The 8th International Coordination Group (ICG) Meeting and
1st AWCI Climate Change Assessment and Adaptation (CCAA) Study Workshop
GEOSS Asian Water Cycle Initiative (AWCI)

General review of the AWCI Status

Toshio Koike
The University of Tokyo

12 Year History of GEOSS Water
6 Year History of GEOSS/AWCI

2000 – **Integrated Global Observing Strategy (IGOS) Water Theme** Proposal

2001 – Water Theme Approved

2002 –Team Report Writing Team

2003 – Preparation for "**Integrated Global Water Cycle Observation (IGWCO)**"

2004 – IGWCO Team Report

2005 – 1st IGWCO in Tokyo → **GEO/GEOSS**

2006 – 2nd IGWCO in Paris

2007 – 3rd IGWCO in DC

2008 – 4th IGWCO in Geneva

2009 – 5th IGWCO in Kyoto

2010 – 6th IGWCO in New York

2011 – 7th IGWCO in Tokyo

World Summit on Sustainable Development (WSSD)

Ad-hoc (GEO)

Preparation for 10-year Implementation Plan

1st GEOSS AP in Tokyo

2nd GEOSS AP in Tokyo

3rd GEOSS AP in Kyoto

4th GEOSS AP in Bali

5th GEOSS AP in Ahmedabad

Asian Water Cycle Initiative (AWCI)

1st Sump. in Tokyo
1st TTM in Bangkok

2nd Simp. in Tokyo
1st ICG in Bali
3rd Simp. in Beppu
2nd ICG in Tokyo
3rd ICG in Beijing
4th ICG in Kyoto
5th ICG in Tokyo
6th ICG in Bali
7th ICG in Tokyo
1st CCAA/T in Tokyo
8th ICG in Seoul

Implementation Plan

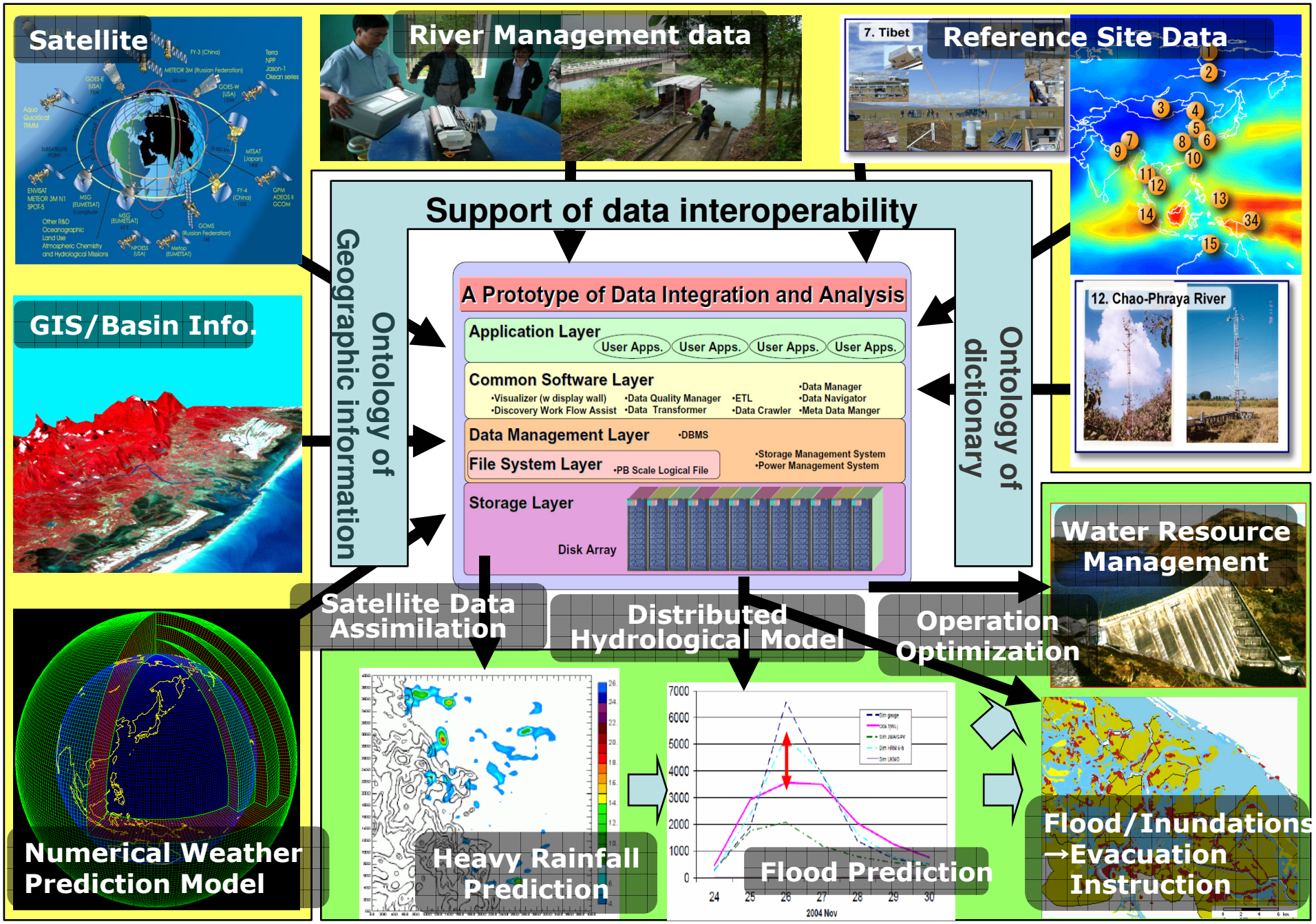
CONTENTS

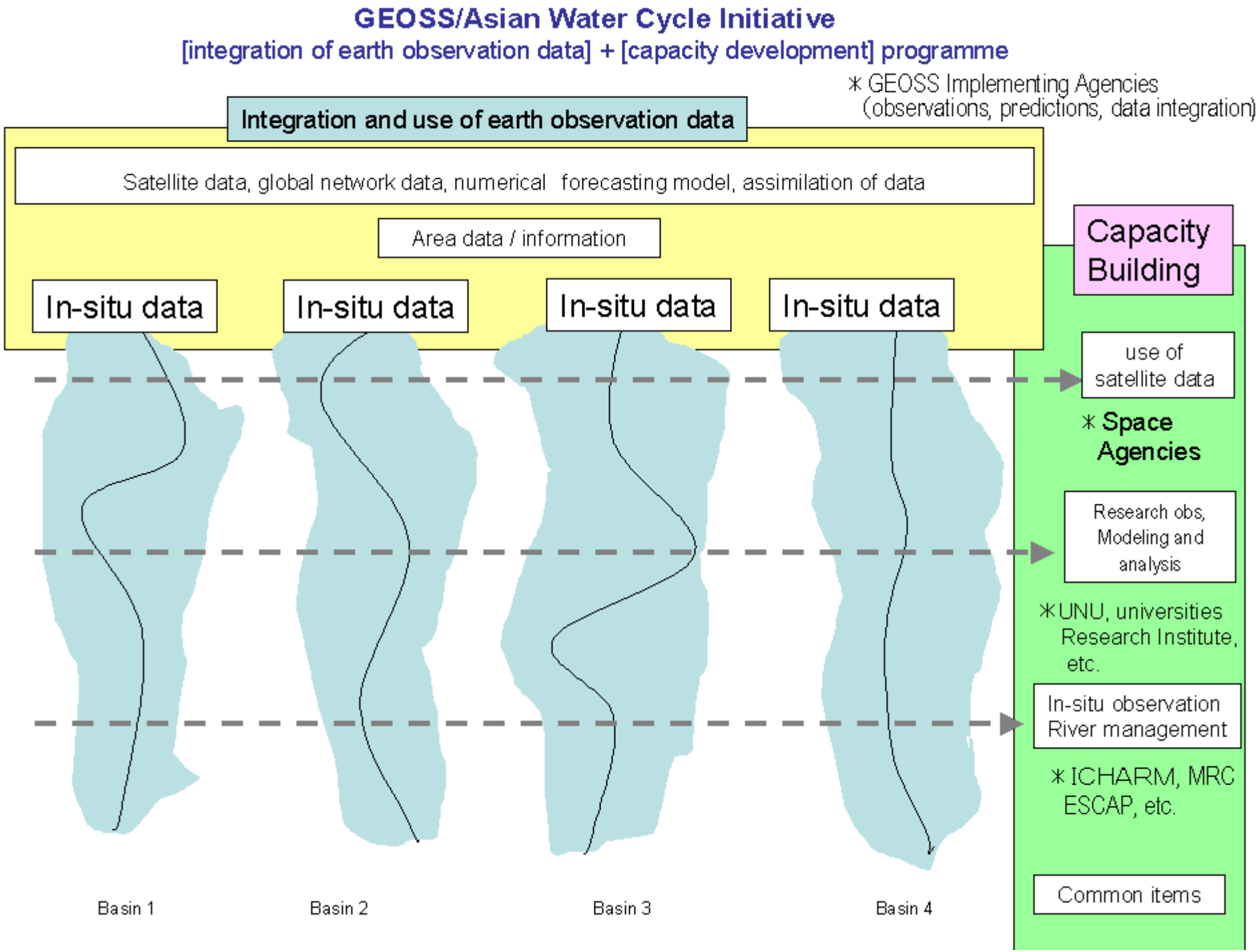
Implementation Plan

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

Implementation Plan

2. Scope


Satellite
River Management data
7. Tibet
Reference Site Data
Support of data interoperability
Ontology of Geographic information
A Prototype of Data Integration and Analysis
Application Layer
User Apps.
User Apps.
User Apps.
User Apps.
Common Software Layer
•Visualizer (w display wall)
•Discovery Work Flow Assist
•Data Quality Manager
•Data Transformer
•ETL
•Data Crawler
•Data Manager
•Data Navigator
•Meta Data Manger
Data Management Layer
•DBMS
File System Layer
•PB Scale Logical File
•Storage Management System
•Power Management System
Storage Layer
Disk Array
Ontology of dictionary
GIS/Basin Info.
12. Chao-Phraya River
Water Resource Management
Satellite Data Assimilation
Distributed Hydrological Model
Operation Optimization
Numerical Weather Prediction Model
Heavy Rainfall Prediction
Flood Prediction
2004 Nov
Flood/Inundations →Evacuation Instruction


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
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
Basin 1
Basin 2
Basin 3
Basin 4

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

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

GOAL:

to facilitate and develop sustainable mechanisms for the countries in Asia Pacific to use advanced earth observations systems, associated 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

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

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

2008

Jan.- Mar.

- Preparation for Meta Data Registration & Data (2003 & 2004) Input

10-12 Mar.

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

2nd ICG: 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 ICG: 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 ICG

2010

Jan.- Mar.

- Evaluation of Models and Data Integration

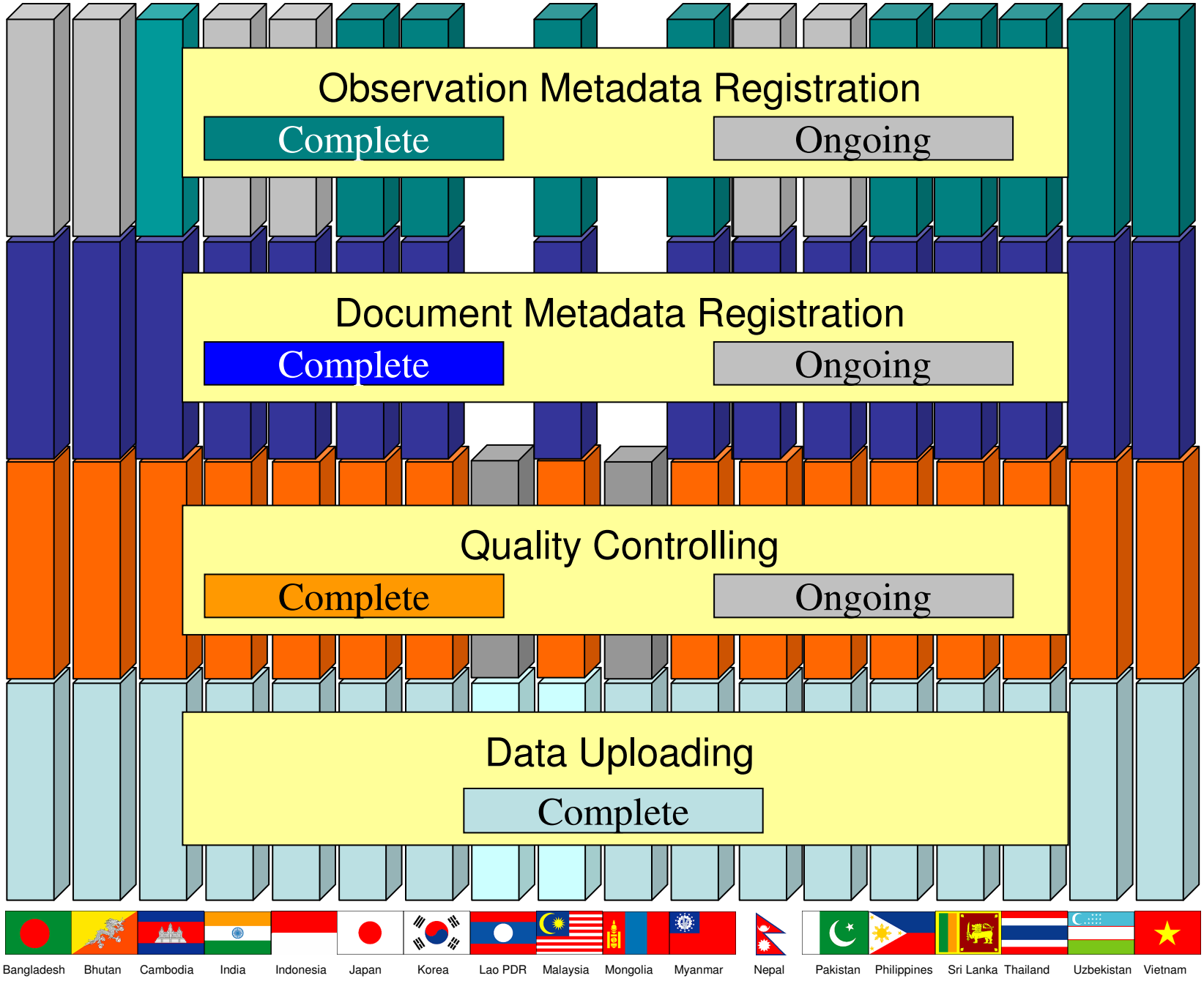
Mar.

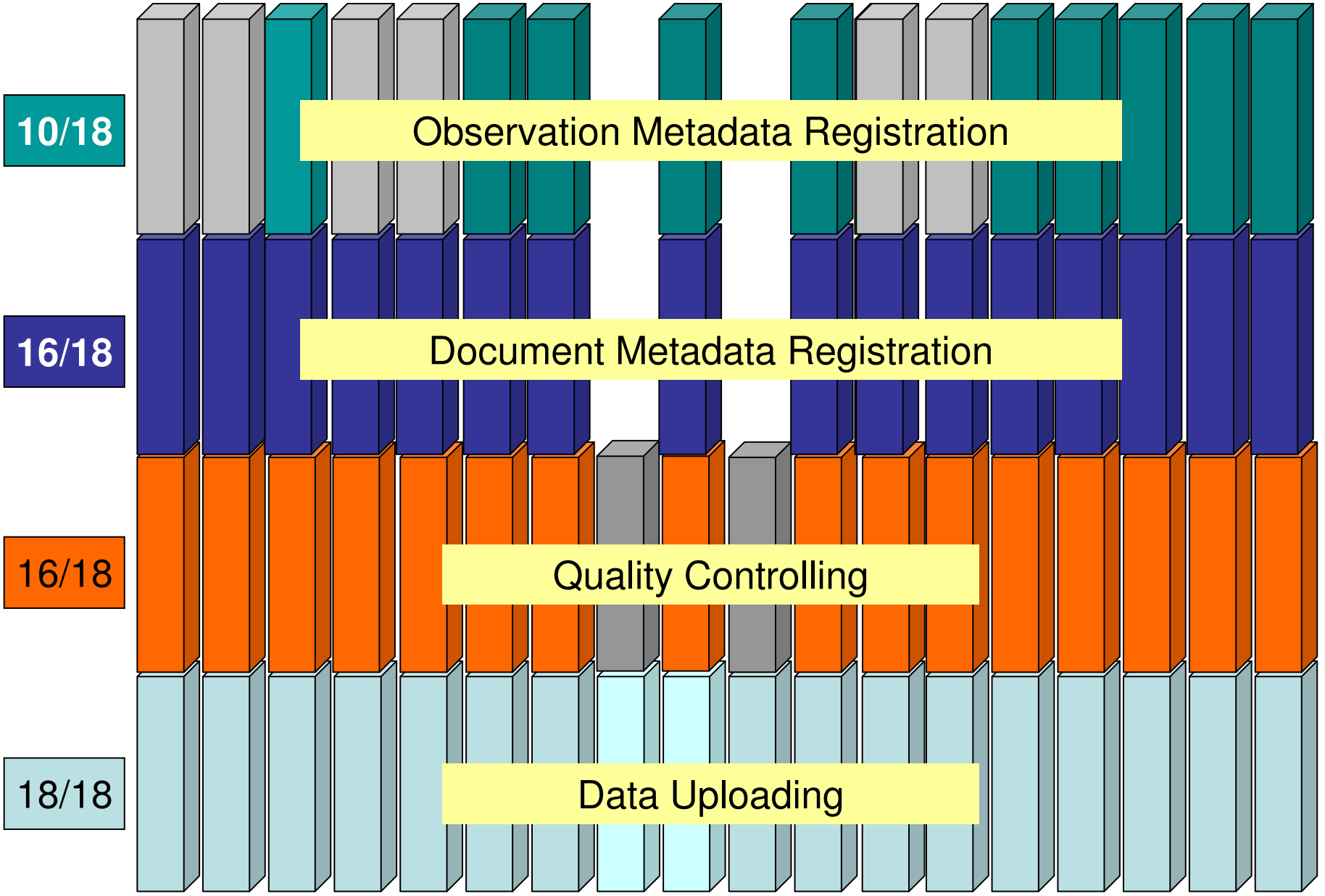
4th GEOSS AP Symposium:

5th AWCS:

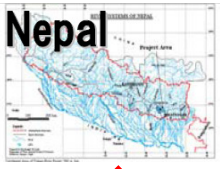
Apr.-

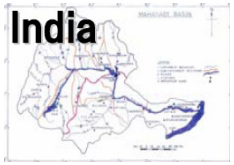
- Preparation for shifting from more-research to more-operational phase

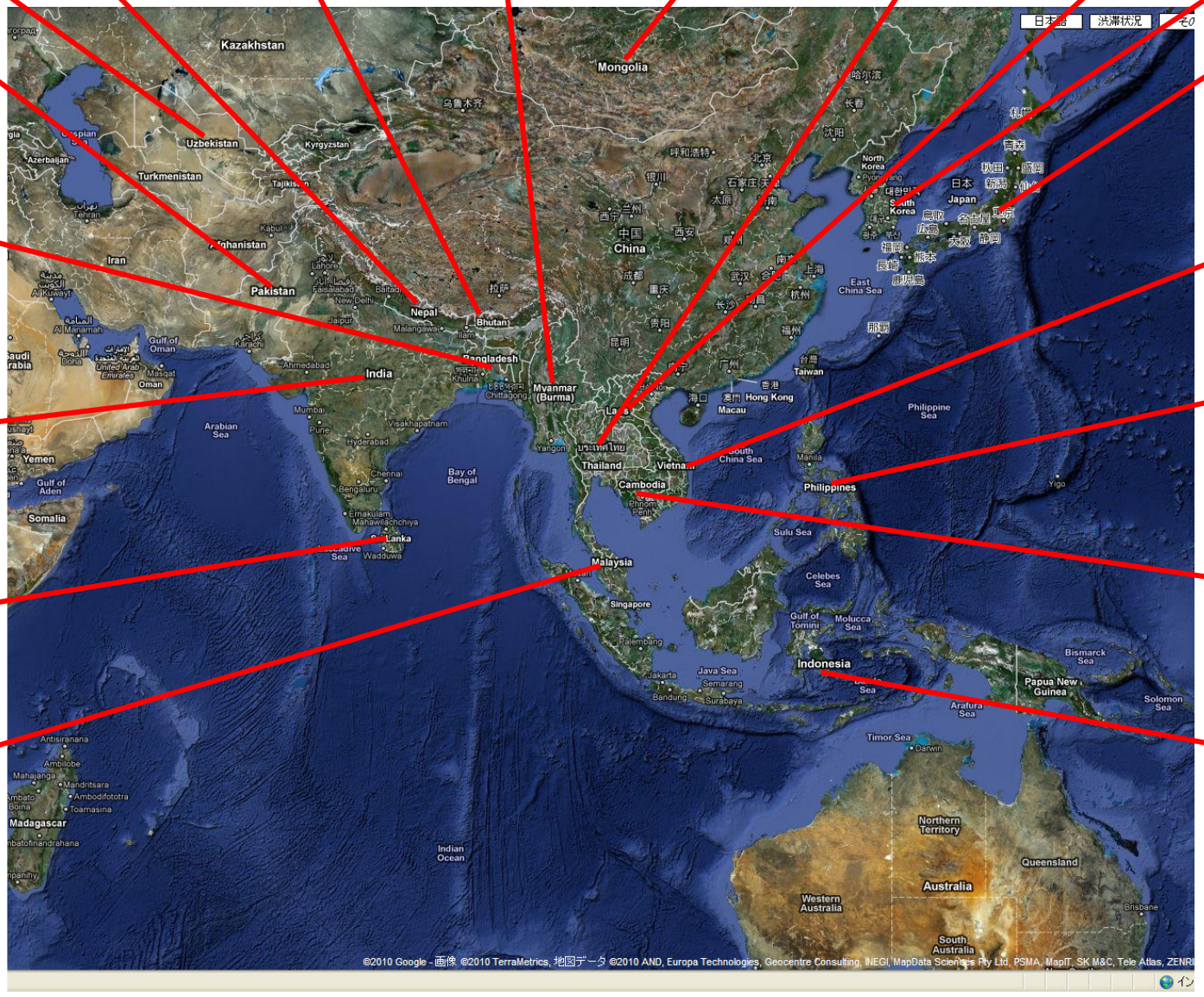

Observation Metadata Registration
Complete
Ongoing
Document Metadata Registration
Complete
Ongoing
Quality Controlling
Complete
Ongoing
Data Uploading
Complete
Bangladesh
Bhutan
Cambodia
India
Indonesia
Japan
Korea
Lao PDR
Malaysia
Mongolia
Myanmar
Nepal
Pakistan
Philippines
Sri Lanka
Thailand
Uzbekistan
Vietnam


10/18
Observation Metadata Registration
16/18
Document Metadata Registration
16/18
Quality Controlling
18/18
Data Uploading

Demonstration River Basins

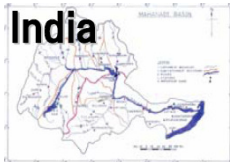


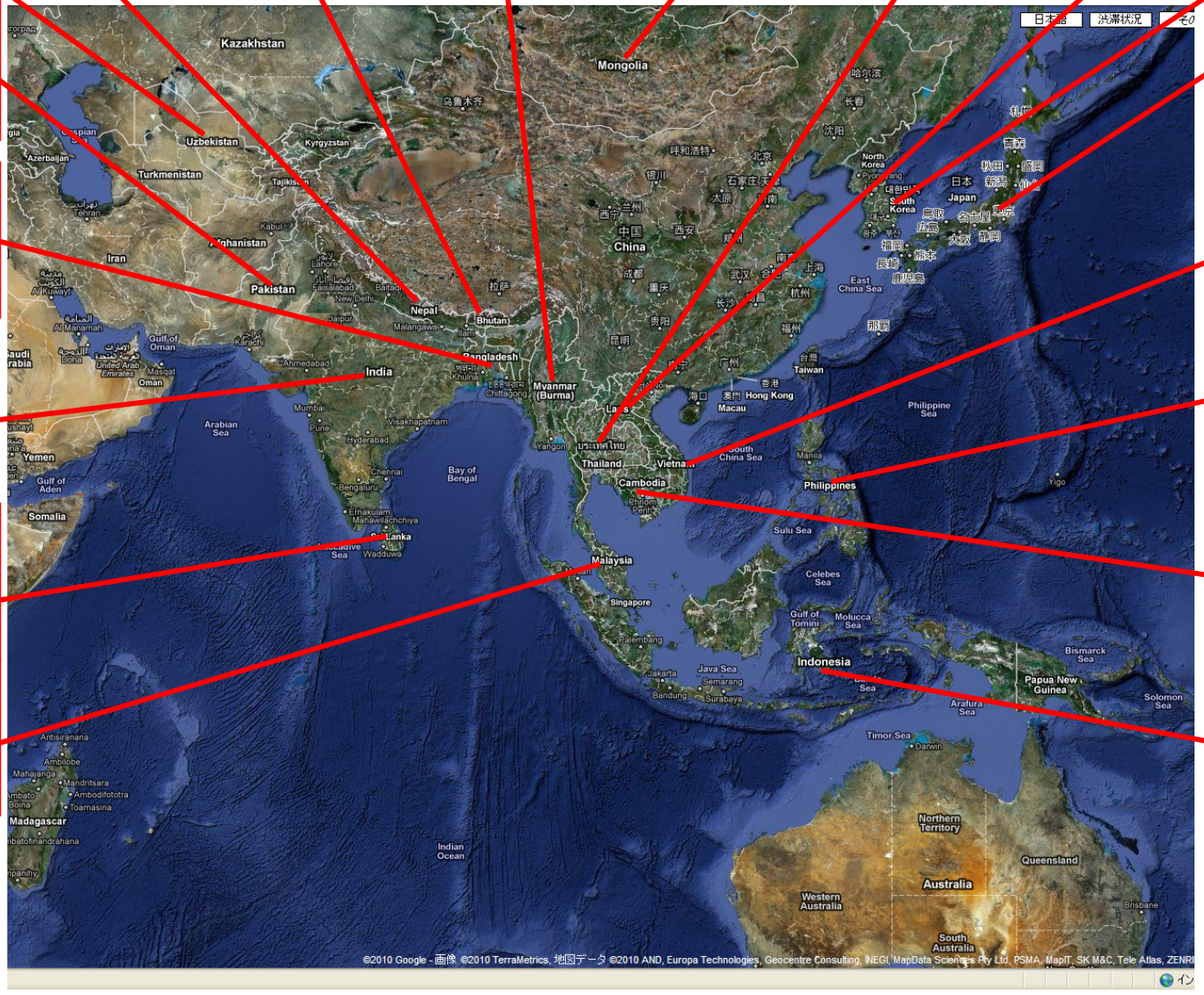




Asian Water Cycle Initiative

Demonstration River Basins

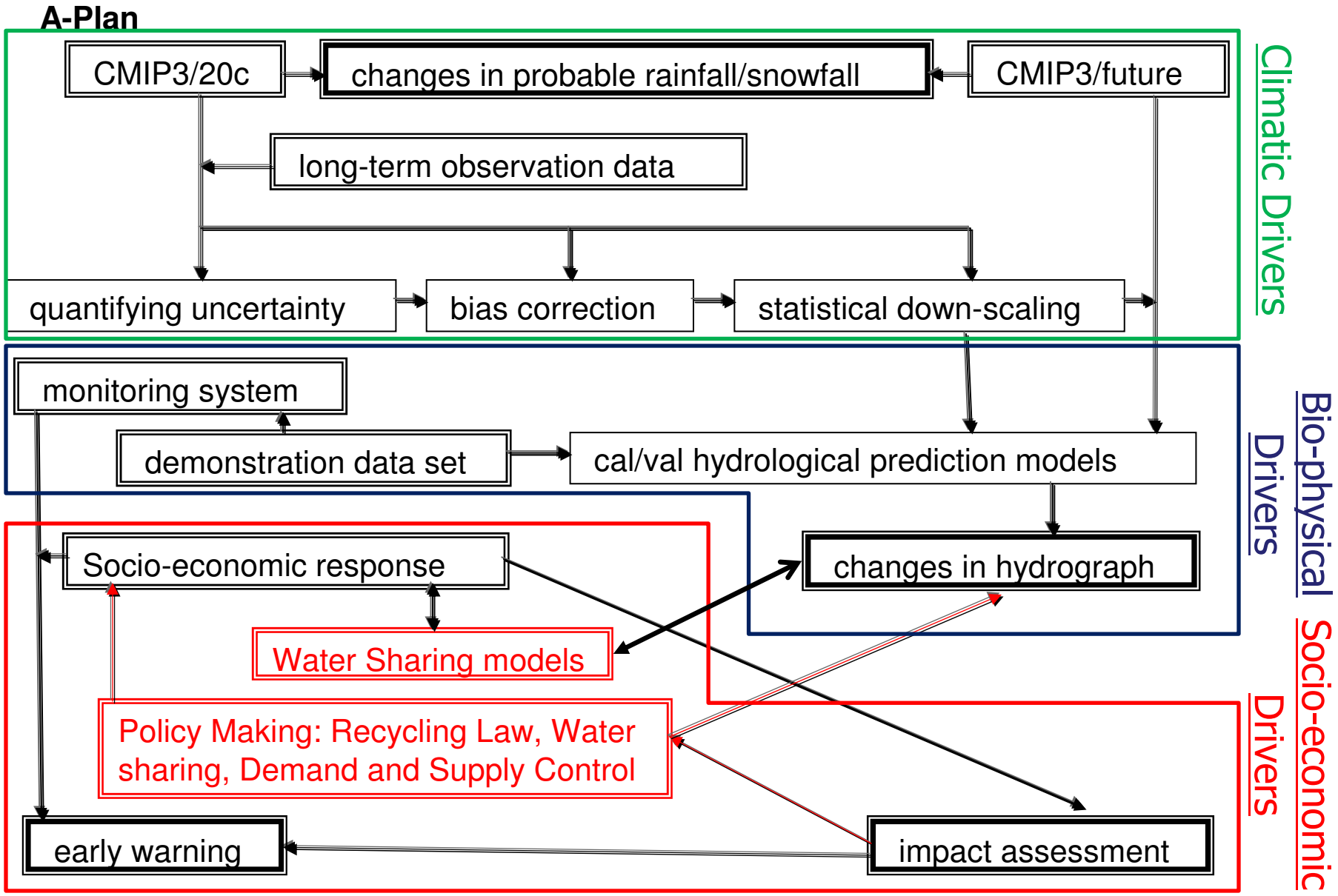




Asian Water Cycle Initiative

Implementation Planning

Question 1: What should be added, removed and modified?




GEOSS/AWCI Training Course on
Downscaling Techniques for Climate Change Assessment/
Adaptation Study (CCAA)
at 12:30, 11th March, 2011

Three steps

1. Evaluation of models -> selecting suitable ones for the region

2. Downloading model precipitation output of selected models and gap-filling

3. Bias correction of historical simulation precipitation output and future projection precipitation output of selected models – using observed precipitation data

Section 1

1. Introduction of the WEB-DHM hydrological model;
2. How to run the hydrological model with long-term forcing data (past and future);
3. How to analyze the simulated long-term discharge, to identify the occurrence of floods and droughts.

Section 2

Interactive discussions between the CCAA participants with our UT team (*Wang, Tsujimoto, Patricia, Shrestha, Thanda, Slamet*).

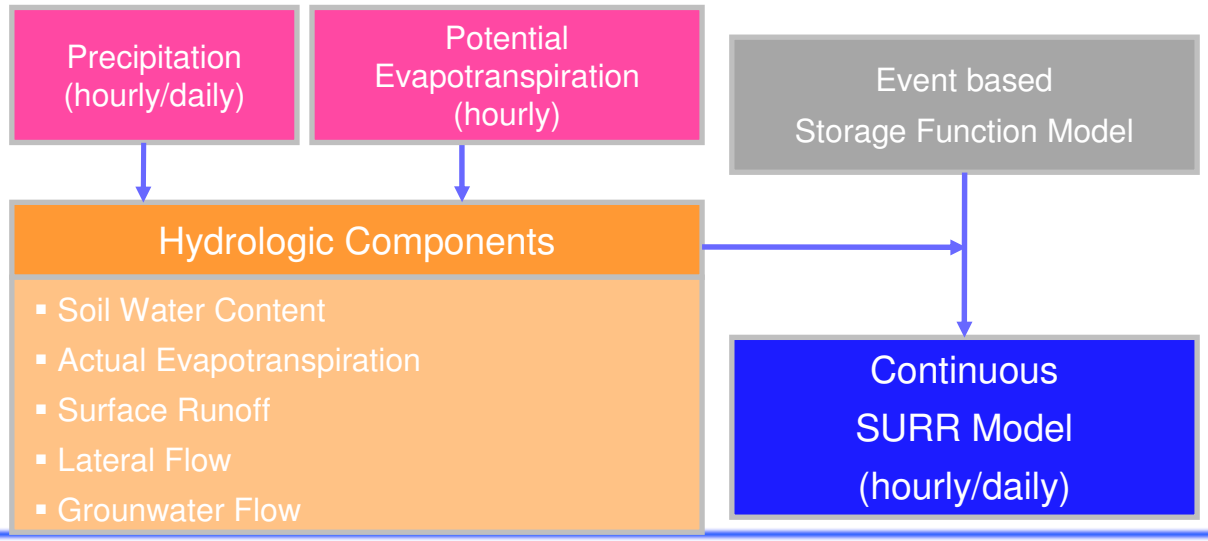
Contents

- General approaches for climate change impact assessment
- Uncertainties of climate change impact assessment
- GME-based climate change impact assessment
- Concluding remarks

Hydrologic Model Theory – Microscale

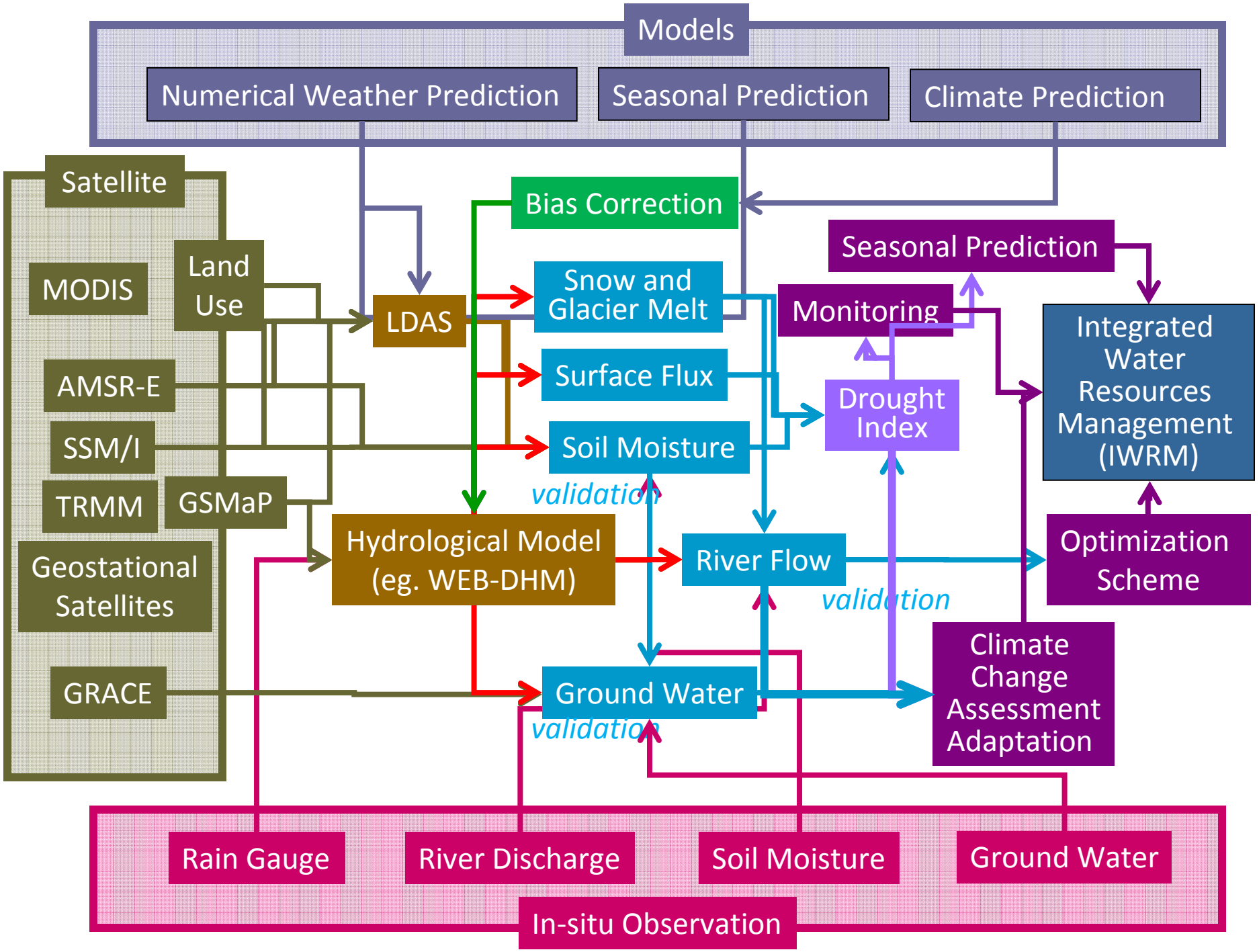
SURR(SEJONG University Rainfall-Runoff) Model

- Storage Function Model based Continuous Rainfall-Runoff Model
- Connection of basin and channel storage function model with Physical - based hydrology Component calculation technique(Lee et al. 2010)
- Properties : Lumpt model based on basin
- Water balance & Channel routing
- Simulation time interval : hourly, daily
- Available and useful both monitoring the flood & drought




Nepal


Bangladesh
Bhudan
Malaysia
Nepal


Models
Numerical Weather Prediction
Seasonal Prediction
Climate Prediction
Satellite
MODIS
Land Use
AMSR-E
SSM/I
TRMM
GSMaP
Geostational Satellites
GRACE
Bias Correction
LDAS
Snow and Glacier Melt
Surface Flux
Soil Moisture
validation
Hydrological Model (eg. WEB-DHM)
River Flow
validation
Ground Water
validation
Seasonal Prediction
Monitoring
Drought Index
Integrated Water Resources Management (IWRM)
Optimization Scheme
Climate Change Assessment Adaptation
Rain Gauge
River Discharge
Soil Moisture
Ground Water
In-situ Observation

2010

Jan.- Mar.

- Evaluation of Models and Data Integration

Mar.

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12 Year History of GEOSS Water
6 Year History of GEOSS/AWCI

1992 Rio Summit

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2003 – Preparation for "**Integrated Global Water Cycle Observation (IGWCO)**"

Ad-hoc (GEO)

→Rio +10

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Preparation for 10-year Implementation Plan

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5th ICG in Tokyo
6th ICG in Bali

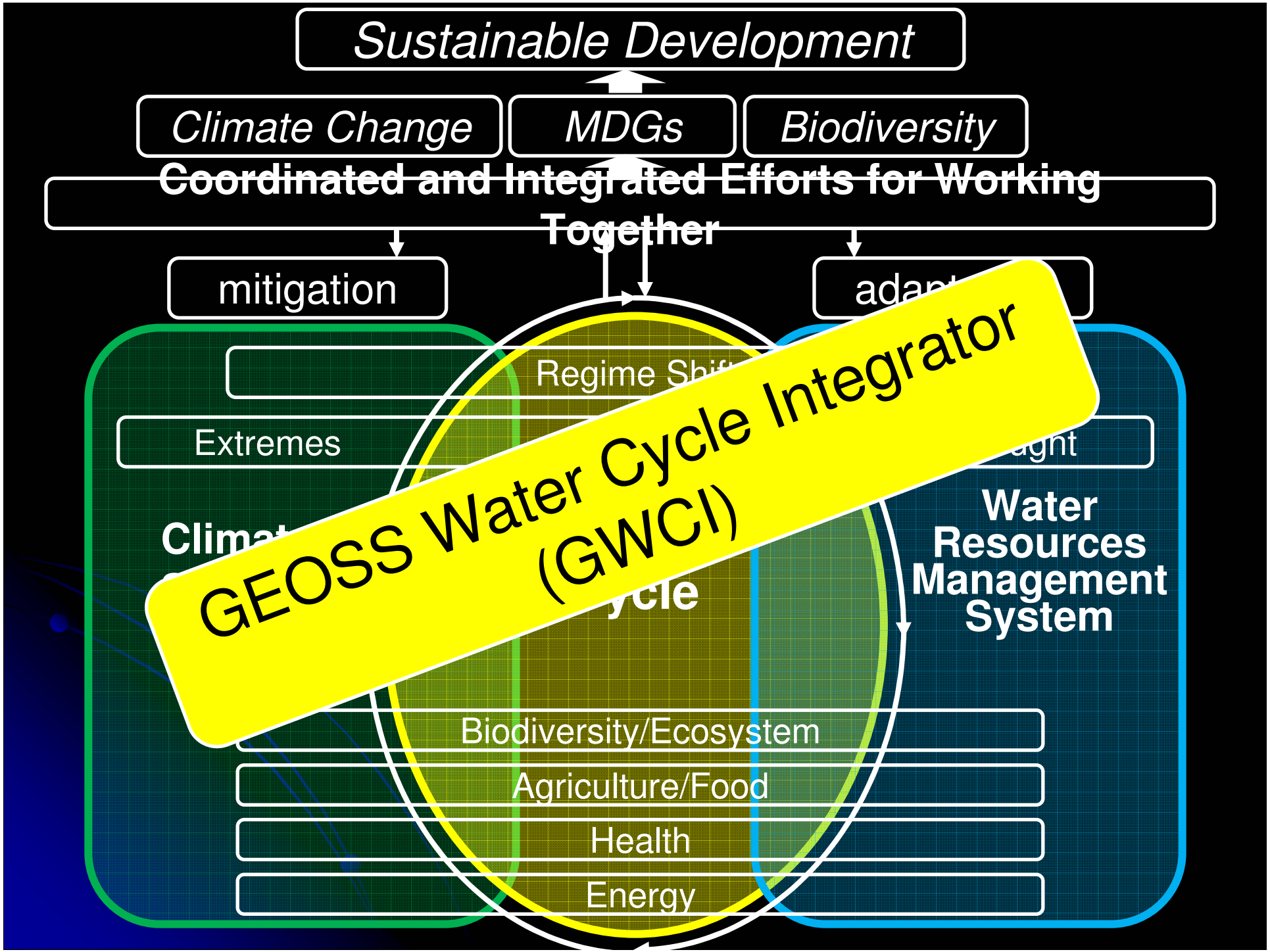
2011 – 7th IGWCO in Tokyo

7th ICG in Tokyo
1st CCAA/T in Tokyo

June 2012: Rio +20

5th GEOSS AP in Ahmedabad

8th ICG in Seoul


Sustainable Development
Climate Change
MDGs
Biodiversity
Coordinated and Integrated Efforts for Working Together
mitigation
adapt
Regime Shift
Extremes
ught
Climat
ycle
Water Resources Management System
GEOSS Water Cycle Integrator (GWCI)
Biodiversity/Ecosystem
Agriculture/Food
Health
Energy

Toward the NEXT STEP

Agenda

1.Opening Session, Welcome Remarks, Photo

2. AWCI Working Group Activity Review Session

3.Country Activity Review and Possible Contributions to the AWCI Next Stage Session

4.Capability of Observation, Data Integration and Prediction Session

5.Breakout discussion session 1 - GEOSS WCI: needs and capabilities

6.Breakout discussion session 2 - GEOSS WCI: practical implementation ideas

7.Breakout session reports

8.Implementation planning for a regional coordination project targeting Climate Change Adaptation

9.Regional Proposal to Rio+20

10.Summary and Closing session