TABLE OF CONTENTS

			Page No.
1.	ORGANIZATION OF THE SESSION		1
	1.1	Opening	1
	1.2	Welcome and organization of the meeting	1
	1.3	Approval of agenda	1
	1.4	Program Manager's report	1
	1.5	NOAA Climate Change Data and Detection Program Report	1
	1.6	GEWEX report	2
2.	STATUS REPORTS OF GPCP CENTRES		2
	2.1	Geostationary Satellite Data Processing Centre (GSDPC) for Meteosat	2
	2.2	GSDPC for GMS (Meteorological Satellite Centre, Japan Meteorological Agency)	3
	2.3	GSDPC for GOES	3
	2.4	Polar Satellite Precipitation Data Centre - Ocean	4
	2.5	Polar Satellite Precipitation Data Centre - Land	4
	2.6	Global Precipitation Climatology Centre (GPCC)	5
	2.7	Global Merge Development Centre (GMDC)	5
	2.8	Surface Reference Data Center (SRDC)	6
3.	OTHER PROGRAMME ACTIVITY		6
	3.1	TRMM Report	6
	3.2	AMSU Report	6
	3.3	Pacific Rain Gauges	6
	3.4	Eurainsat Report	6
	3.5	Global Precipitation Mission (GPM)	6
	3.6	New Initiatives	6
4.	RESEARCH INITIATIVES		7
5.	NEXT MEETING		7

APPENDICES:

A. LIST OF PARTICIPANTS
B. ACTION ITEMS

1. ORGANIZATION OF THE SESSION

1.1 Opening

The fifteenth meeting of the Global Precipitation Climatology Project (GPCP) Working Group on Data Management took place at the Institute of Atmospheric and Oceanic Sciences of the National Council of Research of Italy (ISAO-CNR), Bologna, Italy, 14-17 May 2001. The meeting was formally opened at 0900 on 14 May by Dr. F. Tampieri, Director of ISAO-CNR, who welcomed the participants, briefly reviewed activities at the Research Institute, and offered his best wishes for a successful meeting.

1.2 Welcome and organization of the meeting

On behalf of the Working Group on Data Management, Dr. A. Gruber, the meeting Chairman and GPCP International Program Manager, thanked Dr. Tampieri and the local meeting organizer, Dr. V. Levizzani of ISAO-CNR, for their hospitality. Dr. Levizzani in his turn welcomed participants, and gave information on the local arrangements for the meeting at the host ISAO facility.

1.3 Approval of agenda

The Chairman reviewed the meeting agenda and provided an overview of meeting objectives. He then invited the working group members and meeting participants to introduce themselves (see Appendix A). The proposed meeting agenda was approved by the working group.

1.4 Program Manager's report

Dr. Gruber reported that work was proceeding well across the project. He reviewed accomplishments in the area of GPCP data set development and noted that three new data sets have been added to the GPCP suite of products: a globally complete monthly 2.5°x 2.5° latitude/longitude data set beginning in 1979 and continuing, a daily 1°x 1° data set beginning in 1997 and continuing, and a 2.5°x 2.5° pentad data set beginning in 1979 and updated through December 2000.

ISLSCP-II gridded monthly mean data sets for 1986 - 1995 have been made available, and daily values have been produced, for a sample month, through desegregation of DX data in the 40N - 40S band. The full desegregation will be accomplished when the DX data are available from the SRB project.

Current activities included efforts to initiate regional precipitation estimates, and a proposal to pursue this activity was under consideration by NASA and NOAA. Efforts were also underway to look at new algorithms for higher spatial and temporal resolution, and support from the GEWEX Scientific Steering Group appeared likely. Finally, Dr. Gruber noted that he would be reporting on GPCP activities at an international precipitation working group that would be held in Fort Collins, Colorado, in June 2001.

1.5. NOAA Climate Change Data and Detection Program Report

The Program Officer of the NOAA Climate & Global Change Program, Mr. W. Murray, reported that the United States' Permanent Representative with the World Meteorological Organization has informed the Secretary-General that GPCP activities within the United States would be continued through 2005, subject to normal conditions of availability of funds and satisfactory scientific reviews. Mr. Murray reviewed the organizational locations of the individual activities, and reminded the working group of the importance on linking GPCP products to other products and data sets critical to the identification and quantification of changes in the regional and global behavior of the climate system.

1.6 GEWEX report

Professor S. Sorooshian briefed the working group on recent developments in the Global Energy and Water Cycle Experiment (GEWEX) and on the emerging science initiative on the global water cycle. GEWEX funding was under significant pressure at this time, and a major question was the need for GEWEX and the water cycle activity to co-exist in a way that provided some economies of scale to NASA, the primary supporting agency.

Professor Sorooshian voiced his appreciation for the support and input provided by GPCP to GEWEX. He noted that precipitation information was crucial in both time and space for many applications. Scientific contributions needed from GPCP included more accurate information on snow cover and precipitation trends, refinements in parameterization schemes, and improvements in performance of models in capturing diurnal precipitation cycles. The possibility of adding more direct representation to GPCP from the larger-scale modeling community was suggested. The large scale GPCP mission was recognized, but the need for additional work on finer resolution/smaller scale issues was emphasized. The need to establish a linkage between GPCP and CLIVAR (the Climate Variability and Predictability study) was also pointed out.

2. STATUS REPORTS OF GPCP CENTRES

2.1 Geostationary Satellite Data Processing Centre (GSDPC) for Meteosat

EUMETSAT at Darmstadt, Germany, provided support for GPCP data from the Meteosat-5, -6, and -7 geostationary spacecraft. Mr. V. Gärtner, the EUMETSAT User Support Manager, reported on the status of this element of the project to the WGDM. Mr. Gärtner reported that Meteosat-7 now filled the role of the prime operational spacecraft, located at the nominal position of 0° longitude. Generally, the performance of the imaging subsystem of Meteosat-7 has been excellent with no radiometric anomalies. It did, however, continue to suffer very occasionally from brief interruptions to the down-link signal resulting in a temporary loss of telemetry and a few missing image lines. Operation was expected to continue at least until the end of 2003 (fuel was available to mid-2004).

Meteosat-6, positioned around 9°W, was the in-orbit backup satellite for the entire period. However, this satellite was now fairly regularly used for taking rapid scan images of the northern Hemisphere. In this mode approximately one third of the full earth disc (an area including Europe to the northern tropics) was scanned at 10-minute intervals. The known radiometric image anomaly affecting the infrared and water vapor channel data was still present onboard Meteosat-6. For operational use of the image data, an on-ground correction software tool was being used. Fuel for orbit and altitude control was available only until mid-2001.

For the entire recent period, Meteosat-5 performed continuous imaging from its position at 63°E in support of the Indian Ocean Data Coverage (IODC) service. EUMETSAT's 47th Council meeting in November 2000 agreed to extend the current service over the Indian Ocean beyond the year 2001 until the end of 2003. As the fuel for orbit inclination manoeuvres has long been exhausted, the orbit inclination, now about 5°, would increase further but this should not affect the image and meteorological product quality. Only direct reception from Meteosat-5 (for receiving stations without tracking antennas) would be affected by this. Mr. Gärtner mentioned that Meteosat-5 celebrated its 10th anniversary in space in March 2001 (launched on 2 March 1991) and was still providing a good service. As well as half-hourly images, a full set of derived meteorological products (including GPCP products) were processed, disseminated and archived.

With regard to future programmes, problems with the MSG (Meteosat Second Generation) ground segment have continued and the anticipated launch date for MSG-1 was now June 2002. Parallel operations with Meteosat-7 were committed until at least the end of 2003, with the satellite located at either 10°E or 10°W. The launch of the EUMETSAT Polar System was now scheduled for the end of 2005.

Mr. Gärtner further noted that, as in previous years, the only significant departures from the routine continuous reception of data have been occasional, short-lived problems with the satellite data link between the Primary Ground Station (PGS) in Italy and the main Operational Control Centre (OCC) in Darmstadt resulting in missing image lines. These were normally attributable to the effects of inclement weather either at the transmitting or the receiving site.

During March 2001, the connection between the Meteosat Core Facility at EUMETSAT HQ in Darmstadt, Germany and the Primary Ground Station in Fucino, Italy, was operated over a satellite-based link in the C-band rather than the normally used Ku-band. This was to test a possible permanent change to this link. Unfortunately, the performance of the C-band equipment was not as good as expected and instances of data loss were observed. Some GPCP products will have been slightly affected.

During most of the reporting period an anomaly occurred in the image processing sub-system of the Meteosat Ground Segment (as also during the first half of 2000). This often caused the loss of up to 14 image lines in the extreme southern part of the image. However, being space lines, they had no significant impact on the generation of products and the GPCP products were unaffected.

2.2 GSDPC for GMS (Meteorological Satellite Centre, Japan Meteorological Agency)

Mr. T. Kurino of the Meteorological Satellite Centre at JMA reported that the health of the GMS-5 spacecraft was very good. The satellite, located at 140°E, has been in operation since March 1995, although planned mission life was 5 years. As a result of the unsuccessful launch of the planned replacement spacecraft, MTSAT (Multi-functional Transport Satellite), it was necessary for GMS-5 to continue as an operational satellite until the summer of 2003, when MTSAT-1R was expected to become operational.

In 2001, two North-South position-keeping manoeuvres will be carried out (July and October), but cannot be performed subsequently because of lack of fuel. Consequently, it was estimated that the GMS-5 orbit inclination angle would be over 1.0° in April 2002 (approximately), and 2.0° in the summer of 2003 (approximately). As for Medium-scale Data Utilization Station (MDUS) users, the S-VISSR signal could be received with a bit-error rate less than 10^{-4} until October 2003. It was also estimated that the impact of an expansion of the station keeping range was negligible for reception of WEFAX signals on Small-scale Data Utilization Stations until the summer of 2004 when the range of station keeping would exceed +/- 3° in latitude.

With regard to the IR Histogram Data Processing activity, Mr. Kurino reported that 1°x 1° 3-hourly histogram data have been processed since April 1998. The status of recent image acquisition (August 2000 through April 2001) shows 2,183 obtained out of 2,184 possible, i.e., only one was missed.

2.3 GSDPC for GOES

Mr. J. Janowiak, of the NOAA National Weather Service (NWS) Climate Prediction Center, reported the GOES data collection statistics for the past 12 months: 99.7% of the images have been collected for GOES-8 (2910 out of 2920 possible) and 99.2% of the images have been collected for GOES-10 (2896 out of 2920 possible). With regard to GOES launch planning, the following launch dates reflect current plans: GOES-M July 2001, GOES-N January 2003, GOES-O

April 2005, GOES-P April 2007, GOES-Q April 2010, GOES-R April 2012. GOES-M is different from predecessor systems in several important aspects including the presence of the first Solar X-Ray Imager, a 6.7 micron water vapor channel (used for upper-level winds) with a resolution improvement from 8km to 4km, and the replacement of the 12.0 micron channel with the 13.3 micron channel resulting in an improvement of the accuracy of steering level (approximately 500mb) wind height estimates.

Globally merged histograms and GPI estimates at the 1°x 1°/3-hour resolution have been processed up to November 2000 and distributed to the Merge Centre. Work continued on the development of a procedure to help normalize the IR channel differences among the GOES, Meteosat, and GMS satellites. Work was also continuing on the reasons for differences in histogram populations and gridbox mean brightness temperature between ISCCP and GPCP data during 1992. The difference may be due to the application of calibration normalization information to the ISCCP data, and this hypothesis was being tested.

The WGDM was informed about intercalibration issues between the two GOES reflected in the failure of residual differences to add up to zero. Corrections were being applied in house within the NWS, but these would not be applied to GPCP data until group approval was received.

2.4 Polar Satellite Precipitation Data Centre - Ocean

The Emission Data Processing Center, which prepares oceanic precipitation estimates based on emission from 19 Ghz channel of SSM/I is located at the National Aeronautical and Space Administration (NASA), Goddard Space Flight Center (GSFC). Microwave-based oceanic monthly rain-rates were estimated for the period July 1987 up to the present (except December 1987 during which there were insufficient data). Oceanic rain rate products were generated for 2.5° latitude by 2.5° longitude grid boxes between 65°N and 65°S latitude as well as for 5° latitude by 5° longitude grid boxes between 50°N and 50°S. The 2.5 and 5° data sets were available on the ftp server: snowmelt.gsfc.nasa.gov/PSPDC/SSM/I.rain.rate.html.

An operational improvement that reduced the delay in monthly rain estimates to about 2-4 weeks has now been achieved through use of Wentz FTP data. Current activities were focussed on continued error analyses on SSM/I and TMI rainfall products, improvement of the water vapor absorption code, and the use of look-up tables to correct freezing level estimates.

2.5 Polar Satellite Precipitation Data Centre - Land

The report of this center was presented by Dr. A. Gruber for Mr. R. Ferraro, who was unable to attend the meeting. The working group was informed that SSM/I data (TDR format) continued to be acquired in near real-time through an automated processing system with a reliability rate of nearly 99%. SSM/I F-13, F-14 and F-15 data have been accessed over the past year, and daily, 1/3° fields of SSM/I antenna temperatures, separated by morning and evening orbits, were generated for each satellite.

It was also pointed out that a policy was needed regarding the preferred procedure to combine data from multiple new data sources (e.g., TRMM, NOAA, AMSU, EOS-Aqua, DMSP, SSM/I) so that the biggest impact on product improvement could be achieved. It was suggested that this might be an appropriate time for the WGDM to consider adopting new/improved passive microwave algorithms. It was also recommended that no reprocessing be performed at present solely for the purpose of including dual-SSM/I estimates. Following discussion, the working group decided to replace F14 with F15 rather than have two satellites looking at the same area 30 minutes apart. This decision superceded an action item related to this topic from the last meeting of WGDM.

A mid-latitude validation site for the EOS-Aqua Advanced Microwave Scanning Radiometer has progressed well over the past eight months. Preliminary data collection from rain gauge clusters in Eureka, California, and Leggett, California, began in October, and processing of the data has now begun. Initial work will focus on how to deal with beam blockages due to terrain and to remove persistent ground clutter signatures.

2.6 Global Precipitation Climatology Centre (GPCC)

Dr. B. Rudolf reminded the working group that the aim of the GPCC was the creation of two different gridded data sets, one based on selected (mostly homogeneous) data, and the other based on all data of sufficient quality. The monthly precipitation "monitoring product" for the global land surface, which was based on data from about 7,000 gauges available in near real-time via the GTS at scales of 1°x 1° and 2.5° x 2.5°, was currently being made available with about a 3-month delay. A new version of the "full data product", which was currently being prepared, would be based on 30,000 or more stations and initially cover the period from January 1986 to December 1997; this product was expected to be available by July 2001.

Efforts are also underway to develop a comprehensive global raingauge data base by merging all major data collections, e.g., GPCC/CRU (Climate Research Unit, University of East Anglia), GHCN, FAO, UNESCO, and others. The GPCC/CRU merging has required 6-months so far to load about 8,000 of 10,000 stations and would be finished in June 2001. It was noted, though, that problems have arisen from merging the metadata from these large collections.

Additional problems discussed were those of non-homogeneous definitions of a day on the development on daily gauge analyses, and continuing difficulties with quantifying the effects of wind speed on the accuracy of precipitation measurements.

2.7 Global Merge Development Centre (GMDC)

Dr. G. Huffman reported that final adjustments to the Version 2 processing sequence were developed and applied. Following approval for the official release of Version 2 and the 1DD data sets by the WGDM at last year's meeting, the full time series of data for each was packaged up to November 1999, and released to WDC-A. With respect to inclusion of TOVS data, GMDC has interfaced with the TOVS producers to accelerate Y2K upgrades and delivery of TOVS precipitation estimates for 2000.

In February 2001, the time series was brought to nominal real-time after receipt of the TOVS. As of May 10, 2001, Version 2 and 1DD data are available through January 2001. Also, work has continued on developing techniques for calibrating IR data by microwave precipitation estimates and applying them at the sub-daily time scale. Although these techniques were developed for TRMM, they are expected to be useful for GPCP.

Development work has been underway using TRMM data for the calibration of SSM/I finer scale estimates: 1°x 1° 3-hourly after real-time, and 0.25°x 0.25° 1-hourly real time analyses.

Discontinuation of Version 1c in view of the overlap with Version 2 was discussed. Although Version 1c would not be kept up, components (SSM/I, ACPI, GPCC, errors) should be continued. Other issues discussed included migration of TOVS to new-generation polar orbiters, augmentation of gauge data, future direction of the IR calibration scheme, use of multiple SSM/I's, provision of (gridded) orbit segment data for SSM/I, and the synchronization of mirror sites. With regard to the mirror site issue, Dr. A. Gruber would talk to Dr. D. Smith at NOAA/NCDC about the practicality of NCDC serving as the primary data source and coordinating updates with the mirror sites. Also, it was recommended that Version 1c should be taken off the web-site but saved in case of request; the feasibility of this action also would be checked with Dr. Smith.

2.8 Surface Reference Data Center (SRDC)

Mr. M. Klatt, of the University of Oklahoma, briefed the working group on recent activities at the SRDC, which moved from NCDC to the University of Oklahoma in 1998. SRDC tasks included the collection of high-quality rain gauge observations, the production of a representative suite of validation products, the development of new validation techniques and the provision of these products to the research community. The status of SRDC data sources was reviewed, and particular difficulties were reported in acquiring data from French stations in the South Pacific.

The group was informed that the SRDC was implementing a new server and that the SRDC publication, the *Validator* newsletter, would be continued as an on-line activity but that hard-copy mailings would be discontinued.

3. OTHER PROGRAMME ACTIVITY

3.1 TRMM Report - TRMM has been successful in reducing but has not eliminated uncertainty in tropical and sub-tropical precipitation patterns. TRMM data have also been used in operational forecasting activities, e.g., hurricane forecasting. The operational archiving and distribution to the public of all TRMM science data products were provided by the Goddard Distributed Active Archive Center (DAAC). In addition to archiving and distributing the TRMM science data, the DAAC also provided necessary information and support for manipulating these data files, which were provided in NASA's Hierarchical Data Format (HDF). These files were generally distributed on-line. Finally, the DAAC provided front-line support for any questions concerning the TRMM science data.

3.2 AMSU Report - initial results showed reasonable correspondence between AMSU-B and the multi-sensor (radar/rain gauge) data set. A preliminary comparison with the SSM/I monthly product also showed good correlation, but the AMSU values were typically higher by about 25%. A new retrieval algorithm would be available this summer (2001) and evaluations would continue with emphasis on tropical cyclone and applications over the continental USA.

3.3 Pacific Rain Gauges - A decline has been experienced in observations availability consequent to funding reductions and privatization of operations (e.g., New Zealand). Consequently, there has been a greater involvement in the "Schools of Pacific Rainfall Climate Experiment" (SPARCE) by government meteorological services. Interest has also been expressed in the expansion and enhancement of existing networks in a number of areas including the Kirabati Islands, the northern Cook Islands, and Vanuatu (Federated States of Micronesia). Special efforts were needed to regain data from French Polynesia.

3.4 Eurainsat Report - European satellite rainfall estimation activities have included the development of techniques for use in short and very short range weather monitoring and forecasting. It was noted that this program would serve a variety of users, e.g., air traffic, agriculture, water resource managers, environmental protection and meteorological services. More information is available at: www.isao.bo.cnr.it/~eurainsat.

3.5 Global Precipitation Mission (GPM) - Dr. Gruber gave a brief report on the goals and objectives of the GPM and the potential of those data for GPCP. GPM was currently in the planning stages, but was expected to consist of a TRMM like satellite used for calibration of a constellation of passive microwave systems. It was designed to provide data every three hours.

3.6 New Initiatives - Reports on several new initiatives were presented. Among these was the regional "Satellite Precipitation Algorithm Comparison Experiment" (SPACE), prepared by M. Morrissey, W. Krajewski and A. Gruber and submitted to NASA and NOAA for funding. It was an attempt to provide quantitative estimates of algorithm accuracy on regional scales using carefully characterized reference data, and represented an initial effort towards producing regional precipitation data sets and incorporating new algorithms into GPCP. A proposal by M. Kanamitsu

and A. Gruber for a GEWEX workshop to review objective analysis procedures for merging various estimates of precipitation was also discussed (see action items). Finally, Dr. Gruber briefed the group of plans to form an International Precipitation Working Group under the auspices of the CGMS. The IPWG would foster development of better measurements, and improvement of their utilization; improvement of scientific understanding; and development of international partnerships.

4. RESEARCH INITIATIVES

Scientists at the meeting gave brief reports of current research relevant to the GPCP including:

- K. Arpe (MPI): a case study of rain retrievals from a microwave algorithm in the North Atlantic;
- P. Arkin (NOAA): the use of GPCP data in tree ring research;
- K. Hsu (University of Arizona): the neural network algorithm, PERSIANN;
- A. Ortolani (LMEM, Florence): a pixel level neural network for precipitation estimates for flood forecasting in the Arno river basin;
- G. Huffman (NASA): work by B. Ebert of BMRC on validation of the 1DD product;
- J. Janowiak (NOAA): reconstruction of monthly precipitation back 50 years;
- T. Kurino (JMA): snow depth and snow cover studies using SSM/I data;
- W. Krajewski (University of Iowa): super sites of relatively high density gauges for evaluating error variances of precipitation estimates;
- M. Morrissey (Environmental Verification and Analysis Center): the use of TRMM sites for 1DD validation;
- A. Gruber (NOAA): calculation of the water budget using a combination of satellite observations and model output data;
- B. Rudolf (Deutscher Wetterdienst): studies of gauge errors for snow and rain;
- W. Krajewski (University of Iowa): the requirement for the adjacent location of two rain gauges side by side for assessing accuracy of gauge data.

5. NEXT MEETING

The WGDM accepted the invitation from the JMA to hold its next meeting in Tokyo in May 2002.

LIST OF PARTICIPANTS

Last Name	First Name	Institution	Telephone	Fax	E-mail Address
Amorati	Roberta	ISAO-CNR, Bologna, Italy	+39-051-6399578	+39-051-6399649	r.amorati@isao.bo.cnr.it
Arkin	Philip	NOAA/OAR/OGP, USA	+1-301-427-2089 x 116	+1-301-427-2073	phil.arkin@noaa.gov
Arpe	Klaus	MPI, Hamburg, Germany	+49-4101402308 (Private phone)	+49-404-1173366	arpe@dkrz.de
Costa	Maria Joao	ISAO-CNR, Bologna, Italy	+39-051-6399579	+39-051-6399649	mj.costa@isao.bo.cnr.it
Gaertner	Volker	EUMETSAT, Darmstadt, Germany	+49-6151-807369	+49-6151-807304	gaertner@eumetsat.de
Gruber	Arnold	NOAA/NESDIS, USA	+1-301-763-8251	+1-301-763-8580	arnold.gruber@noaa.gov
Huffman	George	NASA/GSFC & SSAI	+1-301-614-6308	+1-301-614-5492	huffman@agnes.gsfc.nasa.gov
Hsu	Kuolin	U. of Arizona, USA	+1-520-621-1898		hus@hwr.arizona.edu
Janowiak	John	NOAA/NWS/NCEP, USA	+1-301-763-8000 x 7537	+1-301-763-8395	john.janowiak@noaa.gov
Klatt	Michael	OU/SRDC, USA	+1-405-447-8412	+1-405-447-8455	mdklatt@ou.edu
Krajewski	Witold	University of Iowa	+1-319-335-5231	+1-319-335-5238	witold-krajewski@uiowa.edu
Kurino	Toshiyuki	JMA/CPD, Japan	+81-3-3212-8341 x 3162	+81-3-3211-8406	tkurino@met.kishou.go.jp
Levizzani	Vincenzo	ISAO-CNR, Bologna, Italy	+39-051-6399578	+39-051-6399649	v.levizzani@isao.bo.cnr.it
Meneguzzo	Francesco	LaMMA, Florence, Italy	+39-055-8976213	+39-055-8969521	meneguzzo@lamma.rete.toscana.it
Morrissey	Mark	OU/EVAC/SRDC	+1-405-447-8412	+1-405-447-8455	mmorriss@ou.edu
Murray	Bill	NOAA/OGP	+1-301-427-2089 x 133	+1-301-427-2073	william.l.murray@noaa.gov
Ortolani	Alberto	LaMMA, Florence, Italy	+39-055-8976201	+39-055-8969521	ortolani@lamma.rete.toscana.it
Porcu’	Federico	University of Ferrara, Italy	+39-0532-781913	+39-0532-781857	porcu@fe.infn.it
Postawko	Susan	OU/EVAC/SRDC	+1-405-447-8412	+1-405-447-8455	spostawk@ou.edu
Rudolf	Bruno	DWD/GPCC	+49-69-8062-2765	+49-69-8062-3759	bruno.rudolf@dwd.de
Sorooshian	Soroosh	University of Arizona, USA	+1-520-621-1661	+1-520-626-2488	soroosh@hwr.arizona.edu

APPENDIX B

ACTION ITEMS

1) **Meteosat 5 Impacts - M. Morrissey.** To assess the impact of Meteosat 5 on precipitation estimates over the Indian ocean compared to low orbit satellite data, i.e., polar orbiters, used prior to obtaining Meteosat 5 data .

2) **Mirror sites - A. Gruber.** Not always up to date with the latest information. **A. Gruber** to discuss the coordination of the mirror sites with D. Smith. However, GMDC should continue to announce the availability of data to everyone on their list. *Done: A. Gruber will provide D. Smith with B. Rudolf's email so he can be informed every time the NCDC updates its data base. Other mirror site contacts will be added as needed.*

3) **Version 2 GPCP data** - **G. Huffman and A. Gruber.** Version 2 data will replace Version 1. However, it is necessary for Version 2 to have the components, i.e., SSM/I, GPI , etc as part of the data set in much the same way Version 1 has them. There are three actions associated with this:

a) **G. Huffman** to prepare, as soon as possible, the component parts i.e., GPI, SSM/I, AGPI, etc. to go with version 2;

b) **A. Gruber** to talk with D. Smith about discontinuing Version 1 and saving in an "archive". *Done - When D. Smith gets the component parts from G. Huffman he will "retire" Version 1 to a permanent archive.*

c) Interactive links to GPCP causing confusion with regard to accessing the latest data. A. Gruber to discuss with D. Smith. *Done. D. Smith to change the links to indicate that GPCP is for information, and that for data, one should remain at the NCDC site. A. Gruber to change his web site to direct people to the NCDC site for data.*

4) **INSAT Data** - **J. Janowiak**. INSAT IR data which GPCP has been receiving for several years have generally not been used because of the availability of Meteosat 5 data. J. Janowiak to prepare a qualitative comparison of INSAT data with Meteosat data and share it with INSAT colleagues.

5) **Multiple Satellites** - **G. Huffman, R. Ferraro, P. Arkin, Xie, and M. Morrissey**. Use of multiple satellites and reducing the impact of potential discontinuities arising partly because of the way GPCP adjusts the GPI data with the microwave (or conversely adjusts the microwave data with the GPI). **G. Huffman** to consider adjusting each individual microwave estimates against the GPI as is now done and then combine them. **R. Ferraro, P. Arkin, Xie and M. Morrissey** to assist in evaluating the results.

6) **SSM/I - R. Ferraro**. Based on the analysis by R. Ferraro, the replacement of F14 by F15 agreed.

7) **Analysis of expanded stations - B. Rudolf**. The analysis of an expanded gauge network (30,000 stations) is expected to be completed in July 2001. ½° analysis to be produced and made available to the ISLSCP-II project via A. Gruber.

8) **GPCC (Carry-over Actions from WGDM-14) - B. Rudolf:** The analysis of the expanded gauge set has been delayed by about 1 year. The following action items are a carryover from WGDM-14, and should be done and reported on as soon as possible:

i) to perform comparative analysis of the monitoring product and make recommendations for its use in the GPCP;
ii) to evaluate analyses in complex terrain;
iii) to compare both the monitoring and expanded analyses to other "national gauge analyses" in order to provide a measure of representativeness.

9) **Additional GPCC Carryover Actions from WGDM-14 - B. Rudolf**. The following set of action items are carryover from WGDM 14 and need urgently to be addressed. They are as follows:

i) Preparation of a 1°x 1° daily gauge analysis: GPCC to study the problem and develop an acceptable solution to obtaining a daily analysis that is representative of a common definition of a day e.g., 00Z-24Z;

ii) Impact of wind speed on precipitation amounts: GPCC to develop and implement revisions to their climatological wind speed corrections that are now applied to the gauge analysis;

iii) Preparation of an article for publication in a peer reviewed journal (e.g., Journal of Hydrometeorology) on the work carried out for the GPCP in constructing an analysed data set. B. Rudolf, Director of the GPCC, TO COMPLETE ACTION AS SOON AS POSSIBLE.

10) **Version 2 Manuscript - R. Adler/G. Huffman and others.** GPCP Version 2 (which has been approved for over a year). Manuscript to be prepared for publication in the scientific literature. **R. Adler** to draft final version by the end of October 2001. Scientists involved in GPCP have agreed to contribute to the publication and R. Adler also to contact these scientists.

11) **TOGA –TAO - Siphon Data - M. Morrissey.** Apparently rainfall estimates were obtained from TOGA-TAO buoys using some sort of siphon gauge. M. Morrissey to obtain information on these data and to assess whether they are suitable for validation purposes.

12) **Meteosat calibration – V. Gartner**. ISCCP to be informed of the change in calibration (vicarious to blackbody) of Meteosat 5 and 7 (ISCCP contact is W. Rossow, NASA Goddard Institute of Space Studies).

13) **Normalization to one GOES satellite – J. Janowiak.** Normalization of full resolution IR to data from 1998-2001 to two GOES satellites leaves some residual error. Normalization to one GOES satellite recommended and to see whether this can be extended back in time to 1987.

14) **Workshop on merging precipitation estimates – A. Gruber.** Proposal by A. Gruber M. Kanamitsu for a GEWEX sponsored workshop to examine methods of merging various precipitation estimates, e.g., satellite IR and MW and gauges: plan for workshop to be distributed to an ad hoc group (P. Arkin, G. Huffman, W. Krajewski, and M. Morrissey) for review and refinement prior to formally submitting to S. Sorooshian for approval. Comments due back to A. Gruber at the end of August. (*Completed - submitted to S. Sorooshian*)

15) **IR Class Interval and zenith angle changes – G. Huffman**. Changing the IR sampling interval and extending the zenith angle range of the IR data collection: G. Huffman to confer with the satellite operators for the best way to make the changes and prepare a letter for A. Gruber for transmission to S. Sorooshian as a basis for a formal request to the satellite operators.