GEWEX WCRP Global Energy and Water Cycle Experiment

NEWS

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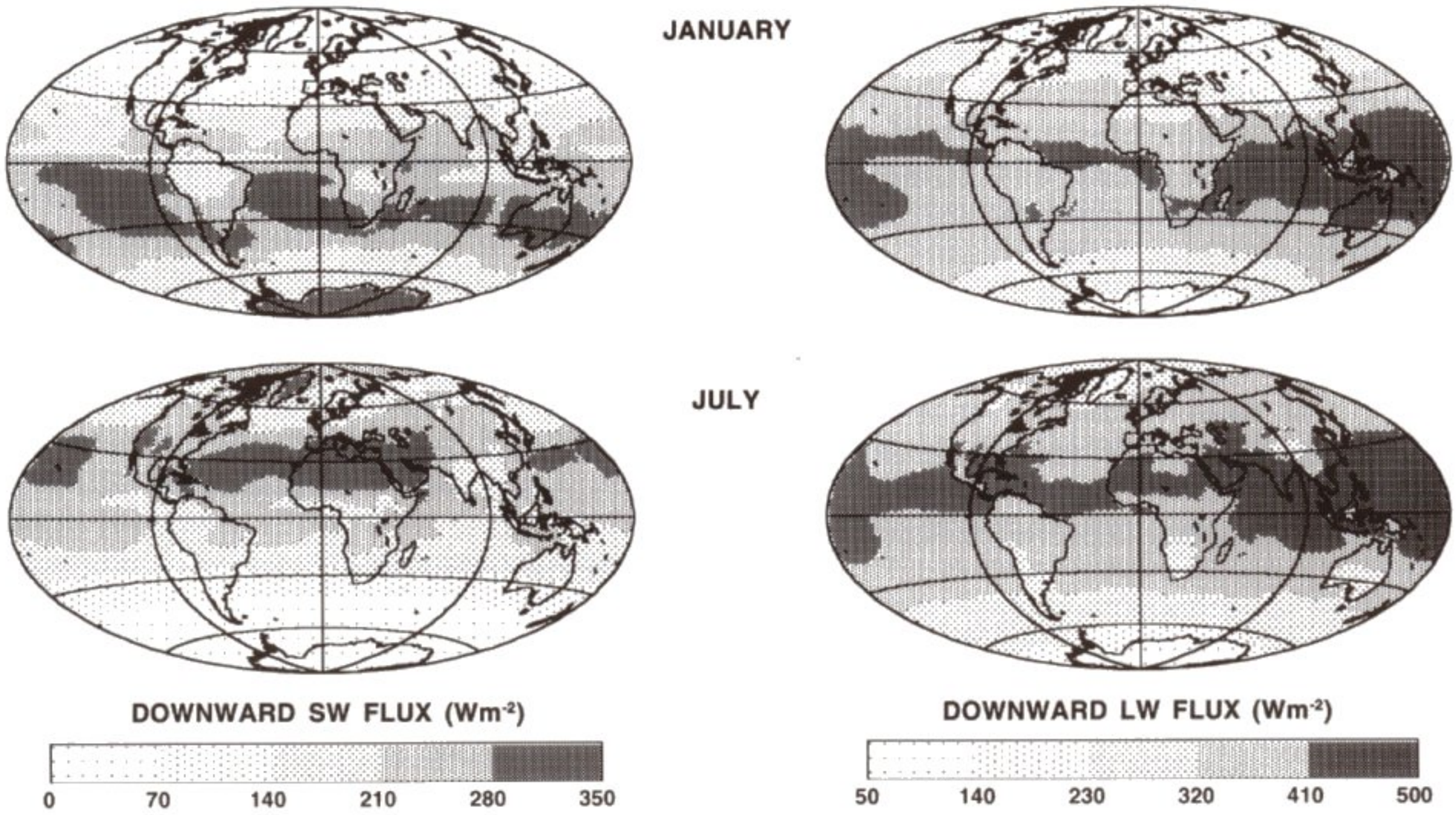
World Climate Research Programme—WCRP

NEW LONGWAVE AND SHORTWAVE SURFACE RADIATION DATA



Geographic distribution of the 8-year (July 1983–June 1991) averages of downward shortwave (SW) fluxes (insolation) and downward longwave (LW) fluxes. See article below.

A GLOBAL LONG-TERM DATA SET OF SHORTWAVE AND LONGWAVE SURFACE RADIATION BUDGET

W.L. Darnell and W.F. Staylor
NASA Langley Research Center
Hampton, Virginia
and
S.K. Gupta, N.A. Ritchey and A.C. Wilber
Lockheed Engineering & Sciences Co.
Hampton, Virginia

A **new** global **long-term** surface radiation budget (SRB) data set consisting of monthly averages of shortwave (SW) and **longwave (LW)** radiative fluxes is now available at the NASA Langley Research Center. Meteorological data and cloud parameters available from the International Satellite Cloud Climatology Project (ISCCP) C1 data were used in the computation of the SRB. ISCCP

(Continued on page 6)

International GEWEX Scientific Conference
(see page 9)

In This Issue

COMMENTARY

USER INVOLVEMENT IN DEVELOPING GEWEX DATA SETS

Moustafa T. Chahine
Chairman, GEWEX Scientific Steering Group

The process of developing global data sets is a dynamic operation driven by the needs and requirements of the scientific users and supported by the funding agencies. Requirements for data products for all GEWEX data sets are developed through workshops by scientists who will use the data for research and who intend to participate in the evaluation and improvement of the final products. The GEWEX program provides the structure necessary to integrate data from different sources and insures compatibility of each data set with other (GEWEX) data products. The data sets are made available as soon as possible to the community for evaluation and cross-validation. It is through feedback from the users, as to the effectiveness of the data sets for studies of climate processes, that the data sets are continuously improved and enhanced.

This end-to-end responsibility is illustrated by the programs and plans under the International Satellite Cloud Climatology Project (ISCCP), the International Satellite Land-Surface Climatology Project (ISLSCP) and the Global Water Vapor Project (GVaP). The ISCCP data sets have been available for research for more than 5 years and reprocessing and improvements have resulted from user assessments. This coming April, ISCCP will host a workshop to review research in progress with ISCCP and related data sets and to determine what needs to be done next.

ISLSCP, too, is conducting a focused interaction with the users of the ISLSCP data sets issued on CD-ROM this summer. A thorough peer review of these data sets was used to ensure the quality of the data and documentation prior to distribution. A broad cross section of the international community initiated the development of the ISLSCP CD-ROM concept with a workshop in 1992 and will continue to be involved in the process of evaluating the usefulness of these initial datasets and in recommending improvements for the next issuance, planned in mid-1997.

GEWEX is now undertaking the development of a global water vapor data set through GVaP. This effort began with an international GEWEX workshop in 1990 to determine a strategy for producing a long-term global climatology of water vapor. Since that time, the feasibility of developing a global data set of the total precipitable water vapor has been demonstrated. Early next year another international workshop will be held to determine the requirements for profiles of water vapor in addition to the total water burden, including projects such as the Stratospheric Processes and their Role in Climate (SPARC), and Climate Variability and Predictability – Global Ocean Atmosphere Land-Surface (CLIVAR–GOALS).

Dialogue with the users is an essential element of the GEWEX strategy on data products as it is intended to be a continuous process of feedback and improvement. We plan, in the future, to hold workshops and evaluations for other GEWEX data sets (e.g. surface radiation, precipitation), and continue to invite the active participation of other WCRP and IGBP programs.

PROFESSOR VERNER SUOMI

We learned with great sadness that Verner E. Suomi, Professor Emeritus in Atmospheric and Oceanic Sciences at the University of Wisconsin, passed away on July 30, 1995. Those who had the privilege to know him will remember the inspiring academic with the broadest interests in Earth Sciences and Technology, the brightly imaginative designer of the first geostationary meteorological observation satellite in Earth orbit, and the intellectual leader of countless research projects. Vern Suomi was uniquely gifted in his ability to transform the bountiful creations of his mind into practical devices or systems, and his intellectual power to generously spread his ideas without ever missing any. But first and foremost, Vern Suomi was a kind and deeply human person, with superlative capabilities and the highest ethical standards, which he was apt to disguise under his distinctive sense of humor and gently satirical pronouncements. His disappearance is our great loss.

Pierre Morel

GCIP COMPLETES BUILDUP FOR ENHANCED OBSERVING PERIOD

John A. Leese, GCIP Office

The GEWEX Continental-Scale International Project (GCIP) will begin its 5-year Enhanced Observing Period (EOP) in October 1995, as the major data collection phase of the Project. Research activities during the first 2 years of the EOP are concentrated on three major thrust areas of (i) coupled model experiments; (ii) energy and water budgets; and (iii) model assimilated and derived variables. Details of these research activities are given in the GCIP Major Activities Plan for 1996, 1997 and Outlook for 1998.

The three-volume GCIP Implementation Plan was completed in 1994. Volume I is the overall planning document for the Project. It addresses the organizational framework for GCIP, the observational and database needs, and the upgrades to be made to existing operational analysis and prediction streams that produce routine four-dimensional data assimilation (4DDA) analyses for the GCIP and global domains. Volume II examines the elements of a GCIP research program needed to assist the research community in addressing the specific scientific questions in the GCIP Science Plan. The strategic plans for data management through the duration of the GCIP Project are described in Volume III. (See page 11 for available GCIP documents).

The understanding and modeling of physical and dynamic processes over a land surface at a continental scale require, from the outset, consideration of nonlinear-scale interactions in the aggregation of smaller processes to the larger scale, and vice versa. Accordingly, the GCIP research approach addresses activities on four scales:

Continental-Scale Area (CSA) activities that span the entire domain of the Mississippi River basin and will operate at essentially a steady level throughout the EOP. The scale size is that of the Mississippi River basin, 3.2 x 10^6 km^2.

Large-Scale Area (LSA) activities that occur in a phased timetable and emphasize a particular region with special characteristics for a period of about 2 years. The scale size is about 10^5 to 10^6 km^2. Four LSAs have been identified that in aggregate cover most of the GCIP domain, as shown in Figure 1 on page 4. The time phasing of activities within each of these areas is also shown.

Intermediate-Scale Area (ISA) activities that will be phased in with those of the LSAs and will serve as the basis for the regionalization of the parameters and coefficients of land surface hydrological models. The scale size is about 10^3 to 10^4 km^2.

Small-Scale Area (SSA) activities that typically occur in association with efforts requiring intensive observing periods over a concentrated region to study a focused set of issues. Scale size is less than 10^2 km^2.

A program of GCIP related research addressing a number of major science issues began in 1992. As the lead implementing agency for GCIP under the structure of the U.S. Global Change Research Program, the National Oceanic and Atmospheric Administration (NOAA) has developed a specific program element for GEWEX/GCIP as part of its NOAA Climate and Global Change Program. Several other agencies are also addressing research related to GCIP objectives. A comprehensive review of GCIP research activities will appear in a special issue of the Journal of Geophysical Research towards the end of 1995.

In 1992 work started on major GCIP components with:

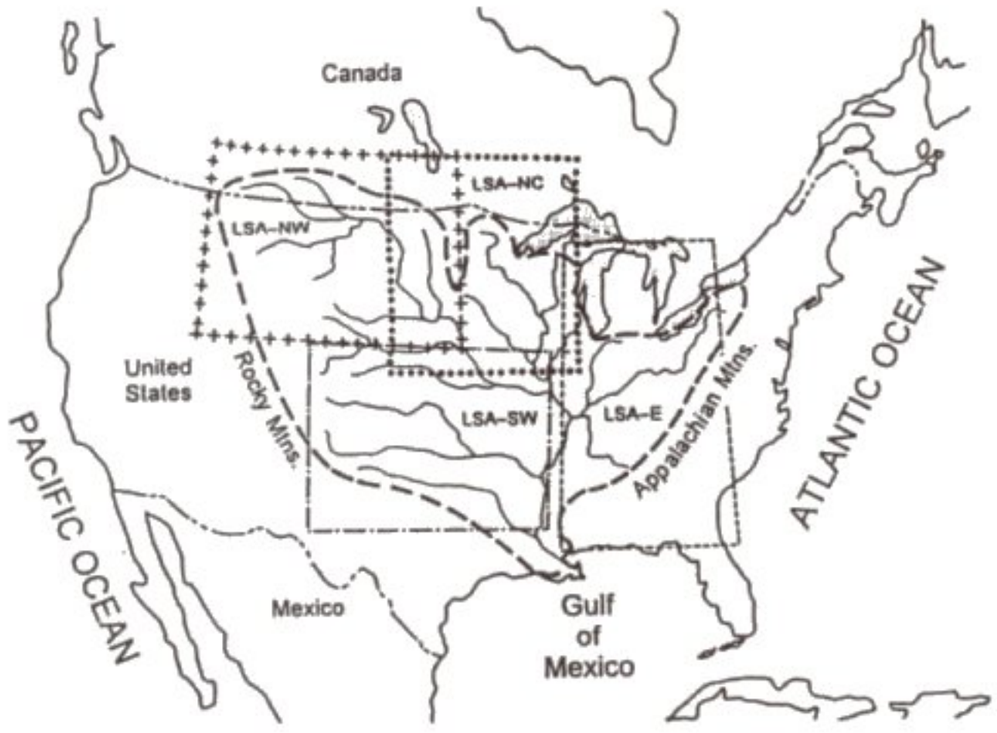
(1) the identification of sources of observations from existing and planned networks;

(2) further enhancements of those networks where necessary;

(3) development of GCIP unique data sets from existing observational systems and derived from model outputs, such as the Eta model; and

(4) development of the GCIP Data Management and Service System (DMSS).

Since the approaches to be taken by the principal operational analysis centers (e.g., the U.S. National Meteorological Center (NMC), the Canadian



	Year					
	1994	1995	1996	1997	1998	1999
	GIST	ENHANCED OBSERVING PERIOD				
Continental-Scale Area	**	***	***	***	***	***
Large-Scale Areas						
LSA-SW	***	***	***	**	**	**
LSA-NC	*	*	***	***	*	*
LSA-E	*	*	*	***	***	*
LSA-NW	*	*	*	*	***	***
EMPHASIS CODE: *** High, ** Moderate, * Low						

Figure 1. Boundaries for large-scale areas (LSA) and temporal emphasis for each LSA from 1994 through 1999.

Meteorological Centre (CMC) and the European Center for Medium-range Weather Forecasting (ECMWF) are different, it is important that GCIP researchers have access to data from more than one assimilation scheme. The NMC Eta Model and the NOAA Forecast Systems Laboratory Mesoscale Analysis and Prediction System (MAPS) Model are both high resolution nested regional models. The ECMWF and NMC operate global models at coarser resolution while the Canadians use a variable grid approach with the Regional Finite Element (RFE) imbedded within a global model. All these model outputs are being made available to GCIP researchers with special efforts being made to archive additional output from the high resolution models, including so-called MOdel Location Time Series (MOLTS). Considerable effort and resources have gone into implementing improved land surface schemes in these operational models.

A number of GCIP initial data sets (GIDS) were prepared to provide the data services support during the buildup period before the EOP. The GIDS data sets were compiled for on-line access by GCIP investigators to the extent that is technically feasible. They were also packaged in a manner (e.g., use of CD-ROM) for wide distribution to persons interested in performing initial diagnostic, evaluation, and modeling studies on GCIP-related topics. Details about the completed GIDS are available through the GCIP Home Page on the World Wide Web at the URL address:

http://www.ncdc.noaa.gov/gcip/gcip_home.html

The first GCIP data set served as both a scientific data set and a GCIP static data system test that made use of existing experimental and operational capability to provide a composite observing and model output data set derived from the new observation and assimilation schemes. A CD-ROM containing a selected portion of GIDS-1 data was distributed in August 1994. A GCIP Integrated Systems Test (GIST) was conducted in 1994. The GIST took place in the LSA-SW which is shown in Figure 1. The compilation of the GIST data set, described on the next page, was completed in June 1995 as the third in a series of initial data sets.

The Enhanced Seasonal Observing Period (ESOP) of 1995 (ESOP-95) is being conducted from 1 April 1995 to 30 September 1995 to initiate the ongoing program of observations in support of the LSA-SW focus (see Figure 1) and to concentrate the buildup in the 6 months prior to the start of the EOP. Research emphasis for the data collection is on energy and water budget studies in the spring and summer seasons in the LSA-SW. The ESOP-95 data set will be completed in June 1996 as the fourth in a series of initial data sets.

The U.S. Geological Survey supported the preparation of a CD-ROM containing a number of different data sets, which is expected to have wide use among GCIP investigators. One of the major criteria for including a specific type of data on the CD-ROM was that the data are expected to change little if any during the next 2 or 3 years. A CD-ROM containing the GCIP Reference Data Set (GREDS) was published in July 1995.

The GCIP Data Management and Service System (DMSS) implementation strategy makes maximum use of existing data centers to minimize the lead time and expense required for development. These existing data centers are made an integral part of the GCIP-DMSS through four data source modules that specialize by data types and are connected to a GCIP central information source that provides "single-point access" to the GCIP-DMSS. Information about the DMSS is available through the GCIP Home Page and in Volume III of the GCIP Implementation Plan.

THIRD GCIP DATA SET AVAILABLE ON-LINE AND ON COMPACT DISK

Steven F. Williams
University Corporation of Atmospheric Research (UCAR)
Office of Field Project Support (OFPS)
and
John A. Leese
GCIP Office

The third of the GCIP Initial Data Sets (GIDS-3) is now available. The GIDS-3 data set contains the data collected during the GCIP Integrated Systems Test (GIST) conducted in the Arkansas-Red River basin from 1 April through 31 August 1994 in the region labeled LSA-SW (see Figure 1 on opposite page). The GIST was conducted in collaboration with the Verification of the Origins of Rotation in Tornadoes Experiment (VORTEX) conducted in the same region during the spring of 1994.

The GIDS-3 data can be obtained through on-line access using the UCAR/OFPS COoperative Distributed Interactive Atmospheric Catalog (CODIAC) system. From the Internet, users may access CODIAC using a World Wide Web browser such as Mosaic or Netscape either directly (http://www.ofps.ucar.edu/) or through the GCIP Home Page (http://www.ncdc.noaa.gov/gcip/gcip_ home.html) and selecting the *in situ* data source module. Users that do not have access to a WWW browser may use telnet to connect to a menu-driven interface compatible with ASCII terminals and X-window display systems (telnet 128.117.90.53; user:storm; password:research).

UCAR/OFPS in cooperation with NOAA's Office of Global Programs have published a subset of atmospheric and hydrologic GIST data on CD-ROM. The CD-ROM set includes imagery (GOES-7 satellite infrared, GOES-7 visible, radar composites, surface/upper air maps, and vegetation index), surface meteorological composites, rawinsonde and profiler data, hydrologic data (streamflow), observing station lists, and complete file documentation. The CD-ROM set has been mastered in ISO9660 allowing for easy use on a variety of systems (i.e., DOS personal computers, UNIX, and Macintosh).

The data on the CD-ROM set are provided in a format compatible with a variety of commercially available software packages (i.e., GIF image viewers and most spreadsheets). Also, a "browse" software tool set compatible for use with the CD-ROM set has been compiled and is available through UCAR/OFPS. This version 1.0 software package (distributed on a separate diskette) contains: (1) software to uncompress the profiler data; (2) a GIF viewer to display the image files; (3) a thermodynamic diagram (SkewT/LogP) plotter to display the rawinsonde data; (4) a plotter to display vertical time series plots of profiler winds; and (5) a time series plotter to display surface observation data. Various versions of this software package compatible with either DOS personal computers, UNIX, and Macintosh are available. Copies of the CD-ROM set and "browse" software package are available from UCAR/OFPS upon request.

Please direct all requests or questions regarding the GIDS-3 (GIST) data to OFPS by telephone (303) 497-8987, Facsimile (303) 497-8158, electronic mail (Internet: sfw@ncar.ucar.edu), or conventional mail (UCAR/Office of Field Project Support, P.O. Box 3000, Boulder, CO 80307, USA).

For Up-to-Date Information

About the GEWEX Program and the Second International Scientific Conference on the Global Energy and Water Cycle

GEWEX Home Page

http://www.cais.com/gewex/gewex.html

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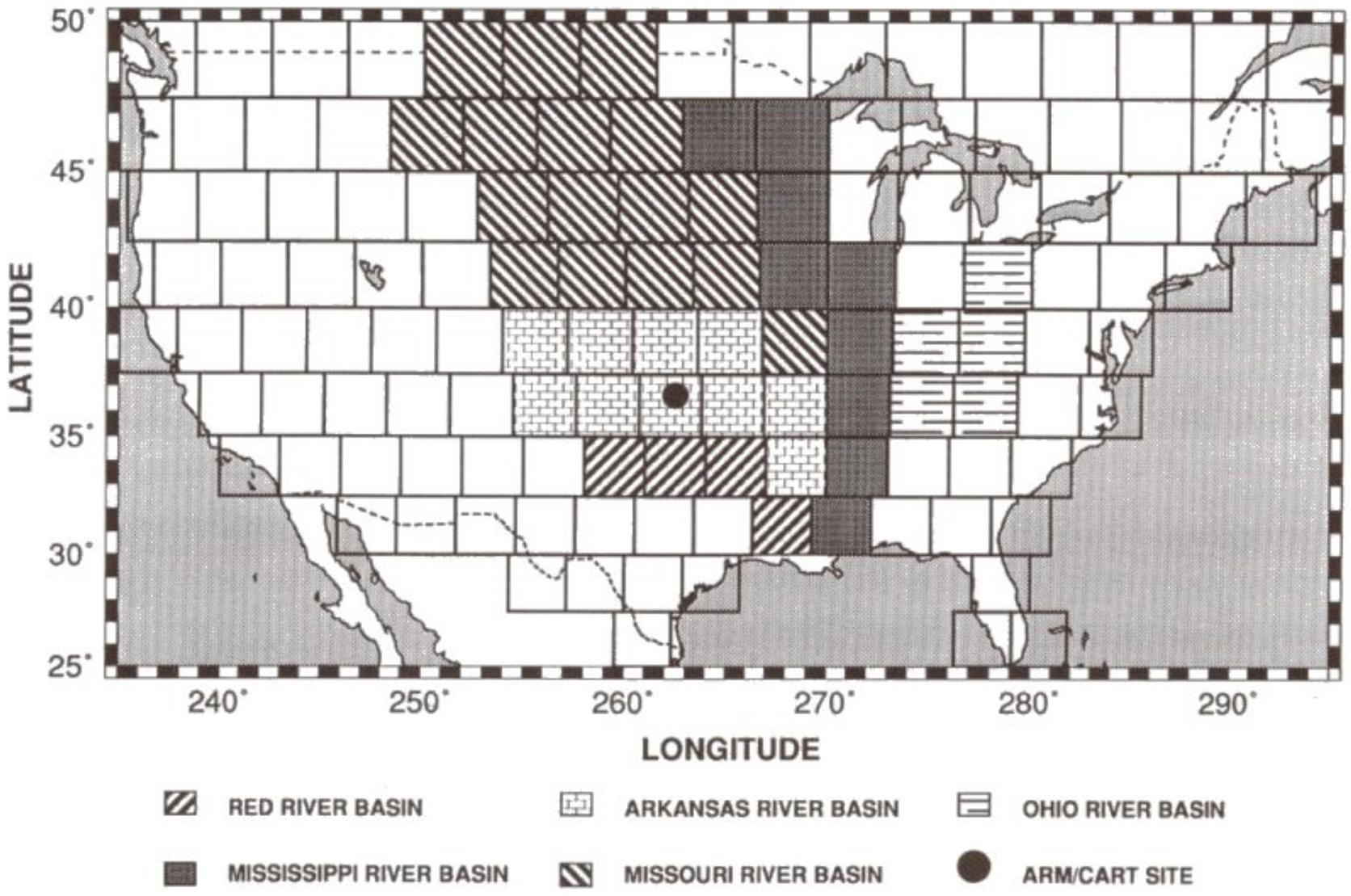

Figure 3. ISCCP regions covering the contiguous United States. Various river basins constituting the GCIP region are shaded. Location of the ARM/CART site is indicated by the solid circle.

the months of January and July. The insolation distribution for both seasons is primarily zonal, but is modulated by the distribution of clouds. The maxima follow the sun from the Southern Hemisphere (SH) in January to the Northern Hemisphere (NH) in July. The highest values for January occur over Antarctica and the subtropical regions of the SH, while for July, they occur over the Arctic, Greenland, and subtropical regions of the NH. The maxima of downward LW flux (DLF) for both seasons occur over broad regions in the tropics with a gradual decrease toward the poles. The maxima of DLF move from south of the Equator in January to north of the Equator in July, but follow the sun weakly when compared to the movement of insolation maxima. The highest values occur over the subtropical deserts; over Australia in January and over the Afro-Asian deserts in July.

Figure 2 shows the time series of monthly averages of downward and net SW and LW fluxes for ISCCP region number 5275 (lat. index 51, long. index 85) which is bounded approximately by 35.0° N and 37.5° N latitude, and 96.2° W and 99.3° W longitude. Results for this region were chosen for illustration as they may be of interest to the radiation/climate science community because of the location of the U.S. Department of Energy Atmospheric Radiation Measurement (ARM) Clouds and Radiation Testbed (CART) site in Oklahoma within the chosen ISCCP region. Results for this and other surrounding ISCCP regions may also be of interest to the scientists engaged in surface process studies under GCIP. The shaded ISCCP regions shown in Figure 3 collectively provide a data set for the GCIP area. A climatology of SRB for the entire GCIP region can be readily extracted from this data set.

The data set contains 96 monthly files, one for each month from July 1983 to June 1991. Each file contains monthly average values of the following seven parameters for each ISCCP region: SWCS – clear-sky downward SW flux (insolation), SWDWN – total-sky downward SW flux, SWNET – total-sky net SW flux (absorbed), LWCS – clear-sky downward LW flux, LWDWN – total-sky net LW flux, and CP – ISCCP-derived cloud cover (percent).

In addition, there is a location identification file that contains ISCCP region numbers (1-6596), and corresponding latitude and longitude indices. File descriptions are given in the "README" file. Also given is a set of formulas that can be used

to derive other SRB parameters such as surface albedo, cloud radiative forcing and total flux parameters. The data set can be obtained either by FTP from cloud.larc.nasa.gov (128.155.17.41) or on an IBM PC-compatible CD-ROM. Requests for the CD-ROM may be sent to: Dr. Charles H. Whitlock, Mail Stop 420, NASA Langley Research Center, Hampton, VA 23681-0001, U.S.A., Tel.: 804/864-5675; Fax: 804/864-7996; E-mail: c.h.whitlock@larc.nasa.gov.

References

Barkstrom, B.R., E.F. Harrison, G.L. Smith, R.N. Green, J.F. Kibler, R.D. Cess, and the ERBE Science Team, 1989: Earth Radiation Budget Experiment archival and April 1985 Results. *Bull. Amer. Meteor. Soc.*, **70**, 1254–1262.

Darnell, W.L., S.K. Gupta, and W.F. Staylor, 1986: Downward longwave surface radiation from Sun-synchronous satellite data. Validation of methodology. *J. Clim. Appl. Meteorol.*, **25**, 101–1021.

Darnell, W.L., W.F. Staylor, S.K. Gupta, and F.M. Denn, 1988: Estimation of surface insolation using Sun-synchronous satellite data. *J. Climate,* **1**, 820–835.

Darnell, W.L., W.F. Staylor, S.K. Gupta, N.A. Ritchey, and A.C. Wilber, 1992: Seasonal variation of surface radiation budget derived from ISCCP-C1 data. *J. Geophys. Res.*, **97**, 15741–15760.

Gupta, S.K., 1989: A parameterization for longwave surface radiation from Sun-synchronous satellite data. *J. Climate*, **2**, 305–320.

Gupta, S.K., W.L. Darnell, and A.C. Wilber, 1992: A parameterization for longwave surface radiation from satellite data: Recent improvements. *J. Appl. Meteorol.*, **31**, 1361–1367.

Pinker, R., and I. Laszlo, 1992: Modeling surface solar irradiance for satellite applications on a global scale. *J. Appl. Meteorol.*, **31**, 194–211.

Rossow, W.B., and R.A. Schiffer, 1991: ISCCP cloud data products. *Bull. Amer. Meteor. Soc.*, **72**, 2-20.

Whitlock, C.H., and co-authors, 1995: First global WCRP shortwave surface radiation budget data set. *Bull. Amer. Meteor. Soc.*, **76**, 905–922.

WMO, 1994: Report of the fifteenth session of the Joint Scientific Committee, Geneva, Switzerland, 14-18 March, 1994, WMO/TD-No. 632, 35–36.

INTERNATIONAL GEWEX WORKSHOP ON COLD-SEASON/REGION HYDROMETEOROLOGY

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Chanhassen, Minnesota, U.S.A.
and
Terry W. Krauss
National Hydrology Research Centre
Saskatoon, Saskatchewan, Canada

A special International GEWEX workshop was held 22–26 May 1995, at Banff, Alberta, concurrently with the 21st Annual General Meeting of the Canadian Geophysical Union, to address key aspects of cold-season/region hydrometeorology. The participants numbered more than 120 from 9 countries and the program consisted of invited plenary talks, oral and poster presentations, and working-group discussion sessions. The objectives of the workshop were to: review the current state of knowledge of cold-season/region hydrology and land-atmosphere interactions; identify and address the most crucial problems facing the modeling community; and provide recommendations on how the GEWEX Continental-Scale International Project (GCIP) and the Canadian Mackenzie GEWEX Study (MAGS) can contribute to solving the scientific problems. The key recommendations are summarized here.

SNOW AND SOIL MOISTURE MODELING: Improve parameterizations to support more physically based snow and soil moisture modeling are required. Snow cover research should incorporate processes to provide a dynamic approach to modeling snow accumulation and distribution, addressing subgrid variability, distributed according to landscape type, temperature, relative humidity, vegetation, and topography. Snowmelt research should refine algorithms for melt processes and the spatial variation in snowmelt to include: the effects of patchy snow on melt rates and evaporation; advection of sensible heat; albedo and the effects of dust, vegetation, and ripening using remote sensing technology; and define better the linkages between snow and soil meltwater and between snow and the atmosphere. Research on soil moisture modeling and infiltration should emphasize heat and mass flows and refine algorithms for frozen and unfrozen soil characteristics including: frost heave/ground ice, winter desiccation, pre-winter soil moisture content; and heat and mass flows across surface boundary layers. Research on soil moisture fluxes should improve surface soil moisture computation and explore the implication of treating soil moisture and ground water as a con-

(Continued on page 10)

SECOND INTERNATIONAL SCIENTIFIC CONFERENCE ON THE GLOBAL ENERGY AND WATER CYCLE
17–21 June 1996, Washington, DC, U.S.A.

The Second International Scientific Conference on the Global Energy and Water Cycle will be held at the U.S. National Academy of Sciences. Results from field experiments, new developments in theory, modeling and observational capability are expected to be reported. Particular emphasis will be on the linking of disciplines such as coupled atmospheric and land surface models and cross discipline studies connecting the water and carbon cycle. The advances in scientific knowledge presented will provide new information to assess the impact on water resource management. In focussing on the GEWEX science areas involving clouds, radiation, hydrologic processes, and modeling, there will be five interrelated sessions:

- **Drought and Flood Prediction: Global Modeling of the Coupled Land-Atmosphere System.** Impact on regional precipitation and the water cycle.
- **Regional Water Resources and Climate**: Use of climate information for managing water resources. Determining continental-scale water budgets, runoff, precipitation and land surface characteristics.
- **Cloud, Water Vapor, Aerosol, and Precipitation Interaction**: Measurement and modeling of the cloud and radiative elements contributing to climate variation.
- **The Water and Carbon Cycle Connection**: Influence of precipitation and radiation on the biogeochemical processes affecting climate.
- **Ocean-Atmosphere-Ice Exchanges**: Measurement and incorporation of ocean, snow and sea ice characteristics into energy and water budget studies.

Call for Papers

Contributed papers covering work on the conference themes will be accepted for oral or poster presentation. Each author should submit an abstract of 250-500 words giving enough detail to permit a meaningful review by the Technical Program Committee. Please be sure to provide all of the following information. Complete title of presentation along with authors' complete names; underline the name of the presenter. (Do not give titles of the authors, e.g. Dr., Prof., etc.). Include the name(s) of the institution(s) typed beneath the authors' name(s). The following line(s) contain the complete mailing address (street, city, state, mail code and country). With your submission, also include commercial telephone and telefax numbers and e-mail address.

Send the abstract in hard copy to Science and Technology Corp., Attn.: Meetings Division (J. Cole), 101 Research Drive, Hampton, VA 23666-1340, and if possible on e-mail through internet to cole@stcnet.com, or on a floppy disk (5-1/4 inches or 3-1/2 inches) for use on IBM compatible computer. WordPerfect 5.2 or 6.1 for Windows is the preferred software, or provide in ASCII format. **Abstract deadline 15 November 1995**. Upon selection, the authors will be provided additional information.

Conference Location and Hotel Information

This conference will be held in the Great Hall of the U.S. National Academy of Sciences, 2101 Constitution Avenue, Washington, DC. Other activities will be at the Key Bridge Marriott Hotel.

A block of sleeping rooms have been reserved at the Key Bridge Marriott, 1401 Lee Highway, Arlington, Virginia, at the current U.S. Government rate: Single (one person) $103.87; Double (two people/1 bed) $122.10 and subject to applicable state and local taxes (currently 9.75%) per room per night. To make hotel reservations, please contact the Key Bridge Marriott (Tel: 703–524–6400; Fax: 703–524–8964) and mention "GEWEX" to receive the special rate. The cut-off date for making reservations at the special discounted rate is 24 May 1996. All reservations must be guaranteed with a first-night deposit by credit card or check.

For additional information about registration procedures and cost contact Science and Technology Corporation, Attention: Meetings Division, (Judy Cole) 101 Research Drive, Hampton, VA, 23666-1340, U.S.A.; E-mail: cole@stcnet.com; or IGPO, 409 Third Street SW., Suite 203, Washington, DC 20024, U.S.A., E-mail: gewex@cais.com or WWW URL: http://www.cais.com/gewex/gewex.html for news on this conference.

Cold Season/Region Hydrology

(Continued from page 8)

tinuum in a hydrologic model; facilitate calculation of land/atmosphere interactions; update model fields of surface moisture using remote sensing information; couple moisture with heat fluxes; improve parameterization of soil properties including macropore effects; explore vegetation distribution/age/type effects on spatial distribution of soil moisture.

HYDROLOGIC AND ATMOSPHERIC MODELING: Controlled experiments should be conducted to determine the sensitivity of areally averaged model flux predictions to subgrid heterogeneities, including snow patchiness, soil characteristics, topography, and vegetation. Structured testing of precipitation products from numerical weather prediction models (and perhaps climate models) to drive hydrologic models over large river basins should be facilitated by GCIP, particularly where known biases in the atmospheric models (e.g., in prediction of orographic precipitation) are small.

REMOTE SENSING: Discussion was restricted to satellite products for cold regions. The identified products are: cloud cover over the land surface; shortwave radiation; areal extent of snow cover; snow depth, snow water equivalent, land surface temperature, and state of the ground (e.g., frozen, wet). To ensure high quality data products, it is recommended that: each product be based on a sound radiometric calibration of the sensor; algorithm development and evaluation be performed for each product; derived geophysical products be validated with ground truth data; procedures be developed for the systematic generation of time series of products; a delivery system be developed to make the products readily available to the GCIP community; and mechanisms be developed for user-friendly integration of the satellite-based products into the GCIP models. A multi-sensor approach (e.g. AVHRR, RADAR, SSM/I) is recommended to tackle the difficult problems of snow related satellite products.

HYDROMETEOROLOGICAL DATA SETS: Point data in particular rain and snow measurements need to be corrected for inconsistencies and known biases.

The workshop brought together scientists from a variety of disciplines to discuss key scientific issues and make recommendations regarding future GEWEX research in cold regions. The most immediate result is the incorporation of these recommendations into the GCIP Major Activities Plan for 1996/97, including research and data collection activities in the Upper North Central region of the Mississippi.

WCRP/GEWEX MEETINGS CALENDAR

For calendar updates, consult the GEWEX Home Page http://www.cais.com/gewex/gewex.html

4–8 September 1995—THIRD INTERNATIONAL CONFERENCE ON MODELLING OF GLOBAL CLIMATE CHANGE AND VARIABILITY, Hamburg, FRG. For information, contact Dr. Lydia Dumenil, Max-Planck-Institut für Meteorologie, Bundesstrasse 55, D-20146 Hamburg, Germany; Tel: 49–40–41173–310; Fax: 49–40–41173–366.

12–15 September 1995—WCRP ARCTIC CLIMATE SYSTEM STUDY SOLID PRECIPITATION CLIMATOLOGY WORKSHOP, Washington, DC. For information, contact Prof. R. Barry, NSIDC/CIRES, University of Colorado, Boulder, Colorado 80309, U.S.A.; Tel: 1–303–492–5488; Fax: 1–303–492–2468; E-mail: rbarry@kryos.colorado.edu.

25–29 September 1995—GAIM SCIENCE CONFERENCE, Garmisch-Partenkirchen, Germany. A GEWEX/WCRP-related session on Global System Integration. For additional information, contact Dr. Dork Sahagian, Institute for the Study of Earth, Oceans and Space, University of New Hampshire, Durham, New Hampshire 03824, U.S.A.; Tel: 1–603–862–3875; Fax: 1–603–862–0188; E-mail: gaim@unh.edu.

16–19 October 1995—GCIP SCIENCE PANEL MEETING, Minneapolis, Minnesota, U.S.A. For information, contact Blair Gollihur, GCIP Office, 1100 Wayne Avenue, Suite 1225, Silver Spring, Maryland, U.S.A.; Tel: 1–301–427–2080 ext. 511; Fax: 1–301–427–2222; E-mail: gcip@ogp.noaa.gov.

30 October–2 November 1995—AEROSOL INTERDISCIPLINARY PROGRAM WORKSHOP, Columbia Inn, Columbia, Maryland. For information contact Dr. Robert J. Curran, NASA Headquarters, Code YS, 300 E Street SW, Washington, DC 20546; Tel: 202–358–1432; Fax: 202–358–2770; E-mail: rcurran@mtpe.hq.nasa.gov.

November 1995—LARGE-SCALE BIOSPHERE-ATMOSPHERE EXPERIMENT IN AMAZONIA (LBA), Brazil. For information, contact Dr. Carlos Nobre, CPTEC-INPE, Rod. Presidente Dutra, KM 40, C. Postal 001 12630–000, C. Paulista SP Brazil; Tel: 55–125–612822; Fax: 55–125–612835; E-mail: nobre@cptec.inpe.br.

1–3 November 1995—GEWEX CLOUD SYSTEM STUDY WORKSHOP, Goddard Institute for Space Studies, New York City, New York, U.S.A. For additional information, contact Dr. Ronald Stewart, Tel: 416–739–4122; Fax: 416–739–5700; E-mail: restewart@dow.on.doe.ca.

26 November–1 December 1995—INTERNATIONAL SYMPOSIUM ON SPECTRAL SENSING RESEARCH, Melbourne, Australia. Sessions include Atmospheric, Oceanic, Land Surface Applications, Analysis and Processing Systems, and Data Collection. For information, contact Science and Technology Corporation, Meetings Division, Attn: ISSSR, 101 Research Drive, Hampton, Virginia 23666-1340, U.S.A.; Tel: 1–804–865–7604; Fax: 1–804–865–8721.

4–6 December 1995—REGIONAL CONFERENCE ON GLOBAL CHANGE, São Paulo, Brazil. For information, contact Ines Iwashita, Instituto de Estudio Avancados, Universidade de São Paulo, 05508-900; Tel: (55)–(11)–818–4442; Fax: (55)–(11)–818–4306; E-mail: iea@cat.cce.usp.br.

6–8 December 1995—GLOBAL PRECIPITATION PROJECT WORKSHOP ON IDENTIFICATION OF PRECIPITATION RATES, Washington, DC. By invitation only.

11–15 December 1995—GEWEX CLOUD SYSTEM STUDY SCIENCE PANEL, Washington, DC, U.S.A.

15–19 January 1996—GEWEX SCIENTIFIC STEERING GROUP MEETING, U.S. National Academy of Sciences, Irvine, California, U.S.A., By invitation only.

28 January–2 February 1996—GEWEX TOPICS AT AMERICAN METEOROLOGICAL SOCIETY MEETING, Atlanta, Georgia, U.S.A.

11–16 March 1996—GEWEX JOINT SCIENTIFIC COMMITTEE, Toulouse, France. By invitation only.

15–19 April 1996—INTERNATIONAL WORKSHOP ON RESEARCH USES OF ISCCP DATA SETS, NASA Goddard Institute for Space Studies, New York, NY, U.S.A. For details contact Dr. William B. Rossow, Goddard Institute for Space Studies, 2880 Broadway, New York, NY 10025; Tel: 212–678–5567; Fax: 212–678–5552; E-mail: clwr@nasagiss.giss.nasa.gov.

6–10 May 1996—EUROPEAN GEOPHYSICAL SOCIETY XXI GENERAL ASSEMBLY, The Hague, The Netherlands. For information contact EGS Office, Postfach 49, Max-Planck-Str. 1, 37189 Katlenburg-Lindau, Germany; Tel: 49–5556–1440; Fax: 49–5556–4709; E-mail: egs@linaxi.dnet.gwdg.de.

15–17 May 1996—INTERNATIONAL WORKSHOP ON MACRO-SCALE HYDROLOGICAL MODELING, Nanjing, China. One page abstracts due before 30 September 1995. For further information contact Prof. Jold, Water Resources Development and Utilization Laboratory, Hohai University, Nanjing, China; Tel: 86 25 330 4195 (after voice in Chinese dial 0544); Fax: 88 25 33 15375.

10–12 June 1996—SCALING UP HYDROLOGICAL VARIABLES USING REMOTE SENSING, Wallingford, U.K. For information, contact Dr. John Stewart, Institute of Hydrology, Crowmarsh Gifford, Wallingsford, Oxfordshire, OX10 8BB, U.K.; Tel: 44–1491–838800; Fax: 44–1491–832256.

17–21 June 1996—SECOND INTERNATIONAL SCIENTIFIC CONFERENCE ON GLOBAL ENERGY AND WATER CYCLE, U.S. National Academy of Sciences, Washington, DC. For additional information, contact IGPO, 409 Third St., SW, Suite 203, Washington, DC, U.S.A.; Tel: 1–202–863–1435; Fax: 1–202–488–5364; E-mail: gewex@cais.com.

19–23 August 1996—12TH INTERNATIONAL CONFERENCE ON CLOUDS AND PRECIPITATION, Zurich, Switzerland. For information, contact Prof. P.R. Jonas, Dept. of Pure and Applied Physics, UMIST, P.O. Box 88, Manchester, M60 1QD, U.K.

9–13 September 1996—SEVENTH CONFERENCE ON MESOSCALE PROCESSES, Reading, U.K. For information, contact Bradley Smull, NOAA/NSL, 325 Broadway, Boulder, Colorado, U.S.A.; Tel: 1–303–497–6886; Fax: 1–303–497–6930; E-mail: smull@mrd3.mmm.ucar.edu, or Susan Ballard, Joint Centre for Mesoscale Meteorology, University of Reading, P.O. Box 240, Reading RG6 2FN, U.K.; Tel: 44–734–318794; Fax: 44–734–318791; E-mail: spballard@email.meto.govt.uk.

GEWEX REPORTS AND DOCUMENTS

(Available from IGPO)

PROJECT FOR INTERCOMPARISON OF LAND-SURFACE PARAMETERIZATION SCHEMES (PILPS), Soil Moisture Simulation. December 1994, IGPO Publication Series No. 14.

LAND-SURFACE CLIMATOLOGIES OF AMIP-PILPS MODELS AND IDENTIFICATION OF REGIONS FOR FUTURE INVESTIGATION (PILPS Phase 3A). November 1994, IGPO Publication Series No. 13.

GEWEX CONTINENTAL-SCALE INTERNATIONAL PROJECT (GCIP) Major Activities Plan for 1995, 1996, and Outlook for 1997. December 1994, IGPO Publications Series No. 12.

GEWEX CLOUD SYSTEM STUDY (GCSS) SCIENCE PLAN. May 1994, IGPO Publication Series No. 11.

GEWEX PAMPHLET (fivefold glossy).

UTILITY AND FEASIBILITY OF A CLOUD PROFILING RADAR: Report of the GEWEX Topical Workshop, 29 June–1 July 1993, Pasadena, California. April 1994, IGPO Publication Series No. 10.

IMPLEMENTATION PLAN FOR GEWEX CONTINENTAL-SCALE PROJECT (GCIP), VOLUME III: Strategic Plan for Data Management. March 1994, IGPO Publication Series No. 9.

IMPLEMENTATION PLAN FOR GEWEX CONTINENTAL-SCALE PROJECT (GCIP), VOLUME II: Research. June 1994, IGPO Publication Series No. 8.

PROJECT FOR INTERCOMPARISON OF LAND-SURFACE PARAMETERIZATION SCHEMES (PILPS): Results from Off-line Control Simulations (Phase 1A). December 1993, IGPO Publication Series No. 7.

GCIP PAMPHLET (trifold glossy).

IMPLEMENTATION PLAN FOR THE GEWEX CONTINENTAL-SCALE INTERNATIONAL PROJECT (GCIP), VOLUME I: Data Collection and Operational Model Upgrade. May 1993, IGPO Publication Series No. 6.

A PRELIMINARY SCIENCE PLAN FOR A LARGE-SCALE BIOSPHERE-ATMOSPHERE FIELD EXPERIMENT IN AMAZON BASIN: Report on Workshop convened 18–20 June 1992 at NASA Goddard Space Flight Center, Greenbelt, Maryland, U.S.A.

INTERNATIONAL SATELLITE LAND SURFACE CLIMATOLOGY PROJECT (ISLSCP) WORKSHOP REPORT, 23–26 June 1992, Columbia, Maryland, U.S.A.

PROJECT FOR INTERCOMPARISON OF LAND-SURFACE PARAMETERIZATION SCHEMES (PILPS): Report on PILPS Workshop, 24–26 June 1992, Columbia, Maryland, and First Science Plan. September 1992, IGPO Publication Series No. 5.

GEWEX CONTINENTAL-SCALE INTERNATIONAL PROJECT (GCIP) DATA WORKSHOP: Summary report on 5–8 May 1992 Workshop. June 1992, IGPO Publication Series No. 4.

GEWEX CONTINENTAL-SCALE INTERNATIONAL PROJECT (GCIP) ATMOSPHERIC SCIENCE COMPONENT: Report on Atmospheric Subpanel Workshop, 18–19 March 1992. May 1992, IGPO Publication Series No. 3.

IMPLEMENTATION PLAN FOR THE PILOT PHASE OF THE GEWEX WATER VAPOR PROJECT (GVaP). March 1992, IGPO Publication Series No. 2.

SCIENTIFIC PLAN FOR THE GEWEX CONTINENTAL-SCALE INTERNATIONAL PROJECT (GCIP)-WCRP-67, February 1992 (WMO/TD No. 461). (Second printing available)

THE ROLE OF WATER VAPOR IN CLIMATE: A STRATEGIC RESEARCH PLAN FOR THE PROPOSED GEWEX WATER VAPOR PROJECT (GVaP): Report of Workshop, Easton, Maryland, U.S.A., 30 October–1 November 1991. NASA Conf Pub. 3210.

GLOBAL ENERGY AND WATER CYCLE EXPERIMENT (GEWEX)—REPORT OF THE FIRST GEWEX TEMPERATURE/HUMIDITY RETRIEVAL WORKSHOP, WCRP-XX, Greenbelt, Maryland, U.S.A., 23–26 October 1990.

NOTICE

Second International Scientific
Conference on the
Global Energy and Water Cycle

Abstract Deadline: 15 November 1995

Participants at the Second International Study Conference for GEWEX in Asia held in Pattaya, Thailand, 6–10 March 1995. A brief summary of the 128 presentations (oral or poster), the working groups, and plans for implementing all the components of the GEWEX Asian Monsoon Experiment (GAME) was published in the May 1995 issue of the GEWEX Newsletter.

GEWEX Science Project Office Opens in Japan

The National Space Development Agency of Japan (NASDA) established the Earth Observation Research Center (EORC) as part of the Office of Earth Observing Systems. The GEWEX Science Project Office is located within the EORC. Responsibilities of the GEWEX Science Project Office include coordination of national and international GEWEX science activities as they relate to the space agency. The GEWEX Science Project Manager is Seiichi Ueno, and the address is: GEWEX Science Project Office, Earth Observation Research Center (EORC), National Space Development Agency of Japan (NASDA), 1–9–9 Roppongi, Minato-ku, Tokyo 106, Japan; Tel: 81–3–3224–7211; Fax: 81–3–3224–7052; E-mail: sueno@rd.tksc.nasda.go.jp.

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