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## LIST OF ACRONYMS

4DDA	Four Dimensional Data Assimilation
AAN	Asian AWS Network
AARRP	Applied Atmospheric Resources Research Program
ACSYS	Arctic Climate System Study
ADEOS	Advanced Earth Observing Satellite
AGCM	Atmospheric General Circulation Model
AIT	Asia Institute of Technology
AMI	Advanced Microwave Instrument
AMIP	Atmospheric Model Intercomparison Project
AMSU	Advanced Microwave Sounding Unit
APN	Asia Pacific Network for Global Change Research
AVHRR	Advanced Very High Resolution Radiometer
AWS	Automatic Weather Station
BAHC	Biosphere Aspects of the Hydrological Cycle
BALTEX	Baltic Sea Experiment
BRAA	Bureau of the Royal Rainmaking and Agricultural Aviation
BSRN	Baseline Surface Radiation Network
CAMS	Chinese Academy of Meteorological Sciences
CANAE	Code for Aggregating Nested Atmosphere and Environment
CAO	Central Aerological Observatory
CAS	Chinese Academy of Sciences
CCSR	Center for Climate System Research (University of Tokyo)
CERES	Clouds and the Earth's Radiant Energy System
CLIVAR	Climate Variability and Predictability Programme
CMA	Chinese Meteorological Administration
COARE	Coupled Ocean Atmosphere Response Experiment
CREQ	Cryosphere Research on Qingzang Plateau
CRL	Communications Research Laboratory
CU	Chulalongkorn University
CWR	Center for Water Research (University of Western Australia)
DAAC	Distributed Active Archive Center
DEM	Digital Elevation Model
DHM	Department of Hydrology & Meteorology, Nepal
DID	Department of Irrigation and Drainage
DMSF	Defense Meteorological Satellite Program
DPRI	Disaster Prevention Research Institute (Kyoto University)
EA	Environmental Agency
ECMWF	European Centre for Medium-range Weather Forecasts
EERS	European Remote Sensing Satellite
EGAT	Electric Generation Authority of Thailand
ENSO	El Nino and Southern Oscillation
EORC	Earth Observation Research Center
ERC	Environmental Research Center (University of Tsukuba)
ERS	Earth Resources Satellite
ETH	Swiss Federal Institute of Technology
ETO	Extended Time Observation
FFPRI	Forestry and Forest Products Research Institute
FRIM	Forestry Research Institute Malaysia
FTP	File Transfer Protocol
FY	Fiscal Year
FY-2	Feng Yun -2
FRSGC	Frontier Research System for Global Change
GAIN	GAME Archive and Information Network
GAME	GEWEX Asian Monsoon Experiment
GAME-T	GAME Tropics
GAW	Global Atmospheric Watch
GCIP	GEWEX Continental-scale International Project

GCM	General Circulation Model
GCTE	Global Change and Terrestrial Ecosystems
GEBA	Global Surface Energy Balance Archive
GEWEX	Global Energy and Water Cycle Experiment
GIS	Geographic Information System
GISP	GAME-ISP
GLI	Global Imager
GMS	Geostationary Meteorological Satellite
GOALS	Global Ocean Atmosphere Land System Program
GPS	Global Positioning System
GRDC	Global Runoff Data Centre
GSFC	Goddard Space Flight Center
GTS	Global Telecommunications System
GWE	Global Weather Experiment
HDP	Human Dimensions of Global Environmental Change Programme
HUBEX	Huaihe River Basin Experiment
IFO	Intensive Field Observation
IGBP	International Geosphere-Biosphere Programme
IGS	International GPS service for Geodynamics
IHAS	Institute for Hydrospheric-Atmospheric Sciences (Nagoya University)
IIS	Institute of Industrial Science (University of Tokyo)
IMD	India Meteorological Department
IMG	Interferometric Monitor for Greenhouse Gases
IMH	Institute of Meteorology and Hydrology
INSAT	Indian Satellite for Meteorology, Communication and Broadcasting
IOP	Intensive Observing Period
IPCC	Intergovernmental Panel on Climate Change
IR	Infrared
IS	Initial System
ISCCP	International Satellite Cloud Climatology Project
ISP	International Science Panel
J-SAR	JERS-1 Synthetic Aperture Radar
JAMSTEC	Japan Marine Science and Technology Center
JCC	Joint Coordination Committee
JERS-1	Japanese Earth Resources Satellite-1
JEXAM	Japanese Experiment on Asian Monsoon
JFY	Japanese Fiscal Year
JMA	Japan Meteorological Agency
JSM	Japan Spectrum Model
KMA	Korea Meteorological Administration
KMITL	King Mongkut's Institute of Technology Ladkrabang
KMITT	King Mongkut's Institute of Technology Thonburi
KORMEX	Korean Monsoon Experiment
KKU	Khon Kaen University
KU	Katsesaert Univerisity
LAI	Leaf Area Index
LANDSAT	Land Resource Technology Satellite
LBA	Large scale Biosphere-Atmosphere Experiment in Amazonia
LDD	Land Development Department
LIGG	Lanzhou Institute of Glaciology and Geocryology
LIPAP	Lanzhou Institute of Plateau Atmospheric Physics
LST	Local Standard Time
MAGS	Mackenzie Etude GEWEX Study
MESSC	Ministry of Education, Sciece, Sports, and Culture
MESSR	Multispectral Electronic Self-Scanning Radiometer
ML	Mixing Layer
MMS	Malaysia Meteorological Service
MONEX	Monsoon Experiment
MOS-1	Marine Observation Satellite-1

MRI	Meteorological Research Institute
NASA	National Aeronautics and Space Administration
NASDA	National Space Development Agency of Japan
NC	The Japan National Committee for GAME
NCAR	National Center for Atmospheric Research
NDVI	Normalized Difference Vegetation Index
NES	Northern Eurasian Study
NIED	National Institute for Earth Science and Disaster Prevention
NIES	National Institute for Environmental Studies
NIO	National Institute of Oceanography
NMC	National Meteorological Center
NOAA	National Oceanic and Atmospheric Administration
NRCT	National Research Council of Thailand
NWP	Numerical Weather Prediction
OCTS	Ocean Color Temperature Scanner
OI	Optimum Interpolation
OLR	Outgoing Longwave Radiation
PAM III	Portable Automated Mesonet III
PBL	Planetary Boundary Layer
PILPS	Project for Intercomparison of Land-Surface Parameterization Schemes
POP	Prephase Observation Period
PPI	Plan Position Indicator
PR	Precipitation Radar
PWRI	Public Works Research Institute
QBO	Quasi-biennial Oscillation
QC	Quality Control
QXPMEX	Qinghai-Xizang Plateau Meteorological Experiment
RADARSAT	Canadian Synthetic Aperture Radar Satellite
RAMS	Regional Atmospheric Modelling System
RAS	Russian Academy of Science
RASC	Radio Atmospheric Science Center
RFD	Royal Forestry Department
RID	Royal Irrigation Department
RS	Remote Sensing
SVISSR	Stretched Visible and Infrared Spin-Scan Radiometer
SAR	Synthetic Aperture Radar
SAT	Sonic Anemometer-Thermometer
SCSMEX	South China Sea Monsoon Experiment
SiB	Simple Biosphere Model
SiBUC	Simple Biosphere Model including Urban Canopy
SMMR	Scanning Multichannel Microwave Radiometer
SOI	Southern Oscillation Index
SPG	Science Promotion Group
SRB	Surface Radiation Budget
SSG	Science Steering Group
SSM/I	Special Sensor Microwave/Imager
SST	Sea Surface Temperature
STA	Science and Technology Agency
START	System for Analysis, Research and Training
TBD	to be decided
TDR	Time Domain Reflectometry
TEACOM	Temprate East Asia Regional Committee for START
TIPEX	Tibetan Plateau Experiment
TM	Thematic Mapper
TMD	Thai Meteorological Department
TMI	TRMM Microwave Imager
TOGA	Tropical Ocean and Global Atmosphere Program
TOMS	Total Ozone Mapping Spectrometer
TOVS	TIROS-n Operational Vertical Sounder

TRMM	Tropical Rainfall Measuring Mission
UTC	Universal Time Coordinated
VCP	Voluntary Cooperation Program
WCRP	World Climate Research Programme
WDC	World Data Center
WG	Working Group
WMO	World Meteorological Organization
WSR	Weather Service Radar
WWW	World Wide Web

## APPENDIX A

### GAME International Science Panel (GAME-ISP) members (as of January, 1998)

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## **APPENDIX B**

### **GAME International Project Office**

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#### Activities:

The GAME International Project Office (GIPO) has practically started in the Institute for Hydrospheric-Atmospheric Sciences, Nagoya University after The Second International Study Conference on GEWEX in Asia and GAME (2nd GAME Conf) held in Pattaya, Thailand in March, 1995 and was officially established by the First GAME International Science Panel (1st ISP) held in Tokyo in March, 1996. The major work of GIPO in fiscal 1996 was to prepare and support the 2nd ISP and the 3rd GAME Conf for 24th-28th, March 1997 at Cheju, Korea. The ISP and GAME Conf were held with kind supports from the Meteorological Institutes, Korea, National Space Development Agency of Japan, World Climate Research Programme, Asia Pacific Network for Global Change Research, and Institute for Hydrospheric-Atmospheric Sciences, Nagoya University, Japan. Since the IOP is scheduled in 1998, the ISP and GAME Conf were very important to clarify the scientific objectives, to harmonize various observations in various fields, and to discuss details of the observations. GIPO also supported the third ISP held in January, 1998 in Tokyo.

## **APPENDIX C**

### **Summaries of GAME ISPs and Conference**

#### **C-1 The 2nd GAME-ISP and the 3rd GAME Conference**

The 2nd GISP was held on 24th and 25th March, 1997. The 24 members from nine countries with an ex-officio member from WCRP participated in the Panel. Many experts and observers have also participated. The main subjects were the coordination of the intensive observation period (IOP) in 1998 and data management. Though each regional experiment has its own scientific objectives and the coordination was not an easy task, core IOP periods in the beginning and mature stage of monsoon were agreed. For the data management, basic guideline was agreed but the details has yet resolved. An working group to discuss the details has been established.

The 3rd GAME Conf was held for 26th-28th March. The participants are about 150 from 15 countries. About eighty presentations were divided into oral and poster ones in sessions of:

- The strategy of GEWEX/GAME and collaborations with other projects
- Regional energy and water cycles
- Energy and water cycles in monsoon Asia
- GCM studies
- Satellite studies.

The first session was started after opening and welcome addresses from Prof. Yasunari, University of Tsukuba, Mr. Sung-Gil Hong, Director-General METRI, and Prof. Jeong-Woo Kim, Yonsei University, Korea. The current status of each subprogram and other related projects, such as, KORMEX were talked. The second and third sessions were mainly concerning the observational results on the monsoon activities and surface observations in Siberia, Tibet Plateau and Thailand. Many are from the preliminary observations before the GAME Intensive observation Period which is scheduled in 1998. KORMEX related studies were also included. GCM model studies and satellite observation are other major component of GAME. Last two sessions were dedicated to those studies.

#### **C-2 The 3rd GAME-ISP**

The third GAME international science panel (ISP) was held from 12 to 14 January, 1998 at Japan Meteorological Agency (JMA), Tokyo, Japan with kind supports of JMA, National Space Development Agency of Japan (NASDA) and WCRP. Twenty three ISP members or representatives and forty two observers/experts from 13 countries participated.

After the opening addresses from Prof. T. Yasunari, Chairperson of GAME, Mr. T. Ono, Director of JMA, Mr. W. Iwamoto, Ministry of Education, Science, Sports, and Culture, Japan, and Mr. T. Tanaka, NASDA/EORC, the panel started. First, current status of each component of GAME and related projects are introduced. Recently launched Tropical Rainfall Measuring Mission (TRMM) initial images were very impressive.

Enhanced radiosonde observation is one of the most important keys for the success of GAME. We need harmonized radiosonde observations as much as possible in time and space. We should seek all possible resources including WMO VCP. Prof. Yasunari proposed the establishment of IOP operational center in JMA. This center promotes the enhanced radio sonde observations in each regional project. The quality of the radiosonde data was one of the issues discussed. Dr. Kuma, JMA pointed out a difference between the first guess of JMA forecast and observation around tropopause in China. An additional radiosonde observation in China for data comparison to clarify the difference may be required.

GAME Data Management was another big issue. The guideline was proposed by Dr. Takahashi from Meteorological Research Institute of JMA (MRI). Taking into consideration that each regional project has its own problems in budget and number of the field workers and also the case of GCIP, the following data release schedule was adopted; (1) the IOP data will be available for the participating institutes and scientists by the end of June 1999 and for the international research community by the end of June 2000, and (2) non-IOP data, that is, data obtained other than IOP, as parts of the GAME observations will be available for the participating institutes and scientists by the end of one year after the observations, and for the international community by the end of two years after observations. All observing bodies are requested to keep the deadline of data release.

Along with the regional experiments which are focused for IOP, a long term monitoring using Asian AMeDAS Network (AAN) is also an important component of GAME. A working group (WG) for AAN was proposed from Prof. Yasunari. GAME has to consider the maintenance of the facilities of AAN after IOP (after 2000), and successive observation i.e. long-term monitoring with more stations than currently-planned 10 stations. GAME needs an international network to lead the AAN activity in the future. AAN WG will make discussion; (1) to design the concrete plan of long-term monitoring, and (2) to decide data information management, and (3) to coordinate with other international activities (IGBP/FLUXNET). After several comments including a possibility to contribute to GTOS and GCOS, the proposal was adopted.

The future GAME was the last subject. Prof. Ohata proposed a working group for the 2nd IOP which was planned from 1999 to 2000. The objectives of the WG are (1) to determine detail scientific objectives and focused issues, (2) to determine the basic direction of implementation, and (3) to seek cooperation from other international project. The WG would have a meeting in the Autumn of 1998 and its scientific back grounds were explained. After several comments on the time frame and the importance to consider the new satellite data such as TRMM and ADEOS II, and to cooperated with the GEWEX framework, the proposal was finally adopted.

In the wrap up session, finalization of the IP regarding IOP referring the handout IP book was a subject. After several requests of modification from participants, the IP was adopted. The radiosonde observations will be implemented from the beginning of April to the end of October. the unified enhanced observations have two phases; one is the onset phase from May 16 to June 15 and the other is the mature phase for full month of July. Each regional project or country will have some different schedule of enhanced radiosonde observations. The regions and countries involved are Japan, China, Hong Kong, Taiwan, Korea, Philippines, Sri Lanka, Vietnam, Thailand, Malaysia, Singapore, India, Bangladesh, Myanmar, Nepal.

As the last businesses, current ISP members were reconfirmed, and Dr. Kuma, JMA newly became a member of ISP as the representative from JMA. Finally, next ISP was proposed to be held in conjunction with the 3rd GAME International Study Conference and 4th GEWEX Conference in 1999 in China and was agreed.