Asian Water Cycle Initiative (AWCI) Contributing to GEOSS

The 20th International CODATA Conference
Beijing, Oct. 23-25, 2006

Toshio Koike
The University of Tokyo

Vision for GEOSS

The vision for GEOSS is to realize
a future wherein decisions and actions for
the benefit of humankind
are informed by
coordinated, comprehensive and sustained
Earth observations and information.

Benefits of GEOSS

10-Year Implementation Plan

Water
Improving water resource management through better understanding of the water cycle

Water-related issues addressed by GEOSS will include: precipitation; soil moisture; streamflow; lake and reservoir levels; snow cover; glaciers and ice; evaporation and transpiration; groundwater; and water quality and water use. GEOSS implementation will improve integrated water resource management by bringing together observations, prediction, and decision support systems and by creating better linkages to climate and other data. In situ networks and the automation of data collection will be consolidated, and the capacity to collect and use hydrological observations will be built where it is lacking.

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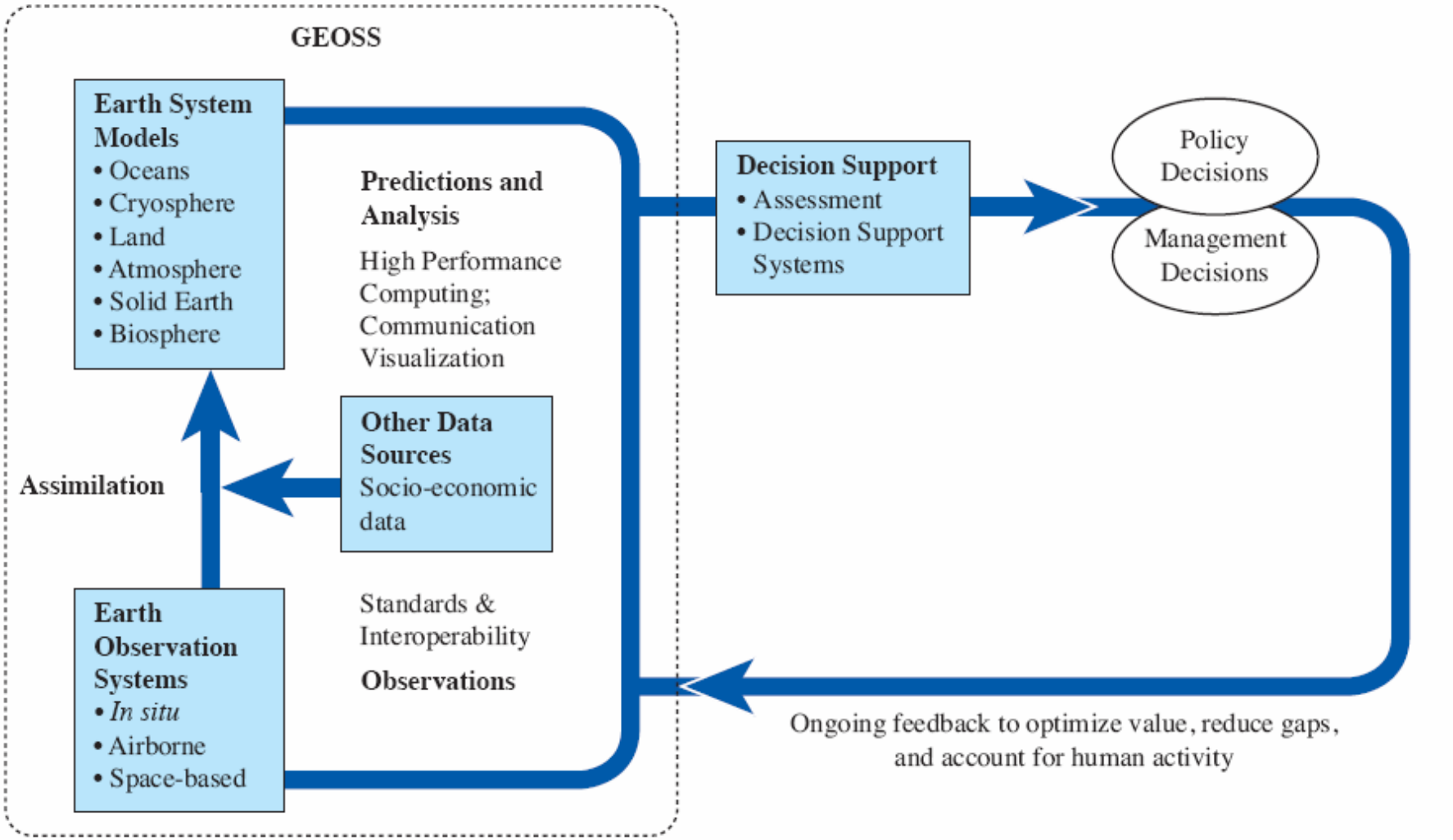
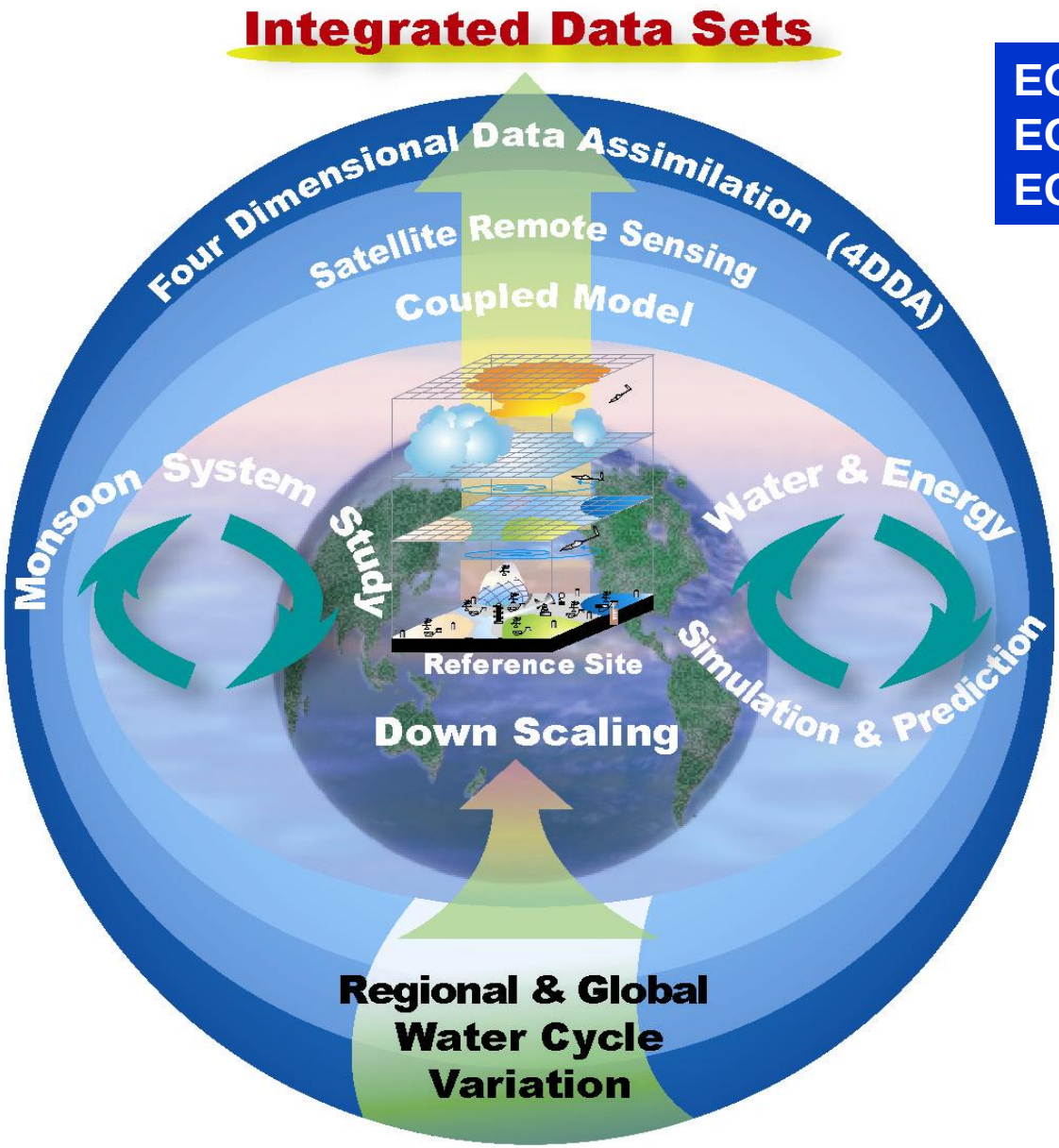
Global Earth Observation System of Systems (GEOSS)



Coordinated Enhanced Observing Period

an Element of WCRP (CEOP) initiated by GEWEX



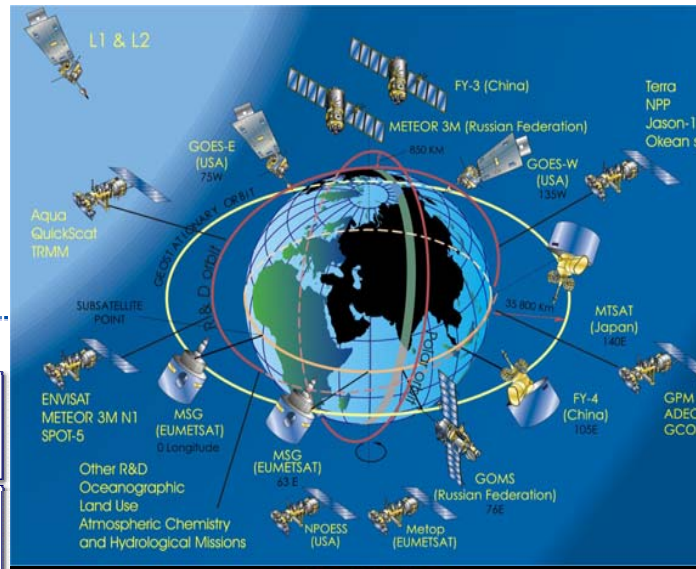
EOP1: Jul.-Sep. 2001
EOP3: Oct. 2002 - Sep. 2003
EOP4: Oct. 2003 - Dec. 2004

http://www.ceop.net

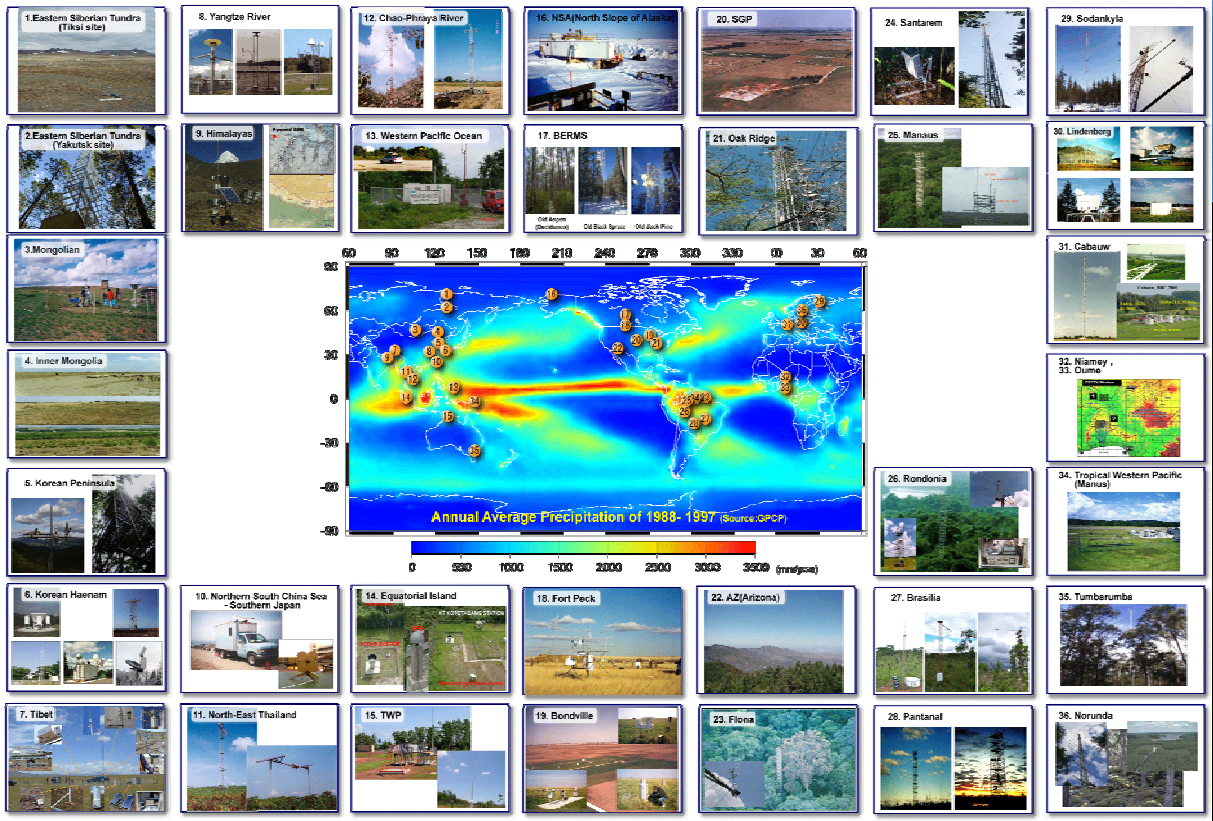
Coordinated Enhanced Observing Period
Three Unique Capabilities

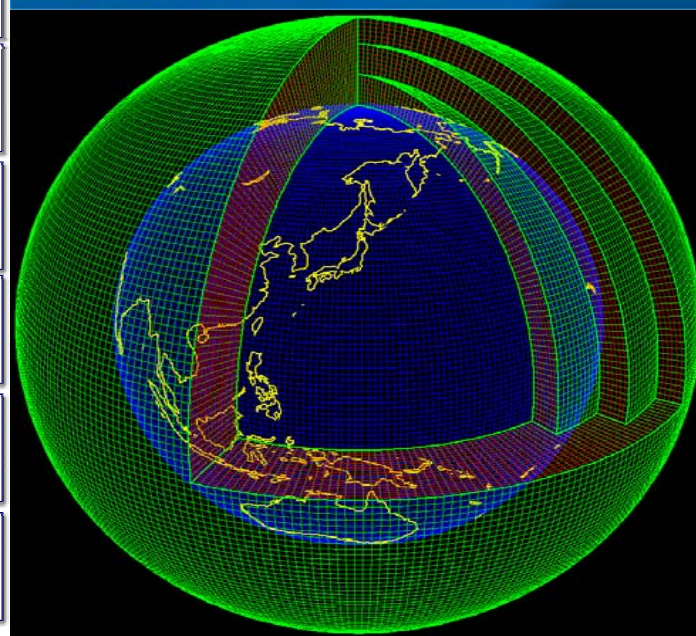
Convergence of Observations

A Prototype of the Global Water Cycle Observation System of Systems



International Cooperation for the Global Coverage

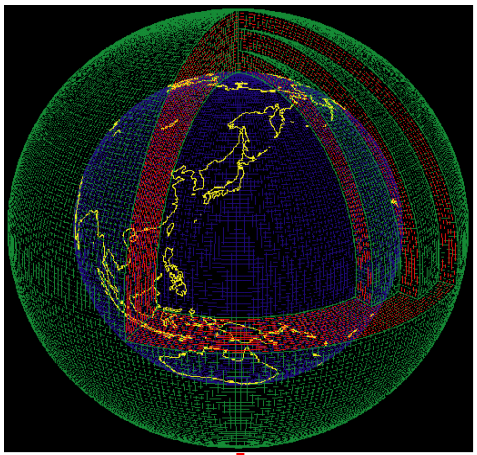


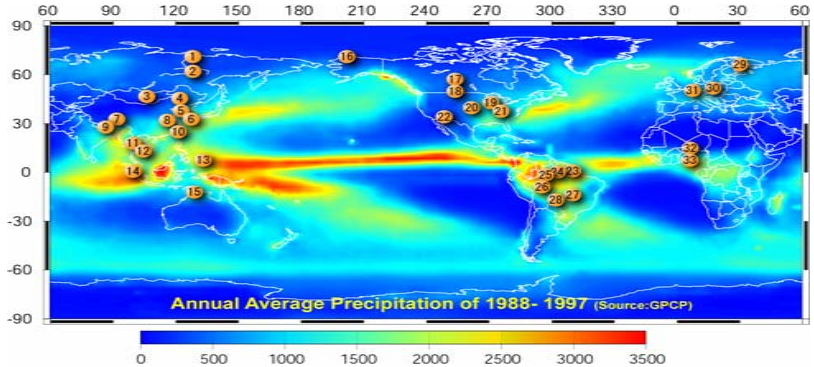


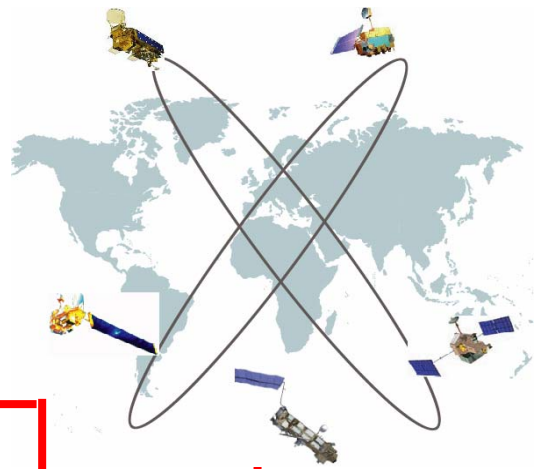
Coordinated Enhanced Observing Period
Three Unique Capabilities

Interoperability Arrangement

A well organized collecting, processing, storing, and disseminating shared data, metadata and products







In-Situ Data Archiving Center at NCAR (National Center for Atmospheric Research) of USA

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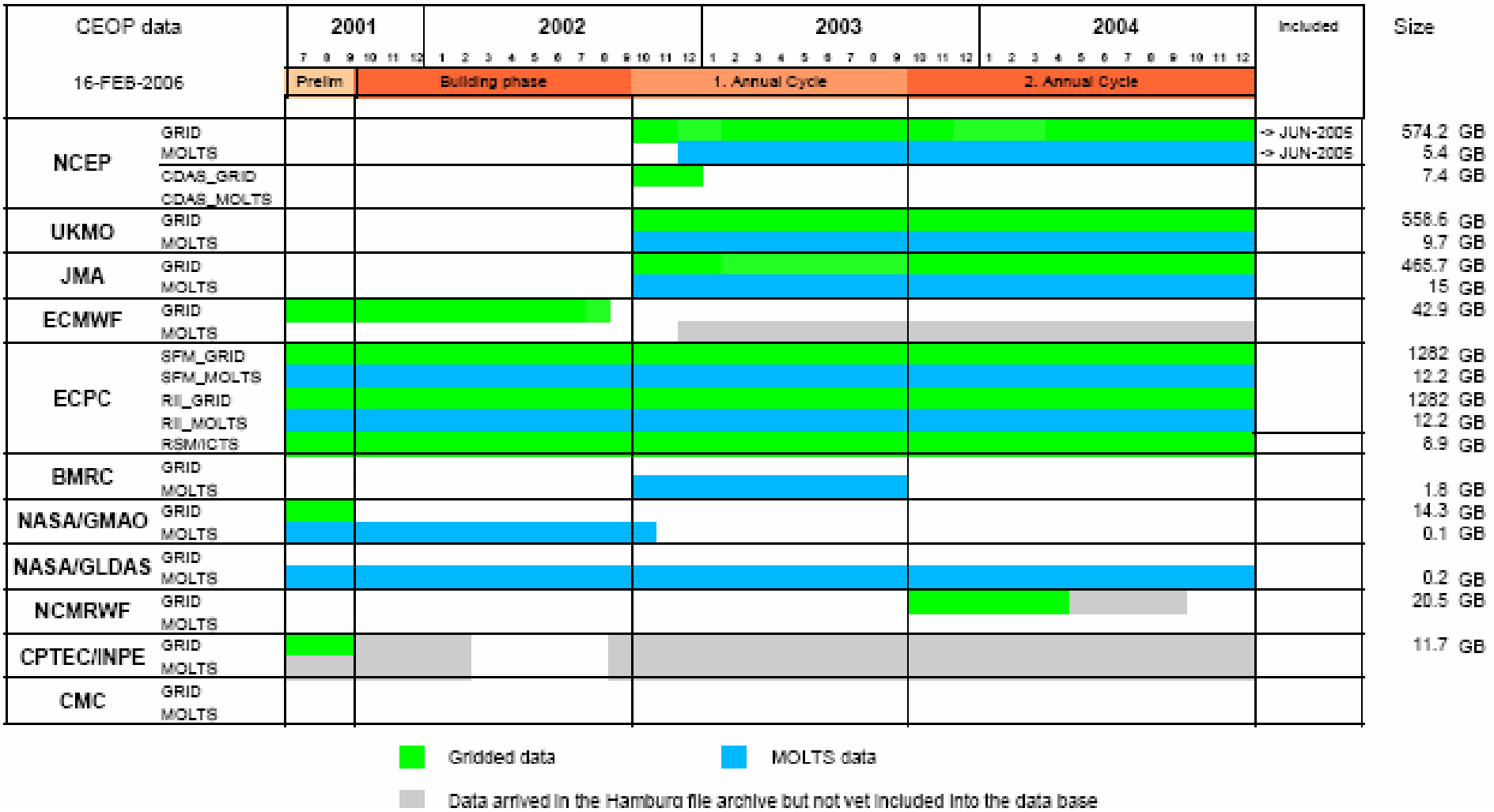
Data Integrating/Archiving Center at University of Tokyo and JAXA of Japan

Numerical Weather Prediction Center Outputs

- 3D Grid Products
- Model Located Time Series (MOLTS)



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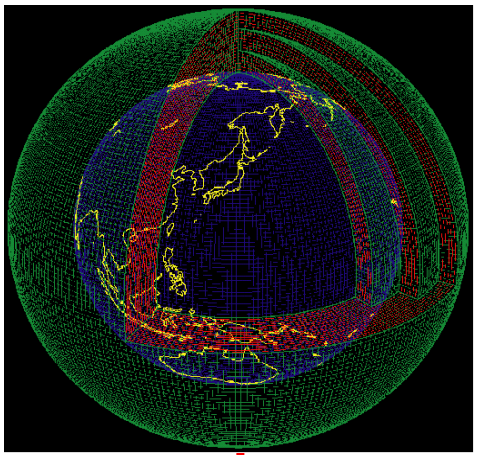

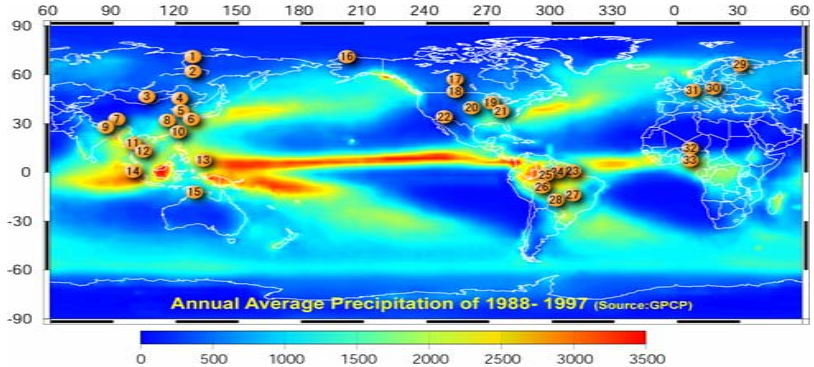

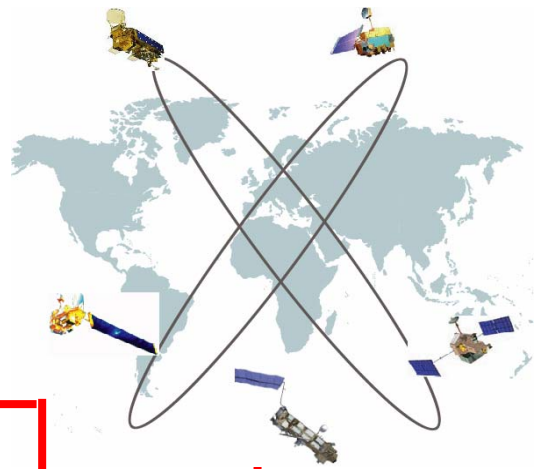

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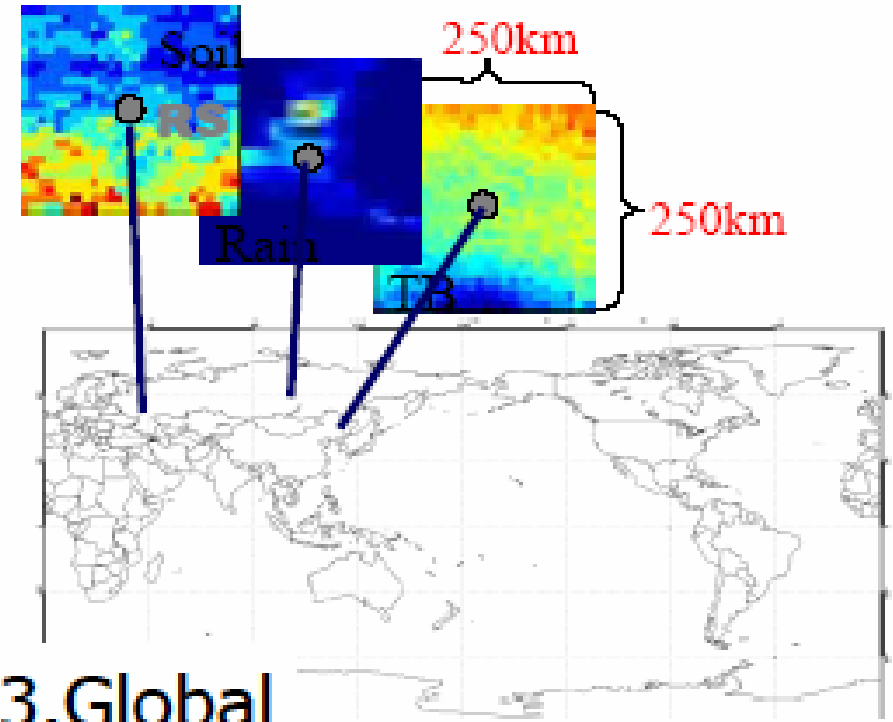
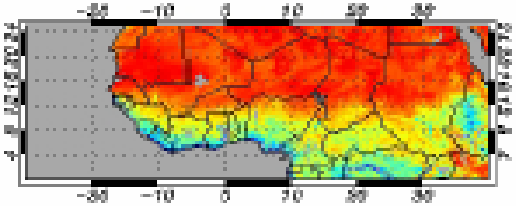
1.Reference site:35 Points

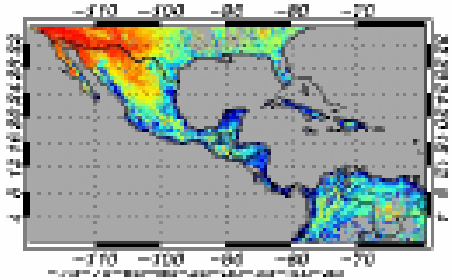


2.Monsoon Region

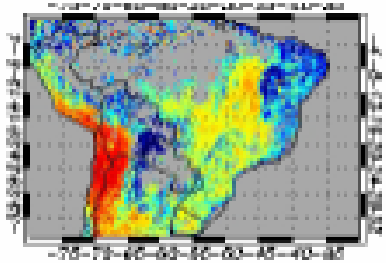
>West African

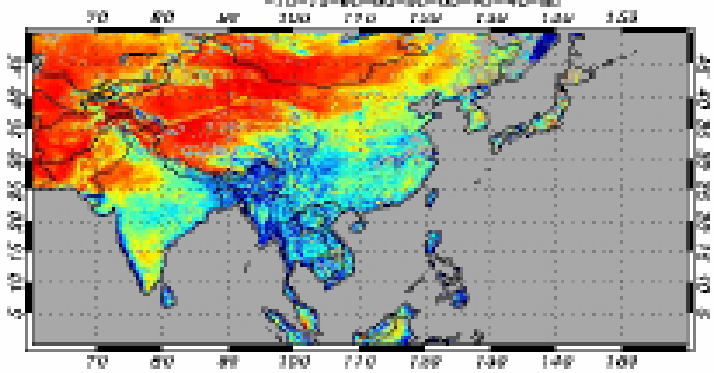


>North American

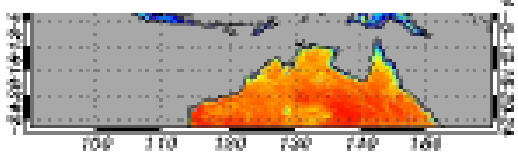


>South American

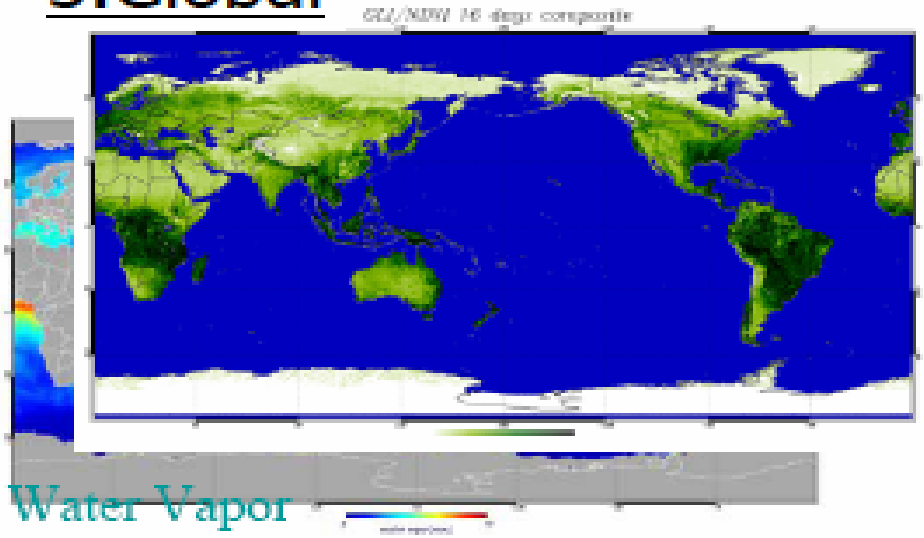




>Asia- Australian



3.Global



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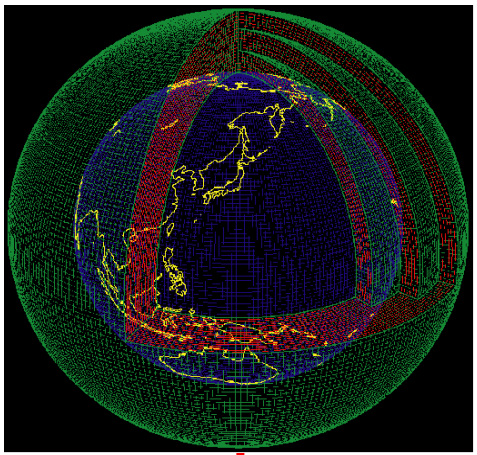

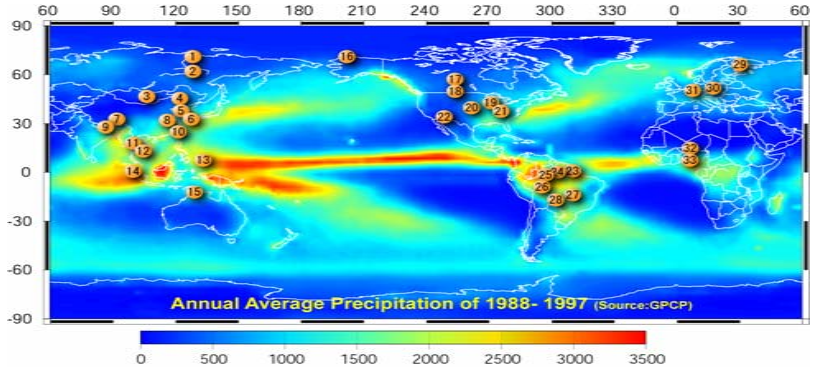

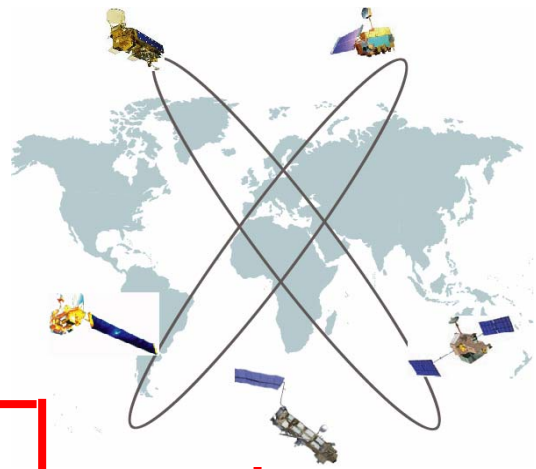

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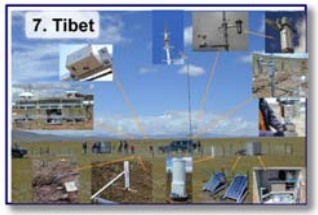
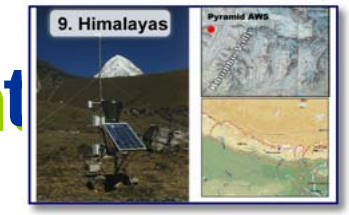
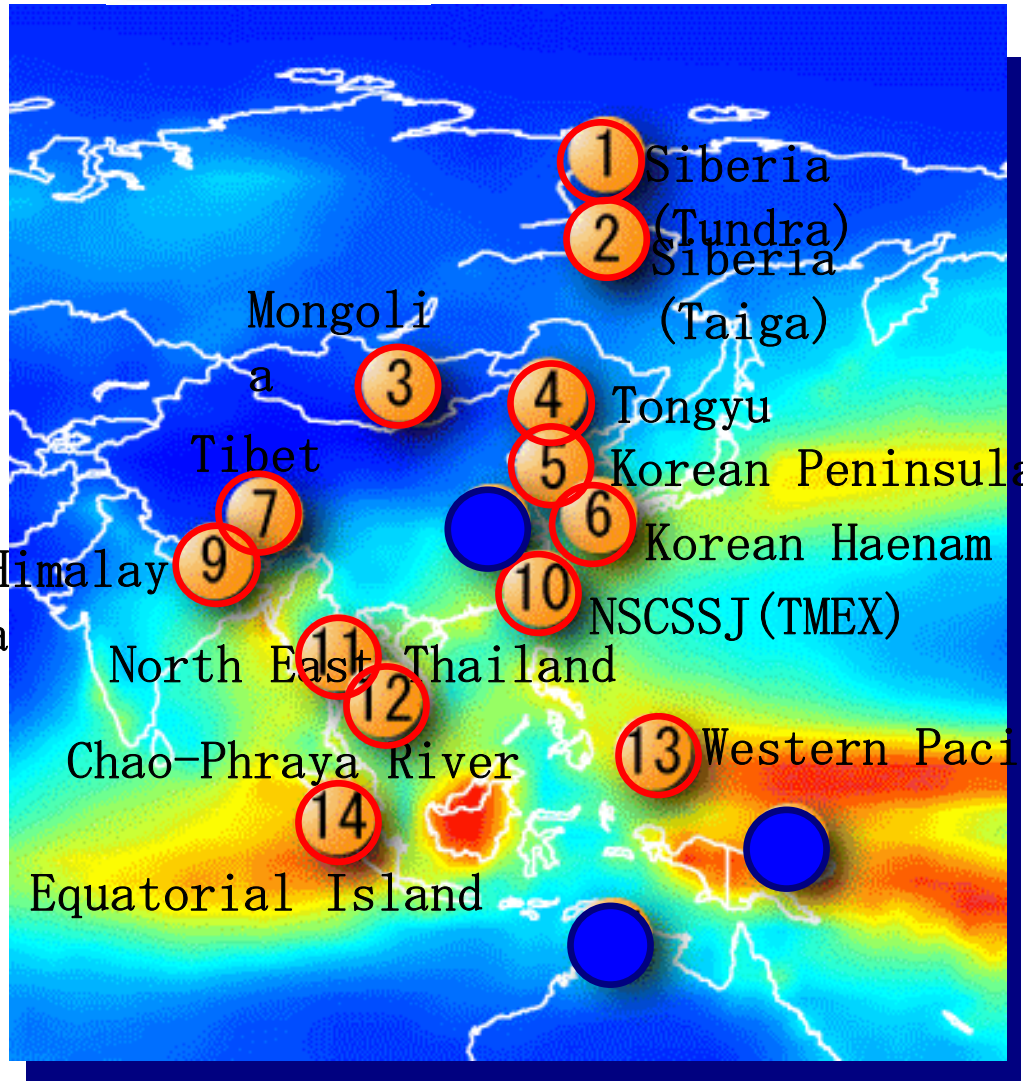
Data Management



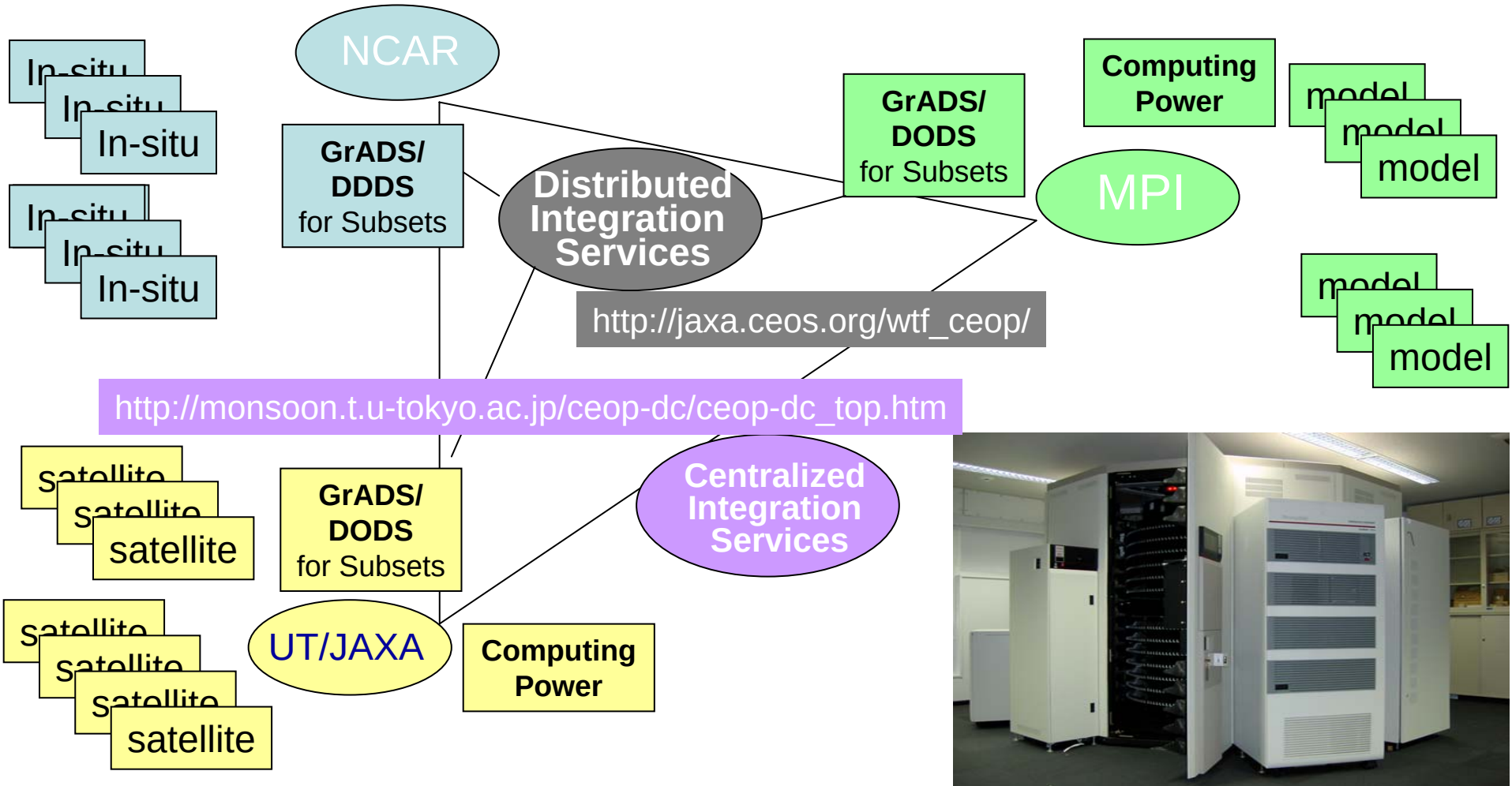




Coordinated Enhanced Observing Period
Three Unique Capabilities

Data Management

Distributed- and Centralized- Data Integration Functions



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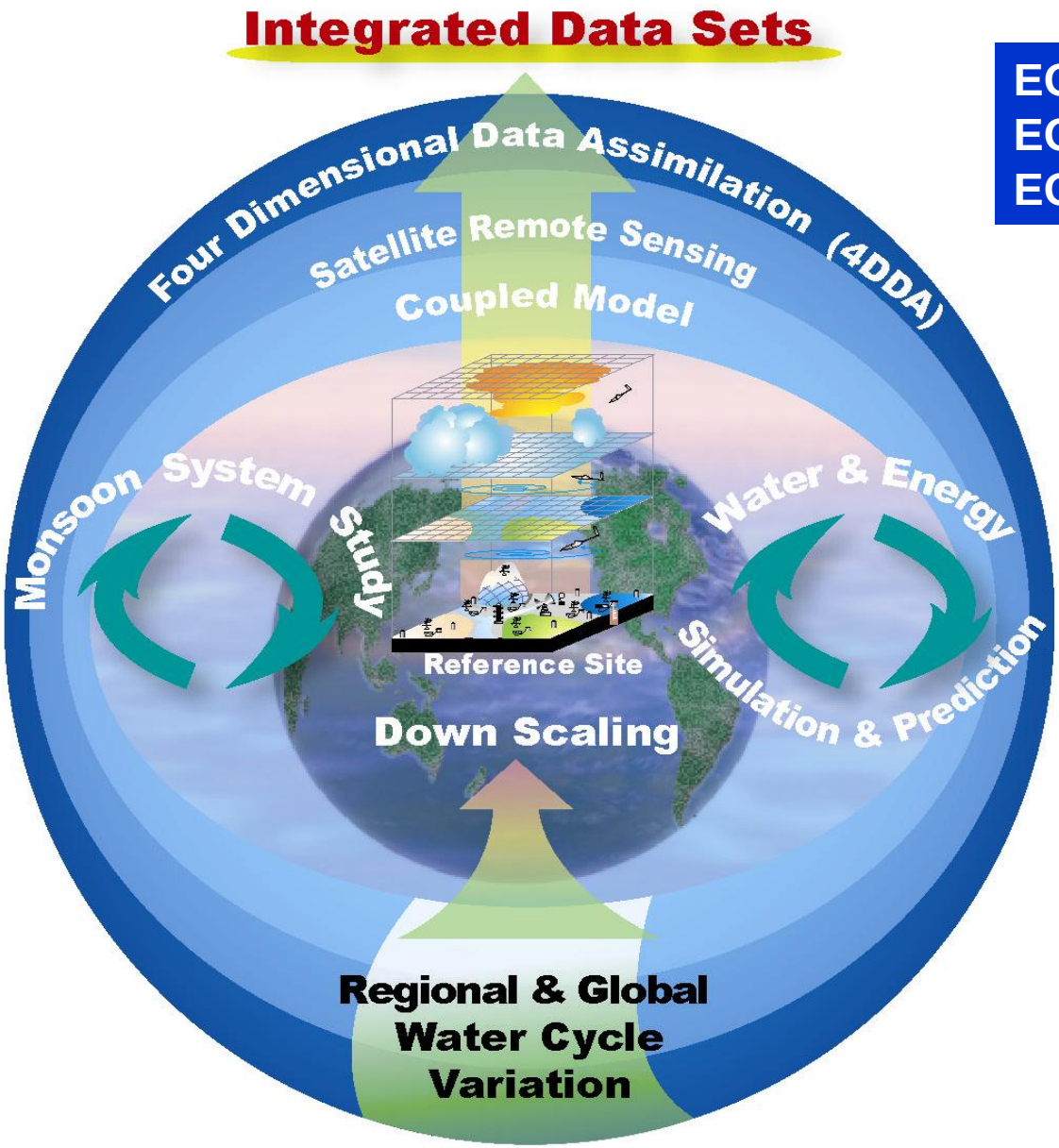

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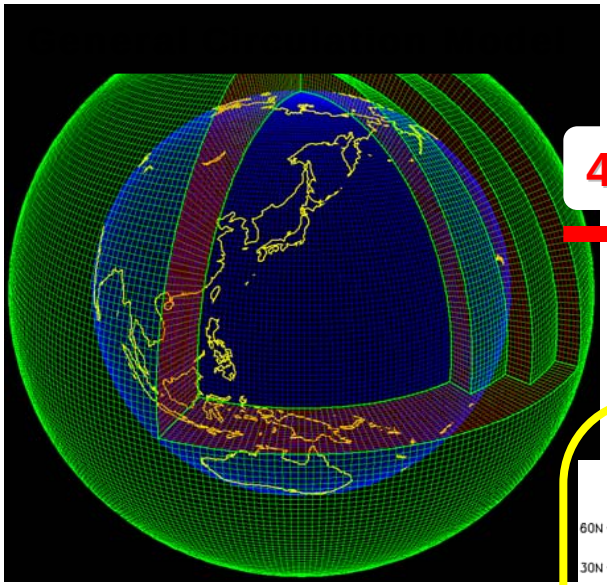
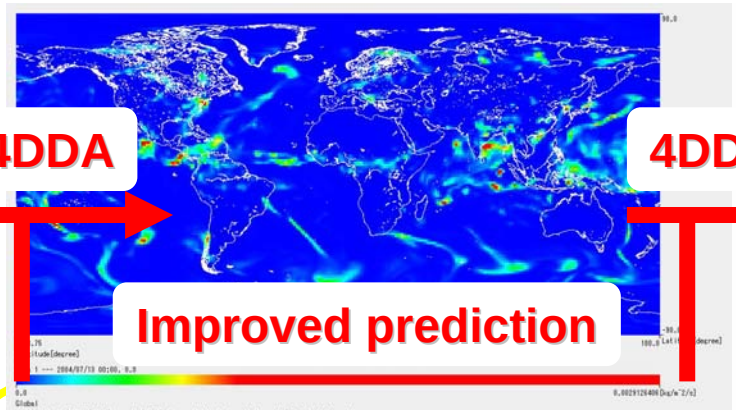
http://www.ceop.net

Global Data to Local Information

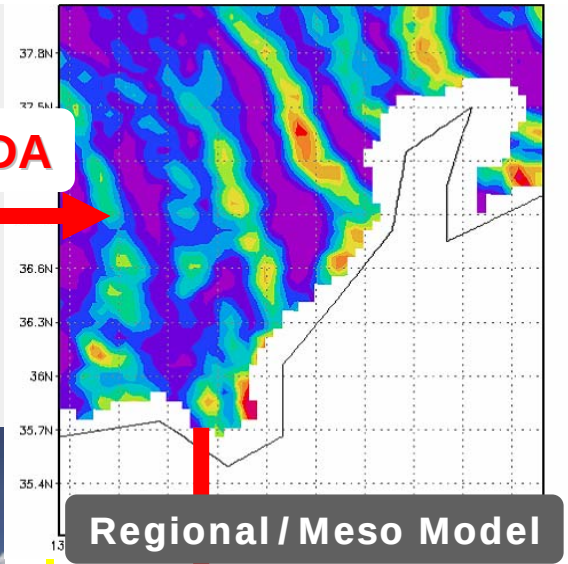


4DDA



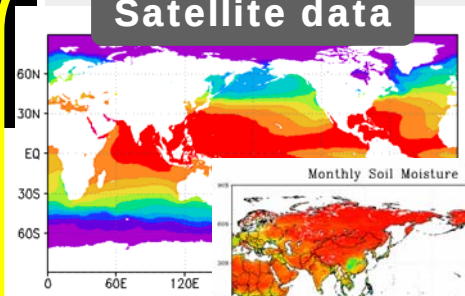
Improved prediction

4DDA



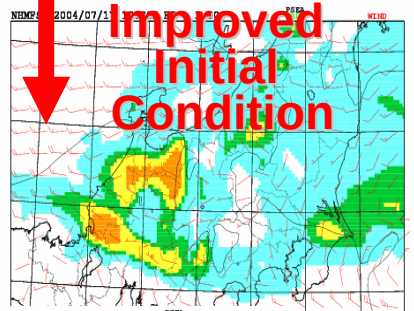
Regional / Meso Model

Satellite data



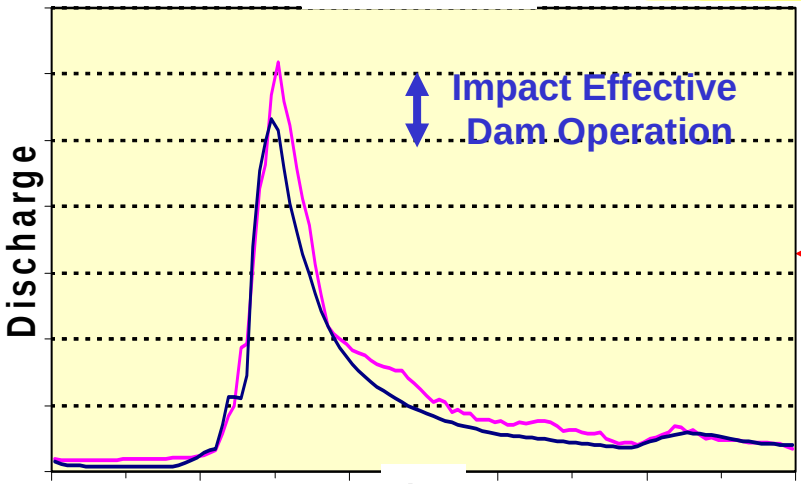
In-situ data

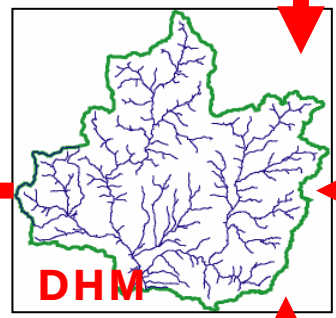
Centralized Data System



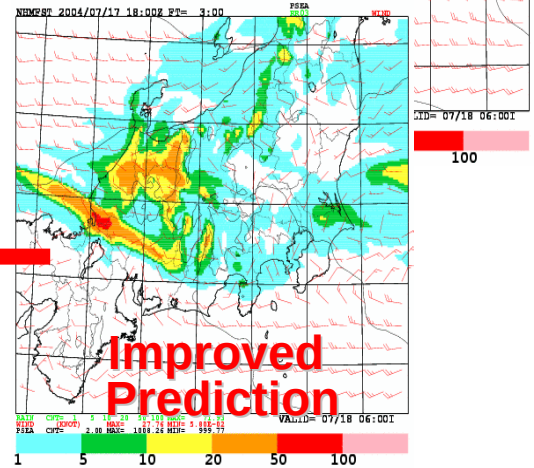
Improved Initial Condition

River Discharge





DHM



Improved Prediction

Socio-Economic Data


The 1st Asian Water Cycle Symposium
The University of Tokyo, Tokyo
Japan, 2-4 November 2005
GEO Secretary
UNESCO
UNEP
WMO
IGOS
Mekong Committee
Bangladesh
China
Indonesia
India
Japan
Korea
Laos
Malaysia
Mongolia
Pakistan
Philippine
Sri Lanka
Thailand
Vietnam

Consensus

The participants recognized the common water-related issues and socio-economic needs on disasters including floods, droughts and landslides, water scarcity, river and water environment, and effects of climate change in Asia.

The participants shared ideas on the large natural variation and the big impacts of the human activities in Asia as their backgrounds.

The participants consider that well coordinated scientific challenges and combination of global earth observation and physical, chemical, biological and socio-economic information in a local scale are essential as well as long term and mainly localized operational efforts.

The participants considered convergence and harmonization of observation activities, interoperability arrangements, and effective and comprehensive data management as the most functional elements.

The participants stepped forward for establishment a basic plan for "Asian Water Cycle Initiative contributing to GEOSS"

Toward the Next Step

A task team was organized for preparing for

- **to make an inventory;**
- **to review the data policies of governments and scientific communities;**
- **to make a draft implementation plan, including a design of a preliminary step.**

The task team consists of a representative of each country and scientific project in voluntary basis. Actual tasks will be done by email and conference call basis.

The Asian Water Cycle Initiative (AWCI) International Task Team (ITT) Working Session

Bangladesh 3
Cambodia 1
Indonesia 1
Japan 2

Lao PDR 1
Myanmar 1
Nepal 1
Pakistan 1

Philippines 1
Sri Lanka 2
Uzbekistan 1
Vietnam 2

Rama Gardens Hotel, Bangkok, Thailand
September 26, 2006

Questionnaire for the Asia Water Cycle Initiative (AWCI) International Task Team (ITT) members

1. Please nominate a candidate river basin(s) in your country that could be involved in the demonstration project of the AWCI, i.e. the integrated data sets and special tools, which will be available through CEOP Phase 2 implemented by WCRP under the GEO framework from 2007 to 2010, will be used to address the issues related to the water resources management in this river basin.

2. Please identify major issues (up to three) and needs related to the water cycle and water resources management in the candidate river basin(s):

3. Please list the available observations and existing data sets in the candidate river basin(s). Please include type of observation (e.g. precipitation), the number of stations (estimate) and since when the observation is available (estimate).

4. Please comment on the Coordinated Enhanced Observing Period (CEOP) Data policy (the document is available in the attachment below on Pg 3-4 and through the CEOP Web pages at: http://www.eol.ucar.edu/projects/ceop/dm/documents/ceop_policy.html).

5. Please introduce your idea on possible demonstration plan under the framework of AWCI.

Proposals
Candidate River Basins for GEOSS Applications

Bangladesh 1(3)
Cambodia 2
India 2
Indonesia 3
Lao PDR 3
Mongolia 3
Myanmar 1
Nepal 2
Pakistan 3
Philippines 1
South Korea 3
Sri Lanka 3
Uzbekistan 2
Vietnam 3

32 River Basins in 14 Countries in Asia!

Demonstration Project (DP) and related inventories (1/2)

1. Objectives

•To develop an information system of systems for promoting the implementation of integrated water resources management (IWRM).
•To make a bridge between global and local information (observation).
•To recognize common issues in Asia and share idea of natural and anthropogenic effects
•To shift from research activities and achievements to operational use
- Demonstration Need

2. Timeline

2007 - Pre-phase: survey of capabilities, test cases using CEOP Phase 1 data (October 2002 - December 2004)
2008 - Start of archiving activities of the DP basins data for the period 2007 - 2010; continue preparations for joint projects.
2009 -2010 - Shift from more-research to more-operational phase

Demonstration Project (DP) and related inventories (1/2)

3. Criteria

(i) Size of the watershed: 100 km2 - 1,000,000 km2
(ii) Data availability - minimum requirement:
Data type: rainfall, streamflow, weather station data (air temp., wind speed, pressure, humidity…), upper air observation is highly recommended
Raingauge density: according to the WMO standard but local specifics will be considered;
Near-real time data availability is highly recommended;
(iii) Watershed characteristics information availability (land use, soil characteristics, dams and other regulation works made to river channels,…)
(iv) Importance of the basin from the point of view of societal benefits as well as hydrological sciences

4. Which data we need for DP?

Global scale NWP outputs
Satellite products (especiall, basin-scale satellite products)
Other global data sets

5. Inventory

Reference Basin Characteristics Table
Location of Model Output Location Time Series (MOLTS) site(s)

Data Policy

Discussion based on the CEOP Reference Site Data Release Guideline

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 CEOP Reference Site Data from the CDA Archive

category 0 – operational data – real-time or near real-time data release
category 1 - standard data - data release after 6 months
category 2 - special data - data release after 15 months

5. Acknowledgement and Citation

6. Co-operation between CEOP Data Users and CEOP Reference Site Principal Investigators (PIs)

7. Co-Authorship for CEOP Reference Site Principal Investigators (PIs)

8. CEOP Publication Library

The 2nd Asian Water Cycle Symposium
9 – 10 January 9-10 2007
The University of Tokyo, Tokyo

Objectives:

The symposium aims to launch the Asian Water Cycle Initiative Demonstration Projects through discussions of the ITT report.

GEOSS Symposium on Integrated Observation for Sustainable Development in the Asia-Pacific Region (GEOSS AP Symposium)
January 11-12, 2007
Tokyo

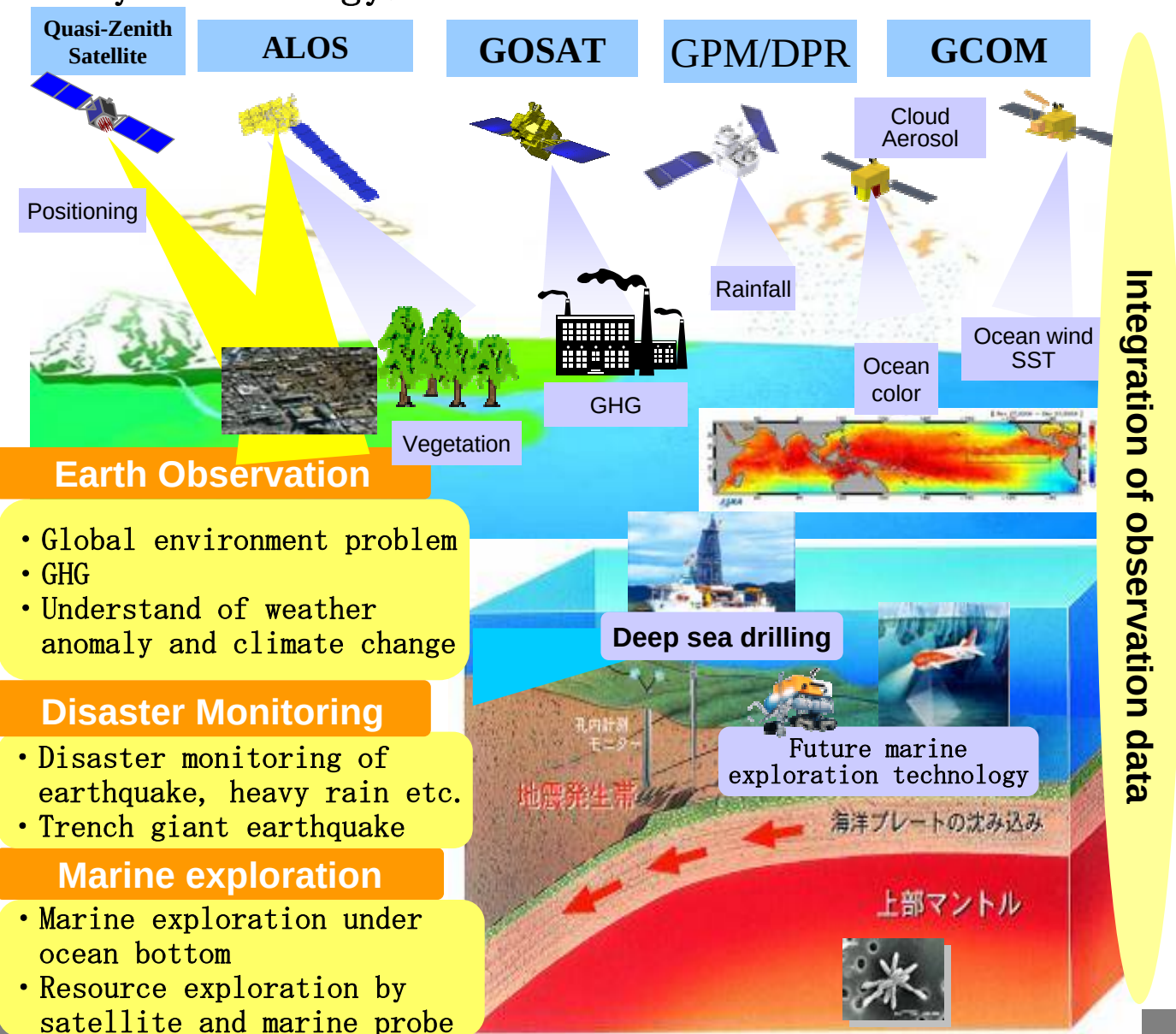
Objectives:

The symposium aims to:

1. present GEO activities based on GEOSS 10-Year Implementation Plan to Governments, Experts, Scientists, Public and Press in Asian-Oceanic countries widely
2. summarize the current situation of in-situ networks, satellite capability, model predictability, and data integration, and discuss future observing plans for filling the observational gaps, avoiding overlaps and contributing to the socio-economic benefits: *Climate Change and Water cycle, Ecosystems and Biodiversities, Disaster*
3. converge existing observational networks in Asian-Oceanic countries to the GEOSS

“Integrated Marine Exploration and Earth Observation System”

Establishment of a fundamental system for Earth observation, disaster monitoring and marine exploration system as a national key technology.



Integration of observation data

DIAS
Data Integration & Analysis System

Data Integration & Analysis

緯度
時間
経度

Policy making

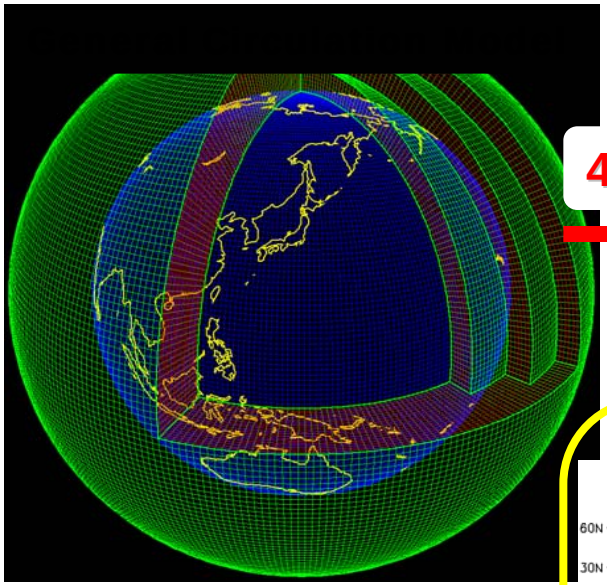
Integrated dataset

Users

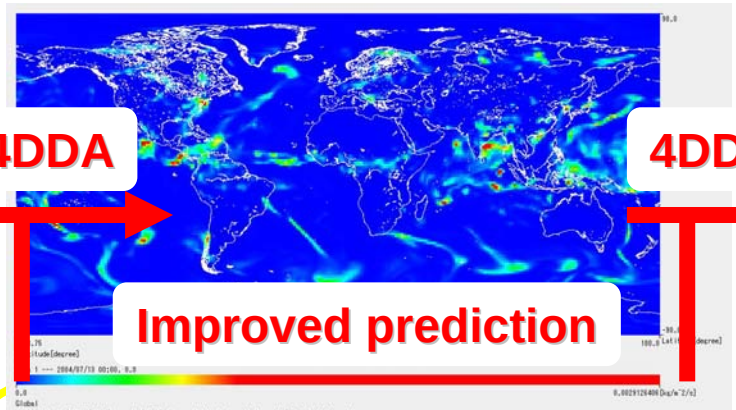
Research institutes

Ministry and agency

Global Data to Local Information

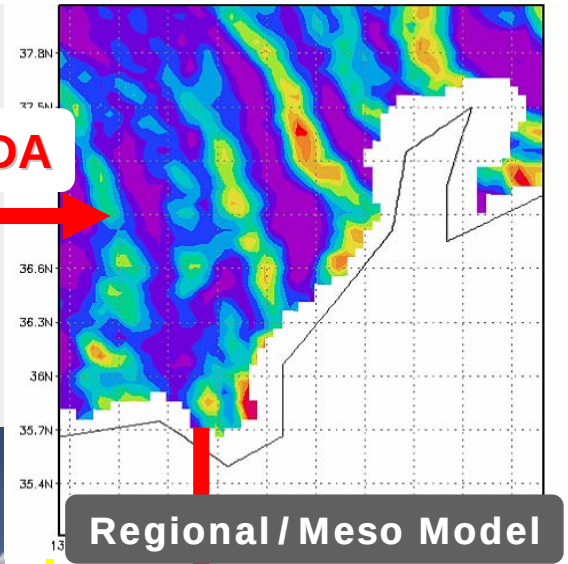


4DDA



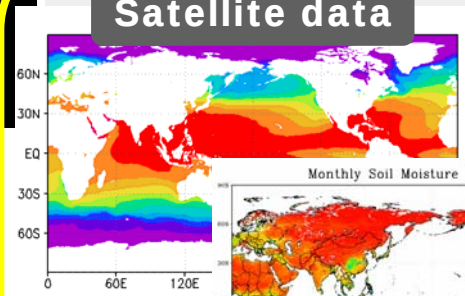
Improved prediction

4DDA



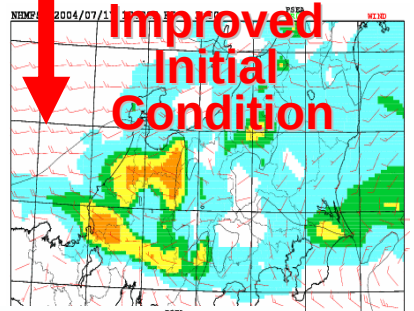
Regional / Meso Model

Satellite data



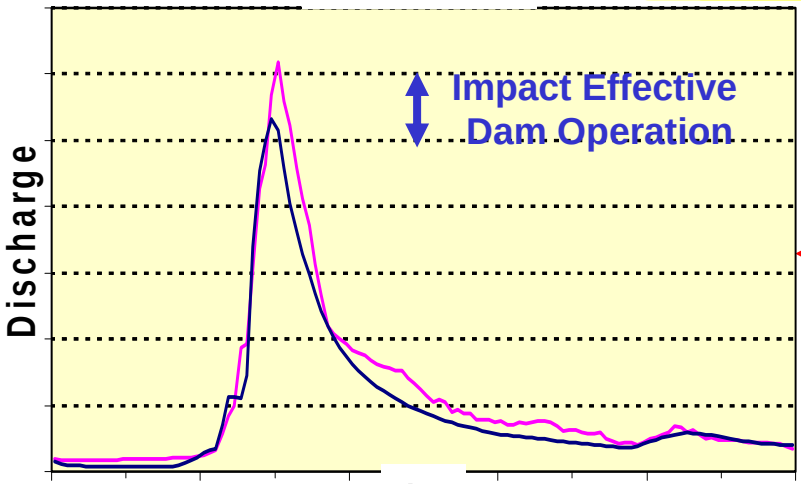
In-situ data

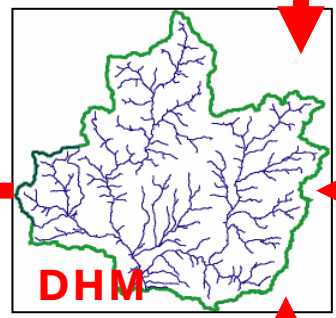
Centralized Data System



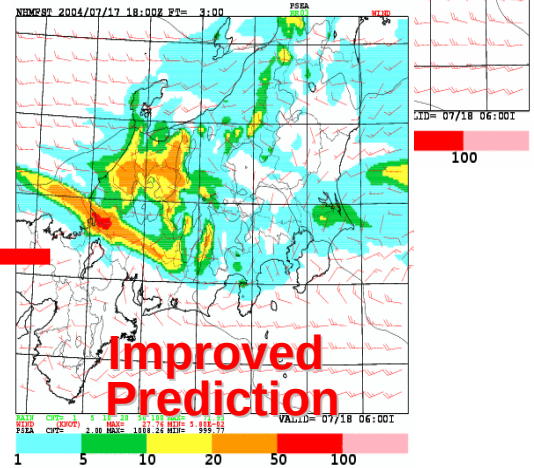
Improved Initial Condition

River Discharge





DHM



Improved Prediction

Socio-Economic Data