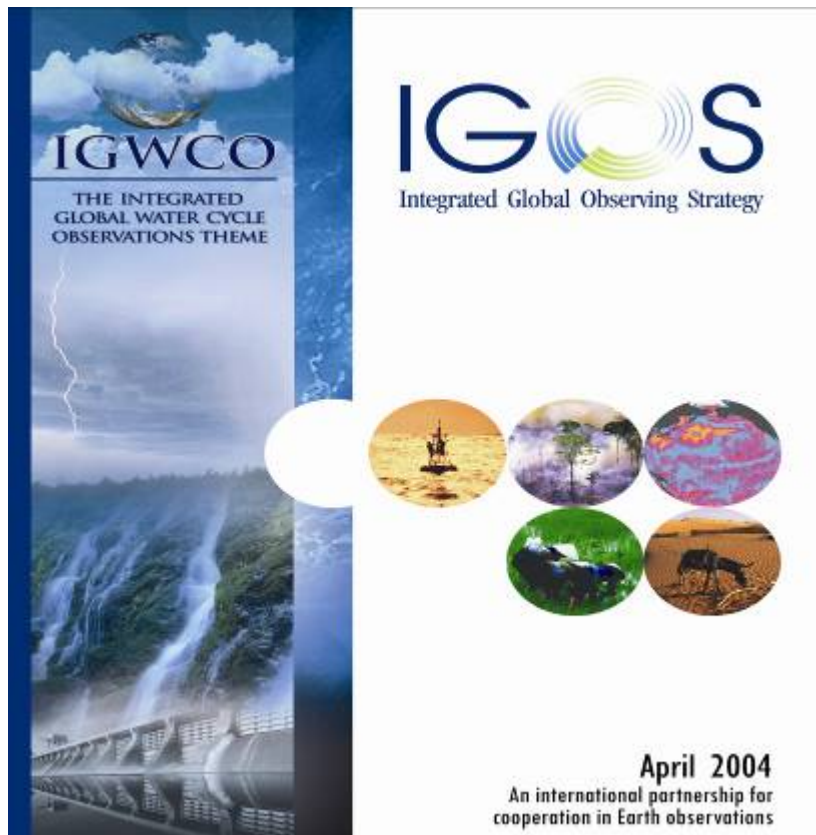


# UPDATE OF IGWCO ACTIVITIES AND LINKS WITH OTHER PROGRAMMES INCLUDING GWSP AND GEOSS

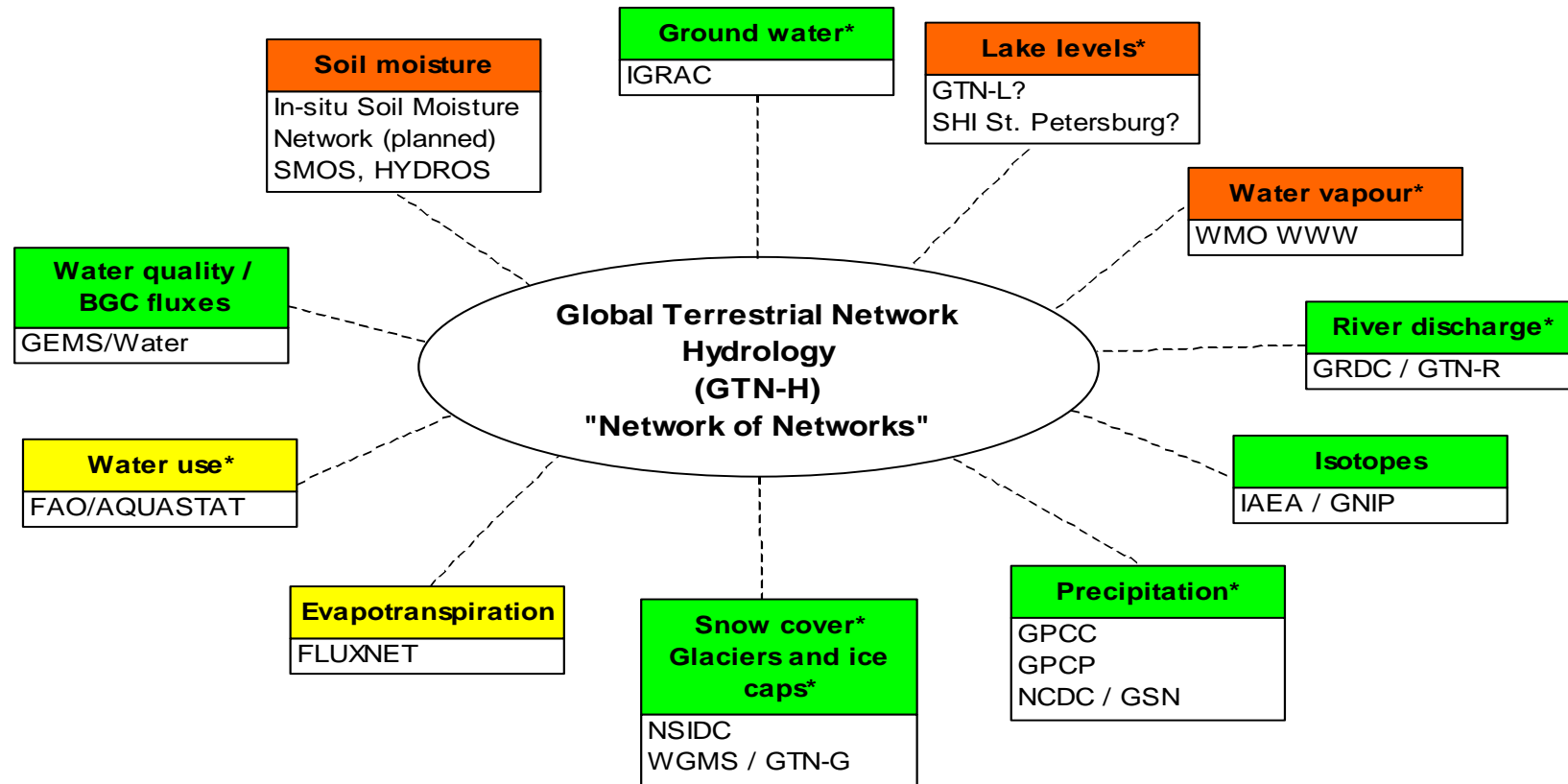


**IGOS 13 Meeting,  
23 May 2006,  
At WMO, Geneva**

Wolfgang Grabs  
(Chief, Water Resources Division, WMO)

....using slides provided by Rick Lawford,  
Charles Vorosmarty, Phil Arkin, Steve Greb,  
Ishida Chu, Petrus van Oevelen, Tom Jackson,  
Ana Medico, Petra Koudelova

# GTN – H CONFIGURATION AS OF JULY 2005



Global network/coverage defined and contact established



Global network/coverage partly existing/identified and/or contact to be improved



No global network/coverage identified

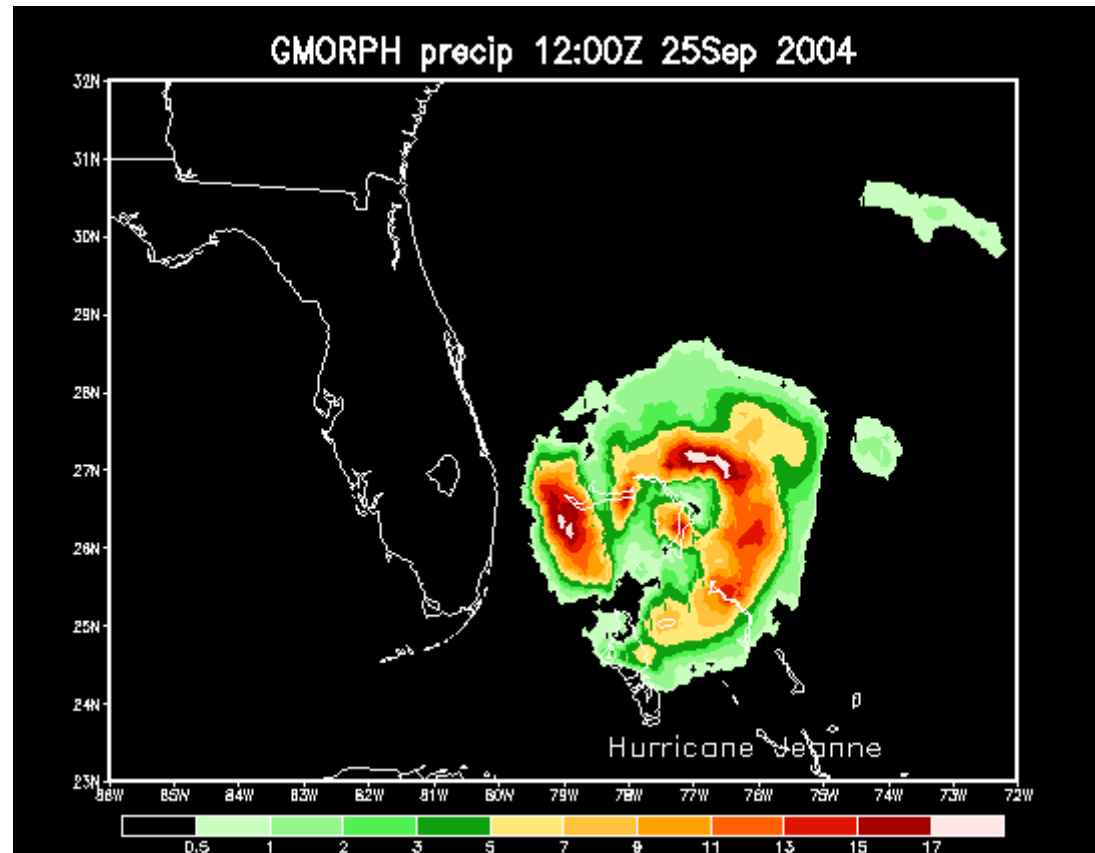
\*

GCOS Essential Climate Variable

# Precipitation in IGWCO

- The objectives of IGWCO require time series of accurate gridded precipitation fields with fine spatial and temporal resolution for nearly all of the land areas of the world
- Rain gauges alone are not able to provide this
  - Often too sparse or inappropriately distributed
  - Not generally available soon enough for some uses
  - Nevertheless, they are vital
- Available global products using satellite-derived estimates (GPCP, CMAP) are too coarse and not timely enough
- But new combined satellite-based precipitation products (PERSIANN, TMPA, CMORPH,...) show promise
- IGWCO will evaluate these methods to determine how they can be used as the basis for an Integrated Precipitation Product

## Some examples



CMORPH (NOAA CPC) uses a combination of precipitation estimates from passive microwave and cloud motion from geostationary IR (see Joyce et al., 2004, J. Hydrometeorology)

# Program for the Evaluation of High Resolution Precipitation Products (PEHRPP)

- Establish a comprehensive hypothesis-based collaborative effort to understand the capabilities and characteristics of these new HRPP (High Resolution Precipitation Products)
- Hypotheses:
  - HRPP errors can be characterized by comparing them to independent observations from rain gauges and radars.
  - Errors of and differences between HRPP are meaningful, in that they can be systematically related to precipitation characteristics and/or algorithm methodology.
  - Improved HRPP can be derived by combining products or methods based on the observed errors and differences.
  - HRPP spatial and temporal variability is realistic on scales appropriate for scientific studies (e.g., hydrology).
  - Numerical weather prediction forecasts of precipitation can be used to improve HRPP in some locations and times (e.g., high latitudes).
- Sponsored by the International Precipitation Working Group (Working Group of CGMS) and endorsed by GEWEX

## Four Suites of Activities

- 1) Regional comparisons – National and regional rain gauge-radar networks
- 2) High time resolution comparisons - CEOP and other high quality reference time series
- 3) Very high quality field programs – NAME, KWAJEX, ...
- 4) "Big picture" comparisons – continental and global patterns, annual cycle, ENSO, etc.

## Status and Schedule

- 1) Self-supporting and self-organizing, with broad international participation
- 2) A number of presentations of early results will be made at the WWRP QPF05 Workshop in Boulder, CO in June 2005
- 3) International Precipitation Working Group will hold workshop to assess results and make recommendations to IGWCO in October 2006 in Melbourne Australia

# Asian Water Resource Management Capacity Building Workshop

## Objectives

- To exchange Information on best practices for applications of Earth observations for water resource management in Asia and other regions.
- To exchange Information on available data and tools for applications of Earth observations for water resource management in Asia.
- To consolidate regional requirements upon existing requirements for Earth observations and capacity building activities for water resource management in Asia.
- To discuss and propose a next step of the regional capacity building projects for applications of Earth observations for water resource management in Asia.

## The Results Expected

- Application and Promotion of available data and tools for applications of Earth observations for water resource management in Asia.
- Proposal for Earth observations and capacity building activities for water resource management in Asia.

## The Outline of the Meeting

- Date: 2006/9/26 Tue.~28 Thu.
- Place: Rama-Gardens Hotel, Bangkok, Thailand
- Cosponsorship: JAXA, AIT, GEO, WCRP/GEWEX, WMO, UNESCO, UNESCAP, ICHARM etc.
- Number of attendees: approx. 100

# Asian Water Resource Management Capacity Building Workshop

## Agenda Draft

- Day 1: Workshop for Policy Makers
  - Report of GEO,IGOS-P Water Cycle Theme
  - Activity Report of International Water Cycle Observation and Water-resources Management Capacity Building in Asia Area
  - Report of Present condition of Water Cycle Observation and Water-resources Management in each country in Asia Area
  
- Day 2: Workshop for Water Cycle Observation and Water-resources Management Working members
  - Report existing useful data, tools and examples for Water-resources Management in Asia Area
  - The Discussion by the Subcommittee and Organize the Proposals to the Local Project
    - Flood
    - Drought
    - Water Quality
  
- Day 3(AM): Workshop for Water Cycle Observation and Water-resources Management Working members (Continuation)
  - Report each Subcommittee and Wrap up5. Approach



# Coordinated Enhanced Observing Period

an Element of WCRP initiated by GEWEX

CEOP HP : <http://www.ceop.net>

### CEOP Objectives:

1. Water and Energy-Cycle Simulation and Prediction
2. Monsoon System Studies

### CEOP Strategy:

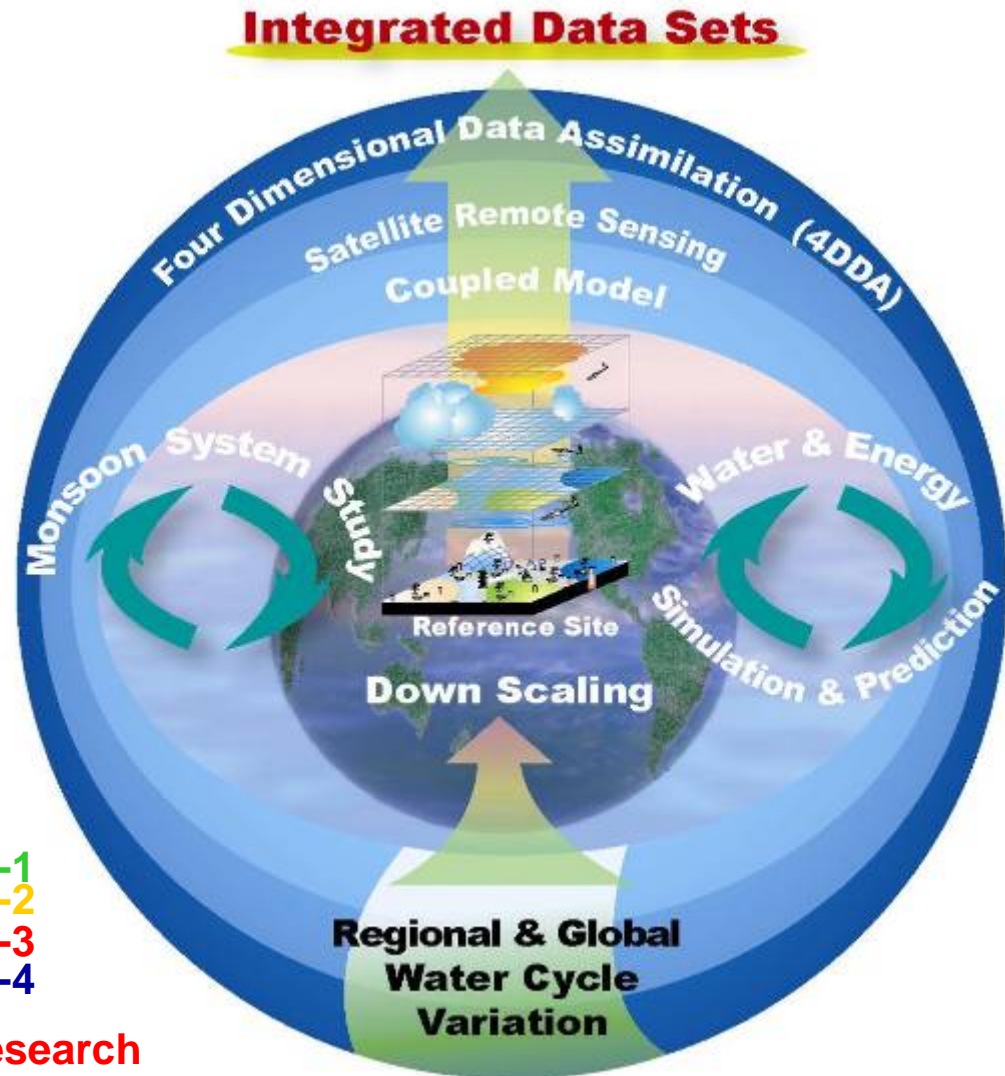
1. The first global integrated data sets of the water cycle with spatial consistency and climate variability, through
  - ( i ) the ground-based observations from the 36 CEOP reference sites
  - ( ii ) the satellite observations of the entire water cycle
  - ( iii ) the simulations of numerical models with physical consistency
2. Challenges to inter-connection of regional water cycles and Down-scaling applications to water resources

### CEOP Schedule: Phase 1

	2001	2002	2003	2004
The Preliminary Data period	1 July	30 Sep		
The Buildup phase		1 Oct	30 Sep	
The First Annual Cycle period			1 Oct	30 Sep
The Second Annual Cycle period				1 Oct 31 Dec

EOP-1  
EOP-2  
EOP-3  
EOP-4

Data Collection:2001-2004 / 2005-2007: Research

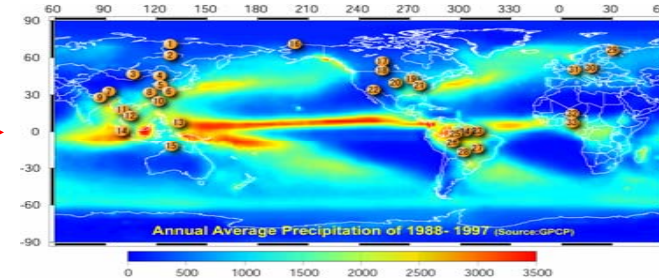


Three unique capabilities has been established and are functioning

**1. Convergence of Observations:**

→ **In-situ observation data:**

**35 reference sites over the globe**



→ **Satellite observation data:**

- **ADEOS-II: GLI** (Radiance, Precipitable water, SST, Snow grain size, Aerosol optical thickness, Cloud parameters, Cloud liquid water, 1km surface reflectance, Vegetation index), **AMSR** (like AQUA AMSR-E)
- **AQUA: AMSR-E** (Brightness temp., Soil moisture, Snow water equivalent, Rain rate, Water vapor, Cloud liquid w., SST, Sea surface wind speed), **AIRS** (request submitted), **MODIS** (request submitted)
- **DMSP: SSM/I** (Brightness temperature)
- **GMS-5: VISSR** (Brightness temperature, Albedo)
- **GOES-9: VISSR** (Brightness temperature, Albedo)
- **ENVISAT: ASAR** (request submitted), **MERIS** (request submitted)
- **NOAA: AVHRR**
- **TERRA: MODIS** (request submitted)
- **TRMM: TMI** (Brightness temp., Rain rate profile, Surface rain), **PR** (Rain rate profile, Surface rain)

- Global fields**
- Five monsoon regions subsets**
- 250x250 km subsets around reference sites**

→ **Model output data:**

Currently **12 contributing NWP and Data assimilation Centers: BMRC** (Australia), **CPTEC** (Brazil), **ECMWF** (Europe), **ECPC** (USA), **EPSON Meteo** (Italy), **JMA** (Japan), **MSC** (Canada), **NASA-GLDAS**, **NASA-GMAO**, **NCEP** (USA), **NCMRWF** (India), **UKMO** (UK)

- Analysis/Assimilation & Forecast products** → **Global** gridded model output & **MOLTS** – (Model Output Location Time Series) at reference site locations
- Operational & Reanalysis** system products; **Global & Regional** NWP systems

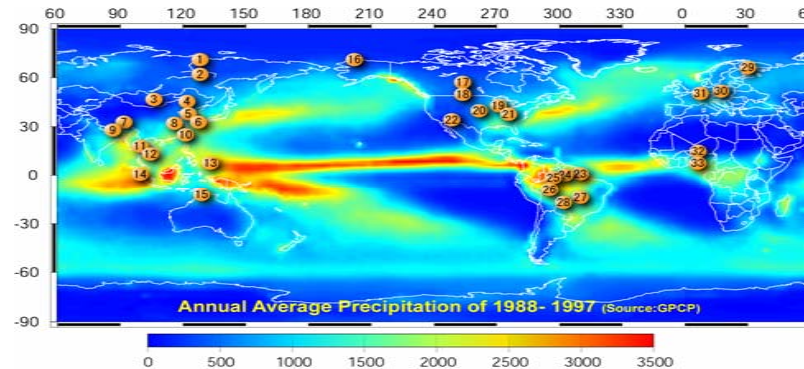
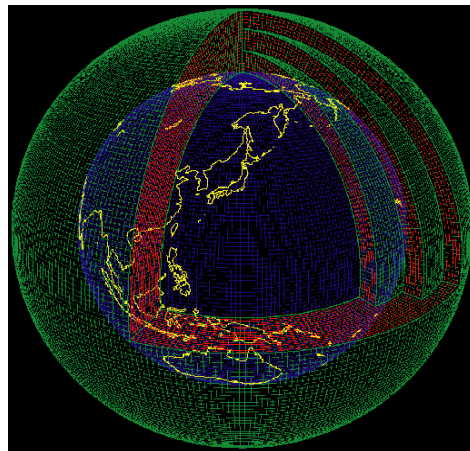
## Three unique capabilities

### 2. Interoperability Arrangement:

A well organized archiving system → data collecting, processing, storing, and disseminating

! Data sharing policy

! Metadata standard - ISO TC/211 19115



Model Output Data Archiving Center at **the World Data Center for Climate, Max-Planck Institute for Meteorology** of Germany

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

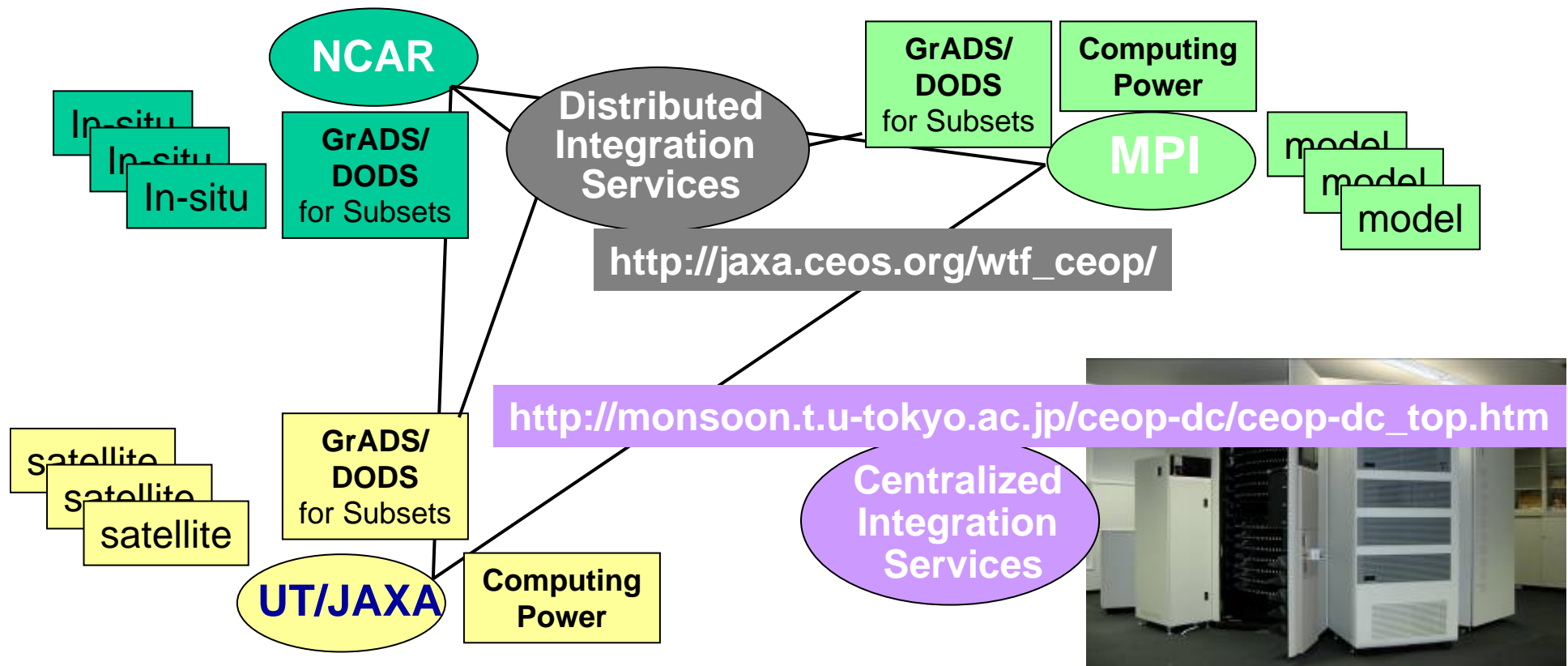
Data Integrating/Archiving Center at **University of Tokyo and JAXA** of Japan

Three unique capabilities

3. Data Management:

Distributed Data Integration System → available on-line since June 2005

Centralized Data Integration System → available on-line since June 2005



## Progress by May 2006

### Data components

- In-situ, Satellite, Model Output data → more than 50% completed – available on-line through the respective archives and the Centralized Data Integration System
- Significant portion of the archived data available also through the Distributed Data Integration System

### Science components

- CEOP special issue** of the Journal of Meteorological Society of Japan (JMSJ) to be published in February 2007 → 41 contributions submitted
- Publications in other journals, CEOP Newsletter (#1 – #9)
  - Water and Energy cycle Simulation and Prediction (WESP)**: Model output validation; GLDAS; GHP/CEOP model transferability study; Model intercomparisons
  - CEOP Inter Monsoon Studies (CIMS)**: Monsoon intercomparisons; Diurnal, intraseasonal and seasonal variability; Monsoon process study using models; Impacts of local and remote forcings on monsoon
  - Satellite**: Algorithm development and validation (*soil moisture, snow*); Data assimilation for land hydrology (*soil moisture, surface fluxes*)

**Phase 2 (2005 – 2010) activities initiated**



## CAPACITY BUILDING IN LATIN AMERICA

### "EARTH OBSERVATIONS IN THE SERVICE OF WATER MANAGEMENT"

October 26-28, 2005, Buenos Aires, Argentina



Programa hidrológico internacional



## **Objective:**

**To bring together those involved in the activities of water management in Latin America with the Earth observation data providers, in order to create a suitable environment for the exchange of experiences and achievements between these two sectors, and to show the possibilities that current Earth observations tools offer today to the field of water management.**



## **Participants:**

Water services,  
hydrological services,  
agricultural services,  
universities, international  
and regional programs and  
space agencies

# Working Groups

Participants were divided into three working groups:

- *Surface Water Availability and Cryosphere*
  - *Water Quality and Groundwater*
  - *Flooding*
-

# Working Groups

- Problems identified:
- Difficult access to ground information that can enable the validation and calibration of satellite data, due to: insufficient coverage of ground networks in some countries or the high cost of the data in countries where ground networks are operated by private organizations.
- Need to improve use of existing information both by facilitating access to the data and expanding current capacities for their application
- Lack of centralized databases regarding water issues in the countries.
- Need for more integrated work between countries

# Working Groups

- Snow: Use of daily information from satellites as GOES, NOAA-AVHRR, MODIS and SAC-C
- Water quality: access to P and L band sensors, hyperspectral sensors, build surface indicators that can be correlated with satellite measurements, create new models, explore GRACE technology
- Flooding: increase satellite spatial resolution for urban studies applications ( $<1\text{m}$ ), develop radar satellite technology to ensure all weather monitoring, generate DEM and risk mapping at regional level validated by local technical teams that integrate the information from satellites dynamically, request the operational continuity of Landsat type missions to ensure coverage to enable continuation of monitoring of water resources

# Workshop Statement (1)

**Given the need to strengthen existing observational programs and to bring more integration to information services in support of water management in Latin America, the workshop recommends that programs be developed at regional and national levels to advance the effective use and sustainability of water in the region. These programs should give support to the development of activities necessary to strengthen and/or generate integrated information systems in support of 1) efficient and effective use of the water resource (eg quantification, conservation and other multiple uses) 2) the management and monitoring of the consequences of the increasingly intensity and frequency of excesses and deficits and 3) taking advantage of the space based observational capabilities that have been developed during the past few decades.**

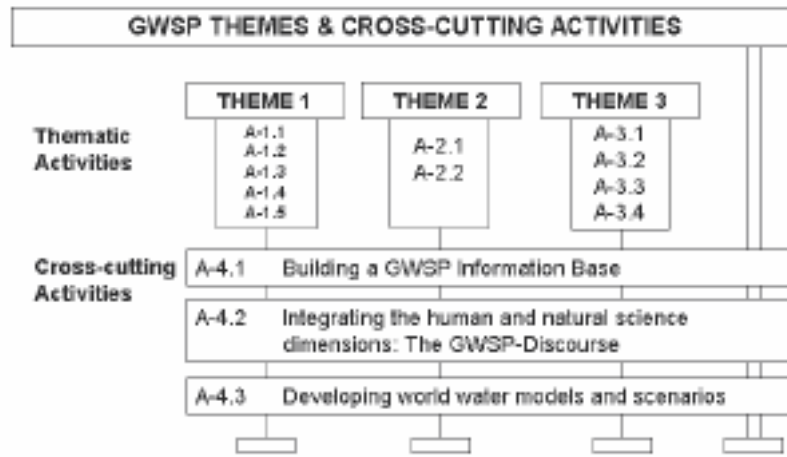
**It is further recommended that the development of these regional Earth observation programs take advantage of the current and emerging programmatic and institutional structures in the countries of the region, as well as the structures of GEO, CEOS, IGWCO, EOPA and regional UN programs.**

# Workshop Statement (2)

**To ensure that the data provided by these systems are used effectively and efficiently in water management, it is recommended that special efforts should be directed at placing the subject in the agenda of the governments through socio-economic and environmental studies, which would help in achieving greater political support for these developments. This entails performing environmental and socio-economic studies and development of training and educational programs for water managers and users and of public awareness..**

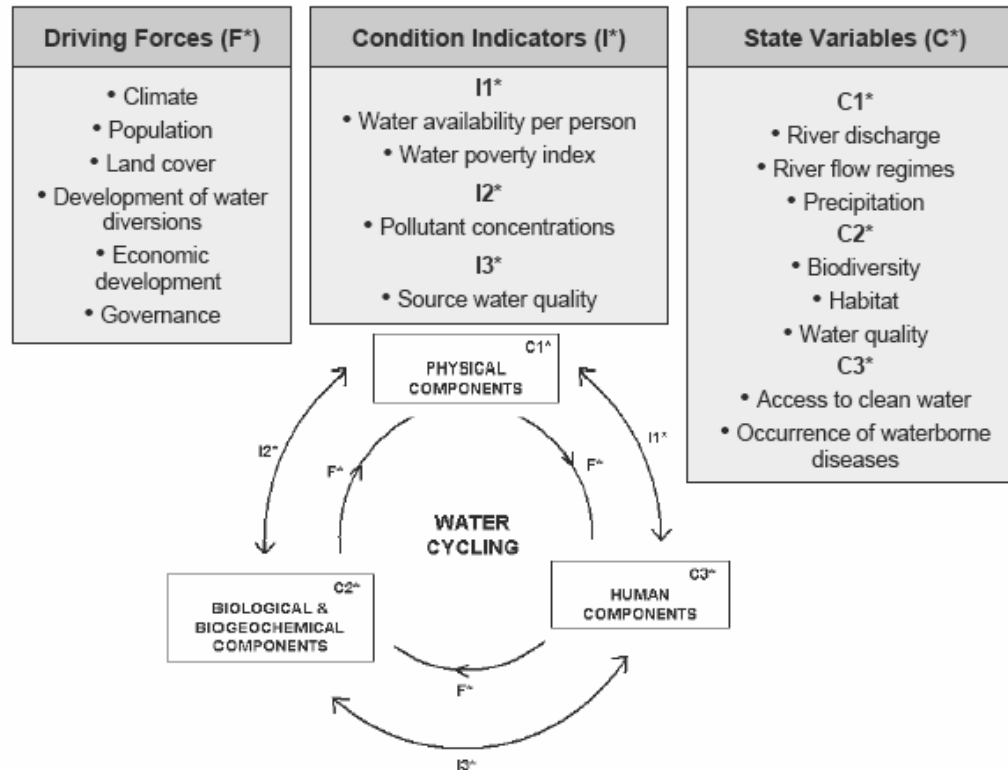
**One important element of this activity should be a capacity building activity modeled in part after the Tiger and Puma activities in Africa that builds on regional expertise and data services and is led by national and regional centers in Latin America in close coordination with international Earth observation agencies.**

# GWSP Water Atlas and Indicators: A Cross-cutting Activity

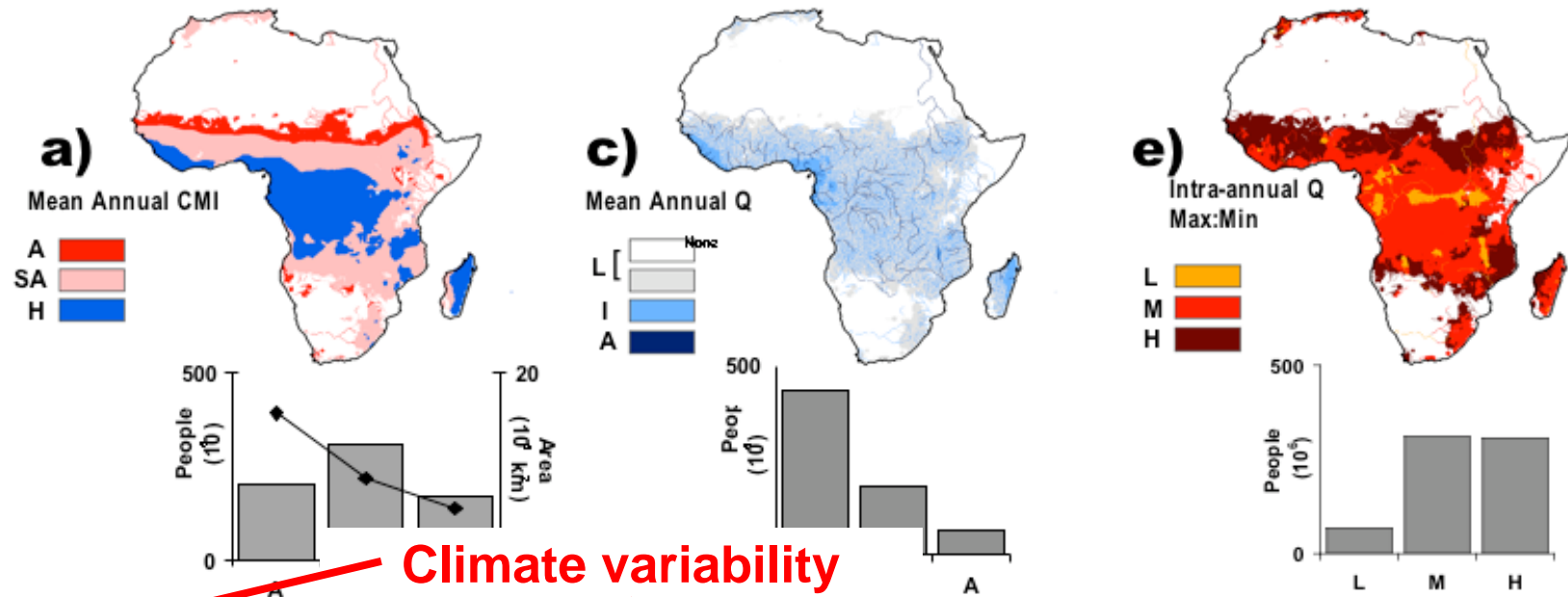


← Overall Structure

Water Cycle Information System



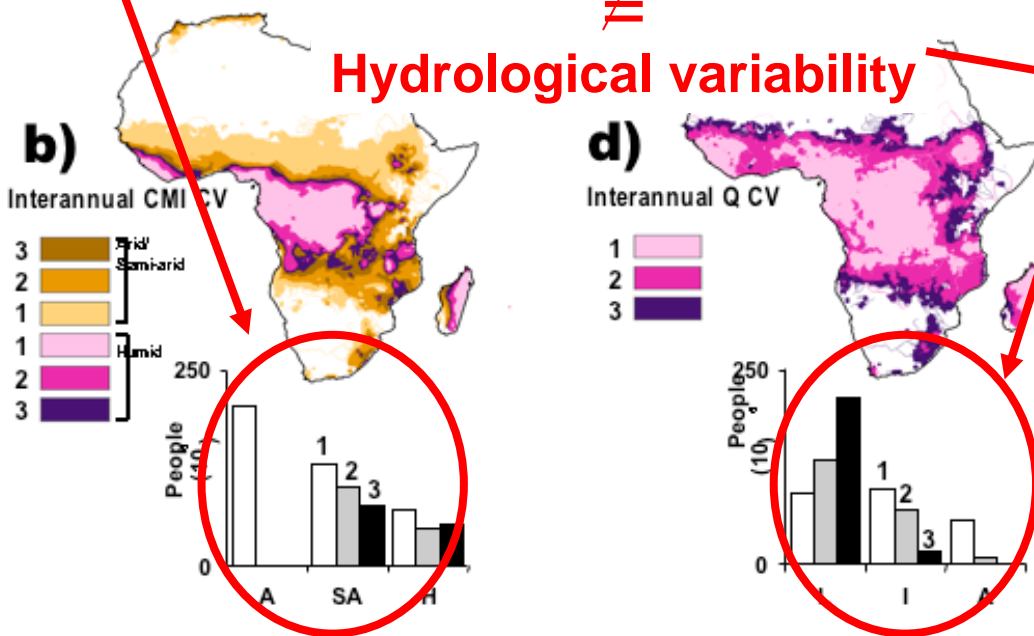
# Merging Geophysical and Social Indicators of Water Resource Stress



Climate variability

Hydrological variability

≠



Explanation			
<b>Mean Annual Climate Moisture Index (CMI) Classes:</b>			
A	Arid (-1 to -0.6)		
SA	Semi-arid (-0.6 to 0)		
H	Humid (0 to 1)		
<b>Mean Annual Discharge (Q) Classes:</b>			
L	Limited (<0.1 km <sup>3</sup> /yr)		
I	Intermediate (0.1 to 10 km <sup>3</sup> /yr)		
A	Abundant (>10 km <sup>3</sup> /yr)		
<b>Interannual Coefficient of Variability (CV) Classes:</b>	<b>Intra-annual Max:Min Discharge Classes:</b>		
1	<0.25	L	Low (<5)
2	0.25 to 0.75	M	Moderate (5 to 50)
3	>0.75	H	High (>50)

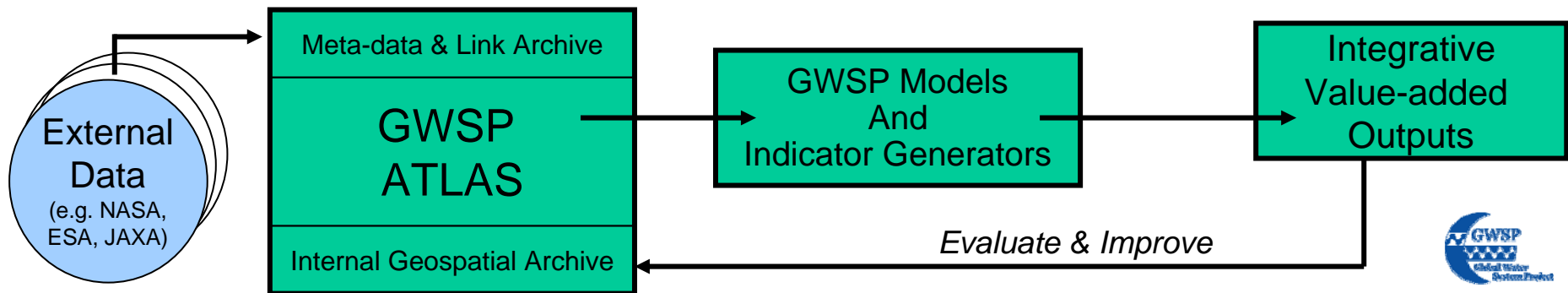
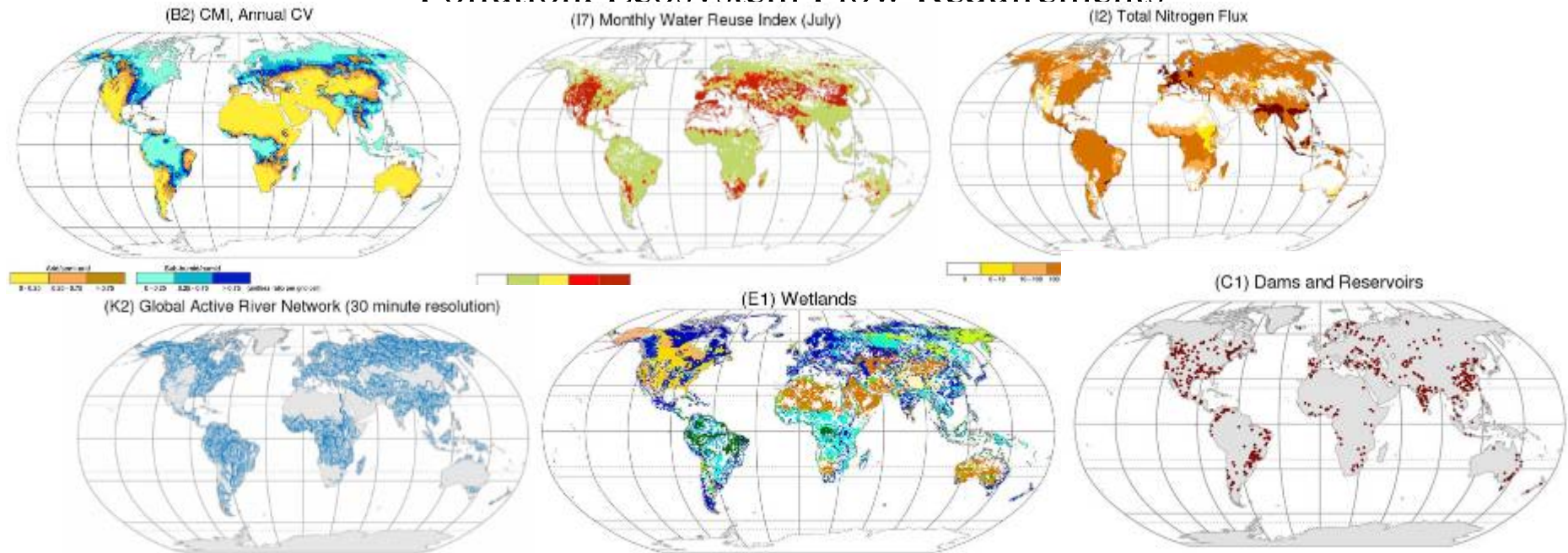
From: Vörösmarty et al. 2005, *Ambio*

# GWSP End-to-End Data Evaluation Study for Water Resources

(joint w/ IGWCO, GEWEX-GSWP/RAP, ICSU-IGOS Socio-Economics Group)  
*(Water-Related Demonstration Project for GEOSS)*

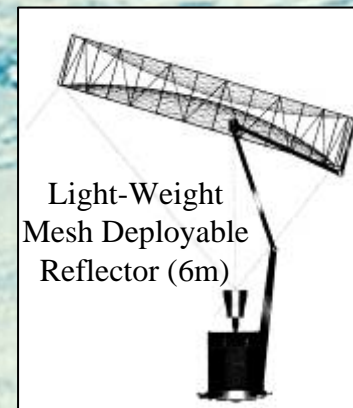
Links Geophysics of H2O, Governance, Vulnerability, Supply Limitation Imposed by

## Pollution, Ecosystem Flow Requirements



# HYDROS STATUS AND PROGRAMME

- 1.41 GHz Radiometer, 40 km footprint, (V, H, U) , Constant 40° Incidence
- 1.26 GHz Radar, 3 km footprint, (VV, HH, HV)
- Data fusion-disaggregation to achieve higher accuracy and spatial resolution
- 1000 km Swath, 1-2 Day Polar and 2-3 Days Equatorial coverage



# Events

- 2002: Hydros proposed to NASA ESSP
- 2003: Selected as an alternate mission to OCOS and Aquarius and supported for risk reduction
- 2004: Letter authorizing mission formulation
- 2005: Change in NASA senior level administrators
- 2006: Letter stating that Hydros was always an alternate mission and with OCOS and Aquarius approved (and no budget) it was now cancelled
- What do we do now?

# What Happens Next?

- Refresh of science community (Workshop 3/7/06)
- What impact will the NRC report have?
- Will there be an ESSP? Earliest FY08...

# NRC Decadal Study

- In response to requests from NASA, NOAA, and the USGS, the National Research Council began a decadal survey of Earth science and applications from space.
- The guiding principle is to set an agenda for observations in support of Earth science and applications from space.
- Among the key tasks are to:
  - Develop a consensus on the top-level scientific questions that should provide the focus for Earth and environmental observations in the period 2005-2015; and
  - Develop a prioritized list of recommended space programs, missions, and supporting activities to address these questions.
- Report due late in 2006.

# NRC Decadal Study (2)

- No one is going to commit to anything until the results are known
- It is expected that these will shape NASA's program, however, they are not binding
- ESSP will not go forward until results are known (FY2008 anyway)

# Role of Future Missions

- Can NASA develop more formal relationships with ALOS and SMOS and support a US team?
- With no Hydros, can SM as part of Aquarius be revisited?
- Can NASA develop more formal relationships with GCOM-W?
- Are there was to develop formal partnerships for any NEXT generation missions?
- What does the US have if NPOESS drops CMIS!



# Development of a Global In-Situ Soil Moisture Network

P.J. van Oevelen

T.J. Jackson

And many others!!



# Rationale

- No current global network
- Soil Moisture regarded as (emerging by GCOS) key variable
- Temporal change is more important than spatial representation
- Data Assimilation
- Earth Observation Validation/calibration
- EO does not give soil moisture profile information



# Measurement Protocol

- Uniformity
- Representative
- Consistency
- Cross-Calibration/Validation

• Important because time series are of essence  
(limited number of stations)

- Enable unified instructions on installation and measurement procedure
- Discontinuity in series easier to take into account
- Full range of possible soil moisture values



# Operational

- Continuity
- Timely delivery –NRT?
- Automation
- Linked to Operation Forecast Centres (World Weather Watch)



# Connected to Existing Networks

- Flux networks (BSRN?)
- WMO Synoptic Network/World Weather Watch
- Build upon existing infrastructure
- Strengthen/Improve existing networks/prevent decline



# Strong User Community

- Involvement
- Support
- Interaction
- Application Fields
  - Earth Observations
  - Weather Forecasting
  - Climate
  - Climate Modelling
  - Agriculture
  - Water Resources



# Links to Other Programs

- WCRP - GEWEX & CEOP
- GCOS
- GEOSS
- FAO
  - GTOS
  - AGRYHMET
- UNEP
- UNDP
- Space Agencies
- EU etc



Asked ISMWWG to act as Custodian for soil moisture network

## GTN-H Global Terrestrial Network - Hydrology



WMO



IOC



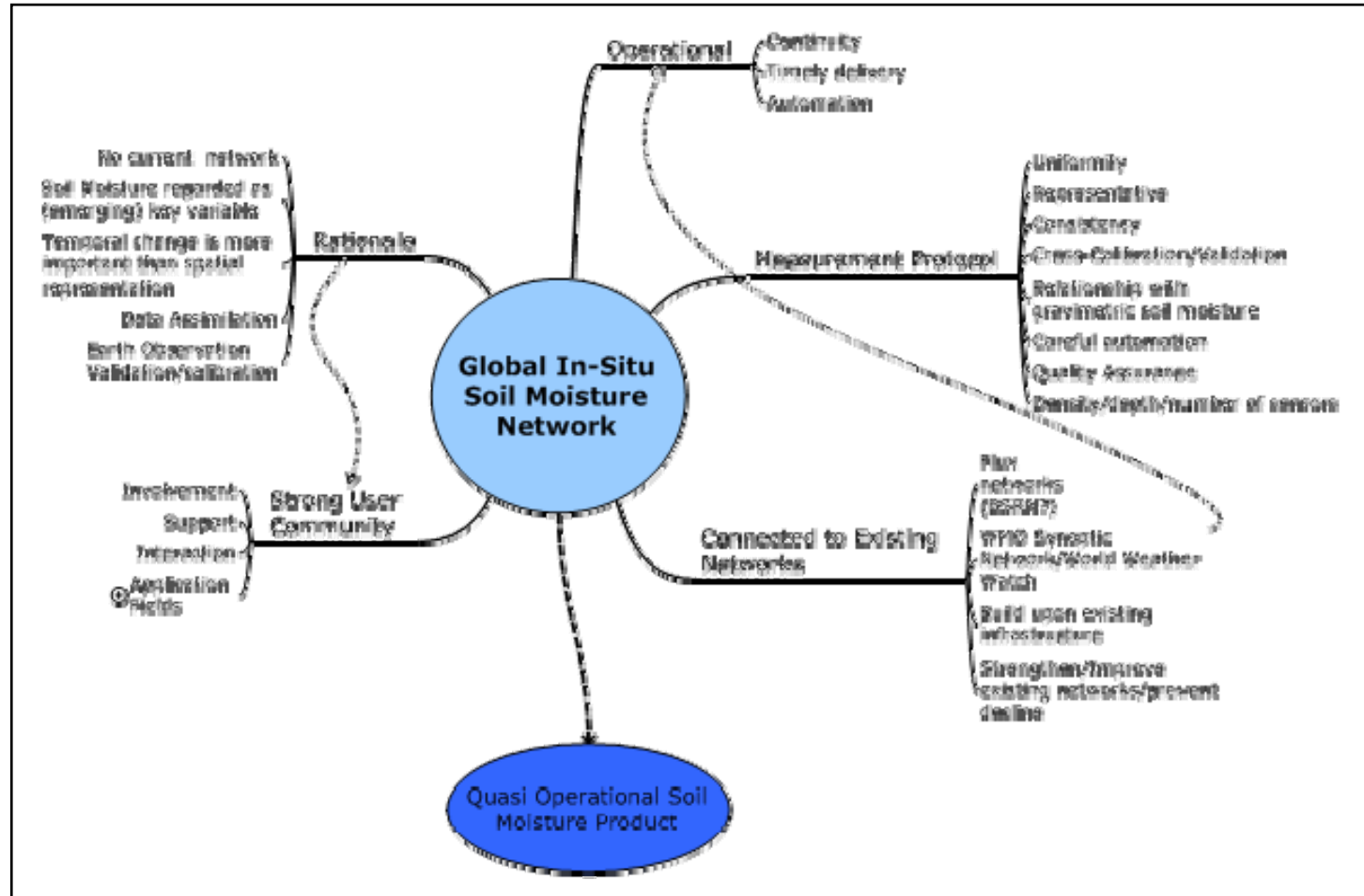
UNEP



ICSU



# Global In-Situ Soil Moisture Network





# ISMWG Workshop '06

March, 28 – 29, 2006 at ESA-ESTEC  
~35 Participants





# ISMWVG Workshop '06

- Objectives
  - Address aforementioned points
  - Current State of Affairs
    - Current Network Activities
    - Planned Activities
    - Historical Data
  - Recommendations for Protocol
  - Database development, management and hosting
  - Development of Roadmap
  - Formation of Task Group

# Outcome



- **Measurement Protocol:**
  - Cross-Validation (site specific, temp, soil texture & bulk density)
  - Relationship with gravimetric sm
  - Density/Depth of sensors
  - Units of representation
- **Network Design**
  - Density of network
  - Linkage of networks
  - Metadata



# What is next?

- Next meeting Spring, 2007 in Asia
- General:
  - Sustain coordination ISMWG and formalise structure
  - Broaden participation
  - Embedding
- 2006:
  - Publish workshop report (due)
  - Set-up web site
  - White paper
  - Data hosting
- 2007:
  - Venue for meeting
  - Data hosting



**Thank you for your attention**

# **Future Directions and Initiatives in the Use of Remote Sensing for Water Quality**

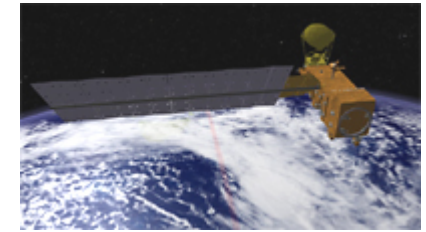


# Future Activities based on the GEOSS framework

## *Protect and Monitor Water Resources*

- *User Requirements*
- *Deployed Observing Capabilities and Commonalities (In-situ Networks, Aircraft, Space)*
- *Major Gaps and Challenges*
- *Institutional Partnerships:  
Interagency/International/Commercial*
- *Capacity Building (Training and building in-house expertise)*
- *Future EO Systems – Not Yet Deployed*
- *Recommendations*

## New Initiatives.....



# Develop a Freshwater Color Coordination Group (adapted from the IOCCG)

To be a focal point and voice of the freshwater water quality-remote sensing community and advocate the use of remote sensing technology for inland water quality science and management

- **To foster expertise in using freshwater-color data through capacity building.**
- **To provide a common voice for the user community**
- **To advocate the importance of the use of remote sensing to the global community.**
- **Optimize quality of data for calibration and validation**
- **Advocate the collection of essential surface water and atmosphere data.**
- **Facilitate merging and access to ocean-color data**



## **New Initiatives.....**

### **Multisensor Spaceborne Monitoring of Global Large Lakes: Towards an Operational Assessment of Trends in Water Quantity and Quality University of Wisconsin (NASA Grant)**

For a set of approximately 40 large lakes worldwide, produce satellite-derived maps showing fluctuations in area over the time of the study (and extending back to 2000 in some cases).

Evaluate the ability of the ICESat/GLAS instrument to provide accurate measurements of lake level, for the same set of 40 lakes. The US/Canada Great Lakes will be used as a validation site to assess the accuracy of GLAS estimates of lake elevation.

For a second set of lakes, acquire both field observations (from the GEMS database) and atmospherically-corrected satellite imagery. Classify the lakes using spectral and physical factors, and develop empirical models relating satellite measurements to water clarity and other in-lake conditions.

## New Initiatives.....

# Increased Capacity Building Efforts

## Proposed Workshop in Latin America

*Provide information on capabilities of remote sensing techniques for freshwater systems*

*Provide a basic understanding of needed expertise, equipment, associated software and costs to analyze the image data*

*Provide hands-on experience in processing/interpreting remotely sensed images*

*Obtain input/feedback from workshop participants on water quality information needs, hardware, software, training needs and course effectiveness*

## New Initiatives.....

# **An expert's workshop on space-borne and in-situ observations for water quality to determine requirements and state of present and future technology**

## **GEOSS Task WA-06-01**

Assemble experts from space agencies, research institutions and the user community to collaboratively chart a course for the future in this area of interest.

Format of the workshop will follow the functional components identified by the GEOSS Implementation plan. All of these components can be applied to the issue of water quality. They include:

- Interface with the user community and the decision support systems they use
- Collect earth observations (remote and *in-situ*)
- Manage data (includes data archiving, access, processing, modeling, communications and delivery)
- Sustain and enhance capacity (includes research, training, and development)
- Deliver information (tailored to the needs of the user community)

# Suggested Topics for a Water Quality/Remote Sensing Experts Workshop

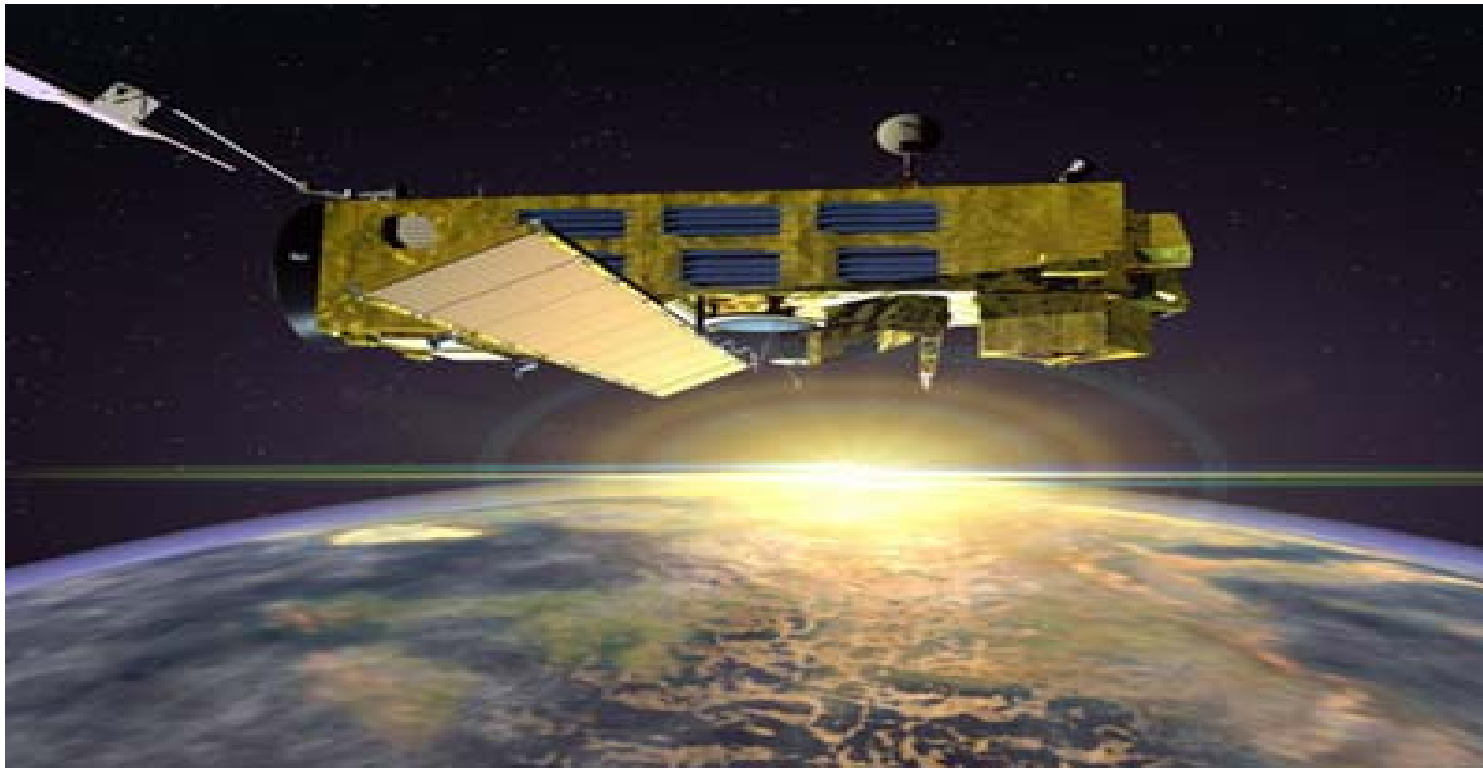
## (GEOSS)

- User needs and data gaps
- Platforms and sensor technology
- Current and planned satellites
- Radiometric, spatial, spectral and temporal resolution issues
- Parameters (Chlor-a, suspended solids, color, temperature, pathogen/health, habitat and aquatic vegetation, surrogates, indicators).
- Cataloging of case II spectral signatures
- Atmospheric correction issues
- Cal/Val issues
- New innovative technological approaches to water quality monitoring, *“thinking outside the box”*.
- Image processing software
- Optical modeling and available products
- Data sharing and interoperability
- In-situ water quality monitoring
- Current networks
- Data bases
- In situ technology
- Decision support tools
- Capacity building

# **WORLD METEOROLOGICAL ORGANIZATION (WMO)**

## **The Global Runoff Monitoring Project**

**A contribution to IGWCO --**



## **Rational:**

Global monitoring of runoff and lake storage is an important element of Integrated Global Observing Systems

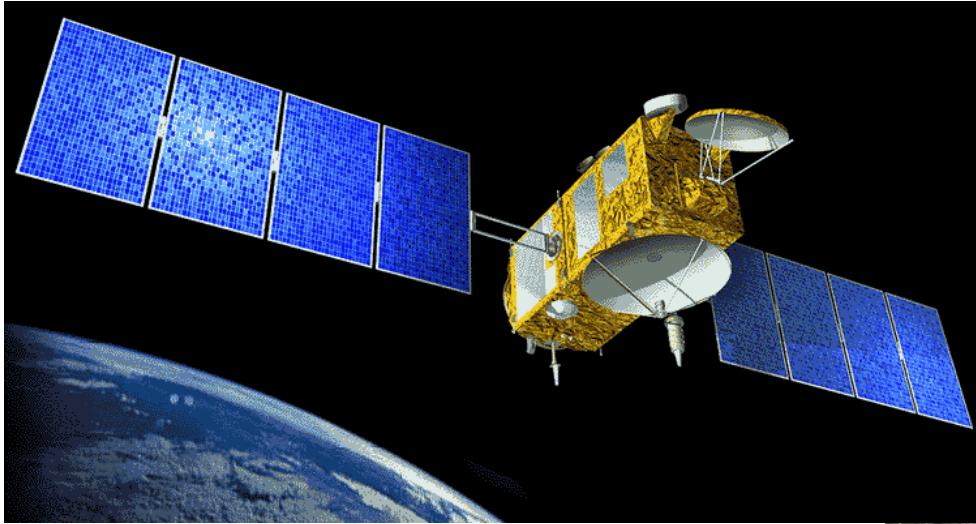
## **Objective:**

To provide Near Real-Time monitoring products of large scale rivers and lakes to observe and analyze surface runoff and lake storage variations and variability over time

## **Application** areas for Hydrological Services and research (examples):

Support to regional and continental scale modelling and data assimilation

Potential to provide critical early warning information on floods, hydrological drought and water resources assessment for management purposes



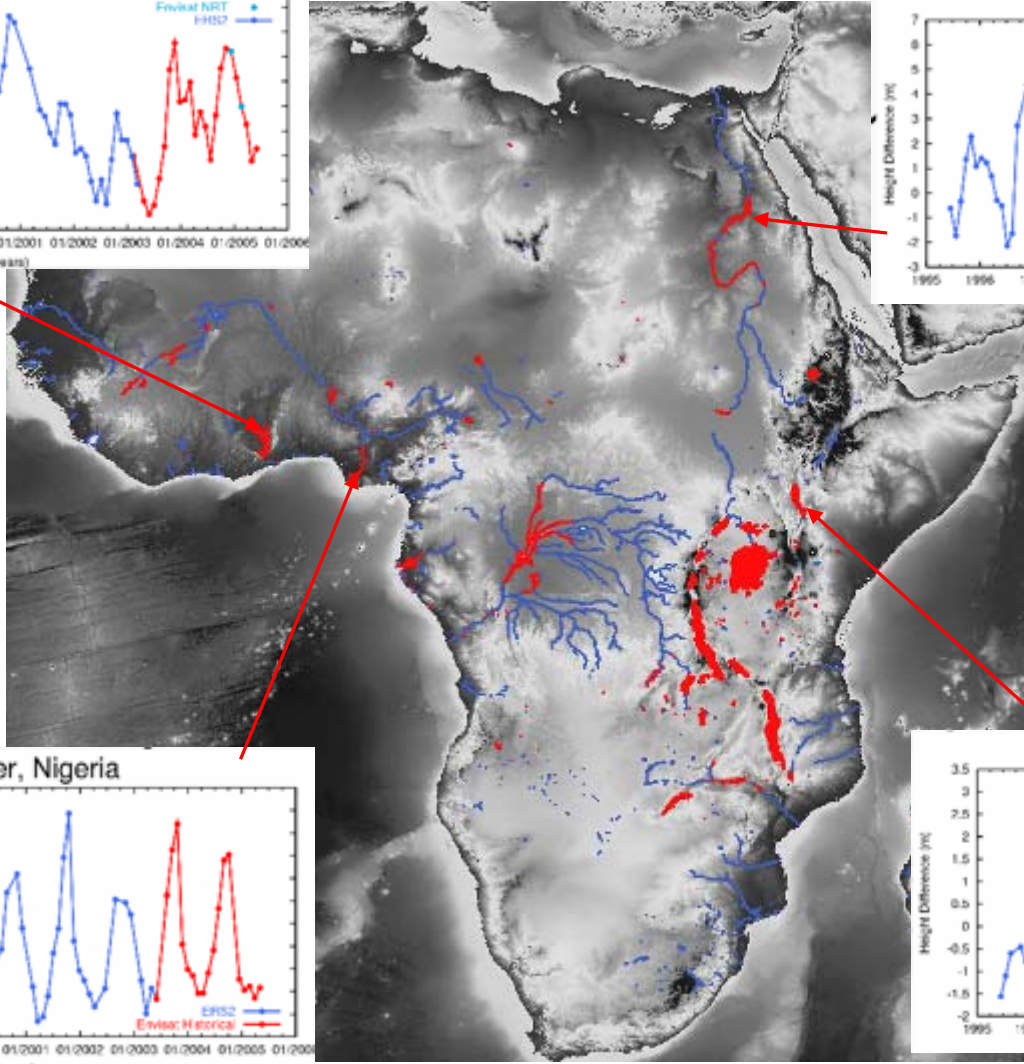
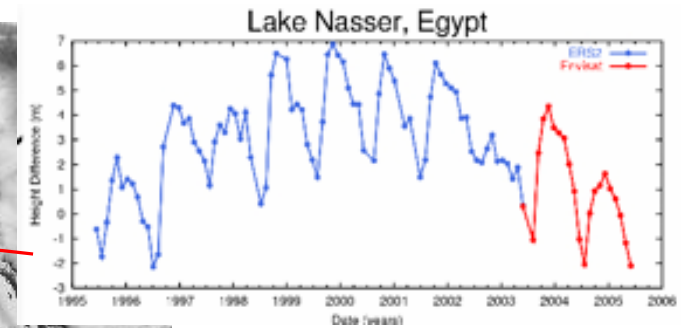
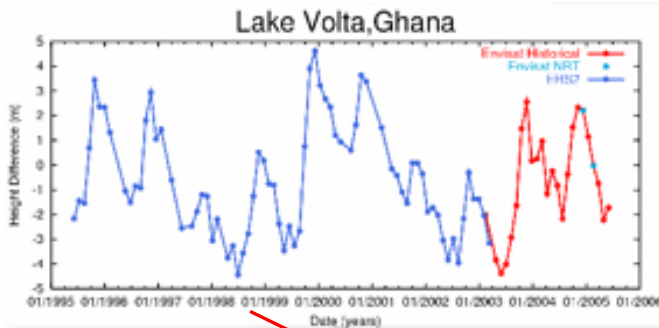
# Project Building Components

1. The project builds on ESA's "Rivers and Lakes" Project that utilizes ENVISAT Radar Altimetry;
  2. Science input is provided by De Montford University, UK in developing the high resolution radar masks and echo interpretation algorithms to convert surface water radar echoes into variations of water levels in rivers and lakes;
  3. Reference data sets to be provided by GRDC in terms of both historical runoff data series and future provision of reference terrestrial water-level observation of selected river gauges
- Core-partners for the project will therefore be ESA, De Montofrd University and GRDC but: *This is NOT a "closed club"!*
- → *Establishing close collaboration with the developing Water Level Recovery Mission (WatER)*

# SCIENCE AND APPLICATION ISSUES

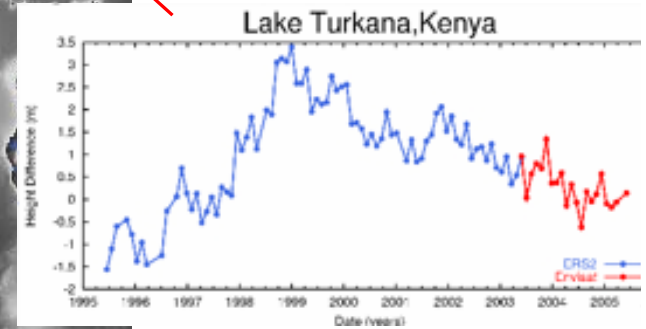
- Satellite altimeters used for years to measure inland water heights of a few special targets
- Existing missions:
  - ERS and Envisat instruments specially configured to operate over non-ocean surfaces; sample same location every 35 days
  - Topex and Jason-1 optimized for ocean, sample every 10 days
- Problem: inland water echoes very complex, hard to interpret to get range to surface
- Solution: design range of re-tracking algorithms to deal with different shapes

# THE RIVER AND LAKE MASK OVER AFRICA



Red indicates area where NRT products are currently generated

Blue indicates area where products may be generated in the future.



# **DEVELOPMENT OF A REGIONAL FLOOD INFORMATION SYSTEM IN THE HINDU KUSH HIMALAYAN REGION USING ALTIMETRY INFORMATION**

**PARTICIPATING COUNTRIES:**

**BANGLADESH**

**BHUTAN**

**CHINA**

**INDIA**

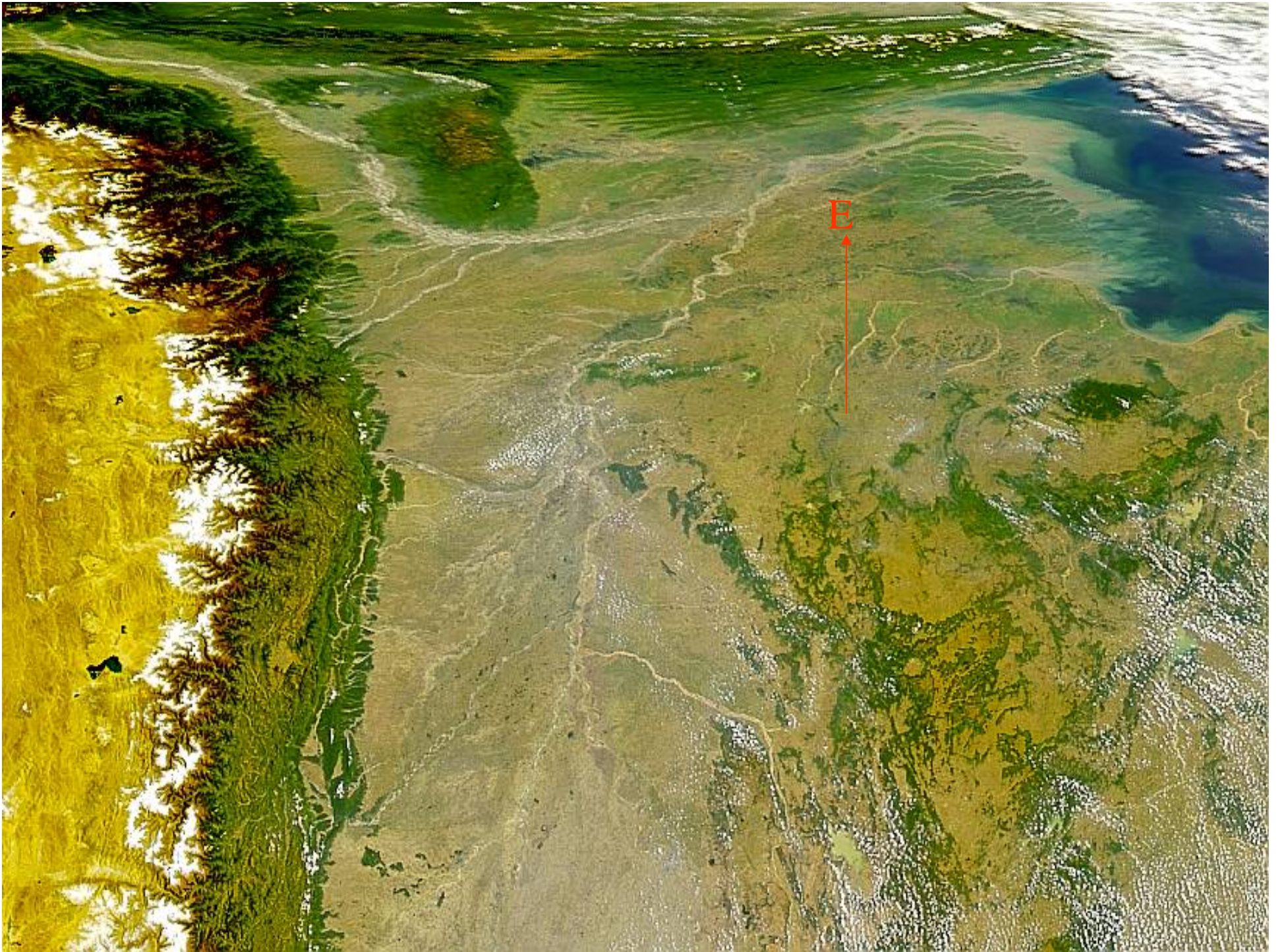
**NEPAL**

**PAKISTAN**

**Basin coverage:**

**Ganges – Brahmaputra –  
Meghna River Basins**

**...based on the HKH – HYCOS Project**



## **Tasks Ahead:**

- Create Task Team for the preparation of a project implementation plan based on existing projects and activities of the core partners with opportunities for linkages with additional partners
- Prepare 1 arc masks for priority areas including Asia
- Obtain gauge height time-series for selected rivers
- Obtain rating curves to convert gauge height into discharge
- Obtain bathymetric information for large lakes and reservoirs to calculate volume changes in storage
- Operationalize NRT products for new lakes/rivers

***Initial Development and Implementation Time Scale: 3 years***

# WHAT'S NEW FOR IGWCO IN 2006

- NEW LEADERSHIP IN THE IGWCO EXECUTIVE WITH WMO TAKING THE LEAD (COMPLETED).
- TWO CAPACITY BUILDING WORKSHOPS INCLUDING ONE IN SOUTHEAST ASIA AND ONE IN AFRICA.
- THE LAUNCH OF A JOINT GARS-UNESCO-IGWCO GROUNDWATER WORKING GROUP.
- A MARCH 2006 WORKSHOP (AT ESTEC) ON IN-SITU SOIL MOISTURE MEASUREMENTS (COMPLETED)
- A SPECIAL SESSION ON SPACE OBSERVATIONS FOR WATER MANAGEMENT AT THE WORLD WATER FORUM IV MEETING (COMPLETED).
- COORDINATION WITH GEO ON SEVERAL WORK PLAN GOALS INCLUDING ONE OR TWO WATER CYCLE WORKSHOPS IN 2007.
- A GEO "COMMUNITY OF PRACTICE" FOR THE WATER CYCLE

	GOALS	LEADERS	ACTIONS	COMM TO DEADLINES	FUNDING SOURCE
CEOP II	FINAL	Toshio Koike Sam Benedict	Phase II plan under review	YES	JAXA, MEXT
INTEG. PRECIP	YES	Phil Arkin	WORKSHOP HELD	Some	NO
GWSP INFO.	<b>FAST TRACK PROJECTS</b>	Charles Vorosmarty	Fast track Activities identified	Driven by GWSP Agenda	NASA seed Money
ISMWG	YES	Tom Jackson	Coordination Ongoing	YES	NASA
WATER Q/ INDICATOR	DRAFT	Pilar Cornejo, Steve Greb	Workshop Proposals under Development	YES	GEO
CAP BLDG	YES	Ana Medico	CB Workshop in BA in Oct. '05	YES FOR ERN ASIA AND AFRICA	JAXA, ESA, WMO, GEO UNESCO, ETC

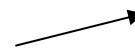
## ICSU RECOMMENDATIONS TO IGOS-P

- Deepen use of socioeconomic data
  - Include socioeconomic data experts on IGOS theme teams.
- Create more georeferenced socioeconomic databases
- Consider expanding IGOS Partnership to include organizations with socioeconomic data expertise

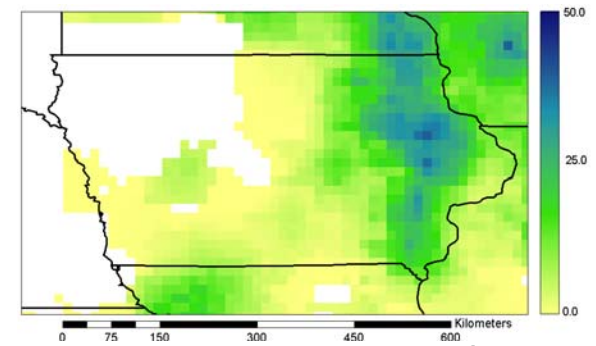
AN IGWCO RESPONSE:

DEVELOPING PLANS FOR A STUDY OF SOIL MOISTURE DERIVED FROM PU/AMSR-E DATA AND POVERTY WILL BE EXPLORED.

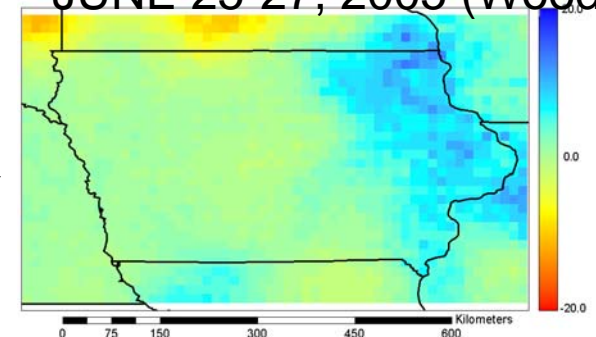
AMSR-E  
PRODUCT



CHANGE IN PRECIPITATION

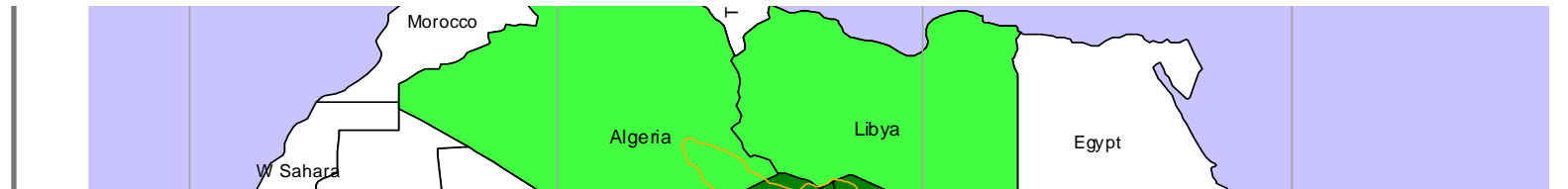


JUNE 25-27, 2005 (Wood)



CHANGE IN SOIL MOISTURE

# A CAPACITY BUILDING PROJECT FOR SOUTH AMERICA



## Mission

“Develop sustainable earth observation information services for integrated water resources management in developing countries, with a focus on South America”

## Key requirements

Sustainability → strategic partners needed

Appropriateness → level of technology must fit user’s capabilities

User engagement → driven by South American users

## Main Sponsor

CONAE, others possible

