Monsoon Asia Integrated Regional Study (MAIRS) and Capacity Building

Ailikun

International Program Office of MAIRS

Beijing, China

3rd GEOSS/AWCS workshop, 1Dec 2007, Oita, Japan

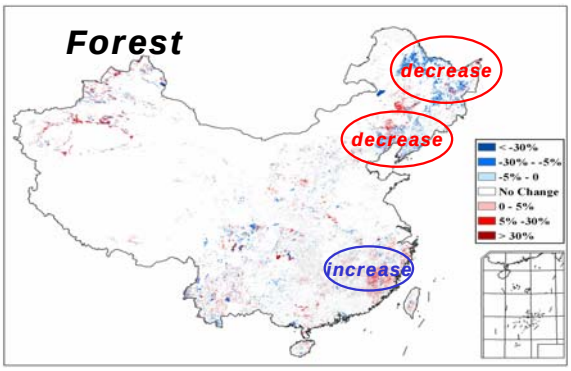
Vision of Monsoon Asia Integrated Regional Study(MAIRS)

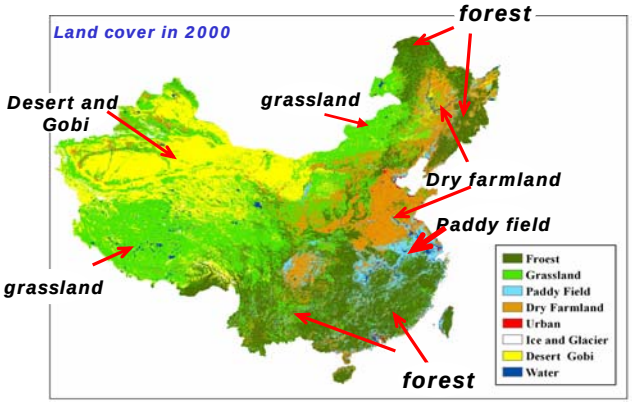
"To significantly advance our understanding of the interactions between the human-natural components of the overall environment in the monsoon Asian region and implications for the global earth system, in order to support the strategies for sustainable development."

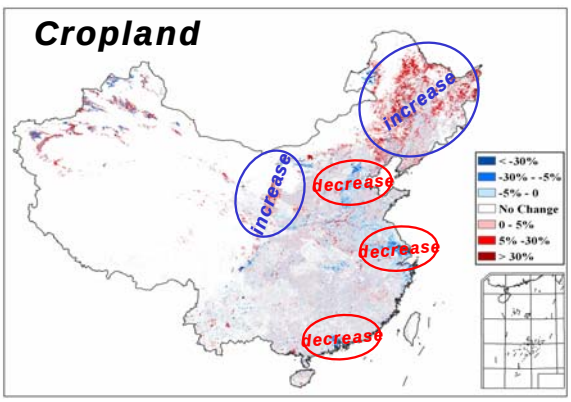
Monsoon Asia is one of the strongest human-driven areas

- 57% of global population, it is the densest area in the world
- Long history of civilization and rapid economic development in recent decades
- Increasing emission of greenhouse gases and air pollutants due to the industrialization and urbanization
- Most significant land degradation and land cover change

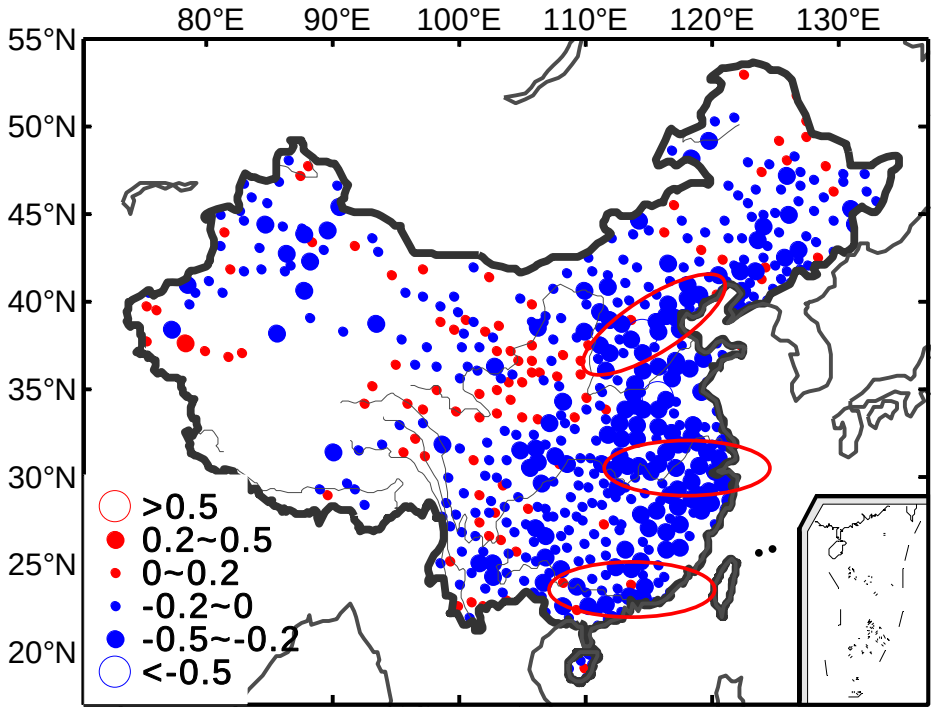
Land use change in China from 1980 to 2000







Change of sunshine duration(hr/d) 1960-2006 (/10a)



By Zhao and Fu, 2007

Functions of Monsoon Asia in Earth System Dynamics

- There are indicators that the intensive and large-scale human activities in Asia may have began to modulate the monsoon system;
- Both the natural process and human perturbation of monsoon system may have profound impacts on the global energy, water and biogeochemical cycles.

Key Questions of MAIRS

- Is the Asian monsoon system resilient to the human transformation of the region's land, water and atmosphere?
- Are societies in the region more, or less vulnerable to changes in the Asian monsoon?
- What are the likely consequences of changes in monsoon Asia on the global climate system?

Major achievements 2006-2007

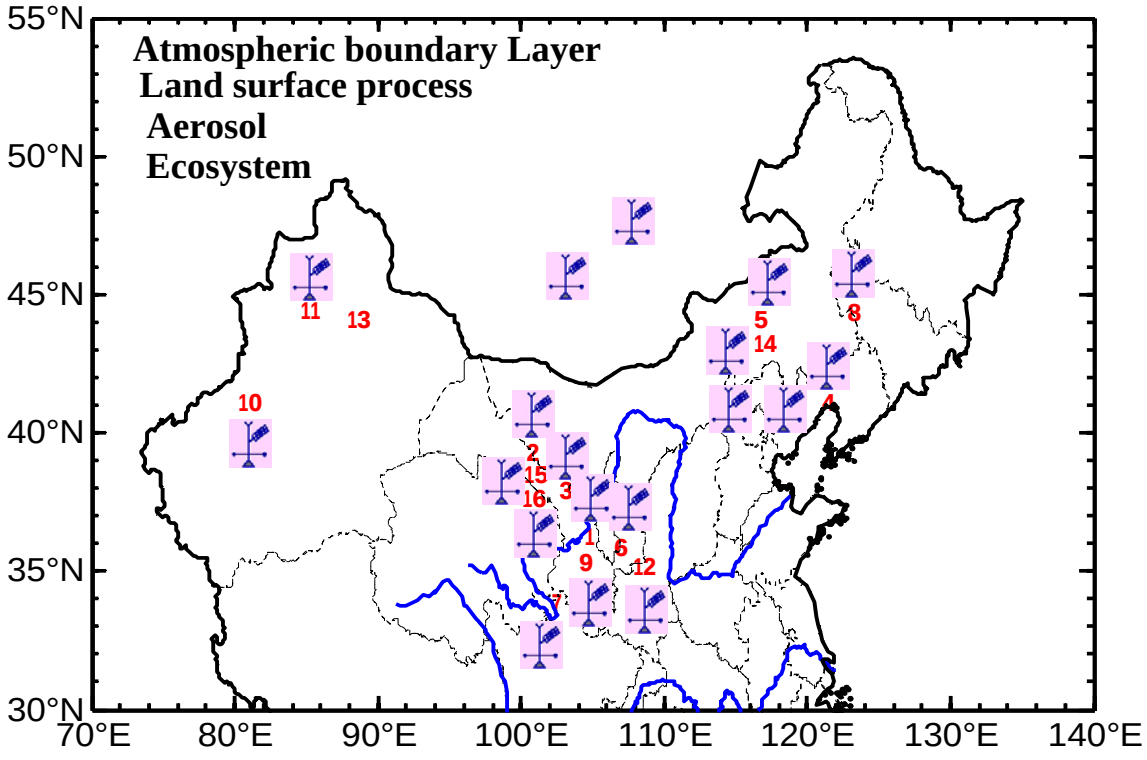
- MAIRS IPO formally opened at Jan 2006.
- MAIRS accepted as the first IRS of ESSP, Nov 2006
- MAIRS Initial Science Plan (WP1) presented, Oct, 2006
- Scientific Steering Committee met 4 times (06, 07)
- Building of MAIRS mountain,urban, coastal, semi-arid working groups
- MAIRS Initial Science Plan formally released in Chinese (WP2), June 2007
- MAIRS mountain group report (WP3)
- International workshops on dryland and urban study

From Planning to Implementation (08-09)

In the following 2 years, MAIRS will focus on developing the muti-discipline observation and researches in

1. Aerosol-cloud-precipitation-climate processes in Monsoon Asia
2. Land use change-climate interaction
3. water cycle/balance in Asian dryland region

MAIRS Muti-discipline Observing Network in Dryland East Asia



Development of Aerosol Observing Network in the Yangtze River Delta Region

Capacity Building for MAIRS

■ As the development of scientific research, MAIRS also wants to share the knowledges and experiences in:

1, regional climate modeling

2, observing and data unifying for study of atmosphere boundary Layer and land-atmosphere process

3, remote sensing Land use/cover change monitoring

4, ground and remote sensing observations of aerosol

Capacity Building for MAIRS

- MAIRS IPO is mainly supported by Chinese Academy of Sciences, especially by the Institute of Atmospheric Physics (IAP), Chinese Academy of Sciences.
- IAP will be the one of the main supporters and drivers for MAIRS capacity building activities.

The Institute of Atmospheric Physics(IAP), CAS

1. The Institute of Atmospheric Physics (IAP) was established in 1928, it was one of the oldest eight institutes in the research of modern natural sciences in China.
2. Under the efforts of several generations of scientists, IAP has become an internationally renowned institute on atmospheric/climate/environment sciences.
3. Now, IAP has 69 professors, 87 associated professors and 105 assistant professors. PhD course students 223, master 95.

IAP

Research centers (9)

- State Key Laboratory of Numerical Modeling for Atmospheric Sciences and Geophysical Fluid Dynamics
- State Key Laboratory of Atmospheric Boundary Layer Physics and Atmospheric Chemistry
- Key Laboratory of Regional Climate- Environment Research for Temperate East Asian, CAS
- Laboratory for Middle Atmosphere and Global Environment Observation
- Laboratory of Cloud-Precipitation Physics and Severe Storms
- International Center for Climate and Environment Sciences
- The Nansen-Zhu International Research Center
- Atmosphere Sub-Center of Chinese Ecosystem Research Network (ASC/CERN)
- East Asian Monsoon System and Climate Predictability Research Center

Supporting teams

- Information and Data Center
- Library
- Editorial Division
- Xianghe Atmospheric Integrated Observatory

The National Key Laboratory of Numerical Modeling for Atmospheric Sciences and Geophysical Fluid Dynamics (LASG)

Research focus

1. The research and development of numerical modeling system
2. Dynamics of weather and climate
3. New theory, method and experiments of weather and climate prediction.
4. Geophysical fluid dynamics

State Key Laboratory of Atmospheric Boundary Layer Physics and Atmospheric Chemistry (LAPC)

Research Areas

•Atmospheric boundary layer structure, turbulent characteristic over various land surface； mass and energy exchange process between the atmosphere and the land surface;

• Aerosols and atmospheric trace gases； monitoring, numerical modeling and prediction of air pollution

Key Laboratory of Regional Climate-Environment for Temperate East Asia (RCE-TEA)

Research Areas

- **Regional climate modeling**
- **Integrated study of Asian monsoon system under regional/global environmental change**
- **studies on abrupt change and extreme events of the regional climate in Asia**

Thank you!

http://www.mairs-essp.org
Info@mairs-essp.org
Or
mairs@mairs-essp.org