7. GAME DATA MANAGEMENT

7.1 Overview of the Strategy

The main objective of the GAME data management is to provide the necessary data for the following research activities under the GAME scientific objectives.

1. Process studies on the energy and water cycles.
2. Development of atmospheric and hydrological models.
3. Input to the four dimensional data assimilation model and its verification.

In order to accomplish the above objectives, the GAME data management will be designed to satisfy the following conditions.

1. The necessary data shall be collected in a consistent manner as possible.
2. Well-documented quality control shall be applied to the collected data.
3. The data shall be archived in an the appropriate way to keep its integrity.
4. The data shall be provided to the users in a smooth way and at nominal cost.

As a guideline for data processing, the GAME data management will apply to following data levels.

Level 1: Original, direct instrumental reading. Data may not be referred to earth coordinates and may require conversion to geophysical parameters.
Level 2: Geophysical parameters obtained from instruments or derived from Level 1 data. Data are referred to earth coordinates, usually as station data. Spatial distribution may not be homogeneous.
Level 3: Homogeneous data fields derived from Level 2 data by analysis or a modeling technique.

The GAME data management will also apply following quality-control levels.

QC 1: The identification of obvious observation errors, including human error and instrumental failure.
QC 2: The identification of errors that become apparent when data from different sources are compared.
QC 3: The adjustment by the processing designed for the intended use of the data. e.g. adjustment for biases, change of algorithms, etc.

7.2 Guideline for Data Exchange and Dissemination

7.2.1 International data resource and institutional holdings

Hereafter the "GAME data" refers to those data which are necessary for archiving the GAME scientific objectives.

(1) International data resource:

"GAME international data resource" is referred to those GAME data obtained under the implementation of the GAME science plan, corresponding to the following categories.

1. All Level-3 data.
2. Level-2 data from the regional experiment to which the quality control higher than QC-1 level is applied.
3. Level-2 Operational data provided in cooperation with the GAME IOP.

The GAME international data resource is subject to unrestricted dissemination for scientific purposes.

(2) Institutional holdings:

"Institutional holdings" is referred to those GAME data corresponding to the following categories.

1. The operational data obtained as a routine observation.
2. The data obtained under the contract with the other institution.
3. The raw GAME data which do not satisfy the data level or quality control as an international asset described above.

The dissemination of institutional holding data are subject to the policy of each institute.

7.2.2 Participating institutes

GAME participating institutes are referred to those institutes which;

1. produce the observational and/or processed data in accordance with the GAME science implementation plan.
2. agree to provide its GAME data holdings for the international dissemination.

GAME participating institutes are subject to the following privileges and obligations.

1. The participating institute can request other participating institutes to provide the holding data which are necessary for the data processing at the requesting institute.
2. The participating institute should respond to the data request made by other participating institute as quickly as possible.
3. When providing GAME data, the participating institute should also provide the necessary information regarding the data level and quality control.

7.2.3 Utilization and transfer

The GAME international data resource can be unrestrictedly utilized provided that;

1. the utilization is for a scientific purpose, and
2. the utilization is non-commercial/non-profitable.

Those users who wish to utilize the GAME international asset for the other purposes should ask for permission to;

1. The GAME International Science Panel, or
2. the organization entrusted by the Panel.

Those users who wish to transfer the GAME international asset to a third party shall be

requested to;

1. acknowledge that the data became available through the GAME project.
2. notify the existence of the present guidelines.

7.2.4. Data Policy (time schedule)

7.2.4.1 For the IOP data

Data obtained as part of the observations during the IOP will be made available according to the following schedule.

1. By the end of June 1999 (6 months after the IOP year),
   for the participating institutes and scientists.
2. By the end of June 2000 (one year later),
   for the international research community.

7.2.4.2 For the non-IOP data

Data obtained as part of the GAME observations during the non-IOP will be made available according to the following schedule.

1. By the end of one year after the observations,
   for the participating institutes and scientists.
2. By the end of two years after the observations,
   for the international research community.

7.2.5 Retention

The GAME participating institute shall be requested to keep its observed/processed/obtained GAME data at least for 10 years after the acquisition in the appropriate condition.

Those institutes shall be requested to;

1. provide the GAIN-Hub (see GAIN) with the necessary data catalog information.
2. respond to the data request/inquiry from the other participating institutes and the user community.

For those institutes which are unable to keep the above functions, the GAIN-Hub shall retain the data on their behalf provided that;

1. the data are already processed at the level higher than Level-2 category and quality control higher than QC-1 level is applied.
2. the said institute agrees to disseminate the data as an GAME international data resource.

7.2.6 Updating

When the participating institute applies the QC-3 level updating to its GAME data, such as a change of the algorithm, it shall be requested to;

1. retain the original data as well as the updated data.
2. reveal the information regarding the update.

When the user updates the GAME data following his/her own purpose, he/she will be requested to acknowledge the followings at the time of publication.

1. The original data became available through the GAME project.
2. The update is applied under his/her own responsibility.

7.3 GAME Archive & Information Network (GAIN)

7.3.1 GAIN

GAME will construct GAIN in order to carry out:
- Data collection
- Data compilation and management
- Data access and analysis

GAIN consists of:
- GAIN Distributed Active Archive Centers (GAIN-DAAC)
- GAIN Hub of Archive & Information Network (GAIN-Hub)
- Information Network System

(1) GAIN-DAAC

All observed and processed data should be maintained by the designated archive facilities. GAME will designate multiple facilities as GAIN Distributed Active Archive Centers (GAIN-DAAC).

Each GAIN-DAAC is to serve the following functions.

1. Maintain the data integrity and all necessary metadata information to keep track of the applied algorithm and quality control.
2. Operate an on-line data information system which can communicate with GAIN-Hub and participants in accordance with the GAIN guidelines.
3. Provide access to GAME data in accordance with the GAME data policy.
4. Accommodate user feedback as to data format/accessibility.

(2) GAIN Hub of Archive & Information Network (GAIN-Hub)

The GAIN-Hub will be the first access point to obtain a comprehensive data information for the participating and non-participating research communities.

GAIN-Hub will act as a hub which links with multiple GAIN-DAACs to collect information and to forward data requests.

The GAIN-Hub will develop and maintain the following functions.
- Comprehensive information management system, including
  - Data directory/catalogue (including off-line data catalogue),
  - Station and instrument information,
  - On-line data Inventories.
- On-line access to selected data sets, including browse capability.

- Software exchange catalogue.

(3) Information Network System

GAIN-Hub and GAIN-DAAC will prepare anonymous FTP servers to provide access for the research community through the Internet.

GAIN-Hub and GAIN-DAAC will establish WWW sites to provide capabilities for a multimedia information system.

7.3.2 Structure :

GAIN-Hub
MRI, JMA http://www.gain-hub.mri-jma.go.jp/

GAIN-DAAC
MRI, JMA -> (same as above)
IHAS, Nagoya Univ.
http://www.ihas.nagoya-u.ac.jp/game/GAIN/index.html
ERC, Univ. Tsukuba
http://www.suiri.tsukuba.ac.jp/gain1.html
Dept. Civil Engineering., Nagaoka Univ. Tech.
http://monsoon.nagaokaut.ac.jp ftp://monsoon.nagaokaut.ac.jp
IIS, Univ. Tokyo
http://hydro.iis.u-tokyo.ac.jp
CCSR, Univ. Tokyo
anonymous ftp, www
NPD, JMA(->MRI, JMA)
FRSGC

India Meteorological Department (magnetic tape, FD)
Korean Meteorological administration (anonymous ftp)
China Meteorological administration

7.4 Schedule for GAIN Initial System (GAIN-IS)

Feb.	1996	Get information on FTP servers for possible GAIN-DAAC's.
		Set up WWW sites.
Mar.	1996	Discuss "guideline for data exchange and dissemination" draft at GISP.
Jun.	1997	Collect data information to be provided by each GAIN-DAAC.
Dec.	1997	Finalize the file and information standards.
Jan.	1998	GAIN-IS set up.