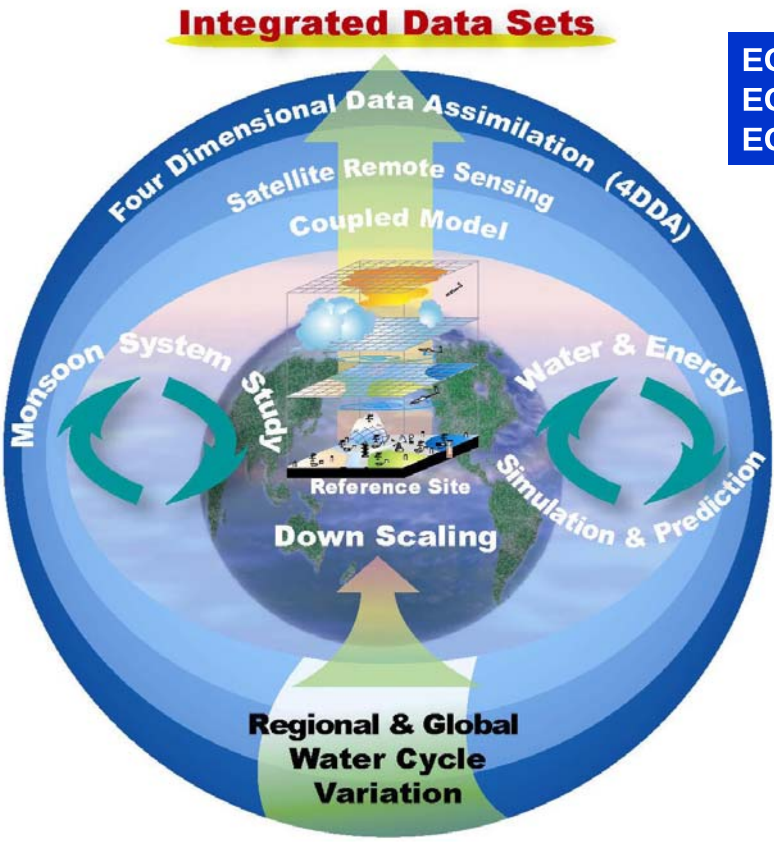
Coordinated Enhanced Observing Period (CEOP)



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

http://www.ceop.net

CEOP SCIENTIFIC OBJECTIVES

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.

OVERALL OBJECTIVE 1

To better document and simulate water and energy fluxes and reservoirs over land on diurnal to annual temporal scales and to better predict these on temporal scales up to seasonal for water resources application.

Water & Energy Simulation & Prediction (WESP)

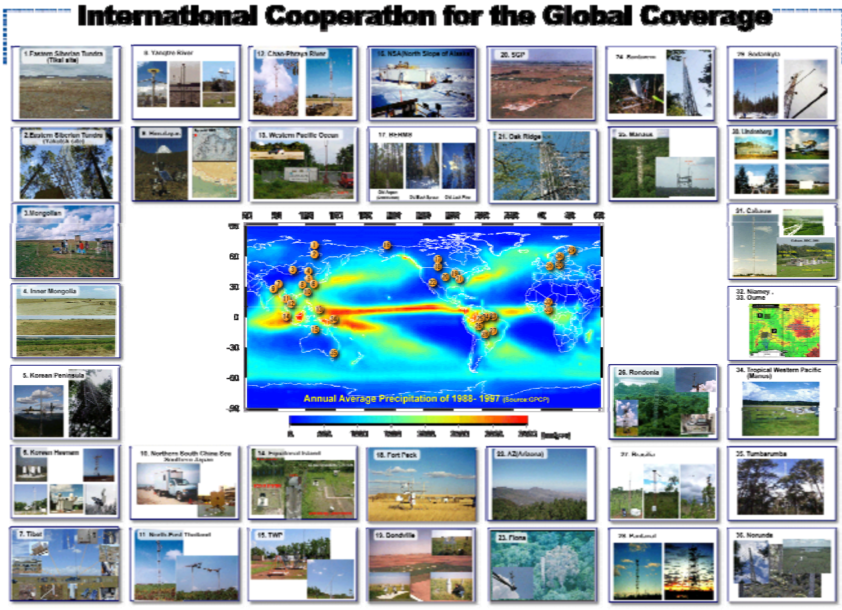
OVERALL OBJECTIVE 2

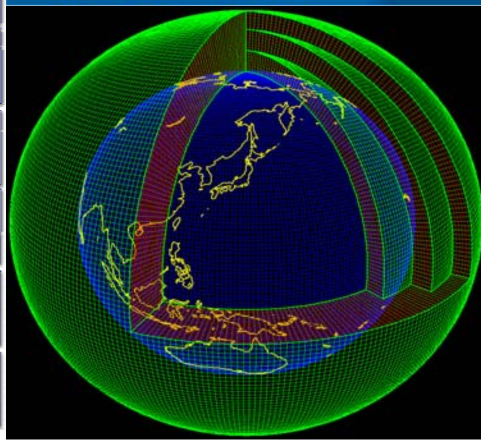
Document the seasonal march of the monsoon systems, assess their living mechanisms, and investigate their possible physical connections.

CEOP Intern-Monsoon Study (CIMS)

Coordinated Enhanced Observing Period
Three Unique Capabilities

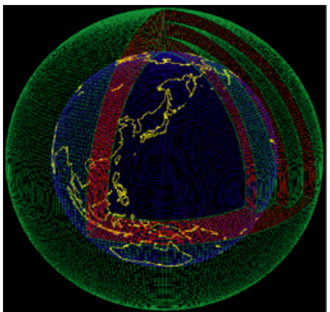
Convergence of Observations
A Prototype of the Global Water Cycle Observation System of Systems

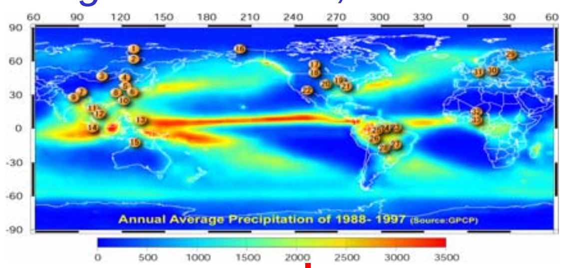




Coordinated Enhanced Observing Period
Three Unique Capabilities

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

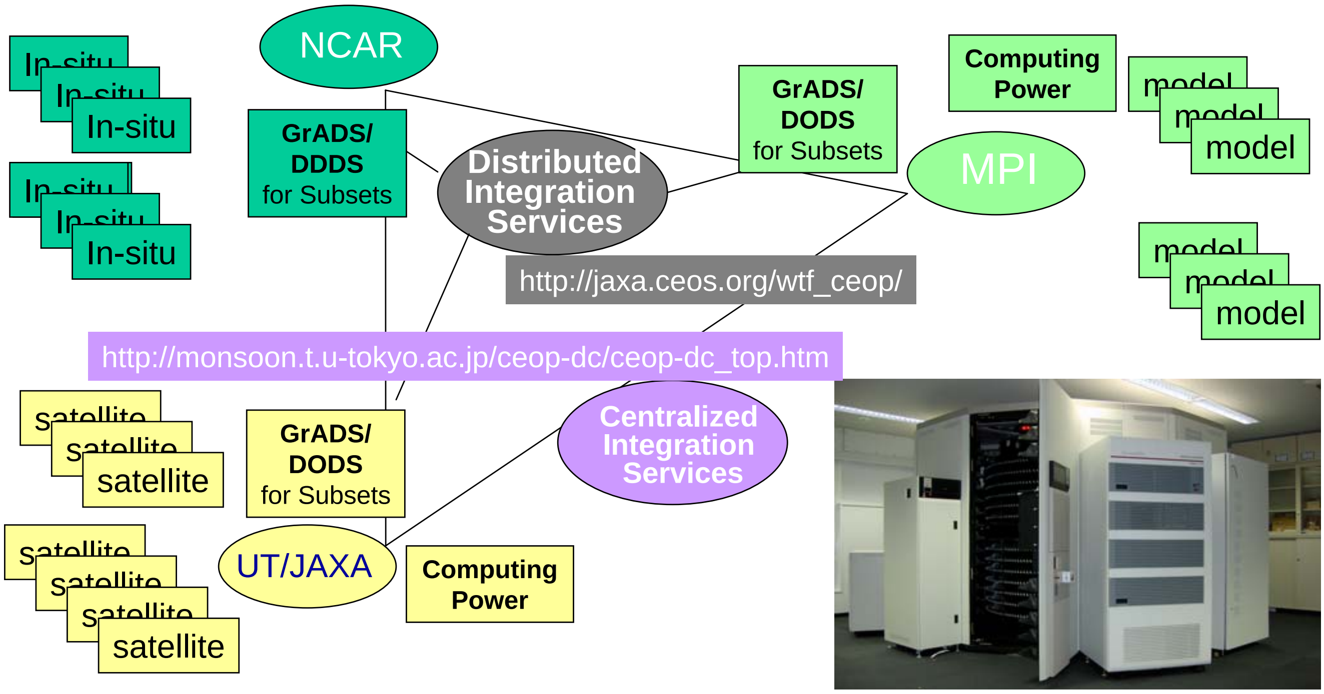
Model Output Data Archiving Center at the World Data Center for Climate, Max-Planck Institute for Meteorology of Germany

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

Coordinated Enhanced Observing Period
Three Unique Capabilities

Data Management

Distributed- and Centralized- Data Integration Functions



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

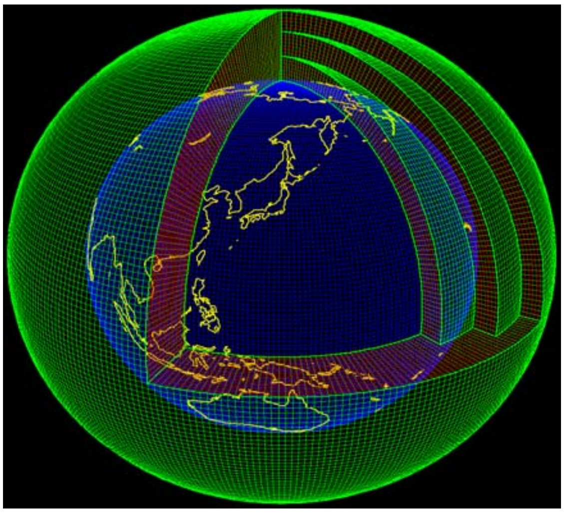
Inter-CSE Transferability Study

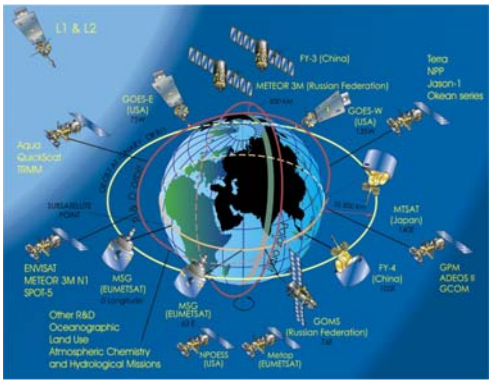
CEOP INTER-MONSOON STUDY (CIMS)

Coordinated Model Integration Process

Monsoon System Inter Comparison

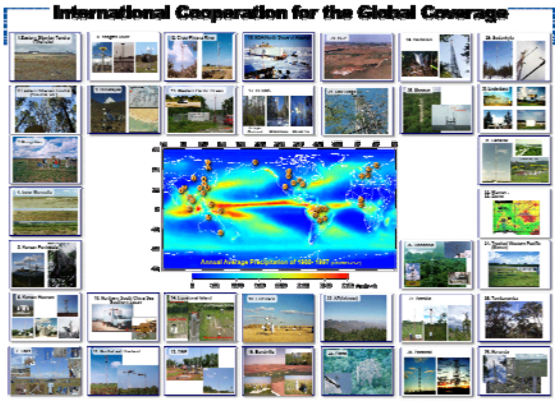
GCM

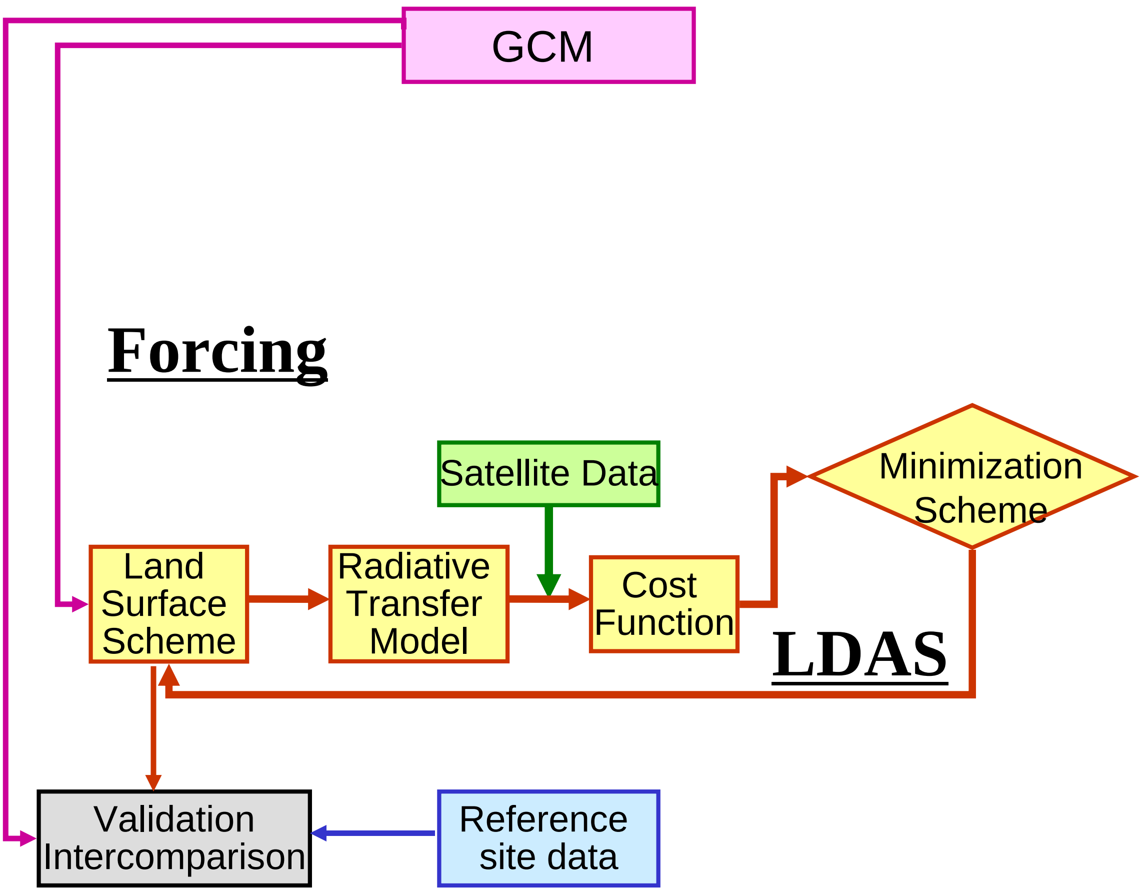




Satellite Data

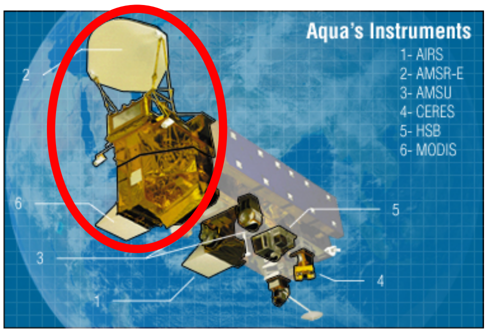
Reference site data



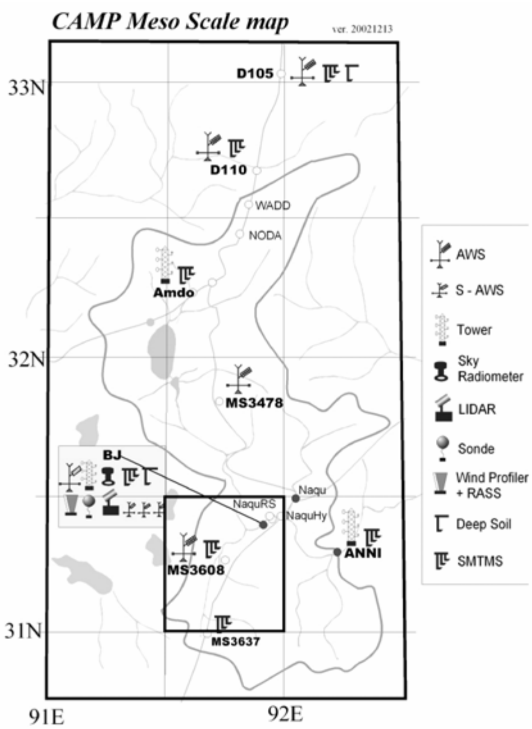


Input Data→ High Applicability in Any Region

- LDAS-UT grid size: 0.5 degree
- Forcing
  - GPCP precipitation: 1 degree
  - ISCCP radiation: 2.5 degree
  - NCEP reanalysis: 1.5 degree
- Leaf area index: MODIS
- Microwave Tb: AMSR-E



First application: A case at CEOP Tibet site

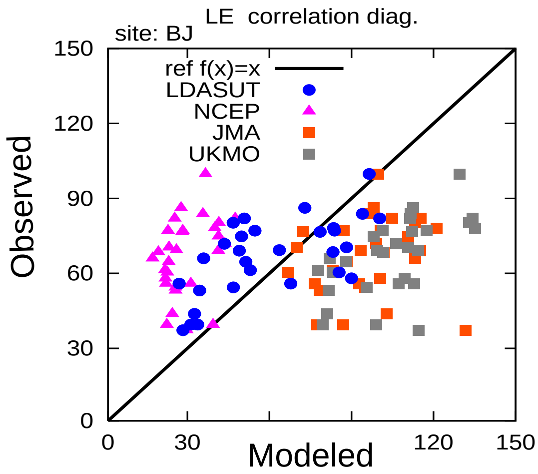


Items	Station (depth)
Precipitation	BJ
Radiation	BJ
Surface temperature	BJ, MS3608 S-AWS1, S-AWS3
Near-surface soil moisture	BJ, MS3608 (4cm) S-AWS1, S-AWS3 (0-5 cm) SSMTMS (0-3 cm)
Turbulent fluxes	BJ (3m, 20m)

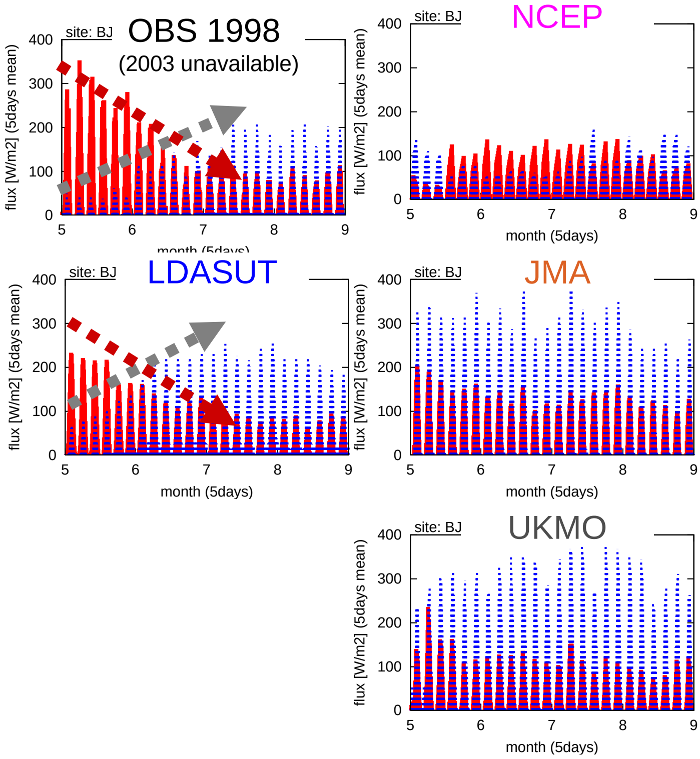
LDASUT- GCMs

LE daily-mean (June)

	H RMSE [W/m²]	LE RMSE [W/m²]
LDASUT	32.0	42.5
NCEP	40.2	68.4
JMA	32.3	79.8
UKMO	35.3	80.1

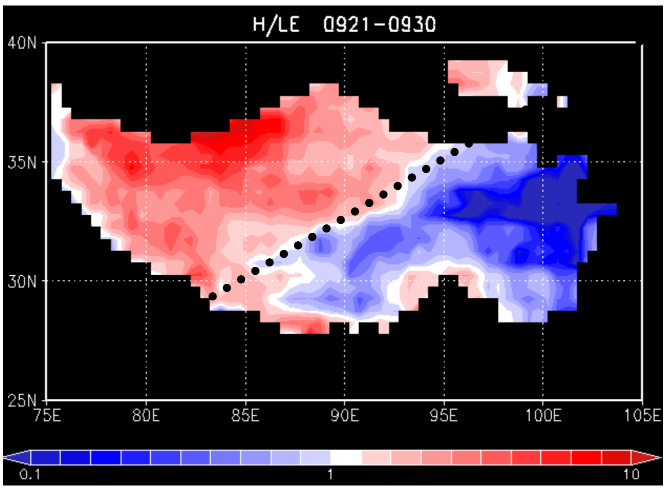


Seasonal variation (May - September)
Sensible (H) —
Latent(LE) —

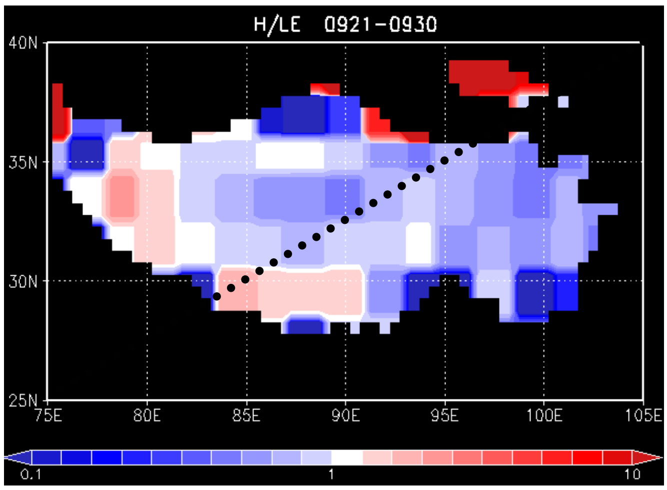


Seasonality of distributed Bowen Ratio: Sensible Heat Flux/Latent Heat Flux

LDASUT

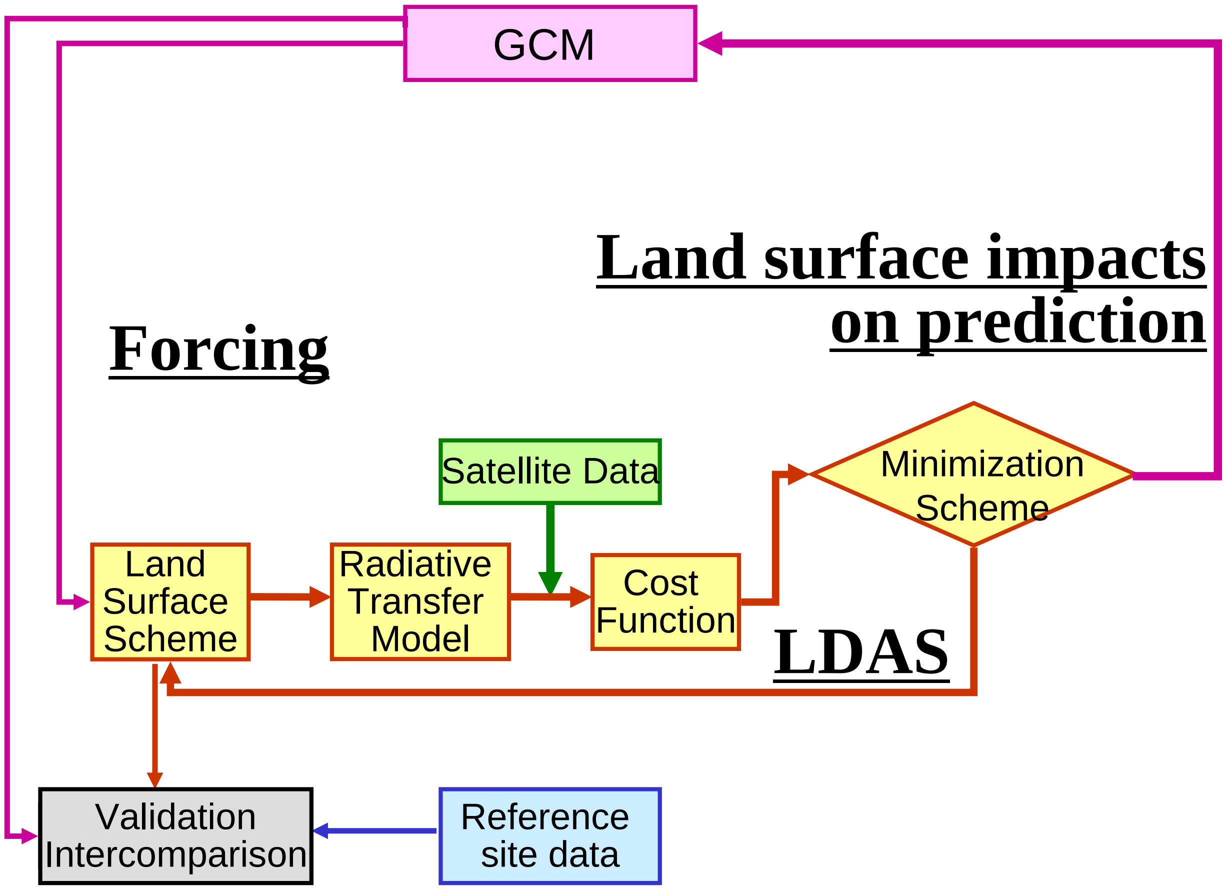


NCEP



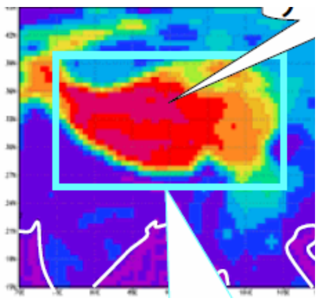
LDAS Seasonality: May~Mid June, H > lE; Mid June~Aug; lE>H

LDAS Regionality: H is dominant in N.W. TP, lE is dominant in S.E. TP

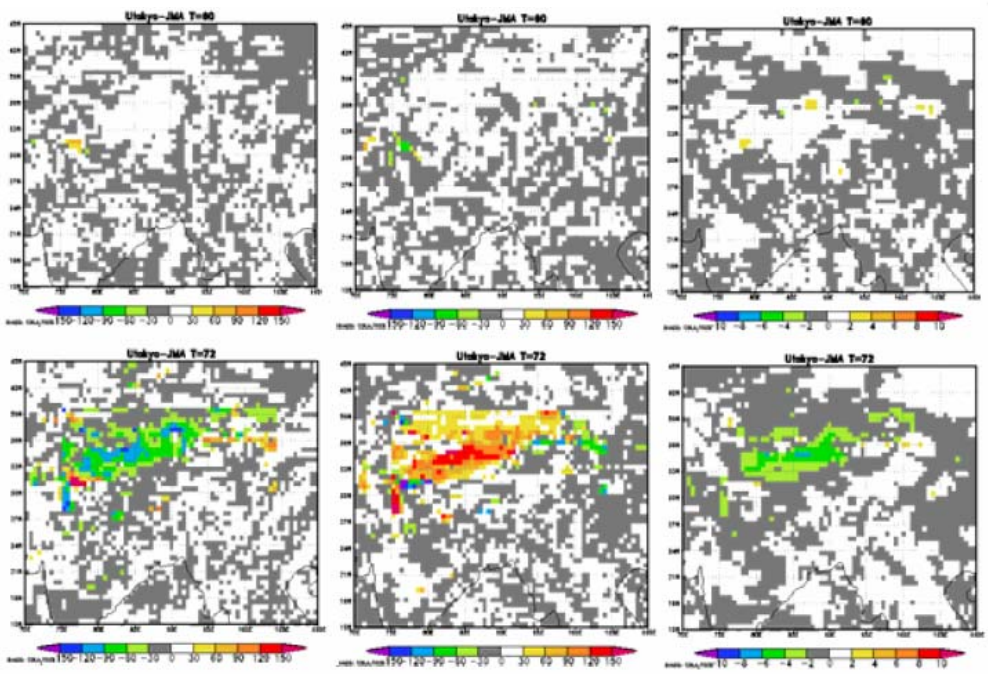


Impacts of the Tibet surface initial conditions on the GCM prediction of the surface parameters

(***UT-JMA Cooperative Research***)



sensible heat flux | latent heat flux | surface temperature



Use the assimilation product as the initial condition

Nighttime

↑

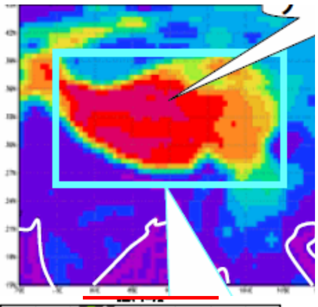
3 Day Prediction

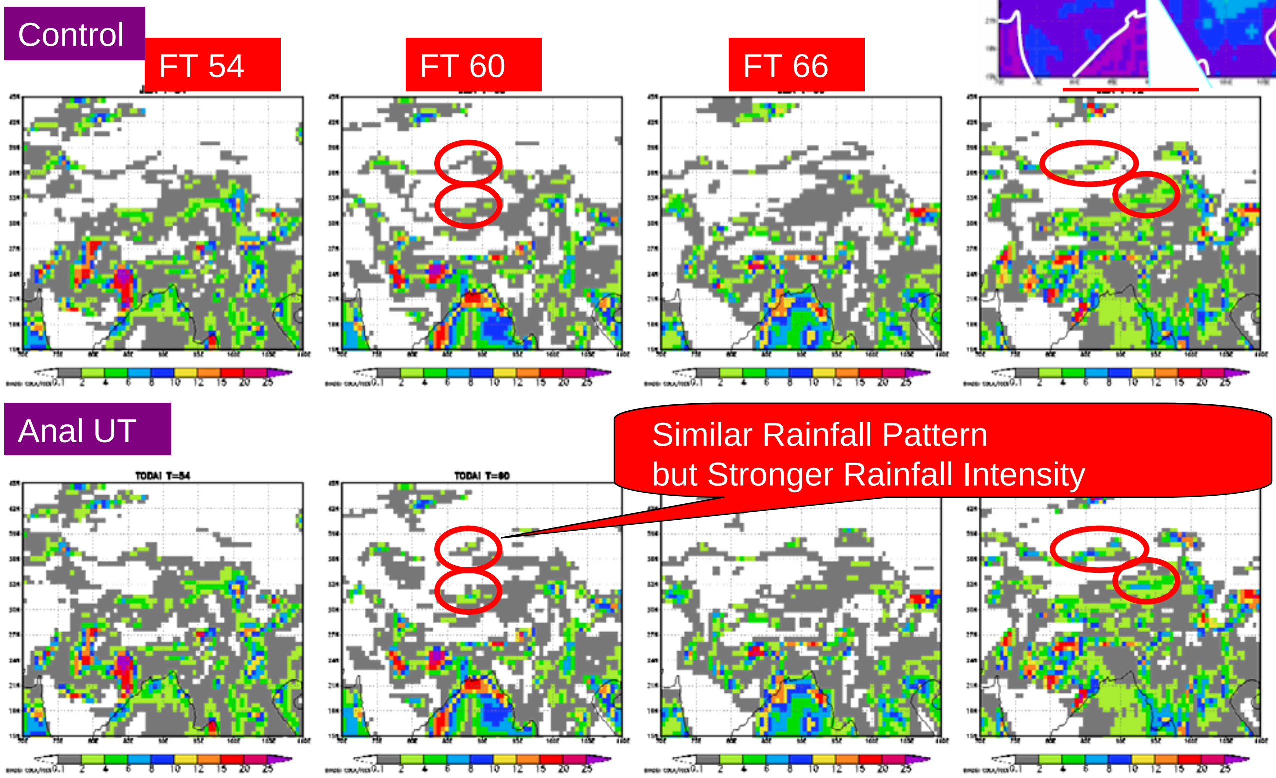
↓

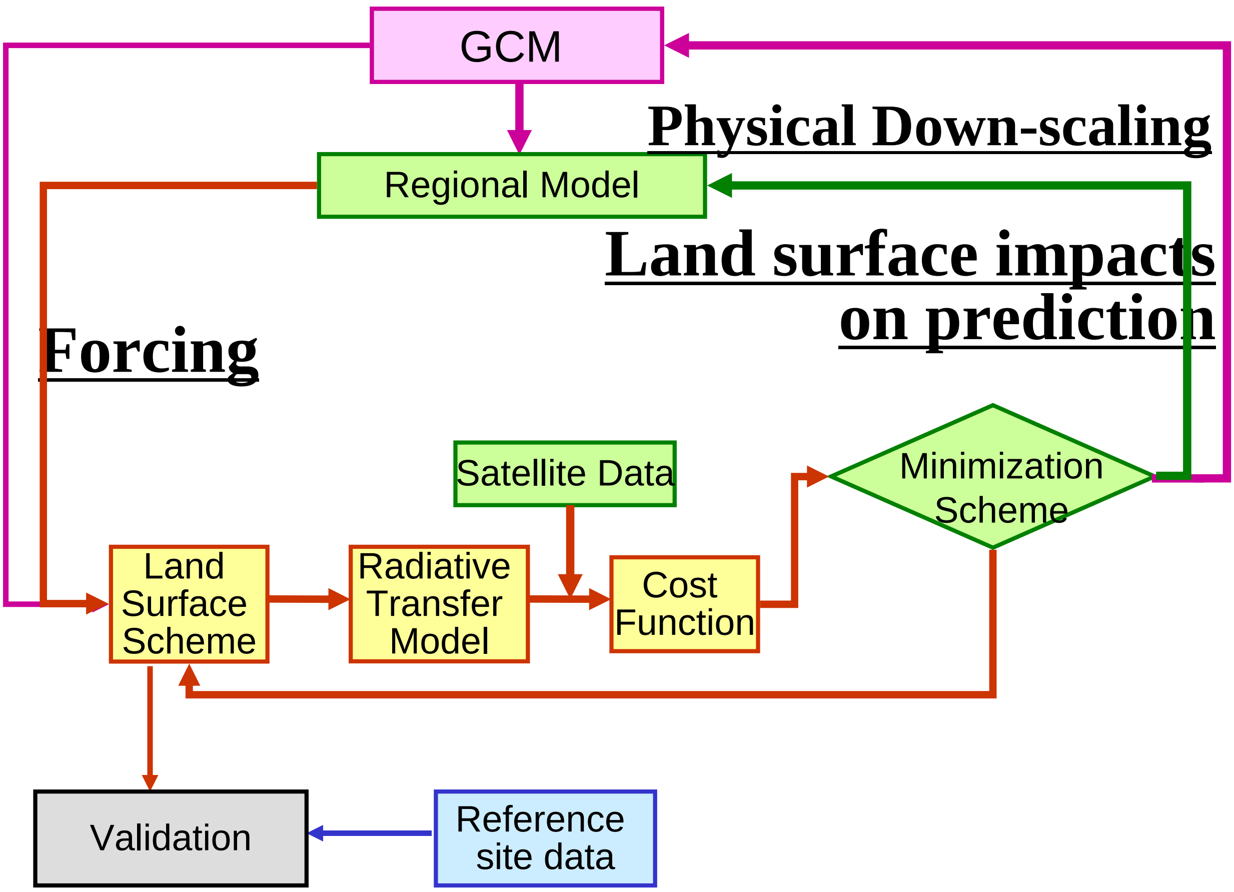
Daytime

Impacts of the Tibet surface initial conditions on the GCM prediction of the precipitation

(***UT-JMA Cooperative Research***)

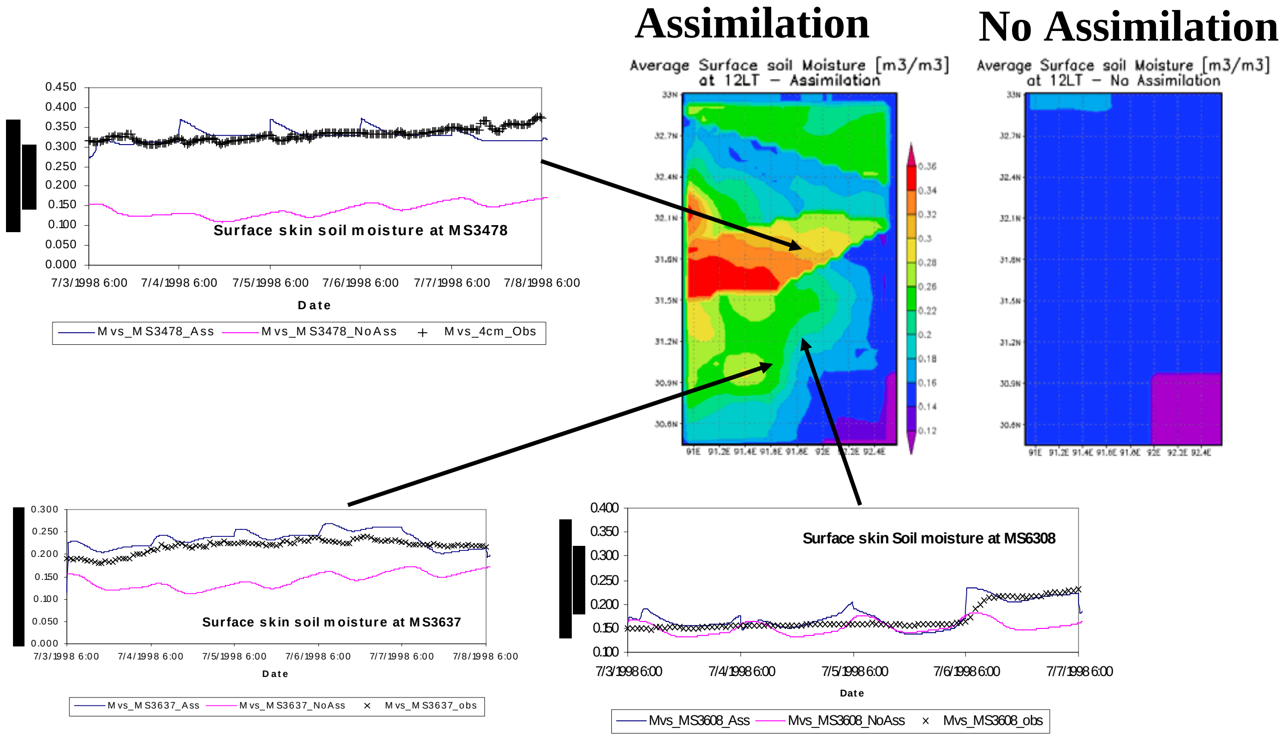




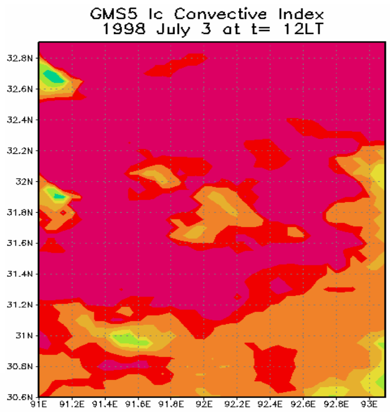


(Surface perspective)

soil moisture

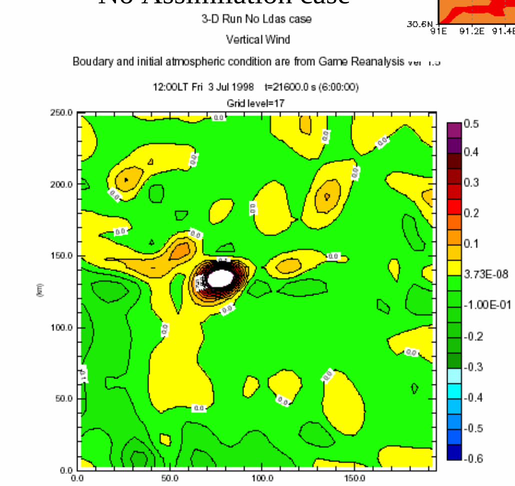


(Atmospheric perspective)



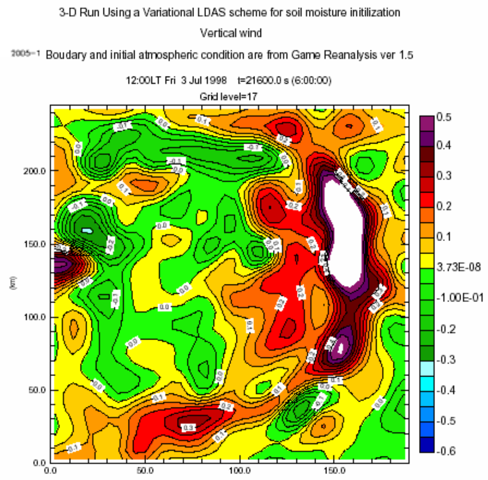
GMS IR1-based convective Index

No Assimilation case

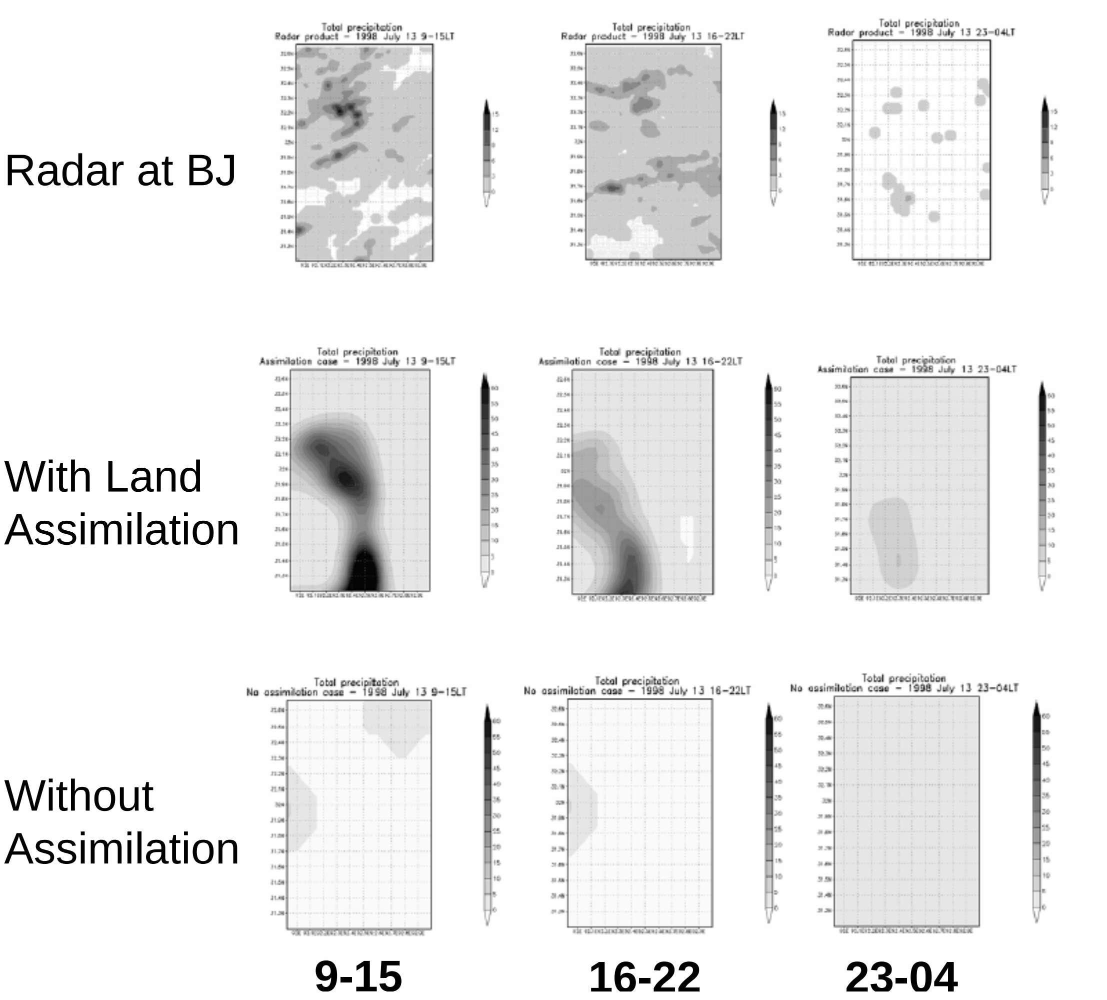


Vertical Wind field

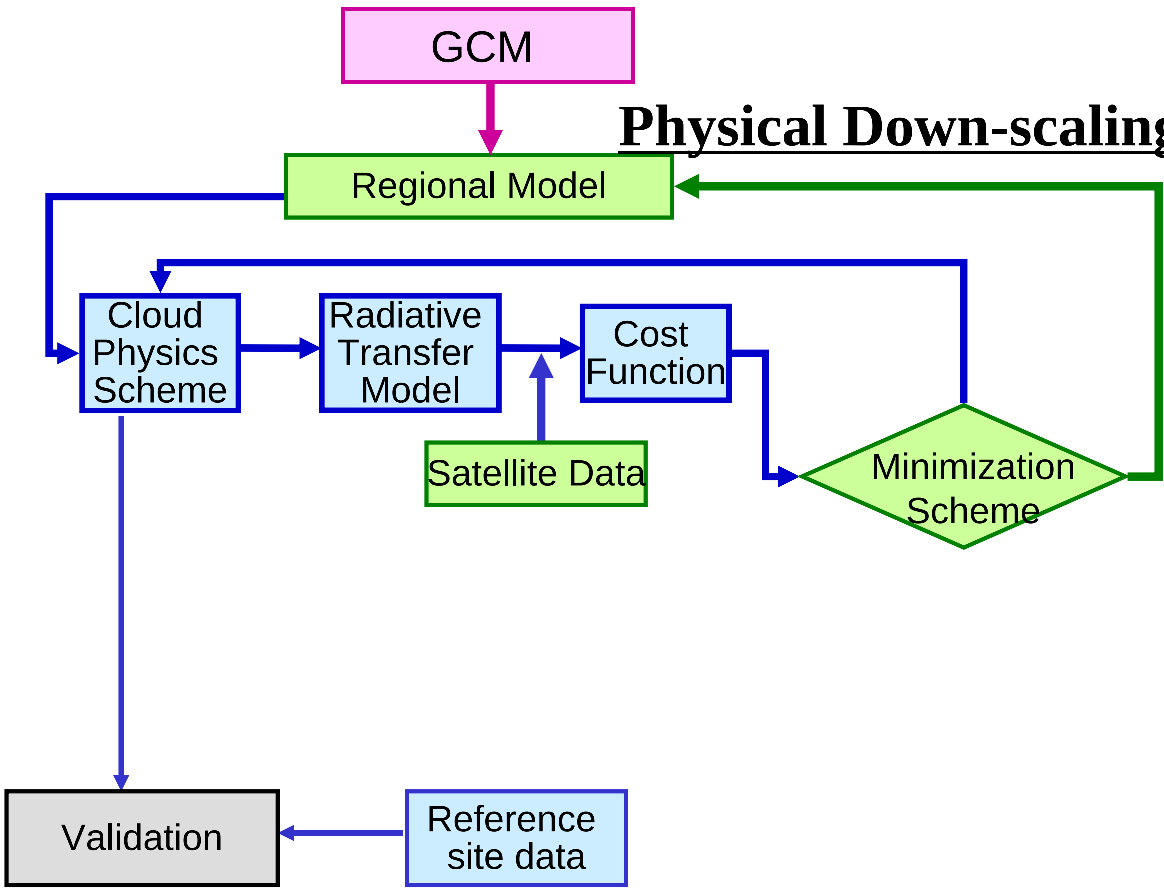
Assimilation case



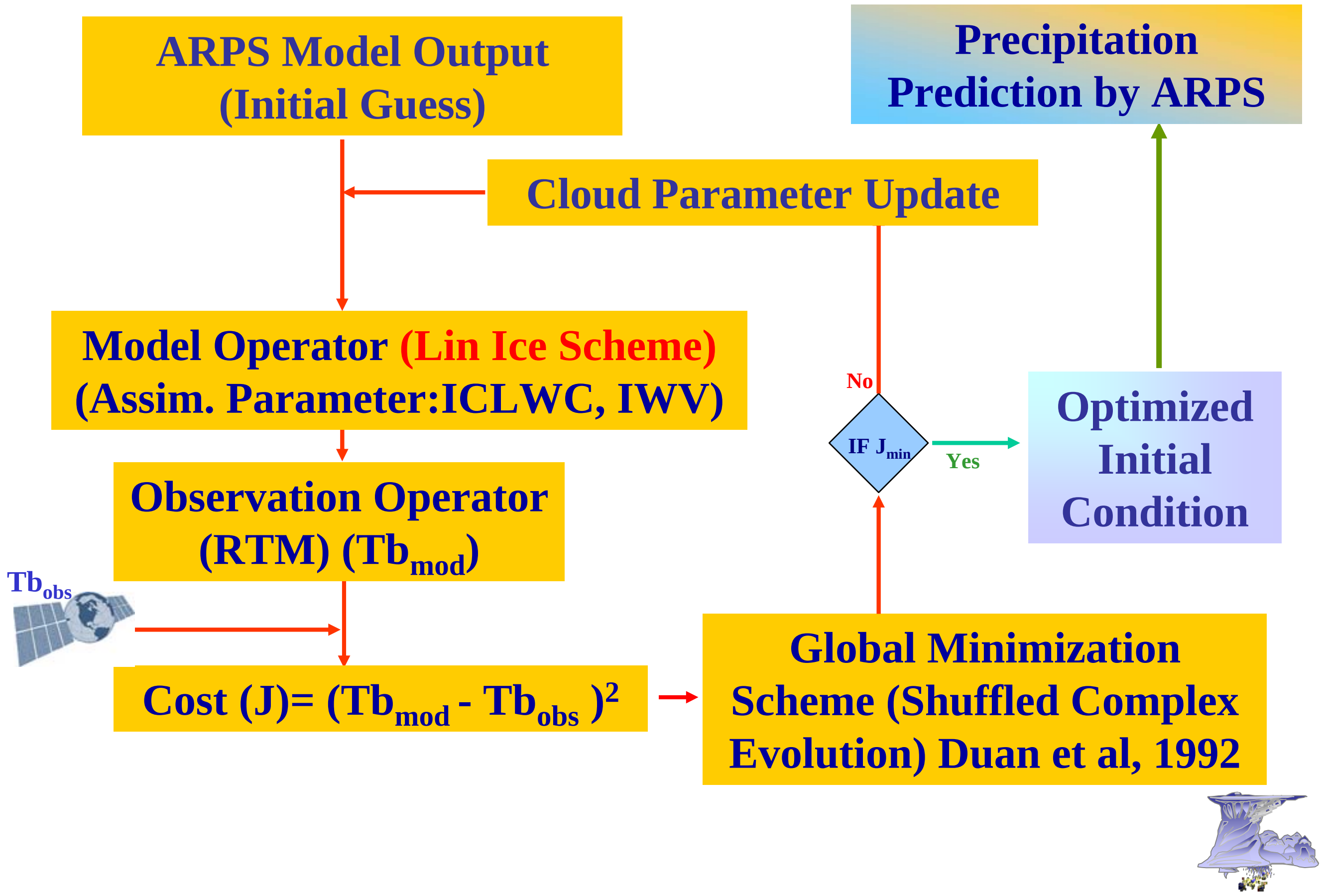
Vertical Wind field

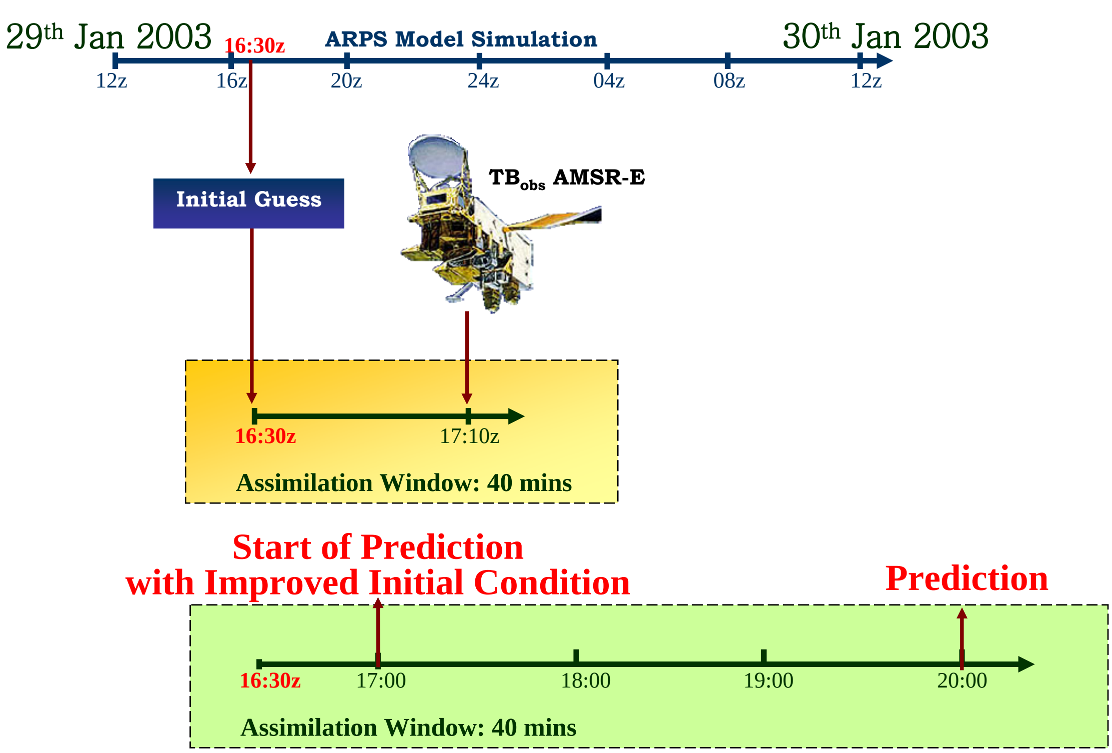


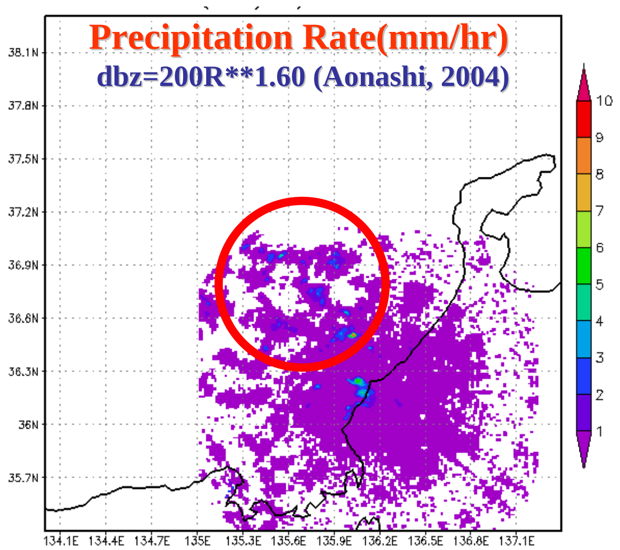
Physical Down-scaling



IMDAS Framework





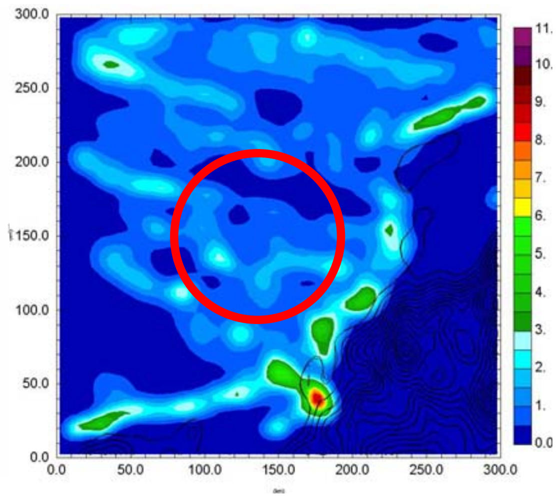


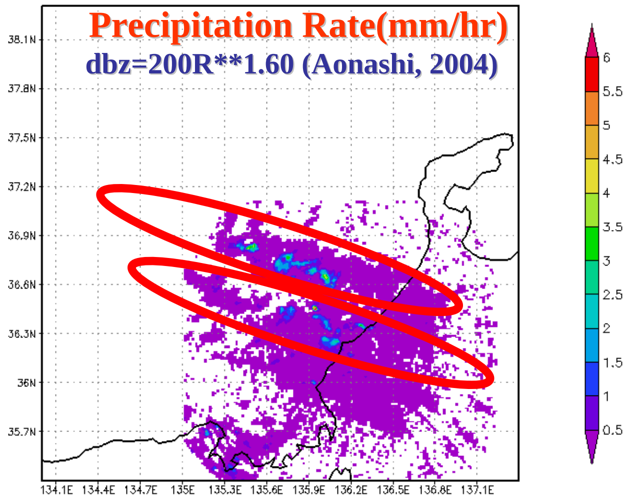
29th Jan, 17:00z

Initial condition
with assimilation

with no assimilation

IMDAS



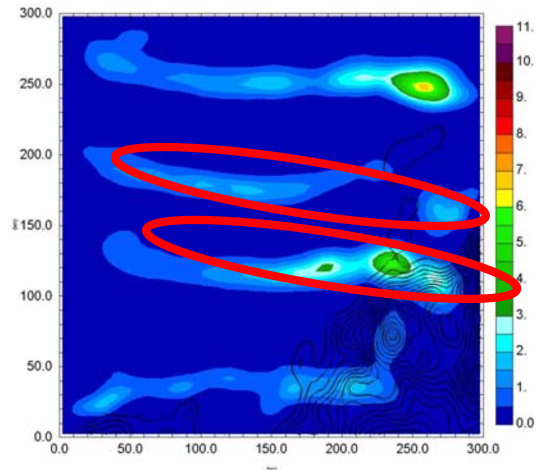


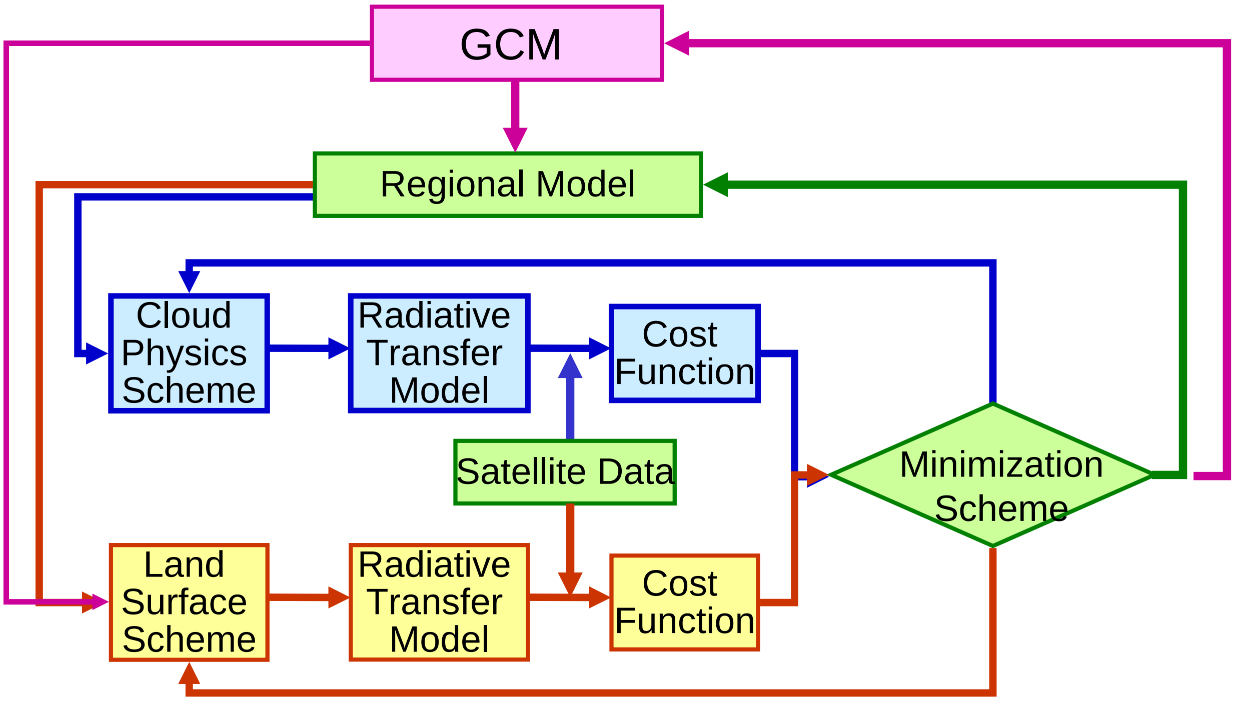
29th Jan, 20:00z

3hour prediction
with assimilation

with no assimilation

IMDAS





An Element of WCRP initiated by GEWEX

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 Due : 20 Feb. '06
Publication: Feb. '07

Water and Energy Simulation and Prediction (WESP): 14
Water and Energy Budget, Data Assimilation, Model Development/Transferability

CEOP Inter-Monsoon Study (CIMS): 8
Data Analysis, Data Integration, Model Simulation, Satellite Remote Sensing

Satellite Remote Sensing: 4
Radiative Transfer Model, Algorithm Development/Validation/Application

Data System: 7
Quality Checking System, Archive/Integration/Dissemination Systems, Meta Data

NWP and Data Assimilation Centers: 8
BMRC, CPTEC, JMA, NCMRWF, EPCP, GLDAS, GMAO, Intercomparison

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6. William K. M. Lau and Kyu-Myong Kim: Characteristics of Diurnal and Seasonal Cycles in Global Monsoon Systems

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2. Hongbo Su, Eric F. Wood, Matthew F. McCabe and Z. Su: Evaluation of remotely sensed evapotranspiration over the CEOP EOP-1 reference sites

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2. Frank Toussaint, Michael Lautenschlager and Hans Luthardt: World Data Center for Climate Data – Support for the CEOP Project in terms of Model Output
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4. Benjamin Burford, Osamu Ochiai, Yonsook Enloe and Ken McDonald: Distributed Data Integration Services Provided by the WGISS Test Facility for CEOP
5. Toshihiro Nemoto, Toshio Koike and Masaru Kitsuregawa: Data Analysis System Attached to the CEOP Centralized Data Archive System
6. Eiji Ikoma, Masaru Kitsuregawa, Kenji Taniguchi and Toshio Koike: Display Wall empowered Visual Mining for CEOP data archive

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