Implementation Plan

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1. Background
   - 1.1 Water-related issues in Asia
   - 1.2 GEO and GEOSS
   - 1.3 Asian Initiative

Implementation Plan

1. Background
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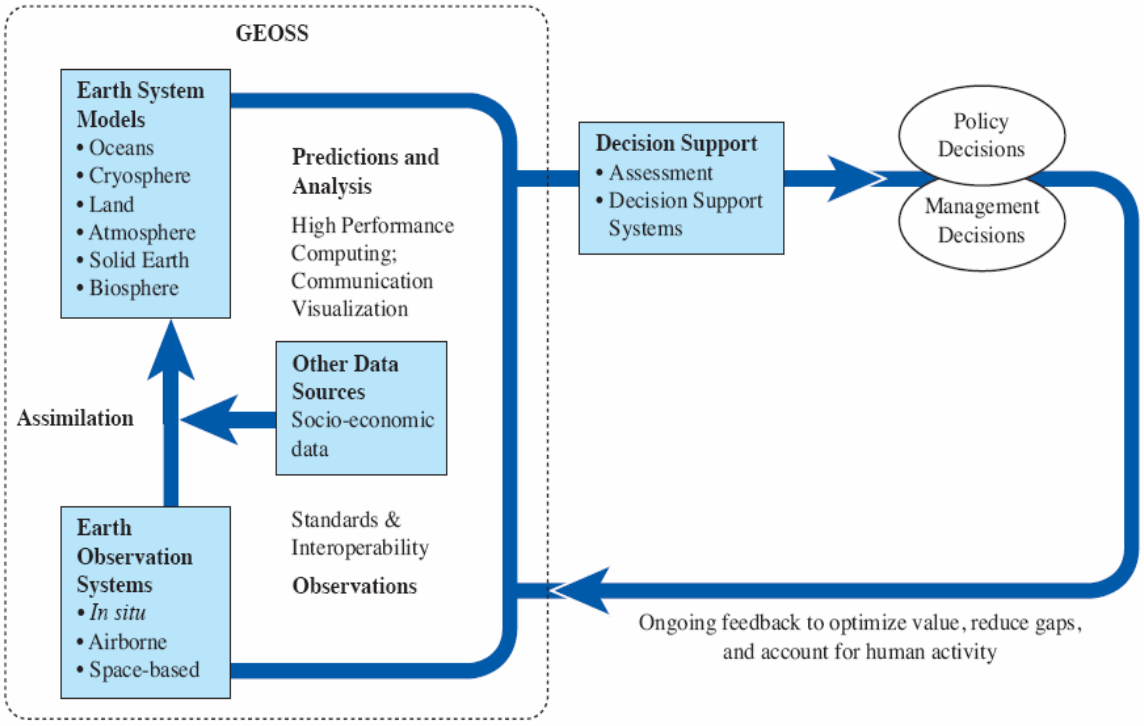
Group on Earth Observations

GEOSS: A Global, Coordinated, Comprehensive and Sustained System of Observing Systems



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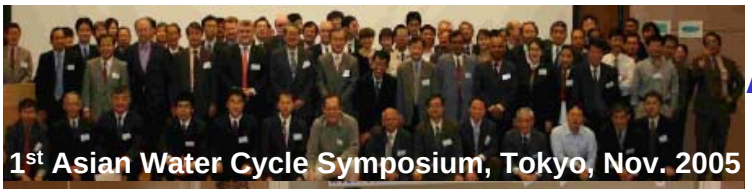


1st Asian Water Cycle Symposium, Tokyo, Nov. 2005

1st Task Team Meeting, Bangkok, Sep. 2006

1st Capacity Building Workshop, Sep. 2006

2nd Asian Water Cycle Symposium, Tokyo, Jan. 2007

1st GEOSS AP Symposium, Tokyo, Jan. 2007

1st International Coordination Group Meeting, Bali, Sep. 2007

GEOSS
Asian Water Cycle Initiative (AWCI)

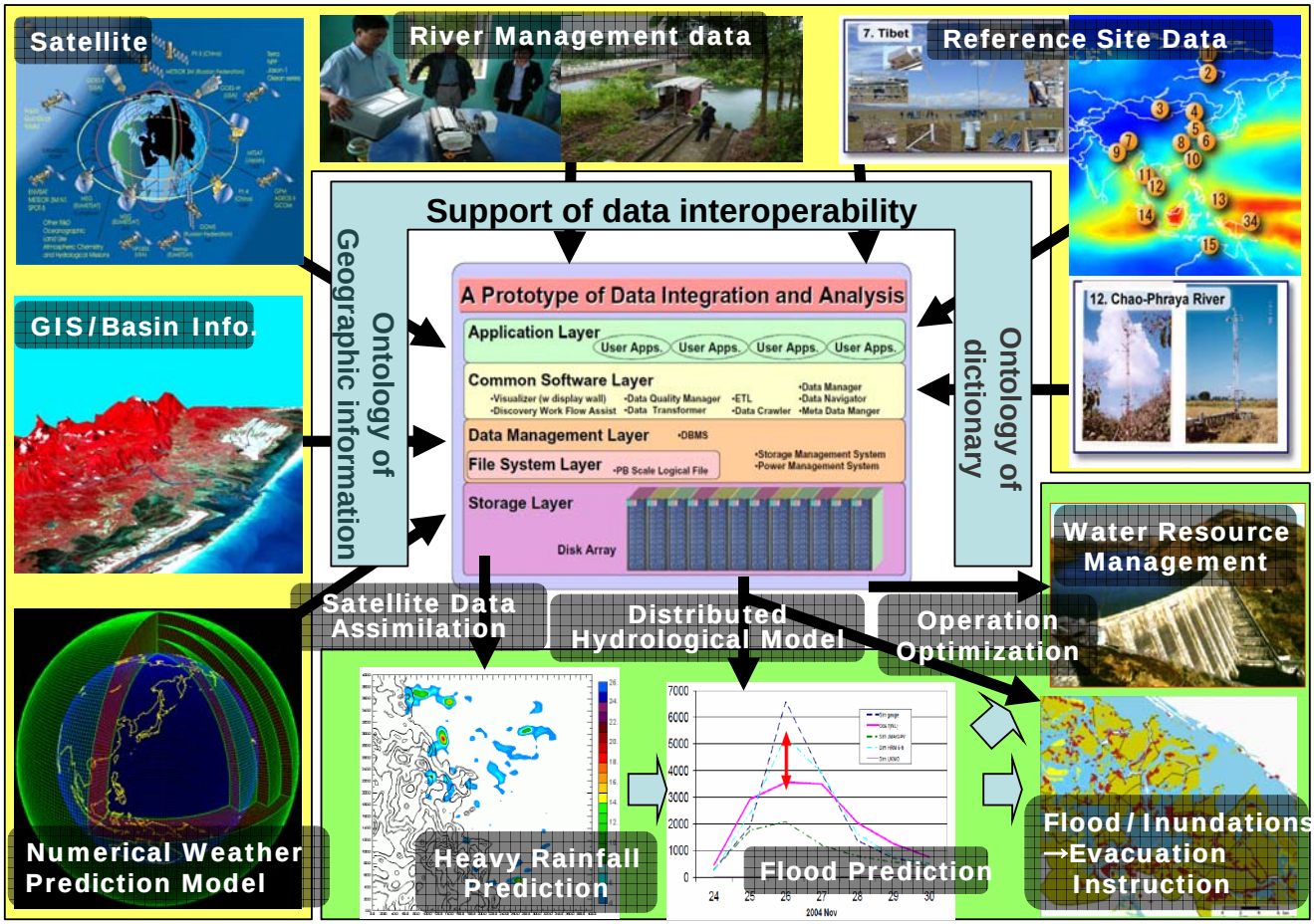
To promote integrated water resources management by making usable information from GEOSS, for addressing the common water-related problems in Asia.

Uniqueness

- **A River Basin of Each Countries**
- **Observation Convergence**
- **Interoperability Arrangement**
- **Data Integration**
- **Open Data & Source Policies**
- **Capacity Building**
- **Early Achievements**

Implementation Plan

2. Scope



GEOSS/Asian Water Cycle Initiative

[integration of earth observation data] + [capacity development] programme

＊GEOSS Implementing Agencies
(observations, predictions, data integration)

Integration and use of earth observation data

Satellite data, global network data, numerical forecasting model, assimilation of data

Area data / information

In-situ data | In-situ data | In-situ data | In-situ data

Basin 1 | Basin 2 | Basin 3 | Basin 4

Capacity Building

use of satellite data

＊Space Agencies

Research obs, Modeling and analysis

＊UNU, universities Research Institute, etc.

In-situ observation River management

＊ICHARM, MRC ESCAP, etc.

Common items

Implementation Plan

3. Observation Convergence, Data Integration, and Information Sharing
   - 3.1 Observation Convergence
   - 3.2 Data Integration and Analysis
   - 3.3 Data Release and Dissemination Guidelines

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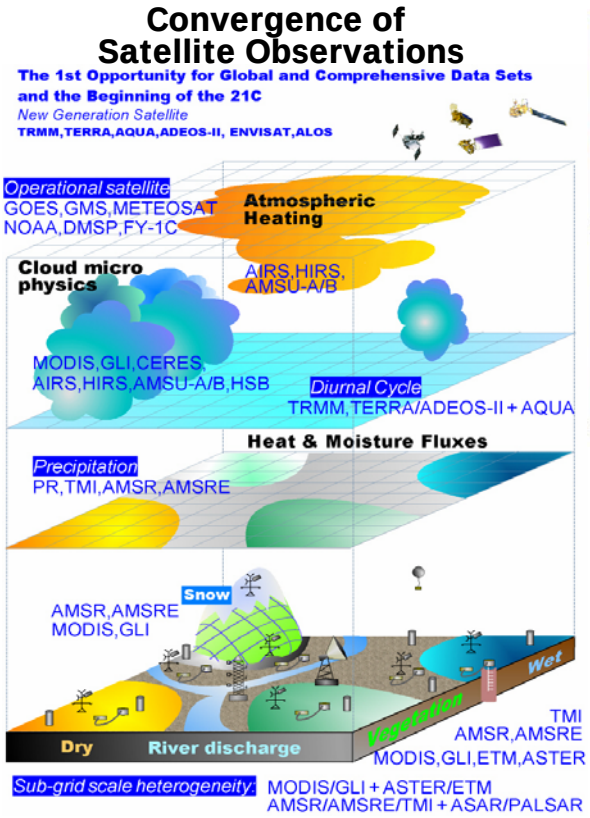
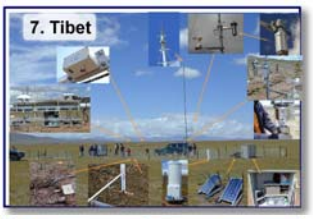
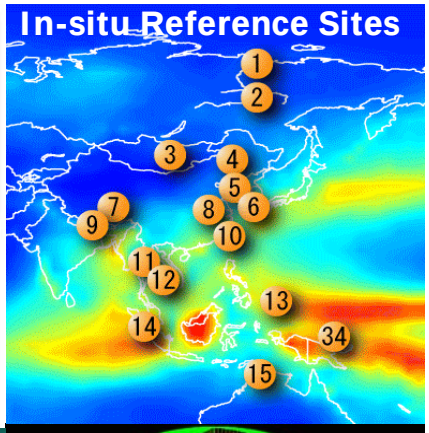
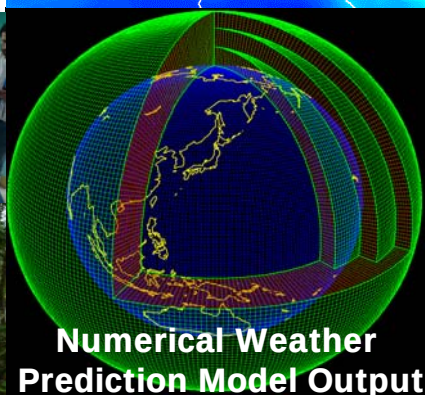
GEOSS Asian Water Cycle Initiative (AWCI)

Observation Convergence









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GEOSS Asian Water Cycle Initiative (AWCI)

Data Integration

•Discovery Work Flow Assist •Data Crawler •Data Navigator
•Data Quality Manager •ETL •Meta Data Manger

Data Management Layer •DBMS

File System Layer

•Storage Management System
•Power management System

Storage Layer

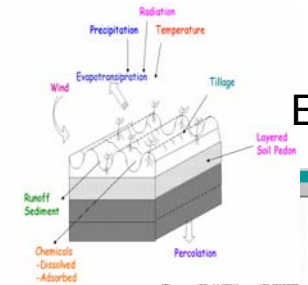
Disk Array

Tape Library

GEOSS Asian Water Cycle Initiative (AWCI)

Interoperability Arrangement

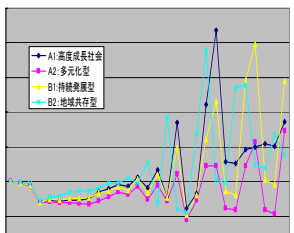
Land use



Natural Resources

Population

Economics



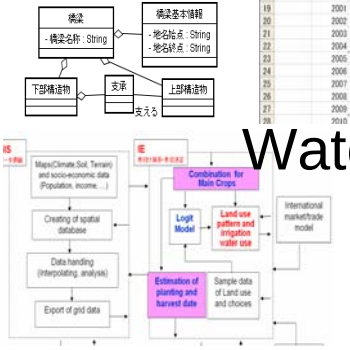
Agriculture

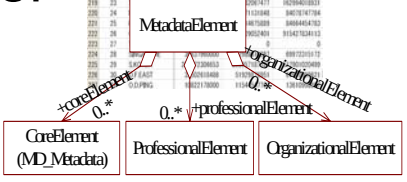
Health

Disaster

Climate

Water





Biodiversity

River Observatory

Observatory name	River name	Amount of flowing	Level of water	Weather	Address of observatory	...
Kawabe	Tone River	1,200m³/s	5.5m	rain	Mugikura, saitama Prefecture	
Umehara	Tone River	1,000m³/s	5.0m	cloudy	Umehara, Saitama Prefecture	

Weather Stations

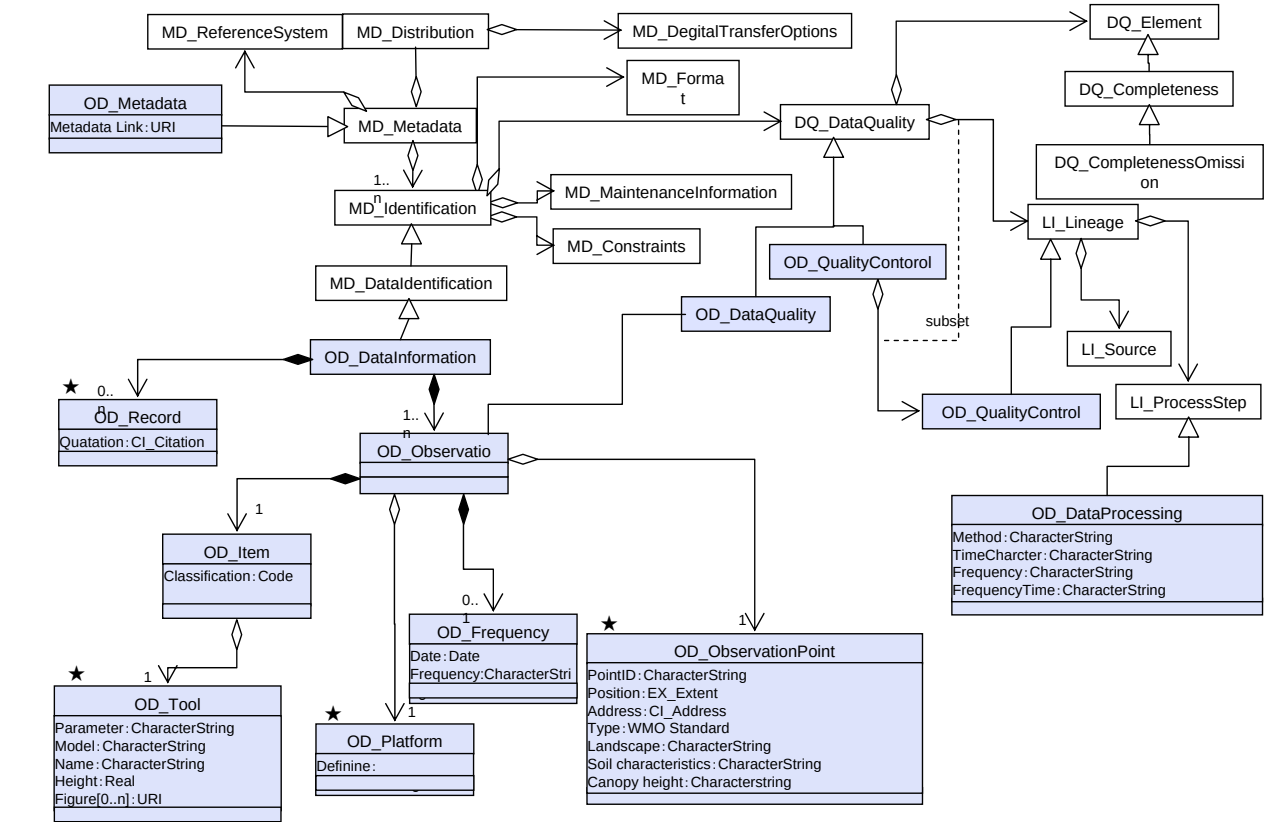
Weather point	Address of observatory	precipitation	humidity	wind direction	wind velocity	...
Ohtone	Ohtone machi, Saitama	5mm	50%	North	5m/s	
Kurihashi	Kurihashi, Saitama	0mm	45%	North east	3m/s	

Census Reports

Town name	Total population	Lower than 15 years old population	15～64 years old population	higher than 65 years old population	the number of households	...
Mugikura	2512	445	1635	432	673	
Sakae	1949	368	1379	202	542	

GEOSS Asian Water Cycle Initiative (AWCI)

Interoperability Arrangement



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GEOSS Asian Water Cycle Initiative (AWCI)

Open Data & Source Policies

1) Release of Data in Compliance with WMO Resolution 40 (CG-XII) and WMO Resolution 25 (CG-XIII)
2) No Commercial Use or Exploitation
3) No Data Transfer to Third Parties
4) Timing for Release of AWCI River Basin Data from the CDA Archive
category 1 - standard data - data release after 6 months
category 2 - special data - data release after 15 months

- *Streamflow data - (i) operational - category 1 data; (ii) research site maintained by university, through a project - category 2 data; also remote sites need to be included in category 2 data*
- *Suggestion: to have 3 categories of data - the third category - real time or near-real time data (radiosonde data from operational sites)*

5) Acknowledgement and Citation
6) Co-operation between AWCI Data Users and AWCI River Basin Principal Investigators (PIs)
7) Co-Authorship for AWCI River Basin Principal Investigators (PIs)
8) AWCI Publication Library

Implementation Plan

4. GEOSS/AWCI Capacity Development Framework
   - 4.1 Goal and Objectives
   - 4.2 Target Groups
   - 4.3 Methodology
   - 4.4 Institutions
   - 4.5 Conceptual Diagram
   - 4.6 Implementation Approach to be provided by WG Co-chair and Prof. Herath

Implementation Plan

4. GEOSS/AWCI Capacity Development Framework
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GOAL:
to facilitate and develop sustainable mechanisms for the countrie
Asia Pacific to use advanced earth observations systems, associat
data and tools for water cycle research and water resources
management under GEOSS framework.

OBJECTIVES:
1)Downscaling regional and global information to basin scale and to improve accuracy required by operational water management applications through a combination of numerical forecasting and fusion of local observations.

2)Identify reliable and efficient tools to convert the available observations and data to useful information for flood management through data transformations, interpolation, classification and estimation algorithms.

3)Conversion of information to water resources management applications, both for operational use and scenario based assessments for planning purposes.

Implementation Plan

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GEOSS Asian Water Cycle Initiative (AWCI)

Capacity Building

Targets

1.Professional/Practitioners:

Introducing new methods, tools, standards

2.Administrative/Local Governors:

Over view of technology and science

3.Researchers/Scientists:

Customizing existing knowledge to suit local conditions supported by global experiences

4. Communities

Caravan training class scene in Sri Lanka, December 2005

A Scene from Mini-Project Fieldwork in Philippines, 2005

Discussion and Suggestion at AIT, 2005 Mini-Project Final Presentation

Implementation Plan

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Implementation Plan

5. Strategic Implementation
    5.1 Demonstration Approach
    5.2 Working Group Approach
        1) Flood WG
        2) Drought WG
        3) Water Quality WG

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1) Importance of the basin from the viewpoint of the socio-economic benefit area and hydrological sciences

2) Minimum requirement of data availability:

a. Data type: rainfall, streamflow, weather station data
(air temp., wind speed, pressure, humidity)

b. Spatial density of observation stations: according to
the WMO standard but local specifics to be considered;

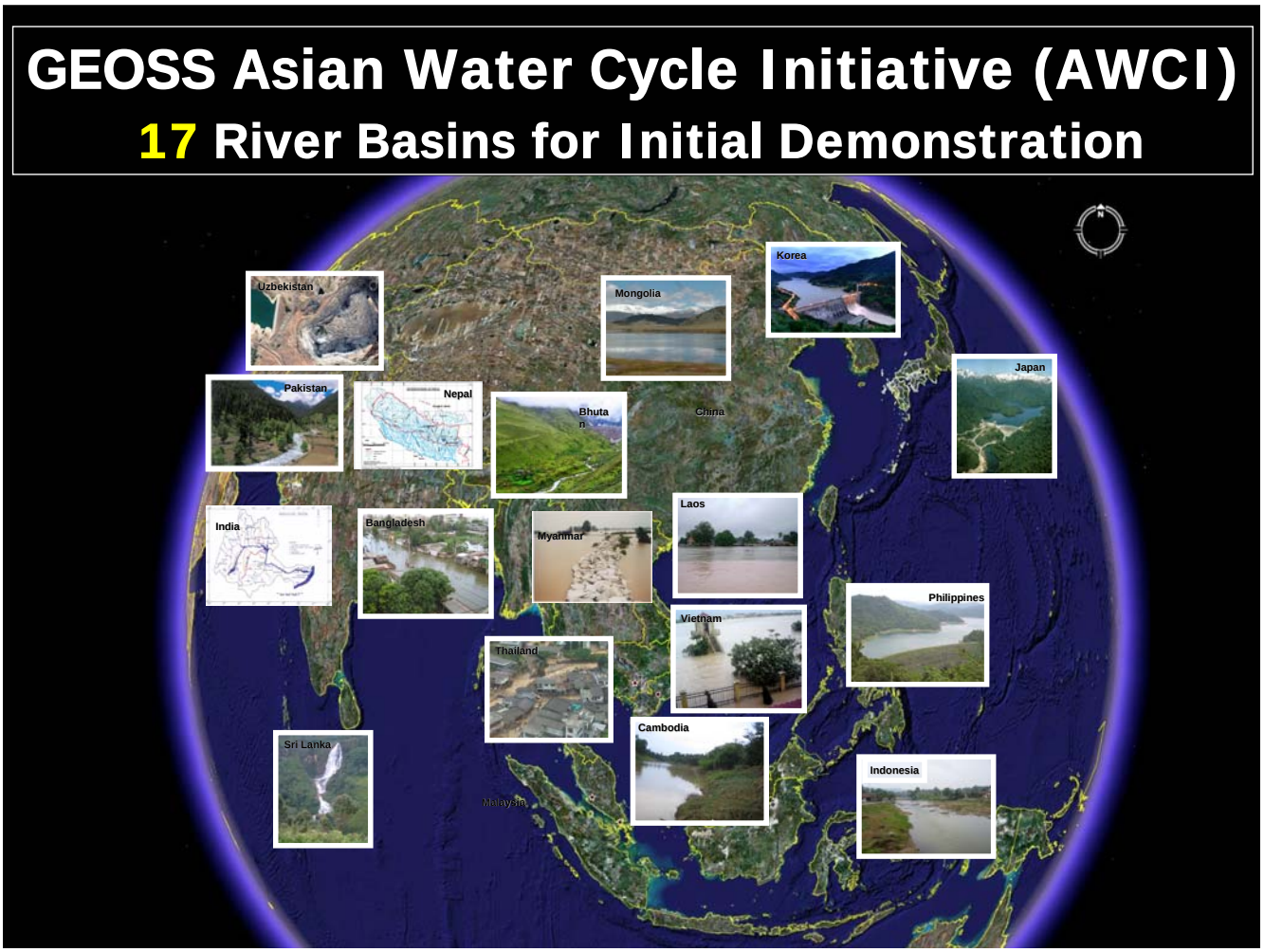
c. Watershed characteristics information

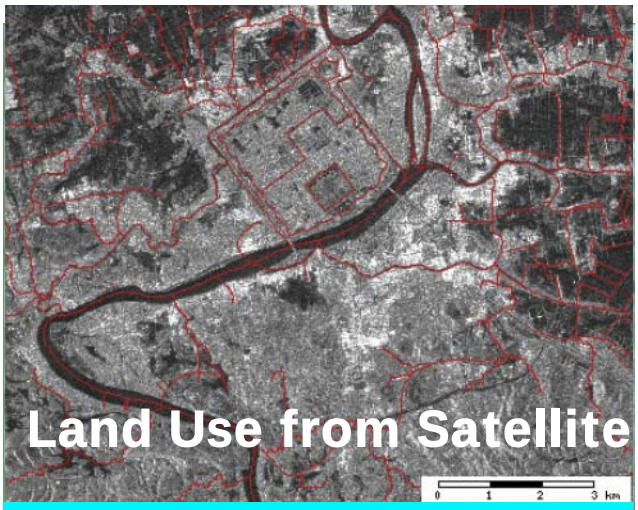
3) Highly expected data:

a. Upper air observation is highly recommended

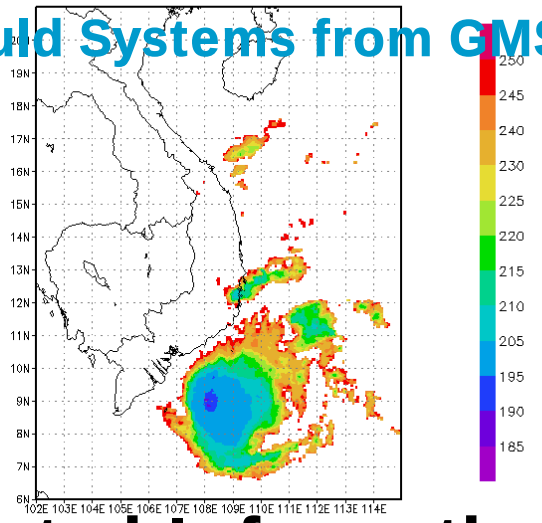
b. Near-real time data availability is highly recommended;

c. Ground water and water quality data availability for



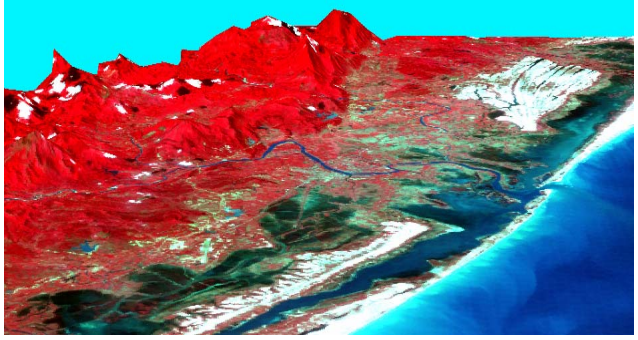


Could Systems from GMS



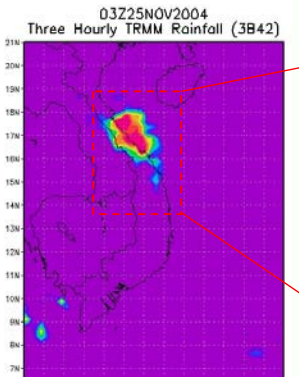
Satellite – GIS Integrated Information

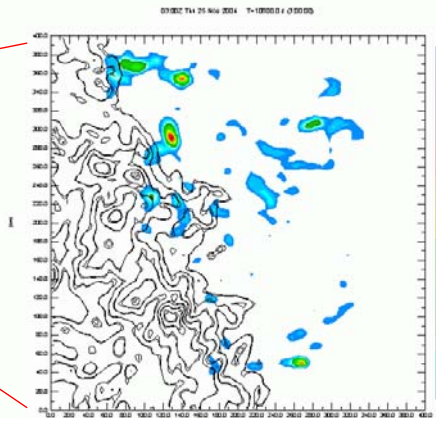
Topography from DEM



River Channel from DEM

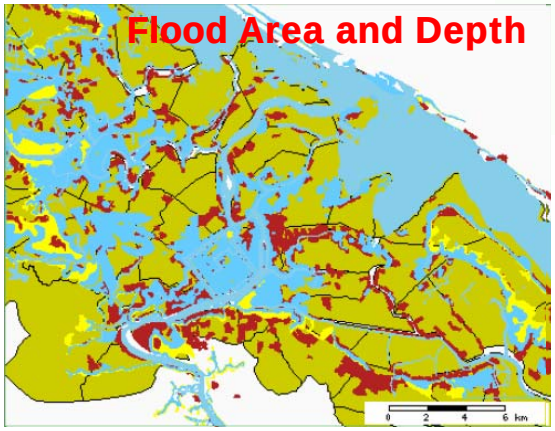
Validation by TRMM Rainfall Product

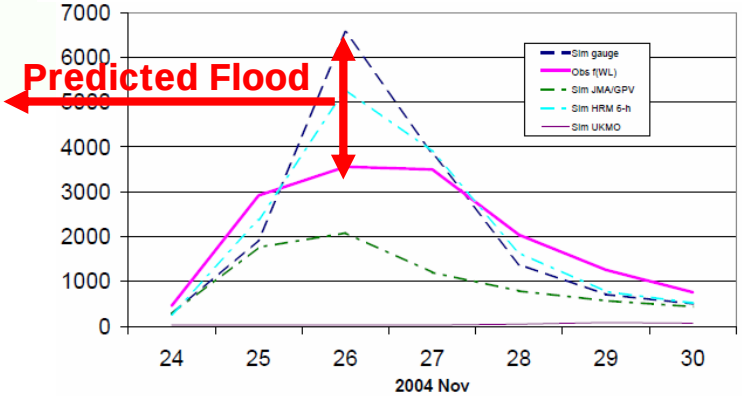




Rainfall Prediction

Prediction Model Integration and Information Fusion





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Implementation Plan

6. International Cooperation and Project Management

International Coordination Group

Country Representative

Bangladesh: Samarendra Karmakar (Bangladesh Meteorological Department)
Bhutan: Karma Chhophel(Hydro-met Services)
Cambodia: So Im Monichoth (Department Hydrology and River Works)
China: Qian Mingkai (Huaihe River Commission, Ministry of Water Resources)
India: Surinder Kaur (India Meteorological Department)
Indonesia: Joesron Loebis (Research Institute for Water Resources)
Japan: Toshio Koike (The University of Tokyo)
Korea: Deg-Hyo Bae (Sejong University)
Lao: Chanthachith Amphaychith (Lao National Mekong Committee)
Malaysia: TBD
Mongolia: Davaa Gombo (Institute of Meteorology and Hydrology)
Myanmar: Htay Htay Than (Dept. of Meteorology and Hydrology)
Nepal: Shiv Kumar Sharma (Department of Water Induced Disaster Prevention)
Pakistan: Bashir AHMAD(Water Resources Research Institute/ National Agriculture Research Center)
Philippines: Flaviana Hilario (PAGASA/DOST)
Sri Lanka: S. B. Weerakoon (University of Peradeniya)
Thailand: Thada Sukhapunaphan (Ministry of Agriculture and Cooperatives)
Uzbekistan: Sergey Myagkov (Hydrometeorological Research Institute)
Vietnam: Khanh Van Duong (National Hydro-meteorological Forecasting Center)

WG Co-chairs:

K. Fukami/S. Herath (Flood)
Ailikun/A. Dolgosuren(Drought)
B.Hoque/ H.Furumai (Water Quality)

Invited Experts:

C. Ishida (Satellite), D. Yang (Hydrological Model), V. Hansa (Integration)

AWCI Secretary:

A.Goda, P.Koudelova, O. Saavedra, K.Tamagawa, K. Taniguchi, K.Umezawa, K.Misawa

Implementation Plan

7. Implementation Plans for the Demonstration Projects

2008

Jan.- Mar.

•Preparation for Meta Data Preparation & Data (2003 & 2004) Input

10-12 Mar.

2nd GEOSS AP Symposium: "Climate Change Impacts and Adaptation"

2nd IGM: Meta Data Registry & Data Submission

Apr.-Jun.

•Data (2003 & 2004) Archive, Meta Data Registration

Jul.- Dec.

•Water Resources Modeling

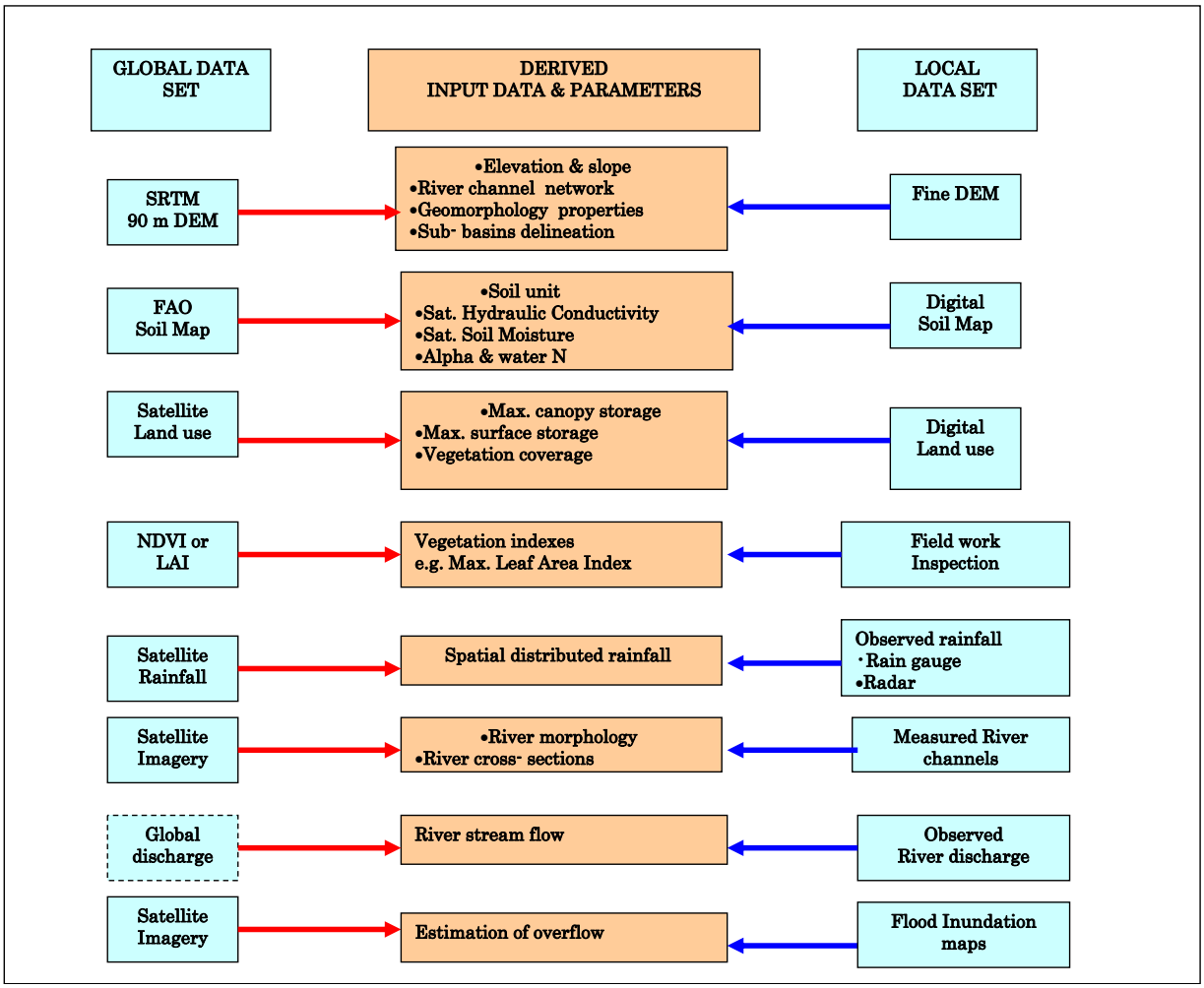
•Rainfall Downscaling

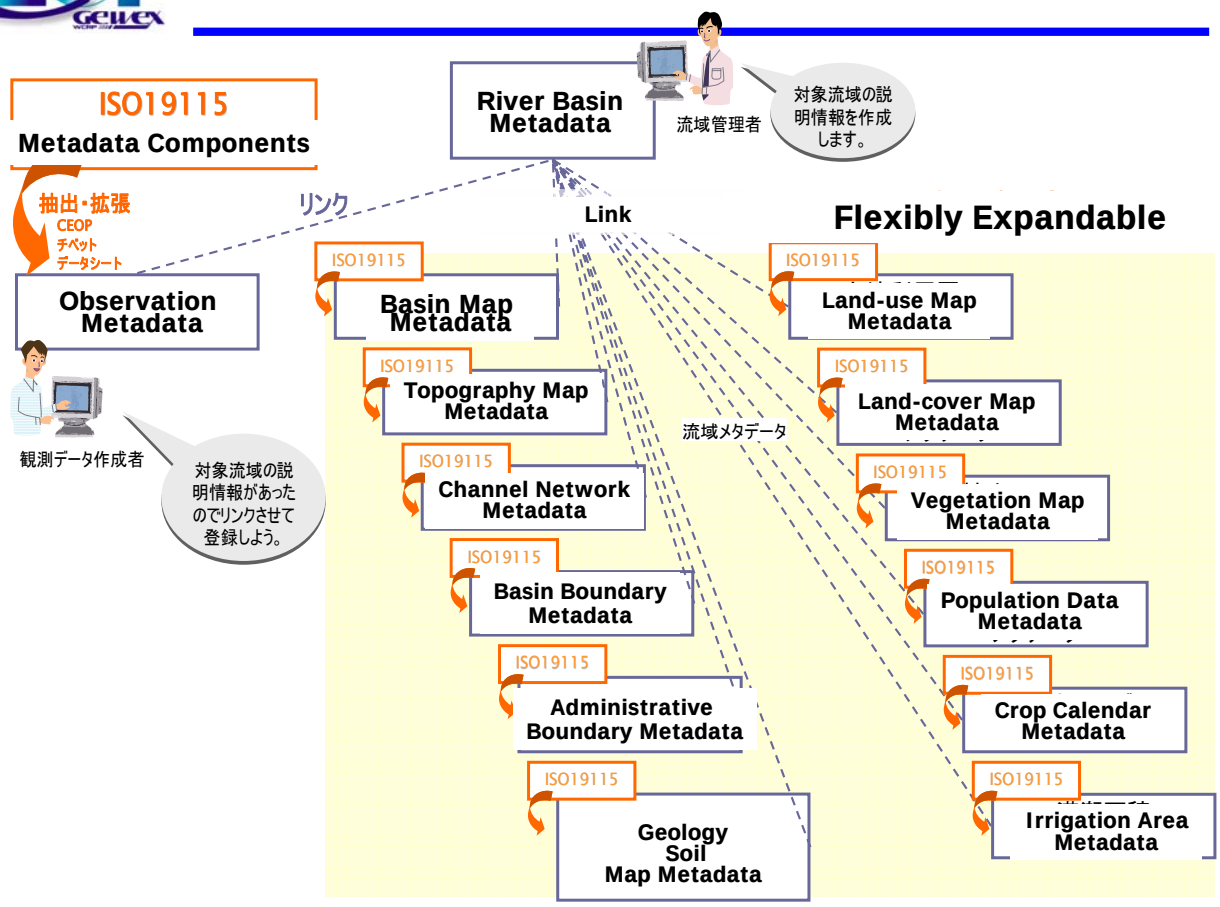
•Data Integration and Analysis for Soil Moisture, Water Quality, Climate Change

Sep. or Oct.:

CEOP Interannual Planning Meeting

3rd IGM: Modeling & Data Integration





2009

Jan.- Mar.

•Evaluation of Models and Data Integration

Mar.

3rd GEOSS AP Symposium:

4th AWCS:

Apr.-Jun.

•Data (2007 & 2008) Archive

Jul.- Dec.

•Water Resources Modeling & Operation Optimization

•Improvement of Rainfall Downscaling

•Advanced Data Integration and Analysis for Soil Moisture, Water Quality, Climate Change

Sep. or Oct.:

CEOP Interannual Planning Meeting

5th IGM:

2010

Jan.- Mar.

•Evaluation of Models and Data Integration

Mar.

4th GEOSS AP Symposium:

5th AWCS:

Apr.-

•Preparation for shifting from more-research to more-operational phase