

Observation plan in NE Asia

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RAISE

(**R**angelands **A**tmosphere-Hydrosphere-Biosphere **I**nteraction
Study **E**xperiment in Northeastern Asia)

Period:

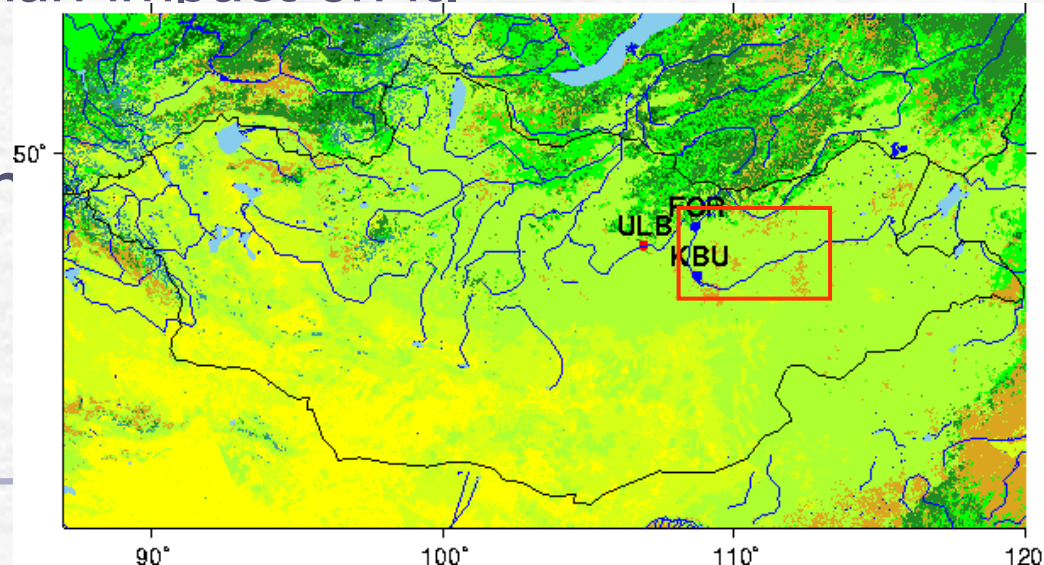
2001/12-2006/11 (Obs. 2002-: IOP 2003)

Objectives:

- Better understandings of the interaction between hydrosphere, atmosphere in the targeted region, and biosphere and human impact on it.

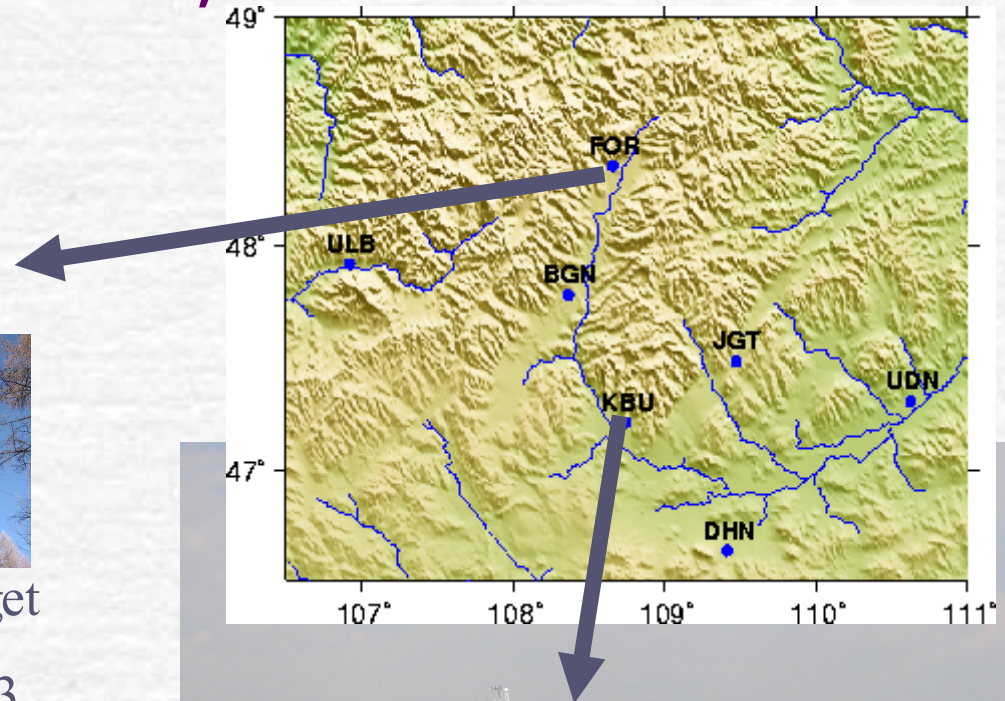
Target Area:

upper Kherlen river basin



Observations; tower flux

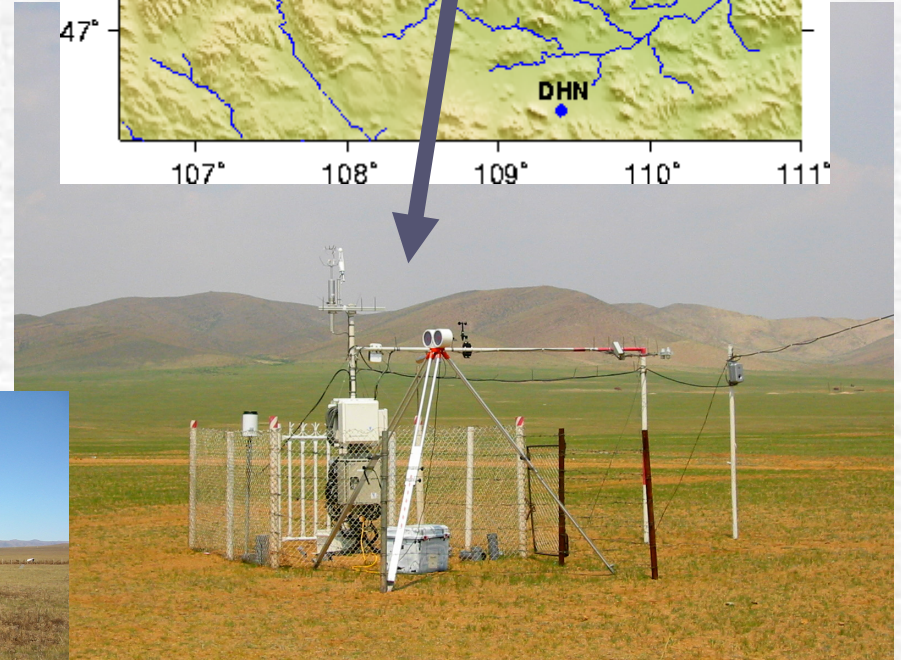
forest(larch forest)



- Radiation, water/heat/carbon budget
- year-round observations since 2003
- First EC flux measurements in the area



fenced area in
KBU

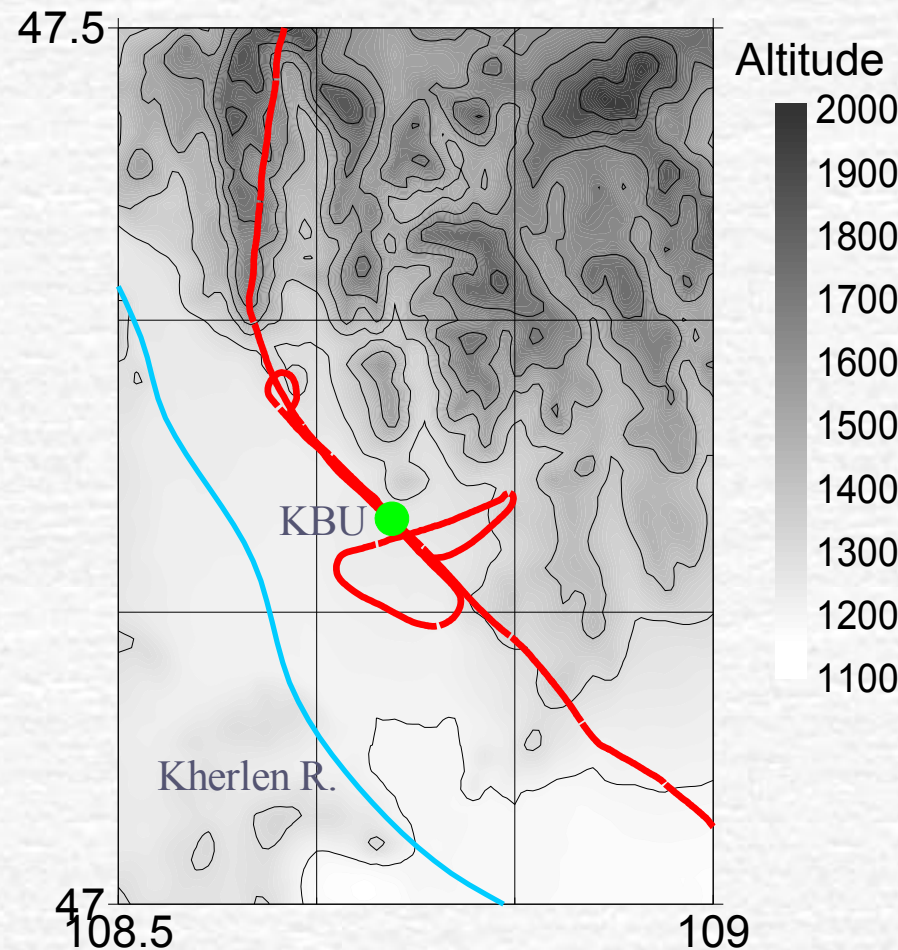
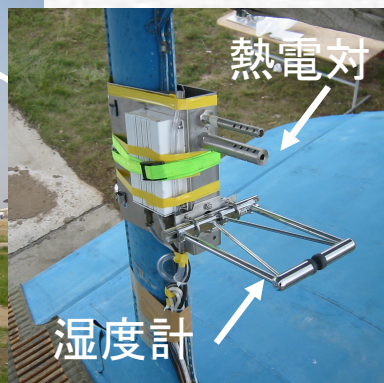


grassland (KBU, semi-arid steppe)

2. 広域地表面熱収支：混合層分散法

Aircraft

- ・ 実施期間：2003年7, 8, 10月 (11回)
- ・ 飛行高度：地上200, 500, 1000m
地上観測サイト上空で高度別に往復
- ・ 飛行パス長：約10km (5分)
- ・ 測定項目：気温, 湿度, 地表面放射温度
短波放射(上下), GPS位置情報
- ・ 記録間隔：気象測定=0.1秒, GPS=2秒
- ・ データ前処理
温湿度：線形トレンド除去



KBU周辺航空機パス(2003/08/22)

Data publications from/through RAISE

Obs. by RAISE (2002-)

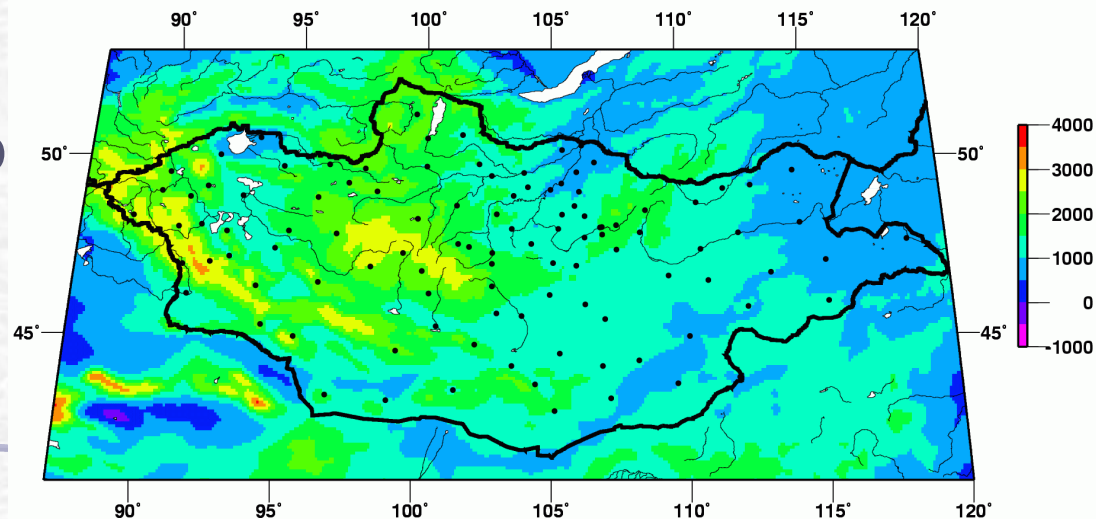
- Water/heat/carbon budget at the 2 tower sites
- GPS precipitable water ; 4 sites
- river discharge, ground water, isotope
- vegetation and soil characteristics
- will be published as DVD in 2007

Obs. by Inst. Met. & Hydro. (1993-RAISE period)

- surface stations
- will be available in 2007 through RAISE data base
- CEOP also has a plan for the data opening.
- Quality check will be involved.

Meteorological Station

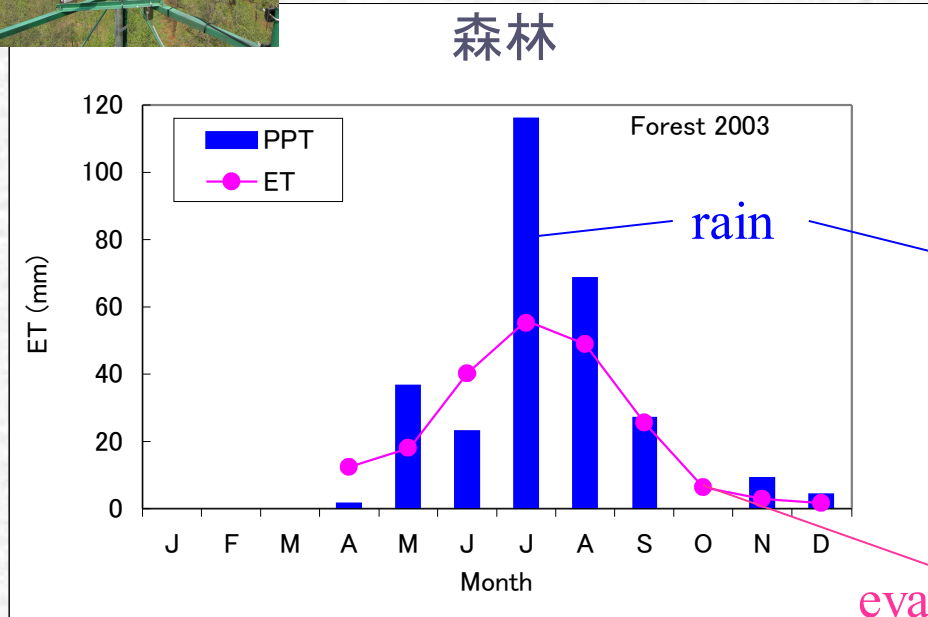
list from "station-only.doc"



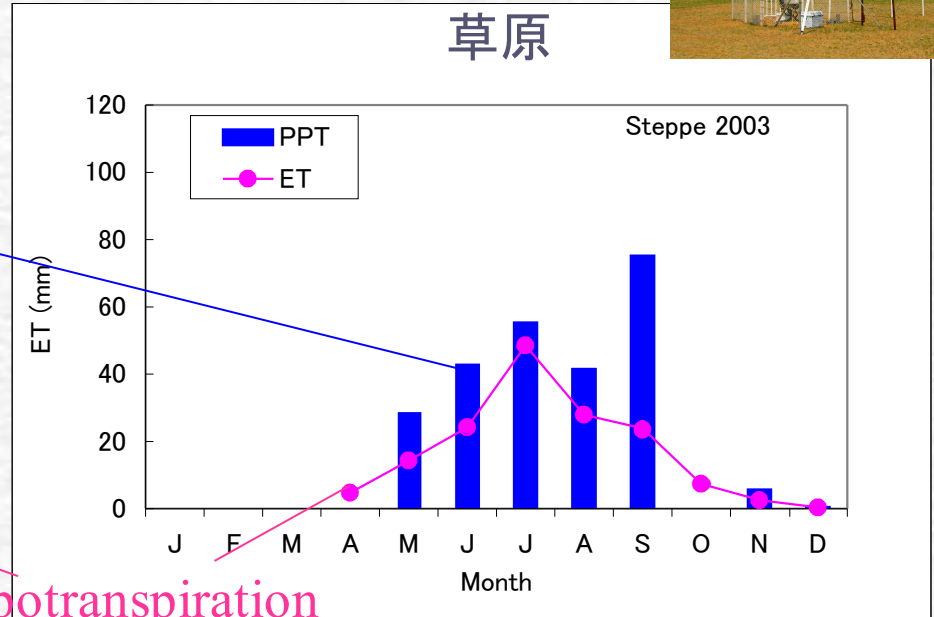
Observed precipitation and evapotranspiration



森林



草原

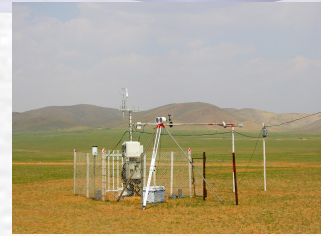
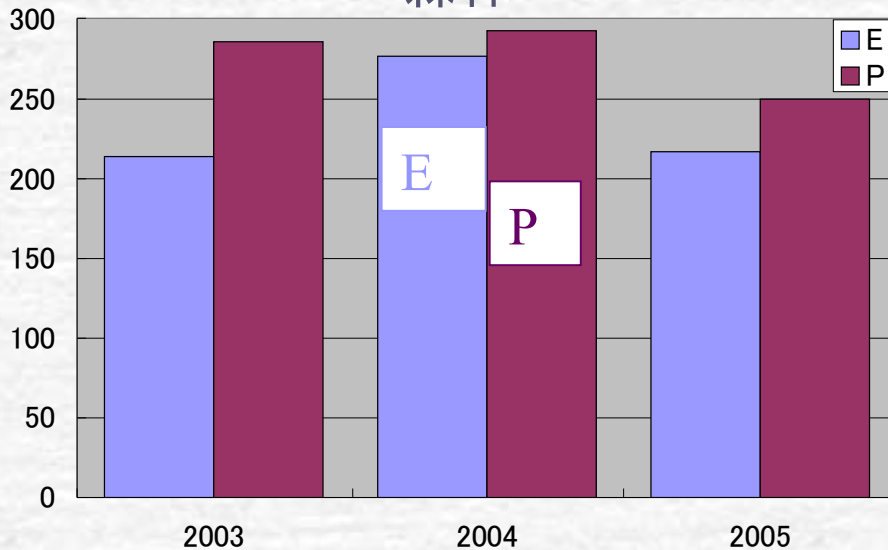


- E at forest is radiation-controlled
- E at grassland is soil-moisture-controlled

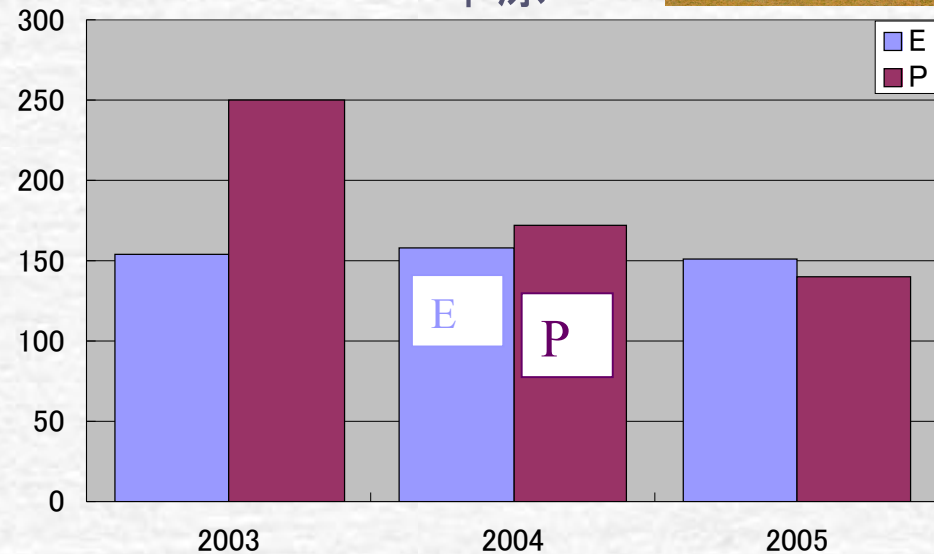
Interannual variation of water budget



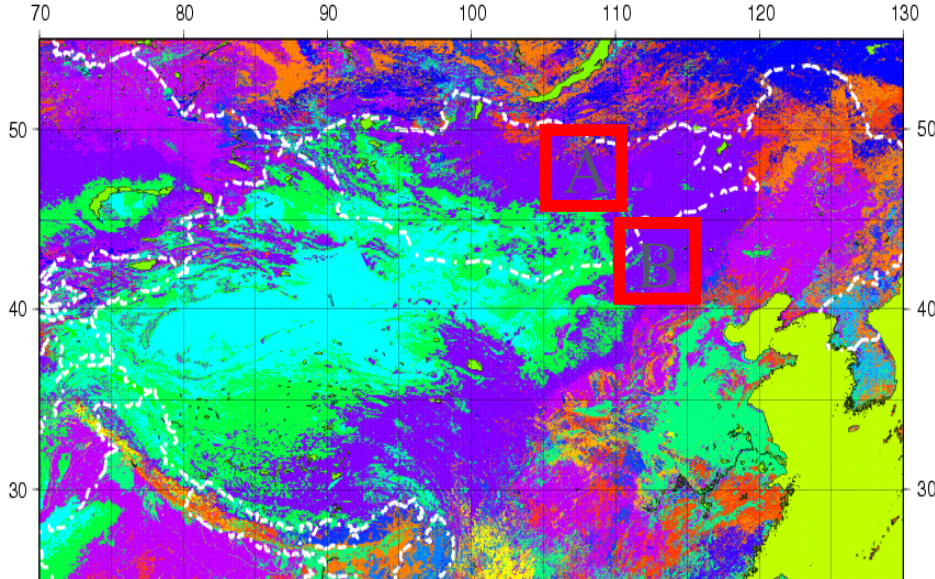
森林



草原



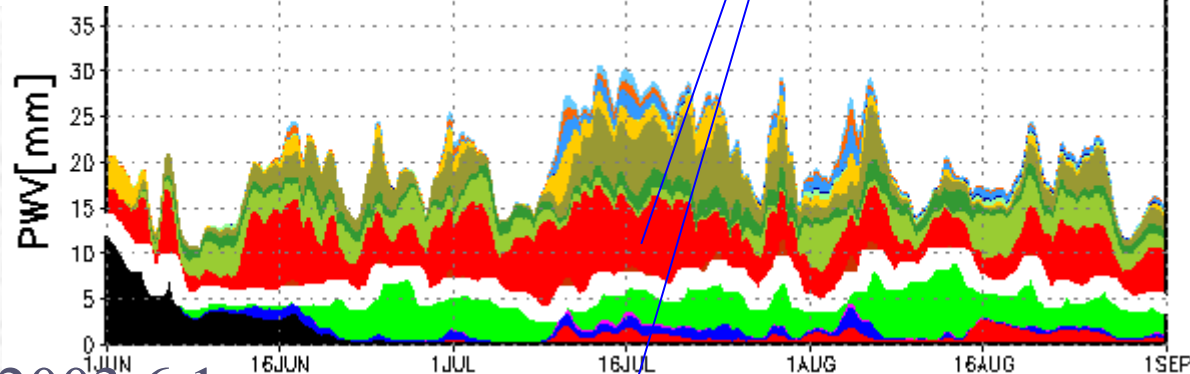
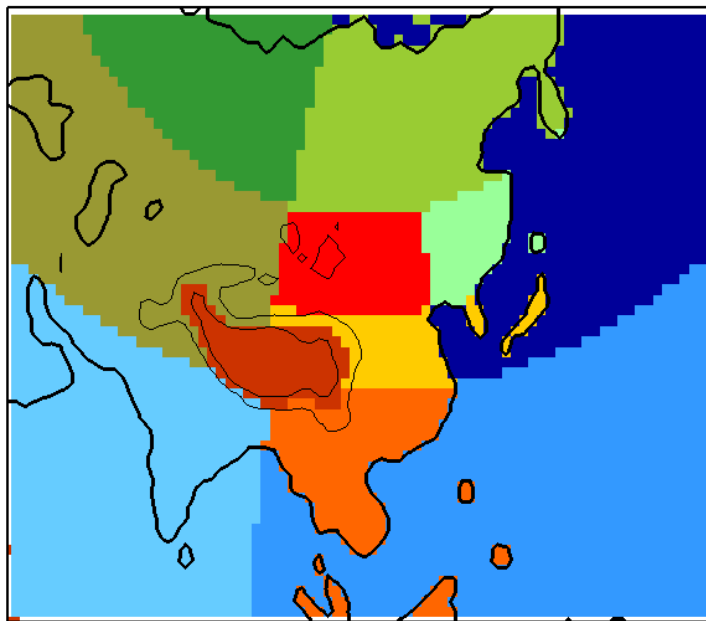
- Larger amount of rain at the forest (upper basin)
 - significant recharge region of groundwater and river water
- Evaporation at the forest follows rainfall
 - radiation-controlled evaporation
- Evaporation at the grassland is almost constant
 - soil-moisture-controlled evaporation



Colored water analysis w/ RCM

Mongolia

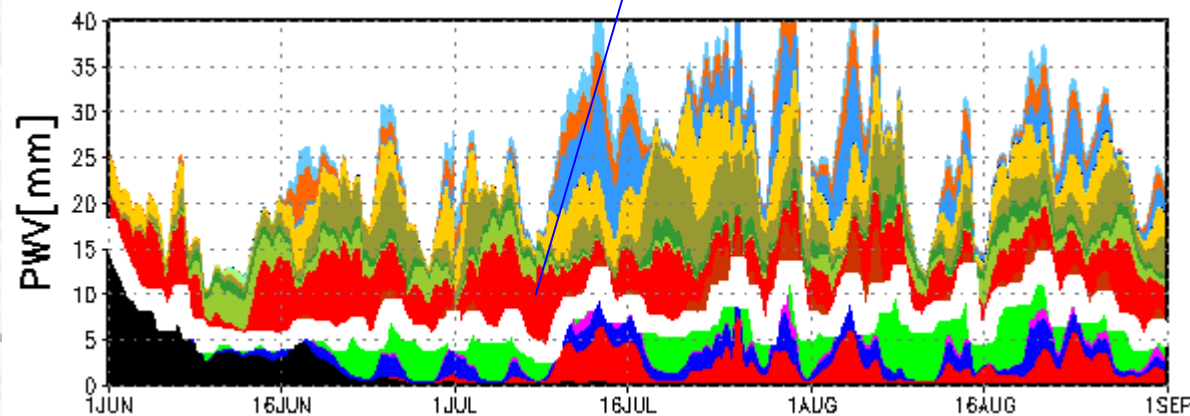
(A) 105-110E, 45-50N



2003.6.1

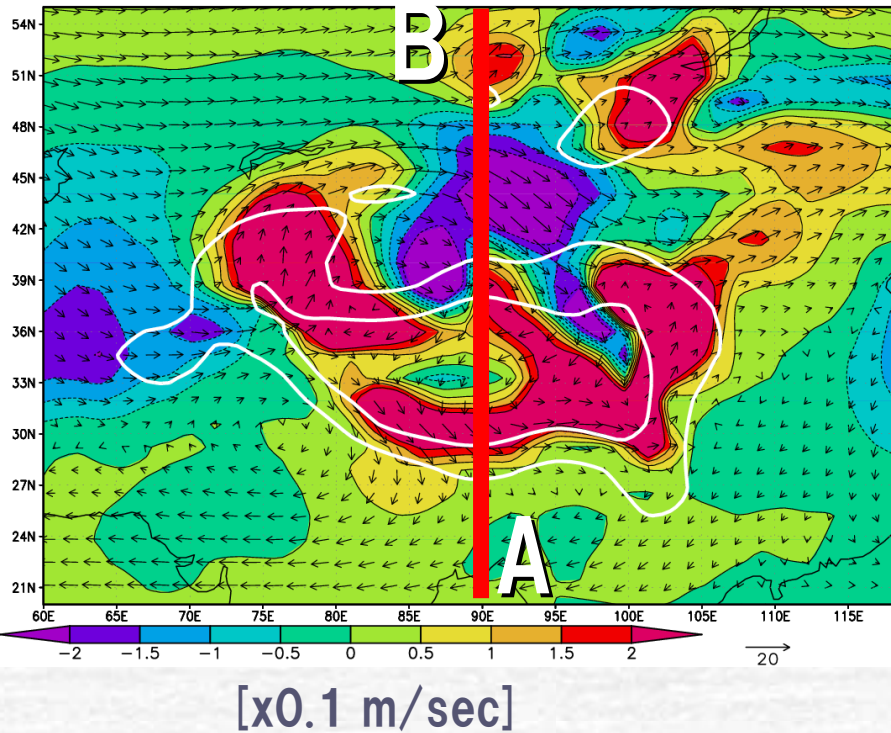
(B) 110-115E-40-45N

2003.9.1

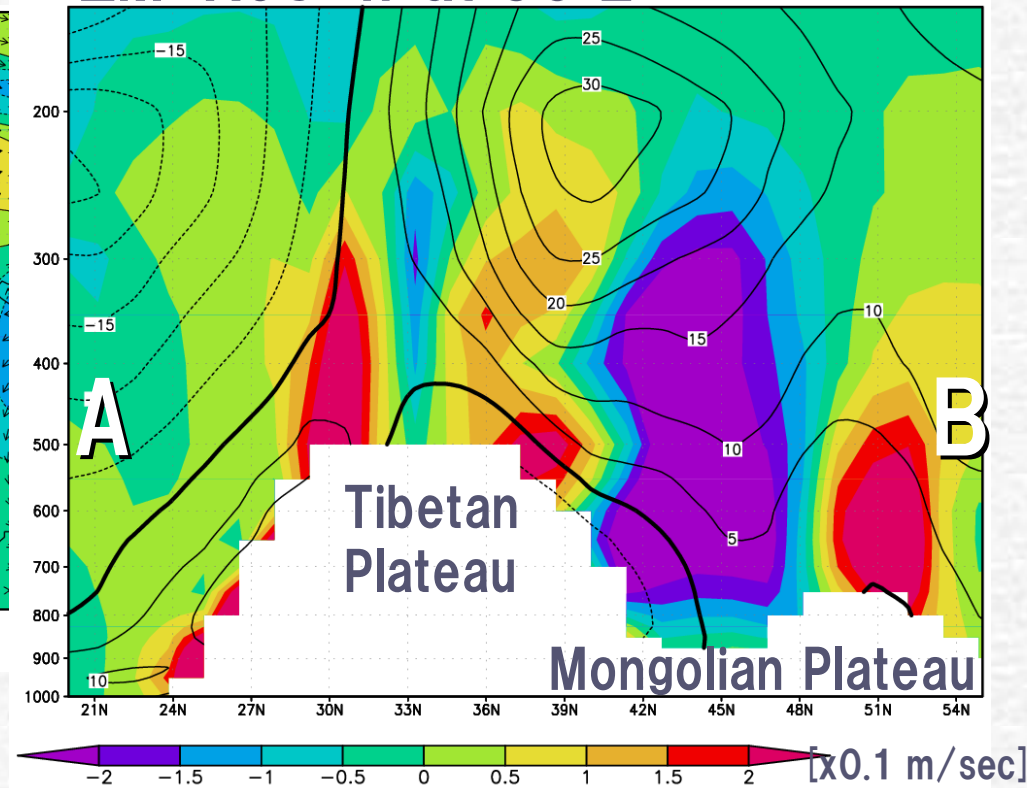


Why it is dry?

ZM-NoC: 500hPa **w**

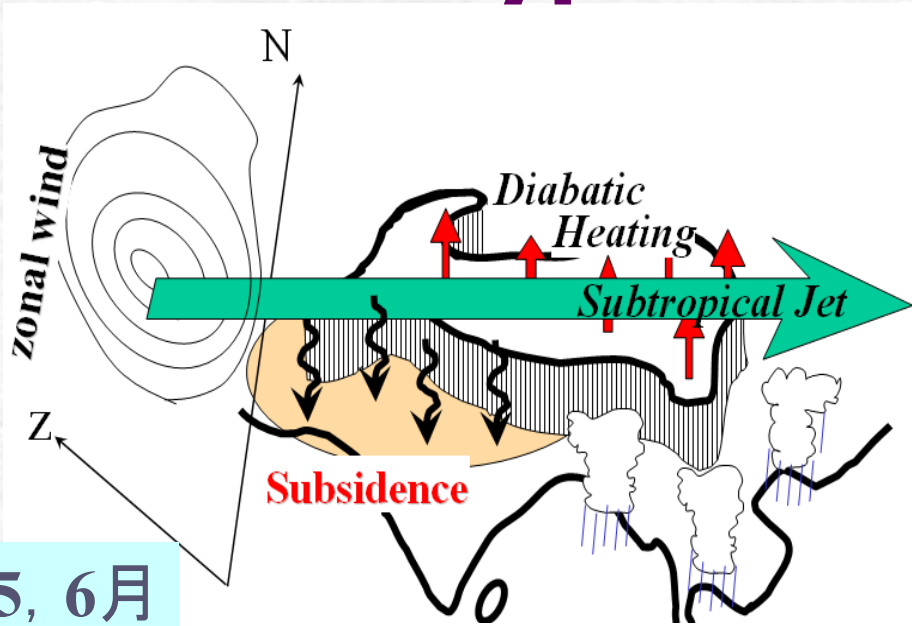


ZM-NoC: w at 90 E



- ❑ ZM-NoC: equilibrium between ZM and radiation
(non-adiabatic heating: radiation only, dry RCM)
- ❑ Dry convection over Tibetan plateau and its slopes
- ❑ Distinct subsidence over the dry region at 300~700hPa

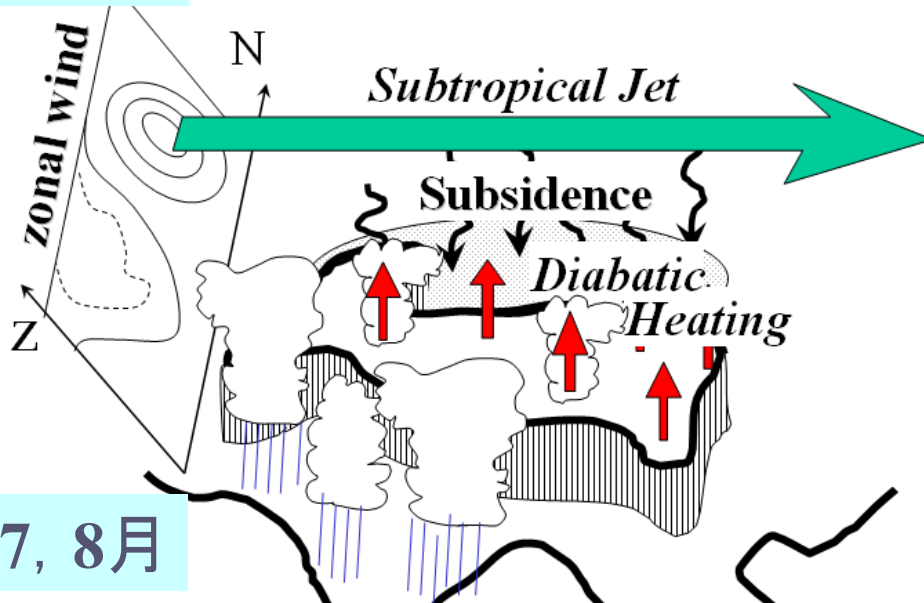
Hypothetical view



In spring when the subtropical jet is located at the south of Tibetan Plateau ...:

Subsidence over northern India.
> delayed monsoon-onset

Sato & Kimura (MWR, in revision)



When the subtropical jet goes up to north....:

Subsidence over north of Tibetan plateau (Taklamakan, Gobi).

> suppressed rainfall in the warm season

Sato & Kimura (2005, GRL)

Future plan

RAISE

- "snap-shot" view for 2-3 years of hydroclimatology of the region



pRAISE

- "interannual variability" of hydroclimatology

Research Targets

☞ Rainfall process

- w ULB radar data & rain gauge mesonet
- Rainfall process
- interannual variations, intra-annual variations

☞ Interannual variation of Land-atmosphere interaction

- vegetation variability and its feedback on the atmosphere
- soil-moisture dynamics and its control on the landsurface process

Future plan (2007-2010) in pRAISE

- Monitoring continued;
 - Kherlen river basin:
 - the 2 tower sites (CEOP reference sites)
 - river discharge, groundwater



Future plan (2007-2010) in pRAISE

- ULB region (in cooperation with IORGCC):
 - Radar data (near ULB airport),
rain gauge mesonet (will be setup)
 - groundwater (in cooperation with IHP)