Activities of FY 2011 of AWCI Drought Working Group

Co-chairs:
Ichirow Kaihotsu (Hiroshima University)
Ghulam Rasul (Pakistan Meteorological Department)

Outline

1 Purposes
2 Monitoring and research network
3 Data bank
4 DP in Pakistan
5 Early warning system of drought
6 Training course for APN/AWCI drought studies
7 Summary and future activities

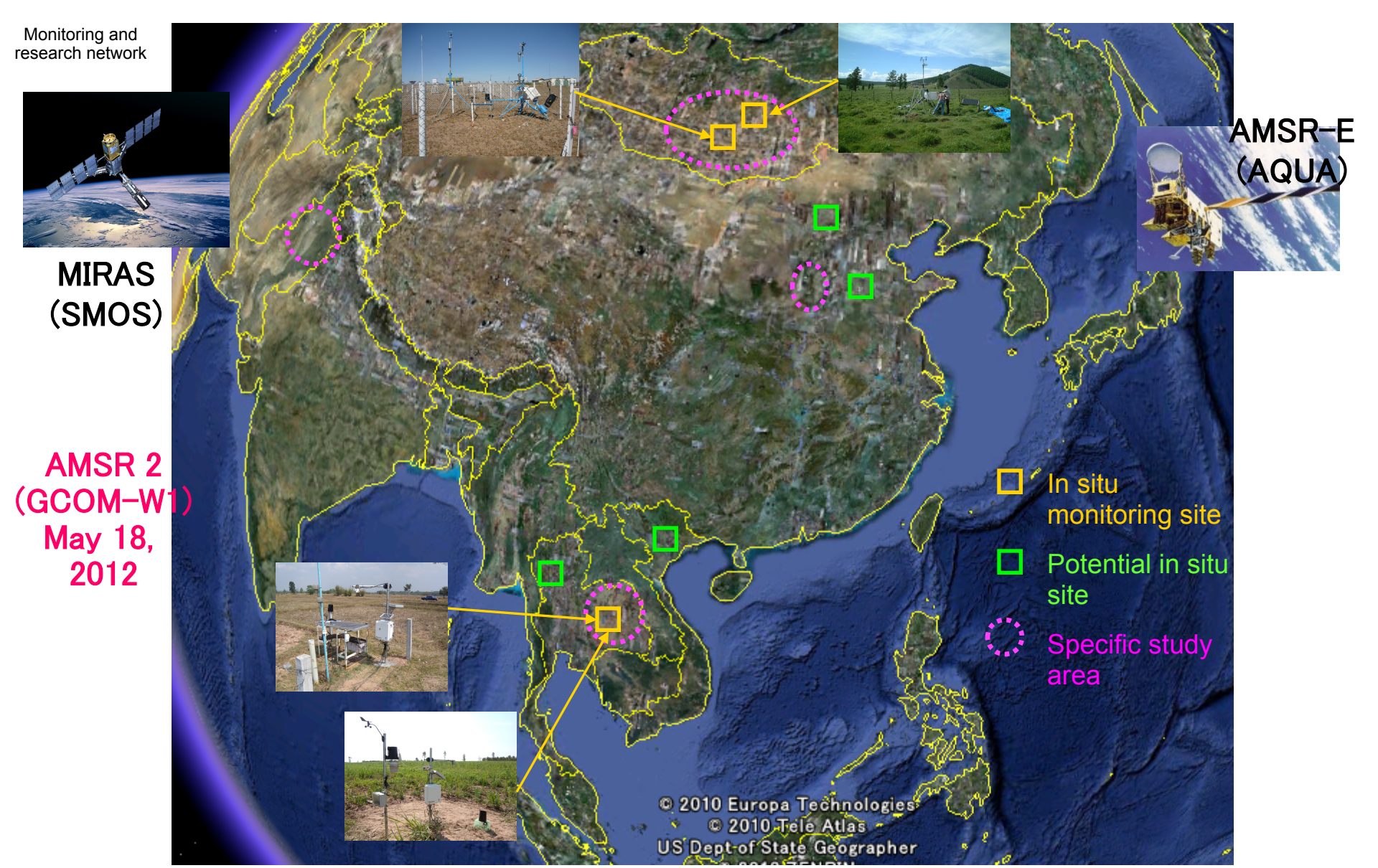
Purposes of AWCI Drought Working Group

P1 To build up a drought monitoring and researching network of member Asian countries

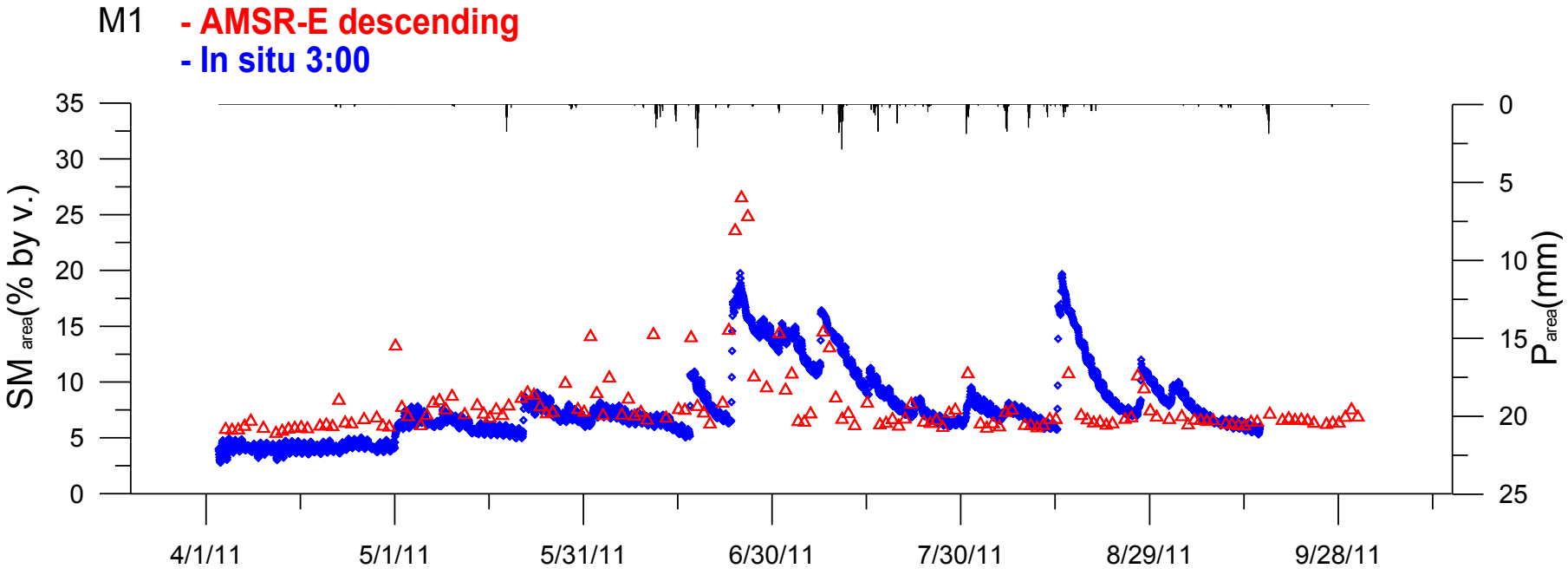
P2 To share and improve the drought monitoring data/capability in various Asian countries

P3 To make a collaboration with the demonstration projects studying climate change

P4 To help developing the early warning system of drought hazard in member countries.

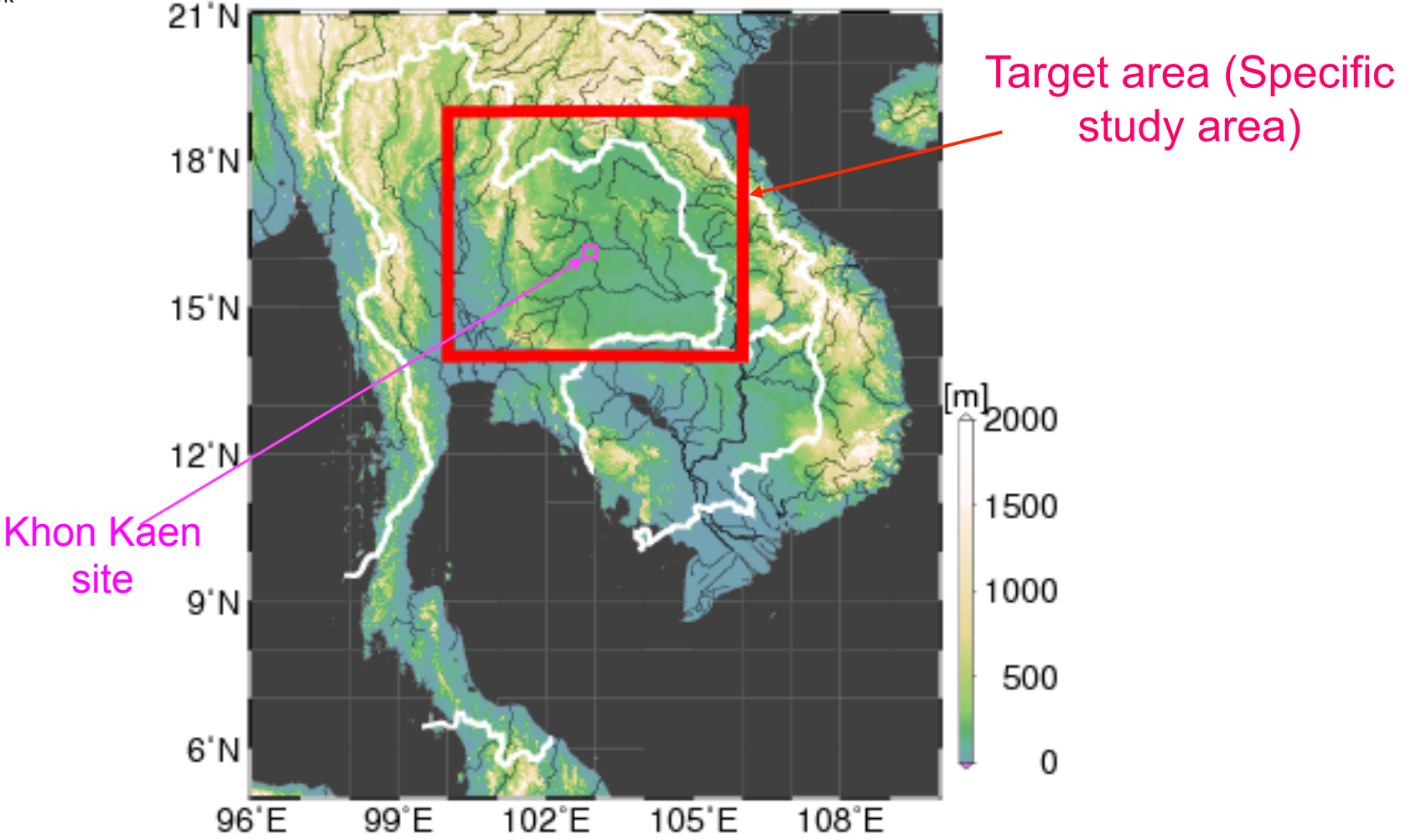


Specific study areas and monitoring sites of networks of Drought Monitoring by in situ and satellite stations and Drought Research of AWCI Drought WG



Comparison results of in situ soil moisture at 3 cm depth with AMSR-E soil moisture estimation (Koike 5.34) in descending orbits in the target area M1 in 2011

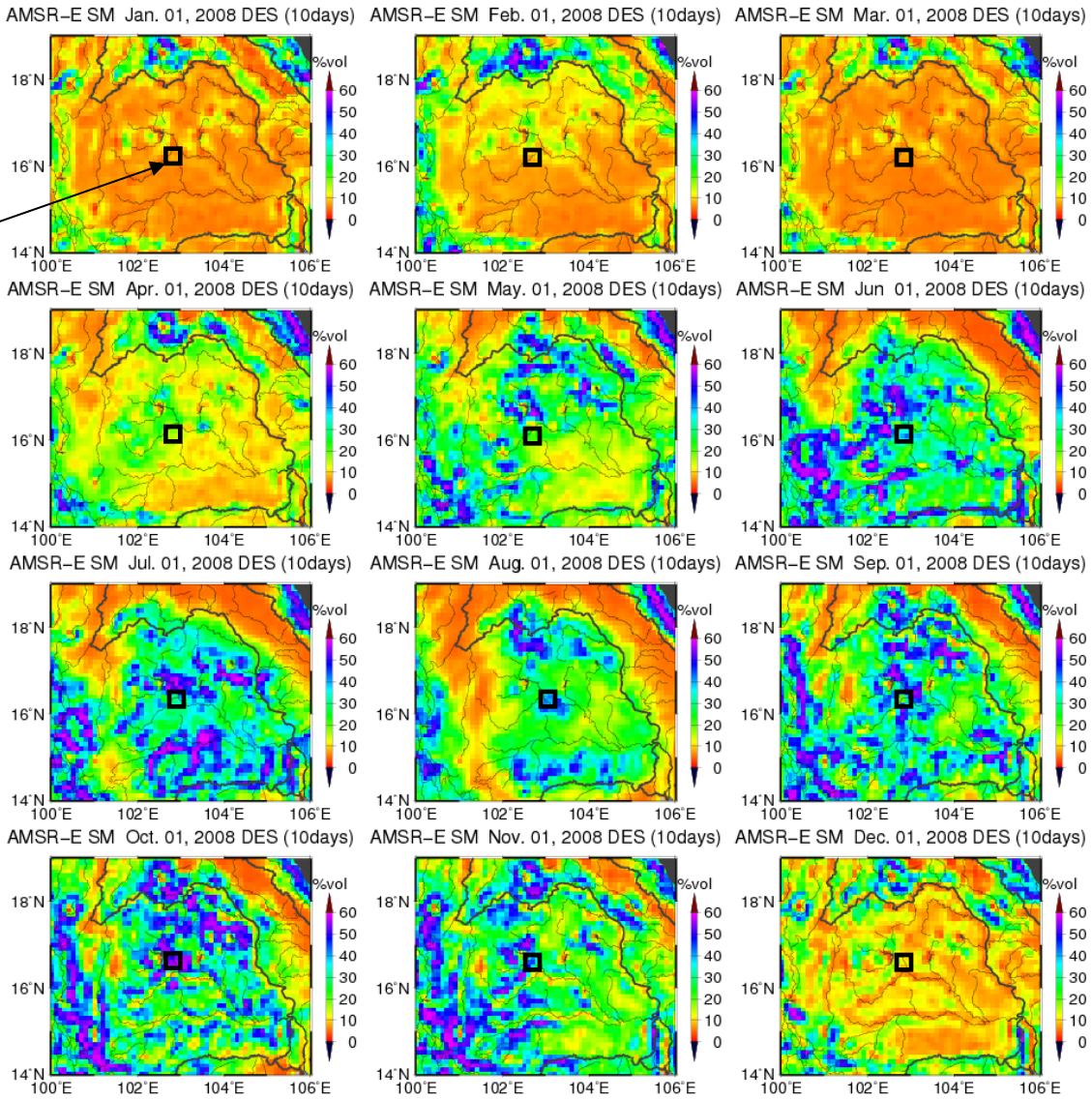
Monitoring and research network



Target area (Specific study area) of the AMSR-E soil moisture estimation in Thailand

Monitoring and research network

Khon Kaen site



Soil moisture estimation results in every early month in 2008 in the target area

Data bank

Soil Moisture (SM) and Soil Temperature (ST) data (including the Drought monitoring network data)

Mongolia: Four AWS sites (Monitoring of SM and fundamental elements of meteorology) in Mongolia from 2006 to 2011, NAMHEM SM data (every 5 cm depth from the surface to the 1m depth) of many stations more than 30 from 2006 to 2010.

China: Shanxi Province, 108 stations, Meteo and ST data 6hour, SM per 10 days, 3 lays (2006-2009)

Pakistan: Soil moisture data available for 4 stations (ten day SM data at the 9 depths in 2002- 2009)

Bangladesh: 9 soil moisture stations (weekly SM data at the 5 depths in 2007)

Vietnam: Binh Thuan Province: (100°34'13"N - 110°37'30"N,107°023'30" E-108°052‘30“E) 3 Surface Stations (Phan Thiet: 110°56' - 108°006', Phú Quý: 100°36' - 108°056', La Gi: 100°40' - 107°046'); P, T, R, RH, 4 times/day ; 1 Soil Temp station (Phan Thiet), 4 times/day ; no soil moisture (daily in 2008 and 2009)

Meteorological data

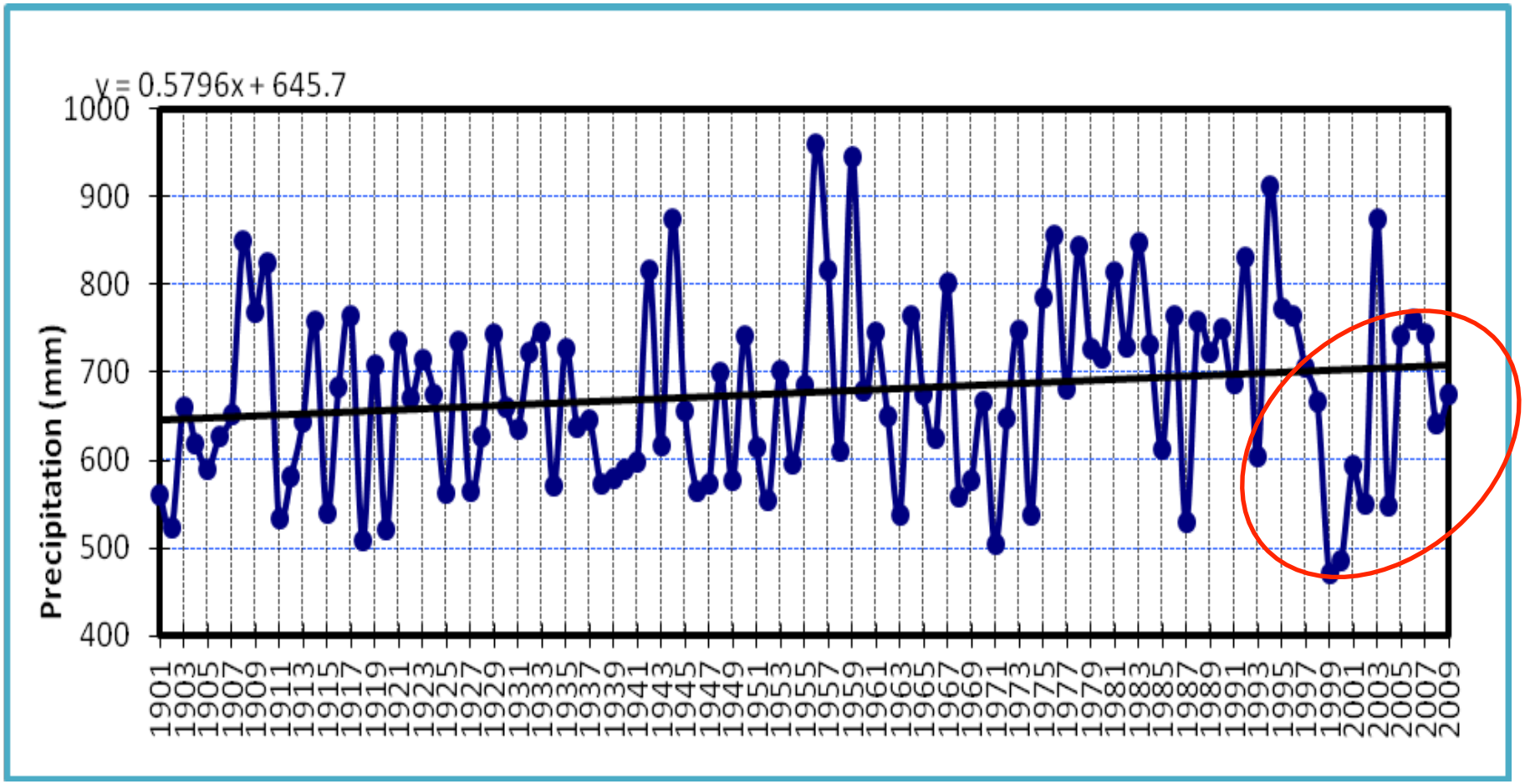
CEOP reference site data

Available satellite data in Mongolia, Thailand, China, Viet Nam, and Bangladesh

AMSR-E SM, MODIS data from 2006 to 2011

You can get and use these data for research/operation on request..

DP in Pakistan:
Inter-annual Variability of Pakistan Precipitation



Presented by Dr. Ghulam Rasul

Extension Plan of Drought Monitoring Network in Pakistan

- Present Network consists 121 meteorological observatories and 51 Automatic Weather Stations

In Frequent Drought-hit Areas

- 5 additional agromet stations will be added
- 4 additional soil moisture monitoring stations to be established.
- Drought advisory service to be initiated.

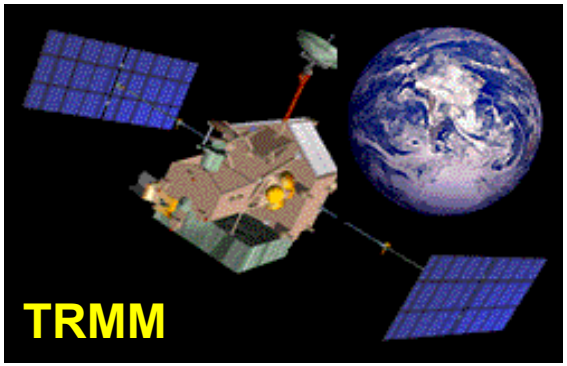
Presented by Dr. Ghulam Rasul

Water and Energy Budget-based Distributed Hydrological Model (WEB-DHM)

Overall Strategy

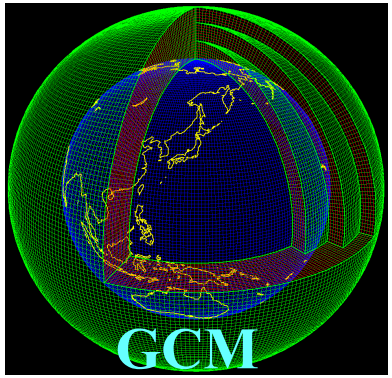
Observation

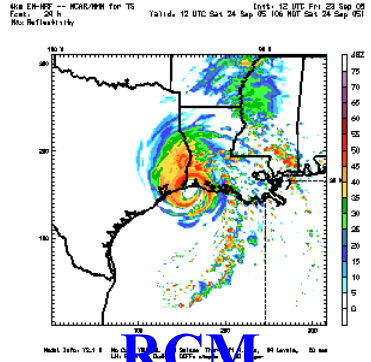
Satellite

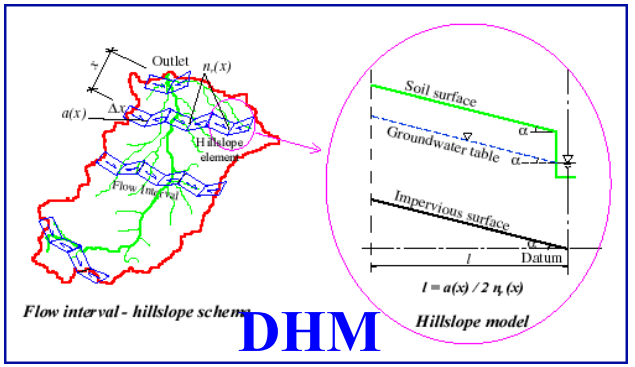


In-situ

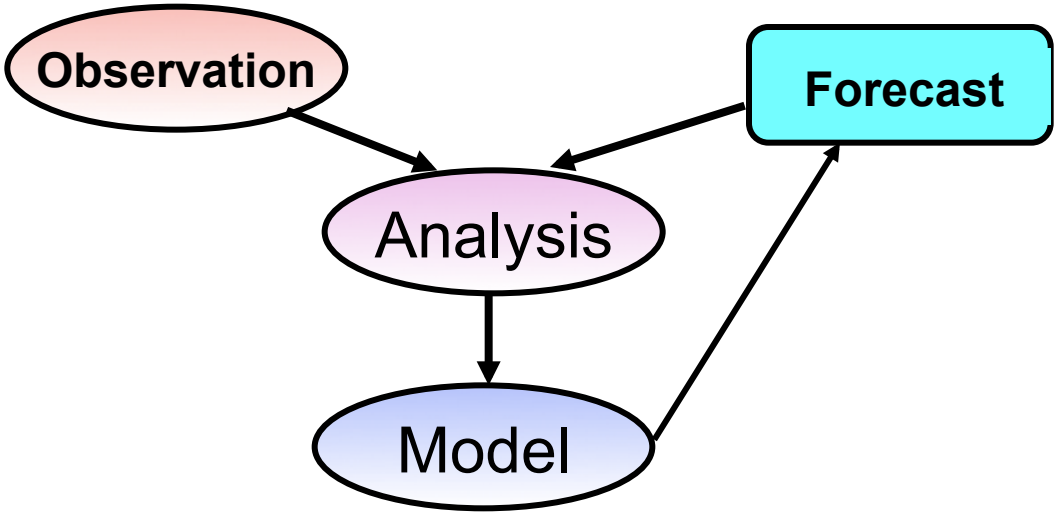
Modeling







Data Assimilation



Presented by Profs. Lei Wang and Toshio Koike

Inputs and Outputs

Inputs:

- meteorological parameters-JRA25
- LAI/FPAR-AVHRR
- DEM-AsterDEM/GDEM (large grid:1kmx1km)
- Rainfall: (observed AWCI or other sources 1981-2000)
- Soil: FAO
- Land Use: USGS

Outputs:

(rain, discharge, soil moisture at the root zone, soil moisture at the surface and groundwater level)

- Basin average values in text files
- Spatially distributed monthly values in binary files

Training Course on Analysis Techniques for APN/AWCI Drought Studies

Date: January 11(Wednesday) – 12 (Thursday), 2012

Venue: Tokyo Office of Hiroshima University

Training contents

- Acquisition method of AMSR-E soil moisture products and how to use them (Mr. Akira Deguchi: JAXA EORC)
- Numerical analysis techniques of drought forecasting using WEB-DHM (Prof. Koike team)
- In situ monitoring methods of drought (Prof. Ichirow Kaihotsu and Prof. Jun Asanuma)

Lecture and trainee

Summary

- Specific study areas and some sites of monitoring and research network of drought

- Successful collection and analysis of data in the data bank

- Making efforts to proceed the demonstration project in Pakistan

- Presentation of a numerical drought early warning system (WEB-DHM-S)

- Useful training course for drought studies

For future

- Drought monitoring and researching network
- Data bank
- DPs
- International workshops and/or training courses
- Application of a drought early warning system (numerical model:WEB-DHM-S) to test basins and/ or demonstration project ones.

APN CAPaBLE Project for FY 2012-2013

Title of project:

Impact of Climate Change on Glacier Melting and Water Cycle Variability in Asian River Basins

Proponent's Name and Title:

Ghulam Rasul, Dr.

(Pakistan Meteorology Department)

Project Award: US$ 80,000 (Two years: FY 2012 – FY 2013)