WCRP/GEWEX/CEOP

(AND THEIR IMPACT ON GEOSS AWCI)

Presentation by S. Benedict 3rd GEOSS Asian Water Cycle Initiative Symposium, Beppu, Oita, Japan, 2-4, December 2007

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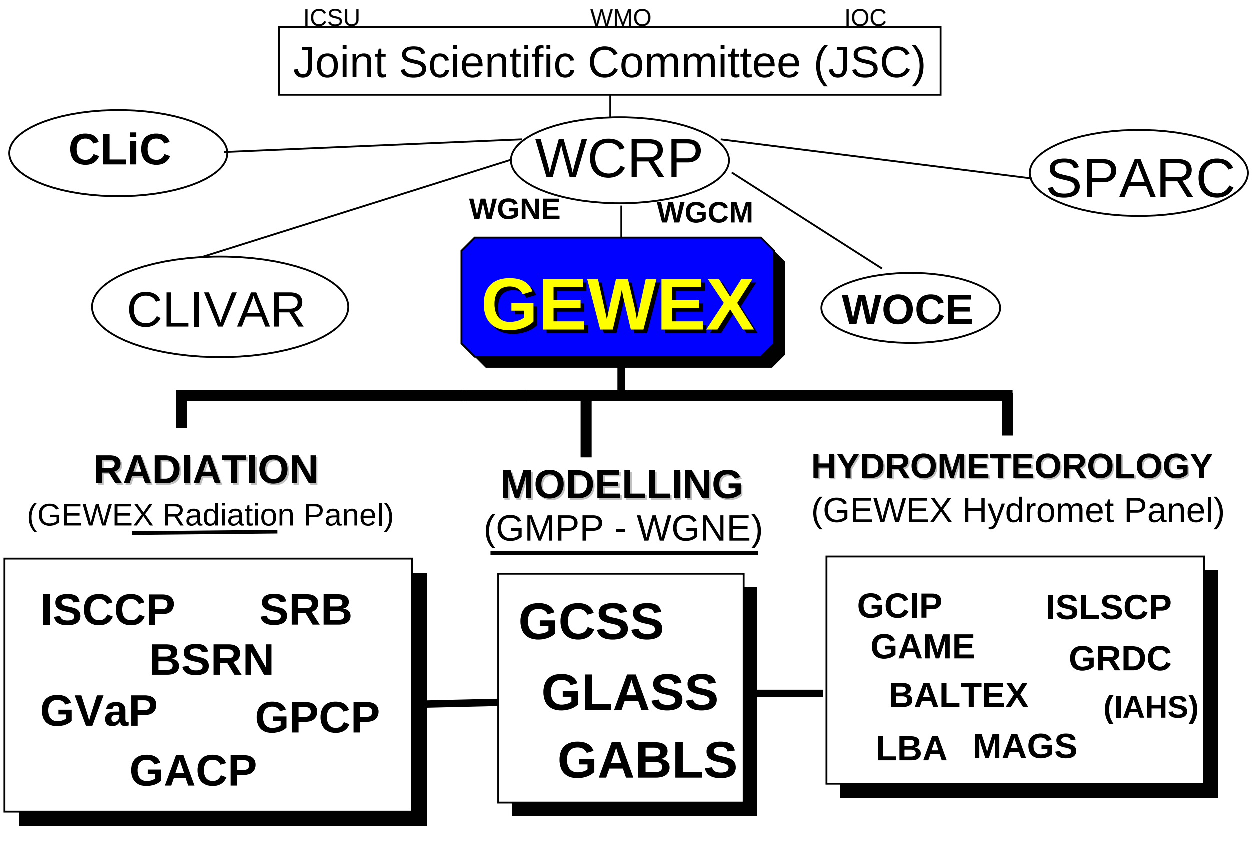
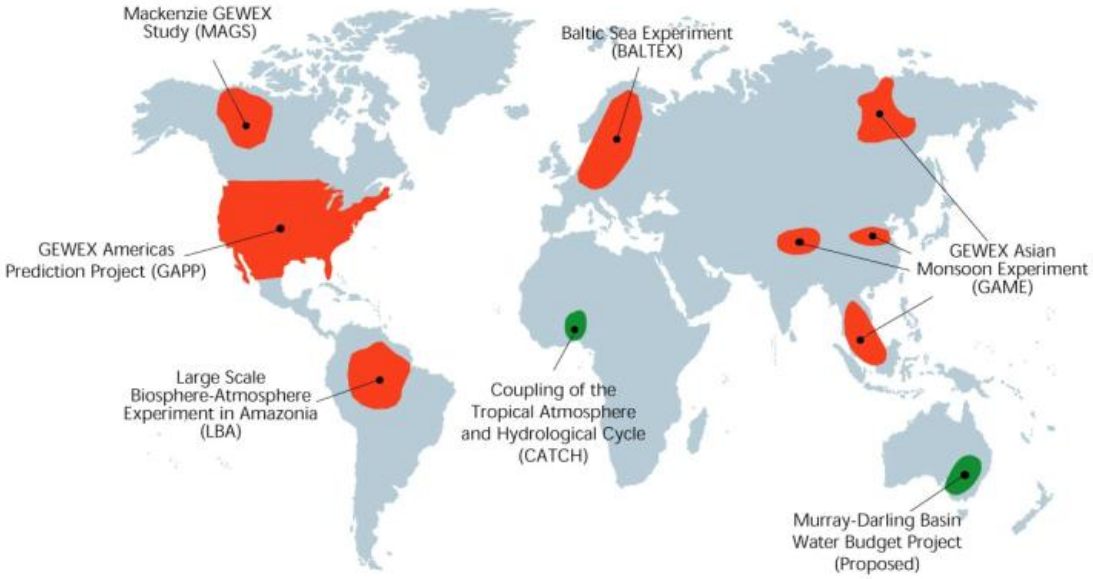
THE GEWEX HYDROMETEOROLOGY PANEL (GHP) WAS FORMED

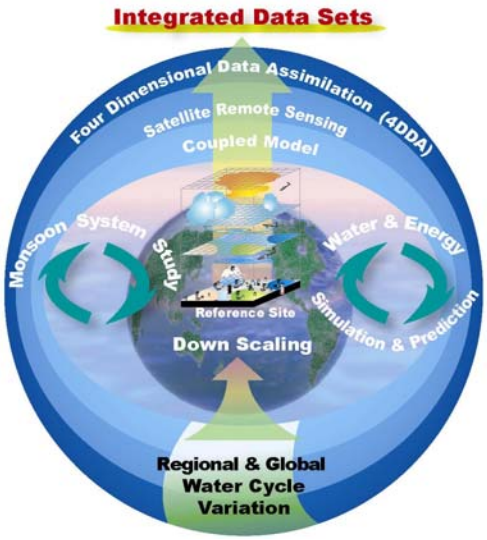


Continental-Scale Experiments



GEWEX established the GHP beginning in 1994 to coordinate the wide range of regional interests and activities involved in the GEWEX Continental Scale Experiments (CSEs).

The overall GHP mission was to “demonstrate the capability to predict changes in water resources and soil moisture at time scales up to seasonal and interannual as a component of the World Climate Research Programme’s prediction goals for the climate system.”



The Coordinated Enhanced Observing Period (CEOP) was part of the initial GHP strategy to help coordinate the diverse GEWEX CSE activities to understand and model the influence of continental hydroclimate processes on the predictability of global atmospheric circulation and changes in water resources.

As a contribution to 'CEOP', the CSEs identified high-quality in situ measurements (many of these are tower sites) at several global locations that would be able to provide coordinated global measurements during the period 2001-2004.

THE REQUIREMENT FROM WCRP/GEWEX WAS TO HAVE:

COORDINATED OBSERVATIONS AND INTEGRATED DATA TO TAKE ADVANTAGE OF:

(1) REFERENCE SITES IN GEWEX CONTINENTAL SCALE EXPERIMENTS (CSEs),

(2) SPACE AGENCY PLANS FOR A LARGE SUITE OF EARTH OBSERVATION SATELLITES AND

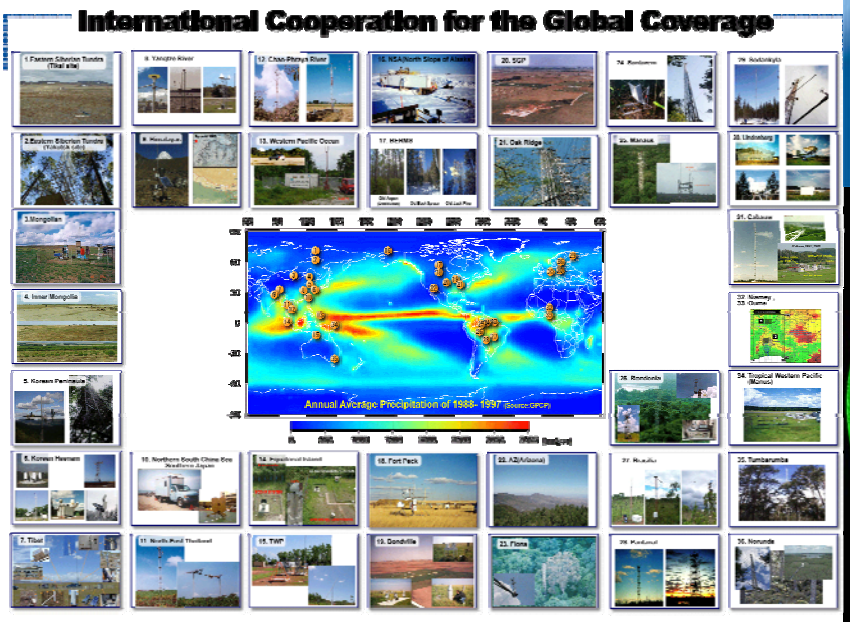
(3) IMPROVED MODEL AND PREDICTION TOOLS;

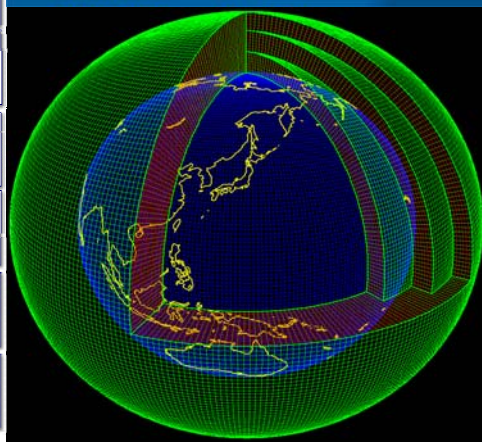
AND SO THE COORDINATED ENHANCED OBSERVING PERIOD (CEOP) WAS CREATED BUT CONTINUTED ITS RELATION WITH DATA AND SCIENCE ELEMENTS OF THE GEWEX HYDROMETEOROLOGY PANEL (GHP).

Coordinated Enhanced Observing Period
Three Unique Capabilities

Convergence of Observations

A Prototype of the Global Water Cycle Observation System of Systems

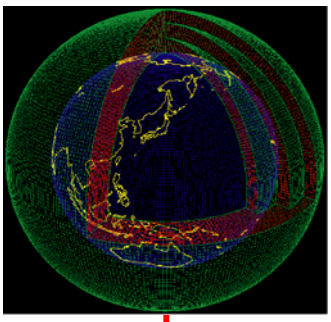


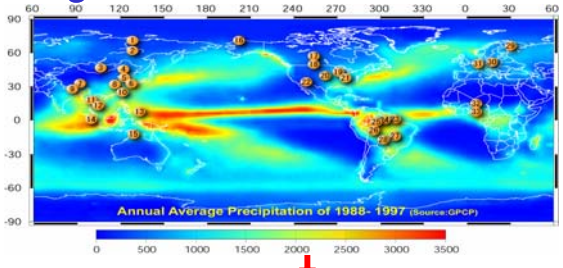


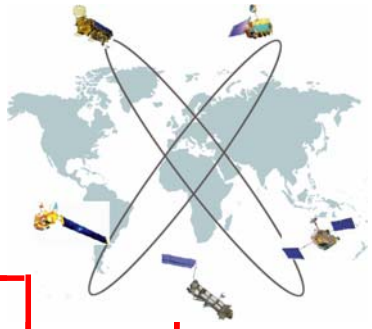
Coordinated Enhanced Observing Period
Three Unique Capabilities

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

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

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

SCIENTIFIC ACTIVITIES OF CEOP PHASE1

MODEL OUTPUT | **REFERENCE SITES** | **SATELLITES**

Global
Regional
Local

DATA INTEGRATION & DISSEMINATION

Diurnal
Intra-seasonal
Seasonal

WATER & ENERGY SIMULATION & PREDICTION (WESP)

Water and Energy Budget Studies

Global Land Data Assimilation Systems

Inter-CSE Transferability Study

CEOP INTER-MONSOON STUDY (CIMS)

Coordinated Model Integration Process

Monsoon System Inter Comparison

LONG-TERM GUIDING GOAL

To understand and model the influence of continental hydroclimate processes on the predictability of global atmospheric circulation and changes in water resources, with a particular focus on the heat source and sink regions that drive and modify the climate system and anomalies.

An Element of WCRP initiated by GEWEX: Measuring Progress in CEOP Phase 1

CEOP Tokyo WORKSHOP'05
43 Extended Abstracts
29 Oral Presentations &
14 Poster Presentations

→CEOP Special Issue of Journal of Meteorology Society of Japan (JMSJ)
Paper Submission : 20 Feb. '06
Publication: Feb. '07

Water and Energy Simulation and Prediction (WESP): 10
Water and Energy Budget, Data Assimilation, Model Development/Transferability

CEOP Inter-Monsoon Study (CIMS): 6
Data Analysis, Data Integration, Model Simulation, Satellite Remote Sensing

Satellite Remote Sensing: 2
Radiative Transfer Model, Algorithm Development/Validation/Application

Data System: 6
Quality Checking System, Archive/Integration/Dissemination Systems, Meta Data

NWP and Data Assimilation Centers: 5
BMRC, CPTEC, JMA, NCMRWF, EPCP, GLDAS, GMAO, Intercomparison

CONCLUSION:

CEOP Phase 1 was an unequivocal success:

- CEOP had developed a viable integrated observation/modeling, data management/science system for water and energy cycle studies
- CEOP had facilitated model evaluation with multi-platform observations, promoting active participation from operational centers, research institutes, and satellite agencies.
- CEOP Increased synergy between satellite, in-situ observations and assimilated data for both regional and global water cycle studies
- CEOP Promoted international organization and coordination of water cycle data processes, research through reference site participations and workshops.
- CEOP Stimulated and coordinated regional monsoon water cycle field campaigns, model intercomparison studies, regional water and energy cycle studies , e.g. draft of a white paper " Aerosol-water cycle interaction: a new challenge to Monsoon climate research" based on an CEOP sponsored workshop in Xining, China, July 2006.

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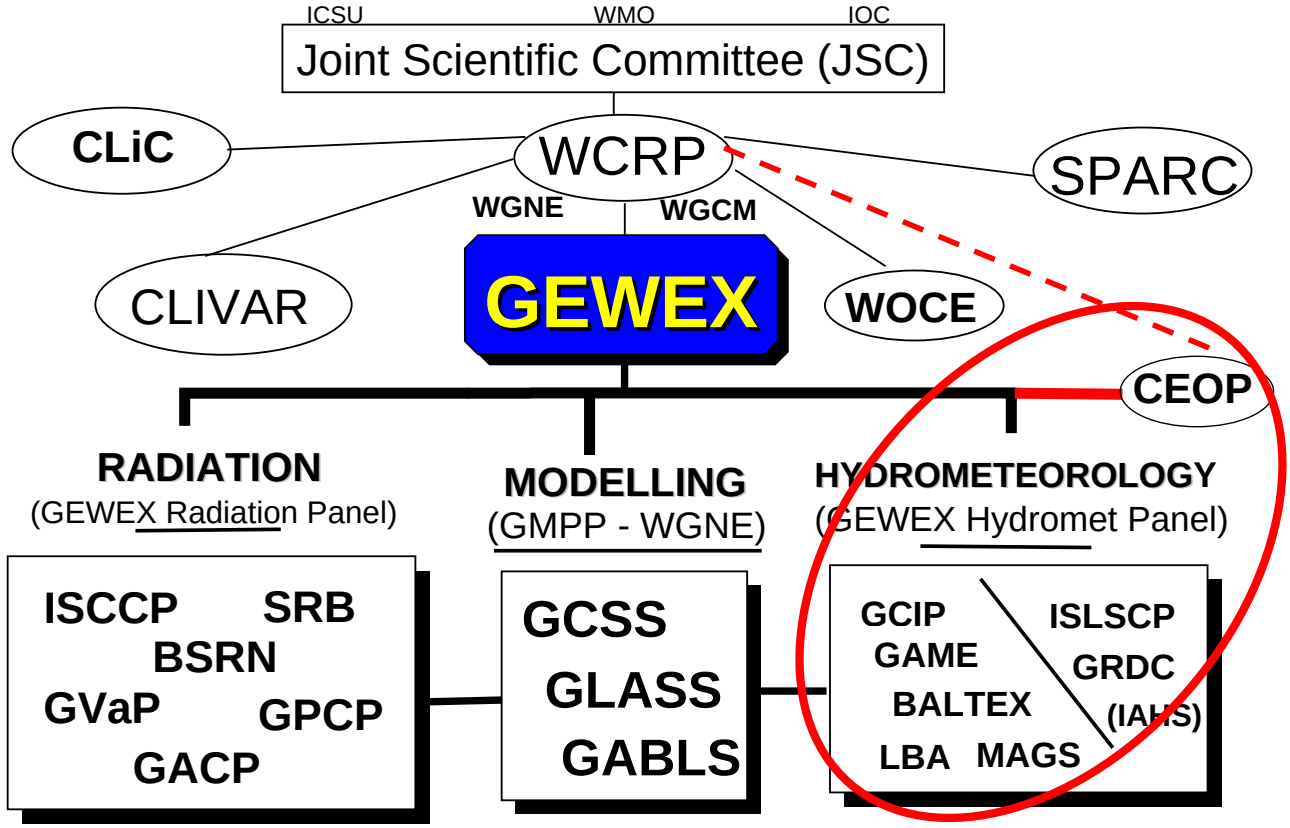


JSC Recommended Action Items for GEWEX

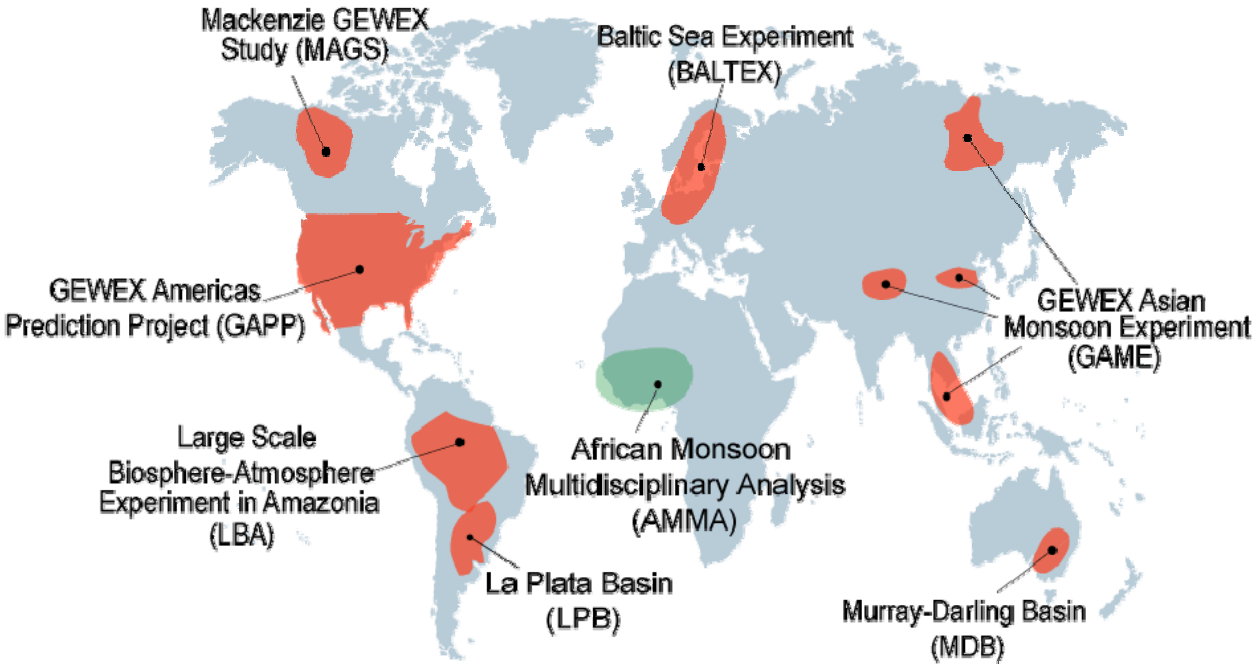
WCRP JSC Meeting Recommendations March 2006:

- "JSC approved the plan for CEOP phase II,

  subject to a technical review of the science plan by experts from each WCRP project, in order to propose ways to maximize synergies and to prevent potential overlaps with existing WCRP activities."

•"GEWEX should propose to next JSC a plan to reorganize its structure in order to better integrate CEOP agenda in its panels."

Continental-Scale Experiments



RHPs

Global Energy and Water Cycle Experiment GEWEX WCRP

A Project of Projects

Panel Functions

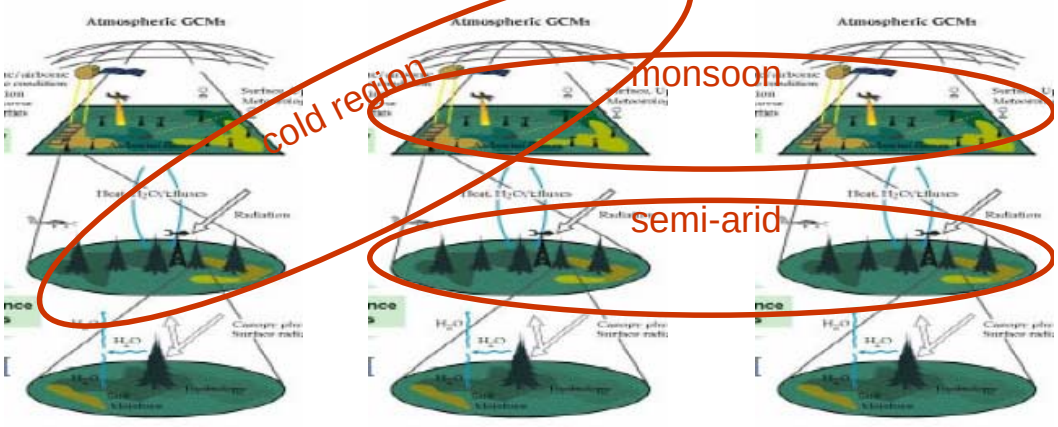
Data Infrastructure

coordination

CEOS Space Agencies

NWPCs

Coordinated Energy and Water-Cycle Observations Project



GEWEX RHPs

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Global Land Data Assimilation Systems

Regional Climate Models

Semi-arid Region Study

Cold Region Study

Stable Water Isotope Intercomparison

CEOP Analyses Intercomparison Project

Extreme Events Impact Analysis Project

CEOP INTER-MONSOON STUDY (CIMS)

Coordinated Model Integration Process

Monsoon System Inter Comparison

Aerosol - Monsoon Water Cycle Interaction

High Elevation Study

H A P

COORDINATED ENERGY & WATER CYCLE OBSERVATION PROJECT (CEOP)

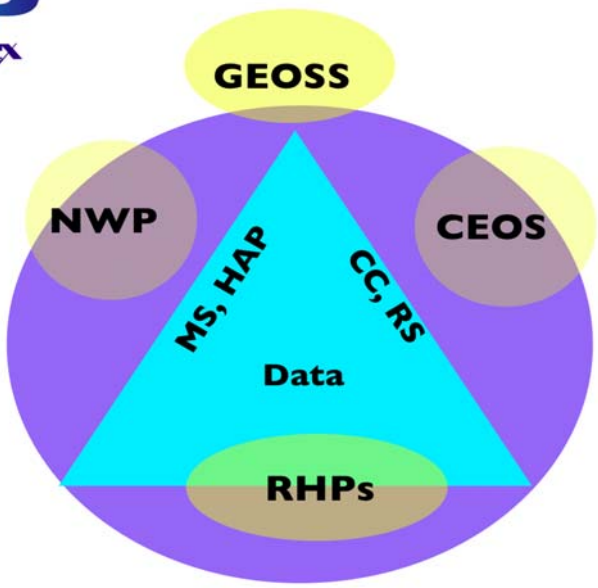
THE COORDINATED ENERGY AND WATER-CYCLE OBSERVATIONS PROJECT

FUTURE;

Coordinated Energy and water cycle Observations Project

Coordinated Energy and water-cycle Observations Project

MS=Model Studies
HAP= Hydrologic Applications
CC= Cross Cutting Studies
RS=Regional Studies
Data=In situ, Model, Remote Sens.
RHPs=Regional Hydroclimate Projects
NWP=Num. Wea. Pred. Centers
CEOS=Comm. on Earth Obs. Sat.
GEOSS=Glob. Earth Obs. Sys. Of Sys.



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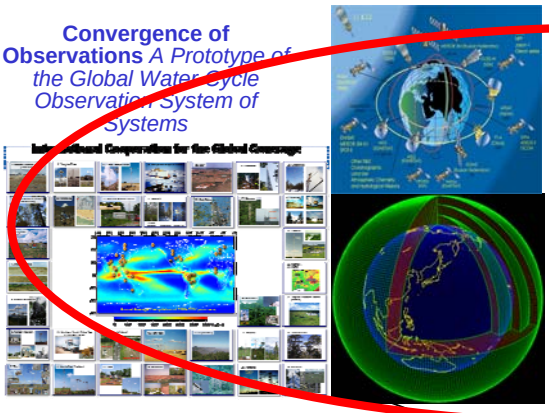

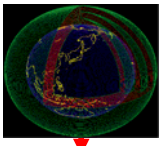

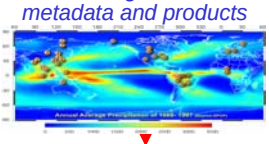

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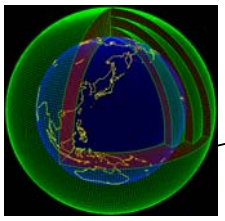

GEOSS

NWP

CEOS

MS, HAP

CC, RS

Data

RHPs

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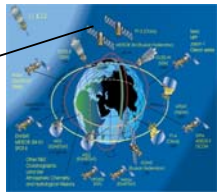

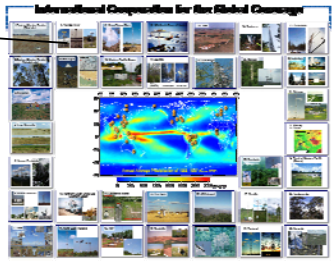

Coordinated Energy and water cycle Observations Project

POTENTIAL CONTRIBUTIONS TO GEOSS AWCI