



# Introduction to **ADMIP**

## **A**Asian **D**Drylands **L**Landsurface **M**Modeling **I**Intercomparison **P**Project

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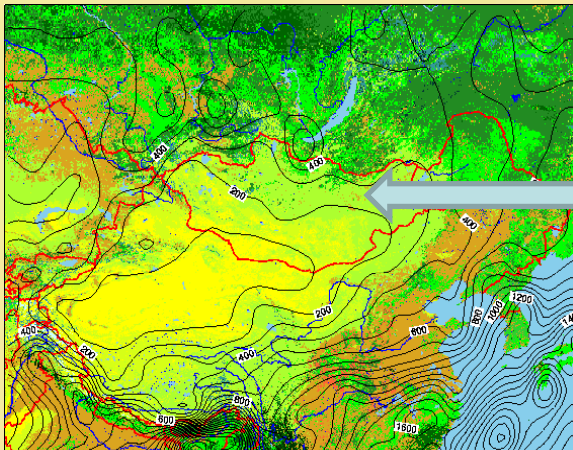
# Motivation:

- ✿ Why western (or eastern) landsurface models do not perform well at Asian continents?
- ✿ Especially at its water-limited stages?



# 1st example: NCAR-CLM3.5 simulation

- ✿ Mongolian sparse grassland (semi-arid climate)
  - ✿ GEWEX-CEOP reference site & AsiaFlux site.
  - ✿ Kherlen-Bayan-Ulaan station of Northern Mongolia
- ✿ Specification
  - ✿ period: 1 year (2003)
  - ✿ forcings & inputs: observation
  - ✿ validation with observations



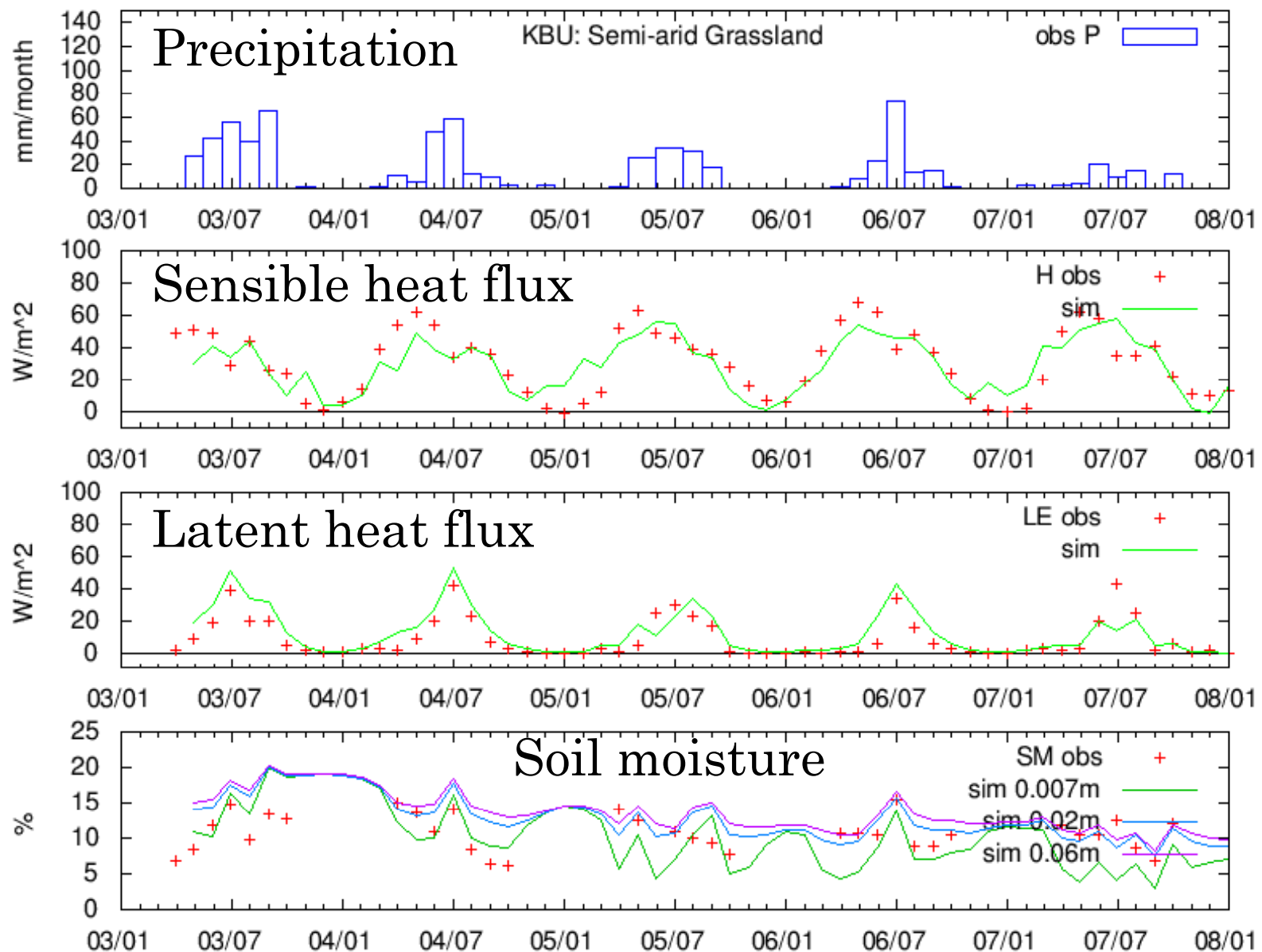
HESSS2





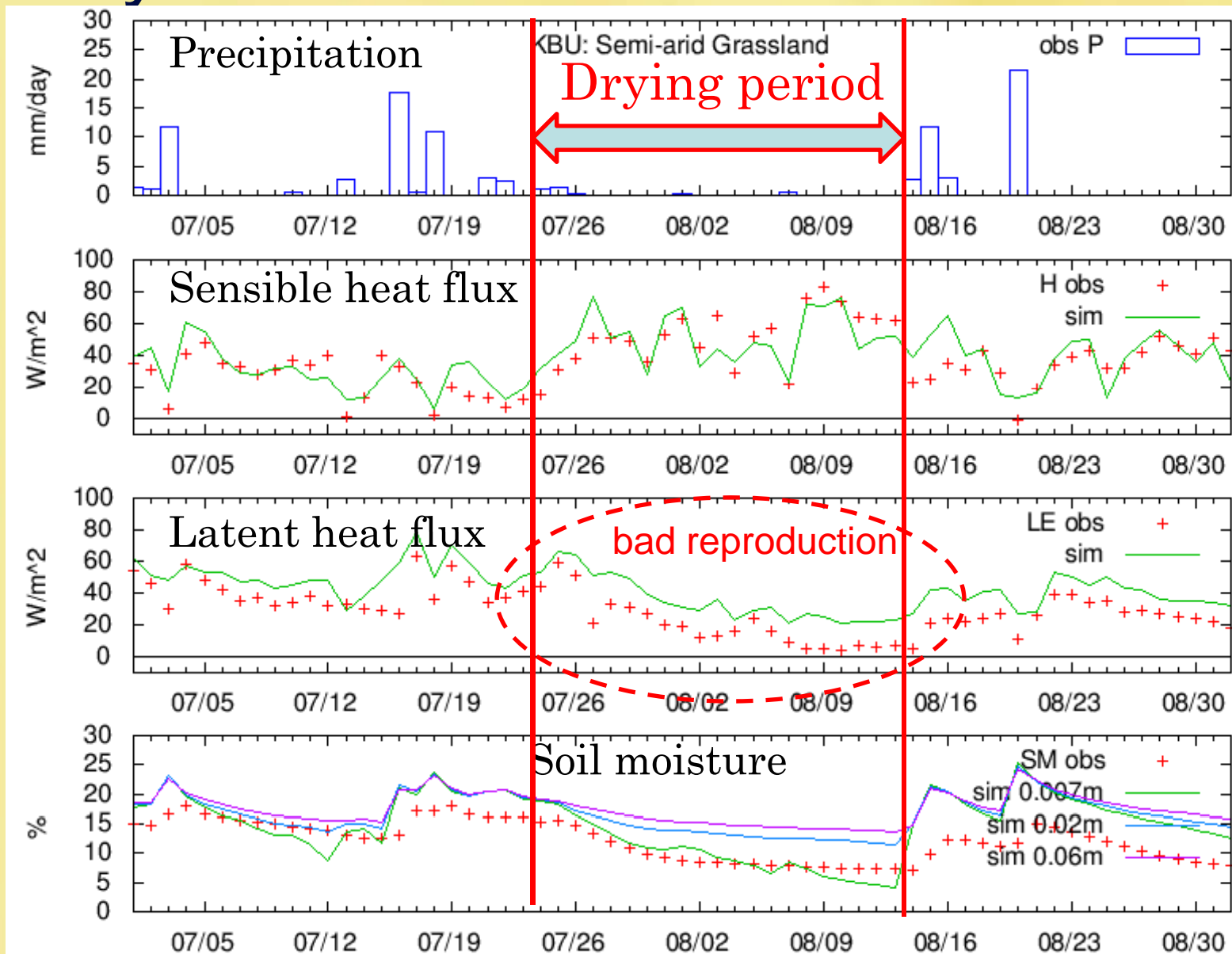


# Comparison with observations monthly basis(2003-2007)



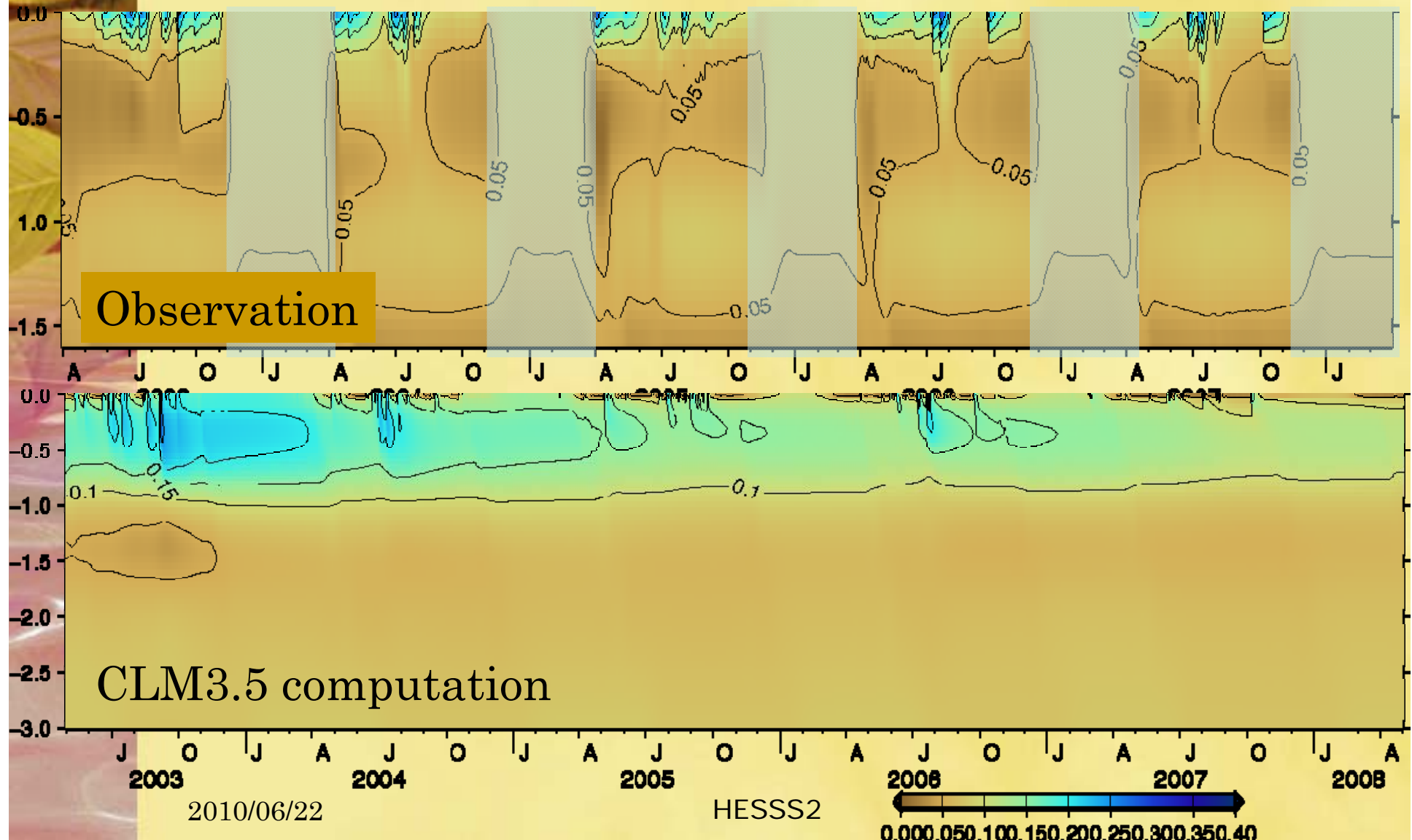


# Comparison with observations daily basis





# Time-depth cross section of soil moisture





# Summarized of CLM3.5 simulation

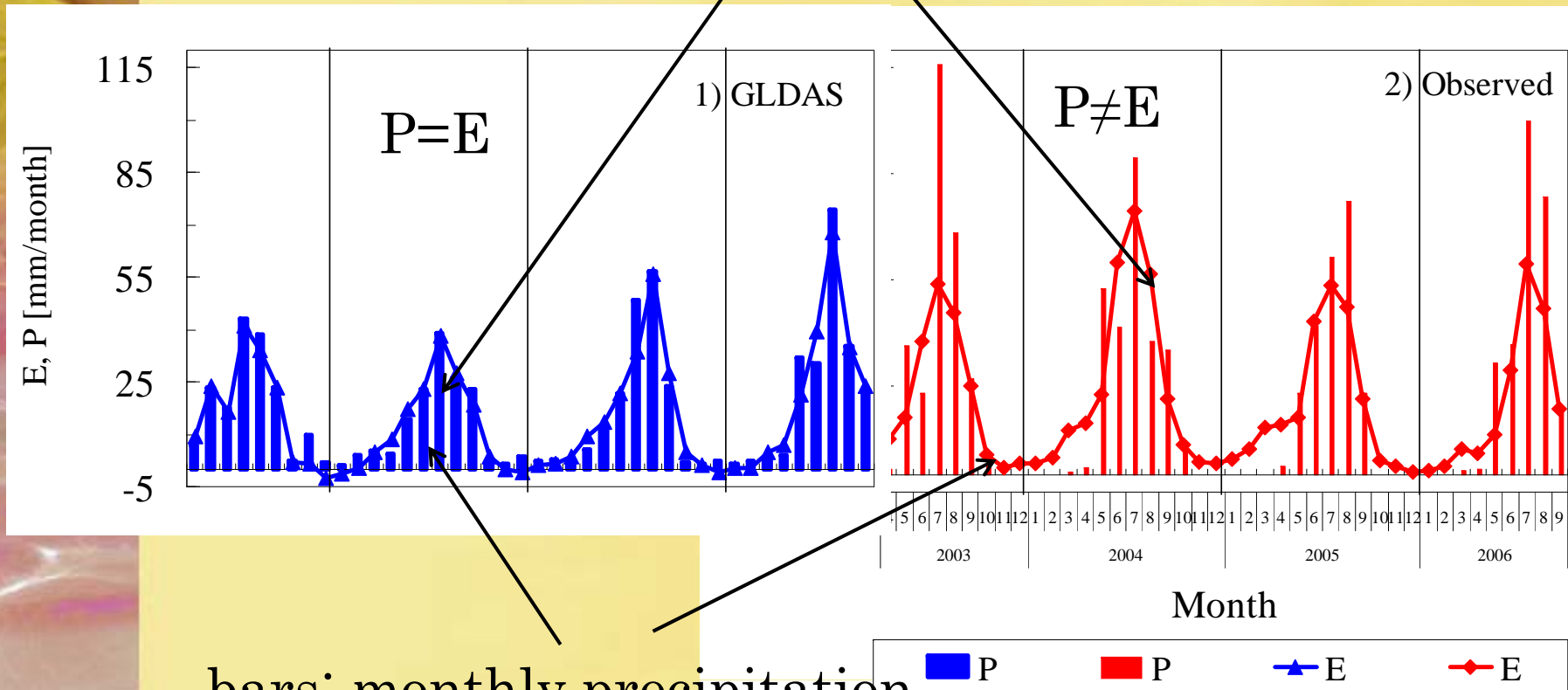
- ✿ Sensible heat is well-reproduce with monthly means, so as with daily means
- ✿ Latent heat at daily basis has relatively poor reproduction
- ✿ Soil moisture profile is also poor
  
- ✿ What is the causes?
  - ✿ soil properties? (parameterized with soil particle distribution)
  - ✿ albedo dependence on surface soil moisture?



# 2nd example: GLDAS compared with observations



lines: monthly evaporation

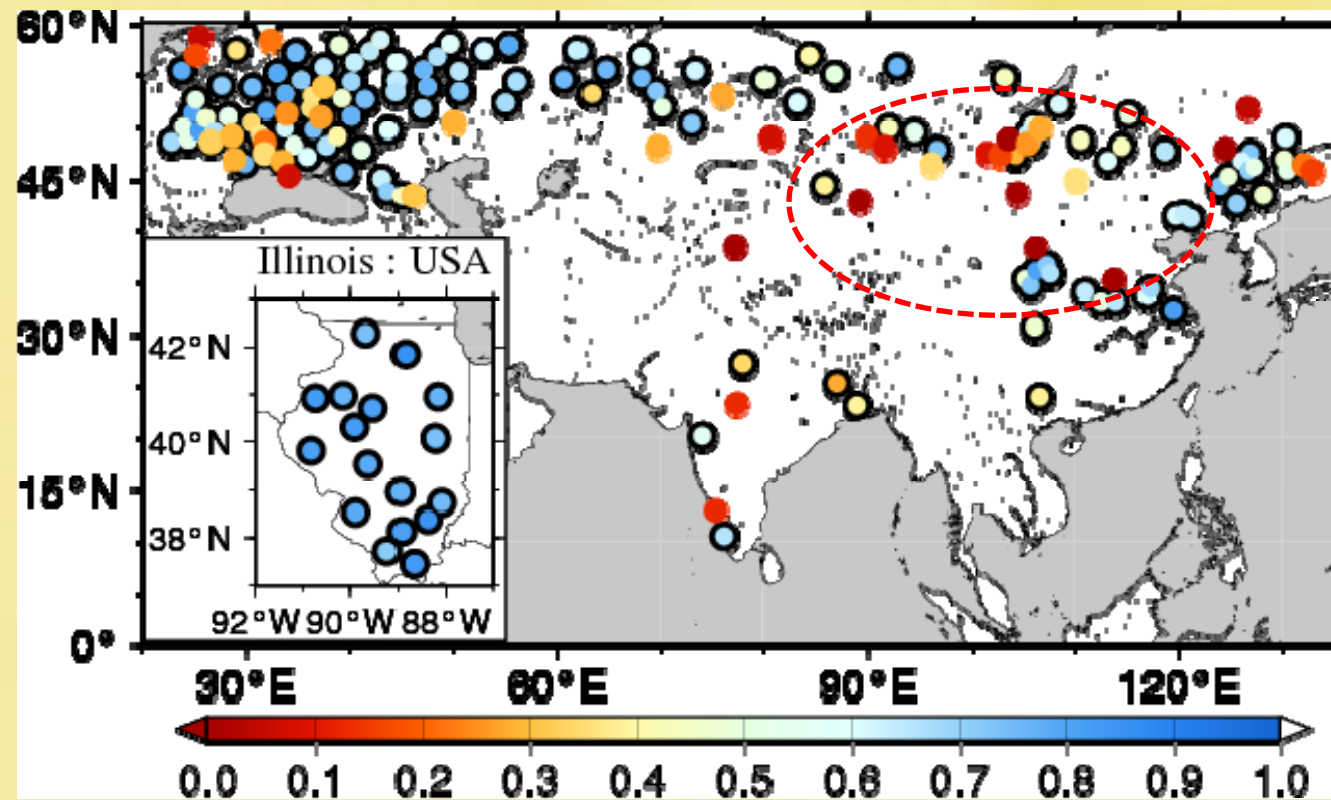


bars: monthly precipitation





## 3rd example: from GSWP2



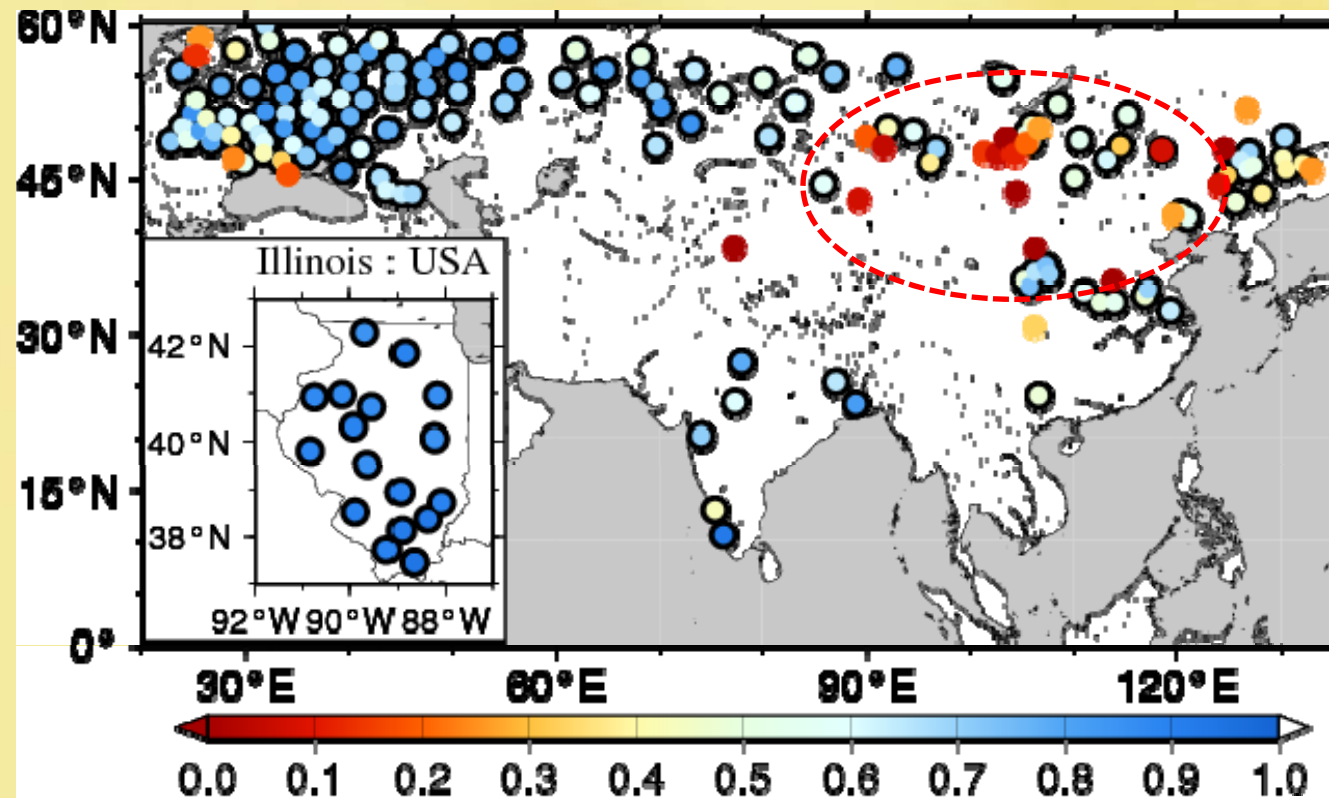
correlation between GSWP2 (mult. models) and GSMDB(obs.)  
(annual means)

figures made by Dr. Yorozu at Kyoto Univ.

20 in reference to Guo, and Dirmeyer (2002) JGR, Vol.111, D22S02



## another example: from GSWP2



correlation between GSWP2(mult. models) and GSMDB(obs.)  
(monthly means)

figures made by Dr. Yorozu at Kyoto Univ.

20 in reference to Guo, and Dirmeyer (2002) JGR, Vol.111, D22S02



# Summary

- ✿ There is, at least, a gap between observation and simulation in Asian dryland especially with evaporation and soil moisture.
- ✿ This can be due to
  - ✿ Lack of our knowledge?
    - observations for validation and for drivers
      - observations are increasing in numbers: CEOP, AsiaFlux
    - soil characteristics, vegetation etc.
      - Are they different from other places?
  - ✿ Lack of study cases?
    - => Let's work together!!!!



# Introduction to ADMIP

Asian Drylands Landsurface Modeling Intercomparison Project

## ✿ Goals

- ✿ Offline testing and improvements of model representation of surface exchange process of heat, water and carbon dioxide at Asian Drylands
  - ✿ especially, at their soil-moisture-limiting stages
- ✿ Regenerating landsurface exchange processes with improved models and parameters





# ADMIP – current framework

## ✿ Research framework

- ✿ under MAHASRI, MAIRS-dryland & CEOP-dryland

## ✿ Principal investigators

- ✿ J. Asanuma, TERC, U. Tsukuba
- ✿ D. Ojima, Colorado State U.

## ✿ Supporting funds (for phase 1)

- ✿ APN (Asia Pacific Network for Global Change Research)
- ✿ ESSP-MAIRS
- ✿ MEXT-JSPS, Japan



2010/06/22





# ADMIP – long term plans

## ✿ phase 1 (being started)

- ✿ PILPS2-type intercomparison
- ✿ off line & observation-based drivers and inputs
- ✿ on a point/points basis

## ✿ phase 2 (in the future)

- ✿ GSWP-type ensemble & regional analysis.
- ✿ reanalysis or grid-based drivers and inputs
- ✿ regional analysis



# ADMIP – models & participants

## ✿ Target Models:

- ✿ Landsurface models and terrestrial ecosystem models and their quasi(off line)-couplings

## ✿ Participating countries

- ✿ Japan, USA, China, Korea, Mongolia, Pakistan, Australia,

## ✿ Participating models

- ✿ Landsurface Models: CLM, CoLM, NOAH, JULES, Sib2, BAIM, SiBUC, MATSIRO
- ✿ Terrestrial Ecosystem Models: VISIT, Biome-BGC, DayCent



# ADMIP – time lines

- ✿ Jul., 2010 Kick off meeting
  - ✿ Beijing, China
  - ✿ hosted by MAIRS-IPO
  - ✿ Jul. 13- MAIRS-UNESCO Training WS
    - ✿ Some trainees will be supported by ADMIP
  
- ✿ mid-Mar. or April, 2011 1<sup>st</sup> International WS
  - ✿ Tokyo, Tsukuba
  - ✿ hosted by TERC, U. Tsukuba