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1. INTRODUCTION

The Second Report on the Adequacy of the Global Climate Observing Systems (GCOS) in support of the United Nations Framework Convention on Climate Change (UNFCCC) in 1992 stated that "there remain serious deficiencies in the ability of the current global observing system for climate to meet the observational needs of the UNFCCC" and that "without urgent action... the Parties will lack the information necessary to effectively plan for, and manage, their response to climate change".

To quantify the performance of the GCOS atmospheric networks, monitoring centers were established at the meteorological services of Germany, Japan and the United Kingdom. The monitoring centers at the Deutscher Wetterdienst (DWD) and Japan Meteorological Agency (JMA) monitor the quality and availability of data from the GCOS Surface Network (GSN) while the Hadley Centre, UK Meteorological Office monitors the GCOS Upper Air Network (GUAN).

Although the monitoring centers produce monthly and annual reports, which are used to track changes in network performance, the centers lack the authority to contact WMO Members directly. Direct communication is essential to provide feedback to National Meteorological and Hydrological Service (NMHS) network managers on the performance of GCOS stations that are part of their national networks so that data reporting problems can be traced and remedied.

The GCOS Secretariat, in cooperation with the World Meteorological Organization's (WMO) Commission for Basic Systems (CBS), has therefore established a group of Lead Centers for the GSN and GUAN. The current and proposed CBS Lead Centers have areas of responsibility that correspond to the official WMO regions, as shown in Figure 1. The points of contact for each Lead Center and associated responsible National Meteorological and Hydrometeorological Services are listed in Table 1.

The goal behind the establishment of the Lead Centers is to investigate and overcome data reporting problems from the GSN and GUAN

2. SUMMARY OF ROLES FOR CONTACT PERSONS IN THE LEAD CENTERS

The current roles of Lead Center Contact Persons are as follows:

- a. Monitor and evaluate the network performance reports from the GCOS Monitoring Centers and the archive of data held by the GCOS Archive Center at NOAA's National Climatic Data Center (NCDC). These data are diagnosed for quality, availability, and success of communication of climate data from the GSN and GUAN stations in the GCOS Lead Centers' areas of responsibility.
- b. Assist in the fixing of anomalies in the routing of GSN data so that JMA and DWD monitoring centers receive the same output (e.g. JMA currently receives substantially less CLIMAT messages than DWD).
- c. Assist in improving coordination between various GCOS station lists.
- d. Co-ordinate activities with other CBS Lead Centers for GCOS as appropriate (through periodic face-to-face meetings, telephone conference calls and group e-mails).
- e. Liaise with national GCOS Focal Points in order to address data and quality issues and communication of the data through the Global Telecommunication System (GTS). For example, a questionnaire could be used for further investigation of the availability of reports from GSN and GUAN networks and reasons for underperformance.
- f. Receive information from GCOS Focal Points on any current and potential problems that might impact on availability and quality of data.
- g. Arrange to be included in the communication loop when WMO Permanent Representatives (PRs) contact WMO and GCOS regarding changes to GCOS stations (e.g. changes from manual to automatic weather stations).
- h. Report six-monthly (e.g. end-September; end-March) to the GCOS Secretariat (and other CBS Lead Centers) on actions taken and progress achieved in addressing GCOS data availability and quality, and communication issues. Such reporting can be input to a single report to be prepared by the GCOS Secretariat and distributed to all, as well as being placed on the GCOS website).

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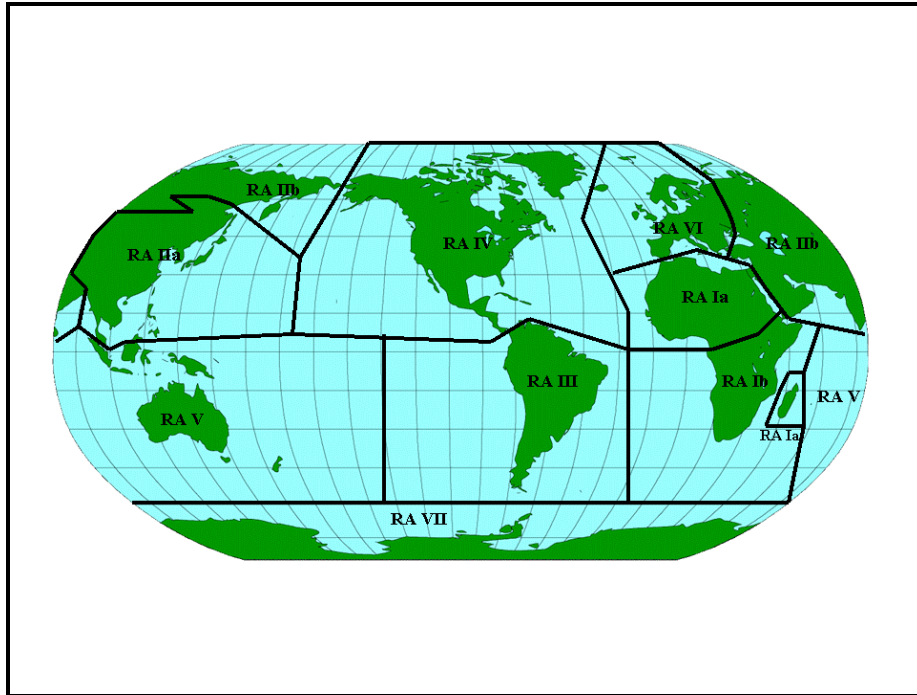


Figure 1. Current Lead Center Geographic Areas of Responsibility

Table 1. Current and Planned Lead Centers

WMO Regional Authority	Contact Authority	Contact Organization
RA I a Northern Africa and Madagascar	Mr. Rachid Sebbari	Moroccan Meteorological Service
RA II a Asia (Eastern parts including Malaysia, the Philippines, Singapore)	Mr. Hidehiko Isobe	Japanese Meteorological Agency
RA II b Asia (Western parts)	Ms. Mina Jabbari	Iranian Meteorological Service
RA III South America	Dr. Jorge Carrasco	Chilean Meteorological Service
RA IV N. America, Central America, Caribbean and W. Indies	Dr. Matthew Menne	U. S. Dept. Commerce, NOAA, National Climatic Data Center
RA V Southwest Pacific (less Malaysia, the Philippines, Singapore and Hawaiian Isl.)	Mr. Phil Alford	Australian Bureau of Meteorology
RA VII Antarctica	Dr. Jonathan Shanklin	British Antarctic Survey
Two Additional Lead Centers		
RA I b Central and Southern Africa	To be determined	Possibly Mozambique
RA VI Europe	To be determined	Possibly Germany

3. SYSTEMATIC PROCEDURE FOR DETECTING AND DIAGNOSING GCOS PROBLEMS

At regular intervals, preferably once per month, a GCOS contact person should go through the following systematic procedure to investigate GCOS data generated from his/her area of responsibility. With regards to the GCOS stations in the area of responsibility, he/she will need to be aware of the associated countries and WMO station index numbers involved. Given that the most useful

monitoring reports provide information in assigned WMO station number order, it is recommended that each Lead Center contact person produce a station-number-order list of the GSN stations and of the GUAN stations for which he/she has coverage.

3.1 GSN Data

a. Firstly, for a quick overview, one looks at the DWD/JMA monthly qualitative report (including monthly CLIMAT reports for the globe and quality-

controlled for precipitation and temperature data) available at:
<http://www.gsnmc.dwd.de/Dataset/Dataset.htm>.

b. Next, one looks at the DWD/JMA quality-control report (past year performance indicators for CLIMAT reports for all stations) at:
<http://www.gsnmc.dwd.de/Product/go.htm?ID=id009.htm>.

The best primary sources of quantitative information for the GSN are the archive reports produced by the US NCDC.

c. Station by station data availability summaries for particular WMO Regions, for all stations (Period of record from 1901 through current Year) (e.g. for WMO RA V, see:
http://www1.ncdc.noaa.gov/pub/data/gcos/WW_RE_G5_POR_summary at:
<http://www1.ncdc.noaa.gov/pub/data/gcos/>.

d. GSN station by station data availability summary (Period of Record through current year) is located at:
http://www1.ncdc.noaa.gov/pub/data/gcos/GSN_PO_R_summary.

e. GSN station by station data availability (for the past 6 years) summary at:
http://www1.ncdc.noaa.gov/pub/data/gcos/GSN_summary_long_term.txt.

f. GSN hourly observations and CLIMAT Data Counts (past 6 months) at:
http://www1.ncdc.noaa.gov/pub/data/gcos/GSN_summary_short_term.txt.

g. GSN current year availability by station, by report type and by hour at:
http://www1.ncdc.noaa.gov/pub/data/gcos/GSN_types_short_term.txt.

All of these NCDC reports are very useful, because ultimately they reveal what data is available in the World Data Center archive.

3.2 GUAN Data

a. For GUAN data, one should start with the NCDC past-six-year data availability summary, available at:
http://www1.ncdc.noaa.gov/pub/data/gcos/GUAN_long_term.txt.

b. Next, one takes a quick look at the ECMWF reports regarding GUAN daily TEMP data, available at:
<http://www.ecmwf.int/products/forecasts/d/charts/monitoring/guan>, and the U. K. Meteorological Office (UKMO) Hadley Centre reports regarding GUAN monthly CLIMAT TEMP data available at:
<http://guanweb.metoffice.com/monitorhome.html>.

NCDC has archived the historical upper air data and can release it to users upon request.

4. CURRENT ACTIVITIES AND FUTURE PLANS

Specific recommendations regarding the Lead Center's action plans were drafted and presented to the Atmosphere Observations Panel for Climate (AOPC) meeting, April 3-7, 2006. Some of the items have already been actioned:

4.1 Regular Working Group Meetings

Periodic working level coordination meetings are needed and should be organized by the GCOS Secretariat. E-mail and telephone conference calls should be used extensively, but periodic actual coordination meetings are important. These working level coordination meetings may initially be needed more frequently, perhaps yearly. The structure for the more formal coordination meetings is naturally the current CBS/GCOS Expert Meeting of the Coordination of GSN and GUAN which last met in Asheville, USA in September of 2005. These Expert Meetings, which also include representatives from the various monitoring centers and the Regional Rapporteurs for GCOS, should continue to be held every 3-4 years.

4.2 Status Reports

Periodic status reports are needed. Each Lead Center has prepared its first status report and will continue every six months. These will be integrated into a single report by the GCOS Secretariat for distribution to all.

4.3 Other Available Reports

The preparation of comprehensive inventories and reports is complete and they are available to users through the Global Observing Systems Information Center (GOSIC) website at: <http://gosic.org> or the Network Performance (formerly Health of the Network) website at: <http://www.ncdc.noaa.gov/oa/hofn/global-insitu.html>.

Various inventories and reports are available through the NCDC website. Some international data may be available on the NCDC Web Search, Store, Retrieve and Display (WSSRD) system, and can be made available to Lead Center personnel upon request.

4.4 More Regular Updating

Following discussions with the staff of the World Weather Watch about the processes of updating the various catalogs and lists, such as Pub 9, Volume A, C1, and the Regional Basic Synoptic Network / Regional Basic Climate Network (RBSN/RBCN) lists, update procedures used by the WWW should be simplified and described in detail so that users can keep their various lists more up-to-date.

Reports giving the historical data actually archived at NCDC will be updated on a regular

basis and made available to Lead Center personnel and other users through the websites mentioned above.

4.5 *Users' Guide Drafted*

A simplified guide that describes the diagnostic processes used by the Lead Center contact persons has been prepared. The guide will be very

useful in training additional Lead Center representatives and is available through the GCOS websites at:

<http://www.wmo.ch/web/gcos/gcoshome.html> and

GOSIC websites at:

<http://gosis.org>.