the GCOS data center definition/activity subgroup chaired by Dr Webster); and (3) a group to focus on the data panel structure (the GCOS data panel structure review subgroup chaired by Mr Withee).

8.2 Discussion Group Reports

The three working groups discussed their respective topics and developed recommendations or project proposals as appropriate. The recommendations and proposals were presented in plenary and subsequent discussions and modifications led to the final recommendations and projects described in the next section.

9. RECOMMENDATIONS AND PROPOSED PROJECTS

Based on the findings of the working groups, the following recommendations and pilot projects were developed:

9.1 Recommendations

At its fifth session, the JSTC requested the GCOS Data and Information Management Panel to consider the possibility that it become a "joint" Panel in support of the three global observing systems (GCOS, GOOS, GTOS). The Panel addressed this issue with appropriate representation from the GOOS, and the planning group for GTOS. Additional experts from the ocean and land surface communities were also in attendance.

The discussion took note of a number of related points of view:

- co-sponsors' formal and informal support for close co-ordination of the global observing systems, especially in areas of mutual interest and in areas of remote sensing and data management,
- explicit support for a single panel to develop a concerted space-based observational perspective,
- explicit support for a single panel to develop a comprehensive data and information management strategy.

With regard to GOOS, the discussion also took note of the:

- deliberations at I-GOOS, J-GOOS, and the Strategy Sub-Committee about data and information management for GOOS,
- the recommendations of the "data think tank" meeting at IOC,
- the IGOSS/IODE strategy document for data management.

Recommendation 1:

The Panel agreed that a single "joint" panel for GCOS, GTOS and GOOS would be very desirable and could be considerably more effective in meeting the needs of the observing systems than separate groups. Consequently, the Panel recommended that a proposal for a joint panel be presented at I-GOOS-P-II for their consideration. If agreed, the Terms of Reference and membership should be reviewed by the appropriate bodies. The Panel further encouraged the active participation of existing data-related programmes and coordination mechanisms (e.g. IGOSS, IODE, CEOS) in the work of the Panel and specifically asked the JPO to formally invite CEOS to appoint a representative to the Panel.

Recommendation 2:

The Panel agreed that the GCOS Data and Information System should be developed through an evolutionary process and the first step should be the establishment of a consortium of GCOS data and support centres to be known as *GCOSnet*. GCOSnet will promote greater collaboration in climate data collection, data-processing, modelling, exchange of personnel and the united development of recommendations. The Panel recommended that the JPO invite centres to participate in GCOS by joining GCOSnet. The invitation letters should be sent out by the end of June as GCOSnet members should be invited to a data system workshop to be held in the fourth quarter of this year. To encourage participation, the requirements for GCOSnet membership should be kept simple. GCOSnet members should:

- Abide by the GCOS Data principles;
- Work with other centres (through the TAG defined below) to establish common procedures.

The Panel agreed that a draft invitational letter prepared by the JPO was a good start but recommended the following changes:

- Keeping in mind that the invitation letter should be kept simple, explain what GCOSnet is and invite participation.
- The letter should include more background information (e.g. a GCOS brochure and the GCOS Data and Information Management Plan).
- The appendix 1 of the letter should be clarified before it is sent out. The table seemed clear at the Offenbach meeting, but it may need further explanation to be clear to recipients. In particular, the list of centre attributes may be confusing to those without the background to understand why there are functional overlaps and why a single centre may serve in several capacities.

The session agreed that the initiation of the GCOS pilot projects described below will serve as an effective stimulus for the creation of GCOSnet.

Recommendation 3:

A Technical Advisory Group (TAG) should be established with the following Terms of Reference.

- Every GCOSnet centre shall have representation on the TAG.
- The TAG will establish procedures and guidelines for operating elements of GCOSnet, such as data-access procedures, standard formats, metadata guidelines, and directory interfaces. As specified at the Offenbach meeting, the

TAG will provide guidance on technical issues while the DIMP will be responsible for scientific- and policy-level issues and for providing direction to the TAG.

- The TAG may elect its own officers, create working subgroups, and establish procedures for carrying out their responsibilities.

- The TAG will report on its activities to the Data and Information Management Panel.

Recommendation 4:

The GCOS JPO should invite sponsors and participating agencies (members of GCOSnet) to host the GCOS Information Centre with the following Terms of Reference.

- Help users; provide a GCOS "Ombudsman" function;

- Provide access to a distributed directory of climate data and information, including links to the datasets;

- Provide information on GCOS programmes and plans including an inventory of data centres, sources, and experts;

- Collate and maintain the requirements for data and information for use by GCOS bodies and panels;

- Prepare documentation on GCOSnet;

- Maintain links to the data and information aspects of the major climate research and operational observing programmes;

- Maintain a bulletin board to facilitate communication between research and operational communities, including plans for data collection;

- Support the Technical Advisory Group in the dissemination of information about standards and procedures.

To be successful, the Centre must work closely with the Joint Planning Office. The GCOS Information Centre will report to the Director, GCOS Joint Planning Office, and to the GCOS Data and Information Management Panel.

Recommendation 5:

The Panel supported the GCOS Data Principles as given in The GCOS Data and Information Management Plan (1 .O) but noted that the principles appear to be

addressed to centres and users in developed countries. For example, point (h) says that directories should be in internationally accessible, on-line systems. Such a requirement ignores the many potential centres and users in countries where such access in not yet possible. The Panel recommended that GCOS data centres publish directories and provide access to their datasets in ways that do not require on-line access.

Recommendation 6:

The Panel endorsed the idea of GCOS-registered datasets, that is, datasets whose accompanying documentation is sufficient to determine the potential value of the dataset to the user. It proposed a data registration pilot activity, linked to one or more of the GCOS Pilot Projects, to test the feasibility of the data registration process as described in the paper presented at DIMP-II by Mr T. Karl. The group noted that the registration process entails only the evaluation of the accompanying metadata and is not intended to be a process to evaluate dataset quality. The Panel did not endorse the idea of a "GCOS Seal of Approval" for dataset quality.

Recommendation 7:

The Panel noted with approval the work of the GCOS JPO in developing GCOS functional guidelines in response to the recommendation of DIMP-I. The Panel agreed that these guidelines should serve as a useful starting point for GCOS data system development. At the same time, the specialized nature of many of the guidelines requires their further refinement by GCOS centres (i.e. the Technical Advisory Group) and by users. The document clearly invites input on unresolved issues, and thus should be used as an interim tool to stimulate further dialogue about GCOS technical requirements.

The Panel agreed with the comments of the WMO CBS Expert Group that the guidelines can be regarded as an interim measure to be implemented as part of a move to a more general language-independent system.

9.2 Proposed Projects

Project 1: The GCOS Distributed Data System

Objective:

To begin implementation of an on-line data system for climate data.

Why?:

To provide convenient, on-line access to important climate datasets.

To test/learn about issues associated with supplementing a distributed, on-line data system for climate research.

To gauge the willingness of data centres to provide data electronically.

To gauge how development of such a system can be effectively led.

Audience:

Climate researchers, national meteorological/oceanographic/terrestrial centres.

Approach:

i) Define a minimum of 20 datasets critical for climate research or operations to be used as an initial set of data to be accessed by the system.

ii) Convene a workshop with representatives of GCOSnet members and data system developers to:

Investigate data system approaches and designs for the distributed data system,
Develop a common design and/or choose an existing data system as a model,
Resolve technical issues necessary for implementation of the data system,
Obtain commitments from data centres to provide data electronically and identify centres willing to host one or more of the target datasets.

iii) Implement the system. An implementation coordinator will coordinate and assist in the efforts of the participating centres to develop and/or install software necessary to operate the agreed system.

Data Set Selection Criteria:

i) It is of significance to climate research or operations.

ii) It is available now, well known, well used, climate data.

iii) It is representative

Type, model, satellite, ***in-situ,*** blended,
Geographic location of provider,
One data set should itself be distributed.

iv) Tentative datasets selected by the Panel are listed in Appendix III. A final list will be developed through feedback on the tentative list solicited from dataset principals and the climate research community.

Workshop:

Before: Obtain funding
Identify possible data systems and potential workshop participants
Determine capabilities of the target audience (including developing countries)
Organize the workshop - where, attendees, when.

During: 4th quarter, 1996 for 2.5 days
Select data system(s)
Outline implementation strategy (define the timetable)
Identify performance measures
Obtain commitments from data providers
Finalize World Wide Web interface (see sample in Annex IV).

After: Write report
Begin implementation. Operational test expected one year after the workshop.

Cost: $ 40K - Workshop
$ 80K - Implementation coordinator
$ 80K - Implementation at data centres (contribution in kind)
$ 200K- Total.

Funding agencies: Possible support from NOAA and NASA will be investigated.

Focal Point: Dr P. Comillon.

Project 2: Stimulate participation of developing countries

Objective:

Exercise the GCOS Data System within the S.E. Asian region.

Why?:

To provide a useful product that would demonstrate system value.

To identify enhancements to the data distribution system.

To stimulate *in-situ* data collections and distribution.

To demonstrate usefulness of system.

Audience:

Environmental Agencies, Research Community.

Approach:

Participating institutions/countries, international organizations and data centres would undertake the following tasks:

i) Institutions/countries
- test data system functionality
- provide relevant *in-situ* data
- archive and manage relevant *in-situ* data
- promote GCOS products
- baseline capabilities

ii) International organizations
- identify institutions/countries
- organize workshop
- follow-up
- organize training

iii) Data centres
- develop/provide data products
- provide training
- build linkages between *in-situ* and space data.

costs: Workshop - $100K

Schedule:

Action	Time	Responsibility
Identify institutions	August /September	Secretariats
Identify resources	Immediate	DIMP, Secretariats
Identify place, time and resource people	+1 Month	Secretariats
Letters of invitation	+2 Months	
Hold Workshop	+ 10 Months	
Present Project Description at ASEAN	July/August 1996	Regional Contacts, Secretariats
Collect base capabilities	September 1996	Secretariats
Test Activity	September/October	

Focal Points: Mr J . Withrow and Dr A.M. Jose.

Project 3: Climate extremes indicator and indices

Objective:

Help to determine if the climate is becoming more extreme.

Why?:

End-product has a large audience.

Developed and developing countries can share in the product development.

Project will provide a test of the most effective way GCOS can integrate data from a variety of sources.

Provides a mechanism to test GCOS data system on an end-to-end basis from assembly, distribution and update.

Scientific interest in end-product.

Practical interest in end-product.

Tests existing availability and quality of metadata.

Audience:

Scientists struggled to answer this in IPCC, but were unable to provide adequate answers sometimes because of poor data quality, access, and an ineffective means to integrate existing data.

Policy-makers often consider extreme events and their frequency as crucially impacting socio-economic and managed and namral ecosystems.

The General Public often asks whether the climate is changing, not because of changes in the mean, but because of apparent changes in extreme events.

The Business community, in particular the re-insurance industry, is very much interested in resolving this question.

Technical and Scientific Feasibility:

The scientific feasibility of such a project has already been demonstrated in two peer-reviewed papers that have been published over the past year. The technical feasibility of integrating a wide array of data sources is something of critical concern to GCOS.

Annroach:

A workshop will be held in January 1997 to bring together all the data centres, scientists, and operational centres who have data of interest and are willing to participate in the joint development of Global and Regional Climate Extreme Indices. Invitations will be given to those institutions or scientists with data for one or more of the following parameters and willing to contribute and participate.

Data to be considered: *in-situ* and/or Reanalysis Model Assimilation Products

i) Temperature daily and monthly averages (including Tmax and Tmin).
ii) Precipitation daily totals.
iii) Pressure (sea level) station.
iv) Global or hemispheric pressure analysis.
v) Hurricane/typhoon tracks/intensity.

A Data Assembly Center or Centres will need to be identified to convert data of a particular type to a common format with appropriate high level metadata. Multiple Processing Centres will process the data into Indices.

Costs: Funds will be needed to hold the workshop and support the Data Assembly Centres.

$100 K Workshop
$150 K Support Assembly Centres (in addition to contributions in kind).

Funding Sources:

Agencies, Reinsurance Companies.

Focal Point: Mr T. Karl.

Project 4: Sea Surface Temperature (SST)

Objective:

To assemble and provide an integrated time series from **all** available sources of Surface Temperature for selected locations around the world to help identify trends of SST. The time series would be assembled from archives, clirnatologies and forecasts.

Why:

OOSDP/CLIVAR has expressed the need to identify locations where variables can be sampled that act as indices of climatic conditions. OOSDP has stated the importance of SST in measuring climate change. This project would test out the requirements for

distributed data provision, metadata needs, and delivery systems to clients. It would be based on JSTC guidance for the right set of locations to work with.

Test lessons in data assembly/metadata requirements.

Test data distribution to global users.

Audience:

Scientists, such as modellers would be given easy access to a few 'test' points for their model development.

Other users would be given indicators for climate change/variability.

Technical and Scientific Feasibility:

The GCOS Ocean Panel will be asked to assess the scientific feasibility of the Project and to suggest scientific contributors to the project.

Approach:

Appropriate agencies would contribute the historical data, climatological averages, model output, model forecasts and real-time data. WDC-A Oceanography would contribute historical data. GODAR would contribute climatology. COADS would contribute climatology. GTSPP would contribute real-time observations. MEDS would contribute real-time buoy observations. URI would contribute satellite information. NMC would contribute model output, ship data and forecasts.

A small workshop would be required to start the project going. All of the contributors would be invited to work out the details of the scope of the project including data and metadata assembly, and other issues related to data quality, and distribution. Depending on the mode of distribution and scope, this project could link to the GCOS Distributed Data Project.

Costs:

As presently scoped, the funding demands from potential contributors would be low. The project would take maximum advantage of programmes that already exist. The potential contributors would be asked to support travel and project developments at their centres .

Focal Point: Mr R. Keeley.

10. CLOSURE OF MEETING

The Chairman thanked Panel members for their active participation in the discussions, and he also recorded the Panel's appreciation for the excellent facilities provided by MEDS.

The meeting closed at noon on 17 May 1996.

ANNEX I

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ANNEX II

AGENDA

1. ORGANIZATION OF THE SESSION
   - 1.1 Opening
   - 1.2 Welcome and Conduct of Meeting
   - 1.3 Approval of Agenda

2. GCOS STATUS AND UPDATE

3. PANEL CHAIRMAN STATEMENT

4. INVITED PROGRESS REPORTS
   - 4.1 GCOS Atmosphere Panel
   - 4.2 GCOS Ocean Panel
   - 4.3 GCOS Terrestrial Panel
   - 4.4 GCOS Space Panel
   - 4.4 GOOS Linkage
   - 4.5 GTOS Linkage
   - 4.6 WWW Linkage

5. REVIEW OF RECOMMENDATIONS AND ACTIONS
   - 5.1 Review of Data Panel-I action items
   - 5.2 Review of JSTC action items

6. DATA SYSTEM CONCEPTS
   - 6.1 status
   - 6.2 GCOS data system functional guidelines

7. DATA CENTER LINKAGES
   - 7.1 Space-based observations
   - 7.2 European Union activities
   - 7.3 Developing countries
   - 7.4 Specialized data centers
   - 7.5 World Data Centers

8. IMPLEMENTATION
   - 8.1 Data set assessment guidelines
   - 8.2 Proposal for Data Support Network
   - 8.3 Proposal for Technical Advisory Group
   - 8.4 Proposal for Technical Centre for Data

9. RECOMMENDATIONS AND PROPOSED PROJECTS

10. CLOSURE

Annex III

Tentative Data Sets for GCOS Distributed Data System Project
(An initial compilation for climate research)

Data Set	Principal
Blended SST Surface temperature	Richard Reynolds (NCEP)
Surface Temperature (land + marine)	Phillip Jones (U of East Anglia)
COADS	Klaus Wolter (OAR/CMDL)
Sea Level Record	P. L. Woodworth (PSMSL)
Global Precip Climatology	Phillip Arkin (NCEP)
40-Year Reanalysis	Eugenia Kalnay (NCEP)
Wind Stress	James O'Brien (U of Florida)
Subsurface Ocean	Sydney Levitus (NESDIS)
U.K. Marine Data	Chris Folland (UK Met Office)
Land Surface Characteristics	David Loveland (EROS Data Center)
Global Historical Clim. Network	Tom Peterson (NCDC)
Comprehensive Aerological Reference	Mike Changery (NOAA)
Microwave Sounding	John Christy (U of Alabama)
Greenhouse Gases	Hisao Ohno (Japan Met Agency)
Trace Gases	James Peterson (OAIUCMDL)
SO1 and ENS0 Advisory	Vernon Kousky (NCEP)
Experimental Long Lead Forecasts	Anthony Bamston (NCEP)
AMIP runs	Larry Gates (Lawrence Livermore NL)
Model Outputs	Tim Palmer (ECMWF)
Model Outputs	Eugenia Kalnay (NCEP)
Model outputs for the S.H.	Neville Nicholls (BMRC)
Snow and Ice Cover	Steve Lapczak (Canadian AES)
Global Precip. Clim Data	Bruno Rudolf (Deutscher Wetterdienst)
OA Coupled Climate Simulations	Mojib Latif (MPI)
Historical Drought/Flood Records	Ding Yihui (China Met Admin)
Diverse SST Data Set	Various SST sources

ANNEXIV

SAMPLE WEB INTERFACE FOR GCOS DISTRIBUTED DATA SYSTEM

Introduction

What and why including links to GCOS Information Centre.

Download software

View dataset descriptions

Access **or retrieve data**

GCOS Distributed Data System

Download Software

Software package 1 description

Mac **Windows 3.x Windows NT UNIX . . .**

Software package 2 description

UNIX1 UNIX2 .

etc.

GCOS Distributed Data System

View Dataset Descriptions

Dataset 1

Dataset 2

Dataset 3

.

.

Dataset n

GCOS Distributed Data System

Dataset 1

Summary: .....

Coverage: ..... (map)

etc.

Detailed metadata

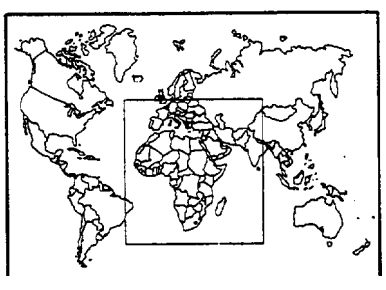
Quicklook/browse

Access or retrieve

GCOS Distributed Data System

Access or Retrieve Data

Please specify the area wanted by adjusting the box on the map



Select parameters

- all...
- Ceiling
- Clound type
- Present weather
- Pressure, sea level
- Pressure, station
- Relative humidity
- Temperature, dew pt
- Temperature, dry blub
- Temperature, wet bulb
- Visibility

OR by specifying the latitude and longitude coordinates below

Maximum Latitude

Minimum Longitude Maximum Longitude

Minimum Latitude

Select delivery option

- Automatic (Web)
- FTP put
- FTP get
- etc...

Specify the date range wanted by adjusting the slider or typng directly into the date fields

Begin date: 1991-01-01 End date: 1996-06-30

Submit Cancel

LIST OF GCOS PUBLICATIONS

GCOS-1 (WMO/TD-No. 493)	Report of the first session of the Joint Scientific and Technical Committee for GCOS (Geneva, Switzerland, April 13-15, 1992)
GCOS-2 (WMO/TD-No. 55 1)	Report of the second session of the Joint Scientific and Technical Committee for GCOS (Washington DC, USA, January 11-14, 1993)
GCOS3 (WMO/TD-No. 590)	Report of the third session of the Joint Scientific and Technical Committee for GCOS (Abingdon, UK, November l-3,1993) [ftp://www.wmo.ch/Documents/gcos/jstc-3.txt]
GCOS-4 (WMO/TD-No. 637)	Report of the fourth session of the Joint Scientific and Technical Committee for GCOS (Hamburg, Germany, September 19-22, 1994) [ftp://www.wmo.ch/Documents/gcos/jstc-4.txt or /jstc-4.wp5]
GCOS-5 (WMO/TD-No. 639)	Report of the GCOS Data System Task Group (Offenbach, Germany, March 22-25, 1994) [ftp://www.wmo.ch/Documents/gcos/dstg.txt or /dstg.wp5]
GCOS-6 (WMO/TD-No. 640)	Report of the GCOS Atmospheric Observation Panel, first session (Hamburg, Germany, April 25-28, 1994) [ftp://www.wmo.ch/Documents/gcos/aop-1.txt or /aop-1.wp5]
GCOS-7 (WMO/TD No. 641)	Report of the GCOS Space-based Observation Task Group (Darmstadt, Germany, May 3-6, 1994) [ftp://www.wmo.ch/Documents/gcos/sotg.txt or /sotg.wp5]
Gcos-8 (WMO/TD No. 642) (UNEP/EAP.MR/94-9)	Report of the GCOS/GTOS Terrestrial Observation Panel, first session (Arlington, VA, USA, June 28-30, 1994) [ftp://www.wmo.ch/Documents/gcos/top-1 .txt or /top-l .wp5]
Gcos-9 (WMO/TD-No. 643)	Report of the GCOS Working Group on Socioeconomic Benefits, first session (Washington DC, USA, August l-3, 1994) [ftp://www.wmo.ch/Documents/gcos/wgsb-1.txt or /wgsb-1.wp5]
GCOS-10 (WMO/TD-No. 666)	Summary of the GCOS Plan, Version 1.0, April 1995 [ftp://www.wmo.ch/Documents/gcos/gps-ver1.txt or /gps-ver1.wp5]
GCOS-11 (WMO/TD-No. 673)	Report of the GCOS Data and Information Management Panel, first session (Washington DC, USA, February 7-10, 1995) [ftp://www.wmo.ch/Documents/gcos/dimp- 1 .txt or /dimp-1.wp5]
GCOS-12 (WMO/TD-No. 674)	The Socioeconomic Benefits of Climate Forecasts: Literature Review and Recommendations (Report prepared by the GCOS Working Group on Socioeconomic Benefits), April 1995 [ftp://www.wmo.ch/Documents/gcos/wgsb-1rr.txt or /wgsb-1rr.wp5]

GCOS-13 (WMO/TD-No. 677)	GCOS Data and Information Management Plan, Version 1.0, April 1995 [ftp://www.wmo.ch/Documents/gcos/dp-ver1.txt or /dp-ver1.wp5]
GCOS-14 (WMO/TD-No. 68 1)	Plan for the Global Climate Observing System (GCOS), Version 1.0, May 1995 [ftp://www.wmo.ch/Documents/gcos/gp-ver1.txt or /gp-ver1.wp5]
GCOS-15 (WMO/TD-No. 684)	GCOS Plan for Space-based Observations, Version 1.0, June 1995 [ftp://www.wmo.ch/Doccuments/gcos/sp-verl .wp5] (wp version only)
GCOS-16 (WMO/TD-No. 685)	GCOS Guide to Satellite Instruments for Climate, June 1995 (will not be on FTP Server)
GCOS-17 (WMO/TD-No. 696)	Report of the GCOS Atmospheric Observation Panel, second session (Tokyo, Japan, March 20-23, 1995) [ftp://www.wmo.ch/Documents/gcos/aop-2.txt or /aop-2.wp5]
GCOS-18 (WMO/TD-No. 697) (UNEP/EAP.MR/95-10)	Report of the GCOS/GTOS Terrestrial Observation Panel, second session (London, UK, April 19-21, 1995) [ftp://www.wmo.ch/Documents/gcos/top-2.txt or /top-2.wp5]
GCOS-19 (WMO/TD-No. 709)	Report of the GCOS Data Centre Implementation/Co-ordination Meeting (Offenbach, Germany, June 27-29, 1995) [ftp://www.wmo.ch/Documents/gcos/dcc-1 .txt or /dcc-1 .wp5]
GCOS-20 (WMO/TD-No. 720)	GCOS Observation Programme for Atmospheric Constituents: Background, Status and Action Plan, September 1995 [ftp://www.wmo.ch/Documents/gcos/atmcons.txt or /atmcons.wp5]
GCOS-21 (WMO/TD-No. 72 1) (UNEP/EAP.TR/95-07)	GCOS/GTOS Plan for Terrestrial Climate-related Observations, version 1.0, November 1995 [ftp://www.wmo.ch/Documents/gcos/top-ver1 .wp5]
GCOS-22 (WMO/TD-No. 722)	Report of the fifth session of the Joint Scientific and Technical Committee for GCOS (Hakone, Japan, October 16-19, 1995) [ftp://www.wmo.ch/Documents/gcos/jstc-5.wp5]
GCOS-23 (WMO/TD-No. 754) (UNEP/DEIA/MR.96-6) (FAO GTOS- 1)	Report of the GCOS/GTOS Terrestrial Observation Panel for Climate, third session (Cape Town, South Africa, March 19-22, 1996) [ftp://www.wmo.ch/Documents/gcos/top-3.wp5]

GCOS-24 (WMO/TD-No. 768) (UNESCO/IOC)	Report of the Joint GCOS/GOOS/WCRP Ocean Observations Panel for Climate, first session (Miami, Florida, USA, March 25-27, 1996)
Gcos-25 (WMO/TD-No. 765) (UNEP/DEIA/MR. 96-5)	Report of the GCOS Data and Information Management Panel, second session (Ottawa, Ontario, Canada, May 14-17, 1996) [ftp: //www . wmo. ch/Documents/gcos/dimp-2. wp5]